DRAINAGE REPORT
FOR
WATERSHED SUBDIVISION

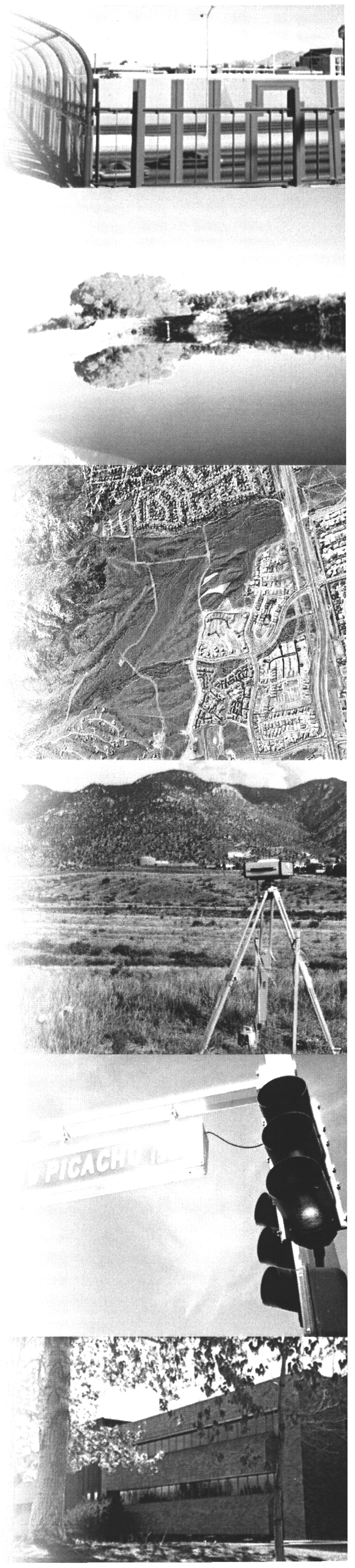
APRIL 9, 2004

Prepared for:

Westland Development

401 Coors Boulevard NW

Albuquerque, NM 87121



Bohannan ▲ Huston INC.

ENGINEERING ▲

SPATIAL DATA ▲

ADVANCED TECHNOLOGIES ▲

DRAINAGE REPORT
FOR
WATERSHED SUBDIVISION

APRIL 9, 2004

Prepared for:

WESTLAND DEVELOPMENT
401 COORS BOULEVARD NW
ALBUQUERQUE, NM 87121

Prepared by:

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RECEIVED
APR 09
HYDROLOGY SECTION

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Bohannan ▲ Huston INC.

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I. PURPOSE AND EXECUTIVE SUMMARY

The purpose of this report is to present the drainage management plan for Watershed Subdivision and to obtain City of Albuquerque approval of the preliminary/final plat and grading plan. The proposed development of Watershed Subdivision consists of 139 single family residential lots and 10 tracts on 44.68 acres.

II. METHODOLOGIES

Site conditions will be analyzed for a 10-year and 100-year, 6-hour storm event in accordance with the City of Albuquerque Drainage Ordinance and the January 1993 City of Albuquerque Development Process Manual (DPM) Volume 2, Design Criteria, Section 22.2, Hydrology.

The site, as described in the 'Site Location and Characteristics' section below, is 44.68 acres. Part A of the DPM, Section 22.2, provides a simplified procedure for projects with sub-basins smaller than 40 acres, therefore, the site was divided into smaller sub-basins.

This report references the following reports:

1) *West Interstate 40 Diversion Drainage Management Plan (DMP)* dated March 2000, which was prepared for AMAFCA by Bohannan Huston, Inc. The West I-40 DMP addresses West Side drainage issues. An area of approximately 40 square miles was analyzed. The DMP boundaries are: the Rio Puerco escarpment on the west, Double Eagle II Airport and Vulcan Volcano on the north, Coors Boulevard and the Rio Grande Bluff on the east, and Bluewater Road and I-40 on the south. The West I-40 DMP report was prepared to support future drainage plans submitted for the development of individual land parcels within the study area; to provide design guidance for the installation of major drainage infrastructure to be constructed in advance of, or simultaneously with individual parcel development; and to provide fully developed flow rates for basins within the study area.

2) *Design Analysis Report Basalt View St., Ladera Blvd. & Prieta Vista Blvd.* prepared by Bohannan Huston, Inc., October 12, 2000. This drainage report shows analysis for the offsite basins, which will impact the on-site basins and storm system for the proposed Watershed Subdivision. In particular it analyzes Tierra Pintada Street drainage characteristics. A portion of Tierra Pintada Street drainage will be captured by inlets and drain to the proposed storm system on-site.

3) *Preliminary Grading and Drainage Plan for the Park West Subdivision*by prepared April 21, 1994. This drainage plan gives the design flow for the Ladera Channel, which our site is to discharge into.

III. SITE LOCATION AND CHARACTERISTICS

Watershed Subdivision is located at the northwest end of existing 98th Street. More specifically, the subdivision is bordered by proposed Tierra Pintada Street to the south, future Tract M to the west, the Petroglyph National Monument to the north and existing Parkwest Unit 3 subdivision to the east. The site will be accessible from proposed Tierra Pintada Street off existing 98th Street.

IV. EXISTING HYDRAULIC AND HYDROLOGIC CONDITIONS

In its existing condition, the site consists of mainly undeveloped land that is currently used for the grazing of cattle. It is covered with native vegetation. The land drains, in general, from northwest to southeast at slopes ranging from 3.5% to 12%. The majority of the site slopes uniformly at an average of 5.5%. The site consists of mainly undeveloped land. The College Zone 2 West Reservoir is located in the northwest corner of the site.

The existing drainage basins and patterns for developed flows are shown graphically on Exhibit 3, called Existing Drainage Basin Map, which was taken from the West 1-40 DMP. There are a number of drainage facilities currently in this development area. The Ladera Dam System

collects the flows that discharge from the Ladera watershed, located north of I-40. Currently the L14 sub-basins flow southeast through the site and into the Ladera Channel to Dam #14. For additional information regarding the existing drainage conditions, please refer to the West 1-40 DMP (March 2000).

The natural soils consist of slightly silty to silty sands. Vegetation on the site consists of weeds, grass and some cacti. There is FEMA Floodplains located along the Mirahaven Arroyo and just outside the north boundary of the proposed development, see Exhibit 6.

V. PROPOSED HYDRAULIC AND HYDROLOGIC CONDITIONS

Exhibit 3-5, Existing Drainage Basin Map, Proposed Drainage Basin Map and the Grading and Drainage Plan respectively, enclosed in the Exhibit section of this report, are provided to facilitate the readers understanding of this section of the Watershed Drainage Report.

Discharge generated by Watershed Subdivision will flow south on Spillway Street and Watershed Drive, and east on Tributary Road, Waterway Road, Watercourse Street, and Aquifer Road when fully developed. Most of the flow generated will travel to Tributary Road and to a low point at the intersection of Aquifer Road and Groundwater Street and be collected by inlets which will discharge runoff via proposed storm drains into the existing Ladera Channel. A small portion of the subdivision will flow directly into Tierra Pintada Street and be captured by inlets; this flow will also be conveyed to the Ladera Channel.

A. On-Site Basins

The proposed site is broken into nine (9) major basins. The basins have been divided into sub-basins for analysis reasons. Major basins are described below. For sub-basin data, see Appendix A.

Basin A (5.89 ac, Q100=19.35cfs) encompasses Spillway Street from Aquifer Road to Spillway stub street and Aquifer Road from Spillway Street to Watershed Drive,

and contains Sub-basins A-1, A-2 and A-3; see Appendix A for more information. Basin A contains seventeen (17) lots, #1-10 and 36-42. Basin B (7.58 ac, Q100=25.12cfs) consists of Watercourse Street and Waterway Road from Spillway Street to Watershed Drive, and Watershed Drive, from a high point just north of Waterway Road to the intersection of Aquifer Road; see Appendix A for more information. Basin B contains twenty-five (25) lots, #11-35. The runoff from Basin A, along with the future Offsite Basin 1A (4.71 ac, Q100=15.0cfs), will travel south on Spillway Street and then east on Aquifer Road. The runoff from Basin B will flow east on Watercourse Street and Waterway Road, along with the Park Basin (4.12 ac, Q100= 8.68cfs), and will combine to flow south on Watershed Drive. Basins A and B will merge at the intersection of Aquifer Road and Watershed Drive and be collected by a series of inlets and a cattleguard inlet along the south side of Watershed drive.

Basin C (8.57 ac, Q100=26.77cfs) encompasses the remaining portion of Aquifer Road, from Watershed Drive to Groundwater Street, and the southern portion of Groundwater Street from a high point midway along the street and contains Sub-basins C-1 and C-2; see Appendix A for more information. Basin C consists of thirty-one (31) lots, #102-115 and 123-139. Runoff generated by Basin C will flow east down Aquifer Road and south down Groundwater Street. Basin C, along with the residual from Basin A and Basin B (12.7cfs), will be collected by two Type "A" inlets in a sump condition. Since there will be no emergency spillway, the inlet will be designed for the two times the 100-year storm event (38.47cfs per inlet).

Basin D (6.97ac, Q100=22.66cfs) consists of the northern portion of Watershed Drive from a high point just north of Waterway Road, Tributary Road west of Watercourse Street and the remaining portion of Waterway Road east of Watershed Drive, and contains Sub-basins D-1, D-2, D-3 and D-4; see Appendix A for more information. Basin D consists of twenty-one (21) lots, #43-46 and 59-75. The runoff from Basin D will flow north on Watershed Drive, northeast on Waterway Road and east along Tributary Road to be

collected by two Type "A" inlets just west of Watercourse Street, leaving a residual (9.96cfs) to continue east on Tributary Road.

Basin E (6.39ac, Q100=19.93cfs) includes Watercourse Street and the remaining portion of Watercourse Street east of Watershed Drive; see Appendix A for more information. Basin E consists of twenty-six (26) lots, #76-101. The runoff from Basin E will flow east and then north on Watercourse Street and be collected by a two Type "A" inlets, leaving a residual (8.11cfs) to continue to flow to Tributary Road.

Basin F (0.30ac, Q100=1.25cfs) consists of a portion of Tributary Road between Watercourse Street and Groundwater Street; see Appendix A for more information. The runoff from Basin F will flow east on Tributary Road and be collected, along with the residual from Basin D (9.96cfs) and Basin E (8.11cfs), by a Type "A" inlet, leaving a residual flow (13.3cfs) to continue to flow east on Tributary Road.

Basin G (2.11ac, Q100=6.79) includes the remaining portions of Aquifer Road and Tributary Road, and contains Sub-basins G-1 and G-2; see Appendix A for more information. Basin G consists of seven (7) lots, #116-122. The runoff from Basin G will travel north on Aquifer Road to Tributary Road and then east on Tributary Road, along with the residual from Basin F (13.31cfs) to be collected by inlet in a sump condition. Since there will be no emergency spillway, the inlet will be designed for the two times the 100-year storm event (38.98cfs).

Basin H (6.31ac, Q100=19.70cfs) consists of the lots along the north most edge of the subdivision; see Appendix A for more information. Basin H contains twelve (12) lots, #47-58. In accordance with the Petroglyph National Monument, these lots will be minimally graded to retain existing contours. The runoff from Basin H will flow northeast with the existing grade and into the existing arroyo, with berms being added between lots to prevent cross lot drainage. Backyard ponds will also be required to reduce erosion impacts to the arroyo. Each lot will be required to have individual grading and drainage

plans prepared by a New Mexico Professional Engineer and reviewed and approved by the Architectural Control Committee.

Basin J (0.56ac, Q100=2.34cfs) is the portions of the Spillway Street and Watershed Drive entrances off of Tierra Pintada Street up to Aquifer Road; see Appendix A for more information. The runoff from Basin J will flow into Tierra Pintada St. and be collected by proposed inlets.

In summary, inlets along Tributary Road and Aquifer Road will collect the majority of the runoff. All of the inlets will drain to their respective storm systems which will all be directed to the Ladera Channel. See Appendix C, Inlet Analysis, for flow distributions.

B. Off-Site Basins

There will be three (3) proposed offsite basins; see Proposed Drainage Basin Map in the Exhibit section at the back of this report.

Basin Offsite 1 (46.65ac, Q_{100}= 149.97cfs) is located west of the site and north of the Mirahaven Arroyo. Basin Offsite 1 will be developed in the future. In the interim the runoff generated will flow southeast into the Mirahaven Arroyo. When the future site is developed, a portion of the basin will be allowed to drain into the Watershed subdivision. Basin Offsite 1A (4.71ac, Q_{100}=15.0cfs) will be assumed to drain into Spillway Street and then be collected along with Basin A.

The northeastern portion of Tierra Pintada St. (8.31ac, Q_{100}= 34.37cfs) was designed with the *Design Analysis Report Basalt View St., Ladera Blvd. & Prieta Vista Blvd.* to be collected by two Type "A" and two Type "C" inlets west of existing 98th Street. These inlets will be connected to proposed storm system in Aquifer Road and drain to the Ladera Channel.

College Zone 2 West Reservoir Site, existing L14.1, L14.2, and approximately half of L14.3 will continue to flow east along the north border of the site into the Ladera Channel.

In summary, all of the flow generated by the basins mentioned above would eventually flow directly into the Ladera Channel or into the proposed storm drain system and discharge to the Ladera Channel. The Ladera Channel is designed for Q=687cfs. The proposed development will discharge 164 cfs along with 478 cfs from the offsite for a total of 642cfs, which is less than the design flow..

VI. CONCLUSION

This report has provided hydrologic and hydraulic considerations of the proposed development of Watershed Subdivision at Westland. This report is in conformance with *The West Interstate 40 Diversion Drainage Management Plan* as well as the *Design Analysis Report Basalt View St., Ladera Blvd. & Prieta Vista Blvd.* which addresses offsite flows generated by this project and the *Preliminary Grading and Drainage Plan for the Park West Subdivision* which gives capacities of the Ladera Channel. This information provides adequate supporting documentation and guidance for approval of this report and to guide future development and phasing of the properties previously mentioned. These flows can be safely conveyed by the improvements proposed in this drainage plan to the existing storm drain system in Ladera Drive, which has adequate capacity to accept such runoff. Erosion and dust control, consisting of erosion control berms, silt fencing and sedimentation basins, are proposed to prevent soil washing or blowing into paved streets, storm drains, and existing development areas. Therefore, we believe this report supports the preliminary/final plat and grading plan submittals and should be approved as requested.

APPENDICES

APPENDIX A: BASIN ANALYSIS

APPENDIX B: STREET HYDRAULICS

APPENDIX C: INLET ANALYSIS

APPENDIX D: STORM DRAIN SYSTEM ANALYSIS

APPENDIX A

BASIN ANALYSIS

Watershed at Westland

BASIN I.D.	AREA (AC)	UNITS #		% LAND TREATMENT A	B	C	D[1]		DISCHARGE (CFS) 10 YR	100YR
HYRDOLOGICAL VOLUMETRIC & DISCHARGE DATA (EXISTING CALCULATED)										
OFF A	4.20			50.0%	50.0%	0.0%	0.0%		2.1	6.9
OFF B	4.42			50.0%	50.0%	0.0%	0.0%		2.2	7.3
BASIN 1	46.65			50.0%	50.0%	0.0%	0.0%		23.4	76.7
TOTAL	55.27								27.8	90.9
HYRDOLOGICAL VOLUMETRIC & DISCHARGE DATA (DEVELOPED)										
ONSITE										
A-1	1.94	7		0.0%	32.4%	32.4%	35.2%		3.4	6.06
A-2	0.89	0		0.0%	5.0%	5.0%	90.0%		2.4	3.72
A-3	3.06	10		0.0%	32.4%	32.4%	35.2%		5.3	9.55
B-1	2.36	9		0.0%	32.4%	32.4%	35.2%		4.1	7.37
B-2	3.85	16		0.0%	32.4%	32.4%	35.2%		6.7	12.02
B-3	1.37	0		0.0%	5.0%	5.0%	90.0%		3.7	5.72
C-1	5.76	20		0.0%	32.4%	32.4%	35.2%		10.0	17.98
C-2	2.81	11		0.0%	32.4%	32.4%	35.2%		4.9	8.77
D-1	1.80	4		0.0%	32.4%	32.4%	35.2%		3.1	5.62
D-2	0.89	3		0.0%	32.4%	32.4%	35.2%		1.5	2.78
D-3	0.85	0		0.0%	5.0%	5.0%	90.0%		2.3	3.55
D-4	3.43	14		0.0%	32.4%	32.4%	35.2%		6.0	10.71
E-1	6.39	26		0.0%	32.4%	32.4%	35.2%		11.1	19.95
F-1	0.30	0		0.0%	5.0%	5.0%	90.0%		0.8	1.25
G-1	0.17	0		0.0%	5.0%	5.0%	90.0%		0.5	0.71
G-2	1.94	7		0.0%	32.4%	32.4%	35.2%		3.4	6.06
H-1	6.31	12		0.0%	32.4%	32.4%	35.2%		11.0	19.70
J-1	0.25	0		0.0%	5.0%	5.0%	90.0%		0.7	1.04
J-2	0.31	0		0.0%	5.0%	5.0%	90.0%		0.8	1.30
SUBTOTAL	44.68	139							65.8	115.8
OFFSITE										
OFF BASIN 1	46.65	0		0.0%	30.0%	30.0%	40.0%		85.1	149.97
(OFF BASIN 1A)	4.71	0		0.0%	30.0%	30.0%	40.0%		8.6	15.14
PARK	4.56	0		0.0%	90.0%	10.0%	0.0%		3.8	9.60
TRACT A	3.33	0		0.0%	90.0%	10.0%	0.0%		2.7	7.01
SUBTOTAL	59.25	0							100.2	181.7

NOTES: 1) Impervious percentages for developed flows were calculated from the DPM equation a-4. The remaining percentages were distributed evenly between land treatment types B and C, except for Basin D which were taken from Table A-5 and the rest placed in land treatment type B.

N=UNITS/ACRES = 3.1

%D= 7*SQRT((N*N)+(5*N)) = 35.2%

APPENDIX B

STREET HYDRAULICS

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

28ff/46rw std full 0.64%

MANNING'S N= .017 SLOPE= .0064

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	37.17	0.67
2	8.37	0.67	6	23.00	0.37	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.85
4	9.00	0.00	8	37.00	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)
0.05	0.05	0.04	0.0	1.71	0.58	1.63	0.01	0.06
0.10	0.10	0.16	0.1	3.41	0.92	3.25	0.01	0.11
0.15	0.15	0.39	0.4	6.82	1.03	6.58	0.02	0.17
0.20	0.20	0.84	1.0	11.92	1.19	11.60	0.02	0.22
0.25	0.25	1.55	2.2	17.03	1.41	16.63	0.03	0.28
0.30	0.30	2.50	4.1	22.13	1.64	21.65	0.04	0.34
0.35	0.35	3.71	6.9	27.23	1.85	26.68	0.05	0.40
0.40	0.40	5.11	11.3	28.84	2.21	28.20	0.08	0.48
0.45	0.45	6.52	16.9	28.94	2.59	28.23	0.10	0.55
0.50	0.50	7.93	23.4	29.04	2.94	28.25	0.13	0.63
0.55	0.55	9.35	30.6	29.15	3.28	28.28	0.17	0.72
0.60	0.60	10.76	38.6	29.25	3.59	28.30	0.20	0.80
0.65	0.65	12.18	47.4	29.35	3.89	28.33	0.23	0.88
0.70	0.70	13.66	53.0	33.11	3.88	32.05	0.23	0.93
0.75	0.75	15.38	59.1	37.76	3.84	36.70	0.23	0.98
0.80	0.80	17.33	66.8	42.41	3.85	41.35	0.23	1.03
0.85	0.85	19.52	75.9	47.06	3.89	46.00	0.23	1.08

Aquifer

Q = A-1 + A-2 + A-3 + Off 1A = 34.35 cfs

d = 0.57

V = 3.43

E = 0.76 < 0.85 ok

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

48ff/66rw inverted full 4.15%

MANNING'S N= .017 SLOPE= .0415

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	1.41	5	11.00	0.42	9	57.63	0.67
2	8.37	1.22	6	55.00	0.13	10	66.00	0.84
3	8.83	1.22	7	57.00	0.00	11	0.00	0.00
4	9.00	0.55	8	57.17	0.67	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)
0.05	0.05	0.02	0.0	0.85	1.47	0.81	0.03	0.08
0.10	0.10	0.08	0.2	1.71	2.34	1.63	0.09	0.19
0.15	0.15	0.22	0.5	5.89	2.02	5.77	0.06	0.21
0.20	0.20	0.70	1.7	13.40	2.49	13.24	0.10	0.30
0.25	0.25	1.55	4.9	20.91	3.14	20.71	0.15	0.40
0.30	0.30	2.77	10.4	28.42	3.77	28.18	0.22	0.52
0.35	0.35	4.37	19.1	35.93	4.37	35.65	0.30	0.65
0.40	0.40	6.34	31.3	43.43	4.93	43.12	0.38	0.78
0.45	0.45	8.62	49.6	46.93	5.75	46.58	0.51	0.96
0.50	0.50	10.97	73.2	47.75	6.68	47.36	0.69	1.19
0.55	0.55	13.35	100.5	48.58	7.53	48.14	0.88	1.43
0.60	0.60	15.76	132.3	48.68	8.40	48.16	1.09	1.69
0.65	0.65	18.17	167.5	48.78	9.22	48.19	1.32	1.97
0.70	0.70	20.62	201.2	50.79	9.76	50.15	1.48	2.18
0.75	0.75	23.18	237.0	53.31	10.22	52.62	1.62	2.37
0.80	0.80	25.88	276.0	55.82	10.67	55.09	1.77	2.57
0.85	0.85	28.69	320.2	57.84	11.16	57.08	1.93	2.78
0.90	0.90	31.55	374.8	57.89	11.88	57.09	2.19	3.09
0.95	0.95	34.40	432.7	57.94	12.58	57.10	2.46	3.41
1.00	1.00	37.26	493.9	58.00	13.26	57.11	2.73	3.73
1.05	1.05	40.11	558.3	58.05	13.92	57.13	3.01	4.06
1.10	1.10	42.97	625.8	58.10	14.56	57.14	3.29	4.39
1.15	1.15	45.83	696.2	58.15	15.19	57.15	3.58	4.73
1.20	1.20	48.68	769.6	58.20	15.81	57.16	3.88	5.08
1.25	1.25	51.58	830.6	59.97	16.10	58.92	4.03	5.28
1.30	1.30	54.58	891.5	62.12	16.33	61.06	4.14	5.44
1.35	1.35	57.68	955.8	64.26	16.57	63.21	4.26	5.61
1.40	1.40	60.90	1023.5	66.41	16.81	65.36	4.39	5.79
1.41	1.41	61.88	1044.5	67.06	16.88	66.00	4.42	5.84

Watershed - Inlet 1

Q. 1/2(B-1+B+2+B+4+Park) = 17.4 cfs

d = 0.34

V = 4.25

E = 0.62 < 0.85 OK

Inlet - 2

Q_{res} = 11.5 cfs

d = 0.306

V = 3.84

E = 0.536

Type "A" inlet nomograph

@ 2.0%, Q = 4.5 cfs

@ 5.0%, Q = 6.5 cfs

so, @ 4.15%, Q = 5.9 cfs

Qres = 11.5 cfs

Type "C" inlet nomograph

@ 2.0% Q = 2.9 cfs

@ 5.0%, Q = 4.4 cfs

so @ 4.15%, Q = 3.975

Qres = 7.5 cfs

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

54ff/72rw 0.75%cross full 1.00%

MANNING'S N= .017 SLOPE= .01

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	7	33.00	0.28	13	63.00	0.01
2	8.37	0.67	8	33.17	0.94	14	63.17	0.69
3	8.83	0.67	9	40.83	0.94	15	63.63	0.69
4	9.00	0.00	10	41.00	0.28	16	72.00	0.87
5	11.00	0.13	11	43.00	0.28	17	0.00	0.00
6	31.00	0.28	12	61.00	0.14	18	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)
0.05	0.05	0.03	0.0	1.45	0.66	1.38	0.01	0.06
0.10	0.10	0.14	0.2	3.16	1.10	3.01	0.02	0.12
0.15	0.15	0.37	0.4	8.97	1.05	8.74	0.02	0.17
0.20	0.20	1.14	1.4	22.41	1.20	22.10	0.02	0.22
0.25	0.25	2.58	3.9	35.84	1.51	35.46	0.04	0.29
0.30	0.30	4.71	8.9	46.66	1.89	46.16	0.06	0.36
0.35	0.35	7.02	17.3	46.87	2.46	46.21	0.09	0.44
0.40	0.40	9.33	27.7	47.08	2.97	46.26	0.14	0.54
0.45	0.45	11.64	40.0	47.28	3.43	46.31	0.18	0.63
0.50	0.50	13.96	53.9	47.49	3.86	46.36	0.23	0.73
0.55	0.55	16.28	69.5	47.70	4.27	46.41	0.28	0.83
0.60	0.60	18.60	86.5	47.90	4.65	46.47	0.34	0.94
0.65	0.65	20.93	105.0	48.11	5.02	46.52	0.39	1.04
0.70	0.70	23.29	121.0	50.82	5.20	49.56	0.42	1.12
0.75	0.75	25.89	135.3	56.03	5.22	54.24	0.42	1.17
0.80	0.80	28.72	152.3	60.79	5.30	58.92	0.44	1.24
0.85	0.85	31.79	171.5	65.54	5.40	63.59	0.45	1.30
0.87	0.87	32.75	178.9	66.27	5.46	64.30	0.46	1.33

Watershed - cattleguard

$Q = 30.67$ cfs

$d = 0.41$

$V = 3.08$

$E = 0.56 < 0.85$ OK

Inlet Analysis - (Neenah)

$Q = K D^{5/3}$

$K = 14$ for 3'x3' grate

$Q = (14)(0.41)^{5/3}$

$Q = 3.16$ cfs $\times$ 15.33 grates

$Q = 48.56 > 30.67$ OK

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

28ff/46rw std full 4.15%

MANNING'S N= .017 SLOPE= .0415

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	37.17	0.67
2	8.37	0.67	6	23.00	0.37	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.85
4	9.00	0.00	8	37.00	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)
0.05	0.05	0.04	0.1	1.71	1.47	1.63	0.03	0.08
0.10	0.10	0.16	0.4	3.41	2.34	3.25	0.09	0.19
0.15	0.15	0.39	1.0	6.82	2.63	6.58	0.11	0.26
0.20	0.20	0.84	2.6	11.92	3.04	11.60	0.14	0.34
0.25	0.25	1.55	5.6	17.03	3.60	16.63	0.20	0.45
0.30	0.30	2.50	10.4	22.13	4.17	21.65	0.27	0.57
0.35	0.35	3.71	17.5	27.23	4.72	26.68	0.35	0.70
0.40	0.40	5.11	28.7	28.84	5.62	28.20	0.49	0.89
0.45	0.45	6.52	43.0	28.94	6.59	28.23	0.68	1.13
0.50	0.50	7.93	59.5	29.04	7.50	28.25	0.87	1.37
0.55	0.55	9.35	78.0	29.15	8.34	28.28	1.08	1.63
0.60	0.60	10.76	98.4	29.25	9.14	28.30	1.30	1.90
0.65	0.65	12.18	120.6	29.35	9.90	28.33	1.52	2.17
0.70	0.70	13.66	134.9	33.11	9.87	32.05	1.51	2.21
0.75	0.75	15.38	150.5	37.76	9.79	36.70	1.49	2.24
0.80	0.80	17.33	170.0	42.41	9.81	41.35	1.49	2.29
0.85	0.85	19.52	193.3	47.06	9.90	46.00	1.52	2.37

Aquifer A B cattleguard Bres

Q= 34.3 + 17 − 30.67 + 7.5 = 28.3 cfs

d = 0.40

V = 5.62

E = 0.89

Type "A" inlet nomograph

@ 2.0%, Q = 6 cfs

@ 5.0%, Q = 8.3 cfs

so, @ 4.15%, Q = 7.65 cfs

Q_{res} = 12.7 cfs

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

28ff/46rw std full 2.99%

MANNING'S N= .017 SLOPE= .0299

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	37.17	0.67
2	8.37	0.67	6	23.00	0.37	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.85
4	9.00	0.00	8	37.00	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)
0.05	0.05	0.04	0.1	1.71	1.25	1.63	0.02	0.07
0.10	0.10	0.16	0.3	3.41	1.99	3.25	0.06	0.16
0.15	0.15	0.39	0.9	6.82	2.23	6.58	0.08	0.23
0.20	0.20	0.84	2.2	11.92	2.58	11.60	0.10	0.30
0.25	0.25	1.55	4.7	17.03	3.05	16.63	0.14	0.39
0.30	0.30	2.50	8.9	22.13	3.54	21.65	0.19	0.49
0.35	0.35	3.71	14.9	27.23	4.00	26.68	0.25	0.60
0.40	0.40	5.11	24.4	28.84	4.77	28.20	0.35	0.75
0.45	0.45	6.52	36.5	28.94	5.60	28.23	0.49	0.94
0.50	0.50	7.93	50.5	29.04	6.36	28.25	0.63	1.13
0.55	0.55	9.35	66.2	29.15	7.08	28.28	0.78	1.33
0.60	0.60	10.76	83.5	29.25	7.76	28.30	0.94	1.54
0.65	0.65	12.18	102.4	29.35	8.41	28.33	1.10	1.75
0.70	0.70	13.66	114.5	33.11	8.38	32.05	1.09	1.79
0.75	0.75	15.38	127.8	37.76	8.31	36.70	1.07	1.82
0.80	0.80	17.33	144.3	42.41	8.32	41.35	1.08	1.88
0.85	0.85	19.52	164.1	47.06	8.41	46.00	1.10	1.95

Aquifer

$Q = C\text{-}1 + B\text{-}3_{res} = 17.98 + 12.7 = 30.7$ cfs

$d = 0.426$

$V = 5.20$

$E = 0.848 < 0.85$ OK

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

28ff/46rw std full 5.55%

MANNING'S N= .017 SLOPE= .0555

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	37.17	0.67
2	8.37	0.67	6	23.00	0.37	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.85
4	9.00	0.00	8	37.00	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)
0.05	0.05	0.04	0.1	1.71	1.70	1.63	0.05	0.10
0.10	0.10	0.16	0.4	3.41	2.71	3.25	0.11	0.21
0.15	0.15	0.39	1.2	6.82	3.04	6.58	0.14	0.29
0.20	0.20	0.84	3.0	11.92	3.52	11.60	0.19	0.39
0.25	0.25	1.55	6.4	17.03	4.16	16.63	0.27	0.52
0.30	0.30	2.50	12.1	22.13	4.82	21.65	0.36	0.66
0.35	0.35	3.71	20.2	27.23	5.45	26.68	0.46	0.81
0.40	0.40	5.11	33.2	28.84	6.50	28.20	0.66	1.06
0.45	0.45	6.52	49.7	28.94	7.63	28.23	0.90	1.35
0.50	0.50	7.93	68.8	29.04	8.67	28.25	1.17	1.67
0.55	0.55	9.35	90.2	29.15	9.65	28.28	1.45	2.00
0.60	0.60	10.76	113.8	29.25	10.57	28.30	1.74	2.34
0.65	0.65	12.18	139.5	29.35	11.45	28.33	2.04	2.69
0.70	0.70	13.66	156.0	33.11	11.42	32.05	2.02	2.72
0.75	0.75	15.38	174.1	37.76	11.32	36.70	1.99	2.74
0.80	0.80	17.33	196.6	42.41	11.34	41.35	2.00	2.80
0.85	0.85	19.52	223.5	47.06	11.45	46.00	2.04	2.89

Waterway Rd.

Q = 10-4 = 10.7 cfs

d = 0.29

V = 4.66

∴ 0.63 < 0.85 ok

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

28ff/46rw std full 4.89%

MANNING'S N= .017 SLOPE= .0489

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	37.17	0.67
2	8.37	0.67	6	23.00	0.37	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.85
4	9.00	0.00	8	37.00	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)
0.05	0.05	0.04	0.1	1.71	1.60	1.63	0.04	0.09
0.10	0.10	0.16	0.4	3.41	2.54	3.25	0.10	0.20
0.15	0.15	0.39	1.1	6.82	2.85	6.58	0.13	0.28
0.20	0.20	0.84	2.8	11.92	3.30	11.60	0.17	0.37
0.25	0.25	1.55	6.0	17.03	3.91	16.63	0.24	0.49
0.30	0.30	2.50	11.3	22.13	4.52	21.65	0.32	0.62
0.35	0.35	3.71	19.0	27.23	5.12	26.68	0.41	0.76
0.40	0.40	5.11	31.2	28.84	6.10	28.20	0.58	0.98
0.45	0.45	6.52	46.7	28.94	7.16	28.23	0.80	1.25
0.50	0.50	7.93	64.6	29.04	8.14	28.25	1.03	1.53
0.55	0.55	9.35	84.6	29.15	9.06	28.28	1.27	1.82
0.60	0.60	10.76	106.8	29.25	9.92	28.30	1.53	2.13
0.65	0.65	12.18	130.9	29.35	10.75	28.33	1.80	2.45
0.70	0.70	13.66	146.4	33.11	10.72	32.05	1.78	2.48
0.75	0.75	15.38	163.4	37.76	10.62	36.70	1.75	2.50
0.80	0.80	17.33	184.5	42.41	10.65	41.35	1.76	2.56
0.85	0.85	19.52	209.8	47.06	10.75	46.00	1.79	2.64

Tributary

Q = D-1 + D-2 + D-3 + D-4 = 22.6 cfs

d = 0.364

V = 5.41

E = 0.82 < 0.85 OK

Type "A" inlets nomograph

@ 2.0%, Q = 4.2 cfs

@ 5.0%, Q = 6.4 cfs

so, @ 4.89%, Q = 6.32 cfs

Qres = 9.96 cfs

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

28ff/46rw std full 1.38%

MANNING'S N= .017 SLOPE= .0138

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	37.17	0.67
2	8.37	0.67	6	23.00	0.37	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.85
4	9.00	0.00	8	37.00	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)
0.05	0.05	0.04	0.0	1.71	0.85	1.63	0.01	0.06
0.10	0.10	0.16	0.2	3.41	1.35	3.25	0.03	0.13
0.15	0.15	0.39	0.6	6.82	1.52	6.58	0.04	0.19
0.20	0.20	0.84	1.5	11.92	1.75	11.60	0.05	0.25
0.25	0.25	1.55	3.2	17.03	2.08	16.63	0.07	0.32
0.30	0.30	2.50	6.0	22.13	2.40	21.65	0.09	0.39
0.35	0.35	3.71	10.1	27.23	2.72	26.68	0.11	0.46
0.40	0.40	5.11	16.6	28.84	3.24	28.20	0.16	0.56
0.45	0.45	6.52	24.8	28.94	3.80	28.23	0.22	0.67
0.50	0.50	7.93	34.3	29.04	4.32	28.25	0.29	0.79
0.55	0.55	9.35	45.0	29.15	4.81	28.28	0.36	0.91
0.60	0.60	10.76	56.7	29.25	5.27	28.30	0.43	1.03
0.65	0.65	12.18	69.6	29.35	5.71	28.33	0.51	1.16
0.70	0.70	13.66	77.8	33.11	5.69	32.05	0.50	1.20
0.75	0.75	15.38	86.8	37.76	5.64	36.70	0.49	1.24
0.80	0.80	17.33	98.0	42.41	5.66	41.35	0.50	1.30
0.85	0.85	19.52	111.5	47.06	5.71	46.00	0.51	1.36

Watercourse

Q = E-1 = 19.93 cfs

d = 0.42

V = 3.47

E = 0.60 < 0.85 ok

Type "A" inlet nomograph

@ 0.2%, Q = 3.0 cfs

@ 2.0%, Q 6.8 cfs

so @ 1.38%, Q_{in} = 5.91 cfs

Q_{tot} = 8.11 cfs

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

28ff/46rw std full 4.26%

MANNING'S N= .017 SLOPE= .0426

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	37.17	0.67
2	8.37	0.67	6	23.00	0.37	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.85
4	9.00	0.00	8	37.00	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)
0.05	0.05	0.04	0.1	1.71	1.49	1.63	0.03	0.08
0.10	0.10	0.16	0.4	3.41	2.37	3.25	0.09	0.19
0.15	0.15	0.39	1.0	6.82	2.66	6.58	0.11	0.26
0.20	0.20	0.84	2.6	11.92	3.08	11.60	0.15	0.35
0.25	0.25	1.55	5.6	17.03	3.65	16.63	0.21	0.46
0.30	0.30	2.50	10.6	22.13	4.22	21.65	0.28	0.58
0.35	0.35	3.71	17.7	27.23	4.78	26.68	0.35	0.70
0.40	0.40	5.11	29.1	28.84	5.69	28.20	0.50	0.90
0.45	0.45	6.52	43.6	28.94	6.68	28.23	0.69	1.14
0.50	0.50	7.93	60.3	29.04	7.60	28.25	0.90	1.40
0.55	0.55	9.35	79.0	29.15	8.45	28.28	1.11	1.66
0.60	0.60	10.76	99.7	29.25	9.26	28.30	1.33	1.93
0.65	0.65	12.18	122.2	29.35	10.04	28.33	1.56	2.21
0.70	0.70	13.66	136.7	33.11	10.00	32.05	1.55	2.25
0.75	0.75	15.38	152.5	37.76	9.91	36.70	1.53	2.28
0.80	0.80	17.33	172.2	42.41	9.94	41.35	1.53	2.33
0.85	0.85	19.52	195.8	47.06	10.03	46.00	1.56	2.41

Tributary: $F_{-1} + (D_{res} + E_{res})$

$Q = 1.25 + (9.96 + 8.11)_{res} = 19.32$ cfs

$d = 0.36$

$V = 4.91$

$E = 0.73 < 0.85$

Type "A" inlet nomograph

@2.0%, Q = 4.2

@5.0%, Q = 6.5

so @4.26%, Q = 6.01

$Q_{res} = 13.31$ cfs

Tierra Pintada
~~Basin~~ View

***** *****

STREET @ S=2.63%
□ MANNING'S N= .017 SLOPE= .0263

□POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.67	4	2.63	0.13	7	30.80	1.17
2	0.46	0.67	5	29.80	0.67	8	31.30	1.17
3	0.63	0.00	6	30.63	0.67	9	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)
0.05	0.05	0.02	0.0	0.85	1.17	0.81	0.02	0.07
0.10	0.10	0.08	0.2	1.71	1.86	1.63	0.05	0.15
0.15	0.15	0.19	0.4	3.41	2.09	3.28	0.07	0.22
0.20	0.20	0.42	1.0	5.95	2.42	5.79	0.09	0.29
0.25	0.25	0.77	2.2	8.49	2.87	8.30	0.13	0.38
0.30	0.30	1.25	4.1	11.04	3.32	10.80	0.17	0.47
0.35	0.35	1.85	7.0	13.58	3.76	13.31	0.22	0.57
0.40	0.40	2.58	10.8	16.13	4.18	15.81	0.27	0.67
0.45	0.45	3.43	15.7	18.67	4.58	18.32	0.33	0.78 →
0.50	0.50	4.41	22.0	21.22	4.98	20.82	0.38	0.88
0.55	0.55	5.52	29.5	23.76	5.35	23.33	0.45	1.00
0.60	0.60	6.74	38.6	26.31	5.72	25.83	0.51	1.11
0.65	0.65	8.10	49.2	28.85	6.08	28.34	0.57	1.22
0.70	0.70	9.59	62.0	31.19	6.46	30.64	0.65	1.35
0.75	0.75	11.13	79.3	31.25	7.12	30.66	0.79	1.54
0.80	0.80	12.66	98.2	31.30	7.75	30.67	0.93	1.73
0.85	0.85	14.19	118.6	31.35	8.36	30.69	1.08	1.93
0.90	0.90	15.73	140.6	31.40	8.94	30.71	1.24	2.14
0.95	0.95	17.27	164.1	31.46	9.50	30.73	1.40	2.35
1.00	1.00	18.80	188.9	31.51	10.05	30.74	1.57	2.57
1.05	1.05	20.34	215.1	31.56	10.58	30.76	1.74	2.79
1.10	1.10	21.88	242.6	31.61	11.09	30.78	1.91	3.01
1.15	1.15	23.42	271.5	31.67	11.59	30.79	2.09	3.24
1.17	1.17	24.03	283.3	31.69	11.79	31.30	2.16	3.33

3.4

Left
dmax = .45 Qmax = 15.7

Right
dmax = .45 Qmax = 15.7

$Q_{10\,total}$ = 22.23

Q_{10} = 11.11 cfs

Q_{10} = 11.11 cfs

Right
Q_{100T} = 34.37 cfs
Q_{100} = 17.19 cfs
d = .46

Left
Q_{100} = 17.19 + 10 residual
= 27.19
d = .53

2nd set of inlets

Q_{100} = 36.66
d = .37

Q_{10} = 15.71
d = .45

APPENDIX C

INLET ANALYSIS

ANALYSIS OF AN INLET IN A SUMP CONDITION - **Aquifer/Groundwater Intersection - SUMP**

INLET TYPE: Double Grate Type "A" with curb opening wings on both sides on inlet.

WEIR: Q=C*L*H^1.5

Wing opening
C= 3.0
L= 4.0 ft
Q=3.0(4.0')H**1.5= 12.0H**1.5

Grate opeining
C=3.0
L(double grate)=[2(2.67')+2(1.8')]=8.94 ft
Q=3.0(8.94)H^1.5=26.82*H^1.5

ORIFICE: Q=C*A*(2*G*H)**0.5

Grate opening
C=0.6
A(double grate)=8.19 sf
Q=4.194*(64.4*H)^0.5

Wing opening
C=0.6
A=2.0 sf
Q=1.2*(64.4*H)^0.5

	WS ELEVATION	HEIGHT ABOVE INLET	Q (CFS) WEIR "A" OPENING	Q (CFS) WEIR DOUBLE GRATE	Q (CFS) ORIFICE DOUBLE GRATE	TOTAL Q (CFS)	COMMENTS:
~FL @ INLET	0.00	0.00	0.00	0.00	0.00	0.00	Flow at double "A" inlet w/ two wing openings
	0.10	0.10	0.38	0.85	12.47	1.61	Weir controls on grate analysis
	0.20	0.20	1.07	2.40	17.64	4.55	
	0.30	0.30	1.97	4.41	21.60	8.35	
	0.40	0.40	3.04	6.78	24.94	12.86	
	0.50	0.50	4.24	9.48	27.88	17.97	
	0.60	0.60	5.58	12.46	30.55	23.62	Q(100 yr) =19.73 cfs is provided at this depth
TOP OF CURB	0.70	0.70	7.03	15.71	32.99	29.76	
	0.80	0.80	8.59	19.19	35.27	36.36	
	0.90	0.90	10.25	22.90	37.41	43.39	Q(2X100 yr) = 39.47 cfs is provided at this depth
ROW LIMIT	1.00	1.00	12.00	26.82	39.43	50.82	

NOTE: The total runoff intercepted by the inlet at the low point in the road is:
Qr(100) = 2*[(runoff of the wing opening) + (the lesser of the weir or orifice amount taken by the double grate)].
THE 100 YR STORM EVENT =19.73 cfs at the sump condition
THE 2 x 100 YR STORM EVENT = 39.47 cfs at the sump condition

ANALYSIS OF AN INLET IN A SUMP CONDITION - **Tributary Road - SUMP**

INLET TYPE: Double Grate Type "A" with curb opening wings on both sides on inlet.

WEIR: Q=C*L*H^1.5		ORIFICE: Q=C*A*(2*G*H)**0.5	
Wing opening	Grate opeining	Grate opening	Wing opening
C= 3.0	C=3.0	C=0.6	C=0.6
L= 4.0 ft	L(double grate)=[2(2.67')+2(1.8')]=8.94 ft	A(double grate)=8.19 sf	A=2.0 sf
Q=3.0(4.0')H**1.5= 12.0H**1.5	Q=3.0(8.94)H^1.5=26.82*H^1.5	Q=4.194*(64.4*H)^0.5	Q=1.2*(64.4*H)^0.5

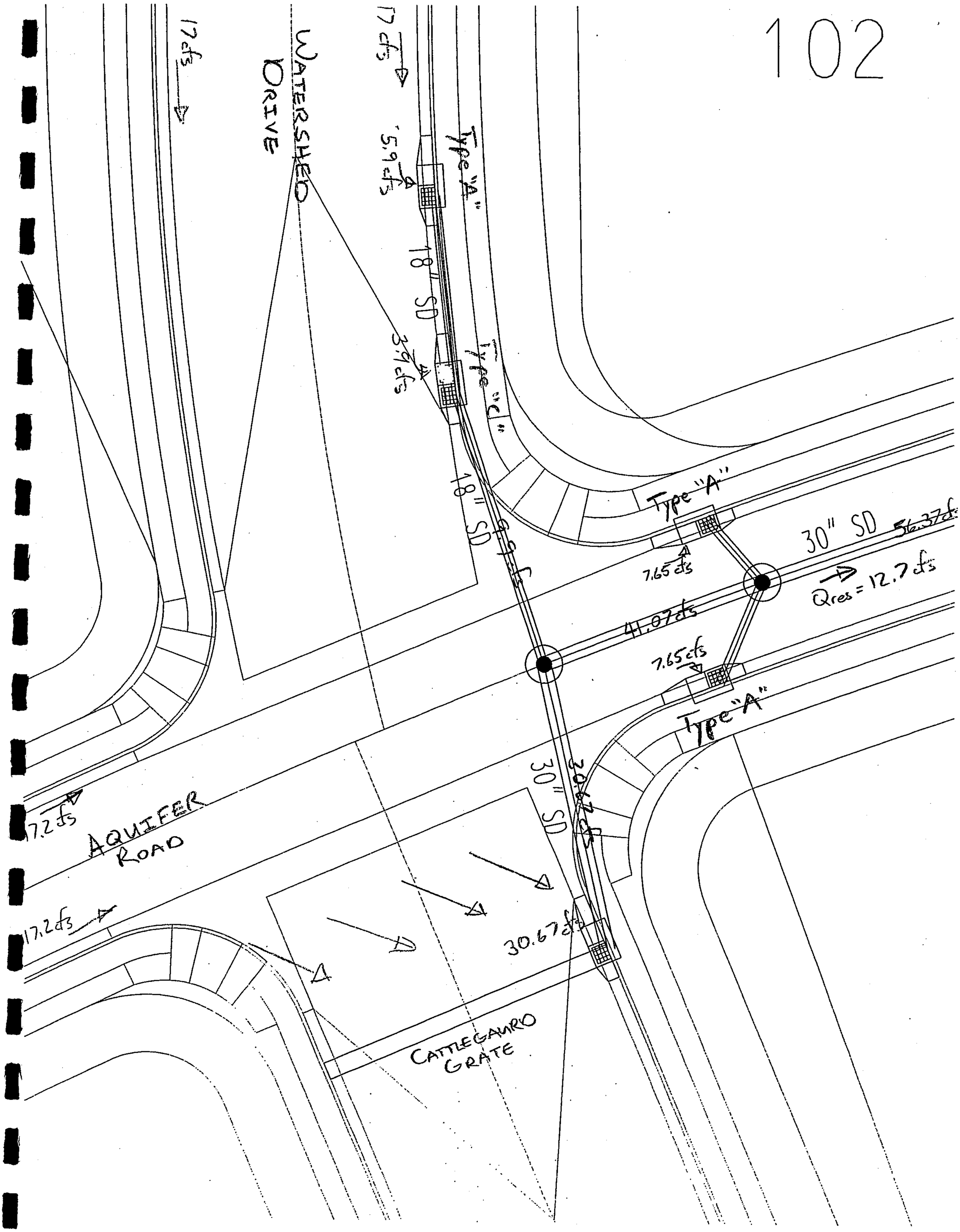
	WS ELEVATION	HEIGHT ABOVE INLET	Q (CFS) WEIR "A" OPENING	Q (CFS) WEIR DOUBLE GRATE	Q (CFS) ORIFICE DOUBLE GRATE	TOTAL Q (CFS)	COMMENTS:
~FL @ INLET	0.00	0.00	0.00	0.00	0.00	0.00	Flow at double "A" inlet w/ two wing openings
	0.10	0.10	0.38	0.85	12.47	1.61	Weir controls on grate analysis
	0.20	0.20	1.07	2.40	17.64	4.55	
	0.30	0.30	1.97	4.41	21.60	8.35	
	0.40	0.40	3.04	6.78	24.94	12.86	
	0.50	0.50	4.24	9.48	27.88	17.97	
	0.60	0.60	5.58	12.46	30.55	23.62	Q(100 yr) = 19.49 cfs is provided at this depth
TOP OF CURB	0.70	0.70	7.03	15.71	32.99	29.76	
	0.80	0.80	8.59	19.19	35.27	36.36	
	0.90	0.90	10.25	22.90	37.41	43.39	Q(2X100 yr) = 38.98 cfs is provided at this depth
ROW LIMIT	1.00	1.00	12.00	26.82	39.43	50.82	

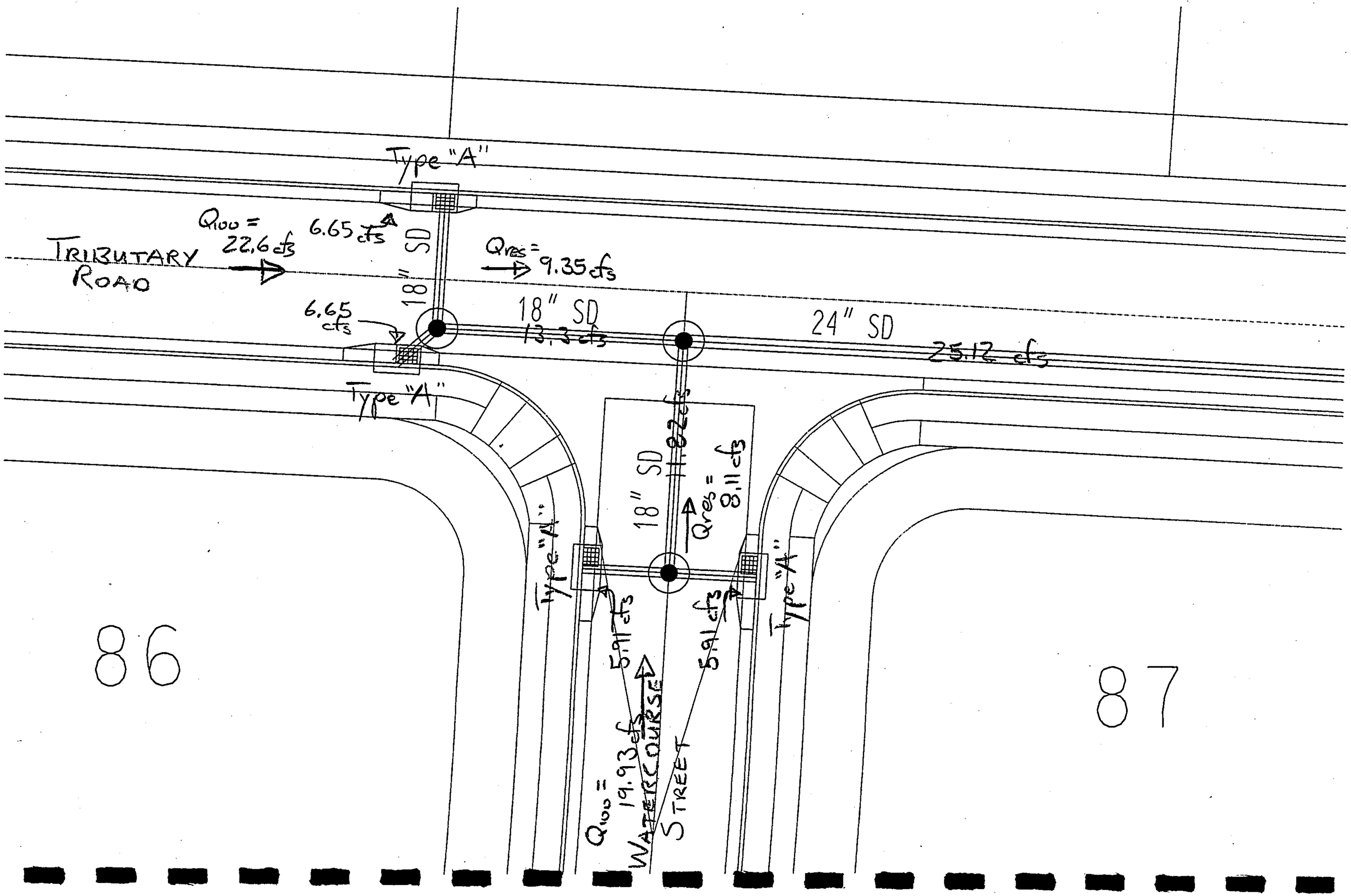
NOTE: The total runoff intercepted by the inlet at the low point in the road is:

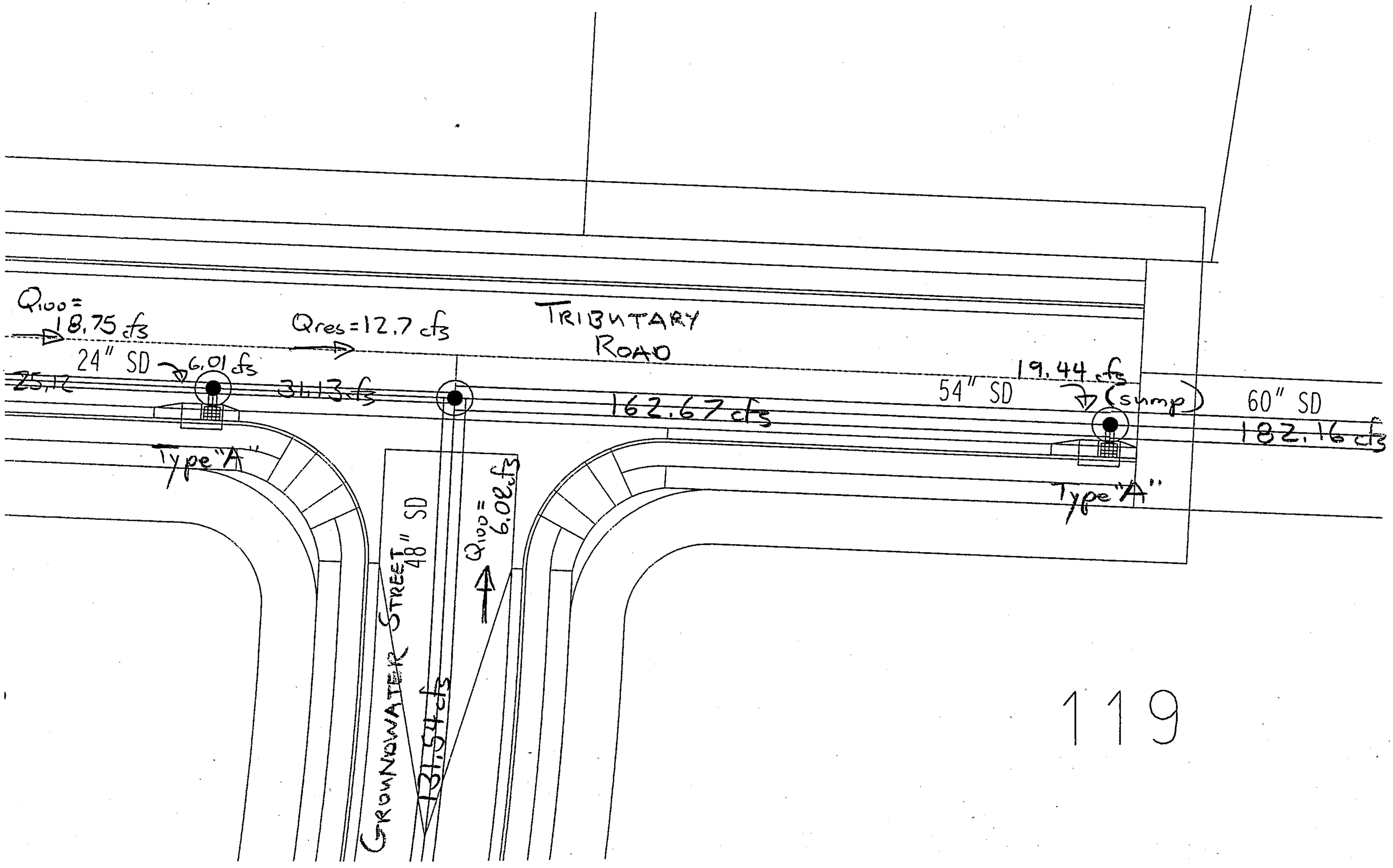
Qr(100) = 2*[(runoff of the wing opening) + (the lesser of the weir or orifice amount taken by the double grate)].

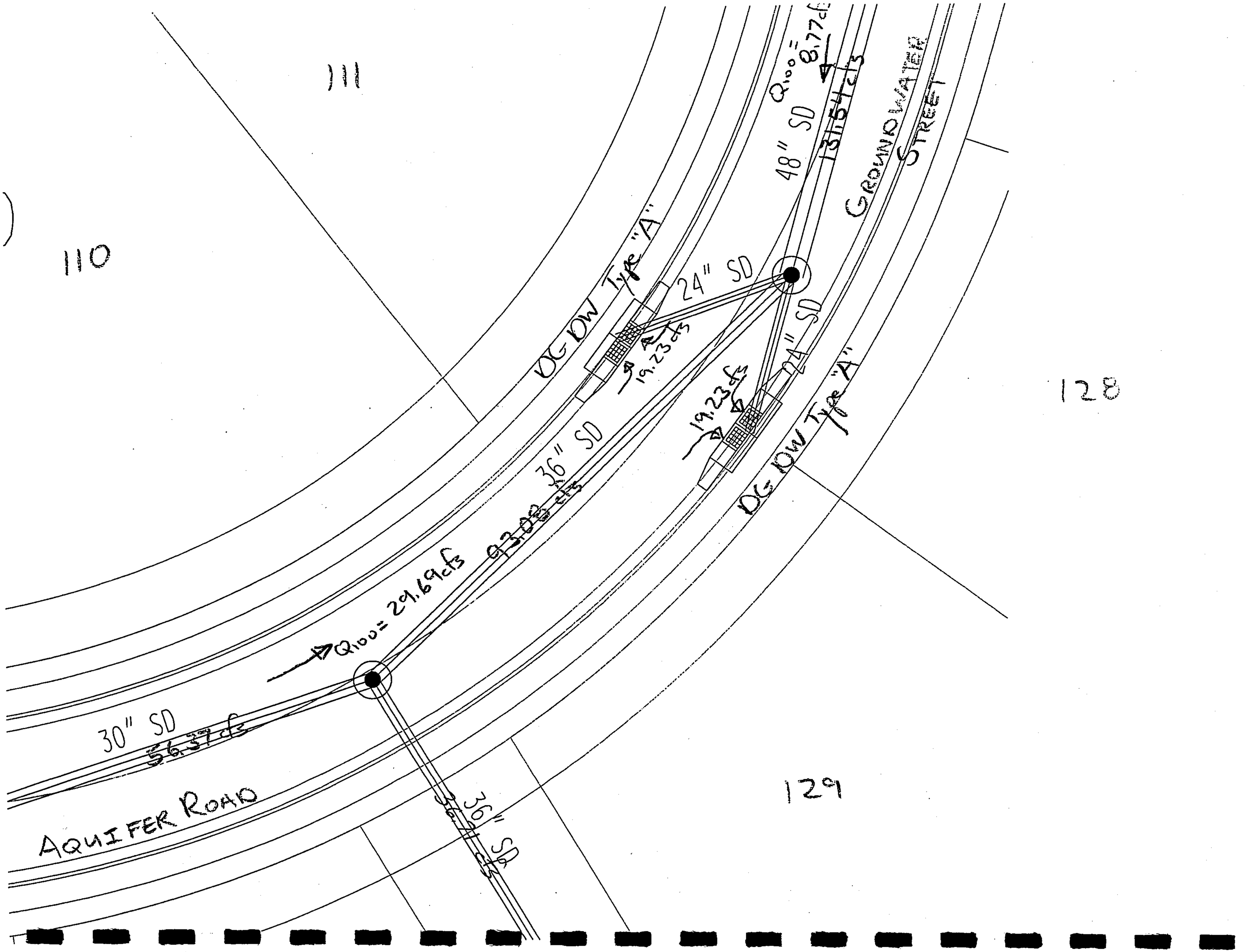
THE 100 YR STORM EVENT =19.49 cfs at the sump condition

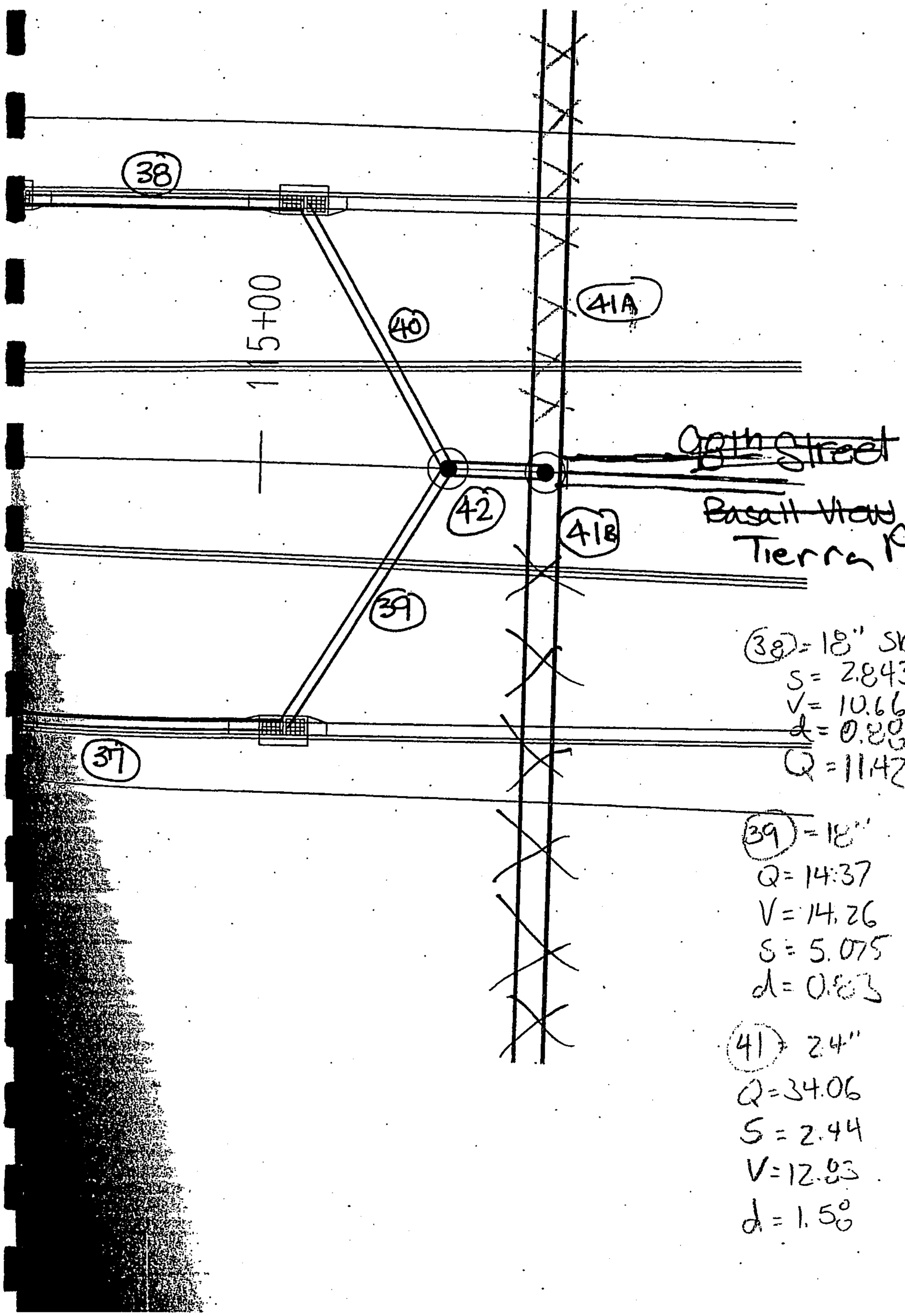
THE 2 x 100 YR STORM EVENT = 38.98 cfs at the sump condition


17 cfs
WATERSHED DRIVE
17 cfs
5.9 cfs
Type "A"
18" SD
3.9 cfs
Type "A"
18" SD
Type "A"
30" SD
56.37 cfs
7.65 cfs
Qres = 12.7 cfs
41.07 cfs
7.65 cfs
Type "A"
30" SD
30.67 cfs
17.2 cfs
AQUIFER ROAD
17.2 cfs
30.67 cfs
CATTLEGUARD GRATE


Type "A"
Q100 = 22.6 cfs
6.65 cfs
TRIBUTARY ROAD
18" SD
Qres = 9.35 cfs
6.65 cfs
18" SD
13.3 cfs
24" SD
25.12 cfs
Type "A"
18" SD
Qres = 8.11 cfs
Type "A"
Type "A"
5.91 cfs
5.91 cfs
Q100 = 19.93 cfs
WATERCOURSE
STREET
86
87


Q100 = 18.75 cfs
Qres = 12.7 cfs
TRIBUTARY ROAD
24" SD
6.01 cfs
25.12
31.13 cfs
162.67 cfs
54" SD
19.44 cfs
(sump)
60" SD
182.16 cfs
Type "A"
Type "A"
GROUNDWATER STREET
48" SD
Q100 = 6.02 cfs
131.54 cfs


111
110
128
129
DG DW Type "A"
24" SD
19.23 cfs
36" SD
9.3.08 cfs
Q100 = 29.69 cfs
30" SD
56.37 cfs
AQUIFER ROAD
36" = SD
36.91 cfs
DG DW Type "A"
24" SD
19.23 cfs
48" SD
131.54 cfs
Q100 = 8.77 cfs
GROUNDWATER STREET



(38) = 18" SD
S = 2.843%
V = 10.66
d = 0.88
Q = 11.42

(37) = 18"
S = 0.909
V = 10.03
d = 0.73
Q = 8.53

(39) = 18"
Q = 14.37
V = 14.26
S = 5.075
d = 0.83

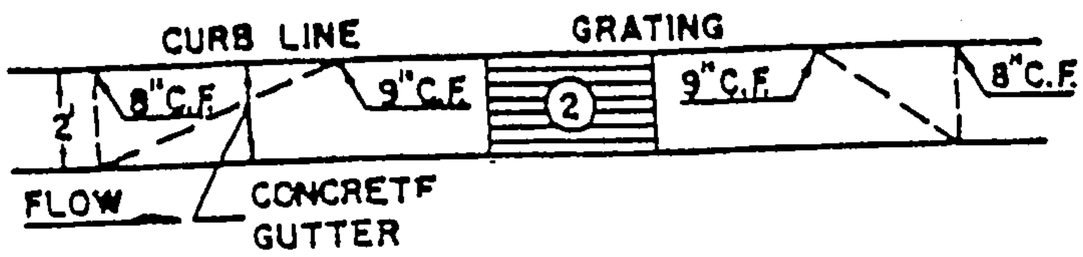
(40) 18"
Q = 19.69
V = 13.77
S = 4.167
d = 1.13

(41) 24"
Q = 34.06
S = 2.44
V = 12.03
d = 1.50

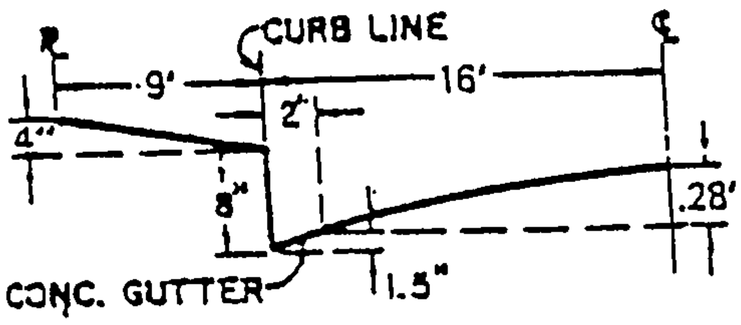
(42) 36"
Q = 34.06
S = 0.400
V = 6.64
d = 2.04

D-41

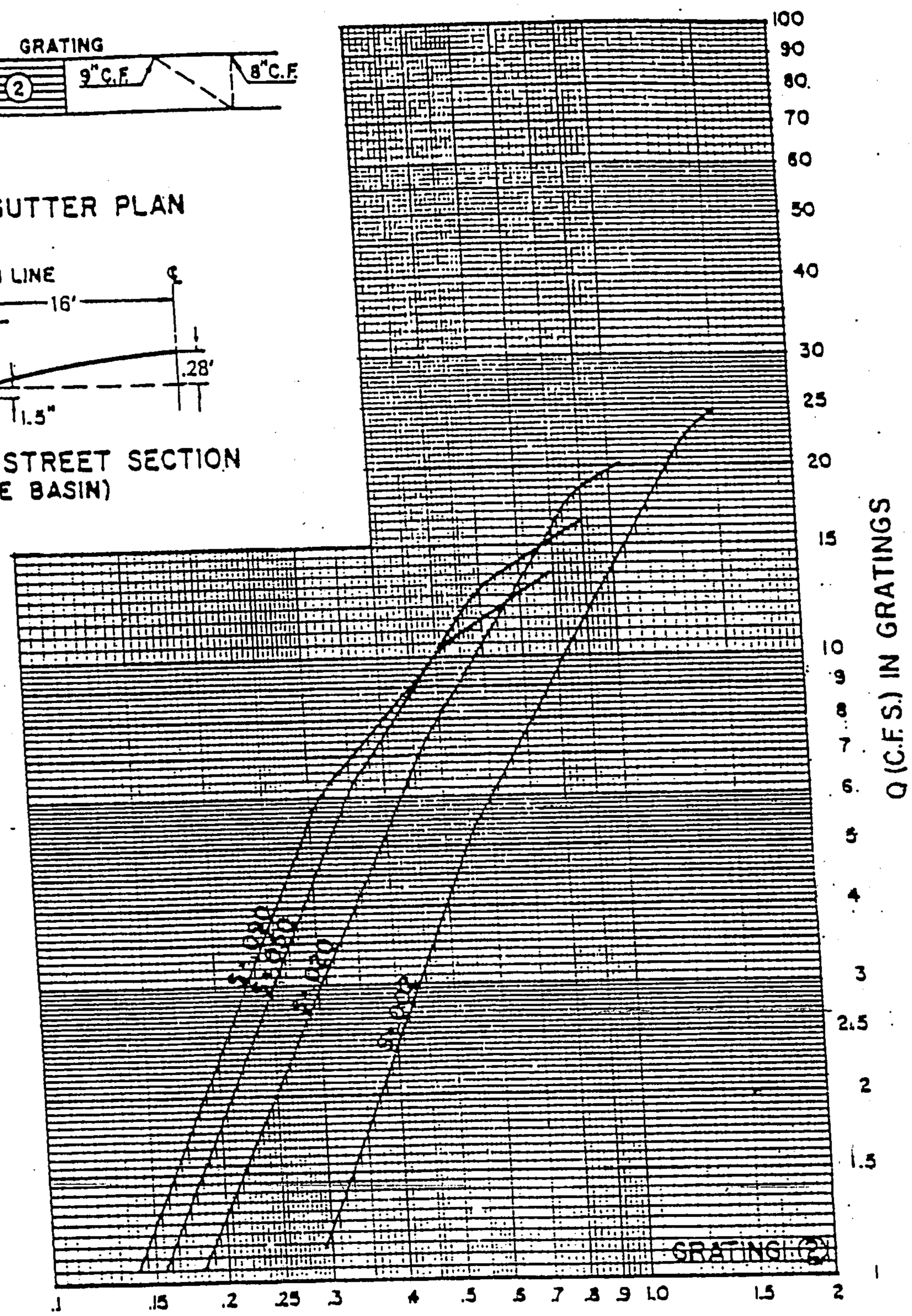
GRATING CAPACITIES FOR TYPE "A", "C" and "D"



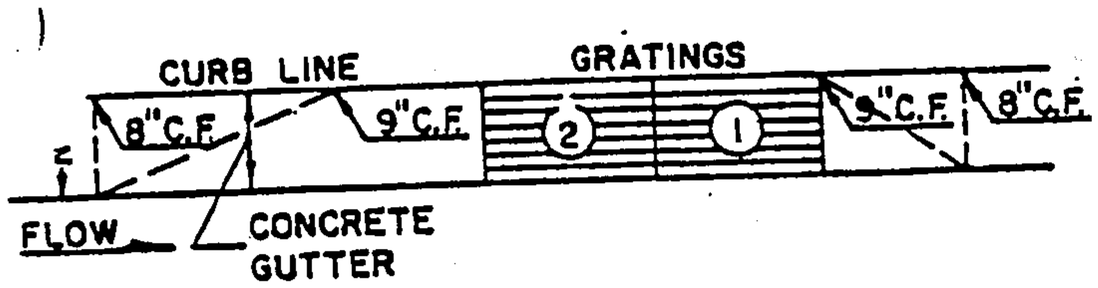
GRATING & GUTTER PLAN



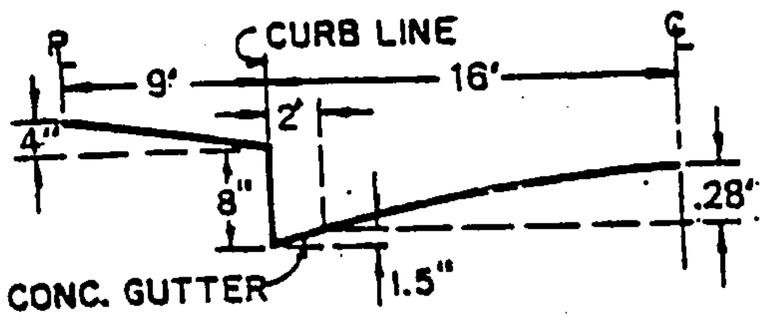
TYPICAL HALF STREET SECTION
(ABOVE BASIN)



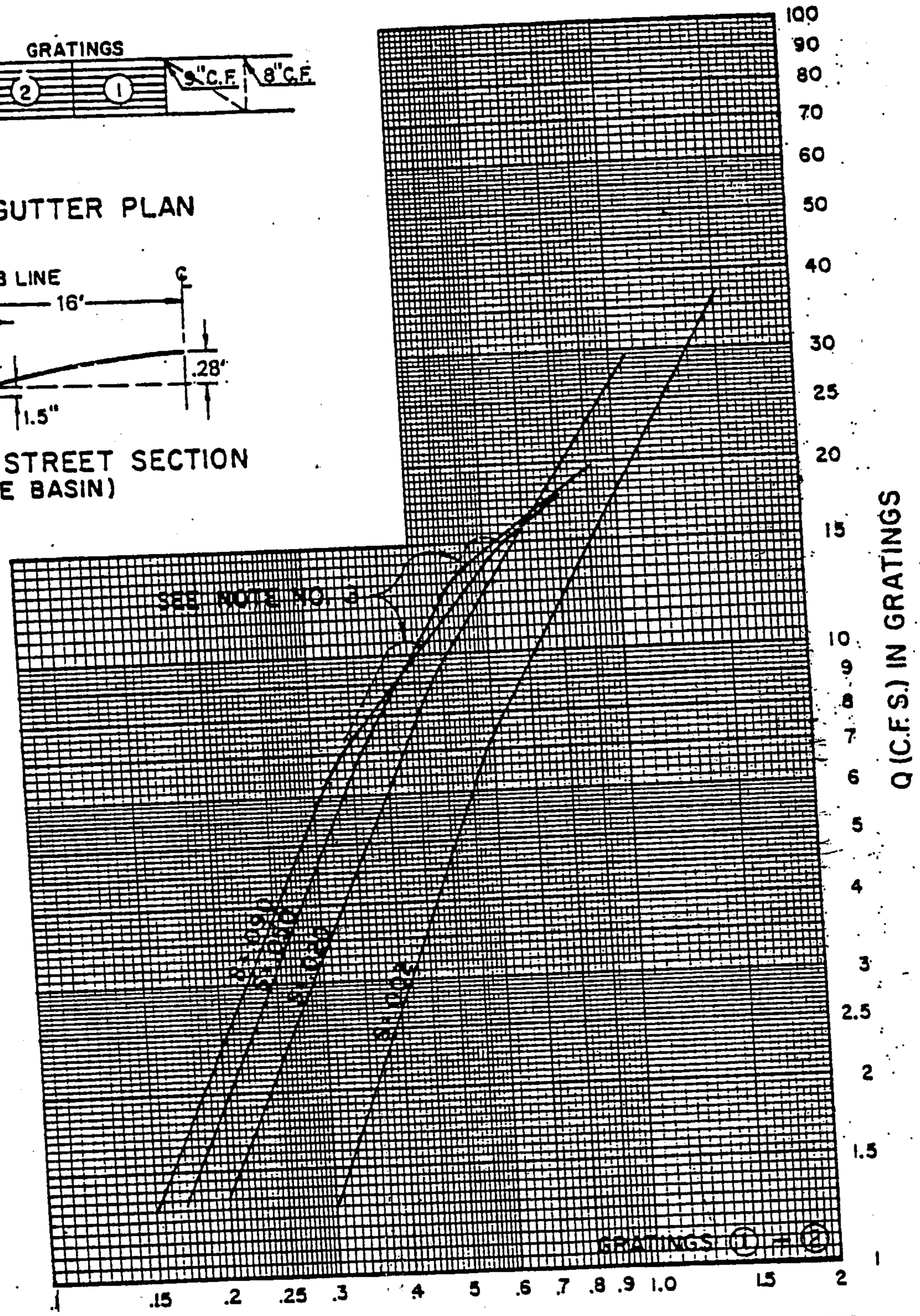
GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



D=DEPTH OF FLOW (FT.) ABOVE NORMAL GUTTER GRADE

APPENDIX D

STORM DRAIN SYSTEM ANALYSIS

Terra Antlodon

Analyzer Report

==========

Drainage Structure Analyzer

Pipe Hydraulic Analysis

Date: Friday, April 09, 2004 8:34:38 AM

==========

Input Data

Shape	Circular
Material	RC C76-A
Roughness	0.013000
Method	Manning
Flow Rate	36.7100 cfs
Slope	0.6000%
Size (W x T):	36.00 x 3.0000

Output Results

Flow Rate	36.7100 cfs
Slope	0.6000%
d/D	0.6227
Capacity	51.6644 cfs
Velocity	7.9337 ft/s
Depth	1.8680 ft
Critical Depth	1.9700 ft
Size (W x T):	36.00 x 3.0000

Aquifer/Groundwater

Analyzer Report

==========

Drainage Structure Analyzer

Pipe Hydraulic Analysis

Date: Friday, April 09, 2004 8:35:21 AM

==========

Input Data

Shape	Circular
Material	RC C76-A
Roughness	0.013000
Method	Manning
Flow Rate	93.0800 cfs
Slope	2.0000%
Size (W x T):	36.00 x 3.0000

Output Results

Flow Rate	93.0800 cfs
Slope	2.0000%
d/D	0.8077
Capacity	94.3258 cfs
Velocity	15.2167 ft/s
Depth	2.4230 ft
Critical Depth	2.8600 ft
Size (W x T):	36.00 x 3.0000

Analyzer Report

==========

Drainage Structure Analyzer

Pipe Hydraulic Analysis

Date: Friday, April 09, 2004 8:36:00 AM

==========

Input Data

Shape	Circular
Material	RC C76-A
Roughness	0.013000
Method	Manning
Flow Rate	56.3700 cfs
Slope	2.0000%
Size (W x T):	30.00 x 2.7500

Output Results

Flow Rate	56.3700 cfs
Slope	2.0000%
d/D	0.7952
Capacity	58.0070 cfs
Velocity	13.4672 ft/s
Depth	1.9880 ft
Critical Depth	2.3600 ft
Size (W x T):	30.00 x 2.7500

Groundwater

Analyzer Report

==========

Drainage Structure Analyzer

Pipe Hydraulic Analysis

Date: Friday, April 09, 2004 8:36:21 AM

==========

Input Data

Shape	Circular
Material	RC C76-A
Roughness	0.013000
Method	Manning
Flow Rate	131.5400 cfs
Slope	1.0000%
Size (W x T):	48.00 x 4.0000

Output Results

Flow Rate	131.5400 cfs
Slope	1.0000%
d/D	0.7525
Capacity	143.6433 cfs
Velocity	12.9670 ft/s
Depth	3.0100 ft
Critical Depth	3.4200 ft
Size (W x T):	48.00 x 4.0000

Tributary

Analyzer Report

==========

Drainage Structure Analyzer

Pipe Hydraulic Analysis

Date: Friday, April 09, 2004 8:36:54 AM

==========

Input Data

Shape	Circular
Material	RC C76-A
Roughness	0.013000
Method	Manning
Flow Rate	162.6700 cfs
Slope	0.8000%
Size (W x T):	54.00 x 4.5000

Output Results

Flow Rate	162.6700 cfs
Slope	0.8000%
d/D	0.7591
Capacity	175.8883 cfs
Velocity	12.5577 ft/s
Depth	3.4160 ft
Critical Depth	3.7200 ft
Size (W x T):	54.00 x 4.5000

Tributary

Analyzer Report

==========

Drainage Structure Analyzer

Pipe Hydraulic Analysis

Date: Friday, April 09, 2004 8:37:14 AM

==========

Input Data

Shape	Circular
Material	RC C76-A
Roughness	0.013000
Method	Manning
Flow Rate	182.1600 cfs
Slope	1.0000%
Size (W x T):	54.00 x 4.5000

Output Results

Flow Rate	182.1600 cfs
Slope	1.0000%
d/D	0.7602
Capacity	196.6491 cfs
Velocity	14.0414 ft/s
Depth	3.4210 ft
Critical Depth	3.9000 ft
Size (W x T):	54.00 x 4.5000

Tributary

Analyzer Report

==========

Drainage Structure Analyzer

Pipe Hydraulic Analysis

Date: Friday, April 09, 2004 8:37:37 AM

==========

Input Data

Shape	Circular
Material	RC C76-A
Roughness	0.013000
Method	Manning
Flow Rate	31.1300 cfs
Slope	2.0000%
Size (W x T):	24.00 x 2.5000

Output Results

Flow Rate	31.1300 cfs
Slope	2.0000%
d/D	0.7960
Capacity	31.9929 cfs
Velocity	11.6094 ft/s
Depth	1.5920 ft
Critical Depth	1.8700 ft
Size (W x T):	24.00 x 2.5000

Cattle guard

Analyzer Report

==========

Drainage Structure Analyzer

Pipe Hydraulic Analysis

Date: Friday, April 09, 2004 8:38:15 AM

==========

Input Data

Shape	Circular
Material	RC C76-A
Roughness	0.013000
Method	Manning
Flow Rate	30.6700 cfs
Slope	0.6000%
Size (W x T):	30.00 x 2.7500

Output Results

Flow Rate	30.6700 cfs
Slope	0.6000%
d/D	0.7900
Capacity	31.7717 cfs
Velocity	7.3737 ft/s
Depth	1.9750 ft
Critical Depth	1.8800 ft
Size (W x T):	30.00 x 2.7500

Aquifer/Watershed

Analyzer Report

==========

Drainage Structure Analyzer

Pipe Hydraulic Analysis

Date: Friday, April 09, 2004 8:38:30 AM

==========

Input Data

Shape	Circular
Material	RC C76-A
Roughness	0.013000
Method	Manning
Flow Rate	41.0700 cfs
Slope	2.0000%
Size (W x T):	30.00 x 2.7500

Output Results

Flow Rate	41.0700 cfs
Slope	2.0000%
d/D	0.6212
Capacity	58.0070 cfs
Velocity	12.8168 ft/s
Depth	1.5530 ft
Critical Depth	2.1500 ft
Size (W x T):	30.00 x 2.7500

EXHIBITS

EXHIBIT 1: BULK LAND PLAT

EXHIBIT 2: PRELIMINARY PLAT

EXHIBIT 3: EXISTING DRAINAGE BASIN MAP

EXHIBIT 4: PROPOSED DRAINAGE BASIN MAP

EXHIBIT 5: GRADING AND DRAINAGE PLAN

EXHIBIT 6: FEMA FLOODPLAIN MAP

EXHIBIT 1

BULK LAND PLAT

EXHIBIT 2

PRELIMINARY PLAT

EXHIBIT 3

EXISTING DRAINAGE BASIN MAP

EXHIBIT 4

PROPOSED DRAINAGE BASIN MAP

EXHIBIT 5

GRADING AND DRAINAGE PLAN

EXHIBIT 6

FEMA FLOODPLAIN MAP

Bohannan ▲ Huston INC.

Courtyard I
7500 Jefferson St. NE
Albuquerque, NM
87109-4335
www.bhinc.com
voice: 505.823.1000
facsimile: 505.798.7988
toll free: 800.877.5332

$H = \left(\frac{Q}{CL}\right)^{-3/2}$

Table 5-3. Values of C in the Formula $Q = CLH^{3/2}$ for Broad-crested Weirs

Measured head in feet, H	Breadth of crest of weir in feet										
	0.50	0.75	1.00	1.50	2.00	2.50	3.00	4.00	5.00	10.00	15.00
0.2	2.80	2.75	2.69	2.62	2.54	2.48	2.44	2.38	2.34	2.49	2.68
0.4	2.92	2.80	2.72	2.64	2.61	2.60	2.58	2.54	2.50	2.56	2.70
0.6	3.08	2.89	2.75	2.64	2.61	2.60	2.68	2.69	2.70	2.70	2.70
0.8	3.30	3.04	2.85	2.68	2.60	2.60	2.67	2.68	2.68	2.69	2.64
1.0	3.32	3.14	2.98	2.75	2.66	2.64	2.65	2.67	2.68	2.68	2.63
1.2	3.32	3.20	3.08	2.86	2.70	2.65	2.64	2.67	2.66	2.69	2.64
1.4	3.32	3.26	3.20	2.92	2.77	2.68	2.64	2.65	2.65	2.67	2.64
1.6	3.32	3.29	3.28	3.07	2.89	2.75	2.68	2.66	2.65	2.64	2.63
1.8	3.32	3.32	3.31	3.07	2.88	2.74	2.68	2.66	2.65	2.64	2.63
2.0	3.32	3.31	3.30	3.03	2.85	2.76	2.72	2.68	2.65	2.64	2.63
2.5	3.32	3.32	3.31	3.28	3.07	2.89	2.81	2.72	2.67	2.64	2.63
3.0	3.32	3.32	3.32	3.32	3.20	3.05	2.92	2.73	2.66	2.64	2.63
3.5	3.32	3.32	3.32	3.32	3.32	3.19	2.97	2.76	2.68	2.64	2.63
4.0	3.32	3.32	3.32	3.32	3.32	3.32	3.07	2.79	2.70	2.64	2.63
4.5	3.32	3.32	3.32	3.32	3.32	3.32	3.32	2.88	2.74	2.64	2.63
5.0	3.32	3.32	3.32	3.32	3.32	3.32	3.32	3.07	2.79	2.64	2.63
5.5	3.32	3.32	3.32	3.32	3.32	3.32	3.32	3.32	2.88	2.64	2.63

Table 5-4. Values of C in the Formula $Q = CLH^{3/2}$ for Models of Broad-crested Weirs with Rounded Upstream Corner

Name of experimenter	Radius of curve in feet	Breadth of weir in feet, B	Height of weir in feet, P	Head in feet, H									
				0.4	0.6	0.8	1.0	1.5	2.0	2.5	3.0	4.0	5.0
Bazin	0.33	2.62	2.46	2.93	2.97	2.98	3.01	3.04					
Bazin	0.33	6.56	2.46	2.70	2.82	2.87	2.89	2.92					
U. S. Deep Waterways	0.33	2.62	4.57	....	2.77	2.80	2.83	2.92	3.00	3.08	3.17	3.34	3.50
U. S. Deep Waterways	0.33	6.56	4.56	....	....	2.83	2.83	2.83	2.82	2.82	2.82	2.82	2.81

Table 5-5. Values of C in the Formula $Q = CLH^{3/2}$ for Broad-crested Weirs with Crests Inclined Slightly Downward

(a)

Crest	Energy head = H_e								
	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.4	1.5
Level	2.78	2.79	2.80	2.81	2.82	2.83	2.85	2.85	2.85
Slope = 0.004	2.95	2.94	2.93	2.92	2.91	2.90	2.88	2.87	2.87
Slope = 0.026	3.07	3.06	3.05	3.04	3.03	3.02	3.00	2.99	

(b)

Slope of crest	Length of weir in feet	Head in feet, H						
		0.1	0.2	0.3	0.4	0.5	0.6	0.7
12 to 1	3.0	2.58	2.87	2.57	2.60	2.84	2.81	2.70
18 to 1	3.0	2.91	2.92	2.53	2.60	2.80	2.74	2.62
18 to 1	10.0	2.52	2.68	2.73	2.80	2.90	2.80	2.68

Table 5-6. Values of C in the Formula $Q = CLH^{3/2}$ for Weirs of Triangular Cross Section with Vertical Upstream Face and Sloping Downstream Face

Slope of downstream face	Height of weir in feet, P	Head in feet, H										
		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.5
Hor. Vert.												
1 to 1	2.46	3.88	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85
2 to 1	2.46	3.48	3.48	3.49	3.49	3.50	3.50	3.50	3.50	3.50	3.51	3.51
2 to 1	1.64	3.56	3.47	3.47	3.51	3.54	3.57	3.58	3.58	3.58	3.59	3.57
3 to 1	1.64	....	2.90	3.11	3.22	3.26	3.33	3.37	3.40	3.40	3.41	3.41
5 to 1	2.46	....	3.08	3.06	3.05	3.05	3.07	3.09	3.12	3.13	3.13	3.13
10 to 1	2.46	....	2.82	2.83	2.84	2.86	2.89	2.90	2.91	2.91	2.92	2.93

CPN 4886.PF

94150783

(NOT DEVELOPER OWNED PROPERTY)

TEMPORARY
PRIVATE FACILITY
DRAINAGE COVENANT AND
RESERVATION OF DRAINAGE EASEMENT

1588

This Drainage Covenant, between [state the name of the present real property owner exactly as shown on the real estate document conveying title to the present owner and state the legal status of the owner, for example, "single person," "husband and wife," "corporation of the State of _____," "partnership":] Westland Development Co., Inc., a Corporation of the State of New Mexico ("Owner"), whose address is 401 Coors Road, N.W., Albuquerque, New Mexico 87121; [state the name of the developer or subdivider required to construct the drainage facility and state the legal status of the developer, for example, "single person," "husband and wife," "corporation of the State of _____," "partnership":] Sivage Thomas Homes, Inc., a Corporation of the State of New Mexico ("Developer"), whose address is 5141 Eastbend N.E., Albuquerque, NM 87109 and the City of Albuquerque, a New Mexico municipal corporation ("City"), whose address is P. O. Box 1293, Albuquerque, New Mexico 87103, is made in Albuquerque, Bernalillo County, New Mexico and is entered into as of the date Owner and Developer sign this Covenant.

1. Recital. The Owner is the owner of the following described real property located at [give legal description, and street address:] For Exhibit A (Attached)

in Bernalillo County, New Mexico (the "Property").

Pursuant to City ordinances, regulations and other applicable laws, the Developer is required to construct and maintain certain drainage facilities and the Owner, for good and valuable consideration received from the Developer, is willing to allow construction and maintenance of the Drainage Facility on its Property, and the parties wish to enter into this Covenant to establish the obligations and responsibilities of the parties.

2. Description and Construction of Drainage Facility. The Developer shall construct the following "Drainage Facility" within the Property at the Developer's sole expense in accordance with the standards, plans and specifications approved by the City: Grading for drainage control for purposes of diversion and desilting pond.

The Drainage Facility is more particularly described in Exhibit A attached hereto and made a part hereof.

231F

(APPROVED BY LEGAL AS TO FORM ONLY 9-6-88)

ParkWest, Unit 3

CPN 4886.93

DEC 20 1994

3. Reservation of Easement. The Owner, for itself, its heirs, successors and assigns, jointly and severally, hereby grants to Developer, its heirs, successors and assigns, jointly and severally, a perpetual easement over and across a portion of the Owner's property for the benefit of [describe the lots, parcels or tracts which are to be benefited by the Drainage Facility and easement] ParkWest Subdivision, Unit 3

for the purpose of permitting the flow, conveyance, and discharge of storm water runoff and for the purpose of permitting ingress and egress for the construction, maintenance and repair of the drainage facility. The land affected by the grant of this easement is more particularly described as:

For Exhibit A (Attached)

STATE OF NEW MEXICO
COUNTY OF BERNALILLO
FILED FOR RECORD
1994 DEC 30 PM 1:15

94-32 1589

4. Maintenance of Drainage Facility. The Developer shall maintain the Drainage Facility and Easement at the Developer's sole cost in accordance with the approved Drainage Report and plans. In the event the Developer fails to maintain the Drainage Facility, Owner agrees that it shall be responsible for maintenance of the Drainage Facility and Easement in accordance with the approved Drainage Report and plans.

5. Benefit to Property. The Developer and Owner acknowledge and understand that the Drainage Facility required herein to be constructed is for the private benefit and protection of the Developer's property and that failure to maintain such facility could result in damage or loss to the Owner's Property and to the property of Developer.

6. Inspection of Drainage Facility. The City shall have no duty or obligation whatsoever to perform any inspection, maintenance or repair of the Drainage Facility, it being the duty of the Developer, its heirs, successors and assigns to construct and maintain the facility in accordance with approved plans and specifications.

7. Liability of City. The Developer and Owner understand and agree that the City shall not be liable to the Developer or the Owner, or their respective heirs, successors or assigns, or to any third parties for any damages resulting from the Developer's or Owner's failure to construct, maintain or repair the Drainage Facility.

8. Indemnification. The Developer owns and controls the Drainage Facility and shall not permit the Drainage Facility to constitute a hazard to the health or safety of the general public. The Developer agrees to indemnify, defend and hold harmless the City, its officials, agents and employees, and the Owner, its heirs, successors and assigns from any claims, actions, suits or other proceedings arising from or out of the negligent acts or omissions of the Developer, its agents, representatives, contractors or subcontractors or arising from the failure of the Developer, its agents, representatives, contractors or subcontractors to perform any act or duty required of the Developer herein; provided, however, to the extent, if at all, Section 56-7-1 NMSA 1978 is applicable to this Agreement, this Agreement to indemnify will not extend to liability, claims, damages, losses or expenses, including attorney's fees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications by the respective indemnitee, or the agents or employees of the respective indemnitee; or (2) the giving of or the failure to give direction or instructions by the respective indemnitee, where such giving or failure to give directions or instructions is the primary cause of bodily injury to persons or damage to property.

9. Assessment. Nothing in this Easement and Covenant shall be construed to relieve the Owner or Developer, or their respective heirs, assigns and successors from an assessment against the Owner's or Developer's property for improvements under a duly authorized and approved Special Assessment District. The parties specifically agree that the value of the Drainage Facility will not reduce the amount assessed by the City.

10. Binding on Owner's Property. The easement, covenants and obligations of the Owner and Developer set forth herein shall be binding on the Owner and Developer, and their respective heirs, assigns and successors and on the Owner's Property and constitute covenants running with the Owner's Property until released by the City's Chief Administrative Officer as approved by the City Engineer.

11. Entire Covenant. This Covenant contains the entire agreement of the parties and supersedes any and all other agreements or understandings, oral or written, whether previous to the execution hereof or contemporaneous herewith.

11a. City's Right of Entry. The City has the right to enter upon the Property at any time and perform whatever inspection, maintenance or repair of the Drainage Facility it deems appropriate, without liability to the Owner.

12. Changes to Covenant. Changes to this Covenant are not binding unless in writing, signed by all parties.

13. Effective Date of Covenant. This Covenant shall be effective as of the date of signature of the Owner and Developer.

DEVELOPER: Savage Thomas Homes, Inc.
By: _____
Its: President
Dated: October 17, 1994

OWNER: Westland Development Co., Inc.
By: Barbara Page
Its: President CEO
Dated: 10-27-94

STATE OF NEW MEXICO ____)
)ss.
COUNTY OF BERNALILLO ____)

This instrument was acknowledged before me on 27 day of October, 1994 by [name of person:] BARBARA PAGE [title or capacity, for instance, "President" or Owner":] PRESIDENT of [name of the entity which owns the Property if other than the individual signing, for instance, the name of the corporation, partnership, or joint venture:] WESTLAND DEVELOPMENT CO. INC.

OFFICIAL SEAL
LINDA J. BLAIR
NOTARY PUBLIC STATE OF N. M.
Notary Bond Filed with Secretary
My Commission Expires 8/5/97

Linda J. Blair
Notary Public

My Commission Expires: _____

CITY OF ALBUQUERQUE:

Approved:

By: _____
Title: Director Public Works Dept.
Dated: 12-29-94

By: _____
City Engineer
Dated: 12/22/94

ParkWest, Unit 3
CPN 4886.93

DEVELOPER'S NOTARY

STATE OF NEW MEXICO____)
)ss.
COUNTY OF BERNALILLO___)

This instrument was acknowledged before me on the 17th day of October, 1994 by [name of person:] Michael D. Sivage, [title or capacity, for instance, "President" or Owner":] President of [Developer:] Sivage Thomas Homes, Inc.

Notary Public

My Commission Expires:
October 29, 1995

My Commission Expires 10-29-95

CITY'S NOTARY

STATE OF NEW MEXICO____)
) ss.
COUNTY OF BERNALILLO___)

This instrument was acknowledged before me on 29th day of December, 1994 by [name of person:] Robert E. Gurule, Director, Public Works Department of the City of Albuquerque, a municipal corporation, on behalf of said corporation.

Notary Public

My Commission Expires:
5-27-97

231F

ParkWest, Unit 3
CPN 4886.73

EXHIBIT A TO THE

Temporary Desiltation Pond, Slope, Graging, Drainage, and Construction Easement

A certain parcel of land lying within the Town of Atrisco Grant, "projected" Sections 4 & 9, Township 10 North, Range 2 East, New Mexico Principal Meridian, City of Albuquerque, County of Bernalillo, State of New Mexico, lying adjacent to Tract B of ParkWest Unit 1, the map of said subdivision filed for public record in the office of the County Clerk, Bernalillo County on August 09, 1994 in Volume 94C, Folio 262 and being more particularly bounded and described as follow, to wit:

Beginning at a point on the northerly right-of-way line of 98th Street, N.W. and from whence the City of Albuquerque Control Station (ACS) "140-19" Brass Cap bears S.33°09'07"E., a distance of 6,453.49 feet;

thence, N.01°29'23"E. along the easterly line os said parcel a distance of 65.04 feet to an angle point;
thence, N.14°58'02"E. along the easterly line of said parcel a distance of 686.15 feet to an angle point;
thence, N.35°41'29"E. along the easterly line of said parcel a distance of 358.54 feet to a point for the northeast corner of said parcel said same point lying on the southerly right-of-way line of Ladera Channel;
thence, N.60°14'03"W. along the northerly line of said parcel a distance of 67.78 feet to a point for the northwest corner of said parcel;
thence, S.35°41'29"W. along the westerly line of said parcel a distance of 20.00 feet to an angle point;
thence, S.09°18'31"W. along the westerly line of said parcel a distance of 60.00 feet to an angle point;
thence, S.35°41'29"W. along the westerly line of said parcel a distance of 293.70 feet to an angle point;
thence, S.14°58'02"W. along the westerly line of said parcel a distance of 495.86 feet to an angle point;
thence, S.59°58'02"W. along the westerly line of said parcel a distance of 99.50 feet to an angle point;
thence, S.14°58'02"W. along the westerly line of said parcel a distance of 130.00 feet to an angle point;
thence, S.30°01'58"E. along the westerly line of said parcel a distance of 50.47 feet to an angle point;
thence, S.01°29'23"E. along the westerly line of said parcel a distance of 62.74 feet to a point for the southwest corner of said parcel;
thence, S.83°14'35"E. along the southerly line of said parcel a distance of 25.11 feet to a point for the southeast corner of said parcel, said point lying on the northerly right-of-way line of 98th Street, N.W., said same point being the true point and place of beginning.

Containing 0.815 acres (35,487 square feet), more or less.

SURVEYOR'S CERTIFICATE

I, J. Robert martinez, being duly registered as a Professional Surveyor by the State of New Mexico, do hereby certify that the parcel description shown above was prepared by me using as a basis the maps prepared for PARKWEST UNIT 1 and that the "tie" shown was computed from the same map data and that the information shown is true and correct to the best of my knowledge.

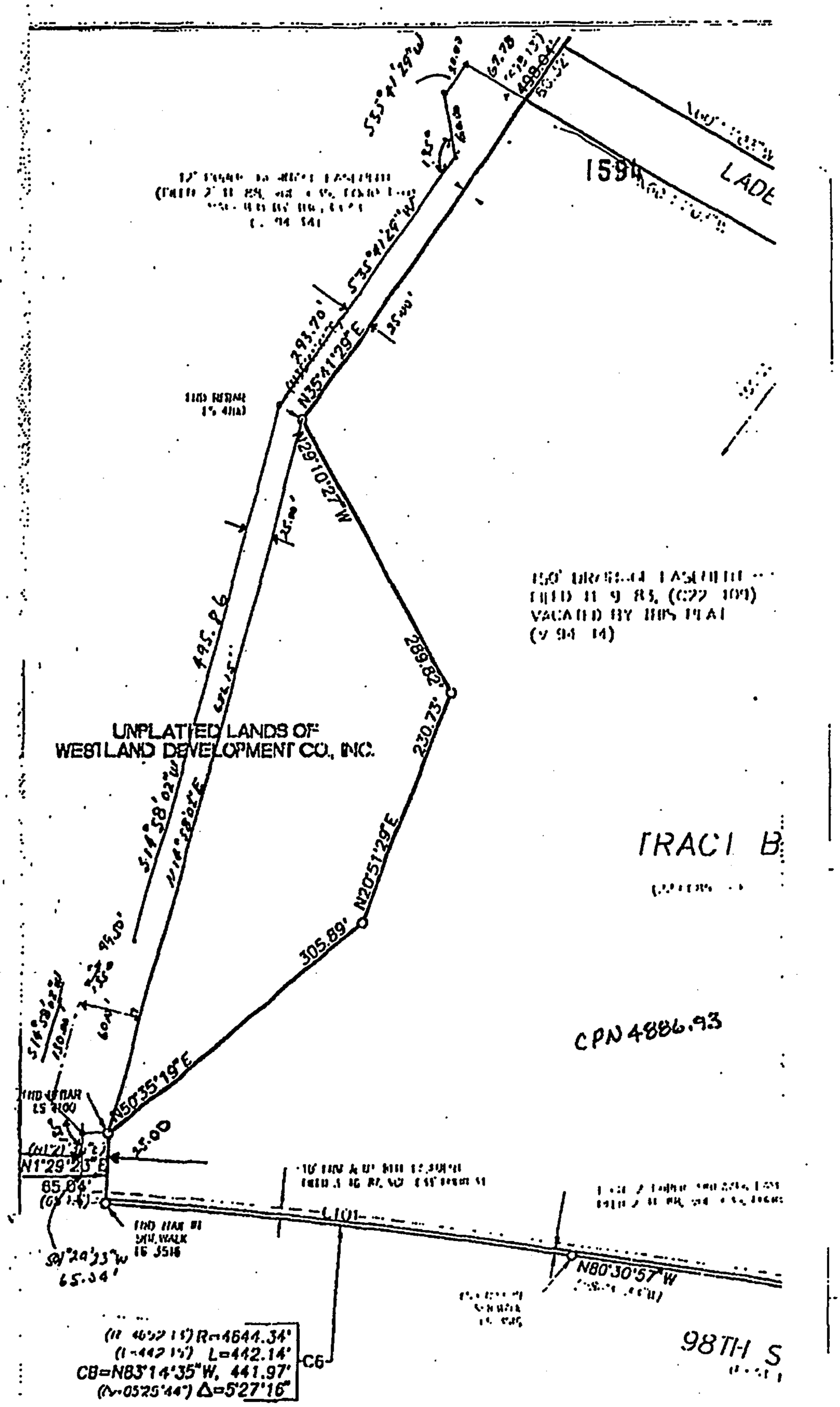
J. Robert Martinez, N.M.P.S. No. 4076

November 04, 1994
Date

REGISTERED LAND SURVEYOR
STATE OF
NO. 4076
NEW MEXICO
J. ROBERT MARTINEZ

CPN4882.93

F.N.: M.WP51.ParkWt03.Des.11039401


S55°41'29"W
67.78
498.04
159th
LADE
S35°41'29"W
293.76'
N35°41'29"E
35.00'
N29°10'27"W
495.26
289.82'
230.73'
UNPLATTED LANDS OF
WESTLAND DEVELOPMENT CO., INC.
S14°58'02"W
N14°58'02"E
N20°51'29"E
305.89'
TRACT B
CPN 4886.93
N50°35'19"E
25.00
N1°29'25"E
85.84'
S81°29'33"W
65.34'
N80°30'57"W
98TH S
R=4644.34'
L=442.14'
CB=N83°14'35"W, 441.97'
Δ=5°27'16"
C6

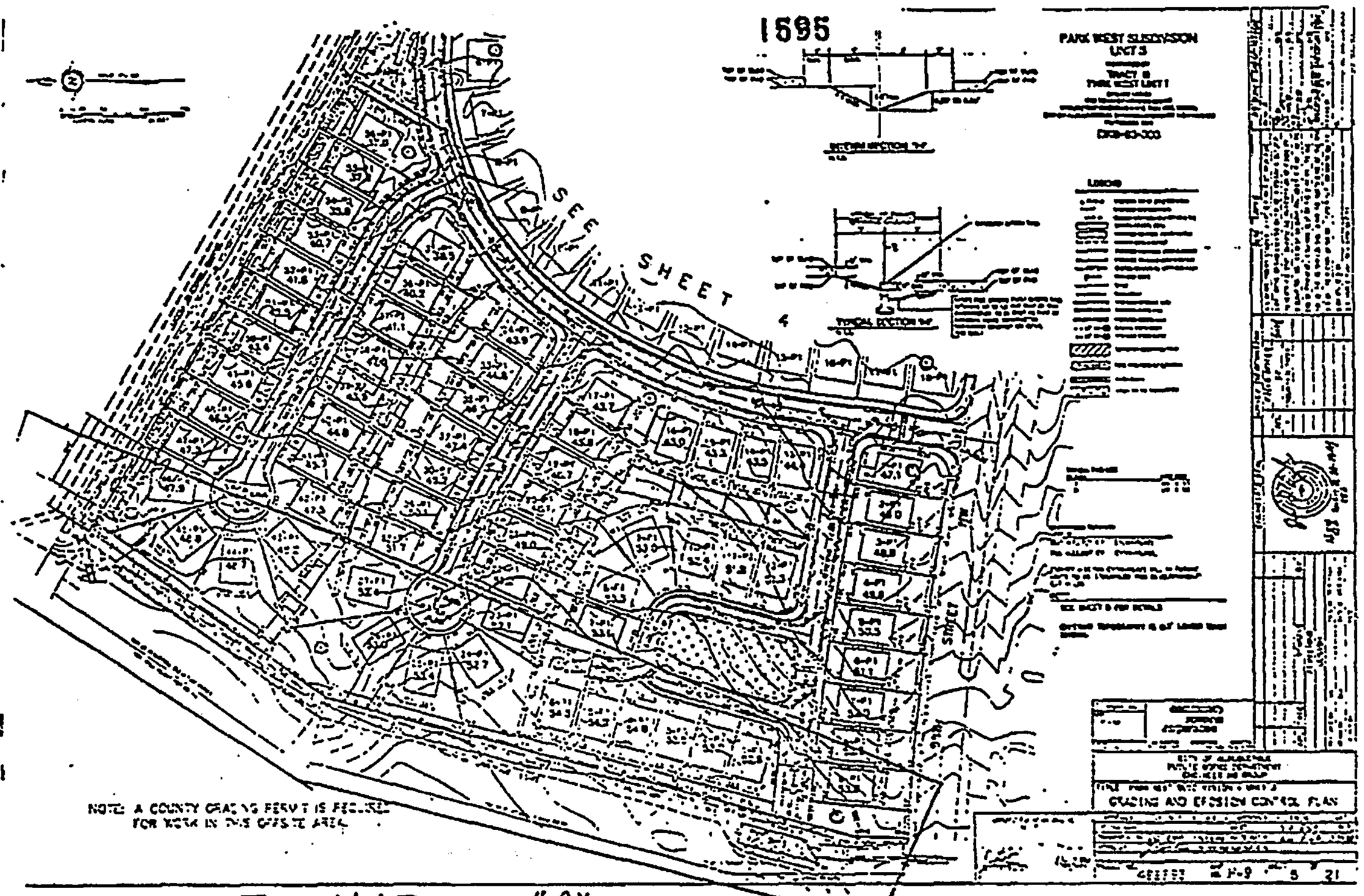

1595
PARK WEST SUBDIVISION
UNIT 3
SEE SHEET 4
NOTE: A COUNTY GRADING PERMIT IS REQUIRED
FOR WORK IN THIS OFFSITE AREA
GRADING AND EROSION CONTROL PLAN

EXHIBIT "A"

Bohannan ▲ Huston INC.

Courtyard I
7500 Jefferson St. NE
Albuquerque, NM
87109-4335

www.bhinc.com

voice: 505.823.1000
facsimile: 505.798.7988
toll free: 800.877.5332

May 18, 2004

Brad Bingham, P.E., Senior Engineer
Planning Department - Hydrology Development
City of Albuquerque
P O Box 1293
Albuquerque, New Mexico 87103

Re: Watershed Subdivision (a portion of Parcel A, Westland North) – Preliminary Plat Submittal
DRB Project Number 1003087

Dear Brad:

The purpose of this letter is to address the comments within your letter dated May 4, 2004, as well as the comments in Lynn Mazur's (AMAFCA Development Review Engineer) letter dated May 12, 2004, concerning the above referenced subdivision. I have enclosed the following additional information that you requested in your letter:

- One (1) copy of the Revised Preliminary Plat
  - We have revised the vacation exhibit to include vacating the entire city drainage easement within the Westland Development area as requested by AMAFCA and then granting a new easement to AMAFCA. We will also grant a 25 foot public storm drain easement within Tract for the storm drain that will connect to the Ladera Channel. .
- One (1) copy of the Revised Grading Plan
  - We have added and removed some proposed retaining walls where it was necessary.
  - We have realigned the berm within Lots 50 – 52 and 57 - 58 so that it does not extend into the FEMA Floodplain. We have also revised the berm detail for those lots 47 – 58 as requested by you (1.5 feet high and a top width of 5 feet.).
  - We have added the following note on the grading plan for lots 47 – 58: (this note will also be required on the final plat as well)

    "EACH INDIVIDUAL LOT (OF THOSE LOTS 47 – 58) IS REQUIRED TO SUBMIT A SEPARATE GRADING AND DRAINAGE PLAN TO THE CITY OF ALBUQUERQUE, PREPARED BY A NEW MEXICO PROFESSIONAL ENGINEER, PRIOR TO BUILDING PERMIT APPROVAL. EACH LOT SHALL PROVIDE AN ONSITE RETENTION POND DESIGNED FOR THE 100 YR 6 HR STORM EVENT AND MAY NOT DISCHARGE STORM WATER TO THE PETROGLYPH NATIONAL PARK."
  - We have added a graded road on Tract L to access the existing reservoir site as requested.

RECEIVED
MAY 25 2004
HYDROLOGY SECTION

- One (1) copy of the Revised Infrastructure List
- Additional analysis regarding the water surface elevation for the Ladera Channel.
- One copy of the drainage easements that we are vacating along the eastern property boundary.

This item was heard on May 5, 2004 and was deferred to the May 19, 2004 DRB Agenda. If you have any questions or require further information, please call me at 823-1000.

Sincerely,

Kevin Patton, P.E.
Vice President
Community Development and Planning Group

KP/am
Enclosures

cc: Leroy Chavez, Westland Dev (w/o encl)
Fred Ambrogi, Westland Dev (w/o encl)
Lynn Mazur, AMAFCA, (w/encl)

RECEIVED
MAY 2 5 2004
HYDROLOGY SECTION

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

May 24, 2004

Kevin Patton, PE
Bohannan Huston, Inc
7500 Jefferson NE
Albuquerque, NM 87109

Re: Watershed Subdivision Drainage Report
Engineer Stamp dated 5-18-04 (H9/D17A)

Dear Mr. Patton,

Based upon the information provided in your submittal dated 5-18-04, the above referenced report is approved for Preliminary Plat action by the DRB. Once that board has approved the plan, please submit a mylar copy for my signature in order to obtain a Rough Grading Permit.

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) or 768-3645 (Bryan Wolfe).

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

Sincerely,

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

C: Chuck Caruso, CoA DMD
Lynn Mazur, AMAFCA
file

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MAY 25 2004
HYDROLOGY SECTION

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

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(REV. 1/11/2002)

H-9/D17A

PROJECT TITLE: **WATERSHED SUBDIVISION** ZONE MAP/DRG. FILE #: **H-9-Z**
DRB #: **1003087** EPC#:_____ WORK ORDER#:_____

LEGAL DESCRIPTION: **A PORTION OF TRACT A, WESTLAND NORTH**
CITY ADDRESS: **TIERRA PINTADA STREET @ 98TH STREET**

ENGINEERING FIRM: **BOHANNAN HUSTON INC** CONTACT: **KEVIN PATTON**
ADDRESS: **7500 JEFFERSON STREET NE** PHONE: **(505) 823-1000**
CITY, STATE: **ALBUQUERQUE, NM 87109** ZIP CODE: **87109**

OWNER: **WESTLAND DEVELOPMENT** CONTACT: **FRED AMBROSI**
ADDRESS: **401 COORS BLVD NW** PHONE: **(505) 831-6900**
CITY, STATE: **ALBUQUERQUE, NM** ZIP CODE: **87121**

ARCHITECT:_____ CONTACT:_____
ADDRESS:_____ PHONE:_____
CITY, STATE:_____ ZIP CODE:_____

SURVEYOR:_____ CONTACT:_____
ADDRESS:_____ PHONE:_____
CITY, STATE:_____ ZIP CODE:_____

CONTRACTOR:_____ CONTACT:_____
ADDRESS:_____ PHONE:_____
CITY, STATE:_____ ZIP CODE:_____

CHECK TYPE OF SUBMITTAL:
- X **DRAINAGE REPORT**
- ___ DRAINAGE PLAN
- ___ 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
- X **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.)
- X **GRADING PERMIT APPROVAL**
- X **PAVING PERMIT APPROVAL**
- ___ WORK ORDER APPROVAL
- ___ OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED:
- ___ YES
- ___ NO
- ___ COPY PROVIDED

RECEIVED MAY 25 2004 HYDROLOGY SECTION

~~RECEIVED MAY 24 2004 HYDROLOGY SECTION~~

DATE SUBMITTED:_____ BY:_____

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature , location and scope of 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.

CITY OF ALBUQUERQUE

December 21, 2006

Mr. Kevin Patton, PE
BOHANNAN-HUSTON, INC.
7500 Jefferson St. NE
Albuquerque, NM 87109

RE: WATERSHED SUBDIVISION AT WESTLAND (H-9/D17A)
Engineers Certification for Release of Financial Guaranty
Engineers Stamp dated 05/18/2004
Engineers Certification dated 12/21/2006

Dear Kevin:

Based upon the information provided in your Engineer's Certification Submittal dated 12/21/2006, the above referenced plan is adequate to satisfy the Grading and Drainage Certification for Release of Financial Guaranty.

If you have any questions, you can contact me at 924-3982

Sincerely,

Arlene V. Portillo

Arlene V. Portillo
Plan Checker, Planning Dept.- Hydrology
Development and Building Services

C: Marilyn Maldonado, COA# 742981
File

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(REV. 1/28/2003rd)

PROJECT TITLE: Watershed Subdivision at Westland ZONE MAP/DRG. FILE # H-9/D17A
DRB #: 1003087 EPC#: WORK ORDER#:

LEGAL DESCRIPTION: Watershed subdivision at Westland
CITY ADDRESS: 98th street just West of Unser Boulevard

ENGINEERING FIRM: Bohannan Huston, Inc. CONTACT: Kevin Patton
ADDRESS: 7500 Jefferson NE – Courtyard I PHONE: (505) 823-1000
CITY, STATE: Albuquerque, NM ZIP CODE: 87109

OWNER: Westland Development Co. Inc. CONTACT: Fred Ambrogi
ADDRESS: 401 Coors Boulevard NW PHONE: (505) 831-4865
CITY, STATE: Albuquerque, NM ZIP CODE: 87121

ARCHITECT: CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

SURVEYOR: CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

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
____ GRADING PLAN
____ EROSION CONTROL PLAN
X 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:

X SIA / FINANCIAL GUARANTEE RELEASE
____ 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 (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
DEC 21 2005
HYDROLOGY SECTION

DATE SUBMITTED: BY:

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature , location and scope of 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.

Bohannan ▲ Huston INC.

Courtyard I
7500 Jefferson St. NE
Albuquerque, NM
87109-4335
www.bhinc.com
voice: 505.823.1000
facsimile: 505.798.7988
toll free: 800.877.5332

CLIENT/COURIER TRANSMITTAL

To: Brad Bingham
City of Albuquerque
Plaza del Sol
600 2nd Street NW
2nd Floor

Requested by: Yolanda Padilla/yp

Date: December 21, 2006

Time Due:
- ☐ This A.M.
- ☒ This P.M.
- ☐ Rush _____
- ☐ By Tomorrow

Phone: 924-3986

DELIVERY VIA
- ☒ Courier
- ☐ Federal Express
- ☐ Mail
- ☐ UPS
- ☐ Other ____

PICK UP
Item:____

Job No.: 040166

Job Name: Watershed

ITEM NO.	QUANTITY	DESCRIPTION
1	1	Grading Certification
2	1	Drainage Info Sheet

RECEIVED
DEC 20 2005
HYDROLOGY SECTION

COMMENTS / INSTRUCTIONS

*REC'D BY:*_____ *DATE:*_____ *TIME:*_____

ENGINEERING ▲
SPATIAL DATA ▲
ADVANCED TECHNOLOGIES ▲

FAX TRANSMISSION

AMAFCA
2600 Prospect Av. NE
Albuquerque, NM 87107
Ph: (505) 884-2215
Fax: (505) 884-0214

To: Kevin Patton
Fax #: 798-7988
From: Lynn Mazur, P.E.
Development Review Engineer

Of: Bohannan Huston, Inc.
Pages: 6, incl. cover sheet
Date: May 7, 2004

Subject: Watershed Subdivision

COMMENTS:

The as-builts for the Ladera Channel referenced the attached easement, so Marty tracked down a copy (Document No. 9032221). It is referenced on the Westland Bulk Land Plat as Doc. No. 88101448. It appears that Westland deeded the property to Laurelwood II Joint Venture, who in turn granted an easement to the City. We will talk to John Kelly about dedicating the easement to AMAFCA since AMAFCA maintains the inlet structure to the channel.

Cc: Brad Bingham, COA Hydrology

FC # 5760 955

TEMPORARY EASEMENT

9032221 3060

This grant of Temporary Easement, between [state the name of the present real property owner exactly as shown on the real estate document conveying title to the present owner and state the legal status of the owner, for example, "single person," "husband and wife," "corporation of the State of X," "partnership":] LAURELWOOD II JOINT VENTURE, a Joint Venture, ("Grantor"), whose address is 4520 Montgomery Boulevard NE, Suite A-A, Albuquerque, NM 87109, and the City of Albuquerque, a New Mexico municipal corporation ("City"), whose address is P. O. Box 1293, Albuquerque, New Mexico 87103, is made in Albuquerque, Bernalillo County, New Mexico and is entered into as of the date Grantor signs this Temporary Easement.

1. Recital. Grantor is the owner of certain real property located at [give general description, for instance, subdivision, lot and block or street address:]
El Rancho Atrisco Phase IV
UPC No. 1-008-059-380-400-20150
Replatted as Laurelwood II, Tracts I, II, III & IV
Located at the NW Quadrant of Unser Boulevard & 98th Street NW
In Bernalillo County, New Mexico (the "Property").

2. Grant of Easement. The Grantor grants to the City a temporary easement ("Temporary Easement") in, over, upon and across the Property for [state the kind of easement, for example, "public street and highway purposes (including all utilities)," "water line," "sewer line," etc.:] drainage.

The Temporary Easement is more particularly described in the attached Exhibit A. [State on the exhibit either the metes and bounds description of the Temporary Easement or state the exact dimensions and location in a manner which would enable a surveyor to locate the Temporary Easement on the ground.]

The grant of the Temporary Easement includes the right of the City to enter upon the Temporary Easement at any time for inspection, installation, maintenance, repair or modification and the right to remove trees, bushes, undergrowth and any other obstacles if the City determines they interfere with the appropriate use of the Temporary Easement. This grant includes the right of access to the easement across the Grantor's adjoining property.

Grantor agrees for itself and its successors in interest that it has been paid in valuable consideration and that the grant of this Temporary Easement is not a gift or donation.

This Temporary Easement is worded pursuant to the provisions of §§47-1-27 to 47-1-44, NMSA 1978 or successor statutes.

3. Ownership Offer. Grantor states that it is the owner in fee simple of the Property and that it has a good lawful right to convey the Property or any part thereof.

(Approved by Legal Dept.
as to form only-' '15/84)

3061

4. Binding on Grantor's Property. The grant and other provisions of this Temporary Easement constitute covenants running with the land for the benefit of the City and its successors and assigns until terminated.

5. Termination of Temporary Easement. This Temporary Easement shall remain in effect until [state date of termination or event which will cause Temporary Easement to end:] released by the City ("Termination"). Upon Termination and demand by the Grantor the City will execute and deliver to Grantor a release of this Temporary Easement.

6. Indemnification. As a part of the consideration for this grant, subject to the provisions of the New Mexico Tort Claims Act and all other applicable New Mexico laws, the City agrees to save Grantor harmless from any and all liability arising from the City's negligent use of the Temporary Easement for the purposes set forth herein. The City does not agree to save Grantor harmless from any liability which may arise from Grantor's use of the Temporary Easement and the Property.

7. Form Not Changed. Grantor agrees that changes to this form are not binding upon the City unless initialed by the Grantor and approved and signed by the City Legal Department in writing on this form.

CITY OF ALBUQUERQUE

Approved:

By: [signature]
Title: City Engineer
Dated: 4-24-90

GRANTOR:

By: [signature]
Its: Managing Partner
Dated: Feb. 23, 1990

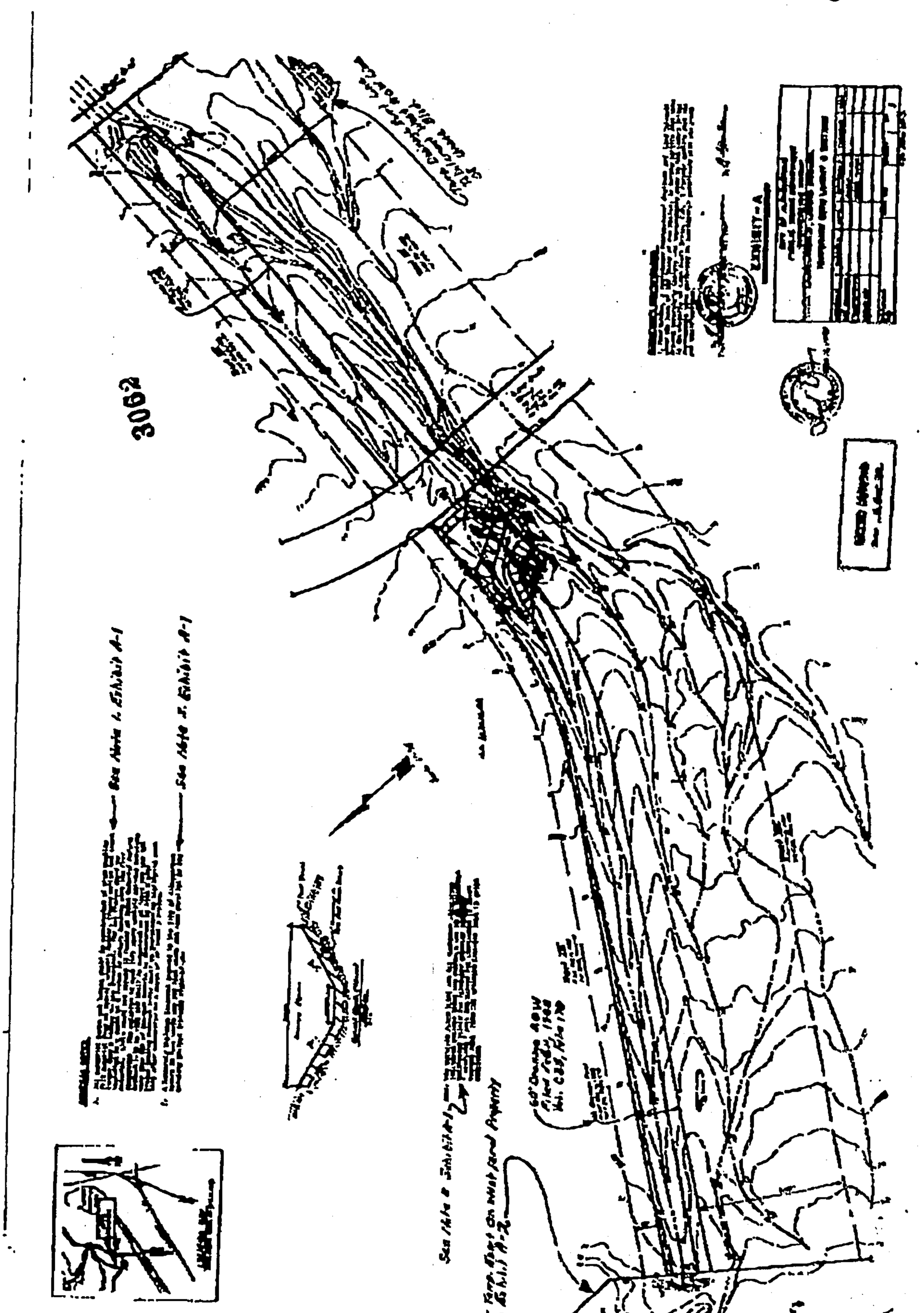
STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

The foregoing instrument was acknowledged before me this 23rd day of February, 19 90, by [name of person signing:] Max Lee Kisker [title or capacity, for instance, "President" or "Owner":] Managing Partner of [name of the entity which owns the Property if other than the individual signing, for instance, the name of the corporation, partnership, or joint venture:] Laurelwood II Joint Venture.

[signature]
Notary Public

My Commission Expires:
December 6, 1992

[Approved by Legal Dept. as to form only-6/15/86]



LAURELWOOD II
LADERA CHANNEL
TEMPORARY BERM LAYOUT & SECTIONS NOTES

3063

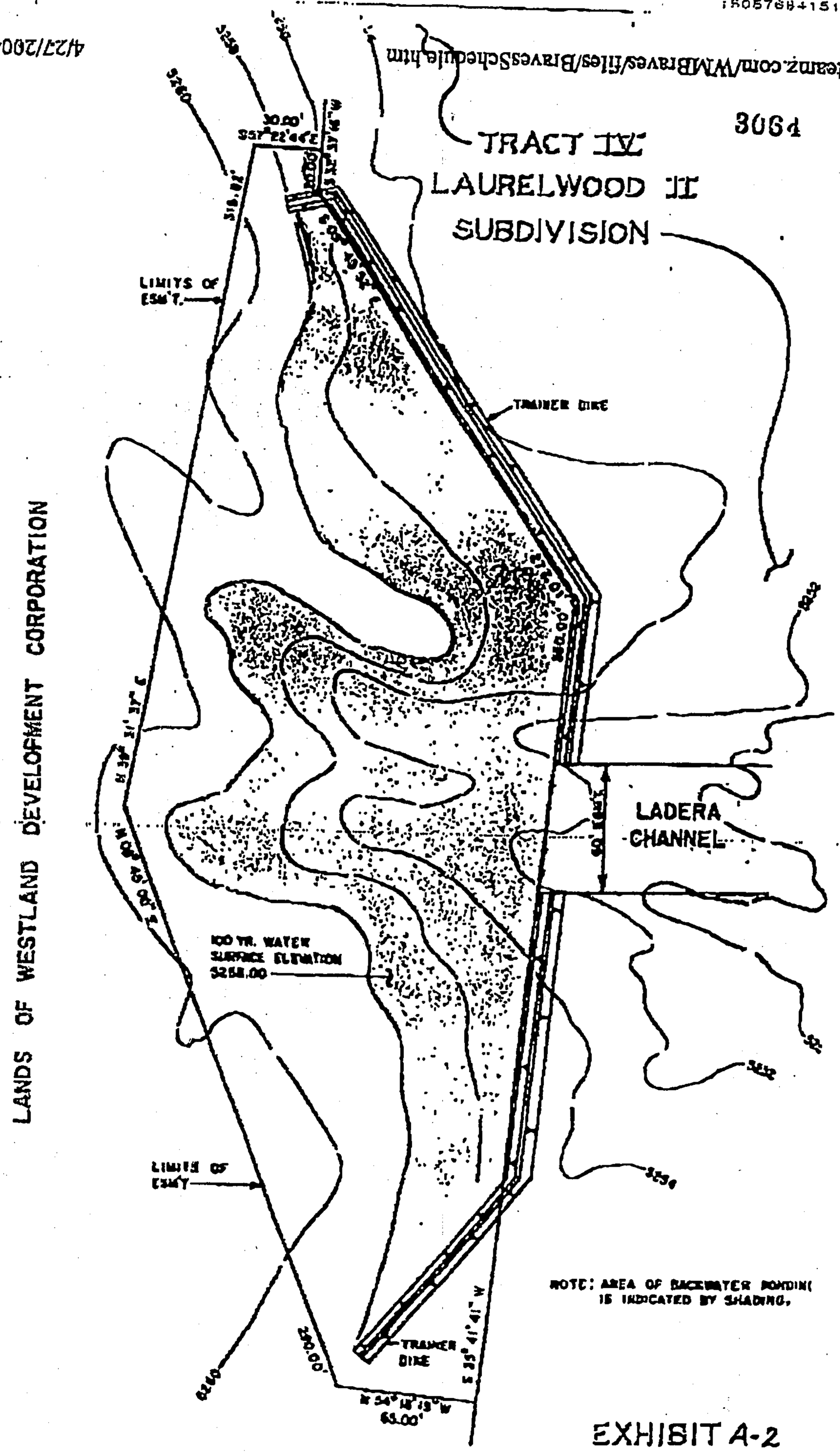
1. All earthfill berms and levees shall be constructed of high quality fill material free of debris, organic matter, frozen matter and stone larger than 6 inches in any dimension. The key trench shall be scarified to a depth of 6 inches to ensure bonding with the fill material. Lifts shall not exceed 12 inches of loose material before compaction. The material in each lift shall contain optimum moisture content (-1% to +3%) and shall be compacted to at least 90% and not more than 95% of maximum density as determined by ASTM D 1557. Proper bonding between lifts shall be guaranteed by scarifying each lift after compaction to a depth of at least 3 inches.

2. A Temporary Drainage Easement granted to the City of Albuquerque covers 30 feet north and 200 feet south and runs parallel to the existing 60-foot drainage right-of-way.

3. The existing Flood Plane and all temporary facilities including unlined berms and channels are to be privately maintained within the temporary upstream easement "Westland" area, and within the Laurelwood II Joint Venture area from the upstream easement area to Unser Boulevard.

STATE OF NEW MEXICO
COUNTY OF BERNALILLO
FILED IN MY OFFICE
90 APR 24 PM 3:11
90-7 340-3064
LOUIS M. DAVIS
CLERK & RECORDER
DEPUTY

Exhibit A-1



LANDS OF WESTLAND DEVELOPMENT CORPORATION

EXHIBIT A-2

FAX TRANSMISSION

File

AMAFCA
2600 Prospect Av. NE
Albuquerque, NM 87107
Ph: (505) 884-2215
Fax: (505) 884-0214

To: Kevin Patton

Fax #: 798-7988

From: Lynn Mazur, P.E.
Development Review Engineer

Of: Bohannan Huston, Inc.

Pages: 6, incl. cover sheet

Date: May 7, 2004

Subject: Watershed Subdivision

COMMENTS:

The as-builts for the Ladera Channel referenced the attached easement, so Marty tracked down a copy (Document No. 9032221). It is referenced on the Westland Bulk Land Plat as Doc. No. 88101448. It appears that Westland deeded the property to Laurelwood II Joint Venture, who in turn granted an easement to the City. We will talk to John Kelly about dedicating the easement to AMAFCA since AMAFCA maintains the inlet structure to the channel.

Cc: Brad Bingham, COA Hydrology

IC # 5720 955

3080

TEMPORARY EASEMENT

9032221

This grant of Temporary Easement, between (state the name of the present real property owner exactly as shown on the real estate document conveying title to the present owner and state the legal status of the owner, for example, "single person," "husband and wife," "corporation of the State of X," "partnership":) LAURELWOOD II JOINT VENTURE, a Joint Venture, ("Grantor"), whose address is 4520 Montgomery Boulevard NE, Suite 4-A, Albuquerque, NM 87109, and the City of Albuquerque, a New Mexico municipal corporation ("City"), whose address is P. O. Box 1293, Albuquerque, New Mexico 87103, is made in Albuquerque, Bernalillo County, New Mexico and is entered into as of the date Grantor signs this Temporary Easement.

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El Rancho Atrisco Phase IV
UPC No. 1-009-059-380-400-20150
Replatted as Laurelwood II, Tracts I, II, III & IV
Located at the NW Quadrant of Unser Boulevard & 98th Street NW

in Bernalillo County, New Mexico (the "Property").

2. Grant of Easement. The Grantor grants to the City a temporary easement ("Temporary Easement") in, over, upon and across the Property for (state the kind of easement, for example, "public street and highway purposes (including all utilities)," "water line," "sewer line," etc.:) Drainage.

The Temporary Easement is more particularly described in the attached Exhibit A. (State on the exhibit either the metes and bounds description of the Temporary Easement or state the exact dimensions and location in a manner which would enable a surveyor to locate the Temporary Easement on the ground.)

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3. Ownership Offer. Grantor states that it is the owner in fee simple of the Property and that it has a good lawful right to convey the Property or any part thereof.

(Approved by Legal Dept.
as to form only- 11/15/96)

3061

4. Binding on Grantor's Property. The grant and other provisions of this Temporary Easement constitute covenants running with the land for the benefit of the City and its successors and assigns until terminated.

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6. Indemnification. As a part of the consideration for this grant, subject to the provisions of the New Mexico Tort Claims Act and all other applicable New Mexico laws, the City agrees to save Grantor harmless from any and all liability arising from the City's negligent use of the Temporary Easement for the purposes set forth herein. The City does not agree to save Grantor harmless from any liability which may arise from Grantor's use of the Temporary Easement and the Property.

7. Form Not Changed. Grantor agrees that changes to this form are not binding upon the City unless initialed by the Grantor and approved and signed by the City Legal Department in writing on this form.

CITY OF ALBUQUERQUE

Approved:

By: [signature]
Title: City Engineer
Dated: 4-24-90

GRANTOR:

By: [signature]
Its: Managing Partner
Dated: Feb 23 1990

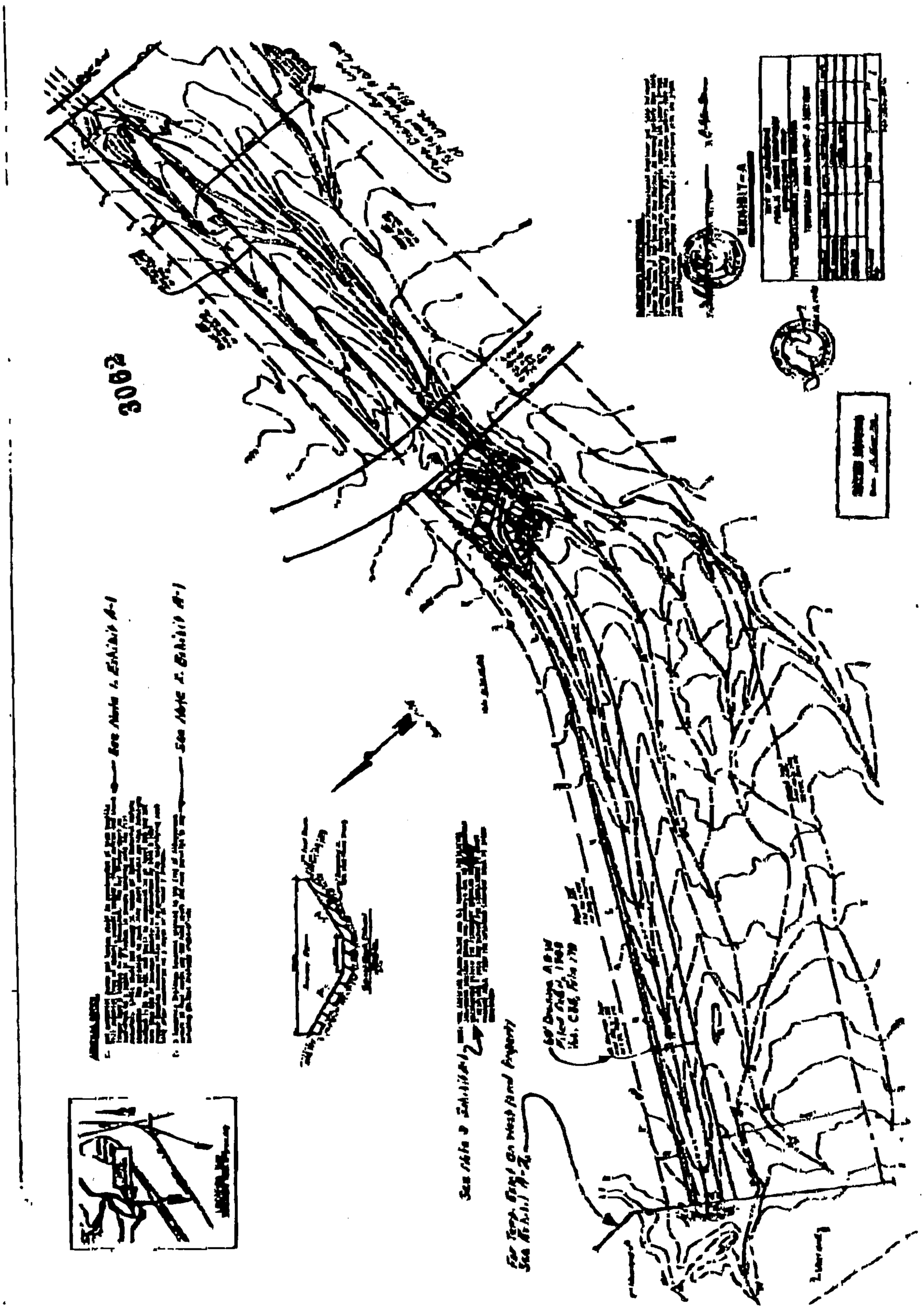
STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

The foregoing instrument was acknowledged before me this 23rd day of February, 19 90, by [name of person signing:] Ray Lee Kiehne [title or capacity, for instance, "president" or "owner":] Managing Partner of [name of the entity which owns the Property if other than the individual signing, for instance, the name of the corporation, partnership, or joint venture:] Lakewood II Joint Venture

[signature]
Notary Public

My Commission Expires:
December 6, 1992

[Approved by Legal Dept. as to form only-6/15/86]



MAY-07-04 FRI 02:19 PM 8840214 FAX NO. 8840214 P. 04/06

http://www.cleamz.com/WMBraves/files/BravesSchedule.htm 4/27/2004

3063

LAURELWOOD II
LADERA CHANNEL
TEMPORARY BERM LAYOUT & SECTIONS NOTES

1. All earthfill berms and levees shall be constructed of high quality fill material free of debris, organic matter, frozen matter and stone larger than 6 inches in any dimension. The key trench shall be scarified to a depth of 6 inches to ensure bonding with the fill material. Lifts shall not exceed 12 inches of loose material before compaction. The material in each lift shall contain optimum moisture content (-1% to +3%) and shall be compacted to at least 90% and not more than 95% of maximum density as determined by ASTM D 1557. Proper bonding between lifts shall be guaranteed by scarifying each lift after compaction to a depth of at least 3 inches.

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3. The existing Flood Plane and all temporary facilities including unlined berms and channels are to be privately maintained within the temporary upstream easement "Westland" area, and within the Laurelwood II Joint Venture area from the upstream easement area to Unser Boulevard.

STATE OF NEW MEXICO
COUNTY OF BERNALILLO
FILED FOR RECORD

90 APR 24 PM 3:11

90-7 320-3014

LOUIS P. DAVIS
COUNTY CLERK & RECORDER

DEPUTY

EXHIBIT A-1

http://www.eteam2.com/WMBraves/files/BravesSchedule.htm 4/27/2004

3064

LANDS OF WESTLAND DEVELOPMENT CORPORATION

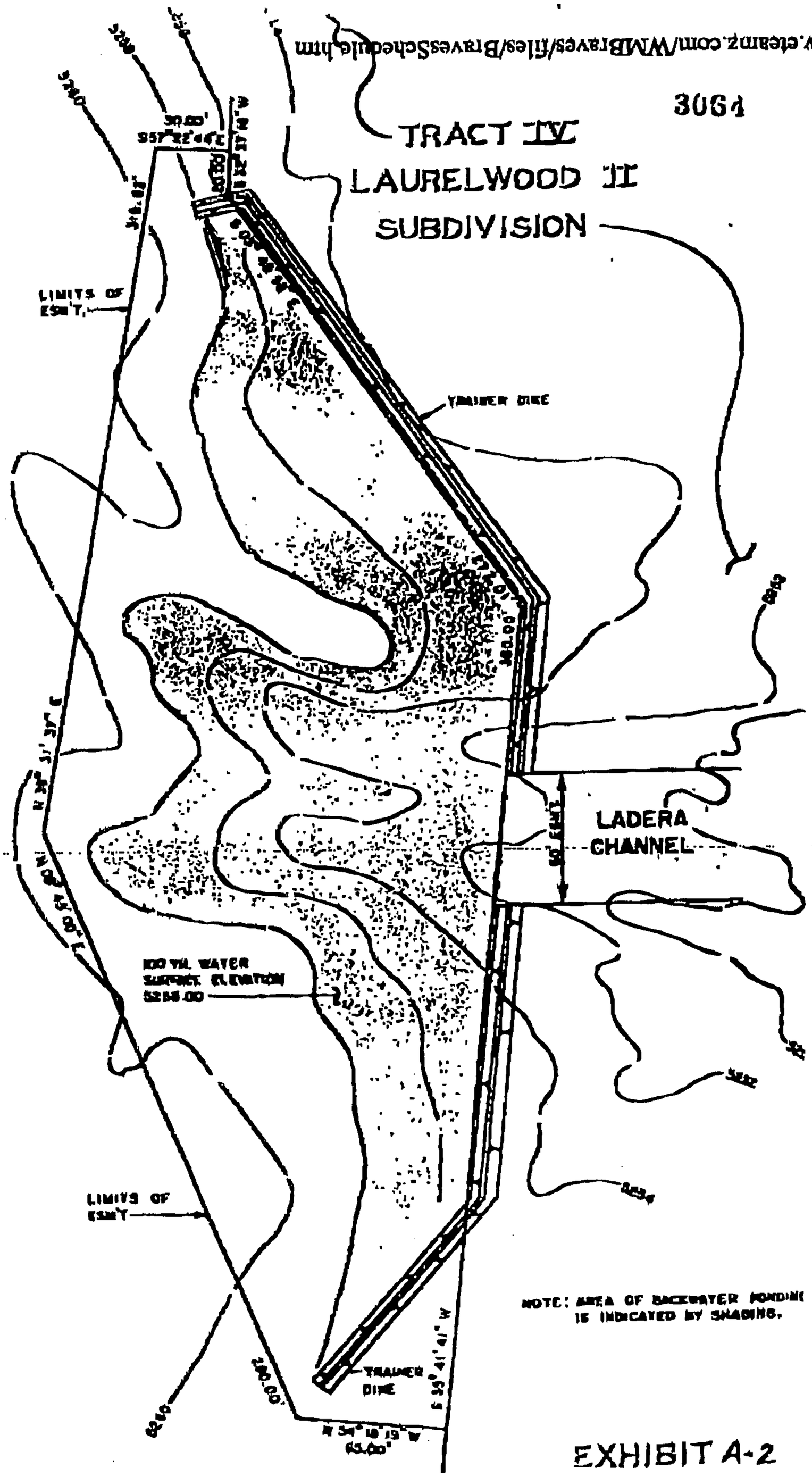


EXHIBIT A-2

****
*** RX REPORT ***
****

RECEPTION OK

TX/RX NO	9402	
CONNECTION TEL		8840214
SUBADDRESS		
CONNECTION ID		
ST. TIME	05/07 15:11	
USAGE T	01'52	
PGS.	6	
RESULT	OK	

Tim Eichenberg, Chair
Linda Stover, Vice-Chair / Asst. Secretary-Treasurer
Ronald D. Brown, Secretary-Treasurer
Daniel Hernandez, Director
Daniel Lyon, Director

John P. Kelly, P.E.
Executive Engineer

Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority

2600 PROSPECT N.E. • ALBUQUERQUE, NM 87107
TELEPHONE (505) 884-2215 FAX (505) 884-0214

Post-It® Fax Note 7671	Date 5-12	# of pages ▶ 1
To BRAD BINGHAM	From LYNN MAZUR	
Co./Dept. HYDROLOGY	Co. AMAFCA	
Phone #	Phone #	
Fax #	Fax #	

May 12, 2004

Mr. Kevin Patton, P.E.
Bohannan Huston, Inc.
7500 Jefferson St. NE, Courtyard I
Albuquerque, New Mexico 87109

Re: Drainage Report for Watershed Subdivision, ZAP H-9
Engineer's Stamp Dated April 9, 2004

Dear Mr. Patton:

AMAFCA has reviewed the referenced report and offers the following comments:

1. The backyard berms on Lots 50, 51, 52, 57, and 58 must not encroach into the AMAFCA Flood Plain Easement.
2. The storm drain outfall to the existing Ladera Channel will require coordination with AMAFCA. Appropriate water quality treatment will also be required.
3. As noted previously, the Temporary Drainage Easement (Document No. 88101448) was superceded by a Temporary Drainage Easement (Document No. 9032221) granted to the City of Albuquerque. AMAFCA does not object to the vacation of the portion of the easement as shown on the Preliminary Plat. However, AMAFCA will request that the remaining portion of the easement be deeded to AMAFCA in fee right-of-way since AMAFCA maintains the inlet structure to the Ladera Channel.
4. A 25-foot public utility easement to be granted to the City is shown crossing the existing concrete apron for the Ladera Channel inlet. When will these utilities be constructed? Can the easement be moved so that construction will not conflict with the apron?

If you have any questions, please call me at 884-2215.

Sincerely,
AMAFCA

Lynn M. Mazur

Lynn M. Mazur, P.E., C.F.M.
Development Review Engineer

Cc: Brad Bingham, COA Hydrology

88101448

327

TEMPORARY DRAINAGE EASEMENT

This grant of Easement, between: Westland Development Co., Inc., a New Mexico corporation ("Grantor"), whose address is 401 Coors Boulevard NW, Albuquerque, New Mexico 87105 and Laurelwood II Joint Venture, a joint venture, ("Grantee"), whose address is 2400 Comanche Road NE, Albuquerque, New Mexico 87107, is made in Albuquerque, Bernalillo County, New Mexico and is entered into as of the date Grantor signs this Easement.

1. Recital. Grantor is the owner of certain unplatted real property located adjacent to the West Boundary of Laurelwood II Subdivision in Bernalillo County, New Mexico (the "Property").

2. Grant of Easement. The Grantor grants to the Grantee a temporary easement ("Easement") in, over, upon and across the Property for: Drainage Facilities. The Easement is more particularly described in the attached Exhibit "A" and is illustrated on the attached Exhibit "B".

The grant of the Easement includes the right of the Grantee to enter upon the Easement at any time for inspection, installation, maintenance, repair or modification to its drainage facilities and the right to remove trees, bushes, undergrowth and any other obstacles if the Grantee determines they interfere with the appropriate use of the Easement for its drainage facilities.

3. Binding on Grantor's Property. The grant and other provisions of this Easement constitute covenants running with the land for the benefit of the Grantee and its successors and assigns.

4. Indemnification. As a part of the consideration for this grant, the Grantee agrees to save Grantor harmless from any and all liability arising from the Grantee's negligent use of the Easement for the purposes set forth herein. The Grantee does not agree to save Grantor harmless from any liability which may arise from Grantor's use of the easement and the Property.

5. This grant of Easement shall be relinquished by the Grantee at that point in time when the Grantor and Grantee both agree that the Easement is no longer needed or when the City of Albuquerque no longer requires said Easement.

6. This Easement shall extend to and bind the heirs personal representatives and assigns of each of the parties and shall inure to the benefit of all successors, transferees and assigns of the parties.

GRANTEE:

LAURELWOOD II JOINT VENTURE

By: Skip Buchanan

Title: MANAGING PARTNER

Dated: 9/26/88

GRANTOR:

WESTLAND DEVELOPMENT CO., INC.

By: Gil E. Cordova
Gil Cordova
Its President and C.E.O.

Dated: 9/13/88

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

The foregoing instrument was acknowledged before me this 13th day of September, 1988, by Gil Cordova, President, of Westland Development Co., Inc., a New Mexico corporation, on behalf of said corporation.

NOTARY PUBLIC

My Commission Expires:

[illegible]

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

The foregoing instrument was acknowledged before me this 26th day of September, 1988, by SKIP BUCHANAN, MANAGING PARTNER, of LAURELWOOD II JOINT VENTURE a New Mexico joint venture, on behalf of said joint venture.

Janet Garland
NOTARY PUBLIC

My Commission Expires:

3-14-92

August 22, 1988

EXHIBIT "A"

329

That certain parcel of land situate within projected Section 9, Township 10 North, Range 2 East of the New Mexico Principal Meridian; lying within the Town of Atrisco Land Grant, Bernalillo County, New Mexico; and being more particularly described as follows:

BEGINNING at a point on the west boundary of the parcel of land shown on the plat entitled "Plat of Laurelwood II Subdivision", as filed for public record with the Office of the Bernalillo County Clerk on February 11, 1988, in Volume C35, Folio 170; whence, the southwest corner of said Laurelwood II Subdivision bears S 16° 44' 13" W, 860.36 feet; and whence, the New Mexico State Highway Commission/Albuquerque City Survey monument "140-19" bears S 27° 47' 01" E, 7039.36 feet;

Thence, N 54° 18' 19" W, 65.00 feet leaving said west boundary;

Thence, N 08° 45' 00" E, 290.00 feet;

Thence, N 39° 31' 37" E, 315.82 feet;

Thence, S 57° 22' 44" E, 30.00 feet to said west boundary;

Thence, following said west boundary for the remaining three (3) courses:

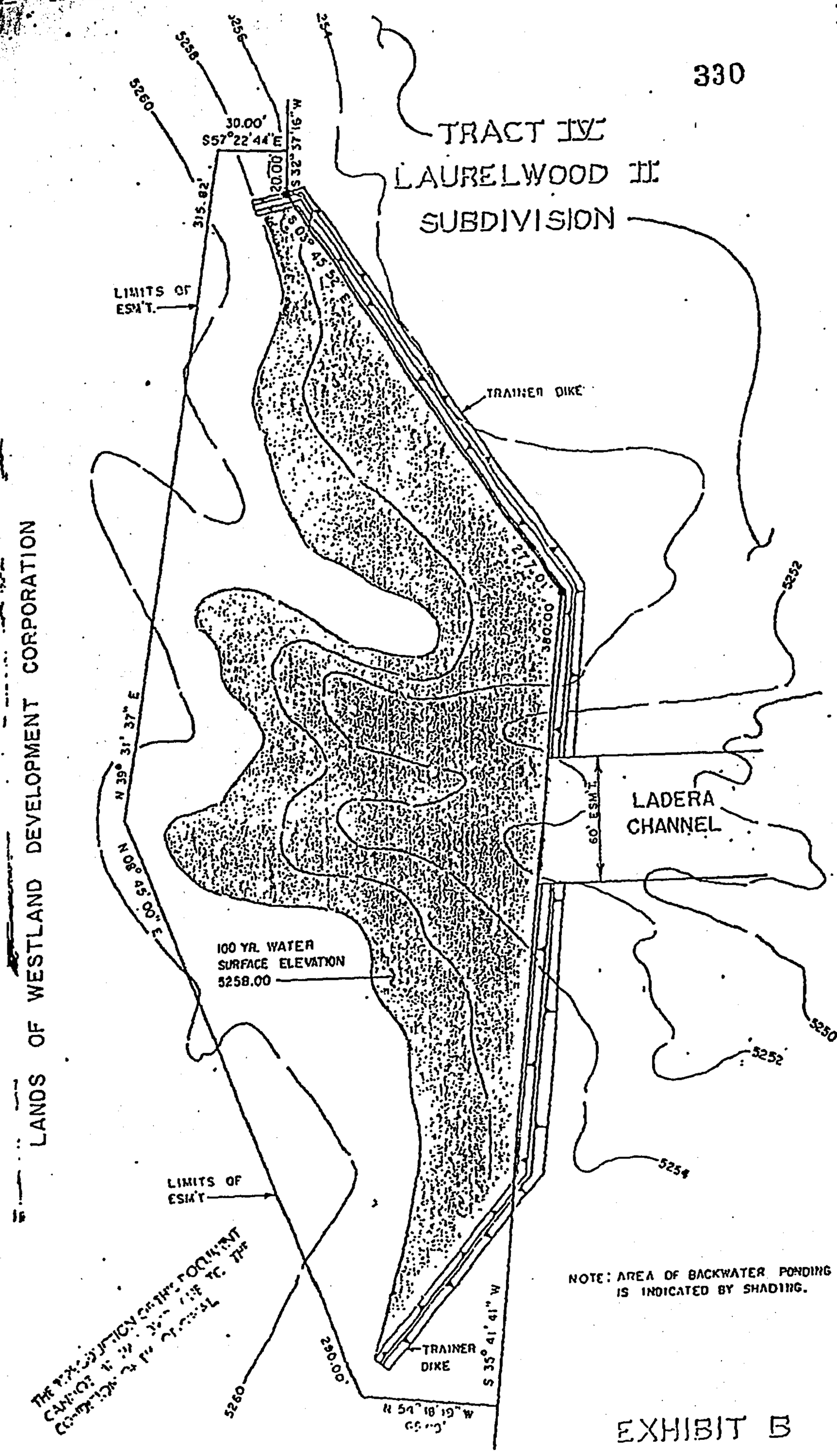
S 32° 37' 16" W, 20.00 feet;

Thence, S 03° 45' 52" E, 227.01 feet;

Thence, S 35° 41' 41" W, 380.00 feet to the POINT OF BEGINNING of the parcel of land herein described.

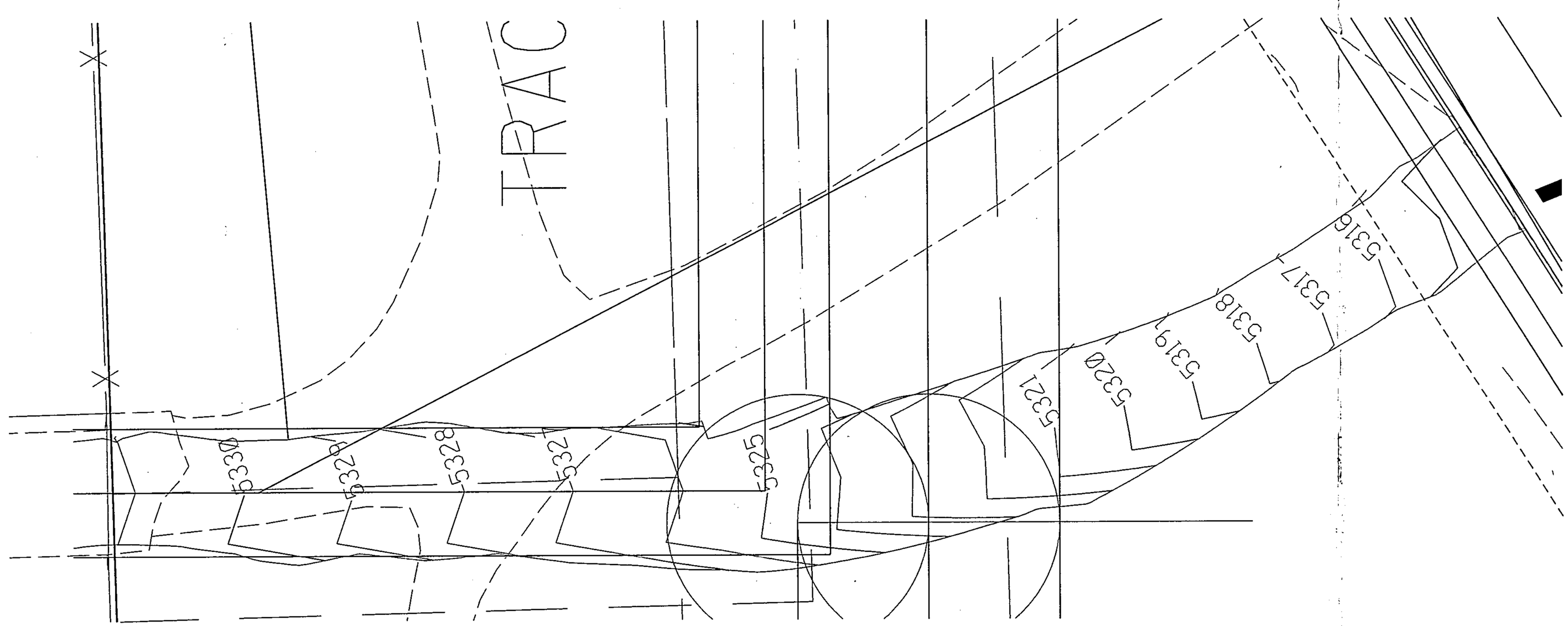
The above delineated parcel of land contains 1.7695 acres, more or less.

MS 6HA 327-330

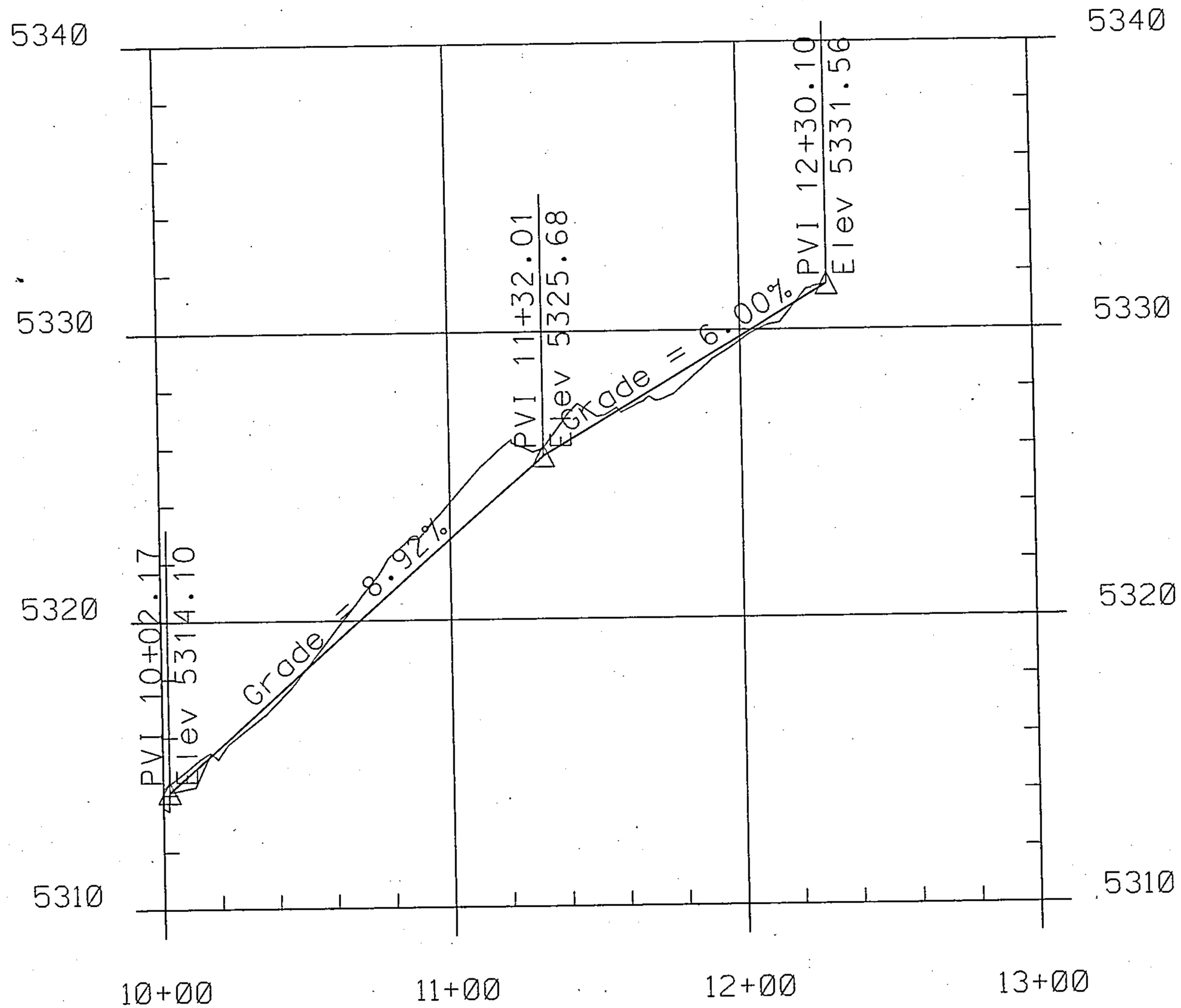


NOTE: AREA OF BACKWATER PONDING IS INDICATED BY SHADING.

EXHIBIT B



Access Road Connection
Through TRACT 'L'



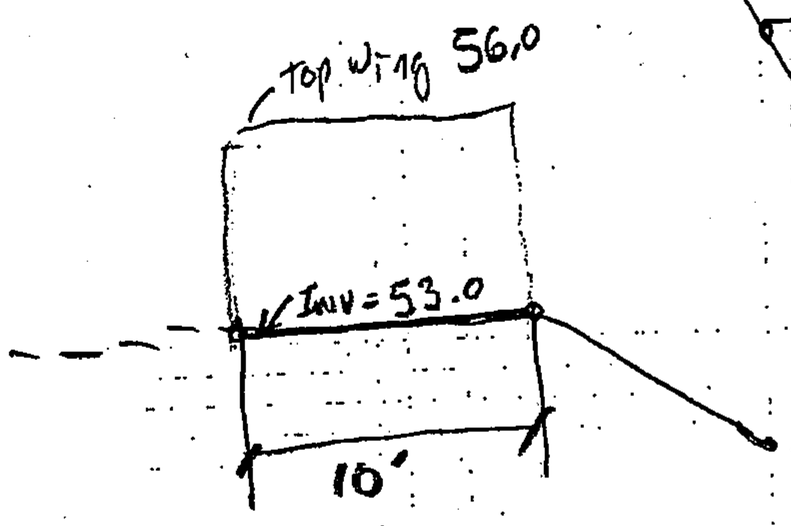
LINE	SURFACE	OFFSET
——	040166proposed	0.00
——	all	0.00

Scaled 10.0000 Times Ver.
Scaled 1.0000 Times Hor.

Channel Design Info from COA Proj # 4886.92 Sheet 4 of 19.
Flow Info from Community Science cop Drainage Report Reviewed by COA
JUL 11, 1997.

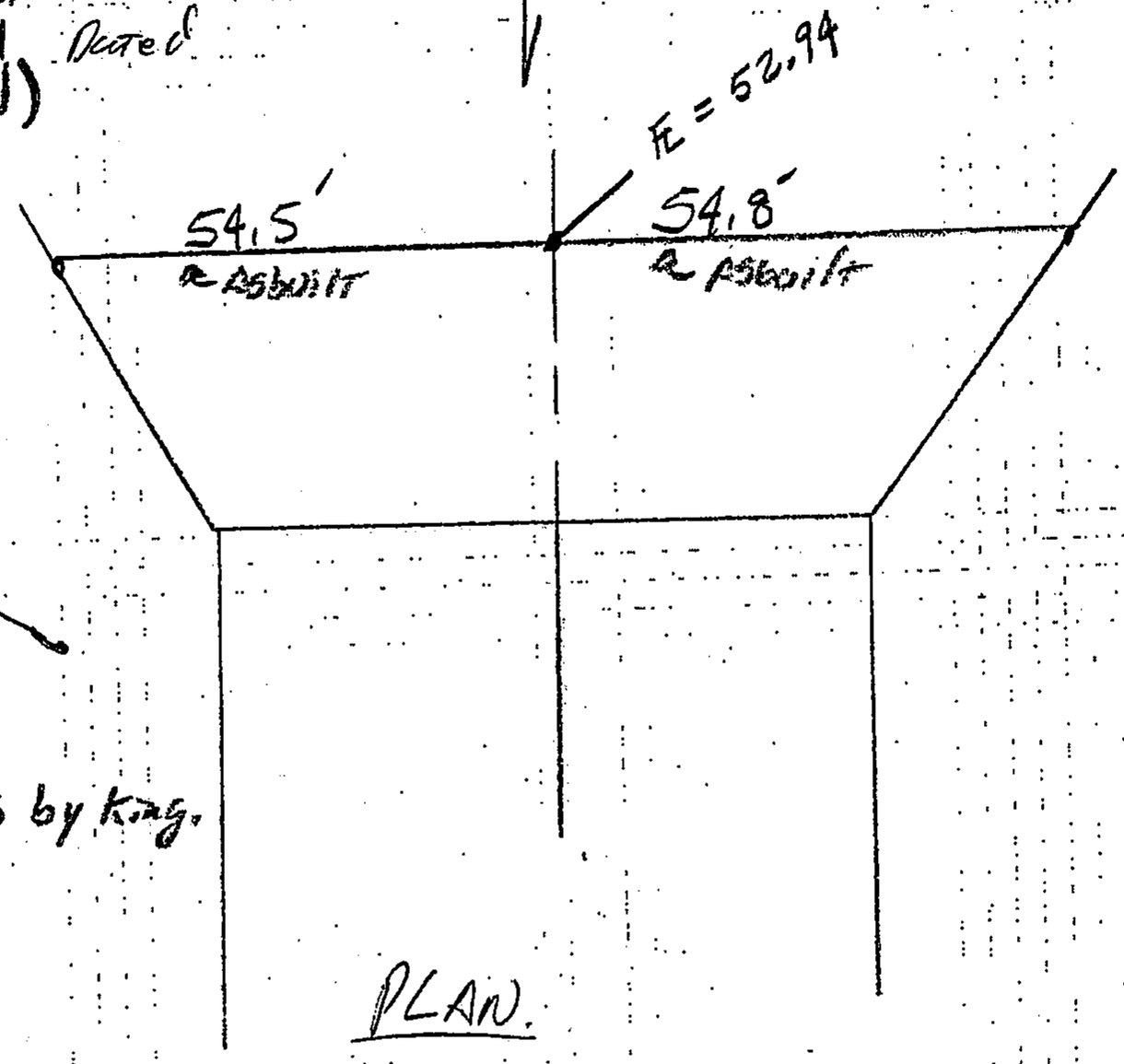
Q from Community Sciences Work MAP
for Lodera Channel Dated
Feb 1995. (ATTACHED)

Q = 570 CFS



weir coef = 2.64
from Hnbk of Hydralics by King.

Profile



PLAN.

Assume broad Crested Weir Condition to Estimate Backwater Elevation and Areal Extents of WATER.

$$h = \left(\frac{Q}{2.64 \cdot L}\right)^{-1.5}$$

$$h = \left(\frac{570}{2.64\,(54.5 + 54.8)}\right)^{-1.5}$$

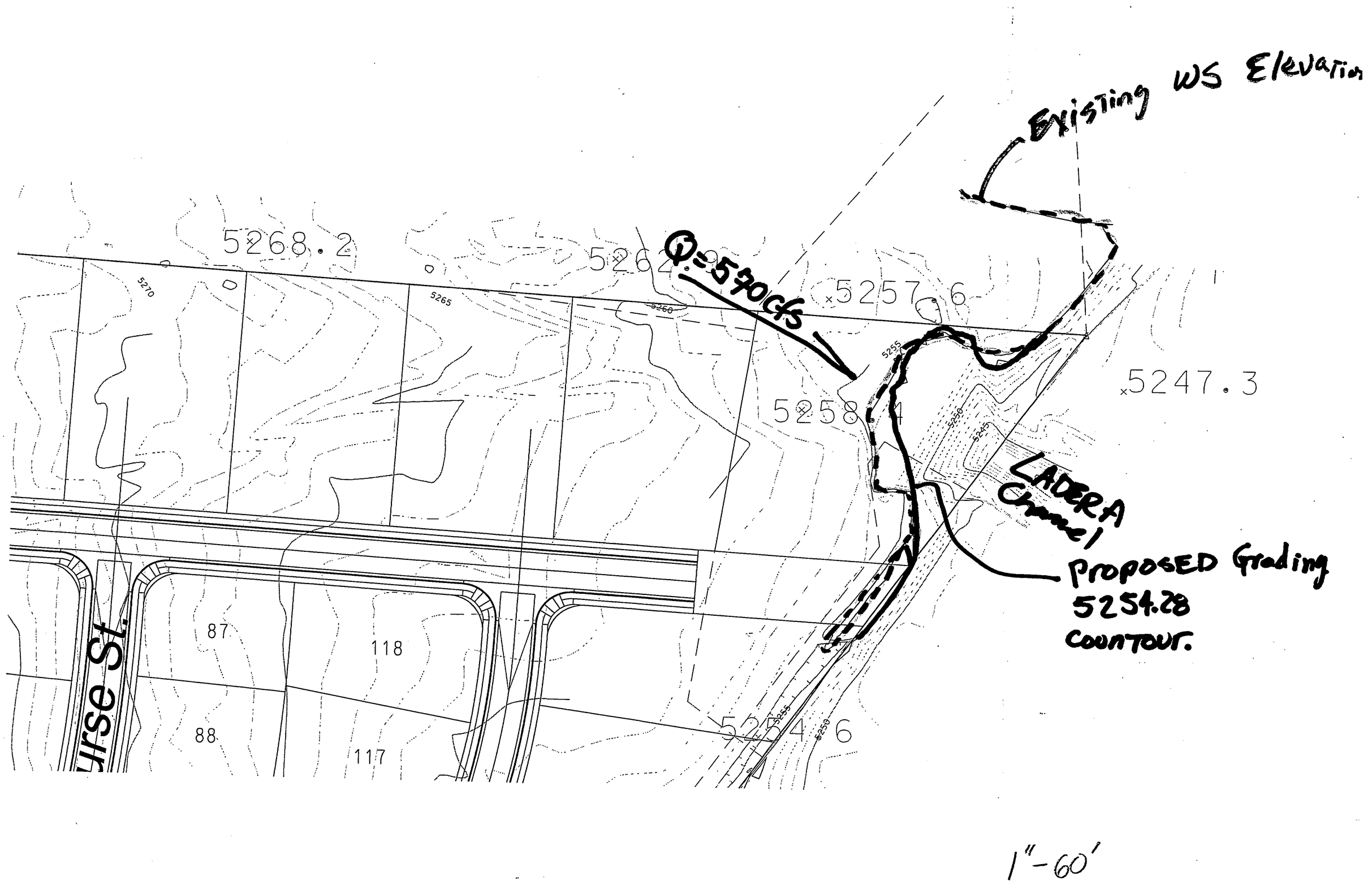
$$h = \left(\frac{570}{287.57}\right)^{-1.5} = (1.97)^{-1.5} = 1.57 \text{ ft} = \text{Depth of flow}$$

Elevation of Water Surface = 5254.57
Freeboard = 5256 - 5254.57 = 1.43 feet

RECEIVED
MAY 25 2004
HYDROLOGY SECTION

Bohannan ▲ Huston INC.
ENGINEERING ▲
SPATIAL DATA ▲
ADVANCED TECHNOLOGIES ▲

PROJECT NAME Watershed SHEET 1 OF 1
PROJECT NO. 040166 BY JP DATE 5/17/04
SUBJECT Weir Calc for Exist Lodera Crl. CH'D _____ DATE _____


Existing WS Elevation
Q=570cfs
5268.2
5262.9
5257.6
5247.3
5258.4
5254.6
5270
5265
5260
5255
5250
5245
LADERA Channel
PROPOSED Grading
5254.28
COUNTOUR.
87
118
88
117
urse St.
1"-60'

Bohannan ▲ Huston INC.

Courtyard I
7500 Jefferson St. NE
Albuquerque, NM
87109-4335

www.bhinc.com

voice: 505.823.1000
facsimile: 505.798.7988
toll free: 800.877.5332

December 21, 2006

Brad Bingham, P.E.
Hydrology Development Division
City of Albuquerque Planning Department
P. O. Box 1293
Albuquerque, NM 87103

Re: Watershed Subdivision at Westland – Grading and Drainage Certification
DRB Case No1003087; COA Drainage File # H9/D17A

Dear Brad:

The purpose of this letter is to request your concurrence of the enclosed grading and drainage certification for the above referenced subdivision in Ventana Ranch. This submittal requests approval of the certification for Ventana Highlands Unit 1 at Ventana Ranch West. The enclosed certified plan is for the grading plan Engineers Stamp dated 2-25-05. Enclosed is the approval letter.

In order to close out this package, approval of the enclosed certification is necessary. If you have any questions, please give me a call at 823-1000.

Sincerely,

Kevin Patton, P.E.
Project Manager
Community Development and Planning

cc: Fred Ambrogi, Westland Development (w/encl)

RECEIVED
DEC 20 2005
HYDROLOGY DIVISION

ENGINEERING ▲
SPATIAL DATA ▲
ADVANCED TECHNOLOGIES ▲

(2)

88101448

TEMPORARY DRAINAGE EASEMENT

This grant of Easement, between: Westland Development Co., Inc., a New Mexico corporation ("Grantor"), whose address is 401 Coors Boulevard NW, Albuquerque, New Mexico 87105 and Laurelwood II Joint Venture, a joint venture, ("Grantee"), whose address is 2400 Comanche Road NE, Albuquerque, New Mexico 87107, is made in Albuquerque, Bernalillo County, New Mexico and is entered into as of the date Grantor signs this Easement.

1. Recital. Grantor is the owner of certain unplatted real property located adjacent to the West Boundary of Laurelwood II Subdivision in Bernalillo County, New Mexico (the "Property").

2. Grant of Easement. The Grantor grants to the Grantee a temporary easement ("Easement") in, over, upon and across the Property for: Drainage Facilities. The Easement is more particularly described in the attached Exhibit "A" and is illustrated on the attached Exhibit "B".

The grant of the Easement includes the right of the Grantee to enter upon the Easement at any time for inspection, installation, maintenance, repair or modification to its drainage facilities and the right to remove trees, bushes, undergrowth and any other obstacles if the Grantee determines they interfere with the appropriate use of the Easement for its drainage facilities.

3. Binding on Grantor's Property. The grant and other provisions of this Easement constitute covenants running with the land for the benefit of the Grantee and its successors and assigns.

4. Indemnification. As a part of the consideration for this grant, the Grantee agrees to save Grantor harmless from any and all liability arising from the Grantee's negligent use of the Easement for the purposes set forth herein. The Grantee does not agree to save Grantor harmless from any liability which may arise from Grantor's use of the easement and the Property.

5. This grant of Easement shall be relinquished by the Grantee at that point in time when the Grantor and Grantee both agree that the Easement is no longer needed or when the City of Albuquerque no longer requires said Easement.

6. This Easement shall extend to and bind the heirs personal representatives and assigns of each of the parties and shall inure to the benefit of all successors, transferees and assigns of the parties.

GRANTEE:

LAURELWOOD II JOINT VENTURE

By: Skip Buchanan

Title: MANAGING PARTNER
Dated: 9/26/88

GRANTOR:

WESTLAND DEVELOPMENT CO., INC.

By: Gil E. Cordova
Gil Cordova
Its President and C.E.O.
Dated: 9/13/88

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

The foregoing instrument was acknowledged before me this 13th day of September, 1988, by Gil Cordova, President, of Westland Development Co., Inc., a New Mexico corporation, on behalf of said corporation.

NOTARY PUBLIC

My Commission Expires:

[illegible]

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

The foregoing instrument was acknowledged before me this 26th day of September, 1988, by SKIP BUCHANAN, MANAGING PARTNER, of LAURELWOOD II JOINT VENTURE, a New Mexico joint venture, on behalf of said joint venture.

Janet Garland
NOTARY PUBLIC

My Commission Expires:

3-14-92

August 22, 1988

EXHIBIT "A"

That certain parcel of land situate within projected Section 9, Township 10 North, Range 2 East of the New Mexico Principal Meridian; lying within the Town of Atrisco Land Grant, Bernalillo County, New Mexico; and being more particularly described as follows:

BEGINNING at a point on the west boundary of the parcel of land shown on the plat entitled "Plat of Laurelwood II Subdivision", as filed for public record with the Office of the Bernalillo County Clerk on February 11, 1988, in Volume C35, Folio 170; whence, the southwest corner of said Laurelwood II Subdivision bears S 16° 44' 13" W, 860.36 feet; and whence, the New Mexico State Highway Commission/Albuquerque City Survey monument "140-19" bears S 27° 47' 01" E, 7039.36 feet;

Thence, N 54° 18' 19" W, 65.00 feet leaving said west boundary;

Thence, N 08° 45' 00" E, 290.00 feet;

Thence, N 39° 31' 37" E, 315.82 feet;

Thence, S 57° 22' 44" E, 30.00 feet to said west boundary;

Thence, following said west boundary for the remaining three (3) courses:

S 32° 37' 16" W, 20.00 feet;

Thence, S 03° 45' 52" E, 227.01 feet;

Thence, S 35° 41' 41" W, 380.00 feet to the POINT OF BEGINNING of the parcel of land herein described.

The above delineated parcel of land contains 1.7695 acres, more or less.

MS 6HA 327-330

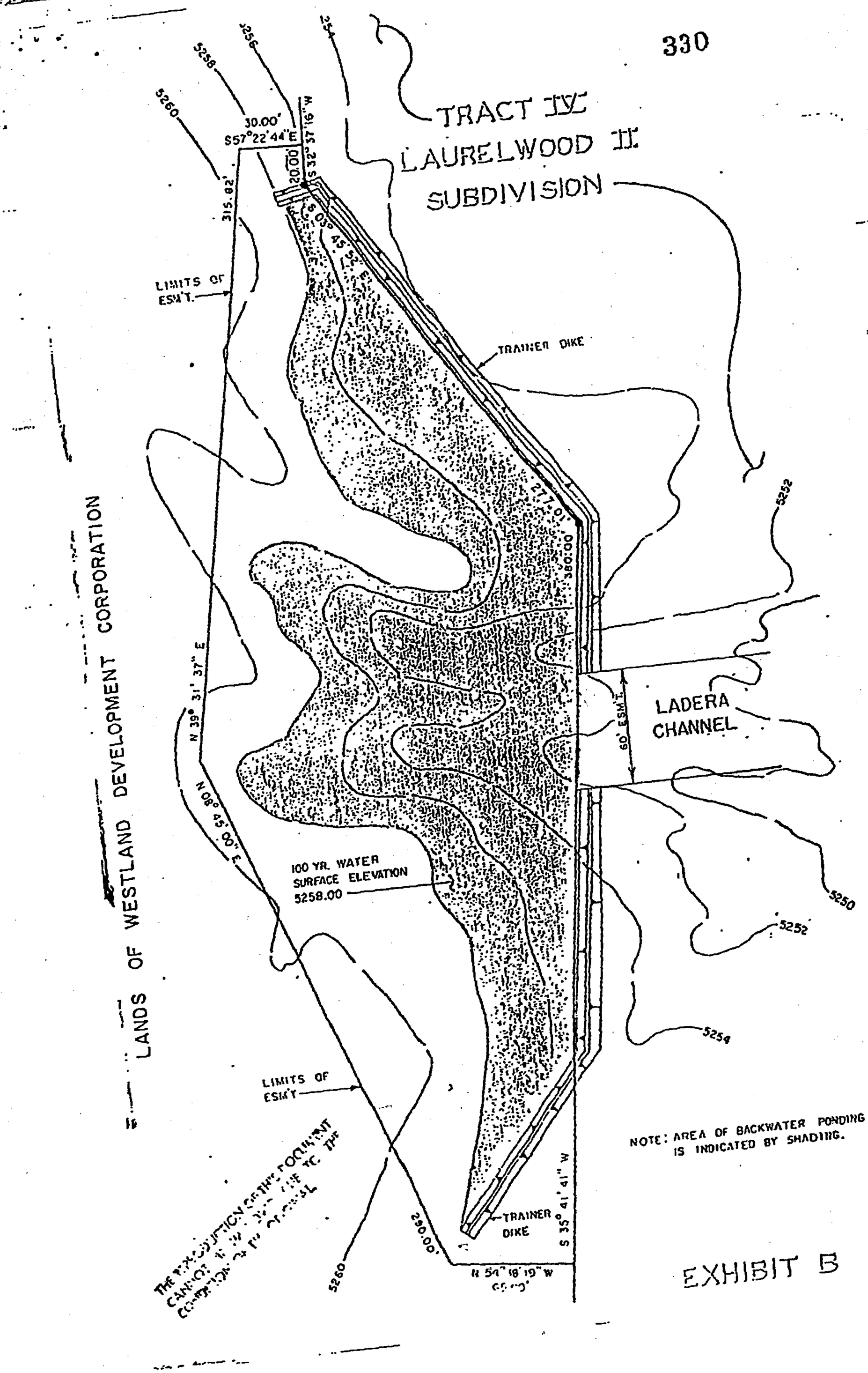

TRACT IV
LAURELWOOD II
SUBDIVISION
LANDS OF WESTLAND DEVELOPMENT CORPORATION
LADERA CHANNEL
TRAINER DIKE
TRAINER DIKE
LIMITS OF ESM'T.
LIMITS OF ESM'T
60' ESM'T.
100 YR. WATER SURFACE ELEVATION 5258.00
30.00'
S57°22'44"E
20.00'
S 32° 37' 19" W
315.82'
S 03° 45' 52" E
277.01'
380.00'
N 39° 31' 37" E
N 08° 45' 00" E
290.00'
S 35° 41' 41" W
N 54° 18' 19" W
5260
5258
5256
5254
5252
5250
5252
5254
5260
NOTE: AREA OF BACKWATER PONDING IS INDICATED BY SHADING.

EXHIBIT B

File

MEMORANDUM

AMAFCA

2600 Prospect Av. NE
Albuquerque, NM 87107
Ph: (505) 884-2215
Fax: (505) 884-0214

To: Drainage File, Watershed Subdivision, ZAP H-9

From: Lynn Mazur, Review Engineer

Subject: Storm Drain Outfall to Ladera Channel

Date: August 30, 2004

H9/D17A

The preliminary work order plans showed the 54-inch storm drain outfall coming in perpendicular to the sloped Ladera Channel inlet, but AMAFCA was concerned about the safety of the gaping hole that would be in the slope paving. I again made the comment that the pipe should enter on the side of the channel as we have done for other projects. Kevin Patton, VP for Bohannan Huston, suggested that we meet in the field to look at it.

Jerry Lovato and I met Kevin and Jim Poorbaugh of BHI at the site. Taking the pipe into the side of the channel appears feasible but does not appear to be the best option. We measured the channel depth and verified that it is 5.5' deep, so the top of pipe would be at the lip of the channel. Also, the wall on Lot 46P-1 that would be next to the trench box is not very stable. We agreed that the best option would be to connect the pipe into the inlet, miter it to the slope, and install railing around the hole.

Since the storm drain will be constructed within the existing Temporary Drainage Easement granted to the City by Document No. 9032221, a three-party license agreement will not be required. However, the standard AMAFCA notes for construction should be included on the work order plans since the easement will be dedicated as fee R/W to AMAFCA and AMAFCA currently maintains the inlet.

Cc: Brad Bingham, City Hydrology

Post-It® Fax Note 7671	Date 8-30	# of pages ▶ 1
To BRAD BINGHAM	From LYNN MAZUR	
Co./Dept. HYDROLOGY	Co. AMAFCA	
Phone #	Phone #	
Fax #	Fax #	

Tim Eichenberg, Chair
Linda Stover, Vice-Chair
Axel Secretary-Treasurer
Ronald D. Brown, Secretary-Treasurer
Daniel Hernandez, Director
Daniel Lyon, Director

John P. Kelly, P.E.
Executive Engineer

Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority

2600 PROSPECT N.E. - ALBUQUERQUE, NM 87107
TELEPHONE (505) 884-2215 FAX (505) 884-0214

Post-it® Fax Note 7671	Date 8-24	# of pages ▶ 3
To BRAD BINGHAM	From LYNN MAZUR	
Co./Dept. HYDROLOGY	Co. AMAFCA	
Phone #	Phone #	
Fax #	Fax #	

H9/D17A

August 23, 2004

Mr. Kevin Patton, P.E.
Bohannan Huston, Inc.
7500 Jefferson St. NE, Courtyard I
Albuquerque, New Mexico 87109

Re: Watershed Subdivision Storm Drain Connection to Ladera Channel, ZAP H-9

Dear Mr. Patton:

On August 17, I received your letter, dated August 5, with attachments to facilitate review of the storm drain connection to the Ladera Channel. After reviewing this submittal with John Kelly, we have the following comments:

1. Due to potential liability issues, AMAFCA does not want to have a large hole on the sloped inlet into the channel.
2. The right-of-way on the corner of Lot 46-P1 was granted with the subdivision plat for Parkwest, Unit 3, Document No. 95003482 (see attached). Also, as shown on the 1999 aerial mapping, the wall on this lot was built on the R/W so that it is parallel to the wingwall. It appears that a trench box could be used to construct a storm drain in this area so that a connection can be made to the trapezoidal channel section. If this won't work, please provide a detail showing a trench box and dimensions.
3. A water quality manhole will be required for the storm drain.

If you have any questions, please call me at 884-2215.

Sincerely,
AMAFCA

Lynn M. Mazur

Lynn M. Mazur, P.E., C.F.M.
Development Review Engineer

Cc: Brad Bingham, COA Hydrology

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

May 4, 2004

Kevin Patton, PE
Bohannan Huston, Inc
7500 Jefferson NE
Albuquerque, NM 87109

Re: Watershed Subdivision Drainage Report
Engineer Stamp dated 4-9-04 (H9/D17A)

Dear Mr. Patton,

Based upon the information provided in your submittal dated 4-9-04, the above referenced report cannot be approved for Preliminary Plat until the following comments are addressed.

- The area encumbered by the temporary drainage easement was to encompass the backwater created by the training dikes needed for the Ladera channel. Vacation of a portion of this easement may cause the backwater to rise. Please provide excerpts of the plan that determined the capacity of the channel and the new backwater surface elevation. What improvements are needed on tract A to

- By your design, lots 47-58 (along Tributary Rd) drain to the Petroglyph National Monument. I will need concurrence by the City's Open Space division to allow this. If these are to be developed as "estate-type" lots, please show building envelopes and ponding areas. The detail of the erosion control berm is not quite adequate enough for this plan. I think the City should be required to review each of these subsequent grading plans as well any Neighborhood Control Committee.

- There are a number of areas where the retaining wall symbol was omitted. Please show all retaining wall needed on the plan.

- Adequate access to the College Reservoir and Pump Station must be shown on the plan.

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

Sincerely,

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

C: Lynn Mazur, AMAFCA
file

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(REV. 1/28/2003rd)

H-09/D017A

PROJECT TITLE: Watershed Subdivision ZONE MAP/DRG. FILE # ~~H-8, H9, H7, J8, J7~~
DRB #: 1003087 EPC#: WORK ORDER#:

LEGAL DESCRIPTION: Westland Tract A
CITY ADDRESS:

ENGINEERING FIRM: Bohannan Huston, Inc. CONTACT: Kevin Patton
ADDRESS: 7500 Jefferson NE – Courtyard I PHONE: (505) 823-1000
CITY, STATE: Albuquerque, NM ZIP CODE: 87109

OWNER: Westland Development, Inc. CONTACT: Fred Ambrogi
ADDRESS: 401 Coors Blvd. NW PHONE: 831-9600
CITY, STATE: Albuquerque, NM ZIP CODE: 87121

ARCHITECT: CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

SURVEYOR: CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

CONTRACTOR: CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

CHECK TYPE OF SUBMITTAL:

X 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
x 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 (PERM.)
___ CERTIFICATE OF OCCUPANCY (TEMP.)
___ GRADING PERMIT APPROVAL
___ PAVING PERMIT APPROVAL
___ WORK ORDER APPROVAL
___ OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED:

___ YES
X NO
___ COPY PROVIDED

RECEIVED
APR 0 8 2004
HYDROLOGY SECTION

DATE SUBMITTED: 4-9-04 BY:

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature , location and scope of 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.

Appendix

Table of Contents