City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

October 6, 2003

Chris Sholtis, PE
Bohannan Huston, Inc
7500 Jefferson NE
Albuquerque, NM 87109

Re: Sundoro Subdivision Drainage Report
Engineer's Stamp dated 9-17-03, (J9/D18)

Dear Mr. Sholtis,

Based upon the information provided in your submittal dated 9-18-03, 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 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 Public Works Hydrology section at 768-3654 (Charles Caruso) or 768-3645 (Brian Wolfe).

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

Sincerely,

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

C: Chuck Caruso, CoA
file

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

J-9 / D18

PROJECT TITLE: Sundoro Subdivision ZONE MAP/DRG. FILE #: ~~L9/L9~~

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

LEGAL DESCRIPTION: Replat of Tract A at Parkway Subdivision and Parcel I of Westland North

CITY ADDRESS: Ladera Drive NW and Arroyo Vista Blvd. NW

ENGINEERING FIRM:	Bohannan Huston, Inc.	CONTACT:	Chris Sholtis
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 Blvd. NW	PHONE:	(505) 831-9600
CITY, STATE:	Albuquerque, NM	ZIP CODE:	87121
ARCHITECT:	N/A	CONTACT:	
ADDRESS:		PHONE:	
CITY, STATE:		ZIP CODE:	
SURVEYOR:	Bohannan Huston, Inc.	CONTACT:	
ADDRESS:		PHONE:	
CITY, STATE:		ZIP CODE:	
CONTRACTOR:	Not Yet Determined	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
- X 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
- ____ PAVING PERMIT APPROVAL
- X WORK ORDER APPROVAL
- ____ OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ____ YES
- X NO
- ____ COPY PROVIDED

RECEIVED
SEP 18 2003
HYDROLOGY SECTION

DATE SUBMITTED: 9-18-03 BY: Christian J. Sholtis, P.E.

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
Hydrology
City of Albuquerque
Plaza del Sol

Requested by: Chris Sholtis

Date: 9-18-03

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

Phone:

Job No.: 040013-004

Job Name: Sundoro Subdivision

DELIVERY VIA

- ☒ **Courier**
- ☐ **Federal Express**
- ☐ **Mail**
- ☐ **UPS**
- ☐ **Other**

PICK UP

Item: _____

ITEM NO.	QUANTITY	DESCRIPTION
1	1	Drainage Report/Grading Plan

COMMENTS / INSTRUCTIONS

Please swap this report out with the previously submitted one.
Thanks,

RECEIVED
SEP 1 8 2003
HYDROLOGY SECTION

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

ENGINEERING ▲
SPATIAL DATA ▲
ADVANCED TECHNOLOGIES ▲

DRAINAGE REPORT
FOR
SUNDORO SUBDIVISION

SEPTEMBER 10, 2003

Prepared for:

Westland Development

401 Coors Boulevard NW

Albuquerque, NM 87121

Bohannan ▲ Huston Inc.

ENGINEERING ▲

SPATIAL DATA ▲

ADVANCED TECHNOLOGIES ▲

DRAINAGE REPORT
FOR
SUNDORO SUBDIVISION

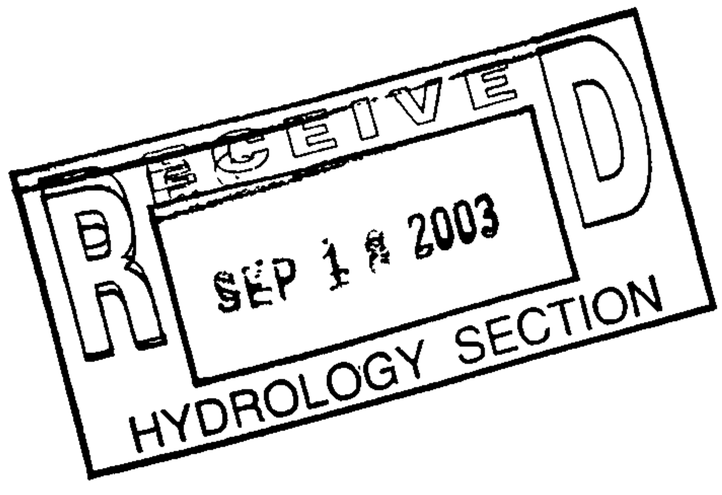
SEPTEMBER 10, 2003

Prepared for:

WESTLAND DEVELOPMENT
401 COORS BOULEVARD NW
ALBUQUERQUE, NM 87121

Prepared by:

BOHANNAN HUSTON, INC.
COURTYARD I
7500 JEFFERSON STREET NE
ALBUQUERQUE, NM 87109



PREPARED BY:

9/10/03
Jared M. Lee, E.I. **Date**

UNDER THE SUPERVISION OF:

09-17-03
Christian J. Sholtis, P.E. **Date**

TABLE OF CONTENTS

APPENDICES

EXHIBITS

I. PURPOSE AND EXECUTIVE SUMMARY

The purpose of this report is to present the drainage management plans for Sundoro Subdivision at Westland North 2 and to obtain approval of the preliminary/final plat and grading plan by the City of Albuquerque. The proposed development of Sundoro Subdivision at Westland North 2 consists of 283 single family residential lots on approximately 60.35 acres. The project will be divided into four units. Units one through four will be built sequentially in order to provide a drainage outfall each phase.

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 Development Process Manual (DPM) Volume 2, Design Criteria, Section 22.2, Hydrology, for the City of Albuquerque, January 1993.

The site, as described in the 'Site Location and Characteristics' section below, is approximately 60.35 acres. Therefore the site was divided into smaller sub-basins and, Part A of the DPM, Section 22.2, which provides a simplified procedure for projects with sub-basins smaller than 40 acres, was used.

This report will reference the following reports:

1) *West Interstate 40 Diversion Drainage Management Plan* dated March 2000, which was prepared for AMAFCA by Bohannan Huston, Inc. The West I-40 DMP addresses the drainage issues covering approximately 40 square miles of the West Side. 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. That report was prepared to support future drainage plans submitted for the development of individual land parcels within the study

area, and to provide design guidance for the installation of major drainage infrastructure to be constructed in advance of, or simultaneously with individual parcel development. In addition, it states that Dam #0 through Dam #14 of the AMAFCA Ladera Dam System located north of the site are designed to fully contain the 100-year storm event. The spillways for these dams are designed to operate when a storm larger than the 100-year event occurs.

2) *Final Drainage Report, Tierra Oeste Subdivision,* prepared by Cinfran Engineering Inc., April 18, 1996. This report allows for the discharge of 16.8 cfs from Basin OFF 2 into Tierra Oeste within Casa Amarilla Road. In addition, this report identifies the capacity of the existing 60" public storm drain within Ladera Drive as being 313.4 cfs.

III. SITE LOCATION AND CHARACTERISTICS

Sundoro Subdivision at Westland North 2 is located near the 98th St. exit of Interstate 40. More specifically, Sundoro is bordered by proposed Ladera Drive to the south, Arroyo Vista to the west, the Ladera System of Dams to the north and existing Ladera Drive and Parkview subdivision to the east. The site will be accessible from Ladera Drive or 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 west to east 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 existing drainage basins and patterns for developed flows are shown graphically on the Existing Drainage Conditions Map (Exhibit 2, which was taken from the West 1-40 DMP) located in the Exhibits section of this report. There are a number of drainage facilities currently in this development area. A major one that impacts our analysis area is the Ladera Dam System. The Ladera System intercepts runoff from the Ladera watershed, preventing these flows from entering the site. As previously referenced, the spillways for the Ladera Dams #6 through #9, will

only discharge runoff during a storm event which is greater than the 100-year event. The Ladera watershed flows are routed in the series of dams numbered from Zero to 15 (Dam 15 is the Ladera Golf Course). Basins OFF-A and OFF-B are located northwest of the site between the site and the Ladera Dams. Flows generated by these basins enter the site along the north and west boundaries as sheet flows and drain through the site toward the southeast. 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 are no recognized FEMA Floodplains within the proposed development.

V. PROPOSED HYDRAULIC AND HYDROLOGIC CONDITIONS

For additional assistance throughout this portion of the report, please refer to the Existing Drainage Basin Map, Proposed Drainage Basin Map and the Grading and Drainage Plan enclosed in the Exhibit section of this report.

Discharge generated by Sundoro Subdivision will flow south on Talang Street, Marapi Street , Kiska Street, and Maroa Street, and east on Pacaya Drive and Sundoro Place when fully developed. Most of the flow generated will travel to Sundoro Place and be collected by inlets which will discharge runoff via proposed storm drains into an existing 60" storm drain located within Ladera Drive near the eastern corner of the site. The Ladera Drive storm drain will be extended toward the west in order to capture runoff generated by the western portion of this project as well as the Ladera Drive roadway itself. A small portion of the subdivision will flow directly into the proposed Ladera Drive The offsite basins will also discharge directly into Ladera Drive. All runoff generated by this project and the Ladera Drive right-of-way will discharge into the existing 60" storm drain within Ladera Drive. The total flow which will enter the existing portion of the Ladera Drive Storm drain located near the eastern corner of the site will be 197.2 cfs. This is significantly less than this existing storm drain's capacity, which is 313.4 cfs.

A. On-Site Basins

The proposed site is broken into fifteen (15) 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 at the back of this report.

Basin A (2.50ac, Q100=8.55cfs) encompasses Pago Court and a portion of Pinatubo Place, up to a high point just east of Pago Court; see Appendix A for more information. Basin A contains twelve (12) lots, #224-235. The runoff from Basin A will travel southeast on Pago Court to Ladera Ave. and be collected by proposed inlets.

Basin B (15.20 ac, Q100=51.95cfs) and Basin C (0.47 ac, Q100=1.62cfs) consists of Sundoro Place from Pinatubo Place to Talang Street, the remaining portion of Pinatubo Place, and portions of Pacaya Drive and Kanaga Drive up to high points in each, and contains Sub-basins B-1, B-2, B-3, B-4, and B-5; see Appendix A for more information. Basin B consists of seventy-two (72) lots, #161-173, 190-223, 236-257, and 266-264. Basin C consists of three (3) lots, #174 and 188-189. Basin B-2 will flow to Sundoro Place through a concrete rundown from the cul-de-sac terminus in Pinatubo Place. The runoff from Basin B and C will flow to Sundoro Place and then east to be collected by a series of inlets just west of the Talang Street intersection. Basin B will first be collected by two Type "A" inlets, leaving a residual (34.3cfs) to be collected, along with the runoff from Basin C, by two Type "C" inlets, leaving a residual (20.94cfs) to continue to flow east along Sundoro Place.

Basin D (5.76 ac, Q100=19.69cfs) encompasses the entire length of Talang Street, the remaining portion of Kanga Road and Sundoro Place from Talang Street to Marapi Street and contains Sub-basins D-1, D-2, and D-3; see Appendix A for more information. Basin D consists of thirty-one (31) lots, #144-160, 175-187 and 275. Runoff generated by Basin D will flow northeast down Kanga Road, south down Talang Street, then east on Sundoro Place. The runoff will be collected, along with the residual from

Basin C (20.94cfs), by two Type "A" inlets just west of the intersection of Marapi Street, leaving a residual (25.83cfs) to continue to flow east on Sundoro Place.

Basin E (4.83 ac, Q100=16.51cfs) encompasses the length of Marapi Street from Pacaya Drive to Sundoro Place; see Appendix A for more information. Basin E consists of twenty-six (26) lots, #118-143. Runoff generated by Basin E will flow south on Marapi Street and be collected by two Type "A" inlets at the intersection of Sundoro Place, leaving a residual(6.63cfs) to flow east into Sundoro Place.

Basin F (1.26ac, Q100=4.31cfs) and Basin G (0.18ac, Q100=0.62cfs) consists of a portion of Sundoro Place from Marapi Street to Kiska Street; see Appendix A for more information. Basin F consists of six (6) lots, #1-6 and Basin G consists of one (1) lot, #7. The runoff from Basin F and G will flow along Sundoro Place and be collected by a series of inlets just west of the Kiska Street intersection. Basin F, along with the residual from Basin E (6.63cfs) and D (25.83cfs), will first be collected by two Type "A" inlets, leaving a residual (22.93cfs) to be collected, along with the runoff from Basin G, by two Type "C" inlets, leaving a residual (12.65cfs) to continue to flow northeast along Sundoro Place.

Basin H (6.41 ac, Q100=21.89cfs) and Basin I (0.17 ac, Q100=0.58cfs) encompasses the entire length of Kiska Street and a portion of Sundoro Place from Kiska Street to Maroa Street, and contains Sub-basins H-1, and H-2; see Appendix A for more information. Basin H consists of thirty-eight (38) lots, #8-14, 76-91 and 103-117. Basin I consists of one (1) lot, #15. The runoff from Basin H and I will flow to Sundoro Place and then northeast to be collected by a series of inlets just west of the Maroa Street intersection. Basin H will first be collected, along with the residual from Basin G (12.65cfs), by two Type "A" inlets, leaving a residual (21.1cfs) to be collected, along with the runoff from Basin I, by two Type "C" inlets, leaving a residual (11.14cfs) to continue to flow northeast along Sundoro Place.

Basin J (12.75 ac, Q100=43.51cfs) encompasses the entire length of Tokachi Drive and Maroa Street, and the remaining portion of Pacaya Drive from the high point at

the far southwest end, and contains Sub-basins J-1, and J-2; see Appendix A for more information. Basin J consists of sixty-six (66) lots, #22-30, 52-75, 92-102, 258-263, 267-274, and 276-283. Runoff generated by Basin J will flow northeast on Pacaya Drive and southeast on Maroa Street and be collected by two Type "A" inlets just northwest of the intersection of Sundoro Place, leaving a residual (27.11cfs) to flow northeast into Sundoro Place.

Basin K (0.70ac, Q100=2.41cfs) consists of a portion of Sundoro Place from Maroa Street to inlets at the returns of the Sundoro Place cul-de-sac; see Appendix A for more information. Basin K consists of four (4) lots, #16-19. The runoff from Basin K will flow along Sundoro Place and be collected, along with the residual from Basins I (11.14cfs) and J (27.11cfs), by two Type "A" inlets at the returns of the Sundoro Place cul-de-sac, leaving a residual (25.9cfs) to continue to flow northeast along Sundoro Place.

Basin L (0.70ac, Q_{100}=2.41cfs) encompasses the remaining far northeast portion of Sundoro Place; see Appendix A for more information. The runoff from Basin L, along with the residual from Basin K (25.9cfs), will flow to a low point at the end to the cul-de-sac and be collected by a double-grate Type "A" inlet in a sump condition. The inlet will drain to existing storm drain in Ladera Drive through a 42" storm drain. The inlet will be designed for the 100 year storm event (28.29cfs), since the flow can back up and be collected by the inlets at the returns of the Sundoro Place cul-de-sac before it reaches the right-of-way.

Basin M (3.66ac, Q100=12.47cfs) encompasses the entire length of Makian Place and the extension of Casa Amarilla Road; see Appendix A for more information. Basin M consists of twenty-one (21) lots, #31-51. The runoff from Basin M will flow along Makian Place to a low point at the Casa Amarilla Road intersection and then east to existing Casa Amarilla Road and be collected by existing inlets in Tierra Oeste Unit 2. The Drainage Report for Tierra Oeste Unit 2 allows for a maximum discharge of 16.8 cfs from this project into Casa Amarilla Road. The proposed flowrate of 12.47 cfs is less than the allowable;

therefore, this discharge into Tierra Oeste Unit 2 is in conformance with that Drainage Report.

Basin N (0.15ac, Q100=0.63cfs) consists of Sundoro Street entrance. Basin O (0.29ac, Q100=1.21cfs) consists of the remaining Marapi Street entrance south of a high point near Sundoro Place; see Appendix A for more information. The runoff from Basins N and Basin O will flow south into Ladera Drive and be collected by proposed inlets.

Ladera Drive is divided into four basins. Ladera 1 (4.96ac, Q100=15.85cfs) and Ladera 2 (3.19ac, Q100=10.19cfs) encompass the westbound and eastbound halves of Ladera, respectively, from 98th Street to the Marapi Street entrance. The discharge from these basins will be collected by a series of inlets in Ladera just west of the Marapi Street entrance. Ladera 1, along with Offsite 1 (1.94cfs), basin A (8.55cfs), and basin N (.63cfs), will be collected by inlets on the north side of Ladera Drive, leaving a residual (5.27cfs) to flow northeast on Ladera. Ladera 2 will be collected entirely by inlets on the north side of Ladera Drive. Ladera 3 (2.00ac, Q100=6.39cfs) and Ladera 4 (1.84ac, Q100= 5.88cfs) encompass the westbound and eastbound halves of Ladera, respectively, from the Marapi Street entrance to the existing portion of Ladera Drive. These basins, along with offsite discharge and the residual from Ladera 1, will flow northeast on Ladera Drive and be collected by existing inlets.

In summary, inlets along Sundoro Place will collect the majority of the runoff and the remaining portions will flow into Ladera Drive and be collected by inlets. All of the inlets will drain to their respective storm systems which will all be directed to a proposed 48" storm drain and connect to an existing 60" storm drain in Ladera Drive. See Appendix C, Inlet Analysis, for flow distributions.

B. Off-Site Basins

There will be three (3) proposed offsite basins, Offsite 1, 2, and 3; see Proposed Drainage Basin Map in the Exhibit section at the back of this report.

Basin Offsite 1A (1.49ac, Q_{100}= 3.14cfs) and Offsite 1B (4.42ac, Q_{100}= 9.31cfs) are located north of the site and south of the Ladera Dam system. Basin Offsite 1A will enter the site at the north end of Pago Court and then be conveyed by the roadway into Ladera Drive. Runoff generated by basin Offsite 1B will be diverted around the site in a northeast direction along the north property line by a graded flowline.

Basin Offsite 1C (0.92ac, Q_{100}= 1.94cfs) is located in the offsite areas bordering the west side of the subdivision. Basins Offsite 2 (0.63ac, Q_{100}= 1.33cfs) and Offsite 3 (2.66ac, Q_{100}= 5.59cfs) are located along the southeast side of the subdivision along Ladera Ave. bordering both sides of the Marapi Street entrance. The flow generated within these basins will flow into Ladera Drive. Basin Offsite 1 will be collected by proposed inlets in Ladera Drive just west of the Marapi Street entrance. Basins Offsite 2 and Offsite 3 will flow into Ladera Drive and travel northeast to be collected by existing inlets.

In summary, all of the flow generated by the basins mentioned above would eventually discharge into the Ladera Drive storm drain system and will be collected by proposed inlets in Ladera Drive or existing inlets just northeast of the site.

VI. CONCLUSION

This report has provided hydrologic and hydraulic considerations of the proposed development of Sundoro Subdivision at Westland. This report is in conformance with *the West Interstate 40 Diversion Drainage Management Plan* as well as the *Drainage Report for Tierra Oeste Subdivision, Unit 2* which addresses offsite flows generated by this project. 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: BASINS

APPENDIX B: STREET HYDRAULICS

APPENDIX C: INLET ANALYSIS

APPENDIX D: STORM DRAIN ANALYSIS

APPENDIX A

BASINS

Sundora 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%	3.0%	2.5	7.5
OFF B	4.42		50.0%	50.0%	0.0%	3.0%	2.6	7.9
BASIN 1	59.00		90.0%	10.0%	0.0%	3.0%	22.9	87.0
TOTAL	**67.62**						**28.0**	**102.4**
HYRDOLOGICAL VOLUMETRIC & DISCHARGE DATA (DEVELOPED)								
ONSITE								
Phases 1 thru 4								
A-1	2.50	12	0.0%	24.7%	24.7%	50.5%	5.0	8.54
B-1	6.16	29	0.0%	24.7%	24.7%	50.5%	12.4	21.05
B-2	2.13	7	0.0%	24.7%	24.7%	50.5%	4.3	7.28
B-3	1.25	6	0.0%	24.7%	24.7%	50.5%	2.5	4.27
B-4	2.06	6	0.0%	24.7%	24.7%	50.5%	4.1	7.04
B-5	3.60	24	0.0%	24.7%	24.7%	50.5%	7.2	12.30
C-1	0.47	3	0.0%	24.7%	24.7%	50.5%	1.0	1.62
D-1	1.12	5	0.0%	24.7%	24.7%	50.5%	2.3	3.83
D-2	3.70	18	0.0%	24.7%	24.7%	50.5%	7.4	12.65
D-3	0.98	8	0.0%	24.7%	24.7%	50.5%	2.0	3.35
E	4.83	26	0.0%	24.7%	24.7%	50.5%	9.7	16.51
F	1.26	6	0.0%	24.7%	24.7%	50.5%	2.5	4.31
G	0.18	1	0.0%	24.7%	24.7%	50.5%	0.4	0.62
H-1	5.19	31	0.0%	24.7%	24.7%	50.5%	10.4	17.74
H-2	1.22	7	0.0%	24.7%	24.7%	50.5%	2.4	4.15
I	0.17	1	0.0%	24.7%	24.7%	50.5%	0.3	0.58
J-1	6.71	33	0.0%	24.7%	24.7%	50.5%	13.5	22.93
J-2	6.04	33	0.0%	24.7%	24.7%	50.5%	12.1	20.64
K	0.70	4	0.0%	24.7%	24.7%	50.5%	1.4	2.41
L	0.70	2	0.0%	24.7%	24.7%	50.5%	1.4	2.39
M	3.66	21	0.0%	24.7%	24.7%	50.5%	7.4	12.51
N	0.15	0	0.0%	5.0%	5.0%	90.0%	0.4	0.63
O	0.29	0	0.0%	5.0%	5.0%	90.0%	0.8	1.21
SUBTOTAL	**55.07**	**283**					**111.1**	**188.5**
OFF 1A	1.49	0	0.0%	90.0%	10.0%	0.0%	1.2	3.14
OFF 1B	4.42	0	0.0%	90.0%	10.0%	0.0%	3.7	9.31
OFF 1C	0.92	0	0.0%	90.0%	10.0%	0.0%	0.8	1.94
OFF 2	0.63	0	0.0%	90.0%	10.0%	0.0%	0.5	1.33
OFF 3	2.66	0	0.0%	90.0%	10.0%	0.0%	2.2	5.59
Ladera 1	4.96	0	0.0%	50.0%	0.0%	50.0%	9.0	15.85
Ladera 2	3.19	0	0.0%	50.0%	0.0%	50.0%	5.8	10.19
Ladera 3	2.00	0	0.0%	50.0%	0.0%	50.0%	3.6	6.39
Ladera 4	1.84	0	0.0%	50.0%	0.0%	50.0%	3.4	5.88
SUBTOTAL	**22.11**	**0**					**30.2**	**59.6**

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 = 5.1

%D= 7*SQRT((N*N)+(5*N)) = 50.5%

APPENDIX B

STREET HYDRAULICS

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

32ff/50rw std full 2.58%

MANNING'S N= .017 SLOPE= .0258

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	41.17	0.67
2	8.37	0.67	6	25.00	0.41	10	41.63	0.67
3	8.83	0.67	7	39.00	0.13	11	50.00	0.85
4	9.00	0.00	8	41.00	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	1.16	1.63	0.02	0.07
0.10	0.10	0.16	0.3	3.41	1.84	3.25	0.05	0.15
0.15	0.15	0.39	0.8	6.82	2.07	6.58	0.07	0.22
0.20	0.20	0.84	2.0	11.92	2.40	11.60	0.09	0.29
0.25	0.25	1.55	4.4	17.03	2.84	16.63	0.13	0.38
0.30	0.30	2.50	8.2	22.13	3.28	21.65	0.17	0.47
0.35	0.35	3.71	13.8	27.23	3.72	26.68	0.21	0.56
0.40	0.40	5.17	21.4	32.34	4.14	31.70	0.27	0.67
0.45	0.45	6.78	33.2	32.94	4.90	32.23	0.37	0.82
0.50	0.50	8.39	47.3	33.05	5.63	32.25	0.49	0.99 .82
0.55	0.55	10.01	63.2	33.15	6.32	32.28	0.62	1.17
0.60	0.60	11.62	81.0	33.25	6.97	32.30	0.75	1.35
0.65	0.65	13.24	100.4	33.35	7.58	32.33	0.89	1.54
0.70	0.70	14.92	114.2	37.11	7.65	36.05	0.91	1.61
0.75	0.75	16.84	129.1	41.76	7.66	40.70	0.91	1.66
0.80	0.80	18.99	147.0	46.41	7.74	45.35	0.93	1.73
0.85	0.85	21.38	168.0	51.06	7.86	50.00	0.96	1.81

Basin B

$Q = 51.8$ cfs

$y_1 = 0.5$ ft 2.

$y_2 = 0.84' < 0.85$

(conjugate depth method)

See nomograph - Single "A"

@ 2.0%, $Q = 8.4$

@ 5.0%, $Q = 10.2$

@ 2.58%, $Q = \underline{8.748}$

more inlets upstream

Basin C + B(res)

$Q = 1.62 + 34.3_{(res)} = 35.92$

$d = 0.46$

$V = 5.04$

$E = 0.85$ ok

see nomograph - Single "C"

@ 2.0%, $Q = 7.1$

@ 5.0% $Q = 9.1$

@ 2.58%, $Q = 7.49$

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

32ff/50rw std full 1.50%

MANNING'S N= .017 SLOPE= .015

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	41.17	0.67
2	8.37	0.67	6	25.00	0.41	10	41.63	0.67
3	8.83	0.67	7	39.00	0.13	11	50.00	0.85
4	9.00	0.00	8	41.00	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	0.89	1.63	0.01	0.06
0.10	0.10	0.16	0.2	3.41	1.41	3.25	0.03	0.13
0.15	0.15	0.39	0.6	6.82	1.58	6.58	0.04	0.19
0.20	0.20	0.84	1.5	11.92	1.83	11.60	0.05	0.25
0.25	0.25	1.55	3.3	17.03	2.16	16.63	0.07	0.32
0.30	0.30	2.50	6.3	22.13	2.50	21.65	0.10	0.40
0.35	0.35	3.71	10.5	27.23	2.84	26.68	0.12	0.47
0.40	0.40	5.17	16.3	32.34	3.15	31.70	0.15	0.55
0.45	0.45	6.78	25.3	32.94	3.73	32.23	0.22	0.67
0.50	0.50	8.39	36.0	33.05	4.29	32.25	0.29	0.79
0.55	0.55	10.01	48.2	33.15	4.82	32.28	0.36	0.91
0.60	0.60	11.62	61.7	33.25	5.31	32.30	0.44	1.04
0.65	0.65	13.24	76.5	33.35	5.78	32.33	0.52	1.17
0.70	0.70	14.92	87.1	37.11	5.83	36.05	0.53	1.23
0.75	0.75	16.84	98.4	41.76	5.84	40.70	0.53	1.28
0.80	0.80	18.99	112.1	46.41	5.90	45.35	0.54	1.34
0.85	0.85	21.38	128.1	51.06	5.99	50.00	0.56	1.41

Basin D + C(res)

$Q = 19.65 + 20.94_{(res)} = 40.59$

$d = 0.52$

$V = 4.46$

$E = 0.83 < 0.85$ ok

see nomograph - Single "A"

@ 0.2%, Q = 4.45

@ 2.0%, Q = 8.5

@ 1.5%, Q = 7.38

Basin F + E(res) + D res

$Q = 4.31 + 6.63 + 25.83 = 36.77$

$d = 0.50$

$V = 4.32$

$E = 0.798 < 0.85$

see nomograph -

@ 0.2%, Q = 4.1

@ 2.0%, Q = 8

@ 1.5%, Q = 6.92

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

32ff/50rw std full 1.50%

MANNING'S N= .017 SLOPE= .015

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	41.17	0.67
2	8.37	0.67	6	25.00	0.41	10	41.63	0.67
3	8.83	0.67	7	39.00	0.13	11	50.00	0.85
4	9.00	0.00	8	41.00	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	0.89	1.63	0.01	0.06
0.10	0.10	0.16	0.2	3.41	1.41	3.25	0.03	0.13
0.15	0.15	0.39	0.6	6.82	1.58	6.58	0.04	0.19
0.20	0.20	0.84	1.5	11.92	1.83	11.60	0.05	0.25
0.25	0.25	1.55	3.3	17.03	2.16	16.63	0.07	0.32
0.30	0.30	2.50	6.3	22.13	2.50	21.65	0.10	0.40
0.35	0.35	3.71	10.5	27.23	2.84	26.68	0.12	0.47
0.40	0.40	5.17	16.3	32.34	3.15	31.70	0.15	0.55
0.45	0.45	6.78	25.3	32.94	3.73	32.23	0.22	0.67
0.50	0.50	8.39	36.0	33.05	4.29	32.25	0.29	0.79
0.55	0.55	10.01	48.2	33.15	4.82	32.28	0.36	0.91
0.60	0.60	11.62	61.7	33.25	5.31	32.30	0.44	1.04
0.65	0.65	13.24	76.5	33.35	5.78	32.33	0.52	1.17
0.70	0.70	14.92	87.1	37.11	5.83	36.05	0.53	1.23
0.75	0.75	16.84	98.4	41.76	5.84	40.70	0.53	1.28
0.80	0.80	18.99	112.1	46.41	5.90	45.35	0.54	1.34
0.85	0.85	21.38	128.1	51.06	5.99	50.00	0.56	1.41

Basin G + F(res)

$Q = 0.62 + 22.93_{(res)} = 23.55$

$d = 0.44$

$V = 3.6'$

$E = 0.65 < 0.85$ ok

see nomograph

@ 0.2% Q = 3.1

@ 2.0% Q = 6.4

so @ 1.5%, Q = 5.45

Basin H + G(res)

$Q = 21.89 + 12.65 = 34.54$

$d = 0.498$

$V = 4.24$

$E = 0.28 < 0.85$ ok

see nomograph

@ 0.2%, Q = 3.9

@ 2.0%, Q = 7.8

so @ 1.5%, Q = 6.72

Basin I + H(res) I(res)

$Q = 0.58 + 21.1 = 21.68$

$d = 0.43$

$V = 3.497$

$E = 0.62 < 0.85$ ok

see nomo

@ 0.2%, Q = 2.85

@ 2.0%, Q = 6.2

so @ 1.5%, Q = 5.27

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

32ff/50rw std full 1.50%

MANNING'S N= .017 SLOPE= .015

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	41.17	0.67
2	8.37	0.67	6	25.00	0.41	10	41.63	0.67
3	8.83	0.67	7	39.00	0.13	11	50.00	0.85
4	9.00	0.00	8	41.00	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	0.89	1.63	0.01	0.06
0.10	0.10	0.16	0.2	3.41	1.41	3.25	0.03	0.13
0.15	0.15	0.39	0.6	6.82	1.58	6.58	0.04	0.19
0.20	0.20	0.84	1.5	11.92	1.83	11.60	0.05	0.25
0.25	0.25	1.55	3.3	17.03	2.16	16.63	0.07	0.32
0.30	0.30	2.50	6.3	22.13	2.50	21.65	0.10	0.40
0.35	0.35	3.71	10.5	27.23	2.84	26.68	0.12	0.47
0.40	0.40	5.17	16.3	32.34	3.15	31.70	0.15	0.55
0.45	0.45	6.78	25.3	32.94	3.73	32.23	0.22	0.67
0.50	0.50	8.39	36.0	33.05	4.29	32.25	0.29	0.79
0.55	0.55	10.01	48.2	33.15	4.82	32.28	0.36	0.91
0.60	0.60	11.62	61.7	33.25	5.31	32.30	0.44	1.04
0.65	0.65	13.24	76.5	33.35	5.78	32.33	0.52	1.17
0.70	0.70	14.92	87.1	37.11	5.83	36.05	0.53	1.23
0.75	0.75	16.84	98.4	41.76	5.84	40.70	0.53	1.28
0.80	0.80	18.99	112.1	46.41	5.90	45.35	0.54	1.34
0.85	0.85	21.38	128.1	51.06	5.99	50.00	0.56	1.41

Basin K + $I_{(res)}$ + $J_{(res)}$

$Q = 2.41 + 11.14 + 27.11 = 40.66$

$d = 0.52$

$V = 4.46$

$E = 0.83 < 0.85$ ok

see nomograph

@ 0.2%, $Q = 4.45$

@ 2.0%, $Q = 8.5$

so @ 1.5%, $Q = 7.38$

Basin L + $K_{(res)}$

$Q = 2.39 + 25.9 = 28.29$

$d = 0.464$

$V = 3.89$

$E = 0.70 < 0.85$ ok

$2 \times Q_{100} = 56.58$

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

32ff/50rw std full 1.90%

MANNING'S N= .017 SLOPE= .019

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	41.17	0.67
2	8.37	0.67	6	25.00	0.41	10	41.63	0.67
3	8.83	0.67	7	39.00	0.13	11	50.00	0.85
4	9.00	0.00	8	41.00	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	1.00	1.63	0.02	0.07
0.10	0.10	0.16	0.3	3.41	1.58	3.25	0.04	0.14
0.15	0.15	0.39	0.7	6.82	1.78	6.58	0.05	0.20
0.20	0.20	0.84	1.7	11.92	2.06	11.60	0.07	0.27
0.25	0.25	1.55	3.8	17.03	2.44	16.63	0.09	0.34
0.30	0.30	2.50	7.1	22.13	2.82	21.65	0.12	0.42
0.35	0.35	3.71	11.8	27.23	3.19	26.68	0.16	0.51
0.40	0.40	5.17	18.4	32.34	3.55	31.70	0.20	0.60
0.45	0.45	6.78	28.5	32.94	4.20	32.23	0.27	0.72
0.50	0.50	8.39	40.6	33.05	4.83	32.25	0.36	0.86
0.55	0.55	10.01	54.3	33.15	5.42	32.28	0.46	1.01
0.60	0.60	11.62	69.5	33.25	5.98	32.30	0.55	1.15
0.65	0.65	13.24	86.1	33.35	6.51	32.33	0.66	1.31
0.70	0.70	14.92	98.0	37.11	6.56	36.05	0.67	1.37
0.75	0.75	16.84	110.8	41.76	6.58	40.70	0.67	1.42
0.80	0.80	18.99	126.2	46.41	6.64	45.35	0.68	1.48
0.85	0.85	21.38	144.2	51.06	6.74	50.00	0.71	1.56

Basin E

$Q = 16.51$

$d = 0.39$

$V = 3.45$

$E = 0.57 < 0.85$ ok

see nomograph

@ 0.2%, $Q = 2.3$

@ 2.0%, $Q = 5.1$

so @ 1.90%, $Q = 4.94$

6.63 cfs

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

32ff/50rw std full 2.45%

MANNING'S N= .017 SLOPE= .0245

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	41.17	0.67
2	8.37	0.67	6	25.00	0.41	10	41.63	0.67
3	8.83	0.67	7	39.00	0.13	11	50.00	0.85
4	9.00	0.00	8	41.00	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	1.13	1.63	0.02	0.07
0.10	0.10	0.16	0.3	3.41	1.80	3.25	0.05	0.15
0.15	0.15	0.39	0.8	6.82	2.02	6.58	0.06	0.21
0.20	0.20	0.84	2.0	11.92	2.34	11.60	0.08	0.28
0.25	0.25	1.55	4.3	17.03	2.77	16.63	0.12	0.37
0.30	0.30	2.50	8.0	22.13	3.20	21.65	0.16	0.46
0.35	0.35	3.71	13.5	27.23	3.62	26.68	0.20	0.55
0.40	0.40	5.17	20.8	32.34	4.03	31.70	0.25	0.65
0.45	0.45	6.78	32.3	32.94	4.77	32.23	0.35	0.80
0.50	0.50	8.39	46.1	33.05	5.49	32.25	0.47	0.97
0.55	0.55	10.01	61.6	33.15	6.16	32.28	0.59	1.14
0.60	0.60	11.62	78.9	33.25	6.79	32.30	0.72	1.32
0.65	0.65	13.24	97.8	33.35	7.39	32.33	0.85	1.50
0.70	0.70	14.92	111.3	37.11	7.45	36.05	0.86	1.56
0.75	0.75	16.84	125.8	41.76	7.47	40.70	0.87	1.62
0.80	0.80	18.99	143.3	46.41	7.54	45.35	0.88	1.68
0.85	0.85	21.38	163.7	51.06	7.66	50.00	0.91	1.76

Basin I

$Q = 43.5$|

$y_1 = 0.49$

$y_2 = 0.80 < 0.85$

(conjugate depth method)

see nomograph

@ 2.0%, $Q = 7.9$

@ 5.0%, $Q = 9.9$

@ 2.45%, $Q = 8.2$

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

ladera std half 2.40%

MANNING'S N= .017 SLOPE= .024

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	1.12	0.81	0.02	0.07
0.10	0.10	0.08	0.1	1.71	1.78	1.63	0.05	0.15
0.15	0.15	0.19	0.4	3.41	2.00	3.28	0.06	0.21
0.20	0.20	0.42	1.0	5.95	2.31	5.79	0.08	0.28
0.25	0.25	0.77	2.1	8.49	2.74	8.30	0.12	0.37
0.30	0.30	1.25	4.0	11.04	3.17	10.80	0.16	0.46
0.35	0.35	1.85	6.6	13.58	3.59	13.31	0.20	0.55
0.40	0.40	2.58	10.3	16.13	3.99	15.81	0.25	0.65
0.45	0.45	3.43	15.0	18.67	4.38	18.32	0.30	0.75
0.50	0.50	4.41	21.0	21.22	4.75	20.82	0.35	0.85
0.55	0.55	5.52	28.2	23.76	5.11	23.33	0.41	0.96
0.60	0.60	6.74	36.9	26.31	5.47	25.83	0.46	1.06
0.65	0.65	8.10	47.0	28.85	5.81	28.34	0.52	1.17
0.70	0.70	9.59	59.2	31.19	6.17	30.64	0.59	1.29
0.75	0.75	11.13	75.7	31.25	6.80	30.66	0.72	1.47
0.80	0.80	12.66	93.8	31.30	7.41	30.67	0.85	1.65
0.85	0.85	14.19	113.3	31.35	7.98	30.69	0.99	1.84
0.90	0.90	15.73	134.3	31.40	8.54	30.71	1.13	2.03
0.95	0.95	17.27	156.7	31.46	9.08	30.73	1.28	2.23
1.00	1.00	18.80	180.5	31.51	9.60	30.74	1.43	2.43
1.05	1.05	20.34	205.5	31.56	10.10	30.76	1.59	2.64
1.10	1.10	21.88	231.8	31.61	10.59	30.78	1.74	2.84
1.15	1.15	23.42	259.3	31.67	11.07	30.79	1.90	3.05
1.17	1.17	24.03	270.7	31.69	11.26	31.30	1.97	3.14

Ladera 1:

$d_{max} = 0.45'$ for one free lane

$Q_{T10} = Off1 + A-1 + N + Ladera\ 1 = 15.2$

$d = 0.45$ ok

$Q_{T100} = 26.97$

$d = 0.54$

$V = 5.05$

$E = 0.94$

see nomograph
@ 2.0%, Q = 9.0
@ 5.0% Q = 11.3
so @ 2.4%, Q = 9.31 cfs

Ladera 2:

$Q = 10.19$

$d = 0.40$

$V = 3.99$

see nomograph
@ 2.0%, Q = 5.3
@ 5.0%, Q = 7.4
so @ 2.4%, Q = 5.58 cfs

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

ladera std half 1.70%

MANNING'S N= .017 SLOPE= .017

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	0.94	0.81	0.01	0.06
0.10	0.10	0.08	0.1	1.71	1.50	1.63	0.03	0.13
0.15	0.15	0.19	0.3	3.41	1.68	3.28	0.04	0.19
0.20	0.20	0.42	0.8	5.95	1.95	5.79	0.06	0.26
0.25	0.25	0.77	1.8	8.49	2.30	8.30	0.08	0.33
0.30	0.30	1.25	3.3	11.04	2.67	10.80	0.11	0.41
0.35	0.35	1.85	5.6	13.58	3.02	13.31	0.14	0.49
0.40	0.40	2.58	8.7	16.13	3.36	15.81	0.18	0.58
→0.45	0.45	3.43	12.7	18.67	3.69	18.32	0.21	0.66
0.50	0.50	4.41	17.6	21.22	4.00	20.82	0.25	0.75
0.55	0.55	5.52	23.7	23.76	4.30	23.33	0.29	0.84
0.60	0.60	6.74	31.0	26.31	4.60	25.83	0.33	0.93
0.65	0.65	8.10	39.6	28.85	4.89	28.34	0.37	1.02
0.70	0.70	9.59	49.8	31.19	5.19	30.64	0.42	1.12
0.75	0.75	11.13	63.7	31.25	5.73	30.66	0.51	1.26
0.80	0.80	12.66	78.9	31.30	6.23	30.67	0.60	1.40
0.85	0.85	14.19	95.4	31.35	6.72	30.69	0.70	1.55
0.90	0.90	15.73	113.1	31.40	7.19	30.71	0.80	1.70
0.95	0.95	17.27	131.9	31.46	7.64	30.73	0.91	1.86
1.00	1.00	18.80	151.9	31.51	8.08	30.74	1.01	2.01
1.05	1.05	20.34	173.0	31.56	8.50	30.76	1.12	2.17
1.10	1.10	21.88	195.1	31.61	8.92	30.78	1.23	2.33
1.15	1.15	23.42	218.2	31.67	9.32	30.79	1.35	2.50
1.17	1.17	24.03	227.8	31.69	9.48	31.30	1.40	2.57

Ladera 1:

Inlet #2:

Q = 17.66

d = 0.50

V = 4.00

E = 0.75

see nomograph

@ 0.2%, Q = 4.1

@ 2.0%, Q = 8.2

so @ 1.7%, Q = 7.516

inlet # 3:

Q = 10.144

d = 0.42

V = 3.48

E = 0.61

see nomograph

@ 0.2%, Q = 2.7

@ 2.0%, Q = 5.3

so @ 1.7%, Q = 4.87

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

ladera std half 1.70%

MANNING'S N= .017 SLOPE= .017

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	0.94	0.81	0.01	0.06
0.10	0.10	0.08	0.1	1.71	1.50	1.63	0.03	0.13
0.15	0.15	0.19	0.3	3.41	1.68	3.28	0.04	0.19
0.20	0.20	0.42	0.8	5.95	1.95	5.79	0.06	0.26
0.25	0.25	0.77	1.8	8.49	2.30	8.30	0.08	0.33
0.30	0.30	1.25	3.3	11.04	2.67	10.80	0.11	0.41
0.35	0.35	1.85	5.6	13.58	3.02	13.31	0.14	0.49
0.40	0.40	2.58	8.7	16.13	3.36	15.81	0.18	0.58
0.45	0.45	3.43	12.7	18.67	3.69	18.32	0.21	0.66
0.50	0.50	4.41	17.6	21.22	4.00	20.82	0.25	0.75
0.55	0.55	5.52	23.7	23.76	4.30	23.33	0.29	0.84
0.60	0.60	6.74	31.0	26.31	4.60	25.83	0.33	0.93
0.65	0.65	8.10	39.6	28.85	4.89	28.34	0.37	1.02
0.70	0.70	9.59	49.8	31.19	5.19	30.64	0.42	1.12
0.75	0.75	11.13	63.7	31.25	5.73	30.66	0.51	1.26
0.80	0.80	12.66	78.9	31.30	6.23	30.67	0.60	1.40
0.85	0.85	14.19	95.4	31.35	6.72	30.69	0.70	1.55
0.90	0.90	15.73	113.1	31.40	7.19	30.71	0.80	1.70
0.95	0.95	17.27	131.9	31.46	7.64	30.73	0.91	1.86
1.00	1.00	18.80	151.9	31.51	8.08	30.74	1.01	2.01
1.05	1.05	20.34	173.0	31.56	8.50	30.76	1.12	2.17
1.10	1.10	21.88	195.1	31.61	8.92	30.78	1.23	2.33
1.15	1.15	23.42	218.2	31.67	9.32	30.79	1.35	2.50
1.17	1.17	24.03	227.8	31.69	9.48	31.30	1.40	2.57

Ladera 2

Inlet #2

Q = 4.61

d = 0.33

V = 2.87

E = 0.456

see nomograph

@ 0.2%, Q = 1.5

@ 2.0%, Q = 3.6

so, @ 1.70%, Q = 3.25

Inlet #3

Q = 1.36

d = 0.22e

see nomograph

@ 0.2%, Q = —

@ 2.0%, Q = 1.5

so @ 1.70%, Q = 1.3

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

32ff/50rw std full 1.91%

MANNING'S N= .017 SLOPE= .0191

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	41.17	0.67
2	8.37	0.67	6	25.00	0.41	10	41.63	0.67
3	8.83	0.67	7	39.00	0.13	11	50.00	0.85
4	9.00	0.00	8	41.00	0.00	12	0.00	0.00

WSEL	DEPTH INC	FLOW AREA	FLOW RATE	WETTED PER	FLOW VEL	TOPWID	VEL HEAD	ENERGY HEAD
(FT)	(FT)	SQ.FT.	(CFS)	(FT)	(FPS)	(FT)	(FT)	(FT)
0.05	0.05	0.04	0.0	1.71	1.00	1.63	0.02	0.07
0.10	0.10	0.16	0.3	3.41	1.59	3.25	0.04	0.14
0.15	0.15	0.39	0.7	6.82	1.78	6.58	0.05	0.20
0.20	0.20	0.84	1.7	11.92	2.06	11.60	0.07	0.27
0.25	0.25	1.55	3.8	17.03	2.44	16.63	0.09	0.34
0.30	0.30	2.50	7.1	22.13	2.83	21.65	0.12	0.42
0.35	0.35	3.71	11.9	27.23	3.20	26.68	0.16	0.51
0.40	0.40	5.17	18.4	32.34	3.56	31.70	0.20	0.60
0.45	0.45	6.78	28.6	32.94	4.21	32.23	0.28	0.73
0.50	0.50	8.39	40.7	33.05	4.85	32.25	0.36	0.86
0.55	0.55	10.01	54.4	33.15	5.44	32.28	0.46	1.01
0.60	0.60	11.62	69.7	33.25	5.99	32.30	0.56	1.16
0.65	0.65	13.24	86.4	33.35	6.52	32.33	0.66	1.31
0.70	0.70	14.92	98.2	37.11	6.58	36.05	0.67	1.37
0.75	0.75	16.84	111.1	41.76	6.59	40.70	0.68	1.43
0.80	0.80	18.99	126.5	46.41	6.66	45.35	0.69	1.49
0.85	0.85	21.38	144.5	51.06	6.76	50.00	0.71	1.56

D-1+D-2

$Q = 3.83 + 12.51 = 16.34$

$d = 0.38$

$V = 3.45$

$E = 0.57 < 0.85$ ok

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

32ff/50rw std full 1.67%

MANNING'S N= .017 SLOPE= .0167

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	41.17	0.67
2	8.37	0.67	6	25.00	0.41	10	41.63	0.67
3	8.83	0.67	7	39.00	0.13	11	50.00	0.85
4	9.00	0.00	8	41.00	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	0.94	1.63	0.01	0.06
0.10	0.10	0.16	0.2	3.41	1.48	3.25	0.03	0.13
0.15	0.15	0.39	0.6	6.82	1.67	6.58	0.04	0.19
0.20	0.20	0.84	1.6	11.92	1.93	11.60	0.06	0.26
0.25	0.25	1.55	3.5	17.03	2.28	16.63	0.08	0.33
0.30	0.30	2.50	6.6	22.13	2.64	21.65	0.11	0.41
0.35	0.35	3.71	11.1	27.23	2.99	26.68	0.14	0.49
0.40	0.40	5.17	17.2	32.34	3.33	31.70	0.17	0.57
0.45	0.45	6.78	26.7	32.94	3.94	32.23	0.24	0.69
0.50	0.50	8.39	38.0	33.05	4.53	32.25	0.32	0.82
0.55	0.55	10.01	50.9	33.15	5.08	32.28	0.40	0.95
0.60	0.60	11.62	65.1	33.25	5.60	32.30	0.49	1.09
0.65	0.65	13.24	80.8	33.35	6.10	32.33	0.58	1.23
0.70	0.70	14.92	91.9	37.11	6.15	36.05	0.59	1.29
0.75	0.75	16.84	103.9	41.76	6.17	40.70	0.59	1.34
0.80	0.80	18.99	118.3	46.41	6.23	45.35	0.60	1.40
0.85	0.85	21.38	135.1	51.06	6.32	50.00	0.62	1.47

← 0.40

+-1

$Q = 17.74$

$d \approx 0.40$

$V = 3.33$

$E = 0.57 < 0.85$ OK

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

32ff/50rw std full 0.67%

MANNING'S N= .017 SLOPE= .0067

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	41.17	0.67
2	8.37	0.67	6	25.00	0.41	10	41.63	0.67
3	8.83	0.67	7	39.00	0.13	11	50.00	0.85
4	9.00	0.00	8	41.00	0.00	12	0.00	0.00

WSEL	DEPTH INC	FLOW AREA	FLOW RATE	WETTED PER	FLOW VEL	TOPWID	VEL HEAD	ENERGY HEAD
(FT)	(FT)	SQ.FT.	(CFS)	(FT)	(FPS)	(FT)	(FT)	(FT)
0.05	0.05	0.04	0.0	1.71	0.59	1.63	0.01	0.06
0.10	0.10	0.16	0.2	3.41	0.94	3.25	0.01	0.11
0.15	0.15	0.39	0.4	6.82	1.06	6.58	0.02	0.17
0.20	0.20	0.84	1.0	11.92	1.22	11.60	0.02	0.22
0.25	0.25	1.55	2.2	17.03	1.45	16.63	0.03	0.28
0.30	0.30	2.50	4.2	22.13	1.67	21.65	0.04	0.34
0.35	0.35	3.71	7.0	27.23	1.90	26.68	0.06	0.41
0.40	0.40	5.17	10.9	32.34	2.11	31.70	0.07	0.47
0.45	0.45	6.78	16.9	32.94	2.49	32.23	0.10	0.55
0.50	0.50	8.39	24.1	33.05	2.87	32.25	0.13	0.63
0.55	0.55	10.01	32.2	33.15	3.22	32.28	0.16	0.71
0.60	0.60	11.62	41.3	33.25	3.55	32.30	0.20	0.80
0.65	0.65	13.24	51.1	33.35	3.86	32.33	0.23	0.88
0.70	0.70	14.92	58.2	37.11	3.90	36.05	0.24	0.94
0.75	0.75	16.84	65.8	41.76	3.91	40.70	0.24	0.99
0.80	0.80	18.99	74.9	46.41	3.94	45.35	0.24	1.04
0.85	0.85	21.38	85.6	51.06	4.00	50.00	0.25	1.10

N-1

$Q = 22.94$

$d = 0.49$

$V = 2.80$

$E = 0.62 < 0.85$ OK

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

32ff/50rw std full 2.76%

MANNING'S N= .017 SLOPE= .0276

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	41.17	0.67
2	8.37	0.67	6	25.00	0.41	10	41.63	0.67
3	8.83	0.67	7	39.00	0.13	11	50.00	0.85
4	9.00	0.00	8	41.00	0.00	12	0.00	0.00

WSEL	DEPTH INC	FLOW AREA	FLOW RATE	WETTED PER	FLOW VEL	TOPWID	VEL HEAD	ENERGY HEAD
(FT)	(FT)	SQ.FT.	(CFS)	(FT)	(FPS)	(FT)	(FT)	(FT)
0.05	0.05	0.04	0.0	1.71	1.20	1.63	0.02	0.07
0.10	0.10	0.16	0.3	3.41	1.91	3.25	0.06	0.16
0.15	0.15	0.39	0.8	6.82	2.14	6.58	0.07	0.22
0.20	0.20	0.84	2.1	11.92	2.48	11.60	0.10	0.30
0.25	0.25	1.55	4.5	17.03	2.94	16.63	0.13	0.38
0.30	0.30	2.50	8.5	22.13	3.40	21.65	0.18	0.48
0.35	0.35	3.71	14.3	27.23	3.85	26.68	0.23	0.58
0.40	0.40	5.17	22.1	32.34	4.28	31.70	0.28	0.68
0.45	0.45	6.78	34.3	32.94	5.06	32.23	0.40	0.85
0.50	0.50	8.39	48.9	33.05	5.82	32.25	0.53	1.03
0.55	0.55	10.01	65.4	33.15	6.54	32.28	0.66	1.21
0.60	0.60	11.62	83.7	33.25	7.21	32.30	0.81	1.41
0.65	0.65	13.24	103.8	33.35	7.84	32.33	0.96	1.61
0.70	0.70	14.92	118.1	37.11	7.91	36.05	0.97	1.67
0.75	0.75	16.84	133.5	41.76	7.93	40.70	0.98	1.73
0.80	0.80	18.99	152.0	46.41	8.01	45.35	1.00	1.80
0.85	0.85	21.38	173.7	51.06	8.13	50.00	1.03	1.88

M

$Q = 12.47$

$d \approx 0.34$

$V = 3.80$

$E = 0.56 < 0.85$ OK

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

32ff/50rw std roll 1.90%

MANNING'S N= .017 SLOPE= .019

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.50	5	11.00	0.13	9	41.17	0.33
2	8.37	0.33	6	25.00	0.41	10	41.63	0.33
3	8.83	0.33	7	39.00	0.13	11	50.00	0.50
4	9.00	0.00	8	41.00	0.00	12	0.00	0.00

WSEL	DEPTH INC	FLOW AREA	FLOW RATE	WETTED PER	FLOW VEL	TOPWID	VEL HEAD	ENERGY HEAD
(FT)	(FT)	SQ.FT.	(CFS)	(FT)	(FPS)	(FT)	(FT)	(FT)
0.05	0.05	0.04	0.0	1.72	1.00	1.65	0.02	0.07
0.10	0.10	0.17	0.3	3.43	1.59	3.30	0.04	0.14
0.15	0.15	0.39	0.7	6.85	1.79	6.65	0.05	0.20
0.20	0.20	0.85	1.8	11.96	2.07	11.71	0.07	0.27
0.25	0.25	1.56	3.8	17.07	2.45	16.76	0.09	0.34
0.30	0.30	2.53	7.2	22.19	2.83	21.81	0.12	0.42
0.35	0.35	3.78	11.4	30.17	3.02	29.76	0.14	0.49
0.40	0.40	5.52	17.7	40.17	3.21	39.76	0.16	0.56
0.45	0.45	7.66	28.1	45.67	3.66	45.25	0.21	0.66
0.50	0.50	9.92	40.4	50.42	4.08	50.00	0.26	0.76

$Q = 16.39$

$A = 0.389$

$V = 3.17$

$E = 0.545 > 0.50$ NG

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

32ff/50rw std roll 2.16%

MANNING'S N= .017 SLOPE= .0216

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.50	5	11.00	0.13	9	41.17	0.33
2	8.37	0.33	6	25.00	0.41	10	41.63	0.33
3	8.83	0.33	7	39.00	0.13	11	50.00	0.50
4	9.00	0.00	8	41.00	0.00	12	0.00	0.00

WSEL	DEPTH INC	FLOW AREA	FLOW RATE	WETTED PER	FLOW VEL	TOPWID	VEL HEAD	ENERGY HEAD
(FT)	(FT)	SQ.FT.	(CFS)	(FT)	(FPS)	(FT)	(FT)	(FT)
0.05	0.05	0.04	0.0	1.72	1.07	1.65	0.02	0.07
0.10	0.10	0.17	0.3	3.43	1.70	3.30	0.04	0.14
0.15	0.15	0.39	0.8	6.85	1.91	6.65	0.06	0.21
0.20	0.20	0.85	1.9	11.96	2.21	11.71	0.08	0.28
→ 0.25	0.25	1.56	4.1	17.07	2.61	16.76	0.11	0.36
0.30	0.30	2.53	7.6	22.19	3.02	21.81	0.14	0.44
0.35	0.35	3.78	12.2	30.17	3.22	29.76	0.16	0.51
0.40	0.40	5.52	18.9	40.17	3.42	39.76	0.18	0.58
0.45	0.45	7.66	29.9	45.67	3.91	45.25	0.24	0.69
0.50	0.50	9.92	43.1	50.42	4.35	50.00	0.29	0.79

D-1

$Q = 4.09\ cfs$

$d = 0.25$

$V = 2.61$

$E = 0.36 < 0.50$ ok

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

32ff/50rw std roll 1.67%

MANNING'S N= .017 SLOPE= .0167

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.50	5	11.00	0.13	9	41.17	0.33
2	8.37	0.33	6	25.00	0.41	10	41.63	0.33
3	8.83	0.33	7	39.00	0.13	11	50.00	0.50
4	9.00	0.00	8	41.00	0.00	12	0.00	0.00

WSEL	DEPTH INC	FLOW AREA	FLOW RATE	WETTED PER	FLOW VEL	TOPWID	VEL HEAD	ENERGY HEAD
(FT)	(FT)	SQ.FT.	(CFS)	(FT)	(FPS)	(FT)	(FT)	(FT)
0.05	0.05	0.04	0.0	1.72	0.94	1.65	0.01	0.06
0.10	0.10	0.17	0.2	3.43	1.49	3.30	0.03	0.13
0.15	0.15	0.39	0.7	6.85	1.68	6.65	0.04	0.19
0.20	0.20	0.85	1.7	11.96	1.94	11.71	0.06	0.26
0.25	0.25	1.56	3.6	17.07	2.29	16.76	0.08	0.33
0.30	0.30	2.53	6.7	22.19	2.65	21.81	0.11	0.41
0.35	0.35	3.78	10.7	30.17	2.83	29.76	0.12	0.47
0.40	0.40	5.52	16.6	40.17	3.01	39.76	0.14	0.54
0.45	0.45	7.66	26.3	45.67	3.43	45.25	0.18	0.63
0.50	0.50	9.92	37.9	50.42	3.82	50.00	0.23	0.72

H-1

$Q = 17.72$

$d = 0.405$

$V = 3.06$

$E = 0.55 > 0.50$ NG

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

32ff/50rw std roll 2.76%

MANNING'S N= .017 SLOPE= .0276

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.50	5	11.00	0.13	9	41.17	0.33
2	8.37	0.33	6	25.00	0.41	10	41.63	0.33
3	8.83	0.33	7	39.00	0.13	11	50.00	0.50
4	9.00	0.00	8	41.00	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	1.72	1.21	1.65	0.02	0.07
0.10	0.10	0.17	0.3	3.43	1.92	3.30	0.06	0.16
0.15	0.15	0.39	0.8	6.85	2.16	6.65	0.07	0.22
0.20	0.20	0.85	2.1	11.96	2.50	11.71	0.10	0.30
0.25	0.25	1.56	4.6	17.07	2.95	16.76	0.14	0.39
0.30	0.30	2.53	8.6	22.19	3.41	21.81	0.18	0.48
0.35	0.35	3.78	13.8	30.17	3.64	29.76	0.21	0.56
0.40	0.40	5.52	21.3	40.17	3.87	39.76	0.23	0.63
0.45	0.45	7.66	33.8	45.67	4.42	45.25	0.30	0.75
0.50	0.50	9.92	48.7	50.42	4.91	50.00	0.37	0.87

E-1

$Q = 12.47$

$d = 0.337$

$V = 3.58$

$E = 0.539 > 0.50$ NG

APPENDIX C

INLET ANALYSIS

ANALYSIS OF AN INLET IN A SUMP CONDITION - **Sundoro Place - Cul-de-sac**

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	
TOP OF CURB	0.70	0.70	7.03	15.71	32.99	29.76	Q(100 yr) = 28.29 cfs is provided at this depth
	0.80	0.80	8.59	19.19	35.27	36.36	
	0.90	0.90	10.25	22.90	37.41	43.39	
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 =28.29 cfs at the sump condition
THE 2 x 100 YR STORM EVENT = 56.58 cfs at the sump condition

173

174

Talang Road

18" SD

Sundora Place

8.75 cfs

8.75 → Q_r = 17.15

7.5 → Q_r = 10.47

16.25

51.8 cfs

35.92 cfs

87.5 cfs

24" SD

8.75 → Q_r = 17.15

7.5 → Q_r = 10.47

16.25

8.75 cfs

C-2

18 "SD

Marcyol Street

16.51

4.94

4.94

Q=3.31

3.31

24 "SD

Sundoro Place

4.98 cfs

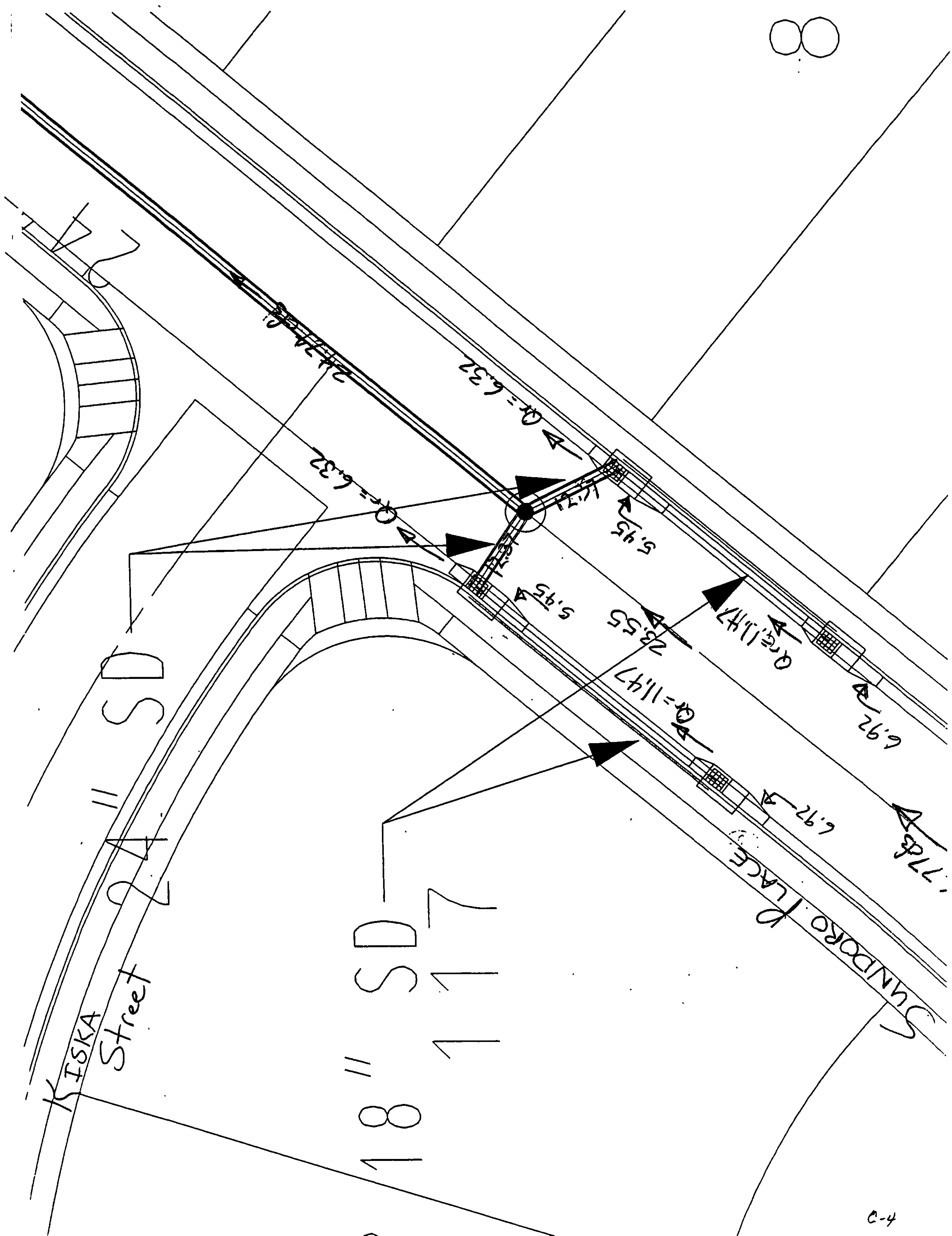
Qr=12.92

7.38

40.59

7.38

Qr=12.92


24" SD
18" SD
KISKA Street
SANDORO PLACE
Qr=6.32
Qr=6.32
5.45
5.45
6.92
6.92
Qr=11.47
Qr=11.47
23.55

24" SD

18" SD

MAROA STREET

43.51 cfs

8.2

13.55

8.2

13.56

36"

65.12 cfs

24" SD

Qr=5.57

48.72

Qr=5.57

11.99

11.99

5.27

5.27

75

18" SD

SUBOKO PLACE

Qr=10.55

21.68

Qr=10.55

6.72

24.54

6.72

30"

1100 1119 1118 343 354 290

42" SD

108.17 cfs

(sump) 28.29 cfs

79.88 cfs

344

253

345

36

22

SUNDORO PLACE

Qr=12.95

Qr=12.95

7.38

7.38

65.12 cfs

10.66 cfs

MARATI STREET

LADERA DRIVE

24" SD

4.87

Qr= 5.27

36

31.89 cfs

SD

57.14

36" SD

89.03 cfs

Qr=10.14

7.52

25.66

Qr= 17.66

9.31

26.97 cfs

18" SD

18" SD

Qr=1.36

1.36

30" SD

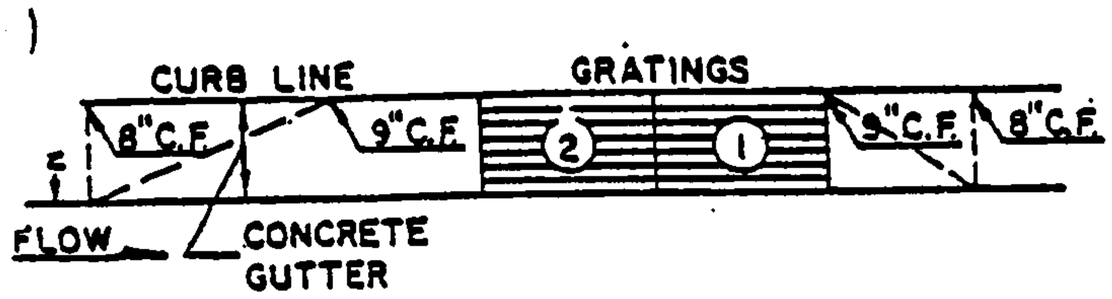
Qr=4.61

3.25

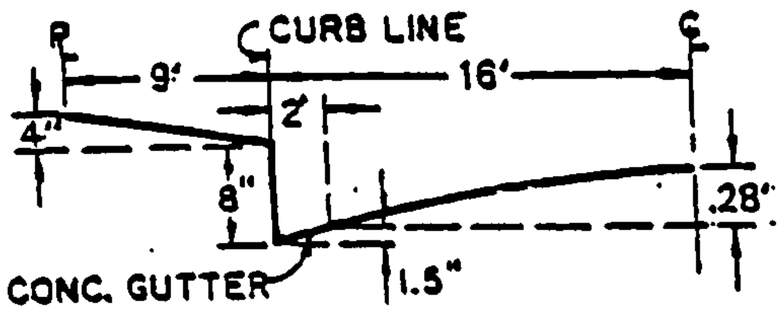
5.38

10.19 cfs

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



GRATING & GUTTER PLAN

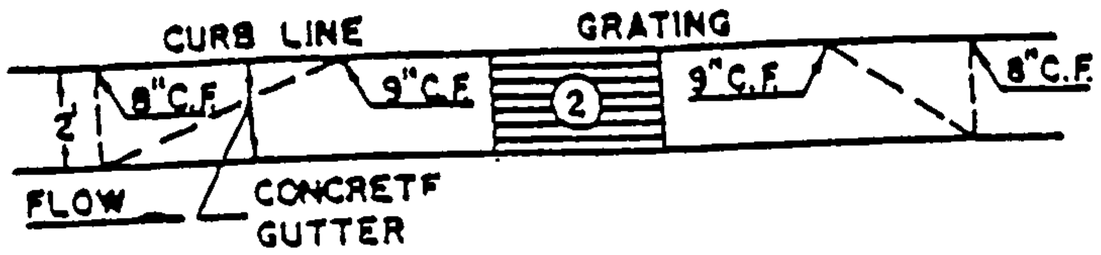


TYPICAL HALF STREET SECTION
(ABOVE BASIN)

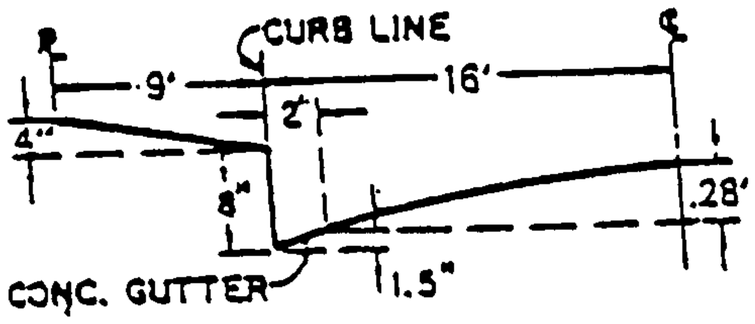
D = DEPTH OF FLOW (FT.) ABOVE NORMAL GUTTER GRADE

C-8

GRATING CAPACITIES FOR TYPE "A" , "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 ANALYSIS

alyzer Report

==========

ainage Structure Analyzer

Pipe Hydraulic Analysis

te: Wednesday, August 27, 2003 2:37:10 PM

==========

Input Data

---

ape Circular

Material RC C76-A

oughness 0.013000

thod Manning

ow Rate 32.4800 cfs

Slope 2.5000%

ize (W x T): 24.00 x 2.5000

utput Results

---

ow Rate 32.4800 cfs

ope 2.5000%

d/D 0.7470

Capacity 35.7692 cfs

locity 12.9043 ft/s

pth 1.4940 ft

Critical Depth 1.8900 ft

Size (W x T): 24.00 x 2.5000

.lyzer Report

==========

:.inage Structure Analyzer

.ape Hydraulic Analysis

:e: Wednesday, August 27, 2003 2:37:39 PM

==========

Input Data

---

ape	Circular
Material	RC C76-A
oughness	0.013000
:hod	Manning
ow Rate	47.2400 cfs
Slope	2.5000%
ize (W x T):	30.00 x 2.7500

Output Results

---

ow Rate	47.2400 cfs
ope	2.5000%
/D	0.6332
Capacity	64.8538 cfs
locity	14.4160 ft/s
pth	1.5830 ft
ritical Depth	2.2600 ft
Size (W x T):	30.00 x 2.7500

[redacted]lyzer Report

==========

[redacted]inage Structure Analyzer

[redacted]ipe Hydraulic Analysis

[redacted]e: Wednesday, August 27, 2003 2:38:49 PM

==========

[redacted]nput Data

[redacted]--------

[redacted]ipe Circular

[redacted]aterial RC C76-A

[redacted]oughness 0.013000

[redacted]thod Manning

[redacted]ow Rate 57.1200 cfs

[redacted]Slope 2.0000%

[redacted]ize (W x T): 30.00 x 2.7500

[redacted]

[redacted]utput Results

[redacted]ow Rate 57.1200 cfs

[redacted]ope 2.0000%

[redacted]/D 0.8060

Capacity 58.0070 cfs

[redacted]locity 13.4727 ft/s

[redacted]pth 2.0150 ft

Critical Depth 2.3700 ft

Size (W x T): 30.00 x 2.7500

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]lyzer Report

==========

[redacted]inage Structure Analyzer

?ipe Hydraulic Analysis

[redacted]:e: Wednesday, August 27, 2003 2:39:14 PM

==========

Input Data

[redacted]--------

[redacted]ape Circular

Material RC C76-A

Roughness 0.013000

[redacted]thod Manning

[redacted]ow Rate 24.7400 cfs

Slope 1.5000%

[redacted]ize (W x T): 24.00 x 2.5000

[redacted]

Output Results

[redacted]ow Rate 24.7400 cfs

[redacted]ope 1.5000%

d/D 0.7365

Capacity 27.7067 cfs

[redacted]locity 9.9749 ft/s

[redacted]pth 1.4730 ft

Critical Depth 1.7500 ft

Size (W x T): 24.00 x 2.5000

[redacted]

[redacted]lyzer Report

==========

[redacted]ainage Structure Analyzer

[redacted]ipe Hydraulic Analysis

[redacted]te: Wednesday, August 27, 2003 2:39:30 PM

==========

Input Data

[redacted]--------

[redacted]ape Circular

Material RC C76-A

Roughness 0.013000

[redacted]thod Manning

[redacted]ow Rate 48.7200 cfs

Slope 1.5000%

[redacted]ize (W x T): 30.00 x 2.7500

[redacted]

[redacted]tput Results

[redacted]ow Rate 48.7200 cfs

[redacted]ope 1.5000%

d/D 0.7936

Capacity 50.2355 cfs

[redacted]locity 11.6621 ft/s

[redacted]pth 1.9840 ft

Critical Depth 2.2800 ft

Size (W x T): 30.00 x 2.7500

[redacted]

ılyzer Report

==========

ıinage Structure Analyzer

._pe Hydraulic Analysis

ːe: Wednesday, August 27, 2003 2:40:07 PM

==========

Input Data

---

ape Circular
Material RC C76-A
oughness 0.013000
thod Manning
ow Rate 65.1200 cfs
Slope 1.5000%
ze (W x T): 36.00 x 3.0000

tput Results

---

ow Rate 65.1200 cfs
ope 1.5000%
/D 0.6747
Capacity 81.6885 cfs
locity 12.8348 ft/s
pth 2.0240 ft
ritical Depth 2.5800 ft
Size (W x T): 36.00 x 3.0000

lyzer Report

==========

inage Structure Analyzer

ape Hydraulic Analysis

e: Wednesday, August 27, 2003 2:40:31 PM

==========

nput Data

---

ape	Circular
Material	RC C76-A
oughness	0.013000
hod	Manning
ow Rate	79.8800 cfs
Slope	1.5000%
ize (W x T):	36.00 x 3.0000

utput Results

---

ow Rate	79.8800 cfs
ope	1.5000%
/D	0.8000
Capacity	81.6885 cfs
locity	13.1768 ft/s
pth	2.4000 ft
Critical Depth	2.7600 ft
Size (W x T):	36.00 x 3.0000

lyzer Report

==========

·inage Structure Analyzer

.pe Hydraulic Analysis

e: Wednesday, August 27, 2003 2:41:29 PM

==========

·-put Data

.pe	Circular
1aterial	RC C76-A
ughness	0.013000
:hod	Manning
ow Rate	108.1700 cfs
Slope	0.6000%
·ze (W x T):	48.00 x 4.0000

..:put Results

ow Rate	108.1700 cfs
ope	0.6000%
d/D	0.7955
Capacity	111.2656 cfs
locity	10.0911 ft/s
pth	3.1820 ft
Critical Depth	3.1400 ft
ize (W x T):	48.00 x 4.0000

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 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

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

CITY OF ALBUQUERQUE

April 11, 2005

Mr. Christian J. Sholtis, PE
BOHANNAN-HUSTON, INC.
7500 Jefferson St. NE
Albuquerque, NM 87109

RE: SUNDORO SUBDIVISION(S) (J-9/D18)
Engineers Certification for Release of Financial Guaranty
Engineers Stamp dated 12/19/2003
Engineers Certification dated 04/07/2005

Dear Chris:

Based upon the information provided in your Engineer's Certification Submittal dated 04/07/2005, 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
Plan Checker, Planning Dept.- Hydrology
Development and Building Services

BLB

C: Marilyn Maldonado, COA# 650282, 650283, 650284, 650285, 650286
File

P.O. Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

PROJECT TITLE: Sundoro Subdivision — ZONE MAP/DRG. FILE #: J9/D18
DRB #. 1002935 — EPC#. — WORK ORDER #. 650282 - 650286

LEGAL DESCRIPTION: Sundoro Subdivision, Units 1-4
CITY ADDRESS: Northeast Corner of Arroyo Vista NW and Ladera Drive NW

ENGINEERING FIRM:	Bohannan Huston, Inc.	CONTACT:	Christian J. Sholtis, PE
ADDRESS:	7500 Jefferson Street NE	PHONE:	(505) 823-1000
CITY, STATE:	Albuquerque, NM	ZIP CODE:	87109
OWNER:	Westland Development Co.	CONTACT:	Fred Ambrogi
ADDRESS:	401 Coors Blvd. NW	PHONE:	831-9600
CITY, STATE:	Albuquerque, NM	ZIP CODE:	87121
ARCHITECT:	N/A	CONTACT:	
ADDRESS:		PHONE:	
CITY, STATE:		ZIP CODE:	
SURVEYOR:	Surv-Tek	CONTACT:	Russ Hugg
ADDRESS:	9384 Valley View Dr. NW	PHONE:	897-3366
CITY, STATE:	Albuquerque, NM	ZIP CODE:	78114
CONTRACTOR:	Salls Brothers Construction, Inc.	CONTACT:	Fred Salls
ADDRESS:	P.O. Box 66239	PHONE:	873-8780
CITY, STATE:	Albuquerque, NM	ZIP CODE:	87193

CHECK TYPE OF SUBMITTAL:

- ____ DRAINAGE REPORT
- ____ DRAINAGE PLAN 1ST SUBMITTAL, ***REQUIRES TCL or equal***
- ____ DRAINAGE PLAN RESUBMITTAL
- ____ GRADING PLAN
- ____ EROSION CONTROL PLAN
- X ENGINEER'S CERTIFICATION (HYDROLOGY)
- ____ CLOMR/LOMR
- ____ TRAFFIC CIRCULATION LAYOUT (TCL)
- ____ ENGINEER'S CERTIFICATION (TCL)
- ____ ENGINEER'S 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
- X NO
- ____ COPY PROVIDED

RECEIVED
APR 07 2005
HYDROLOGY SECTION

DATE SUBMITTED: 4-7-05 — BY: Christian J. Sholtis, PE

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.

Westland Development
Company, Incorporated

401 Coors Blvd. N.W.
Albuquerque, New Mexico 87121
(505) 831-9600
Fax (505) 831-4865
1-800-726-3250

March 7, 2005

Mr. Brad Bingham
Senior Engineer, Hydrology
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87102

Re: Sundoro Subdivision Unit 1, Lot 39, Rear Yard Drainage.

Dear Mr. Bingham:

Several weeks ago it was brought to my attention by my perimeter wall contractor, that the northeast corner of the rear yard of the above referenced lot slopes down to the northeast toward an existing AMAFCA easement and a small adjacent parcel owned by Westland. This is a very wide lot at the end of the Makian Place cul-du-sac, which has a large rear and side yard. The entire house pad portion of the lot and the front yard area drain forward to the street and cul-du-sac as specified by the approved grading plan, however the earthwork contractor did not fill the far northeast corner of the lot so it slopes gradually down to the existing natural grade. I no longer had a contractor left on site with heavy equipment to fill the rear corner of this lot, so I advised the wall contractor to turn a block sideways at the low corner so that portion of the yard could drain out to the rear.

Two blocks were turned, one on the north side wall adjacent to the AMAFCA easement and one the east rear wall adjacent to the Westland parcel. Chris Sholtis of BHI looked at the lot and confirmed that the pad area and front yard will drain to the street. He advised me that the maximum flow coming off of the rear corner of lot 39 should not exceed about 0.3 c.f.s., which is significantly less than the historic flows which drained that way prior to the construction of our subdivision. Westland therefore agrees to accept the runoff from the east side turned block on to our parcel. I will have my wall contractor plug the turned block on the north side adjacent to the AMAFCA easement.

Since this portion of the perimeter wall is not designed and constructed as a retaining wall, the expense to make this corner of the lot drain forward to the street would be considerable; much more than is warranted by the minimal magnitude of the drainage situation. Thank you for your consideration regarding this matter.

Sincerely,

Fred Ambrogi

Fred Ambrogi,
VP, Development Division

Cc: Chris Sholtis, Bohannan-Huston, Inc.

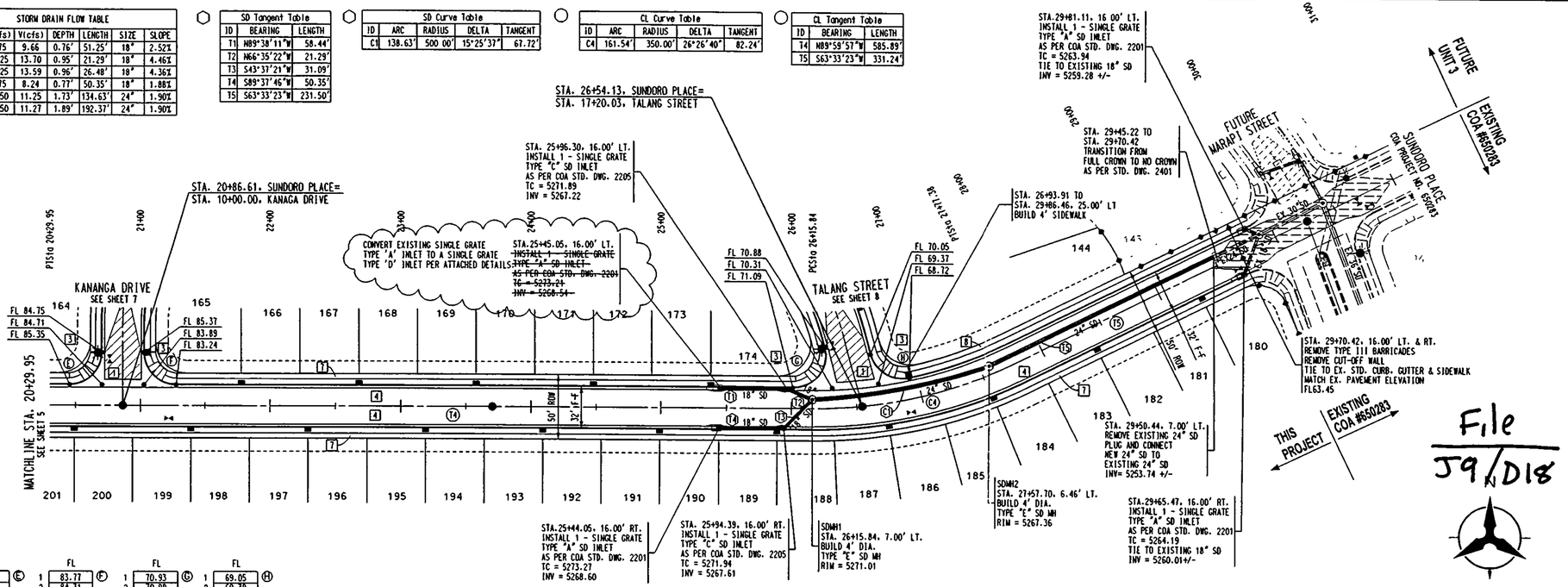
STORM DRAIN FLOW TABLE						
NUMBER	Q(cfs)	V(cfs)	DEPTH	LENGTH	SIZE	SLOPE
T1	8.75	9.66	0.76'	51.25'	18"	2.52%
T2	16.25	13.70	0.95'	21.29'	18"	4.46%
T3	16.25	13.59	0.96'	26.48'	18"	4.36%
T4	8.75	8.24	0.77'	50.35'	18"	1.88%
C1	32.50	11.25	1.73'	134.63'	24"	1.90%
T5	32.50	11.27	1.89'	192.37'	24"	1.90%

SD Tangent Table		
ID	BEARING	LENGTH
T1	N89°38'11"W	58.44'
T2	N66°35'22"W	21.29'
T3	S43°37'21"W	31.09'
T4	S89°37'46"W	50.35'
T5	S63°33'23"W	231.50'

SD Curve Table				
ID	ARC	RADIUS	DELTA	TANGENT
C1	138.63'	500.00'	15°25'37"	67.72'

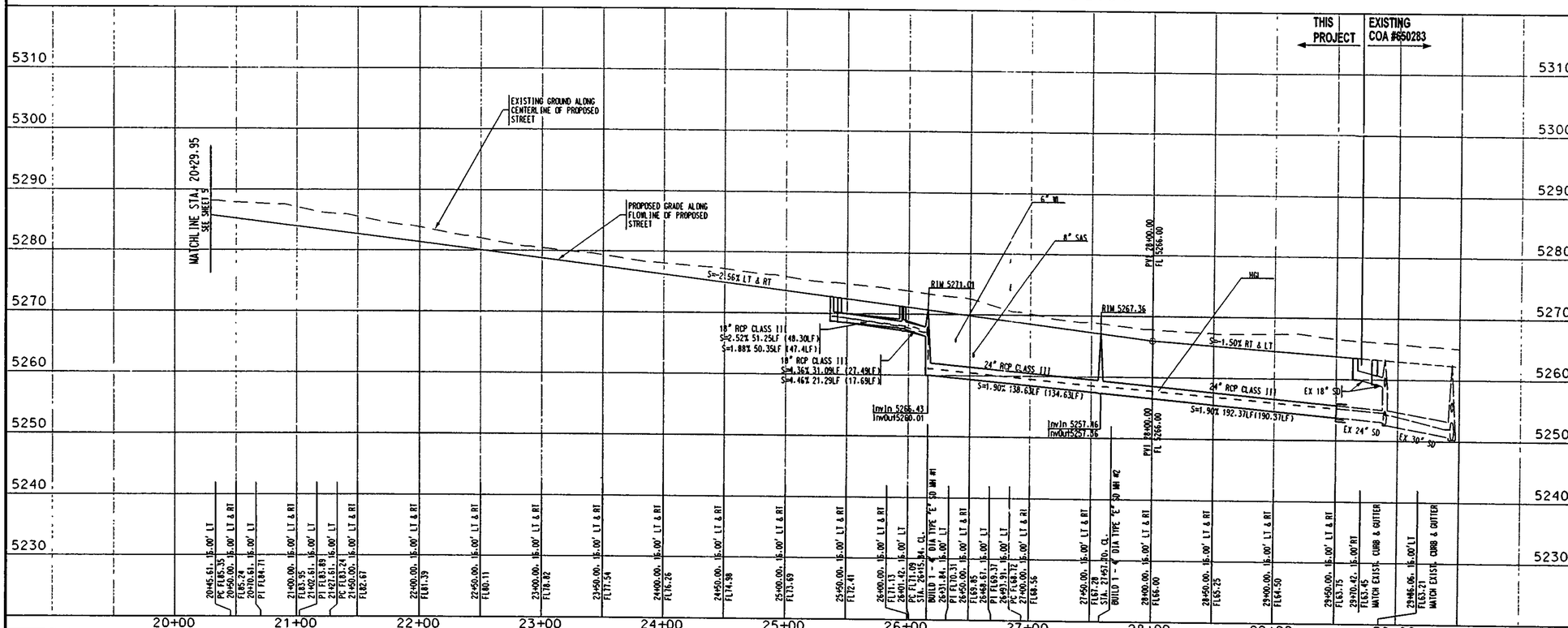
CL Curve Table				
ID	ARC	RADIUS	DELTA	TANGENT
C4	161.54'	350.00'	26°26'40"	82.24'

CL Tangent Table		
ID	BEARING	LENGTH
T4	N89°59'57"W	585.89'
T5	S63°33'23"W	331.24'



FL													
1	84.90	E		1	83.77	F		1	70.93	G		1	69.05	H
2	85.06			2	84.31			2	70.99			2	69.39	
3	85.20			3	84.84			3	71.04			3	69.72	
D = 90°00'00"				D = 90°00'00"				D = 104°11'22"				D = 88°02'31"			
L = 39.27'				L = 39.27'				L = 45.70'				L = 38.41'			
R = 25.00'				R = 25.00'				R = 25.00'				R = 25.00'			

SUNDORO PLACE STA. 20+29.95 TO 30+00.00



SCALE: 1" = 50' (HORIZ)
1" = 10' (VERT)

BHI JOB NO. 04 0013

NOTES

1. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITY LOCATIONS AND NOTIFY THE ENGINEER IMMEDIATELY OF OF ANY DISCREPANCIES.
2. ALL CURB RETURN RADII SHALL BE 25' UNLESS OTHERWISE SPECIFIED.
3. ALL CURVE DATA AND DIMENSIONS REFER TO FACE OF CURB UNLESS OTHERWISE SPECIFIED.
4. GRADE ELEVATIONS, WHERE NOTED, ARE ALONG FLOWLINE OF STANDARD CURB UNLESS OTHERWISE SPECIFIED.
5. CONTRACTOR IS TO INSTALL A 4" X 4" X 5' POST AND EMD AT THE END OF EACH SANITARY SEWER SERVICE.
6. CONTRACTOR IS RESPONSIBLE FOR REPAIR AND/OR REPLACEMENT OF ALL UTILITY CONDUITS AND EXISTING LINES.
7. ANY ADDITIONAL GRADING REQUIRED TO MATCH PROPOSED STREET GRADES SHALL BE INCIDENTAL TO PAVING ITEMS.
8. CONTRACTOR SHALL PROVIDE THE INSPECTORS, (CITY AND PRIVATE) WITH THE PROPOSED HYDROSTATIC TESTING PLAN. THE PLAN MUST BE APPROVED BEFORE TESTING OPERATIONS BEGIN.
9. CONTRACTOR SHALL PARK EQUIPMENT AND VEHICLES AS NOT TO INTERFERE WITH NORMAL ACTIVITIES OF RESIDENTS OR OTHER CONTRACTORS ON SITE.
10. ANY DAMAGE TO THE EXISTING FACILITIES (CURB & GUTTER), PAVEMENT, CONDUITS, LANDSCAPING, UTILITY LINES, ETC.) DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTORS' EXPENSE.
11. REMOVAL OF THE EXISTING CURB AND GUTTER SHALL BE AS PER COA STD. DWG. 2415 (SAWCUT ONLY).
12. WHEELCHAIR RAMPS SHALL BE CONSTRUCTED PRIOR TO ACCEPTANCE OF CURB & GUTTER.
13. ALL EXCAVATION, TRENCHING AND SHORING ACTIVITIES MUST BE CARRIED-OUT IN ACCORDANCE WITH OSHA 29 CFR 1926.650 SUBPART P.

NOTICE TO CONTRACTORS (SO 19)

1. AN EXCAVATION/CONSTRUCTION PERMIT WILL BE REQUIRED BEFORE BEGINNING ANY WORK WITHIN THE CITY RIGHT-OF-WAY. AN APPROVED COPY OF THESE PLANS MUST BE SUBMITTED AT THE TIME OF APPLICATION FOR THIS PERMIT
2. ALL WORK DETAILED ON THESE PLANS TO BE PERFORMED, EXCEPT AS OTHERWISE STATED OR PROVIDED HEREON, SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF ALBUQUERQUE STANDARD SPECS FOR PUBLIC WORKS CONSTRUCTION, 1986
3. TWO WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT LINE LOCATION SERVICE, 765-1234, FOR LOCATION OF EXISTING UTILITIES.
4. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY
5. BACKFILL COMPACTION SHALL BE TO ARTERIAL STREET USE
6. MAINTENANCE OF THESE FACILITIES SHALL BE THE RESPONSIBILITY OF THE OWNER OF THE PROPERTY SERVED.

DESIGN APPROVAL:

HYDROLOGY SECTION — DATE 5/17/05

INSPECTION APPROVAL

TRANS/STREET MAINT — DATE

ACCEPTANCE:

CONSTRUCTION MGT. DIV. — DATE

Bohannan ▲ Huston INC

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

ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES

SEAL — SURVEY INFORMATION — BENCH MARKS — AS-BUILT INFORMATION

FIELD NOTES — ACS STATION NAMED 4 - K6. 3 -1/4" ALUM. CAP — CONTRACTOR

NO. | BY | DATE — HV18 = 4 - K6 GEOGRAPHIC POSITION (1927) — SURVEYED BY

N.M. STATE PLANE COORDINATES (CENTRAL ZONE) — INSPECTOR'S ACCEPTANCE BY — DATE

X=1,369,918.47, Y=1,483,515.05 — FIELD LOCATION BY — DATE

GROUND-TO-GRID FACTOR .0999656356 — DRAWINGS CORRECTED BY — DATE

NGVD 1929 ELEVATION = 5732.892 — MICRO-FILM INFORMATION

ON PASED DEL VULCAN, 0.91 MI NORTH — RECORDED BY — DATE

OF I-40, 0.74 MI SOUTH OF POWERLINES. 39.6' — NO.

NW OF CENTERLINE OF PASED DEL VULCAN

ENGINEER'S SEAL

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	

DESIGNED BY CJS DATE 10/2003
DRAWN BY BS DATE 10/2003
CHECKED BY CJS DATE 10/2003

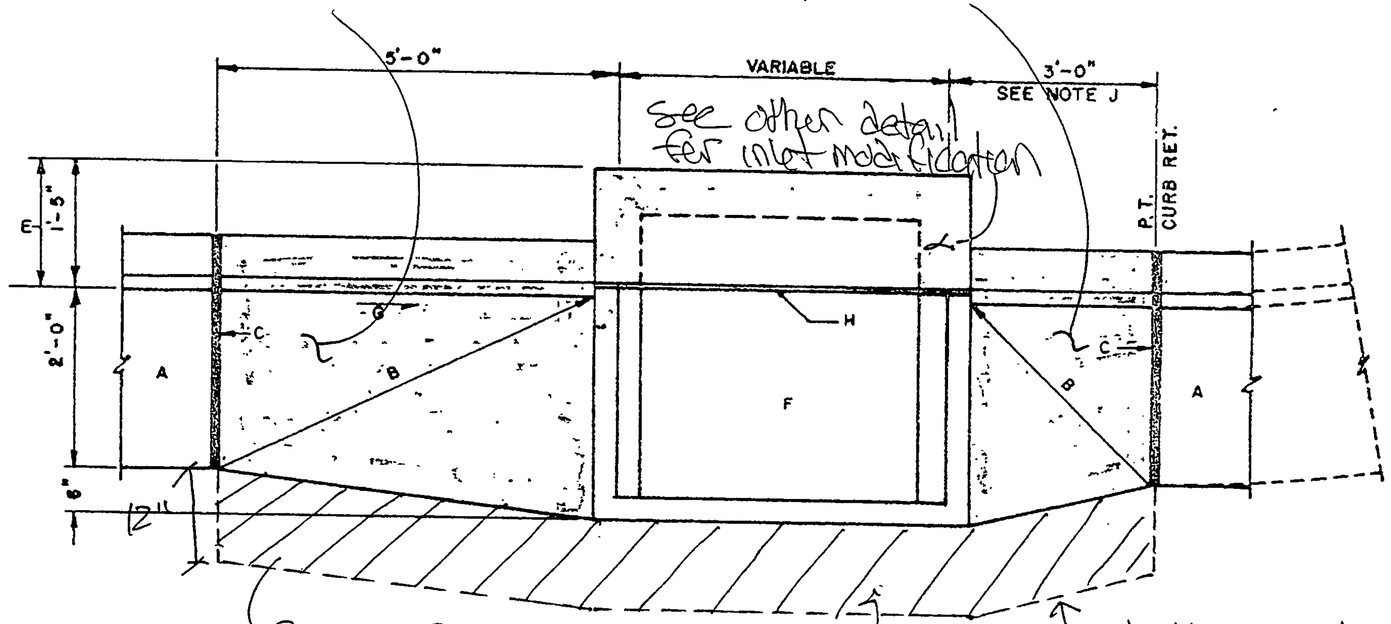
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING DEVELOPMENT GROUP

SUNDORO SUBDIVISION – UNIT 2
PAVING PLAN & PROFILE
SUNDORO PLACE STA. 20+29.95 – 30+00.00

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	LAST DESIGN UPDATE	MO./DAY/YR.	MO./DAY/YR.

CITY PROJECT NO. ~~650284~~ | ZONE MAP NO. J-8, J-9 | SHEET 16 OF 313

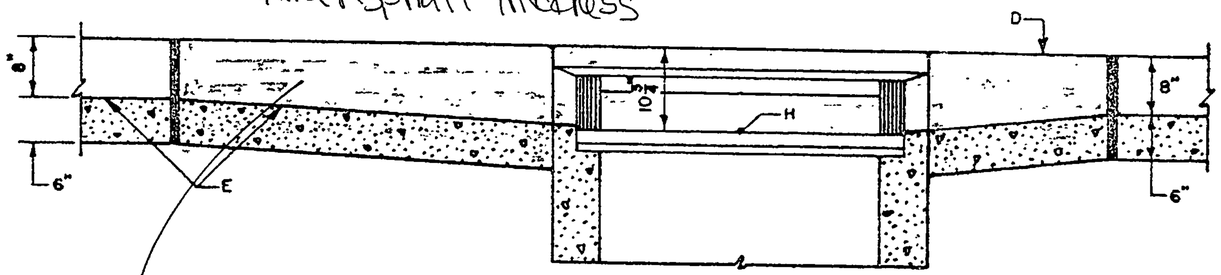
Remove & Relay Gutter Pan Slope (S=6.25%)



PLAN

Remove & Replace Existing Residential Pavement w/ 2" Extra Asphalt Thickness

Neatly Sawcut



LONGITUDINAL SECTION ALONG FLOWLINE

Remove existing curb and replace w/ drive pad.

GENERAL NOTES:

1. DETAILS FOR PLACING CATCH BASINS. STANDARD CURB AND GUTTER.

CONSTRUCTION NOTES:

A. STANDARD CURB AND GUTTER.

B. STRAIGHT GRADE.

C. EXPANSION JOINT.

D. TOP OF CURB.

E. FLOWLINE.

F. FOR FRAME & GRATE SEE DWG 2216, 2220 & 2221.

G. DIRECTION OF FLOW.

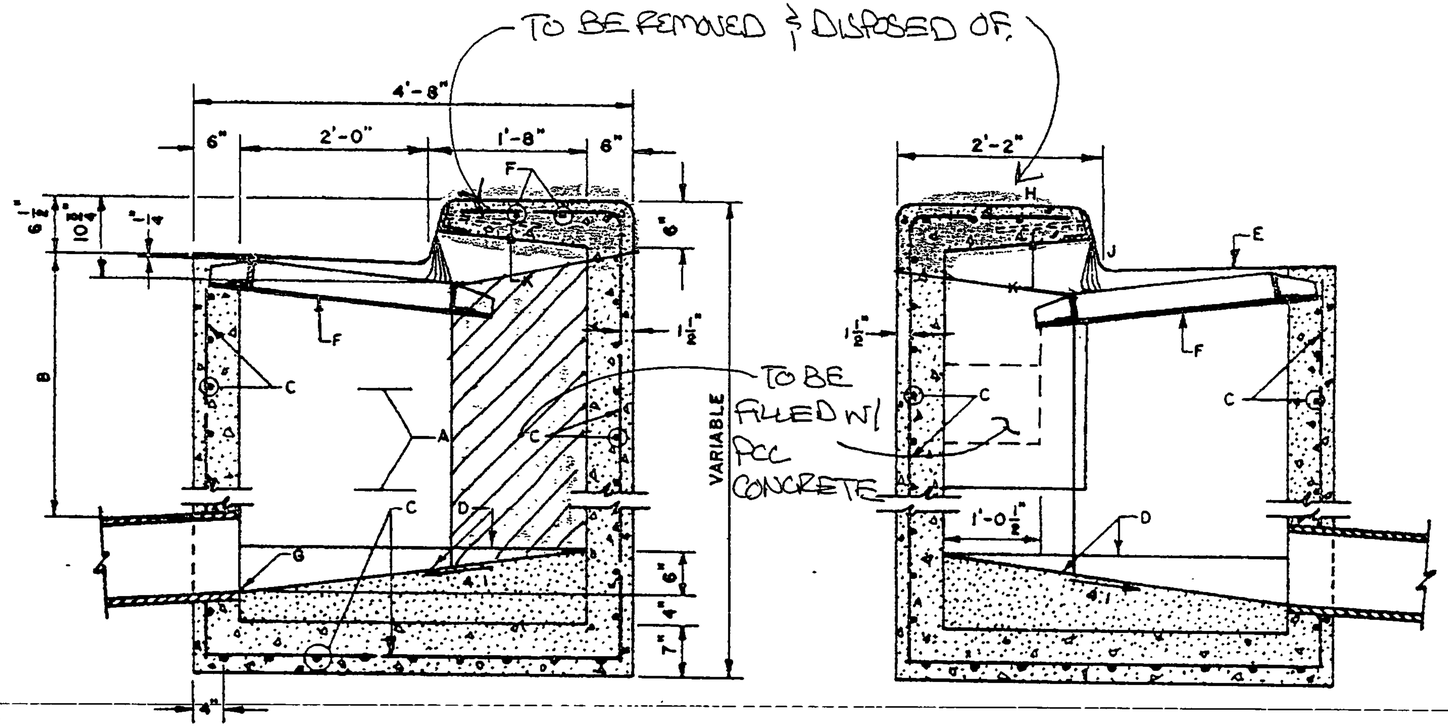
H. POINT OF MEASUREMENT FOR TOP OF GRATE ELEVATION.

J. PROVIDE 5 FEET TRANSITION EACH SIDE OF CATCH BASIN, WHEN INSTALLING AT SAG POINT IN INSTALLATIONS OTHER THAN AT CURB RETURN.

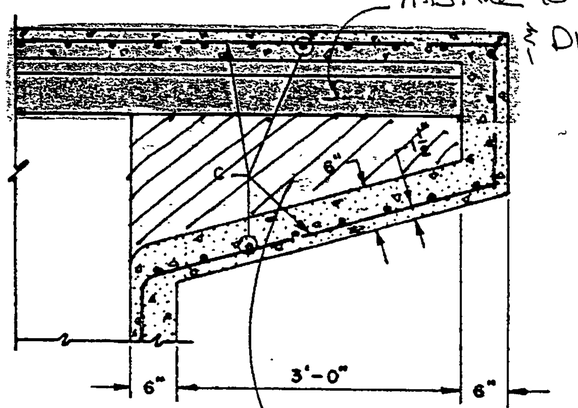
CONVERT EXISTING SINGLE GRATE TYPE 'A' INLET TO A TYPE 'D' SINGLE GRATE INLET

CITY OF ALBUQUERQUE

REVISIONS	DRAINAGE STORM INLET GUTTER TRANSITION DWG. 2207 AUG. 1986



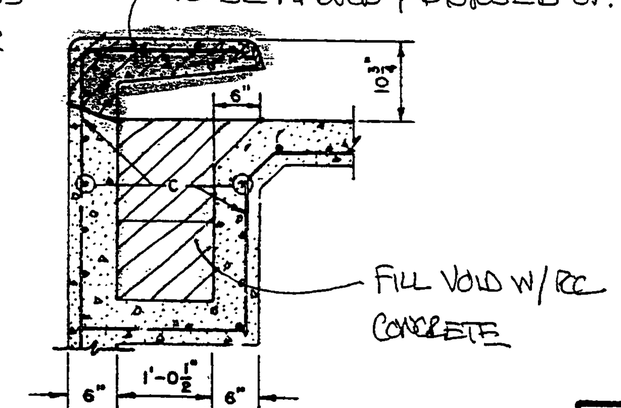
SECTION B-B



SECTION D-D

THIS AREA TO BE FILLED W/ PCC CONCRETE

SECTION C-C



SECTION E-E

GENERAL NOTES:

1. SEE DWG 2201 FOR PLAN AND SECTION A-A.
2. GENERAL NOTES 2, 3 & 4 ON DWG 2201 ALSO APPLY TO THIS DWG.
3. FOR ANCHOR DETAIL, SEE DWG 2205

CONSTRUCTION NOTES:

A. STORM INLET STEPS, SEE DWG 2229 FOR SPACING.

B. 1'-10" MIN UNLESS OTHER WISE DIRECTED.

C. NO. 4 BARS AT 6" O.C. EACH WAY.

D. CONCRETE FILL, MINIMUM SLOPES SHOWN IN SECTIONS.

E. NORMAL GUTTER.

F. GRATE FRAME.

G. INVERT ELEVATION PER DESIGN.

H. TOP OF CURB.

J. FLOWLINE.

K. ANGLE ANCHOR.

CONVERT EXISTING SINGLE GRATE TYPE 'A' INLET TO A TYPE 'D' SINGLE GRATE INLET

REVISIONS	CITY OF ALBUQUERQUE
	DRAINAGE STORM INLET TYPE "A" SECTIONS B-B, C-C, D-D & E-E DWG. 2202 AUG. 1986

Westland Development Company, Incorporated

401 Coors Blvd. N.W.
Albuquerque, New Mexico 87121
(505) 831-9600
Fax (505) 831-4865
1-800-726-3250

File:
J9/D19

June 28, 2005

Mr. Brian Miller
Sundoro Project Superintendent
Longford Homes New Mexico, Inc.
7301 Jefferson St. NE, Suite G-H
Albuquerque, New Mexico 87109

Re: Sundoro Subdivision, covered storm drain inlets.

Dear Brian:

The purpose of this letter is to restate and document my concern regarding the covered storm drain inlets along Sundoro Place NW. We have discussed this issue over the phone several times, most recently yesterday. As you are aware from our prior conversations, there are a total of ten storm drain inlets along both sides of Sundoro place between Marapi Street and the cul-de-sac at the east end. There are two additional inlets at the south end of Maroa Street just before it intersects with Sundoro Place and there is a double grate inlet at the back end of the cul-de-sac. Many of the streets in the Sundoro neighborhood surface drain down to Sundoro Place where the flows are then picked up by these fourteen inlets and drained out through a 42 inch diameter concrete pipe to a larger storm drain located in Ladera Drive.

As we have previously discussed, Longford Homes' SWPPP compliance contractor has covered all of these inlets with heavy wire mesh and a thick non-porous plastic and completely dammed them off with sand bags placed in the gutter around the perimeter of the drop inlet box. This treatment renders the storm drain inlets completely inoperable. This first came to my attention in April when a small overnight rain storm generated enough water to overrun the curb at the end of the cul-de-sac and drain out over the surface of the easement to Ladera. This runoff caused some erosion in the easement which came very close to destroying portions of the asphalt pedestrian trail in that area. After that, I removed the sandbags and plastic cover from the double inlet at the back edge of the cul-de-sac, and called you to express my concern.

I have raised this concern with you on a couple of other occasions, but the sand bags have since been replaced around the double inlet and the other twelve inlets still remain covered. (Please see the enclosed photos that were taken this morning.) We are now entering into our traditional summer monsoon season. When I hear the weather reports about some of the heavy rain and hail storms that are occurring around the state, I am concerned that you are courting disaster for the existing homes at the downhill end of the cul-de-sac by keeping the storm drain inlets covered. I asked you again yesterday to

un-cover the inlets and you responded that your SWPPP contractor advised you that removing the covers would violate EPA standards.

EPA standards or not, people's safety and property must take a higher priority. There must be another way to accomplish your SWPPP BMP's. Westland strongly recommends that you immediately un-cover all of those inlets so that they can function as they were designed to. I can assure you that the EPA is not going to indemnify or hold any of us harmless if the houses at the end of the cul-de-sac get flooded out.

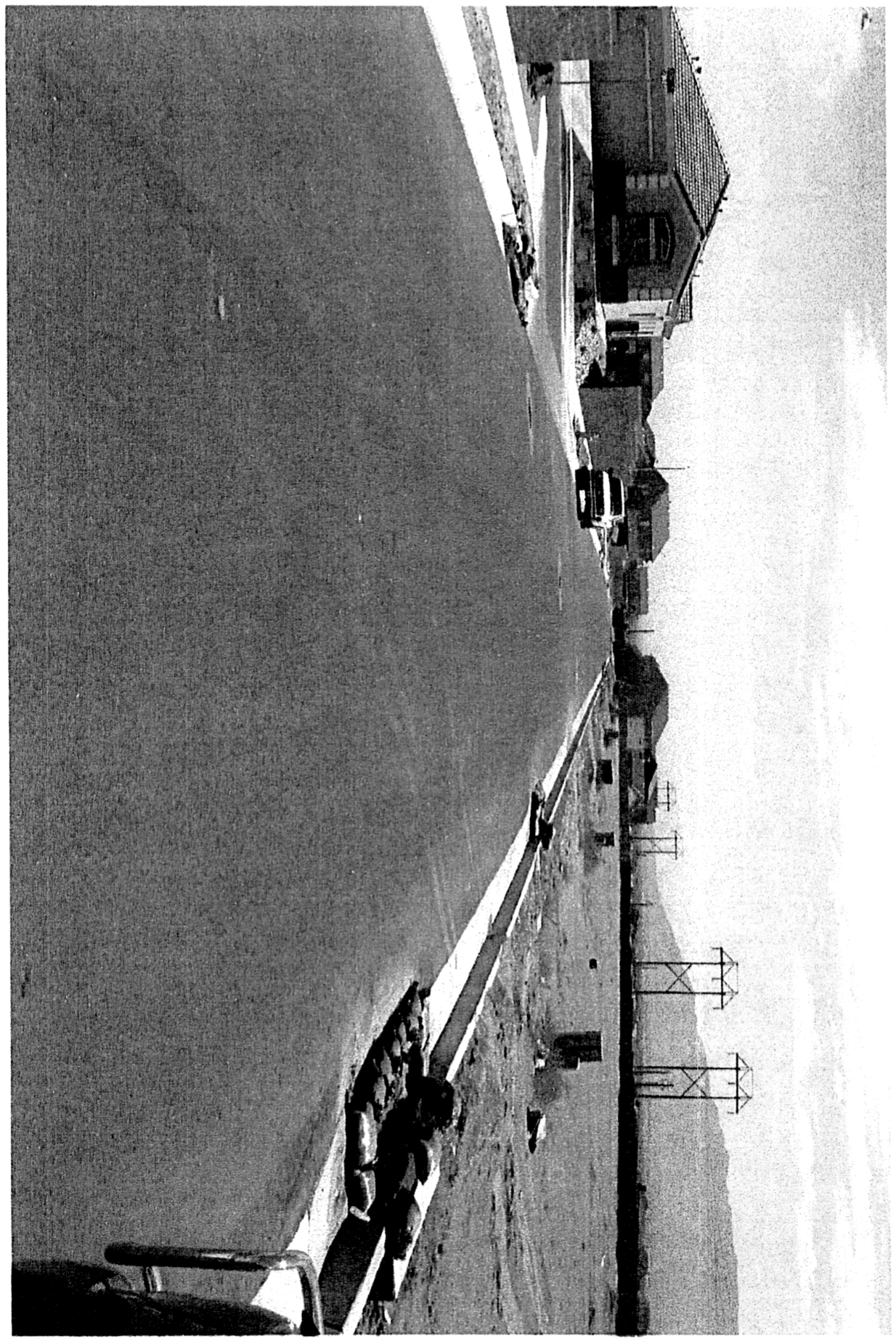
I hope that you will reconsider your response to my verbal request yesterday. Thank you for your consideration regarding this matter.

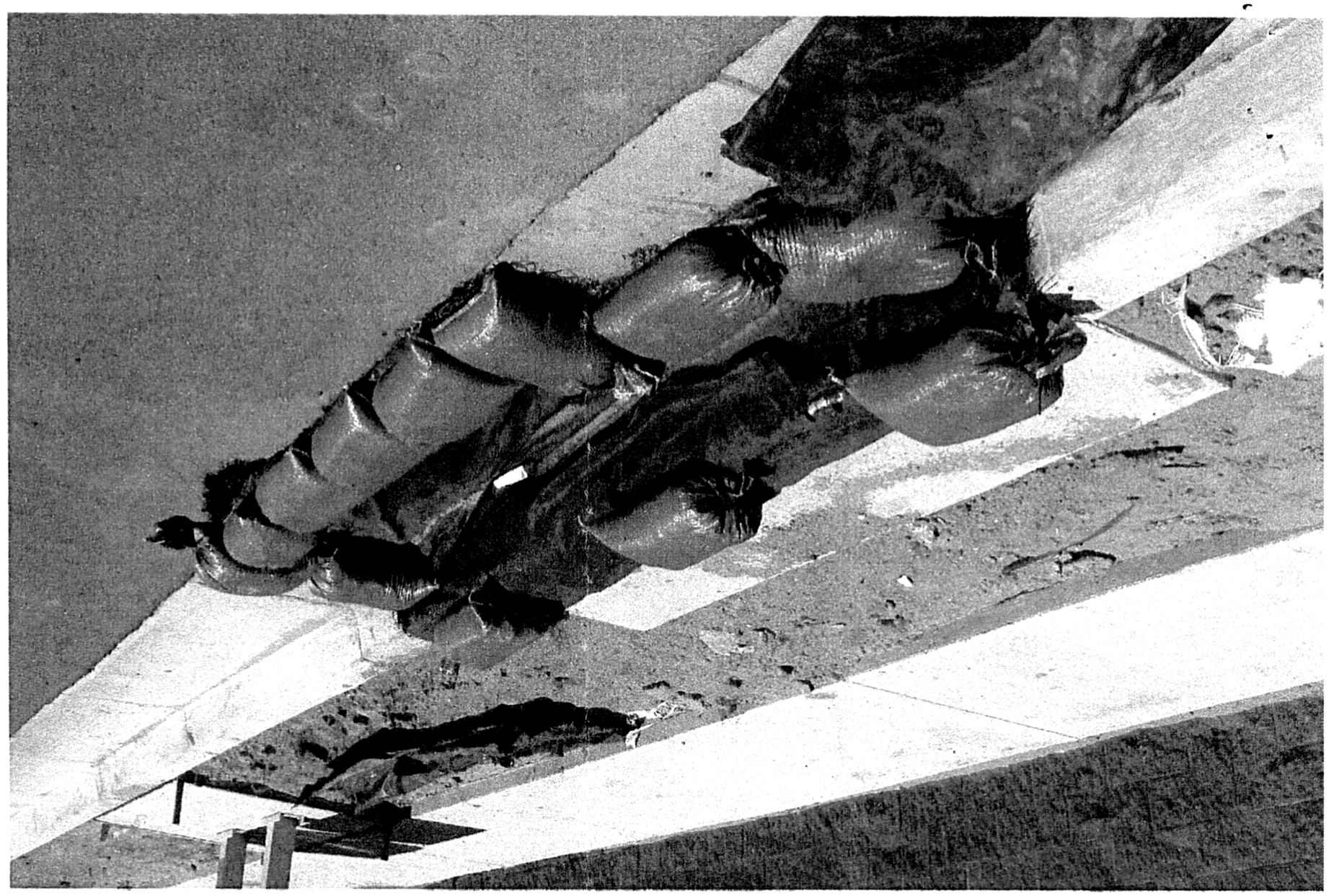
Sincerely,

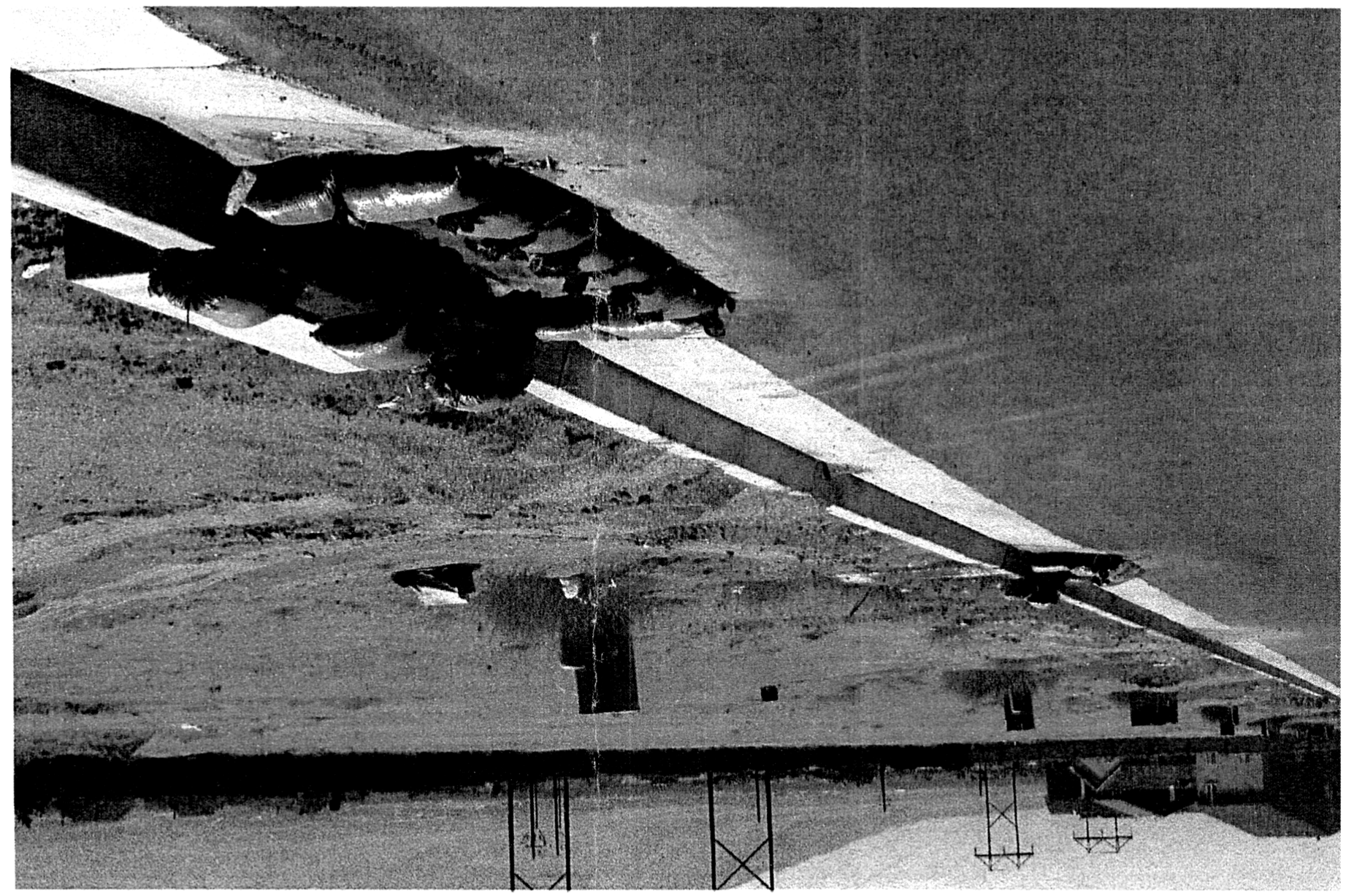
Fred Ambrogi

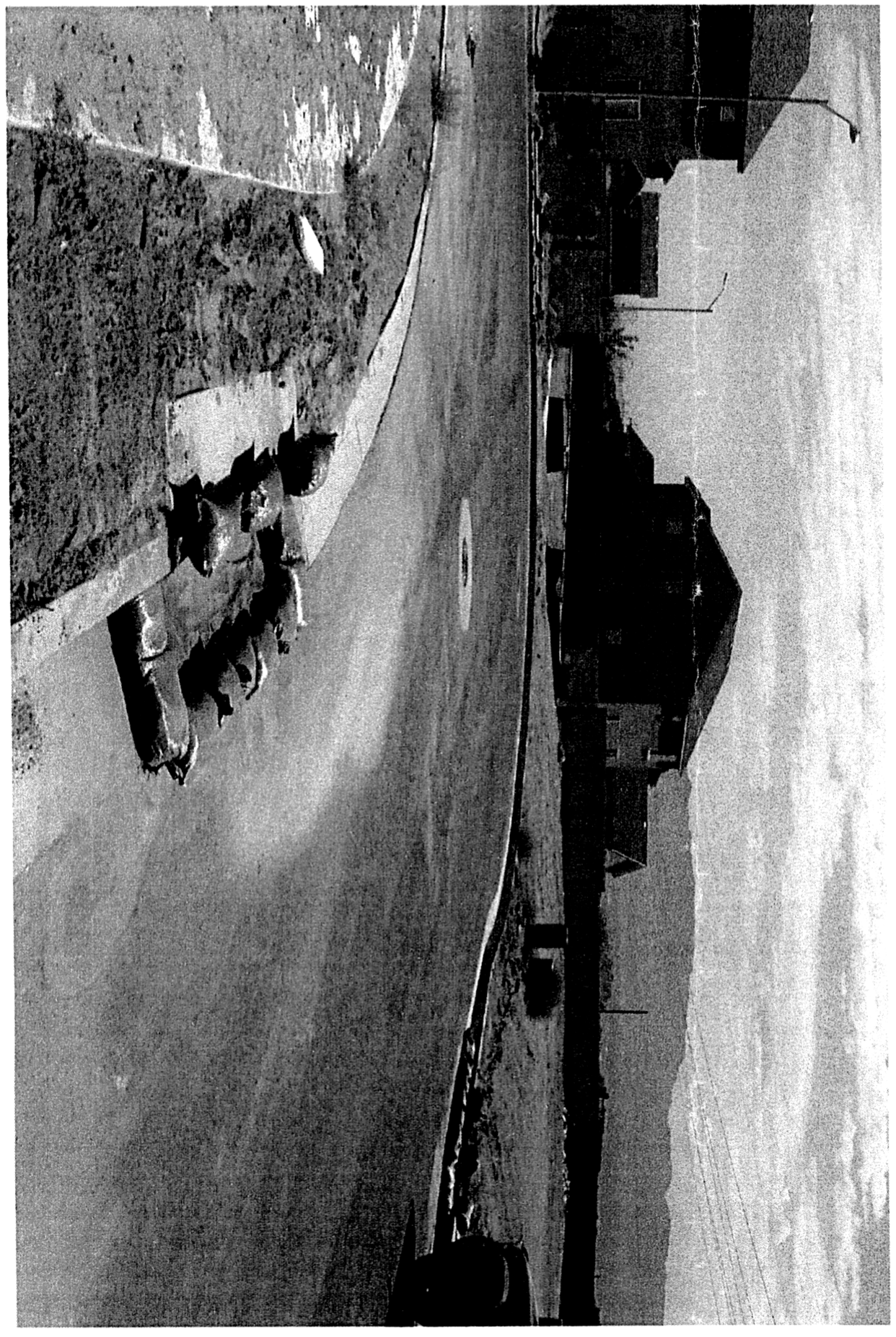
Fred Ambrogi,
VP, Development Division

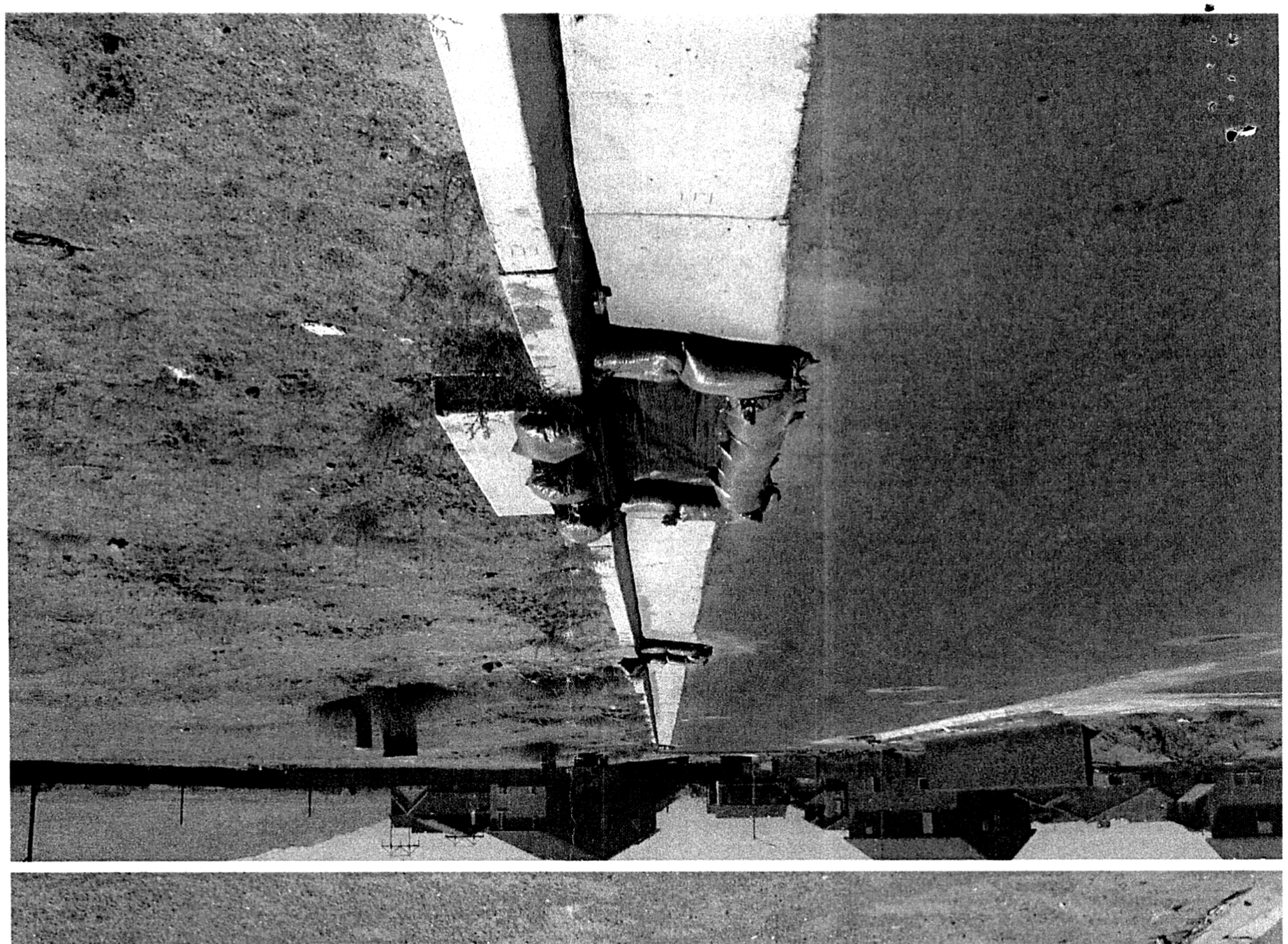
Cc: Leroy Chavez, Westland Development Co.
Brent Lesley, Westland Development Co.
Brad Bingham, City of Albuquerque
Kevin Patton, Bohannan Huston Inc.

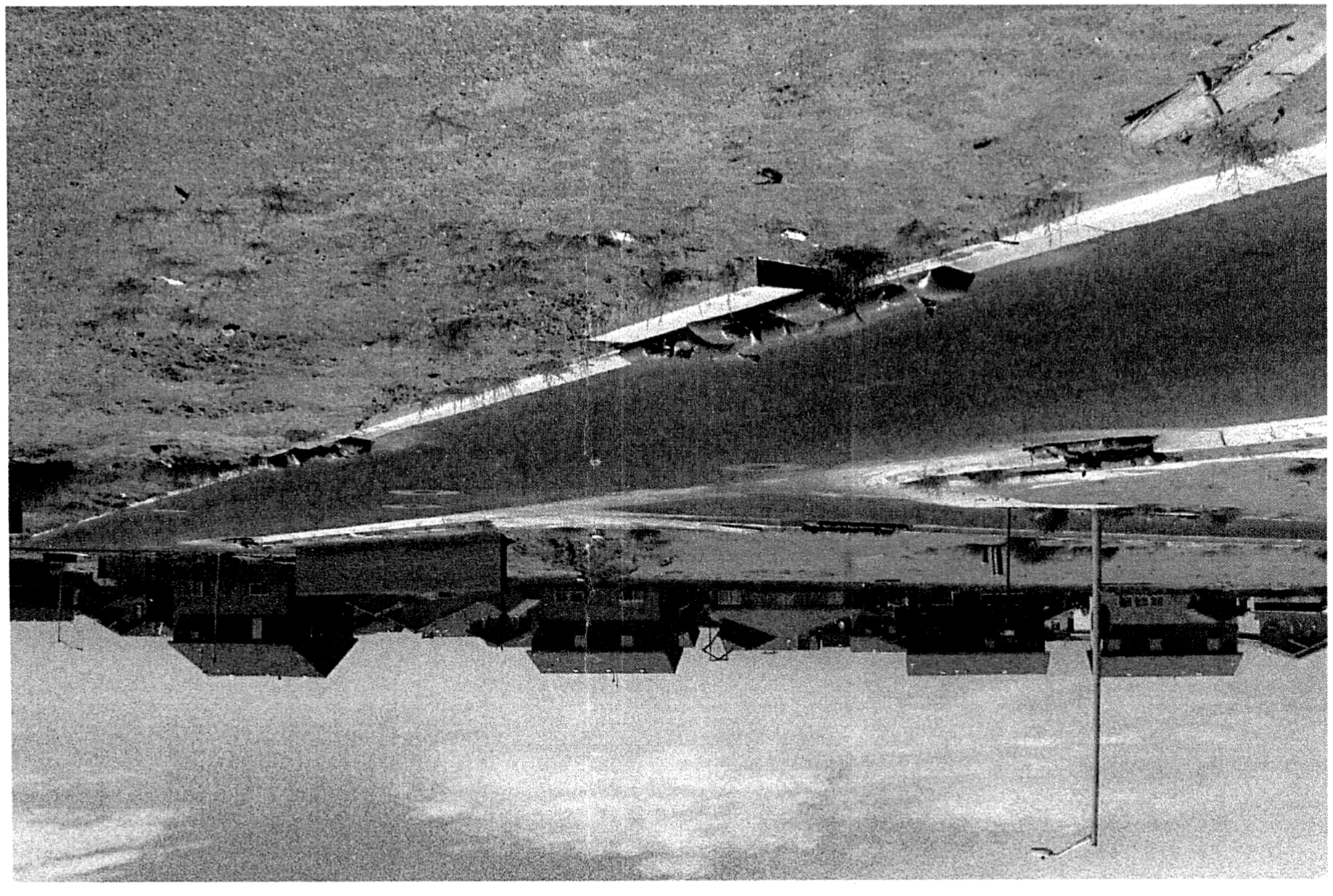












City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

November 20, 2003

Chris Sholtis, PE
Bohannan Huston, Inc
7500 Jefferson NE
Albuquerque, NM 87109

Re: Sundoro Subdivision Revised Grading Plan
Engineer's Stamp dated 10-9-03, (J9/D18)

Dear Mr. Sholtis,

Based upon the information provided in your submittal dated 10-14-03, the above referenced plan is approved for Grading Permit. This is now the plan that must be certified for release of SIA and Financial Guarantee.

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

Sincerely,

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

C: Chuck Caruso, CoA
file

Bohannan Huston Inc.

Courtyard I
7500 Jefferson NE
Albuquerque, NM
87109-4335
www.bhinc.com

voice: 505.823.1000
fax: 505.798.7988
toll free: 800.877.5332

October 14, 2003

Brad Bingham, P.E.
Development & Building Services
City of Albuquerque
P. O. Box 1293
Albuquerque, NM 87103

Re: Sundoro Subdivision (J9/D18)
DRB Project No. 1002935

Dear Mr. Bingham:

We are providing you with a revised Grading Plan for the subject project. The revision includes the addition of about 160 LF of retaining wall. This addition does not impact the overall drainage scheme for the project; therefore, no changes have been made to the previously approved Drainage Report.

Please call if you have questions or if we may be of further assistance to you in your review.

Sincerely,

Christian J. Sholtis, P.E.
Project Engineer
Community Development and Planning

CJS/am
Enclosure

P:\040013\cdp\corres\bbingham.doc

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

PROJECT TITLE: Sundoro Subdivision ZONE MAP/DRG. FILE # J9/D18
DRB #: 1002935 EPC#: WORK ORDER#:

LEGAL DESCRIPTION: Replat of Tract A at Parkway Subdivision and Parcel I of Westland North
CITY ADDRESS: Ladera Drive NW and Arroyo Vista Blvd. NW

ENGINEERING FIRM: Bohannan Huston, Inc. CONTACT: Chris Sholtis
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 Blvd. NW PHONE: (505) 831-9600
CITY, STATE: Albuquerque, NM ZIP CODE: 87121

ARCHITECT: N/A CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

SURVEYOR: Bohannan Huston, Inc. CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

CONTRACTOR: Not Yet Determined CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

CHECK TYPE OF SUBMITTAL:

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

CHECK TYPE OF APPROVAL SOUGHT:

____ SIA / FINANCIAL GUARANTEE RELEASE
____ PRELIMINARY PLAT APPROVAL
____ S. DEV. PLAN FOR SUB'D. APPROVAL
____ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
____ SECTOR PLAN APPROVAL
____ 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

DATE SUBMITTED: 10-14-03 BY: Christian J. Sholtis, PE

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

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

February 11, 2004

Chris Sholtis, PE
Bohannan Huston, Inc
7500 Jefferson NE
Albuquerque, NM 87109

Re: Sundoro Subdivision Revised Grading Plan
Engineer's Stamp dated 12-19-03, (J9/D18)

Dear Mr. Sholtis,

Based upon the information provided in your submittal dated 12-19-03, the above referenced plan is approved for Grading Permit. *This* is now the plan that must be certified for release of SIA and Financial Guarantee and the previous plans dated 9-17-03 and 10-09-03 are void.

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

Sincerely,

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

C: file

Bohannan Huston

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

J-9/D18

December 19, 2003

Brad Bingham, P.E.
Development & Building Services
City of Albuquerque
P. O. Box 1293
Albuquerque, NM 87103

Re: Sundoro Subdivision (J9/D18)
DRB Project No. 1002935

Dear Mr. Bingham:

We are providing you with a revised Grading Plan for the subject project. This revision includes changes to the lot lines for lots 250/255 and lots 53/54 as per a meeting with Mr. John Kelly of AMAFCA on November 26, 2003. This addition does not impact the overall drainage scheme for the project; therefore, no changes have been made to the previously approved Drainage Report.

Please call if you have questions or if we may be of further assistance to you in your review.

Sincerely,

Christian J. Sholtis, P.E.
Project Engineer
Community Development and Planning

CJS/am
Enclosure

RECEIVED
DEC 19 2003
HYDROLOGY SECTION

Cc: John Kelly PE, AMAFCA w/ Enclosure
Fred Ambrogi, Westland Development Co., Inc. w/ Enclosure

RECEIVED
DEC 19 2003
HYDROLOGY SECTION

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ENGINEERING
SPATIAL DATA
ADVANCED TECHNOLOGIES

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

PROJECT TITLE: Sundoro Subdivision ZONE MAP/DRG. FILE # J9/D18
DRB #: 1002935 EPC#: WORK ORDER#:

LEGAL DESCRIPTION: Replat of Tract A at Parkway Subdivision and Parcel I of Westland North
CITY ADDRESS: Ladera Drive NW and Arroyo Vista Blvd. NW

ENGINEERING FIRM: Bohannan Huston, Inc. CONTACT: Chris Sholtis
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 Blvd. NW PHONE: (505) 831-9600
CITY, STATE: Albuquerque, NM ZIP CODE: 87121

ARCHITECT: N/A CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

SURVEYOR: Bohannan Huston, Inc. CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

CONTRACTOR: Not Yet Determined CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

CHECK TYPE OF SUBMITTAL:

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

CHECK TYPE OF APPROVAL SOUGHT:

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

WAS A PRE-DESIGN CONFERENCE ATTENDED:

____ YES
__X__ NO
____ COPY PROVIDED

RECEIVED
DEC 19 2003
HYDROLOGY SECTION

DATE SUBMITTED: 12-19-03 BY: Christian J. Sholtis, PE

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2. **Drainage Plans:** Required for building permits, grading permits, paving permits and site plans less than five (5) acres.
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