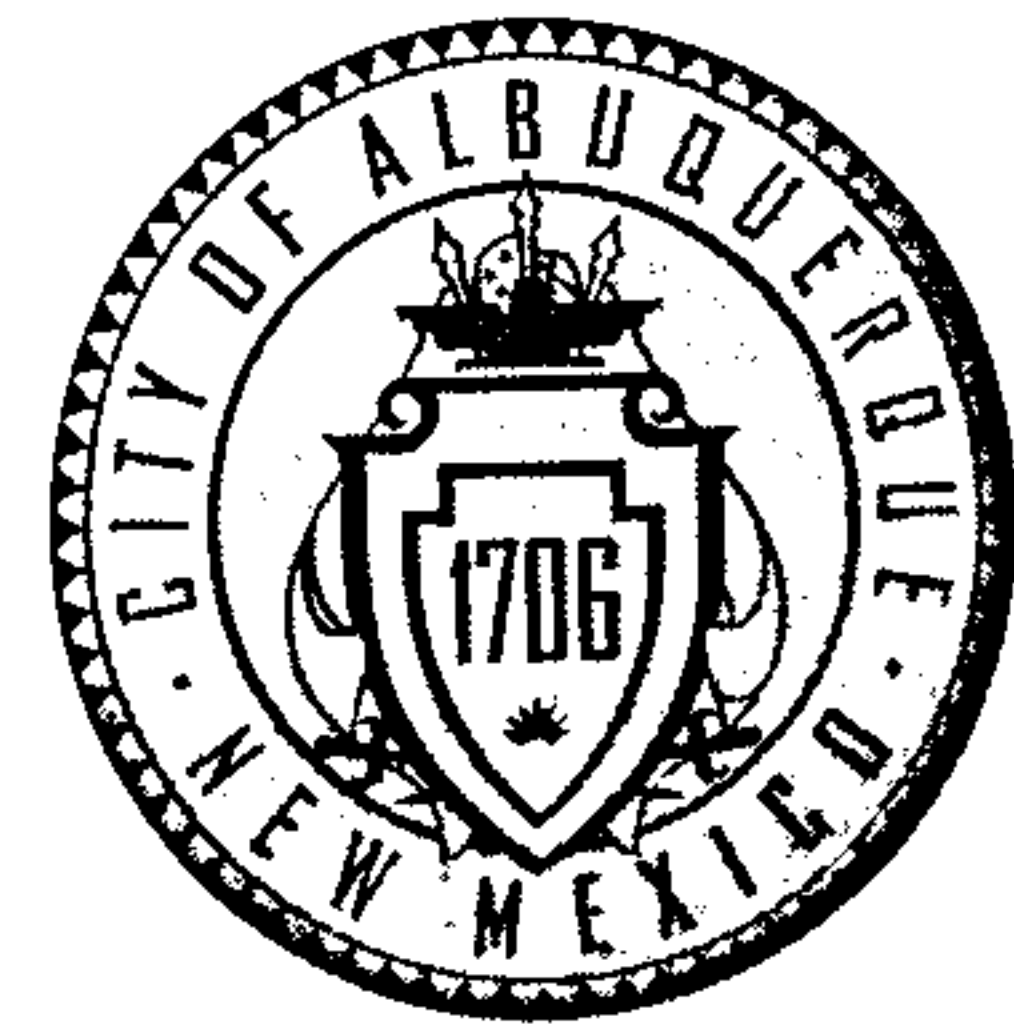


CITY OF ALBUQUERQUE



January 22, 2016

Yolanda Padilla-Moyer, PE
Bohannon-Huston
7500 Jefferson St NE Courtyard I
Albuquerque, NM 87109

**Re: Del Webb @ Mirehaven
Pad Certification for lot 41
Engineer's Stamp dated: 3-20-14 (H09D017C)
Certification dated: 1-21-16**

Dear Ms. Padilla-Moyer,

Based on the Certification received 1/22/2016, the above referenced Certification for Del Webb is acceptable for building permit by Hydrology.

If you have any questions, you can contact me at 924-3695 or Totten Elliott at 924-3982.

Sincerely,

PO Box 1293

Albuquerque

Rita Harmon, PE
Senior Engineer, Hydrology
Planning Department

New Mexico 87103

TE/RH
C: email
Miranda, Rachel; Cordova, Camille C.; Sandoval, Darlene M.; Barreras, Gary S.;
Blocker, Lois

www.cabq.gov







City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: Del Webb @ Mirehaven Phase 1 Building Permit #: _____ City Drainage #: 1091017C
DRB#: 1006864 EPC#: _____ Work Order#: 650383
Legal Description: N-2-A OF THE WATERSHED SUBDIVISION
City Address: _____

Engineering Firm: BOHANNAN HUSTON INC Contact: Yolanda Moyer
Address: 7500 JEFFERSON ST NE COURTYARD 1 ALBUQUERQUE NM 87109
Phone#: 823-1000 Fax#: _____ E-mail: ypadilla@bhinc.com

Owner: PULTE HOMES OF NM Contact: Peter Steen
Address: 7601 JEFFERSON ST NE, SUITE 320, ALBUQUERQUE, NM
Phone#: 505-761-9606 Fax#: _____ E-mail: peter.steen@pulte.com

Architect: _____ Contact: _____
Address: _____
Phone#: _____ Fax#: _____ E-mail: _____

Surveyor: _____ Contact: _____
Address: _____
Phone#: _____ Fax#: _____ E-mail: _____

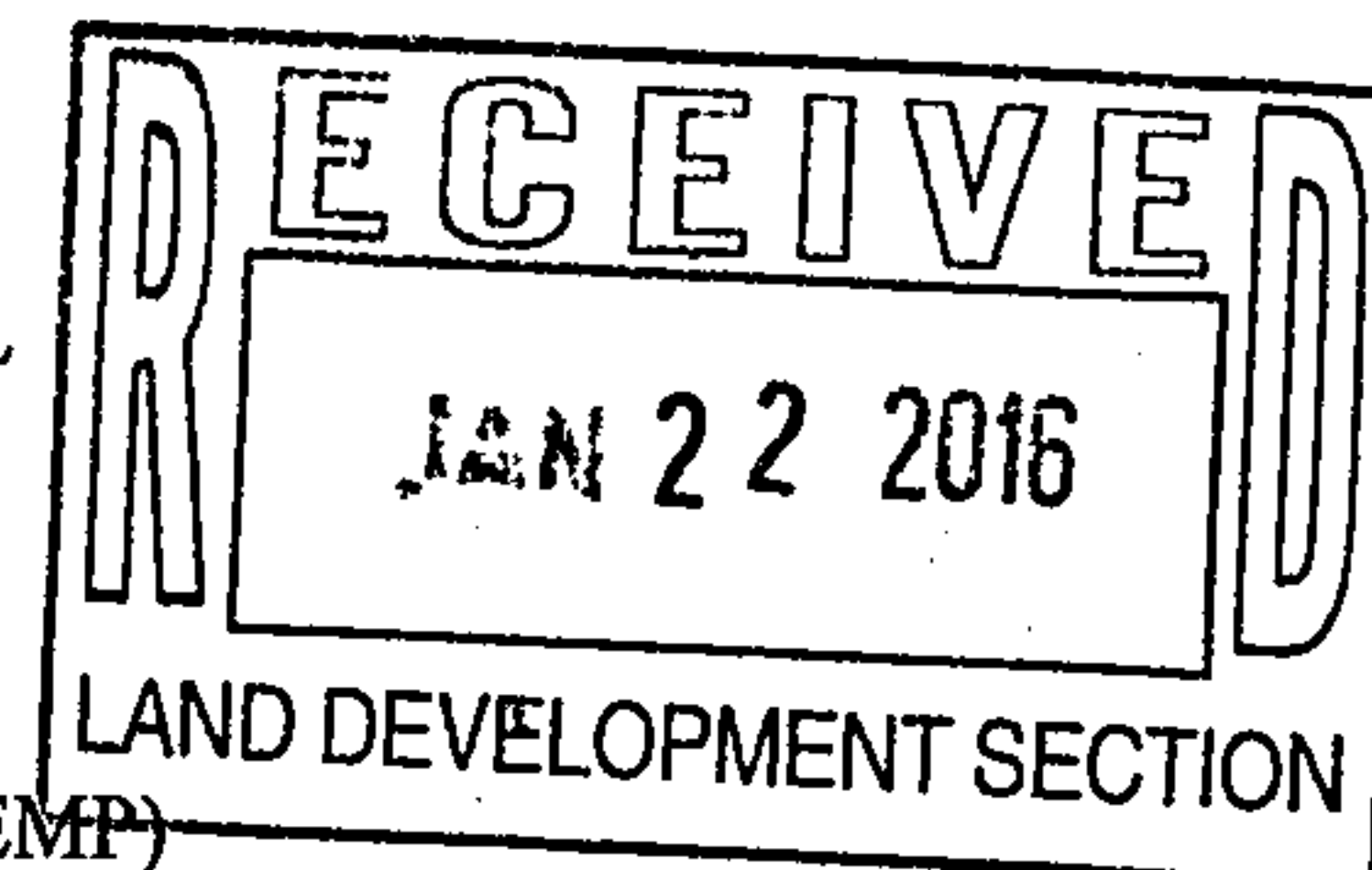
Contractor: _____ Contact: _____
Address: _____
Phone#: _____ Fax#: _____ E-mail: _____

TYPE OF SUBMITTAL:

- ☐ DRAINAGE REPORT
- ☐ DRAINAGE PLAN 1st SUBMITTAL
- ☐ DRAINAGE PLAN RESUBMITTAL
- ☐ CONCEPTUAL G & D PLAN
- ☐ GRADING PLAN
- ☐ EROSION & SEDIMENT CONTROL PLAN (ESC)
- ☒ ENGINEER'S CERT (HYDROLOGY)
- ☐ CLOMR/LOMR
- ☐ TRAFFIC CIRCULATION LAYOUT (TCL)
- ☐ ENGINEER'S CERT (TCL)
- ☐ ENGINEER'S CERT (DRB SITE PLAN)
- ☐ ENGINEER'S CERT (ESC)
- ☐ SO-19
- ☐ OTHER (SPECIFY) _____

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

- ☐ SIA/FINANCIAL GUARANTEE RELEASE
- ☐ PRELIMINARY PLAT APPROVAL
- ☐ S. DEV. PLAN FOR SUB'D APPROVAL
- ☐ S. DEV. FOR BLDG. PERMIT APPROVAL
- ☐ SECTOR PLAN APPROVAL
- ☐ FINAL PLAT APPROVAL
- ☐ CERTIFICATE OF OCCUPANCY (PERM)
- ☐ CERTIFICATE OF OCCUPANCY (TCL TEMP)
- ☐ FOUNDATION PERMIT APPROVAL
- ☐ BUILDING PERMIT APPROVAL
- ☐ GRADING PERMIT APPROVAL
- ☐ PAVING PERMIT APPROVAL
- ☐ WORK ORDER APPROVAL
- ☐ GRADING CERTIFICATION
- ☐ SO-19 APPROVAL
- ☐ ESC PERMIT APPROVAL
- ☐ ESC CERT. ACCEPTANCE
- ☒ OTHER (SPECIFY) PAD CERTIFICATION



WAS A PRE-DESIGN CONFERENCE ATTENDED: _____ Yes _____ No _____ Copy Provided

DATE SUBMITTED: 01-21-16 By: Yolanda Padilla Moyer

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location, and scope to 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 subdivision containing more than ten (10) lots or constituting five (5) acres or more
4. **Erosion and Sediment Control Plan:** Required for any new development and redevelopment site with 1-acre or more of land disturbing area, including project less than 1-acre than are part of a larger common plan of development

Bohannon Huston

January 21, 2016

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

Ms. Rita Harmon
Hydrology Section
City of Albuquerque
600 2nd Street NW
Albuquerque, NM 87102

Re: Partial Grading and Drainage Certification, Del Webb @ Mirehaven Phase 1
DRB Case No. 1006864

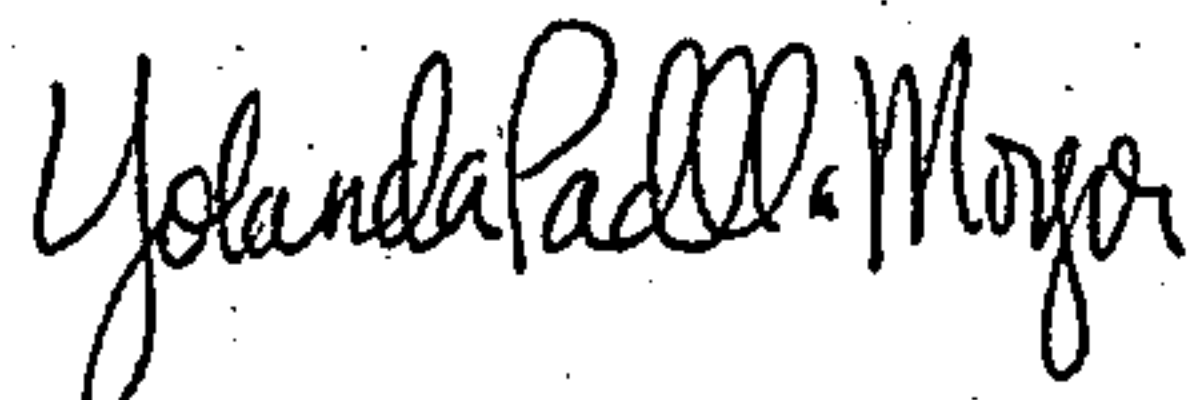
Dear Rita:

We are submitting a partial grading and drainage certification for Del Webb @ Mirehaven Phase 1. The partial certification includes Lot 41. Enclosed for your review is the approved grading and drainage plan dated 3/11/14 and 3/20/14. These lots have been graded; retaining walls, curb and gutter, pavement and downstream infrastructure have been constructed. The remaining lots have been graded, but the retaining walls have not been completed. The remaining lots will be certified once construction of all improvements has been completed.

After reviewing these as-built elevations and visiting the site on 01/21/16 it is my belief that the above lots have been graded in substantial compliance with the approved grading and drainage plan and that the interim drainage improvements allow runoff to be managed in the interim condition.

Your review and approval is requested for Building Permit Approval for the above listed buildings. I appreciate your time and consideration. If you have questions or require additional information, please contact me at 823-1000.

Sincerely,



Yolanda Padilla Moyer, P.E.
Senior Project Manager
Community Development & Planning

Enclosure

cc: Peter Steen, Pulte Homes
Kevin Patton, Pulte Homes



Engineering ▲

Spatial Data ▲

Advanced Technologies ▲

Yolanda Padilla Moyer

From: Yolanda Padilla Moyer
Sent: Thursday, January 21, 2016 3:49 PM
To: 'PLNDRS@cabq.gov'
Cc: 'Harmon Rita T. (rharmon@cabq.gov)'; 'Kevin Patton (Kevin.Patton@PulteGroup.com)'; Elliott, Stanice (staniceelliott@cabq.gov)
Subject: RE: Del Webb at Mirehaven Partial Lot Cert (Lot 41)
Attachments: Lot 41 Cert_Digital Submittal.pdf

Please find enclosed the digital submittal for the above mentioned project.

Yolanda Padilla Moyer, P.E.
Senior Project Manager
Bohannon Huston, Inc.



CITY OF ALBUQUERQUE



April 8, 2015

Yolanda Padilla-Moyer, P.E.
Bohannon Huston, Inc.
7500 Jefferson St NE
Albuquerque, NM 87109

**Re: Del Webb @Mirehaven Amendment No.2
Drainage Report and Grading Plan (Sheets 2, 5 and 8B)
Engineer's Stamp Date 3-20-15 (H09D017C)**

Dear Ms. Padilla-Moyer,

Based upon the information provided in your submittal received 3-20-15, the above referenced report and plan are approved for Grading Permit. These are the sheets to be certified for Building Permit approval and Release of Financial Guarantee.

Other sheets in the plan set were approved previously.

If you have any questions, you can contact me at 924-3420.

PO Box 1293

Albuquerque

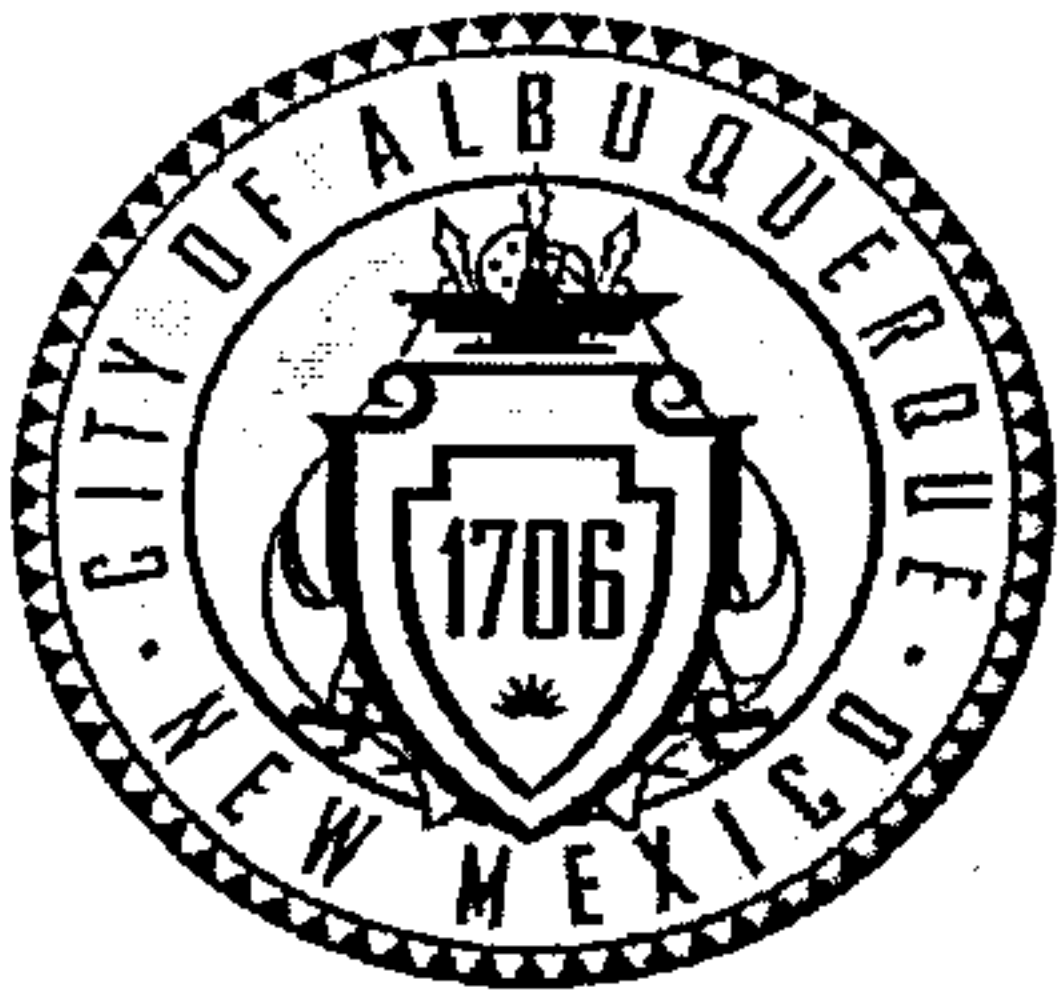
New Mexico 87103

Sincerely,

Curtis Cherne, P.E.
Principal Engineer,
Planning Dept.

C: e-mail

www.cabq.gov



City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: CONCRETE LINED CHANNEL DMP FOR THE DEL WEBB @ MIREHAVEN PHASE 1 AND 2

Building Permit #:

City Drainage #: H09DD07C

DRB#: 1006864

EPC#:

Work Order#:

Legal Description: N-2-E OF THE WATERSHED SUBDIVISION

City Address:

Engineering Firm: BOHANNAN HUSTON INC

Contact: BRIAN PATTERSON

Address: 7500 JEFFERSON ST NE COURTYARD 1 ALBUQUERQUE NM 87109

Phone#: 823-1000

Fax#:

E-mail: BPATTERSON@BHINC.COM

Owner: PULTE GROUP

Contact: KEVIN PATTON

Address: 7601 JEFFERSON ST NE SUITE 320 ABLUQUERQUE NM 87109

Phone#: 505-341-8591

Fax#:

E-mail:

Architect:

Contact:

Address:

Phone#:

Fax#:

E-mail:

Surveyor:

Contact:

Address:

Phone#:

Fax#:

E-mail:

Contractor:

Contact:

Address:

Phone#:

Fax#:

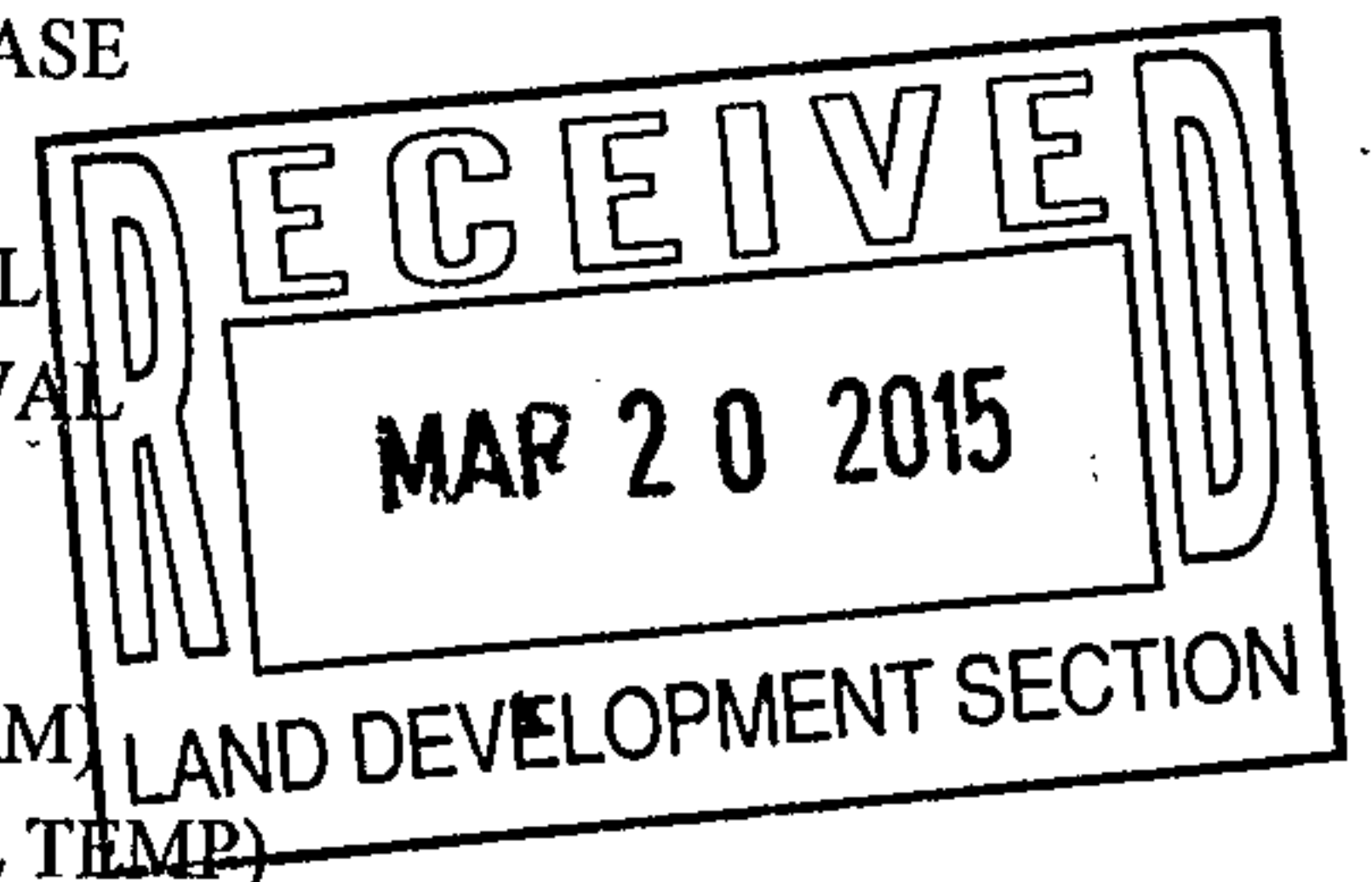
E-mail:

TYPE OF SUBMITTAL:

- ☒ DRAINAGE REPORT
- ☐ DRAINAGE PLAN 1st SUBMITTAL
- ☒ DRAINAGE PLAN RESUBMITTAL
- ☐ CONCEPTUAL G & D PLAN
- ☒ GRADING PLAN
- ☐ EROSION & SEDIMENT CONTROL PLAN (ESC)
- ☐ ENGINEER'S CERT (HYDROLOGY)
- ☐ CLOMR/LOMR
- ☐ TRAFFIC CIRCULATION LAYOUT (TCL)
- ☐ ENGINEER'S CERT (TCL)
- ☐ ENGINEER'S CERT (DRB SITE PLAN)
- ☐ ENGINEER'S CERT (ESC)
- ☐ SO-19
- ☐ OTHER (SPECIFY)

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

- ☐ SIA/FINANCIAL GUARANTEE RELEASE
- ☐ PRELIMINARY PLAT APPROVAL
- ☐ S. DEV. PLAN FOR SUB'D APPROVAL
- ☐ S. DEV. FOR BLDG. PERMIT APPROVAL
- ☐ SECTOR PLAN APPROVAL
- ☐ FINAL PLAT APPROVAL
- ☐ CERTIFICATE OF OCCUPANCY (PERM)
- ☐ CERTIFICATE OF OCCUPANCY (TCL TEMP)
- ☐ FOUNDATION PERMIT APPROVAL
- ☐ BUILDING PERMIT APPROVAL
- ☒ GRADING PERMIT APPROVAL
- ☐ PAVING PERMIT APPROVAL
- ☐ WORK ORDER APPROVAL
- ☐ GRADING CERTIFICATION
- ☐ SO-19 APPROVAL
- ☐ ESC PERMIT APPROVAL
- ☐ ESC CERT. ACCEPTANCE
- ☐ OTHER (SPECIFY)



WAS A PRE-DESIGN CONFERENCE ATTENDED:

☐ Yes

☐ No

☐ Copy Provided

DATE SUBMITTED: 3-20-15

By: YOLANDA MOYER

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location, and scope to 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 subdivision containing more than ten (10) lots or constituting five (5) acres or more
4. **Erosion and Sediment Control Plan:** Required for any new development and redevelopment site with 1-acre or more of land disturbing area, including project less than 1-acre than are part of a larger common plan of development

Bohannon Huston

March 20, 2015

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

Mr. Curtis Cherne
Hydrology Section
City of Albuquerque
600 2nd Street NW
Albuquerque, NM 87102

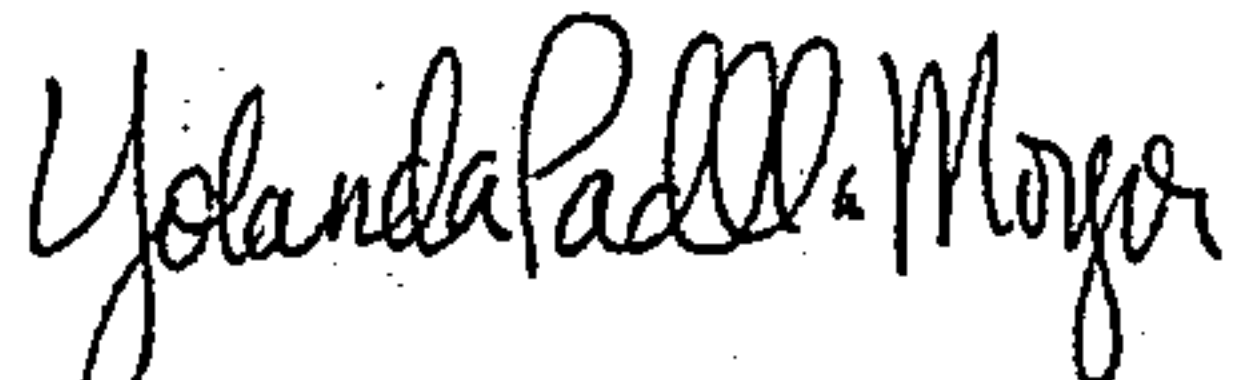
Re: Amendment No.2 to Drainage Master Plan for Del Webb @ Mirehaven Phase 1 & 2
DRB Case No. 1006864

Dear Curtis:

We are submitting Amendment No. 2 which entails the revision to the concrete lined diversion channel along the west and north side of the Del Webb Subdivision and ultimately drains to the Mirehaven Channel. Per our conversations, the revision is a trapezoidal shotcrete channel varying from 2' to 5' wide.

Please find enclosed the Amendment No. 2 report which includes the revised plan. We are requesting your review and approval. I appreciate your time and consideration. If you have questions or require additional information, please contact me at 823-1000.

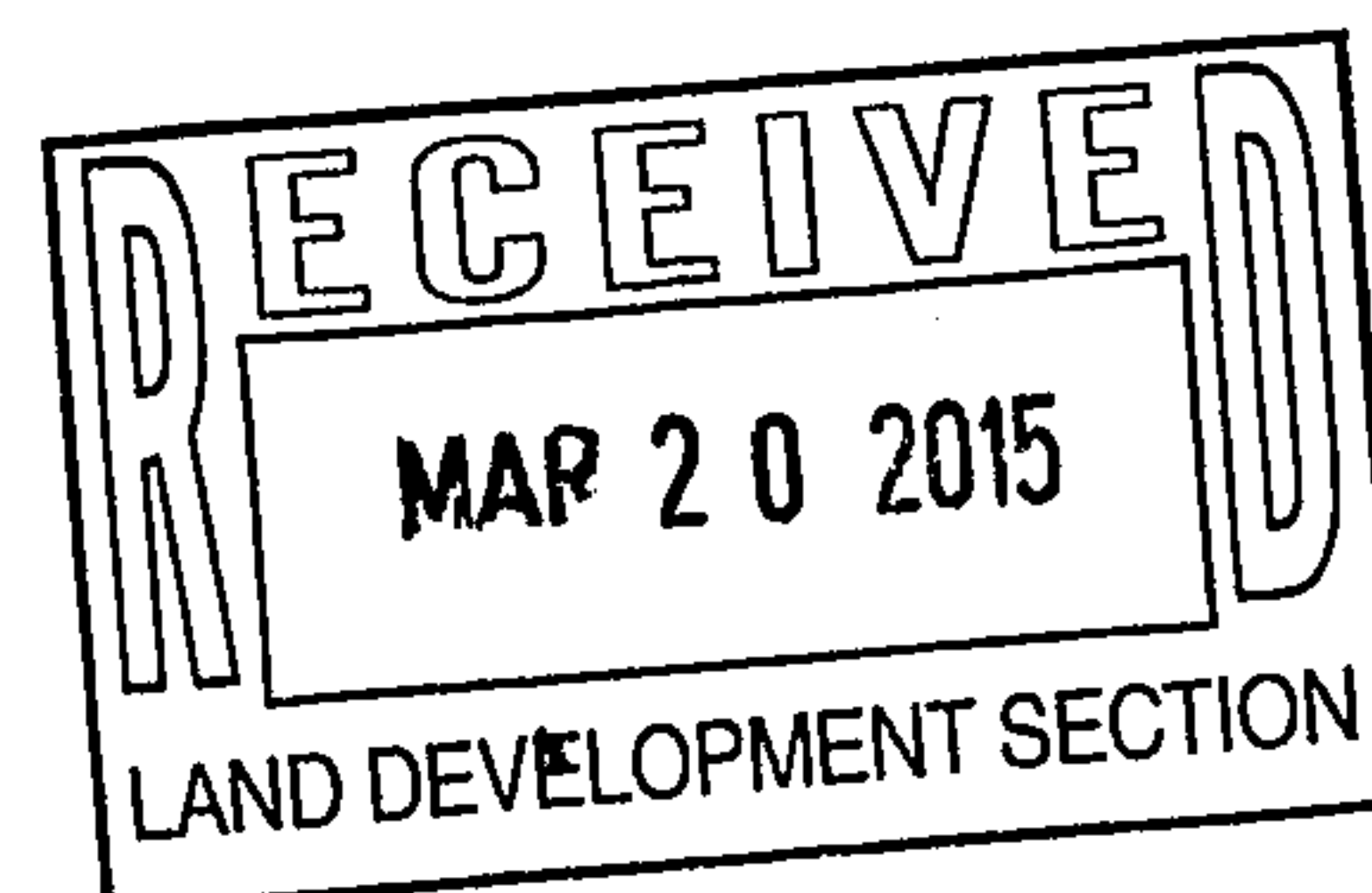
Sincerely,



Yolanda Padilla Moyer, P.E.
Senior Project Manager
Community Development & Planning

Enclosure

cc: Kevin Patton, Pulte Homes



Engineering ▲

Spatial Data ▲

Advanced Technologies ▲

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: Curtis Cherne, PE
COA-PDS
Hydrology

Requested by: Yolanda Moyer

Date: 3-20-15

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

Phone:

Job No.: 20130375.027

Job Name:

DELIVERY VIA

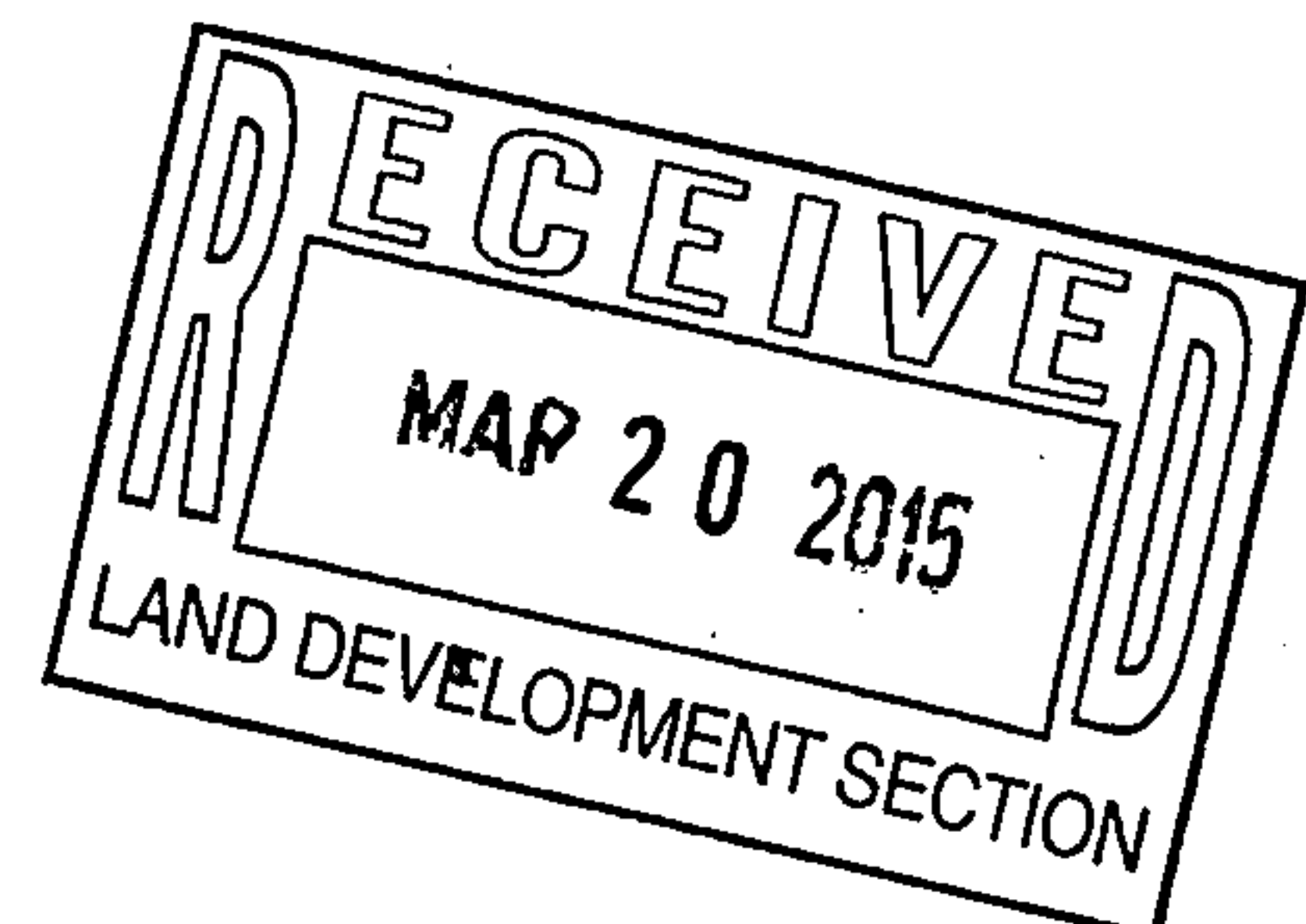
☒ Courier ☐ Federal Express
☐ Mail ☐ UPS
☐ Other

PICK UP

Item: _____

<u>ITEM NO.</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>
1	1	Amendment No. 2 - DW DMP
2	1	Drainage Info Sheet
3	1	Letter

COMMENTS / INSTRUCTIONS



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

AMENDMENT No. 2

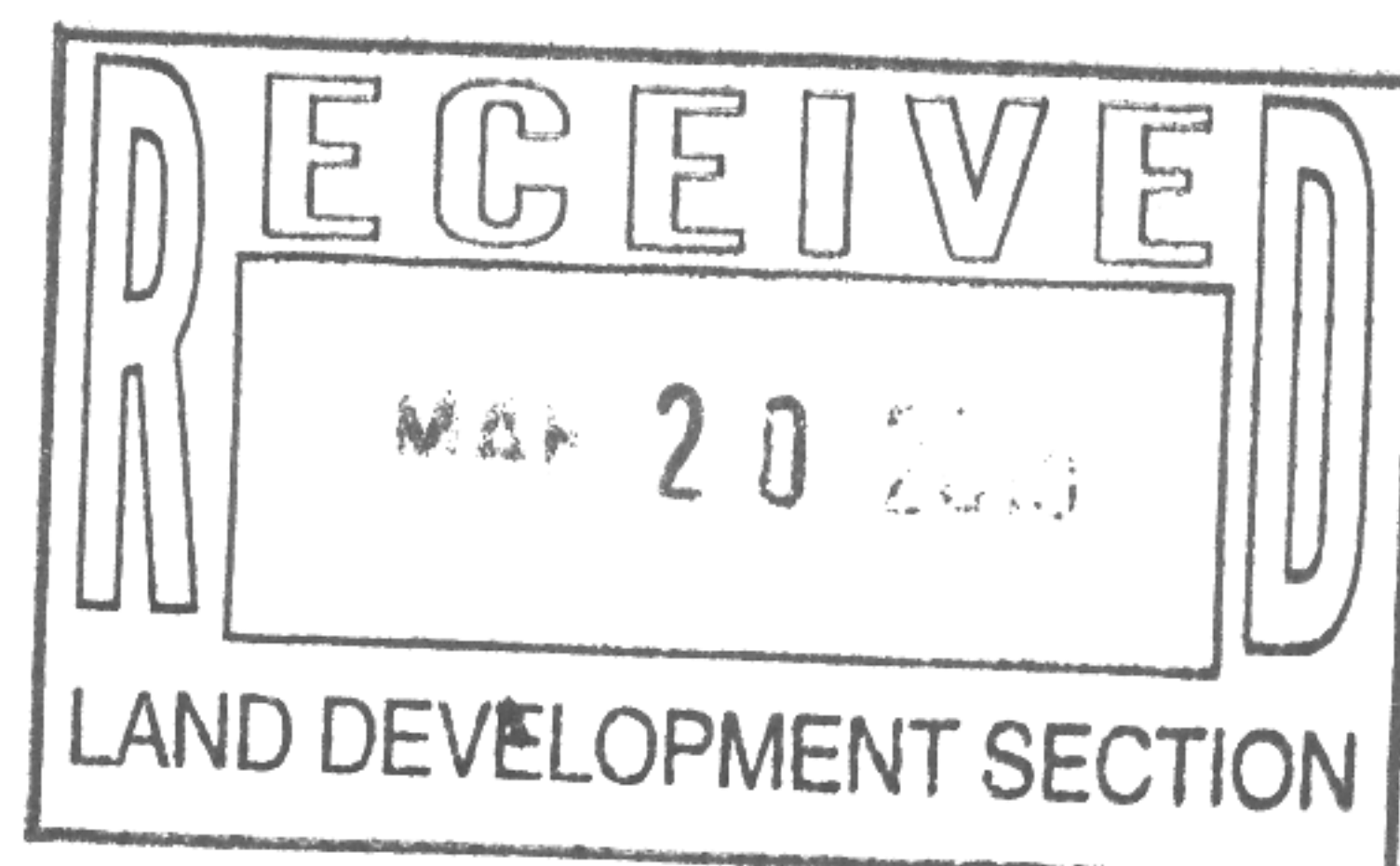
DRAINAGE MANAGEMENT PLAN FOR DEL WEBB @ MIREHAVEN PHASES 1 AND 2

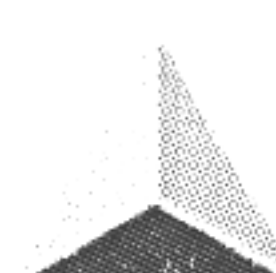
(TRACTS N-2-A OF THE
WATERSHED SUBDIVISION)

MARCH 20, 2015

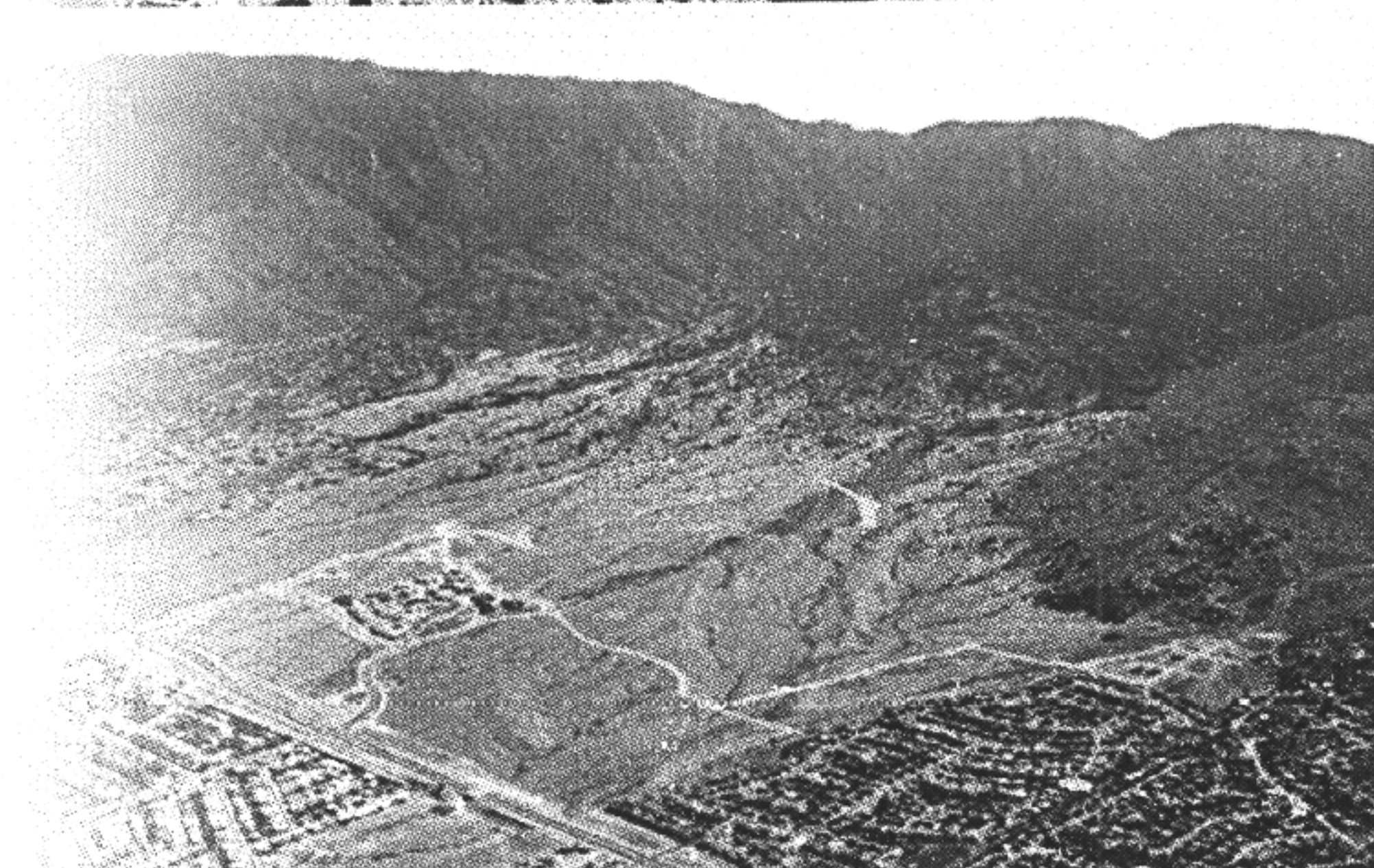
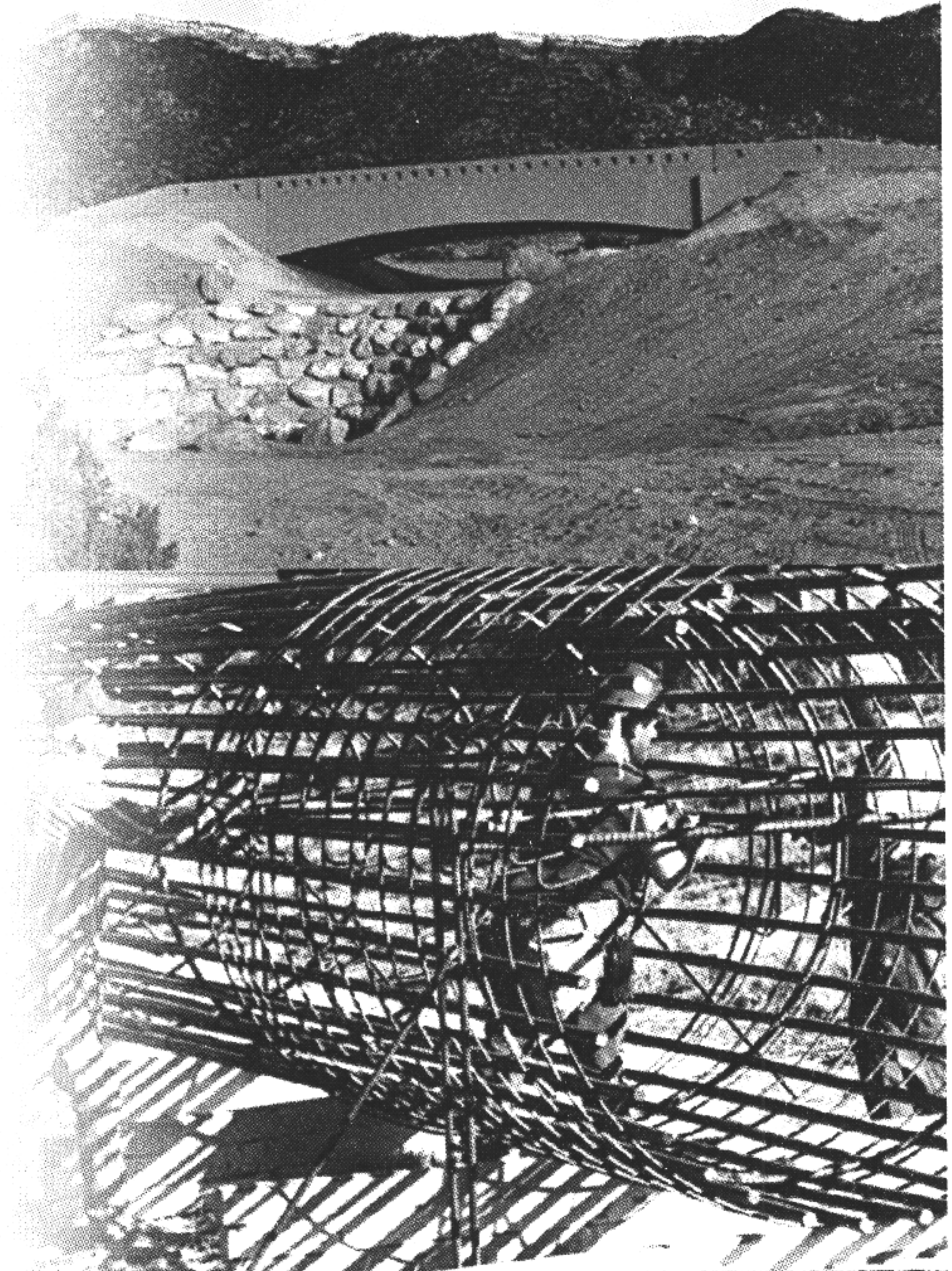
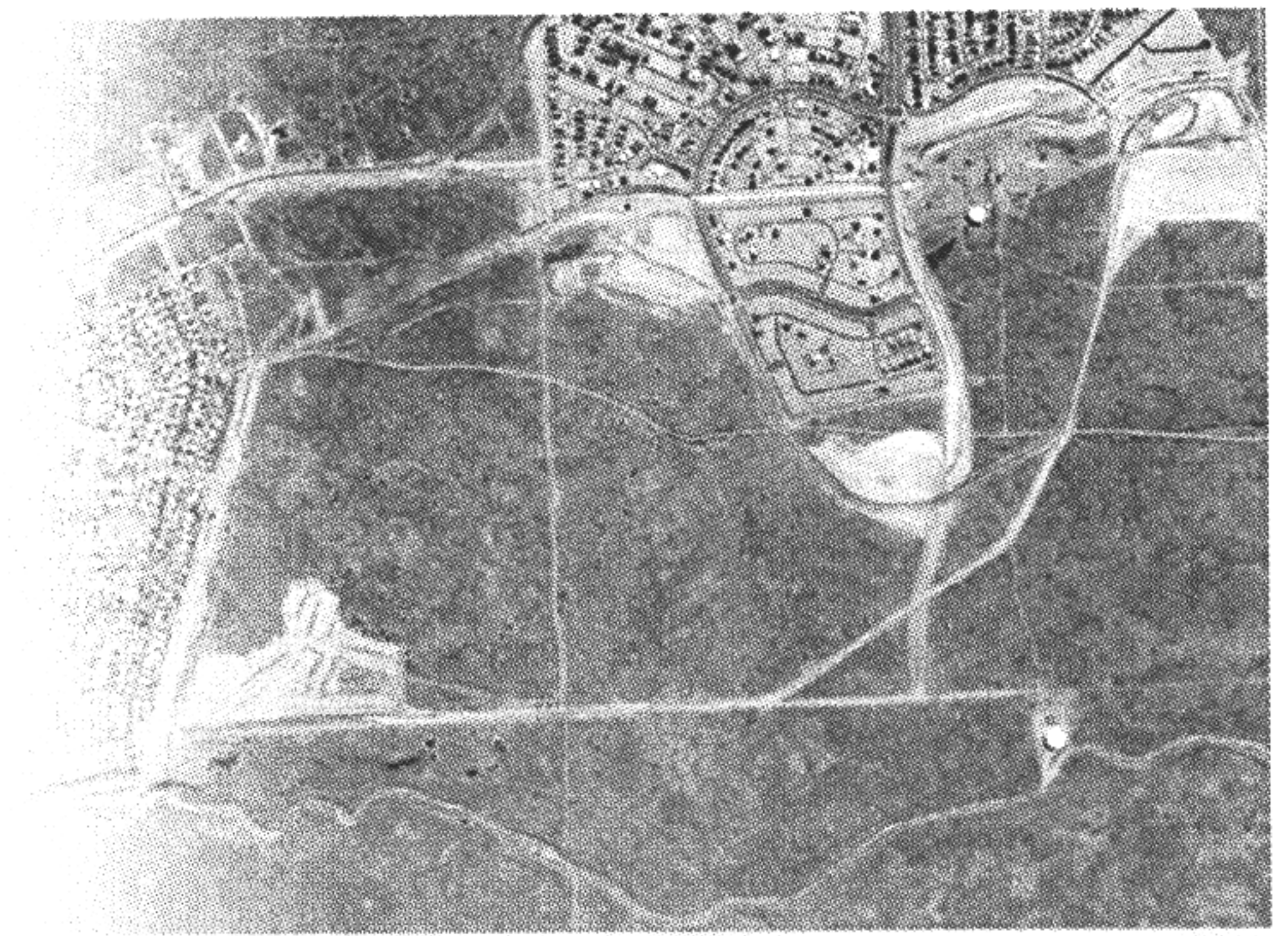
Prepared for:

Pulte Homes of New Mexico
7601 Jefferson St NE – Suite 320
Albuquerque, NM 87109



Bohannon  **Huston**

Engineering
Spatial Data
Advanced Technologies



**AMENDMENT NO. 2
DRAINAGE MANAGEMENT PLAN
FOR
DEL WEBB @ MIREHAVEN PHASES 1 AND 2
(TRACTS N-2-A OF THE WATERSHED SUBDIVISION)**

MARCH 20, 2015

Prepared for:
**PULTE HOMES OF NEW MEXICO
7601 JEFFERSON BLVD. NE, SUITE 320
ALBUQUERQUE, NM 87109**

Prepared by:
**BOHANNAN HUSTON, INC.
COURTYARD I
7500 JEFFERSON STREET NE
ALBUQUERQUE, NM 87109**

Prepared by:

Yolanda Padilla Moyer

Yolanda Padilla Moyer, P.E.
Senior Project Manager

Date

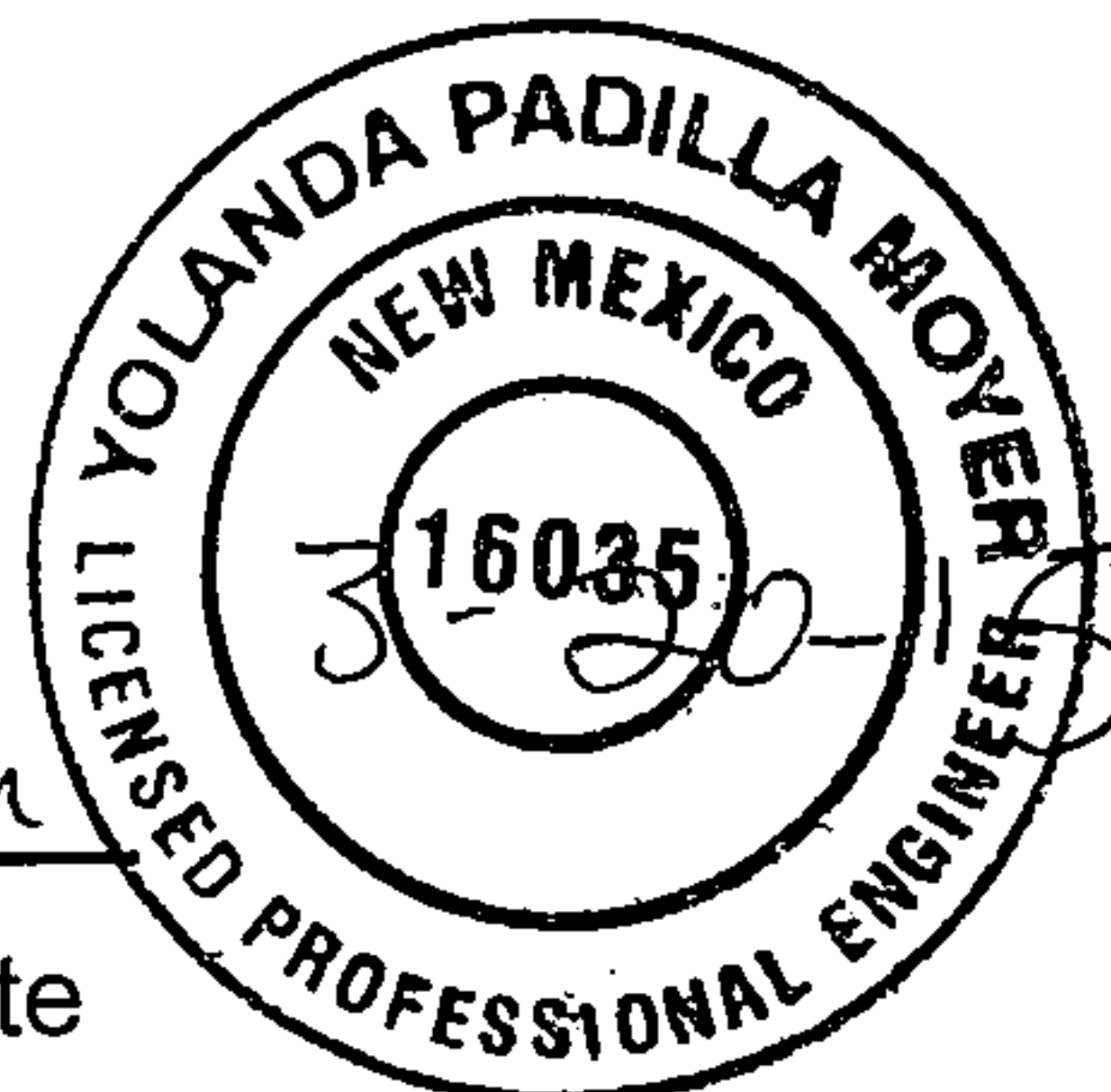


TABLE OF CONTENTS

I. PURPOSE 1

APPENDICES

- APPENDIX A: BASIN CALCULATIONS
- APPENDIX B: SWALE ANALYSIS

EXHIBITS

- EXHIBIT 1: BASIN MAP
- EXHIBIT 2: GRADING PLAN
- EXHIBIT 3: ORTHO EXHIBIT

I. PURPOSE

This report will serve as Amendment No. 2 to the Drainage Management Plan for Del Webb @ Mirehaven Phases 1 and 2, February 2014, which was prepared for Pulte Homes of New Mexico. The DMP provides drainage analysis to support proposed site specific drainage infrastructure for Del Webb @ Mirehaven Phase 1 and 2. This amendment summarizes proposed design modifications to the previously approved concrete diversion channel located along the northwestern boundary of the site just east of the Petroglyph National Monument. The intent of this amendment is to provide a design alternative to the concrete channel that can safely convey flows in the same manner as previously approved while utilizing the same grading footprint.

As previously discussed, the originally approved concrete channel was "over-designed" to capture the entire flows of $Q=65.0$ cfs from Basin 12. As discussed and agreed upon, this revision will still capture and convey the full flow of $Q=65.0$ cfs. This amendment proposes to a shotcrete swale, 2 ft. and 5 ft. wide, see Appendix B for Cross-sections that will capture the flows that will ultimately be to the Mirehaven Arroyo. As shown in Exhibit 1- Basin Map, **Basin 12.18B ($A=42.0$ acres, $Q=65.0$ cfs)** is defined to show the original basin area impacting the diversion. **Offsite Basin A ($A=3.1$ acres, $Q=4.2$ cfs)** and **Offsite Basin B ($A=0.8$ acres, $Q=1.2$ cfs)** are the sub-basins that directly impacts the diversion. **Offsite Basin A** is redirected by a 2 ft. swale that drains north. **Offsite Basin B** will combine with **Offsite Basin A** for a total combined $Q=5.38$ cfs and will be redirected by a 2 ft. swale that continues north. Approximately 150 ft. south of the West-East Petroglyph National Monument boundary the swale will transition to a 5 ft. wide swale and capture the remaining portion of Basin 12.18B for a total combined flow of $Q=65.0$ cfs. The 5 ft. swale continues north and then east where it will discharge into a 20 ft. wide maintenance road/pedestrian path. The maintenance road is a 20 ft. wide concrete, 2 percent inverted crown with 2 ft. max garden wall on either side to contain the flow, see Appendix B for cross-section. This maintenance road discharges directly into the Mirehaven Arroyo.

As shown in Exhibit 3 - Grading Plan, revised sheets incorporated with this amendment are sheets 1, 2, 5, and 8B. This amendment to the drainage plan maintains the overall drainage pattern of the previously approved DMP and allows for the safe management of storm runoff in the fully developed condition as well as interim conditions.

APPENDICES

APPENDIX A: BASIN CALCULATIONS

APPENDIX B: SWALE ANALYSIS

APPENDIX A

BASIN CALCULATIONS

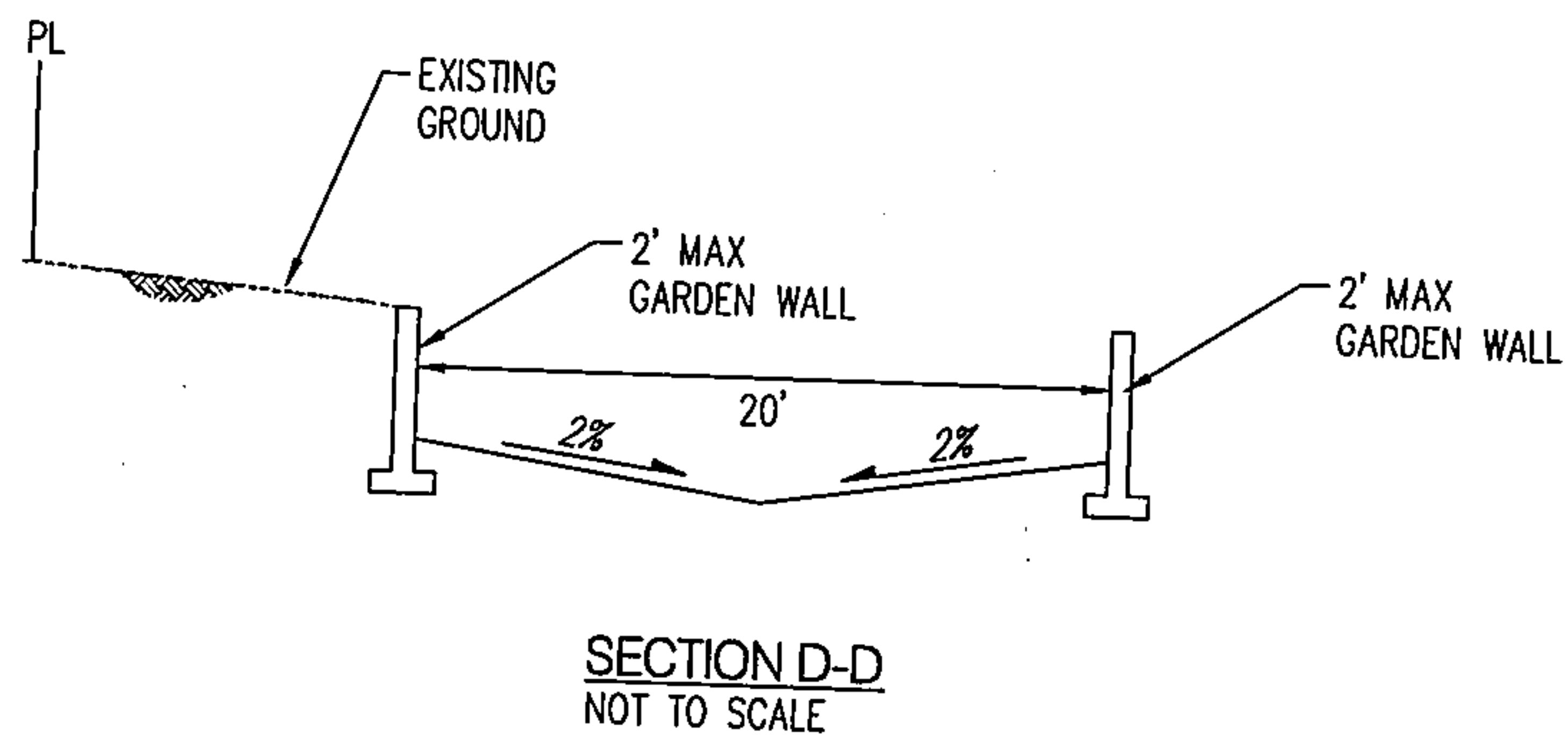
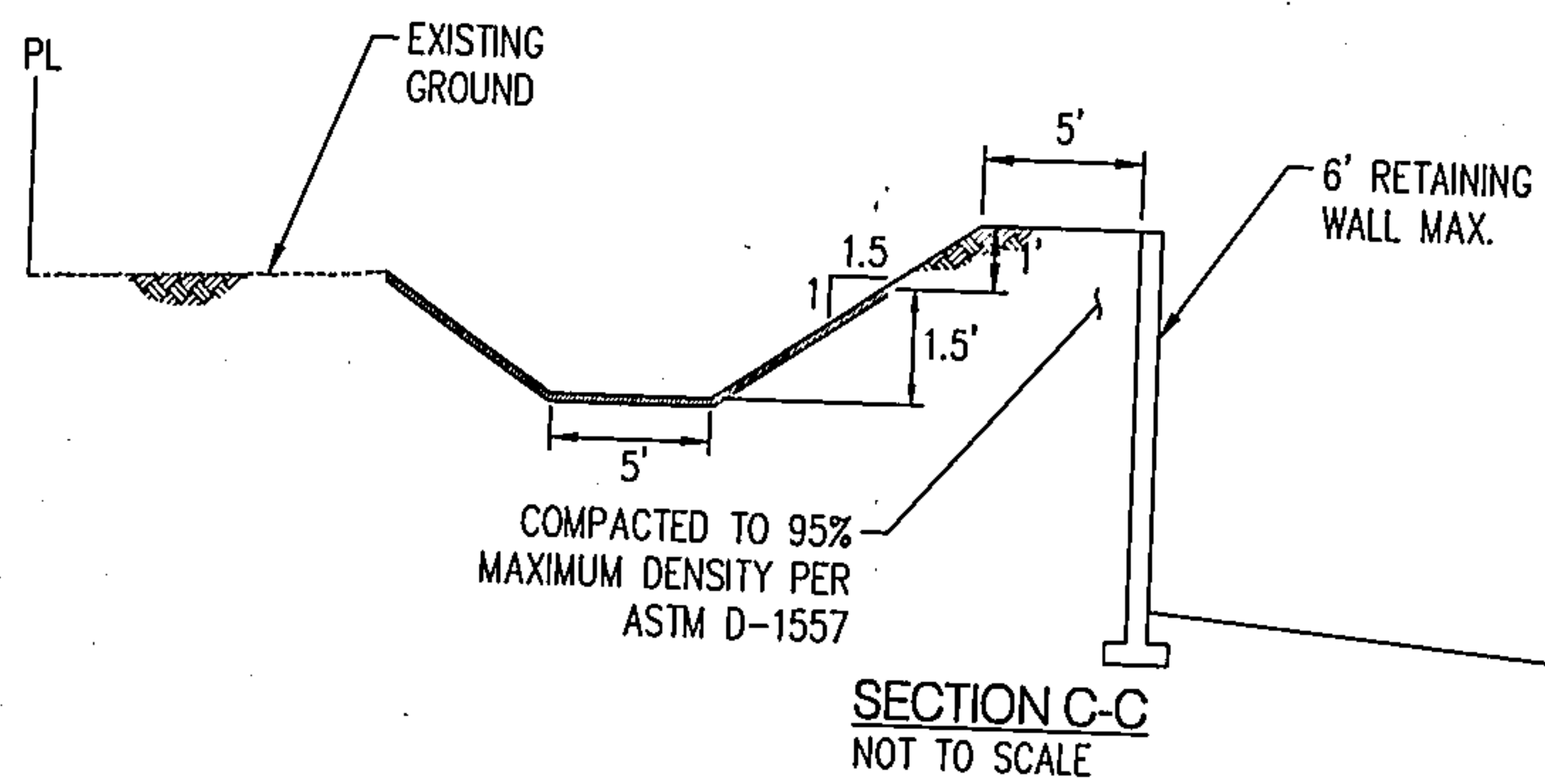
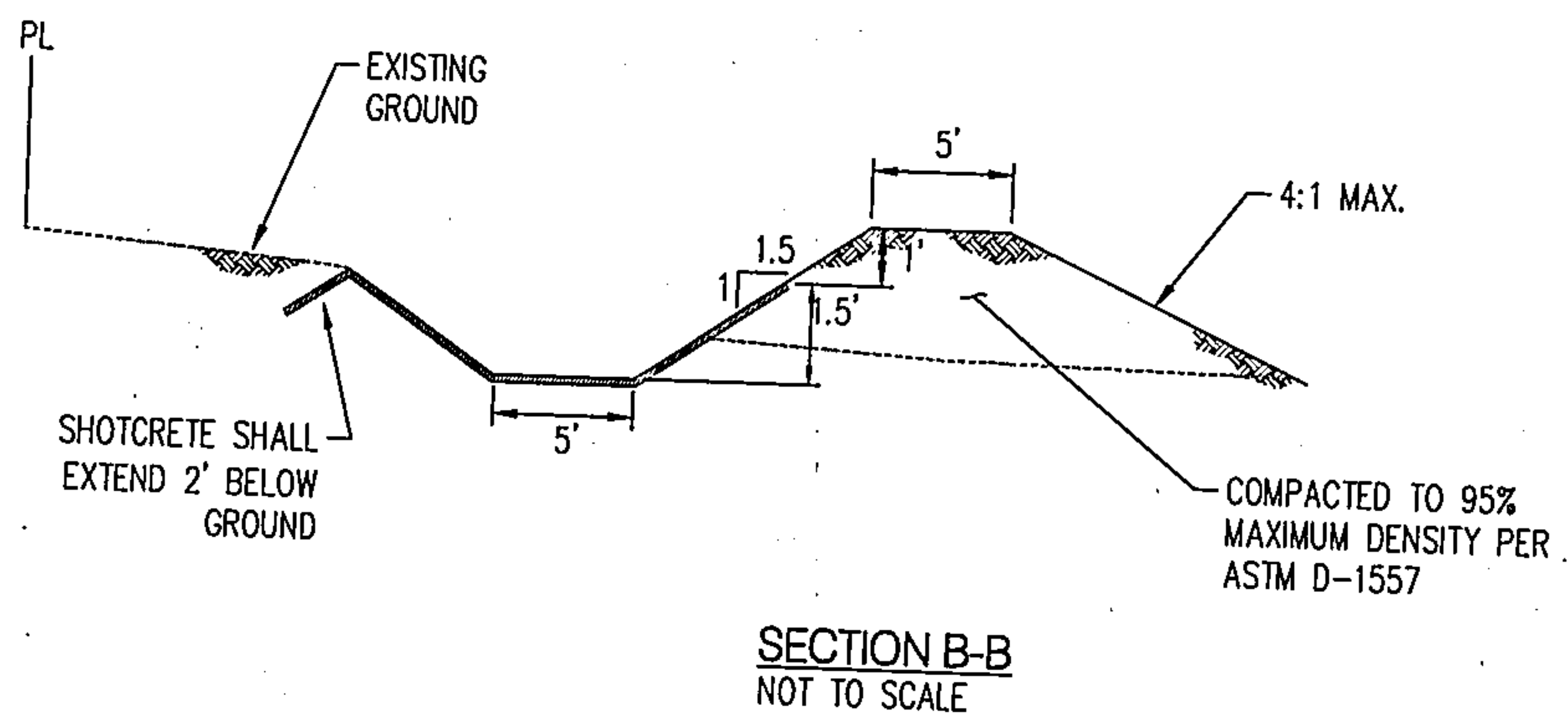
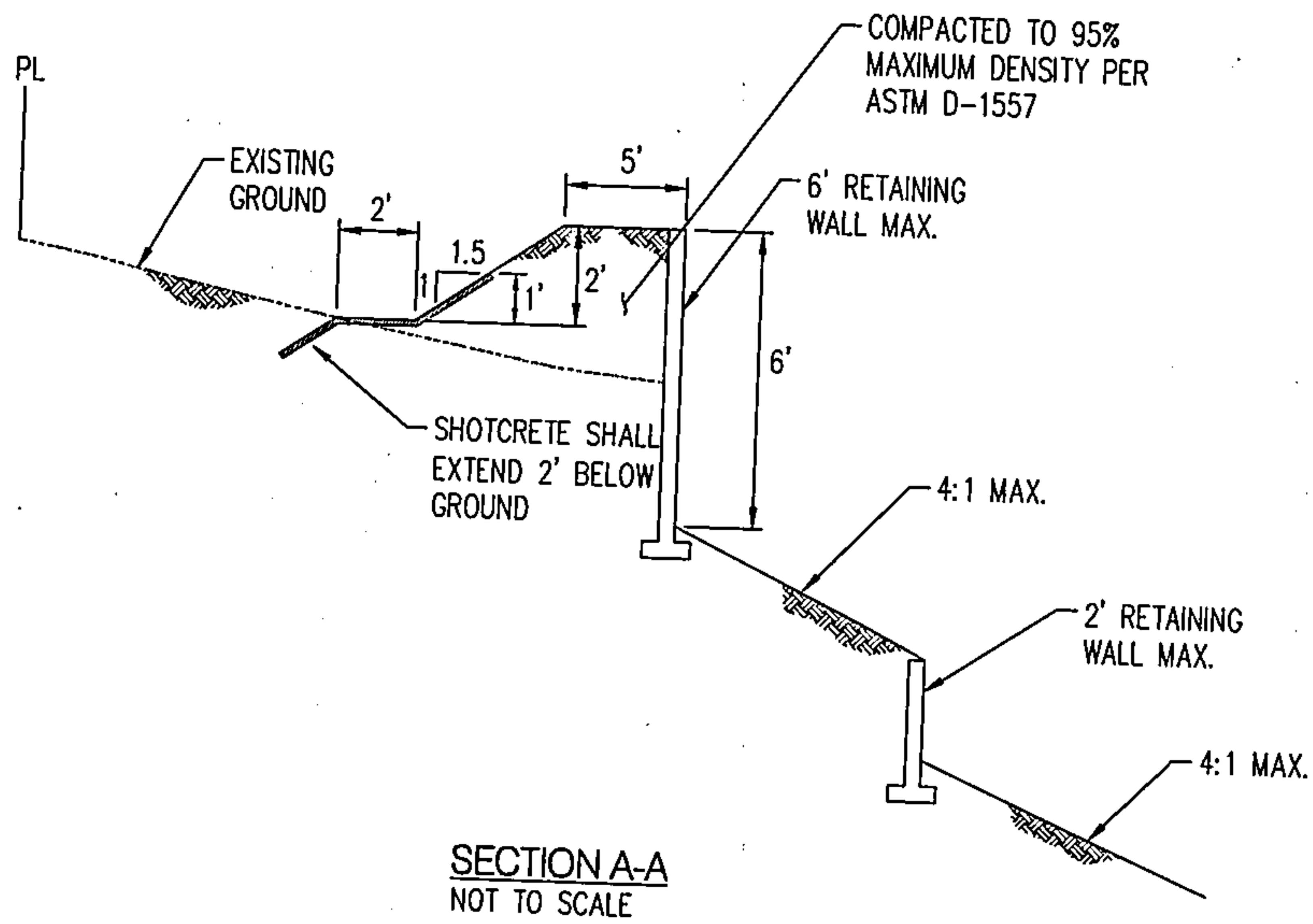
BASIN SUMMARY FOR DIVERSION CHANNEL

BASIN I.D.	AREA (AC)	UNITS #	% LAND TREATMENT				DISCHARGE (CFS)	
			A	B	C	D	10 YR	100YR

HYRDOLOGICAL VOLUMETRIC & DISCHARGE DATA (EXISTING CALCULATED)

Offsite Basin A	3.10			89.00%	11.00%	0.00%	0.00%		0.95	4.19
Offsite Basin B	0.80			73.00%	25.00%	2.00%	0.00%		0.32	1.19
TOTAL	3.9								1.27	5.38

APPENDIX B
SWALE ANALYSIS



6,018

1- CROSS-SECTION A-A

MANNING'S N = 0.015 SLOPE = 0.028

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	2.0	3.0	22.0	0.0			
2.0	20.0	0.0	4.0	25.0	2.0			

WSEL FT.	DEPTH INC	AREA SQ.FT.	FLOW RATE (CFS)	FLOW PER (FT)	WETTED VEL (FPS)	FLOW PLUS OBSTRUCTIONS	TOPWID ENERGY (FT)	TOTAL
0.100	0.100	0.258	0.804	3.185	3.121	3.150	0.252	
0.200	0.200	0.630	2.892	4.371	4.590	4.300	0.528	
0.300	0.300	1.118	6.405	5.556	5.731	5.450	0.811	
0.400	0.400	1.720	11.552	6.741	6.716	6.600	1.102	
0.500	0.500	2.438	18.540	7.926	7.606	7.750	1.400	
0.600	0.600	3.270	27.570	9.112	8.431	8.900	1.706	
0.700	0.700	4.218	38.834	10.297	9.208	10.050	2.019	
0.800	0.800	5.280	52.516	11.482	9.946	11.200	2.339	
0.900	0.900	6.458	68.797	12.667	10.654	12.350	2.665	
1.000	1.000	7.750	87.848	13.853	11.335	13.500	2.999	
1.100	1.100	9.158	109.839	15.038	11.994	14.650	3.338	
1.200	1.200	10.680	134.932	16.223	12.634	15.800	3.683	
1.300	1.300	12.318	163.287	17.408	13.256	16.950	4.033	
1.400	1.400	14.070	195.059	18.594	13.863	18.100	4.389	
1.500	1.500	15.938	230.401	19.779	14.457	19.250	4.751	
1.600	1.600	17.920	269.462	20.964	15.037	20.400	5.117	
1.700	1.700	20.018	312.388	22.150	15.606	21.550	5.488	
1.800	1.800	22.230	359.322	23.335	16.164	22.700	5.864	
1.900	1.900	24.558	410.405	24.520	16.712	23.850	6.244	

Q100=3.81cfs D=0.23'

2- CROSS-SECTION A-A

MANNING'S N = 0.015 SLOPE = 0.007

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	2.0	3.0	22.0	0.0			
2.0	20.0	0.0	4.0	25.0	2.0			

WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID	TOTAL
INC	AREA	RATE	PER	VEL	PLUS	ENERGY	
FT.	SQ.FT.	(CFS)	(FT)	(FPS)	OBSTRUCTIONS	(FT)	

0.100	0.100	0.258	0.410	3.185	1.593	3.150	0.139
0.200	0.200	0.630	1.476	4.371	2.343	4.300	0.285
0.300	0.300	1.118	3.269	5.556	2.926	5.450	0.433
0.400	0.400	1.720	5.897	6.741	3.428	6.600	0.583
0.500	0.500	2.438	9.464	7.926	3.883	7.750	0.734
0.600	0.600	3.270	14.073	9.112	4.304	8.900	0.888
0.700	0.700	4.218	19.823	10.297	4.700	10.050	1.044
0.800	0.800	5.280	26.807	11.482	5.077	11.200	1.201
0.900	0.900	6.458	35.118	12.667	5.438	12.350	1.360
1.000	1.000	7.750	44.843	13.853	5.786	13.500	1.521
1.100	1.100	9.158	56.068	15.038	6.123	14.650	1.683
1.200	1.200	10.680	68.877	16.223	6.449	15.800	1.847
1.300	1.300	12.318	83.350	17.408	6.767	16.950	2.012
1.400	1.400	14.070	99.569	18.594	7.077	18.100	2.179
1.500	1.500	15.938	117.609	19.779	7.379	19.250	2.347
1.600	1.600	17.920	137.548	20.964	7.676	20.400	2.516
1.700	1.700	20.018	159.460	22.150	7.966	21.550	2.687
1.800	1.800	22.230	183.417	23.335	8.251	22.700	2.859
1.900	1.900	24.558	209.493	24.520	8.531	23.850	3.032

Q100=3.81cfs D=0.32'

3- CROSS-SECTION A-A

MANNING'S N = 0.015 SLOPE = 0.005

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	2.0	3.0	22.0	0.0			
2.0	20.0	0.0	4.0	25.0	2.0			

WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID	TOTAL
FT.	INC	AREA	RATE	PER	VEL	PLUS	ENERGY
FT.	SQ.FT.	(CFS)	(FT)	(FPS)	OBSTRUCTIONS	(FT)	

0.100	0.100	0.258	0.337	3.185	1.310	3.150	0.127
0.200	0.200	0.630	1.213	4.371	1.926	4.300	0.258
0.300	0.300	1.118	2.687	5.556	2.405	5.450	0.390
0.400	0.400	1.720	4.847	6.741	2.818	6.600	0.524
0.500	0.500	2.438	7.779	7.926	3.191	7.750	0.658
0.600	0.600	3.270	11.568	9.112	3.538	8.900	0.795
0.700	0.700	4.218	16.294	10.297	3.863	10.050	0.932
0.800	0.800	5.280	22.035	11.482	4.173	11.200	1.071
0.900	0.900	6.458	28.867	12.667	4.470	12.350	1.211
1.000	1.000	7.750	36.860	13.853	4.756	13.500	1.352
1.100	1.100	9.158	46.087	15.038	5.033	14.650	1.494
1.200	1.200	10.680	56.616	16.223	5.301	15.800	1.637
1.300	1.300	12.318	68.514	17.408	5.562	16.950	1.781
1.400	1.400	14.070	81.845	18.594	5.817	18.100	1.926
1.500	1.500	15.938	96.674	19.779	6.066	19.250	2.072
1.600	1.600	17.920	113.064	20.964	6.309	20.400	2.219
1.700	1.700	20.018	131.075	22.150	6.548	21.550	2.367
1.800	1.800	22.230	150.768	23.335	6.782	22.700	2.515
1.900	1.900	24.558	172.202	24.520	7.012	23.850	2.665

Q100=3.81cfs D=0.35'

4- CROSS-SECTION A-A

MANNING'S N = 0.015 SLOPE = 0.012

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	2.0	3.0	22.0	0.0			
2.0	20.0	0.0	4.0	25.0	2.0			

WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID	TOTAL
FT.	INC	AREA	RATE	PER	VEL	PLUS	ENERGY
		SQ.FT.	(CFS)	(FT)	(FPS)	OBSTRUCTIONS	(FT)

0.100	0.100	0.258	0.518	3.185	2.012	3.150	0.163
0.200	0.200	0.630	1.864	4.371	2.959	4.300	0.336
0.300	0.300	1.118	4.128	5.556	3.694	5.450	0.512
0.400	0.400	1.720	7.446	6.741	4.329	6.600	0.692
0.500	0.500	2.438	11.951	7.926	4.903	7.750	0.874
0.600	0.600	3.270	17.771	9.112	5.435	8.900	1.059
0.700	0.700	4.218	25.032	10.297	5.935	10.050	1.248
0.800	0.800	5.280	33.851	11.482	6.411	11.200	1.439
0.900	0.900	6.458	44.346	12.667	6.867	12.350	1.634
1.000	1.000	7.750	56.626	13.853	7.307	13.500	1.830
1.100	1.100	9.158	70.801	15.038	7.731	14.650	2.030
1.200	1.200	10.680	86.975	16.223	8.144	15.800	2.232
1.300	1.300	12.318	105.253	17.408	8.545	16.950	2.436
1.400	1.400	14.070	125.733	18.594	8.936	18.100	2.642
1.500	1.500	15.938	148.514	19.779	9.319	19.250	2.851
1.600	1.600	17.920	173.692	20.964	9.693	20.400	3.061
1.700	1.700	20.018	201.361	22.150	10.059	21.550	3.274
1.800	1.800	22.230	231.614	23.335	10.419	22.700	3.488
1.900	1.900	24.558	264.542	24.520	10.772	23.850	3.705

Q100=3.81cfs D=0.29'

5- CROSS-SECTION A-A

MANNING'S N = 0.015 SLOPE = 0.041

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	2.0	3.0	22.0	0.0			
2.0	20.0	0.0	4.0	25.0	2.0			

WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID	TOTAL
INC	AREA	RATE	PER	VEL	PLUS	ENERGY	
FT.	SQ.FT.	(CFS)	(FT)	(FPS)	OBSTRUCTIONS	(FT)	

0.100	0.100	0.258	0.962	3.185	3.737	3.150	0.317
0.200	0.200	0.630	3.462	4.371	5.495	4.300	0.670
0.300	0.300	1.118	7.667	5.556	6.861	5.450	1.032
0.400	0.400	1.720	13.829	6.741	8.040	6.600	1.405
0.500	0.500	2.438	22.195	7.926	9.106	7.750	1.790
0.600	0.600	3.270	33.005	9.112	10.093	8.900	2.185
0.700	0.700	4.218	46.489	10.297	11.023	10.050	2.590
0.800	0.800	5.280	62.869	11.482	11.907	11.200	3.005
0.900	0.900	6.458	82.358	12.667	12.754	12.350	3.430
1.000	1.000	7.750	105.165	13.853	13.570	13.500	3.864
1.100	1.100	9.158	131.491	15.038	14.359	14.650	4.307
1.200	1.200	10.680	161.530	16.223	15.125	15.800	4.758
1.300	1.300	12.318	195.474	17.408	15.870	16.950	5.217
1.400	1.400	14.070	233.509	18.594	16.596	18.100	5.684
1.500	1.500	15.938	275.818	19.779	17.306	19.250	6.159
1.600	1.600	17.920	322.578	20.964	18.001	20.400	6.640
1.700	1.700	20.018	373.966	22.150	18.682	21.550	7.129
1.800	1.800	22.230	430.152	23.335	19.350	22.700	7.624
1.900	1.900	24.558	491.305	24.520	20.006	23.850	8.126

Q100=3.81cfs D=0.21'

6- CROSS-SECTION A-A

MANNING'S N = 0.015 SLOPE = 0.041

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	2.0	3.0	22.0	0.0			
2.0	20.0	0.0	4.0	25.0	2.0			

WSEL FT.	DEPTH INC	AREA SQ.FT.	FLOW RATE (CFS)	FLOW PER (FT)	WETTED VEL (FPS)	FLOW PLUS OBSTRUCTIONS	TOPWID ENERGY (FT)	TOTAL
0.100	0.100	0.258	0.970	3.185	3.769	3.150	0.321	
0.200	0.200	0.630	3.491	4.371	5.542	4.300	0.678	
0.300	0.300	1.118	7.733	5.556	6.920	5.450	1.045	Q100=3.81cfs D=0.21'
0.400	0.400	1.720	13.947	6.741	8.109	6.600	1.423	
0.500	0.500	2.438	22.385	7.926	9.184	7.750	1.812	
0.600	0.600	3.270	33.287	9.112	10.180	8.900	2.212	
0.700	0.700	4.218	46.887	10.297	11.117	10.050	2.622	
0.800	0.800	5.280	63.407	11.482	12.009	11.200	3.043	
0.900	0.900	6.458	83.064	12.667	12.863	12.350	3.474	
1.000	1.000	7.750	106.066	13.853	13.686	13.500	3.913	
1.100	1.100	9.158	132.616	15.038	14.482	14.650	4.362	
1.200	1.200	10.680	162.913	16.223	15.254	15.800	4.819	
1.300	1.300	12.318	197.148	17.408	16.006	16.950	5.285	
1.400	1.400	14.070	235.509	18.594	16.738	18.100	5.758	
1.500	1.500	15.938	278.180	19.779	17.454	19.250	6.239	
1.600	1.600	17.920	325.341	20.964	18.155	20.400	6.727	
1.700	1.700	20.018	377.168	22.150	18.842	21.550	7.222	
1.800	1.800	22.230	433.835	23.335	19.516	22.700	7.724	
1.900	1.900	24.558	495.512	24.520	20.178	23.850	8.233	

7- CROSS-SECTION A-A

MANNING'S N = 0.015 SLOPE = 0.037

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	2.0	3.0	22.0	0.0			
2.0	20.0	0.0	4.0	25.0	2.0			

WSEL FT.	DEPTH INC	AREA SQ.FT.	FLOW RATE (CFS)	FLOW PER (FT)	WETTED VEL (FPS)	FLOW PLUS OBSTRUCTIONS	TOPWID ENERGY (FT)	TOTAL
0.100	0.100	0.258	0.919	3.185	3.568	3.150	0.298	
0.200	0.200	0.630	3.305	4.371	5.246	4.300	0.628	
0.300	0.300	1.118	7.320	5.556	6.551	5.450	0.967	Q100=5.38cfs D=0.25'
0.400	0.400	1.720	13.203	6.741	7.676	6.600	1.317	
0.500	0.500	2.438	21.190	7.926	8.694	7.750	1.676	
0.600	0.600	3.270	31.511	9.112	9.636	8.900	2.044	
0.700	0.700	4.218	44.385	10.297	10.524	10.050	2.423	
0.800	0.800	5.280	60.024	11.482	11.368	11.200	2.810	
0.900	0.900	6.458	78.632	12.667	12.177	12.350	3.206	
1.000	1.000	7.750	100.407	13.853	12.956	13.500	3.611	
1.100	1.100	9.158	125.541	15.038	13.709	14.650	4.023	
1.200	1.200	10.680	154.221	16.223	14.440	15.800	4.443	
1.300	1.300	12.318	186.629	17.408	15.152	16.950	4.871	
1.400	1.400	14.070	222.943	18.594	15.845	18.100	5.305	
1.500	1.500	15.938	263.337	19.779	16.523	19.250	5.746	
1.600	1.600	17.920	307.982	20.964	17.186	20.400	6.194	
1.700	1.700	20.018	357.044	22.150	17.837	21.550	6.648	
1.800	1.800	22.230	410.687	23.335	18.474	22.700	7.109	
1.900	1.900	24.558	469.073	24.520	19.101	23.850	7.575	

8- CROSS-SECTION A-A

MANNING'S N = 0.015 SLOPE = 0.035

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	2.0	3.0	22.0	0.0			
2.0	20.0	0.0	4.0	25.0	2.0			

WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID	TOTAL
INC	AREA	RATE	PER	VEL	PLUS	ENERGY	
FT.	SQ.FT.	(CFS)	(FT)	(FPS)	OBSTRUCTIONS	(FT)	

0.100	0.100	0.258	0.895	3.185	3.475	3.150	0.288
0.200	0.200	0.630	3.219	4.371	5.110	4.300	0.606
0.300	0.300	1.118	7.130	5.556	6.381	5.450	0.933
0.400	0.400	1.720	12.861	6.741	7.477	6.600	1.270
0.500	0.500	2.438	20.641	7.926	8.468	7.750	1.615
0.600	0.600	3.270	30.694	9.112	9.386	8.900	1.970
0.700	0.700	4.218	43.234	10.297	10.251	10.050	2.334
0.800	0.800	5.280	58.467	11.482	11.073	11.200	2.707
0.900	0.900	6.458	76.592	12.667	11.861	12.350	3.088
1.000	1.000	7.750	97.802	13.853	12.620	13.500	3.477
1.100	1.100	9.158	122.284	15.038	13.353	14.650	3.873
1.200	1.200	10.680	150.220	16.223	14.066	15.800	4.277
1.300	1.300	12.318	181.787	17.408	14.758	16.950	4.688
1.400	1.400	14.070	217.159	18.594	15.434	18.100	5.105
1.500	1.500	15.938	256.505	19.779	16.094	19.250	5.529
1.600	1.600	17.920	299.992	20.964	16.741	20.400	5.959
1.700	1.700	20.018	347.781	22.150	17.374	21.550	6.395
1.800	1.800	22.230	400.033	23.335	17.995	22.700	6.837
1.900	1.900	24.558	456.904	24.520	18.605	23.850	7.284

6.837
d = .06

2FT 0.80%

MANNING'S N = 0.015 SLOPE = 0.008

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	2.0	3.0	22.0	0.0			
2.0	20.0	0.0	4.0	25.0	2.0			

WSEL FT.	DEPTH INC	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID PLUS OBSTRUCTIONS	TOTAL ENERGY (FT)
0.100	0.100	0.258	0.427	3.185	1.657	3.150	0.143
0.200	0.200	0.630	1.535	4.371	2.436	4.300	0.292
0.300	0.300	1.118	3.399	5.556	3.042	5.450	0.444
0.400	0.400	1.720	6.131	6.741	3.565	6.600	0.598
0.500	0.500	2.438	9.840	7.926	4.037	7.750	0.753
0.600	0.600	3.270	14.633	9.112	4.475	8.900	0.911
0.700	0.700	4.218	20.611	10.297	4.887	10.050	1.071
0.800	0.800	5.280	27.873	11.482	5.279	11.200	1.233
0.900	0.900	6.458	36.514	12.667	5.654	12.350	1.397
1.000	1.000	7.750	46.625	13.853	6.016	13.500	1.563
1.100	1.100	9.158	58.296	15.038	6.366	14.650	1.730
1.200	1.200	10.680	71.614	16.223	6.705	15.800	1.899
1.300	1.300	12.318	86.664	17.408	7.036	16.950	2.070
1.400	1.400	14.070	103.527	18.594	7.358	18.100	2.242
1.500	1.500	15.938	122.284	19.779	7.673	19.250	2.416
1.600	1.600	17.920	143.016	20.964	7.981	20.400	2.591
1.700	1.700	20.018	165.798	22.150	8.283	21.550	2.767
1.800	1.800	22.230	190.708	23.335	8.579	22.700	2.945
1.900	1.900	24.558	217.820	24.520	8.870	23.850	3.124

0.143
1.37

2FT 6.31%

MANNING'S N = 0.015 SLOPE = 0.063

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	2.0	3.0	22.0	0.0			
2.0	20.0	0.0	4.0	25.0	2.0			

WSEL FT.	DEPTH INC	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID PLUS OBSTRUCTIONS	TOTAL ENERGY (FT)
0.100	0.100	0.258	1.198	3.185	4.653	3.150	0.437
0.200	0.200	0.630	4.310	4.371	6.841	4.300	0.928
0.300	0.300	1.118	9.547	5.556	8.543	5.450	1.435
0.400	0.400	1.720	17.219	6.741	10.011	6.600	1.959
0.500	0.500	2.438	27.636	7.926	11.338	7.750	2.499
0.600	0.600	3.270	41.095	9.112	12.567	8.900	3.057
0.700	0.700	4.218	57.885	10.297	13.725	10.050	3.630
0.800	0.800	5.280	78.280	11.482	14.826	11.200	4.219
0.900	0.900	6.458	102.547	12.667	15.880	12.350	4.823
1.000	1.000	7.750	130.945	13.853	16.896	13.500	5.440
1.100	1.100	9.158	163.724	15.038	17.879	14.650	6.072
1.200	1.200	10.680	201.127	16.223	18.832	15.800	6.716
1.300	1.300	12.318	243.392	17.408	19.760	16.950	7.373
1.400	1.400	14.070	290.751	18.594	20.665	18.100	8.042
1.500	1.500	15.938	343.431	19.779	21.549	19.250	8.722
1.600	1.600	17.920	401.655	20.964	22.414	20.400	9.414
1.700	1.700	20.018	465.639	22.150	23.262	21.550	10.116
1.800	1.800	22.230	535.598	23.335	24.093	22.700	10.829
1.900	1.900	24.558	611.742	24.520	24.911	23.850	11.552

Q = 500
d = .22

B B

5FT 0.50%

MANNING'S N = 0.015 SLOPE = 0.005

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	3.0	3.0	9.5	0.0			
2.0	4.5	0.0	4.0	14.0	3.0			

WSEL FT.	DEPTH INC	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID PLUS OBSTRUCTIONS	TOTAL ENERGY (FT)
0.100	0.100	0.515	0.757	5.361	1.469	5.300	0.134
0.200	0.200	1.060	2.413	5.721	2.277	5.600	0.281
0.300	0.300	1.635	4.771	6.082	2.918	5.900	0.432
0.400	0.400	2.240	7.759	6.442	3.464	6.200	0.587
0.500	0.500	2.875	11.342	6.803	3.945	6.500	0.742
0.600	0.600	3.540	15.500	7.163	4.379	6.800	0.898
0.700	0.700	4.235	20.224	7.524	4.776	7.100	1.055
0.800	0.800	4.960	25.509	7.884	5.143	7.400	1.211
0.900	0.900	5.715	31.355	8.245	5.487	7.700	1.368
1.000	1.000	6.500	37.764	8.606	5.810	8.000	1.525
1.100	1.100	7.315	44.740	8.966	6.116	8.300	1.682
1.200	1.200	8.160	52.289	9.327	6.408	8.600	1.839
1.300	1.300	9.035	60.417	9.687	6.687	8.900	1.996
1.400	1.400	9.940	69.132	10.048	6.955	9.200	2.152
1.500	1.500	10.875	78.441	10.408	7.213	9.500	2.309
1.600	1.600	11.840	88.352	10.769	7.462	9.800	2.466
1.700	1.700	12.835	98.876	11.129	7.704	10.100	2.623
1.800	1.800	13.860	110.020	11.490	7.938	10.400	2.780
1.900	1.900	14.915	121.794	11.851	8.166	10.700	2.937
2.000	2.000	16.000	134.207	12.211	8.388	11.000	3.094
2.100	2.100	17.115	147.269	12.572	8.605	11.300	3.252
2.200	2.200	18.260	160.990	12.932	8.817	11.600	3.409
2.300	2.300	19.435	175.379	13.293	9.024	11.900	3.567
2.400	2.400	20.640	190.445	13.653	9.227	12.200	3.724
2.500	2.500	21.875	206.199	14.014	9.426	12.500	3.882
2.600	2.600	23.140	222.651	14.374	9.622	12.800	4.040
2.700	2.700	24.435	239.810	14.735	9.814	13.100	4.198
2.800	2.800	25.760	257.685	15.096	10.003	13.400	4.356
2.900	2.900	27.115	276.288	15.456	10.189	13.700	4.515

Q-6C
d-1.35'

B-E 2

MANNING'S N = 0.015 SLOPE = 0.070

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	3.0	3.0	9.5	0.0			
2.0	4.5	0.0	4.0	14.0	3.0			

WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID	TOTAL
INC	AREA	RATE	PER	VEL	PLUS	ENERGY	
FT.	SQ.FT.	(CFS)	(FT)	(FPS)	OBSTRUCTIONS	(FT)	

0.100	0.100	0.515	2.840	5.361	5.514	5.300	0.573
0.200	0.200	1.060	9.055	5.721	8.543	5.600	1.335
0.300	0.300	1.635	17.902	6.082	10.949	5.900	2.165
0.400	0.400	2.240	29.114	6.442	12.997	6.200	3.028
0.500	0.500	2.875	42.558	6.803	14.803	6.500	3.908
0.600	0.600	3.540	58.162	7.163	16.430	6.800	4.799
0.700	0.700	4.235	75.888	7.524	17.919	7.100	5.694
0.800	0.800	4.960	95.720	7.884	19.298	7.400	6.593
0.900	0.900	5.715	117.656	8.245	20.587	7.700	7.492
1.000	1.000	6.500	141.705	8.606	21.801	8.000	8.392
1.100	1.100	7.315	167.881	8.966	22.950	8.300	9.293
1.200	1.200	8.160	196.206	9.327	24.045	8.600	10.193
1.300	1.300	9.035	226.705	9.687	25.092	8.900	11.093
1.400	1.400	9.940	259.405	10.048	26.097	9.200	11.993
1.500	1.500	10.875	294.335	10.408	27.065	9.500	12.894
1.600	1.600	11.840	331.528	10.769	28.001	9.800	13.795
1.700	1.700	12.835	371.015	11.129	28.907	10.100	14.697
1.800	1.800	13.860	412.831	11.490	29.786	10.400	15.599
1.900	1.900	14.915	457.011	11.851	30.641	10.700	16.503
2.000	2.000	16.000	503.590	12.211	31.474	11.000	17.408
2.100	2.100	17.115	552.604	12.572	32.288	11.300	18.315
2.200	2.200	18.260	604.088	12.932	33.083	11.600	19.223
2.300	2.300	19.435	658.079	13.293	33.860	11.900	20.133
2.400	2.400	20.640	714.613	13.653	34.623	12.200	21.045
2.500	2.500	21.875	773.728	14.014	35.370	12.500	21.959
2.600	2.600	23.140	835.460	14.374	36.105	12.800	22.875
2.700	2.700	24.435	899.845	14.735	36.826	13.100	23.794
2.800	2.800	25.760	966.921	15.096	37.536	13.400	24.715
2.900	2.900	27.115	1036.724	15.456	38.234	13.700	25.638

Q=65
d=64

.018
MANNING'S N = 0.015 SLOPE = 0.069

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	3.0	3.0	9.5	0.0			
2.0	4.5	0.0	4.0	14.0	3.0			

WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID	TOTAL
FT.	INC	AREA	RATE	PER	VEL	PLUS	ENERGY
		SQ.FT.	(CFS)	(FT)	(FPS)	OBSTRUCTIONS	(FT)

0.100	0.100	0.515	2.805	5.361	5.447	5.300	0.561
0.200	0.200	1.060	8.945	5.721	8.439	5.600	1.308
0.300	0.300	1.635	17.684	6.082	10.816	5.900	2.120
0.400	0.400	2.240	28.760	6.442	12.839	6.200	2.964
0.500	0.500	2.875	42.042	6.803	14.623	6.500	3.826
0.600	0.600	3.540	57.456	7.163	16.230	6.800	4.697
0.700	0.700	4.235	74.966	7.524	17.702	7.100	5.574
0.800	0.800	4.960	94.557	7.884	19.064	7.400	6.453
0.900	0.900	5.715	116.227	8.245	20.337	7.700	7.333
1.000	1.000	6.500	139.983	8.606	21.536	8.000	8.214
1.100	1.100	7.315	165.842	8.966	22.671	8.300	9.095
1.200	1.200	8.160	193.823	9.327	23.753	8.600	9.976
1.300	1.300	9.035	223.951	9.687	24.787	8.900	10.856
1.400	1.400	9.940	256.254	10.048	25.780	9.200	11.737
1.500	1.500	10.875	290.760	10.408	26.737	9.500	12.619
1.600	1.600	11.840	327.500	10.769	27.660	9.800	13.500
1.700	1.700	12.835	366.508	11.129	28.555	10.100	14.383
1.800	1.800	13.860	407.817	11.490	29.424	10.400	15.266
1.900	1.900	14.915	451.460	11.851	30.269	10.700	16.151
2.000	2.000	16.000	497.473	12.211	31.092	11.000	17.036
2.100	2.100	17.115	545.891	12.572	31.895	11.300	17.923
2.200	2.200	18.260	596.749	12.932	32.681	11.600	18.812
2.300	2.300	19.435	650.085	13.293	33.449	11.900	19.703
2.400	2.400	20.640	705.932	13.653	34.202	12.200	20.595
2.500	2.500	21.875	764.329	14.014	34.941	12.500	21.489
2.600	2.600	23.140	825.311	14.374	35.666	12.800	22.386
2.700	2.700	24.435	888.914	14.735	36.379	13.100	23.284
2.800	2.800	25.760	955.176	15.096	37.080	13.400	24.185
2.900	2.900	27.115	1024.131	15.456	37.770	13.700	25.089

6.453
6.4

MANNING'S N = 0.015 SLOPE = 0.030

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	3.0	3.0	9.5	0.0			
2.0	4.5	0.0	4.0	14.0	3.0			

WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID	TOTAL
FT.	INC	AREA	RATE	PER	VEL	PLUS	ENERGY
		SQ.FT.	(CFS)	(FT)	(FPS)	OBSTRUCTIONS	(FT)

0.100	0.100	0.515	1.854	5.361	3.599	5.300	0.302
0.200	0.200	1.060	5.911	5.721	5.577	5.600	0.684
0.300	0.300	1.635	11.686	6.082	7.147	5.900	1.095
0.400	0.400	2.240	19.005	6.442	8.485	6.200	1.520
0.500	0.500	2.875	27.782	6.803	9.663	6.500	1.952
0.600	0.600	3.540	37.968	7.163	10.725	6.800	2.389
0.700	0.700	4.235	49.539	7.524	11.698	7.100	2.828
0.800	0.800	4.960	62.485	7.884	12.598	7.400	3.269
0.900	0.900	5.715	76.805	8.245	13.439	7.700	3.709
1.000	1.000	6.500	92.503	8.606	14.231	8.000	4.150
1.100	1.100	7.315	109.591	8.966	14.982	8.300	4.591
1.200	1.200	8.160	128.082	9.327	15.696	8.600	5.032
1.300	1.300	9.035	147.991	9.687	16.380	8.900	5.473
1.400	1.400	9.940	169.337	10.048	17.036	9.200	5.914
1.500	1.500	10.875	192.139	10.408	17.668	9.500	6.355
1.600	1.600	11.840	216.418	10.769	18.279	9.800	6.797
1.700	1.700	12.835	242.195	11.129	18.870	10.100	7.238
1.800	1.800	13.860	269.493	11.490	19.444	10.400	7.680
1.900	1.900	14.915	298.333	11.851	20.002	10.700	8.123
2.000	2.000	16.000	328.739	12.211	20.546	11.000	8.566
2.100	2.100	17.115	360.735	12.572	21.077	11.300	9.010
2.200	2.200	18.260	394.343	12.932	21.596	11.600	9.454
2.300	2.300	19.435	429.588	13.293	22.104	11.900	9.899
2.400	2.400	20.640	466.493	13.653	22.601	12.200	10.345
2.500	2.500	21.875	505.083	14.014	23.090	12.500	10.792
2.600	2.600	23.140	545.381	14.374	23.569	12.800	11.240
2.700	2.700	24.435	587.411	14.735	24.040	13.100	11.689
2.800	2.800	25.760	631.198	15.096	24.503	13.400	12.139
2.900	2.900	27.115	676.765	15.456	24.959	13.700	12.589

$C = 65$
 $d = 89$

MANNING'S N = 0.015 SLOPE = 0.0081

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	3.0	3.0	9.5	0.0			
2.0	4.5	0.0	4.0	14.0	3.0			

WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID	TOTAL
FT.	INC	AREA	RATE	PER	VEL	PLUS	ENERGY
	SQ.FT.	(CFS)	(FT)	(FPS)	OBSTRUCTIONS	(FT)	

0.100	0.100	0.515	0.957	5.361	1.859	5.300	0.154
0.200	0.200	1.060	3.053	5.721	2.880	5.600	0.329
0.300	0.300	1.635	6.035	6.082	3.691	5.900	0.512
0.400	0.400	2.240	9.814	6.442	4.381	6.200	0.699
0.500	0.500	2.875	14.346	6.803	4.990	6.500	0.887
0.600	0.600	3.540	19.607	7.163	5.539	6.800	1.077
0.700	0.700	4.235	25.582	7.524	6.041	7.100	1.268
0.800	0.800	4.960	32.267	7.884	6.505	7.400	1.458
0.900	0.900	5.715	39.662	8.245	6.940	7.700	1.649
1.000	1.000	6.500	47.769	8.606	7.349	8.000	1.840
1.100	1.100	7.315	56.593	8.966	7.737	8.300	2.031
1.200	1.200	8.160	66.141	9.327	8.106	8.600	2.222
1.300	1.300	9.035	76.422	9.687	8.458	8.900	2.413
1.400	1.400	9.940	87.445	10.048	8.797	9.200	2.604
1.500	1.500	10.875	99.220	10.408	9.124	9.500	2.795
1.600	1.600	11.840	111.758	10.769	9.439	9.800	2.986
1.700	1.700	12.835	125.069	11.129	9.744	10.100	3.177
1.800	1.800	13.860	139.165	11.490	10.041	10.400	3.368
1.900	1.900	14.915	154.059	11.851	10.329	10.700	3.559
2.000	2.000	16.000	169.760	12.211	10.610	11.000	3.751
2.100	2.100	17.115	186.283	12.572	10.884	11.300	3.943
2.200	2.200	18.260	203.638	12.932	11.152	11.600	4.134
2.300	2.300	19.435	221.838	13.293	11.414	11.900	4.327
2.400	2.400	20.640	240.896	13.653	11.671	12.200	4.519
2.500	2.500	21.875	260.824	14.014	11.923	12.500	4.711
2.600	2.600	23.140	281.634	14.374	12.171	12.800	4.904
2.700	2.700	24.435	303.338	14.735	12.414	13.100	5.097
2.800	2.800	25.760	325.949	15.096	12.653	13.400	5.290
2.900	2.900	27.115	349.480	15.456	12.889	13.700	5.484

Q = 65
A = 1.11

5FT 1.27%

MANNING'S N = 0.015 SLOPE = 0.013

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	3.0	3.0	9.5	0.0			
2.0	4.5	0.0	4.0	14.0	3.0			

WSEL FT.	DEPTH INC	FLOW AREA SQ. FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID PLUS OBSTRUCTIONS	TOTAL ENERGY (FT)
0.100	0.100	0.515	1.206	5.361	2.342	5.300	0.185
0.200	0.200	1.060	3.846	5.721	3.628	5.600	0.405
0.300	0.300	1.635	7.603	6.082	4.650	5.900	0.636
0.400	0.400	2.240	12.366	6.442	5.520	6.200	0.874
0.500	0.500	2.875	18.076	6.803	6.287	6.500	1.115
0.600	0.600	3.540	24.703	7.163	6.978	6.800	1.357
0.700	0.700	4.235	32.232	7.524	7.611	7.100	1.601
0.800	0.800	4.960	40.655	7.884	8.197	7.400	1.845
0.900	0.900	5.715	49.972	8.245	8.744	7.700	2.089
1.000	1.000	6.500	60.187	8.606	9.259	8.000	2.334
1.100	1.100	7.315	71.305	8.966	9.748	8.300	2.578
1.200	1.200	8.160	83.335	9.327	10.213	8.600	2.822
1.300	1.300	9.035	96.289	9.687	10.657	8.900	3.067
1.400	1.400	9.940	110.178	10.048	11.084	9.200	3.311
1.500	1.500	10.875	125.014	10.408	11.496	9.500	3.555
1.600	1.600	11.840	140.811	10.769	11.893	9.800	3.800
1.700	1.700	12.835	157.582	11.129	12.278	10.100	4.045
1.800	1.800	13.860	175.343	11.490	12.651	10.400	4.289
1.900	1.900	14.915	194.108	11.851	13.014	10.700	4.534
2.000	2.000	16.000	213.891	12.211	13.368	11.000	4.780
2.100	2.100	17.115	234.709	12.572	13.714	11.300	5.025
2.200	2.200	18.260	256.576	12.932	14.051	11.600	5.271
2.300	2.300	19.435	279.507	13.293	14.382	11.900	5.517
2.400	2.400	20.640	303.520	13.653	14.705	12.200	5.764
2.500	2.500	21.875	328.628	14.014	15.023	12.500	6.010
2.600	2.600	23.140	354.847	14.374	15.335	12.800	6.258
2.700	2.700	24.435	382.194	14.735	15.641	13.100	6.505
2.800	2.800	25.760	410.683	15.096	15.943	13.400	6.753
2.900	2.900	27.115	440.331	15.456	16.239	13.700	7.002

60 60

1.04

BB 7

MANNING'S N = 0.015 SLOPE = 0.050

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	3.0	3.0	9.5	0.0			
2.0	4.5	0.0	4.0	14.0	3.0			

WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID	TOTAL
INC	AREA	RATE	PER	VEL	PLUS	ENERGY	
FT.	SQ.FT.	(CFS)	(FT)	(FPS)	OBSTRUCTIONS	(FT)	

0.100	0.100	0.515	2.393	5.361	4.647	5.300	0.436
0.200	0.200	1.060	7.631	5.721	7.199	5.600	1.006
0.300	0.300	1.635	15.087	6.082	9.227	5.900	1.624
0.400	0.400	2.240	24.536	6.442	10.954	6.200	2.266
0.500	0.500	2.875	35.866	6.803	12.475	6.500	2.921
0.600	0.600	3.540	49.016	7.163	13.846	6.800	3.582
0.700	0.700	4.235	63.955	7.524	15.101	7.100	4.247
0.800	0.800	4.960	80.668	7.884	16.264	7.400	4.914
0.900	0.900	5.715	99.155	8.245	17.350	7.700	5.582
1.000	1.000	6.500	119.421	8.606	18.373	8.000	6.250
1.100	1.100	7.315	141.482	8.966	19.341	8.300	6.919
1.200	1.200	8.160	165.353	9.327	20.264	8.600	7.587
1.300	1.300	9.035	191.056	9.687	21.146	8.900	8.255
1.400	1.400	9.940	218.613	10.048	21.993	9.200	8.924
1.500	1.500	10.875	248.051	10.408	22.809	9.500	9.592
1.600	1.600	11.840	279.395	10.769	23.598	9.800	10.261
1.700	1.700	12.835	312.673	11.129	24.361	10.100	10.931
1.800	1.800	13.860	347.914	11.490	25.102	10.400	11.601
1.900	1.900	14.915	385.146	11.851	25.823	10.700	12.272
2.000	2.000	16.000	424.401	12.211	26.525	11.000	12.943
2.100	2.100	17.115	465.707	12.572	27.210	11.300	13.616
2.200	2.200	18.260	509.095	12.932	27.880	11.600	14.290
2.300	2.300	19.435	554.596	13.293	28.536	11.900	14.966
2.400	2.400	20.640	602.240	13.653	29.178	12.200	15.642
2.500	2.500	21.875	652.059	14.014	29.808	12.500	16.320
2.600	2.600	23.140	704.084	14.374	30.427	12.800	17.000
2.700	2.700	24.435	758.345	14.735	31.035	13.100	17.681
2.800	2.800	25.760	814.873	15.096	31.633	13.400	18.364
2.900	2.900	27.115	873.699	15.456	32.222	13.700	19.049

Q = 65 cfs
d = 11

MANNING'S N = 0.015 SLOPE = 0.047

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	3.0	3.0	9.5	0.0			
2.0	4.5	0.0	4.0	14.0	3.0			

WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID	TOTAL
FT.	INC	AREA	RATE	PER	VEL	PLUS	ENERGY
		SQ.FT.	(CFS)	(FT)	(FPS)	OBSTRUCTIONS	(FT)

0.100	0.100	0.515	2.323	5.361	4.510	5.300	0.416
0.200	0.200	1.060	7.407	5.721	6.987	5.600	0.959
0.300	0.300	1.635	14.643	6.082	8.956	5.900	1.548
0.400	0.400	2.240	23.814	6.442	10.631	6.200	2.158
0.500	0.500	2.875	34.811	6.803	12.108	6.500	2.780
0.600	0.600	3.540	47.574	7.163	13.439	6.800	3.409
0.700	0.700	4.235	62.072	7.524	14.657	7.100	4.041
0.800	0.800	4.960	78.294	7.884	15.785	7.400	4.676
0.900	0.900	5.715	96.236	8.245	16.839	7.700	5.310
1.000	1.000	6.500	115.907	8.606	17.832	8.000	5.946
1.100	1.100	7.315	137.318	8.966	18.772	8.300	6.581
1.200	1.200	8.160	160.486	9.327	19.667	8.600	7.216
1.300	1.300	9.035	185.432	9.687	20.524	8.900	7.852
1.400	1.400	9.940	212.179	10.048	21.346	9.200	8.487
1.500	1.500	10.875	240.750	10.408	22.138	9.500	9.123
1.600	1.600	11.840	271.171	10.769	22.903	9.800	9.759
1.700	1.700	12.835	303.470	11.129	23.644	10.100	10.395
1.800	1.800	13.860	337.673	11.490	24.363	10.400	11.032
1.900	1.900	14.915	373.810	11.851	25.063	10.700	11.670
2.000	2.000	16.000	411.909	12.211	25.744	11.000	12.309
2.100	2.100	17.115	451.999	12.572	26.410	11.300	12.948
2.200	2.200	18.260	494.110	12.932	27.060	11.600	13.589
2.300	2.300	19.435	538.272	13.293	27.696	11.900	14.231
2.400	2.400	20.640	584.514	13.653	28.319	12.200	14.874
2.500	2.500	21.875	632.867	14.014	28.931	12.500	15.519
2.600	2.600	23.140	683.360	14.374	29.532	12.800	16.165
2.700	2.700	24.435	736.024	14.735	30.122	13.100	16.812
2.800	2.800	25.760	790.889	15.096	30.702	13.400	17.462
2.900	2.900	27.115	847.984	15.456	31.274	13.700	18.112

Q = 65
λ = 0.72

C-C 2

MANNING'S N = 0.015 SLOPE = 0.008

CROSS-SECTION

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	3.0	3.0	9.5	0.0			
2.0	4.5	0.0	4.0	14.0	3.0			

WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID	TOTAL	
INC	AREA	RATE	PER	VEL	PLUS	ENERGY		
FT.	SQ.FT.	(CFS)	(FT)	(FPS)	OBSTRUCTIONS	(FT)		
0.100	0.100	0.515	0.957	5.361	1.859	5.300	0.154	
0.200	0.200	1.060	3.053	5.721	2.880	5.600	0.329	
0.300	0.300	1.635	6.035	6.082	3.691	5.900	0.512	
0.400	0.400	2.240	9.814	6.442	4.381	6.200	0.699	
0.500	0.500	2.875	14.346	6.803	4.990	6.500	0.887	
0.600	0.600	3.540	19.607	7.163	5.539	6.800	1.077	
0.700	0.700	4.235	25.582	7.524	6.041	7.100	1.268	
0.800	0.800	4.960	32.267	7.884	6.505	7.400	1.458	
0.900	0.900	5.715	39.662	8.245	6.940	7.700	1.649	
1.000	1.000	6.500	47.769	8.606	7.349	8.000	1.840	
1.100	1.100	7.315	56.593	8.966	7.737	8.300	2.031	
1.200	1.200	8.160	66.141	9.327	8.106	8.600	2.222	Q100=65cfs D=1.19'
1.300	1.300	9.035	76.422	9.687	8.458	8.900	2.413	
1.400	1.400	9.940	87.445	10.048	8.797	9.200	2.604	
1.500	1.500	10.875	99.220	10.408	9.124	9.500	2.795	
1.600	1.600	11.840	111.758	10.769	9.439	9.800	2.986	
1.700	1.700	12.835	125.069	11.129	9.744	10.100	3.177	
1.800	1.800	13.860	139.165	11.490	10.041	10.400	3.368	
1.900	1.900	14.915	154.059	11.851	10.329	10.700	3.559	
2.000	2.000	16.000	169.760	12.211	10.610	11.000	3.751	
2.100	2.100	17.115	186.283	12.572	10.884	11.300	3.943	
2.200	2.200	18.260	203.638	12.932	11.152	11.600	4.134	
2.300	2.300	19.435	221.838	13.293	11.414	11.900	4.327	
2.400	2.400	20.640	240.896	13.653	11.671	12.200	4.519	
2.500	2.500	21.875	260.824	14.014	11.923	12.500	4.711	
2.600	2.600	23.140	281.634	14.374	12.171	12.800	4.904	
2.700	2.700	24.435	303.338	14.735	12.414	13.100	5.097	
2.800	2.800	25.760	325.949	15.096	12.653	13.400	5.290	
2.900	2.900	27.115	349.480	15.456	12.889	13.700	5.484	

MANNING'S N = 0.015 SLOPE = 0.032

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	3.0	3.0	9.5	0.0			
2.0	4.5	0.0	4.0	14.0	3.0			

WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID	TOTAL
INC	AREA	RATE	PER	VEL	PLUS	ENERGY	
FT.	SQ.FT.	(CFS)	(FT)	(FPS)	OBSTRUCTIONS	(FT)	

0.100	0.100	0.515	1.917	5.361	3.723	5.300	0.316
0.200	0.200	1.060	6.115	5.721	5.769	5.600	0.718
0.300	0.300	1.635	12.088	6.082	7.393	5.900	1.150
0.400	0.400	2.240	19.659	6.442	8.777	6.200	1.598
0.500	0.500	2.875	28.738	6.803	9.996	6.500	2.054
0.600	0.600	3.540	39.274	7.163	11.094	6.800	2.514
0.700	0.700	4.235	51.244	7.524	12.100	7.100	2.977
0.800	0.800	4.960	64.635	7.884	13.031	7.400	3.441
0.900	0.900	5.715	79.447	8.245	13.902	7.700	3.906
1.000	1.000	6.500	95.686	8.606	14.721	8.000	4.371
1.100	1.100	7.315	113.362	8.966	15.497	8.300	4.836
1.200	1.200	8.160	132.489	9.327	16.236	8.600	5.300
1.300	1.300	9.035	153.083	9.687	16.943	8.900	5.765
1.400	1.400	9.940	175.164	10.048	17.622	9.200	6.230
1.500	1.500	10.875	198.750	10.408	18.276	9.500	6.695
1.600	1.600	11.840	223.865	10.769	18.908	9.800	7.160
1.700	1.700	12.835	250.529	11.129	19.519	10.100	7.626
1.800	1.800	13.860	278.765	11.490	20.113	10.400	8.092
1.900	1.900	14.915	308.598	11.851	20.690	10.700	8.559
2.000	2.000	16.000	340.051	12.211	21.253	11.000	9.026
2.100	2.100	17.115	373.147	12.572	21.802	11.300	9.493
2.200	2.200	18.260	407.912	12.932	22.339	11.600	9.962
2.300	2.300	19.435	444.369	13.293	22.864	11.900	10.431
2.400	2.400	20.640	482.544	13.653	23.379	12.200	10.902
2.500	2.500	21.875	522.462	14.014	23.884	12.500	11.373
2.600	2.600	23.140	564.146	14.374	24.380	12.800	11.845
2.700	2.700	24.435	607.623	14.735	24.867	13.100	12.318
2.800	2.800	25.760	652.916	15.096	25.346	13.400	12.792
2.900	2.900	27.115	700.051	15.456	25.818	13.700	13.268

0-65
1-20

MANNING'S N = 0.015 SLOPE = 0.016

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	3.0	3.0	9.5	0.0			
2.0	4.5	0.0	4.0	14.0	3.0			

WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID	TOTAL
INC	AREA	RATE	PER	VEL	PLUS	ENERGY	
FT.	SQ.FT.	(CFS)	(FT)	(FPS)	OBSTRUCTIONS	(FT)	

0.100	0.100	0.515	1.354	5.361	2.629	5.300	0.207
0.200	0.200	1.060	4.317	5.721	4.073	5.600	0.458
0.300	0.300	1.635	8.534	6.082	5.220	5.900	0.724
0.400	0.400	2.240	13.880	6.442	6.196	6.200	0.997
0.500	0.500	2.875	20.289	6.803	7.057	6.500	1.275
0.600	0.600	3.540	27.728	7.163	7.833	6.800	1.554
0.700	0.700	4.235	36.178	7.524	8.543	7.100	1.835
0.800	0.800	4.960	45.633	7.884	9.200	7.400	2.117
0.900	0.900	5.715	56.090	8.245	9.815	7.700	2.398
1.000	1.000	6.500	67.555	8.606	10.393	8.000	2.680
1.100	1.100	7.315	80.034	8.966	10.941	8.300	2.962
1.200	1.200	8.160	93.538	9.327	11.463	8.600	3.244
1.300	1.300	9.035	108.077	9.687	11.962	8.900	3.526
1.400	1.400	9.940	123.666	10.048	12.441	9.200	3.808
1.500	1.500	10.875	140.319	10.408	12.903	9.500	4.090
1.600	1.600	11.840	158.050	10.769	13.349	9.800	4.372
1.700	1.700	12.835	176.874	11.129	13.781	10.100	4.654
1.800	1.800	13.860	196.810	11.490	14.200	10.400	4.936
1.900	1.900	14.915	217.872	11.851	14.608	10.700	5.219
2.000	2.000	16.000	240.077	12.211	15.005	11.000	5.502
2.100	2.100	17.115	263.443	12.572	15.393	11.300	5.785
2.200	2.200	18.260	287.987	12.932	15.771	11.600	6.069
2.300	2.300	19.435	313.727	13.293	16.142	11.900	6.353
2.400	2.400	20.640	340.679	13.653	16.506	12.200	6.638
2.500	2.500	21.875	368.860	14.014	16.862	12.500	6.923
2.600	2.600	23.140	398.290	14.374	17.212	12.800	7.208
2.700	2.700	24.435	428.984	14.735	17.556	13.100	7.494
2.800	2.800	25.760	460.962	15.096	17.894	13.400	7.781
2.900	2.900	27.115	494.239	15.456	18.228	13.700	8.068

Q = 45
1.518

MANNING'S N = 0.015 SLOPE = 0.023

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	3.0	3.0	9.5	0.0			
2.0	4.5	0.0	4.0	14.0	3.0			

WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID	TOTAL
FT.	INC	AREA	RATE	PER	VEL	PLUS	ENERGY
		SQ.FT.	(CFS)	(FT)	(FPS)	OBSTRUCTIONS	(FT)

0.100	0.100	0.515	1.620	5.361	3.145	5.300	0.254
0.200	0.200	1.060	5.165	5.721	4.872	5.600	0.569
0.300	0.300	1.635	10.210	6.082	6.245	5.900	0.907
0.400	0.400	2.240	16.605	6.442	7.413	6.200	1.255
0.500	0.500	2.875	24.273	6.803	8.443	6.500	1.609
0.600	0.600	3.540	33.172	7.163	9.371	6.800	1.966
0.700	0.700	4.235	43.282	7.524	10.220	7.100	2.325
0.800	0.800	4.960	54.593	7.884	11.007	7.400	2.684
0.900	0.900	5.715	67.104	8.245	11.742	7.700	3.044
1.000	1.000	6.500	80.819	8.606	12.434	8.000	3.405
1.100	1.100	7.315	95.749	8.966	13.089	8.300	3.765
1.200	1.200	8.160	111.904	9.327	13.714	8.600	4.125
1.300	1.300	9.035	129.298	9.687	14.311	8.900	4.485
1.400	1.400	9.940	147.948	10.048	14.884	9.200	4.846
1.500	1.500	10.875	167.870	10.408	15.436	9.500	5.206
1.600	1.600	11.840	189.082	10.769	15.970	9.800	5.567
1.700	1.700	12.835	211.604	11.129	16.486	10.100	5.928
1.800	1.800	13.860	235.453	11.490	16.988	10.400	6.289
1.900	1.900	14.915	260.650	11.851	17.476	10.700	6.650
2.000	2.000	16.000	287.216	12.211	17.951	11.000	7.012
2.100	2.100	17.115	315.170	12.572	18.415	11.300	7.374
2.200	2.200	18.260	344.533	12.932	18.868	11.600	7.737
2.300	2.300	19.435	375.327	13.293	19.312	11.900	8.101
2.400	2.400	20.640	407.570	13.653	19.747	12.200	8.465
2.500	2.500	21.875	441.286	14.014	20.173	12.500	8.830
2.600	2.600	23.140	476.494	14.374	20.592	12.800	9.195
2.700	2.700	24.435	513.215	14.735	21.003	13.100	9.561
2.800	2.800	25.760	551.471	15.096	21.408	13.400	9.928
2.900	2.900	27.115	591.282	15.456	21.806	13.700	10.296

Q = 672
J = .18

MANNING'S N = 0.015 SLOPE = 0.026

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	3.0	3.0	9.5	0.0			
2.0	4.5	0.0	4.0	14.0	3.0			

WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID	TOTAL
FT.	INC	AREA	RATE	PER	VEL	PLUS	ENERGY
	SQ.FT.	(CFS)	(FT)	(FPS)	OBSTRUCTIONS	(FT)	

0.100	0.100	0.515	1.726	5.361	3.351	5.300	0.275
0.200	0.200	1.060	5.503	5.721	5.192	5.600	0.619
0.300	0.300	1.635	10.879	6.082	6.654	5.900	0.989
0.400	0.400	2.240	17.693	6.442	7.899	6.200	1.370
0.500	0.500	2.875	25.863	6.803	8.996	6.500	1.759
0.600	0.600	3.540	35.346	7.163	9.985	6.800	2.151
0.700	0.700	4.235	46.118	7.524	10.890	7.100	2.545
0.800	0.800	4.960	58.171	7.884	11.728	7.400	2.939
0.900	0.900	5.715	71.501	8.245	12.511	7.700	3.335
1.000	1.000	6.500	86.116	8.606	13.249	8.000	3.730
1.100	1.100	7.315	102.024	8.966	13.947	8.300	4.126
1.200	1.200	8.160	119.238	9.327	14.612	8.600	4.521
1.300	1.300	9.035	137.772	9.687	15.249	8.900	4.917
1.400	1.400	9.940	157.644	10.048	15.860	9.200	5.312
1.500	1.500	10.875	178.872	10.408	16.448	9.500	5.708
1.600	1.600	11.840	201.474	10.769	17.016	9.800	6.104
1.700	1.700	12.835	225.472	11.129	17.567	10.100	6.500
1.800	1.800	13.860	250.884	11.490	18.101	10.400	6.896
1.900	1.900	14.915	277.733	11.851	18.621	10.700	7.293
2.000	2.000	16.000	306.040	12.211	19.127	11.000	7.691
2.100	2.100	17.115	335.826	12.572	19.622	11.300	8.088
2.200	2.200	18.260	367.113	12.932	20.105	11.600	8.487
2.300	2.300	19.435	399.925	13.293	20.578	11.900	8.886
2.400	2.400	20.640	434.282	13.653	21.041	12.200	9.286
2.500	2.500	21.875	470.207	14.014	21.495	12.500	9.687
2.600	2.600	23.140	507.722	14.374	21.941	12.800	10.088
2.700	2.700	24.435	546.850	14.735	22.380	13.100	10.490
2.800	2.800	25.760	587.613	15.096	22.811	13.400	10.893
2.900	2.900	27.115	630.034	15.456	23.236	13.700	11.298

Q = 600
d = 25

5FT 4.63%

MANNING'S N = 0.015 SLOPE = 0.046

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	3.0	3.0	9.5	0.0			
2.0	4.5	0.0	4.0	14.0	3.0			

WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID	TOTAL
FT.	INC	AREA	RATE	PER	VEL	PLUS	ENERGY
		SQ. FT.	(CFS)	(FT)	(FPS)	OBSTRUCTIONS	(FT)
0.100	0.100	0.515	2.303	5.361	4.471	5.300	0.411
0.200	0.200	1.060	7.344	5.721	6.928	5.600	0.947
0.300	0.300	1.635	14.518	6.082	8.879	5.900	1.526
0.400	0.400	2.240	23.611	6.442	10.540	6.200	2.128
0.500	0.500	2.875	34.514	6.803	12.005	6.500	2.742
0.600	0.600	3.540	47.168	7.163	13.324	6.800	3.361
0.700	0.700	4.235	61.543	7.524	14.532	7.100	3.985
0.800	0.800	4.960	77.626	7.884	15.650	7.400	4.610
0.900	0.900	5.715	95.415	8.245	16.696	7.700	5.236
1.000	1.000	6.500	114.918	8.606	17.680	8.000	5.862
1.100	1.100	7.315	136.146	8.966	18.612	8.300	6.488
1.200	1.200	8.160	159.117	9.327	19.500	8.600	7.114
1.300	1.300	9.035	183.851	9.687	20.349	8.900	7.740
1.400	1.400	9.940	210.369	10.048	21.164	9.200	8.367
1.500	1.500	10.875	238.697	10.408	21.949	9.500	8.993
1.600	1.600	11.840	268.859	10.769	22.708	9.800	9.620
1.700	1.700	12.835	300.882	11.129	23.442	10.100	10.248
1.800	1.800	13.860	334.793	11.490	24.155	10.400	10.875
1.900	1.900	14.915	370.622	11.851	24.849	10.700	11.504
2.000	2.000	16.000	408.396	12.211	25.525	11.000	12.134
2.100	2.100	17.115	448.144	12.572	26.184	11.300	12.764
2.200	2.200	18.260	489.896	12.932	26.829	11.600	13.396
2.300	2.300	19.435	533.681	13.293	27.460	11.900	14.028
2.400	2.400	20.640	579.529	13.653	28.078	12.200	14.662
2.500	2.500	21.875	627.469	14.014	28.684	12.500	15.298
2.600	2.600	23.140	677.532	14.374	29.280	12.800	15.934
2.700	2.700	24.435	729.747	14.735	29.865	13.100	16.573
2.800	2.800	25.760	784.143	15.096	30.440	13.400	17.213
2.900	2.900	27.115	840.751	15.456	31.007	13.700	17.854

Q. 65

2. 12

5FT 1.80%

MANNING'S N = 0.015 SLOPE = 0.018

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	3.0	3.0	9.5	0.0			
2.0	4.5	0.0	4.0	14.0	3.0			

WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID	TOTAL
FT.	INC	AREA	RATE	PER	VEL	PLUS	ENERGY
		SQ. FT.	(CFS)	(FT)	(FPS)	OBSTRUCTIONS	(FT)
0.100	0.100	0.515	1.436	5.361	2.788	5.300	0.221
0.200	0.200	1.060	4.579	5.721	4.320	5.600	0.490
0.300	0.300	1.635	9.052	6.082	5.536	5.900	0.777
0.400	0.400	2.240	14.722	6.442	6.572	6.200	1.072
0.500	0.500	2.875	21.520	6.803	7.485	6.500	1.371
0.600	0.600	3.540	29.410	7.163	8.308	6.800	1.674
0.700	0.700	4.235	38.373	7.524	9.061	7.100	1.977
0.800	0.800	4.960	48.401	7.884	9.758	7.400	2.281
0.900	0.900	5.715	59.493	8.245	10.410	7.700	2.586
1.000	1.000	6.500	71.653	8.606	11.024	8.000	2.890
1.100	1.100	7.315	84.889	8.966	11.605	8.300	3.195
1.200	1.200	8.160	99.212	9.327	12.158	8.600	3.499
1.300	1.300	9.035	114.633	9.687	12.688	8.900	3.804
1.400	1.400	9.940	131.168	10.048	13.196	9.200	4.108
1.500	1.500	10.875	148.831	10.408	13.686	9.500	4.413
1.600	1.600	11.840	167.637	10.769	14.159	9.800	4.718
1.700	1.700	12.835	187.604	11.129	14.617	10.100	5.023
1.800	1.800	13.860	208.748	11.490	15.061	10.400	5.328
1.900	1.900	14.915	231.088	11.851	15.494	10.700	5.634
2.000	2.000	16.000	254.640	12.211	15.915	11.000	5.940
2.100	2.100	17.115	279.424	12.572	16.326	11.300	6.246
2.200	2.200	18.260	305.457	12.932	16.728	11.600	6.553
2.300	2.300	19.435	332.757	13.293	17.122	11.900	6.860
2.400	2.400	20.640	361.344	13.653	17.507	12.200	7.167
2.500	2.500	21.875	391.236	14.014	17.885	12.500	7.475
2.600	2.600	23.140	422.450	14.374	18.256	12.800	7.784
2.700	2.700	24.435	455.007	14.735	18.621	13.100	8.093
2.800	2.800	25.760	488.924	15.096	18.980	13.400	8.403
2.900	2.900	27.115	524.220	15.456	19.333	13.700	8.714

Q-45
1.15

5ft 5.0%

MANNING'S N = 0.015 SLOPE = 0.050

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	3.0	3.0	9.5	0.0			
2.0	4.5	0.0	4.0	14.0	3.0			

WSEL FT.	DEPTH INC	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID PLUS OBSTRUCTIONS	TOTAL ENERGY (FT)
0.100	0.100	0.515	2.393	5.361	4.647	5.300	0.436
0.200	0.200	1.060	7.631	5.721	7.199	5.600	1.006
0.300	0.300	1.635	15.087	6.082	9.227	5.900	1.624
0.400	0.400	2.240	24.536	6.442	10.954	6.200	2.266
0.500	0.500	2.875	35.866	6.803	12.475	6.500	2.921
0.600	0.600	3.540	49.016	7.163	13.846	6.800	3.582
0.700	0.700	4.235	63.955	7.524	15.101	7.100	4.247
0.800	0.800	4.960	80.668	7.884	16.264	7.400	4.914
0.900	0.900	5.715	99.155	8.245	17.350	7.700	5.582
1.000	1.000	6.500	119.421	8.606	18.373	8.000	6.250
1.100	1.100	7.315	141.482	8.966	19.341	8.300	6.919
1.200	1.200	8.160	165.353	9.327	20.264	8.600	7.587
1.300	1.300	9.035	191.056	9.687	21.146	8.900	8.255
1.400	1.400	9.940	218.613	10.048	21.993	9.200	8.924
1.500	1.500	10.875	248.051	10.408	22.809	9.500	9.592
1.600	1.600	11.840	279.395	10.769	23.598	9.800	10.261
1.700	1.700	12.835	312.673	11.129	24.361	10.100	10.931
1.800	1.800	13.860	347.914	11.490	25.102	10.400	11.601
1.900	1.900	14.915	385.146	11.851	25.823	10.700	12.272
2.000	2.000	16.000	424.401	12.211	26.525	11.000	12.943
2.100	2.100	17.115	465.707	12.572	27.210	11.300	13.616
2.200	2.200	18.260	509.095	12.932	27.880	11.600	14.290
2.300	2.300	19.435	554.596	13.293	28.536	11.900	14.966
2.400	2.400	20.640	602.240	13.653	29.178	12.200	15.642
2.500	2.500	21.875	652.059	14.014	29.808	12.500	16.320
2.600	2.600	23.140	704.084	14.374	30.427	12.800	17.000
2.700	2.700	24.435	758.345	14.735	31.035	13.100	17.681
2.800	2.800	25.760	814.873	15.096	31.633	13.400	18.364
2.900	2.900	27.115	873.699	15.456	32.222	13.700	19.049

Q-1545
1-71

20ft 5.0%

MANNING'S N = 0.013 SLOPE = 0.050

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	2.2	3.0	10.0	0.0	5.0	20.0	2.2
2.0	0.1	0.2	4.0	19.9	0.2			

WSEL FT.	DEPTH INC	FLOW AREA SQ. FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID PLUS OBSTRUCTIONS	TOTAL ENERGY (FT)
0.100	0.100	0.495	1.717	9.902	3.469	9.900	0.287
0.200	0.200	1.980	10.902	19.804	5.506	19.800	0.672
0.300	0.300	3.961	34.387	20.004	8.683	19.810	1.473
0.400	0.400	5.942	67.166	20.205	11.304	19.820	2.387
0.500	0.500	7.925	107.818	20.405	13.606	19.830	3.379
0.600	0.600	9.908	155.437	20.605	15.688	19.840	4.428
0.700	0.700	11.893	209.363	20.805	17.605	19.850	5.521
0.800	0.800	13.878	269.081	21.006	19.389	19.860	6.647
0.900	0.900	15.865	334.171	21.206	21.064	19.870	7.801
1.000	1.000	17.852	404.279	21.406	22.646	19.880	8.977
1.100	1.100	19.841	479.102	21.606	24.148	19.890	10.170
1.200	1.200	21.830	558.374	21.807	25.578	19.900	11.376
1.300	1.300	23.821	641.861	22.007	26.946	19.910	12.593
1.400	1.400	25.812	729.350	22.207	28.256	19.920	13.819
1.500	1.500	27.805	820.653	22.407	29.515	19.930	15.050
1.600	1.600	29.798	915.595	22.608	30.727	19.940	16.285
1.700	1.700	31.793	1014.019	22.808	31.895	19.950	17.523
1.800	1.800	33.788	1115.779	23.008	33.023	19.960	18.762
1.900	1.900	35.785	1220.740	23.208	34.114	19.970	20.001
2.000	2.000	37.782	1328.778	23.409	35.170	19.980	21.239
2.100	2.100	39.781	1439.776	23.609	36.193	19.990	22.475

Check 65 ft
d = 37

20ft 0.6%.txt

MANNING'S N = 0.013 SLOPE = 0.006

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	2.2	3.0	10.0	0.0	5.0	20.0	2.2
2.0	0.1	0.2	4.0	19.9	0.2			

WSEL FT.	DEPTH INC	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID PLUS OBSTRUCTIONS	TOTAL ENERGY (FT)
0.100	0.100	0.495	0.595	9.902	1.202	9.900	0.122
0.200	0.200	1.980	3.777	19.804	1.907	19.800	0.257
0.300	0.300	3.961	11.912	20.004	3.008	19.810	0.441
0.400	0.400	5.942	23.267	20.205	3.916	19.820	0.638
0.500	0.500	7.925	37.349	20.405	4.713	19.830	0.846
0.600	0.600	9.908	53.845	20.605	5.434	19.840	1.059
0.700	0.700	11.893	72.525	20.805	6.098	19.850	1.278
0.800	0.800	13.878	93.212	21.006	6.717	19.860	1.502
0.900	0.900	15.865	115.760	21.206	7.297	19.870	1.728
1.000	1.000	17.852	140.046	21.406	7.845	19.880	1.957
1.100	1.100	19.841	165.966	21.606	8.365	19.890	2.188
1.200	1.200	21.830	193.427	21.807	8.861	19.900	2.421
1.300	1.300	23.821	222.347	22.007	9.334	19.910	2.655
1.400	1.400	25.812	252.654	22.207	9.788	19.920	2.890
1.500	1.500	27.805	284.282	22.407	10.224	19.930	3.126
1.600	1.600	29.798	317.171	22.608	10.644	19.940	3.362
1.700	1.700	31.793	351.267	22.808	11.049	19.950	3.599
1.800	1.800	33.788	386.517	23.008	11.439	19.960	3.835
1.900	1.900	35.785	422.877	23.208	11.817	19.970	4.072
2.000	2.000	37.782	460.302	23.409	12.183	19.980	4.309
2.100	2.100	39.781	498.753	23.609	12.538	19.990	4.545

Q100=6.4
c=.66

EXHIBITS

EXHIBIT 1: BASIN MAP

EXHIBIT 2: GRADING PLAN

EXHIBIT 3: ORTHO EXHIBIT

EXHIBIT 1
BASIN MAP

EXHIBIT 2
GRADING PLAN

EXHIBIT 3
ORTHO EXHIBIT

Bohannon Huston

Albuquerque

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

voice: 505.823.1000
facsimile: 505.798.7988
toll free: 800.877.5332

Las Cruces

425 S. Telshor Blvd.
Suite C-103
Las Cruces, NM
88011-8237

voice: 575.532.8670
facsimile: 575.532.8680

Denver

Meridian One
9785 Maroon Circle
Suite 140
Englewood, CO
80112-5928

voice: 303.799.5103
facsimile: 303.799.5104
toll free: 877.799.5103

www.bhinc.com





