ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates

Åsa Weber <asaw@iacivil.com>

H9/D022 Stormcloud Subdivision - Supplemental Info. Landscape Buffer Swale Volume Calcs

1 message

Åsa Weber <asaw@iacivil.com> Wed, Dec 14, 2016 at 3:55 PM
To: "Abiel X. Carrillo" <acarrillo@cabq.gov>, PLNDRS@cabq.gov

Hi Abiel,

Per our phone conversation yesterday, I'm attaching volume calcs for the landscape buffer swales.

We resubmitted the g&d plan on 4/7/2015 and it was approved on 5/6/15. DRC plans will be resubmitted sometime early next year because plans were approved more than a year ago.

We will submit a hard copy of the Supplemental Info. tomorrow.

Thank you.

Åsa Nilsson-Weber, P.E.
Principal / Vice President
Isaacson & Arfman, P.A.
128 Monroe St. N.E.
Albuquerque, NM 87108
Phone: (505)266-1688
asaw@iacivil.com

H9-D022 - STORMCLOUD UNIT 5 First Flush Supplemental Information.pdf
308K

RECEIVED
DEC 15 2016
LAND DEVELOPMENT SECTION

For info ONLY

Ac

to show compliance w/ First Flush

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 09/2015)

Project Title: Stormcloud Unit 5 Building Permit # _____ City Drainage #: H9/D022

DRB#: _____ EPC#: _____ Work Order#: _____

Legal Description: Bulk Land Plat of Tracts A, B, & C, Stormcloud Subdivsion

City Address: _____

Engineering Firm: Isaacson & Arfman, P.A. Contact: Asa Nilsson-Weber

Address: 128 Monroe Street NE - Albuquerque, NM 87108

Phone#: (505) 268-8828 Fax#: _____ E-mail: asaw@iacivil.com

Owner: Western Albuquerque Land Holdings, LLC -- c/o Garrett Development Corporation Contact: Jeff Garrett

Address: 6900 East Camelback Road, Suite 607 - Scottsdale, AZ 85251

Phone# (480) 970-4002 Fax#. _____ E-mail: _____

Architect: _____ Contact: _____

Address: _____

Phone# _____ Fax# _____ E-mail: _____

Other Contact: _____ Contact: _____

Address: _____

Phone# _____ Fax#: _____ E-mail: _____

Check all that Apply

DEPARTMENT:

X HYDROLOGY/ DRAINAGE

____ TRAFFIC/ TRANSPORTATION

____ MS4/ EROSION & SEDIMENT CONTROL

TYPE OF SUBMITTAL:

____ ENGINEER/ ARCHITECT CERTIFICATION

____ CONCEPTUAL G & D PLAN

____ GRADING PLAN

____ DRAINAGE MASTER PLAN

____ DRAINAGE REPORT

____ CLOMR/LOMR

____ TRAFFIC CIRCULATION LAYOUT (TCL)

____ TRAFFIC IMPACT STUDY (TIS)

____ EROSION & SEDIMENT CONTROL PLAN (ESC)

X OTHER (SPECIFY) Supplemental Information
Landscape Buffer Swale Volume Calcs

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

____ BUILDING PERMIT APPROVAL

____ CERTIFICATE OF OCCUPANCY

____ PRELIMINARY PLAT APPROVAL

____ SITE PLAN FOR SUB'D APPROVAL

____ SITE PLAN FOR BLDG PERMIT APPROVAL

____ FINAL PLAT APPROVAL

____ SIA/ RELEASE OF FINANCIAL GUARANTEE

____ FOUNDATION PERMIT APPROVAL

____ GRADING PERMIT APPROVAL

____ SO-19 APPROVAL

____ PAVING PERMIT APPROVAL

____ GRADING/ PAD CERTIFICATION

____ WORK ORDER APPROVAL

____ CLOMR/LOMR

____ PRE-DESIGN MEETING

____ OTHER (SPECIFY) _____

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LAND DEVELOPMENT SECTION

IS THIS A RESUBMITTAL? ____ Yes ____ No

DATE SUBMITTED: December 14, 2016 By: Åsa Nilsson-Weber

COA STAFF ELECTRONIC SUBMITTAL RECEIVED ___

SUPPLEMENTAL INFORMATION FOR

STORM CLOUD SUBDIVISION, UNIT 5

AN 87-DWELLING UNIT SINGLE-DETACHED RESIDENTIAL SUBDIVISION

ALBUQUERQUE, NEW MEXICO

DECEMBER 14, 2016

BY

Åsa Nilsson-Weber 12/14/16

ÅSA M. NILSSON-WEBER
NEW MEXICO
17631
LICENSED PROFESSIONAL ENGINEER

RECEIVED
DEC 15 2016
LAND DEVELOPMENT SECTION

ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates

Thomas O. Isaacson, PE & LS
Fred C. Arfman, PE
Åsa Nilsson-Weber, PE

I&A Project No. 1822

Supplemental Information for

Stormcloud Subdivision, Unit 5 - H9-D022

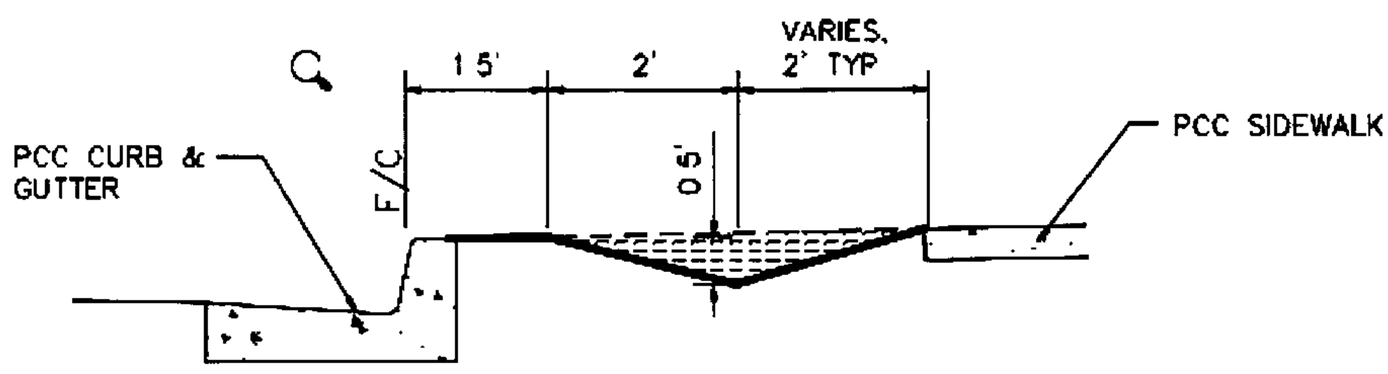
Landscape Buffer Swales – First Flush Volumes

The volume for the landscape buffer swales shown on the grading plan are calculated below.

Length of sidewalks	= 7,671 ft
Less 87 driveways @ 18' ea	= -1,566 ft
Total	= 6,105 ft

Area of swale = 4*0.5/2 = 1 sf; Use 0.5 sf to account for sloped swales

Volume = 6,105 ft * 0.5 sf = **3,053 cf**



WATER HARVESTING DETAIL

SCALE: 1"=2'

A 6" DEEP WATER HARVESTING AREA SHALL BE GRADED BETWEEN SIDEWALK AND CURB TO CAPTURE "FIRST FLUSH" WATER. GRADING SHALL TRANSITION TO ENSURE WATER METERS, LIGHT POLE BASES AND INLET BOXES ARE NOT LOCATED IN THE WATER HARVESTING AREAS. (NOT PART OF GRADING CERTIFICATION)

First Flush Water Harvesting Detail from
Grading & Drainage Plan stamped 4/7/15; approved 5/6/15

H09D022

Cherne, Curtis

From: Mazur, Lynn <lmazur@amafca.org>
Sent: Thursday, June 04, 2015 7:41 AM
To: Cherne, Curtis
Cc: Genny Donart
Subject: RE: mirehaven arroyo construction plans for stormcloud

Thanks, Curtis. I'll take a look at these comments. We always welcome another set of eyes on plans.

Lynn

From: Cherne, Curtis [mailto:CCherne@cabq.gov]
Sent: Wednesday, June 03, 2015 4:42 PM
To: Mazur, Lynn; Genny Donart (gennyd@iacivil.com)
Subject: mirehaven arroyo construction plans for stormcloud

Lynn/Genny,
Rita is busy so I volunteered to review the construction plans for the Mirehaven arroyo through Stormcloud.

General:
The improved arroyo is soft bottom upstream and downstream of this reach. Soft-bottomed arroyos allow for infiltration of low-flows. Why is a shotcrete channel being considered?

Detailed comments for proposed shotcrete section:

1. The plans show a velocity of 17 to 18 ft/sec. This will erode the transition dirt section (Station 22 area) shown on the plans with a few storms. Should the transition be wire-tied or grouted rip-rap?
2. Did the plan for the existing arroyo downstream from here account for the higher velocity of a shotcrete channel? Or did it assume soft bottom velocities?
3. At the upstream tie-in an 8-6" deep cut-off wall is proposed. Should the cut-off wall extend up the arroyo sides to prevent flows from getting behind the shotcrete?

At the end of the day this is an AMAFCA maintained facility. Comments are primarily provided to reduce AMAFCA maintenance of the facility.

Curtis

STORM CLOUD, UNIT 5

BASIN AREA AND LAND TREATMENT TABLE-- PROPOSED CONDITIONS

BASIN	AREA			LAND TREATMENT (%)				Q100, cfs	AREA 'D' (ac.)
	SF	AC.	SQ. MI.	A	B	C	D		
F1	128118	2.9412	0.00460	0	29	29	42	9.6	**1.24**
F2	100086	2.2977	0.00359	0	29	29	42	7.5	**0.97**
F3	65208	1.4970	0.00234	0	29	29	42	4.9	**0.63**
F4	97208	2.2316	0.00349	0	29	29	42	7.3	**0.94**
F5	41190	0.9456	0.00148	0	29	29	42	3.1	**0.40**
F6	45479	1.0441	0.00163	0	29	29	42	3.4	**0.44**
F7	83564	1.9184	0.00300	0	29	29	42	6.2	**0.81**
F8	34460	0.7911	0.00124	0	29	29	42	2.6	**0.33**
F9	96462	2.2145	0.00346	0	29	29	42	7.2	**0.93**
F10	155818	3.5771	0.00559	0	29	29	42	11.7	**1.50**
F11	28361	0.6511	0.00102	0	29	29	42	2.2	**0.27**
F12	33286	0.7641	0.00119	0	29	29	42	2.5	**0.32**
F13	10290	0.2362	0.00037	0	29	29	42	0.8	**0.10**
F14	12819	0.2943	0.00046	0	29	29	42	1	**0.12**
TOTAL	932349	21.4038	0.0334					70.0	**8.99**

CITY OF ALBUQUERQUE

May 6, 2015

ASA M. Nilsson-Weber, P.E.
Isaacson & Arfman, P.A.
128 Monroe St NE
Albuquerque, NM 87108

Re: Storm Cloud Subdivision, Units ~~4~~ & 5
Revised Grading and Drainage Plans
Engineer's Stamp Date 4/7/2015 (H9/D022)

Dear Mrs. Nilsson-Weber,

Based upon the information provided in your submittal received 4-8-15, the grading and Drainage Plan is approved for Final Plat and Grading Permit.

Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology. Engineer Certification per the DPM checklist will be required.

If you have any questions, you can contact me at 924-3695.

Sincerely,

Rita Harmon, P.E.
Senior Engineer, Planning Dept.
Development and Building Services

C: e-mail, file

PO Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

City of Albuquerque

Planning Department
Development & Building Services Division
DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(REV 02/2013)

Project Title: Stormcloud Subdivision Unit 5 Building Permit #: _____ City Drainage #: H9/D022
DRB#: 1005029 EPC#: _____ Work Order#: _____
Legal Description: Tracts B & J, The Crossing and Tract R, Stormcloud Subdivision Unit 3
City Address: _____

Engineering Firm: Isaacson & Arfman, P.A. Contact: Åsa Nilsson-Weber
Address: 128 Monroe Street NE - Albuquerque, NM 87108
Phone#: (505) 268-8828 Fax#: _____ E-mail: asaw@iacivil.com

Owner: Western Albuquerque Land Holdings, LLC Contact: _____
Address: _____
Phone#: _____ Fax#: _____ E-mail: _____

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

Surveyor: Surv-Tek, Inc. Contact: _____
Address: _____
Phone#: _____ Fax#: _____ E-mail: _____

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

TYPE OF SUBMITTAL:

____ DRAINAGE REPORT
____ DRAINAGE PLAN 1st SUBMITTAL
x DRAINAGE PLAN RESUBMITTAL
____ CONCEPTUAL G & D PLAN
x 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
x FINAL PLAT APPROVAL
____ CERTIFICATE OF OCCUPANCY (PERM)
____ CERTIFICATE OF OCCUPANCY (TCL TEMP)
____ FOUNDATION PERMIT APPROVAL
____ BUILDING PERMIT APPROVAL
____ GRADING PERMIT APPROVAL
____ PAVING PERMIT APPROVAL
x WORK ORDER APPROVAL
____ GRADING CERTIFICATION
____ SO-19 APPROVAL
____ ESC PERMIT APPROVAL
____ ESC CERT. ACCEPTANCE
____ OTHER (SPECIFY)

RECEIVED
APR 08 2015
LAND DEVELOPMENT SECTION

VS verified

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

DATE SUBMITTED: April 6, 2015 By: Åsa Nilsson-Weber
Isaacson & Afrman, P.A.

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

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

Asa Nilsson-Weber

From: Asa Nilsson-Weber <asaw@iacivil.com>
Sent: Tuesday, April 07, 2015 4:42 PM
To: Harmon Rita T.
Cc: Monica Ortiz (mortiz@cabq.gov)
Subject: Stormcloud Unit 5--Grading Plan Resubmittal
Attachments: 1822 GRD SET ANW SIGNED 04-07-15.pdf

Rita,

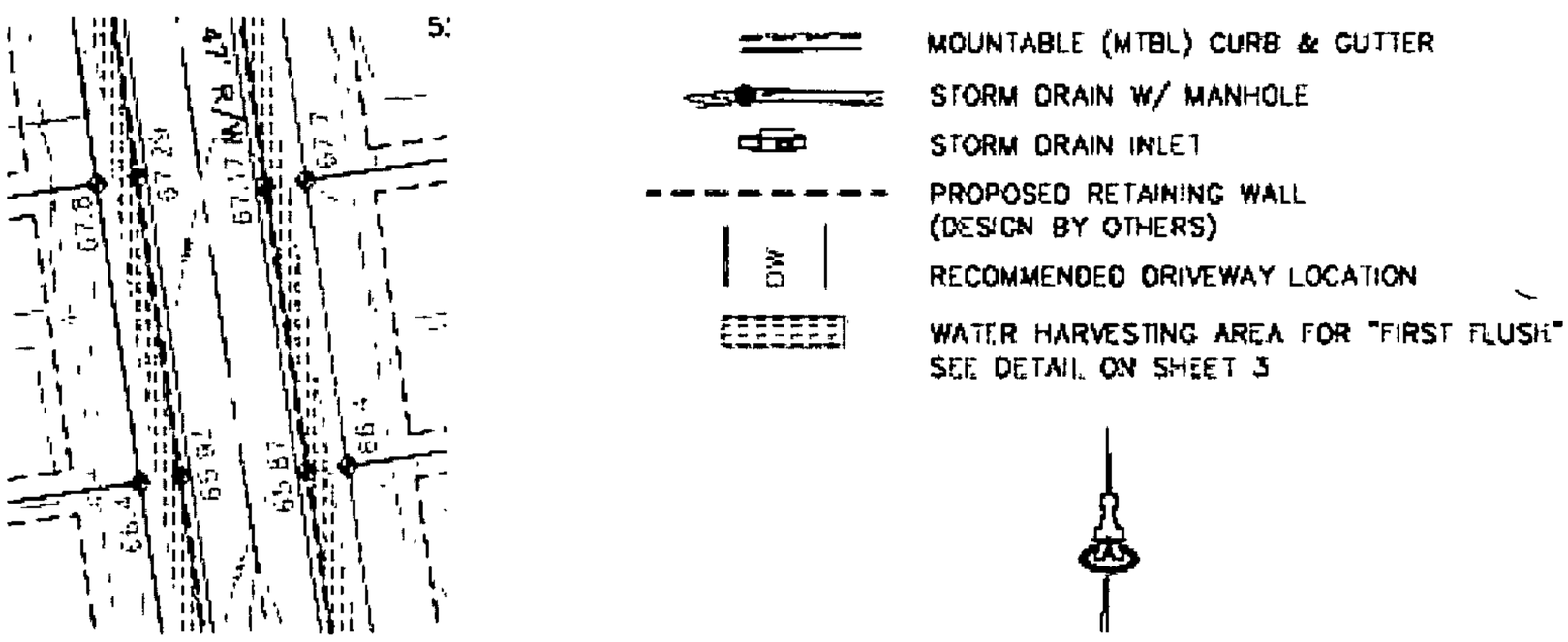
The attached grading & drainage plan is re-submitted because the project has been "dormant" for a few years. The plan was approved prior to the ESC plan and First Flush requirements took effect. The DRC plans will need to be resubmitted because it has been over a year since approval.

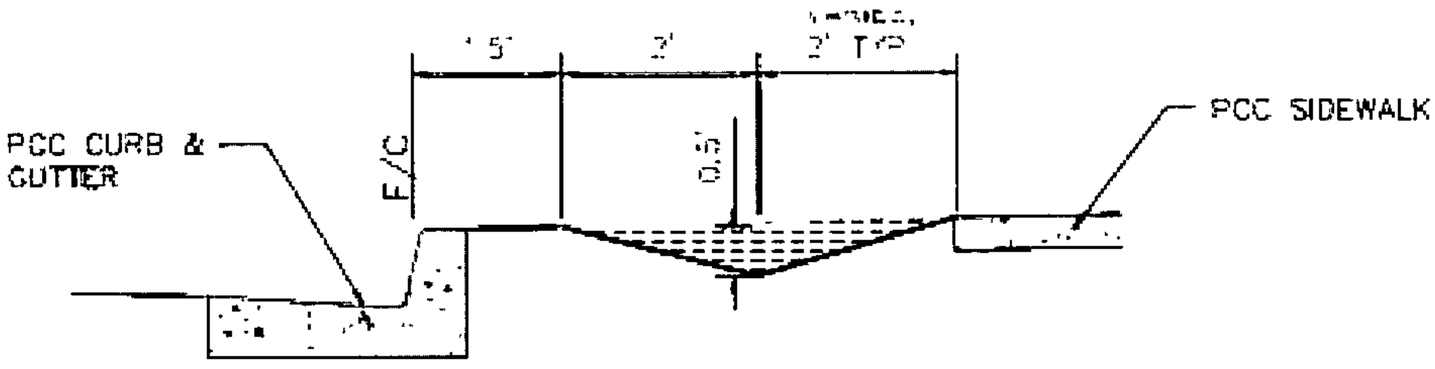
Curtis requested that we resubmit the g&d plan showing water harvesting areas between the sidewalk and the curb to "somewhat" address first flush requirements. He also required that we submit an ESC plan (to be prepared by Inspections Plus). The DRC plans will be updated to reflect the first flush water harvesting areas.

I added a hatch to the first flush areas on the plan and to the legend and a detail per below. I noted on the detail that the grading for the first flush areas will not be part of the grading cert. I will add this detail to the DRC plans.

Please let me know if you have any questions.

Thank you.





WATER HARVESTING DETAIL

SCALE: 1"=2'

A 6" DEEP WATER HARVESTING AREA SHALL BE GRADED BETWEEN SIDEWALK AND CURB TO CAPTURE "FIRST FLUSH" WATER. GRADING SHALL TRANSITION TO ENSURE WATER METERS, LIGHT POLE BASES AND INLET BOXES ARE NOT LOCATED IN THE WATER HARVESTING AREAS. (NOT PART OF GRADING CERTIFICATION)

Åsa Nilsson-Weber, P.E.
Principal / Vice President

Isaacson & Arfman, P.A.
Consulting Engineering Associates
128 Monroe St. N.E.
Albuquerque, NM 87108
Phone: (505)268-8828
Fax: (505)268-2632
asaw@iacivil.com

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Recipient acknowledges that any attached electronic files may not contain all of the information on the approved construction documents and are not intended to be relied upon as a replacement for the approved construction document(s). This information is provided to the user as a courtesy by I&A for this project only and shall not be used for any other purpose without the express written consent of Isaacson & Arfman, PA.

CITY OF ALBUQUERQUE
PLANNING DEPARTMENT

HYDROLOGY DEVELOPMENT SECTION
DEVELOPMENT REVIEW BOARD MEMO

DRB PROJECT NO: 1009289 **AGENDA ITEM NO: 4**

SUBJECT:

Plat Approval

ENGINEERING COMMENTS:

Hydrology has no objection to the plat, however, the typo in general note 3 "Albuquerquem", should probably be fixed.

RESOLUTION/COMMENTS:

SIGNED:

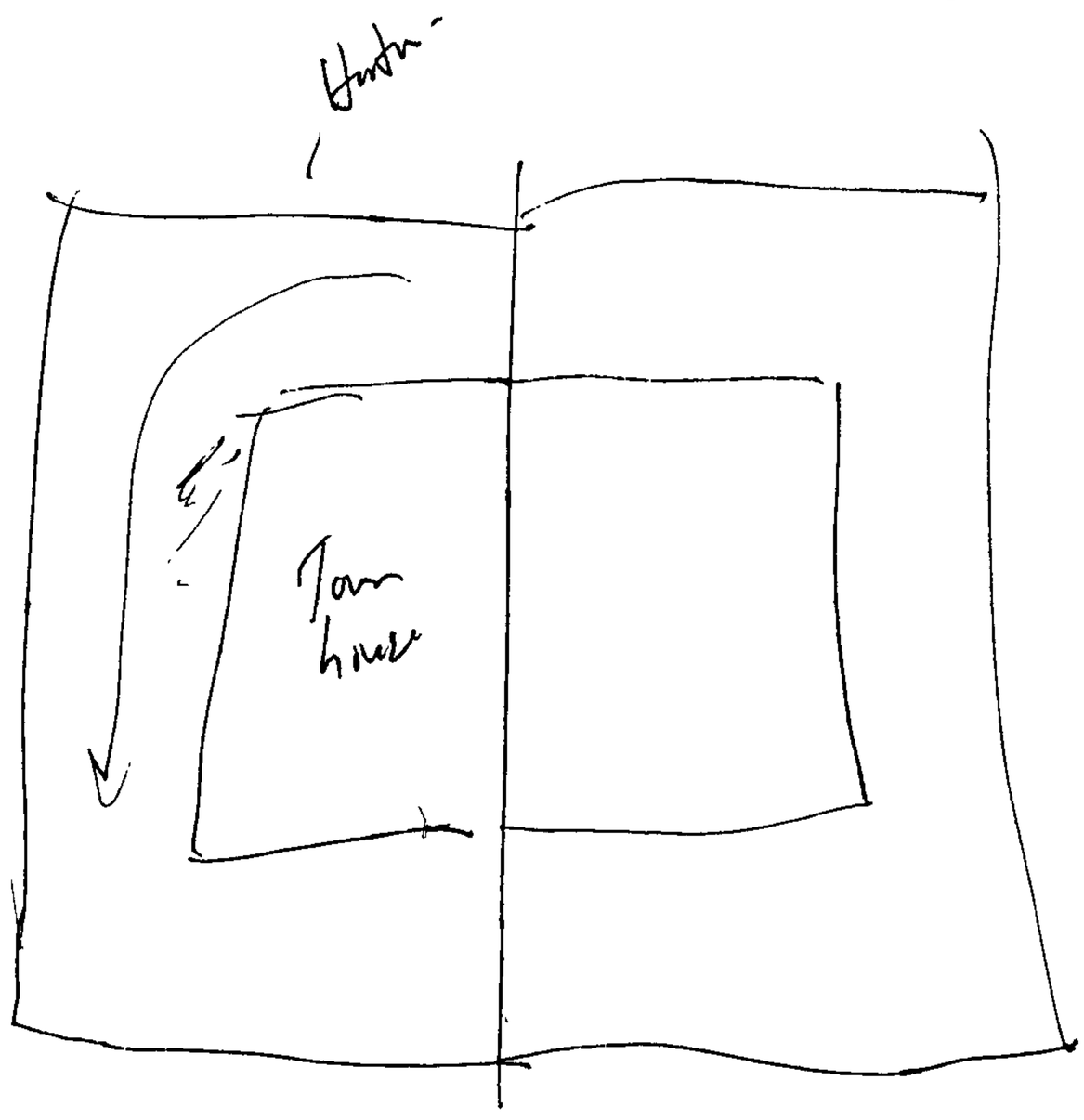
Curtis Cherne
Hydrology Section
City Engineer Designee
AMAFCA Designee
924-3986

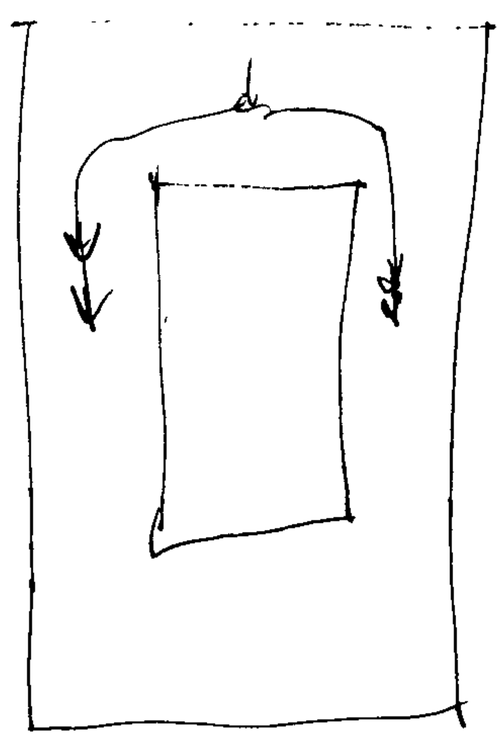
DATE: 1-30-13

Conversation at Town Patton concerning changing lots for from single family residential ~~[illegible]~~ to

= Townhouse units — townhomes on the grading.

Cut a chunk next 2nd





CITY OF ALBUQUERQUE

April 12, 2012

ASA M. Nilsson-Weber, P.E.
Isaacson & Arfman, P.A.
128 Monroe St NE
Albuquerque, NM 87108

Re: Storm Cloud Subdivision, Units 4 & 5
Drainage Report
Engineer's Stamp Date 3/26/2012 (H9/D022)

Dear Mrs. Nilsson-Weber,

Based upon the information provided in your submittal received 3-27-12, the grading and Drainage Plan is approved for Preliminary Plat and Grading Permit.

This project requires a National Pollutant Discharge Elimination System (NPDES) permit for storm water discharge for disturbing one acre or more and a Topsoil Disturbance Permit for disturbing ¾ of an acre or more. Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology. Engineer Certification per the DPM checklist will be required.

Albuquerque's MS4 Permit became effective March 1st, 2012. Grading and Drainage Plans and Drainage Reports will have to comply with the requirements of the new permit (www.cabq.gov/Planning/landcoord/Hydrology.html).

If you have any questions, you can contact me at 924-3695.

Sincerely,

Shahab Biazar, P.E.
Senior Engineer, Planning Dept.
Development and Building Services

C: e-mail

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

DRAINA AND TRANSPORTATION INFORMATI SHEET
(Rev. 12/05)

PROJECT TITLE: Storm Cloud Units 4 & 5 ZONE MAP/DRG. FILE # H-9 D022
DRB#: 1005029 EPC#: _____ WORK ORDER#: _____

LEGAL DESCRIPTION: Tracts B & J, The Crossing
CITY ADDRESS: _____

ENGINEERING FIRM: ISAACSON & ARFMAN, PA CONTACT: Åsa Nilsson-Weber
ADDRESS: 128 MONROE NE PHONE: 268-8828
CITY, STATE: ALBUQUERQUE, NM ZIP CODE: 87108

OWNER: Western Albuq. Land Holdings c/o Garrett Dev. Co. CONTACT: Jeff Garrett
ADDRESS: 3131 E. Camelback Rd, Ste 200 PHONE: _____
CITY, STATE: Phoenix, AZ ZIP CODE: 85016

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

SURVEYOR: SurvTek, Inc. CONTACT: Russ Hugg
ADDRESS: _____ PHONE: _____
CITY, STATE: Albuq. NM ZIP CODE: _____

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

TYPE OF SUBMITTAL:
- X DRAINAGE REPORT
- ___ DRAINAGE PLAN 1st SUBMITTAL
- ___ DRAINAGE PLAN RESUBMITTAL
- ___ CONCEPTUAL G & D PLAN
- X GRADING PLAN
- ___ EROSION CONTROL PLAN
- ___ ENGINEER'S CERT (HYDROLOGY)
- ___ CLOMR/LOMR
- ___ TRAFFIC CIRCULATION LAYOUT
- ___ ENGINEER/ARCHITECT CERT (TCL)
- ___ ENGINEER/ARCHITECT CERT (DRB S.P.)
- ___ ENGINEER/ARCHITECT CERT (AA)
- X OTHER (SPECIFY) supplemental/ revised information for Drainage Report.

CHECK TYPE OF APPROVAL SOUGHT:
- ___ SIA/FINANCIAL GUARANTEE RELEASE
- X PRELIMINARY PLAT APPROVAL
- ___ S. DEV. PLAN FOR SUB'D APPROVAL
- ___ S. DEV. FOR BLDG. PERMIT APPROVAL
- ___ SECTOR PLAN APPROVAL
- ___ FINAL PLAT APPROVAL
- ___ FOUNDATION PERMIT APPROVAL
- ___ 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
- ___ NO
- ___ COPY PROVIDED

RECEIVED
MAR 2 2012
HYDROLOGY SECTION

SUBMITTED BY: Åsa Nilsson-Weber DATE: 3/26/2012
Isaacson & Arfman, P.A.

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 define 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.

CITY OF ALBUQUERQUE

March 27, 2013

Genevieve L. Donart, P.E.
Isaacson & Arfman, P.A.
128 Monroe St NE
Albuquerque, NM 87108

Re: Mirehaven Arroyo At Storm Cloud
Drainage Report, Engineer's Stamp Date 3/26/2013 (H9/D022)

Dear Mrs. Donart,

Based upon the information provided in your submittal received 3-26-13, the revised Drainage Report and Plans are approved for Work Order and Grading Permit.

This project requires a National Pollutant Discharge Elimination System (NPDES) permit for storm water discharge for disturbing one acre or more and a Topsoil Disturbance Permit for disturbing ¾ of an acre or more. Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology. Engineer Certification per the DPM checklist will be required.

If you have any questions, you can contact me at 924-3695.

Sincerely,

Shahab Biazar, P.E.
Senior Engineer, Planning Dept.
Development and Building Services

C: e-mail

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

Isaacson & Arfman, P.A. Consulting Engineering Associates

*Thomas O. Isaacson, PE (Ret.) & LS (Ret.) * Fred C. Arfman, PE * Åsa Nilsson-Weber, PE*

RECEIVED
MAR 27 2012
HYDROLOGY SECTION

March 26, 2012

Mr. Shahab Biazar, Senior Engineer
Planning Dept., Development and Building Services
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

RE: Storm Cloud Subdivision, Units 4 & 5--Drainage Report Submittal 2/10/12 (H9/D022)

Dear Mr. Biazar,

This letter is in reference to your comments for the referenced project dated 3/9/12 (attached). Please see below for responses to your comments.

1. *Show proposed Tierra Pintada Blvd. and grades on the plans.*
   Added per Bohannan Huston plans.

2. *Show proposed Tierra Pintada Blvd. 3-90" RCPs and grades on the plans.*
   Added per Bohannan Huston plans.

3. *Provide updated HEC-RAS analysis for the Mirehaven starting east of the 3-90" RCPs. Include an exhibit showing the proposed floodplain limits east of the culverts and the proposed WSEL/EGL along the Mirehaven Channel.*
   Plan & profile exhibits and HEC-RAS analysis are included in the Revised/Supplemental Calculations.

4. *Remove Mirehaven stationing from the grading plan and include them on a separate sheet with updated channel analysis.*
   Stationing was removed from grading plans. Plan & profile exhibits of the Mirehaven Arroyo are included in the Revised/Supplemental Calculations.

5. *Since the streets are on a slope top back of the sidewalk on one side of the sidewalk culverts will be lower. Therefore, you may have to lower the invert of the sidewalk culverts to insure the 0.67' head is provided.*
   Inverts of the sidewalk culverts are 0.67' below top of sidewalk at the upstream end.

6. *Appendix E, Unit 4, Inlets 4 and 5 should say 5 & 6 to match the inlet numbers on the Basin Exhibit.*
   The sump inlet calculation sheet for Unit 4 showing corrected inlet numbers is included in the Revised/Supplemental Calculations.

7. *Inlets 5, 6 & 7 under Unit 5, are designed to be in swamp condition. Please make sure that all three inlets are built with the same top of grate elevation and 0.67' head is provided. The runoff should not overflow to the east. The high point in the street is at 58.67' and grate elevation is at 58.04'.*
   The high point elevation is at 58.71' per profile exhibit of Camino del Venado included in Revised/Supplemental Calculations. Inlets 5 & 6, both double-grate inlets, will capture 41.3 cfs at a head of 0.67', and inlet 7 which has a higher top of grate elevation, will capture the remaining 2.6 cfs. Flows will not overflow to the east.

128 Monroe St. N.E. * Albuquerque, NM 87108 * (505) 268-8828 * Fax: (505) 268-2632 * www.iacivil.com

8. *Provide adequate water block (+/- 1') at the proposed entrances from the Tierra Pintada Boulevard.*
   Because of the grading constraints on this site, water blocks are not 1'. The flows were analyzed to ensure that no offsite flows from Tierra Pintada would enter the subdivision (but calculations were inadvertently not included in the Drainage Report previously submitted). A basin exhibit of the Tierra Pintada areas that contribute to flows at the entrances to Units 4 & 5 along with AHYMO calculations and sections at the entrances are included in the Revised/Supplemental Information. The entrance to Unit 4 (Monsoon Rd) is just north of the high point in Tierra Pintada, and the flow rate is 2.1 cfs at the entrance. The section shows a water depth of 0.11' at the Unit 4 entrance, and the water block is 0.21'-0.22'. At the entrance to Unit 5 (Watershed Ln), the flow rate is 10.8 cfs. The section shows a water depth of 0.22', and the water block is 0.48' at south end and 0.94' at north end. Therefore, flows in Tierra Pintada will not overtop the water blocks provided at the entrances.

9. *Include the lot numbers for Unit 4.*
   Included.

10. *Fix the text overlaps on the grading plans.*
    Fixed.

11. *Clearly show all the existing retaining walls, and label the retaining walls that will be removed.*
    Wall demolition plans showing existing retaining walls to be removed or to remain have been added.

12. *If the retaining wall will not be certified with the certification of the grading plan, the following note should be added to the plans: "The side and rear lot retaining walls will be constructed by home builders."*
    Retaining walls will be certified.

13. *Proposed legends for curb and gutters do not match the actual layout on the grading plans.*
    Fixed.

If you have question or additional comments, please call me at 268-8828 or email me at asaw@iacivil.com. Thank you.

Sincerely,
ISAACSON & ARFMAN P.A.

Åsa Nilsson-Weber

Åsa Nilsson-Weber, P.E.

Attachments

CITY OF ALBUQUERQUE

March 9, 2012

ASA M. Nilsson-Weber, P.E.
Isaacson & Arfman, P.A.
128 Monroe St NE
Albuquerque, NM 87108

Re: Storm Cloud Subdivision, Units 4 & 5
Drainage Report
Engineer's Stamp Date 2/10/2012 (H9/D022)

Dear Mrs. Nilsson-Weber,

Based upon the information provided in your submittal received 2/10/2012, the following comments have to be addressed prior to Preliminary Plat Approval:

- Show proposed Tierra Pintada Boulevard and grades on the plans.
- Show proposed 3-90" RCPs and grades on the plans.
- Provide updated HEC-RAS analysis for the Mirehaven starting east of the 3-90" RCPs. Include an exhibit showing the proposed floodplain limits east of the culverts and the proposed WSEL/EGL along the Mirehaven Channel.
- Remove Mirehaven Stationing from the grading plan and include them on a separate sheet with updated channel analysis.
- Since the streets are on a slope top back of the sidewalk on one side of the sidewalk culverts will be lower. Therefore, you may have to lower the invert of the sidewalk culverts to insure the 0.67' head is provided.
- Appendix E, Unit 4, Inlets 4 and 5 should say 5 & 6 to match the inlet numbers on the Basin Exhibit.
- Inlets 5, 6, & 7 under Unit 5, are designed to be in swamp condition. Please make sure that all three inlets are built with the same top of grate elevation and 0.67' head is provided. The runoff should not overflow to the east. The high point in the street is at 58.67', and grate elevation is at 58.04'.
- Provide adequate water block (+/- 1') at the proposed entrances from the Tierra Pintada Boulevard.
- Include the lot number for Unit 4.
- Show the existing 36" storm drain pipe on Summer Breeze Dr.
- Fix the text overlaps on the grading plans.
- Clearly show all the existing retaining walls, and label the retaining walls that will be removed.

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

- If the retaining wall will not be certified with the certification of the grading plan, the following not should be added to the plans: "The side and rear lot retaining walls will be constructed by home builders.
- Proposed legends for curb and gutters does not match what the actual layout on the grading plans.

If you have any questions, you can contact me at 924-3695.

Sincerely,

Shahab Biazar, P.E.
Senior Engineer, Planning Dept.
Development and Building Services

C: e-mail

REVISED/SUPPLEMENTAL INFORMATION FOR

DRAINAGE REPORT

FOR

STORM CLOUD SUBDIVISION, UNITS 4 & 5

A 241-DWELLING UNIT SINGLE-DETACHED RESIDENTIAL SUBDIVISION

ALBUQUERQUE, NEW MEXICO

MARCH 26, 2012

RECEIVED
MAR 27 2012
HYDROLOGY SECTION

BY

ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates

Thomas O. Isaacson, PE & LS
Fred C. Arfman, PE
Åsa Nilsson-Weber, PE

REVISED/SUPPLEMENTAL INFORMATION FOR

DRAINAGE REPORT

FOR

STORM CLOUD SUBDIVISION, UNITS 4 & 5

A 241-DWELLING UNIT SINGLE-DETACHED RESIDENTIAL SUBDIVISION

ALBUQUERQUE, NEW MEXICO
MARCH 26, 2012

Prepared by:

ISAACSON & ARFMAN, P.A.
128 Monroe Street NE
Albuquerque, NM 87108
(505) 268-8828

RECEIVED
MAR 27 2012
HYDROLOGY SECTION

ÅSA M. NILSSON-WEBER
NEW MEXICO
17631
LICENSED PROFESSIONAL ENGINEER

Åsa Nilsson-Weber 3-26-12

Åsa Nilsson-Weber, PE **Date**

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- AHYMO Calculations
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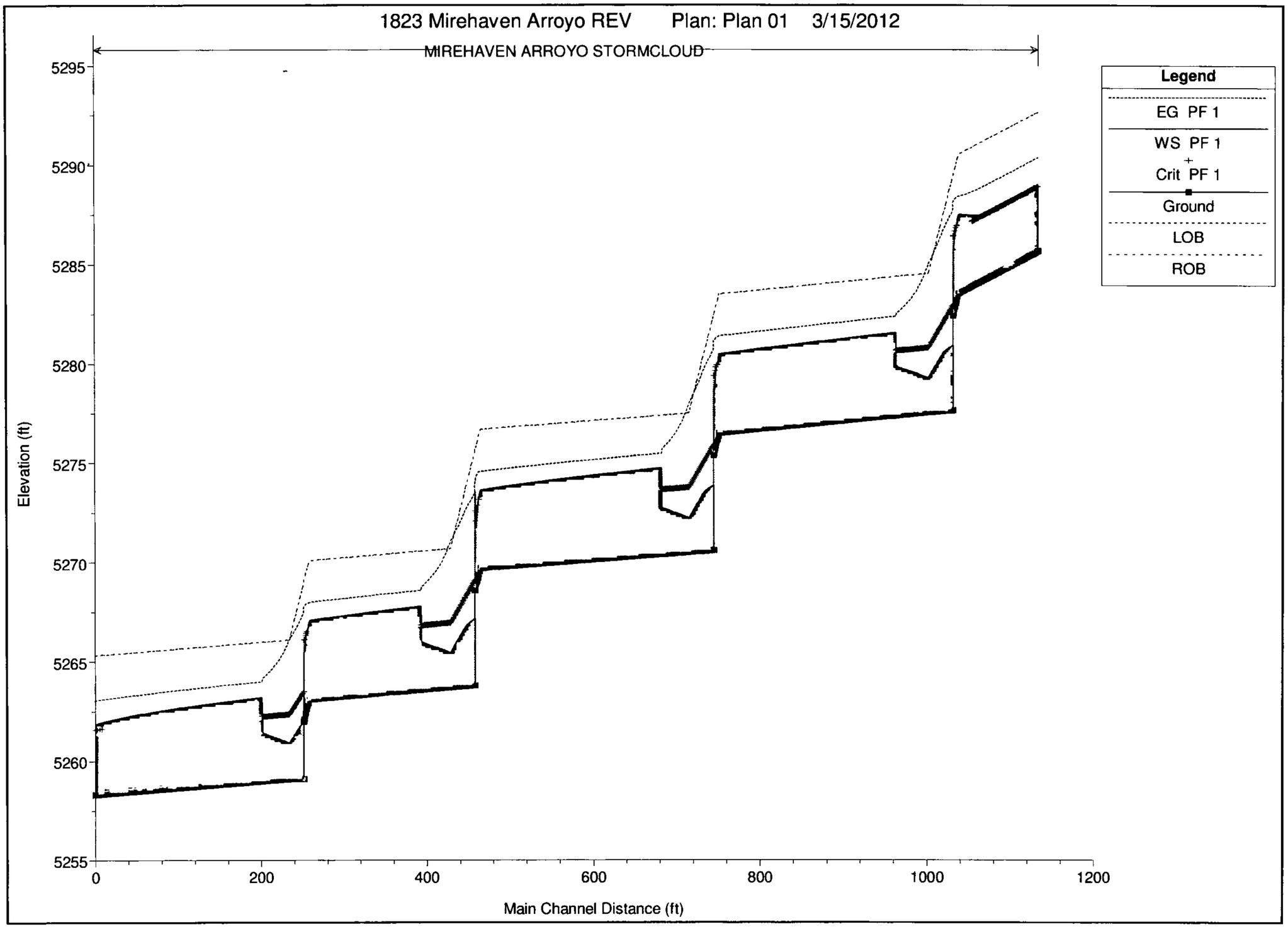
ATTACHMENT

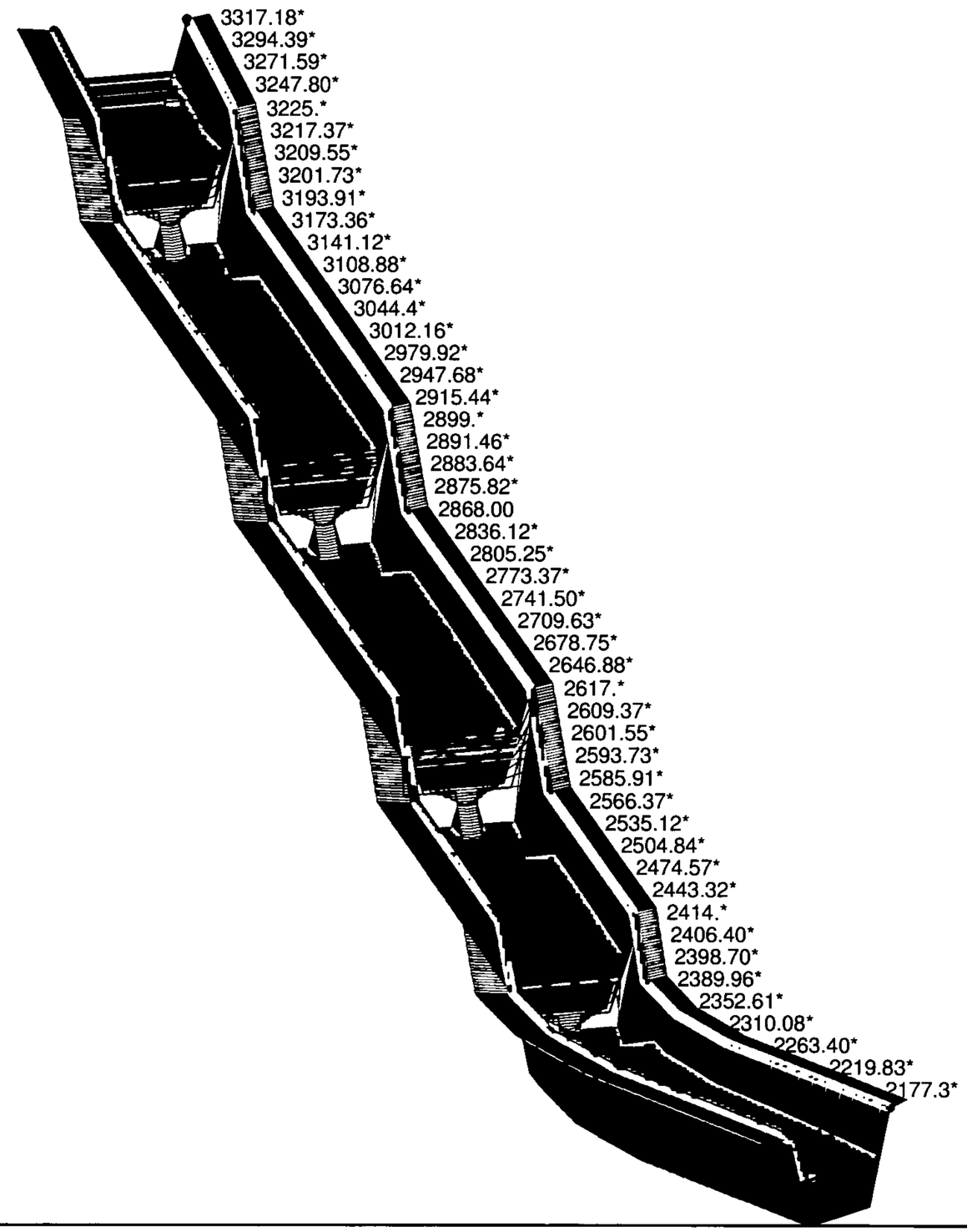
- Unit 4 Grading & Drainage and Retaining Wall Plans (9 Sheets)
- Unit 5 Grading & Drainage and Retaining Wall Plans (7 sheets)

I. MIREHAVEN ARROYO

HEC-RAS Calculations & Output Files
Plan & Profile Exhibits


1823 Mirehaven Arroyo REV Plan: Plan 01 3/15/2012
MIREHAVEN ARROYO STORMCLOUD
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
LOB
ROB
Elevation (ft)
5295
5290
5285
5280
5275
5270
5265
5260
5255
0
200
400
600
800
1000
1200
Main Channel Distance (ft)

1823 Mirehaven Arroyo REV Plan: Plan 01 3/19/2012



Legend

WS PF 1

Ground

Bank Sta

Ground

HEC-RAS Plan: wilson 1 River MIREHAVEN ARROYO Reach: STORMCLOUD Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	3318.18	PF 1	1495.00	5285.68	5288.94	2 87	5288.94	5290 38	0.009678	9 65	154.97	54 09	1 00
STORMCLOUD	3226.00	PF 1	1495 00	5283 59	5287 58	3.43		5288.48	0.004820	7.65	195.40	57.00	0.73
STORMCLOUD	3220.00	PF 1	1495 00	5282.59	5285 78	2 21	5286.47	5288 24	0 023479	12.59	118.72	53.82	1.49
STORMCLOUD	3219.34	PF 1	1495.00	5282.48	5285.75	2.20	5286.46	5288.22	0 023667	12.61	118.58	53.87	1.50
STORMCLOUD	3219.33	PF 1	1495 00	5277.68	5280 97	2 21	5282.98	5287 78	0.072404	20.94	71.38	32.31	2 48
STORMCLOUD	3190.00	PF 1	1495.00	5277.59	5279.33	1.62	5280 85	5285.08	0 081301	19.24	77 70	48.04	2.67
STORMCLOUD	2904.00	PF 1	1495.00	5276.50	5280.48	3.43		5281.39	0 004824	7 65	195.35	57.00	0.73
STORMCLOUD	2898	PF 1	1495.00	5275.50	5278.68	2.20	5279.38	5281 16	0.023771	12.64	118.25	53 79	1 50
STORMCLOUD	2897.34	PF 1	1495.00	5275.39	5278.65	2.19	5279 37	5281.14	0 023946	12 65	118 14	53.84	1.51
STORMCLOUD	2897 33	PF 1	1495.00	5270.59	5273.88	2.21	5275 90	5280.71	0 072627	20 97	71 30	32 29	2.49
STORMCLOUD	2868.00	PF 1	1495 00	5270.50	5272.25	1.62	5273.76	5277 99	0.081148	19.23	77.75	48 04	2 66
STORMCLOUD	2618.00	PF 1	1495 00	5269 70	5273.64	3 40		5274.58	0 005005	7.75	192.96	56 83	0 74
STORMCLOUD	2612	PF 1	1495 00	5268.70	5273 58	3.96	5272.06	5274 07	0.002277	5.58	268.04	67.65	0 49
STORMCLOUD	2611.34	PF 1	1495 00	5268 59	5272.56	2.78	5272.56	5273.97	0 009962	9.52	156 97	56.51	1 01
STORMCLOUD	2611.33	PF 1	1495 00	5263.80	5267.18	2 26	5269.10	5273 48	0.065211	20.15	74 21	32 89	2 36
STORMCLOUD	2582.00	PF 1	1495.00	5263.70	5265.47	1 64	5266 96	5271.05	0 077713	18 97	78 83	48.13	2.61
STORMCLOUD	2415	PF 1	1495 00	5263 10	5267 09	3 43		5268 00	0 004786	7 63	195 88	57 03	0 73
STORMCLOUD	2409	PF 1	1495.00	5262.10	5265.53	2.37	5266 13	5267.80	0 019597	12 07	123 86	52.23	1.38
STORMCLOUD	2408.34	PF 1	1495 00	5261 99	5265 48	2.34	5266 09	5267.78	0.020348	12.19	122.69	52.36	1.40
STORMCLOUD	2408.33	PF 1	1495.00	5259.10	5262.05	1.79	5263 50	5267.47	0 071349	18 68	80.02	44.75	2.46
STORMCLOUD	2391	PF 1	1495.00	5259.10	5260.93	1 69	5262.36	5266.10	0 068906	18 25	81.91	48.39	2 47
STORMCLOUD	2153.44	PF 1	1495.00	5258.32	5261.58	2.87	5261 58	5263.02	0.009663	9 64	155.05	54.10	1 00

HEC-RAS - SUMMARY OUTPUT

*****

HEC-RAS Plan: wilson 1 River: MIREHAVEN ARROYO Reach STORMCLOUD Profile. PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	3318.18	PF 1	1495 00	5285.68	5288.94	2.87	5288 94	5290.38	0 009678	9.65	154.97	54.09	1 00
STORMCLOUD	3317.18*	PF 1	1495.00	5285.66	5288.84	2 80	5288.91	5290.37	0.010571	9.93	150 52	53.76	1 05
STORMCLOUD	3316.19*	PF 1	1495.00	5285 64	5288.83	2 81	5288.90	5290.35	0.010455	9 90	151 07	53.80	1 04
STORMCLOUD	3315.20*	PF 1	1495 00	5285.61	5288 83	2.84	5288.87	5290 31	0 010020	9 76	153.20	53.96	1 02
STORMCLOUD	3314.21*	PF 1	1495 00	5285.59	5288.82	2 85	5288.84	5290.29	0.009917	9.73	153 73	54.00	1 02
STORMCLOUD	3313.22*	PF 1	1495.00	5285 57	5288.81	2.85	5288.83	5290.27	0.009809	9.69	154.28	54 04	1.01
STORMCLOUD	3312.23*	PF 1	1495.00	5285.55	5288.81	2.86	5288.81	5290.25	0.009703	9.66	154 83	54 08	1.01
STORMCLOUD	3311.24*	PF 1	1495.00	5285.52	5288.63	2.75	5288 77	5290 24	0 011325	10.16	147.14	53 51	1 08
STORMCLOUD	3310.25*	PF 1	1495.00	5285 50	5288.62	2 76	5288.76	5290.21	0.011203	10.12	147.66	53.55	1 07
STORMCLOUD	3309.25*	PF 1	1495 00	5285.48	5288.61	2 76	5288.74	5290.19	0.011096	10.09	148.13	53.58	1 07
STORMCLOUD	3308.26*	PF 1	1495.00	5285 46	5288.60	2.77	5288.71	5290.17	0.010989	10.06	148.60	53 62	1.06
STORMCLOUD	3307.27*	PF 1	1495.00	5285.43	5288 62	2.81	5288.69	5290 14	0.010449	9 89	151.09	53 80	1 04
STORMCLOUD	3306.28*	PF 1	1495.00	5285 41	5288 61	2.82	5288.67	5290 12	0 010345	9.86	151.59	53.84	1.04
STORMCLOUD	3305.29*	PF 1	1495 00	5285.39	5288.60	2.82	5288.64	5290 10	0.010237	9.83	152.12	53.88	1.03
STORMCLOUD	3304.30*	PF 1	1495.00	5285.37	5288.58	2.83	5288.63	5290.07	0.010131	9.79	152 65	53 92	1 03
STORMCLOUD	3303.31*	PF 1	1495.00	5285.34	5288.63	2.89	5288.60	5290 04	0 009332	9.53	156.84	54.23	0.99
STORMCLOUD	3302.32*	PF 1	1495.00	5285.32	5288.59	2 88	5288.57	5290.02	0.009535	9.60	155 73	54.15	1.00
STORMCLOUD	3301.33*	PF 1	1495.00	5285.30	5288 59	2.89	5288.56	5290 00	0.009380	9.55	156.58	54.21	0.99
STORMCLOUD	3300.33*	PF 1	1495.00	5285.28	5288 54	2.87	5288.54	5289.98	0 009628	9.63	155.23	54.11	1.00
STORMCLOUD	3299.34*	PF 1	1495.00	5285.25	5288.37	2 75	5288.51	5289.96	0.011288	10.15	147 29	53.52	1.08
STORMCLOUD	3298.35*	PF 1	1495.00	5285 23	5288.35	2.76	5288.49	5289.94	0.011167	10 11	147 82	53.56	1 07
STORMCLOUD	3297.36*	PF 1	1495.00	5285.21	5288.34	2.77	5288.46	5289.92	0.011060	10.08	148 29	53 59	1 07
STORMCLOUD	3296.37*	PF 1	1495.00	5285.19	5288.33	2.77	5288.45	5289 90	0.010954	10.05	148.76	53.63	1.06
STORMCLOUD	3295.38*	PF 1	1495.00	5285.16	5288.35	2 81	5288.42	5289.87	0.010422	9.89	151.23	53 81	1.04
STORMCLOUD	3294.39*	PF 1	1495 00	5285.14	5288 34	2.82	5288.39	5289.85	0.010318	9.85	151.72	53.85	1.03
STORMCLOUD	3293.4*	PF 1	1495 00	5285.12	5288.33	2 83	5288.38	5289.82	0.010210	9.82	152 25	53.89	1 03
STORMCLOUD	3292.40*	PF 1	1495 00	5285 10	5288.32	2 83	5288.36	5289.80	0.010104	9.79	152 78	53 93	1 02
STORMCLOUD	3291.41*	PF 1	1495.00	5285 07	5288.36	2.89	5288.32	5289.77	0 009332	9.53	156.84	54 23	0.99
STORMCLOUD	3290.42*	PF 1	1495.00	5285.05	5288.32	2.88	5288 30	5289 75	0.009535	9 60	155 73	54.15	1.00
STORMCLOUD	3289.43*	PF 1	1495.00	5285.03	5288.32	2.89	5288.29	5289 73	0 009380	9 55	156.58	54.21	0.99
STORMCLOUD	3288.44*	PF 1	1495 00	5285.01	5288 27	2.87	5288 27	5289.71	0.009628	9 63	155 23	54.11	1 00
STORMCLOUD	3287.45*	PF 1	1495.00	5284 98	5288.10	2 75	5288.24	5289.69	0.011264	10.14	147 40	53 53	1.08
STORMCLOUD	3286.46*	PF 1	1495 00	5284.96	5288 09	2.76	5288 21	5289 67	0.011143	10 11	147 92	53.57	1.07
STORMCLOUD	3285.47*	PF 1	1495.00	5284 94	5288 08	2.77	5288 20	5289 65	0.011036	10 07	148.39	53.60	1 07
STORMCLOUD	3284.48*	PF 1	1495 00	5284.92	5288.06	2.78	5288 18	5289.63	0.010925	10.04	148 89	53.64	1 06
STORMCLOUD	3283.48*	PF 1	1495.00	5284 89	5288.08	2.81	5288.14	5289.60	0.010400	9.88	151.33	53.82	1.04
STORMCLOUD	3282.49*	PF 1	1495 00	5284.87	5288.07	2 82	5288.13	5289.58	0.010296	9.85	151 83	53.86	1.03
STORMCLOUD	3281.50*	PF 1	1495 00	5284.85	5288.06	2.83	5288 11	5289.55	0.010189	9.81	152 36	53 90	1 03
STORMCLOUD	3280.51*	PF 1	1495.00	5284.83	5288.05	2 83	5288.08	5289 53	0 010083	9.78	152.88	53 94	1.02
STORMCLOUD	3279 52*	PF 1	1495.00	5284.80	5288.06	2.87	5288 06	5289.50	0.009673	9 65	154 99	54.09	1 00
STORMCLOUD	3278.53*	PF 1	1495.00	5284.78	5287 96	2.80	5288.04	5289 49	0 010543	9.92	150.65	53 77	1.04
STORMCLOUD	3277.54*	PF 1	1495.00	5284.76	5287.95	2.81	5288 01	5289.47	0.010427	9 89	151 20	53.81	1 04
STORMCLOUD	3276.55*	PF 1	1495.00	5284 74	5287.94	2 82	5288.00	5289 45	0 010323	9.86	151.70	53 85	1.03

HEC RAS-DETAILED OUTPUT

HEC-RAS Plan: wilson 1 River: MIREHAVEN ARROYO Reach. STORMCLOUD Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	3275.55*	PF 1	1495 00	5284.71	5287 95	2 85	5287 97	5289 41	0.009896	9.72	153.83	54 01	1 01
STORMCLOUD	3274.56*	PF 1	1495.00	5284 69	5287 94	2.86	5287 94	5289 39	0.009789	9 68	154.39	54.05	1 01
STORMCLOUD	3273.57*	PF 1	1495 00	5284.67	5287.93	2.86	5287.93	5289 37	0.009683	9.65	154.94	54.09	1 00
STORMCLOUD	3272.58*	PF 1	1495 00	5284.65	5287 83	2 80	5287.91	5289.36	0.010571	9.93	150.52	53.76	1 05
STORMCLOUD	3271.59*	PF 1	1495.00	5284.62	5287 83	2.83	5287 87	5289 32	0 010146	9 80	152.57	53.91	1.03
STORMCLOUD	3270.60*	PF 1	1495 00	5284 60	5287.82	2 84	5287 86	5289.30	0 010041	9.77	153 09	53 95	1 02
STORMCLOUD	3269.61*	PF 1	1495 00	5284 58	5287.81	2 85	5287 84	5289.28	0 009932	9.73	153 65	53 99	1.02
STORMCLOUD	3268.62*	PF 1	1495 00	5284.56	5287.80	2 85	5287.81	5289 26	0.009824	9.70	154.20	54.03	1 01
STORMCLOUD	3267.63*	PF 1	1495.00	5284.53	5287 64	2.75	5287 79	5289 25	0 011325	10 16	147.14	53 51	1.08
STORMCLOUD	3266.63*	PF 1	1495.00	5284.51	5287.63	2 76	5287 77	5289.22	0.011203	10.12	147.66	53.55	1.07
STORMCLOUD	3265.64*	PF 1	1495.00	5284.49	5287 62	2.76	5287.74	5289 20	0 011102	10 09	148.11	53.58	1 07
STORMCLOUD	3264.65*	PF 1	1495.00	5284 47	5287.61	2 77	5287.73	5289.18	0 010995	10.06	148 58	53.61	1 07
STORMCLOUD	3263.66*	PF 1	1495.00	5284 44	5287.63	2.81	5287 70	5289.15	0 010449	9.89	151 09	53.80	1.04
STORMCLOUD	3262.67*	PF 1	1495.00	5284.42	5287.62	2 82	5287.67	5289.13	0.010345	9.86	151 59	53 84	1 04
STORMCLOUD	3261.68*	PF 1	1495.00	5284.40	5287.60	2 82	5287 66	5289.10	0 010237	9.83	152 12	53.88	1 03
STORMCLOUD	3260.69*	PF 1	1495.00	5284 38	5287 59	2.83	5287 64	5289.08	0.010131	9 79	152.65	53.92	1.03
STORMCLOUD	3259.7*	PF 1	1495.00	5284 35	5287 64	2.89	5287.60	5289.05	0.009380	9 55	156.58	54 21	0.99
STORMCLOUD	3258.70*	PF 1	1495 00	5284.33	5287.59	2.87	5287.59	5289 03	0.009628	9.63	155 23	54.11	1 00
STORMCLOUD	3257.71*	PF 1	1495 00	5284.31	5287 49	2 80	5287 57	5289.02	0 010532	9 92	150 70	53.77	1.04
STORMCLOUD	3256.72*	PF 1	1495 00	5284.29	5287.48	2 81	5287.54	5289.00	0 010416	9.88	151 25	53 81	1.04
STORMCLOUD	3255.73*	PF 1	1495.00	5284 26	5287.50	2.85	5287 52	5288.96	0 009906	9 72	153 78	54 00	1.02
STORMCLOUD	3254.74*	PF 1	1495 00	5284.24	5287 49	2.85	5287 50	5288 94	0 009809	9 69	154.28	54 04	1.01
STORMCLOUD	3253.75*	PF 1	1495.00	5284 22	5287.39	2.80	5287 47	5288.93	0 010605	9 94	150.36	53 75	1.05
STORMCLOUD	3252.76*	PF 1	1495.00	5284 20	5287.38	2.81	5287 46	5288.91	0 010493	9 91	150.88	53 79	1.04
STORMCLOUD	3251.77*	PF 1	1495.00	5284.17	5287.52	2 94	5287 43	5288.88	0 008751	9.33	160.21	54 48	0.96
STORMCLOUD	3250.78*	PF 1	1495 00	5284 15	5287 52	2 95	5287 41	5288 86	0 008599	9.28	161 15	54.54	0 95
STORMCLOUD	3249.78*	PF 1	1495.00	5284 13	5287.52	2 97	5287 39	5288.84	0.008455	9.23	162 05	54.61	0 94
STORMCLOUD	3248.79*	PF 1	1495.00	5284.11	5287 51	2.98	5287 36	5288 82	0 008314	9 17	162.96	54.68	0 94
STORMCLOUD	3247.80*	PF 1	1495.00	5284 08	5287.53	3 01	5287 34	5288.80	0 007970	9.05	165.26	54 85	0.92
STORMCLOUD	3246.81*	PF 1	1495.00	5284.06	5287 52	3.03	5287.32	5288 78	0 007835	9 00	166.20	54 91	0.91
STORMCLOUD	3245.82*	PF 1	1495.00	5284 04	5287.52	3.04	5287 29	5288.76	0 007703	8 94	167.14	54 98	0.90
STORMCLOUD	3244.83*	PF 1	1495 00	5284 02	5287.52	3 05	5287.28	5288 75	0.007570	8.89	168 10	55.05	0 90
STORMCLOUD	3243.84*	PF 1	1495.00	5283.99	5287.53	3 09	5287 25	5288.73	0.007272	8.78	170 36	55.22	0 88
STORMCLOUD	3242.85*	PF 1	1495 00	5283 97	5287.53	3 10	5287 22	5288.71	0 007145	8.72	171 36	55.29	0 87
STORMCLOUD	3241.85*	PF 1	1495 00	5283.95	5287 53	3 11	5287 21	5288 69	0.007021	8 67	172.36	55 36	0.87
STORMCLOUD	3240.86*	PF 1	1495.00	5283.93	5287 52	3 13	5287 19	5288.68	0 006900	8.62	173 36	55 43	0 86
STORMCLOUD	3239 87*	PF 1	1495.00	5283 90	5287.54	3 16		5288.66	0 006631	8.51	175 67	55.60	0.84
STORMCLOUD	3238.88*	PF 1	1495 00	5283.88	5287 53	3 17		5288.65	0 006519	8 46	176.67	55 67	0.84
STORMCLOUD	3237.89*	PF 1	1495 00	5283.86	5287 53	3.19		5288 63	0 006391	8 41	177.84	55 76	0.83
STORMCLOUD	3236.90*	PF 1	1495.00	5283 84	5287.54	3.21		5288.62	0.006263	8.35	179 04	55.84	0 82
STORMCLOUD	3235.91*	PF 1	1495.00	5283.81	5287.54	3 23		5288 60	0.006053	8.26	181 09	55.99	0 81
STORMCLOUD	3234.92*	PF 1	1495.00	5283.79	5287 54	3.25		5288.59	0 005934	8 20	182.29	56 07	0.80
STORMCLOUD	3233.92*	PF 1	1495.00	5283 77	5287.55	3 27		5288 58	0.005818	8.15	183 50	56.16	0.79

HEC-RAS Plan: wilson 1 River. MIREHAVEN ARROYO Reach. STORMCLOUD Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	3232.93*	PF 1	1495.00	5283.75	5287.55	3.28		5288.56	0.005707	8.10	184.68	56.24	0.79
STORMCLOUD	3231.94*	PF 1	1495 00	5283 72	5287.56	3 32		5288.55	0 005496	7 99	187 02	56 41	0 77
STORMCLOUD	3230.95*	PF 1	1495 00	5283 70	5287.56	3.33		5288.54	0.005393	7 94	188.20	56 49	0.77
STORMCLOUD	3229.96*	PF 1	1495.00	5283.68	5287 56	3.35		5288.53	0.005290	7.89	189.42	56.58	0.76
STORMCLOUD	3228.97*	PF 1	1495.00	5283.66	5287.56	3 36		5288 52	0 005190	7 84	190 63	56.67	0.75
STORMCLOUD	3227.98*	PF 1	1495 00	5283.63	5287.57	3.40		5288.50	0.005005	7.75	192 96	56.83	0.74
STORMCLOUD	3226.99*	PF 1	1495 00	5283.61	5287.57	3 41		5288 49	0 004914	7.70	194 15	56 91	0.73
STORMCLOUD	3226.00	PF 1	1495 00	5283.59	5287.58	3.43		5288.48	0 004820	7.65	195 40	57 00	0.73
STORMCLOUD	3225.*	PF 1	1495.00	5283.42	5287.40	3.17		5288.47	0.006208	8.28	180.46	56.96	0.82
STORMCLOUD	3224.*	PF 1	1495.00	5283 26	5287 01	2.79	5287 01	5288.42	0.009720	9.55	156.49	56.08	1 01
STORMCLOUD	3223.*	PF 1	1495.00	5283.09	5286 83	2.65	5286 98	5288.40	0.011570	10.07	148.51	56.02	1.09
STORMCLOUD	3222.*	PF 1	1495.00	5282.92	5286.53	2 48	5286.89	5288.36	0 014713	10.85	137.81	55.51	1.21
STORMCLOUD	3221.*	PF 1	1495.00	5282 76	5286 18	2.33	5286.73	5288.31	0.018666	11.70	127.82	54.77	1.35
STORMCLOUD	3220.00	PF 1	1495.00	5282.59	5285.78	2.21	5286.47	5288.24	0.023479	12.59	118.72	53.82	1.49
STORMCLOUD	3219.34	PF 1	1495.00	5282.48	5285.75	2.20	5286 46	5288.22	0.023667	12.61	118.58	53.87	1.50
STORMCLOUD	3219.33	PF 1	1495.00	5277.68	5280.97	2 21	5282.98	5287.78	0 072404	20 94	71 38	32 31	2.48
STORMCLOUD	3218.35*	PF 1	1495.00	5277.68	5280 95	2.19	5282 92	5287.69	0.072127	20.83	71.76	32.78	2.48
STORMCLOUD	3217.37*	PF 1	1495.00	5277.67	5280 93	2.17	5282 84	5287.61	0.072065	20.75	72.05	33.21	2.48
STORMCLOUD	3216.39*	PF 1	1495.00	5277.67	5280.90	2.15	5282.77	5287 53	0 071973	20 65	72.40	33.72	2 48
STORMCLOUD	3215.41*	PF 1	1495.00	5277.67	5280 88	2.12	5282.70	5287.44	0.071987	20.56	72.73	34 25	2.49
STORMCLOUD	3214.44*	PF 1	1495.00	5277.67	5280.86	2.10	5282 64	5287.36	0.071985	20.46	73.07	34.79	2.49
STORMCLOUD	3213.46*	PF 1	1495.00	5277.66	5280 82	2 07	5282.55	5287 28	0 072367	20 40	73 29	35 34	2.50
STORMCLOUD	3212.48*	PF 1	1495 00	5277.66	5280.79	2.05	5282.49	5287 20	0.072580	20.31	73.60	35.93	2 50
STORMCLOUD	3211.50*	PF 1	1495.00	5277 66	5280.76	2 02	5282.41	5287.12	0.073099	20 24	73.85	36 58	2 51
STORMCLOUD	3210 53*	PF 1	1495 00	5277 65	5280.72	1.99	5282 34	5287.05	0.073907	20.20	74.00	37.22	2 53
STORMCLOUD	3209.55*	PF 1	1495.00	5277.65	5280.68	1.96	5282.27	5286.98	0.074569	20.14	74.24	37.92	2.54
STORMCLOUD	3208.57*	PF 1	1495.00	5277 65	5280.65	1.93	5282 20	5286.88	0.075106	20.04	74 59	38.74	2.55
STORMCLOUD	3207.59*	PF 1	1495.00	5277.64	5280.59	1 52	5282.13	5286 78	0 100190	19 96	74 90	49 42	2 86
STORMCLOUD	3206.62*	PF 1	1495 00	5277.64	5280.53	1 52	5282.06	5286.67	0.098409	19.88	75.19	49 37	2 84
STORMCLOUD	3205.64*	PF 1	1495.00	5277.64	5280.46	1 53	5281.99	5286 56	0 096833	19 82	75 43	49 32	2 82
STORMCLOUD	3204.66*	PF 1	1495 00	5277.64	5280.39	1.54	5281.92	5286 45	0.095276	19.76	75.68	49 26	2.81
STORMCLOUD	3203.68*	PF 1	1495.00	5277.63	5280 32	1 54	5281.84	5286 35	0 094076	19.71	75 86	49 21	2.80
STORMCLOUD	3202.71*	PF 1	1495 00	5277.63	5280.25	1 55	5281.77	5286.25	0.092763	19.66	76 06	49.15	2 78
STORMCLOUD	3201.73*	PF 1	1495.00	5277.63	5280.19	1.55	5281.70	5286 15	0 091427	19.60	76.28	49 09	2.77
STORMCLOUD	3200.75*	PF 1	1495.00	5277.62	5280.11	1 56	5281.63	5286 06	0 090565	19.57	76 39	49 02	2.76
STORMCLOUD	3199.77*	PF 1	1495.00	5277 62	5280.04	1.56	5281.56	5285.96	0.089411	19.53	76.57	48.95	2.75
STORMCLOUD	3198.79*	PF 1	1495.00	5277 62	5279.98	1 57	5281.49	5285.87	0.088222	19.47	76.77	48 88	2.74
STORMCLOUD	3197.82*	PF 1	1495 00	5277.61	5279.90	1 57	5281.42	5285 78	0.087519	19 46	76 84	48 80	2.73
STORMCLOUD	3196.84*	PF 1	1495.00	5277 61	5279.83	1.58	5281.34	5285.69	0.086567	19.42	76.98	48 72	2 72
STORMCLOUD	3195.86*	PF 1	1495.00	5277.61	5279 77	1.59	5281.27	5285.59	0 085503	19.37	77 17	48.64	2.71
STORMCLOUD	3194.88*	PF 1	1495.00	5277.60	5279 69	1.59	5281.20	5285.51	0 084946	19.36	77.21	48.55	2.71
STORMCLOUD	3193.91*	PF 1	1495 00	5277.60	5279.62	1 60	5281.13	5285 42	0.083991	19.32	77.37	48 47	2 70
STORMCLOUD	3192.93*	PF 1	1495.00	5277.60	5279 55	1.60	5281 07	5285.33	0 083229	19.30	77.47	48.36	2 69

HEC-RAS Plan wilson 1 River. MIREHAVEN ARROYO Reach: STORMCLOUD Profile. PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	3191.95*	PF 1	1495.00	5277 60	5279.48	1.61	5280 99	5285.25	0 082466	19.27	77.57	48 25	2 68
STORMCLOUD	3190.97*	PF 1	1495 00	5277 59	5279 41	1 61	5280.92	5285 17	0.081991	19.26	77 61	48.16	2 67
STORMCLOUD	3190.00	PF 1	1495.00	5277.59	5279.33	1 62	5280.85	5285.08	0.081301	19 24	77.70	48.04	2.67
STORMCLOUD	3188.96*	PF 1	1495 00	5277.59	5279 35	1 64	5280 85	5284.96	0 078150	19 00	78.68	48 12	2 62
STORMCLOUD	3187.92*	PF 1	1495 00	5277 58	5279 36	1 65	5280.84	5284.84	0.075433	18.79	79 58	48 19	2.58
STORMCLOUD	3186.88*	PF 1	1495.00	5277.58	5279 38	1.67	5280 84	5284.73	0.072571	18 56	80 57	48.27	2 53
STORMCLOUD	3185.84*	PF 1	1495.00	5277.57	5279 39	1 68	5280.83	5284 62	0.070164	18.36	81 44	48 35	2.49
STORMCLOUD	3184.8*	PF 1	1495.00	5277.57	5279.41	1.70	5280.83	5284.52	0 067495	18 13	82.46	48.43	2 45
STORMCLOUD	3183.76*	PF 1	1495 00	5277.57	5279 43	1 72	5280.83	5284 42	0.064955	17.91	83 47	48 52	2.41
STORMCLOUD	3182.72*	PF 1	1495.00	5277 56	5279 44	1.74	5280.82	5284 32	0.062868	17.72	84 35	48.59	2 37
STORMCLOUD	3181.68*	PF 1	1495 00	5277 56	5279.46	1 75	5280.82	5284.22	0 060497	17 51	85.40	48 67	2 33
STORMCLOUD	3180.64*	PF 1	1495.00	5277.55	5279 47	1 77	5280.81	5284 13	0.058591	17.33	86.28	48.75	2.30
STORMCLOUD	3179.6*	PF 1	1495 00	5277.55	5279.49	1 79	5280.81	5284.04	0 056377	17 12	87.35	48 83	2.26
STORMCLOUD	3178.56*	PF 1	1495.00	5277 55	5279 51	1.80	5280 81	5283 97	0.054636	16.94	88 23	48.91	2.22
STORMCLOUD	3177.52*	PF 1	1495 00	5277.54	5279 52	1 82	5280 80	5283.90	0 053231	16 80	88.97	48 97	2 20
STORMCLOUD	3176.48*	PF 1	1495.00	5277 54	5279.54	1.84	5280.80	5283.82	0 051230	16 60	90 07	49.06	2 16
STORMCLOUD	3175.44*	PF 1	1495.00	5277 53	5279.55	1.85	5280 79	5283 74	0.049732	16.44	90 94	49.13	2 13
STORMCLOUD	3174.4*	PF 1	1495 00	5277.53	5279 57	1 87	5280 79	5283.68	0 048210	16 28	91.85	49 20	2.10
STORMCLOUD	3173.36*	PF 1	1495.00	5277 53	5279 58	1.88	5280.79	5283 62	0.046749	16.12	92 76	49.27	2 07
STORMCLOUD	3172.32*	PF 1	1495.00	5277.52	5279 59	1 89	5280.78	5283 56	0.045635	15.99	93 48	49.33	2.05
STORMCLOUD	3171 28*	PF 1	1495.00	5277 52	5279 61	1.91	5280.78	5283 50	0.044237	15 83	94.42	49.41	2 02
STORMCLOUD	3170.24*	PF 1	1495.00	5277.51	5279 61	1 92	5280.77	5283 45	0.043200	15.71	95.15	49.47	2 00
STORMCLOUD	3169.2*	PF 1	1495.00	5277 51	5279.63	1.94	5280 77	5283.39	0 041897	15 56	96.09	49 54	1.97
STORMCLOUD	3168.16*	PF 1	1495.00	5277 51	5279.65	1.96	5280 77	5283 33	0 040613	15.40	97.06	49 62	1.94
STORMCLOUD	3167.12*	PF 1	1495 00	5277 50	5279.66	1 97	5280 76	5283.28	0.039653	15.28	97 81	49 68	1.92
STORMCLOUD	3166.08*	PF 1	1495 00	5277.50	5279 68	1 99	5280.76	5283 23	0.038427	15.13	98 81	49.76	1 89
STORMCLOUD	3165.04*	PF 1	1495 00	5277 49	5279.68	2.00	5280 75	5283 18	0.037533	15 02	99 56	49.82	1 87
STORMCLOUD	3164.*	PF 1	1495 00	5277 49	5279.70	2 02	5280 75	5283.13	0 036390	14.87	100.56	49 90	1.85
STORMCLOUD	3162.96*	PF 1	1495 00	5277.49	5279.72	2 03	5280.75	5283 08	0.035240	14.71	101 61	49.99	1.82
STORMCLOUD	3161.92*	PF 1	1495 00	5277 48	5279.73	2 04	5280 74	5283.04	0 034465	14 61	102.34	50 05	1 80
STORMCLOUD	3160.88*	PF 1	1495 00	5277.48	5279 75	2 06	5280.74	5282.99	0.033367	14.46	103 42	50 13	1.77
STORMCLOUD	3159.84*	PF 1	1495 00	5277.48	5279 77	2.08	5280 74	5282 95	0.032291	14 30	104 52	50.22	1 75
STORMCLOUD	3158.8*	PF 1	1495.00	5277.47	5279 78	2 09	5280.73	5282 91	0.031575	14.20	105 28	50.28	1.73
STORMCLOUD	3157.76*	PF 1	1495 00	5277.47	5279.80	2 11	5280.73	5282.86	0.030572	14.05	106.38	50.37	1 70
STORMCLOUD	3156.72*	PF 1	1495 00	5277.46	5279 80	2.12	5280.72	5282 83	0.029905	13 95	107 15	50.43	1 69
STORMCLOUD	3155.68*	PF 1	1495.00	5277 46	5279.83	2.14	5280 72	5282.78	0 028928	13 80	108.31	50.52	1 66
STORMCLOUD	3154.64*	PF 1	1495.00	5277 46	5279.85	2.16	5280 72	5282.74	0.027954	13 65	109.52	50.62	1 64
STORMCLOUD	3153.6*	PF 1	1495 00	5277.45	5279 86	2 18	5280.71	5282 71	0 027321	13.55	110.33	50 68	1.62
STORMCLOUD	3152.56*	PF 1	1495 00	5277.45	5279 88	2.20	5280.71	5282.67	0 026379	13.40	111.59	50 78	1 59
STORMCLOUD	3151.52*	PF 1	1495.00	5277.44	5279 88	2.20	5280 70	5282 64	0.026057	13.34	112 04	50.82	1 58
STORMCLOUD	3150.48*	PF 1	1495.00	5277 44	5281.68	3.62	5280 70	5282 46	0.003898	7.12	209 84	58.01	0 66
STORMCLOUD	3149.44*	PF 1	1495 00	5277 44	5281.67	3 61		5282.46	0 003915	7 14	209.53	57 98	0 66
STORMCLOUD	3148.4*	PF 1	1495.00	5277.43	5281 67	3 62		5282.46	0.003892	7.12	209 95	58.01	0.66

HEC-RAS Plan: wilson 1 River. MIREHAVEN ARROYO Reach. STORMCLOUD Profile. PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	3147.36*	PF 1	1495 00	5277.43	5281.66	3.61		5282.45	0.003909	7.13	209.64	57 99	0.66
STORMCLOUD	3146.32*	PF 1	1495.00	5277.42	5281.66	3.62		5282.45	0.003884	7.12	210.09	58 02	0.66
STORMCLOUD	3145.28*	PF 1	1495 00	5277.42	5281 66	3.62		5282.44	0.003903	7.13	209.75	58 00	0.66
STORMCLOUD	3144.24*	PF 1	1495.00	5277 42	5281.65	3 61		5282.44	0.003922	7 14	209 41	57 98	0.66
STORMCLOUD	3143.2*	PF 1	1495.00	5277.41	5281.65	3.62		5282 44	0 003900	7 13	209.81	58.00	0 66
STORMCLOUD	3142.16*	PF 1	1495.00	5277.41	5281 64	3.61		5282.43	0.003917	7.14	209 50	57.98	0.66
STORMCLOUD	3141.12*	PF 1	1495 00	5277.40	5281 64	3.62		5282 43	0 003892	7 12	209.95	58.01	0 66
STORMCLOUD	3140.08*	PF 1	1495 00	5277.40	5281.63	3.61		5282.42	0.003911	7 13	209 61	57.99	0.66
STORMCLOUD	3139.04*	PF 1	1495.00	5277 40	5281 63	3.61		5282.42	0.003930	7.14	209 27	57.97	0.66
STORMCLOUD	3138.*	PF 1	1495.00	5277 39	5281.62	3 62		5282.41	0.003906	7.13	209.70	58 00	0.66
STORMCLOUD	3136.96*	PF 1	1495.00	5277.39	5281.62	3.61		5282 41	0 003925	7 14	209.36	57.97	0 66
STORMCLOUD	3135.92*	PF 1	1495 00	5277.38	5281.62	3.62		5282 40	0 003900	7 13	209.81	58.00	0 66
STORMCLOUD	3134.88*	PF 1	1495.00	5277 38	5281 61	3.61		5282 40	0 003917	7.14	209.50	57.98	0.66
STORMCLOUD	3133.84*	PF 1	1495 00	5277.38	5281 60	3.61		5282.40	0 003936	7 15	209.16	57.96	0 66
STORMCLOUD	3132.8*	PF 1	1495.00	5277 37	5281.60	3 61		5282.39	0.003914	7.13	209.55	57 99	0.66
STORMCLOUD	3131.76*	PF 1	1495.00	5277.37	5281 60	3.61		5282.39	0.003931	7.14	209.24	57 96	0 66
STORMCLOUD	3130.72*	PF 1	1495.00	5277 36	5281.59	3.62		5282.38	0.003906	7 13	209 70	58 00	0.66
STORMCLOUD	3129.68*	PF 1	1495.00	5277 36	5281.59	3.61		5282.38	0.003923	7.14	209 38	57 97	0 66
STORMCLOUD	3128.64*	PF 1	1495.00	5277 36	5281.58	3.61		5282.38	0.003941	7.15	209.07	57.95	0 66
STORMCLOUD	3127.6*	PF 1	1495 00	5277 35	5281.58	3 61		5282 37	0.003917	7 14	209 50	57 98	0.66
STORMCLOUD	3126.56*	PF 1	1495.00	5277.35	5281 58	3.61		5282 37	0 003934	7 15	209 19	57.96	0.66
STORMCLOUD	3125.52*	PF 1	1495 00	5277.34	5281.57	3.61		5282.36	0.003909	7.13	209.64	57 99	0.66
STORMCLOUD	3124.48*	PF 1	1495.00	5277 34	5281.57	3 61		5282.36	0.003928	7.14	209.30	57 97	0 66
STORMCLOUD	3123.44*	PF 1	1495 00	5277 34	5281.56	3.61		5282.36	0.003947	7.15	208.96	57 94	0.66
STORMCLOUD	3122.4*	PF 1	1495 00	5277 33	5281.56	3 61		5282.35	0.003925	7.14	209.36	57.97	0 66
STORMCLOUD	3121.36*	PF 1	1495 00	5277 33	5281.55	3.61		5282 35	0.003942	7.15	209 04	57.95	0.66
STORMCLOUD	3120 32*	PF 1	1495 00	5277.32	5281 55	3.61		5282.34	0.003917	7 14	209 50	57.98	0.66
STORMCLOUD	3119.28*	PF 1	1495 00	5277.32	5281.54	3 61		5282.34	0.003936	7.15	209.16	57 96	0 66
STORMCLOUD	3118.24*	PF 1	1495.00	5277.32	5281 54	3.60		5282 33	0 003955	7 16	208 82	57.94	0.66
STORMCLOUD	3117.2*	PF 1	1495.00	5277.31	5281 54	3.61		5282 33	0 003931	7 14	209.24	57.96	0 66
STORMCLOUD	3116.16*	PF 1	1495.00	5277.31	5281 53	3 61		5282.33	0.003950	7.16	208 90	57.94	0.66
STORMCLOUD	3115.12*	PF 1	1495 00	5277.30	5281 53	3.61		5282 32	0 003925	7.14	209.36	57.97	0 66
STORMCLOUD	3114.08*	PF 1	1495 00	5277.30	5281.52	3 61		5282.32	0.003942	7.15	209 04	57.95	0.66
STORMCLOUD	3113.04*	PF 1	1495 00	5277.30	5281.52	3.60		5282 31	0.003961	7.16	208 70	57.93	0.67
STORMCLOUD	3112.*	PF 1	1495 00	5277 29	5281.51	3 61		5282.31	0.003939	7.15	209 10	57.95	0.66
STORMCLOUD	3110.96*	PF 1	1495.00	5277 29	5281.51	3 60		5282.30	0 003957	7.16	208.79	57.93	0.66
STORMCLOUD	3109.92*	PF 1	1495.00	5277.28	5281.51	3 61		5282.30	0.003931	7.14	209 24	57.96	0.66
STORMCLOUD	3108.88*	PF 1	1495.00	5277.28	5281.50	3.61		5282 30	0.003949	7.16	208 93	57 94	0 66
STORMCLOUD	3107.84*	PF 1	1495.00	5277 28	5281.50	3 60		5282.29	0 003966	7.17	208.62	57 92	0.67
STORMCLOUD	3106.8*	PF 1	1495.00	5277.27	5281 49	3.61		5282 29	0 003942	7 15	209 04	57.95	0 66
STORMCLOUD	3105.76*	PF 1	1495 00	5277 27	5281.49	3.60		5282 28	0 003960	7 16	208.73	57.93	0 66
STORMCLOUD	3104.72*	PF 1	1495.00	5277.26	5281.49	3.61		5282 28	0 003934	7 15	209 19	57.96	0 66
STORMCLOUD	3103.68*	PF 1	1495 00	5277.26	5281.48	3 60		5282.28	0.003953	7.16	208 85	57 94	0.66

HEC-RAS Plan. wilson 1 River MIREHAVEN ARROYO Reach: STORMCLOUD Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	3102.64*	PF 1	1495 00	5277.26	5281 47	3.60		5282.27	0 003973	7.17	208 51	57.91	0.67
STORMCLOUD	3101.6*	PF 1	1495 00	5277.25	5281.47	3 61		5282 27	0.003950	7 16	208.90	57 94	0.66
STORMCLOUD	3100.56*	PF 1	1495 00	5277.25	5281.46	3.60		5282.26	0.003969	7 17	208 56	57 92	0.67
STORMCLOUD	3099.52*	PF 1	1495.00	5277 25	5281 46	3.60		5282.26	0 003990	7.18	208 20	57.89	0 67
STORMCLOUD	3098.48*	PF 1	1495 00	5277.24	5281.46	3.60		5282 25	0.003966	7 17	208 62	57 92	0.67
STORMCLOUD	3097.44*	PF 1	1495.00	5277 24	5281 45	3 60		5282 25	0 003985	7 18	208.28	57 90	0 67
STORMCLOUD	3096.4*	PF 1	1495.00	5277 23	5281.45	3 60		5282 24	0 003960	7 16	208.73	57 93	0 66
STORMCLOUD	3095.36*	PF 1	1495 00	5277 23	5281 44	3.60		5282.24	0 003977	7.17	208 42	57.91	0 67
STORMCLOUD	3094.32*	PF 1	1495 00	5277.23	5281 44	3.59		5282 24	0.003998	7 19	208.05	57 88	0.67
STORMCLOUD	3093.28*	PF 1	1495.00	5277 22	5281.43	3 60		5282.23	0 003976	7.17	208.45	57.91	0 67
STORMCLOUD	3092.24*	PF 1	1495 00	5277.22	5281 43	3.60		5282 23	0.003995	7.18	208 11	57 89	0.67
STORMCLOUD	3091.2*	PF 1	1495 00	5277.21	5281.42	3 60		5282 22	0 003969	7 17	208 56	57.92	0 67
STORMCLOUD	3090.16*	PF 1	1495 00	5277.21	5281 42	3 60		5282 22	0 003990	7 18	208.20	57 89	0 67
STORMCLOUD	3089.12*	PF 1	1495.00	5277 21	5281.41	3 59		5282.22	0 004010	7.19	207 86	57.87	0.67
STORMCLOUD	3088.08*	PF 1	1495.00	5277.20	5281 41	3.60		5282 21	0.003987	7 18	208.25	57 90	0 67
STORMCLOUD	3087.04*	PF 1	1495 00	5277.20	5281.40	3.59		5282.21	0.004006	7.19	207.91	57 87	0.67
STORMCLOUD	3086.*	PF 1	1495 00	5277.19	5281.40	3.60		5282.20	0.003981	7.17	208.37	57 90	0.67
STORMCLOUD	3084.96*	PF 1	1495 00	5277 19	5281.40	3 59		5282 20	0 004002	7 19	208.00	57.88	0 67
STORMCLOUD	3083.92*	PF 1	1495.00	5277 19	5281 39	3.59		5282.19	0 004023	7.20	207 63	57 85	0.67
STORMCLOUD	3082.88*	PF 1	1495.00	5277 18	5281 39	3.59		5282.19	0 003998	7.19	208 05	57.88	0.67
STORMCLOUD	3081 84*	PF 1	1495 00	5277.18	5281 38	3.59		5282 18	0.004018	7 20	207.72	57 86	0 67
STORMCLOUD	3080.8*	PF 1	1495.00	5277 17	5281 38	3.60		5282.18	0 003992	7.18	208 17	57 89	0.67
STORMCLOUD	3079.76*	PF 1	1495 00	5277.17	5281 37	3.59		5282.18	0.004013	7 19	207.80	57 86	0.67
STORMCLOUD	3078.72*	PF 1	1495.00	5277.17	5281 37	3.59		5282.17	0 004034	7.21	207 43	57 84	0 67
STORMCLOUD	3077.68*	PF 1	1495 00	5277.16	5281 36	3.59		5282 17	0.004010	7 19	207 86	57 87	0.67
STORMCLOUD	3076.64*	PF 1	1495.00	5277 16	5281.36	3 59		5282 16	0 004031	7 21	207.49	57.84	0.67
STORMCLOUD	3075.6*	PF 1	1495 00	5277.15	5281 35	3.59		5282 16	0 004005	7 19	207.94	57 87	0 67
STORMCLOUD	3074.56*	PF 1	1495 00	5277 15	5281 35	3.59		5282.15	0 004024	7.20	207 60	57 85	0 67
STORMCLOUD	3073.52*	PF 1	1495.00	5277.15	5281.34	3.58		5282 15	0.004045	7 21	207.23	57 83	0.67
STORMCLOUD	3072.48*	PF 1	1495 00	5277.14	5281 34	3.59		5282 14	0.004023	7 20	207 63	57 85	0 67
STORMCLOUD	3071.44*	PF 1	1495.00	5277.14	5281.33	3.58		5282 14	0.004042	7 21	207.29	57 83	0.67
STORMCLOUD	3070.4*	PF 1	1495.00	5277 13	5281 33	3.59		5282.13	0 004016	7.20	207 74	57.86	0 67
STORMCLOUD	3069.36*	PF 1	1495 00	5277 13	5281.32	3 59		5282.13	0 004037	7 21	207.38	57 84	0 67
STORMCLOUD	3068.32*	PF 1	1495.00	5277 13	5281.32	3 58		5282.13	0 004057	7 22	207.04	57 81	0 67
STORMCLOUD	3067.28*	PF 1	1495 00	5277 12	5281 32	3.59		5282.12	0 004034	7.21	207 43	57.84	0.67
STORMCLOUD	3066.24*	PF 1	1495.00	5277.12	5281 31	3.58		5282 12	0.004054	7 22	207.09	57.82	0.67
STORMCLOUD	3065.2*	PF 1	1495 00	5277.11	5281 31	3.59		5282 11	0.004027	7 20	207.55	57.85	0.67
STORMCLOUD	3064.16*	PF 1	1495.00	5277 11	5281.30	3 58		5282.11	0 004049	7.22	207.18	57.82	0.67
STORMCLOUD	3063.12*	PF 1	1495.00	5277 11	5281.29	3 58		5282.11	0 004070	7 23	206 81	57.80	0 67
STORMCLOUD	3062.08*	PF 1	1495.00	5277.10	5281 29	3.58		5282 10	0.004045	7 21	207.23	57 83	0.67
STORMCLOUD	3061.04*	PF 1	1495.00	5277 10	5281 29	3.58		5282.10	0.004067	7.23	206.87	57 80	0.67
STORMCLOUD	3060.*	PF 1	1495 00	5277 09	5281.28	3 58		5282.09	0 004042	7 21	207 29	57.83	0 67
STORMCLOUD	3058.96*	PF 1	1495.00	5277 09	5281 28	3.58		5282.09	0.004064	7.22	206 92	57 80	0.67

HEC-RAS Plan. wilson 1 River: MIREHAVEN ARROYO Reach. STORMCLOUD Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	3057.92*	PF 1	1495 00	5277.09	5281 27	3.57		5282.08	0.004085	7 24	206 56	57.78	0 67
STORMCLOUD	3056.88*	PF 1	1495 00	5277.08	5281.27	3 58		5282.08	0.004060	7.22	206 98	57 81	0.67
STORMCLOUD	3055.84*	PF 1	1495.00	5277.08	5281.26	3.58		5282.07	0.004082	7 24	206 61	57.78	0 67
STORMCLOUD	3054.8*	PF 1	1495 00	5277.07	5281 26	3.58		5282 07	0.004057	7 22	207.04	57.81	0 67
STORMCLOUD	3053.76*	PF 1	1495.00	5277 07	5281.25	3 58		5282.06	0.004078	7.23	206.67	57 79	0 67
STORMCLOUD	3052.72*	PF 1	1495.00	5277.07	5281 25	3.57		5282.06	0 004100	7.25	206.30	57.76	0.68
STORMCLOUD	3051.68*	PF 1	1495.00	5277 06	5281.24	3.58		5282.06	0.004077	7.23	206.70	57.79	0.67
STORMCLOUD	3050.64*	PF 1	1495 00	5277.06	5281.24	3.57		5282.05	0 004098	7.25	206.33	57.76	0.68
STORMCLOUD	3049.6*	PF 1	1495.00	5277 05	5281.23	3.58		5282.05	0.004073	7.23	206 76	57.79	0.67
STORMCLOUD	3048.56*	PF 1	1495 00	5277.05	5281.23	3 57		5282.04	0 004093	7 24	206 42	57.77	0 68
STORMCLOUD	3047.52*	PF 1	1495.00	5277.05	5281.22	3.57		5282.04	0.004115	7.26	206 05	57.74	0.68
STORMCLOUD	3046.48*	PF 1	1495.00	5277.04	5281 22	3.57		5282 03	0.004092	7 24	206.44	57 77	0 68
STORMCLOUD	3045.44*	PF 1	1495 00	5277 04	5281.21	3 57		5282.03	0.004113	7.25	206 08	57 75	0.68
STORMCLOUD	3044.4*	PF 1	1495.00	5277.04	5281 21	3.56		5282 03	0 004135	7.27	205.71	57 72	0 68
STORMCLOUD	3043.36*	PF 1	1495 00	5277 03	5281.20	3 57		5282.02	0.004110	7.25	206 13	57.75	0.68
STORMCLOUD	3042.32*	PF 1	1495.00	5277 03	5281.20	3.56		5282.02	0 004132	7.27	205.77	57.72	0 68
STORMCLOUD	3041.28*	PF 1	1495 00	5277 02	5281.19	3 57		5282.01	0.004110	7.25	206 13	57 75	0.68
STORMCLOUD	3040.24*	PF 1	1495.00	5277.02	5281.19	3.56		5282.01	0 004132	7.27	205.77	57 72	0 68
STORMCLOUD	3039.2*	PF 1	1495.00	5277.02	5281 18	3.56		5282 00	0 004154	7.28	205.40	57.70	0 68
STORMCLOUD	3038.16*	PF 1	1495.00	5277 01	5281 18	3.57		5282 00	0 004129	7.26	205.82	57.73	0 68
STORMCLOUD	3037.12*	PF 1	1495.00	5277 01	5281.17	3 56		5281.99	0 004151	7.28	205.46	57 70	0.68
STORMCLOUD	3036.08*	PF 1	1495.00	5277.00	5281 17	3.57		5281 99	0.004129	7 26	205.82	57.73	0 68
STORMCLOUD	3035.04*	PF 1	1495 00	5277.00	5281.16	3.56		5281.98	0.004151	7.28	205.46	57 70	0.68
STORMCLOUD	3034.*	PF 1	1495.00	5277.00	5281 15	3.56		5281.98	0 004173	7 29	205.09	57.68	0 68
STORMCLOUD	3032.96*	PF 1	1495 00	5276 99	5281 15	3 56		5281.97	0.004151	7.28	205.46	57 70	0.68
STORMCLOUD	3031.92*	PF 1	1495.00	5276.99	5281 15	3 56		5281.97	0 004173	7.29	205.09	57 68	0.68
STORMCLOUD	3030.88*	PF 1	1495.00	5276 98	5281.14	3.56		5281.96	0 004145	7.27	205.54	57 71	0.68
STORMCLOUD	3029.84*	PF 1	1495.00	5276.98	5281.14	3.56		5281 96	0 004168	7 29	205.18	57.68	0.68
STORMCLOUD	3028.8*	PF 1	1495 00	5276.98	5281 13	3.55		5281 96	0.004190	7 30	204 81	57.66	0 68
STORMCLOUD	3027.76*	PF 1	1495.00	5276.97	5281.13	3.56		5281 95	0.004166	7 29	205.20	57.69	0 68
STORMCLOUD	3026.72*	PF 1	1495 00	5276.97	5281 12	3.55		5281 95	0.004188	7.30	204 84	57.66	0 68
STORMCLOUD	3025.68*	PF 1	1495.00	5276.96	5281.12	3.56		5281 94	0 004162	7 28	205.26	57 69	0 68
STORMCLOUD	3024.64*	PF 1	1495 00	5276.96	5281 11	3.55		5281.94	0 004185	7 30	204.89	57.66	0 68
STORMCLOUD	3023.6*	PF 1	1495 00	5276.96	5281 10	3.55		5281.93	0 004209	7.31	204.50	57.64	0.68
STORMCLOUD	3022.56*	PF 1	1495 00	5276.95	5281 10	3.55		5281.93	0.004185	7.30	204 89	57.66	0.68
STORMCLOUD	3021.52*	PF 1	1495.00	5276 95	5281.10	3 55		5281.92	0 004207	7.31	204 53	57 64	0.68
STORMCLOUD	3020.48*	PF 1	1495 00	5276 94	5281.09	3 55		5281.92	0.004181	7.29	204 95	57 67	0.68
STORMCLOUD	3019.44*	PF 1	1495 00	5276.94	5281 09	3 55		5281.92	0.004203	7.31	204 59	57.64	0.68
STORMCLOUD	3018.4*	PF 1	1495.00	5276.94	5281 08	3.54		5281 91	0 004228	7.32	204.19	57 61	0 69
STORMCLOUD	3017.36*	PF 1	1495 00	5276.93	5281.08	3.55		5281.91	0.004203	7.31	204 59	57 64	0.68
STORMCLOUD	3016.32*	PF 1	1495 00	5276.93	5281.07	3.54		5281 90	0 004226	7 32	204 22	57.62	0 69
STORMCLOUD	3015.28*	PF 1	1495 00	5276.92	5281.07	3 55		5281.90	0.004200	7.31	204.64	57 65	0.68
STORMCLOUD	3014.24*	PF 1	1495.00	5276.92	5281.06	3.55		5281 89	0.004222	7 32	204 28	57.62	0 68

HEC-RAS Plan wilson 1 River: MIREHAVEN ARROYO Reach. STORMCLOUD Profile. PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	3013.2*	PF 1	1495 00	5276.92	5281 05	3.54		5281 89	0 004245	7.33	203.91	57 60	0.69
STORMCLOUD	3012.16*	PF 1	1495.00	5276 91	5281 05	3.55		5281.88	0 004221	7.32	204 30	57 62	0 68
STORMCLOUD	3011.12*	PF 1	1495.00	5276.91	5281 04	3.54		5281 88	0 004243	7 33	203.94	57 60	0.69
STORMCLOUD	3010.08*	PF 1	1495.00	5276.90	5281.04	3 55		5281 87	0.004217	7 32	204 36	57 63	0.68
STORMCLOUD	3009.04*	PF 1	1495 00	5276.90	5281 04	3.54		5281.87	0 004240	7 33	203 99	57 60	0 69
STORMCLOUD	3008.*	PF 1	1495.00	5276 90	5281.03	3 54		5281 87	0.004264	7 34	203 60	57.57	0 69
STORMCLOUD	3006.96*	PF 1	1495.00	5276 89	5281.03	3 54		5281 86	0.004240	7.33	203.99	57.60	0 69
STORMCLOUD	3005.92*	PF 1	1495.00	5276 89	5281 02	3 54		5281 86	0 004263	7 34	203.63	57 58	0.69
STORMCLOUD	3004.88*	PF 1	1495 00	5276.88	5281 02	3.54		5281.85	0.004236	7.33	204 05	57.60	0 69
STORMCLOUD	3003.84*	PF 1	1495 00	5276 88	5281.01	3 54		5281.85	0.004261	7 34	203.66	57 58	0.69
STORMCLOUD	3002.8*	PF 1	1495 00	5276.88	5281 00	3.53		5281.84	0 004284	7 35	203.29	57 55	0.69
STORMCLOUD	3001.76*	PF 1	1495 00	5276.87	5281 00	3.54		5281.84	0 004261	7.34	203 66	57.58	0 69
STORMCLOUD	3000.72*	PF 1	1495 00	5276.87	5280 99	3.53		5281.83	0 004284	7 35	203 29	57.55	0.69
STORMCLOUD	2999.68*	PF 1	1495.00	5276 86	5280.99	3 54		5281 83	0.004257	7.34	203 71	57.58	0 69
STORMCLOUD	2998.64*	PF 1	1495 00	5276 86	5280.98	3 53		5281 82	0 004280	7 35	203.35	57 56	0.69
STORMCLOUD	2997.6*	PF 1	1495.00	5276 86	5280.98	3 53		5281 82	0.004305	7 37	202.95	57 53	0 69
STORMCLOUD	2996.56*	PF 1	1495.00	5276.85	5280.97	3 53		5281 81	0.004280	7.35	203 35	57.56	0 69
STORMCLOUD	2995.52*	PF 1	1495 00	5276.85	5280 97	3 53		5281 81	0 004303	7 37	202.98	57 53	0.69
STORMCLOUD	2994.48*	PF 1	1495 00	5276.84	5280 97	3.53		5281.80	0 004277	7.35	203 40	57.56	0 69
STORMCLOUD	2993.44*	PF 1	1495 00	5276.84	5280 96	3.53		5281.80	0 004301	7 36	203.01	57 53	0 69
STORMCLOUD	2992.4*	PF 1	1495.00	5276 84	5280.95	3 52		5281 80	0.004324	7.38	202 65	57.51	0 69
STORMCLOUD	2991.36*	PF 1	1495.00	5276 83	5280.95	3.53		5281 79	0.004301	7.36	203 01	57.53	0.69
STORMCLOUD	2990.32*	PF 1	1495.00	5276.83	5280.94	3 52		5281 79	0 004324	7 38	202 65	57 51	0.69
STORMCLOUD	2989.28*	PF 1	1495.00	5276.83	5280.94	3 52		5281 78	0.004348	7 39	202 28	57 48	0.69
STORMCLOUD	2988.24*	PF 1	1495 00	5276.82	5280 93	3.52		5281.78	0 004321	7 38	202.70	57 51	0.69
STORMCLOUD	2987.2*	PF 1	1495.00	5276 82	5280.93	3 52		5281 77	0 004346	7.39	202 31	57.48	0 69
STORMCLOUD	2986.16*	PF 1	1495.00	5276.81	5280 92	3.52		5281.77	0 004321	7.38	202 70	57 51	0 69
STORMCLOUD	2985.12*	PF 1	1495 00	5276.81	5280 92	3.52		5281.76	0.004344	7 39	202.34	57 49	0 69
STORMCLOUD	2984.08*	PF 1	1495.00	5276 81	5280.91	3 51		5281 76	0.004368	7.40	201 97	57.46	0 70
STORMCLOUD	2983.04*	PF 1	1495.00	5276 80	5280 91	3.52		5281.75	0 004342	7.39	202 36	57.49	0 69
STORMCLOUD	2982.*	PF 1	1495.00	5276 80	5280.90	3.52		5281 75	0.004366	7 40	202 00	57.46	0 70
STORMCLOUD	2980.96*	PF 1	1495 00	5276 79	5280.90	3.52		5281 75	0 004342	7 39	202.36	57 49	0.69
STORMCLOUD	2979.92*	PF 1	1495.00	5276.79	5280 89	3 52		5281 74	0.004366	7 40	202.00	57 46	0.70
STORMCLOUD	2978.88*	PF 1	1495.00	5276 79	5280.88	3 51		5281 74	0.004389	7 41	201 64	57 44	0 70
STORMCLOUD	2977.84*	PF 1	1495 00	5276.78	5280 88	3.52		5281 73	0 004362	7 40	202.06	57 47	0 70
STORMCLOUD	2976.8*	PF 1	1495 00	5276.78	5280.88	3.51		5281 73	0.004388	7.41	201.66	57.44	0 70
STORMCLOUD	2975.76*	PF 1	1495 00	5276.77	5280.87	3.52		5281.72	0 004362	7.40	202.06	57.47	0 70
STORMCLOUD	2974.72*	PF 1	1495.00	5276 77	5280.87	3 51		5281 72	0.004388	7 41	201.66	57 44	0 70
STORMCLOUD	2973.68*	PF 1	1495.00	5276 77	5280 86	3.51		5281 72	0.004411	7.43	201 30	57 41	0 70
STORMCLOUD	2972.64*	PF 1	1495.00	5276 76	5280.86	3 51		5281 71	0 004384	7 41	201.72	57.44	0.70
STORMCLOUD	2971.6*	PF 1	1495.00	5276.76	5280.85	3 51		5281 71	0.004409	7 43	201.33	57 42	0.70
STORMCLOUD	2970.56*	PF 1	1495 00	5276.75	5280 85	3 51		5281.70	0 004384	7 41	201 72	57.44	0 70
STORMCLOUD	2969.52*	PF 1	1495.00	5276 75	5280.84	3.51		5281 70	0.004408	7.42	201 35	57.42	0 70

HEC-RAS Plan: wilson 1 River. MIREHAVEN ARROYO Reach STORMCLOUD Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	2968.48*	PF 1	1495.00	5276.75	5280.83	3.50		5281.69	0.004433	7 44	200 96	57 39	0.70
STORMCLOUD	2967.44*	PF 1	1495 00	5276.74	5280 83	3.51		5281.69	0 004409	7.43	201.33	57 42	0 70
STORMCLOUD	2966.4*	PF 1	1495 00	5276.74	5280 82	3 50		5281.68	0.004435	7 44	200.93	57 39	0.70
STORMCLOUD	2965.36*	PF 1	1495.00	5276 73	5280.82	3 51		5281.68	0.004408	7 42	201.35	57.42	0.70
STORMCLOUD	2964.32*	PF 1	1495.00	5276.73	5280.81	3.50		5281.67	0.004431	7 44	200 99	57.39	0.70
STORMCLOUD	2963.28*	PF 1	1495 00	5276.73	5280.81	3.50		5281.67	0.004457	7.45	200.60	57.36	0.70
STORMCLOUD	2962.24*	PF 1	1495.00	5276.72	5280.80	3 50		5281.66	0.004431	7.44	200 99	57.39	0.70
STORMCLOUD	2961.2*	PF 1	1495 00	5276.72	5280 80	3.50		5281.66	0.004459	7.45	200.57	57 36	0.70
STORMCLOUD	2960.16*	PF 1	1495.00	5276 71	5280.79	3 50		5281.65	0.004431	7 44	200 99	57.39	0.70
STORMCLOUD	2959.12*	PF 1	1495 00	5276.71	5280 79	3.50		5281 65	0 004457	7 45	200.60	57.36	0.70
STORMCLOUD	2958.08*	PF 1	1495.00	5276 71	5280.78	3 49		5281.65	0.004483	7.47	200 21	57 34	0 70
STORMCLOUD	2957.04*	PF 1	1495 00	5276.70	5280 78	3.50		5281 64	0 004457	7 45	200.60	57.36	0 70
STORMCLOUD	2956.*	PF 1	1495.00	5276 70	5280 77	3 49		5281.64	0.004485	7.47	200 18	57 34	0 70
STORMCLOUD	2954.96*	PF 1	1495.00	5276.69	5280.77	3.50		5281.63	0 004457	7.45	200.60	57.36	0 70
STORMCLOUD	2953.92*	PF 1	1495.00	5276 69	5280.76	3.49		5281.63	0.004483	7.47	200 21	57 34	0 70
STORMCLOUD	2952.88*	PF 1	1495.00	5276.69	5280 75	3.49		5281 62	0.004510	7.48	199.81	57.31	0.71
STORMCLOUD	2951.84*	PF 1	1495.00	5276.68	5280.75	3 49		5281.62	0.004483	7.47	200.21	57 34	0 70
STORMCLOUD	2950.8*	PF 1	1495.00	5276.68	5280 74	3.49		5281 61	0.004512	7.48	199.79	57.31	0 71
STORMCLOUD	2949.76*	PF 1	1495.00	5276.67	5280 74	3.49		5281 61	0.004483	7 47	200.21	57.34	0.70
STORMCLOUD	2948.72*	PF 1	1495.00	5276.67	5280 73	3.49		5281 60	0.004510	7.48	199.81	57.31	0.71
STORMCLOUD	2947.68*	PF 1	1495.00	5276 67	5280.73	3 48		5281.60	0.004536	7.50	199.42	57 28	0.71
STORMCLOUD	2946.64*	PF 1	1495.00	5276.66	5280 72	3.49		5281 59	0 004510	7.48	199.81	57.31	0.71
STORMCLOUD	2945.6*	PF 1	1495 00	5276.66	5280 72	3.48		5281 59	0.004538	7 50	199.39	57.28	0 71
STORMCLOUD	2944.56*	PF 1	1495 00	5276.65	5280.71	3.49		5281.58	0 004510	7.48	199.81	57 31	0.71
STORMCLOUD	2943.52*	PF 1	1495 00	5276.65	5280.71	3.48		5281.58	0.004536	7 50	199.42	57.28	0 71
STORMCLOUD	2942.48*	PF 1	1495.00	5276.65	5280.70	3.48		5281.58	0.004565	7.51	199 00	57.25	0.71
STORMCLOUD	2941.44*	PF 1	1495.00	5276 64	5280.70	3 48		5281.57	0.004540	7.50	199 37	57.28	0.71
STORMCLOUD	2940.4*	PF 1	1495.00	5276.64	5280.69	3 48		5281.56	0.004567	7.51	198.98	57 25	0.71
STORMCLOUD	2939.36*	PF 1	1495 00	5276.63	5280 69	3.48		5281 56	0.004540	7 50	199.37	57.28	0.71
STORMCLOUD	2938.32*	PF 1	1495 00	5276.63	5280 68	3.48		5281.55	0.004567	7.51	198.98	57 25	0 71
STORMCLOUD	2937.28*	PF 1	1495 00	5276.63	5280.67	3.47		5281 55	0 004596	7 53	198 56	57.22	0 71
STORMCLOUD	2936.24*	PF 1	1495.00	5276.62	5280.67	3.47		5281 54	0 004571	7 52	198 92	57.25	0.71
STORMCLOUD	2935.2*	PF 1	1495 00	5276.62	5280.66	3.47		5281 54	0 004597	7 53	198.53	57.22	0 71
STORMCLOUD	2934.16*	PF 1	1495.00	5276.61	5280 66	3.47		5281 53	0 004571	7 52	198.92	57.25	0 71
STORMCLOUD	2933.12*	PF 1	1495.00	5276.61	5280 65	3.47		5281.53	0 004597	7 53	198.53	57.22	0 71
STORMCLOUD	2932.08*	PF 1	1495 00	5276.61	5280.64	3.46		5281 53	0.004627	7.55	198 11	57.19	0.71
STORMCLOUD	2931.04*	PF 1	1495 00	5276.60	5280 64	3.47		5281 52	0.004601	7 53	198.47	57.22	0.71
STORMCLOUD	2930.*	PF 1	1495 00	5276.60	5280.63	3.46		5281 52	0.004632	7 55	198.03	57.19	0 71
STORMCLOUD	2928.96*	PF 1	1495 00	5276.60	5280.62	3 46		5281.51	0.004662	7.57	197 61	57 16	0.72
STORMCLOUD	2927.92*	PF 1	1495.00	5276 59	5280.62	3.46		5281 51	0 004634	7 55	198.00	57.18	0.72
STORMCLOUD	2926.88*	PF 1	1495.00	5276 59	5280.61	3 46		5281.50	0 004664	7.57	197.58	57.15	0 72
STORMCLOUD	2925.84*	PF 1	1495 00	5276.58	5280.61	3.46		5281 50	0.004640	7 55	197 91	57.18	0.72
STORMCLOUD	2924.8*	PF 1	1495.00	5276 58	5280.60	3.46		5281 49	0 004670	7.57	197.49	57.15	0 72

HEC-RAS Plan. wilson 1 River· MIREHAVEN ARROYO Reach. STORMCLOUD Profile PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	2923.76*	PF 1	1495 00	5276.58	5280 59	3.45		5281.49	0 004701	7.59	197 05	57.12	0.72
STORMCLOUD	2922.72*	PF 1	1495 00	5276 57	5280.59	3 46		5281 48	0.004674	7 57	197.44	57.14	0.72
STORMCLOUD	2921.68*	PF 1	1495 00	5276.57	5280 58	3.45		5281 48	0.004703	7 59	197.02	57.11	0.72
STORMCLOUD	2920.64*	PF 1	1495.00	5276 56	5280 58	3 45		5281.47	0 004677	7.57	197 38	57.14	0.72
STORMCLOUD	2919.6*	PF 1	1495.00	5276 56	5280.57	3 45		5281 47	0.004709	7 59	196.94	57 11	0 72
STORMCLOUD	2918.56*	PF 1	1495.00	5276.56	5280 57	3.44		5281.46	0 004739	7.61	196.52	57.08	0.72
STORMCLOUD	2917.52*	PF 1	1495.00	5276 55	5280.56	3 45		5281 46	0 004711	7.59	196 91	57.11	0 72
STORMCLOUD	2916 48*	PF 1	1495 00	5276.55	5280 55	3 44		5281 45	0.004741	7 61	196.49	57 08	0.72
STORMCLOUD	2915.44*	PF 1	1495.00	5276 54	5280.55	3 45		5281.45	0.004715	7 59	196 85	57.10	0 72
STORMCLOUD	2914.4*	PF 1	1495 00	5276.54	5280 54	3.44		5281.44	0.004747	7.61	196.41	57 07	0.72
STORMCLOUD	2913.36*	PF 1	1495.00	5276 54	5280 54	3 44		5281 44	0 004777	7 63	195.99	57 04	0 73
STORMCLOUD	2912.32*	PF 1	1495.00	5276 53	5280.53	3.44		5281.43	0 004749	7.61	196 38	57.07	0 72
STORMCLOUD	2911.28*	PF 1	1495.00	5276 53	5280.53	3 44		5281 43	0 004779	7.63	195 96	57.04	0 73
STORMCLOUD	2910.24*	PF 1	1495.00	5276.52	5280 52	3.44		5281 42	0.004755	7 62	196.30	57 06	0 72
STORMCLOUD	2909.2*	PF 1	1495.00	5276 52	5280.51	3 43		5281 42	0 004786	7.63	195 88	57.03	0 73
STORMCLOUD	2908.16*	PF 1	1495.00	5276.52	5280.51	3 43		5281 42	0 004816	7.65	195 46	57.01	0 73
STORMCLOUD	2907.12*	PF 1	1495 00	5276 51	5280.50	3 43		5281 41	0 004788	7.63	195.85	57.03	0 73
STORMCLOUD	2906.08*	PF 1	1495 00	5276.51	5280 50	3.43		5281.40	0 004818	7.65	195 43	57.00	0 73
STORMCLOUD	2905.04*	PF 1	1495 00	5276.50	5280 49	3.43		5281 40	0.004792	7.64	195.79	57 03	0.73
STORMCLOUD	2904.00	PF 1	1495 00	5276.50	5280 48	3.43		5281.39	0 004824	7.65	195 35	57.00	0.73
STORMCLOUD	2903.*	PF 1	1495.00	5276 33	5280.31	3.17		5281 38	0.006213	8.29	180 41	56 95	0.82
STORMCLOUD	2902.*	PF 1	1495.00	5276.17	5279 92	2.79	5279 92	5281.33	0.009694	9.54	156 63	56.09	1 01
STORMCLOUD	2901.*	PF 1	1495 00	5276.00	5279 72	2.63	5279.90	5281.31	0 011851	10.15	147 35	55.94	1.10
STORMCLOUD	2900.*	PF 1	1495.00	5275.83	5279 43	2 47	5279.80	5281.28	0 014920	10 90	137.19	55.46	1 22
STORMCLOUD	2899.*	PF 1	1495 00	5275.67	5279 09	2.33	5279 62	5281.22	0 018795	11.72	127 53	54.75	1.35
STORMCLOUD	2898	PF 1	1495 00	5275.50	5278 68	2.20	5279 38	5281 16	0.023771	12.64	118.25	53.79	1.50
STORMCLOUD	2897.34	PF 1	1495.00	5275.39	5278 65	2.19	5279 37	5281.14	0 023946	12.65	118.14	53.84	1 51
STORMCLOUD	2897.33	PF 1	1495.00	5270 59	5273 88	2 21	5275.90	5280.71	0 072627	20.97	71 30	32.29	2 49
STORMCLOUD	2896 35*	PF 1	1495 00	5270.59	5273 86	2.19	5275 82	5280.62	0.072346	20 86	71.68	32.76	2 48
STORMCLOUD	2895.37*	PF 1	1495 00	5270.58	5273 83	2.17	5275 78	5280.53	0 072241	20 77	71 99	33 20	2.49
STORMCLOUD	2894.39*	PF 1	1495 00	5270.58	5273 81	2 15	5275.69	5280 44	0.072105	20 66	72.35	33 71	2 49
STORMCLOUD	2893.41*	PF 1	1495.00	5270 58	5273.79	2 12	5275.61	5280 36	0.072116	20.57	72 68	34.25	2.49
STORMCLOUD	2892.44*	PF 1	1495 00	5270 57	5273.76	2 10	5275.54	5280.28	0.072261	20.50	72 94	34.74	2 49
STORMCLOUD	2891.46*	PF 1	1495.00	5270 57	5273.73	2 07	5275.46	5280 20	0 072512	20.41	73 24	35.33	2 50
STORMCLOUD	2890.48*	PF 1	1495 00	5270.57	5273 70	2 05	5275.40	5280 12	0.072728	20 33	73.54	35 92	2 50
STORMCLOUD	2889.50*	PF 1	1495.00	5270 57	5273.67	2.02	5275 33	5280 04	0 073250	20.26	73 79	36.57	2 51
STORMCLOUD	2888.53*	PF 1	1495.00	5270 56	5273.63	1.99	5275 25	5279 96	0 073760	20.19	74 05	37.23	2 52
STORMCLOUD	2887 55*	PF 1	1495 00	5270.56	5273 60	1 96	5275.18	5279.87	0.074117	20 09	74.40	37 96	2 53
STORMCLOUD	2886.57*	PF 1	1495 00	5270.56	5273 56	1 93	5275 11	5279.77	0.074644	20.00	74 76	38 78	2.54
STORMCLOUD	2885.59*	PF 1	1495.00	5270 55	5273.50	1 52	5275.04	5279.68	0 099926	19 94	74 96	49.42	2 85
STORMCLOUD	2884.62*	PF 1	1495.00	5270 55	5273.44	1 52	5274.97	5279 57	0 098152	19 87	75.25	49.38	2 84
STORMCLOUD	2883.64*	PF 1	1495 00	5270.55	5273.37	1.53	5274 89	5279.46	0 096569	19.80	75 49	49 32	2 82
STORMCLOUD	2882.66*	PF 1	1495 00	5270 54	5273.30	1.54	5274.83	5279 36	0.095263	19 75	75.70	49 27	2.81

HEC-RAS Plan wilson 1 River. MIREHAVEN ARROYO Reach: STORMCLOUD Profile. PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	2881.68*	PF 1	1495.00	5270 54	5273.23	1.54	5274 75	5279.25	0 093875	19.69	75.91	49 21	2.79
STORMCLOUD	2880.71*	PF 1	1495 00	5270.54	5273 16	1.55	5274.68	5279.15	0.092484	19 64	76 13	49.15	2 78
STORMCLOUD	2879.73*	PF 1	1495.00	5270 54	5273 10	1 56	5274 61	5279.05	0.091153	19.58	76.36	49.09	2 77
STORMCLOUD	2878.75*	PF 1	1495.00	5270.53	5273.02	1 56	5274.54	5278 96	0.090335	19 56	76.45	49.03	2 76
STORMCLOUD	2877.77*	PF 1	1495 00	5270.53	5272.95	1.57	5274.46	5278.86	0.089175	19 51	76 63	48.95	2 75
STORMCLOUD	2876.79*	PF 1	1495.00	5270 53	5272.89	1.57	5274.40	5278 77	0.088000	19.46	76.83	48 89	2.74
STORMCLOUD	2875.82*	PF 1	1495 00	5270.52	5272 81	1.58	5274.32	5278.68	0.087251	19.44	76 92	48.81	2.73
STORMCLOUD	2874.84*	PF 1	1495 00	5270.52	5272 74	1.58	5274 26	5278 59	0.086313	19.40	77.05	48 72	2.72
STORMCLOUD	2873.86*	PF 1	1495.00	5270.52	5272.68	1.59	5274.19	5278.50	0.085337	19 36	77.21	48.64	2.71
STORMCLOUD	2872.88*	PF 1	1495.00	5270.52	5272.61	1 59	5274 12	5278.41	0 084540	19 34	77.32	48.55	2 70
STORMCLOUD	2871.91*	PF 1	1495.00	5270.51	5272 53	1 60	5274.04	5278.32	0.083856	19.31	77.41	48.47	2.69
STORMCLOUD	2870.93*	PF 1	1495.00	5270.51	5272 46	1.60	5273.97	5278.24	0.083105	19.29	77.51	48 37	2.69
STORMCLOUD	2869.95*	PF 1	1495.00	5270.51	5272.39	1 61	5273.90	5278.15	0.082344	19.26	77 61	48.26	2.68
STORMCLOUD	2868.97*	PF 1	1495.00	5270.50	5272.32	1.61	5273.83	5278.07	0.081835	19.25	77 66	48 16	2.67
STORMCLOUD	2868 00	PF 1	1495.00	5270 50	5272.25	1.62	5273.76	5277 99	0 081148	19 23	77.75	48.04	2 66
STORMCLOUD	2867.00*	PF 1	1495.00	5270.50	5272 27	1 64	5273.76	5277.86	0.078004	18 99	78 73	48.12	2.62
STORMCLOUD	2866.00*	PF 1	1495.00	5270.49	5272.27	1.65	5273 75	5277 75	0 075294	18 78	79.63	48.20	2 57
STORMCLOUD	2865.01*	PF 1	1495.00	5270.49	5272.30	1 67	5273 75	5277.64	0.072438	18 55	80.61	48.28	2 53
STORMCLOUD	2864.01*	PF 1	1495.00	5270.49	5272 32	1 69	5273.75	5277.53	0.069720	18 32	81 61	48.36	2.49
STORMCLOUD	2863.02*	PF 1	1495.00	5270 48	5272.32	1 70	5273 74	5277.43	0.067434	18 13	82.48	48.43	2 45
STORMCLOUD	2862.02*	PF 1	1495.00	5270 48	5272.34	1.72	5273 74	5277.32	0.064898	17.90	83.50	48 52	2.41
STORMCLOUD	2861.02*	PF 1	1495.00	5270 48	5272.37	1.74	5273.74	5277.22	0.062428	17 68	84.54	48.60	2.36
STORMCLOUD	2860.03*	PF 1	1495 00	5270.47	5272.37	1 75	5273.73	5277.13	0.060444	17.50	85 42	48.68	2 33
STORMCLOUD	2859.03*	PF 1	1495 00	5270.47	5272 40	1.77	5273.73	5277.04	0.058139	17.29	86.49	48.76	2 29
STORMCLOUD	2858.04*	PF 1	1495 00	5270.47	5272 42	1.79	5273.73	5276.94	0.055947	17.07	87.56	48 85	2.25
STORMCLOUD	2857.04*	PF 1	1495.00	5270.46	5272.42	1.80	5273 72	5276 88	0 054544	16.94	88.28	48.91	2.22
STORMCLOUD	2856.04*	PF 1	1495.00	5270.46	5272.44	1 82	5273.72	5276.81	0 052876	16 77	89.16	48.98	2 19
STORMCLOUD	2855.05*	PF 1	1495.00	5270.46	5272 46	1 84	5273.72	5276.72	0.050850	16.56	90.29	49 07	2 15
STORMCLOUD	2854.05*	PF 1	1495.00	5270.46	5272.49	1.86	5273 72	5276.64	0.048963	16 36	91.39	49 16	2.11
STORMCLOUD	2853.06*	PF 1	1495 00	5270.45	5272 49	1.87	5273 71	5276.58	0.047781	16.23	92.11	49.22	2.09
STORMCLOUD	2852.06*	PF 1	1495.00	5270 45	5272.51	1 89	5273 71	5276.52	0.046336	16 07	93.03	49.30	2.06
STORMCLOUD	2851.06*	PF 1	1495.00	5270.45	5272.53	1.90	5273.71	5276 46	0 044911	15.91	93.97	49.37	2.03
STORMCLOUD	2850.07*	PF 1	1495.00	5270 44	5272.53	1 92	5273 70	5276 40	0.043853	15 79	94.69	49.43	2 01
STORMCLOUD	2849.07*	PF 1	1495 00	5270.44	5272 55	1.93	5273.70	5276 35	0 042525	15 63	95.63	49.51	1 98
STORMCLOUD	2848.08*	PF 1	1495.00	5270 44	5272.57	1.95	5273.70	5276 29	0 041217	15 48	96.60	49.59	1 95
STORMCLOUD	2847.08*	PF 1	1495.00	5270.43	5272.58	1.96	5273.69	5276.24	0.040269	15.36	97.33	49.64	1.93
STORMCLOUD	2846.08*	PF 1	1495.00	5270 43	5272.60	1 98	5273.69	5276.19	0.039049	15.21	98.30	49 72	1.91
STORMCLOUD	2845.09*	PF 1	1495.00	5270 43	5272.62	1 99	5273 69	5276.14	0.037847	15.06	99 29	49.80	1.88
STORMCLOUD	2844.09*	PF 1	1495 00	5270.42	5272 62	2.01	5273.68	5276.09	0.036970	14.94	100 05	49.86	1.86
STORMCLOUD	2843.1*	PF 1	1495.00	5270 42	5272.64	2 02	5273 68	5276 04	0 035822	14 79	101 07	49.94	1 83
STORMCLOUD	2842.10*	PF 1	1495 00	5270.42	5272.66	2.04	5273 68	5275 99	0 034695	14 64	102.12	50 03	1 81
STORMCLOUD	2841.10*	PF 1	1495.00	5270 41	5272.67	2 05	5273.67	5275.95	0 033910	14 53	102 88	50.09	1 79
STORMCLOUD	2840.11*	PF 1	1495 00	5270.41	5272 69	2 07	5273.67	5275.90	0.032835	14.38	103.95	50 18	1.76

HEC-RAS Plan. wilson 1 River MIREHAVEN ARROYO Reach: STORMCLOUD Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	2839.11*	PF 1	1495 00	5270.41	5272.71	2 09	5273.67	5275 86	0 031804	14.23	105.03	50.26	1.74
STORMCLOUD	2838.12*	PF 1	1495 00	5270 40	5272 72	2 10	5273 66	5275.82	0 031102	14 13	105.79	50 32	1 72
STORMCLOUD	2837.12*	PF 1	1495.00	5270 40	5272.74	2 12	5273 66	5275.77	0 030075	13.98	106 95	50 41	1 69
STORMCLOUD	2836.12*	PF 1	1495 00	5270.40	5272 76	2 14	5273.66	5275 73	0 029071	13.83	108 13	50 51	1 67
STORMCLOUD	2835.13*	PF 1	1495.00	5270 40	5274.75	3 70	5273 66	5275.49	0.003550	6 90	216.55	58 47	0 63
STORMCLOUD	2834.13*	PF 1	1495.00	5270 39	5274 75	3.71		5275 49	0.003528	6 89	217 00	58.50	0.63
STORMCLOUD	2833.13*	PF 1	1495.00	5270 39	5274 74	3.71		5275 48	0.003543	6 90	216 69	58.48	0.63
STORMCLOUD	2832.14*	PF 1	1495 00	5270.39	5274.74	3 70		5275.48	0 003558	6.91	216.38	58 45	0.63
STORMCLOUD	2831.14*	PF 1	1495.00	5270 38	5274 74	3.71		5275 48	0.003535	6 89	216 86	58.49	0 63
STORMCLOUD	2830.15*	PF 1	1495 00	5270.38	5274 73	3 70		5275 47	0 003549	6.90	216 58	58.47	0.63
STORMCLOUD	2829.15*	PF 1	1495.00	5270 38	5274.73	3.70		5275.47	0.003564	6 91	216.26	58 45	0 63
STORMCLOUD	2828.15*	PF 1	1495 00	5270.37	5274 73	3.71		5275 46	0 003542	6 90	216 72	58.48	0.63
STORMCLOUD	2827.16*	PF 1	1495.00	5270.37	5274 72	3.70		5275 46	0.003557	6 91	216 40	58.46	0 63
STORMCLOUD	2826.16*	PF 1	1495 00	5270.37	5274.71	3 70		5275 46	0 003572	6.92	216 09	58 44	0.63
STORMCLOUD	2825.17*	PF 1	1495.00	5270 36	5274 71	3.70		5275.45	0.003549	6.90	216.58	58.47	0 63
STORMCLOUD	2824.17*	PF 1	1495.00	5270 36	5274.71	3.70		5275.45	0.003563	6.91	216.29	58 45	0.63
STORMCLOUD	2823.17*	PF 1	1495.00	5270 36	5274.70	3 70		5275.45	0 003578	6.92	215.98	58 43	0.63
STORMCLOUD	2822.18*	PF 1	1495.00	5270.35	5274 70	3.70		5275 44	0.003556	6 91	216.43	58.46	0 63
STORMCLOUD	2821.18*	PF 1	1495 00	5270.35	5274.70	3.70		5275 44	0 003570	6 92	216 15	58 44	0.63
STORMCLOUD	2820.19*	PF 1	1495.00	5270.35	5274 69	3.69		5275 44	0.003585	6 93	215.83	58.42	0.64
STORMCLOUD	2819 19*	PF 1	1495 00	5270 34	5274.69	3.70		5275.43	0 003563	6.91	216 29	58 45	0.63
STORMCLOUD	2818.19*	PF 1	1495.00	5270.34	5274 68	3.70		5275 43	0.003577	6 92	216 01	58.43	0.63
STORMCLOUD	2817.20*	PF 1	1495 00	5270 34	5274.68	3 69		5275 42	0 003592	6.93	215 69	58 41	0.64
STORMCLOUD	2816.20*	PF 1	1495 00	5270.33	5274.68	3 70		5275 42	0 003570	6 92	216 15	58.44	0.63
STORMCLOUD	2815.21*	PF 1	1495 00	5270 33	5274.67	3 70		5275.42	0 003584	6 93	215.86	58 42	0 63
STORMCLOUD	2814.21*	PF 1	1495.00	5270 33	5274 67	3.69		5275 41	0.003599	6 94	215.55	58.40	0.64
STORMCLOUD	2813.21*	PF 1	1495.00	5270 32	5274.66	3 70		5275 41	0 003577	6 92	216 01	58.43	0.63
STORMCLOUD	2812.22*	PF 1	1495 00	5270.32	5274.66	3 69		5275.40	0 003591	6.93	215.72	58 41	0 64
STORMCLOUD	2811.22*	PF 1	1495.00	5270.32	5274 65	3.69		5275 40	0.003606	6 94	215 41	58.39	0.64
STORMCLOUD	2810.23*	PF 1	1495.00	5270 31	5274 65	3.70		5275.40	0.003584	6 93	215.86	58.42	0 63
STORMCLOUD	2809.23*	PF 1	1495.00	5270 31	5274 65	3.69		5275 39	0.003599	6 94	215 55	58.40	0.64
STORMCLOUD	2808.23*	PF 1	1495 00	5270.31	5274 64	3 69		5275 39	0 003615	6.95	215 24	58 38	0 64
STORMCLOUD	2807.24*	PF 1	1495.00	5270 31	5274 63	3 68		5275 39	0 003630	6.96	214 92	58 35	0.64
STORMCLOUD	2806.24*	PF 1	1495 00	5270 30	5274 63	3 69		5275 38	0 003608	6.94	215 38	58 39	0.64
STORMCLOUD	2805.25*	PF 1	1495 00	5270 30	5274.63	3 68		5275.38	0 003623	6 95	215.06	58 36	0.64
STORMCLOUD	2804.25*	PF 1	1495.00	5270 30	5274.62	3.68		5275.37	0.003639	6 96	214.75	58.34	0.64
STORMCLOUD	2803.25*	PF 1	1495.00	5270 29	5274.62	3 69		5275.37	0.003618	6 95	215.18	58.37	0.64
STORMCLOUD	2802.26*	PF 1	1495.00	5270.29	5274 61	3 68		5275 37	0 003633	6.96	214 86	58.35	0.64
STORMCLOUD	2801.26*	PF 1	1495 00	5270.29	5274 61	3.68		5275.36	0 003649	6.97	214 55	58 33	0.64
STORMCLOUD	2800.27*	PF 1	1495.00	5270 28	5274.61	3 68		5275.36	0 003626	6.95	215.01	58 36	0 64
STORMCLOUD	2799.27*	PF 1	1495 00	5270 28	5274.60	3 68		5275.35	0 003642	6.96	214.69	58 34	0.64
STORMCLOUD	2798.27*	PF 1	1495 00	5270.28	5274 59	3.68		5275 35	0.003658	6.97	214 38	58.32	0 64
STORMCLOUD	2797.28*	PF 1	1495 00	5270 27	5274.59	3 68		5275 34	0 003638	6.96	214 78	58 35	0 64

HEC-RAS Plan. wilson 1 River. MIREHAVEN ARROYO Reach. STORMCLOUD Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	2796.28*	PF 1	1495.00	5270 27	5274.59	3.68		5275 34	0.003655	6 97	214.44	58.32	0.64
STORMCLOUD	2795.29*	PF 1	1495 00	5270.27	5274.58	3.67		5275.34	0.003671	6.98	214.12	58 30	0 64
STORMCLOUD	2794.29*	PF 1	1495 00	5270 26	5274.58	3.68		5275 33	0 003648	6.97	214.58	58 33	0 64
STORMCLOUD	2793.29*	PF 1	1495.00	5270 26	5274 57	3.67		5275 33	0 003665	6 98	214.24	58 31	0 64
STORMCLOUD	2792.30*	PF 1	1495 00	5270.26	5274.57	3.67		5275.33	0.003682	6.99	213.90	58 28	0.64
STORMCLOUD	2791.30*	PF 1	1495 00	5270.25	5274.56	3 67		5275.32	0.003662	6.98	214 30	58.31	0.64
STORMCLOUD	2790.31*	PF 1	1495 00	5270.25	5274.56	3 67		5275.32	0.003678	6.99	213 98	58.29	0.64
STORMCLOUD	2789.31*	PF 1	1495.00	5270.25	5274 55	3 67		5275 31	0.003694	7 00	213.67	58.27	0 64
STORMCLOUD	2788.31*	PF 1	1495 00	5270.25	5274.55	3 66		5275.31	0.003710	7.01	213.36	58.25	0.65
STORMCLOUD	2787.32*	PF 1	1495 00	5270.24	5274.54	3 67		5275.30	0.003690	6.99	213 75	58.27	0.64
STORMCLOUD	2786.32*	PF 1	1495.00	5270.24	5274 54	3.66		5275 30	0.003707	7 01	213.41	58.25	0.64
STORMCLOUD	2785.33*	PF 1	1495.00	5270 24	5274 53	3.66		5275 30	0 003725	7.02	213.07	58.23	0.65
STORMCLOUD	2784.33*	PF 1	1495.00	5270 23	5274 53	3.67		5275 29	0 003701	7 00	213.53	58.26	0 64
STORMCLOUD	2783.33*	PF 1	1495.00	5270.23	5274.52	3.66		5275.29	0 003717	7.01	213 21	58.24	0 65
STORMCLOUD	2782.34*	PF 1	1495.00	5270.23	5274 52	3 66		5275.29	0.003735	7 02	212.87	58.21	0 65
STORMCLOUD	2781.34*	PF 1	1495.00	5270 22	5274.52	3.66		5275.28	0.003714	7.01	213.27	58 24	0 65
STORMCLOUD	2780.35*	PF 1	1495.00	5270 22	5274 51	3.66		5275 28	0.003731	7 02	212.96	58.22	0.65
STORMCLOUD	2779.35*	PF 1	1495.00	5270.22	5274.51	3.65		5275.27	0.003747	7.03	212.65	58 20	0 65
STORMCLOUD	2778.35*	PF 1	1495 00	5270.21	5274.50	3.66		5275.27	0.003725	7.02	213 07	58 23	0.65
STORMCLOUD	2777.36*	PF 1	1495.00	5270 21	5274.50	3.65		5275 26	0 003743	7.03	212.73	58.20	0 65
STORMCLOUD	2776.36*	PF 1	1495.00	5270 21	5274 49	3 65		5275 26	0.003760	7 04	212.39	58.18	0.65
STORMCLOUD	2775.37*	PF 1	1495.00	5270 20	5274.49	3.66		5275 25	0.003740	7 03	212.79	58 21	0 65
STORMCLOUD	2774.37*	PF 1	1495 00	5270.20	5274.48	3.65		5275.25	0.003756	7.04	212.47	58 19	0 65
STORMCLOUD	2773.37*	PF 1	1495.00	5270 20	5274 48	3.65		5275 25	0.003772	7 05	212.16	58.17	0 65
STORMCLOUD	2772.38*	PF 1	1495.00	5270 19	5274 47	3.65		5275.24	0 003750	7.03	212.59	58.19	0 65
STORMCLOUD	2771.38*	PF 1	1495 00	5270.19	5274.47	3.65		5275.24	0.003768	7.04	212.25	58.17	0.65
STORMCLOUD	2770.39*	PF 1	1495.00	5270.19	5274.46	3 64		5275.24	0.003786	7 05	211.91	58.15	0.65
STORMCLOUD	2769.39*	PF 1	1495.00	5270.18	5274.46	3 65		5275 23	0 003763	7 04	212.33	58.18	0.65
STORMCLOUD	2768.39*	PF 1	1495.00	5270.18	5274 45	3.65		5275.23	0 003781	7.05	211.99	58 15	0 65
STORMCLOUD	2767.40*	PF 1	1495.00	5270 18	5274 45	3 64		5275 22	0 003798	7.06	211.68	58 13	0 65
STORMCLOUD	2766.40*	PF 1	1495.00	5270 17	5274.45	3.65		5275.22	0.003774	7.05	212 13	58.16	0.65
STORMCLOUD	2765.41*	PF 1	1495 00	5270.17	5274 44	3 64		5275 21	0 003792	7.06	211 79	58 14	0 65
STORMCLOUD	2764.41*	PF 1	1495.00	5270.17	5274.43	3 64		5275.21	0.003810	7.07	211 45	58.12	0.65
STORMCLOUD	2763.41*	PF 1	1495.00	5270 17	5274 43	3.63		5275.21	0.003828	7.08	211 11	58.09	0.65
STORMCLOUD	2762.42*	PF 1	1495.00	5270.16	5274.43	3 64		5275.20	0.003807	7 07	211 51	58.12	0.65
STORMCLOUD	2761.42*	PF 1	1495 00	5270.16	5274 42	3.64		5275 20	0 003824	7.08	211.20	58.10	0.65
STORMCLOUD	2760.43*	PF 1	1495.00	5270.16	5274 41	3 63		5275 20	0 003842	7 09	210.86	58 08	0.66
STORMCLOUD	2759.43*	PF 1	1495 00	5270.15	5274.41	3.64		5275 19	0.003818	7 07	211.31	58.11	0.65
STORMCLOUD	2758.43*	PF 1	1495.00	5270 15	5274 41	3.63		5275.19	0 003835	7.09	211.00	58 09	0 66
STORMCLOUD	2757.44*	PF 1	1495 00	5270.15	5274 40	3 63		5275.18	0 003853	7 10	210.66	58.06	0.66
STORMCLOUD	2756.44*	PF 1	1495 00	5270.14	5274.40	3 63		5275 18	0.003832	7 08	211.06	58.09	0.65
STORMCLOUD	2755.45*	PF 1	1495.00	5270 14	5274.39	3.63		5275 17	0 003848	7.09	210 74	58 07	0.66
STORMCLOUD	2754.45*	PF 1	1495 00	5270.14	5274.39	3 62		5275 17	0.003867	7 11	210.40	58.04	0.66

HEC-RAS Plan: wilson 1 River MIREHAVEN ARROYO Reach: STORMCLOUD Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	2753.45*	PF 1	1495 00	5270 13	5274 38	3 63		5275.17	0.003842	7.09	210.86	58.08	0.66
STORMCLOUD	2752.46*	PF 1	1495.00	5270.13	5274.38	3.63		5275.16	0.003859	7 10	210 55	58.05	0 66
STORMCLOUD	2751.46*	PF 1	1495.00	5270.13	5274.37	3.62		5275 16	0 003878	7 11	210.20	58.03	0.66
STORMCLOUD	2750.47*	PF 1	1495 00	5270 12	5274 37	3.63		5275.15	0.003856	7.10	210.60	58.06	0.66
STORMCLOUD	2749.47*	PF 1	1495.00	5270.12	5274.36	3.62		5275 15	0.003873	7 11	210 29	58 04	0 66
STORMCLOUD	2748.47*	PF 1	1495 00	5270 12	5274 36	3 62		5275.15	0.003890	7.12	209.98	58 02	0 66
STORMCLOUD	2747 48*	PF 1	1495 00	5270.11	5274.36	3 62		5275.14	0 003867	7.11	210.40	58 04	0 66
STORMCLOUD	2746.48*	PF 1	1495 00	5270 11	5274 35	3 62		5275 14	0.003886	7.12	210.06	58.02	0.66
STORMCLOUD	2745 49*	PF 1	1495.00	5270.11	5274.34	3.62		5275 13	0.003904	7.13	209 72	58.00	0 66
STORMCLOUD	2744.49*	PF 1	1495.00	5270.10	5274.34	3.62		5275.13	0.003881	7.11	210 15	58 03	0 66
STORMCLOUD	2743.49*	PF 1	1495 00	5270 10	5274 34	3 62		5275 13	0.003900	7.13	209.81	58 00	0.66
STORMCLOUD	2742.50*	PF 1	1495.00	5270.10	5274.33	3 61		5275 12	0.003917	7.14	209.50	57.98	0.66
STORMCLOUD	2741.50*	PF 1	1495 00	5270 10	5274 33	3 61		5275.12	0.003934	7.15	209.19	57 96	0 66
STORMCLOUD	2740.51*	PF 1	1495.00	5270.09	5274.32	3 61		5275 11	0 003909	7.13	209.64	57.99	0.66
STORMCLOUD	2739.51*	PF 1	1495 00	5270 09	5274 32	3.61		5275.11	0.003928	7.14	209.30	57 97	0 66
STORMCLOUD	2738.51*	PF 1	1495 00	5270 09	5274.31	3.61		5275.11	0.003947	7.15	208 96	57 94	0 66
STORMCLOUD	2737.52*	PF 1	1495 00	5270.08	5274.31	3.61		5275.10	0.003925	7.14	209.36	57 97	0 66
STORMCLOUD	2736.52*	PF 1	1495.00	5270.08	5274 30	3 61		5275 10	0 003942	7.15	209.04	57.95	0.66
STORMCLOUD	2735.53*	PF 1	1495 00	5270 08	5274.30	3.60		5275 09	0 003960	7.16	208.73	57 93	0.66
STORMCLOUD	2734.53*	PF 1	1495.00	5270.07	5274.30	3.61		5275.09	0 003934	7 15	209.19	57 96	0 66
STORMCLOUD	2733.53*	PF 1	1495 00	5270 07	5274 29	3.60		5275.09	0.003953	7 16	208.85	57 94	0.66
STORMCLOUD	2732 54*	PF 1	1495.00	5270.07	5274.28	3.60		5275.08	0.003973	7 17	208.51	57 91	0 67
STORMCLOUD	2731.54*	PF 1	1495 00	5270 06	5274 28	3 61		5275.08	0.003950	7.16	208.90	57.94	0.66
STORMCLOUD	2730.55*	PF 1	1495 00	5270 06	5274 27	3 60		5275.07	0.003969	7.17	208.56	57.92	0.67
STORMCLOUD	2729.55*	PF 1	1495.00	5270.06	5274.27	3.60		5275 07	0 003989	7 18	208 22	57 89	0 67
STORMCLOUD	2728.55*	PF 1	1495.00	5270.05	5274.27	3.60		5275.06	0.003963	7.16	208 68	57 93	0 67
STORMCLOUD	2727 56*	PF 1	1495 00	5270 05	5274 26	3.60		5275 06	0 003981	7.17	208.37	57.90	0.67
STORMCLOUD	2726.56*	PF 1	1495 00	5270 05	5274 25	3.59		5275 06	0 004002	7 19	208 00	57 88	0 67
STORMCLOUD	2725.57*	PF 1	1495.00	5270.04	5274.25	3.60		5275.05	0.003977	7 17	208 42	57 91	0 67
STORMCLOUD	2724.57*	PF 1	1495.00	5270.04	5274.25	3.59		5275.05	0 003998	7 19	208 05	57 88	0 67
STORMCLOUD	2723.57*	PF 1	1495 00	5270.04	5274.24	3.59		5275.04	0 004018	7 20	207 72	57 86	0 67
STORMCLOUD	2722.58*	PF 1	1495.00	5270 03	5274 24	3 60		5275 04	0.003992	7.18	208.17	57 89	0.67
STORMCLOUD	2721.58*	PF 1	1495.00	5270 03	5274 23	3 59		5275 04	0.004013	7.19	207.80	57.86	0.67
STORMCLOUD	2720.59*	PF 1	1495.00	5270 03	5274 23	3 59		5275 03	0.004034	7 21	207.43	57.84	0.67
STORMCLOUD	2719.59*	PF 1	1495.00	5270.03	5274.22	3 58		5275 03	0 004055	7 22	207 07	57 81	0 67
STORMCLOUD	2718.59*	PF 1	1495 00	5270.02	5274.22	3.59		5275.02	0 004031	7 21	207 49	57 84	0 67
STORMCLOUD	2717.60*	PF 1	1495 00	5270.02	5274.21	3.58		5275 02	0 004052	7 22	207 12	57 82	0 67
STORMCLOUD	2716.60*	PF 1	1495 00	5270.02	5274.20	3 58		5275.02	0.004073	7 23	206 76	57 79	0 67
STORMCLOUD	2715.61*	PF 1	1495 00	5270.01	5274.20	3.58		5275.01	0.004049	7 22	207 18	57 82	0 67
STORMCLOUD	2714.61*	PF 1	1495 00	5270 01	5274 19	3 58		5275.01	0.004070	7.23	206 81	57 80	0.67
STORMCLOUD	2713.61*	PF 1	1495 00	5270 01	5274 19	3.57		5275.00	0.004092	7 24	206 44	57 77	0.68
STORMCLOUD	2712.62*	PF 1	1495.00	5270.00	5274 19	3 58		5275 00	0 004067	7 23	206.87	57 80	0 67
STORMCLOUD	2711.62*	PF 1	1495 00	5270 00	5274.18	3.57		5274.99	0.004088	7 24	206 50	57 77	0 67

HEC-RAS Plan: wilson 1 River: MIREHAVEN ARROYO Reach: STORMCLOUD Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	2710.62*	PF 1	1495.00	5270 00	5274.17	3 57		5274.99	0.004110	7 25	206.13	57.75	0 68
STORMCLOUD	2709.63*	PF 1	1495.00	5269.99	5274.17	3 57		5274.98	0 004085	7.24	206.56	57.78	0.67
STORMCLOUD	2708.63*	PF 1	1495.00	5269.99	5274 16	3.57		5274.98	0 004107	7.25	206.19	57 75	0.68
STORMCLOUD	2707.64*	PF 1	1495.00	5269 99	5274.16	3.57		5274 98	0.004129	7.26	205.82	57.73	0 68
STORMCLOUD	2706.64*	PF 1	1495 00	5269.98	5274.15	3.57		5274 97	0.004103	7.25	206 25	57.76	0.68
STORMCLOUD	2705.64*	PF 1	1495 00	5269.98	5274.15	3.57		5274.97	0.004125	7 26	205.88	57.73	0.68
STORMCLOUD	2704.65*	PF 1	1495 00	5269.98	5274.14	3 56		5274.96	0.004145	7.27	205 54	57.71	0.68
STORMCLOUD	2703.65*	PF 1	1495 00	5269.97	5274 14	3.57		5274.96	0.004122	7 26	205.94	57 74	0.68
STORMCLOUD	2702.66*	PF 1	1495.00	5269.97	5274.13	3 56		5274 95	0 004144	7.27	205 57	57 71	0.68
STORMCLOUD	2701.66*	PF 1	1495.00	5269 97	5274.13	3.56		5274.95	0 004166	7.29	205 20	57.69	0 68
STORMCLOUD	2700.66*	PF 1	1495 00	5269.96	5274.12	3 56		5274.94	0 004140	7.27	205.63	57 71	0.68
STORMCLOUD	2699.67*	PF 1	1495.00	5269.96	5274 12	3.56		5274.94	0.004162	7 28	205.26	57 69	0.68
STORMCLOUD	2698.67*	PF 1	1495.00	5269.96	5274.11	3.55		5274.94	0 004185	7 30	204 89	57 66	0.68
STORMCLOUD	2697.68*	PF 1	1495 00	5269.96	5274 10	3.55		5274.93	0.004209	7 31	204.50	57 64	0.68
STORMCLOUD	2696.68*	PF 1	1495.00	5269 95	5274.10	3.55		5274 93	0 004185	7.30	204 89	57.66	0 68
STORMCLOUD	2695.68*	PF 1	1495 00	5269.95	5274.10	3.55		5274.92	0.004207	7.31	204.53	57.64	0.68
STORMCLOUD	2694.69*	PF 1	1495 00	5269.95	5274.09	3 54		5274 92	0 004229	7.32	204 16	57.61	0 69
STORMCLOUD	2693.69*	PF 1	1495 00	5269.94	5274.09	3.55		5274.92	0.004203	7.31	204.59	57.64	0.68
STORMCLOUD	2692.70*	PF 1	1495.00	5269.94	5274.08	3.54		5274.91	0.004226	7 32	204.22	57.62	0.69
STORMCLOUD	2691.70*	PF 1	1495 00	5269.94	5274 07	3.54		5274.91	0.004249	7.33	203.85	57.59	0.69
STORMCLOUD	2690.70*	PF 1	1495.00	5269.93	5274.07	3 54		5274 90	0 004224	7.32	204 25	57.62	0 69
STORMCLOUD	2689.71*	PF 1	1495.00	5269.93	5274 06	3.54		5274.90	0.004247	7.33	203.88	57 59	0.69
STORMCLOUD	2688.71*	PF 1	1495.00	5269 93	5274 06	3.54		5274.90	0.004270	7.35	203.52	57 57	0.69
STORMCLOUD	2687.72*	PF 1	1495 00	5269.92	5274 05	3 54		5274.89	0 004243	7.33	203.94	57 60	0.69
STORMCLOUD	2686.72*	PF 1	1495 00	5269.92	5274 05	3.54		5274.89	0.004266	7 34	203.57	57 57	0.69
STORMCLOUD	2685.72*	PF 1	1495.00	5269 92	5274.04	3.53		5274.88	0.004291	7 36	203.18	57.54	0.69
STORMCLOUD	2684.73*	PF 1	1495.00	5269 91	5274.04	3.54		5274.88	0.004266	7.34	203 57	57.57	0.69
STORMCLOUD	2683.73*	PF 1	1495.00	5269.91	5274.03	3.53		5274 87	0 004291	7.36	203 18	57 54	0.69
STORMCLOUD	2682.74*	PF 1	1495 00	5269.91	5274.03	3 53		5274.87	0 004314	7 37	202.81	57 52	0.69
STORMCLOUD	2681.74*	PF 1	1495 00	5269.90	5274.02	3.53		5274 86	0 004287	7 36	203.24	57 55	0.69
STORMCLOUD	2680.74*	PF 1	1495 00	5269.90	5274 02	3.53		5274.86	0.004310	7 37	202.87	57.52	0 69
STORMCLOUD	2679.75*	PF 1	1495.00	5269.90	5274.01	3 52		5274.86	0 004335	7 38	202.48	57 50	0.69
STORMCLOUD	2678.75*	PF 1	1495.00	5269.89	5274 01	3.53		5274.85	0.004310	7 37	202.87	57 52	0.69
STORMCLOUD	2677.76*	PF 1	1495 00	5269.89	5274 00	3.52		5274.85	0.004335	7 38	202.48	57 50	0.69
STORMCLOUD	2676.76*	PF 1	1495 00	5269 89	5273 99	3.52		5274.84	0.004359	7.40	202 11	57.47	0 70
STORMCLOUD	2675.76*	PF 1	1495.00	5269 89	5273.99	3.51		5274 84	0.004382	7.41	201 75	57.44	0 70
STORMCLOUD	2674.77*	PF 1	1495.00	5269 88	5273.98	3.52		5274 83	0.004355	7.39	202.17	57.47	0 69
STORMCLOUD	2673.77*	PF 1	1495.00	5269 88	5273 98	3.51		5274.83	0.004380	7.41	201.78	57 45	0.70
STORMCLOUD	2672.78*	PF 1	1495.00	5269.88	5273.97	3.51		5274.83	0 004406	7.42	201.38	57 42	0 70
STORMCLOUD	2671 78*	PF 1	1495.00	5269.87	5273.97	3.51		5274.82	0.004380	7 41	201.78	57 45	0.70
STORMCLOUD	2670.78*	PF 1	1495 00	5269.87	5273 96	3.51		5274.82	0.004404	7 42	201.41	57 42	0 70
STORMCLOUD	2669.79*	PF 1	1495.00	5269 87	5273.95	3.50		5274.81	0 004428	7 44	201 05	57.40	0.70
STORMCLOUD	2668.79*	PF 1	1495 00	5269.86	5273.95	3.51		5274.81	0 004400	7.42	201 47	57.43	0 70

HEC-RAS Plan: wilson 1 River: MIREHAVEN ARROYO Reach STORMCLOUD Profile. PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	2667.80*	PF 1	1495.00	5269.86	5273 95	3.50		5274 80	0.004424	7.43	201 10	57 40	0 70
STORMCLOUD	2666.80*	PF 1	1495 00	5269.86	5273 94	3 50		5274.80	0 004450	7 45	200.71	57 37	0 70
STORMCLOUD	2665.80*	PF 1	1495.00	5269.85	5273 94	3 50		5274.79	0 004424	7.43	201.10	57 40	0 70
STORMCLOUD	2664.81*	PF 1	1495 00	5269 85	5273.93	3 50		5274.79	0 004450	7.45	200 71	57 37	0 70
STORMCLOUD	2663.81*	PF 1	1495 00	5269 85	5273.92	3 49		5274.79	0.004478	7.46	200.29	57.34	0 70
STORMCLOUD	2662.82*	PF 1	1495.00	5269.84	5273 92	3 50		5274 78	0 004450	7.45	200 71	57 37	0.70
STORMCLOUD	2661.82*	PF 1	1495.00	5269 84	5273 91	3.49		5274 78	0 004476	7 46	200 32	57 35	0.70
STORMCLOUD	2660.82*	PF 1	1495.00	5269 84	5273.90	3 49		5274.77	0 004502	7 48	199.93	57 32	0 71
STORMCLOUD	2659.83*	PF 1	1495.00	5269 83	5273 90	3.49		5274 77	0.004476	7 46	200 32	57.35	0.70
STORMCLOUD	2658 83*	PF 1	1495 00	5269.83	5273.90	3 49		5274.76	0 004502	7.48	199.93	57 32	0 71
STORMCLOUD	2657.84*	PF 1	1495 00	5269.83	5273.89	3.48		5274.76	0 004531	7 49	199.51	57.29	0 71
STORMCLOUD	2656.84*	PF 1	1495.00	5269.82	5273.88	3.49		5274 75	0.004502	7 48	199.93	57.32	0.71
STORMCLOUD	2655.84*	PF 1	1495 00	5269 82	5273.88	3.48		5274 75	0.004529	7 49	199.53	57.29	0 71
STORMCLOUD	2654.85*	PF 1	1495.00	5269.82	5273 87	3.48		5274 75	0 004555	7.51	199 14	57 26	0 71
STORMCLOUD	2653.85*	PF 1	1495 00	5269 81	5273.87	3 48		5274.74	0 004529	7 49	199.53	57.29	0 71
STORMCLOUD	2652.86*	PF 1	1495.00	5269.81	5273.86	3 48		5274 74	0 004555	7.51	199.14	57 26	0 71
STORMCLOUD	2651.86*	PF 1	1495.00	5269.81	5273 85	3 47		5274 73	0 004582	7.52	198 75	57 24	0 71
STORMCLOUD	2650.86*	PF 1	1495 00	5269 81	5273.85	3 47		5274.73	0 004609	7 54	198.36	57.21	0 71
STORMCLOUD	2649.87*	PF 1	1495.00	5269 80	5273.84	3.47		5274.72	0.004582	7 52	198 75	57.24	0.71
STORMCLOUD	2648.87*	PF 1	1495 00	5269 80	5273.84	3 47		5274.72	0.004611	7 54	198 33	57.21	0.71
STORMCLOUD	2647 88*	PF 1	1495.00	5269 80	5273.83	3.46		5274 72	0.004640	7 55	197 91	57.18	0.72
STORMCLOUD	2646.88*	PF 1	1495 00	5269 79	5273.83	3 47		5274.71	0.004613	7 54	198 30	57.20	0.71
STORMCLOUD	2645.88*	PF 1	1495.00	5269.79	5273.82	3.46		5274 71	0 004642	7.55	197 89	57 18	0.72
STORMCLOUD	2644.89*	PF 1	1495.00	5269.79	5273.81	3 46		5274.70	0.004672	7 57	197 47	57.15	0.72
STORMCLOUD	2643 89*	PF 1	1495.00	5269 78	5273 81	3.46		5274 70	0 004644	7.56	197 86	57 17	0 72
STORMCLOUD	2642.9*	PF 1	1495.00	5269 78	5273 80	3.46		5274 69	0 004674	7.57	197.44	57 14	0 72
STORMCLOUD	2641.90*	PF 1	1495.00	5269 78	5273 79	3.45		5274 69	0 004703	7.59	197 02	57 11	0 72
STORMCLOUD	2640.90*	PF 1	1495.00	5269 77	5273.79	3.45		5274 68	0 004677	7.57	197 38	57 14	0.72
STORMCLOUD	2639.91*	PF 1	1495 00	5269.77	5273 78	3 45		5274.68	0 004707	7 59	196.96	57 11	0 72
STORMCLOUD	2638.91*	PF 1	1495.00	5269 77	5273 78	3 44		5274 67	0 004737	7.61	196.55	57 08	0.72
STORMCLOUD	2637.92*	PF 1	1495 00	5269.76	5273.77	3 45		5274.67	0.004709	7 59	196.94	57 11	0 72
STORMCLOUD	2636.92*	PF 1	1495.00	5269.76	5273 77	3.44		5274 66	0 004739	7.61	196.52	57.08	0.72
STORMCLOUD	2635.92*	PF 1	1495 00	5269.76	5273.76	3 44		5274 66	0.004769	7 62	196 10	57.05	0.72
STORMCLOUD	2634.93*	PF 1	1495 00	5269.75	5273 75	3.44		5274 65	0.004743	7 61	196 46	57.08	0.72
STORMCLOUD	2633.93*	PF 1	1495 00	5269.75	5273.75	3 44		5274.65	0 004773	7.63	196 05	57 05	0 72
STORMCLOUD	2632.94*	PF 1	1495 00	5269 75	5273 74	3.43		5274 65	0.004804	7 64	195.63	57.02	0 73
STORMCLOUD	2631.94*	PF 1	1495 00	5269 74	5273.74	3.44		5274.64	0.004777	7 63	195.99	57.04	0 73
STORMCLOUD	2630.94*	PF 1	1495.00	5269.74	5273 73	3.43		5274 64	0 004808	7 64	195 57	57 01	0.73
STORMCLOUD	2629 95*	PF 1	1495.00	5269 74	5273 72	3.42		5274 63	0.004839	7 66	195 15	56.98	0.73
STORMCLOUD	2628.95*	PF 1	1495 00	5269.74	5273.71	3 42		5274.63	0 004870	7.68	194.74	56.95	0.73
STORMCLOUD	2627.96*	PF 1	1495.00	5269.73	5273 71	3 42		5274.62	0 004839	7.66	195 15	56 98	0.73
STORMCLOUD	2626.96*	PF 1	1495 00	5269 73	5273 70	3.42		5274.62	0.004872	7 68	194 71	56.95	0.73
STORMCLOUD	2625.96*	PF 1	1495.00	5269 73	5273 70	3.41		5274 62	0 004905	7 70	194 26	56 92	0 73

HEC-RAS Plan wilson 1 River: MIREHAVEN ARROYO Reach: STORMCLOUD Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	2624.97*	PF 1	1495.00	5269.72	5273 69	3 42		5274 61	0 004878	7.68	194.63	56.95	0 73
STORMCLOUD	2623.97*	PF 1	1495.00	5269 72	5273.68	3 41		5274.60	0.004914	7.70	194 15	56.91	0.73
STORMCLOUD	2622.98*	PF 1	1495.00	5269.72	5273.68	3.41		5274 60	0.004947	7.72	193 71	56 88	0.74
STORMCLOUD	2621.98*	PF 1	1495 00	5269.71	5273.67	3 41		5274 59	0.004918	7.70	194.10	56.91	0 73
STORMCLOUD	2620.98*	PF 1	1495 00	5269 71	5273.67	3 40		5274.59	0.004952	7 72	193.65	56.88	0 74
STORMCLOUD	2619.99*	PF 1	1495.00	5269.71	5273.66	3.40		5274.59	0.004988	7.74	193 18	56.85	0.74
STORMCLOUD	2618.99*	PF 1	1495 00	5269.70	5273.65	3 40		5274.58	0.004967	7 73	193.46	56.86	0 74
STORMCLOUD	2618.00	PF 1	1495.00	5269.70	5273.64	3.40		5274.58	0.005005	7.75	192 96	56 83	0.74
STORMCLOUD	2617.*	PF 1	1495 00	5269.53	5273 45	3.12		5274.56	0.006583	8 45	176.83	56.59	0 84
STORMCLOUD	2616.*	PF 1	1495 00	5269.37	5273.15	2.72	5273 15	5274 53	0.009770	9.44	158 36	58 12	1.01
STORMCLOUD	2615.*	PF 1	1495 00	5269 20	5272.78	2 26	5273 14	5274.48	0.015311	10 47	142.86	63.20	1.23
STORMCLOUD	2614.*	PF 1	1495.00	5269 03	5272.28	1 92	5272.86	5274.42	0.024039	11.74	127.33	66.16	1 49
STORMCLOUD	2613.*	PF 1	1495 00	5268.87	5271 75	1.75	5272 50	5274.35	0.033788	12 95	115.47	66 13	1 73
STORMCLOUD	2612	PF 1	1495 00	5268.70	5273 58	3.96	5272.06	5274.07	0.002277	5 58	268.04	67 65	0.49
STORMCLOUD	2611.34	PF 1	1495 00	5268.59	5272.56	2.78	5272.56	5273 97	0 009962	9.52	156.97	56 51	1.01
STORMCLOUD	2611.33	PF 1	1495 00	5263.80	5267 18	2.26	5269.10	5273 48	0 065211	20.15	74.21	32 89	2.36
STORMCLOUD	2610.35*	PF 1	1495.00	5263 80	5267.16	2 23	5269.03	5273.40	0.065052	20.05	74 57	33.37	2.36
STORMCLOUD	2609.37*	PF 1	1495.00	5263 79	5267.13	2 21	5268.95	5273.33	0 065121	19.98	74 81	33 80	2.37
STORMCLOUD	2608.39*	PF 1	1495.00	5263.79	5267.10	2.19	5268.91	5273 25	0 065124	19.90	75.14	34 31	2.37
STORMCLOUD	2607.41*	PF 1	1495.00	5263.79	5267.08	2.16	5268.82	5273.18	0 065260	19.82	75 43	34 85	2.37
STORMCLOUD	2606.44*	PF 1	1495.00	5263.78	5267.04	2 14	5268.74	5273.11	0.065575	19.77	75 63	35 34	2.38
STORMCLOUD	2605.46*	PF 1	1495.00	5263.78	5267.01	2.11	5268.67	5273.04	0.065906	19.70	75.89	35 93	2.39
STORMCLOUD	2604.48*	PF 1	1495 00	5263.78	5266 98	2.08	5268.60	5272.96	0.066230	19 63	76.16	36.53	2.40
STORMCLOUD	2603.50*	PF 1	1495 00	5263.77	5266 94	2.05	5268 52	5272 90	0.067012	19 60	76.26	37.12	2 41
STORMCLOUD	2602.53*	PF 1	1495 00	5263 77	5266.90	2.02	5268.45	5272.82	0.067460	19.53	76 57	37 84	2.42
STORMCLOUD	2601.55*	PF 1	1495 00	5263.77	5266 86	1.99	5268 39	5272 76	0 068233	19.48	76.75	38 55	2.43
STORMCLOUD	2600.57*	PF 1	1495 00	5263.76	5266 82	1.84	5268 31	5272.68	0 074753	19.43	76.95	41.90	2.53
STORMCLOUD	2599.59*	PF 1	1495 00	5263.76	5266.75	1 56	5268.24	5272.59	0.091344	19.39	77.09	49 54	2.74
STORMCLOUD	2598.62*	PF 1	1495.00	5263.76	5266 69	1.56	5268 18	5272 49	0 089957	19.33	77.32	49 49	2.73
STORMCLOUD	2597.64*	PF 1	1495.00	5263 75	5266.61	1 57	5268.10	5272.40	0.089069	19.31	77 43	49 43	2.72
STORMCLOUD	2596.66*	PF 1	1495.00	5263 75	5266 55	1.57	5268 03	5272 30	0.087832	19.26	77.64	49 39	2 71
STORMCLOUD	2595.68*	PF 1	1495 00	5263 75	5266.48	1 58	5267.95	5272.21	0.086826	19.22	77 79	49.33	2.70
STORMCLOUD	2594.71*	PF 1	1495.00	5263 74	5266.40	1 58	5267.88	5272 12	0.086062	19 20	77.87	49 26	2.69
STORMCLOUD	2593.73*	PF 1	1495 00	5263 74	5266.33	1 59	5267.82	5272.03	0.084974	19.15	78 06	49.20	2.68
STORMCLOUD	2592.75*	PF 1	1495.00	5263 74	5266.26	1.59	5267.74	5271.94	0 084175	19.13	78.16	49 13	2.67
STORMCLOUD	2591.77*	PF 1	1495.00	5263.73	5266 19	1.59	5267 67	5271 86	0 083557	19 11	78.22	49 06	2.67
STORMCLOUD	2590.79*	PF 1	1495.00	5263.73	5266.12	1.60	5267.59	5271 77	0 082659	19.08	78.36	48 99	2.66
STORMCLOUD	2589.82*	PF 1	1495.00	5263 73	5266.05	1 60	5267.53	5271.69	0.081963	19.06	78.44	48 91	2.65
STORMCLOUD	2588.84*	PF 1	1495.00	5263 72	5265.97	1.61	5267.45	5271 61	0 081481	19 05	78.47	48 82	2.65
STORMCLOUD	2587.86*	PF 1	1495 00	5263.72	5265 91	1 61	5267 39	5271.52	0.080694	19 02	78.59	48.74	2 64
STORMCLOUD	2586.88*	PF 1	1495 00	5263.72	5265 83	1.62	5267.32	5271 44	0 080040	19 00	78.67	48 65	2 63
STORMCLOUD	2585.91*	PF 1	1495.00	5263 71	5265.76	1 62	5267 24	5271.36	0.079633	19.00	78.69	48.57	2.63
STORMCLOUD	2584.93*	PF 1	1495.00	5263 71	5265.69	1.62	5267.17	5271.29	0 079079	18.99	78 74	48 46	2.62

HEC-RAS Plan wilson 1 River. MIREHAVEN ARROYO Reach STORMCLOUD Profile. PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	2583.95*	PF 1	1495 00	5263 71	5265 62	1 63	5267 10	5271.21	0 078572	18.98	78 78	48.35	2 62
STORMCLOUD	2582.97*	PF 1	1495 00	5263.70	5265 54	1.63	5267 03	5271.13	0 078271	18.98	78 77	48 25	2.62
STORMCLOUD	2582.00	PF 1	1495 00	5263.70	5265 47	1.64	5266 96	5271.05	0.077713	18.97	78 83	48 13	2 61
STORMCLOUD	2581.02*	PF 1	1495.00	5263 70	5265.49	1 66	5266 96	5270 94	0 074739	18.73	79 81	48.21	2 57
STORMCLOUD	2580.04*	PF 1	1495 00	5263.69	5265 50	1.67	5266 95	5270.83	0.072240	18.53	80 68	48.28	2 53
STORMCLOUD	2579.07*	PF 1	1495 00	5263 69	5265.52	1 69	5266.95	5270 72	0.069469	18 30	81 70	48 37	2.48
STORMCLOUD	2578.09*	PF 1	1495 00	5263.69	5265 54	1.71	5266 95	5270 61	0.066833	18.07	82 72	48.45	2.44
STORMCLOUD	2577.11*	PF 1	1495.00	5263 68	5265.55	1 72	5266.94	5270 51	0 064611	17 88	83.62	48 53	2 40
STORMCLOUD	2576.14*	PF 1	1495 00	5263.68	5265 57	1.74	5266 94	5270 41	0 062155	17.66	84 66	48.61	2 36
STORMCLOUD	2575.16*	PF 1	1495 00	5263.68	5265 59	1.76	5266 94	5270 31	0.059818	17 44	85 70	48 70	2.32
STORMCLOUD	2574.18*	PF 1	1495.00	5263 67	5265.60	1 78	5266.93	5270 23	0 057940	17 27	86.59	48 77	2 28
STORMCLOUD	2573.21*	PF 1	1495 00	5263.67	5265.62	1.79	5266 93	5270.14	0 055757	17.05	87 66	48.86	2.24
STORMCLOUD	2572.23*	PF 1	1495.00	5263 67	5265 64	1.81	5266 93	5270.05	0 053679	16.85	88 73	48.95	2.21
STORMCLOUD	2571.25*	PF 1	1495 00	5263 66	5265.65	1 83	5266.92	5269 97	0.052045	16 68	89.62	49.02	2 17
STORMCLOUD	2570.28*	PF 1	1495.00	5263 66	5265 67	1 85	5266 92	5269.89	0 050060	16.48	90 74	49.11	2 14
STORMCLOUD	2569.30*	PF 1	1495.00	5263 65	5265.68	1 86	5266.91	5269 83	0 048844	16 35	91.46	49.17	2 11
STORMCLOUD	2568.32*	PF 1	1495.00	5263 65	5265.70	1 88	5266.91	5269 76	0 047357	16 18	92.38	49.24	2 08
STORMCLOUD	2567.35*	PF 1	1495 00	5263.65	5265 71	1.89	5266 91	5269.70	0.045929	16.03	93.29	49 32	2 05
STORMCLOUD	2566.37*	PF 1	1495 00	5263.64	5265 72	1 90	5266.90	5269 65	0.044840	15 90	94.01	49.38	2 03
STORMCLOUD	2565.39*	PF 1	1495 00	5263.64	5265 74	1.92	5266 90	5269.59	0.043473	15 74	94.95	49 45	2 00
STORMCLOUD	2564.42*	PF 1	1495.00	5263 64	5265.76	1 94	5266.90	5269 53	0 042160	15 59	95.90	49.53	1.97
STORMCLOUD	2563.44*	PF 1	1495 00	5263.63	5265 76	1 95	5266.89	5269 48	0 041185	15 47	96.62	49 59	1 95
STORMCLOUD	2562.46*	PF 1	1495.00	5263 63	5265.78	1 96	5266.89	5269 43	0.039929	15 32	97 59	49.67	1 93
STORMCLOUD	2561.49*	PF 1	1495.00	5263 63	5265.80	1 98	5266.89	5269 37	0 038692	15 16	98 59	49.75	1 90
STORMCLOUD	2560.51*	PF 1	1495 00	5263 62	5265 81	1.99	5266 88	5269.32	0.037789	15.05	99 34	49.81	1.88
STORMCLOUD	2559 53*	PF 1	1495 00	5263.62	5265 83	2.01	5266 88	5269.27	0.036610	14 90	100.36	49 89	1.85
STORMCLOUD	2558.56*	PF 1	1495 00	5263.62	5265 85	2.03	5266.88	5269.22	0 035477	14.75	101 39	49 97	1 82
STORMCLOUD	2557.58*	PF 1	1495.00	5263 61	5265.85	2 04	5266.87	5269 18	0 034669	14 64	102 14	50.03	1 81
STORMCLOUD	2556.60*	PF 1	1495 00	5263.61	5265 87	2.06	5266 87	5269.13	0 033588	14.49	103 19	50.11	1 78
STORMCLOUD	2555.63*	PF 1	1495.00	5263 61	5265.90	2 08	5266 87	5269.09	0 032502	14.33	104 30	50.20	1 75
STORMCLOUD	2554.65*	PF 1	1495 00	5263.60	5265 90	2.09	5266 86	5269.04	0.031758	14.23	105 08	50.27	1 73
STORMCLOUD	2553.67*	PF 1	1495 00	5263 60	5265 92	2.11	5266.86	5269 00	0.030747	14 08	106.19	50 35	1.71
STORMCLOUD	2552.70*	PF 1	1495.00	5263 59	5265.93	2 12	5266 85	5268.96	0 030075	13.98	106 95	50 41	1.69
STORMCLOUD	2551.72*	PF 1	1495.00	5263 59	5265 95	2 14	5266 85	5268.92	0 029071	13.83	108 13	50.51	1 67
STORMCLOUD	2550.74*	PF 1	1495 00	5263 59	5265.98	2 16	5266.85	5268 88	0.028091	13 67	109.34	50 60	1 64
STORMCLOUD	2549.77*	PF 1	1495.00	5263 58	5265 98	2 17	5266.84	5268.85	0 027722	13.61	109 81	50.64	1 63
STORMCLOUD	2548.79*	PF 1	1495.00	5263 58	5266.00	2.19	5266.84	5268.81	0 026780	13 46	111.05	50.74	1 60
STORMCLOUD	2547.81*	PF 1	1495.00	5263.58	5266 02	2.21	5266 84	5268.78	0 025862	13.31	112 31	50 84	1.58
STORMCLOUD	2546.84*	PF 1	1495.00	5263.57	5267 81	3.62	5266 83	5268.59	0 003900	7.13	209 81	58 00	0.66
STORMCLOUD	2545.86*	PF 1	1495 00	5263 57	5267.80	3 61		5268 59	0.003917	7 14	209.50	57.98	0 66
STORMCLOUD	2544.88*	PF 1	1495 00	5263 57	5267.79	3 61		5268 59	0.003936	7 15	209.16	57.96	0 66
STORMCLOUD	2543.91*	PF 1	1495.00	5263 56	5267.79	3 61		5268 58	0 003914	7 13	209 55	57 99	0.66
STORMCLOUD	2542.93*	PF 1	1495 00	5263.56	5267 79	3.61		5268.58	0.003931	7 14	209.24	57.96	0 66

HEC-RAS Plan. wilson 1 River: MIREHAVEN ARROYO Reach: STORMCLOUD Profile. PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	2541.95*	PF 1	1495 00	5263.56	5267.78	3.61		5268.58	0.003950	7 16	208.90	57 94	0 66
STORMCLOUD	2540.98*	PF 1	1495.00	5263.55	5267 78	3.61		5268 57	0 003925	7 14	209.36	57.97	0.66
STORMCLOUD	2540.00*	PF 1	1495.00	5263 55	5267 77	3.61		5268.57	0 003942	7 15	209 04	57 95	0 66
STORMCLOUD	2539.02*	PF 1	1495 00	5263.55	5267.77	3 60		5268.56	0.003961	7 16	208.70	57.93	0 67
STORMCLOUD	2538.05*	PF 1	1495.00	5263.54	5267 76	3 61		5268 56	0.003939	7.15	209.10	57 95	0.66
STORMCLOUD	2537.07*	PF 1	1495.00	5263 54	5267.76	3.60		5268.55	0 003957	7.16	208.79	57.93	0.66
STORMCLOUD	2536.09*	PF 1	1495.00	5263.54	5267 75	3.60		5268.55	0 003976	7.17	208.45	57 91	0.67
STORMCLOUD	2535.12*	PF 1	1495.00	5263 53	5267.75	3.61		5268.55	0 003950	7.16	208.90	57.94	0 66
STORMCLOUD	2534.14*	PF 1	1495.00	5263 53	5267 74	3.60		5268.54	0 003969	7.17	208.56	57 92	0.67
STORMCLOUD	2533.17*	PF 1	1495.00	5263.52	5267 74	3 61		5268 54	0.003945	7.15	208.99	57 95	0.66
STORMCLOUD	2532.19*	PF 1	1495.00	5263 52	5267.74	3.60		5268.53	0.003963	7.16	208.68	57.93	0.67
STORMCLOUD	2531.21*	PF 1	1495.00	5263.52	5267.73	3 60		5268.53	0.003982	7 18	208.34	57.90	0 67
STORMCLOUD	2530.24*	PF 1	1495.00	5263 51	5267 73	3.60		5268.52	0.003957	7.16	208.79	57.93	0 66
STORMCLOUD	2529.26*	PF 1	1495 00	5263 51	5267.72	3.60		5268.52	0.003976	7.17	208.45	57 91	0 67
STORMCLOUD	2528.28*	PF 1	1495.00	5263 51	5267.72	3.60		5268.52	0 003995	7.18	208 11	57.89	0 67
STORMCLOUD	2527.31*	PF 1	1495 00	5263 50	5267.71	3.60		5268.51	0.003973	7 17	208.51	57 91	0.67
STORMCLOUD	2526.33*	PF 1	1495.00	5263 50	5267.71	3.60		5268.51	0.003992	7 18	208.17	57.89	0 67
STORMCLOUD	2525.35*	PF 1	1495.00	5263 50	5267.70	3.59		5268.51	0.004013	7 19	207.80	57 86	0.67
STORMCLOUD	2524.38*	PF 1	1495 00	5263.49	5267 70	3.60		5268 50	0 003990	7 18	208.20	57.89	0.67
STORMCLOUD	2523.40*	PF 1	1495.00	5263.49	5267.69	3.59		5268.50	0.004010	7 19	207.86	57 87	0.67
STORMCLOUD	2522.42*	PF 1	1495.00	5263.49	5267 69	3.59		5268.49	0 004031	7.21	207.49	57 84	0 67
STORMCLOUD	2521.45*	PF 1	1495.00	5263.48	5267.68	3.59		5268.49	0.004005	7.19	207.94	57 87	0 67
STORMCLOUD	2520.47*	PF 1	1495 00	5263.48	5267.68	3 59		5268 48	0.004024	7 20	207.60	57 85	0.67
STORMCLOUD	2519.49*	PF 1	1495.00	5263 48	5267.67	3.58		5268.48	0.004045	7.21	207.23	57 83	0 67
STORMCLOUD	2518.52*	PF 1	1495 00	5263.47	5267.67	3.59		5268.47	0.004023	7 20	207.63	57 85	0 67
STORMCLOUD	2517.54*	PF 1	1495.00	5263.47	5267 66	3 58		5268.47	0.004042	7 21	207.29	57.83	0.67
STORMCLOUD	2516.56*	PF 1	1495.00	5263.46	5267 66	3 59		5268 46	0 004016	7 20	207.74	57.86	0.67
STORMCLOUD	2515.59*	PF 1	1495.00	5263 46	5267 65	3.59		5268.46	0 004037	7.21	207 38	57.84	0.67
STORMCLOUD	2514.61*	PF 1	1495 00	5263.46	5267.65	3.58		5268.46	0.004057	7 22	207.04	57 81	0.67
STORMCLOUD	2513.63*	PF 1	1495.00	5263 45	5267.65	3.59		5268.45	0 004034	7.21	207.43	57.84	0.67
STORMCLOUD	2512.66*	PF 1	1495 00	5263.45	5267.64	3 58		5268.45	0.004055	7 22	207.07	57 81	0 67
STORMCLOUD	2511.68*	PF 1	1495 00	5263 45	5267.63	3.58		5268.45	0.004077	7.23	206.70	57 79	0 67
STORMCLOUD	2510.70*	PF 1	1495 00	5263.44	5267.63	3 58		5268.44	0.004052	7.22	207.12	57 82	0 67
STORMCLOUD	2509.73*	PF 1	1495 00	5263 44	5267.62	3.58		5268.44	0.004073	7 23	206.76	57.79	0 67
STORMCLOUD	2508.75*	PF 1	1495 00	5263.44	5267.62	3.57		5268 43	0.004093	7.24	206.42	57 77	0.68
STORMCLOUD	2507.77*	PF 1	1495.00	5263 43	5267.61	3.58		5268.43	0.004070	7.23	206 81	57.80	0 67
STORMCLOUD	2506.80*	PF 1	1495.00	5263.43	5267.61	3.57		5268.42	0.004092	7.24	206 44	57.77	0.68
STORMCLOUD	2505.82*	PF 1	1495.00	5263.43	5267 60	3.57		5268 42	0.004113	7.25	206 08	57 75	0.68
STORMCLOUD	2504 84*	PF 1	1495.00	5263.42	5267.60	3.57		5268.41	0.004088	7.24	206.50	57 77	0 67
STORMCLOUD	2503.87*	PF 1	1495.00	5263.42	5267 59	3.57		5268.41	0.004110	7.25	206 13	57.75	0.68
STORMCLOUD	2502.89*	PF 1	1495 00	5263.42	5267 59	3.56		5268 41	0.004132	7.27	205 77	57.72	0.68
STORMCLOUD	2501.91*	PF 1	1495.00	5263 41	5267.58	3.57		5268.40	0.004110	7.25	206.13	57.75	0 68
STORMCLOUD	2500.94*	PF 1	1495 00	5263.41	5267.58	3.56		5268 40	0.004132	7 27	205.77	57.72	0.68

HEC-RAS Plan. wilson 1 River. MIREHAVEN ARROYO Reach STORMCLOUD Profile. PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	2499.96*	PF 1	1495.00	5263 41	5267 57	3 56		5268.39	0.004152	7 28	205.43	57.70	0.68
STORMCLOUD	2498.98*	PF 1	1495 00	5263.40	5267.57	3 57		5268 39	0.004127	7 26	205 85	57 73	0 68
STORMCLOUD	2498.01*	PF 1	1495 00	5263.40	5267.56	3 56		5268.38	0.004149	7 28	205 49	57 70	0.68
STORMCLOUD	2497.03*	PF 1	1495 00	5263 40	5267 56	3.56		5268 38	0 004171	7 29	205.12	57.68	0.68
STORMCLOUD	2496.05*	PF 1	1495 00	5263.39	5267.55	3 56		5268 37	0.004147	7.27	205.51	57 71	0.68
STORMCLOUD	2495.08*	PF 1	1495 00	5263 39	5267 55	3.56		5268 37	0 004169	7 29	205.15	57 68	0.68
STORMCLOUD	2494.10*	PF 1	1495 00	5263 38	5267 54	3.56		5268 36	0 004142	7 27	205.60	57 71	0 68
STORMCLOUD	2493 12*	PF 1	1495.00	5263.38	5267 54	3 56		5268.36	0.004164	7 28	205 23	57.69	0.68
STORMCLOUD	2492.15*	PF 1	1495 00	5263.38	5267 53	3.55		5268 36	0.004186	7.30	204 87	57 66	0 68
STORMCLOUD	2491.17*	PF 1	1495 00	5263 37	5267.53	3.56		5268 35	0.004162	7.28	205.26	57.69	0 68
STORMCLOUD	2490.19*	PF 1	1495.00	5263 37	5267 52	3 55		5268.35	0.004185	7 30	204 89	57.66	0.68
STORMCLOUD	2489.22*	PF 1	1495 00	5263.37	5267 52	3 55		5268 34	0 004207	7.31	204 53	57 64	0 68
STORMCLOUD	2488.24*	PF 1	1495.00	5263 36	5267 51	3 55		5268.34	0.004181	7 29	204 95	57 67	0 68
STORMCLOUD	2487.26*	PF 1	1495 00	5263.36	5267.51	3.55		5268 33	0 004203	7.31	204.59	57.64	0.68
STORMCLOUD	2486.29*	PF 1	1495.00	5263 36	5267 50	3 54		5268.33	0.004228	7 32	204 19	57 61	0 69
STORMCLOUD	2485.31*	PF 1	1495.00	5263 35	5267 50	3 55		5268.33	0.004203	7 31	204 59	57 64	0.68
STORMCLOUD	2484.33*	PF 1	1495 00	5263 35	5267 49	3.54		5268.32	0.004228	7 32	204.19	57 61	0.69
STORMCLOUD	2483.36*	PF 1	1495 00	5263.35	5267.48	3 54		5268 32	0 004250	7.33	203.83	57 59	0 69
STORMCLOUD	2482.38*	PF 1	1495 00	5263 34	5267 48	3.54		5268 31	0 004224	7 32	204.25	57.62	0.69
STORMCLOUD	2481.40*	PF 1	1495 00	5263 34	5267 47	3.54		5268.31	0 004247	7.33	203.88	57.59	0.69
STORMCLOUD	2480.43*	PF 1	1495.00	5263 34	5267 47	3 53		5268 31	0.004271	7 35	203 49	57 57	0.69
STORMCLOUD	2479.45*	PF 1	1495 00	5263.33	5267 46	3 54		5268.30	0 004247	7.33	203 88	57.59	0.69
STORMCLOUD	2478.47*	PF 1	1495.00	5263.33	5267.46	3 54		5268 30	0.004270	7 35	203 52	57 57	0 69
STORMCLOUD	2477.50*	PF 1	1495.00	5263 32	5267 45	3 54		5268 29	0.004243	7.33	203 94	57 60	0.69
STORMCLOUD	2476.52*	PF 1	1495 00	5263.32	5267.45	3.54		5268 29	0 004266	7.34	203 57	57 57	0 69
STORMCLOUD	2475.55*	PF 1	1495 00	5263 32	5267 44	3.53		5268.28	0 004291	7 36	203.18	57.54	0 69
STORMCLOUD	2474.57*	PF 1	1495 00	5263.31	5267.44	3.54		5268 28	0.004266	7.34	203 57	57 57	0 69
STORMCLOUD	2473.59*	PF 1	1495 00	5263.31	5267 43	3 53		5268 27	0.004291	7 36	203 18	57 54	0 69
STORMCLOUD	2472.62*	PF 1	1495 00	5263.31	5267.43	3.53		5268 27	0 004314	7.37	202 81	57 52	0 69
STORMCLOUD	2471.64*	PF 1	1495 00	5263.30	5267.42	3.53		5268 26	0.004287	7.36	203 24	57 55	0 69
STORMCLOUD	2470.66*	PF 1	1495 00	5263 30	5267.42	3.53		5268 26	0 004310	7.37	202 87	57 52	0 69
STORMCLOUD	2469.69*	PF 1	1495 00	5263 30	5267 41	3.52		5268 26	0 004335	7 38	202.48	57.50	0.69
STORMCLOUD	2468.71*	PF 1	1495 00	5263.29	5267 41	3 53		5268 25	0 004310	7 37	202.87	57.52	0.69
STORMCLOUD	2467.73*	PF 1	1495 00	5263.29	5267.40	3.52		5268 25	0 004335	7 38	202.48	57 50	0 69
STORMCLOUD	2466.76*	PF 1	1495.00	5263 29	5267 39	3 52		5268.24	0 004359	7 40	202 11	57 47	0 70
STORMCLOUD	2465.78*	PF 1	1495 00	5263.28	5267 39	3 52		5268.24	0.004332	7.38	202 53	57 50	0 69
STORMCLOUD	2464.80*	PF 1	1495.00	5263 28	5267 38	3 52		5268.23	0.004355	7 39	202 17	57 47	0 69
STORMCLOUD	2463.83*	PF 1	1495.00	5263 28	5267.38	3.51		5268 23	0 004380	7 41	201.78	57.45	0.70
STORMCLOUD	2462.85*	PF 1	1495 00	5263.27	5267.37	3.52		5268.22	0 004355	7.39	202.17	57.47	0 69
STORMCLOUD	2461 87*	PF 1	1495.00	5263 27	5267 37	3 51		5268.22	0.004380	7 41	201.78	57 45	0 70
STORMCLOUD	2460.90*	PF 1	1495.00	5263 27	5267 36	3 51		5268.22	0.004404	7 42	201 41	57 42	0.70
STORMCLOUD	2459.92*	PF 1	1495 00	5263.26	5267.36	3 51		5268 21	0 004377	7.41	201 83	57 45	0 70
STORMCLOUD	2458.94*	PF 1	1495 00	5263 26	5267 35	3 51		5268.21	0.004402	7 42	201 44	57 42	0 70

HEC-RAS Plan: wilson 1 River: MIREHAVEN ARROYO Reach. STORMCLOUD Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	2457.97*	PF 1	1495.00	5263 25	5267 35	3.51		5268 20	0 004377	7.41	201.83	57 45	0.70
STORMCLOUD	2456.99*	PF 1	1495 00	5263.25	5267.34	3 51		5268 20	0 004402	7 42	201.44	57.42	0 70
STORMCLOUD	2456.01*	PF 1	1495 00	5263 25	5267 33	3.50		5268.19	0 004426	7 44	201.07	57 40	0 70
STORMCLOUD	2455.04*	PF 1	1495.00	5263 24	5267 33	3.51		5268 19	0.004400	7.42	201 47	57 43	0.70
STORMCLOUD	2454.06*	PF 1	1495.00	5263.24	5267.33	3.50		5268 18	0.004424	7.43	201.10	57 40	0 70
STORMCLOUD	2453.08*	PF 1	1495 00	5263.24	5267 32	3.50		5268 18	0.004452	7 45	200.68	57.37	0 70
STORMCLOUD	2452.11*	PF 1	1495.00	5263.23	5267 32	3.50		5268 17	0 004424	7 43	201.10	57 40	0.70
STORMCLOUD	2451.13*	PF 1	1495 00	5263.23	5267.31	3 50		5268.17	0.004450	7 45	200 71	57.37	0 70
STORMCLOUD	2450.15*	PF 1	1495.00	5263 23	5267 30	3.49		5268.17	0 004476	7 46	200.32	57 35	0 70
STORMCLOUD	2449.18*	PF 1	1495.00	5263 22	5267.30	3 50		5268.16	0.004450	7.45	200 71	57 37	0.70
STORMCLOUD	2448.20*	PF 1	1495.00	5263.22	5267.29	3.49		5268 16	0.004476	7 46	200.32	57.35	0 70
STORMCLOUD	2447.22*	PF 1	1495 00	5263.22	5267.28	3.49		5268.15	0.004504	7.48	199 90	57.32	0.71
STORMCLOUD	2446.25*	PF 1	1495.00	5263.21	5267 28	3.49		5268 15	0.004476	7 46	200 32	57.35	0 70
STORMCLOUD	2445.27*	PF 1	1495 00	5263.21	5267 27	3.49		5268.14	0.004502	7.48	199 93	57.32	0.71
STORMCLOUD	2444.29*	PF 1	1495.00	5263 21	5267 27	3.48		5268.14	0 004529	7 49	199.53	57.29	0 71
STORMCLOUD	2443.32*	PF 1	1495.00	5263.20	5267 27	3.49		5268.13	0.004502	7 48	199 93	57 32	0.71
STORMCLOUD	2442.34*	PF 1	1495.00	5263.20	5267 26	3.48		5268.13	0.004531	7 49	199.51	57.29	0 71
STORMCLOUD	2441.36*	PF 1	1495 00	5263.19	5267 25	3.49		5268.12	0.004502	7 48	199 93	57.32	0.71
STORMCLOUD	2440.39*	PF 1	1495 00	5263.19	5267.25	3.48		5268.12	0.004529	7.49	199.53	57.29	0.71
STORMCLOUD	2439.41*	PF 1	1495.00	5263.19	5267 24	3.48		5268 12	0.004557	7 51	199.11	57.26	0 71
STORMCLOUD	2438.43*	PF 1	1495.00	5263 18	5267 24	3.48		5268 11	0.004532	7 49	199.48	57.29	0 71
STORMCLOUD	2437.46*	PF 1	1495.00	5263.18	5267 23	3 48		5268 11	0.004559	7 51	199.09	57.26	0 71
STORMCLOUD	2436.48*	PF 1	1495.00	5263.18	5267.22	3 47		5268.10	0.004586	7.52	198.70	57.23	0.71
STORMCLOUD	2435.50*	PF 1	1495.00	5263.17	5267 22	3 48		5268.10	0.004559	7 51	199.09	57.26	0.71
STORMCLOUD	2434.53*	PF 1	1495 00	5263 17	5267.21	3 47		5268.09	0.004586	7.52	198 70	57.23	0.71
STORMCLOUD	2433.55*	PF 1	1495.00	5263.17	5267.21	3.47		5268.09	0 004615	7.54	198.28	57.20	0.71
STORMCLOUD	2432.57*	PF 1	1495.00	5263.16	5267.20	3.47		5268 08	0.004590	7.53	198.64	57.23	0.71
STORMCLOUD	2431.60*	PF 1	1495 00	5263.16	5267 20	3 47		5268.08	0.004619	7.54	198 22	57.20	0 71
STORMCLOUD	2430.62*	PF 1	1495 00	5263 16	5267.19	3 46		5268.08	0.004646	7.56	197 83	57.17	0.72
STORMCLOUD	2429.64*	PF 1	1495 00	5263 15	5267.19	3 47		5268.07	0.004617	7 54	198 25	57.20	0 71
STORMCLOUD	2428.67*	PF 1	1495.00	5263 15	5267 18	3.46		5268.06	0 004646	7.56	197.83	57.17	0.72
STORMCLOUD	2427.69*	PF 1	1495 00	5263.15	5267.17	3 45		5268.06	0 004675	7 57	197 41	57 14	0.72
STORMCLOUD	2426.71*	PF 1	1495 00	5263.14	5267.17	3.46		5268.05	0.004652	7 56	197 75	57 17	0 72
STORMCLOUD	2425.74*	PF 1	1495.00	5263.14	5267 16	3.45		5268.05	0.004681	7 58	197 33	57.14	0 72
STORMCLOUD	2424.76*	PF 1	1495.00	5263.14	5267.15	3.45		5268.05	0.004711	7.59	196.91	57 11	0.72
STORMCLOUD	2423.79*	PF 1	1495.00	5263 13	5267.15	3 45		5268.04	0.004681	7.58	197.33	57 14	0.72
STORMCLOUD	2422.81*	PF 1	1495 00	5263.13	5267 14	3 45		5268.04	0.004711	7.59	196 91	57 11	0.72
STORMCLOUD	2421.83*	PF 1	1495 00	5263.12	5267 14	3.45		5268.03	0.004685	7 58	197 27	57.13	0 72
STORMCLOUD	2420.86*	PF 1	1495 00	5263 12	5267.13	3 45		5268.03	0 004715	7.59	196.85	57 10	0 72
STORMCLOUD	2419.88*	PF 1	1495.00	5263.12	5267 12	3.44		5268.02	0.004747	7.61	196 41	57 07	0.72
STORMCLOUD	2418.90*	PF 1	1495.00	5263.11	5267.12	3.45		5268.02	0.004719	7 60	196.80	57.10	0 72
STORMCLOUD	2417.93*	PF 1	1495.00	5263.11	5267 11	3 44		5268.01	0 004749	7.61	196.38	57 07	0.72
STORMCLOUD	2416.95*	PF 1	1495.00	5263 11	5267.11	3.44		5268 01	0 004779	7 63	195 96	57.04	0 73

HEC-RAS Plan: wilson 1 River. MIREHAVEN ARROYO Reach: STORMCLOUD Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	2415.97*	PF 1	1495.00	5263 10	5267.10	3 44		5268.00	0.004755	7 62	196.30	57 06	0.72
STORMCLOUD	2415	PF 1	1495 00	5263.10	5267 09	3 43		5268 00	0.004786	7.63	195 88	57.03	0 73
STORMCLOUD	2414.*	PF 1	1495 00	5262.93	5266 92	3 21		5267.98	0.006089	8.27	180 86	56 40	0 81
STORMCLOUD	2413 *	PF 1	1495.00	5262 77	5266 67	2 96	5266.52	5267 96	0.008166	9.09	164 44	55 58	0.93
STORMCLOUD	2412.*	PF 1	1495.00	5262.60	5266 50	2.82	5266 50	5267 93	0.009694	9 59	155.81	55.21	1 01
STORMCLOUD	2411.*	PF 1	1495 00	5262 43	5266.20	2 63	5266 44	5267 90	0 012675	10.46	142.91	54 27	1.14
STORMCLOUD	2410.*	PF 1	1495.00	5262.27	5265.89	2 49	5266.31	5267 85	0 015814	11.24	133.00	53 36	1.25
STORMCLOUD	2409	PF 1	1495 00	5262.10	5265 53	2 37	5266 13	5267 80	0.019597	12 07	123 86	52.23	1 38
STORMCLOUD	2408.34	PF 1	1495.00	5261 99	5265.48	2.34	5266 09	5267.78	0.020348	12 19	122.69	52 36	1.40
STORMCLOUD	2408.33	PF 1	1495.00	5259 10	5262.05	1 79	5263.50	5267 47	0.071349	18.68	80 02	44.75	2.46
STORMCLOUD	2407.36*	PF 1	1495.00	5259.10	5261 99	1.62	5263.42	5267.39	0 079893	18.65	80.16	49 36	2 58
STORMCLOUD	2406 40*	PF 1	1495.00	5259 10	5261.93	1 63	5263 36	5267.30	0 078873	18.61	80.35	49 33	2.57
STORMCLOUD	2405.44*	PF 1	1495.00	5259 10	5261.87	1.63	5263 30	5267.22	0 077973	18 57	80.50	49 29	2.56
STORMCLOUD	2404.47*	PF 1	1495 00	5259.10	5261 81	1 64	5263.23	5267 13	0.076661	18.50	80.80	49.26	2.55
STORMCLOUD	2403.51*	PF 1	1495.00	5259.10	5261.75	1.64	5263 17	5267.05	0 075855	18 47	80.93	49 21	2 54
STORMCLOUD	2402.55*	PF 1	1495 00	5259.10	5261 68	1.65	5263 11	5266 97	0.075156	18 45	81 03	49.16	2.53
STORMCLOUD	2401.59*	PF 1	1495 00	5259.10	5261 62	1 65	5263.05	5266 89	0.074408	18.42	81 16	49.12	2.53
STORMCLOUD	2400.62*	PF 1	1495.00	5259 10	5261 56	1.66	5262 99	5266 82	0 073786	18 40	81.24	49.06	2 52
STORMCLOUD	2399.66*	PF 1	1495.00	5259.10	5261.50	1 66	5262 92	5266.75	0 073237	18 39	81.31	49.01	2 52
STORMCLOUD	2398.70*	PF 1	1495.00	5259 10	5261 44	1.66	5262 86	5266 67	0 072589	18 36	81 43	48.96	2 51
STORMCLOUD	2397.74*	PF 1	1495.00	5259 10	5261.37	1.67	5262 80	5266.60	0 072077	18 35	81.49	48 89	2 50
STORMCLOUD	2396.77*	PF 1	1495.00	5259.10	5261 31	1.67	5262.73	5266.53	0.071519	18.33	81 58	48.84	2.50
STORMCLOUD	2395.81*	PF 1	1495 00	5259 10	5261.25	1.67	5262.67	5266.45	0.071037	18 31	81.64	48 77	2 49
STORMCLOUD	2394.85*	PF 1	1495.00	5259 10	5261 18	1.68	5262.61	5266.39	0.070617	18 30	81 68	48.69	2 49
STORMCLOUD	2393.88*	PF 1	1495.00	5259 10	5261.12	1.68	5262 55	5266.31	0 070087	18 28	81.77	48 63	2 48
STORMCLOUD	2392.92*	PF 1	1495 00	5259 10	5261.06	1 69	5262 48	5266.24	0.069691	18.27	81 81	48 55	2.48
STORMCLOUD	2391.96*	PF 1	1495 00	5259 10	5261.00	1.69	5262 42	5266.17	0 069284	18 26	81 87	48.47	2 48
STORMCLOUD	2391	PF 1	1495.00	5259 10	5260.93	1.69	5262 36	5266.10	0 068906	18 25	81.91	48 39	2 47
STORMCLOUD	2389.96*	PF 1	1495.00	5259.10	5260 95	1 71	5262.36	5266 00	0.066298	18.03	82 93	48 47	2 43
STORMCLOUD	2388.92*	PF 1	1495 00	5259 09	5260 96	1 73	5262.35	5265 90	0.064155	17.84	83.81	48 54	2.39
STORMCLOUD	2387.88*	PF 1	1495.00	5259.09	5260 98	1.74	5262.35	5265.80	0.061721	17 62	84 85	48.63	2 35
STORMCLOUD	2386.85*	PF 1	1495 00	5259 09	5261.00	1 76	5262.35	5265 71	0.059405	17.40	85 89	48 71	2.31
STORMCLOUD	2385.81*	PF 1	1495.00	5259 08	5261 01	1 78	5262.34	5265 62	0.057544	17.23	86 78	48 79	2.28
STORMCLOUD	2384.77*	PF 1	1495.00	5259 08	5261.03	1 80	5262.34	5265 53	0 055380	17.02	87 85	48 87	2.24
STORMCLOUD	2383.73*	PF 1	1495 00	5259.08	5261 05	1 81	5262 34	5265 46	0.053679	16 85	88 73	48.95	2 21
STORMCLOUD	2382.70*	PF 1	1495.00	5259 07	5261.06	1 83	5262 33	5265.39	0 052305	16 71	89.47	49 01	2.18
STORMCLOUD	2381.66*	PF 1	1495.00	5259 07	5261.08	1.84	5262 33	5265.31	0 050349	16 51	90.58	49 10	2 14
STORMCLOUD	2380.62*	PF 1	1495.00	5259 07	5261 10	1 86	5262.33	5265 23	0.048486	16.31	91 68	49.19	2 10
STORMCLOUD	2379.58*	PF 1	1495.00	5259 06	5261.11	1 88	5262.32	5265 17	0 047281	16.18	92 42	49 25	2.08
STORMCLOUD	2378.55*	PF 1	1495 00	5259.06	5261 13	1.89	5262 32	5265 11	0 045855	16 02	93 34	49.32	2 05
STORMCLOUD	2377.51*	PF 1	1495 00	5259.06	5261 15	1 91	5262.32	5265 05	0.044449	15.86	94 28	49.40	2 02
STORMCLOUD	2376.47*	PF 1	1495.00	5259 05	5261 15	1 92	5262 31	5264.99	0 043405	15 74	95.00	49 46	2 00
STORMCLOUD	2375.43*	PF 1	1495 00	5259.05	5261 17	1 94	5262.31	5264.94	0 042094	15.58	95 95	49 53	1.97

HEC-RAS Plan: wilson 1 River MIREHAVEN ARROYO Reach. STORMCLOUD Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	2374.40*	PF 1	1495.00	5259.05	5261 19	1.95	5262.31	5264 88	0.040803	15.43	96.91	49.61	1.95
STORMCLOUD	2373.36*	PF 1	1495 00	5259 04	5261.19	1.97	5262 30	5264.83	0.039836	15 31	97 66	49 67	1 92
STORMCLOUD	2372.32*	PF 1	1495.00	5259 04	5261 21	1 98	5262 30	5264.78	0.038633	15.16	98.64	49.75	1.90
STORMCLOUD	2371.29*	PF 1	1495.00	5259.04	5261 23	2 00	5262.30	5264 73	0.037447	15.01	99.63	49.83	1.87
STORMCLOUD	2370.25*	PF 1	1495.00	5259.03	5261.24	2.01	5262 29	5264 68	0.036610	14.90	100.36	49.89	1.85
STORMCLOUD	2369.21*	PF 1	1495 00	5259.03	5261.26	2.03	5262.29	5264.63	0 035477	14 75	101 39	49.97	1.82
STORMCLOUD	2368.17*	PF 1	1495.00	5259.02	5261.26	2.04	5262 28	5264.59	0.034669	14 64	102.14	50.03	1.81
STORMCLOUD	2367.14*	PF 1	1495.00	5259.02	5261.28	2.06	5262.28	5264.54	0 033588	14 49	103 19	50 11	1 78
STORMCLOUD	2366.10*	PF 1	1495.00	5259 02	5261.31	2 08	5262.28	5264 50	0.032502	14.33	104.30	50 20	1 75
STORMCLOUD	2365.06*	PF 1	1495 00	5259 02	5261.33	2.10	5262.28	5264 45	0 031461	14.18	105 40	50.29	1 73
STORMCLOUD	2364.02*	PF 1	1495.00	5259.01	5261.33	2.11	5262.27	5264.41	0.030769	14.08	106.16	50.35	1.71
STORMCLOUD	2362.99*	PF 1	1495.00	5259.01	5261.36	2.13	5262.27	5264.37	0.029778	13 93	107.29	50 44	1 68
STORMCLOUD	2361.95*	PF 1	1495.00	5259 00	5261 36	2 14	5262.26	5264 33	0.029092	13.83	108.11	50.51	1.67
STORMCLOUD	2360.91*	PF 1	1495.00	5259.00	5261.39	2 16	5262 26	5264 29	0.028110	13.68	109.32	50.60	1.64
STORMCLOUD	2359.87*	PF 1	1495 00	5259 00	5261.41	2 18	5262.26	5264 25	0 027171	13.53	110 53	50.70	1.61
STORMCLOUD	2358.84*	PF 1	1495.00	5258.99	5261.41	2.19	5262 25	5264.23	0.026817	13.47	111.00	50.73	1 60
STORMCLOUD	2357.80*	PF 1	1495 00	5258.99	5261 43	2 21	5262.25	5264 19	0.025880	13.31	112.29	50.84	1.58
STORMCLOUD	2356.76*	PF 1	1495.00	5258.99	5261.46	2.23	5262 25	5264 15	0.024950	13.16	113.63	50.94	1 55
STORMCLOUD	2355.72*	PF 1	1495.00	5258.98	5263.19	3.60	5262 24	5263.99	0.003995	7 18	208.11	57 89	0 67
STORMCLOUD	2354.69*	PF 1	1495.00	5258.98	5263.18	3.59		5263.98	0.004016	7 20	207 74	57 86	0 67
STORMCLOUD	2353.65*	PF 1	1495.00	5258.98	5263.17	3.59		5263 98	0.004037	7.21	207.38	57.84	0 67
STORMCLOUD	2352.61*	PF 1	1495.00	5258.97	5263.17	3.59		5263.98	0.004013	7.19	207 80	57 86	0.67
STORMCLOUD	2351.58*	PF 1	1495.00	5258 97	5263.17	3.59		5263.97	0.004034	7.21	207 43	57 84	0.67
STORMCLOUD	2350.54*	PF 1	1495.00	5258 97	5263.16	3.58		5263.97	0 004054	7 22	207 09	57 82	0 67
STORMCLOUD	2349.50*	PF 1	1495 00	5258 96	5263.16	3 59		5263 96	0 004027	7.20	207.55	57 85	0 67
STORMCLOUD	2348.46*	PF 1	1495.00	5258.96	5263 15	3 58		5263 96	0.004049	7.22	207.18	57.82	0.67
STORMCLOUD	2347.43*	PF 1	1495.00	5258.96	5263.14	3.58		5263.96	0.004070	7.23	206.81	57.80	0.67
STORMCLOUD	2346.39*	PF 1	1495.00	5258.95	5263.14	3.58		5263.95	0.004045	7 21	207.23	57 83	0 67
STORMCLOUD	2345.35*	PF 1	1495 00	5258 95	5263 14	3 58		5263 95	0.004067	7.23	206.87	57.80	0 67
STORMCLOUD	2344.31*	PF 1	1495 00	5258 95	5263.13	3.57		5263.94	0 004088	7 24	206 50	57 77	0 67
STORMCLOUD	2343.28*	PF 1	1495 00	5258 94	5263.13	3 58		5263 94	0.004064	7.22	206.92	57.80	0 67
STORMCLOUD	2342.24*	PF 1	1495.00	5258.94	5263.12	3.57		5263 93	0 004085	7.24	206.56	57.78	0.67
STORMCLOUD	2341.20*	PF 1	1495 00	5258.94	5263 11	3.57		5263 93	0.004107	7.25	206.19	57.75	0 68
STORMCLOUD	2340.16*	PF 1	1495.00	5258.93	5263.11	3.58		5263 92	0 004082	7.24	206 61	57.78	0 67
STORMCLOUD	2339.13*	PF 1	1495 00	5258 93	5263 10	3.57		5263 92	0.004103	7.25	206.25	57.76	0.68
STORMCLOUD	2338.09*	PF 1	1495.00	5258 93	5263 10	3 57		5263.92	0.004125	7 26	205 88	57.73	0 68
STORMCLOUD	2337.05*	PF 1	1495 00	5258.92	5263.10	3 57		5263 91	0.004100	7 25	206.30	57.76	0.68
STORMCLOUD	2336.01*	PF 1	1495.00	5258 92	5263 09	3.57		5263 91	0.004122	7.26	205.94	57.74	0 68
STORMCLOUD	2334.98*	PF 1	1495.00	5258.92	5263.08	3.56		5263.90	0.004142	7.27	205 60	57 71	0 68
STORMCLOUD	2333.94*	PF 1	1495.00	5258.91	5263.08	3.57		5263.90	0 004118	7.26	205.99	57.74	0.68
STORMCLOUD	2332.90*	PF 1	1495.00	5258.91	5263.07	3.56		5263.90	0.004140	7 27	205 63	57.71	0 68
STORMCLOUD	2331.86*	PF 1	1495 00	5258 91	5263 07	3 56		5263 89	0.004162	7.28	205.26	57.69	0.68
STORMCLOUD	2330.83*	PF 1	1495.00	5258.90	5263.06	3.56		5263.89	0.004137	7 27	205.68	57 72	0 68

HEC-RAS Plan: wilson 1 River: MIREHAVEN ARROYO Reach STORMCLOUD Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	2329.79*	PF 1	1495 00	5258.90	5263 06	3 56		5263.88	0 004159	7 28	205.32	57.69	0 68
STORMCLOUD	2328.75*	PF 1	1495.00	5258 90	5263.05	3 55		5263.88	0.004183	7.30	204.92	57 67	0 68
STORMCLOUD	2327.72*	PF 1	1495 00	5258.89	5263 05	3 56		5263.87	0 004159	7 28	205.32	57 69	0 68
STORMCLOUD	2326.68*	PF 1	1495.00	5258 89	5263 04	3 55		5263.87	0 004181	7 29	204.95	57.67	0 68
STORMCLOUD	2325.64*	PF 1	1495.00	5258.89	5263.04	3.55		5263 87	0.004203	7.31	204.59	57 64	0.68
STORMCLOUD	2324.60*	PF 1	1495 00	5258 88	5263.03	3.55		5263.86	0 004178	7 29	205 01	57.67	0 68
STORMCLOUD	2323.57*	PF 1	1495.00	5258 88	5263.03	3.55		5263.86	0.004202	7 31	204 61	57.64	0.68
STORMCLOUD	2322.53*	PF 1	1495.00	5258.88	5263 02	3 54		5263 85	0.004224	7 32	204.25	57 62	0 69
STORMCLOUD	2321.49*	PF 1	1495.00	5258 87	5263.02	3.55		5263.85	0.004200	7 31	204 64	57 65	0.68
STORMCLOUD	2320.45*	PF 1	1495 00	5258 87	5263.01	3.55		5263.84	0 004222	7 32	204 28	57.62	0.68
STORMCLOUD	2319.42*	PF 1	1495.00	5258.87	5263 00	3 54		5263 84	0.004245	7.33	203.91	57 60	0 69
STORMCLOUD	2318.38*	PF 1	1495 00	5258 86	5263.00	3.55		5263.83	0 004219	7.32	204 33	57 62	0.68
STORMCLOUD	2317.34*	PF 1	1495.00	5258 86	5263 00	3.54		5263 83	0.004242	7.33	203 97	57 60	0.69
STORMCLOUD	2316.30*	PF 1	1495 00	5258.85	5262.99	3 55		5263.82	0.004217	7 32	204.36	57.63	0 68
STORMCLOUD	2315.27*	PF 1	1495.00	5258 85	5262 99	3.54		5263 82	0.004240	7.33	203 99	57 60	0 69
STORMCLOUD	2314.23*	PF 1	1495.00	5258.85	5262 98	3 54		5263 82	0 004263	7 34	203.63	57.58	0 69
STORMCLOUD	2313 19*	PF 1	1495 00	5258.84	5262 98	3 54		5263.81	0 004236	7 33	204.05	57.60	0.69
STORMCLOUD	2312.15*	PF 1	1495.00	5258.84	5262.97	3.54		5263 81	0.004261	7.34	203 66	57 58	0.69
STORMCLOUD	2311.12*	PF 1	1495 00	5258.84	5262.96	3 53		5263.80	0.004284	7.35	203 29	57.55	0 69
STORMCLOUD	2310.08*	PF 1	1495 00	5258.83	5262.96	3.54		5263 80	0.004261	7.34	203 66	57 58	0.69
STORMCLOUD	2309.04*	PF 1	1495 00	5258.83	5262 95	3 53		5263.79	0 004284	7 35	203.29	57 55	0.69
STORMCLOUD	2308.01*	PF 1	1495 00	5258.83	5262 95	3 53		5263.79	0 004307	7 37	202.93	57.53	0 69
STORMCLOUD	2306.97*	PF 1	1495.00	5258 82	5262 94	3.53		5263 78	0.004280	7 35	203.35	57 56	0 69
STORMCLOUD	2305.93*	PF 1	1495 00	5258.82	5262 94	3 53		5263.78	0 004303	7 37	202.98	57 53	0 69
STORMCLOUD	2304.89*	PF 1	1495.00	5258 82	5262 93	3.52		5263 78	0.004328	7.38	202 59	57 50	0 69
STORMCLOUD	2303.86*	PF 1	1495.00	5258.81	5262.93	3.53		5263 77	0 004303	7 37	202 98	57.53	0.69
STORMCLOUD	2302.82*	PF 1	1495.00	5258.81	5262 92	3.52		5263 77	0 004328	7 38	202 59	57.50	0 69
STORMCLOUD	2301.78*	PF 1	1495 00	5258.81	5262 92	3 52		5263.76	0 004351	7 39	202.22	57 48	0 69
STORMCLOUD	2300.74*	PF 1	1495.00	5258.80	5262 91	3 52		5263 76	0.004324	7.38	202 65	57 51	0.69
STORMCLOUD	2299.71*	PF 1	1495 00	5258.80	5262 91	3 52		5263.75	0 004348	7 39	202.28	57 48	0.69
STORMCLOUD	2298.67*	PF 1	1495.00	5258 80	5262 90	3 51		5263.75	0.004373	7.41	201.89	57 45	0.70
STORMCLOUD	2297.63*	PF 1	1495 00	5258 79	5262.90	3.52		5263.74	0 004348	7.39	202 28	57.48	0 69
STORMCLOUD	2296.59*	PF 1	1495 00	5258 79	5262 89	3.51		5263 74	0.004373	7 41	201 89	57.45	0.70
STORMCLOUD	2295.56*	PF 1	1495.00	5258.79	5262 88	3.51		5263 74	0.004397	7.42	201 52	57 43	0.70
STORMCLOUD	2294.52*	PF 1	1495 00	5258 78	5262 88	3 51		5263 73	0 004369	7 40	201.94	57 46	0.70
STORMCLOUD	2293.48*	PF 1	1495.00	5258.78	5262 87	3.51		5263 73	0.004395	7.42	201 55	57 43	0.70
STORMCLOUD	2292.44*	PF 1	1495.00	5258.78	5262 87	3 50		5263 72	0.004420	7.43	201.16	57 40	0.70
STORMCLOUD	2291.41*	PF 1	1495 00	5258 77	5262.86	3.51		5263.72	0 004395	7.42	201 55	57.43	0 70
STORMCLOUD	2290.37*	PF 1	1495 00	5258 77	5262.86	3 50		5263.71	0 004420	7 43	201 16	57.40	0 70
STORMCLOUD	2289.33*	PF 1	1495.00	5258.77	5262 85	3 50		5263 71	0.004446	7 45	200 77	57 38	0.70
STORMCLOUD	2288.29*	PF 1	1495.00	5258.76	5262 85	3 50		5263 70	0.004420	7 43	201.16	57 40	0 70
STORMCLOUD	2287.26*	PF 1	1495 00	5258 76	5262.84	3.50		5263 70	0.004446	7.45	200 77	57.38	0.70
STORMCLOUD	2286.22*	PF 1	1495 00	5258.76	5262.83	3.49		5263.70	0 004472	7 46	200.37	57 35	0 70

HEC-RAS Plan: wilson 1 River: MIREHAVEN ARROYO Reach: STORMCLOUD Profile. PF 1 (Continued)

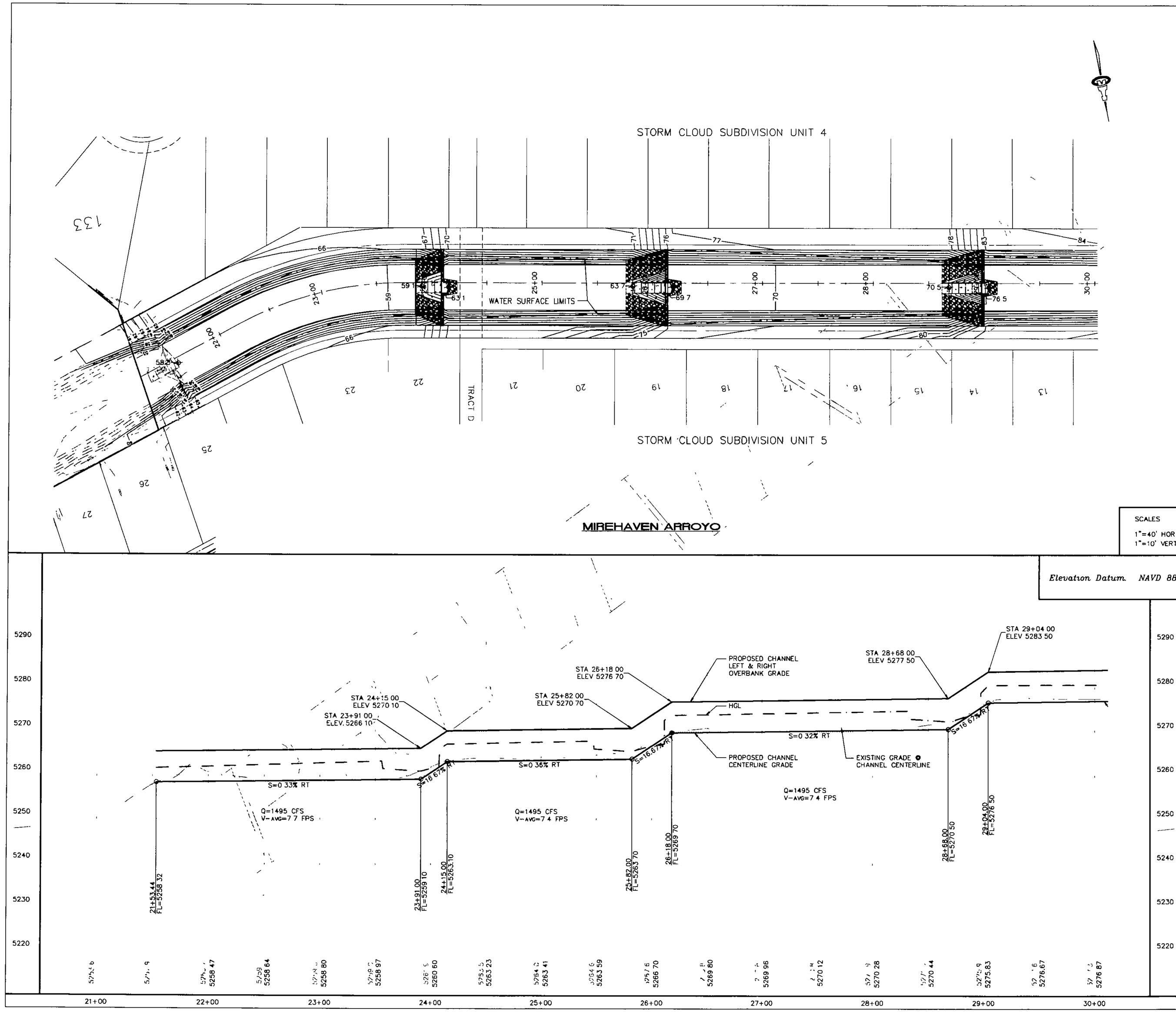
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	2285.18*	PF 1	1495.00	5258.75	5262 83	3.50		5263.69	0.004446	7.45	200.77	57.38	0.70
STORMCLOUD	2284.15*	PF 1	1495.00	5258 75	5262.82	3.49		5263.69	0.004472	7.46	200 37	57.35	0.70
STORMCLOUD	2283.11*	PF 1	1495.00	5258 75	5262 82	3.49		5263.68	0.004498	7 48	199.98	57 32	0.71
STORMCLOUD	2282.07*	PF 1	1495 00	5258.74	5262 81	3 49		5263.68	0.004472	7 46	200 37	57.35	0 70
STORMCLOUD	2281 03*	PF 1	1495.00	5258 74	5262 81	3.49		5263.67	0.004498	7 48	199.98	57 32	0.71
STORMCLOUD	2280.*	PF 1	1495.00	5258 74	5262.80	3.48		5263 67	0.004527	7.49	199.56	57.29	0.71
STORMCLOUD	2278 96*	PF 1	1495.00	5258 73	5262.80	3.49		5263.66	0.004498	7.48	199.98	57 32	0.71
STORMCLOUD	2277.92*	PF 1	1495.00	5258.73	5262.79	3.48		5263 66	0.004525	7.49	199 59	57 29	0 71
STORMCLOUD	2276.88*	PF 1	1495 00	5258.73	5262 78	3.48		5263.66	0 004551	7 51	199 20	57.27	0 71
STORMCLOUD	2275.85*	PF 1	1495.00	5258 72	5262.78	3 48		5263.65	0 004525	7.49	199 59	57.29	0.71
STORMCLOUD	2274.81*	PF 1	1495 00	5258.72	5262.77	3.48		5263.65	0.004553	7 51	199.17	57.27	0.71
STORMCLOUD	2273.77*	PF 1	1495 00	5258.71	5262 77	3.48		5263.64	0.004525	7 49	199.59	57 29	0.71
STORMCLOUD	2272.73*	PF 1	1495.00	5258.71	5262.76	3 48		5263.64	0.004551	7 51	199.20	57 27	0.71
STORMCLOUD	2271.70*	PF 1	1495 00	5258.71	5262.76	3.47		5263.63	0.004578	7.52	198.81	57.24	0.71
STORMCLOUD	2270.66*	PF 1	1495.00	5258 71	5262.75	3 47		5263 63	0 004607	7.54	198.39	57.21	0 71
STORMCLOUD	2269.62*	PF 1	1495 00	5258.70	5262.74	3.47		5263.62	0.004582	7.52	198.75	57 24	0.71
STORMCLOUD	2268.58*	PF 1	1495.00	5258.70	5262.74	3.47		5263.62	0.004609	7 54	198.36	57 21	0.71
STORMCLOUD	2267.55*	PF 1	1495 00	5258.69	5262 73	3.47		5263.61	0.004582	7.52	198.75	57.24	0 71
STORMCLOUD	2266.51*	PF 1	1495 00	5258 69	5262.73	3.47		5263.61	0.004611	7.54	198.33	57.21	0 71
STORMCLOUD	2265.47*	PF 1	1495 00	5258.69	5262 72	3.46		5263.61	0.004640	7.55	197 91	57.18	0.72
STORMCLOUD	2264.44*	PF 1	1495 00	5258.68	5262 72	3 47		5263.60	0.004613	7 54	198.30	57 20	0.71
STORMCLOUD	2263.40*	PF 1	1495.00	5258 68	5262.71	3.46		5263.60	0 004642	7.55	197 89	57.18	0 72
STORMCLOUD	2262.36*	PF 1	1495.00	5258.68	5262.70	3 46		5263.59	0.004672	7 57	197.47	57 15	0.72
STORMCLOUD	2261.32*	PF 1	1495.00	5258.67	5262.70	3 46		5263.59	0 004644	7 56	197.86	57 17	0.72
STORMCLOUD	2260.29*	PF 1	1495 00	5258.67	5262 69	3.46		5263.58	0.004674	7 57	197 44	57 14	0.72
STORMCLOUD	2259.25*	PF 1	1495.00	5258.67	5262.68	3 45		5263 58	0 004703	7.59	197 02	57.11	0.72
STORMCLOUD	2258.21*	PF 1	1495.00	5258.66	5262.68	3.45		5263.57	0 004677	7 57	197.38	57.14	0.72
STORMCLOUD	2257.17*	PF 1	1495 00	5258.66	5262.67	3.45		5263.57	0.004709	7 59	196.94	57 11	0 72
STORMCLOUD	2256.14*	PF 1	1495 00	5258.66	5262 67	3.44		5263.56	0.004739	7.61	196.52	57 08	0.72
STORMCLOUD	2255.10*	PF 1	1495 00	5258.65	5262 66	3.45		5263.56	0.004711	7 59	196.91	57 11	0.72
STORMCLOUD	2254.06*	PF 1	1495 00	5258.65	5262 65	3.44		5263.55	0.004741	7.61	196.49	57 08	0.72
STORMCLOUD	2253.02*	PF 1	1495.00	5258.65	5262.65	3 44		5263 55	0.004771	7.62	196.07	57.05	0 72
STORMCLOUD	2251.99*	PF 1	1495.00	5258.64	5262.64	3 44		5263.54	0.004747	7 61	196.41	57 07	0.72
STORMCLOUD	2250.95*	PF 1	1495.00	5258.64	5262.64	3 44		5263.54	0.004777	7 63	195.99	57.04	0 73
STORMCLOUD	2249.91*	PF 1	1495 00	5258.64	5262.63	3.43		5263.54	0.004808	7 64	195.57	57.01	0.73
STORMCLOUD	2248.87*	PF 1	1495 00	5258.63	5262 63	3.44		5263.53	0.004777	7.63	195 99	57.04	0 73
STORMCLOUD	2247.84*	PF 1	1495 00	5258.63	5262.62	3 43		5263.53	0.004808	7 64	195.57	57.01	0.73
STORMCLOUD	2246.80*	PF 1	1495.00	5258 63	5262.61	3 42		5263 52	0 004839	7 66	195.15	56.98	0 73
STORMCLOUD	2245.76*	PF 1	1495 00	5258.62	5262.61	3.43		5263.52	0.004812	7 65	195.52	57.01	0.73
STORMCLOUD	2244.72*	PF 1	1495.00	5258 62	5262 60	3.42		5263 51	0 004843	7.66	195 10	56.98	0 73
STORMCLOUD	2243.69*	PF 1	1495 00	5258.62	5262 59	3.42		5263.51	0 004874	7.68	194 68	56.95	0 73
STORMCLOUD	2242.65*	PF 1	1495.00	5258 61	5262.59	3.42		5263 50	0 004843	7 66	195.10	56 98	0.73
STORMCLOUD	2241.61*	PF 1	1495.00	5258.61	5262 58	3 42		5263.50	0.004874	7.68	194 68	56.95	0.73

HEC-RAS Plan. wilson 1 River: MIREHAVEN ARROYO Reach: STORMCLOUD Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	2240.58*	PF 1	1495.00	5258 61	5262.58	3 41		5263.50	0 004907	7.70	194 24	56 92	0 73
STORMCLOUD	2239.54*	PF 1	1495.00	5258 60	5262.57	3.42		5263 49	0.004886	7 69	194.51	56.94	0 73
STORMCLOUD	2238.50*	PF 1	1495.00	5258 60	5262.56	3.41		5263 48	0.004922	7 70	194.04	56 91	0 74
STORMCLOUD	2237.46*	PF 1	1495 00	5258 60	5262.55	3.40		5263.48	0.004956	7.72	193.60	56 87	0 74
STORMCLOUD	2236.43*	PF 1	1495.00	5258.59	5262 55	3 41		5263 47	0 004926	7 71	193.99	56.90	0 74
STORMCLOUD	2235.39*	PF 1	1495 00	5258.59	5262.54	3 40		5263.47	0 004960	7.72	193 54	56.87	0.74
STORMCLOUD	2234.35*	PF 1	1495.00	5258.59	5262 53	3 40		5263 47	0 004996	7.74	193 07	56.84	0.74
STORMCLOUD	2233.31*	PF 1	1495.00	5258 58	5262 53	3.40		5263.46	0.004975	7 73	193.35	56 86	0 74
STORMCLOUD	2232.28*	PF 1	1495 00	5258.58	5262 52	3 39		5263.45	0 005012	7.75	192.88	56.82	0 74
STORMCLOUD	2231.24*	PF 1	1495 00	5258.58	5262 51	3 39		5263.45	0 005048	7.77	192.40	56.79	0.74
STORMCLOUD	2230.20*	PF 1	1495.00	5258 57	5262 51	3.39		5263.44	0.005018	7 75	192.79	56 82	0 74
STORMCLOUD	2229.16*	PF 1	1495 00	5258.57	5262.50	3 39		5263 44	0 005055	7.77	192.32	56.78	0 74
STORMCLOUD	2228.13*	PF 1	1495 00	5258.56	5262.50	3 39		5263 43	0 005033	7 76	192.60	56.80	0 74
STORMCLOUD	2227.09*	PF 1	1495.00	5258 56	5262.49	3 38		5263.43	0 005070	7.78	192 13	56 77	0.75
STORMCLOUD	2226.05*	PF 1	1495.00	5258.56	5262 48	3.38		5263 42	0.005107	7 80	191.66	56 74	0 75
STORMCLOUD	2225.01*	PF 1	1495.00	5258.55	5262 48	3.38		5263 42	0.005079	7 79	192.02	56 76	0 75
STORMCLOUD	2223.98*	PF 1	1495.00	5258 55	5262 47	3.38		5263.41	0.005116	7 80	191.55	56 73	0 75
STORMCLOUD	2222.94*	PF 1	1495 00	5258.55	5262 46	3.37		5263 41	0 005154	7 82	191 07	56.70	0.75
STORMCLOUD	2221.90*	PF 1	1495 00	5258 54	5262.45	3 37		5263 40	0 005134	7.81	191 32	56 71	0.75
STORMCLOUD	2220.87*	PF 1	1495.00	5258.54	5262.45	3 37		5263.40	0 005172	7.83	190 85	56.68	0.75
STORMCLOUD	2219.83*	PF 1	1495.00	5258 54	5262 44	3.36		5263.40	0.005210	7 85	190 38	56.65	0.75
STORMCLOUD	2218.79*	PF 1	1495 00	5258 53	5262.43	3 36		5263.39	0.005188	7.84	190 66	56 67	0.75
STORMCLOUD	2217.75*	PF 1	1495.00	5258 53	5262 42	3.36		5263.38	0.005228	7 86	190.16	56.63	0 76
STORMCLOUD	2216.72*	PF 1	1495.00	5258 53	5262 42	3.35		5263.38	0.005267	7 88	189.69	56 60	0 76
STORMCLOUD	2215.68*	PF 1	1495.00	5258.52	5262 41	3.35		5263 37	0.005247	7 87	189.94	56.62	0 76
STORMCLOUD	2214.64*	PF 1	1495 00	5258.52	5262 40	3.35		5263 37	0 005286	7.89	189 47	56 58	0.76
STORMCLOUD	2213.60*	PF 1	1495 00	5258.52	5262 39	3 34		5263.36	0 005327	7.91	188 97	56 55	0 76
STORMCLOUD	2212.57*	PF 1	1495.00	5258 51	5262.39	3.35		5263 36	0.005304	7 90	189.25	56 57	0 76
STORMCLOUD	2211.53*	PF 1	1495 00	5258.51	5262 38	3 34		5263 35	0 005348	7.92	188 72	56.53	0.76
STORMCLOUD	2210.49*	PF 1	1495 00	5258.51	5262 37	3 33		5263 35	0.005393	7 94	188 20	56.49	0.77
STORMCLOUD	2209.45*	PF 1	1495.00	5258.50	5262.36	3 33		5263.34	0.005372	7.93	188 45	56 51	0 77
STORMCLOUD	2208.42*	PF 1	1495.00	5258.50	5262.35	3.33		5263 34	0.005417	7 96	187.92	56.47	0 77
STORMCLOUD	2207.38*	PF 1	1495 00	5258.50	5262.34	3.32		5263.33	0 005462	7 98	187.40	56 44	0 77
STORMCLOUD	2206.34*	PF 1	1495.00	5258 49	5262.34	3.32		5263.33	0 005441	7 97	187.65	56 45	0 77
STORMCLOUD	2205.30*	PF 1	1495 00	5258.49	5262 33	3 32		5263 32	0 005484	7 99	187 15	56.42	0 77
STORMCLOUD	2204.27*	PF 1	1495 00	5258.49	5262 32	3.31		5263.32	0 005530	8.01	186 63	56 38	0.78
STORMCLOUD	2203.23*	PF 1	1495 00	5258.48	5262 32	3 31		5263 31	0 005506	8.00	186 90	56.40	0 77
STORMCLOUD	2202.19*	PF 1	1495.00	5258 48	5262.31	3.31		5263.31	0.005550	8 02	186.41	56 37	0 78
STORMCLOUD	2201.15*	PF 1	1495.00	5258 48	5262.30	3 30		5263.30	0.005594	8.04	185 91	56 33	0.78
STORMCLOUD	2200.12*	PF 1	1495 00	5258.47	5262 29	3.30		5263 29	0.005572	8 03	186.16	56.35	0 78
STORMCLOUD	2199.08*	PF 1	1495.00	5258.47	5262 28	3.30		5263.29	0.005619	8 05	185.64	56.31	0.78
STORMCLOUD	2198.04*	PF 1	1495 00	5258 47	5262.27	3 29		5263 29	0 005667	8.08	185 12	56 27	0 78
STORMCLOUD	2197.01*	PF 1	1495.00	5258 46	5262 27	3 29		5263.28	0.005644	8 07	185.36	56.29	0 78

HEC-RAS Plan wilson 1 River: MIREHAVEN ARROYO Reach STORMCLOUD Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth C	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
STORMCLOUD	2195.97*	PF 1	1495 00	5258 46	5262 26	3.29		5263.27	0.005692	8.09	184 84	56.26	0 79
STORMCLOUD	2194.93*	PF 1	1495 00	5258.46	5262.25	3 28		5263.27	0.005743	8.11	184.29	56 22	0.79
STORMCLOUD	2193.89*	PF 1	1495 00	5258 45	5262.24	3 28		5263 26	0.005722	8 10	184.51	56 23	0.79
STORMCLOUD	2192.86*	PF 1	1495.00	5258.45	5262.23	3 27		5263 26	0 005776	8.13	183.94	56 19	0.79
STORMCLOUD	2191.82*	PF 1	1495 00	5258 45	5262.22	3.27		5263.26	0.005828	8.15	183 39	56 15	0 79
STORMCLOUD	2190.78*	PF 1	1495.00	5258.44	5262 22	3.27		5263 25	0.005805	8.14	183 63	56.17	0.79
STORMCLOUD	2189.74*	PF 1	1495 00	5258 44	5262 21	3.26		5263.24	0.005857	8 17	183 09	56.13	0 80
STORMCLOUD	2188.71*	PF 1	1495.00	5258.44	5262.20	3 25		5263.24	0 005913	8.19	182.51	56 09	0.80
STORMCLOUD	2187.67*	PF 1	1495.00	5258.43	5262 19	3 26		5263 23	0.005891	8.18	182 73	56 10	0 80
STORMCLOUD	2186 63*	PF 1	1495 00	5258 43	5262 18	3.25		5263.23	0.005945	8.21	182 18	56 07	0.80
STORMCLOUD	2185.59*	PF 1	1495.00	5258.43	5262.17	3 24		5263 22	0.006001	8 23	181.61	56 02	0.81
STORMCLOUD	2184.56*	PF 1	1495 00	5258 42	5262.17	3.24		5263.22	0.005977	8.22	181.85	56 04	0.80
STORMCLOUD	2183.52*	PF 1	1495.00	5258.42	5262.16	3 24		5263.21	0.006034	8 25	181.28	56.00	0.81
STORMCLOUD	2182.48*	PF 1	1495 00	5258 42	5262.15	3 23		5263.21	0.006092	8 27	180.71	55 96	0.81
STORMCLOUD	2181.44*	PF 1	1495.00	5258.41	5262.14	3 23		5263.20	0.006069	8 26	180 92	55.98	0 81
STORMCLOUD	2180.41*	PF 1	1495 00	5258 41	5262.13	3 22		5263.20	0 006128	8 29	180.35	55 94	0.81
STORMCLOUD	2179.37*	PF 1	1495.00	5258.40	5262.12	3 23		5263.19	0.006105	8 28	180 57	55.95	0 81
STORMCLOUD	2178.33*	PF 1	1495 00	5258.40	5262.11	3 22		5263.18	0.006167	8 31	179.97	55 91	0.82
STORMCLOUD	2177.3*	PF 1	1495 00	5258 40	5262.10	3.21		5263.18	0.006229	8.33	179.37	55.86	0.82
STORMCLOUD	2176.26*	PF 1	1495 00	5258 40	5262.09	3 20		5263.18	0 006295	8 36	178.74	55.82	0.82
STORMCLOUD	2175.22*	PF 1	1495.00	5258.39	5262.08	3 20		5263.17	0 006275	8 36	178.93	55.83	0 82
STORMCLOUD	2174.18*	PF 1	1495 00	5258 39	5262.07	3.20		5263.16	0.006341	8.38	178 30	55.79	0.83
STORMCLOUD	2173.15*	PF 1	1495 00	5258.38	5262.07	3.20		5263 16	0.006318	8.37	178 52	55.80	0.83
STORMCLOUD	2172.11*	PF 1	1495 00	5258 38	5262.06	3.19		5263.15	0.006385	8.40	177 90	55.76	0.83
STORMCLOUD	2171.07*	PF 1	1495.00	5258.38	5262.04	3 18		5263.15	0 006453	8 43	177.27	55.71	0 83
STORMCLOUD	2170 03*	PF 1	1495 00	5258 37	5262.04	3.18		5263.14	0.006432	8.42	177 46	55.73	0.83
STORMCLOUD	2169.00*	PF 1	1495.00	5258.37	5262 03	3 18		5263 14	0 006501	8 45	176.83	55 68	0 84
STORMCLOUD	2167.96*	PF 1	1495.00	5258.37	5262.02	3.17		5263.13	0 006570	8.48	176.21	55 64	0.84
STORMCLOUD	2166.92*	PF 1	1495.00	5258.36	5262 01	3.17		5263 12	0.006546	8 47	176.43	55.65	0 84
STORMCLOUD	2165.88*	PF 1	1495.00	5258.36	5262.00	3 16		5263 12	0 006622	8 51	175.75	55 60	0 84
STORMCLOUD	2164.85*	PF 1	1495 00	5258 36	5261.98	3.15		5263.12	0 006699	8.54	175 07	55 56	0.85
STORMCLOUD	2163.81*	PF 1	1495.00	5258 35	5261 98	3 15		5263 11	0.006681	8 53	175.23	55.57	0 85
STORMCLOUD	2162.77*	PF 1	1495.00	5258.35	5261.97	3.14		5263.10	0 006759	8.56	174 55	55 52	0.85
STORMCLOUD	2161.73*	PF 1	1495.00	5258.35	5261.95	3 13	5261 61	5263.10	0 006842	8.60	173 85	55 47	0.86
STORMCLOUD	2160.70*	PF 1	1495 00	5258 34	5261 95	3.14		5263.09	0.006819	8.59	174 04	55.48	0.85
STORMCLOUD	2159.66*	PF 1	1495.00	5258.34	5261 93	3 13		5263 09	0 006903	8.62	173.34	55.43	0.86
STORMCLOUD	2158.62*	PF 1	1495.00	5258 34	5261 92	3 12	5261.60	5263.08	0.006985	8.66	172.66	55.38	0 86
STORMCLOUD	2157.58*	PF 1	1495 00	5258 33	5261 91	3.12		5263 08	0.006965	8.65	172 82	55.39	0 86
STORMCLOUD	2156.55*	PF 1	1495.00	5258.33	5261.90	3 11		5263.07	0 007054	8.69	172.09	55 34	0.87
STORMCLOUD	2155.51*	PF 1	1495 00	5258 33	5261 89	3.10	5261 58	5263 07	0.007145	8.72	171 36	55 29	0.87
STORMCLOUD	2154.47*	PF 1	1495 00	5258 32	5261.88	3.10	5261 58	5263.06	0.007125	8.72	171 52	55 30	0.87
STORMCLOUD	2153.44	PF 1	1495.00	5258.32	5261 58	2.87	5261.58	5263 02	0.009663	9 64	155.05	54.10	1 00



SURVEY INFORMATION		
FIELD NOTES		
1	SURVTEK	04/11

BENCH MARKS

Albuquerque Control Survey Monument "4-H19" having a published elevation of 5209 315 feet (NAVD 88)

AS-BUILT INFORMATION

CONTRACTOR
WORK STAKED BY — DATE
INSPECTOR ACCEPTANCE BY — DATE
FIELD VERIFICATION BY — DATE
DRAWINGS CORRECTED BY — DATE

MICRO-FILM INFORMATION

RECORDED BY — DATE
NO.

ENGINEER'S SEAL

PRELIMINARY
FOR REVIEW ONLY
NOT FOR CONSTRUCTION USE.

NO	DATE	REMARKS	BY

REVISIONS

DESIGNED BY ANW — DATE XX
DRAWN BY Thor — DATE XX
CHECKED BY ANW — DATE XX

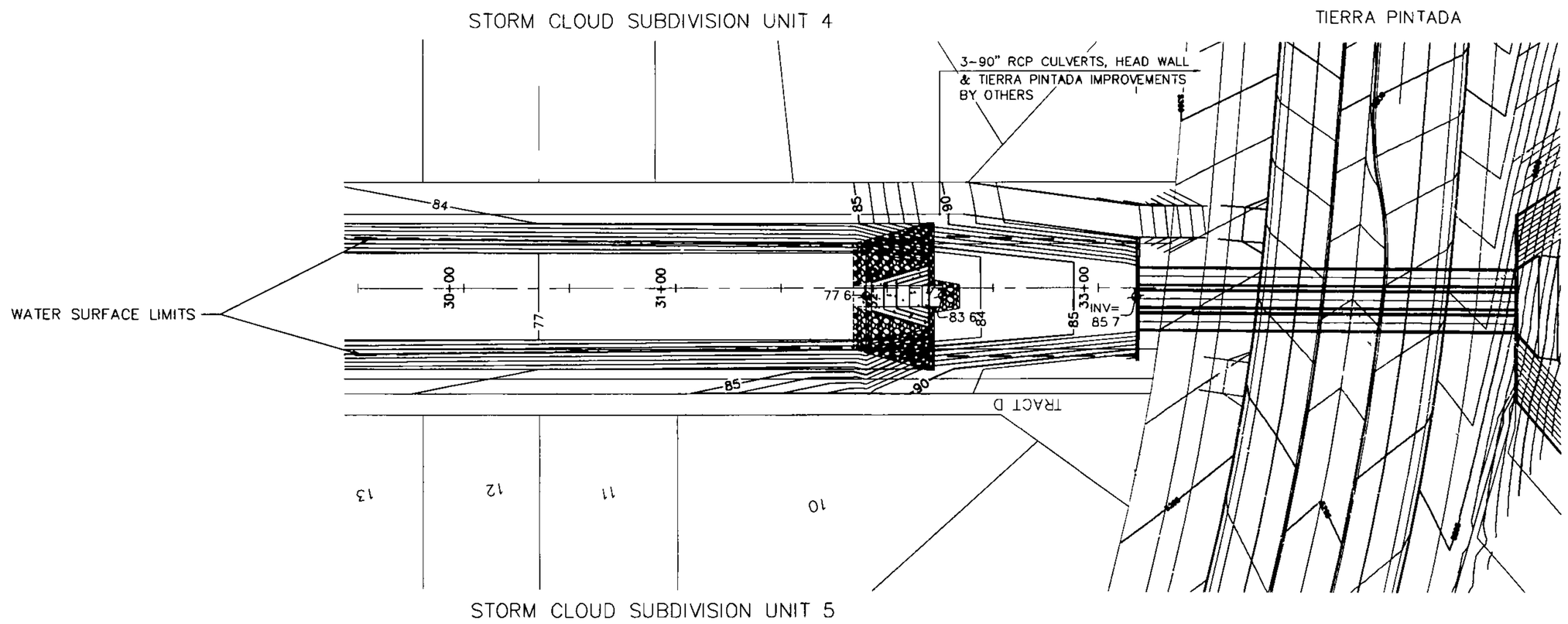
ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates
128 Monroe Street N E
Albuquerque, New Mexico 87108
Ph 505-268-8828 www iacivil com
1823 CU-301 dwg Mar 14,2012

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

TITLE MIREHAVEN ARROYO IMPROVEMENTS
MIREHAVEN ARROYO STA 22+00 TO STA 30+00

Design Review Committee	City Engineer Approval	Last Design Update	Mo/Day/Yr	Mo/Day/Yr

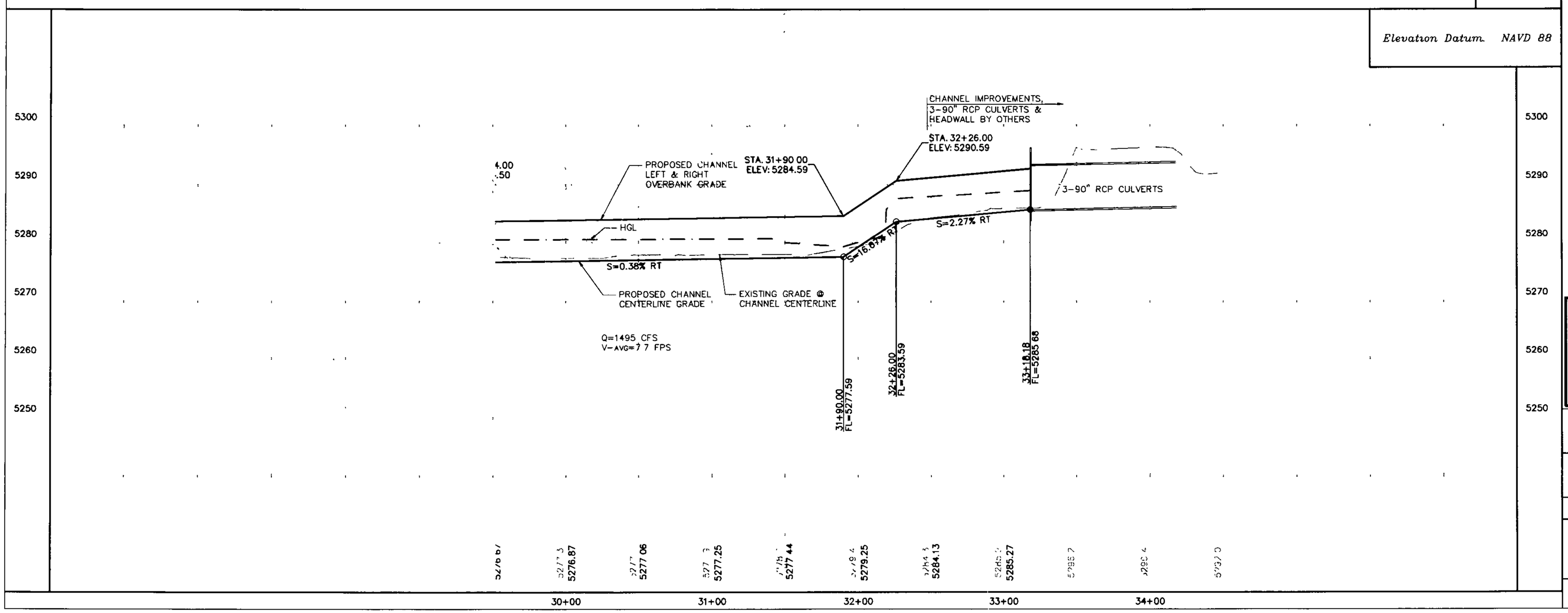
City Project No . | Zone Map No . | Sheet 5 Of .



MIREHAVEN ARROYO

SCALES
1"=40' HOR
1"=10' VERT

Elevation Datum NAVD 88



AS-BUILT INFORMATION

CONTRACTOR	
STAKED BY	DATE
INSPECTOR'S ACCEPTANCE BY	DATE
FIELD VERIFICATION BY	DATE
DRAWINGS CORRECTED BY	DATE

MICRO-FILM INFORMATION

RECORDED BY	
DATE	
NO	

BENCH MARKS

Albuquerque Control Survey Monument
"4-H9", having a published elevation
of 5209 315 feet (NAVD 88)

SURVEY INFORMATION

FIELD NOTES		
1	SURVTEK	04/11

ENGINEER'S SEAL

PRELIMINARY
FOR REVIEW ONLY
NOT FOR CONSTRUCTION USE.

NO	DATE	REMARKS	BY

REVISIONS

DESIGN		
DESIGNED BY	ANW	DATE XX
DRAWN BY	thor	DATE XX
CHECKED BY	ANW	DATE XX

ISAACSON & ARFMAN, P.A.
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Albuquerque, New Mexico 87108
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1823 CU-301 dwg Mar 14 2012

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

TITLE MIREHAVEN ARROYO IMPROVEMENTS
MIREHAVEN ARROYO STA 30+00 TO END

Design Review Committee	City Engineer Approval	Last Design Update	Mo /Day/Yr	Mo /Day/Yr

City Project No	Zone Map No	Sheet	Of
.	.	6	.

II. CORRECTION TO APPENDIX E

Corrected Unit 4 Sump Inlet Designations

STORM CLOUD, UNIT 4

SUMP INLET CAPACITY

GRATE OPEN AREA:
(per COA std dwg #2220, single grate)

GROSS AREA FOR ONE GRATE =	(25 in/12)(40 in/12) =	6.94 SF
LESS BEARING BARS =	(0.5 in/12)(3.33 ft)(13) =	1.80 SF
LESS CROSS BARS =	(0.5 in/12)(7)[(25 in/12)-(13)(0 5 in/12)] =	0.45 SF
	NET GRATE OPEN AREA =	**4.69 SF**
	GRATE OPEN AREA (assuming 50% clogging factor) =	***2.35 SF***

ORIFICE EQUATION:

$$Q = CA(2gh)^{1/2}$$

Where:

C = 0 67
A = 2.35 ft^2
g = 32.2 ft/sec^2
h = height of the water surface above the grate

CAPACITY CALCULATIONS:

INLET # 3 & 4
LOCATION: SUMMER BREEZE

h = 0 67 ft
$Q_{(capacity)}$ = 10.32273 cfs REQUIRED Q = 21.6 cfs

NUMBER OF GRATES REQUIRED = **3**

INLET # 5 & 6 ← CORRECTION
LOCATION: MONSOON

h = 0.67 ft
$Q_{(capacity)}$ = 10.32273 cfs REQUIRED Q = 21.2 cfs

NUMBER OF GRATES REQUIRED = 3

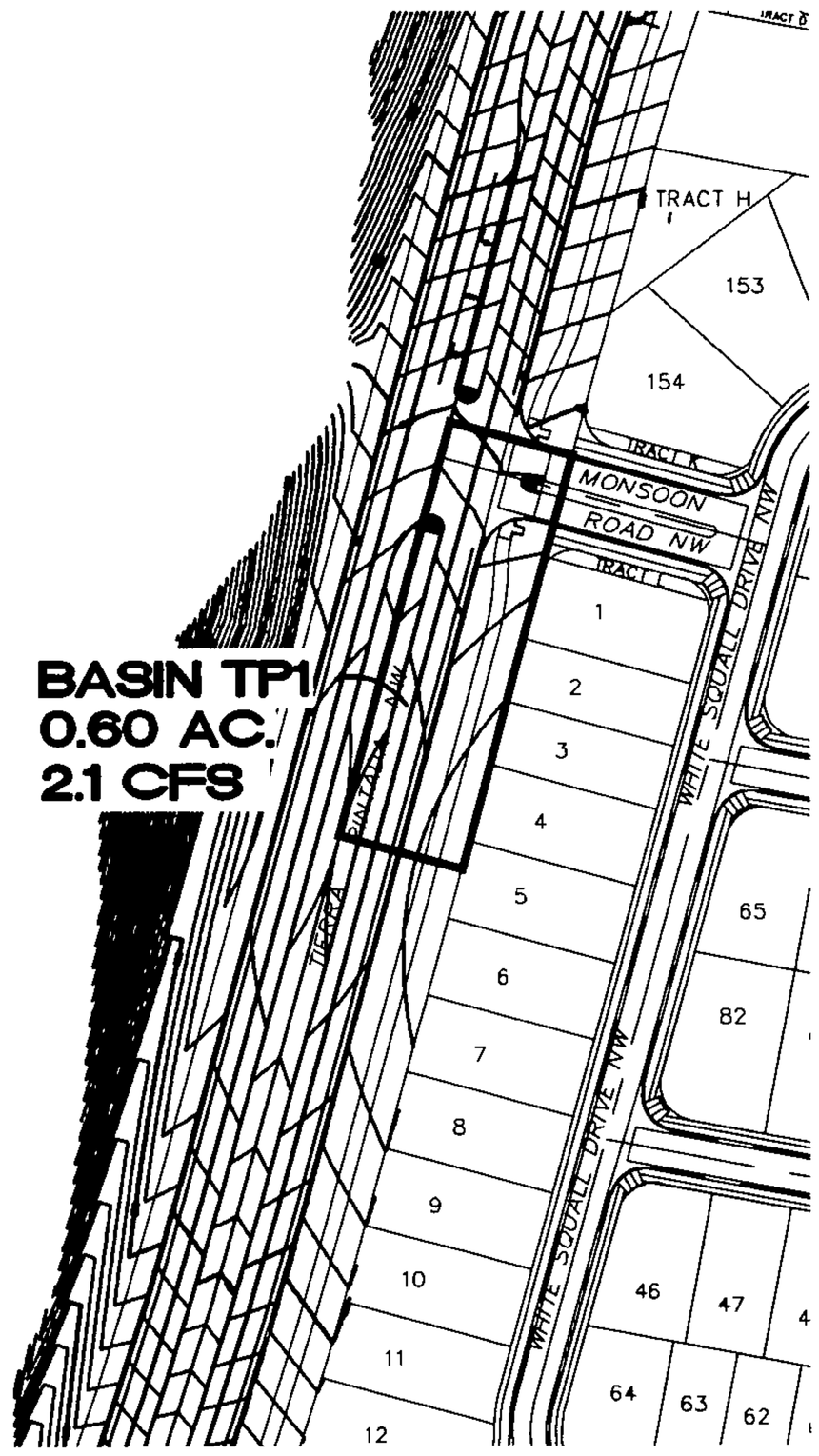
INLET # 9 & 10
LOCATION: SUMMER BREEZE

h = 0.67 ft
$Q_{(capacity)}$ = 10 32273 cfs REQUIRED Q = 13.9 cfs

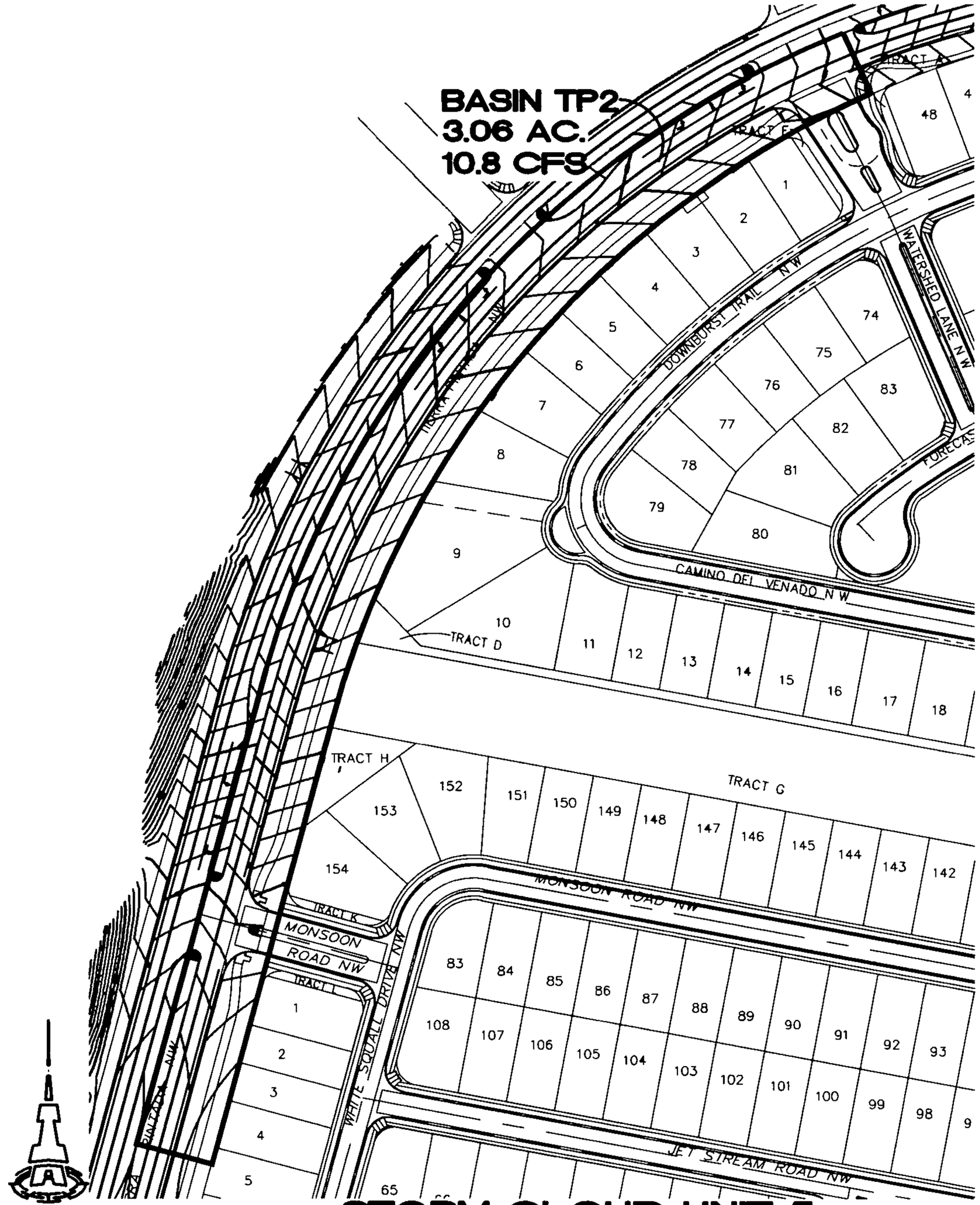
NUMBER OF GRATES REQUIRED = **2**

III. CAMINO DEL VENADO SUMP INLETS

Profile Exhibit to Illustrate High Point Elevation



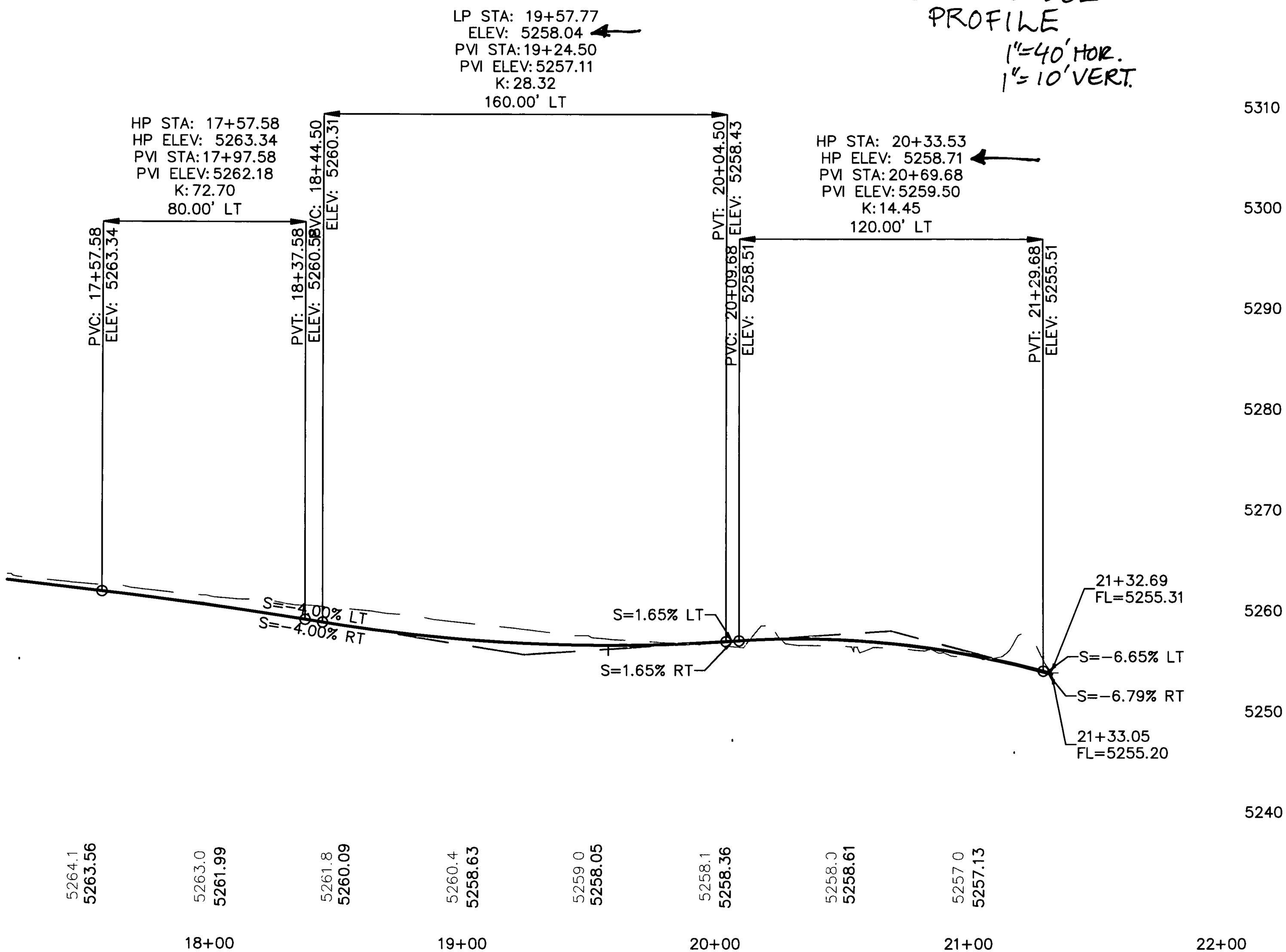
STORM CLOUD UNIT 4
TIERRA PINTADA BASIN
EXHIBIT



1"=200'

STORM CLOUD UNIT 5
TIERRA PINTADA BASIN
EXHIBIT

CAMINO DEL VENADO
PROFILE
1"=40' HOR.
1"= 10' VERT.



IV. TIERRA PINTADA WATER BLOCKS AT ENTRANCES

Tierra Pintada Basin Exhibit
Basin Areas & Land Treatments
AHYMO Calculations
Street Flow Depth at Entrances

STORM CLOUD, UNITS 4 & 5
TIERRA PINTADA BASINS

BASIN AREA AND LAND TREATMENT TABLE--
PROPOSED CONDITIONS

BASIN	*AREA*			*LAND TREATMENT (%)*				Q100, cfs
	SF	*AC.*	*SQ. MI.*	*A*	*B*	*C*	*D*	
TP1	26160	0.6006	0.00094	0	0	53	47	2.1
TP2	133353	3.0614	0.00478	0	0	53	47	10.8

TP1 Basin contributing flows to Monsoon Rd. entrance in Unit 4
TP2 Basin contributing flows to Watershed Ln. entrance in Unit 5

```
AHYMO PROGRAM SUMMARY TABLE (AHYMO-S4)                        - Ver. S4.01a, Rel: 01a      RUN DATE (MON/DAY/YR) =03/12/2012
INPUT FILE = C:\Users\Public\AHYMOdata\1822P2.DAT                                        USER NO.= AHYMO_Temp_User:20122010

                              FROM  TO                    PEAK        RUNOFF                TIME TO    CFS      PAGE =   1
                 HYDROGRAPH   ID    ID        AREA     DISCHARGE     VOLUME      RUNOFF      PEAK     PER
COMMAND        IDENTIFICATION  NO.  NO.     (SQ MI)      (CFS)       (AC-FT)    (INCHES)   (HOURS)    ACRE     NOTATION

*S*******************************************************************
*S       STORM CLOUD, UNIT 5
*S       TIERRA PINTADA BASIN
*S       DEVELOPED CONDITIONS
*S       100-YR, 6-HR STORM
*S       1822P2.DAT
*S       MARCH 2012
*S       BY ASA NILSSON-WEBER
*S       ISAACSON & ARFMAN, P.A.
*S*******************************************************************
START                                                                                                   TIME=      0.00
RAINFALL  TYPE= 1 NOAA 14                                                                               RAIN6=    2.210
*S  BASIN TP1—TIERRA PINTADA BASIN CONTRIBUTING FLOW TO
*S  MONSOON RD ENTRANCE UNIT 4
COMPUTE NM HYD        101.00   -     1       0.00094        2.15       0.072      1.44368    1.530    3.568 PER IMP=  47.00
*S  BASIN TP2—TIERRA PINTADA BASIN CONTRIBUTING FLOW TO
*S  WATERSHED LN ENTRANCE UNIT 5
COMPUTE NM HYD        102.00   -     2       0.00478       10.84       0.368      1.44368    1.530    3.544 PER IMP=  47.00
FINISH
```

Channel Report

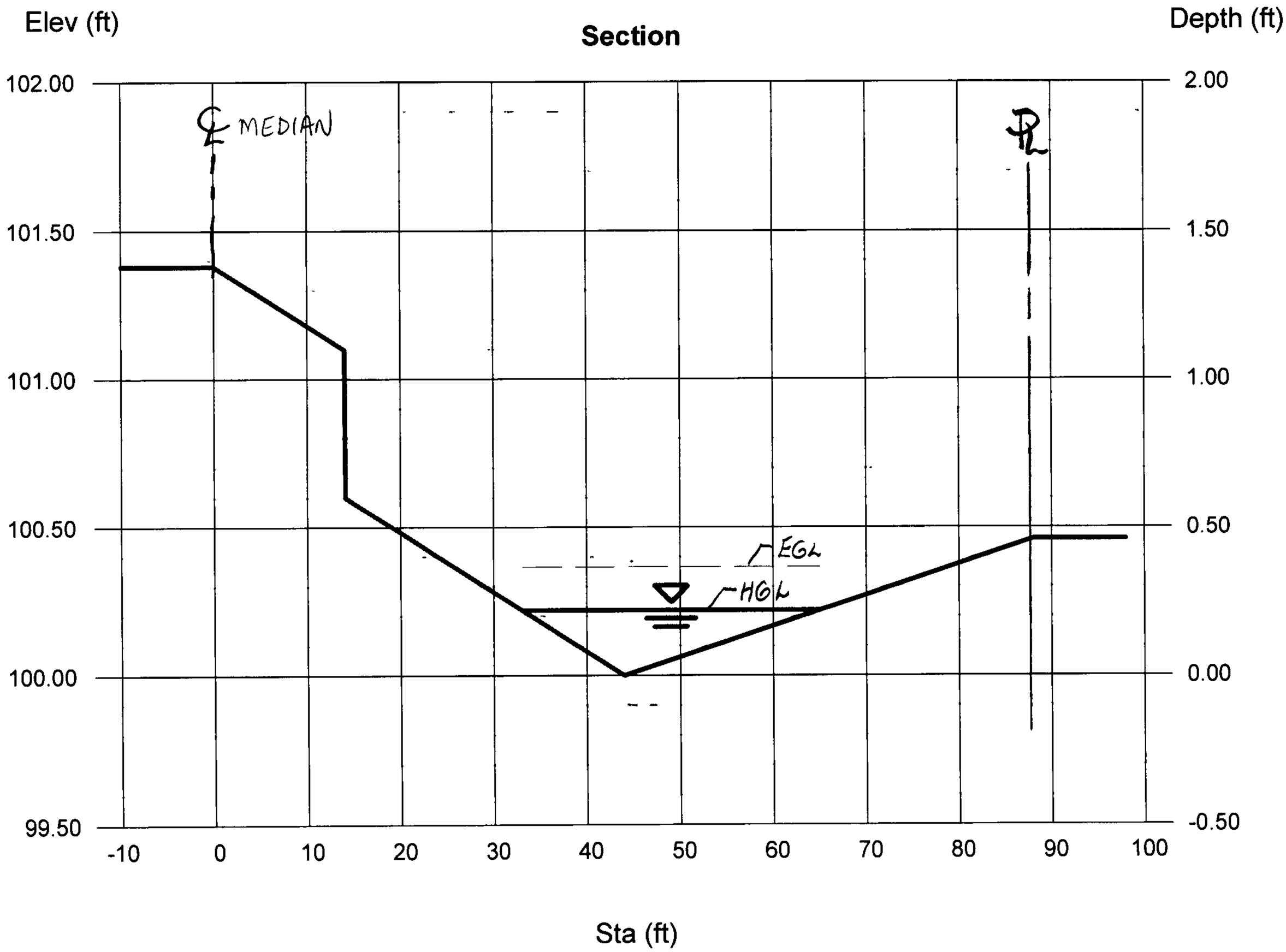
Hydraflow Express Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc. Monday, Mar 12 2012

TIERRA PINTADA SECTION AT WATERSHED LN (LOOKING NORTH)

User-defined		Highlighted	
Invert Elev (ft)	= 100.00	Depth (ft)	= 0.22
Slope (%)	= 2.60	Q (cfs)	= 10.80
N-Value	= 0.017	Area (sqft)	= 3.52
		Velocity (ft/s)	= 3.07
Calculations		Wetted Perim (ft)	= 32.01
Compute by:	Known Q	Crit Depth, Yc (ft)	= 0.27
Known Q (cfs)	= 10.80	Top Width (ft)	= 32.01
		EGL (ft)	= 0.37

(-9.00, 101.38)-(14.00, 101.10, 0.017)-(14.10, 100 60, 0.017)-(44.00, 100.00, 0.017)-(88 00, 100.46, 0.017)

(Sta, El, n)-(Sta, El, n)...



Channel Report

Hydraflow Express Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc — Monday, Mar 12 2012

TIERRA PINTADA SECTION AT MONSOON RD (LOOKING NORTH)

User-defined

Invert Elev (ft)	= 100.00
Slope (%)	= 2.40
N-Value	= 0.017

Calculations

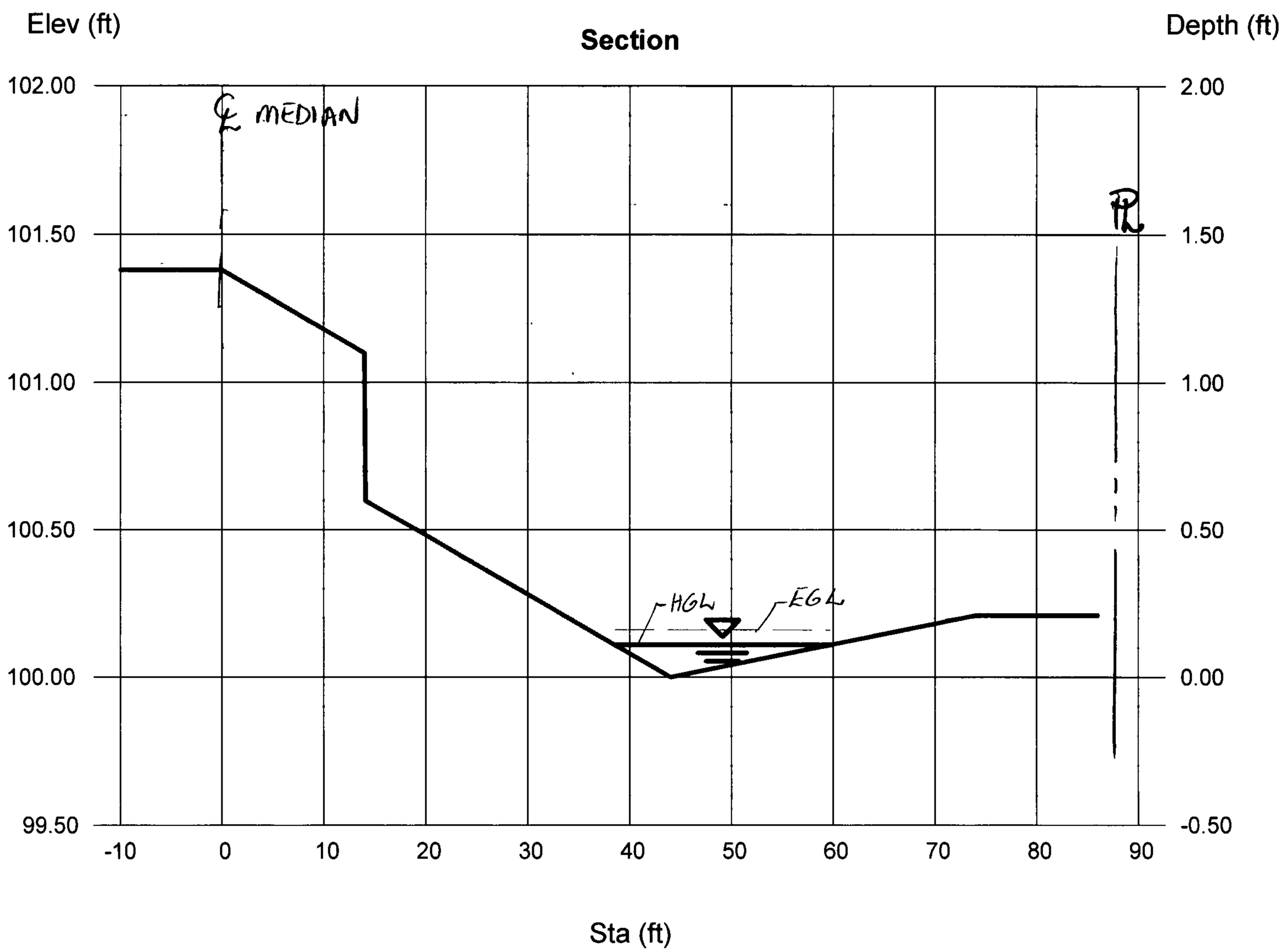
Compute by:	Known Q
Known Q (cfs)	= 2.10

Highlighted

Depth (ft)	= 0.11
Q (cfs)	= 2.100
Area (sqft)	= 1.17
Velocity (ft/s)	= 1.80
Wetted Perim (ft)	= 21.20
Crit Depth, Yc (ft)	= 0.13
Top Width (ft)	= 21.20
EGL (ft)	= 0.16

(-20.00, 101.38)-(14.00, 101.10, 0.017)-(14 10, 100 60, 0 017)-(44.00, 100.00, 0.017)-(74.00, 100.21, 0 017)-(76.00, 100.21, 0.017)

(Sta, El, n)-(Sta, El, n)...



MARCH 12, 2013

REVISED DRAINAGE REPORT

FOR

MIREHAVEN ARROYO AT STORMCLOUD

RECEIVED
MAR 2 6 2013
LAND DEVELOPMENT SECTION

ALBUQUERQUE, NEW MEXICO

MARCH 12, 2013

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MAR 2 6 2
LAND DEVELOPMENT SECTION

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MAR 1 6 2013

BY

ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates

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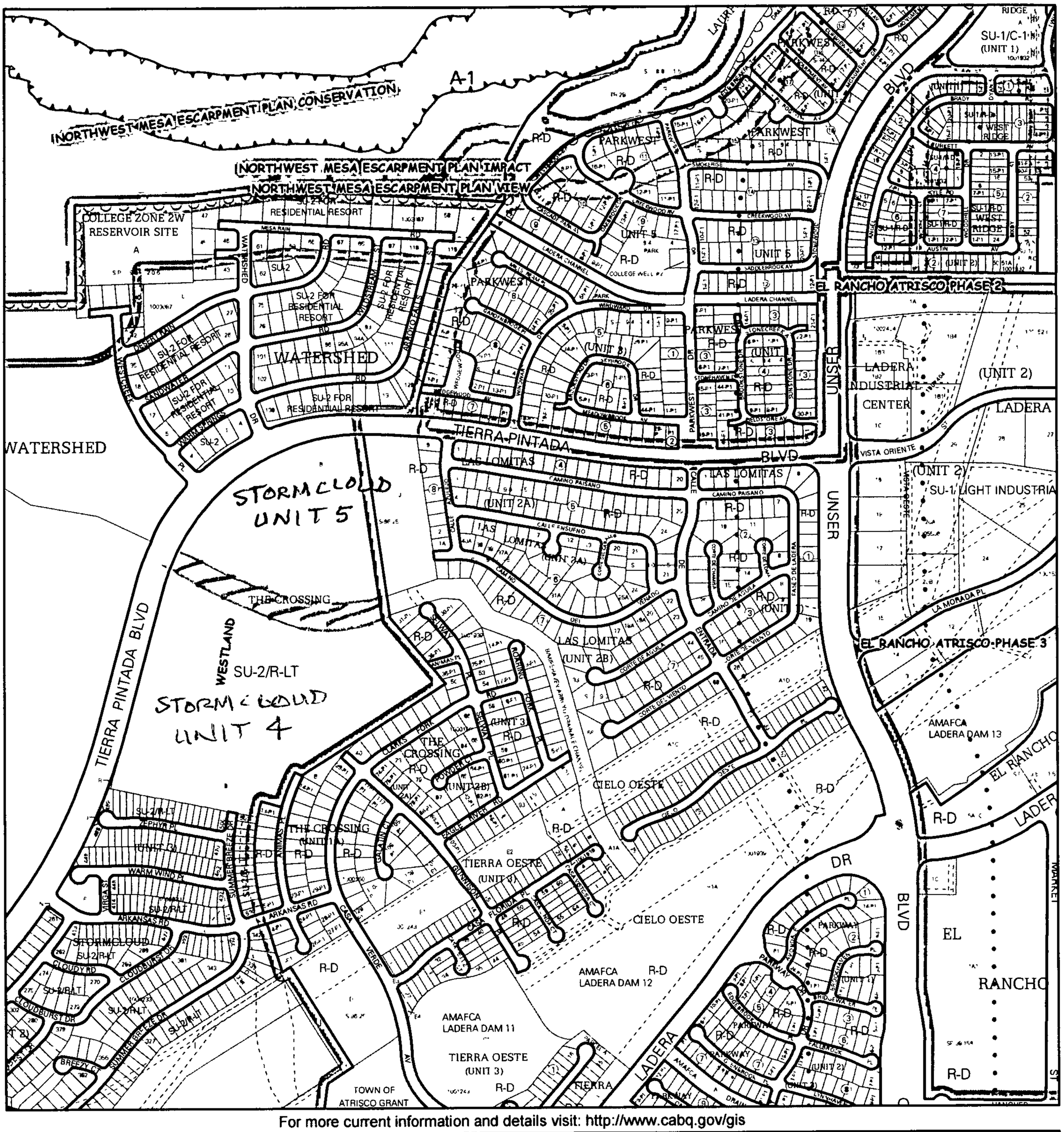
Åsa Nilsson-Weber, PE

GENEVIEVE L. DONART
NEW MEXICO
15088
LICENSED PROFESSIONAL ENGINEER
03/20/13

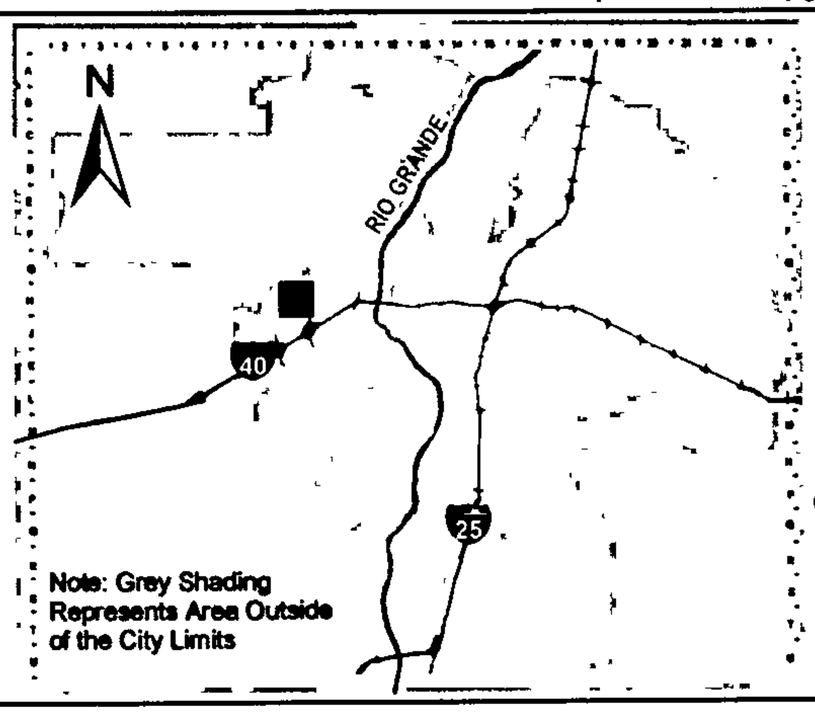
I&A Project No. 1883
M:\PROJECT DOCUMENTS\1800-1899 1883\REPORTS & EXHIBITS



For more current information and details visit: http://www.cabq.gov/gis

Albuquerque Geographic Information System

Map amended through: 4/2/2012



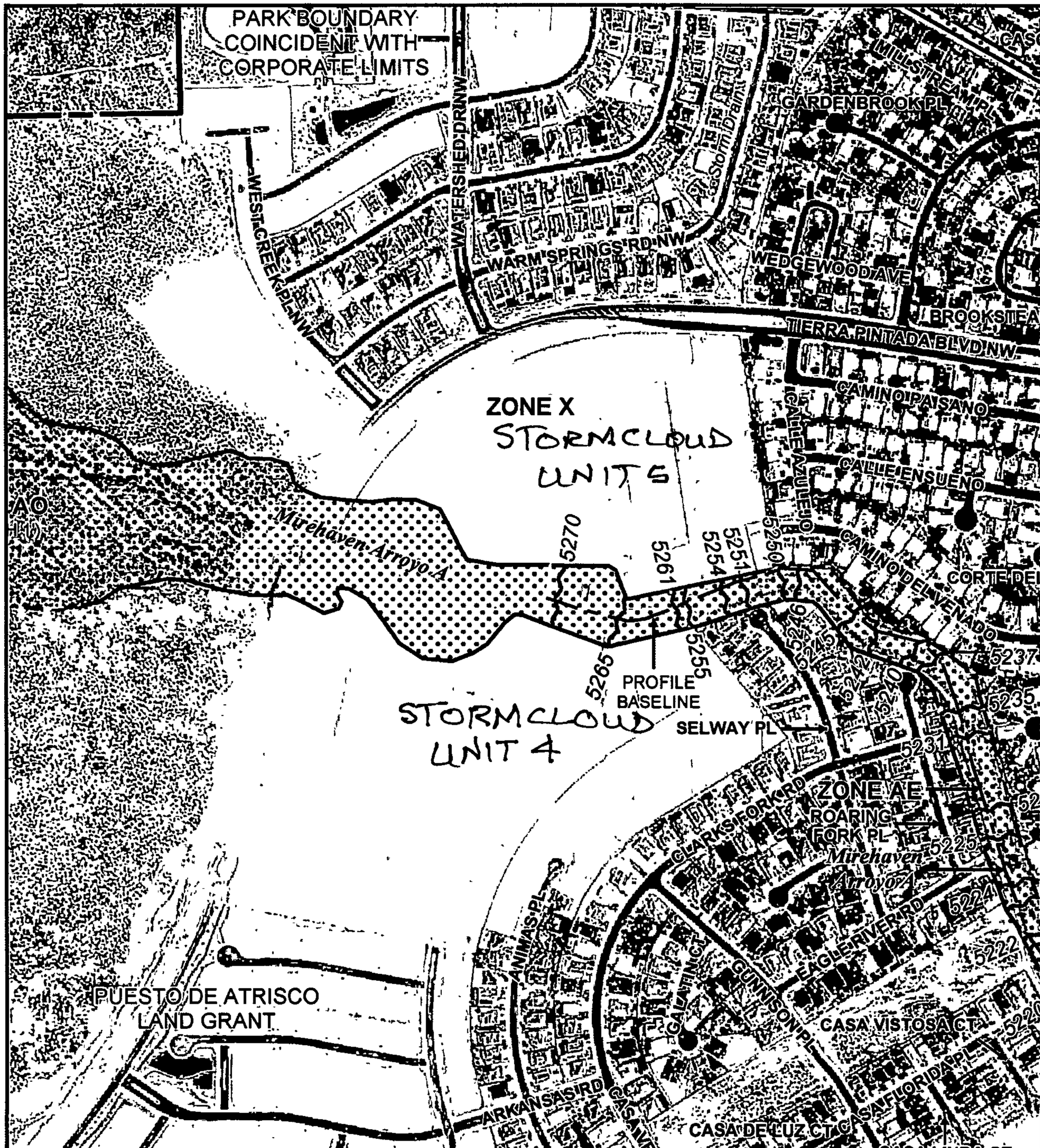
Zone Atlas Page:

H-09-Z

Selected Symbols

- SECTOR PLANS
- Design Overlay Zones
- City Historic Zones
- H-1 Buffer Zone
- Petroglyph Mon
- Escarpment
- 2 Mile Airport Zone
- Airport Noise Contours
- Wall Overlay Zone

0 750 1 500 Feet



MAP SCALE 1" = 500'

50 0 500 1000 FEET

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0326H

FIRM

FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO

AND INCORPORATED AREAS

PANEL 326 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0326	H
BERNALILLO COUNTY UNINCORPORATED AREAS	350001	0326	H

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community

MAP NUMBER
35001C0326H

MAP REVISED
AUGUST 16, 2012

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

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VICINITY MAP

FLOODPLAIN MAPS

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III. EXISTING CONDITIONS ..... Page 3

IV. PROPOSED CONDITIONS ..... Page 4

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APPENDICES

APPENDIX A: Existing Conditions
- Existing Conditions Exhibit
- Excerpts from FEMA Flood Insurance Study
- Excerpts from "West I-40 DMP" prepared by Bohannon-Huston, Inc. dated June, 2000
- HEC-RAS Output

APPENDIX B: Proposed Conditions
- Site Exhibit
- Mirehaven Arroyo Plans
- Excerpts from "Drainage Report for Stormcloud Units 4 & 5" prepared by Isaacson and Arfman, P.A., dated February 10, 2012
- HEC-RAS Output
- Scour Calculations
- Riprap Sizing Calculations
- Riprap Sizing for Storm Drain Outlet Calculations
- Freeboard Calculations
- Superelevation Calculations

APPENDIX C: Alternate Conditions
- Site Exhibit - Alternate
- Mirehaven Arroyo Alternate Plans
- HEC-RAS Output
- Freeboard Calculations
- Superelevation Calculations
- Riprap Sizing Calculations

I. PROJECT INFORMATION

PROPOSED LEGAL DESCRIPTION:
Tract O, Stormcloud Unit 4

EXISTING LEGAL DESCRIPTION:
Tract B, The Crossing

ENGINEER: Isaacson & Arfman, P.A.
128 Monroe Street NE
Albuquerque, NM 87108
(505) 268-8828
Attn: Genevieve Donart

SURVEYOR: Surv-Tek, Inc.
(505) 897-3366
Attn: Russ Hugg, NMPLS No. 9750

DEVELOPER: Western Albuquerque Land Holdings, LLC
c/o Garrett Development Corp
PO Box 56790
Albuquerque, NM 87187
(602) 427-4064

TOTAL AREA: 2.80 Acres

FLOOD PLAIN: This site lies within Zone "X" (areas determined to be outside the 0.2% annual chance floodplain), and Zone "A0", (DEPTH 1') (Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined as shown on National Flood Insurance Program Flood Insurance Rate Maps 35001C0326H revised August 16, 2012.

II. INTRODUCTION

The Mirehaven Arroyo at Stormcloud is a proposed channel west of Tierra Pintada Blvd, within the existing Crossings subdivision. This drainage report addresses improvements to the channel that will protect proposed development on either side, called Stormcloud Units 4 & 5. It includes a CLOMR application for the

This portion of the Mirehaven Arroyo and Stormcloud Units 4 & 5 were previously designed by Advanced Engineering and Consulting, LLC in 2007, showing a buried riprap design with occasional drop structures. At that time the site was graded, including the Mirehaven Arroyo and the adjoining Stormcloud subdivisions. Construction of public improvements was never implemented, and improvements that would protect the arroyo from erosion and allow for a revision of the floodplain were never built. The property has since changed ownership.

Due to changes in requirements since the original plan, the channel is redesigned with this report, keeping the basic concept of the Advanced Engineering design. In order to allow for cost effective bidding, an alternate design is also presented that shotcrete lines the channel. Upstream, Tierra Pintada Blvd was designed by Bohannan-Huston, Inc., and is under construction. The Tierra Pintada Blvd improvements include culverts under the road to pass Mirehaven Arroyo flows. The new Mirehaven Arroyo design matches the Bohannan-Huston, Inc. design at the west end of the Stormcloud project.

III. EXISTING CONDITIONS

The existing site is bounded to the west by Tierra Pintada Blvd, and to the east by The Crossing, Unit 3 residential subdivision. It runs west to east between the proposed Stormcloud Units 4 & 5. The site is rough graded to match the Advanced Engineering design from 2007, with 2:1 side slopes, a 41' wide bottom, 4' or 6' high drops at intervals, with flatter slopes of approximately 0.3% -0.4% between the drops. (See Existing Conditions Exhibit in APPENDIX A.)

Downstream of this site, the Mirehaven Arroyo was developed as part of The Crossing, Unit 3, in a manner consistent with the original Advanced Engineering design. At the eastern end of the proposed channel, there is an existing 4' high drop structure with a concrete retaining wall, and concrete ramp at a 6:1 slope.

Upstream of this site, Tierra Pintada Blvd is under construction; including culverts to pass Mirehaven Arroyo flows under the road. A tied-riprap pad for erosion control is designed at the culvert outlet.

The FEMA Flood Insurance Study for the Mirehaven Arroyo shows this channel to have a 100-year flow of 1,033 cfs at the confluence of the north branch tributary of the Mirehaven. It also shows a 100-year flow of 1,630 cfs at the confluence with the Ladera Dams. The Stormcloud stretch of the Mirehaven is approximately midway between the 2 confluences. Per the West 1-40 DMP (See excerpts in APPENDIX A), the developed flow rate in the Mirehaven Arroyo at Tierra Pintada Blvd is 1,495 cfs.

No significant flows enter the Mirehaven Arroyo along the portion covered by this report. Existing offsite stormwater is contained within the limits of the Stormcloud Units 4 & 5 areas.

An existing conditions model of the site was run using HEC-RAS. (See HEC-RAS Calculations in APPENDIX A.)

FLOODPLAINS

A Zone AO (Depth 1') covers most of the appropriate area of the Mirehaven Arroyo, and portions of Stormcloud Units 4 & 5. Downstream, the channel was studied during The Crossing, Unit 3, and is primarily contained within the channel with a Zone AE, with some areas that intrude into the boundaries of Stormcloud Units 4 & 5. (See FIRMette of FEMA Panel 35001C0326H at beginning of report.)

IV. PROPOSED CONDITIONS

Stormcloud Units 4 & 5 are planned single-family residential subdivisions to the north and south of the proposed Mirehaven Arroyo. The Mirehaven Arroyo will be improved in order to protect these developments from Mirehaven flows, and to remove FEMA flood hazard zones from proposed building pads.

Two designs are presented to allow for cost effective bidding. The primary proposed design keeps the basic concept of the Advanced Engineering design; including a 41' bottom width, buried riprap side slopes and 4' high or 6' high drop structures drop structures that have concrete retaining walls and ramps. The alternate design lines the channel with shotcrete, narrows the channel bottom to 25', with upstream and downstream transitions, and eliminates the drop structures.

In both designs the improvements:

- Follow the same alignment and basic profile.
- Match the existing channel section and invert downstream.
- Match the section and invert of the outlet structure under construction with the Tierra Pintada Blvd improvements.
- Have 2:1 side slopes.
- Have 7' minimum channel depth.
- Include a 15' wide maintenance access ramp into the channel on the upstream end.
- Include a storm drain pipe penetration each from Stormcloud Units 4 & 5.

A HEC-RAS analysis for each condition was performed, using a 100-year flow rate of 1,495 cfs as per the West I-40 DMP. Additional flows of 41 cfs enter the arroyo from the proposed Stormcloud Unit 4 storm drain pipe penetration and 67 cfs from the proposed Stormcloud Unit 5 storm drain pipe penetration. (See excerpts from Stormcloud Units 4 & 5 Drainage Report in APPENDIX B.) The Unit 5 storm drain penetrates downstream of the proposed improvements.

PROPOSED IMPROVEMENTS

The primary design for the channel improvements is a dirt- and buried riprap-lined channel with concrete drop structures at intervals to slow the flows. (See plans in APPENDIX B). The drop structures consist of a 4' or 6' high retaining wall with a 1' deep, 10' wide weir centered in the wall, and a sloped concrete ramp (6:1), that runs from 6' upstream of the retaining wall to 6' past where it daylights with the downstream invert. (The downstream 6' is inclusive of 1' bury of the ramp at the downstream end.) The ramp has 2:1 concrete side-slopes that daylight to the channel invert.

The channel was assumed to have a Manning's n-value of 0.030. Flows between drop structures are in a subcritical condition, with isolated exceptions where the channel is constricted by the maintenance access ramp. At the downstream side of the drop structures the flows are supercritical. (See HEC-RAS Calculations in APPENDIX B.)

The primary channel section includes an earthen bottom, with buried riprap side slopes that have 5' deep scour protection. Scour calculations confirmed that the 5' scour protection is sufficient for the majority of the channel. (See Scour Calculations in APPENDIX B.) Riprap on the side slopes is sized as Type 'L' (D_{50} = 9"). (See Riprap Sizing Calculations in APPENDIX B.)

There are several areas where higher velocities and channel contraction would require a deeper bury in order to protect the side slopes from scour; at the base of the drop structures, where flows are supercritical; and at the stretch upstream of the westernmost drop structure, where velocities are higher due to a slightly steeper invert slope and channel contraction from the maintenance access ramp. (See Scour Calculations in APPENDIX B.) Instead of creating deeper scour protection, the invert of the channel is also riprap-lined in these areas.

At the base of the drop structures, riprap is sized as Type 'M' (D_{50}=18"). In the westernmost portion, riprap was sized as Type 'L' (D_{50} = 9"). (See Riprap Sizing Calculations in APPENDIX B.).

A 36" RCP storm drain penetrates the channel from Stormcloud Unit 4 to the south at STA 23+72. It discharges 41 cfs and requires a minimum 6.5' long by 12' wide by 18" thick Type 'L' riprap pad at the outlet. (See Riprap Sizing for Storm Drain Outlet Calculations in APPENDIX B.)

A 42" RCP storm drain penetrates the previously constructed channel from Stormcloud Unit 5 to the north at STA 18+92, which is downstream of the proposed channel improvements. It discharges 67 cfs and requires a minimum 6.5' long by 14' wide by 18" thick Type 'L' riprap pad at the outlet. (See Riprap Sizing for Storm Drain Outlet Calculations in APPENDIX B.)

Freeboard and Superelevation requirements were calculated for the channel. The worst case has 1.6 ft of freeboard and 0.13 ft of superelevation. This creates a maximum freeboard need of 1.8 ft. Added to the maximum hydraulic depth of 4.3 ft, this means the channel must be at least 6.1' deep. The channel is designed at 7' depth. (See Freeboard and Superelevation Calculations in APPENDIX B.)

ALTERNATE IMPROVEMENTS

The alternate design for the channel improvements is a shotcrete lined channel with grade changes at intervals that match locations of the drop structures in the proposed improvement. (See plans in APPENDIX C). The shotcrete channel was assumed to have a Manning's n-value of 0.022.

Flows are primarily supercritical, with some subcritical areas at the upstream and downstream transitions. (See HEC-RAS Calculations in APPENDIX C.)

A 36" RCP storm drain penetrates the channel from Stormcloud Unit 4 to the south at STA 23+72. It discharges 41 cfs.

A 42" RCP storm drain penetrates the previously constructed channel from Stormcloud Unit 5 to the north at STA 18+92, which is downstream of the proposed channel improvements. It discharges 67 cfs and requires a minimum 6.5' long by 14' wide by 18" thick Type 'L' riprap pad at the outlet. (See Riprap Sizing for Storm Drain Outlet Calculations in APPENDIX B.)

Freeboard and Superelevation requirements were calculated for the channel. The worst case has 1.8 ft of freeboard and 0.5 ft of superelevation. This creates a maximum freeboard need of 2.3 ft. Most of the channel only needs 1.6 ft of freeboard. The maximum water depth is 5.5 ft at the upstream transition, and for most of the channel length is below 4' deep. The channel is designed at 7' depth. (See Freeboard and Superelevation Calculations in APPENDIX C.)

FLOODPLAINS

The existing Zone AO (Depth 1') that covers the upstream area of the Mirehaven Arroyo and portions of Stormcloud Units 4 & 5 will be removed by a LOMR. It will be replaced with a Zone AE. The existing Zone AE that was studied as part of The Crossing, Unit 3, is not indicative of proposed conditions. The Zone AE will be modified to show different Base Flood Elevations (BFE's) and floodplain limits that are contained within the channel.

The floodplain revisions extend downstream of the proposed improvements, to reflect that existing improvements in the arroyo contain the 100-year flood within the channel. (See HEC-RAS Calculations in APPENDIX B & APPENDIX C.)

A LOMR shall be submitted to FEMA upon completion of improvements required in this report.

V. SUMMARY & CONCLUSIONS

The Mirehaven Arroyo at Stormcloud Units 4 & 5 requires the following improvements:

1. A tract to be dedicated to AMAFCA for the Mirehaven Arroyo right-of-way.
2. Line the arroyo with buried riprap, or alternatively with shotcrete, per the Proposed Plan & Profiles.
3. For the Proposed Improvements, 4' or 6' high drop structures as indicated on the Proposed Plan & Profiles.
4. Provide a 15' wide maintenance access ramp at the upstream end of the improvements.
5. Provide 15' wide maintenance access roads on either side of the arroyo.
6. Install storm drain pipe penetration with 6.5' long by 12' wide by 18" thick Type 'L' riprap pad at the outlet per Stormcloud Unit 4 requirements. In alternate design, allow for pipe penetration through shotcrete channel lining.
7. Install storm drain pipe penetration with 6.5' long by 14' wide by 18" thick Type 'L' riprap pad at the outlet per Stormcloud Unit 5 requirements.
8. Upon completion of improvements and acceptance by AMAFCA and the City of Albuquerque, prepare LOMR for submittal to FEMA.

APPENDIX A

Existing Conditions

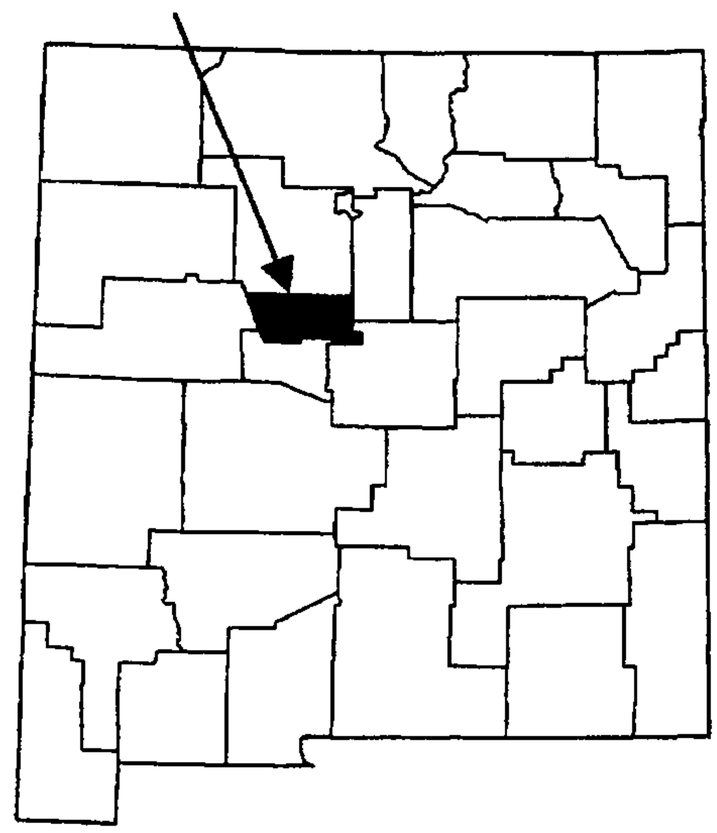
FLOOD INSURANCE STUDY

VOLUME 1 OF 2

BERNALILLO COUNTY, NEW MEXICO
AND INCORPORATED AREAS

Community Name	*Community Number*
BERNALILLO COUNTY (UNINCORPORATED AREAS)	350001
ALBUQUERQUE, CITY OF	350002
LOS RANCHOS DE ALBUQUERQUE, VILLAGE OF	350123
TIJERAS, VILLAGE OF	350135

Bernalillo County



Revised:
November 19, 2003

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
35001CV001A

Table 4 - Summary of Discharges for Shallow Flooding Areas *(Continued)*

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cfs) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
La Rinconada Arroyo[1]					
At outfall to gravel pit	1.98	*	*	814	*
Los Indos Arroyo "A"[1]					
Downstream of Raymac Dam	2.48	*	*	25	*
Upstream of Raymac Dam	2.48	*	*	1,194	*
At Gun Club Lateral	1.29	*	*	173	*
Middle Branch of the Piedras Marcadas Arroyo					
Piedras Marcadas Dam outflow	5.62	*	*	80	*
Piedras Marcadas Dam inflow	5.62	*	*	2,375	*
Approximately 1,300 feet upstream of Piedras Marcadas Dam	4.86	*	*	1,786	*
Mirehaven Arroyo "A"[1]					
At Ladera Detention Ponds	3.69	*	*	1,630	*
At confluence of South Branch	2.13	*	*	1,033	*
Mirehaven Arroyo "A" – South[1]					
At confluence with Main Arroyo	1.20	*	*	654	*
North Arroyo de Domingo Baca					
At Wyoming Boulevard	3.79	*	*	658	*
Approximately 950 feet upstream of Barstow Street	3.42	*	*	538	*
At Holbrook Street	2.79	*	*	220	*
At inflow to Upper Dam	2.68	*	*	2,794	*
At Tramway Boulevard	0.89	*	*	1,080	*

[1] Reference 5

* Data not available

WEST I-40 DMP

VOLUME II

FINAL HYDROLOGY

JUNE 29, 2000

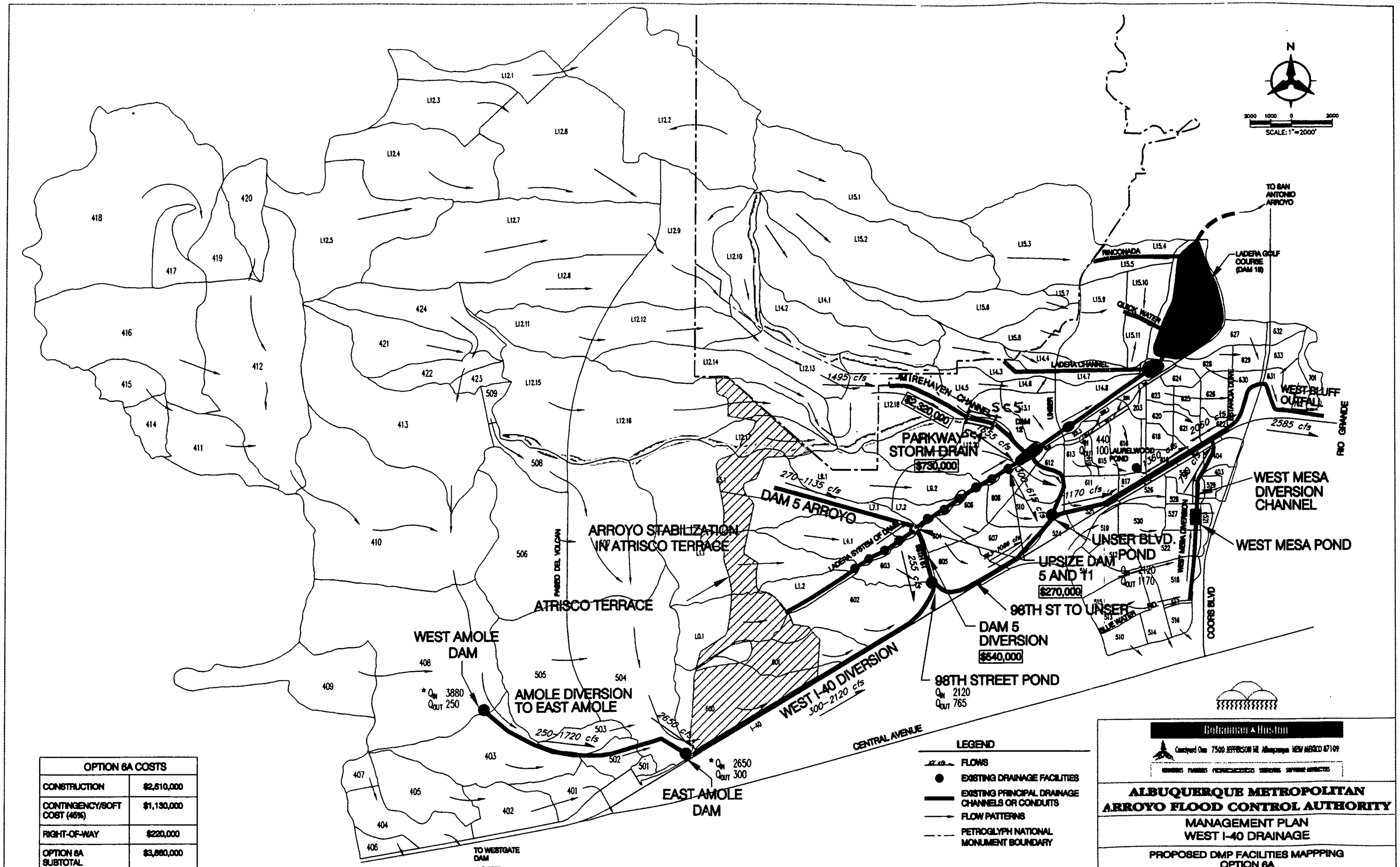
RECEIVED
DEC 26 2002
HYDROLOGY SECTION

PREPARED FOR:

RECEIVED
DEC 26 2002
HYDROLOGY SECTION

ALBUQUERQUE METROPOLITAN ARROYO
FLOOD CONTROL AUTHORITY
2600 PROSPECT NE
ALBUQUERQUE, NM 87107

H-11/D000



OPTION 6A COSTS	
CONSTRUCTION	$2,510,000
CONTINGENCY/SOFT COST (45%)	$1,130,000
RIGHT-OF-WAY	$220,000
OPTION 6A SUBTOTAL	$3,860,000
TRUNK (6A)	$24,010,000
OPTION 6A TOTAL	$27,870,000

*NOTE:
FLOW RATES REPRESENTS THE LARGER FLOW RATE BETWEEN OPTIONS 2D AND 3C.1 FOR ANY GIVEN FACILITY EXCEPT AS NOTED.

NOTE:

1. THIS MAPPING WAS PRODUCED FROM COMPUTERIZED DIGITAL INFORMATION CONTAINED WITHIN THE ALBUQUERQUE GEOGRAPHIC INFORMATION SYSTEM (AGIS). IT IS FOR INFORMATION PURPOSES ONLY. PUBLISHED IN THIS FORM SOLELY FOR THE CONVENIENCE OF THE USER. THEREFORE THIS MAPPING SHOULD NOT BE USED FOR EXACT MEASUREMENTS OR LEGAL DESCRIPTION OF PROPERTY.

Bohannan ▲ Huston

Courtyard One 7500 JEFFERSON NE Albuquerque NEW MEXICO 87109

ENGINEERS PLANNERS ENVIRONMENTALISTS SURVEYORS SOFTWARE ARCHITECTS

ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

MANAGEMENT PLAN
WEST I-40 DRAINAGE

PROPOSED DMP FACILITIES MAPPPING
OPTION 6A

DRAWING NO.	MAP NO.	SHEET N-4 OF 29

FIGURE 7

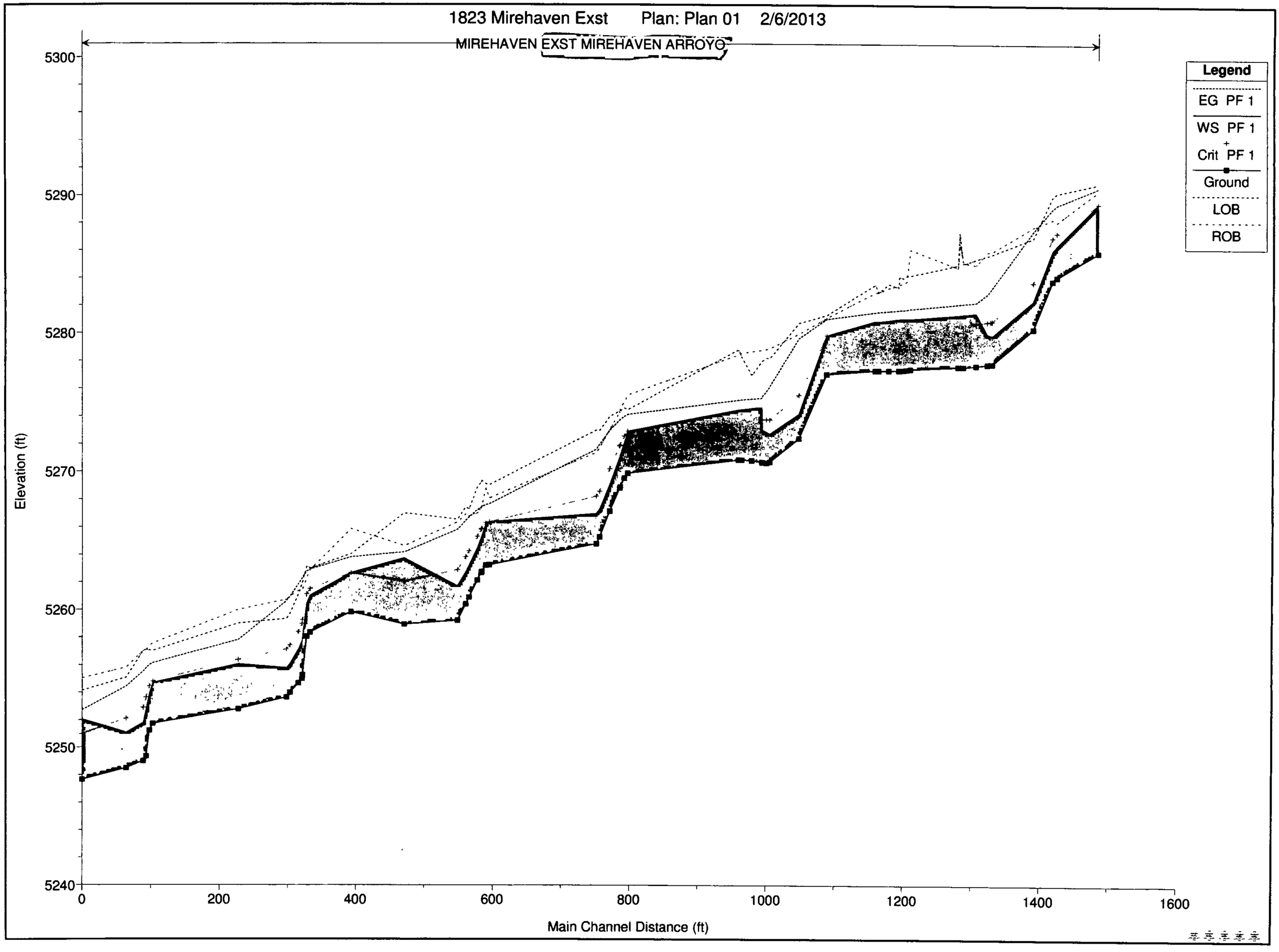
Copyright Bohannan Huston 2000
Date:

A_BH_801.95276.HYDRO.STUDY.DG-BB73.95276DMP04.DWG
Xrefs: 95276TBLOCK1.DWG

95276C 2135

```
                                FROM  TO                    PEAK        RUNOFF                TIME TO   CFS
                   HYDROGRAPH   ID    ID        AREA     DISCHARGE     VOLUME      RUNOFF      PEAK    PER
COMMAND          IDENTIFICATION NO.  NO.      (SQ MI)     (CFS)       (AC-FT)    (INCHES)   (HOURS)  ACRE      NOTATION

ROUTE MCUNGE        L12.18_1     2   50       6.50270      594.31      475.017     1.36967    1.850    .143 CCODE =      .1
*S  ADD  L12.14-17 & L12.10-13
*S  TOTAL FLOW MIREHAVEN A, B, C ARROYOS BELOW ESCARPMT, DNSTRM FROM TR DIKE
ADD HYD             L12.18_2  4&50    3       7.75490     1326.26      526.333     1.27258    1.800    .267
*S  ROUTE L12.3-17 THROUGH MIREHAVEN ARROYO TO INTERSECTN W/FUTURE 98TH ST
*S  LTOT=4625 FT.  1ST 1300' IN PETROG NM, NAT CHAN.  LAST PART IS CONC CHAN.
ROUTE MCUNGE        L12.18_3     3    4       7.75490     1316.89      526.005     1.27179    1.900    .265 CCODE =      .1
ROUTE MCUNGE        L12.18_3     4   50       7.75490     1308.99      525.713     1.27108    1.950    .264 CCODE =      .1
SEDIMENT BULK                                                                                              PK BF =    1.05
*S
*S  COMPUTE HYDROGRAPH FOR BASIN L12.18
COMPUTE NM HYD        L12.18     -    1        .51410      487.07       24.019      .87602    1.600   1.480 PER IMP=  16.00
*S
*S  ADD  L12.3-17 & L12.18 --  TOTAL FLOW IN MIREHAVEN AT FUTURE 98TH STREET
ADD HYD             L12.18_4  1&50    2       8.26900     1494.36      549.732     1.24652    1.900    .282
*S
SEDIMENT BULK                                                                                              PK BF =    1.03
*S
*S  COMPUTE HYDROGRAPH FOR BASIN L12.19
COMPUTE NM HYD        L12.19     -    1        .18440      334.88       13.034     1.32527    1.500   2.838 PER IMP=  34.00
*S  ROUTE L12.19 TO MIREHAVEN ARROYO
ROUTE MCUNGE        L12.19_2     1   50        .18440      331.74       13.014     1.32332    1.550   2.811 CCODE =      .2
*S  ADD  L12.3-18 & L12.19 --  TOTAL FLOW IN MIREHAVEN AT FUTURE 98TH STREET
ADD HYD             L12.18_5  2&50    2       8.45340     1576.21      562.747     1.24820    1.900    .291
*S
*S  ROUTE COMBINED (L12.13-L12.19) IN MIREHAVEN THRU L12.20 TO DAM#12
ROUTE MCUNGE        L12.20_1     2   51       8.45340     1575.38      562.467     1.24758    1.950    .291 CCODE =      .2
SEDIMENT BULK                                                                                              PK BF =    1.02
*S
*S  COMPUTE HYDROGRAPH FOR BASIN L12.20
COMPUTE NM HYD        L12.20     -    1        .34220      583.27       26.947     1.47648    1.550   2.663 PER IMP=  46.00
*S  DIVIDE L12.20 HYD
DIVIDE HYD          L12.20_3     1    4        .17110      291.63       13.473     1.47648    1.550   2.663
                    L12.20_4   AND    2        .17110      291.63       13.473     1.47648    1.550   2.663
*S  ADD TO FLOW FROM DAM #10
ADD HYD             TO_DAM11  4& 9   10       2.80376      291.69      120.745      .80747    1.550    .163
*S
*S  ROUTE FLOW THROUGH DAM #11
*S  ENLARGE POND STORAGE 1.6 TIMES FOR I-40 DMP OPTIONS   (NM 6/03/96)
ROUTE RESERVOIR       POND11    10    9       2.80376       45.38       77.448      .51793   29.950    .025 AC-FT=   43.283
*S  ROUTE OVERLAND FLOW FROM DAM #11 THROUGH  BASIN L12.20
ROUTE MCUNGE        L12.20_6     9   10       2.80376       45.35       76.975      .51476   29.950    .025 CCODE =      .2
*S
*S  ADD SECOND HALF OF FLOW FROM L12.20 TO MIREHAVEN CHAN
*S  TOTAL FLOW IN MIREHAVEN CHANNEL NORTH OF DAM 12
ADD HYD             L12.20_7  2&51    3       8.62450     1651.20      575.941     1.25212    1.950    .299
*S PLOT2  HYD=L12.20_7   TOTAL FLOW IN MIREHAVEN CHANNEL NORTH OF DAM 12
*S
*S  COMBINED MIREHAVEN AND DAM #11 OUTFLOW -- TOTAL FLOW INTO DAM #12
ADD HYD             TO_DAM12  3&10    9      11.42826     1660.41      652.915     1.07122    1.950    .227
*S PLOT3
*S
*S   ROUTE FLOW THROUGH POND #12
*S*** LADERA POND 12 - EXISTING CHARACTERISTICS
*S***
*S MODIFIED TO REMOVE PROPOSED DIVERSION TO I-40
*S DIVERSION TO I-40 THUR 1 - 66" GROOVE EDGE PIPE
```


1823 Mirehaven Exst Plan: Plan 01 2/6/2013
MIREHAVEN EXST MIREHAVEN ARROYO
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
LOB
ROB
Elevation (ft)
5300
5290
5280
5270
5260
5250
5240
0
200
400
600
800
1000
1200
1400
1600
Main Channel Distance (ft)

HEC-RAS Plan - XS, CONDITIONS

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth	Invert Slope	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Shear Chan	Specif Force
			(cfs)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(lb/sq ft)	(cu ft)
MIREHAVEN ARROYO	3309.34	PF 1	1495.00	5285.91	5289.45	2.26	0.0296	5289.45	5290.60	0.010245	8.61	173.72	76.78	1.01	1.44	645.94
MIREHAVEN ARROYO	3249.58	PF 1	1495.00	5284.14	5286.43	1.78	0.0443	5287.33	5289.38	0.036217	13.78	108.45	60.82	1.82	4.00	745.40
MIREHAVEN ARROYO	3243.04	PF 1	1495.00	5283.85	5286.06	1.78	0.1256	5287.00	5289.13	0.037752	14.06	106.32	59.67	1.86	4.16	755.19
MIREHAVEN ARROYO	3215.41	PF 1	1495.00	5280.38	5282.39	1.48	0.0428	5283.73	5287.46	0.079808	18.07	82.71	55.87	2.62	7.31	905.04
MIREHAVEN ARROYO	3155.58	PF 1	1495.00	5277.82	5279.88	1.66	0.0000	5280.93	5283.37	0 047394	14.98	99.78	60.15	2.05	4.85	783.46
MIREHAVEN ARROYO	3153.24	PF 1	1495.00	5277.82	5279.93	1.70	0.0060	5280.91	5283.20	0.043123	14.52	102.93	60.56	1.96	4.52	767.10
MIREHAVEN ARROYO	3148.24	PF 1	1495.00	5277.79	5280.01	1.79	0.0049	5280.88	5282.89	0.035374	13.62	109.75	61.25	1.79	3.91	736.66
MIREHAVEN ARROYO	3131.88	PF 1	1495.00	5277.71	5281.50	3.09	0.0048	5280.80	5282.27	0.004658	7.07	211.60	68.54	0.71	0.88	681.42
MIREHAVEN ARROYO	3113.14	PF 1	1495.00	5277.62	5281.40	3.04	0.0021		5282.19	0.004811	7.11	210.39	69.26	0.72	0.89	675.33
MIREHAVEN ARROYO	3108.14	PF 1	1495.00	5277.61	5281.38	3.03	0.0000		5282.16	0.004808	7.09	210.77	69.53	0.72	0.89	674.37
MIREHAVEN ARROYO	3105.83	PF 1	1495.00	5277.61	5281.37	3.03	0.0026		5282.15	0.004788	7.08	211.20	69.67	0.72	0.89	674.26
MIREHAVEN ARROYO	3036.3	PF 1	1495.00	5277.43	5281.09	2.92	0.0076		5281.80	0.004646	6.78	220.45	75.43	0.70	0.83	658.91
MIREHAVEN ARROYO	3031	PF 1	1495.00	5277.39	5281.09	2.97	0.0061		5281.77	0.004331	6.63	225.61	75.97	0.68	0.78	665.80
MIREHAVEN ARROYO	3026	PF 1	1495.00	5277.36	5281.09	3.05	0.0016		5281.73	0.003916	6.42	232.98	76.46	0.65	0.73	678.69
MIREHAVEN ARROYO	3020	PF 1	1495.00	5277.35	5281.07	3.03	0.0000		5281.71	0.003959	6.43	232.50	76.80	0.65	0.73	676.69
MIREHAVEN ARROYO	3019.33	PF 1	1495.00	5277 35	5281.07	3.03	0.0007		5281.71	0.003963	6.43	232.41	76.78	0.65	0.73	676.51
MIREHAVEN ARROYO	3004.67	PF 1	1495.00	5277.34	5280.97	2.96	0.0007		5281.65	0.004290	6.60	226.47	76.50	0.68	0.78	666 72
MIREHAVEN ARROYO	2990	PF 1	1495.00	5277.33	5280.89	2.94	0.0000		5281.59	0.004448	6.69	223.58	76.14	0.69	0.80	662.87
MIREHAVEN ARROYO	2985	PF 1	1495.00	5277.33	5280.90	3.04	0.0038		5281.55	0.003954	6.45	231.68	76.20	0.65	0.74	677.25
MIREHAVEN ARROYO	2914.17	PF 1	1495.00	5277.06	5279.88	2.35	0.1148	5279.88	5281.07	0.010156	8.74	171.05	72.88	1.01	1.47	621.55
MIREHAVEN ARROYO	2873.56	PF 1	1495.00	5272.40	5274.19	1.30	0.0402	5275.55	5279.68	0.102194	18.80	79.51	60.95	2.90	8.26	934.34
MIREHAVEN ARROYO	2831	PF 1	1495.00	5270.69	5272.76	1.63	0.0140	5273.77	5276.19	0.047881	14.87	100.53	61.75	2.05	4.80	778.31
MIREHAVEN ARROYO	2826	PF 1	1495.00	5270.62	5272.91	1.74	-0.0083	5273.79	5275.84	0.037422	13.72	108.94	62.62	1.83	4.00	737 52
MIREHAVEN ARROYO	2820	PF 1	1495 00	5270.67	5273.05	1.87	-0.0153	5273.78	5275.51	0.028539	12.58	118.79	63.43	1.62	3.29	701.97
MIREHAVEN ARROYO	2819.33	PF 1	1495.00	5270.68	5274.66	3.25	-0.0082	5273.78	5275.34	0.003837	6.62	225.70	69.35	0.65	0 76	701 18
MIREHAVEN ARROYO	2804.67	PF 1	1495.00	5270.80	5274.60	3.22	-0.0027		5275.28	0.003911	6.65	224.84	69.79	0.65	0.77	696.83
MIREHAVEN ARROYO	2790	PF 1	1495.00	5270.84	5274.51	3.13	0.0000		5275.23	0.004227	6.79	220.27	70 40	0.68	0.81	684 82
MIREHAVEN ARROYO	2785	PF 1	1495 00	5270.84	5274 49	3.12	0.0060		5275.20	0.004229	6.78	220.51	70.67	0.68	0 81	683.55
MIREHAVEN ARROYO	2623	PF 1	1495.00	5269.87	5272.93	2.41	0.0721	5272.93	5274.14	0.010033	8.84	169.15	70.27	1.00	1.49	632.35
MIREHAVEN ARROYO	2618	PF 1	1495.00	5269.51	5272.10	2.04	0.1083	5272.59	5274.00	0.019517	11.06	135.18	66 14	1.36	2.46	662.83
MIREHAVEN ARROYO	2612	PF 1	1495.00	5268.86	5271 13	1.84	0.0896	5271.94	5273.77	0.031199	13.04	114.67	62.27	1.69	3.54	717.48
MIREHAVEN ARROYO	2611.33	PF 1	1495.00	5268.80	5271 03	1.82	0.1131	5271.87	5273.75	0.032579	13.23	112 96	61.97	1.73	3.66	723.64
MIREHAVEN ARROYO	2596.66	PF 1	1495.00	5267 14	5269.07	1.60	0.1269	5270.21	5273.02	0.055889	15.94	93.78	58.52	2.22	5 54	819.95
MIREHAVEN ARROYO	2582	PF 1	1495.00	5265.28	5267 32	1.48	0.1000	5268.58	5272.00	0.073867	17.37	86.05	58.26	2.52	6 76	875.57
MIREHAVEN ARROYO	2577	PF 1	1495.00	5264.78	5266.97	1.47	0.0100	5268.23	5271.62	0.073667	17.30	86.41	58.67	2.51	6.71	872.56
MIREHAVEN ARROYO	2420.33	PF 1	1495.00	5263.22	5266.37	2.57	0.0040	5266.37	5267.67	0.009949	9.14	163.50	63.74	1.01	1.56	649.62
MIREHAVEN ARROYO	2415.33	PF 1	1495.00	5263.20	5266.17	2.46	0.0767	5266.31	5267.61	0.011622	9.62	155.35	63.13	1 08	1.76	651.77
MIREHAVEN ARROYO	2409.33	PF 1	1495.00	5262.74	5265.32	2.11	0.1049	5265.89	5267.46	0.021184	11.74	127 39	60.45	1 42	2.75	688.21
MIREHAVEN ARROYO	2408.66	PF 1	1495.00	5262.67	5265.22	2.08	0.0991	5265.84	5267.43	0.022340	11.94	125.16	60.22	1.46	2.86	693 49
MIREHAVEN ARROYO	2403.11	PF 1	1495.00	5262.12	5264.50	1.92	0.1015	5265.32	5267.23	0.030547	13.27	112.66	58.61	1.69	3.62	731.35
MIREHAVEN ARROYO	2390.89	PF 1	1495.00	5260 88	5263.21	1.75	0.1000	5264.26	5266 71	0.044146	15.01	99.63	56.95	2.00	4.77	791.26
MIREHAVEN ARROYO	2385.89	PF 1	1495.00	5260.38	5262.72	1.71	0.1012	5263.83	5266.45	0.048368	15.50	96.47	56.26	2.09	5.12	810.08
MIREHAVEN ARROYO	2374.33	PF 1	1495.00	5259.21	5261.72	1.67	0.0036	5262.90	5265.82	0.055112	16.26	91.95	55.07	2.22	5.69	842.10
MIREHAVEN ARROYO	2296.49	PF 1	1495.00	5258.93	5263.75	3.83	-0.0114	5262.06	5264.19	0.002005	5.35	279.47	73.03	0.48	0.47	849.10
MIREHAVEN ARROYO	2218.64	PF 1	1495.00	5259.82	5262.69	2.25	0.0246	5262.69	5263.82	0 010203	8.56	174.67	77.51	1.00	1.43	615.73
MIREHAVEN ARROYO	2158.45	PF 1	1495.00	5258.34	5261.04	2.10	0.0580	5261.52	5262.93	0.018781	11.05	135.30	64.47	1 34	2.44	668.31
MIREHAVEN ARROYO	2153.45	PF 1	1495.00	5258.05	5260.47	1.90	0.4666	5261.15	5262.79	0.026254	12.22	122.37	64.39	1.56	3.08	692.80
MIREHAVEN ARROYO	2147.45	PF 1	1495.00	5255.25	5258.07	1.49	0.4030	5259.26	5262.35	0.068033	16.60	90.08	60.42	2.40	6.18	858.71
MIREHAVEN ARROYO	2146.78	PF 1	1495.00	5254.98	5257.77	1 47	0.0595	5258.99	5262.28	0.073301	17.06	87 64	59.58	2 48	6.57	879.13
MIREHAVEN ARROYO	2141.23	PF 1	1495 00	5254.65	5257.10	1.50	0.0558	5258.40	5261.85	0.074308	17.50	85.44	56.80	2.51	6.84	890.15
MIREHAVEN ARROYO	2129.04	PF 1	1495.00	5253.97	5256.07	1.63	0.0660	5257.43	5260.97	0.068414	17.77	84.12	51.74	2.46	6.86	898.91
MIREHAVEN ARROYO	2124.04	PF 1	1495.00	5253.64	5255.76	1.67	0.0122	5257.12	5260.62	0.065309	17.69	84.50	50.52	2.41	6.74	897.11
MIREHAVEN ARROYO	2053.45	PF 1	1495.00	5252.78	5256.04	2.46	0.0085	5256.37	5257.82	0.014410	10.71	139.65	56.67	1.20	2.17	686.00
MIREHAVEN ARROYO	1928.78	PF 1	1495.00	5251.72	5254.66	2.49	0 1021	5254.79	5256.11	0.011603	9.67	154.59	62.05	1.08	1.77	653.05
MIREHAVEN ARROYO	1923.78	PF 1	1495.00	5251.21	5253.91	2.15	0.3780	5254.44	5255.98	0.020105	11.55	129.48	60.24	1.39	2.65	682.59
MIREHAVEN ARROYO	1918.78	PF 1	1495.00	5249.32	5252.73	1.88	0.0824	5253.62	5255.75	0.035238	13.95	107.14	56.91	1.79	4.04	760.52
MIREHAVEN ARROYO	1914.78	PF 1	1495.00	5248.99	5251.77	1.78	0.0210	5252.88	5255.51	0.046575	15.53	96.26	53.98	2 05	5.09	817.54

APPENDIX B

Proposed Conditions

DRAINAGE REPORT

FOR

STORM CLOUD SUBDIVISION, UNITS 4 & 5

A 241-DWELLING UNIT SINGLE-DETACHED RESIDENTIAL SUBDIVISION

ALBUQUERQUE, NEW MEXICO
FEBRUARY 10, 2012

Prepared by:

ISAACSON & ARFMAN, P.A.
128 Monroe Street NE
Albuquerque, NM 87108
(505) 268-8828

Åsa Nilsson-Weber 2-10-12

Åsa Nilsson-Weber, PE **Date**

Unit 4:

A 36" storm drain with two on-grade inlets in Chinook Road and two sump inlets in Summer Breeze Drive will convey 28.8 cfs to an existing 36" storm drain at the south end of the site. In case the sump inlets would clog, emergency overflow would be directed south in Summer Breeze Drive. The starting HGL for the storm drain was assumed at 62.7 per HGL shown on the as-built drawing.

A 36"/24" storm drain system discharges 41.3 cfs to the Mirehaven Arroyo. The storm drain extends from the Mirehaven Arroyo, a drainage easement, through Gunnison Place and Jet Stream Road, and terminates at two sump inlets in Summer Breeze Dr. In case of clogging, the emergency overflow would be directed south to the sump inlets connecting to the two sump inlets connected to the storm drain system in Summer Breeze Drive, which have been conservatively sized with double grates. Three on-grade inlets are located at the intersection of Jet Stream Rd and Gunnison Place, and two sump inlets are located in Monsoon Drive, next to the drainage easement which would provide emergency overflow.

Unit 5:

A 42" storm drain located in a drainage easement with two on-grade inlets in Torrent Lane, two on-grade inlets and three sump inlets in Camino del Venado will discharge 67.1 cfs to the Mirehaven Arroyo. An emergency flow path is provided through the drainage easement.

SIDEWALK CULVERTS

The parks in Unit 4 and Unit 5 will drain to sidewalk culverts. In Unit 4, a 3-foot culvert is required at the northeast corner of the park at Animas Place, and in Unit 5, a 2-foot culvert is required at the southeast corner of the park at Camino del Venado. See Appendix F for calculations.

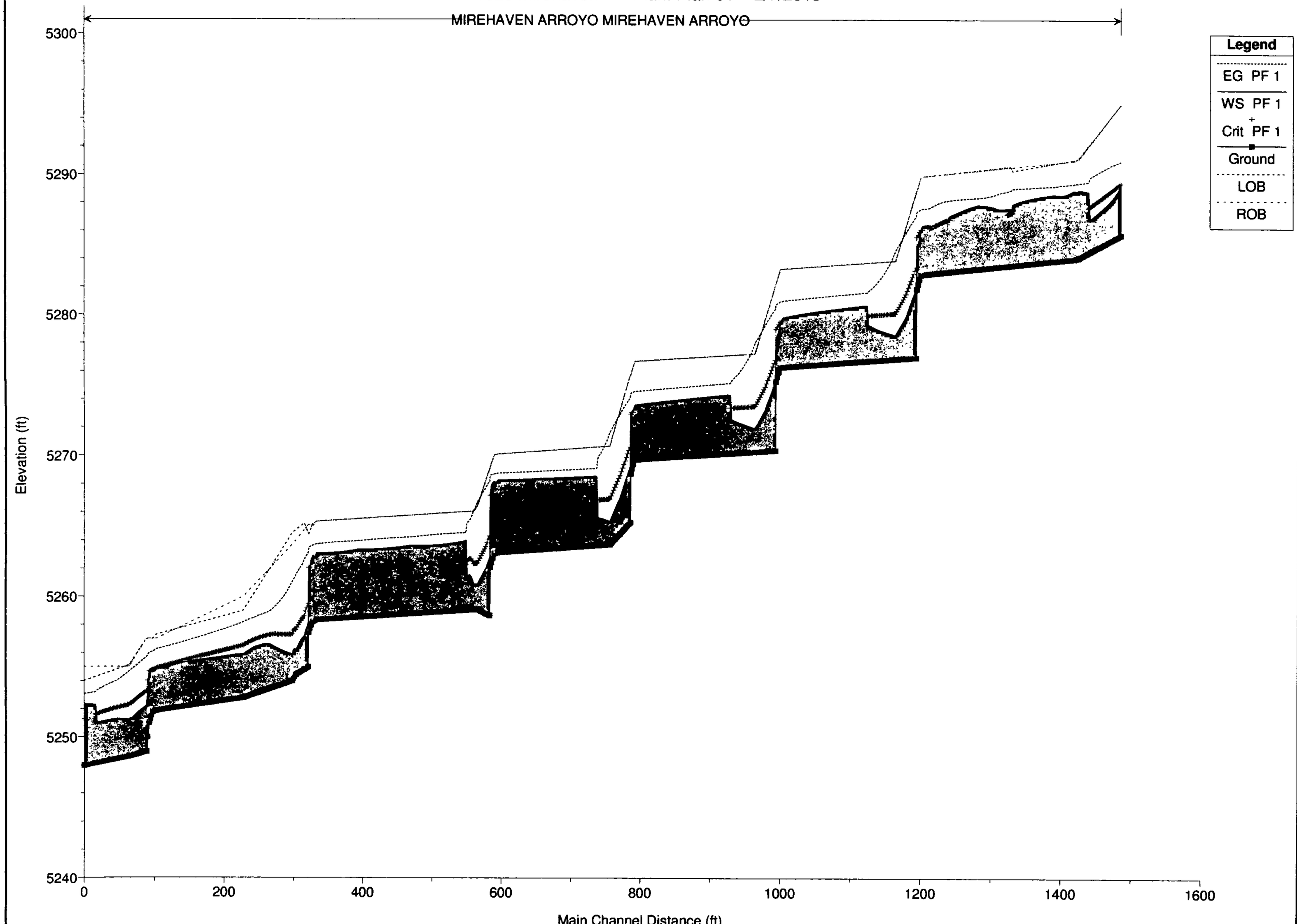
MIREHAVEN ARROYO

The channel improvements have been designed by Wilson & Co. and shall be constructed with either Unit 4 or Unit 5, whichever is developed first.

TIERRA PINTADA

Plans for Tierra Pintada, including box culvert at the Mirehaven Arroyo crossing are currently being designed by Bohannan Huston, Inc.

1823 Mirehaven Plan: Plan 01 2/7/2013



HEC-RAS Plan: Plan 01 River: MIREHAVEN ARROYO Reach: MIREHAVEN ARROYO Profile PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth	Invert Slope	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Shear Chan	Specif Force
			(cfs)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(lb/sq ft)	(cu ft)
MIREHAVEN ARROYO	3309.34	PF 1	1495.00	5285.70	5289 38	3.10	0.0253	5289.38	5290.94	0.009543	10.05	148.81	48.03	1 01	1.78	722.61
MIREHAVEN ARROYO	3307.34*	PF 1	1495.00	5285.65	5289 03	2.88	0.0302	5289.30	5290.90	0.012482	10.97	136.27	47.24	1.14	2.18	726 20
MIREHAVEN ARROYO	3305.35*	PF 1	1495.00	5285.59	5288.83	2.78	0.0250	5289.22	5290.86	0.014205	11.43	130.80	47.05	1 21	2.39	730.51
MIREHAVEN ARROYO	3303.36*	PF 1	1495.00	5285.54	5288.68	2.71	0.0302	5289.15	5290.82	0.015490	11.73	127.40	47.05	1.26	2.54	733 81
MIREHAVEN ARROYO	3301.37*	PF 1	1495.00	5285.48	5288.52	2.63	0 0250	5289.07	5290.78	0.017009	12.08	123.81	47.03	1 31	2 71	738 71
MIREHAVEN ARROYO	3299.38*	PF 1	1495.00	5285.43	5288.40	2.58	0 0302	5288.99	5290.74	0.018043	12.28	121.74	47.18	1 35	2 82	741.45
MIREHAVEN ARROYO	3297.38*	PF 1	1495.00	5285.37	5288.26	2.53	0.0253	5288 91	5290.70	0.019294	12.53	119.36	47.25	1.39	2.96	745.53
MIREHAVEN ARROYO	3295.39*	PF 1	1495.00	5285.32	5288 15	2.48	0.0250	5288 84	5290.65	0.020254	12 69	117.77	47.42	1.42	3.06	748 07
MIREHAVEN ARROYO	3293.40*	PF 1	1495.00	5285.27	5288.05	2.45	0.0302	5288 76	5290 60	0.021009	12.81	116.67	47.64	1 44	3 13	749 72
MIREHAVEN ARROYO	3291.41*	PF 1	1495.00	5285.21	5287.95	2.42	0 0250	5288.68	5290.55	0 021752	12.93	115.64	47.85	1.47	3.20	751.33
MIREHAVEN ARROYO	3289.42*	PF 1	1495.00	5285.16	5287.85	2.39	0 0302	5288.61	5290.49	0.022465	13.03	114 72	48 08	1.49	3.26	752 81
MIREHAVEN ARROYO	3287.42*	PF 1	1495.00	5285.10	5287.76	2 36	0 0253	5288.54	5290.44	0.023221	13.14	113.78	48.31	1.51	3 33	754.49
MIREHAVEN ARROYO	3285.43*	PF 1	1495.00	5285.05	5287.67	2 33	0.0299	5288.46	5290 39	0.023926	13 23	112.99	48.58	1 53	3.39	755 75
MIREHAVEN ARROYO	3283.44*	PF 1	1495.00	5284.99	5287.57	2.30	0.0253	5288.38	5290 33	0.024681	13.33	112.13	48.80	1.55	3.46	757.46
MIREHAVEN ARROYO	3281.45*	PF 1	1495.00	5284.94	5287.48	2 27	0.0302	5288.31	5290 27	0.025308	13.41	111.52	49.08	1.57	3.51	758.37
MIREHAVEN ARROYO	3279.46*	PF 1	1495.00	5284.88	5287 39	2.25	0.0250	5288.23	5290.22	0.026026	13.49	110 80	49 34	1.59	3.57	759.79
MIREHAVEN ARROYO	3277.46*	PF 1	1495 00	5284.83	5287.31	2.22	0.0253	5288.16	5290.16	0.026629	13.56	110 27	49 61	1.60	3 61	760.65
MIREHAVEN ARROYO	3275.47*	PF 1	1495.00	5284.78	5287.22	2.20	0.0299	5288.09	5290.11	0.027249	13.62	109.73	49 88	1.62	3 66	761.53
MIREHAVEN ARROYO	3273.48*	PF 1	1495.00	5284.72	5287.14	2.18	0.0253	5288.02	5290.05	0.027892	13.69	109.21	50 18	1.64	3.71	762 49
MIREHAVEN ARROYO	3271.49*	PF 1	1495.00	5284.67	5287 06	2.16	0.0302	5287.94	5289.99	0.028440	13.74	108.81	50.47	1.65	3.75	763 01
MIREHAVEN ARROYO	3269.5*	PF 1	1495.00	5284.61	5286.97	2 13	0.0250	5287.86	5289 93	0.029041	13.80	108.35	50.75	1.66	3.79	763 82
MIREHAVEN ARROYO	3267.50*	PF 1	1495.00	5284.56	5286.89	2.12	0 0302	5287.79	5289 87	0.029568	13.84	108.02	51 07	1.68	3.82	764.16
MIREHAVEN ARROYO	3265.51*	PF 1	1495.00	5284.50	5286 81	2 10	0.0250	5287 72	5289.81	0.030121	13.89	107.65	51 34	1 69	3.86	764.76
MIREHAVEN ARROYO	3263.52*	PF 1	1495.00	5284.45	5288 78	3 69	0.0253	5287.65	5289.49	0.003409	6.76	221.31	59.98	0 62	0.76	764.95
MIREHAVEN ARROYO	3261.53*	PF 1	1495.00	5284.40	5288 80	3.75	0.0302		5289 47	0.003157	6.57	227.54	60.68	0.60	0.71	776.75
MIREHAVEN ARROYO	3259.54*	PF 1	1495 00	5284.34	5288 82	3.81	0 0250		5289.45	0.002925	6.39	233.93	61.38	0.58	0 67	789.85
MIREHAVEN ARROYO	3257.54*	PF 1	1495 00	5284.29	5288 84	3.87	0.0302		5289.44	0.002722	6.23	240 11	62.07	0.56	0.64	803.01
MIREHAVEN ARROYO	3255.55*	PF 1	1495 00	5284 23	5288 85	3.93	0.0250		5289.42	0.002532	6.07	246.47	62.75	0.54	0.60	817.51
MIREHAVEN ARROYO	3253.56*	PF 1	1495.00	5284.18	5288.87	3.98	0.0302		5289.41	0.002367	5.92	252 58	63.43	0.52	0.57	831 79
MIREHAVEN ARROYO	3251.57*	PF 1	1495.00	5284.12	5288.88	4.04	0.0253		5289 40	0.002209	5.77	258.98	64.10	0.51	0 54	847 61
MIREHAVEN ARROYO	3249.58	PF 1	1495 00	5284.07	5288.89	4.09	0.0123		5289.39	0.002073	5.64	265.09	64.78	0.49	0 51	862.94
MIREHAVEN ARROYO	3247.94*	PF 1	1495.00	5284.05	5288.83	3.89	0.0183		5289.38	0.002453	5.94	251.58	64.75	0.53	0.58	817.38
MIREHAVEN ARROYO	3246.31*	PF 1	1495.00	5284.02	5288.81	3.83	0.0123		5289.37	0.002544	6.01	248.89	64 93	0 54	0.59	812 98
MIREHAVEN ARROYO	3244.67*	PF 1	1495 00	5284 00	5288.83	3.92	0.0122		5289.36	0.002343	5.85	255.60	65.22	0.52	0.56	835.49
MIREHAVEN ARROYO	3243.04	PF 1	1495.00	5283 98	5288.86	4.13	0 0050		5289.34	0.001954	5.51	271.21	65 64	0.48	0.49	878.01
MIREHAVEN ARROYO	3241.06*	PF 1	1495 00	5283 97	5288.81	3 99	0.0052		5289 33	0.002217	5.75	260.05	65 19	0 51	0 54	851 70
MIREHAVEN ARROYO	3239.09*	PF 1	1495.00	5283.96	5288 76	3 86	0.0050		5289.32	0.002502	5.98	249 82	64.69	0.54	0 59	827 49
MIREHAVEN ARROYO	3237.11*	PF 1	1495.00	5283.95	5288.71	3.75	0.0052		5289.31	0 002802	6.21	240 59	64 20	0.57	0.64	805.42
MIREHAVEN ARROYO	3235.14*	PF 1	1495.00	5283.94	5288.66	3.65	0.0050		5289.30	0 003097	6.42	232.70	63.71	0.59	0.69	786.48
MIREHAVEN ARROYO	3233.17*	PF 1	1495.00	5283.93	5288.61	3.57	0.0052		5289.29	0.003380	6.62	225.96	63.22	0.62	0 73	770 36
MIREHAVEN ARROYO	3231.19*	PF 1	1495.00	5283.92	5288.57	3.52	0.0050		5289.28	0.003599	6.76	221.16	62.80	0.63	0.77	758.50
MIREHAVEN ARROYO	3229.22*	PF 1	1495.00	5283 91	5288.55	3.50	0.0052		5289.28	0.003738	6 85	218 18	62.42	0.65	0.79	750.71
MIREHAVEN ARROYO	3227.25*	PF 1	1495.00	5283.90	5288.53	3.49	0.0050		5289.27	0.003788	6 89	216.91	62.08	0.65	0.80	746.72
MIREHAVEN ARROYO	3225.27*	PF 1	1495 00	5283 89	5288.53	3.52	0.0052		5289 26	0.003746	6.88	217.33	61.80	0.65	0 80	746.76
MIREHAVEN ARROYO	3223.30*	PF 1	1495 00	5283 88	5288.52	3 56	0.0050		5289 25	0 003626	6.82	219.16	61.52	0 64	0.78	750 96
MIREHAVEN ARROYO	3221.33*	PF 1	1495 00	5283.87	5288.53	3.63	0.0052		5289 23	0.003435	6.72	222.50	61.27	0.62	0.76	760 05
MIREHAVEN ARROYO	3219.35*	PF 1	1495 00	5283 86	5288.54	3 72	0.0050		5289.21	0 003197	6.58	227.12	61.04	0.60	0 72	774 04
MIREHAVEN ARROYO	3217.38*	PF 1	1495 00	5283 85	5288 56	3.83	0.0052		5289.20	0.002927	6.42	233.04	60.83	0.58	0.68	793.77
MIREHAVEN ARROYO	3215.41	PF 1	1495 00	5283.84	5288.58	3 97	0.0049		5289.18	0.002627	6.21	240.59	60 65	0 55	0.63	821 05
MIREHAVEN ARROYO	3213.41*	PF 1	1495 00	5283.83	5288.56	3.96	0.0052		5289 17	0.002672	6.26	238.84	60 32	0 55	0.64	818.62
MIREHAVEN ARROYO	3211.42*	PF 1	1495 00	5283.82	5288.55	3.95	0.0049		5289 17	0 002717	6.30	237.15	60.00	0 56	0.65	816.21
MIREHAVEN ARROYO	3209.42*	PF 1	1495.00	5283.81	5288.54	3.95	0.0052		5289 16	0 002766	6 35	235.36	59.65	0.56	0.66	813.80
MIREHAVEN ARROYO	3207.43*	PF 1	1495.00	5283.80	5288 52	3.94	0.0049		5289 16	0.002816	6.40	233.58	59.32	0.57	0 67	811.34
MIREHAVEN ARROYO	3205.43*	PF 1	1495.00	5283.79	5288 51	3.93	0.0052		5289.15	0.002864	6.45	231.88	58.99	0.57	0 68	809.11
MIREHAVEN ARROYO	3203.44*	PF 1	1495 00	5283.78	5288 49	3.92	0.0049		5289.15	0.002919	6.50	230.06	58.66	0.58	0.69	806.61
MIREHAVEN ARROYO	3201.45*	PF 1	1495.00	5283.77	5288.48	3 91	0.0101		5289.14	0.002975	6.55	228.21	58.31	0.58	0 70	804.19
MIREHAVEN ARROYO	3199.45*	PF 1	1495.00	5283.75	5288 46	3.91	0.0049		5289.13	0 003025	6.60	226.56	57 97	0 59	0.71	802.26

HEC-RAS Plan Plan 01 River MIREHAVEN ARROYO Reach MIREHAVEN ARROYO Profile PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth	Invert Slope	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Shear Chan	Specif Force
			(cfs)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(lb/sq ft)	(cu ft)
MIREHAVEN ARROYO	3091.92*	PF 1	1495.00	5283.19	5287 60	3.60	0 0049		5288.30	0.003555	6.68	223.82	62.24	0.62	0.75	736.48
MIREHAVEN ARROYO	3089.93*	PF 1	1495 00	5283.18	5287.56	3.52	0.0052		5288.29	0.003795	6.82	219.18	62.18	0.64	0.79	727.29
MIREHAVEN ARROYO	3087.95*	PF 1	1495.00	5283.17	5287.52	3.45	0.0049		5288.28	0 004061	6.97	214.45	62.12	0.66	0.83	718.83
MIREHAVEN ARROYO	3085.96*	PF 1	1495.00	5283.16	5287.48	3.38	0.0052		5288.27	0.004336	7.12	209.97	62.06	0 68	0 87	711.72
MIREHAVEN ARROYO	3083.97*	PF 1	1495.00	5283.15	5287 44	3 32	0 0049		5288.26	0.004625	7.27	205.66	62.00	0.70	0 92	705.77
MIREHAVEN ARROYO	3081.99*	PF 1	1495 00	5283.14	5287.40	3.26	0.0052		5288 26	0.004916	7.41	201.64	61.94	0.72	0.96	701.11
MIREHAVEN ARROYO	3080.00*	PF 1	1495.00	5283.13	5287.36	3.19	0.0049		5288 25	0 005237	7.57	197.56	61.87	0.75	1 00	697 06
MIREHAVEN ARROYO	3078.01*	PF 1	1495.00	5283 12	5287.32	3.14	0 0052		5288.24	0.005546	7.71	193 91	61.80	0.77	1.05	694.39
MIREHAVEN ARROYO	3076.03*	PF 1	1495.00	5283.11	5287.27	3 08	0 0049		5288.23	0 005915	7 87	189.88	61.71	0.79	1.10	692.03
MIREHAVEN ARROYO	3074.04*	PF 1	1495.00	5283.10	5287.22	3.02	0.0101		5288.22	0.006302	8.04	186.01	61.63	0.82	1 15	690.51
MIREHAVEN ARROYO	3072.05*	PF 1	1495.00	5283.08	5287.18	2 98	0.0052		5288.21	0.006569	8.15	183.46	61 56	0 83	1.19	691.10
MIREHAVEN ARROYO	3070.07*	PF 1	1495.00	5283.07	5287.13	2.93	0.0049		5288.20	0.006945	8.30	180.14	61.48	0.85	1.24	691.32
MIREHAVEN ARROYO	3068.08*	PF 1	1495.00	5283.06	5287.10	2.90	0.0052		5288.19	0.007177	8.39	178 16	61.43	0.87	1.27	692.81
MIREHAVEN ARROYO	3066.09*	PF 1	1495.00	5283.05	5287.06	2.86	0.0049	5286.82	5288.18	0.007489	8 51	175.66	61.36	0 89	1 31	694 28
MIREHAVEN ARROYO	3064.11*	PF 1*	1495.00	5283.04	5286.80	2.68	0 0052	5286.80	5288.15	0.009743	9.31	160.65	60.03	1.00	1 60	692.83
MIREHAVEN ARROYO	3062.12*	PF 1	1495.00	5283.03	5286 76	2 71	0.0049	5286.77	5288.14	0.009817	9.41	158.91	58.71	1.01	1.63	695.32
MIREHAVEN ARROYO	3060.13*	PF 1	1495.00	5283.02	5286.70	2.72	0.0052	5286.73	5288.12	0.010100	9.57	156.24	57.46	1.02	1.68	697.38
MIREHAVEN ARROYO	3058.15*	PF 1	1495 00	5283 01	5286.69	2.77	0 0049	5286.69	5288.09	0.009783	9.52	157 06	56.80	1.01	1.65	698 66
MIREHAVEN ARROYO	3056.16*	PF 1	1495.00	5283 00	5286.57	2.74	0.0049	5286.65	5288.07	0.010545	9.82	152.17	55.50	1.05	1.77	700 17
MIREHAVEN ARROYO	3054.17*	PF 1	1495 00	5282 99	5286.56	2.79	0 0052	5286.61	5288.03	0.010143	9.73	153 59	55.14	1 03	1.73	700.16
MIREHAVEN ARROYO	3052.19*	PF 1	1495 00	5282 98	5286.55	2.83	0 0049	5286.56	5287.99	0.009670	9 61	155.61	54.92	1 01	1.67	699.90
MIREHAVEN ARROYO	3050.20*	PF 1	1495 00	5282 97	5286.35	2.74	0 0052	5286.51	5287.96	0.011315	10.17	147.00	53 60	1.08	1.89	701.46
MIREHAVEN ARROYO	3048.21*	PF 1	1495 00	5282 96	5286.38	2.81	0.0049	5286.45	5287.90	0.010385	9 89	151.13	53 82	1.04	1.78	699 05
MIREHAVEN ARROYO	3046.23*	PF 1	1495.00	5282.95	5286.24	2.75	0 0052	5286.40	5287.86	0.011400	10 22	146.25	53.15	1.09	1 91	699 51
MIREHAVEN ARROYO	3044.24*	PF 1	1495.00	5282 94	5286.29	2.83	0.0049	5286.35	5287 80	0.010281	9 87	151.42	53.59	1 04	1.77	696.20
MIREHAVEN ARROYO	3042.26*	PF 1	1495.00	5282.93	5286.14	2.75	0 0052	5286.30	5287.76	0.011394	10 22	146.34	53.15	1 08	1 91	696.10
MIREHAVEN ARROYO	3040.27*	PF 1	1495.00	5282.92	5286.38	2.98	0.0049	5286.24	5287 70	0.008343	9.20	162 56	54 58	0.94	1.51	693.19
MIREHAVEN ARROYO	3038.28*	PF 1	1495.00	5282 91	5286.41	3.04	0.0052	5286 19	5287.65	0.007675	8.93	167 34	55.04	0.90	1.42	693.05
MIREHAVEN ARROYO	3036.3	PF 1	1495.00	5282.90	5286 44	3.10	0.0055		5287 61	0.007067	8.68	172.26	55.54	0.87	1 33	693.65
MIREHAVEN ARROYO	3034.53*	PF 1	1495.00	5282.89	5286 43	3.09	0.0058		5287.60	0.007150	8.71	171.60	55.50	0.87	1.34	693 31
MIREHAVEN ARROYO	3032.76*	PF 1	1495.00	5282.88	5286.41	3 08	0.0055		5287.60	0.007231	8.74	170.96	55.46	0.88	1.35	693 02
MIREHAVEN ARROYO	3031	PF 1	1495.00	5282.87	5286 39	3 07	0.0061		5287.59	0.007314	8 78	170.31	55.44	0.88	1.36	692.69
MIREHAVEN ARROYO	3029.33*	PF 1	1495.00	5282.86	5286 37	3 06	0.0058		5287.58	0.007426	8 83	169.36	55 28	0.89	1.38	692 57
MIREHAVEN ARROYO	3027.66*	PF 1	1495.00	5282.85	5286.35	3.05	0 0061	5286.10	5287 57	0 007554	8 88	168.29	55.13	0.90	1.40	692.39
MIREHAVEN ARROYO	3026	PF 1	1495.00	5282 84	5286.09	2.86	0.1650	5286 09	5287.54	0 009722	9.66	154.72	54.06	1.01	1.69	688 86
MIREHAVEN ARROYO	3024.*	PF 1	1495.00	5282.51	5285.50	2.54	0.1699	5285 93	5287 48	0.015702	11.27	132.63	52 22	1.25	2 40	705 70
MIREHAVEN ARROYO	3022.*	PF 1	1495 00	5282.17	5285.15	2.42	0.1650	5285 74	5287.41	0.019609	12.06	123 94	51 29	1 37	2.81	723.21
MIREHAVEN ARROYO	3020	PF 1	1495 00	5281.84	5284.87	2 34	7.3133	5285.56	5287.35	0.022987	12.63	118.33	50 51	1.45	3.13	739.34
MIREHAVEN ARROYO	3019.33	PF 1	1495.00	5276.94	5281.88	1.97	0.0053	5283.38	5287.05	0.065559	18.24	81.98	41.52	2.29	7.06	981 82
MIREHAVEN ARROYO	3017.49*	PF 1	1495.00	5276 93	5281 63	1.94	0.0000	5283.14	5286.91	0 067570	18 45	81.05	41.75	2.33	7 23	983.81
MIREHAVEN ARROYO	3015.66*	PF 1	1495.00	5276 93	5281.38	1.91	0.0056	5282.91	5286 78	0.069585	18 64	80.20	42.05	2 38	7 40	985.86
MIREHAVEN ARROYO	3013.83*	PF 1	1495 00	5276.92	5281.13	1 87	0.0000	5282 67	5286 63	0 071757	18.83	79 39	42 37	2.42	7.57	988 30
MIREHAVEN ARROYO	3012.*	PF 1	1495 00	5276.92	5280.88	1.84	0.0053	5282 42	5286 49	0.073844	19.01	78 63	42.64	2.47	7.74	990 85
MIREHAVEN ARROYO	3010.16*	PF 1	1495.00	5276.91	5280.62	1.82	0.0056	5282.19	5286.34	0.076075	19.19	77.89	42.90	2.51	7 91	994.17
MIREHAVEN ARROYO	3008.33*	PF 1	1495 00	5276.90	5280.36	1.79	0.0000	5281.95	5286.19	0.078221	19 36	77.20	43 10	2 55	8.07	997.63
MIREHAVEN ARROYO	3006.50*	PF 1	1495 00	5276 90	5280.11	1 77	0 0053	5281.71	5286.03	0.080203	19 52	76.58	43.26	2.59	8 22	1000 97
MIREHAVEN ARROYO	3004.67	PF 1	1495 00	5276.89	5279.85	1 75	0.0056	5281.46	5285.87	0.082273	19.69	75.92	43.31	2 62	8.38	1005 37
MIREHAVEN ARROYO	3002.83*	PF 1	1495 00	5276.88	5279.68	1.73	0.0000	5281.29	5285.71	0 082770	19.71	75.85	43.87	2 64	8.41	1000.40
MIREHAVEN ARROYO	3001.00*	PF 1	1495 00	5276.88	5279 52	1.71	0.0053	5281.11	5285.55	0 083084	19.70	75.88	44 45	2.66	8.41	995 03
MIREHAVEN ARROYO	2999.16*	PF 1	1495.00	5276.87	5279 36	1.68	0 0000	5280 93	5285.39	0.083743	19.72	75.83	45.02	2.68	8.43	990.99
MIREHAVEN ARROYO	2997.33*	PF 1	1495.00	5276.87	5279 20	1.66	0 0056	5280 77	5285.23	0.084227	19.71	75.86	45.59	2.69	8.44	986.76
MIREHAVEN ARROYO	2995.50*	PF 1	1495.00	5276.86	5279.03	1.64	0.0053	5280 60	5285 07	0 084993	19.72	75.82	46.13	2 71	8 47	983.93
MIREHAVEN ARROYO	2993.66*	PF 1	1495.00	5276.85	5278.87	1.62	0.0000	5280.43	5284.91	0 085839	19.72	75.82	46 72	2.73	8.49	981 44
MIREHAVEN ARROYO	2991.83*	PF 1	1495.00	5276.85	5278.71	1.60	0.0056	5280.27	5284.74	0.086650	19.71	75 86	47.31	2.74	8 50	979.20
MIREHAVEN ARROYO	2990	PF 1	1495.00	5276.84	5278.55	1.58	0.0058	5280.09	5284.58	0.087732	19 72	75.83	47.87	2 76	8.53	978 37
MIREHAVEN ARROYO	2988.33*	PF 1	1495.00	5276.83	5278.57	1.61	0.0000	5280.09	5284.36	0.082060	19.30	77 45	47.99	2.68	8 13	961.81
MIREHAVEN ARROYO	2986.66*	PF 1	1495.00	5276.83	5278.60	1 64	0.0061	5280.09	5284 15	0.076864	18.90	79.08	48.12	2.60	7.75	945 99

HEC-RAS Plan Plan 01 River MIREHAVEN ARROYO Reach MIREHAVEN ARROYO Profile PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth	Invert Slope	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Shear Chan	Specif Force
			(cfs)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(lb/sq ft)	(cu ft)
MIREHAVEN ARROYO	2873.56	PF 1	1495 00	5276.42	5280.20	3.27	0 0051		5281 23	0.005810	8.14	183.56	56.15	0.79	1.15	706.86
MIREHAVEN ARROYO	2871.62*	PF 1	1495.00	5276.41	5280.19	3.27	0.0000		5281 22	0.005823	8.15	183.42	56.14	0 79	1.15	706 69
MIREHAVEN ARROYO	2869.69*	PF 1	1495.00	5276.41	5280 17	3.25	0.0053		5281.21	0.005929	8 20	182.33	56.06	0 80	1.17	705.39
MIREHAVEN ARROYO	2867.75*	PF 1	1495.00	5276.40	5280.15	3.25	0.0051		5281.20	0 005942	8 21	182.19	56.05	0.80	1 17	705.23
MIREHAVEN ARROYO	2865.82*	PF 1	1495 00	5276.39	5280.14	3.25	0.0000		5281.19	0.005958	8.21	182.03	56.04	0.80	1.17	705 04
MIREHAVEN ARROYO	2863.88*	PF 1	1495 00	5276.39	5280 12	3.23	0.0053		5281 18	0.006069	8.26	180.90	55.96	0.81	1.19	703.77
MIREHAVEN ARROYO	2861.95*	PF 1	1495.00	5276.38	5280.11	3.23	0.0051		5281.17	0.006081	8.27	180.79	55.95	0 81	1.19	703.65
MIREHAVEN ARROYO	2860.01*	PF 1	1495.00	5276.37	5280.10	3 23	0 0000		5281.16	0 006097	8 28	180.63	55.94	0.81	1.19	703 47
MIREHAVEN ARROYO	2858.08*	PF 1	1495.00	5276.37	5280 07	3.21	0.0053		5281 15	0.006217	8.33	179.46	55.86	0.82	1.21	702 21
MIREHAVEN ARROYO	2856.14*	PF 1	1495.00	5276.36	5280.06	3.21	0.0051		5281.14	0.006237	8.34	179.27	55.84	0.82	1 21	702.00
MIREHAVEN ARROYO	2854.21*	PF 1	1495 00	5276.35	5280.05	3.21	0.0053		5281.13	0.006260	8 35	179.05	55.83	0.82	1.22	701.78
MIREHAVEN ARROYO	2852.28*	PF 1	1495 00	5276 34	5280.03	3 20	0.0000		5281.12	0.006280	8.36	178 85	55.80	0.82	1.22	701 59
MIREHAVEN ARROYO	2850.34*	PF 1	1495.00	5276.34	5280.01	3.19	0.0051		5281 11	0.006408	8.41	177 66	55 73	0 83	1.24	700 37
MIREHAVEN ARROYO	2848.41*	PF 1	1495.00	5276.33	5280 00	3.18	0.0053		5281.10	0.006441	8 43	177.36	55.71	0.83	1.24	700.07
MIREHAVEN ARROYO	2846.47*	PF 1	1495.00	5276.32	5279 98	3.18	0.0000		5281.09	0.006465	8.44	177.14	55.69	0.83	1.25	699.86
MIREHAVEN ARROYO	2844.54*	PF 1	1495.00	5276.32	5279.96	3.16	0 0051		5281.08	0 006604	8.50	175 89	55.60	0.84	1.27	698.68
MIREHAVEN ARROYO	2842.60*	PF 1	1495.00	5276.31	5279.95	3 16	0.0053		5281.07	0 006637	8.51	175 59	55.58	0 84	1 27	698 41
MIREHAVEN ARROYO	2840.67*	PF 1	1495.00	5276 30	5279.93	3.16	0 0000		5281.06	0 006668	8.53	175 32	55.56	0 85	1.27	698.16
MIREHAVEN ARROYO	2838.73*	PF 1	1495.00	5276.30	5279.90	3 13	0.0051		5281.05	0 006861	8.61	173 67	55.44	0.86	1 30	696.73
MIREHAVEN ARROYO	2836.80*	PF 1	1495 00	5276.29	5279.88	3.13	0.0053		5281.04	0.006903	8.63	173.32	55.41	0.86	1.31	696.44
MIREHAVEN ARROYO	2834.86*	PF 1	1495 00	5276 28	5279.87	3.12	0.0000		5281 03	0.006942	8.64	172.99	55.39	0.86	1.31	696.18
MIREHAVEN ARROYO	2832.93*	PF 1	1495.00	5276.28	5279 83	3.09	0.0051		5281.02	0.007206	8.75	170.86	55.24	0.88	1.35	694 56
MIREHAVEN ARROYO	2831	PF 1	1495 00	5276.27	5279.81	3.09	0.0061		5281.01	0.007261	8.77	170.43	55.21	0.88	1.36	694.25
MIREHAVEN ARROYO	2829.33*	PF 1	1495 00	5276.26	5279 80	3.08	0 0000	5279.52	5281.00	0 007296	8.79	170 16	55 19	0.88	1 36	694.07
MIREHAVEN ARROYO	2827.66*	PF 1	1495.00	5276.26	5279 53	2.87	0 0058	5279 51	5280.96	0 009578	9.62	155.48	54.11	1.00	1.67	688.85
MIREHAVEN ARROYO	2826*	PF 1	1495 00	5276.25	5279.50	2 86	0.1650	5279 50	5280.95	0.009722	9.66	154.72	54.06	1.01	1.69	688.86
MIREHAVEN ARROYO	2824.*	PF 1	1495.00	5275 92	5278.92	2.54	0 1699	5279.33	5280 88	0.015601	11 25	132.91	52.24	1.24	2 39	705 31
MIREHAVEN ARROYO	2822.*	PF 1	1495.00	5275 58	5278.57	2.42	0.1650	5279.15	5280.82	0.019524	12 04	124.12	51 30	1 36	2 80	722.84
MIREHAVEN ARROYO	2820*	PF 1	1495.00	5275.25	5278.28	2.34	7.3133	5278.97	5280.75	0.022914	12.62	118.45	50.52	1 45	3.12	739.01
MIREHAVEN ARROYO	2819.33	PF 1	1495.00	5270.35	5275.29	1.97	0.0056	5276.79	5280.45	0 065509	18.23	82 00	41.52	2.29	7.05	981.65
MIREHAVEN ARROYO	2817.49*	PF 1	1495.00	5270.34	5275 04	1.94	0.0000	5276 55	5280.32	0.067546	18.44	81 06	41.75	2.33	7.23	983 73
MIREHAVEN ARROYO	2815.66*	PF 1	1495.00	5270.34	5274 79	1.91	0.0053	5276.32	5280.18	0.069580	18.64	80.20	42 05	2 38	7.40	985 86
MIREHAVEN ARROYO	2813.83*	PF 1	1495.00	5270.33	5274.54	1.87	0.0000	5276.08	5280.04	0.071756	18.83	79.39	42.37	2.42	7.57	988.29
MIREHAVEN ARROYO	2812.*	PF 1	1495.00	5270 33	5274.29	1.84	0 0056	5275.85	5279.90	0 073806	19.01	78.65	42.64	2 47	7 74	990 80
MIREHAVEN ARROYO	2810.16*	PF 1	1495.00	5270.32	5274 03	1.82	0 0053	5275 61	5279.75	0.076021	19.19	77.91	42.90	2.51	7 90	994.00
MIREHAVEN ARROYO	2808.33*	PF 1	1495 00	5270.31	5273.77	1.79	0 0000	5275.36	5279 59	0.078186	19.36	77 21	43.10	2.55	8.07	997.52
MIREHAVEN ARROYO	2806.50*	PF 1	1495.00	5270.31	5273.52	1.77	0.0056	5275.11	5279.44	0.080185	19.52	76.58	43 27	2 59	8 22	1000 92
MIREHAVEN ARROYO	2804.67*	PF 1	1495.00	5270 30	5273.26	1.75	0.0053	5274.86	5279.28	0 082237	19 69	75.93	43.31	2.62	8 38	1005.27
MIREHAVEN ARROYO	2802.83*	PF 1	1495.00	5270.29	5273 09	1.73	0.0000	5274.69	5279.12	0.082743	19.71	75.86	43.87	2 64	8 40	1000 32
MIREHAVEN ARROYO	2801.00*	PF 1	1495.00	5270.29	5272 93	1 71	0 0056	5274.52	5278.96	0.083077	19.70	75.88	44.45	2.66	8.41	995 00
MIREHAVEN ARROYO	2799.16*	PF 1	1495.00	5270 28	5272.77	1.68	0.0053	5274.34	5278.80	0.083780	19.72	75 82	45.02	2.68	8 44	991.11
MIREHAVEN ARROYO	2797.33*	PF 1	1495.00	5270 27	5272.60	1.66	0.0000	5274 17	5278.64	0.084396	19.72	75.81	45 57	2 69	8.45	987.42
MIREHAVEN ARROYO	2795.50*	PF 1	1495.00	5270.27	5272 45	1.64	0.0056	5274 02	5278.48	0 084933	19.71	75.85	46.15	2.71	8 46	983 67
MIREHAVEN ARROYO	2793.66*	PF 1	1495.00	5270.26	5272.28	1 62	0.0000	5273.84	5278.32	0.085844	19.72	75.82	46.72	2.73	8 49	981 46
MIREHAVEN ARROYO	2791.83*	PF 1	1495.00	5270.26	5272.12	1 60	0 0053	5273.67	5278.15	0.086680	19.71	75 85	47.31	2.74	8.50	979.28
MIREHAVEN ARROYO	2790.	PF 1	1495 00	5270 25	5271.96	1.58	0.0058	5273.51	5277.99	0.087732	19 72	75.83	47 87	2.76	8.53	978 37
MIREHAVEN ARROYO	2788.33*	PF 1	1495.00	5270.24	5271.98	1.61	0.0000	5273 49	5277.77	0 082060	19.30	77.45	47 99	2.68	8 13	961 81
MIREHAVEN ARROYO	2786.66*	PF 1	1495.00	5270.24	5272.01	1.64	0.0061	5273 50	5277.56	0.076947	18.91	79.07	48.15	2.60	7.75	946.03
MIREHAVEN ARROYO	2785	PF 1	1495.00	5270.23	5272.04	1.67	0.0049	5273 49	5277 37	0.072163	18 53	80 69	48.26	2.52	7.40	931.13
MIREHAVEN ARROYO	2783.*	PF 1	1495.00	5270.22	5272 07	1.71	0.0000	5273.48	5277.16	0.067125	18.10	82.58	48 41	2 44	7.02	914 65
MIREHAVEN ARROYO	2781.*	PF 1	1495 00	5270.22	5272.11	1 74	0.0051	5273.48	5276.95	0.062149	17.66	84 64	48.58	2.36	6 64	897.74
MIREHAVEN ARROYO	2779.*	PF 1	1495 00	5270.21	5272.14	1.77	0 0049	5273.47	5276.78	0.058185	17.29	86.45	48.73	2.29	6.33	883.79
MIREHAVEN ARROYO	2777.*	PF 1	1495.00	5270.20	5272.16	1.81	0 0000	5273 46	5276.62	0.054450	16 93	88.31	48.88	2.22	6.03	870.22
MIREHAVEN ARROYO	2775.*	PF 1	1495.00	5270.20	5272.21	1 84	0 0051	5273.45	5276.45	0.050473	16.52	90.48	49 06	2.14	5.70	855 29
MIREHAVEN ARROYO	2773.*	PF 1	1495.00	5270.19	5272.24	1.88	0.0000	5273.44	5276.30	0.047204	16.17	92.45	49.22	2.08	5.43	842.62
MIREHAVEN ARROYO	2771.*	PF 1	1495 00	5270.19	5272.29	1.92	0.0049	5273.45	5276.15	0.043740	15 78	94.76	49.42	2 01	5.13	828.71
MIREHAVEN ARROYO	2769.*	PF 1	1495 00	5270.18	5272.32	1.95	0 0051	5273 43	5276 02	0.040805	15.43	96.89	49.58	1.95	4.88	816 74

HEC-RAS Plan: Plan 01 River: MIREHAVEN ARROYO Reach: MIREHAVEN ARROYO Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth	Invert Slope	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Shear Chan	Specif Force
			(cfs)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(lb/sq ft)	(cu ft)
MIREHAVEN ARROYO	2653.*	PF 1	1495.00	5269.81	5273.81	3.44	0.0000		5274.71	0.004772	7.63	196.03	57.01	0.72	0.99	724.76
MIREHAVEN ARROYO	2651.*	PF 1	1495 00	5269.81	5273.79	3.43	0.0051		5274.71	0.004827	7.66	195.29	56.98	0.73	1.00	723.39
MIREHAVEN ARROYO	2649.*	PF 1	1495.00	5269.80	5273.78	3 43	0.0000		5274.70	0.004830	7.66	195.24	56.97	0.73	1.00	723.39
MIREHAVEN ARROYO	2647 *	PF 1	1495.00	5269.80	5273 77	3.42	0.0049		5274.69	0.004891	7.69	194 43	56.92	0.73	1.01	722.01
MIREHAVEN ARROYO	2645.*	PF 1	1495 00	5269 79	5273.76	3.42	0.0051		5274.68	0.004891	7.69	194.43	56.92	0.73	1.01	722 01
MIREHAVEN ARROYO	2643.*	PF 1	1495 00	5269.78	5273.75	3.41	0.0000		5274 67	0.004900	7.69	194.31	56.90	0.73	1.01	721.98
MIREHAVEN ARROYO	2641.*	PF 1	1495.00	5269.78	5273.73	3.40	0.0049		5274 66	0.004959	7.72	193.54	56.86	0.74	1 02	720 62
MIREHAVEN ARROYO	2639.*	PF 1	1495.00	5269.77	5273 72	3.40	0 0051		5274.65	0 004964	7.73	193.47	56.85	0.74	1.02	720 59
MIREHAVEN ARROYO	2637.*	PF 1	1495.00	5269 76	5273.71	3.40	0.0000		5274.64	0 004967	7.73	193.42	56 84	0.74	1.02	720.60
MIREHAVEN ARROYO	2635.*	PF 1	1495 00	5269.76	5273 70	3.39	0.0049		5274 63	0.005025	7.76	192.68	56.80	0.74	1 03	719.30
MIREHAVEN ARROYO	2633.*	PF 1	1495 00	5269.75	5273.69	3.39	0 0000		5274 62	0.005033	7.76	192.58	56.79	0.74	1 03	719.23
MIREHAVEN ARROYO	2631.*	PF 1	1495 00	5269.75	5273.67	3.38	0.0049		5274 62	0.005102	7.80	191.71	56.73	0.75	1.04	717.84
MIREHAVEN ARROYO	2629.*	PF 1	1495.00	5269.74	5273 66	3.38	0 0051		5274.61	0 005104	7 80	191.69	56.73	0 75	1.04	717 80
MIREHAVEN ARROYO	2627.*	PF 1	1495.00	5269.73	5273 65	3.38	0 0000		5274.60	0.005109	7.80	191.61	56.72	0.75	1.04	717 77
MIREHAVEN ARROYO	2625.*	PF 1	1495.00	5269.73	5273.63	3.37	0.0049		5274.59	0.005180	7 84	190.74	56.66	0.75	1 05	716.41
MIREHAVEN ARROYO	2623	PF 1	1495.00	5269.72	5273 62	3.37	0.0061		5274.58	0 005186	7.84	190.66	56.65	0.75	1 06	716.34
MIREHAVEN ARROYO	2621.33*	PF 1	1495.00	5269.71	5273 62	3.37	0.0000		5274.57	0.005179	7.84	190.75	56.66	0.75	1.05	716.46
MIREHAVEN ARROYO	2619.66*	PF 1	1495.00	5269 71	5273.60	3.36	0.0058		5274.56	0 005247	7.87	189.92	56 60	0 76	1.06	715.26
MIREHAVEN ARROYO	2618	PF 1	1495.00	5269.70	5273.59	3.36	0.1650		5274 55	0.005245	7.87	189.95	56 60	0.76	1.06	715.30
MIREHAVEN ARROYO	2616.*	PF 1	1495.00	5269.37	5273.29	3.02	0.1702	5273 05	5274.51	0.007653	8.88	168.39	55.78	0 90	1.40	704.34
MIREHAVEN ARROYO	2614.*	PF 1	1495.00	5269.03	5273.04	2 81	0.1648	5273 04	5274 46	0.009932	9.56	156.32	55.66	1 01	1 67	698.29
MIREHAVEN ARROYO	2612	PF 1	1495.00	5268.70	5272.59	2.52	5.1350	5272.94	5274 41	0.015065	10.83	138.04	54.76	1 20	2.24	702.72
MIREHAVEN ARROYO	2611.33	PF 1	1495.00	5265.26	5269.24	1.86	0.0544	5270 62	5274.09	0.060658	17.68	84.57	45.40	2.28	6.61	929.36
MIREHAVEN ARROYO	2609.49*	PF 1	1495.00	5265.16	5268.97	1.84	0 0547	5270 39	5273.97	0 063330	17.94	83.33	45.41	2.33	6.83	936.33
MIREHAVEN ARROYO	2607.66*	PF 1	1495.00	5265.06	5268.70	1 81	0 0491	5270.15	5273.83	0 065872	18 18	82.23	45.43	2.38	7.03	942 92
MIREHAVEN ARROYO	2605.82*	PF 1	1495.00	5264.97	5268.43	1.79	0.0547	5269.90	5273.69	0.068346	18.41	81.19	45.42	2.43	7.24	949.39
MIREHAVEN ARROYO	2603.99*	PF 1	1495.00	5264.87	5268 16	1.77	0.0547	5269.64	5273.55	0.070896	18.64	80.21	45.44	2.47	7 44	956.04
MIREHAVEN ARROYO	2602.16*	PF 1	1495.00	5264.77	5267.88	1.75	0.0547	5269.38	5273.40	0.073378	18.86	79.28	45.42	2.52	7.63	962.69
MIREHAVEN ARROYO	2600.32*	PF 1	1495 00	5264 67	5267.61	1.73	0.0491	5269 14	5273.25	0.075862	19.07	78 41	45.43	2.56	7.83	969.17
MIREHAVEN ARROYO	2598.49*	PF 1	1495 00	5264 58	5267.33	1.71	0.0547	5268 88	5273 10	0.078254	19.26	77.61	45.42	2.60	8.01	975.56
MIREHAVEN ARROYO	2596.66	PF 1	1495 00	5264 48	5267.05	1.69	0.0547	5268.61	5272.94	0 080774	19 47	76.80	45 40	2 64	8 20	982 35
MIREHAVEN ARROYO	2594.82*	PF 1	1495.00	5264.38	5266.84	1.67	0.0491	5268.40	5272.78	0.082292	19.56	76.44	45.69	2 66	8 30	983.25
MIREHAVEN ARROYO	2592.99*	PF 1	1495 00	5264 29	5266.64	1.65	0 0547	5268.20	5272.63	0.083777	19.64	76.12	46.02	2.69	8.39	983.89
MIREHAVEN ARROYO	2591.16*	PF 1	1495.00	5264.19	5266.43	1.64	0.0547	5268.00	5272.47	0.085251	19.72	75.81	46 31	2.72	8 47	984.94
MIREHAVEN ARROYO	2589.33*	PF 1	1495.00	5264.09	5266.22	1.62	0.0544	5267 79	5272.31	0.086806	19 80	75.49	46 59	2 74	8.57	986 33
MIREHAVEN ARROYO	2587.49*	PF 1	1495.00	5263.99	5266.01	1.60	0 0494	5267.58	5272.14	0.088360	19 88	75.21	46.90	2.77	8.65	987.73
MIREHAVEN ARROYO	2585 66*	PF 1	1495.00	5263.90	5265.80	1.59	0 0547	5267.37	5271.98	0.089782	19.94	74.97	47.19	2.79	8.73	989.01
MIREHAVEN ARROYO	2583.83*	PF 1	1495 00	5263.80	5265.59	1.57	0.0544	5267.17	5271 81	0.091286	20.01	74.72	47.48	2 81	8 81	990 74
MIREHAVEN ARROYO	2582	PF 1	1495 00	5263.70	5265 38	1.56	0.0061	5266.96	5271.63	0.092742	20 07	74.49	47.75	2 83	8.89	992.71
MIREHAVEN ARROYO	2580.33*	PF 1	1495 00	5263 69	5265.40	1.59	0.0000	5266 94	5271.41	0.087104	19 67	76 00	47.88	2.75	8.49	976.63
MIREHAVEN ARROYO	2578.66*	PF 1	1495.00	5263 69	5265 44	1.62	0.0058	5266 95	5271.20	0.081542	19.26	77.61	48 01	2.67	8.09	960.21
MIREHAVEN ARROYO	2577	PF 1	1495.00	5263.68	5265.46	1 65	0.0052	5266.94	5270.99	0.076527	18.88	79 20	48.14	2 59	7 73	944 88
MIREHAVEN ARROYO	2575.01*	PF 1	1495.00	5263.67	5265.49	1 68	0.0000	5266.93	5270 77	0.071202	18.45	81.05	48.30	2 51	7.33	927.97
MIREHAVEN ARROYO	2573.03*	PF 1	1495 00	5263.67	5265.53	1.71	0.0049	5266.92	5270 56	0.065954	18.00	83 05	48.46	2.42	6.93	910.67
MIREHAVEN ARROYO	2571.05*	PF 1	1495.00	5263.66	5265.55	1.74	0.0052	5266.92	5270.38	0.061830	17.63	84.79	48.61	2.35	6.61	896.57
MIREHAVEN ARROYO	2569.06*	PF 1	1495 00	5263.65	5265.58	1.78	0.0049	5266 90	5270.21	0.057951	17.27	86.57	48.75	2 28	6 31	882 89
MIREHAVEN ARROYO	2567.08*	PF 1	1495 00	5263.64	5265.61	1.81	0 0000	5266.90	5270.05	0.054233	16.91	88.42	48.90	2.22	6 01	869 41
MIREHAVEN ARROYO	2565.10*	PF 1	1495 00	5263.64	5265.65	1.85	0 0052	5266.90	5269.88	0.050311	16.50	90.58	49 08	2.14	5.69	854.59
MIREHAVEN ARROYO	2563.11*	PF 1	1495 00	5263.63	5268.56	4.13	0.0049	5266.89	5269.11	0.002301	5.96	250.75	60.75	0 52	0 57	854 62
MIREHAVEN ARROYO	2561.13*	PF 1	1495.00	5263.62	5268.55	4.13	0.0000		5269.10	0.002291	5 95	251.11	60.78	0.52	0 57	855.72
MIREHAVEN ARROYO	2559.15*	PF 1	1495.00	5263.62	5268.55	4 13	0.0052		5269.10	0.002301	5.96	250 76	60.75	0.52	0.57	854 64
MIREHAVEN ARROYO	2557.16*	PF 1	1495.00	5263.61	5268 54	4.13	0 0049		5269.10	0.002291	5.95	251.13	60 78	0 52	0.57	855.79
MIREHAVEN ARROYO	2555.18*	PF 1	1495 00	5263.60	5268.54	4.14	0.0000		5269.09	0 002281	5.94	251.50	60.80	0.52	0.57	856 89
MIREHAVEN ARROYO	2553.20*	PF 1	1495 00	5263.60	5268.54	4.14	0.0052		5269 09	0.002285	5.95	251.34	60.78	0.52	0.57	856.34
MIREHAVEN ARROYO	2551.21*	PF 1	1495.00	5263 59	5268.53	4.14	0.0049		5269.08	0.002279	5.94	251.58	60.81	0 51	0.57	857.14
MIREHAVEN ARROYO	2549.23*	PF 1	1495.00	5263.58	5268.53	4 14	0.0052		5269.08	0.002269	5 93	251.94	60 83	0 51	0 56	858.24
MIREHAVEN ARROYO	2547.25*	PF 1	1495.00	5263.57	5268 52	4.15	0 0000		5269.07	0.002259	5.92	252.32	60.86	0.51	0.56	859.40

HEC-RAS Plan: Plan 01 River: MIREHAVEN ARROYO Reach: MIREHAVEN ARROYO Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth	Invert Slope	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Shear Chan	Specif Force
			(cfs)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(lb/sq ft)	(cu ft)
MIREHAVEN ARROYO	2432.22*	PF 1	1495.00	5263.16	5268.29	4.27	0.0000		5268.79	0.001998	5.68	263.09	61 56	0.48	0.51	893.47
MIREHAVEN ARROYO	2430.24*	PF 1	1495.00	5263.16	5268.29	4.27	0.0052		5268.79	0.002002	5.69	262.91	61.54	0.48	0.51	892.92
MIREHAVEN ARROYO	2428.26*	PF 1	1495.00	5263 15	5268 28	4.28	0.0049		5268.78	0 001992	5.68	263 33	61.57	0.48	0.51	894.29
MIREHAVEN ARROYO	2426.28*	PF 1	1495 00	5263 14	5268.28	4.28	0.0052		5268.78	0 001986	5.67	263.63	61 59	0.48	0.51	895.24
MIREHAVEN ARROYO	2424.29*	PF 1	1495 00	5263.13	5268.28	4.28	0.0000		5268.77	0 001977	5.66	264.04	61 62	0.48	0.51	896.60
MIREHAVEN ARROYO	2422.31*	PF 1	1495 00	5263.13	5268.27	4.28	0.0049		5268.77	0 001981	5.67	263.87	61 60	0.48	0.51	896 07
MIREHAVEN ARROYO	2420.33	PF 1	1495.00	5263.12	5268 27	4.29	0.0120		5268.77	0.001972	5 66	264.25	61 63	0.48	0.51	897.31
MIREHAVEN ARROYO	2418.66*	PF 1	1495.00	5263.10	5268 13	3 89	0.0120		5268 75	0.002742	6 30	237.35	61.03	0 56	0.65	817 17
MIREHAVEN ARROYO	2416.99*	PF 1	1495.00	5263.08	5268.12	3.88	0.0120		5268 74	0.002780	6.32	236.44	60.94	0.57	0 65	806.31
MIREHAVEN ARROYO	2415.33	PF 1	1495.00	5263.06	5268 19	4.23	0.1599		5268.71	0.002095	5.78	258.64	61.15	0.50	0 53	880 65
MIREHAVEN ARROYO	2413.33*	PF 1	1495.00	5262.74	5268.09	3.89	0.1650		5268 69	0.002741	6.25	239 31	61.55	0.56	0.64	816 64
MIREHAVEN ARROYO	2411.33*	PF 1	1495 00	5262.41	5267.92	3.50	0.1602		5268.67	0.003956	6.94	215.34	61 50	0.65	0.82	760 19
MIREHAVEN ARROYO	2409.33	PF 1	1495.00	5262.09	5267.20	2.74	5.1189	5267 20	5268.60	0.010487	9.47	157.79	57 66	1.01	1.67	706 70
MIREHAVEN ARROYO	2408.66	PF 1	1495 00	5258 66	5262.79	1.88	-0.0269	5264 32	5268 18	0.069617	18.63	80.25	42.76	2 40	7 40	970.37
MIREHAVEN ARROYO	2406.81*	PF 1	1495 00	5258 71	5262.55	1.84	-0.0216	5264.09	5268.05	0.071525	18.82	79.42	43.10	2 44	7 56	973.95
MIREHAVEN ARROYO	2404.96*	PF 1	1495.00	5258.75	5262.28	1.81	-0.0269	5263 83	5267.90	0 074131	19.03	78.56	43.29	2 49	7.76	979.03
MIREHAVEN ARROYO	2403.11	PF 1	1495.00	5258 80	5262.00	1.79	-0 0229	5263 57	5267.75	0.077296	19.25	77.67	43 42	2 54	7 97	985.75
MIREHAVEN ARROYO	2401.36*	PF 1	1495.00	5258 84	5261.86	1.75	-0 0287	5263 40	5267.60	0.078471	19.23	77.74	44 43	2.56	7.99	979 79
MIREHAVEN ARROYO	2399.61*	PF 1	1495 00	5258.89	5261 72	1 67	-0.0229	5263.24	5267.46	0.082429	19.24	77 70	46.52	2.62	8.10	975 03
MIREHAVEN ARROYO	2397.87*	PF 1	1495.00	5258.93	5261.55	1.66	-0.0229	5263.08	5267.32	0.082149	19 27	77 59	46.81	2 64	8.11	971 06
MIREHAVEN ARROYO	2396.12*	PF 1	1495.00	5258.97	5261.39	1 64	-0.0226	5262.92	5267.17	0.082124	19 30	77 46	47 09	2.65	8.13	968 24
MIREHAVEN ARROYO	2394.38*	PF 1	1495.00	5259 01	5261.22	1.63	-0.0287	5262.74	5267.03	0 082434	19 34	77.29	47.35	2.67	8.16	966 79
MIREHAVEN ARROYO	2392.63*	PF 1	1495.00	5259 06	5261.05	1.62	-0.0229	5262 57	5266 88	0.082963	19.38	77.13	47.62	2.68	8.20	966 19
MIREHAVEN ARROYO	2390.89	PF 1	1495.00	5259 10	5260.87	1.61	0.0061	5262 40	5266.74	0.083951	19.44	76.90	47.84	2.70	8.26	967.45
MIREHAVEN ARROYO	2389.22*	PF 1	1495.00	5259 09	5260.87	1.63	0.0000	5262.37	5266.54	0 079314	19.10	78.29	47 98	2.63	7.93	953.65
MIREHAVEN ARROYO	2387.55*	PF 1	1495.00	5259.09	5260.89	1.66	0.0058	5262.36	5266.34	0 074783	18.74	79.78	48.16	2.57	7.60	939 48
MIREHAVEN ARROYO	2385.89	PF 1	1495.00	5259 08	5260.90	1.68	0 0053	5262.34	5266 17	0.070884	18.42	81.15	48.29	2.50	7.31	927 04
MIREHAVEN ARROYO	2383.96*	PF 1	1495.00	5259.07	5261.16	1.84	0.0000	5262.54	5265.89	0 056525	17.46	85.61	46.61	2.27	6.37	896.05
MIREHAVEN ARROYO	2382.03*	PF 1	1495.00	5259.07	5261.42	1.92	0 0051	5262 68	5265.64	0.047550	16 49	90.66	47.27	2.10	5.60	864 17
MIREHAVEN ARROYO	2380.11*	PF 1	1495.00	5259.06	5261.56	1.85	0.0053	5262.72	5265 46	0.045861	15 84	94.37	50.96	2.05	5.23	839 39
MIREHAVEN ARROYO	2378.18*	PF 1	1495.00	5259 05	5261.53	1.87	0.0000	5262.67	5265 35	0.044451	15.70	95.25	50.85	2.02	5.11	828.91
MIREHAVEN ARROYO	2376.25*	PF 1	1495.00	5259 05	5261.37	1.88	0.0051	5262 53	5265 26	0.045059	15.82	94.51	50.29	2 03	5.19	829.81
MIREHAVEN ARROYO	2374.33	PF 1	1495.00	5259 04	5264.02	4 16	0.0051	5262.30	5264 56	0.002228	5 90	253 49	60.93	0 51	0.56	863 08
MIREHAVEN ARROYO	2372.33*	PF 1	1536.00	5259 03	5263.95	4.08	0 0000		5264.55	0.002522	6 20	247 79	60.70	0 54	0.62	859.81
MIREHAVEN ARROYO	2370.33*	PF 1	1536.00	5259.03	5263.94	4.04	0 0049		5264 54	0.002611	6.27	245 07	60.63	0.55	0 64	850.80
MIREHAVEN ARROYO	2368.34*	PF 1	1536.00	5259.02	5263.92	4.00	0 0051		5264.54	0 002699	6.33	242.54	60.59	0.56	0.65	842 53
MIREHAVEN ARROYO	2366.34*	PF 1	1536.00	5259.01	5263.90	3.97	0.0000		5264.54	0.002780	6.39	240.29	60 56	0.57	0.66	835 33
MIREHAVEN ARROYO	2364.35*	PF 1	1536.00	5259 01	5263.88	3 93	0.0049		5264.53	0.002873	6.46	237.78	60 49	0.57	0.68	827 87
MIREHAVEN ARROYO	2362.35*	PF 1	1536.00	5259.00	5263.87	3 90	0.0000		5264.53	0 002946	6.51	235 93	60 48	0 58	0.69	822.31
MIREHAVEN ARROYO	2360.35*	PF 1	1536 00	5259.00	5263.85	3.87	0.0049		5264.52	0.003034	6 57	233 76	60.44	0 59	0.71	816.14
MIREHAVEN ARROYO	2358.36*	PF 1	1536.00	5258.99	5263 83	3.84	0 0051		5264.52	0.003111	6.62	231 88	60.38	0.60	0 72	811.28
MIREHAVEN ARROYO	2356.36*	PF 1	1536 00	5258.98	5263 82	3.81	0 0000		5264.51	0.003182	6 67	230.22	60.35	0.60	0 73	807.03
MIREHAVEN ARROYO	2354.37*	PF 1	1536.00	5258.98	5263 80	3.79	0 0049		5264.50	0.003260	6 72	228.46	60.32	0.61	0 75	802.64
MIREHAVEN ARROYO	2352.37*	PF 1	1536.00	5258.97	5263.79	3.77	0.0051		5264.50	0.003326	6.77	226.99	60.27	0.61	0 76	799 46
MIREHAVEN ARROYO	2350.37*	PF 1	1536.00	5258.96	5263.77	3.75	0.0000		5264.49	0.003383	6 80	225.77	60.25	0.62	0.77	796 85
MIREHAVEN ARROYO	2348.38*	PF 1	1536.00	5258.96	5263 76	3.73	0.0049		5264 49	0.003444	6.84	224.50	60 23	0 62	0.78	794 08
MIREHAVEN ARROYO	2346.38*	PF 1	1536.00	5258.95	5263.75	3 71	0.0051		5264.48	0.003490	6.87	223.51	60 18	0.63	0.78	792 56
MIREHAVEN ARROYO	2344.39*	PF 1	1536.00	5258.94	5263 74	3.70	0.0000		5264 47	0.003527	6.90	222.76	60.17	0 63	0.79	791 46
MIREHAVEN ARROYO	2342.39*	PF 1	1536.00	5258.94	5263 72	3.69	0 0049		5264.47	0.003568	6.92	221 93	60.16	0.64	0 80	790.06
MIREHAVEN ARROYO	2340.4*	PF 1	1536.00	5258.93	5263 71	3.68	0 0051		5264.46	0.003595	6 94	221 36	60.12	0.64	0.80	789.78
MIREHAVEN ARROYO	2338.40*	PF 1	1536.00	5258.92	5263 71	3.68	0 0000		5264.45	0 003600	6 94	221 26	60.13	0 64	0.80	790 25
MIREHAVEN ARROYO	2336.40*	PF 1	1536.00	5258.92	5263 70	3.67	0 0049		5264.45	0 003627	6 96	220 72	60 13	0 64	0.81	789 69
MIREHAVEN ARROYO	2334.41*	PF 1	1536 00	5258.91	5263.69	3.67	0.0000		5264.44	0 003627	6.96	220.69	60.11	0 64	0.81	790.66
MIREHAVEN ARROYO	2332.41*	PF 1	1536.00	5258.91	5263.68	3.67	0.0051		5264.43	0 003632	6.96	220.57	60.11	0.64	0.81	791.08
MIREHAVEN ARROYO	2330.42*	PF 1	1536.00	5258.90	5263 67	3.68	0.0049		5264.42	0 003612	6.95	220.93	60.11	0.64	0 80	792.85
MIREHAVEN ARROYO	2328.42*	PF 1	1536 00	5258.89	5263 67	3.68	0.0000		5264.41	0.003591	6.94	221.32	60.10	0.64	0 80	794.78
MIREHAVEN ARROYO	2326.42*	PF 1	1536 00	5258.89	5263 66	3.69	0 0051		5264.41	0.003577	6.93	221.55	60.10	0.64	0.80	795 93

HEC-RAS Plan: Plan 01 River: MIREHAVEN ARROYO Reach: MIREHAVEN ARROYO Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth	Invert Slope	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Shear Chan	Specif Force
			(cfs)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(lb/sq ft)	(cu ft)
MIREHAVEN ARROYO	2210.87*	PF 1	1536.00	5258.51	5263.29	3.91	0.0050		5263.95	0.002951	6.53	235.33	60.16	0.58	0.70	823.07
MIREHAVEN ARROYO	2208.93*	PF 1	1536.00	5258.50	5263.27	3.89	0.0050		5263.94	0.003022	6.58	233.55	60.12	0.59	0.71	818.09
MIREHAVEN ARROYO	2206.99*	PF 1	1536.00	5258.49	5263.26	3.86	0.0000		5263.94	0.003090	6.62	231.90	60.09	0.59	0.72	813.52
MIREHAVEN ARROYO	2205.04*	PF 1	1536.00	5258.49	5263.24	3.83	0.0053		5263.93	0.003160	6.67	230.24	60.05	0.60	0.73	809.13
MIREHAVEN ARROYO	2203.10*	PF 1	1536.00	5258.48	5263.23	3.81	0.0050		5263.93	0.003220	6.71	228.86	60.03	0.61	0.74	805.76
MIREHAVEN ARROYO	2201.16*	PF 1	1536.00	5258.47	5263.21	3.79	0.0000		5263.92	0.003273	6.75	227.66	60.00	0.61	0.75	802.95
MIREHAVEN ARROYO	2199.22*	PF 1	1536.00	5258.47	5263.20	3.78	0.0053		5263.92	0.003327	6.78	226.47	59.96	0.62	0.76	800.31
MIREHAVEN ARROYO	2197.28*	PF 1	1536.00	5258.46	5263.19	3.76	0.0000		5263.91	0.003369	6.81	225.54	59.94	0.62	0.77	798.55
MIREHAVEN ARROYO	2195.34*	PF 1	1536.00	5258.46	5263.18	3.75	0.0050		5263.90	0.003410	6.84	224.67	59.93	0.62	0.77	796.71
MIREHAVEN ARROYO	2193.39*	PF 1	1536.00	5258.45	5263.17	3.74	0.0053		5263.90	0.003439	6.86	224.06	59.91	0.62	0.78	795.76
MIREHAVEN ARROYO	2191.45*	PF 1	1536.00	5258.44	5263.16	3.73	0.0000		5263.89	0.003458	6.87	223.64	59.90	0.63	0.78	795.46
MIREHAVEN ARROYO	2189.51*	PF 1	1536.00	5258.44	5263.15	3.73	0.0050		5263.88	0.003482	6.88	223.11	59.87	0.63	0.79	794.84
MIREHAVEN ARROYO	2187.57*	PF 1	1536.00	5258.43	5263.14	3.72	0.0000		5263.88	0.003486	6.89	223.04	59.89	0.63	0.79	795.07
MIREHAVEN ARROYO	2185.63*	PF 1	1536.00	5258.43	5263.13	3.72	0.0053		5263.87	0.003504	6.90	222.64	59.85	0.63	0.79	794.83
MIREHAVEN ARROYO	2183.69*	PF 1	1536.00	5258.42	5263.13	3.73	0.0050		5263.86	0.003482	6.89	223.06	59.86	0.63	0.79	796.49
MIREHAVEN ARROYO	2181.74*	PF 1	1536.00	5258.41	5263.12	3.73	0.0000		5263.85	0.003468	6.88	223.34	59.86	0.63	0.78	797.64
MIREHAVEN ARROYO	2179.80*	PF 1	1536.00	5258.41	5263.11	3.73	0.0053		5263.85	0.003458	6.87	223.56	59.87	0.63	0.78	798.49
MIREHAVEN ARROYO	2177.86*	PF 1	1536.00	5258.40	5263.11	3.75	0.0000		5263.84	0.003418	6.85	224.35	59.88	0.62	0.78	801.00
MIREHAVEN ARROYO	2175.92*	PF 1	1536.00	5258.40	5263.10	3.76	0.0050		5263.83	0.003394	6.83	224.82	59.87	0.62	0.77	802.42
MIREHAVEN ARROYO	2173.98*	PF 1	1536.00	5258.39	5263.10	3.77	0.0053		5263.82	0.003357	6.81	225.60	59.88	0.62	0.77	804.55
MIREHAVEN ARROYO	2172.04*	PF 1	1536.00	5258.38	5263.10	3.79	0.0000		5263.81	0.003299	6.77	226.84	59.89	0.61	0.76	807.85
MIREHAVEN ARROYO	2170.1*	PF 1	1536.00	5258.38	5263.09	3.80	0.0050		5263.80	0.003257	6.74	227.77	59.91	0.61	0.75	809.98
MIREHAVEN ARROYO	2168.15*	PF 1	1536.00	5258.37	5263.09	3.82	0.0053		5263.79	0.003200	6.71	229.06	59.93	0.60	0.74	813.04
MIREHAVEN ARROYO	2166.21*	PF 1	1536.00	5258.36	5263.09	3.85	0.0000		5263.78	0.003125	6.66	230.80	59.95	0.60	0.73	817.11
MIREHAVEN ARROYO	2164.27*	PF 1	1536.00	5258.36	5263.09	3.87	0.0050		5263.77	0.003067	6.62	232.19	59.96	0.59	0.72	820.07
MIREHAVEN ARROYO	2162.33*	PF 1	1536.00	5258.35	5263.09	3.90	0.0000		5263.76	0.002995	6.56	234.03	60.01	0.59	0.70	824.02
MIREHAVEN ARROYO	2160.39*	PF 1	1536.00	5258.35	5263.09	3.93	0.0053		5263.75	0.002924	6.51	235.82	60.01	0.58	0.69	827.86
MIREHAVEN ARROYO	2158.45	PF 1	1536.00	5258.34	5263.09	3.96	0.0240		5263.74	0.002847	6.46	237.89	60.05	0.57	0.68	832.11
MIREHAVEN ARROYO	2156.78*	PF 1	1536.00	5258.30	5262.85	3.49	0.0298		5263.71	0.004429	7.46	205.85	58.99	0.70	0.94	764.29
MIREHAVEN ARROYO	2155.11*	PF 1	1536.00	5258.25	5262.82	3.47	0.0240		5263.70	0.004535	7.52	204.32	58.82	0.71	0.96	753.60
MIREHAVEN ARROYO	2153.45	PF 1	1536.00	5258.21	5262.94	3.85	0.1299		5263.64	0.003199	6.73	228.26	59.22	0.60	0.74	809.55
MIREHAVEN ARROYO	2151.45*	PF 1	1536.00	5257.95	5262.69	3.34	0.1250		5263.61	0.004982	7.67	200.28	59.98	0.74	1.01	746.92
MIREHAVEN ARROYO	2149.45*	PF 1	1536.00	5257.70	5262.27	3.06	0.1301	5262.07	5263.56	0.007905	9.08	169.12	55.27	0.91	1.46	725.35
MIREHAVEN ARROYO	2147.45	PF 1	1536.00	5257.44	5262.07	2.88	3.6417	5262.07	5263.51	0.009675	9.65	159.15	55.34	1.00	1.68	731.89
MIREHAVEN ARROYO	2146.78	PF 1	1536.00	5255.00	5258.16	1.63	0.0325	5259.50	5263.15	0.072740	17.92	85.70	52.67	2.48	7.06	947.16
MIREHAVEN ARROYO	2144.93*	PF 1	1536.00	5254.94	5257.83	1.57	0.0325	5259.22	5262.99	0.078407	18.23	84.25	53.61	2.56	7.38	950.41
MIREHAVEN ARROYO	2143.08*	PF 1	1536.00	5254.88	5257.57	1.50	0.0325	5258.95	5262.83	0.083045	18.41	83.45	55.48	2.64	7.59	952.03
MIREHAVEN ARROYO	2141.23	PF 1	1536.00	5254.82	5257.21	1.43	0.0286	5258.61	5262.65	0.091711	18.73	82.02	57.32	2.76	7.99	967.27
MIREHAVEN ARROYO	2139.48*	PF 1	1536.00	5254.77	5257.12	1.46	0.0345	5258.51	5262.46	0.086891	18.53	82.88	56.76	2.70	7.76	955.80
MIREHAVEN ARROYO	2137.74*	PF 1	1536.00	5254.71	5257.02	1.49	0.0286	5258.41	5262.29	0.083426	18.42	83.37	56.09	2.66	7.61	950.76
MIREHAVEN ARROYO	2136.00*	PF 1	1536.00	5254.66	5256.89	1.52	0.0345	5258.27	5262.14	0.080412	18.39	83.50	54.94	2.63	7.52	950.20
MIREHAVEN ARROYO	2134.26*	PF 1	1536.00	5254.60	5256.73	1.56	0.0289	5258.13	5262.00	0.077552	18.41	83.43	53.44	2.60	7.47	951.61
MIREHAVEN ARROYO	2132.52*	PF 1	1536.00	5254.55	5256.55	1.59	0.0342	5257.97	5261.86	0.076147	18.48	83.11	52.26	2.58	7.47	953.88
MIREHAVEN ARROYO	2130.78*	PF 1	1536.00	5254.49	5256.37	1.59	0.0289	5257.81	5261.72	0.076821	18.57	82.73	52.02	2.59	7.54	956.08
MIREHAVEN ARROYO	2129.04	PF 1	1536.00	5254.44	5256.19	1.57	0.0898	5257.62	5261.58	0.078542	18.63	82.43	52.39	2.62	7.63	957.24
MIREHAVEN ARROYO	2127.37*	PF 1	1536.00	5254.29	5256.29	1.64	0.0839	5257.68	5261.36	0.069810	18.07	85.00	51.96	2.49	7.07	939.38
MIREHAVEN ARROYO	2125.70*	PF 1	1536.00	5254.15	5256.19	1.67	0.0898	5257.59	5261.23	0.067426	18.01	85.27	51.01	2.46	6.98	939.31
MIREHAVEN ARROYO	2124.04	PF 1	1536.00	5254.00	5255.90	1.64	0.0152	5257.32	5261.10	0.071313	18.29	83.97	51.06	2.51	7.24	946.75
MIREHAVEN ARROYO	2122.07*	PF 1	1536.00	5253.97	5255.93	1.69	0.0204	5257.32	5260.90	0.065619	17.88	85.90	50.76	2.42	6.85	931.22
MIREHAVEN ARROYO	2120.11*	PF 1	1536.00	5253.93	5255.96	1.74	0.0154	5257.32	5260.71	0.060537	17.49	87.81	50.46	2.34	6.50	916.92
MIREHAVEN ARROYO	2118.15*	PF 1	1536.00	5253.90	5256.00	1.79	0.0152	5257.32	5260.54	0.055737	17.09	89.87	50.24	2.25	6.15	902.42
MIREHAVEN ARROYO	2116.19*	PF 1	1536.00	5253.87	5256.04	1.84	0.0204	5257.31	5260.37	0.051366	16.70	91.98	50.06	2.17	5.82	888.50
MIREHAVEN ARROYO	2114.23*	PF 1	1536.00	5253.83	5256.07	1.88	0.0154	5257.31	5260.22	0.047554	16.34	94.00	49.88	2.10	5.52	876.19
MIREHAVEN ARROYO	2112.27*	PF 1	1536.00	5253.80	5256.11	1.93	0.0152	5257.31	5260.07	0.043912	15.96	96.22	49.80	2.02	5.23	863.46
MIREHAVEN ARROYO	2110.31*	PF 1	1536.00	5253.77	5256.16	1.98	0.0204	5257.31	5259.94	0.040614	15.60	98.49	49.77	1.95	4.95	851.33
MIREHAVEN ARROYO	2108.35*	PF 1	1536.00	5253.73	5256.20	2.02	0.0152	5257.31	5259.81	0.037763	15.26	100.67	49.77	1.89	4.71	840.69
MIREHAVEN ARROYO	2106.39*	PF 1	1536.00	5253.70	5256.24	2.07	0.0154	5257.31	5259.69	0.034959	14.90	103.09	49.85	1.83	4.45	829.49

HEC-RAS Plan: Plan 01 River: MIREHAVEN ARROYO Reach: MIREHAVEN ARROYO Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Hydr Depth	Invert Slope	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Shear Chan	Specif Force
			(cfs)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(lb/sq ft)	(cu ft)
MIREHAVEN ARROYO	1992.10*	PF 1	1536.00	5252.36	5255.51	2 46	0 0101	5255 76	5257.15	0.013200	10.27	149 61	60.86	1.15	2.00	689.62
MIREHAVEN ARROYO	1990.12*	PF 1	1536.00	5252.34	5255.49	2.46	0 0049	5255 74	5257.12	0.013121	10.24	149.97	60.95	1.15	1.99	688.94
MIREHAVEN ARROYO	1988.14*	PF 1	1536 00	5252.33	5255 48	2.47	0.0101	5255.71	5257 09	0.012893	10.18	150.93	61.11	1.14	1.96	687 84
MIREHAVEN ARROYO	1986 16*	PF 1	1536.00	5252.31	5255 46	2 47	0.0052	5255 69	5257.06	0 012778	10.14	151.42	61 18	1 14	1.95	687.09
MIREHAVEN ARROYO	1984.18*	PF 1	1536.00	5252.30	5255.45	2.48	0.0049	5255.66	5257.03	0.012553	10.08	152.37	61 32	1 13	1.92	686.02
MIREHAVEN ARROYO	1982.21*	PF 1	1536 00	5252.29	5255.44	2.50	0 0101	5255.63	5257 00	0.012301	10.01	153.42	61.42	1.12	1 89	684 98
MIREHAVEN ARROYO	1980.23*	PF 1	1536.00	5252 27	5255 42	2 50	0.0052	5255 62	5256.97	0 012225	9.99	153.80	61.51	1 11	1.88	684 37
MIREHAVEN ARROYO	1978.25*	PF 1	1536.00	5252.26	5255.41	2.51	0.0099	5255.58	5256 94	0.011988	9 92	154.82	61.61	1 10	1.85	683.44
MIREHAVEN ARROYO	1976.27*	PF 1	1536 00	5252.24	5255.39	2.52	0.0052	5255.55	5256 91	0.011900	9.89	155.25	61.69	1.10	1.84	682 83
MIREHAVEN ARROYO	1974.29*	PF 1	1536 00	5252.23	5255 38	2.53	0.0101	5255 54	5256.88	0.011671	9.83	156.26	61.77	1.09	1.81	682.01
MIREHAVEN ARROYO	1972 31*	PF 1	1536.00	5252.21	5255.36	2.53	0.0049	5255 50	5256 85	0.011580	9 80	156.72	61 85	1.09	1 80	681.44
MIREHAVEN ARROYO	1970.33*	PF 1	1536.00	5252.20	5255.35	2.55	0 0052	5255.47	5256 82	0.011364	9.74	157.73	61.96	1.08	1 78	680 65
MIREHAVEN ARROYO	1968.35*	PF 1	1536 00	5252 19	5255 34	2.56	0.0101	5255.45	5256.79	0 011145	9.67	158.77	62.06	1.07	1.75	679 92
MIREHAVEN ARROYO	1966.37*	PF 1	1536 00	5252 17	5255.32	2 56	0 0049	5255.42	5256.76	0.011054	9 65	159.23	62.11	1 06	1.74	679.47
MIREHAVEN ARROYO	1964.4*	PF 1	1536.00	5252.16	5255.31	2.58	0 0101	5255.39	5256.74	0.010848	9.58	160.26	62 22	1 05	1 71	678.81
MIREHAVEN ARROYO	1962.42*	PF 1	1536.00	5252.14	5255.29	2.58	0 0052	5255.37	5256.71	0.010772	9.56	160 67	62.28	1.05	1.71	678.39
MIREHAVEN ARROYO	1960.44*	PF 1	1536.00	5252.13	5255.28	2.59	0.0101	5255.34	5256.68	0.010560	9.50	161 75	62.37	1.04	1.68	677 84
MIREHAVEN ARROYO	1958.46*	PF 1	1536.00	5252.11	5255.26	2.60	0.0049	5255.31	5256 65	0.010489	9.47	162.16	62.43	1.04	1.67	677.44
MIREHAVEN ARROYO	1956.48*	PF 1	1536.00	5252.10	5255 25	2.61	0.0052	5255.29	5256.62	0.010281	9.41	163.23	62.50	1.03	1.65	676.99
MIREHAVEN ARROYO	1954.50*	PF 1	1536.00	5252 09	5255 24	2 62	0.0101	5255 26	5256.60	0 010089	9.35	164.29	62.61	1 02	1 62	676.56
MIREHAVEN ARROYO	1952.52*	PF 1	1536 00	5252 07	5255 22	2 63	0 0049	5255 23	5256.57	0 010017	9 33	164 70	62.65	1.01	1 61	676.23
MIREHAVEN ARROYO	1950.54*	PF 1	1536.00	5252 06	5255.21	2 64	0 0101	5255 22	5256.54	0.009819	9 26	165 81	62.74	1.00	1.59	675.94
MIREHAVEN ARROYO	1948.56*	PF 1	1536 00	5252.04	5255.12	2.59	0 0052	5255.18	5256 52	0.010609	9.50	161.77	62.52	1.04	1.68	676 13
MIREHAVEN ARROYO	1946.59*	PF 1	1536.00	5252.03	5255.11	2.60	0.0101	5255.16	5256 49	0.010403	9.43	162.82	62 60	1.03	1 66	675 71
MIREHAVEN ARROYO	1944.61*	PF 1	1536.00	5252.01	5255.09	2 61	0.0049	5255 12	5256 46	0.010317	9.41	163.29	62.65	1 03	1 65	675.39
MIREHAVEN ARROYO	1942.63*	PF 1	1536.00	5252.00	5255 08	2 62	0.0049	5255 10	5256.43	0.010117	9 34	164.37	62.73	1.02	1.62	675.04
MIREHAVEN ARROYO	1940.65*	PF 1	1536.00	5251 99	5255.07	2 63	0 0101	5255 08	5256.41	0.009917	9 28	165 46	62.81	1.01	1 60	674.73
MIREHAVEN ARROYO	1938.67*	PF 1	1536 00	5251.97	5255 05	2.64	0.0052	5255.06	5256.38	0.009849	9.26	165.86	62.84	1.00	1.59	674.50
MIREHAVEN ARROYO	1936.69*	PF 1	1536 00	5251.96	5254.96	2.58	0.0101	5255.02	5256 36	0 010655	9.49	161.78	62.65	1 04	1.68	674 75
MIREHAVEN ARROYO	1934.71*	PF 1	1536.00	5251.94	5254.94	2.59	0.0049	5255.00	5256.33	0.010562	9.47	162.26	62.67	1.04	1 67	674.47
MIREHAVEN ARROYO	1932.73*	PF 1	1536.00	5251.93	5254.93	2.60	0.0101	5254 97	5256.30	0.010352	9 40	163.34	62.74	1.03	1 65	674.10
MIREHAVEN ARROYO	1930.75*	PF 1	1536 00	5251 91	5254 91	2.61	0.0052	5254.94	5256.27	0.010279	9.38	163.76	62.80	1.02	1.64	673 87
MIREHAVEN ARROYO	1928.78	PF 1	1536.00	5251 90	5254.90	2.62	0.0178	5254.93	5256 24	0.010074	9.32	164.85	62 86	1 01	1.61	673.58
MIREHAVEN ARROYO	1927.11*	PF 1	1536 00	5251.87	5254.64	2.45	0.0181	5254.86	5256.21	0 012800	10.05	152 76	62.29	1.13	1 92	677 16
MIREHAVEN ARROYO	1925.44*	PF 1	1536.00	5251.84	5254.89	2 71	0 0178	5254 79	5256.13	0.008910	8.95	171.70	63.40	0 96	1.47	672 37
MIREHAVEN ARROYO	1923.78	PF 1	1536.00	5251 81	5254.93	2.79	0.1558	5254.74	5256 08	0.007974	8.62	178 11	63.81	0.91	1.36	673 98
MIREHAVEN ARROYO	1922.11*	PF 1	1536 00	5251.55	5254.89	2.77	0.1497	5254.72	5256.06	0 008165	8.68	176 87	63.96	0.92	1 38	673 93
MIREHAVEN ARROYO	1920.44*	PF 1	1536 00	5251.30	5254.70	2.62	0.1555	5254 70	5256.02	0 009926	9.23	166.45	63 60	1 01	1 58	673.67
MIREHAVEN ARROYO	1918.78	PF 1	1536.00	5251.04	5254 54	2.51	0.5151	5254.67	5255.99	0.011611	9.67	158 80	63.34	1 08	1.77	678.62
MIREHAVEN ARROYO	1916.78*	PF 1	1536.00	5250.01	5253.24	2.04	0.5149	5254.01	5255.85	0.027241	12 97	118.43	57.95	1.60	3 40	753.84
MIREHAVEN ARROYO	1914.78	PF 1	1536.00	5248.98	5252.22	1.84	0.0156	5253 27	5255.70	0.042288	14 97	102.60	55.68	1.94	4 70	820.64
MIREHAVEN ARROYO	1912.87*	PF 1	1536 00	5248.95	5252.16	1.86	0 0105	5253 18	5255.62	0.041373	14.93	102 86	55.28	1 93	4.66	820.30
MIREHAVEN ARROYO	1910.96*	PF 1	1536.00	5248.93	5252.09	1.88	0.0158	5253.13	5255.55	0.040807	14.93	102.85	54.85	1.92	4.65	821.41
MIREHAVEN ARROYO	1909.06*	PF 1	1536.00	5248.90	5252.01	1.89	0.0105	5253.05	5255.48	0.040292	14.94	102.80	54.40	1 92	4 63	822.89
MIREHAVEN ARROYO	1907.15*	PF 1	1536.00	5248.88	5251.95	1.91	0.0156	5252 98	5255.39	0.039250	14.88	103.21	53 98	1.90	4.58	822 10
MIREHAVEN ARROYO	1905.24*	PF 1	1536 00	5248.85	5251.87	1.93	0 0158	5252 90	5255.31	0.038583	14.87	103.27	53.47	1.89	4.55	823.09
MIREHAVEN ARROYO	1903.34*	PF 1	1536.00	5248 82	5251 79	1.95	0.0105	5252 83	5255 23	0.037973	14 87	103.28	52.93	1 88	4 53	824.32
MIREHAVEN ARROYO	1901.43*	PF 1	1536.00	5248.80	5251 71	1.98	0.0156	5252.75	5255 15	0.037112	14 87	103.28	52.10	1.86	4.51	825 40
MIREHAVEN ARROYO	1899.53*	PF 1	1536.00	5248.77	5251.62	2.01	0.0156	5252.67	5255.06	0 036406	14.89	103.15	51.21	1.85	4.50	826.92
MIREHAVEN ARROYO	1897.62*	PF 1	1536.00	5248.74	5251.52	2.04	0.0105	5252 58	5255.00	0.036203	14.96	102.65	50.41	1 85	4.52	829.94
MIREHAVEN ARROYO	1895.71*	PF 1	1536 00	5248.72	5251.42	2 05	0 0158	5252.49	5254 93	0.036063	15.02	102.24	49.78	1.85	4.54	832 23
MIREHAVEN ARROYO	1893.81*	PF 1	1536.00	5248.69	5251 31	2.06	0.0105	5252.40	5254 86	0.036279	15.11	101 64	49.26	1.85	4.59	835.38
MIREHAVEN ARROYO	1891.90*	PF 1	1603.00	5248.67	5251.36	2.19	0.0156	5252.40	5254.75	0.032134	14.78	108.46	49 54	1 76	4.31	864 78
MIREHAVEN ARROYO	1890	PF 1	1603 00	5248.64	5251.24	2 19	0 0100	5252.29	5254.69	0.032715	14.90	107.59	49.15	1.77	4 38	868 81
MIREHAVEN ARROYO	1888.00*	PF 1	1603.00	5248.62	5251.26	2 21	0.0100	5252.28	5254 59	0.031227	14.64	109 48	49.59	1.74	4.22	859.41
MIREHAVEN ARROYO	1886.00*	PF 1	1603.00	5248.60	5251.27	2.22	0.0100	5252.25	5254 51	0 030201	14.45	110.92	50 00	1.71	4.10	852.38
MIREHAVEN ARROYO	1884.01*	PF 1	1603.00	5248.58	5251.27	2.23	0.0100	5252.24	5254.43	0.029209	14 26	112.38	50.40	1 68	3.99	845.62

SCOUR CALCULATION WORK SHEET

(Based on "Sediment and Erosion Design Guide," AMAFCA)

Project: #1823 - MIREHAVEN ARROYO

Notes:

Check Dams

$d_s = KH_t^{.225} q^{.54} - y_m$

y_s	=	local scour depth for overfall	y_s =	**9.5 ft**	NEEDS RIPRAP LINING ON BOTTOM
q	=	discharge/unit width	=	33.2	41.06 wide 1495 cfs
H_t	=	drop in head--$EGL_{upstream}$-$EGL_{downstream}$	=	6	28+26 to 27+56
y_m	=	tailwater depth	=	3.6	
K	=	1.32			

Scour Along Floodwall

Flow at an angle $y_s = y_1[(0.73+0.14\pi F^2)\cos\beta + 4F^{.33}\sin\beta]$ (along edge of access ramp)

y_s	=	scour depth	y_s =	**5.2 ft**	NEEDS RIPRAP LINING ON BOTTOM
y_1	=	flow depth	=	3.56	at 31+20.63
F	=	Froude number	=	0.61	
β	=	angle	=	9.6	

Parallel flow $y_s = y_1(0.73+0.14\pi F^2)$ (at bottom of drop structure ramp)

y_s	=	scour depth	y_s =	**6.4 ft**	NEEDS RIPRAP LINING ON BOTTOM
y_1	=	flow depth	=	1.58	at 29+90
F	=	Froude number	=	2.76	

Parallel flow $y_s = y_1(0.73+0.14\pi F^2)$ (before hydraulic jump)

y_s	=	scour depth	y_s =	**5.5 ft**	NEEDS RIPRAP LINING ON BOTTOM
y_1	=	flow depth	=	1.74	at 29+81.06
F	=	Froude number	=	2.36	

Parallel flow $y_s = y_1(0.73+0.14\pi F^2)$ (after hydraulic jump)

y_s	=	scour depth	y_s =	**3.3 ft**	OK
y_1	=	flow depth	=	3.43	at 29+49.58
F	=	Froude number	=	0.73	

RIPRAP SIZING FOR LOW ENERGY APPLICATIONS - CHANNEL BANKS

PROJECT: MIREHAVEN ARROYO
DATE: 1/21/2013

Method per Urban Storm Drainage Criteria Manual Vol. 1 (2001, rev. 2008)

$$D_{50} = \frac{(VS^{0.17})^2}{[4.5\,(G_s-1)^{0.66}]^2} \qquad \text{(EQ. MD-13)}$$

where: D_{50} = median stone diameter (ft)
V = average channel velocity (ft/s)
S = channel slope (ft/ft)
G_s = specific gravity of stone (min. = 2.50)
Per COA Specs 165 pcf/62.4 pcf = 2.64

LOCATION	V (ft/s)	S	D_{50} (ft)	DESCRIPTION
31+49.90	8.98	0.0069	**0.382**	At narrowest point of maintenance access ramp
30+50.2	10.17	0.0110	**0.574**	Above upstream drop structure
29+75.16	16.55	0.0051	**1.170**	Below drop structure, before hydraulic jump, typ.
29+00.63	7.93	0.0053	**0.272**	Between drop structures, typ.
28+31	8.77	0.0061	**0.349**	Above drop structure, typ.
			0.000	
			0.000	
			0.000	

RIPRAP SIZING FOR STORM DRAIN OUTLET

PROJECT: MIREHAVEN ARROYO
DATE: 1/22/2013

Method per Urban Storm Drainage Criteria Manual Vol. 1 (2001, rev. 2008)

$P_d = (V^2 + gd)^{1/2}$ (EQ. HS-16e)

$L = 4D$ or $L = D^{1/2}(V/2)$ (EQ. HS-18)

$W = 4D$ (EQ. HS-20)

where:
- P_d = Riprap design parameter (ft/s)
- V = velocity at pipe outlet (ft/s)
- g = gravity (ft/s^2) = 32.2 ft/s^2
- d = design depth of flow at pipe outlet (ft)
- L = riprap pad length (ft)
- D = diameter of pipe (or height of rectangular conduit)
- W = riprap pad width (ft)

LOCATION	V (ft/s)	d (ft)	P_d (ft)	Size per Figure HS-20c	D (ft)	L (ft)	W (ft)
42" RCP from Stormcloud U5	7.0	3.5	**12.7**	Type 'L'	3.5	**6.5**	**14.0**
36" RCP from Stormcloud U4	7.5	2.0	**11.0**	Type 'L'	3.0	**6.50**	**12.00**
			0.0			**0.00**	**0.00**

FREEBOARD CALCULATIONS

PROPOSED CONDITION

Per City of Albuquerque DPM Chapter 22.3.C

For Q < 100 cfs and V_{ave} < 35 fps:

$$\text{Freeboard (feet)} = 1.0 + 0.025Vd^{1/3}$$

For Q > 100 cfs and V_{ave} > 35 fps:

$$\text{Freeboard (feet)} = 0.7\,(2.0 + 0.025Vd^{1/3})$$

Q =	1495	cfs
V =	6.96	fps
d =	3.67	ft

Freeboard = 1.6 ft

CHANNEL SUPERELEVATION CALCS
PROPOSED CONDITION

MIREHAVEN ARROYO

Project #: 1823
Date: 1/15/2013

Trapezoidal Channel
Per COA DPM Chapter 23, Section 3.c.3.a.(2)

For SUBcritical flow (Froude # < 1)

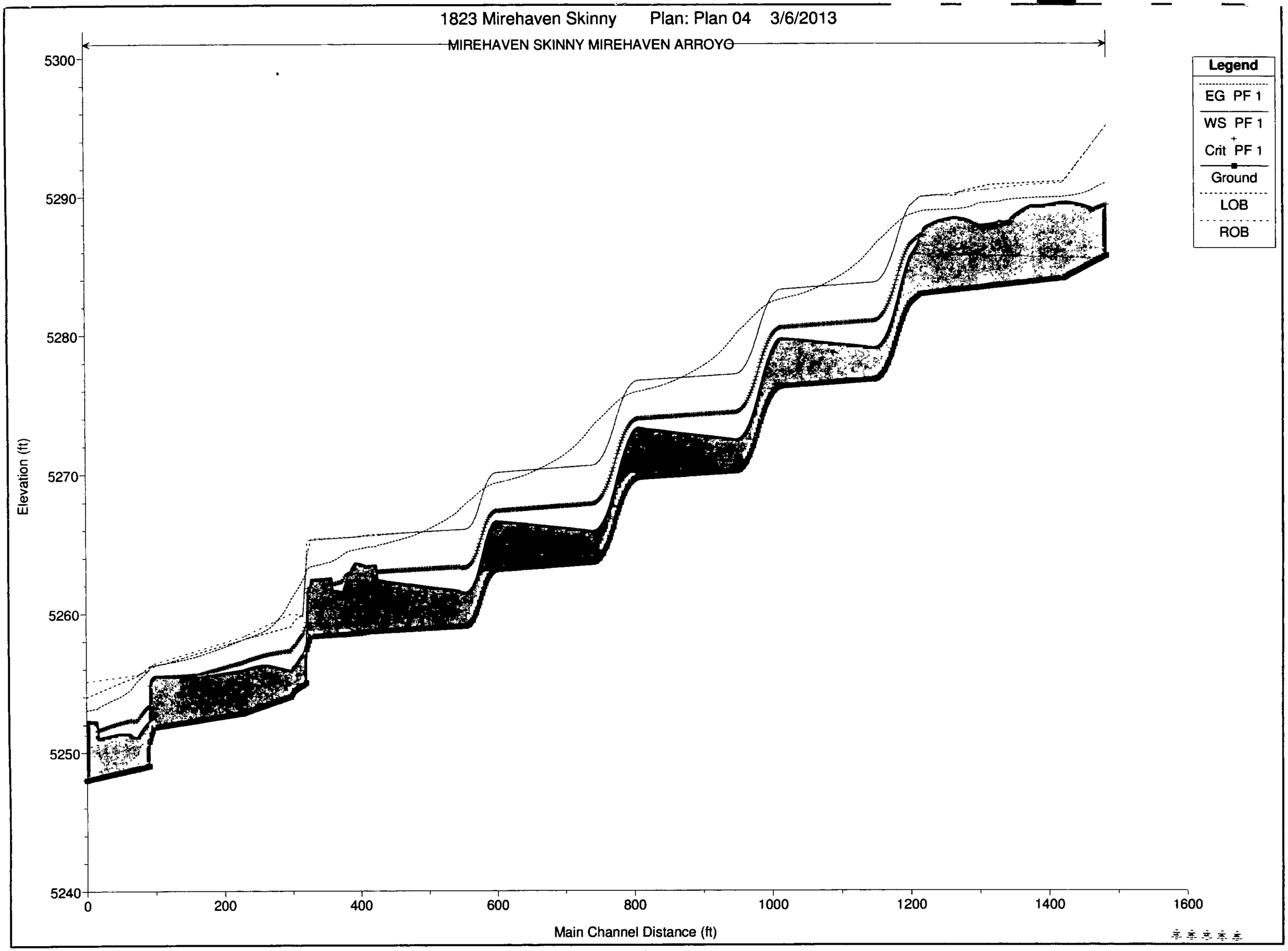
$$S = \frac{1.15\,V^2\,(b + 2zD)}{2gr}$$

where:
S = superelevation height (ft)
V = velcoity of the flow cross section (fps)
b = channel bottom width (ft)
g = 32.2 ft/s2
z = cotangent of bank slope (z:1)
D = Depth of flow for an equivalent straight reach (ft)
r = radius of channel centerline curve (ft)

STA	V (ft/s)	b (ft)	z (z:1)	D (ft)	r (ft)	Superelevation (ft)
23+00.48	6.36	41	2	4	310	0.13

APPENDIX C

Alternate Conditions


1823 Mirehaven Skinny Plan: Plan 04 3/6/2013
MIREHAVEN SKINNY MIREHAVEN ARROYO
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
LOB
ROB
Elevation (ft)
5300
5290
5280
5270
5260
5250
5240
0
200
400
600
800
1000
1200
1400
1600
Main Channel Distance (ft)

HEC-RAS Plan Plan 03 River MIREHAVEN SKINNY Reach MIREHAVEN ARROYO Profile PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Max Chl Dpth	Invert Slope	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Shear Chan	Specif Force
			(cfs)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(lb/sq ft)	(cu ft)
MIREHAVEN ARROYO	3309.34	PF 1	1495.00	5285 70	5289 40	3 70	0.0257	5289.38	5290.94	0.012685	9 97	150 00	48.13	0 99	2 38	722 61
MIREHAVEN ARROYO	3307.38*	PF 1	1495.00	5285 65	5289 36	3 71	0.0254	5289.36	5290.91	0.012960	10 00	149 52	48 56	1 00	2.41	719.43
MIREHAVEN ARROYO	3305.42*	PF 1	1495 00	5285 60	5289 24	3.64	0.0306	5289 33	5290.88	0 014211	10.27	145.52	48 68	1.05	2.57	717 24
MIREHAVEN ARROYO	3303.47*	PF 1	1495 00	5285 54	5289.22	3 68	0 0254	5289.30	5290 83	0 014066	10.20	146.56	49 22	1 04	2 53	714 48
MIREHAVEN ARROYO	3301.51*	PF 1	1495 00	5285 49	5289 21	3.72	0.0257	5289 26	5290 79	0 013779	10.09	148.11	49 78	1 03	2 48	711.81
MIREHAVEN ARROYO	3299.56*	PF 1	1495 00	5285 44	5289 21	3 77	0.0254	5289 22	5290.74	0.013266	9.93	150.49	50 38	1 01	2 40	709 40
MIREHAVEN ARROYO	3297.60*	PF 1	1495 00	5285 39	5289 04	3 65	0 0257	5289 18	5290 70	0.015155	10 35	144 41	50.29	1 08	2.64	709 19
MIREHAVEN ARROYO	3295.65*	PF 1	1495 00	5285 34	5289 06	3 72	0 0254	5289 13	5290.64	0 014139	10.09	148.23	50.98	1 04	2 49	706 24
MIREHAVEN ARROYO	3293.69*	PF 1	1495 00	5285.29	5289 08	3 79	0 0306	5289 08	5290 58	0 013139	9 81	152.38	51.71	1 01	2 35	704 18
MIREHAVEN ARROYO	3291.73*	PF 1	1495 00	5285 23	5288 83	3 60	0 0254	5289.03	5290 54	0.016152	10 48	142.64	51.29	1 11	2 73	706.32
MIREHAVEN ARROYO	3289.78*	PF 1	1495 00	5285.18	5289.16	3.98	0 0257	5288 97	5290 46	0 010909	9 17	163 00	53 24	0 92	2.03	703 88
MIREHAVEN ARROYO	3287.82*	PF 1	1495 00	5285 13	5289 20	4.06	0 0254	5288.91	5290 41	0 009905	8 86	168 72	53 99	0 88	1 88	705 94
MIREHAVEN ARROYO	3285.87*	PF 1	1495 00	5285 08	5289 23	4.15	0 0257		5290 37	0 009014	8 57	174 54	54 76	0 85	1 74	709 46
MIREHAVEN ARROYO	3283.91*	PF 1	1495.00	5285 03	5289 27	4.24	0.0254		5290.33	0.008169	8 27	180.78	55 53	0.81	1 61	714.58
MIREHAVEN ARROYO	3281.96*	PF 1	1495.00	5284.98	5289 30	4 32	0 0306		5290 30	0 007453	8 00	186 82	56 28	0.77	1 50	720.86
MIREHAVEN ARROYO	3280.00*	PF 1	1495 00	5284 92	5289 33	4 41	0 0254		5290 26	0 006736	7.72	193 62	57 04	0.74	1.39	729 67
MIREHAVEN ARROYO	3278.04*	PF 1	1495 00	5284 87	5289 36	4 49	0 0257		5290 23	0.006148	7.48	199.99	57 75	0 71	1 29	738 89
MIREHAVEN ARROYO	3276.09*	PF 1	1495 00	5284 82	5289 39	4 57	0 0254		5290.20	0 005613	7.24	206.56	58 47	0.68	1 20	749 50
MIREHAVEN ARROYO	3274.13*	PF 1	1495.00	5284 77	5289.41	4 64	0.0254		5290 18	0 005123	7.01	213.33	59 18	0.65	1 12	761 54
MIREHAVEN ARROYO	3272.18*	PF 1	1495.00	5284 72	5289 44	4.71	0 0257		5290 15	0 004691	6 79	220 07	59.86	0.62	1 05	774 55
MIREHAVEN ARROYO	3270.22*	PF 1	1495.00	5284 67	5289.46	4 79	0.0306		5290.13	0.004292	6 58	227 11	60.58	0.60	0.98	789 19
MIREHAVEN ARROYO	3268.27*	PF 1	1495 00	5284 61	5289 48	4 87	0 0254		5290 11	0 003905	6 37	234 76	61.27	0 57	0 91	806.66
MIREHAVEN ARROYO	3266.31*	PF 1	1495.00	5284.56	5289 50	4.94	0 0257		5290.09	0 003579	6 18	242 05	61 95	0 55	0 85	823.80
MIREHAVEN ARROYO	3264.36*	PF 1	1495 00	5284 51	5289 52	5.01	0 0254		5290 07	0 003280	5.99	249.65	62 65	0 53	0 79	842.68
MIREHAVEN ARROYO	3262.40*	PF 1	1495.00	5284.46	5289.53	5 07	0.0254		5290.06	0.003009	5 81	257.32	63 32	0 51	0 74	862 50
MIREHAVEN ARROYO	3260.44*	PF 1	1495.00	5284.41	5289.55	5 14	0 0257		5290 04	0.002764	5.64	265.14	63 97	0 49	0 69	883 58
MIREHAVEN ARROYO	3258.49*	PF 1	1495.00	5284 36	5289.56	5.20	0 0254		5290 03	0 002538	5 47	273 24	64 66	0 47	0.65	906.27
MIREHAVEN ARROYO	3256.53*	PF 1	1495.00	5284 31	5289.58	5 27	0 0306		5290 02	0.002337	5 31	281 37	65 33	0.45	0 61	929 84
MIREHAVEN ARROYO	3254.58*	PF 1	1495.00	5284 25	5289 59	5.34	0 0254		5290.00	0.002139	5.15	290 24	65.99	0 43	0 57	957 05
MIREHAVEN ARROYO	3252.62*	PF 1	1495.00	5284 20	5289 60	5 40	0.0257		5289.99	0.001970	5.00	298 81	66.64	0 42	0 53	983 41
MIREHAVEN ARROYO	3250.67	PF 1	1495.00	5284.15	5289 62	5.47	0.0229		5289 98	0 001817	4.86	307 57	67 31	0.40	0.50	1011.17
MIREHAVEN ARROYO	3248.92*	PF 1	1495.00	5284.11	5289 57	5 46	0 0229		5289 98	0 001450	5.09	293 77	67.59	0 43	0 38	953 72
MIREHAVEN ARROYO	3247.18*	PF 1	1495 00	5284.07	5289.61	5 54	0 0064		5289 96	0 000664	4.72	316 43	68.17	0 39	0 19	1038 73
MIREHAVEN ARROYO	3245.65*	PF 1	1495 00	5284 06	5289.56	5 50	0 0067		5289 95	0 000810	5.04	296 75	67.74	0 42	0 21	963.78
MIREHAVEN ARROYO	3244.13	PF 1	1495.00	5284 05	5289.58	5 53	0 0051		5289 94	0 000684	4.78	312 69	67.59	0 39	0.19	1030 31
MIREHAVEN ARROYO	3242.20*	PF 1	1495.00	5284.04	5289.57	5 52	0 0053		5289 94	0 000728	4.89	305 76	67.15	0.40	0 20	1010 54
MIREHAVEN ARROYO	3240.27*	PF 1	1495 00	5284 03	5289 55	5 52	0.0051		5289 93	0.000774	5 00	299 29	66.71	0 42	0 21	991 96
MIREHAVEN ARROYO	3238.34*	PF 1	1495 00	5284.02	5289.53	5 51	0.0053		5289.93	0.000820	5.10	293.14	66 21	0.43	0.22	974 34
MIREHAVEN ARROYO	3236.41*	PF 1	1495.00	5284 01	5289.51	5 50	0.0051		5289.93	0.000867	5.20	287 30	65 73	0.44	0 23	957 40
MIREHAVEN ARROYO	3234 48*	PF 1	1495 00	5284 00	5289.49	5 49	0 0104		5289 93	0.000914	5 30	281.82	65 17	0 45	0 24	941 70
MIREHAVEN ARROYO	3232.55*	PF 1	1495 00	5283.98	5289.47	5 49	0 0051		5289.92	0.000955	5 39	277 21	64 61	0 46	0 25	929.03
MIREHAVEN ARROYO	3230.62*	PF 1	1495 00	5283 97	5289 45	5.48	0 0053		5289 92	0.001001	5.49	272 50	64 12	0 47	0.26	915.73
MIREHAVEN ARROYO	3228.70*	PF 1	1495 00	5283.96	5289 43	5 47	0 0051		5289.92	0.001042	5 57	268 41	63.64	0 48	0 27	904 15
MIREHAVEN ARROYO	3226.77*	PF 1	1495 00	5283.95	5289 42	5 47	0 0053		5289.91	0.001082	5 65	264 63	63 16	0 49	0 27	893 76
MIREHAVEN ARROYO	3224.84*	PF 1	1495 00	5283.94	5289.40	5.46	0.0051		5289.91	0.001118	5 72	261 27	62.67	0 49	0 28	884 92
MIREHAVEN ARROYO	3222.91*	PF 1	1495 00	5283 93	5289.39	5 46	0 0053		5289.91	0.001151	5 79	258 26	62 20	0 50	0 29	877.28
MIREHAVEN ARROYO	3220.98*	PF 1	1495 00	5283 92	5289.38	5 45	0 0051		5289.90	0.001175	5 84	256 03	61 75	0 51	0 29	872.15
MIREHAVEN ARROYO	3219.05*	PF 1	1495 00	5283 91	5289.36	5 45	0 0053		5289.90	0.001196	5 89	253 96	61 28	0 51	0 30	868 12
MIREHAVEN ARROYO	3217.12*	PF 1	1495 00	5283 90	5289.35	5 45	0 0051		5289 90	0 001208	5 92	252 54	60 84	0 51	0 30	866 25
MIREHAVEN ARROYO	3215.2*	PF 1	1495.00	5283 89	5289.35	5 46	0 0053		5289 90	0 001216	5 95	251 40	60 39	0 51	0 30	865.70
MIREHAVEN ARROYO	3213.27*	PF 1	1495 00	5283.88	5289 34	5 46	0 0104		5289 89	0 001211	5 95	251 06	59 97	0 51	0.30	868.04
MIREHAVEN ARROYO	3211.34*	PF 1	1495.00	5283 86	5289 34	5 48	0 0051		5289 89	0 001200	5 95	251.19	59.54	0 51	0 30	872 69
MIREHAVEN ARROYO	3209.41*	PF 1	1495.00	5283 85	5289 34	5 49	0.0053		5289 89	0 001182	5.94	251 71	59 14	0.51	0 30	879.05
MIREHAVEN ARROYO	3207.48*	PF 1	1495 00	5283.84	5289 34	5.50	0 0051		5289 88	0 001161	5.92	252 46	58 73	0.50	0 30	886 82
MIREHAVEN ARROYO	3205.55*	PF 1	1495 00	5283.83	5289 34	5.51	0.0053		5289 88	0 001130	5 89	253 94	58 33	0 50	0.29	897.76
MIREHAVEN ARROYO	3203.62*	PF 1	1495.00	5283.82	5289 34	5.52	0 0051		5289 87	0 001099	5.85	255 52	57.92	0 49	0.29	910 05
MIREHAVEN ARROYO	3201.7	PF 1	1495.00	5283 81	5289 35	5 54	0 0052		5289 87	0 001060	5 80	257 75	57 53	0 48	0 28	925 63
MIREHAVEN ARROYO	3199.71*	PF 1	1495.00	5283.80	5289 31	5.50	0 0049		5289 86	0.001163	5 99	249 64	56 97	0 50	0 30	899 07
MIREHAVEN ARROYO	3197.73*	PF 1	1495.00	5283 79	5289 26	5.47	0 0052		5289 86	0.001273	6 18	241.85	56 36	0 53	0 33	875 33
MIREHAVEN ARROYO	3195.74*	PF 1	1495.00	5283 78	5289.22	5 44	0 0049		5289 85	0.001393	6 38	234 29	55.74	0 55	0.35	853.84
MIREHAVEN ARROYO	3193.76*	PF 1	1495.00	5283 77	5289.17	5 40	0.0052		5289 84	0 001525	6.59	226 90	55.10	0 57	0 38	834 69

HEC-RAS Plan Plan 03 River MIREHAVEN SKINNY Reach MIREHAVEN ARROYO Profile PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Max Chl Dpth	Invert Slope	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Shear Chan	Specif Force
			(cfs)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(lb/sq ft)	(cu ft)
MIREHAVEN ARROYO	3078.32*	PF 1	1495.00	5283 13	5288.37	5 24	0 0053		5289.02	0 001444	6.48	230 70	55 23	0 56	0 36	851 65
MIREHAVEN ARROYO	3076.49*	PF 1	1495 00	5283 12	5288 35	5 23	0 0056		5289 02	0 001490	6 57	227.68	54 68	0 57	0 37	847.26
MIREHAVEN ARROYO	3074.65*	PF 1	1495 00	5283 11	5288 33	5 22	0 0053		5289.02	0 001537	6 65	224 69	54.12	0 58	0 38	843 07
MIREHAVEN ARROYO	3072 82*	PF 1	1495 00	5283 10	5288 31	5 21	0 0056		5289.01	0 001588	6.74	221 65	53 56	0 58	0 39	839 00
MIREHAVEN ARROYO	3070.99*	PF 1	1495 00	5283 09	5288.28	5 19	0 0053		5289 01	0 001641	6.84	218.59	52 99	0 59	0 40	835 04
MIREHAVEN ARROYO	3069.16*	PF 1	1495.00	5283 08	5288.26	5.18	0 0056		5289 01	0.001691	6.93	215.79	52 44	0 60	0 42	831 67
MIREHAVEN ARROYO	3067.33	PF 1	1495.00	5283 07	5288 24	5 17	0.0053		5289 00	0.001747	7.02	212.85	51 86	0.61	0.43	828 25
MIREHAVEN ARROYO	3065.49*	PF 1	1495.00	5283 06	5288.20	5 14	0 0056		5289 00	0 001832	7 16	208 82	51 25	0 63	0 45	821 52
MIREHAVEN ARROYO	3063.66*	PF 1	1495 00	5283.05	5288 17	5 12	0 0053		5289 00	0.001920	7 30	204.93	50 65	0 64	0 46	815.57
MIREHAVEN ARROYO	3061.83*	PF 1	1495 00	5283 04	5288 13	5 09	0.0056		5288 99	0 002018	7 44	200.91	50 04	0 65	0 48	809 60
MIREHAVEN ARROYO	3059.99*	PF 1	1495 00	5283 03	5288 09	5 06	0 0053		5288 99	0 002122	7.59	196 91	49.42	0.67	0 51	804 26
MIREHAVEN ARROYO	3058.16*	PF 1	1495 00	5283 02	5288 05	5.03	0 0056		5288.98	0 002233	7 75	192 96	48 79	0 69	0 53	799.33
MIREHAVEN ARROYO	3056.33*	PF 1	1495 00	5283 01	5288 01	5.00	0.0053		5288.98	0.002342	7 90	189 30	48 19	0 70	0.55	795 22
MIREHAVEN ARROYO	3054.49*	PF 1	1495 00	5283 00	5287 96	4.96	0 0053		5288 97	0 002469	8 06	185 40	47.55	0 72	0.57	791 28
MIREHAVEN ARROYO	3052.66*	PF 1	1495 00	5282 99	5287.91	4.92	0.0056		5288.97	0 002599	8 23	181 65	46.93	0 74	0.60	787 87
MIREHAVEN ARROYO	3050.83*	PF 1	1495.00	5282 98	5287 86	4 88	0.0053		5288.96	0 002744	8 41	177.81	46.28	0 76	0 63	784 79
MIREHAVEN ARROYO	3049	PF 1	1495.00	5282 97	5287 81	4 84	0.0061		5288 96	0 002896	8 59	174 08	45 65	0 78	0.66	782.19
MIREHAVEN ARROYO	3047.33*	PF 1	1495 00	5282 96	5287 73	4 77	0 0058		5288 95	0.003135	8 85	168 90	44.96	0 80	0.70	777 55
MIREHAVEN ARROYO	3045.66*	PF 1	1495 00	5282.95	5287 63	4 68	0 0061	5287 16	5288 94	0.003457	9.18	162 87	44 17	0 84	0 76	773 05
MIREHAVEN ARROYO	3044	PF 1	1495 00	5282.94	5287 20	4 26	0 0065	5287.19	5288 90	0 005022	10 48	142 66	42.03	1.00	1.02	764 47
MIREHAVEN ARROYO	3042.50*	PF 1	1495 00	5282 93	5287.19	4.26	0.0068	5287.18	5288 89	0 005021	10.48	142 67	42 03	1.00	1.02	764 50
MIREHAVEN ARROYO	3041.01	PF 1	1495 00	5282 92	5287 17	4 25	0.0478	5287.17	5288 88	0 005053	10 50	142.35	41 99	1 01	1.02	764.53
MIREHAVEN ARROYO	3039.13*	PF 1	1495.00	5282 83	5286.76	3 93	0.0426	5287.09	5288.84	0 006702	11 58	129 06	40.70	1 15	1 27	771.16
MIREHAVEN ARROYO	3037.25*	PF 1	1495.00	5282 75	5286 55	3.80	0.0426	5287 00	5288.81	0 007524	12 06	124 00	40.21	1 21	1.39	777 24
MIREHAVEN ARROYO	3035.38*	PF 1	1495.00	5282.67	5286.38	3 71	0 0478	5286 91	5288 78	0 008249	12 44	120 14	39.83	1 26	1 49	783.39
MIREHAVEN ARROYO	3033.50*	PF 1	1495 00	5282 58	5286.19	3 61	0 0426	5286 83	5288 76	0 009058	12 85	116 32	39.44	1 32	1 60	791.03
MIREHAVEN ARROYO	3031.62*	PF 1	1495 00	5282 50	5286.04	3 54	0 0478	5286 75	5288 73	0 009753	13.18	113 41	39.15	1 36	1 69	797 77
MIREHAVEN ARROYO	3029.75*	PF 1	1495 00	5282.41	5285 89	3 48	0 0426	5286.66	5288 70	0.010362	13 46	111 07	38 91	1.40	1 77	803 98
MIREHAVEN ARROYO	3027.87*	PF 1	1495 00	5282.33	5285 76	3 43	0 0478	5286 58	5288 67	0.010904	13.70	109 14	38 71	1 44	1 84	809 51
MIREHAVEN ARROYO	3026	PF 1	1495 00	5282.24	5285 62	3 38	0 1020	5286 49	5288.64	0.011498	13 95	107.18	38 50	1.47	1 92	815 70
MIREHAVEN ARROYO	3024.33*	PF 1	1495 00	5282.07	5285.35	3 27	0.0956	5286.32	5288 60	0.012796	14 47	103 32	38 10	1 55	2 08	829 26
MIREHAVEN ARROYO	3022 66*	PF 1	1495 00	5281 91	5285.11	3.20	0 1017	5286.16	5288 55	0 013905	14.89	100 43	37.79	1 61	2.22	840 84
MIREHAVEN ARROYO	3021	PF 1	1495 00	5281 74	5284 87	3.13	0.1260	5285 99	5288 50	0 015079	15 30	97 69	37 50	1 67	2.36	853.01
MIREHAVEN ARROYO	3019.33*	PF 1	1495 00	5281 53	5284 57	3 04	0 1257	5285.78	5288.46	0 016615	15 82	94.52	37.16	1.75	2 54	868.69
MIREHAVEN ARROYO	3017.66*	PF 1	1495 00	5281 32	5284 29	2 97	0.1257	5285.57	5288 40	0 018027	16 26	91 94	36 88	1 82	2 70	882 83
MIREHAVEN ARROYO	3016	PF 1	1495.00	5281 11	5284 02	2 91	0 1565	5285 36	5288 34	0 019435	16 68	89 62	36 63	1.88	2 86	896 62
MIREHAVEN ARROYO	3014.33*	PF 1	1495 00	5280 85	5283 68	2 83	0 1506	5285 10	5288.28	0.021306	17.21	86.87	36 32	1.96	3 07	914 53
MIREHAVEN ARROYO	3012.67*	PF 1	1495 00	5280 60	5283.37	2 77	0 1568	5284 85	5288 22	0 023059	17 68	84.58	36.08	2.03	3 26	930 70
MIREHAVEN ARROYO	3011.01	PF 1	1495.00	5280 34	5283.05	2 71	0 1650	5284 59	5288 16	0 024866	18.13	82 45	35 84	2 11	3.45	946 93
MIREHAVEN ARROYO	3009.01*	PF 1	1495 00	5280 01	5282.65	2.64	0.1699	5284 26	5288 08	0 027220	18.69	79 98	35.56	2 20	3 69	967.37
MIREHAVEN ARROYO	3007.01*	PF 1	1495 00	5279 67	5282.25	2.58	0.1650	5283.93	5287.99	0 029593	19 23	77 75	35 31	2 28	3 93	987 26
MIREHAVEN ARROYO	3005.01	PF 1	1495.00	5279 34	5281.86	2 52	0 1497	5283 59	5287 90	0 031902	19.72	75 82	35 09	2 36	4 16	1005 77
MIREHAVEN ARROYO	3003.34*	PF 1	1495 00	5279.09	5281.58	2 49	0 1555	5283.34	5287.82	0 033562	20 05	74 55	34 96	2 42	4 32	1018.66
MIREHAVEN ARROYO	3001.67*	PF 1	1495 00	5278 83	5281.28	2 45	0 1497	5283 08	5287.74	0 035288	20 39	73 30	34 81	2 48	4 49	1031.81
MIREHAVEN ARROYO	3000.01	PF 1	1495 00	5278 58	5281 00	2 42	0 1257	5282 83	5287 66	0.036922	20 71	72 20	34 69	2.53	4.65	1043.97
MIREHAVEN ARROYO	2998.34*	PF 1	1495 00	5278.37	5280 77	2 40	0 1257	5282 62	5287.58	0 038197	20 94	71 38	34 59	2 57	4.77	1053.33
MIREHAVEN ARROYO	2996.67*	PF 1	1495 00	5278 16	5280 53	2 37	0 1257	5282 41	5287.50	0.039494	21 18	70.59	34 49	2 61	4.89	1062.62
MIREHAVEN ARROYO	2995.01	PF 1	1495.00	5277 95	5280 30	2 35	0 1020	5282 20	5287.42	0 040755	21.40	69 85	34 41	2 65	5 00	1071 52
MIREHAVEN ARROYO	2993.34*	PF 1	1495 00	5277 78	5280.12	2.34	0 0956	5282 03	5287 33	0 041600	21.55	69 36	34 34	2 67	5 08	1077 52
MIREHAVEN ARROYO	2991.67*	PF 1	1495 00	5277 62	5279 94	2 32	0 1017	5281 87	5287 25	0 042428	21.69	68 93	34.31	2 70	5.16	1082 95
MIREHAVEN ARROYO	2990	PF 1	1495.00	5277 45	5279 76	2.31	0.0719	5281.70	5287.16	0 043254	21 83	68.47	34 25	2.72	5 23	1088 70
MIREHAVEN ARROYO	2988.33*	PF 1	1495 00	5277.33	5279 63	2 30	0 0658	5281 58	5287 09	0 043732	21.91	68 22	34 22	2 73	5.28	1091.92
MIREHAVEN ARROYO	2986.66*	PF 1	1495 00	5277 22	5279 52	2 30	0 0719	5281 47	5287 01	0 043990	21.96	68.09	34 20	2 74	5 30	1093.65
MIREHAVEN ARROYO	2985	PF 1	1495 00	5277 10	5279.39	2 29	0 0480	5281 35	5286 93	0 044445	22.03	67.86	34.17	2 76	5 34	1096 70
MIREHAVEN ARROYO	2983.33*	PF 1	1495 00	5277 02	5279 31	2.29	0 0418	5281 27	5286 86	0 044544	22.05	67 81	34.17	2.76	5 35	1097.36
MIREHAVEN ARROYO	2981.66*	PF 1	1495 00	5276 95	5279 24	2.29	0 0480	5281 20	5286 79	0 044544	22 05	67.81	34 17	2.76	5 35	1097 36
MIREHAVEN ARROYO	2980	PF 1	1495.00	5276 87	5279 16	2.29	0 0182	5281 12	5286 72	0 044642	22 06	67 76	34 16	2.76	5 36	1098 01
MIREHAVEN ARROYO	2978.33*	PF 1	1495 00	5276 84	5279.14	2.30	0 0121	5281 09	5286 62	0 043929	21 95	68 12	34 20	2 74	5.29	1093 34
MIREHAVEN ARROYO	2976.67*	PF 1	1495 00	5276 82	5279 13	2 31	0 0179	5281 07	5286.52	0 043157	21 82	68 53	34 26	2 72	5.22	1087 96
MIREHAVEN ARROYO	2975.01	PF 1	1495 00	5276.79	5279.11	2 32	0 0051	5281.04	5286.44	0 042656	21.73	68 80	34.29	2 70	5.18	1084.55
MIREHAVEN ARROYO	2973.01*	PF 1	1495 00	5276.78	5279 12	2 34	0 0000	5281.03	5286 32	0 041498	21 53	69 43	34.36	2 67	5 07	1076 63

HEC-RAS Plan Plan 03 River MIREHAVEN SKINNY Reach: MIREHAVEN ARROYO Profile. PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W S. Elev	Max Chl Dpth	Invert Slope	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Shear Chan	Specif Force
			(cfs)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(lb/sq ft)	(cu ft)
MIREHAVEN ARROYO	2849.01*	PF 1	1495 00	5276 33	5279.75	3 42	0 0051	5280.58	5282 68	0.011006	13 74	108.79	38 66	1 44	1.86	810 63
MIREHAVEN ARROYO	2847.01*	PF 1	1495.00	5276.32	5279.75	3.43	0.0049	5280 57	5282 66	0 010888	13 69	109.19	38 70	1 44	1 84	809.46
MIREHAVEN ARROYO	2845.01*	PF 1	1495 00	5276 31	5279 75	3 44	0 0000	5280.56	5282 64	0.010778	13 64	109.57	38.74	1 43	1 83	808.33
MIREHAVEN ARROYO	2843.01*	PF 1	1495 00	5276.31	5279 78	3 47	0 0051	5280.56	5282 61	0 010425	13 49	110.83	38 87	1 41	1 78	804 65
MIREHAVEN ARROYO	2841.01	PF 1	1495.00	5276.30	5279.78	3 48	0 0178	5280.55	5282 59	0.010328	13 45	111.18	38.91	1 40	1 77	803.69
MIREHAVEN ARROYO	2839.34*	PF 1	1495 00	5276.27	5279 74	3 47	0 0120	5280 52	5282 57	0 010443	13 50	110 76	38.86	1.41	1 78	804 89
MIREHAVEN ARROYO	2837.67*	PF 1	1495 00	5276.25	5279 72	3 47	0 0178	5280 50	5282 54	0 010400	13.48	110 94	38.90	1 41	1.78	804 28
MIREHAVEN ARROYO	2836 01	PF 1	1495 00	5276 22	5279 68	3 46	0 0480	5280 46	5282 52	0 010515	13 53	110 51	38 85	1 41	1 79	805 49
MIREHAVEN ARROYO	2834.34*	PF 1	1495 00	5276 14	5279 56	3 42	0.0421	5280 39	5282 50	0 011044	13.76	108 65	38 64	1 45	1.86	811 10
MIREHAVEN ARROYO	2832.67*	PF 1	1495.00	5276 07	5279 44	3 37	0 0477	5280 32	5282.47	0 011588	13.98	106.90	38 49	1.48	1 93	816.53
MIREHAVEN ARROYO	2831.01	PF 1	1495 00	5275 99	5279.32	3.33	0 0719	5280 24	5282 45	0 012130	14.21	105 21	38 28	1 51	2 00	822 40
MIREHAVEN ARROYO	2829.34*	PF 1	1495 00	5275.87	5279 14	3 26	0 0661	5280 12	5282.41	0 012944	14 53	102 90	38 04	1 56	2 10	830 92
MIREHAVEN ARROYO	2827.67*	PF 1	1495.00	5275 76	5278.97	3 21	0 0716	5280 01	5282 38	0.013699	14.81	100 96	37 87	1 60	2 19	838.59
MIREHAVEN ARROYO	2826	PF 1	1495.00	5275.64	5278.80	3 16	0 1017	5279 89	5282 34	0.014473	15 09	99.07	37 65	1 64	2 29	846.74
MIREHAVEN ARROYO	2824.33*	PF 1	1495.00	5275 47	5278 56	3 09	0 0959	5279 72	5282 29	0.015648	15.50	96 47	37 37	1 70	2 43	858 85
MIREHAVEN ARROYO	2822.66*	PF 1	1495 00	5275.31	5278 35	3 04	0.1017	5279 56	5282.24	0.016680	15 84	94.39	37 15	1 75	2 55	869.35
MIREHAVEN ARROYO	2821	PF 1	1495 00	5275 14	5278.13	2 98	0 1257	5279 39	5282 19	0 017749	16.18	92 42	36 94	1.80	2 67	880 07
MIREHAVEN ARROYO	2819.33*	PF 1	1495 00	5274.93	5277.85	2.92	0 1199	5279 18	5282 13	0 019163	16 60	90 05	36 68	1 87	2 83	893 97
MIREHAVEN ARROYO	2817 66*	PF 1	1495 00	5274.73	5277 59	2 86	0 1257	5278 98	5282 07	0.020500	16 99	88 01	36 46	1 93	2.98	906 84
MIREHAVEN ARROYO	2816	PF 1	1495.00	5274.52	5277 33	2 81	0 1568	5278.77	5282 02	0 021905	17.37	86 06	36.24	1.99	3 13	920 06
MIREHAVEN ARROYO	2814.33*	PF 1	1495.00	5274 26	5277 01	2 75	0 1506	5278 51	5281 95	0 023716	17 85	83 78	35.98	2.06	3 33	936 72
MIREHAVEN ARROYO	2812.67*	PF 1	1495.00	5274 01	5276 70	2 69	0 1565	5278 26	5281 89	0 025466	18 28	81 80	35.78	2 13	3 51	952 13
MIREHAVEN ARROYO	2811.01	PF 1	1495 00	5273.75	5276 39	2.64	0 1650	5278.00	5281 81	0 027182	18 68	80 02	35 57	2 20	3 69	967.04
MIREHAVEN ARROYO	2809.01*	PF 1	1495 00	5273.42	5276.00	2 58	0 1699	5277 67	5281 73	0 029488	19 20	77.86	35 33	2 28	3 92	986 25
MIREHAVEN ARROYO	2807.01*	PF 1	1495 00	5273.08	5275 61	2 53	0 1650	5277 33	5281 64	0 031838	19 71	75.87	35 09	2 36	4 16	1005 33
MIREHAVEN ARROYO	2805.01	PF 1	1495 00	5272 75	5275 23	2 48	0 1497	5277 00	5281 54	0 034119	20 17	74 13	34 90	2 44	4 38	1023 02
MIREHAVEN ARROYO	2803.34*	PF 1	1495 00	5272 50	5274 94	2 44	0.1555	5276 75	5281 46	0 035781	20 49	72 96	34 77	2 49	4 54	1035 51
MIREHAVEN ARROYO	2801.67*	PF 1	1495 00	5272 24	5274 65	2.41	0 1497	5276 49	5281 38	0 037521	20 82	71 81	34 64	2 55	4 70	1048 35
MIREHAVEN ARROYO	2800.01	PF 1	1495 00	5271 99	5274 37	2.38	0 1260	5276.24	5281 29	0 039149	21 12	70 80	34 52	2 60	4 85	1060.09
MIREHAVEN ARROYO	2798.34*	PF 1	1495.00	5271 78	5274 14	2 36	0 1257	5276 03	5281 21	0 040426	21 34	70 05	34 44	2 64	4.97	1069 07
MIREHAVEN ARROYO	2796 67*	PF 1	1495.00	5271.57	5273 91	2 34	0 1257	5275.82	5281.13	0 041682	21 56	69 33	34 35	2 67	5.09	1077 93
MIREHAVEN ARROYO	2795.01	PF 1	1495 00	5271 36	5273 68	2.32	0 1017	5275 60	5281.04	0 042939	21.78	68 64	34 27	2 71	5 20	1086.56
MIREHAVEN ARROYO	2793.34*	PF 1	1495.00	5271 19	5273 49	2 30	0 0959	5275 44	5280.95	0 043764	21 92	68 21	34 21	2 74	5 28	1092.14
MIREHAVEN ARROYO	2791.67*	PF 1	1495 00	5271 03	5273 32	2 29	0.1017	5275.28	5280 87	0 044564	22 05	67 80	34 18	2 76	5 35	1097 36
MIREHAVEN ARROYO	2790	PF 1	1495.00	5270.86	5273 14	2 28	0 0716	5275 11	5280.78	0 045375	22 18	67 39	34 12	2.78	5 42	1102 86
MIREHAVEN ARROYO	2788.33*	PF 1	1495.00	5270 74	5273 01	2 27	0 0661	5274 99	5280 71	0 045815	22.26	67 17	34 09	2.79	5 46	1105 75
MIREHAVEN ARROYO	2786.66*	PF 1	1495 00	5270 63	5272 90	2 27	0 0719	5274.88	5280 62	0 046054	22.29	67 06	34 08	2 80	5.48	1107.32
MIREHAVEN ARROYO	2785	PF 1	1495 00	5270 51	5272 77	2.26	0 0418	5274 76	5280 54	0.046502	22.37	66.84	34 05	2 81	5 52	1110 24
MIREHAVEN ARROYO	2783 33*	PF 1	1495.00	5270 44	5272 70	2 26	0 0480	5274 69	5280 47	0 046502	22.37	66.84	34.05	2 81	5 52	1110.24
MIREHAVEN ARROYO	2781 66*	PF 1	1495 00	5270 36	5272 62	2 26	0.0418	5274.61	5280 40	0.046607	22 38	66.79	34 05	2 82	5 53	1110 92
MIREHAVEN ARROYO	2780	PF 1	1495 00	5270 29	5272 55	2.26	0 0182	5274 54	5280 33	0 046607	22 38	66.79	34.05	2 82	5 53	1110 92
MIREHAVEN ARROYO	2778.33*	PF 1	1495 00	5270.26	5272 53	2 27	0 0179	5274 51	5280 23	0 045853	22 26	67 15	34 08	2 80	5 47	1106 10
MIREHAVEN ARROYO	2776 67*	PF 1	1495 00	5270 23	5272.51	2 28	0 0179	5274 48	5280 13	0 045141	22 15	67 50	34.12	2 78	5 40	1101 40
MIREHAVEN ARROYO	2775 01	PF 1	1495 00	5270 20	5272.49	2 29	0 0051	5274 45	5280.03	0 044446	22 03	67 85	34.17	2 76	5.34	1096 79
MIREHAVEN ARROYO	2773 01*	PF 1	1495 00	5270.19	5272.50	2 31	0 0000	5274 44	5279 90	0 043198	21 83	68 50	34 24	2 72	5 23	1088 44
MIREHAVEN ARROYO	2771 01*	PF 1	1495 00	5270 19	5272 52	2 33	0 0049	5274 44	5279 77	0 041891	21.60	69 21	34.33	2 68	5 11	1079 45
MIREHAVEN ARROYO	2769.01*	PF 1	1495 00	5270 18	5272 53	2 35	0 0051	5274.43	5279 65	0.040730	21 40	69 86	34 40	2 65	5 00	1071 46
MIREHAVEN ARROYO	2767.01*	PF 1	1495 00	5270 17	5272 54	2 37	0 0000	5274 42	5279 53	0.039638	21 21	70 49	34 47	2 61	4.90	1063 78
MIREHAVEN ARROYO	2765.01*	PF 1	1495 00	5270 17	5272 56	2 39	0.0049	5274 42	5279 41	0.038467	20 99	71 21	34 56	2 58	4 79	1055 35
MIREHAVEN ARROYO	2763.01*	PF 1	1495 00	5270 16	5272 57	2.41	0 0000	5274 41	5279 29	0 037425	20 80	71 86	34.63	2 55	4 69	1047 85
MIREHAVEN ARROYO	2761.01*	PF 1	1495 00	5270 16	5272 59	2 43	0 0051	5274 42	5279 18	0 036310	20 59	72 60	34 72	2 51	4 59	1039 57
MIREHAVEN ARROYO	2759.01*	PF 1	1495 00	5270 15	5272 60	2 45	0 0049	5274 40	5279 07	0.035347	20 41	73 25	34 79	2.48	4.50	1032 45
MIREHAVEN ARROYO	2757.01*	PF 1	1495 00	5270 14	5272 61	2.47	0 0000	5274.39	5278 97	0.034431	20 23	73 90	34 86	2.45	4.41	1025 51
MIREHAVEN ARROYO	2755.01*	PF 1	1495 00	5270 14	5272 63	2.49	0 0051	5274.39	5278 86	0.033427	20 03	74 64	34 95	2 42	4 31	1017 74
MIREHAVEN ARROYO	2753.01*	PF 1	1495 00	5270 13	5272 64	2 51	0 0049	5274 38	5278 76	0 032561	19.86	75 29	35 02	2 39	4 23	1011 06
MIREHAVEN ARROYO	2751.01*	PF 1	1495 00	5270 12	5272 65	2.53	0 0000	5274 37	5278.67	0 031735	19 68	75.95	35.10	2 36	4 15	1004 55
MIREHAVEN ARROYO	2749.01*	PF 1	1495 00	5270 12	5272.67	2 55	0 0051	5274 37	5278 57	0 030809	19 49	76 71	35 19	2 33	4 05	997 09
MIREHAVEN ARROYO	2747.01*	PF 1	1495 00	5270 11	5272 68	2 56	0 0049	5274 36	5278 49	0 030167	19.35	77 25	35 25	2 30	3.99	991 97
MIREHAVEN ARROYO	2745.01*	PF 1	1495 00	5270 10	5272.68	2 58	0.0000	5274.35	5278 42	0 029554	19 22	77 79	35 31	2 28	3 93	986.95
MIREHAVEN ARROYO	2743.01*	PF 1	1495.00	5270 10	5272 70	2 60	0 0051	5274 35	5278.32	0 028670	19 02	78 59	35.40	2 25	3 84	979.59
MIREHAVEN ARROYO	2741.01*	PF 1	1495.00	5270 09	5272.71	2 62	0.0000	5274.34	5278 25	0 028066	18 89	79 15	35 46	2 23	3 78	974 61

HEC-RAS Plan Plan 03 River. MIREHAVEN SKINNY Reach MIREHAVEN ARROYO Profile PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Max Chl Dpth	Invert Slope	Crit W.S.	E.G Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Shear Chan	Specif Force
			(cfs)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(lb/sq ft)	(cu ft)
MIREHAVEN ARROYO	2619.67*	PF 1	1495 00	5269 21	5272.49	3 28	0 0719	5273 46	5275 73	0.012710	14 43	103.58	38.14	1 54	2.07	828 26
MIREHAVEN ARROYO	2618	PF 1	1495 00	5269 09	5272 32	3 23	0 1017	5273.34	5275.69	0 013508	14.74	101.43	37.90	1 59	2.17	836 70
MIREHAVEN ARROYO	2616.33*	PF 1	1495 00	5268 92	5272 07	3 15	0 0959	5273 17	5275 64	0 014688	15 17	98 57	37.60	1.65	2 31	848.97
MIREHAVEN ARROYO	2614.66*	PF 1	1495 00	5268 76	5271 85	3 09	0.1017	5273.01	5275 60	0.015788	15 54	96 18	37.34	1.71	2.44	860 29
MIREHAVEN ARROYO	2613	PF 1	1495 00	5268 59	5271 61	3 02	0.1257	5272 84	5275 55	0.016947	15 92	93 89	37.10	1.76	2.58	872.04
MIREHAVEN ARROYO	2611.33*	PF 1	1495 00	5268 38	5271 34	2 96	0 1196	5272 63	5275.49	0.018364	16.36	91 36	36 82	1 83	2 74	886 15
MIREHAVEN ARROYO	2609 66*	PF 1	1495 00	5268 18	5271 08	2 90	0.1257	5272.43	5275.44	0.019700	16 76	89 21	36.59	1 89	2 89	899.18
MIREHAVEN ARROYO	2608	PF 1	1495 00	5267 97	5270 81	2 84	0 1568	5272.22	5275 38	0 021099	17.15	87 16	36 36	1 95	3.04	912 51
MIREHAVEN ARROYO	2606.33*	PF 1	1495.00	5267 71	5270.49	2 77	0 1506	5271.96	5275.32	0.022922	17 64	84 75	36 09	2.03	3.24	929 50
MIREHAVEN ARROYO	2604.67*	PF 1	1495 00	5267.46	5270 18	2 72	0 1565	5271.71	5275.25	0 024675	18 08	82 67	35 87	2 10	3.43	945.16
MIREHAVEN ARROYO	2603.01	PF 1	1495 00	5267 20	5269 86	2 66	0 1650	5271.45	5275.19	0 026458	18.51	80.75	35 65	2 17	3 61	960 84
MIREHAVEN ARROYO	2601.01*	PF 1	1495 00	5266 87	5269.47	2 60	0 1702	5271.12	5275 10	0.028760	19 04	78 51	35.40	2 25	3 85	980.31
MIREHAVEN ARROYO	2599.01*	PF 1	1495 00	5266 53	5269 07	2.54	0 1648	5270.78	5275 01	0 031125	19 56	76.45	35 16	2 34	4 09	999 67
MIREHAVEN ARROYO	2597.01	PF 1	1495 00	5266 20	5268.69	2 49	0 1497	5270.45	5274.92	0 033403	20 02	74 66	34 96	2 41	4 31	1017 51
MIREHAVEN ARROYO	2595.34*	PF 1	1495.00	5265.95	5268 41	2 46	0 1558	5270.20	5274.84	0 035068	20 35	73 46	34 83	2 47	4 47	1030 15
MIREHAVEN ARROYO	2593 67*	PF 1	1495 00	5265 69	5268 11	2 42	0 1497	5269.94	5274.76	0 036800	20.68	72.28	34 69	2 53	4 63	1043 14
MIREHAVEN ARROYO	2592 01	PF 1	1495 00	5265.44	5267.83	2 39	0 1257	5269.68	5274.67	0 038462	20 99	71 22	34 57	2.58	4.79	1055 18
MIREHAVEN ARROYO	2590.34*	PF 1	1495 00	5265 23	5267.60	2.37	0 1257	5269 48	5274 59	0.039765	21 23	70 44	34 49	2.62	4 91	1064 41
MIREHAVEN ARROYO	2588.67*	PF 1	1495 00	5265.02	5267.37	2.35	0.1257	5269 27	5274 51	0.041042	21 45	69 70	34 40	2 66	5 03	1073.37
MIREHAVEN ARROYO	2587 01	PF 1	1495 00	5264.81	5267 14	2 33	0.1017	5269 06	5274 43	0 042305	21 67	68.99	34 32	2.69	5 15	1082 11
MIREHAVEN ARROYO	2585.34*	PF 1	1495 00	5264.64	5266 95	2 31	0.0959	5268.89	5274 34	0 043108	21 81	68.54	34 24	2 72	5 22	1087 83
MIREHAVEN ARROYO	2583.67*	PF 1	1495.00	5264 48	5266 78	2 30	0 1017	5268 73	5274 26	0 043912	21 94	68 14	34 22	2 74	5 29	1093 01
MIREHAVEN ARROYO	2582	PF 1	1495 00	5264 31	5266 60	2 29	0 0719	5268 56	5274.17	0 044741	22.08	67 71	34.16	2 76	5 37	1098 67
MIREHAVEN ARROYO	2580 33*	PF 1	1495 00	5264 19	5266.47	2 28	0 0658	5268 44	5274.10	0 045207	22.16	67 47	34 13	2 78	5 41	1101 75
MIREHAVEN ARROYO	2578.66*	PF 1	1495 00	5264 08	5266 36	2 28	0 0719	5268 33	5274 01	0 045442	22.20	67 36	34 12	2 78	5 43	1103 30
MIREHAVEN ARROYO	2577	PF 1	1495 00	5263 96	5266.23	2 27	0 0480	5268.21	5273.93	0.045883	22 27	67 14	34 09	2 80	5 47	1106 20
MIREHAVEN ARROYO	2575 33*	PF 1	1495 00	5263 88	5266.15	2.27	0 0418	5268 13	5273 86	0 045985	22 28	67 09	34.08	2 80	5 48	1106 87
MIREHAVEN ARROYO	2573.66*	PF 1	1495 00	5263 81	5266.08	2 27	0.0480	5268 06	5273 79	0.045985	22 28	67 09	34 08	2 80	5 48	1106 87
MIREHAVEN ARROYO	2572	PF 1	1495 00	5263 73	5266 00	2.27	0.0179	5267 98	5273 72	0 046088	22 30	67 04	34 08	2 80	5 49	1107 54
MIREHAVEN ARROYO	2570 33*	PF 1	1495 00	5263 70	5265 98	2.28	0 0121	5267 95	5273.62	0 045342	22 18	67 40	34.11	2.78	5 42	1102 73
MIREHAVEN ARROYO	2568.67*	PF 1	1495 00	5263 68	5265.97	2 29	0 0182	5267 93	5273 52	0 044542	22 05	67 81	34 18	2 76	5 35	1097 25
MIREHAVEN ARROYO	2567.01	PF 1	1495 00	5263.65	5265 95	2.30	0 0049	5267 90	5273 44	0 044020	21 96	68 08	34.21	2 74	5.30	1093.77
MIREHAVEN ARROYO	2565.01*	PF 1	1495 00	5263 64	5265 96	2.32	0 0000	5267 89	5273.31	0.042812	21 76	68 72	34 28	2 71	5 19	1085.61
MIREHAVEN ARROYO	2563 01	PF 1	1495 00	5263.64	5265 98	2.34	0 0051	5267 89	5273 18	0.041525	21 54	69 42	34 36	2 67	5 07	1076 78
MIREHAVEN ARROYO	2561.01*	PF 1	1495 00	5263.63	5265.99	2 36	0 0049	5267.88	5273 06	0.040403	21 34	70 06	34 44	2 64	4 97	1068 97
MIREHAVEN ARROYO	2559.01*	PF 1	1495 00	5263 62	5266 00	2.38	0.0051	5267 87	5272 94	0 039319	21.15	70 70	34 51	2 60	4 87	1061 31
MIREHAVEN ARROYO	2557.01*	PF 1	1495 00	5263.61	5266 00	2.39	0 0000	5267 86	5272 82	0.038272	20.96	71 34	34 59	2.57	4 77	1053 81
MIREHAVEN ARROYO	2555.01*	PF 1	1495 00	5263 61	5266 03	2.42	0 0049	5267.85	5272.71	0 037130	20.75	72.06	34 67	2 54	4.66	1045.50
MIREHAVEN ARROYO	2553.01*	PF 1	1495 00	5263 60	5266 03	2 43	0.0051	5267 85	5272 60	0 036156	20 56	72.71	34.74	2 50	4.57	1038.31
MIREHAVEN ARROYO	2551.01*	PF 1	1495.00	5263.59	5266 04	2 45	0.0000	5267 84	5272 49	0.035215	20.38	73.35	34.82	2 47	4.48	1031.27
MIREHAVEN ARROYO	2549.01*	PF 1	1495 00	5263 59	5266 06	2 47	0 0049	5267.83	5272 38	0 034164	20.17	74 10	34 90	2 44	4 38	1023.29
MIREHAVEN ARROYO	2547.01*	PF 1	1495 00	5263.58	5266.07	2 49	0 0051	5267 83	5272.28	0 033288	20 00	74 75	34 98	2.41	4 30	1016 54
MIREHAVEN ARROYO	2545.01*	PF 1	1495 00	5263 57	5266.08	2 51	0 0049	5267.82	5272 19	0 032441	19.83	75 40	35 05	2 38	4 21	1009.94
MIREHAVEN ARROYO	2543.01*	PF 1	1495 00	5263 56	5266.09	2 53	0 0000	5267 81	5272 09	0 031620	19 66	76 05	35 13	2 35	4 13	1003 46
MIREHAVEN ARROYO	2541.01*	PF 1	1495 00	5263 56	5266 11	2.55	0.0051	5267 81	5271.99	0 030683	19 46	76 83	35 22	2 32	4 04	995.95
MIREHAVEN ARROYO	2539.01*	PF 1	1495 00	5263 55	5266.12	2 57	0 0049	5267.80	5271.92	0 030058	19 33	77.36	35 28	2 30	3 98	990 89
MIREHAVEN ARROYO	2537.01*	PF 1	1495 00	5263 54	5266 12	2 58	0.0000	5267.79	5271.84	0 029429	19 19	77.91	35 34	2 28	3 92	985.75
MIREHAVEN ARROYO	2535.01*	PF 1	1495 00	5263 54	5266.15	2 60	0 0051	5267 79	5271.75	0 028554	19 00	78 70	35 43	2 25	3.83	978 52
MIREHAVEN ARROYO	2533.01*	PF 1	1495 00	5263 53	5266 15	2 62	0 0049	5267 78	5271 67	0 027947	18 86	79 28	35 49	2 22	3 77	973 43
MIREHAVEN ARROYO	2531.01*	PF 1	1495 00	5263 52	5266.16	2 64	0 0051	5267 77	5271 60	0 027356	18 72	79 85	35 56	2.20	3 71	968 44
MIREHAVEN ARROYO	2529.01*	PF 1	1495 00	5263 51	5266 16	2.65	0 0000	5267.76	5271.53	0 026781	18 59	80 42	35 62	2.18	3 65	963 53
MIREHAVEN ARROYO	2527.01*	PF 1	1495 00	5263.51	5266.19	2 68	0 0049	5267 76	5271 44	0 025972	18 40	81 26	35 71	2 15	3 56	956.55
MIREHAVEN ARROYO	2525.01*	PF 1	1495 00	5263 50	5266.19	2 69	0.0049	5267 75	5271 38	0 025466	18 28	81.80	35 78	2.13	3.51	952 13
MIREHAVEN ARROYO	2523.01*	PF 1	1495 00	5263.49	5266.20	2 71	0.0051	5267.74	5271 32	0 024970	18 16	82 34	35.84	2 11	3.46	947 76
MIREHAVEN ARROYO	2521.01*	PF 1	1495 00	5263 48	5266.20	2 72	0 0000	5267.73	5271.25	0 024466	18 03	82.90	35.88	2 09	3.41	943 43
MIREHAVEN ARROYO	2519.01*	PF 1	1495 00	5263 48	5266 22	2 74	0 0049	5267.73	5271 19	0.023871	17 88	83 60	35.98	2 07	3.34	937 98
MIREHAVEN ARROYO	2517.01*	PF 1	1495 00	5263 47	5266 23	2 76	0 0051	5267.72	5271 13	0 023415	17.77	84 15	36 04	2 05	3 29	933 85
MIREHAVEN ARROYO	2515.01*	PF 1	1495 00	5263 46	5266 23	2 77	0 0000	5267 71	5271 07	0 022962	17 65	84 70	36.09	2.03	3 25	929 79
MIREHAVEN ARROYO	2513.01*	PF 1	1495 00	5263.46	5266 25	2 79	0 0049	5267 71	5271 01	0 022401	17 50	85 42	36 18	2.01	3 19	924 59
MIREHAVEN ARROYO	2511.01*	PF 1	1495 00	5263 45	5266 26	2 81	0.0051	5267 70	5270 95	0 021982	17.39	85 97	36 24	1 99	3.14	920.70
MIREHAVEN ARROYO	2509.01*	PF 1	1495 00	5263 44	5266 26	2 82	0.0049	5267 69	5270 90	0 021572	17 28	86 51	36 30	1 97	3 10	916 89

HEC-RAS Plan Plan 03 River MIREHAVEN SKINNY Reach: MIREHAVEN ARROYO Profile PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Max Chl Dpth	Invert Slope	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Shear Chan	Specif Force
			(cfs)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(lb/sq ft)	(cu ft)
MIREHAVEN ARROYO	2391.01	PF 1	1495 00	5259 51	5261.99	2.48	0 0658	5263 76	5268 29	0.033984	20.14	74 23	34 91	2 43	4 36	1021.97
MIREHAVEN ARROYO	2389.34*	PF 1	1495 00	5259 40	5261.87	2.47	0 0599	5263 65	5268 23	0 034457	20.24	73 88	34 87	2 45	4 41	1025.66
MIREHAVEN ARROYO	2387.67*	PF 1	1495 00	5259.30	5261 76	2.46	0 0658	5263.54	5268.16	0 034761	20.29	73 67	34.85	2 46	4 44	1027 91
MIREHAVEN ARROYO	2386.01	PF 1	1495 00	5259 19	5261 64	2.45	0 0240	5263 44	5268.10	0 035244	20.39	73 33	34 81	2 48	4 49	1031 56
MIREHAVEN ARROYO	2384.34*	PF 1	1495.00	5259 15	5261 61	2.46	0 0240	5263 40	5268 03	0 034982	20.34	73 51	34 82	2 47	4 46	1029 65
MIREHAVEN ARROYO	2382 67*	PF 1	1495.00	5259 11	5261 57	2 46	0.0240	5263 36	5267 97	0 034742	20.29	73 68	34.84	2 46	4 44	1027 83
MIREHAVEN ARROYO	2381.01	PF 1	1495 00	5259.07	5261.54	2 47	0 0058	5263 32	5267 90	0 034502	20.24	73 85	34 86	2 45	4 42	1026 01
MIREHAVEN ARROYO	2379.34*	PF 1	1495 00	5259 06	5261.54	2 48	0 0000	5263 31	5267 83	0 033916	20.13	74 27	34 91	2 43	4 36	1021.52
MIREHAVEN ARROYO	2377.67*	PF 1	1495 00	5259 06	5261.56	2 50	0 0061	5263 31	5267.74	0.033071	19 96	74 91	34.98	2 40	4.28	1014 99
MIREHAVEN ARROYO	2376.*	PF 1	1495 00	5259 05	5261 56	2 51	0 0000	5263.30	5267 68	0.032515	19 85	75.33	35.03	2 38	4 22	1010 65
MIREHAVEN ARROYO	2374 33	PF 1	1495 00	5259 05	5261 57	2 52	0 0050	5263 29	5267 61	0 031858	19 71	75.86	35.10	2 36	4 16	1005 42
MIREHAVEN ARROYO	2372 36*	PF 1	1536 00	5259 04	5261 66	2 62	0 0000	5263 36	5267 48	0 029411	19 36	79.35	35.49	2 28	3 97	1021 46
MIREHAVEN ARROYO	2370.40*	PF 1	1536 00	5259 04	5261.69	2 65	0 0052	5263 35	5267 39	0.028581	19.17	80.12	35.58	2.25	3.88	1014 26
MIREHAVEN ARROYO	2368.43*	PF 1	1536 00	5259 03	5261 69	2 66	0 0000	5263 35	5267 32	0 028006	19 04	80.67	35.64	2.23	3 82	1009 33
MIREHAVEN ARROYO	2366.47*	PF 1	1536 00	5259 03	5261 71	2 68	0 0050	5263 35	5267 23	0 027209	18 86	81.46	35 73	2.20	3 74	1002 25
MIREHAVEN ARROYO	2364.50*	PF 1	1536 00	5259 02	5261 72	2 70	0.0000	5263 34	5267 17	0.026667	18 73	82.01	35.79	2 18	3 68	997.51
MIREHAVEN ARROYO	2362.54*	PF 1	1536 00	5259.02	5261 74	2 72	0 0052	5263 34	5267 10	0 026048	18.58	82 67	35 87	2 16	3 62	991 89
MIREHAVEN ARROYO	2360.57*	PF 1	1536.00	5259.01	5261.74	2 73	0 0000	5263 33	5267 03	0 025553	18 46	83 20	35 92	2 14	3 57	987.48
MIREHAVEN ARROYO	2358.61*	PF 1	1536.00	5259 01	5261 76	2.75	0 0050	5263.33	5266.97	0 024966	18.32	83 86	36 00	2 11	3 50	982 05
MIREHAVEN ARROYO	2356.64*	PF 1	1536 00	5259 00	5261 77	2.77	0 0000	5263.32	5266.91	0 024481	18 20	84 41	36 06	2 10	3 45	977 64
MIREHAVEN ARROYO	2354.68*	PF 1	1536 00	5259.00	5261 78	2 78	0 0050	5263 32	5266 84	0 023925	18 05	85 08	36.14	2 07	3 39	972 41
MIREHAVEN ARROYO	2352.71*	PF 1	1536 00	5258 99	5261 79	2 80	0 0000	5263 31	5266.79	0.023480	17 94	85 61	36.19	2.06	3 35	968 30
MIREHAVEN ARROYO	2350.75*	PF 1	1536 00	5258.99	5261.81	2 82	0 0052	5263 31	5266 73	0.022939	17.80	86 30	36 27	2.03	3.29	963 12
MIREHAVEN ARROYO	2348.78*	PF 1	1536.00	5258 98	5261.81	2 83	0 0000	5263 30	5266 67	0 022526	17.69	86 83	36 33	2 02	3 24	959 19
MIREHAVEN ARROYO	2346.82*	PF 1	1536.00	5258 98	5261.83	2 85	0 0050	5263 30	5266 61	0 022003	17.55	87 52	36 41	1 99	3 18	954 17
MIREHAVEN ARROYO	2344 85*	PF 1	1536 00	5258 97	5261 84	2.87	0 0000	5263.28	5266 56	0 021599	17.44	88 07	36.47	1 98	3 14	950 26
MIREHAVEN ARROYO	2342.89*	PF 1	1536 00	5258 97	5261 86	2.89	0.0052	5263.29	5266.50	0 021091	17 30	88.79	36 55	1 96	3 08	945 30
MIREHAVEN ARROYO	2340.92*	PF 1	1536 00	5258 96	5261 86	2 90	0 0000	5263 27	5266 45	0 020720	17 20	89 32	36 60	1 94	3 04	941 66
MIREHAVEN ARROYO	2338.96*	PF 1	1536 00	5258.96	5261 88	2.92	0 0050	5263 28	5266 40	0 020246	17.06	90.03	36 69	1 92	2 99	936 90
MIREHAVEN ARROYO	2337.*	PF 1	1536 00	5258.95	5261.89	2.93	0 0052	5263 27	5266.35	0 019874	16.95	90 59	36 74	1 90	2 95	933 27
MIREHAVEN ARROYO	2335.03*	PF 1	1536 00	5258 94	5261.89	2.95	0.0000	5263 26	5266 30	0 019523	16 85	91 14	36 79	1 89	2 91	929 81
MIREHAVEN ARROYO	2333.07*	PF 1	1536 00	5258 94	5261 91	2.97	0 0050	5263 26	5266.25	0.019061	16.72	91 89	36 88	1 87	2 86	925.09
MIREHAVEN ARROYO	2331.10*	PF 1	1536 00	5258 93	5261 92	2 99	0.0000	5263 25	5266 20	0 018717	16 61	92 45	36 94	1.85	2 82	921 66
MIREHAVEN ARROYO	2329.14*	PF 1	1536.00	5258 93	5261 94	3.01	0.0052	5263 25	5266.15	0 018268	16 48	93 22	37 03	1 83	2 77	917 01
MIREHAVEN ARROYO	2327.17*	PF 1	1536 00	5258 92	5261 94	3 02	0 0000	5263 24	5266 11	0 017942	16 38	93.79	37.08	1 81	2 73	913 72
MIREHAVEN ARROYO	2325.21*	PF 1	1536 00	5258 92	5261 96	3 04	0.0050	5263.23	5266 06	0 017517	16.24	94 56	37.17	1.79	2 68	909 26
MIREHAVEN ARROYO	2323.24*	PF 1	1536.00	5258 91	5261 97	3.06	0 0000	5263 23	5266.02	0 017214	16.15	95 13	37 23	1 78	2 64	906.11
MIREHAVEN ARROYO	2321.28*	PF 1	1536 00	5258 91	5261 99	3.08	0 0052	5263 22	5265 97	0 016795	16.01	95 93	37 32	1 76	2 59	901.73
MIREHAVEN ARROYO	2319.31*	PF 1	1536 00	5258 90	5261.99	3.09	0 0000	5263.22	5265 93	0 016498	15.92	96.51	37 38	1 75	2.56	898 62
MIREHAVEN ARROYO	2317.35*	PF 1	1536 00	5258 90	5262.02	3.12	0 0050	5263 22	5265 88	0 016092	15 78	97.33	37 47	1 73	2 51	894 33
MIREHAVEN ARROYO	2315.38*	PF 1	1536 00	5258 89	5262 02	3 13	0 0000	5263 20	5265 84	0 015802	15 68	97.94	37 53	1.71	2.48	891 26
MIREHAVEN ARROYO	2313.42*	PF 1	1536 00	5258 89	5262 05	3.16	0 0052	5263 21	5265 80	0 015401	15 55	98 80	37 63	1.69	2 43	886 98
MIREHAVEN ARROYO	2311.45*	PF 1	1536 00	5258 88	5262 05	3 17	0 0000	5263 19	5265.76	0 015136	15 45	99 39	37 69	1 68	2 40	884 15
MIREHAVEN ARROYO	2309.49*	PF 1	1536 00	5258 88	5262 07	3 19	0 0050	5263 20	5265 72	0.014748	15 32	100 27	37.78	1 66	2 35	879 99
MIREHAVEN ARROYO	2307.52*	PF 1	1536 00	5258 87	5262.08	3 21	0 0000	5263 19	5265 68	0 014488	15 23	100 88	37 85	1 64	2 32	877 19
MIREHAVEN ARROYO	2305.56*	PF 1	1536 00	5258 87	5262.11	3.23	0 0052	5263.18	5265 64	0.014106	15 09	101 81	37 94	1 62	2 27	873 06
MIREHAVEN ARROYO	2303.59*	PF 1	1536 00	5258 86	5262.10	3.24	0 0000	5263 18	5265 61	0 013964	15.04	102.16	37.98	1 62	2 25	871 54
MIREHAVEN ARROYO	2301.63*	PF 1	1536 00	5258 86	5262 13	3 27	0 0050	5263 17	5265.58	0.013592	14 90	103 11	38.08	1 60	2 21	867.50
MIREHAVEN ARROYO	2299.67	PF 1	1536 00	5258 85	5262 13	3 28	0.0052	5263 17	5265 55	0 013456	14.85	103 46	38.12	1.59	2 19	866.03
MIREHAVEN ARROYO	2297.67*	PF 1	1536.00	5258 84	5262 13	3 29	0.0000	5263 15	5265 53	0 013323	14.80	103 81	38 15	1 58	2.17	864.58
MIREHAVEN ARROYO	2295.68*	PF 1	1536.00	5258 84	5262.15	3 31	0.0049	5263.16	5265 49	0 012950	14.65	104 83	38 27	1 56	2.13	860 48
MIREHAVEN ARROYO	2293.69*	PF 1	1536.00	5258 83	5262.15	3 32	0.0000	5263 15	5265 46	0 012822	14 60	105 19	38 31	1 55	2.11	859 08
MIREHAVEN ARROYO	2291.70*	PF 1	1536.00	5258.83	5262.18	3.35	0.0052	5263.14	5265.43	0 012464	14 46	106 23	38 43	1 53	2 07	855 09
MIREHAVEN ARROYO	2289.71*	PF 1	1536.00	5258.82	5262.18	3 36	0.0000	5263.14	5265.40	0 012341	14 41	106 58	38.45	1.53	2 05	853 85
MIREHAVEN ARROYO	2287.72*	PF 1	1536.00	5258.82	5262.21	3.39	0.0049	5263 14	5265.37	0 011987	14 27	107 66	38 58	1.51	2 01	849 91
MIREHAVEN ARROYO	2285.73*	PF 1	1536 00	5258 81	5262.21	3 40	0.0000	5263 13	5265.35	0.011871	14 22	108.02	38 61	1.50	1 99	848 65
MIREHAVEN ARROYO	2283.74*	PF 1	1536.00	5258.81	5262 24	3.43	0 0052	5263 13	5265 31	0.011508	14 07	109 18	38.74	1.48	1 94	844.65
MIREHAVEN ARROYO	2281.75*	PF 1	1536 00	5258.80	5262 24	3.44	0.0049	5263 12	5265 29	0.011398	14.02	109 54	38.78	1.47	1 93	843 47
MIREHAVEN ARROYO	2279.76*	PF 1	1536.00	5258.79	5262.24	3 45	0 0000	5263 10	5265 27	0 011281	13 97	109.92	38.81	1.46	1.91	842.26
MIREHAVEN ARROYO	2277.77*	PF 1	1536.00	5258.79	5262 27	3 48	0 0052	5263.11	5265 23	0.010933	13 82	111 12	38 94	1 44	1.87	838 45
MIREHAVEN ARROYO	2275.78*	PF 1	1536 00	5258 78	5262.27	3.48	0 0000	5263.10	5265 21	0 010831	13 78	111 48	38 98	1 44	1 86	837 35

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Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Max Chl Dpth	Invert Slope	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Shear Chan	Specif Force
			(cfs)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(lb/sq ft)	(cu ft)
MIREHAVEN ARROYO	2157.34*	PF 1	1536 00	5258 35	5262 50	4 15	0 0000		5263.44	0 006620	7 77	197 63	56 64	0 73	1 39	750.68
MIREHAVEN ARROYO	2155.39*	PF 1	1536.00	5258 35	5262.50	4 15	0 0053		5263.42	0 006491	7.71	199.30	57 00	0 73	1.37	751 28
MIREHAVEN ARROYO	2153.45	PF 1	1536 00	5258 34	5262 49	4.15	0 1499		5263 40	0 006402	7.66	200 64	57 36	0 72	1.35	751 29
MIREHAVEN ARROYO	2151.45*	PF 1	1536 00	5258 04	5261.88	3.84	0 1499	5261.88	5263 33	0 011675	9 66	159.02	55 52	1 01	2.04	713 47
MIREHAVEN ARROYO	2149.45*	PF 1	1536.00	5257 74	5261.58	3 84	0 1501	5261 81	5263.29	0 014266	10 49	146 41	54 85	1 13	2.32	718 66
MIREHAVEN ARROYO	2147.45	PF 1	1536 00	5257.44	5260 93	3 49	3 6417	5261 51	5263 20	0 019122	12 08	127.10	52.34	1 37	2.80	747 69
MIREHAVEN ARROYO	2146.78	PF 1	1536 00	5255 00	5258 02	3 02	0 0325	5259 36	5262 92	0 070621	17.76	86 51	53.39	2 46	6.91	936 89
MIREHAVEN ARROYO	2144.93*	PF 1	1536 00	5254 94	5257 66	2.72	0.0325	5259 02	5262 76	0 073891	18.13	84 70	53 09	2.53	7 21	943 39
MIREHAVEN ARROYO	2143.08*	PF 1	1536.00	5254 88	5257 38	2.50	0.0325	5258.77	5262 61	0.079431	18.34	83 75	54 73	2 61	7 47	946 57
MIREHAVEN ARROYO	2141.23	PF 1	1536 00	5254 82	5257.16	2.34	0 0286	5258.54	5262 44	0 085928	18 44	83 28	57 12	2 69	7 68	953.20
MIREHAVEN ARROYO	2139.48*	PF 1	1536.00	5254.77	5257 06	2.29	0 0345	5258 43	5262 27	0.082525	18 32	83 83	56 51	2 65	7.53	945 98
MIREHAVEN ARROYO	2137.74*	PF 1	1536.00	5254.71	5256 94	2 23	0 0286	5258 31	5262 10	0.079749	18.23	84 25	55 89	2 62	7.41	941 30
MIREHAVEN ARROYO	2136.00*	PF 1	1536 00	5254.66	5256 82	2.16	0 0345	5258.19	5261 96	0.077700	18 19	84 44	55 21	2 59	7 34	939 47
MIREHAVEN ARROYO	2134.26*	PF 1	1536 00	5254 60	5256 69	2 09	0 0289	5258 07	5261 83	0 075868	18 18	84 48	54.34	2 57	7 29	939 33
MIREHAVEN ARROYO	2132.52*	PF 1	1536 00	5254.55	5256 56	2 01	0.0342	5257 94	5261.70	0 074713	18 20	84 41	53 63	2 56	7 27	940 06
MIREHAVEN ARROYO	2130 78*	PF 1	1536 00	5254 49	5256 42	1 93	0 0289	5257 82	5261 57	0.073730	18 21	84.36	53 01	2.54	7 25	940 27
MIREHAVEN ARROYO	2129.04	PF 1	1536 00	5254 44	5256.28	1.84	0 0898	5257 68	5261 44	0.073803	18 24	84 23	52.80	2.54	7 27	940 91
MIREHAVEN ARROYO	2127.37*	PF 1	1536.00	5254 29	5256.27	1 98	0 0839	5257 65	5261 28	0 069761	17 95	85 58	52 78	2 48	7.00	931 41
MIREHAVEN ARROYO	2125.70*	PF 1	1536.00	5254.15	5256 16	2.01	0 0898	5257 54	5261 16	0.068119	17 96	85.54	51.78	2 46	6 96	934.23
MIREHAVEN ARROYO	2124.04	PF 1	1536 00	5254.00	5255.93	1 93	0 0152	5257.33	5261 03	0.069410	18 12	84 76	51 21	2 48	7.09	939.96
MIREHAVEN ARROYO	2122.07*	PF 1	1536.00	5253.97	5255.96	1 99	0 0204	5257 33	5260 83	0 064344	17 72	86 71	51.20	2 40	6.73	924 38
MIREHAVEN ARROYO	2120.11*	PF 1	1536.00	5253 93	5255 98	2 05	0 0154	5257 31	5260 65	0 059963	17 35	88.54	51 17	2 32	6.40	910 66
MIREHAVEN ARROYO	2118.15*	PF 1	1536.00	5253 90	5256 01	2.11	0 0152	5257 31	5260 48	0.055881	16 98	90 47	51 23	2 25	6 09	896 86
MIREHAVEN ARROYO	2116 19*	PF 1	1536.00	5253 87	5256.03	2.16	0 0204	5257 29	5260 32	0.052192	16 62	92 40	51 31	2.18	5 80	883 82
MIREHAVEN ARROYO	2114 23*	PF 1	1536 00	5253 83	5256 05	2 22	0.0154	5257 28	5260 17	0.048866	16 29	94 31	51.40	2.12	5 53	871 87
MIREHAVEN ARROYO	2112.27*	PF 1	1536 00	5253 80	5256 08	2 28	0 0152	5257 27	5260 03	0 045766	15.95	96 27	51 52	2 06	5.28	860 08
MIREHAVEN ARROYO	2110.31*	PF 1	1536 00	5253 77	5256.11	2 34	0 0204	5257 26	5259.90	0.042807	15 62	98.35	51 69	2 00	5.03	848.35
MIREHAVEN ARROYO	2108.35*	PF 1	1536 00	5253 73	5256.13	2 40	0 0152	5257.24	5259 77	0 040326	15 32	100 26	51.87	1.94	4 81	838 31
MIREHAVEN ARROYO	2106.39*	PF 1	1536 00	5253.70	5256.15	2 45	0 0154	5257 23	5259 65	0.037897	15.01	102 35	52 13	1.89	4 59	827 76
MIREHAVEN ARROYO	2104 43*	PF 1	1536 00	5253.67	5256 18	2 51	0 0204	5257 21	5259 54	0 035625	14 70	104 48	52.40	1 83	4.39	817 69
MIREHAVEN ARROYO	2102 47*	PF 1	1536 00	5253 63	5256 20	2.57	0.0152	5257 20	5259 43	0 033718	14 43	106.46	52 70	1.79	4 21	808 95
MIREHAVEN ARROYO	2100.51*	PF 1	1536.00	5253.60	5256 23	2 63	0 0154	5257 18	5259 33	0.031815	14.14	108.65	53 10	1 74	4 02	799 72
MIREHAVEN ARROYO	2098 54*	PF 1	1536 00	5253 57	5256 25	2.68	0 0204	5257.16	5259 24	0 030105	13 86	110 79	53 48	1 70	3.85	791 17
MIREHAVEN ARROYO	2096.58*	PF 1	1536 00	5253.53	5256 27	2.74	0 0152	5257 14	5259.15	0 028627	13 62	112 81	53 88	1 66	3 70	783 68
MIREHAVEN ARROYO	2094.62*	PF 1	1536.00	5253.50	5256.29	2.79	0.0152	5257.12	5259.06	0 027117	13.35	115 06	54 36	1 62	3 54	775 62
MIREHAVEN ARROYO	2092.66*	PF 1	1536.00	5253 47	5256 32	2.85	0.0204	5257.11	5258 96	0 025173	13 02	117 94	54 68	1 56	3.35	766 08
MIREHAVEN ARROYO	2090.70*	PF 1	1536 00	5253 43	5256 33	2.89	0 0154	5257.08	5258 90	0 024368	12 88	119.23	54 82	1 54	3 27	762 11
MIREHAVEN ARROYO	2088.74*	PF 1	1536.00	5253.40	5256.33	2 93	0 0152	5257 06	5258 85	0 023500	12 73	120.70	55 00	1.51	3 18	757 61
MIREHAVEN ARROYO	2086.78*	PF 1	1536 00	5253 37	5256 34	2 96	0 0204	5257 04	5258 79	0 022680	12 57	122.15	55 17	1 49	3 10	753 32
MIREHAVEN ARROYO	2084.82*	PF 1	1536 00	5253.33	5256 33	3 00	0.0154	5257 01	5258 74	0 022039	12.45	123 35	55 33	1 47	3.03	749 99
MIREHAVEN ARROYO	2082.86*	PF 1	1536.00	5253.30	5256 33	3 03	0 0152	5256 99	5258 69	0 021375	12.32	124.67	55 51	1 45	2 96	746 32
MIREHAVEN ARROYO	2080.90*	PF 1	1536 00	5253.27	5256.33	3 06	0 0204	5256.96	5258 64	0 020729	12.19	125.96	55 67	1 43	2 89	742 85
MIREHAVEN ARROYO	2078.94*	PF 1	1536 00	5253.23	5256 31	3.08	0 0152	5256 94	5258 60	0.020492	12.14	126 47	55 75	1 42	2.87	741 41
MIREHAVEN ARROYO	2076.98*	PF 1	1536 00	5253 20	5256 30	3.10	0.0154	5256 91	5258 57	0.020210	12 08	127 10	55 85	1.41	2 84	739 58
MIREHAVEN ARROYO	2075 01*	PF 1	1536 00	5253.17	5256 28	3.11	0 0204	5256 88	5258.53	0.019942	12 03	127 69	55 93	1.40	2 81	737 90
MIREHAVEN ARROYO	2073.05*	PF 1	1536.00	5253 13	5256 26	3.13	0.0152	5256.86	5258 49	0.019734	11 99	128 16	55 99	1.40	2 79	736 60
MIREHAVEN ARROYO	2071.09*	PF 1	1536 00	5253.10	5256 24	3 14	0 0154	5256.82	5258 45	0 019547	11 94	128 62	56.08	1 39	2 76	735 20
MIREHAVEN ARROYO	2069.13*	PF 1	1536 00	5253 07	5256 22	3.15	0 0204	5256.80	5258 42	0 019378	11 91	129 02	56 14	1 38	2 74	733 96
MIREHAVEN ARROYO	2067.17*	PF 1	1536 00	5253 03	5256 19	3 16	0 0152	5256.77	5258 38	0 019248	11 88	129 33	56 20	1 38	2 73	733.01
MIREHAVEN ARROYO	2065.21*	PF 1	1536 00	5253 00	5256 16	3 16	0 0152	5256 73	5258 35	0 019236	11 87	129 39	56 23	1 38	2 73	732 50
MIREHAVEN ARROYO	2063.25*	PF 1	1536 00	5252 97	5256 13	3 16	0 0204	5256.70	5258 31	0.019178	11 86	129 55	56 26	1 38	2.72	731 81
MIREHAVEN ARROYO	2061.29*	PF 1	1536 00	5252 93	5256.09	3 16	0 0154	5256 67	5258 29	0 019297	11 88	129 31	56 26	1 38	2 73	732 04
MIREHAVEN ARROYO	2059 33*	PF 1	1536 00	5252 90	5256.06	3 16	0 0152	5256 63	5258 25	0.019211	11 86	129.52	56.29	1 38	2 72	731.29
MIREHAVEN ARROYO	2057.37*	PF 1	1536 00	5252 87	5256.03	3 16	0.0204	5256 60	5258.21	0 019089	11.83	129.82	56 34	1 37	2 71	730.33
MIREHAVEN ARROYO	2055 41*	PF 1	1536 00	5252 83	5256 00	3 17	0 0154	5256 56	5258 17	0 019127	11 84	129 73	56 31	1 37	2.71	730 33
MIREHAVEN ARROYO	2053.45	PF 1	1536 00	5252.80	5255.97	3 17	0 0102	5256.52	5258 13	0 018990	11 81	130 06	56 36	1 37	2 70	729 37
MIREHAVEN ARROYO	2051.47*	PF 1	1536 00	5252 78	5255 95	3 17	0.0050	5256.50	5258.10	0.018820	11 77	130 53	56.49	1 36	2 68	728.05
MIREHAVEN ARROYO	2049.50*	PF 1	1536 00	5252.77	5255 94	3.17	0 0102	5256 48	5258 05	0 018387	11 67	131 63	56 69	1 35	2 63	725.49
MIREHAVEN ARROYO	2047 53*	PF 1	1536.00	5252.75	5255 92	3.17	0 0050	5256 44	5258 01	0.018206	11 62	132.18	56.86	1 34	2.61	724 05
MIREHAVEN ARROYO	2045.56*	PF 1	1536 00	5252.74	5255 91	3 17	0 0102	5256 41	5257 97	0 017799	11 53	133.27	57.06	1.33	2 56	721.63
MIREHAVEN ARROYO	2043 59*	PF 1	1536 00	5252 72	5255.89	3 17	0 0052	5256 39	5257.94	0 017651	11 49	133 73	57 20	1 32	2 54	720 43

HEC-RAS Plan. Plan 03 River MIREHAVEN SKINNY Reach MIREHAVEN ARROYO Profile PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Max Chl Dpth	Invert Slope	Crit W.S.	E.G. Elev	E G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Shear Chan	Specif Force
			(cfs)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(lb/sq ft)	(cu ft)
MIREHAVEN ARROYO	1921.86*	PF 1	1536 00	5251 55	5255.47	3 92	0 1667		5256 29	0 004692	7 28	211 05	65 53	0.71	0 92	713.27
MIREHAVEN ARROYO	1920.36*	PF 1	1536 00	5251 30	5255.39	4 09	0 1667		5256 28	0 005292	7.58	202.76	64.91	0.76	1 01	707 99
MIREHAVEN ARROYO	1918 86*	PF 1	1536 00	5251 05	5255.27	4 21	0 1667		5256.26	0.006215	7.99	192.15	63 83	0 81	1.14	704 24
MIREHAVEN ARROYO	1917.36	PF 1	1536.00	5250 80	5254 84	4 04	2.6468	5254 84	5256 21	0.009968	9.40	163.46	60 38	1 01	1.63	699 55
MIREHAVEN ARROYO	1916.68	PF 1	1536 00	5249 00	5252 31	3 31	0 0103	5253.40	5255.98	0.046268	15 37	99.96	54 61	2 00	5.00	836 32
MIREHAVEN ARROYO	1914 73*	PF 1	1536 00	5248 98	5252 22	3 24	0.0103	5253.31	5255.87	0 045125	15 33	100 21	54 30	1 99	4 95	835 31
MIREHAVEN ARROYO	1912.79*	PF 1	1536 00	5248 96	5252 12	3 16	0.0154	5253.21	5255 79	0.044848	15.37	99.92	54.03	1 99	4 97	837 30
MIREHAVEN ARROYO	1910.85*	PF 1	1536 00	5248 93	5252.01	3.08	0 0103	5253.11	5255.70	0.044506	15.41	99.65	53.62	1 99	4.98	839 20
MIREHAVEN ARROYO	1908.90*	PF 1	1536 00	5248 91	5251.89	2 98	0.0103	5253.00	5255 61	0 044164	15 48	99 22	53 00	1 99	5 00	842 02
MIREHAVEN ARROYO	1906 96*	PF 1	1536 00	5248 89	5251 76	2 87	0 0103	5252 88	5255.52	0 043967	15.56	98 74	52 40	2 00	5.03	845.16
MIREHAVEN ARROYO	1905.02*	PF 1	1536 00	5248 87	5251 62	2 75	0.0156	5252 76	5255 43	0 043899	15.65	98 12	51 71	2 00	5.08	849 12
MIREHAVEN ARROYO	1903.07*	PF 1	1536 00	5248.84	5251 47	2 63	0 0103	5252 63	5255 33	0 043979	15 78	97 37	50 95	2 01	5 14	854 00
MIREHAVEN ARROYO	1901.13*	PF 1	1536.00	5248 82	5251 31	2 49	0 0103	5252 49	5255 23	0 044123	15 90	96 63	50 28	2 02	5 20	858 98
MIREHAVEN ARROYO	1899.19	PF 1	1536 00	5248 80	5251 13	2 33	0 0101	5252 33	5255 14	0 044760	16 06	95 67	49 68	2 04	5.30	865 53
MIREHAVEN ARROYO	1897 21*	PF 1	1536 00	5248 78	5251 16	2 38	0 0101	5252 32	5255 01	0 042323	15 74	97 56	50 04	1.99	5.07	853 99
MIREHAVEN ARROYO	1895.24*	PF 1	1536 00	5248.76	5251 18	2 42	0 0150	5252 30	5254 88	0 040000	15 43	99 52	50 43	1 94	4 86	842.69
MIREHAVEN ARROYO	1893.26*	PF 1	1536 00	5248 73	5251.20	2 47	0 0101	5252 29	5254.76	0 037943	15 15	101 37	50 76	1 89	4.66	832 62
MIREHAVEN ARROYO	1891 28*	PF 1	1603 00	5248 71	5251 37	2 66	0.0101	5252 36	5254.61	0 031438	14 44	110 98	51 81	1 74	4 14	848 45
MIREHAVEN ARROYO	1889.31*	PF 1	1603 00	5248 69	5251.39	2 70	0 0101	5252 33	5254 51	0 029883	14 19	112 95	52 13	1 70	3 98	839 77
MIREHAVEN ARROYO	1887.33*	PF 1	1603 00	5248.67	5251 39	2.72	0.0101	5252 31	5254 44	0.028817	14 01	114 46	52 45	1 67	3 87	833 40
MIREHAVEN ARROYO	1885.36*	PF 1	1603 00	5248 65	5251.40	2 75	0 0101	5252 29	5254 37	0.027794	13 82	115.97	52 75	1.64	3 76	827 32
MIREHAVEN ARROYO	1883 38*	PF 1	1603 00	5248 63	5251 41	2 78	0 0101	5252 27	5254.30	0 026799	13 64	117.49	53.04	1 62	3 65	821 46
MIREHAVEN ARROYO	1881.41*	PF 1	1603 00	5248 61	5251 41	2 80	0 0150	5252 25	5254 23	0 025839	13 47	119 03	53 33	1 59	3.55	815.76
MIREHAVEN ARROYO	1879.43*	PF 1	1603 00	5248.58	5251 41	2 83	0 0101	5252 22	5254 17	0 025088	13 32	120 34	53 61	1.57	3 47	811 18
MIREHAVEN ARROYO	1877.46*	PF 1	1603 00	5248 56	5251.41	2 84	0 0101	5252 20	5254.11	0 024438	13 20	121 48	53 84	1.55	3 39	807 25
MIREHAVEN ARROYO	1875 48*	PF 1	1603 00	5248 54	5251 40	2 86	0 0101	5252.17	5254 05	0.023844	13.07	122.62	54.11	1 53	3 33	803 46
MIREHAVEN ARROYO	1873.51*	PF 1	1603 00	5248 52	5251.40	2.87	0 0101	5252 14	5254.00	0 023236	12.95	123 79	54 35	1.51	3.26	799 70
MIREHAVEN ARROYO	1871.53*	PF 1	1603 00	5248 50	5251.39	2 89	0 0101	5252 12	5253.94	0.022672	12 83	124 93	54 61	1 49	3.19	796 13
MIREHAVEN ARROYO	1869.56*	PF 1	1603 00	5248 48	5251 37	2 89	0.0150	5252 10	5253 90	0 022416	12 77	125 57	54 85	1 49	3.16	794 10
MIREHAVEN ARROYO	1867.58*	PF 1	1603 00	5248 45	5251 34	2 89	0 0101	5252 06	5253 87	0 022386	12 75	125 75	55 00	1 49	3 15	793.44
MIREHAVEN ARROYO	1865.61*	PF 1	1603 00	5248.43	5251 32	2 89	0 0101	5252 02	5253 82	0.022161	12.69	126 30	55 19	1 48	3 12	791 69
MIREHAVEN ARROYO	1863 63*	PF 1	1603 00	5248 41	5251 30	2.89	0 0101	5251 99	5253 78	0 021927	12 63	126.88	55.39	1 47	3.09	789 89
MIREHAVEN ARROYO	1861 66*	PF 1	1603 00	5248 39	5251 28	2 89	0 0101	5251.96	5253 73	0 021650	12.57	127.54	55 59	1 46	3 06	787 92
MIREHAVEN ARROYO	1859.68*	PF 1	1603 00	5248 37	5251 26	2 89	0 0101	5251.94	5253 69	0 021356	12 50	128.25	55 79	1 45	3 03	785 81
MIREHAVEN ARROYO	1857.71*	PF 1	1603.00	5248 35	5251.24	2.89	0 0153	5251 90	5253 64	0 021044	12.43	128 99	55 99	1 44	2 99	783 66
MIREHAVEN ARROYO	1855.73*	PF 1	1603 00	5248 32	5251.21	2 89	0 0101	5251.87	5253 60	0 020924	12 39	129 36	56 15	1 44	2 97	782 55
MIREHAVEN ARROYO	1853.76*	PF 1	1603 00	5248 30	5251.19	2 89	0.0101	5251.83	5253.54	0 020569	12 31	130 21	56 34	1.43	2 93	780.18
MIREHAVEN ARROYO	1851.78*	PF 1	1603 00	5248 28	5251 17	2.89	0 0101	5251 80	5253 49	0 020210	12 23	131 09	56 54	1 42	2.89	777 77
MIREHAVEN ARROYO	1849.81*	PF 1	1603 00	5248 26	5251 15	2 89	0.0099	5251 76	5253.44	0.019833	12.14	132.00	56 71	1.40	2 84	775 28
MIREHAVEN ARROYO	1847.83*	PF 1	1603 00	5248 24	5251 13	2 89	0.0101	5251.72	5253.39	0 019469	12.06	132.93	56 92	1 39	2 80	772.83
MIREHAVEN ARROYO	1845.86*	PF 1	1603 00	5248 22	5251.11	2 89	0.0153	5251.70	5253 34	0 019055	11 97	133 96	57 08	1 38	2 75	770 11
MIREHAVEN ARROYO	1843.88*	PF 1	1603 00	5248.19	5251 07	2.88	0 0101	5251.65	5253 29	0.019128	11.98	133 81	57 06	1 38	2 76	770 10
MIREHAVEN ARROYO	1841 91*	PF 1	1603 00	5248 17	5252 29	4 12	0 0101	5251 61	5253 20	0 004894	7.64	209 73	62 65	0.74	1 00	770 44
MIREHAVEN ARROYO	1839.93*	PF 1	1603 00	5248.15	5252 30	4 15	0 0101		5253 18	0.004716	7 54	212 50	62 93	0 72	0 97	773 80
MIREHAVEN ARROYO	1837.96*	PF 1	1603 00	5248 13	5252 30	4 17	0 0101		5253 16	0 004528	7 44	215 53	63 22	0 71	0.94	777 79
MIREHAVEN ARROYO	1835.98*	PF 1	1603 00	5248 11	5252 31	4.20	0.0101		5253 14	0 004346	7 33	218 69	63.55	0 70	0 91	782 15
MIREHAVEN ARROYO	1834.01*	PF 1	1603 00	5248 09	5252.31	4 22	0 0150		5253 12	0.004171	7 22	221 89	63 86	0 68	0 88	786 80
MIREHAVEN ARROYO	1832.03*	PF 1	1603.00	5248 06	5252 33	4 27	0 0101		5253 11	0 003963	7 10	225 84	64 19	0 67	0 85	793 26
MIREHAVEN ARROYO	1830.06*	PF 1	1603 00	5248 04	5252 33	4.29	0.0101		5253 09	0 003811	7 00	228 97	64 47	0 65	0 82	798 17
MIREHAVEN ARROYO	1828.08*	PF 1	1603 00	5248 02	5252 34	4 32	0 0101		5253 08	0 003655	6 90	232 38	64.79	0 64	0 80	803 86
MIREHAVEN ARROYO	1826 11	PF 1	1603.00	5248 00	5252 34	4 34		5251 27	5253 06	0 003500	6 79	235 94	65 11	0 63	0 77	810 00

FREEBOARD CALCULATIONS

ALTERNATE CONDITION

Per City of Albuquerque DPM Chapter 22.3.C

For Q < 100 cfs and V_{ave} < 35 fps:

$$\text{Freeboard (feet)} = 1.0 + 0.025Vd^{1/3}$$

For Q > 100 cfs and V_{ave} > 35 fps:

$$\text{Freeboard (feet)} = 0.7\,(2.0 + 0.025Vd^{1/3})$$

Q =	1495	cfs	STA 32+45.65
V =	5.04	fps	
d =	5.51	ft	

Freeboard = 1.56 ft

CHANNEL SUPERELEVATION CALCS

MIREHAVEN ARROYO - ALTERNATE CONDITION

Project #: 1823
Date: 3/12/2013

Trapezoidal Channel
Per COA DPM Chapter 23, Section 3.c.3.a.(2)

For SUBcritical flow (Froude # < 1)

$$S = \frac{1.15\,V^2\,(b + 2zD)}{2gr}$$

where:
S = superelevation height (ft)
V = velcoity of the flow cross section (fps)
b = channel bottom width (ft)
g = 32.2 ft/s2
z = cotangent of bank slope (z:1)
D = Depth of flow for an equivalent straight reach (ft
r = radius of channel centerline curve (ft)

STA	V (ft/s)	b (ft)	z (z:1)	D (ft)	r (ft)	Superelevation (ft)
22+99.67	14.85	25	2	3.28	310	0.48

RIPRAP SIZING FOR LOW ENERGY APPLICATIONS - CHANNEL BANKS

PROJECT: MIREHAVEN ARROYO - ALTERNATE CONDITION
DATE: 3/7/2013

Method per Urban Storm Drainage Criteria Manual Vol. 1 (2001, rev. 2008)

$$D_{50} = \frac{(VS^{0.17})^2}{[4.5\,(G_s-1)^{0.66}]^2} \qquad \text{(EQ. MD-13)}$$

where: D_{50} = median stone diameter (ft)
V = average channel velocity (ft/s)
S = channel slope (ft/ft)
G_s = specific gravity of stone (min. = 2.50)
Per COA Specs 165 pcf/62.4 pcf = 2.64

LOCATION	V (ft/s)	S	D_{50} (ft)	DESCRIPTION
22+00.07	13.03	0.0028	**0.591**	At beginning of downstream riprap
21-90.43	11.97	0.0028	**0.499**	In downstream riprap
			0.000	

CITY OF ALBUQUERQUE

March 9, 2012

ASA M. Nilsson-Weber, P.E.
Isaacson & Arfman, P.A.
128 Monroe St NE
Albuquerque, NM 87108

Re: Storm Cloud Subdivision, Units 4 & 5
Drainage Report
Engineer's Stamp Date 2/10/2012 (H9/D022)

Dear Mrs. Nilsson-Weber,

Based upon the information provided in your submittal received 2/10/2012, the following comments have to be addressed prior to Preliminary Plat Approval:

- Show proposed Tierra Pintada Boulevard and grades on the plans.
- Show proposed 3-90" RCPs and grades on the plans.
- Provide updated HEC-RAS analysis for the Mirehaven starting east of the 3-90" RCPs. Include an exhibit showing the proposed floodplain limits east of the culverts and the proposed WSEL/EGL along the Mirehaven Channel.
- Remove Mirehaven Stationing from the grading plan and include them on a separate sheet with updated channel analysis.
- Since the streets are on a slope top back of the sidewalk on one side of the sidewalk culverts will be lower. Therefore, you may have to lower the invert of the sidewalk culverts to insure the 0.67' head is provided.
- Appendix E, Unit 4, Inlets 4 and 5 should say 5 & 6 to match the inlet numbers on the Basin Exhibit.
- Inlets 5, 6, & 7 under Unit 5, are designed to be in swamp condition. Please make sure that all three inlets are built with the same top of grate elevation and 0.67' head is provided. The runoff should not overflow to the east. The high point in the street is at 58.67' and grate elevation is at 58.04'.
- Provide adequate water block (+/- 1') at the proposed entrances from the Tierra Pintada Boulevard.
- Include the lot number for Unit 4.
- Show the existing 36" storm drain pipe on Summer Breeze Dr.
- Fix the text overlaps on the grading plans.
- Clearly show all the existing retaining walls, and label the retaining walls that will be removed.

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

- If the retaining wall will not be certified with the certification of the grading plan, the following not should be added to the plans: "The side and rear lot retaining walls will be constructed by home builders.
- Proposed legends for curb and gutters does not match what the actual layout on the grading plans.

If you have any questions, you can contact me at 924-3695.

Sincerely,

Shahab Biazar, P.E.
Senior Engineer, Planning Dept.
Development and Building Services

C: e-mail

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(Rev. 12/05)

PROJECT TITLE: Storm Cloud Units 4 & 5 ZONE MAP/DRG. FILE # H-9/D022
DRB#: 1005029 EPC#: WORK ORDER#:

LEGAL DESCRIPTION: Tracts B & J, The Crossing
CITY ADDRESS:

ENGINEERING FIRM: ISAACSON & ARFMAN, PA CONTACT: Åsa Nilsson-Weber
ADDRESS: 128 MONROE NE PHONE: 268-8828
CITY, STATE: ALBUQUERQUE, NM ZIP CODE: 87108

OWNER: Western Albuq. Land Holdings c/o Garrett Dev. Co. CONTACT: Jeff Garrett
ADDRESS: 3131 E. Camelback Rd, Ste200 PHONE:
CITY, STATE: Phoenix, AZ ZIP CODE: 85016

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

SURVEYOR: SurvTek, Inc. CONTACT: Russ Hugg
ADDRESS: PHONE:
CITY, STATE: Albuq. NM ZIP CODE:

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

TYPE OF SUBMITTAL:
- X DRAINAGE REPORT
- X DRAINAGE PLAN 1st SUBMITTAL
- ___ DRAINAGE PLAN RESUBMITTAL
- ___ CONCEPTUAL G & D PLAN
- X GRADING PLAN
- ___ EROSION CONTROL PLAN
- ___ ENGINEER'S CERT (HYDROLOGY)
- ___ CLOMR/LOMR
- ___ TRAFFIC CIRCULATION LAYOUT
- ___ ENGINEER/ARCHITECT CERT (TCL)
- ___ ENGINEER/ARCHITECT CERT (DRB S.P.)
- ___ ENGINEER/ARCHITECT CERT (AA)
- ___ OTHER (SPECIFY)

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

RECEIVED
FEB 19 2012
HYDROLOGY SECTION

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

$2460.00

SUBMITTED BY: Åsa Nilsson-Weber DATE: 2/9/2012
Isaacson & Arfman, P.A.

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 define 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.

FEBRUARY 1, 2012

DRAINAGE REPORT

FOR

STORM CLOUD SUBDIVISION, UNITS 4 & 5

A 241-DWELLING UNIT SINGLE-DETACHED RESIDENTIAL SUBDIVISION

ALBUQUERQUE, NEW MEXICO

FEBRUARY 10, 2012

RECEIVED
FEB 1 0 2012
HYDROLOGY SECTION

BY

ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates

Thomas O. Isaacson, PE & LS
Fred C. Arfman, PE
Åsa Nilsson-Weber, PE

DRAINAGE REPORT

FOR

STORM CLOUD SUBDIVISION, UNITS 4 & 5

A 241-DWELLING UNIT SINGLE-DETACHED RESIDENTIAL SUBDIVISION

ALBUQUERQUE, NEW MEXICO
FEBRUARY 10, 2012

Prepared by:

ISAACSON & ARFMAN, P.A.
128 Monroe Street NE
Albuquerque, NM 87108
(505) 268-8828

Åsa Nilsson-Weber 2-10-12

Åsa Nilsson-Weber, PE **Date**

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IV. PROPOSED CONDITIONS

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APPENDIX C: Drainage Basin Exhibits
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Unit 5 Basin Exhibit

APPENDIX D: Street Flow Capacity Calculations

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Sump Inlet Capacity Calculations
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POCKETS

Unit 4 Grading & Drainage and Retaining Wall Plans (8 Sheets)

Unit 5 Grading & Drainage and Retaining Wall Plans (6 sheets)

NORTHWEST MESA ESCARPMENT PLAN CONSERVATION

NORTHWEST MESA ESCARPMENT PLAN IMPACT

NORTHWEST MESA ESCARPMENT PLAN VIEW

COLLEGE ZONE 2W RESERVOIR SITE

WATERSHED

TIERRA PINTADA BLVD

LAS LOMITAS BLVD

UNSER

LADERA INDUSTRIAL CENTER

EL RANCHO ATRISCO PHASE 2

EL RANCHO ATRISCO PHASE 3

THE CROSSING

WESTLAND

CIELO OESTE

TIERRA OESTE (UNIT 3)

AMAFCA LADERA DAM 11

AMAFCA LADERA DAM 12

AMAFCA LADERA DAM 13

TOWN OF ATRISCO GRANT

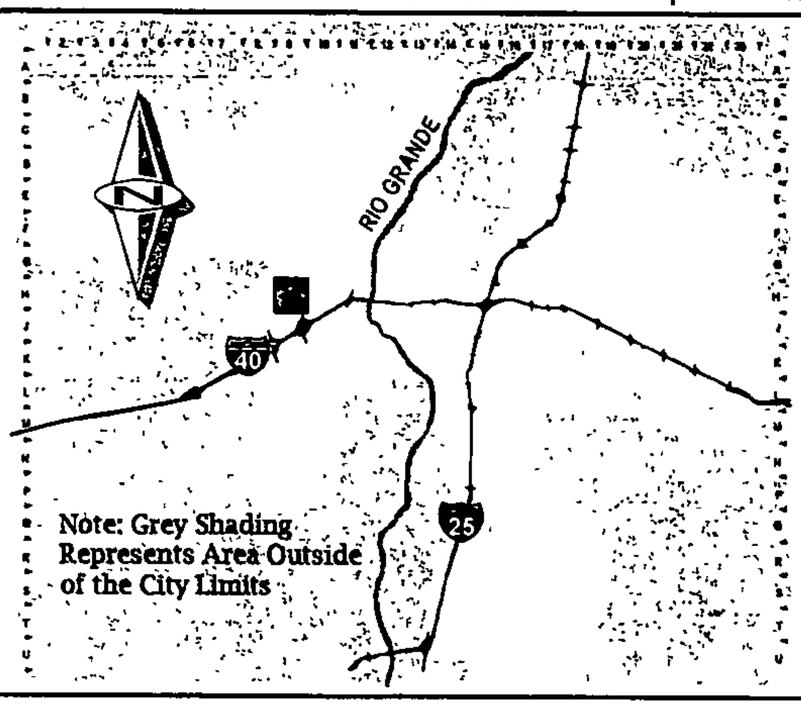
EL RANCHO

For more current information and more details visit: http://www.cabq.gov/gis

AGIS

Albuquerque Geographic Information System

Map amended through: 1/24/2011



Zone Atlas Page:

H-09-Z

Selected Symbols

SECTOR PLANS

Design Overlay Zones

City Historic Zones

H-1 Buffer Zone

Petroglyph Mon.

Escarpment

2 Mile Airport Zone

Airport Noise Contours

Wall Overlay Zone

0 750 1,500 Feet

MAP SCALE 1" = 500'

250 0 500 1000 FEET

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0326G

FIRM

FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO

AND INCORPORATED AREAS

PANEL 326 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0326	G
BERNALILLO COUNTY UNINCORPORATED AREAS	350001	0326	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
35001C0326G

MAP REVISED
SEPTEMBER 26, 2008

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

I. PROJECT INFORMATION

PROPOSED LEGAL DESCRIPTION:
Storm Cloud Subdivision, Units 4 & 5

EXISTING LEGAL DESCRIPTION:
Tracts B & J, The Crossings, and Tract R, Storm Cloud Subdivision, Unit 3

ENGINEER: Isaacson & Arfman, P.A.
128 Monroe Street NE
Albuquerque, NM 87108
(505) 268-8828
Attn: Åsa Nilsson-Weber

SURVEYOR: Surv-Tek, Inc.
(505) 897-3366
Attn: Russ P. Hugg, NMPLS No. 9750

DEVELOPER: WALH, LLC
c/o The Garrett Group
Attn: Jeff Garrett

NUMBER OF PROPOSED DWELLING UNITS: 241

TOTAL AREA: 55.24 Acres
Unit 4 = 31.036 AC.
Unit 5 = 21.404 AC.
Mirehaven Arroyo = 2.802 Ac.

FLOOD PLAIN: This site lies within Zone "X" (areas determined to be outside the 0.2% annual chance floodplain), Zone "A0, (DEPTH 1')" (Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined), and Zone "AE" (Base Flood Elevations determined) as shown on National Flood Insurance Program Flood Insurance Rate Map Number 35001C0326G, Map Revised September 26, 2008.

II. INTRODUCTION

Storm Cloud Subdivision, Units 4 & 5, will be developed with 241 lots. The site is bounded on the west and north by Tierra Pintada, NW, and on the east and south by existing subdivisions (see vicinity map). The Mirehaven Arroyo separates the two units with Unit 4 being on the north side and Unit 5 on the south side. A preliminary plat and grading plan was approved in 2006/2008, and the site has been graded and retaining wall and perimeter walls have been partially installed based on the original layout. The approved drainage report for the original layout was prepared by Advanced Engineering and Consulting, LLC, in 2006. The new Owners of the site are now pursuing a revised layout with Unit 5 being a private, gated community with wider lots (55'-65'), and Unit 4 being redesigned to have lot widths of 45'-55'. The street layout in Unit 5 will remain the same, but the street layout in Unit 4 has been revised. This report presents drainage recommendations for the development of Storm Cloud Subdivision, Units 4 & 5.

III. EXISTING CONDITIONS

The site has been graded and retaining and perimeter walls have been partially installed per the original grading plan. A retaining wall investigation has been performed, and a number of walls are failing and some have already collapsed. Unit 4 is graded to drain to the Mirehaven Arroyo, and Unit 5 is graded to drain to the Mirehaven Arroyo, to a storm drain system in Summer Breeze Drive, and via surface flow to Gunnison Road and Animas Place.

IV. PROPOSED CONDITIONS

The site will be developed in two phases with154 lots in Unit 4 and 87 lots in Unit 5. The interior retaining walls and portions of the perimeter walls shall be removed and the site shall be re-graded.

The Grading & Drainage Plans and Retaining Wall Plans for Units 4 & 5 are in the pocket at the back pockets of this report.

LAND TREATMENTS & BASIN AREAS

Land treatment percent D was calculated based on the equation in DPM 22.2 Table A-6, and the remaining area was split between land treatments B and C. See Appendix A for land treatment calculations and basin area table and Appendix C for Drainage Basin Exhibits.

Unit 4:

A 36" storm drain with two on-grade inlets in Chinook Road and two sump inlets in Summer Breeze Drive will convey 28.8 cfs to an existing 36" storm drain at the south end of the site. In case the sump inlets would clog, emergency overflow would be directed south in Summer Breeze Drive. The starting HGL for the storm drain was assumed at 62.7 per HGL shown on the as-built drawing.

A 36"/24" storm drain system discharges 41.3 cfs to the Mirehaven Arroyo. The storm drain extends from the Mirehaven Arroyo, a drainage easement, through Gunnison Place and Jet Stream Road, and terminates at two sump inlets in Summer Breeze Dr. In case of clogging, the emergency overflow would be directed south to the sump inlets connecting to the two sump inlets connected to the storm drain system in Summer Breeze Drive, which have been conservatively sized with double grates. Three on-grade inlets are located at the intersection of Jet Stream Rd and Gunnison Place, and two sump inlets are located in Monsoon Drive, next to the drainage easement which would provide emergency overflow.

Unit 5:

A 42" storm drain located in a drainage easement with two on-grade inlets in Torrent Lane, two on-grade inlets and three sump inlets in Camino del Venado will discharge 67.1 cfs to the Mirehaven Arroyo. An emergency flow path is provided through the drainage easement.

SIDEWALK CULVERTS

The parks in Unit 4 and Unit 5 will drain to sidewalk culverts. In Unit 4, a 3-foot culvert is required at the northeast corner of the park at Animas Place, and in Unit 5, a 2-foot culvert is required at the southeast corner of the park at Camino del Venado. See Appendix F for calculations.

MIREHAVEN ARROYO

The channel improvements have been designed by Wilson & Co. and shall be constructed with either Unit 4 or Unit 5, whichever is developed first. → Needs to be updated Based on the New Datum: 3-90" Culverts

TIERRA PINTADA

Plans for Tierra Pintada, including box culvert at the Mirehaven Arroyo crossing are currently being designed by Bohannan Huston, Inc.

HYDROLOGY

The 100-year, 6-hour flows were calculated using AHYMO. The summary and output files are included in Appendix B. The Drainage Basin Exhibits in Appendix C show the flow rates for each basin, street flow at critical analysis points (AP) and storm drain flows for each inlet. Below is a summary of discharge locations:

Unit 4:

- 29.4 cfs Summer Breeze Drive—29.2 to existing 36" storm drain and 0.2 cfs surface flow (29.8 cfs allowed)
- 3.3 cfs Animas Place south end—surface flow (3.5 cfs allowed)
- 19.6 cfs Animas Place north end—surface flow (20.5 cfs allowed)
- 10.6 cfs Gunnison Place—surface flow (13 cfs allowed)
- 41.8 cfs Mirehaven Arroyo—41.3 cfs to 36" storm drain ; 0.5 cfs surface flow

104.7 cfs total

Unit 5:

- 67.9 cfs Mirehaven Arroyo—67.1 to 42" storm drain and 0.8 cfs surface flow
- 1.0 cfs Camino del Venado east end—surface flow (4.0 cfs allowed) via A 2' concrete rundowns connecting from new curb to existing offsite street via openings in wall.

68.9 cfs total

The total allowable discharge rates listed are per the approved drainage report for Storm Cloud Units 4 & 5 by Advanced Engineering, 2006.

STREET CAPACITY

The streets in Unit 4 will be public and the streets in Unit 5 will be private. All streets will have mountable or standard curb and gutter. Appendix D shows street flow depths at critical analysis points, which are labeled on the Drainage Basin Exhibits in Appendix C.

STORM DRAIN

On-grade inlets were sized using DPM Plates 22.3-D5 and 22.3-D6, and sump inlet capacities were calculated based on the orifice equation (See Appendix E). There will be two separate storm drain systems on Unit 4 and one system on Unit 5. Storm Drain Exhibits and Hydraflow Storm Sewer Calculations are included in Appendix D.

V. SUMMARY & CONCLUSIONS

The site will be developed in two phases. The Mirehaven Arroyo drop structures shall be constructed with the first unit to be developed.

Based on this report, it is recommended that the following improvements be constructed (as shown on the Grading Plans in the back pockets):

Unit 4:

- Standard or mountable curb as shown on plans
- Retaining walls as shown on plans
- Inlets as shown on plans
- 18"-36" storm drains as shown on plans
- 3' sidewalk culvert to convey flows from park tract onto Animas Place

Unit 5:

- Standard or mountable curb as shown on plans
- Retaining walls as shown on plans
- Inlets as shown on plans
- 18"-42" storm drains as shown on plans
- 2' sidewalk culvert to convey flows from park tract to Camino del Venado
- Wall openings and 2' concrete rundowns from gutters at east end of Camino del Venado connecting to existing street to convey 1.0 cfs to existing offsite street

APPENDIX A

Land Treatments & Basin Areas

LAND TREATMENT CALCULATIONS

(Per the City of Albuquerque DPM Section 22.2, Table A-5)

PROJECT NAME: **Storm Cloud, Unit 4**

JOB NUMBER: 1821

Total Area 31.04 Acres

# of Lots 154 lots

N = 4.96 D.U./Ac.

Percentage of Impervious Land (Type D)

$\%D = 7(N^2+5N)^{1/2}$

%D= 49.21 %

A+D= 49.21 %

B+C= 50.79 %

LAND TREATMENTS		USE	
Type A=	**0 %**	**0**	**%**
Type B=	**25.39 %**	**26**	**%**
Type C=	**25.39 %**	**25**	**%**
Type D=	**49.21 %**	**49**	**%**
Σ=	100 %		

STORM CLOUD, UNIT 4

BASIN AREA AND LAND TREATMENT TABLE-- PROPOSED CONDITIONS

BASIN	AREA			LAND TREATMENT (%)				Q100, cfs
	SF	AC.	SQ. MI.	A	B	C	D	
A1	90130	2.0691	0.00323	0	26	25	49	7
A2	153082	3.5143	0.00549	0	26	25	49	11.9
A3	65521	1.5042	0.00235	0	26	25	49	5.1
A4	69002	1.5841	0.00248	0	26	25	49	5.4
A5	2625	0.0603	0.00009	0	26	25	49	0.2
B	41794	0.9595	0.00150	0	26	25	49	3.3
C	78955	1.8126	0.00283	0	26	25	49	6.1
D1	78985	1.8132	0.00283	0	26	25	49	6.1
D2	68298	1.5679	0.00245	0	26	25	49	5.3
D3	32372	0.7432	0.00116	0	26	25	49	2.8
D4	101608	2.3326	0.00364	0	26	25	49	7.9
D5	36266	0.8326	0.00130	0	26	25	49	2.5
D6	274285	6.2967	0.00984	0	26	25	49	21.2
D7	5772	0.1325	0.00021	0	26	25	49	0.5
E1	51325	1.1783	0.00184	0	26	25	49	4.0
E2	201914	4.6353	0.00724	0	26	25	49	15.6
TOTAL	1351935	31.0362	0.0485					104.9

<u>Q100, cfs OUTFALL (after AHYMO routing)</u>

19.6	Animas north
3.3	Animas south
10.6	Gunnison
0.2	Summer Breeze surface flow
29.2	Summer Breeze storm drain
41.3	Gunnison storm drain to Mirehaven
0.5	NW corner rundown to Mirehaven
104.7	TOTAL

LAND TREATMENT CALCULATIONS

(Per the City of Albuquerque DPM Section 22.2, Table A-5)

PROJECT NAME: **Storm Cloud, Unit 5**

JOB NUMBER: 1822

Total Area 21.404 Acres

# of Lots 87 lots

N = 4.06 D.U./Ac.

Percentage of Impervious Land (Type D)

$\%D = 7(N^2+5N)^{1/2}$

%D= 42.49 %

A+D= 42.49 %

B+C= 57.51 %

LAND TREATMENTS		USE	
Type A=	**0 %**	**0**	**%**
Type B=	**28.76 %**	**29**	**%**
Type C=	**28.76 %**	**29**	**%**
Type D=	**42.49 %**	**42**	**%**
Σ=	100 %		

STORM CLOUD, UNIT 5

BASIN AREA AND LAND TREATMENT TABLE-- PROPOSED CONDITIONS

BASIN	AREA			LAND TREATMENT (%)				Q100, cfs
	SF	AC.	SQ. MI.	A	B	C	D	
F1	128118	2.9412	0.00460	0	29	29	42	9.6
F2	100086	2.2977	0.00359	0	29	29	42	7.5
F3	65208	1.4970	0.00234	0	29	29	42	4.9
F4	97208	2.2316	0.00349	0	29	29	42	7.3
F5	41190	0.9456	0.00148	0	29	29	42	3.1
F6	45479	1.0441	0.00163	0	29	29	42	3.4
F7	83564	1.9184	0.00300	0	29	29	42	6.2
F8	34460	0.7911	0.00124	0	29	29	42	2.6
F9	96462	2.2145	0.00346	0	29	29	42	7.2
F10	155818	3.5771	0.00559	0	29	29	42	11.7
F11	28361	0.6511	0.00102	0	29	29	42	2.2
F12	33286	0.7641	0.00119	0	29	29	42	2.5
F13	10290	0.2362	0.00037	0	29	29	42	0.8
F14	12819	0.2943	0.00046	0	29	29	42	1
TOTAL	932349	21.4038	0.0334					70.0

Q100, CFS, OUTFALL (after AHYMO routing)

67.1	Camino del Venado storm drain to Mirehaven
0.8	Basin F13 to Mirehaven
1.0	Basin F14 to east Camino del Venado
68.9	

APPENDIX B

Drainage Calculations

NOAA Atlas 14, Volume 1, Version 5
Location name: Albuquerque, New Mexico, US*
Coordinates: 35.1038, -106.7418
Elevation: 5259ft*
* source. Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.164 (0.141-0.191)	0.213 (0.182-0.248)	0.286 (0.243-0.334)	0.344 (0.292-0.400)	0.423 (0.357-0.491)	0.485 (0.408-0.563)	0.551 (0.460-0.638)	0.620 (0.514-0.719)	0.715 (0.586-0.829)	0.790 (0.643-0.916)
10-min	0.250 (0.214-0.291)	0.324 (0.276-0.377)	0.436 (0.370-0.509)	0.523 (0.444-0.609)	0.644 (0.543-0.748)	0.738 (0.621-0.857)	0.838 (0.699-0.972)	0.944 (0.782-1.09)	1.09 (0.892-1.26)	1.20 (0.979-1.40)
15-min	0.309 (0.266-0.361)	0.401 (0.343-0.468)	0.540 (0.459-0.630)	0.649 (0.551-0.755)	0.798 (0.673-0.927)	0.915 (0.769-1.06)	1.04 (0.867-1.20)	1.17 (0.970-1.36)	1.35 (1.11-1.57)	1.49 (1.21-1.73)
30-min	0.417 (0.358-0.486)	0.541 (0.462-0.630)	0.727 (0.618-0.849)	0.874 (0.742-1.02)	1.08 (0.907-1.25)	1.23 (1.04-1.43)	1.40 (1.17-1.62)	1.58 (1.31-1.83)	1.82 (1.49-2.11)	2.01 (1.63-2.33)
60-min	0.516 (0.443-0.602)	0.669 (0.571-0.780)	0.900 (0.765-1.05)	1.08 (0.918-1.26)	1.33 (1.12-1.55)	1.53 (1.28-1.77)	1.73 (1.45-2.01)	1.95 (1.62-2.26)	2.25 (1.84-2.61)	2.49 (2.02-2.88)
2-hr	0.596 (0.510-0.702)	0.762 (0.652-0.900)	1.01 (0.862-1.19)	1.21 (1.03-1.42)	1.49 (1.26-1.74)	1.72 (1.44-2.00)	1.96 (1.63-2.28)	2.21 (1.82-2.57)	2.57 (2.09-2.98)	2.86 (2.30-3.33)
3-hr	0.644 (0.559-0.758)	0.821 (0.709-0.964)	1.08 (0.932-1.26)	1.28 (1.11-1.50)	1.57 (1.34-1.83)	1.80 (1.53-2.09)	2.04 (1.72-2.37)	2.31 (1.93-2.68)	2.67 (2.20-3.10)	2.97 (2.42-3.45)
6-hr	0.744 (0.650-0.864)	0.940 (0.822-1.09)	1.22 (1.06-1.41)	1.43 (1.25-1.66)	1.73 (1.50-2.00)	1.96 (1.69-2.26)	2.21 (1.89-2.55)	2.46 (2.09-2.84)	2.82 (2.37-3.25)	3.12 (2.59-3.60)
12-hr	0.829 (0.729-0.945)	1.05 (0.921-1.19)	1.33 (1.16-1.51)	1.55 (1.36-1.76)	1.85 (1.61-2.10)	2.08 (1.81-2.36)	2.33 (2.00-2.63)	2.58 (2.20-2.92)	2.92 (2.47-3.31)	3.19 (2.68-3.63)
24-hr	0.941 (0.833-1.07)	1.18 (1.05-1.34)	1.48 (1.31-1.68)	1.72 (1.52-1.94)	2.04 (1.79-2.30)	2.28 (2.00-2.57)	2.54 (2.22-2.86)	2.80 (2.43-3.15)	3.15 (2.72-3.54)	3.42 (2.94-3.85)
2-day	0.992 (0.884-1.11)	1.24 (1.11-1.40)	1.56 (1.39-1.74)	1.80 (1.60-2.01)	2.13 (1.89-2.38)	2.38 (2.10-2.66)	2.64 (2.33-2.95)	2.91 (2.54-3.25)	3.26 (2.84-3.65)	3.53 (3.06-3.96)
3-day	1.13 (1.02-1.25)	1.41 (1.27-1.56)	1.75 (1.58-1.93)	2.01 (1.81-2.22)	2.36 (2.13-2.61)	2.64 (2.36-2.91)	2.91 (2.60-3.21)	3.19 (2.84-3.52)	3.56 (3.15-3.93)	3.84 (3.38-4.25)
4-day	1.27 (1.16-1.39)	1.58 (1.44-1.73)	1.93 (1.77-2.12)	2.22 (2.02-2.42)	2.60 (2.36-2.84)	2.89 (2.62-3.16)	3.18 (2.88-3.47)	3.47 (3.13-3.79)	3.86 (3.46-4.22)	4.15 (3.71-4.55)
7-day	1.46 (1.33-1.59)	1.81 (1.65-1.97)	2.20 (2.02-2.40)	2.51 (2.30-2.73)	2.92 (2.66-3.17)	3.22 (2.93-3.49)	3.52 (3.20-3.82)	3.81 (3.46-4.14)	4.19 (3.80-4.56)	4.47 (4.03-4.87)
10-day	1.62 (1.48-1.76)	2.01 (1.84-2.18)	2.46 (2.26-2.67)	2.81 (2.58-3.05)	3.28 (3.00-3.55)	3.63 (3.32-3.93)	3.99 (3.63-4.32)	4.33 (3.94-4.70)	4.79 (4.33-5.19)	5.12 (4.62-5.57)
20-day	2.03 (1.86-2.22)	2.53 (2.32-2.76)	3.07 (2.82-3.35)	3.48 (3.19-3.79)	4.00 (3.67-4.36)	4.38 (4.01-4.77)	4.75 (4.34-5.16)	5.10 (4.64-5.54)	5.54 (5.03-6.02)	5.85 (5.30-6.36)
30-day	2.45 (2.24-2.65)	3.03 (2.78-3.29)	3.65 (3.35-3.96)	4.11 (3.77-4.45)	4.69 (4.29-5.06)	5.10 (4.66-5.51)	5.49 (5.01-5.93)	5.86 (5.34-6.32)	6.30 (5.73-6.80)	6.61 (6.01-7.14)
45-day	2.99 (2.75-3.23)	3.69 (3.41-4.00)	4.41 (4.06-4.76)	4.91 (4.53-5.31)	5.53 (5.10-5.97)	5.96 (5.48-6.43)	6.34 (5.84-6.84)	6.69 (6.15-7.22)	7.08 (6.51-7.64)	7.32 (6.74-7.90)
60-day	3.44 (3.17-3.73)	4.26 (3.93-4.62)	5.08 (4.69-5.50)	5.67 (5.23-6.13)	6.38 (5.88-6.90)	6.87 (6.33-7.42)	7.31 (6.74-7.91)	7.71 (7.11-8.34)	8.17 (7.53-8.85)	8.47 (7.81-9.16)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5% Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical

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AHYMO PROGRAM SUMMARY TABLE (AHYMO-S4)                    - Ver. S4.01a, Rel: 01a      RUN DATE (MON/DAY/YR) =11/11/2011
INPUT FILE = M:\PROJECT DOCUMENTS\1800-1899\1821\CALCS\1821P1.DAT                     USER NO.= AHYMO_Temp_User:20122010

                              FROM  TO                  PEAK        RUNOFF                TIME TO    CFS      PAGE =   1
                HYDROGRAPH    ID    ID        AREA    DISCHARGE     VOLUME      RUNOFF     PEAK     PER
COMMAND       IDENTIFICATION  NO.   NO.     (SQ MI)     (CFS)       (AC-FT)    (INCHES)  (HOURS)    ACRE     NOTATION

*S*********************************************************************
*S       STORM CLOUD, UNIT 4
*S       DEVELOPED CONDITIONS
*S       100-YR, 6-HR STORM
*S       1821P1.DAT
*S       OCTOBER 2011
*S       BY ASA NILSSON-WEBER
*S       ISAACSON & ARFMAN, P.A.
*S*********************************************************************
START                                                                                                   TIME=      0.00
RAINFALL  TYPE= 1 NOAA 14                                                                               RAIN6=    2.210
*S  BASIN A1
COMPUTE NM HYD        101.00   -     1      0.00323        6.99       0.241      1.39851    1.530    3.379 PER IMP=  49.00
*S  BASIN A2
COMPUTE NM HYD        102.00   -     2      0.00549       11.86       0.409      1.39851    1.530    3.376 PER IMP=  49.00
*S  BASIN A3
COMPUTE NM HYD        103.00   -     3      0.00235        5.09       0.175      1.39851    1.530    3.382 PER IMP=  49.00
*S  BASIN A4
COMPUTE NM HYD        104.00   -     4      0.00248        5.37       0.185      1.39851    1.530    3.382 PER IMP=  49.00
*S  BASIN A5
COMPUTE NM HYD        105.00   -     5      0.00009        0.21       0.007      1.39851    1.530    3.691 PER IMP=  49.00
*S  BASIN B
COMPUTE NM HYD        106.00   -     6      0.00150        3.25       0.112      1.39851    1.530    3.389 PER IMP=  49.00
*S  BASIN C
COMPUTE NM HYD        107.00   -     7      0.00283        6.12       0.211      1.39851    1.530    3.380 PER IMP=  49.00
*S  BASIN D1
COMPUTE NM HYD        108.00   -     8      0.00283        6.12       0.211      1.39851    1.530    3.380 PER IMP=  49.00
*S  BASIN D2
COMPUTE NM HYD        109.00   -     9      0.00245        5.30       0.183      1.39851    1.530    3.382 PER IMP=  49.00
*S  BASIN D5
COMPUTE NM HYD        110.00   -    10      0.00130        2.82       0.097      1.39851    1.530    3.392 PER IMP=  49.00
*S  BASIN D3
COMPUTE NM HYD        111.00   -    11      0.00116        2.52       0.087      1.39851    1.530    3.394 PER IMP=  49.00
*S  BASIN D4
*S  *** AP5 ***
COMPUTE NM HYD        112.00   -    12      0.00364        7.87       0.271      1.39851    1.530    3.378 PER IMP=  49.00
*S  BASIN D6
*S  *** AP8 ***
COMPUTE NM HYD        113.00   -    13      0.00984       21.24       0.734      1.39851    1.530    3.373 PER IMP=  49.00
*S  BASIN D7
COMPUTE NM HYD        114.00   -    14      0.00021        0.47       0.016      1.39851    1.530    3.506 PER IMP=  49.00
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COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	TIME TO RUNOFF (INCHES)	PEAK (HOURS)	CFS PER ACRE	NOTATION
*S BASIN E1										
COMPUTE NM HYD	115.00	-	15	0.00184	3.99	0.137	1.39851	1.530	3.385	PER IMP= 49.00
*S BASIN E2										
COMPUTE NM HYD	116.00	-	16	0.00724	15.64	0.540	1.39851	1.530	3.374	PER IMP= 49.00
*S ROUTE FLOWS FROM BASIN A1 THROUGH 30' F-F STREET										
ROUTE MCUNGE	200.00	1	20	0.00323	6.99	0.241	1.39847	1.550	3.379	CCODE = 0.2
*S ADD BASINS A1 & A2										
*S *** AP1 ***										
ADD HYD	200.10	2&20	21	0.00872	18.75	0.650	1.39845	1.540	3.360	
*S DIVIDE FLOWS, 7.6 CFS TO SD; REM. IN STREET										
DIVIDE HYD	220.SD	21	22	0.00639	7.60	0.476	1.39845	1.420	1.860	
	230.ST	and	23	0.00233	11.15	0.174	1.39845	1.540	7.465	
*S ADD BASINS A3 & D1										
*S *** AP2 ***										
ADD HYD	240.00	3& 8	24	0.00518	11.21	0.386	1.39841	1.530	3.381	
*S ROUTE FLOWS FROM BASIN A3 THROUGH 26' F-F STREET										
ROUTE MCUNGE	200.00	3	25	0.00235	5.08	0.175	1.39844	1.540	3.380	CCODE = 0.2
*S ADD FLOWS AT BASIN AP3-LOW POINT										
*S *** AP3 ***										
ADD HYD	260.00	25& 4	26	0.00483	10.43	0.360	1.39839	1.540	3.373	
ADD HYD	270.00	23&26	27	0.00716	21.58	0.534	1.39841	1.540	4.706	
*S ROUTE FLOWS FROM BASIN D2 THROUGH 26' F-F STREET										
ROUTE MCUNGE	280.00	9	28	0.00245	5.30	0.183	1.39845	1.540	3.382	CCODE = 0.2
*S ADD FLOWS AT AP4-LOW POINT (BASINS D1-D3)										
*S *** AP4 ***										
ADD HYD	290.00	8&11	29	0.00399	8.64	0.298	1.39838	1.530	3.384	
ADD HYD	300.00	28&29	30	0.00644	13.91	0.480	1.39838	1.530	3.376	
*S DIVIDE FLOWS FROM BASIN D4, 3.2 CFS TO SD; REM. IN STREET										
*S *** AP5 ***										
DIVIDE HYD	310.SD	12	31	0.00267	3.20	0.199	1.39844	1.410	1.873	
	320.ST	and	32	0.00097	4.67	0.072	1.39844	1.530	7.513	
*S ADD BASIN D5										
*S *** AP6 ***										
ADD HYD	330.00	10&32	33	0.00227	7.49	0.169	1.39836	1.530	5.154	
*S DIVIDE FLOWS, 3.0 CFS TO SD; REM. IN STREET										
DIVIDE HYD	340.SD	33	34	0.00154	3.00	0.115	1.39836	1.440	3.051	
	350.ST	and	35	0.00073	4.49	0.055	1.39836	1.530	9.552	
*S ADD BASIN C										
*S *** AP8 ***										
ADD HYD	360.00	7&35	36	0.00356	10.61	0.266	1.39840	1.530	4.652	
*S ADD BASINS E1 & E2										
*S *** AP9 ***										
ADD HYD	370.00	15&16	37	0.00908	19.62	0.677	1.39845	1.530	3.377	
FINISH										

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AHYMO PROGRAM SUMMARY TABLE (AHYMO-S4)                        - Ver. S4.01a, Rel: 01a      RUN DATE (MON/DAY/YR) =12/13/2011
INPUT FILE = M:\PROJECT DOCUMENTS\1800-1899\1822\CALCS\1822P1.DAT                        USER NO.= AHYMO_Temp_User:20122010

                              FROM  TO                    PEAK        RUNOFF                TIME TO    CFS      PAGE =   1
                HYDROGRAPH    ID    ID        AREA     DISCHARGE     VOLUME      RUNOFF      PEAK     PER
COMMAND       IDENTIFICATION  NO.   NO.     (SQ MI)      (CFS)       (AC-FT)    (INCHES)   (HOURS)   ACRE     NOTATION

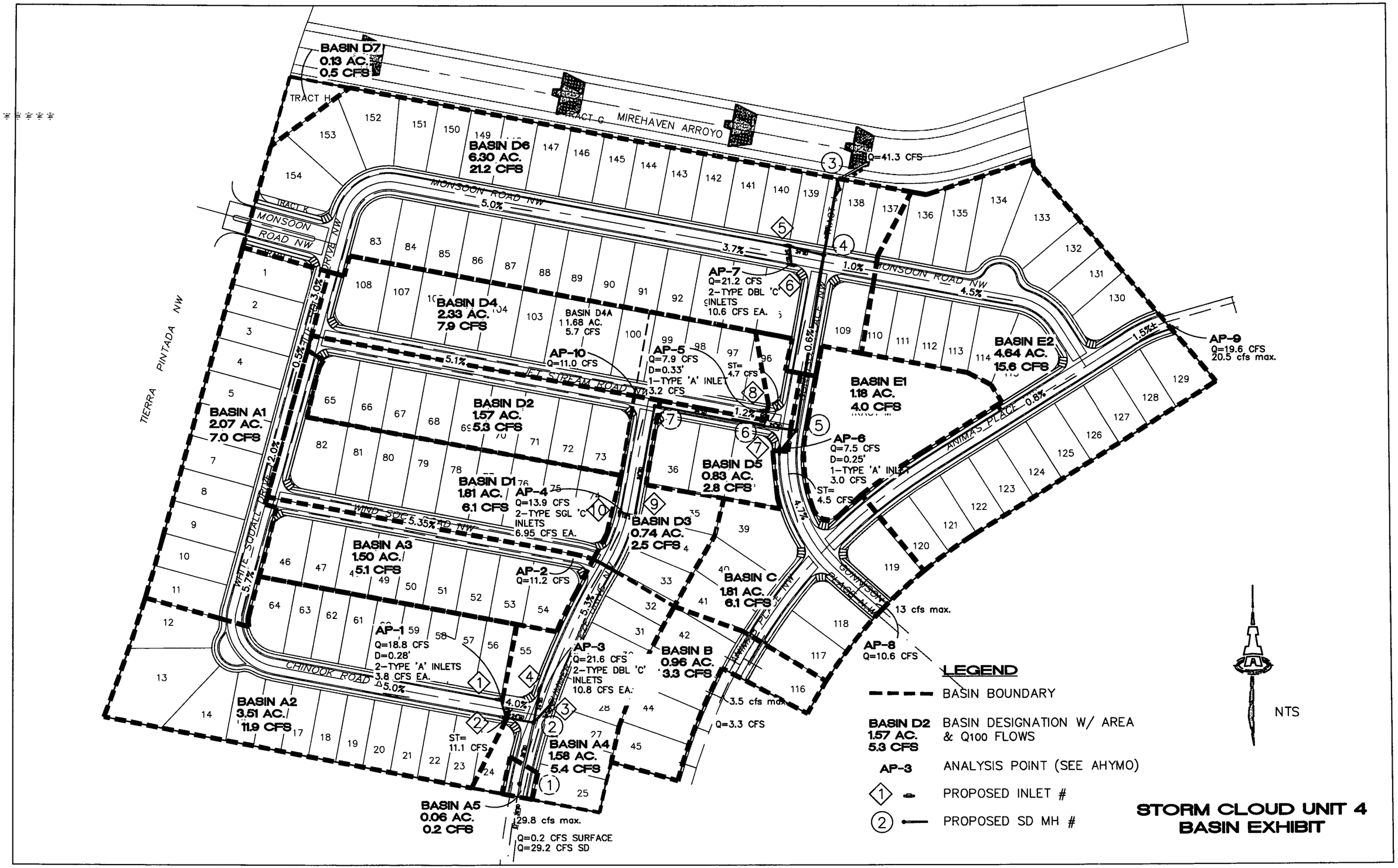
*S*********************************************************************
*S       STORM CLOUD, UNIT 5
*S       DEVELOPED CONDITIONS
*S       100-YR, 6-HR STORM
*S       1822P1.DAT
*S       OCTOBER 2011
*S       BY ASA NILSSON-WEBER
*S       ISAACSON & ARFMAN, P.A.
*S*********************************************************************
START                                                                                                   TIME=      0.00
RAINFALL  TYPE= 1 NOAA 14                                                                               RAIN6=    2.210
*S  BASIN F1
COMPUTE NM HYD        101.00   -     1       0.00460        9.61       0.325      1.32312    1.530    3.266 PER IMP=  42.00
*S  BASIN F2
COMPUTE NM HYD        102.00   -     2       0.00359        7.51       0.253      1.32312    1.530    3.267 PER IMP=  42.00
*S  BASIN F3
COMPUTE NM HYD        103.00   -     3       0.00234        4.90       0.165      1.32312    1.530    3.272 PER IMP=  42.00
*S  BASIN F4
COMPUTE NM HYD        104.00   -     4       0.00349        7.30       0.246      1.32312    1.530    3.268 PER IMP=  42.00
*S  BASIN F5
COMPUTE NM HYD        105.00   -     5       0.00148        3.11       0.104      1.32312    1.530    3.278 PER IMP=  42.00
*S  BASIN F6
COMPUTE NM HYD        106.00   -     6       0.00163        3.42       0.115      1.32312    1.530    3.276 PER IMP=  42.00
*S  BASIN F7
COMPUTE NM HYD        107.00   -     7       0.00300        6.28       0.212      1.32312    1.530    3.269 PER IMP=  42.00
*S  BASIN F8
COMPUTE NM HYD        108.00   -     8       0.00124        2.60       0.088      1.32312    1.530    3.282 PER IMP=  42.00
*S  BASIN F9
COMPUTE NM HYD        109.00   -     9       0.00346        7.24       0.244      1.32312    1.530    3.268 PER IMP=  42.00
*S  BASIN F10
COMPUTE NM HYD        110.00   -    10       0.00559       11.68       0.394      1.32312    1.530    3.265 PER IMP=  42.00
*S  BASIN F11
COMPUTE NM HYD        111.00   -    11       0.00102        2.15       0.072      1.32312    1.530    3.287 PER IMP=  42.00
*S  BASIN F12
COMPUTE NM HYD        112.00   -    12       0.00119        2.50       0.084      1.32312    1.530    3.283 PER IMP=  42.00
*S  BASIN F13
COMPUTE NM HYD        113.00   -    13       0.00037        0.79       0.026      1.32312    1.530    3.335 PER IMP=  42.00
*S  BASIN F14
COMPUTE NM HYD        114.00   -    14       0.00046        0.98       0.032      1.32312    1.530    3.320 PER IMP=  42.00
*S  ROUTE FLOWS FROM BASIN F1 THROUGH 32' F-F STREET
ROUTE MCUNGE          200.00    1   20       0.00460        9.61       0.325      1.32308    1.550    3.264 CCODE =    0.2
*S  ADD BASIN F2
ADD HYD               210.00  2&20  21       0.00819       17.02       0.578      1.32305    1.540    3.248
```

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
*S ADD BASINS F7 AND F8										
ADD HYD	220.00	7& 8	22	0.00424	8.88	0.299	1.32299	1.530	3.273	
*S ADD FLOWS AT SUN DROP AND DOWNBURST										
*S * * * AP-1 * * *										
ADD HYD	230.00	21&22	23	0.01243	25.87	0.877	1.32303	1.540	3.252	
*S ROUTE FLOWS FROM BASINS F1, F2, F7 & F8 THROUGH 32' F-F STREET										
ROUTE MCUNGE	240.00	23	24	0.01243	25.87	0.877	1.32304	1.550	3.252	CCODE = 0.2
*S ADD BASIN F3										
*S TOTAL FLOWS AT TORRENT AND DOWNBURST										
*S * * * AP-2 * * *										
ADD HYD	250.00	3&24	25	0.01477	30.69	1.042	1.32303	1.550	3.247	
*S ROUTE FLOWS THROUGH 32' F-F STREET										
ROUTE MCUNGE	270.00	25	27	0.01477	30.66	1.042	1.32311	1.570	3.243	CCODE = 0.2
*S ADD BASIN F4 - TOTAL FLOWS AT INLET 1										
*S * * * AP3 * * *										
ADD HYD	280.00	4&27	28	0.01826	37.66	1.289	1.32309	1.560	3.223	
*S DIVIDE FLOWS, 7.0 CFS TO SD; REM. IN STREET										
DIVIDE HYD	290.SD	28	29	0.00912	7.00	0.643	1.32309	1.390	1.199	
	300.ST	and	30	0.00914	30.66	0.645	1.32309	1.560	5.241	
*S ADD BASIN F5 - TOTAL FLOWS AT INLET 2										
*S * * * AP4 * * *										
ADD HYD	310.00	5&30	31	0.01062	33.66	0.749	1.32307	1.560	4.952	
*S DIVIDE FLOWS, 7.4 CFS TO SD; REM. IN STREET										
DIVIDE HYD	320.SD	31	32	0.00440	7.40	0.310	1.32307	1.440	2.630	
	330.ST	and	33	0.00622	26.26	0.439	1.32307	1.560	6.593	
*S ADD BASINS F6 & F10										
*S TOTAL FLOWS AT SUN DROP AND CAMINO DEL VENDADO										
*S * * * AP5 * * *										
ADD HYD	340.00	6&10	34	0.00722	15.10	0.509	1.32305	1.530	3.267	
*S ADD BASINS 9 & 11										
*S TOTAL FLOWS AT INLETS 3 & 4										
*S * * * AP6 * * *										
ADD HYD	350.00	9&11	35	0.00448	9.38	0.316	1.32300	1.530	3.272	
ADD HYD	360.00	34&35	36	0.01170	24.48	0.826	1.32303	1.530	3.269	
*S DIVIDE FLOWS, 8.8 CFS TO SD; REM. IN STREET										
DIVIDE HYD	380.SD	36	38	0.00804	8.80	0.567	1.32303	1.400	1.710	
	390.ST	and	39	0.00366	15.68	0.258	1.32303	1.530	6.696	
*S ADD BASIN F12 AND FLOWS FROM TORRENT										
*S TOTAL FLOWS AT SUMP INLETS 5 & 6										
*S * * * AP 7 * * *										
ADD HYD	400.00	12&39	40	0.00485	18.18	0.342	1.32300	1.530	5.858	
ADD HYD	410.00	33&40	41	0.01107	43.88	0.781	1.32304	1.550	6.192	
*S ADD STORM DRAIN FLOW										
ADD HYD	500.00	29&32	50	0.01352	14.40	0.954	1.32308	1.440	1.665	
ADD HYD	510.00	38&50	51	0.02156	23.20	1.521	1.32306	1.440	1.682	
ADD HYD	520.00	41&51	52	0.03263	67.08	2.302	1.32305	1.550	3.212	
FINISH										

* * * * *

APPENDIX C

Drainage Basin Exhibits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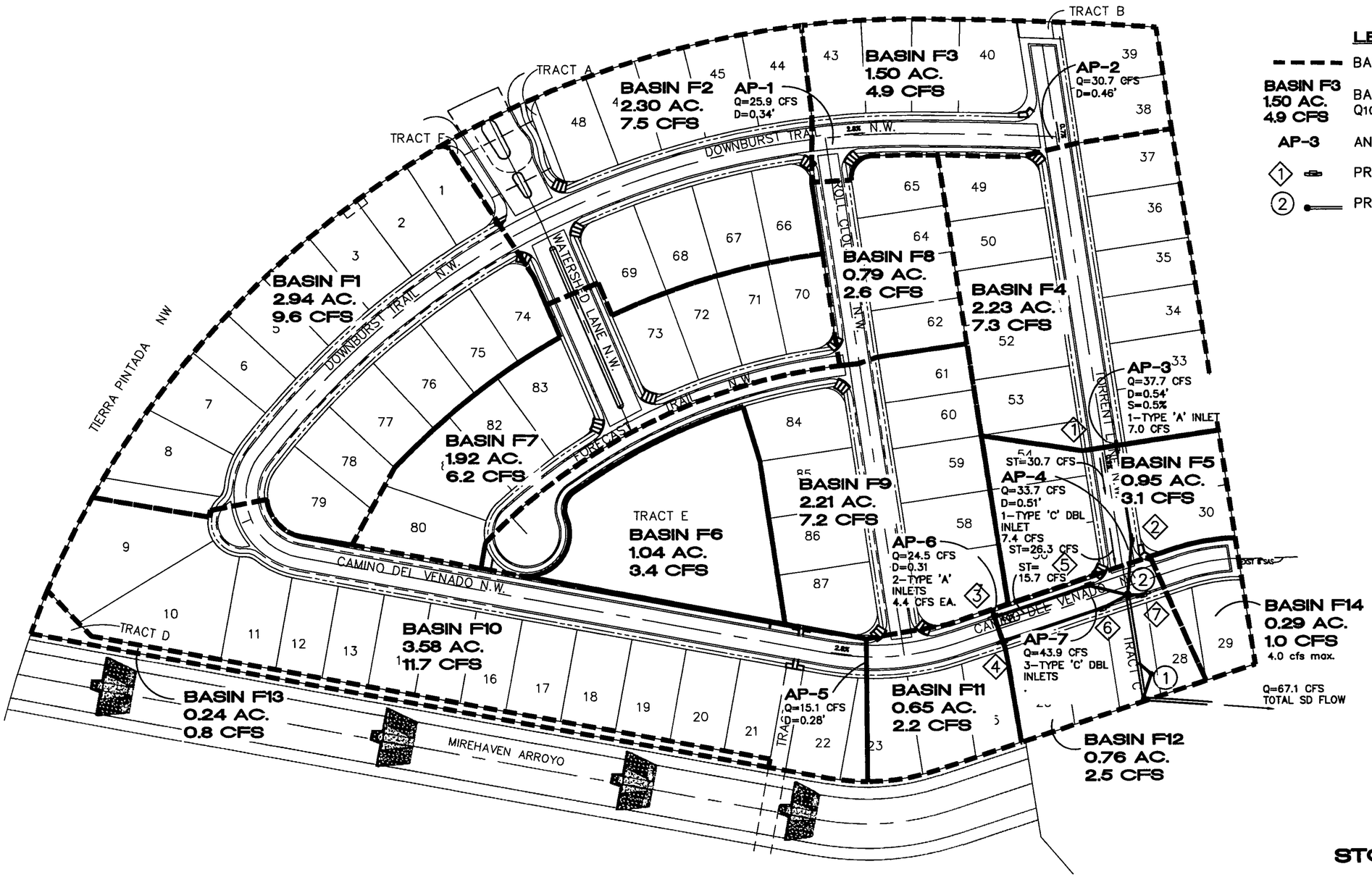
0.5 CFS
TRACT H
TRACT G MIREHAVEN ARROYO
Q=41.3 CFS
BASIN D6
6.30 AC.
21.2 CFS
TRACT K
MONSOON ROAD NW
MONSOON ROAD NW
5.0%
3.7%
1.0%
4.5%
AP-7
Q=21.2 CFS
2-TYPE DBL 'C'
INLETS
10.6 CFS EA.
BASIN D4
2.33 AC.
7.9 CFS
BASIN D4A
1.68 AC.
5.7 CFS
AP-10
Q=11.0 CFS
AP-5
Q=7.9 CFS
D=0.33'
1-TYPE 'A' INLET
3.2 CFS
ST=
4.7 CFS
JET STREAM ROAD NW
5.1%
1.2%
0.6%
BASIN E1
1.18 AC.
4.0 CFS
BASIN E2
4.64 AC.
15.6 CFS
1.5%
AP-9
Q=19.6 CFS
20.5 cfs max.
ANIMAS PLACE
0.8%
TIERRA PINTADA NW
BASIN A1
2.07 AC.
7.0 CFS
BASIN D2
1.57 AC.
5.3 CFS
BASIN D1
1.81 AC.
6.1 CFS
AP-4
Q=13.9 CFS
2-TYPE SGL 'C'
INLETS
6.95 CFS EA.
WIND SOCK ROAD NW
5.35%
WHITE SQUALL DRIVE
5.7%
2.0%
BASIN D5
0.83 AC.
2.8 CFS
AP-6
Q=7.5 CFS
D=0.25'
1-TYPE 'A' INLET
3.0 CFS
ST=
4.5 CFS
4.7%
BASIN D3
0.74 AC.
2.5 CFS
BASIN A3
1.50 AC.
5.1 CFS
AP-2
Q=11.2 CFS
BASIN C
1.81 AC.
6.1 CFS
GUNNISON
13 cfs max.
AP-8
Q=10.6 CFS
AP-1
Q=18.8 CFS
D=0.28'
2-TYPE 'A' INLETS
3.8 CFS EA.
CHINOOK ROAD
5.0%
AP-3
Q=21.6 CFS
2-TYPE DBL 'C'
INLETS
10.8 CFS EA.
5.3%
BASIN B
0.96 AC.
3.3 CFS
3.5 cfs max.
Q=3.3 CFS
BASIN A2
3.51 AC.
11.9 CFS
ST=
11.1 CFS
4.0%
BASIN A4
1.58 AC.
5.4 CFS
BASIN A5
0.06 AC.
0.2 CFS
29.8 cfs max.
Q=0.2 CFS SURFACE
Q=29.2 CFS SD
LEGEND
BASIN BOUNDARY
BASIN D2 1.57 AC. 5.3 CFS
BASIN DESIGNATION W/ AREA & Q100 FLOWS
AP-3
ANALYSIS POINT (SEE AHYMO)
PROPOSED INLET #
PROPOSED SD MH #
NTS
STORM CLOUD UNIT 4
BASIN EXHIBIT



LEGEND

- BASIN BOUNDARY
- BASIN F3 1.50 AC. 4.9 CFS — BASIN DESIGNATION W/ AREA & Q100 FLOWS
- AP-3 — ANALYSIS POINT (SEE AHYMO)
- (1) — PROPOSED INLET #
- (2) — PROPOSED SD MH #

STORM CLOUD UNIT 5
BASIN EXHIBIT

APPENDIX D

Street Flow Capacity Calculations

STREET FLOW DEPTH TABLE

STORM CLOUD, UNIT 4

STREET	LOCATION	STREET WIDTH	CURB TYPE	SLOPE (ft/ft)	Q_{100} (cfs)	DEPTH (ft)	EGL DEPTH (ft)
CHINOOK	AP1; INLETS 1 & 2	30' F-F	STD	0.0400	18.8	0.28	0.62
WIND SOCK	AP2	28' F-F	MTBL	0.0340	11.2	0.24	0.47
SUMMER BREEZE	AP3; INLETS 3 & 4	26' F-F	STD	0.0050	21.6	0.44	0.55
SUMMER BREEZE	AP4; INLETS 9 & 10	26' F-F	STD	0.0050	13.9	0.36	0.45
JET STREAM	AP5; INLET 8	30' F-F	STD	0.0120	15.8	0.33	0.46
GUNNISON	AP6; INLET 7	30' F-F	STD	0.0470	15	0.25	0.59
MONSOON RD	AP7; INLETS 5 & 6	30' F-F	STD	0.0050	21.2	0.43	0.53
GUNNISON	AP8	28' F-F	STD	0.0400	10.6	0.23	0.48
ANIMAS PL	AP9	28' F-F	STD	0.0150	19.6	0.34	0.53
JET STREAM	AP10	30' F-F	MTBL	0.0510	11	0.22	0.53

STREET FLOW CAPACITY CALCULATIONS, STORM CLOUD, UNIT 4

STREET NAME: **CHINOOK** 1
LOCATION: **AP1; INLETS 1 & 2**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.04	Road Width/2	15
Q_{100}	18.8	Curb Height	0.67
Right-of-way Width	51	1/2 Wetted Perimeter (P)	14.484
Road Width	30	1/2 Area(STD)	2.016
Curb Type	STD	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	9.407
Depth	0.284		

RESULTS

HGL

Q_{100} FLOW CAPACITY = 18.81 cfs OK
at an HGL Depth= 0.28 ft < Curb height = 0.67
OK

EGL

Velocity 4.67 fps
$V^2/2g$ 0.34 ft
EGL Depth = 0.62 ft < Right-of-way height = 0.87
OK

STREET NAME: **WIND SOCK** 2
LOCATION: **AP2**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.034	Road Width/2	14
Q_{100}	11.2	Curb Height	0.33
Right-of-way Width	47	1/2 Wetted Perimeter (P)	12.342
Road Width	28	1/2 Area(STD)	----
Curb Type	MTBL	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	1.464
Manning's N	0.017	Discharge (1/2 Q)	5.657
Depth	0.242		

RESULTS

HGL

Q_{100} FLOW CAPACITY = 11.31 cfs OK
at an HGL Depth= 0.24 ft < Curb height = 0.33
OK

EGL

Velocity 3.86 fps
$V^2/2g$ 0.23 ft
EGL Depth = 0.47 ft < Right-of-way height = 0.51
OK

STREET NAME: **SUMMER BREEZE** 3
LOCATION: **AP3; INLETS 3 & 4**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.005	Road Width/2	13
Q_{100}	21.6	Curb Height	0.67
Right-of-way Width	45	1/2 Wetted Perimeter (P)	13.435
Road Width	26	1/2 Area(STD)	3.965
Curb Type	STD	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	10.819
Depth	0.435		

RESULTS

HGL

Q_{100} FLOW CAPACITY = 21.64 cfs OK
at an HGL Depth= 0.44 ft < Curb height = 0.67
OK

EGL

Velocity 2.73 fps
$V^2/2g$ 0.12 ft
EGL Depth = 0.55 ft < Right-of-way height = 0.85
OK

STREET FLOW CAPACITY CALCULATIONS, STORM CLOUD, UNIT 4

STREET NAME: SUMMER BREEZE 4
LOCATION: AP4; INLETS 9 & 10

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.005	Road Width/2	13
Q_{100}	13.9	Curb Height	0.67
Right-of-way Width	45	1/2 Wetted Perimeter (P)	13.364
Road Width	26	1/2 Area(STD)	3.042
Curb Type	STD	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	6.975
Depth	0.364		

RESULTS

HGL

Q_{100} FLOW CAPACITY = 13.95 cfs OK
at an HGL Depth= 0.36 ft < Curb height = 0.67
OK

EGL

Velocity 2.29 fps
$V^2/2g$ 0.08 ft
EGL Depth = 0.45 ft < Right-of-way height = 0.86
OK

STREET NAME: JET STREAM 5
LOCATION: AP5; INLET 8 =7.9 cfs north side

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.012	Road Width/2	15
Q_{100}	15.8	Curb Height	0.67
Right-of-way Width	51	1/2 Wetted Perimeter (P)	15.328
Road Width	30	1/2 Area(STD)	2.670
Curb Type	STD	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	7.928
Depth	0.328		

RESULTS

HGL

Q_{100} FLOW CAPACITY = 15.86 cfs OK
at an HGL Depth= 0.33 ft < Curb height = 0.67
OK

EGL

Velocity 2.97 fps
$V^2/2g$ 0.14 ft
EGL Depth = 0.46 ft < Right-of-way height = 0.87
OK

STREET NAME: GUNNISON 6
LOCATION: AP6; INLET 7 =7.5 cfs west side

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.047	Road Width/2	15
Q_{100}	15	Curb Height	0.67
Right-of-way Width	51	1/2 Wetted Perimeter (P)	12.903
Road Width	30	1/2 Area(STD)	1.600
Curb Type	STD	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	7.489
Depth	0.253		

RESULTS

HGL

Q_{100} FLOW CAPACITY = 14.98 cfs ****DEPTH INSUFFICIENT, TRY AGAIN****
at an HGL Depth= 0.25 ft < Curb height = 0.67
OK

EGL

Velocity 4.68 fps
$V^2/2g$ 0.34 ft
EGL Depth = 0.59 ft < Right-of-way height = 0.87
OK

STREET FLOW CAPACITY CALCULATIONS, STORM CLOUD, UNIT 4

STREET NAME: **MONSOON RD** 7
LOCATION: **AP7; INLETS 5 & 6**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.005	Road Width/2	15
Q_{100}	21.2	Curb Height	0.67
Right-of-way Width	51	1/2 Wetted Perimeter (P)	15.426
Road Width	30	1/2 Area(STD)	4.140
Curb Type	STD	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	10.600
Depth	0.428		

RESULTS

HGL

Q_{100} FLOW CAPACITY = 21.20 cfs OK
at an HGL Depth= 0.43 ft < Curb height = 0.67
OK

EGL

Velocity 2.56 fps
$V^2/2g$ 0.10 ft
EGL Depth = 0.53 ft < Right-of-way height = 0.87
OK

STREET NAME: **GUNNISON** 8
LOCATION: **AP8**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.04	Road Width/2	14
Q_{100}	10.6	Curb Height	0.67
Right-of-way Width	47	1/2 Wetted Perimeter (P)	11.730
Road Width	28	1/2 Area(STD)	1.323
Curb Type	STD	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	5.357
Depth	0.230	Flow in West Haven Street = 14.57 cfs	

RESULTS

HGL

Q_{100} FLOW CAPACITY = 10.71 cfs OK
at an HGL Depth= 0.23 ft < Curb height = 0.67
OK

EGL

Velocity 4.05 fps
$V^2/2g$ 0.25 ft
EGL Depth = 0.48 ft < Right-of-way height = 0.85
OK

STREET NAME: **ANIMAS PL** 9
LOCATION: **AP9**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.015	Road Width/2	14
Q_{100}	19.6	Curb Height	0.67
Right-of-way Width	47	1/2 Wetted Perimeter (P)	14.338
Road Width	28	1/2 Area(STD)	2.772
Curb Type	STD	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	9.868
Depth	0.338		

RESULTS

HGL

Q_{100} FLOW CAPACITY = 19.74 cfs OK
at an HGL Depth= 0.34 ft < Curb height = 0.67
OK

EGL

Velocity 3.56 fps
$V^2/2g$ 0.20 ft
EGL Depth = 0.53 ft < Right-of-way height = 0.85
OK

STREET FLOW CAPACITY CALCULATIONS, STORM CLOUD, UNIT 4

STREET NAME: **JET STREAM** 10
LOCATION: **AP10**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.051	Road Width/2	15
Q_{100}	11	Curb Height	0.33
Right-of-way Width	51	1/2 Wetted Perimeter (P)	11.322
Road Width	30	1/2 Area(STD)	----
Curb Type	MTBL	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	1.232
Manning's N	0.017	Discharge (1/2 Q)	5.503

Depth 0.222

RESULTS

HGL

Q_{100} FLOW CAPACITY = 11.01 cfs OK
at an HGL Depth= 0.22 ft < Curb height = 0.33
OK

EGL

Velocity 4.47 fps
$V^2/2g$ 0.31 ft
EGL Depth = 0.53 ft < Right-of-way height = 0.53
OK

STREET FLOW DEPTH TABLE

STORM CLOUD, UNIT 5

STREET	LOCATION	STREET WIDTH	CURB TYPE	SLOPE (ft/ft)	Q_{100} (cfs)	DEPTH (ft)	EGL DEPTH (ft)
DOWNBURST	AP1	32' F-F	STD	0.0280	25.9	0.34	0.66
DOWNBURST/TORRENT	AP2	32' F-F	STD	0.0070	30.7	0.46	0.62
TORRENT	AP3; INLET 1	32' F-F	STD	0.0050	37.7	0.54	0.69
TORRENT	AP4; INLET 2	32' F-F	STD	0.0050	33.7	0.51	0.65
CAMINO DEL VENADO	AP5	32' F-F	STD	0.0280	15.1	0.28	0.51
CAMINO DEL VENADO	AP6; INLETS 3 & 4	32' F-F	STD	0.0400	24.5	0.31	0.70
CAMINO DEL VENADO	AP7; INLETS 5-7	32' F-F	STD	0.0050	43.9	0.57	0.74

STREET FLOW CAPACITY CALCULATIONS
STORM CLOUD, UNIT 5

STREET NAME: **DOWNBURST** 1
LOCATION: **AP1**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.028	Road Width/2	16
Q_{100}	25.9	Curb Height	0.67
Right-of-way Width	51	1/2 Wetted Perimeter (P)	16.339
Road Width	32	1/2 Area(STD)	2.864
Curb Type	STD	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	13.045

Depth 0.339

RESULTS

HGL

Q_{100} FLOW CAPACITY = 26.09 cfs OK
at an HGL Depth= 0.34 ft < Curb height = 0.67
OK

EGL

Velocity 4.55 fps
$V^2/2g$ 0.32 ft
EGL Depth = 0.66 ft < Right-of-way height = 0.85
OK

STREET NAME: **DOWNBURST/TORRENT** 2
LOCATION: **AP2**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.007	Road Width/2	16
Q_{100}	30.7	Curb Height	0.67
Right-of-way Width	51	1/2 Wetted Perimeter (P)	16.460
Road Width	32	1/2 Area(STD)	4.800
Curb Type	STD	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	15.374

Depth 0.460

RESULTS

HGL

Q_{100} FLOW CAPACITY = 30.75 cfs OK
at an HGL Depth= 0.46 ft < Curb height = 0.67
OK

EGL

Velocity 3.20 fps
$V^2/2g$ 0.16 ft
EGL Depth = 0.62 ft < Right-of-way height = 0.85
OK

STREET NAME: **TORRENT** 3
LOCATION: **AP3; INLET 1**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.005	Road Width/2	16
Q_{100}	37.7	Curb Height	0.67
Right-of-way Width	51	1/2 Wetted Perimeter (P)	16.536
Road Width	32	1/2 Area(STD)	6.016
Curb Type	STD	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	18.886

Depth 0.536

RESULTS

HGL

Q_{100} FLOW CAPACITY = 37.77 cfs OK
at an HGL Depth= 0.54 ft < Curb height = 0.67
OK

EGL

Velocity 3.14 fps
$V^2/2g$ 0.15 ft
EGL Depth = 0.69 ft < Right-of-way height = 0.85
OK

STREET FLOW CAPACITY CALCULATIONS
STORM CLOUD, UNIT 5

STREET NAME: **TORRENT** 4
LOCATION: **AP4; INLET 2**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.005	Road Width/2	16
Q_{100}	33.7	Curb Height	0.67
Right-of-way Width	51	1/2 Wetted Perimeter (P)	16.511
Road Width	32	1/2 Area(STD)	5.616
Curb Type	STD	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	16.853

Depth 0.511

RESULTS

HGL

Q_{100} FLOW CAPACITY = 33.71 cfs OK
at an HGL Depth= 0.51 ft < Curb height = 0.67
OK

EGL

Velocity 3.00 fps
$V^2/2g$ 0.14 ft
EGL Depth = 0.65 ft < Right-of-way height = 0.85
OK

STREET NAME: **CAMINO DEL VENADO** 5
LOCATION: **AP5**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.028	Road Width/2	16
Q_{100}	15.1	Curb Height	0.67
Right-of-way Width	51	1/2 Wetted Perimeter (P)	14.280
Road Width	32	1/2 Area(STD)	1.960
Curb Type	STD	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	7.578

Depth 0.280

RESULTS

HGL

Q_{100} FLOW CAPACITY = 15.16 cfs OK
at an HGL Depth= 0.28 ft < Curb height = 0.67
OK

EGL

Velocity 3.87 fps
$V^2/2g$ 0.23 ft
EGL Depth = 0.51 ft < Right-of-way height = 0.85
OK

STREET NAME: **CAMINO DEL VENADO** 6
LOCATION: **AP6; INLETS 3 & 4**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.04	Road Width/2	16
Q_{100}	24.5	Curb Height	0.67
Right-of-way Width	51	1/2 Wetted Perimeter (P)	16.014
Road Width	32	1/2 Area(STD)	2.465
Curb Type	STD	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	12.300

Depth 0.314

RESULTS

HGL

Q_{100} FLOW CAPACITY = 24.60 cfs OK
at an HGL Depth= 0.31 ft < Curb height = 0.67
OK

EGL

Velocity 4.99 fps
$V^2/2g$ 0.39 ft
EGL Depth = 0.70 ft < Right-of-way height = 0.85
OK

STREET FLOW CAPACITY CALCULATIONS
STORM CLOUD, UNIT 5

STREET NAME:	CAMINO DEL VENADO	7
LOCATION:	AP7; INLETS 5-7	

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.005	Road Width/2	16
Q_{100}	43.9	Curb Height	0.67
Right-of-way Width	51	1/2 Wetted Perimeter (P)	16.572
Road Width	32	1/2 Area(STD)	6.592
Curb Type	STD	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	21.970

Depth: 0.572

RESULTS

HGL

Q_{100} FLOW CAPACITY =	**43.94 cfs**	OK		
at an HGL Depth=	**0.57 ft**	<	Curb height =	0.67
		OK		

EGL

Velocity	3.33 fps			
$V^2/2g$	0.17 ft			
EGL Depth =	**0.74 ft**	<	Right-of-way height =	0.85
		OK		

APPENDIX E

Storm Drain Calculations

STORM CLOUD, UNIT 4

SUMP INLET CAPACITY

GRATE OPEN AREA:
(per COA std dwg #2220, single grate)

GROSS AREA FOR ONE GRATE =	(25 in/12)(40 in/12) =	6.94 SF
LESS BEARING BARS =	(0.5 in/12)(3.33 ft)(13) =	1.80 SF
LESS CROSS BARS =	(0.5 in/12)(7)[(25 in/12)-(13)(0.5 in/12)] =	0.45 SF
	NET GRATE OPEN AREA =	**4.69 SF**
	GRATE OPEN AREA (assuming 50% clogging factor) =	***2.35 SF***

ORIFICE EQUATION:

$$Q = CA(2gh)^{1/2}$$

Where:

C = 0.67
A = 2.35 ft^2
g = 32.2 ft/sec^2
h = height of the water surface above the grate

CAPACITY CALCULATIONS:

INLET # 3 & 4
LOCATION: SUMMER BREEZE

h = 0.67 ft
$Q_{(capacity)}$ = 10.32273 cfs REQUIRED Q = 21.6 cfs

NUMBER OF GRATES REQUIRED = **3**

INLET # ~~4 & 5~~ 5 & 6
LOCATION: MONSOON

h = 0.67 ft
$Q_{(capacity)}$ = 10.32273 cfs REQUIRED Q = 21.2 cfs

NUMBER OF GRATES REQUIRED = **3**

INLET # 9 & 10
LOCATION: SUMMER BREEZE

h = 0.67 ft
$Q_{(capacity)}$ = 10.32273 cfs REQUIRED Q = 13.9 cfs

NUMBER OF GRATES REQUIRED = **2**

STORM CLOUD, UNIT 5

SUMP INLET CAPACITY

GRATE OPEN AREA:
(per COA std dwg #2220, single grate)

GROSS AREA FOR ONE GRATE =	(25 in/12)(40 in/12) =	6.94 SF
LESS BEARING BARS =	(0.5 in/12)(3.33 ft)(13) =	1.80 SF
LESS CROSS BARS =	(0.5 in/12)(7)[(25 in/12)-(13)(0.5 in/12)] =	0.45 SF
	NET GRATE OPEN AREA =	**4.69 SF**
	GRATE OPEN AREA (assuming 50% clogging factor) =	***2.35 SF***

ORIFICE EQUATION:

$$Q = CA(2gh)^{1/2}$$

Where:

C = 0.67
A = 2.35 ft^2
g = 32.2 ft/sec^2
h = height of the water surface above the grate

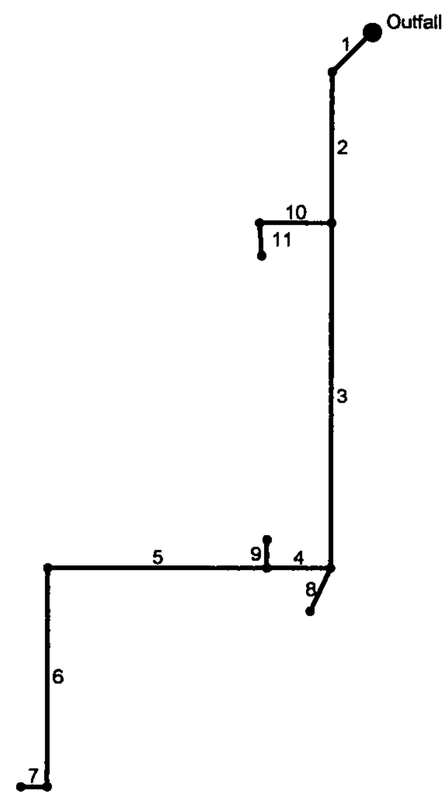
CAPACITY CALCULATIONS:

INLETS # 5, 6 & 7
LOCATION: CAMINO DEL VENADO

h = 0.67 ft
$Q_{(capacity)}$ = 10.32273 cfs REQUIRED Q = 43.9 cfs

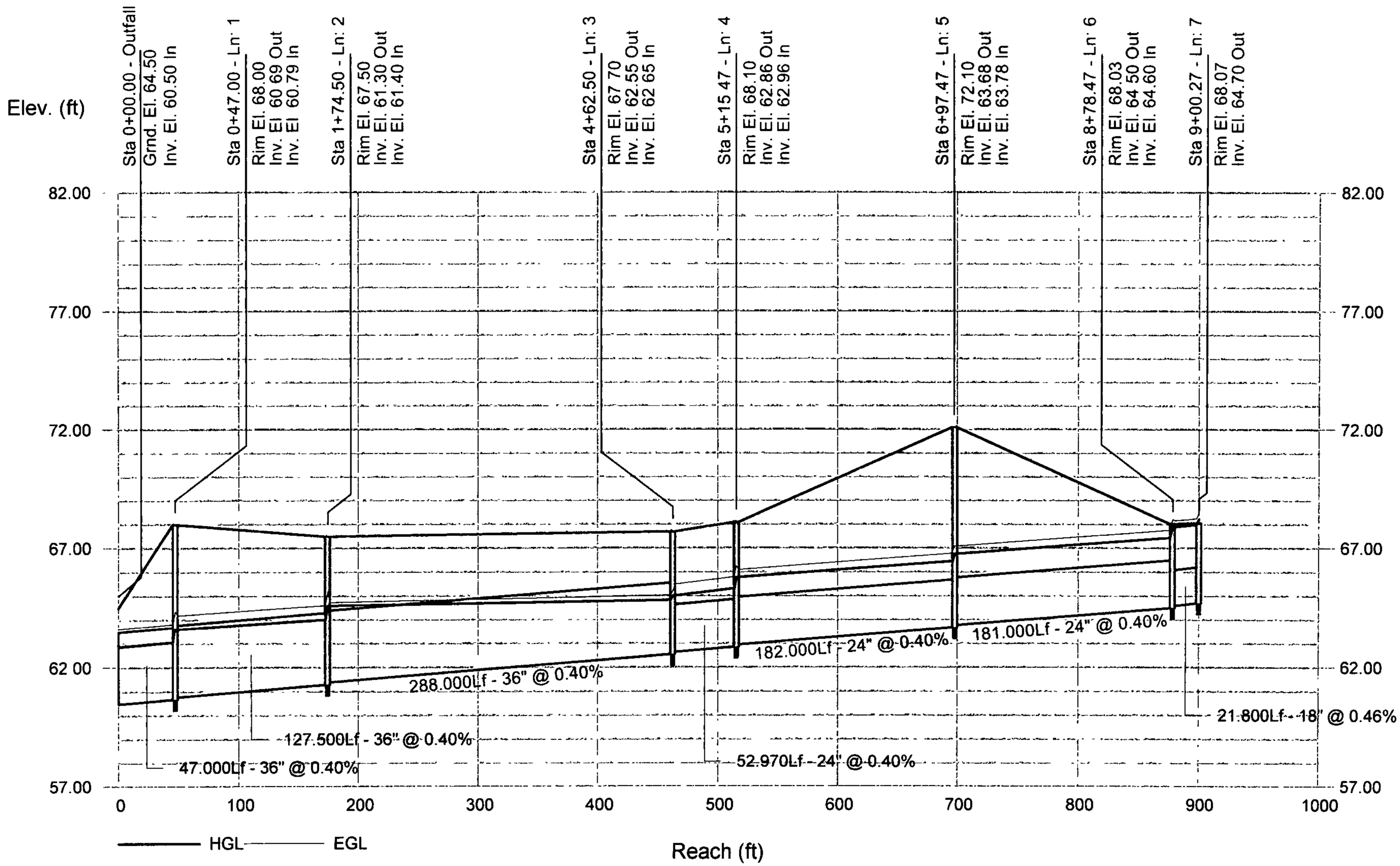
NUMBER OF GRATES REQUIRED = **5**

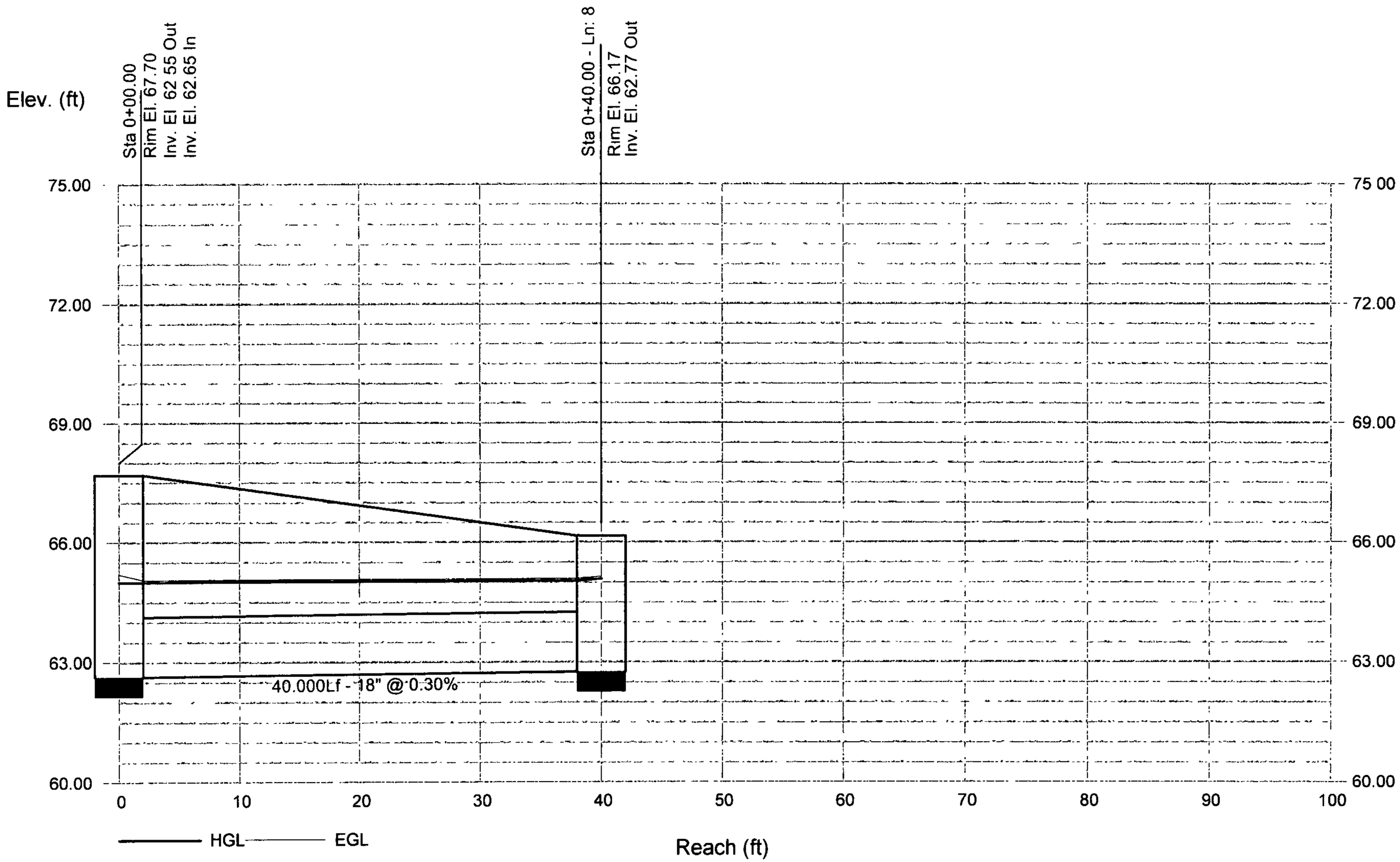
GUNNISON SD UNIT 4



Project File: 1821 GUNNISON SD.stm	Number of lines: 11	Date: 12/13/2011

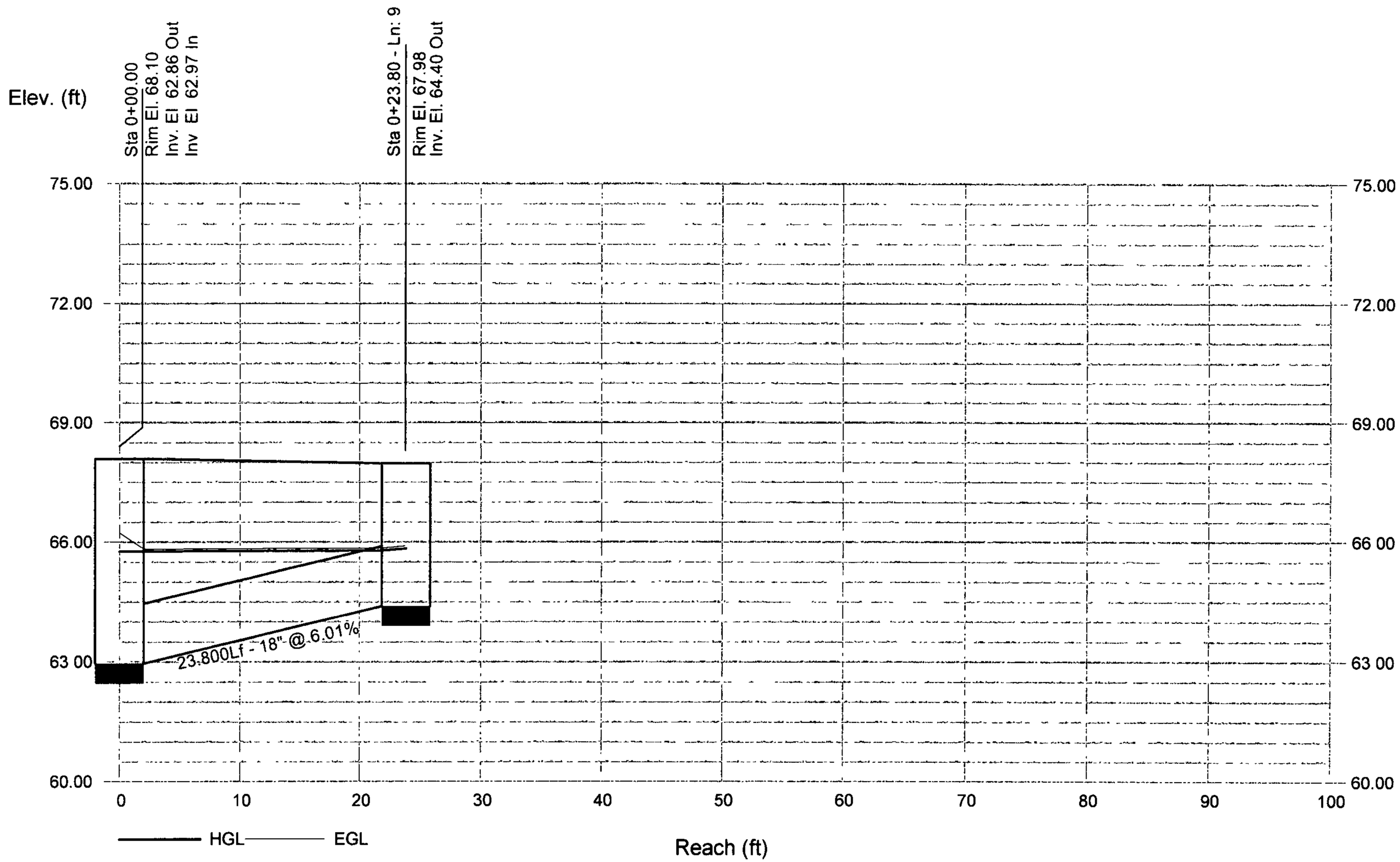
Storm Sewers v9 00

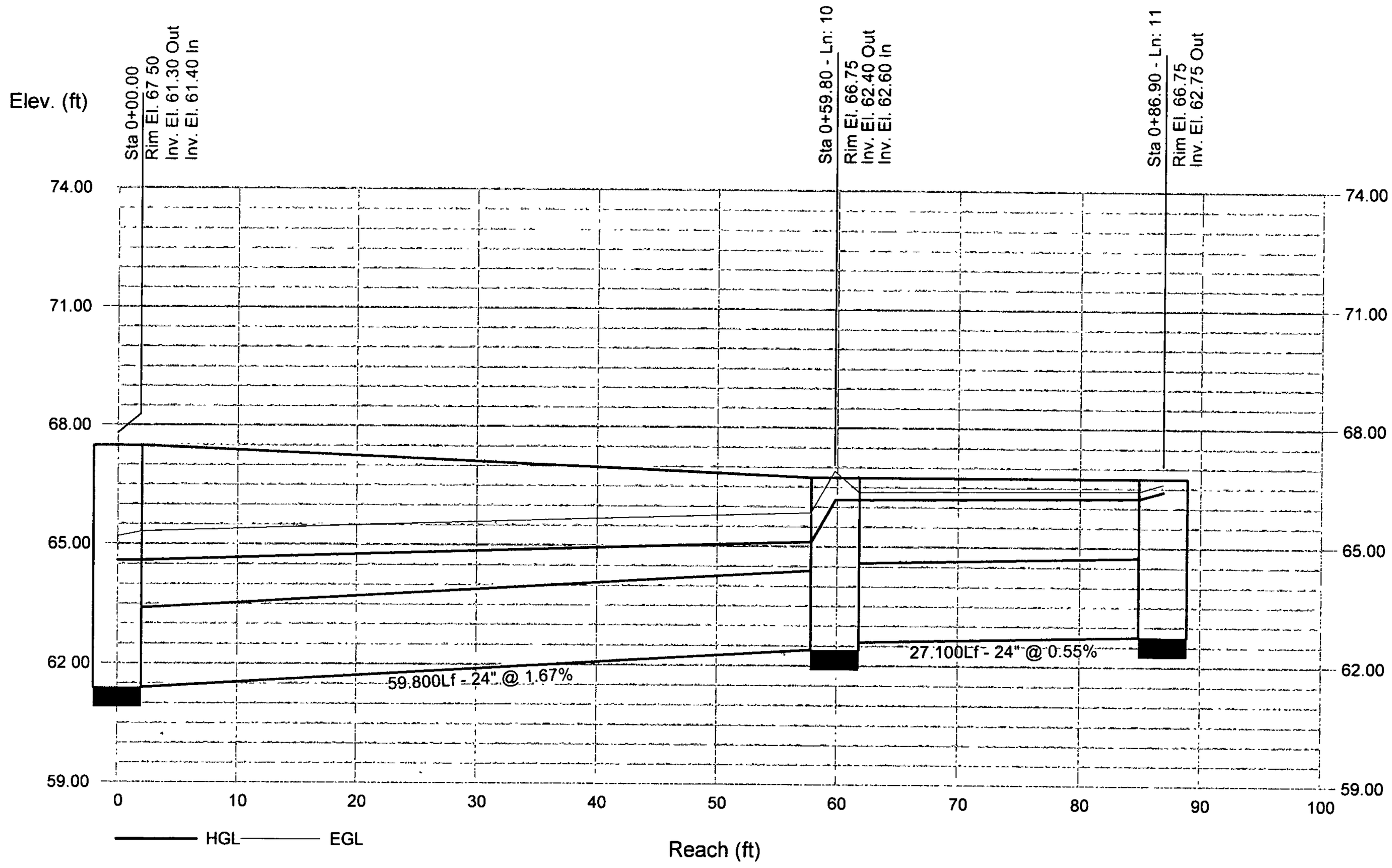

Elev. (ft)
Sta 0+00.00 - Outfall
Grnd. El. 64.50
Inv. El. 60.50 In
Sta 0+47.00 - Ln: 1
Rim El. 68.00
Inv. El. 60.69 Out
Inv. El. 60.79 In
Sta 1+74.50 - Ln: 2
Rim El. 67.50
Inv. El. 61.30 Out
Inv. El. 61.40 In
Sta 4+62.50 - Ln: 3
Rim El. 67.70
Inv. El. 62.55 Out
Inv. El. 62.65 In
Sta 5+15.47 - Ln: 4
Rim El. 68.10
Inv. El. 62.86 Out
Inv. El. 62.96 In
Sta 6+97.47 - Ln: 5
Rim El. 72.10
Inv. El. 63.68 Out
Inv. El. 63.78 In
Sta 8+78.47 - Ln: 6
Rim El. 68.03
Inv. El. 64.50 Out
Inv. El. 64.60 In
Sta 9+00.27 - Ln: 7
Rim El. 68.07
Inv. El. 64.70 Out
82.00
77.00
72.00
67.00
62.00
57.00
288.000Lf - 36" @ 0.40%
182.000Lf - 24" @ 0.40%
181.000Lf - 24" @ 0.40%
127.500Lf - 36" @ 0.40%
47.000Lf - 36" @ 0.40%
52.970Lf - 24" @ 0.40%
21.800Lf - 18" @ 0.46%
0
100
200
300
400
500
600
700
800
900
1000
HGL
EGL
Reach (ft)


Elev. (ft)
Sta 0+00.00
Rim El. 67.70
Inv. El 62.55 Out
Inv. El. 62.65 In
Sta 0+40.00 - Ln: 8
Rim El. 66.17
Inv. El. 62.77 Out
75.00
72.00
69.00
66.00
63.00
60.00
40.000Lf - 18" @ 0.30%
0
10
20
30
40
50
60
70
80
90
100
HGL
EGL
Reach (ft)

Storm Sewer Profile

Project file: 1[illegible] GUNNISON [illegible]




Elev. (ft)
Sta 0+00.00
Rim El. 67.50
Inv. El. 61.30 Out
Inv. El. 61.40 In
Sta 0+59.80 - Ln: 10
Rim El. 66.75
Inv. El. 62.40 Out
Inv. El. 62.60 In
Sta 0+86.90 - Ln: 11
Rim El. 66.75
Inv. El. 62.75 Out
74.00
71.00
68.00
65.00
62.00
59.00
59.800Lf - 24" @ 1.67%
27.100Lf - 24" @ 0.55%
0
10
20
30
40
50
60
70
80
90
100
HGL
EGL
Reach (ft)

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1		41.30	36	Cir	47.000	60.50	60.69	0.404	62.88	63.07	0.55	63.62	End	Manhole
2		41.30	36	Cir	127.500	60.79	61.30	0.400	63.62	64.02	0.59	64.60	1	Manhole
3		20.10	36	Cir	288.000	61.40	62.55	0.399	64.60	64.82	0.19	65.01	2	Manhole
4		17.10	24	Cir	52.970	62.65	62.86	0.396	65.01*	65.31*	0.46	65.77	3	Manhole
5		13.90	24	Cir	182.000	62.96	63.68	0.396	65.77*	66.46*	0.30	66.76	4	Manhole
6		13.90	24	Cir	181.000	63.78	64.50	0.398	66.76*	67.45*	0.46	67.91	5	Generic
7		6.95	18	Cir	21.800	64.60	64.70	0.459	67.91*	68.00*	0.24	68.24	6	Generic
8		3.00	18	Cir	40.000	62.65	62.77	0.300	65.01*	65.04*	0.04	65.09	3	Generic
9		3.20	18	Cir	23.800	62.97	64.40	6.008	65.77	65.79	0.05	65.84	4	Generic
10		21.20	24	Cir	59.800	61.40	62.40	1.672	64.60*	65.13*	1.06	66.19	2	Generic
11		10.60	24	Cir	27.100	62.60	62.75	0.554	66.19*	66.25*	0.18	66.43	10	Generic

GUNNISON SD | Number of lines: 11 | Run Date: 12/13/2011

NOTES: Return period = 2 Yrs. ; *Surcharged (HGL above crown).

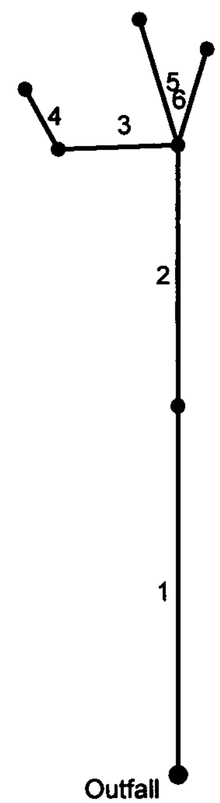
Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	47.000	0.00	0.00	0.00	0.00	0.00	0.0	3.7	0.0	41.30	42.40	6.86	36	0.40	60.50	60.69	62.88	63.07	64.50	68.00	
2	1	127.500	0.00	0.00	0.00	0.00	0.00	0.0	3.3	0.0	41.30	42.18	6.06	36	0.40	60.79	61.30	63.62	64.02	68.00	67.50	
3	2	288.000	0.00	0.00	0.00	0.00	0.00	0.0	1.6	0.0	20.10	42.14	3.17	36	0.40	61.40	62.55	64.60	64.82	67.50	67.70	
4	3	52.970	0.00	0.00	0.00	0.00	0.00	0.0	1.5	0.0	17.10	14.24	5.44	24	0.40	62.65	62.86	65.01	65.31	67.70	68.10	
5	4	182.000	0.00	0.00	0.00	0.00	0.00	0.0	0.8	0.0	13.90	14.23	4.42	24	0.40	62.96	63.68	65.77	66.46	68.10	72.10	
6	5	181.000	0.00	0.00	0.00	0.00	0.00	0.0	0.1	0.0	13.90	14.27	4.42	24	0.40	63.78	64.50	66.76	67.45	72.10	68.03	
7	6	21.800	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	6.95	7.11	3.93	18	0.46	64.60	64.70	67.91	68.00	68.03	68.07	
8	3	40.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	3.00	5.75	1.70	18	0.30	62.65	62.77	65.01	65.04	67.70	66.17	
9	4	23.800	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	3.20	25.74	1.84	18	6.01	62.97	64.40	65.77	65.79	68.10	67.98	
10	2	59.800	0.00	0.00	0.00	0.00	0.00	0.0	0.1	0.0	21.20	29.25	6.75	24	1.67	61.40	62.40	64.60	65.13	67.50	66.75	
11	10	27.100	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	10.60	16.83	3.37	24	0.55	62.60	62.75	66.19	66.25	66.75	66.75	

GUNNISON SD	Number of lines: 11	Run Date: 12/13/2011

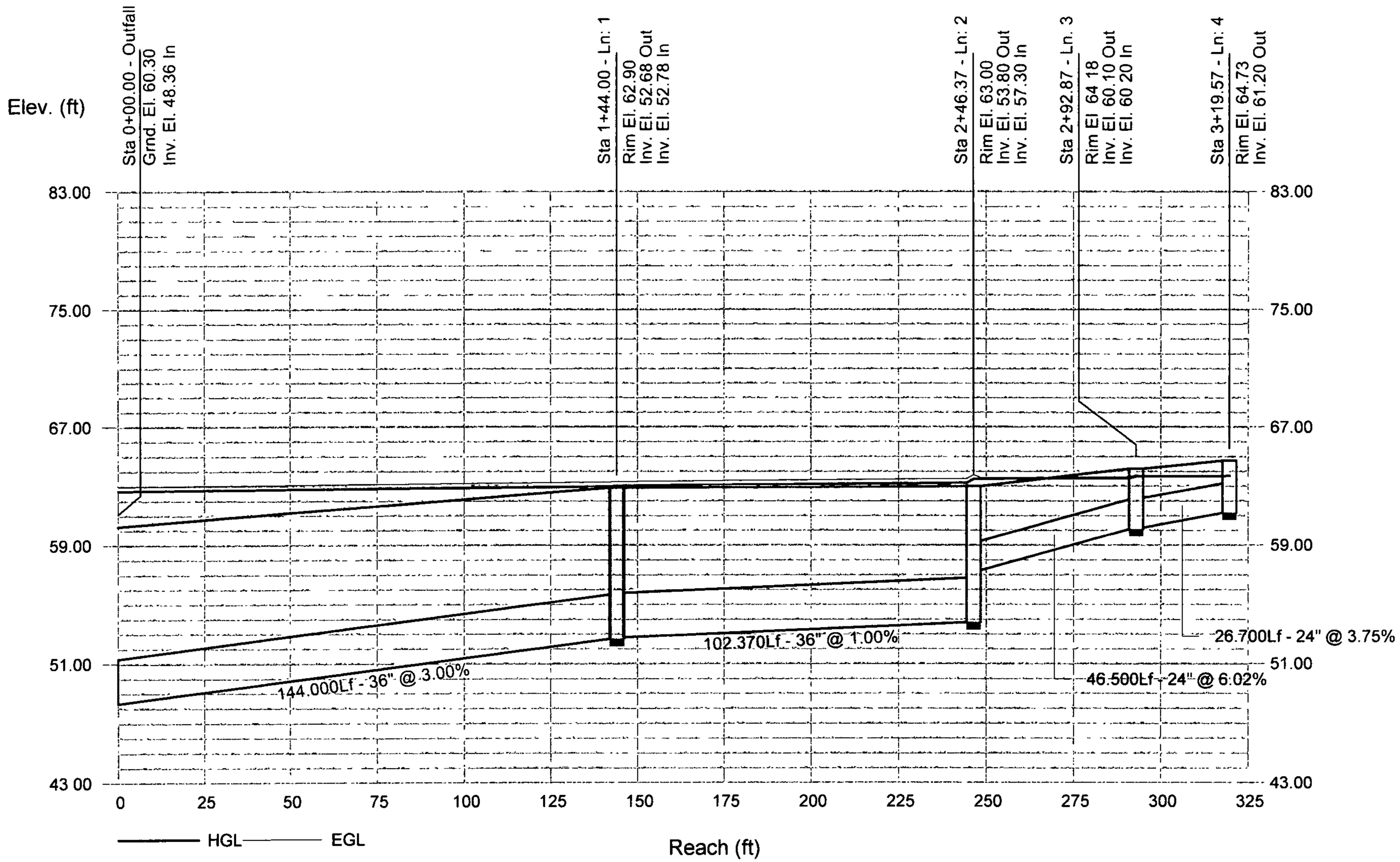
NOTES:Intensity = 69.87 / (Inlet time + 13.10) ^ 0.87; Return period =Yrs. 2 ; c = cir e = ellip b = box

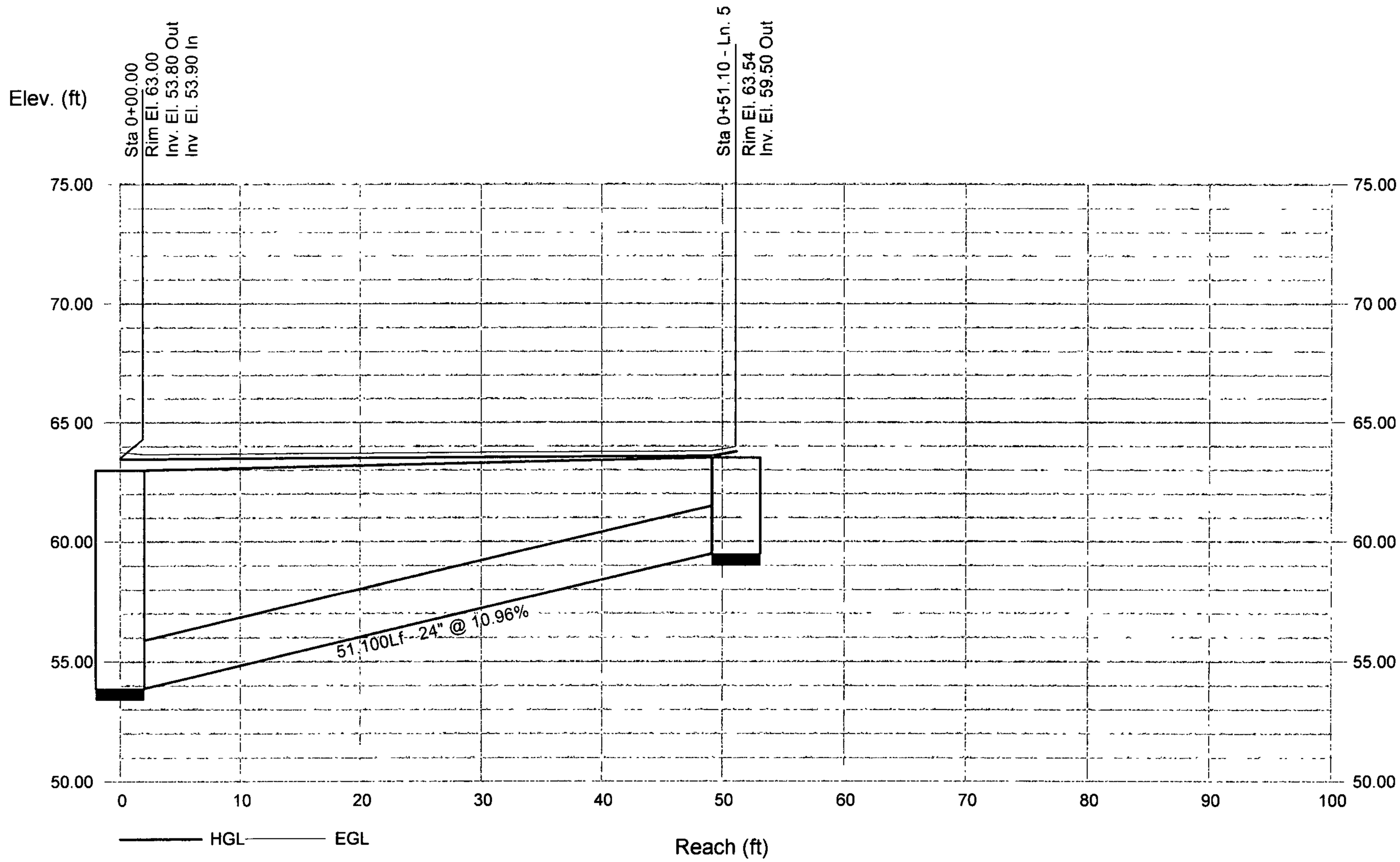
1821 SUMMER BREEZE SD UNIT 4

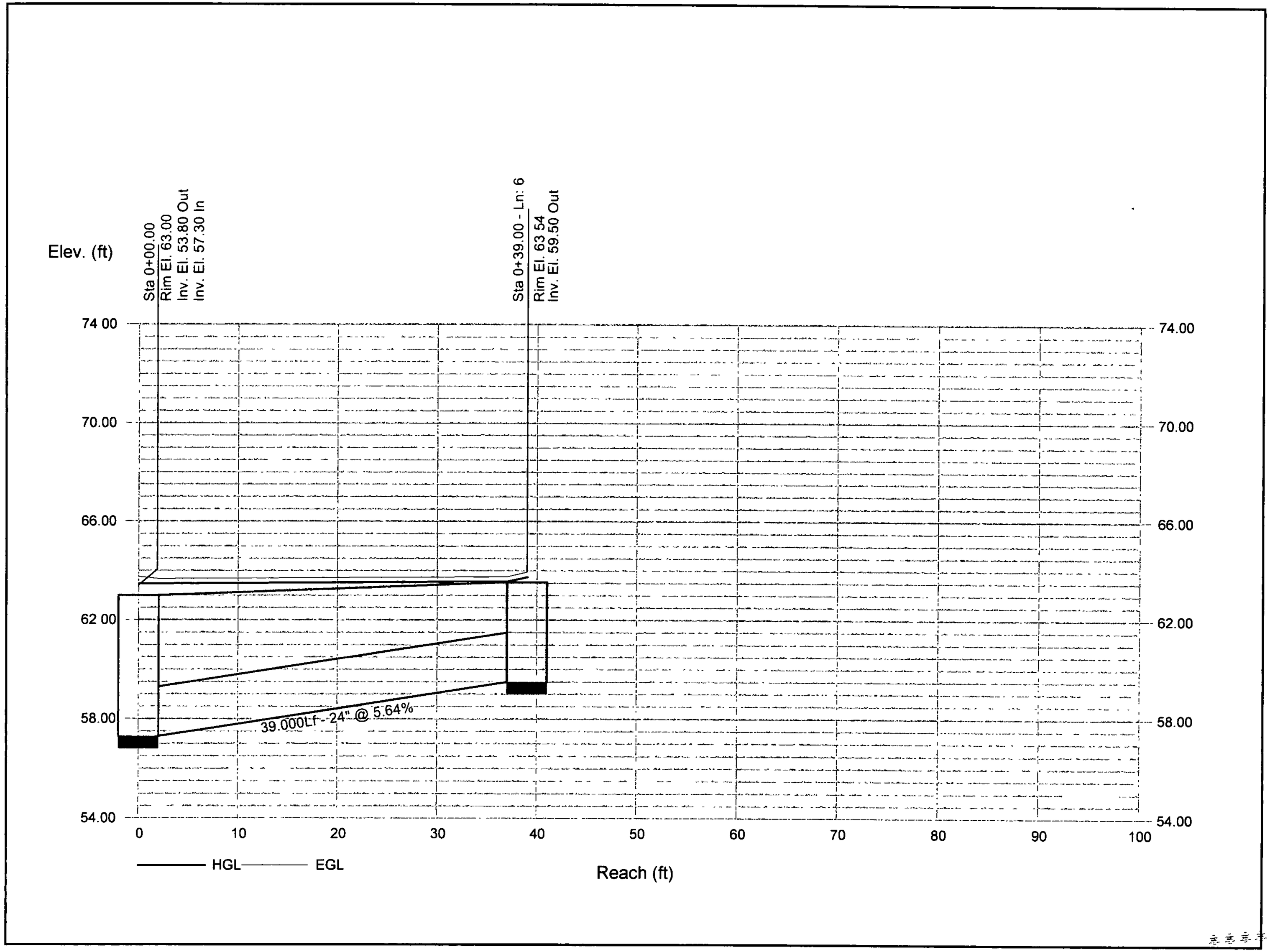


Project File: 1821 SUMMER BREEZE SD.stm	Number of lines: 6	Date: 12/13/2011

Storm Sewers v9.00


Elev. (ft)
Sta 0+00.00 - Outfall
Grnd. El. 60.30
Inv. El. 48.36 In
Sta 1+44.00 - Ln: 1
Rim El. 62.90
Inv. El. 52.68 Out
Inv. El. 52.78 In
Sta 2+46.37 - Ln: 2
Rim El. 63.00
Inv. El. 53.80 Out
Inv. El. 57.30 In
Sta 2+92.87 - Ln. 3
Rim El 64 18
Inv. El. 60.10 Out
Inv. El. 60 20 In
Sta 3+19.57 - Ln: 4
Rim El. 64.73
Inv. El. 61.20 Out
83.00
75.00
67.00
59.00
51.00
43 00
0
25
50
75
100
125
150
175
200
225
250
275
300
325
144.000Lf - 36" @ 3.00%
102.370Lf - 36" @ 1.00%
46.500Lf - 24" @ 6.02%
26.700Lf - 24" @ 3.75%
HGL
EGL
Reach (ft)


Elev. (ft)
Sta 0+00.00
Rim El. 63.00
Inv. El. 53.80 Out
Inv El. 53.90 In
Sta 0+51.10 - Ln. 5
Rim El. 63.54
Inv. El. 59.50 Out
75.00
70.00
65.00
60.00
55.00
50.00
51.100Lf - 24" @ 10.96%
0
10
20
30
40
50
60
70
80
90
100
HGL
EGL
Reach (ft)


Elev. (ft)
Sta 0+00.00
Rim El. 63.00
Inv. El. 53.80 Out
Inv. El. 57.30 In
Sta 0+39.00 - Ln: 6
Rim El. 63.54
Inv. El. 59.50 Out
74.00
70.00
66.00
62.00
58.00
54.00
39.000Lf - 24" @ 5.64%
0
10
20
30
40
50
60
70
80
90
100
HGL
EGL
Reach (ft)

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1		29.20	36	Cir	144.000	48.36	52.68	3.000	62.70*	62.98*	0.04	63.02	End	Manhole
2		29.20	36	Cir	102.370	52.78	53.80	0.996	63.02*	63.21*	0.27	63.48	1	Manhole
3		7.60	24	Cir	46.500	57.30	60.10	6.022	63.48*	63.53*	0.12	63.65	2	Generic
4		3.80	24	Cir	26.700	60.20	61.20	3.745	63.65*	63.66*	0.02	63.69	3	Generic
5		10.80	24	Cir	51.100	53.90	59.50	10.959	63.48*	63.59*	0.18	63.78	2	Generic
6		10.80	24	Cir	39.000	57.30	59.50	5.641	63.48*	63.57*	0.18	63.75	2	Generic

1821 SUMMER BREEZE SD | Number of lines: 6 | Run Date: 12/13/2011

NOTES: Return period = 2 Yrs. ; *Surcharged (HGL above crown).

Storm Sewer Tabulation

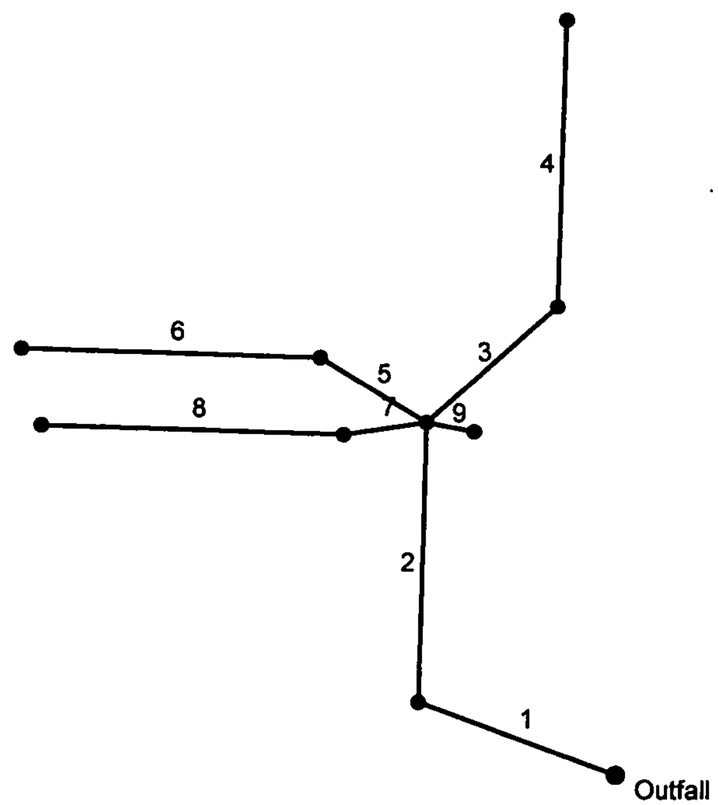
Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	144.000	0.00	0.00	0.00	0.00	0.00	0.0	1.1	0.0	29.20	115.5	4.13	36	3.00	48.36	52.68	62.70	62.98	60.30	62.90	
2	1	102.370	0.00	0.00	0.00	0.00	0.00	0.0	0.7	0.0	29.20	66.57	4.13	36	1.00	52.78	53.80	63.02	63.21	62.90	63.00	
3	2	46.500	0.00	0.00	0.00	0.00	0.00	0.0	0.4	0.0	7.60	55.50	2.42	24	6.02	57.30	60.10	63.48	63.53	63.00	64.18	
4	3	26.700	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	3.80	43.77	1.21	24	3.75	60.20	61.20	63.65	63.66	64.18	64.73	
5	2	51.100	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	10.80	74.87	3.44	24	10.96	53.90	59.50	63.48	63.59	63.00	63.54	
6	2	39.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	10.80	53.72	3.44	24	5.64	57.30	59.50	63.48	63.57	63.00	63.54	

1821 SUMMER BREEZE SD | Number of lines: 6 | Run Date: 12/13/2011

NOTES:Intensity = 69.87 / (Inlet time + 13.10) ^ 0.87; Return period =Yrs. 2 ; c = cir e = ellip b = box

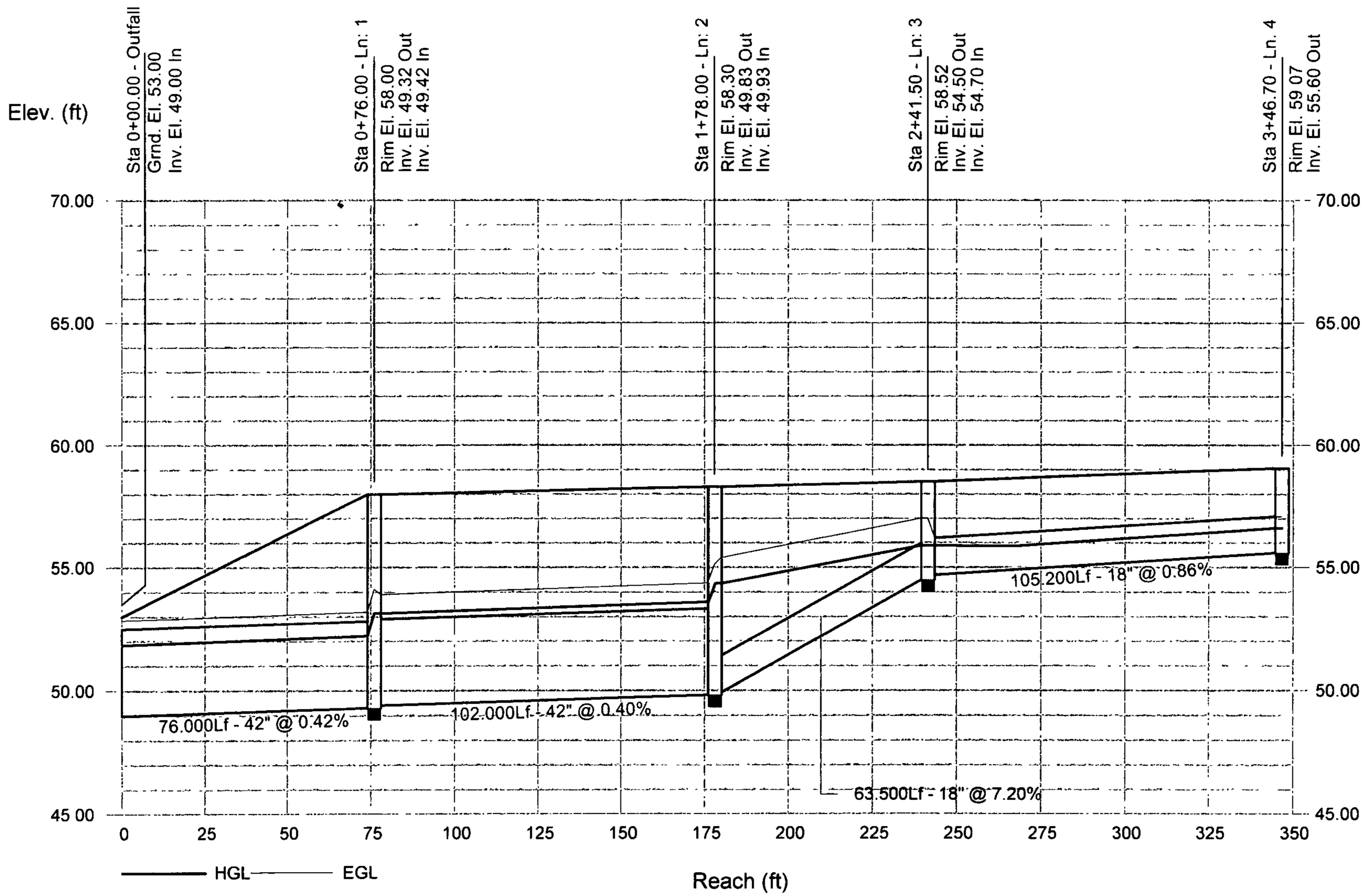
Hydraflow Storm Sewers Extension for AutoCAD® Civil 3D® 2012 Plan

CAMINO DEL VENADO / TORRENT DR SD
UNIT 5

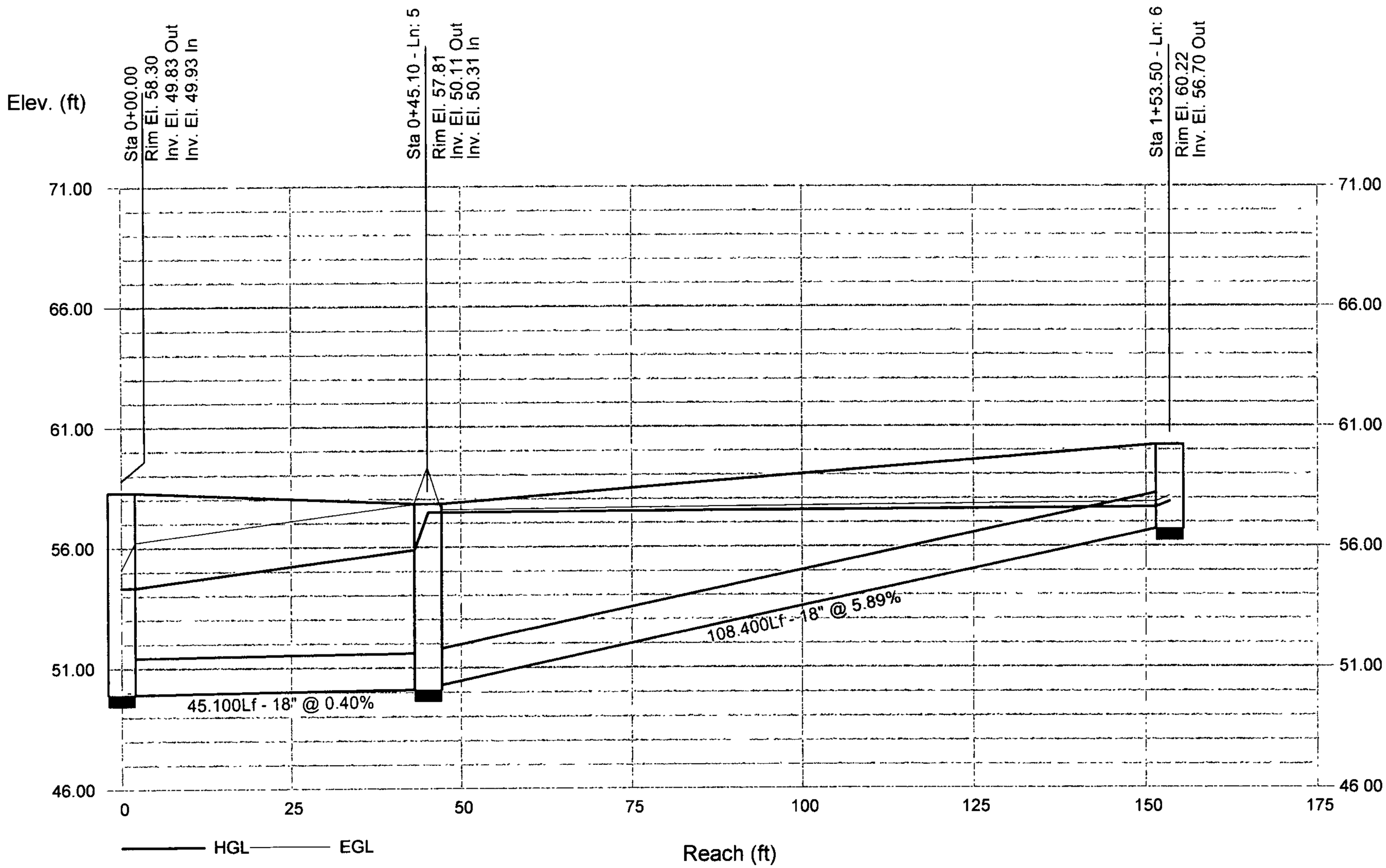


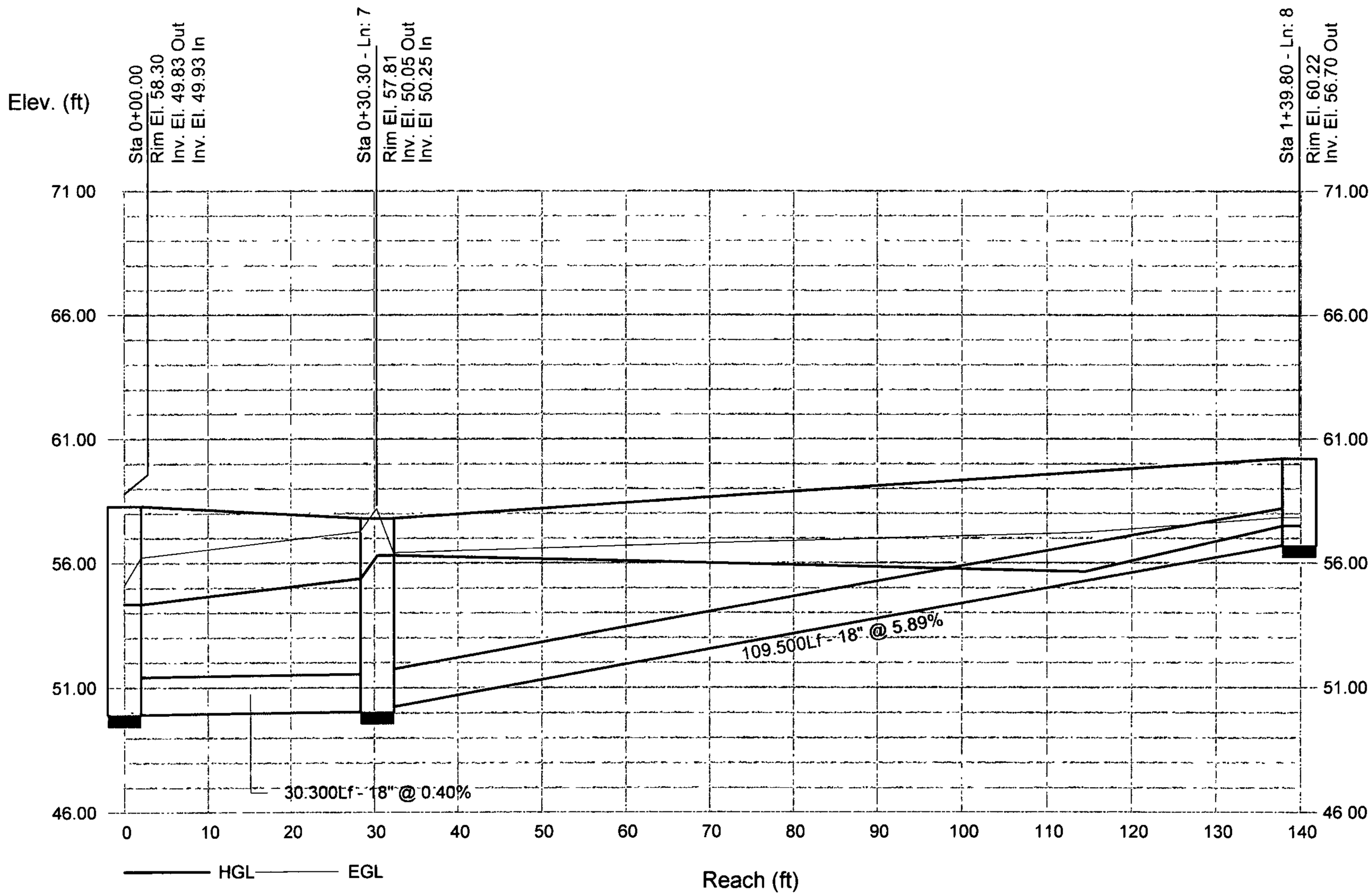
Project File: 1822 CAMINO TORRENT SD.stm	Number of lines: 9	Date: 12/13/2011

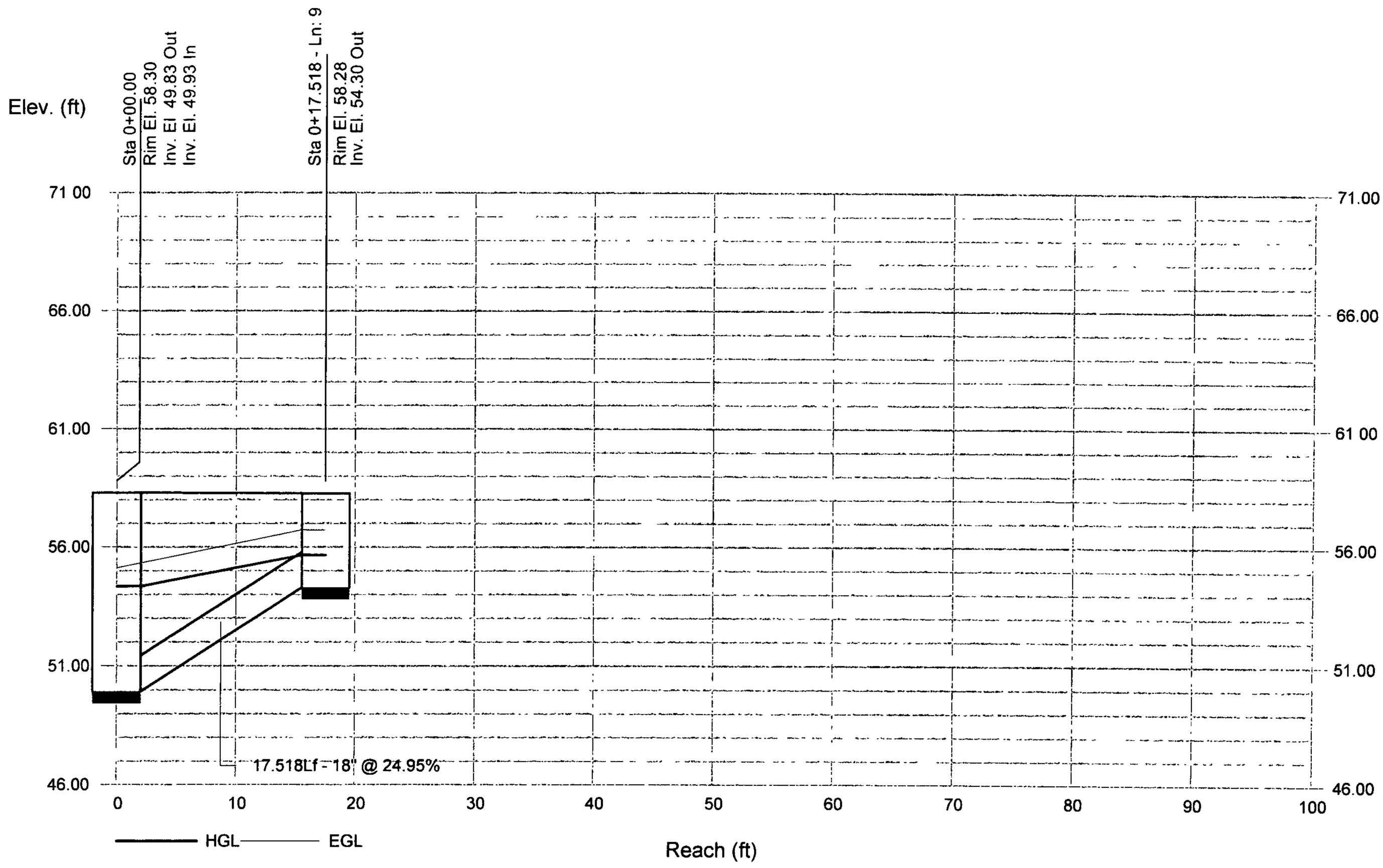
Storm Sewers v9.00


Elev. (ft)
Sta 0+00.00 - Outfall
Grnd. El. 53.00
Inv. El. 49.00 In
Sta 0+76.00 - Ln: 1
Rim El. 58.00
Inv. El. 49.32 Out
Inv. El. 49.42 In
Sta 1+78.00 - Ln: 2
Rim El. 58.30
Inv. El. 49.83 Out
Inv. El. 49.93 In
Sta 2+41.50 - Ln: 3
Rim El. 58.52
Inv. El. 54.50 Out
Inv. El. 54.70 In
Sta 3+46.70 - Ln. 4
Rim El. 59.07
Inv. El. 55.60 Out
70.00
65.00
60.00
55.00
50.00
45.00
76.000Lf - 42" @ 0.42%
102.000Lf - 42" @ 0.40%
63.500Lf - 18" @ 7.20%
105.200Lf - 18" @ 0.86%
0
25
50
75
100
125
150
175
200
225
250
275
300
325
350
HGL
EGL
Reach (ft)

Storm Sewer Profile




Elev. (ft)
Sta 0+00.00
Rim El. 58.30
Inv. El. 49.83 Out
Inv. El. 49.93 In
Sta 0+30.30 - Ln: 7
Rim El. 57.81
Inv. El. 50.05 Out
Inv. El 50.25 In
Sta 1+39.80 - Ln: 8
Rim El. 60.22
Inv. El. 56.70 Out
71.00
66.00
61.00
56.00
51.00
46.00
109.500Lf - 18" @ 5.89%
30.300Lf - 18" @ 0.40%
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
HGL
EGL
Reach (ft)


Elev. (ft)
Sta 0+00.00
Rim El. 58.30
Inv. El 49.83 Out
Inv. El. 49.93 In
Sta 0+17.518 - Ln: 9
Rim El. 58.28
Inv. El. 54.30 Out
71 00
66.00
61.00
56.00
51.00
46.00
17.518Lf - 18" @ 24.95%
0
10
20
30
40
50
60
70
80
90
100
HGL
EGL
Reach (ft)

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1		67.10	42	Cir	76.000	49.00	49.32	0.421	51.85	52.21	0.93	53.14	End	Manhole
2		67.10	42	Cir	102.000	49.42	49.83	0.402	53.14*	53.60*	0.76	54.35	1	Manhole
3		14.40	18	Cir	63.500	49.93	54.50	7.197	54.35	55.89	n/a	55.89	2	Generic
4		7.00	18	Cir	105.200	54.70	55.60	0.856	55.89	56.61	n/a	56.61 j	3	Generic
5		19.40	18	Cir	45.100	49.93	50.11	0.399	54.35*	55.89*	1.56	57.45	2	Generic
6		4.40	18	Cir	108.400	50.31	56.70	5.895	57.45	57.60	0.24	57.85	5	Generic
7		19.40	18	Cir	30.300	49.93	50.05	0.396	54.35*	55.39*	0.94	56.33	2	Generic
8		4.40	18	Cir	109.500	50.25	56.70	5.890	56.33	57.50	n/a	57.50 j	7	Generic
9		13.90	18	Cir	17.518	49.93	54.30	24.946	54.35	55.68	n/a	55.68	2	Generic

Project File: 1822 CAMINO TORRENT SD.stm | Number of lines: 9 | Run Date: 12/13/2011

NOTES: Return period = 2 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	76.000	0.00	0.00	0.00	0.00	0.00	0.0	1.0	0.0	67.10	65.28	7.94	42	0.42	49.00	49.32	51.85	52.21	53.00	58.00	
2	1	102.000	0.00	0.00	0.00	0.00	0.00	0.0	0.8	0.0	67.10	63.79	6.97	42	0.40	49.42	49.83	53.14	53.60	58.00	58.30	
3	2	63.500	0.00	0.00	0.00	0.00	0.00	0.0	0.4	0.0	14.40	28.17	8.28	18	7.20	49.93	54.50	54.35	55.89	58.30	58.52	
4	3	105.200	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	7.00	9.71	5.09	18	0.86	54.70	55.60	55.89	56.61	58.52	59.07	
5	2	45.100	0.00	0.00	0.00	0.00	0.00	0.0	0.7	0.0	19.40	6.63	10.98	18	0.40	49.93	50.11	54.35	55.89	58.30	57.81	
6	5	108.400	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.40	25.50	3.22	18	5.89	50.31	56.70	57.45	57.60	57.81	60.22	
7	2	30.300	0.00	0.00	0.00	0.00	0.00	0.0	0.7	0.0	19.40	6.61	10.98	18	0.40	49.93	50.05	54.35	55.39	58.30	57.81	
8	7	109.500	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.40	25.49	3.54	18	5.89	50.25	56.70	56.33	57.50	57.81	60.22	
9	2	17.518	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	13.90	52.45	8.02	18	24.95	49.93	54.30	54.35	55.68	58.30	58.28	

Project File: 1822 CAMINO TORRENT SD.stm

Number of lines: 9

Run Date: 12/13/2011

NOTES:Intensity = 69.87 / (Inlet time + 13.10) ^ 0.87; Return period =Yrs. 2 ; c = cir e = ellip b = box

APPENDIX F

Sidewalk Culvert Calculations

STORM CLOUD UNITS 4 & 5
SIDEWALK CULVERT CAPACITY CALCULATIONS

UNIT 4, PARK IN TRACT M--4.0 CFS
CURB OPENING LENGTH REQUIERD

Weir equation:		$Q=CLH^{3/2}$
Constant	C =	3.33
Curb height	H =	0.67 feet
Opening Length	L =	2.20 feet

Q= 4.0 cfs

Use 3' sidewalk culvert

UNIT 5, PARK IN TRACT E--3.4 CFS
CURB OPENING LENGTH REQUIERD

Weir equation:		$Q=CLH^{3/2}$
Constant	C =	3.33
Curb height	H =	0.67 feet
Opening Length	L =	1.85 feet

Q= 3.4 cfs

Use 2' sidewalk culvert

Biazar, Shahab

H9/Woodall

From: Mazur, Lynn [lmazur@amafca.org]
Sent: Tuesday, March 26, 2013 8:27 AM
To: Genny Donart; Woodall, Stephen P.; Biazar, Shahab
Cc: Åsa Nilsson-Weber; R.P. Bohannan
Subject: RE: Mirehaven Arroyo - water quality MH discharge pipe

My opinions are:

1. An 18" sump won't do much good. It should be at least 3 feet deep.
2. Running the 8" pipe east to catch grade is not a good option. The drain pipe is not intended to be long line.
3. A sump MH with no drain will only go septic if it is not maintained (i.e., vactor truck after storm events).

On another note, I forgot to mention that we will need 2 licenses for construction besides the already signed turnkey agreement. The first will be a temporary construction and access license between AMAFCA and the contractor for construction. R.P., let me know when a contractor has been selected, and I will have Jeff Willis prepare that license.

The second will be a permanent utility license between AMAFCA and the City for both storm drain outfalls from Units 4 and 5. I will start that one.

Lynn

From: Genny Donart [mailto:gennyd@iacivil.com]
Sent: Monday, March 25, 2013 2:05 PM
To: Stephen Woodall; Mazur, Lynn; Shahab Biazar
Cc: Åsa Nilsson-Weber; R.P. Bohannan
Subject: Mirehaven Arroyo - water quality MH discharge pipe

Good afternoon,

Per our discussion at DRC on Weds, Mar 20th, I looked at the possibility of running a line from the bottom of the sump in the storm water quality MH to discharge in the arroyo.

Here's what I found (reference attached sketch):

1. **If the pipe came out at the invert of the arroyo, it would be at an elevation of 59.07.**
2. **If I ran the pipe back at a flat grade to the water quality MH, there would only be an 18" deep sump. (36" SD to the NE INV = 60.55 – 59.07 = 1.48'), instead of the 4' deep sump that the AMAFCA standard detail calls for.**
3. **Where the 8" perforated drain pipe with a flat grade crosses under the 36" SD we would have less than 5" clearance. (36" SD INV at crossing = 60.47 – (59.07 + 0.67') - 0.33' RCP thickness = 0.4')**
4. **In the best case, the 8" pipe would cross behind a retaining wall with ~1.2' clearance. (NW Corner of Lot 138).**
5. **The 8" drain runs mostly under the 18" RCP bypass line north of the storm water quality MH.**

If we put any kind of grade on the 8" drain pipe, or try to get it above the bottom of the channel, it gets worse. I think Asa's original analysis is valid. That style of drain is probably not going to work well in this location.

Shahab, since the City will maintain this MH, what is your opinion of our detail that shows the gravel pit under the MH? Should we just eliminate the drains and allow the water to stay in the sump in spite of the potential for a septic situation?

The only other thing I can think to do is:

1. **drop the drain/sump invert**
2. **run a non-perforated pipe north**
3. **install a bend to the east, somewhere under the 36" SD**
4. **run a perforated drain east, parallel to the channel and under the maintenance road, as close to centered between the retaining walls on the R/W line and the edge of the channel as possible.**

This still presents some possibility for subgrade issues for both the retaining wall and the edge of the chan although maybe less than other alternatives.

Does anyone have any other recommendations?

Genny Donart, P.E.
Registered Engineer

Isaacson & Arfman, P.A.
Consulting Engineering Associates
128 Monroe St. N.E.
Albuquerque, NM 87108
Phone: (505)268-8828
Fax: (505)268-2632
gennyd@iacivil.com

CONFIDENTIALITY STATEMENT and CONTENT NOTIFICATION : This message and any accompanying attachment(s) contain information which may be confidential or privileged and is intended only for the individual or entity named above. It is prohibited to disclose, copy, or distribute the contents of this message. If you received this message in error, please notify us immediately.

Recipient acknowledges that any attached electronic files may not contain all of the information on the approved construction documents and are not intended to be relied upon as a replacement for the approved construction documents(s).

This information is provided to the user as a courtesy by I&A for this project only and shall not be used for any other purpose without the express written consent of Isaacson & Arfman, PA.

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(Rev. 12/05)

PROJECT TITLE: Mirehaven Arroyo at Stormcloud ZONE MAP/DRG. FILE # H9/D 022
DRB#: _____ EPC#: _____ WORK ORDER#: 691584

LEGAL DESCRIPTION: Tract B, the Crossing
CITY ADDRESS: _____

ENGINEERING FIRM: ISAACSON & ARFMAN, PA CONTACT: _____
ADDRESS: 128 MONROE NE PHONE: 268-8828
CITY, STATE: ALBUQUERQUE, NM ZIP CODE: 87108

OWNER: Western Albuquerque Land Holdings, LLC c/o Garrett Development Corp CONTACT: Jeff Garrett
ADDRESS: PO Box 56790 PHONE: (602) 427-4064
CITY, STATE: Albuquerque, NM ZIP CODE: 87187

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

SURVEYOR: Surv-Tek, Inc CONTACT: Russ Hugg
ADDRESS: 9384 Valley View Dr NW PHONE: 897-3366
CITY, STATE: Albuquerque, NM ZIP CODE: 87114

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

TYPE OF SUBMITTAL:
- X DRAINAGE REPORT
- _____ DRAINAGE PLAN 1st SUBMITTAL
- _____ DRAINAGE PLAN RESUBMITTAL
- _____ CONCEPTUAL G & D PLAN
- _____ GRADING PLAN
- _____ EROSION CONTROL PLAN
- _____ ENGINEER'S CERT (HYDROLOGY)
- _____ CLOMR/LOMR
- _____ TRAFFIC CIRCULATION LAYOUT
- _____ ENGINEER/ARCHITECT CERT (TCL)
- _____ ENGINEER/ARCHITECT CERT (DRB S.P.)
- _____ ENGINEER/ARCHITECT CERT (AA)
- _____ OTHER (SPECIFY)

CHECK TYPE OF APPROVAL 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
- _____ FOUNDATION PERMIT APPROVAL
- _____ BUILDING PERMIT APPROVAL
- _____ CERTIFICATE OF OCCUPANCY (PERM)
- _____ CERTIFICATE OF OCCUPANCY (TEMP)
- _____ GRADING PERMIT APPROVAL
- _____ PAVING PERMIT APPROVAL
- X WORK ORDER APPROVAL
- _____ OTHER (SPECIFY)

RECEIVED FEB 19 2013

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

SUBMITTED BY: Genevieve Donart DATE: 2/14/2013
Isaacson & Arfman, P A.

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 define 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.

Verbal No on 3/5/13
They analysis changed &
a new Report is being
Submitted.

Shahab

FEBRUARY 13, 2013

DRAINAGE REPORT

FOR

MIREHAVEN ARROYO AT STORMCLOUD

ALBUQUERQUE, NEW MEXICO

FEBRUARY 13, 2013

BY

ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates

Thomas O. Isaacson, PE(RET.) & LS(RET.)
Fred C. Arfman, PE
Åsa Nilsson-Weber, PE

I&A Project No. 1883

M PROJECT DOCUMENTS 1800-1899 1883 REPORTS & EXHIBITS

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(Rev. 12/05)

H09D022

PROJECT TITLE: Mirehaven Arroyo at Stormcloud ZONE MAP/DRG. FILE # H9/D
DRB#: _____ EPC#: _____ WORK ORDER#: 691584

LEGAL DESCRIPTION: Tract B, the Crossing
CITY ADDRESS: _____

ENGINEERING FIRM: ISAACSON & ARFMAN, PA CONTACT: _____
ADDRESS: 128 MONROE NE PHONE: 268-8828
CITY, STATE: ALBUQUERQUE, NM ZIP CODE: 87108

OWNER: Western Albuquerque Land Holdings, LLC c/o Garrett Development Corp CONTACT: Jeff Garrett
ADDRESS: PO Box 56790 PHONE: (602) 427-4064
CITY, STATE: Albuquerque, NM ZIP CODE: 87187

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

SURVEYOR: Surv-Tek, Inc CONTACT: Russ Hugg
ADDRESS: 9384 Valley View Dr NW PHONE: 897-3366
CITY, STATE: Albuquerque, NM ZIP CODE: 87114

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

TYPE OF SUBMITTAL:
_____ DRAINAGE REPORT
_____ DRAINAGE PLAN 1st SUBMITTAL
__X__ DRAINAGE PLAN RESUBMITTAL
_____ CONCEPTUAL G & D PLAN
_____ GRADING PLAN
_____ EROSION CONTROL PLAN
_____ ENGINEER'S CERT (HYDROLOGY)
_____ CLOMR/LOMR
_____ TRAFFIC CIRCULATION LAYOUT
_____ ENGINEER/ARCHITECT CERT (TCL)
_____ ENGINEER/ARCHITECT CERT (DRB S.P.)
_____ ENGINEER/ARCHITECT CERT (AA)
_____ OTHER (SPECIFY)

CHECK TYPE OF APPROVAL 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
_____ 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)

RECEIVED
MAR 13 2013

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

SUBMITTED BY: Genevieve Donart DATE: 3/13/2013
Isaacson & Arfman, P A

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 define the degree of drainage detail. One or more of the following levels of submittal may be required based on the following:

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3. **Drainage Report**: Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more.

MARCH 12, 2013

Verbal No On 3/21/13
Provide More Details on
The Arroyo Sections +
Stamp & Date all the
Plans + Reports
Shahab

REVISED DRAINAGE REPORT

FOR

MIREHAVEN ARROYO AT STORMCLOUD

ALBUQUERQUE, NEW MEXICO

MARCH 12, 2013

RECEIVED
MAR 12 2013

BY

ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates

Thomas O. Isaacson, PE(RET.) & LS(RET.)
Fred C. Arfman, PE
Åsa Nilsson-Weber, PE

I&A Project No. 1883
M PROJECT DOCUMENTS 1800-1899 1883 REPORTS & EXHIBITS

CITY OF ALBUQUERQUE

March 5, 2013

ASA M. Nilsson-Weber, P.E.
Isaacson & Arfman, P.A.
128 Monroe St NE
Albuquerque, NM 87108

Re: Storm Cloud Subdivision, Units 5
Revised Grading Plan, Engineer's Stamp Date 2/18/2013 (H9/D022)

Dear Mrs. Nilsson-Weber,

Based upon the information provided in your submittal received 2-19-13, the revised grading Plan is approved for Work Order and Grading Permit.

This project requires a National Pollutant Discharge Elimination System (NPDES) permit for storm water discharge for disturbing one acre or more and a Topsoil Disturbance Permit for disturbing ¾ of an acre or more. Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology. Engineer Certification per the DPM checklist will be required.

If you have any questions, you can contact me at 924-3695.

Sincerely,

Shahab Biazar, P.E.
Senior Engineer, Planning Dept.
Development and Building Services

C: e-mail

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(Rev. 12/05)

PROJECT TITLE: Storm Cloud Unit 5 ZONE MAP/DRG. FILE # H-9 / D022
DRB#: 1005029 EPC#: _____ WORK ORDER#: 691583

LEGAL DESCRIPTION: Tracts B & J, The Crossing and Tract R, Stormcloud Subdivision, Unit 3
CITY ADDRESS: _____

ENGINEERING FIRM: ISAACSON & ARFMAN, PA CONTACT: Åsa Nilsson-Weber
ADDRESS: 128 MONROE NE PHONE: 268-8828
CITY, STATE: ALBUQUERQUE, NM ZIP CODE: 87108

OWNER: Western Albuquerque Land Holdings, LLC CONTACT: Jeff Garrett
ADDRESS: c/o Garrett Development Corporation PHONE: (602) 427-4064
CITY, STATE: 6991 East Camelback Rd, Suite B-297 ZIP CODE: 85251
Scottsdale, AZ

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

SURVEYOR: Surv-Tek, Inc. CONTACT: Russ P. Hugg
ADDRESS: 9384 Valley View Drive NW PHONE: 897-3366
CITY, STATE: Albuquerque, NM ZIP CODE: 87114

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

TYPE OF SUBMITTAL:
_____ DRAINAGE REPORT
_____ DRAINAGE PLAN 1st SUBMITTAL
_____ DRAINAGE PLAN RESUBMITTAL
_____ CONCEPTUAL G & D PLAN
X GRADING PLAN
_____ EROSION CONTROL PLAN
_____ ENGINEER'S CERT (HYDROLOGY)
_____ CLOMR/LOMR
_____ TRAFFIC CIRCULATION LAYOUT
_____ ENGINEER/ARCHITECT CERT (TCL)
_____ ENGINEER/ARCHITECT CERT (DRB S.P.)
_____ ENGINEER/ARCHITECT CERT (AA)
_____ OTHER (SPECIFY)

CHECK TYPE OF APPROVAL SOUGHT:
_____ SIA/FINANCIAL GUARANTEE RELEASE
_____ PRELIMINARY PLAT APPROVAL
_____ S. DEV. PLAN FOR SUB'D APPROVAL
_____ S. DEV. 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)

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FEB 19 2013
LAND DEVELOPMENT SECTION

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

SUBMITTED BY: Åsa Nilsson Weber DATE: 2-18-13
Isaacson & Arfman, P A

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 define 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.

A Transmittal From

Isaacson & Arfman, P.A.

Consulting Engineering Associates

TO:

Shahab Biazar, City of Albuquerque

DATE: 2/18/13
JOB NO: 1822

FROM: Åsa Nilsson-Weber

REFERENCE: Stormcloud Unit 5--H-9/D022

WE ARE SENDING YOU ATTACHED THE FOLLOWING ITEMS:	
Revised Grading & Drainage Plan	
Plans were revised to reflect new retaining wall locations along Tierra Pintada where tracts/easements were created for the ABCWUA waterline and vaults; street names were updated to reflect public street designations; and a detail for wall openings was added for the rundowns at the east end of Camino del Venado.	
THIS INFORMATION IS TRANSMITTED:	
☐ As per your request	☐ For your files
☒ For your review and approval	☐ For your use
☐ For your information	☐ Please review and return
☐ For your attention	☐ For return to your files
☐ For your signature	☒ Please advise
☐	☐
COMMENTS	

RECEIVED
FEB 19 2013
LAND DEVELOPMENT SECTION

RECEIVED BY: _____

DATE: _____ TIME: _____

COPIES TO: file

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Cherne, Curtis H9- D22

From: RP Bohannan [rpbohannan@gmail.com]
Sent: Wednesday, February 13, 2013 7:44 AM
To: Cherne, Curtis
Cc: Rael, Jane E.; Åsa Nilsson-Weber; RT Starr; RP Bohannan
Subject: RE: Stormcloud Unit 5 and Mirehaven Arroyo SIAs and Financial Guaranties

Good morning Curtis,

The fee for preparation of the LOMR is $14,445.00 including NMGRT. The LOMR application fee is estimated at $9,400.00. So the total is approximately $23,845.00.

After discussion with Jane, I think that having a separate SIA and financial guaranty for the LOMR is the best approach. That should allow us to release other SIAs and financial guarantees well before the LOMR is approved by FEMA.

Please let me know if you see any problems with this approach.

Thanks,

RP

R.P. Bohannan, PE
Paragon Engineering Group, LLC
(505) 414-2292

From: Cherne, Curtis [mailto:CCherne@cabq.gov]
Sent: Tuesday, February 12, 2013 11:21 AM
To: RP Bohannan
Cc: Rael, Jane E.
Subject: RE: Stormcloud Unit 5 and Mirehaven Arroyo SIAs and Financial Guaranties

RP,
I recently reviewed the IL. We have $40k for the LOMR. We take our best guess at this amount.
I understand that you don't wait the release of FG held up waiting for the LOMR approval. At the same time, the City does not want to be in a position to complete the LOMR.

Do you have a contract and cost for the LOMR?

Curtis

From: RP Bohannan [mailto:rpbohannan@gmail.com]
Sent: Tuesday, February 12, 2013 10:18 AM
To: Cherne, Curtis
Cc: Rael, Jane E.
Subject: RE: Stormcloud Unit 5 and Mirehaven Arroyo SIAs and Financial Guaranties

Curtis,

Yikes! I am working on a schedule that I need to deliver in the next day or so. Jane and I will meet and try to catch up with you by email if we have questions.

One question is whether a separate SIA and financial guaranty is needed for the LOMR associated with

CITY OF ALBUQUERQUE

December 18, 2012

ASA M. Nilsson-Weber, P.E.
Isaacson & Arfman, P.A.
128 Monroe St NE
Albuquerque, NM 87108

Re: Storm Cloud Subdivision, Units 4 & 5
Drainage Report
Grading Engineer's Stamp Date 12/03/2012 and Drainage Report with Revised/Supplemental Information Engineer's Stamp Date 12/05/2012 (H9/D022)

Dear Mrs. Nilsson-Weber,

Based upon the information provided in your submittal received 12-05-12, the grading and Drainage Plan is approved for Work Order and Grading Permit.

This project requires a National Pollutant Discharge Elimination System (NPDES) permit for storm water discharge for disturbing one acre or more and a Topsoil Disturbance Permit for disturbing ¾ of an acre or more. Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology. Engineer Certification per the DPM checklist will be required.

If you have any questions, you can contact me at 924-3695.

Sincerely,

Shahab Biazar, P.E.
Senior Engineer, Planning Dept.
Development and Building Services

C: e-mail

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(Rev. 12/05)

PROJECT TITLE: Storm Cloud Units 4 & 5 ZONE MAP/DRG. FILE # H-9 / D022
DRB#: 1005029 EPC#: _____ WORK ORDER#: 691582

LEGAL DESCRIPTION: Tracts B & J, The Crossing and Tract R, Stormcloud Subdivision, Unit 3
CITY ADDRESS: _____

ENGINEERING FIRM: ISAACSON & ARFMAN, PA CONTACT: Åsa Nilsson-Weber
ADDRESS: 128 MONROE NE PHONE: 268-8828
CITY, STATE: ALBUQUERQUE, NM ZIP CODE: 87108

OWNER: Western Albuquerque Land Holdings, LLC CONTACT: Jeff Garrett
ADDRESS: c/o Garrett Development Corporation PHONE: (602) 427-4064
CITY, STATE: 6991 East Camelback Rd, Suite B-297 ZIP CODE: 85251
Scottsdale, AZ

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

SURVEYOR: Surv-Tek, Inc. CONTACT: Russ P. Hugg
ADDRESS: 9384 Valley View Drive NW PHONE: 897-3366
CITY, STATE: Albuquerque, NM ZIP CODE: 87114

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

TYPE OF SUBMITTAL:
_____ DRAINAGE REPORT
_____ DRAINAGE PLAN 1st SUBMITTAL
X DRAINAGE PLAN RESUBMITTAL
_____ CONCEPTUAL G & D PLAN
X GRADING PLAN
_____ EROSION CONTROL PLAN
_____ ENGINEER'S CERT (HYDROLOGY)
_____ CLOMR/LOMR
_____ TRAFFIC CIRCULATION LAYOUT
_____ ENGINEER/ARCHITECT CERT (TCL)
_____ ENGINEER/ARCHITECT CERT (DRB S.P.)
_____ ENGINEER/ARCHITECT CERT (AA)
X OTHER (SPECIFY) Supplemental Calculations

CHECK TYPE OF APPROVAL SOUGHT:
_____ SIA/FINANCIAL GUARANTEE RELEASE
_____ PRELIMINARY PLAT APPROVAL
_____ S. DEV. PLAN FOR SUB'D APPROVAL
_____ S. DEV. 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)

RECEIVED
DEC - 5 2012

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

SUBMITTED BY: Åsa Nilsson-Weber DATE: 12/5/2012
Isaacson & Arfman, P A.

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 define 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.

Isaacson & Arfman, P.A.

Consulting Engineering Associates

*Thomas O. Isaacson, PE (Ret.) & LS (Ret.) * Fred C. Arfman, PE * Åsa Nilsson-Weber, PE*

December 5, 2012

Mr. Shahab Biazar, Senior Engineer
Planning Dept., Development and Building Services
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

RE: Storm Cloud Subdivision, Units 4 & 5—Revised Grading & Drainage Plan (H9/D022)

Dear Mr. Biazar,

We are resubmitting the referenced grading and drainage plans because of the following changes:

1. A drop structure in the Mirehaven Arroyo shifted east because AMAFCA required that a maintenance access ramp be installed east of Tierra Pintada. Therefore, retaining wall grades changed in both Unit 4 and Unit 5 adjacent to the arroyo.

2. Grades along all the knuckles were adjusted in both Unit 4 and Unit 5, and there were other minor adjustments to the lot grades in both units.

3. Animas Place in Unit 4 was lowered from the Gunnison Rd intersection to about 250' east so that backyard grades would better match up with the grades of the existing retaining wall to remain adjacent to The Crossing, Unit 2-B.

4. A small portion of the backyard of Lot 134, Unit 4, is shown to pond because there is a low point at the existing retaining wall to remain adjacent to The Crossing, Unit 3. The 100-year flow generated from this area is 0.04 cfs and the volume is 44 cf. The volume provided is 54 cf—See Revised/Supplemental Information.

5. The storm drain in Summer Breeze Drive, Unit 4, was redesigned because of utility conflicts, including pipe sizes. There were minor changes in invert elevations for the Gunnison Pl/Jet Stream Rd, Unit 4 storm drain system. The Unit 5 storm drain also has changes in invert elevations. See Revised/Supplemental Information for Hydraflow Storm Sewer calculations.

If you have question or comments regarding this submittal, please call me at 268-8828 or email me at asaw@iacivil.com. Thank you.

Sincerely,
ISAACSON & ARFMAN P.A.

Åsa Nilsson-Weber

Åsa Nilsson-Weber, P.E.

Attachments

128 Monroe St. N.E. * Albuquerque, NM 87108 * (505) 268-8828 * Fax: (505) 268-2632 * www.iacivil.com

REVISED/SUPPLEMENTAL INFORMATION FOR

DRAINAGE REPORT

FOR

STORM CLOUD SUBDIVISION, UNITS 4 & 5

A 241-DWELLING UNIT SINGLE-DETACHED RESIDENTIAL SUBDIVISION

ALBUQUERQUE, NEW MEXICO

DECEMBER 5, 2012

BY

ISAACSON & ARFMAN, P.A.

Consulting Engineering Associates

Thomas O. Isaacson, PE & LS *PE (Ret.) & LS (Ret)*
Fred C. Arfman, PE
Åsa Nilsson-Weber, PE

REVISED/SUPPLEMENTAL INFORMATION FOR

DRAINAGE REPORT

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A 241-DWELLING UNIT SINGLE-DETACHED RESIDENTIAL SUBDIVISION

ALBUQUERQUE, NEW MEXICO
DECEMBER 5, 2012

Prepared by:

ISAACSON & ARFMAN, P.A.
128 Monroe Street NE
Albuquerque, NM 87108
(505) 268-8828

Åsa Nilsson-Weber, PE Date

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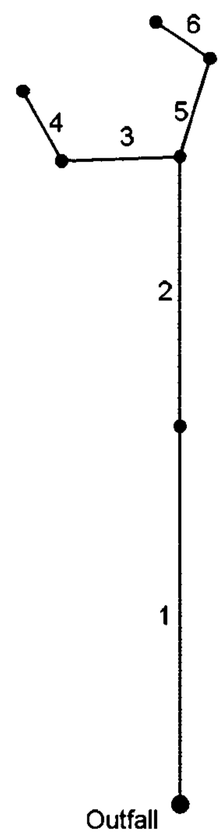
Unit 5 Grading & Drainage and Retaining Wall Plans (7 sheets)

I. STORM DRAIN CALCULATIONS

Hydraflow Storm Sewer Calculations & Output Files

1821 SUMMER BREEZE SD

UNIT 4



Project File 1821 SUMMER BREEZE SD.stm	Number of lines: 6	Date: 12/4/2012

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1		29.20	36	Cir	144 000	48.36	52 68	3.000	59 70*	59.98*	0.04	60.02	End	Manhole
2		29.20	42	Cir	102.370	52.78	55.85	2.999	60.02*	60.10*	0.14	60.25	1	Manhole
3		7.60	24	Cir	44.500	56.85	59.80	6.629	60.25	60.78	n/a	60.78 j	2	Generic
4		3.80	18	Cir	30.200	60.00	60 80	2.649	60 78	61 54	n/a	61.54 j	3	Generic
5		21.60	24	Cir	39.000	56.85	57 65	2.051	60.25*	60 60*	1.07	61.67	2	Generic
6		10.80	24	Cir	24.800	57 85	58 10	1.008	61.67*	61.72*	0.18	61.91	5	Generic

1821 SUMMER BREEZE SD | Number of lines 6 | Run Date. 12/4/2012

NOTES Return period = 2 Yrs ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump

Storm Sewer Tabulation

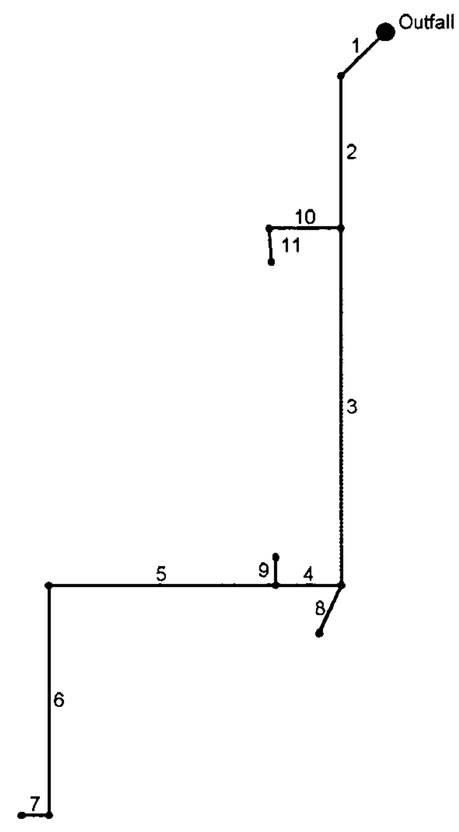
Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	144.000	0 00	0.00	0.00	0.00	0 00	0.0	1.1	0.0	29.20	115 5	4.13	36	3.00	48 36	52 68	59.70	59 98	60.30	62.90	
2	1	102.370	0 00	0.00	0.00	0.00	0.00	0.0	0.5	0.0	29.20	174.2	3.04	42	3.00	52.78	55.85	60.02	60 10	62.90	63.00	
3	2	44.500	0 00	0.00	0.00	0.00	0.00	0.0	0.2	0 0	7.60	58.23	3.70	24	6.63	56 85	59.80	60.25	60 78	63.00	63.82	
4	3	30.200	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0 0	3.80	17.09	4 23	18	2 65	60.00	60.80	60.78	61 54	63.82	64.55	
5	2	39.000	0.00	0.00	0 00	0.00	0.00	0.0	0 1	0 0	21.60	32 39	6 88	24	2.05	56.85	57.65	60 25	60 60	63.00	62.33	
6	5	24.800	0 00	0.00	0 00	0 00	0.00	0.0	0.0	0 0	10.80	22.71	3 44	24	1 01	57.85	58 10	61 67	61 72	62.33	62.33	

1821 SUMMER BREEZE SD | Number of lines 6 | Run Date: 12/4/2012

NOTES.Intensity = 69.87 / (Inlet time + 13 10) ^ 0.87 , Return period =Yrs. 2 , c = cir e = ellip b = box

GUNNISON SD

UNIT 4



Project File: 1821 GUNNISON SD.stm	Number of lines: 11	Date: 12/4/2012

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	50.000	0 00	0.00	0.00	0.00	0 00	0.0	3.7	0.0	41 30	42.18	7 14	36	0.40	60 30	60.50	62.55	62.83	64.50	68 00	
2	1	123.120	0 00	0 00	0.00	0.00	0 00	0.0	3.3	0.0	41 30	42.07	6.09	36	0.40	60 60	61.09	63.40	63.78	68.00	67 50	
3	2	288.000	0 00	0 00	0.00	0.00	0 00	0.0	1.6	0.0	20.10	42.14	3.19	36	0.40	61 19	62.34	64.38	64.60	67.50	67 70	
4	3	52.970	0 00	0 00	0.00	0.00	0 00	0.0	1.5	0.0	17.10	14.24	5.44	24	0 40	62 44	62.65	64.79	65.09	67.70	68 10	
5	4	182.000	0.00	0 00	0.00	0.00	0 00	0.0	0 8	0.0	13.90	14.32	4.42	24	0.40	62.75	63.48	65.55	66.24	68.10	72 10	
6	5	186.000	0.00	0.00	0.00	0 00	0.00	0.0	0 1	0.0	13.90	12.30	4.42	24	0 30	63.58	64.13	66.54	67.25	72.10	68 11	
7	6	22.000	0.00	0.00	0.00	0 00	0.00	0.0	0.0	0.0	6.95	5.92	3.93	18	0 32	64.23	64.30	67.70	67.80	68.11	68 12	
8	3	42.800	0.00	0.00	0.00	0 00	0.00	0.0	0.0	0.0	3.00	9.22	1.70	18	0.77	62.44	62 77	64.79	64.82	67.70	66.17	
9	4	23 000	0.00	0.00	0 00	0.00	0.00	0.0	0 0	0.0	3.20	26.18	2.00	18	6 22	62.97	64.40	65 55	65.55	68.10	68.36	
10	2	57 800	0.00	0.00	0 00	0 00	0.00	0.0	0.1	0 0	21.20	32.72	6.75	24	2.09	61.19	62 40	64.38	64 88	67.50	66.75	
11	10	27.100	0 00	0.00	0 00	0 00	0.00	0.0	0.0	0 0	10 60	16.83	3.37	24	0.55	62.60	62 75	65.95	66 01	66.75	66.75	

GUNNISON SD | Number of lines: 11 | Run Date: 12/4/2012

NOTES Intensity = 69.87 / (Inlet time + 13 10) ^ 0.87 , Return period =Yrs 2 , c = cir e = ellip b = box

Storm Sewer Summary Report

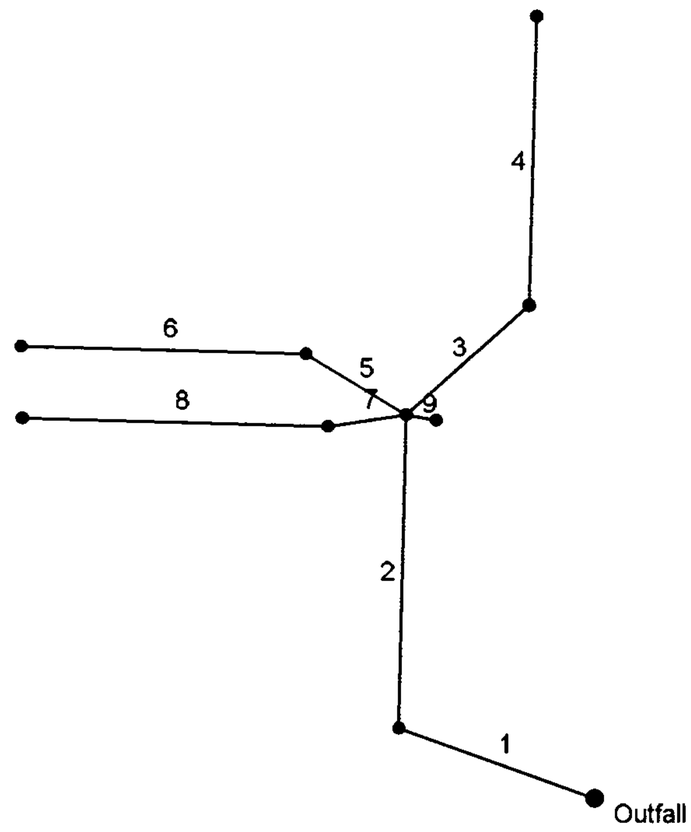
Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1		41.30	36	Cir	50 000	60.30	60.50	0.400	62.55	62.83	0 57	63.40	End	Manhole
2		41.30	36	Cir	123 120	60.60	61.09	0.398	63.40	63.78	0.59	64.38	1	Manhole
3		20.10	36	Cir	288.000	61.19	62.34	0 399	64 38	64.60	0.19	64.79	2	Manhole
4		17.10	24	Cir	52.970	62.44	62 65	0.396	64 79*	65.09*	0 46	65 55	3	Manhole
5		13.90	24	Cir	182.000	62 75	63.48	0.401	65.55*	66.24*	0 30	66.54	4	Manhole
6		13 90	24	Cir	186 000	63.58	64.13	0.296	66.54*	67.25*	0.46	67.70	5	Generic
7		6.95	18	Cir	22.000	64.23	64.30	0.318	67.70*	67.80*	0.24	68.04	6	Generic
8		3 00	18	Cir	42.800	62.44	62 77	0.771	64.79*	64.82*	0 04	64.87	3	Generic
9		3 20	18	Cir	23.000	62.97	64.40	6.217	65.55	65 55	0.08	65.63	4	Generic
10		21.20	24	Cir	57.800	61.19	62.40	2.093	64.38*	64.88*	1 06	65 95	2	Generic
11		10 60	24	Cir	27.100	62.60	62.75	0.554	65.95*	66.01*	0.18	66 18	10	Generic

GUNNISON SD | Number of lines: 11 | Run Date: 12/4/2012

NOTES: Return period = 2 Yrs , *Surcharged (HGL above crown).

Hydraflow Storm Sewers Extension for AutoCAD® Civil 3D® 2012 Plan

CAMINO DEL VENADO/TORRENT SD
UNIT 5



Project File 1822 CAMINO TORRENT SD.stm	Number of lines. 9	Date: 12/4/2012

Storm Sewers v9 00

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1		67 10	42	Cir	80 000	48.60	48 88	0.350	52.10*	52.46*	0.73	53.18	End	Manhole
2		67 10	42	Cir	122 000	48.98	49 41	0.352	53.18*	53.73*	0.76	54.48	1	Manhole
3		14.40	18	Cir	63.600	51.00	52 80	2 830	54.48*	55.68*	1.19	56.87	2	Generic
4		7 00	18	Cir	112.000	55.00	55.60	0 536	56.87*	57.36*	0 24	57.61	3	Generic
5		19.40	18	Cir	45.120	49.51	50 00	1 086	54.48*	56.02*	1.56	57.58	2	Generic
6		4.40	18	Cir	110.000	54.30	56.70	2 182	57.58	57.74	0 18	57.91	5	Generic
7		19.40	18	Cir	30.300	49.51	49 70	0.627	54.48*	55.52*	0.94	56 45	2	Generic
8		4.40	18	Cir	118 000	54 30	56 70	2.034	56.45	57.50	n/a	57.50 j	7	Generic
9		13.90	18	Cir	11.800	54.00	54.70	5.932	54.79*	57.67*	0 96	58 63	2	Generic

Project File: 1822 CAMINO TORRENT SD.stm | Number of lines: 9 | Run Date: 12/4/2012

NOTES: Return period = 2 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	80.000	0 00	0.00	0 00	0 00	0.00	0.0	1 1	0.0	67.10	59.52	6.97	42	0.35	48 60	48.88	52 10	52.46	53.00	58.40	
2	1	122.000	0 00	0.00	0 00	0 00	0.00	0.0	0 8	0.0	67.10	59.73	6.97	42	0.35	48.98	49.41	53.18	53 73	58.40	58.49	
3	2	63.600	0 00	0.00	0.00	0 00	0.00	0 0	0 5	0.0	14.40	17.67	8.15	18	2.83	51.00	52.80	54.48	55.68	58.49	58.53	
4	3	112 000	0.00	0.00	0.00	0 00	0.00	0.0	0.0	0.0	7.00	7.69	3.96	18	0.54	55.00	55.60	56.87	57.36	58.53	59 10	
5	2	45.120	0.00	0.00	0.00	0.00	0.00	0.0	0.7	0.0	19.40	10.94	10.98	18	1.09	49.51	50.00	54.48	56.02	58.49	57 81	
6	5	110 000	0.00	0.00	0.00	0.00	0.00	0 0	0.0	0.0	4.40	15.51	2.93	18	2.18	54.30	56.70	57.58	57 74	57.81	60 26	
7	2	30 300	0.00	0.00	0 00	0.00	0.00	0.0	0.8	0.0	19.40	8.32	10.98	18	0.63	49.51	49.70	54.48	55.52	58.49	57 81	
8	7	118 000	0.00	0.00	0.00	0.00	0.00	0 0	0.0	0.0	4.40	14.98	3.54	18	2.03	54.30	56.70	56.45	57.50	57.81	60.29	
9	2	11.800	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	13.90	25.58	11.32	18	5.93	54.00	54 70	54.79	57.67	58.49	58.24	

Project File: 1822 CAMINO TORRENT SD.stm | Number of lines: 9 | Run Date: 12/4/2012

NOTES:Intensity = 69.87 / (Inlet time + 13.10) ^ 0.87 ; Return period =Yrs 2 ; c = cir e = ellip b = box

FL-DOT Report

Date: 12/5/2012
Frequency: 2 yrs
Proj: CN U3 SD.stm

Line No	To Line	Type of struc	n - Value	Len (ft)	Drainage Area C1 = 0.2 C2 = 0.5 C3 = 0.9 Increment (ac)	Sub-Total (ac)	Sum CA	Time of conc (min)	Time of Flow in sect (min)	Inten (I) (in/hr)	Total CA	Add Q / Total Flow Q (cfs)	Inlet elev (ft)	Elev of HGL / Elev of Crown / Elev of Invert Up (ft)	Down (ft)	Fall (ft)	Rise / Span Size (in)	HGL / Pipe Slope (%)	ADD / Full Flow Vel (ft/s)	Cap (cfs)	Line description
1	End	MH	0 013	81.100	0.00	0.00	0.00	0.16	0.21	0.00	0.00	10.00	85 51	82.48	78.00	4 48	24	5.53	6.93	20 00	SD A
					0 00	0.00	0.00					20.00		82.90	77.00		24	7.27	19 42	61.01	
					0.00	0.00	0.00							80.90	75.00	5.90	Cir				
2	1	MH	0.013	30.000	0 00	0.00	0.00	0.00	0.16	0.00	0.00	10 00	85.50	82.37	82.48	-0.11	24	-0 36	4.68	10 00	SD A1
					0.00	0 00	0 00					10.00		83 25	82 95		24	1.00	7.20	22 62	
					0.00	0 00	0.00							81.25	80.95	0.30	Cir				
3	End	MH	0.013	40.600	0.00	0 00	0.00	0 00	0.11	0 00	0 00	29.00	78.94	78.20	78.00	0.20	30	0.50	5.91	29.00	SD B
					0.00	0 00	0.00					29.00		77.80	77.50		30	0 74	7.18	35.25	
					0.00	0.00	0.00							75 30	75.00	0 30	Cir				

NOTES: Intensity = 69.87 / (Inlet time + 13.10) ^ 0 87 (in/hr) ; Time of flow in section is based on full flow.

CIELO NORTE U3

II. LOT 134, UNIT 4 BACKYARD PONDING CALCULATIONS

Hydrology & Pond Calculations

Job Name:	**STORM CLOUD 4--LOT 134 BACKYARD PONDING AREA**
Client:	WALH
Date Prepared:	11/28/2012
Date Modified:	
Precipitation Zone:	1

CALCULATIONS: STORM CLOUD 4--LOT 134 BACKYARD PONDING AREA :

Based on Drainage Design Criteria for City of Albuquerque Section 22.2, DPM, Vol 2, dated Jan., 1993

ON-SITE

AREA OF SITE: 535 SF = 0.01

100-year, 6-hour

HISTORIC FLOWS:

		Treatment SF	%
Area A	=	0	0%
Area B	=	0	0%
Area C	=	535	100%
Area D	=	0	0%
Total Area	=	535	100%

DEVELOPED FLOWS:

		Treatment SF	%
Area A	=	0	0%
Area B	=	0	0%
Area C	=	535	100%
Area D	=	0	0%
Total Area	=	535	100%

EXCESS PRECIP:

Precip. Zone 1

$E_A = 0.44$

$E_B = 0.67$

$E_C = 0.99$

$E_D = 1.97$

On-Site Weighted Excess Precipitation (100-Year, 6-Hour Storm)

$$\text{Weighted E} = \frac{E_A A_A + E_B A_B + E_C A_C + E_D A_D}{A_A + A_B + A_C + A_D}$$

Historic E	=	0.99 in.	Developed E	=	0.99 in.

On-Site Volume of Runoff: V360 = E*A / 12

Historic V_{360}	=	44 CF	Developed V_{360}	=	44 CF

On-Site Peak Discharge Rate: $Qp = Q_{pA}A_A+Q_{pB}A_B+Q_{pC}A_C+Q_{pD}A_D / 43{,}560$

For Precipitation Zone 1

Q_{pA} = 1.29 Q_{pC} = 2.87

Q_{pB} = 2.03 Q_{pD} = 4.37

Historic Q_p	=	0.04 CFS	Developed Q_p	=	0.04 CFS

PONDING AREA IS 535 SF*0.2' = 107 CF; V360=44 CF <u>OK</u>

CITY OF ALBUQUERQUE

July 3, 2008

Shahab Biazar, P.E.
Advanced Engineering & Consulting, LLC
4416 Anaheim Avenue NE
Albuquerque, NM 87113

RE: Stormcloud Subdivision Units 4 & 5, (H-09/D22)
Engineers Certification for Release of Financial Guaranty
Engineers Stamp dated 02/14/2007
Engineers Certification dated 06/13/2008

Mr. Biazar:

Based upon the information provided in your Engineer's Certification submittal dated 07/01/2008, 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,

Timothy E. Sims
Plan Checker, Planning Dept. - Hydrology
Development and Building Services

C: Marilyn Maldonado, COA# 650277
File

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

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

PROJECT TITLE: STORMCLOUD SUBDIVISION UNITS 4 & 5 ZONE ATLAS/DRG. FILE #: H9-D22
DRB #: EPC #: WORK ORDER #:

LEGAL DESCRIPTION: TRACTS B AND J THE CROSSINGS, & TRACT R STORMCLOUD SUBDIVISION UNIT 3.
CITY ADDRESS:

ENGINEERING FIRM: *Advanced Engineering and Consulting, LLC* CONTACT: Shahab Biazar
ADDRESS: 4416 Anaheim Ave., NE PHONE: (505) 899-5570
CITY, STATE: Albuquerque, New Mexico ZIP CODE: 87113

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

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

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

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

CHECK TYPE OF SUBMITTAL:

- ___ DRAINAGE REPORT
- ___ DRAINAGE PLAN 1ST SUBMITTAL, REQUIRES TCL OR EQUAL
- ___ CONCEPTUAL GRADING & DRAINAGE PLAN
- ___ 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
- X CERTIFICATION OF THE PADS

RECEIVED
JUL 01 2008
HYDROLOGY SECTION

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ___ YES
- X NO
- ___ COPY PROVIDED

DATE SUBMITTED: 06 / 13 / 2008 BY: Shahab Biazar, 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 submittals may be required based on the following:

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

ADVANCED ENGINEERING and CONSULTING, LLC

Consulting
Design
Development
Management
Inspection
Surveying

June 13, 2008

Mr. Bradley L. Bingham, P.E.
Sr. Engineer, Planing Dept.
Development and Building Services
600 Second Street NW
Albuquerque, New Mexico 87102

515
5029

RE: PAD CERTIFICATION APPROVAL FOR STORM CLOUD SUBDIVISION UNITS 4 & 5 (H9-D22)

Dear Mr. Bingham:

This letter is in request of Pad Certification Approval for the above mentioned project. I Shahab Biazar, NMPE, of the Advanced Engineering, LLC hereby certify that the pads have been graded in substantial compliance with and design intent of the approved plan dated 02/14/2007. See enclosed plan for as-built grades.

Please contact me if there are any questions or concerns regarding this submittal.

Sincerely yours,

Shahab Biazar, P.E.

SHAHAB BIAZAR
NEW MEXICO
13479
6/13/08
REGISTERED PROFESSIONAL ENGINEER

RECEIVED
JUL 01 2008
HYDROLOGY SECTION

4416 Anaheim Ave., N.E., Albuquerque, NM 87113 PH (505) 899-5570 FAX (505) 897-4996 EMAIL AECLLC@aol.com

CITY OF ALBUQUERQUE

October 11, 2006

Shahab Biazar, P.E.
Advanced Engineering & Consulting, LLC
4416 Anaheim NE
Albuquerque, NM 87113

Re: Storm Cloud Subdivision Units 4 and 5, Engineer's Stamp dated 10-2-06
Tracts B & J of the Crossings and Tract R of Storm Cloud Unit 3 (H9/D22)

Dear Mr. Biazar,

Based upon the information provided in your submittal received October 3, 2006, the above referenced plan is approved for Preliminary Platting action by the DRB. However, there are some additional items that must be addressed prior to approval of either Work Order or Final Platting action. Those items are detailed below.

- Please provide spot elevations within Unit 4 for the north and south corners of lot 59, the south corner of lot 87, the eastern corner of lot 119, the southwest corners of lots 63, 77, 79, 124, and 143, and the southeast corner of lot 65.
- The spot elevation at the northeast corner of lot 133 Unit 4 appears to create a ponding situation in that backyard.
- The spot elevation for the southwest corner of lot 24 Unit 4 appears to be incorrect.
- The spot elevation for the southeast corner of lot 69 Unit 5 is a foot higher than the adjacent TRW elevation.
- The TF elevation at the northwest corner of lot 91 Unit 5 (72.55) is approximately 2-feet higher than the adjacent spot elevation (70.13).
- Please provide a spot elevation at the southeast corner of lot 14 and the west corner of lot 103 Unit 5.
- Please provide spot elevations and a typical cross section for the proposed pedestrian trail along the Mirehaven Arroyo.
- Ownership of the rundown / emergency overflow on the west side of lot 124 Unit 4 is unclear. Will this be a separate tract or part of lot 124 as an easement encumbrance? The same issue is present for the pipe corridor on the west side of lot 28 Unit 5.
- The TRW and TW elevations along the south side of the Mirehaven indicate that a 13-foot, non-compound wall will be constructed

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

- The walls over the proposed pipe corridors, as well as the wall at between tract H and the open space must be removed.
- The TRW / TF elevations at the southeast corner of lot 64, the southwest corner of lot 60, and the northwest corner of lot 122 Unit 4 are incorrect.
- Please provide cross sections for the various compound retaining wall configurations.
- Please show the high point elevation on White Squall just south of Gunnison as there is an apparent conflict between the street spot elevation and the planned flow direction.
- The wall criteria at lots 45 through 47 Unit 4 is not visible on either sheets 6 or 7 of the retaining wall plan.
- Please provide flow line elevations for the sidewalk culvert that drains the Unit 4 open space to Monsoon.

If you have any questions or need additional information, feel free to contact me at 924-3990.

Sincerely,

Jeremy Hoover, P.E.
Senior Engineer
Hydrology Section
Development and Building Services

cc: file H9/D22

CITY OF ALBUQUERQUE

September 8, 2006

Shahab Biazar, P.E.
Advanced Engineering & Consulting, LLC
4416 Anaheim NE
Albuquerque, NM 87113

Re: Storm Cloud Subdivision Units 4 and 5, Engineer's Stamp dated 8-24-06 (H9/D22)
Tracts B & J of the Crossings and Tract R of Stormcloud Unit 3

Dear Mr. Biazar,

Additional information must be submitted prior to approval for DRB actions or any permits. The following comments should be considered general information and do not constitute a complete drainage review. Such review will be performed and additional comments will be given upon receipt of a complete submittal.

- No Drainage Report was provided. Calculations and a drainage narrative are required. A basin map must be provided and off-site flows addressed along with the proposed improvements to the AMAFCA facility.
- No lot numbers were shown on the plan.
- No calculations were given.
- The benchmark used for boundary determination must be indicated.
- Many lots do not have the flow patterns shown.
- All easements must be called out.
- A mechanism must be provided to allow drainage of the open spaces without overtopping adjacent sidewalks.

If you have any questions or need additional information, feel free to contact me at 924-3990.

Sincerely,

Jeremy Hoover, P.E.
Senior Engineer
Hydrology Section
Development and Building Services

cc: file H9/D22

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

DRAINAGE INFORMATION SHEET

(REV. 1/28/2003rd)

PROJECT TITLE: STORMCLOUD SUBDIVISION UNTS 4 & 5 ZONE ATLAS/DRG. FILE #: H9 / D22

DRB #: EPC #: WORK ORDER #:

LEGAL DESCRIPTION: TRACTS B AND J THE CROSSINGS, & TRACT R STORMCLOUD SUBDIVISION UNIT 3.

CITY ADDRESS:

ENGINEERING FIRM: *Advanced Engineering and Consulting, LLC* CONTACT: Shahab Biazar
ADDRESS: 4416 Anaheim Ave., NE PHONE: (505) 899-5570
CITY, STATE: Albuquerque, New Mexico ZIP CODE: 87113

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

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

CHECK TYPE OF SUBMITTAL:

- X DRAINAGE REPORT
- DRAINAGE PLAN 1ST SUBMITTAL, REQUIRES TCL OR EQUAL
- CONCEPTUAL GRADING & DRAINAGE PLAN
- X GRADING PLAN
- EROSION CONTROL PLAN
- 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:

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

RECEIVED
AUG 25 2006
HYDROLOGY SECTION

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- YES
- X NO
- COPY PROVIDED

DATE SUBMITTED: 08 / 24 / 2006 BY: Shahab Biazar, 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 submittals may be required based on the following:

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

- NEED TO SHOW WALLS w/ TW/BW ELEVS
  SHEET 3A / 3C
- LOT #'S
- BASIN MAP
- NARRATIVE
- CALCS
- EASMENTS
- MANY LOTS SHOWN W/O FLOW PATTERNS
  SHEET 3C
- AMARCA
  CONCURRENCE
- PROVIDE MECHANISM FOR DRAINAGE OF OPEN SPACES TO R.O.W. ~~AMARAO DELGADO~~ W/O OVER TOPPING SWLK

Danny Hernandez - Chair
Janet Saiers - Vice Chair
Tim Eichenberg - Secretary - Treasurer
Ronald D. Brown - Assistant Secretary - Treasurer
Daniel Lyon - Director

John P. Kelly, P.E.
Executive Engineer

Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority
2600 Prospect N.E., Albuquerque, NM 87107
Phone: (505) 884-2215 Fax: (505) 884-0214

April 25, 2007

Mr. Shahab Biazar, P.E.
Advanced Engineering & Consulting
4416 Anaheim Ave. NE
Albuquerque, NM 87113

Re: Work Order Plans for Stormcloud Subdivision, Units 4 & 5, ZAP H-9
City Project No. 650277, Engineer's Stamp Dated March 21, 2007

Dear Mr. Biazar:

We discussed at the previous Design Review Committee (DRC) meeting the need for access to the storm drain manholes next to the Mirehaven Arroyo. I requested drivepads on the streets for access to the easements, but there is an inlet at the end of Summer Breeze Drive that makes this option difficult. Maintenance vehicles can take access from Tierra Pintada, about 900 feet to the west, along the AMAFCA maintenance road, but then they have to either back up into the easement to turn around or continue driving straight through (to where?) to get out. A drivepad can be placed next to the inlet at the end of Torrent Drive, where there is no access road next to the arroyo. Having these large maintenance vehicles driving over curbs is problematic. I defer to City Hydrology on this issue.

I also discussed with the owner the connections from private trails to the AMAFCA maintenance road. I believe these are shown on the landscaping plans on not on work order plans. AMAFCA will not allow these trail connections. These would have to be licensed to the homeowners' association, and AMAFCA is not willing to do that.

AMAFCA still has not received the executed Turnkey Agreement for construction of the Mirehaven Arroyo and Encroachment License for construction in the existing AMAFCA easement. These are items the owner need to address before construction begins. If you have any questions, please call me at 884-2215.

Sincerely,
AMAFCA

Lynn M. Mazur

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

Cc: Brad Bingham, Jeremy Hoover, City Hydrology
John Nelson, Suncal

CITY OF ALBUQUERQUE

March 7, 2007

Shahab Biazar, P.E.
Advanced Engineering & Consulting, LLC
4416 Anaheim NE
Albuquerque, NM 87113

Re: Storm Cloud Subdivision Units 4 and 5, Engineer's Stamp dated 2-14-07
Tracts B & J of the Crossings and Tract R of Storm Cloud Unit 3 (H9/D22)

Dear Mr. Biazar,

Based upon the information provided in your submittal received February 16, 2007, the above referenced plan is approved for both Preliminary and Final Platting action by the DRB. Once the plan has been approved by the DRB, please submit a mylar copy to me in order to obtain rough grading approval.

If you have any questions or need additional information, feel free to contact me at 924-3990.

Sincerely,

Jeremy Hoover, P.E.
Senior Engineer
Hydrology Section
Development and Building Services

cc: file H9/D22
Lynn Mazur, P.E., C.F.M., AMAFCA

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

****
*** TX REPORT ***
****

TRANSMISSION OK

TX/RX NO	0923	
CONNECTION TEL		98974996
SUBADDRESS		
CONNECTION ID		
ST. TIME	10/11 14:33	
USAGE T	01'22	
PGS.	3	
RESULT	OK	

City of Albuquerque
Hydrology
505-924-3900 (main number)
505-924-3864 (fax number - 2nd Level)
505-924-3440 (fax number - 4th Floor)
Development and Building Services (One Stop Shop)
600 2nd Street NW
Albuquerque, NM 87102

City of Albuquerque
Hydrology Section
Development & Bldg. Services

Fax

To:	Shahab Biazar, P.E.	**From:**	Jeremy Hoover, P.E.
Fax:	897-4996	**Pages Sent:**	3
Phone:		**Date:**	October 11, 2006
Subject:	Storm Cloud	**Time:**	2:37 PM

☐ **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☒ **Please Recycle**

FAX

Post-It® Fax Note 7671	Date 9-5	# of pages ▶ 3
To Jeremy Hoover	From Lynn Mazur	
Co./Dept. Hydrology	Co. AMAFCA	
Phone #	Phone #	
Fax #	Fax #	

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

To: Shahab Biazar **Of:** Advanced Engineering

Fax #: 897-4996 **Pages:** 3, incl. cover sheet

From: Lynn Mazur, P.E., C.F.M. **Date:** September 5, 2007
Development Review Engineer

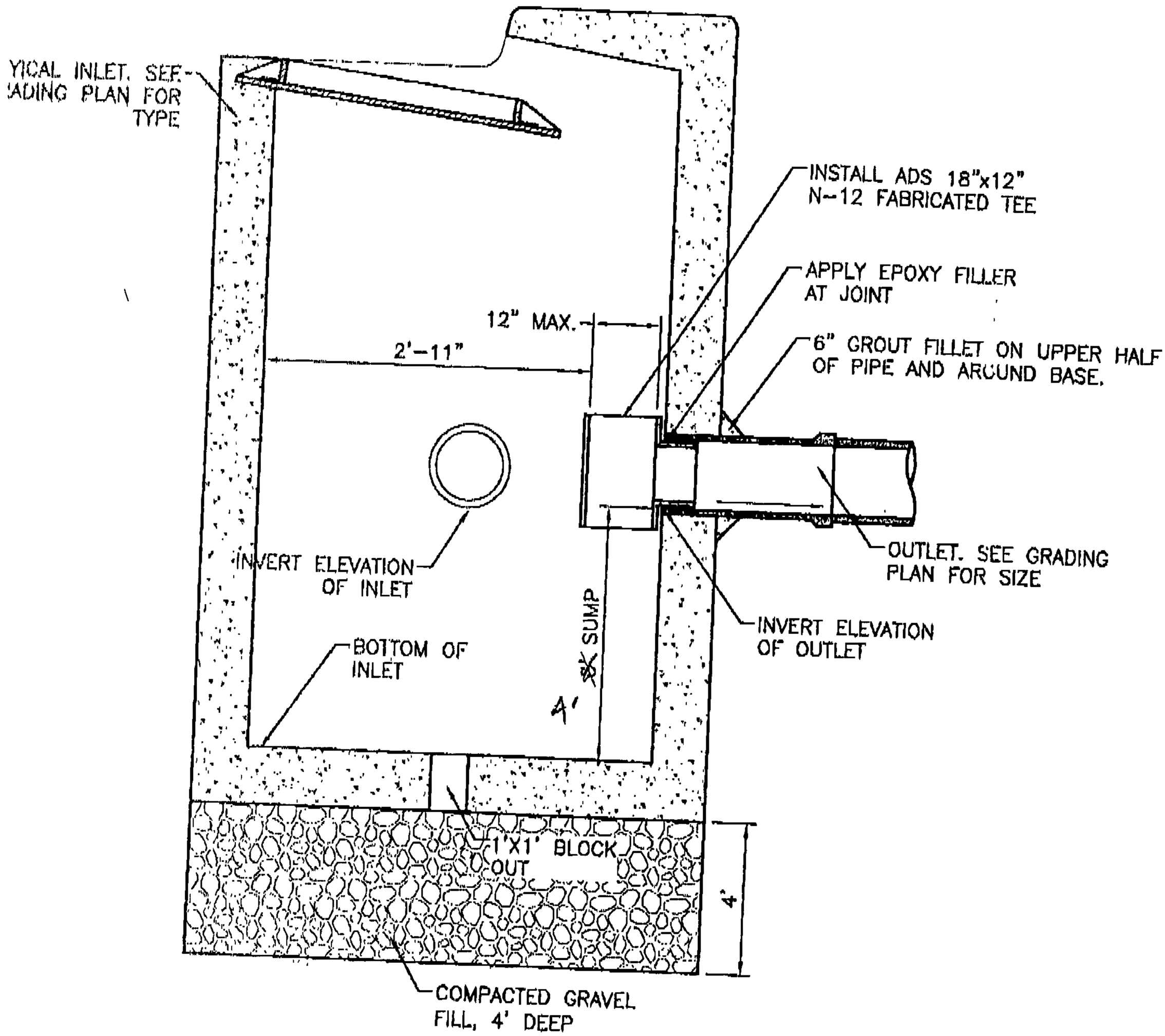
Subject: Stormcloud, Units 4 & 5

COMMENTS:

At the last DRC, I expressed concern about access to the manholes at the storm drain outfalls to the arroyo. I understand that I will receive the subdivision plans today, but on the Tierra Pintada and Mirehaven Arroyo plans (Project 650276), I do not see drivepads from Monsoon Road or Camino del Venado. Whether it is the City's truck or AMAFCA's contractor, we can't have large vactor trucks driving over curbs and inlets. Since the water quality manholes will require the most maintenance, I propose that the WQ manholes be eliminated and an aluminum plate insert be installed inside the inlets. Another option is a PVC tee-section – probably a minimum 18" tee with a 4-foot sump for the flow rates in this subdivision (see attached details). This will switch the water quality feature to the inlets in the roads, which will be easier to access.

The manhole at the junction point at the arroyo from Monsoon can be accessed from the arroyo maintenance road. The other manhole at Camino del Venado will not have easy access. If the City agrees to this, I would like to make this change.

Cc: Jeremy Hoover, City Hydrology



TYPICAL WATER QUALITY INLET DETAIL

NTS

Sidewalk Culvert Flow Calculations

Orifice Equation: $Q=CA\sqrt{(2gh)}$
Q = 3.90 cfs (maximum runoff)
C = 0.6
g = 32.20
h = 0.67' (at the back of the sd/wk culvert)
Opening = 2.00'
A= 2.00 x 0.67 = 1.34 sf

$Q = 0.60 \times 1.34\sqrt{(2 \times 32.2 \times 0.67)}$
Q = 5.28 cfs > 3.90 cfs

Therefore, 2' sidewalk culverts will be installed in order to drain the open space to to Camino De Venado Ave., Unit 5.

RETENTION POND
SPILLWAY CALCULATIONS

SPILLWAY WIDTH

Weir Equation: $Q=CLH^{3/2}$
Q = 1677.00 cfs
C = 3.10
h = 205.00'
Opening = 9.00'

$Q = 3.1(205.00)(2.00)^{3/2}$
Q = 1797.46 cfs > 1677.00 cfs

VOLUME CALCULATIONS FOR 10-DAY STORM

(UNDER EXISTING CONDITIONS)

DRAINAGE BASINS

SUB-BASIN	AREA (SF)	AREA (AC-FT)	AREA (MI^2)
TOTAL	2,267,893.57	52.06367	0.081349

$$E = \frac{EA(AA) + EB(AB) + EC(AC) + ED(AD)}{AA + AB + AC + AD}$$

V-360 = E (AA + AB + AC + AD)

V-10 Day = V-360 + AD (P-10 Day - P-360) / 12 in/ft

EA = 0.44
EB = 0.67
EC = 0.99
ED = 1.97

AA = 100.00%
AB = 0.00%
AC = 0.00%
AD = 0.00%

P-60 = 1.87
P-360 = 2.20
P-1440 = 2.66
P-10 Day = 3.67

E =	**0.4400**	**IN**
V-360 =	**1.9090**	**AC-FT**
AD =	**0.0000**	**AC**
V-10 Day =	**1.9090**	**AC-FT**
V-10 DAY =	**83,156.10**	**CF**

PONDING REQUIREMENT:

(V-PROPOSED) - (V-EXISTING) =	**383765.39**	**-**	**83156.10**
PONDING REQUIREMENT =	**300,609.29**	**CF**	
	6.90104	**AC-FT**	

VOLUME CALCULATIONS FOR 10-DAY STORM

(UNDER PROPOSED CONDITIONS)

DRAINAGE BASINS

SUB-BASIN	AREA (SF)	AREA (AC-FT)	AREA (MI^2)
TOTAL	2,267,893.57	52.06367	0.081349

$$E = \frac{EA(AA) + EB(AB) + EC(AC) + ED(AD)}{AA + AB + AC + AD}$$

V-360 = E (AA + AB + AC + AD)

V-10 Day = V-360 + AD (P-10 Day - P-360) / 12 in/ft

EA = 0.44
EB = 0.67
EC = 0.99
ED = 1.97

AA = 0.00%
AB = 27.00%
AC = 27.00%
AD = 46.00%

P-60 = 1.87
P-360 = 2.20
P-1440 = 2.66
P-10 Day = 3.67

E =	**1.3544**	**IN**
V-360 =	**5.8763**	**AC-FT**
AD =	**23.9493**	**AC**
V-10 Day =	**8.8100**	**AC-FT**
V-10 DAY =	**383,765.39**	**CF**

POND CALCULATIONS
PROPOSED RETENTION POND

TOP SURFACE ARE OF THE POND =	57,689.41	SF	@ ELEVATION			5,290 00	FT			
BOTTOM SURFACE ARE OF THE POND =	28,467 33	SF	@ ELEVATION			5,283.00	FT			
DEPTH OF THE POND =	7 00	FT								
SLOPE OF THE POND =	4.1									
VOLUME =	(57,689 41	+	28,467 33) /	2 00	*	7 00	=	301,548 59	CF	
						VOLUME PROVIDED =		**301,548.59**	**CF**	
						VOLUME REQUIRED =		**300,609.29**	**CF**	

BOX CULVERT CROSSING AT TIERRA PINTADA STREET (FLOW DEPTH ANALYSIS)

Rectangular Channel Analysis & Design

Open Channel - Uniform flow

Worksheet Name: 639-BOX-CLVT

Description: BOX CULVERT AT TIERRA PINTADA STREET

Solve For .....Depth

Bottom Width...	30.00 ft	Velocity.....	11.94 fps
Manning's n....	0.013	Flow Area.....	140.48 sf
Channel Slope..	0.0020 ft/ft	Flow Top Width..	30.00 ft
Depth.....	4.68 ft	Wetted Perimeter	39.37 ft
Discharge.....	1677.00 cfs	Critical Depth..	4.60 ft
		Critical Slope..	0.0021 ft/ft
		Froude Number...	0.97

Open Channel Flow Module, Version 3.13 (c)

Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

ADVANCED ENGINEERING and CONSULTING, LLC

Consulting
Design
Development
Management
Inspection
Surveying

February 14, 2007

Mr. Jeremy Hoover, P.E.
Senior Engineer
Hydrology Section
Development and Building Services
600 Second Street NW
Albuquerque, New Mexico 87102

RE: STORM CLOUD SUBDIVISION UNITS 4 & 5 (H9-D22)

Dear Mr. Hoover:

This letter and submittal is based on your comments received dated January 24, 2007. The following are the responses to your comments:

- We are addressing AMAFCA comments with this submittal as well. A pond covenant will be submitted at a later time once we have one signed from the owners.

- We will add a drainage easement on the plat within Tract I. The work within Tract I will be included in the work order set.

- The contour labeling were corrected on Tract E, Unit 4. The contour labels are from 5281 5302.

- The floating retaining wall description on lot 138, Unit 4 was corrected. TF/TRW elevation was added for the discontinuity of the wall at the western edge of lot 138.

- Southeastern corner spot elevation was added for lot 33, Unit 4.

- The pad elevations were corrected to maintain a maximum 1.5' elevation difference for the lots 72 and 73. The back spot elevation for lot 73 was raised to have a better slope for drainage to the front.

RECEIVED
FEB 15 2007
HYDROLOGY SECTION

4416 Anaheim Ave., N.E., Albuquerque, NM 87113 PH (505) 899-5570 FAX (505) 897-4996 EMAIL AECLLC@aol.com

Some of the retaining walls were changed to three and two level retaining wall to reduce the height of the walls.

Sincerely yours,

Shahab Biazar, P.E.

SHAHAB BIAZAR
NEW MEXICO
13479
REGISTERED PROFESSIONAL ENGINEER
2/14/07

CC: Lynn M. Mazur, P.E.
AMAFCA

RECEIVED
FEB 15 2007
HYDROLOGY SECTION

ADVANCED ENGINEERING and CONSULTING, LLC

Consulting
Design
Development
Management
Inspection
Surveying

February 14, 2007

Ms. Lynn M. Mazur, P.E.
Development Review Engineer
AMAFCA
2600 Prospect NE
Albuquerque, New Mexico 87107

RE: GRADING AND DRAINAGE PLAN FOR STORMCLOUD, UNITS 4 AND 5

Dear Ms. Mazur:

This letter is in reference to your comments received dated January 10, 2007. The following are responses to your comments:

Comments regarding the revised G&D plan:

1. The retention pond west of Tierra Pintada will be maintained by the owners.

2. Section F-F was changed to show the correct dimension of 100'.

Comments regarding the work order plans:

1. We will obtain Parks and Recreation Department approval on the trail adjacent to arroyo.

2. Orifice Equation was used to calculate the inlet conditions for the box culvert. See attached calculations.

3. Weir calculations for the overflow of the retention pond is attached.

RECEIVED
FEB 15 2007
HYDROLOGY SECTION

4416 Anaheim Ave., N.E., Albuquerque, NM 87113 PH (505) 899-5570 FAX (505) 897-4996 EMAIL AECLLC@aol.com

Since we are planing to build a retention pond for the extra flow being generated from this project we are hoping that we would able to move forward with full approval of the subdivision. All the required easement and pond covenant will be provided to the City. I believed we can hold the release of the financial guarantee until the study from BHI is finalized and release the rest of the approvals meanwhile. We will deliver the construction plans to your review sometime next week.

Please contact me if there are any questions or concerns regarding this submittal.

Sincerely yours,

Shahab Biazar, P.E.

CC: Mr. Jeremy Hoover, City of Albuquerque

RECEIVED
FEB 15 2007
HYDROLOGY SECTION

Retention Pond Overflow Calculations

<u>Overflow Opening</u>

Weir Equation: $Q=CLH^{3/2}$
Q = 2.34 cfs (maximum runoff)
C = 3.10
h = 2.00'
Opening = 205.00'

$Q = 3.1(205)(2.00)^{3/2}$
Q = 1797.47 cfs > 1677.00 cfs

SHAWN BIAZAR
NEW MEXICO
13479
REGISTERED PROFESSIONAL ENGINEER
2/14/07

RECEIVED
FEB 15 2007
HYDROLOGY SECTION

BOX CULVERT CALCULATIONS

Box culvert capacity calculations at the inlet of the culvert were done using the orifice equation.

Orifice Equation: $Q=CA\sqrt{2gh}$

h (head) = 6.00'
A = 180 sf
g = 32.20

$Q = 0.60 \times 180 \times \sqrt{(2 \times 32.2 \times 6.00)}$
= 2122.96 cfs >> 1677 cfs

h (head) = 8.00' (to top of header wall)
A = 180 sf
g = 32.20

$Q = 0.60 \times 180 \times \sqrt{(2 \times 32.2 \times 8.00)}$
= 2451.39 cfs >> 1677 cfs

SHAHAB BIAZAR
NEW MEXICO
13479
2/4/07
REGISTERED PROFESSIONAL ENGINEER

REVISED POND CALCULATIONS

PROPOSED RETENTION POND

TOP SURFACE ARE OF THE POND =	43,507.75	SF	@ ELEVATION				5,290.00	FT			
BOTTOM SURFACE ARE OF THE POND =	19,827.66	SF	@ ELEVATION				5,280.00	FT			
DEPTH OF THE POND =	10.00	FT									
SLOPE OF THE POND =	3:1										
VOLUME =	(43,507.75	+	19,827.66) /	2.00	*	10.00		=	316,677.05	CF	

VOLUME PROVIDED = 316,677.05 CF

VOLUME REQUIRED = 300,609.29 CF

WE REVISED THE RETENTION POND TO KEEP IT WITHIN THE EXISTING EASEMENT

SHAHAB BIAZAR
NEW MEXICO
13479
REGISTERED PROFESSIONAL ENGINEER
2/14/07

CITY OF ALBUQUERQUE

January 24, 2007

Shahab Biazar, P.E.
Advanced Engineering & Consulting, LLC
4416 Anaheim NE
Albuquerque, NM 87113

Re: Storm Cloud Subdivision Units 4 and 5, Engineer's Stamp dated 12-20-06
Tracts B & J of the Crossings and Tract R of Storm Cloud Unit 3 (H9/D22)

Dear Mr. Biazar,

Based upon the information provided in your submittal received January 2, 2007, there are some additional items that must be addressed prior to approval of additional permits or for a Final Platting action by the DRB. Those items are detailed below.

- AMAFCA approval is required. The issues described in their letter dated January 10, 2007 must therefore be addressed and included in the revised plan set. Pond maintenance responsibilities will require the execution an agreement and covenant approved through the DRB.
- You show Tract E Unit 4 as draining to a sidewalk culvert at Monsoon via Tract H. That parcel is called out on the proposed plat as Tract I. Whether H or I, a drainage easement through this property is required and should also be included in the work order plans.
- The 5,191 through 5,194 elevation contours on Tract E Unit 4 are mislabeled as 5,290 and the 5,281 contour through Tract I / H is labeled as 5,282.
- There is a floating retaining wall description on lot 138 Unit 4 that points to a spot elevation on the common lot line with lot 137. A TF / TRW elevation description is also necessary for the discontinuity of the wall at the western edge of lot 138.
- Please provide the southeastern corner spot elevation for lot 33 Unit 4.
- Please revise the elevations for lot 73 Unit 4. Your letter indicates that retaining walls are necessary for pad elevation differences greater than 1.5-feet and the difference from lot 72 is 1.7-feet. With a 0.1-foot difference between the southern and western corners of the lot, drainage is also marginal.

If you have any questions or need additional information, feel free to contact me at 924-3990.

Sincerely,

Jeremy Hoover, P.E.
Senior Engineer
Hydrology Section
Development and Building Services

cc: file H9/D22
Lynn Mazur, P.E., CFM, AMAFCA

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

Tim Eichenberg - Chair
Danny Hernandez - Vice Chair
Daniel F. Lyon - Secretary - Treasurer
Ronald D. Brown - Assistant Secretary - Treasurer
Janet Saiers - Director

John P. Kelly, P.E.
Executive Engineer

Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority
2600 Prospect N.E., Albuquerque, NM 87107
Phone: (505) 884-2215 Fax: (505) 884-0214

Post-it® Fax Note 7671	Date 1-10	# of pages ▶ 2
To Jeremy Haever	From Lynn Mazur	
Co./Dept. Hydrology	Co. AMAFCA	
Phone #	Phone #	
Fax #	Fax #	

January 10, 2007

Mr. Shahab Biazar, P.E.
Advanced Engineering & Consulting
4416 Anaheim Ave. NE
Albuquerque, NM 87113

Re: Revised Grading & Drainage Plan for Stormcloud Subdivision, Units 4 & 5, ZAP H-9
Engineer's Stamp Dated December 20, 2006

Dear Mr. Biazar:

AMAFCA approved the referenced subdivision for Preliminary Plat in October 2006. There was subsequent discussion regarding the capacity of Ladera Dam 12, into which the Mirehaven Arroyo outfalls. You noted in your cover letter that Bohannan Huston, Inc. was preparing an analysis of the dam capacity. AMAFCA will allow grading to proceed but will not approve subsequent action on the subdivision until the Ladera Dam 12 analysis is complete and approved by AMAFCA.

Following are comments for the revised G&D plan:

1. The retention pond west of Tierra Pintada is an interim facility until Ladera Dams 9 and 10 are expanded. Who will maintain the pond?
2. The Grading & Drainage Plan shows 100 + feet for the Mirehaven Arroyo right-of-way, but Section F-F shows 72 feet. The Turnkey Agreement with Westland for construction of the arroyo specifies a minimum of 100 feet.

The following items should be addressed at time of work order plans:

1. City of Albuquerque Parks and Recreation Department will be required to sign the Mirehaven Arroyo plans with regard to the trail adjacent to the arroyo.
2. Inlet control calculations should be provided for the 3-10' x 6' box culvert at Tierra Pintada to determine if flow will overtop the road.
3. If the retention pond is required, provide weir calculations for the emergency spillway. AMAFCA recommends riprap or other hardened surface on the spillway to the box culvert entrance.

AMAFCA will sign work order plans, Mirehaven Arroyo plans and Final Plat. If you have any questions, please call me at 884-2215.

Sincerely,
AMAFCA

Lynn M. Mazur

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

Cc: Jeremy Hoover, City Hydrology

ADVANCED ENGINEERING and CONSULTING, LLC

Consulting
Design
Development
Management
Inspection
Surveying

January 2, 2007

Mr. Jeremy Hoover, P.E.
Senior Engineer
Hydrology Section
Development and Building Services
600 Second Street NW
Albuquerque, New Mexico 87102

RE: STORM CLOUD SUBDIVISION UNITS 4 & 5 (H9-D22)

Dear Mr. Hoover:

This letter and submittal is based on your comments received dated October 11, 2006. The following are the responses to your comments (The entire site was lowered to reduce the imported fill and height of the retaining walls along the Mirehaven Arroyo):

- Spot elevations on the Lots 59, 87, 119, 63, 77, 79, 124, 143, and 65 Unit 4 are added to the grading plan.
- The spot elevation at the northeast corner of Lot 133 Unit 4 is corrected.
- The spot elevation for the southwest corner of Lot 24 Unit 4 was changed to 5267.49.
- The spot elevation for the southeast corner of Lot 69 unit 5 is corrected. The TRW is set at 73.44 and adjacent spot Elevation is set at 72.70.
- The TF elevation at the northwest corner of Lot 91 unit 5 is corrected. The Tf is 70.55 and adjacent sport Elevation is 71.50.
- Spot elevations at the southeast corner of Lot 14, Unit 5 was added. No Lot 103 exists in Unit 5. But we checked Lot 103 in Unit 4 to make sure all spot elevations were in place.
- Spot elevations and a typical cross section for the proposed pedestrian trail along the Mirehaven Arroyo is added. See Section F-F on Sheet 7 of 7.
- Separate Tracts will be assigned for the rundown/emergency overflow on the west side of Lot 124, Unit 4 and for the pipe corridor on the west side of lot 28 unit 5. Homeowner Association will be the owners of the Tracts and drainage easement will be granted to City of Albuquerque.

4416 Anaheim Ave., N.E., Albuquerque, NM 87113 PH (505) 899-5570 FAX (505) 897-4996 EMAIL AECLLC@aol.com

- The site was lowered to reduce the retaining wall heights and the amount of imported fill. Therefore, retaining wall heights were lowered along the south side of the Mirehaven Arroyo. The maximum wall height is ±10.00'.

- The walls over the proposed pipe corridors as well as the walls between tract H and the open space were removed.

- The TRW/TF elevations were corrected at the southeast corner of lot 64, the southwest corner of lot 60, and the northwest corner of lot 122 unit 4.

- Cross sections for the various compound retaining wall configurations were added to the plans. See sheet 7 of 7 for the sections.

- High point elevation 5303.40 is shown just south of Gunnison on White Squall.

- All wall criteria for all the lots are visible with this submittal.

- Flow line elevations for the sidewalk culvert that drains the Unit 4 open space to Monsoon are added.

Bohannan Houston is preparing a ponding capacity analysis of Pond #12 were all the runoff from Mirehaven drains to. The analysis is to check if we are able to free discharge the developed runoff from the Strom Cloud into Pond #12. Meanwhile we have provided a retention pond just east of Tierra Pintada at Mirehaven Crossing. The retention pond volume equals to developed volume minus historical volume for the runoff of the areas of the subdivision which drains directly to Mirehaven Arroyo. The retention pond is designed incase Pond #12 does not have enough capacity to take the developed runoff from Storm Cloud Subdivision. The Box Culvert sizes were also changed to 3-10x6 box culverts. See attached calculations for the retention pond volume calculations and the revised box culvert hydraulic calculations.

Please contact me if there are any questions or concerns regarding this submittal.

Sincerely yours,

Shahab Biazar, P.E.

CC: Lynn M. Mazur, P.E.
AMAFCA

Albuquerque Bernalillo County Water Utility Authority

One Civic Plaza NW, Room 5012
Albuquerque, NM 87102
Phone (505) 768-2500
Fax (505) 768-2580

July 10, 2006

Chair
Alan B. Armijo
County of Bernalillo
Commissioner, District 1

Vice-Chair
Issac Benton
City of Albuquerque
Councillor, District 3

Michael J. Cadigan
City of Albuquerque
Councillor, District 5

Teresa Cordova
County of Bernalillo
Commissioner, District 2

Martin Heinrich
City of Albuquerque
Councillor, District 6

Deanna A Archuleta-Loeser
County of Bernalillo
Commissioner, District 3

Martin J. Chávez
City of Albuquerque
Mayor

Ex-Officio Member
Pablo R. Rael
Village of Los Ranchos
Board Trustee

Executive Director
Mark S Sanchez

Website
http://www.cabq gov/wua

Advanced Engineering
4416 Anaheim Ave. NE
Albuquerque, NM 87113

RE: Crossings, Tracts J & B H-09

Sirs:

Existing Conditions: The property includes approximately 55-acres on the southeast side of Tierra Pintada, east of Las Lomitas Subdivision. There is an AMAFCA channel running west to east across Tract B an existing 20-inch zone 2W master plan water running north to south through the middle of Tract J. System maps also show a 6-inch zone 2W distribution line crossing the property from Selway Place to Camino Del Venado. Infrastructure in Las Lomitas to the East was built out several years ago. See project #26-4422.91. The Crossings Unit 2B to the southeast is more recent: #26-5453.88. These projects included zone 2W water lines and or sanitary sewer stubs in the various streets dead-ending at your property line(s). Onsite improvements for the Stormcloud Subdivision to the southwest, are in progress under three simultaneous phases of Project #6502.78, .79, .80. Adjoining portions of Tierra Pintada are included in the Watershed Subdivision: #7429.81, and a fourth phase of Stormcloud: 'Offsite improvements' #6502.89. Tierra Pintada improvements will include half width paving, a 10-inch zone 3W water line from the PRV (approximately at Watershed) west and south to Arroyo Vista Blvd, and an 8-inch 3W stub proximate to the existing 20-inch. Stormcloud Phase 3 includes a bottom of zone 10-inch zone 3W master plan water line to your south property line west of Animas.

Proposed Development: The sketch plat provided shows a 231 lot single family subdivision. Actually, since you show an improved arroyo with no crossing structures, it's actually two distinct subdivisions. The south subdivision shows vehicular connections to Tierra Pintada, Animas, Gunnison, and Henry Fork Rd., but not connection to Summer Breeze Drive (aka Summer Rain) were the new master plan line is being stubbed out. The north subdivision shows two access points on Tierra Pintada, but none at Camino Del Venado. While the plat may be approved without any arroyo crossings, I expect vehicular connections will be required at Camino Del Venda, and Summer breeze. This will be determined during DRB review.

Infrastructure: Your inquiry did not include **any** grading information. As such detailed infrastructure requirements will have to be established after a review of the final grading plan. As discussed above there are both 2W, and 3W water lines on-site and abutting the property. The design zone boundary is defined by the 5255'msl contour. In general, no off-site water system improvements will be required. Service will require construction of looped zone 3W distribution lines in all internal streets.

Design must include completion of the 10-inch bottom of zone line from Summer Breeze to Tierra Pintada. Ideally the 10-inch should be routed through the entire subdivision, following the zone boundary, paralleling the existing 20-inch to Tierra Pintada, with the looping connection being made just downstream of the PRV. Final alignment will be determined during design. Construction must include a 2W looping line from Animas to Selway, with a connection in Gunnison. Depending on finish floor elevations this line MAY be available for service connections. However, I anticipate service will be from a parallel 3W line in the same corridor. Public Sewer lines will be required in standard locations in all internal streets with outfalls to existing lines in Las Lomitas and the Crossings Unit 2B. Some offsite flows may be routed through the property. Construction must outfall to Tierra Pintada on both sides of the Arroyo, including a 10-inch to the existing 10-inch in Gunnison. Again, detailed infrastructure requirements will be established after a review of the final grading plan.

Easements: To the extent possible all lines must be routed in standard locations in dedicated right of way. Lines constructed outside dedicated right of way require an exclusive easement established by plat. We will not accept public lines in yards or other landscaped areas

Design and construction of all required improvements will be at the developer / property owner's expense and must be coordinated through the City of Albuquerque via the DRC / City Work Order process. Designs must be by a licensed, New Mexico registered Professional Engineer. Construction must be by a licensed, bonded, public utility contractor.

Costs and Fees: In addition to installation and construction costs, each sanitary sewer and metered water service will be subject to Utility Expansion Charges (UEC) payable at the time of service application. All charges and rates collected will be based on the ordinances and policies in effect at the time service is actually requested and authorized.

Consumptive Use: All new development shall be required to meet the standard water usage of 180 gallons per household per day which is equivalent to 75 gallons per capita day. Indoor water use shall consist of 70% of total use with outdoor limited to 30%. Where available, outdoor water usage shall utilize reclaimed water.

Closure: This statement of availability will remain in effect for a period of one (1) year from the date of issue and applies only to the development identified herein. Its validity is, in part, contingent upon the continuing accuracy of the information supplied by the developer. Changes in the proposed development may require reevaluation of availability and should be brought to the attention of the Utility Development Section of the Water Utility Department as soon as possible. Please feel free to contact that office at (505) 924-3987, or by fax at (505) 924-3864 if you have questions regarding the information presented herein or need additional information.

Sincerely,

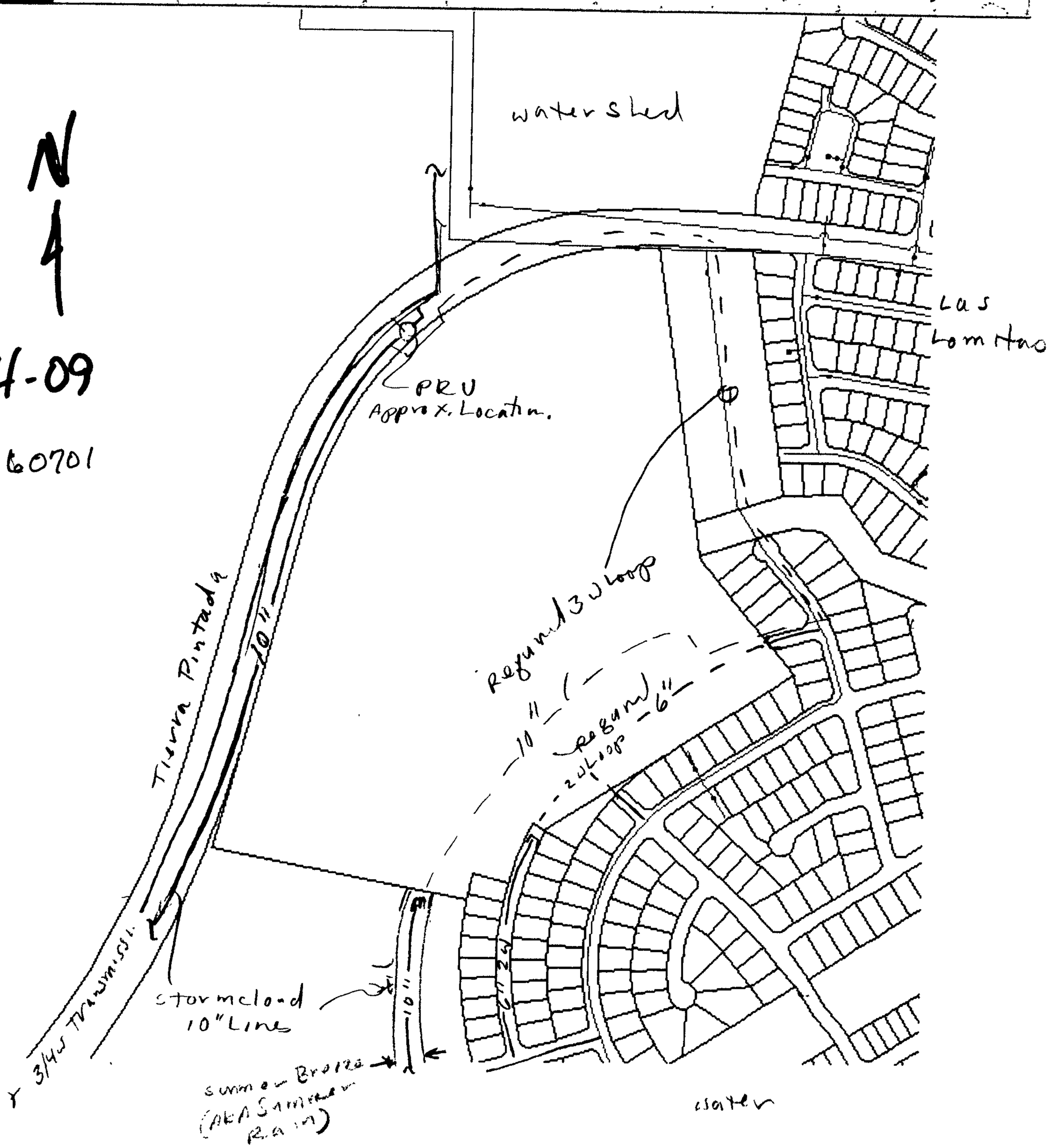
Mark S. Sanchez
Executive Director
Albuquerque Bernalillo County Water Utility Authority
encl: System / Area Map(s)

cc: f/ Readers #60701
f/ Project #1003087
f/ Availability H-09

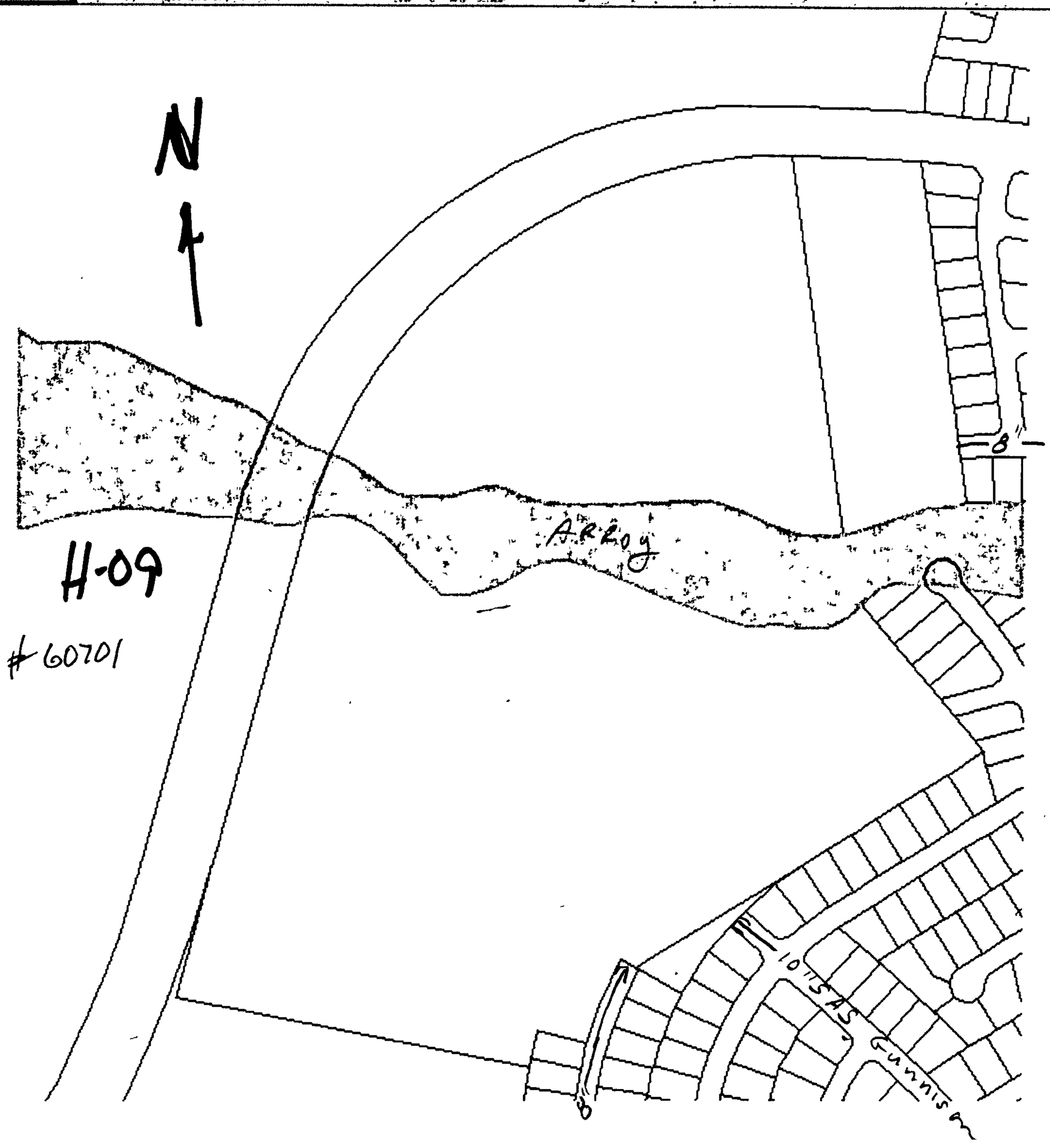
N

H-09

#60701



WATER



Sewer

SEWER

ADVANCED ENGINEERING and CONSULTING, LLC

Consulting
Design
Development
Management
Inspection
Surveying

October 2, 2006

Mr. Jeremy Hoover, P.E.
Senior Engineer
Hydrology Section
Development and Building Services
600 Second Street NW
Albuquerque, New Mexico 87102

RE: STORM CLOUD SUBDIVISION UNITS 4 & 5 (H9-D22)

Dear Mr. Hoover:

This letter and submittal is based on your comments received dated September 20, 2006. The following are the responses to your comments:

- The spot elevation was corrected at the Chinook / White Squall intersection. Therefore, we do not have 10% slope. Elevation 5279.48 was changed to 5281.15.

- The text along the Mirehaven has been shifted around so it could be easier to read.

- Some adjacent lot grades are shown on the grading plan. Also copies of the grading plans for the adjacent projects is enclosed with this submittal.

- Street grades for Animas and Camino de Venado are added to the plan. Copies of the design of Tierra Pintada is included in this submittal. It does not appear that Tierra Pintada will be super elevated at any location. Mirehaven Arroyo is the only offsite flow which enters this project from upstream Watershed.

- The channel rundown are removed from the plans. The flows are being routed through the pipe network.

- Mirehaven Arroyo improvements was changed at Tierra Pintada. A copy of the plat with an existing easement upstream of the new box structure is enclosed.

- We have submitted the plans and the report to AMAFCA for review.

- The pad section was changed to show that the difference between the pad elevations can be up to 1.57'. Maximum pad elevation on our plans without the

4416 Anaheim Ave., N.E., Albuquerque, NM 87113 PH (505) 899-5570 FAX (505) 897-4996 EMAIL AECLLC@aol.com

retaining walls is 1.50'. The pad elevations for lots 78 / 80 Unit 4 was corrected. The pad elevation was changed from 5272.64 to 5269.95.

- There is a setback in the boundary line by Lot 20, Unit 4. Therefore, it appears that there is a discontinuity of the wall.
- The floating wall elevation on lot 56 Unit 5 was removed.
- Sidewalk culverts were added at the locations were the open space areas were draining into the streets.
- The compound wall between lots 56 and 57 Unit 5 was eliminated. The lower wall was increased to remove the upper wall.
- The retaining wall elevations for lots 27, 51, 52 and 53 Unit 5 as well as lots 18, 98, 134 and 135 Unit 4 was corrected.
- The elevations of the walls for the properties on the south side of Chinook Road was corrected. Additional wall elevations were deleted from the plans.
- The missing elevations for the end of the retaining walls were added to the revised plans.

Please contact me if there are any questions or concerns regarding this submittal.

Sincerely yours,

Shahab Biazar, P.E.

48.33			
	4.67		10.0
48.33			
46.00			
	2.00–4.00		0.0
46.00			
	4.00		0.0
46.00			
	5.33		0.0
46.00			
	6.00		0.0
46.00			
	6.67–8.00		0.0
46.00			
	8.00–9.33		0.0
46.00			
	9.33–6.67		0.0
49.33			
	6.67		0.0
49.33			
	6.67–4.00		0.0
49.33			
50.33			
	4.00		5.0
50.33			
48.67			
	4.00		5.0
48.67			
46.67			
	4.00		0.0
46.67			
44.67			
	4.00		5.0
44.67			

12–2	45.33	41.33/40.67		
			4.00–3.33	25.0
12–3	43.33	40.67/40.00		
			3.33	40.0
12–4	43.33/42.67	40.00/39.33		
			3.33	45.0
12–5	42.67	39.33		
13–1	41.33	38.00		
			3.33	68.0
13–2	41.33/44.00	38.00/40.00		
			4.00	30.0
13–3	44.00/44.67	40.00/40.67		
			4.00	30.0
13–4	44.67/46.00	40.67/41.33		
			4.67	30.0
13–5	46.00/46.67	41.33/42.00		
			4.67	30.0
13–6	46.67/48.00	42.00/42.67		
			5.33	30.0
13–7	48.00	42.67/43.33		
			4.67	30.0
13–8	48.00	43.33		
14–1	41.33	36.67		
			4.67	110.0
14–2	41.33	36.67		

BENCH MARK

A.C.S. Aluminum Tablet Stamped "BH–40" Data:
New Mexico State Plane Grid Coordinates (Central Zone)
NAD 1927 X=352,790.66 Y=1,492,346.53
Ground to grid factor = 0.9996105
Delta Alpha = (–)00°16'59"

A.C.S. Aluminum Tablet Stamped "BH–41" Data:
New Mexico State Plane Grid Coordinates (Central Zone)
NAD 1927 X=351,455.56 Y=1,496,546.13
Ground to grid factor = 0.99966704
Delta Alpha = (–)00°17'08"

LEGEND

	UNIT 3 PROPERTY LINE
	RIGHT OF WAY
EXISTING	
5200	INDEX CONTOUR
5199	INTERMEDIATE CONTOUR
37.58	SPOT ELEVATION
	RETAINING WALL
PROPOSED	
5200	INDEX CONTOUR
	INTERMEDIATE CONTOUR
	GRADING LIMITS
	CURB AND GUTTER
37.58	SPOT ELEVATION
	RETAINING WALL
	DIRECTION OF FLOW

APPROVED FOR ROUGH GRADING ±1'
Brad S. Bish 11/18/03
COA DATE

WILSON & COMPANY
2600 THE AMERICAN ROAD S.E.
SUITE 100
RIO RANCHO, NEW MEXICO
87124
(505) 898–8021

BRIGITTE FULLER
NEW MEXICO
15102
10/23/03
REGISTERED PROFESSIONAL ENGINEER

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

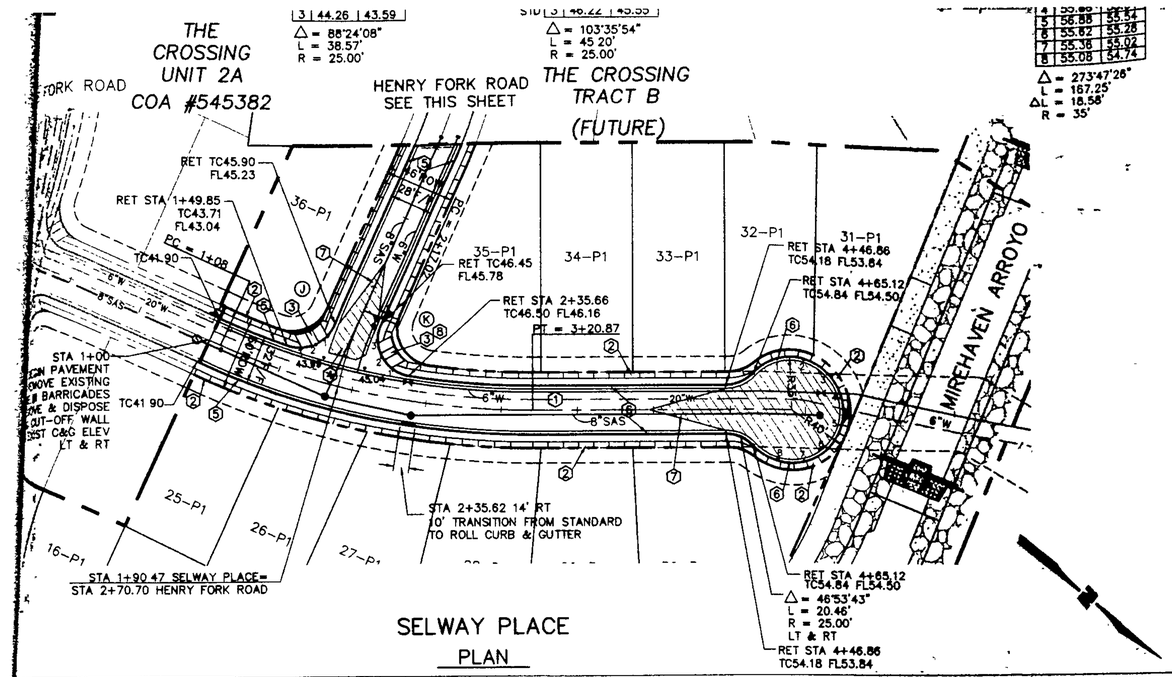
THE CROSSING SUBDIVISION UNIT 3
GRADING & DRAINAGE PLAN

Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.
For Information Only				

City Project No.	Zone Map No.	Sheet	Of
545983	H–9–Z	2	3

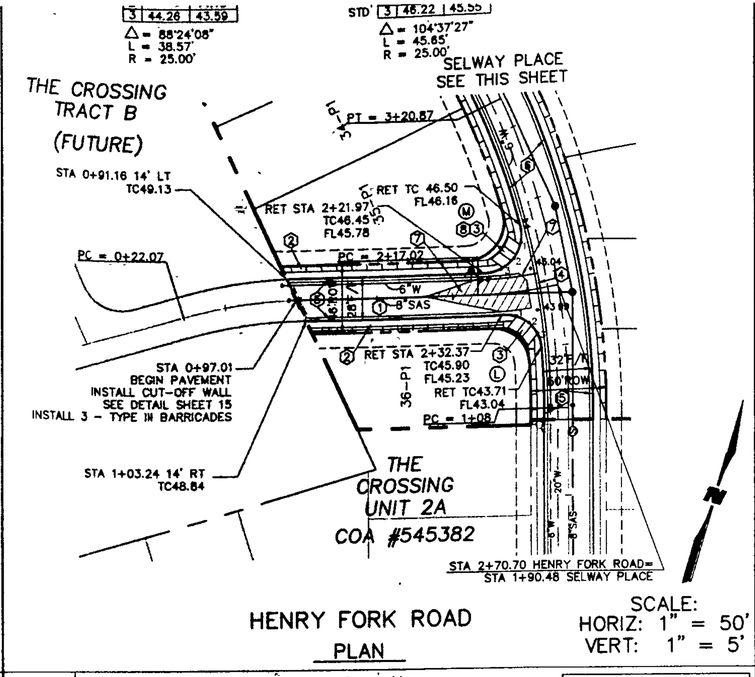
WCEA #X3218008
JUNE 2003

\SHEETS\83086G02.DWG \10–23–03\DLC



SELWAY PLACE

PLAN

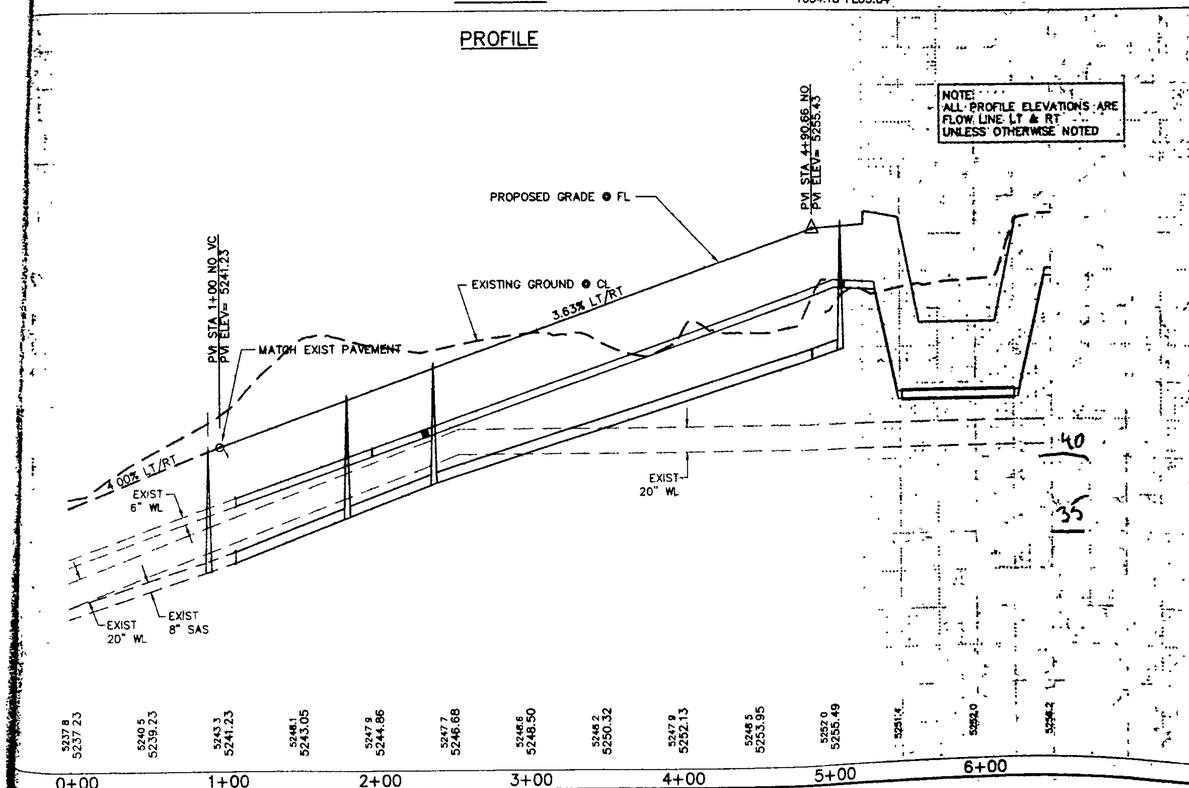


HENRY FORK ROAD

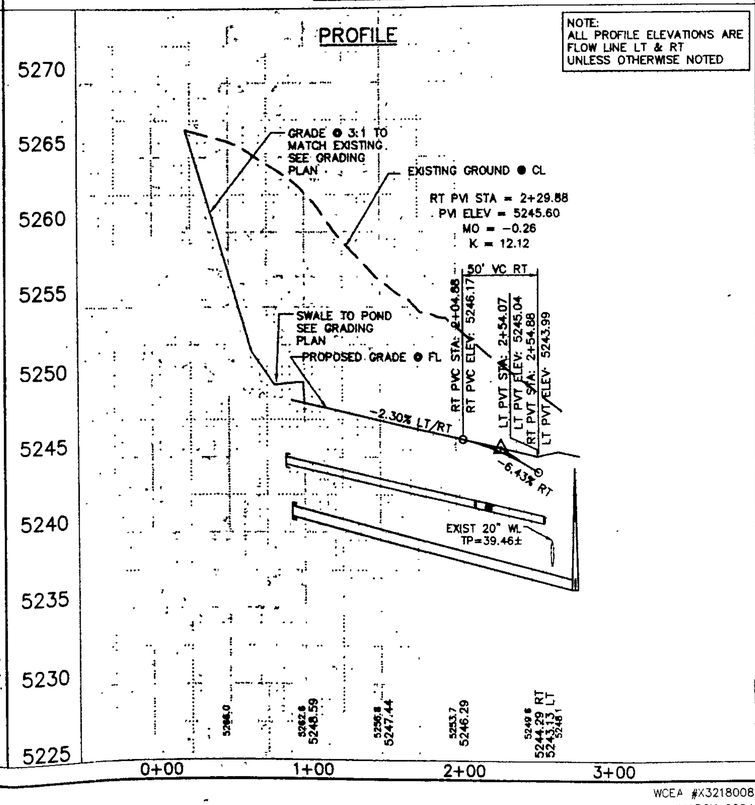
PLAN

SCALE:
HORIZ: 1" = 50'
VERT: 1" = 5'

PROFILE



PROFILE



WCEA #X3218008
MARCH 2004

5	BUILD 8' PCC STD CURB AND GUTTER PER COA STD DWG 2415A
6	BUILD PCC ROLL CURB AND GUTTER PER COA STD DWG 2415A
7	PAVEMENT TRANSITION FROM FULL CROWN TO NO CROWN AT RETURN
8	TRANSITION FROM STD TO ROLL CURB & GUTTER THROUGH WCR PER STD DWG 2418

GENERAL NOTES

1. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITY LOCATIONS AND NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

2. ALL CURB RETURN RADII SHALL BE 25' TO FACE OF CURB UNLESS OTHERWISE SPECIFIED.

3. ALL CURVE DATA AND DIMENSIONS REFER TO FACE OF CURB UNLESS OTHERWISE SPECIFIED.

4. GRADE ELEVATIONS, WHERE NOTED, ARE FOR TOP OF CURB UNLESS OTHERWISE SPECIFIED.

5. CONTRACTOR IS TO INSTALL A 4"x4"x5' 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 SO AS NOT TO INTERFERE WITH NORMAL ACTIVITIES OF RESIDENTS OR OTHER CONTRACTORS ON SITE.

10. ANY DAMAGE TO THE EXISTING FACILITIES (CURB AND GUTTER, PAVEMENT, CONDUITS, LANDSCAPING, UTILITY LINES, ETC.) DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTORS EXPENSE.

11 WHEEL CHAIR RAMPS SHALL BE CONSTRUCTED PRIOR TO ACCEPTANCE OF CURB AND GUTTER.

AS CONTRA. WORK STAKED PROJECT ASBUILT FIELD VERIFIED CORRECTED MIC RECORD NO

BENCH MARKS

A.C.S. Aluminum Tablet Stamped "BH-40" Data:
New Mexico State Plane Grid Coordinates (Central Zone)
NAD 1927 X=352,790.66 Y=1,492,346.53
Ground to grid factor = 0.9996105
Delta Alpha = (-)00°16'59" ELEV = 5305.43

A.C.S. Aluminum Tablet Stamped "BH-41" Data:
New Mexico State Plane Grid Coordinates (Central Zone)
NAD 1927 X=351,455.56 Y=1,496,546.13
Ground to grid factor = 0.9996704
Delta Alpha = (-)00°17'08" ELEV = 5398.63

SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL

DANIEL S. CALDERON 15655 REGISTERED PROFESSIONAL ENGINEER STATE OF NEW MEXICO

NO.	DATE	REMARKS	BY

REVISIONS

WILSON & COMPANY, ENGINEERS & ARCHITECTS

DESIGNED BY	JMT	DATE APRIL 2003
DRAWN BY	DLC	DATE APRIL 2003
CHECKED BY	BMS	DATE APRIL 2003

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

THE CROSSING SUBDIVISION UNIT 3
PAVING PLAN & PROFILE
SELWAY PLACE, HENRY FORK ROAD

Design Review Committee: APPROVED APR 2 3 2004 DESIGN REVIEW COMMITTEE

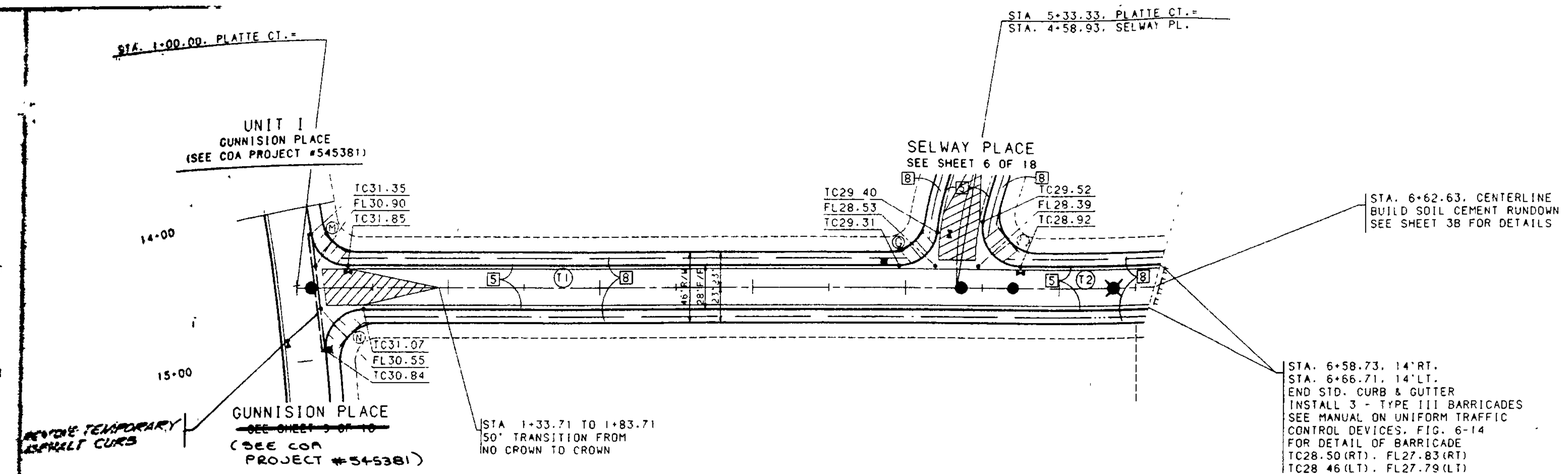
City Engineer Approval: APPROVED MAY - 3 2004 CITY ENGINEER

Last Design Update | Mo./Day/Yr | Mo./Day/Yr

City Project No.	Zone Map No.	Sheet	Of
545383	H-9-Z	13	19

WILSON & COMPANY

EETS\X32*8008\B308PP06.DWG\03-14-04\DLC



	TC	FL
1	31.48	30.81
2	30.95	30.93
3	31.73	31.06

D= 80° 58' 59.6"
L= 35.34'
R= 25.00'
WR= 53.86'

	TC	FL
1	30.90	30.23
2	30.31	30.29
3	31.01	30.35

D= 95° 46' 18.8"
L= 41.78'
R= 25.00'
WR= 105.61'

NOTE:
ALL TC ELEVATIONS ARE FOR TOP OF STANDARD CURB UNLESS OTHERWISE NOTED.
TC50.25R = TOP OF ROLL CURB

CENTERLINE TANGENT DATA

NUMBER	BEARING	DISTANCE
T1	N57°54'27"E	433.33'
T1	N57°54'27"E	129.30'

	TC	FL
1	29.38	28.71
2	27.80	28.68
3	29.33	28.67

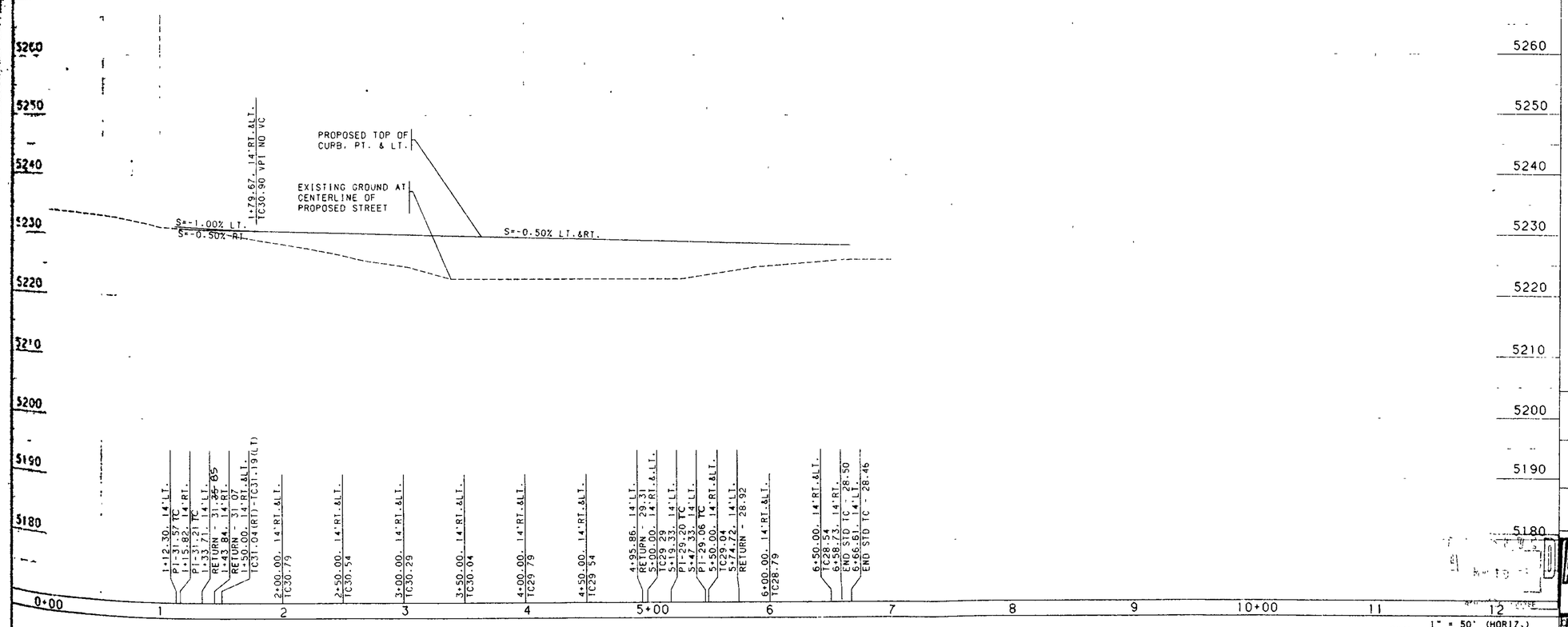
D=229°10'59"
L=36.31'
R=25.00'
WR=52.15'

	TC	FL
1	29.07	28.40
2	28.55	28.53
3	29.37	28.70

D=100°33'36.6"
L=43.87'
R=25.00'
WR=255.46'

SCALE: 1" = 50' (HORIZ.)

PLATTE COURT



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

BHI JOB NO C95335A2440

1. ALL EXISTING UTILITY LOCATIONS AND NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES

2. ALL CURB RETURN RADII SHALL BE 25' TO FACE OF CURB UNLESS OTHERWISE SPECIFIED.

3. ALL CURVE DATA AND DIMENSIONS REFER TO FACE OF CURB UNLESS OTHERWISE SPECIFIED.

4. GRADE ELEVATIONS. WHERE NOTED. ARE FOR TOP OF STANDARD CURB UNLESS OTHERWISE SPECIFIED.

5. CONTRACTOR IS TO INSTALL A 4"x4"x5' 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 AND 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. WHEEL CHAIR RAMPS SHALL BE CONSTRUCTED PRIOR TO ACCEPTANCE OF CURB AND GUTTER.

KEYED GENERAL NOTES

1. INSTALL 6 FT WIDE CONCRETE VALLEY GUTTER AS PER STD. DWG. 2420
2. INSTALL CONCRETE VALLEY GUTTER AS PER STD. DWG. 2421
3. INSTALL WHEEL CHAIR RAMP AS PER STD. DWG. 2441. CASE I
4. INSTALL WHEEL CHAIR RAMP AS PER STD DWG. 2441. CASE II
5. STD. CURB & GUTTER AS PER STD. DWG. 2415
6. ROLL CURB & GUTTER AS PER STD. DWG. 2415
7. MEDIAN CURB & GUTTER AS PER STD. DWG. 2415
8. ~~DEFERRED~~ ~~FUTURE~~ 4' SIDEWALK
9. BUILD 4' SIDEWALK
10. 10' MEANDERING ASPHALT TRAIL BY OTHERS

AS-BUILT INFORMATION
CONTRACTOR SUPPLIED BY
INSPECTOR'S ACCEPTANCE BY
FIELD VERIFICATION BY
DRAWINGS CORRECTED BY
MICRO-FILM INFORMATION
RECORDED BY
NO
DATE

BENCH MARKS
ACS ALUMINUM TABLET STAMPED "BH-40"
GEOGRAPHIC POSITION (NAD 1927)
N.M. STATE PLANE COORDINATES
(CENTRAL ZONE) X = 362,790.66
Y = 1,492,346.53
GROUND TO GRID FACTOR = 0.99967105
D = 00° 16' 59"
NGVD 1929 ELEVATION = 5305.43

SURVEY INFORMATION
FIELD NOTES
NO. DATE BY

ENGINEER'S SEAL
STATE OF NEW MEXICO
MICHAL M. EMERY
No. 5908
REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REMARKS	BY
		(Gunnison Place) New Tie Per Con 545381	SAR

REVISIONS

DESIGN		
DESIGNED BY	KP/BJS	DATE 8/96
DRAWN BY	BS	DATE 8/96
CHECKED BY	KP	DATE 8/96

BOHANNAN-HUSTON INC
ENGINEERS • PLANNERS • PHOTOGRAMMETRISTS • SURVEYORS • LANDSCAPE ARCHITECTS
ALBUQUERQUE LAS CRUCES SANTA FE

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING DEVELOPMENT GROUP

THE CROSSING SUBDIVISION UNIT II
PAVING PLAN & PROFILE
PLATTE COURT

DESIGN REVIEW COMMITTEE
CITY ENGINEER APPROVAL
APPROVED OCT - 8 2003
CITY ENGINEER
LAST DESIGN UPDATE
MO/DAY/YR MO/DAY/YR

CITY PROJECT NO. 545382
FEB 2 8 2006
DESIGN REVIEW COMMITTEE
ZONE MAP NO H-9, J-9
SHEET 8 OF 18

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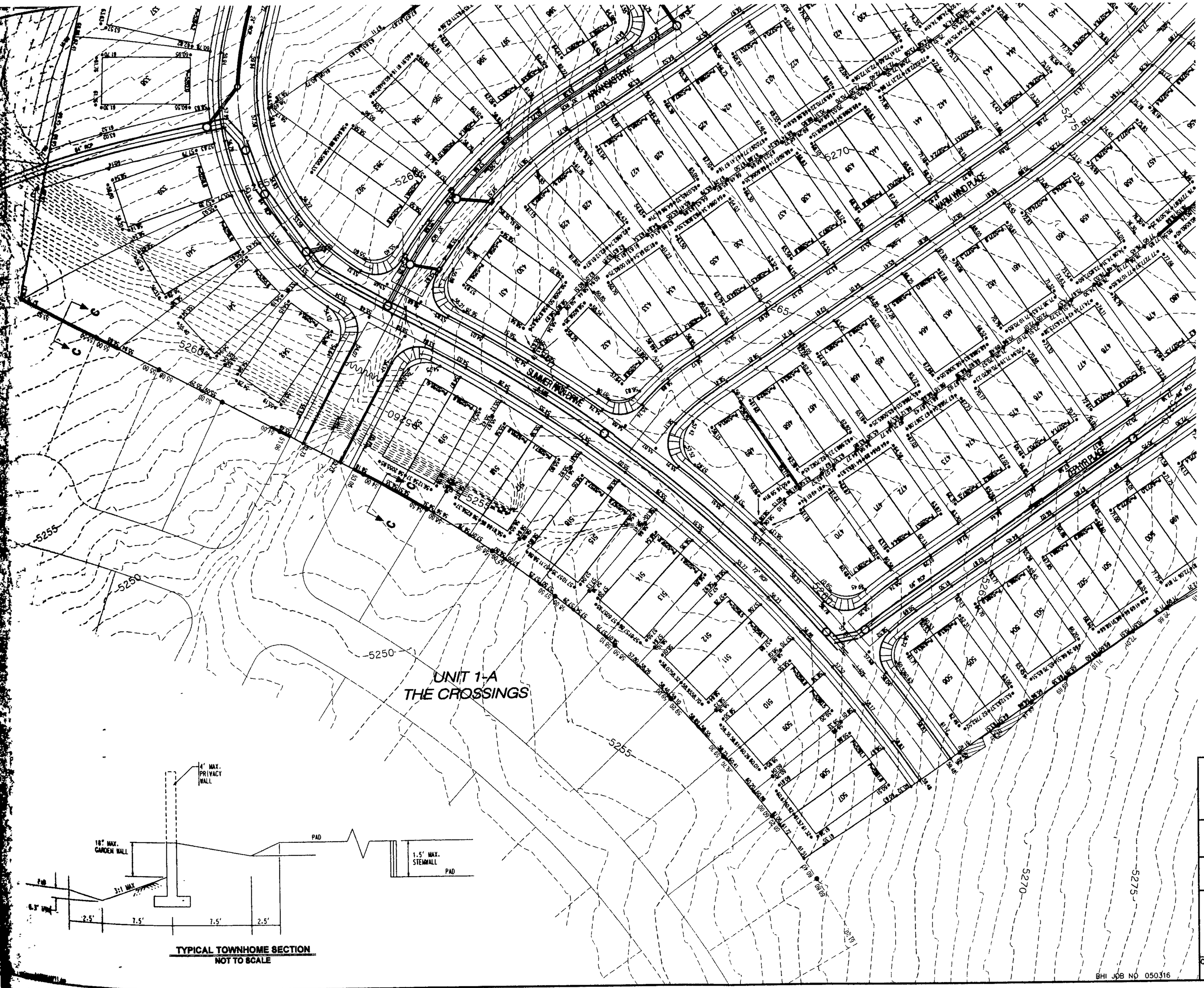
DATE MAY 1996



TYPICAL TOWNHOME SECTION
NOT TO SCALE

LEGEND

PROPOSED SPOT ELEVATION	• 5235.25
EXISTING SPOT ELEVATION	⊙ 5235.25
EXISTING CONTOUR	
PHASE BOUNDARY	
DIRECTION OF FLOW	
EXISTING STORM DRAIN LINE	SD
PROPOSED STORM DRAIN INLET	
PROPOSED STORM DRAIN LINE	
PROPOSED STORM DRAIN MANHOLE	
PROPOSED WATER BLOCK	
RETAINING WALL	
GARDEN WALL	
POND CONTOUR	
PAD	
TB	10 P=5300.00 TURNED BLOCK

N

40 20 0 40
SCALE. 1"=40'
(HORIZ.)

Bohannan ▲ Huston
Courtyard I 7500 Jefferson St. NE Albuquerque, NM 87109-4335
ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING DEVELOPMENT GROUP

STORMCLOUD SUBDIVISION
GRADING AND DRAINAGE PLAN

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

CITY PROJECT NO.	ZONE MAP NO.	SHEET	OF
650278-80	H-9, J-8, J-9	21	28

AS-BUILT INFORMATION

CONTRACTOR	
WORK STAKED BY	DATE
ACCEPTANCE BY	
FIELD VERIFICATION BY	DATE
DRAWINGS CORRECTED BY	DATE

MICRO-FILM INFORMATION

RECORDED BY	DATE
NO	

BENCH MARKS

ACS STATION NAMED 4 - K6. 3 -1/4" ALUM. CAP
HV18 = 4 - K6 GEOGRAPHIC POSITION (1927)
N.M. STATE PLANE COORDINATES (CENTRAL ZONE)
X=536,818.47, Y=1,483,515.05
GROUND-TO-GRID FACTOR .999965636356
NGVD 1929 ELEVATION = 5732.892
ON PASED DEL VULCAN, 0.91 MI NORTH
OF I-40, 0.74 MI SOUTH OF POWERLINES, 39.6'
NW OF CENTERLINE OF PASED DEL VULCAN

SURVEY INFORMATION

FIELD NOTES		
NO.	BY	DATE

ENGINEER'S SEAL

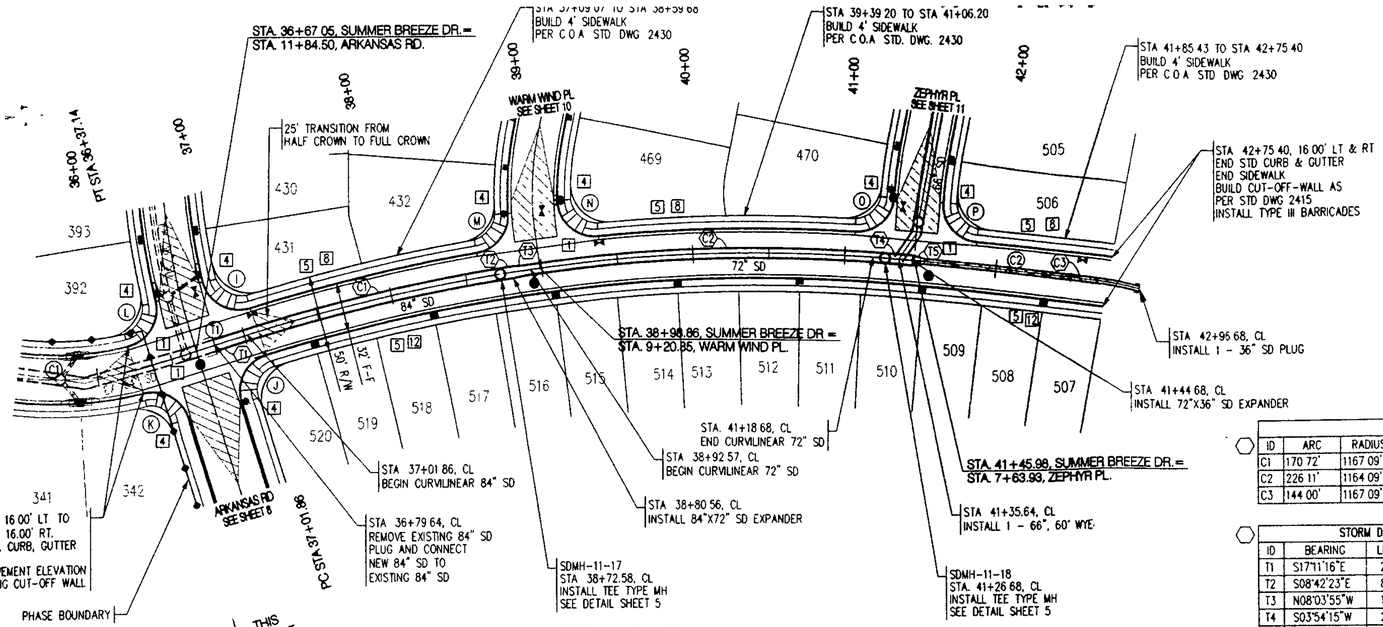
BOHANNAN & HUSTON
NEW MEXICO
5/16/05

REVISIONS

NO.	DATE	REMARKS	BY

DESIGNED BY	KM/JML	DATE 05/05
DRAWN BY	AR	DATE 05/05
CHECKED BY	KGP	DATE 05/05

3D 18



NOTE
SEE SHEET 8 FOR
GRADE POINT FLOWLINE
ELEVATION TABLES FOR I,J,K,& L

CL Curve Table				
ID	ARC	RADIUS	DELTA	TANGENT
C1	263.19'	200.00'	75°23'55"	154.57'
C2	695.17'	1167.09'	34°07'42"	358.24'

CL Tangent Table		
ID	BEARING	LENGTH
T1	N17°11'16"W	64.72'

SUMMER BREEZE DRIVE

(M) FLOWLINE DATA FOR CURB RETURN

PC	55.74
1	55.49
2	55.24
3	54.99
PT	54.74
PI	54.88

D = 84°08'03"
R = 25.00'
T = 22.56'
L = 36.71'
C = 33.50'

PC STA 38+83.75, 38.70' LT
PT STA 38+59.68, 16.00' LT
PI STA 38+83.10, 16.00' LT.
RAD STA 38+59.68, 41.00' LT

(N) FLOWLINE DATA FOR CURB RETURN

PC	55.21
1	55.44
2	55.66
3	55.88
PT	56.11
PI	55.06

D = 93°59'12"
R = 25.00'
T = 26.80'
L = 41.01'
C = 36.56'

PC STA 39+39.20, 16.00' LT
PT STA 39+15.14, 43.00' LT
PI STA 39+14.56, 16.00' LT.
RAD STA 39+39.20, 41.00' LT

(O) FLOWLINE DATA FOR CURB RETURN

PC	58.26
1	57.89
2	57.52
3	57.15
PT	56.78
PI	57.16

D = 88°17'47"
R = 25.00'
T = 24.27'
L = 38.53'
C = 34.83'

PC STA 41+30.35, 40.52' LT
PT STA 41+06.20, 16.00' LT
PI STA 41+30.13, 16.00' LT
RAD STA 41+06.20, 41.00' LT

(P) FLOWLINE DATA FOR CURB RETURN

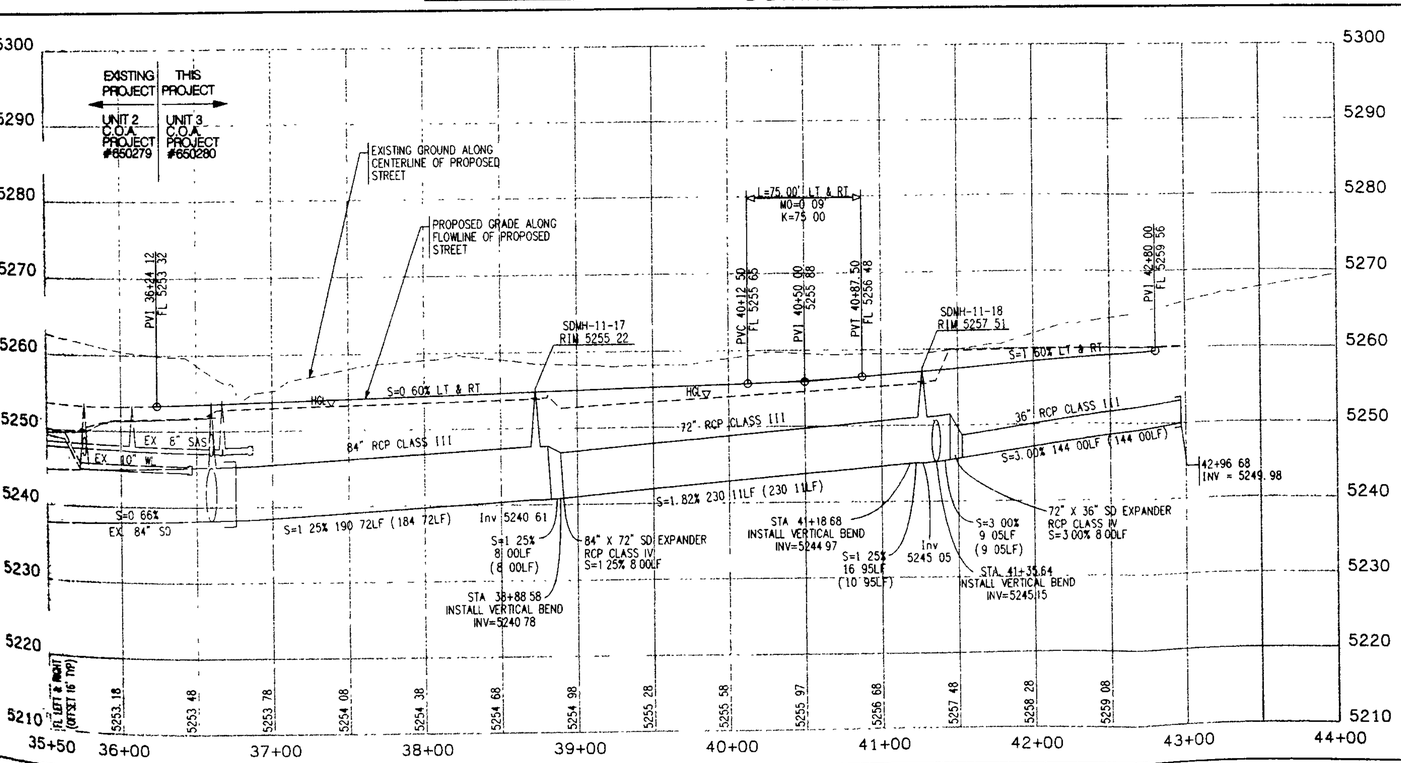
PC	58.04
1	58.16
2	58.28
3	58.40
PT	58.52
PI	57.66

D = 87°48'50"
R = 25.00'
T = 24.06'
L = 38.32'
C = 34.67'

PC STA. 41+85.43, 16.00' LT
PT STA 41+61.28, 40.30' LT
PI STA 41+61.70, 16.00' LT
RAD STA 41+85.43, 41.00' LT

STORM DRAIN CURVE & FLOW TABLE									
ID	ARC	RADIUS	DELTA	TANGENT	Q(cfs)	V(f/s)	DEPTH	SIZE	SLOPE
C1	170.72'	1167.09'	08°22'52"	85.51'	459.44	11.94	7.00	84"	1.25%
C2	226.11'	1164.09'	11°07'44"	113.41'	459.44	16.25	6.00	72"	1.82%
C3	144.00'	1167.09'	07°04'10"	72.09'	30.00	4.21	3.00	36"	3.00%

STORM DRAIN TANGENT & FLOW TABLE									
ID	BEARING	LENGTH	Q(cfs)	V(f/s)	DEPTH	SIZE	SLOPE
T1	S17°11'16"E	26.22'	459.44	11.94	7.00	84"	0.67%
T2	S08°42'23"E	8.00'	459.44	11.94	7.00	84"	1.25%
T3	N08°03'55"W	12.00'	459.44	16.25	6.00	72"	1.25%
T4	S03°54'15"W	26.00'	459.44	16.25	6.00	72"	1.25%
T5	S04°44'36"W	8.00'	29.76	4.21	3.00	36"	3.00%



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 CURB UNLESS OTHERWISE SPECIFIED.
5. CONTRACTOR IS TO INSTALL A 4" X 4" X 5' POST AND END 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. FOR STORM DRAIN CONSTRUCTION, RCP PIPE JOINTS SHALL NOT BE GROUTED PRIOR TO FINAL INSPECTION. FINAL INSPECTION WILL DETERMINE JOINTS TO BE GROUTED FOR FINAL ACCEPTANCE OF THE CONSTRUCTION.
14. ALL WATER SERVICE LINES SHALL BE 3/4", UNLESS OTHERWISE NOTED

KEYED GENERAL NOTES

1. INSTALL 6' CONCRETE VALLEY GUTTER AS PER STD DWG. 2420
2. INSTALL 4' CONCRETE VALLEY GUTTER AS PER STD. DWG. 2421
3. INSTALL 12' CONCRETE VALLEY GUTTER AS PER STD. DWG. 2422
4. INSTALL WHEELCHAIR RAMP AS PER DETAIL SHEET 5
5. STD. CURB & GUTTER AS PER STD. DWG. 2415A
6. MEDIAN CURB & GUTTER AS PER STD. DWG. 2415B
7. ROLL CURB & GUTTER AS PER STD. DWG. 2415A
8. BUILD 4' SIDEWALK PER STD. DWG. 2430
9. 8' ASPHALT TRAIL BUILD W/ LANDSCAPE PLANS
10. BUILD 6' SIDEWALK PER STD. DWG. 2430
11. CONCRETE MEDIAN PAVING SECTION AS PER STD. DWG. 2408
12. DEFERRED 4" SIDEWALK
13. BUILD 4" TEXTURED MEDIAN PAVEMENT FROM MEDIAN NOSE TO 10' FROM NOSE (BAJA RED) MEDIAN NOSES SHALL BE PAINTED YELLOW TO APPROX. 6' BEHIND PC/PT. PER COA STD DWG 2408

Bohannan ▲ Huston
Courtyard I 7500 Jefferson St. NE Albuquerque, NM 87109-4335
ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES

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

BENCH MARKS
ACS STATION NAMED 4 - K6. 3 -1/4" ALUM. CAP
H118 = 4 - K6 GEOGRAPHIC POSITION (1927).
N.M. STATE PLANE COORDINATES (CENTRAL ZONE)
X=336,918.47, Y=1,483,515.05
GROUND-TO-GRID FACTOR .0999656356
NGVD 1929 ELEVATION = 5732.492
ON PASEO DEL VULCAN, 0.91 MI NORTH OF I-40, 0.74 MI SOUTH OF POWERLINES, 39.6' NW OF CENTERLINE OF PASEO DEL VULCAN

SURVEY INFORMATION
FIELD NOTES
NO. | BY | DATE

ENGINEER'S SEAL
KEITH G. PATTON NEW MEXICO 11/8/05

NO	DATE	REMARKS	BY

REVISIONS
DESIGN

		DATE
DESIGNED BY	KJW/JML	09/05
DRAWN BY	AR/BS	09/05
CHECKED BY	KJW	09/05

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING DEVELOPMENT GROUP

STORMCLOUD SUBDIVISION (UNIT 3)
PAVING PLAN & PROFILE
SUMMER BREEZE DRIVE

DESIGN REVIEW COMMITTEE | CITY ENGINEER APPROVAL: APPROVED NOV 3 2005 CITY ENGINEER | LAST DESIGN UPDATE | MO./DAY/YR | MO./DAY/YR

CITY PROJECT NO	ZONE MAP NO	SHEET	OF
650280	H-9, J-8, J-9	9	18

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

BHI JOB NO 050316

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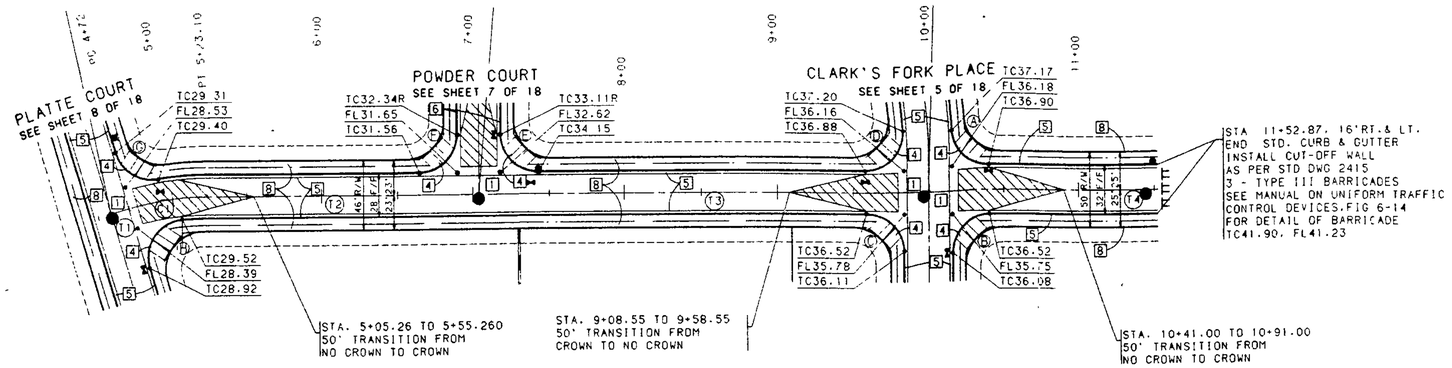
8-NOV-2005 - 11:13AM, Plotted by: jee



NOTE:
TRANSITION FROM STD. CURB TO
ROLL CURB THROUGH WHEEL RAMPS
E & F AS PER STD. DWG. 2418.
SELWAY PLACE = STD. CURB
POWDER COURT = ROLL CURB

NOTE:
ALL TC ELEVATIONS ARE FOR TOP OF
STANDARD CURB UNLESS OTHERWISE NOTED.
TCXX.XXR = TOP OF ROLL CURB

NOTE:
SEE SHEET 4 OF 18
FOR TEMPORARY ASPHALT
CROSS SECTION DETAILS

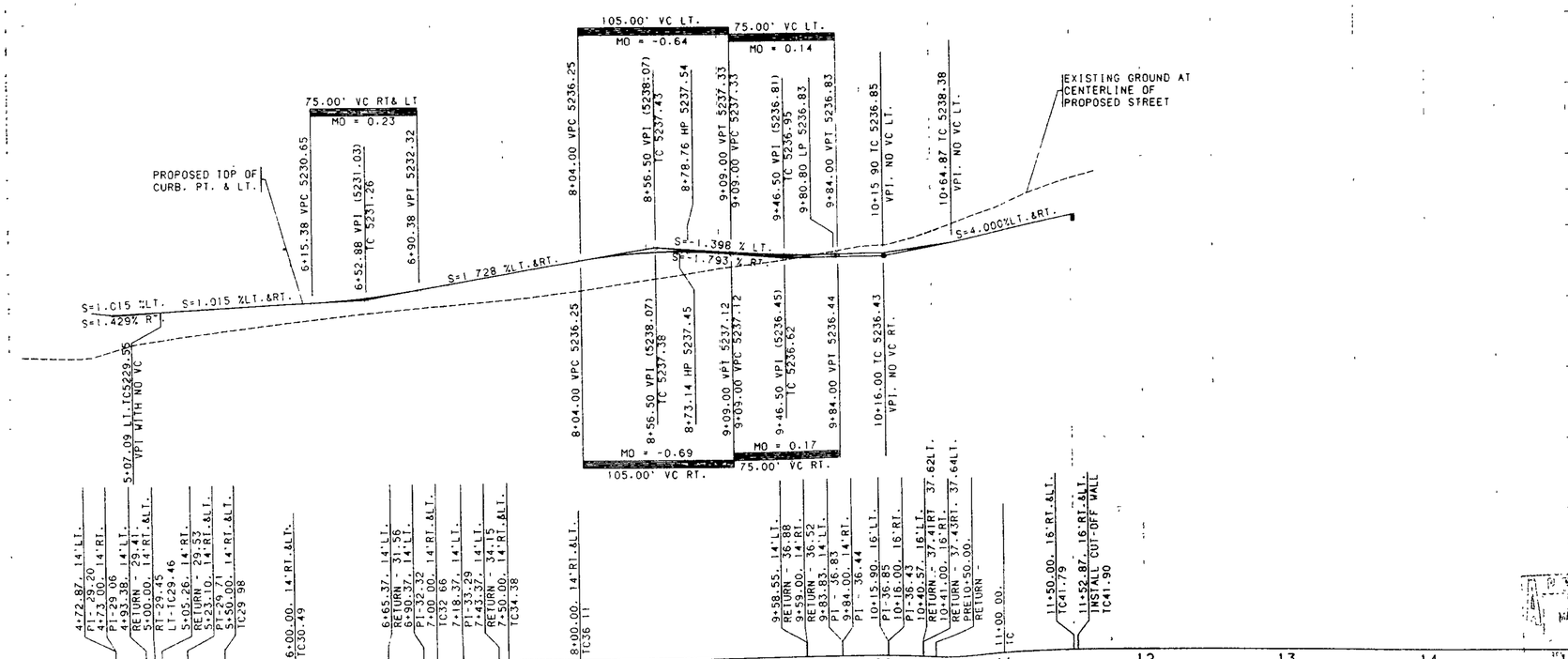
CENTERLINE TANGENT DATA		
	BEARING	DISTANCE
	N32°05'33"W	13.16'
	S15°51'19"E	181.27'
	S15°51'19"E	295.63'
	S15°51'19"E	160.87'

CENTERLINE CURVE DATA TABLE					
	PI STA.	DELTA	TANGENT	ARC	RADIUS
	4+97.77	16°14'14.0"	25.68'	51.01'	180.00'
	12+68.95	24°23'39.7"	108.08'	212.88'	500.00'

	TC	FL	TC	FL	TC	FL	TC	FL	TC	FL	TC	FL	TC	FL	TC	FL
1	37.10	36.44	36.41	35.74	36.42	35.75	37.12	36.45	32.05R	31.72	33.97	33.30	29.38	28.71	29.07	28.40
2	36.39	36.37	35.65	35.63	35.67	35.65	35.67	36.37	31.46	31.44	33.14	33.12	27.80	28.68	28.55	28.53
3	36.97	36.30	36.19	35.52	36.21	35.55	36.96	36.29	31.83	31.17	33.28R	32.95R	29.33	28.67	29.37	28.70
	A		B		C		D		E		F		G		H	
	D=87°7'1.6"		D=89°59'60.0"		D=90°0'0.0"		D=93°23'12.5"		D=229°10'59"		D=229°10'59"		D=229°10'59"		D=100°33'36.6"	
	L=38.00'		L=39.27'		L=39.27'		L=40.73'		L=39.27'		L=39.27'		L=36.31'		L=43.87'	
	R=25.00'		R=25.00'		R=25.00'		R=25.00'		R=25.00'		R=25.00'		R=25.00'		R=25.00'	
	WR=57.98'		WR=67.26'		WR=67.26'		WR=88.20'		WR=67.26'		WR=67.26'		WR=52.15'		WR=255.46'	

SCALE: 1" = 50' (HORIZ.)

SELWAY PLACE



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

BHI JOB NO C95335A2440

IMMEDIATELY OF ANY DISCREPANCIES.

2. ALL CURB RETURN RADII SHALL BE 25' TO FACE OF CURB UNLESS OTHERWISE SPECIFIED.

3. ALL CURVE DATA AND DIMENSIONS REFER TO FACE OF CURB UNLESS OTHERWISE SPECIFIED.

4. GRADE ELEVATIONS, WHERE NOTED, ARE FOR TOP OF STANDARD CURB UNLESS OTHERWISE SPECIFIED.

5. CONTRACTOR IS TO INSTALL A 4"x4"x5' 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.

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11. REMOVAL OF THE EXISTING CURB AND GUTTER SHALL BE AS PER COA STD. DWG. 2415 (SAWCUT ONLY)

12. WHEEL CHAIR RAMPS SHALL BE CONSTRUCTED PRIOR TO ACCEPTANCE OF CURB AND GUTTER.

KEYED GENERAL NOTES

1. 6 FT WIDE INSTALL CONCRETE VALLEY GUTTER AS PER STD. DWG 2420
2. INSTALL CONCRETE VALLEY GUTTER AS PER STD. DWG. 2421
3. INSTALL WHEEL CHAIR RAMP AS PER STD. DWG. 2441, CASE I
4. INSTALL WHEEL CHAIR RAMP AS PER STD. DWG. 2441, CASE II
5. STD. CURB & GUTTER AS PER STD. DWG. 2415
6. ROLL CURB & GUTTER AS PER STD. DWG. 2415
7. MEDIAN CURB & GUTTER AS PER STD. DWG. 2415
8. ~~FUTURE~~ DEFERRED 4' SIDEWALK
9. BUILD 4' SIDEWALK
10. 10' MEANDERING ASPHALT TRAIL BY OTHERS

AS-BUILT INFO
CONTRACTOR
WORK STAKED BY
INSPECTOR'S ACCEPTANCE BY
FIELD VERIFICATION BY
DRAWINGS CORRECTED BY
MICRO-FILM INFO
RECORDED BY
DATE
NO.

BENCH MARKS
ACS ALUMINUM TABLET STAMPED "BH-40"
GEOGRAPHIC POSITION (NAD 1927)
N.M. STATE PLANE COORDINATES
(CENTRAL ZONE) X = 362,790.66
Y = 1,492,345.53
GROUND TO GRID FACTOR = 0.99967105
D = 00° 16' 59"
NGVD 1929 ELEVATION = 5305.43

SURVEY INFORMATION
FIELD NOTES
NO. | BY | DATE

ENGINEER'S SEAL
STATE OF NEW MEXICO
BRUCE J. STOWORT
14523
REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	

DESIGNED BY KP/BJS DATE 8/96
DRAWN BY BS DATE 8/96
CHECKED BY KP DATE 8/96

BOHANNAN-HUSTON INC
ENGINEERS • PLANNERS • PHOTOGRAMMETRISTS • SURVEYORS • LANDSCAPE ARCHITECTS
ALBUQUERQUE LAS CRUCES SANTA FE

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING DEVELOPMENT GROUP

THE CROSSING SUBDIVISION UNIT II
PAVING PLAN & PROFILE
SELWAY PLACE

DESIGN REVIEW COMMITTEE — APPROVED — MAR 1 9
CITY ENGINEER APPROVAL — APPROVED — OCT 8 2008 — CITY ENGINEER
LAST DESIGN UPDATE | MO/DAY/YR | MO/DAY/YR
CITY PROJECT NO. 545382
DESIGN REVIEW COMMITTEE — APPROVED — 2 8 2008
ZONE MAP NO H-9, J-9
SHEET 6 OF 18

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DATE: MAY, 1996