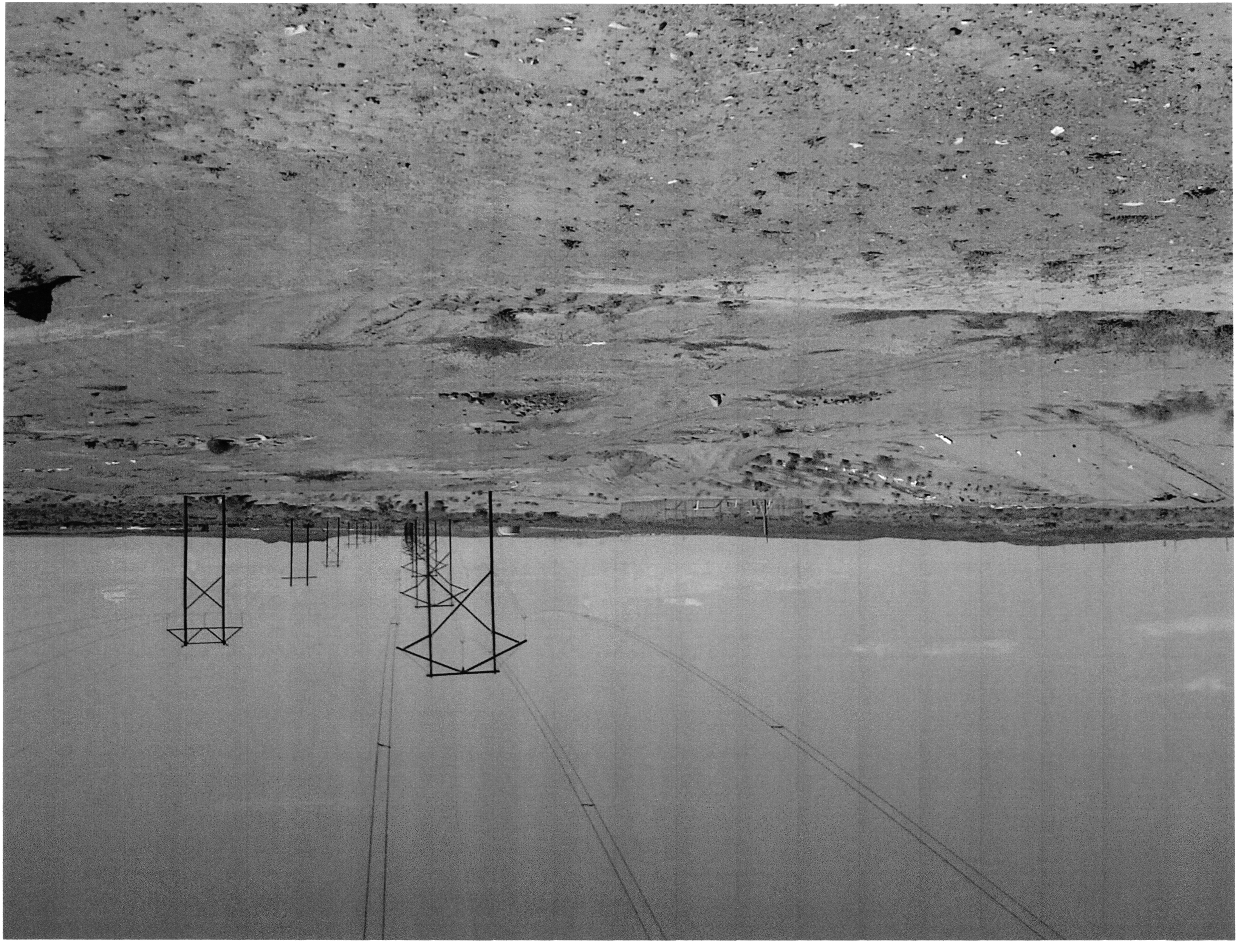


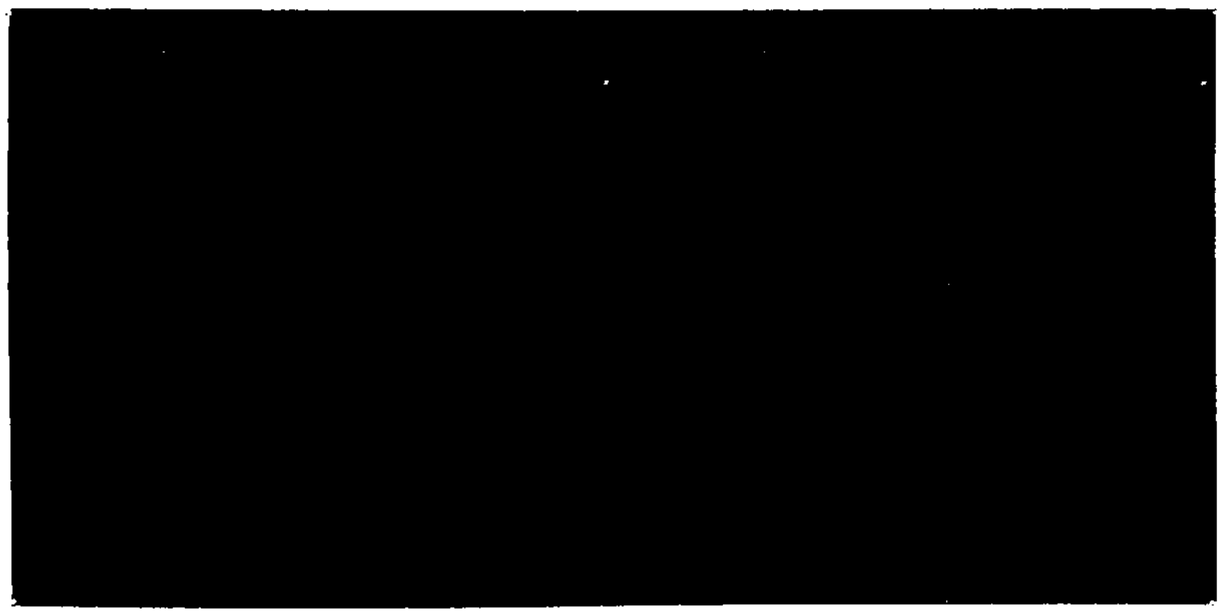




Google earth

feet 600

meters 100



CITY OF ALBUQUERQUE

November 29, 2007

Diane Hoelzer, PE
Mark Goodwin & Associates
P.O. Box 90606,
Albuquerque, NM 87199

Re: Anderson Heights 118th St. Ponds Revision Drainage Report
Engineer's Stamp dated [redacted]7, (P8/D3)
10-25-07

Dear Ms. Hoelzer,

Based upon the information provided in your submittal dated 10-26-07, the above referenced report is approved for Work Order. Any minor comments can be addressed at DRC.

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

Sincerely,

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

C: file

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

118TH Street Powerline Ponds

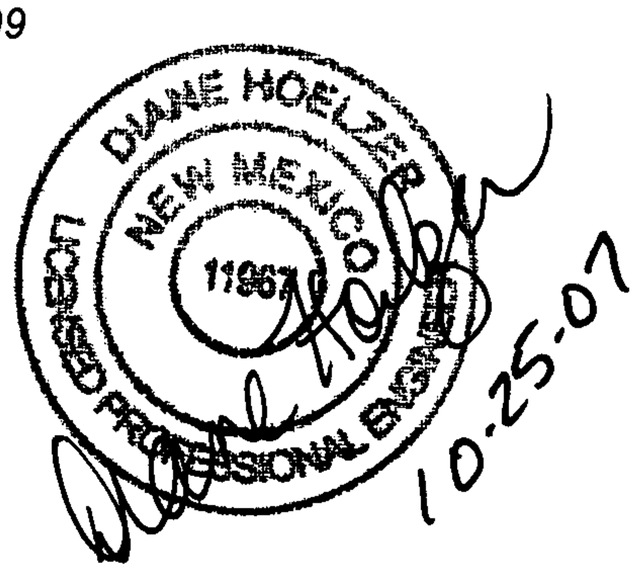
Revisions to Ponds #5 and #6

Prepared for

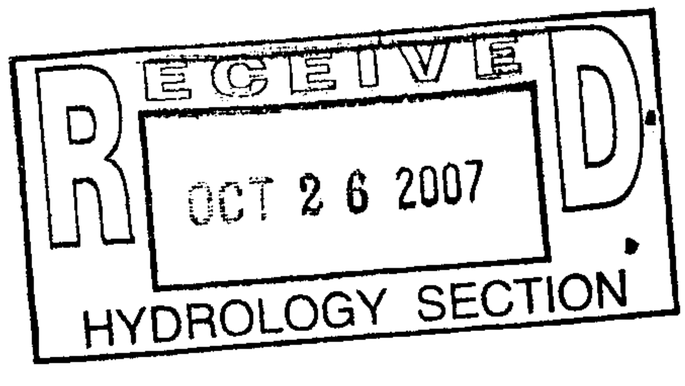
KB HOME New Mexico, Inc.
6330 Riverside Plaza Lane NW, Suite 200
Albuquerque, NM 87120
(505) 353-5300

Prepared by

Mark Goodwin & Associates, PA
P.O. Box 90606
Albuquerque, NM 87199
(505) 828-2200



October 2007



118th Street Powerline Ponds

Table of Contents

I. Introduction

II. Existing Drainage Plan

III. Revised Interim Drainage Plan

IV. Summary and Conclusions

Appendix A - Approved 118th St. Ponds Grading and Drainage Plan (8-7-06)

Appendix B - 118TH St. Ponds Survey As-builts

Appendix C – Hydrology

Summary Table 1 - 100 yr 24 hr Flow Rate and Volumes
Summary Table 2 – Pond Volumes
AHYMO Printouts

Appendix D - Hydraulics

Summary Table 1 – HECRAS Results for Diversion Channel
HEC RAS Input and Output
48" Pipe Calculations

Appendix E – Permanent Easement

Appendix F - Right of Entry Agreement

Pocket 1 - Exhibit 1 Amole Hubbell Drainage Basin Map

Pocket 2 - Exhibit 2 HEC RAS Map Diversion Channel West and North
- Exhibit 3 HEC RAS Map Diversion Channel South

Pocket 3 – 118th Street Pond Revisions (shts 18.1 thru 18.4)

I. Introduction

In April of 2004, the preliminary plat was approved for Anderson Heights Unit 1. As part of that approval a large portion of the master planned 118th Street Powerline Detention Ponds (AMAFCA, 1998) were to be designed and constructed. Prior to constructing the ponds, public drainage easement(s) were required from the underlying property owner(s). An easement document was obtained and recorded in April 2005 at which time, the construction of Unit 1 infrastructure and the 118th Street ponds commenced, extending from Dennis Chavez on the south and northward along the westside of the powerlines approximately 4,000 feet. The ponds were completed and grading as-builts were obtained on October 19, 2006. In December of 2006, it was brought to the City's attention that the portion of the public drainage easement underlying Ponds #5 and #6 was improperly represented and recorded. After exhaustive negotiations between SunCal and KB Home to try and acquire a legal and proper easement under these ponds, it was finally decided that ponds #5 and #6 would be filled in and the grades on SunCals property returned to approximate "existing conditions" prior to the construction of the ponds. When Suncal decides to develop at a later date, they will be required to reconstruct pond(s) to complete the "118th Street Powerline Master Drainage Plan" as set forth by AMAFCA in their 1998 Amole-Hubbell Drainage Management Plan. For the interim, a temporary drainage solution is being presented in this report to handle the offsite flows coming from the west in the area of Pond # 5 and # 6 that will protect the development to the east known as Anderson Heights.

II. Existing Drainage Plan

The 118th Street powerline ponds #2, #3A, #3B, #4A, #4B, #5 and #6 and appurtenances were constructed in accordance with City approved plans (CPN 753981) in May 2005 and as modified in September 2005 and revised in August of 2006. A copy of the final revised plans that were used for construction are shown in Appendix A and the as-built survey is shown in Appendix B. In accordance with AMAFCA and the City this series of detention ponds were built to intercept the 100 year "developed conditions" flows from the west and convey them south to Dennis Chavez Blvd. and then east in a 48" and 54" storm drain before ultimately discharging into the existing Rio Bravo Channel located on the north side of Dennis Chavez Blvd. With the construction of these ponds all of the land area to the east of these ponds was to be permanently removed from the 100 year FEMA floodplain.

III. Revised Interim Drainage Plan

Filling in the existing Ponds #5 and #6 on the Suncal property, necessitated the development of an alternative "interim" drainage plan that would divert the flows approaching 118th street from the Suncal property on the west and modify the use of the detention ponds to the north. This 'interim' plan and the required modifications and revised hydrology and hydraulic analysis are presented in this report and in the appendices.

A temporary 10' wide diversion berm located within a 156' public drainage easement (future 118th street) will divert the "Suncal" property flows to the north or the south. Flows that are diverted south will be intercepted by a new 48" storm pipe that will connect directly to the existing 48" storm pipe that drains east and parallels Dennis Chavez Blvd. This storm pipe ultimately discharges into the Rio Bravo Channel. Flows that are diverted north will be intercepted by a new temporary retention pond # 5A. This pond is located on property owned by KB Home and Westpac. A recorded Permanent Easement has been acquired from the owners and can be found in Appendix E.

Temporary Pond #5A was designed to retain the 'existing conditions' 100-year 24 hour runoff volumes from sub-basins 5A, 5B, and 5C. (Refer to Exhibit 1 Revised Amole Hubbell Drainage Basin Map). Runoff from sub-basin 5A will flow east along its natural drainage path into Pond #5A. 'Diversion Channel West' will divert flow from sub-basin 5B into Pond #5A and the temporary diversion berm/channel will divert flows from sub-

basin 5C into Pond #5A. (Refer to Exhibit 2 HEC-RAS Map Diversion Channel West and North).

Flows from sub-basin 6B and 6C will be diverted south by the temporary diversion berm/channel and into a new 48" storm drain that will connect to the existing 10' diameter storm manhole located in the Dennis Chavez ROW. (Refer to Exhibit 3 HEC-RAS Map Diversion Channel South). The original 100 year discharge from Pond #6 for the fully 'developed conditions' and into this manhole was 187 cfs. The revised 100 year 'existing conditions' discharge was determined to be 68 cfs. As a result of the reduced flow in the overall system, the downstream storm drain and channel is not expected to be adversely impacted over the previous design, therefore no additional analysis was done downstream of this manhole in Dennis Chavez.

In addition to these revisions, the temporary loss of the use of detention ponds #5 and #6 in the ultimate drainage plan requires that all the upstream detention ponds be converted to temporary retention ponds. The existing sub basin boundaries were modified slightly and available pond volume capacities were verified and the maximum WSEL were determined for in the ponds for runoff from the 'existing conditions' 100 year 24 hour storm event. This was verified and the summary tables and AHYMO files are found in Appendix C.

A HEC-RAS model was developed to analyze the channel hydraulics for the two channels diverting flow into Pond #5A, and the channel diverting flow south into the 48" pipe. Flow depths are generally less than 1-foot, with the majority being under 0.5-feet. The top elevation of the diversion berm is significantly higher than the 100-year water surface elevations, as shown on the revised grading and infrastructure plans located in the back pocket of this report. The diversion channel west conveying flow from sub-basin 5B between HEC-RAS stations 50 and 40 will be lined with shotcrete from the rundowns that are to be removed and broken into 8"-12" pieces. These will be used to line both the channel bottom and side slopes as shown on the plans. The remaining shotcrete will be used at the end of the diversion channel south adjacent to the 48" storm pipe. Results of the HEC-RAS model and calculations are included in Appendix C. The HEC RAS Maps are in one of the pockets in this report.

IV. Summary and Conclusions

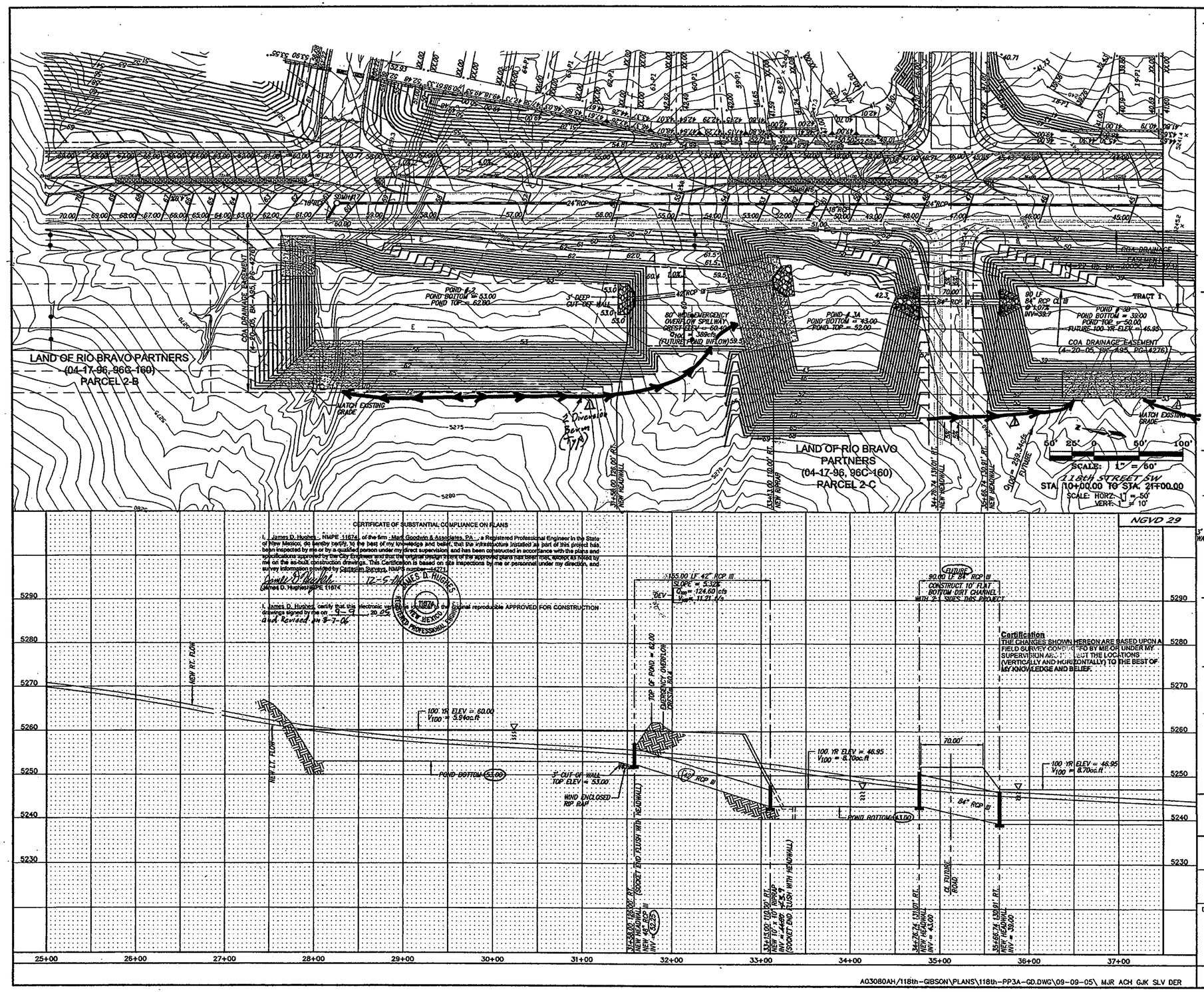
The master planned South Powerline Channel/Detention Project for fully developed conditions was coordinated, approved and built with the Anderson Heights development. That master plan was revised to fill in and remove Ponds #5 and #6 from the system at the request of the underlying property owners. The loss of these ponds necessitated the development of an 'interim' drainage plan.

This 'interim' plan involves the construction of a temporary retention pond # 5A, diversion berm and diversion channels. All of the upstream detention ponds #2, #3A, #3B, #4A, #4B, designed and built for the ultimate fully developed drainage conditions, will be turned into temporary retention ponds that contain 'existing conditions' flows for the 100 year 24 hour storm event. Minor modifications to these ponds made this conversion by plugging the outfalls from pond #2, #3B and #4B. The 10' wide diversion berm in the 118th street public drainage easement will direct flows from the Suncal property either north to the temporary pond #5A or south to the existing storm system located in the Dennis Chavez right-of-way.

This interim drainage plan was designed to handle the 'existing conditions' flows only. When the Suncal property develops in the future and a new pond configuration is designed and constructed on their property, the new pond(s) will need to accept the fully developed flows from Pond #4B and all of the upstream temporary retentions ponds will need to be unplugged and converted back into detention ponds.

APPENDIX A
118TH STREET PONDS
GRADING AND DRAINAGE PLAN

RECORD DRAWINGS



CERTIFICATE OF SUBSTANTIAL COMPLIANCE ON PLANS

I, James D. Hughes, NMPE 11674, of the firm Mark Goodwin & Associates, PA, a Registered Professional Engineer in the State of New Mexico, do hereby certify, to the best of my knowledge and belief, that the infrastructure installed as part of this project has been inspected by me or by a qualified person under my direct supervision, and has been constructed in accordance with the plans and specifications approved by the City Engineer, and that the original design in one of the approved plans has been met, except as noted by me on the as-built construction drawings. This Certification is based on site inspections by me or personnel under my direction, and survey information provided by Cartesian Surveys, NMPS number 14271.

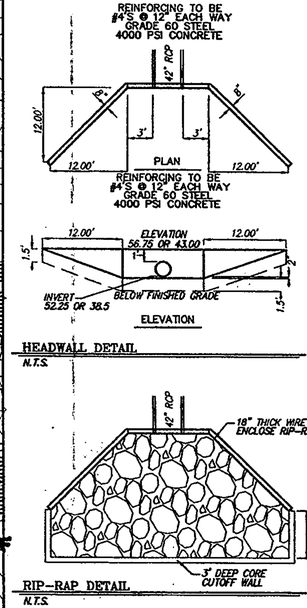
James D. Hughes 12-5-04
James D. Hughes, NMPE 11674

I, James D. Hughes, certify that this electronic version is identical to the original reproducible APPROVED FOR CONSTRUCTION drawings signed by me on 9-9, 20 05
and Revised on 8-7-06

JAMES D. HUGHES 11674 REGISTERED PROFESSIONAL ENGINEER STATE OF NEW MEXICO

A03080AH/118th-GIBSON\PLANS\118th-PP3A-GD.DWG\09-09-05\ MJR ACH GJK SLV DER

NOTES



LEGEND

PERMANENT PAVING

6" SHOTCRETE

Certification
THE CHANGES SHOWN HEREON ARE BASED UPON A FIELD SURVEY CONDUCTED BY ME OR UNDER MY SUPERVISION AND ARE CORRECT THE LOCATIONS (VERTICALLY AND HORIZONTALLY) TO THE BEST OF MY KNOWLEDGE AND BELIEF.

AS BUILT INFORMATION
CONTRACTOR
WORK STARTED ON: DATE
WORK ACCEPTED ON: DATE
CERTIFICATION BY: Cartesian Surveys Inc. DATE
CONTRACTOR: DATE
ENGINEER: DATE
RECORDED BY: DATE
NO.

BENCH MARKS
STATION "3-PVC" IS LOCATED 5.8 MI. SW OF DOWNTOWN ALBUQUERQUE TO REACH STATION FROM INT. OF COORS AND ISLETA BLVD. (FORMERLY RIO BRAVO), GO S. ON COORS BLVD. 0.62 MI. TO THE STATION WHICH IS ON AN EARTHEN BERM 162.2 FEET WEST OF THE CENTERLINE OF COORS BLVD. THE STATION IS A STANDARD AGS. 3 1/4" ALUMINUM CAP RIVETED TO A PIPE 0.85' ABOVE THE GROUND AND IS STAMPED "3-PVC, 1998". X=360733.56, Y=1462437.48 (NAD 27). ELEV=6035.735 (SLD 29).

SURVEY INFORMATION
FIELD NOTES
DATE
NO.

ENGINEER'S SEAL
JAMES D. HUGHES 11674 REGISTERED PROFESSIONAL ENGINEER STATE OF NEW MEXICO
Rev 8-7-06

NO.	DATE	REVISIONS	BY
		DESIGN	
		REMARKS	
1	9-7-06	Berms Added	MJH
		DATE	
DESIGNED BY		GJK	02/04
DRAWN BY		MJR	02/04
CHECKED BY		DMG	02/04

dmg MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
(505) 828-2200, FAX (505) 797-9539

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE: ANDERSON HEIGHTS - UNIT 1
118th STREET S.W.
GRADING & DRAINAGE PLAN

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

CITY PROJECT NO.

ZONE MAP NO. N-8/P-8

SHEET 1 OF 4

RECORD DRAWINGS

LAND OF RIO BRAVO PARTNERS
(04-17-96, 96C-160)
PARCEL 2-C

UNPLATTED LANDS OF WESTLAND DEVELOPMENT CO., INC. (04-17-96, 96C-160)

POND # 39
POND BOTTOM = 39.00
POND TOP = 50.00
100 YR ELEV = 46.85

POND # 44
POND BOTTOM = 35.00
POND TOP = 43.00

POND # 45
POND BOTTOM = 33.00
POND TOP = 43.00
100 YR ELEV = 41.33
V_{100} = 7.51ac-ft

50' WIDE EMERGENCY OVERFLOW SPILLWAY
CREST ELEV = 41.6
$Q_{EMERGENCY}$ = 245.00cfs (PEAK INFLOW)

COA DRAINAGE EASEMENT (4-22-05, BK-2005C, PG-123)

COA DRAINAGE EASEMENT (BK-A95, PG-4276)

35' WIDE CONCRETE EMERGENCY OVERFLOW SPILLWAY (2.5' DEEP)
Q_{100} = 344.72cfs (FUTURE POND INFLOW)
CREST = 47.3

2' Diversion Berm TYP

MATCH EXISTING GRADE

SCALE: 1" = 50'

118th STREET SW
STA. 37+50.00 TO STA. 50+00.00
SCALE: HOR. 1" = 50'
VERT. 1" = 10'

NGVD 29

110 LF 42" RCP III
SLOPE = 3.18%
DEV — Q_{100} = 128.98 cfs
V_{100} = 13.4 f/s

FUTURE 110.00 LF 84" RCP III
CONSTRUCT 10' FLAT BOTTOM DIRT CHANNEL WITH 2:1 SIDES THIS PROJECT.

388.93 LF 48" RCP II
SLOPE = 0.77%
DEV — Q_{100} = 120.71 cfs
V_{100} = 10.57 f/s

100 YEAR ELEV.= 49.90
V_{100} = 9.82ac-ft

TOP OF JAW = 50.00
DETROIT OVERFLOW SPILLWAY CREST ELEV=47.3

2' CUTOFF WALL

42" RCP II

POND BOTTOM=39.00

SECTION P-P

PROPOSED STOP MARKER OVER 48" RCP

6" SHOT CRETE

30'

FUTURE 84" RCP II

100 YR ELEV = 41.33
V_{100} = 7.51ac-ft

NEW LT. FLOWLINE

BOTTOM OF POND 35.0

48" RCP III

EXIST. GRADE

Certification
THE CHANGES SHOWN HEREON ARE BASED UPON A FIELD SURVEY CONDUCTED BY ME OR UNDER MY SUPERVISION AND REFLECT THE LOCATIONS (VERTICALLY AND HORIZONTALLY) TO THE BEST OF MY KNOWLEDGE AND BELIEF.

38+00 39+00 40+00 41+00 42+00 43+00 44+00 45+00 46+00 47+00 48+00 49+00 50+00

5260 5250 5240 5230 5220 52.10 5200

A03080AH\118th-GIBSON\PLANS\118th-PP4A-gd.DWG\09-09-05\ MJR GJK ACH SLV DER

CERTIFICATE OF SUBSTANTIAL COMPLIANCE ON PLANS

I, James D. Hughes, NMPE 11674, of the firm Mark Goodwin & Associates, P.A., a Registered Professional Engineer in the State of New Mexico, do hereby certify, to the best of my knowledge and belief, that the infrastructure installed as part of this project has been inspected by me or by a qualified person under my direct supervision, and has been constructed in accordance with the plans and specifications approved by the City Engineer, and that the original design intent of the approved plans has been met, except as noted by me on the as-built construction drawings. This certification is based on site inspections by me or personnel under my direction, and survey information provided by Sanderson Surveys, NMPS number 14271.

James D. Hughes 12-5-06
James D. Hughes NMPE 11674

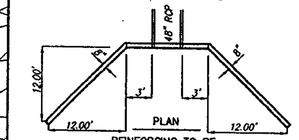
I, James M. Hughes, certify that this electronic version is the original reproducible APPROVED FOR CONSTRUCTION drawings signed by me on 9-9-05
Rev Revised 8-7-06

JAMES D. HUGHES — NEW MEXICO — REGISTERED PROFESSIONAL ENGINEER

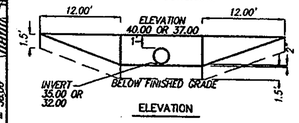
NOTES

1. ALL STATIONING IS CENTERLINE STATIONING.

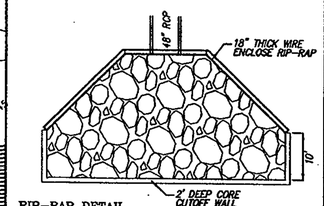
REINFORCING TO BE #4'S @ 12" EACH WAY GRADE 60 STEEL 4000 PSI CONCRETE



REINFORCING TO BE #4'S @ 12" EACH WAY GRADE 60 STEEL 4000 PSI CONCRETE



HEADWALL DETAIL
N.T.S.



RIP-RAP DETAIL
N.T.S.

TYPICAL RUNDOWN DETAIL
N.T.S.

LEGEND

PERMANENT PAVING

6" SHOTCRETE

dmg MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
(505) 828-2200, FAX (505) 797-9539

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE: ANDERSON HEIGHTS UNIT -1
118th STREET S.W.
GRADING & DRAINAGE PLAN

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

CITY PROJECT NO. | ZONE MAP NO. N-8/P-8 | SHEET 2 OF 4

AS BUILT INFORMATION
CONTRACTOR
STAMPED BY: Cartesian Surveys Inc. DATE: 10 6
INSPECTOR'S STAMPED BY: DATE
REMARKS: Cartesian Surveys Neg. DATE: Jan. 0.5
CORRECTED BY: DATE
MICRO-FILM INFORMATION
RECORDED BY: DATE
NO.

BENCH MARKS
STATION "3-F10" IS LOCATED 5.9 MI. SW. OF DOWNTOWN ALBUQUERQUE
TO REACH STATION FROM INT. OF COORS AND DENNIS CHAVEZ BLVD.
(FORMERLY RIO BRAVO), GO S. ON COORS BLVD. 0.62 MI. TO THE
STATION WHICH IS ON AN EARTHEN BERM 162 ft. WEST OF THE
CENTERLINE OF COORS BLVD. THE STATION IS A STANDARD AGS
3 1/4" ALUMINUM CAP RIVETED TO A PIPE 0.25' ABOVE THE GROUND
AND IS STAMPED "3-F10, 1998"
X=380733.56, Y=1462437.48 (NAD 27) ELEV=4935.735 (SEA LEVEL)

SURVEY INFORMATION
FIELD NOTES
NO. BY DATE

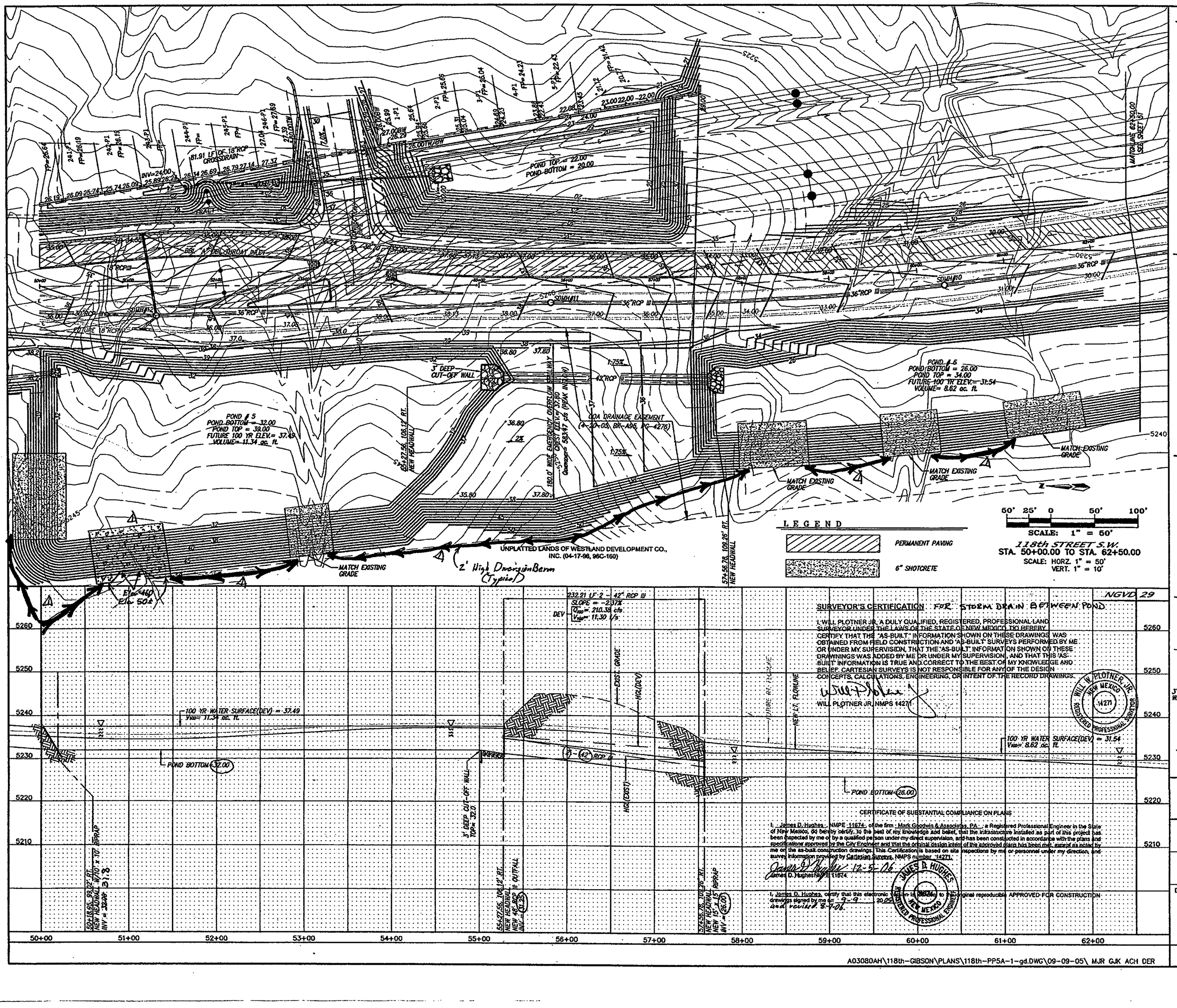
ENGINEER'S SEAL
JAMES D. HUGHES — 11674 — NEW MEXICO — REGISTERED PROFESSIONAL ENGINEER
9-7-06 Rev 9-7-06

NO.	DATE	REMARKS	BY
1	9-7-06	Berms Added	JPH

REVISIONS

DESIGNED BY	GJK	DATE 02/04
DRAWN BY	MJR	DATE 02/04
CHECKED BY	DMG	DATE 02/04

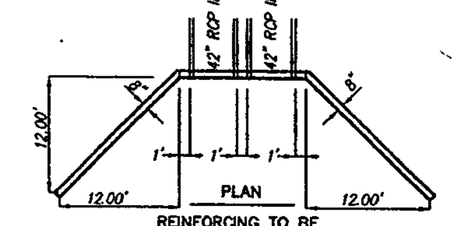
RECORD DRAWINGS



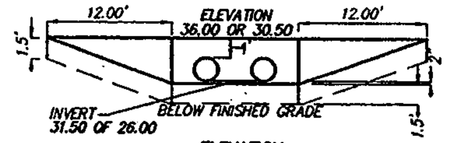
A03080AH\118th-GIBSON\PLANS\118th-PP5A-1-gd.DWG\09-09-05\ MJR GJK ACH DER

NOTES

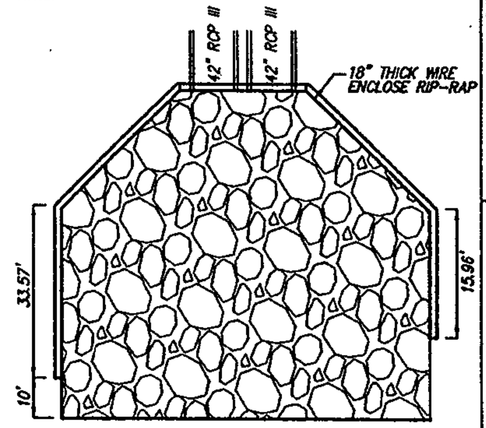
REINFORCING TO BE #4'S @ 12" EACH WAY GRADE 60 STEEL 4000 PSI CONCRETE



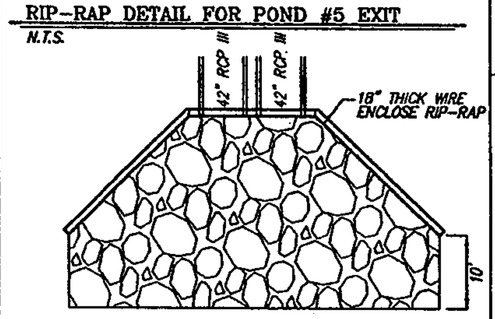
REINFORCING TO BE #4'S @ 12" EACH WAY GRADE 60 STEEL 4000 PSI CONCRETE



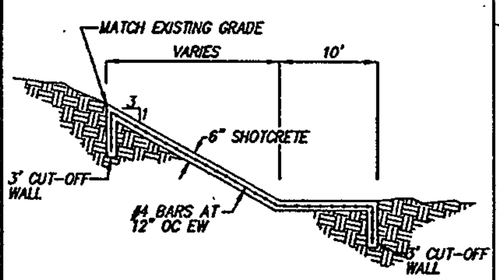
HEADWALL DETAIL
N.T.S.



RIP-RAP DETAIL FOR POND #5 EXIT
N.T.S.



RIP-RAP DETAIL
N.T.S.



TYPICAL RUNDOWN DETAIL
N.T.S.

SURVEYOR'S CERTIFICATION FOR STORM DRAIN BETWEEN POND

I, WILL PLOTNER JR, A DULY QUALIFIED, REGISTERED, PROFESSIONAL LAND SURVEYOR UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE "AS-BUILT" INFORMATION SHOWN ON THESE DRAWINGS WAS OBTAINED FROM FIELD CONSTRUCTION AND "AS-BUILT" SURVEYS PERFORMED BY ME OR UNDER MY SUPERVISION, THAT THE "AS-BUILT" INFORMATION SHOWN ON THESE DRAWINGS WAS ADDED BY ME OR UNDER MY SUPERVISION, AND THAT THIS "AS-BUILT" INFORMATION IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. CARTESIAN SURVEYS IS NOT RESPONSIBLE FOR ANY OF THE DESIGN CONCEPTS, CALCULATIONS, ENGINEERING, OR INTENT OF THE RECORD DRAWINGS.

WILL PLOTNER JR. NMPS 14271

WILL W. PLOTNER JR. NEW MEXICO 14271 REGISTERED PROFESSIONAL SURVEYOR

CERTIFICATE OF SUBSTANTIAL COMPLIANCE ON PLANS

I, James D. Hughes, NMPE 11874, of the firm Mark Goodwin & Associates, P.A., a Registered Professional Engineer in the State of New Mexico, do hereby certify, to the best of my knowledge and belief, that the infrastructure installed as part of this project has been inspected by me or by a qualified person under my direct supervision, and has been constructed in accordance with the plans and specifications approved by the City Engineer and that the original design intent of the approved plans has been met, except as noted by me on the as-built construction drawings. This Certification is based on site inspections by me or personnel under my direction, and survey information provided by Cartesian Surveys, NMPS number 14271.

James D. Hughes NMPE 11874 12-5-06

I, James D. Hughes, certify that this electronic file is an exact duplicate of the original reproducible APPROVED FOR CONSTRUCTION dated 9-9-05 and signed by me on 9-7-06.

JAMES D. HUGHES NEW MEXICO 11874 REGISTERED PROFESSIONAL ENGINEER

AS BUILT INFORMATION

CONTRACTOR: MARK Goodwin & Assoc. DATE: 11/28/06
INSPECTOR'S SIGNATURE & DATE:
FIELD VERIFICATION BY: Cartesian Surveys Inc. DATE: 10/28/06
DRAWINGS CORRECTED BY: DATE:

MICRO-FILM INFORMATION

RECORDED BY: DATE:
NO.:

BENCH MARKS

STATION "3-P10" IS LOCATED 5.9 MI. SW OF DOWNTOWN ALBUQUERQUE AND 1.2 MI. SW OF COORS AND DENNIS CHAVEZ BLVD. STATION WHICH IS ON AN EARTHEN BERM 162.2' WEST OF THE CENTERLINE OF COORS BLVD. THE STATION IS A STANDARD AGS 3 1/4" ALUMINUM CAP PUNTED TO A PIPE 0.25' ABOVE THE GROUND AND IS STAMPED "3-P10. 1999". Y=1,462,427.48 (NAD 27). ELEV=4933.735 (SLD 29).

SURVEY INFORMATION

FIELD NOTES BY: DATE:

NO.	BY	REMARKS	DATE
	GJK	DESIGN	02/04
	MJR	DRAWN	02/04
	DMG	CHECKED	02/04
1	GJK	Berm & Roadway Added	8-7-06

ENGINEER'S SEAL

JAMES D. HUGHES NEW MEXICO 11874 REGISTERED PROFESSIONAL ENGINEER 9-9-05 Rev. 9-7-06

dmg MARK GOODWIN & ASSOCIATES, P.A. CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
(505) 828-2200, FAX (505) 797-9539

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE: ANDERSON HEIGHTS - UNIT I
118th STREET S.W.
GRADING & DRAINAGE PLAN

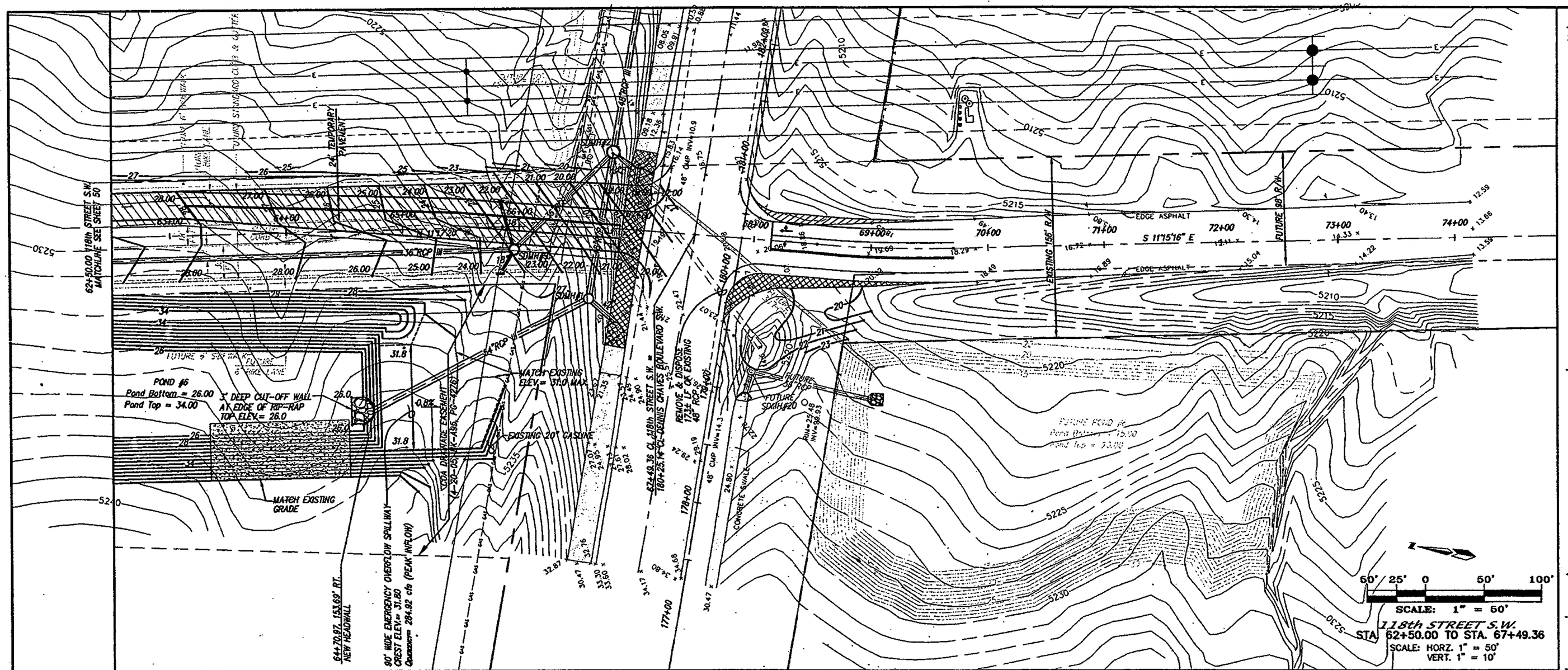
DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	LAST DESIGN UPDATE	MO./DAY/YR.	MO./DAY/YR.

CITY PROJECT NO.

ZONE MAP NO. N-8/P-8

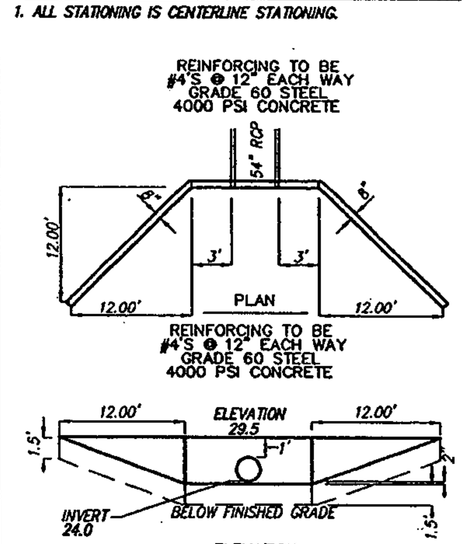
SHEET 3 OF 4

RECORD DRAWINGS

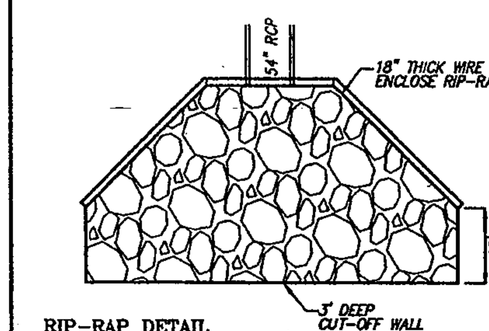


NOTES

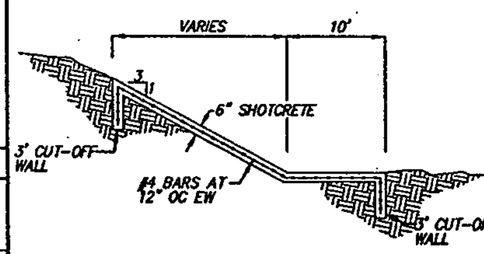
1. ALL STATIONING IS CENTERLINE STATIONING.



HEADWALL DETAIL
N.T.S.



RIP-RAP DETAIL
N.T.S.



TYPICAL RUNDOWN DETAIL
N.T.S.

LEGEND

- PERMANENT PAVEMENT (THIS PROJECT)
- TEMP. PAVEMENT (THIS PROJECT)
- 6" SHOTCRETE
- REMOVAL

Certification
THE CHANGES SHOWN HEREON ARE BASED UPON A FIELD SURVEY CONDUCTED BY ME OR UNDER MY SUPERVISION AND ON THE LOCATIONS (VERTICALLY AND HORIZONTALLY) TO THE BEST OF MY KNOWLEDGE AND BELIEF.

CERTIFICATE OF SUBSTANTIAL COMPLIANCE ON PLANS

I, James D. Hughes, NMPE 11674, of the firm Mark Goodwin & Associates, P.A., a Registered Professional Engineer in the State of New Mexico, do hereby certify, to the best of my knowledge and belief, that the infrastructure installed as part of this project has been inspected by me or by a qualified person under my direct supervision, and has been constructed in accordance with the plans and specifications approved by the City Engineer and that the original design intent of the approved plans has been met, except as noted by me on the as-built construction drawings. This Certification is based on site inspections by me or personnel under my direction, and survey information provided by Cartesian Surveys, NMPS number 14271.

James D. Hughes, NMPE 11674 — 12-5-05

I, James D. Hughes, certify that this electronic version of the drawings is the exact reproducible APPROVED FOR CONSTRUCTION drawings signed by me on 9-9, 20 05.

AS BUILT INFORMATION

BENCH MARKS
STATION "3-P10" IS LOCATED 5.9 MI. SW OF DOMINTION ALBUQUERQUE (FORMERLY RIO RANCHO), GO S. ON COORS BLVD. 0.62 MI. TO THE STATION WHICH IS ON AN EARTHEN BERM 162.2' WEST OF THE CENTERLINE OF COORS BLVD. THE STATION IS A STANDARD AXIS 3 1/4" ALUMINUM CAP IMBEDED TO A PIPE 0.25' ABOVE THE GROUND AND IS STAMPED "3-P10, 1998". Y=1,360735.56, X=1462437.48 (NAD 27). ELEV=4935.735 (SLD 29)

NO.	DATE	REMARKS	DESIGNED BY	DRAWN BY	CHECKED BY
		REVISIONS			
		DESIGN	GMC	MJR	DMG

NO.	DATE	FIELD NOTES BY

SURVEY INFORMATION

CONTRACTOR: STAKED by Cartesian Surveys Inc. DATE 04/APR 06
INSPECTOR'S FIELD CHANGES BY: Cartesian Surveys Inc. DATE 04/APR 06
AS-BUILTED BY: DATE
CORRECTED BY: DATE
MICRO-FILM INFORMATION
RECORDED BY: DATE
NO.

ENGINEER'S SEAL
JAMES D. HUGHES 11674 NEW MEXICO REGISTERED PROFESSIONAL ENGINEER
09/04

NO.	DATE	BY

	DATE	BY
DESIGNED BY	09/04	GMC
DRAWN BY	09/04	MJR
CHECKED BY	09/04	DMG

dmg MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
(505) 828-2200, FAX (505) 797-9539

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE: ANDERSON HEIGHTS - UNIT 1
118th STREET S.W.
GRADING & DRAINAGE PLAN

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

CITY PROJECT NO.

ZONE MAP NO. N-8/P-8

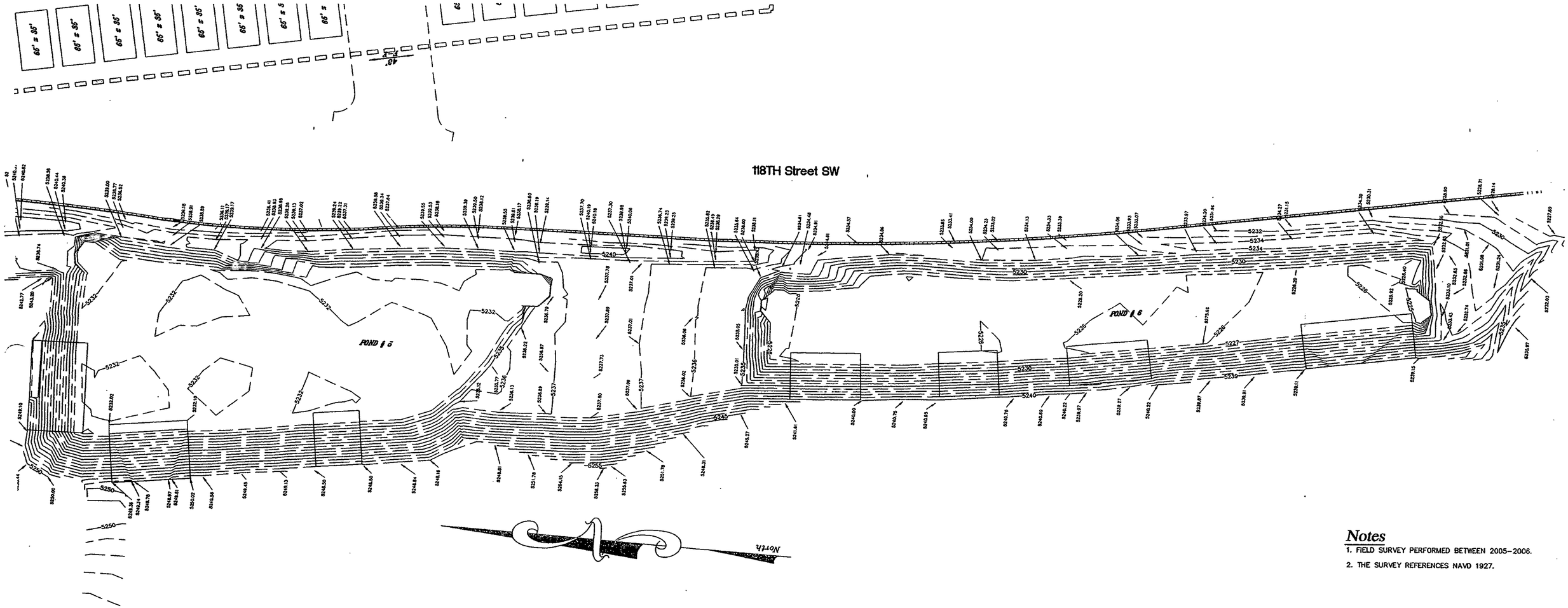
SHEET 4 OF 4

A03080AH\118th-GIBSON\PLANS\118th-PP8-gd.DWG\09-09-05\ MJR NHE ACH DER

APPENDIX B
118TH STREET PONDS
SURVEY AS-BUILTS

THIS IS NOT A BOUNDARY SURVEY, APPARENT PROPERTY CORNERS ARE SHOWN FOR ORIENTATION ONLY. BOUNDARY DATA SHOWN IS FROM PREVIOUS SURVEY REFERENCED HEREON.

Topographic Map
for
Ponds 2, 3A, 3B, 4A, 4B, 5 and 6
Anderson Heights
City of Albuquerque
Bernalillo County, New Mexico
October 2006



GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

Notes
1. FIELD SURVEY PERFORMED BETWEEN 2005–2006.
2. THE SURVEY REFERENCES NAVD 1927.

Surveyor's Certificate
I, WILL PLOTNER JR., A NEW MEXICO REGISTERED PROFESSIONAL LAND SURVEYOR DO HEREBY CERTIFY THAT THE TOPOGRAPHIC MAP SHOWN HEREON MEETS NATIONAL MAPPING STANDARDS AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEFS.

Will Plotner 10/19/06

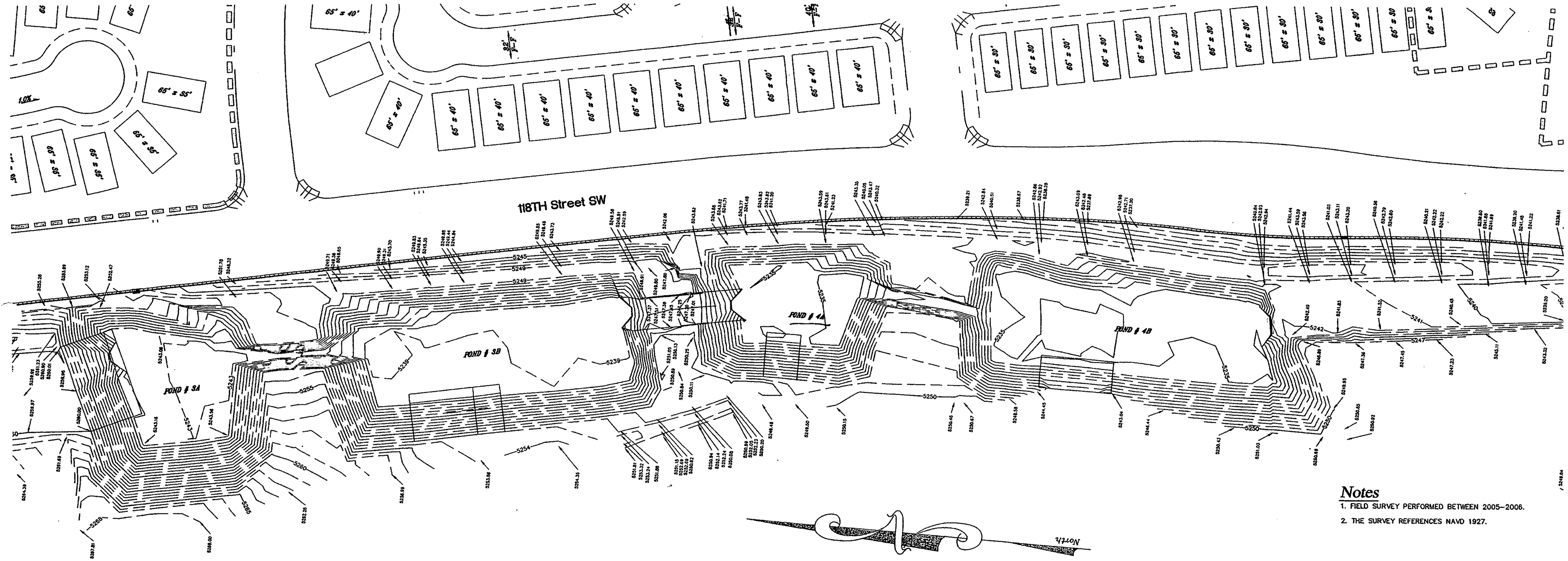
WILL PLOTNER JR. — DATE
N.M.P.S. No. 14271

WILL M. PLOTNER JR. NEW MEXICO No. 14271 REGISTERED PROFESSIONAL SURVEYOR

CARTESIAN SURVEYS INC.
P.O. BOX 44414 RIO RANCHO, N.M. 87174
Phone (505) 896-3050 Fax (505) 891-0244

THIS IS NOT A BOUNDARY SURVEY; APPARENT PROPERTY CORNERS ARE SHOWN FOR ORIENTATION ONLY. BOUNDARY DATA SHOWN IS FROM PREVIOUS SURVEY REFERENCED HEREON.

Topographic Map
for
Ponds 2, 3A, 3B, 4A, 4B, 5 and 6
Anderson Heights
City of Albuquerque
Bernalillo County, New Mexico
October 2006



GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

Notes

1. FIELD SURVEY PERFORMED BETWEEN 2005–2006.
2. THE SURVEY REFERENCES NAVD 1927.

Surveyor's Certificate

I, WILL PLOTNER JR., A NEW MEXICO REGISTERED PROFESSIONAL LAND SURVEYOR DO HEREBY CERTIFY THAT THE TOPOGRAPHIC MAP SHOWN HEREON MEETS NATIONAL MAPPING STANDARDS AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEFS.

WILL PLOTNER JR.
N.M.P.S. No. 14271

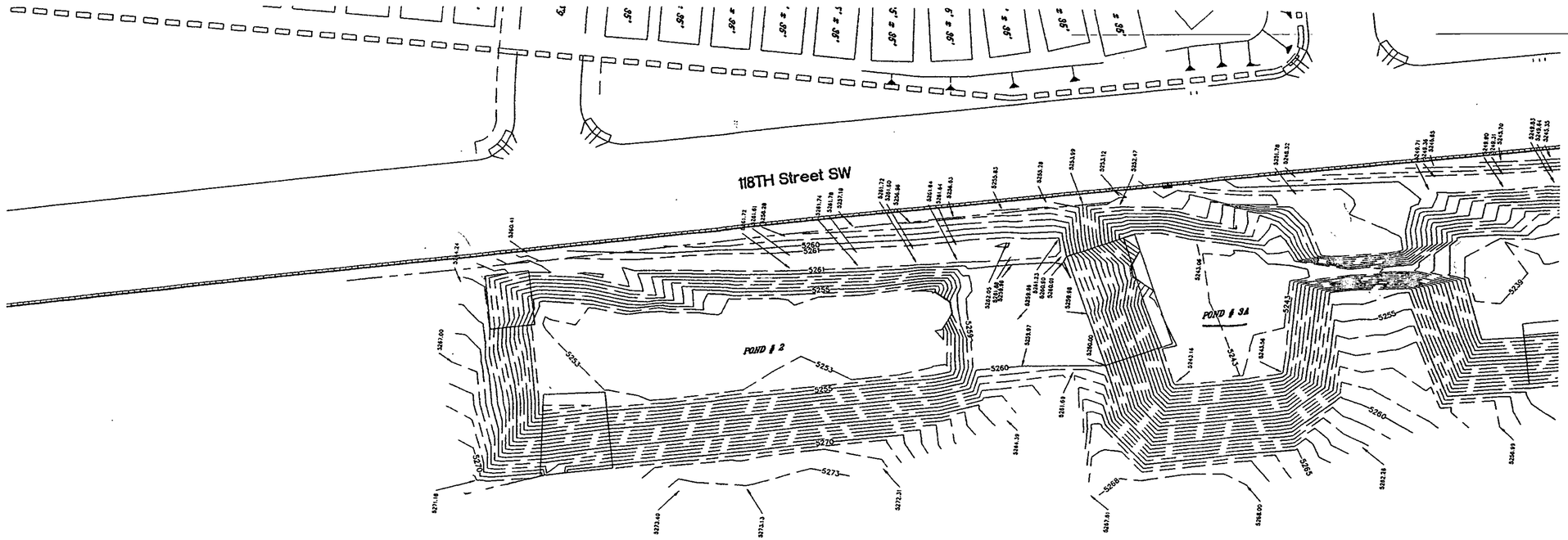
DATE 10/19/06

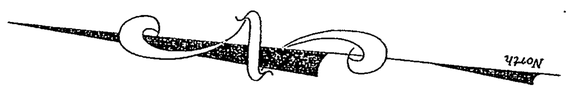
WILL W. PLOTNER JR. NEW MEXICO No. 14271 REGISTERED PROFESSIONAL SURVEYOR

CARTESIAN SURVEYS INC.
P.O. BOX 44414 RIO RANCHO, N.M. 87174
Phone (505) 896-3050 Fax (505) 891-0244

THIS IS NOT A BOUNDARY SURVEY, APPARENT PROPERTY CORNERS ARE SHOWN FOR ORIENTATION ONLY. BOUNDARY DATA SHOWN IS FROM PREVIOUS SURVEY REFERENCED HEREON.

Topographic Map
for
Ponds 2, 3A, 3B, 4A, 4B, 5 and 6
Anderson Heights
City of Albuquerque
Bernalillo County, New Mexico
October 2006





GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

Notes

1. FIELD SURVEY PERFORMED BETWEEN 2005–2006.
2. THE SURVEY REFERENCES NAVD 1927.

Surveyor's Certificate

I, WILL PLOTNER JR., A NEW MEXICO REGISTERED PROFESSIONAL LAND SURVEYOR HEREBY CERTIFY THAT THE TOPOGRAPHIC MAP SHOWN HEREON MEETS NATIONAL MAPPING STANDARDS AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEFS.

Will Plotner 10/19/06

WILL PLOTNER JR. N.M.P.S. No. 14271 — DATE

WILL W. PLOTNER NEW MEXICO No. 14271 REGISTERED PROFESSIONAL SURVEYOR

CARTESIAN SURVEYS INC.
P.O. BOX 44414 RIO RANCHO, N.M. 87174
Phone (505) 896-3050 Fax (505) 891-0244

APPENDIX C
HYDROLOGY
SUMMARY TABLES
AHYMO PRINTOUTS

SUMMARY TABLE 1
100-Year / 24-Hour Flow Rates and Flow Volumes

Sub-Basin(s) ID	Area (Sq Mi)	Q, 100-Year, 24-Hour (cfs)	Outfall	Volume Required, 100-Year, 24-Hour (AF)	Volume Provided (AF)	100-Year, 24-Hour WSEL in Pond (Ft)	Notes
60106, 60107, 60108, 60109	0.2018	156.55	Pond 2	4.132	7.73	5258.2	Flow follows historic path
60110	0.0075	5.2	Pond 3A	0.147	3.6	See Below	Flows to Pond 3B
60111	0.143	113.48	Pond 3B	3.069	11.78	5243.13	
60106,60107, 60108, 60109,60111	0.1505	118.68	Ponds 3A+ 3B	3.216	15.38	5243.13	Volume from Ponds 3A+3B
60116	0.0398	28.28	Pond 4A	0.798	3.37	See Below	Flow follows historic path
60113	0.0563	40	Pond 4B	1.128	8.63	5236.53	Flow follows historic path
60116, 60113	0.0961	68.28	Ponds 4A+ 4B	1.926	12.01	5236.53	Flow follows historic path
5A	0.18	148.85	Pond 5A	3.953	See Below	See Below	Flow follows historic path
5B	0.1258	97.39	Pond 5A	2.65	See Below	See Below	Flow conveyed within Diversion Channel West
5C	0.0121	10.31	Pond 5A	0.284	See Below	See Below	Flow conveyed within Diversion Channel North
5B+5C	0.1379	107.7	Pond 5A	2.934	See Below	See Below	Total flow into pond 5A via concrete weir
5A+5B+5C	0.3179	256.55	Pond 5A	6.888	8.14	5231.9	Total Flow into Pond 5A
6B	0.0068	6.72	48" SD Pipe	0.182	n/a	n/a	Flow conveyed within Diversion Channel South
6C	0.0687	61.63	48" SD Pipe	1.685	n/a	n/a	Flow conveyed within Diversion Channel South
6B+6C	0.0755	68.35	48" SD Pipe	1.867	n/a	n/a	Flow conveyed within Diversion Channel South
203N	0.0394	49.94	30" SD Pipe	1.872	n/a	n/a	Flow follows historic path Channel South

SUMMARY TABLE 2

Pond Volume

Sub-Basin I.D.	Drainage Area (Sq Mi)	100-year 2-hr Runoff Volume (AF)	Retention Volume Required (AF)	Retention Volume Provided (AF)	Excess Volume (AF)	Note
Pond 2 60106, 60107, 60108, 60109	0.2018	4.132	4.132	7.73	3.60	
Pond 3A 60110	0.0075	0.147	0.147	3.60	3.46	To Pond 3B
Pond 3B 60111	0.1430	3.069	3.069	11.78	8.71	
Ponds 3A+3B 6010+60111	0.1505	3.216	3.216	15.38	12.17	Volume From 3A+3B
Pond 4A 60116	0.0398	0.798	0.798	3.37	2.58	To Pond 4B
Pond 4B 60113	0.0563	1.128	1.128	8.63	7.51	
Pond 4A+4B 60116+60113	0.0961	1.926	1.926	12.01	10.08	Volume From 4A+4B Bottom of basins are same elevation
Pond 5 5A, 5B, 5C	0.3170	6.888	6.888	8.14	1.25	

SUMMARY FILE

```
*S*************************************************************************
*S
*S*******************************************************
*S ADD BASINS FROM SOUTH POWERLINE DIVERSION
*S TO THE RIO BRAVO RUN
*S
*S*******************************************************
*S
*S  APPLY A 3% SEDIMENT BULKING FACTOR TO ALL COMPUTED HYDROGRAPHS
SEDIMENT BULK                                                                  PK BF =    1.03
*S CALCULATE THE FLOW FROM SUB-BASINS A60106, A60107, 60108 & 60109
*S INTO POND 2
□□□
```


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
COMPUTE NM HYD	INTOPOND2	-	1	.20180	156.55	4.132	.38393	1.500	1.212	PER IMP= .00
*S										
*S CALCULATE THE FLOW FROM SUB-BASIN 60110 INTO POND 3A										
COMPUTE NM HYD	INTOPOND3A	-	2	.00750	5.20	.147	.36779	1.500	1.082	PER IMP= .00
*S										
*S CALCULATE THE FLOW FROM SUB-BASIN 60111										
*S INTO POND 3B										
COMPUTE NM HYD	INTOPOND3B	-	3	.14300	113.48	3.069	.40245	1.500	1.240	PER IMP= .00
*S										
*S ADD THE ROUTED FLOW FROM 3A TO THE FLOW FROM 3B FOR TOTAL FLOW INTO POND 3B										
*S										
ADD HYD	3AB	2& 3	4	.15050	118.68	3.216	.40072	1.500	1.232	
*S										
*S CALCULATE THE FLOW FROM SUB-BASINS 60116										
*S INTO POND 4A										
COMPUTE NM HYD	INTOPOND4A	-	5	.03980	28.28	.798	.37576	1.500	1.110	PER IMP= .00
*S										
*S CALCULATE THE FLOW FROM SUB-BASINS A60113										
*S INTO POND 4B										
COMPUTE NM HYD	INTOPOND4B	-	6	.05630	40.00	1.128	.37576	1.500	1.110	PER IMP= .00
*S										
*S ADD THE ROUTED FLOW FROM 4A TO THE FLOW FROM 4B FOR TOTAL FLOW INTO POND 4B										
*S										
ADD HYD	4AB	5& 6	7	.09610	68.28	1.926	.37576	1.500	1.110	
*S										
*S CALCULATE THE FLOW FROM SUB-BASIN 5A INTO POND 5										
COMPUTE NM HYD	5A	-	8	.18000	148.85	3.954	.41183	1.500	1.292	PER IMP= .00
*S										
*S CALCULATE THE FLOW FROM SUB-BASIN 5B INTO POND 5 VIA CHANNEL WEST										
COMPUTE NM HYD	5B	-	9	.12580	97.39	2.650	.39500	1.500	1.210	PER IMP= .00
*s										
*S COMPUTE FLOWS FROM SUB-BASIN 5C INTO POND 5 VIA CHANNEL NORTH										
COMPUTE NM HYD	5C	-	10	.01210	10.31	.284	.44046	1.500	1.331	PER IMP= .00
*S										
*S ADD THE ROUTED FLOW FROM 5B TO THE FLOW FROM 5C FOR TOTAL FLOW INTO POND 5										

```
*S OVER POND 5 WEIR
ADD HYD                 5BC  9&10  11        .13790       107.70       2.934       .39899    1.500    1.220
*S
*S ADD THE ROUTED FLOW FROM 5A TO THE FLOW FROM 5B+5C FOR TOTAL FLOW INTO POND 5
*S
ADD HYD                5ABC  8&11  12        .31790       256.55       6.888       .40626    1.500    1.261
*S
*S COMPUTE FLOWS FROM SUB-BASIN 6B
COMPUTE NM HYD          6B   -    13        .00680         6.72        .182       .50248    1.500    1.545 PER IMP=     .00
*S
*S COMPUTE FLOWS FROM SUB-BASIN 6C
COMPUTE NM HYD          6C   -    14        .06870        61.63       1.685       .45995    1.500    1.402 PER IMP=     .00
*S
*S ADD THE ROUTED FLOW FROM 6B TO THE FLOW FROM 6C FOR TOTAL FLOW INTO 118TH ST
*S BERM, CHANNEL SOUTH
ADD HYD                 6BC 13&14  15        .07550        68.35       1.867       .46378    1.500    1.415
*S
*S COMPUTE FLOWS FROM SUB-BASIN 203N(THE NORTH HALF OF DENNIS CHAVEZ BLVD - 72'
COMPUTE NM HYD         203N   -    17        .03940        49.94       1.872       .89081    1.500    1.981 PER IMP=   20.00
*S
*S ADD THE ROUTED FLOW FROM 6B+6C TO THE FLOW FROM 203N
ADD HYD              6BC203N 15&17  18        .11490       118.30       3.739       .61021    1.500    1.609
*S
*S COMPUTE FLOWS FROM NORTH SIDE OF 118TH STREET
```

□□□

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
										PAGE = 3
COMPUTE NM HYD	118TH	-	19	.01780	39.47	1.937	2.04013	1.500	3.464	PER IMP= 75.00

```
*S
*S ADD THE FLOWS FROM 118TH STREET TO 6BC203N
*S FOR THE TOTAL FLOW IN DENNIS CHAVEZ EAST OF 118TH STREET
ADD HYD             JUNCTION 18&19  20        .13270       157.76       5.676       .80201    1.500    1.858
*S
*S
*S COMPUTE FLOWS FROM SUB-BASIN 204W (COMMERCIAL TRACT DIRECTLY TO CHANNEL)
COMPUTE NM HYD         204W   -    21        .04037        89.62       4.524      2.10119    1.500    3.468 PER IMP= 80.00
*S
*S ADD THE FLOWS FROM 118TH STREET ON THE NORTH SIDE OF DENNIS CHAVEZ TO THE FLO
*S FROM SUB-BASIN 204W AT THE COMERCIAL JUNCTION POINT ON THE NORTH SIDE OF DENN
ADD HYD             JUNCTION 19&21  22        .05817       129.08       6.461      2.08250    1.500    3.467
*S
*S COMPUTE FLOWS FROM SUB-BASIN 204E (ANDERSON HEIGHTS DIRECTLY TO CHANNEL)
COMPUTE NM HYD         204E   -    23        .08878       170.20       7.801      1.64761    1.500    2.996 PER IMP= 56.26
*S
*S ADD THE FLOWS FROM JUNCTION AT THE COMERCIAL TRACT TO THE FLOWS FROM SUB-BASI
*S THIS IS THE FLOW THAT WILL ENTER THE RIO BRAVO CHANNEL AT THE EASTERN EDGE OF
*S ANDERSON HEIGHTS
ADD HYD             JUNCTION 21&23  24        .12915       259.82      12.325      1.78939    1.500    3.143
*S
*S COMPUTE FLOWS FROM SUB-BASINS 205, 206, 60122 & 60123 (ANDERSON HEIGHTS TO PO
```

```
COMPUTE NM HYD    INTOPOND10    -    25        .27140       510.37      23.849      1.64761    1.500    2.938 PER IMP=  56.26
*S
*S ROUTE FLOWS THROUGH POND 10 - 30" ORIFICE
ROUTE RESERVOIR   POND10.OUT    24   26        .12915        39.54      12.285      1.78352    2.100     .478 AC-FT=    6.644
*S
ROUTE                 209.10    25    4        .27140       477.37      23.849      1.64761    1.550    2.748
COMPUTE NM HYD        207.00    -     1        .03023        48.84       2.455      1.52279    1.550    2.524 PER IMP=  46.00
ADD HYD             JUNCTION    4& 1  2        .30163       526.20      26.304      1.63510    1.550    2.726
ROUTE                 208.10     2    4        .30163       522.59      26.304      1.63510    1.550    2.707
COMPUTE NM HYD         208.A    -     1        .03201        54.71       2.448      1.43385    1.500    2.671 PER IMP=  41.00
ADD HYD             JUNCTION    4& 1  2        .33364       575.32      28.752      1.61579    1.550    2.694
ROUTE                 209.10     2    4        .33364       564.36      28.752      1.61579    1.550    2.643
COMPUTE NM HYD         208.B    -     1        .02696        51.38       2.215      1.54057    1.500    2.978 PER IMP=  47.00
ADD HYD             JUNCTION    4& 1  2        .36060       609.90      30.967      1.61016    1.550    2.643
COMPUTE NM HYD        209.00    -     1        .01110        16.34       1.113      1.88065    1.650    2.301 PER IMP=  65.00
ADD HYD             JUNCTION    2& 1  4        .37170       623.73      32.080      1.61824    1.550    2.622
COMPUTE NM HYD        210.00    -     1        .02280        41.69       1.722      1.41606    1.500    2.857 PER IMP=  40.00
ADD HYD             JUNCTION   23& 1  2        .11158       211.90       9.523      1.60029    1.500    2.967
ADD HYD             JUNCTION    4& 2  3        .48328       808.97      41.603      1.61409    1.550    2.615
ROUTE                 210.10     3    4        .48328       795.25      41.603      1.61410    1.550    2.571
COMPUTE NM HYD        211.00    -     1        .15300       242.18      14.209      1.74130    1.600    2.473 PER IMP=  57.00
COMPUTE NM HYD        212.00    -     2        .00950        17.11        .953      1.88065    1.550    2.814 PER IMP=  65.00
ADD HYD             JUNCTION    1& 2  3        .16250       258.60      15.162      1.74945    1.550    2.487
COMPUTE NM HYD        213.00    -     1        .01730        31.64       1.307      1.41606    1.500    2.857 PER IMP=  40.00
ADD HYD             JUNCTION    4& 1  2        .50058       823.39      42.910      1.60725    1.550    2.570
ADD HYD             JUNCTION    3& 2  4        .66308      1081.99      58.071      1.64210    1.550    2.550
COMPUTE NM HYD        214.00    -     1        .05930        94.84       5.507      1.74131    1.600    2.499 PER IMP=  57.00
ADD HYD             JUNCTION    4& 1  2        .72238      1176.69      63.579      1.65024    1.550    2.545
ROUTE                 216.10     2    4        .72238      1183.63      63.579      1.65024    1.600    2.560
COMPUTE NM HYD        216.00    -     1        .01570        27.95       1.186      1.41606    1.500    2.782 PER IMP=  40.00
ADD HYD             JUNCTION    1& 4  2        .73808      1204.17      64.764      1.64526    1.600    2.549
FINISH
□(s10H□□□□□□□□□□□□□□
```

□(s16.66H□□□□□□□□□□□□
AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - - VERSION: 1997.02d RUN DATE (MON/DAY/YR) =10/24/2007
INPUT FILE = F:\TomG\ANDERS~1\berms\AHYMOF~1\AHAB10~1.TXT USER NO.= AHYMO-I-9702dGoodwinM-AH

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

START TIME= .00
*S
*S RIO BRAVO
*S
*S
*S
*S 100-YR, 24-HR STORM WITH SEDIMENT
*S FILE NAME: RB_DMP.DAT
*S BY: RICHARD STOCKTON
*S REVISED BY MARK GOODWIN AND ASSOCIATES 5-25-04.
*S REVISED BY MARK GOODWIN AND ASSOCIATES again 8-8-05.
*S LAST REVISION: 7-15-03
*S**********
*S AS-BUILT 5-31-06 (POND # 6 IS ONLY DEVIATION FROM APPROVED PLAN)
*S JDH 8-15-06 SOUTHERLY 125' OF 300' RIGHT OF WAY OFDENNIS CHAVEZ (BASINS 210,
*S 213, AND 216) AND ALL OF BASIN 215 DELETED
*S DUE TO CONSTRICTION AT CONDISHIRE ST BOX CULVERT
*S**********
*S THE PURPOSE OF THIS MODEL IS TO CALCULATE THE RUNOFF FROM FROM THE
*S SACATE BLANCO WATERSHED WEST OF THE POWERLINE EASEMENT (AKA SOUTH
*S POWERLINE DIVERSION AND DETENTION FACILITY);
*S AND THE RIO BRAVO WATERSHED.
*S
*S FLOWS FROM THIS WATERSHED ARE CONVEYED TO HUBBLE LAKE DETENTION
*S FACILITY VIA THE HUBBLE LAKE/AMOLE DIVERSION CHANNEL.
*S
*S THE ORGINIAL RIO BRAVO MODEL WAS DEVELOPED BY AVID (AND ACCEPTED BY
*S THE COUNTY). ASSUMPTIONS MADE IN THE AVID MODEL ARE INVALID, AND HAVE
*S BEEN CORRECTED WITH THE 4-25-03 REVISIONS. DIVERSIONS TO THE BOREGA DAM
*S AND THE AMOLE CHANNEL REDUCE THIS BASIN AND 114 AC. OF THE SACATE BLANCO
*S BELOW THE POWER LINE IS ADDED TO THE RIO BRAVO CHANNEL.
*S PONDS 7 & 9 ARE DELETED AND POND 10 IS ADDED.
*S**********
*S ANALYSIS ASSUMPTIONS:
*S**********
*S 1. THE PUNCH HYD COMMAND WAS ADDED TO THE END OF THIS FILE SO THE OUTFALL
*S HYDROGRAPH COULD BE USED IN THE AMOLE DEL NORTE EXISTING CONDITIONS MODEL
*S AA100D1B.DAT, WHICH WILL BE USED IN THE ANALYSIS OF THE AMOLE ARROYO SYSTE
*S
*S
*S**********
*S RAINFALL FROM NOAA ATLAS 2
*S THESE VALUES WERE REDUCED FOR AREA BY 12%, 5% AND 3% FOR 1, 6, AND 24 HOUR
RAINFALL TYPE= 2 RAIN24= 2.660

INPUT FILE

```
                                        AHAB100po
START                0.0 HOURS    PC=0   PL=-1
*S
*S              RIO BRAVO
*S
*S
*S
*S 100-YR, 24-HR STORM WITH SEDIMENT
*S FILE NAME: RB_DMP.DAT
*S BY: RICHARD STOCKTON
*S REVISED BY MARK GOODWIN AND ASSOCIATES 5-25-04.
*S REVISED BY MARK GOODWIN AND ASSOCIATES again 8-8-05.
*S LAST REVISION: 7-15-03
*S*************************************************************
*S AS-BUILT 5-31-06 (POND # 6 IS ONLY DEVIATION FROM APPROVED PLAN)
*S JDH 8-15-06 SOUTHERLY 125' OF 300' RIGHT OF WAY OFDENNIS CHAVEZ (BASINS 210,
*S 213, AND 216) AND ALL OF BASIN 215 DELETED
*S DUE TO CONSTRICTION AT CONDISHIRE ST BOX CULVERT
*S*************************************************************
*S THE PURPOSE OF THIS MODEL IS TO CALCULATE THE RUNOFF FROM FROM THE
*S SACATE BLANCO WATERSHED WEST OF THE POWERLINE EASEMENT (AKA SOUTH
*S POWERLINE DIVERSION AND DETENTION FACILITY);
*S AND THE RIO BRAVO WATERSHED.
*S
*S FLOWS FROM THIS WATERSHED ARE CONVEYED TO HUBBLE LAKE DETENTION
*S FACILITY VIA THE HUBBLE LAKE/AMOLE DIVERSION CHANNEL.
*S
*S THE ORGINIAL RIO BRAVO MODEL WAS DEVELOPED BY AVID (AND ACCEPTED BY
*S THE COUNTY).  ASSUMPTIONS MADE IN THE AVID MODEL ARE INVALID, AND HAVE
*S BEEN CORRECTED WITH THE 4-25-03 REVISIONS. DIVERSIONS TO THE BOREGA DAM
*S AND THE AMOLE CHANNEL REDUCE THIS BASIN AND 114 AC. OF THE SACATE BLANCO
*S BELOW THE POWER LINE IS ADDED TO THE RIO BRAVO CHANNEL.
*S PONDS 7 & 9 ARE DELETED AND POND 10 IS ADDED.
*S*************************************************************
*S ANALYSIS ASSUMPTIONS:
*S*************************************************************
*S 1. THE PUNCH HYD COMMAND WAS ADDED TO THE END OF THIS FILE SO THE OUTFALL
*S    HYDROGRAPH COULD BE USED IN THE AMOLE DEL NORTE EXISTING CONDITIONS MODEL
*S    AA100D1B.DAT, WHICH WILL BE USED IN THE ANALYSIS OF THE AMOLE ARROYO SYSTEM.
*S
*S
*S*************************************************************
*S RAINFALL FROM NOAA ATLAS 2
*S THESE VALUES WERE REDUCED FOR AREA BY 12%, 5% AND 3% FOR 1, 6, AND 24 HOUR
RAINFALL              TYPE=2  0.0  1.64  2.11  2.66    DT=0.05
* *S 10 YEAR 24HR STORM  CONDITION
* RAINFALL              TYPE=2  0.0  1.08  1.41  1.78    DT=0.05
*S*************************************************************
*S
*S*************************************************************
*S ADD BASINS FROM SOUTH POWERLINE DIVERSION
*S TO THE RIO BRAVO RUN
*S
*S*************************************************************
*S
*S  APPLY A 3% SEDIMENT BULKING FACTOR TO ALL COMPUTED HYDROGRAPHS
SEDIMENT BULK          CODE=1   BULKING FACTOR = 1.03
*S CALCULATE THE FLOW FROM SUB-BASINS A60106, A60107, 60108 & 60109
*S INTO POND 2
COMPUTE NM HYD          ID=1  HYD=INTOPOND2  AREA=0.2018 SQ MI
                        A=90  B=10  C=0  D=0
                        TP=0.1333   MASSRAIN=-1
PRINT HYD               ID=1  CODE=1
*S
```

```
*S CALCULATE THE FLOW FROM SUB-BASIN 60110 INTO POND 3A
COMPUTE NM HYD          ID=2  HYD=INTOPOND3A  AREA=0.0075 SQ MI
                        A=100  B=0  C=0  D=0
                        TP=0.1333   MASSRAIN=-1
PRINT HYD               ID=2  CODE=1
*S
*S CALCULATE THE FLOW FROM SUB-BASIN 60111
*S INTO POND 3B
COMPUTE NM HYD          ID=3  HYD=INTOPOND3B  AREA=0.1430 SQ MI
                        A=80   B=20 C=0  D=0
                        TP=0.1333   MASSRAIN=-1
PRINT HYD               ID=3  CODE=1
*S
*S ADD THE ROUTED FLOW FROM 3A TO THE FLOW FROM 3B FOR TOTAL FLOW INTO POND 3B
*S
ADD HYD                 ID=4 HYD=3AB I=2 II=3
PRINT HYD               ID=4 CODE=10
*S
*S CALCULATE THE FLOW FROM SUB-BASINS 60116
*S INTO POND 4A
COMPUTE NM HYD          ID=5  HYD=INTOPOND4A  AREA=0.0398 SQ MI
                        A=95  B=5 C=0  D=0
                        TP=0.1333   MASSRAIN=-1
PRINT HYD               ID=5  CODE=1
*S
*S CALCULATE THE FLOW FROM SUB-BASINS A60113
*S INTO POND 4B
COMPUTE NM HYD          ID=6  HYD=INTOPOND4B  AREA=0.0563 SQ MI
                        A=95  B=5 C=0  D=0
                        TP=0.1333   MASSRAIN=-1
PRINT HYD               ID=6  CODE=1
*S
*S ADD THE ROUTED FLOW FROM 4A TO THE FLOW FROM 4B FOR TOTAL FLOW INTO POND 4B
*S
ADD HYD                 ID=7 HYD=4AB I=5 II=6
PRINT HYD               ID=7 CODE=10
*S
*S CALCULATE THE FLOW FROM SUB-BASIN 5A INTO POND 5
COMPUTE NM HYD          ID=8  HYD=5A  AREA=0.180 SQ MI
                        A=80  B=15  C=5  D=0
                        TP=0.133  MASSRAIN=-1
PRINT HYD               ID=8  CODE=1
*S
*S CALCULATE THE FLOW FROM SUB-BASIN 5B INTO POND 5 VIA CHANNEL WEST
COMPUTE NM HYD          ID=9 HYD NO=5B  AREA=0.1258 SQ MI
                        A=85  B=14  C=1  D=0
                        TP=0.133 HR
                        MASS RAINFALL=-1
PRINT HYD               ID=9 CODE=1
*s
*S COMPUTE FLOWS FROM SUB-BASIN 5C INTO POND 5 VIA CHANNEL NORTH
COMPUTE NM HYD          ID=10  HYD NO=5C  AREA=0.0121 SQ MI
                        A=60  B=40  C=0  D=0
                        TP=0.133 HR
                        MASS RAINFALL=-1
PRINT HYD               ID=10 CODE=1
*S
*S ADD THE ROUTED FLOW FROM 5B TO THE FLOW FROM 5C FOR TOTAL FLOW INTO POND 5
*S OVER POND 5 WEIR
ADD HYD                 ID=11 HYD=5BC I=9 II=10
PRINT HYD               ID=11 CODE=10
*S
*S ADD THE ROUTED FLOW FROM 5A TO THE FLOW FROM 5B+5C FOR TOTAL FLOW INTO POND 5
```

```
*S
ADD HYD                    ID=12 HYD=5ABC I=8 II=11
PRINT HYD                  ID=12 CODE=10
*S
*S COMPUTE FLOWS FROM SUB-BASIN 6B
COMPUTE NM HYD             ID=13  HYD NO=6B  AREA=0.0068 SQ MI
                           A=30  B=70  C=0  D=0
                           TP=0.133 HR
                           MASS RAINFALL=-1
PRINT HYD                  ID=13 CODE=1
*S
*S COMPUTE FLOWS FROM SUB-BASIN 6C
COMPUTE NM HYD             ID=14  HYD NO=6C  AREA=0.0687 SQ MI
                           A=50  B=50  C=0  D=0
                           TP=0.133 HR
                           MASS RAINFALL=-1
PRINT HYD                  ID=14 CODE=1
*S
*S ADD THE ROUTED FLOW FROM 6B TO THE FLOW FROM 6C FOR TOTAL FLOW INTO 118TH ST
*S BERM, CHANNEL SOUTH
ADD HYD                    ID=15 HYD=6BC I=13 II=14
PRINT HYD                  ID=15 CODE=10
*S
*S COMPUTE FLOWS FROM SUB-BASIN 203N(THE NORTH HALF OF DENNIS CHAVEZ BLVD - 72' OF
PAVEMENT TOTAL)
COMPUTE NM HYD             ID=17  HYD NO=203N  AREA=0.0394 SQ MI
                           A=45  B=17.5  C=17.5  D=20
                           TP=0.1333 HR
                           MASS RAINFALL=-1
PRINT HYD                  ID=17 CODE=1
*S
*S ADD THE ROUTED FLOW FROM 6B+6C TO THE FLOW FROM 203N
ADD HYD                    ID=18 HYD=6BC203N I=15 II=17
PRINT HYD                  ID=18 CODE=1
*S
*S COMPUTE FLOWS FROM NORTH SIDE OF 118TH STREET
COMPUTE NM HYD             ID=19  HYD NO=118TH  AREA=0.0178 SQ MI
                           A=0  B=12  C=13  D=75
                           TP=0.1333 HR
                           MASS RAINFALL=-1
PRINT HYD                  ID=19 CODE=1
*S
*S ADD THE FLOWS FROM 118TH STREET TO 6BC203N
*S FOR THE TOTAL FLOW IN DENNIS CHAVEZ EAST OF 118TH STREET
ADD HYD                    ID=20 HYD=JUNCTION I=18 II=19
PRINT HYD                  ID=20 CODE=10
*S
*S
*S COMPUTE FLOWS FROM SUB-BASIN 204W (COMMERCIAL TRACT DIRECTLY TO CHANNEL)
COMPUTE NM HYD             ID=21  HYD NO=204W  AREA=0.040372 SQ MI
                           A=0  B=20  C=0  D=80
                           TP=0.1333 HR
                           MASS RAINFALL=-1
PRINT HYD                  ID=21 CODE=1
*S
*S ADD THE FLOWS FROM 118TH STREET ON THE NORTH SIDE OF DENNIS CHAVEZ TO THE FLOWS
*S FROM SUB-BASIN 204W AT THE COMERCIAL JUNCTION POINT ON THE NORTH SIDE OF DENNIS
CHAVEZ
ADD HYD                    ID=22 HYD=JUNCTION I=19 II=21
PRINT HYD                  ID=22 CODE=10
*S
*S COMPUTE FLOWS FROM SUB-BASIN 204E (ANDERSON HEIGHTS DIRECTLY TO CHANNEL)
COMPUTE NM HYD             ID=23  HYD NO=204E  AREA=0.088779 SQ MI
```

```
                          A=0  B=43.74  C=0  D=56.26
                          TP=0.13 HR
                          MASS RAINFALL=-1
PRINT HYD                 ID=23 CODE=1
*S
*S ADD THE FLOWS FROM JUNCTION AT THE COMERCIAL TRACT TO THE FLOWS FROM SUB-BASIN
204E
*S THIS IS THE FLOW THAT WILL ENTER THE RIO BRAVO CHANNEL AT THE EASTERN EDGE OF
*S ANDERSON HEIGHTS
ADD HYD                   ID=24 HYD=JUNCTION I=21 II=23
PRINT HYD                 ID=24 CODE=10
*S
*S COMPUTE FLOWS FROM SUB-BASINS 205, 206, 60122 & 60123 (ANDERSON HEIGHTS TO POND
10)
COMPUTE NM HYD            ID=25  HYD NO=INTOPOND10  AREA=0.2714 SQ MI
                          A=0 B=43.74 C=0 D=56.26
                          TP=0.1333 HR
                          MASS RAINFALL=-1
PRINT HYD                 ID=25 CODE=1
*S
*S ROUTE FLOWS THROUGH POND 10 - 30" ORIFICE
ROUTE RESERVOIR           ID=26 HYD=POND10.OUT I=24 CODE=10
                          Q OUT    STORE      ELEV
                           0.0      0.00      5234
                           8.9      2.10      5235
                          23.6      4.31      5236
                          39.4      6.62      5237
                          54.0      9.03      5238
                          60.6     11.55      5239
                          62.4     14.18      5240
                          64.2     16.92      5241
PRINT HYD                 ID=26 CODE=1
*S
COMPUTE RATING CURVE      CID=1  VS NO=1  CODE=-1
                          SLP=0.024 D=3.0 N=0.013
COMPUTE TRAVEL TIME       ID=4  REACH NO=1  NO VS=1  L=1900 FT
                          SLP=0.024
ROUTE                     OUTFLOW ID=4  OUTFLOW HYD=209.1
                          INFLOW ID=25  DT=0.0
PRINT HYD                 ID=4 CODE=1
COMPUTE NM HYD            ID=1  HYD NO=207.0  DA=0.03023 SQ MI
                          %A, B, C, & D 0 27 27 46
                          TP=0.18 HR
                          MASS RAINFALL=-1
PRINT HYD                 ID=1 CODE=1
ADD HYD                   ID=2 HYD=JUNCTION I=4 II=1
PRINT HYD                 ID=2 CODE=10
COMPUTE RATING CURVE      CID=1  VS NO=1  CODE=-1
                          SLP=0.007 D=4.0 N=0.013
COMPUTE TRAVEL TIME       ID=4  REACH NO=1  NO VS=1  L=560 FT
                          SLP=0.007
ROUTE                     OUTFLOW ID=4  OUTFLOW HYD=208.1
                          INFLOW ID=2  DT=0.0
PRINT HYD                 ID=4 CODE=1
COMPUTE NM HYD            ID=1  HYD NO=208.A DA=0.03201 SQ MI
                          %A, B, C, & D 0 29.5 29.5 41
                          TP=0.15 HR
                          MASS RAINFALL=-1
PRINT HYD                 ID=1 CODE=1
ADD HYD                   ID=2 HYD=JUNCTION I=4 II=1
PRINT HYD                 ID=2 CODE=10
COMPUTE RATING CURVE      CID=1  VS NO=1  CODE=-1
                          SLP=0.010 D=4.0 N=0.013
```

```
COMPUTE TRAVEL TIME     ID=4  REACH NO=1  NO VS=1  L=600 FT
                        SLP=0.010
ROUTE                   OUTFLOW ID=4  OUTFLOW HYD=209.1
                        INFLOW ID=2  DT=0.0
PRINT HYD               ID=4 CODE=1
COMPUTE NM HYD          ID=1  HYD NO=208.B  DA=0.02696 SQ MI
                        %A, B, C, & D 0 26.5 26.5 47
                        TP=0.1333 HR
                        MASS RAINFALL=-1
PRINT HYD               ID=1 CODE=1
ADD HYD                 ID=2 HYD=JUNCTION I=4 II=1
PRINT HYD               ID=2 CODE=10
COMPUTE NM HYD          ID=1  HYD NO=209.0  DA=0.0111 SQ MI
                        %A, B, C, & D 0 11 24 65
                        TP=0.27 HR
                        MASS RAINFALL=-1
PRINT HYD               ID=1 CODE=1
ADD HYD                 ID=4 HYD=JUNCTION I=2 II=1
PRINT HYD               ID=4 CODE=10
COMPUTE NM HYD          ID=1  HYD NO=210.0  DA=0.0228 SQ MI
                        %A, B, C, & D 0 30 30 40
                        TP=0.1333 HR
                        MASS RAINFALL=-1
PRINT HYD               ID=1 CODE=1
ADD HYD                 ID=2 HYD=JUNCTION I=23 II=1
PRINT HYD               ID=2 CODE=10
ADD HYD                 ID=3 HYD=JUNCTION I=4 II=2
PRINT HYD               ID=3 CODE=10
COMPUTE RATING CURVE    CID=1  VN=1  NS=1  MIN EL=100  MAX EL=104
                        CS=0.028  FS=0.028  N=0.013  DIST=26
                        DIST    EL      DIST    EL
                        0       104     08       100
                        18      100     26      104
COMPUTE TRAVEL TIME     ID=4  RN=1  NVS=1  L=2750 S=0.028
ROUTE                   ID=4  HYD=210.1 INFLOW ID=3  DT=0.0
PRINT HYD               ID=4  CODE=1
COMPUTE NM HYD          ID=1  HYD NO=211.0  DA=0.1530 SQ MI
                        %A, B, C, & D 0 14 29 57
                        TP=0.21 HR
                        MASS RAINFALL=-1
PRINT HYD               ID=1 CODE=1
COMPUTE NM HYD          ID=2  HYD NO=212.0  DA=0.0095 SQ MI
                        %A, B, C, & D 0 11 24 65
                        TP=0.19 HR
                        MASS RAINFALL=-1
PRINT HYD               ID=2 CODE=1
ADD HYD                 ID=3 HYD=JUNCTION I=1 II=2
PRINT HYD               ID=3 CODE=10
COMPUTE NM HYD          ID=1  HYD NO=213.0  DA=0.0173 SQ MI
                        %A, B, C, & D 0 30 30 40
                        TP=0.1333 HR
                        MASS RAINFALL=-1
PRINT HYD               ID=1 CODE=1
ADD HYD                 ID=2 HYD=JUNCTION I=4 II=1
PRINT HYD               ID=2 CODE=10
ADD HYD                 ID=4 HYD=JUNCTION I=3 II=2
PRINT HYD               ID=4 CODE=10
COMPUTE NM HYD          ID=1  HYD NO=214.0  DA=0.0593 SQ MI
                        %A, B, C, & D 0 14 29 57
                        TP=0.21 HR
                        MASS RAINFALL=-1
PRINT HYD               ID=1 CODE=1
ADD HYD                 ID=2 HYD=JUNCTION I=4 II=1
```

```
PRINT HYD                ID=2 CODE=10
COMPUTE RATING CURVE     CID=1  VN=1  NS=1  MIN EL=100  MAX EL=104
                         CS=0.014  FS=0.014  N=0.013  DIST=26
                         DIST    EL       DIST    EL
                         0       104      08       100
                         18      100      26       104
COMPUTE TRAVEL TIME      ID=4  RN=1  NVS=1  L=1400 S=0.014
ROUTE                    ID=4  HYD=216.1 INFLOW ID=2  DT=0.0
PRINT HYD                ID=4  CODE=1
COMPUTE NM HYD           ID=1  HYD NO=216.0  DA=0.0157 MI
                         %A, B, C, & D 0 30 30 40
                         TP=0.14 HR
                         MASS RAINFALL=-1
PRINT HYD                ID=1 CODE=1
ADD HYD                  ID=2 HYD=JUNCTION I=1 II=4
PRINT HYD                ID=2 CODE=10
FINISH
```

118th STREET PONDS
AHYMO

□(s16.66H□□□□□□□□□□□

```
        AHYMO PROGRAM (AHYMO_97) -                          - Version:  1997.02d
             RUN DATE (MON/DAY/YR) = 10/15/2007
             START TIME (HR:MIN:SEC) = 09:49:36     USER NO.= AHYMO-I-9702dGoodwinM-AH
             INPUT FILE = F:\TomG\ANDERS~1\berms\AHYMOF~1\AHAB10~1.TXT

    START                0.0 HOURS    PC=0   PL=-1
    *S
    *S              RIO BRAVO
    *S
    *S
    *S
    *S 100-YR, 24-HR STORM WITH SEDIMENT
    *S FILE NAME: RB_DMP.DAT
    *S BY: RICHARD STOCKTON
    *S REVISED BY MARK GOODWIN AND ASSOCIATES 5-25-04.
    *S REVISED BY MARK GOODWIN AND ASSOCIATES again 8-8-05.
    *S LAST REVISION: 7-15-03
    *S*************************************************************************
    *S AS-BUILT 5-31-06 (POND # 6 IS ONLY DEVIATION FROM APPROVED PLAN)
    *S JDH 8-15-06 SOUTHERLY 125' OF 300' RIGHT OF WAY OFDENNIS CHAVEZ (BASINS 210,
    *S 213, AND 216) AND ALL OF BASIN 215 DELETED
    *S DUE TO CONSTRICTION AT CONDISHIRE ST BOX CULVERT
    *S*************************************************************************
    *S THE PURPOSE OF THIS MODEL IS TO CALCULATE THE RUNOFF FROM FROM THE
    *S SACATE BLANCO WATERSHED WEST OF THE POWERLINE EASEMENT (AKA SOUTH
    *S POWERLINE DIVERSION AND DETENTION FACILITY);
    *S AND THE RIO BRAVO WATERSHED.
    *S
    *S FLOWS FROM THIS WATERSHED ARE CONVEYED TO HUBBLE LAKE DETENTION
    *S FACILITY VIA THE HUBBLE LAKE/AMOLE DIVERSION CHANNEL.
    *S
    *S THE ORGINIAL RIO BRAVO MODEL WAS DEVELOPED BY AVID (AND ACCEPTED BY
    *S THE COUNTY).  ASSUMPTIONS MADE IN THE AVID MODEL ARE INVALID, AND HAVE
    *S BEEN CORRECTED WITH THE 4-25-03 REVISIONS. DIVERSIONS TO THE BOREGA DAM
    *S AND THE AMOLE CHANNEL REDUCE THIS BASIN AND 114 AC. OF THE SACATE BLANCO
    *S BELOW THE POWER LINE IS ADDED TO THE RIO BRAVO CHANNEL.
    *S PONDS 7 & 9 ARE DELETED AND POND 10 IS ADDED.
    *S*************************************************************************
    *S ANALYSIS ASSUMPTIONS:
    *S*************************************************************************
    *S 1. THE PUNCH HYD COMMAND WAS ADDED TO THE END OF THIS FILE SO THE OUTFALL
    *S    HYDROGRAPH COULD BE USED IN THE AMOLE DEL NORTE EXISTING CONDITIONS MODEL
    *S    AA100D1B.DAT, WHICH WILL BE USED IN THE ANALYSIS OF THE AMOLE ARROYO SYSTE
    *S
    *S
    *S*************************************************************************
    *S RAINFALL FROM NOAA ATLAS 2
    *S THESE VALUES WERE REDUCED FOR AREA BY 12%, 5% AND 3% FOR 1, 6, AND 24 HOUR
    RAINFALL             TYPE=2  0.0  1.64  2.11  2.66    DT=0.05

                  COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
                  DT =    .050000 HOURS       END TIME =    24.000000 HOURS
                     .0000   .0055   .0112   .0171   .0231   .0294   .0359
                     .0426   .0496   .0568   .0644   .0723   .0805   .0892
                     .0983   .1079   .1180   .1289   .1404   .1528   .1663
                     .1732   .1808   .2030   .2553   .3452   .4843   .6846
                     .9584  1.1744  1.2720  1.3535  1.4248  1.4886  1.5464
                    1.5992  1.6475  1.6921  1.7332  1.7711  1.8063  1.8151
                    1.8234  1.8312  1.8386  1.8457  1.8525  1.8590  1.8652
                    1.8712  1.8771  1.8827  1.8882  1.8935  1.8986  1.9037
                    1.9086  1.9134  1.9181  1.9226  1.9271  1.9315  1.9358
                    1.9400  1.9442  1.9483  1.9523  1.9562  1.9601  1.9639
                    1.9676  1.9713  1.9749  1.9785  1.9821  1.9855  1.9890
                    1.9924  1.9957  1.9990  2.0023  2.0055  2.0087  2.0119
                    2.0150  2.0181  2.0211  2.0241  2.0271  2.0301  2.0330
                    2.0359  2.0388  2.0416  2.0444  2.0472  2.0500  2.0527
                    2.0554  2.0581  2.0608  2.0635  2.0661  2.0687  2.0713
                    2.0738  2.0764  2.0789  2.0814  2.0839  2.0863  2.0888
                    2.0912  2.0936  2.0960  2.0984  2.1007  2.1031  2.1054
                    2.1077  2.1100  2.1123  2.1146  2.1169  2.1192  2.1215
                    2.1237  2.1260  2.1283  2.1305  2.1328  2.1350  2.1372
                    2.1394  2.1416  2.1438  2.1460  2.1482  2.1504  2.1526
                    2.1548  2.1569  2.1591  2.1612  2.1634  2.1655  2.1676
                    2.1697  2.1719  2.1740  2.1761  2.1782  2.1803  2.1823
                    2.1844  2.1865  2.1885  2.1906  2.1927  2.1947  2.1967
                    2.1988  2.2008  2.2028  2.2048  2.2068  2.2088  2.2108
                    2.2128  2.2148  2.2168  2.2188  2.2207  2.2227  2.2247
                    2.2266  2.2286  2.2305  2.2324  2.2344  2.2363  2.2382
                    2.2401  2.2420  2.2439  2.2458  2.2477  2.2496  2.2515
```

```
2.2534  2.2552  2.2571  2.2590  2.2608  2.2627  2.2645
2.2664  2.2682  2.2700  2.2719  2.2737  2.2755  2.2773
2.2791  2.2809  2.2827  2.2845  2.2863  2.2881  2.2899
2.2917  2.2935  2.2952  2.2970  2.2987  2.3005  2.3023
2.3040  2.3057  2.3075  2.3092  2.3109  2.3127  2.3144
2.3161  2.3178  2.3195  2.3212  2.3229  2.3246  2.3263
2.3280  2.3297  2.3314  2.3331  2.3347  2.3364  2.3381
2.3397  2.3414  2.3430  2.3447  2.3463  2.3480  2.3496
2.3512  2.3529  2.3545  2.3561  2.3577  2.3594  2.3610
2.3626  2.3642  2.3658  2.3674  2.3690  2.3706  2.3721
2.3737  2.3753  2.3769  2.3785  2.3800  2.3816  2.3832
2.3847  2.3863  2.3878  2.3894  2.3909  2.3925  2.3940
2.3955  2.3971  2.3986  2.4001  2.4017  2.4032  2.4047
2.4062  2.4077  2.4092  2.4107  2.4122  2.4137  2.4152
2.4167  2.4182  2.4197  2.4212  2.4227  2.4241  2.4256
2.4271  2.4285  2.4300  2.4315  2.4329  2.4344  2.4358
2.4373  2.4387  2.4402  2.4416  2.4431  2.4445  2.4459
2.4474  2.4488  2.4502  2.4516  2.4531  2.4545  2.4559
2.4573  2.4587  2.4601  2.4615  2.4629  2.4643  2.4657
2.4671  2.4685  2.4699  2.4713  2.4727  2.4740  2.4754
2.4768  2.4782  2.4795  2.4809  2.4823  2.4836  2.4850
2.4864  2.4877  2.4891  2.4904  2.4918  2.4931  2.4944
2.4958  2.4971  2.4985  2.4998  2.5011  2.5024  2.5038
2.5051  2.5064  2.5077  2.5091  2.5104  2.5117  2.5130
2.5143  2.5156  2.5169  2.5182  2.5195  2.5208  2.5221
2.5234  2.5247  2.5260  2.5272  2.5285  2.5298  2.5311
2.5324  2.5336  2.5349  2.5362  2.5374  2.5387  2.5400
2.5412  2.5425  2.5438  2.5450  2.5463  2.5475  2.5488
2.5500  2.5512  2.5525  2.5537  2.5550  2.5562  2.5574
2.5587  2.5599  2.5611  2.5624  2.5636  2.5648  2.5660
2.5672  2.5685  2.5697  2.5709  2.5721  2.5733  2.5745
2.5757  2.5769  2.5781  2.5793  2.5805  2.5817  2.5829
2.5841  2.5853  2.5865  2.5877  2.5888  2.5900  2.5912
2.5924  2.5936  2.5947  2.5959  2.5971  2.5983  2.5994
2.6006  2.6018  2.6029  2.6041  2.6052  2.6064  2.6076
2.6087  2.6099  2.6110  2.6122  2.6133  2.6144  2.6156
2.6167  2.6179  2.6190  2.6202  2.6213  2.6224  2.6236
2.6247  2.6258  2.6269  2.6281  2.6292  2.6303  2.6314
2.6325  2.6337  2.6348  2.6359  2.6370  2.6381  2.6392
2.6403  2.6414  2.6425  2.6436  2.6447  2.6458  2.6469
2.6480  2.6491  2.6502  2.6513  2.6524  2.6535  2.6546
2.6557  2.6568  2.6578  2.6589  2.6600

* *S 10 YEAR 24HR STORM  CONDITION
* RAINFALL            TYPE=2  0.0  1.08  1.41  1.78    DT=0.05
*S*************************************************************************
*S
*S*********************************************************
*S ADD BASINS FROM SOUTH POWERLINE DIVERSION
*S TO THE RIO BRAVO RUN
*S
*S*********************************************************
*S
*S  APPLY A 3% SEDIMENT BULKING FACTOR TO ALL COMPUTED HYDROGRAPHS
SEDIMENT BULK          CODE=1   BULKING FACTOR = 1.03
*S CALCULATE THE FLOW FROM SUB-BASINS A60106, A60107, 60108 & 60109
*S INTO POND 2
COMPUTE NM HYD         ID=1  HYD=INTOPOND2  AREA=0.2018 SQ MI
                       A=90  B=10  C=0  D=0
                       TP=0.1333   MASSRAIN=-1

     K =   .151952HR    TP =   .133300HR    K/TP RATIO =  1.139924     SHAPE CONSTANT, N =  3.106152
     UNIT PEAK =   439.58    CFS   UNIT VOLUME =    .9995       B =   290.37      P60 = 1.6400
     AREA =      .201800 SQ MI    IA =    .63500 INCHES    INF =   1.62800 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

    BULKING FACTOR APPLIED TO HYDROGRAPH.  FACTOR =  1.03000 AT PEAK FLOW.

PRINT HYD              ID=1  CODE=1

                                   HYDROGRAPH FROM AREA INTOPOND2


    RUNOFF VOLUME =      .38393 INCHES     =       4.1320 ACRE-FEET
    PEAK DISCHARGE RATE =     156.55 CFS  AT   1.500 HOURS   BASIN AREA =   .2018 SQ. MI.


*S
*S CALCULATE THE FLOW FROM SUB-BASIN 60110 INTO POND 3A
COMPUTE NM HYD         ID=2  HYD=INTOPOND3A  AREA=0.0075 SQ MI
```

```
                        A=100  B=0  C=0  D=0
                        TP=0.1333   MASSRAIN=-1

     K =   .169482HR    TP =   .133300HR    K/TP RATIO =  1.271433     SHAPE CONSTANT, N =  2.810713
     UNIT PEAK =   14.967    CFS   UNIT VOLUME =    .9970       B =   266.01      P60 = 1.6400
     AREA =      .007500 SQ MI    IA =    .65000 INCHES    INF =   1.67000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

    BULKING FACTOR APPLIED TO HYDROGRAPH.  FACTOR =  1.03000 AT PEAK FLOW.

PRINT HYD               ID=2  CODE=1

                                        HYDROGRAPH FROM AREA INTOPOND3A

    RUNOFF VOLUME =      .36779 INCHES     =        .1471 ACRE-FEET
    PEAK DISCHARGE RATE =       5.20 CFS  AT   1.500 HOURS   BASIN AREA =   .0075 SQ. MI.


*S
*S CALCULATE THE FLOW FROM SUB-BASIN 60111
*S INTO POND 3B
COMPUTE NM HYD          ID=3  HYD=INTOPOND3B  AREA=0.1430 SQ MI
                        A=80   B=20 C=0  D=0
                        TP=0.1333   MASSRAIN=-1

     K =   .155042HR    TP =   .133300HR    K/TP RATIO =  1.163109     SHAPE CONSTANT, N =  3.048008
     UNIT PEAK =   306.50    CFS   UNIT VOLUME =    .9992       B =   285.71      P60 = 1.6400
     AREA =      .143000 SQ MI    IA =    .62000 INCHES    INF =   1.58600 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

    BULKING FACTOR APPLIED TO HYDROGRAPH.  FACTOR =  1.03000 AT PEAK FLOW.

PRINT HYD               ID=3  CODE=1

                                        HYDROGRAPH FROM AREA INTOPOND3B

    RUNOFF VOLUME =      .40245 INCHES     =       3.0693 ACRE-FEET
    PEAK DISCHARGE RATE =     113.48 CFS  AT   1.500 HOURS   BASIN AREA =   .1430 SQ. MI.


*S
*S ADD THE ROUTED FLOW FROM 3A TO THE FLOW FROM 3B FOR TOTAL FLOW INTO POND 3B
*S
ADD HYD                 ID=4 HYD=3AB I=2 II=3
PRINT HYD               ID=4 CODE=10

                                        HYDROGRAPH FROM AREA 3AB

        TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME
FLOW
         HRS       CFS           HRS       CFS           HRS       CFS           HRS       CFS           HRS
CFS
        .000        .0          1.500     118.7         3.000       1.2         4.500       .0
        .500        .0          2.000      10.1         3.500        .4         5.000       .0
       1.000        .0          2.500       3.5         4.000        .1         5.500       .0

    RUNOFF VOLUME =      .40072 INCHES     =       3.2164 ACRE-FEET
    PEAK DISCHARGE RATE =     118.68 CFS  AT   1.500 HOURS   BASIN AREA =   .1505 SQ. MI.


*S
*S CALCULATE THE FLOW FROM SUB-BASINS 60116
*S INTO POND 4A
COMPUTE NM HYD          ID=5  HYD=INTOPOND4A  AREA=0.0398 SQ MI
                        A=95  B=5 C=0  D=0
                        TP=0.1333   MASSRAIN=-1

     K =   .167760HR    TP =   .133300HR    K/TP RATIO =  1.258514     SHAPE CONSTANT, N =  2.836368
     UNIT PEAK =   80.077    CFS   UNIT VOLUME =    .9980       B =   268.20      P60 = 1.6400
     AREA =      .039800 SQ MI    IA =    .64250 INCHES    INF =   1.64900 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

    BULKING FACTOR APPLIED TO HYDROGRAPH.  FACTOR =  1.03000 AT PEAK FLOW.

PRINT HYD               ID=5  CODE=1
```

HYDROGRAPH FROM AREA INTOPOND4A

RUNOFF VOLUME = .37576 INCHES = .7976 ACRE-FEET
PEAK DISCHARGE RATE = 28.28 CFS AT 1.500 HOURS BASIN AREA = .0398 SQ. MI.

```
*S
*S CALCULATE THE FLOW FROM SUB-BASINS A60113
*S INTO POND 4B
COMPUTE NM HYD          ID=6  HYD=INTOPOND4B  AREA=0.0563 SQ MI
                        A=95  B=5 C=0  D=0
                        TP=0.1333   MASSRAIN=-1

     K =   .167760HR    TP =   .133300HR    K/TP RATIO =  1.258514     SHAPE CONSTANT, N =  2.836368
     UNIT PEAK =   113.27    CFS   UNIT VOLUME =    .9980       B =   268.20      P60 = 1.6400
     AREA =      .056300 SQ MI    IA =    .64250 INCHES    INF =   1.64900 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

    BULKING FACTOR APPLIED TO HYDROGRAPH.  FACTOR =  1.03000 AT PEAK FLOW.

PRINT HYD               ID=6  CODE=1
```

HYDROGRAPH FROM AREA INTOPOND4B

RUNOFF VOLUME = .37576 INCHES = 1.1283 ACRE-FEET
PEAK DISCHARGE RATE = 40.00 CFS AT 1.500 HOURS BASIN AREA = .0563 SQ. MI.

```
*S
*S ADD THE ROUTED FLOW FROM 4A TO THE FLOW FROM 4B FOR TOTAL FLOW INTO POND 4B
*S
ADD HYD                 ID=7 HYD=4AB I=5 II=6
PRINT HYD               ID=7 CODE=10
```

HYDROGRAPH FROM AREA 4AB

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.500	68.3	3.000	.8	4.500	.0		
.500	.0	2.000	6.2	3.500	.3	5.000	.0		
1.000	.0	2.500	2.3	4.000	.1	5.500	.0		

RUNOFF VOLUME = .37576 INCHES = 1.9259 ACRE-FEET
PEAK DISCHARGE RATE = 68.28 CFS AT 1.500 HOURS BASIN AREA = .0961 SQ. MI.

```
*S
*S CALCULATE THE FLOW FROM SUB-BASIN 5A INTO POND 5
COMPUTE NM HYD          ID=8  HYD=5A  AREA=0.180 SQ MI
                        A=80  B=15  C=5  D=0
                        TP=0.133  MASSRAIN=-1

     K =   .150035HR    TP =   .133000HR    K/TP RATIO =  1.128079     SHAPE CONSTANT, N =  3.137019
     UNIT PEAK =   396.28    CFS   UNIT VOLUME =    .9997       B =   292.81      P60 = 1.6400
     AREA =      .180000 SQ MI    IA =    .61250 INCHES    INF =   1.56500 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

    BULKING FACTOR APPLIED TO HYDROGRAPH.  FACTOR =  1.03000 AT PEAK FLOW.

PRINT HYD               ID=8  CODE=1
```

HYDROGRAPH FROM AREA 5A

RUNOFF VOLUME = .41183 INCHES = 3.9535 ACRE-FEET
PEAK DISCHARGE RATE = 148.85 CFS AT 1.500 HOURS BASIN AREA = .1800 SQ. MI.

```
*S
*S CALCULATE THE FLOW FROM SUB-BASIN 5B INTO POND 5 VIA CHANNEL WEST
COMPUTE NM HYD          ID=9 HYD NO=5B  AREA=0.1258 SQ MI
                        A=85  B=14  C=1  D=0
                        TP=0.133 HR
```

```
                    MASS RAINFALL=-1

     K =   .157519HR    TP =   .133000HR    K/TP RATIO =  1.184355     SHAPE CONSTANT, N =  2.997196
     UNIT PEAK =   266.35    CFS   UNIT VOLUME =    .9988       B =   281.59      P60 = 1.6400
     AREA =      .125800 SQ MI    IA =    .62600 INCHES    INF =   1.60280 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

    BULKING FACTOR APPLIED TO HYDROGRAPH.  FACTOR =  1.03000 AT PEAK FLOW.

PRINT HYD              ID=9 CODE=1

                                   HYDROGRAPH FROM AREA 5B

    RUNOFF VOLUME =      .39500 INCHES     =       2.6502 ACRE-FEET
    PEAK DISCHARGE RATE =      97.39 CFS  AT   1.500 HOURS   BASIN AREA =   .1258 SQ. MI.


*s
*S COMPUTE FLOWS FROM SUB-BASIN 5C INTO POND 5 VIA CHANNEL NORTH
COMPUTE NM HYD         ID=10  HYD NO=5C  AREA=0.0121 SQ MI
                            A=60  B=40  C=0  D=0
                       TP=0.133 HR
                       MASS RAINFALL=-1

     K =   .155354HR    TP =   .133000HR    K/TP RATIO =  1.168078     SHAPE CONSTANT, N =  3.035917
     UNIT PEAK =   25.905    CFS   UNIT VOLUME =    .9987       B =   284.74      P60 = 1.6400
     AREA =      .012100 SQ MI    IA =    .59000 INCHES    INF =   1.50200 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

    BULKING FACTOR APPLIED TO HYDROGRAPH.  FACTOR =  1.03000 AT PEAK FLOW.

PRINT HYD              ID=10 CODE=1

                                   HYDROGRAPH FROM AREA 5C

    RUNOFF VOLUME =      .44046 INCHES     =       .2842 ACRE-FEET
    PEAK DISCHARGE RATE =      10.31 CFS  AT   1.500 HOURS   BASIN AREA =   .0121 SQ. MI.


*S
*S ADD THE ROUTED FLOW FROM 5B TO THE FLOW FROM 5C FOR TOTAL FLOW INTO POND 5
*S OVER POND 5 WEIR
ADD HYD                ID=11 HYD=5BC I=9 II=10
PRINT HYD              ID=11 CODE=10

                                   HYDROGRAPH FROM AREA 5BC

      TIME    FLOW        TIME    FLOW        TIME    FLOW        TIME    FLOW        TIME    FLOW
       HRS     CFS         HRS     CFS         HRS     CFS         HRS     CFS         HRS     CFS
      .000     .0        1.500   107.7       3.000    1.1       4.500     .0
      .500     .0        2.000     9.3       3.500     .4       5.000     .0
     1.000     .0        2.500     3.2       4.000     .1       5.500     .0

    RUNOFF VOLUME =      .39899 INCHES     =       2.9344 ACRE-FEET
    PEAK DISCHARGE RATE =     107.70 CFS  AT   1.500 HOURS   BASIN AREA =   .1379 SQ. MI.


*S
*S ADD THE ROUTED FLOW FROM 5A TO THE FLOW FROM 5B+5C FOR TOTAL FLOW INTO POND 5
*S
ADD HYD                ID=12 HYD=5ABC I=8 II=11
PRINT HYD              ID=12 CODE=10

                                   HYDROGRAPH FROM AREA 5ABC

      TIME    FLOW        TIME    FLOW        TIME    FLOW        TIME    FLOW        TIME    FLOW
       HRS     CFS         HRS     CFS         HRS     CFS         HRS     CFS         HRS     CFS
      .000     .0        1.500   256.5       3.000    2.4       4.500     .1
      .500     .0        2.000    21.6       3.500     .8       5.000     .0
     1.000     .0        2.500     7.3       4.000     .3       5.500     .0

    RUNOFF VOLUME =      .40626 INCHES     =       6.8879 ACRE-FEET
```

```
    PEAK DISCHARGE RATE =     256.55 CFS  AT   1.500 HOURS   BASIN AREA =   .3179 SQ. MI.


*S
*S COMPUTE FLOWS FROM SUB-BASIN 6B
COMPUTE NM HYD          ID=13  HYD NO=6B  AREA=0.0068 SQ MI
                        A=30  B=70  C=0  D=0
                        TP=0.133 HR
                        MASS RAINFALL=-1

     K =   .145045HR    TP =   .133000HR    K/TP RATIO =  1.090562     SHAPE CONSTANT, N =  3.240312
     UNIT PEAK =   15.382    CFS   UNIT VOLUME =    .9991       B =   300.86      P60 = 1.6400
     AREA =      .006800 SQ MI    IA =    .54500 INCHES    INF =   1.37600 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

    BULKING FACTOR APPLIED TO HYDROGRAPH.  FACTOR =  1.03000 AT PEAK FLOW.

PRINT HYD               ID=13 CODE=1

                                    HYDROGRAPH FROM AREA 6B


    RUNOFF VOLUME =       .50248 INCHES     =         .1822 ACRE-FEET
    PEAK DISCHARGE RATE =       6.72 CFS  AT   1.500 HOURS   BASIN AREA =   .0068 SQ. MI.


*S
*S COMPUTE FLOWS FROM SUB-BASIN 6C
COMPUTE NM HYD          ID=14  HYD NO=6C  AREA=0.0687 SQ MI
                        A=50  B=50  C=0  D=0
                        TP=0.133 HR
                        MASS RAINFALL=-1

     K =   .151473HR    TP =   .133000HR    K/TP RATIO =  1.138897     SHAPE CONSTANT, N =  3.108798
     UNIT PEAK =   150.09    CFS   UNIT VOLUME =    .9995       B =   290.58      P60 = 1.6400
     AREA =      .068700 SQ MI    IA =    .57500 INCHES    INF =   1.46000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

    BULKING FACTOR APPLIED TO HYDROGRAPH.  FACTOR =  1.03000 AT PEAK FLOW.

PRINT HYD               ID=14 CODE=1

                                    HYDROGRAPH FROM AREA 6C


    RUNOFF VOLUME =       .45995 INCHES     =        1.6853 ACRE-FEET
    PEAK DISCHARGE RATE =      61.63 CFS  AT   1.500 HOURS   BASIN AREA =   .0687 SQ. MI.


*S
*S ADD THE ROUTED FLOW FROM 6B TO THE FLOW FROM 6C FOR TOTAL FLOW INTO 118TH ST
*S BERM, CHANNEL SOUTH
ADD HYD                 ID=15 HYD=6BC I=13 II=14
PRINT HYD               ID=15 CODE=10

                                  HYDROGRAPH FROM AREA 6BC

        TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME
FLOW
         HRS       CFS           HRS       CFS           HRS       CFS           HRS       CFS           HRS
CFS
        .000        .0          1.500      68.4         3.000        .6         4.500        .0
        .500        .0          2.000       5.8         3.500        .2         5.000        .0
       1.000        .0          2.500       1.9         4.000        .1

      RUNOFF VOLUME =       .46378 INCHES     =        1.8675 ACRE-FEET
      PEAK DISCHARGE RATE =      68.35 CFS  AT   1.500 HOURS   BASIN AREA =   .0755 SQ. MI.


    *S
    *S COMPUTE FLOWS FROM SUB-BASIN 203N(THE NORTH HALF OF DENNIS CHAVEZ BLVD - 72'
    COMPUTE NM HYD          ID=17  HYD NO=203N  AREA=0.0394 SQ MI
                            A=45  B=17.5  C=17.5  D=20
                            TP=0.1333 HR
                            MASS RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
```

```
 UNIT PEAK =   31.111    CFS   UNIT VOLUME =    .9988       B =   526.28      P60 = 1.6400
 AREA =      .007880 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


 K =   .147650HR    TP =   .133300HR    K/TP RATIO =  1.107654     SHAPE CONSTANT, N =  3.192173
 UNIT PEAK =   70.260    CFS   UNIT VOLUME =    .9997       B =   297.13      P60 = 1.6400
 AREA =      .031520 SQ MI    IA =    .55156 INCHES    INF =   1.39437 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

BULKING FACTOR APPLIED TO HYDROGRAPH.  FACTOR =  1.03000 AT PEAK FLOW.

PRINT HYD              ID=17 CODE=1

                                   HYDROGRAPH FROM AREA 203N


RUNOFF VOLUME =      .89081 INCHES     =       1.8719 ACRE-FEET
PEAK DISCHARGE RATE =      49.94 CFS  AT   1.500 HOURS   BASIN AREA =   .0394 SQ. MI.



*S
*S ADD THE ROUTED FLOW FROM 6B+6C TO THE FLOW FROM 203N
ADD HYD                ID=18 HYD=6BC203N I=15 II=17
PRINT HYD              ID=18 CODE=1

                                   HYDROGRAPH FROM AREA 6BC203N


RUNOFF VOLUME =      .61021 INCHES     =       3.7394 ACRE-FEET
PEAK DISCHARGE RATE =     118.30 CFS  AT   1.500 HOURS   BASIN AREA =   .1149 SQ. MI.



*S
*S COMPUTE FLOWS FROM NORTH SIDE OF 118TH STREET
COMPUTE NM HYD         ID=19  HYD NO=118TH  AREA=0.0178 SQ MI
                       A=0  B=12  C=13  D=75
                       TP=0.1333 HR
                       MASS RAINFALL=-1

 K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
 UNIT PEAK =   52.707    CFS   UNIT VOLUME =    .9989       B =   526.28      P60 = 1.6400
 AREA =      .013350 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


 K =   .118963HR    TP =   .133300HR    K/TP RATIO =   .892442     SHAPE CONSTANT, N =  3.973368
 UNIT PEAK =   11.797    CFS   UNIT VOLUME =   1.000       B =   353.39      P60 = 1.6400
 AREA =      .004450 SQ MI    IA =    .42200 INCHES    INF =   1.03160 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

BULKING FACTOR APPLIED TO HYDROGRAPH.  FACTOR =  1.03000 AT PEAK FLOW.

PRINT HYD              ID=19 CODE=1

                                   HYDROGRAPH FROM AREA 118TH


RUNOFF VOLUME =     2.04013 INCHES     =       1.9368 ACRE-FEET
PEAK DISCHARGE RATE =      39.47 CFS  AT   1.500 HOURS   BASIN AREA =   .0178 SQ. MI.



*S
*S ADD THE FLOWS FROM 118TH STREET TO 6BC203N
*S FOR THE TOTAL FLOW IN DENNIS CHAVEZ EAST OF 118TH STREET
ADD HYD                ID=20 HYD=JUNCTION I=18 II=19
PRINT HYD              ID=20 CODE=10

                                   HYDROGRAPH FROM AREA JUNCTION

        TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME
FLOW
         HRS       CFS           HRS       CFS           HRS       CFS           HRS       CFS           HRS
CFS
        .000        .0          5.000        .6         10.000        .5         15.000        .4
20.000        .3
        .500        .0          5.500        .6         10.500        .5         15.500        .4
20.500        .3
```

	1.000	2.3	6.000	.6	11.000	.5	16.000	.4
21.000	.3							
	1.500	157.8	6.500	.6	11.500	.5	16.500	.4
21.500	.3							
	2.000	22.0	7.000	.6	12.000	.5	17.000	.4
22.000	.3							
	2.500	4.8	7.500	.6	12.500	.5	17.500	.4
22.500	.3							
	3.000	1.8	8.000	.6	13.000	.4	18.000	.4
23.000	.3							
	3.500	.9	8.500	.6	13.500	.4	18.500	.4
23.500	.3							
	4.000	.7	9.000	.5	14.000	.4	19.000	.4
24.000	.3							
	4.500	.6	9.500	.5	14.500	.4	19.500	.4
24.500	.0							

RUNOFF VOLUME = .80201 INCHES = 5.6761 ACRE-FEET
PEAK DISCHARGE RATE = 157.76 CFS AT 1.500 HOURS BASIN AREA = .1327 SQ. MI.

```
*S
*S
*S COMPUTE FLOWS FROM SUB-BASIN 204W (COMMERCIAL TRACT DIRECTLY TO CHANNEL)
COMPUTE NM HYD          ID=21  HYD NO=204W  AREA=0.040372 SQ MI
                        A=0  B=20  C=0  D=80
                        TP=0.1333 HR
                        MASS RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   127.51    CFS   UNIT VOLUME =    .9990       B =   526.28      P60 = 1.6400
     AREA =      .032298 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


     K =   .135039HR    TP =   .133300HR    K/TP RATIO =  1.013045     SHAPE CONSTANT, N =  3.484507
     UNIT PEAK =   19.335    CFS   UNIT VOLUME =    1.000       B =   319.20      P60 = 1.6400
     AREA =      .008074 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

    BULKING FACTOR APPLIED TO HYDROGRAPH.  FACTOR =  1.03000 AT PEAK FLOW.

PRINT HYD               ID=21 CODE=1
```

HYDROGRAPH FROM AREA 204W

RUNOFF VOLUME = 2.10119 INCHES = 4.5242 ACRE-FEET
PEAK DISCHARGE RATE = 89.62 CFS AT 1.500 HOURS BASIN AREA = .0404 SQ. MI.

```
*S
*S ADD THE FLOWS FROM 118TH STREET ON THE NORTH SIDE OF DENNIS CHAVEZ TO THE FLO
*S FROM SUB-BASIN 204W AT THE COMERCIAL JUNCTION POINT ON THE NORTH SIDE OF DENN
ADD HYD                 ID=22 HYD=JUNCTION I=19 II=21
PRINT HYD               ID=22 CODE=10
```

HYDROGRAPH FROM AREA JUNCTION

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
.000	.0	5.500	1.3	11.000	1.1	16.500	.8		
.500	.0	6.000	1.4	11.500	1.0	17.000	.8		
1.000	5.0	6.500	1.4	12.000	1.0	17.500	.8		
1.500	129.1	7.000	1.3	12.500	1.0	18.000	.8		
2.000	29.4	7.500	1.3	13.000	1.0	18.500	.8		
2.500	4.5	8.000	1.3	13.500	.9	19.000	.8		
3.000	2.0	8.500	1.2	14.000	.9	19.500	.8		
3.500	1.4	9.000	1.2	14.500	.9	20.000	.7		
4.000	1.2	9.500	1.2	15.000	.9	20.500	.7		

4.500	1.2	10.000	1.1	15.500	.9	21.000	.7
5.000	1.2	10.500	1.1	16.000	.9	21.500	.7

RUNOFF VOLUME = 2.08250 INCHES = 6.4609 ACRE-FEET
PEAK DISCHARGE RATE = 129.08 CFS AT 1.500 HOURS BASIN AREA = .0582 SQ. MI.

```
*S
*S COMPUTE FLOWS FROM SUB-BASIN 204E (ANDERSON HEIGHTS DIRECTLY TO CHANNEL)
COMPUTE NM HYD          ID=23  HYD NO=204E  AREA=0.088779 SQ MI
                        A=0  B=43.74  C=0  D=56.26
                        TP=0.13 HR
                        MASS RAINFALL=-1
```

K = .071573HR TP = .130000HR K/TP RATIO = .550559 SHAPE CONSTANT, N = 7.014762
UNIT PEAK = 200.54 CFS UNIT VOLUME = .9993 B = 521.95 P60 = 1.6400
AREA = .049947 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .130792HR TP = .130000HR K/TP RATIO = 1.006093 SHAPE CONSTANT, N = 3.508723
UNIT PEAK = 95.875 CFS UNIT VOLUME = 1.001 B = 320.97 P60 = 1.6400
AREA = .038832 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.03000 AT PEAK FLOW.

```
PRINT HYD               ID=23 CODE=1
```

HYDROGRAPH FROM AREA 204E

RUNOFF VOLUME = 1.64761 INCHES = 7.8012 ACRE-FEET
PEAK DISCHARGE RATE = 170.20 CFS AT 1.500 HOURS BASIN AREA = .0888 SQ. MI.

```
*S
*S ADD THE FLOWS FROM JUNCTION AT THE COMERCIAL TRACT TO THE FLOWS FROM SUB-BASI
*S THIS IS THE FLOW THAT WILL ENTER THE RIO BRAVO CHANNEL AT THE EASTERN EDGE OF
*S ANDERSON HEIGHTS
ADD HYD                 ID=24 HYD=JUNCTION I=21 II=23
PRINT HYD               ID=24 CODE=10
```

HYDROGRAPH FROM AREA JUNCTION

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	5.500	2.3	11.000	1.9	16.500	1.5	22.000	1.2
.500	.0	6.000	2.5	11.500	1.9	17.000	1.5	22.500	1.2
1.000	9.0	6.500	2.5	12.000	1.8	17.500	1.5	23.000	1.2
1.500	259.8	7.000	2.4	12.500	1.8	18.000	1.4	23.500	1.2
2.000	54.8	7.500	2.3	13.000	1.7	18.500	1.4	24.000	1.2
2.500	8.6	8.000	2.3	13.500	1.7	19.000	1.4	24.500	.1
3.000	3.7	8.500	2.2	14.000	1.7	19.500	1.4	25.000	.0
3.500	2.6	9.000	2.1	14.500	1.6	20.000	1.3		
4.000	2.2	9.500	2.1	15.000	1.6	20.500	1.3		
4.500	2.2	10.000	2.0	15.500	1.6	21.000	1.3		
5.000	2.2	10.500	2.0	16.000	1.5	21.500	1.3		

RUNOFF VOLUME = 1.78939 INCHES = 12.3253 ACRE-FEET
PEAK DISCHARGE RATE = 259.82 CFS AT 1.500 HOURS BASIN AREA = .1292 SQ. MI.

```
*S
*S COMPUTE FLOWS FROM SUB-BASINS 205, 206, 60122 & 60123 (ANDERSON HEIGHTS TO PO
COMPUTE NM HYD          ID=25  HYD NO=INTOPOND10  AREA=0.2714 SQ MI
                        A=0 B=43.74 C=0 D=56.26
                        TP=0.1333 HR
                        MASS RAINFALL=-1
```

K = .078539HR TP = .133300HR K/TP RATIO = .589187 SHAPE CONSTANT, N = 6.437843
UNIT PEAK = 565.84 CFS UNIT VOLUME = .9985 B = 493.99 P60 = 1.6400
AREA = .152690 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .127673HR TP = .133300HR K/TP RATIO = .957785 SHAPE CONSTANT, N = 3.689317
UNIT PEAK = 297.35 CFS UNIT VOLUME = 1.001 B = 333.90 P60 = 1.6400
AREA = .118710 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.03000 AT PEAK FLOW.

PRINT HYD ID=25 CODE=1

HYDROGRAPH FROM AREA INTOPOND10

RUNOFF VOLUME = 1.64761 INCHES = 23.8484 ACRE-FEET
PEAK DISCHARGE RATE = 510.37 CFS AT 1.500 HOURS BASIN AREA = .2714 SQ. MI.

*S
*S ROUTE FLOWS THROUGH POND 10 - 30" ORIFICE
ROUTE RESERVOIR ID=26 HYD=POND10.OUT I=24 CODE=10

Q OUT	STORE	ELEV
0.0	0.00	5234
8.9	2.10	5235
23.6	4.31	5236
39.4	6.62	5237
54.0	9.03	5238
60.6	11.55	5239
62.4	14.18	5240
64.2	16.92	5241

* * * * * * * * * * * * * * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	5234.00	.000	.00
.50	.00	5234.00	.000	.00
1.00	9.05	5234.05	.104	.44
1.50	259.82	5235.40	2.995	14.85
2.00	54.77	5236.98	6.574	39.08
2.50	8.58	5236.72	5.962	34.90
3.00	3.68	5236.26	4.902	27.65
3.50	2.55	5235.87	4.014	21.63
4.00	2.20	5235.55	3.317	16.99
4.50	2.15	5235.31	2.781	13.43
5.00	2.19	5235.12	2.374	10.72
5.50	2.32	5234.98	2.068	8.76
6.00	2.48	5234.87	1.827	7.74
6.50	2.47	5234.77	1.628	6.90
7.00	2.41	5234.69	1.458	6.18
7.50	2.34	5234.63	1.313	5.57
8.00	2.25	5234.57	1.189	5.04
8.50	2.19	5234.52	1.082	4.58
9.00	2.13	5234.47	.990	4.19
9.50	2.07	5234.43	.910	3.86
10.00	2.01	5234.40	.841	3.56
10.50	1.97	5234.37	.781	3.31
11.00	1.91	5234.35	.729	3.09
11.50	1.86	5234.33	.683	2.89
12.00	1.82	5234.31	.643	2.73
12.50	1.77	5234.29	.608	2.58
13.00	1.72	5234.27	.577	2.45
13.50	1.70	5234.26	.549	2.33
14.00	1.66	5234.25	.525	2.22
14.50	1.64	5234.24	.503	2.13
15.00	1.60	5234.23	.483	2.05
15.50	1.57	5234.22	.466	1.97
16.00	1.53	5234.21	.450	1.91
16.50	1.51	5234.21	.435	1.84
17.00	1.48	5234.20	.422	1.79
17.50	1.46	5234.20	.410	1.74
18.00	1.42	5234.19	.399	1.69
18.50	1.40	5234.18	.388	1.64
19.00	1.38	5234.18	.379	1.60

19.50	1.37	5234.18	.370	1.57
20.00	1.32	5234.17	.361	1.53
20.50	1.31	5234.17	.353	1.50
21.00	1.29	5234.16	.346	1.47
21.50	1.27	5234.16	.339	1.44
22.00	1.24	5234.16	.333	1.41
22.50	1.23	5234.16	.326	1.38
23.00	1.21	5234.15	.320	1.36
23.50	1.20	5234.15	.315	1.33
24.00	1.17	5234.15	.309	1.31
24.50	.06	5234.13	.274	1.16
25.00	.01	5234.11	.231	.98
25.50	.00	5234.09	.194	.82
26.00	.00	5234.08	.163	.69
26.50	.00	5234.06	.137	.58
27.00	.00	5234.05	.115	.49
27.50	.00	5234.05	.096	.41

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
28.00	.00	5234.04	.081	.34
28.50	.00	5234.03	.068	.29
29.00	.00	5234.03	.057	.24
29.50	.00	5234.02	.048	.20

PEAK DISCHARGE = 39.543 CFS - PEAK OCCURS AT HOUR 2.10
MAXIMUM WATER SURFACE ELEVATION = 5237.010
MAXIMUM STORAGE = 6.6436 AC-FT INCREMENTAL TIME= .050000HRS

PRINT HYD ID=26 CODE=1

HYDROGRAPH FROM AREA POND10.OUT

RUNOFF VOLUME = 1.78352 INCHES = 12.2849 ACRE-FEET
PEAK DISCHARGE RATE = 39.54 CFS AT 2.100 HOURS BASIN AREA = .1292 SQ. MI.

*S
COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1
SLP=0.024 D=3.0 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.16	.14	.54	1.33
.31	.39	2.35	1.83
.47	.71	5.47	2.18
.63	1.07	9.84	2.44
.78	1.46	15.36	2.63
.94	1.89	21.92	2.78
1.09	2.33	29.36	2.89
1.25	2.79	37.54	2.96
1.41	3.26	46.28	2.99
1.56	3.72	55.39	3.00
1.72	4.19	64.66	3.00
1.88	4.65	73.88	3.00
2.03	5.10	82.81	3.00
2.19	5.53	91.16	3.00
2.35	5.93	98.65	3.00
2.50	6.30	104.87	3.00
2.66	6.62	109.32	3.00
2.81	6.89	111.15	3.00
3.00	7.07	111.15	3.00

COMPUTE TRAVEL TIME ID=4 REACH NO=1 NO VS=1 L=1900 FT
SLP=0.024

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.156	.140	.54	.1368
.313	.391	2.35	.0877
.469	.706	5.47	.0681
.625	1.068	9.84	.0573
.782	1.465	15.36	.0503

.938	1.889	21.92	.0455
1.094	2.332	29.36	.0419
1.251	2.790	37.54	.0392
1.407	3.255	46.28	.0371
1.563	3.724	55.39	.0355
1.720	4.191	64.66	.0342
1.876	4.650	73.88	.0332
2.032	5.097	82.81	.0325
2.189	5.525	91.16	.0320
2.345	5.928	98.65	.0317
2.501	6.297	104.87	.0317
2.658	6.622	109.32	.0320
2.814	6.887	111.15	.0327
3.000	7.069	111.15	.0336

```
    ROUTE                   OUTFLOW ID=4  OUTFLOW HYD=209.1
                            INFLOW ID=25  DT=0.0
TRAVEL TIME TABLE EXCEEDED
    PRINT HYD               ID=4 CODE=1

                                PARTIAL HYDROGRAPH   209.10


      RUNOFF VOLUME =     1.64761 INCHES     =      23.8484 ACRE-FEET
      PEAK DISCHARGE RATE =     477.37 CFS  AT   1.550 HOURS   BASIN AREA =    .2714 SQ. MI.


COMPUTE NM HYD          ID=1  HYD NO=207.0  DA=0.03023 SQ MI
                        %A, B, C, & D 0 27 27 46
                        TP=0.18 HR
                        MASS RAINFALL=-1

     K =    .098100HR    TP =    .180000HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   40.657    CFS   UNIT VOLUME =     .9993       B =   526.28      P60 = 1.6400
     AREA =       .013906 SQ MI    IA =     .10000 INCHES    INF =     .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000


     K =    .161475HR    TP =    .180000HR    K/TP RATIO =    .897081     SHAPE CONSTANT, N =  3.951476
     UNIT PEAK =   31.916    CFS   UNIT VOLUME =     .9999       B =   351.92      P60 = 1.6400
     AREA =       .016324 SQ MI    IA =     .42500 INCHES    INF =    1.04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000

    BULKING FACTOR APPLIED TO HYDROGRAPH.  FACTOR =  1.03000 AT PEAK FLOW.

PRINT HYD               ID=1 CODE=1

                                PARTIAL HYDROGRAPH   207.00


    RUNOFF VOLUME =     1.52279 INCHES     =       2.4551 ACRE-FEET
    PEAK DISCHARGE RATE =      48.84 CFS  AT   1.550 HOURS   BASIN AREA =    .0302 SQ. MI.


ADD HYD                 ID=2 HYD=JUNCTION I=4 II=1
PRINT HYD               ID=2 CODE=10
```

HYDROGRAPH FROM AREA JUNCTION

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	5.500	4.7	11.000	3.9	16.500	3.1	22.000	2.5
.500	.0	6.000	5.0	11.500	3.8	17.000	3.0	22.500	2.5
1.000	16.1	6.500	5.0	12.000	3.7	17.500	2.9	23.000	2.5
1.500	499.1	7.000	4.9	12.500	3.6	18.000	2.9	23.500	2.4
2.000	132.0	7.500	4.7	13.000	3.5	18.500	2.8	24.000	2.4
2.500	21.7	8.000	4.6	13.500	3.5	19.000	2.8	24.500	.3
3.000	8.7	8.500	4.4	14.000	3.4	19.500	2.8	25.000	.0
3.500	5.5	9.000	4.3	14.500	3.3	20.000	2.7	25.500	.0
4.000	4.6	9.500	4.2	15.000	3.2	20.500	2.7		

4.500	4.4	10.000	4.1	15.500	3.2	21.000	2.6
5.000	4.4	10.500	4.0	16.000	3.1	21.500	2.6

RUNOFF VOLUME = 1.63510 INCHES = 26.3035 ACRE-FEET
PEAK DISCHARGE RATE = 526.20 CFS AT 1.550 HOURS BASIN AREA = .3016 SQ. MI.

COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1
SLP=0.007 D=4.0 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.21	.25	.63	1.78
.42	.69	2.74	2.44
.63	1.25	6.36	2.91
.83	1.90	11.44	3.25
1.04	2.60	17.87	3.51
1.25	3.36	25.49	3.71
1.46	4.15	34.15	3.85
1.67	4.96	43.66	3.94
1.88	5.79	53.83	3.99
2.08	6.62	64.42	4.00
2.29	7.45	75.21	4.00
2.50	8.27	85.93	4.00
2.71	9.06	96.31	4.00
2.92	9.82	106.03	4.00
3.13	10.54	114.73	4.00
3.34	11.20	121.97	4.00
3.54	11.77	127.15	4.00
3.75	12.24	129.28	4.00
4.00	12.57	129.28	4.00

COMPUTE TRAVEL TIME ID=4 REACH NO=1 NO VS=1 L=560 FT
SLP=0.007

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.208	.250	.63	.0616
.417	.695	2.74	.0395
.625	1.255	6.36	.0307
.834	1.898	11.44	.0258
1.042	2.604	17.87	.0227
1.251	3.358	25.49	.0205
1.459	4.146	34.15	.0189
1.668	4.960	43.66	.0177
1.876	5.788	53.83	.0167
2.084	6.621	64.42	.0160
2.293	7.451	75.21	.0154
2.501	8.267	85.93	.0150
2.710	9.062	96.31	.0146
2.918	9.823	106.03	.0144
3.127	10.539	114.73	.0143
3.335	11.195	121.97	.0143
3.544	11.773	127.15	.0144
3.752	12.243	129.28	.0147
4.000	12.566	129.28	.0151

ROUTE OUTFLOW ID=4 OUTFLOW HYD=208.1
INFLOW ID=2 DT=0.0

TRAVEL TIME TABLE EXCEEDED
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 208.10

RUNOFF VOLUME = 1.63510 INCHES = 26.3035 ACRE-FEET
PEAK DISCHARGE RATE = 522.59 CFS AT 1.550 HOURS BASIN AREA = .3016 SQ. MI.

COMPUTE NM HYD ID=1 HYD NO=208.A DA=0.03201 SQ MI
%A, B, C, & D 0 29.5 29.5 41
TP=0.15 HR
MASS RAINFALL=-1

K = .081750HR TP = .150000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 46.046 CFS UNIT VOLUME = 1.000 B = 526.28 P60 = 1.6400
AREA = .013124 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .134562HR TP = .150000HR K/TP RATIO = .897081 SHAPE CONSTANT, N = 3.951474
UNIT PEAK = 44.309 CFS UNIT VOLUME = 1.000 B = 351.92 P60 = 1.6400
AREA = .018886 SQ MI IA = .42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.03000 AT PEAK FLOW.

PRINT HYD ID=1 CODE=1

HYDROGRAPH FROM AREA 208.A

RUNOFF VOLUME = 1.43385 INCHES = 2.4479 ACRE-FEET
PEAK DISCHARGE RATE = 54.71 CFS AT 1.500 HOURS BASIN AREA = .0320 SQ. MI.

ADD HYD ID=2 HYD=JUNCTION I=4 II=1

PRINT HYD ID=2 CODE=10

HYDROGRAPH FROM AREA JUNCTION

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	5.500	5.0	11.000	4.2	16.500	3.3	22.000	2.7
.500	.0	6.000	5.4	11.500	4.1	17.000	3.3	22.500	2.7
1.000	16.7	6.500	5.4	12.000	4.0	17.500	3.2	23.000	2.7
1.500	513.6	7.000	5.3	12.500	3.9	18.000	3.1	23.500	2.6
2.000	144.6	7.500	5.1	13.000	3.8	18.500	3.1	24.000	2.6
2.500	24.5	8.000	5.0	13.500	3.7	19.000	3.0	24.500	.4
3.000	9.7	8.500	4.8	14.000	3.7	19.500	3.0	25.000	.1
3.500	6.0	9.000	4.7	14.500	3.6	20.000	2.9	25.500	.0
4.000	5.0	9.500	4.5	15.000	3.5	20.500	2.9		
4.500	4.7	10.000	4.4	15.500	3.4	21.000	2.8		
5.000	4.8	10.500	4.3	16.000	3.4	21.500	2.8		

RUNOFF VOLUME = 1.61579 INCHES = 28.7514 ACRE-FEET
PEAK DISCHARGE RATE = 575.32 CFS AT 1.550 HOURS BASIN AREA = .3336 SQ. MI.

COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1
SLP=0.010 D=4.0 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.21	.25	.75	1.78
.42	.69	3.27	2.44
.63	1.25	7.60	2.91
.83	1.90	13.68	3.25
1.04	2.60	21.35	3.51
1.25	3.36	30.47	3.71
1.46	4.15	40.82	3.85
1.67	4.96	52.19	3.94
1.88	5.79	64.33	3.99
2.08	6.62	77.00	4.00
2.29	7.45	89.89	4.00
2.50	8.27	102.71	4.00
2.71	9.06	115.11	4.00
2.92	9.82	126.73	4.00
3.13	10.54	137.13	4.00
3.34	11.20	145.78	4.00

	3.54	11.77	151.97	4.00
	3.75	12.24	154.52	4.00
	4.00	12.57	154.52	4.00

COMPUTE TRAVEL TIME ID=4 REACH NO=1 NO VS=1 L=600 FT
SLP=0.010

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.208	.250	.75	.0553
.417	.695	3.27	.0354
.625	1.255	7.60	.0275
.834	1.898	13.68	.0231
1.042	2.604	21.35	.0203
1.251	3.358	30.47	.0184
1.459	4.146	40.82	.0169
1.668	4.960	52.19	.0158
1.876	5.788	64.33	.0150
2.084	6.621	77.00	.0143
2.293	7.451	89.89	.0138
2.501	8.267	102.71	.0134
2.710	9.062	115.11	.0131
2.918	9.823	126.73	.0129
3.127	10.539	137.13	.0128
3.335	11.195	145.78	.0128
3.544	11.773	151.97	.0129
3.752	12.243	154.52	.0132
4.000	12.566	154.52	.0136

ROUTE OUTFLOW ID=4 OUTFLOW HYD=209.1
INFLOW ID=2 DT=0.0

TRAVEL TIME TABLE EXCEEDED

PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 209.10

RUNOFF VOLUME = 1.61579 INCHES = 28.7514 ACRE-FEET
PEAK DISCHARGE RATE = 564.36 CFS AT 1.550 HOURS BASIN AREA = .3336 SQ. MI.

COMPUTE NM HYD ID=1 HYD NO=208.B DA=0.02696 SQ MI
%A, B, C, & D 0 26.5 26.5 47
TP=0.1333 HR
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 50.027 CFS UNIT VOLUME = .9989 B = 526.28 P60 = 1.6400
AREA = .012671 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .119581HR TP = .133300HR K/TP RATIO = .897081 SHAPE CONSTANT, N = 3.951476
UNIT PEAK = 37.723 CFS UNIT VOLUME = 1.001 B = 351.92 P60 = 1.6400
AREA = .014289 SQ MI IA = .42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.03000 AT PEAK FLOW.

PRINT HYD ID=1 CODE=1

HYDROGRAPH FROM AREA 208.B

RUNOFF VOLUME = 1.54057 INCHES = 2.2151 ACRE-FEET
PEAK DISCHARGE RATE = 51.38 CFS AT 1.500 HOURS BASIN AREA = .0270 SQ. MI.

ADD HYD ID=2 HYD=JUNCTION I=4 II=1
PRINT HYD ID=2 CODE=10

HYDROGRAPH FROM AREA JUNCTION

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS

	.000	.0	5.500	5.4	11.000	4.5	16.500	3.5
22.000	2.9							
	.500	.0	6.000	5.7	11.500	4.4	17.000	3.5
22.500	2.9							
	1.000	17.2	6.500	5.8	12.000	4.3	17.500	3.4
23.000	2.9							
	1.500	526.1	7.000	5.6	12.500	4.2	18.000	3.3
23.500	2.8							
	2.000	160.4	7.500	5.5	13.000	4.1	18.500	3.3
24.000	2.8							
	2.500	26.9	8.000	5.3	13.500	4.0	19.000	3.2
24.500	.6							
	3.000	10.6	8.500	5.1	14.000	3.9	19.500	3.2
25.000	.1							
	3.500	6.5	9.000	5.0	14.500	3.8	20.000	3.1
25.500	.0							
	4.000	5.3	9.500	4.9	15.000	3.8	20.500	3.1
26.000	.0							
	4.500	5.0	10.000	4.7	15.500	3.7	21.000	3.0
	5.000	5.1	10.500	4.6	16.000	3.6	21.500	3.0

RUNOFF VOLUME = 1.61016 INCHES = 30.9664 ACRE-FEET
PEAK DISCHARGE RATE = 609.90 CFS AT 1.550 HOURS BASIN AREA = .3606 SQ. MI.

COMPUTE NM HYD ID=1 HYD NO=209.0 DA=0.0111 SQ MI
%A, B, C, & D 0 11 24 65
TP=0.27 HR
MASS RAINFALL=-1

K = .147150HR TP = .270000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 14.063 CFS UNIT VOLUME = .9992 B = 526.28 P60 = 1.6400
AREA = .007215 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .230582HR TP = .270000HR K/TP RATIO = .854009 SHAPE CONSTANT, N = 4.166404
UNIT PEAK = 5.2680 CFS UNIT VOLUME = .9976 B = 366.12 P60 = 1.6400
AREA = .003885 SQ MI IA = .39714 INCHES INF = .96200 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.03000 AT PEAK FLOW.

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 209.00

RUNOFF VOLUME = 1.88065 INCHES = 1.1133 ACRE-FEET
PEAK DISCHARGE RATE = 16.34 CFS AT 1.650 HOURS BASIN AREA = .0111 SQ. MI.

ADD HYD ID=4 HYD=JUNCTION I=2 II=1
PRINT HYD ID=4 CODE=10

HYDROGRAPH FROM AREA JUNCTION

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	5.500	5.6	11.000	4.7	16.500	3.7		
22.000	3.0								
.500	.0	6.000	6.0	11.500	4.5	17.000	3.6		
22.500	3.0								
1.000	17.6	6.500	6.0	12.000	4.4	17.500	3.5		
23.000	3.0								
1.500	536.6	7.000	5.9	12.500	4.3	18.000	3.5		
23.500	2.9								
2.000	167.4	7.500	5.7	13.000	4.2	18.500	3.4		
24.000	2.9								
2.500	28.6	8.000	5.5	13.500	4.1	19.000	3.4		
24.500	.6								
3.000	11.3	8.500	5.3	14.000	4.1	19.500	3.3		
25.000	.1								
3.500	6.9	9.000	5.2	14.500	4.0	20.000	3.2		
25.500	.0								
4.000	5.6	9.500	5.1	15.000	3.9	20.500	3.2		
26.000	.0								

4.500	5.2	10.000	4.9	15.500	3.8	21.000	3.1
5.000	5.3	10.500	4.8	16.000	3.7	21.500	3.1

RUNOFF VOLUME = 1.61824 INCHES = 32.0797 ACRE-FEET
PEAK DISCHARGE RATE = 623.73 CFS AT 1.550 HOURS BASIN AREA = .3717 SQ. MI.

COMPUTE NM HYD ID=1 HYD NO=210.0 DA=0.0228 SQ MI
%A, B, C, & D 0 30 30 40
TP=0.1333 HR
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 36.006 CFS UNIT VOLUME = .9988 B = 526.28 P60 = 1.6400
AREA = .009120 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .119581HR TP = .133300HR K/TP RATIO = .897081 SHAPE CONSTANT, N = 3.951476
UNIT PEAK = 36.116 CFS UNIT VOLUME = 1.001 B = 351.92 P60 = 1.6400
AREA = .013680 SQ MI IA = .42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000
BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.03000 AT PEAK FLOW.

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 210.00

RUNOFF VOLUME = 1.41606 INCHES = 1.7219 ACRE-FEET
PEAK DISCHARGE RATE = 41.69 CFS AT 1.500 HOURS BASIN AREA = .0228 SQ. MI.

ADD HYD ID=2 HYD=JUNCTION I=23 II=1
PRINT HYD ID=2 CODE=10

HYDROGRAPH FROM AREA JUNCTION

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	5.500	1.7	11.000	1.4	16.500	1.1	22.000	.9
.500	.0	6.000	1.8	11.500	1.3	17.000	1.1	22.500	.9
1.000	6.5	6.500	1.8	12.000	1.3	17.500	1.0	23.000	.9
1.500	211.9	7.000	1.7	12.500	1.3	18.000	1.0	23.500	.9
2.000	41.3	7.500	1.7	13.000	1.2	18.500	1.0	24.000	.8
2.500	6.6	8.000	1.6	13.500	1.2	19.000	1.0	24.500	.0
3.000	2.8	8.500	1.6	14.000	1.2	19.500	1.0	25.000	.0
3.500	1.9	9.000	1.5	14.500	1.2	20.000	1.0		
4.000	1.6	9.500	1.5	15.000	1.1	20.500	.9		
4.500	1.5	10.000	1.4	15.500	1.1	21.000	.9		
5.000	1.6	10.500	1.4	16.000	1.1	21.500	.9		

RUNOFF VOLUME = 1.60029 INCHES = 9.5231 ACRE-FEET
PEAK DISCHARGE RATE = 211.90 CFS AT 1.500 HOURS BASIN AREA = .1116 SQ. MI.

ADD HYD ID=3 HYD=JUNCTION I=4 II=2
PRINT HYD ID=3 CODE=10

HYDROGRAPH FROM AREA JUNCTION

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	5.500	7.2	11.000	6.0	16.500	4.8	22.000	3.9

	.500	.0	6.000	7.7	11.500	5.9	17.000	4.7
22.500	3.9							
	1.000	24.1	6.500	7.8	12.000	5.7	17.500	4.6
23.000	3.9							
	1.500	748.5	7.000	7.6	12.500	5.6	18.000	4.5
23.500	3.8							
	2.000	208.7	7.500	7.3	13.000	5.5	18.500	4.4
24.000	3.7							
	2.500	35.2	8.000	7.1	13.500	5.4	19.000	4.4
24.500	.6							
	3.000	14.1	8.500	6.9	14.000	5.3	19.500	4.3
25.000	.1							
	3.500	8.7	9.000	6.7	14.500	5.2	20.000	4.2
25.500	.0							
	4.000	7.2	9.500	6.5	15.000	5.0	20.500	4.1
26.000	.0							
	4.500	6.8	10.000	6.3	15.500	5.0	21.000	4.1
	5.000	6.9	10.500	6.2	16.000	4.8	21.500	4.0

RUNOFF VOLUME = 1.61409 INCHES = 41.6028 ACRE-FEET
PEAK DISCHARGE RATE = 808.97 CFS AT 1.550 HOURS BASIN AREA = .4833 SQ. MI.

COMPUTE RATING CURVE CID=1 VN=1 NS=1 MIN EL=100 MAX EL=104
CS=0.028 FS=0.028 N=0.013 DIST=26

DIST	EL	DIST	EL
0	104	08	100
18	100	26	104

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	10.00
100.21	2.19	14.38	10.84
100.42	4.57	46.14	11.68
100.63	7.11	91.86	12.53
100.84	9.84	150.45	13.37
101.05	12.74	221.50	14.21
101.26	15.82	304.88	15.05
101.47	19.08	400.61	15.89
101.68	22.52	508.81	16.74
101.89	26.13	629.67	17.58
102.11	29.92	763.40	18.42
102.32	33.88	910.26	19.26
102.53	38.03	1070.51	20.11
102.74	42.35	1244.44	20.95
102.95	46.85	1432.33	21.79
103.16	51.52	1634.48	22.63
103.37	56.38	1851.19	23.47
103.58	61.41	2082.77	24.32
103.79	66.61	2329.51	25.16
104.00	72.00	2591.73	26.00

COMPUTE TRAVEL TIME ID=4 RN=1 NVS=1 L=2750 S=0.028

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.211	2.194	14.38	.1166
.421	4.565	46.14	.0756
.632	7.114	91.86	.0592
.842	9.839	150.45	.0500
1.053	12.742	221.50	.0439
1.263	15.823	304.88	.0396
1.474	19.080	400.61	.0364
1.684	22.515	508.81	.0338
1.895	26.127	629.67	.0317
2.105	29.917	763.40	.0299
2.316	33.883	910.26	.0284
2.526	38.028	1070.51	.0271
2.737	42.349	1244.44	.0260
2.947	46.847	1432.33	.0250
3.158	51.523	1634.48	.0241
3.368	56.376	1851.19	.0233
3.579	61.407	2082.77	.0225
3.789	66.615	2329.51	.0218
4.000	72.000	2591.73	.0212

```
ROUTE                    ID=4  HYD=210.1 INFLOW ID=3  DT=0.0
PRINT HYD                ID=4  CODE=1

                                PARTIAL HYDROGRAPH   210.10


    RUNOFF VOLUME =      1.61410 INCHES     =      41.6029 ACRE-FEET
    PEAK DISCHARGE RATE =     795.25 CFS  AT   1.550 HOURS   BASIN AREA =   .4833 SQ. MI.


COMPUTE NM HYD           ID=1  HYD NO=211.0  DA=0.1530 SQ MI
                         %A, B, C, & D 0 14 29 57
                         TP=0.21 HR
                         MASS RAINFALL=-1

     K =   .118470HR    TP =   .210000HR    K/TP RATIO =   .564143     SHAPE CONSTANT, N =  6.800429
     UNIT PEAK =   212.51    CFS   UNIT VOLUME =    1.000       B =   511.72      P60 = 1.6400
     AREA =      .087210 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


     K =   .180544HR    TP =   .210000HR    K/TP RATIO =   .859733     SHAPE CONSTANT, N =  4.136265
     UNIT PEAK =   114.08    CFS   UNIT VOLUME =    1.000       B =   364.15      P60 = 1.6400
     AREA =      .065790 SQ MI    IA =    .39884 INCHES    INF =    .96674 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

    BULKING FACTOR APPLIED TO HYDROGRAPH.  FACTOR =  1.03000 AT PEAK FLOW.

PRINT HYD                ID=1 CODE=1

                                PARTIAL HYDROGRAPH   211.00


    RUNOFF VOLUME =      1.74130 INCHES     =      14.2090 ACRE-FEET
    PEAK DISCHARGE RATE =     242.18 CFS  AT   1.600 HOURS   BASIN AREA =   .1530 SQ. MI.


COMPUTE NM HYD           ID=2  HYD NO=212.0  DA=0.0095 SQ MI
                         %A, B, C, & D 0 11 24 65
                         TP=0.19 HR
                         MASS RAINFALL=-1

     K =   .103550HR    TP =   .190000HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   17.104    CFS   UNIT VOLUME =    .9996       B =   526.28      P60 = 1.6400
     AREA =      .006175 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


     K =   .162262HR    TP =   .190000HR    K/TP RATIO =   .854009     SHAPE CONSTANT, N =  4.166404
     UNIT PEAK =   6.4070    CFS   UNIT VOLUME =    .9985       B =   366.12      P60 = 1.6400
     AREA =      .003325 SQ MI    IA =    .39714 INCHES    INF =    .96200 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

    BULKING FACTOR APPLIED TO HYDROGRAPH.  FACTOR =  1.03000 AT PEAK FLOW.

    PRINT HYD                ID=2 CODE=1

                                PARTIAL HYDROGRAPH   212.00


        RUNOFF VOLUME =      1.88065 INCHES     =        .9529 ACRE-FEET
        PEAK DISCHARGE RATE =      17.11 CFS  AT   1.550 HOURS   BASIN AREA =   .0095 SQ. MI.


    ADD HYD                  ID=3 HYD=JUNCTION I=1 II=2
    PRINT HYD                ID=3 CODE=10

                                HYDROGRAPH FROM AREA JUNCTION

          TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME
FLOW
          HRS       CFS           HRS       CFS           HRS       CFS           HRS       CFS           HRS
CFS
          .000       .0           5.500      2.6          11.000      2.2          16.500      1.7
22.000      1.4
          .500       .0           6.000      2.8          11.500      2.1          17.000      1.7
22.500      1.4
```

	1.000	7.2	6.500	2.8	12.000	2.1	17.500	1.7
23.000	1.4							
	1.500	220.9	7.000	2.7	12.500	2.0	18.000	1.6
23.500	1.4							
	2.000	81.9	7.500	2.7	13.000	2.0	18.500	1.6
24.000	1.3							
	2.500	18.3	8.000	2.6	13.500	1.9	19.000	1.6
24.500	.2							
	3.000	7.5	8.500	2.5	14.000	1.9	19.500	1.5
25.000	.0							
	3.500	4.0	9.000	2.4	14.500	1.9	20.000	1.5
25.500	.0							
	4.000	2.9	9.500	2.4	15.000	1.8	20.500	1.5
26.000	.0							
	4.500	2.6	10.000	2.3	15.500	1.8	21.000	1.5
	5.000	2.5	10.500	2.2	16.000	1.7	21.500	1.5

RUNOFF VOLUME = 1.74945 INCHES = 15.1618 ACRE-FEET
PEAK DISCHARGE RATE = 258.60 CFS AT 1.550 HOURS BASIN AREA = .1625 SQ. MI.

COMPUTE NM HYD ID=1 HYD NO=213.0 DA=0.0173 SQ MI
%A, B, C, & D 0 30 30 40
TP=0.1333 HR
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 27.321 CFS UNIT VOLUME = .9987 B = 526.28 P60 = 1.6400
AREA = .006920 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .119581HR TP = .133300HR K/TP RATIO = .897081 SHAPE CONSTANT, N = 3.951476
UNIT PEAK = 27.404 CFS UNIT VOLUME = 1.001 B = 351.92 P60 = 1.6400
AREA = .010380 SQ MI IA = .42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.03000 AT PEAK FLOW.

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 213.00

RUNOFF VOLUME = 1.41606 INCHES = 1.3065 ACRE-FEET
PEAK DISCHARGE RATE = 31.64 CFS AT 1.500 HOURS BASIN AREA = .0173 SQ. MI.

ADD HYD ID=2 HYD=JUNCTION I=4 II=1
PRINT HYD ID=2 CODE=10

HYDROGRAPH FROM AREA JUNCTION

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS
.000	.0	5.500	7.3	11.000	6.2	16.500	4.9	
22.000	4.1							
.500	.0	6.000	7.8	11.500	6.1	17.000	4.8	
22.500	4.0							
1.000	13.0	6.500	8.0	12.000	5.9	17.500	4.7	
23.000	4.0							
1.500	699.3	7.000	7.8	12.500	5.8	18.000	4.6	
23.500	3.9							
2.000	223.9	7.500	7.6	13.000	5.7	18.500	4.6	
24.000	3.9							
2.500	40.1	8.000	7.3	13.500	5.5	19.000	4.5	
24.500	1.1							
3.000	16.6	8.500	7.1	14.000	5.4	19.500	4.4	
25.000	.2							
3.500	9.9	9.000	6.9	14.500	5.3	20.000	4.3	
25.500	.0							
4.000	7.7	9.500	6.7	15.000	5.2	20.500	4.3	
26.000	.0							
4.500	7.0	10.000	6.6	15.500	5.1	21.000	4.2	
5.000	7.0	10.500	6.4	16.000	5.0	21.500	4.1	

RUNOFF VOLUME = 1.60725 INCHES = 42.9093 ACRE-FEET

PEAK DISCHARGE RATE = 823.39 CFS AT 1.550 HOURS BASIN AREA = .5006 SQ. MI.

ADD HYD ID=4 HYD=JUNCTION I=3 II=2
PRINT HYD ID=4 CODE=10

HYDROGRAPH FROM AREA JUNCTION

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	5.500	10.0	11.000	8.4	16.500	6.6		
.500	.0	6.000	10.6	11.500	8.2	17.000	6.5		
1.000	20.2	6.500	10.8	12.000	8.0	17.500	6.4		
1.500	920.2	7.000	10.6	12.500	7.8	18.000	6.3		
2.000	305.8	7.500	10.2	13.000	7.6	18.500	6.1		
2.500	58.4	8.000	9.9	13.500	7.5	19.000	6.1		
3.000	24.1	8.500	9.6	14.000	7.3	19.500	5.9		
3.500	13.9	9.000	9.4	14.500	7.2	20.000	5.9		
4.000	10.6	9.500	9.1	15.000	7.0	20.500	5.8		
4.500	9.6	10.000	8.8	15.500	6.9	21.000	5.7		
5.000	9.5	10.500	8.6	16.000	6.7	21.500	5.6		

RUNOFF VOLUME = 1.64210 INCHES = 58.0711 ACRE-FEET
PEAK DISCHARGE RATE = 1081.99 CFS AT 1.550 HOURS BASIN AREA = .6631 SQ. MI.

COMPUTE NM HYD ID=1 HYD NO=214.0 DA=0.0593 SQ MI
%A, B, C, & D 0 14 29 57
TP=0.21 HR
MASS RAINFALL=-1

K = .114450HR TP = .210000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 84.708 CFS UNIT VOLUME = 1.000 B = 526.28 P60 = 1.6400
AREA = .033801 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .179892HR TP = .210000HR K/TP RATIO = .856628 SHAPE CONSTANT, N = 4.152552
UNIT PEAK = 44.346 CFS UNIT VOLUME = .9999 B = 365.22 P60 = 1.6400
AREA = .025499 SQ MI IA = .39884 INCHES INF = .96674 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

BULKING FACTOR APPLIED TO HYDROGRAPH. FACTOR = 1.03000 AT PEAK FLOW.

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 214.00

RUNOFF VOLUME = 1.74131 INCHES = 5.5071 ACRE-FEET
PEAK DISCHARGE RATE = 94.84 CFS AT 1.600 HOURS BASIN AREA = .0593 SQ. MI.

ADD HYD ID=2 HYD=JUNCTION I=4 II=1
PRINT HYD ID=2 CODE=10

HYDROGRAPH FROM AREA JUNCTION

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	5.500	10.9	11.000	9.2	16.500	7.2		
.500	.0	6.000	11.6	11.500	9.0	17.000	7.1		

	1.000	22.8	6.500	11.9	12.000	8.8	17.500	7.0
23.000	5.9							
	1.500	1000.6	7.000	11.5	12.500	8.6	18.000	6.9
23.500	5.8							
	2.000	335.5	7.500	11.2	13.000	8.3	18.500	6.7
24.000	5.7							
	2.500	65.0	8.000	10.9	13.500	8.2	19.000	6.6
24.500	1.3							
	3.000	26.8	8.500	10.5	14.000	8.0	19.500	6.5
25.000	.2							
	3.500	15.4	9.000	10.2	14.500	7.9	20.000	6.4
25.500	.0							
	4.000	11.6	9.500	10.0	15.000	7.7	20.500	6.3
26.000	.0							
	4.500	10.5	10.000	9.7	15.500	7.5	21.000	6.2
	5.000	10.4	10.500	9.4	16.000	7.4	21.500	6.1

RUNOFF VOLUME = 1.65024 INCHES = 63.5782 ACRE-FEET
PEAK DISCHARGE RATE = 1176.69 CFS AT 1.550 HOURS BASIN AREA = .7224 SQ. MI.

COMPUTE RATING CURVE CID=1 VN=1 NS=1 MIN EL=100 MAX EL=104
CS=0.014 FS=0.014 N=0.013 DIST=26

DIST	EL	DIST	EL
0	104	08	100
18	100	26	104

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	10.00
100.21	2.19	10.17	10.84
100.42	4.57	32.63	11.68
100.63	7.11	64.95	12.53
100.84	9.84	106.38	13.37
101.05	12.74	156.63	14.21
101.26	15.82	215.58	15.05
101.47	19.08	283.27	15.89
101.68	22.52	359.79	16.74
101.89	26.13	445.24	17.58
102.11	29.92	539.81	18.42
102.32	33.88	643.65	19.26
102.53	38.03	756.97	20.11
102.74	42.35	879.95	20.95
102.95	46.85	1012.81	21.79
103.16	51.52	1155.75	22.63
103.37	56.38	1308.99	23.47
103.58	61.41	1472.74	24.32
103.79	66.61	1647.21	25.16
104.00	72.00	1832.63	26.00

COMPUTE TRAVEL TIME ID=4 RN=1 NVS=1 L=1400 S=0.014

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.211	2.194	10.17	.0839
.421	4.565	32.63	.0544
.632	7.114	64.95	.0426
.842	9.839	106.38	.0360
1.053	12.742	156.63	.0316
1.263	15.823	215.58	.0285
1.474	19.080	283.27	.0262
1.684	22.515	359.79	.0243
1.895	26.127	445.24	.0228
2.105	29.917	539.81	.0216
2.316	33.883	643.65	.0205
2.526	38.028	756.97	.0195
2.737	42.349	879.95	.0187
2.947	46.847	1012.81	.0180
3.158	51.523	1155.75	.0173
3.368	56.376	1308.99	.0167
3.579	61.407	1472.74	.0162
3.789	66.615	1647.21	.0157
4.000	72.000	1832.63	.0153

ROUTE ID=4 HYD=216.1 INFLOW ID=2 DT=0.0
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 216.10

RUNOFF VOLUME = 1.65024 INCHES = 63.5782 ACRE-FEET
PEAK DISCHARGE RATE = 1183.63 CFS AT 1.600 HOURS BASIN AREA = .7224 SQ. MI.

```
COMPUTE NM HYD          ID=1  HYD NO=216.0  DA=0.0157 MI
                        %A, B, C, & D 0 30 30 40
                        TP=0.14 HR
                        MASS RAINFALL=-1

 K =   .076300HR   TP =   .140000HR   K/TP RATIO =   .545000   SHAPE CONSTANT, N =  7.106420
 UNIT PEAK =   23.607   CFS   UNIT VOLUME =    .9979      B =   526.28      P60 = 1.6400
 AREA =      .006280 SQ MI   IA =    .10000 INCHES   INF =    .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


 K =   .125591HR   TP =   .140000HR   K/TP RATIO =   .897081   SHAPE CONSTANT, N =  3.951476
 UNIT PEAK =   23.679   CFS   UNIT VOLUME =    1.001      B =   351.92      P60 = 1.6400
 AREA =      .009420 SQ MI   IA =    .42500 INCHES   INF =   1.04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

BULKING FACTOR APPLIED TO HYDROGRAPH.  FACTOR =  1.03000 AT PEAK FLOW.

PRINT HYD               ID=1 CODE=1
```

PARTIAL HYDROGRAPH 216.00

RUNOFF VOLUME = 1.41606 INCHES = 1.1857 ACRE-FEET
PEAK DISCHARGE RATE = 27.95 CFS AT 1.500 HOURS BASIN AREA = .0157 SQ. MI.

```
ADD HYD                 ID=2 HYD=JUNCTION I=1 II=4
PRINT HYD               ID=2 CODE=10
```

HYDROGRAPH FROM AREA JUNCTION

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	5.500	11.0	11.000	9.4	16.500	7.4		
.500	.0	6.000	11.7	11.500	9.1	17.000	7.3		
1.000	14.4	6.500	12.1	12.000	8.9	17.500	7.1		
1.500	947.2	7.000	11.8	12.500	8.7	18.000	7.0		
2.000	351.5	7.500	11.4	13.000	8.5	18.500	6.9		
2.500	70.8	8.000	11.1	13.500	8.3	19.000	6.8		
3.000	28.1	8.500	10.7	14.000	8.2	19.500	6.6		
3.500	16.3	9.000	10.4	14.500	8.0	20.000	6.5		
4.000	12.1	9.500	10.1	15.000	7.8	20.500	6.4		
4.500	10.8	10.000	9.9	15.500	7.7	21.000	6.3		
5.000	10.6	10.500	9.6	16.000	7.5	21.500	6.2		

RUNOFF VOLUME = 1.64526 INCHES = 64.7639 ACRE-FEET
PEAK DISCHARGE RATE = 1204.17 CFS AT 1.600 HOURS BASIN AREA = .7381 SQ. MI.

```
FINISH

    NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 09:49:36
□(s10H□□□□□□□□□□□□□□
```

APPENDIX D
HYDRAULICS
SUMMARY TABLES
HEC RAS PRINTOUTS

Anderson Heights
As Built Retention Provided Calculations

Note: Volume computations based upon Conic Method where
Incremental Volume = h/3(A1+A2+(A1*A2)^0.5)

Pond 2

Elevation	Area (sq. ft.)	Area (Ac.)	Average Area (Ac.)	Volume Provided (AF)	Cumulative (AF)
53.00	22337	0.51			
54.00	29603	0.68	25970	0.59	0.59
55.00	32234	0.74	30919	0.71	1.30
56.00	35284	0.81	33759	0.77	2.08
57.00	38333	0.88	36808	0.84	2.92
58.00	41382	0.95	39857	0.91	3.84
59.00	44458	1.02	42920	0.99	4.82
59.95	47480	1.09	45969	1.00	5.83
60.00	47819	1.10	47650	0.05	5.88
61.00	50965	1.17	49392	1.13	7.01
61.60	53197	1.22	52081	0.72	7.73
			Total =		**7.73**

VOLUME NEEDED = 4.13 AF

HW = 58.2

Anderson Heights
As Built Retention Provided Calculations

Note: Volume computations based upon Conic Method where
Incremental Volume = h/3(A1+A2+(A1*A2) ^ 0.5)

Pond 3A

Elevation	Area (sq. ft.)	Area (Ac.)	Average Area (Ac.)	Volume Provided (AF)	Cumulative (AF)
5243.00	5078	0.12			
5244.00	14304	0.33	9691	0.21	0.21
5245.00	16480	0.38	15392	0.35	0.57
5246.00	18185	0.42	17333	0.40	0.96
5247.00	20005	0.46	19095	0.44	1.40
5248.00	21858	0.50	20932	0.48	1.88
5249.00	23999	0.55	22929	0.53	2.41
5250.00	26045	0.60	25022	0.57	2.98
5251.00	28101	0.65	27073	0.62	3.60
			Total =		**3.60**

TO POND 3B

Pond 3B

Elevation	Area (sq. ft.)	Area (Ac.)	Average Area (Ac.)	Volume Provided (AF)	Cumulative (AF)
5239.00	14428	0.33			
5240.00	28490	0.65	21459	0.48	0.48
5241.00	33976	0.78	31233	0.72	1.20
5242.00	40075	0.92	37026	0.85	2.05
5243.00	46609	1.07	43342	0.99	3.04
5244.00	53529	1.23	50069	1.15	4.19
5245.00	58761	1.35	56145	1.29	5.48
5246.00	63597	1.46	61179	1.40	6.88
5247.00	68389	1.57	65993	1.51	8.40
5247.19	69260	1.59	68825	0.30	8.70
5247.30	70131	1.61	69696	0.18	8.87
5248.00	73616	1.69	70349	1.63	10.03
5249.00	78885	1.81	76251	1.75	11.78
			Total =		**11.78**

VOL 3A + 3B AT 5243.00 = 3.04 AF
VOL 3A + 3B AT 5244.00 = 4.40 AF
VOL NEEDED = 3.26 AF
HW = 5243.13

Anderson Heights
As Built Retention Provided Calculations

Note: Volume computations based upon Conic Method where
Incremental Volume = h/3(A1+A2+(A1*A2)^0.5)

Pond 4A

Elevation	Area (sq. ft.)	Area (Ac.)	Average Area (Ac.)	Volume Provided (AF)	Cumulative (AF)
5235.00	31750	0.73			
5236.00	11965	0.27	21858	0.48	0.48
5237.00	13519	0.31	12742	0.29	0.78
5238.00	15156	0.35	14338	0.33	1.10
5239.00	16870	0.39	16013	0.37	1.47
5240.00	18600	0.43	17735	0.41	1.88
5241.00	20968	0.48	19784	0.45	2.33
5242.00	22707	0.52	21838	0.50	2.83
5243.00	24313	0.56	23510	0.54	3.37
			Total =		**3.37**

TO POND 4B

Pond 4B

Elevation	Area (sq. ft.)	Area (Ac.)	Average Area (Ac.)	Volume Provided (AF)	Cumulative (AF)
5235.00	21351	0.49			
5236.00	43090	0.99	32221	0.73	0.73
5237.00	47480	1.09	45285	1.04	1.76
5238.00	52272	1.20	49876	1.14	2.91
5239.00	57064	1.31	54668	1.25	4.16
5240.00	62291	1.43	59677	1.37	5.53
5241.00	67518	1.55	64904	1.49	7.02
5241.32	69260	1.59	68389	0.50	7.53
5241.37	69260	1.59	69260	0.08	7.60
5241.60	70567	1.62	69914	0.37	7.97
5242.00	72875	1.67	69896	1.61	8.63
			Total =		**8.63**

VOL 4A+4B AT 5236.00 = 1.21 AF
VOL 4A+4B AT 5237.00 = 2.54 AF

VOL NEEDED = 1.926 AF

HW = 5236.53

Anderson Heights
Retention Provided Calculations

Note: Volume computations based upon Conic Method where
Incremental Volume = h/3(A1+A2+(A1*A2)^0.5)

Pond 5

Elevation	Area (sq. ft.)	Area (Ac.)	Average Area (Ac.)	Volume Provided (AF)	Cumulative (AF)
5224.00	28645	0.66			
5225.00	30826	0.71	29736	0.68	0.68
5226.00	33096	0.76	31961	0.73	1.42
5227.00	35455	0.81	34276	0.79	2.20
5228.00	37902	0.87	36679	0.84	3.04
5229.00	40437	0.93	39170	0.90	3.94
5230.00	43012	0.99	41725	0.96	4.90
5231.00	45654	1.05	44333	1.02	5.92
5232.00	48364	1.11	47009	1.08	7.00
5233.00	51351	1.18	49858	1.14	8.14
			Total =		**8.14**

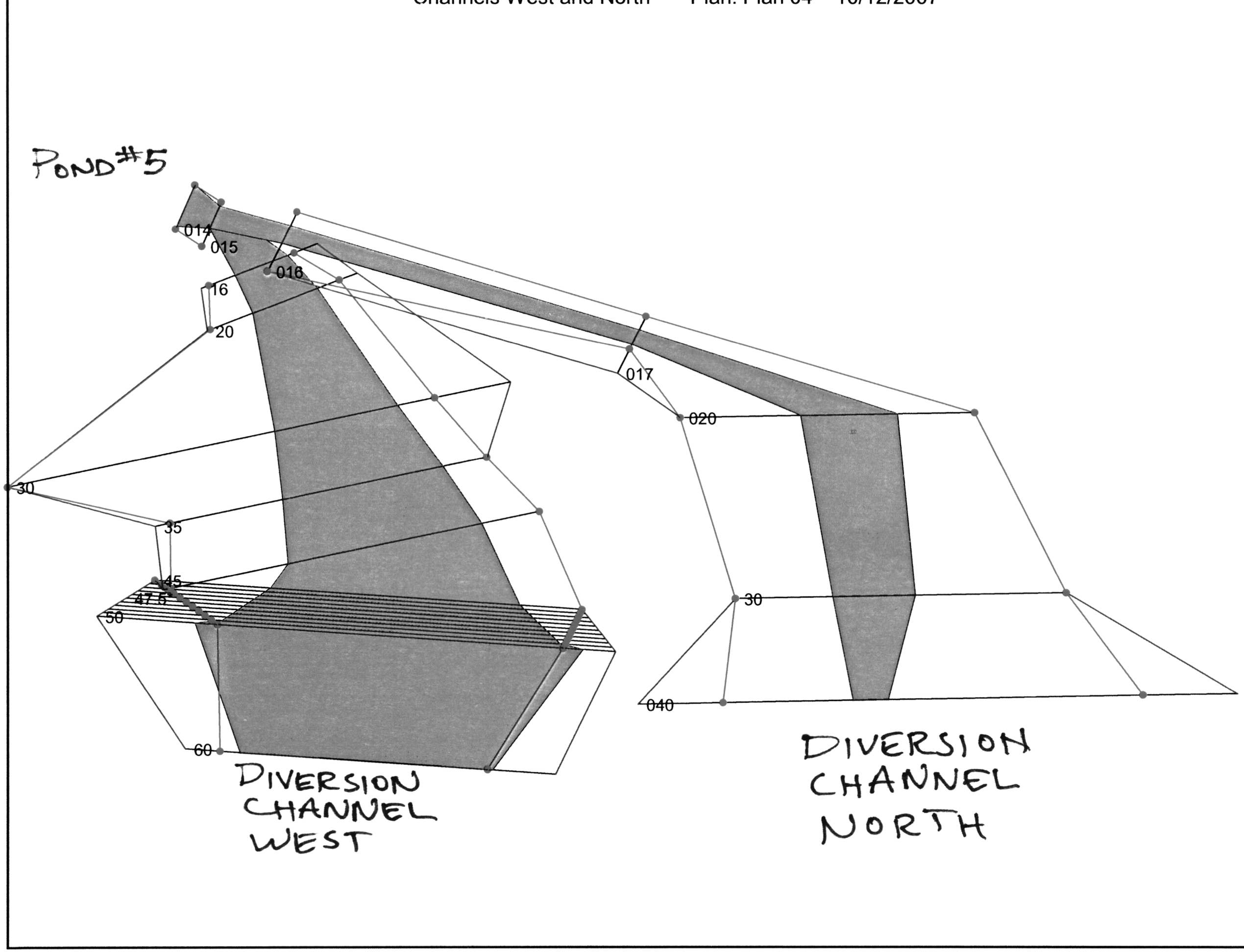
VOL NEEDED = 6.88 AF

HW = 5231.90

HEC-RAS Results for Diversion Channels

HEC-RAS ID	Min. Channel El (ft)	100-Year WESL (ft)	Top of Channel Elevation (ft)	Velocity (ft/s)
Diversion Channel West, To Pond #5 Flow From Sub-Basin 5B, Q^{100} = 97.39 cfs				
60	5257.60	5258.17	Natural Ground	4.59
50	5254.00	5254.19	5255.00	2.46
45	5444.70	5244.83	5252.30	5.24
40	5238.80	5239.02	5250.60	3.89
35	5237.80	5238.12	5247.20	3.19
30	5236.80	5237.09	5244.80	4.78
20	5234.80	5235.30	5240.70	4.83
16	5234.40	5235.07	5239.20	4.91
Diversion Channel North, Flow From Sub-Basin 5C, Q^{100} = 10.31 cfs				
40	5253.50	5253.82	Natural Ground	3.08
30	5247.50	5247.63	5250.00	3.41
20	5240.50	5240.66	5241.80	2.21
17	5236.10	5236.34	5240.00	3.92
16	5234.20	5234.70	5237.50	2.83
Weir in Pond #5, Flow From Sub-Basins 5B+5C, Q^{100} = 107.70 cfs				
015, Weir into Basin 5	5232.70	5233.01	5237.00	7.58
014 Basin 5	5224.00	5231.20	5237.00	0.18
Diversion Channel South, To 48-Inch Pipe and SD System in Rio Bravo Blvd. Flow From Sub-Basins 6B+6C, Q^{100} = 68.35 cfs				
50	5245.00	5245.76	Natural Ground	4.78
40	5233.70	5234.00	5235.00	4.17
20	5226.00	5226.85	5232.00	5.83
10	5225.00	5227.00	5231.00	2.36

Channels West and North Plan: Plan 04 10/12/2007

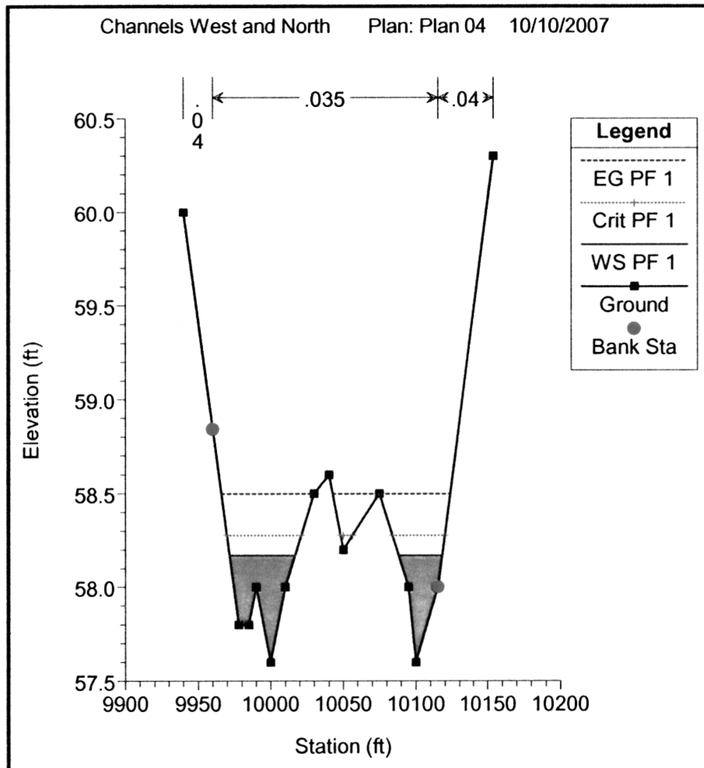


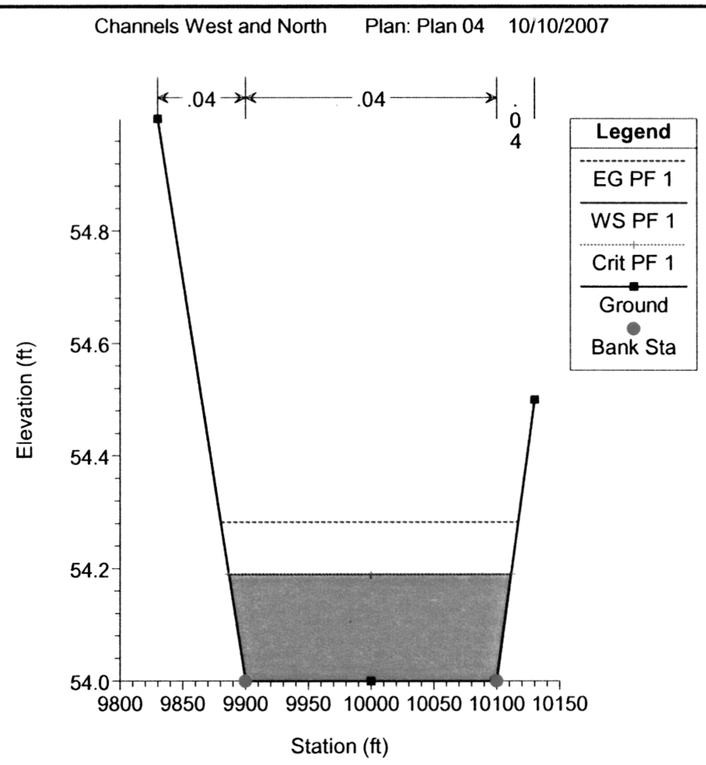
10-12-07

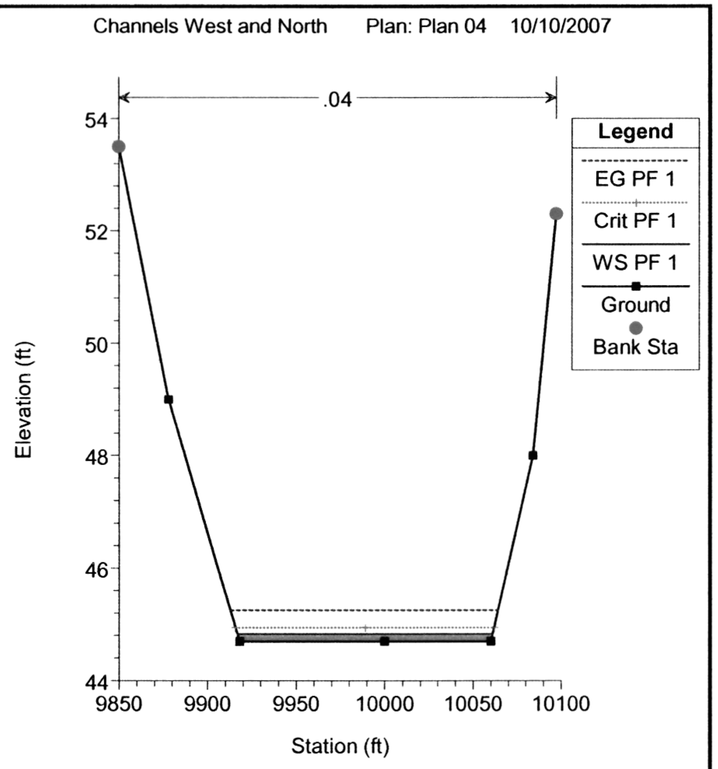
DIVERSION CHANNEL WEST & NORTH

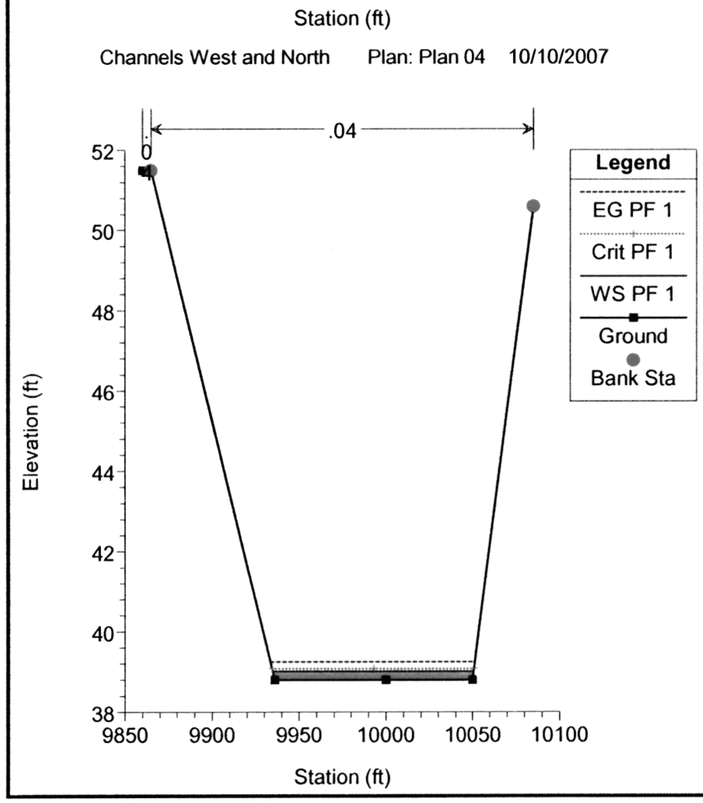
HEC-RAS Plan: Plan 04 Profile: PF 1

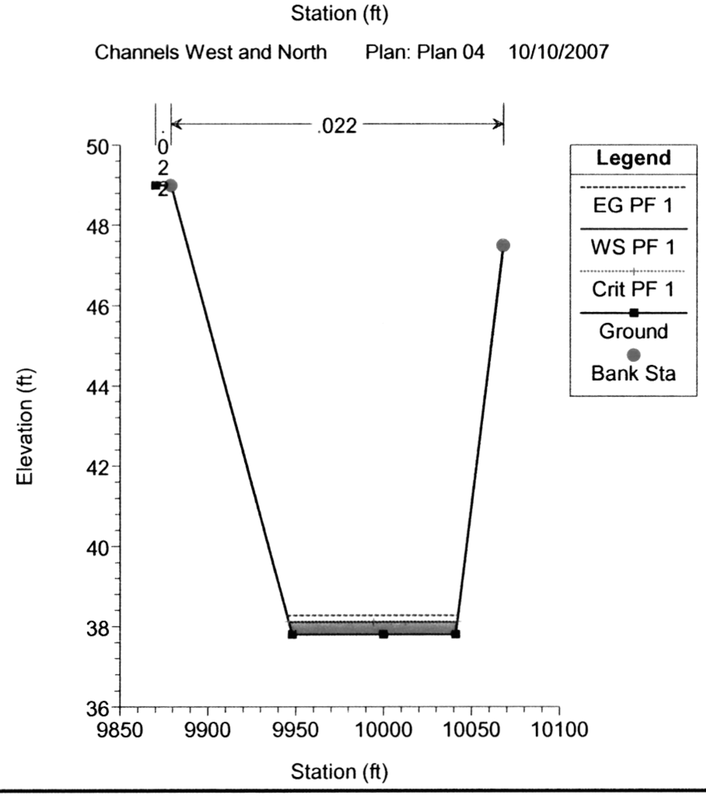
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
5B	60	PF 1	97.39	57.60	58.17	58.28	58.50	0.060024	4.59	21.38	74.96	1.49
5B	50	PF 1	97.39	54.00	54.19	54.19	54.28	0.040106	2.46	40.43	224.75	0.99
5B	45	PF 1	97.39	44.70	44.83	44.94	45.26	0.304712	5.24	18.60	144.15	2.57
5B	40	PF 1	97.39	38.80	39.02	39.08	39.25	0.084496	3.89	25.05	115.87	1.47
5B	35	PF 1	97.39	37.80	38.12	38.12	38.28	0.010318	3.19	30.49	95.89	1.00
5B	30	PF 1	97.39	36.80	37.09	37.19	37.44	0.027880	4.78	20.36	73.66	1.60
5B	20	PF 1	97.39	34.80	35.30	35.38	35.67	0.013661	4.83	20.15	41.93	1.23
5B	16	PF 1	97.39	34.40	35.02	35.07	35.40	0.010899	4.91	19.83	33.80	1.13
118	040	PF 1	10.31	53.50	53.82	53.86	53.97	0.060042	3.08	3.35	20.82	1.35
118	30	PF 1	10.31	47.50	47.63	47.67	47.81	0.102204	3.41	3.03	48.35	2.40
118	020	PF 1	10.31	40.50	40.66	40.68	40.74	0.029784	2.21	4.67	56.69	1.36
118	017	PF 1	10.31	36.10	36.34	36.41	36.58	0.025823	3.92	2.63	12.06	1.48
118	016	PF 1	10.31	34.20	34.70	34.70	34.83	0.011110	2.83	3.64	14.47	1.00
5Ba	015	PF 1	107.70	32.70	33.01	33.26	33.90	0.046575	7.58	14.20	51.07	2.53
5Ba	014	PF 1	107.70	24.00	31.20	24.45	31.20	0.000000	0.18	602.82	93.78	0.01

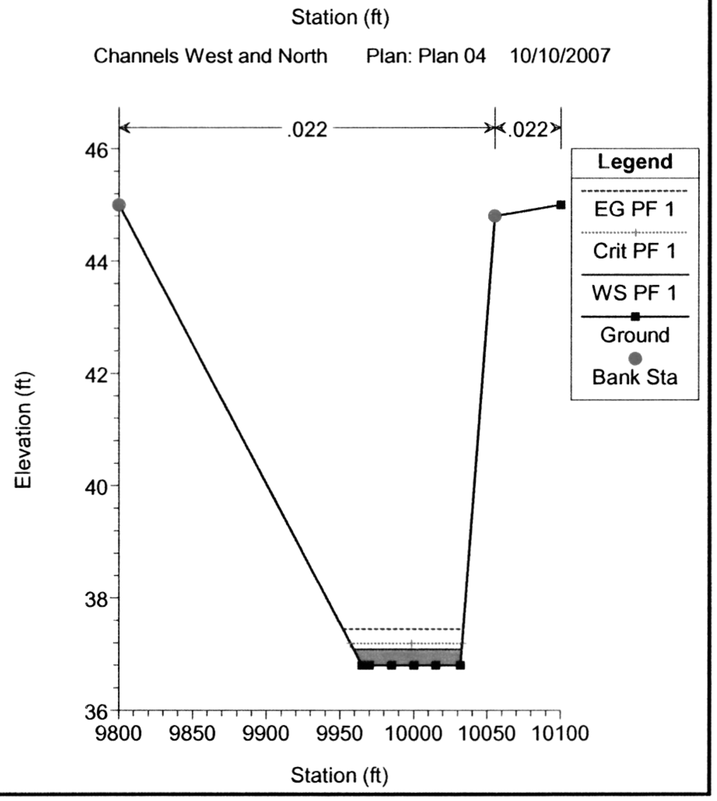

Channels West and North Plan: Plan 04 10/10/2007
.04
.035
.04
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

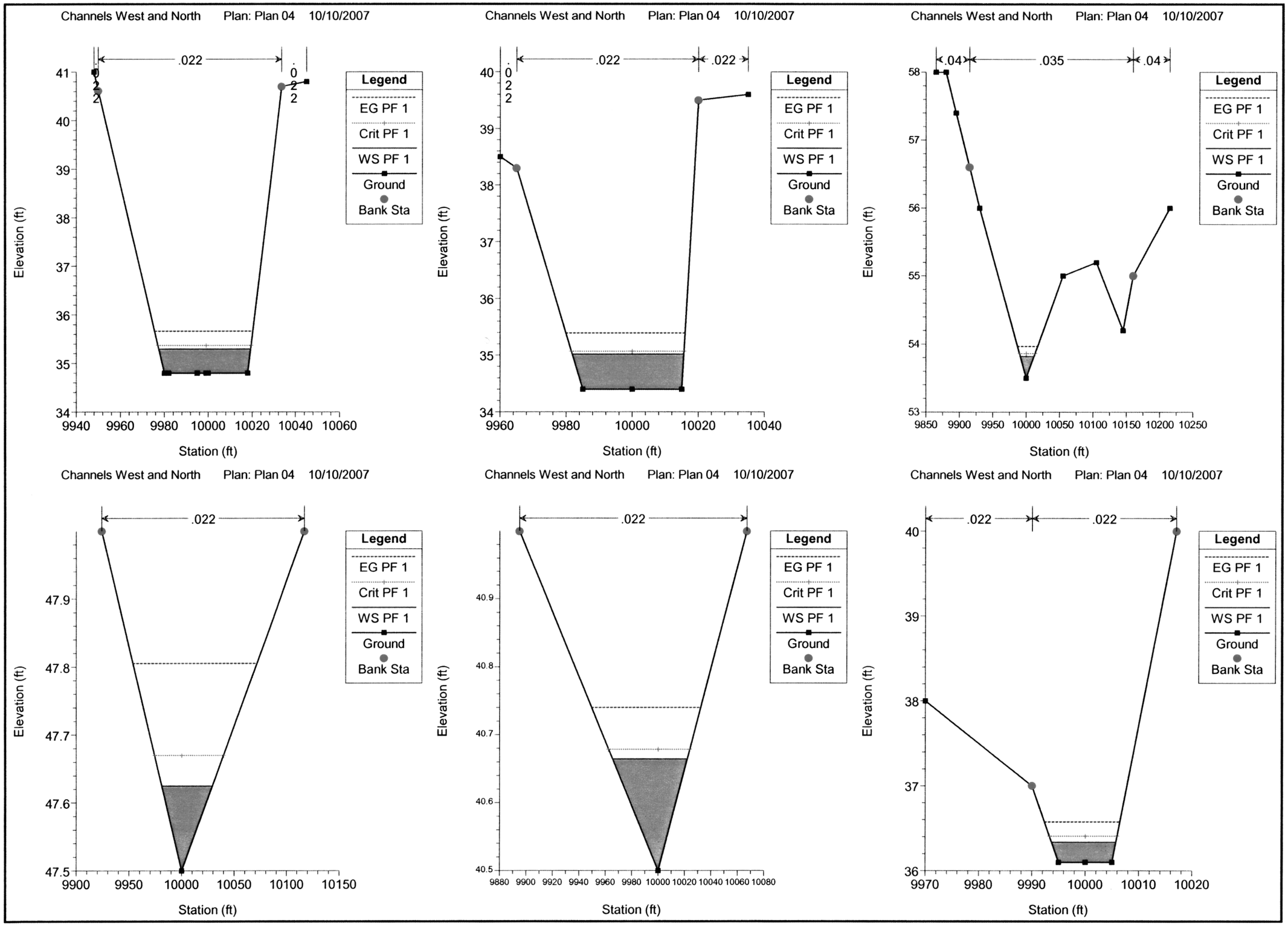

Channels West and North Plan: Plan 04 10/10/2007
.04
.04
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

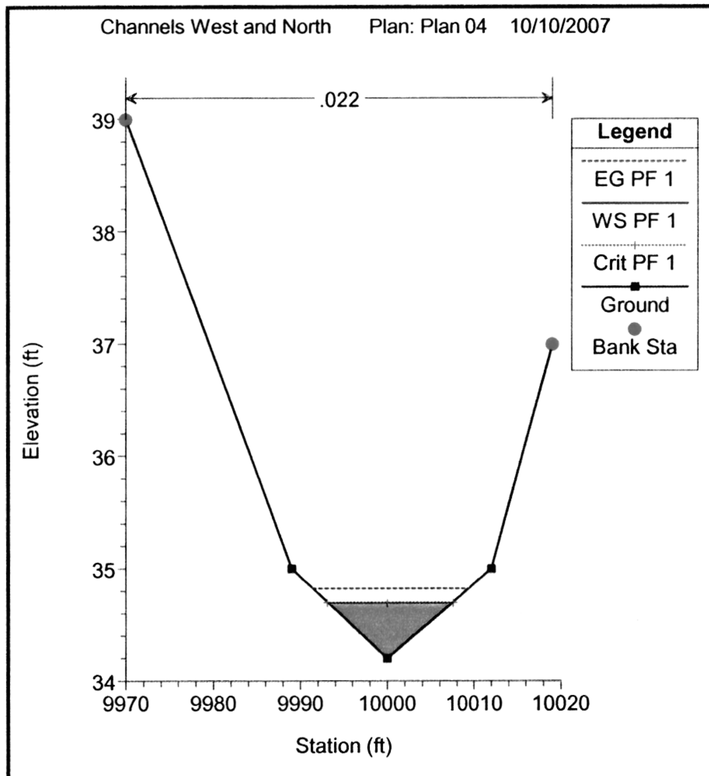

Channels West and North Plan: Plan 04 10/10/2007
.04
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

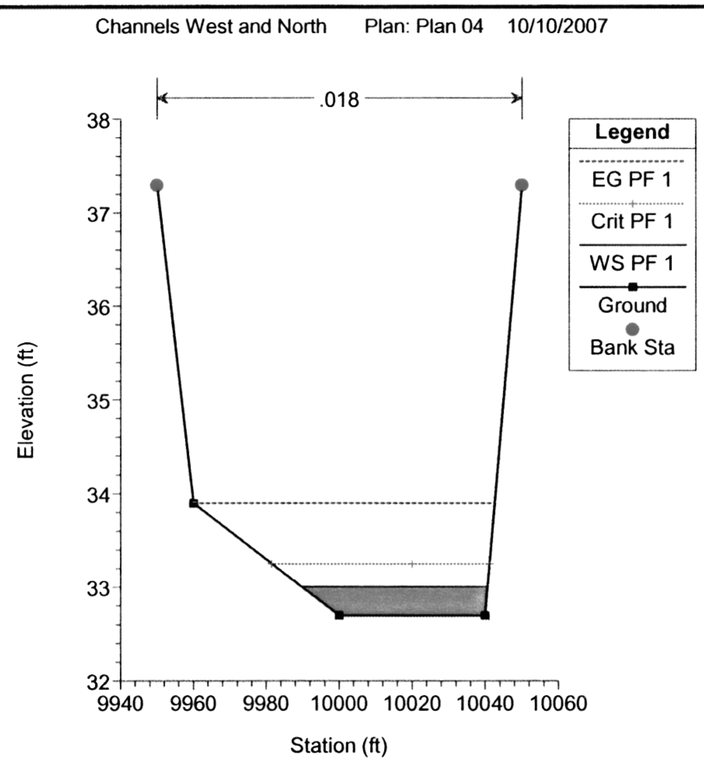

Channels West and North Plan: Plan 04 10/10/2007
.04
.04
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

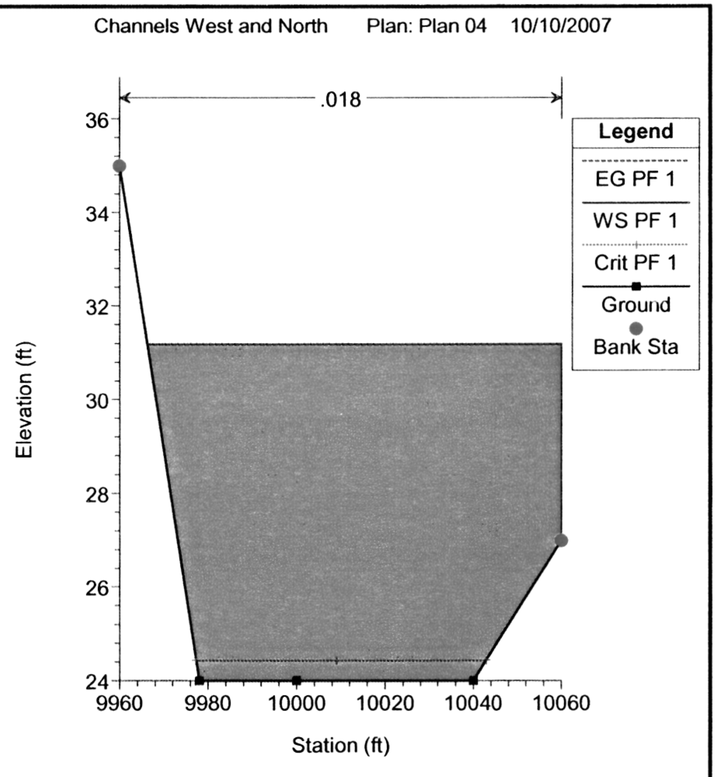

Channels West and North Plan: Plan 04 10/10/2007
.022
.022
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

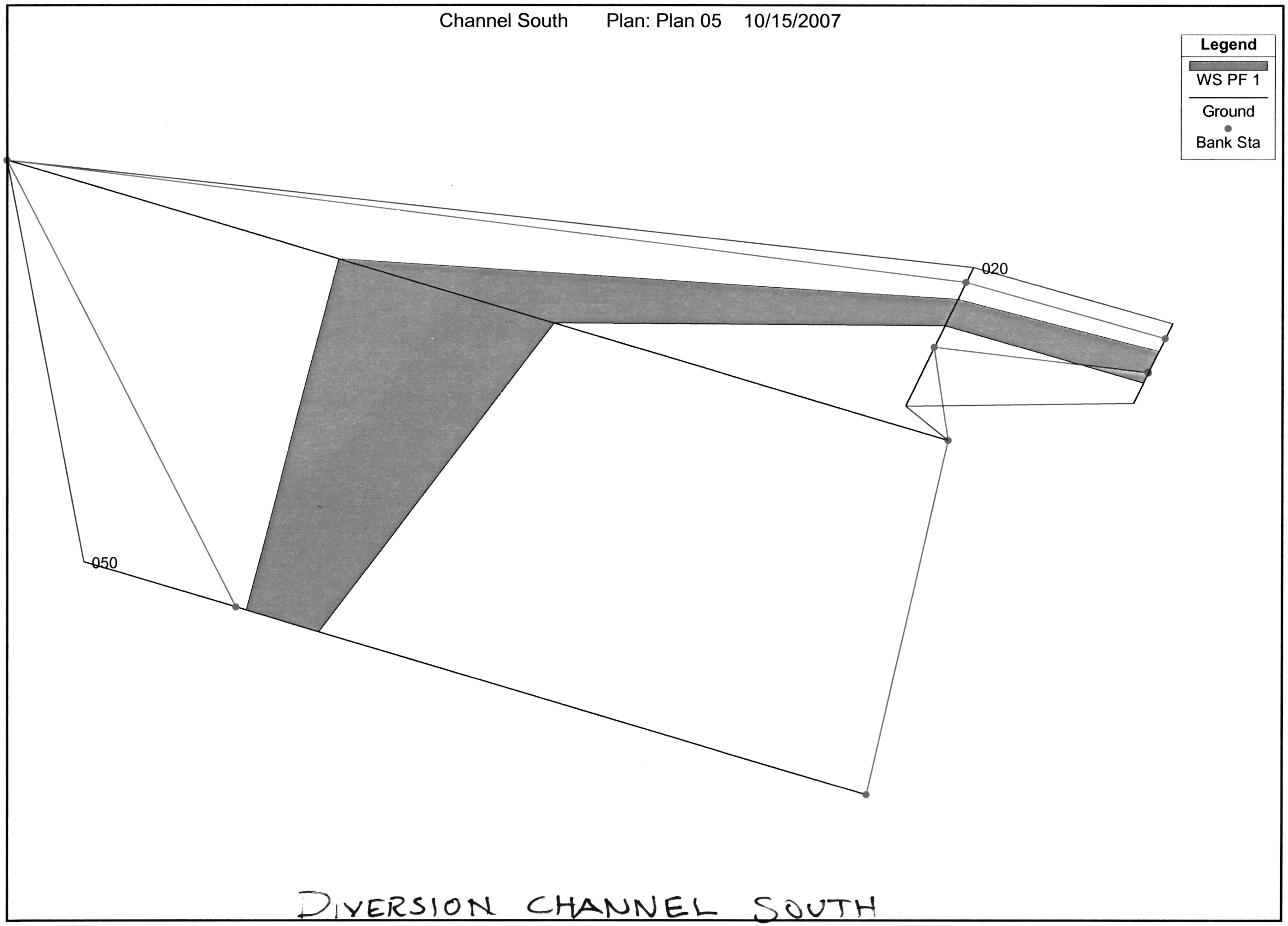

Channels West and North Plan: Plan 04 10/10/2007
.022
.022
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Channels West and North Plan: Plan 04 10/10/2007
.022
.022
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Channels West and North Plan: Plan 04 10/10/2007
.022
.022
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Channels West and North Plan: Plan 04 10/10/2007
.04
.035
.04
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Channels West and North Plan: Plan 04 10/10/2007
.022
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Channels West and North Plan: Plan 04 10/10/2007
.022
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Channels West and North Plan: Plan 04 10/10/2007
.022
.022
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Channels West and North Plan: Plan 04 10/10/2007
.022
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
39
38
37
36
35
34
9970
9980
9990
10000
10010
10020


Channels West and North Plan: Plan 04 10/10/2007
.018
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
38
37
36
35
34
33
32
9940
9960
9980
10000
10020
10040
10060


Channels West and North Plan: Plan 04 10/10/2007
.018
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
36
34
32
30
28
26
24
9960
9980
10000
10020
10040
10060

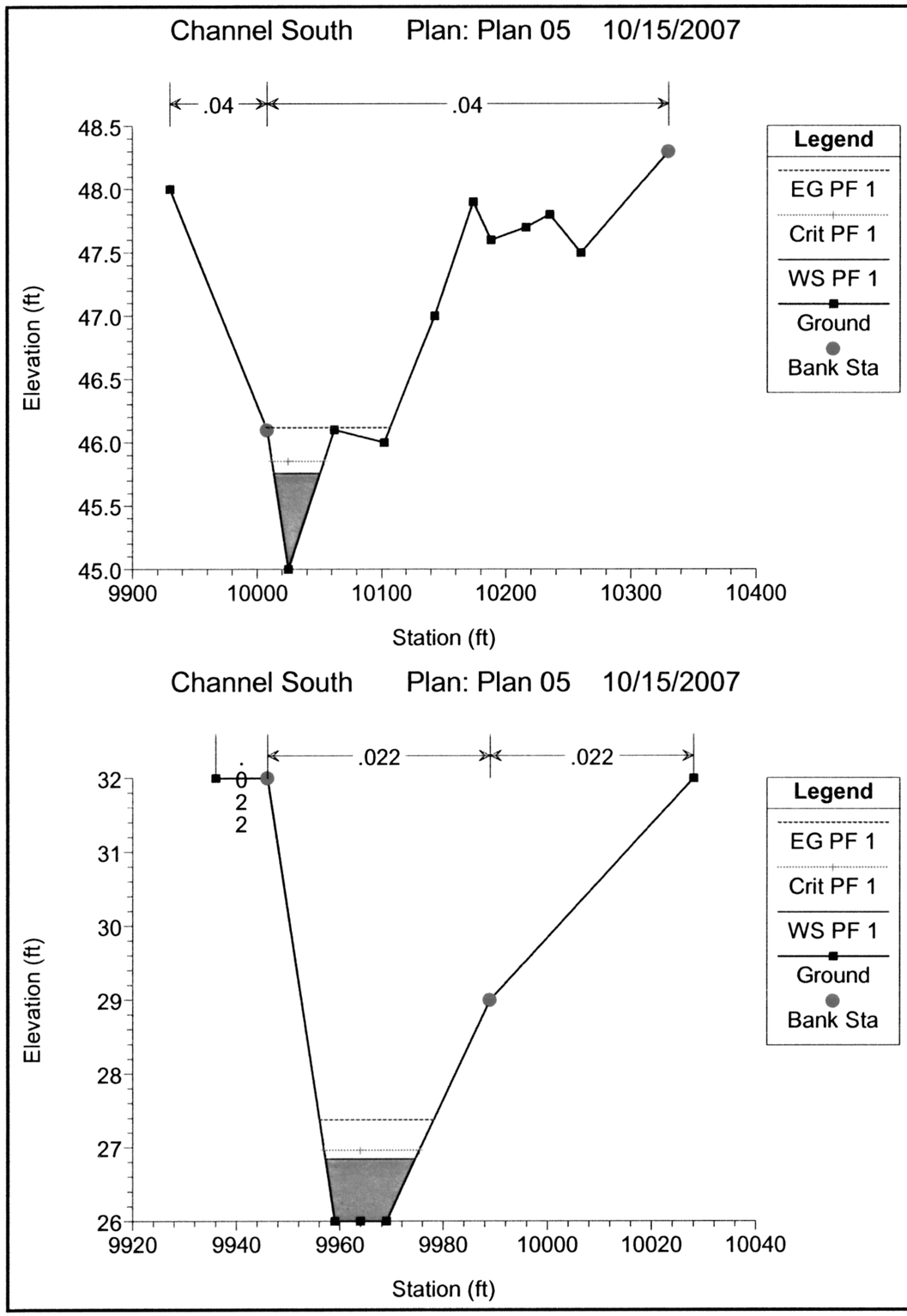


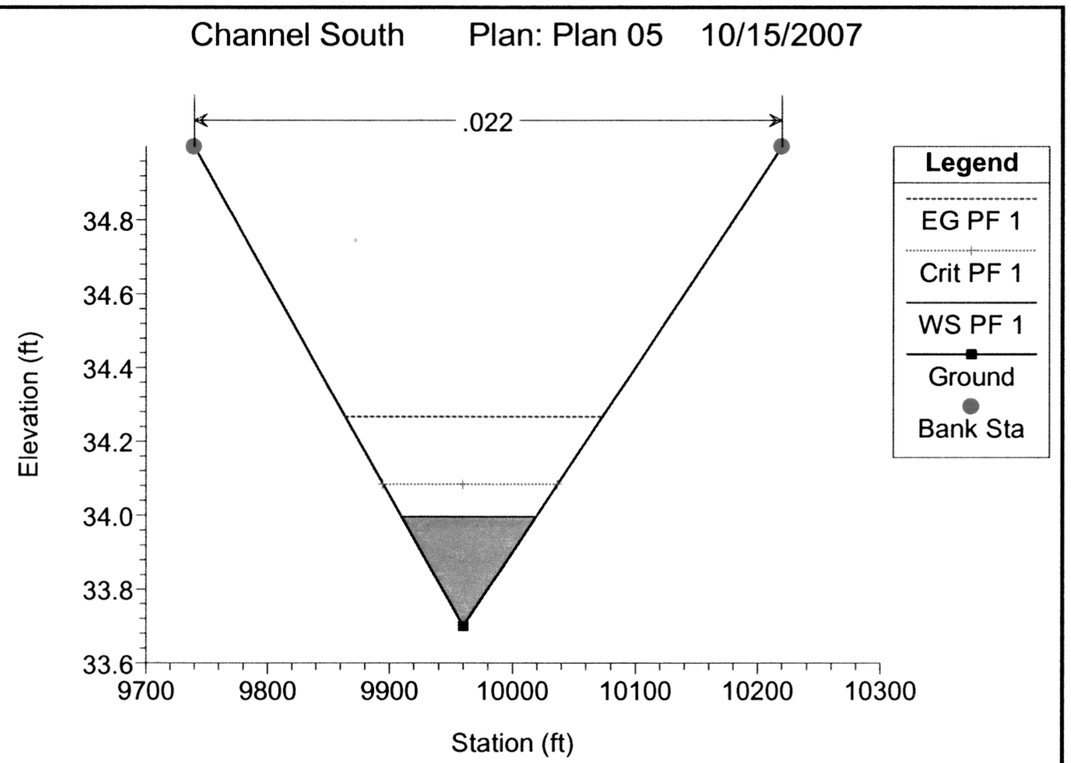
DIVERSION CHANNEL SOUTH

10-15-07
DIVERSION CHANNEL SOUTH)

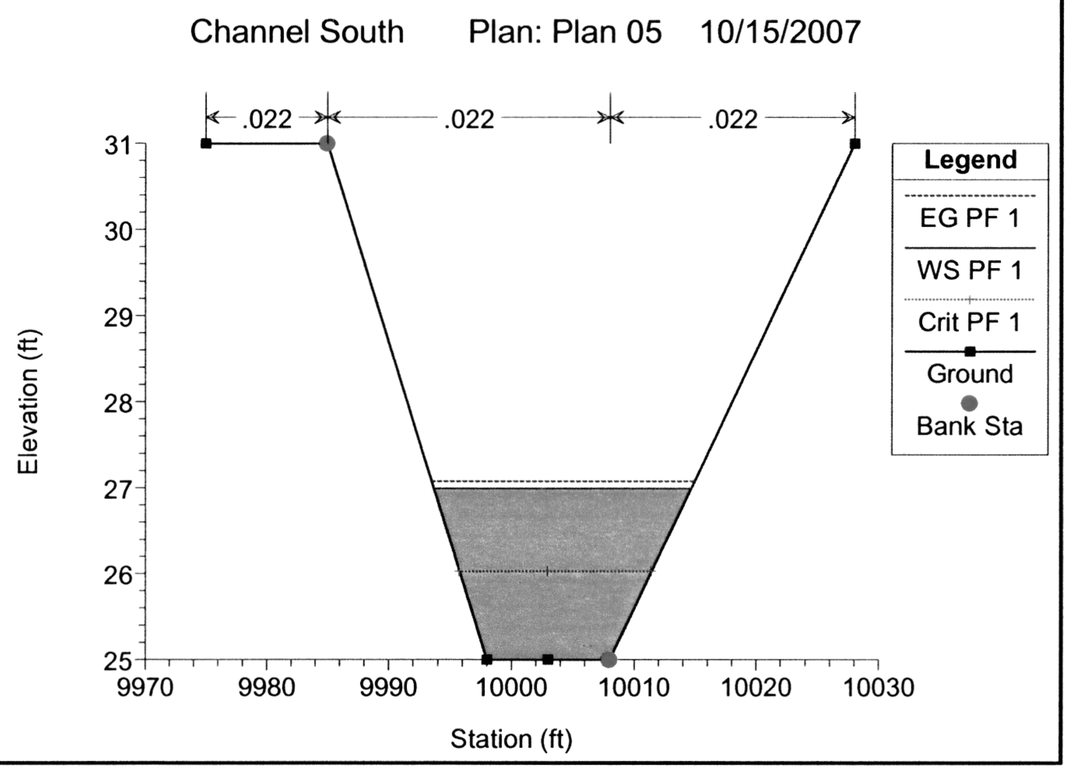
HEC-RAS Plan: Plan 04 River: 6A Reach: 6A Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	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/s)	(sq ft)	(ft)	
6A	050	PF 1	68.35	45.00	45.76	45.86	46.12	0.060048	4.78	14.29	37.45	1.37
6A	040	PF 1	68.35	33.70	34.00	34.09	34.27	0.048342	4.17	16.38	109.98	1.91
6A	020	PF 1	68.35	26.00	26.85	26.97	27.38	0.012949	5.83	11.73	17.53	1.25
6A	010	PF 1	68.35	25.00	27.00	26.03	27.08	0.000627	2.36	31.00	21.00	0.32


Channel South Plan: Plan 05 10/15/2007
.04
.04
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta


Channel South Plan: Plan 05 10/15/2007
.022
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

Channel South Plan: Plan 05 10/15/2007
.022
.022
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta


Channel South Plan: Plan 05 10/15/2007
.022
.022
.022
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta

CALCULATION 48-INCH PIPE

PIPE CULVERT ANALYSIS
COMPUTATION OF CULVERT PERFORMANCE CURVE

October 16, 2007

PROGRAM INPUT DATA

DESCRIPTION	VALUE
Culvert Diameter (ft)	4.0
FHWA Chart Number	1
FHWA Scale Number (Type of Culvert Entrance)	1
Manning's Roughness Coefficient (n-value)	0.012
Entrance Loss Coefficient of Culvert Opening	0.5
Culvert Length (ft)	243.0 ← Pipe + End sect.
Invert Elevation at Downstream end of Culvert (ft)	8.84
Invert Elevation at Upstream end of Culvert (ft)	24.0
Culvert Slope (ft/ft)	0.0624
Starting Flow Rate (cfs)	68.35 ← Q_{100}
Incremental Flow Rate (cfs)	0.0
Ending Flow Rate (cfs)	68.35
Starting Tailwater Depth (ft)	12.84
Incremental Tailwater Depth (ft)	1.0
Ending Tailwater Depth (ft)	12.84

COMPUTATION RESULTS

Flow Rate (cfs)	Tailwater Depth (ft)	Headwater (ft) Inlet Control	Headwater (ft) Outlet Control	Normal Depth (ft)	Critical Depth (ft)	Depth at Outlet (ft)	Outlet Velocity (fps)
68.35	12.84	3.73	-1.16	1.13	2.5	1.13	23.3

HYDROCALC Hydraulics for Windows, Version 1.2a Copyright (c) 1996
Dodson & Associates, Inc., 5629 FM 1960 West, Suite 314, Houston, TX 77069
Phone:(281)440-3787, Fax:(281)440-4742, Email:software@dodson-hydro.com
All Rights Reserved.

HW = 3.73'

Top of Berm = 5231.00

INV 48" PIPE = 5224.00

5224.00 + 3.73' = 5227.73'

5227.73' > 5231.00

OK

APPENDIX E
TEMPORARY POND 5A
PERMANENT EASEMENT

230

753981

PERMANENT EASEMENT

Grant of Permanent Easement, between Albuquerque Rio Bravo Partners LLC and Peoria Car Wash Partners LLC and Tempe Car Wash Partners LLC and Tamarish, LLC ("Grantor"), whose addresses are 805 Aerovista Place #202, San Luis Obispo, CA 93401 and the City of Albuquerque, a New Mexico municipal corporation ("City"), whose address is P.O. Box 1293, Albuquerque, New Mexico, 87103.

Grantor grants to the City an exclusive, permanent easement ("Easement") in, over, upon and across the real property described on Exhibit "A" attached hereto ("Property") for the construction, installation, maintenance, repair, modification, replacement and operation of drainage ponds and appurtenances, together with the right to remove trees, bushes, undergrowth and any other obstacles upon the Property if the City determines they interfere with the appropriate use of this Easement.

In the event Grantor constructs any improvements ("Improvements") within the Easement, the City has the right to enter upon Grantors property at any time and perform whatever inspection, installation, maintenance, repair, modification or removal ("Work") it deems appropriate without liability to the City. If the Work effects any Improvements or encroachments made by the Grantor, the City will not be financially or otherwise responsible for rebuilding or repairing the Improvements or encroachments. If in the opinion of the City, the Work to be performed by the City could endanger the structural integrity or otherwise damage the Improvements or encroachments, the Grantor shall, at its own expense, take whatever protective measures are required to safeguard the Improvements or encroachments.

Grantor covenants and warrants that Grantor is the owner in fee simple of the Property, that Grantor has a good lawful right to convey the Property or any part thereof and that Grantor will forever warrant and defend the title to the Property against all claims from all persons or entities.

The grant and other provisions of this Easement constitute covenants running with the Property for the benefit of the City and its successors and assigns until terminated.

This Easement shall not be effective until approved by the City Engineer in the signature block below.

WITNESS my hand and seal this _____ day of _____, 20_____.

APPROVED:

City Engineer

5-22-07
Dated

5/16/07

5-18-07

GRANTORS:

Albuquerque Rio Bravo Partners, LLC
a Delaware limited liability company

By: Patrick N. Smith, Manager

Peoria Car Wash Partners, LLC
an Arizona limited liability company
By: SBP, LLC
an Arizona limited liability company
Its: Manager

By: Patrick N. Smith, Manager

F:\1-Projects\2003\A03080 - Anderson Heights\Unit 5\Esmt - Perma

Maggie Toulouse Bern. Co. EASE R 23.00
2007076134
6659661
Page: 1 of 8
05/23/2007 03:43P

Tempe Car Wash Partners, LLC
an Arizona limited liability company

By: SBP, LLC
an Arizona limited liability company
Its: Manager

By: Patrick N. Smith, Manager

Tamarisk, LLC
an Arizona limited liability company

By: Patrick N. Smith, Manager

GRANTOR'S NOTARY

STATE OF _____)
) ss
COUNTY OF _____)

This instrument was acknowledged before me on _____ day of _____, 20___, by Patrick N. Smith, manager, on behalf of Albuquerque Rio Bravo Partners LLC and Peoria Car Wash Partners LLC and Tempe Car Wash Partners LLC and Tamarish, LLC,.

Notary Public

My Commission Expires:

_____

See attached acknowledgement certificate 5/4/07 mag

(EXHIBIT"A" ATTACHED)

F:\1-Projects\2003\A03080 - Anderson Heights\Unit 5\Esmt - Permanr

2007076134
6659001
Page: 2 of 8
05/23/2007 03:43P
Bk-A137 Pg-5969

State of California

County of San Luis Obispo

On May 4, 2007 before me, Margaret A George, Notary Public , personally appeared Patrick N Smith personally known to me ~~(or proved to me on the basis of satisfactory evidence)~~ to be the person (s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal.

Margaret A George

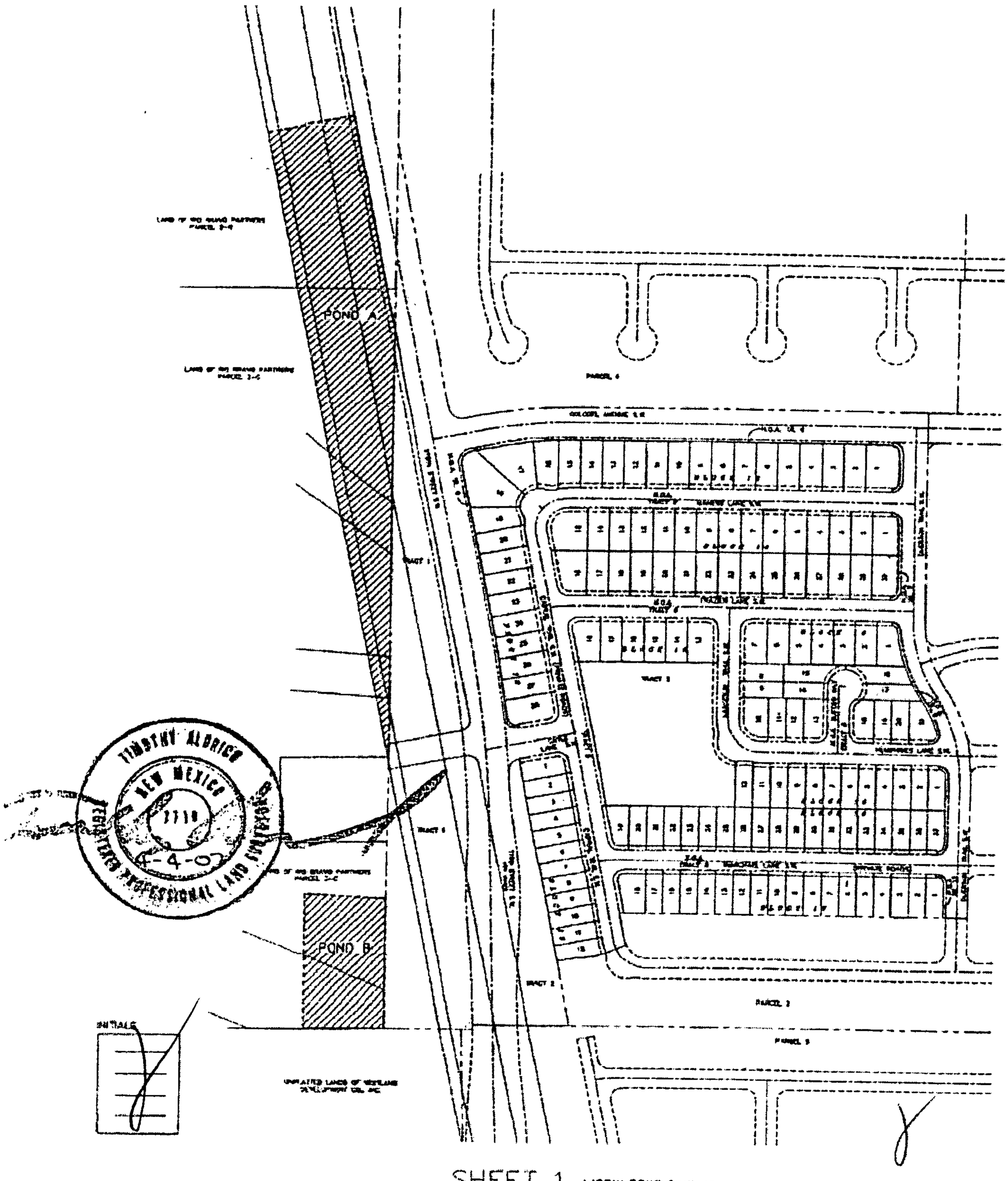
MARGARET A. GEORGE
COMM. #1703443
NOTARY PUBLIC - CALIFORNIA
SAN LUIS OBISPO COUNTY
My Comm. Expires NOV. 8, 2010

ARS6 ARS6

2007076134
6659981
Page: 3 of 8
05/23/2007 03:43P
Maggie Toulouse Bern. Co. ERSE R 23.00 A1-A137 Pg-5959

"EXHIBIT "A"

CITY OF ALBUQUERQUE PUBLIC DRAINAGE EASEMENT



"EXHIBIT "A"

CITY OF ALBUQUERQUE PUBLIC DRAINAGE EASEMENT

DESCRIPTION

A City of Albuquerque Public Drainage Easement within the Town of Atrisco Grant, projected Section 5, Township 9 North, Range 2 East, New Mexico Pricipal Meridian, City of Albuquerque, Bernalillo County, New Mexico being within PARCELS 2-B AND 2-C, LANDS OF RIO BRAVO PARTNERS, as the same is shown and designated on said plat filed for record in the office of the County Clerk of Bernalillo County, New Mexico on April 17, 1996 in Volume 96C, Folio 160 and being more particularly described as follows:

BEGINNING at the northwest corner of the herein described Easement from whence the Albuquerque Control Survey Monument "1-N8" bears N 09°22'57" W, 2242.97 feet;

THENCE N 78°44'25" E, 200.00 feet to the northeast corner;

THENCE S 11°15'35" E, 513.90 feet to a point;

THENCE S 00°01'24" W, 1022.21 feet to a point

THENCE N 11°15'35" W, 1516.36 feet to the point of beginning and containing 4.6608 acres more or less.

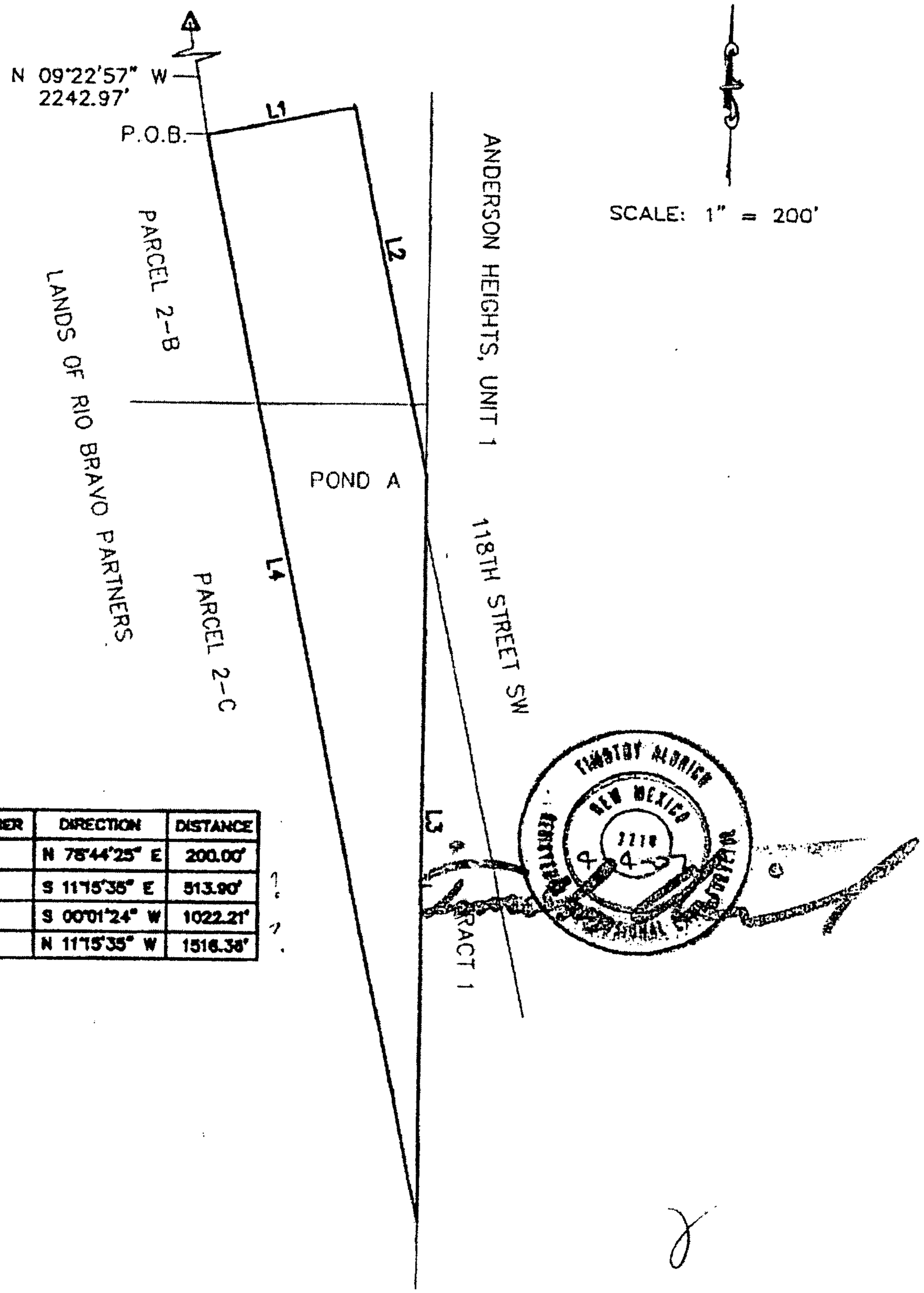


INITIALS

SHEET

2007076134
Page: 5 of 8
05/23/2007 03:43P
Maggie Toulouse Bern Co

"EXHIBIT "A"
CITY OF ALBUQUERQUE PUBLIC DRAINAGE EASEMENT



NUMBER	DIRECTION	DISTANCE
L1	N 78°44'25" E	200.00'
L2	S 11°15'35" E	513.90'
L3	S 00°01'24" W	1022.21'
L4	N 11°15'35" W	1516.36'

INITIALS

SHEET

2007076134
Page: 6 of 8
05/23/2007 03:43P

"EXHIBIT "A"

CITY OF ALBUQUERQUE PUBLIC DRAINAGE EASEMENT

DESCRIPTION

A City of Albuquerque Public Drainage Easement within the Town of Atrisco Grant, projected Section 5, Township 9 North, Range 2 East, New Mexico Pricipal Meridian, City of Albuquerque, Bernalillo County, New Mexico being within PARCEL 2-C, LANDS OF RIO BRAVO PARTNERS, as the same is shown and designated on said plat filed for record in the office of the County Clerk of Bernalillo County, New Mexico on April 17, 1996 in Volume 96C, Folio 160 and being more particularly described as follows:

BEGINNING at the northwest corner of the herein described Easement from whence the Albuquerque Control Survey Monument "1-N8" bears N 09°45'26" W, 4045.33 feet;

THENCE S 86°38'37" E, 185.94 feet to the northeast corner;

THENCE S 00°01'24" W, 300.08 feet to the southeast corner;

THENCE S 89°47'35" W, 184.37 feet to the southwest corner;

THENCE N 00°12'25" W, 311.64 feet to the point of beginning and containing 1.2989 acres more or less.

TIMOTHY ALDRICH NEW MEXICO 7118 REGISTERED PROFESSIONAL LAND SURVEYOR

INITIALS

SHEET

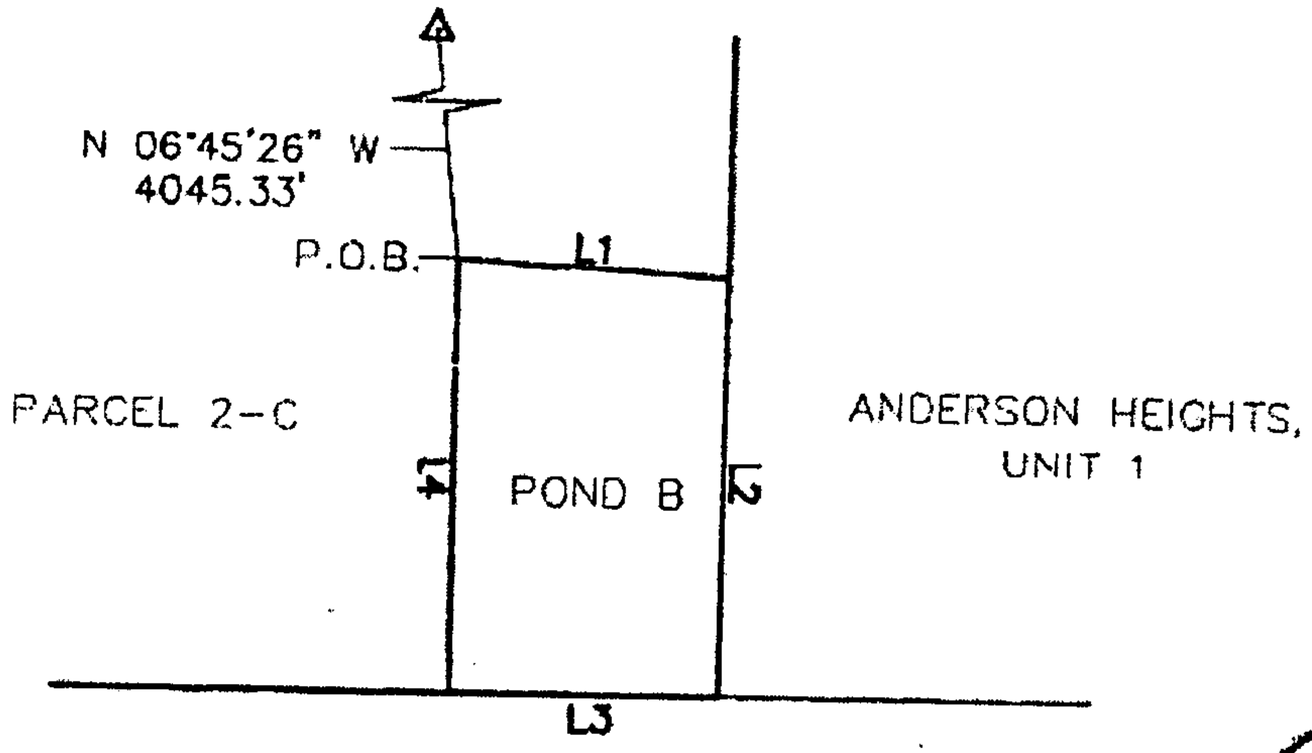
2007076134
6859681
Page: 7 of 8
05/23/2007 03:43P

"EXHIBIT "A"

CITY OF ALBUQUERQUE PUBLIC DRAINAGE EASEMENT

SCALE: 1" = 200'

LANDS OF RIO BRAVO PARTNERS



WESTLAND DEVELOPMENT COMPANY
"SOUTH TRACT"
(SURVEY DATED 08-19-74)
(PREPARED BY J. ROBERT MARTINEZ)

NUMBER	DIRECTION	DISTANCE
L1	S 86°38'37" E	185.94'
L2	S 00°01'24" W	300.08'
L3	S 89°47'35" W	184.37'
L4	N 00°12'25" W	311.64'

INITIALS

SHEET

2007076134
Page: 8 of 8
05/23/2007 03:43P

APPENDIX F
RIGHT OF ENTRY AGREEMENT

RIGHT OF ENTRY AGREEMENT

THIS RIGHT OF ENTRY AGREEMENT ("Agreement") is made as of October 12, 2007 by and between WESTLAND DEVCO, LP, a Delaware limited partnership, "Licensor," and KB HOME, hereinafter referred to as the "Licensee."

RECITALS

A. Licensor is the owner of certain real property located in the City of Albuquerque, County of Bernalillo, State of New Mexico, commonly known as the "118th Street Ponds" (the "Property").

B. Licensee desires to enter upon a portion of the Property – specifically the portion of the Property that contains the Ponds (defined below) and a reasonable area for ingress and egress (the "License Area"), to perform certain work specified herein, and Licensor is willing to allow such entry on the terms and conditions hereinafter specified.

NOW, THEREFORE, with reference to the foregoing recitals, the parties hereto agree as follows:

1. Licensor hereby grants to Licensee and its employees, agents, consultants and contractors ("Related Parties") a non-exclusive revocable license ("License") to enter upon and use the License Area for the purpose of filling in those certain drainage ponds and removing existing shotcrete rundowns and stormdrain pipe (the "Project"), commonly known as ponds 5 and 6 (the "Ponds").

2. The term of the License shall commence on October 15, 2007 at 12:00 AM, and shall terminate on the earlier of the completion of the Project or on December 31, 2007 at 11:59 AM, local time.

3. Licensee shall obtain, at is sole cost and expense, all governmental permits and authorizations required by any governmental agencies for the Project. Licensee shall comply with, and shall cause all of its Related Parties to comply with all applicable governmental laws, rules, regulations and requirements governing the Project.

4. Licensee agrees to indemnify, defend and save harmless Licensor and its divisions, subsidiaries, partners and affiliated companies and its employees, officers, shareholders, trustees, directors, agents, representatives, successors and assigns (collectively, the "Indemnitees") from and against any and all claims, demands, losses or liabilities of any kind or nature which Licensor or the Indemnitees may sustain or incur or which may be imposed upon them, or any of them, for injury to or death of persons, or damage to property as a result of, or arising out of, the entry on the

Property of Licensee, its officers, agents, employees, representatives, invitees or licensees, in connection with the use of the Property.

5. Licensee agrees to (i) promptly restore and repair any damage to the Property resulting from the activities of Licensee on the License Area so that the License Area shall be in the same condition that it existed in prior to construction of the Ponds. Specifically, Licensee agrees to reseed and straw crimp the Property and install appropriate dust control measures to the satisfaction of Licensor; (ii) fully comply with all laws, ordinances, rules, regulations, orders and requirements applicable to such activities; (iii) not allow the activities undertaken by Licensee to result in any liens, judgments or other encumbrances being filed or recorded against the Property, and Licensee shall, at its sole cost and expense, promptly discharge of record any such liens or encumbrances that are so filed or recorded; and (iv) promptly remove from the Property any and all materials brought onto the License Area by Licensee or its Related Parties, including but not limited to the existing shotcrete rundowns, existing Reinforced Concrete Pipe (RCP) and associated cutoff walls and riprap.

6. Licensee shall maintain commercial general liability insurance in an amount no less than [Two Million and No/100 Dollars ($2,000,000.00)]. Within ten (10) days after the date of this Agreement (but in any event prior to commencing any work on the Project), Licensee shall provide Licensor with a Certificate of Insurance evidencing the existence of such coverage and naming Licensor as an additional insured on such policy.

7. This Agreement may not be assigned, whether voluntarily or by operation of law.

8. Each signatory hereto warrants to the other party that it has authority to sign on behalf of the party for whom it purports to sign.

9. In the event any party hereto brings suit to enforce the terms of this Agreement or on account of breach hereof, the party not prevailing in such suit shall pay all reasonable costs and expenses incurred by the other party in such suit, including, without limitation, court costs and attorneys' fees.

10. This Agreement shall be governed by the laws of the State of New Mexico.

11. This Agreement may be executed in counterparts, and all counterparts together shall be construed as one document. The parties hereto agree to accept executed copies of this Agreement by facsimile and to treat such facsimile copies as originals.

[SIGNATURES ON FOLLOWING PAGE]

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date first above written.

"LICENSOR"

Westland DevCo, LP,
a Delaware limited partnership

By: Westland Holdco, Inc.,
a Delaware corporation,
Its: Managing General Partner

By: _____
Name: William F. Stead
Its: Vice President

"LICENSEE"

KB Home New Mexico, Inc.

By: _____
Name: Donald D Britt
Its: Director of Land Acq.

Diane Hoelzer

From: Mark Goodwin
Sent: Tuesday, October 23, 2007 1:22 PM
To: Diane Hoelzer
Subject: FW: 118th pond insurance certificate and endorsement

Mark Goodwin, PE
MARK GOODWIN & ASSOCIATES, PA
(505) 828-2200
(505) 797-9539 fax
mark@goodwinengineers.com

From: Leroy Chavez [mailto:lchavez@suncal.com]
Sent: Tuesday, October 23, 2007 1:21 PM
To: dbritt@kbhome.com
Cc: Fred Ambrogi; Will Steadman; Mark Goodwin; Vigil, Fernando; Donald Lecceadone
Subject: RE: 118th pond insurance certificate and endorsement

Don Britt,

We are good to go.

Please let me know when you get started. Please copy me on soils tests.

We will need to coordinate what storm pipe needs to be removed! (We need all run downs removed!

Thanks.

Leroy J. Chavez
V.P. of Development
SunCal Companies
New Mexico Division
505-831-9600 (O)
505-280-2031 (C)
LChavez@suncal.com

From: Donald Lecceadone
Sent: Tuesday, October 23, 2007 10:20 AM
To: Leroy Chavez
Cc: 'Don Britt (dbritt@kbhome.com)'; Fred Ambrogi; Will Steadman
Subject: RE: 118th pond insurance certificate and endorsement

Looks good to me. Thanks.

Don Lecceadone, ARM-P
Division Risk Manager

D. Mark Goodwin & Associates, P.A.
Consulting Engineers
P.O. BOX 90606, ALBUQUERQUE,NM 87199
(505) 828-2200 FAX 797-9539

p 8/03

March 12, 2007

Mr. Brad Bingham
Hydrology Department
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: Anderson Heights – Interim 118th Street Drainage Plan

Dear Mr. Bingham:

The purpose of this letter is to transmit plans and a report for your approval, so that all of the Anderson Heights Development may proceed. Since KB HOME New Mexico has not been able to persuade SunCal New Mexico to deliver easements or title to the property where the master planned "Amole Hubble, South Power Line Diversion" Ponds 5 and 6 have already been constructed, and since significant development has already occurred downstream where floodplain removal is dependent on the "South Power Line Diversion", a temporary system of diversion swales and retention ponds is needed in the existing 156' drainage easement to divert the existing floodplains and other storm water runoff from the undeveloped upstream properties to protect the properties downstream of 118th Street and to remove the floodplains from the downstream properties.

Time is of the essence. The downstream development should be allowed to proceed immediately since the developer's financial guarantees that are in place for Unit 1 are sufficient to construct the temporary system including:

1. *The temporary conversion of ponds #2, #3 and #4 to retention by capping the outlet of pond #3 and removing the outlet pipe from pond #4.*
2. *Temporary relocation of pond #5 and conversion to retention within a new drainage easement north of SunCal's property.*
3. *Temporary removal of pond #6.*
4. *Temporary diversion swale and storm pipes in 118th Street from Dennis Chavez to the new easement at temporary pond #5.*

The reason that these improvements are termed temporary is because they are not sized for future development of upstream properties. The permanent facilities will be constructed in accordance with the approved master plan when those upstream properties develop. These temporary improvements will permanently remove the downstream 100-YR floodplain.

It is intended that the attached documentation be approved for filed change order to the Unit 1 work order (revised sheets added at time of as-built plans), and to be included in the LOMR application to FEMA:

1. *Modified drainage basin map from approved CLOMR*
2. *Copy of existing undeveloped conditions AHYMO from approved drainage report*
3. *Pond #5 volume calculations*
4. *Pond volume summary table*

5. *Revised constructions plans for Anderson Heights Subdivision, Unit 1 – City Project Number 753981, sheets 18R, 19R, 20R and 21R of 83.*

If you concur, please sign and return this letter so the contractor may proceed with these field changes.

Sincerely,

MARK GOODWIN & ASSOCIATES, P.A.

James D. Hughes, PE
Senior Engineer

JDH/la

Approved for Field Changes:

_____
Hydrology *Date*

_____
Transportation *Date*

_____
Construction Inspection *Date*

xc: *Jane Rael – COA Construction Inspection*
Gary Jenkins – KB HOME New Mexico
Mike Adams - Albuquerque Rio Bravo Partners, LLC

CITY OF ALBUQUERQUE

April 4, 2007

Doug Hughes, PE
Mark Goodwin & Associates
P.O. Box 90606,
Albuquerque, NM 87199

Re: Anderson Heights 118th St. Ponds Revision Plan
Engineer's Stamp dated 3-12-07, (P8/D3)

Dear Mr. Hughes,

Based upon the information provided in your submittal dated 3-12-07, I offer the following comments.

- This request must be processed as a change order, not a field change.
- Typically, the City does not allow temporary drainage facilities in road R/W but since the negotiations between your client and the property owner has reached an impasse, I will consider allowing it.
- The easement that is being debated is a critical requirement for the entire South Powerline facility, as identified in the Amole-Hubbell DMP, so if your client cannot provide it, I will make sure that it is a requirement when the land owner develops their land through coordination with the County and AMAFCA. Ponds 5 and 6 and associated piping will still be required upon development of land within the basin contributing to said ponds.
- The grading plan submitted shows grading on property not owned by your client and I will need written concurrence from that landowner prior to the change order signoff.
- In order to get a LOMR, the City must assure the maintenance of the berms and temporary retention pond. Since the City does not provide maintenance of temporary facilities, an agreement and covenant as well as the public drainage easement will be required prior to this change order. Since this change is different from the approved CLOMR, the financial guarantee must be withheld until FEMA approves the LOMR. Keep in mind that additional requirements may be needed as identified by FEMA.

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

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

Sincerely,

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

C: Lynn Mazur, PE, AMAFCA
Brian Kent, PE, BCPW
file

POND-2 Version: 4.01
S/N: 88020607

118th Street pond #5 temporary retention.

CALCULATED 03-19-2007 08:32:02
DISK FILE : F:AH5NEW .VOL

Planimeter scale: 1 inch = 1 ft.

Elevation (ft)	Planimeter (sq.in.)	Area (acres)	A1+A2+sqr(A1*A2) (acres)	* Volume (acre-ft)	Volume Sum (acre-ft)
5,224.00	32,696.00	0.75	0.00	0.00	0.00
5,231.00	*I*	1.13	2.81	6.55	6.55
5,233.00	*I*	1.26	2.98	8.94	8.94
5,237.00	66,365.00	1.52	3.34	14.49	14.49

I ---> Interpolated area from closest two planimeter readings.

$$IA = (sq.rt(Area1) + ((Ei-E1)/(E2-E1))*(sq.rt(Area2)-sq.rt(Area1)))^2$$

where: E1, E2 = Closest two elevations with planimeter data
Ei = Elevation at which to interpolate area
Area1,Area2 = Areas computed for E1, E2, respectively
IA = Interpolated area for Ei

* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

Pond Volume Summary Table

Pond #	Area	Required Volume [1]	As-Built Volume [2]	Peak Flow
2	138 Ac.	4.41 Ac. Ft.	5.95 Ac. Ft.	167.99 cfs
3	92 Ac.	2.93 Ac. Ft.	8.87 Ac. Ft.	108.03 cfs
4	37 Ac.	1.18 Ac. Ft.	7.59 Ac. Ft.	42.30 cfs
5	203 Ac.	6.49 Ac. Ft.	8.94 Ac. Ft.	259.40 cfs [3]
6	62 Ac.	1.98 Ac. Ft.	—	71.73 cfs

(1) *Required volumes are based on existing undeveloped conditions in the upstream watersheds and include the 100-year, 24-hour runoff volume from the AHYMO model.*

(2) *As-built volumes are the volumes of the ponds at the crest of the overflow spillways.*

(3) *About 33 acres drains to the south rundown in Pond #5. This is 42.17 cfs and 1.05 ac.ft. by proration.*

Sediment Transport Levee and Freeboard Criteria

From the Anderson Hills DMP Volume II, Appendix C, page 45, the floodplain running through Pond #6 has 914 tons (15,000 cf @ 120 lb/cf) of total sediment transported in a 24 hour storm, where the peak flow rate is 73.84 cfs and runoff volume is 3.46 ac.ft. This volume would fit in a 500' length of either swale at a depth of less than 2 feet.

Minimum swale slope is 1% with Q100 = 71.73 cfs and the flow depth d=1.25' and velocity v=4.11 fps by Manning's equation where 'n'=0.035. At 42.17 cfs d= 0.93' and v=3.49 fps. These two depths allow more than 3' of freeboard for the 6' and 4' high berms, respectively. The berms provide 1' of freeboard for 2' sediment plus peak 100-year flows.

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

PROJECT TITLE: Anderson Heights - 118th Street Ponds
DRB #: 1002739 EPC#:_____

ZONE MAP/DRG. FILE #:~~N8/D2~~
WORK ORDER#:753987 (P-8/P3)

LEGAL DESCRIPTION: Anderson Heights Unit 7&8
CITY ADDRESS:_____

ENGINEERING FIRM: Mark Goodwin & Associates, PA
ADDRESS: PO Box 90606
CITY, STATE: Albuquerque, NM

CONTACT: Diane Hoelzer
PHONE: 828-2200
ZIP CODE: 87199

OWNER:_____KB Home New Mexico Inc.
ADDRESS: 6330 Riverside Plaza lane NW, Ste 200
CITY, STATE: Albuquerque, NM

CONTACT: Tony Sciarillo
PHONE: 353-5300
ZIP CODE: 87120

ARCHITECT: NA
ADDRESS: _____
CITY, STATE: _____

CONTACT: _____
PHONE:
ZIP CODE: _____

SURVEYOR: Surv-Tek
ADDRESS: 9384 Valley View Drive
CITY, STATE: Albuquerque, NM

CONTACT: Gary Hugg
PHONE: 897-3366
ZIP CODE: 87114

CONTRACTOR: Salls Brothers Construction Inc.
ADDRESS: 7301 Reading Drive, SE
CITY, STATE: Albuquerque, NM

CONTACT: Fred Salls
PHONE: 873-8780
ZIP CODE: 87193

CHECK TYPE OF SUBMITTAL:

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

CHECK TYPE OF APPROVAL SOUGHT:

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

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ☐ YES
- ☒ NO
- ☐ COPY PROVIDED

RECEIVED
OCT 26 2007
HYDROLOGY SECTION

DATE SUBMITTED:10/26/07

BY:DIANE HOELZER, PE

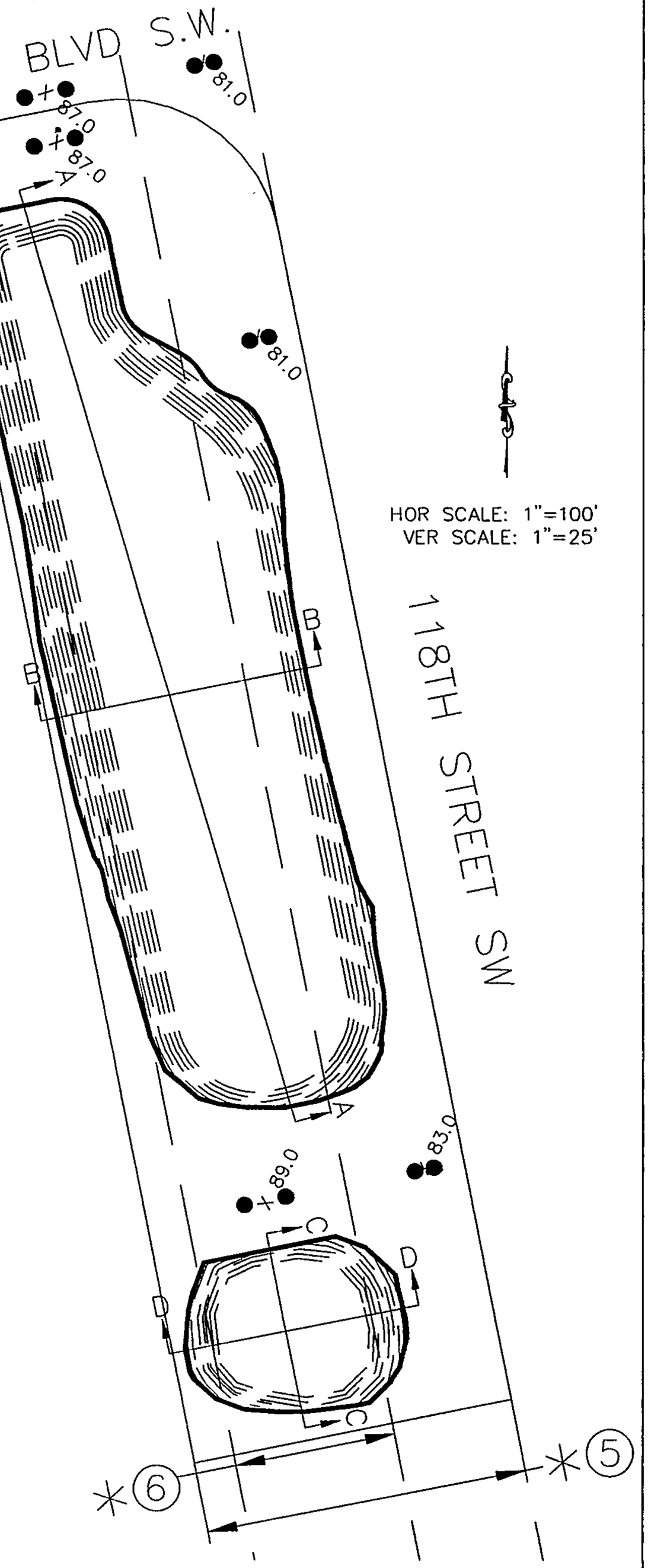
Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature , location and scope ot the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based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

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

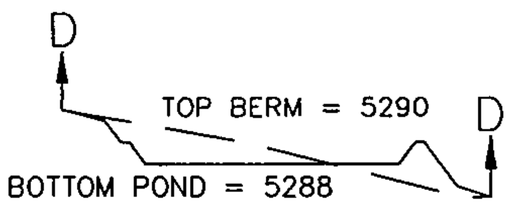
REVISED EXHIBIT "A"
PNM ENCROACHMENT AGREEMENT FOR PUBLIC DRAINAGE AND POND EASEMENT INTO 100' AND 200' PNM EASEMENTS

LEGEND

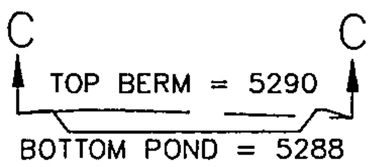
- ● EXISTING POWER POLE
- ● FUTURE POWER POLE
- —— EXISTING TOPOGRAPHY
- —— FUTURE FINSH GRADE (PONDS)
- x 81 0 SPOT ELEV AT EXISTING STRUCTURE
- x 81 0 SPOT ELEV AT FUTURE STRUCTURE



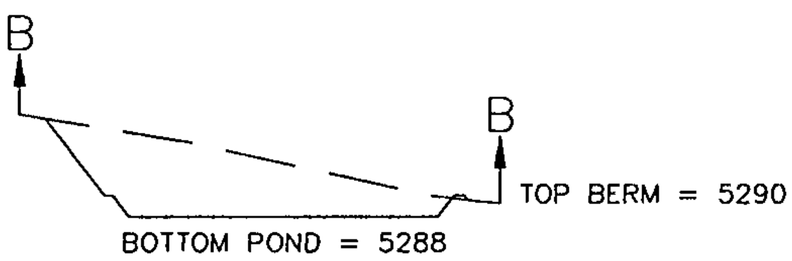
HOR SCALE: 1"=100'
VER SCALE: 1"=25'



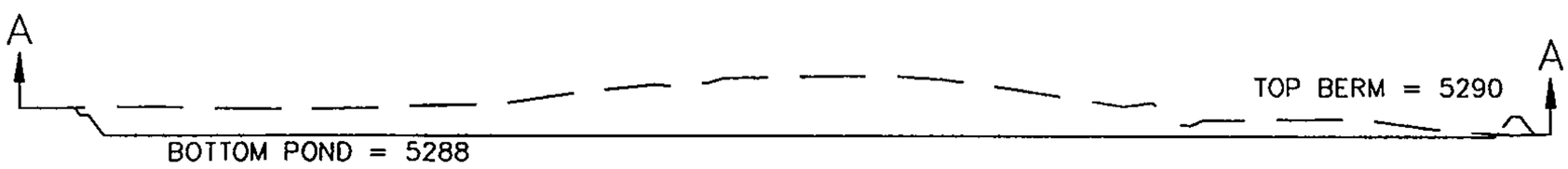
SECTION D–D



SECTION C–C



SECTION B–B



SECTION A–A