2013 92341

Cherne, Curtis

From: Mark Goodwin [Mark@goodwinengineers.com]
Sent: Thursday, September 12, 2013 9:05 AM
To: Cherne, Curtis
Cc: grgmbe@gmail.com
Subject: Tract 2-A-2-C Black Ranch

Attachments: Scanned from a Xerox multifunction device.pdf

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Curtis - we represent the owner of the referenced Tract and are preparing a Grading and Drainage Plan for an Assisted Living facility they plan to build there - they received the attached letter from the city and asked us to look into the problem - the drainage from the adjacent property has been blocked off, but our clients have had no activity on the property themselves - we believe the damage was done by the contractor for the Coors pond who staged off of our clients property - we will propose a remedy shortly and our client will assure that action be taken - one item we wish to point out is that the Exhibit 2 attached to the City's demand letter is an Agreement and Covenant for a different property located on Sage SW - this doesn't change the situation with this property but we thought you should know.

Thanks Curtis.

Mark Goodwin, P.E.
President
MARK GOODWIN & ASSOCIATES, PA
(505) 828-2200
(505) 797-9539 FAX
mark@goodwinengineers.com

-----Original Message-----
From: sharp_copier@goodwinengineers.com [mailto:sharp_copier@goodwinengineers.com]
Sent: Thursday, September 12, 2013 1:59 AM
To: Mark Goodwin
Subject: Scanned from a Xerox multifunction device

Please open the attached document. It was scanned and sent to you using a Xerox multifunction device.

Attachment File Type: pdf, Multi-Page

multifunction device Location: machine location not set
Device Name: XRX_9C934E158C24

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CITY OF ALBUQUERQUE

August 20, 2013

LLO-BRO, LLC
4828 Summerlin NW
Albuquerque, NM 87114

Re: Stormwater Drainage from Tract 2-A-2-C Black Ranch

To Whom It May Concern:

This correspondence is in follow-up to a letter sent on February 6, 2013, by the City of Albuquerque ("City") Hydrologist, Curtis Cherne, regarding fill material that has been imported onto Tract 2-A-2-C. This fill has raised the grade of your lot and created a condition that is damaging adjacent property. Under this site's plat, the owner of Tract 2-A-2-C's is required to maintain a drainage easement over the back edge of the site (see note to plat attached hereto as Exhibit 1). In addition, your tract is encumbered by a drainage covenant with the City (see drainage covenant attached hereto as Exhibit 2), which covenant requires the property's owner to maintain the drainage facility in accordance with approved drainage plans. Per the master drainage plan for this area (Wilson & Co., Dec. 2003), the flows from adjacent lots should flow through this site. Accordingly, your site is not managing stormwater in accordance with its approved drainage plan and is in violation of the City's Drainage Ordinance (§§ 14-5-2-1 *et seq.*, R.O. Albuquerque 1994).

Mr. Cherne's letter requested that you remedy this situation by April 15th, 2013. It has been brought to my attention that the situation still has not been remedied. This correspondence is a final request for you to remedy this violation. If the offending fill is not remediated by September 25, 2013, then the City will seek a legal remedy. If you have any questions, please contact me through the phone number or email address in my signature.

Very truly yours,

Blake Whitcomb
Assistant City Attorney
Real Estate & Land Use
Office of the City Attorney
1 Civic Plaza NW, 4th Floor
P.O. Box 2248
Albuquerque, NM 87103
P: (505) 768-4654
F: (505) 768-4525
bwhitcomb@cabq.gov

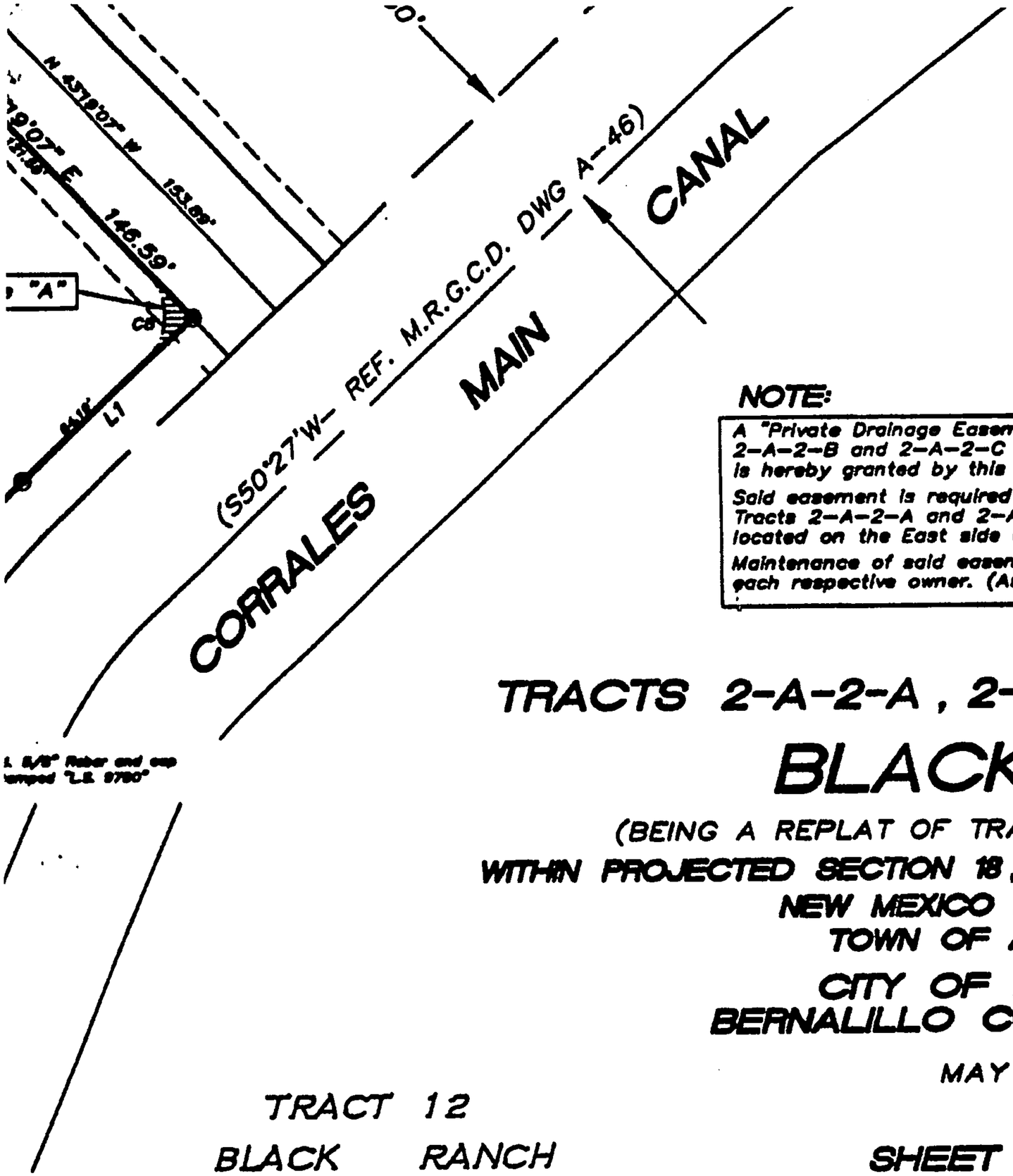
cc: Bryan Wolfe
Curtis Cherne

PO Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov



TRACT 12
BLACK RANCH
(UNPLATTED)

EXHIBIT 1

NOTE:

A "Private Drainage Easement" covering Tracts 2-A-2-A, 2-A-2-B and 2-A-2-C (Excepting therefrom any buildings) is hereby granted by this plat.

Said easement is required to accept sheet flows from said Tracts 2-A-2-A and 2-A-2-B to an existing drainage outfall located on the East side of Tract 2-A-2-C.

Maintenance of said easement to be the responsibility of each respective owner. (As to each Tract)

TRACTS 2-A-2-A, 2-A-2-B AND 2-A-2-C

BLACK RANCH

(BEING A REPLAT OF TRACT 2-A-2, BLACK RANCH)

WITHIN PROJECTED SECTION 18, TOWNSHIP 11 NORTH, RANGE 3 EAST
NEW MEXICO PRINCIPAL MERIDIAN
TOWN OF ALAMEDA GRANT

CITY OF ALBUQUERQUE
BERNALILLO COUNTY, NEW MEXICO

MAY, 2003

TRACT 12
BLACK RANCH
(UNPLATTED)

SHEET 3 OF 3

SURV TEK, INC.
Consulting Surveyors
5643 Paradise Blvd. N.W. Albuquerque, New Mexico 87114
Phone: 505-897-3366
Fax: 505-897-3377

170-

AGREEMENT AND COVENANT

This Agreement and Covenant, between the City of Albuquerque, New Mexico ("City") and Mor Land, LLC., ("User") is made in Albuquerque, New Mexico and is entered into as of the date of recording this Agreement with the Bernalillo County Clerk.

1. Recital. The User is the owner of certain real property ("User's Property") located at NW Corner of Sage Rd. SW and 82nd St. SW, in Albuquerque, New Mexico, and more particularly described as: (give legal description and filing information)

EXISTING: *Tract 463, Town of Atrisco Grant, Unit 7 (12-5-44, D-118)*
PROPOSED: TRACT A, DESERT SAGE 3 SUBDIVISION

All being records of Bernalillo County, NM

The City is the owner of certain real property, easement or public right-of-way ("City's Property") in the vicinity of, contiguous to, abutting or within User's Property, and more particularly described as:

Tract A of the proposed Desert Sage 3 Subdivision filed for record November 6, 2003 *in Book* 2003C *at Page* 331 *In Doc #* 2003203359 *Bernalillo County, New Mexico.*

The User wishes to construct upon, improve or repair and to maintain the following "Improvement" on the City's Property (or already has done so):

Temporary Retention Pond. A sketch of the proposed or existing improvement is attached as Exhibit A and made a part of the Agreement.

A sketch of the proposed or existing Improvement is attached as Exhibit A and made a part of this Agreement.

The City agrees to permit the Improvement to exist on the City's Property provided the User complies with the terms of this Agreement.

2. City Use of City's Property and City Liability. The City has the right to enter upon the City's Property at any time and perform whatever inspection, installation, maintenance, repair, modification or removal ("Work") it deems appropriate without liability to the User. If the Work affects the Improvement the City will not be financially or otherwise responsible for rebuilding or repairing the Improvement. The User promptly will repair the Improvement to the City's satisfaction. The cost of repairing the Improvement will be paid by User.

3. User's Responsibility for Improvement. The User will be solely responsible for constructing, maintaining, repairing and, if required, removing the Improvement, all in accordance with standards required by the City as per the approved Grading and Drainage

rpd4/agmcov3
f:\\a02102 - de

EXHIBIT
2

Plan L10/D24 on file at the City Engineer's office. The User will be solely responsible for paying all related costs. The User will not permit the Improvement to constitute a hazard to the health or safety of the general public or to interfere with the City's use of the City's Property. The User will conform with all applicable laws, ordinances and regulations.

4. Use of the Improvement. If the City's Property is a public right-of-way, it shall be open to the use of the general public at all times, subject to reasonable curtailment during periods of construction, maintenance or repair.

5. Demand for Repair, Modification or Removal. The City may send written notice ("Notice") to the User requiring the User to repair, modify or remove the Improvement within 30 days ("Deadline") and the User will comply promptly with the requirements of the Notice. If removal is demanded, the City also may require the User to return the City's Property to its original condition by the Deadline. The User will perform all required work by the Deadline, at User's sole expense.

6. Failure to Perform by User and Emergency Work by City. If the User fails to comply with the terms of the Notice by the Deadline stated, or, if the City determines that an emergency condition exists, the City may perform the work itself. The City then may assess the User for the cost of the work and for any other expenses or damages which result from User's failure to perform. The User agrees promptly to pay the City the amount assessed. If the User fails to pay the city within thirty (30) days after the City gives the User written notice of the amount due, the City may impose a lien against User's Property for the total resulting amount.

7. Cancellation of Agreement and Release of Covenant. This Agreement may be canceled, and User's covenants released by the City at will by the City's mailing to the User notice of the City's intention to record a Cancellation and Release with the Bernalillo County Clerk. The Cancellation and Release will be effective thirty (30) days after the date of mailing the notice to the User unless a later date is stated in the notice or the Cancellation and Release. After the effective date, the City will record the Cancellation and Release with the Bernalillo County Clerk.

8. Condemnation. If any part of the User's Property is ever condemned by the City, the User will forego all claims to compensation for any portion of User's structure which encroaches on City Property and for severance damage to the remaining portion of User's structure on User's Property.

9. Assessment. Nothing in this Agreement shall be construed to relieve the User, his heirs, assigns and successors from an assessment against User's Property for improvements to the City Property under a duly authorized and approved Special Assessment District. The parties specifically agree that the value of the Improvement will not reduce the amount assessed by the City.

10. Notice. For purposes of giving formal written notice to the User, User's address is:

8200 Reilly Ct SW

Mor Land, LLC
2820 Broadbent Parkway, NE
Suite E
Albuquerque, NM 87107

GM Land & Development
8691 Washington NE
Suite E

Notice may be given to the User either in person or by mailing the notice by regular U.S. mail, postage paid. Notice will be considered to have been received by the User within 3 days after the notice is mailed if there is no actual evidence of receipt. The User may change User's address by giving written notice of the change by certified mail, return receipt requested, to the City Engineer at P.O. Box 1293, Albuquerque, New Mexico 87103.

11. Indemnification. The User agrees to defend, indemnify and hold harmless the City, its officials, agents and employees from and against any and all claims, actions, suits or proceedings of any kind brought against said parties as a result of user's use of the City's Property. To the extent, if at all, Section 56-7-1 NMSA 1978 is applicable to this Agreement, this Agreement to indemnify will not extend to liability, claims, damages, losses or expense, including attorney's fees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications by the indemnitee, or the agents or employees of the indemnitee; or (2) the giving of or failure to give directions or instructions is the primary cause of bodily injury to persons or damage to property.

12. Term. This Agreement shall continue until revoked by the City pursuant to Section 7 above.

13. Binding on User's Property. The covenants and obligations of the User set forth herein shall be binding on User, his heirs, assigns and successors and on User's Property and constitute covenants running with User's Property until release by the City.

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

15. Changes of Agreement. Changes to this Agreement are not binding unless made in writing, signed by both parties.

16. Construction and Severability. If any part of this Agreement is held to be invalid or unenforceable, the remainder is reasonably capable of completion.

17. Captions. The captions to the sections or paragraphs of this Agreement are not part of this Agreement and will not affect the meaning or construction of any of its provisions.

CITY OF ALBUQUERQUE:

By: _____
Chief Administrative Officer
Dated: 7-15-03

USER:

By: _____
Title: MANAGING PARTNER
Dated: 6-11-03

APPROVED:

_____ 7/15/03
Director, Public Works Dept.

Reviewed by:

_____ 7/15/03
City Engineer

7/14/03

CITY'S ACKNOWLEDGMENT

STATE OF NEW MEXICO)
) **SS**
COUNTY OF BERNALILLO)

This instrument was acknowledged before me on July 15, 2003, by Fred J. Aguirre for Chief Administrative Officer for the City of Albuquerque, a New Mexico municipal corporation, on behalf of the corporation.

_____
Notary Public

My Commission Expires:

11-15-2003

USER'S ACKNOWLEDGMENT

STATE OF New Mexico)
) **SS**
COUNTY OF Bernalillo)

This instrument was acknowledged before me on June 11, 2003, by Mel Cittley, Managing Member on behalf of Mor Land, LLC.

_____
Notary Public

My Commission Expires:

12/14/05

9/6/2004

OFFICIAL SEAL
SUSAN RASINSKI
NOTARY PUBLIC-STATE OF NEW MEXICO
My commission expires: 9-3-04

TEMPORARY RETENTION POND
AVAIL = 61,236 CF
REQ. = 65,907 CF
WS = 82.2

87.2 x
86.3 x
87.77
87.71 x
87.47 x
24"SD
86.1 x
E
TC=87.44
FL=86.79
4
5
84
72
TYPACT "A"
85.84 x
10' WIDE 4"-6"
RIP-RAP PAD, 1' DEEP
REILLY CT SW
NEW 24"SD
SAGE ROAD S.W.
TC=86.41
FL=85.79
TC=85.92
FL=85.29
85.43
85.50 x
RIM=85.59
INV=70.19(N,W&E)
85.06
NEW 18"SD
82ND STREET S.W.
85.14 x
85.81
84.93
24"SD
85.35
85.25 x
84.9 x

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Page: 5 of 5
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Bk-A68 Pg-4995
Mary Herrera Bern. Co. AGRE R 17.00

SCALE: 1"= 40'

A02\obs\A2102ds3\EXHIBITS\Exhibit-A.dwg\07-08-03\DER

DESERT SAGE SUBDIVISION UNIT 3
EXHIBIT "A" - AGREEMENT & COVENANT

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

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

March 18, 2003

Dan Aguirre
Wilson & Company
2600 American Road SE, Suite 100
Albuquerque, New Mexico 87114

RE: Grading and Drainage Report For Black Ranch Tracts 2 & 3 (C13-D25) Dated December 23, 2003

Dear Mr. Aguirre:

The above referenced drainage plan received March 11, 2003 is approved for Final Plat action by the DRB

If you have any questions please call me at 924-3982.

Sincerely,

Carlos A. Montoya
City Floodplain Administrator

C: Lynn Mazur, AMAFCA

2/19/03

Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority
2600 PROSPECT N.E., ALBUQUERQUE, NM 87107
PHONE: (505) 884-2215 FAX: (505) 884-0214

Post-it® Fax Note 7671	Date 2-19	# of pages ▶ 2
To CARLOS MONTOYA	From LYNN MAZUR	
Co./Dept. HYDROLOGY	Co. AMAFCA	
Phone #	Phone #	
Fax #	Fax #	

January 29, 2003

Mr. Dan Aguirre, P.E.
Wilson & Company
2600 American Road SE, Ste. 100
Rio Rancho, NM 87124

Re: Drainage Master Plan for Black Ranch, Tracts 2 & 3, ZAP C-13
Engineer's Stamp Dated December 23, 2002

Dear Mr. Aguirre:

Marty Eckert, AMAFCA Real Estate Manager, and I spoke to Sheldon Greer of your office regarding this plan. Since Tract 2-A is now going through a platting procedure, AMAFCA's primary concern is assuring that appropriate access to Tract 2-B, which AMAFCA owns, from the future Valley View Drive is obtained at this time. We are particularly concerned with grading for the future Valley View crossing over the Canal. Sheldon said that final design is not complete, but he would review the preliminary layout to see if AMAFCA's north/south access just west of the Canal will be affected. Guardrail requirements should also be considered to ensure that they will not impact access to Tract 2-B.

We have the following additional comments:

1. An additional 25-foot radius easement adjacent to Valley View Drive and the northwest corner of the 20-foot wide portion of Tract 2-B will be required to allow an appropriate turning radius for AMAFCA vehicles (see attached). AMAFCA will allow gravel landscaping within the easement. Also at this location, there should be a minimum 14-foot wide drivepad centered in the 20-foot parcel frontage.

2. A 15-foot wide access road on top of the 36-inch storm drain in the 20-foot wide portion of Tract 2-B will be required. The access road should be 6-inch Type II-B base course and sloped toward the middle (see attached detail) with open grate manholes to collect runoff. It will be used by AMAFCA and City personnel. AMAFCA will allow joint use of the access road for service vehicles for Wendy's.

3. Slope stabilization will be required along the western slope of the Canal south of Valley View adjacent to the 20-foot wide section of Tract 2-B where the City storm drain will be constructed.

4. We have compiled a set of standard notes to be added to plans for construction within AMAFCA right-of-way (see attached). Please add these along with the signature block.

Also be aware that a three-party Encroachment License Agreement for construction of public utilities within the AMAFCA right-of-way will be required before final DRC sign-off. This Agreement will cover construction of the 36-inch storm drain within Tract 2-B. It will be among the owner, the City and AMAFCA. Please provide the owner's name(s), type of corporation, an Exhibit "A" vicinity map and an Exhibit "B" showing the storm drain in the right-of-way, and I will prepare the document. The exhibits are limited to 8 ½" x 11" or 8 ½" x 14".

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

Sincerely,
AMAFCA

Lynn M. Mazur

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

Cc: Brad Bingham, City Hydrology

NEW MEXICO STATE HIGHWAY and TRANSPORTATION DEPARTMENT
AN EQUAL OPPORTUNITY EMPLOYER

January 14, 2003

John Black
West Wood Realty
3613 NM-528 NW, Suite H
Albuquerque, New Mexico 87114

John:

I have discussed your letter dated December 17, 2002 via Wilson and Company with both Steve Harris and Kathy Trujillo. We see no problems with the agreement with the exception of the schedule to complete the through lanes. To adjust this section of road to three through lanes will require taking the drainage ditch that runs parallel to the east side of the road and placing it in a pipe. The Highway Department does not have this scheduled currently and it will take some time to get it going. However, we do have a rough design that has where everything is located. We will be able take some intermediate steps to avoid impeding your development. The Highway Department can construct the right turn bays necessary to provide access to your development.

Another problem with this agreement is that it has several items that the City of Albuquerque needs to agree with. You will need to get their concurrence on the landscaping deviations and anything that pertains to them.

I short we agree to all of the items you presented that fall under our jurisdiction but the timing will be governed by funding and environmental considerations. We look forward to working with you on this project and hope that it will be successful. Please feel free to contact me at 841-2700 at any time.

Thank You!

Tom Raught
Acting District Engineer

xc: Steve Harris, DSO
Kathy Trujillo, DTE

att: Letter to Steve Harris dated 12-17-03

DRAINAGE MASTER PLAN

for

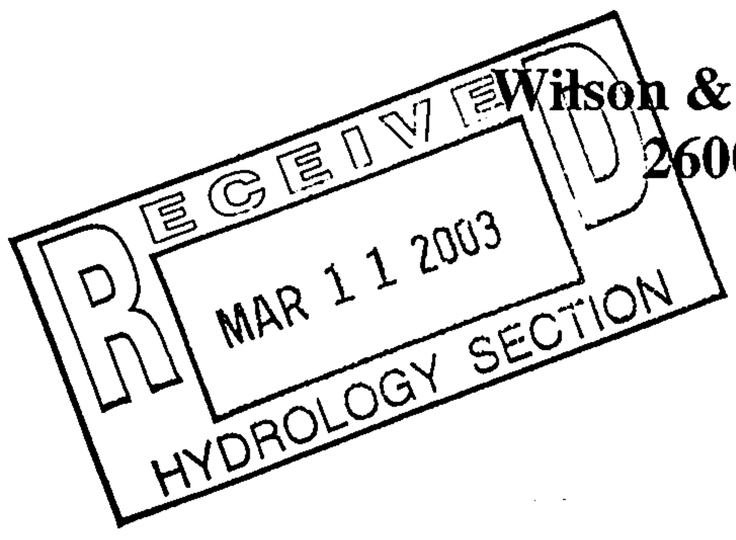
BLACK RANCH, TRACTS 2 & 3
Albuquerque, New Mexico

December 2002

PREPARED FOR:

Westwood Realty
3613 Rio Rancho Blvd. NW
Rio Rancho, New Mexico 87114

PREPARED BY:



Wilson & Company, Engineers & Architects
2600 American Rd. SE Suite 100
Rio Rancho, NM 87124

WCEA File No. X2-218-061

DRAINAGE MASTER PLAN

for

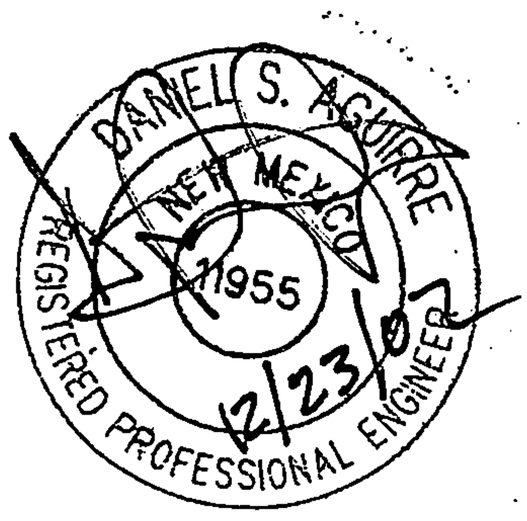
BLACK RANCH, TRACTS 2 & 3
Albuquerque, New Mexico

December 2002

I, Daniel S. Aguirre, do hereby certify that this report was prepared by me or under my direction and that I am a duly registered Professional Engineer under the laws of the State of New Mexico.

Daniel S. Aguirre, P.E.
NM No. 11955

12/23/02
Date



Introduction

Wilson & Company prepared this drainage master plan under contract with Westwood Realty. The document provides a basis for the design of storm water conveyance systems within Black Ranch Tracts 2 & 3. The systems in question will control both onsite and offsite storm runoff associated with the proposed subdivision of Tract 2A. The first objective of this report is to analyze the hydrologic characteristics associated with the existing and developed conditions. The second is to present the proposed storm drain design, as well as surface water conveyance structures and detention pond, used to mitigate the storm water runoff generated by Tracts 2 & 3.

All areas generating storm water runoff affecting the project site are intended to discharge into the Corrales Main Canal through a future AMAFCA regional Detention Facility adjacent to the intersection of Coors Blvd. and Paseo del Norte (*North Coors Drainage Management Plan*, Smith Engineering 1997). These areas include, but are not limited to, the tracts North of Paseo del Norte, East of Coors Blvd., West of the Corrales Main Canal, and South of Irving Blvd. Also included in the tributary area is the Eastern half of Coors Blvd. from Westside Drive to a point adjacent to the project site (See the Plate 1).

It is intended that the storm water runoff from the associated tracts will drain to Valley View Drive. A proposed storm drain system within Valley View Drive will then intercept and carry the flows into a regional detention pond to be located on Tract 2B.

Existing Conditions

(Refer to Plate 1 – Existing Conditions)
Several tracts within the area of interest are currently developed or are in construction. These developments include a bank on Tract 3B, a *Burger King* on Tract 3D, and a *Jiffy Lube* is under construction on Tract 3C1. All these tracts discharge freely to Valley View Drive. Tract 3A1 currently has a gas station on it and discharges to a separate drainage facility east of the Corrales Main Canal. There is an existing detention facility on Tract 3F1 that will be replaced by the proposed regional detention facility to be located on Tract 2B. This existing detention facility currently mitigates flows generated by the tracts discharging to Valley View Drive (*Black Ranch Track 3 Grading, Drainage, and Terrain Management Plan*, Easterling & Associates, Inc. 1990).

Undeveloped tracts within the area of interest are covered with various brush and grasses. The soil is primarily sandy throughout the area. Slopes vary from tract to tract, but generally fall between 3% and 10%. The steepest slopes can be found in Tracts 2A and 2B.

Storm water runoff generated by basins EX-2 thru EX-6 drains into Valley View Drive, South along the street, and into the existing detention pond. These flows, along with

those associated with the pond area (EX-7) then discharge into a pond east of the Corrales Main Canal. Slopes within Valley View Drive vary from 0.75% to 1.2%.

Basins EX-8 thru EX-11 generally drain to the South and into the existing detention pond along the southern border of Tract 2B. The existing runoff generated by these basins is 29 cfs. The detention pond then discharges into the Corrales Main canal by way of two 30" CMP culverts.

Basin EX-1 is a long thin basin that encompasses half of Coors Blvd from Westside Drive to a point adjacent to basin EX-8. Basin EX-1 generates a peak flow of 19 cfs. Storm water runoff flows East into an earthen swale that parallels Coors Blvd. The swale generally follows the same slopes as the roadway of approximately 1% to 1.2%. At the intersection of Coors Blvd and Irving Blvd, an existing storm drain discharges 32 cfs into the existing swale. The swale eventually tapers off after crossing beneath Valley View Place. At this point, the runoff conveyed by the swale is returned to Coors Blvd. Shortly after the swale tapers off and the runoff returns to the street, curb and gutter begins. The flows then travel along the gutter and are intercepted by a combination inlet within the northbound off ramp from Paseo del Norte. The combination inlet then discharges these flows into the existing detention pond along the southern boundary of Tract 2B. The following table outlines the hydrological data of all existing basins.

Basin	Area, acres	Q_{100YR}, cfs	V_{100YR}, acft
EX-1	4.61	19.09	0.71
EX-2	1.44	5.82	0.21
EX-3	1.34	2.71	0.07
EX-4	1.13	4.58	0.17
EX-5	4.39	9.74	0.29
EX-6	1.72	5.11	0.16
EX-7	0.70	2.09	0.06
EX-8	2.25	6.70	0.20
EX-9	1.30	2.90	0.09
EX-10	2.89	5.86	0.16
EX-11	6.71	13.57	0.37
EX-30*	N/A	31.93	1.17

Developed Conditions

(Refer to Plate 2 – Developed Conditions)

Developed conditions for this site will include the full development of existing vacant tracts within the proposed boundaries, the extension of Valley View Drive to a point south of Tract 3F1, the construction of a storm drain system in Valley View Drive, the construction of a storm drain system that will replace the swale paralleling Coors Blvd, and the construction of a detention facility within Tract 2B.

Basins D-2 thru D-7 and D-10 will all discharge freely into Valley View Drive. These developed flows will then be intercepted by the proposed storm drain system within Valley View Drive. Basin D-8 will drain south into a temporary desilting pond that discharges into the proposed Valley View Drive storm drain. The proposed storm drain will then discharge into a proposed detention facility near the northern boundary of tract 2B. The peak flow discharging to the proposed detention facility from said storm drain is 69-cfs (100yr, 6hr storm). The existing runoff discharged into the swale near Irving Blvd as well as flows generated by basin D-1 will be conveyed to the proposed detention facility by a structure yet to be determined. Basin D-9 encompasses the proposed detention facility. The overall peak flow discharging to the proposed detention facility is 118-cfs. The detention facility will be required to have a wet volume of 2.09 acre-feet (100yr, 6 hour storm). The allowable discharge from the proposed pond is equal to the existing flows generated by Basins EX-8 through EX-11 (~39-cfs). The emergency spillway for this proposed facility will be capable discharging a design flow of 118-cfs into the existing AMAFCA detention facility.

The proposed detention facility will capture a portion to the storm water originally slated to enter the AMAFCA regional detention facility in Tract 2B (Volume = 21.2 acft). Information regarding the volume and general area of this proposed regional pond can be found in Appendix E. The proposed detention pond will have no negative effect on downstream systems. The proposed structure that will convey the runoff from basin D-1 to the detention facility will require a drainage easement due to the lack of room within the Coors Blvd. right-of-way. The following table outlines the hydrological data for the developed basins.

Basin	Area, acres	Q_{100YR}, cfs	V_{100YR}, acft
D-1	3.14	13.00	0.48
D-2	1.44	5.82	0.21
D-3	1.34	5.39	0.20
D-4	1.13	4.58	0.17
D-5	4.39	17.69	0.65
D-6	0.70	2.82	0.10
D-7	1.31	5.25	0.19
D-8	2.89	11.65	0.43
D-9	1.90	3.85	0.11
D-10	3.97	15.90	0.58
D-30*	N/A	31.93	1.17

Grading Plan

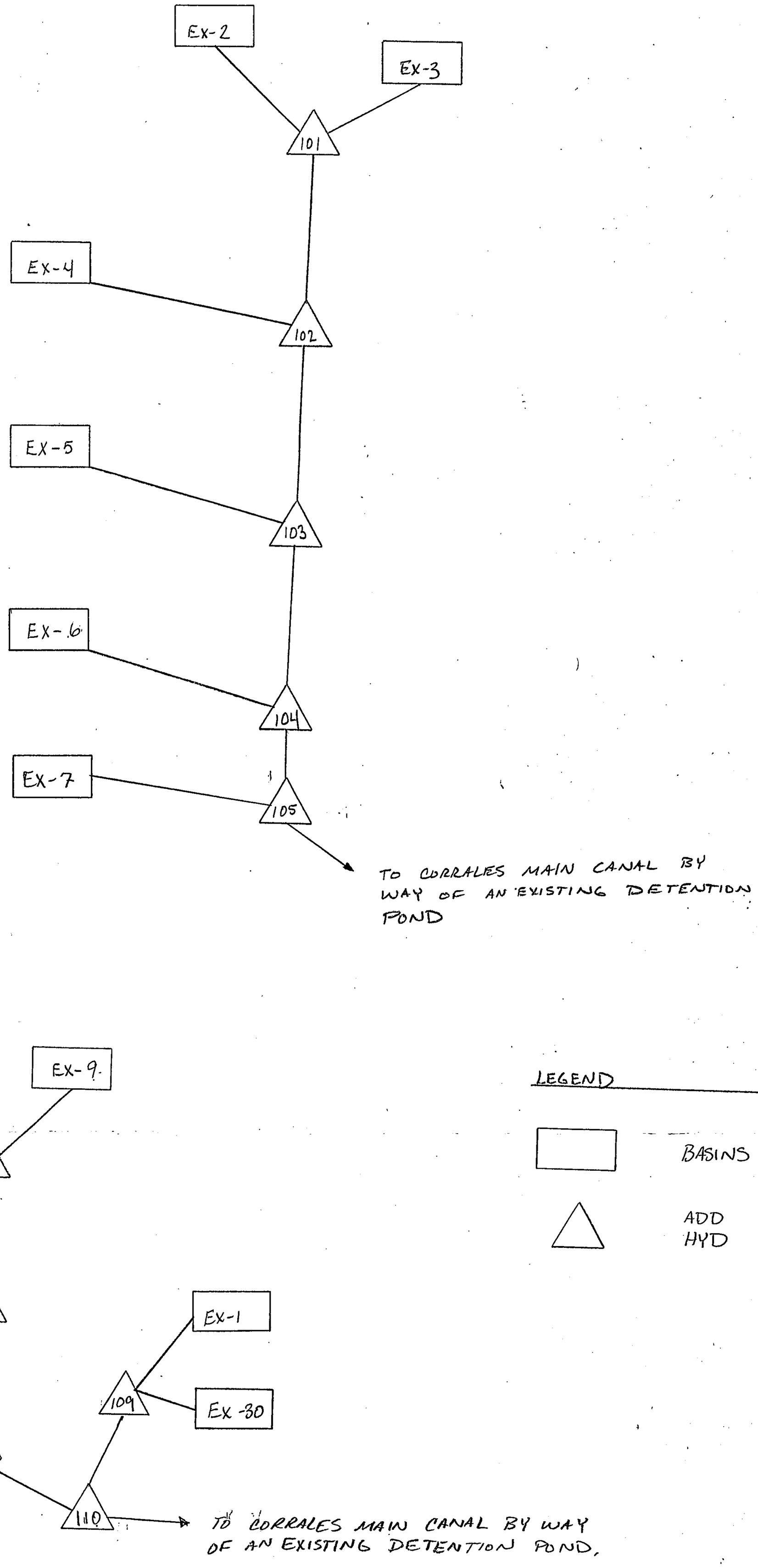
The Conceptual Grading Plan for Black Ranch Tracts 2 & 3 is attached as Plate 3. This sheet illustrates the overall grading concept for the areas of interest.

Conclusion

The analysis indicates that the proposed system is adequate to handle the storm runoff generated by onsite and offsite basins. Wilson & Company recommends that the proposed storm drain system undergo regular maintenance activities. This should include removing debris from grate inlets, as well as removing sediment buildup within the pipe system.

AHYMO FLOWCHART

~ EXISTING ~

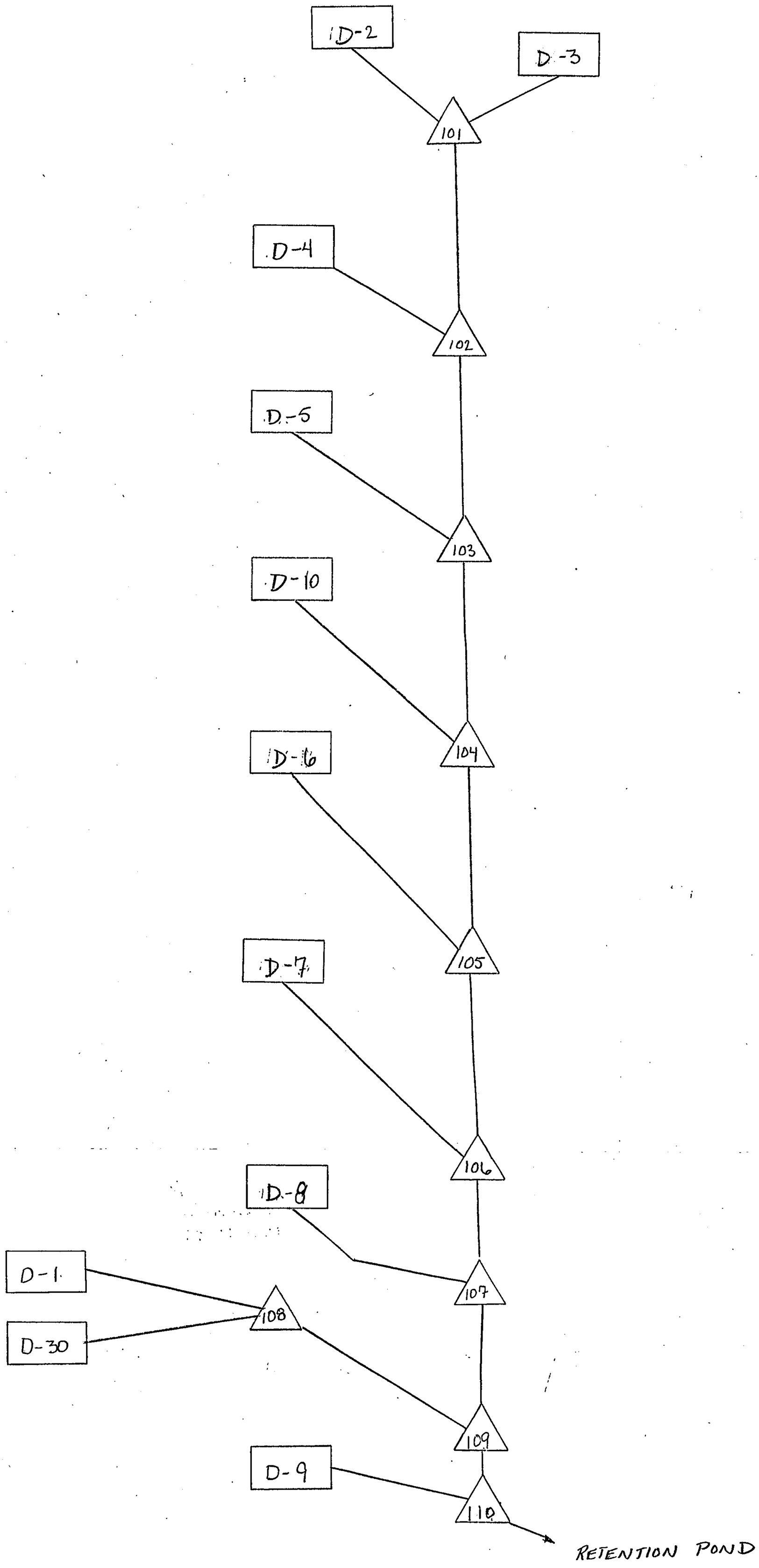


AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - - VERSION: 1997.02c RUN DATE (MON/DAY/YR) =11/11/2002
INPUT FILE = EXIST.TXT USER NO.= AHYMO-C-9803c01UNMLIB-AH

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
RAINFALL TYPE= 1										RAIN6= 2.200
COMPUTE NM HYD	1.10	-	1	.00720	19.09	.705	1.83566	1.500	4.142	PER IMP= 90.00
COMPUTE NM HYD	1.20	-	2	.00225	5.82	.213	1.77075	1.500	4.032	PER IMP= 85.00
COMPUTE NM HYD	1.30	-	3	.00209	2.71	.074	.66738	1.533	2.027	PER IMP= .00
COMPUTE NM HYD	1.40	-	4	.00177	4.58	.167	1.77075	1.500	4.034	PER IMP= 85.00
COMPUTE NM HYD	1.50	-	5	.00687	9.74	.287	.78380	1.500	2.216	PER IMP= 10.00
COMPUTE NM HYD	1.60	-	6	.00268	5.11	.155	1.08269	1.500	2.976	PER IMP= 15.00
COMPUTE NM HYD	1.70	-	7	.00109	2.09	.063	1.08269	1.500	2.990	PER IMP= 15.00
COMPUTE NM HYD	1.80	-	8	.00352	6.70	.203	1.08269	1.500	2.974	PER IMP= 15.00
COMPUTE NM HYD	1.90	-	9	.00203	2.90	.085	.78380	1.500	2.224	PER IMP= 10.00
COMPUTE NM HYD	1.10	-	10	.00452	5.86	.161	.66738	1.533	2.024	PER IMP= .00
COMPUTE NM HYD	1.11	-	11	.01048	13.57	.373	.66738	1.533	2.023	PER IMP= .00
COMPUTE NM HYD	3.10	-	30	.01240	31.93	1.171	1.77075	1.500	4.023	PER IMP= 85.00
ADD HYD	101.00	2& 3	12	.00434	8.52	.287	1.23995	1.500	3.065	
ADD HYD	102.00	12& 4	13	.00612	13.09	.455	1.39371	1.500	3.346	
ADD HYD	103.00	13& 5	14	.01298	22.83	.742	1.07109	1.500	2.748	
ADD HYD	104.00	14& 6	15	.01566	27.94	.896	1.07306	1.500	2.787	
ADD HYD	105.00	15& 7	16	.01675	30.02	.959	1.07368	1.500	2.800	
ADD HYD	106.00	8& 9	17	.00555	9.59	.288	.97312	1.500	2.699	
ADD HYD	107.00	17&10	18	.01007	15.43	.449	.83590	1.500	2.394	
ADD HYD	108.00	18&11	19	.02056	28.97	.822	.74996	1.500	2.202	
ADD HYD	109.00	1&30	20	.01960	51.02	1.876	1.79457	1.500	4.067	
ADD HYD	109.00	19&20	21	.04016	79.99	2.698	1.25986	1.500	3.112	
FINISH										

AHYMO FLOWCHART

~ PROPOSED ~



9/24/02 TRAN

AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - - VERSION: 1997.02c RUN DATE (MON/DAY/YR) =11/08/2002
INPUT FILE = DEVEL.TXT USER NO.= AHYMO-C-9803c01UNMLIB-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
RAINFALL TYPE= 1										RAIN6=	2.200
COMPUTE NM HYD	1.10	-	1	.00490	13.00	.480	1.83566	1.500	4.143	PER IMP=	90.00
COMPUTE NM HYD	1.20	-	2	.00225	5.82	.213	1.77075	1.500	4.032	PER IMP=	85.00
COMPUTE NM HYD	1.30	-	3	.00209	5.39	.197	1.77075	1.500	4.032	PER IMP=	85.00
COMPUTE NM HYD	1.40	-	4	.00177	4.58	.167	1.77075	1.500	4.034	PER IMP=	85.00
COMPUTE NM HYD	1.50	-	5	.00687	17.69	.648	1.77075	1.500	4.025	PER IMP=	85.00
COMPUTE NM HYD	1.60	-	6	.00109	2.82	.103	1.77075	1.500	4.044	PER IMP=	85.00
COMPUTE NM HYD	1.70	-	7	.00203	5.25	.192	1.77075	1.500	4.033	PER IMP=	85.00
COMPUTE NM HYD	1.80	-	8	.00452	11.65	.427	1.77075	1.500	4.026	PER IMP=	85.00
COMPUTE NM HYD	1.90	-	9	.00297	3.85	.106	.66738	1.533	2.025	PER IMP=	.00
COMPUTE NM HYD	1.10	-	10	.00617	15.90	.583	1.77075	1.500	4.025	PER IMP=	85.00
COMPUTE NM HYD	3.10	-	30	.01240	31.93	1.171	1.77075	1.500	4.023	PER IMP=	85.00
ADD HYD	101.00	2& 3	11	.00434	11.21	.410	1.77062	1.500	4.032		
ADD HYD	102.00	11& 4	12	.00612	15.78	.577	1.77061	1.500	4.033		
ADD HYD	103.00	12& 5	13	.01298	33.47	1.226	1.77066	1.500	4.029		
ADD HYD	104.00	13&10	14	.01915	49.36	1.809	1.77068	1.500	4.027		
ADD HYD	105.00	14& 6	15	.02024	52.19	1.912	1.77067	1.500	4.028		
ADD HYD	106.00	15& 7	16	.02228	57.44	2.104	1.77066	1.500	4.029		
ADD HYD	107.00	16& 8	17	.02680	69.09	2.531	1.77067	1.500	4.028		
ADD HYD	108.00	1&30	18	.01730	44.93	1.651	1.78911	1.500	4.057		
ADD HYD	109.00	18&17	19	.04410	114.02	4.182	1.77790	1.500	4.040		
ADD HYD	110.00	19& 9	20	.04707	117.86	4.287	1.70788	1.500	3.912		
ROUTE RESERVOIR	Pond.1	20	21	.04707	36.25	4.253	1.69418	1.867	1.203	AC-FT=	2.091
FINISH											

Valley View Drive: AP-1
Worksheet for Irregular Channel

Project Description	
Worksheet	Valley View: Al
Flow Element	Irregular Chani
Method	Manning's For
Solve For	Channel Depth

Input Data		
Slope	012000	ft/ft
Dischargi	33.20	cfs

Options	
Current Roughness Metho	ved Lotter's Method
Open Channel Weighting	ved Lotter's Method
Closed Channel Weightin	Horton's Method

Results		
Mannings Coefficiei	0.017	
Water Surface Elev	99.64	ft
Elevation Range	.13 to 100.00	
Flow Area	8.9	ft²
Wetted Perimeter	37.08	ft
Top Width	36.31	ft
Actual Depth	0.51	ft
Critical Elevation	99.69	ft
Critical Slope	0.006517	ft/ft
Velocity	3.71	ft/s
Velocity Head	0.21	ft
Specific Energy	99.86	ft
Froude Number	1.32	
Flow Type	Supercritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	0+56	0.017

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	100.00
0+10	99.80
0+10	99.13
0+12	99.26
0+28	99.58
0+44	99.26
0+46	99.13
0+46	99.80
0+56	100.00

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Valley View Drive: AP-2
Worksheet for Irregular Channel

Project Description	
Worksheet	Valley View: Al
Flow Element	Irregular Chani
Method	Manning's For
Solve For	Channel Depth

Input Data		
Slope	007500	ft/ft
Dischargi	22.76	cfs

Options	
Current Roughness Metho	ved Lotter's Method
Open Channel Weighting	ved Lotter's Method
Closed Channel Weightin	Horton's Method

Results		
Mannings Coefficiei	0.017	
Water Surface Elev	99.62	ft
Elevation Range	.13 to 100.00	
Flow Area	8.2	ft²
Wetted Perimeter	37.04	ft
Top Width	36.29	ft
Actual Depth	0.49	ft
Critical Elevation	99.63	ft
Critical Slope	0.007061	ft/ft
Velocity	2.77	ft/s
Velocity Head	0.12	ft
Specific Energy	99.74	ft
Froude Number	1.03	
Flow Type	Supercritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	0+56	0.017

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	100.00
0+10	99.80
0+10	99.13
0+12	99.26
0+28	99.58
0+44	99.26
0+46	99.13
0+46	99.80
0+56	100.00

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Valley View Drive: AP-3
Worksheet for Irregular Channel

Project Description	
Worksheet	Valley View: Al
Flow Element	Irregular Chanı
Method	Manning's For
Solve For	Channel Depth

Input Data		
Slope	015500	ft/ft
Dischargı	18.72	cfs

Options	
Current Roughness Methc	ved Lotter's Method
Open Channel Weighting	ved Lotter's Method
Closed Channel Weightin	Horton's Method

Results		
Mannings Coefficiel	0.017	
Water Surface Elev	99.55	ft
Elevation Range	.13 to 100.00	
Flow Area	5.7	ft²
Wetted Perimeter	33.85	ft
Top Width	33.21	ft
Actual Depth	0.42	ft
Critical Elevation	99.60	ft
Critical Slope	0.007362	ft/ft
Velocity	3.30	ft/s
Velocity Head	0.17	ft
Specific Energy	99.72	ft
Froude Number	1.41	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	0+56	0.017

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	100.00
0+10	99.80
0+10	99.13
0+12	99.26
0+28	99.58
0+44	99.26
0+46	99.13
0+46	99.80
0+56	100.00

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Valley View Drive: AP-4
Worksheet for Irregular Channel

Project Description	
Worksheet	Valley View: Al
Flow Element	Irregular Chanı
Method	Manning's For
Solve For	Channel Depth

Input Data		
Slope	015500	ft/ft
Dischargı	10.00	cfs

Options	
Current Roughness Metho	ved Lotter's Method
Open Channel Weighting	ved Lotter's Method
Closed Channel Weightin	Horton's Method

Results		
Mannings Coefficie	0.017	
Water Surface Elev	99.48	ft
Elevation Range	.13 to 100.00	
Flow Area	3.5	ft²
Wetted Perimeter	26.46	ft
Top Width	25.93	ft
Actual Depth	0.35	ft
Critical Elevation	99.51	ft
Critical Slope	0.008085	ft/ft
Velocity	2.84	ft/s
Velocity Head	0.13	ft
Specific Energy	99.60	ft
Froude Number	1.36	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00	0+56	0.017

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00	100.00
0+10	99.80
0+10	99.13
0+12	99.26
0+28	99.58
0+44	99.26
0+46	99.13
0+46	99.80
0+56	100.00

Valley View Drive: AP-5
Worksheet for Irregular Channel

Project Description	
Worksheet	Valley View: Al
Flow Element	Irregular Chanı
Method	Manning's For
Solve For	Channel Depth

Input Data		
Slope	060000	ft/ft
Dischargı	2.00	cfs

Options	
Current Roughness Methc	ved Lotter's Method
Open Channel Weighting	ved Lotter's Method
Closed Channel Weightin	Horton's Method

Results		
Mannings Coefficiel	0.017	
Water Surface Elev	99.31	ft
Elevation Range	.13 to 100.00	
Flow Area	0.6	ft²
Wetted Perimeter	9.32	ft
Top Width	9.04	ft
Actual Depth	0.18	ft
Critical Elevation	99.36	ft
Critical Slope	0.009924	ft/ft
Velocity	3.40	ft/s
Velocity Head	0.18	ft
Specific Energy	99.49	ft
Froude Number	2.35	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	0+56	0.017

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	100.00
0+10	99.80
0+10	99.13
0+12	99.26
0+28	99.58
0+44	99.26
0+46	99.13
0+46	99.80
0+56	100.00

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Valley View Drive - DI-1A & 1B
Worksheet for Combination Inlet On Grade

Project Description	
Worksheet	DI-1A/1B
Type	Combination Inlet On
Solve For	Efficiency

Input Data		
Discharge	16.60	cfs
Local Depression	2.7	in
Local Depression \	2.50	ft
Slope	0.012000	ft/ft
Gutter Width	2.00	ft
Gutter Cross Slope	0.062500	ft/ft
Road Cross Slope	0.020000	ft/ft
Mannings Coefficie	0.017	
Curb Opening Len	7.45	ft
Grate Width	2.00	ft
Grate Length	2.95	ft
Grate Type	0 mm (P-1-7/8")	
Clogging	25.0	%

Options	
Calculation Opt	Use Both
Grate Flow Opti	clude None

Results		
Efficiency	0.58	
Intercepted Flow	9.63	cfs
Bypass Flow	6.97	cfs
Spread	20.10	ft
Depth	0.44	ft
Flow Area	3.3	ft²
Gutter Depression	1.0	in
Total Depression	3.8	in
Velocity	3.74	ft/s
Splash Over Velocity	8.56	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.07	
Grate Flow Ratio	0.39	
Equivalent Cross Slo	054980	ft/ft
Active Grate Length	2.21	ft
Length Factor	0.15	
Total Interception Ler	34.04	ft

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Valley View Drive - DI-2A & 2B
Worksheet for Combination Inlet On Grade

Project Description	
Worksheet	DI-2A/2B
Type	Combination Inlet On
Solve For	Efficiency

Input Data		
Discharge	11.38	cfs
Local Depression	2.7	in
Local Depression \	2.50	ft
Slope	0.007500	ft/ft
Gutter Width	2.00	ft
Gutter Cross Slope	0.062500	ft/ft
Road Cross Slope	0.020000	ft/ft
Mannings Coefficie	0.017	
Curb Opening Len	7.45	ft
Grate Width	2.00	ft
Grate Length	2.95	ft
Grate Type	0 mm (P-1-7/8")	
Clogging	25.0	%

Options	
Calculation Opt	Use Both
Grate Flow Opti	lude None

Results		
Efficiency	0.67	
Intercepted Flow	7.65	cfs
Bypass Flow	3.73	cfs
Spread	19.02	ft
Depth	0.41	ft
Flow Area	2.7	ft²
Gutter Depression	1.0	in
Total Depression	3.8	in
Velocity	2.78	ft/s
Splash Over Velocity	8.56	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.12	
Grate Flow Ratio	0.43	
Equivalent Cross Slo	056975	ft/ft
Active Grate Length	2.21	ft
Length Factor	0.21	
Total Interception Ler	24.69	ft

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Valley View Drive - DI-3A & 3B
Worksheet for Combination Inlet On Grade

Project Description	
Worksheet	DI-3A/3B
Type	Combination Inlet On
Solve For	Efficiency

Input Data		
Discharge	9.36	cfs
Local Depression	2.7	in
Local Depression \	2.50	ft
Slope	0.010000	ft/ft
Gutter Width	2.00	ft
Gutter Cross Slope	0.062500	ft/ft
Road Cross Slope	0.020000	ft/ft
Mannings Coefficie	0.017	
Curb Opening Len	7.45	ft
Grate Width	2.00	ft
Grate Length	2.95	ft
Grate Type	0 mm (P-1-7/8")	
Clogging	25.0	%

Options	
Calculation Opt	Use Both
Grate Flow Opti	clude None

Results		
Efficiency	0.71	
Intercepted Flow	6.66	cfs
Bypass Flow	2.70	cfs
Spread	16.65	ft
Depth	0.36	ft
Flow Area	2.0	ft²
Gutter Depression	1.0	in
Total Depression	3.8	in
Velocity	2.95	ft/s
Splash Over Velocity	8.56	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.11	
Grate Flow Ratio	0.49	
Equivalent Cross Slo	062183	ft/ft
Active Grate Length	2.21	ft
Length Factor	0.22	
Total Interception Ler	23.53	ft

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Valley View Drive - DI-4A & 4B
Worksheet for Combination Inlet On Grade

Project Description	
Worksheet	DI-4A/4B
Type	Combination Inlet On
Solve For	Efficiency

Input Data		
Discharge	5.00	cfs
Local Depression	2.7	in
Local Depression \	2.50	ft
Slope	0.017000	ft/ft
Gutter Width	2.00	ft
Gutter Cross Slope	0.062500	ft/ft
Road Cross Slope	0.020000	ft/ft
Mannings Coefficie	0.017	
Curb Opening Len	7.45	ft
Grate Width	2.00	ft
Grate Length	3.33	ft
Grate Type	0 mm (P-1-7/8")	
Clogging	25.0	%

Options	
Calculation Opt	Use Both
Grate Flow Opti	clude None

Results		
Efficiency	0.85	
Intercepted Flow	4.23	cfs
Bypass Flow	0.77	cfs
Spread	11.62	ft
Depth	0.27	ft
Flow Area	0.9	ft²
Gutter Depression	1.0	in
Total Depression	3.8	in
Velocity	3.09	ft/s
Splash Over Velocity	9.10	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.13	
Grate Flow Ratio	0.69	
Equivalent Cross Slo	079386	ft/ft
Active Grate Length	2.50	ft
Length Factor	0.27	
Total Interception Ler	18.31	ft

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Valley View Drive - DI-5A & 5B
Worksheet for Combination Inlet On Grade

Project Description	
Worksheet	DI-5A/5B
Type	Combination Inlet On
Solve For	Efficiency

Input Data		
Discharge	1.00	cfs
Local Depression	2.7	in
Local Depression \	2.50	ft
Slope	0.080000	ft/ft
Gutter Width	2.00	ft
Gutter Cross Slope	0.062500	ft/ft
Road Cross Slope	0.020000	ft/ft
Mannings Coefficie	0.017	
Curb Opening Len	7.45	ft
Grate Width	2.00	ft
Grate Length	2.95	ft
Grate Type	0 mm (P-1-7/8")	
Clogging	25.0	%

Options	
Calculation Opt	Use Both
Grate Flow Opti	clude None

Results		
Efficiency	1.00	
Intercepted Flow	1.00	cfs
Bypass Flow	0.00	cfs
Spread	3.36	ft
Depth	0.10	ft
Flow Area	0.1	ft²
Gutter Depression	1.0	in
Total Depression	3.8	in
Velocity	3.88	ft/s
Splash Over Velocity	8.56	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.07	
Grate Flow Ratio	1.00	
Equivalent Cross Slo	141759	ft/ft
Active Grate Length	2.21	ft
Length Factor	0.50	
Total Interception Ler	10.47	ft

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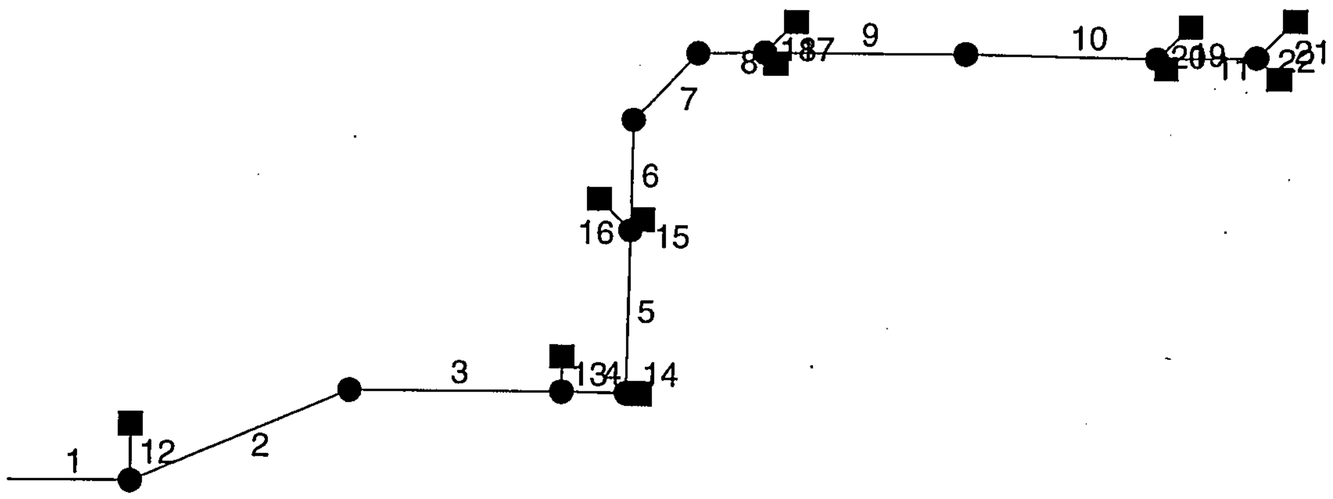
Hydraflow Plan View



Project file: vv-sd-110802.stm	IDF file: sampleFHA.IDF	No. Lines: 22	11-08-2002

COMP. JRW

CK.

DATE 11/08/02

EASTERLING & ASSOCIATES

A DIVISION OF WILSON & COMPANY

LOC. FILE X2218061

PROJ. BLACK RANCH SHEET 1

SUBJ. MINOR LOSS CALCS. OF

NOTE:

REFER TO HYDRAFLOW SCHEMATIC FOR JUNCTION/MH LOCATIONS. ANALYSIS BEGINS DOWNSTREAM AND WORKS UPSTREAM.

SEE DPM FOR PROCEDURES.

LINE 1

$h_m = 0.05\left(\frac{V^2}{2g}\right) = 0.05\ (1.60) = 0.08$

$h_B = K_b\left(\frac{V^2}{2g}\right)$ $\qquad K_b = 0.2\sqrt{\frac{A}{30}} = 0.10$

$= 0.10\ (1.60) = 0.16$

$h_j = \frac{V_2^2}{2g} - \frac{V_1^2}{2g} - \frac{2A_3}{A_2}\cdot\frac{V_3^2}{2g}\cdot\cos\theta$

$= 1.60 - 1.04 - 0 = 0.56$

$h_T = \Sigma h_i = 0.08 + 0.16 + 0.56 = 0.79'$

$TLC = h_T/\left(\frac{V^2}{2g}\right) = 0.79/1.59 = \underline{0.49}$

LINE 2

$h_m = 0.05\ (1.04) = 0.052'$

$h_b = 0.10\ (1.04) = 0.104$

$h_T = 0.156'$

$TLC = 0.156/1.04 = \underline{0.15}$

LINE 3

$h_m = 0.05(1.04) = 0.052$

$h_J = 1.04 - 1.01 - 0 = 0.03$

$h_T = 0.052 + 0.03 = 0.082'$

$TLC = 0.082/1.04 = \underline{0.079}$

COMP. JRW

CK.

DATE 11/8/02

EASTERLING & ASSOCIATES

A DIVISION OF WILSON & COMPANY

LOC. FILE

PROJ. BLACK RANCH SHEET 2

SUBJ. MINOR LOSS CALCS. OF

LINE 4

$h_m = 0.05\,(1.01) = 0.0505$

$h_B = 0.2\,(1.01) = 0.202$ $\quad K_b = 0.2\sqrt{\frac{90}{90}} = 0.2$

$h_J = 1.01 - 0.99 - 2(0.5)(0.01)(1) = 0.01$

$h_T = 0.26'$

$JLC = 0.24/1.01 = \underline{0.26}$

LINE 5

$h_m = 0.05\,(0.99) = 0.045$

HEADLOSS DUE TO THE JUNCTION OF THE TWO LATERALS IS NEGATIVE, TO REMAIN CONSERVATIVE, A HEADLOSS OF +0.10' WILL BE APPLIED INSTEAD.

$h_T = 0.145'$

$JLC = 0.145/0.99 = \underline{0.146}$

LINE 6

$h_m = 0.05\,(1.48) = 0.074$

$h_b = 0.093\,(1.48) = 0.138$ $\quad K_b = 0.2\sqrt{\frac{42}{90}} = 0.093$

$h_T = 0.22'$

$JLC = 0.212/1.48 = \underline{0.143}$

LINE 7

$h_m = 0.05\,(1.48) = 0.074$

$h_b = 0.14\,(1.48) = 0.212$

$h_T = 0.286'$

$JLC = 0.286/1.48 = \underline{0.193}$

COMP. JRUS

CK.

DATE 11/08/02

EASTERLING & ASSOCIATES

A DIVISION OF WILSON & COMPANY

LOC.

FILE X2218061

PROJ. BLACK RANCH SHEET 3

SUBJ. MINOR LOSS CALCS. OF

LINE 8

$h_m = 0.05(1.48) = 0.074$

$h_j = 1.48 - 0.77 - 0.186 = 0.52'$

$h_T = 0.597'$

JLC = 0.40

LINE 9

$h_m = 0.05(0.77) = 0.039$

$h_j = 0.039$

JLC = 0.05

LINE 10

$h_m = 0.05(0.77) = 0.039$

$h_j = 0.77 - 0.58 - 0.246 = -0.05$

USE ZERO TO BE CONSERVATIVE.

$h_T = 0.039'$

JLC = 0.05

LINE 11

$h_m = 0.05(0.58) = 0.029$

$h_j = 0.58 - 0.46 - 1.06 = -0.94$

USE ZERO

$h_T = 0.029$

JLC = 0.05

Hydraflow Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	72.0	0.0	MH	0.00	0.00	0.00	0.0	4996.60	0.50	4996.96	36	Cir	0.013	0.49	5003.21	
2	1	141.0	-23.0	MH	0.00	0.00	0.00	0.0	4996.96	0.50	4997.66	36	Cir	0.013	0.14	5005.24	
3	2	127.0	23.0	MH	0.00	0.00	0.00	0.0	4997.66	0.50	4998.29	36	Cir	0.013	0.08	5006.23	
4	3	38.0	1.0	MH	0.00	0.00	0.00	0.0	4998.29	0.58	4998.51	36	Cir	0.013	0.26	5005.82	
5	4	98.0	-90.0	MH	0.00	0.00	0.00	0.0	4998.51	0.50	4999.00	36	Cir	0.013	0.15	5008.39	
6	5	67.0	0.0	MH	0.00	0.00	0.00	0.0	4999.00	0.75	4999.50	30	Cir	0.013	0.14	5009.25	
7	6	56.0	42.0	MH	0.00	0.00	0.00	0.0	4999.50	0.75	4999.92	30	Cir	0.013	0.19	5010.14	
8	7	40.0	46.0	MH	0.00	0.00	0.00	0.0	4999.92	1.50	5000.52	30	Cir	0.013	0.40	5010.79	
9	8	120.0	1.0	MH	0.00	0.00	0.00	0.0	5000.52	2.27	5003.24	30	Cir	0.013	0.05	5012.67	
10	9	113.0	1.0	MH	0.00	0.00	0.00	0.0	5003.24	2.44	5006.00	30	Cir	0.013	0.05	5014.44	
11	10	60.0	-2.0	MH	0.00	0.00	0.00	0.0	5006.00	1.67	5007.00	24	Cir	0.013	0.05	5015.09	
12	1	34.0	-90.0	DrGrt	11.65	0.00	0.00	0.0	4997.25	8.09	5000.00	18	Cir	0.013	0.00	5005.50	DESILT
13	3	21.0	-90.0	Comb	0.77	0.00	0.00	0.0	4999.04	1.05	4999.26	18	Cir	0.013	0.00	5007.50	DI-5A
14	4	8.0	0.0	Comb	0.77	0.00	0.00	0.0	4999.26	1.00	4999.34	18	Cir	0.013	0.00	5007.40	DI-5B
15	5	10.0	45.0	Comb	4.23	0.00	0.00	0.0	4999.75	1.00	4999.85	18	Cir	0.013	0.00	5012.00	DI-4B
16	5	27.0	-45.0	Comb	4.23	0.00	0.00	0.0	4999.75	1.00	5000.02	18	Cir	0.013	0.00	5012.00	DI-4A
17	8	26.0	-45.0	Comb	6.66	0.00	0.00	0.0	5001.02	3.19	5001.85	18	Cir	0.013	0.00	5014.50	DI-3A
18	8	9.0	45.0	Comb	6.66	0.00	0.00	0.0	5001.02	7.22	5001.67	18	Cir	0.013	0.00	5014.50	DI-3B
19	10	28.0	-45.0	Comb	7.65	0.00	0.00	0.0	5006.50	1.00	5006.78	18	Cir	0.013	0.00	5015.50	DI-2A
20	10	8.0	45.0	Comb	7.65	0.00	0.00	0.0	5006.50	1.00	5006.58	18	Cir	0.013	0.00	5015.50	DI-2B
21	11	31.0	-45.0	Comb	9.63	0.00	0.00	0.0	5007.00	0.97	5007.30	18	Cir	0.013	0.00	5015.45	DI-1A

Project File: vv-sd-110802.stm | IDF File: sampleFHA.IDF | Total number of lines: 22 | Date: 11-14-2002

Hydraflow Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
22	11	18.0	45.0	Comb	9.63	0.00	0.00	0.0	5007.00	1.00	5007.18	18	Cir	0.013	0.00	5015.50	DI-1B

Project File: vv-sd-110802.stm	IDF File: sampleFHA.IDF	Total number of lines: 22	Date: 11-14-2002

Hydraflow Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1		69.53	36 c	72.0	4996.60	4996.96	0.500	4999.27*	5000.21*	0.74	End
2		57.88	36 c	141.0	4996.96	4997.66	0.497	5000.94*	5002.01*	0.15	1
3		57.88	36 c	127.0	4997.66	4998.29	0.496	5002.15*	5003.11*	0.08	2
4		57.11	36 c	38.0	4998.29	4998.51	0.578	5003.19*	5003.47*	0.26	3
5		56.34	36 c	98.0	4998.51	4999.00	0.500	5003.74*	5004.44*	0.15	4
6		47.88	30 c	67.0	4999.00	4999.50	0.746	5004.58*	5005.50*	0.21	5
7		47.88	30 c	56.0	4999.50	4999.92	0.750	5005.71*	5006.47*	0.28	6
8		47.88	30 c	40.0	4999.92	5000.52	1.500	5006.75*	5007.30*	0.59	7
9		34.56	30 c	120.0	5000.52	5003.24	2.267	5007.89*	5008.74*	0.04	8
10		34.56	30 c	113.0	5003.24	5006.00	2.442	5008.78*	5009.58*	0.04	9
11		19.26	24 c	60.0	5006.00	5007.00	1.667	5009.62*	5010.06*	0.03	10
12	DESILT	11.65	18 c	34.0	4997.25	5000.00	8.088	5000.94	5001.30	0.00	1
13	DI-5A	0.77	18 c	21.0	4999.04	4999.26	1.046	5003.19*	5003.19*	0.00	3
14	DI-5B	0.77	18 c	8.0	4999.26	4999.34	1.001	5003.74*	5003.74*	0.00	4
15	DI-4B	4.23	18 c	10.0	4999.75	4999.85	1.001	5004.58*	5004.60*	0.00	5
16	DI-4A	4.23	18 c	27.0	4999.75	5000.02	1.000	5004.58*	5004.63*	0.00	5
17	DI-3A	6.66	18 c	26.0	5001.02	5001.85	3.193	5007.89*	5007.99*	0.00	8
18	DI-3B	6.66	18 c	9.0	5001.02	5001.67	7.221	5007.89*	5007.92*	0.00	8
19	DI-2A	7.65	18 c	28.0	5006.50	5006.78	0.999	5009.62*	5009.77*	0.00	10
20	DI-2B	7.65	18 c	8.0	5006.50	5006.58	1.001	5009.62*	5009.66*	0.00	10
21	DI-1A	9.63	18 c	31.0	5007.00	5007.30	0.967	5010.09*	5010.35*	0.00	11
22	DI-1B	9.63	18 c	18.0	5007.00	5007.18	1.001	5010.09*	5010.24*	0.00	11

Project File: vv-sd-110802.stm	IDF File: sampleFHA.IDF	Total No. Lines: 22	Run Date: 11-14-2002

NOTES: c = circular; e = elliptical; b = box; Return period = 100 Yrs.; * Indicates surcharge condition.

Hydraflow Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp line No
							Ht (in)	L (ft)	area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	depth (ft)	spread (ft)	depth (ft)	spread (ft)	Dep (in)	
1		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	0.000	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
2		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	0.000	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	1
3		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	0.000	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	2
4		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	0.000	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	3
5		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	0.000	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	4
6		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	0.000	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	5
7		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	0.000	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	6
8		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	0.000	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	7
9		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	0.000	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	8
10		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	0.000	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	9
11		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	0.000	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	10
12		11.65*	0.00	11.65	0.00	DrGrt	0.0	0.00	6.95	3.33	2.00	Sag	2.50	0.020	0.020	0.000	0.65	67.96	0.65	67.96	0.0	1
13		0.77*	0.00	0.77	0.00	Comb	8.0	7.45	0.00	3.33	2.00	0.050	2.50	0.063	0.020	0.013	0.14	2.22	0.17	1.53	2.75	3
14		0.77*	0.00	0.77	0.00	Comb	8.0	7.45	0.00	3.33	2.00	0.050	2.50	0.063	0.020	0.013	0.14	2.22	0.17	1.53	2.75	4
15		4.23*	0.00	4.23	0.00	Comb	8.0	7.45	0.00	3.33	2.00	0.010	2.50	0.063	0.020	0.013	0.32	10.63	0.41	8.94	2.75	5
16		4.23*	0.00	4.23	0.00	Comb	8.0	7.45	0.00	3.33	2.00	0.010	2.50	0.063	0.020	0.013	0.32	10.63	0.41	8.94	2.75	5
17		6.66*	0.00	6.66	0.00	Comb	8.0	7.45	0.00	3.33	2.00	0.005	2.50	0.063	0.020	0.013	0.41	15.12	0.50	13.74	2.75	8
18		6.66*	0.00	6.66	0.00	Comb	8.0	7.45	0.00	3.33	2.00	0.005	2.50	0.063	0.020	0.013	0.41	15.12	0.50	13.74	2.75	8
19		7.65*	0.00	7.65	0.00	Comb	8.0	7.45	0.00	3.33	2.00	0.005	2.50	0.063	0.020	0.013	0.42	15.62	0.52	14.64	2.75	10
20		7.65*	0.00	7.65	0.00	Comb	8.0	7.45	0.00	3.33	2.00	0.005	2.50	0.063	0.020	0.013	0.42	15.62	0.52	14.64	2.75	10
21		9.63*	0.00	9.63	0.00	Comb	8.0	7.45	0.00	3.33	2.00	0.005	2.50	0.063	0.020	0.013	0.45	17.12	0.55	16.29	2.75	11
22		9.63*	0.00	9.63	0.00	Comb	8.0	7.45	0.00	3.33	2.00	0.005	2.50	0.063	0.020	0.013	0.45	17.12	0.55	16.29	2.75	11

Project File: vv-sd-110802.stm	I-D-F File: sampleFHA.IDF	Total number of lines: 22	Run Date: 11-14-2002

NOTES: Inlet N-Values = 0.016 ; Intensity = 127.16 / (Inlet time + 17.80) ^ 0.82; Return period = 100 Yrs. ; * Indicates Known Q added

Hydraflow Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	36	69.53	4996.60	4999.27	2.67	6.65	10.46	1.70	5000.97	0.966	72.0	4996.96	5000.21	3.00	7.07	9.84	1.50	5001.71	1.087	1.027	0.739	0.49	0.74
2	36	57.88	4996.96	5000.94	3.00	7.07	8.19	1.04	5001.99	0.753	141	4997.66	5002.01	3.00	7.07	8.19	1.04	5003.05	0.753	0.753	1.062	0.14	0.15
3	36	57.88	4997.66	5002.15	3.00	7.07	8.19	1.04	5003.20	0.753	127	4998.29	5003.11	3.00	7.07	8.19	1.04	5004.15	0.753	0.753	0.957	0.08	0.08
4	36	57.11	4998.29	5003.19	3.00	7.07	8.08	1.02	5004.21	0.734	38.0	4998.51	5003.47	3.00	7.07	8.08	1.01	5004.49	0.733	0.733	0.279	0.26	0.26
5	36	56.34	4998.51	5003.74	3.00	7.07	7.97	0.99	5004.73	0.714	98.0	4999.00	5004.44	3.00	7.07	7.97	0.99	5005.42	0.714	0.714	0.700	0.15	0.15
6	30	47.88	4999.00	5004.58	2.50	4.91	9.76	1.48	5006.06	1.364	67.0	4999.50	5005.50	2.50	4.91	9.75	1.48	5006.98	1.363	1.363	0.913	0.14	0.21
7	30	47.88	4999.50	5005.71	2.50	4.91	9.76	1.48	5007.19	1.364	56.0	4999.92	5006.47	2.50	4.91	9.75	1.48	5007.95	1.363	1.363	0.763	0.19	0.28
8	30	47.88	4999.92	5006.75	2.50	4.91	9.76	1.48	5008.23	1.364	40.0	5000.52	5007.30	2.50	4.91	9.75	1.48	5008.78	1.363	1.363	0.545	0.40	0.59
9	30	34.56	5000.52	5007.89	2.50	4.91	7.04	0.77	5008.66	0.710	120	5003.24	5008.74	2.50	4.91	7.04	0.77	5009.51	0.710	0.710	0.852	0.05	0.04
10	30	34.56	5003.24	5008.78	2.50	4.91	7.04	0.77	5009.55	0.710	113	5006.00	5009.58	2.50	4.91	7.04	0.77	5010.35	0.710	0.710	0.803	0.05	0.04
11	24	19.26	5006.00	5009.62	2.00	3.14	6.13	0.58	5010.21	0.725	60.0	5007.00	5010.06	2.00	3.14	6.13	0.58	5010.64	0.725	0.725	0.435	0.05	0.03
12	18	11.65	4997.25	5000.94	1.50	1.77	6.59	0.68	5001.62	1.231	34.0	5000.00	5001.30	1.30**	1.63	7.15	0.79	5002.10	1.125	1.178	N/A	0.00	0.00
13	18	0.77	4999.04	5003.19	1.50	1.77	0.44	0.00	5003.20	0.005	21.0	4999.26	5003.19	1.50	1.77	0.44	0.00	5003.20	0.005	0.005	0.001	0.00	0.00
14	18	0.77	4999.26	5003.74	1.50	1.77	0.44	0.00	5003.74	0.005	8.0	4999.34	5003.74	1.50	1.77	0.44	0.00	5003.74	0.005	0.005	0.000	0.00	0.00
15	18	4.23	4999.75	5004.58	1.50	1.77	2.39	0.09	5004.67	0.162	10.0	4999.85	5004.60	1.50	1.77	2.39	0.09	5004.69	0.162	0.162	0.016	0.00	0.00
16	18	4.23	4999.75	5004.58	1.50	1.77	2.39	0.09	5004.67	0.162	27.0	5000.02	5004.63	1.50	1.77	2.39	0.09	5004.72	0.162	0.162	0.044	0.00	0.00
17	18	6.66	5001.02	5007.89	1.50	1.77	3.77	0.22	5008.11	0.402	26.0	5001.85	5007.99	1.50	1.77	3.77	0.22	5008.21	0.402	0.402	0.105	0.00	0.00
18	18	6.66	5001.02	5007.89	1.50	1.77	3.77	0.22	5008.11	0.402	9.0	5001.67	5007.92	1.50	1.77	3.77	0.22	5008.15	0.402	0.402	0.036	0.00	0.00
19	18	7.65	5006.50	5009.62	1.50	1.77	4.33	0.29	5009.91	0.531	28.0	5006.78	5009.77	1.50	1.77	4.33	0.29	5010.06	0.531	0.531	0.149	0.00	0.00
20	18	7.65	5006.50	5009.62	1.50	1.77	4.33	0.29	5009.91	0.531	8.0	5006.58	5009.66	1.50	1.77	4.33	0.29	5009.96	0.531	0.531	0.042	0.00	0.00
21	18	9.63	5007.00	5010.09	1.50	1.77	5.45	0.46	5010.55	0.841	31.0	5007.30	5010.35	1.50	1.77	5.45	0.46	5010.81	0.841	0.841	0.261	0.00	0.00

Project File: vv-sd-110802.stm	IDF File: sampleFHA.IDF	Total number of lines: 22	Run Date: 11-14-2002

NOTES: Initial tailwater elevation = 4999.27 (ft) , * Normal depth assumed., ** Critical depth assumed.

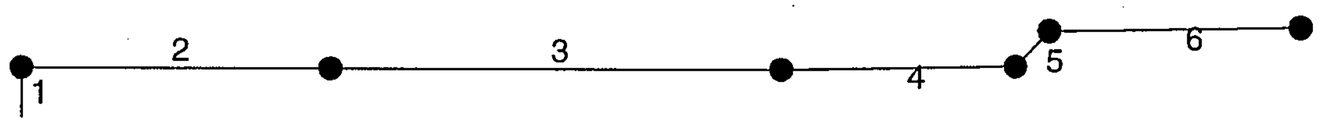
Hydraflow Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
22	18	9.63	5007.00	5010.09	1.50	1.77	5.45	0.46	5010.55	0.841	18.0	5007.18	5010.24	1.50	1.77	5.45	0.46	5010.70	0.841	0.841	0.151	0.00	0.00

Project File: vv-sd-110802.stm	IDF File: sampleFHA.IDF	Total number of lines: 22	Run Date: 11-14-2002

NOTES: Initial tailwater elevation = 4999.27 (ft) , * Normal depth assumed., ** Critical depth assumed.

Hydraflow Plan View



Project file: COORS.stm	IDF file: sampleFHA.IDF	No. Lines: 6	11-12-2002

Hydraflow Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	35.0	-90.0	MH	0.00	0.00	0.00	0.0	4999.00	1.00	4999.35	30	Cir	0.013	0.25	5005.00	
2	1	217.0	90.0	MH	0.00	0.00	0.00	0.0	4999.35	2.37	5004.49	30	Cir	0.013	0.05	5011.00	
3	2	319.0	0.0	MH	0.00	0.00	0.00	0.0	5004.49	2.25	5011.67	30	Cir	0.013	0.05	5016.00	
4	3	166.0	-1.0	MH	0.00	0.00	0.00	0.0	5011.67	2.60	5015.98	30	Cir	0.013	0.05	5020.00	
5	4	35.0	-45.0	MH	0.00	0.00	0.00	0.0	5015.98	2.37	5016.81	30	Cir	0.013	0.15	5020.00	
6	5	176.0	45.0	MH	48.00	0.00	0.00	0.0	5016.81	2.37	5020.98	30	Cir	0.013	0.15	5024.00	

Project File: COORS.stm	IDF File: sampleFHA.IDF	Total number of lines: 6	Date: 11-12-2002

Hydraflow Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1		48.00	30 c	35.0	4999.00	4999.35	1.000	5001.50*	5001.98*	0.37	End
2		48.00	30 c	217.0	4999.35	5004.49	2.369	5002.35	5006.77	0.08	1
3		48.00	30 c	319.0	5004.49	5011.67	2.251	5006.85	5013.95	0.08	2
4		48.00	30 c	166.0	5011.67	5015.98	2.596	5014.03	5018.26	0.08	3
5		48.00	30 c	35.0	5015.98	5016.81	2.372	5018.34	5019.09	0.24	4
6		48.00	30 c	176.0	5016.81	5020.98	2.369	5019.33	5023.26	0.24	5

Project File: COORS.stm	IDF File: sampleFHA.IDF	Total No. Lines: 6	Run Date: 11-12-2002

NOTES: c = circular; e = elliptical; b = box; Return period = 100 Yrs.; * Indicates surcharge condition.

Hydraflow Hydraulic Grade Line Computations

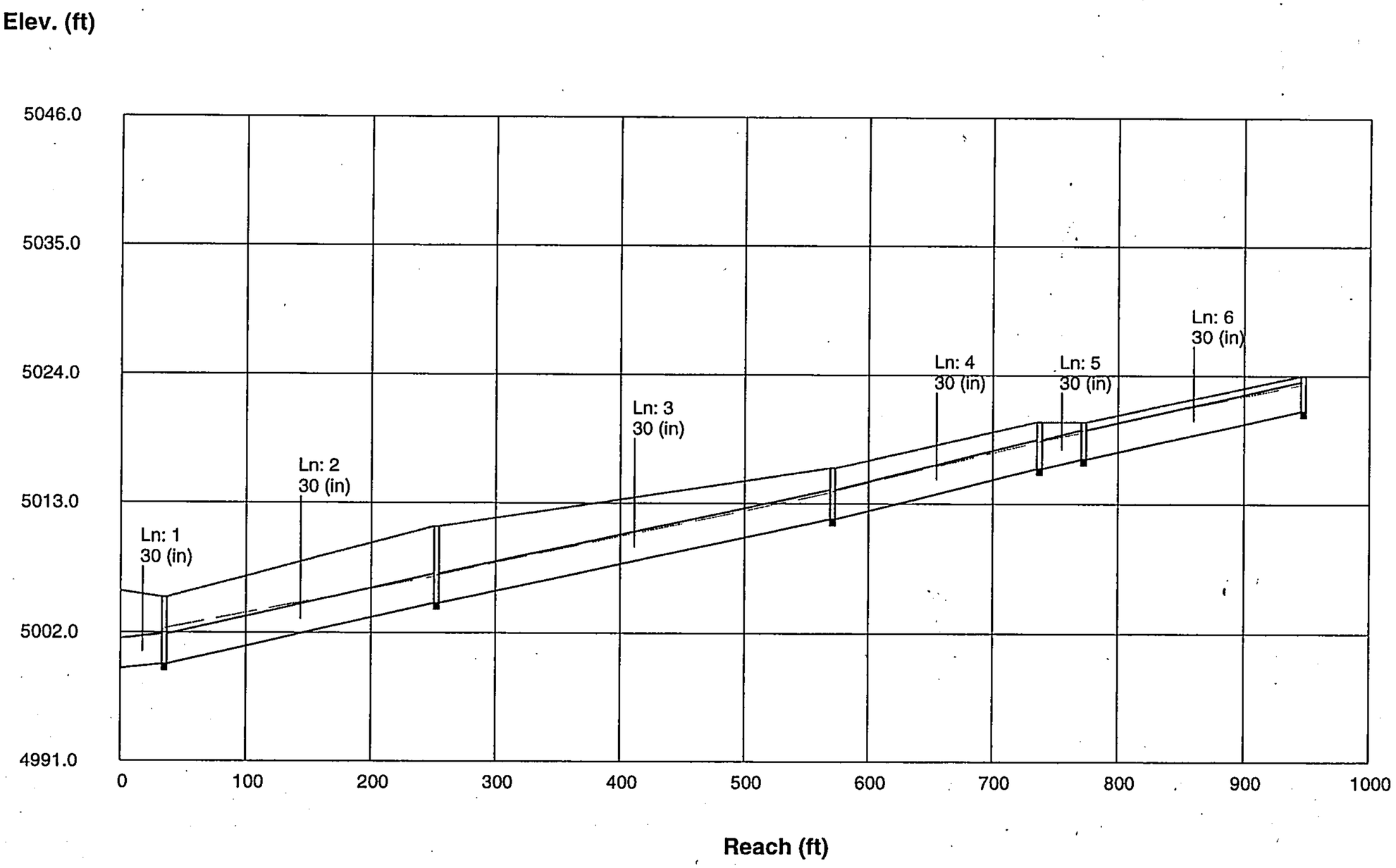
Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	30	48.00	4999.00	5001.50	2.50	4.91	9.78	1.49	5002.99	1.370	35.0	4999.35	5001.98	2.50	4.91	9.78	1.49	5003.47	1.370	1.370	0.480	0.25	0.37
2	30	48.00	4999.35	5002.35	2.50	4.91	9.78	1.49	5003.84	1.370	217	5004.49	5006.77	2.28**	4.69	10.23	1.63	5008.39	1.195	1.283	N/A	0.05	0.08
3	30	48.00	5004.49	5006.85	2.36	4.80	10.00	1.56	5008.40	1.184	319	5011.67	5013.95	2.28**	4.69	10.23	1.63	5015.57	1.195	1.190	N/A	0.05	0.08
4	30	48.00	5011.67	5014.03	2.36	4.80	10.00	1.56	5015.58	1.184	166	5015.98	5018.26	2.28**	4.69	10.23	1.63	5019.88	1.195	1.190	N/A	0.05	0.08
5	30	48.00	5015.98	5018.34	2.36	4.80	10.00	1.56	5019.89	1.184	35.0	5016.81	5019.09	2.28**	4.69	10.23	1.63	5020.71	1.195	1.190	N/A	0.15	0.24
6	30	48.00	5016.81	5019.33	2.50	4.91	9.78	1.49	5020.82	1.370	176	5020.98	5023.26	2.28**	4.69	10.23	1.63	5024.88	1.195	1.283	N/A	0.15	0.24

Project File: COORS.stm	IDF File: sampleFHA.IDF	Total number of lines: 6	Run Date: 11-12-2002

NOTES: Initial tailwater elevation = 5001.5 (ft) , * Normal depth assumed., ** Critical depth assumed.

Storm Sewer Profile

Proj. file: COORS.stm



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764781

File
C13/D25E

PRIVATE FACILITY
DRAINAGE COVENANT

This Drainage Covenant, between Black Development Two, LLC whose address is 3613 NMSR 528, Suite H, and the City of Albuquerque, a New Mexico municipal corporation ("City"), whose address is P.O. Box 1293, Albuquerque, New Mexico 87103, is made in Albuquerque, Bernalillo County, New Mexico and is entered into as of the date Owner signs this Covenant.

1. Recital. The Owner is the owner of the following described real property located at Tract 2A-2, Black Ranch within projected section 18, Township 11 North, Range 3 East, New Mexico Principal Meridian, Town of Alameda Grant, City of Albuquerque, (October 2002) in Bernalillo County, New Mexico (the "Property").

Pursuant to City ordinances, regulations and other applicable laws, the Owner is required to construct and maintain certain drainage facilities on the Property, and the parties wish to enter into this Covenant to establish the obligations and responsibilities of the parties.

2. Description and Construction of Drainage Facility. The Owner shall construct the following "Drainage Facility" within the Property at the Owner's sole expense in accordance with the standards, plans and specifications approved by the City: Temporary Desilting Pond with CMP riser
The Drainage Facility is more particularly described in Exhibit A and B attached hereto and made a part hereof.

3. Maintenance of Drainage Facility. The Owner shall maintain the Drainage Facility at the Owner's sole cost in accordance with the approved Drainage Report and plans.

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

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

6. Liability of City. The Owner understands and agrees that the City shall not be liable to the Owner, its heirs, successors or assigns, or to any third parties for any damages resulting from the Owner's failure to construct, maintain or repair the Drainage Facility.

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

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

9. Binding on Owner's Property. The covenants and obligations of the Owner set forth herein shall be binding on the Owner, its heirs, assigns and successors and on the Owner's Property and constitute covenants running with the Owner's Property until released by the City. This Covenant can only be released by the City's Chief Administrative Officer with the concurrence of the City Engineer.

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

11. Changes to Covenant. Changes to this Covenant are not binding unless made in writing, signed by both parties.

12. Effective Date of Covenant. This Covenant shall be effective as of the date of signature of the Owner.

CITY OF ALBUQUERQUE: 3/26/03

ACCEPTED: 3/18/03

By: ~~Lawrence Rael~~

Chief Administrative Officer

Dated: 3-22-03

OWNER: Black Development Two, LLC
a New Mexico

By:

Title: Managing Partner

Dated: 3/6/03

APPROVED:

3/26/03

Director, Public Works Dept.

Reviewed by:

City Engineer

CITY'S ACKNOWLEDGMENT

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

This instrument was acknowledged before me on March 26, ~~199~~ 2003 by Fred J. Aguirre ~~, by Lawrence Rael~~, Chief Administrative Officer for the City of Albuquerque, a New Mexico municipal corporation, on behalf of the corporation.

Gloria A. Saavedra
Notary Public

My Commission Expires:
11-15-2003

OWNER'S ACKNOWLEDGMENT

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

This instrument was acknowledged before me on March 6, 2003, by John F. Black, Managing Partner, on behalf of Black Development II.

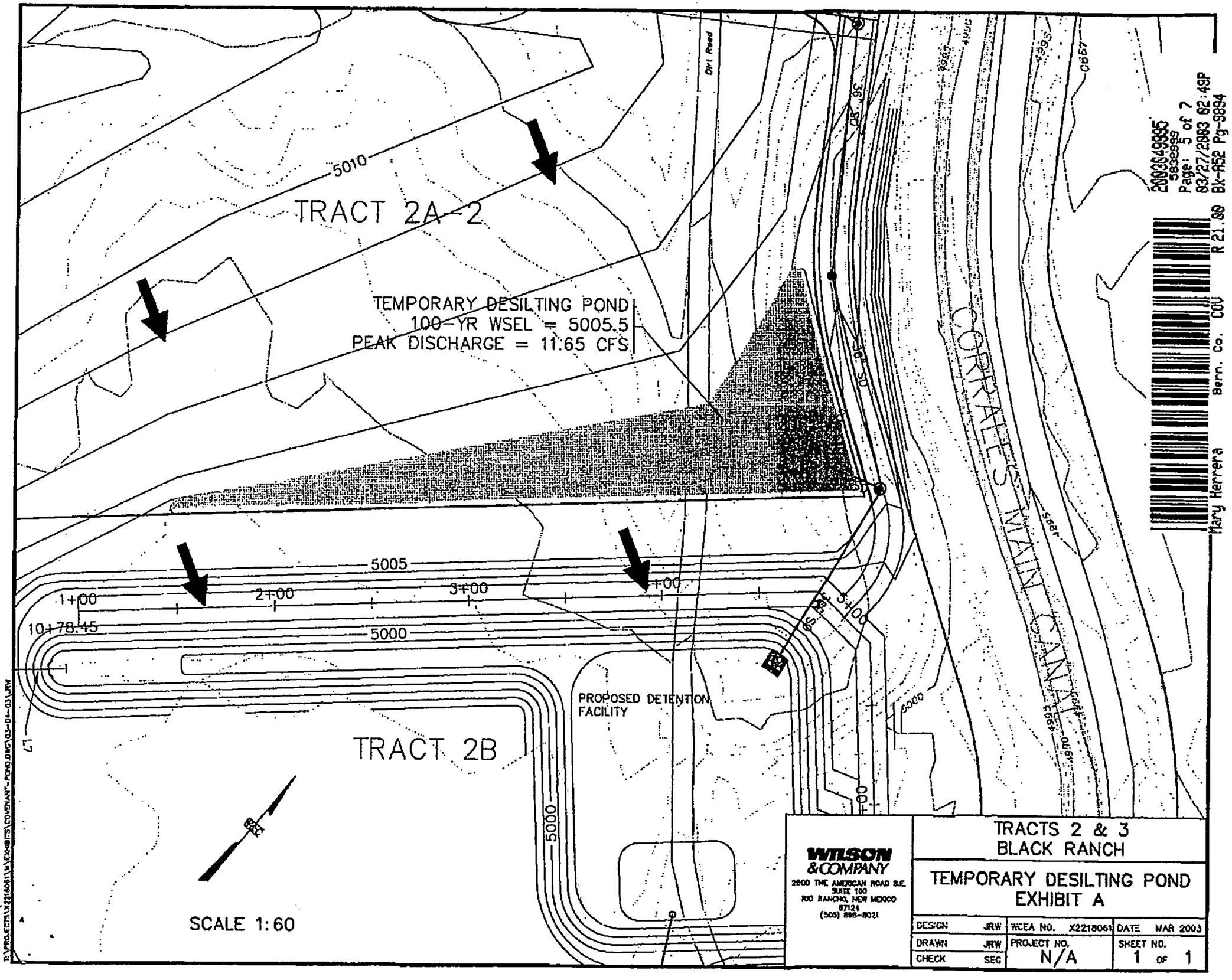
Notary Public Sharon L Hollins

My Commission Expires:
Nov. 29, 2003

OFFICIAL SEAL
Sharon L. Hollins
NOTARY PUBLIC-STATE OF NEW MEXICO
My commission expires: 11/29/03

[EXHIBIT A ATTACHED]

Mary Herrera Bern. Co. COV R 21.00 2003049895 5832999 Page: 4 of 7 03/27/2003 02:49P Bk-A52 Pg-9894



WILSON & COMPANY
2600 THE AMERICAN ROAD S.E.
SUITE 100
RIO RANCHO, NEW MEXICO
87124
(505) 896-8021

TRACTS 2 & 3
BLACK RANCH

TEMPORARY DESILTING POND
EXHIBIT A

DESIGN	JRW	WCEA NO. X2218061	DATE MAR 2003
DRAWN	JRW	PROJECT NO. N/A	SHEET NO. 1 OF 1
CHECK	SEG		

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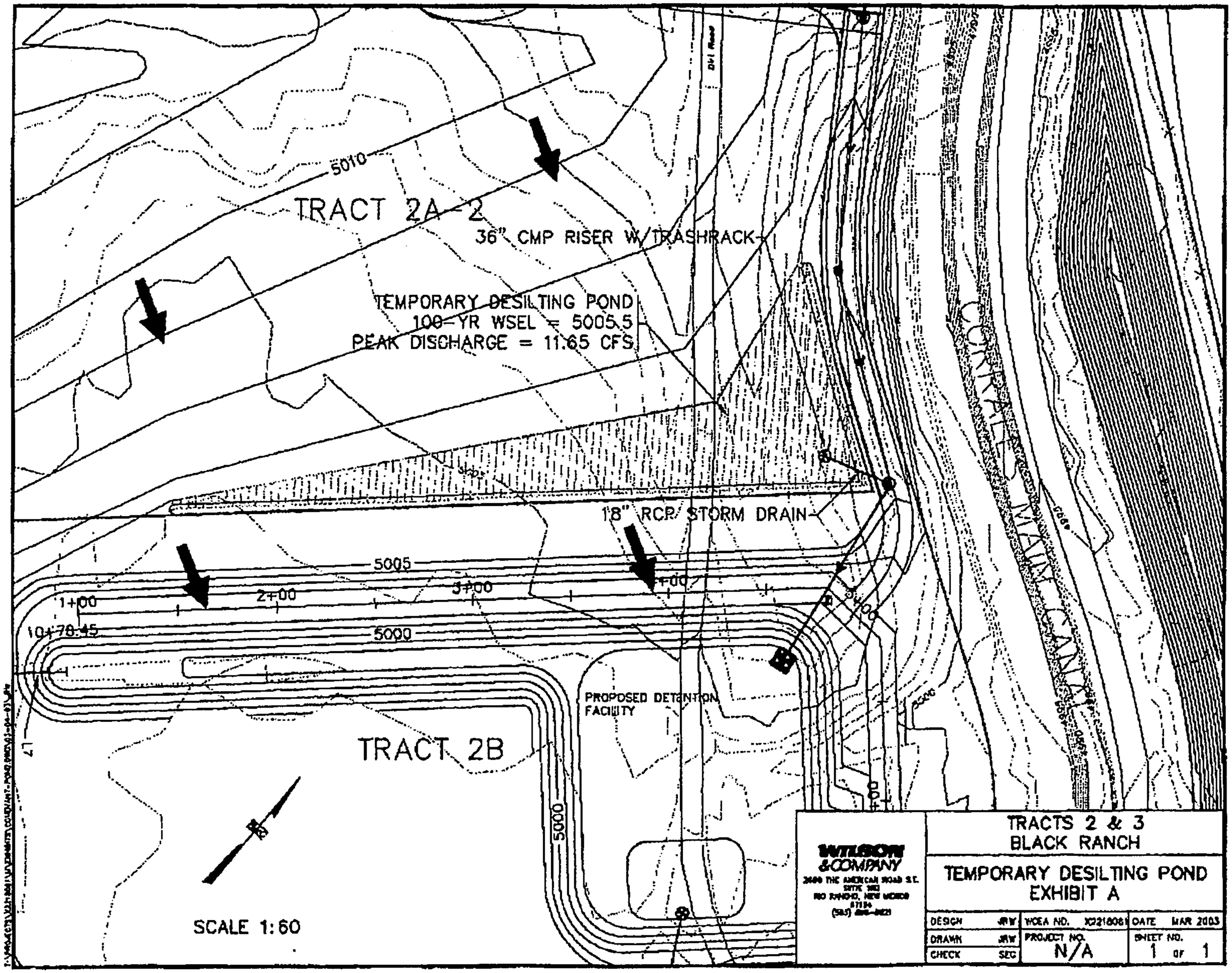

WILSON & COMPANY
2600 THE AMERICAN ROAD S.E.
SUITE 303
RIO RANCHO, NEW MEXICO
87124
(505) 896-8621

TRACTS 2 & 3
BLACK RANCH

TEMPORARY DESILTING POND
EXHIBIT A

DESIGN	JRW	WOEA NO.	X2218061	DATE	MAR 2003
DRAWN	JRW	PROJECT NO.	N/A	SHEET NO.	1 OF 1
CHECK	SEC				

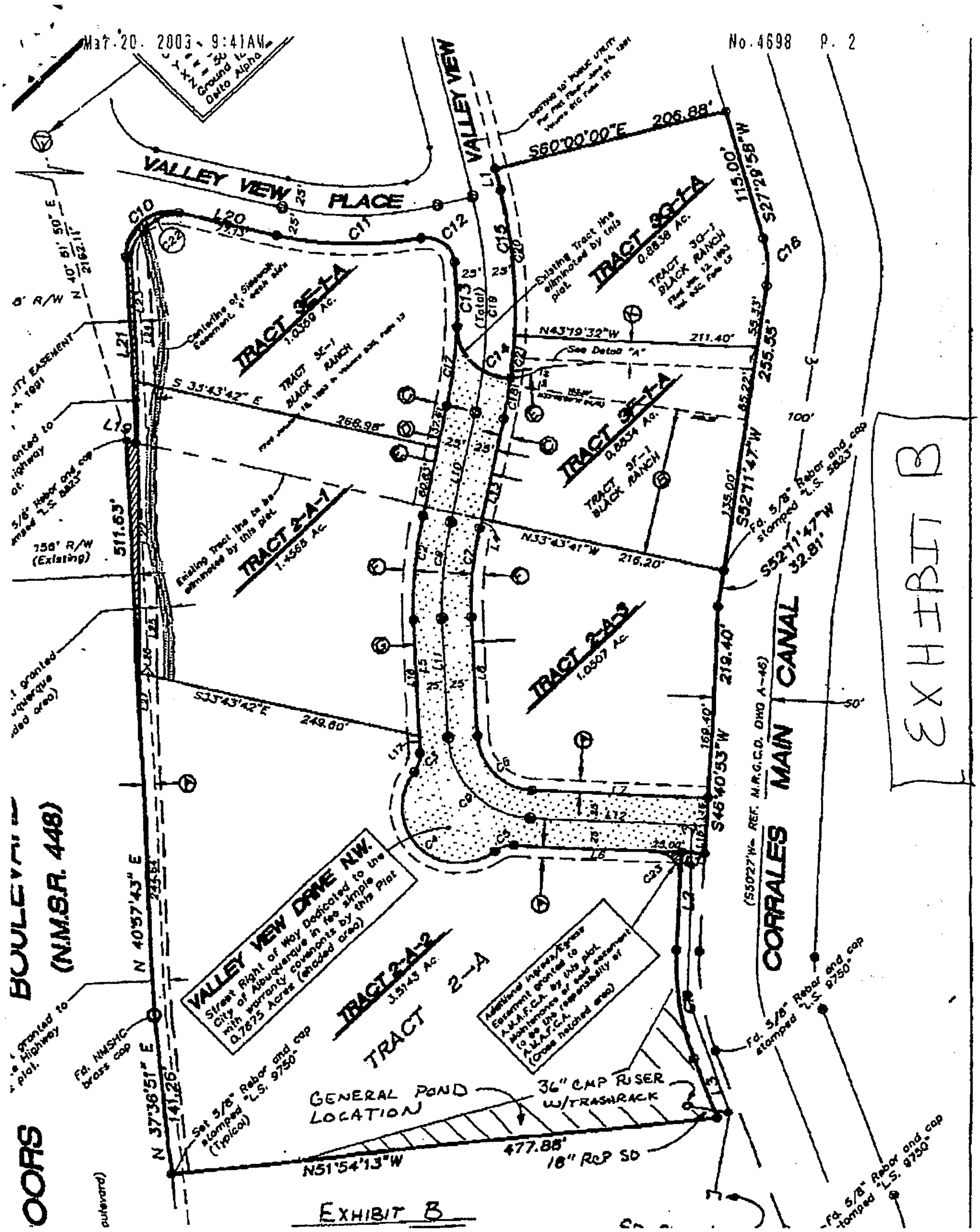

EXHIBIT B

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5832999
Page: 7 of 7
03/27/2003 02:49P
Bk-A52 Pg-9894
Mary Herrera Bern. Co. COV R 21.00