City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

KEN SCHULTZ
MAYOR

CLARENCE V. LITHGOW
CHIEF ADMINISTRATIVE OFFICER

DAN WEAKS
DEPUTY CAO PUBLIC SERVICES

FRED E. MONDRAGON
DEPUTY CAO DEVELOPMENT & ENTERPRISE SERVICES

RAY R. BACA
DEPUTY CAO PUBLIC SAFETY

August 24, 1989

CERTIFICATE OF COMPLETION AND ACCEPTANCE

Mr. Jafari
Cintel Corporation
10832 Prospect N.E., Suite F
Albuquerque, NM 87112

RE: PROJECT NO. 2565, NORTH FOUR HILLS SUBDIVISION, (MAP NO. L-23)

Dear Mr. Jafari:

This is to certify that the City of Albuquerque accepts Project No. 2565 as being completed according to approved plans and construction specifications. If all required right-of-ways and/or easements have been dedicated, the City of Albuquerque will accept for continuous maintenance all public infrastructure improvements constructed as part of Project No. 2565. If the required right-of-ways and/or easements have not been dedicated, the City of Albuquerque cannot accept the project for continuous maintenance and said maintenance will be the responsibility of the developer.

The project is described as follows:

- Installed waterline, sewerline, storm drainage facilities and paving in the North Four Hills Subdivision on the following streets; 1) Carmellia Dr., 2) Pointsetta Pl., 3) Narcissus Pl., and 4) Waterfall Dr.

- The contractor's warranty begins the date of this letter and will be effective for a period of one (1) year.

Sincerely,

Russell B. Givler, P.E.
Chief Construction Engineer
Construction Mgmt. Division
Engineering Group
Public Works Department

RBG:tjp

CHIP MUENZE, CCIM
Associate Broker
THE VAUGHAN COMPANY
Commercial Properties
6501 INDIAN SCHOOL RD. N.E.
FOURTH FLOOR
ALBUQUERQUE, NEW MEXICO 87110

July 26, 1989

To: Addressees

From: Mark Goodwin, P.E.

Subject: Final Inspection North Four Hills Subdivision
Project No. 2565, July 25, 1989

The following punch list items need to be corrected by the Contractor prior to Final Acceptance:

Liquid Waste

1. MH #5: Patch MH barrel at downstream side.
2. MH #2: Redo invert to create circular section.
3. MH #9: Grind invert and grout sides.
4. MH #1: Repair loose step.
5. MH #15: Clean invert and remove plastic substance from over pipe.
6. MH #16: Remove small depression in invert at downstream end.
7. MH #17: Grout voids in invert.
8. MH #18: Provide concrete collar.
9. MH #19: Reduce pipe penetration and provide concrete collar.
10. MH #38: Reduce pipe penetration and provide concrate collar.
11. MH #39: Repair transition to interceptor.

Storm Drainage

1. Remove high rip-rap at rundown on Narcissus.
2. Remove high rip-rap at outlet to 42" RCP.

Water Resources

1. Flush entire system and obtain new potability tests.
2. Provide all valve extensions (13).
3. Provide concrete collars for two valves not in street.
4. Block cap for stubout at Sta. 9 + 96.
5. Straighten valve can at Sta. 13 + 08.
6. Raise valve can at Sta. 13 + 87.
7. Raise valve can at Sta. 0 + 70, Narcissus.
8. Paint all fire hydrant extensions.

9. Level all meter yokes.
10. Repair all deflected meter boxes.
11. Provide stem and pitcock on all gauges in PRV stations.

Street Maintenance

1.

THE AMERICAN INSTITUTE OF ARCHITECTS

AIA Document A101

Standard Form of Agreement Between Owner and Contractor

where the basis of payment is a

STIPULATED SUM

1977 EDITION

THIS DOCUMENT HAS IMPORTANT LEGAL CONSEQUENCES; CONSULTATION WITH AN ATTORNEY IS ENCOURAGED WITH RESPECT TO ITS COMPLETION OR MODIFICATION

Use only with the 1976 Edition of AIA Document A201, General Conditions of the Contract for Construction.

This document has been approved and endorsed by The Associated General Contractors of America.

AGREEMENT

made as of the 6th day of March in the year of Nineteen Hundred and Eighty Seven

BETWEEN the Owner: Cintel Corporation

and the Contractor: MJB Construction

The Project: North Four Hills Subdivision

The Architect: N/A

The Owner and the Contractor agree as set forth below.

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SCHEDULE A

PROJECT: North Four Hills Subdivision

OWNER: Cintel, Inc.
ENGINEER: D. Mark Goodwin & Associates, P.A.
CONTRACTOR: MJB Construction

PROJECT NO. 2565

SHEET 1 OF 2

ITEM NO	SHORT DESCRIPTION	ESTIMATED UNIT PRICE	ESTIMATED QUANTITY		ESTIMATED AMOUNT
P-4	Grading	$0.60	900	S.Y.	$540.00
P-21	Proc. 8" + Subgr.	$0.60	900	S.Y.	$540.00
P-19	Proc. 6" Subbs.	$0.40	900	S.Y.	$360.00
P-24	6" C.T.B.	$2.50	900	S.Y.	$2,250.00
P-27	2-1/2" AC BS 1500-M	$2.54	900	S.Y.	$2,286.00
P-30	Tack Coat	$0.15	900	S.Y.	$135.00
P-35	1-1/2" AC SF 1800-M	$1.70	900	S.Y.	$1,530.00
P-4	Grading	$0.60	17,210	S.Y.	$10,326.00
P-19	Proc. 6" Subgr.	$0.40	17,210	S.Y.	$6,884.00
P-17	Proc. 4" Subbs.	$0.40	17,210	S.Y.	$6,884.00
P-25	1-1/2" AC BS 1500-M	$1.60	17,210	S.Y.	$27,536.00
P-30	Tack Coat	$0.15	17,210	S.Y.	$2,581.50
P-32	1-1/2" AC SF 1500-M	$1.60	17,210	S.Y.	$27,536.00
P-4	Grading	$0.60	3,945	S.Y.	$2,367.00
P-19	Proc 6" Subgr.	$0.40	3,945	S.Y.	$1,578.00
P-17	Proc 4" Subbs.	$0.42	3,945	S.Y.	$1,656.00
P-25	1-1/2" AC BS 1500-M	$1.50	2,860	S.Y.	$4,290.00
P-30	Tack Coat	$0.16	2,860	S.Y.	$457.60
P-25	1-1/2" AC BS 1500-M	$1.58	2,860	S.Y.	$4,518.80
P-42	Conc. Handicap Ramp & Sidewalks	$1.05	44,590	S.F.	$46,819.50
P-43	Conc. Drivepad	$2.80	72	S.Y.	$201.60
P-44	Conc. Valley Gutter	$3.00	2,970	S.F.	$8,910.00
P-45	Conc. Alley Gutter	$5.98	611	L.F.	$3,653.78
P-46	Std. Curb & Gutter	$5.00	9,600	L.F.	$48,000.00
	Mountable Curb-Roll Type	$5.80	490	L.F.	$2,842.00
	Bollards (4" Steel Pipe)	$3.12	42	L.F.	$131.04
M-39	Unreinforced Conc.	$70.00	1	C.Y.	$70.00
	Pressure Reducing Station	$3,000.00	2	Ea.	$6,000.00
B-1	4" PVC	$4.12	420	L.F.	$1,730.40
B-2	6" PVC	$6.05	380	L.F.	$2,299.00
B-3	8" PVC	$7.97	4,810	L.F.	$38,335.70
W-36	6' - 8' Trench	$1.85	550	L.F.	$1,017.50
W-37	8' - 14' Trench	$2.70	285	L.F.	$769.50
W-45	Pressurized Connection	$300.00	2	Ea.	$600.00
W-52	MJ Fittings	$0.99	4,000	LB.	$3,960.00
W-56	Caps 4" - 6"	$40.00	3	Ea.	$120.00
	8" Caps	$40.00	12	Ea.	$480.00
W-65	4" Gate Valves	$180.00	2	Ea.	$360.00
W-66	6" Gate Valves	$270.00	2	Ea.	$540.00
W-67	8" Gate Valves	$380.00	17	Ea.	$6,460.00
W-82	Valve Box - Type A	$139.00	21	Ea.	$2,919.00

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W-86	Fire Hydrant - 4` Bury	$600.00	5	ea	$ 3,000.00
W-134	Meter Box	83.00	25	ea	2,075.00
W-180	Single Service - 3/4" w/new main	173.00	8	ea	1,384.00
W-181	Double Service - 3/4" w/new main	296.00	17	ea	5,032.00
W-186	Blocking Pipe	62.00	52	c.y.	3,224.00
S-1	4" DIP	7.00	1,050	l.f.	7,350.00
G-3	8" PVC	3.90	4,090	l.f.	15,951.00
G-9	4" Core Drilled Tap	10.80	42	ea	453.60
S-12	Trenching 6` - 8`	4.00	3,170	l.f.	12,680.00
S-13	Trenching 8` - 10`	4.53	600	l.f.	2,718.00
S-14	Trenching 10` - 14`	8.10	945	l.f.	7,654.50
S-15	Trenching 14` - 18`	9.25	40	l.f.	370.00
S-22	4` Diam. MH 6` - 10`	728.00	30	ea	21,840.00
S-23	4` Diam. MH 10` - 14`	800.00	10	ea	8,000.00
S-24	4` Diam. MH 14` - 18`	48.00	6	v.f.	288.00
S-37	Wet Connection	108.00	3	ea	324.00
S-46	MH Steps	10.50	176	ea	1,848.00
	8" PVC Yelomine Pipe	11.00	900	l.f.	9,900.00
	Unreinforced Conc. for Conc. Pads	160.00	33	c.y.	5,280.00
K-10	42" RCP	38.00	251	l.f.	9,538.00
K-51	6" Reinforced Concrete	2.86	1,000	s.f.	2,860.00
K-53	8" Reinforced Channel Lining	3.00	320	s.f.	960.00
K-52	7" Reinforced Channel Lining	2.90	3,600	s.f.	10,440.00
	12" Reinforced Channel Lining	3.05	500	s.f.	1,525.00
K-61	Chain Link Fence	2.98	200	s.f.	596.00
K-68	Grouted Rip-rap	52.00	190	c.y.	9,680.00
K-69	Plain Rip-rap	24.00	820	c.y.	19,680.00
	10 x 2 Steel Plates	270.00	18	ea	4,860.00
	Unreinforced Concrete	180.00	20	c.y.	3,600.00
	Granular Bedding	1.10	1,800	s.y.	1,980.00
K-45	Channel Excavation	2.10	1,953	c.y.	4,101.30
	6" PRV	1,000.00	2	ea	2,000.00
	2" PRV	800.00	2	ea	1,600.00

TOTAL $463,467.32

ARTICLE 1

THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, the Conditions of the Contract (General, Supplementary and other Conditions), the Drawings, the Specifications, all Addenda issued prior to and all Modifications issued after execution of this Agreement. These form the Contract, and all are as fully a part of the Contract as if attached to this Agreement or repeated herein. An enumeration of the Contract Documents appears in Article 7.

ARTICLE 2

THE WORK

The Contractor shall perform all the Work required by the Contract Documents for

(Here insert the caption descriptive of the Work as used on other Contract Documents.)

Infrastructure Improvements, North Four Hills Subdivision

ARTICLE 3

TIME OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

The Work to be performed under this Contract shall be commenced June 1, 1987

and, subject to authorized adjustments, Substantial Completion shall be achieved not later than

(Here insert any special provisions for liquidated damages relating to failure to complete on time.)

180 Calendar Days - November 28, 1987

ARTICLE 4

CONTRACT SUM

The Owner shall pay the Contractor in current funds for the performance of the Work, subject to additions and deductions by Change Order as provided in the Contract Documents, the Contract Sum of

The Contract Sum is determined as follows:
(State here the base bid or other lump sum amount, accepted alternates, and unit prices, as applicable.)

Unit prices per the attached Schedule "A"

ARTICLE 5

PROGRESS PAYMENTS

Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided in the Contract Documents for the period ending the 25th day of the month as follows:

Not later than 30 days following the end of the period covered by the Application for Payment Variable percent (XXX%) of the portion of the Contract Sum properly allocable to labor, materials and equipment incorporated in the Work and Variable percent (XXX%) of the portion of the Contract Sum properly allocable to materials and equipment suitably stored at the site or at some other location agreed upon in writing, for the period covered by the Application for Payment, less the aggregate of previous payments made by the Owner; and upon Substantial Completion of the entire Work, a sum sufficient to increase the total payments to ten percent (10 %) of the Contract Sum, less such amounts as the Architect shall determine for all incomplete Work and unsettled claims as provided in the Contract Documents.

(If not covered elsewhere in the Contract Documents, here insert any provision for limiting or reducing the amount retained after the Work reaches a certain stage of completion.)

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate entered below, or in the absence thereof, at the legal rate prevailing at the place of the Project.
(Here insert any rate of interest agreed upon.)

1.5% per month

Usury laws and requirements under the Federal Truth in Lending Act, similar state and local consumer credit laws and other regulations at the Owner's and Contractor's principal places of business, the location of the Project and elsewhere may affect the validity of this provision. Specific legal advice should be obtained with respect to deletion, modification, or other requirements such as written disclosures or waivers.)

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ARTICLE 6

FINAL PAYMENT

Final payment, constituting the entire unpaid balance of the Contract Sum, shall be paid by the Owner to the Contractor when the Work has been completed, the Contract fully performed, and a final Certificate for Payment has been issued by the Architect.

ARTICLE 7

MISCELLANEOUS PROVISIONS

7.1 Terms used in this Agreement which are defined in the Conditions of the Contract shall h .. meanings designated in those Conditions.

7.2 The Contract Documents, which constitute the entire agreement between the Owner and the Contractor, are listed in Article 1 and, except for Modifications issued after execution of this Agreement, are enumerated as follows:
(List below the Agreement, the Conditions of the Contract (General, Supplementary, and other Conditions), the Drawings, the Specifications, and any Addenda and accepted alternates, showing page or sheet numbers in all cases and dates where applicable.)

North Four Hills Subdivision (prepared by Resource Technology. Inc.)

City of Albuquerque Interim Standard Specifications for Public Works Construction, Latest Edition

A.I.A. Document A201 - General Conditions

This Agreement entered into as of the day and year first written above.

OWNER	CONTRACTOR
M.R. JAFARI	
President	MJB Construction
Cintel Corp.	

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[PROCEDURE "A"]

AGREEMENT FOR THE CONSTRUCTION OF PUBLIC IMPROVEMENTS

THIS AGREEMENT made this 22nd day of June, 1987, by and between the City of Albuquerque, New Mexico (hereinafter referred to as the "City") and Cintel Corporation (hereinafter referred to as the "Developer").

WHEREAS, the Developer desires to develop certain lands within the City of Albuquerque, County of Bernalillo, State of New Mexico, described as North Four Hills Subdivision (hereinafter referred to as "Developer's Lands"); and

WHEREAS, Developer proposes to install certain public improvements upon the lands of the City nearby or adjacent to the Developer's lands for the benefit of Developer's Lands; and

WHEREAS, as a prerequisite to granting permission to the Developer to enter onto City lands to construct said improvements the City requires certain assurances from the Developer; and

WHEREAS, the Developer is willing to provide said assurances and is willing to construct the proposed public improvements at no cost to the City;

NOW, THEREFORE, in consideration of the above, the City and the Developer hereby agree as follows:

1. The Developer agrees to install and complete to the satisfaction of the City the following described public improvements, identified as Project No. 2565, on or before the 29th day of September, 1987, at no cost to the City:

(See Attached Contract Documents)

2. The City agrees to issue a Work Permit to Developer or Developer's agent and grant to the Developer permission to enter upon City lands to construct the above-described public improvements upon delivery to the City of the following documents:

(a) Evidence, in a form acceptable to the City, that the Developer has procured or has cause to be procured public liability insurance in the amount of not less than One Million Dollars ($1,000,000.00) combined single limit for accidents or occurrences which cause bodily injury, death, or property damage to any member of the public resulting from any condition of the lands of the subdivision or improvements therein or the construction activities thereon. The insurance policy must name the City of Albuquerque, its employees, and elected officials, as their interest may appear, as additional insureds. The

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(1966E)

Developer shall maintain such insurance until acceptance of the improvements by the City. Any cancellation provision must provide that if the policy is cancelled prior to the expiration date hereof, materially changed, or not renewed, the issuing company will mail 30 days written notice to the City, attention City Engineer. The Developer shall furnish the City Engineer a certificate of said insurance prior to issuance of a Work Order for construction of the improvements;

(b) Evidence, in a form acceptable to the City, that the Developer has furnished or has caused to be furnished a bond or other suitable financial guarantee running to the City which guarantees the completed public improvements against defective materials and workmanship for a period of three (3) years following the date of acceptance by the City; and

(c) Detailed construction plans, in a form acceptable to the City, which clearly delineates the scope and extent of work to be performed by the Developer.

(d) A copy of a fully executed, legally binding contract between Developer and a contractor fully licensed by the State of New Mexico to construct the public improvements described herein.

3. Inspection, surveying and testing of the public improvements described herein shall be undertaken in accordance with the agreement of the parties contained in Exhibit A, which is attached hereto and incorporated herein.

4. Prior to issuance of a Work Order by the City, the Developer agrees to comply with all applicable laws, ordinances and regulations, including, but not limited to the City's excavation ordinance and sidewalk ordinance; and to pay all required engineering, staking, testing, design review and related City fees.

5. Upon final completion of the public improvements to the satisfaction of the City, ~~and~~ submittal of acceptable constructed drawings, the City agrees to issue a Certificate of Completion and Acceptance for the improvements and with the exception of the bond or other guarantee against defective materials and workmanship described in Paragraph 2(b) above, the Developer's obligations to the City pursuant to this Agreement shall terminate.

6. Until acceptance of the improvements by the City, the Developer shall be solely responsible for maintaining the premises upon which the public improvements are being constructed in a safe condition. The Developer agrees to defend, indemnify and hold harmless the City and its officers, agents and employees from and against all suits, actions or claims of any character brought because of any injury or damage arising out of the design or construction of the improvements or by reason of any act or omission, or misconduct of the Developer, his agents, employees or the Engineer or Contractor or their agents or employees. The indemnity required hereunder shall not be limited by reason of the specifications of any particular insurance coverage in this Agreement. Nothing herein is intended to impair any right or indemnity under the laws of the State of New Mexico.

**a release of lien in a form acceptable to the City which has been signed by all labor and material contractors and suppliers, and submittal of "M.A.J."

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7. In the event the Developer fails to complete construction of the public improvements within the time limit set forth herein, the Developer understands and agrees that the City may make demand upon the excavation bond posted in accordance with City Ordinance 8-7-3(A)(3) to insure completion of all phases of the work at no cost to the City. Should the costs of completing the public improvements exceed the amount of the excavation bond, the City reserves the right to proceed against the Developer for the balance of completion costs and any other damages incurred by the City as a result of Developer's failure to perform according to the terms of this Agreement.

Executed on the date first written above.

Attest:

n/a
City Clerk

CITY OF ALBUQUERQUE

By: [signature] 6-23-87
Chief Administrative Officer

DEVELOPER:

By: M.R. JAFARI
Its: President

RECOMMENDED:

[signature]
Walter H. Nickerson, Jr., City Engineer,
Utility Dev. Div., Engineering Group/PWD

Reviewed as to Form Only:

[signature]
Assistant City Attorney

[signature] 6/19
City Attorney

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

The foregoing instrument was acknowledged before me on this 6 day of March, 1987, by M. R. Jafari (Name), President (Title), of Cintel Corp. (Name of Company).

[signature]
Notary Public

My Commission Expires:
9/30/90

OFFICIAL SEAL
BARBARA GOODWIN
NOTARY PUBLIC-NEW MEXICO
Notary Bond Filed with Secretary of State
My Commission Expires 9/30/90

Rev. 10/85

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

The foregoing instrument was acknowledged before me on this 22nd day of June, 19 87 by Gene Romo, Chief Administrative Officer of the City of Albuquerque, a municipal corporation on behalf of said corporation.

Priscilla Phillips
Notary Public

My Commission Expires:

3-17-90

EXHIBIT "A"
TO AGREEMENT FOR THE CONSTRUCTION OF PUBLIC IMPROVEMENTS
EXECUTED BETWEEN Cintel Corp. (DEVELOPER)
AND THE CITY OF ALBUQUERQUE (CITY)
ON THE 12th DAY OF June, 1987.

1. CONSTRUCTION INSPECTION METHODS

Inspection of the public improvements construction shall be performed by Mark Goodwin, P.E., a New Mexico Registered Professional Engineer, in accordance with all applicable laws, ordinances and regulations. If said inspection is performed by an entity other than the City, the City may monitor said inspection and the Developer shall ensure that the inspecting entity provides all inspection results, reports and related data to the City as required for review. The City retains the right to perform its own general overall inspection of the construction project at any time prior to final acceptance of the improvements if deemed necessary or advisable by the City Engineer. For any inspections performed by the City, the Developer shall pay to the City a reasonable fee therefor.

2. CONSTRUCTION SURVEYING

Construction surveying for the public improvements construction shall be performed by Mark Goodwin & Assoc. in accordance with all applicable laws, ordinances and regulations. If said construction surveying is performed by an entity other than the City, the City may monitor said construction surveying and th. Developer shall ensure that the construction surveying entity provides all construction surveying field notes, plats, reports and related data to the City as required for review. If any construction surveying is performed by the City, the Developer shall pay to the City a reasonable fee therefor.

3. FIELD TESTING

Field testing of the public improvements construction shall be performed by Western Technologies, Inc., a certified testing laboratory under the supervision of a New Mexico Registered Professional Engineer, in accordance with the technical standards contained in the applicable contract documents and all applicable laws, ordinances and regulations. If any field testing is performed by an entity other than the City, the City may monitor said field testing and the Developer shall ensure that the field testing entity provides all field testing results, reports and related data to the City as required for review. If any field testing is performed by the City, the Developer shall pay to the City a reasonable fee therefor.

4. RECORD TESTING

Notwithstanding the provisions of Paragraph 3 above, the City retains the right to perform any and all record testing which may be deemed necessary or advisable by the City Engineer and the Developer shall pay to City a reasonable fee therefor.

D. Mark Goodwin & Associates, P.A.
Consulting Engineers
P.O. BOX 21307, ALBUQUERQUE, NM 87154
(505) 265-0905

August 21, 1989

Mr. Philip Fischer
Public Works Department
CITY OF ALBUQUERQUE
PO Box 1293
Albuquerque, NM 87103

Re: North Four Hills Subdivision; Project No. 2565

Dear Mr. Fischer:

This letter is to certify that representatives of D. Mark Goodwin and Associates made site visits and observations at the referenced project on 357 occasions. Of these occasions, no work was occurring on 51 different days. These days were noted in the daily reports which should be on file at the City.

We appreciate your efforts concerning this project, and if we may be of any help, please let us know.

Sincerely,

D. MARK GOODWIN AND ASSOCIATES, P.A.

Mark Goodwin, P.E.

DMG/mbs

CERTIFICATE OF SUBSTANTIAL COMPLIANCE

I, D. Mark Goodwin, P.E. of the firm of D. MARK GOODWIN AND ASSOCIATES, P.A. a Registered Professional Engineer in the State of New Mexico, and Project Engineer for the construction of the following facilities:

North Four Hills Subdivision, Subdivision Improvements

Project No: 2565 Sheets 1 - 22, 22A

Including:

X Storm Drainage

X Sanitary Sewer

X Water

X Curb and Gutter

X Paving

as constructed by MJB Construction Company of Albuquerque, NM under contract to CINTEL CORP. of Albuquerque, NM

The Developer; do hereby certify that the facilities noted above have been inspected by me or under my direct superivision and have been constructed in substantial compliance with the City of Albuquerque Public Works Contract No. 2565 contract documents and the construction drawings noted above to the best of my knowledge and belief.

Respectfully Submitted,

Mark Goodwin 8/15/89.
Signature Date

Attachments:

X NOTE: All applicable reports were submitted previously to the City Project Manager

X Potability Tests
X Test Reports
X As Built Drawings
X Inspection Reports
X Final Estimate
__ Manhole Data Sheets
X Valve Data Sheets

D. MARK GOODWIN NEW MEXICO 8948 REGISTERED PROFESSIONAL ENGINEER

Work Order Date: June 22, 1987 Start 6/1/87
FINAL INSPECTION DATE: July 25, 1989 Complete 8-14-89

INP 1175

dmg D. Mark Goodwin & Associates, P.A.
Consulting Engineers
P.O. BOX 21307, ALBUQUERQUE, NM 87154
(505) 265-0905

August 21, 1989

Mr. Philip Fischer
Public Works Department
CITY OF ALBUQUERQUE
PO Box 1293
Albuquerque, NM 87103

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We appreciate your efforts concerning this project, and if we may be of any help, please let us know.

Sincerely,

D. MARK GOODWIN AND ASSOCIATES, P.A.

Mark Goodwin

Mark Goodwin, P.E.

DMG/mbs

DRAINAGE REPORT
for
FOUR HILLS NORTH, TRACT A
TOWN AND COUNTRY VILLAGE
ALBUQUERQUE, NEW MEXICO

prepared for
Morteza Jafari and Cyrus Varan
10800 Menaul Blvd. NE
Albuquerque, New Mexico 87112

by
RESOURCE TECHNOLOGY, INCORPORATED
7800 Marble Avenue NE, Suite 5
Albuquerque, New Mexico 87110

10 August 1982
first revision September 1, 1982
second revision October 10, 1984

Elvidio V. Diniz
P.E. Number 7111

PURPOSE

This report presents an analysis of existing and conceptual drainage conditions for North Four Hills, a subdivision comprised of 42 individual lots and 10 commercial and townhouse tracts. This subdivision was surveyed and platted originally by Douglas H. Smith, 3228 Vassar N.E., Albuquerque, N.M. (884-1626). The latest plat, a copy of which is also attached, was prepared by Dennis D. Lynn, Route 3, Box 860, Los Lunas, N.M. (869-3548). This report substantially revises an earlier report dated September 1, 1982 which presented a conceptual drainage plan and the proposed street grading plan.

All survey information, a legal description, and related easements and rights-of-way pertaining to this site are provided on the attached copy of the latest plat revision (2 sheets) prepared by Mr. D. Lynn as previously noted. As a result of the change in drainage easements, a revised plat may be developed after approval of the drainage plan.

This report was prepared in accordance with criteria provided in the Development Process Manual and consultations with City Engineering staff.

SITE LOCATION AND DESCRIPTION

As shown on the location map (Figure 1) the 66.45 acre site lies to the south of Interstate Highway 40 and approximately 1,000 feet east of Four Hills Road. It is bounded on the north by the IH-40 Frontage Road and on the south by Tijeras Arroyo.

The site is very hilly with a major arroyo longitudinally crossing the eastern half of the site. This arroyo lies in a valley approximately 30 feet deep and 20 feet wide at the bottom. The western half of the site is dissected by several small channels which generally flow west. The soil is predominantly Tesajo-Millet stony sandy loam with Embudo-Tijeras gravelly fine sandy loam in the northern part as shown in Figure 2. These soils are grouped in the SCS A and B Hydrologic Series. Slopes on this site vary from 5% to 40% with approximately half the original area having slopes greater than 30%. After

extensive regrading of the site as a result of street grading and imported fill, only about 20% of the site now has slopes greater than 30%.

There are no existing paved streets, structures, or facilities located on the site. However, all the streets for the subdivision have been rough graded as shown on the Drainage and Grading (D&G) Plan. Also most of the southern half of the subdivision has been graded to provide approximately level sites for homes. This grading was accomplished by placing road excavation materials onto adjacent lots. But additional fill dirt was hauled onto lots 7A, 9, 10, and 11A, Block Two and Tracts C through G to raise and level the existing ground elevations across the lots.

With respect to off-site conditions, there is one abandoned dike across a small arroyo draining off-site area H (Figure 3). This structure extends from the project site to the adjacent property to the east and is expected to be removed in the future because it is not maintained and severely eroded. Therefore, ponding elevation information and runoff storage was not determined for this structure.

On the north side of the site, several culverts convey flows onto the site from IH-40 and areas north of the highway. These culverts are identified by size and location on Figure 3, and computations for these contributory drainage areas are discussed in a later section of this report. The frontage road along the north side of the site is not curbed, consequently, no curb or flow line elevations are available.

There are no retaining walls, garden walls, etc. or public right-of-way on the site at present.

FLOOD PLAIN EASEMENTS

The southern edge of the site lies within the 100-year flood plain of Tijeras Arroyo. The limits of this flood plain as developed in the Master Drainage Plan for Tijeras Arroyo, (Bovay Engineers, Inc., 1981), is shown on the Drainage and Grading (D&G) Plan.

The southern edges of lots 7A, 9, 10, and 11A, in Block Two, originally extended 0 to 20 feet into the 100-year flood plain of Tijeras Arroyo. As a result of lot levelling and filling, these encroachments have been reduced such that only small portions of lots 9 and 11A still remain within the floodplain. This flood plain area is an embayment caused by a flow restriction approximately 150 feet downstream where the floodplain width is reduced from 250 feet to 140 feet. The water surface elevations in the embayment are controlled by backwater effects at the constriction; therefore, the fill area will probably not affect the flow elevations of Tijeras Arroyo at this location.

The 100-year flood plain of the major arroyo on this site is also shown on the D&G Plan. These flood plain limits were determined by computing uniform flow depths in the arroyo at representative cross sections as described in the following paragraphs.

After consultation with engineers designing drainage structures north of IH-40, the 100-year developed condition flow entering Tract A in the major arroyo is approximately 160 cfs. With on-site developed condition flows from Tract A and off site flows D, E, and F, the 100-year developed condition flow in the arroyo on Tract A is conservatively estimated at 185 cfs. South of Pinewood Place NE, after additional on-site flows enter this arroyo, including all of the flow from the other streets in this subdivision, the 100-year developed condition flows will increase to 270 cfs. These flow rates are based on detailed computations as described later in this report.

The depth of flow and flood plain extent for developed conditions along the major arroyo were computed from the 100-year developed condition flows, existing channel slope, and representative cross sections. A relatively high value of Manning's "n" coefficient (0.07) was used in these computations because the 100-year flow depth is less than 2 feet and the channel bottom is extremely congested by woody vegetation species which will not lay down when flow occurs. It is estimated that 60 percent of the flow area of the average cross section would be blocked out by the vegetation. According to Chow's "Open Channel Hydraulics", very high vegetation raises the "n" value by .025 to .05 (pg. 109), and medium to dense brush has an "n" value ranging from .045 to .110, with an average value of 0.07. A copy of a photograph (Figure 4) from the USGS report " Roughness Characteristics of Natural Channels", showing dense vegetation, lists the selected value as 0.07.

Consequently, the flow depth and velocity in the major arroyo are 1.55 feet and 5.8 fps respectively south of Pinewood Place NE, and 1.2 feet and 4.89 fps respectively north of the street.

All lot areas within the 100-year flood plains of the two arroyos are reserved as flood plain easements as shown on the D&G Plan and listed in Table 1. To facilitate descriptions, most of the easements are rectilinear and bearings of all easement boundaries are parallel to the adjacent property boundaries. The exceptions to this rule are the flood plain and drainage easements (No. 13, 14 and 15) on Tract A, Easement # 16 on Tract K, Easement # 4 on Tract G, and Easement # 1 on Tract E which are described along easement centerlines. The flood plain easements are described on Table 1.

OFF-SITE FLOWS

Figure 3 shows the off-site drainage areas with respect to this property. On the north side four culverts carry flows under and off IH-40 and the frontage road. The flow magnitudes and velocities, assuming full flow, are shown on Table 2 using the notation shown on the D&G Plan.

To the east three small areas consisting of 1.32, 4.56, and 5.01 acres in area, flow onto the site. The magnitudes, velocities and depths of flows from each of these areas are also indicated on Table 2 using the notation shown on the D&G Plan. The southernmost off-site drainage area is currently retained by a small earthen dam with no apparent outlet and an excavated spillway - - for this study it was assumed that the dam would be removed in the future, so channel conditions are assumed. Each of these off-site flows will be conveyed to the major arroyos through drainage easements and street flows as shown on the D&G Plan.

ON-SITE FLOWS

On-site watersheds are shown on the D&G Plan. These watershed areas were subdivided into smaller drainage areas within the proposed tract and lot areas for which the undeveloped and developed flow magnitudes and volumes were computed. These computations are summarized in Table 3.

Developed condition flows will be conveyed in earth and concrete lined channels or controlled in detention ponds. All channels will be 3H:1V side slopes, V-shaped and located in 10 to 30 feet wide drainage easements as shown on the D&G Plan. Typical channel cross sections are shown in Figure 5. Computations for these channels are listed in Table 4. Most channels will be excavated in natural rock which lies close to the surface. For high velocity reaches, concrete or rip rap will also be required. Final design slopes will be adjusted for permissible velocities. Rip rap or concrete lining will be required at all channel bends where local velocities exceed 8 fps (or lower velocity limits, if channel conditions so require).

The proposed treatment of on-site flows are discussed for each tract as follows:

Tract A - The major arroyo will be retained in its existing channel, within a 50 foot wide flood plain and drainage easement. Flows from off site drainage areas E and F are conveyed to this arroyo through earth channels. Flow from off site area D presently discharges into a natural earth channel immediately north of the tract boundary, and flows east to the major arroyo on the property; therefore, the existing channel turns a right angle at this location. Rip rap will be placed on the banks of the channel to protect from erosion; size of rip rap and method of placement will be submitted with the drainage report for this individual tract.

Tract B - Three watersheds lie in this tract. Flows to the east will proceed overland to the street; flows to the northwest will be conveyed in an earth channel (#10) to the west street (Rosewood Place NE); and flows to the southwest will flow south in an earth channel (#12) to the street.

Tract C - Three watersheds drain from this tract. Flows to the north will be intercepted by the earth channel (#10) for Tract B, and conveyed to the street; flows to the west and south will flow directly to the street.

Tract D - Flows from the west side of this tract will flow directly to the street on the west. Because this street is to be constructed on fill, the low area east of the street, on Tracts D and C will be filled, in order to provide positive drainage from this tract to the street. The extent of the fill area and new contours are shown on the D&G Plan. Flows from the east side of this tract will be conveyed to the east street through an earth channel (#11). Off site flow B will be conveyed west in an earth channel along the south side of the frontage road and discharged onto Rosewood Place NE. Off site flow C will be conveyed east in an earth channel along the south side of the frontage road and discharged onto Cherrywood Place NE. These two off site flows can be turned at right angles to the present direction of flow using the hydraulic principles for side channel spillways, except on a much smaller scale. A preliminary schematic of the proposed structure is shown in Figure 6.

Tract E - Two watersheds drain this tract. The eastern watershed will flow into detention pond P-A on Tracts E and F. Flows from the western watershed will be diverted south along the property line in an earth channel (#2) to detention pond P-A on Tract F. Off site flow A will be allowed to proceed unaffected across the northwest corner of this tract. A 10 foot easement (#1) is provided for this purpose.

Tract F - Three watersheds cover this tract. Flows in the northern watershed will be controlled in detention pond P-A. This pond will also hold runoff from Tract E. Flows in the central watershed will be detained in pond P-B, and flows from the southern watershed will flow through an earth and concrete channel (#4) to detention pond P-C on Tract G. Characteristics of these detention ponds are provided in Table 5.

Tract G - This entire tract is within a single watershed and all flows will be controlled in detention pond P-C. Characteristics of detention pond P-C are provided in Table 5.

Tract H - The entire tract will drain to the major (park and drainage) arroyo crossing the property and adjacent to this tract on the east side. A channel cut, approximately 30 feet long, will be required in a 4-6 foot high ridge on the southeast corner of the tract, if the site is developed as is. However, it is expected that site development will result in the low areas on the tract being filled in, and consequently, surface drainage directly to the major arroyo will be feasible. These site specific details will be submitted with the drainage report for this individual tract.

Tract J - The entire tract will drain to the arroyo crossing the property. A 10 to 40 foot flood plain and drainage easement is provided along the western side of this property to accomodate the present alignment of the arroyo, discharges from the proposed culvert under Pinewood Place SE, and street runoff from Cherrywood Place SE and Pinewood Place SE.

Tract K - Most of this tract will drain onto Pinewood Place SE. Off site flow G will be conveyed in an earth channel, # 16, and discharged onto Pinewood Place SE. This channel will be constructed on fill in order to allow discharge onto the street. The southeast corner of Tract K will be drained through an earth channel, # 22, along the eastern property line.

Blocks One and Two - All of the lots in these blocks will drain into the arroyo, the streets or into earth or concrete channels, as specified in Tables 3 and 4, for eventual discharge to the streets or to Tijeras Arroyo. Flows that collect at the south ends of Rosewood Place SE and Pinewood Place SE will be conveyed to Tijeras Arroyo in storm sewers which will be installed in sewer and drainage right-of-ways and a drainage easement along lot lines as shown on the D&G Plan.

Major Arroyo Crossing - Flows in the major arroyo on the site, will be carried under Pinewood Place SE in a 42-inch diameter reinforced concrete pipe culvert. The feasibility of this crossing and appropriate hydraulic parameters are shown in Figure 7. The entrance to this

culvert will be a concrete chute inlet with 9H:1V slope and fixed wingwalls, as shown in Figure 8. This culvert will discharge into a concrete channel which terminates in a stilling basin with rip rap at the downstream end to reduce the velocities of flows discharged to the existing channel. The concrete rundown from Cherrywood Place SE will join this channel at the stilling basin. This concept is described in Figures 9 and 10.

STREET FLOWS

Discharge onto streets occurs from Tracts B, C, D, and K, and several lots in Blocks One and Two. Computed street flows are presented in Table 6. As shown on the D&G Plan, extensive cut and fill was required for street construction. Wherever possible, slopes will be graded to 3H:1V and adequately protected from erosion as discussed in the Slope Stability Section of this report. Where slopes greater than 3H:1V are required along the streets, as shown on the D&G Plan, concrete or rip rap lining or other erosion control and slope stabilizing means will be provided. All property line elevations along the street right-of-way will be at least one foot above the street flow line elevation. Where drainage crosses private streets, a concrete dip section, at 10H:1V side slope (Figure 11), will be provided.

DETENTION PONDS

Three temporary detention ponds are proposed on Tracts E, F and G. Details on these ponds are presented in Table 5. Because these ponds will be deeper than 18 inches, fences will be constructed around the ponds and landscaping will be provided if the individual tracts (in which they are located) are developed. Otherwise, final development drainage plans will consider the acquisition of drainage easements to Tijeras Arroyo. Maintenance provisions and commitments will be submitted with the drainage reports for the individual tracts.

DRAINAGE EASEMENTS

All drainage easements are 10 to 30 feet wide, as shown in the D&G Plan and listed in Table 4. In general easements follow tract or lot boundaries and would be divided equally between adjacent tracts or lots except along the

property boundaries where they would lie wholly within the tract or lot. Where lot boundary bearings and easement bearings do not coincide, the bearings of the easement lines are indicated on the D&G Plan.

Easement lengths and hydraulic data for the channels in each easement are provided in Table 4. All building slab elevations on the site will be at least one foot above the elevation of the 100-year flow in these channels. Retaining walls will be constructed when the vertical grade change for this requirement will be greater than 18 inches.

CONSTRUCTION EASEMENTS

Temporary construction easements 250 feet wide and centered on the public street centerlines will be provided for construction of all public streets and drainage facilities.

SLOPE STABILITY

All cut and fill slopes will be on a 3H:1V slope wherever possible. Adequate erosion protection as specified in NMSHD Specifications, Sections 2.11 and 2.12, will be provided in all disturbed areas. Where steeper slopes are required concrete or rip rap lining or other means of erosion control will be provided.

Because this drainage plan is conceptual, no detailed cross sections and spot elevations are provided at this time.

TABLE 1

FLOOD PLAIN EASEMENT PARAMETERS

Easement ID	Tract or Block	Lot No.	Width (ft)	Length (ft)
A	A	---	50	630
B1	J	---	30	200
B2	J	---	10	100
C	J	---	40	200
D	2	1	10	90
F	2	3	10	102
G	2	4	10	55
H	2	5A and 6A	30	40
J	2	9	20	75
L	2	11A	20	250
L1	2	11A and 12A	40	75
M	1	13 and 14	10	120

Note: Bearings for all easements are as noted or parallel to adjacent property lines.

TABLE 2

OFF SITE FLOW DETERMINATIONS

Area ID	Contrib. Area (ac)	Percent Develop.	Pipe Size	Runoff Coeff.	100-Year Flow Q (cfs)	V (fps)	D (ft)	10-Year Flow Q (cfs)	V (fps)	D (ft)
A	5.74	0	30" RCP	.35	10.93	2.23	----	7.18	1.46	----
B	0.55	95	24" RCP	.97	2.90	0.92	----	1.91	0.61	----
C	2.06	0	24" RCP	.35	3.93	1.25	----	2.58	0.82	----
D	52.91	30	4'x3' C.B.	.53	152.15	12.68	----	100.23	8.35	----
E	5.88	30	36" RCP	.53	16.95	2.40	----	11.14	1.58	----
F	1.32	0	channel	.20	1.44	1.71	0.29	0.95	1.52	0.25
G	4.56	0	channel	.20	4.96	3.10	0.80	3.26	2.82	0.68
H	5.01	0	channel	.20	5.45	1.79	0.45	3.58	1.57	0.39

Note: channel "n" value = 0.07; slope from topo map;
100-year rainfall intensity = 5.44 in/hr from DPM pg. 22.2.13
10-year rainfall intensity = 3.57 in/hr

TABLE 3

ON SITE FLOW DETERMINATIONS

Area ID	Contrib. Area (ac)	Undeveloped(100-yr) C	Q (cfs)	Vol. (ft^3)	Developed(100-yr) C	Q (cfs)	Vol. (ft^3)	Undev.(10-yr) Q (cfs)	Vol. (ft^3)	Dev. (10-yr) Q (cfs)	Vol. (ft^3)
I	3.03	.35	5.73	10,559	.89	14.56	22,438	3.76	1,320	9.57	11,879
J1	0.40	.20	0.43	697	.69	1.49	1,742	0.28	174	0.98	871
J2	1.24	.20	1.34	2,161	.69	4.62	5,401	0.88	532	3.04	2,701
J3	3.44	.20	3.72	5,994	.69	12.82	14,985	2.44	1,499	8.42	7,493
K1	1.78	.20	1.92	3,101	.69	6.63	7,754	1.26	775	4.36	3,877
K2	0.57	.20	0.62	993	.69	2.12	2,483	0.41	248	1.39	1,242
K3	1.81	.20	1.95	3,154	.69	6.74	7,884	1.28	789	4.43	3,942
L1	1.72	.35	3.25	5,994	.89	8.27	12,737	2.14	749	5.43	6,743
L2	4.87	.35	9.20	16,971	.89	23.41	36,063	6.04	2,121	15.38	19,092
M1	0.81	.35	1.53	2,823	.89	3.89	5,998	1.01	353	2.56	3,175
M2	1.57	.35	2.97	5,471	.89	7.55	11,626	1.95	684	4.96	6,155
N1	1.95	.20	2.11	3,398	.69	7.27	8,494	1.39	850	4.78	4,247
N2	1.77	.20	1.91	3,084	.69	6.60	7,710	1.25	771	4.34	3,885
N3	0.37	.20	0.40	645	.69	1.38	1,612	0.26	161	0.91	806
O	3.78	.20	4.08	6,586	.69	14.08	16,466	2.68	1,647	9.25	8,233
P	1.28	.20	1.38	2,230	.69	4.76	5,576	0.90	558	3.13	2,789
Q	1.50	.20	1.62	2,614	.69	5.59	6,534	1.06	654	3.67	3,267
R	2.11	.20	2.28	3,676	.69	7.86	9,191	1.50	919	5.16	4,596

Note: 100-year rainfall intensity = 5.44 in/hr
10-year rainfall intensity = 3.57 in/hr

TABLE 3 (CONTD.)

ON SITE FLOW DETERMINATIONS

Area ID	Contrib. Area (ac)	Undeveloped(100-yr) C	Q (cfs)	Vol. (ft^3)	Developed(100-yr) C	Q (cfs)	Vol. (ft^3)	Undev.(10-yr) Q (cfs)	Vol. (ft^3)	Dev. (10-yr) Q (cfs)	Vol. (ft^3)
S1	0.83	0.2	0.90	1,446	0.43	1.94	3,254	0.59	362	1.27	1,446
S2	0.76	0.2	0.83	1,324	0.43	1.78	2,980	0.55	331	1.17	1,324
S3	0.34	0.2	0.37	592	0.43	0.80	1,333	0.24	148	0.53	592
S4	4.21	0.2	4.58	7,336	0.55	12.64	16,505	3.01	1,834	8.30	7,336
T	23.94	0.3	39.07	55,230	0.69	89.86	94,675	25.67	23,670	59.04	63,117
U1	5.82	0.2	6.33	10,890	0.23	7.32	13,613	4.16	2,723	4.81	4,084
U2	6.85	0.2	7.45	12,685	0.24	9.12	15,856	4.89	3,171	5.99	4,757
U3	7.24	0.2	7.88	13,364	0.24	9.43	16,705	5.18	3,341	6.20	5,012
U4	1.15	0.2	1.25	2,004	0.43	2.69	4,508	0.82	510	1.77	2,004
U5	0.50	0.2	0.54	893	0.43	1.17	1,962	0.36	588	0.77	1,265
U6	2.16	0.2	2.35	3,764	0.43	5.05	8,468	1.54	941	3.32	3,764
U7	1.22	0.2	1.33	2,126	0.84	5.57	7,971	0.87	531	3.66	4,251
U8	0.40	0.2	0.44	697	0.43	0.94	1,568	0.29	174	0.62	697
U9	1.17	0.2	1.27	2,095	0.43	2.73	4,505	0.83	1,374	1.79	2,955

Note: 100-year rainfall intensity = 5.44 in/hr
10-year rainfall intensity = 3.57 in/hr

TABLE 4

DRAINAGE EASEMENT AND CHANNEL PARAMETERS

Easement No.	Contributing Tract or Lot	L	S	100-Year Flow				10-Year Flow			
		(ft)	(ft/ft)	Q (cfs)	V (fps)	d (ft)	F.N.	Q (cfs)	V (fps)	d (ft)	F.N.
1	off site flow	40	.02	10.93	4.11	0.94	--	7.18	3.70	0.80	--
2	E	195	.03	3.89	3.70	0.59	--	2.56	3.33	0.51	--
4	F	180	.08	1.38	4.12	0.35	--	0.92	3.73	0.29	--
5	1, 2, 3 Block 1	320	.03	2.15	3.19	0.47	--	1.41	2.87	0.40	--
6	1, 2, 3, 4 Block 1	200	.13	2.34	5.65	0.37	1.64	1.54	5.09	0.32	1.[illegible]
7	6, 7 Block 1	124	.12	1.78	5.12	0.34	1.55	1.17	4.61	0.29	--
8	9 Block 1	100	.02	0.80	2.14	0.35	--	0.53	1.93	0.30	--
10	B, C	370	.02	8.12	3.82	0.84	--	5.33	3.44	0.72	--
11	D	130	.04	8.27	4.98	0.74	--	5.43	4.48	0.64	--
12	B, C	290	.10*	11.36	14.22	0.52	3.49	7.46	12.80	0.44	3.40
13	A, off site flow	630	.05	185.5	4.89	1.20	0.79	121.87	4.24	0.95	0.77
14	off site flow	90	.12	1.44	4.85	0.31	--	0.95	4.37	0.27	--
15	off site flow	75	.07*	16.95	13.75	0.64	3.03	11.14	12.38	0.55	2.95
16	off site flow	285	.08	4.96	5.68	0.54	1.36	3.25	5.11	0.46	1.33
17	K, A, off site flow	200	.07*	16.91	13.74	0.64	3.03	11.11	12.37	0.55	2.95
19	15, 19 Block 2	120	.01	2.69	2.30	0.18	--	1.96	2.13	0.16	--
20	14, 15, Block 2	150	.12	2.69	5.67	0.40	1.58	1.77	5.11	0.34	1.54
21	14, 15, 13A, 17A, 16A, Block 2	320	.02*	3.37	4.39	0.19	--	2.77	5.01	0.17	--
(22)	(17A, 17B, 18A, K, off site)	380	.04	7.32	4.83	0.71	--	4.81	4.35	0.61	--
(23)	(17A, 17B, 18A, K off site)	205	.15*	9.12	15.67	0.44	4.16	5.99	14.11	0.38	[illegible]
24	14,13A,13B,12B,17A,17B,18 Block 2	215	.03**	13.02	14.49	0.76	2.33	8.55	12.85	0.60	[illegible]
25	8, 9 Block 2	165	.33*	5.57	18.62	0.32	5.84	3.66	16.77	0.27	5.69
27	off site flow	50	.01	3.93	2.46	0.73	--	2.58	2.21	0.62	--
28	off site flow	310	.01	2.90	2.28	0.65	--	1.91	2.05	0.56	--
29	1, 2, 3, 4, Block 1	200	.01	1.96	2.13	0.16	--	1.38	1.95	0.14	--
30	16A, 13A, 17A	195	.05	2.88	4.09	0.47	--	1.84	3.67	0.41	--

Note: * Proposed concrete channel (n = 0.013); all others are earth (n = 0.030).
** Proposed 18" PVC Yelomine Pipe (n = .009).
F.N. is Fronde Number

TABLE 5

DETENTION POND PARAMETERS

Detention Pond Location	P-A Tract F	P-B Tract F	P-C Tract G
Pond			
Inflow Q100 (cfs)	18.71	6.60	14.08
Inflow Volume (ft^3)	26,118	7,710	18,080
Pond Capacity (ft^3)	17,250	4,626	10,850
10-yr W. S. Elevation (ft)	5671.0	5671.3	5647.9
100-yr W. S. Elevation (ft)	5672.2	5648.5	5648.2
Spillway			
Crest Elevation (ft)	5672.2	5672.5	5648.2
Outflow Q (cfs)	3.93	0.83	2.04
Length (ft)	9.5	2.0	5.0
Conduit			
Diameter (in)	4	4	6
Outflow Q5 (cfs)	1.15	1.04	2.44
Dam			
Height (ft)	6.5	4.7	6.8
Side Slopes (H:V)	3:1	3:1	3:1

Note: All dams will have 1.0 ft. freeboard; maximum design flow depth over spillway will be 0.25 ft.

TABLE 6

STREET FLOW PARAMETERS

Street Name	Lane	Width (ft)	Max Capacity (cfs)	Ave Slope (ft/ft)	100 Year Flood Q (cfs)	100 Year Flood V (fps)	100 Year Flood d (ft)	10 Year Flood Q (cfs)	10 Year Flood V (fps)	10 Year Flood d (ft)
ROSE WOOD PL. (N)	E	40	70	.01	53.20	4.8	.78	34.95	4.2	.67
	W		70		5.20	2.5	.35	3.42	2.4	.33
CHERRYWOOD PL.	E	40	70	.06	3.37	4.8	.26	2.21	4.3	.23
	W		70		28.39	7.4	.47	18.65	6.7	.42
PINE WOOD PL. (N)	E	32	56	.01	14.68	3.4	.49	9.64	2.9	.44
	W		56		2.23	2.1	.29	1.47	1.9	.26
PINE WOOD PL. (S)	E	32	56	.07	1.88	4.4	.21	1.24	4.1	.18
	W		56		1.88	4.4	.21	1.24	4.1	.18
ROSE WOOD PL. (S)	E	32	56	.10	2.45	5.4	.22	1.61	5.0	.18
	W		56		10.19	7.1	.32	6.16	6.6	.28

Note: Max. capacity determined from DPM Plates 22.3 D-1 and 22.3 D-2

L-23-Z

SITE

I-40

Central Ave

4 Hills Rd

FIGURE 1
LOCATION MAP

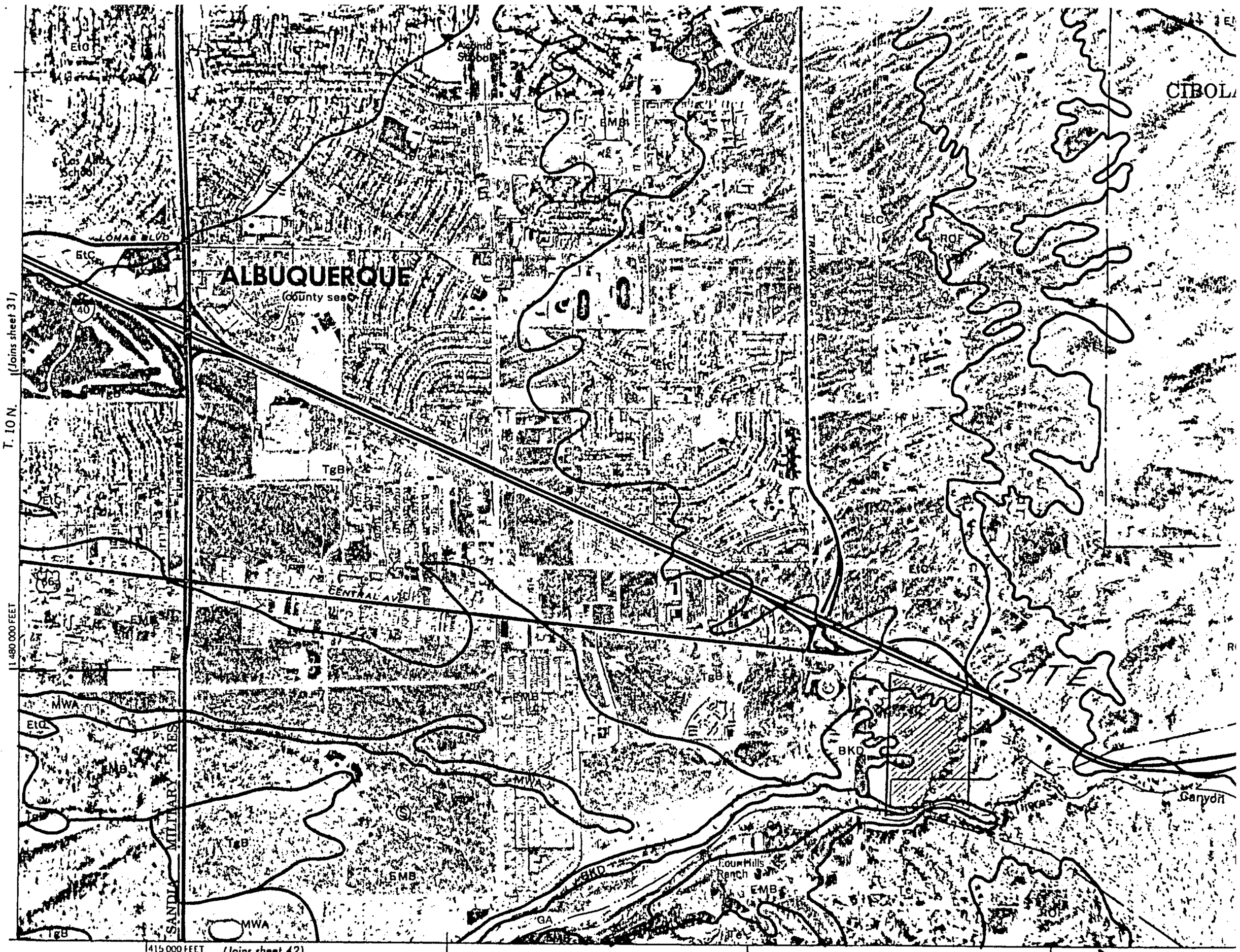
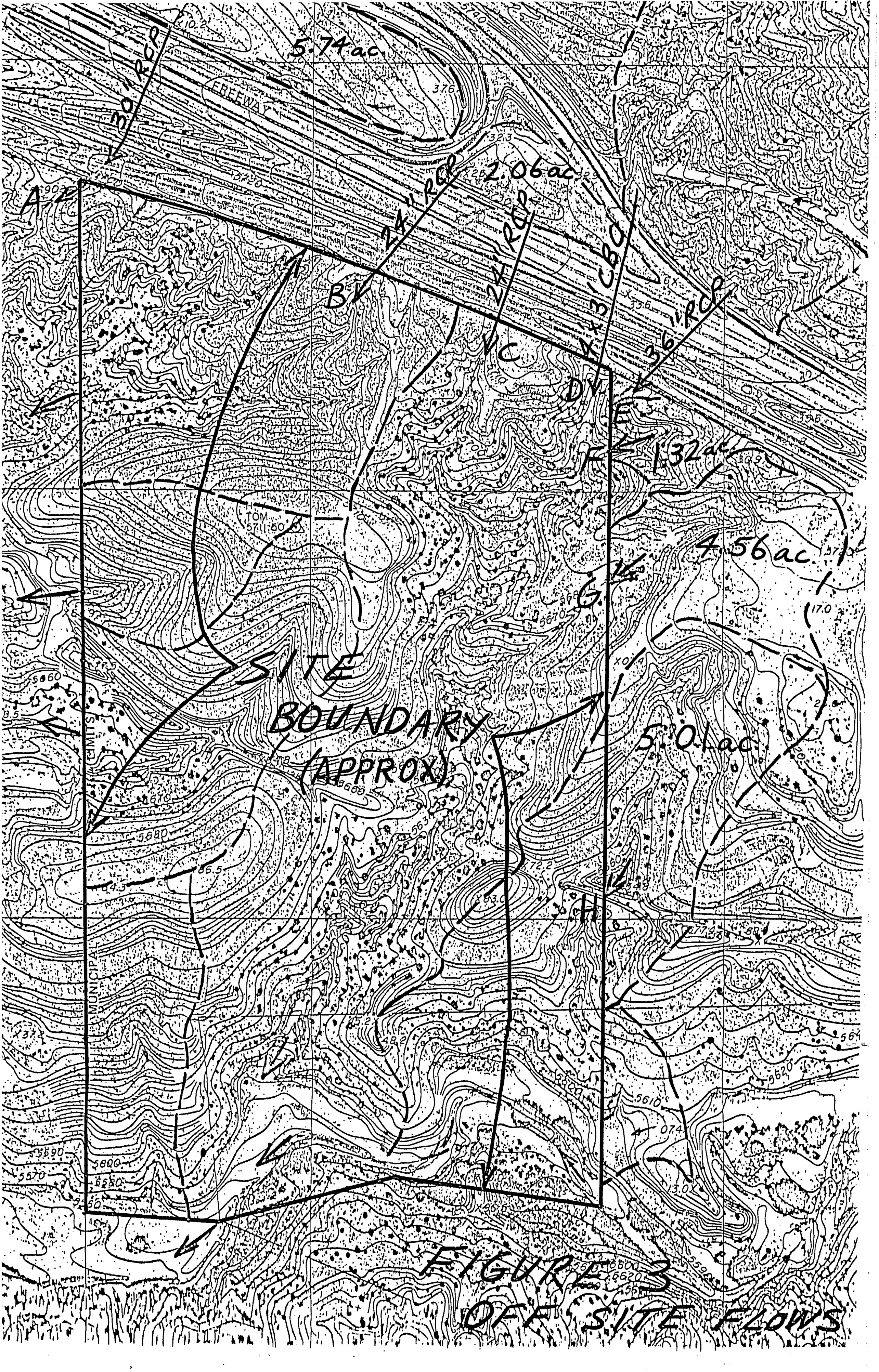


FIGURE 2 - SOILS MAP (ref. SCS)


5.74ac
FREEWAY
2.06ac
3.80ac
1.32ac
4.56ac
5.04ac
A
B
C
D
E
F
G
H
TOM
SITE BOUNDARY (APPROX)
FIGURE 3
OFF SITE FLOWS

No. 452 downstream from above section 1,
Pond Creek near Louisville, Ky.

No. 453 upstream from right bank at section 7,
Pond Creek near Louisville, Ky.

FIGURE 4 - REPRESENTATIVE ROUGHNESS VALUES " from "Roughness Characteristics of Natural Channels", USGS WSP

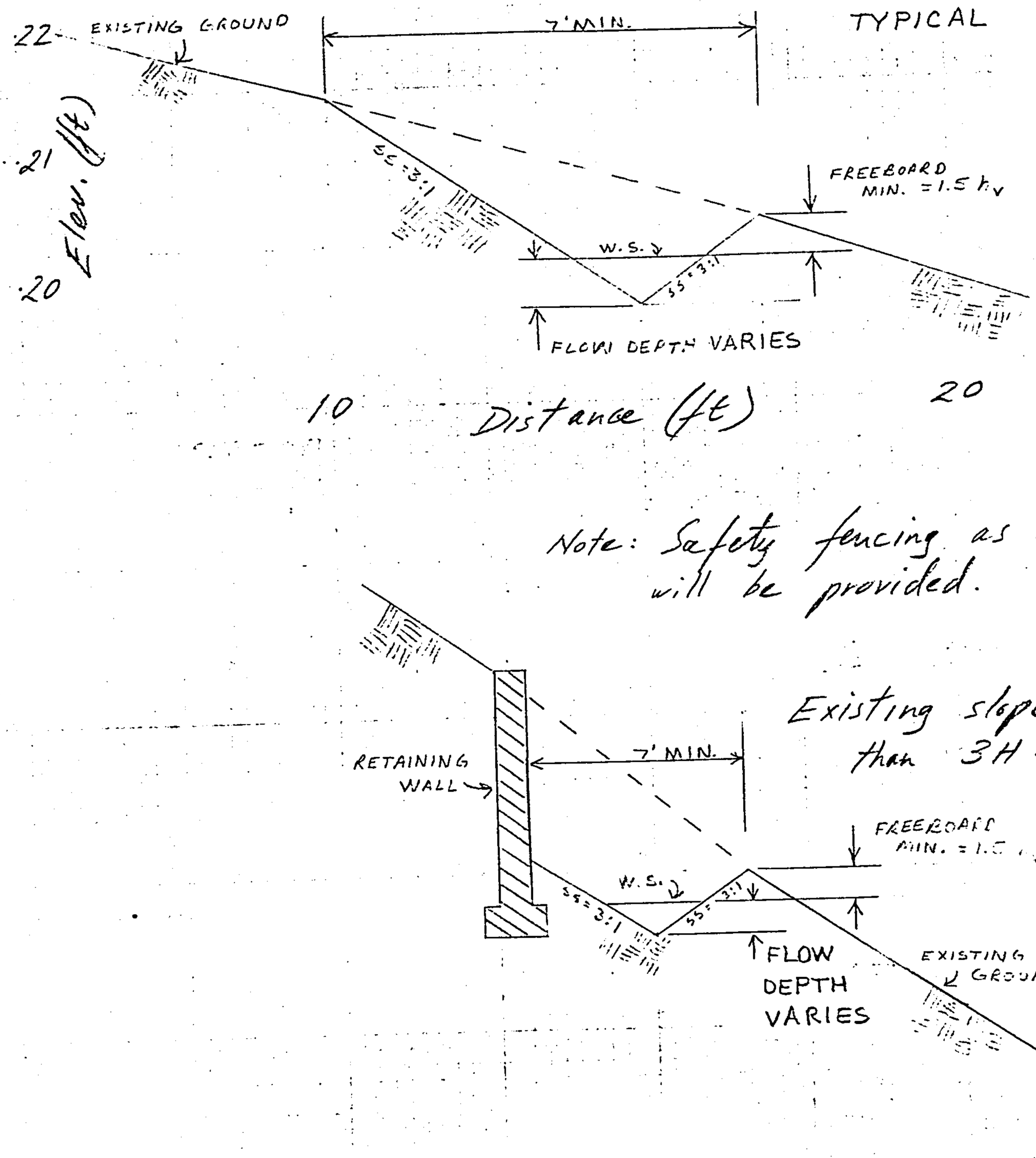
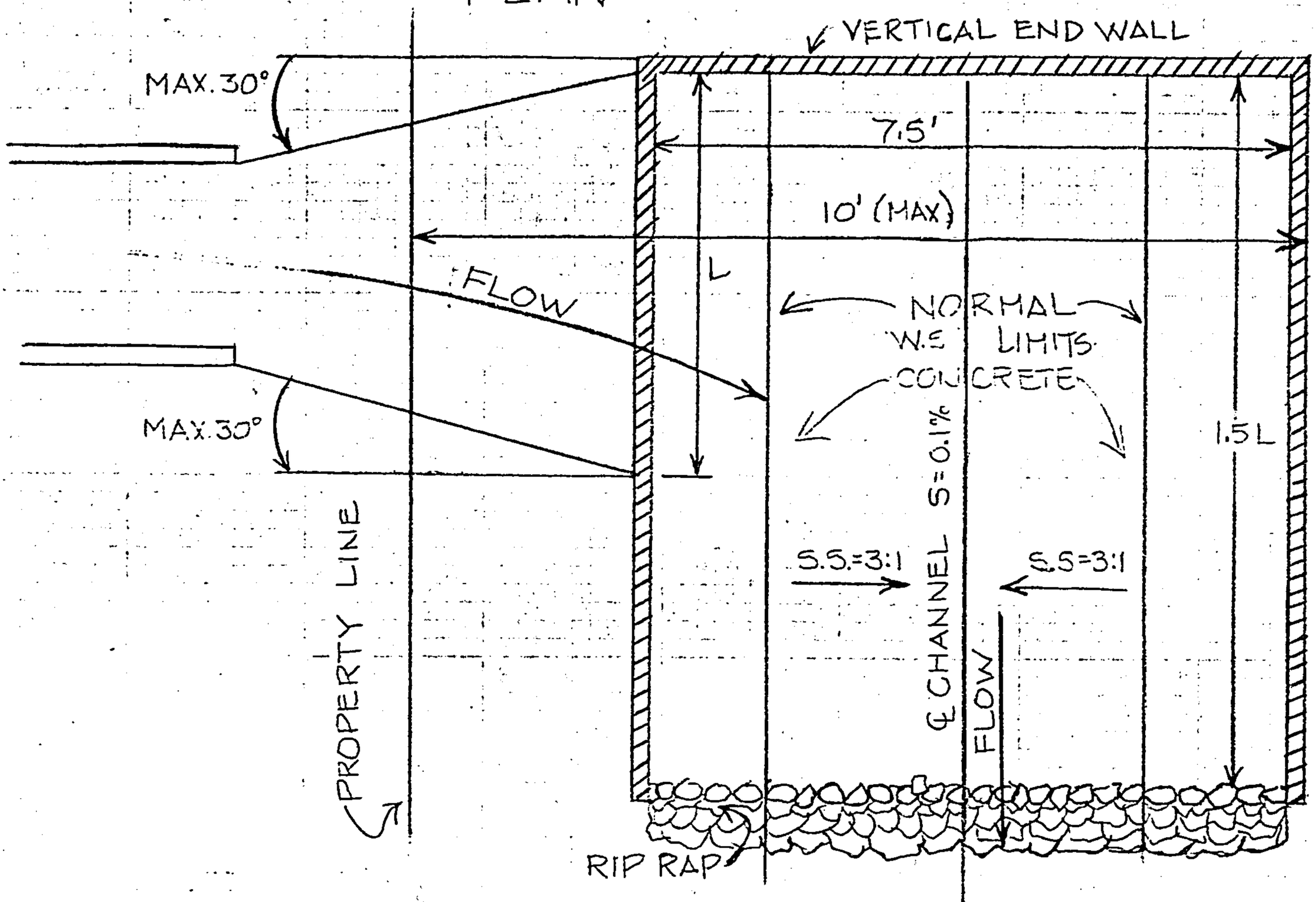


FIGURE 5 -- TYPICAL CROSS SLOPE CHANNELS

PLAN



PROFILE

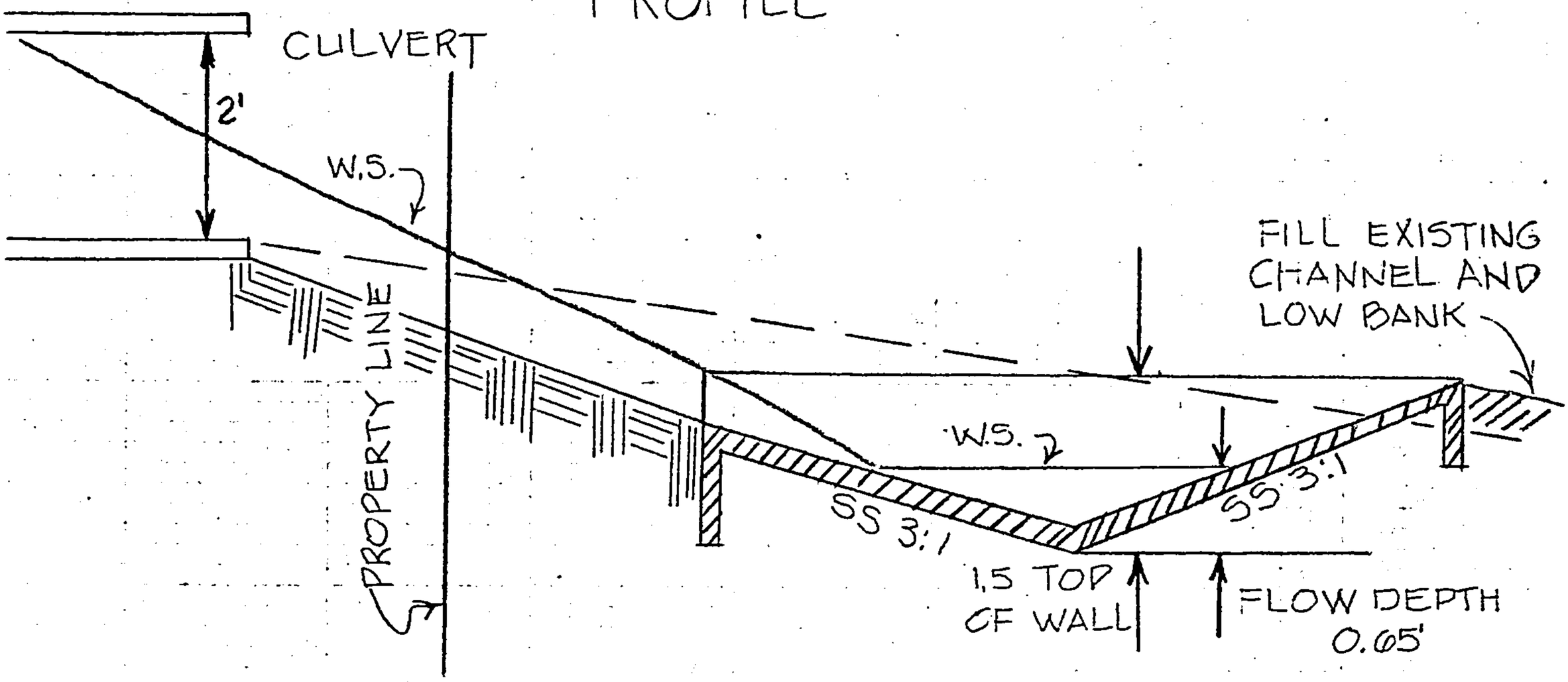


FIGURE 6 – PROPOSED STRUCTURE FOR RIGHT ANGLE TURN FOR OFF SITE FLOW B&C.

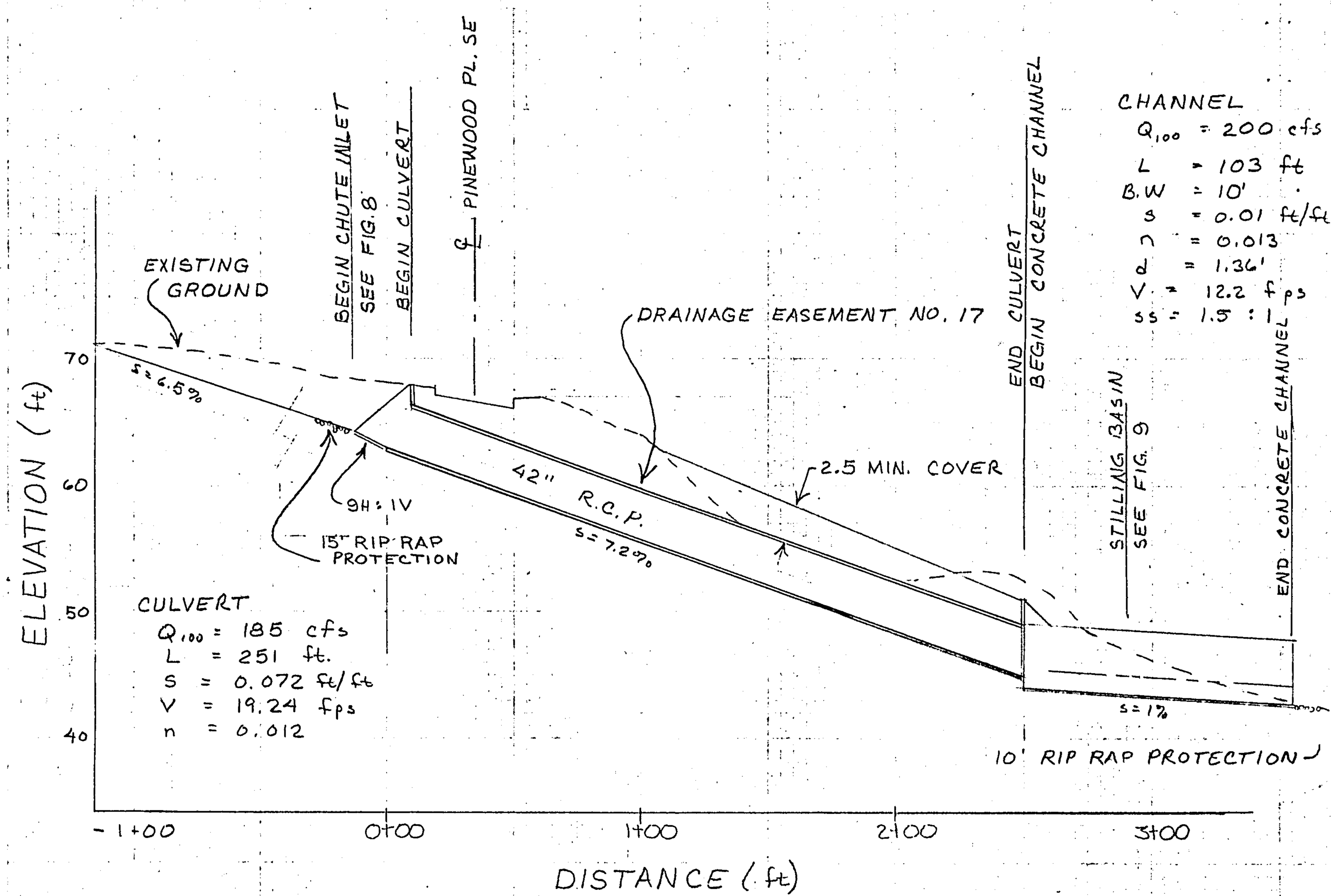
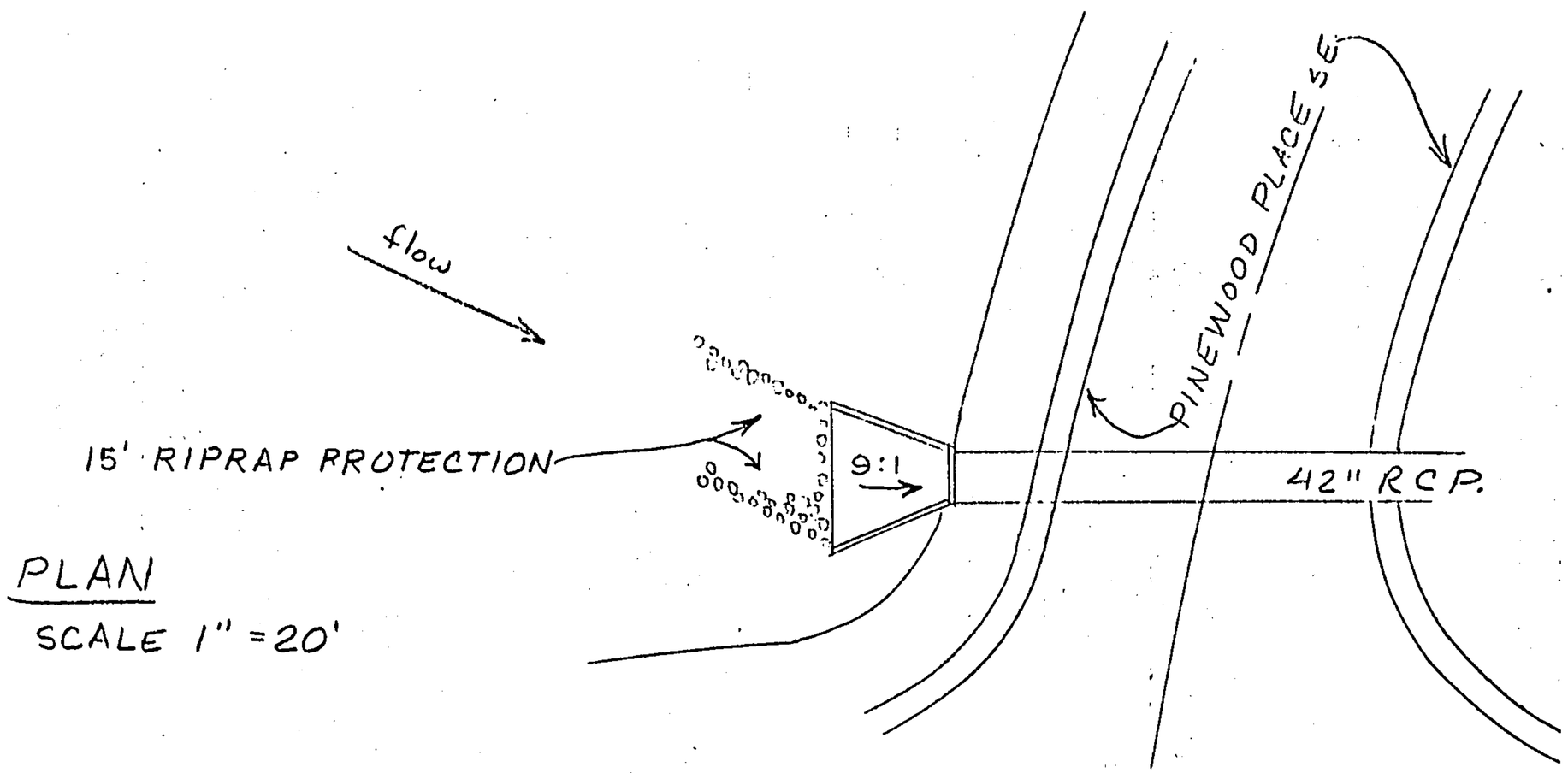
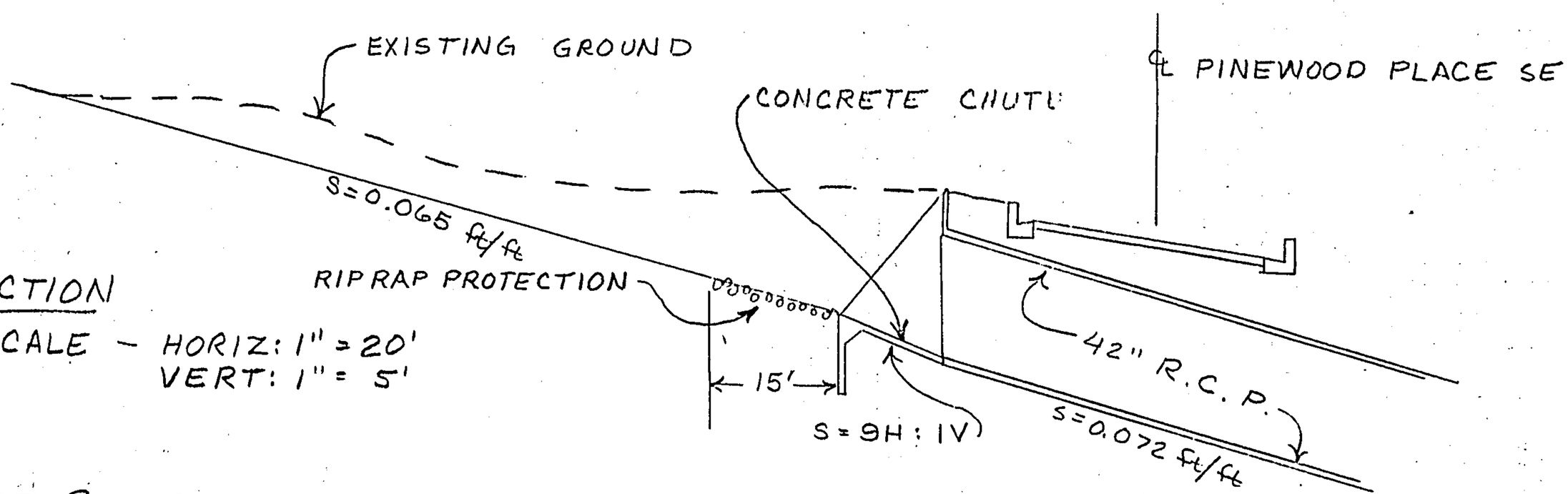


FIG. 7 - CULVERT UNDER PINEWOOD PLACE, SE



PLAN

SCALE 1" = 20'



SECTION

SCALE - HORIZ: 1" = 20'
VERT: 1" = 5'

FIGURE 8 — CHUTE INLET FOR CULVERT UNDER PINEWOOD PLACE S.E.

N

SCALE 1"=20'

CHERRY WOOD PLACE S.E.

GRADE

FLOW

STD. CURB

1% SLOPE

CONCRETE STREET SECTION

40'

STD. CURB

RUNDOWN CURB

42" R.C.P.

E. STILLING BASIN

10' TRANSITION SECTION

16.8% SLOPE

30'

CONCRETE RUNDOWN

TRANSITION TO 6" INVERTED CROWN

FLOW

Note: Safety fencing will be provided as necessary around all structures.

10' RIP RAP PROTECTION

Flow

60'

40'

STD. CURB

GRADE

STORM SEWER

PIPE CONTINUES TO MEET C.B. ON NORTH SIDE OF STREET

M.H.

CATCH BASIN

FIGURE 9 — CONCRETE RUNDOWN FROM CHERRYWOOD PLACE S.E.

RUNDOWN: WITH 6" INVERTED CROWN
Q = 139
S = .168 ft/ft
n = 0.013
Bω = 30'
d = 0.51'
V = 18 fps

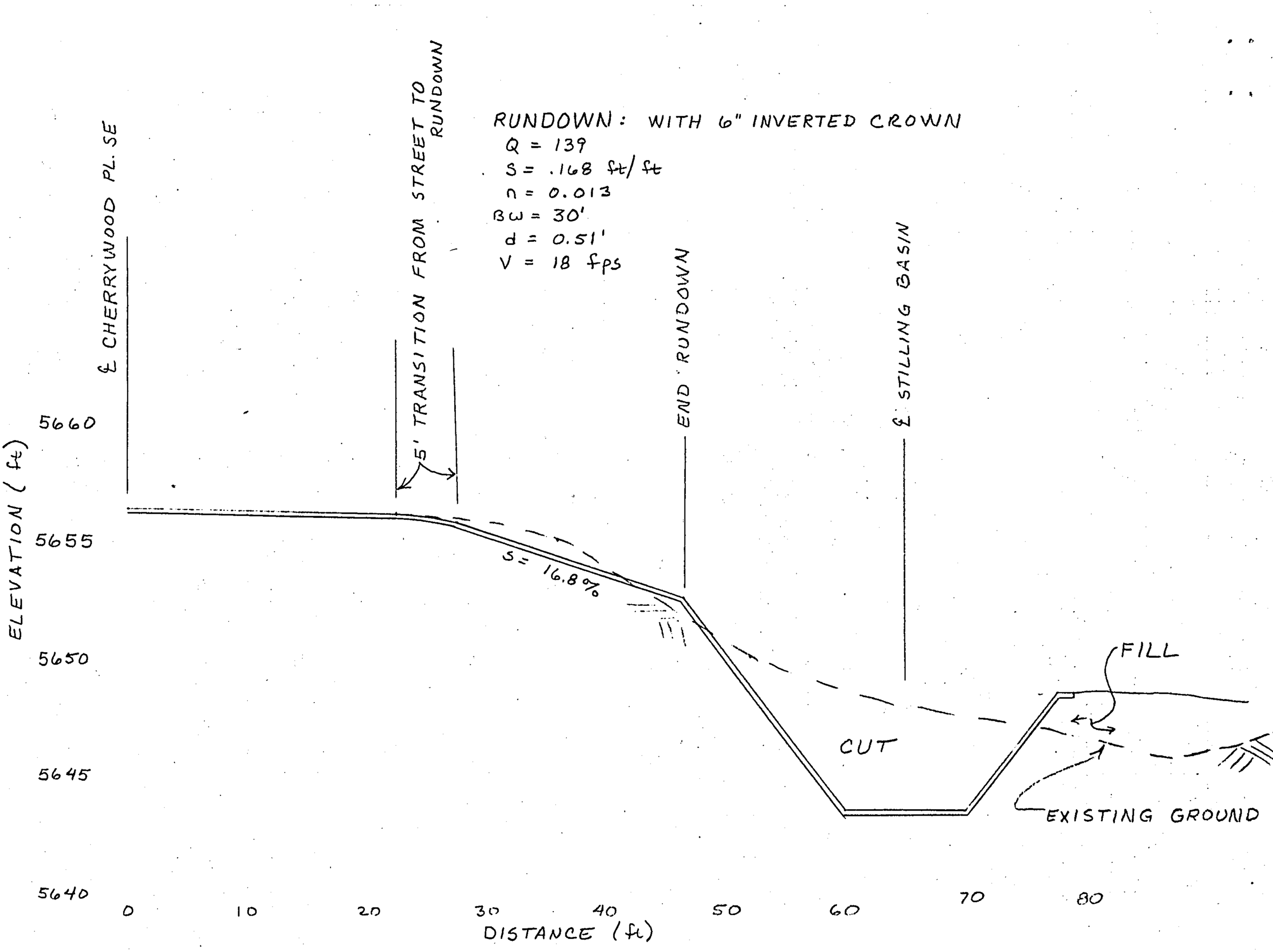


FIGURE 10 - SECTION THROUGH CONCRETE RUNDOWN FROM CHERRYWOOD PL. SE

PROJECT TITLE: North 4 Hills Lot 7A1 ZONE ATLAS/DRNG. FILE #: L-23 / D7c

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

LEGAL DESCRIPTION: LOT 7A1 North 4 HILLS

CITY ADDRESS: _____

ENGINEERING FIRM: Bennett Engineers CONTACT: HAROLD L BENNETT

ADDRESS: 406 San Mateo NE, 87108 PHONE: 266 3038

OWNER: CYRUS VARAN CONTACT: C. Varan

ADDRESS: 2400 Louisiana NE-87110 PHONE: 884-4402

ARCHITECT: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

CONTRACTOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT

___ DRAINAGE PLAN

___ CONCEPTUAL GRADING & DRAINAGE PLAN

X GRADING PLAN

___ EROSION CONTROL PLAN

___ ENGINEER'S CERTIFICATION

___ OTHER

PRE-DESIGN MEETING:

X YES

___ NO

___ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

___ SKETCH PLAT APPROVAL

___ PRELIMINARY PLAT APPROVAL

___ S. DEV. PLAN FOR SUB'D. APPROVAL

X S. DEV. PLAN FOR BLDG. PERMIT APPROVAL

___ SECTOR PLAN APPROVAL

___ FINAL PLAT APPROVAL

___ FOUNDATION PERMIT APPROVAL

X BUILDING PERMIT APPROVAL

___ CERTIFICATE OF OCCUPANCY APPROVAL

___ GRADING PERMIT APPROVAL

___ PAVING PERMIT APPROVAL

___ S.A.D. DRAINAGE REPORT

___ DRAINAGE REQUIREMENTS

___ OTHER _____ (SPECIFY)

RECEIVED
SEP 17 1993
HYDROLOGY DIVISION

DATE SUBMITTED: _____

BY: Harold L Bennett

THE AMERICAN INSTITUTE OF ARCHITECTS

AIA Document A101

Standard Form of Agreement Between Owner and Contractor

where the basis of payment is a

STIPULATED SUM

1977 EDITION

THIS DOCUMENT HAS IMPORTANT LEGAL CONSEQUENCES; CONSULTATION WITH AN ATTORNEY IS ENCOURAGED WITH RESPECT TO ITS COMPLETION OR MODIFICATION

Use only with the 1976 Edition of AIA Document A201, General Conditions of the Contract for Construction.

This document has been approved and endorsed by The Associated General Contractors of America.

AGREEMENT

made as of the 6th day of March in the year of Nineteen Hundred and Eighty Seven

BETWEEN the Owner: Cintel Corporation

and the Contractor: MJB Construction

The Project: North Four Hills Subdivision

The Architect: N/A

The Owner and the Contractor agree as set forth below.

W-07 6" Gate Valves	$380.00		
W-82 Valve Box - Type A	$139.00	21	Ea.