

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

PROJECT TITLE: TVI Courtyard ZONE MAP / DRG. FILE #: K15 / - D16A
DRB #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: A Portion of TV-I Main Campus, City of Albuquerque
CITY ADDRESS: _____

ENGINEERING FIRM: Isaacson & Arfman, P.A. CONTACT: Scott M. McGee
ADDRESS: 128 Monroe St. NE PHONE: 268-8828
CITY, STATE: Albuquerque, NM ZIP CODE: 87108

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

ARCHITECT: Morrow Reardon Wilkinson, LTD CONTACT: Elizabeth Calhoon
ADDRESS: 210 La Veta Dr. NE PHONE: 268-2266
CITY, STATE: Albuquerque, New Mexico ZIP CODE: 87108

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

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

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

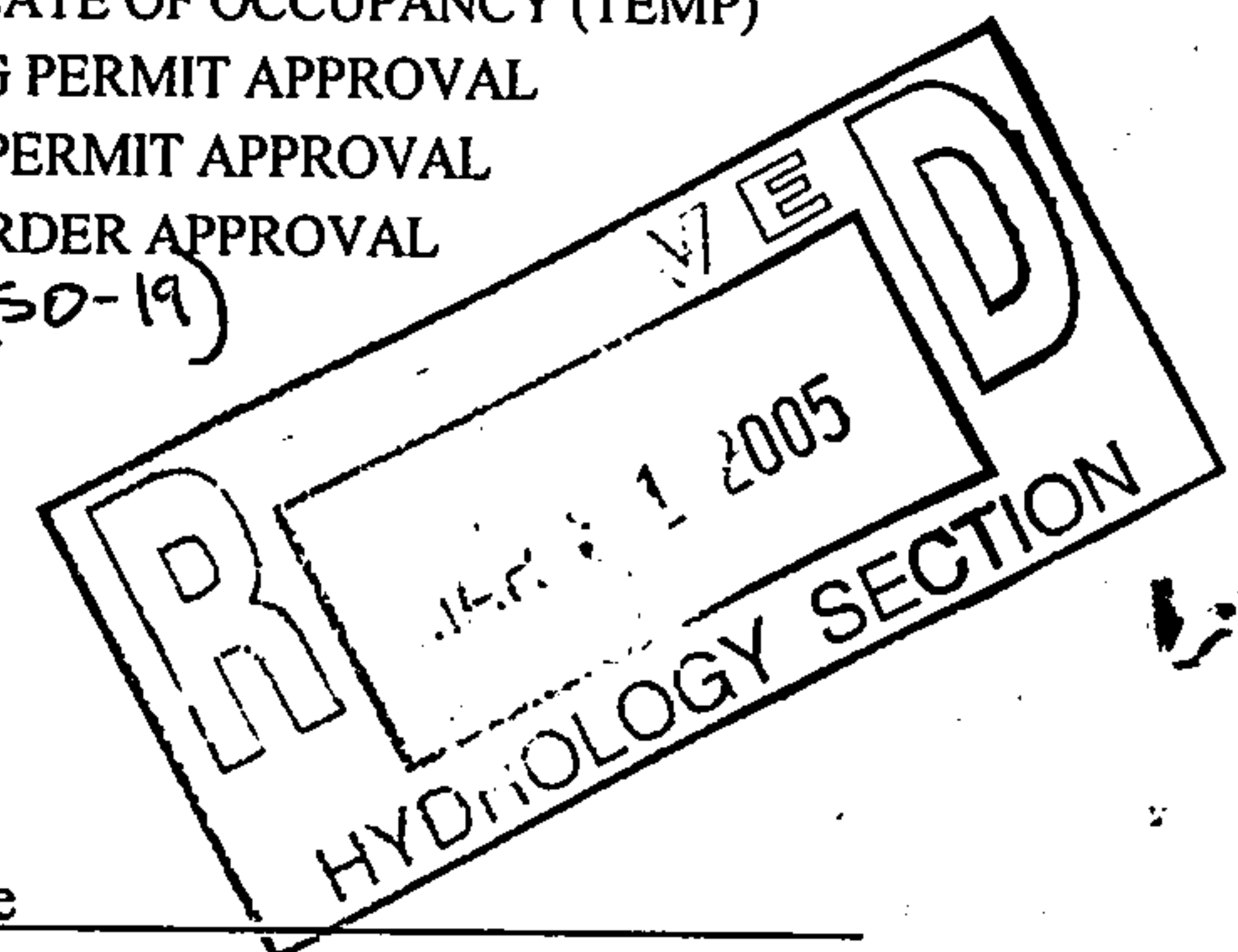
CHECK TYPE OF APPROVAL SOUGHT:
☐ SIA / FINANCIAL GUARANTEE RELEASE
☐ PRELIMINARY PLAT APPROVAL
☐ S. DEV. PLAN FOR SUB'D APPROVAL
☐ S. DEV. PLAN FOR BLDG. PERMIT APPR.
☐ SECTOR PLAN APPROVAL
☐ FINAL PLAT APPROVAL
☐ FOUNDATION PERMIT APPROVAL
☒ BUILDING PERMIT APPROVAL
☐ CERTIFICATE OF OCCUPANCY (PERM)
☐ CERTIFICATE OF OCCUPANCY (TEMP)
☐ GRADING PERMIT APPROVAL
☒ PAVING PERMIT APPROVAL
☐ WORK ORDER APPROVAL
☒ OTHER (SD-19)

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

DATE SUBMITTED: Thursday, March 31, 2005 BY: Scott M. McGee
Isaacson & Arfman, P.A.

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

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





ISAACSON & ARFMAN, P.A.

Consulting Engineering Associates

*Thomas O. Isaacson, PE & LS • Fred C. Arfman, PE
Scott M. McGee, PE*

March 31, 2005

Mr. Phillip J. Lovato, E.I.
Engineering Associate, Planning Department
Development and Building Services

RE: TVI Courtyard (K15-D16A) Revised Drainage and Grading Plan

Dear Mr. Lovato,

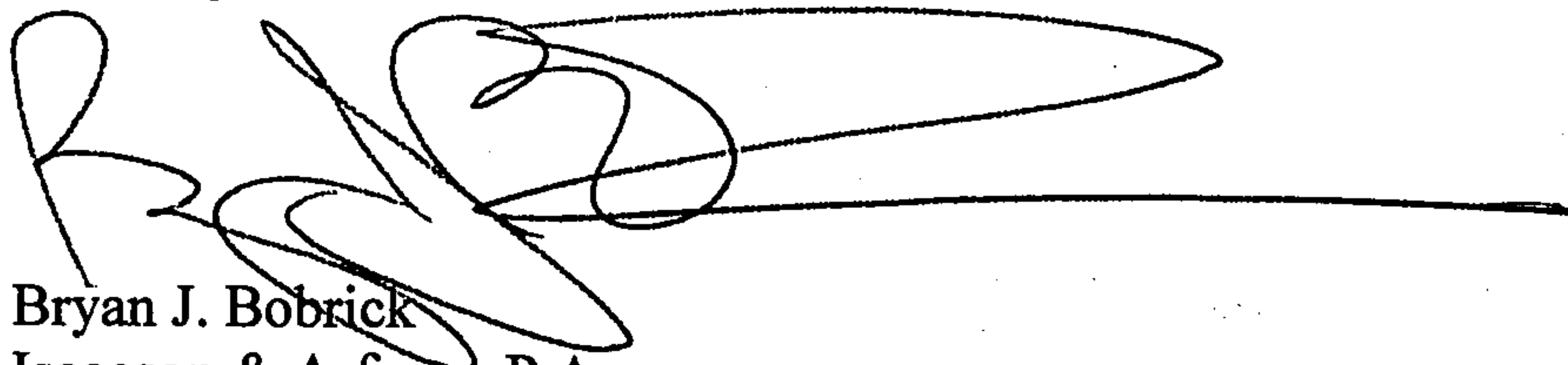
Enclosed with this letter are two copies of the revised TV-I Courtyard Drainage and Grading Plan. This plan was previously approved for Paving Permit and SO-19 Permit on March 25, 2005. Revisions are as follows:

1. Sheet 4A
 - a. Sheet title revised
 - b. Keyed notes revised to reference individual sheet numbers
2. Sheet 4B
 - a. Sheet title revised
 - b. Keyed notes revised to reference individual sheet numbers
 - c. Double cleanout and Keyed note 12 added
3. Sheet 5
 - a. Sheet title revised
 - b. Double cleanout detail and Keyed note E added.

No changes to the site plan were made other than the addition of a cleanout.

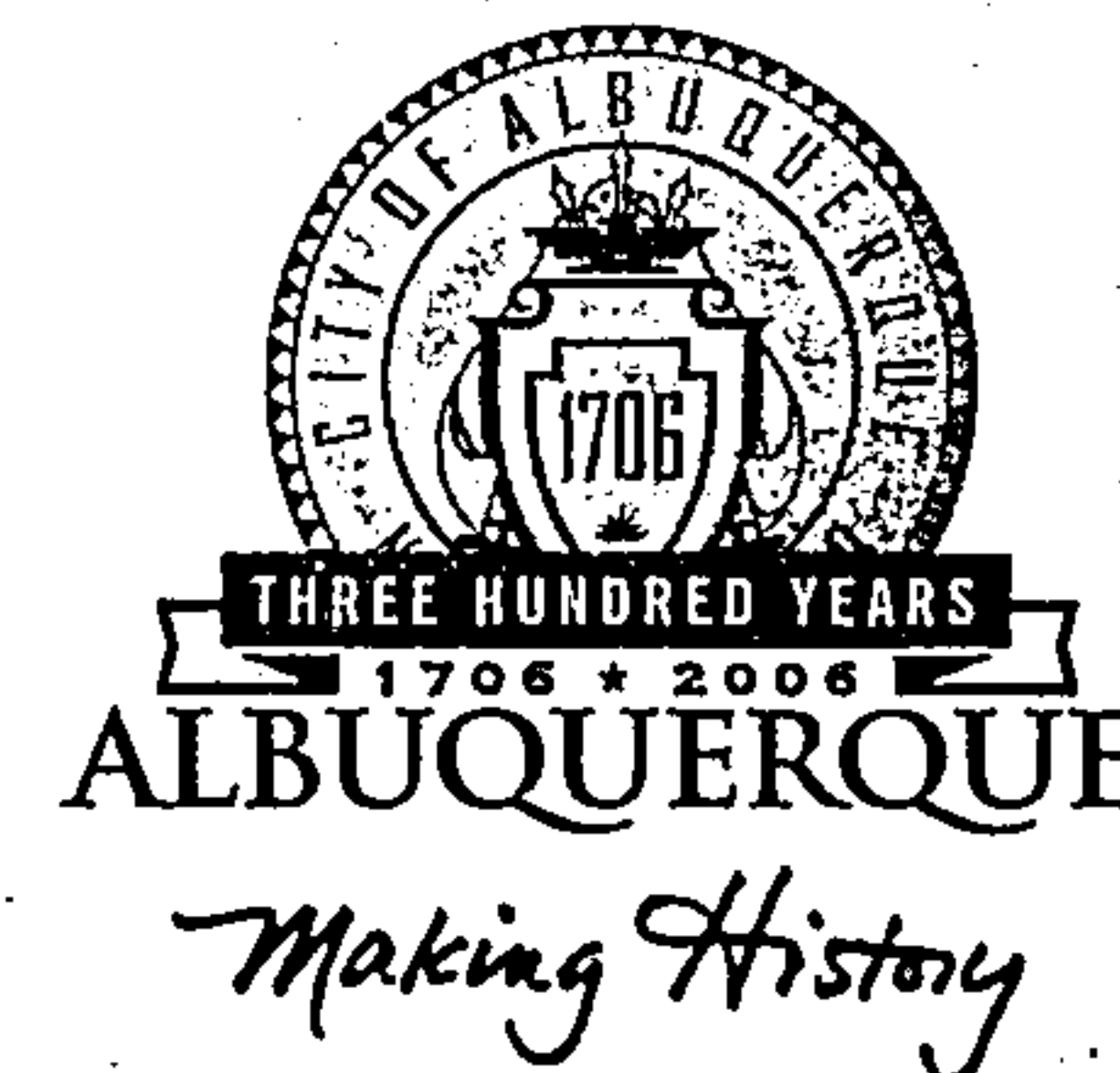
Please don't hesitate to call with any questions or comments.

Sincerely,



Bryan J. Bobrick
Isaacson & Arfman, P.A.

CITY OF ALBUQUERQUE



April 8, 2005

Scott McGee, P.E.
Isaacson & Arfman, P.A.
128 Monroe St. NE
Albuquerque, NM 87108

**Re: TVI Courtyard, a portion of the TVI Main Campus, Grading and
Drainage Plan**

Engineer's Stamp dated 3-30-05 (K15-D16A)

76A

Dear Mr. McGee,

Based upon the information provided in your submittal received 3-31-05, the above referenced plan is approved for Paving and Grading Permit. Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology.

P.O. Box 1293

A separate permit (SO#19) is required for construction within City Right of Way. A copy of this approval letter must be on hand when applying for the excavation permit. Prior to Certificate of Occupancy release, Engineer Certification per the DPM checklist will be required.

Albuquerque

New Mexico 87103

This project requires a National Pollutant Discharge Elimination System (NPDES) permit. If you have any questions regarding this permit please feel free to call the DMD Storm Drainage Design section at 768-3654 (Charles Caruso).

www.cabq.gov

If you have any questions, you can contact me at 924-3981.

Sincerely,

Kristal D. Metro
Engineering Associate, Planning Dept.
Development and Building Services

C: Matt Cline, Arroyo Maintenance
Ruben Ortega, Excavation Permits
Charles Caruso, DMD Storm Drainage Design
File

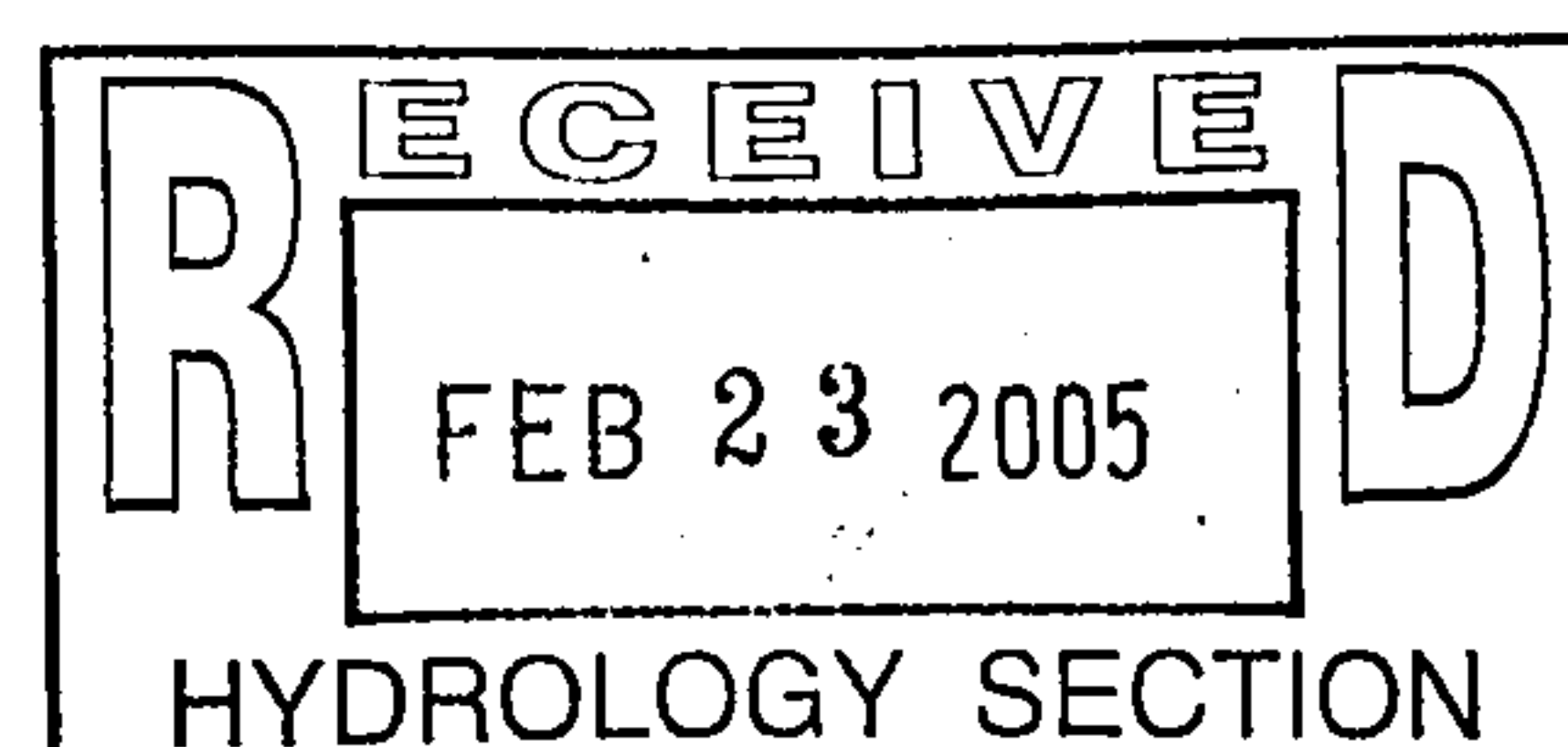
FEBRUARY 22, 2005

SUPPLEMENTAL INFORMATION

FOR

Albuquerque Technical Vocational
Courtyards At Buildings M & E Institute

BY



CALCULATIONS: TVI : February 22, 2005

Calculations are based on the Drainage Design Criteria for City of Albuquerque Section 22.2, DPM, Vol 2, dated Jan., 1993

ON-SITE**CONSTRUCTION AREA:** 84150 SF = 1.932 Ac.

see attached exhibit

HISTORIC FLOWS:

On-Site Historic Land Condition

Area a	=	0	SF
Area b	=	9100	SF
Area c	=	2000	SF
Area d	=	73050	SF
Total Area	=	84150	SF

DEVELOPED FLOWS:

On-Site Developed Land Condition

Area a	=	0	SF
Area b	=	8500	SF
Area c	=	500	SF
Area d	=	75150	SF
Total Area	=	84150	SF

EXCESS PRECIPITATION:

Precip. Zone	2
Ea	= 0.53
Eb	= 0.78
Ec	= 1.13
Ed	= 2.12

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

$$\text{Weighted E} = \frac{EaAa + EbAb + EcAc + EdAd}{Aa + Ab + Ac + Ad}$$

Historic E	=	1.95 in.	Developed E	=	1.98 in.
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On-Site Volume of Runoff: $V_{360} = E \cdot A / 12$

Historic V_{360}	=	13685 CF	Developed V_{360}	=	13876 CF
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On-Site Peak Discharge Rate: $Q_p = Q_{pa}Aa + Q_{pb}Ab + Q_{pc}Ac + Q_{pd}Ad / 43,560$

For Precipitation Zone 2

Q_{pa}	=	1.56	Q_{pc}	=	3.14
Q_{pb}	=	2.28	Q_{pd}	=	4.70

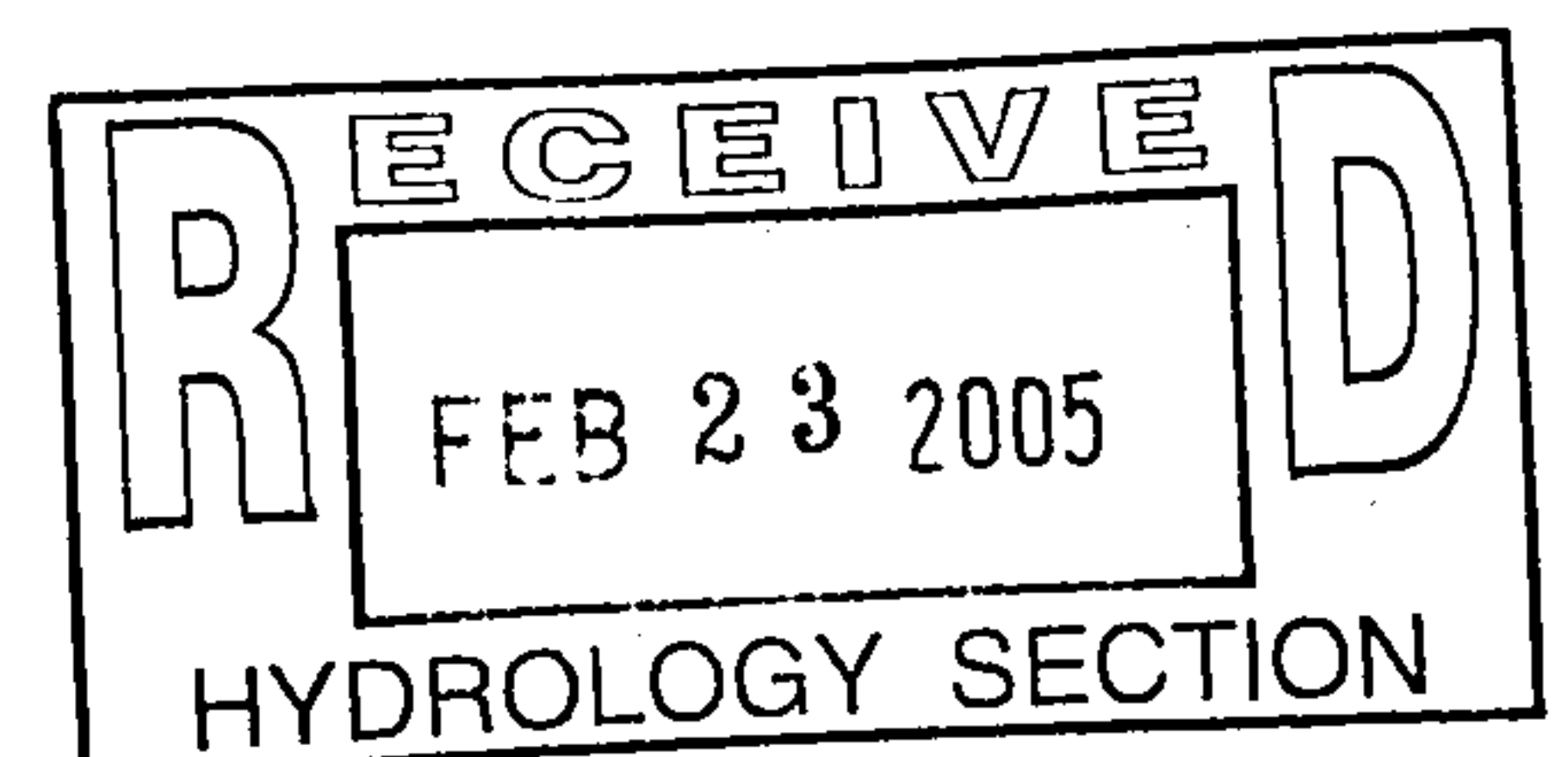
Historic Q_p	=	8.5 CFS	Developed Q_p	=	8.6 CFS
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The proposed improvements to the TVI campus includes the removal / replacement of the existing courtyard paving and associated landscaping.

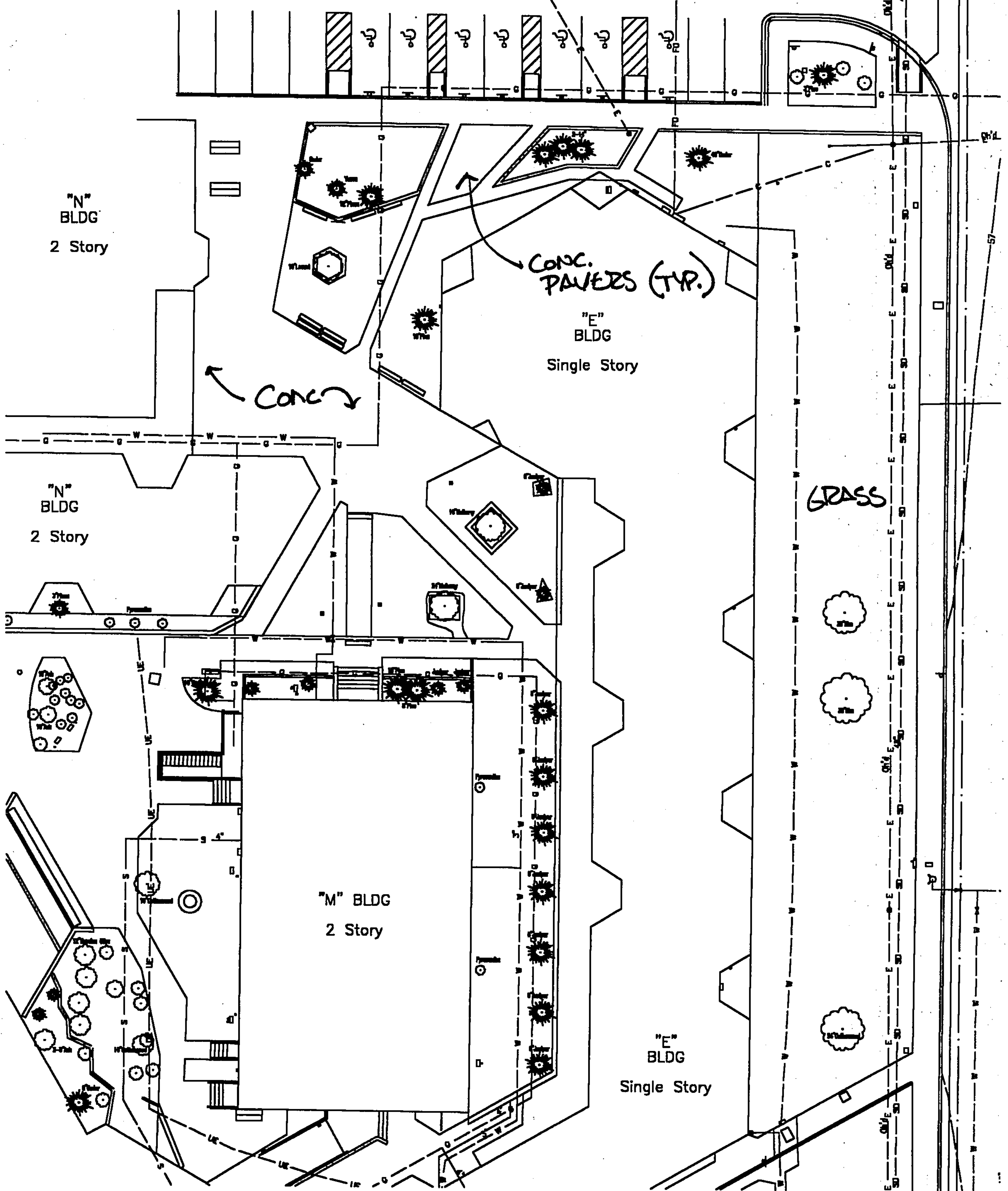
Historic discharge currently sheetflows north to enter the existing storm drain system at inlets north of the site.

Proposed development discharge will be captured within the proposed on-site storm drain system and released into the existing public storm drain manhole as shown.

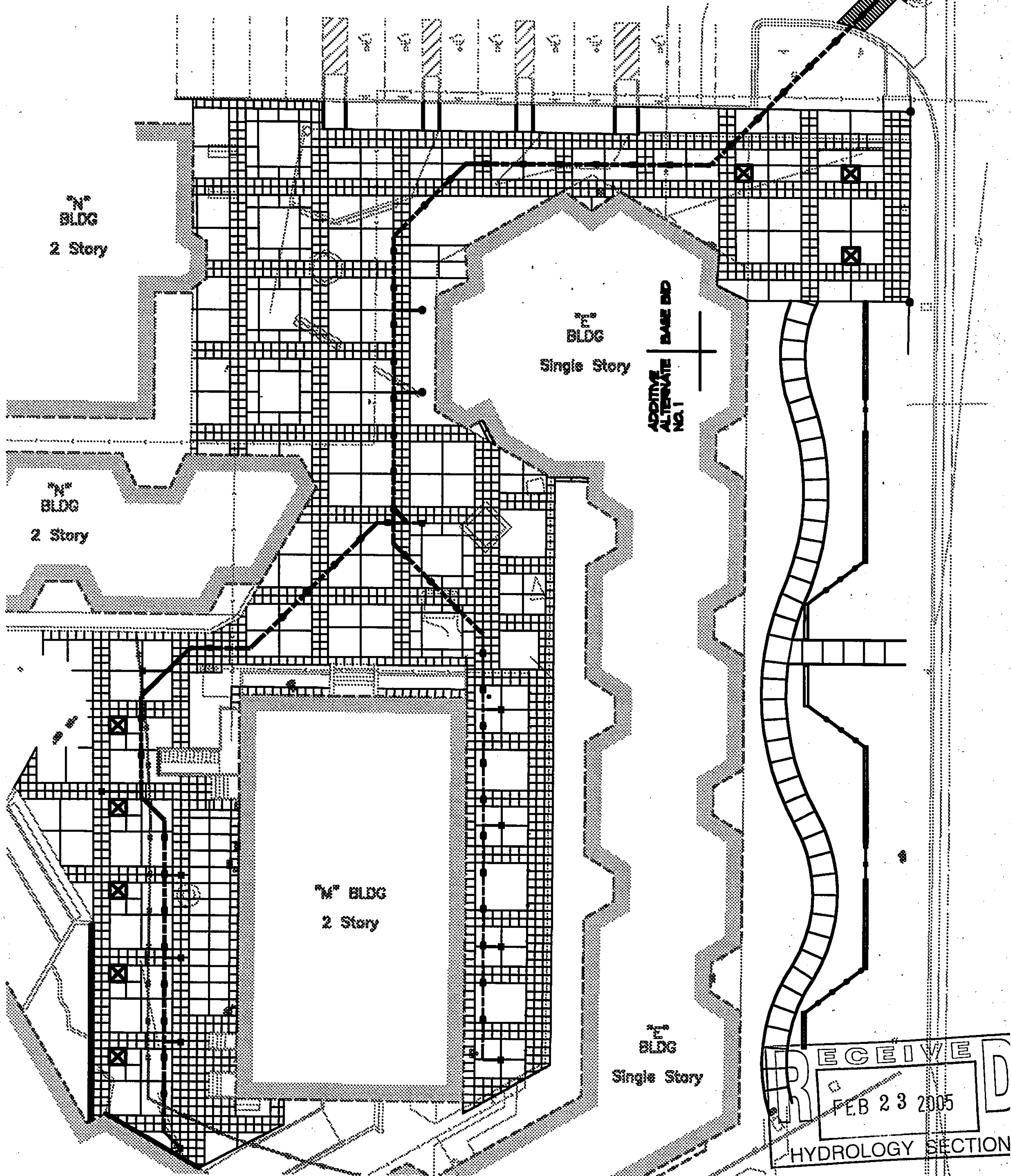
Based on the above calculations, the increase in flow due to development is 0.1 cfs. This will have a negligible affect on the existing storm drain system.



EXISTING

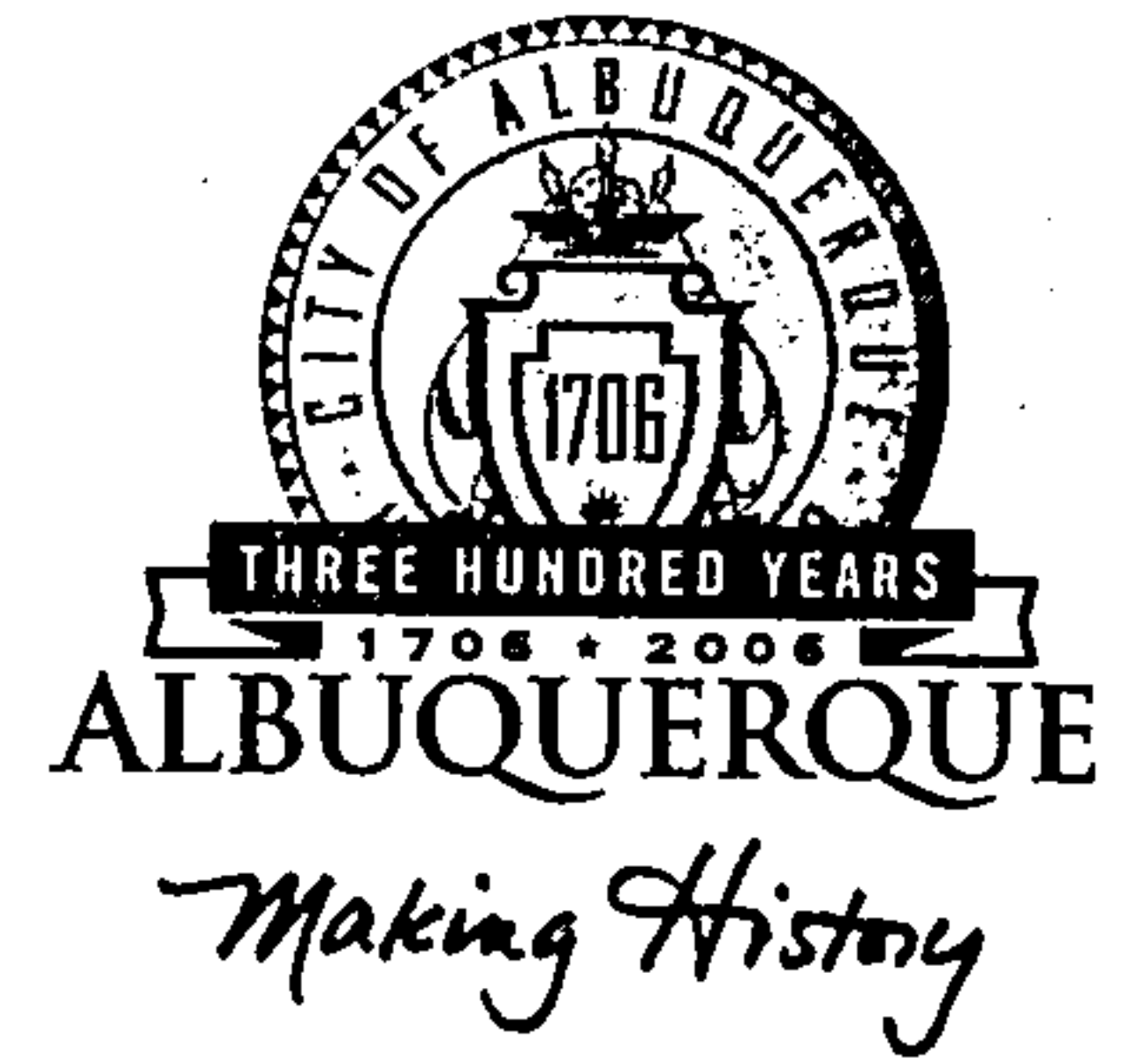


PROPOSED CONSTRUCTION



RECEIVED
FEB 23 2005
HYDROLOGY SECTION

CITY OF ALBUQUERQUE



March 25, 2005

Scott M. McGee, P.E.
Isaacson & Arfman, P.A.
128 Monroe St. NE
Albuquerque, NM 87108

Re: TVI Courtyard, A portion of TVI Main Campus, Grading and Drainage
Plan - Engineer's Stamp dated 02-22-05 (K15 - D16A)
76A

Dear Mr. McGee,

Based upon the information provided in your submittal dated 2-23-05, the above referenced plan is approved for Paving Permit and S019 Permit. Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology.

Also, at the completion of the project please provide Certified As-builts for our file.

If you have any questions, you can contact me at 924-3990.

Sincerely,

Phillip J. Lovato, E.I.
Engineering Associate, Planning Dept.
Development and Building Services

C: Pam Lujan, Excavation & Barricading
Matt Cline, Storm Drain Maintenance
file

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov



August 24, 1998

John A. Andrews, P.E.
AAR-The Larkin Group, Inc.
8500 Menaul Boulevard NE, Suite A-440
Albuquerque, New Mexico 87112

RE: *Grading and Drainage Plan for Albuquerque TVI North Perimeter Beautification (K15/D65)*
Engineer's Stamp Dated 5/12/98. ZLA

Dear Mr. Andrews:

The Grading and Paving permits for the above referenced site cannot be released until the following comments are addressed:

1. The plan shows a 10' wide drainage easement for the existing 48" storm drain through this site. This easement is not to City standards. Please provide an adequate easement for this storm drain.
2. The one foot water blocks are required by City Hydrology to make sure that street flows do not enter the site. If the one foot elevation difference cannot be provided, please provide the street flow analyses to demonstrate that the runoff from Buena Vista Drive and Coal Place do not enter the site.

If you have any questions regarding these comments, please call me at 924-3982.

Sincerely,

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Andrew Garcia, City Hydrology
File



DRAINAGE INFORMATION SHEET

APPLICANT'S NAME: AAR-LARKIN GROUP, INC., ZONE ATLAS/DRNG. FILE #: K15/D65

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

LEGAL DESCRIPTION: ALBUQUERQUE TVI MAIN CAMPUS

CITY ADDRESS: 525 BURMA VISTA DR SE, ALBUQUERQUE, NM

ENGINEERING FIRM: AAR-LARKIN GROUP, INC. CONTACT: PAUL GONZALES

ADDRESS: 8500 MENAUL BLVD NE, SUITE A-440 PHONE: (505) 275-7500
ALBUQUERQUE, 87112

OWNER: ALBUQUERQUE TVI CONTACT: _____

ADDRESS: _____ PHONE: _____

ARCHITECT: GREER STAFFORD SJCF CONTACT: ANSON RANKE

ADDRESS: 6020 ACADEMY NE, ALBUQUERQUE PHONE: (505) 821-0235
87109

SURVEYOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

CONTRACTOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL: RESUBMITTAL
☐ DRAINAGE REPORT
☒ DRAINAGE PLAN
☐ CONCEPTUAL GRADING & DRAINAGE PLAN
☒ GRADING PLAN
☐ EROSION CONTROL PLAN
☐ ENGINEER'S CERTIFICATION
☐ OTHER _____

PRE-DESIGN MEETING:

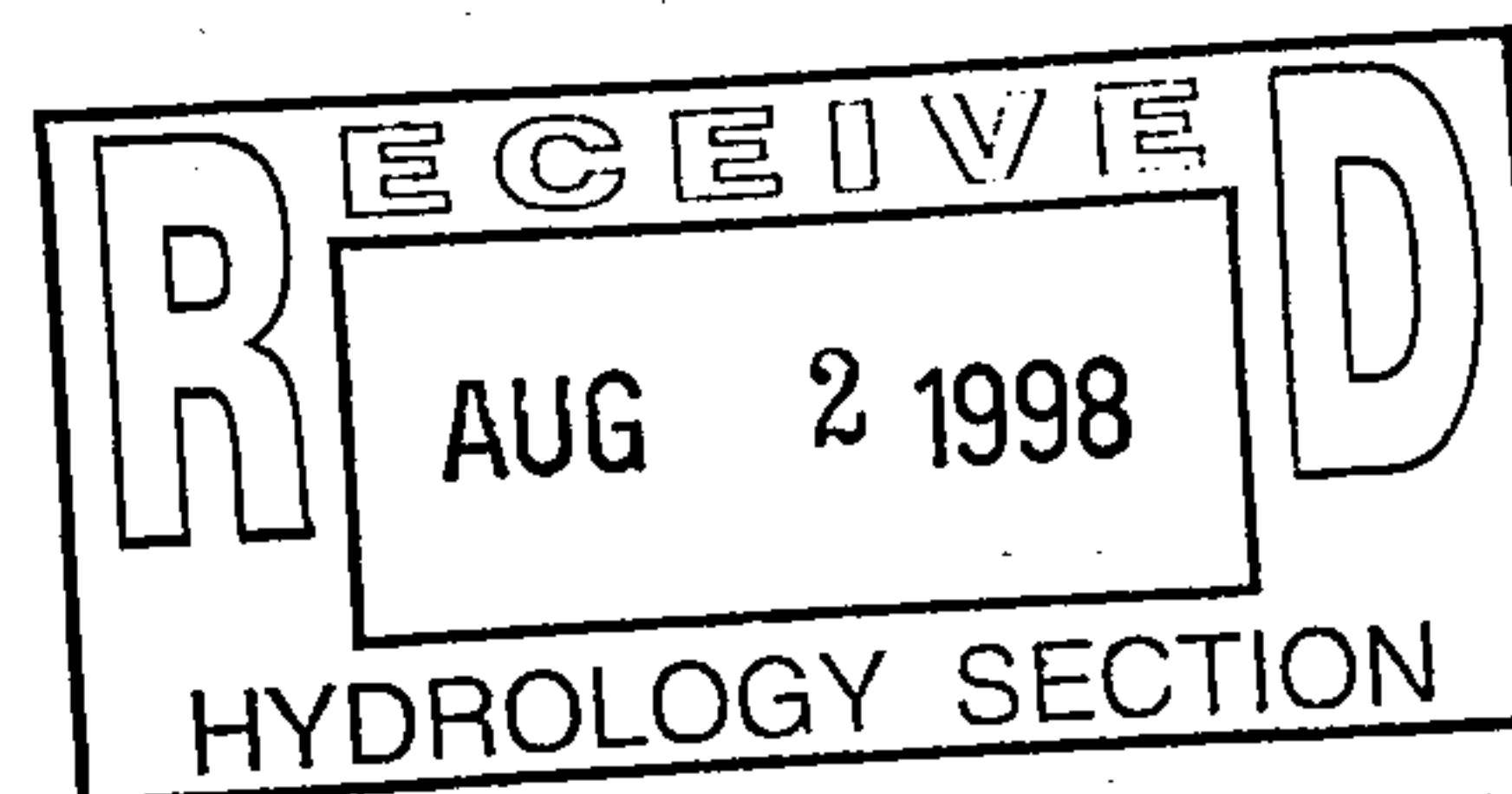
☐ YES
☐ NO
☐ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:
☐ SKETCH PLAT APPROVAL
☐ PRELIMINARY PLAT APPROVAL
☐ S. DEV. PLAN FOR SUB'D APPROVAL
☐ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
☐ SECTOR PLAN APPROVAL
☐ FINAL PLAT APPROVAL
☐ FOUNDATION PERMIT APPROVAL
☐ BUILDING PERMIT APPROVAL
☐ CERTIFICATE OF OCCUPANCY APPROVAL
☒ GRADING PERMIT APPROVAL
☒ PAVING PERMIT APPROVAL
☐ S.A.D. DRAINAGE REPORT
☐ DRAINAGE REQUIREMENTS
☐ SUBDIVISION CERTIFICATION
☐ OTHER _____ (SPECIFY)

DATE SUBMITTED: AUGUST 3, 1998

BY: Paul J. Gonzales

Revised 02/98



August 3, 1998

Susan Calongne, P.E.
City of Albuquerque, Public Works Department
Hydrology Division
P.O. Box 1293
Albuquerque, NM 87103

**RE: TVI NORTH PERIMETER BEAUTIFICATION (K15-D65). DRAINAGE REPORT FOR
PAVING PERMIT APPROVAL**

Dear Ms. Calongne:

This letter is in response to the five comments presented in your letter, dated June 10, 1998.

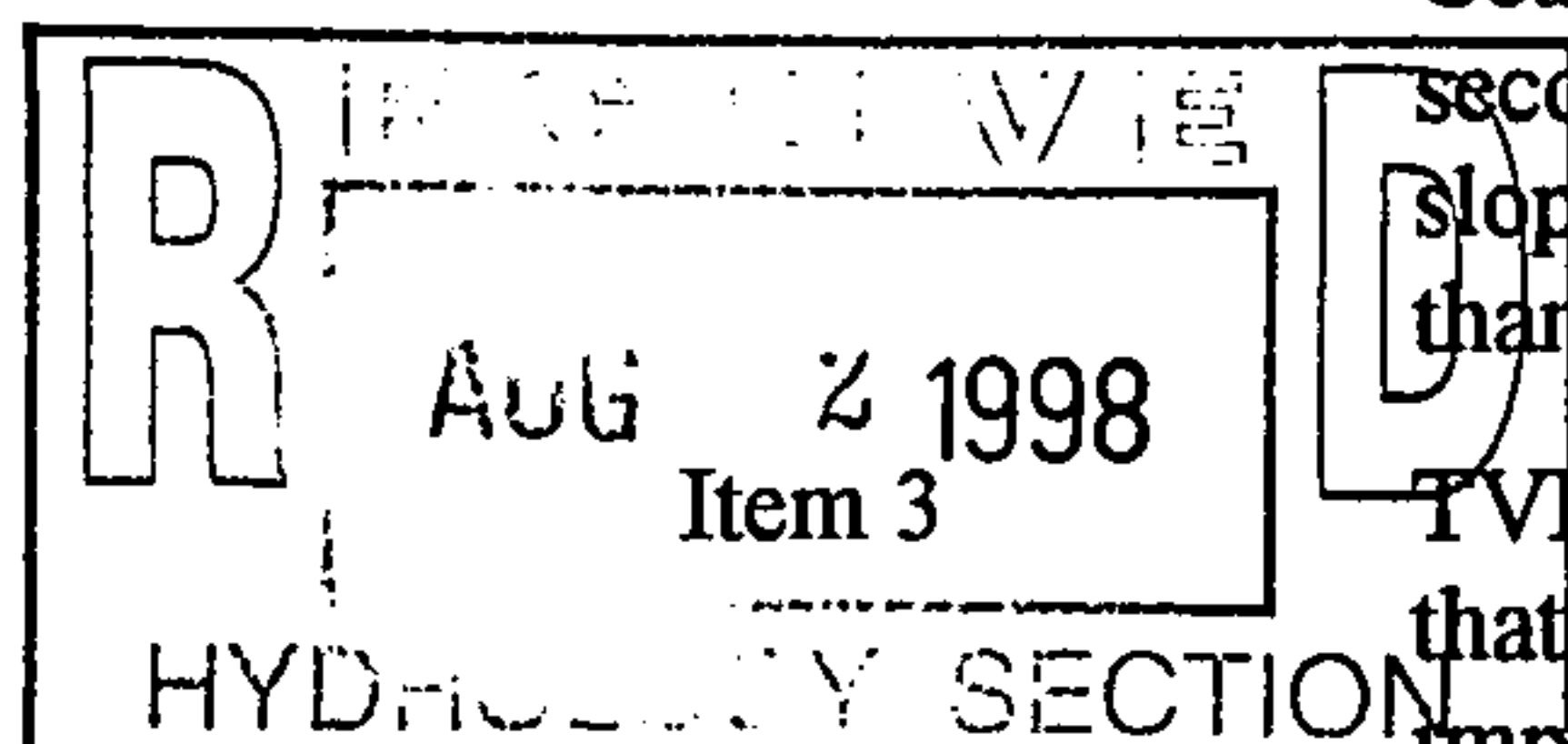
Item 1 The 48-inch diameter storm drain shown in the grading and drainage plan is a City of Albuquerque storm drain line within a City drainage easement as it crosses TVI's parking lot. The City of Albuquerque maintains the storm drain. The 48-inch storm drain on the west side of Buena Vista is within the Right-Of-Way of Buena Vista Drive SE (See revised Grading and Drainage Plan).

Item 2 The 48-inch storm drain that passes through the TVI parking lot, north of the North Building, originates at Aliso Drive SE and Burton Avenue SE in the Granada Heights Addition which is approximately 9900 feet east. As-Built information on the 48-inch storm drain, north of the TVI North Building, indicates that the full flow storm drain capacity increases from 128.5 to over 155 cubic feet per second at Sycamore Street and Coal Avenue.

An increase in peak runoff of 1.2 cubic feet per second, due to TVI's parking lot, is negligible as compared to the full flow capacity, 128.5 cubic feet per second, and timing of peak flow within the storm drain. Please reference Table 2, page 6, of the Drainage Report and Table 4, page 10, for the peak runoff at analysis point AP-B. The hydrologic methods used by the City of Albuquerque assume that all precipitation is distributed evenly over a given watershed. The short time of concentration, less than or equal to 12 minutes and time to peak flow, less than or equal to 8 minutes, from the TVI parking lot will cause that runoff to pass through the storm drain system well before the peak flow of the upstream runoff occurs. The storm drain continues upstream and east from the TVI parking lot for approximately 9900 feet. The upstream, off-site drainage area is largely residential. Assuming the peak flow occurs at the upstream reaches of the basin, it would take approximately an additional 27.5 minutes, at an average flow velocity of 6 feet per second, for that flow to reach the TVI campus location.

The recently constructed storm drain in Yale Boulevard collects all flows in Coal Place at Yale, which is one block east of Buena Vista. The 100-year event runoff discharged to Coal Place from TVI is reduced from the existing 2.47 to a developed 1.47 cubic feet per second (See Plans). PLATE 22.3 D-1 of the DPM indicates that this flow at the existing slope of Coal Place, approximately 0.005 foot per foot, will result in a flow depth of less than 0.30 foot.

TVI will be responsible for maintenance of the proposed catch basins. It is not anticipated that the proposed storm drains should become clogged due to the proposed, largely impervious, land use. The COA DPM recommends that the Type "B" catch basins be analyzed with a clogging of 15 percent. In addition to the two Type "B" inlets, a Type

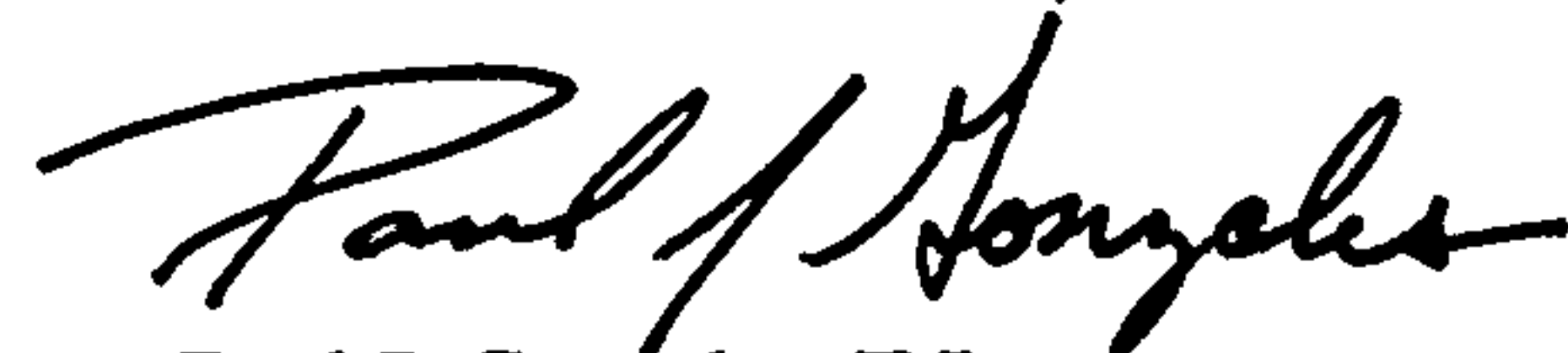


Double "D" inlet at the sump area of the existing access way southwest of the North Building has been added. The addition of the Type double "D" inlet nearly doubles the required inlet capacity of the 100-year storm event. Please reference the attached drainage calculations. As per your conversations with Mr. John Andrews, P.E., this is an acceptable solution to the drainage of the TVI parking lot. Vehicles are not allowed to park alongside the TVI North Building at the location of the catch basins, as it is a delivery access and fire lane.

- Item 4 The COA DPM Chapter 23, Section 3, Article D (4) (d), paragraph 1 states that "the **maximum** (emphasis added) height of water blocks will be 12 inches as measured from projected flowline gutter elevation of the major or through street to the gutter flowline elevation at the high point of the minor leg gutter." The differences in flowline elevation at the parking lot access points are 0.5 feet at the north entrance and 0.9 feet at the east entrance. Buena Vista and Coal Place are near the crest of vertical curves and as such will not develop the 1.0 foot of runoff depth.
- Item 5 TVI has held discussions with Robert Romero of the Zoning Department. Mr. Romero has stated that the City of Albuquerque's Zoning Department and City Planning hold no jurisdiction over TVI. If you have any questions, please contact Mr. Romero at City of Albuquerque, Zoning Department directly.

These responses should fully address your comments as related to hydrology and hydraulics. Should you have any further questions or comments, please feel free to contact me at 275-7500.

Very Truly Yours,
AAR-LARKIN GROUP, INC.



Paul J. Gonzales, E.I.
Staff Engineer

Enclosures



CLIENT GREER STAFFORD SICF ARCHITECTS
JOB TVI NORTH PERIMETER BEAUTIFICATION

CATCH BASIN CAPACITY CALCULATIONS

- GIVEN:
- 1) $Q_{p100} = 7.94$ CFS AT PROPOSED CATCH BASIN LOCATION
 - 2) 2 - TYPE "B" CATCH BASINS USED IN SERIES
 - 3) ASSUME GRATE AND CURB OPENING 15% CLOGGED WITH DEBRIS. (DPM CHAPTER 22, SECTION 3, ARTICLE D(3)(b), PARAGRAPH 4; pg 22-154, JUNE 1997)

CONDITIONS AT FIRST CATCH BASIN IN SERIES

$$Q_{p100} = 7.94 \text{ CFS}$$

DEPTH OF FLOW IN BUTTER, d , AT LONGITUDINAL SLOPE,
 $S = 0.01$ FT/FT

$$d = 0.34 \text{ FT} \quad \text{SEE TRIANGULAR ANALYSIS, ATTACHED}$$

GRATE CAPACITY AT 0.34 FT GUTTER DEPTH AND 0.01 FT/FT
LONGITUDINAL SLOPE

$$Q_{CAP_GRATE} = 4.0 \text{ CFS} \quad \text{FROM COA DPM PLATE 22.3 D-1}$$

REDUCED CAPACITY; $Q_{CAP_GRATE_R}$

$$Q_{CAP_GRATE_R} = (1 - 0.15) 4 \text{ CFS} = 3.4 \text{ CFS}$$

CURB OPENING INLET CAPACITY - TEXAS HIGHWAY CURB OPENING
INLET CAPACITY CHART
(SEE ATTACHED)

AT GUTTER DEPTH, $d = 0.34$ FT AND INTERPOLATING WITHIN THE
CHART:

AVG CAPACITY, PER FOOT OF LENGTH, IS APPROXIMATELY
 0.453 CFS/FT

RESULTING CURB OPENING INLET CAPACITY, Q_{CAP_O}
 $Q_{CAP_O} = 0.453 \text{ CFS/FT} (2.948 \text{ FT}) = 1.34 \text{ CFS}$

REDUCED CURB OPENING INLET CAPACITY, $Q_{CAP_O_R}$

$$Q_{CAP_O_R} = (1 - 0.15)(1.34 \text{ CFS}) = 1.14 \text{ CFS}$$



CLIENT GREER STAFFORD SJCF ARCHITECTS
JOB TVI NORTH PERIMETER BEAUTIFICATION

CATCH BASIN CALCULATIONS

TOTAL CATCH BASIN CAPACITY, $Q_{CAP, R}$ (REDUCED)

$$Q_{CAP, GRATE, R} + Q_{CAP, O, R} = Q_{CAP, R}$$

$$3.4 \text{ CFS} + 1.14 \text{ CFS} = Q_{CAP, R} = 4.54 \text{ CFS}$$

2ND CATCH BASIN IN SERIES

$$Q_{P, 100} = 7.94 \text{ CFS} - Q_{CAP, R} = 7.94 - 4.54 = 3.4 \text{ CFS}$$

20' SPACING BETWEEN CATCH BASINS

DEPTH OF FLOW AT GUTTER, d

$$d = 0.25 \text{ FT} \quad \text{SEE TRIANGULAR CHANNEL ANALYSIS, ATTACHED}$$

GRATE CAPACITY AT 0.25 FT GUTTER FLOW DEPTH AND
0.01 FT/FT LONGITUDINAL SLOPE

$$Q_{CAP, GRATE} = 2.0 \text{ CFS}$$

REDUCED GRATE CAPACITY, $Q_{CAP, GRATE, R}$

$$Q_{CAP, GRATE, R} = (1 - 0.15) (2.0 \text{ CFS}) = 1.7 \text{ CFS}$$

CURB OPENING INLET CAPACITY - TEXAS HIGHWAY CURB OPENING
INLET CAPACITY CHART
(SEE ATTACHED)

AT GUTTER DEPTH, $d = 0.25 \text{ FT}$, AND INTERPOLATING WITHIN
THE CHART...

AVG. CAPACITY, PER FOOT OF LENGTH, IS APPROXIMATELY
0.374 CFS / FT

RESULTING CURB INLET CAPACITY, $Q_{CAP, O}$

$$Q_{CAP, O} = 0.374 \text{ CFS/FT} (2.948 \text{ FT}) = 1.1 \text{ CFS}$$

REDUCED CURB INLET CAPACITY, $Q_{CAP, O, R}$

$$Q_{CAP, O, R} = (1 - 0.15) (1.1 \text{ CFS}) = 0.94 \text{ CFS}$$



LARKIN ASSOCIATES
CONSULTING ENGINEERS, INC.
9233 WARD PARKWAY, SUITE 300
KANSAS CITY, MISSOURI 64114
TELEPHONE 816/361-0440
FAX 816/361-0045

Page 3/7

Date JULY 27, 1998

Job No. AL97-0795

Made By P. GONZALES

Chkd. By _____

CLIENT GREER STAFFORD SJCF ARCHITECTS

JOB TVI NORTH PERIMETER BEAUTIFICATION

CATCH BASIN CALCULATIONS

TOTAL CATCH BASIN CAPACITY, $Q_{CAP_{2R}}$ (REDUCED)

$$Q_{CAP_{2R}} = 1.7 \text{ CFS} + 0.94 \text{ CFS} = 2.64 \text{ CFS}$$

TOTAL FLOW PASSING 2ND CATCH BASIN

$$Q_{P100} - Q_{CAP_{2R}} = Q_{P100 \text{ PASS}}$$

$$3.4 - 2.64 = 0.76 = Q_{P100 \text{ PASS}}$$

THIS FLOW PASSES TO A PROPOSED TYPE DOUBLE "D" INLET.

CAPACITY AND REDUCED CAPACITY OF TYPE DOUBLE "D" INLET

USING COA STD. DWG. 2220 - STANDARD GRATE
GRATE HAS A FREE OPEN AREA OF 4.56 FT.²
A DOUBLE "D" INLET W/ COA STD. GRATE HAS
9.0 FT OF FREE PERIMETER.

0.5 FEET OF HEAD ALLOWED TO DEVELOP AT INLET LOCATION.
CHECK WEIR CAPACITY:

$$Q_w = 3.3P(h)^{1.5} = 3.3(9.0)(0.5)^{1.5}$$

$$Q_w = 10.5 \text{ CFS}$$

REDUCE W/ 15% CLOGGING

$$Q_{RW} = 10.5 \text{ CFS} (1 - 0.15) = 8.93 \text{ CFS}$$

CHECK ORIFICE FLOW:

$$Q_o = 0.6 A \sqrt{2gh} = 0.6(9.12) \sqrt{2(32.2)(0.5)} = 31.05 \text{ CFS}$$

REDUCE W/ 15% CLOGGING

$$Q_{R_o} = 31.05 (1 - 0.15) = 26.39 \text{ CFS}$$

USE $Q_{RW} = 8.93 \text{ CFS}$ AS CAPACITY



LARKIN ASSOCIATES
CONSULTING ENGINEERS, INC.
9233 WARD PARKWAY, SUITE 300
KANSAS CITY, MISSOURI 64114
TELEPHONE 816/361-0440
FAX 816/361-0045

Page 4/7
Date JULY 27, 1998
Job No. AL98-0795
Made By P. GONZALES
Chkd. By _____

CLIENT GIRER STAFFORD SJCF ARCHITECTS
JOB TVI NORTH PERIMETER BEAUTIFICATION

ASSUMING TYPE DOUBLE "D" INLET REACHES
CAPACITY, CHECK HW REQUIRED FOR 18" RCP
ASSUMING INLET CONTROL.

USING CHART 2 OF HEC-5 CHARTS:

9.0 CFS REQUIRES 23.4 INCHES OF HW.

BASIN IS 3.0 FT OR 36 INCHES IN DEPTH

$$36 > 23.4$$

∴ BASIN PROVIDES SUFFICIENT HW DEPTH
TO PASS WEIR CAPACITY FLOWS.

3 CATCH BASINS PROVIDE A TOTAL REDUCED
CAPACITY OF $3.4 \text{ CFS} + 2.64 \text{ CFS} + 8.93 \text{ CFS}$
FOR A TOTAL OF 14.97 CFS.

THIS TOTAL OF 14.97 CFS IS APPROXIMATELY
1.9 TIMES THE CALCULATED 100-YR PEAK
RUNOFF.

THEREFORE, THE PROPOSED STORM DRAINAGE IMPROVEMENTS
ARE SUFFICIENT TO ADDRESS THE 100-YEAR
PRECIPITATION EVENT.

Triangular Channel Analysis & Design
Open Channel -- Uniform flow

Worksheet Name:

Comment:

Solve For Depth

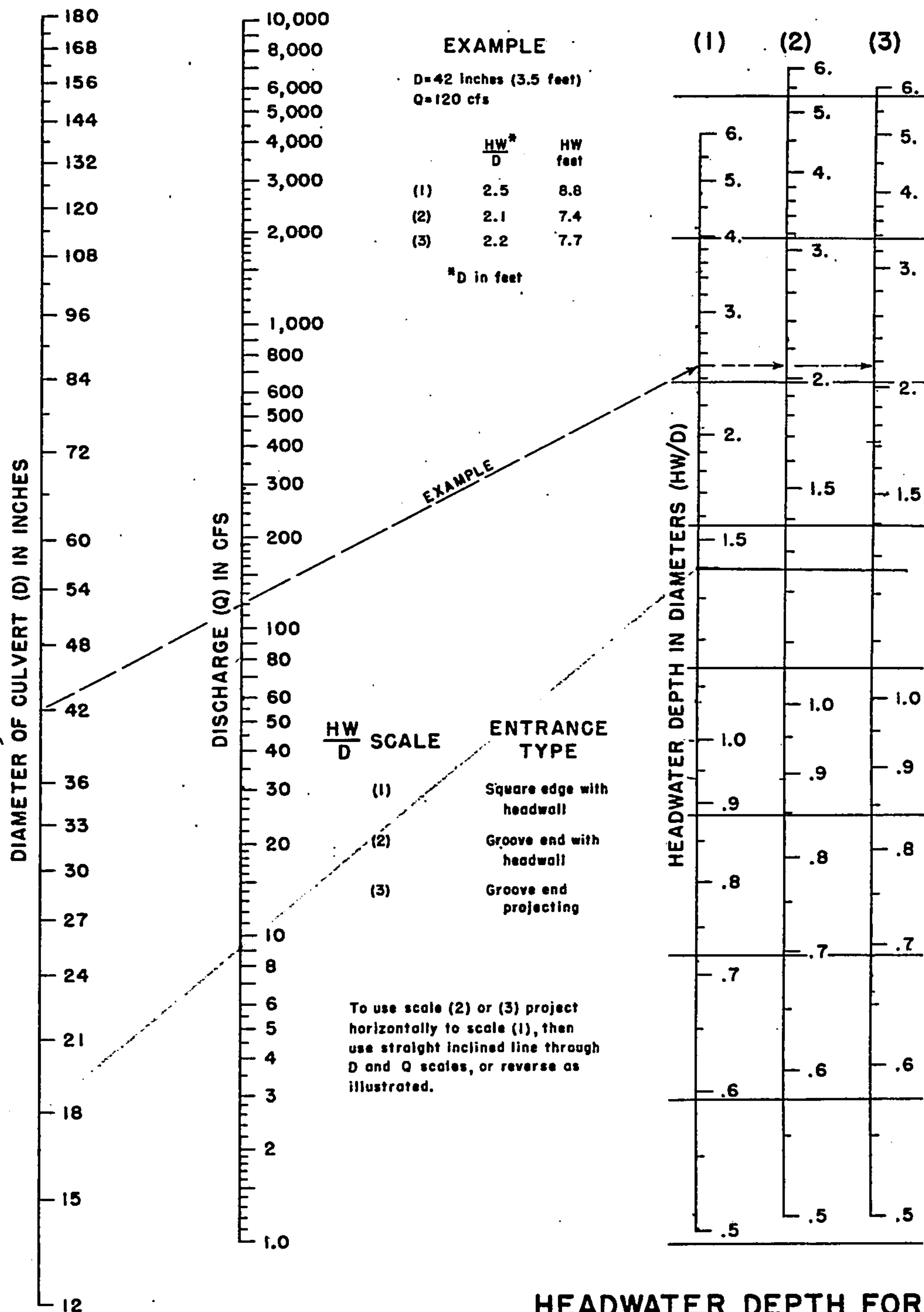
Given Input Data:

Left Side Slope..	50.00:1 (H:V)
Right Side Slope.	0.00:1 (H:V)
Manning's n.....	0.017
Channel Slope....	0.0100 ft/ft
Discharge.....	3.40 cfs

Computed Results:

Depth.....	0.25 ft
Velocity.....	2.16 fps
Flow Area.....	1.57 sf
Flow Top Width...	12.54 ft
Wetted Perimeter.	12.80 ft
Critical Depth...	0.26 ft
Critical Slope...	0.0086 ft/ft
Froude Number....	1.08 (flow is Supercritical)

CHART 2



HEADWATER DEPTH FOR CONCRETE PIPE CULVERTS WITH INLET CONTROL

TABLE II

**CURB OPENING INLET CAPACITIES
USED BY THE TEXAS STATE HIGHWAY DEPARTMENT**

FOR THE CITY OF ALBUQUERQUE

DEPTH OF FLOW IN GUTTER (FT.)	DEPTH OF DEPRESSION (IN.)	AVERAGE CAPACITY PER FOOT OF LENGTH (CFS)
0.10	2.75	0.263
0.20	2.75	0.330
0.30	2.75	0.418
0.40	2.75	0.505
0.50	2.75	0.603