HYDROLOGY G16/D49 NO PLANS

G16/D49

5 PLANS

December 14, 1981

Joe Boehning
Boehning, Protz, Cook, Pogue and Associates
110 Second Street SW - Suite 500
Albuquerque, NM 87102

RE: PRODUCTION CREDIT ASSOCIATION OFFICE BUILDING

Dear Mr. Boehning:

We are aware of the potential for water to overflow the sidewalk along the west end of the conference room due to a nearby roof canale. However, we agree that the runoff will be negligible except in the case of very heavy rain. In this instance, if some water should run over the sidewalk, we hereby agree not to hold the City liable for any bodily injuries resulting from this condition.

Very truly yours,

PRODUCTION CREDIT ASSOCIATION

James C. Henrie
President

JCH:BCT:mal

boehning protz cook pogue
& associates p.a.
architecture planning engineering

joe boehning aia pe
d craig protz aia
david cook aia
ernest pogue aia pe
bruce thomas aia

December 14, 1981

Bernie Montoya
City of Albuquerque
Department of Hydrology
Municipal Development Division
P. O. Box 1293
Albuquerque, NM 87103

RE: PRODUCTION CREDIT ASSOCIATION OFFICE BUILDING
3915 Carlisle Blvd. NE

Dear Mr. Montoya:

Regarding the yellow tag on the referenced project due to potential drainage flow over a sidewalk, pursuant to your request I have enclosed a letter from Mr. Henri, representing Production Credit Association (owner), stating their awareness of the situation and their acceptance that the City not be held liable for injuries, should any occur, stemming from the situation.

I trust this will be acceptable and the yellow tag rescinded. If you should have any further concerns, please call me.

Very truly yours,

Bruce Thomas

Bruce Thomas

BCT:mal
pc: Ed Sims, Jaynes Corp.

suite 500 sunshine building
110 second street s.w.
albuquerque, new mexico 87102
505 242-4044

121 wyatt – suite 4
las cruces, new mexico 88001
505 524-8071

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

G16-D24

August 6, 1981

Frank Lovelady, P.E.
Boyle Engineering Corp.
3939 San Pedro N.E., Suite D
Albuquerque, New Mexico 87110

RE: Montgomery Heights Addition Tract A-2-A

Dear Frank:

The approval of the referenced drainage report is contingent on the acceptance of the alley grades (prepared by your organization) by the City Engineer's office. Please advise us when the alley grades have been approved.

Sincerely,

Fred J. Aguirre, P.E.
Civil Engineer

FJA:gc
7824A
cc Drainage Files ✓
f/Reading

Boyle Engineering Corporation

Suite D
3939 San Pedro N.E.
Albuquerque, New Mexico 87110

consulting engineers

505 / 883-7700

JUL 30 1981

Mr. Quinton R. Kielich, P.E.
Assistant City Engineer, Design
P.O. Box 1293
Albuquerque, New Mexico 87103

July 28, 1981

RE: MONTGOMERY HEIGHTS TRACT A-2-A, B01-111-01, CONSTRUCTION PLANS FOR CONNECTION TO 66" STORM SEWER

Dear Bob:

In accordance with Special Order No. 19, attached are three (3) sets of construction plans for connection to the storm drain in the NW quadrant of Comanche Road and Carlisle Boulevard.

The design for the junction structure is based on a Los Angeles City standard which Chuck Easterling recommended I use.

The construction plans are being prepared in connection with the drainage report for Montgomery Heights Addition Tract A-2-A. The foundation permit has already been given, but the building permit issuance is subject to approval of the drainage report, these plans and the alley grades which are being submitted to the City Engineer under separate letter.

We request your assistance in expediting the approval of these plans at the earliest possible time.

Sincerely,

BOYLE ENGINEERING CORPORATION

Frank D. Lovelady

Frank D. Lovelady, P.E.
Senior Civil Engineer

FDL:sof

Attachments

Boyle Engineering Corporation

Suite D
3339 San Pedro N.E.
Albuquerque, New Mexico 87110

consulting engineers
(505) 884-7700

RECEIVED
JUN 23 1981
CITY ENGINEER

TO: City of Albuquerque-City Engineer DATE: June 22, 1981

PROJECT: Tract A-2-A Montgomery Heights Addition-Drainage Report TRANSMITTAL No: _____

Forwarded herewith are 2 copies/sets each of:

____ Shop Drawings	____ Schedules	____ Descriptive Literature
____ Design Calcs.	____ Tracings	____ Check Prints
____ Details	____ Other _____ (Description)	

Sheets: 1) Drainage Report dated June 19, 1981

2) Grading and Drainage Plan Scale 1"-10'

Supplier: _____

Shop Drawings have been checked as noted:

_____ Resubmittal is not required. Corrections, if any, are noted.

_____ Please Correct and Resubmit.

REMARKS: _____

BY: Frank DeTrowbridge

Boyle
Engineering
Corporation
consulting engineers

Suite D
3939 San Pedro N.E.
Albuquerque, New Mexico 87110

505/883 7700

JUL 28 1981

DRAINAGE REPORT

FOR

TRACT A-2-A

MONTGOMERY HEIGHTS ADDITION

PREPARED FOR

BOEHNING PROTZ COOK POGUE
& ASSOCIATES P.A.

REVISED JULY 24, 1981

Boyle Engineering Corporation

Suite D
3939 San Pedro N.E.
Albuquerque, New Mexico 87110

consulting engineers

505 / 883-7700

Mr. Richard S. Heller, P.E.
City Engineer
P.O. Box 1293
Fourth Floor
Albuquerque, New Mexico 87103

July 28, 1981

RE: DRAINAGE REPORT MONTGOMERY HEIGHTS ADDITION TRACT A-2-A
B01-111-01

Dear Mr. Heller:

Attached are two copies of the revised drainage report dated July 24, 1981. Also attached are eight sets of plans of the alley grades for the alley adjoining the property on the north. The alley grade is one of the items requested by the reviewing hydrology engineer. All other requested modifications have been made. The construction plans per Special Order No. 19 have been submitted directly to A.C.E./Design Section.

Your early review and approval of the alley grades and drainage report is requested.

Sincerely,

BOYLE ENGINEERING CORPORATION

Frank D. Lovelady

Frank D. Lovelady, P.E.
Senior Civil Engineer

FDL:sof

Attachments

Boyle Engineering Corporation

consulting engineers

Suite D
3939 San Pedro N.E.
Albuquerque, New Mexico 87110

505 883-7700

July 28, 1981

Mr. Quinton R. Kielich
Assistant City Engineer, Design
P.O. Box 1293
Albuquerque, New Mexico 87103

RE: MONTGOMERY HEIGHTS TRACT A-2-A, B01-111-01, CONSTRUCTION PLANS FOR CONNECTION TO 66" STORM SEWER

Dear Bob:

In accordance with Special Order No. 19, attached are three (3) sets of construction plans for connection to the storm drain in the NW quadrant of Comanche Road and Carlisle Boulevard.

The design for the junction structure is based on a Los Angeles City standard which Chuck Easterling recommended I use.

The construction plans are being prepared in connection with the drainage report for Montgomery Heights Addition Tract A-2-A. The foundation permit has already been given, but the building permit issuance is subject to approval of the drainage report, these plans and the alley grades which are being submitted to the City Engineer under separate letter.

We request your assistance in expediting the approval of these plans at the earliest possible time.

Sincerely,

BOYLE ENGINEERING CORPORATION

Frank D. Lovelady

Frank D. Lovelady, P.E.
Senior Civil Engineer

FDL:sof

Attachments

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DRAINAGE REPORT
TRACT A-2-A, BLOCK 2
MONTGOMERY HEIGHTS ADDITION

I. PURPOSE

The purpose of this report is to present data and an analysis of storm runoff from a tract containing 0.8543 acres fronting on the west side of Carlisle Blvd. N.E. The tract is being developed as a single story office building site.

II. SCOPE

The scope of this report includes determination of off-site and onsite flow rates and the capability of the existing storm sewer adjacent to the west end of the tract to accept runoff generated from the developed tract. Since the approach of the report is to show that the storm sewer does, in fact, have adequate capacity to accept the full free flow from the 100 year storm (Q_{100}), the computation of runoff volumes and pond capacities was not done.

III. LOCATION

The area being developed is Tract A-2-A of Block 2, Montgomery Heights addition. The property is bounded on the east by Carlisle Blvd., on the north by a 30 ft. wide alley, on the west by a drainage easement for an existing 66 inch diameter storm sewer, and on the south by undeveloped land.

IV. EXISTING DRAINAGE CONDITIONS

Soils at the site are decomposed granite sparsely vegetated with native grasses. North across the alley, the undeveloped portion drains in a northwesterly direction away from the tract. The developed portion containing apartments appears to drain toward the alley. The alley drains to the low point which is within the existing surface drainage easement from which point the water drains northwest between the apartment buildings, into Tulane Road and finally discharging into the AMAFCA channel. This is also the route of the 66 inch RCP storm sewer.

On the east, drainage along Carlisle Blvd. is confined to the gutter. The high point on Carlisle is approximately 200' south of the alley and drainage is toward the north. The alley entrance has curb returns but the existing paving between the returns slopes back into Carlisle Blvd. which will prevent what small amount of drainage that accumulates in the Carlisle gutter line from entering the alley.

On the south, the land is undeveloped. Approximately 0.3 acres of this land gently slopes toward the northwest bringing a small amount of overland sheet flow onto the property. This will contribute a small amount to the peak runoff rate but its impact will not be significant. The existing alley is to be left unpaved at this time. Since the City could not furnish alley grades they will be furnished in conjunction with this report. Since the alley is not being paved, all drainage is to be routed

across the property so that no runoff enters the alley, except as discussed under Section V. Proposed Drainage Plans.

Further to the south is the 66" RCP and the surface drainage easement. The 15 foot wide easement for the 66" RCP abuts the southwest tip of the property and the surface drainage easement, 30' in width, takes up the southwest 30 feet of the property. The Master Drainage Plan shows the capacity of the 66" RCP as being 270 cfs. The remaining 216 cfs is overland flow.

A hydrograph for the storm sewer capacity at Carlisle Blvd. near KOAT was prepared by Mr. Charles M. Easterling. This is shown in the Appendix to this report.

V. PROPOSED DRAINAGE PLANS

A. Criteria

(1) General: Resolution No. 1972-2, Albuqerque Metropolitan Flood Control Authority
(2) Project Storm: Intensity/duration curve based on NOAA Atlas 2 dated 1973.

B. Flood Protection

The Flood Hazard Boundary Map is shown in the Appendix. Although the western end of the property is inundated by the 100 year flood. The proposed finished floor elevation of the building is five feet above high water.

C. Site Drainage

As shown on the attached plan, the general pattern of the existing drainage will not have to be altered significantly in developing the property. As mentioned earlier in the report, the hydrograph supplied by Mr. Easterling shows that the capacity of the storm drain is 270 cfs. The time of concentration for this tract is approximately seven minutes. By examining the hydrograph, the discharge at seven minutes (0.12 hours) is approximately 53 cfs or about 20 percent of its capacity. Therefore, there is more than adequate unused capacity in the storm drain to accept the free discharge of the peak runoff from this site

The tract is essentially divided into three areas for the purpose of drainage computations.

(1) AREA 1 (approx. 3,400 sf): This area, which consists of the front lawn and landscaping and approximately 20 percent of the roof area, is proposed to drain into the alley Although this is contrary to the condition established by the City Engineering hydrology section (i.e. that all drainage be routed across the site and none into the alley if the alley is not to be paved), it is not practical to force runoff from this area around the south side of the building. On the north side, the clearance between the building and the alley is not sufficient to accomodate a drainage way of any kind. The cost and associated maintenance

problems of an underground drain is not warranted by the small amount of drainage this area will generate.

(2) AREA 2 (approx. 23,600 sf): This is the developed area of the tract, less Area 1, and it is proposed that runoff from this area concentrate at the northwest corner of the parking lot. From this point it will be channeled to the west along the north property line via a paved swale to a catch basin centered in the 30' surface drainage and underground utility easement. The catch basin will be connected directly to the 66" RCP storm sewer by a 12" RCP. The point of connection will be in the alley to avoid moving the chain link fence around the KOAT property.

(3) AREA 3 (approx. 10,213 sf): This area is the undeveloped portion of the tract and it is proposed that it remain undeveloped, at least until it becomes necessary to expand the parking area. Since no grading is proposed, an erosion control plan is not required. It is proposed to collect whatever amount of drainage can be collected from this area by the catch basin without altering the existing contours. The remaining drainage will flow down the surface drainage easement. For purposes of computing catch basin capacity, it is assumed that all the drainage from Area 3 enters the catch basin simultaneously with runoff from Area 2.

VI. CONCLUSIONS AND RECOMMENDATIONS

On the basis of the study performed herein, the following recommendations are made.

(1) The 66" RCP storm sewer has adequate capacity to accept the free discharge of the peak runoff from this site. It is recommended that the runoff be discharged directly into the storm sewer without ponding.

(2) It is recommended that a drainage inlet be constructed with 12" minimum RCP outlet connected directly to the 66" RCP storm sewer. The inlet should be surrounded by asphalt paving and asphalt curb so that all drainage from the site and alley will drain to it but will not drain past it into the adjacent KOAT property. Maintenance will be the responsibility of the property owner.

(3) It is recommended that the drainage swale between the parking lot and the catch basin be asphalt paved to prevent erosion and to reduce the maintenance of the catch basin which might otherwise become silted more rapidly.

(4) As the turnout to the alley presently exists, the asphalt paving is sufficiently higher than Carlisle Blvd. flowline to prevent water from entering the alley from Carlisle Blvd. The proposed alley grade has been designed to insure that this does not occur.

In conclusion, if the above listed recommendations are implemented with the development of the property, the development will not create a flood hazard to surrounding properties. The proposed improvements are not in danger of flooding in any case.

FRANK D. LOVELADY
NEW MEXICO
6512
6/24/81
REGISTERED PROFESSIONAL ENGINEER

Respectfully Submitted,

BOYLE ENGINEERING CORPORATION

Frank D. Lovelady

Frank D. Lovelady, P.E.
Senior Civil Engineer

REFERENCES

Albuquerque Metropolitan Arroyo Flood Control Authority Resolution No. 1972-2

Bohannan-Huston Inc. Albuquerque Master Drainage Study, January 1981

Seelye, El . Design: Data Book for Civil Engineers, 1960

APPENDIX A

DRAINAGE CALCULATIONS

Total Project Area = 0.8543 acres

Length = 370 feet

Average Slope $= \frac{5116-5110}{370} = 0.0162$ ft./ft.

I. Existing Conditions

A. Determination of Time of Concentration, t_c

Undeveloped ground - poor grass and bare ground

From: Figure 8 - Overland Flow Time
Page 18-01, Data Book for Civil Engineers: Design by Elwyn Seelye

t_c = 14.7 minutes

B. Determination of Intensity

For 100 year storm - From curve based on NOAA Atlas 2 dated 1973

Intensity = 5.13 in. per hour

C. Determination of Runoff for 100 Year Storm

Rate of flow, $Q_{100} = CIA$

C = Coefficient of runoff
A = Area, in acres
I = Intensity, in./hr.

$Q_{100} = 0.4\ (5.13)(0.8543) = 1.75$ cfs

II. Condition after Development

A. Area 1 (approx. 3,400 SF)

1. Average coefficient of runoff

Roof	870 (0.9) =	783
Grass & landscaping	2,530 (0.4) =	1,012
	3,400	1,795

Average $C = \frac{1795}{3400} = 0.53$

2. Determination of runoff from Area 1 for 100 year storm.

Use minimum t_c of 10 minutes

Use intensity of 5.9 in./hr. per NOAA Atlas 2 curve.

$Q_{100} = (0.53)(5.9)(\frac{3400}{43,560}) = 0.24$ cfs

B. AREA 2 (approx. 23,600 SF)

1. Average coefficient of runoff. All surfaces to be either roof, sidewalk, asphalt paving or southwestern type landscaping. Therefore, C = 0.9

2. Time of concentration

Slope = $\frac{5116.33-5112.5}{270} = 0.0142$ ft./ft.

From nomograph, t_c = 6.5 minutes (use 10 minute minimum)

3. Determination of runoff from Area 2 for 100 year storm.

$Q_{100} = (0.9)(5.9)(\frac{23,600}{43,560}) = 2.88$

C. AREA 3 (approx. 10,213 SF)

1. Coefficient of runoff - This area will remain undeveloped. Therefore, C = 0.4

2. Determination of runoff from Area 3.

Use minimum t_c of 10 minutes.

Use intensity of 5.9 inches per hour.

$Q_{100} = (0.4)(5.9)(\frac{10,213}{43,560}) = 0.55$ cfs

III. Capacity of Various Channels, Inlets, Pipes, Etc.

A. Opening in asphalt curb at N.W. corner of parking lot.

Q = 2.88 cfs

For trapezoidal weir $Q = 3.367\ LH^{3/2}$ $H = 0.5$

Solving for L $L = 2.88/(3.367)(0.5)^{3/2}$

$= 2.41'$

Use 4' opening

B. Paved swale 4' wide; determine depth

Mannings formula $V = \frac{1.486}{n} R^{2/3} S^{1/2}$ $S = \frac{5112.5-5109.5}{130}$

Use n = 0.14 for asphalt surface. = 0.0231

Trial	Depth	Area	WP	R	$R^{2/3}$	V	Q
1	9"	1.5	4.28	0.35	0.5	6.93	10.39
2	6"	1.0	4.12	0.24	0.39	5.49	5.49
3	4"	0.66	4.06	0.16	0.30	4.16	2.93

2.93 cfs > 2.88 cfs 4" depth is adequate.

C. Capacity of catch basin grate, single "D"
(See City of Albuquerque standard drawing K-8-1)

Area of one opening

Space between bars is 3/4" wide

Length = 41.38 - 8" (Bearing angles) - 1" (2-½" pipe spacers)
= 32.38" for 3

Ave. Length = 10.79

$Q = Ca\sqrt{2gh}$

C = 0.65

$a = \frac{0.75 \times 10.79}{144} = 0.0562$ SF

h = 0.5' above grate

$Q = 0.65(0.0562)\sqrt{2(32.2)0.5} = 0.2073$ cfs per opening

Neglect outside 5/8" opening, each side.
Number of openings = 3 rows of 19 openings = 57 openings
Assume 50% clogging factor
57 x 0.2073 x 0.5 = 5.91 cfs = capacity of grate

Total flow to catch basin is 2.88 cfs from Area 2
plus 0.55 cfs from Area 3 equals 3.43 cfs.

Therefore, capacity of grate is greater than expected flow.
Single "D" grate is adequate.

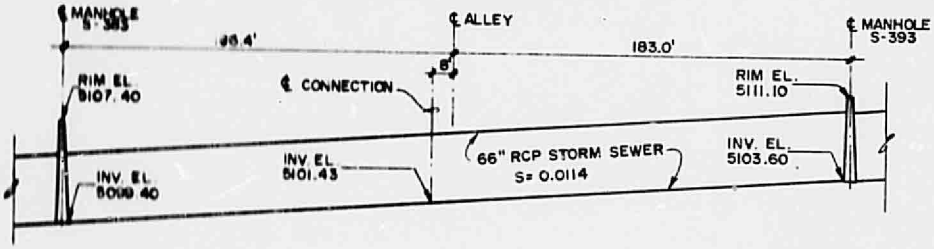
D. Capacity of catch basin outlet pipe.

Slope of pipe is 6 percent and outlet enters 66" RCP above the spring line. Therfore the outlet will have free, unsubmerged discharge.

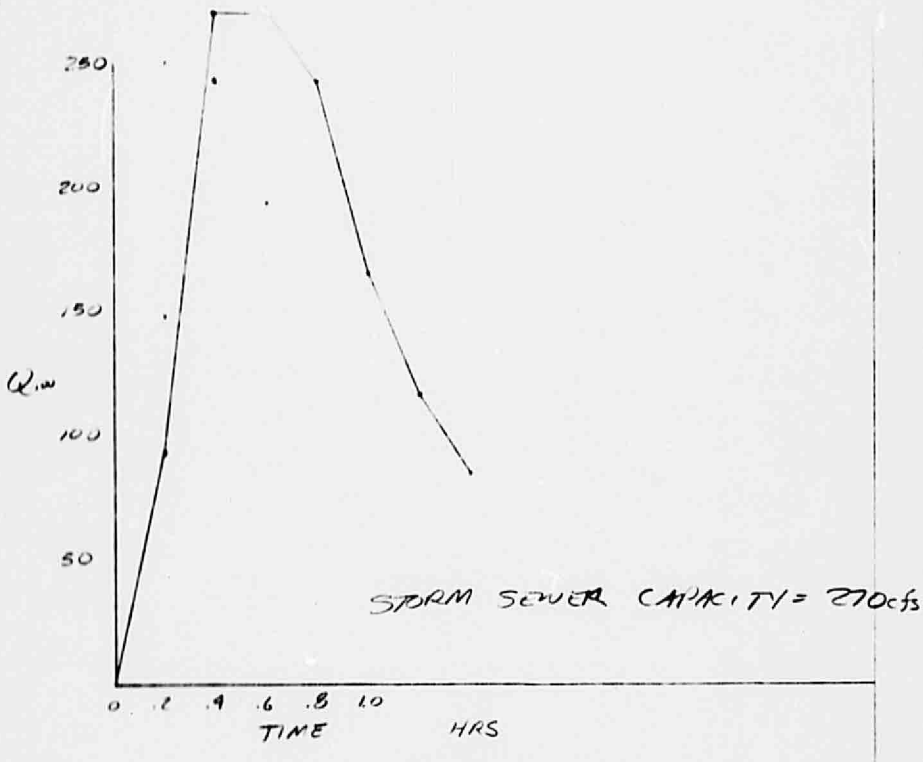
Using inlet control nomograph, chart 2, Bureau of Public Roads, 1963 for a 12" RCP at 3.43 cfs using scale 1, entrance type square edge with headwall, headwater depth in diameters is 1.4 or 1.4 feet above the invert. This headwater depth is easily contained within the depth of catch basin box provided.

E. Connections to Existing 66" Storm Sewer

The connection is located between manholes S-383 and S-393. Invert elevations were shot on both of the manholes and the distance between them was measured. The slope between the manholes was computed and the elevation at the point of connection was calculated. This information is shown in the diagram below.

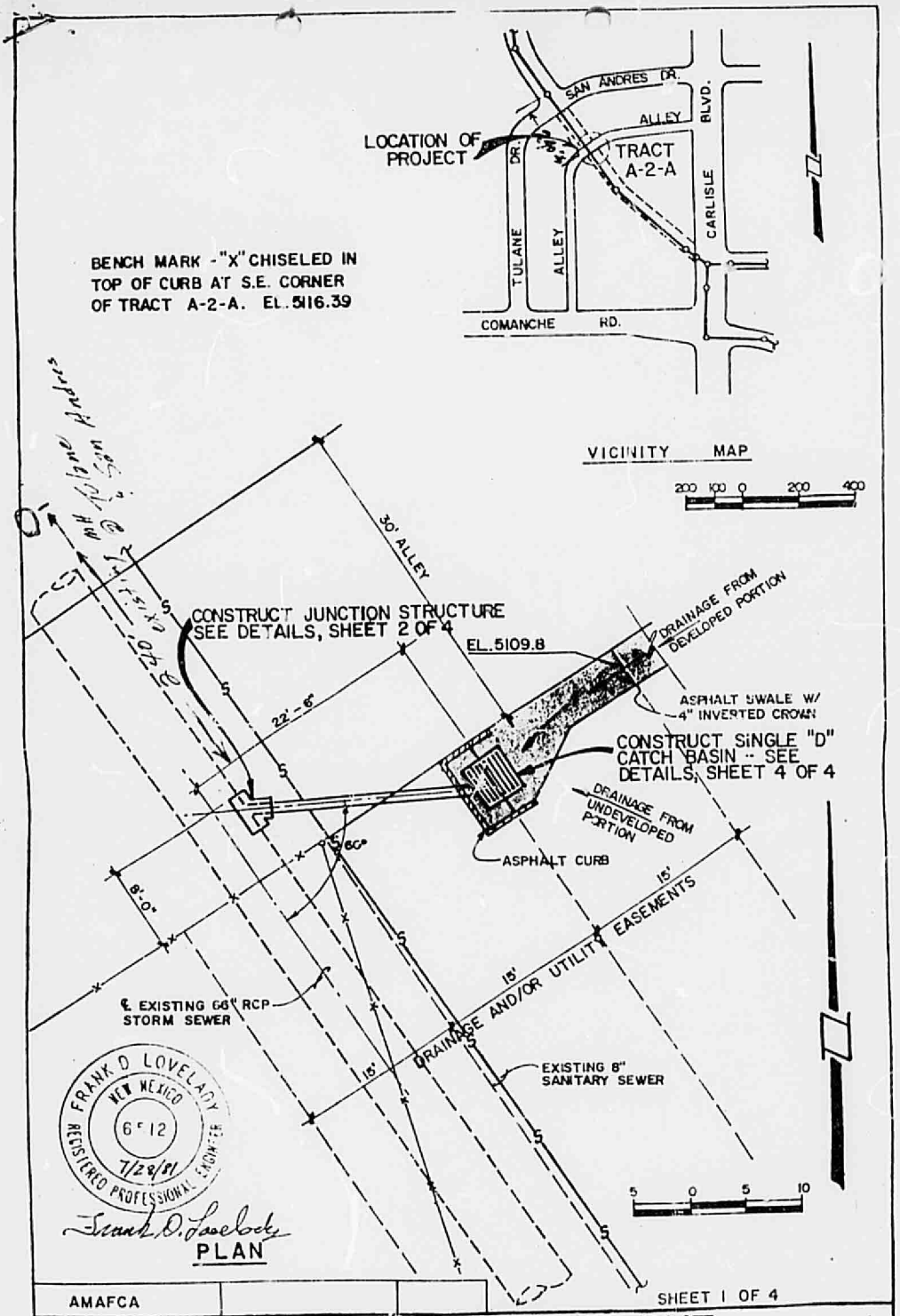


APPENDIX B



Q_{100} HYDROGRAPH AT CARLISLE NEAR KOAT-TV

6/17/81



AMAFCA		

SHEET 1 OF 4

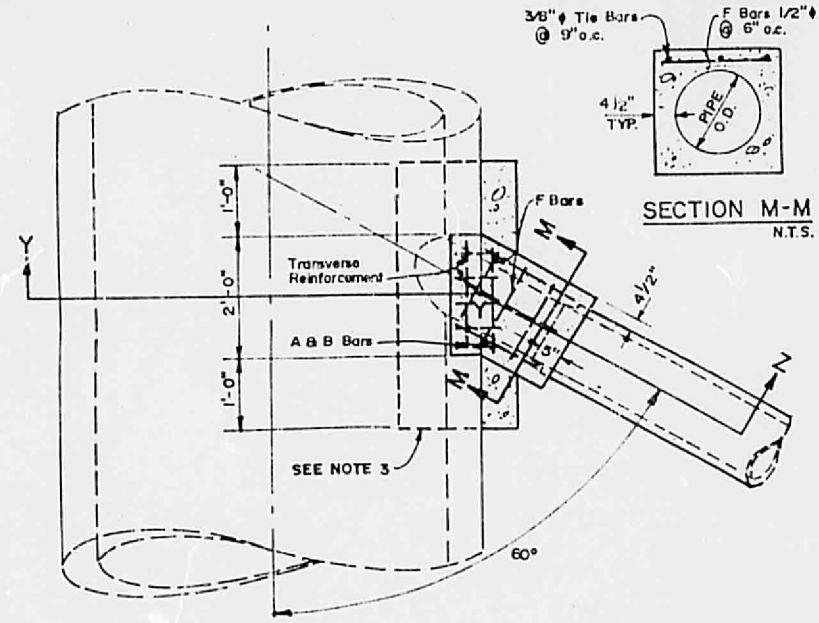
CITY OF ALBUQUERQUE

APPROVALS	ENGINEER	DATE
A.C.E. / DESIGN	[illegible]	11-20-81
INSPECTOR	[illegible]	2-16-82
A.C.E. / FIELD	[illegible]	3-3-82

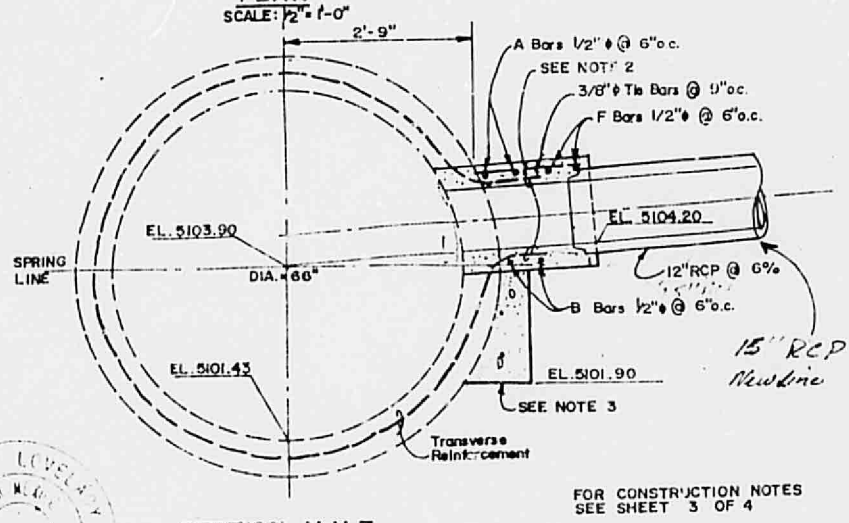
TITLE: MONTGOMERY HEIGHTS ADDITION TRACT A-2-A
CATCH BASIN & JUNCTION STRUCTURE

PROJECT NO. 3715 Carlisle [illegible] 2-02775

MAP NO. G-16



PLAN
SCALE: 1/2" = 1'-0"



FOR CONSTRUCTION NOTES SEE SHEET 3 OF 4

SECTION Y-Y-Z
SCALE: 1/2" = 1'-0"

FRANK D. LOVELADY NEW MEXICO 7112 REGISTERED PROFESSIONAL ENGINEER 7/29/91

Frank D. Lovelady

AMAFCA			SHEET 2 OF 4

CITY OF ALBUQUERQUE

APPROVALS	ENGINEER	DATE	TITLE: MONTGOMERY HEIGHTS ADDITION TRACT A-2-A JUNCTION STRUCTURE DETAILS
A.C.E. / DESIGN	[illegible]	[illegible]	
INSPECTOR			PROJECT NO. / MAP NO. G-16
A.C.E. / FIELD			

NOTES:

1. Rectangular opening in main line pipe shall be cut within the limits shown normal to pipe surface without damaging steel.

2. Transverse reinforcement in pipe shall be cut in center of opening and bent to uniform distance from top and bottom of junction structure.

3. Main line pipe, beneath and to each side of rectangular opening, shall be cradled in concrete as shown on the plan. Bottom of cradle shall be poured against undisturbed soil.

4. Concrete shall be 3000 psi.

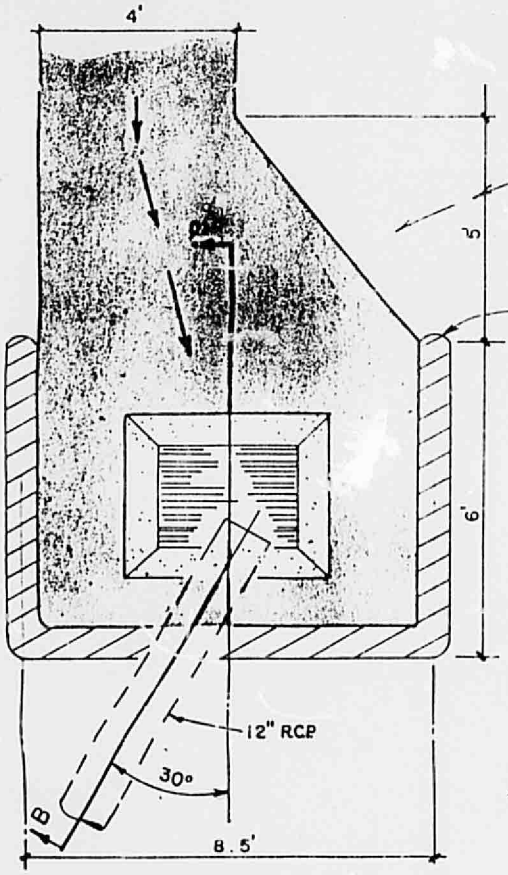
5. Reinforcing steel shall be round, deformed, straight bars 1½" clear from face of concrete unless otherwise shown.

6. Design is based on City of Los Angeles, Department of Public Works Standard Plan Number B-1529, Junction Structure B.

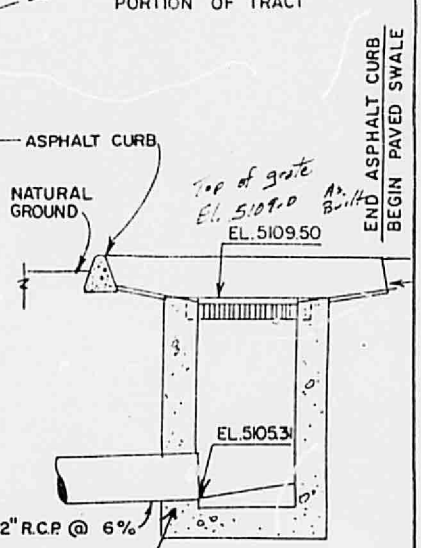
FRANK D. LOVELADY
NEW MEXICO
6512
7/23/01
REGISTERED PROFESSIONAL ENGINEER

SHEET 3 OF 4

AMAFCA			CITY OF ALBUQUERQUE	
APPROVALS	ENGINEER	DATE	TITLE: MONTGOMERY HEIGHTS ADDITION TRACT A-2-A CONSTRUCTION NOTES - JUNCT'N STRUCTURE	
A.C.E. / DESIGN				
INSPECTOR			PROJECT NO.	MAP NO. G-16
A.C.E. / FIELD				



PLAN
SCALE 3/8"=1'-0"



SECTION - B B
SCALE: 3/8"=1'-0"

NOTES:

1. For catch basin details, see City of Albuquerque Standard Drawing K-6-1 catch basin, double "D".

2. For asphalt curb see City of Albuquerque Standard Drawing P-8-2 Paving Curb and Gutter.

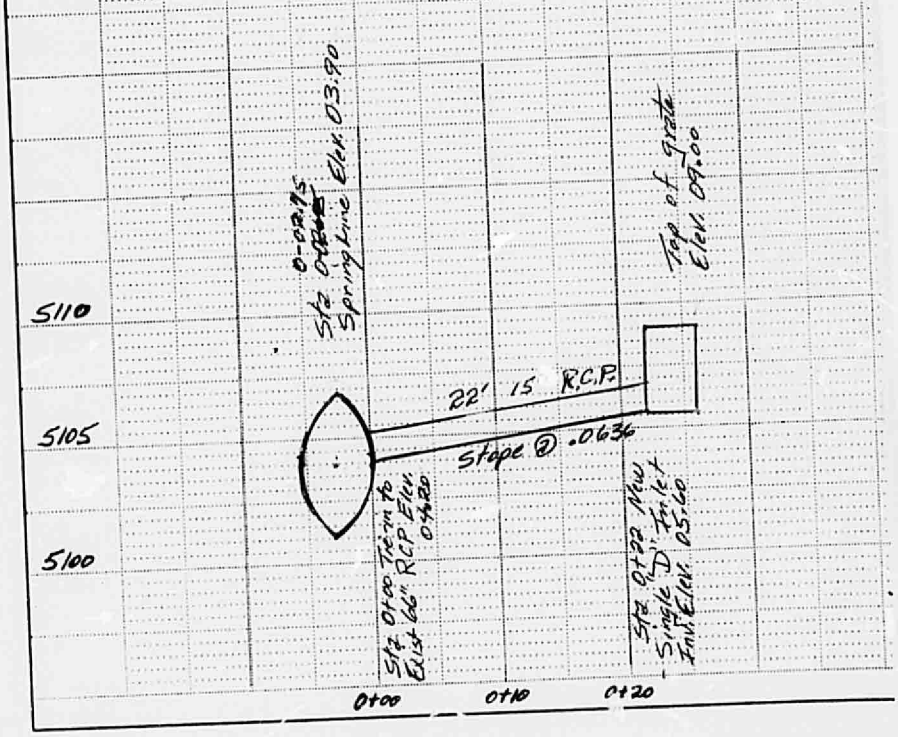
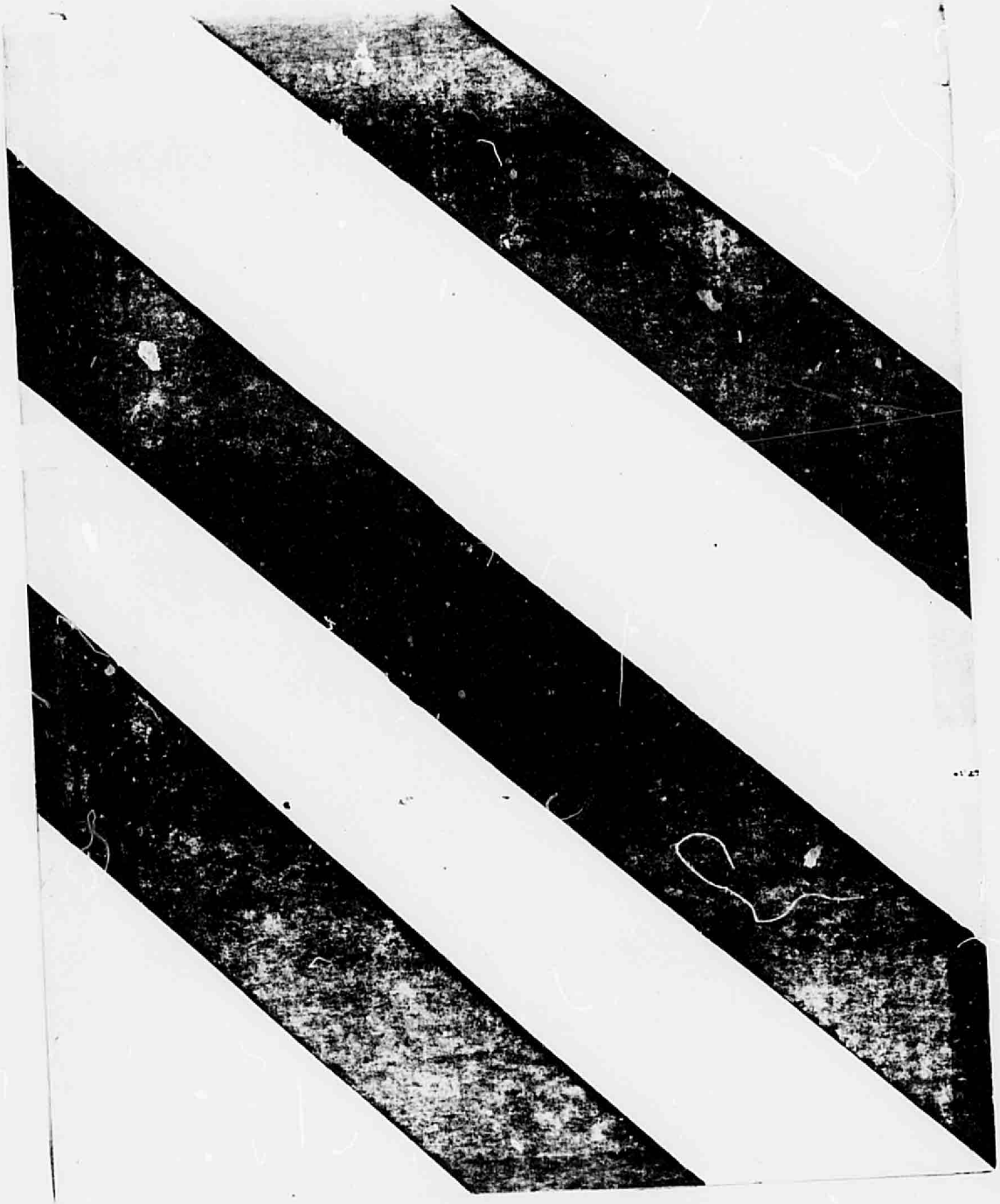
FRANK D. LOVELADY
NEW MEXICO
6512
1/28/81
REGISTERED PROFESSIONAL ENGINEER

Frank D. Lovelady

AMAFCA			SHEET 4 OF 4

CITY OF ALBUQUERQUE

APPROVALS	ENGINEER	DATE	TITLE: MONTGOMERY HEIGHTS ADDITION TRACT A-2 A CATCH BASIN AND PAVING DETAILS
A.C.E. / DESIGN			
INSPECTOR			PROJECT NO. / MAP NO. G-16
A.C.E. / FIELD			

3915 Carlisle NE.
Project No. D-02775

As Built