HYDROLOGY K15/D23 3 PLANS

K15/D23

3 PLANS

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

DESIGN HYDROLOGY SECTION
123 Central NW, Albuquerque, NM 87102
(505) 766-7644

May 21, 1984

Mr. Thornton D. Schwenk PE
Senior Civil Engineer
Boyle Engineering Corp.
3939 San Pedro NE, Suite D
Albuquerque, NM 87103

REF: DRAINAGE PLAN FOR PRESBYTERIAN HOSPITAL PARKING LOTS 1-2, BLOCK 31 AND LOTS 3-6, BLOCK 38, TERRACE ADDITION (K15-D23) 5/2/84

Dear Mr. Schwenk:

Based on the information provided on your May 15, 1984 resubmittal, the above referenced drainage is approved.

The approved "Drainage Facilities Within City R/W" documents for both facilities must be attached to the construction sets before Hydrology will sign-off.

If you have any questions or comments, please feel free to call me at 766-7644.

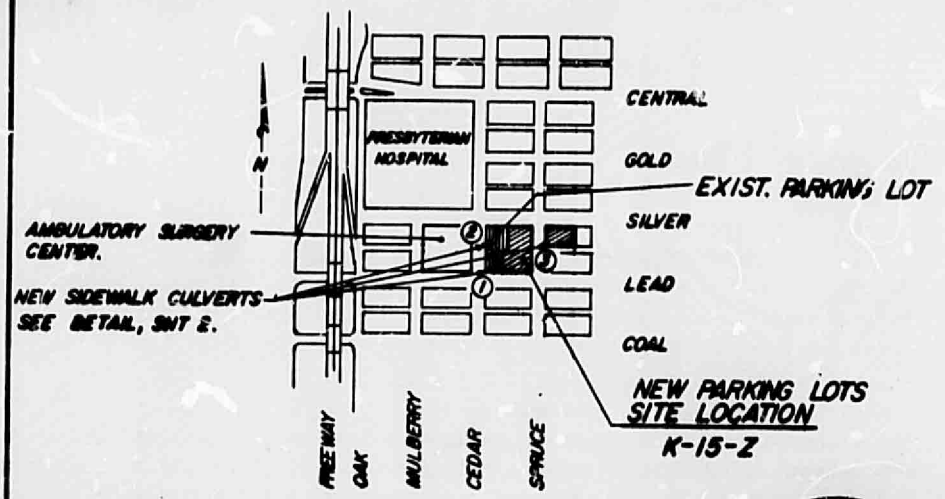
Sincerely,

Billy J. Goolsby

Billy J. Goolsby, PE
City/County Flood Plain Admin.

BJG:BJM:mrk

Rec'd 7/18/84



VICINITY MAP

N.T.S.

PROFESSIONAL ENGINEER No. 6738 NEW MEXICO THEODORE D. SCHNEIDER

1-20-84

NOTICE TO CONTRACTOR

1. An excavation/construction permit will be required before beginning any work within City right-of-way. An approved copy of these plans must be submitted at the time of application for this permit.

2. All work detailed on these plans to be performed, except as otherwise stated or provided herein, shall be constructed in accordance with Public Works Contract No. 84-1.

3. Two working days prior to any excavation, contractor must contact Line Locating Service, 765-1234, for location of existing utilities.

4. Prior to construction, the contractor shall excavate and verify the horizontal and vertical locations of all obstructions. Should a conflict exist, the contractor shall notify the engineer so that the conflict can be resolved with a minimum amount of delay.

5. Backfill compaction shall be according to Residential street use.

PROJECT NO: 801-236-00

Okay Tom

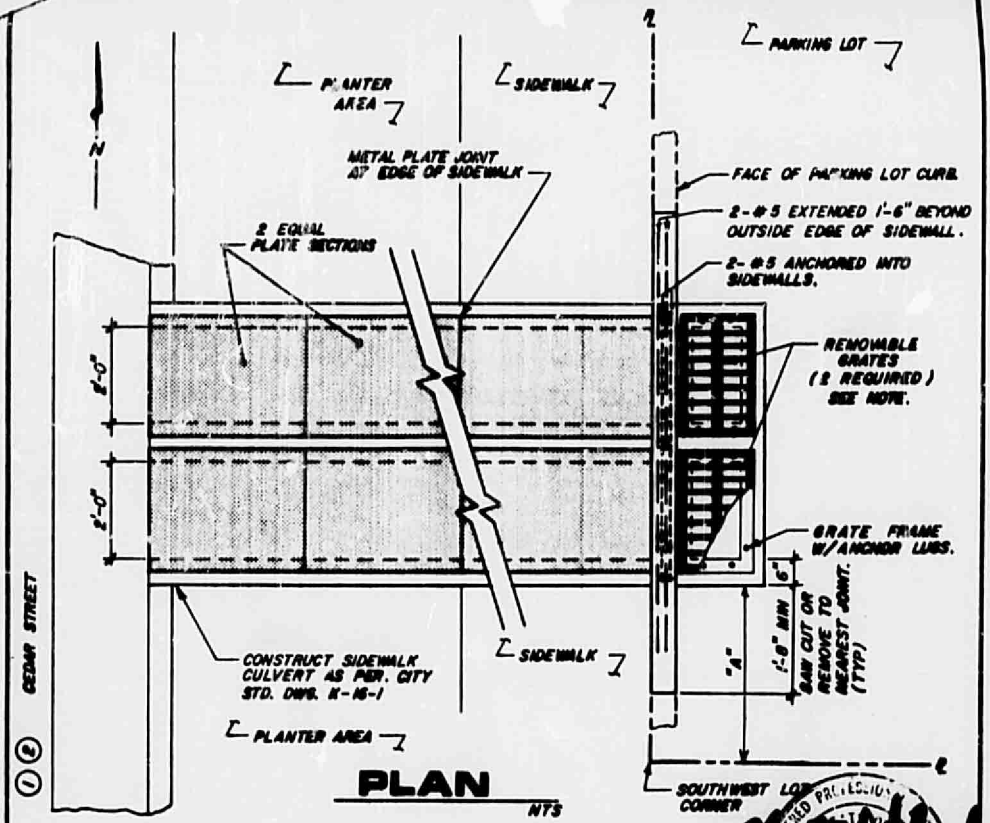
Universal Const. Revised D-12
#14033

Souls Engineering Corporation
consulting engineers / architects

CITY OF ALBUQUERQUE

APPROVALS	ENGINEER	DATE	TITLE
A.C.E. / DESIGN	A L Oka	5/17/84	PRESBYTERIAN HOSPITAL CENTER SOUTH PARKING LOTS
INSPECTOR	L. Romero	3-8-85	PERMIT NO. 14033 / MAP NO. K-15
A.C.E. / FIELD	W. McNamara	3/15/85	SHEET NO. 1 of 3

FIGURE 7



PLAN

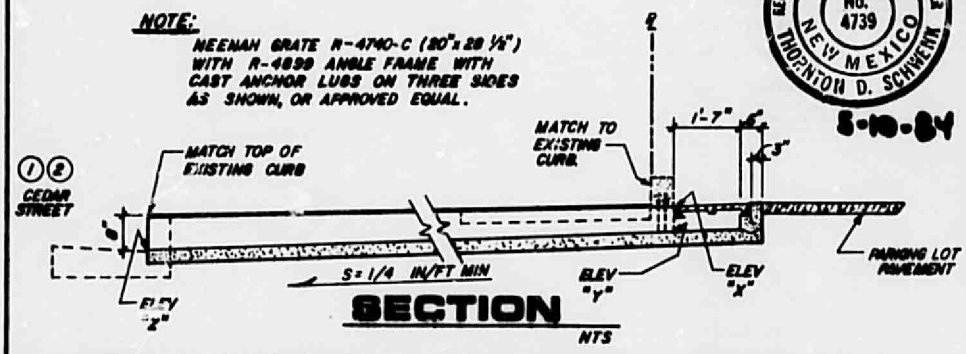
NTS

NOTE:

NEENAH GRATE R-4740-C (20"x 28 1/2") WITH R-4899 ANGLE FRAME WITH CAST ANCHOR LUGS ON THREE SIDES AS SHOWN, OR APPROVED EQUAL.

REGISTERED PROFESSIONAL ENGINEER No. 4739 NEW MEXICO THORNTON D. SCHWENK

5-10-84



SECTION

NTS

CULVERT LOCATION	STREET AT OUTLET	PROPERTY CORNER AT INLET	PARKING LOT CURB	DIMENSION "A"	INLET ELEV. "X"	INLET ELEV. "Y"	OUTLET ELEV. "Z"
1	CEDAR	LOT 7, BLK 31	EXIST.	6'-0"	5081.96'	5081.29'	5080.83'
2	CEDAR	LOT 6, BLK 31	EXIST	2'-0"	5086.46'	5085.79'	5085.35'

BENCH MARK:

A.C.S. BM. K-15-S
A STANDARD BRASS TABLET SET IN CONCRETE LOCATED 0.35 MILES NORTH OF STADIUM BLVD. & 250' WEST OF UNIVERSITY BLVD.
ELEVATION = 5117.817' MSL

Revised D-12

PROJECT NO. 501-236-00

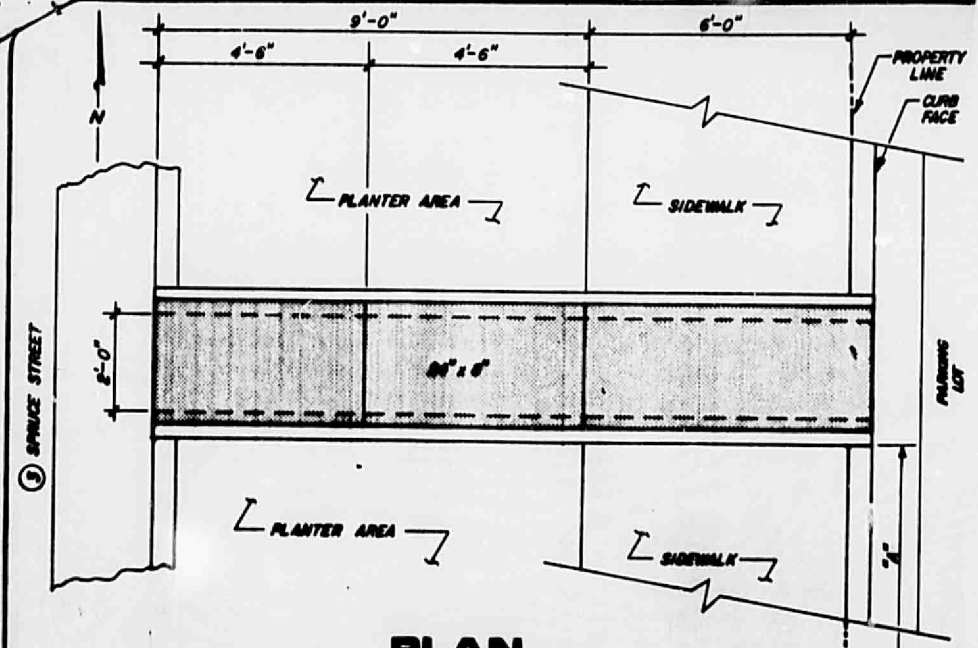
Boyle Engineering Corporation
consulting engineers / architects

Universal const. Permit #14033

CITY OF ALBUQUERQUE

APPROVALS	ENGINEER	DATE	TITLE
A.C.E. / DESIGN	[illegible]	5/17/84	PRESBYTERIAN HOSPITAL CENTER SOUTH PARKING LOTS
INSPECTOR	[illegible]	3-8-85	PERMIT NO. 14033
A.C.E. / FIELD	W. J. McNamara	3/15/85	SHEET NO. 2 of 3

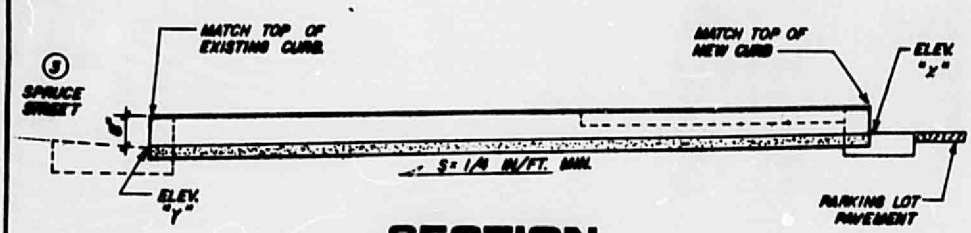
MAP NO. K - 15



PLAN

3/8" = 1'-0"

NOTE: CONSTRUCT SIDEWALK CULVERT AS PER CITY STD. DWG. K-18-1



SECTION

3/8" = 1'-0"

CULVERT LOCATION	STREET AT OUTLET	PROPERTY CORNER AT INLET	PARKING LOT CURB	DIMENSION "A"	CURB CULVERT INLET EL. "X"	CURB CULVERT OUTLET EL. "Y"
3	SPRUCE	LOT 6, BLK 38	NEW	4'-6"	5102.55'	5102.24'

STATE OF NEW MEXICO No. 4739 REGISTERED PROFESSIONAL ENGINEER THORNTON D. SCHWENK

5-10-84

Revised D-12

BENCH MARK:

A.C.S. BM. K-15-S
A STANDARD BRASS TABLET SET IN CONCRETE LOCATED 0.35 MILES NORTH OF STANAM BLVD. & 250' WEST OF UNIVERSITY BLVD.
ELEVATION = 5117.617' MSL D-12

PROJECT NO. 501-236-00

Boyle Engineering Corporation
consulting engineers / architects

Universal Const
Permit #14033

CITY OF ALBUQUERQUE

APPROVALS	ENGINEER	DATE
A.C.E. / DESIGN	[illegible]	5/17/84
INSPECTOR	L. Romero	3-8-85
A.C.E. / FIELD	[illegible]	3/15/85

TITLE
PRESBYTERIAN HOSPITAL CENTER
SOUTH PARKING LOTS

PERMIT NO. 14033
SHEET No. 3 of 3
MAP NO. K - 15

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

March 1, 1984

Mr. Thornton D. Schwenk, P.E.
Senior Civil Engineer
Boyle Engineering Corporation
3939 San Pedro NE, Suite D
Albuquerque, NM 87103

REF: DRAINAGE PLAN FOR PRESBYTERIAN HOSPITAL PARKING LOTS 1-12, BLOCK 31 AND LOTS 3-6, BLOCK 38, TERRACE ADDITION (K15-D23)

Dear Mr. Schwenk:

Based on the information provided on your January 24, 1984 submittal of the above referenced drainage report, listed below you will find certain concerns that will need to be addressed before final approval is granted:

1. Professional's stamp with signature and date

   A. Engineer who prepared the drainage report or plan.

2. City Engineer approved alley grades for unpaved alley which abuts Block 38 will be required.

3. Per the DPM: need more spot elevations on top of curb and flow line to determine if the elevation of the property line is at-least 1.0 foot above adjacent flow line (which means that spot elevations are needed around perimeter of proposed sites in question).

4. Show inverts at the inlet and outlet of each proposed sidewalk culvert.

5. Please include the sidewalk culvert hydraulics on your resubmittal.

6. Elevations on Block 31 will need to be based directly on City of Albuquerque Datum.

7. Please include a copy of survey done on Block 38 by Albuquerque Surveying Company, Inc.

8. You will need to demonstrate with spot elevations that the water from Block 38 will turn at Lead Avenue and flow west toward the existing catch basin.

9. Benchmark-location, description and elevation of the

   A. Site benchmark . . rebar

If you have any questions on the above comments, please feel free to call me at 766-7644.

Sincerely,

Bernie J. Montoya

Bernie J. Montoya
Hydrologic Engineering Tech.
C.E.

BJM:mrk

Boyle Engineering Corporation

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

consulting engineers

505 / 883-7700

City of Albuquerque
P. O. Box 1293
Albuquerque, New Mexico 87103

January 23, 1984
AL-S01-236-00

ATTN: Mr. Fred J. Aguirre, Civil Engineer/Hydrology

RE: DRAINAGE PLAN FOR PRESBYTERINAN HOSPITAL PARKING LOTS
LOTS 1-12, BLK 31 & LOTS 3-6, BLK 38, TERRACE ADDITION, K-15-Z

Dear Fred:

Transmitted herewith are three copies of the subject drainage plan.

The Special Order No. 19 sheets 1 and 2 of 2 have been approved by Bob Kielich and are bound in the report.

We thank you for the assistance of Billy Goolsby from your staff in recommending a drainage concept which eliminates the need for detention ponds on the site. Please call if you have any questions during the review of this report.

Sincerely,

BOYLE ENGINEERING CORPORATION

Thornton D. Schwenk

Thornton D. Schwenk, P.E.
Senior Civil Engineer

cc: Chris Willadsen; Stevens, Mallory, Pearl & Campbell

RECEIVED
JAN 24 1984
HYDROLOGY SECTION

INFORMATION SHEET

PROJECT TITLE Presbyterian Hospital Center South Parking Lots TYPE OF SUBMITTAL Drainage Plan

ZONE ATLAS PAGE NO. K15 CITY ADDRESS

LEGAL DESCRIPTION Lots 1,2,3,9,10,11,12 of Block 31 and Track A , Lots 3-6 of Block 38 Terrace Addition, Albuquerque, New Mexico

ENGINEERING FIRM Boyle Engineering Corporation CONTACT Thornton D. Schwenk

ADDRESS 3939 San Pedro, N.E., Suite D PHONE 883-7700

OWNER Presbyterian Hospital Center CONTACT Jim Hinton

ADDRESS 1100 Central, S.E. PHONE 841-1234

ARCHITECT Stevens,Mallory, Pearl & Campbell CONTACT Chris Willadsen

ADDRESS 115 Amherst, S.E. PHONE 255-8668

SURVEYOR Albuquerque Surveying Co. Inc. CONTACT Fred Sanchez

ADDRESS 2119 Menaul, N.E. PHONE 884-2036

CONTRACTOR CONTACT

ADDRESS PHONE

PRE-DESIGN MEETING:

X YES
NO
X COPY OF CONFERENCE RECAP SHEET PROVIDED

PLEASE CHECK TYPE OF APPROVAL EXPECTED WITH THIS SUBMITTAL:

SKETCH PLAT APPROVAL
PRELIMINARY PLAT APPROVAL
SITE DEVELOPMENT PLAN APPROVAL
FINAL PLAT APPROVAL
BUILDING PERMIT APPROVAL
CERTIFICATE OF OCCUPANCY APPROVAL
ROUGH GRADING PERMIT APPROVAL
X GRADING/PAVING PERMIT APPROVAL
OTHER (SPECIFY)

RECEIVED JAN 24 1984 HYDROLOGY SECTION

DATE SUBMITTED: January 23, 1984 BY: Thornton D. Schwenk

Boyle
Engineering
Corporation

Suite D
6600 San Pedro N.E.
Albuquerque, New Mexico 87110
505 883-7700

DRAINAGE PLAN

for the

PRESBYTERIAN HOSPITAL PARKING LOTS

occupying former

Lots 1 - 12, Block 31, Terrace Addition

Lots 3 - 6 , Block 38, Terrace Addition

Presbyterian Hospital Center

Albuquerque, New Mexico

K15 - D23

RECEIVED
MAY 1 - 1984
HYDROLOGY SECTION

January 23, 1984

(REV. NO. 1 - MAY 11, 1984)

Boyle Engineering Corporation

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

consulting engineers

505 / 883-7700

City of Albuquerque
P. O. Box 1293
Albuquerque, New Mexico 87103

May 11, 1984
AL-S01-236-00

ATTN: Mr. Fred J. Aguirre, Civil Engineer/Hydrology

RE: REVISED DRAINAGE PLAN FOR PRESBYTERINAN HOSPITAL PARKING LOTS
LOTS 1-12, BLK 31 & LOTS 3-6, BLK 38, TERRACE ADD'N, K15-D23

Dear Fred:

Transmitted herewith are two copies of the revised drainage plan for the above-referenced project. All comments contained in Bernie Montoya's review of March 1, 1984 have been addressed by this revision.

The comment of major significance had to do with preparation of alley grades which were approved by the City's Design Review Committee on May 2, 1984 as City Drawing No. 2137.

We believe that our report should now meet the DPM criteria and therefore request your approval as soon as possible.

Sincerely,

BOYLE ENGINEERING CORPORATION

Thornton D. Schwenk, P.E.
Senior Civil Engineer

cc: Chris Willadsen; Stevens, Mallory, Pearl & Campbell

RECEIVED
MAY 1[illegible] 1984
HYDROLOGY SECTION

TABLE OF CONTENTS

LETTER OF TRANSMITTAL

INFORMATION SHEET

CONFERENCE RECAP OCTOBER 12, 1983

I. PURPOSE

II. SCOPE

III. LOCATION

IV. EXISTING DRAINAGE CONDITIONS

V. PROPOSED DRAINAGE CONDITIONS

VI. EROSION CONTROL PLAN

VII. FINDINGS AND CONCLUSIONS

VIII. RECOMMENDATIONS

APPENDIX - DRAINAGE CALCULATIONS

LISTS

FIGURE 1 - ZONE ATLAS SHEET K-15-Z

FIGURE 2 - 100-YEAR FLOOD HAZARD AREAS
ALBUQUERQUE MASTER DRAINAGE STUDY, VOL. II 1981

FIGURE 3 - FLOOD HAZARD BOUNDARY MAP
COMMUNITY PANEL NUMBER 350002 00005B 12-4-79

FIGURE 4 - SOILS SURVEY OF BERNALILLO COUNTY
SHEET 31, SCS, JUNE 1977

FIGURE 5 - EXISTING STORM SEWERS
ALBUQUERQUE MASTER DRAINAGE STUDY, VOL. II 1981

FIGURE 6 - BENCH MARK K15-S, CONTROL STATION DATA
ALBUQUERQUE CITY SURVEYS

FIGURE 7 - SPECIAL ORDER NO. 19 FORMS, SHEETS 1 THRU 3,
FOR CONSTRUCTION IN THE PUBLIC R.O.W.

TABLE 1 - INVENTORY OF EXISTING STORM SEWERS
ALBUQUERQUE MASTER DRAINAGE STUDY, VOL. II 1981
PAGE 2B-35

EXHIBIT 1 - DEVELOPMENT REVIEW BOARD RESOLUTION
VACATION OF EAST-WEST ALLEYS IN BLOCKS 26 & 31
V-83-28, SEPTEMBER 22, 1983

PLATE I - SITE & DRAINAGE PLAN, MAY 2, 1984

INFORMATION SHEET

PROJECT TITLE Presbyterian Hospital Center South Parking Lots TYPE OF SUBMITTAL Drainage Plan

ZONE ATLAS PAGE NO. K15 CITY ADDRESS N.A. (Parking Lots)

LEGAL DESCRIPTION Lots 1,2,3,9,10,11,12 of Block 31 and Track A , Lots 3-6 of Block 38 Terrace Addition, Albuquerque, New Mexico

ENGINEERING FIRM Boyle Engineering Corporation CONTACT Thornton D. Schwenk

ADDRESS 3939 San Pedro, N.E., Suite D PHONE 883-7700

OWNER Presbyterian Hospital Center CONTACT Jim Hinton

ADDRESS 1100 Central, S.E. PHONE 841-1234

ARCHITECT Stevens,Mallory, Pearl & Campbell CONTACT Chris Willadsen

ADDRESS 115 Amherst, S.E. PHONE 255-8668

SURVEYOR Albuquerque Surveying Co. Inc. CONTACT Fred Sanchez

ADDRESS 2119 Menaul, N.E. PHONE 884-2036

CONTRACTOR Page & Wirtz CONTACT Jack Wirtz

ADDRESS 5001 Los Angeles, NE PHONE 823-2940

PRE-DESIGN MEETING:

X YES
___ NO
X COPY OF CONFERENCE RECAP SHEET PROVIDED

RECEIVED MAY 1 1984 HYDROLOGY SECTION

PLEASE CHECK TYPE OF APPROVAL EXPECTED WITH THIS SUBMITTAL:

___ SKETCH PLAT APPROVAL
___ PRELIMINARY PLAT APPROVAL
___ SITE DEVELOPMENT PLAN APPROVAL
___ FINAL PLAT APPROVAL
___ BUILDING PERMIT APPROVAL
___ CERTIFICATE OF OCCUPANCY APPROVAL
___ ROUGH GRADING PERMIT APPROVAL
X GRADING/PAVING PERMIT APPROVAL
___ OTHER _____ (SPECIFY)

DATE SUBMITTED: January 23, 1984 BY: Thornton D. Schwenk

Rev. No. 1 Submitted May 11, 1984

CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION

HYDROLOGY SECTION PROJ. NO. _____ DATE: 10/12/83

PLANNING DIVISION NO. _____

CONFERENCE RECAP

SUBJECT: Terrace Add, portions of Lot 31 & 38 (K15)

ATTENDANCE:	WHO	REPRESENTING
	Thornton Schwenk	Boyle
	F.J. Aguirre	C.F.

FINDINGS:

1. Drainage plan required per the DPM for the proposed parking lot.

2. Ponding not required if downstream capacity exists

3. Recommend removal of lot lines.

The undersigned agrees that the above findings are summarized accurately and are only subject to change if further investigation reveals that they are not reasonable or that they are based on inaccurate information.

SIGNED: [signature] SIGNED: Thornton A. Schwenk

TITLE: _____ TITLE: Senior Civil Engineer

DATE: 10/12/83 DATE: 10/12/83

DRAINAGE PLAN

FOR

ADDITIONAL PRESBYTERIAN HOSPITAL PARKING LOTS

OCCUPYING

LOTS 1 THROUGH 12, BLOCK 31, TERRACE ADDITION
LOTS 3 THROUGH 6, BLOCK 38, TERRACE ADDITION

AT THE MAIN CAMPUS OF THE

PRESBYTERIAN HOSPITAL CENTER

ALBUQUERQUE, NEW MEXICO

(Revision No. 1, May 11, 1984)

I. PURPOSE:

The purpose of this report is to present information, calculations, and recommendations relative to storm runoff for the site of two proposed parking lots, a planned expansion at the main campus of Presbyterian Hospital.

II. SCOPE:

This report is limited to an investigation of the existing and proposed conditions which affect storm flows on the study site. The proposed development is to be protected from flooding due to storm runoff, without increasing the threat of damage to downstream properties. Upstream areas which have been constructed since 1972 are presumed to meet the restrictions of applicable drainage ordinances and resolutions, beginning with AMAFCA Resolution 1972-2. Estimation of maximum runoff is based on the site being developed as proposed.

The drainage areas designated as 1B and 3B were studied in a previous Drainage Plan entitled "Presbyterian Hospital Drainage Study, Terrace Addition, Block 31, Lots 4, 5, 6, 7 & 8". This Plan was prepared by Boyle Engineering Corporation on August 21, 1979. These areas are re-examined and included in the present report for purposes of continuity for the site of the Block 31 parking lot.

III. LOCATION:

The study sites comprise a total of 2.544 acres (110,820 sq ft) located within a fully developed residential neighborhood in the Southeast Heights of Albuquerque.

The Block 31 parking lot (1.938 acres) has paved streets on all four sides: Silver Avenue on the north, Spruce Street on the east, Lead Avenue on the south, and Cedar Street on the west. It lies immediately east of the Presbyterian Hospital Ambulatory Surgery Center, presently under construction. Legally this lot is defined as Lot "A", Block 31, as shown on the "Dedication and Vacation Plat of Blocks 26 and 31 of the Amended Map of the Terrace Addition", recorded on September 16, 1983, in Volume C22, Folio 30 of the records of the County Clerk of Bernalillo County. Block 31 is zoned SU for Hospital Use.

The Block 38 parking lot (0.606 acres) has paved streets on its north and west boundaries, Silver Avenue and Spruce Streets, respectively. The portion of Silver fronting Block

38 will be closed to through traffic by a new concrete barrier island at the intersection with Sycamore. This closure is awaiting approval and a final resolution by the DRB in January 1984. An existing 16-ft alley adjoins the south property line. Houses to the east of this lot on Lots 2 and 1 have been razed, and these lots remain vacant. Legally the Block 38 parking lot is defined as Tract "A", Block 38, as shown on the "Re-plat of Lots 3, 4, 5 & 6, Block 38", recorded on December 22, 1983, in Volume C22, Folio 173. Block 38 is zoned SU for Hospital Use.

IV. EXISTING DRAINAGE CONDITIONS:

A. Topography and Soils

Slopes on the site are generally from northeast to southwest. The high point for the Block 31 lot at the corner of Silver and Spruce is 5104 feet. (See Note on Architectural Plan - Plate I - for converting Block 31 elevations to Mean Sea Level elevations.) The low point at the corner of Lead and Cedar is 5091 feet. The distance between these points is 411 feet, giving an average slope of 3.16%.

The high point for the Block 38 lot is 5119 and the low point is 5103. The distance between the northeast and southwest corners is 240 feet, giving an average slope of 6.68%.

The natural soils at the site are described in the SCS Soil Survey of Bernalillo County as "Cu - Cut and Fill Land". These soils consist of sandy loam and very gravelly sand that has been mixed by filling for residential development. The Hydrologic Soil Group is "A".

B. Off-Site and On-Site Drainage Conditions

In preparation for the proposed construction, the sites were cleared of all residential structures so that the exact deliniation of impervious areas could not be determined for calculation of the existing coefficient of runoff. Therefore an approximate value of 0.55 was selected based on similar drainage studies of sites developed by Presbyterian Hospital in adjoining blocks. (Ref. August 21, 1979, Drainage Study.)

The portion of Block 31 which is presently a paved lot will remain in its present state (Areas 1B and 3B, formerly Lots 4 through 8). The new paving will extend eastward to cover the remaining area of Block 31. Areas 1B and 3B were also assumed to have a conservative value of C = 0.55 for purposes of this report, even though they are presently impervious.

There are no natural or artificial water courses crossing the sites. Moreover, they do not lie in a 100-year flood hazard area as shown in Figures 2 and 3.

The runoff pattern and existing curb and gutter prevent off-site flows from entering Block 31. Runoff on the east is down Spruce Street and then west on Lead. Runoff on the north side of the property is westward on Silver Avenue on the south side of a landscaped median, thence southward on Cedar, and finally west again on Lead. An unpaved 16-foot public alley through the center of the site has been vacated by Vac. Ord. V-83-28 (See Exhibit 1). Such vacation is also shown on the aforementioned Dedication and Vacation Plat.

Similarly, the runoff and existing curb and gutter prevent off-site flows from entering the Block 38 lot. Runoff on the north side of the property flows westward on Silver, thence southward on Spruce, then west on Lead. The residential Lot 2 on the east had been graded in such a way that it drained south to the existing alley and hence west to Spruce. Consequently no flow enters the Block 38 Lot from the east.

V. PROPOSED DRAINAGE CONDITIONS:

A. Criteria

The computations, conclusions and recommendations contained in this report are based on criteria found in the City of Albuquerque Development Process Manual, Volume 2, Design Criteria.

B. Off-Site Drainage

During the initial planning conference with the City Engineer's office on October 12, 1983, it was determined that no detention ponds would be needed on the sites, if downstream capacity exists. Detailed calculations in the Appendix and summarized below demonstrate that the downstream capacity does indeed exist. Therefore, storm water from Blocks 38 and 31 site can be discharged directly into Spruce and Cedar Streets, respectively. The flow would be carried along the north curb of Lead Avenue until it is intercepted by an existing Double "A" catch basin east of the intersection at Mulberry, shown in Figure 5. This catch basin is connected to an existing 96-inch RCP storm drain running south down Mulberry Street.

This drain is part of System No. 213, the Grand Ave. - Cedar St. System, draining Basin No. 36, and running between points S-502 and S-503. (See Figure 5.) Flows in this line enter the 108-inch I-025 Interceptor and thence the South Diversion Channel. As noted in Table 1, this reinforced concrete pipe (RCP) has an existing capacity of 538 cfs, but is calculated to carry a 100-year discharge of only 460 cfs. This system therefore has the necessary excess capacity to accommodate the net developed discharge of 5.45 cfs from the two new parking lots.

A more-detailed investigation of the intersection at Spruce Street and Lead Avenue was carried out to see if the water from Block 38 would turn at Lead Avenue and head west toward the existing catch basin at point S-503. Spot elevations were surveyed in the field and plotted on the Drainage Plan. It appears that the flow pattern at this intersection is quite complicated and would be very difficult to analyze mathematically due to the varying velocities and momenta of water mass, intersecting at various angles with varying slopes. However such an analysis is a moot question in any case, because of the existence of additional storm sewer capacity in System 213 to collect any water from Block 31 which does manage to cross Lead and continue south down Spruce, instead of turning west on Lead. Again the Master Drainage Study shows that the 36-inch and 42-inch lines in Coal Avenue between Spruce and Cedar have ample capacity to pick up the 1.3 cfs net flow from the Block 38 lot. The 36-inch line has a capacity of 100 cfs versus a 100-year Q = 15 cfs.

C. On-Site Drainage and Special Features

Accordingly the site grading plans were designed in such a way that the runoff would be collected at the low corners of the lots where it could be discharged into the streets through new standard City sidewalk culverts. Two 24-inch wide culverts are necessary to pass the flow from

Areas 1A & 1B, as well as from 3A & 3B. One 24-inch culvert is sufficient to drain Area 4 as shown on Plate I. These culverts will penetrate a continuous concrete curb around each of the three areas of collection: 1A-1B, 3A-3B and 4.

Design details for construction of these sidewalk culverts within the public right-of-way are provided on Special Order 19 drawings. These drawings have been approved by the City Engineer/Design and are included in this report as Figure 7.

Four new driveway entrances will be cut into the existing curbs on Spruce Street. Two will be cut on the west curb into Block 31 and two will be cut on the east curb into Block 38. To prevent gutter flows in Spruce from entering the downstream parking lot on Block 31, City standard drive pads will be constructed at the two locations on the west curb.

Section 7, Para. B of the 63-1982 Drainage Ordinance requires that the 100-year design storm runoff shall not exceed a depth of 0.87 feet at any point within the street right-of-way, or 0.2 feet above top of curb, nor enter private property from a street. The DPM adds an additional margin of safety by stating that the elevation of the property line shall be at least 0.33 feet above top of curb, or 1.0 feet above flow line.

The site of the proposed parking lots is in a fully developed neighborhood. The existing property line at the upstream

boundaries of Block 31 does not meet the 1.0 ft criterion. However, it may be easily shown that the depth of the 100-year flow in Spruce Street, For a slope of 0.03 ft/ft in a 32-ft street, the capacity is approximately 150 cfs according to Plate 22.3 D-1 in the DPM. A careful study of Plate K-15 of the Albuquerque Master Drainage Study shows that, at most, 3 acres (Block 31) can contribute to the flow in Spruce Street. The runoff from 3 acres is approximately 13 cfs. Therefore the flow depth is much less than curb height and there is no flooding hazard at the property line. Similar reasoning could be applied to the street flows in the adjacent streets in this fully-developed neighborhood. for example, does not exceed curb height, by a wide margin.

VI. EROSION CONTROL PLAN:

The primary purpose of an Erosion Control Plan (ECP) is to mitigate damages due to soil erosion and deposition from the 10-year design storm runoff on 1.0 acres or more. Due to the unique features of these two sites, an ECP is not needed for the following reasons:

A. Block 31 Lot

Although the Block 31 lot comprises a total of 1.938 acres, 0.746 acres of this is presently paved and will remain in that state. Any runoff from the remaining 1.192 acres must pass over a minimum length of 100 ft of paved area. For all practical purposes, all sediment

transported from the graded area upstream will be deposited from the low-velocity sheet flow across the existing pavement, before the sediment reaches the public right-of-way at Cedar Street. An existing parking curb on the west property line of this lot would also trap any sediment which managed to traverse the paved area.

B. Block 38 Lot

The area of this lot (Area 4) is 0.606 acres, which is less than the minimum area of 1.0 acres stated in the DEM guidelines for which an ECP is required.

C. The sole purpose of the site grading is for construction of parking lots. There are no buildings, foundations or other excavations on the sites or downstream of the sites which would be endangered by flooding during construction. Paving will begin as soon as the proper grading and compaction of the subgrade has been completed, so that the time period for risk and exposure to erosion is minimal.

VII. FINDINGS AND CONCLUSIONS:

A. The total 100-year developed discharge for both parking lots is 12.11 cfs which exceeds the discharge from the previous residential development by 5.45 cfs.

B. The excess 100-year capacity of the 96-inch RCP in Mulberry Street is 78 cfs, which provides more than ample

capacity to receive the net site discharge of 5.45 cfs from both lots.

C. Although the property lines of the parking lots are not elevated a full 1.0 feet above the adjacent flow line, there is no flooding hazard because flows in the adjacent streets are well below curb height.

VIII. RECOMMENDATIONS:

A. Permit direct discharge of runoff from Block 31 and 38 parking lots into Lead Avenue, where an existing catch basin will convey the flow into the existing 96-inch RCP in Mulberry Street.

B. Construct standard sidewalk culverts to transfer surface flows from the low corners of Block 31 and 38 Lots into Cedar and Spruce Streets, respectively. Refer to Special Order 19 drawings approved by the City Engineer/Design.

C. Confine gutter flows to the street by building standard City drive pads at the two new driveway entrances in the west curb of Spruce Street.

D. An Erosion Control Plan is not needed for either parking lot. (See detailed discussion in Para. VI.)

Respectfully submitted,

BOYLE ENGINEERING CORPORATION

Thornton D. Schwenk

REGISTERED PROFESSIONAL ENGINEER STATE OF NEW MEXICO No. 4739 THORNTON D. SCHWENK

5-11-84

Thornton D. Schwenk, P.E.
Senior Civil Engineer

APPENDIX

DRAINAGE CALCULATIONS

PRESBYTERIAN HOSPITAL PARKING LOTS

occupying

LOTS 1 THRU 12, BLOCK 31, TERRACE ADDITION
LOTS 3 THRU 6, BLOCK 38, TERRACE ADDITION

DRAINAGE CALCULATIONS

(Revision No. 1, May 11, 1984)

I. TIME OF CONCENTRATION:

DRAINAGE AREA NO.	DESCRIPTION	DIMENSIONS	AREAS (sq ft)	AREAS (acres)
1A	Lots 9, 10, 11, 12	205 x 132.7	27,204	0.625
1B	Lots 7, 8	95 x 132.7	12,606	0.289
2	Vacated Alley	300 x 16	4,800	0.110
3A	Lots 1, 2, 3	150 x 132.7	19,905	0.457
3B	Lots 4, 5, 6	150 x 132.7	19,905	0.457
4	Lots 3 - 6, Blk 38	200 x 132	26,400	0.606
			---	---
			110,820	2.544

AREA NO.	L, BASIN LENGTH	ELEV (HIGH)	ELEV (LOW)	DIFF. IN ELEV	S, SLOPE	Tc*, TIME OF CONCENTRATION
1A	244	5099	5086	13	0.053	1.7
1B	163	5091	5080.5	10.5	0.064	1.2
2	300	5100	5084.2	15.8	0.053	2.0
3A	200	5104	5095	9	0.045	1.5
3B	200	5096	5085.5	10.5	0.053	1.4
4	240	5119	5103	16	0.067	1.5

* $T_c = 0.0078\ (L^{0.77}/S^{0.385})$ (P. 22.2-3, DPM)

Use T_c = 10 minutes (minimum)

II. RAINFALL INTENSITY: (Ref. Plate 22.2 D-1, DPM)

i_{100} = 2.25 inches (100-year, 6-hour rainfall volume)

$I_{100} = i_{100}\ (6.84)\ T_c^{-0.51}$ (Plate 22.2 D-2, DPM))

$= 2.25\ (6.84)\ 10^{-0.51}$

$= 4.76$ inches/hr

$I_5 = 0.541\ I_{100}$ (Plate 22.2 D-1, DPM)

$= 0.541\ (4.76) = 2.58$ inches/hr

III. UNDEVELOPED FLOWS AND VOLUMES:

A = 2.544 acres = 110,820 sq ft

C = 0.55 (assumed, see text)

$V_{100} = \frac{2.25}{12}(110{,}820)(0.55) = 11{,}430$ cu ft

$Q_{100} = 0.55\ (4.76)(2.544) = 6.66$ cfs

IV. DRAINAGE AREAS AND "C" FACTORS: (Plate 22.2 C-1, DPM)

AREA NO.	AREA (acres)	PLANTED	IMPERVIOUS	PERCENT IMPERVIOUS	"C" FACTOR(2)
1A	0.625	0	0.625	100	1.0
1B	0.289	0	0.289	100	1.0
2	0.110	0 (1)	0.110	100	1.0
3A	0.457	0	0.457	100	1.0
3B	0.457	0	0.457	100	1.0
4	0.606	0	0.606	100	1.0
	---	-	---	---	---
	2.544	0	2.544	100 (AVG.)	1.0 (AVG.)

(1) Assume Southwestern landscaping in planter area
(2) For SCS Group "A" soils

V. DEVELOPED FLOWS AND VOLUMES:

AREA NO.	AREA (sq ft)	AREA (acres)	V_{100} (cu ft)	Q_{100} (cfs)		CONVEYANCE
1A	27,204	0.625	5,100	2.98	4.36	(3)
1B	12,606	0.289	2,364	1.38		(3)
2	4,800	0.110	900	0.52		(4)
3A	19,905	0.457	3,732	2.18	4.36	(3)
3B	19,905	0.457	3,732	2.18		(3)
4	26,400	0.606	4,950	2.88		(3)
	---	---	---	---		
	110,820	2.544	20,778	12.11		

(3) Two 24-inch sidewalk culverts, each w/ capacity 2.8 cfs
(4) Sheet flow to sidewalk

Net developed discharge = 12.11 -6.60 = 5.45 cfs

Excess capacity of downstream structure (96" RCP) prior to development of parking lot = 538 - 460 = 78 cfs

VI. CAPACITY OF STANDARD CITY SIDEWALK CULVERT

A. For inlets into Cedar Street from Lots 6 and 7, Block 38:

GIVEN: M, width of opening = 24 in = 2.0 ft
S, slope = (86.46-85.35/15 = 0.0740 ft/ft
D, depth of flow = 3 in = 0.25 ft
n, Manning's coefficient = 0.013

$R = A/P = (2.0)(0.25)/[2(0.25) + 2.0] = 0.20$

$$V = \frac{1.486}{n} R^{2/3} S^{1/2}$$

$$= \frac{1.486}{0.013} (0.20)^{2/3} \quad (0.0740)^{1/2}$$

$= 10.63$ ft/sec

$Q = VA = 10.63(0.5) = 5.31$ cfs

Capacity for 2 culverts = 10.63 cfs > 4.36 cfs discharge

B. For inlet into Spruce Street from Lot 6, Block 38:

GIVEN: M, width of opening = 24 in = 2.0 ft
S, slope = (2.55-2.24)/15 = 0.0207 ft/ft
D, depth of flow = 3 in = 0.25 ft
n, Manning's coefficient = 0.013

$R = A/P = (2.0)(0.25)/[2(0.25) + 2.0] = 0.20$

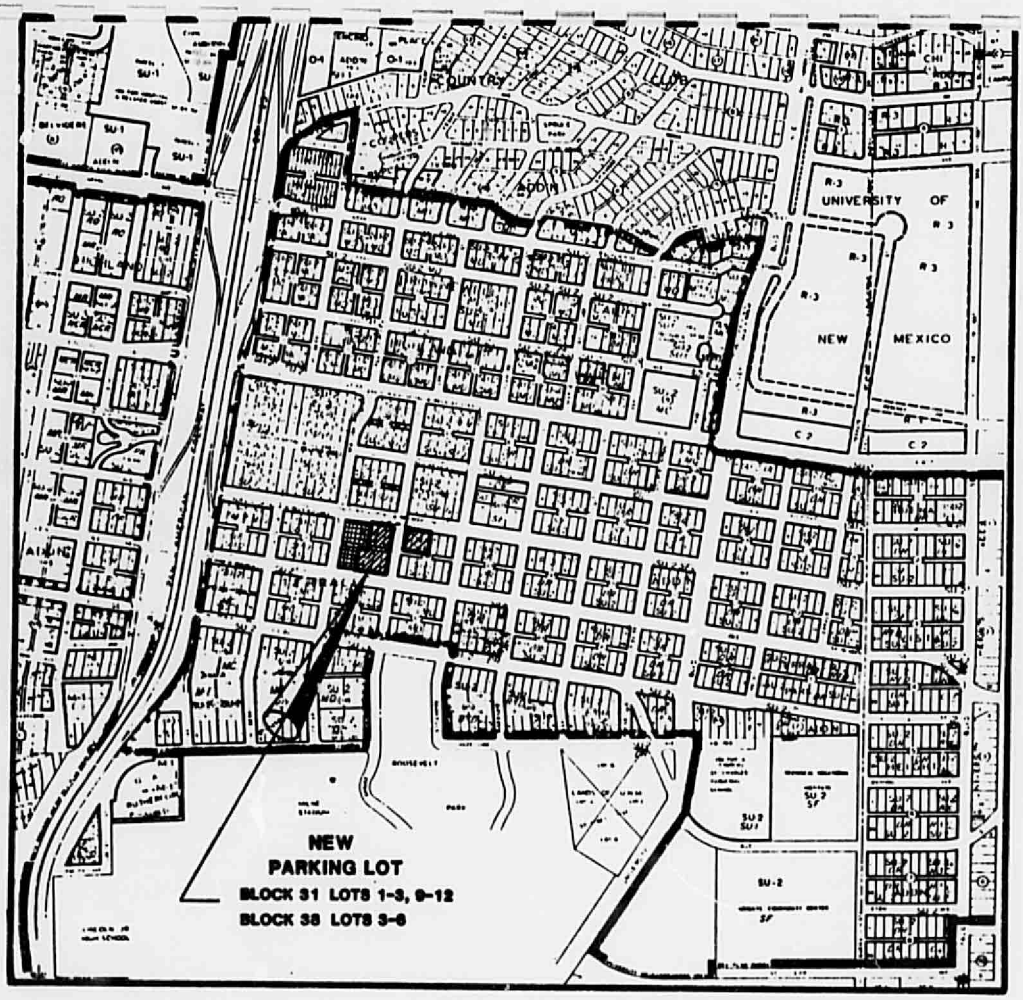
$$V = \frac{1.486}{n} R^{2/3} S^{1/2}$$

$$= \frac{1.486}{0.013} (0.20)^{2/3} \quad (0.0208)^{1/2}$$

$= 5.62$ ft/sec

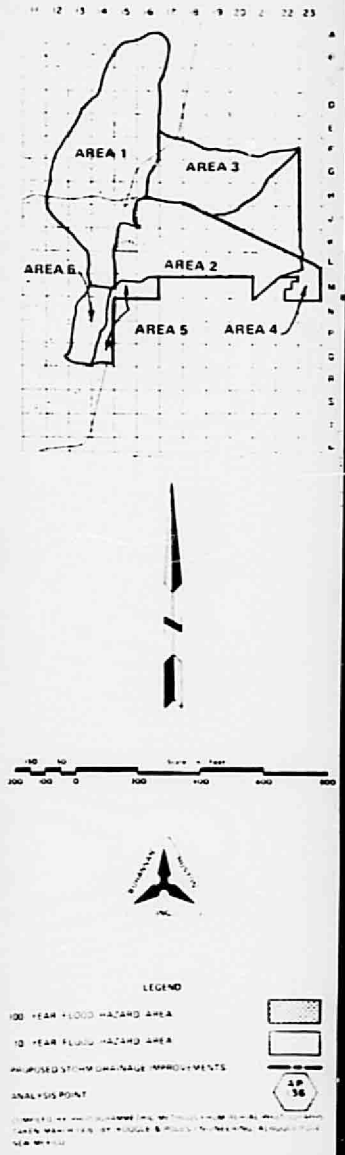
$Q = VA = 5.62(0.5) = 2.81$ cfs

Capacity for one culvert = 2.81 cfs _ 2.88 cfs discharge



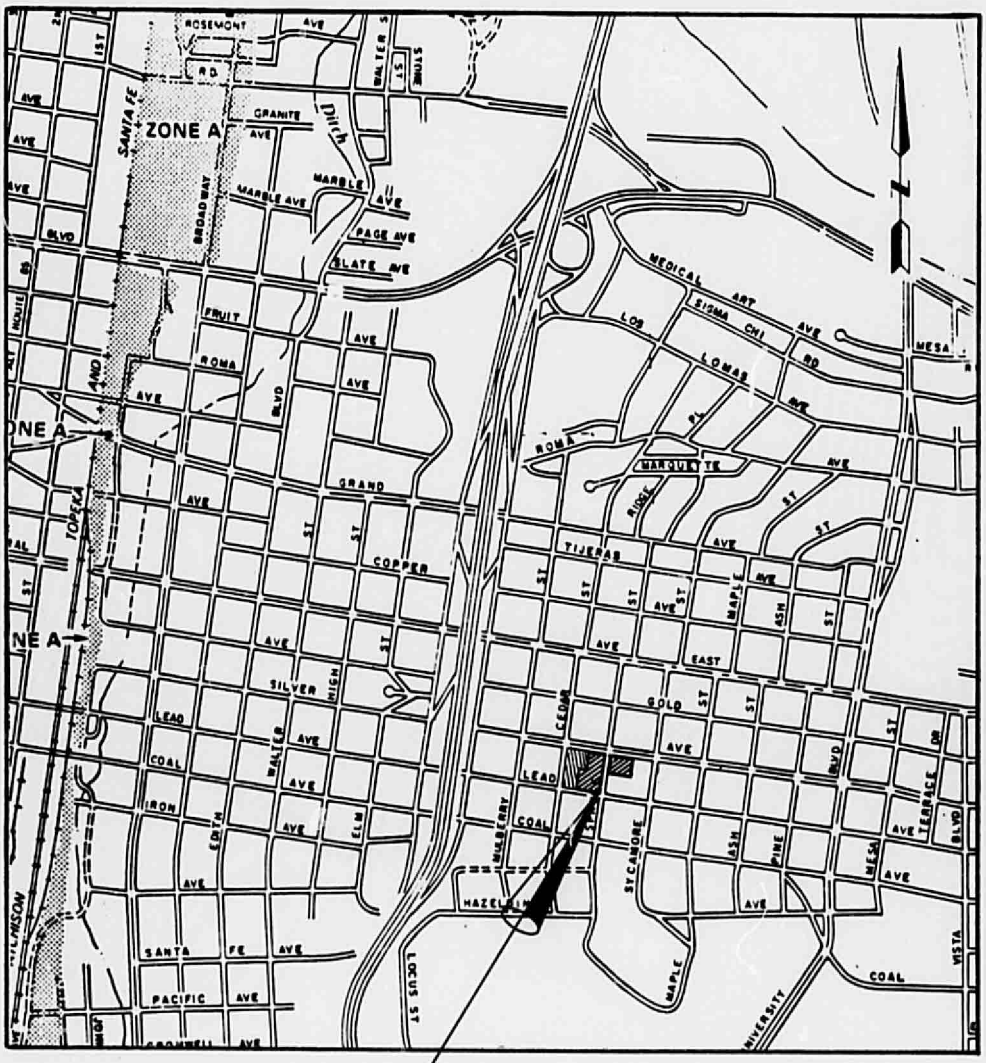
K-15-Z

FIGURE 1



K-15
FIGURE 2

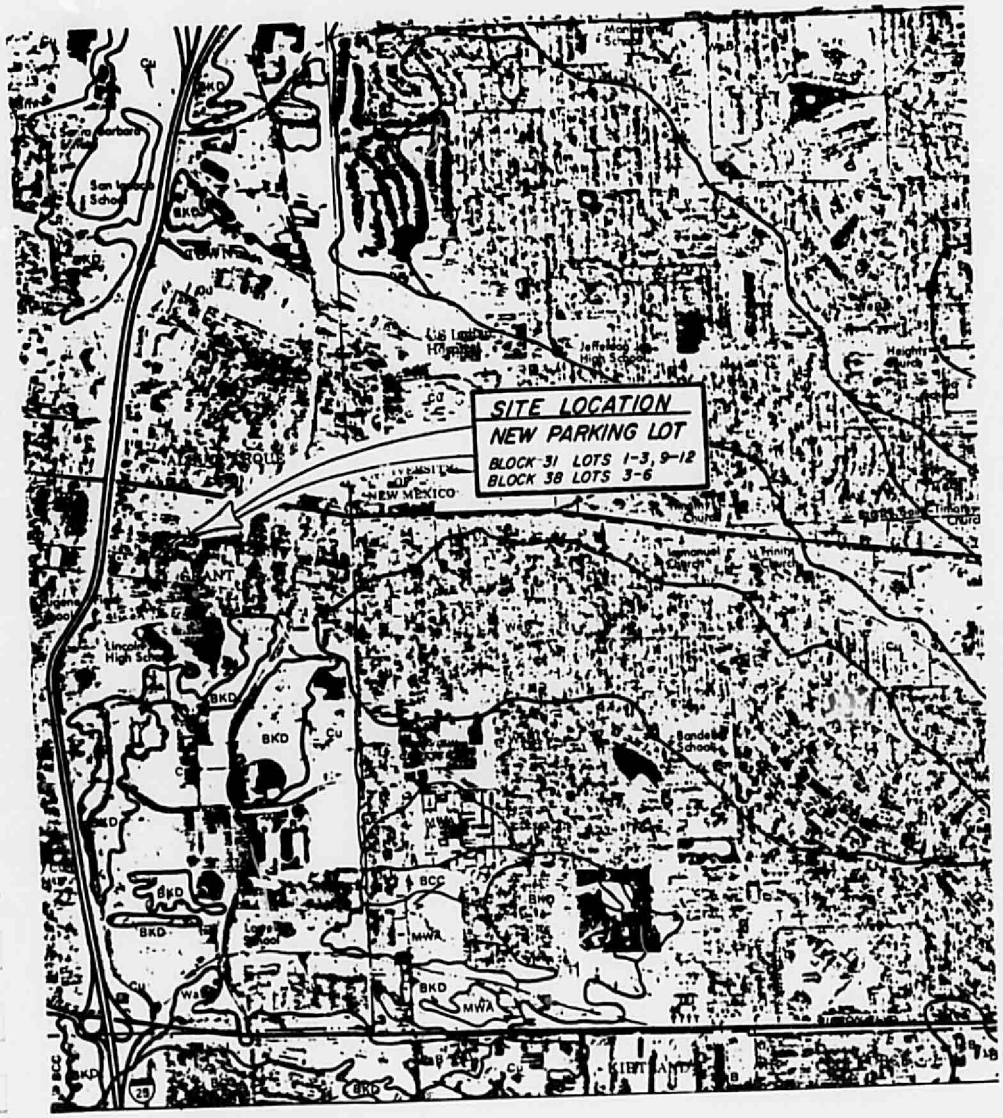
ALBUQUERQUE MASTER DRAINAGE STUDY



SITE LOCATION
NEW PARKING LOT
BLOCK 31 LOTS 1-3, 9-12
BLOCK 38 LOTS 3-6

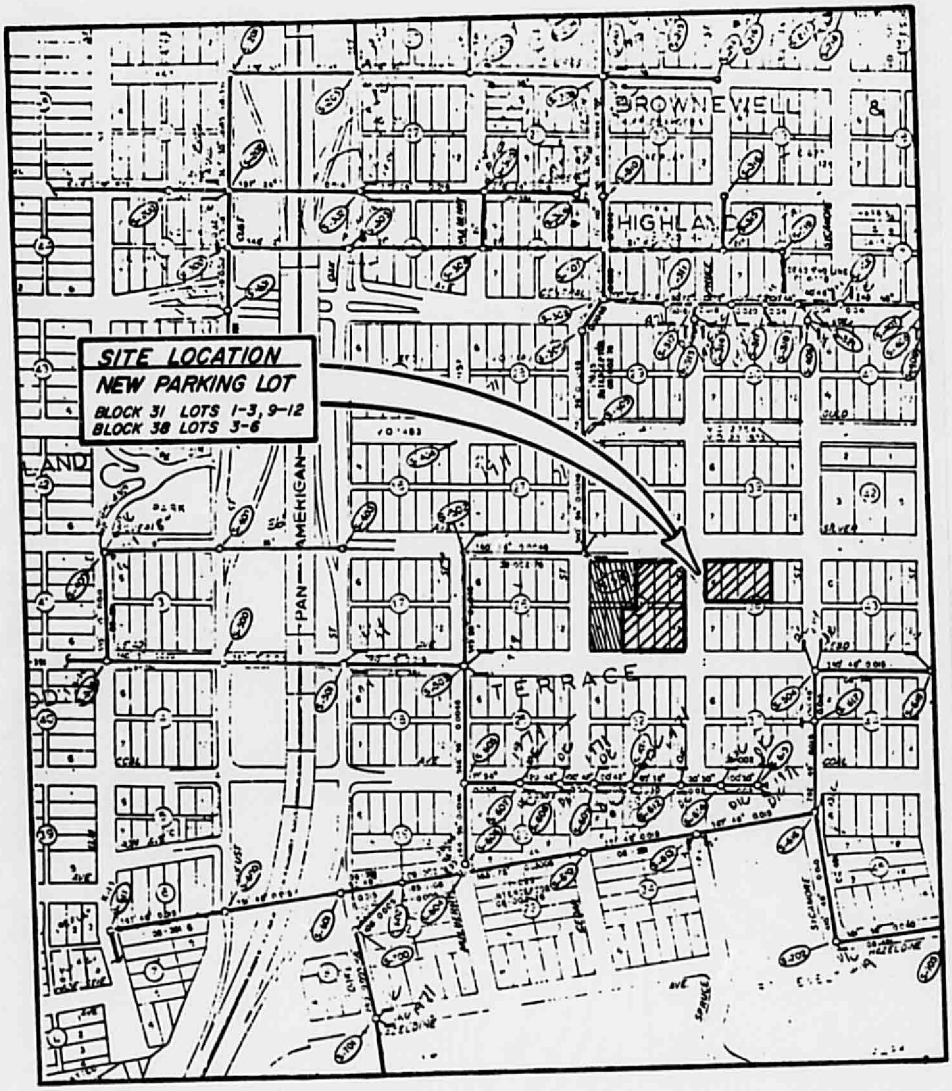
FLOOD HAZARD BOUNDARY MAP
COMMUNITY PANEL NUMBER
350002 0005B 12-4-79

FIGURE 3



SOIL SURVEY OF
BERNALILLO COUNTY
(SHEET 31)
SCS, JUNE, 1977

FIGURE 4



ALBUQUERQUE MASTER
DRAINAGE STUDY
VOL. II 1981
EXISTING STORM SEWER

FIGURE 5

C-222

(2)

CONTROL STATION DATA

City of Albuquerque, New Mexico
Public Works Department
Engineering Division

Name of Station K15-S State NM County Bernalillo

Establishing Agency ACS Year 1969 Chief of Party L. I. Urban

Section _____ Township _____ Range _____ Map No. K-15

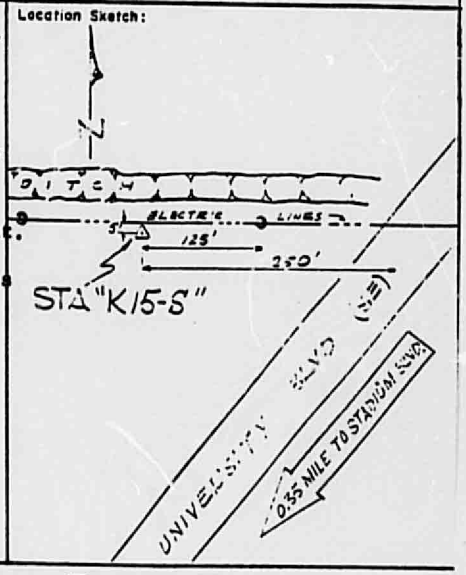
Description:

The station is located 1.3 miles southeast of downtown Albuquerque.

To reach the station from the intersection of Central Ave. and University Blvd., go south on University Blvd. 0.7 miles to the crossing of an overhead electric transmission line. The station is about 250 ft. west of this point.

The station mark is a standard ACS brass tablet, stamped "K15-S", set in top of a concrete post flush with the ground.

Location Sketch:



HORIZONTAL DATA

FIELD METHOD: ☒ Traverse ☐ Triangulation ☐ Trilateration

GEOGRAPHIC POSITION (NAD 1927) 2nd-order

Latitude 35° 04' 22.41975" Longitude 106° 37' 49.14696"

PLANE COORDINATES Projection TM State NM Zone Central

X 386203.66 Y 1481994.03 Ground-to-Grid Factor 0.99967008

ELEVATION DATA

SPIRIT LEVEL ELEVATION (SLD 1929) Feet 5117.017 Meters 1559.914 2nd-Order

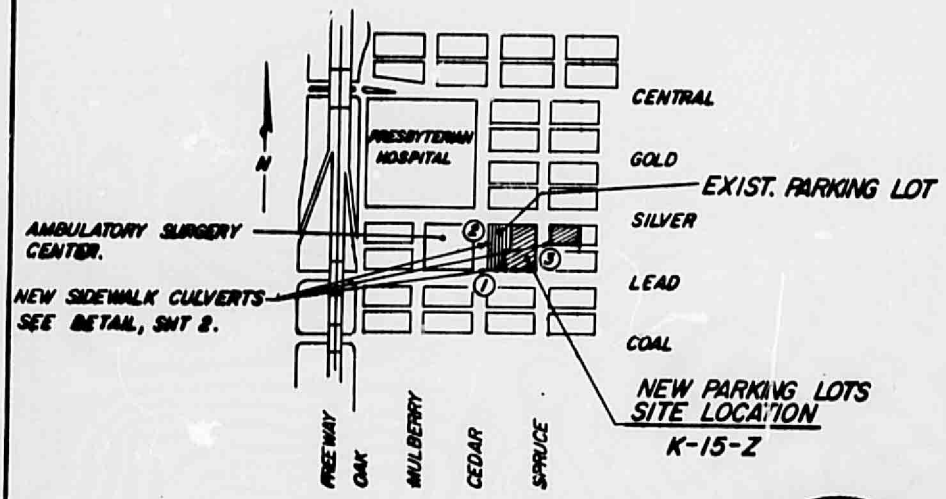
TRIGONOMETRIC ELEVATION Feet _____ Meters _____

AZIMUTH DATA

O (or Δα) Angle -0° 13' 07"

Station	Azimuth	Back Azimuth	DISTANCE Feet	DISTANCE Meters
1-M15	00° 11' 25"		6946.598	2117.327

FIGURE 6



VICINITY MAP

N.T.S.

REGISTERED PROFESSIONAL ENGINEER No. 4739 NEW MEXICO THORNTON D. SCHWENK

1-20-84

NOTICE TO CONTRACTOR

1. An excavation/construction permit will be required before beginning any work within City right-of-way. An approved copy of these plans must be submitted at the time of application for this permit.

2. All work detailed on these plans to be performed, except as otherwise stated or provided hereon, shall be constructed in accordance with Public Works Contract No. 84-1.

3. Two working days prior to any excavation, contractor must contact Line Locating Service, 765-1234, for location of existing utilities.

4. Prior to construction, the contractor shall excavate and verify the horizontal and vertical locations of all obstructions. Should a conflict exist, the contractor shall notify the engineer so that the conflict can be resolved with a minimum amount of delay.

5. Backfill compaction shall be according to Residential street use.

PROJECT NO: SO1-236-00

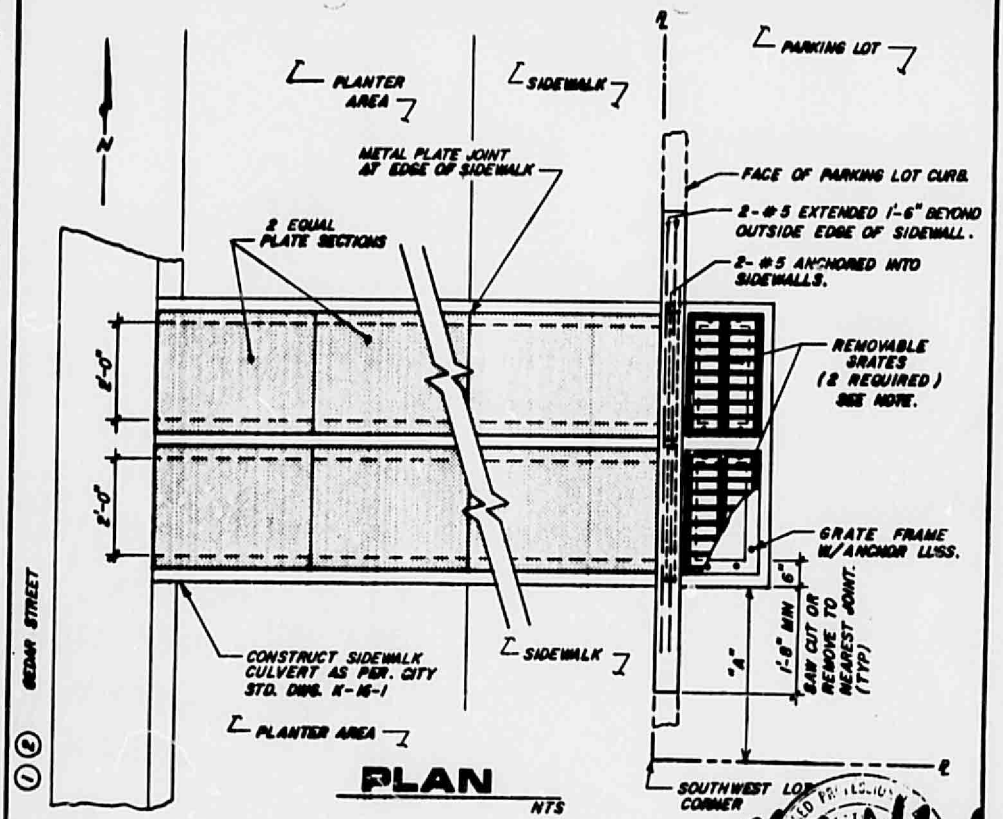
Boyle Engineering Corporation
consulting engineers / architects

D-12

CITY OF ALBUQUERQUE

APPROVALS	ENGINEER	DATE	TITLE
A.C.E. / DESIGN			PRESBYTERIAN HOSPITAL CENTER SOUTH PARKING LOTS
INSPECTOR			PERMIT NO. / MAP
A.C.E. / FIELD			SHEET NO. 1 of 3 / NO. K-15

FIGURE 7

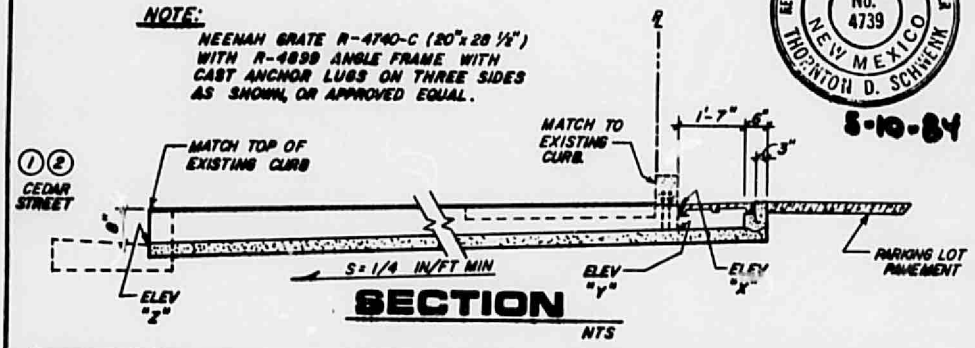


PLAN

NTS

NOTE:

NEENAH GRATE R-4740-C (20" x 28 1/2") WITH R-4899 ANGLE FRAME WITH CAST ANCHOR LUGS ON THREE SIDES AS SHOWN, OR APPROVED EQUAL.



SECTION

NTS

CULVERT LOCATION	STREET AT OUTLET	PROPERTY CORNER AT INLET	PARKING LOT CURB	DIMENSION "A"	INLET ELEV. "X"	INLET ELEV. "Y"	OUTLET ELEV. "Z"
1	CEDAR	LOT 7, BLK 31	EXIST.	6'-0"	5081.96'	5081.29'	5080.83'
2	CEDAR	LOT 6, BLK 31	EXIST	2'-0"	5086.46'	5085.79'	5085.35'

BENCH MARK:

A.C.S. BM. K-15-S
A STANDARD BRASS TABLET SET IN CONCRETE LOCATED 0.35 MILES NORTH OF STADIUM BLVD. @ 250' WEST OF UNIVERSITY BLVD.
ELEVATION = 5117.817' MSL

D-12

PROJECT NO. 501-236-00

Boyle Engineering Corporation
consulting engineers / architects

REGISTERED PROFESSIONAL ENGINEER No. 4739 NEW MEXICO THORNTON D. SCHWENK

5-10-84

CITY OF ALBUQUERQUE

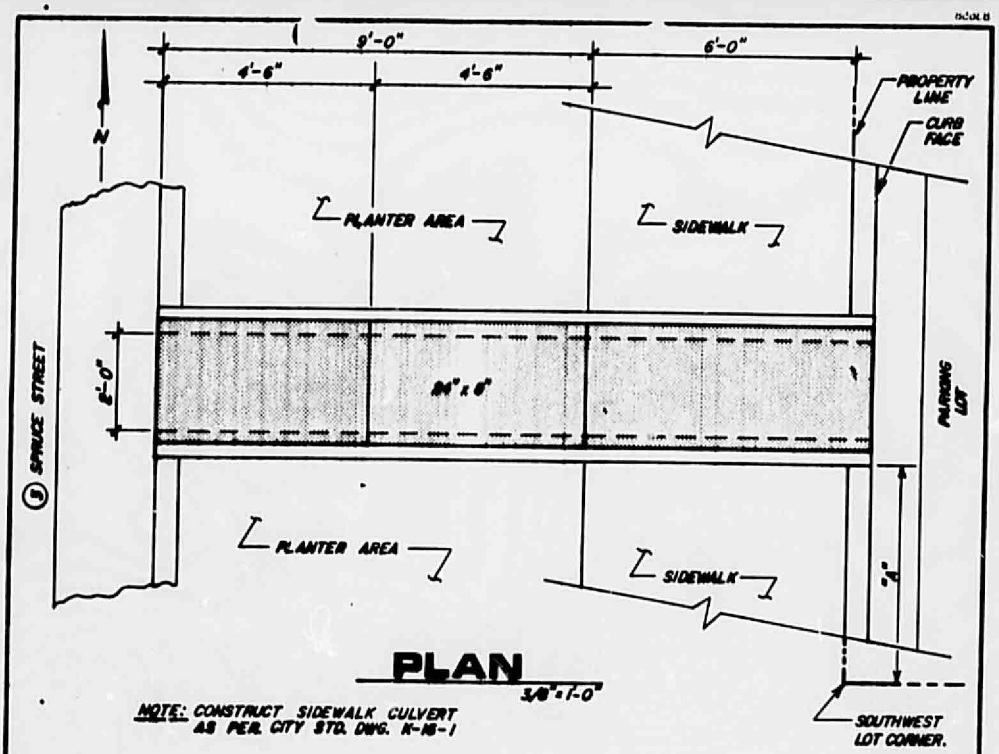
APPROVALS	ENGINEER	DATE
A.C.E. / DESIGN		
INSPECTOR		
A.C.E. / FIELD		

TITLE
PRESBYTERIAN HOSPITAL CENTER SOUTH PARKING LOTS

PERMIT NO.

SHEET NO. 2 of 3

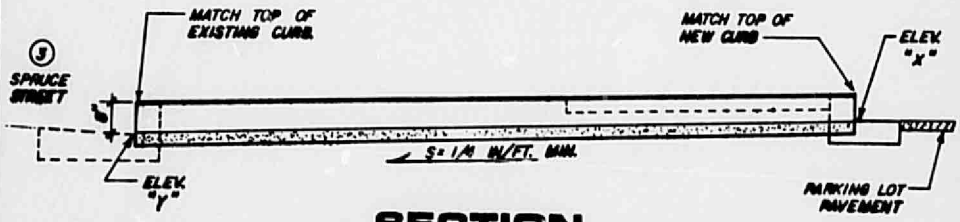
MAP NO. K - 15



PLAN

3/8" = 1'-0"

NOTE: CONSTRUCT SIDEWALK CULVERT AS PER CITY STD. DWG. K-16-1



SECTION

3/8" = 1'-0"

CULVERT LOCATION	STREET AT OUTLET	PROPERTY CORNER AT INLET	PARKING LOT CURB	DIMENSION "A"	CURB CULVERT INLET EL. "X"	CURB CULVERT OUTLET EL. "Y"
3	SPRUCE	LOT 6, BLK 38	NEW	4'-6"	5102.55'	5102.24'

REGISTERED PROFESSIONAL ENGINEER
STATE OF NEW MEXICO
No. 4739
THORNTON D. SCHWENK

5-10-84

BENCH MARK:

A.C.S. BM. K-15-S
A STANDARD BRASS TABLET SET IN CONCRETE LOCATED 0.35 MILES NORTH OF STADIUM BLVD. & 250' WEST OF UNIVERSITY BLVD.
ELEVATION = 5117.617' MSL D-12

PROJECT NO. 501-236-00

Boyle Engineering Corporation
consulting engineers | architects

CITY OF ALBUQUERQUE

APPROVALS	ENGINEER	DATE
A.C.E. / DESIGN		
INSPECTOR		
A.C.E. / FIELD		

TITLE
PRESBYTERIAN HOSPITAL CENTER SOUTH PARKING LOTS

PERMIT NO.
SHEET NO. 3 of 3

MAP NO. K - 15

AREA 2

ALBUQUERQUE MASTER DRAINAGE STUDY
INVENTORY OF EXISTING STORM SEWERS

GRAND AVE. - CEDAR ST. STORM SEWER SYSTEM — SYS. - 213

Location	From	To	Pipe Size (in)	Type of Pipe	Length (ft)	Slope (ft/ft)	Flow Velocity	Existing Capacity (cfs)	Total 10 Year Discharge (cfs)	Total 100 Year Discharge (cfs)	Comments MAP#	Comments BASIN#
GOLD AVE.	S-405 CEDAR ST.	S-404 MULBERRY ST.	96"	RCP	360'	.0046	10.7	538.0	155	480	E-15	(36)
MULBERRY ST.	S-404 GOLD AVE.	S-402 SILVER AVE.	96"	RCP	376'	.0046	10.7	538.0	146	470	E-15	(36)
MULBERRY ST.	S-402 SILVER AVE.	S-403 LEAD AVE.	96"	RCP	329'	.0046	10.7	538.0	138	460	E-15	(36)
MULBERRY ST.	S-403 LEAD AVE.	S-406 COAL AVE.	96"	RCP	366'	.0046	10.7	538.0	128	450	E-15	(36)
COAL AVE.	S-615 220' E. OF SPRUCE ST.	S-614 120' E. OF SPRUCE ST.	30"	RCP	100'	.020	10.4	51.0	2	5	E-15	(36)
COAL AVE.	S-614 120' E. OF SPRUCE ST.	S-612 SPRUCE ST.	30"	RCP	120'	.020	10.4	51.0	4	10	E-15	(36)
COAL AVE.	S-612 SPRUCE ST.	S-611 100' E. OF CEDAR ST	36"	RCP	180'	.010	14.1	100.0	7	15	E-15	(36)
COAL AVE.	S-611 100' E. OF CEDAR ST.	S- 609 CEDAR ST.	42"	RCP	100'	.020	18.1	155.0	9	20	E-15	(36)
COAL AVE.	S-609 CEDAR ST.	S-608 "ACROSS" CEDAR ST.	42"	RCP	100'	.020	18.1	155.0	12	25	E-15	(36)
COAL AVE.	S-608 CEDAR ST.	S-606 171' E. OF MULBERRY ST.	42"	RCP	120'	.020	18.1	155.0	15	30	E-15	(36)
COAL AVE.	S-607 171' E. OF MULBERRY ST.	S-605 MULBERRY ST.	54"	RCP	171'	.020	18.9	300.0	18	35	E-15	(36)
MULBERRY ST.	S-405 COAL AVE.	S-604 264' E. OF COAL AVE.	96"	RCP	264'	.0046	10.7	538.0	142	536	E-15	(36)
BETWEEN HAZELDINE AVE. & COAL AVE.	S-616 SYCAMORE ST.	S-613 714' E. OF MULBERRY ST.	48"	RCP	367'	.015	12.1	155.0	150	150	E-15	(36)
BETWEEN HAZELDINE AVE. & COAL AVE.	S-613 714' E. OF MULBERRY ST.	S-610 363' E. OF MULBERRY ST.	48"	RCP	351'	.015	12.1	155.0	150	150	E-15	(36)
BETWEEN HAZELDINE AVE. & COAL AVE.	S-610 363' E. OF MULBERRY ST.	S-603 MULBERRY ST.	72"	RCP	363'	.030	22.5	637.4	150	150	E-15	(36)
BETWEEN HAZELDINE AVE. & COAL AVE.	S-606 MULBERRY ST.	S-608 "ACROSS" MULBERRY ST.	96"	RCP	45'	.0046	10.7	538.0	290	610	E-15	(36)
BETWEEN HAZELDINE AVE. & COAL AVE.	S-603 MULBERRY ST.	S-602 298' E. OF OAK ST.	108"	RCP	158'	.005	12.1	767.0	350	640	E-15	(36)
BETWEEN HAZELDINE AVE. & COAL AVE.	S-602 298' E. OF OAK ST.	S-700 OAK ST.	108"	RCP	298'	.005	12.1	767.0	411	675	E-15	(36)
OAK ST.	S-700 262' N. OF HAZELDINE ST.	S-701 HAZELDINE ST.	108"	RCP	262'	.005	12.1	767.0	411	687	E-15	(36 & 37)
EAST SIE. OF LINCOLN JR. HIGH SCHOOL	S-701 HAZELDINE ST.	S-900 905' S. OF HAZELDINE ST.	108"	RCP	905'	.005	12.1	767.0	411	687	E-15	(37)
EAST SIDE OF LINCOLN JR. HIGH SCHOOL	S-900 905' S. OF HAZELDINE ST.	S-901 1205' S. OF HAZELDINE ST.	108"	RCP	300'	.005	12.1	767.0	411	687	E-15	(37)
EAST SIDE OF LINCOLN JR. HIGH SCHOOL	S-901 1205 S. OF HAZELDINE ST.	EMPTIES INTO S. DIVERSION CHANNEL	108"	RCP	100'	.005	12.1	767.0	411	687	E-15	(37)

EXISTING STORM SEWER

TABLE 1

83 65184

V-83-28
September 22, 1983

DEVELOPMENT REVIEW BOARD RESOLUTION

919

VACATING THE EAST-WEST ALLEYS IN BLOCKS 26 AND 31, TERRACE ADDITION, BOUNDED BY MULBERRY, SPRUCE, LEAD AND SILVER AVENUES, S.E., AMENDING THE DEVELOPMENT REVIEW BOARD RESOLUTION FILED IN THE OFFICE OF THE CLERK OF BERNALILLO COUNTY ON SEPTEMBER 9, 1983, BK. MISC. 46-A, PG. 370-371.

WHEREAS, there has heretofore been dedicated and conveyed to the City of Albuquerque, New Mexico a certain easement for street purposes, more particularly described below; and

WHEREAS, a portion of said right-of-way is not needed for public use;

NOW, THEREFORE, BE IT ENACTED BY THE DEVELOPMENT REVIEW BOARD OF THE CITY OF ALBUQUERQUE UNDER ARTICLE 7-11, RO. 1974, BEING ORDINANCE NO. 56-1983, AS AMENDED.

SECTION 1. The vacated east-west alleys in Blocks 26 and 31, Terrace Addition, bounded by Mulberry, Spruce, Lead and Silver Avenues, S.E., as shown on (SP-83-259) a replat of Blocks 26 and 31, Terrace Addition, as filed in the Office of the County Clerk on September 16, 1983, Vol. C22, Folio 30, and consisting of two (2) pages, is hereby closed and vacated.

SECTION 3. Immediately upon the filing of this resolution in the office of the County Clerk of Bernalillo County, New Mexico the land above-described shall be effectively vacated.

ADOPTED AT A PUBLIC HEARING BY THE DEVELOPMENT REVIEW BOARD, CITY OF ALBUQUERQUE, NEW MEXICO ON JULY 26, 1983.

APPROVED:

Gene Mares

Authorized Representative of The City Planner, City of Albuquerque, New Mexico

Subscribed and sworn to before me this 22 day of September, 1983, by Gene Mares, authorized representative of The City Planner, City of Albuquerque, New Mexico.

Notary Public

My Commission Expires: 10-12-86

EXHIBIT 1