

DRAINAGE REPORT
FOR
LEESURE ACRES
ZONE ATLAS SHEET E-14

APRIL, 1977

PREPARED FOR
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DRAINAGE REPORT FOR LEESURE ACRES

PURPOSE

The purpose of this report is twofold. The first objective is to determine the undeveloped and developed runoff from two tracts of land, generated by a 100 year frequency storm, and to establish guidelines so that the developed runoff from these properties does not exceed acceptable values. Secondly, an investigation is made of the parking and street drainage characteristics within the Leasure Acres Apartments.

PROJECT LOCATION AND DESCRIPTION

The three parcels of land are adjacent to each other and northwest of the intersection of Guadalupe Trail and Fourth Street, N.W. (see Plate I).

Tract 1 contains approximately 3.4 acres of barren land, within the Leasure Acres Apartments. The property is nearly flat, with an average slope of 0.6% from north to south. Tract 1 is presently zoned SU-1 and it is anticipated that a YMCA will be constructed on the site.

Tract 2 contains approximately 15 acres and is located at the northwest corner of Guadalupe Trail and Fourth Street, N.W. It is bordered on the north by the Harwood Lateral. Tract 2 is also nearly flat with an existing slope of 0.7% from north to south. Vegetation is sparse. Presently, this property is expected to be developed as a community shopping center.

The third parcel of land consists of the developed portion of

the Leasure Acres Apartments and lies between Tracts 1 and 2. The apartments will be remodeled as condominiums. Streets and parking areas will be remodeled and renovated to meet the necessary City requirements.

HYDROLOGY

Peak flow rates were determined with the use of the rational formula for a 100 year frequency storm. Rainfall intensities were selected from curves presented in the Master Plan of Drainage, 1963, for the City of Albuquerque. Detention basin volume requirements were based on the modified rational method analysis as presented in Practices in Detention of Urban Storm Water Runoff, produced by the American Public Works Association. Calculations are provided in the Appendix.

DEVELOPMENT OF LEASURE ACRES APARTMENTS

A field investigation of the Leasure Acres Apartments was conducted to determine existing grades. Also, an analysis of the existing pavement is being conducted. With the above information, it was ascertained that positive drainage can be provided.

No attempt will be made to control the runoff from this already developed site, but there will be an extension of the storm sewer from Fourth Street to Track 1. The storm sewer has an excess capacity of 2.4 cfs, and 0.7 cfs of this capacity will be used to help drain the intersection of Guadalupe Trail and Grecian Road, the point to which Leasure Acres drains. This will be accomplished by the construction of a single "C" type drop inlet, with inlet control, at the intersection of Grecian Road and Guadalupe Trail (see Plate II and the Appendix).

DEVELOPMENT OF TRACT 1

Tract 1 receives minor flows from the developed portion of Leasure Acres. This flow will be retained in the Leasure Acres street system with the completion of the curb and gutter on the north side of the tract. Therefore, for the purpose of this report, no external flow will enter this tract.

Tract 1 has an undeveloped runoff rate of 7.1 cfs. According to the AMAFCA Drainage Resolution 1972-2, the development of property should not increase runoff. In accordance with this guideline, the developed runoff rate will not exceed 7.1 cfs. The excess runoff from the developed site will be stored on the site in a detention area, possibly the parking lot. The detention area will be designed such that it will hold all runoff volume minus the 0.8 cfs released through an orifice to the storm sewer that will be constructed to the site. There will be a weir on the detention basin with a maximum flow rate of 4.2 cfs, the crest of the weir being the top surface of the stored volume (see Plates II, IV, and the Appendix).

DEVELOPMENT OF TRACT 2

Tract 2 is lower, in elevation, than the surrounding streets. Therefore, Tract 2 receives upland runoff from the west half of Fourth Street and the north half of Guadalupe Trail. To prevent this upland flow from entering the property, the construction of a berm along Fourth Street and Guadalupe Trail is recommended. Therefore, for the purpose of this report, upland runoff will be neglected.

After the construction of the berm, all runoff from the site will be diverted to a detention area, preferably, along the inside edge of the berm. The detention basin will release 0.9 cfs through an inlet

control device into the storm sewer (see Appendix).

The berm and detention area both could be used to fulfill the City of Albuquerque's requirement for 7% of the property to be landscaped.

RECOMMENDATIONS

The following recommendations are made for the development of the three parcels.

1. Extend the storm sewer from Fourth Street to the east edge of Tract 1.
2. Construct a drop inlet at the intersection of Guadalupe Trail and Grecian Road with an orifice to control inlet capacity.
3. Limit discharge into the storm sewer from Tracts 1 and 2 after development to 0.8 and 0.9 cfs respectively. Procedures outlined in this report for controlling the runoff are suggested.
4. Construct curb and gutter to the north of Tract 1.
5. Upgrade pavement and valley gutters in the Leasure Acres apartment complex to allow positive drainage to Grecian Road and as outlined in the report by F. M. Fox & Associates.

CALCULATE RESERVE CAPACITY OF 24" PIPE IN 4TH ST

$$Q = cA \sqrt{2gh}$$

FROM SEE LYE

$$Q = (1.6)(.44)(1.8[(2)(32.2)(.39)]^{1/2})$$

DATA BOOK FOR CIVIL ENGR. DESIGN

$$Q = 2.38 (1.66) \leftarrow \text{CLOSING FACTOR} = 1$$

$$Q = \boxed{1.59 \text{ CFS}} \quad \text{INLET TYPE A}$$

CAPACITY OF 12" PIPE @ $S = .0012$ IN ALAMOSA RD.

$$Q = \frac{1.49}{.011} \left(\frac{12}{4 \times 12} \right)^{2/3} \left(.0012 \right)^{1/2} \left(\frac{\pi \left(\frac{12}{12} \right)^2}{4} \right)$$

$$= 1.46 \text{ CFS} \quad \text{CAPACITY OF 12" PIPE CONTROLS FLOW FROM INLETS}$$

CAPACITY OF 24" DIA PIPE IN 4TH STREET

$$Q = \frac{1.49}{.011} \left(\frac{24}{4 \times 12} \right)^{2/3} \left(.0011 \right)^{1/2} \left(\frac{\pi \left(\frac{24}{12} \right)^2}{4} \right)$$

$$Q = 8.89$$

CAPACITY REMAINING

$$8.89 \text{ CFS} - (1.46 + 5) = \underline{2.43 \text{ CFS}}$$

1 SINGLE "C" DROP INLET
IN GUADALUPE TRAIL



PROJECT NAME LEASURE Acres

SHEET 2 OF 14

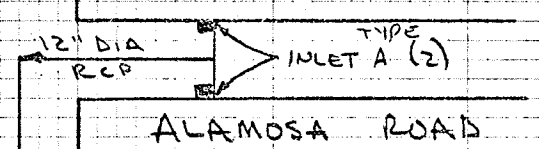
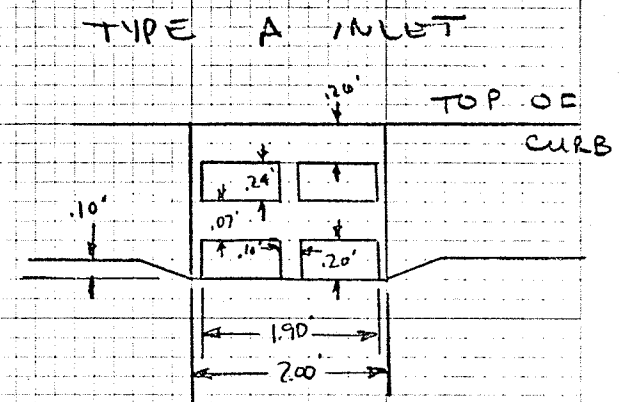
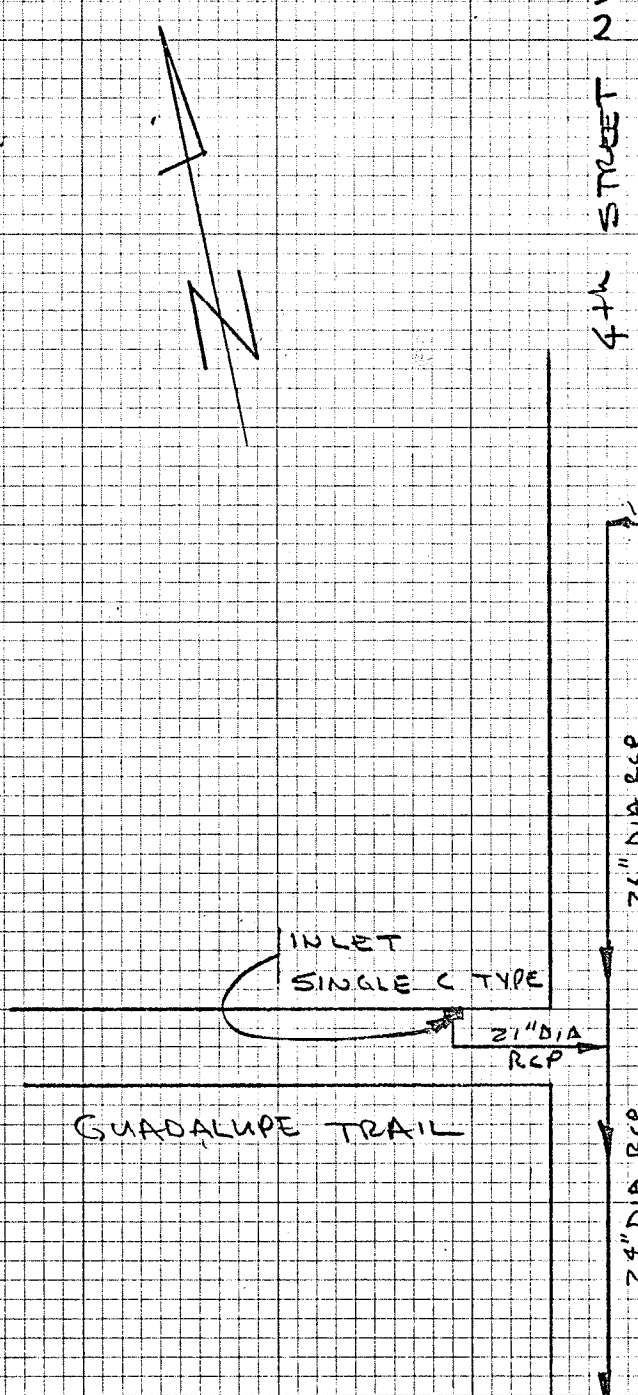
PROJECT NO. 77-054

BY WJ1 DATE 4-13-77

SUBJECT Storm Sewer Capacity

CH'D _____ DATE _____

EXISTING STORM SEWER AT THE INTERSECTION OF GUADALUPE TRAIL & 4TH STREET NW



DIRECTION OF
FLOW →



PROJECT NAME LEESURE ACRES SHEET 1 OF 14
 PROJECT NO. 77-054 BY MJI DATE 5-9-77
 SUBJECT DRAINAGE REPORT CH'D _____ DATE _____

CONT.

STORM DURATION	INTENSITY	RUNOFF RATE	VOLUME OF RUNOFF	DISCHARGE RATE	DISCHARGE VOLUME	A VOLUME
(t)	(i)	(Q)	CF	(Q _{out})	CF	CF
190	.88	11.22	127858	.9	10260	117598
195	.86	10.96	128240	.9	10530	117710
200	.84	10.72	128606	.9	10800	117805
205	.82	10.48	128955	.9	11070	117885
210	.80	10.26	129290	.9	11340	117950
215	.79	10.05	129610	.9	11610	118000
220	.77	9.84	129918	.9	11880	118038
225	.76	9.65	130213	.9	12150	118063
230	.74	9.46	130497	.9	12420	118077
235	.73	9.27	130770	.9	12690	118080 *
240	.71	9.10	131032	.9	12960	118072
245	.70	8.93	131285	.9	13230	118055

118080 CF STORAGE AREA



PROJECT NAME LEESURE ACRES SHEET 11 OF 14
 PROJECT NO. 77-054 BY MJI DATE 4-18-77
 SUBJECT DRAINAGE REPORT CH'D _____ DATE _____

CONT.

STORM DURATION	INTENSITY	RUNOFF RATE	VOLUME OF RUNOFF	DISCHARGE RATE	DISCHARGE VOLUME	Δ VOLUME
85 MIN	1.72 ^{IN} /HR	4.95 CFS	25250	.8	4100	21150
90	1.64	4.74	25550	.8	4300	21250
95	1.58	4.54	25850	.8	4550	21300
100	1.51	4.36	26141	.8	4800	21341
105	1.45	4.19	26392	.8	5040	21352 *
110	1.40	4.03	26675	.8	5280	21345
115	1.35	3.89	26841	.8	5520	21321

VOLUME TO BE STORED ON SITE AT
PEAK 21352 CF



PROJECT NAME LEASURE ACRES SHEET 7 OF 14
 PROJECT NO. 77-054 BY MJI DATE 4-14-77
 SUBJECT WATER RETENTION CH'D _____ DATE _____

Q FOR STAND PIPE

$$Q = \frac{(\pi)(.75)^2}{144} (.6) \sqrt{2(32.2)35} + \frac{(\pi)(.75)^2}{144} (4)(.6) \sqrt{2(32.2)3.75} \\ + \frac{(\pi)(.75)^2}{(144)2} (.6) \sqrt{2(32.2)4}$$

$$Q = .9 \text{ CFS}$$

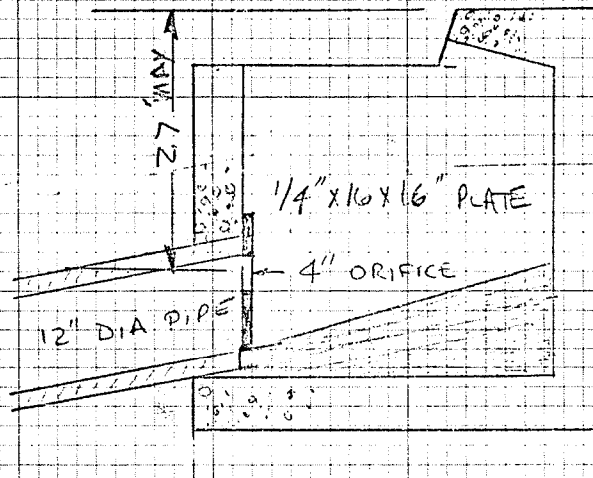
THIS DISCHARGE FROM THE STORAGE AREA FOR TRACT 2 SHOULD BE LOCATED IN THE VICINITY OF THE SOUTH EAST CORNER OF THE TRACT AND DISCHARGE INTO THE MANHOLE AT THE INTERSECTION OF 4TH AND GUADALUPE TRAIL



PROJECT NAME LEASURE ACRES SHEET 13 OF 14
PROJECT NO. 77-054 BY MJI DATE 4-18-77
SUBJECT DRAINAGE REPORT CH'D _____ DATE _____

INLET CONTROL AT DROP INLET

AT THE INTERSECTION OF GREGAN ROAD AND
GUADALUPE TRAIL T.C.



$$Q = (.6)(.0873) [(2)(32.2)(2.7)]^{1/2}$$

2.7' HEAD

$$= .69 \text{ CFS}$$

$$Q = (.6)(.0873) [(2)(32.2)(3.4)]^{1/2}$$

3.4' HEAD

$$= .78 \text{ CFS}$$



PROJECT NAME LEASURE ACRES SHEET 14 OF 14
PROJECT NO. 77-054 BY MJI DATE _____
SUBJECT DROP INLET CONTROL CH'D _____ DATE _____



LEESURE ACRES APARTMENTS

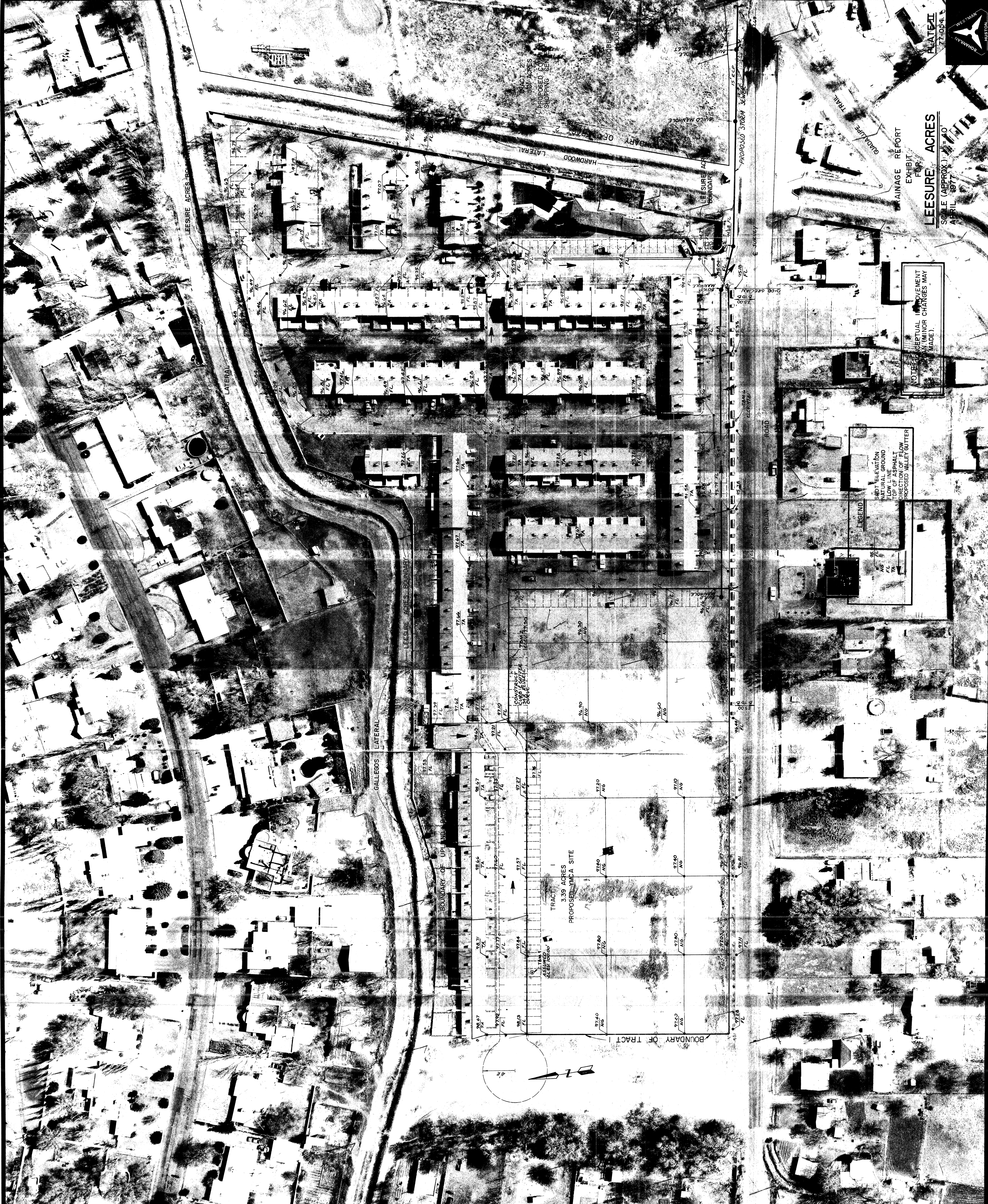
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E-14-7

ALBUQUERQUE PLANNING DEPARTMENT



NOTICE: SPECTUAL IMPROVEMENT
ANY MINOR CHANGES MAY
MADE.

LEGEND
SPOT ELEVATION
NATURAL GROUND
TOP OF ASPHALT
DIRECTION OF FLOW
PROPOSED VALLEY GUTTER

LEASURE ACRES
SCALE (APPROX) 1" = 40'
APRIL 1977

