HYDROLOGY L22/D12 NO PLANS

L 22/ D12

NO PLANS

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

MAYOR
Harry E. Kinney

CHIEF
ADMINISTRATIVE OFFICER
Frank A. Kleinhenz

March 2, 1977

Mr. John Leverton
Leverton Engineering
4022-I Rio Grande Blvd. N.W.
Albuquerque, N.M. 87107

SUBJECT: GALLAGHER ADDITION, REPLAT BLOCKS 3 AND 4, DRAINAGE REPORT

Dear Mr. Leverton:

The drainage report submitted by your letter of February 18, 1977 has been reviewed and is approved.

Sincerely,

V. M. Kimmick
City Engineer

VMK/fs

cc: Jim Smith, AMAFCA
Bob Kielich
Dwayne Sheppard
Drainage File

Public Works Department

Director — Erwin F. Hensch, P. E. 766-7467
Engineering 766-7441 — V. M. Kimmick, P. E.
Street Maint. 766-7755 — G. E. Paul, P. E.
Ass't. Director — Harold R. Orr, Jr. P. E.
Liquid Waste 766-7535 — R. P. Lowe, P. E.
Water 766-7437 — W. H. Otto, P. E.

AN EQUAL OPPORTUNITY EMPLOYER

LEVERTON ENGINEERING

4022-I RIO GRANDE BLVD., N.W.
ALBUQUERQUE, NEW MEXICO 87107
(505) 345-5479

May 5, 1977

Mr. Coda Roberson
Roberson Construction Company
9212 Trumbull Avenue, S.E.
Albuquerque, New Mexico

Re: Gallagher Addition Drainage

Dear Coda,

The approved concept of drainage in the subject subdivision provided for the ponding of storm water for the area from the front line of each building to the rear property line of the lot.

The volume of the typical pond for a lot was requested yesterday by Mr. Bruno Conegliano, City Drainage Engineer.

The following calculations derive the volume for a typical lot in Gallagher Addition using the locally accepted arguments:

1. Area of lot from the front building line to the rear property line: 110' X 32' = 3520 sq ft
2. Roof area: 1340 sq ft
3. Composite run-off coefficient using a factor of 0.35 for the lot developed in the normal fashion and 0.95 for the roof = 0.58
4. Volume pond required to contain the water of a 2.5" rainfall
   2.5 X 3520 X 0.58/12 = 425 cubic feet

If we can be of further assistance, please let me know.

John Leverton

John Leverton

DRAINAGE REPORT

for

RePlat of Blocks 3 and 4

of

Gallagher Addition

Albuquerque, New Mexico

Zone Atlas Sheet L-22

Prepared For

Coda Roberson Construction Co., Inc.

Developer

Prepared By: Leverton Engineering Co.
4022-H Rio Grande Boulevard NW
Albuquerque, New Mexico

February 1977

John G. Leverton
PE No. 1874
New Mexico

STATE OF NEW MEXICO
JOHN G. LEVERTON
No. 1874
REGISTERED
PROFESSIONAL ENGINEER AND LAND SURVEYOR

DRAINAGE REPORT
RePlat of Blocks 3 and 4 of Gallagher Addition

Scope and Objectives:

1. To determine the effect of storm water run-off from drainage areas located above the subject subdivision. The routing of such off-site flow around or through the subdivision.
2. To develope criteria for the design of lot grading to insure that no larger quantity of storm water run-off is allowed to flow from the developed subdivision than now occurs.
3. To demonstrate that homes built in the subdivision will not be adversely affected by storm water run-off.

Development of Run-off Quantities:

1. The 100 year storm return was used in the calculation of run-off in each instance.
2. The "Rational Formula" was used to evaluate run-off quantities.
3. Run-off factors were selected and evaluated by weighting to reflect the degree of development of the land either as existing or after the ultimate development that may occur.
4. Time of concentration was determined by using the length and characteristics of the watershed as the entrance argument to the nomograph on page 18-01 in Seelye's Date Book For Civil Engineers.
5. Rainfall intensity was derived from the 100 year curve on Chart 1 of "The Master Plan of Drainage, City of Albuquerque, New Mexico and Environs, 1963".
6. "Manning's Formula" was used in computing the hydraulic capacities of the streets.

Off-Site Drainage:

Please refer to attached Exhibit "A".

The off-site drainage areas which contribute storm water flow to the vicinity of the subdivision are evaluated as follows:

1. Area "A":

Present use; KOA Campground and 60% undeveloped.
Area: 18 acres.
Coefficient of run-off after development: 20% as 1.0; 40% as 0.35; and 40% as 0.70. Composite "c" = 0.62.
Rainfall intensity: 4.2 inches per hour.

Q = 47 cfs

2. Area "B": (Skyline Road)
   Present use; Paved, sidewalks, and undeveloped right-of-way.
   Area; 3.2 acres.
   Coefficient of run-off: 73% as 1.0; 27% as 0.35;
   Composite "c" = 0.82.
   Rainfall intensity; 4.2 inches per hour

   Q = 11 cfs

3. Area "C":
   Presently undeveloped. SU-1 permit exists for the site for Church related recreational facilities.
   Area; 3.9 acres.
   Coefficient of run-off after development; 40% as 0.95; 60% as 0.35. Composite "c" = 0.58.
   Rainfall intensity; 5.1 inches per hour

   Q = 12 cfs

4. Area "D":
   Present use; Undeveloped. The location and zoning indicate probable development as multi-family.
   Area; 7.7 acres.
   Coefficient of run-off; 60% as 1.0; 40% as 0.35.
   Composite "c" = 0.74.
   Rainfall intensity; 4.3 inches per hour.

   Q = 25 cfs

Routing of off-site drainage:

1. Run-off from areas "A" and "B":

   The combined storm water flow out of these two drainage areas is calculated to be 58 cfs in the developed condition. This flow will be intercepted and conveyed along and past the northern line of the subdivision by Skyline Road which has the hydraulic capacity of 185 cfs. (8" curbs, 6" crown, 48' width, and a longitudinal slope of 0.03) The existing paved intersections at Burma and Zena Lona are constructed, as determined by field survey, to provide a 0.5' depth of water section in Skyline which is more than sufficient to contain the required flow of 58 cfs.

2. Run-off from area "C":
   The storm water run-off from drainage area "C" is calculated to be 12 cfs after development. This will be intercepted and conveyed along and past the eastern line of the subdivision by Burma Drive which will have the hydraulic capacity of 51 cfs. (8" curbs, 8" lateral slope, 32' width, and a longitudinal slope of 0.01)

The eastern curb and the paving of Burma will be built with Paving District 191 which is in the design stage. The Western curb will be constructed in the course of development of this subdivision.

3. Run-off from area "D":
The storm water run-off from drainage area "D" is calculated to be 25 cfs after development. This will be intercepted and conveyed by Figueroa Street which has the hydraulic capacity of 110 cfs. (8 " curbs, 6" crown, 40' width, and a longitudinal slope of 0.02)

Site Run-Off, Undeveloped. See Exhibit "B":

Use: Presently undeveloped. Natural mesa type vegetation, poorly graded sand and silt in consolidated condition, uniform slope.
Area: 5.6 acres.
Coefficient of run-off: 0.35
Rainfall intensity: 4.7 inches per hour.

Q = 9.2 cfs

Site Run-Off, Developed: See Exhibit "C":

Use: Zero lot line Townhouses as shown on attached exhibit.
Areas: For the purposes of this report the subdivision is divided into four segments:

1. Drainage Area 1. Defined as extending from front line to front line of Townhouses on Zena Lona.
   This area is comprised of:
   A. Curb and gutter, pavement, and sidewalks:
      41.25' X 520' = 0.49 acres.
      Coefficient of run-off = 1.0
   B. Paved drives:
      24 each at 18' X 31.9' = 0.32 acres
      Coefficient of run-off = 1.0
   C. Front yards--side walk to buildings:
      2 X 31.9 X 520 minus drives = 0.44 acres
      Coefficient of run-off = 0.35

Total area = 1.25 acres
Combined "c" = 0.77
Rainfall intensity = 4.85 inches per hour

Q = 4.7 cfs

2. Drainage Area 2: Defined as extending from the front line of Townhouses on Burma to the centerline of the street.
   This area is comprised of: One-half of the areas as developed in area 1 above with the same coefficients of run-off and intensity. Q = 2.4 cfs

3. Drainage Area 3: Defined as extending from the southern property line of the subdivision to the curb on Linn Avenue. For the purposes of this report area 3 is further studied as three segments which are shown as 3a, 3b, and 3c on the attached exhibit "C" to reflect the differing outfall locations.
   Each of the three segments is comprised of:
   A. Curb and gutter and sidewalk:
      6.6 X 108' = 0.02 acres
      Coefficient of run-off = 1.0
   B. Southerly property line to sidewalk:
      9.4 X 108' = 0.02 acres
      Coefficient of run-off = 0.35

Total Area = 0.04 (each of the three segments)
Combined "c" = 0.68
Rainfall intensity = 7.2 inches per hour

<u>Q = 0.2 cfs</u>

4. Drainage Area 4: Defined as the extending from the front Townhouse line to the rear lot line. Rainfall on this area will be stored by rear yard ponding on each lot in conformance with the generalized grading plan shown on the attached exhibit "C". The Developer is committed to construct all lots in accordance with the grading plan to effect rear yard ponding.
   Weighted area of each lot = 4475 sq. ft.
   Ponding volume required per lot = 2.5" (6 hour--100 year storm) X area in sq. ft. X runoff coefficient divided by 12 = <u>326 cubic feet</u>.

Streets After Development: See Exhibit "C".

1. Burma Drive: Burma Drive will be required to convey the outfall from area 2 calculated as 2.4 cfs plus the run-off from the off-site area "C" which was shown to be 12 cfs for a total of 14.4 cfs.
   The hydraulic capacity of Burma previously calculated was 51 cfs.
2. Zena Lona Avenue: The storm water outfall from area 1 was calculated as 4.7 cfs after development.
   The hydraulic capacity of Zena Lona is 51 cfs.
   (8" curbs, 8" lateral slope, 32' width, and slope of 0.01.

Drainage at Linn Avenue: See exhibit "D"

The undeveloped area now contributing storm water run-off to the western reach of Linn Avenue south of the subdivision is shown on the attached exhibit "D".
Area 2.8 acres
Coefficient of run-off: 0.35
Rainfall intensity: 4.5 inches per hour

Q = 4.4 cfs

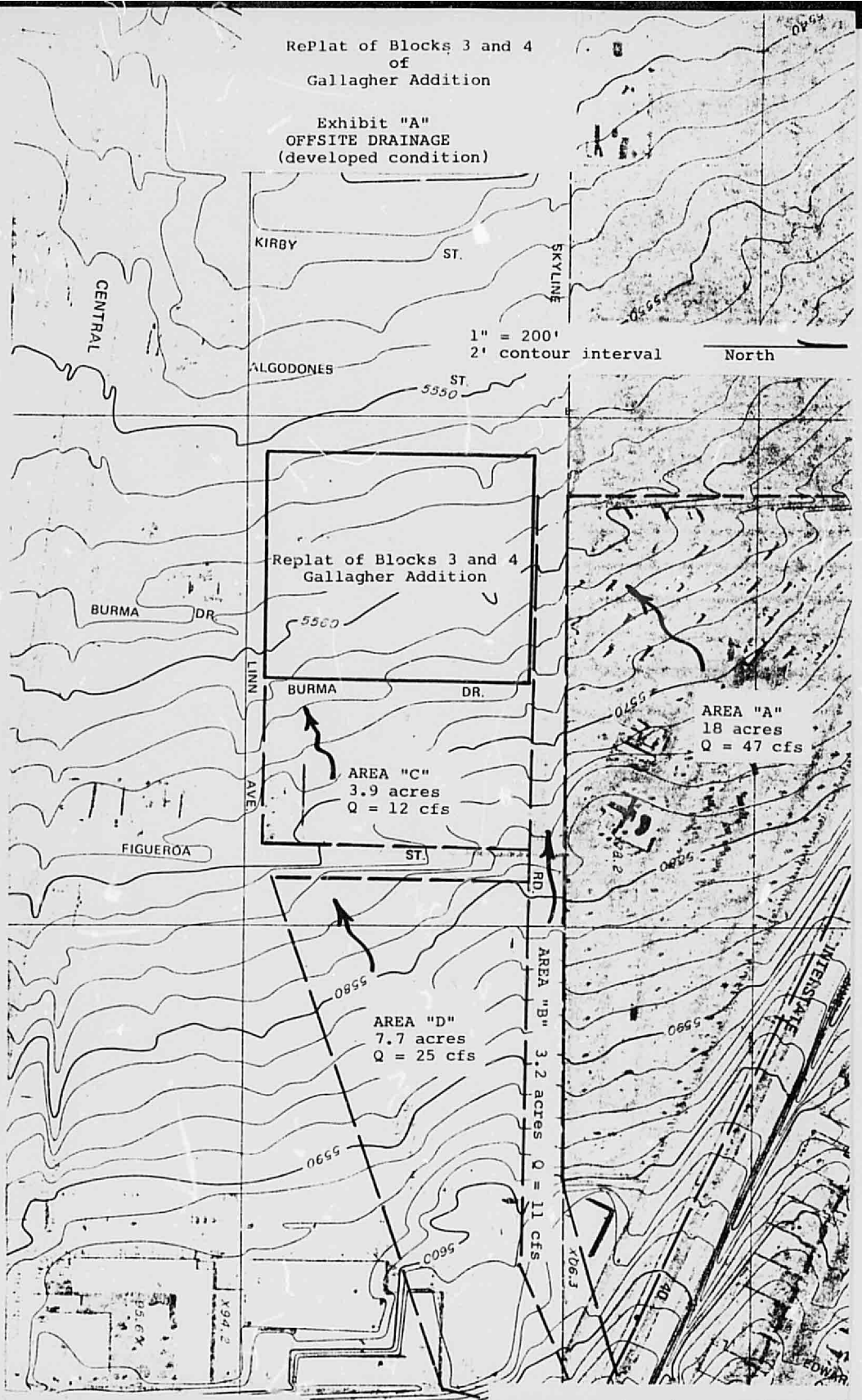
Storm water flow from the subdivision, after development, outfalling to the western reach of Linn Avenue south of the subdivision is calculated to be 5.1 cfs. This is composed of the flow from drainage areas 1, 3a, and 3b.

Runoff Summary And Conclusions:

1. Storm water flow from a 100 year rain in the present undeveloped state: 9.2 cfs
2. Run-off after development: 7.7 cfs
3. The decrease in run-off shown above is effected by rear yard ponding.
4. Storm water outfall from off-site drainage areas will be intercepted by streets having more than sufficient hydraulic capacity to conduct such flow.
5. The streets of the subdivision have adequate capacity to accept the flow of storm water from the developed subdivision.
6. Townhouses built in the subdivision will not be adversely affected by the run-off from a 100 year storm.

RePlat of Blocks 3 and 4
of
Gallagher Addition

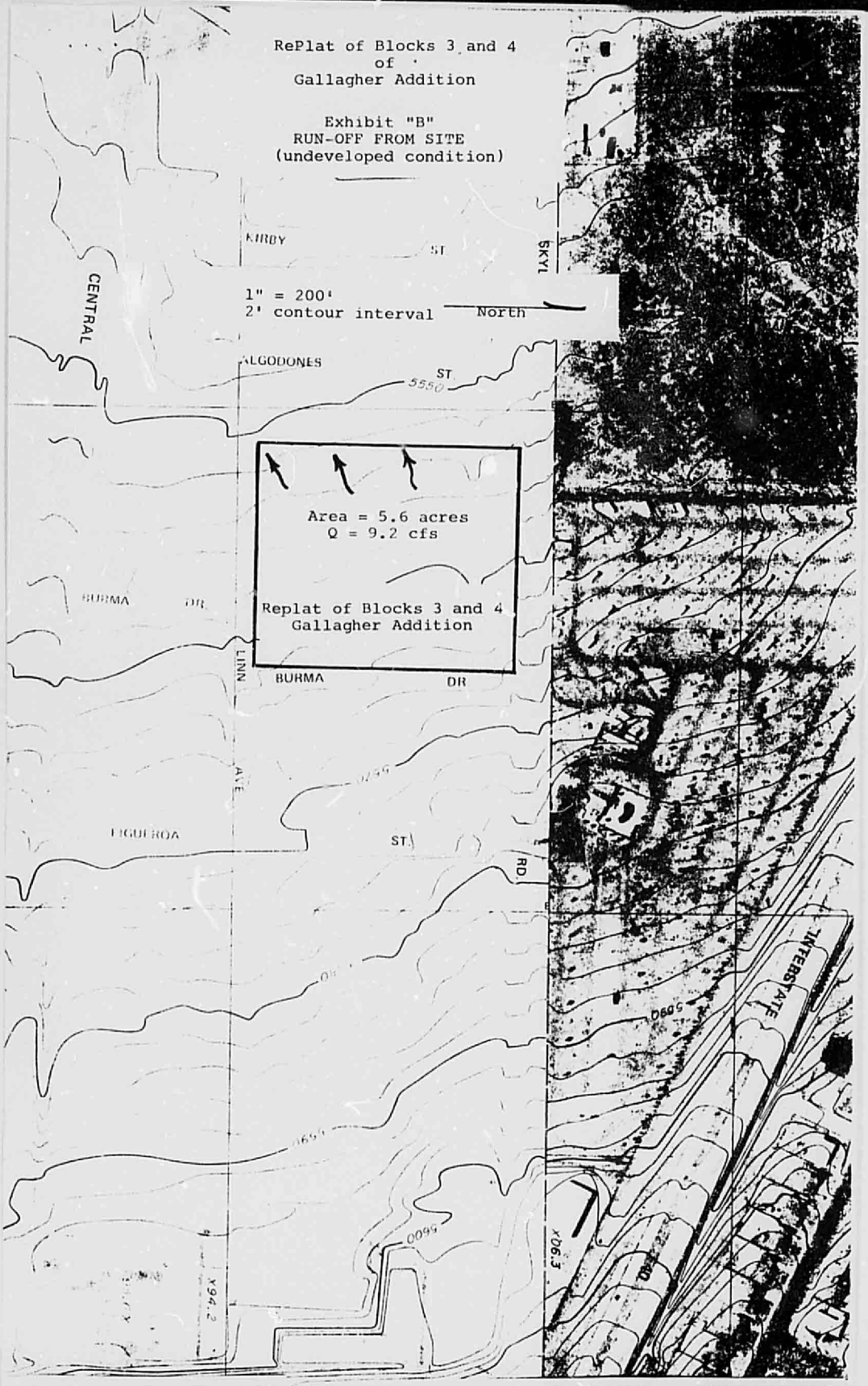
Exhibit "A"
OFFSITE DRAINAGE
(developed condition)



From Ortho-Topo Map L-22

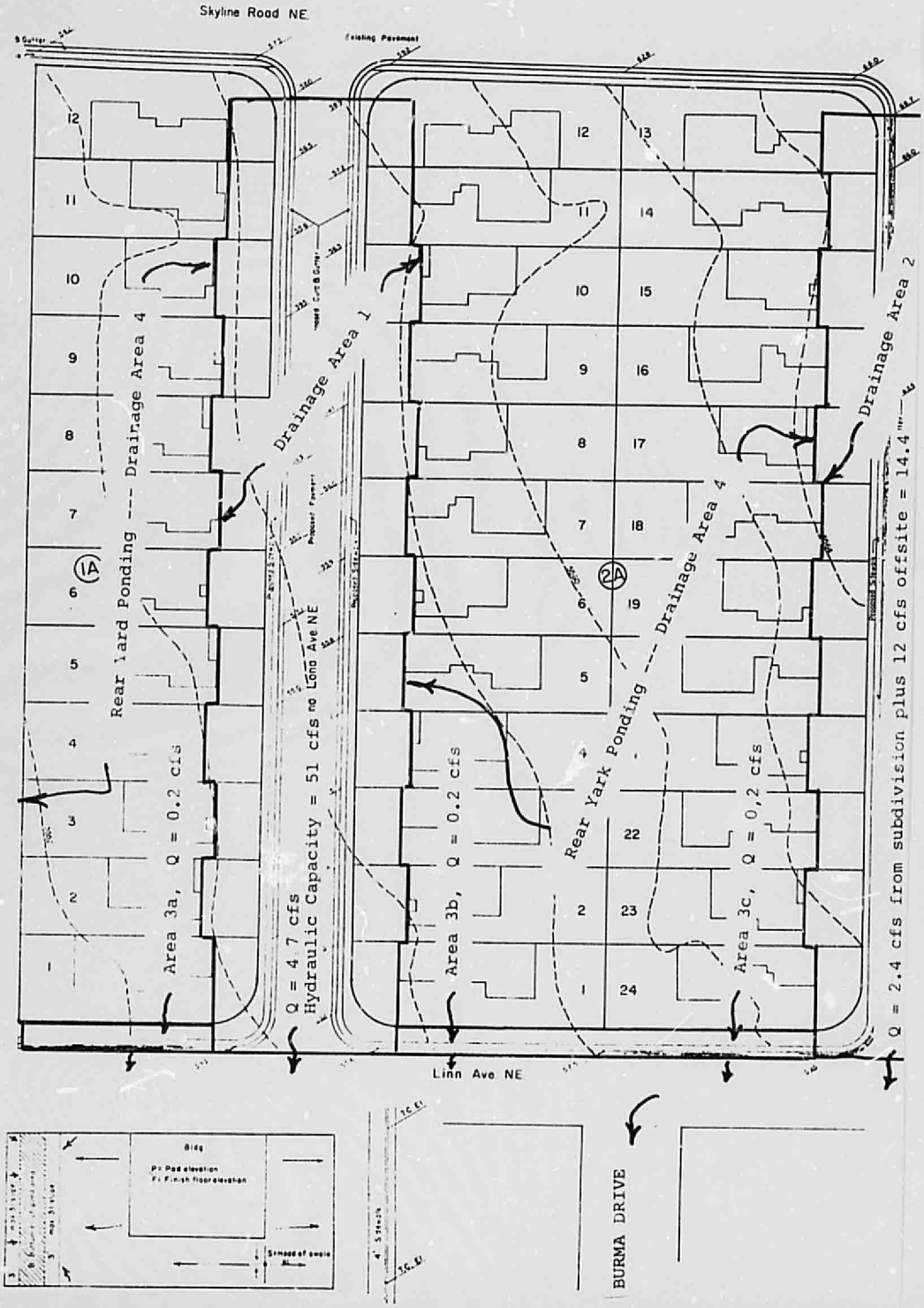
Leverton Engineering----February 19

THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT



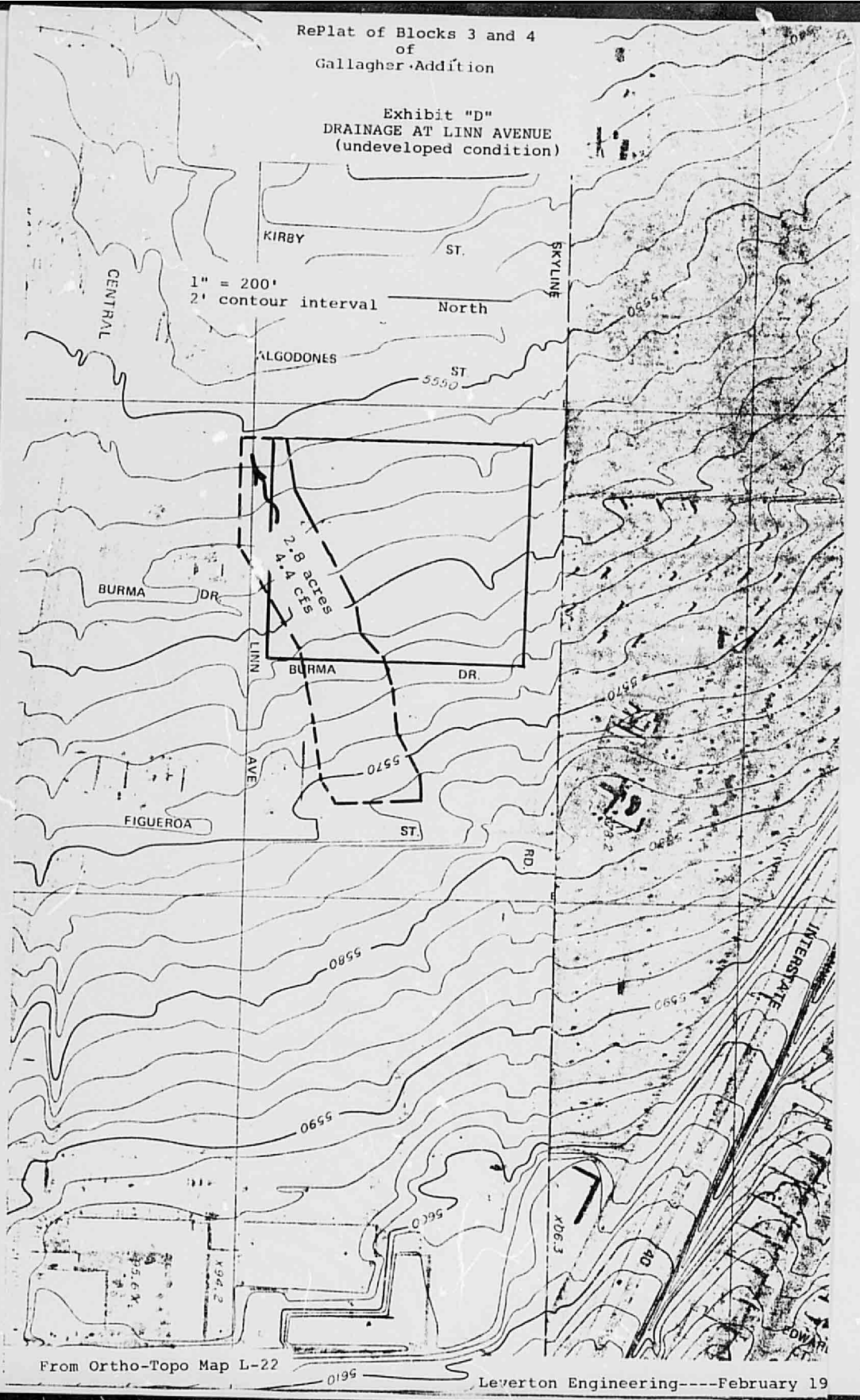
From Ortho-Topo Map L-22 Leverton Engineering----February 1977

RePlat of Blocks 3 and 4
of
Gallagher Addition
Exhibit "C"
RUNOFF FROM SITE AFTER DEVELOPMENT



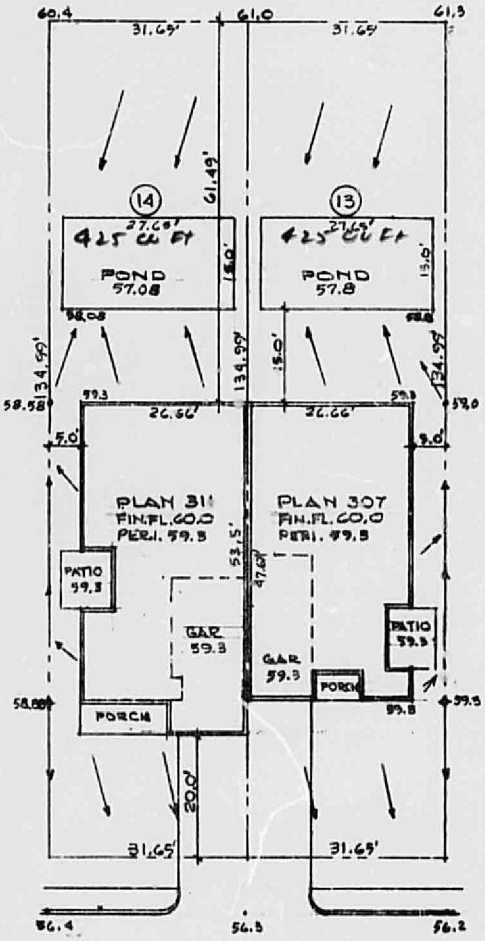
RePlat of Blocks 3 and 4
of
Gallagher Addition

Exhibit "D"
DRAINAGE AT LINN AVENUE
(undeveloped condition)



From Ortho-Topo Map L-22

Leverton Engineering----February 19



ZENA LONA AVE. N.E.

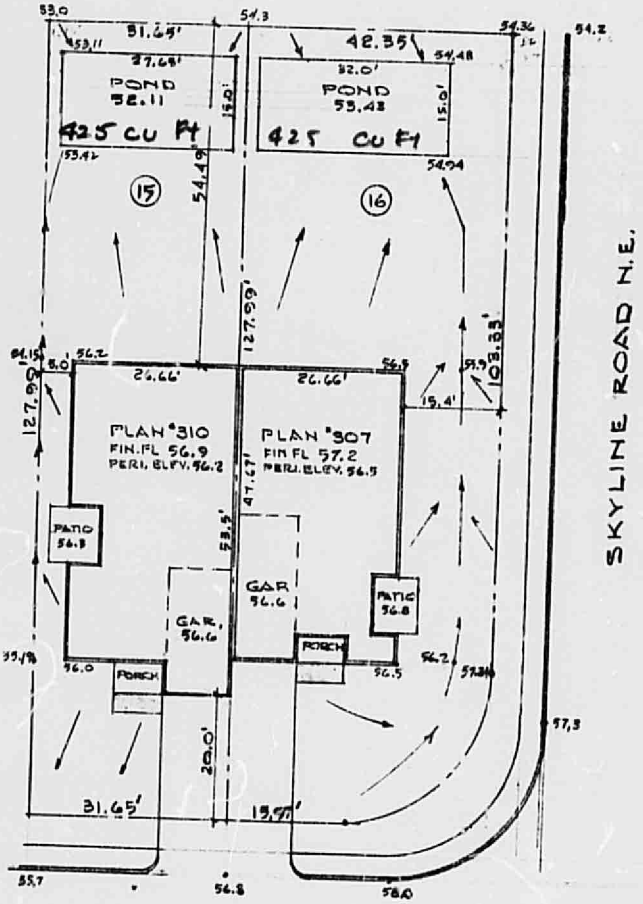
N

SCALE: 1" = 20.0'

SITE PLAN

252 & 248 ZENA LONA AVE. N.E.
LOTS: #14 & #13
BLK: 2A
REPLAT OF BLOCKS #3 & #4
GALLAGHER ADDITION

DRAWN BY: P.W. ROBINSON 4/29/77
REV. DRAINAGE 5/5/77 P.W.R.



SITE PLAN

257 & 261 ZENA LONA AVE. N.E.

SCALE: 1" = 20.0'

LOTS: #15 & #16

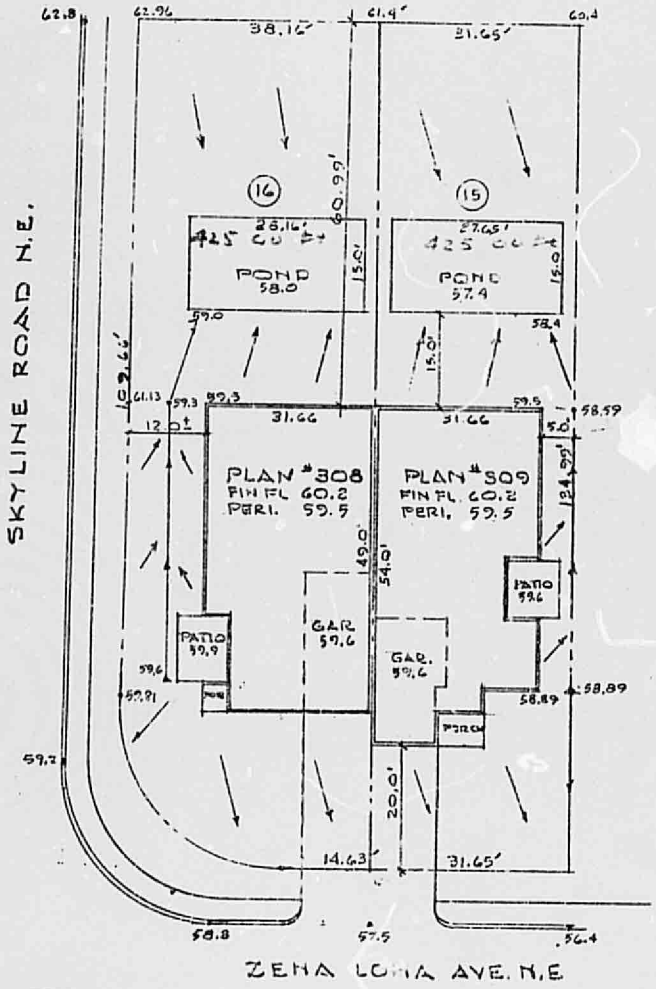
BLK: #1-A

REPLAT OF BLOCKS #3 & #4

GALLAGHER ADDITION

DRAWN BY: P.W. ROBINSON 4/29/77

REV. DRAINAGE 5/5/77 P.W.R.



SCALE: 1" = 20.0'

SITE PLAN

260 & 256 ZENA LOMA AVE. N.E.

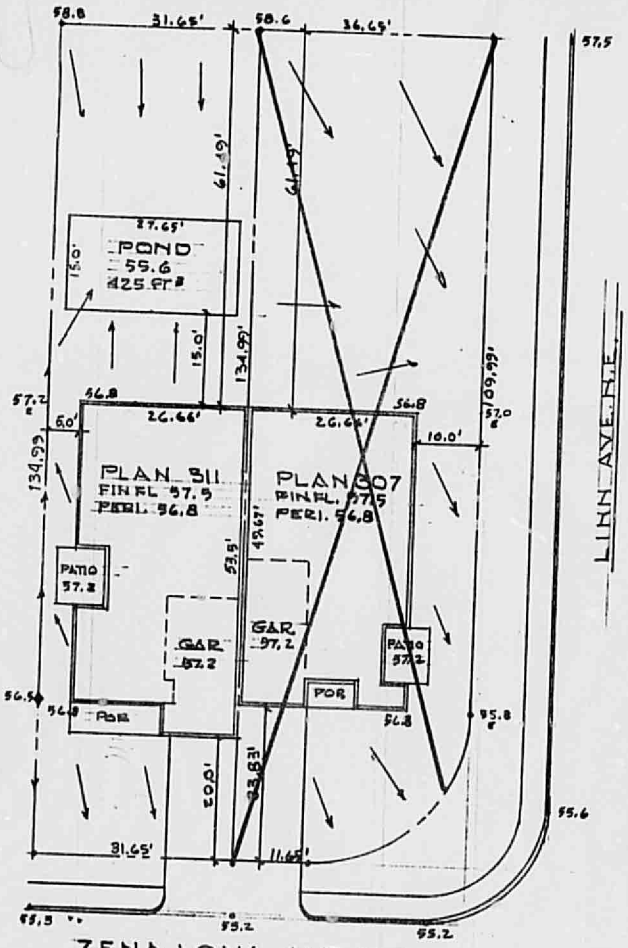
LOTS: #16 & #15

BLK: #2A

REPLAT OF BLOCKS #3 & #4

GALLAGHER ADDITION

DRAWN BY: F.W. ROBINSON 4/29/77



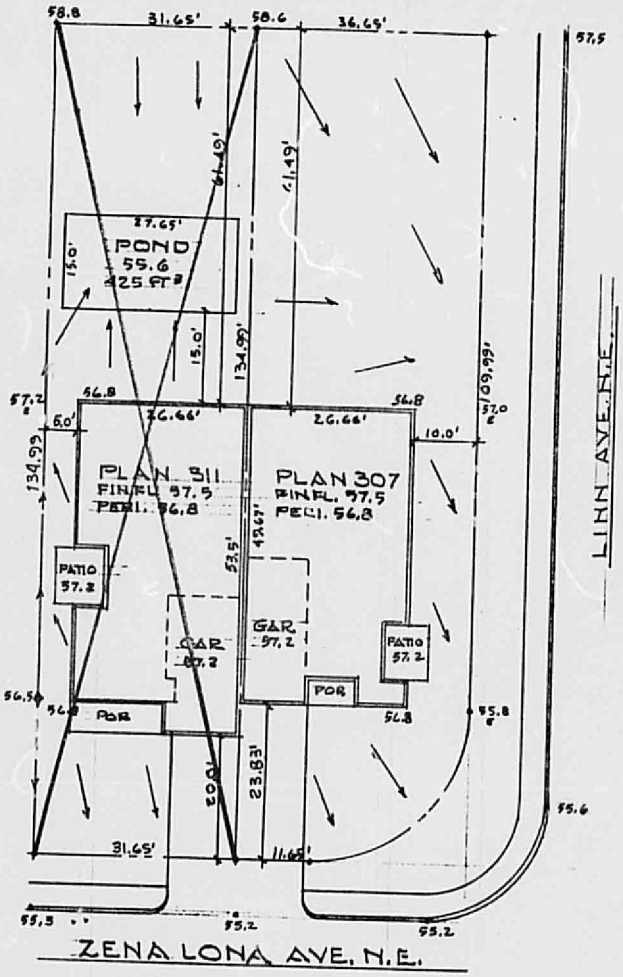
SITE PLAN

SCALE: 1" = 20.0'

200 # [redacted] ZENA LONA AVE. N.E.
LOTS: #1 & #2
BLK: 2-A
REPLAT OF BLOCKS #3 & #4
GALLAGHER ADDITION

DRAWN BY: P.W. ROBINSON 6/13/77

REISSUE OF [redacted] 252 ZENA LONA AVE. N.E.



N

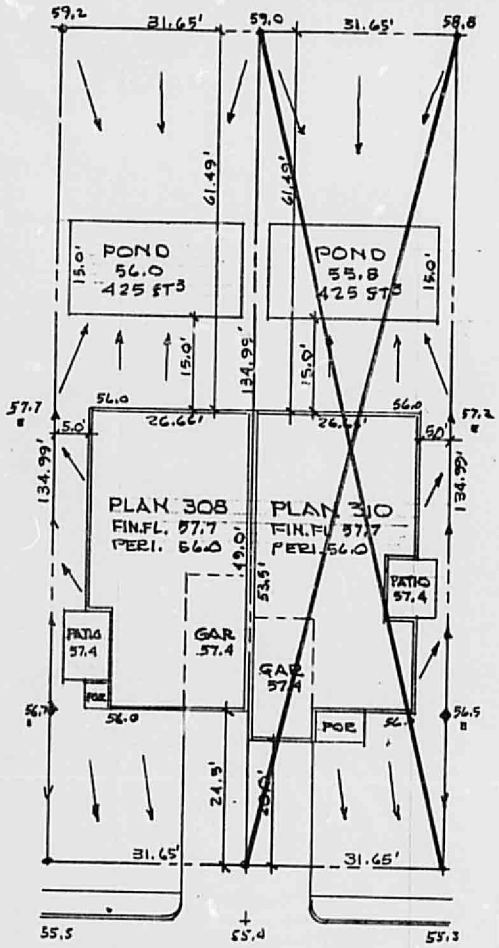
SITE PLAN

SCALE: 1" = 20.0'

[redacted] & 204 ZENA LONA AVE. N.E.
LOTS: #1 & #2
BLK: 2-A
REPLAT OF BLOCKS #3 & #4
GALLAGHER ADDITION

DRAWN BY: P.W. ROBINSON 6/13/77

REISSUE OF 261 ZENA LONA AVE. N.E.



N

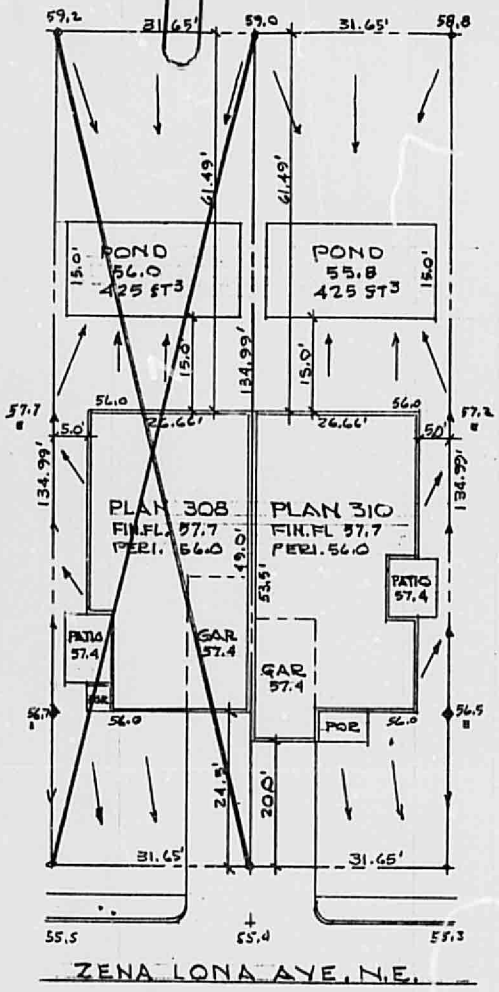
SITE PLAN

SCALE: 1" = 20.0'

208 & ~~[illegible]~~ ZENA LONA AVE. N.E.
LOTS: # 3 & #4
BLK: 2-A
REPLAT OF BLOCKS #3 & #4
GALLAGHER ADDITION

DRAWN BY: P.W. ROBINSON 6/13/77

REISSUE OF 260 ZENA LONA AVE NE



N

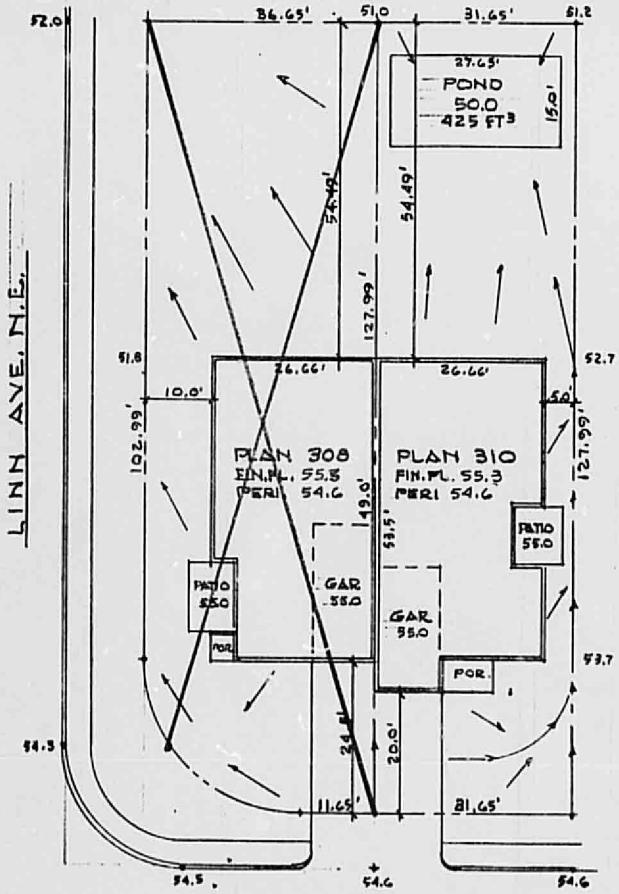
SITE PLAN

SCALE: 1" = 20.0'

[redacted] 212 ZENA LONA AVE. N.E.
LOTS: # 3 & #4
BLK: 2-A
REPLAT OF BLOCKS #3 & #4
GALLAGHER ADDITION

DRAWN BY: P.W. ROBINSON 6/13/77

REISSUE OF 257 ZENA LONA AVE N.E.



ZENA LONA AVE. N.E.

SITE PLAN

N

[redacted] # 205 ZENA LONA AVE. N.E. SCALE: 1" = 20.0'

LOTS: #1 & #2

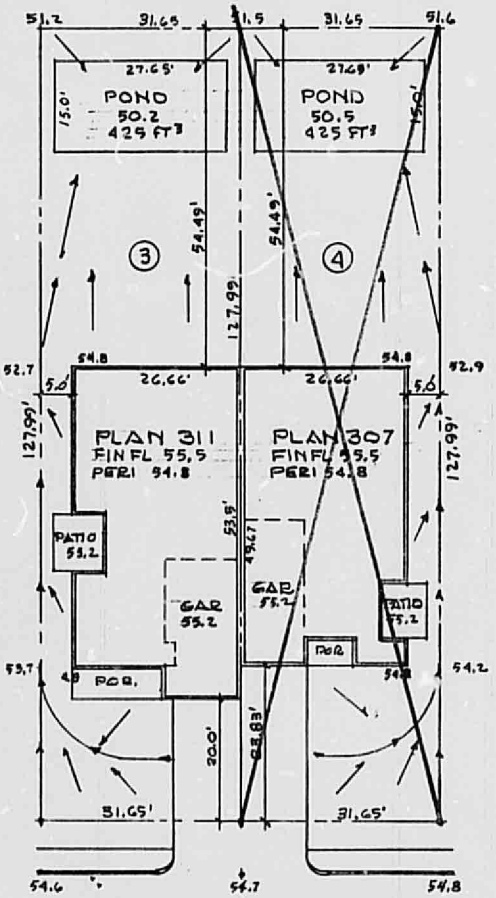
BLK: 1-A

REPLAT OF BLOCKS #3 & #4

GALLAGHER ADDITION

DRAWN BY: P.Y. ROBINSON 6/13/77

REISSUE OF 257 ZENA LONA AVE N.E.



SITE PLAN

209 & [redacted] ZENA LONA AVE.N.E. SCALE: 1"=20.0'

LOTS: #3 & #4

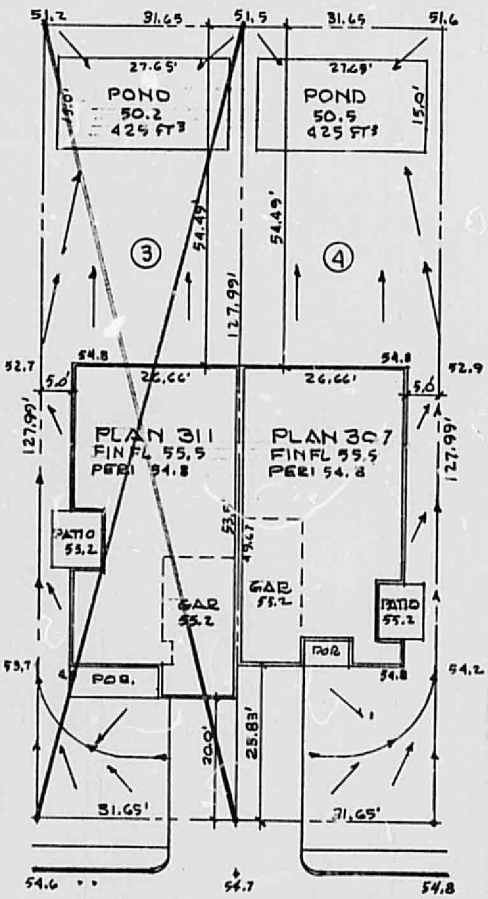
BLK: 1-A

REPLAT OF BLOCKS #3 & #4

GALLAGHER ADDITION

DRAWN BY: P.Y. ROBINSON 6/13/77

REISSUE OF 252 ZENA LONA AVE NE



SITE PLAN

[redacted] # 213 ZENA LONA AVE. N.E. SCALE: 1" = 20.0'

LOTS: #3 + #4

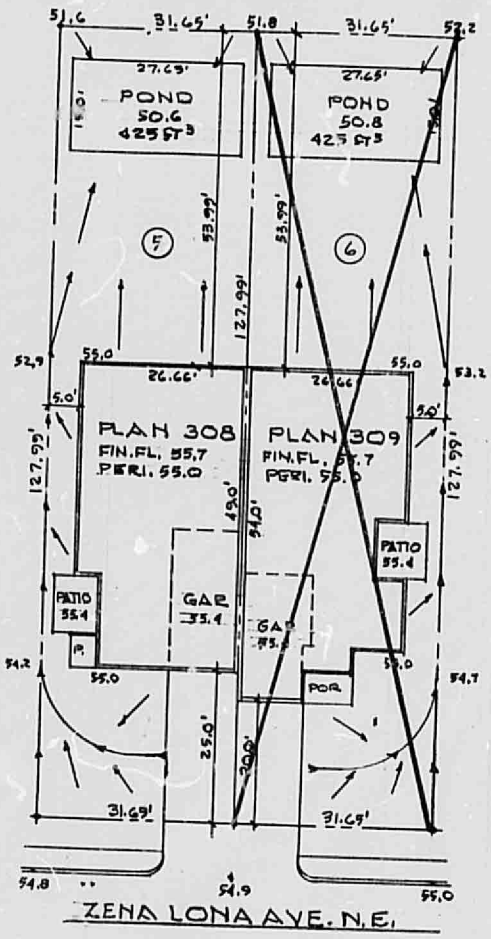
BLK: 1-A

REPLAT OF BLOCKS #3 + #4

GALLAGHER ADDITION

DRAWN BY: P.W. ROBINSON 6/13/77

REISSUE OF 261 ZENA LONA AVE. N.E.



SITE PLAN

217 # [redacted] ZENA LONA AVE. N.E SCALE: 1"=20.0'

LOTS: #5 #6

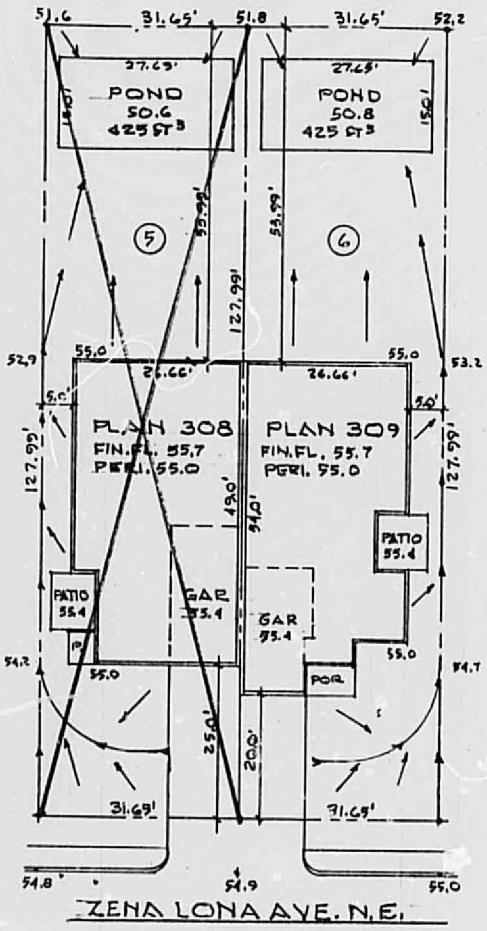
BLK: 1-A

REPLAT OF BLOCKS #3 #4

GALLAGHER ADDITION

DRAWN BY: P.W. ROBINSON. 6/13/77

REISSUE OF 260 ZENA LONA AVE NE.



SITE PLAN

[redacted] # 221 ZENA LONA AVE. N.E. SCALE: 1" = 20.0'

LOTS: #5 & #6

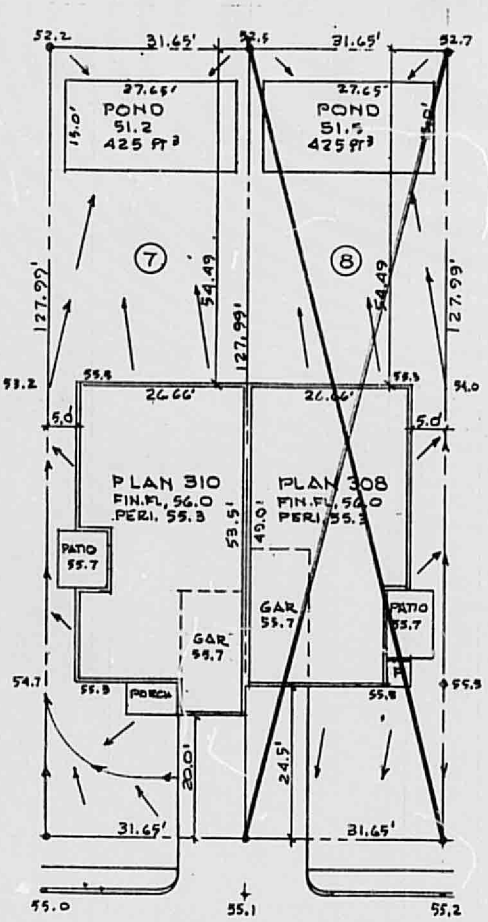
BLK: 1-A

REPLAT OF BLOCKS #3 & #4

GALLAGHER ADDITION

DRAWN BY: P.W. ROBINSON. 6/13/77

REISSUE OF 256 ZENA LONA AVE N.E.



ZENA LONA AVE. N.E.

N

SCALE: 1" = 20.0'

SITE PLAN

225 [redacted] ZENA LONA AVE N.E.

LOTS: #7 & #8

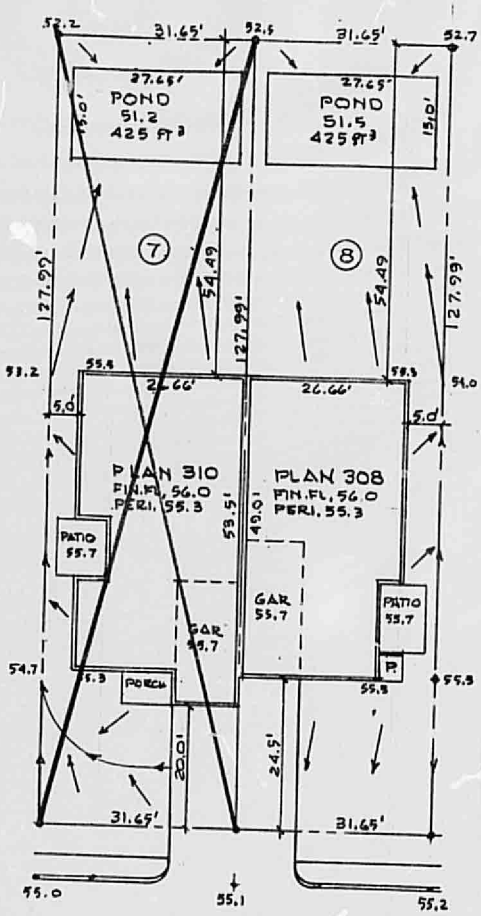
BLK: #1A

REPLAT OF BLOCKS #3 & #4

GALLAGHER ADDITION

DRAWN BY: P.W. ROBINSON 6/13/77

REISSUE OF 257 ZENA LONA AVE NE



ZENA LONA AVE. N.E.

N

SCALE: 1" = 20.0'

SITE PLAN

[redacted] # 229 ZENA LONA AVE. N.E.

LOTS: #7 & #8

BLK: #1A

REPLAT OF BLOCKS #3 & #4

GALLAGHER ADDITION

DRAWN BY: P.W. ROBINSON 6/13/77

REISSUE OF 260 ZENA LONA AVE NE