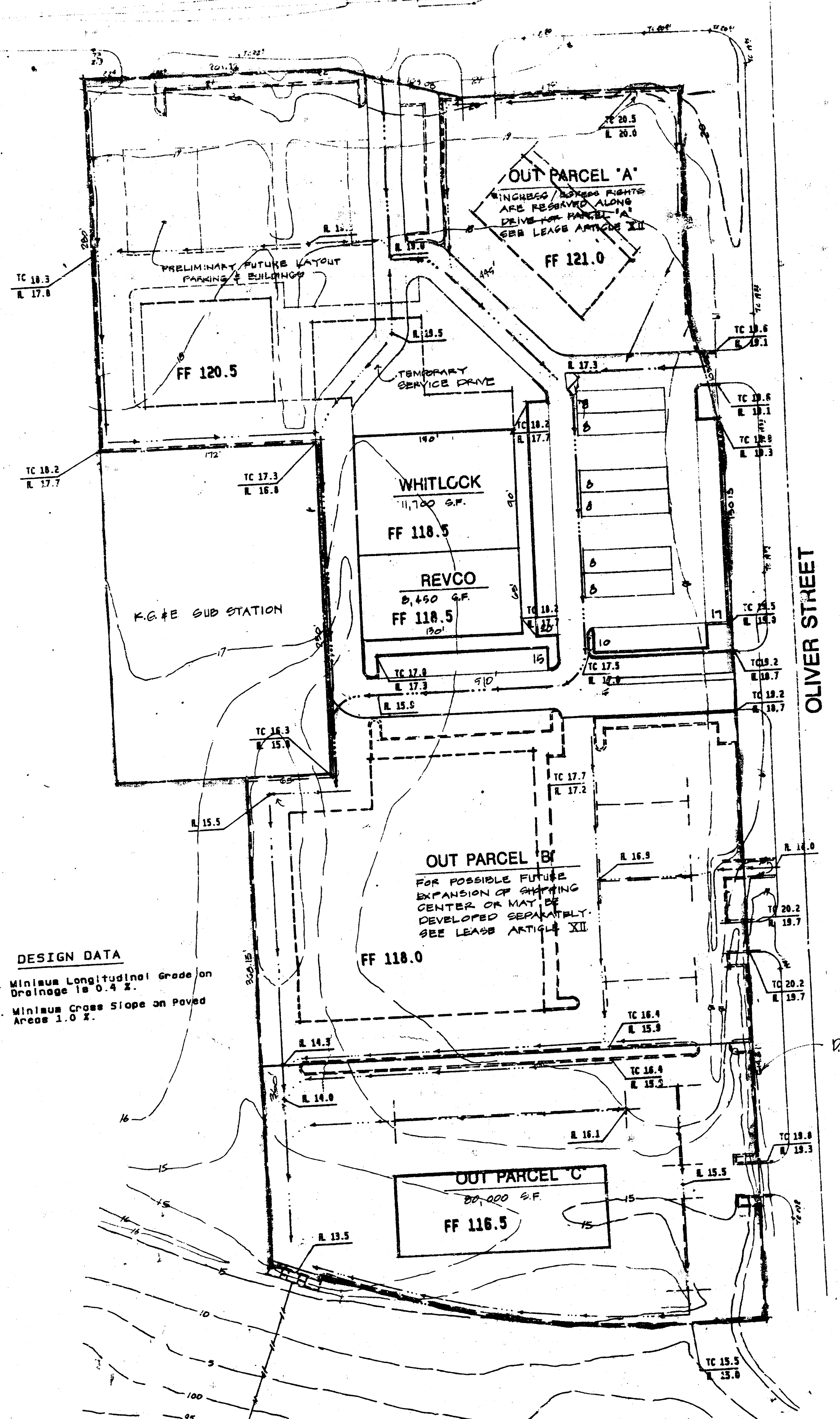




POE & ASSOCIATES OF KANSAS INC.
January 3, 1989

Ms. Vicki Huang, P.E.
Engineering, 7th Floor
655 North Main
Wichita, Kansas 67202

Re: Spencer Gardens 2nd Addition

Dear Vicki:

The enclosed plans are for the construction of an area inlet and storm sewer to drain the above referenced addition. Calculations for drainage runoff from the current site plan for this area indicate a 52 cfs peak discharge for the 100 year storm. This was the design storm used to size the inlet and pipe for this structure. Calculations for this design are enclosed.

Please review the plans and contact me if you have any questions.

Yours truly,
POE & ASSOCIATES OF KANSAS, INC.
Kenneth E. Hylle, P.E.
Project Manager
KEH:cmh
Encl.

Final Design

4.0780/1264 5' x 5' A. 6

$Q = 0.47 A [4.32(d - \frac{h}{2})]^{1/2}$

$d = 7.5 \quad h = 0.5 \quad Q = 48.4 \quad 112.5 + 2.5 = 115.0 \quad HW$

Bearing

$Q = 5.37 A d^{0.5}$

$d = 1.5' \quad A = \frac{\pi r^2}{2} = 1.6 \quad 50\% \text{ OPEN AREA}$

$Q = 10.5 cfs \quad 113.5 + 1.5 = 115.0 \quad HW$

$10.5 + 48.4 = 58.9 cfs \quad \text{TOTAL WFLOW @ HW} = 115$

TABLE 8
MINOR LOSSES AND HYDRAULIC GRADE LINE

STRUCTURE NO. TYPE (IN/OUT) INLET ELEVATION (FEET) OUTLET ELEVATION (FEET) LOSS (FEET) HEAD LOSS (FEET) TOTAL HEAD LOSS (FEET) INLET VELOCITY (FPS) OUTLET VELOCITY (FPS) INLET DEPTH (FEET) OUTLET DEPTH (FEET)

STRUCTURE NO.	TYPE (IN/OUT)	INLET ELEVATION (FEET)	OUTLET ELEVATION (FEET)	LOSS (FEET)	HEAD LOSS (FEET)	TOTAL HEAD LOSS (FEET)	INLET VELOCITY (FPS)	OUTLET VELOCITY (FPS)	INLET DEPTH (FEET)	OUTLET DEPTH (FEET)
1	HOUSE	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
2	20" C/P @ 32 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
3	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
4	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
5	INLET	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
6	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
7	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
8	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
9	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
10	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
11	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
12	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
13	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
14	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
15	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
16	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
17	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
18	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
19	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
20	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
21	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
22	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
23	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
24	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
25	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
26	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
27	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
28	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
29	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
30	20" C/P @ 52 cfs	111.5	110.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5

NOTES:
1. NOT LESS THAN 1 FT. BELOW BOTTOM OF SLAB.
2. RATIO OF LENGTH TO SMALLER PIPE DIAMETER.
3. FROM CHART 7.
4. HEAD LOSS DUE TO FRICTION FROM TABLE 7.
5. H₁ HEAD LOSS AT JUNCTION COL. 5 & COL. 11.
6. H₂ HEAD LOSS AT JUNCTION COL. 11 & COL. 12.
7. CALC. ENERGY GRADE LINE.
8. H₁ VELOCITY HEAD $V^2/2g$ = 0.44.
9. H₂ VELOCITY HEAD $V^2/2g$ = 0.44.
10. HGL HYDRAULIC GRADE LINE = E.L. + H₁.

TEXAS HYDRAULIC SYSTEM - 221108
THYSYS

DATA FILE: C:\FRIEND\SPENCER2.THY

SPENCER GARDENS 2nd ADDITION - DRAINAGE CALCULATIONS

WENT AREA 6.9 AC. L = 1170' S = 0.54%

$V = 1.08 \quad 1170 \div 1.08 \div 60 = 18.0 \text{ MIN TC} \quad C = 0.85 \quad i = 4.2$

$Q = 6.9 \times 0.85 \times 4.2 = 24.9 cfs$

$200 \div 6.9 \times 0.91 \times 0.32 = 22.2 cfs$

EXIT AREA 3.3 AC. L = 330' S = 0.37% V = 1.0

$690 \div 60 = 11.5 \text{ MIN TC} \quad i = 4.2 \quad C = 0.85$

$Q = 3.3 \times 0.85 \times 4.2 = 12.2 cfs$

$200 \div 3.3 \times 0.91 \times 0.315 = 20.8 cfs$

TYPE 1-A INLET MAX CAPACITY IN 60 SEC CONDITIONS WITH OFFICE FLOW @ T.C. FORMULA

$Q = 0.47 A [4.32(d - \frac{h}{2})]^{1/2} \quad h = 0.5' \quad A = 5' \times 5' = 25'$

$Q = 0.47 \times 25 [4.32(7.5 - \frac{0.5}{2})]^{1/2}$

$Q = 11.0 cfs$

WENT AREA - REMAINING FOR 200 = 39.2 cfs

4 TYPE 1-A INLETS = 44 cfs MAX TO T.C. 39.2 cfs REMAINING

18" @ 7.3 cfs HGL @ 0.9% V = 5.4 f/s

24" @ 19.6 cfs HGL @ 0.8% V = 6.2 f/s

30" @ 27.5 cfs HGL @ 0.3% V = 4.5 f/s

Final Area - Design for 200 = 39.5

3 TYPE 1-A INLETS = 39.5 cfs MAX TO T.C. 39.5 cfs REMAINING

18" @ 7.3 cfs HGL @ 0.9% V = 5.4 f/s

24" @ 19.6 cfs HGL @ 0.8% V = 6.2 f/s

30" @ 27.5 cfs HGL @ 0.3% V = 4.5 f/s

YS AND PUBLIC TRANSPORTATION
REQ: 12/27/1988 TIME: 15:00
TEXAS HYDRAULIC SYSTEM - 221108
THYSYS

TEXAS HYDRAULIC SYSTEM - 221108
THYSYS

HIGHWAYS AND PUBLIC TRANSPORTATION
REQ: 12/27/1988 TIME: 15:00
TEXAS HYDRAULIC SYSTEM - 221108
THYSYS

HYDRAULIC DATA												
LINE	U.S. ID	D.S. ID	'N'	JUNC LOSS	FLOW	U.S. HEAD	D.S. HEAD	HYDR. GRAD	DEPTH	VELOC.	PIPE CAPAC.	
1	1	A	2	0.018	0.00	52.00	115.64	112.99	0.03082	0.49	21.7	110.1
2	2	A	3	0.018	0.17	52.00	112.99	111.80	0.03082	1.00	10.6	20.9

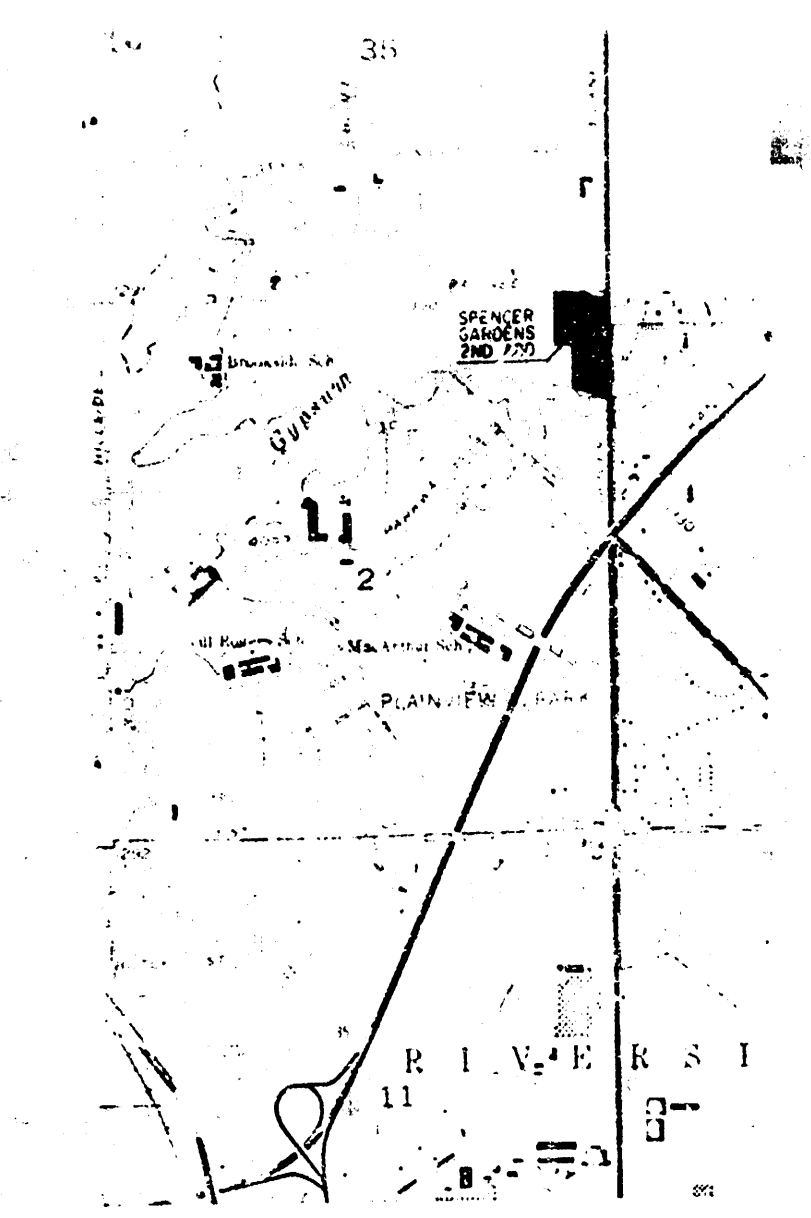
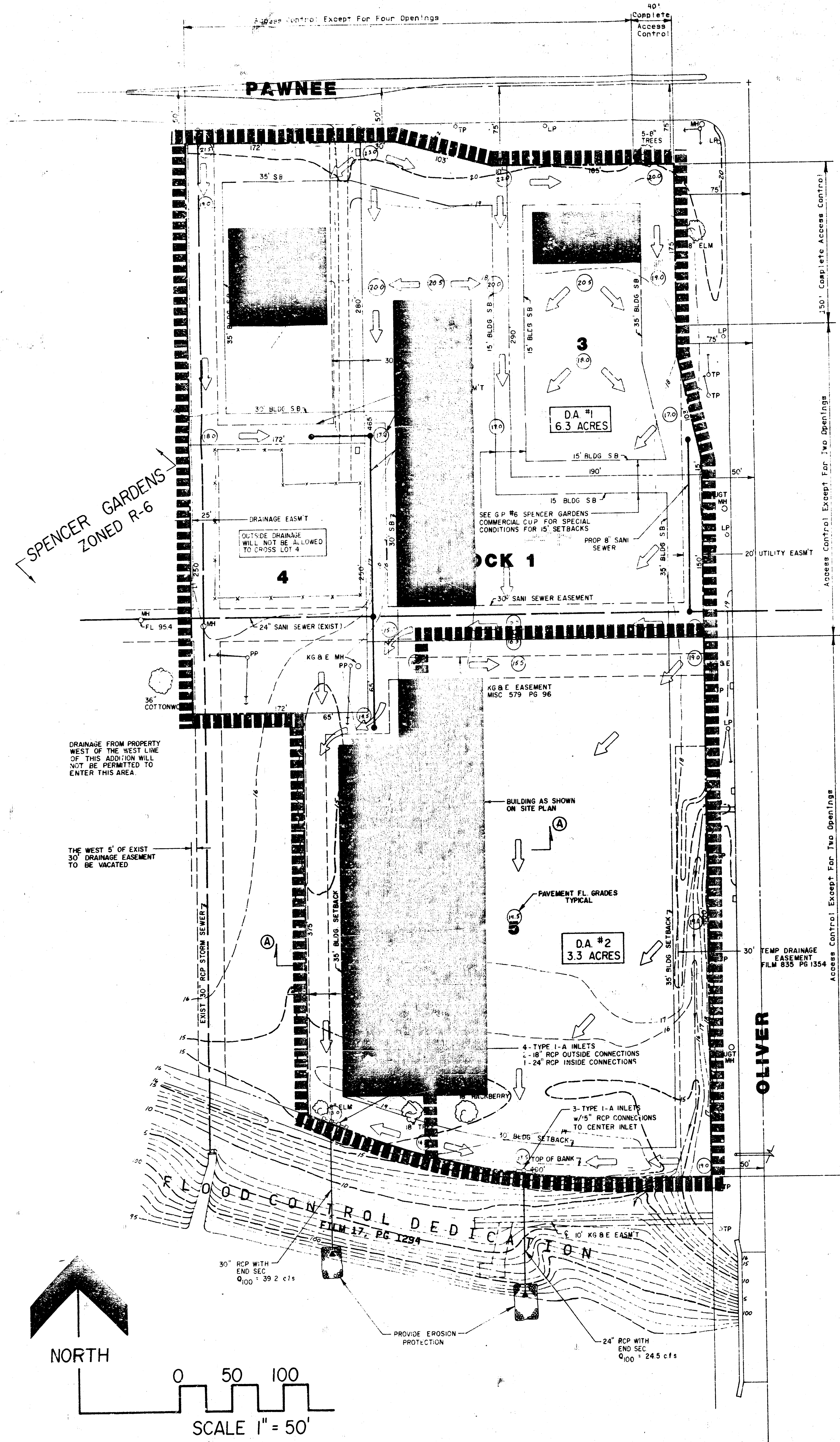
SEWER		ANALYSIS		SEWER		FREQUENCY=99 TR		2
DA A 1	5.6	JUNC A 1	TYPE= CSAG	L1315V	T 22	30	6	12
JUNC A 1	TYPE= CSAG	SEW0023=INLET DATA INCOMPLETE.			38			
JUNC A 2	TYPE=JUNCT							
OUTLET	STATIONING	0.00 T.W. ELEV	111.9	A 3				
DSGN	1 A 1 A 2	US 110.5 D	96.65	86			30	CIRC
DSGN	2 A 2 A 3	US 98.65 D	96.50	30		.018	30	CIRC
ANAL	1 A 1 A 2	1 12						
ANAL	2 A 2 A 3	1 13						
ENDATA					.17			

SEWER

SEWER ANALYSIS

CONFIGURATION DATA

LINE	U.S. ID	D.S. ID	U.S. F.L. ELEV	D.S. F.L. ELEV	LENGTH FEET	SLOPE	BBL/S	RISE	SPAN	SHAPE
1	A	1	2	108.00	96.15	86	0.13779	1	30	CIRC
2	A	2	A	96.15	96.00	30	0.00500	1	30	CIRC



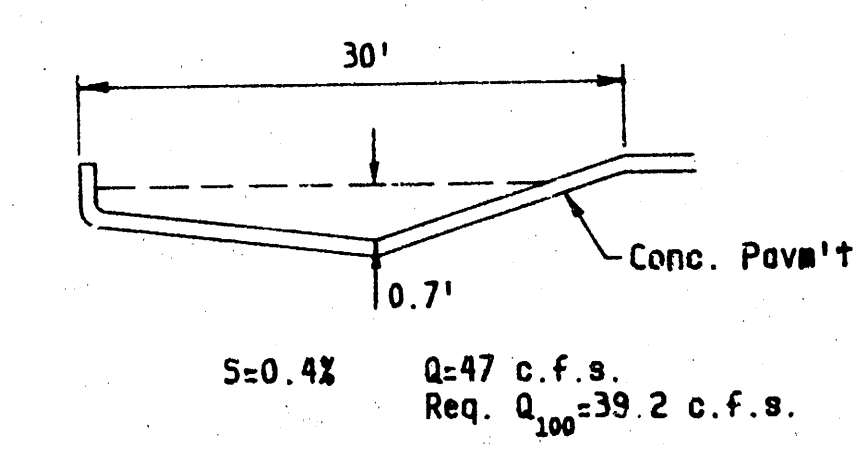
VICINITY
SCALE 1" =

SPENCER GARDENS ADDITION
(Drainage)

NOTE:

1. Cross Lot Drainage will be Provided as Shown.
2. Refer to "Spencer Gardens Drainage Computations" Dated 5-15-87 For Detailed Calculations.

SECTION A-A

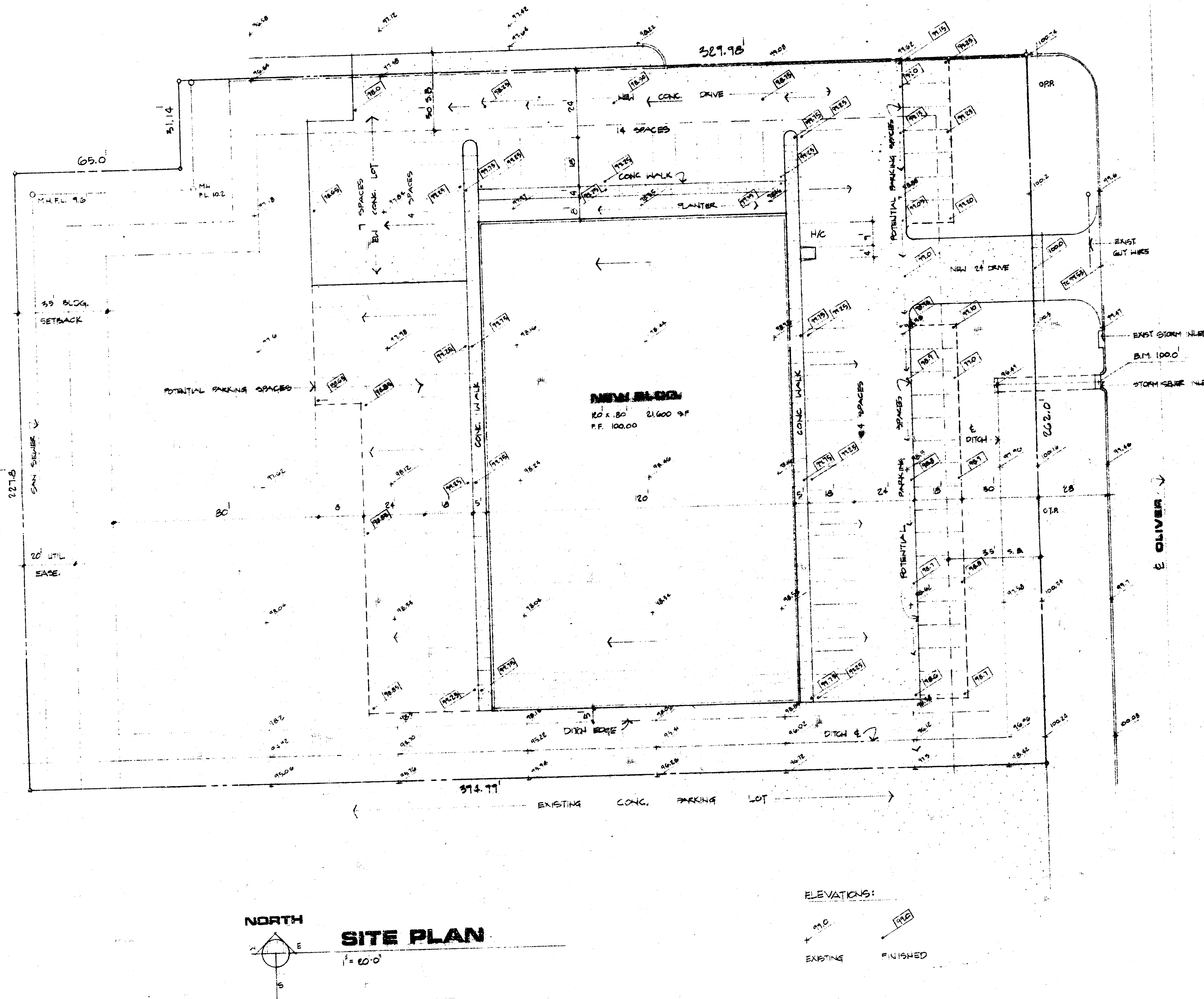


*Cross lot drainage easements or agreements
for 1 across lot 4, lot 3 across lot 4 into 1234 across
lot 5.
SWS may be part of site development
Tapering drainage easement to be vacated?*

GENERAL NOTES:

1. Topographic Survey Completed Jan. 14, 1987
2. B.M. #1 City of Wichita Std. Disc 52' N. and 42' E. of the Centerlines of Oliver and Pawnee. Elev. 121.146
3. Elevations shown are to City of Wichita Datum.
4. Platting will conform to requirements indicated on the Spencer Gardens Commercial Community Unit Plan DP-169.
5. Spencer Gardens is a replat of part of Lots 2, 4 and all of Lots 3, 5 in Spencer Gardens Addition.
6. All Lots in this Subdivision will be zoned L-C.

DRAINAGE PLAN SPENCER GARDENS SECOND ADDITION



DATA BLOCK		
SITE	BUILDINGS	MECHANICAL
LEGAL DESCRIPTION	FLOOR AREA SLOPE 1/4"	PLUMBING FIXTURES & LAUNDRIES
ZONING	BUILDING TYPE S.F.	FIRE HYDRANT H.E. 200' 1/2" 1/2" 1/2"
ACREAGE 17.410 T. S.F.	OCCUPANCIES	ELECTRICAL
PARKING SPACES 17 SHOWN	SEPARATION	SPRINKLERS
FLOOD PLAIN	LIVE LOADS 20 P. LBS. 2"	
PAD ELEVATION F.F. 100.00	OCCUPANT LOADS	

SHEET SCHEDULE	
SHEET	DESCRIPTION
A-1	SITE PLAN
A-2	FOUNDATION PLAN & DETAILS
A-3	FOUNDATION PLAN & DETAILS
A-4	FLOOR PLAN
A-5	FINISH SCHEDULES
A-6	ELEVATIONS
M-1	PLUMBING PLAN
M-2	HVAC PLAN
E-1	ELECTRICAL PLAN

SMITH CONSTRUCTION CO., INC.
NICHITA, MISSOURI 65113
480-8379
480-8379

THE BEDROOM
2305 S. OLIVE
NICHITA, MISSOURI 65113

KEYS: 10 NOV. 1981
11 DEC. 1981

NOV 81

NOV 81

NOV 81

NOV 81

NOV 81

NOV 81

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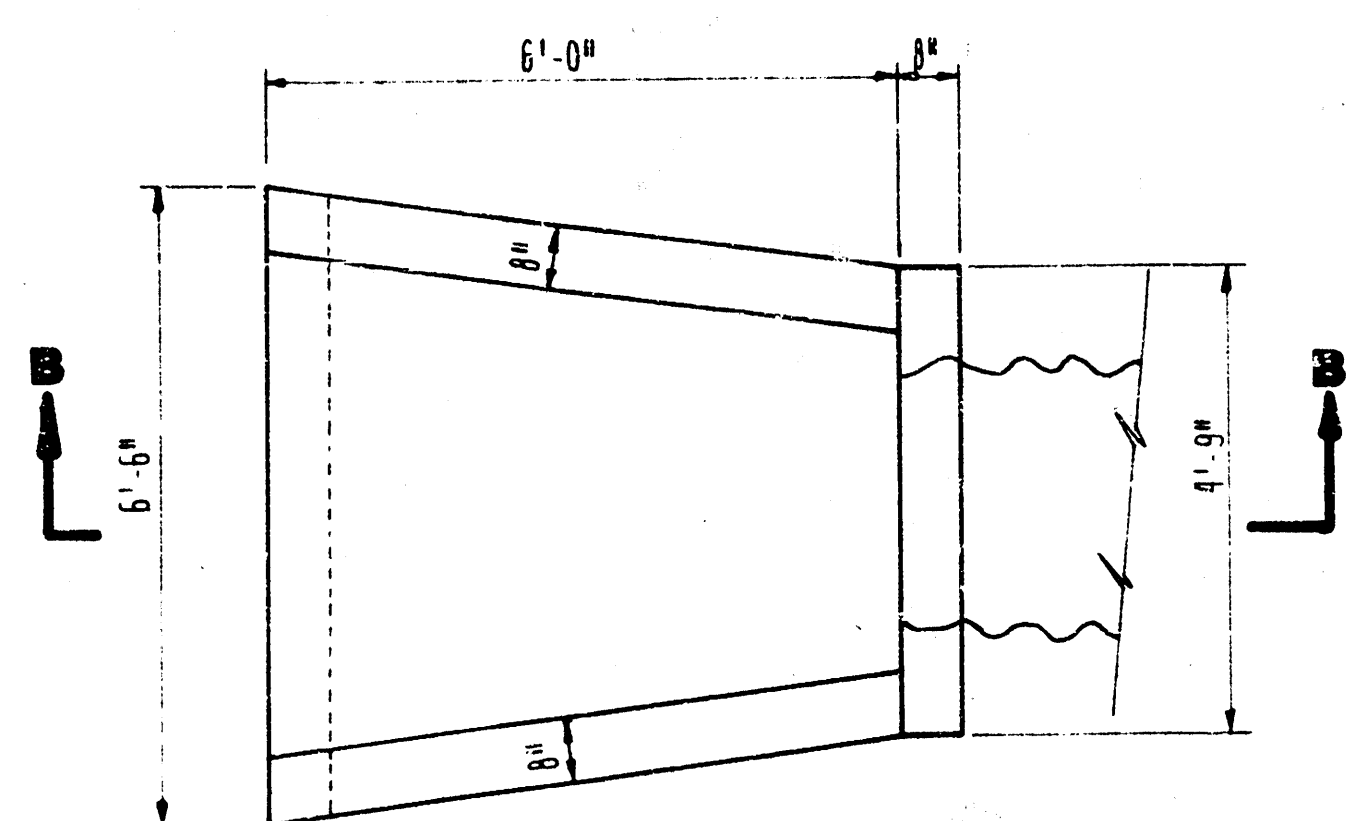
NOV 81

NOV 81

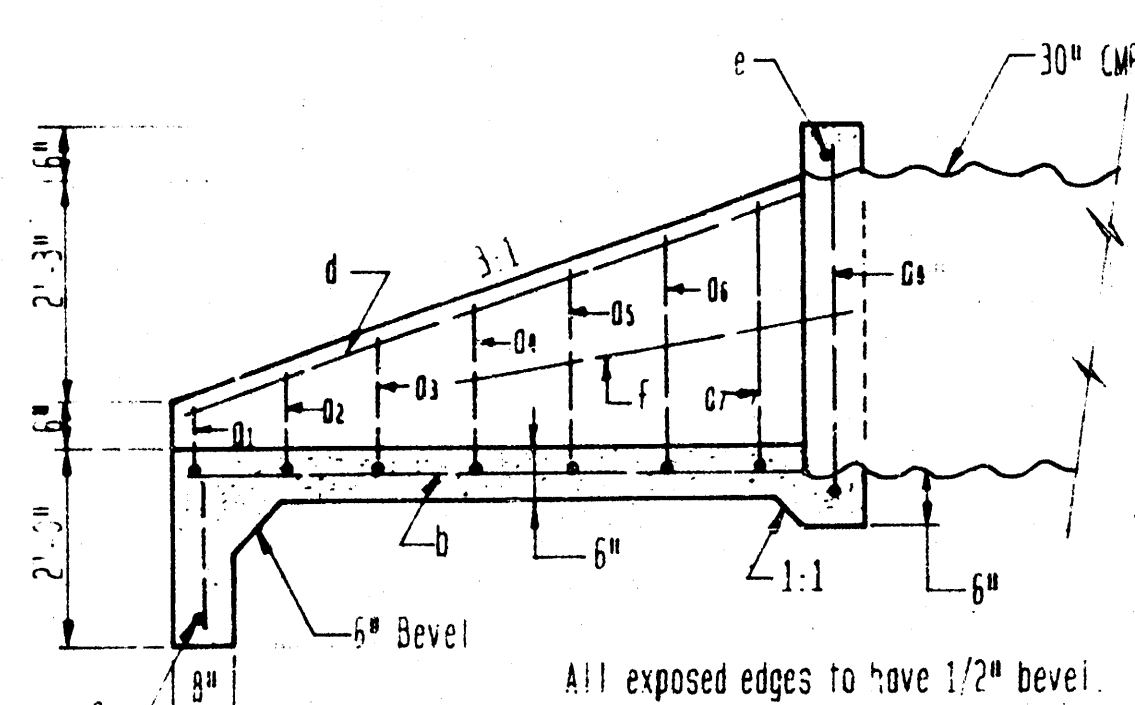
THIS PLAN IS THE PROPERTY OF SMITH CONSTRUCTION CO., AND IS NOT TO BE REPRODUCED UNDER ANY CIRCUMSTANCES. VIOLATION OF COPYRIGHT IS SUBJECT TO PROSECUTION.

A-1

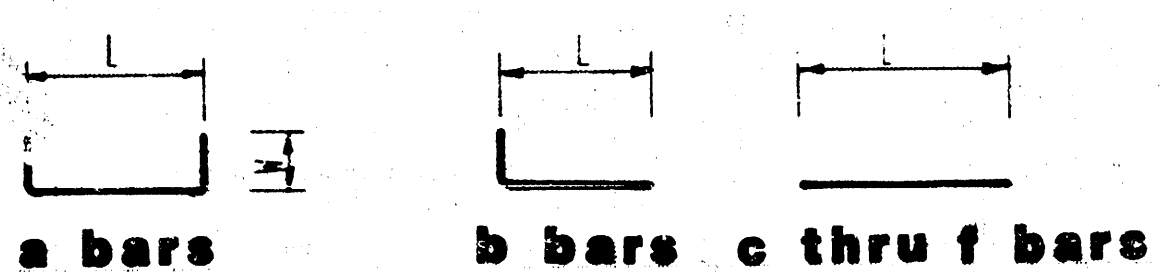
B.M. 1/4" cut on K&E Minute Ring 42 1/2" N. and 9 1/2" W. of SE Cor. Lot 4 Spencer Gardens 2nd Addition. Elev. 116.66 City of Wichita D.W. 11/88



PLAN



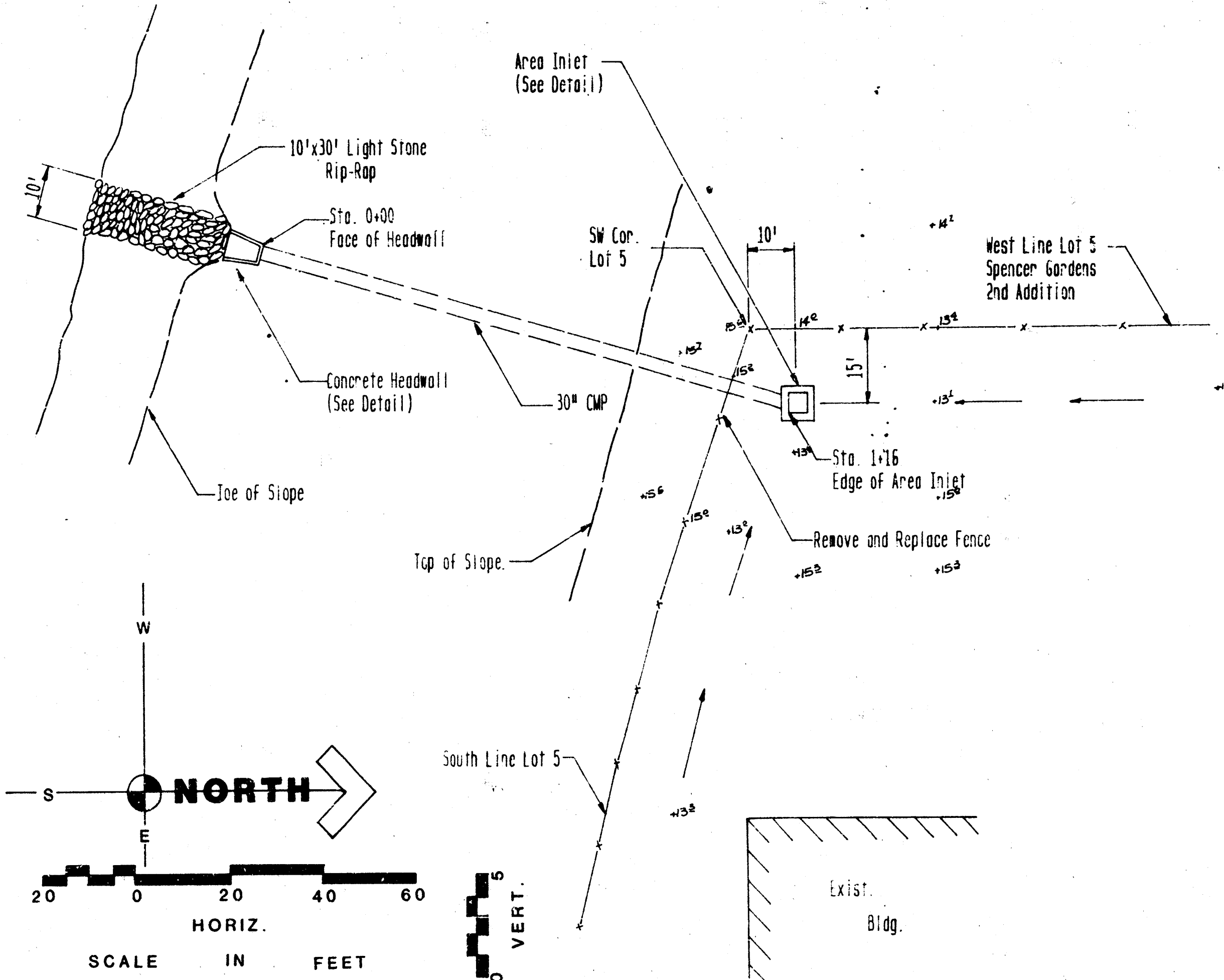
SECTION B-B



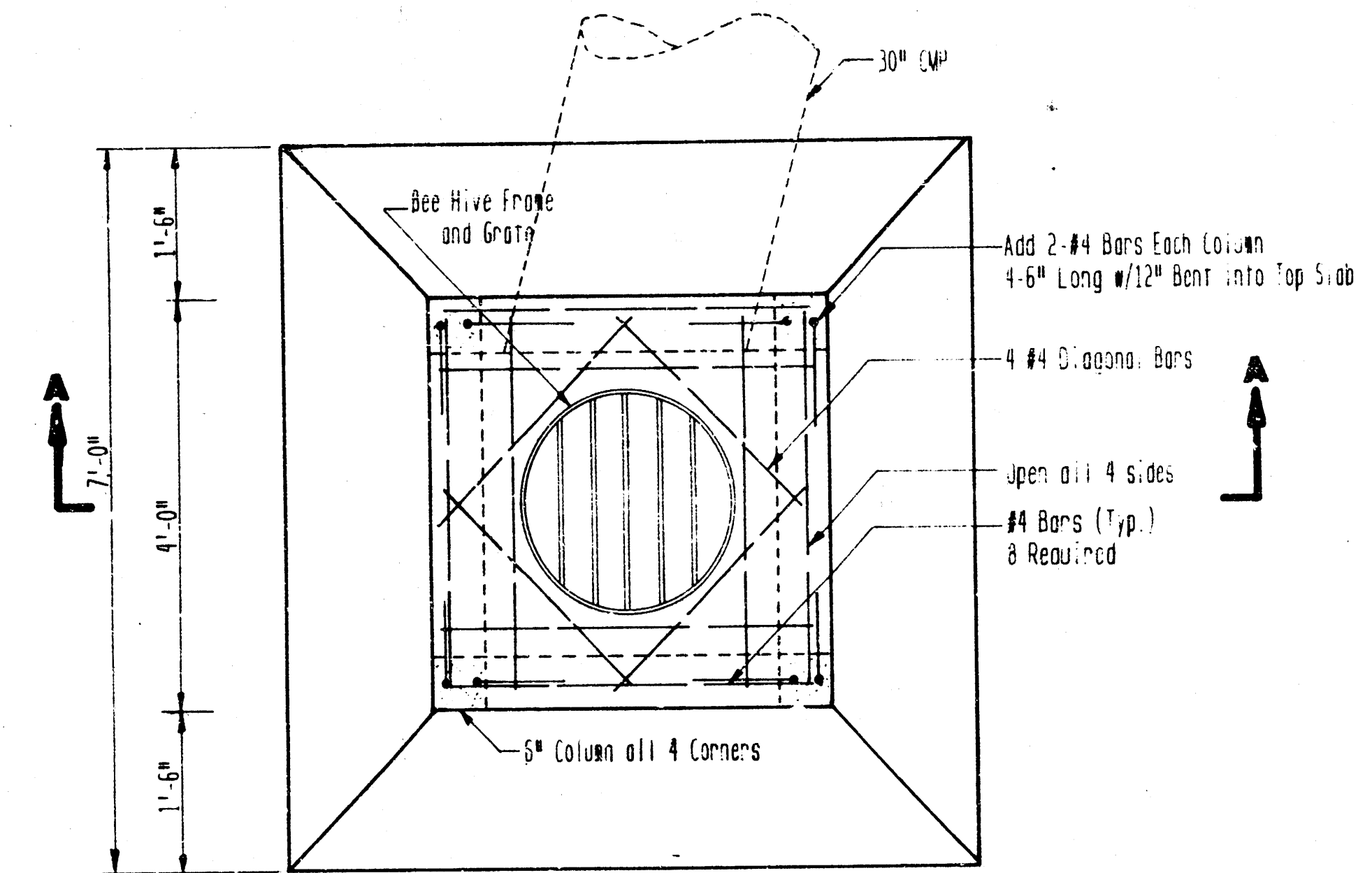
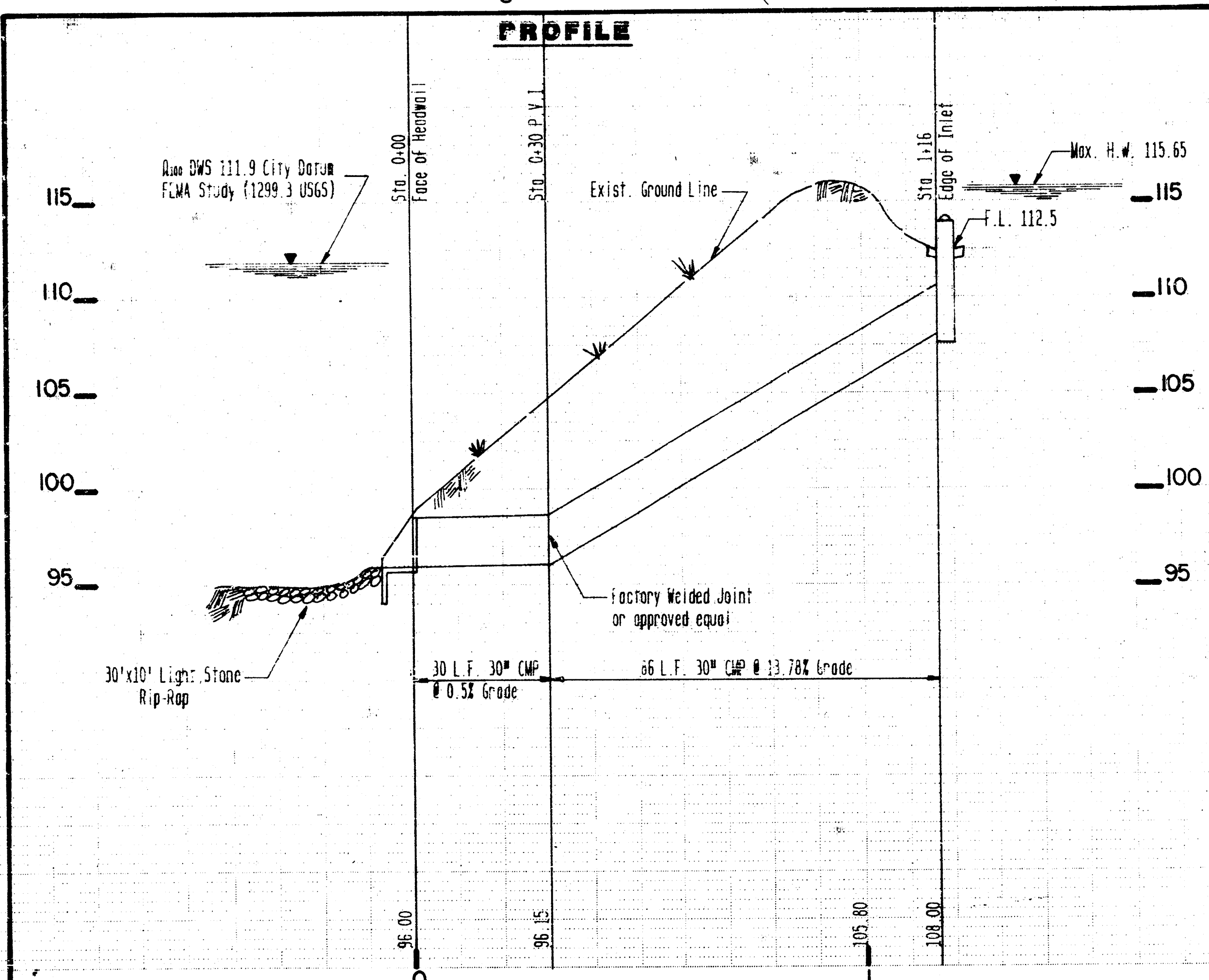
BAR	L	W	NUMBER	SIZE
a1	5'-0"	8"	1	#4
a2	5'-0"	11"	1	#4
a3	5'-3"	1'-3"	1	#4
a4	5'-0"	1'-7"	1	#4
a5	4'-0"	1'-11"	1	#4
a6	4'-5"	2'-3"	1	#4
a7	4'-3"	2'-7"	1	#4
a8	4'-1"	3'-5"	1	#4
b	7'-0"	1'-5"	7	#4
c	6'-0"	-	1	#4
d	7'-5"	-	2	#4
e	4'-5"	-	1	#4
f	4'-3"	-	2	#4

CONCRETE HEADWALL DETAILS

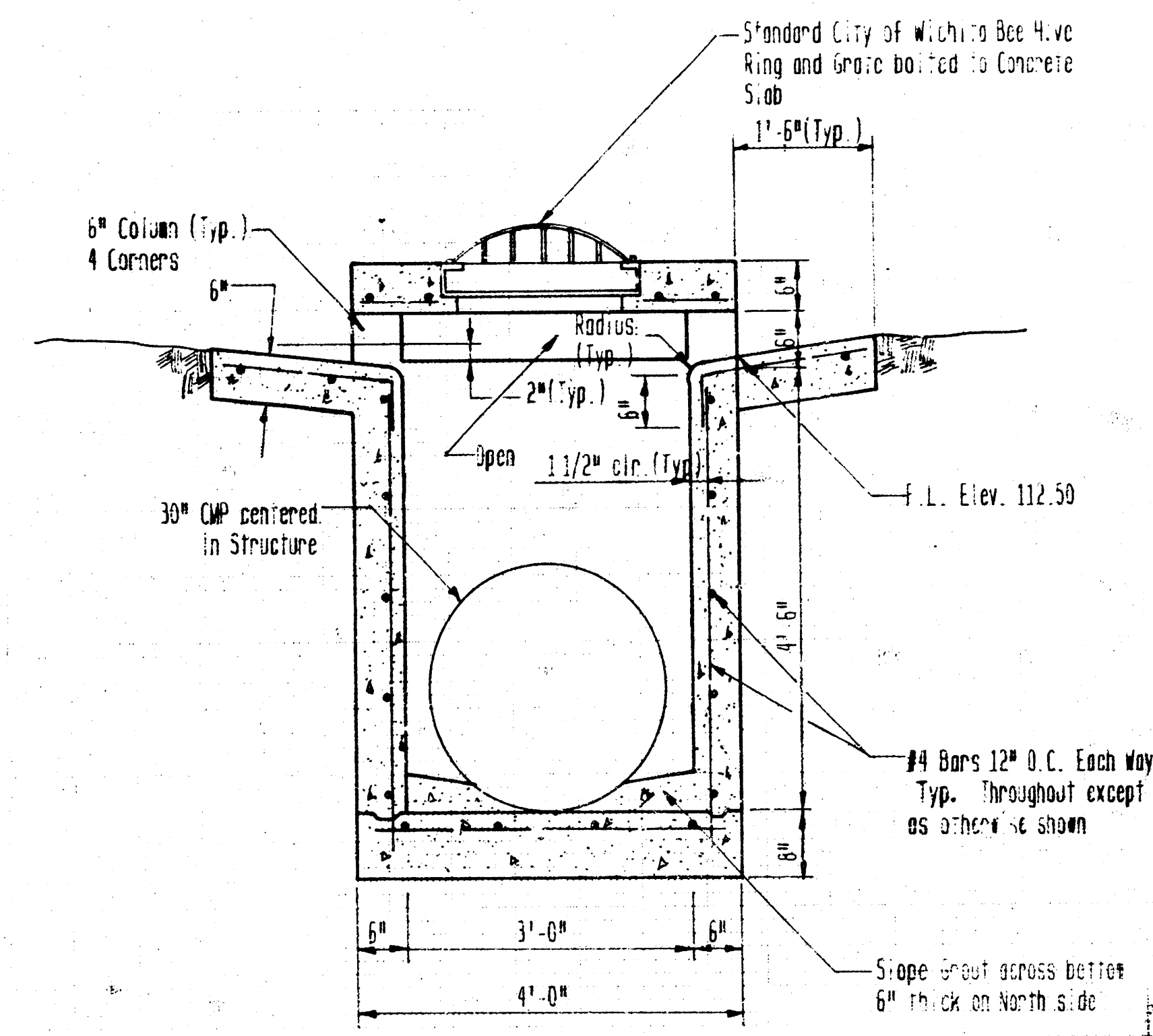
SCALE 1/2" = 1'-0"



PROFILE



PLAN



SECTION A-A

AREA INLET

SCALE 3/4" = 1'-0"

POE & ASSOCIATES OF KANSAS INC. CONSULTING ENGINEERS	
OWNER CITY OF WICHITA	PROJECT NO. 199
DESIGNED BY T.E.B.	DATE DEC. 1988
CITY OF WICHITA, KANSAS	