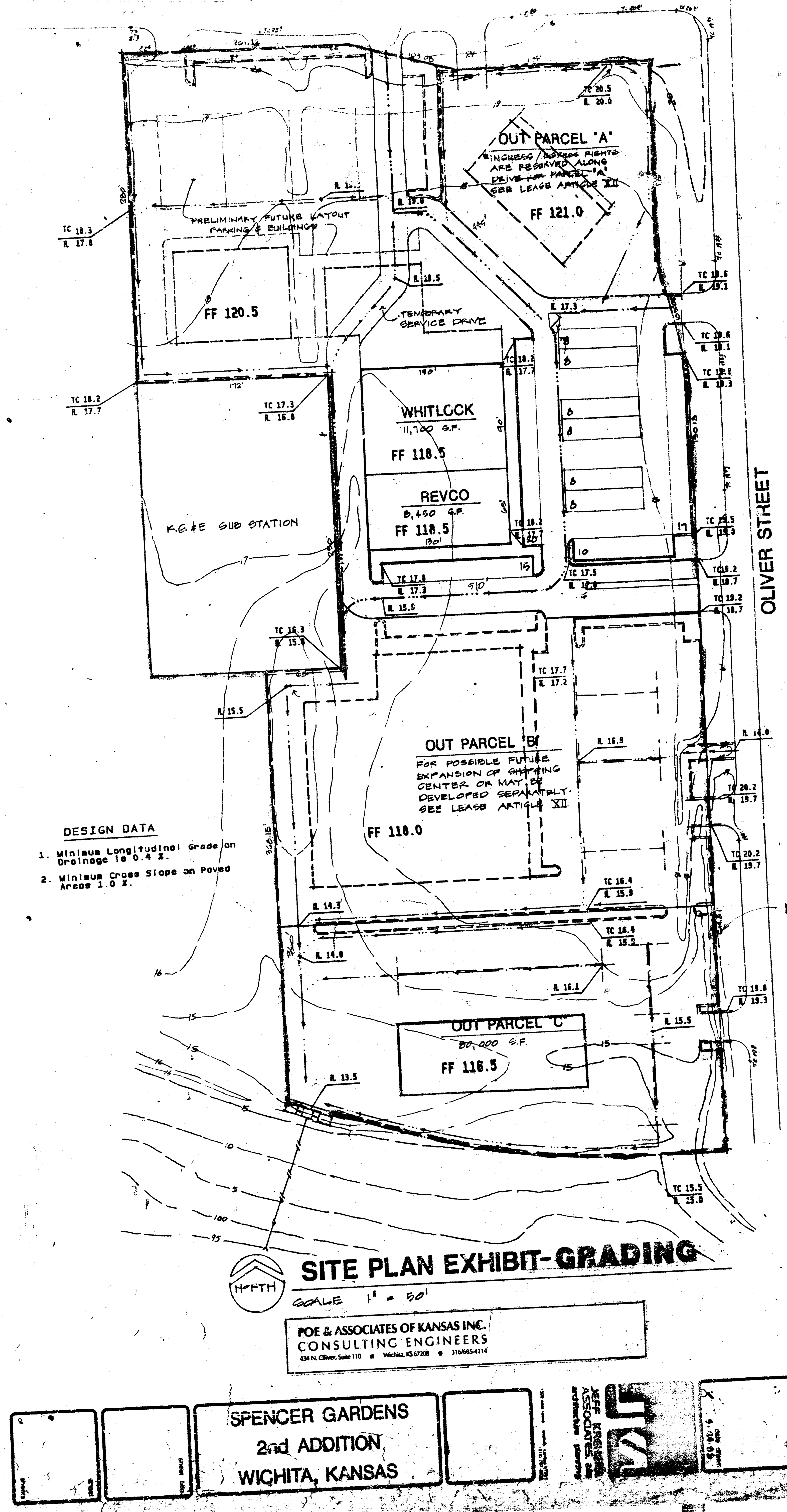


POE & ASSOCIATES OF KANSAS INC.
CONSULTING ENGINEERS
434 N. Oliver, Suite 110 · Wichita, KS 67208 · 316/685-4114

January 3, 1989

Ms. Vicki Huang, P.E.
Engineering, 7th Floor
455 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.

Kenny E. Hill, P.E.
Project Manager

KEH:crb

Encl.

FINAL DESIGN

4 openings 3' × 6" A = 6

$Q = 0.67\,A\left[64.32\left(d - \frac{h}{2}\right)\right]^{1/2}$

d = 2.5 h = 0.5 Q = 48.4   112.5 + 2.5 = 115.0 HW

BEEHIVE

$Q = 5.37\,A d^{0.5}$

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

Q = 10.5 cfs   113.5 + 1.5 = 115.0 HW

10.5 + 48.4 = 58.9 cfs TOTAL INFLOW @ HW = 115

FINAL DESIGN

PROJECT Spencer Gardens 2nd

TABLE 6
MINOR LOSSES AND HYDRAULIC GRADE LINE

SHEET 1 OF 1
BY K. HILL
DATE 12-20-88

(1) Structure No.	(2) Type (MH or C.B.)	(3) Max Elevation H.G.L.	(4) D_2/D_1	(5) K_j	(6) V	(7) H_f	(8) H_j	(9) H_{mh}	(10) E.G.L.	(11) H_v	(12) H.G.L.	(13) Invert Elevation	(14) Depth
1	HDWL	111.9			10.6				113.64	1.74	*111.9	*96.00	*
30' - 30" CMP @ 52 cfs PIPE @ 0.5%						0.93			114.57	1.74	112.83	96.15	
2	BEND				10.6		0.17		114.74	1.74	113.00		
86' - 30" CMP @ 52 cfs PIPE @ 13.78%						2.65			117.39	1.74	115.65	108.00	
3	INLET												

V = 4.2 fps @ 20.9 cfs

(3) NOT LESS THAN 1 FT. BELOW BOTTOM OF SLAB.
(4) RATIO OF LARGER TO SMALLER PIPE DIAMETER.
(5) FROM CHART 7.
(6) VELOCITY FROM TABLE 6
(7) HEAD LOSS DUE TO FRICTION FROM TABLE 7
(8) Hj = HEAD LOSS AT JUNCTION = COL. 5 X COL. 11
(9) Hmh = HEAD LOSS AT MH = 0.02 ALWAYS.
(10) EGL = ENERGY GRADE LINE.
(11) Hv = VELOCITY HEAD = $V^2 \div 64.4$
(12) HGL = HYDRAULIC GRADE LINE = E.G.L. − Hv
*GIVEN

HMV2.36 SN:84021495   TEXAS HYDRAULIC SYSTEM - 221108
THYSYS

DATA FILE: C:\FRIEND\SPENCR2.THY

THYSYS
TEXAS HYDRAULICS SYSTEM

[illegible] TO

Spencer Gardens - Drainage Computations

West Area 6.3 Ac. L = 1170' $S = \frac{6}{1110} = 0.54\%$

V = 1.08 1170 ÷ 1.08 ÷ 60 = 18.0 MIN Tc C = 0.85 i = 4.2

Q_5 = 6.3 × 0.85 × 4.2 = 22.5 cfs

Q_{100} = 6.3 × 0.91 × 6.84 = 39.2 cfs

East Area 3.3 Ac. L = 690 $S = \frac{2}{470} = 0.43\%$ V = 1.0

690 ÷ 60 = 11.5 MIN. Tc i_5 = 5.03 C = 0.85

Q_5 = 3.3 × 0.85 × 5.03 = 14.2 cfs

Q_{100} = 3.3 × 0.91 × 8.15 = 24.5 cfs

Type 1-A inlet max capacity in sump condition with orifice flow @ T.C. ponding

$Q = 0.67\,A\left[64.32\left(d - \frac{h}{2}\right)\right]^{1/2}$ h = 0.5' A = 5' × .5 = 2.5 ft²

d = 11" = 0.92'

$Q = 0.67 \times 2.5\left[64.32\left(.92 - \frac{0.5}{2}\right)\right]^{1/2}$

Q = 11.0 cfs

West Area - Design for Q_{100} = 39.2 cfs

Use 4 Type 1-A inlets = 44 cfs max to T.C. 39.2 cfs req'd
9.8 cfs / inlet

18" @ 9.3 cfs HGL @ 0.9% V = 5.6 fps
24" @ 19.6 cfs HGL @ 0.8% V = 6.2 fps
30" RCP @ 40 cfs HGL @ 1.0% V = 8 fps
30" Q_5 = 22.5 cfs HGL @ 0.3% V = 4.5 fps

East Area - Design for Q_{100} = 24.5

Use 3 Type 1-A inlets = [illegible] 3.2 cfs / inlet

15" RCP @ 8.2 cfs HGL @ 1.5% V = 6.5
24" RCP @ 24.5 cfs HGL @ 1.25% V = 8 fps

24" Q_5 = 14.2 cfs HGL @ 0.3% V = 4.0 fps

...YS AND PUBLIC TRANSPORTATION   XEQ: 12/27/1988 Time: 15:00
TEXAS HYDRAULIC SYSTEM - 221108
THYSYS

HMV2.36 SN:84021495

HYDRAULIC DATA

RUN	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.[illegible]
2	[illegible]	A 3	0.018	0.17	52.00	112.99	111.90	0.03082	1.00	10.6	20.[illegible]

HMV2.36 SN:84021495   TEXAS HYDRAULIC SYSTEM - 221108
THYSYS

```
SEWER                    ANALYSIS              SEWER   FREQUENCY=99 YR   2
DA A  1    9.6                      L1315V     T 22      30      6   52
                                                          38
JUNC A  1 TYPE= GSAG
SEW0028--INLET DATA INCOMPLETE.
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 DS  98.65   86           .018    30 CIRC
DSGN   2  A  2 A  3 US  98.65 DS  98.50   30           .018    30 CIRC
ANAL   1  A  1 A  2     1  [illegible]
ANAL   2  A  2 A  3     1  [illegible]                .17
ENDATA
```

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

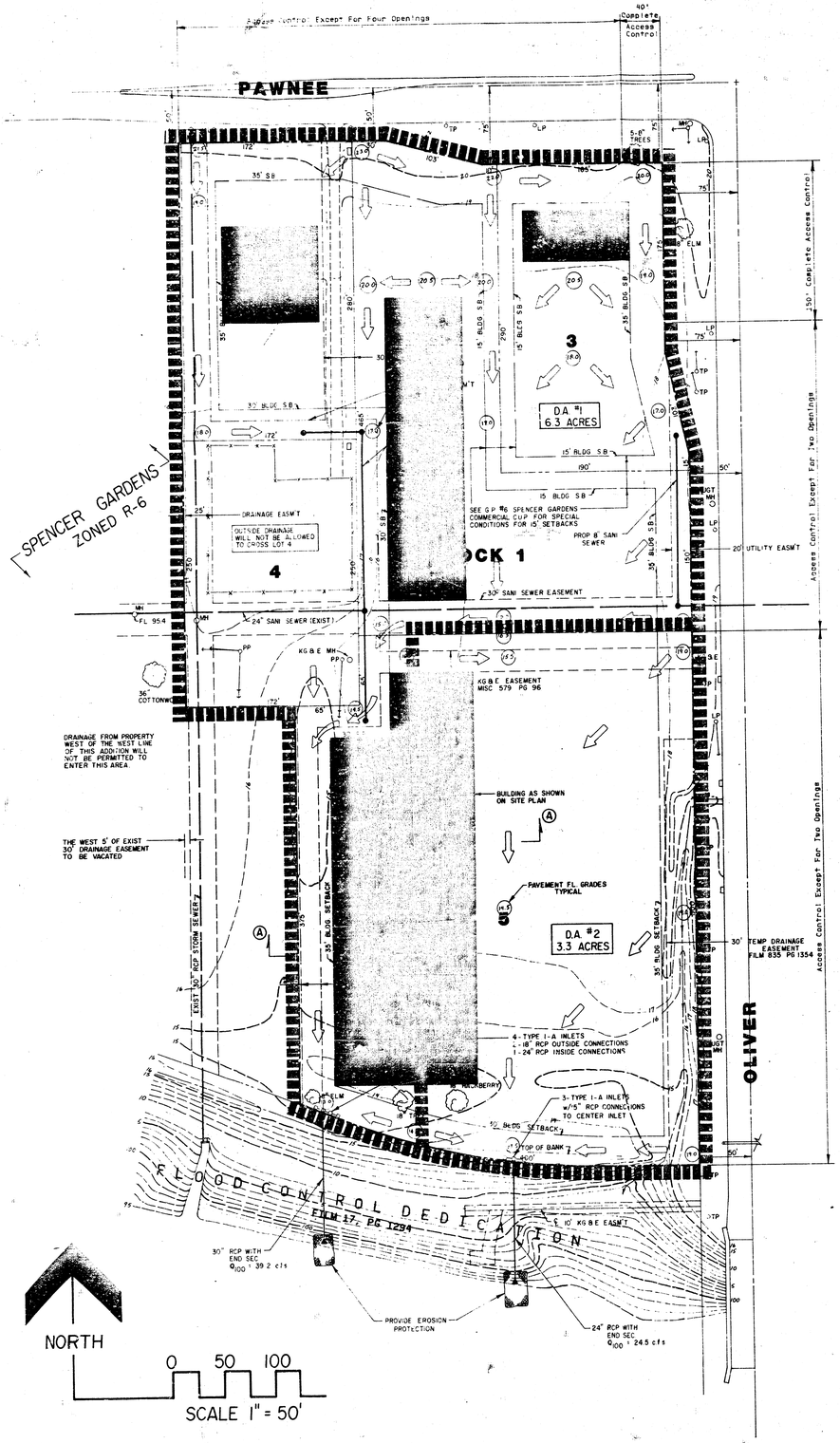
HMV2.36 SN:84021495

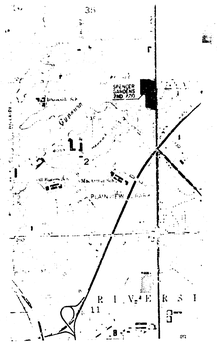
SEWER

SEWER ANALYSIS

CONFIGURATION DATA

RUN	U.S. ID	D.S. ID	U.S. F.L. ELEV	D.S. F.L. ELEV	LENGTH FEET	SLOPE	BBLS	RISE	SPAN	SHAPE
1	A 1	A 2	108.00	96.15	86	0.13779	1	30	30	CIRC
2	A 2	A 3	96.15	96.00	30	0.00500	1	30	30	CIRC





VICINITY
SCALE 1" =

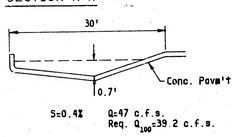
SPENCER GARDENS 2ND ADDITION
(Drainage)

7

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



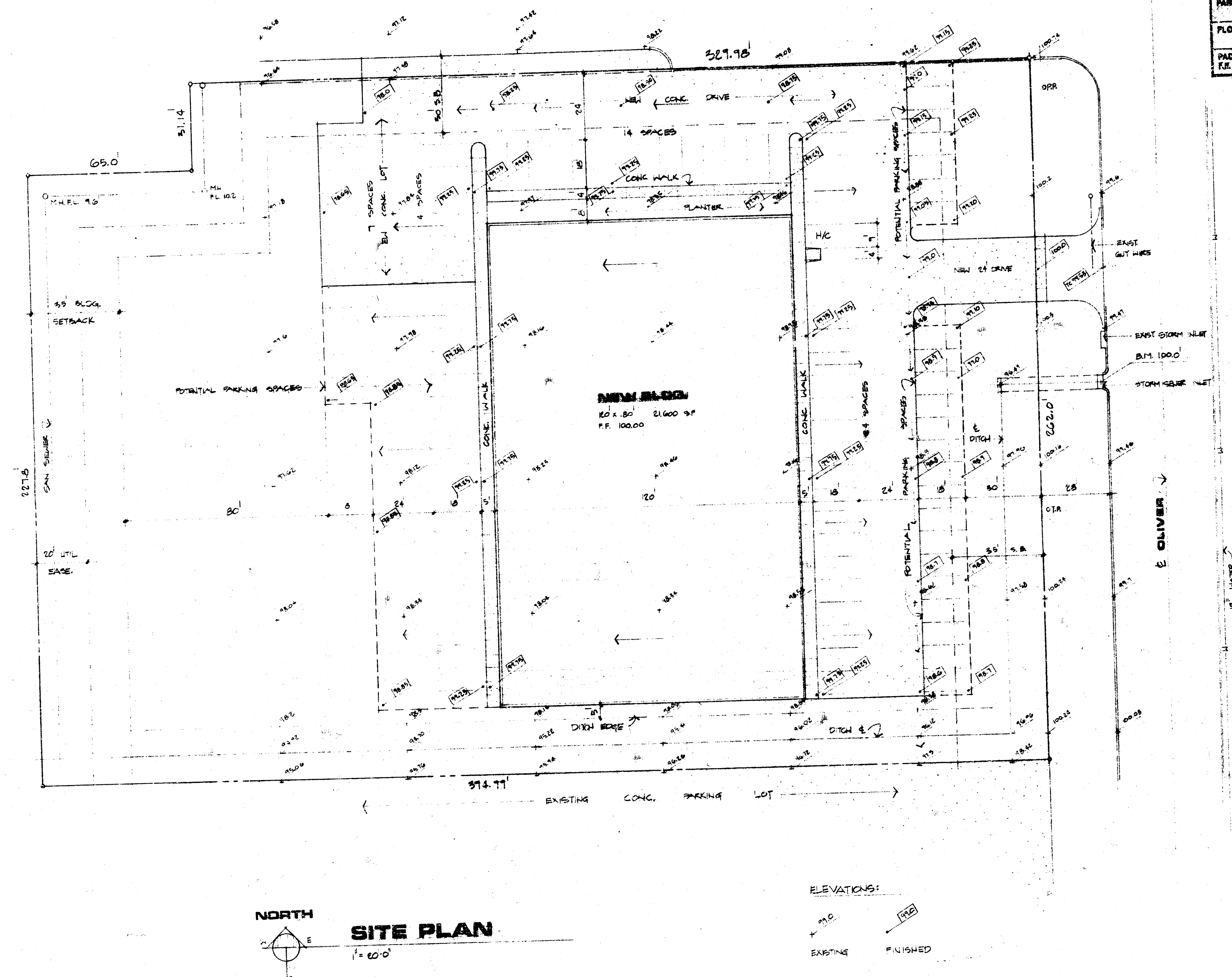
S=0.4% Q=47 c.f.s.
Req. Q_{100}=39.2 c.f.s.

Cross lot drainage easements or agreements
Lot 1 across Lot 4, Lot 3 across Lot 2 and Lot 1 across Lot 5
SWS may be part of site development
Temporary 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	BUILDING	MECHANICAL
LEGAL DESCRIPTION	FLOOR AREA 21,600 S.F.	PLUMBING FIXTURES 2 TOILETS 2 LAVATORIES
ZONING	BUILDING TYPE B-II	FIRE HYDRANT N.E. COR. OLIVER & [illegible]
ACREAGE [illegible] S.F.	OCCUPANCIES	ELECTRICAL
PARKING SPACES 49 SHOWN	SEPARATION	SPRINKLERS
FLOOD PLAIN	LIVE LOADS 20 & LIVE 25	
PAD ELEVATION F.E. 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.
P.O. BOX 12213
4620 ESTHNER
WICHITA, KS 67213
(316) 942-7869

THE BEDROOM
2905 S. OLIVER
WICHITA, KANSAS

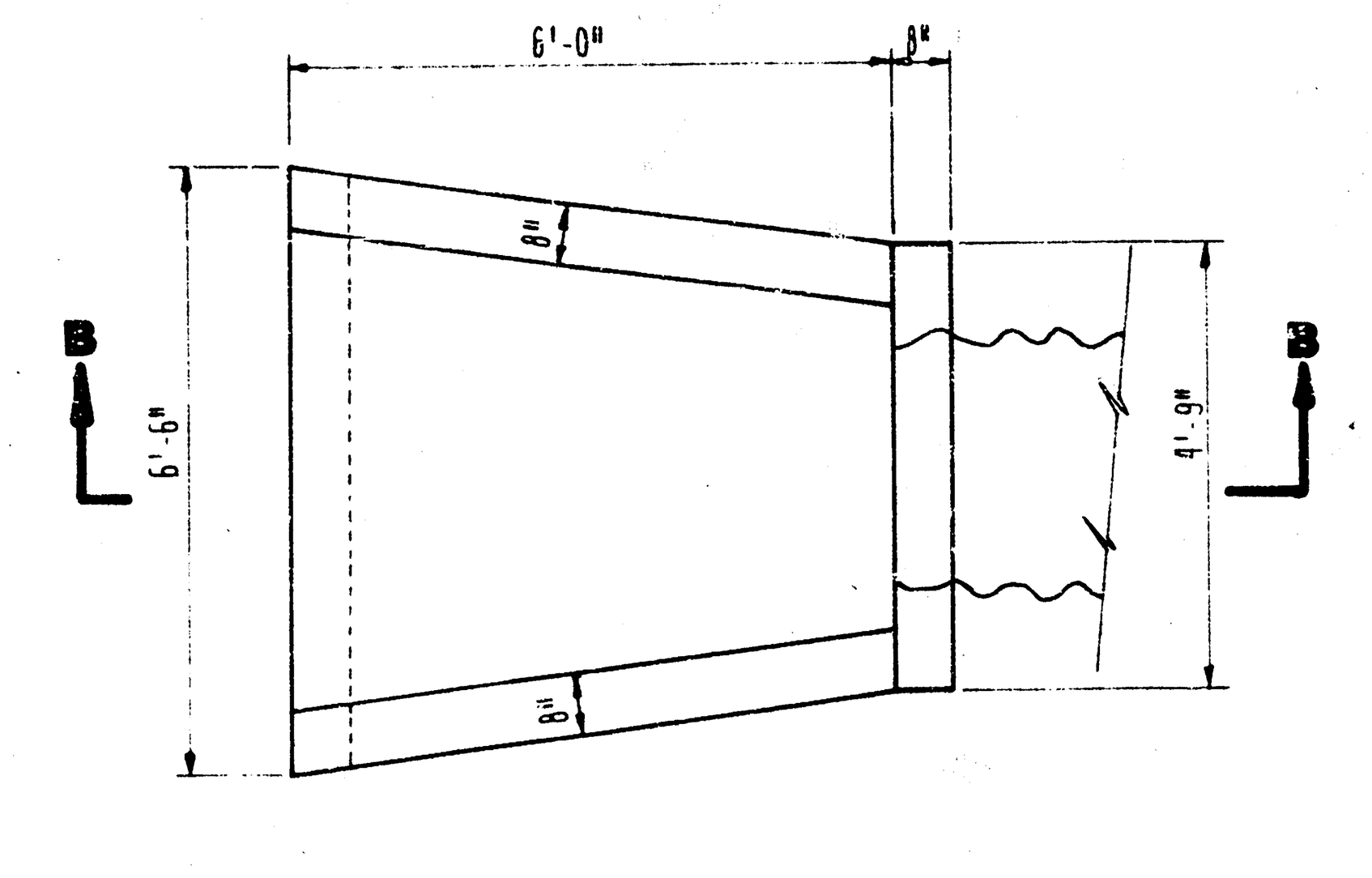
REVISIONS
30 NOV '89
11 DEC 1989

7 NOV 89
1" = 20'
D. WILLIAMS

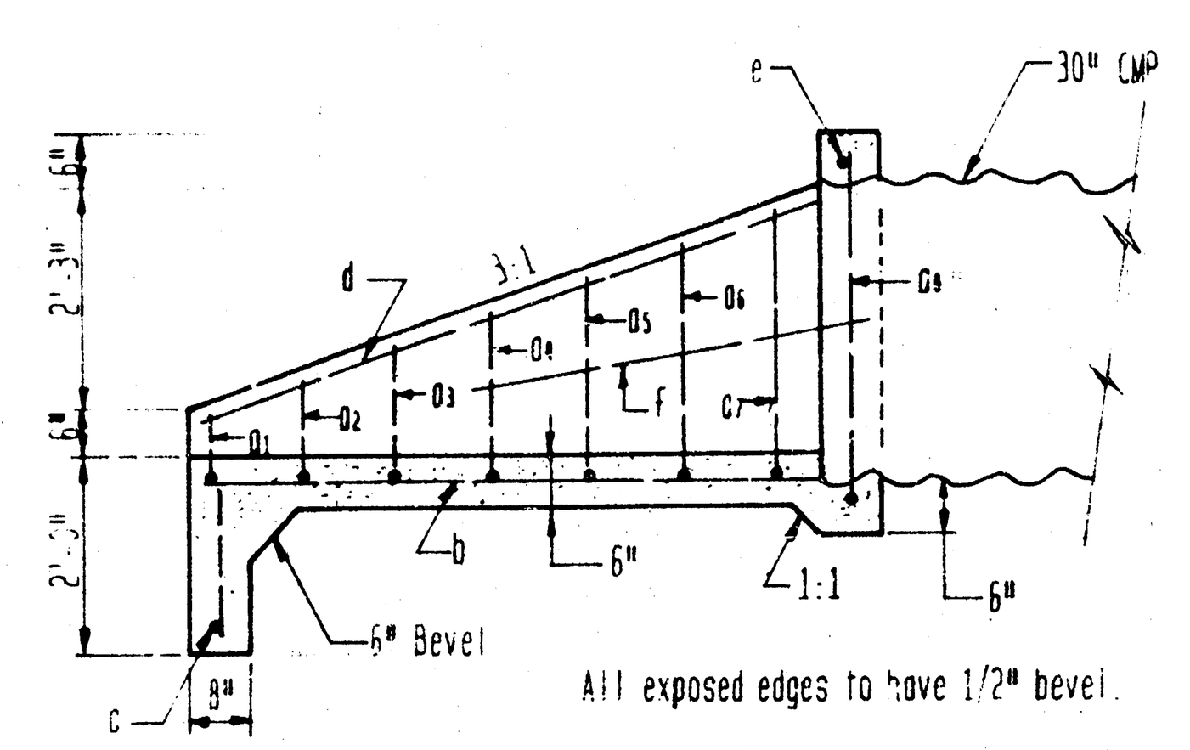
A-1

SPENCER GARDENS 2ND ADDITION
(Drainage)

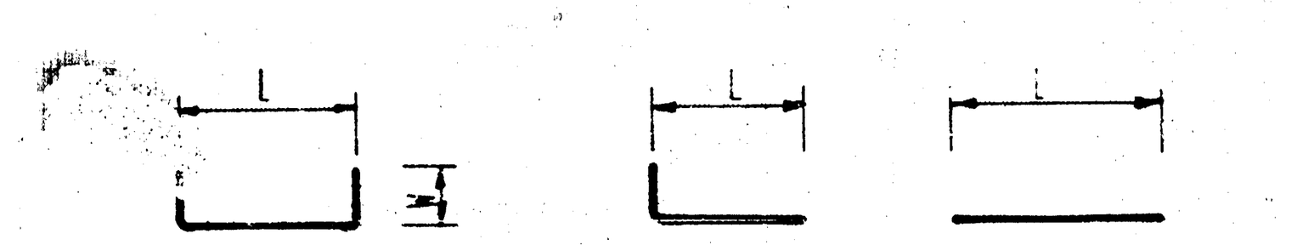
B.M. "+" cut on KG&E Mainote Ring 42'± N. and 9'± W. of SE Cor. Lot 4 Spencer Gardens 2nd Addition
Elev. 116.66 City of Wichita Datum



PLAN



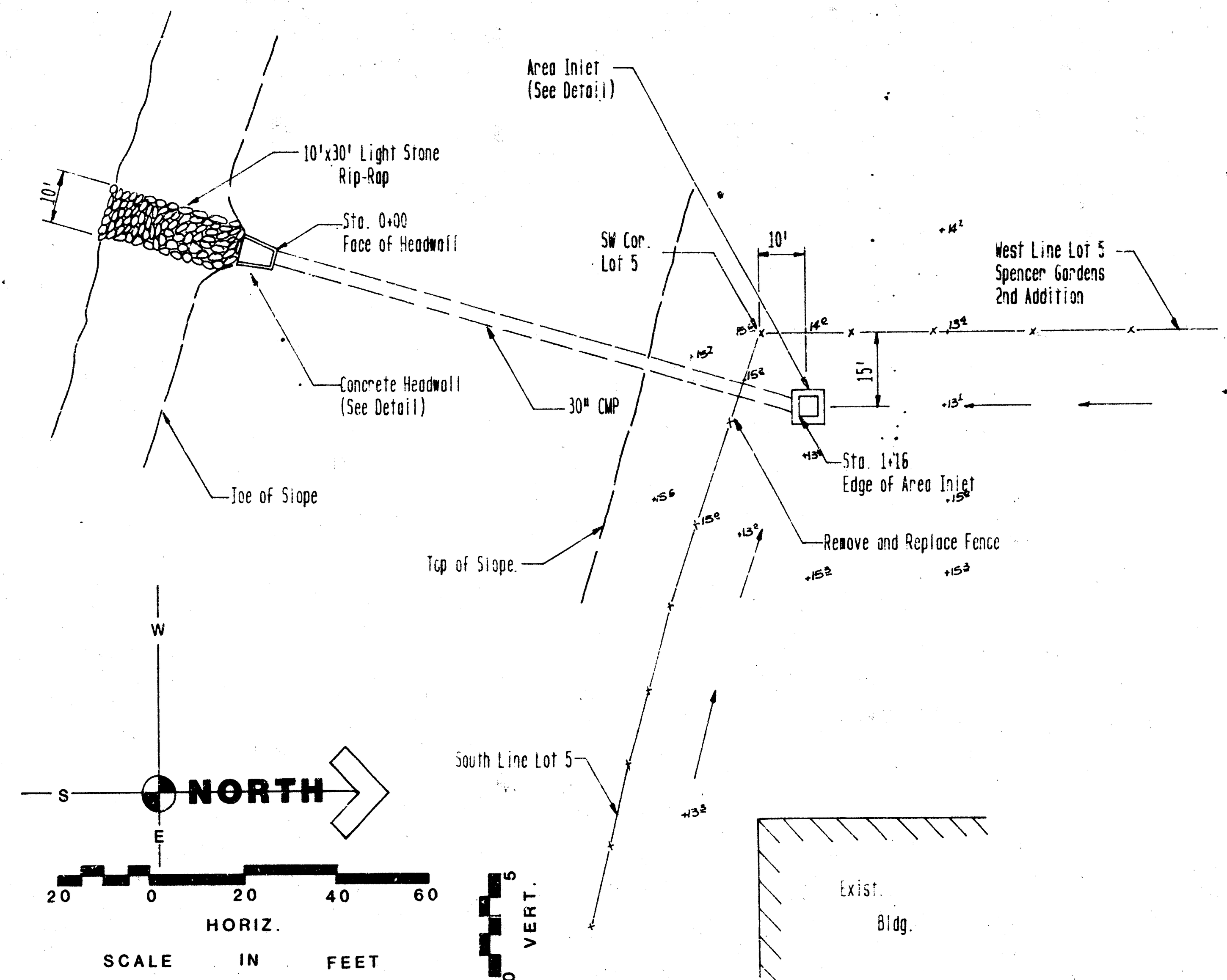
SECTION B-B

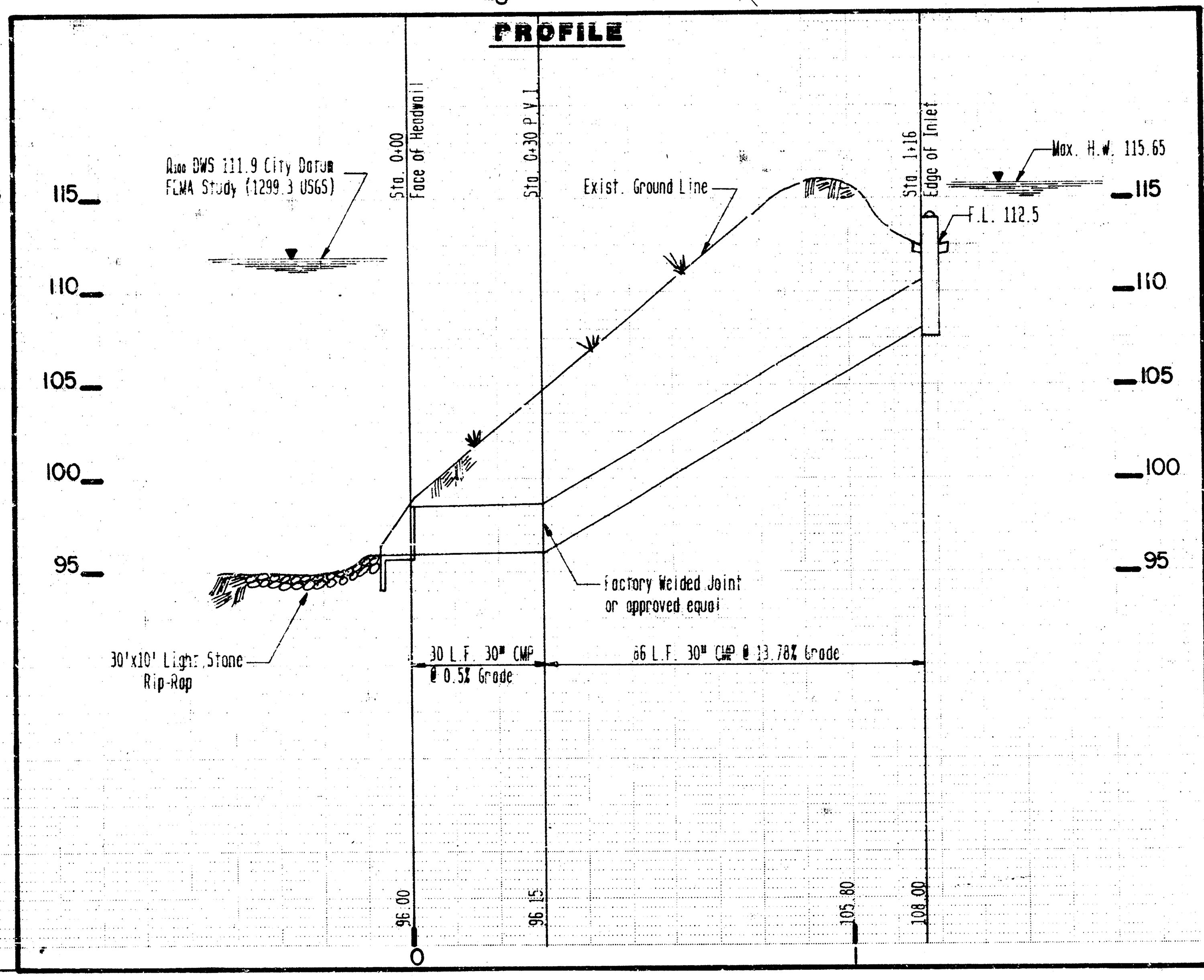


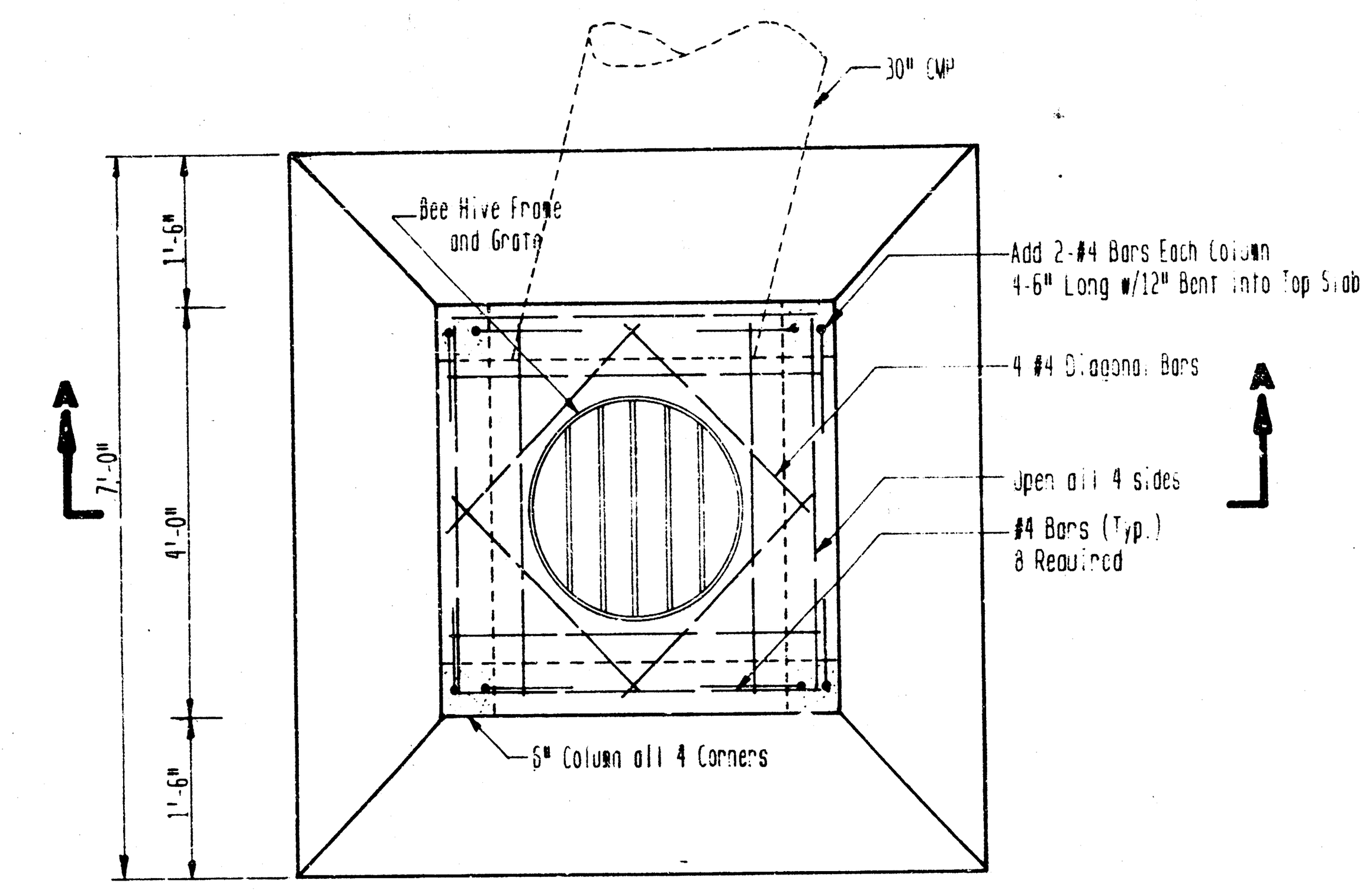
BAR	L	W	NUMBER	SIZE
a1	5'-8"	8"	1	#4
a2	5'-6"	11"	1	#4
a3	5'-3"	1'-3"	1	#4
a4	5'-0"	1'-7"	1	#4
a5	4'-8"	1'-11"	1	#4
a6	4'-6"	2'-3"	1	#4
a7	4'-3"	2'-7"	1	#4
a8	4'-1"	3'-6"	1	#4
b	7'-0"	1'-6"	7	#4
c	6'-0"	-	1	#4
d	7'-6"	-	2	#4
e	4'-5"	-	1	#4
f	4'-3"	-	2	#4

CONCRETE HEADWALL DETAILS

SCALE 1/2" = 1'-0"







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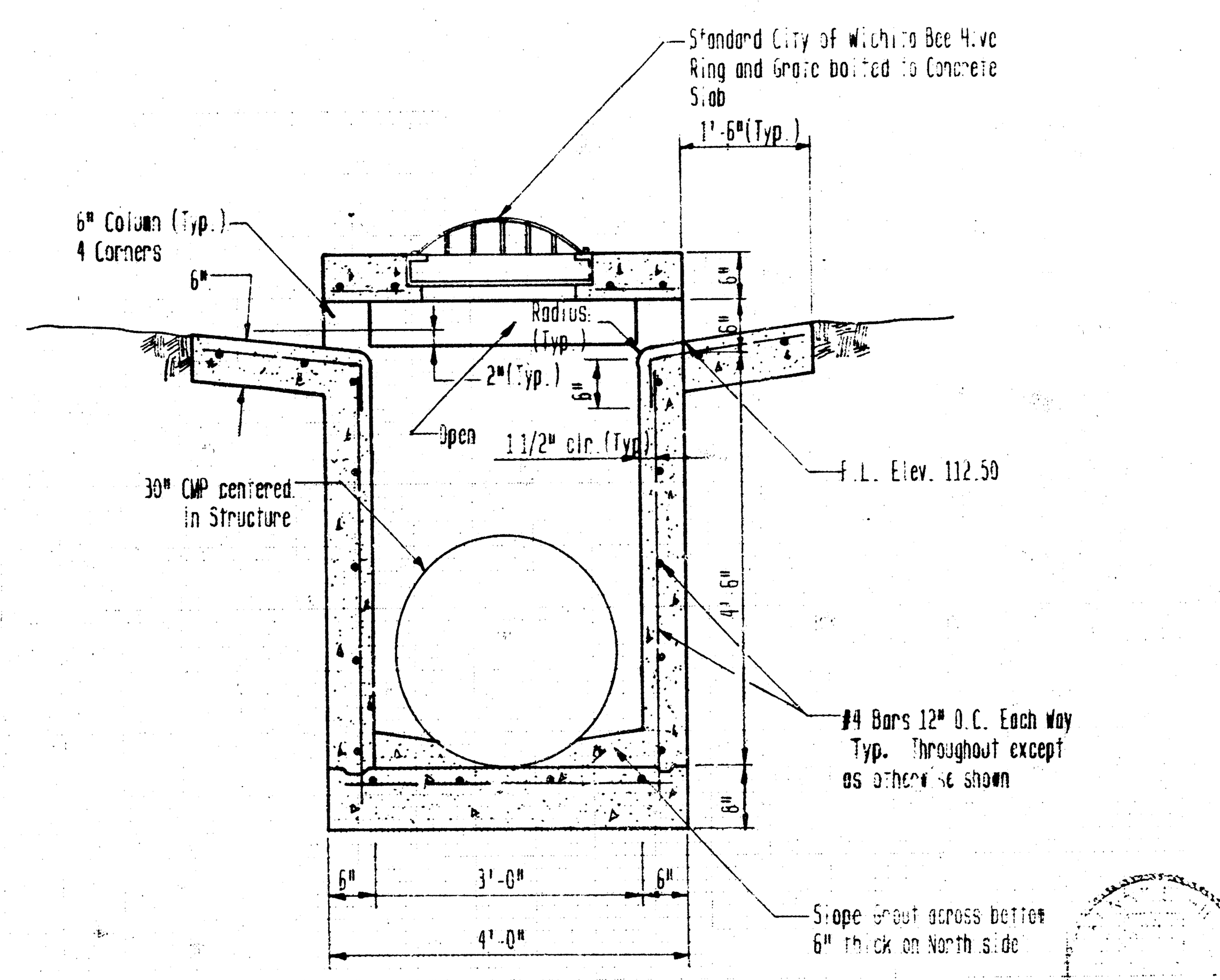

SECTION A-A

AREA INLET

SCALE 3/4" = 1'-0"

STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS

POE & ASSOCIATES OF KANSAS INC.
CONSULTING ENGINEERS
434 N. Oliver Suite 110 ■ Wichita KS 67208 ■ 316-685-4114

ENGINEER K.H.	Spencer Gardens 2nd Addition
ENG. TECH	To
DRAWN BY T.E.B.	
DATE DEC. 1988	CITY OF WICHITA, KANSAS
SHEET 1 OF 1	PROJECT NO. 199