

# CITY OF ADDISON DALLAS COUNTY, TEXAS

## CONSTRUCTION PLANS FOR: MIDWAY ROAD

FROM BELT LINE ROAD TO WRIGHT BROTHERS DRIVE  
AND DITCH IMPROVEMENTS  
FROM MIDWAY ROAD TO SURVEYOR BOULEVARD

PROJECT LENGTH ± 3,548 L.F. (PAVING)  
± 2,466 L.F. (DITCH)

### CITY OF CARROLLTON

LEDDIE TAYLOR - MAYOR

COUNCIL MEMBERS:

CAROLYN STANDRIDGE

DAVE GILMORE

RICHARD WALKER

PAT ARNOLD

SANDY JACOBS

CLONIS LUALLEN - CITY MANAGER

JIM JENNE - DIRECTOR of COMMUNITY  
DEVELOPMENT

### CITY OF ADDISON

JERRY J. REDDING - MAYOR

COUNCIL MEMBERS:

JOHN B. ALLEN

RICHARD RODER

WILLIAM F. SELLMAYER

BARVO WALKER

TERRY ROBERTS

C.J. WEBSTER - CITY ADMINISTRATOR

GEORGE DOWLING, P.E. - DIRECTOR of COMMUNITY  
DEVELOPMENT

### CITY OF CARROLLTON

Approved By: *[Signature]*

City Manager

Date: 3-6-81

### CITY OF ADDISON

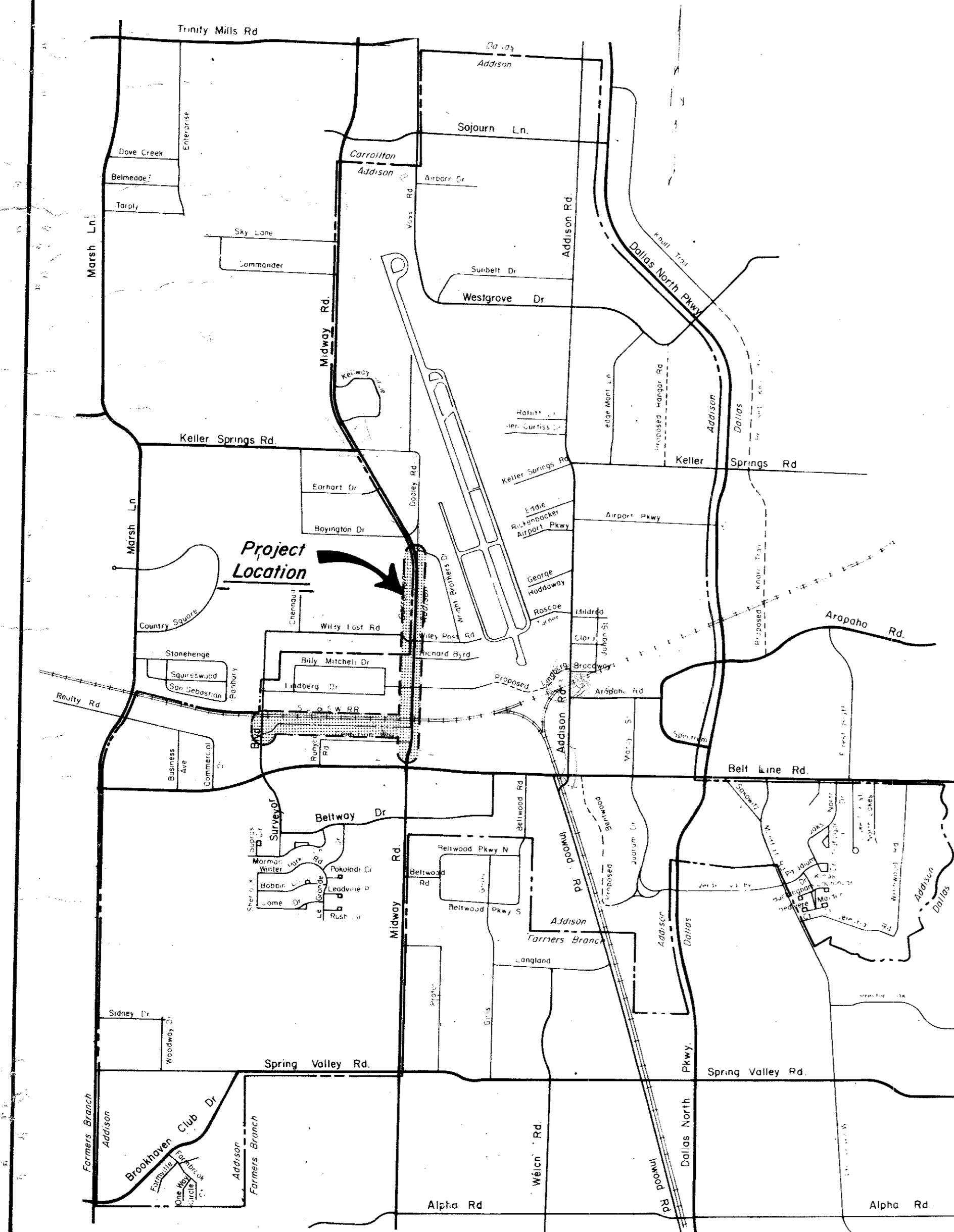
Approved By: *[Signature]*

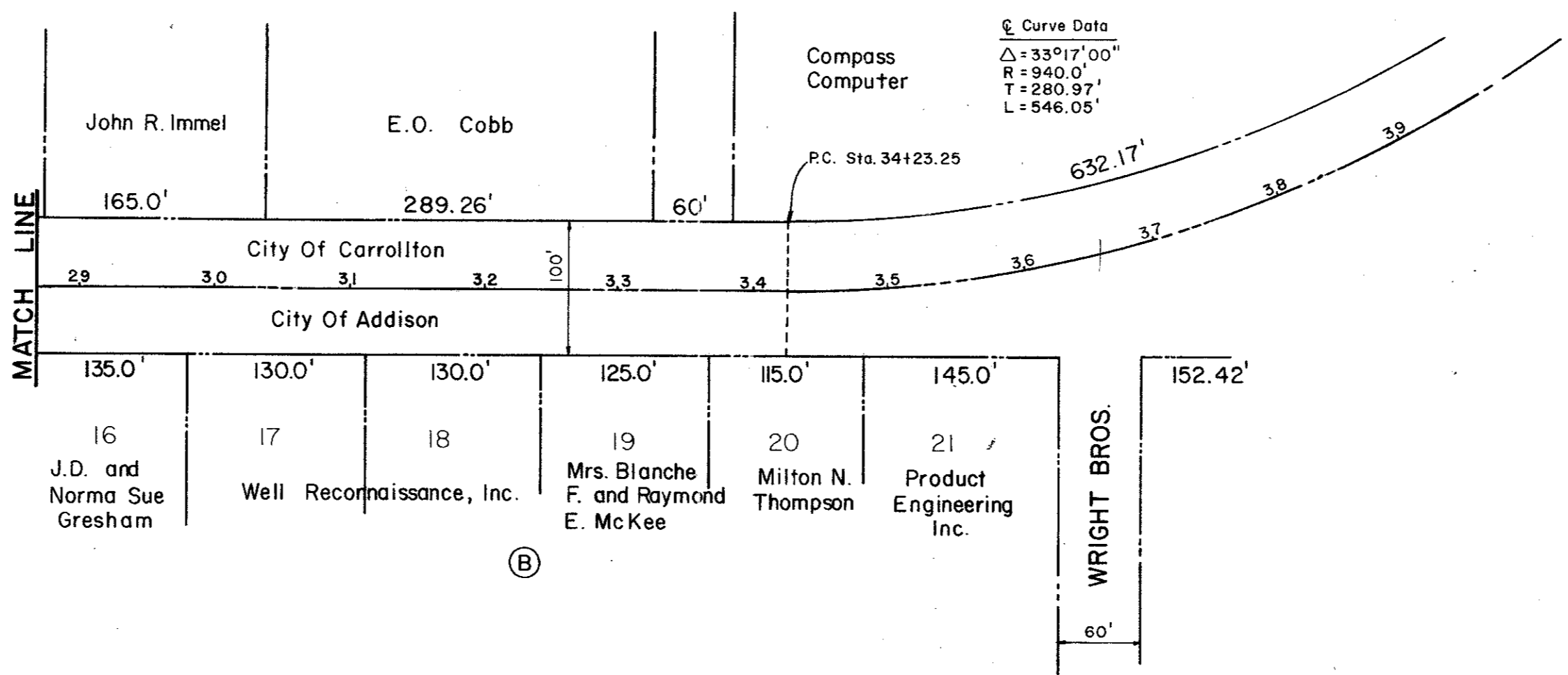
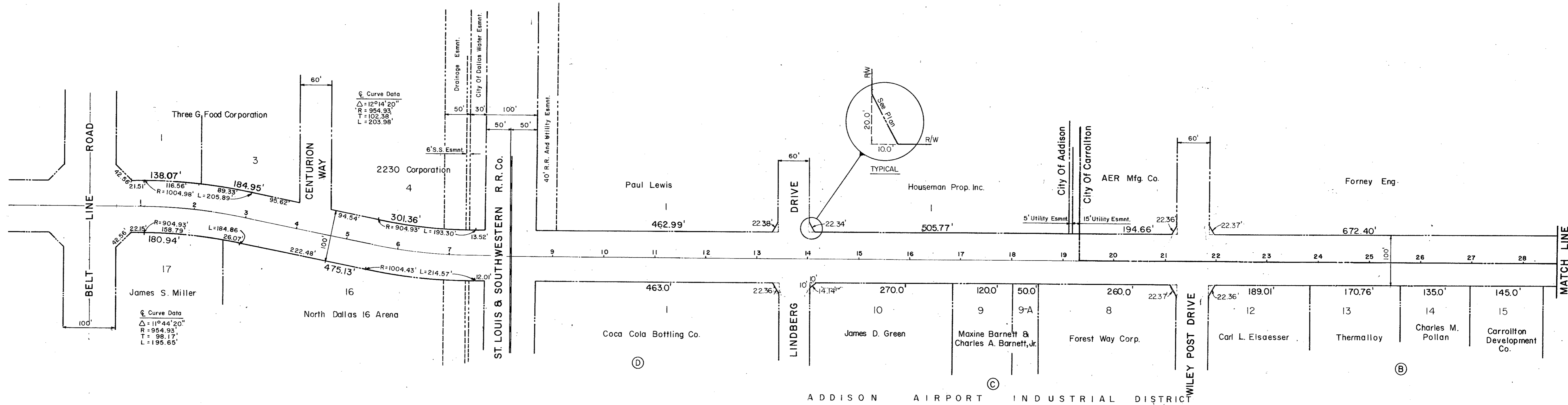
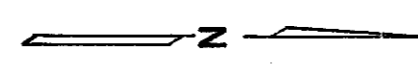
Mayor

Date: 3-6-81

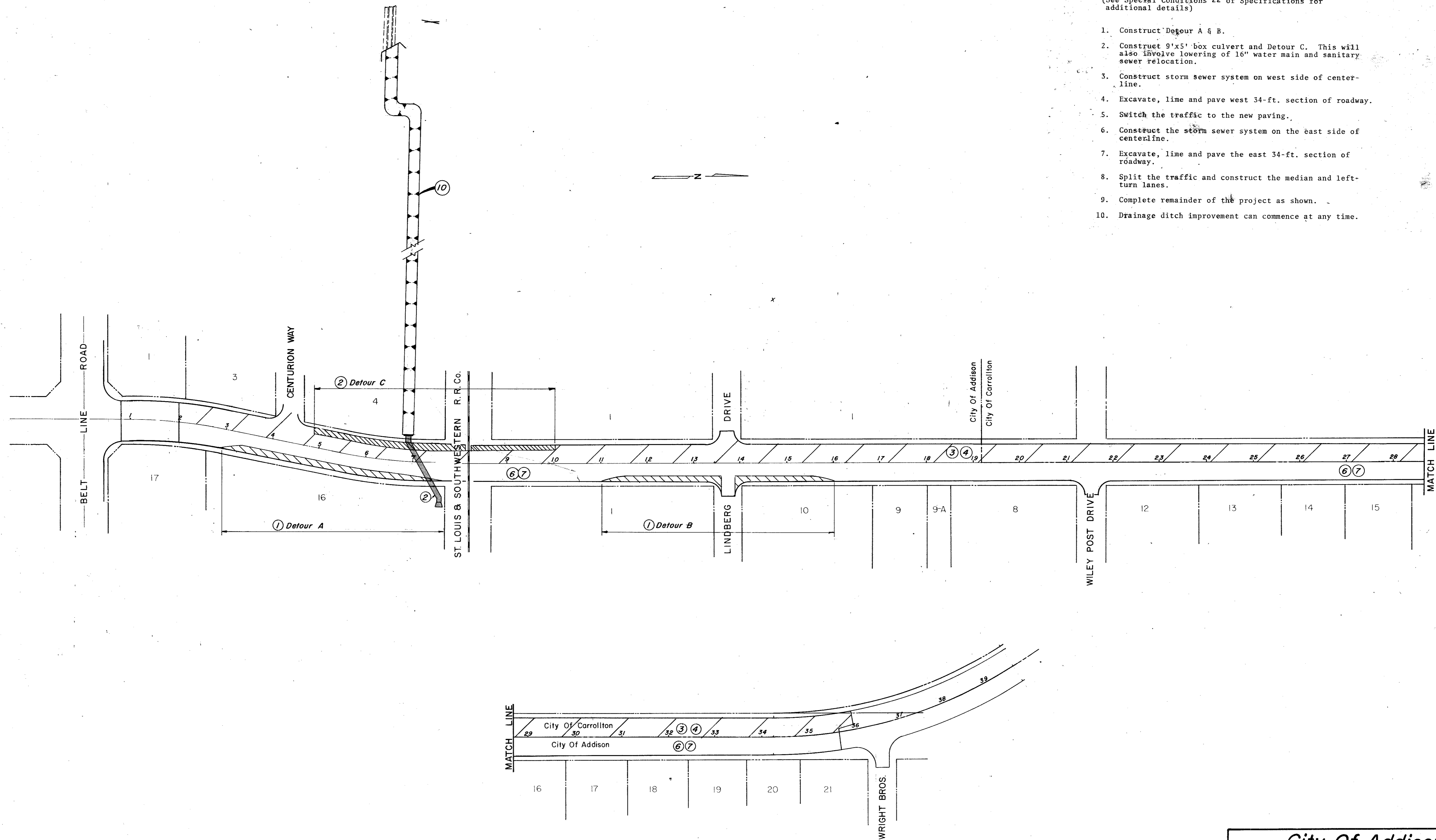


GINN INC.  
CONSULTING ENGINEERS  
DALLAS, TEXAS



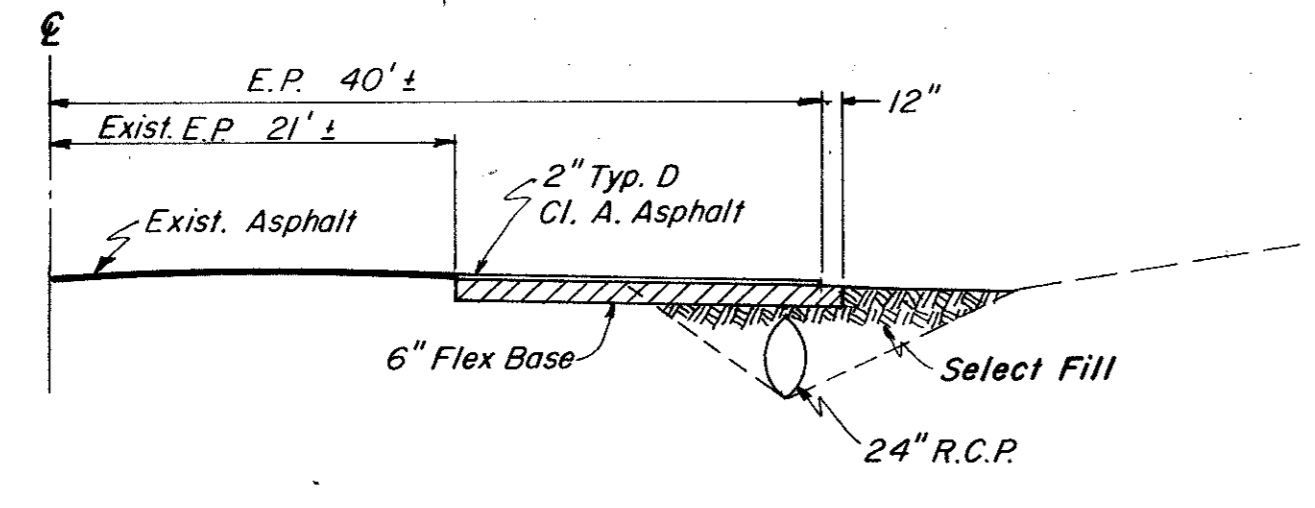
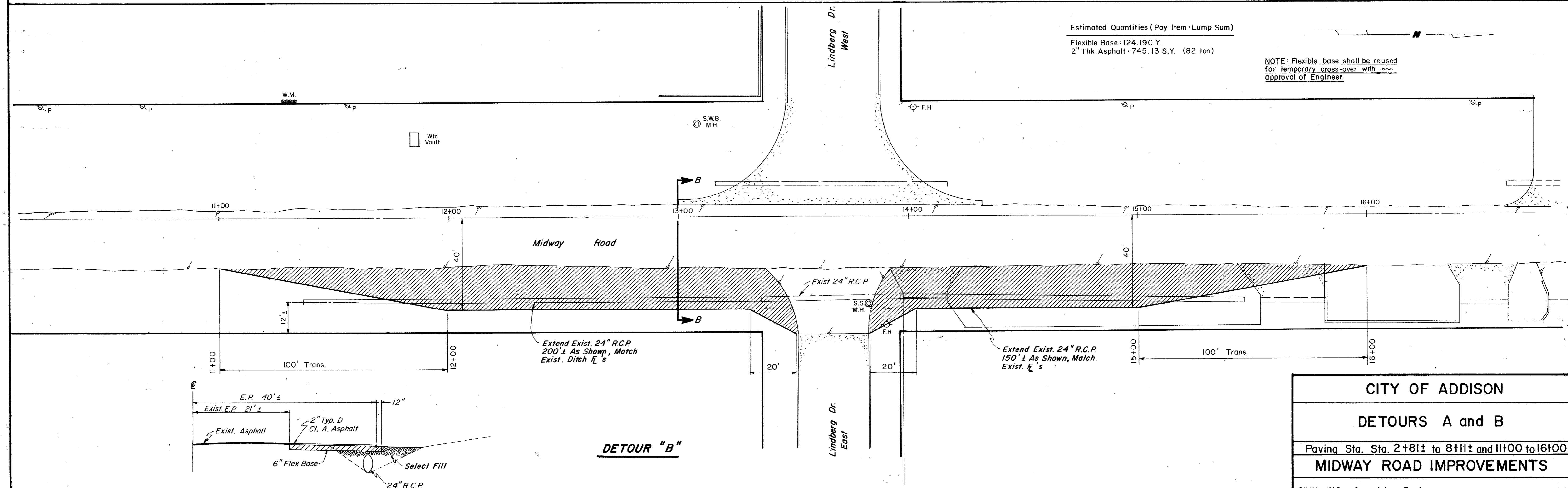
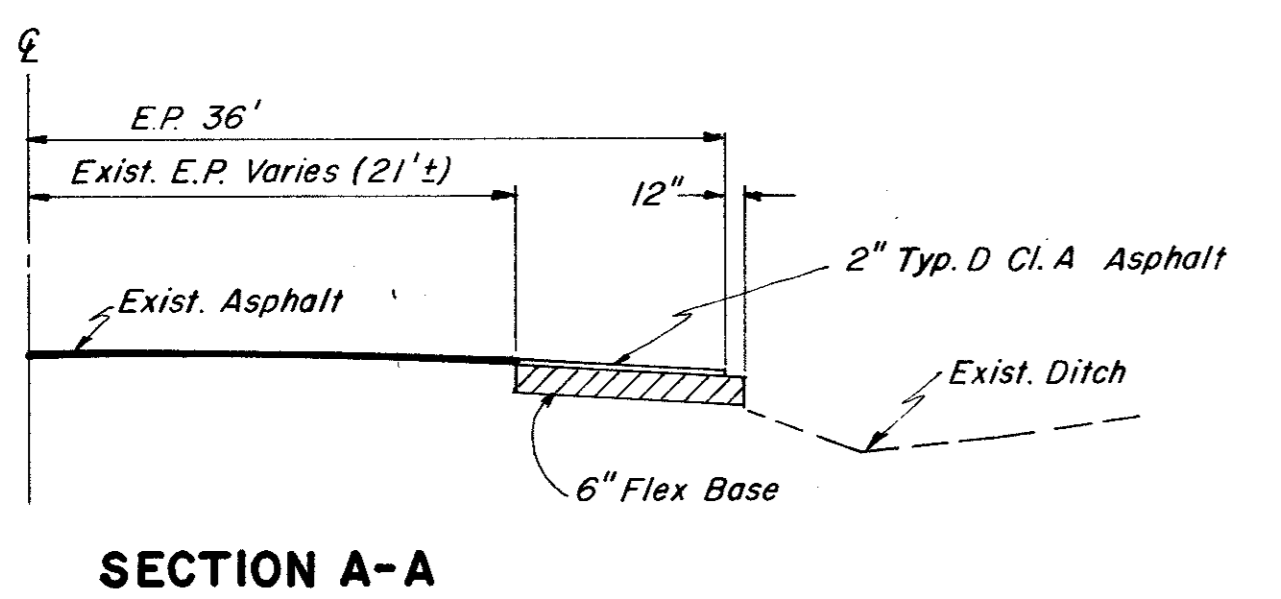
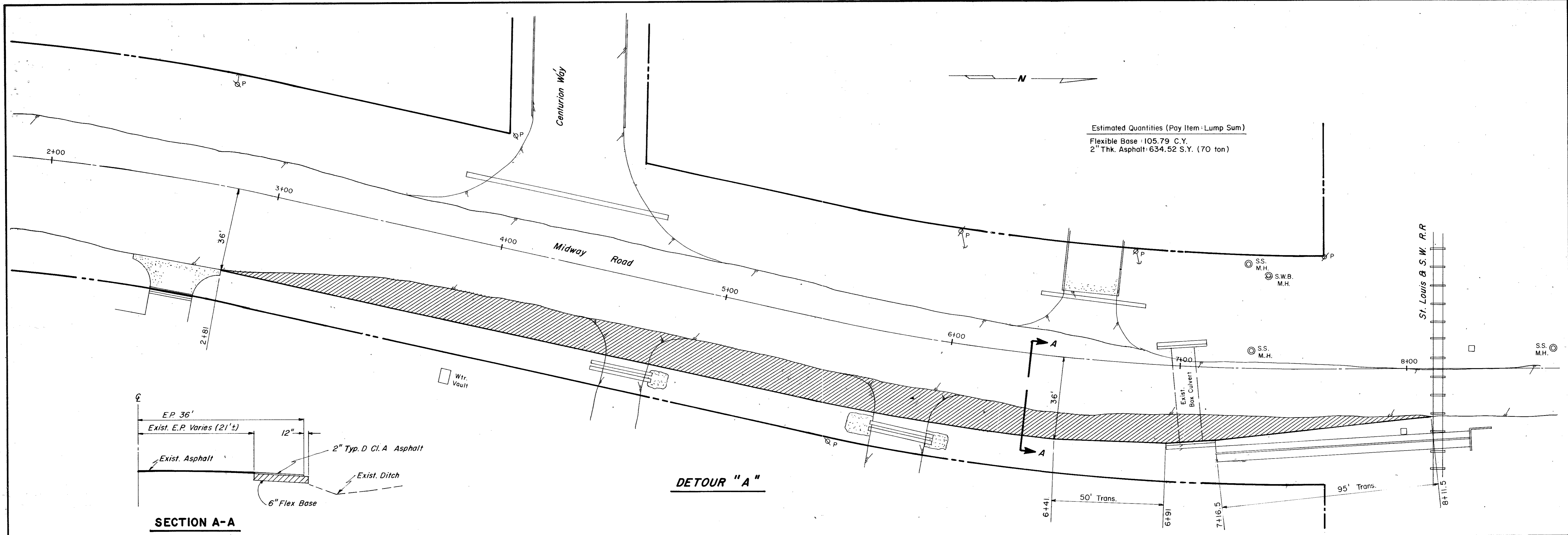


<b>City Of Addison</b>			
<b>MIDWAY ROAD IMPROVEMENTS</b>			
<b>RIGHT OF WAY MAP</b>			
DESIGNED W.K.	DRAWN R.G.B.	DATE MARCH, 1981	FILE
APPROVED H.W.G.	CHECKED A.G.F.	SCALE 1" = 100'	SHEET 2 OF



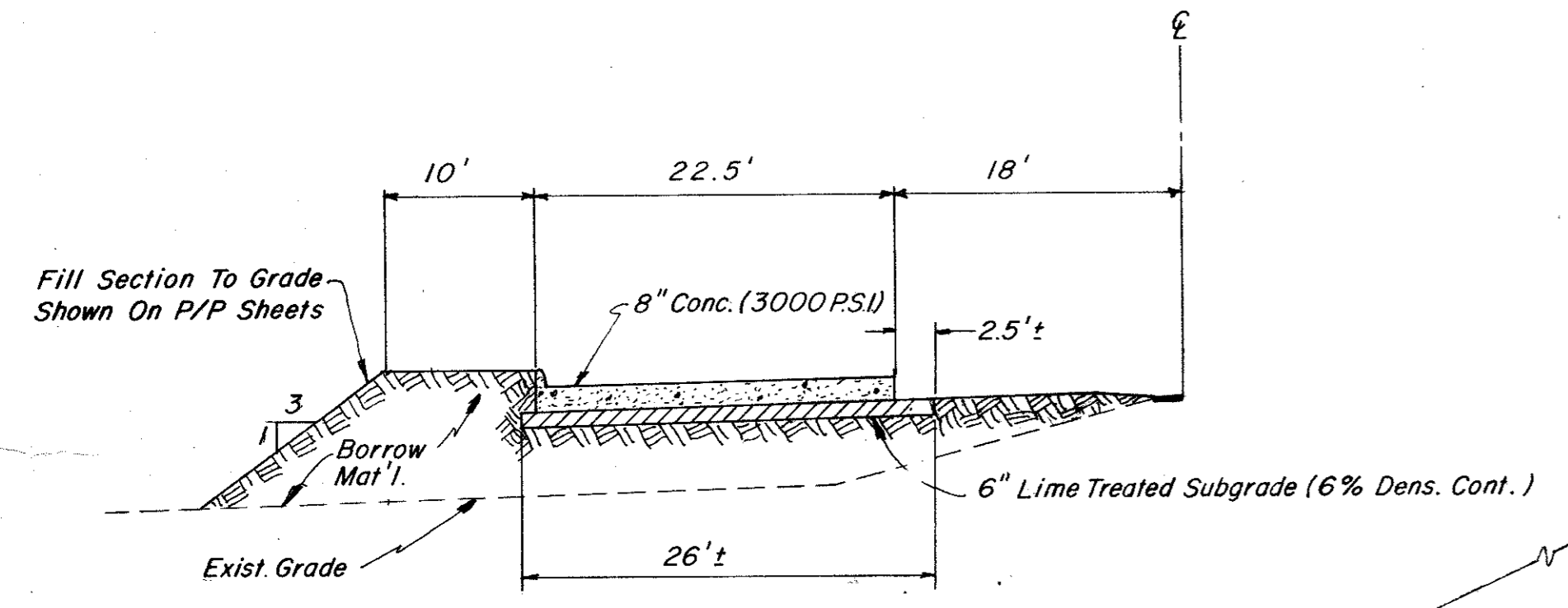
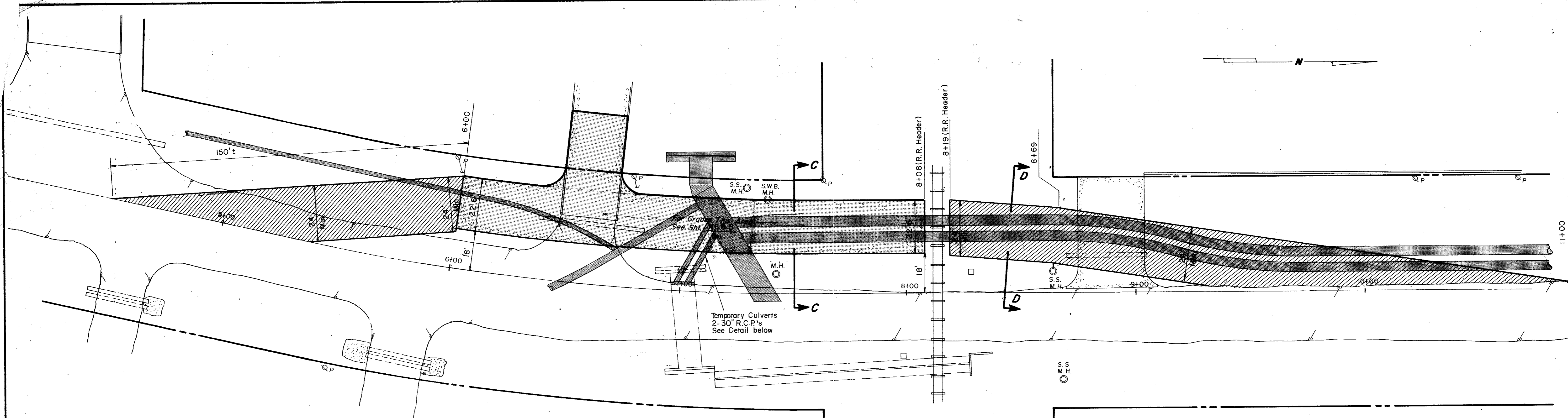
- SUMMARY CONSTRUCTION SEQUENCE**  
 (See Special Conditions 22 of Specifications for additional details)
1. Construct Detour A & B.
  2. Construct 9'x5' box culvert and Detour C. This will also involve lowering of 16" water main and sanitary sewer relocation.
  3. Construct storm sewer system on west side of centerline.
  4. Excavate, lime and pave west 34-ft. section of roadway.
  5. Switch the traffic to the new paving.
  6. Construct the storm sewer system on the east side of centerline.
  7. Excavate, lime and pave the east 34-ft. section of roadway.
  8. Split the traffic and construct the median and left-turn lanes.
  9. Complete remainder of the project as shown.
  10. Drainage ditch improvement can commence at any time.

<b>City Of Addison</b>			
<b>MIDWAY ROAD IMPROVEMENTS</b>			
<b>CONSTRUCTION SEQUENCE</b>			
DESIGNED H.B.J.	DRAWN R.G.B.	DATE MARCH, 1981	FILE
APPROVED H.W.G.	CHECKED A.G.F.	SCALE 1" = 100'	SHEET 3A OF



CITY OF ADDISON			
DETOURS A and B			
Paving Sta. Sta. 2+81± to 8+11± and 11+00 to 16+00			
MIDWAY ROAD IMPROVEMENTS			
GINN, INC., Consulting Engineers			
DESIGNED - H.B.J.	DRAWN - S.M.M.	DATE - MARCH, 1981	
APPROVED - H.W.G.	CHECK - C.F.	SCALE 1" = 20'	SHEET 3B OF





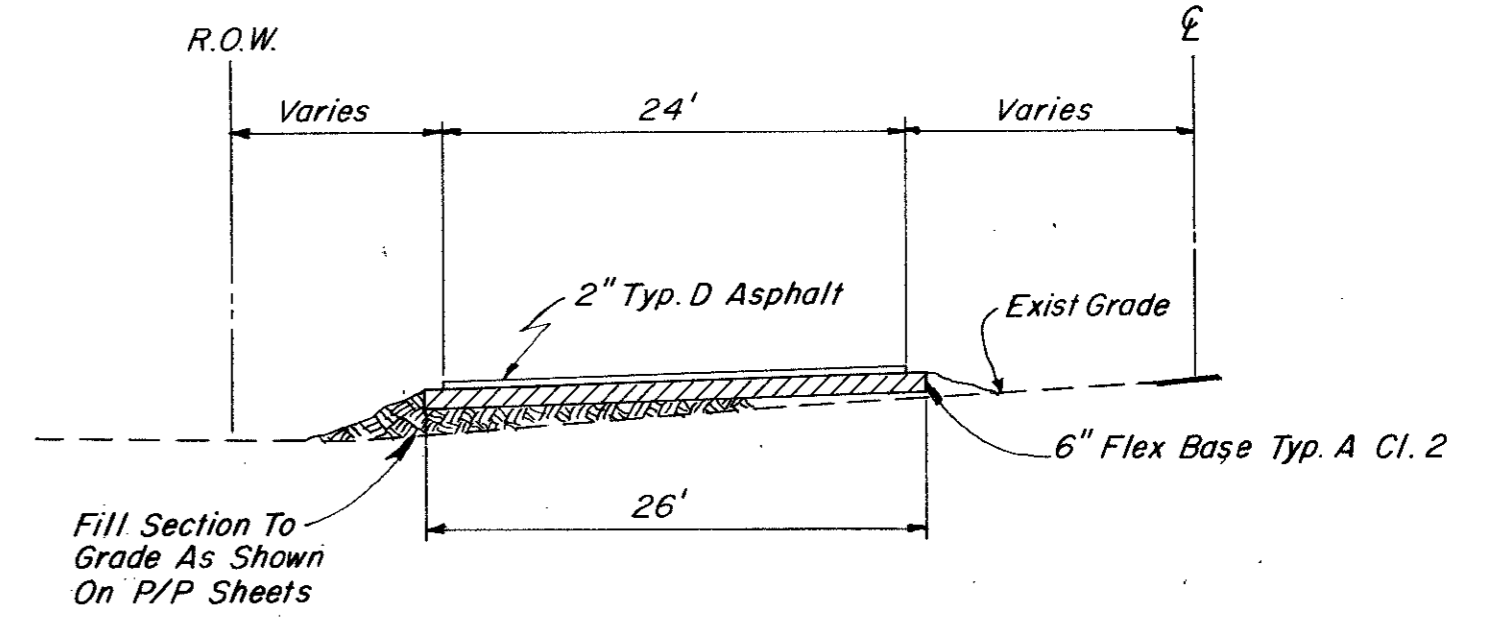
**SECTION "C-C"**

**DETOUR C**  
Scale: 1"=20'

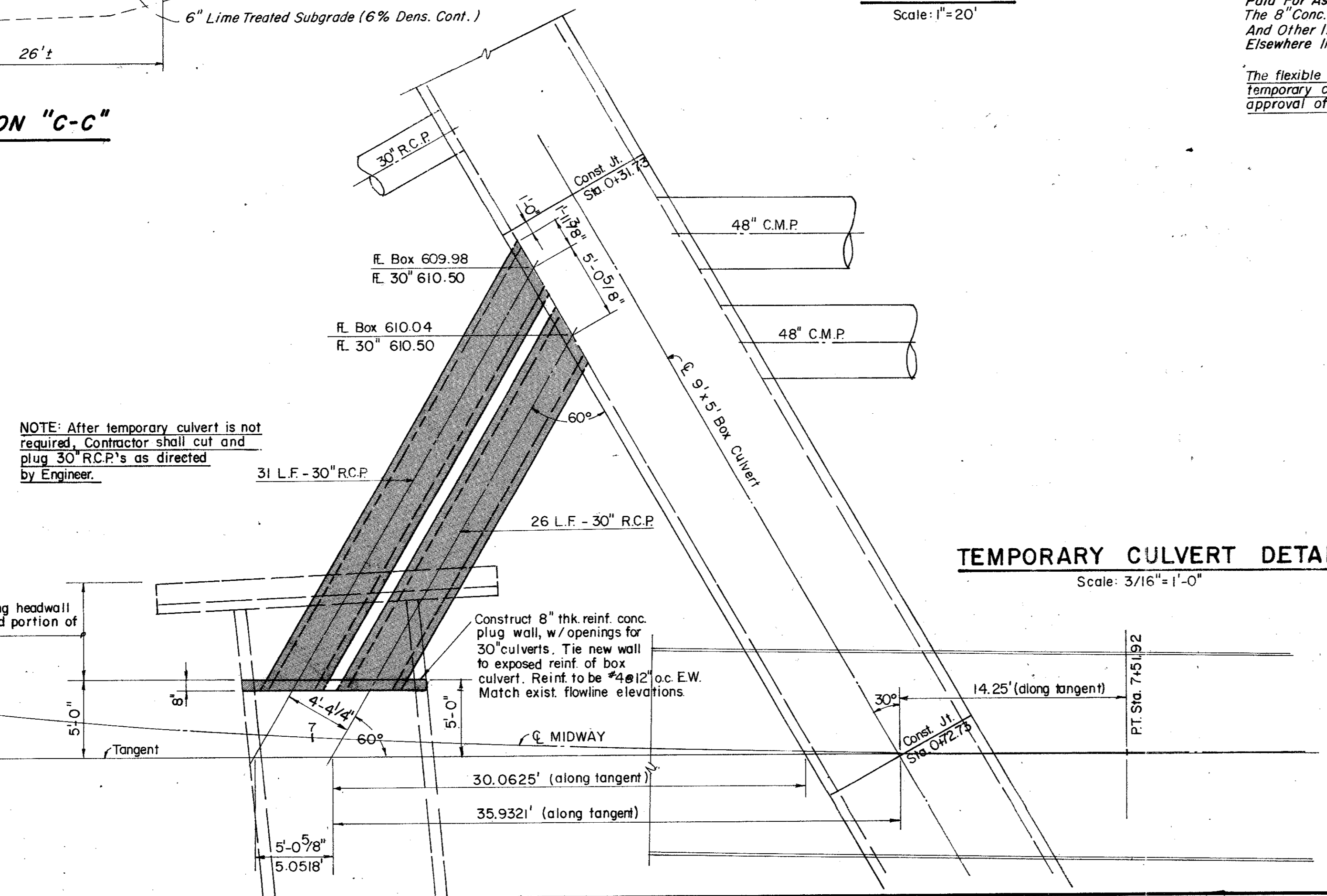
**Estimated Quantities**  
Flexible Base : 135.78 C.Y.  
2" Thk. Asphalt : 814.67 S.Y. (90 tons)

**NOTE:** The Flexible Base And Asphalt Will Be Paid For As Separate Items As Shown, The 8" Conc. Paving, Borrow, Box Culvert, And Other Items Are Shown As Pay Items Elsewhere In Plans.

The flexible base shall be reused for temporary cross over with approval of Engineer.



**SECTION "D-D"**



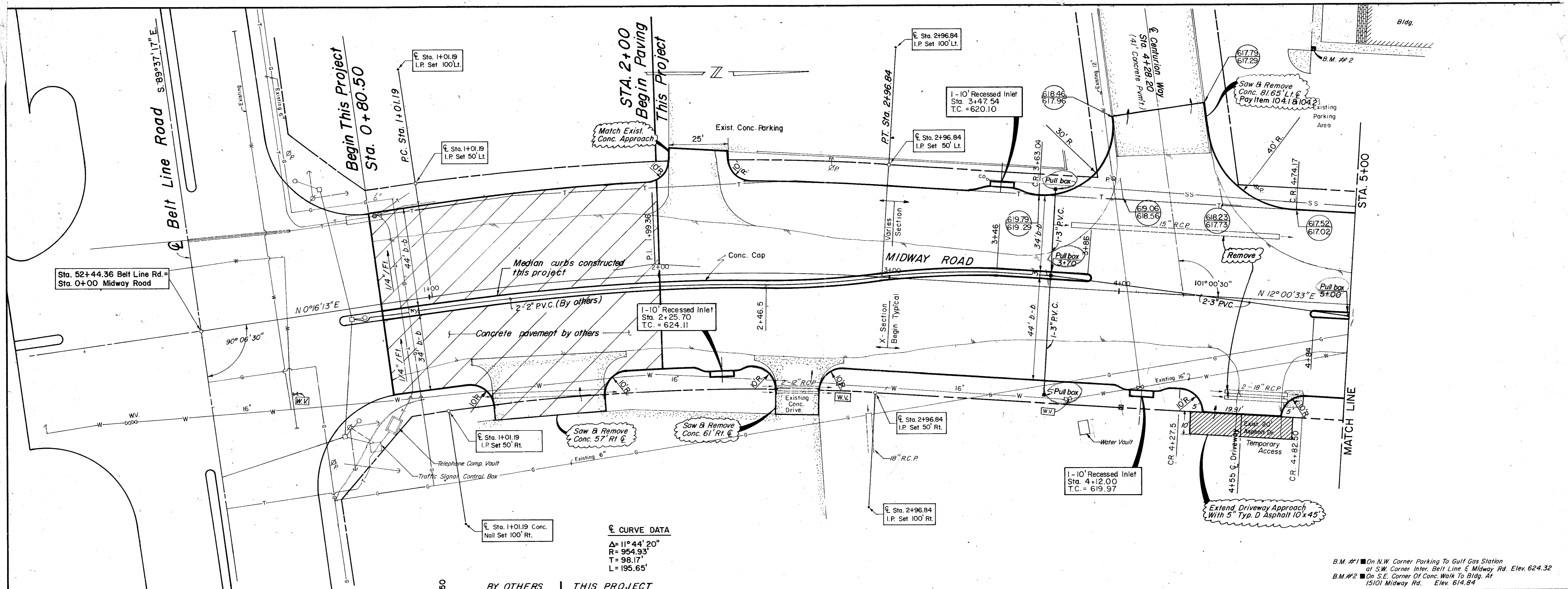
**TEMPORARY CULVERT DETAIL**  
Scale: 3/16"=1'-0"

**NOTE:** After temporary culvert is not required, Contractor shall cut and plug 30" R.C.P.'s as directed by Engineer.

Remove existing headwall and designated portion of box culvert

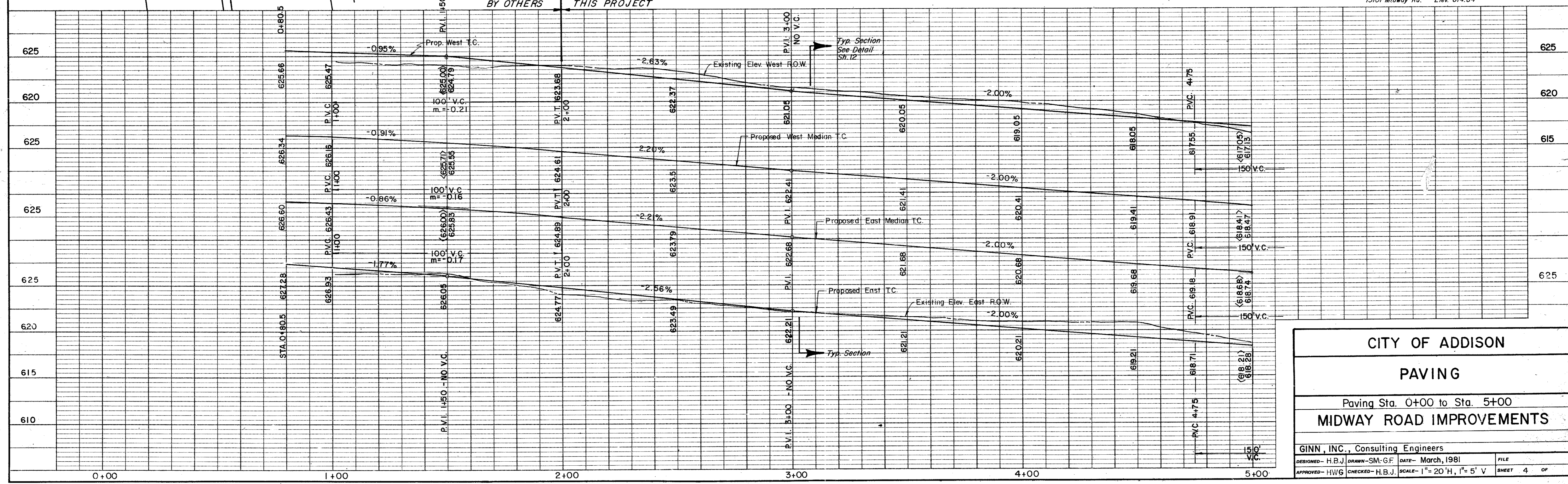
<b>CITY OF ADDISON</b>			
<b>DETOUR C</b>			
Paving Sta. 8+50± to 11+00			
<b>MIDWAY ROAD IMPROVEMENTS</b>			
GINN, INC., Consulting Engineers			
DESIGNED - H.B.J.	DRAWN - S.M.M.	DATE - MARCH, 1981	
APP'D - H.W.G.	CHECK - C.F.	SCALE - 1"=20'	SHEET 3 C OF





**△ CURVE DATA**  
 $\Delta = 11^\circ 44' 20''$   
 $R = 954.93'$   
 $T = 98.17'$   
 $L = 195.65'$

B.M. #1 ■ On N.W. Corner Parking To Gulf Gas Station  
 of S.W. Corner Inter. Belt Line & Midway Rd. Elev. 624.32  
 B.M. #2 ■ On S.E. Corner Of Conc. Walk To Bldg. At  
 15101 Midway Rd. Elev. 614.84



**CITY OF ADDISON**

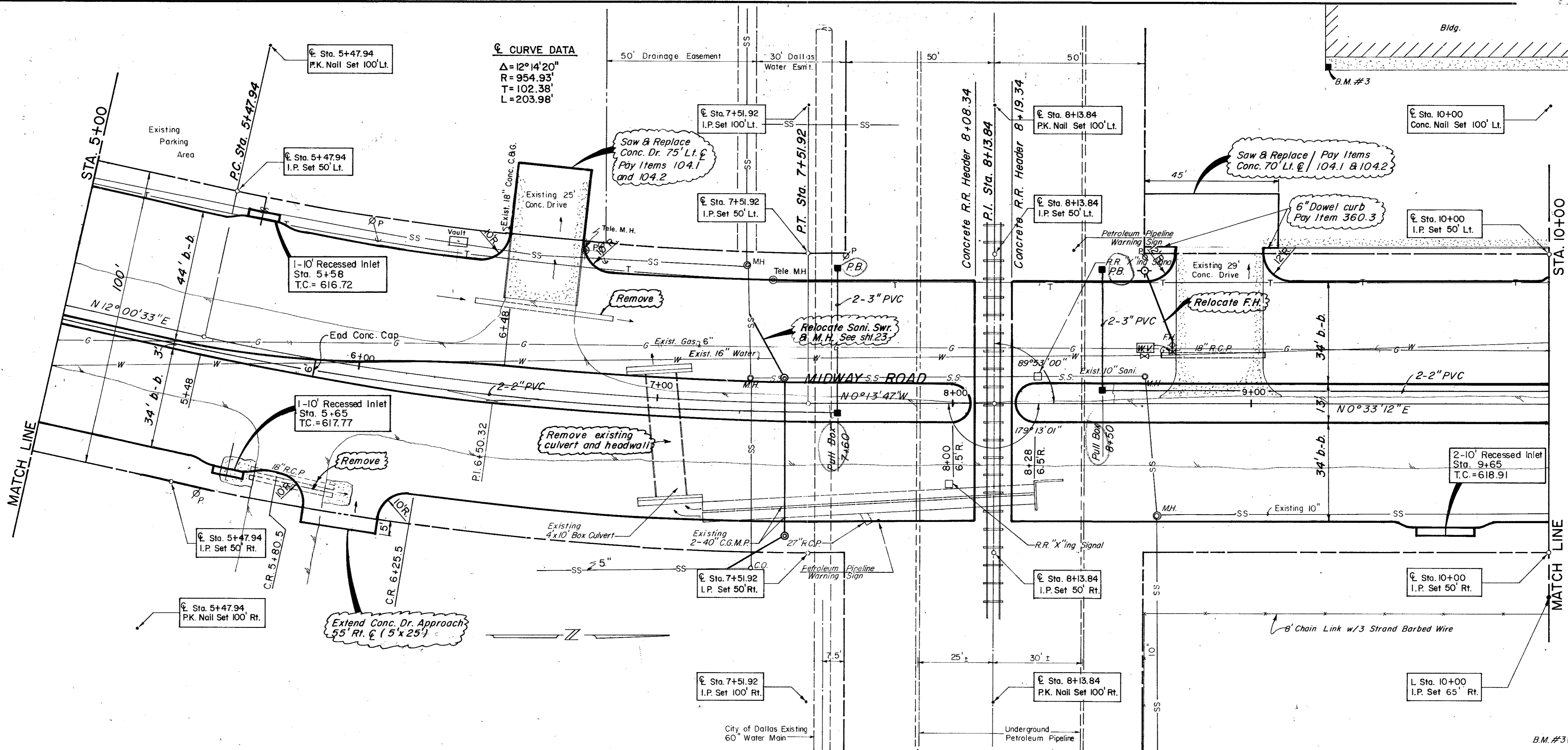
**PAVING**

Paving Sta. 0+00 to Sta. 5+00  
**MIDWAY ROAD IMPROVEMENTS**

GINN, INC., Consulting Engineers

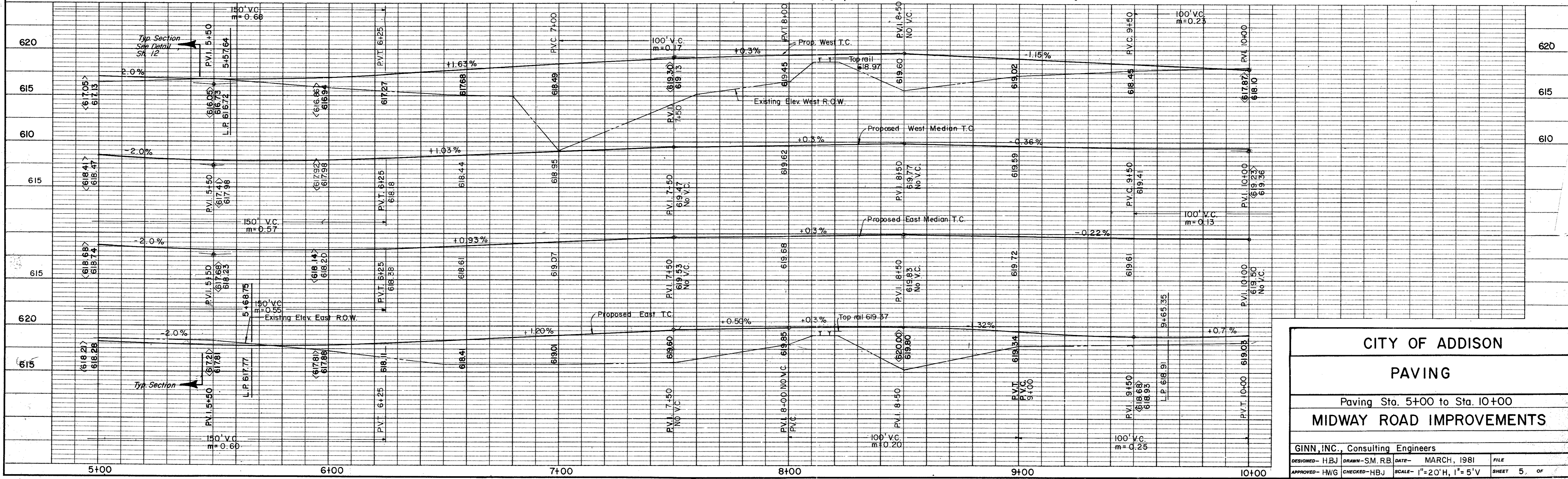
DESIGNED - H.B.J. DRAWN - SM-GF DATE - March, 1981 FILE  
 APPROVED - HWG CHECKED - H.B.J. SCALE - 1" = 20' H, 1" = 5' V SHEET 4 OF





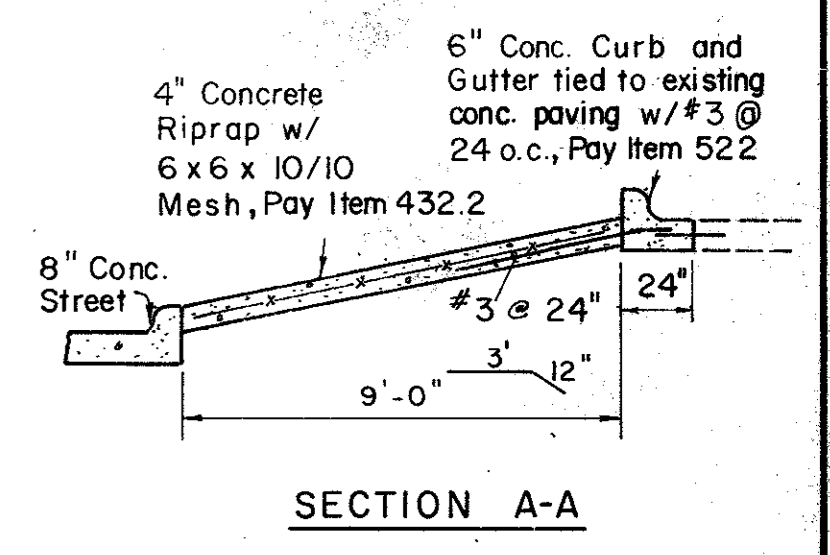
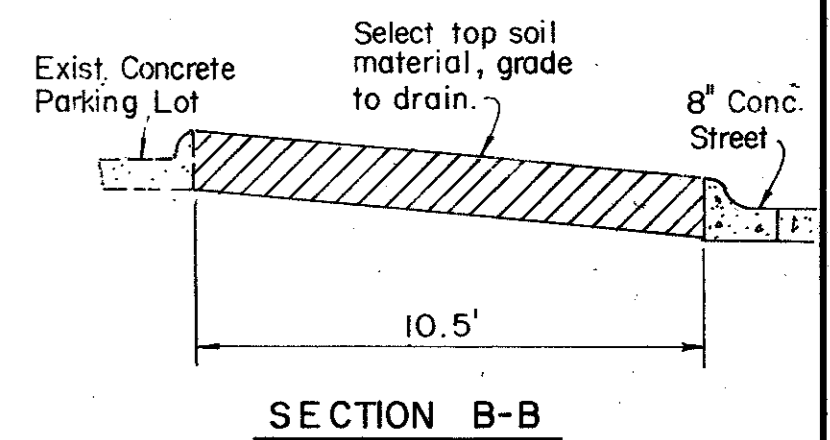
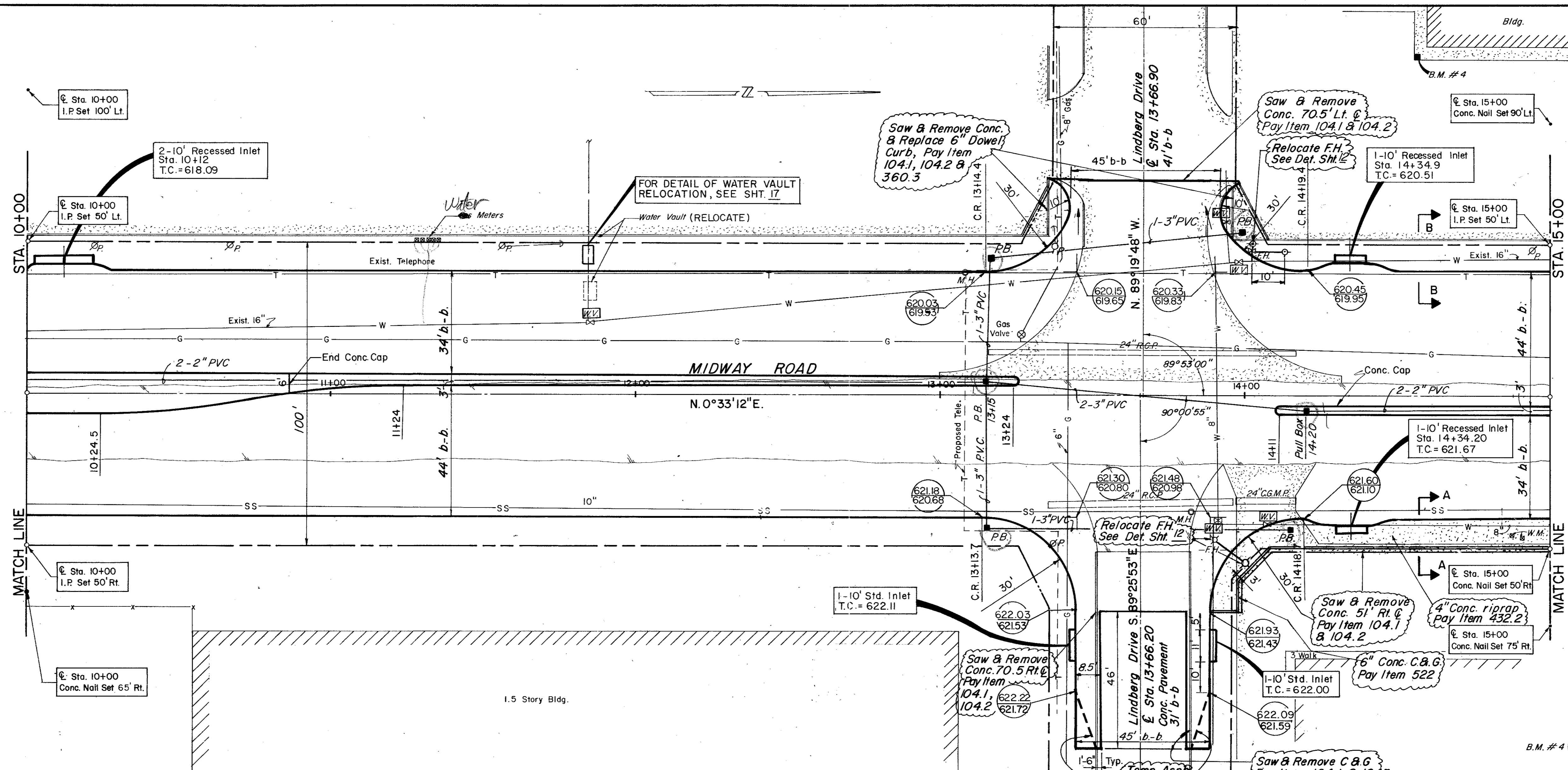
**☉ CURVE DATA**  
 $\Delta = 12^\circ 14' 20''$   
 $R = 954.93'$   
 $T = 102.38'$   
 $L = 203.98'$

B.M. #3 On Conc. Walk at S.E. Corner of Bldg. at 15201 Midway Rd. Elev. 618.14

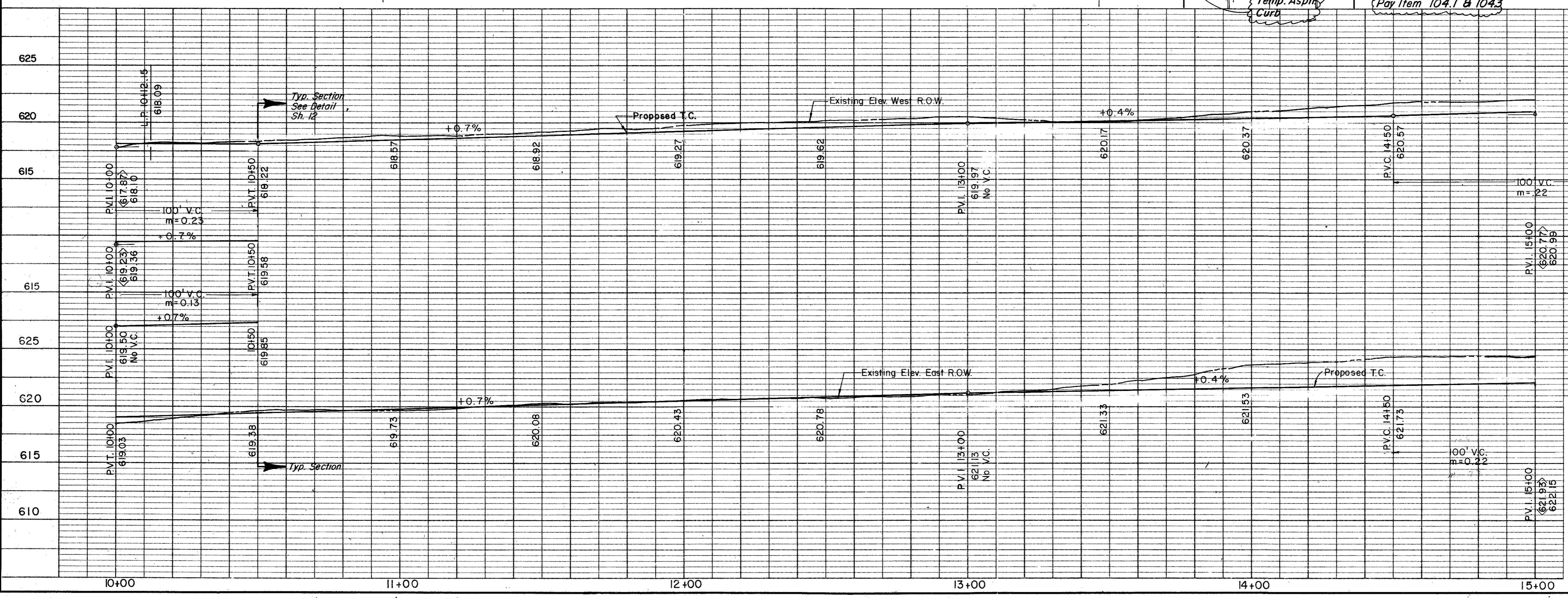


<b>CITY OF ADDISON</b>	
<b>PAVING</b>	
Paving Sta. 5+00 to Sta. 10+00	
<b>MIDWAY ROAD IMPROVEMENTS</b>	
GINN, INC., Consulting Engineers	
DESIGNED - H.B.J.	DRAWN - S.M.R.B.
DATE - MARCH, 1981	FILE
APPROVED - H.W.G.	CHECKED - H.B.J.
SCALE - 1" = 20' H, 1" = 5' V	SHEET 5 OF





B.M. #4 On Conc. Walk At S.E. Corner Of Bldg At 15301 Midway Rd. Elev. 621.43



**CITY OF ADDISON**

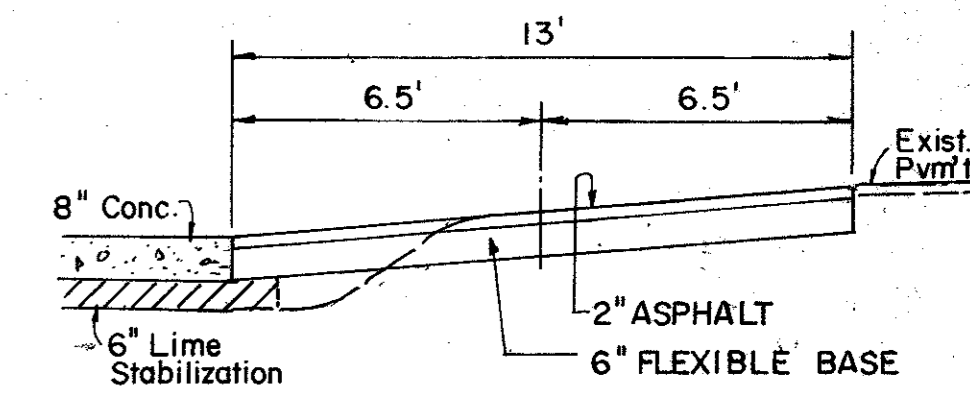
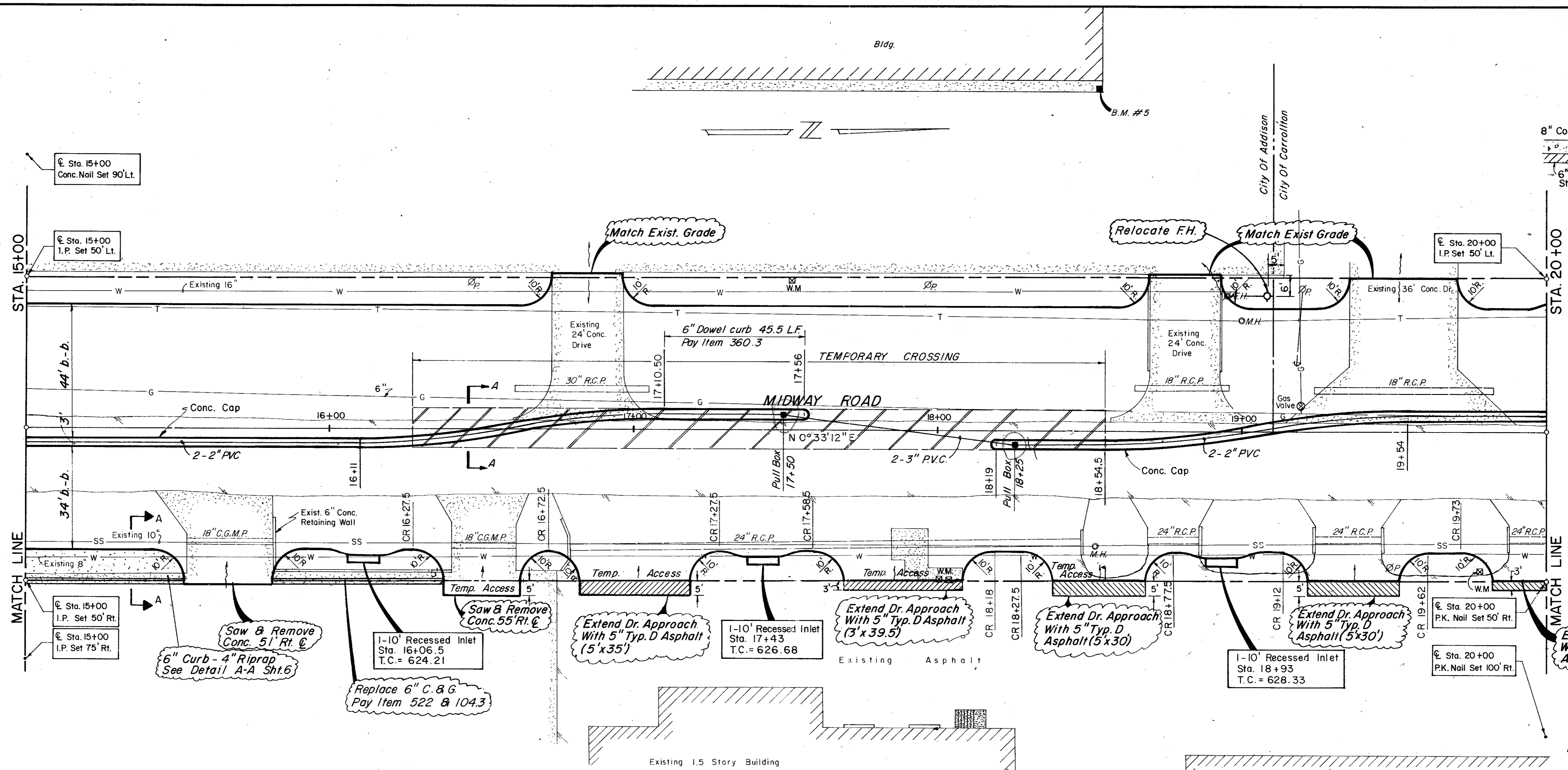
**PAVING**

Paving Sta. 10+00 to Sta. 15+00  
**MIDWAY ROAD IMPROVEMENTS**

GINN, INC., Consulting Engineers

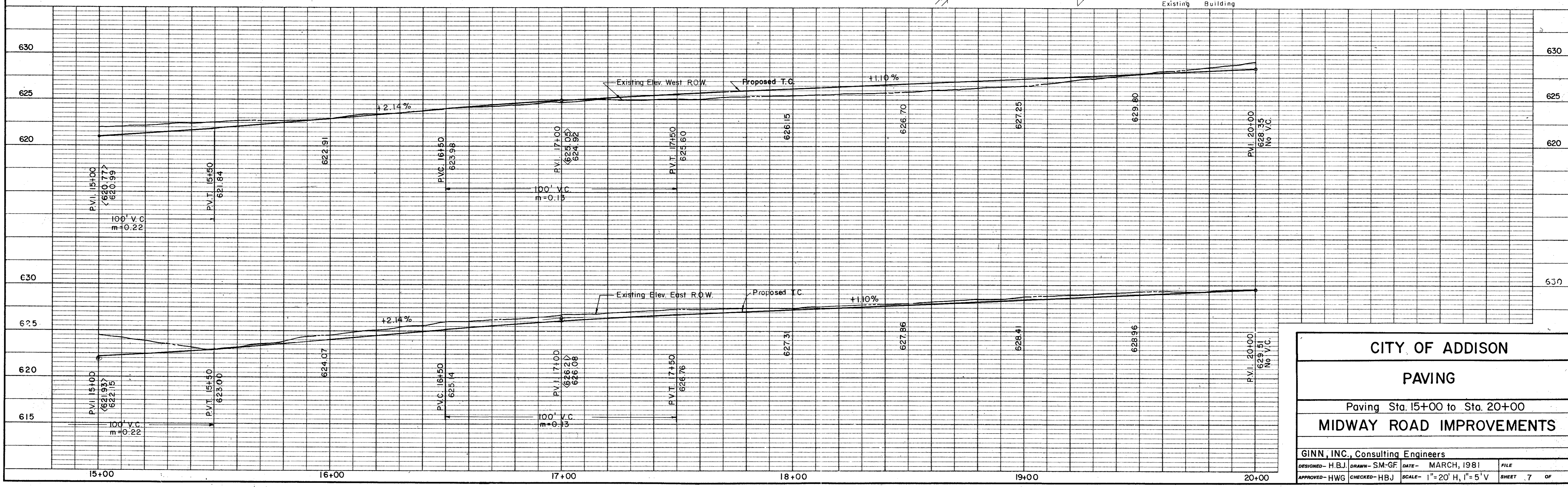
DESIGNED - HBJ DRAWN - SM - GF DATE - MARCH, 1981 FILE  
APPROVED - HWG CHECKED - HBJ SCALE - 1" = 20' H, 1" = 5' V SHEET 6 OF





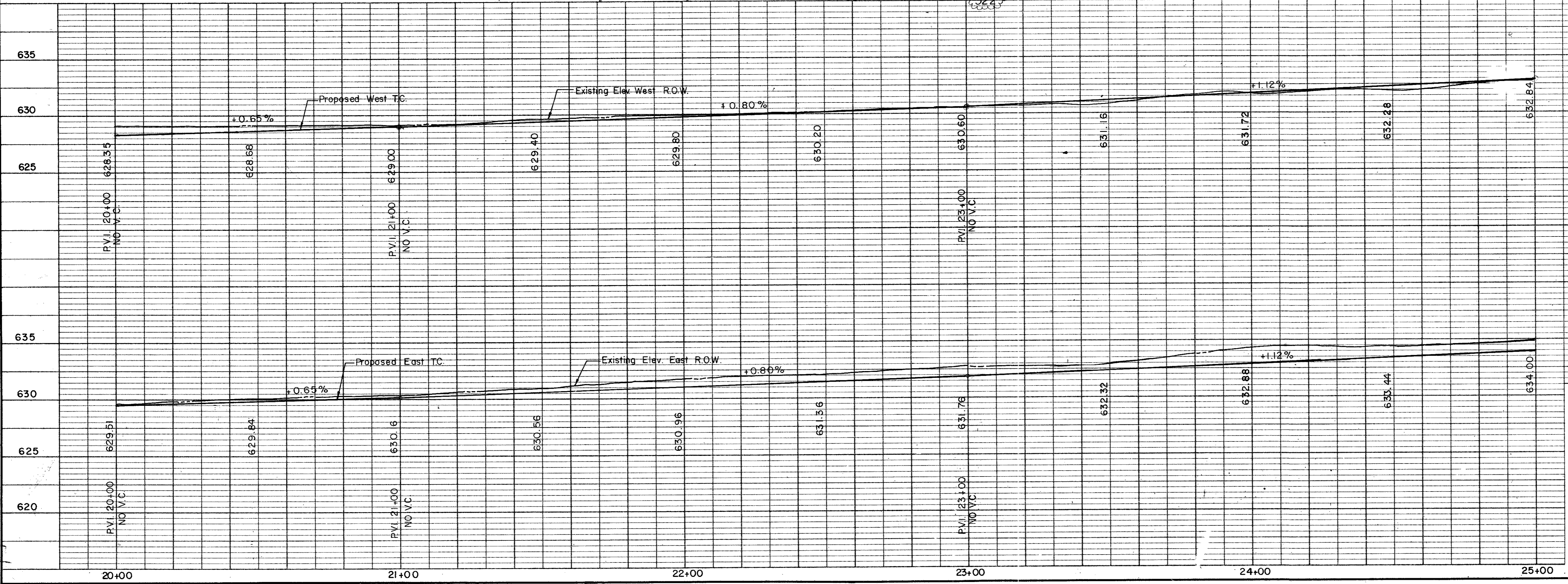
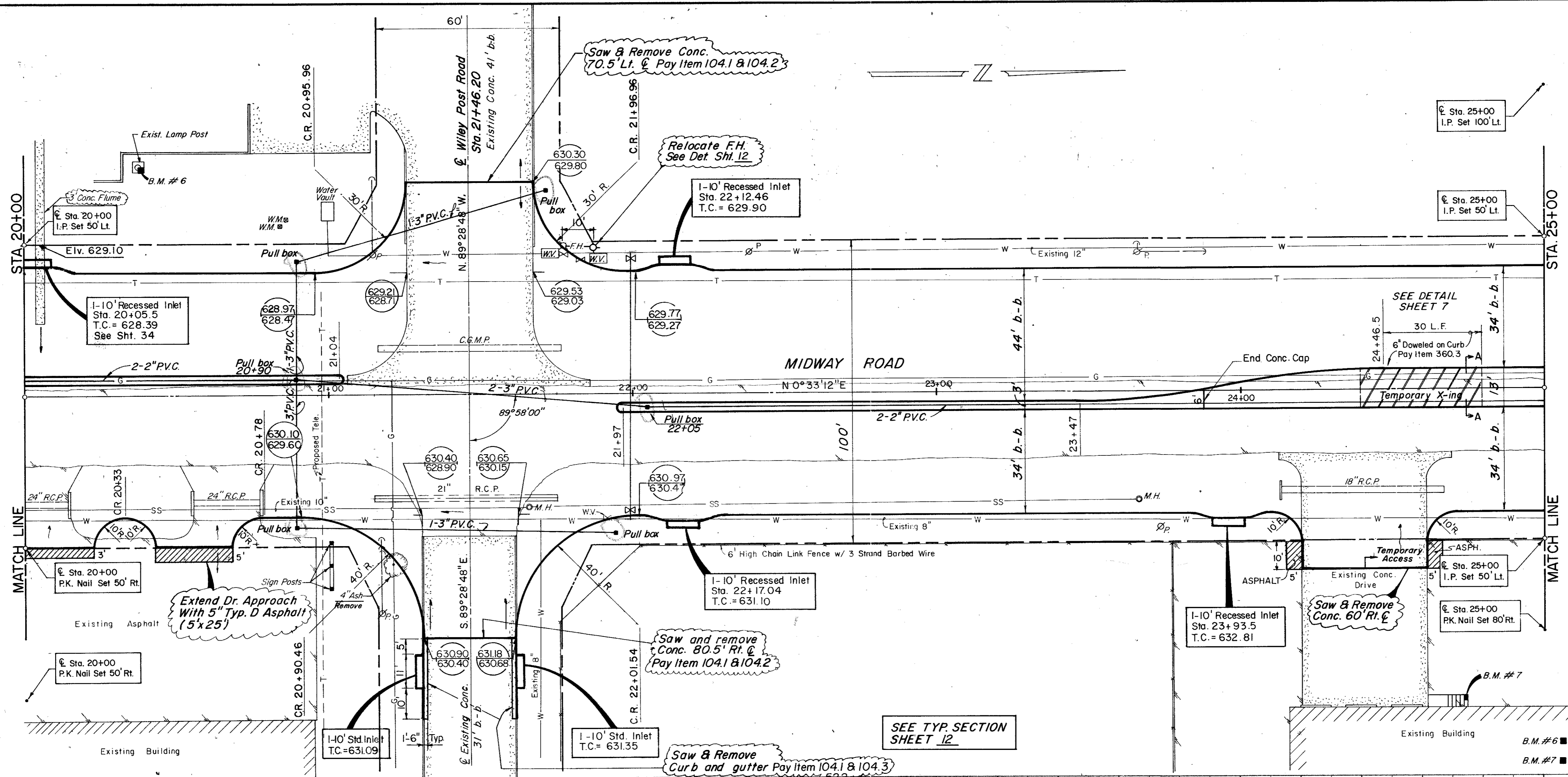
SECTION A-A  
 DETAIL - TEMPORARY CROSSING  
 NOTE: Salvaged flexible base mat. shall be used with approval of Engineer.

B.M. #5 On Conc. Walk At N.E. Corner Of Bldg. At 15321 Midway Rd. Elev. 625.55



<b>CITY OF ADDISON</b>		
<b>PAVING</b>		
Paving Sta. 15+00 to Sta. 20+00		
<b>MIDWAY ROAD IMPROVEMENTS</b>		
GINN, INC., Consulting Engineers		
DESIGNED - H.B.J.	DRAWN - SM-GF	DATE - MARCH, 1981
APPROVED - HWG	CHECKED - HBJ	SCALE - 1" = 20' H, 1" = 5' V
		FILE SHEET 7 OF





**CITY OF ADDISON**

**PAVING**

Paving Sta. 20+00 to Sta. 25+00  
**MIDWAY ROAD IMPROVEMENTS**

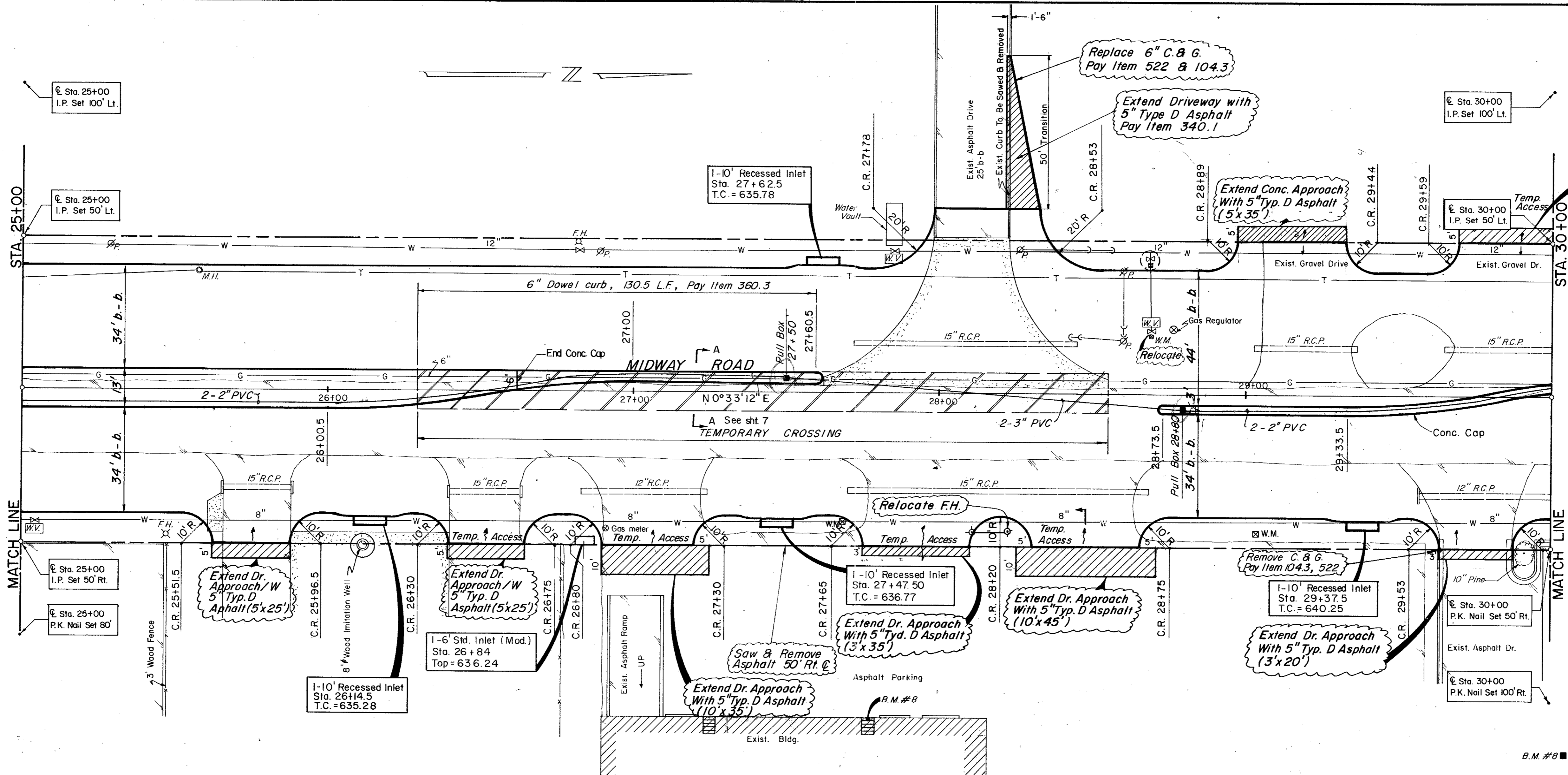
GINN, INC., Consulting Engineers

DESIGNED- HBJ DRAWN-SM GF DATE- March, 1981 FILE

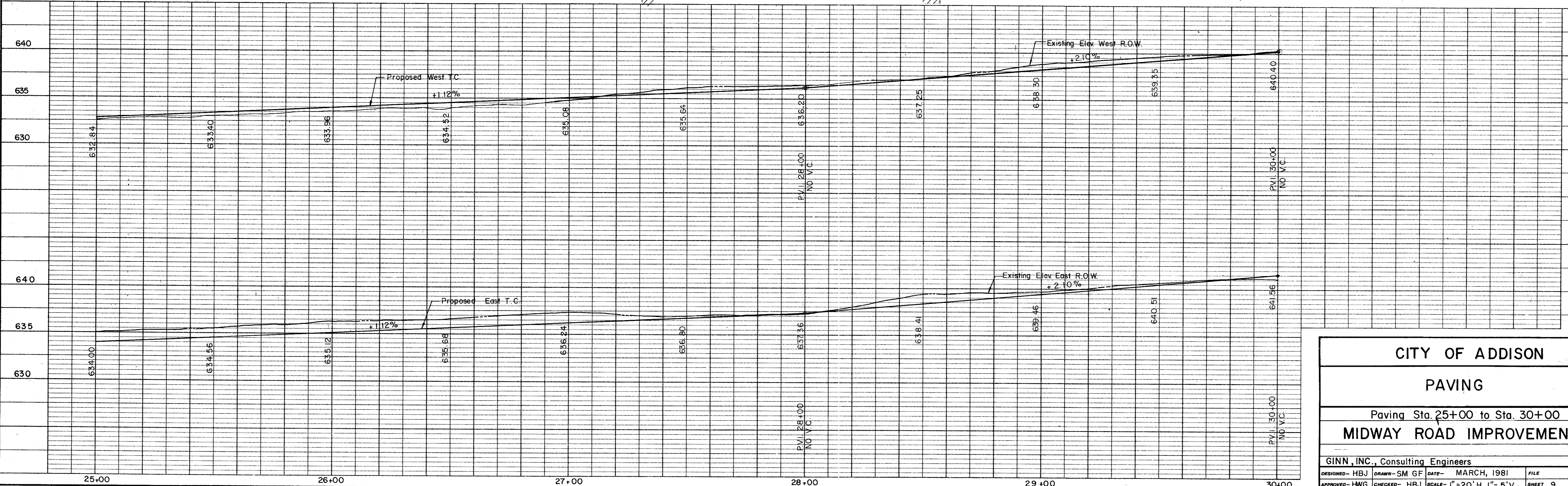
APPROVED- HWG CHECKED-HBJ SCALE-1"=20' H, 1"=5' V SHEET 8 OF

B.M. #6 On Conc. Base To Lamp Post At S.W. Corner Of Inter. Wiley Post Rd & Midway Rd. Elev. 631.34  
B.M. #7 On Bottom Step To Loading Dock At 15502 Midway Rd. Elev. 636.05





B.M. #8 On Bottom Step To Bldg. At 15508 Midway Rd. Elev. 638.57



**CITY OF ADDISON**

**PAVING**

Paving Sta. 25+00 to Sta. 30+00  
**MIDWAY ROAD IMPROVEMENTS**

GINN, INC., Consulting Engineers

DESIGNED - HBJ	DRAWN - SM GF	DATE - MARCH, 1981	FILE
APPROVED - HWG	CHECKED - HBJ	SCALE - 1" = 20' H, 1" = 5' V	SHEET 9 OF



Sta. 30+00  
I.P. Set 100' Lt.

Sta. 30+00  
I.P. Set 50' Lt.

Sta. 30+00  
I.P. Set 50' Rt.

Sta. 30+00  
I.P. Set 100' Rt.

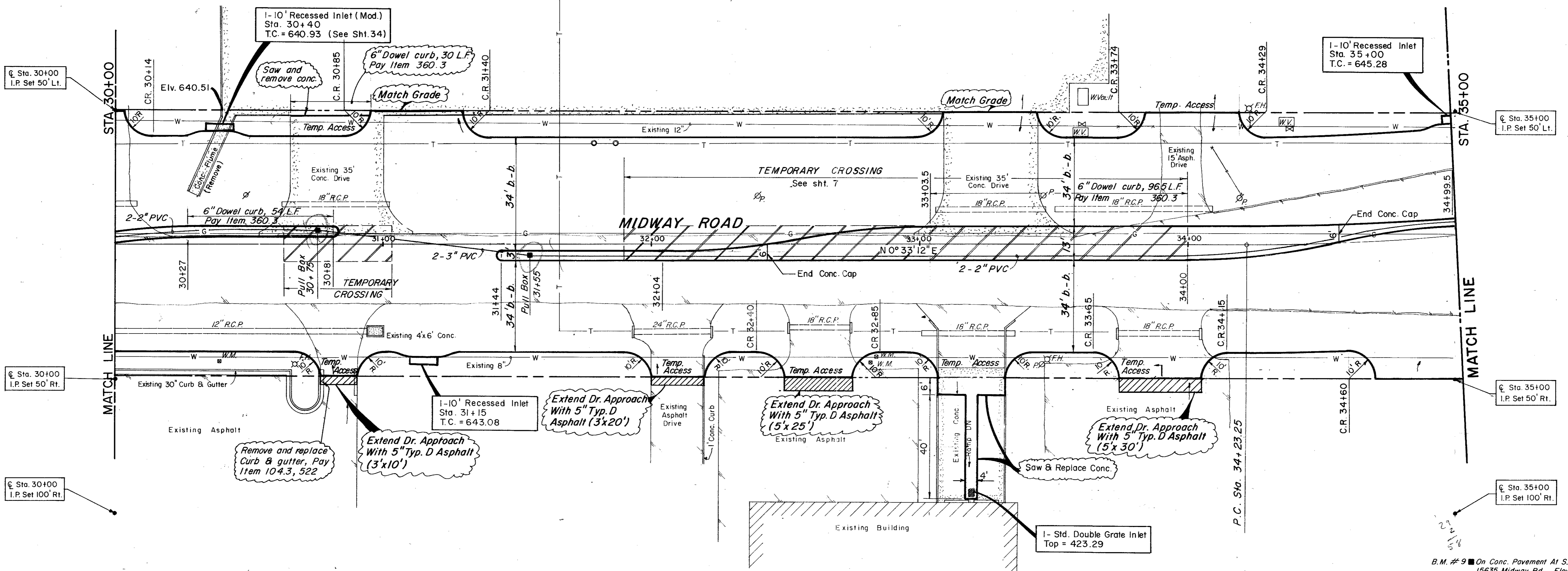
Curve Data  
Δ = 33°17'00"  
R = 940.0'  
T = 280.97'  
L = 546.05'

Sta. 35+00  
I.P. Set 100' Lt.

Sta. 35+00  
I.P. Set 50' Lt.

Sta. 35+00  
I.P. Set 50' Rt.

Sta. 35+00  
I.P. Set 100' Rt.



B.M. #9 On Conc. Pavement At S.E. Corner Of Bldg. At 15635 Midway Rd. Elev. 642.61



**CITY OF ADDISON**

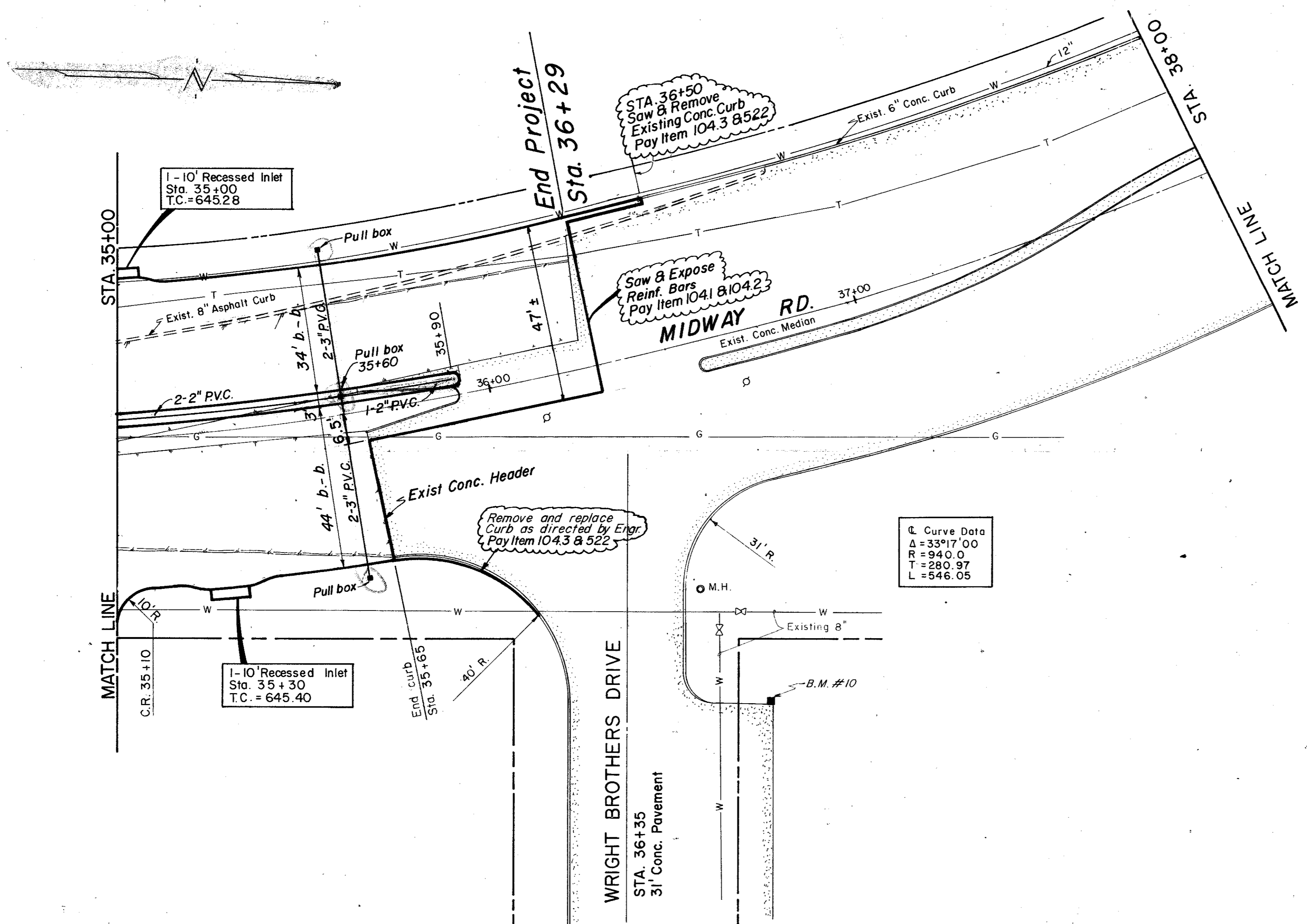
**PAVING**

Paving Sta. 30+00 to Sta. 35+00  
**MIDWAY ROAD IMPROVEMENTS**

GINN, INC., Consulting Engineers

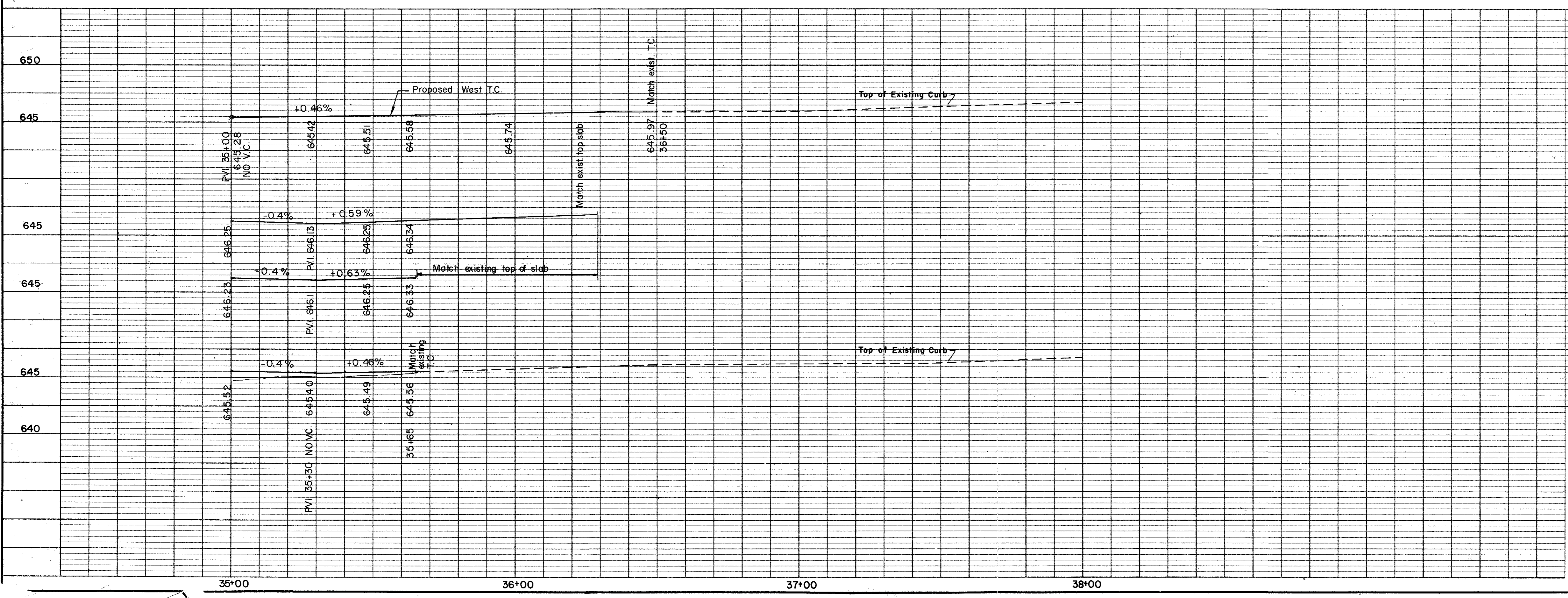
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APPROVED - HWG	CHECKED - HBJ	SCALE - 1" = 20' H, 1" = 5' V	SHEET 10 OF



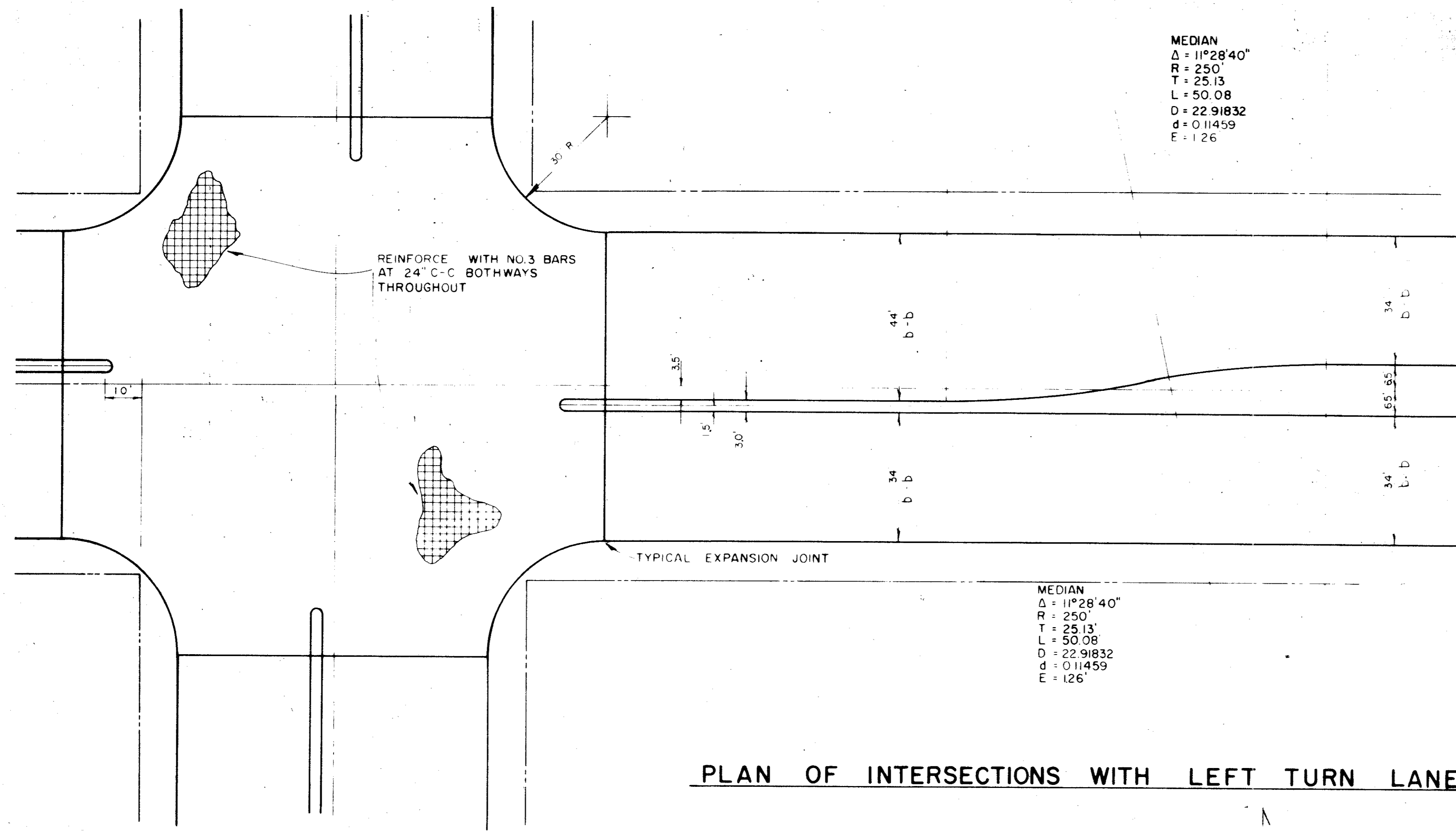


Curve Data  
 $\Delta = 33^\circ 17' 00''$   
 $R = 940.0$   
 $T = 280.97$   
 $L = 546.05$

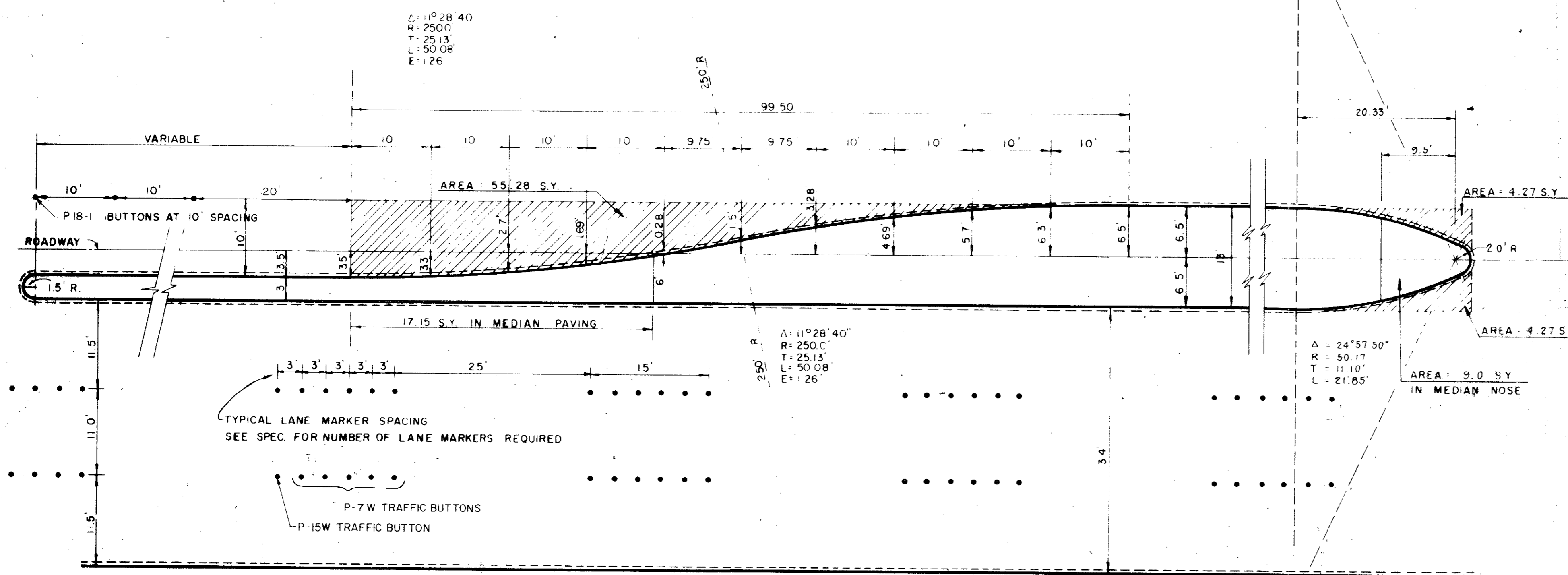
B.M. #10 On Corner Curb At N.W. Corner Of Parking At Wright Brothers Dr. E 15700 Midway Rd. Elev. 647.28



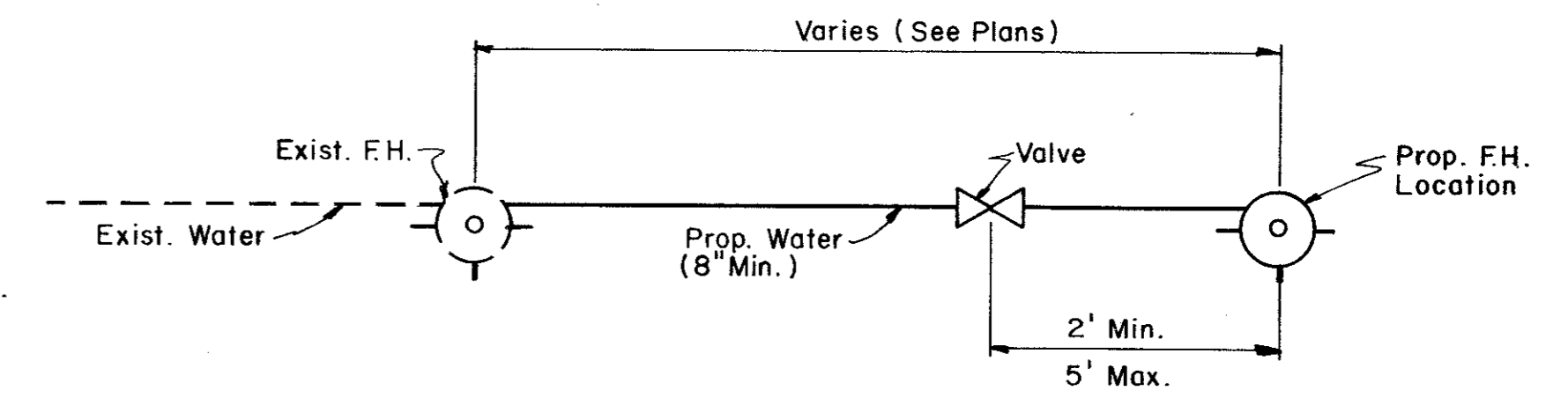
<b>CITY OF ADDISON</b>			
<b>PAVING</b>			
Paving Sta. 35+00 to Sta. 36+29			
<b>MIDWAY ROAD IMPROVEMENTS</b>			
GINN, INC., Consulting Engineers			
DESIGNED - HBJ	DRAWN - GF-SM	DATE - March, 1981	FILE
APPROVED - HWG	CHECKED - HBJ	SCALE - 1" = 20' H, 1" = 5' V	SHEET 11 OF



PLAN OF INTERSECTIONS WITH LEFT TURN LANE



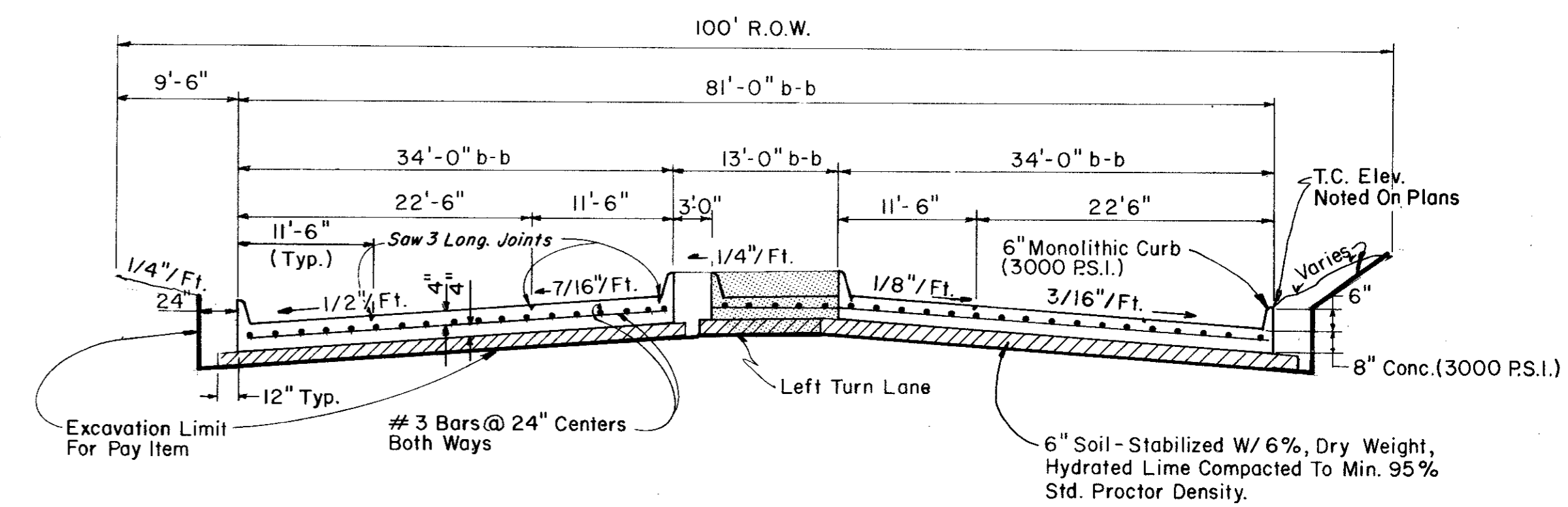
LEFT TURN LANE & LANE MARKER DETAIL



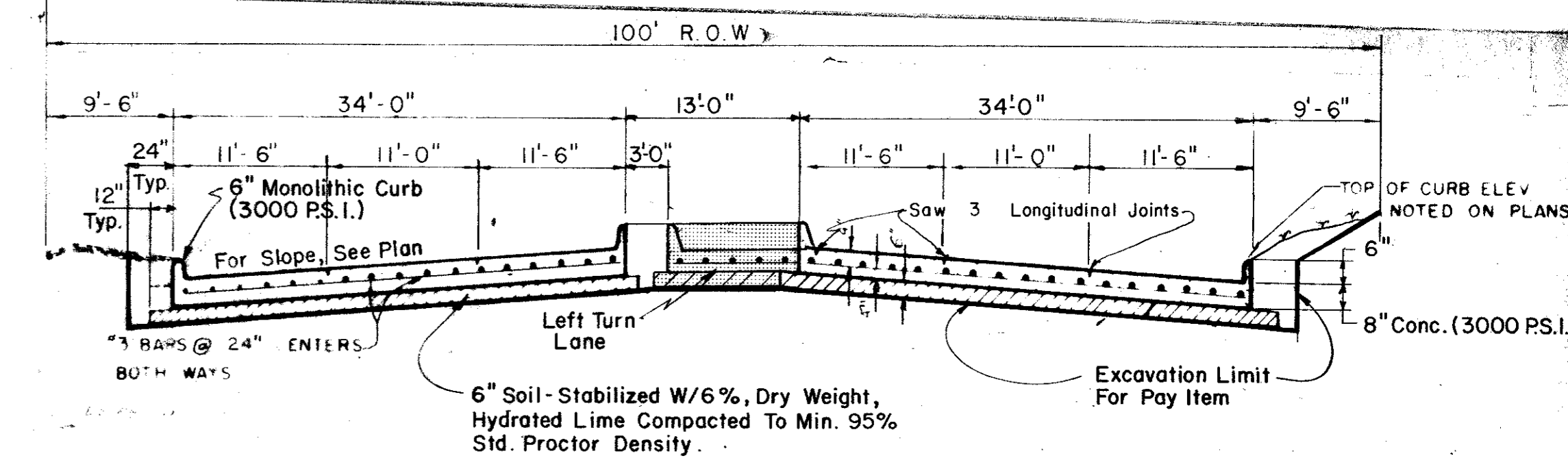
Salvage & Reuse  
Fire Hydrant  
Valve  
90° Bend

FIRE HYDRANT RELOCATION DETAIL

Typical Section  
Sta. 3+00 to 5+50  
Sta. 10+50 to 32+00



PAVING SECTION DETAIL



PAVING SECTION DETAIL

Sta. 0+80.5 to 3+00,  
Sta. 5+50 to 10+50,  
Sta. 32+00 to 36+50

CITY OF ADDISON  
DALLAS COUNTY, TEXAS  
MIDWAY ROAD

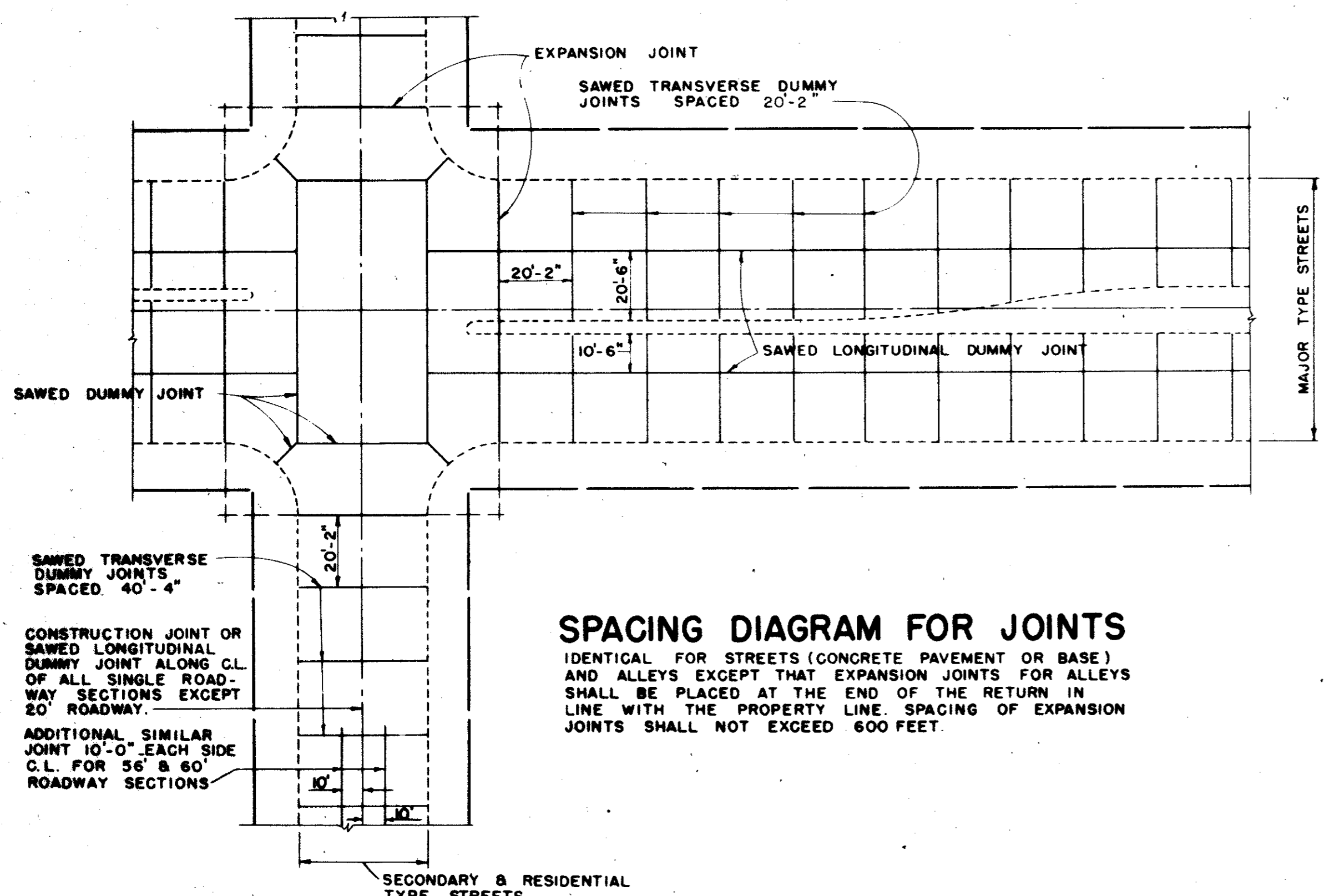
PAVING DETAILS A

GINN, INC.

Consulting Engineers - Dallas, Texas

Designed - H.B.J. Drawn - S.M.M. Date - MARCH, 1981  
Approved - H.W.G. Checked - G.F. Scale - NONE Sheet 12 Of

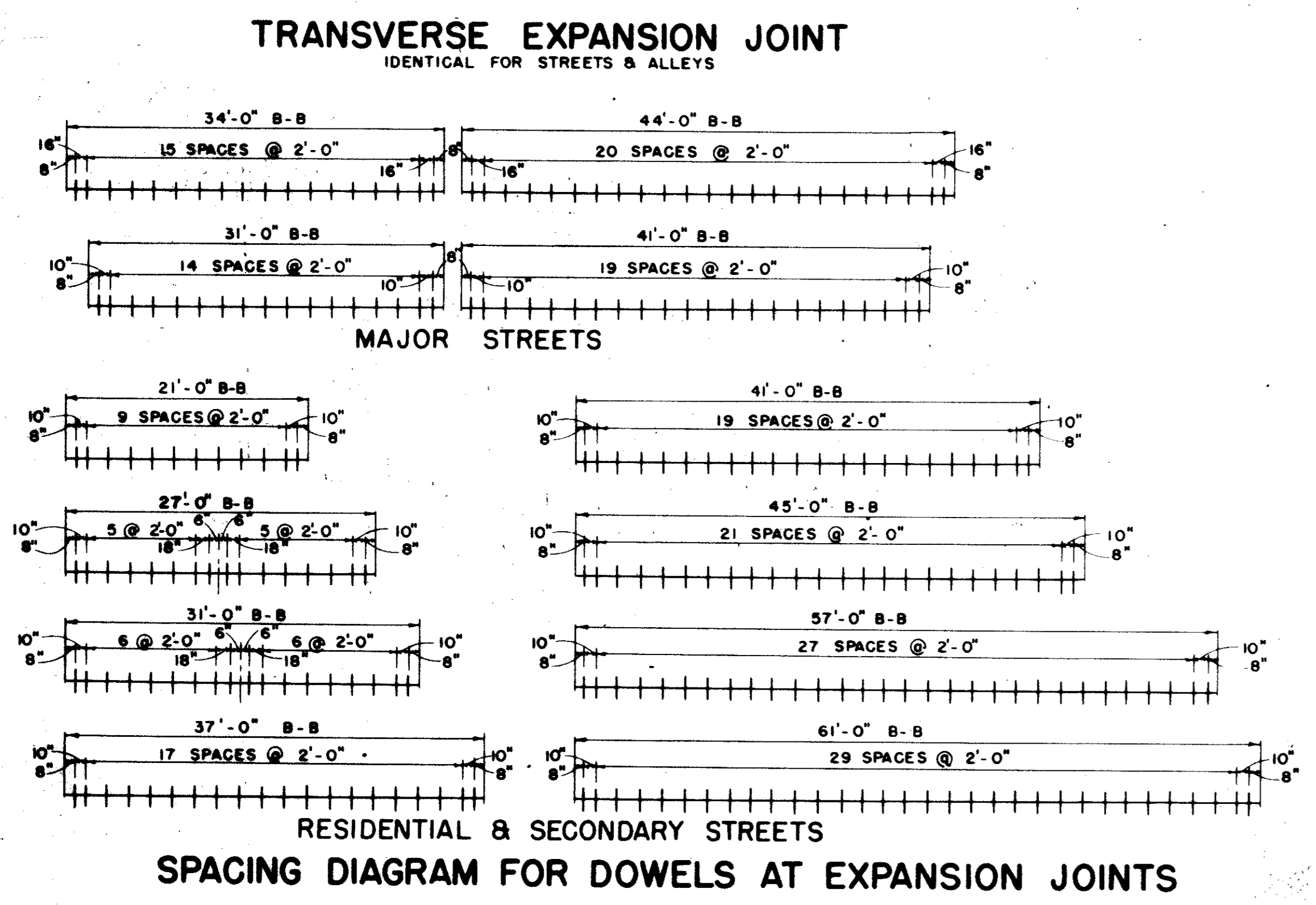
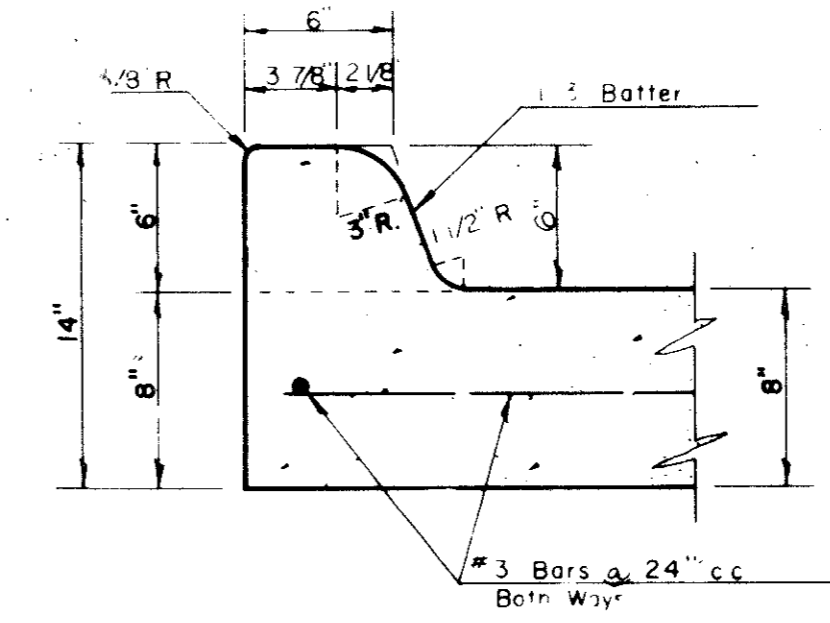
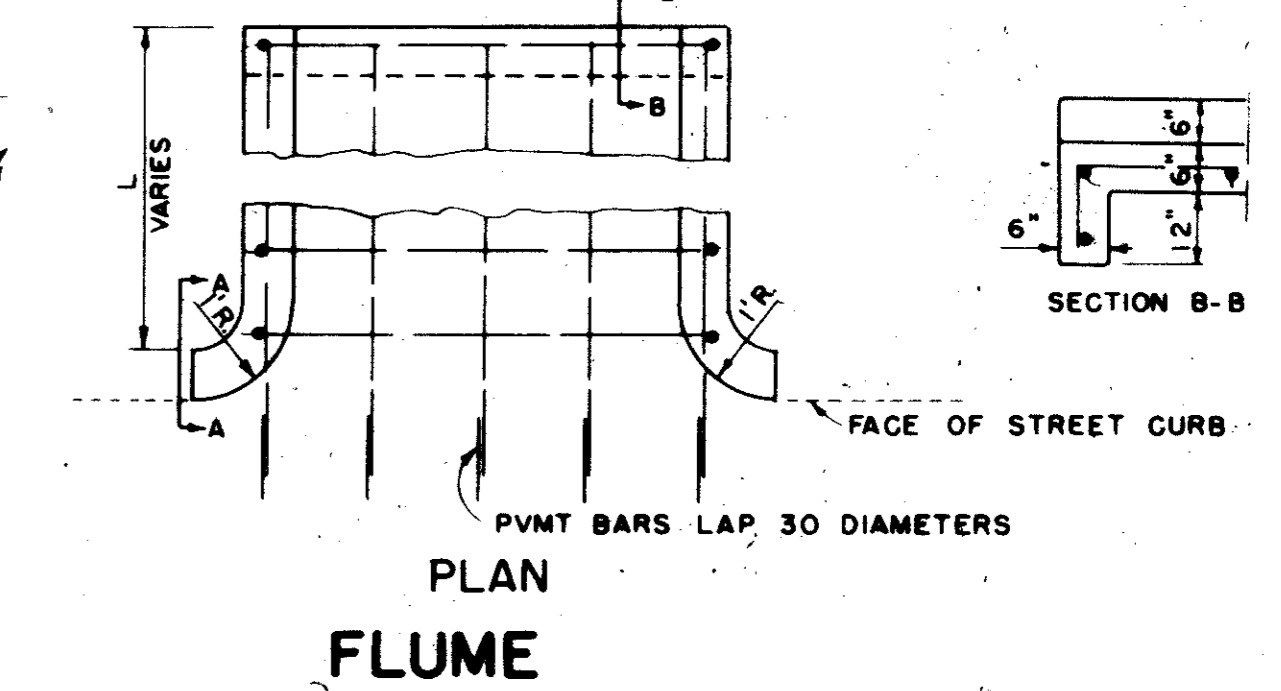
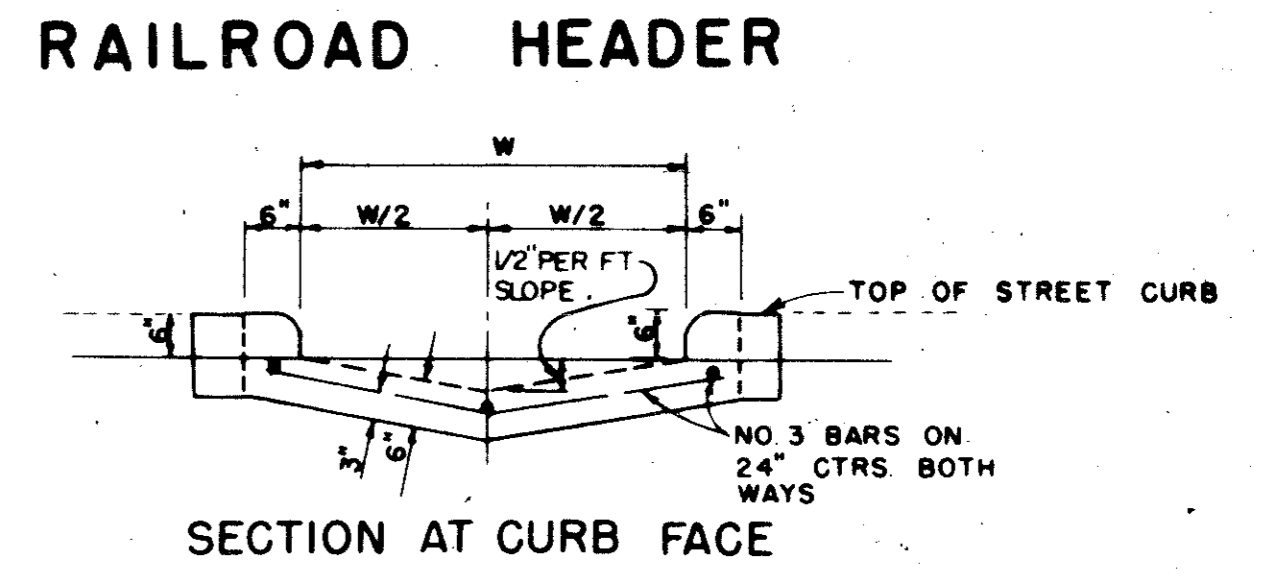
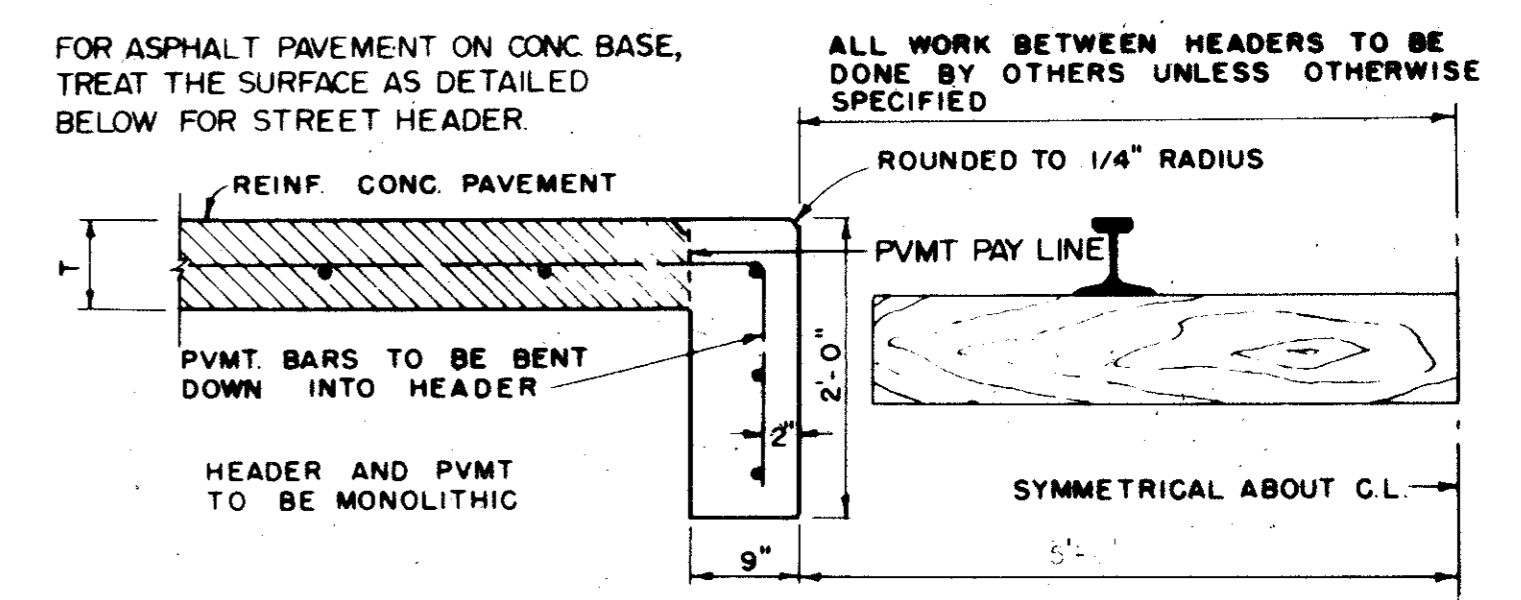
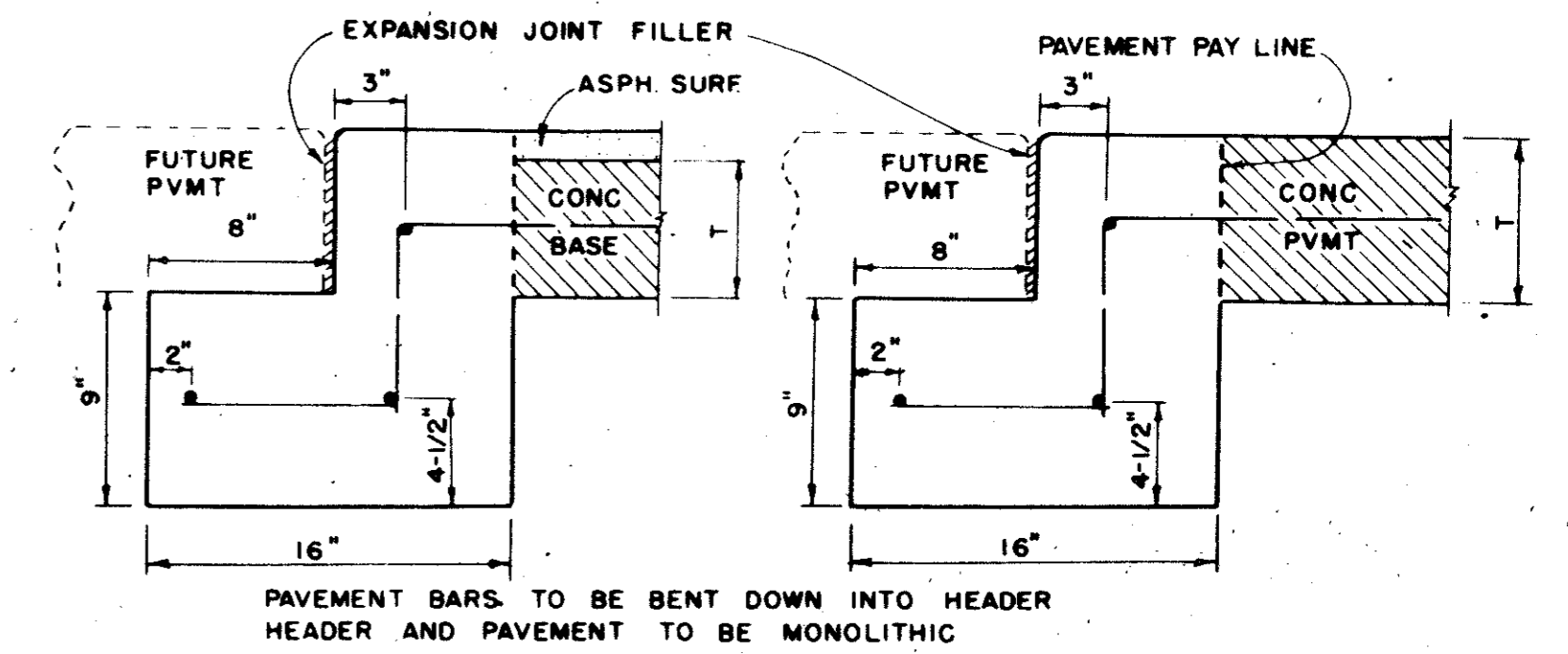
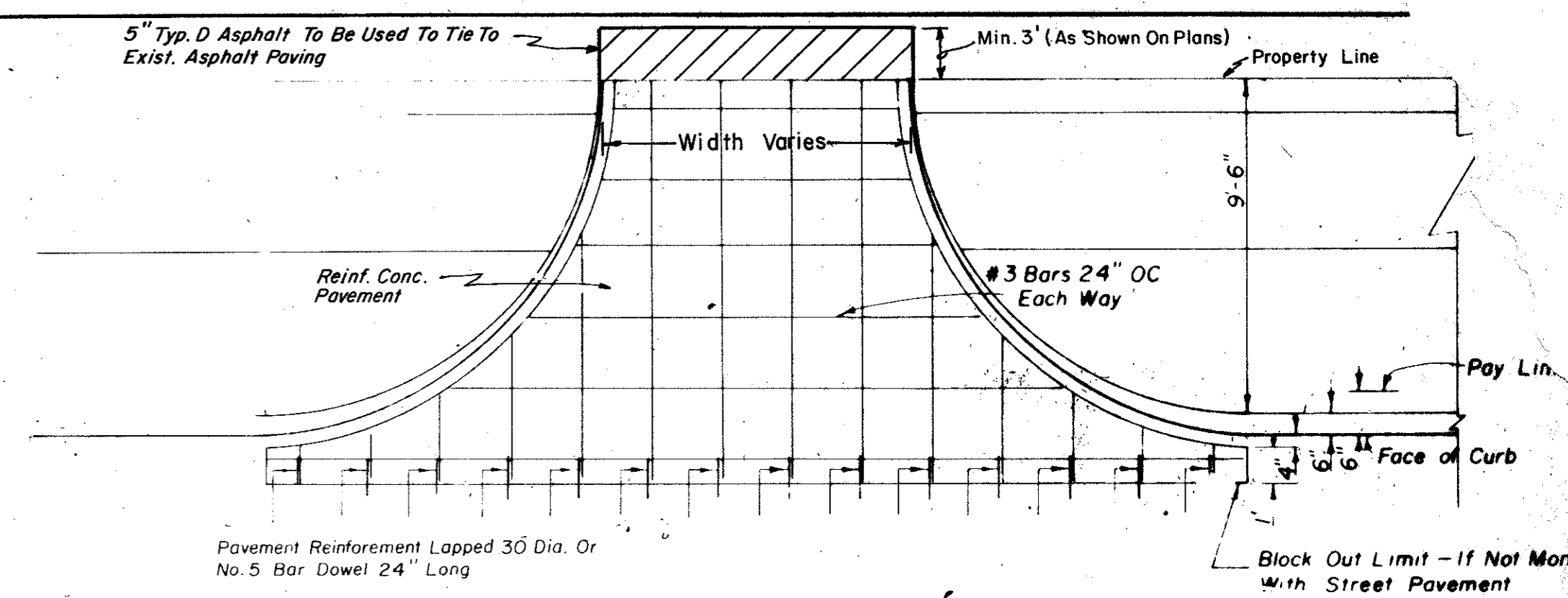
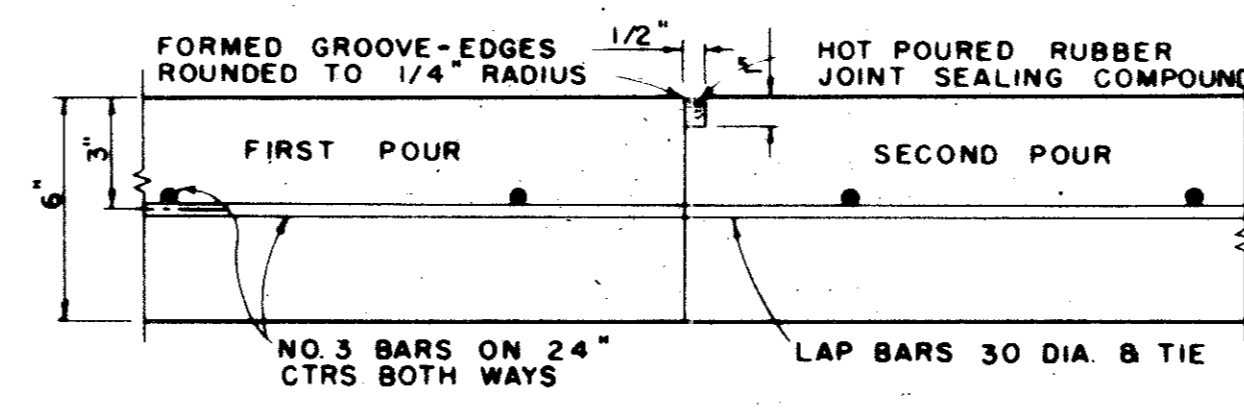
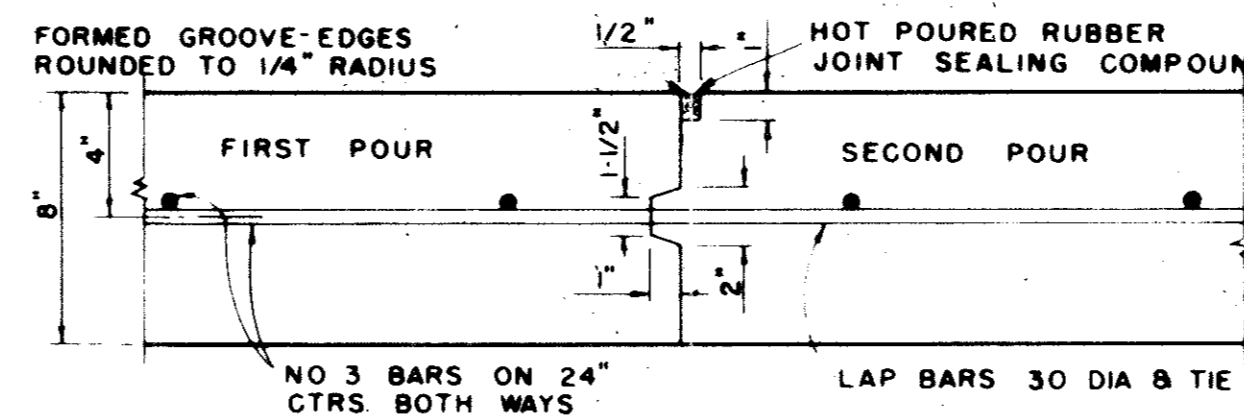
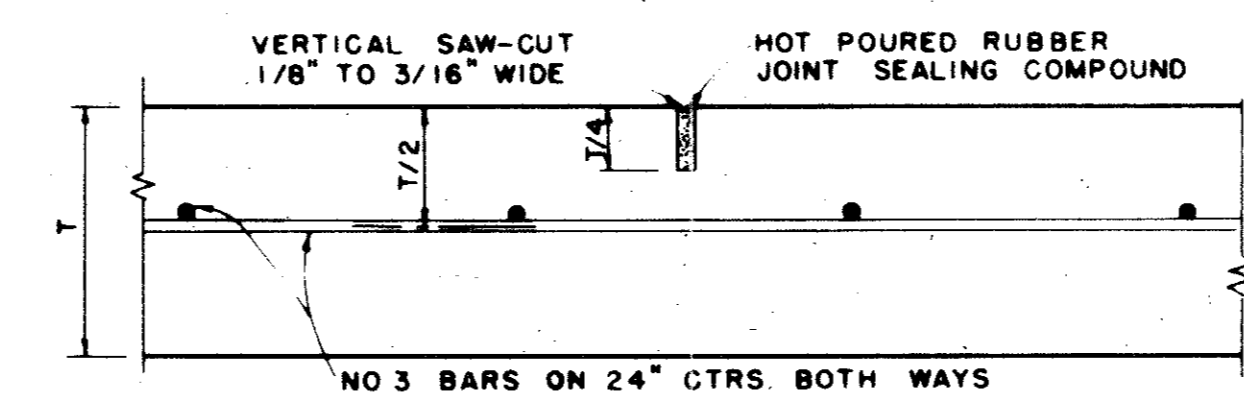




**SPACING DIAGRAM FOR JOINTS**  
IDENTICAL FOR STREETS (CONCRETE PAVEMENT OR BASE) AND ALLEYS EXCEPT THAT EXPANSION JOINTS FOR ALLEYS SHALL BE PLACED AT THE END OF THE RETURN IN LINE WITH THE PROPERTY LINE. SPACING OF EXPANSION JOINTS SHALL NOT EXCEED 600 FEET.

**SEPARATE CURB & GUTTER**  
REINFORCEMENT SHALL BE NO. 5 BARS

**CURB AND CURB & GUTTER**

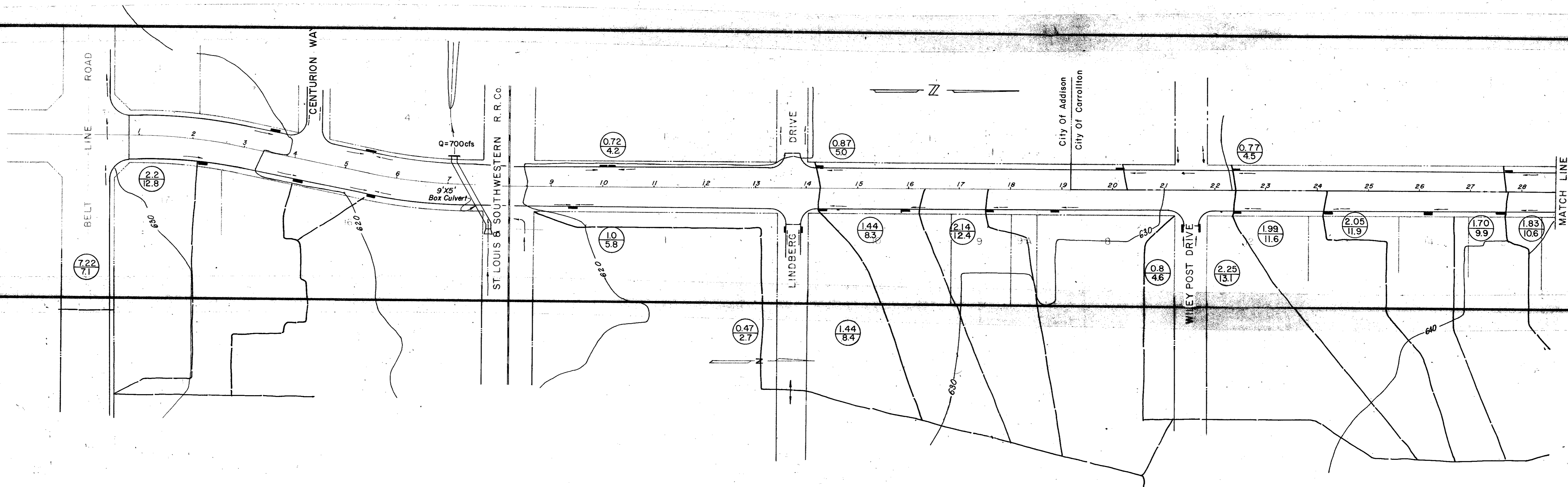


CITY OF ADDISON  
DALLAS COUNTY, TEXAS  
**MIDWAY ROAD**

**PAVING DETAILS B**

**GINN, INC.**  
Consulting Engineers - Dallas, Texas

DESIGNED - H.B.U. DRAWN - S.M. DATE - MARCH, 1981 FILE  
APPROVED - H.W.C. CHECKED - B.H. SCALE - NONE SHEET - 13



Drainage Calculations (T.H.D. Hydraulic Manual)

Rolling Terrain 1%-3.5%

Impervious Soils

Commercial C=0.6-0.9 (use C=0.75)

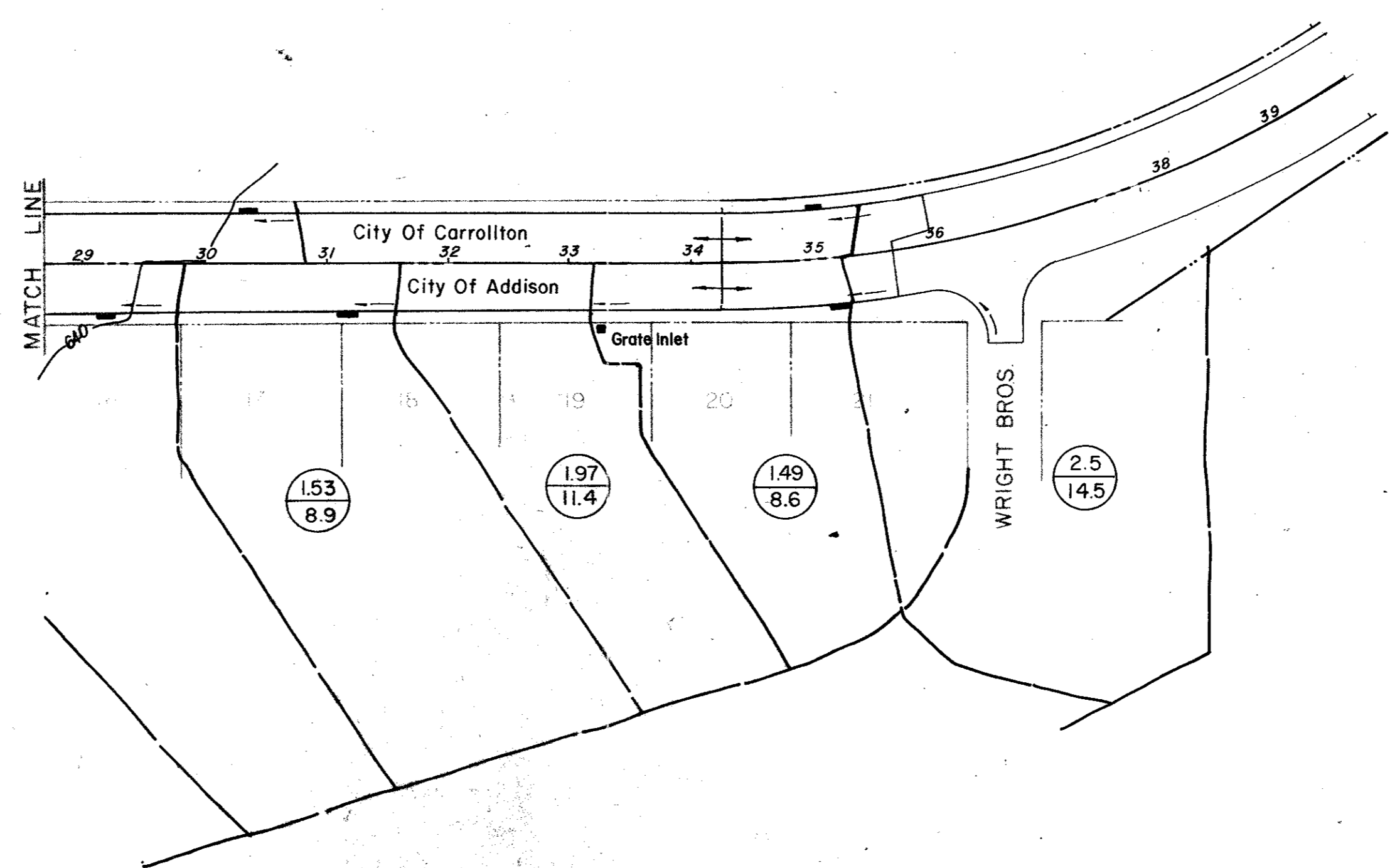
For Dallas County

$Q_{100} = (C)(I)(A) = (0.75)(7.8)(Ac.)$

$Q_{100} = (5.8cfs)(Ac)$

2.5 ACRES

14.5  $Q_{100}$



*City Of Addison*

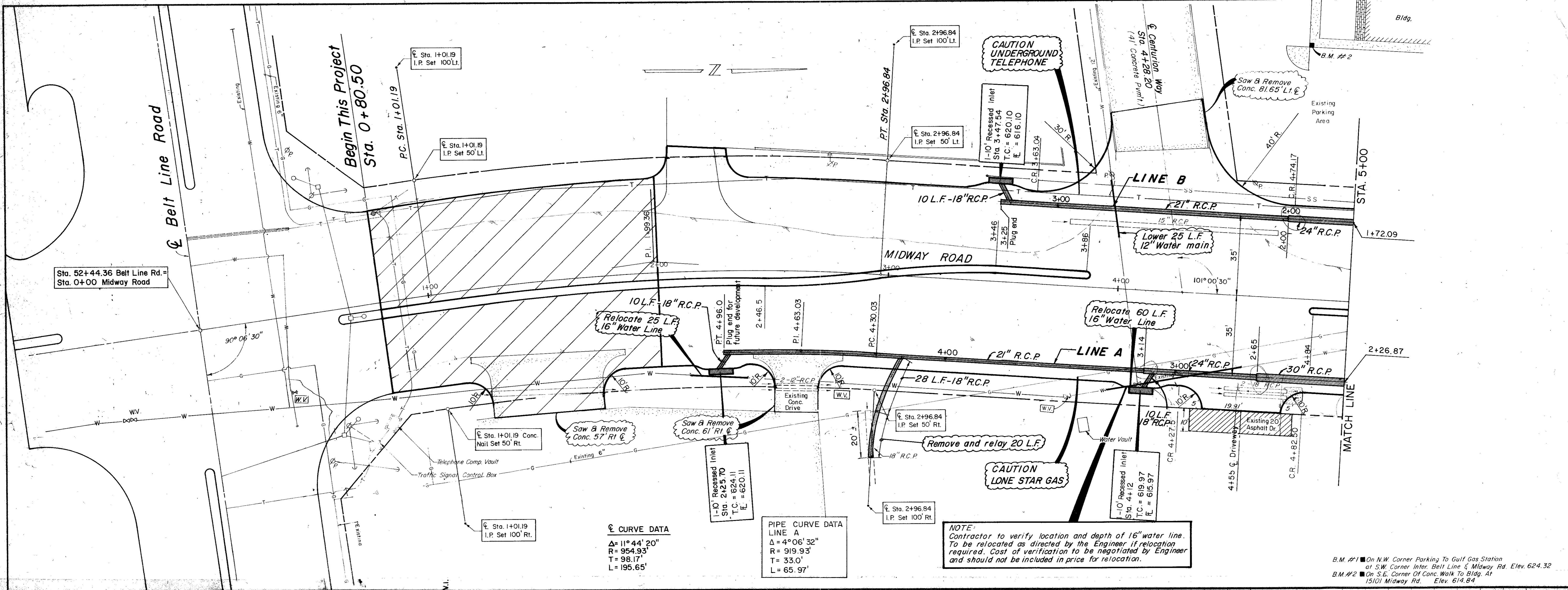
MIDWAY ROAD IMPROVEMENTS

**Drainage Area Map**

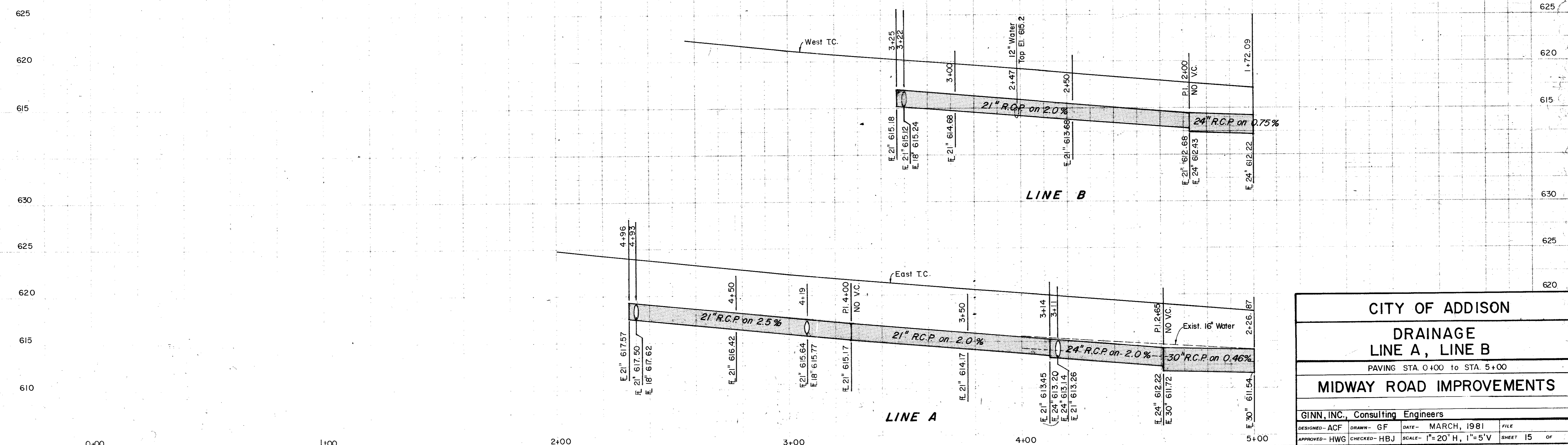
DESIGNED: \_\_\_\_\_ DRAWN: R.G.B. DATE: MARCH, 1981 FILE: \_\_\_\_\_

CHECKED: \_\_\_\_\_ SCALE: 1"=100' SHEET: 14 OF \_\_\_\_\_



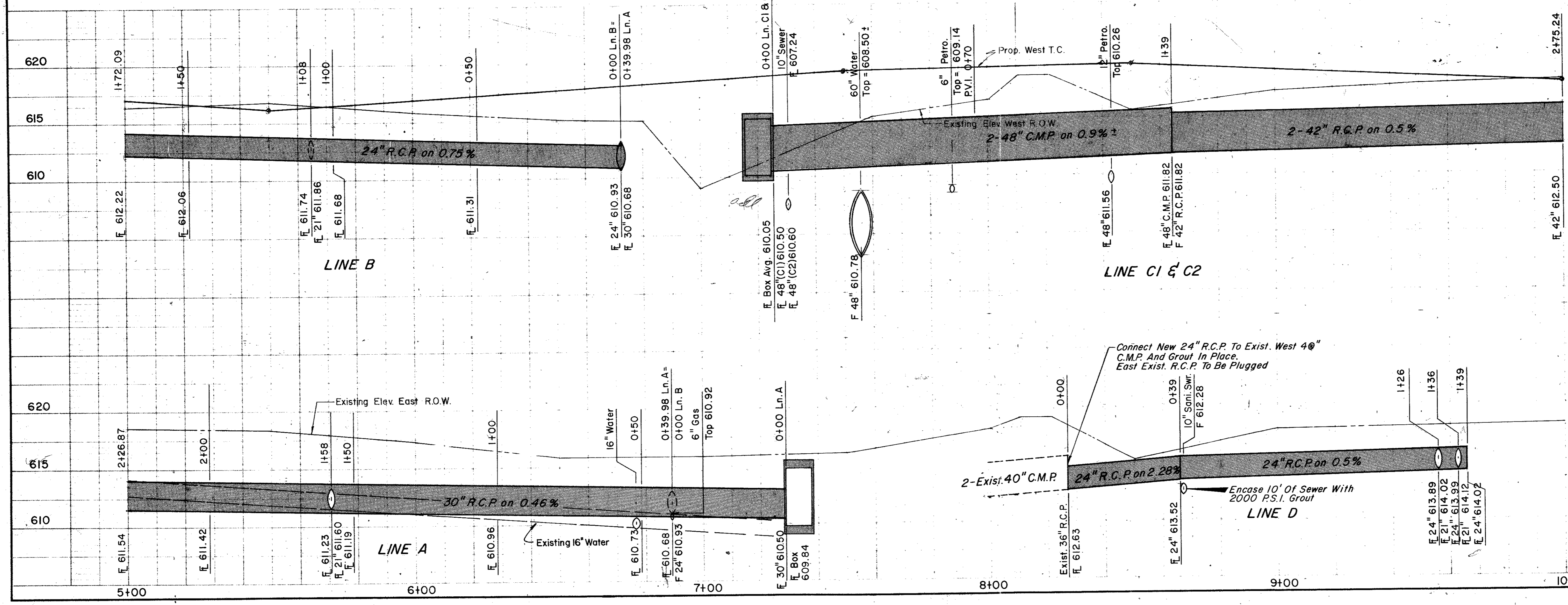
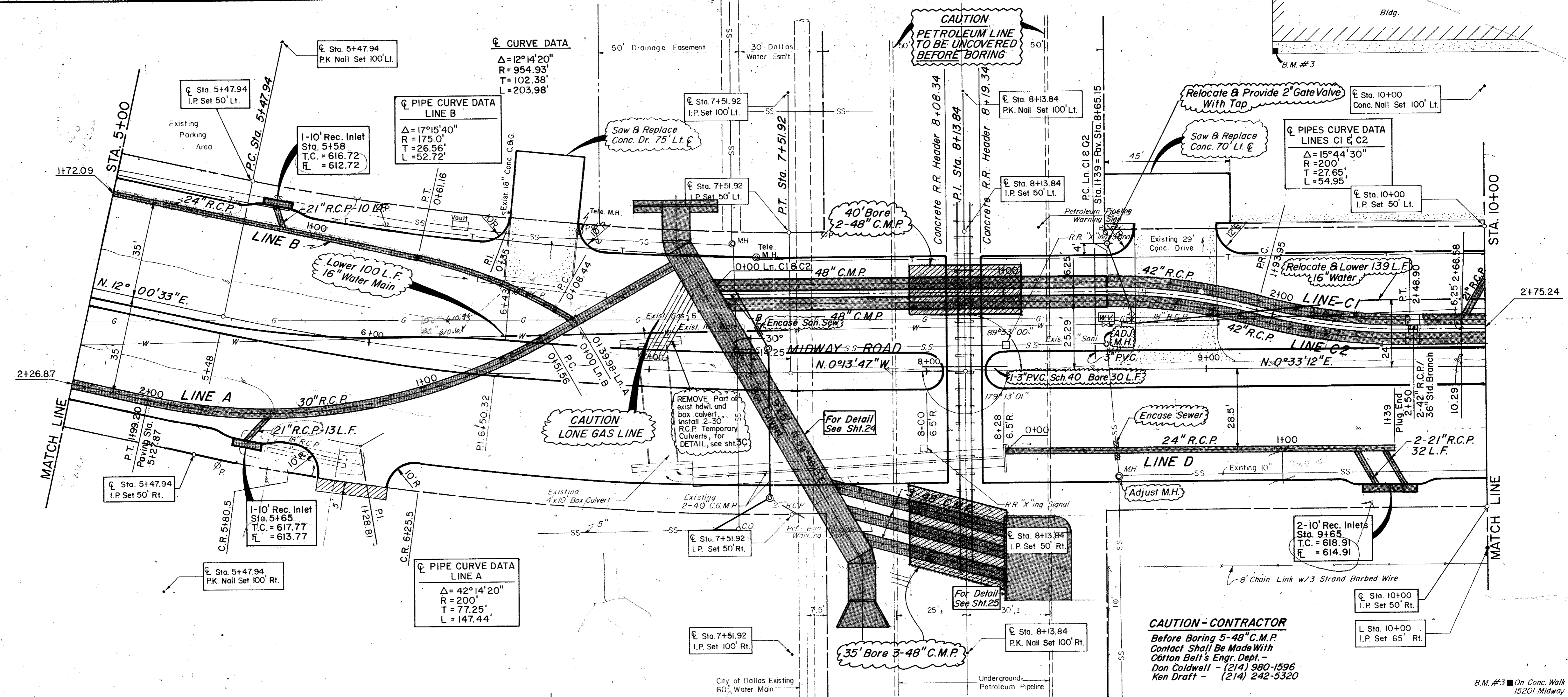


B.M. #1 On N.W. Corner Parking To Gulf Gas Station at S.W. Corner Inter. Belt Line & Midway Rd. Elev. 624.32  
 B.M. #2 On S.E. Corner Of Conc. Walk To Bldg. At 15101 Midway Rd. Elev. 614.84



<b>CITY OF ADDISON</b>			
<b>DRAINAGE LINE A, LINE B</b>			
PAVING STA. 0+00 to STA. 5+00			
<b>MIDWAY ROAD IMPROVEMENTS</b>			
GINN, INC., Consulting Engineers			
DESIGNED - ACF	DRAWN - GF	DATE - MARCH, 1981	FILE
APPROVED - HWG	CHECKED - HBJ	SCALE - 1" = 20' H, 1" = 5' V	SHEET 15 OF





**CITY OF ADDISON**

**DRAINAGE**  
**LINE A, B, C1, C2, D**

PAVING STA. 5+00 TO STA. 10+00

**MIDWAY ROAD IMPROVEMENTS**

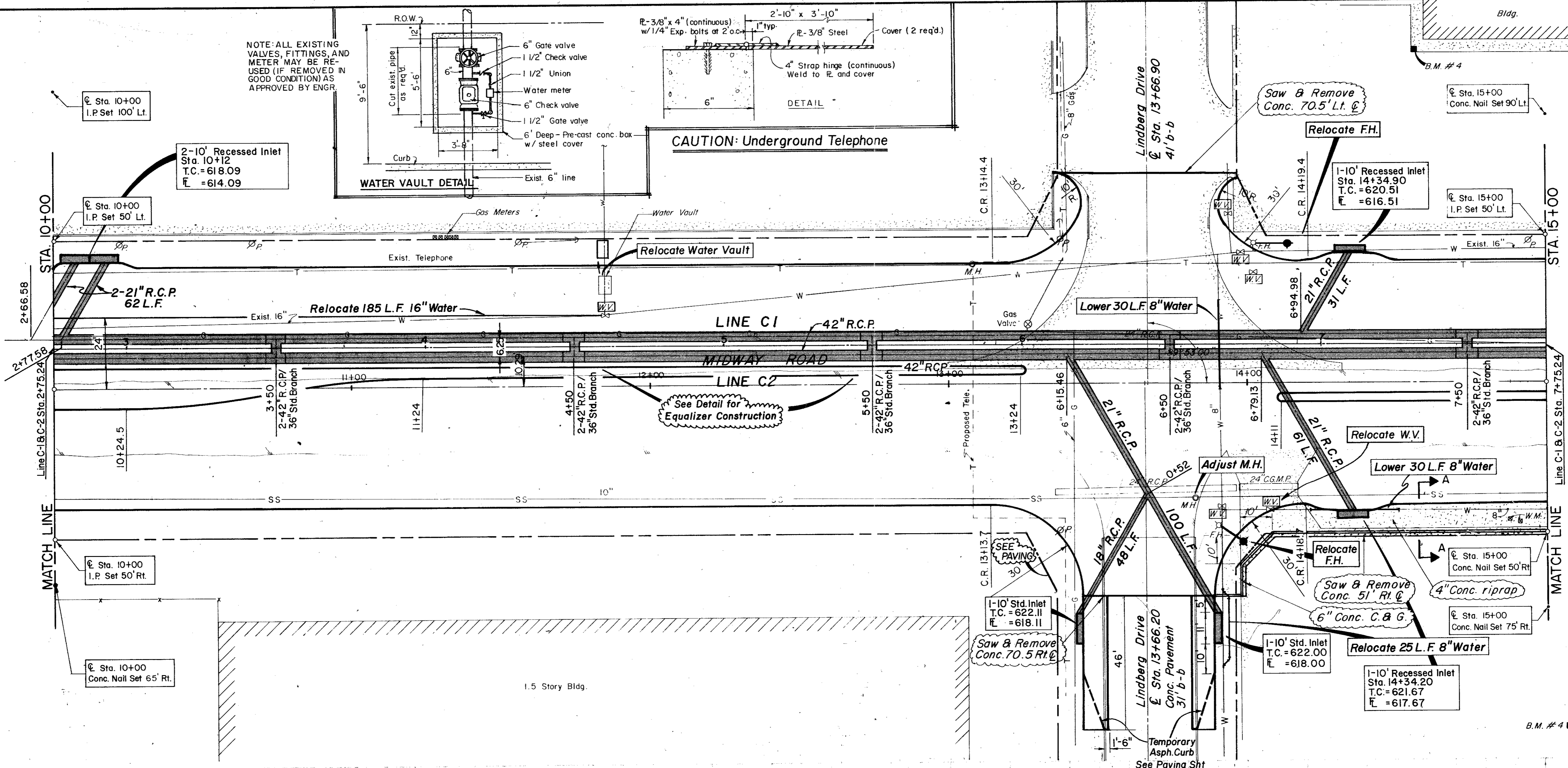
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GINN, INC., Consulting Engineers

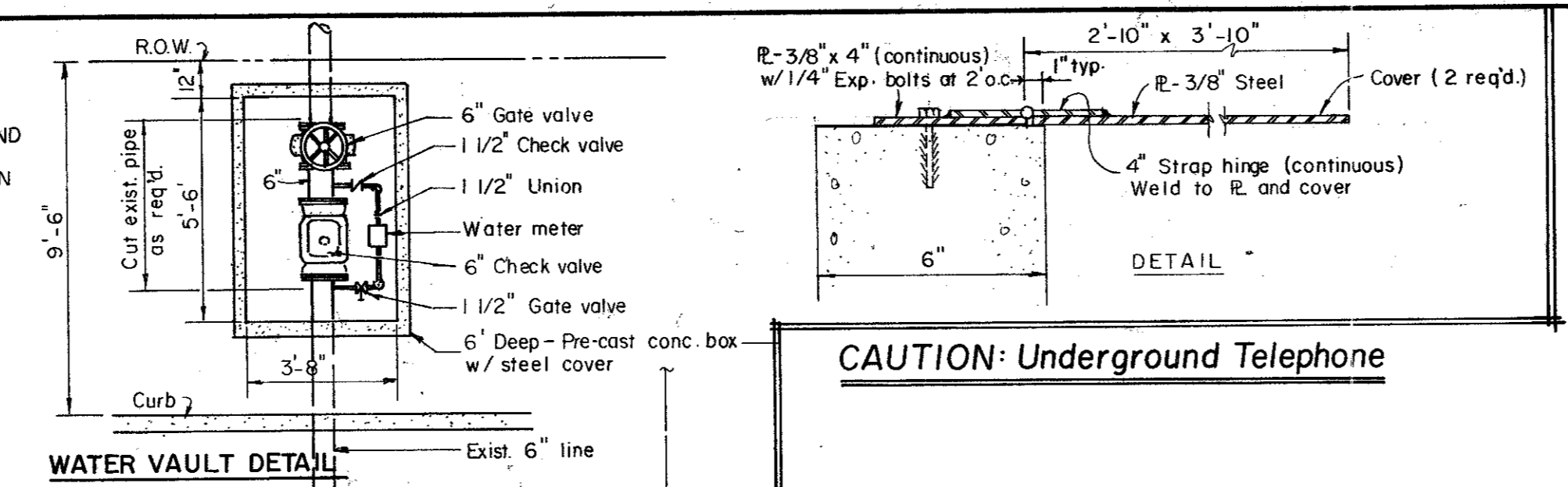
DESIGNED - A.C.F. DRAWN - S.M.M. DATE - March, 1981 FILE

APPROVED - H.W.G. CHECKED - A.G.F. SCALE - Horz. 1"=20' Vert. 1"=5' SHEET 16 OF

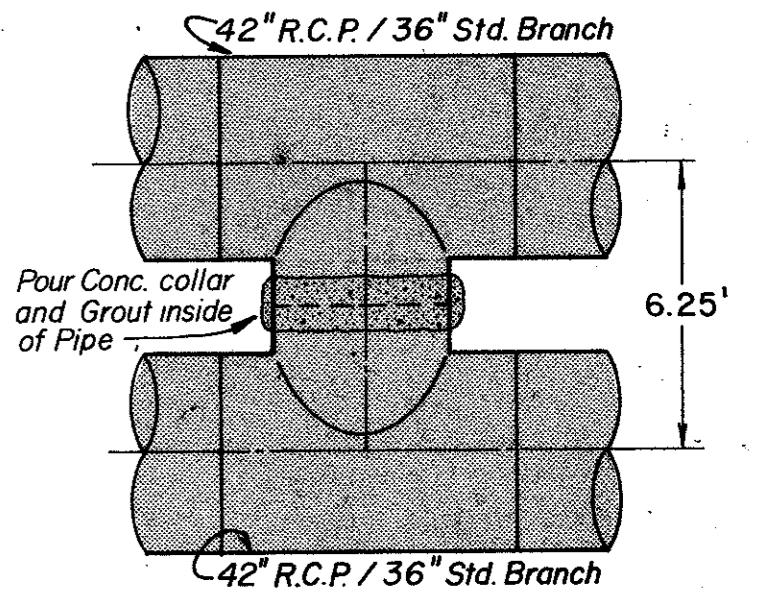




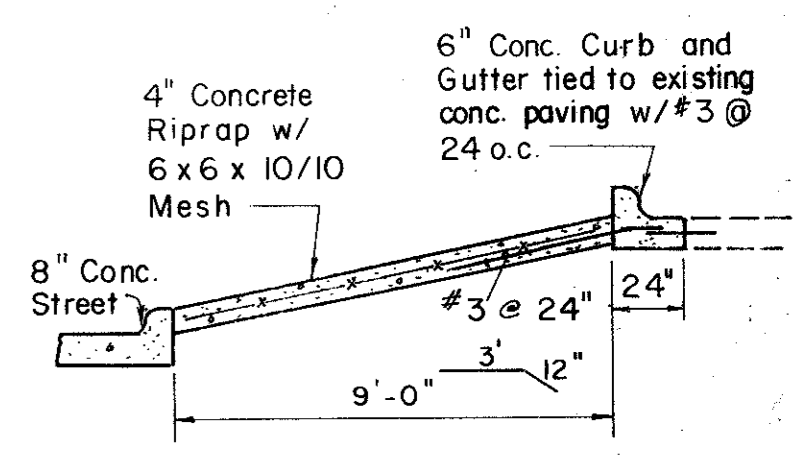
NOTE: ALL EXISTING VALVES, FITTINGS, AND METER MAY BE RE-USED (IF REMOVED IN GOOD CONDITION) AS APPROVED BY ENGR.



CAUTION: Underground Telephone

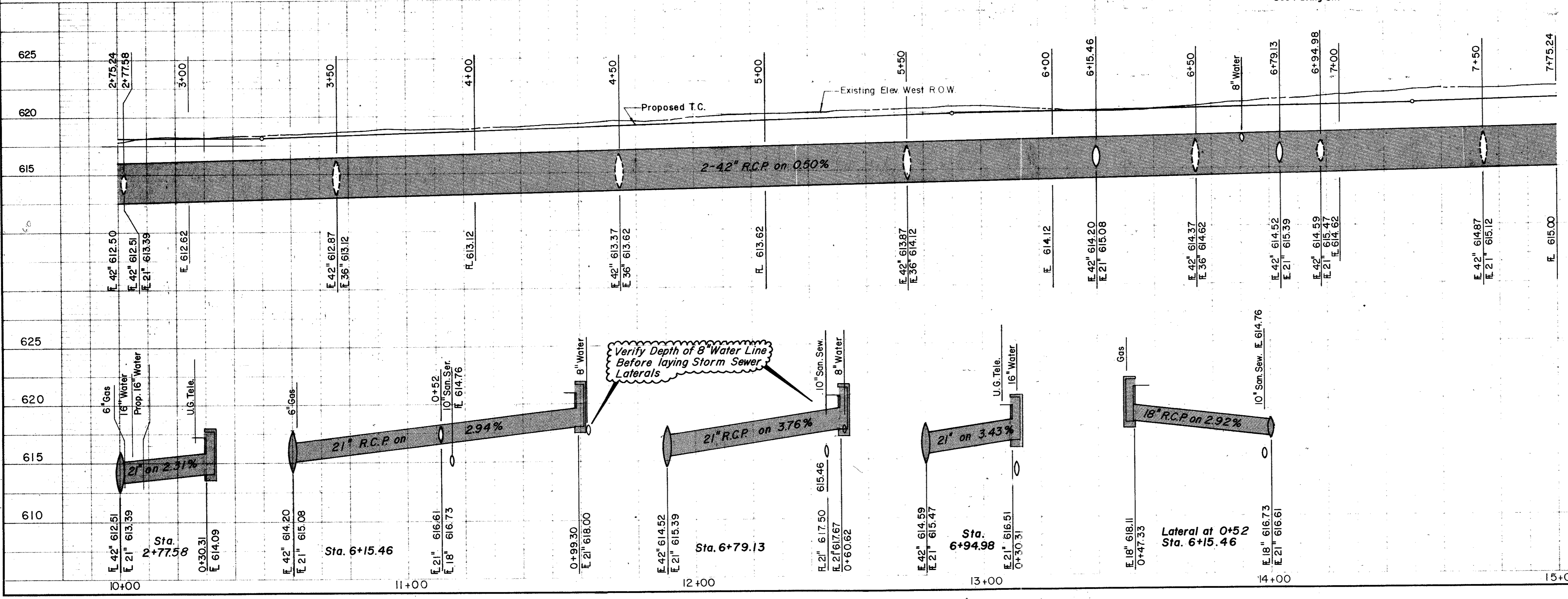


EQUALIZER DETAIL



SECTION A-A

B.M. # 4 On Conc. Walk At S.E. Corner Of Bldg At 15301 Midway Rd. Elev. 621.43



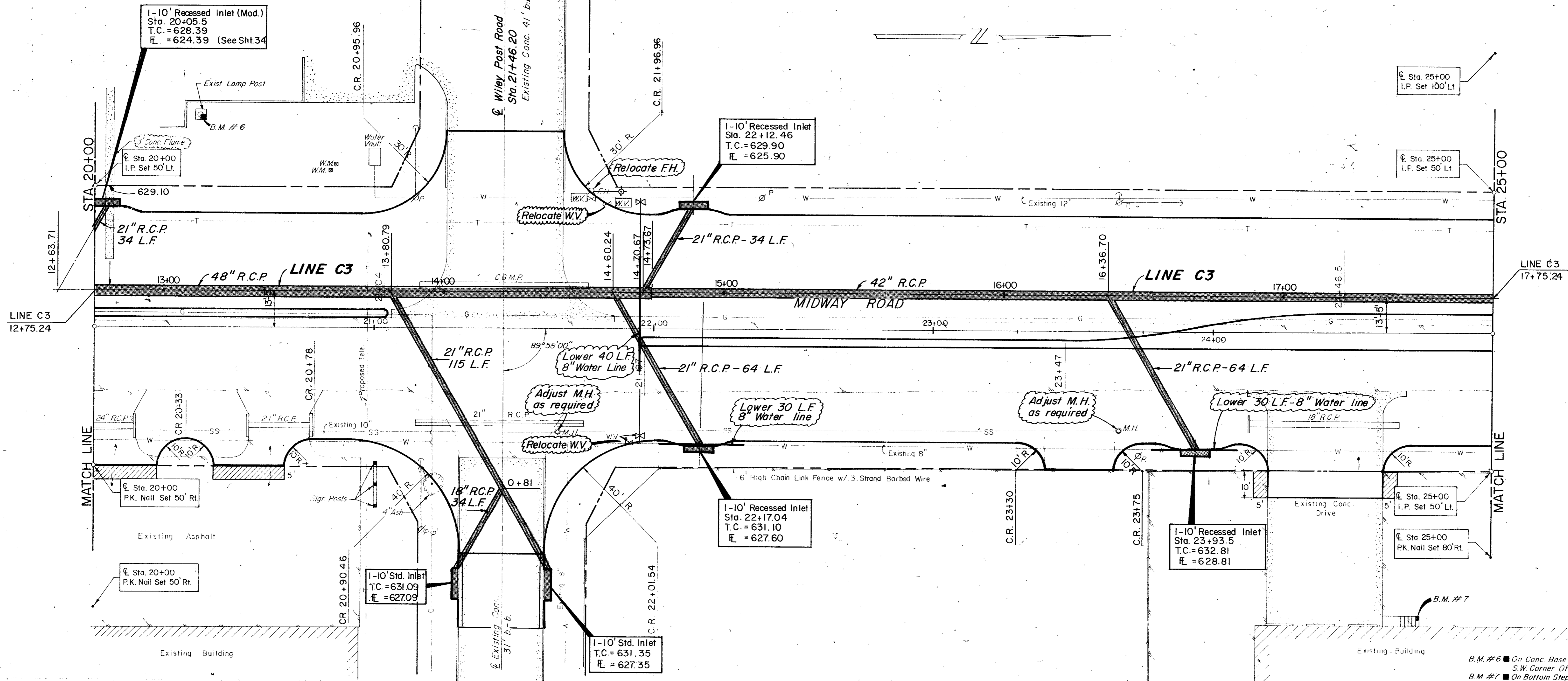
Verify Depth of 8" Water Line Before laying Storm Sewer Laterals

<b>CITY OF ADDISON</b>			
<b>DRAINAGE</b>			
<b>LINE C1, LINE C2</b>			
PAVING STA. 10+00 TO STA. 15+00			
<b>MIDWAY ROAD IMPROVEMENTS</b>			
GINN, INC., Consulting Engineers			
DESIGNED- ACF	DRAWN- RGB	DATE- March, 1981	FILE
APPROVED- HWG	CHECKED- HBJ	SCALE- 1"=20' H, 1"=5' V	SHEET 17 OF

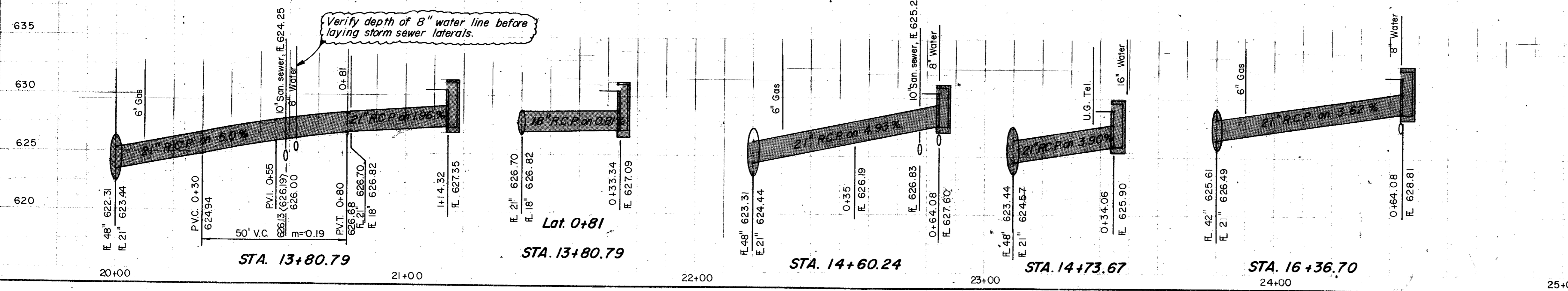
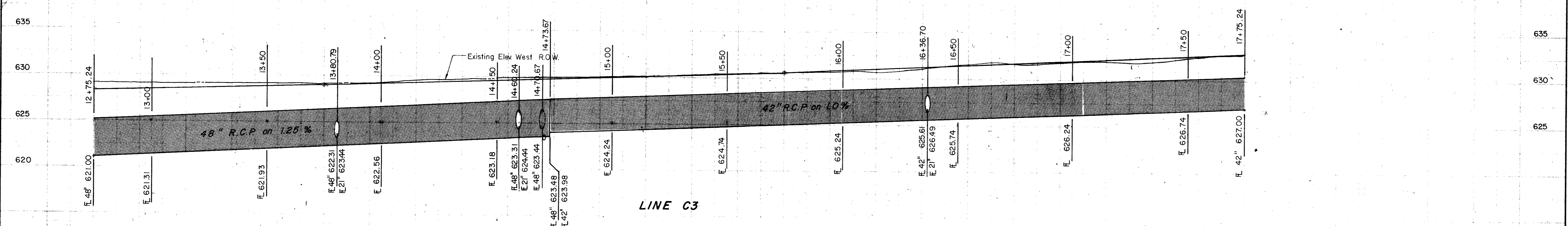








B.M. #6 ■ On Conc. Base To Lamp Post At S.W. Corner Of Inter. Wiley Post Rd & Midway Rd. Elev. 631.34  
 B.M. #7 ■ On Bottom Step To Loading Dock At 15502 Midway Rd. Elev. 636.05

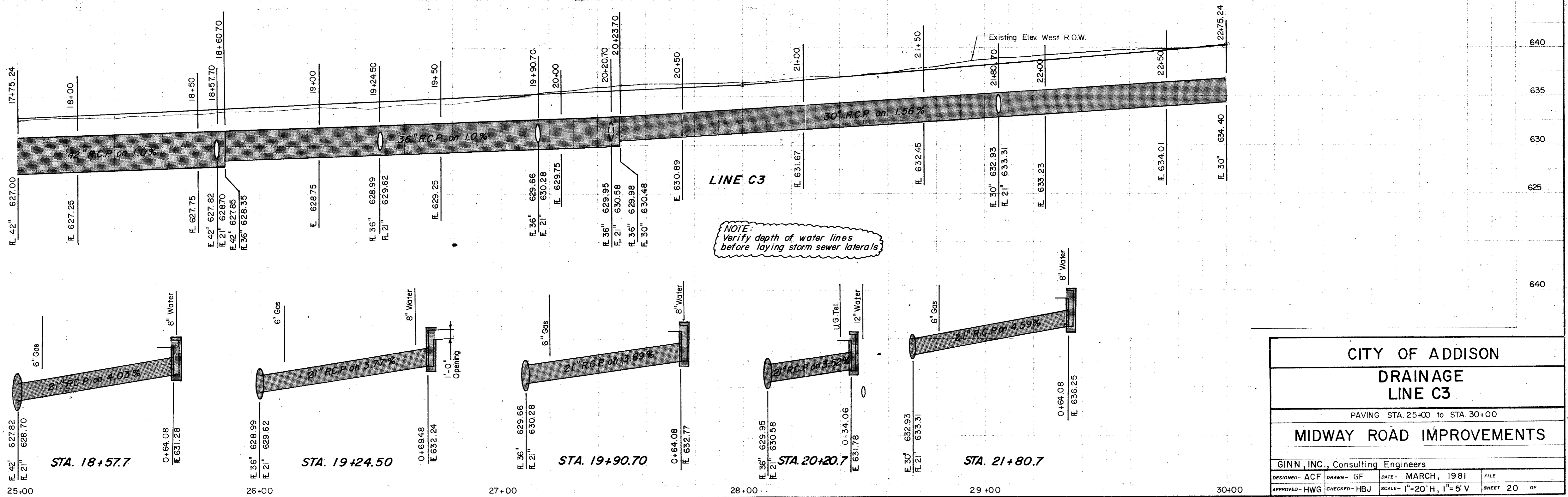
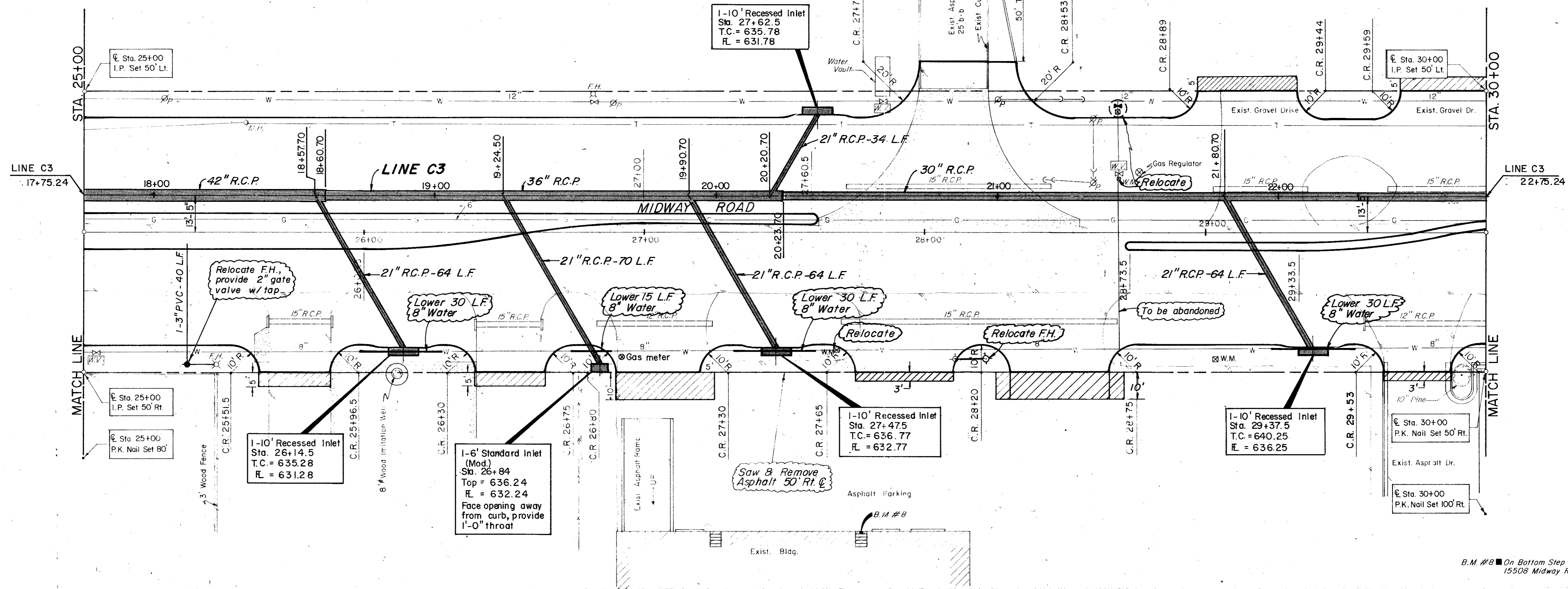


<b>CITY OF ADDISON</b>			
<b>DRAINAGE LINE C3</b>			
PAVING STA. 20+00 TO STA. 25+00			
<b>MIDWAY ROAD IMPROVEMENTS</b>			
GINN, INC., Consulting Engineers			
DESIGNED - ACF	DRAWN - GF	DATE - March, 1981	FILE
APPROVED - HWG	CHECKED - HBJ	SCALE - 1" = 20' H, 1" = 5' V	SHEET 19 OF









B.M. #8 On Bottom Step To Bldg. At 15508 Midway Rd. Elev. 638.57

<b>CITY OF ADDISON</b>			
<b>DRAINAGE LINE C3</b>			
PAVING STA. 25+00 to STA. 30+00			
<b>MIDWAY ROAD IMPROVEMENTS</b>			
GINN, INC., Consulting Engineers			
DESIGNED - ACF	DRAWN - GF	DATE - MARCH, 1981	FILE
APPROVED - HWG	CHECKED - HBJ	SCALE - 1"=20' H, 1"=5' V	SHEET 20 OF



Sta. 30+00  
I.P. Set 100' Lt.

Sta. 30+00  
I.P. Set 50' Lt.

Sta. 30+00  
I.P. Set 50' Rt.

Sta. 30+00  
I.P. Set 100' Rt.

Sta. 35+00  
I.P. Set 100' Lt.

Sta. 35+00  
I.P. Set 50' Lt.

Sta. 35+00  
I.P. Set 50' Rt.

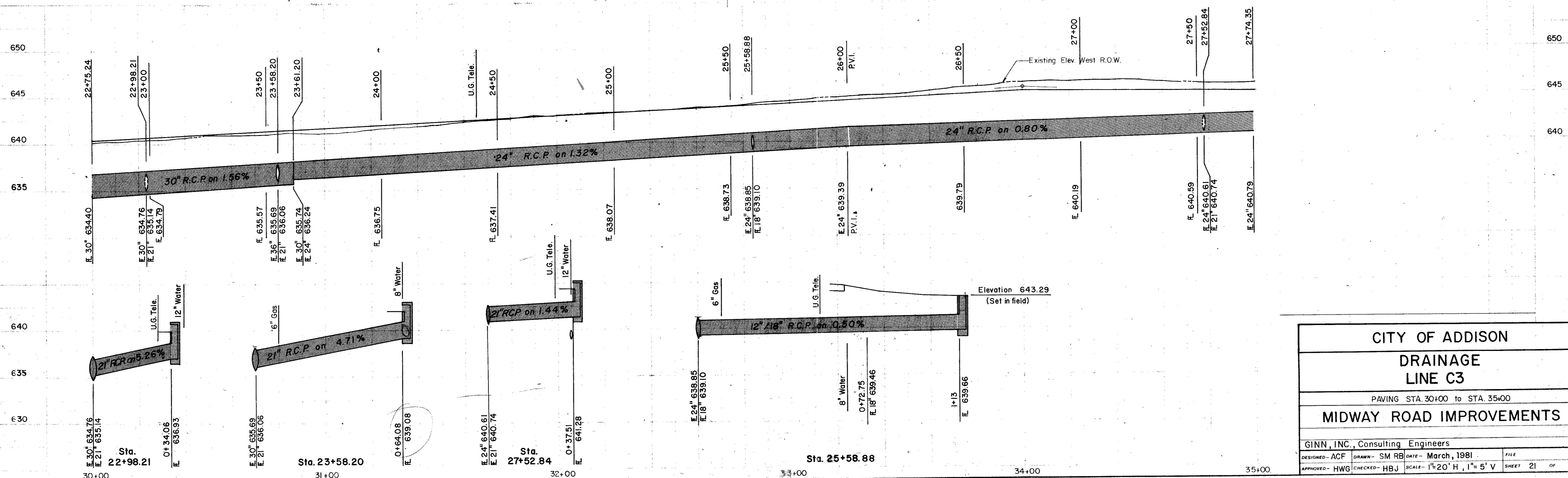
Sta. 35+00  
I.P. Set 100' Rt.

CAUTION: Underground Telephone

LINE C3

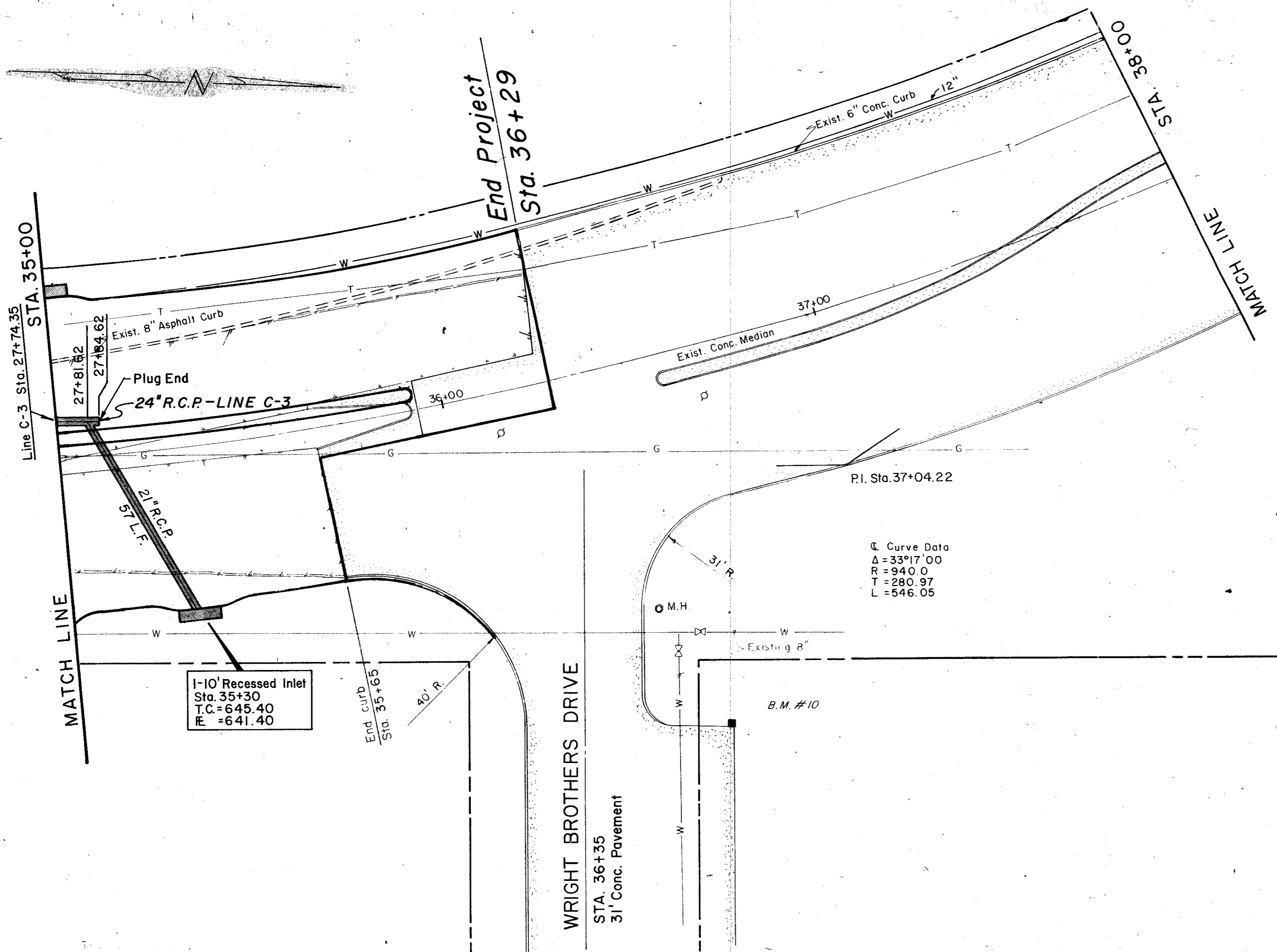
MATCH LINE

B.M. # 9 On Conc. Pavement At S.E. Corner Of Bldg. At 15635 Midway Rd. Elev. 642.61

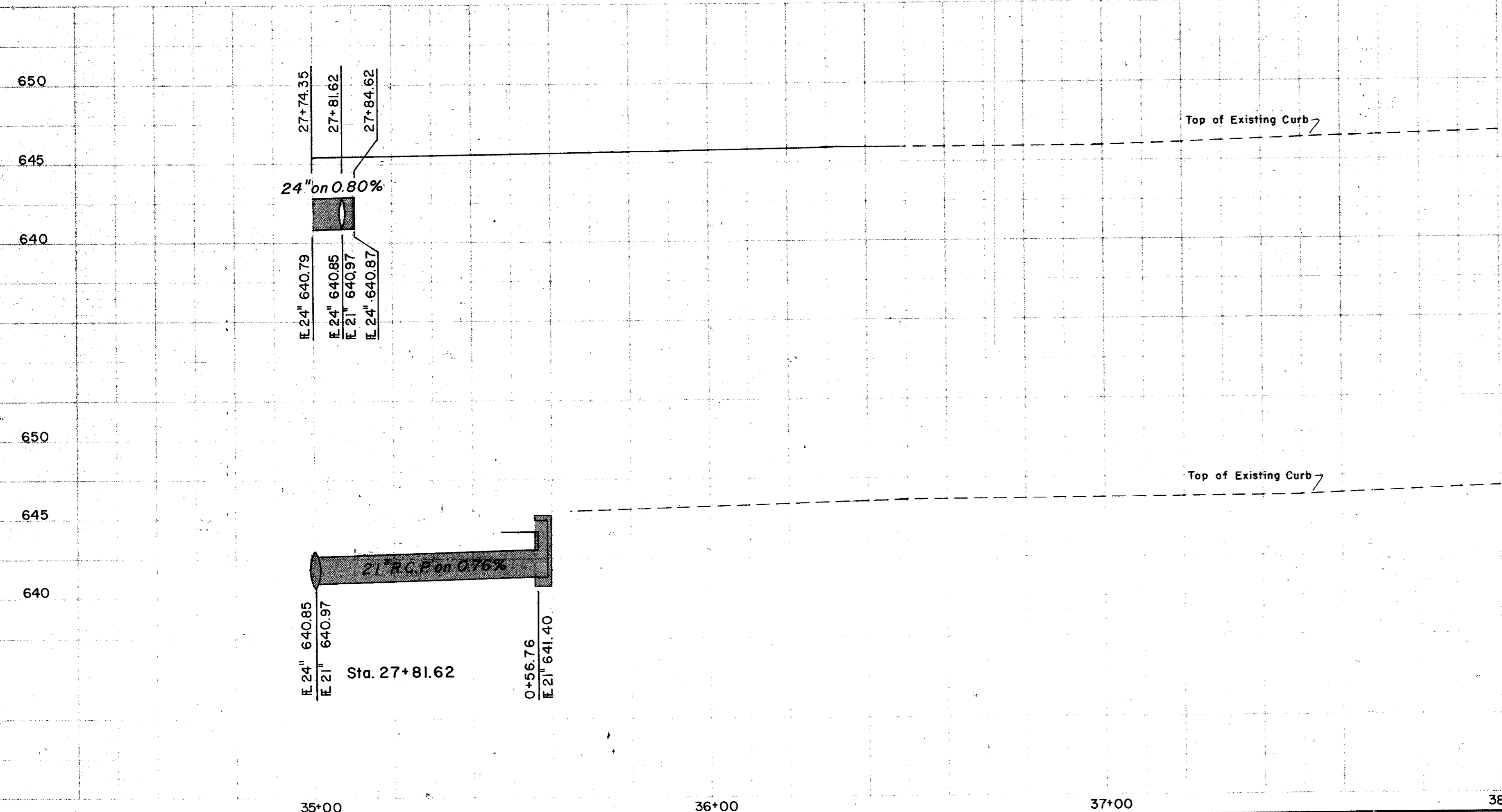


<b>CITY OF ADDISON</b>			
<b>DRAINAGE LINE C3</b>			
PAVING STA. 30+00 to STA. 35+00			
<b>MIDWAY ROAD IMPROVEMENTS</b>			
GINN, INC., Consulting Engineers			
DESIGNED - ACF	DRAWN - SM RB	DATE - March, 1981	FILE
APPROVED - HWG	CHECKED - HB	SCALE - 1"=20' H, 1"=5' V	SHEET 21 OF



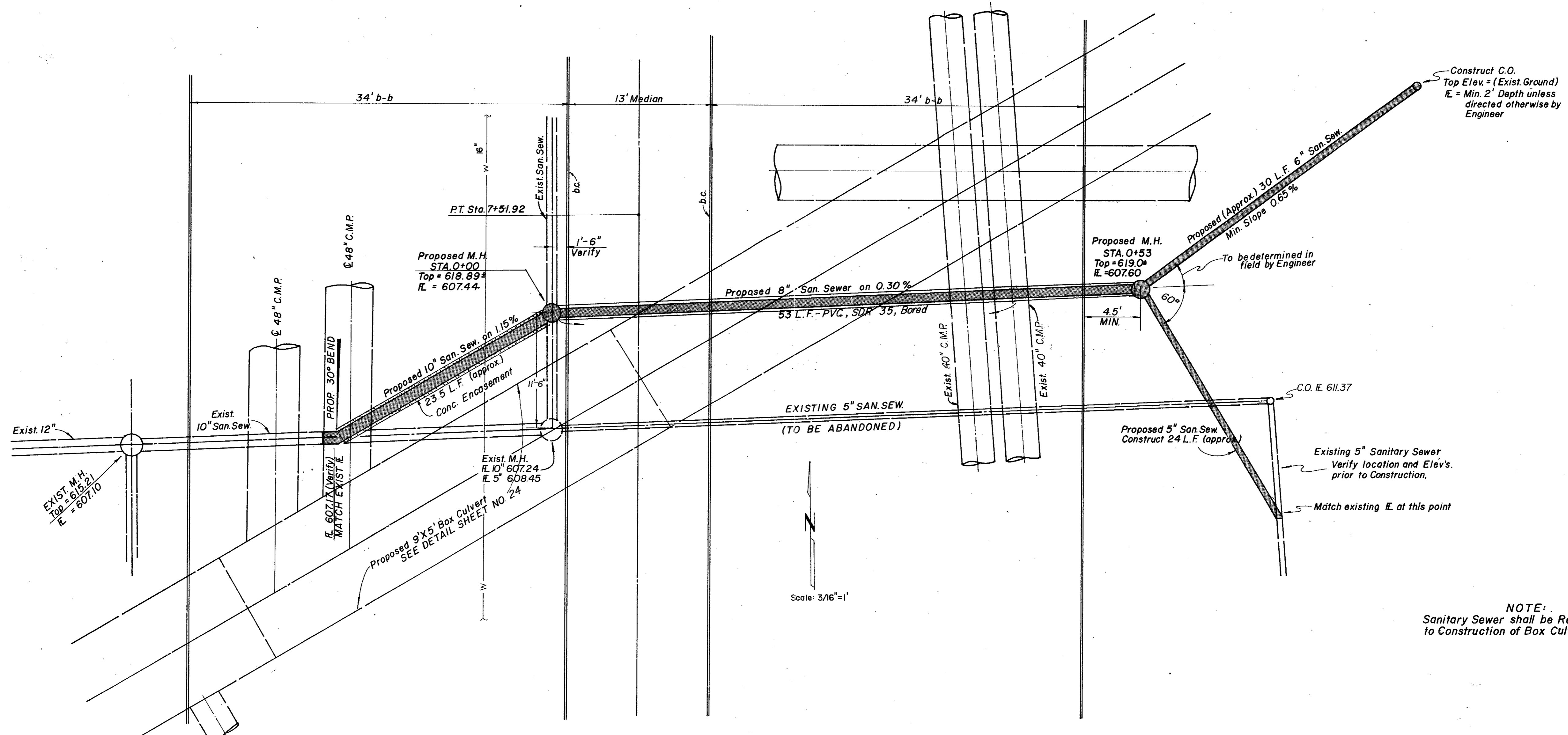


B.M. #10 On Corner Curb At N.W. Corner Of Parking At Wright Brothers Dr. & 15700 Midway Rd. Elev. 647.28

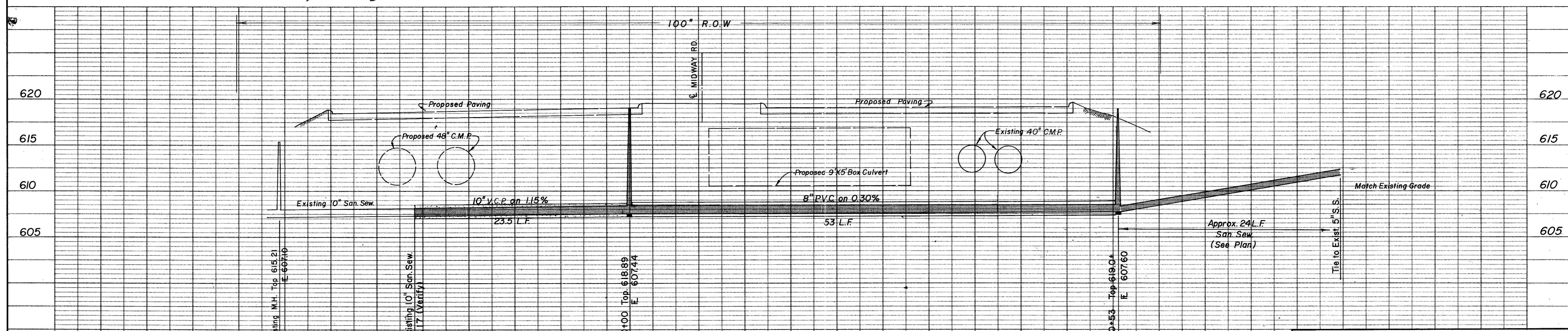


CITY OF ADDISON			
DRAINAGE LINE C3			
PAVING STA. 35+00 to STA. 36+29			
MIDWAY ROAD IMPROVEMENTS			
GINN, INC., Consulting Engineers			
DESIGNED - ACF	DRAWN - RGB	DATE - MARCH, 1981	FILE
APPROVED - HWG	CHECKED - HBJ	SCALE - 1" = 20'H, 1" = 5'V	SHEET 22 OF



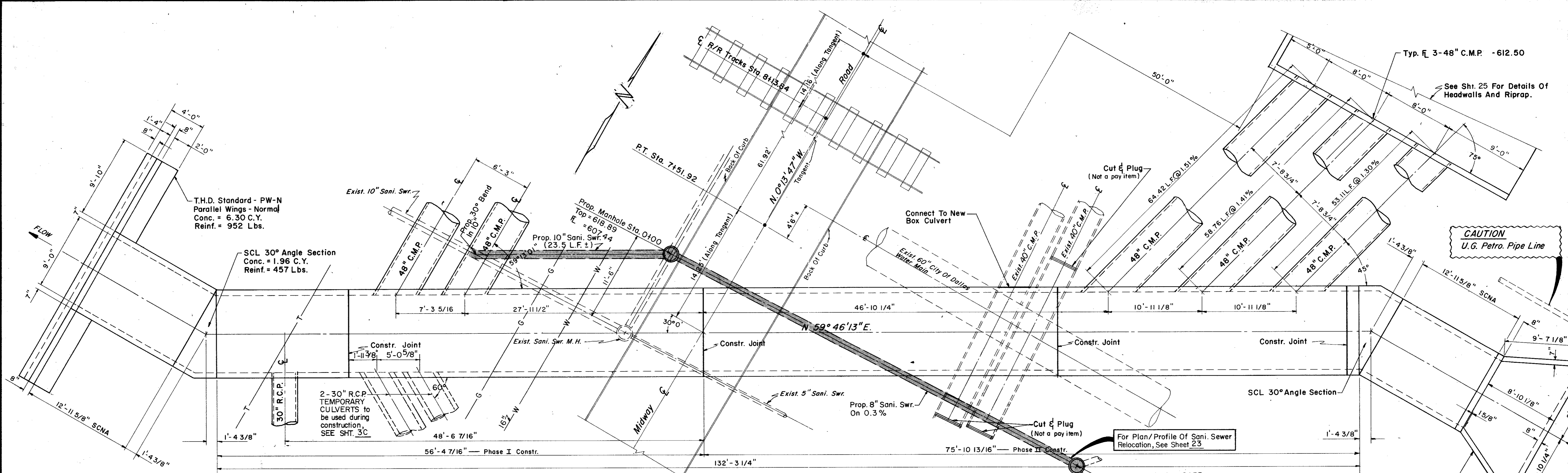


NOTE:  
Sanitary Sewer shall be Relocated prior to Construction of Box Culvert.

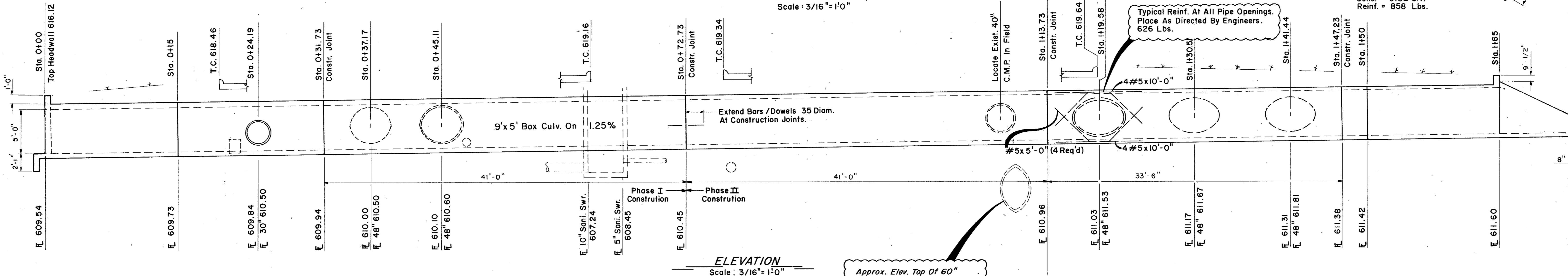


CITY OF ADDISON			
SANITARY SEWER RELOCATION			
MIDWAY ROAD IMPROVEMENTS			
DESIGNED - ACF	DRAWN - RGB	DATE - MARCH, 1981	FILE
APPROVED - HWG	CHECKED - HBJ	SCALE - 3/16" = 1' H. 1" = 5' V	SHEET 23 OF 1

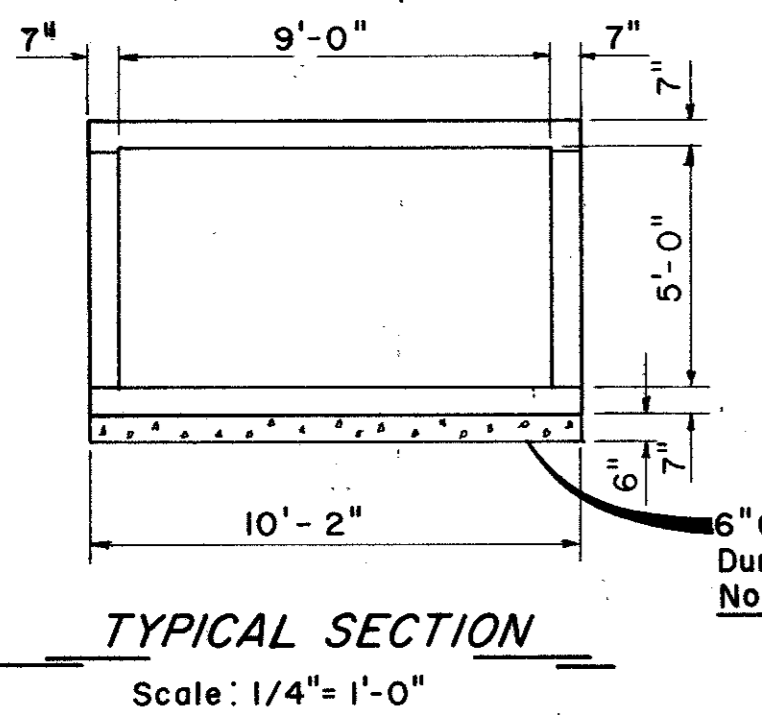




**PLAN OF 9'x5' T.H.D. STD. SCNA BOX CULVERT**  
 Conc. = 105.02 C.Y. / Reinf. = 17,476 Lbs.  
 Scale: 3/16" = 1'-0"



**ELEVATION**  
 Scale: 3/16" = 1'-0"



**TYPICAL SECTION**  
 Scale: 1/4" = 1'-0"

**Note:**  
 Subgrade material below 6" gravel base must be of a compactible nature. All undesirable material must be removed and replaced by dry embankment material compacted as directed by the engineer. Cost of subgrade excavation to be considered subsidiary to cost of box culvert. Areas of concern fall within old channel both ends.

6" Gravel Base For Drainage During Constr. Of Bottom. No Sand. 35 C.Y.

Approx. Elev. Top Of 60" City Of Dallas Water Main 608.5.  
 CONTRACTOR TO VERIFY DEPTH AT EAST R.O.W. LINE PRIOR TO START OF CULVERT CONSTRUCTION

ESTIMATED QUANTITIES	
Class A Concrete (Box Culvert)	109.1 C.Y.
Reinf. (Box Culvert)	19,016.0 Lbs.
Gravel Base (6")	35.0 C.Y.
Class A Concrete (Wingwalls)	16.1 C.Y.
Reinf. (Wingwalls)	1,810.0 Lbs.

**GENERAL NOTES:**  
 For notes and details not shown see the following Texas Highway Department Standards:  
 Single Culverts - Normal SC-NA Direct Traffic to 10'-0" Fill Lengthening Details 30° Skew SCL 30°  
 Parallel Wings - Normal Single Box Culverts PW-N  
 Flared Wings - Normal Single Box Culverts FW-N

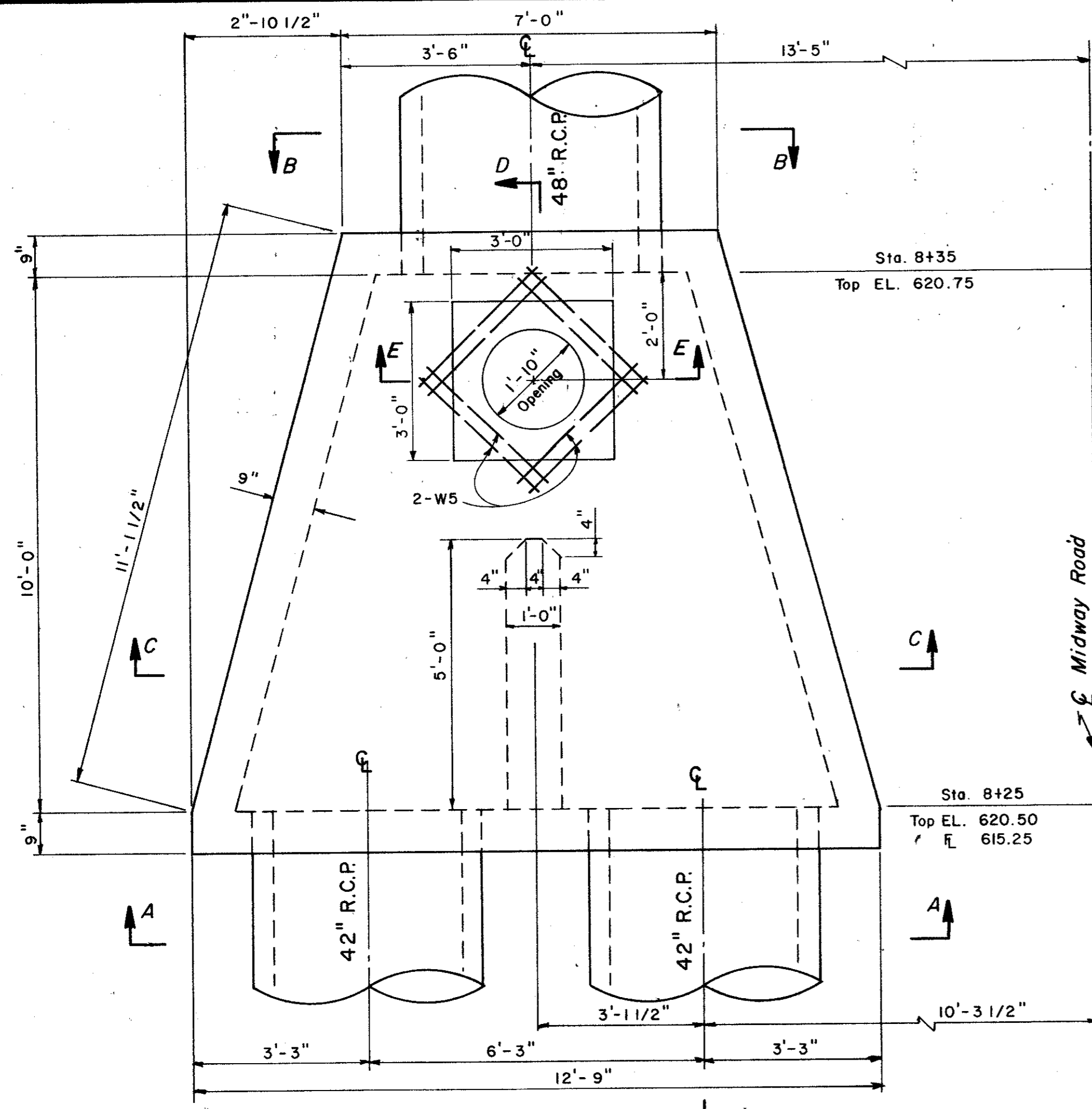
CITY OF ADDISON  
 DALLAS COUNTY, TEXAS  
**MIDWAY ROAD**

**9'x5' BOX CULVERT DETAIL**

GINN, INC.  
 Consulting Engineers - Dallas, Texas

Designed - C.F. Drawn - S.M.M. Date - MARCH, 1981  
 Approved - H.W.G. Checked - G.F. Scale - AS SHOWN Sheet 24 OF





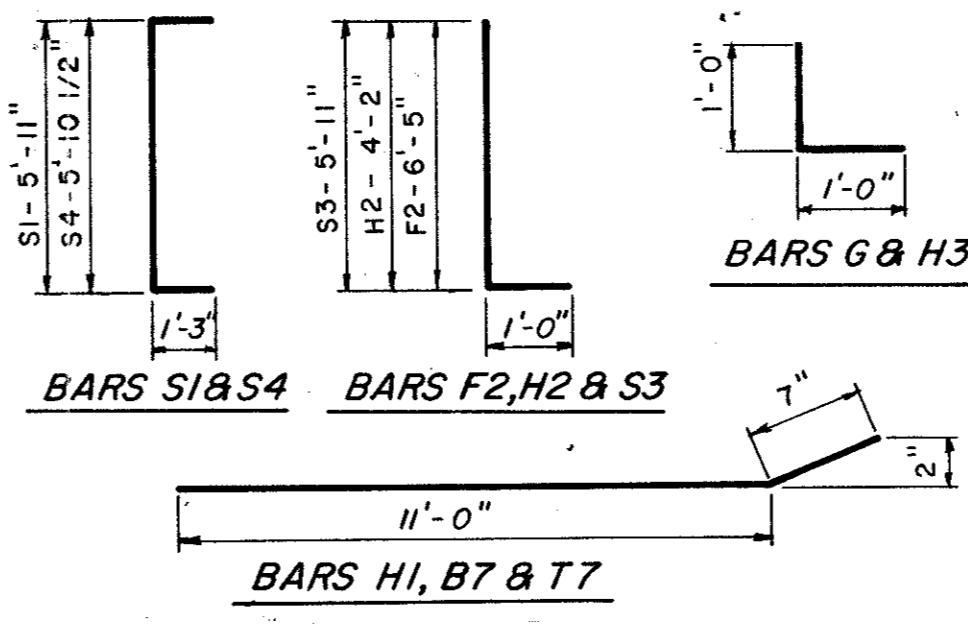
**PLAN**  
Scale: 1/2"=1'-0"

BAR SCHEDULE					
BAR	TYPE	SIZE	NO.	LENGTH	WEIGHT
B1	Str.	#5	11	9'-8" Avg.	111
B2	do	5	10	9'-8" Avg.	101
B3	do	5	1	12'-6"	13
B4	do	5	1	6'-9"	7
B5	do	5	12	11'-4" Avg.	142
B6	do	5	12	11'-4" Avg.	142
B7	Bt.	5	2	11'-7"	24
S1	Bt.	5	26	8'-5"	228
S2	Str.	4	32	5'-2"	110
S3	Bt.	5	12	7'-2"	90
S4	do	5	6	8'-4"	52
H1	Bt.	4	16	11'-7"	124
H2	do	4	8	6'-2"	33
H3	do	4	16	2'-0"	21
W1	Str.	5	8	4'-0"	33
W2	do	5	8	3'-0"	25
W3	do	5	4	3'-6"	15
W4	do	5	4	3'-9"	16
W5	do	5	16	4'-6"	75
T1	Str.	5	11	9'-8" Avg.	111
T2	do	7	15	9'-8" Avg.	293
T3	do	5	1	12'-6"	13
T4	do	5	1	6'-9"	7
T5	do	4	12	11'-4" Avg.	91
T6	do	5	12	11'-4" Avg.	142
T7	Bt.	4	2	11'-7"	16
Total					2035

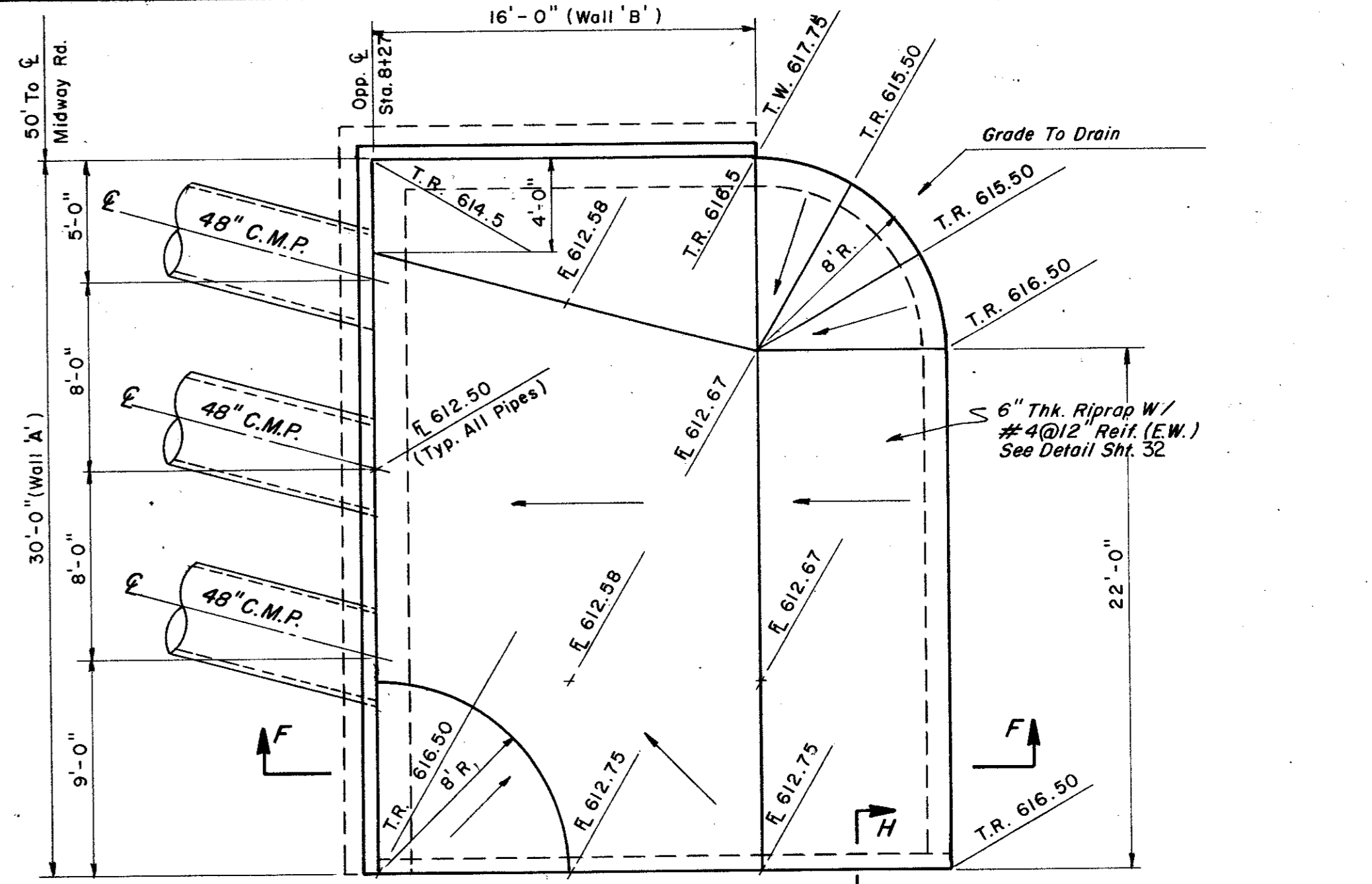
BAR SCHEDULE RET. WALL 'A' & 'B'					
BAR	TYPE	SIZE	NO.	LENGTH	WEIGHT
A1	Str.	#4	2	31'-1"	42
A2	do	4	2	17'-1"	23
E1	do	5	2	30'-4"	63
E2	do	5	8	16'-4"	136
E3	do	5	6	6'-6"	41
E4	do	5	12	3'-4"	42
E5	dg	5	6	2'-11"	18
F1	do	5	40	6'-5"	267
F2	Bt.	5	40	7'-5"	309
G	do	5	4	3'-0"	13
Total For Walls 'A' & 'B'					954

B1 & T1 - 7'-0" To 12'-5" In 10 Equal Steps  
 B2 - 7'-4" To 12'-1" In 9 Equal Steps  
 B5 & T5 - 11'-2" To 11'-7" In 5 Equal Steps  
 B6 & T6 - 11'-2" To 11'-7" In 5 Equal Steps  
 T2 - 7'-4" To 12'-1" In 14 Equal Steps

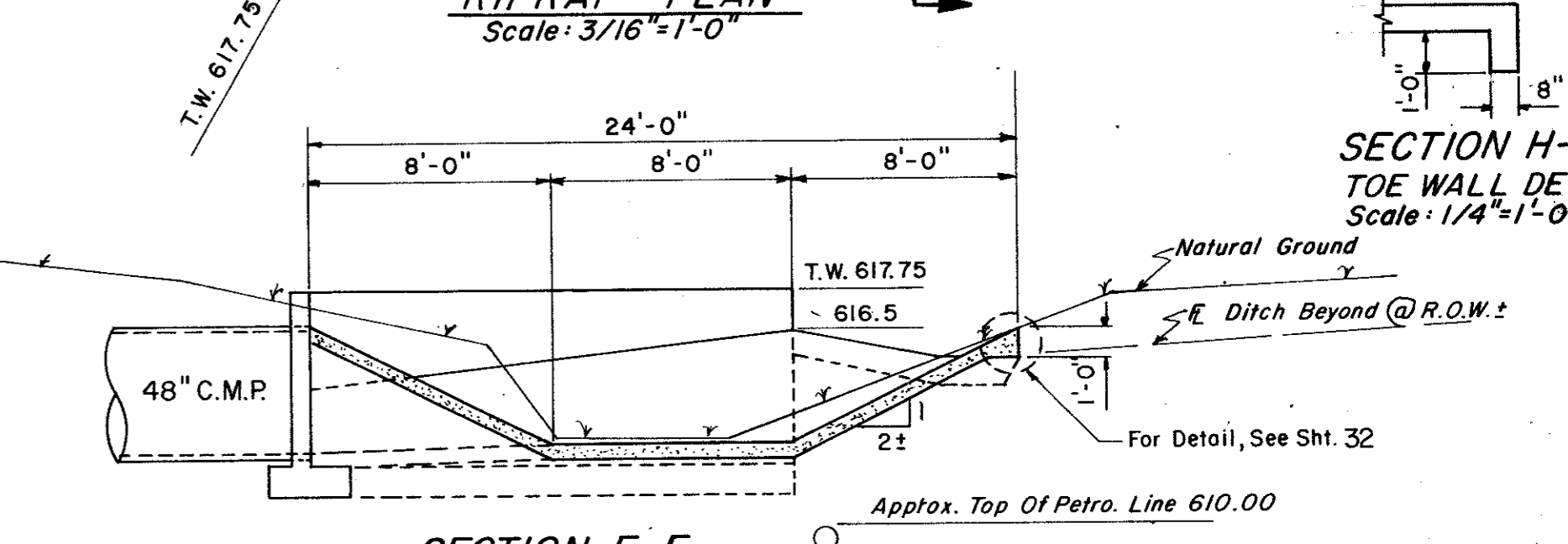
**BARS B1, T1, B2, T2, B5, T5, B6, & T6**



ESTIMATED QUANTITIES		
Class A Concrete (Spec. Manhole)		13.0 C.Y.
Reinforced Steel (Spec. Manhole)		2035.0 LBS.
Frame and Cover		1.0 EA.

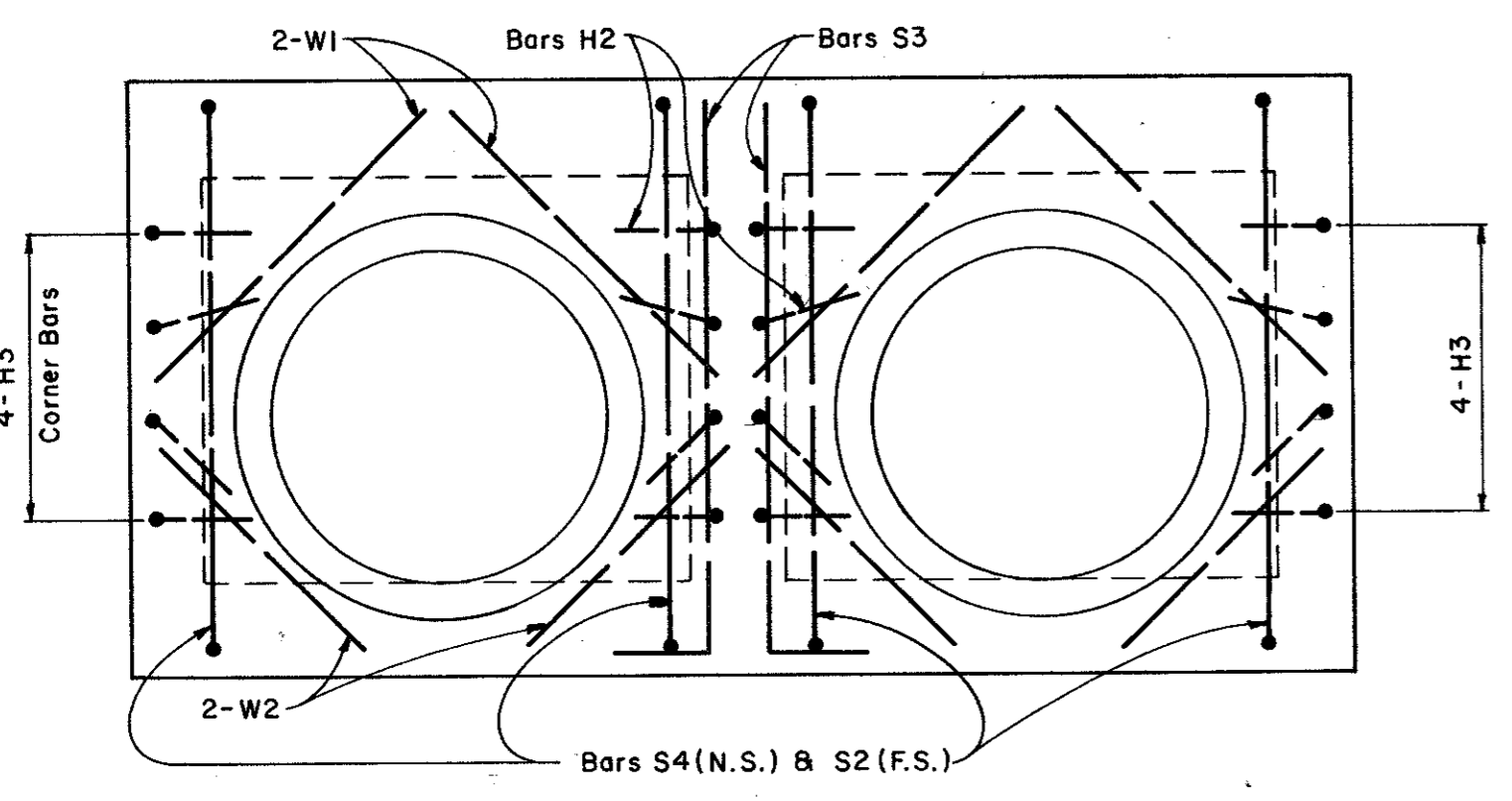


**RIPRAP PLAN**  
Scale: 3/16"=1'-0"

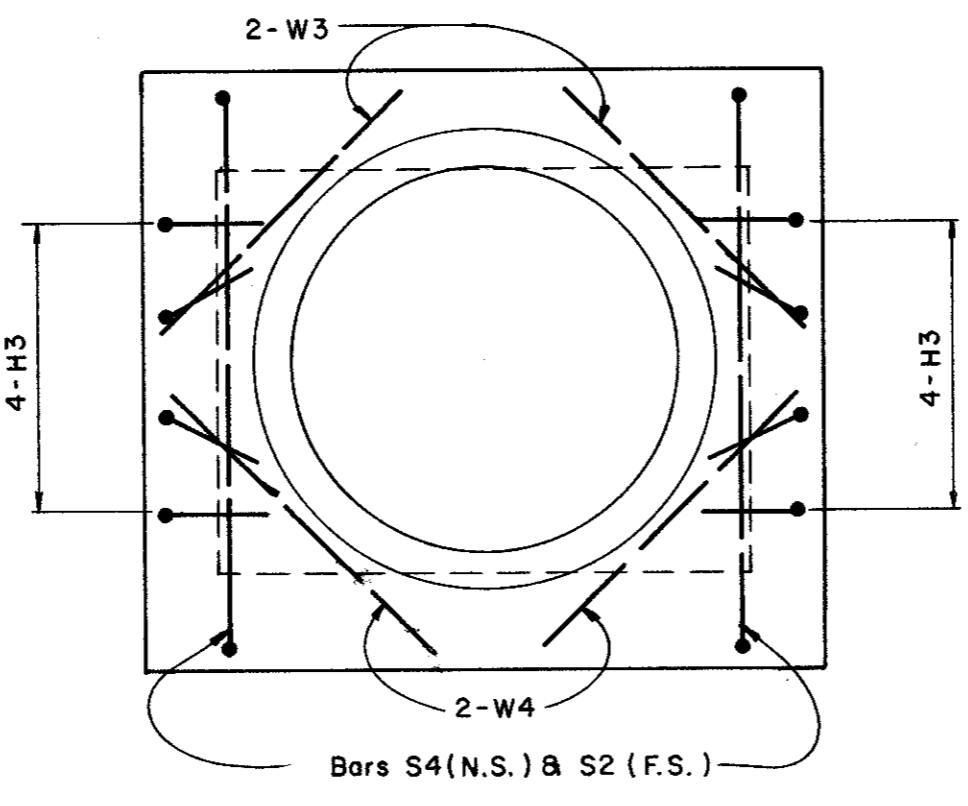


**SECTION F-F**  
Scale: 3/16"=1'-0"

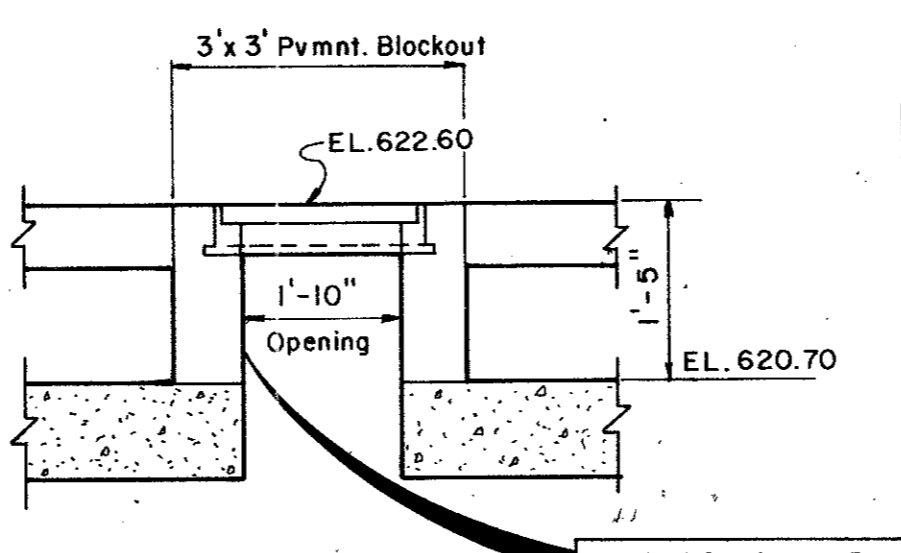
**SECTION H-H TOE WALL DETAIL**  
Scale: 1/4"=1'-0"



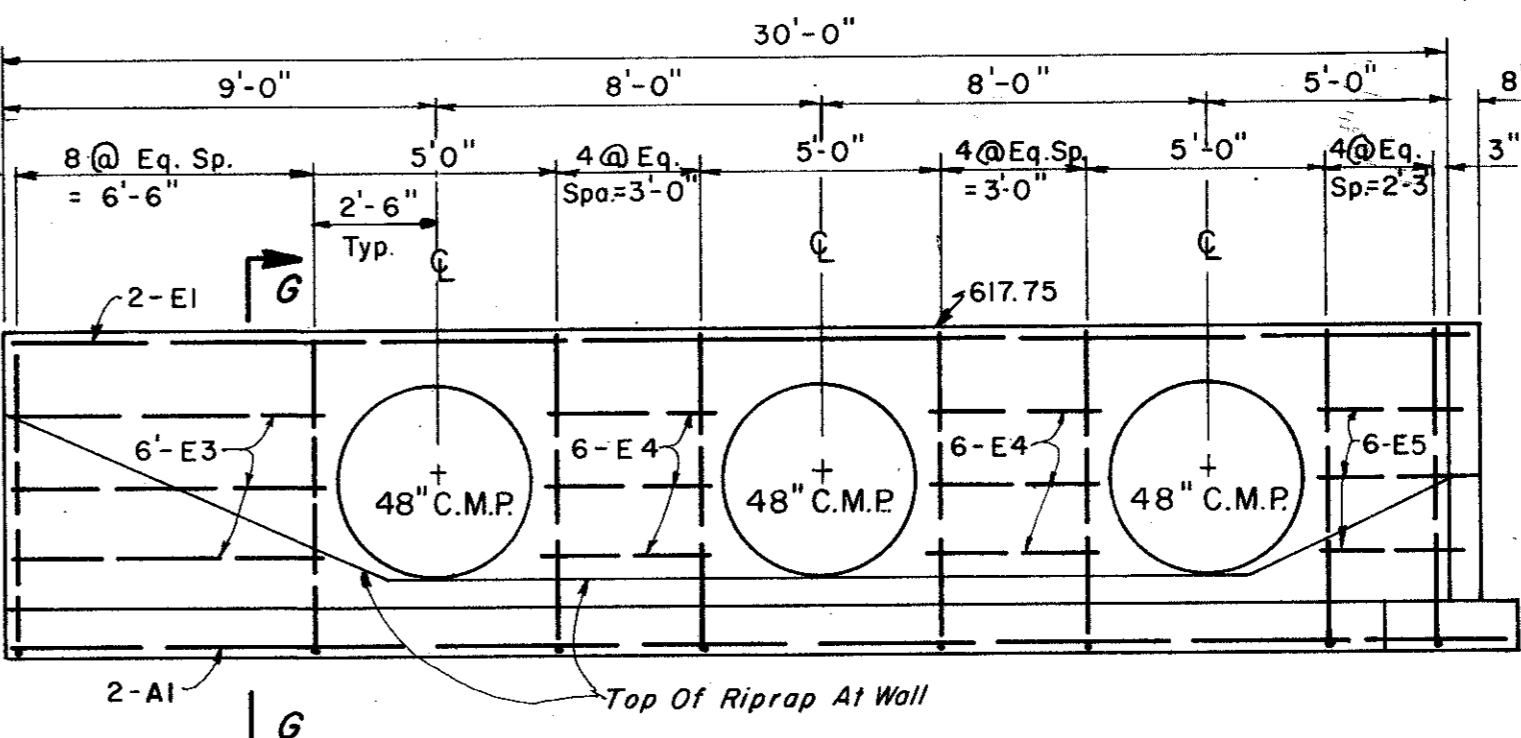
**ELEV. A-A**  
Scale: 1/2"=1'-0"



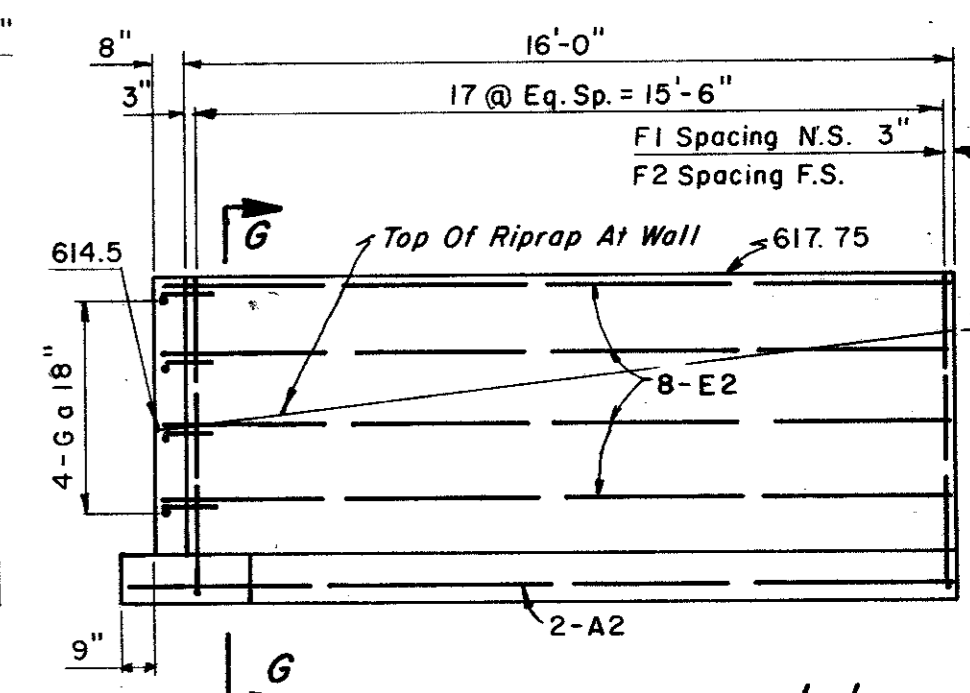
**ELEV. B-B**  
Scale: 1/2"=1'-0"



**SECTION E-E**  
Scale: 1/2"=1'-0"

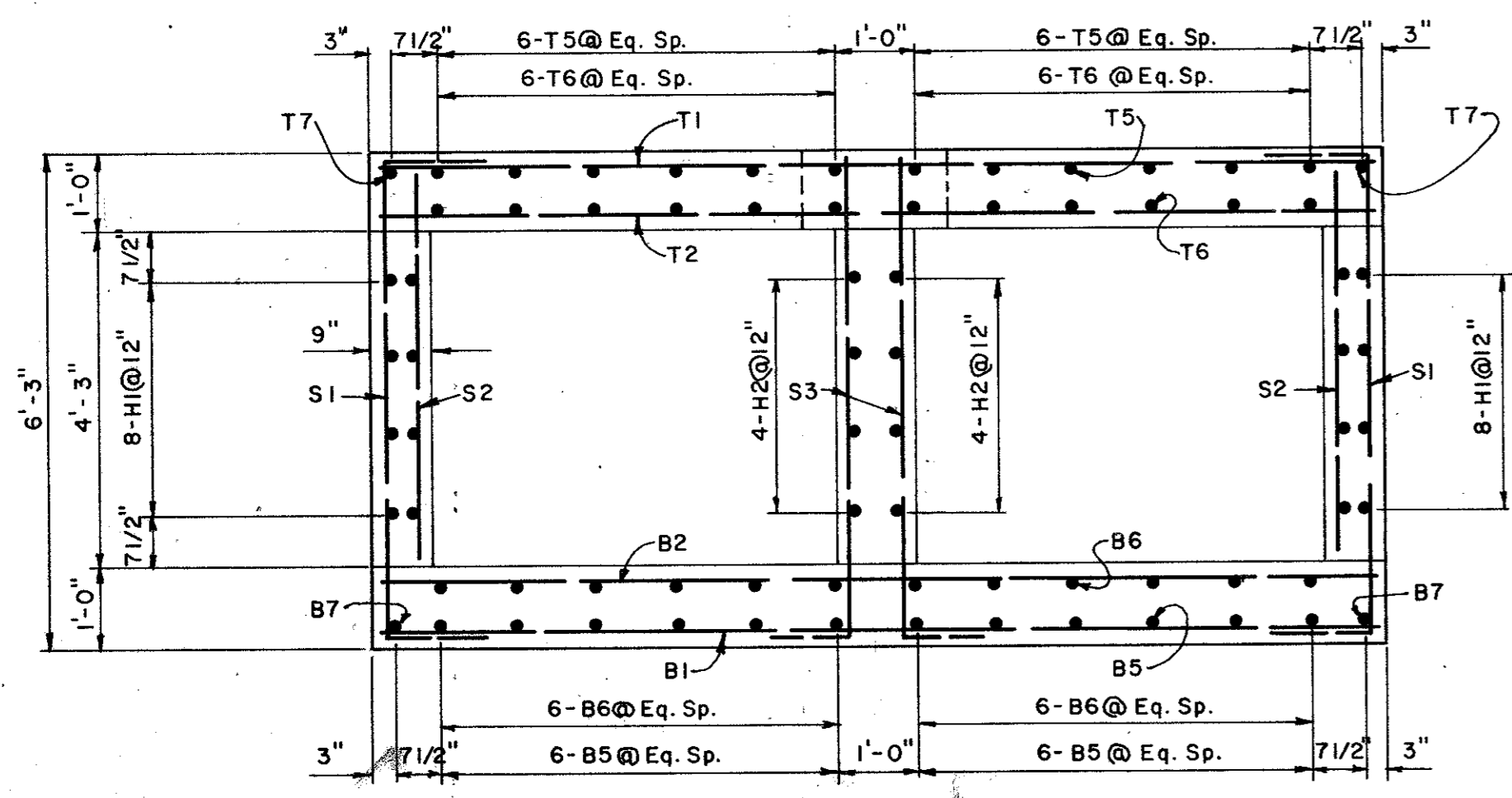


**ELEVATION WALL 'A'**  
Scale: 1/4"=1'-0"

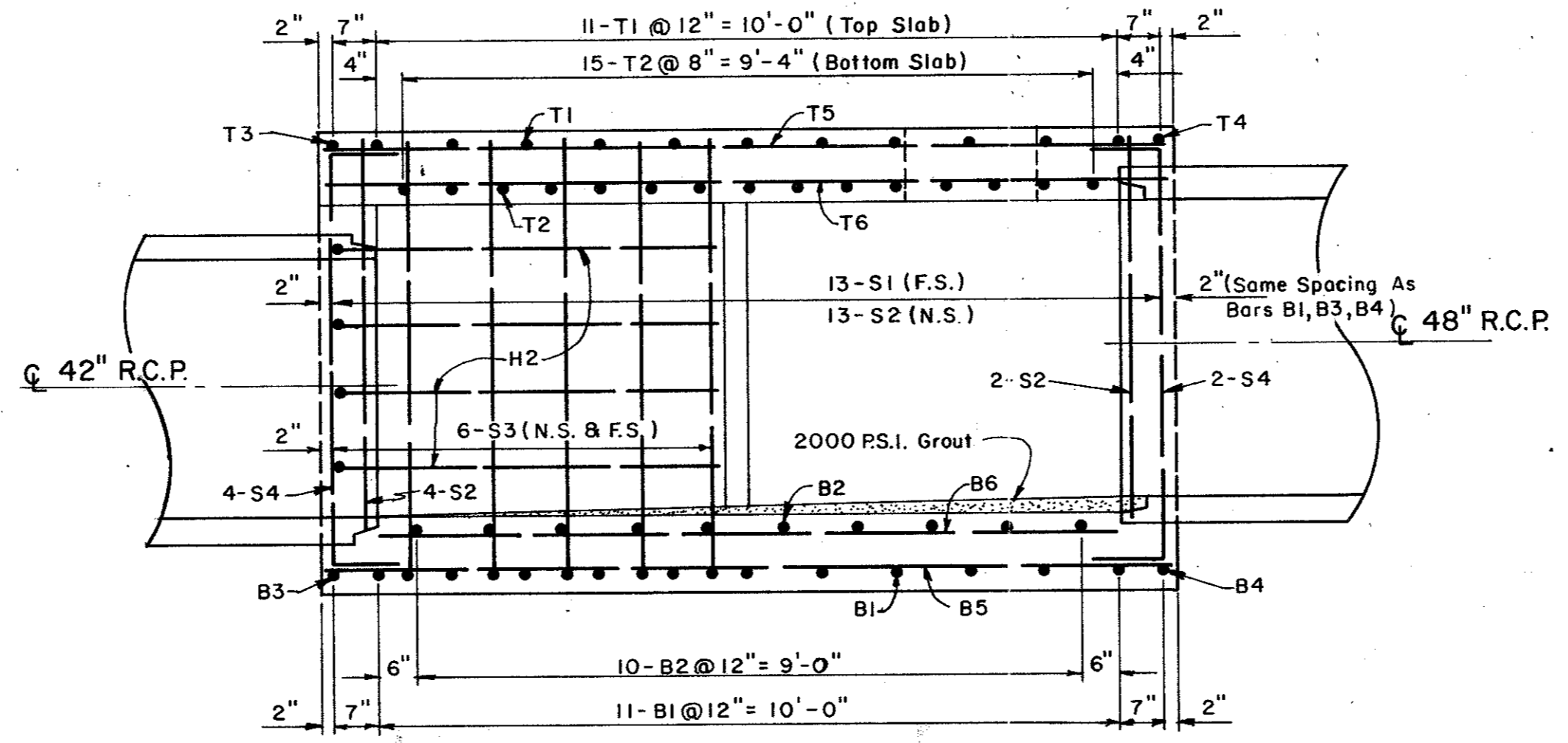


**ELEVATION WALL 'B'**  
Scale: 1/4"=1'-0"

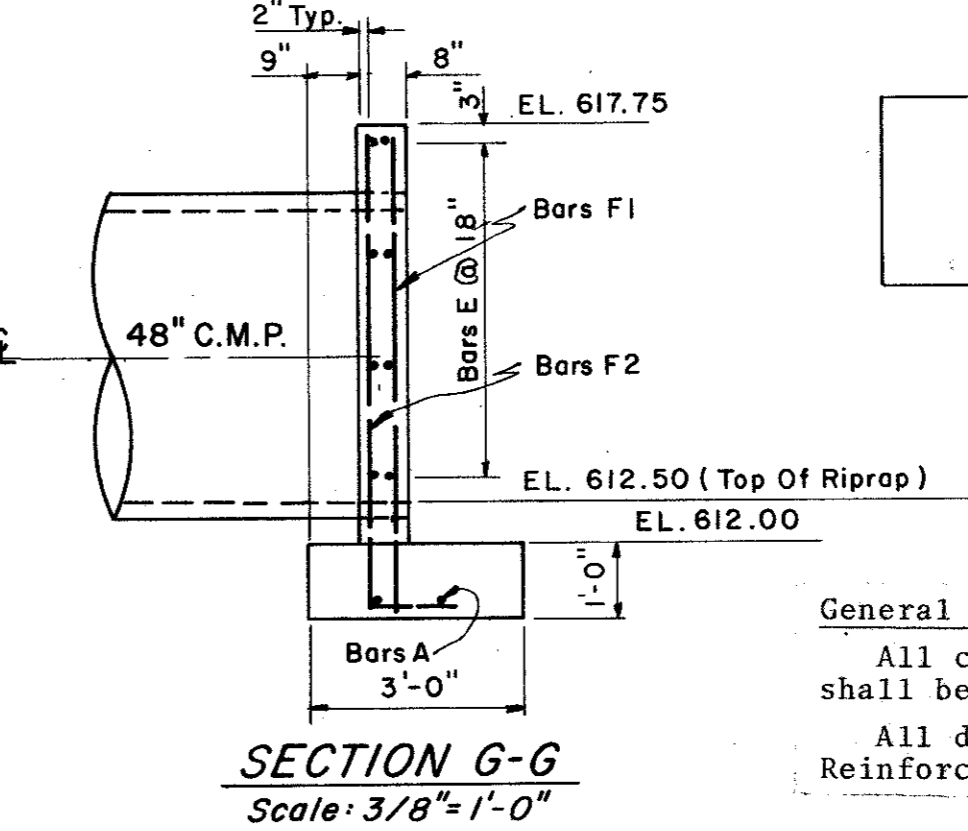
Class A. Concrete (Retaining Walls)	11.7 c.y.
Reinf. Steel (Retaining Walls)	954.0 lbs.
Class A Concrete (Riprap)	15.35 c.y.



**SECTION C-C**  
Scale: 1/2"=1'-0"



**SECTION D-D**  
Scale: 1/2"=1'-0"



**SECTION G-G**  
Scale: 3/8"=1'-0"

**General Notes:**  
 All concrete shall be Class A. All exposed corners of Walls 'A' & 'B' shall be chamfered 3/4".  
 All dimensions relating to reinforcing steel are to centers of bars. Reinforcing bars to be A.S.T.M. Grade 40.

CITY OF ADDISON  
 DALLAS COUNTY, TEXAS  
**MIDWAY ROAD**

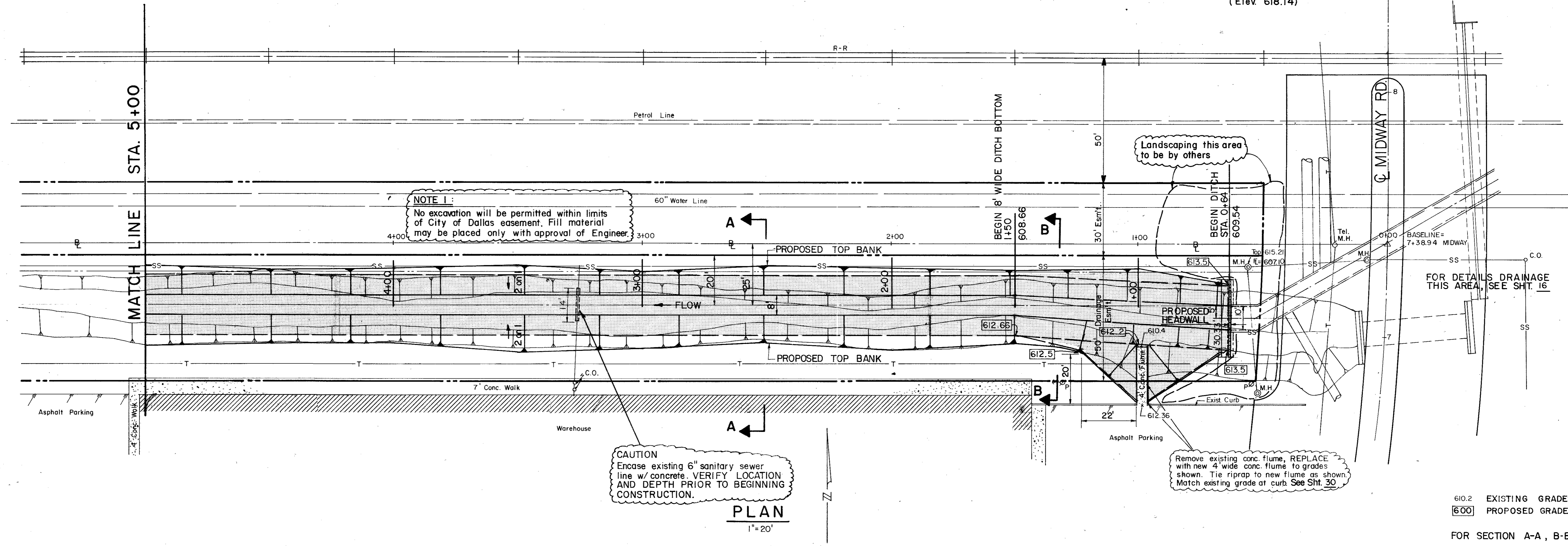
**JUNCTION BOX DETAIL**

GINN, INC.  
 Consulting Engineers - Dallas, Texas

Designed - A.C.F. Drawn - S.M.M. Date - MARCH, 1981  
 Approved - H.W.G. Checked - A.G.F. Scale - As Shown Sheet 25 of

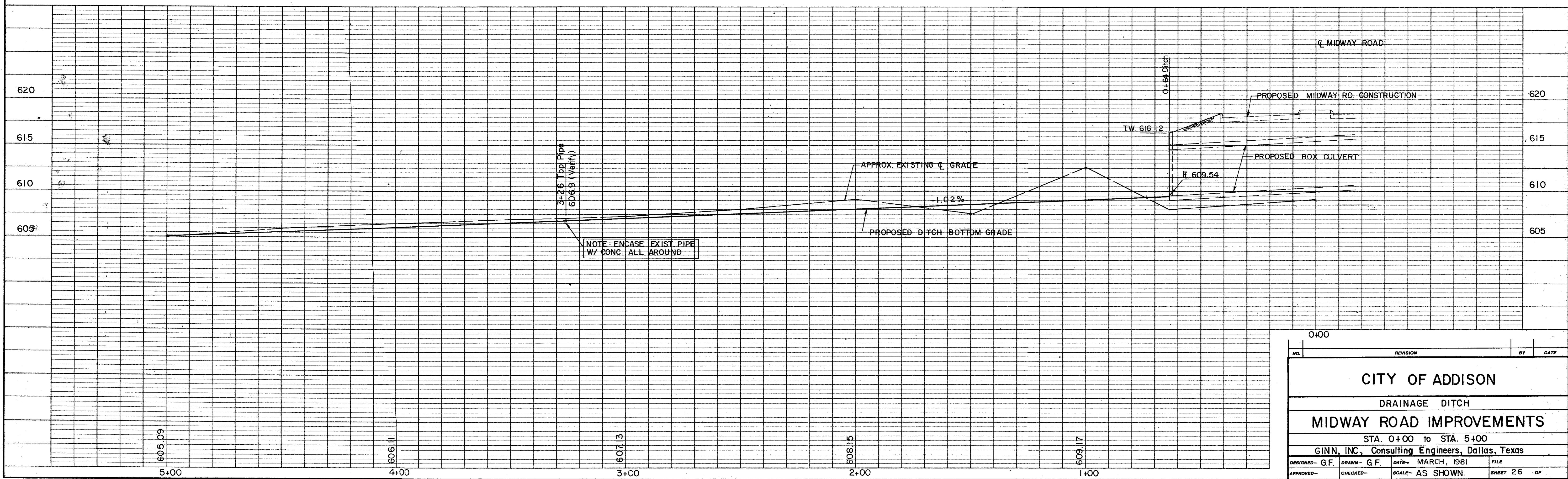


B.M. 3 - "□" on concrete walk @ S.E. corner of building @ 15201 Midway. (Elev. 618.14)



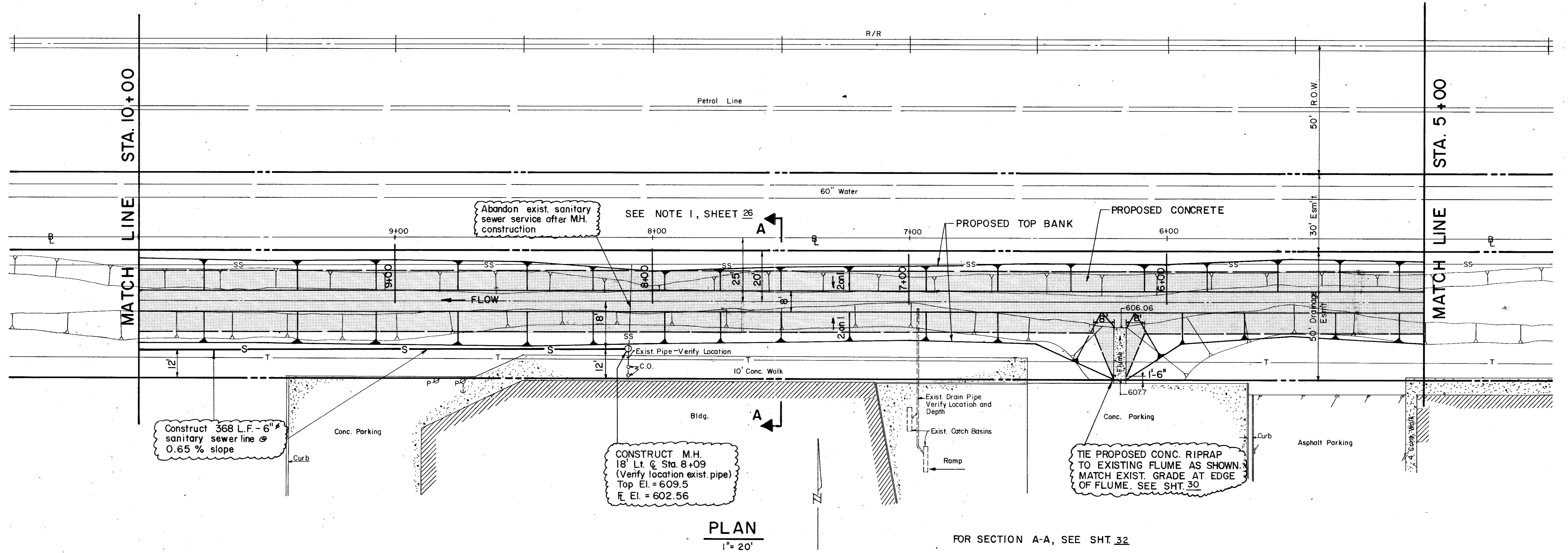
PLAN  
1" = 20'

610.2 EXISTING GRADES  
600 PROPOSED GRADES  
FOR SECTION A-A, B-B, SEE SHT. 32



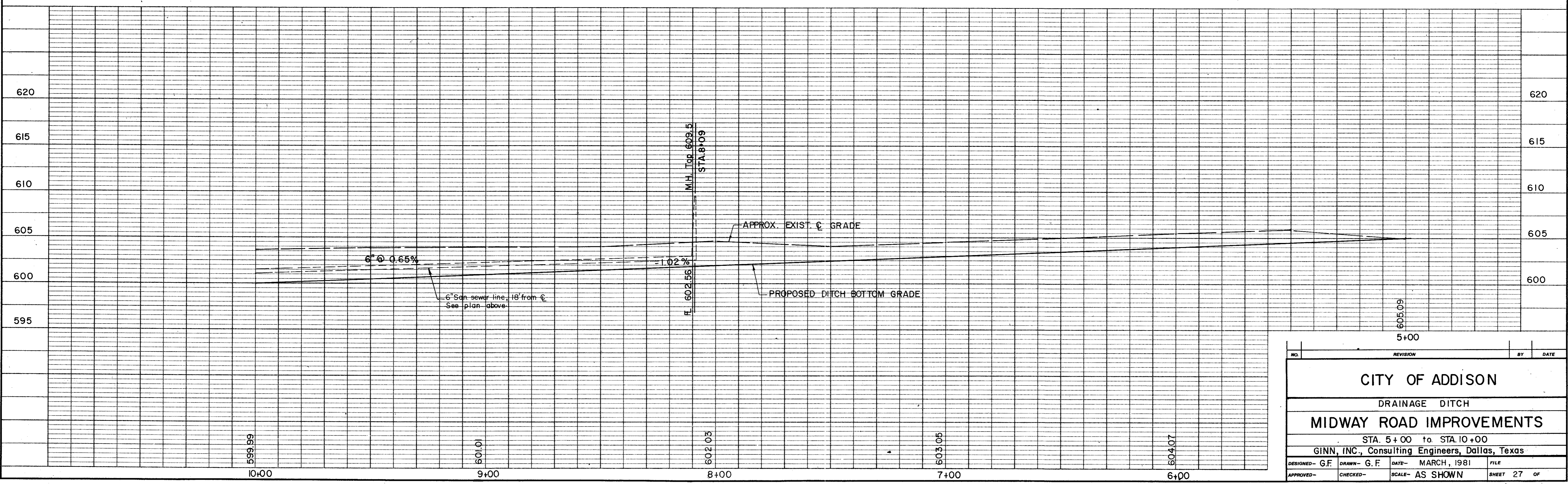
NO.	REVISION	BY	DATE
<b>CITY OF ADDISON</b>			
DRAINAGE DITCH			
<b>MIDWAY ROAD IMPROVEMENTS</b>			
STA. 0+00 to STA. 5+00			
GINN, INC., Consulting Engineers, Dallas, Texas			
DESIGNED - G.F.	DRAWN - G.F.	DATE - MARCH, 1981	FILE
APPROVED -	CHECKED -	SCALE - AS SHOWN	SHEET 26 OF





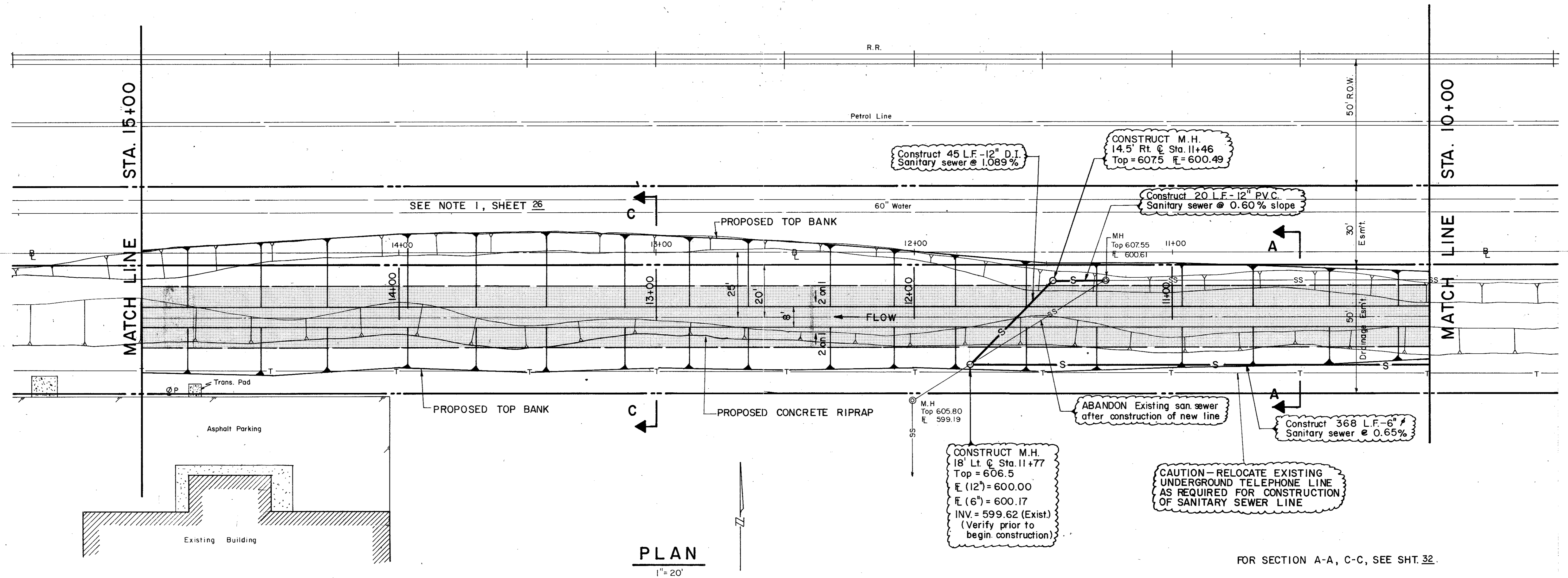
PLAN  
1" = 20'

FOR SECTION A-A, SEE SHT. 32



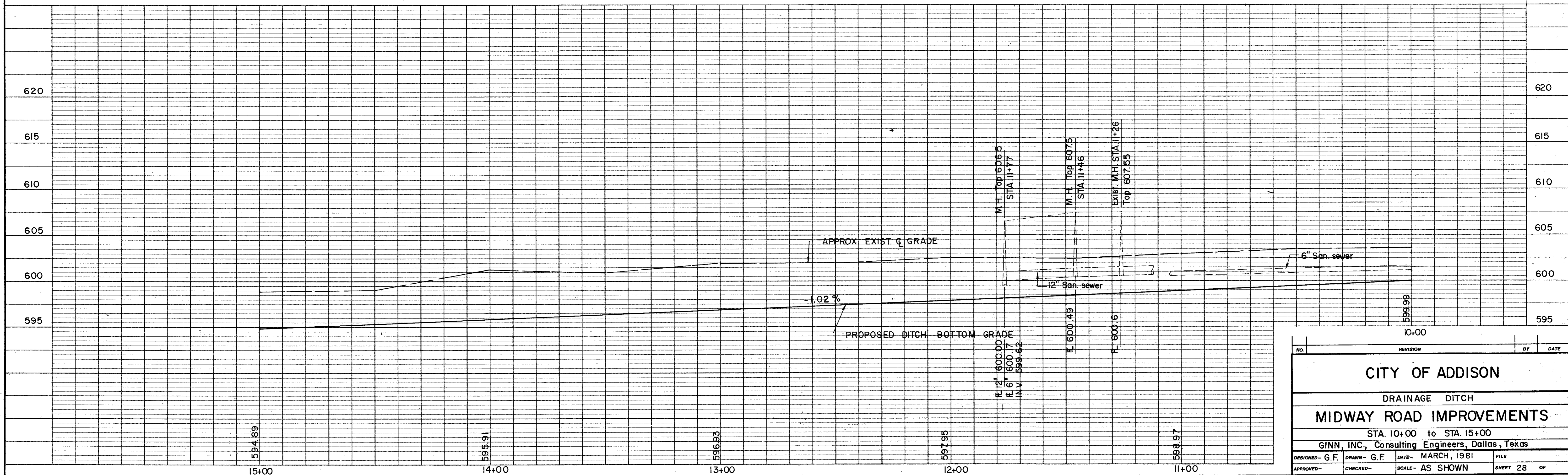
NO.	REVISION	BY	DATE
<b>CITY OF ADDISON</b>			
DRAINAGE DITCH			
<b>MIDWAY ROAD IMPROVEMENTS</b>			
STA. 5+00 to STA. 10+00			
GINN, INC., Consulting Engineers, Dallas, Texas			
DESIGNED - G.F.	DRAWN - G.F.	DATE - MARCH, 1981	FILE
APPROVED -	CHECKED -	SCALE - AS SHOWN	SHEET 27 OF





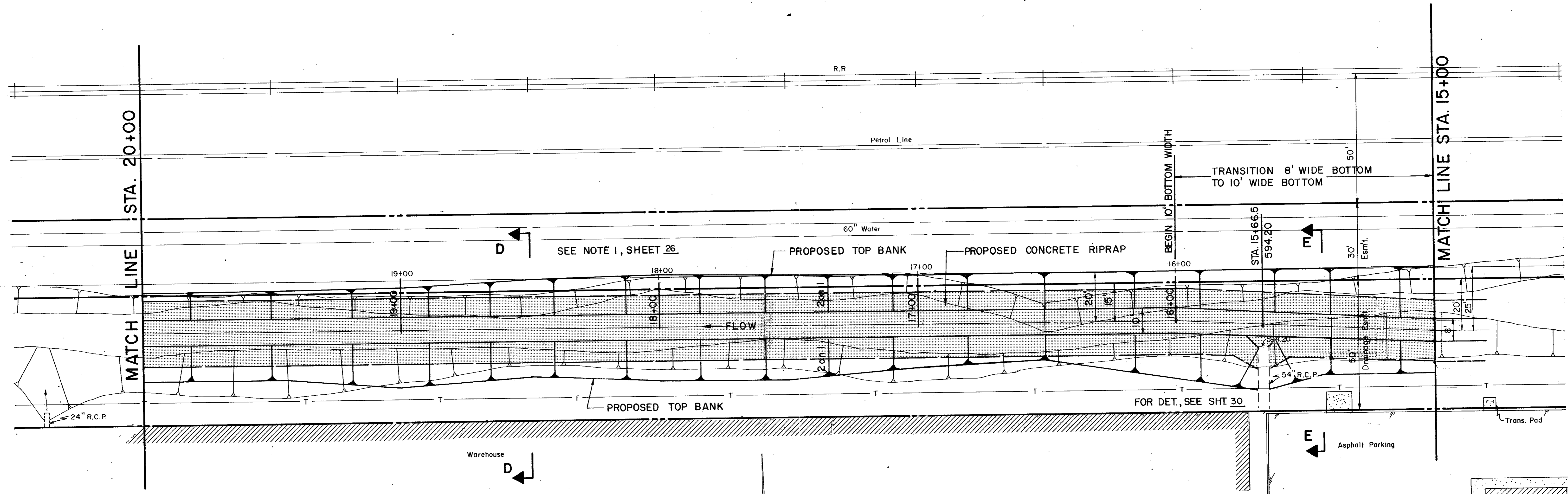
**PLAN**  
1" = 20'

FOR SECTION A-A, C-C, SEE SHT. 32.



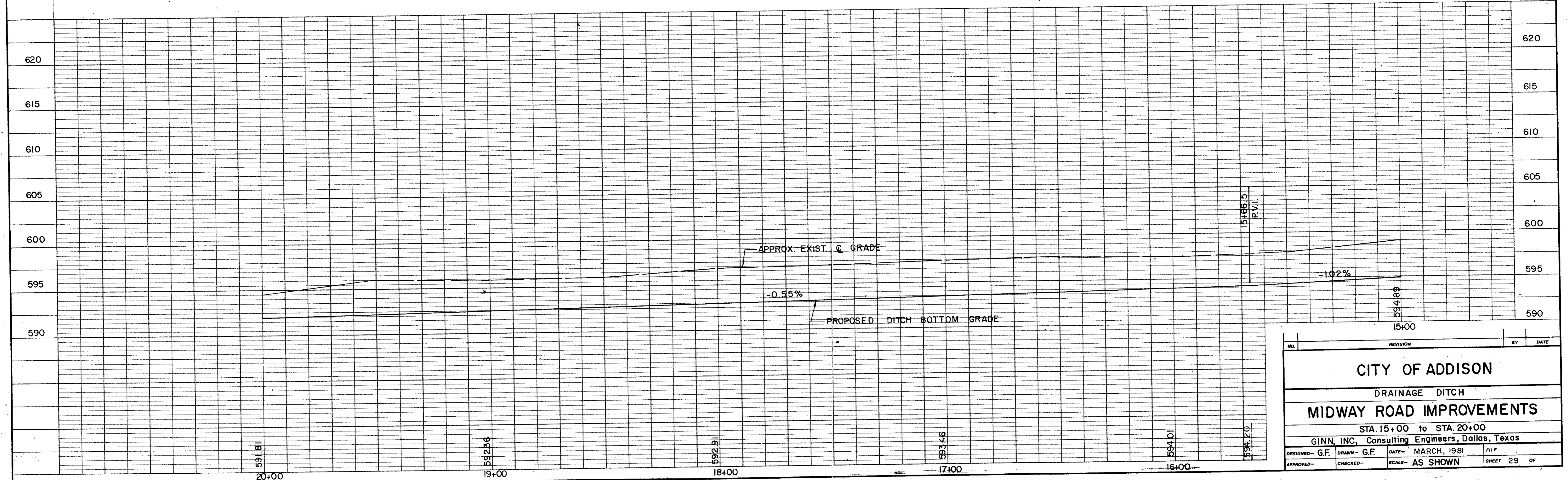
NO.	REVISION	BY	DATE
<b>CITY OF ADDISON</b>			
DRAINAGE DITCH			
<b>MIDWAY ROAD IMPROVEMENTS</b>			
STA. 10+00 to STA. 15+00			
GINN, INC., Consulting Engineers, Dallas, Texas			
DESIGNED- G.F.	DRAWN- G.F.	DATE- MARCH, 1981	FILE
APPROVED-	CHECKED-	SCALE- AS SHOWN	SHEET 28 OF





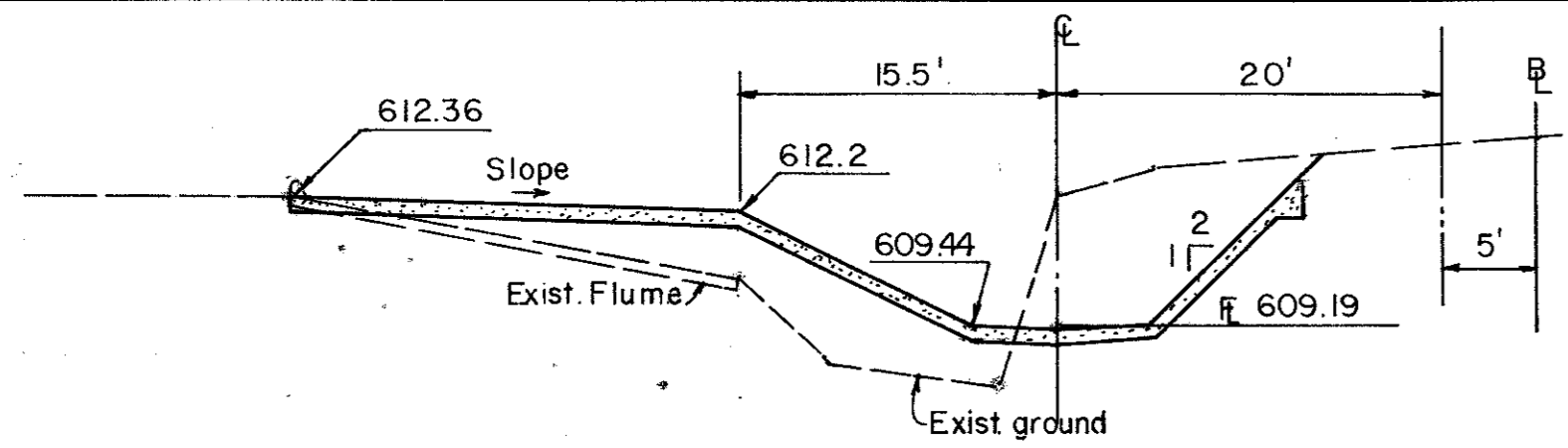
**PLAN**  
1" = 20'

FOR SECTION D-D, E-E, SEE SHT. 32



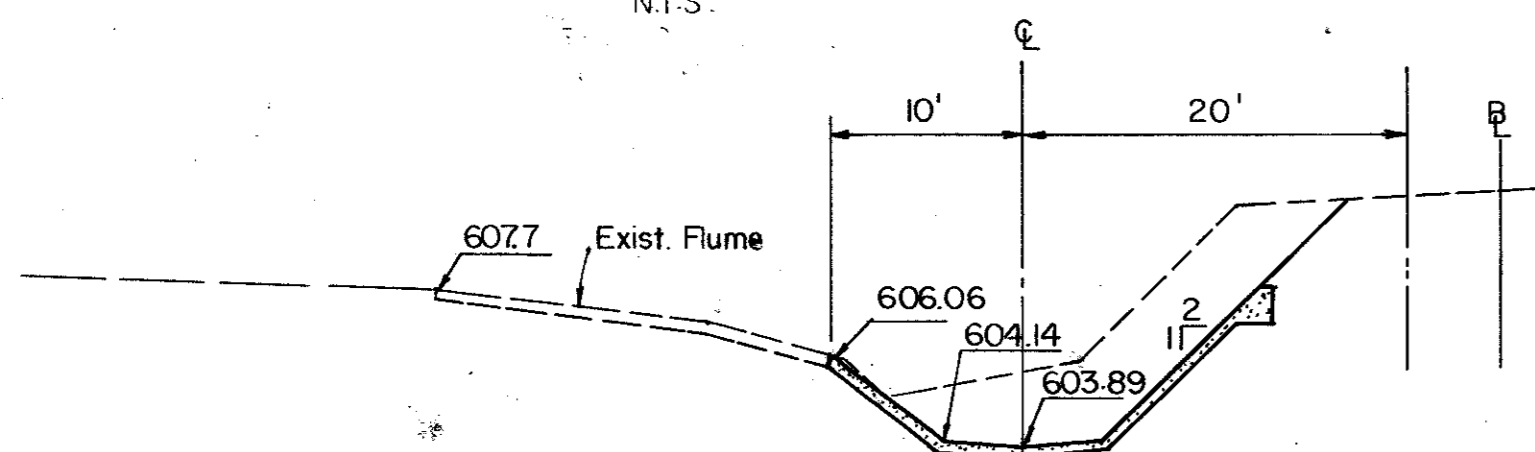
NO.	REVISION	BY	DATE
<b>CITY OF ADDISON</b>			
DRAINAGE DITCH			
<b>MIDWAY ROAD IMPROVEMENTS</b>			
STA. 15+00 to STA. 20+00			
GINN, INC., Consulting Engineers, Dallas, Texas			
DESIGNED - G.F.	DRAWN - G.F.	DATE - MARCH, 1981	FILE
APPROVED -	CHECKED -	SCALE - AS SHOWN	SHEET 29 OF





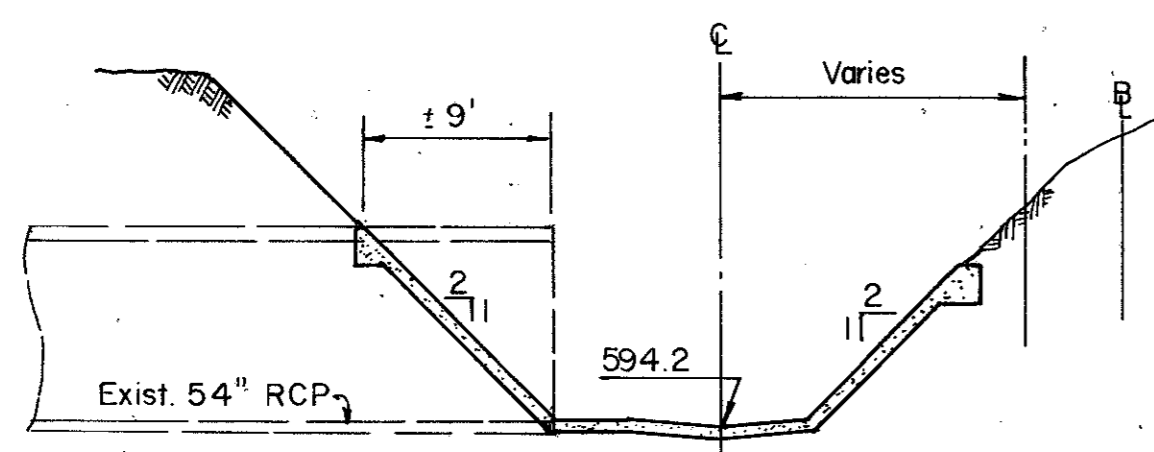
**FLUME AT STA. 0+98.5**

N.T.S.



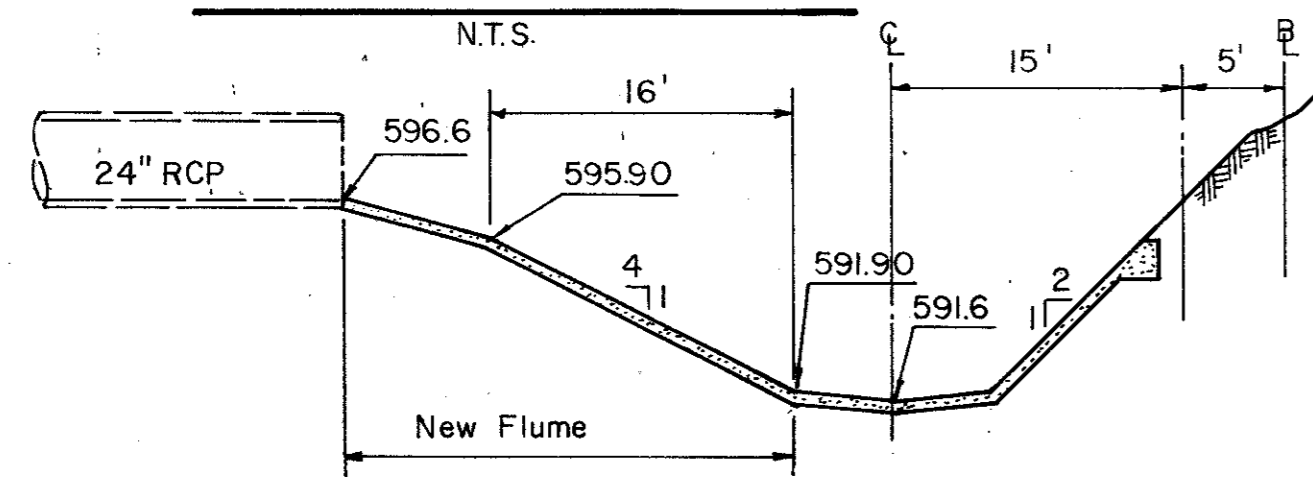
**FLUME AT STA. 6+18.0**

N.T.S.



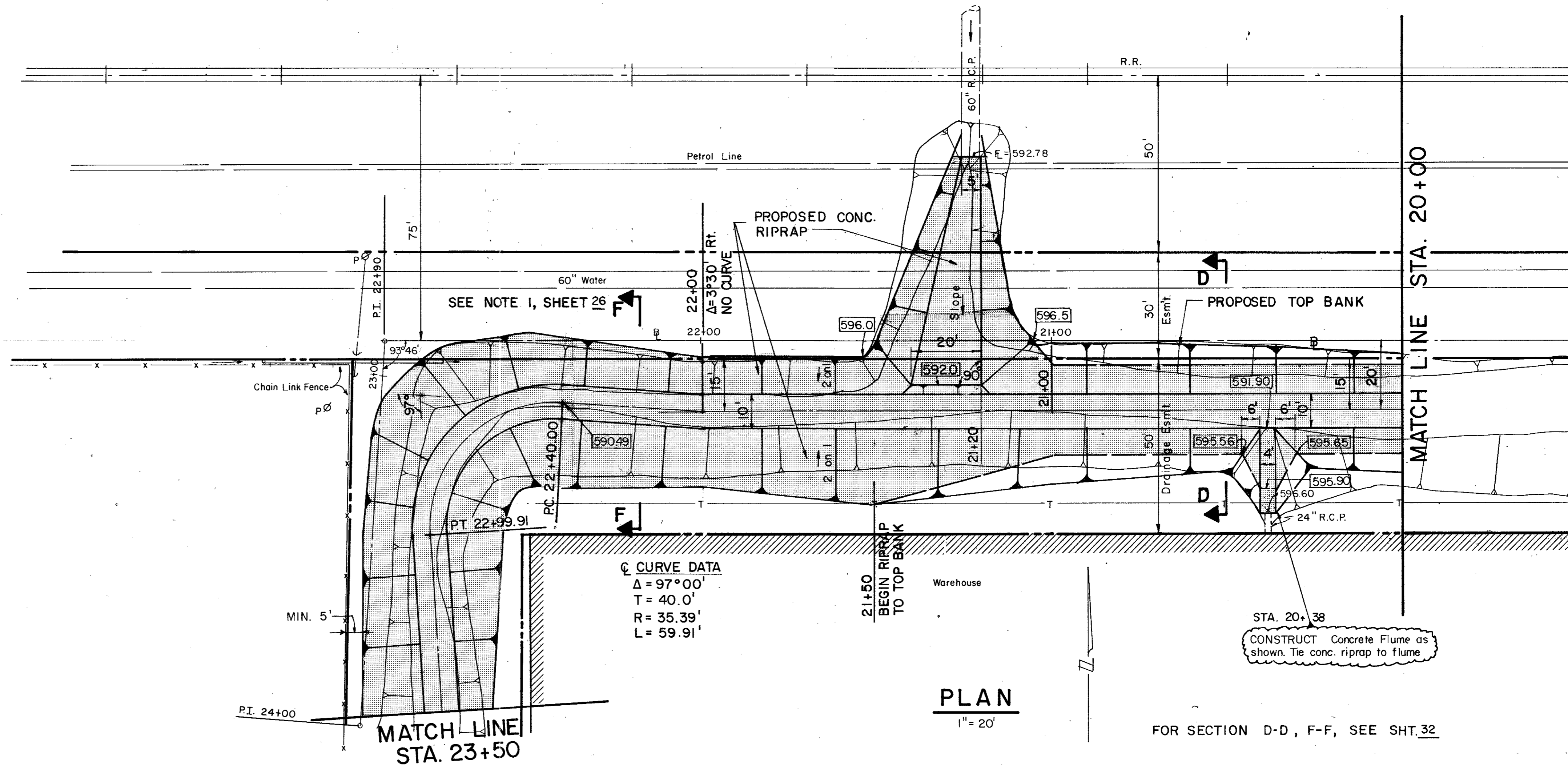
**PIPE AT STA. 15+66.5**

N.T.S.



**FLUME AT STA. 20+38**

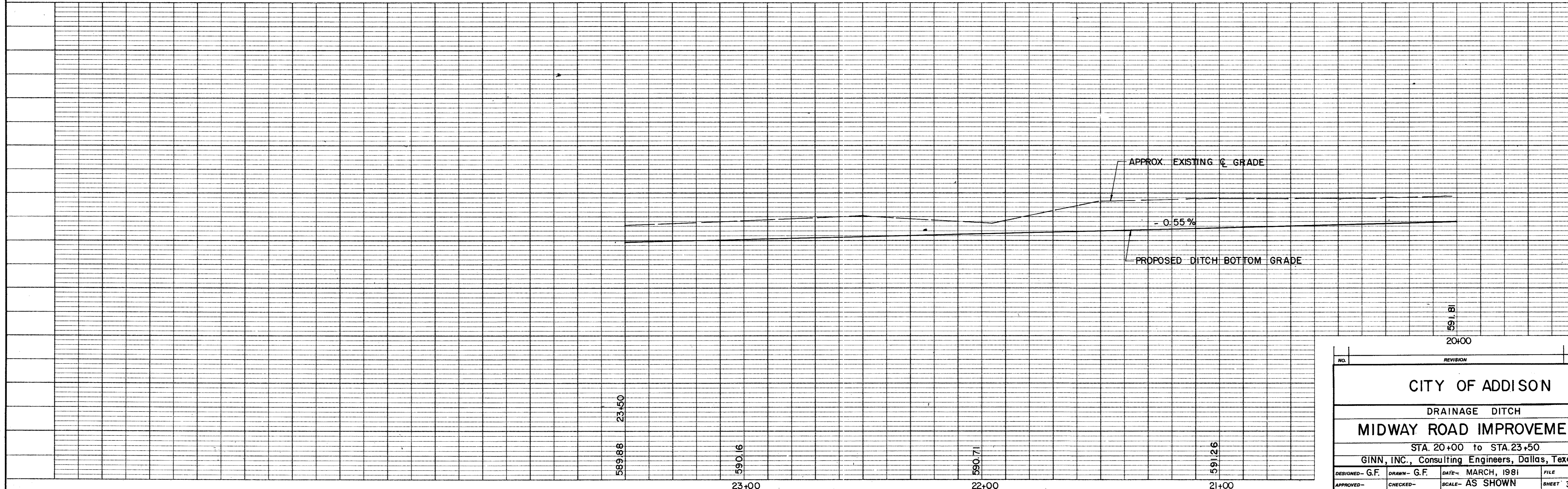
N.T.S.



**PLAN**

1" = 20'

FOR SECTION D-D, F-F, SEE SHT. 32

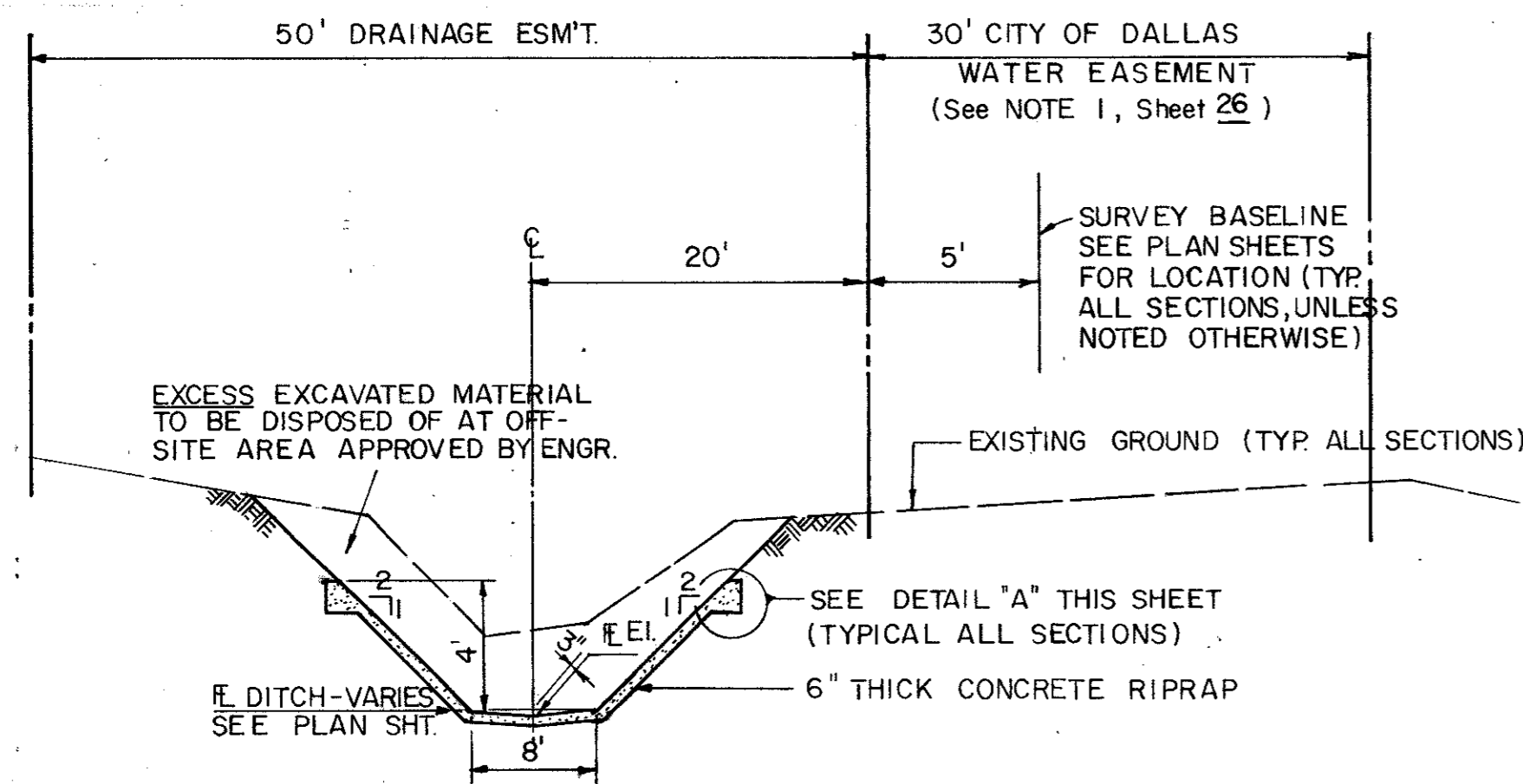


CITY OF ADDISON			
DRAINAGE DITCH			
MIDWAY ROAD IMPROVEMENTS			
STA. 20+00 to STA. 23+50			
GINN, INC., Consulting Engineers, Dallas, Texas			
DESIGNED - G.F.	DRAWN - G.F.	DATE - MARCH, 1981	FILE
APPROVED -	CHECKED -	SCALE - AS SHOWN	SHEET 30 OF

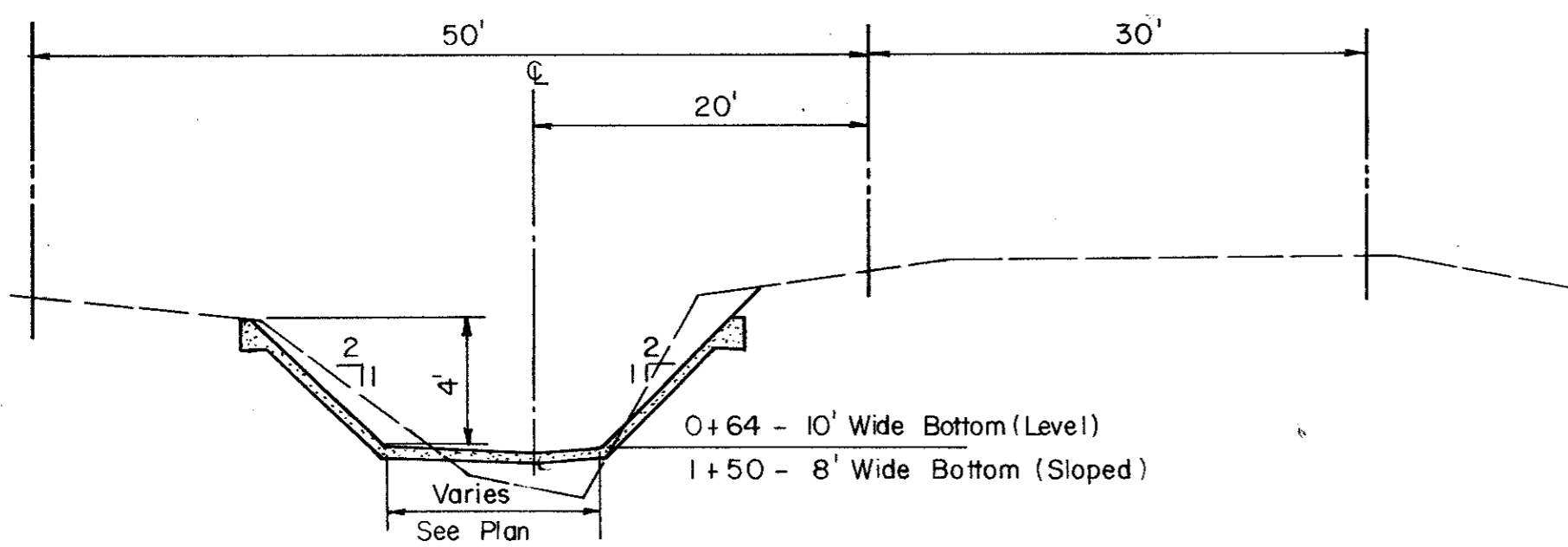




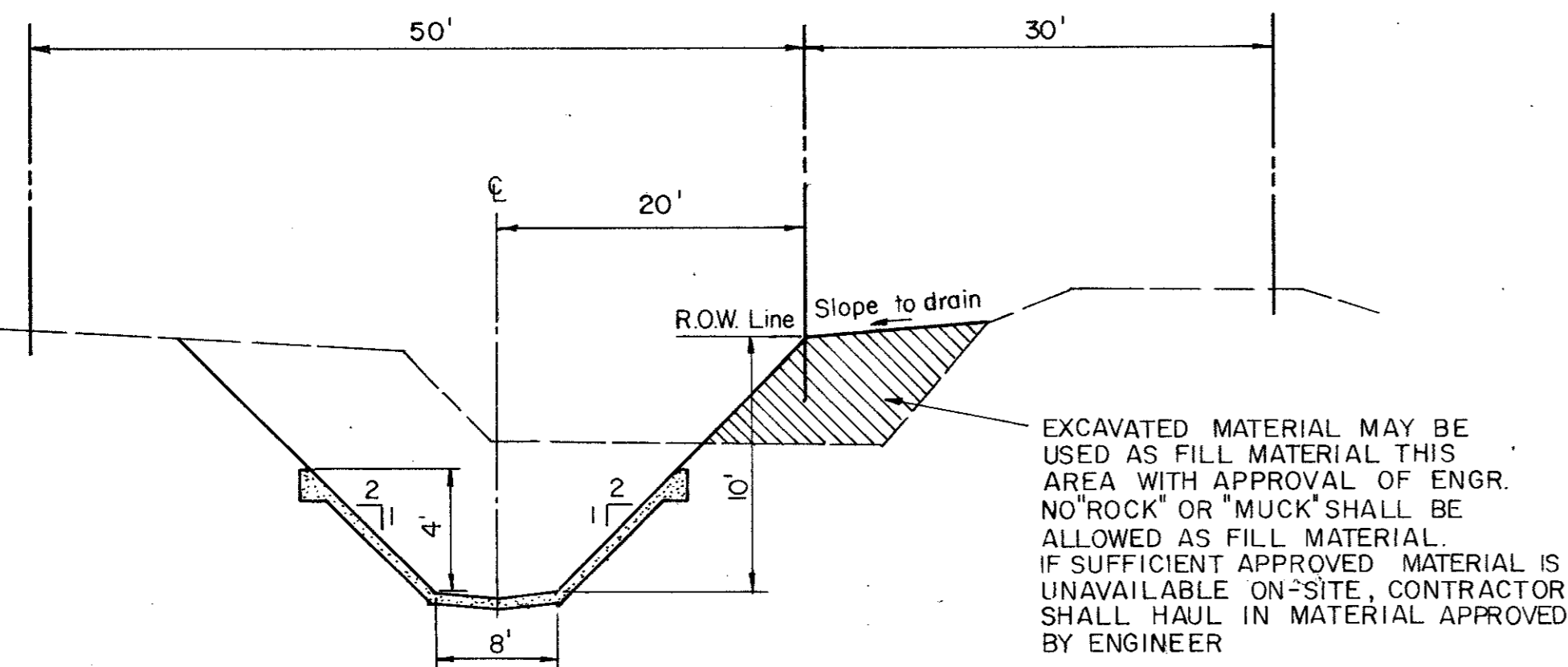




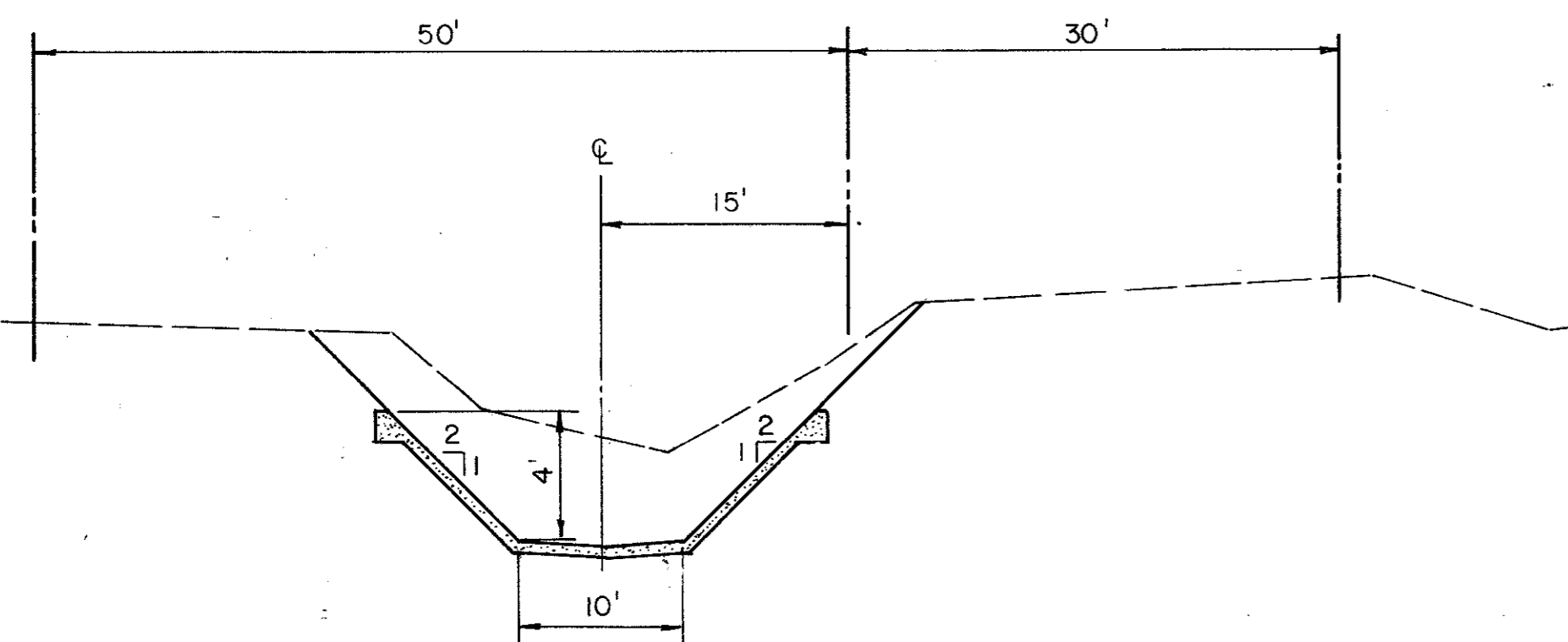
**SECTION A-A TYPICAL STA. 1+50 to 11+50**



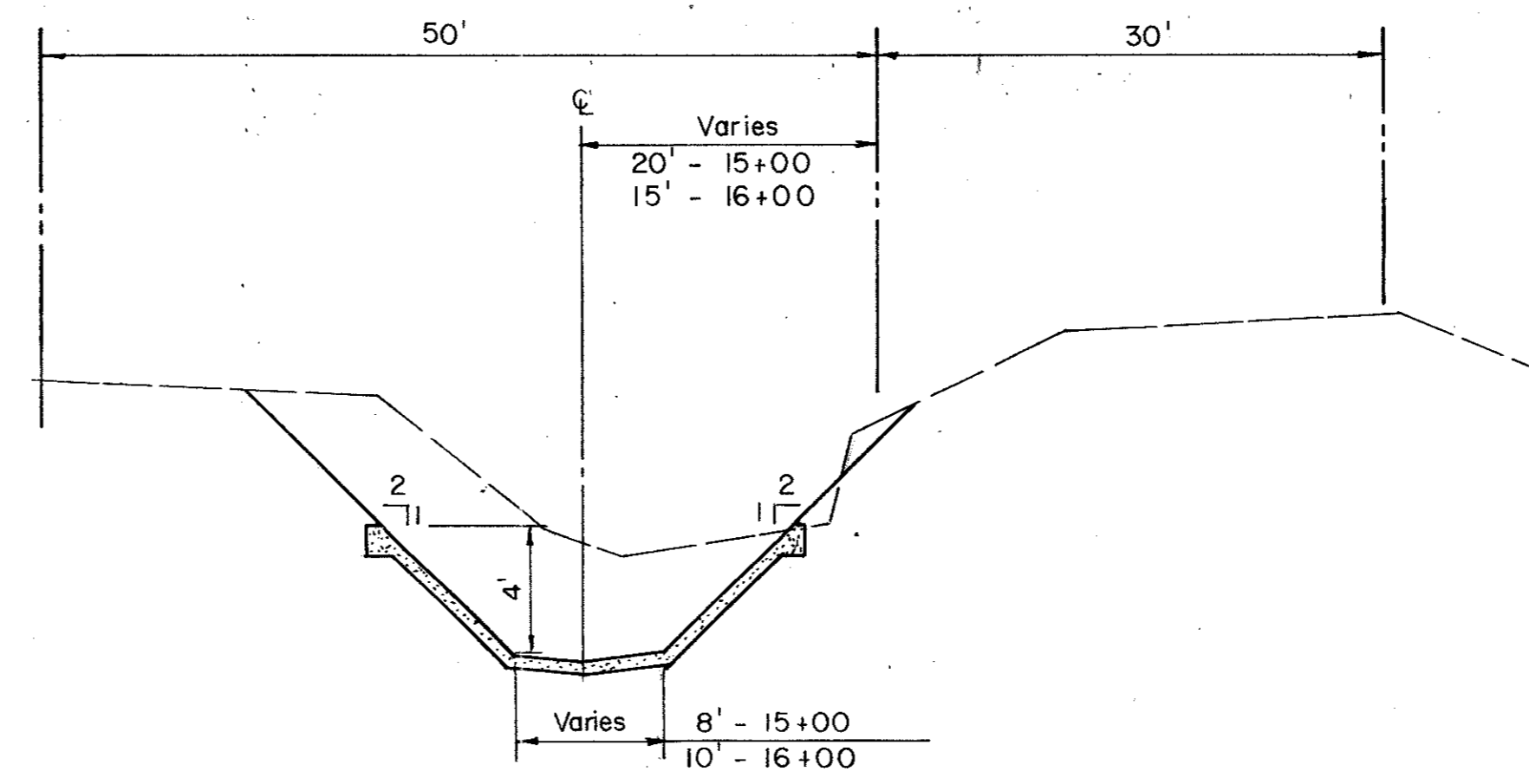
**SECTION B-B TYPICAL STA. 0+64 to 1+50**



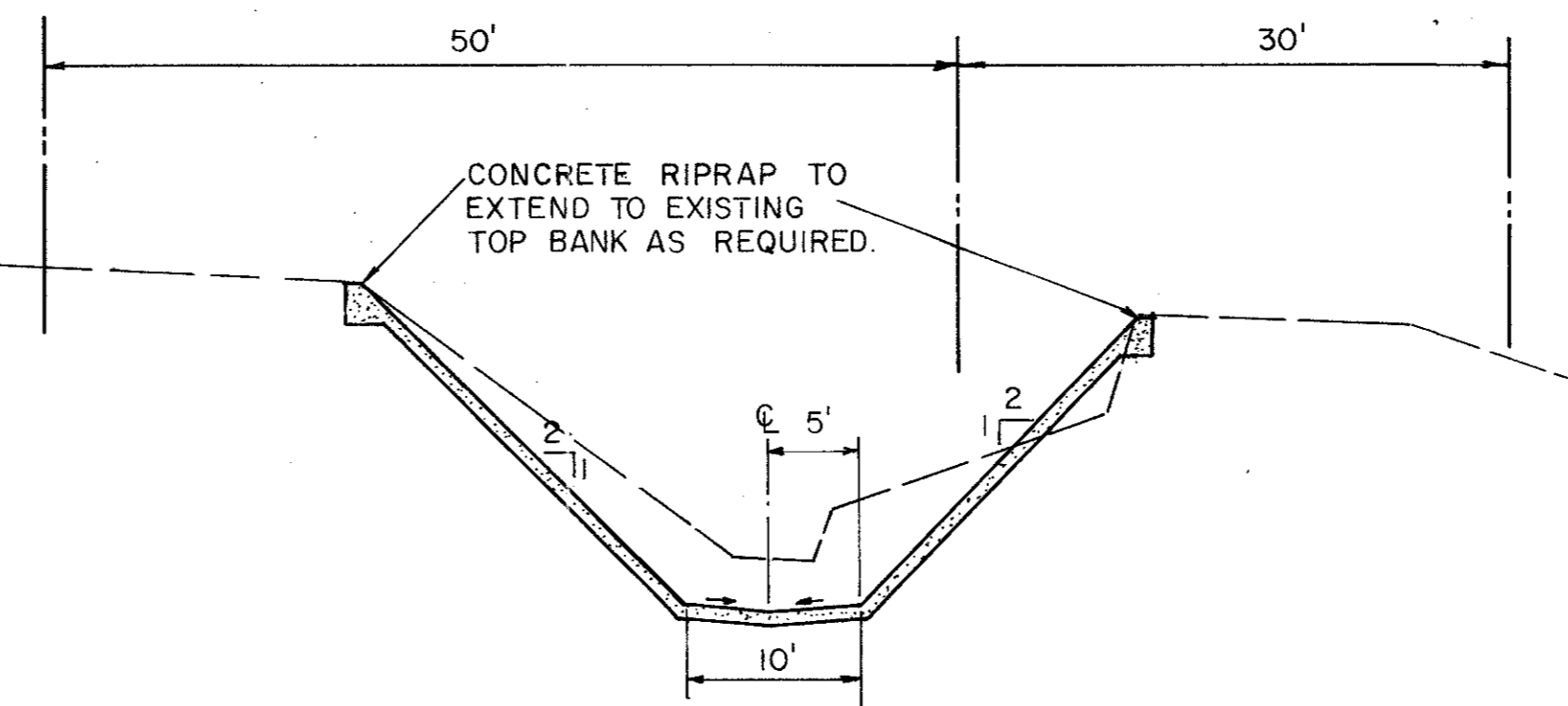
**SECTION C-C TYPICAL STA. 11+50 to 15+00**



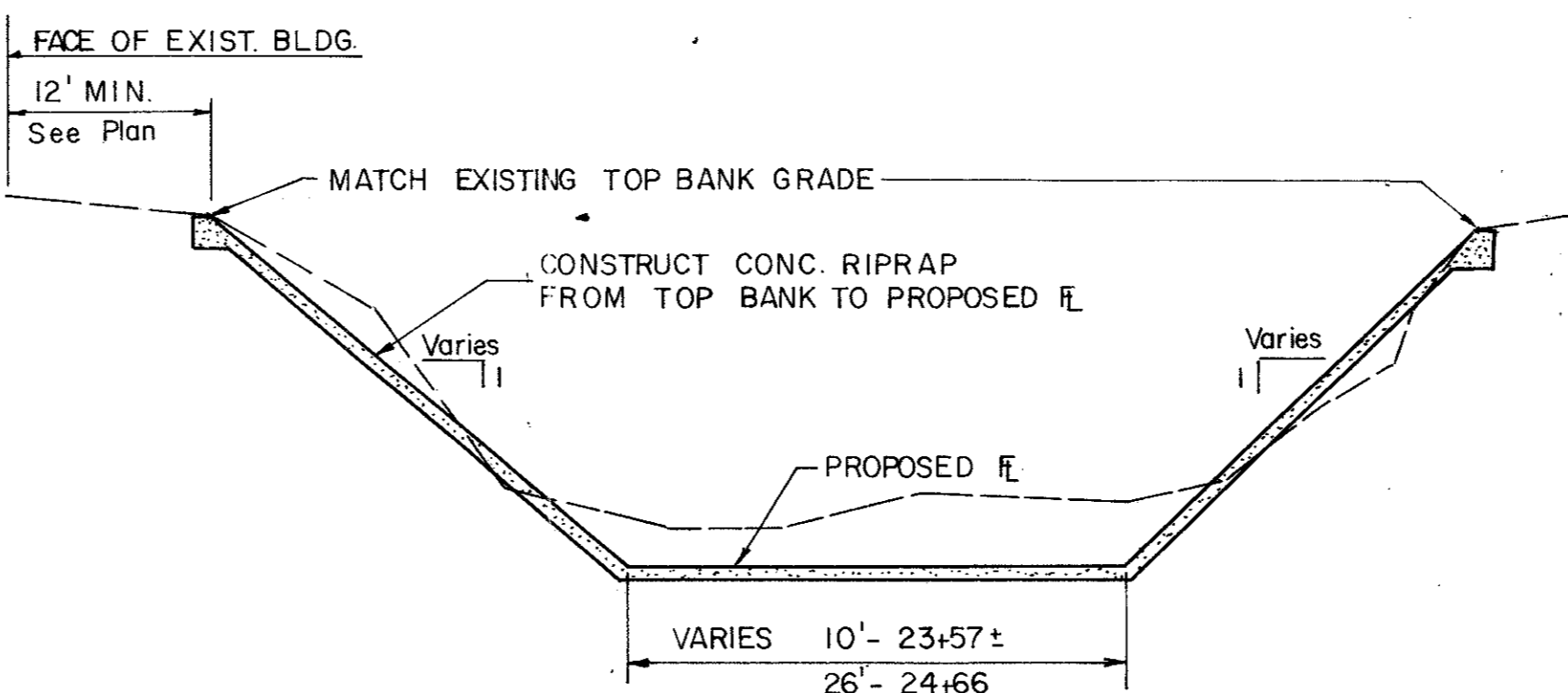
**SECTION D-D TYPICAL STA. 16+00 to 21+00**



**SECTION E-E TYPICAL STA. 15+00 to 16+00**



**SECTION F-F TYPICAL STA. 21+00 to 23+57**

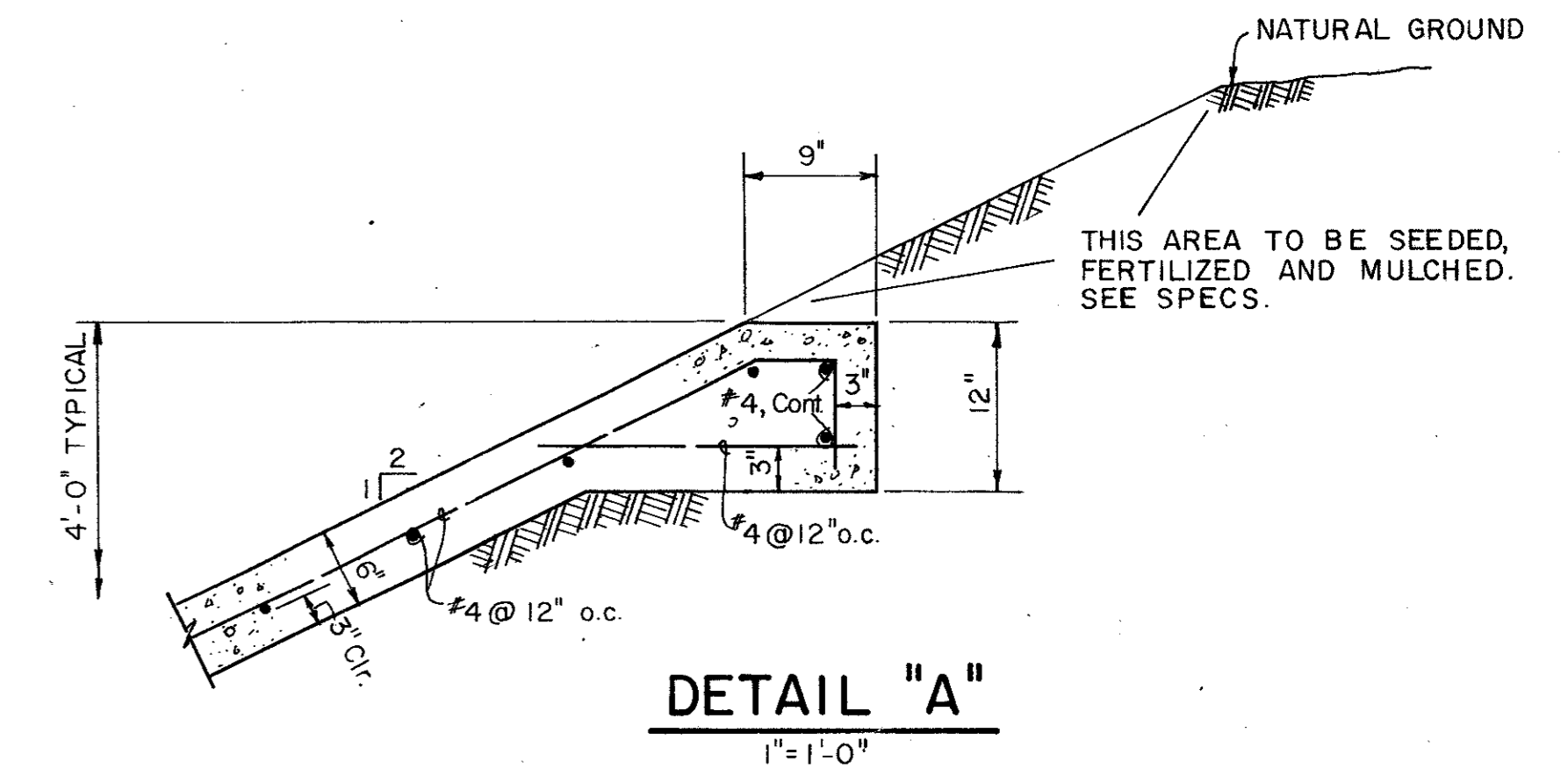


**SECTION G-G TYPICAL STA. 23+57 to 24+66**

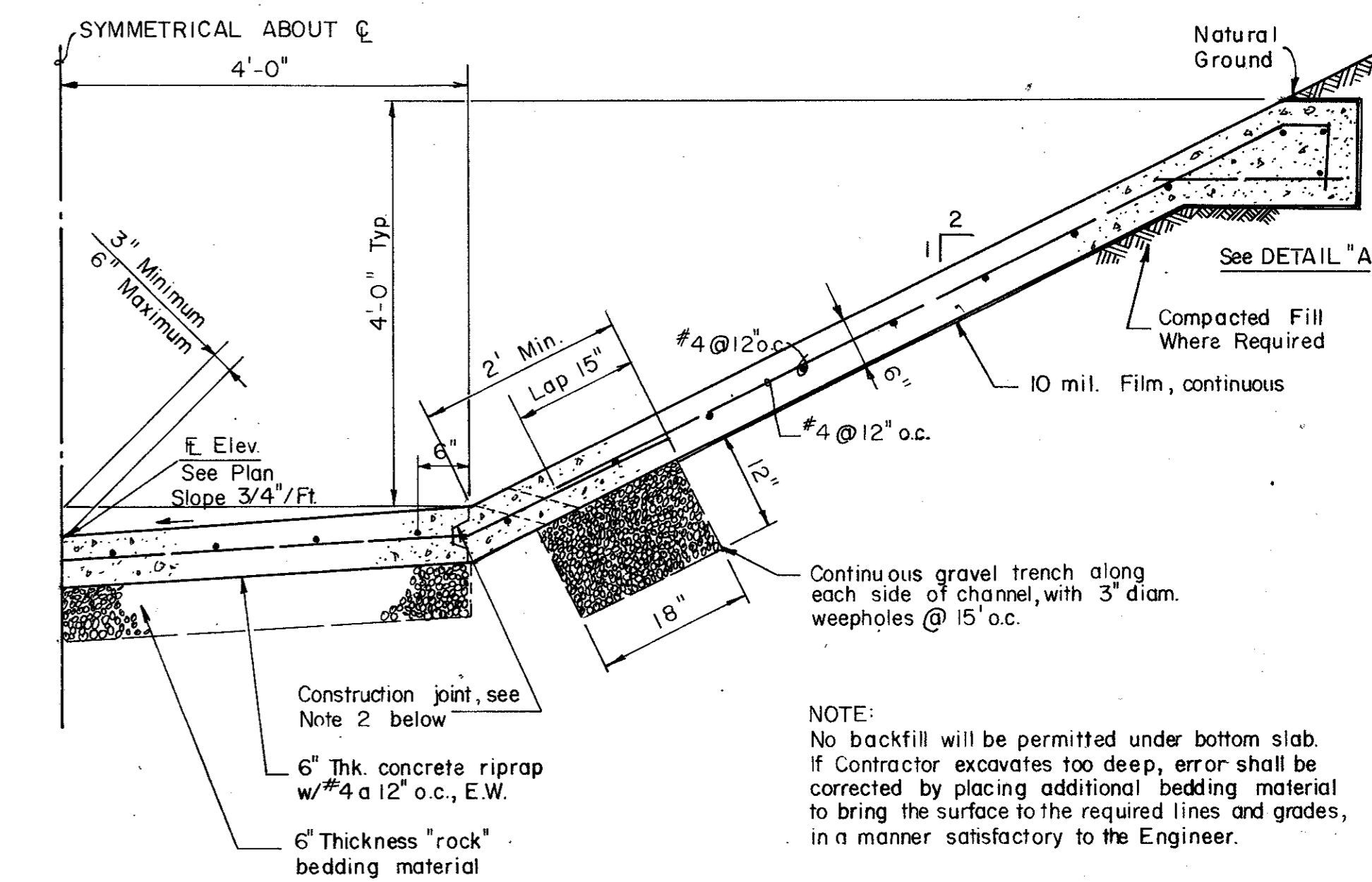
**TYPICAL DITCH SECTIONS**

Scale: 1"=10' Horiz, 1"=5' Vert.

1. CONCRETE SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 3000 psi @ 28 DAYS.
2. CONSTRUCTION JOINTS WHERE BOTTOM SLOPE MEETS SIDE SLOPE IS OPTIONAL; MONOLITHIC CONSTRUCTION MAY BE USED.
3. USE A FLOAT FINISH ON BOTTOM AND SLOPED SURFACES (TO BE EXPOSED).
4. ALL REINF. STEEL SHALL BE #4 @ 12" o.c., E.W. UNLESS OTHERWISE NOTED.
5. PROVIDE TRANSVERSE EXPANSION JOINTS AT 80' o.c., TOOLED JOINTS AT 20' o.c.. CONSTRUCTION JOINTS MAY BE USED IN LIEU OF TOOLED JOINTS. JOINTS SHALL EXTEND UP SIDE SLOPES.
6. DESIGNATION OF TYPICAL SECTIONS BY STATIONS IS APPROXIMATE AND MAY BE MODIFIED AS FIELD CONDITIONS DICTATE.

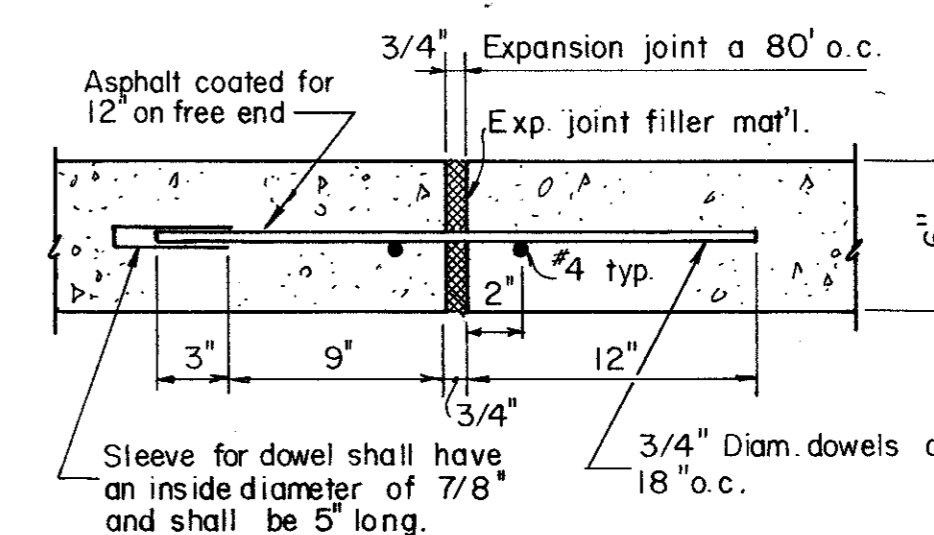


**DETAIL "A"**  
1"=1'-0"

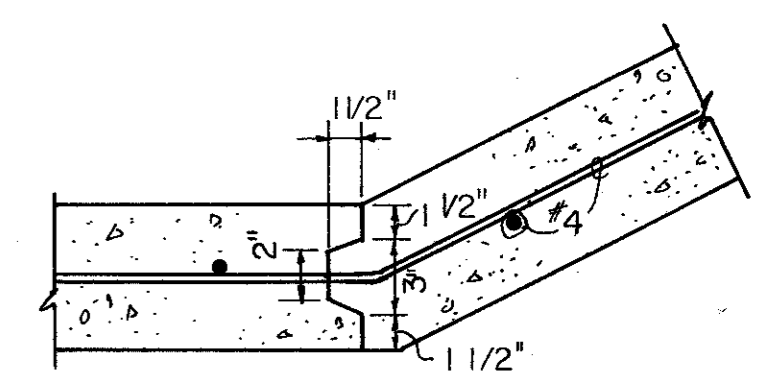


**TYPICAL CHANNEL SECTION**  
3/4"=1'-0"

NOTE:  
No backfill will be permitted under bottom slab. If Contractor excavates too deep, error shall be corrected by placing additional bedding material to bring the surface to the required lines and grades, in a manner satisfactory to the Engineer.



**TRANSVERSE EXPANSION JOINT**  
1 1/2"=1'-0"



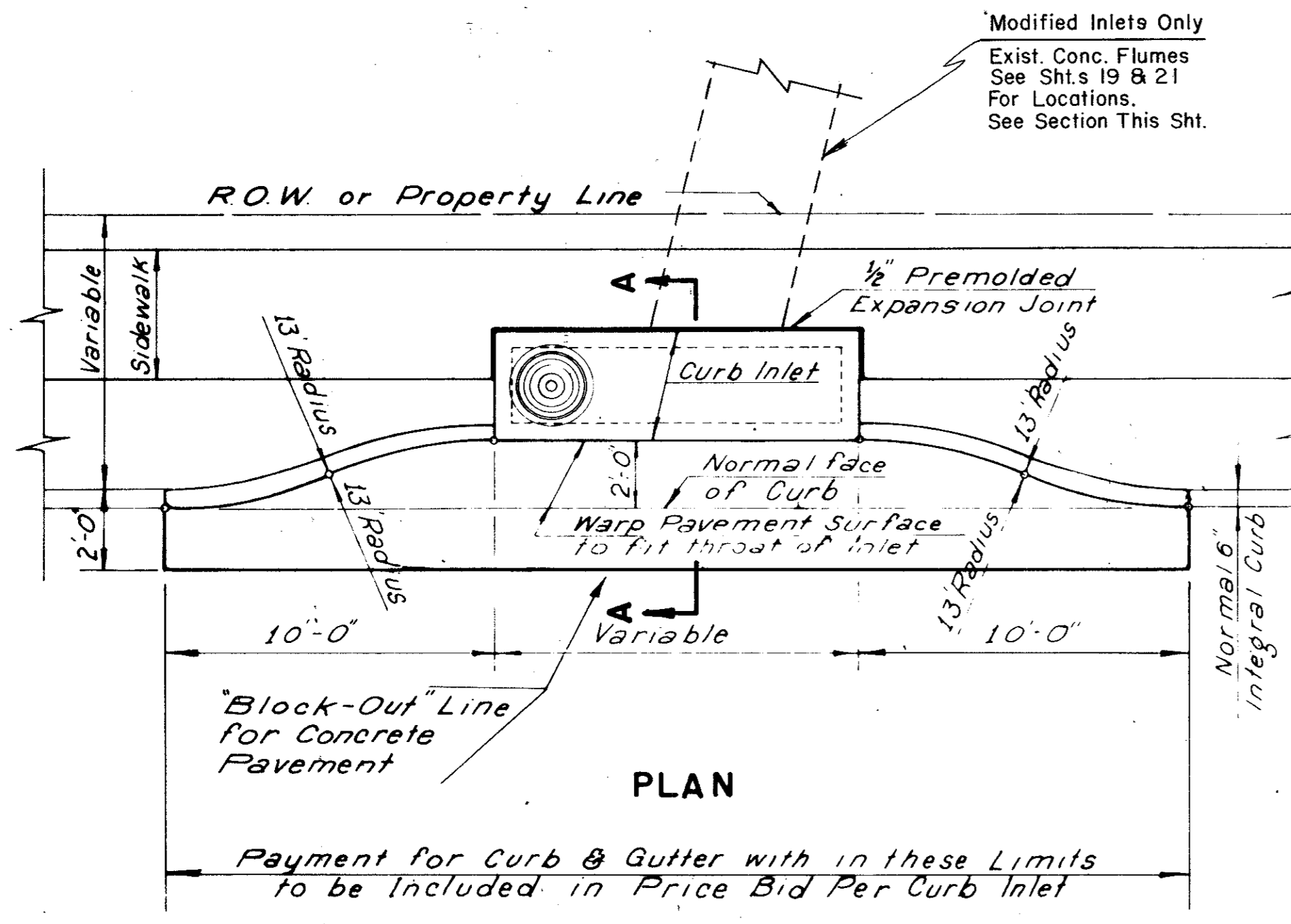
**CONSTRUCTION JOINT**  
1 1/2"=1'-0"

<b>CITY OF ADDISON</b>			
<b>DRAINAGE DITCH DETAILS</b>			
<b>MIDWAY ROAD IMPROVEMENTS</b>			
GINN, INC., Consulting Engineers, Dallas, Texas			
Designed-G.F.	Drawn-G.F.	Date- MARCH, 1981	
Approved-	Checked-	Scale- AS SHOWN	Sheet 32 of



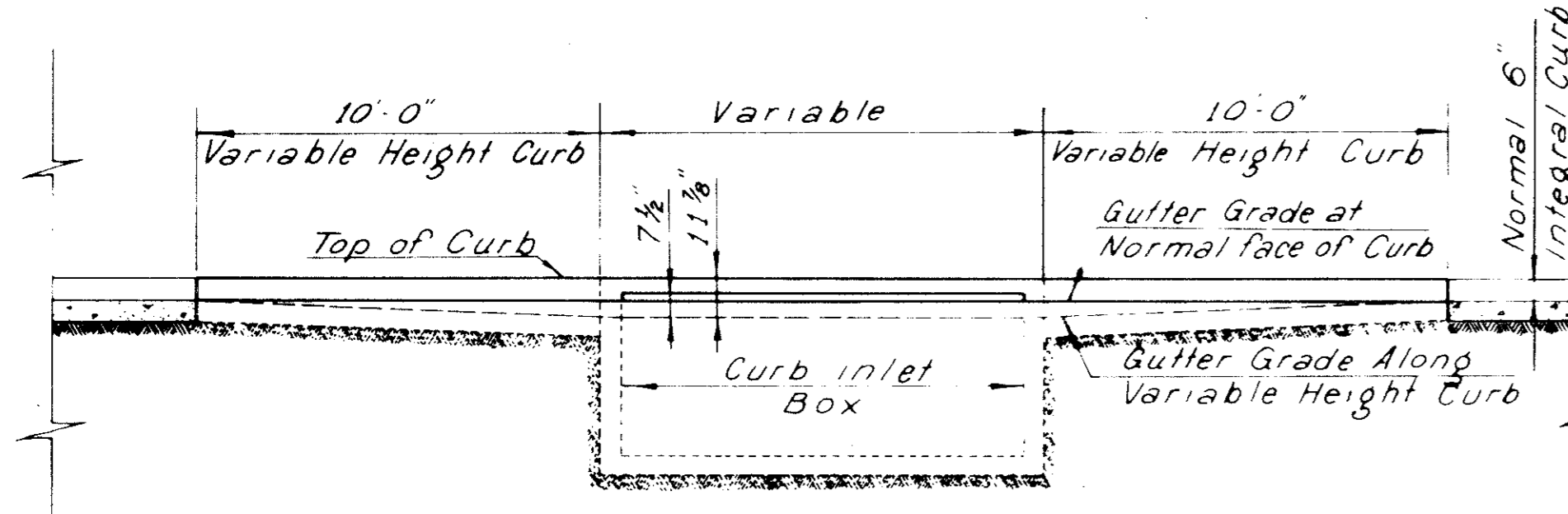




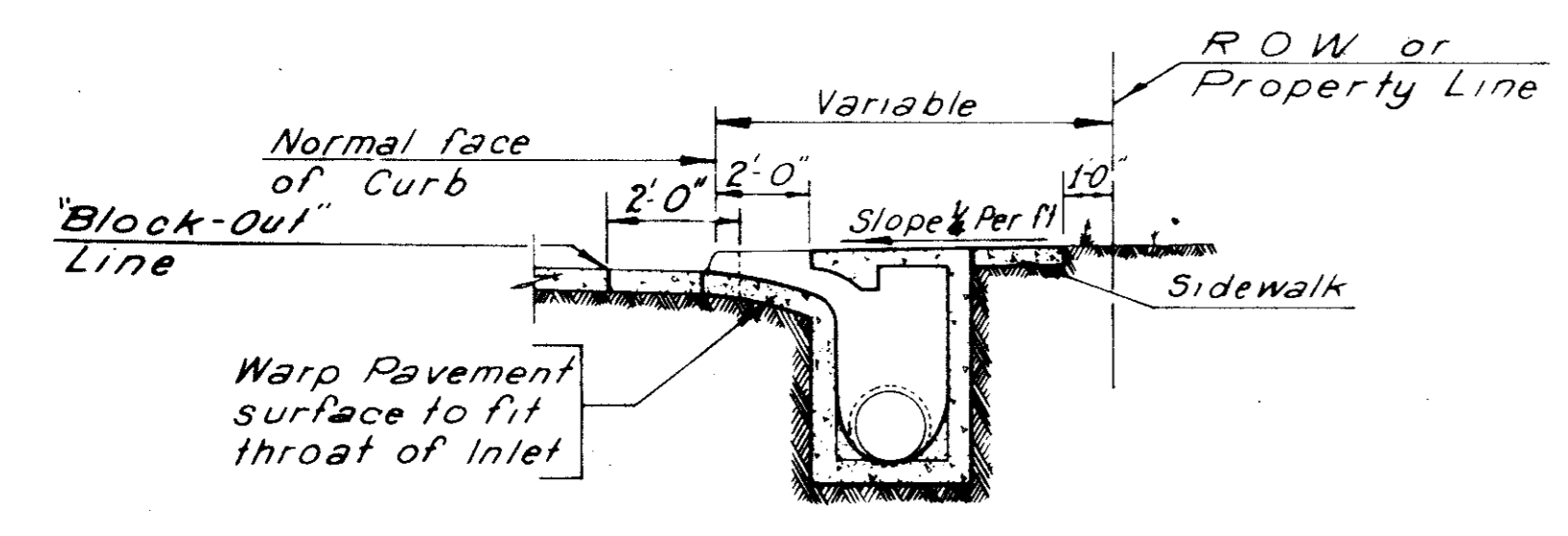


PLAN

Payment for Curb & Gutter with in these Limits to be Included in Price Bid Per Curb Inlet

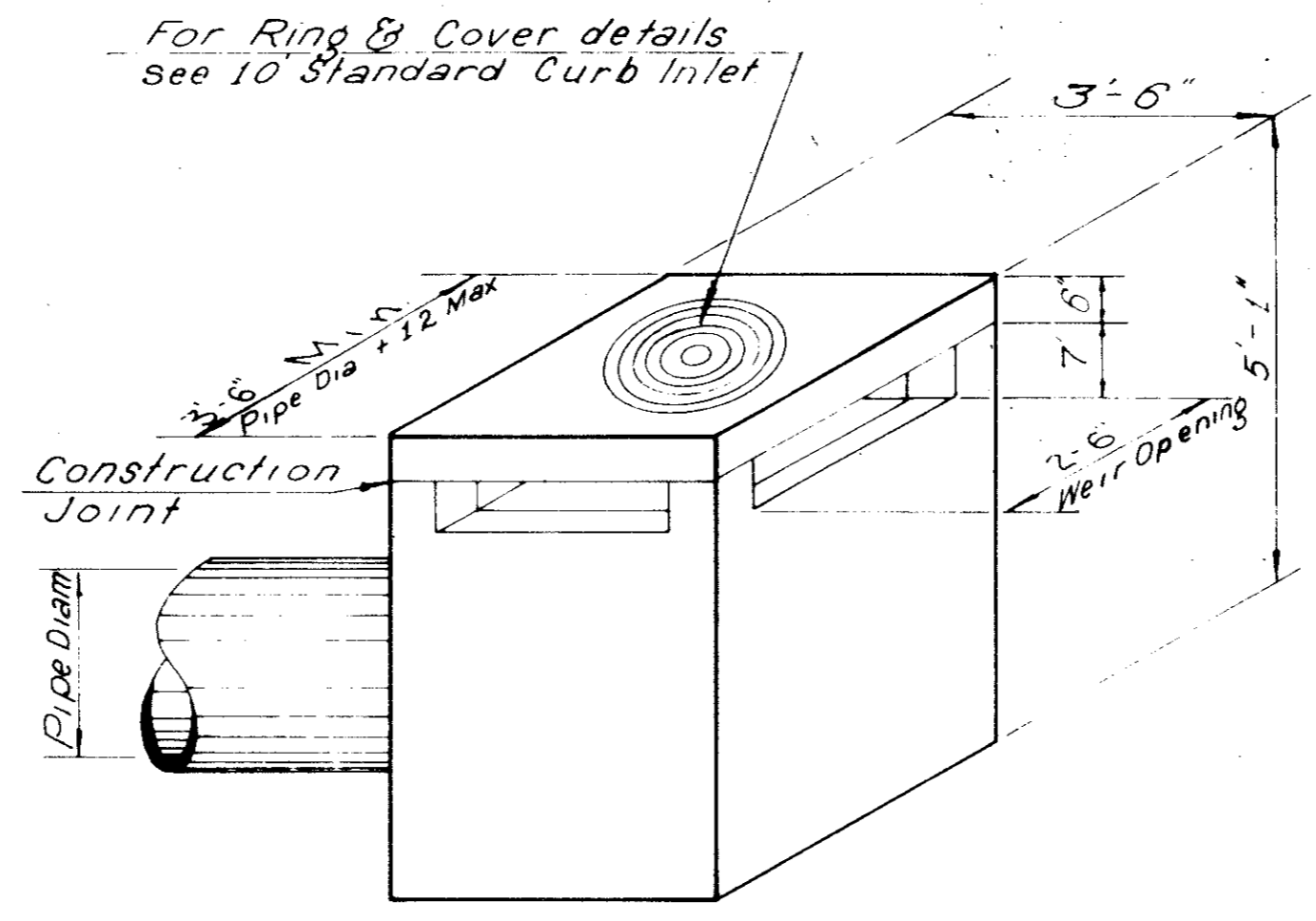


ELEVATION



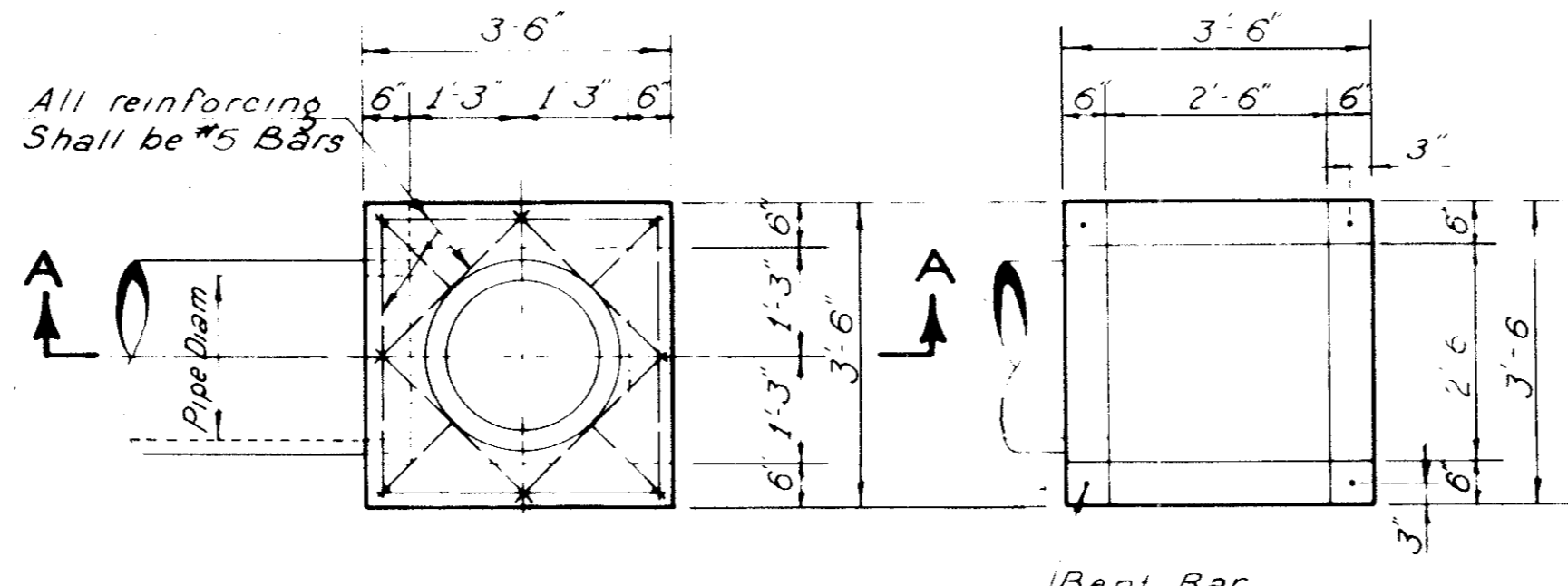
SECTION A-A

RECESSED STORM SEWER CURB INLET  
SCALE: 1/4" = 1'-0"



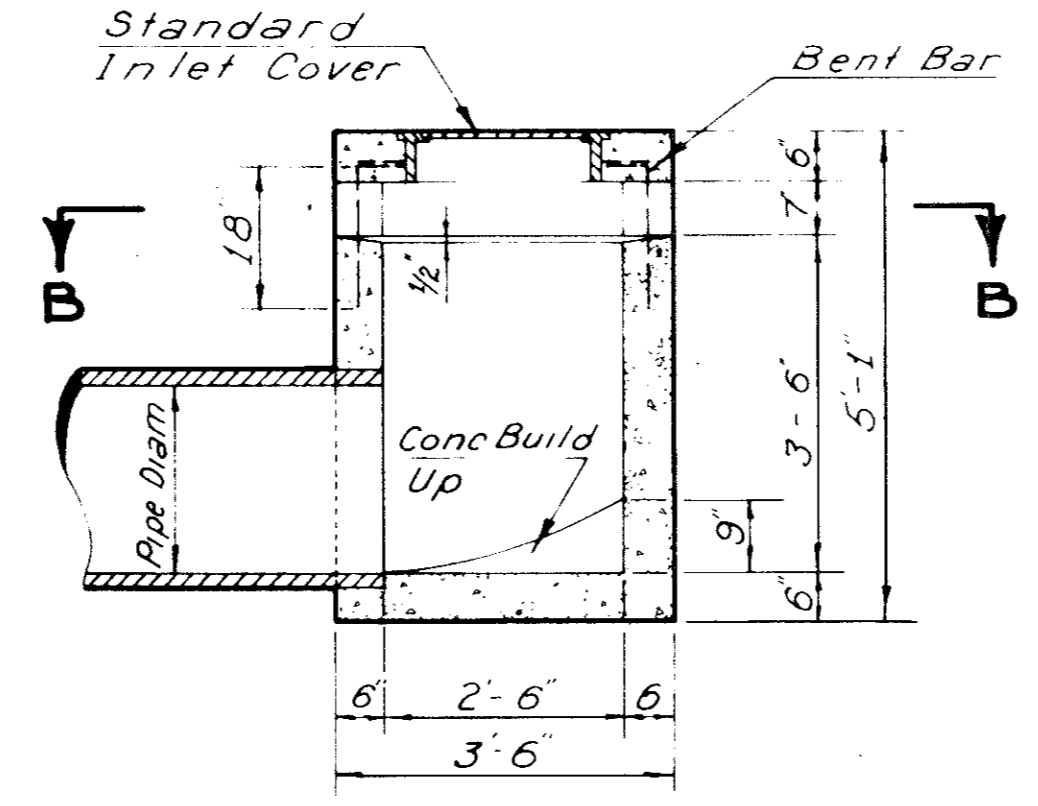
ISOMETRIC DETAIL

NOTE:  
Type 'X' Inlet - Weir opening are required on four sides  
Type 'Y' Inlet - Weir opening are required on two opposite sides



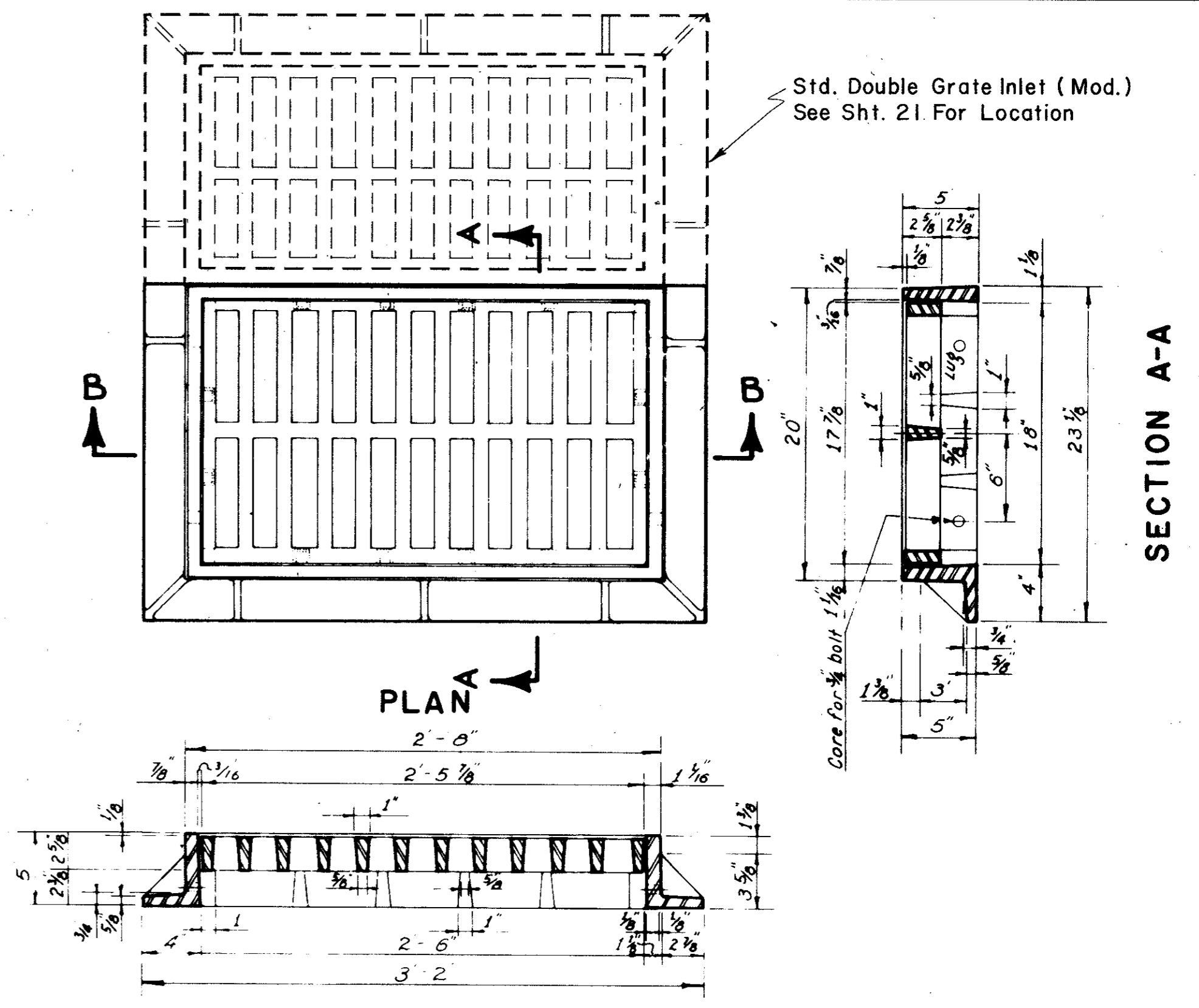
PLAN

SECTION B-B



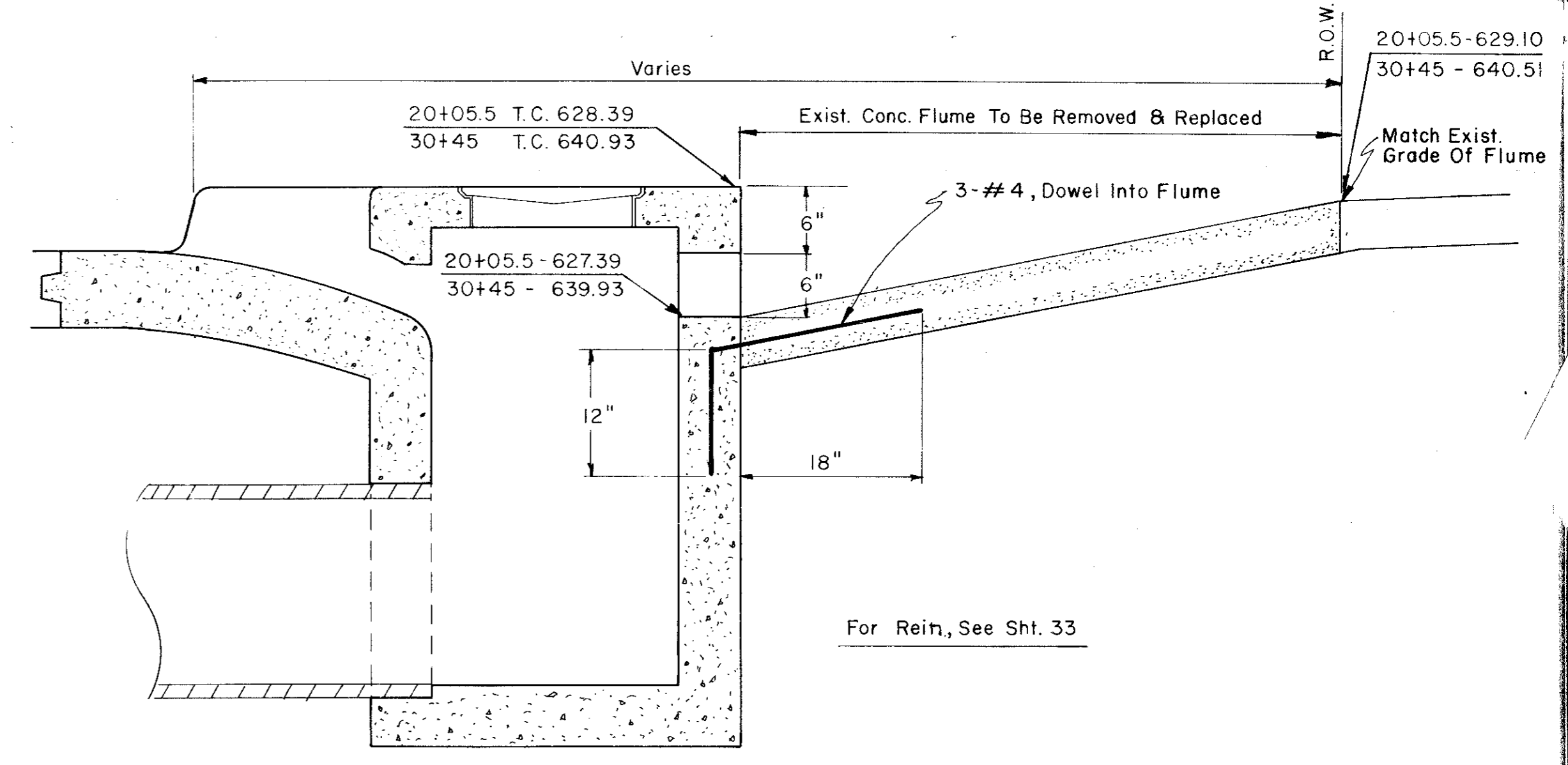
SECTION A-A

STANDARD TYPE "X" & "Y" INLETS  
SCALE: 1/2" = 1'-0"  
NOT IN CONTRACT



SECTION B-B

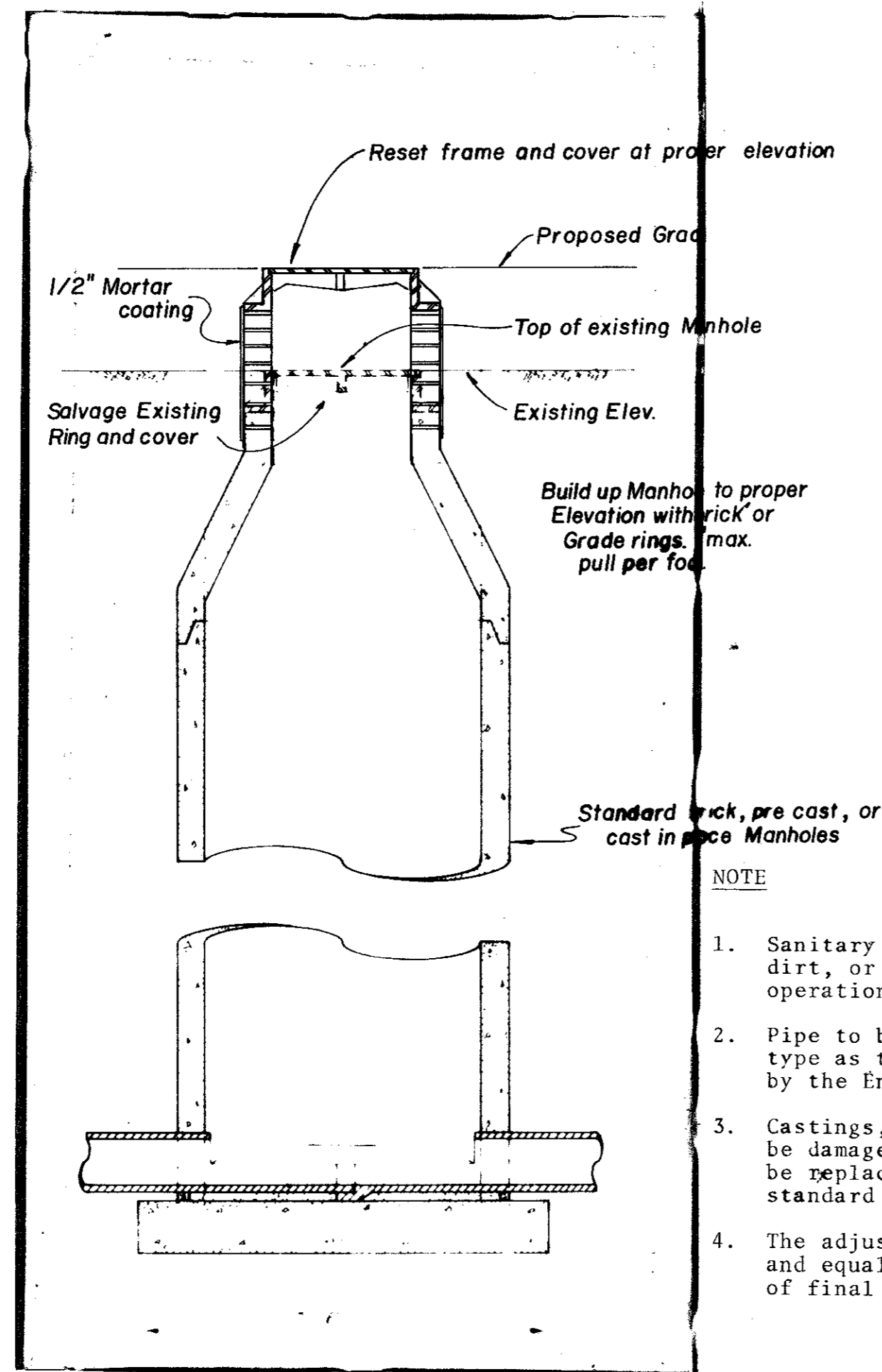
INLET GRATE & FRAME  
SCALE: 1/2" = 1'-0"



10' MODIFIED RECESSED INLET  
(STA. 20+05.5 AND STA. 30+45)

CITY OF ADDISON			
MIDWAY ROAD IMPROVEMENTS			
RECESSED CURB INLET DETAILS			
BIN, NC Consulting Engineers			
DESIGN	BY S.M.M.	DATE	11-20-1980
PREP. BY	G.F.	SCALE	NONE
			SHEET 34 OF

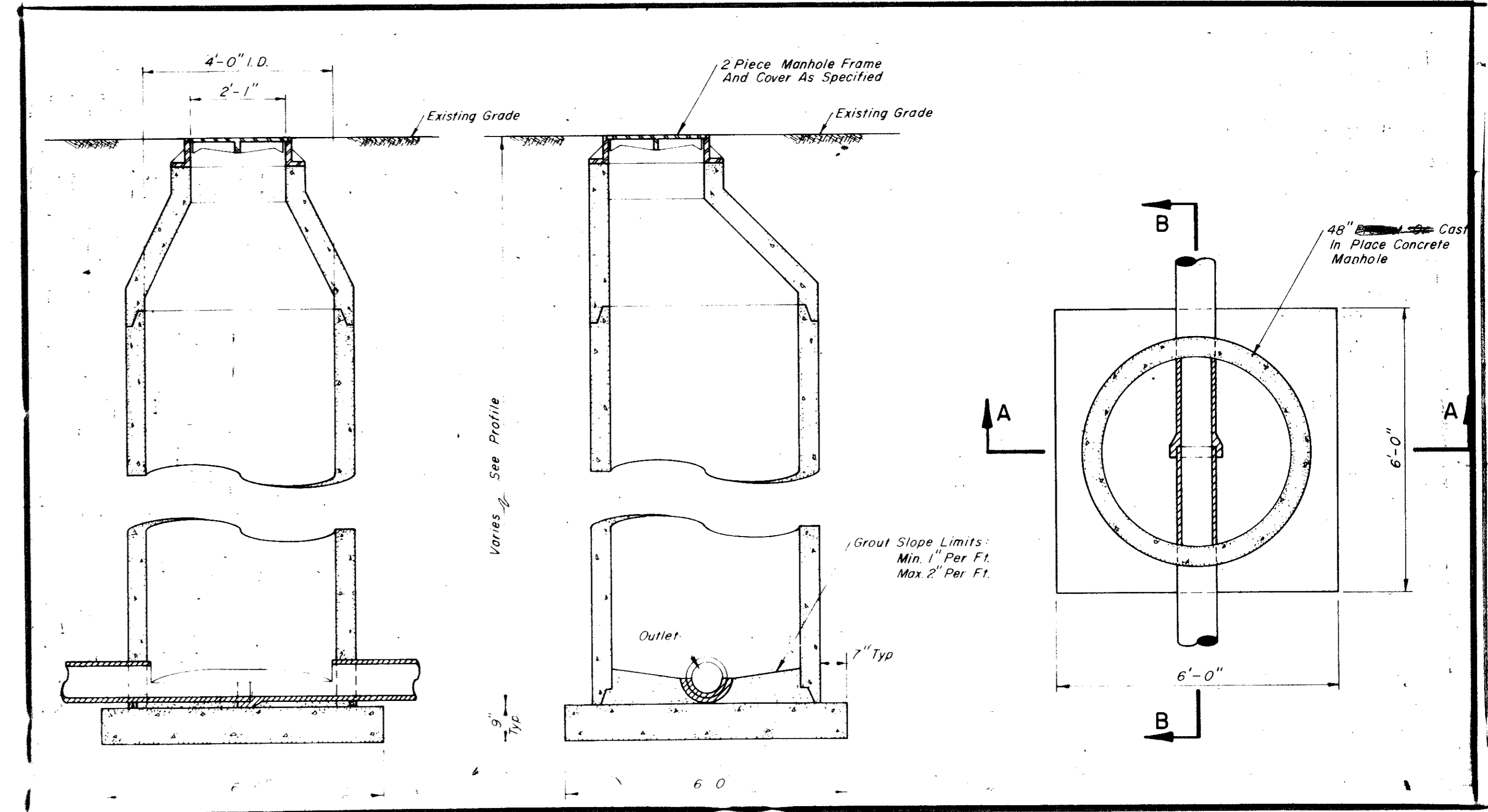




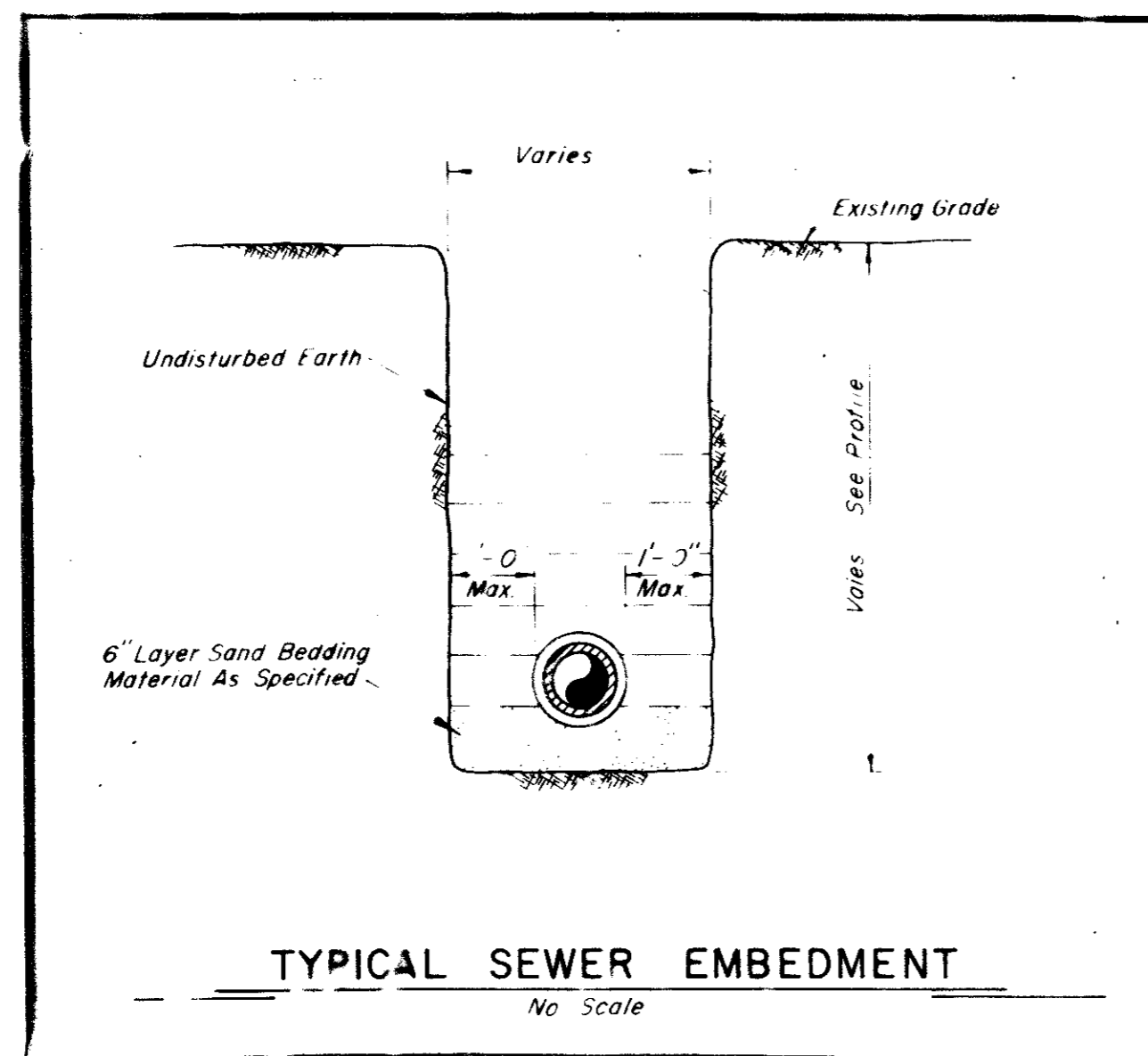
**NOTE**

- Sanitary sewer shall be kept clear of broken concrete, dirt, or any other debris resulting from construction operations.
- Pipe to be extended or replaced will be of the same type as the existing unless alternate type is approved by the Engineer.
- Castings, covers or any other material parts which may be damaged or lost by the contractor's operations will be replaced at the contractor's expense with City standard appurtenances.
- The adjusted facilities must be clean, fully operational and equal in quality with new construction at the time of final inspection of the project.

**TYPICAL MANHOLE ADJUSTMENT**

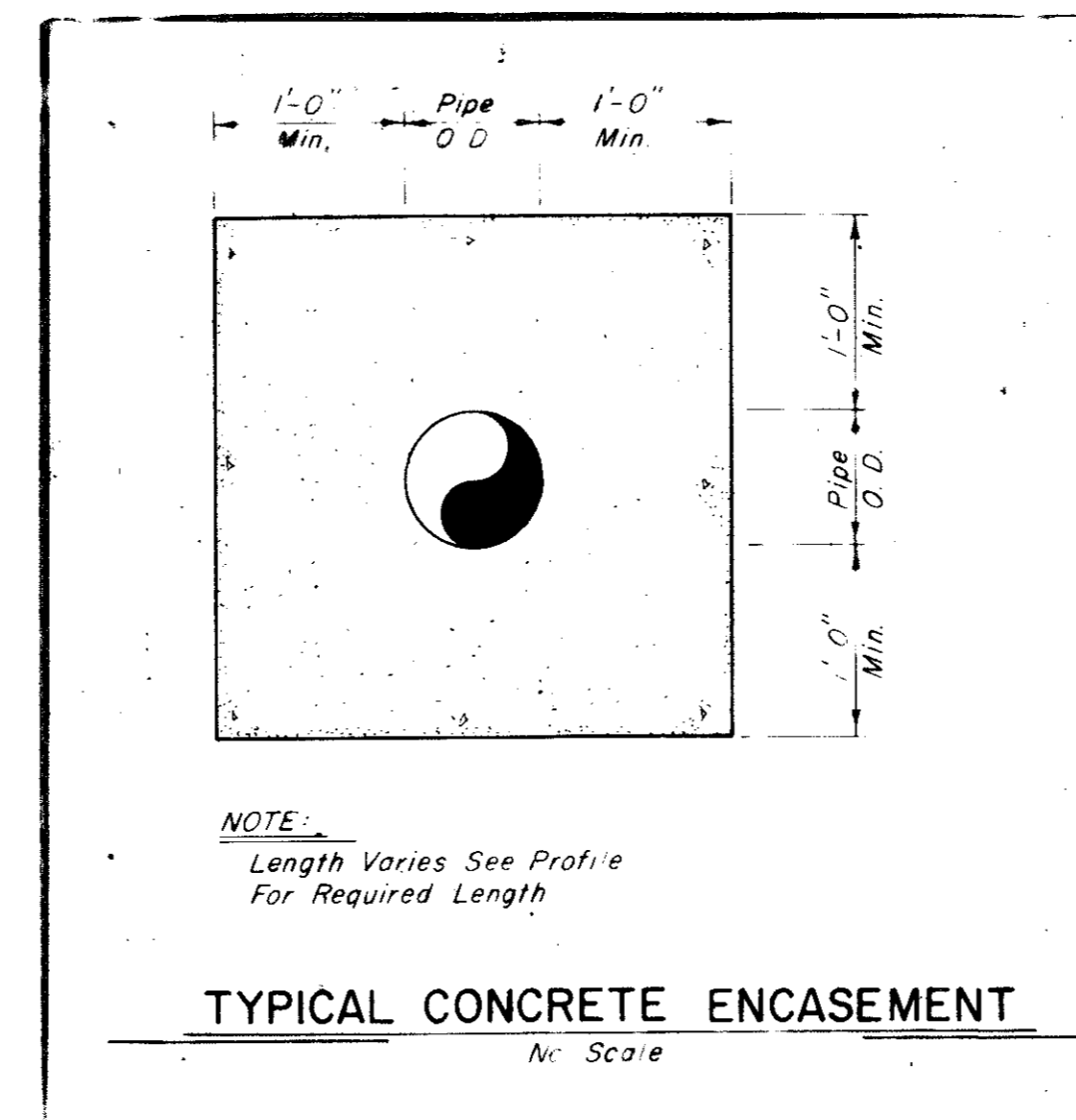


**TYPICAL MANHOLE DETAIL**



**TYPICAL SEWER EMBEDMENT**

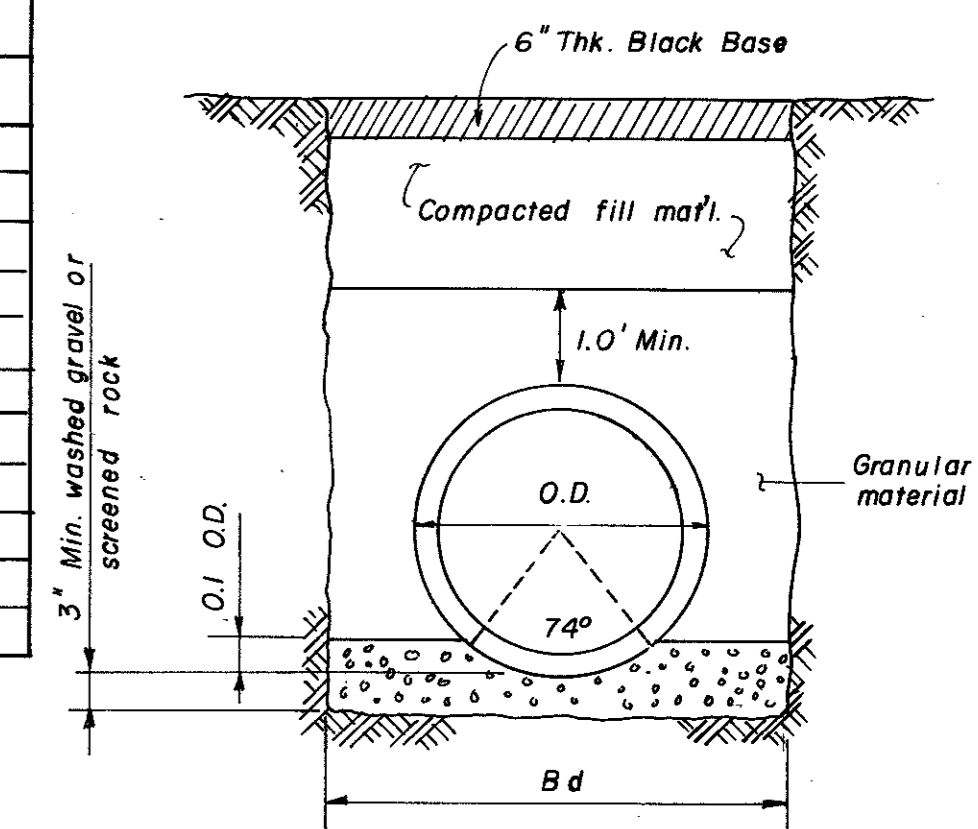
No Scale



**TYPICAL CONCRETE ENCASEMENT**

No Scale

PIPE DIA.		B d	CUBIC YARDS PER 100 L.F.	
I. D.	O. D.		GRAVEL	GRANULAR MATERIAL
15"	19"	39"	4.53	22.28
18"	22.5"	42"	5.13	25.15
21"	26"	45"	5.76	28.03
24"	29.5"	48"	6.42	30.94
27"	33"	51"	7.11	33.86
30"	37"	54"	7.85	36.72
33"	40.5"	57"	8.59	39.64
36"	44"	60"	9.36	42.58
39"	47.5"	63"	10.16	45.53
42"	51"	66"	10.99	48.51
48"	58"	72"	12.72	54.51



**STORM SEWER EMBEDMENT**

**CITY OF ADDISON**

**MIDWAY ROAD IMPROVEMENTS**

**TYPICAL MANHOLE STANDARD DET.**

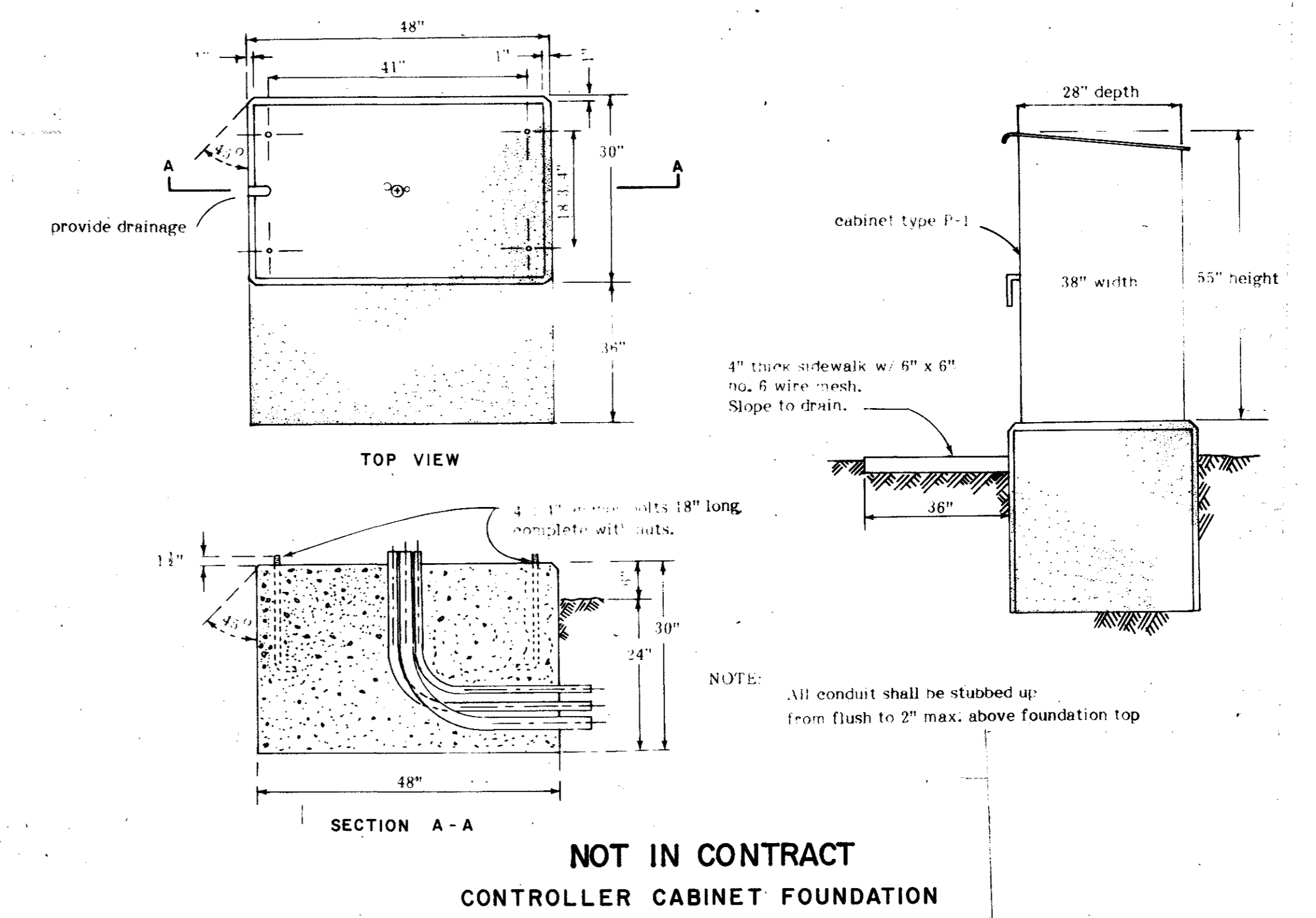
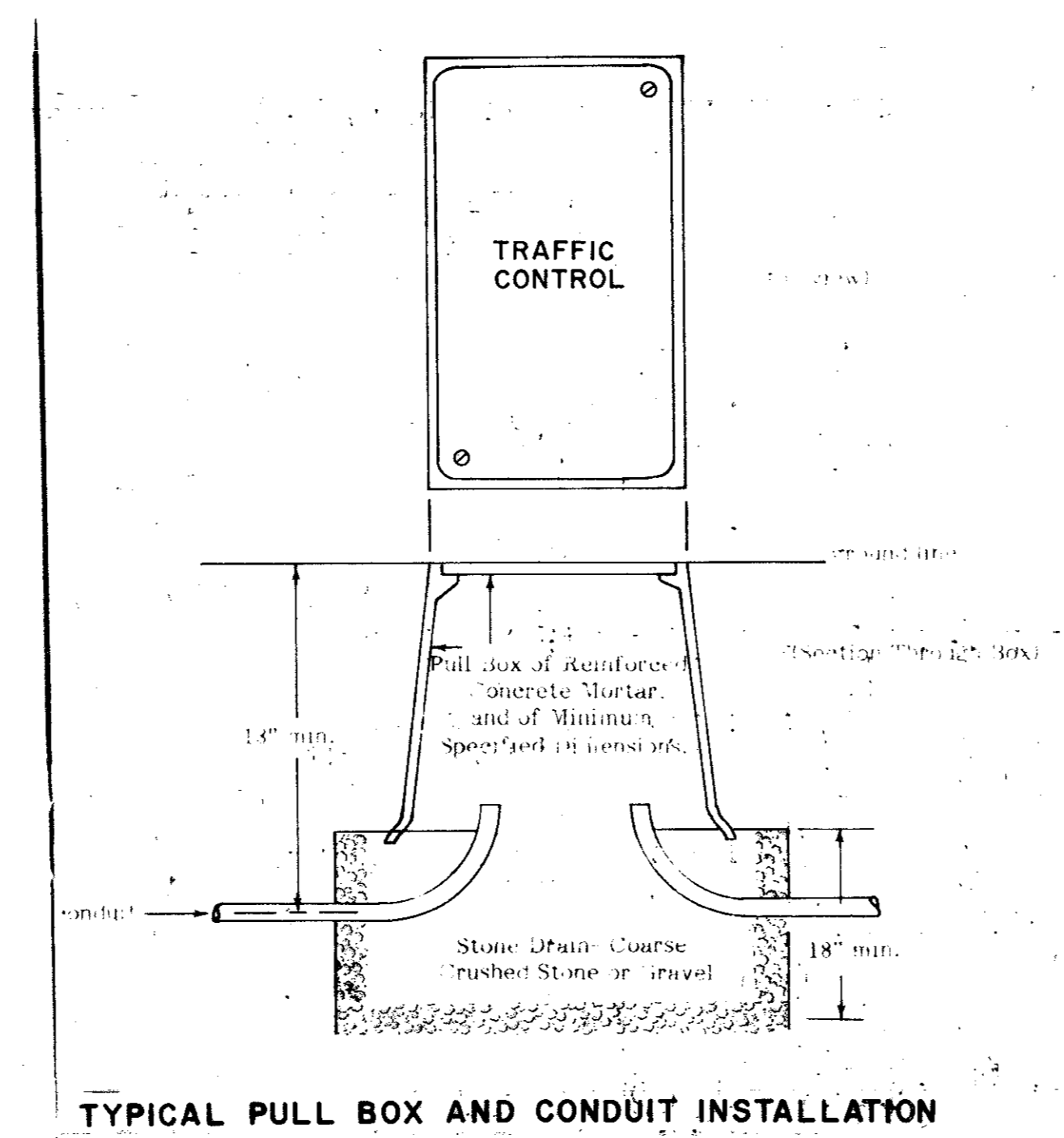
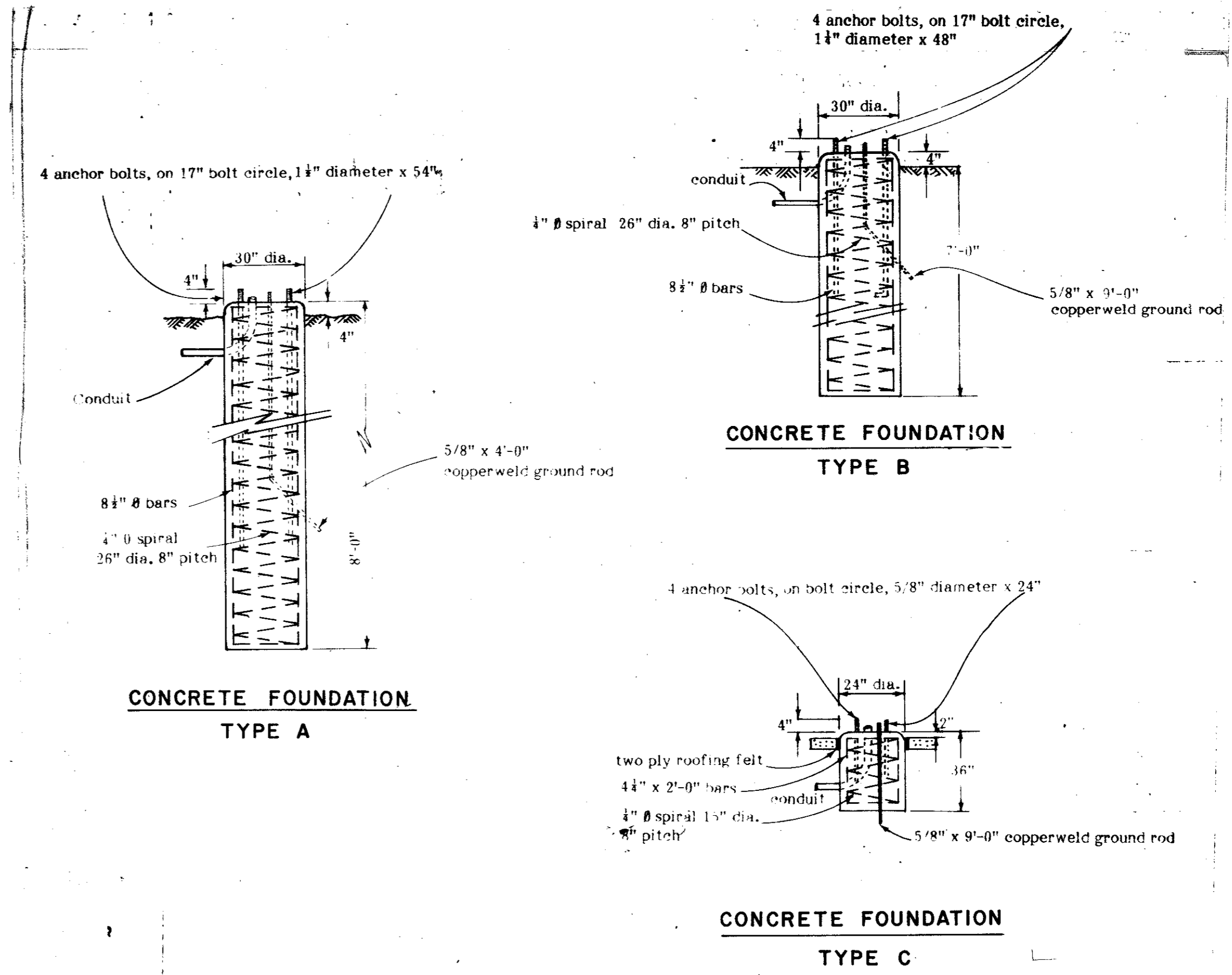
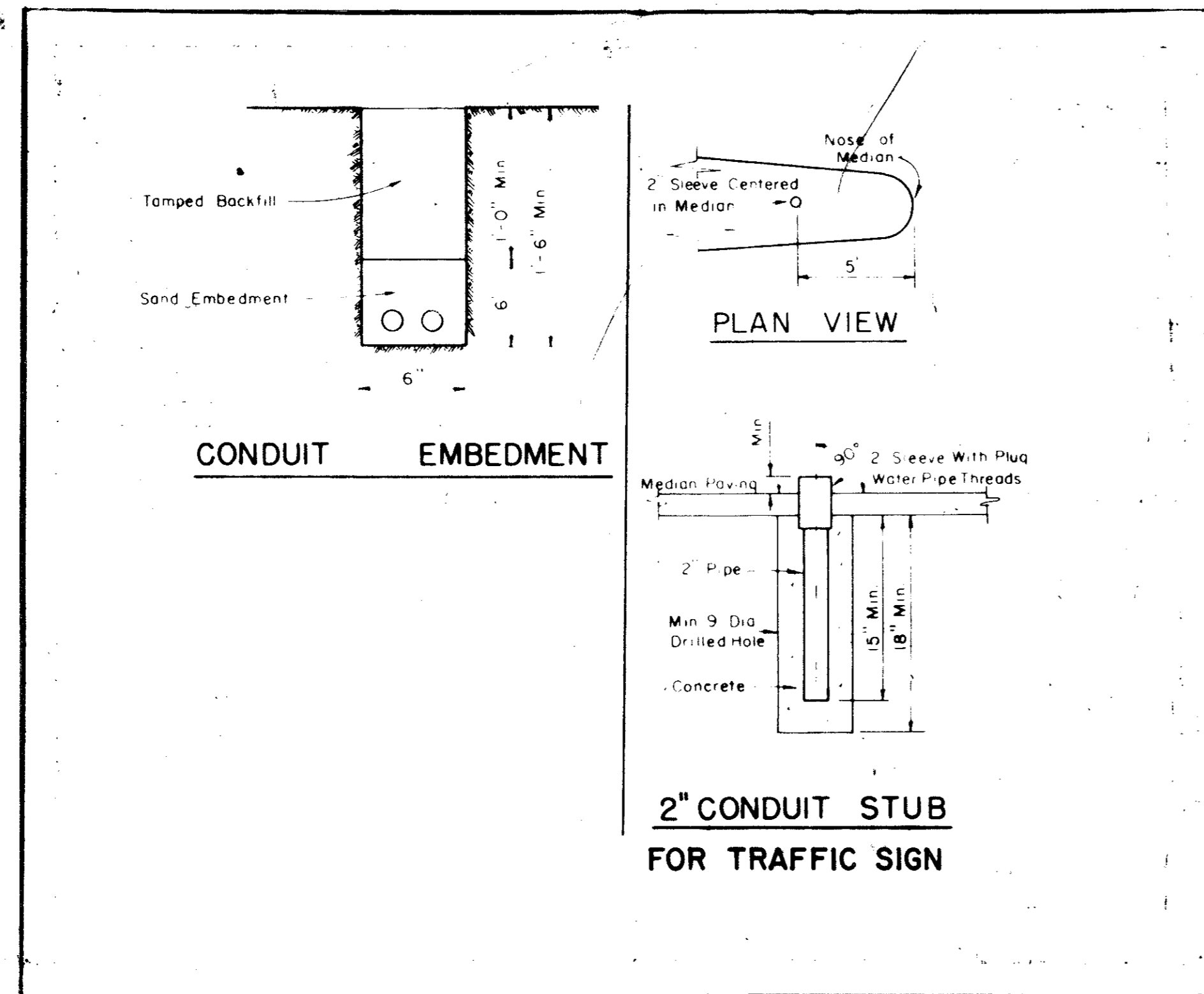
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GINN, INC., Consulting Engineers

DESIGNED - DRAWN - R.G.B. DATE - March, 1981

APPROVED - CHECKED - SCALE - None SHEET 35 OF

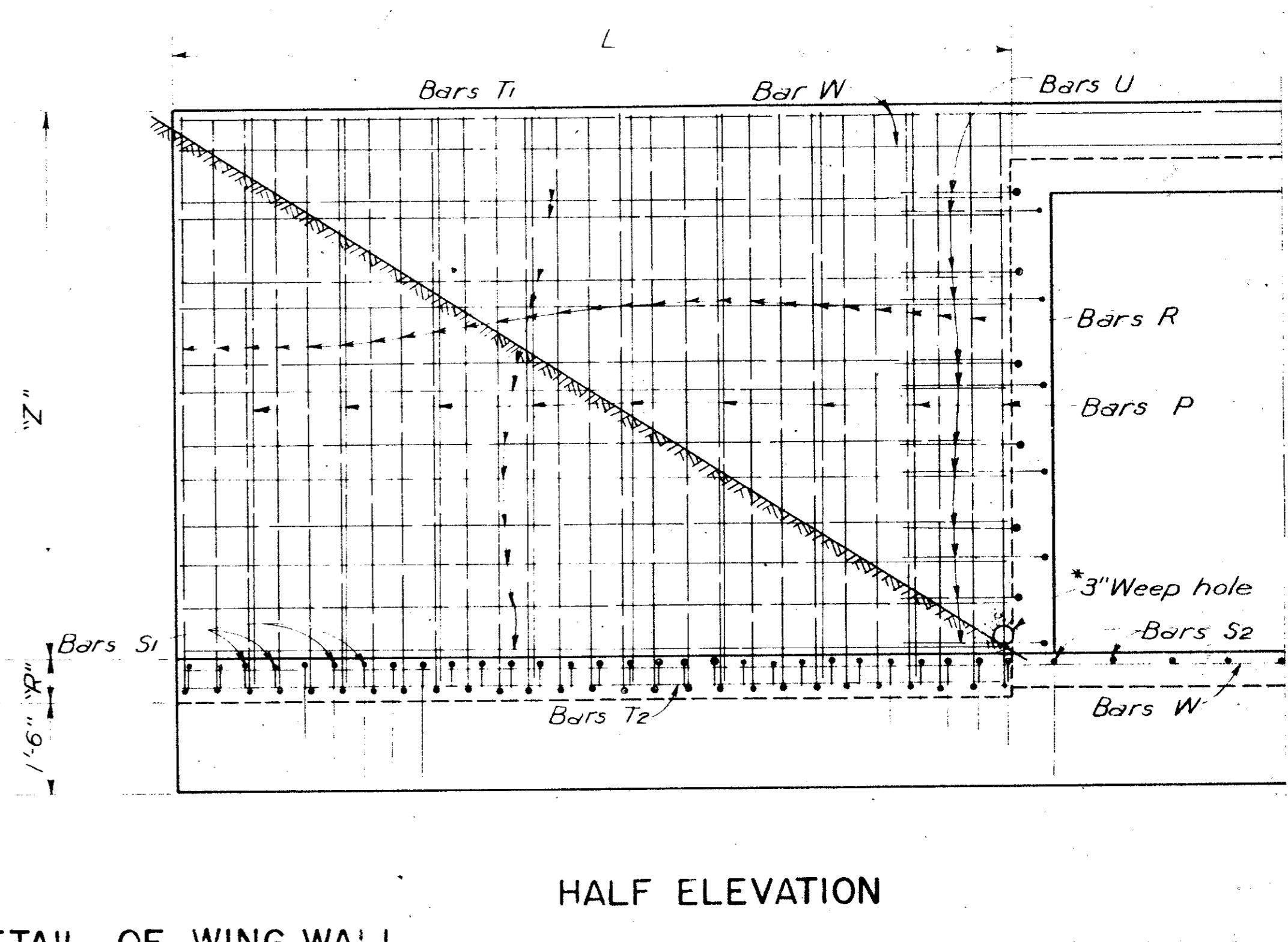
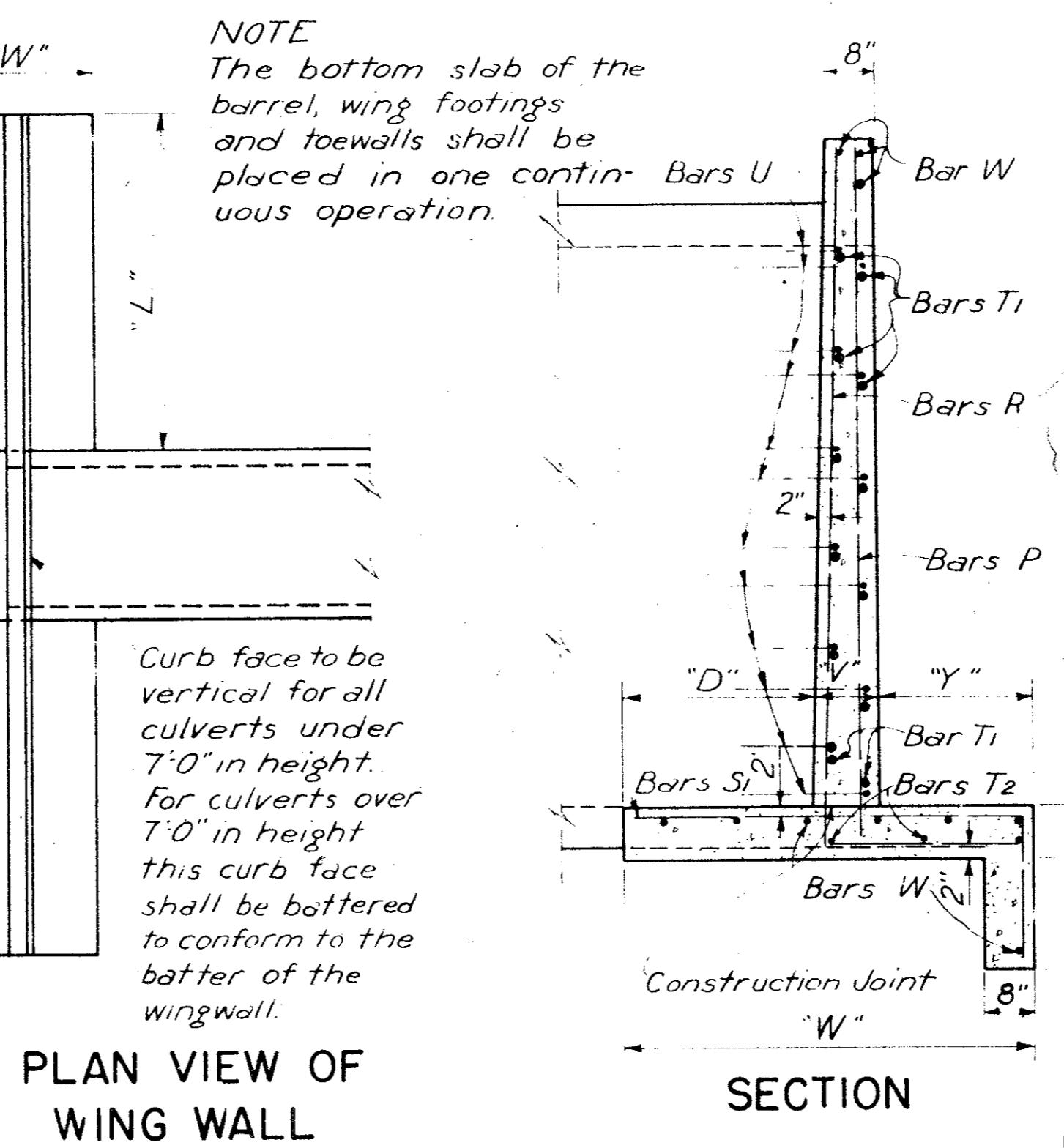
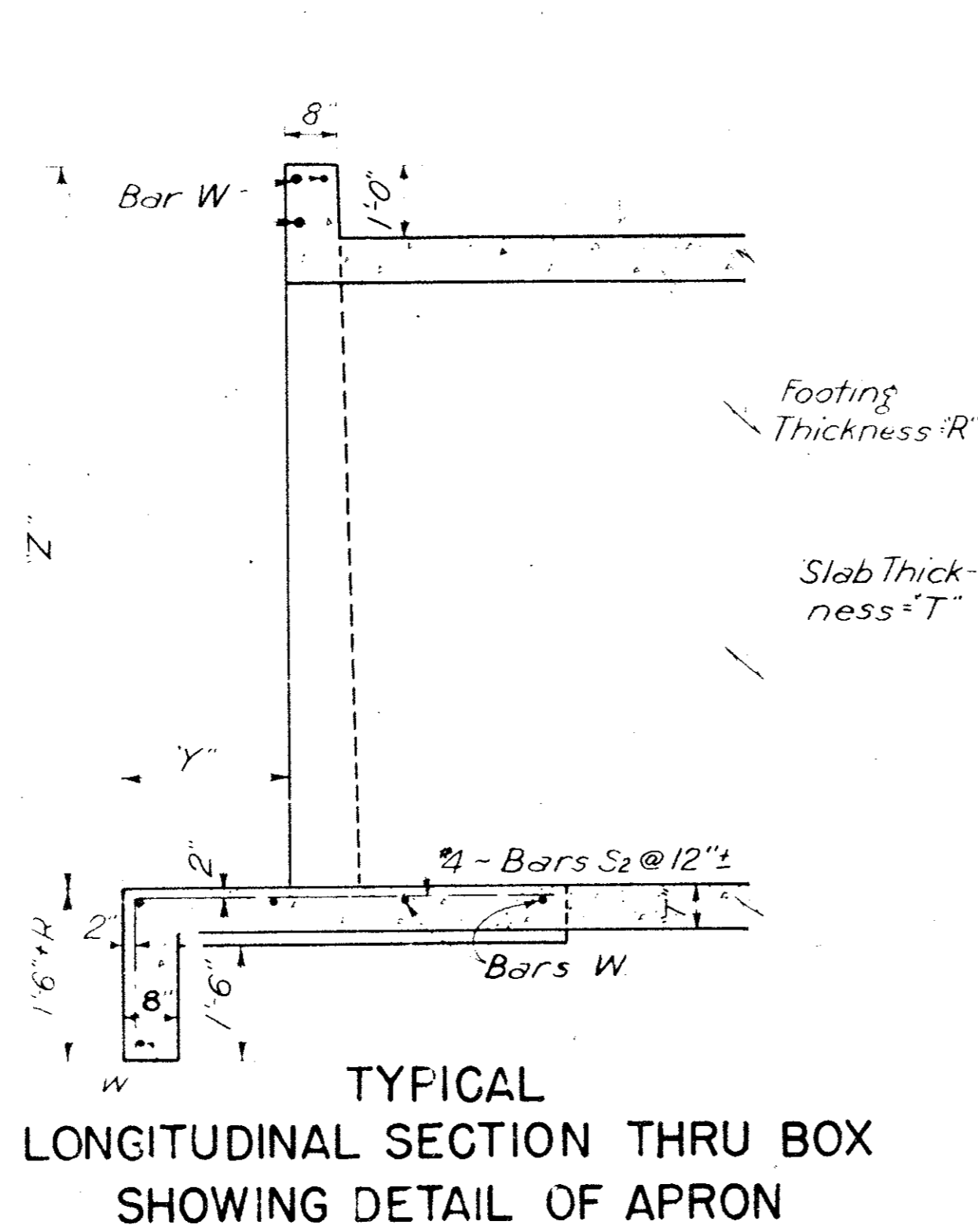




CITY OF ADDISON DALLAS COUNTY, TEXAS			
<b>TYPICAL PULL BOX DETAILS</b>			
GINN, INC. Consulting Engineers - Dallas, Texas			
DESIGNED - H.K.	DRAWN - S.M.M.	DATE - March, 1981	
APPROVED - H.W.G.	CHECKED - H.B.J.	SCALE - NONE	SHEET 36 OF



CULVERT SIZE	SLAB DEPTH	MAX WING HEIGHT	WING LENGTH	TOTAL QUANT. 4 WING WALLS		TABLE OF DIMENSIONS		WING SIZE		BARS R		BARS S <sub>1</sub>		#4 BARS T <sub>1</sub> @ 18"±		#4 BARS T <sub>2</sub> @ 12"±		BARS U		#4 BARS P @ 18"±		#4 BARS W @ 12"±		TOTAL WEIGHT																	
				CY	LB	R	V	D	Y	Z	L	NO	SIZE	SPAC	LENGTH	WEIGHT	NO	SIZE	SPAC	LENGTH	WEIGHT	NO	SIZE		SPAC	LENGTH	WEIGHT	NO	SIZE	SPAC	LENGTH	WEIGHT	NO	SIZE	SPAC	LENGTH	WEIGHT				
3 x 2	6"	14"	3'-6"	5'-3"	4.10	558	6 1/2"	2'-6"	8"	10'	1'-0"	3'-6"	5'-3"	24	#4	12"	5'-1"	81	24	#4	12"	3'-11"	63	16	5'-0"	53	8	5'-0"	27	16	#5	18"	6'-0"	100	20	3'-9"	50	28	8'-9"	164	538
3 x 3	6"	14"	4'-6"	6'-9"	6.11	818	7"	2'-10"	8"	1'-2"	1'-0"	4'-6"	6'-9"	32	#4	11"	6'-1"	130	32	#4	11"	4'-3"	91	24	6'-6"	104	8	6'-6"	35	24	#5	18"	6'-0"	150	24	4'-9"	76	28	11'-3"	210	796
4 x 2	6"	12"	3'-6"	5'-3"	4.21	564	6 1/2"	2'-6"	8"	10'	1'-0"	5'-6"	8'-3"	60	#4	7"	7'-3"	291	60	#4	7"	4'-10"	194	32	8'-0"	171	8	8'-0"	43	32	#5	18"	6'-0"	200	28	5'-9"	108	32	13'-3"	283	1290
4 x 3	6"	12"	4'-6"	6'-9"	6.23	824	7"	2'-10"	8"	1'-2"	1'-0"	6'-6"	9'-9"	56	#5	8 1/2"	8'-5"	492	60	#5	8"	5'-5"	339	32	9'-6"	203	12	9'-6"	76	32	#5	18"	6'-0"	200	32	6'-9"	144	36	15'-9"	379	1833
4 x 4	6"	12"	5'-6"	8'-3"	8.75	1322	7"	3'-5"	8"	1'-7"	1'-2"	7'-6"	11'-3"	80	#5	7"	9'-10"	820	80	#5	7"	6'-1"	507	40	11'-0"	294	12	11'-0"	88	40	#5	18"	6'-0"	250	36	7'-9"	186	36	17'-3"	415	2560
5 x 2	6"	8"	3'-6"	5'-3"	4.33	569	7"	2'-6"	8"	10'	1'-0"	8'-6 1/2"	12'-10"	112	#5	5 1/2"	11'-4"	1324	104	#5	6"	6'-7"	714	48	12'-7"	403	12	12'-7"	101	48	-5	18"	6'-0"	300	40	8'-9"	234	40	18'-11"	505	3581
5 x 3	6"	8"	4'-6"	6'-9"	6.34	829	7"	2'-10"	8"	1'-2"	1'-0"	9'-6 1/2"	14'-4"	108	#6	6 1/2"	12'-9"	2068	116	#6	6"	7'-4"	1277	48	14'-1"	452	16	14'-1"	150	48	-5	18"	6'-0"	300	44	9'-9"	287	44	20'-6"	603	5137
5 x 4	6"	8"	5'-6"	8'-3"	8.87	1328	7"	3'-5"	8"	1'-7"	1'-2"	10'-7"	15'-10"	140	#6	5 1/2"	14'-4"	3013	140	#6	5 1/2"	7'-11"	1665	56	15'-7"	583	16	15'-7"	167	56	-5	18"	6'-0"	350	48	10'-10"	347	44	22'-0"	647	6772
5 x 5	6"	8"	6'-6"	9'-9"	11.86	1876	7"	4'-0"	8"	2'-0"	1'-4"	11'-7"	17'-4"	168	#6	5"	15'-9"	3974	168	#6	5"	8'-7"	2165	64	17'-1"	730	16	17'-1"	183	64	-5	18"	6'-0"	401	52	11'-10"	411	48	23'-6"	754	8618



NOTE  
The bottom slab of the barrel, wing footings and toe walls shall be placed in one continuous operation.

Curb face to be vertical for all culverts under 7'0" in height. For culverts over 7'0" in height this curb face shall be battered to conform to the batter of the wing wall.

WING WALL HEIGHT	WING WALL LENGTH	NO. BARS	SIZE	SPACING	WEIGHT
3'-0"	3'-6"	20	#4	12"	71
3'-6"	4'-0"	26	#4	12"	78
4'-0"	4'-6"	31	#4	12"	85
4'-6"	5'-0"	36	#4	12"	92
5'-0"	5'-6"	41	#4	12"	99
5'-6"	6'-0"	46	#4	12"	106
6'-0"	6'-6"	51	#4	12"	113
6'-6"	7'-0"	56	#4	12"	120
7'-0"	7'-6"	61	#4	12"	127
7'-6"	8'-0"	66	#4	12"	134
8'-0"	8'-6"	71	#4	12"	141
8'-6"	9'-0"	76	#4	12"	148
9'-0"	9'-6"	81	#4	12"	155
9'-6"	10'-0"	86	#4	12"	162
10'-0"	10'-6"	91	#4	12"	169
10'-6"	11'-0"	96	#4	12"	176
11'-0"	11'-6"	101	#4	12"	183
11'-6"	12'-0"	106	#4	12"	190
12'-0"	12'-6"	111	#4	12"	197
12'-6"	13'-0"	116	#4	12"	204
13'-0"	13'-6"	121	#4	12"	211
13'-6"	14'-0"	126	#4	12"	218
14'-0"	14'-6"	131	#4	12"	225
14'-6"	15'-0"	136	#4	12"	232
15'-0"	15'-6"	141	#4	12"	239
15'-6"	16'-0"	146	#4	12"	246
16'-0"	16'-6"	151	#4	12"	253
16'-6"	17'-0"	156	#4	12"	260
17'-0"	17'-6"	161	#4	12"	267
17'-6"	18'-0"	166	#4	12"	274
18'-0"	18'-6"	171	#4	12"	281
18'-6"	19'-0"	176	#4	12"	288
19'-0"	19'-6"	181	#4	12"	295
19'-6"	20'-0"	186	#4	12"	302
20'-0"	20'-6"	191	#4	12"	309
20'-6"	21'-0"	196	#4	12"	316
21'-0"	21'-6"	201	#4	12"	323
21'-6"	22'-0"	206	#4	12"	330
22'-0"	22'-6"	211	#4	12"	337
22'-6"	23'-0"	216	#4	12"	344
23'-0"	23'-6"	221	#4	12"	351
23'-6"	24'-0"	226	#4	12"	358
24'-0"	24'-6"	231	#4	12"	365
24'-6"	25'-0"	236	#4	12"	372
25'-0"	25'-6"	241	#4	12"	379
25'-6"	26'-0"	246	#4	12"	386
26'-0"	26'-6"	251	#4	12"	393
26'-6"	27'-0"	256	#4	12"	400
27'-0"	27'-6"	261	#4	12"	407
27'-6"	28'-0"	266	#4	12"	414
28'-0"	28'-6"	271	#4	12"	421
28'-6"	29'-0"	276	#4	12"	428
29'-0"	29'-6"	281	#4	12"	435
29'-6"	30'-0"	286	#4	12"	442
30'-0"	30'-6"	291	#4	12"	449
30'-6"	31'-0"	296	#4	12"	456
31'-0"	31'-6"	301	#4	12"	463
31'-6"	32'-0"	306	#4	12"	470
32'-0"	32'-6"	311	#4	12"	477
32'-6"	33'-0"	316	#4	12"	484
33'-0"	33'-6"	321	#4	12"	491
33'-6"	34'-0"	326	#4	12"	498
34'-0"	34'-6"	331	#4	12"	505
34'-6"	35'-0"	336	#4	12"	512
35'-0"	35'-6"	341	#4	12"	519
35'-6"	36'-0"	346	#4	12"	526
36'-0"	36'-6"	351	#4	12"	533
36'-6"	37'-0"	356	#4	12"	540
37'-0"	37'-6"	361	#4	12"	547
37'-6"	38'-0"	366	#4	12"	554
38'-0"	38'-6"	371	#4	12"	561
38'-6"	39'-0"	376	#4	12"	568
39'-0"	39'-6"	381	#4	12"	575
39'-6"	40'-0"	386	#4	12"	582
40'-0"	40'-6"	391	#4	12"	589
40'-6"	41'-0"	396	#4	12"	596
41'-0"	41'-6"	401	#4	12"	603
41'-6"	42'-0"	406	#4	12"	610
42'-0"	42'-6"	411	#4	12"	617
42'-6"	43'-0"	416	#4	12"	624
43'-0"	43'-6"	421	#4	12"	631
43'-6"	44'-0"	426	#4	12"	638
44'-0"	44'-6"	431	#4	12"	645
44'-6"	45'-0"	436	#4	12"	652
45'-0"	45'-6"	441	#4	12"	659
45'-6"	46'-0"	446	#4	12"	666
46'-0"	46'-6"	451	#4	12"	673
46'-6"	47'-0"	456	#4	12"	680
47'-0"	47'-6"	461	#4	12"	687
47'-6"	48'-0"	466	#4	12"	694
48'-0"	48'-6"	471	#4	12"	701
48'-6"	49'-0"	476	#4	12"	708
49'-0"	49'-6"	481	#4	12"	715
49'-6"	50'-0"	486	#4	12"	722
50'-0"	50'-6"	491	#4	12"	729
50'-6"	51'-0"	496	#4	12"	736
51'-0"	51'-6"	501	#4	12"	743
51'-6"	52'-0"	506	#4	12"	750
52'-0"	52'-6"	511	#4	12"	757
52'-6"	53'-0"	516	#4	12"	764
53'-0"	53'-6"	521	#4	12"	771
53'-6"	54'-0"	526	#4	12"	778
54'-0"	54'-6"	531	#4	12"	785
54'-6"	55'-0"	536	#4	12"	792
55'-0"	55'-6"	541	#4	12"	799
55'-6"	56'-0"	546	#4	12"	806
56'-0"	56'-6"	551	#4	12"	813
56'-6"	57'-0"	556	#4	12"	820
57'-0"	57'-6"	561	#4	12"	827
57'-6"	58'-0"	566	#4	12"	834
58'-0"	58'-6"	571	#4	12"	841
58'-6"	59'-0"	576	#4	12"	848
59'-0"	59'-6"	581	#4	12"	855
59'-6"	60'-0"	586	#4	12"	862
60'-0"	60'-6"	591	#4	12"	869
60'-6"	61'-0"	596	#4	12"	876
61'-0"	61'-6"	601	#4	12"	883
61'-6"	62'-0"	606	#4	12"	890
62'-0"	62'-6"	611	#4	12"	897
62'-6"	63'-0"	616	#4	12"	904
63'-0"	63'-6"	621	#4	12"	911
63'-6"	64'-0"	626	#4	12"	918
64'-0"	64'-6"	631	#4	12"	925
64'-6"	65'-0"	636	#4	12"	932
65'-0"	65'-6"	641	#4	12"	939
65'-6"	66'-0"	646	#4	12"	946
66'-0"	66'-6"	651	#4	12"	953
66'-6"	67'-0"	656	#4	12"	960
67'-0"	67'-6"	661	#4	12"	967
67'-6"	68'-0"	666	#4	12"	974
68'-0"	68'-6"	671	#4	12"	981
68'-6"	69'-0"	676	#4	12"	988
69'-0"</					



CULVERT SIZE	TABLE OF DIMENSIONS										TOTAL QUANTITIES		TABLE OF REINFORCING STEEL FOR 2 WINGS																CULVERT SIZE																					
	S	H	L	M	V	W	C	D	Ta	MAX FILL			Conc	Steel	Bars H-#4		Bars J-#6		Bars O-#4 @ 12"		Bars O <sub>1</sub> -O <sub>x</sub> #4 @ 12"		Bars P-#4 @ 12"		Bars P <sub>1</sub> -P <sub>x</sub> #4 @ 12"		Bars Q <sub>1</sub> -Q <sub>x</sub> #4 @ 12"			Bars R-#4		Bars S-#4		Bars U-#4		Bars V <sub>1</sub> -V <sub>x</sub>		8 Bars W												
										K	K	K			No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt		No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	
3 x 2	3'-6"	3'-8"	6"	6'-5 1/2"	1'-0"	2'-8"	6"	-	-	10"	1.73	241	12	20	8	48	3	5'-11"	12	4	3'-6"	9	3	6'-5"	13	4	4'-0"	11	6	5'-0"	20	6'-6"	17	3'-5"	18	8	3'-1"	16	16	#4	12"	3'-6"	37	#4	3'-9"	20	3 x 2			
3 x 3	5'-6"	5'-11"	6"	8'-5 1/2"	1'-0"	3'-8"	6"	-	-	10"	3.03	371	16	27	8	48	4	5'-11"	16	4	5'-6"	18	4	6'-5"	17	6	5'-0"	20	10	6'-0"	40	8'-6"	23	5'-8"	30	12	4'-4"	35	24	#4	12"	4'-0"	64	#4	6'-3"	33	3 x 3			
4 x 3	5'-6"	5'-11"	6"	8'-5 1/2"	1'-0"	3'-8"	6"	-	-	10"	3.29	390	16	27	8	48	4	5'-11"	16	4	5'-6"	18	4	6'-5"	17	6	5'-0"	20	10	6'-0"	40	8'-6"	23	5'-8"	30	12	4'-4"	35	24	#4	12"	4'-0"	64	#4	6'-3"	33	4 x 3			
4 x 4	7'-6"	8'-2 1/2"	6"	11'-5 1/2"	1'-0"	4'-8"	6"	-	-	10"	4.98	558	20	33	8	48	4	7'-11"	21	6	4'-6"	18	4	8'-5"	22	6	5'-0"	20	10	7'-0"	47	9'-6"	25	5'-8"	30	12	4'-4"	35	24	#4	12"	4'-0"	64	#4	6'-3"	33	4 x 4			
5 x 2	3'-6"	3'-8"	6"	6'-5 1/2"	1'-0"	2'-8"	6"	-	-	10"	2.12	271	12	20	8	48	5	5'-11"	20	4	3'-6"	9	5	6'-5"	17	4	4'-0"	11	6	5'-0"	20	10	7'-0"	47	9'-6"	25	5'-8"	30	12	4'-4"	35	24	#4	12"	4'-0"	64	#4	6'-3"	33	4 x 4
5 x 3	5'-6"	5'-11"	6"	8'-5 1/2"	1'-0"	3'-8"	6"	-	-	10"	3.56	410	16	27	8	48	5	5'-11"	20	4	3'-6"	9	5	6'-5"	17	4	4'-0"	11	6	5'-0"	20	10	7'-0"	47	9'-6"	25	5'-8"	30	12	4'-4"	35	24	#4	12"	4'-0"	64	#4	6'-3"	33	5 x 3
5 x 4	7'-6"	8'-2 1/2"	6"	11'-5 1/2"	1'-0"	4'-8"	6"	-	-	10"	5.32	583	20	33	8	48	5	5'-11"	20	4	3'-6"	9	5	6'-5"	17	4	4'-0"	11	6	5'-0"	20	10	7'-0"	47	9'-6"	25	5'-8"	30	12	4'-4"	35	24	#4	12"	4'-0"	64	#4	6'-3"	33	5 x 4
5 x 5	8'-7 1/2"	9'-3 1/2"	7"	13'-5 1/2"	1'-6"	5'-8"	6"	-	-	10"	7.17	723	24	40	8	48	5	9'-11"	33	8	5'-6"	29	5	10'-5"	35	8	6'-0"	32	14	9'-0"	84	12'-6"	33	7'-10"	42	16	5'-7"	60	36	#4	12"	4'-6"	108	#4	8'-7"	46	5 x 4			
6 x 3	5'-6"	5'-11"	6"	8'-5 1/2"	1'-0"	3'-8"	6"	-	-	10"	3.83	432	16	27	8	48	6	7'-11"	32	6	4'-6"	18	6	8'-5"	34	6	5'-0"	20	10	9'-0"	60	11'-6"	31	5'-8"	30	12	4'-4"	35	24	#4	12"	4'-0"	64	#4	6'-3"	33	5 x 3			
6 x 4	7'-6"	8'-2 1/2"	6"	11'-5 1/2"	1'-0"	4'-8"	6"	-	-	10"	5.66	610	20	33	8	48	6	7'-11"	32	6	4'-6"	18	6	8'-5"	34	6	5'-0"	20	10	9'-0"	60	11'-6"	31	5'-8"	30	12	4'-4"	35	24	#4	12"	4'-0"	64	#4	6'-3"	33	5 x 3			
6 x 5	8'-7 1/2"	9'-3 1/2"	7"	13'-5 1/2"	1'-6"	5'-8"	6"	-	-	10"	7.55	757	24	40	8	48	6	9'-11"	40	8	5'-6"	29	6	10'-5"	42	8	6'-0"	32	14	10'-0"	94	13'-6"	36	7'-10"	42	16	5'-7"	60	36	#4	12"	4'-6"	108	#4	8'-7"	46	6 x 4			
6 x 6	10'-7 1/2"	11'-6 1/2"	7"	16'-5 1/2"	1'-6"	6'-8"	6"	-	-	10"	10.13	972	28	47	8	48	6	10'-11"	44	8	6'-6"	35	6	11'-5"	46	8	7'-0"	37	16	10'-6"	112	14'-6"	39	9'-0"	48	20	6'-6"	87	40	#4	12"	5'-3"	140	#5	9'-8"	81	6 x 6			
7 x 3	5'-7 1/2"	6'-0 1/2"	6"	12'-6 1/2"	1'-0"	4'-8 1/2"	6 1/2"	10"	10"	10"	4.36	465	16	27	8	48	7	8'-0"	37	6	4'-7"	18	7	8'-6"	40	6	5'-1"	20	10	10'-0"	67	12'-7"	34	5'-8"	30	12	4'-4"	35	28	#4	12"	4'-1"	76	#4	6'-4"	33	7 x 3			
7 x 4	7'-7 1/2"	8'-3 1/2"	6"	14'-6 1/2"	1'-0"	4'-8 1/2"	6 1/2"	10"	10"	10"	6.37	642	20	33	8	48	7	10'-0"	47	8	5'-7"	30	7	10'-6"	49	8	6'-1"	33	14	11'-0"	103	14'-7"	39	8'-0"	43	16	5'-7"	60	36	#4	12"	4'-7"	110	#4	8'-9"	47	7 x 4			
7 x 5	8'-8 1/2"	9'-4 1/2"	7"	15'-6 1/2"	1'-6"	5'-8 1/2"	6 1/2"	10"	10"	10"	8.37	792	24	40	8	48	7	11'-0"	51	8	6'-7"	35	7	11'-6"	54	8	7'-1"	38	16	11'-0"	123	15'-7"	42	9'-1"	49	20	6'-6"	87	40	#4	12"	5'-4"	142	#5	9'-11"	83	7 x 5			
7 x 6	10'-8 1/2"	11'-7 1/2"	7"	17'-6 1/2"	1'-6"	6'-8 1/2"	6 1/2"	10"	10"	10"	11.15	1014	28	47	8	48	7	13'-0"	61	10	7'-7"	51	7	13'-6"	63	10	8'-1"	54	20	12'-6"	167	17'-7"	47	11'-4"	61	24	7'-9"	124	48	#4	12"	5'-10"	187	#5	12'-5"	104	7 x 6			
8 x 4	7'-8 1/2"	8'-4 1/2"	6"	15'-7 1/2"	1'-0"	4'-9"	7"	9 1/2"	10"	10 1/2"	7.14	671	20	33	8	48	8	10'-1"	54	8	5'-8"	30	8	10'-7"	57	8	6'-2"	33	14	12'-0"	112	15'-8"	42	8'-1"	43	16	5'-7"	60	36	#4	12"	4'-8"	112	#4	8'-10"	47	8 x 4			
8 x 5	8'-9 1/2"	9'-6"	7"	16'-7 1/2"	1'-6"	5'-9"	7"	9 1/2"	10"	10 1/2"	9.26	828	24	40	8	48	8	11'-1"	59	8	6'-8"	36	8	11'-7"	62	8	7'-2"	38	16	12'-6"	134	16'-8"	45	9'-2"	49	20	6'-7"	88	40	#4	12"	5'-5"	145	#5	10'-1"	84	8 x 5			
8 x 6	10'-9 1/2"	11'-8 1/2"	7"	18'-7 1/2"	1'-6"	6'-9"	7"	9 1/2"	10"	10 1/2"	12.25	1053	28	47	8	48	8	13'-1"	70	10	7'-8"	51	8	13'-7"	73	10	8'-2"	55	20	13'-6"	180	18'-8"	50	11'-5"	61	24	7'-9"	124	48	#4	12"	5'-11"	190	#5	12'-6"	104	8 x 6			
8 x 7	12'-9 1/2"	13'-1 1/2"	7"	20'-7 1/2"	1'-6"	7'-9"	7"	9 1/2"	10"	10 1/2"	15.60	1385	32	53	8	48	8	15'-1"	81	12	8'-8"	69	8	15'-7"	83	12	9'-2"	73	24	14'-6"	232	20'-8"	55	13'-8"	73	28	8'-11"	167	76	#4	9"	6'-5"	326	#5	15'-0"	125	8 x 7			
8 x 8	13'-9 1/2"	15'-1 1/2"	8"	21'-7 1/2"	2'-0"	8'-9"	7"	9 1/2"	10"	10 1/2"	19.25	1818	36	60	8	48	8	16'-2"	86	12	9'-9"	78	8	16'-8"	89	12	10'-3"	82	26	15'-0"	261	21'-8"	58	14'-9"	79	32	9'-9"	208	120	#4	6"	7'-2"	575	#6	16'-2"	194	8 x 8			
9 x 5	8'-10 1/2"	9'-7 1/2"	7"	17'-8 1/2"	1'-6"	5'-9 1/2"	7"	9 1/2"	9 1/2"	10"	9.82	858	24	40	8	48	9	11'-2"	67	8	6'-9"	36	9	11'-8"	70	8	7'-3"	39	16	13'-6"	144	17'-9"	47	9'-3"	49	20	6'-7"	88	40	#4	12"	5'-5"	145	#5	10'-2"	85	9 x 5			
9 x 6	10'-10 1/2"	11'-10"	7"	19'-8 1/2"	1'-6"	6'-9 1/2"	7"	9 1/2"	9 1/2"	10"	12.91	1106	28	47	8	48	9	13'-2"	79	10	7'-9"	52	9	13'-8"	82	10	8'-3"	55	20	14'-6"	194	19'-9"	53	11'-6"	61	24	7'-9"	124	52	#4	12"	5'-11"	206	#5	12'-7"	105	9 x 6			
9 x 7	12'-10 1/2"	14'-0 1/2"	7"	21'-8 1/2"	1'-6"	7'-9 1/2"	7"	9 1/2"	9 1/2"	10"	16.36	1428	32	53	8	48	9	15'-2"	91	12	8'-9"	70	9	15'-8"	94	12	9'-3"	74	24	15'-6"	248	21'-9"	58	13'-6"	73	28	8'-11"	167	76	#4	9"	6'-5"	326	#5	15'-1"	126	9 x 7			
9 x 8	13'-10 1/2"	15'-2 1/2"	8"	22'-8 1/2"	2'-0"	8'-9 1/2"	7"	9 1/2"	9 1/2"	10"	20.09	1894	36	60	8	48	9	16'-3"	98	14	8'-10"	83	9	16'-9"	101	14	9'-4"	87	26	16'-0"	278	22'-9"	61	14'-10"	79	32	9'-10"	210	124	#4	6"	7'-2"	594	#6	16'-3"	195	9 x 8			
9 x 9	15'-10 1/2"	17'-5 1/2"	8"	24'-8 1/2"	2'-0"	9'-9 1/2"	7"	9 1/2"	9 1/2"	10"	24.47	2563	40	67	8	48	9	18'-3"	110	16	9'-10"	105	9	18'-9"	113	16	10'-4"	110	30	17'-0"	341	24'-9"	66	17'-1"	91	36	11'-0"	265	120	#5	7"	8'-2"	1022	#6	18'-9"	225	9 x 9			
10 x 5	8'-11 1/2"	9'-8 1/2"	7"	18'-9 1/2"	1'-6"	5'-10"	7 1/2"	9"	10"	10 1/2"	10.82	894	24	40	8	48	10	11'-3"	75	8	6'-10"	37	10	11'-9"	78	8	7'-4"	39	16	14'-6"	155	18'-10"	50	9'-4"	50	20	6'-8"	89	40	#4	12"	5'-6"	147	#5	10'-3"	86	10 x 5			
10 x 6	10'-11 1/2"	11'-11 1/2"	7"	20'-9 1/2"</																																														

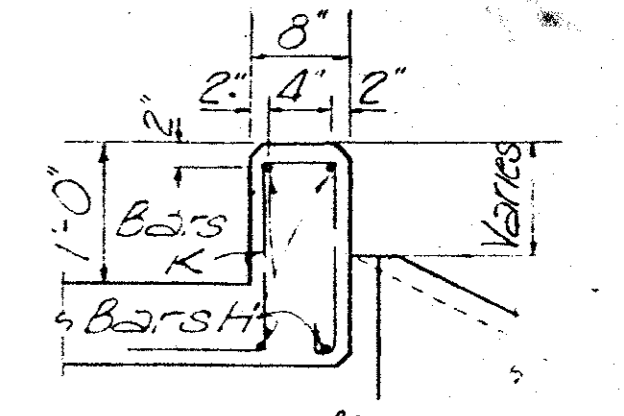




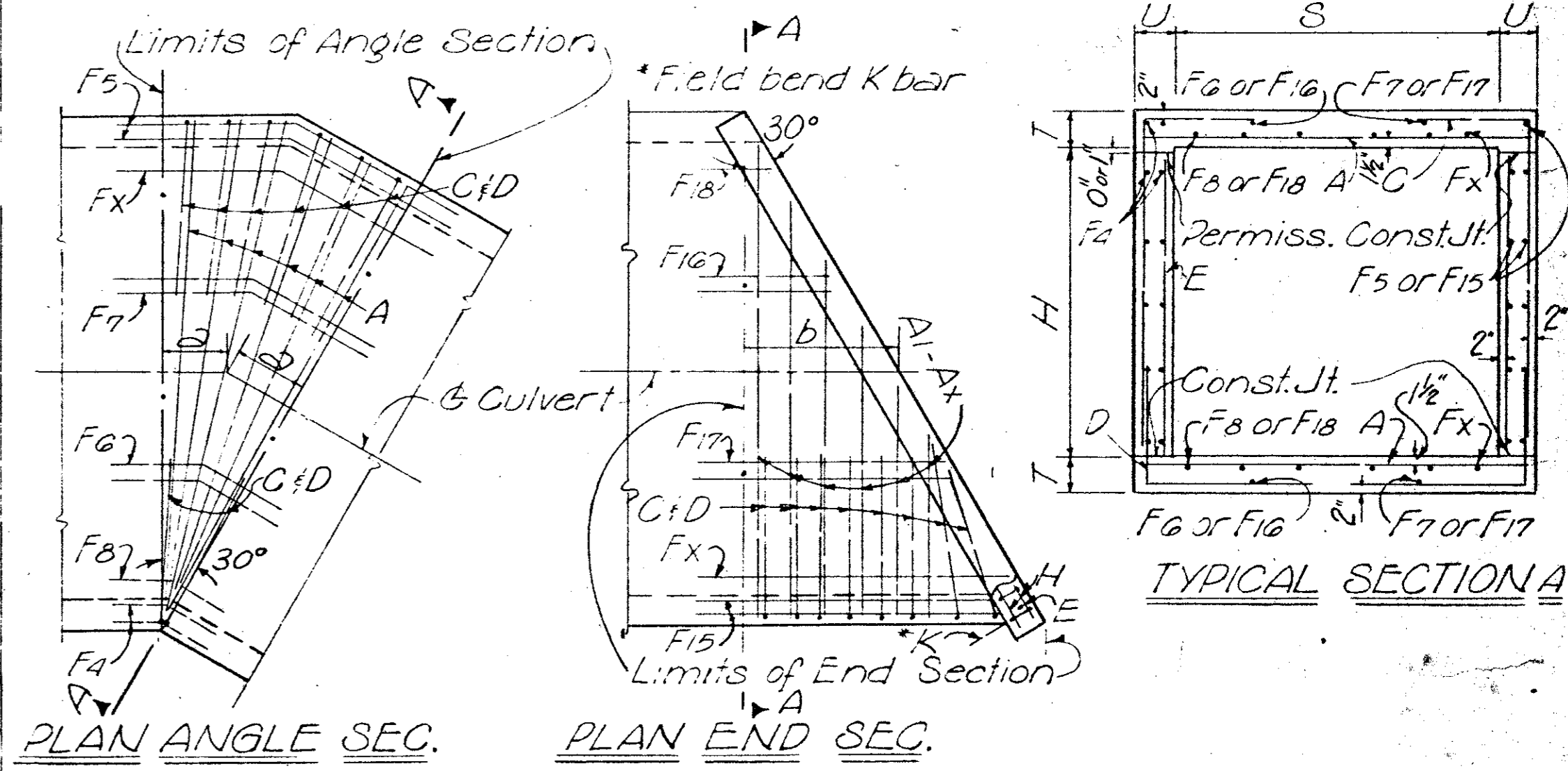


**BILL OF STEEL- END SECTION**

CULVERT SIZE	DIM B	TOTAL QUANTITIES		BARS A - AX IN TOP & BOTTOM SLAB				BARS C WALLS & TOP CORNER				BARS D IN BOTTOM CORNER				4 BARS E 18" C/O C		NUMBER OF 4 BARS F LENGTH SHOWN IN TABLE				4 BARS H 4" - 5" BARS K 5/8" C/O C 3'-1" LONG				4 BARS M 1/2" IN TOP SLAB & WALLS				4 BARS N 1/2" IN BOTTOM SLAB							
		CONC.	STEEL	No	SIZE	SPA	LGTH	WT	No	SIZE	SPA	LGTH	WT	No	SIZE	SPA	LGTH	WT	No	WT	F5	F6	F7	F8-x	WT	LATH	WT	No	WT	No	SPA	LGTH	WT	No	SPA	LGTH	WT
3	2	24	78	4	4	7	3'8"	10												4	4	1	1	6	33	2	5'4"	2	6'0"	19	2	6'8"	2	5'2"	16		
	3	28	82	4	4	7	3'8"	10												4	4	1	1	6	33	2	10'4"	2	7'0"	23	2	6'8"	2	5'2"	16		
4	2	35	99	5	4	6	4'8"	16												4	4	1	1	8	40	2	9'4"	2	7'0"	22	2	7'8"	2	6'2"	18		
	3	40	103	5	4	6	4'8"	16												4	4	1	1	8	40	2	11'4"	2	8'0"	26	2	7'8"	2	6'2"	18		
5	2	48	125	5	4	6	4'8"	16	7	4	8	4'10"	23	7	4	8	4'11"	19		4	4	2	2	10	53	2	9'4"	2	7'0"	22	2	7'8"	2	6'2"	18		
	3	54	129	10	5	8	5'8"	59	7	4	8	4'10"	27	7	4	8	4'11"	19		5	5	2	2	10	53												
6	2	69	165	12	5	8	6'8"	83	10	4	6	5'10"	39	10	4	6	4'11"	27		4	4	2	2	10	57												
	4	76	177	12	5	8	6'8"	83	10	4	6	6'10"	46	10	4	6	4'11"	27	3	4	11"	10	10	10	2	2	10	89	4	2'2"	4'7"	2'9 1/2"	3'10 1/2"	12"	2'6 1/2"	F11-2'1 1/2"	
7	2	92	221	12	5	8	6'10"	85	10	4	6	7'10"	37	7	4	8	4'11"	19	3	4	11"	10	10	10	2	2	10	89	5	2'2"	5'1 1/2"	3'4"	3'10 1/2"	12"	2'6 1/2"	F12-4'8"	
	4	101	229	12	5	8	6'10"	85	11	4	5 1/2	8'10"	65	11	4	5 1/2	4'11"	30	3	5	11"	12	10	10	2	2	10	89	5	2'2"	5'1 1/2"	3'4"	4'5"	16"	2'5 1/2"	F12-5'3 1/2"	
8	2	93	229	14	5	7	7'8"	112	9	5	7 1/2	6'2"	58	9	5	7 1/2	4'10"	45		4	4	2	2	10	62												
	4	101	244	14	5	8	7'8"	112	9	5	8	7'2"	67	9	5	8	4'10"	45		5	5	2	2	10	68												
9	2	119	302	14	5	6 1/2	7'10"	114	9	5	8	8'2"	77	9	5	8	4'10"	45	3	4	11"	10	10	10	2	2	10	96	8	2'2"	6'10"	3'6"	5'4 1/2"	18"	2'5 1/2"	F13-6'5 1/2"	
	4	128	313	14	5	6 1/2	7'10"	114	9	5	8	9'2"	86	9	5	8	4'10"	45	3	5	11"	12	10	10	2	2	10	96	9	2'2"	7'4"	3'6"	5'11"	18"	2'8 1/2"	F13-6'5 1/2"	
10	2	138	352	14	5	6 1/2	7'10"	114	10	5	7 1/2	10'2"	106	10	5	7 1/2	4'10"	50	3	5	11"	12	12	12	2	2	10	108	10	2'3"	8'0"	3'7 1/2"	6'5 1/2"	18"	2'7 1/2"	F14-7'5 1/2"	
	4	136	309	14	6	8	8'8"	182	10	5	7 1/2	7'3"	76	10	5	7 1/2	4'11"	51		5	5	2	2	12	78												
10	2	157	364	14	6	8	8'10"	186	10	5	8	8'3"	86	10	5	8	4'11"	51	4	4	11"	13	10	10	2	2	12	108									
	4	168	377	14	6	8	8'10"	186	10	5	8	9'3"	96	10	5	8	4'11"	51	4	5	11"	16	10	10	2	2	12	108									
10	2	179	402	14	6	8	8'10"	186	10	5	7 1/2	10'3"	107	10	5	7 1/2	4'11"	51	4	6	11"	18	12	12	2	2	12	120									
	4	207	434	14	6	8	9'0"	189	11	5	7	11'3"	129	11	5	7	4'11"	56	4	7	11"	21	12	12	2	2	12	120									
10	2	196	457	18	6	7	9'10"	266	13	5	6 1/2	8'4"	123	13	5	6 1/2	5'0"	68	4	4	11"	13	10	10	2	2	12	115									
	4	207	474	18	6	7	9'10"	266	13	5	6 1/2	9'4"	127	13	5	6 1/2	5'0"	68	4	5	11"	16	10	10	2	2	12	115									
10	2	219	514	20	6	6 1/2	9'10"	295	13	5	6 1/2	10'4"	140	13	5	6 1/2	5'0"	68	4	6	11"	18	12	12	2	2	12	126									
	4	251	534	20	6	6 1/2	10'0"	300	13	5	6 1/2	11'4"	154	13	5	6 1/2	5'0"	68	4	7	11"	21	12	12	2	2	12	126									
10	2	264	532	20	6	6 1/2	10'0"	300	14	5	6	12'4"	180	14	5	6	5'0"	73	4	8	11"	24	14	14	2	2	12	140									
	4	296	570	16	7	8 1/2	10'10"	354	11	6	8	8'6"	140	11	6	8	5'5"	89	4	4	11"	13	10	10	2	2	12	143									
10	2	253	590	16	7	8	10'10"	354	11	6	8	9'6"	157	11	6	8	5'5"	89	4	5	11"	12	10	10	2	2	12	129									
	4	266	622	16	7	8	10'10"	354	11	6	8	10'6"	173	11	6	8	5'5"	89	4	6	11"	18	12	12	2	2	12	143									
10	2	301	699	18	7	8	11'0"	404	12	6	8	11'6"	207	12	6	8	5'5"	98	5	7	11"	26	12	12	2	2	12	143									
	4	316	734	18	7	8	11'0"	404	12	6	7 1/2	12'6"	225	12	6	7 1/2	5'5"	98	5	8	11"	30	14	14	2	2	12	156									
10	4	331	798	18	7	7 1/2	11'0"	404	13	6	7	13'6"	264	13	6	7	5'5"	106	5	9	11"	33	16	16	2	2	12	170									



NOTE: It is desirable to have at least one foot of straight extension before beginning Angle Section. Bars F may be eliminated from this one foot section.



**BILL OF STEEL- ANGLE SECTION**

CULVERT SIZE	DIM S	TOTAL QUANTITIES		BARS A IN TOP & BOTTOM SLAB				BARS C WALLS & TOP CORNER				BARS D IN BOTTOM CORNER				4 BARS E 18" C/O C		NUMBER OF 4 BARS F (LENGTH SHOWN IN TABLE)				4 BARS M IN TOP SLAB & WALLS				4 BARS N IN BOTTOM SLAB									
		CONC.	STEEL	No	SIZE	SPA	LGTH	WT	No	SIZE	SPA	LGTH	WT	No	SIZE	SPA	LGTH	WT	No	WT	F4	F5	F6	F7	F8-x	WT	No	LATH	WT	No	LATH	WT	No	LATH	WT
3	2	24	78	4	4	7	3'8"	10												4	4	1	1	6	33	2	5'4"	2	6'0"	19	2	6'8"	2	5'2"	16
	3	28	82	4	4	7	3'8"	10												4	4	1	1	6	33	2	10'4"	2	7'0"	23	2	6'8"	2	5'2"	16
4	2	35	99	5	4	6	4'8"	16												4	4	1	1	8	40	2	9'4"	2	7'0"	22	2	7'8"	2	6'2"	18
	3	40	103	5	4	6	4'8"	16												4	4	1	1	8	40	2	11'4"	2	8'0"	26	2	7'8"	2	6'2"	18
5	2	48	125	5	4	6	4'8"	16	7	4	8	4'10"	23	7	4	8	4'11"	19		4	4	2	2	10	53	2	9'4"	2	7'0"	22	2	7'8"	2	6'2"	18
	3	54	129	10	5	8	5'8"	59	7	4	8	4'10"	27	7	4	8	4'11"	19		5	5	2	2	10	53										
6	2	69	165	12	5	8	6'8"	83	10	4	6	5'10"	39	10	4	6	4'11"	27		4	4	2	2	10	57										
	4	76	177	12	5	8	6'8"	83	10	4	6	6'10"	46	10	4	6	4'11"	27	3	4	11"	10	10	10	2	2	10	89	4	2'2"	4'7"	2'9 1/2"	3'10 1/2"	12"	2'6 1/2"
7	2	92	221	12	5	8	6'10"	85	10	4	6	7'10"	37	7	4	8	4'11"	19	3	4	11"	10	10	10	2										