

# DEPARTMENT OF ENGINEERING

**MAYOR**

**John Campbell**

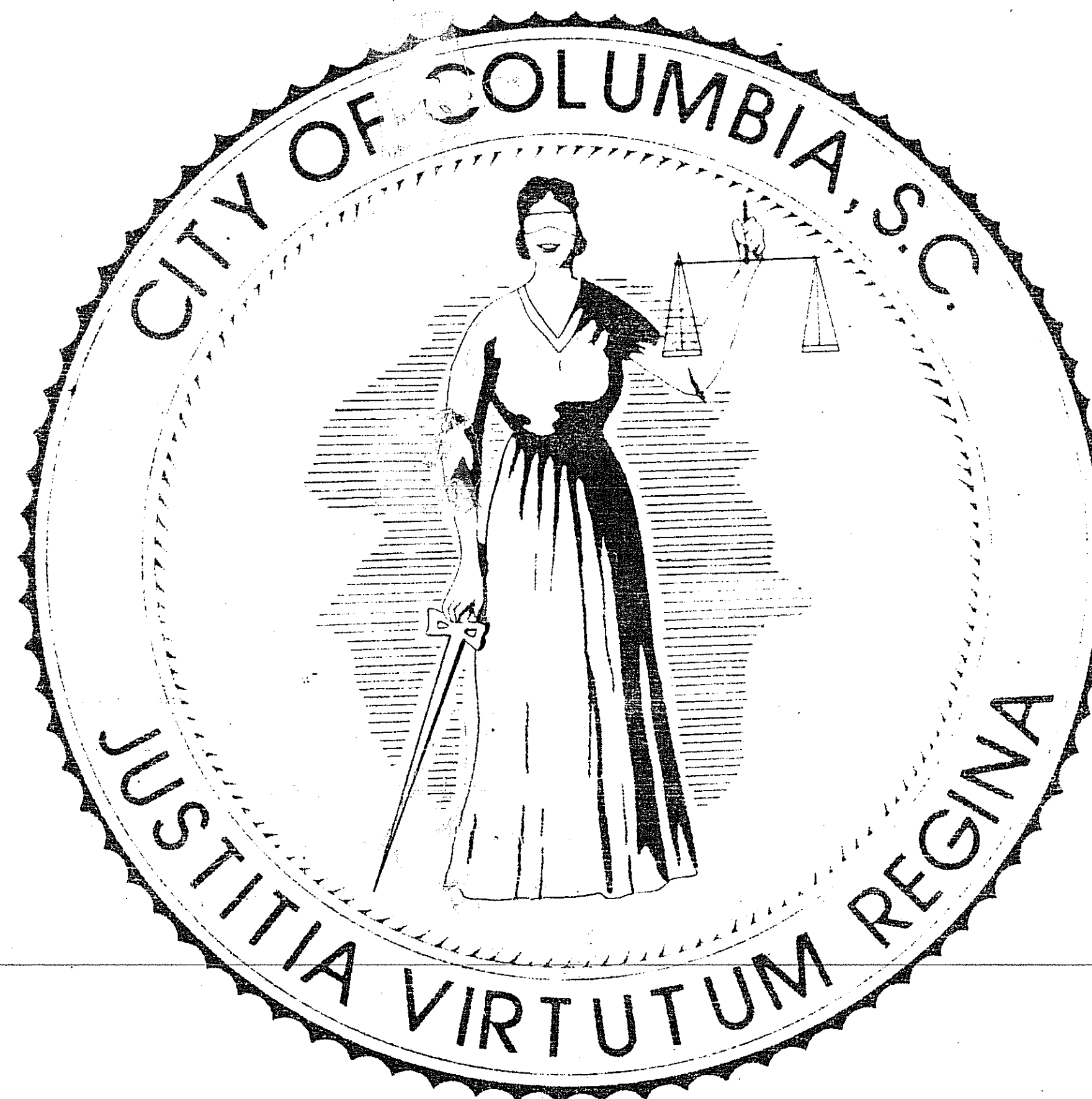
**COUNCIL**

**W C Ouzts**

**Jesse T Reese**

**REL Freeman**

**W S Durham Jr**



**CITY MANAGER**

**Graydon V Olive, Jr**

**CITY ENGINEER**

**John A Ricketts**

**DATE 9-13-72**

**REVISED: 10-2-73**

**REVISED AS-BUILTS 2-26-76**

CITY OF COLUMBIA, S.C.  
DEPARTMENT OF UTILITIES & ENGINEERING

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# WATER MAIN CONSTRUCTION

**Phase I**

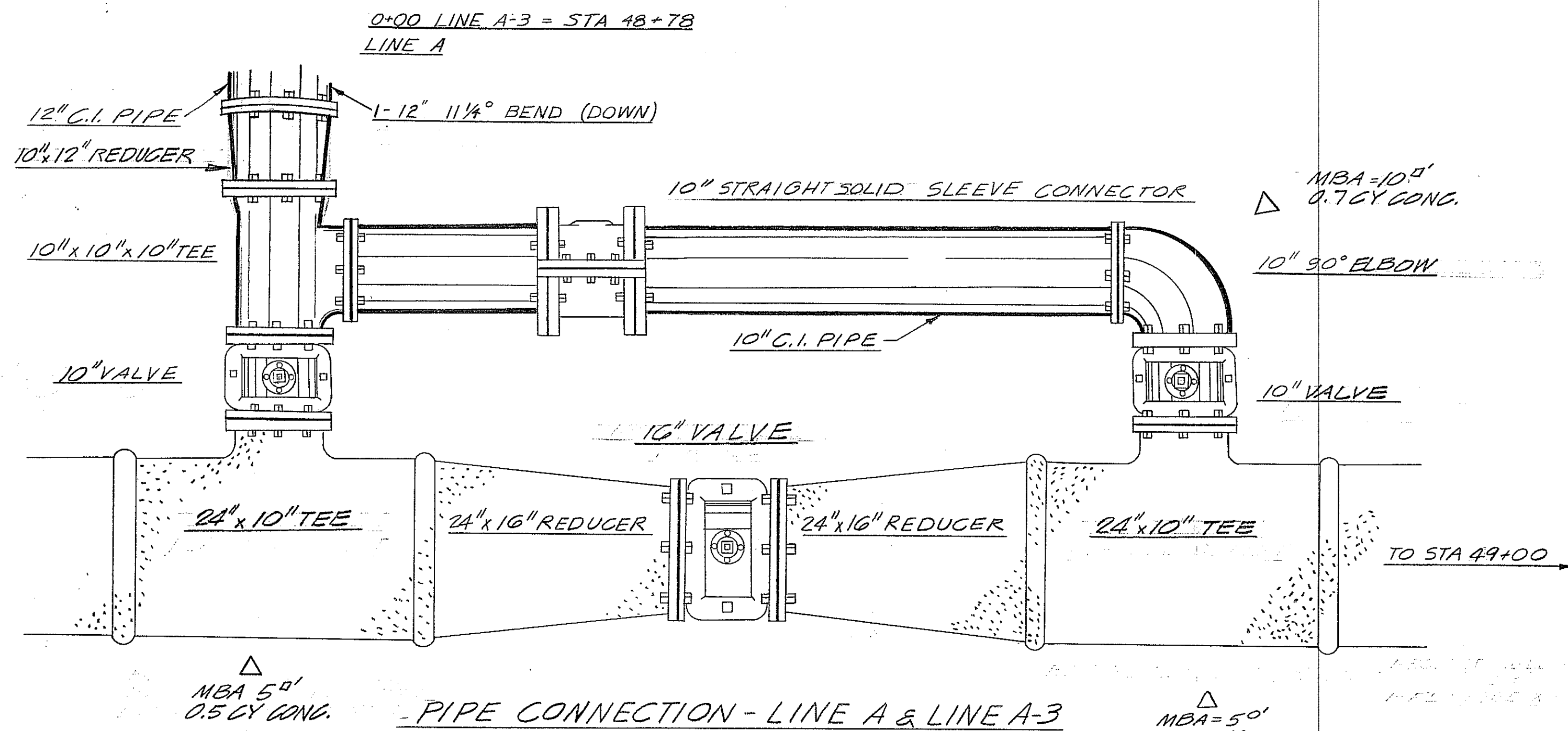
**24" WATER MAIN CONSTRUCTION**

**CITY CONTRACT NO 4-73**

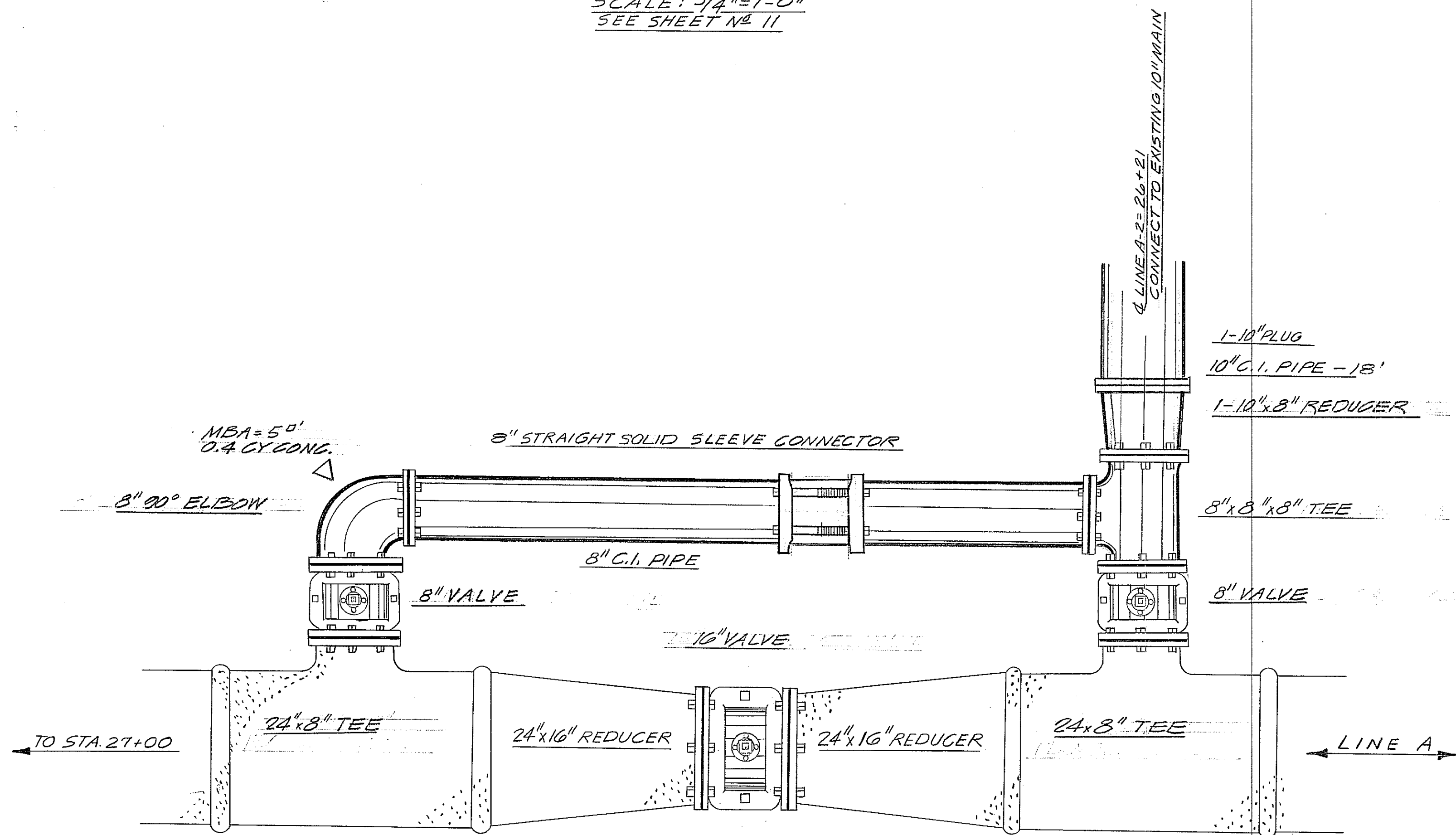
SCANNED

HUD PROJECT NO WS-SC-136

69-14

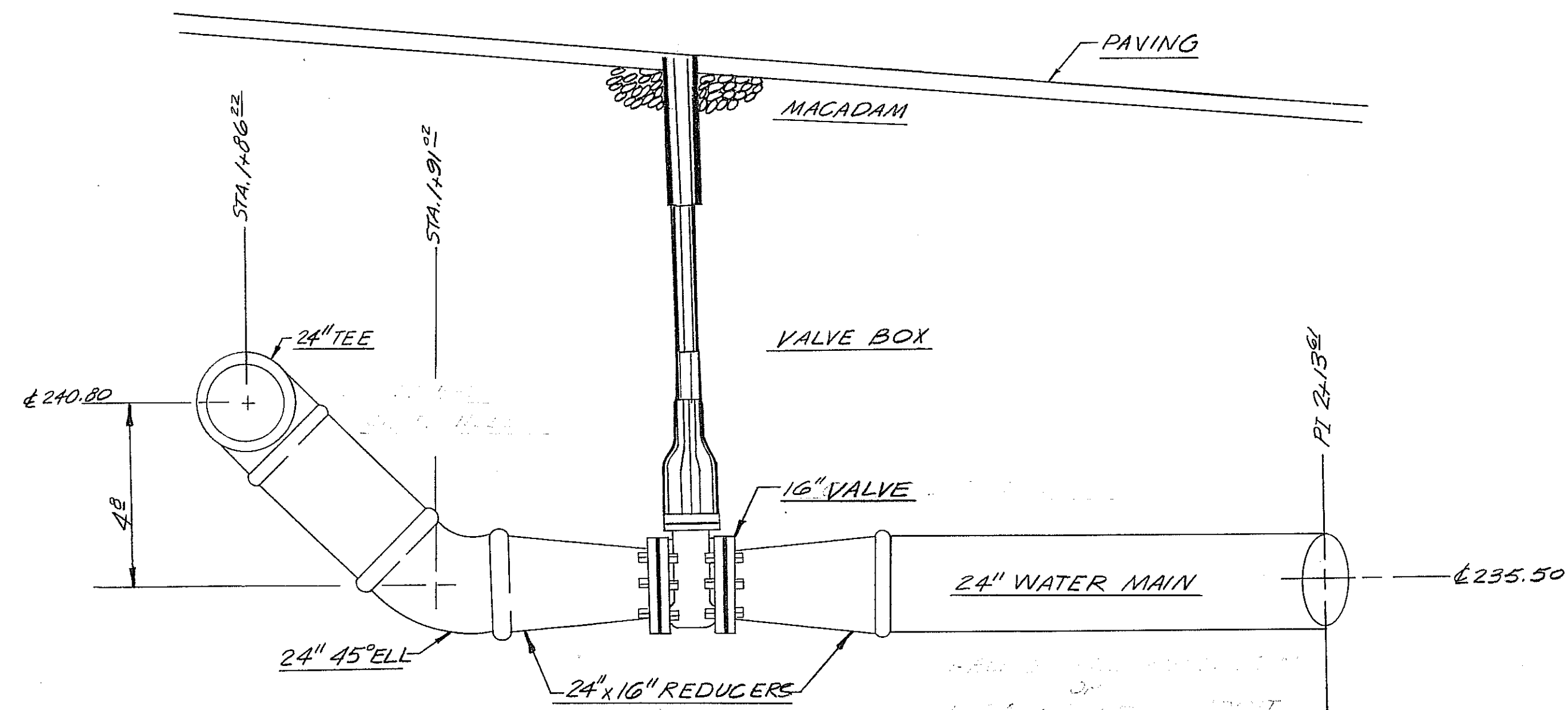


PIPE CONNECTION - LINE A & LINE A-3  
APPROX STA 48+78 LINE A  
SCALE: 3/4" = 1'-0"  
SEE SHEET NO 11



PIPE CONNECTION LINE A & A-2  
APPROX. STA. 26+21 LINE A  
SCALE: 3/4" = 1'-0"  
SEE SHEET NO 9

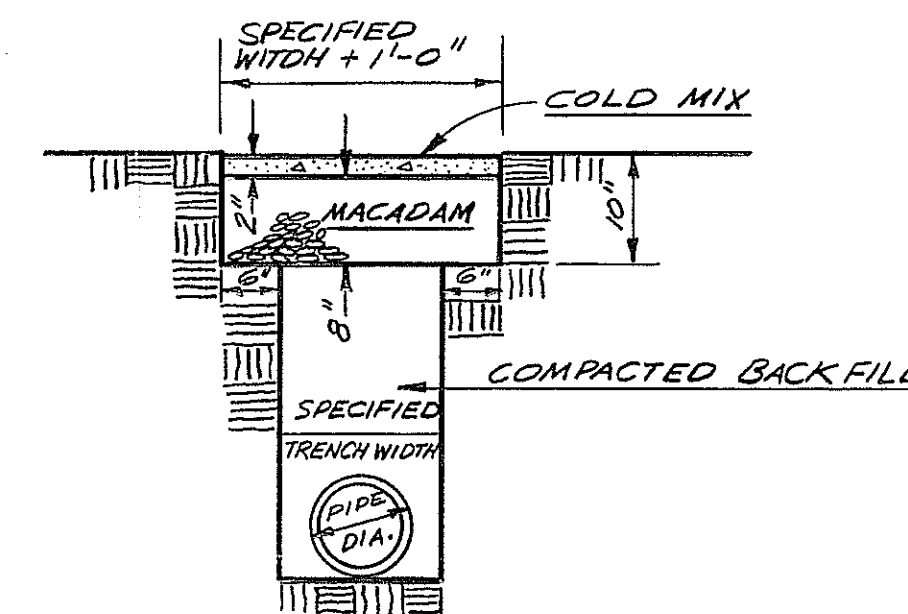
1-BELL x BOLTED BELL JOINT OR  
1-BELL x FLANGED JOINT



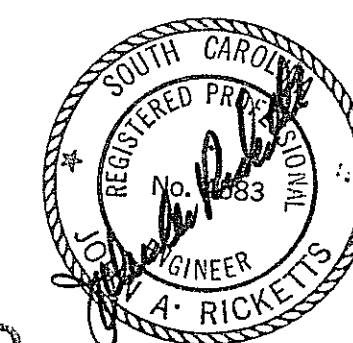
SECTION A-A  
ARROWOOD ROAD  
SCALE: 1:30  
SEE SHEET NO 3

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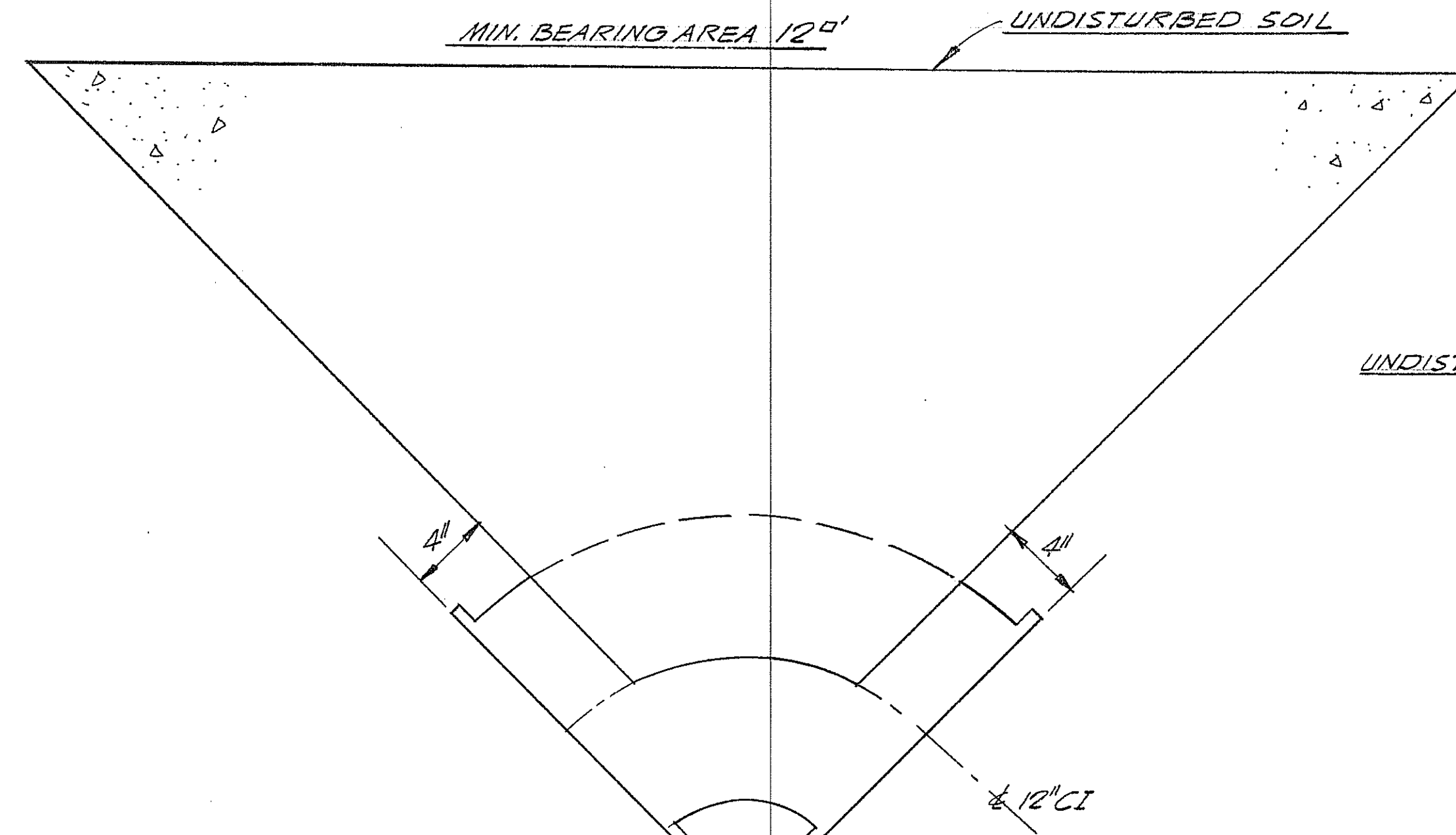
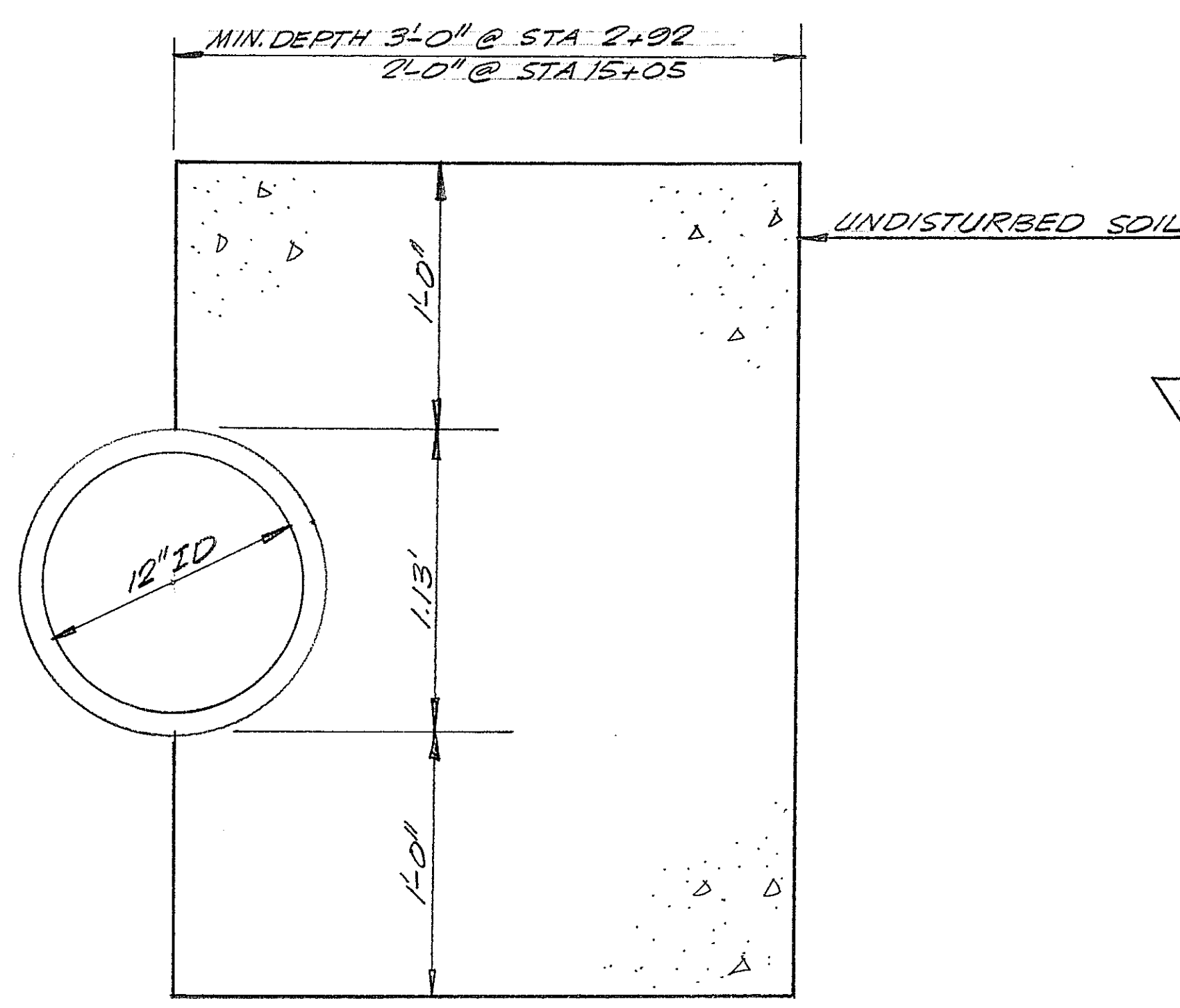
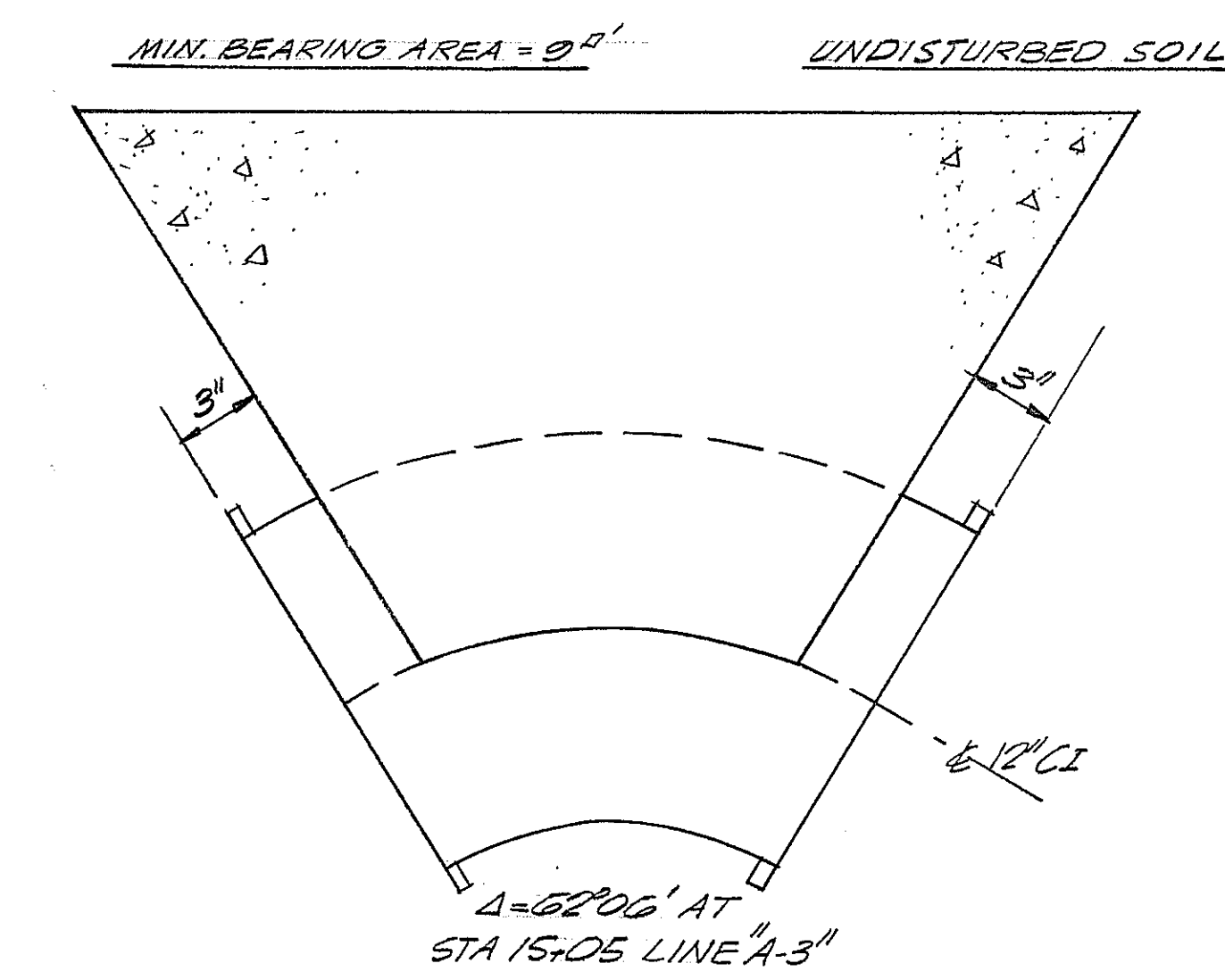
TYPICAL SECTION  
REMOVE & REPLACE PAVING



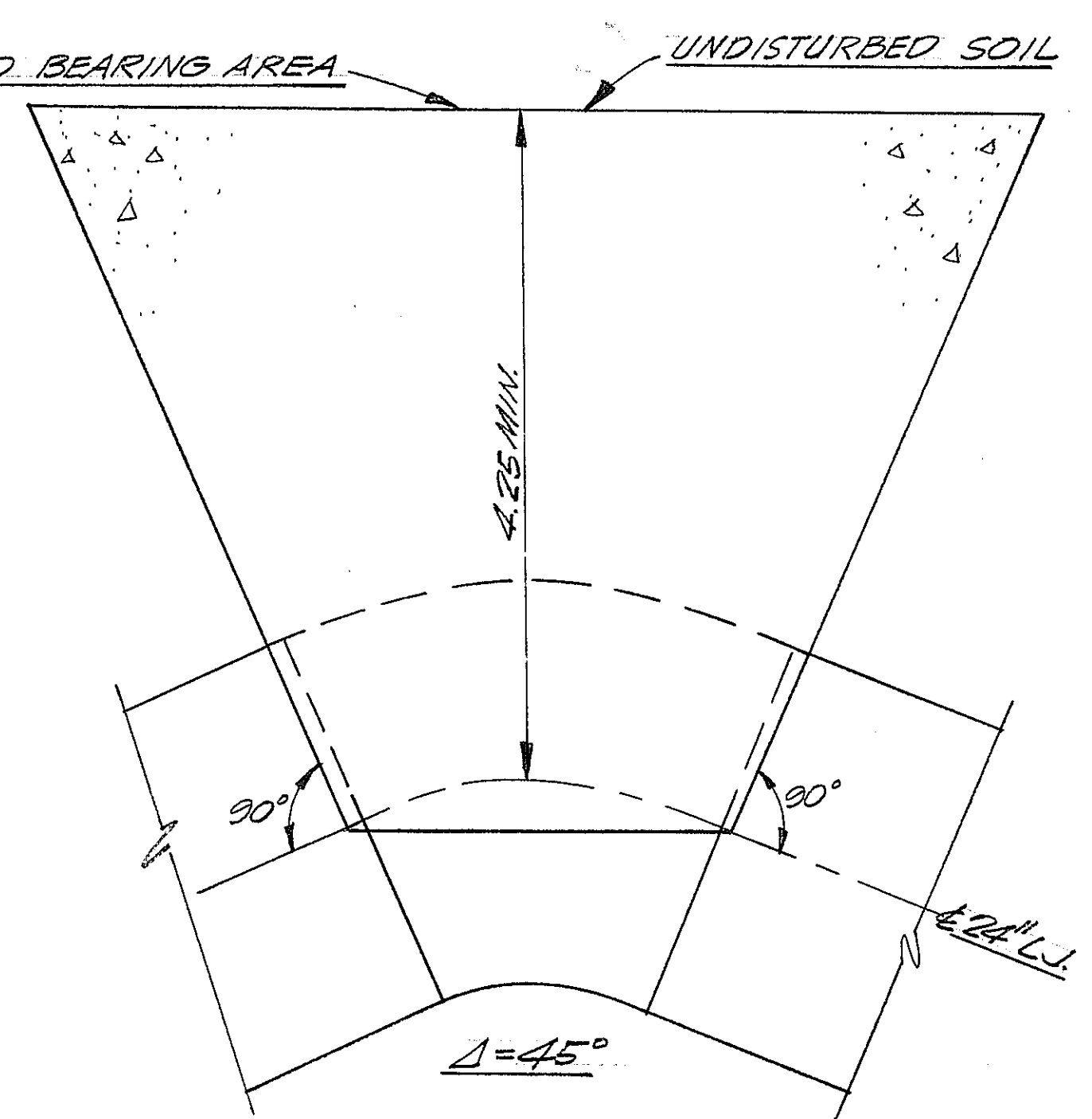
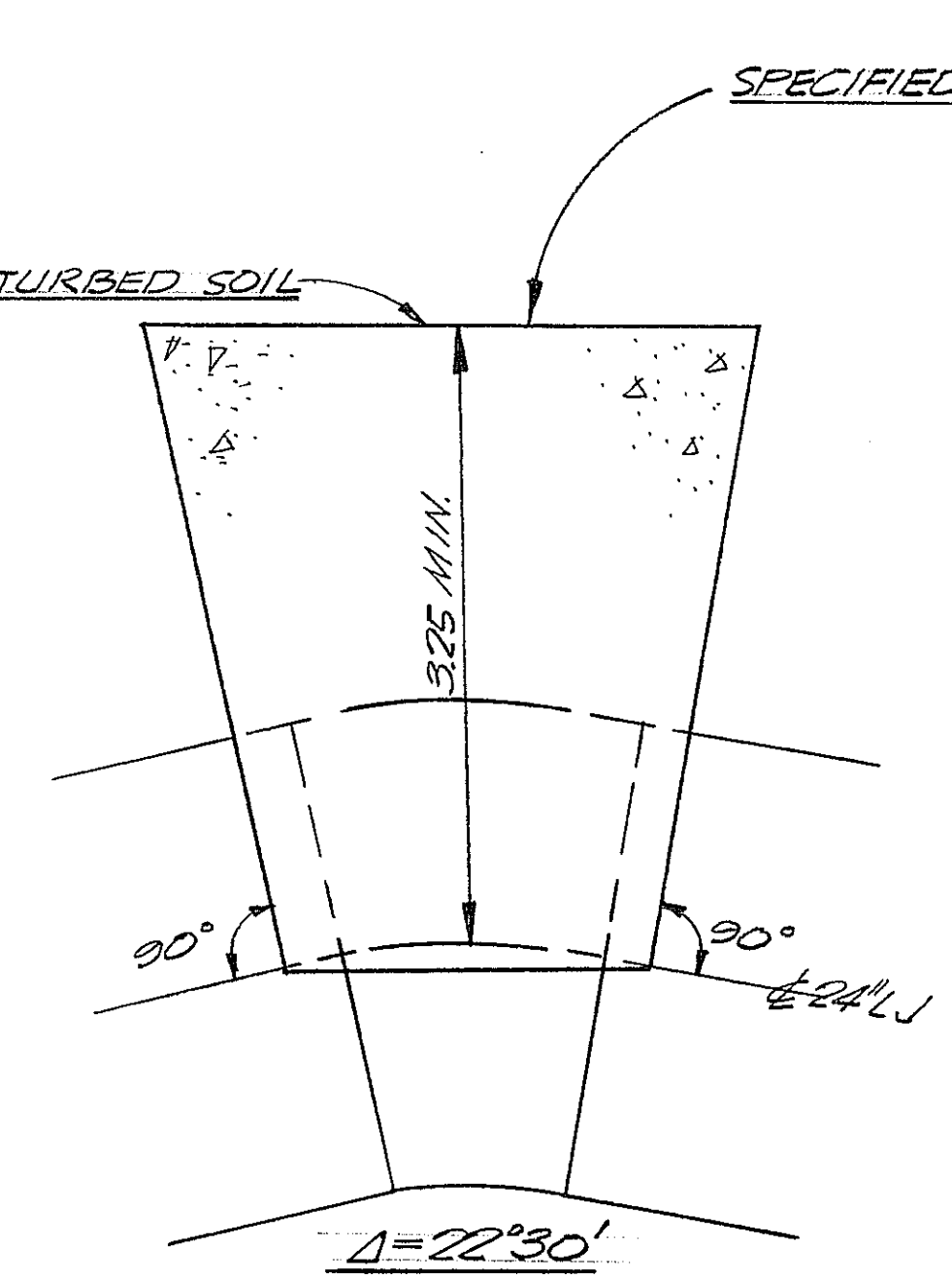
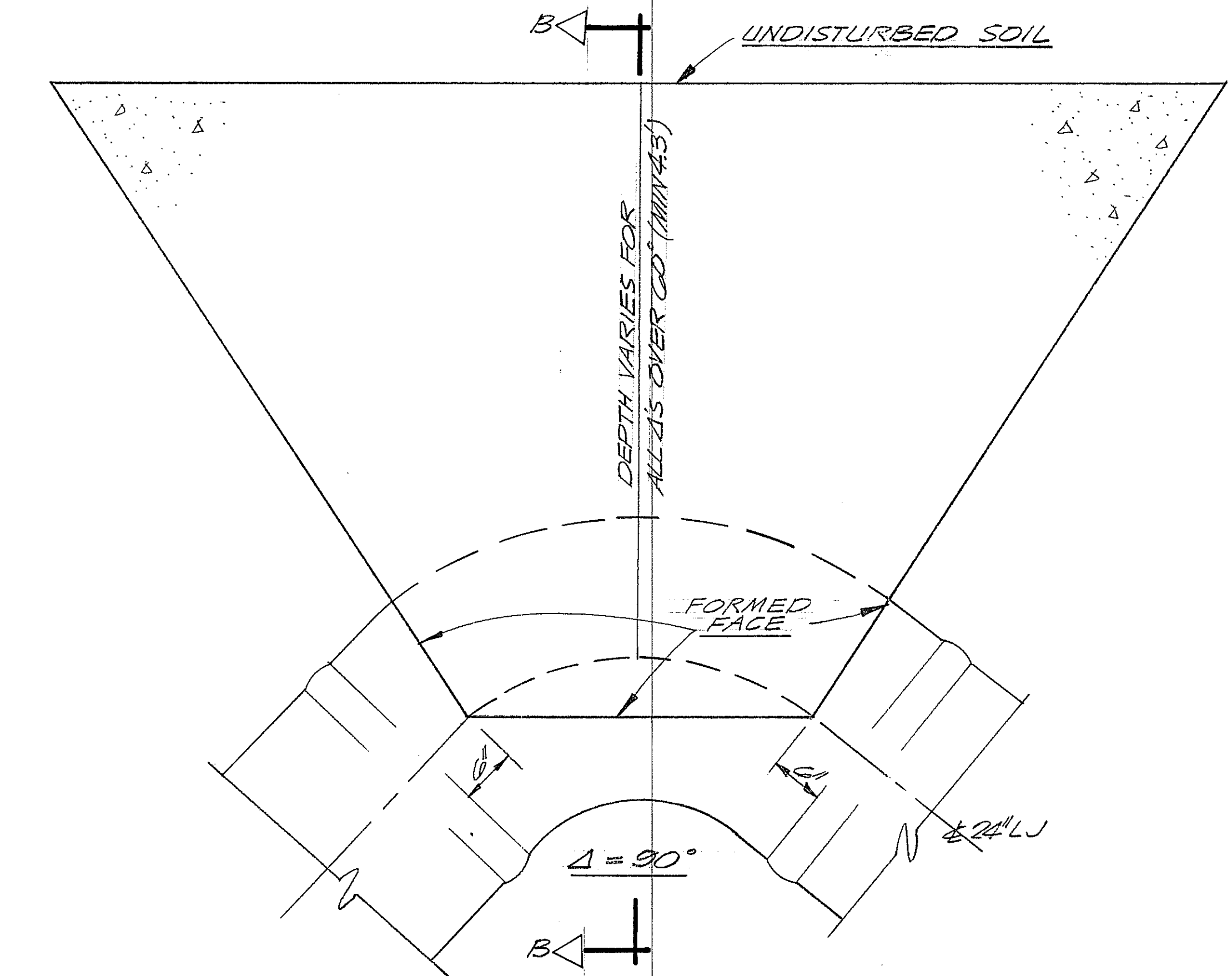
SCANNED

69-14

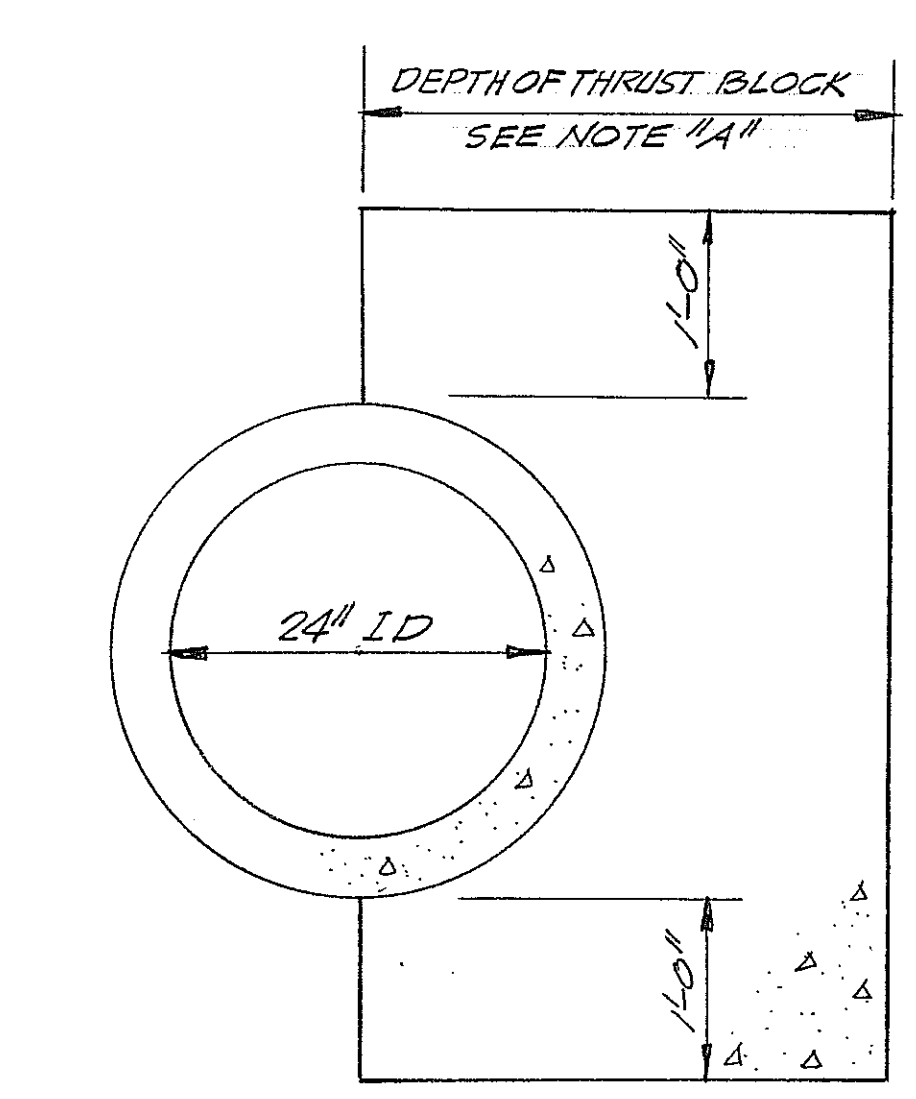




NOTE: Δ = 90° TO BE USED AT 2+02 FOR Δ = 88°06' RT LINE A-3



TYPICAL THRUST BLOCKS



SECTION B-B

NOTE A

Δ RANGE	DEPTH OF BLOCK
1° - 25°	3.30'
25°01' - 52°	4.30'
52°01' - 60°	5.30'
* 60°01' - 95°	4.30' MIN.

\* FOR 60°01' AND GREATER, SIDES OF THRUST BLOCK ARE NOT TO BE PERPENDICULAR TO Δ OF 24" LJ, BUT ALIGNED FROM 6" INSIDE JOINT TO POINT AT WHICH MIN. BEARING AREA IS ATTAINED.

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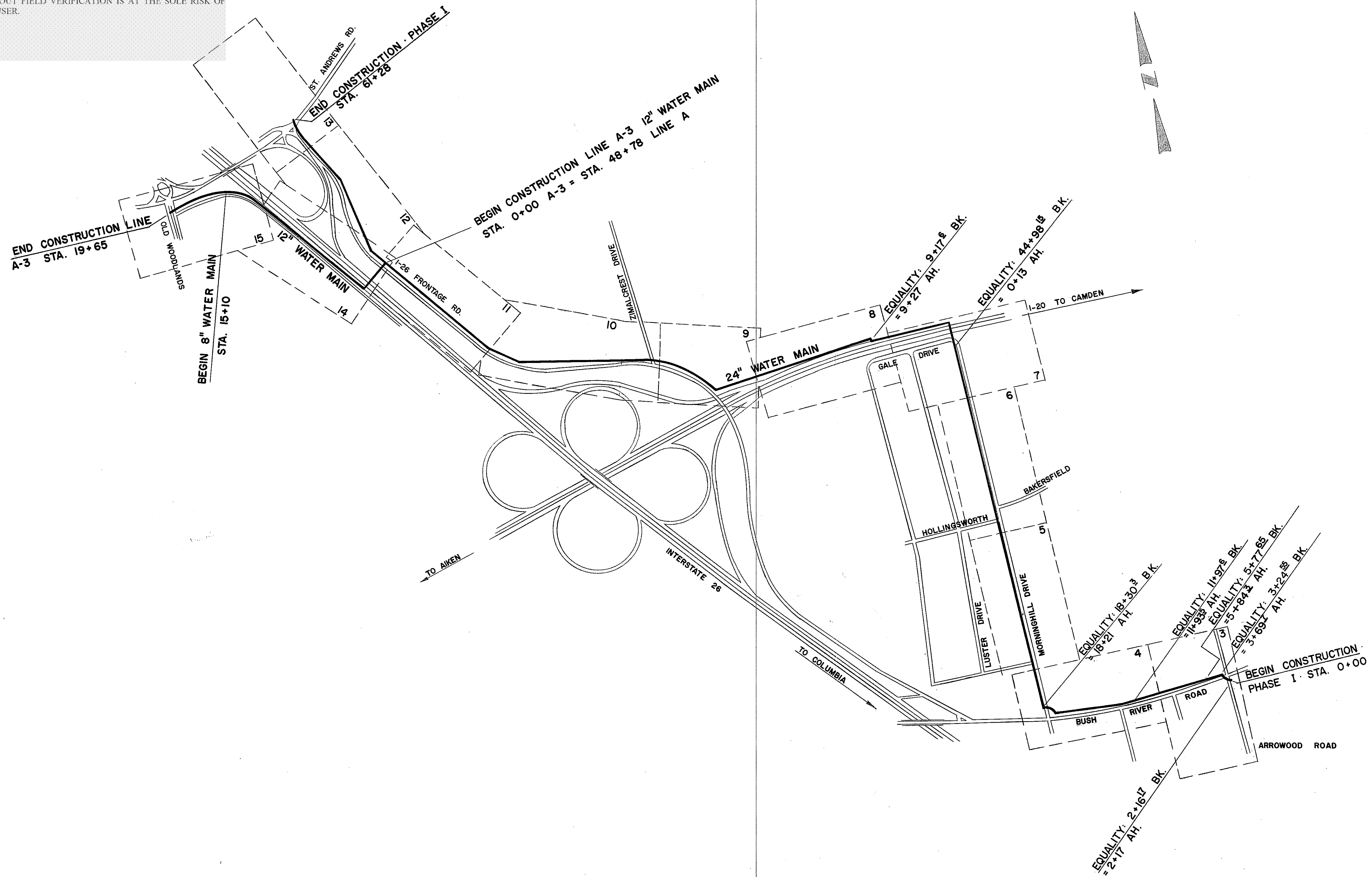
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THRUST BLOCK DETAILS  
FOR 24" LJ & 12" CI

SCANNED  
FRASER

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LOCATION MAP  
PHASE I - 24" WATER MAIN  
WATER SYSTEM IMPROVEMENTS  
HUD PROJECT NO WS-SC-136



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EXISTING 24" WATER MAIN

PROP. IRON  
AIR RELIEF VALVE  
IN METER BOX

PAVED DRIVE

SIDEWALK

SEE DETAIL SHEET N<sup>o</sup> 1  
FOR SECTION A-A

BEGIN CONSTRUCTION  
LINE "A" STA. 1+36.22  
Δ = 90°-00' LT.  
MBA = 50'  
6.3 CY CONC.  
SEE DETAIL SHEET N<sup>o</sup> 2.

1-24" TEE STA. 1+36.22  
1-16" VALVE  
EXIST. HYDRANT

12" WATER MAIN

EXTREME CAUTION!!!

GAS MAIN

SEE DETAIL SHEET N<sup>o</sup> 1 FOR  
REM. & REPL. PAVING DETAIL

STA. 2+13.61  
Δ = 65°-29' RT.  
1-24" 45° BEND  
1-24" 22 1/2° BEND  
MBA = 45'  
4.8 C.Y. CONC.

EQUALITY:  
STA. 2+13.61 BK =  
STA. 2+11.41

8" SAN SEWER

4' SIDEWALK

BUSH RIVER ROAD  
62' PAVING

R & R 5.4 SY PAVING

82'-36" C.I. CASING

REMOVE & REPLACE  
298 SY PAVING

CAR WASH  
ENTRANCE

LIGHT POLE  
WATER METER  
C&D VALVE

SMALL UTILITY LINES

UNDERGROUND SERVICE

SEWER PLANT

DRIVE

STATION

MATCH LINE

SHEET 4

1-24" 45° BEND

1-24" 22 1/2° BEND

MBA = 40'

4.8 C.Y. CONC.

STA. 3+13.61

Δ = 65°-29' RT.

1-24" 45° BEND

1-24" 22 1/2° BEND

MBA = 40'

4.8 C.Y. CONC.

STA. 3+13.61

Δ = 65°-29' RT.

1-24" 45° BEND

1-24" 22 1/2° BEND

MBA = 40'

4.8 C.Y. CONC.

STA. 3+13.61

Δ = 65°-29' RT.

1-24" 45° BEND

1-24" 22 1/2° BEND

MBA = 40'

4.8 C.Y. CONC.

STA. 3+13.61

Δ = 65°-29' RT.

1-24" 45° BEND

1-24" 22 1/2° BEND

MBA = 40'

4.8 C.Y. CONC.

STA. 3+13.61

Δ = 65°-29' RT.

1-24" 45° BEND

1-24" 22 1/2° BEND

MBA = 40'

4.8 C.Y. CONC.

STA. 3+13.61

Δ = 65°-29' RT.

1-24" 45° BEND

1-24" 22 1/2° BEND

MBA = 40'

4.8 C.Y. CONC.

STA. 3+13.61

Δ = 65°-29' RT.

1-24" 45° BEND

1-24" 22 1/2° BEND

MBA = 40'

4.8 C.Y. CONC.

STA. 3+13.61

Δ = 65°-29' RT.

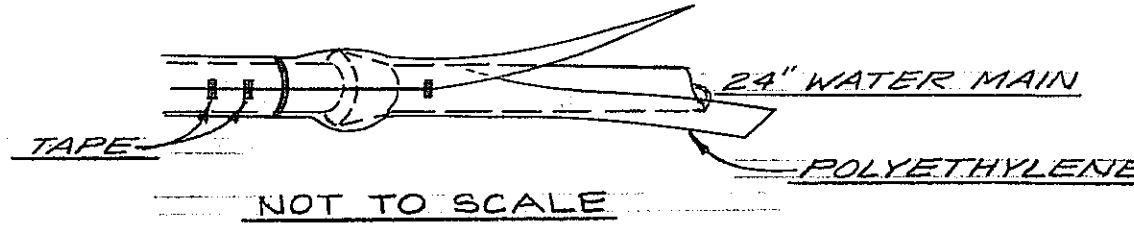
1-24" 45° BEND

1-24" 22 1/2° BEND

MBA = 40'

4.8 C.Y. CONC.

NOTE:  
IN THE EVENT DUCTILE OR CAST IRON PIPE IS USED,  
PIPE WILL BE WRAPPED WITH POLYETHYLENE 8 MIL. MIN.  
THICK, 20' BEFORE AND 20' AFTER ALL UTILITY CROSSINGS!!  
SEE DETAIL THIS SHEET.



NOT TO SCALE

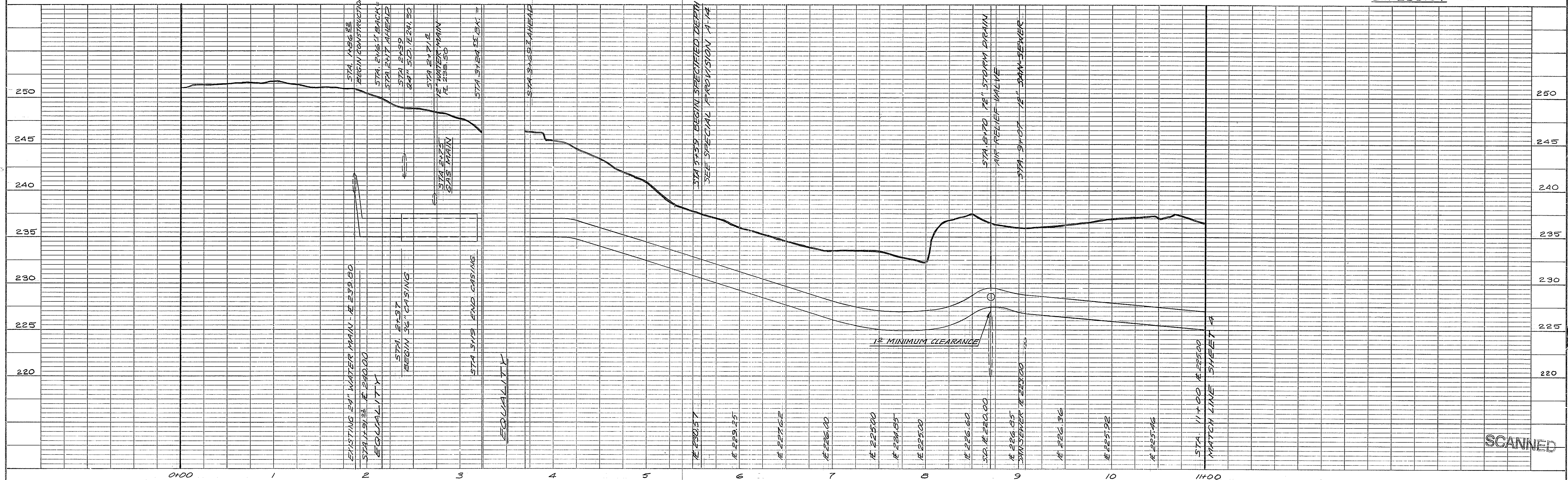
NOTE:  
EASEMENTS OTHER THAN THOSE  
OBTAINED BY THE CITY WILL BE  
OBTAINED BY THE CONTRACTOR!!  
SEE SPEC. PROV. SP

NOTE:  
MINIMUM BEARING AREA OF THRUST BLOCKS  
WILL BE NOTED AT ALL Δ'S GREATER THAN  
4° AS MBA, APPROX. CU. YDS. CONC. REQ'D  
ALSO NOTED. SEE DETAIL SHEET N<sup>o</sup> 2

SPECIAL ITEMS THIS SHEET  
R & R 23.0 SY PAVING  
R & R 54.95 SY ASPH. DRIVE  
15.9 C.Y. THRUST BLOCK CONC.

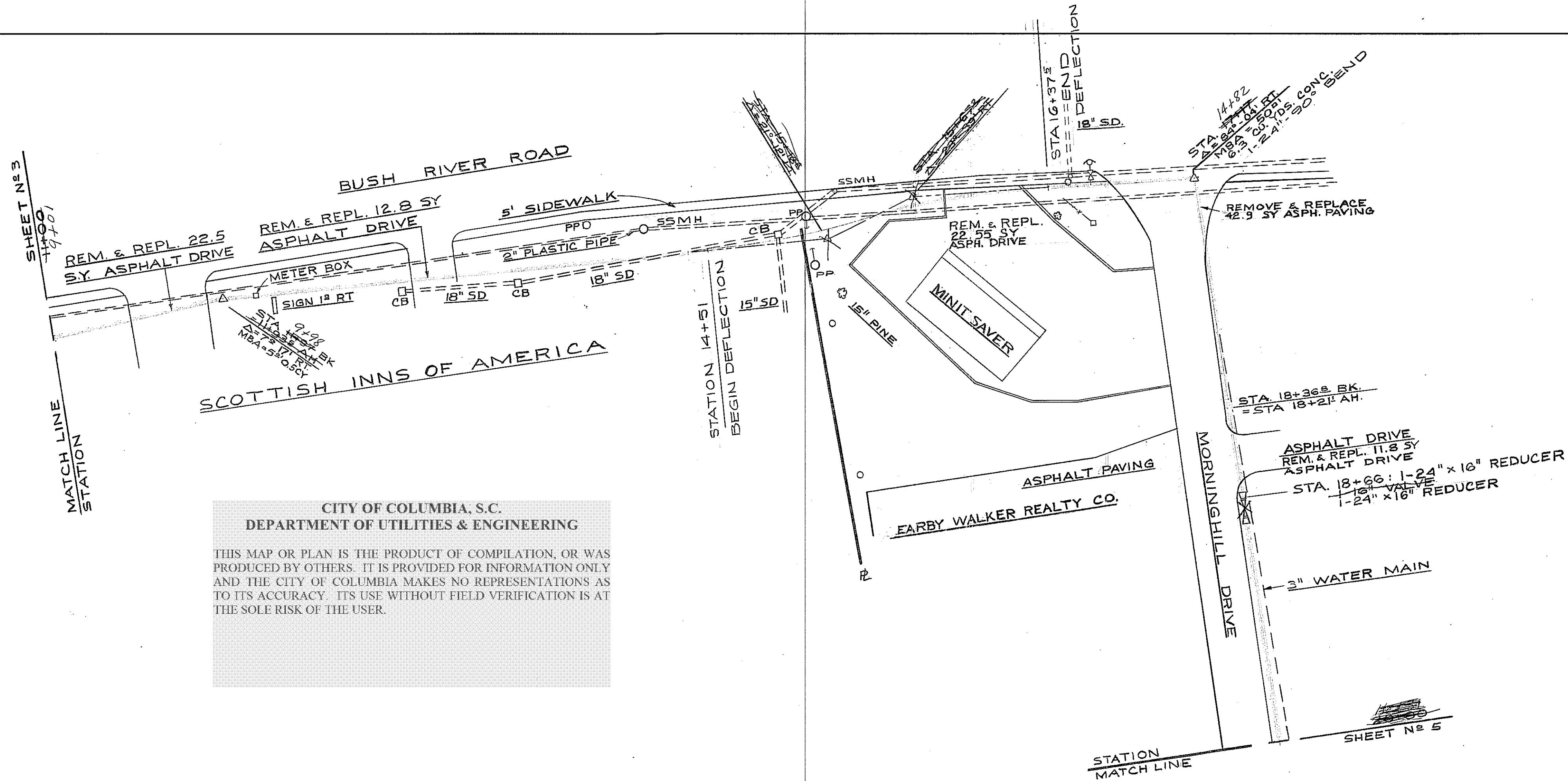
SCALE: PLAN - 1" = 40'  
VERT - 1" = 5'  
HORIZ - 1" = 50'

BENCH MARK: NAILS IN POLE  
#159983 SW CORNER  
ARROWOOD & BUSH RIVER RD.  
EL. 250.97





PLAN	DATE	BY	DATE
SURVEYED	12/12/73	G. PENDERGRAFT	12/12/73
NOTE BOOK			
NO. 123			
NO. 124			



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CITY OF COLUMBIA DEPARTMENT OF ENGINEERING COLUMBIA, SOUTH CAROLINA			
SCALE: AS SHOWN	DESIGNED BY: <i>G. Pendergraft</i>	DRAWN BY: GP	
DATE: 12/20/73	DESIGN ENGINEER	REVISED: 9/27/73	
PHASE I - ST. ANDREWS WATER MAIN CONSTRUCTION			
FIELD BOOK No. 123 - 139 - 142 - 161 - 158 - 151	DRAWING NUMBER 4		
REVISIONS	NO.	DESCRIPTION	DATE
2	BK. 161	STA. 7+19 TO STA. 11+97 1/2 CHANGE ALIGNMENT AND PROFILE	11/1/73
3	BK. 158	STA. 5+30 TO STA. 11+97 1/2 CHANGE ALIGNMENT AND PROFILE	11/27/73
4	BK. 151	STA. 15+16 1/2 TO STA. 18+36 1/2 CHANGE ALIGNMENT AND PROFILE	12/27/73
5	BK.	STA. 14+51 AH. TO STA. 16+31 BK. CHANGE ALIGNMENT	

REVISION: 11/1/73 BK. 161 STA. 11+00 TO 11+97 1/2 BK. = 11+93 1/2 AH. CHANGE IN ALIGNMENT AND PROFILE

NOTE: (A) = ASPHALT  
(C) = CONCRETE

REMOVE & REPLACE 42.9 SY PAVING  
REMOVE & REPLACE 69.65 SY ASPH. DR.

SCALE: VERT. 1" = 5'  
HORIZ. 1" = 40'  
PROFILE 1" = 50'

BENCH MARK  
NAILS IN POLE NO. 159992 N. SIDE  
BUSH RIVER RD. EL. 228.82

PROFILE	DATE	BY	DATE
SURVEYED	12/12/73	G. PENDERGRAFT	12/12/73
NOTE BOOK			
NO. 123			
NO. 124			

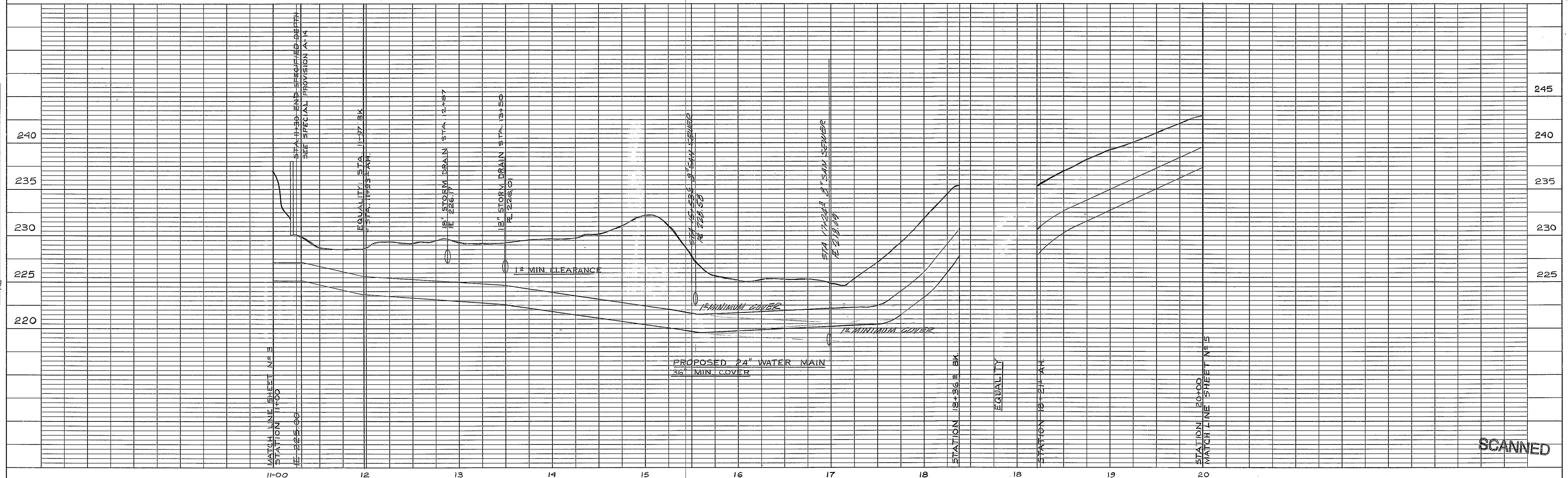


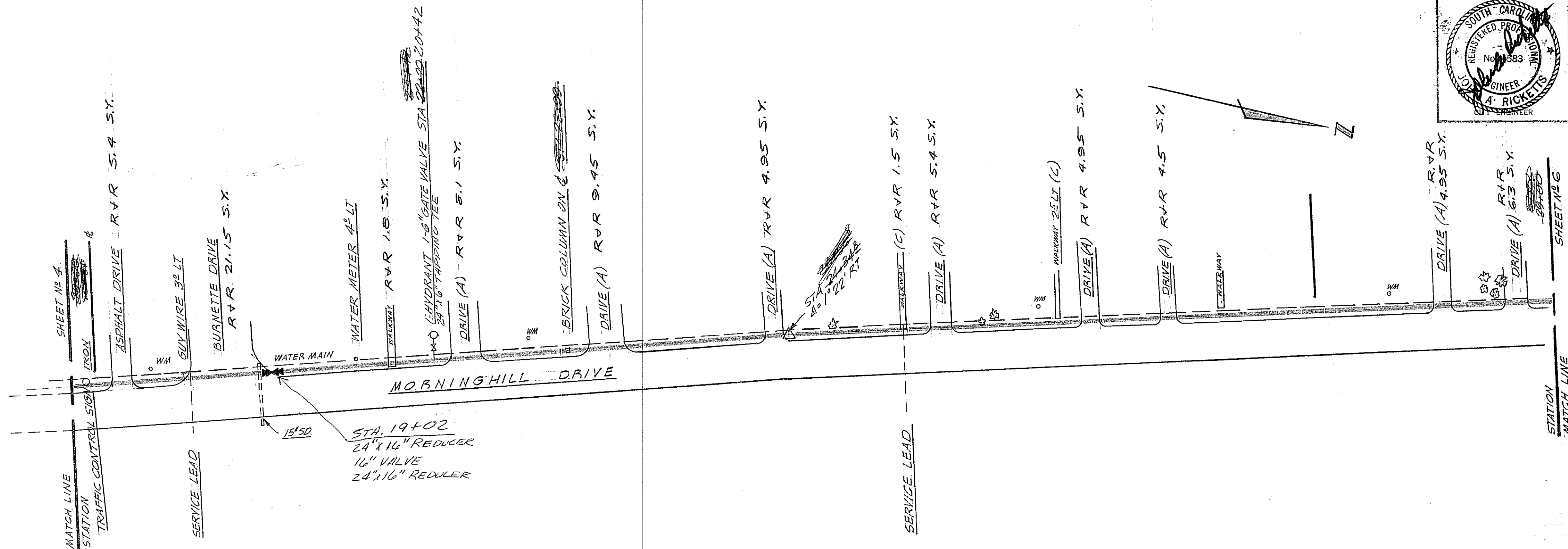
PLATE 1 PLAN-PROFILE O. P. & R. E. STANDARD  
100% RAG PAPER - MADE AND PRINTED IN U.S.A.  
EUGENE DIETZEN CO.

PLAN	SURVEYED	BY	DATE
	PLOTTED	BY	
	CHECKED	BY	
	RT. OF WAY CHECKED	BY	
NO. 142			

PROFILE	SURVEYED	BY	DATE
	GRADES CHECKED	BY	
	NOTED	BY	
	STRUCTURE NOTATION CHD	BY	
NO. 142			

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CITY OF COLUMBIA DEPARTMENT OF ENGINEERING COLUMBIA, SOUTH CAROLINA		17	WH	BY	F
SCALE: AS SHOWN	DATE: 7-16-73	DESIGN ENGINEER		REVISED	
PHASE I - ST. ANDREWS WATER MAIN CONSTRUCTION					
FIELD BOOK No. 142		DRAWING NUMBER 5			

REMOVE + REPLACE BRICK COLUMN  
STA. 22+99  
REMOVE + REPLACE 54.0 SY. ASPH. DRIVE  
REMOVE + REPLACE 3.3 S.Y. CONC.  
WALKWAY  
REMOVE & REPLACE 21.15 S.Y. PAVING

NOTE  
(A) = ASPHALT  
(C) = CONCRETE

SCALE: HORIZ 1"=40'  
VERT 1"=5'  
BENCHMARK: "X" ON S.E. COR.  
SIDEWALK AT BOT. STEP  
TO HOUSE #1521 MORNING-  
HILL RD. ELEV. 252.03

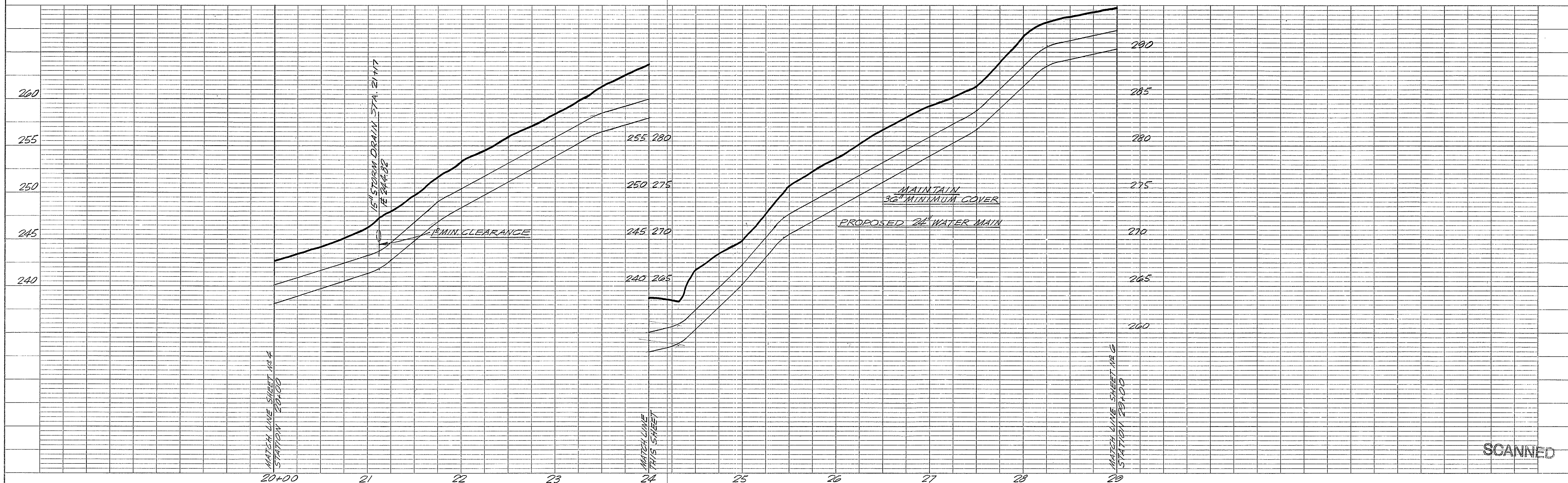


PLATE 1, PLAN-PROFILE  
KEUFFEL & ESSER CO.

48 7008 ALBANENE® TRACING PAPER 29535  
MADE IN U.S.A.

SCANNED

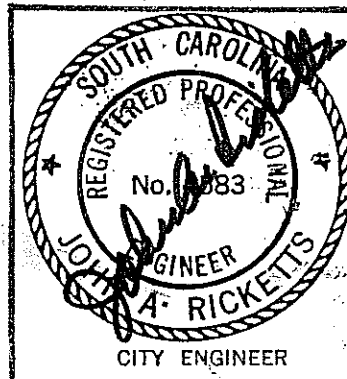
SHEET No 5

69-14

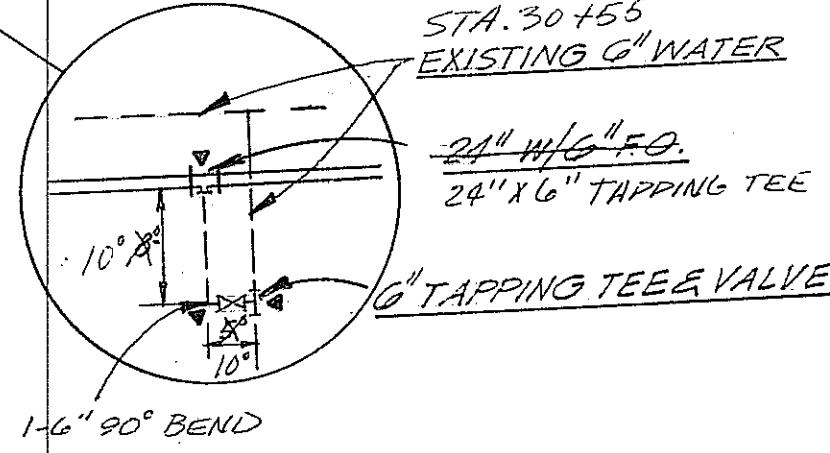
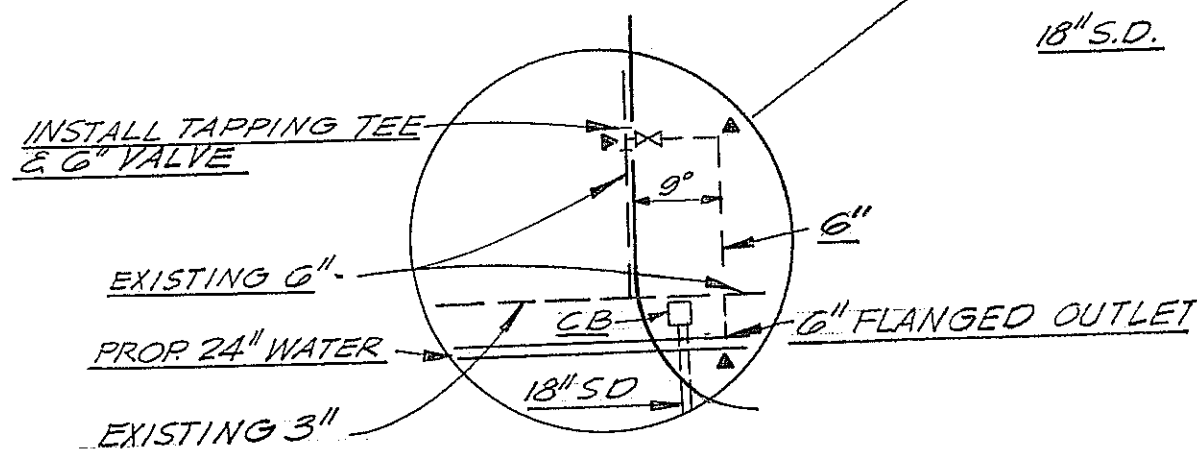
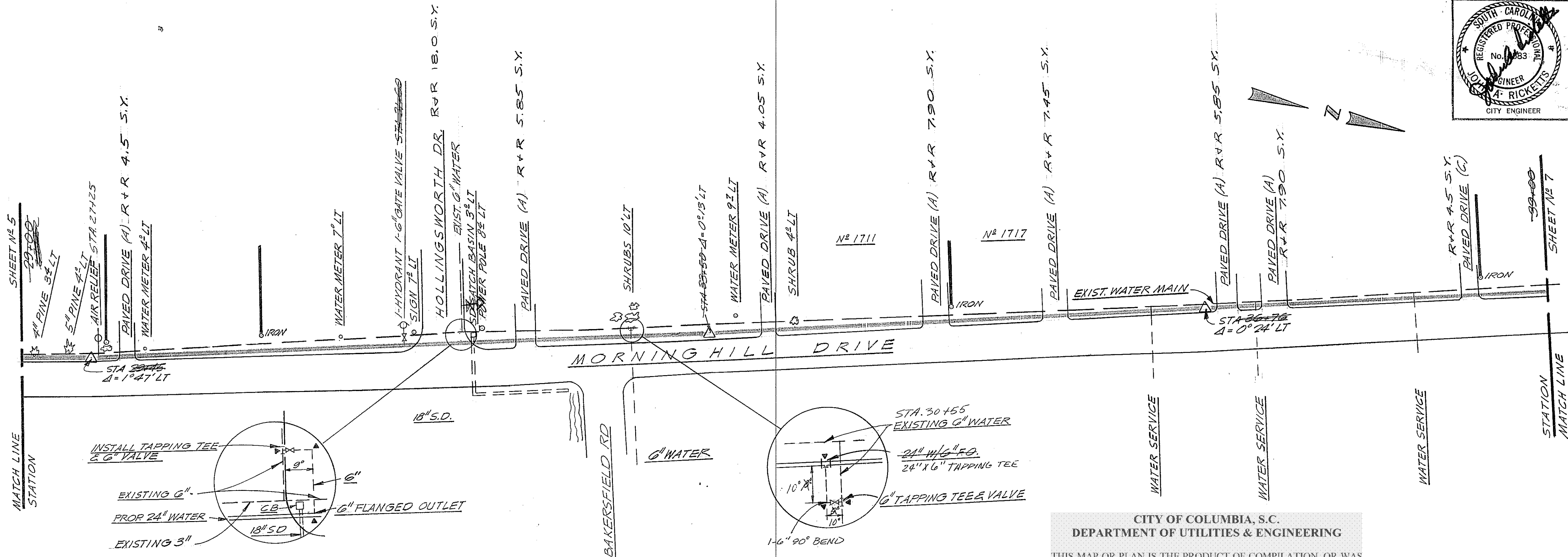


PLAN	DATE
BY HOOPER FRASER	
REVIEWED NOTED	
NOTE BOOK NO. 142	
ALIGNMENT CHECKED BY	
REVISIONS CHECKED BY	

PROFILE	DATE
BY BRITZELL FRASER	
REVIEWED NOTED	
NOTE BOOK NO. 142	
GRADES CHECKED BY	
REVISIONS CHECKED BY	



CITY OF COLUMBIA DEPARTMENT OF ENGINEERING COLUMBIA, SOUTH CAROLINA	APPROVED BY <i>E.H. Clark, Jr.</i> DESIGN ENGINEER	DRAWN BY F REVISED
SCALE: AS SHOWN DATE: 7/17/73	PHASE I - ST. ANDREWS WATER MAIN CONSTRUCTION	FIELD BOOK No. 142
		DRAWING NUMBER 6



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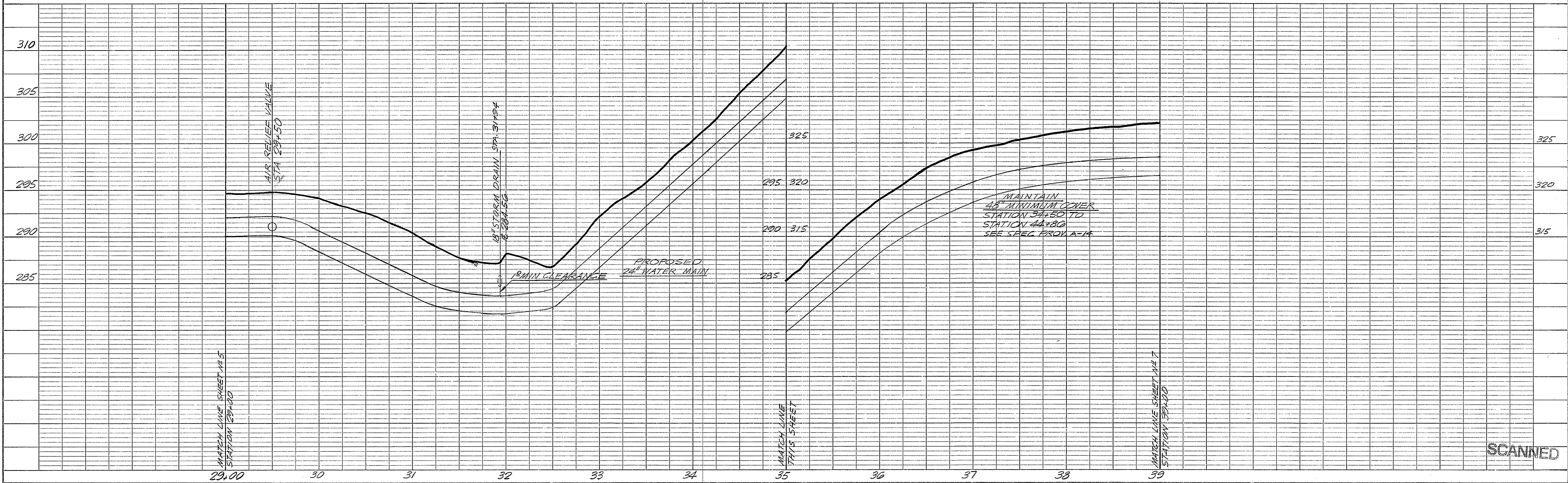
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NOTE:  
(A) ASPHALT  
(C) CONCRETE

NOTE:  
REMOVE & REPLACE 18.0 S.Y. PAVING.  
REMOVE & REPLACE 43.5 S.Y. ASPHALT DRIVE.  
REMOVE & REPLACE 4.5 S.Y. CONCRETE DRIVE.

SCALE: VERT 1"=5'  
HORIZ 1"=40'

BENCH MARK  
X ON N.E. COR. BTM STEP TO HOUSE NO. 1727 MORNINGHILL RD. EL. 310.54



SCANNED

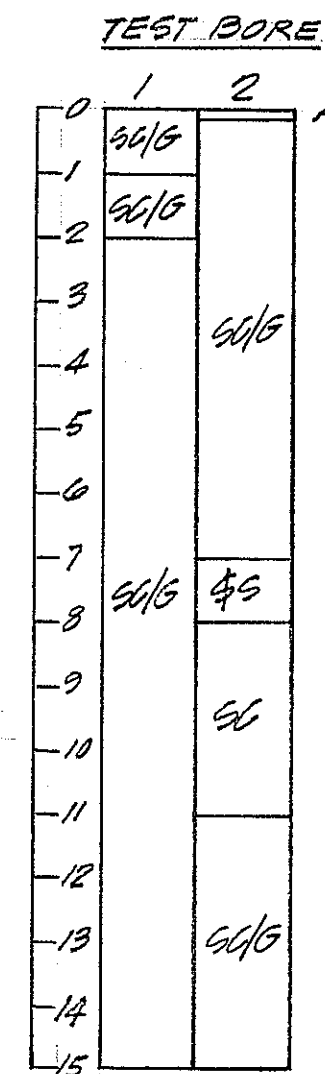


<b>PROFILE</b> NOTE BOOK No. _____	SURVEYED _____	BY _____	DATE _____
	PLOTTED _____		
	GRADES CHECKED _____		
	B. M.'s NOTED _____		

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A circular professional engineer seal for the State of South Carolina. The outer ring contains the text "SOUTH CAROLINA" at the top and "CITY ENGINEER" at the bottom, separated by two stars. The inner circle contains the text "REGISTERED PROFESSIONAL" at the top, "No. 4583" in the center, and "ENGINEER" at the bottom. A signature, "John A. Ricketts", is written across the seal in cursive.

<p>CITY OF COLUMBIA DEPARTMENT OF ENGINEERING COLUMBIA, SOUTH CAROLINA</p>	
<p>SCALE: <i>AS SHOWN</i></p>	<p>DRAWN BY: <i>"F"</i></p>
<p>DATE: <i>7-18-73</i></p>	<p>DESIGN ENGINEER: <i>[Signature]</i></p>
<p><b>PHASE I - ST. ANDREWS WATER MAIN CONSTRUCTION</b></p>	
<p>FIELD BOOK NO. <i>442 &amp; 156</i></p>	<p>DRAWING NUMBER <i>7</i></p>



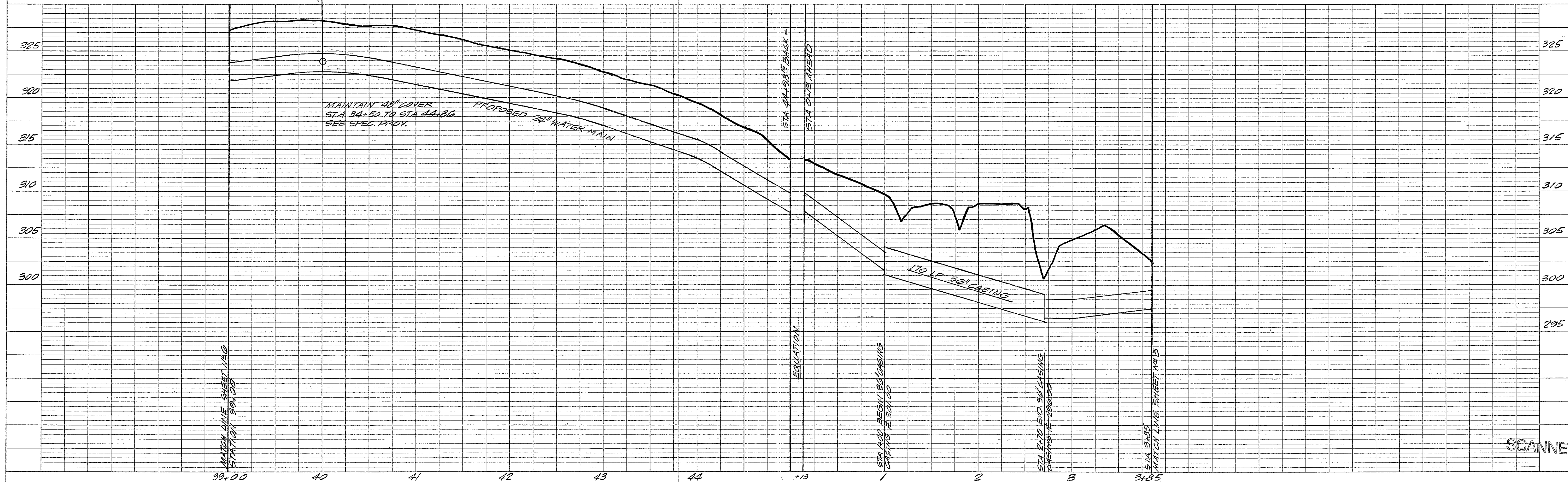
LEGEND

SG/G - SANDY CLAY GRAVEL  
\$S - SILTY SAND  
A - ASPHALT  
SC - SANDY CLAY

SPECIAL ITEMS THIS SHEET  
 REMOVE & REPLACE 18.26 SY CONC. DRIVE  
 REMOVE & REPLACE 16.10 SY ASPH. DRIVE  
 REMOVE & REPLACE 33.1 S.Y. PAVING

SCALE° HORIZ 1" = 40'  
VERT 1" = 5'  
PROFILE 1" = 50'

BENCH MARK° X ON NE COR BTM STEP  
HSE NO 1727 MORNINGHILL - ELEV. 319.54



SCANNED

SHEET N° 7

69-14

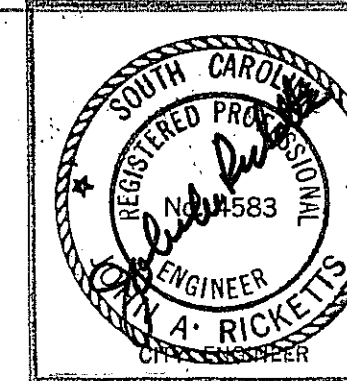


PLAN	DATE	BY	DATE
SURVEYED			
NOTED			
ALIGNED			
CHECKED			
NO. 156			

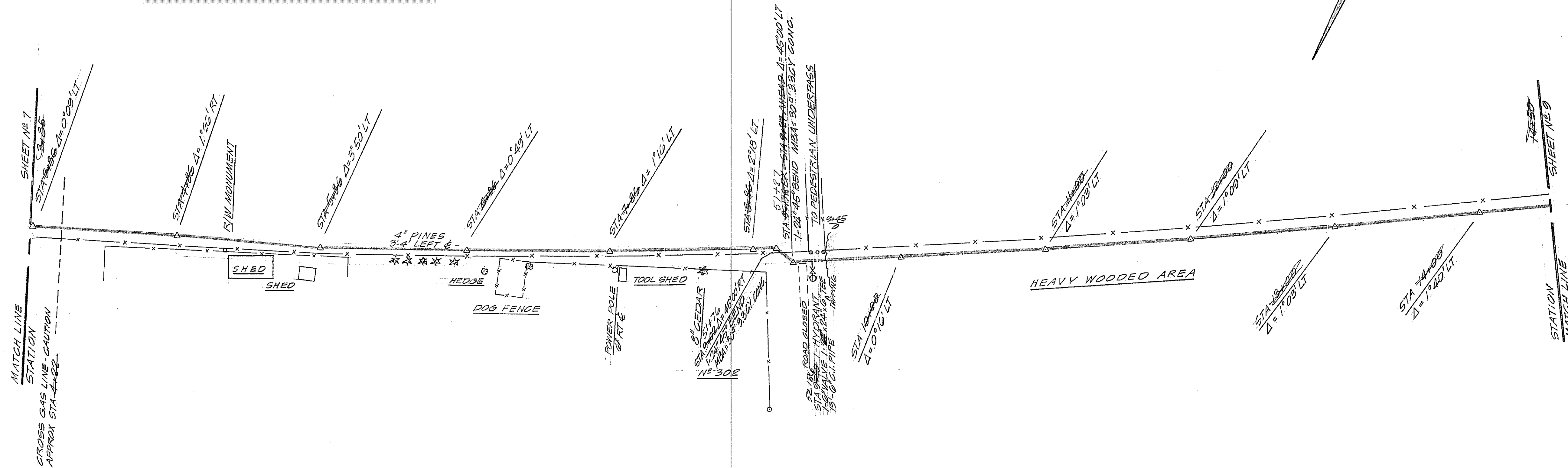
PROFILE	DATE	BY	DATE
SURVEYED			
NOTED			
GRADES			
CHECKED			
NO. 156			

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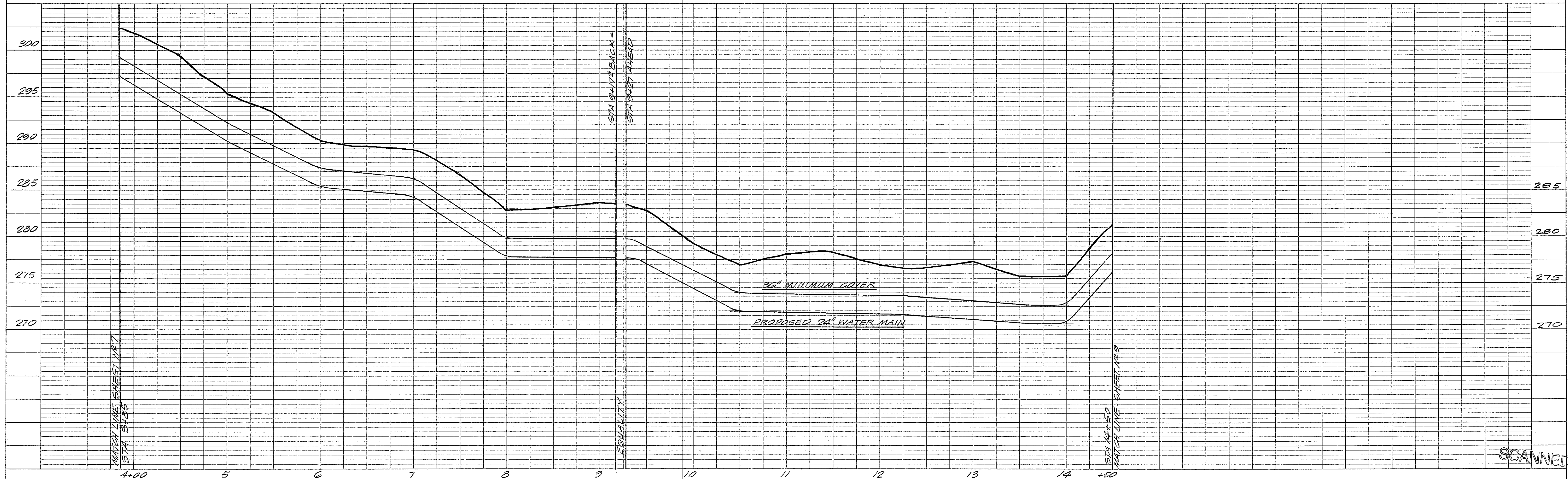


CITY OF COLUMBIA DEPARTMENT OF ENGINEERING COLUMBIA, SOUTH CAROLINA	SCALE: AS SHOWN	DESIGNED BY <i>E. H. Clark, Jr.</i>	DRAWN BY "F"
DATE: 7-10-73	ENGINEER	REVISOR	
PHASE I - ST. ANDREWS WATER MAIN CONSTRUCTION	FIELD BOOK NO. 150	DRAWING NUMBER 8	



SCALE: HORIZ 1" = 40'  
VERT 1" = 5'  
PROFILE 1" = 50'

BENCH MARK  
1" ON NE COR BTM STEP TO HSE  
NO 1727 MORNINGHILL DRIVE  
ELEV. 319.54





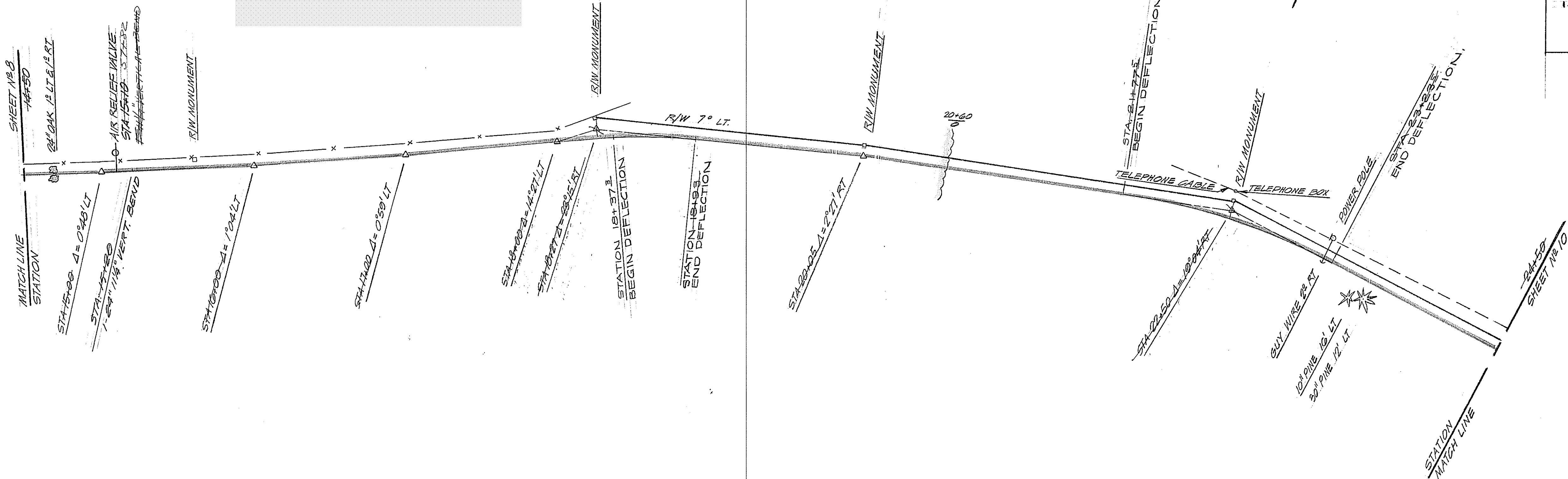
PLAN	DATE	BY
	SURVEYED	
	NOTED	
	NOTE BOOK	
No.		

PROFILE	DATE	BY
	SURVEYED	
	NOTED	
	NOTE BOOK	
No.		

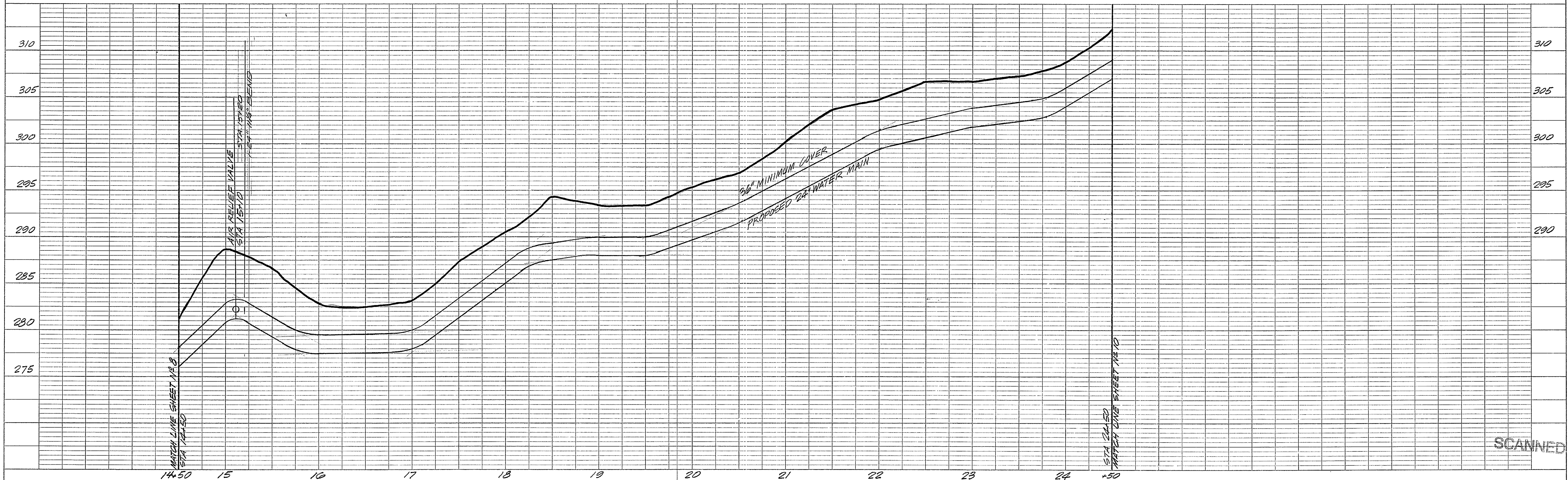
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	CITY OF COLUMBIA DEPARTMENT OF ENGINEERING COLUMBIA, SOUTH CAROLINA	
	SCALE: AS SHOWN	DESIGNED BY: E. H. Clark, Jr.
	DATE: 7-20-73	REVISION 10-18-73
	PHASE I - ST. ANDREWS WATER MAIN CONSTRUCTION	
FIELD BOOK No. 156	DRAWING NUMBER 9	
REVISION No.	DESCRIPTION	DATE
1.	BK. - STA. 18+37.3 AH. TO STA. 18+91.3 BK. AN STA. 21+77.5 AH. TO STA. 23+21.5 BK. CHANGE ALIGNMENT	2-8-74




SCALE: HORIZ 1" = 40'  
VERT 1" = 5'  
PROFILE 1" = 50'  
BENCH MARK  
"X" ON NE COR BTM STEP TO  
N. 1727 MORNINGHILL DRIVE  
EL 319.54

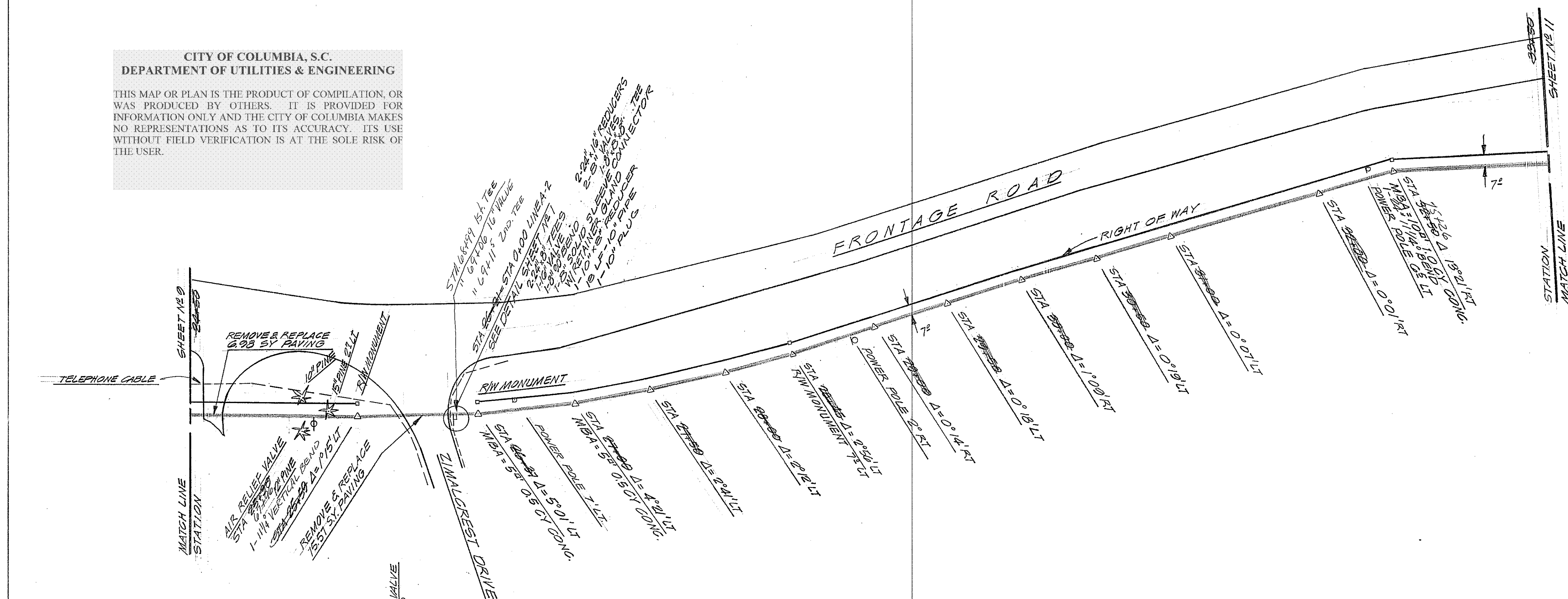




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	SURVEYED _____ BY _____ DATE _____	
	PLOTTED _____	
NOTE BOOK	ALIGNMENT CHECKED _____	
No. _____	RT. OF WAY CHECKED _____	

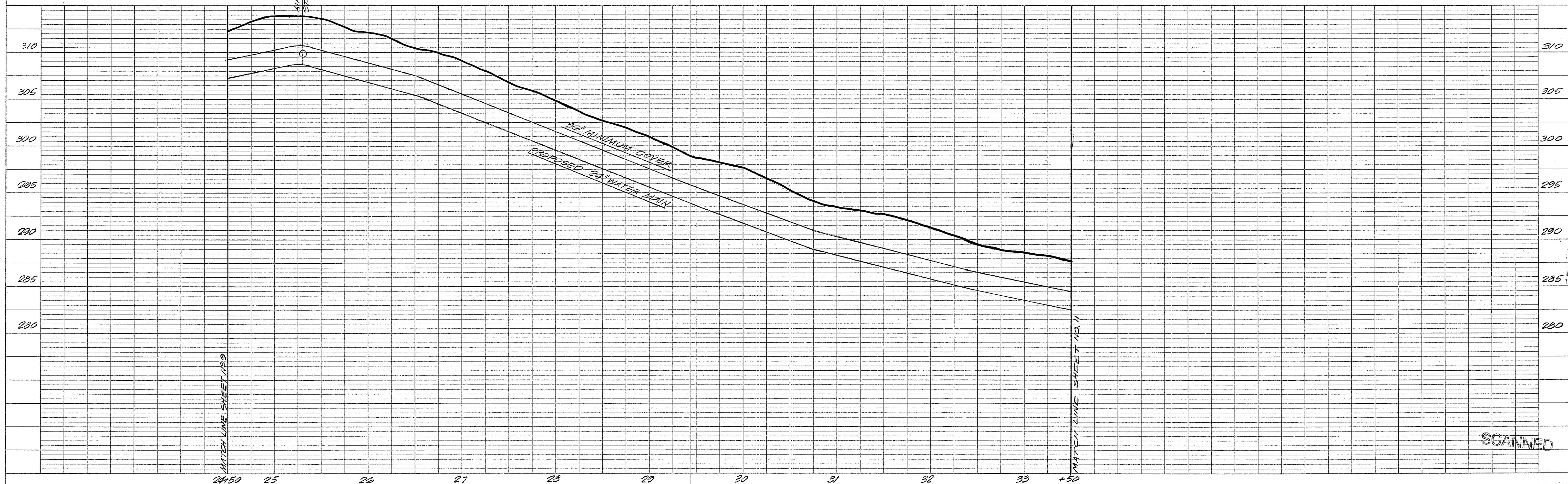
<b>PROFILE</b> and DATA	SURVIVED	BY	DATE
NOTE BOOK	PLOTTED		
No.	GRADES CHECKED		
	B. M.'S. NOTED		
	STRUCTURE NOTATIONS CHECKED		



SPECIAL ITEMS THIS SHEET  
REMOVE & REPLACE 22.55 SY  
PAVING.

SCALE: HORIZ 1" = 40'  
VERT 1" = 5'  
PROFILE 1" = 50'

BENCH MARK  
"X" ON NE COR BTM STEP N<sup>o</sup> 1727  
MORNINGHILL DRIVE ELEV. 319.54

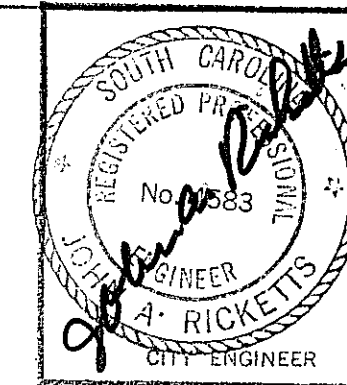


SCANNED



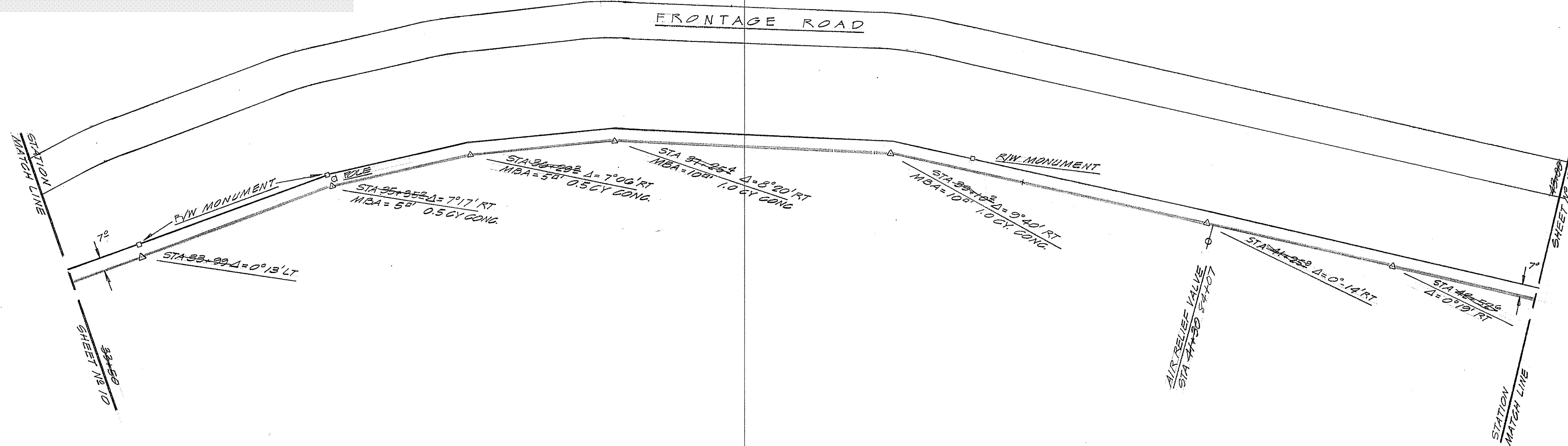
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DEPARTMENT OF UTILITIES & ENGINEERING

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CITY OF COLUMBIA DEPARTMENT OF ENGINEERING COLUMBIA, SOUTH CAROLINA		DRAWN BY JF
SCALE: AS SHOWN	APPROVED BY S. H. Clark, Jr. DESIGN ENGINEER	REVISOR
DATE: 7-25-73	PHASE I - ST. ANDREWS WATER MAIN CONSTRUCTION	
FIELD BOOK No. 152 & 156	DRAWING NUMBER 11	

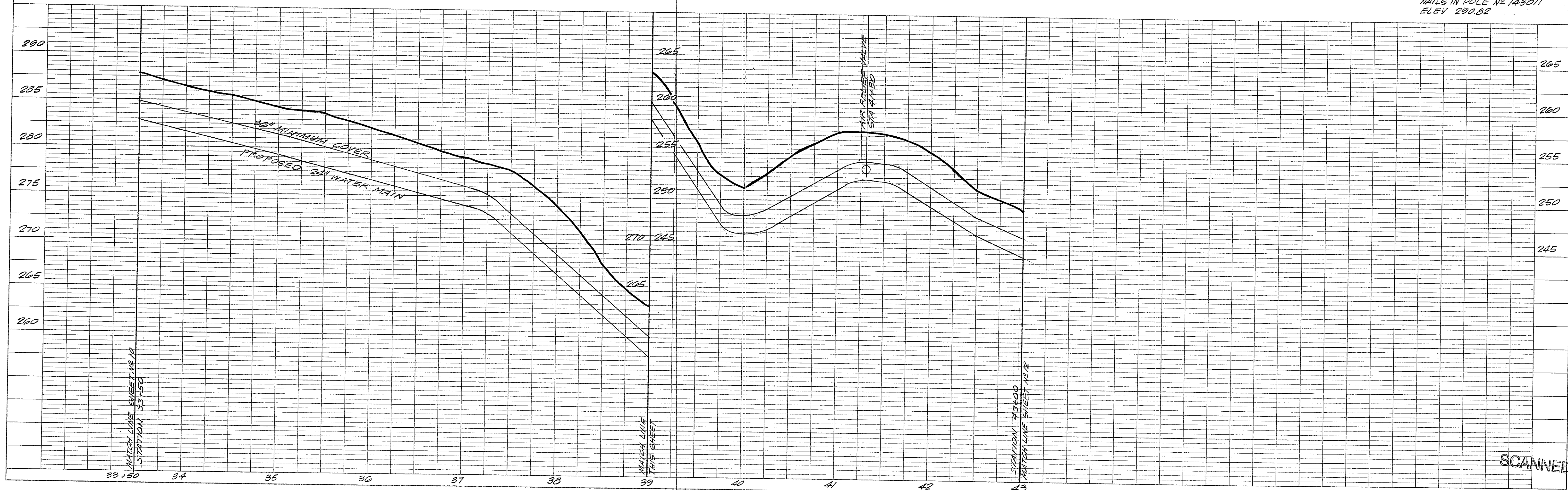
PLAN	SURVEYED	DATE
	NOTED	BY
	CHECKED	
	BY OF WAY CHECKED	



SCALE: HORIZ 1" = 40'  
VERT 1" = 5'  
PROFILE 1" = 50'

BENCH MARK  
NAILS IN POLE NO 143011  
ELEV 290.82

PROFILE	SURVEYED	DATE
	NOTED	BY
	CHECKED	
	STRUCTURE LOCATIONS CHECKED	

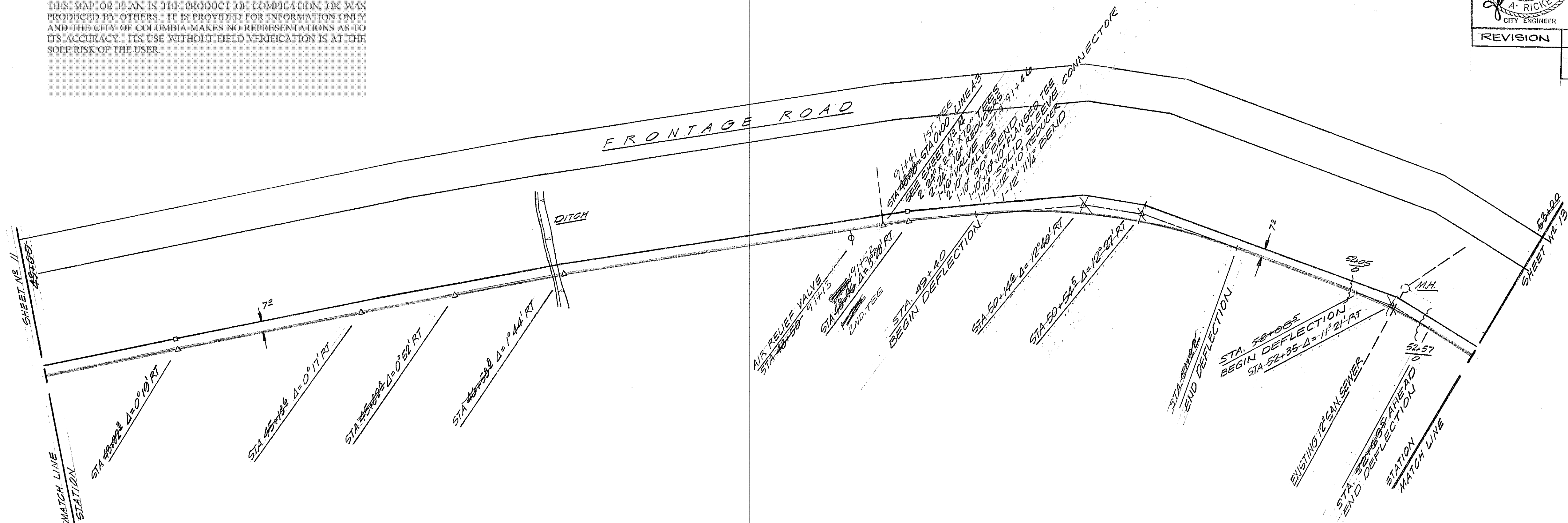




CITY OF COLUMBIA, S.C.  
DEPARTMENT OF UTILITIES & ENGINEERING

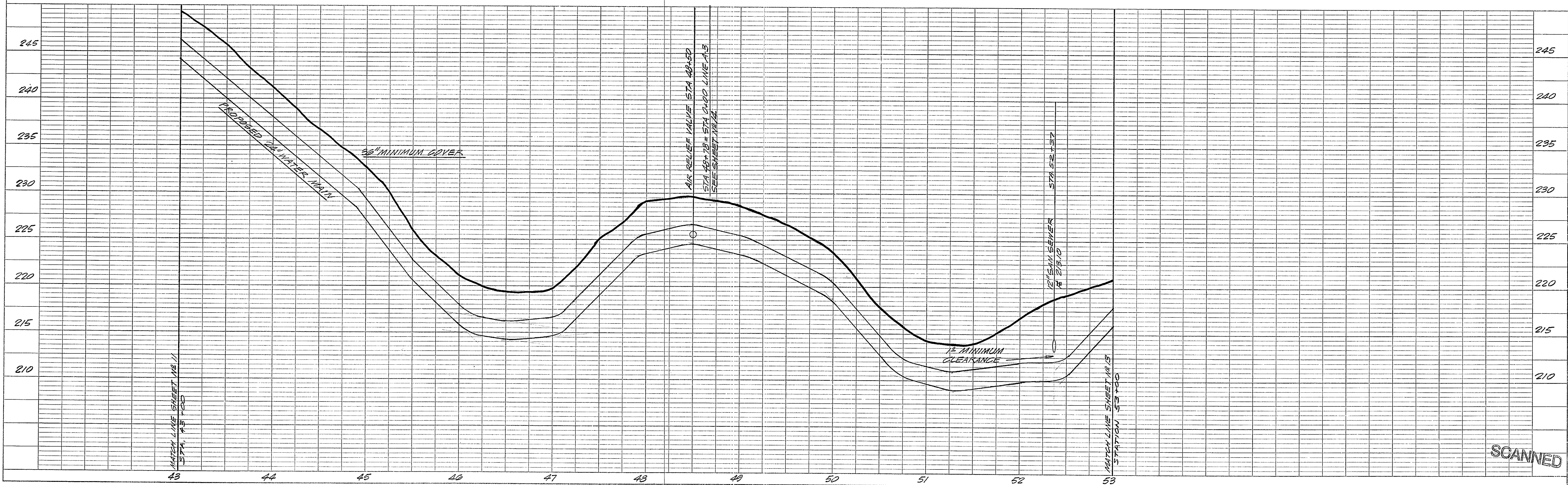
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CITY OF COLUMBIA DEPARTMENT OF ENGINEERING COLUMBIA, SOUTH CAROLINA			
SCALE: AS SHOWN DATE: 7-25-73	APPROVED BY: <i>[Signature]</i> DESIGN ENGINEER		
DRAWN BY: F REVISED			
PHASE I - ST. ANDREWS WATER MAIN CONSTRUCTION			
FIELD BOOK NO. 152	DRAWING NUMBER 12		
REVISION	N <sup>o</sup>	DESCRIPTION	DATE
1.	BK.	STA. 49+40 A.H. TO STA. 51+20 BK. AND STA. 52+08 TO STA. 52+62 BK. REVISED ALIGNMENT	2-8-74




SCALE = HORIZ 1" = 40'  
VERT 1" = 5'  
PROFILE 1" = 50'

BENCH MARK  
NAILS IN POLE NO 143011  
ELEV 290.82

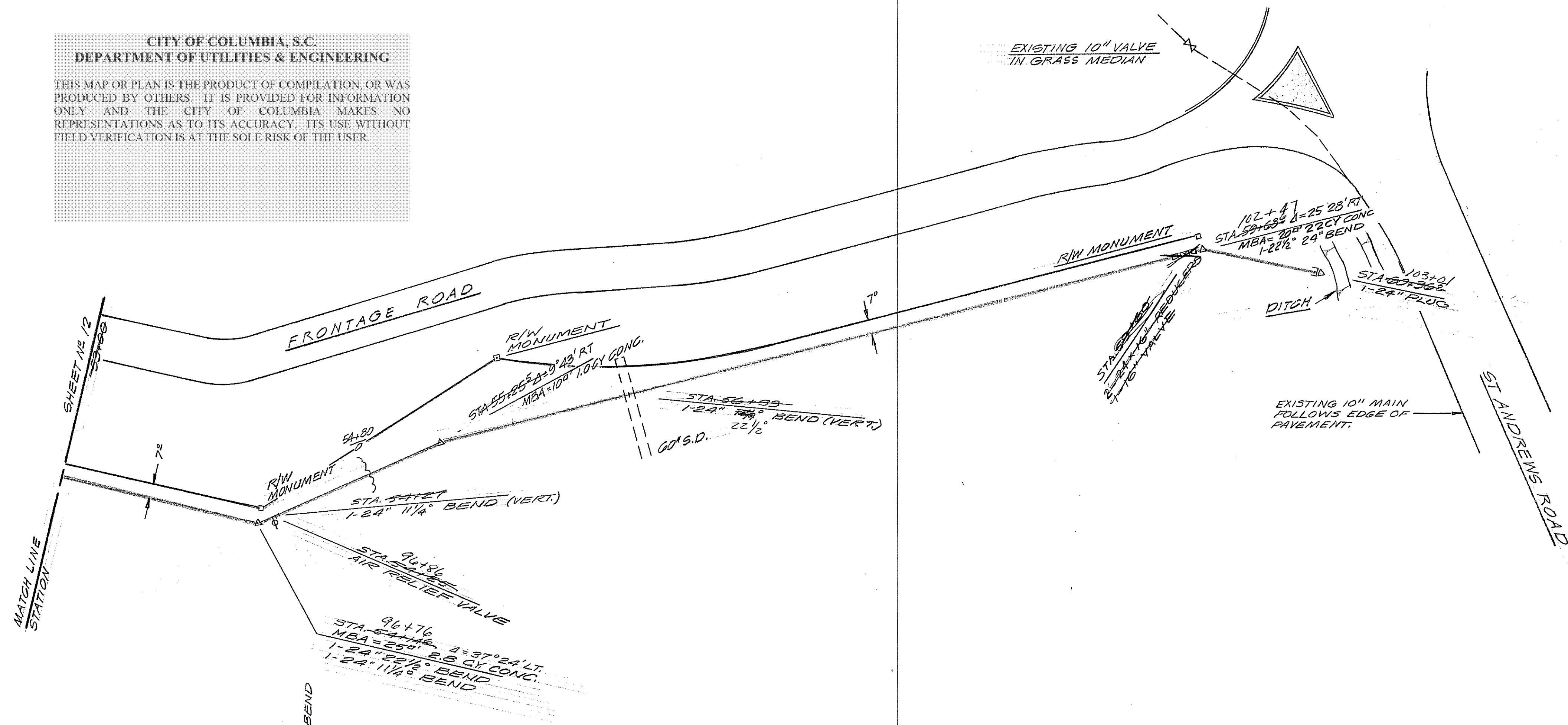




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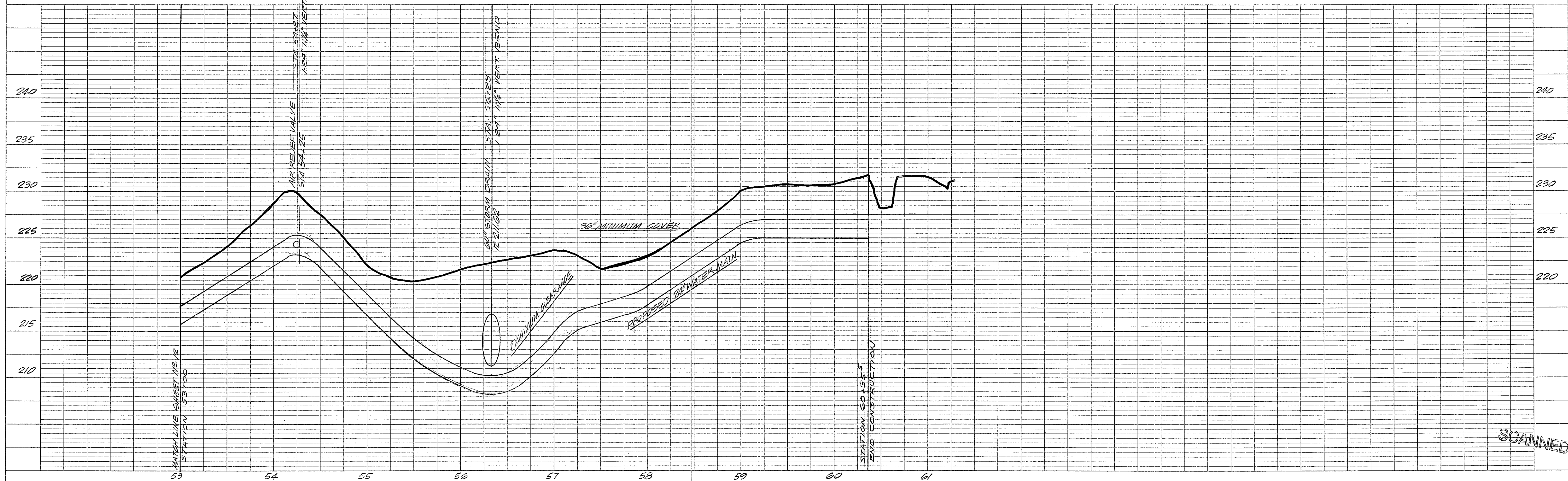
	SURVEYED.....	BY.....	DATE.....
	PLOTTED.....		7-26-73
	ALIGNMENT CHECKED.....		
RT. OF WAY CHECKED.....			
No. ....			

<b>PROFILE</b>	SURVEYED _____		BY _____	DATE _____
	PLOTTED _____		7-26-75	
	GRADES CHECKED _____			
<b>NOTE BOOK</b>	B. M.'s NOTED _____			
No. _____	STRUCTURE NOTATIONS CHECKED _____			



SCALE = HORIZ 1" = 40'  
VERT 1" = 5'  
PROFILE 1" = 50'

BENCH MARK  
"X" ON NE COR OVERPASS I-26  
& ST. ANDREWS RD. EL 233.04

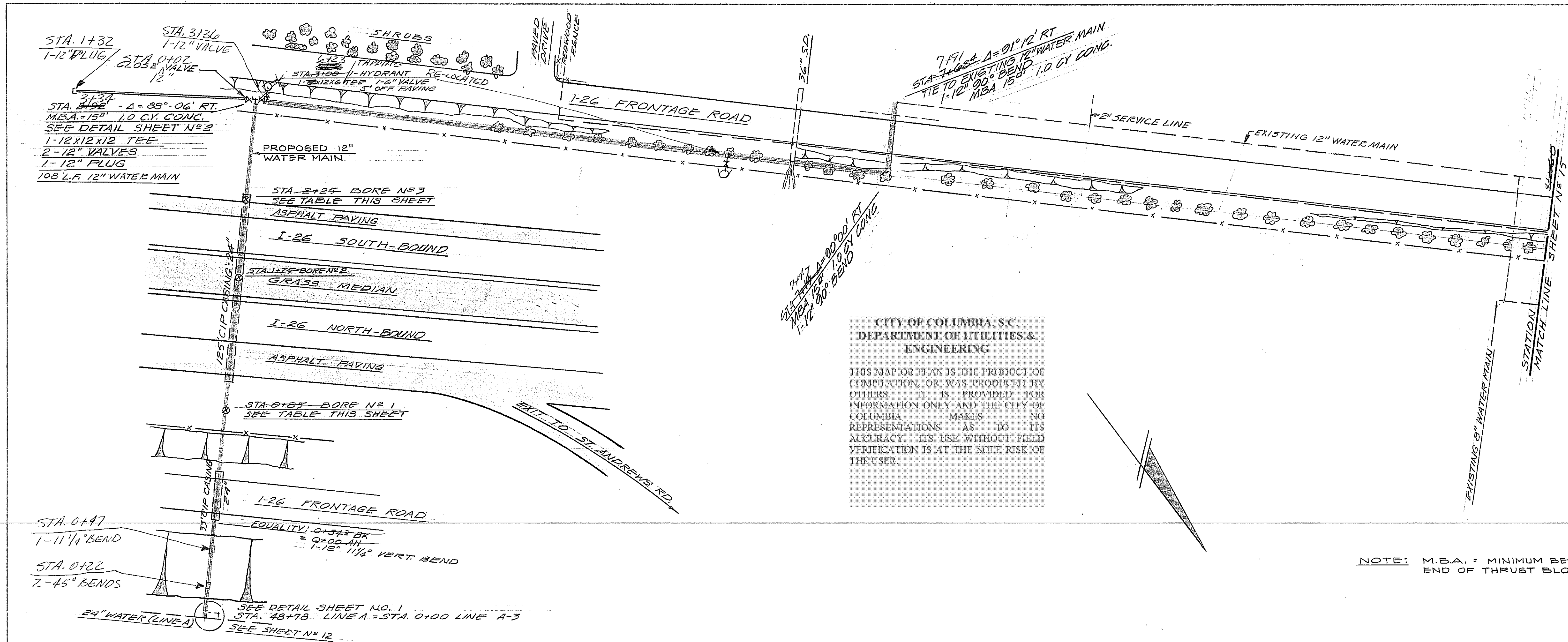


SCANNED



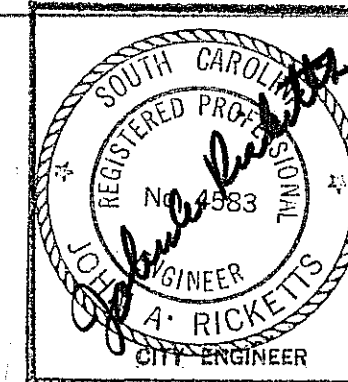
DATE	9-13-73
BY	BRUNDT
SURVISED	
NOTE BOOK	
NO. 111	
REVISIONS	

DATE	
BY	
SURVISED	
NOTE BOOK	
NO. 111	
REVISIONS	



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DEPARTMENT OF UTILITIES &  
ENGINEERING**

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THE USER.



CITY OF COLUMBIA DEPARTMENT OF ENGINEERING COLUMBIA, SOUTH CAROLINA			
SCALE: AS SHOWN	APPROVED BY S. J. Clark, Jr. DESIGN ENGINEER	DRAWN BY GLVB	
DATE: 9-13-73		REVISED	
PHASE I - ST. ANDREWS WATER MAIN CONSTRUCTION			
FIELD BOOK NO.	141, 136, 152	DRAWING NUMBER 14	

DEPTH IN FEET	1	2	3
0	SC	SC/DR	SC/G
1			
2			
3			
4			
5			
6	SC		SC/G
7	SC/DR	SC/DR	
8			

**LEGEND**

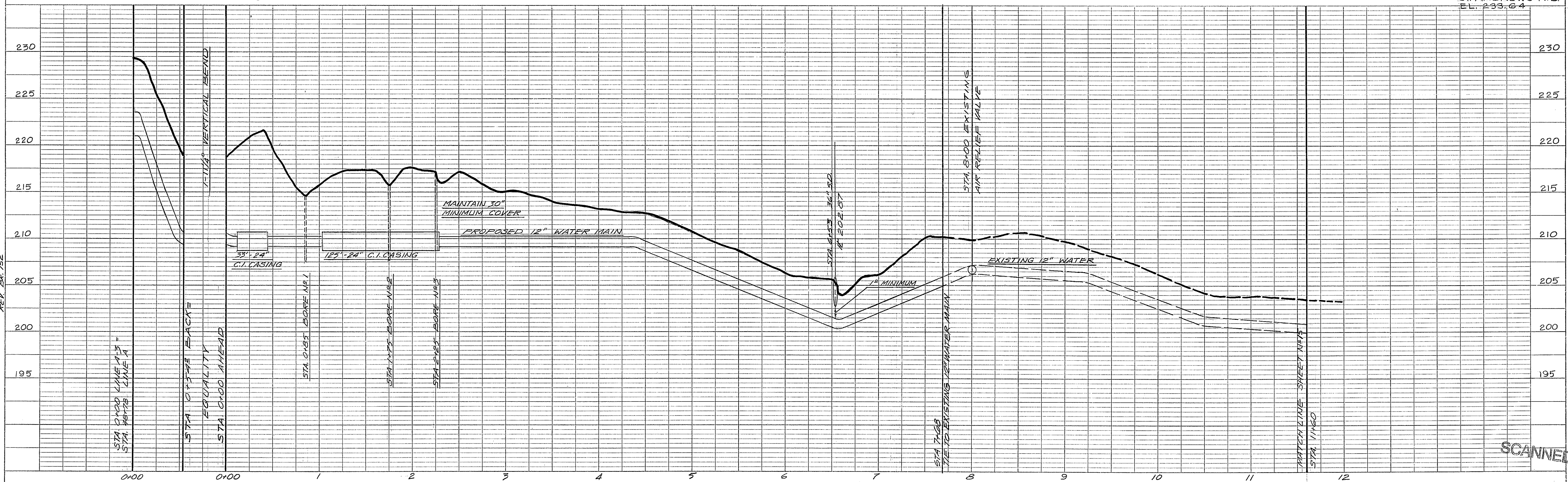
SC	SANDY-CLAY
SC/DR	SANDY-CLAY W/DISINTEGRATED ROCK
SC/G	SANDY-CLAY W/GRAVEL

**TEST BORE TABLE**

NOTE: M.B.A. = MINIMUM BEARING AREA  
END OF THRUST BLOCK

SCALE: PLAN 1"=40'  
PROFILE 1"=50' HORIZ.  
1"=5' VERT.

BENCH MARK: 'X' ON ABUTMENT  
N.E. CORNER - E. END  
BRIDGE AT I-26 &  
ST. ANDREWS R.D.  
E.L. 233.64



SCANNED



PLAN	BY	DATE
NO. 1		
NOTE BOOK		
RT. OF WAY CHECKED		
NO.		

PROFILE	BY	DATE
NO. 1		
NOTE BOOK		
GRADES CHECKED		
STRUCTURE NOTATIONS CHECKED		
NO.		

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CITY OF COLUMBIA  
DEPARTMENT OF ENGINEERING  
COLUMBIA, SOUTH CAROLINA

SCALE: AS SHOWN  
DATE: 11-2-78  
DESIGN ENGINEER: *E. H. Clark, Jr.*  
FIELD BOOK NO. 149  
DRAWN BY: J. F. RICKETTS  
REVISED  
DRAWING NUMBER 15

