

COLORADO STATE HIGHWAY DEPARTMENT

PLAN AND PROFILE OF PROPOSED FEDERAL AID PROJECT NO 208-A STATE HIGHWAY NO. 4 MESA COUNTY

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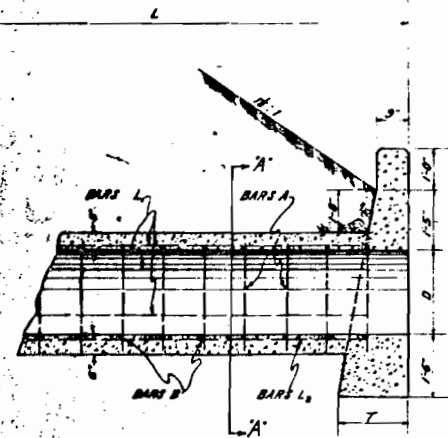
FED. AID DIST. NO.	SEAL	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
1	100	208-A	1	1

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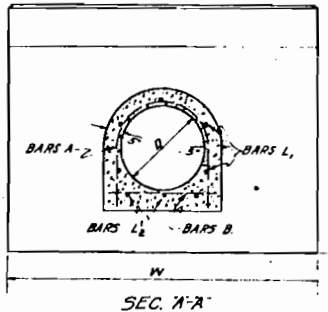
TYPICAL CROSS SECTION OF IMPROVEMENT AND SUMMARY OF QUANTITIES

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	COLO.	206-A	2	2

July 1964



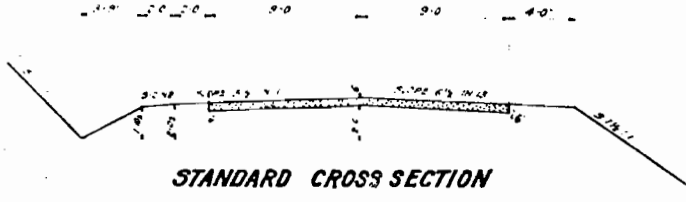
15' TO 30" CULV.



SEC. A-A

HEADWALL DIMENSIONS

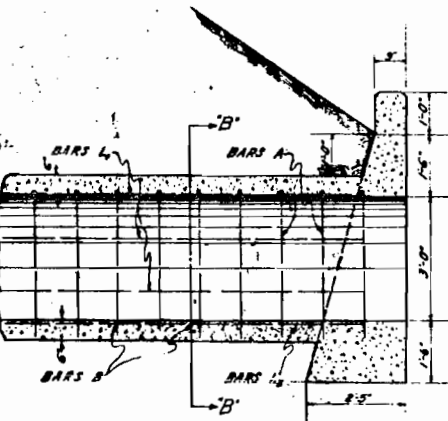
D	W	H	T
15'	5'-7"	5'-2"	1'-8"
18'	6'-0"	5'-5"	1'-9"
24'	7'-6"	5'-11"	2'-0"
36'	10'-6"	7'-0"	2'-5"



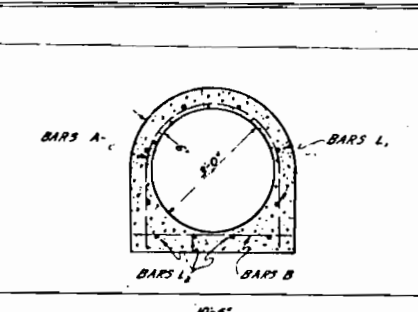
STANDARD CROSS SECTION

SUMMARY OF QUANTITIES

UNIT	CU YDS	STA YDS	LBS	LIN FT
EXCV	8,000			
ROCK	50			
GRAVEL SURFACING	6,363			
CONCRETE CL. A	336			
CONCRETE CL. B	48			
REIN. STEEL			24,800	
BORROW FILL	1,000			
15" N°20 PLAIN IP				1,160
18" N°20 PLAIN IP				252
24" N°20 PLAIN IP				92
36" N°20 PLAIN IP				40
15" C.M. PIPE				1,150
Overhaul		2,000		



36" CULV.



SEC. B-B

Scale 1 in. = 2 ft.

NOTES

ALL BARS TO BE YESULARE
MINIMUM FILL OVER TOP OF CULV. TO BE 1 FT
MINIMUM DISTANCE CENTER OF BARS TO EDGE OF CONCRETE TO BE 1 1/2"
MINIMUM GRADE OF CULV. TO BE 1 1/4"
ALL CONCRETE TO BE CLASS 40 (11,000 PSI)
ALL REIN. TO BE DONE IN ACCORDANCE WITH STANDARD
SPECIFICATIONS OF THE COLORADO STATE HIGHWAY DEPARTMENT.
BLACK IRON PIPE FOR CENTERING TO BE N°20
GANGE, SINGLE RAIL

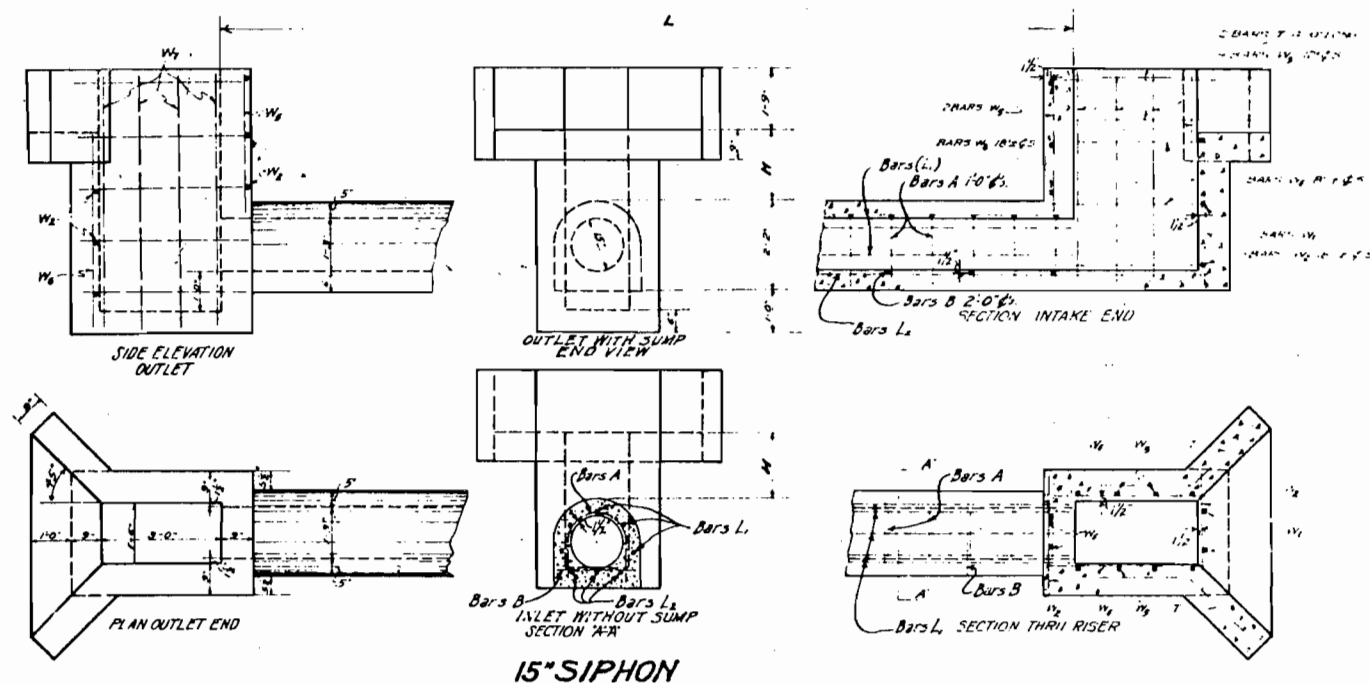
DETAILS OF REINFORCING BARS					
SIZE OF PIPE	D	15'	18'	24'	36'
BARS A ARCH BARS	SPACING	1'-0"	1'-0"	1'-0"	1'-0"
	NUMBER	L-1	L-1	L-1	L-1
	LENGTH	4'-3"	4'-11"	6'-2"	8'-9"
BARS B TENSILE BARS UNDER PIPE	SPACING	2'-0"	2'-0"	2'-0"	2'-0"
	NUMBER	1/2 L	1/2 L	1/2 L	1/2 L
	LENGTH	1'-10"	2'-7"	2'-7"	3'-7"
BARS L LONGITUDINAL IN ARCH	SPACING	—	—	—	—
	NUMBER	5	5	5	6
	LENGTH	L-2'-0"	L-2'-0"	L-2'-0"	L-2'-0"
BARS L LONGITUDINAL UNDER PIPE	SPACING	—	—	—	—
	NUMBER	3	3	3	4
	LENGTH	L-2'-0"	L-2'-0"	L-2'-0"	L-2'-0"

FORMULAE FOR QUANTITIES

15' CULVERT	
CONCRETE CU YDS	1.88 + 10.21
STEEL LBS	(13.166 L - 20.25) X .85
15" BLACK IRON PIPE	L
18' CULVERT	
CONCRETE CU YDS	2.39 + 12.21
STEEL LBS	(13.956 L - 20.916) X .85
18" BLACK IRON PIPE	L
24' CULVERT	
CONCRETE CU YDS	3.37 + 15.81
STEEL LBS	(15.458 L - 22.166) X .85
24" BLACK IRON PIPE	L
36' CULVERT	
CONCRETE CU YDS	6.27 + 26.71
STEEL LBS	(20.541 L - 28.75) X .85
36" BLACK IRON PIPE	L

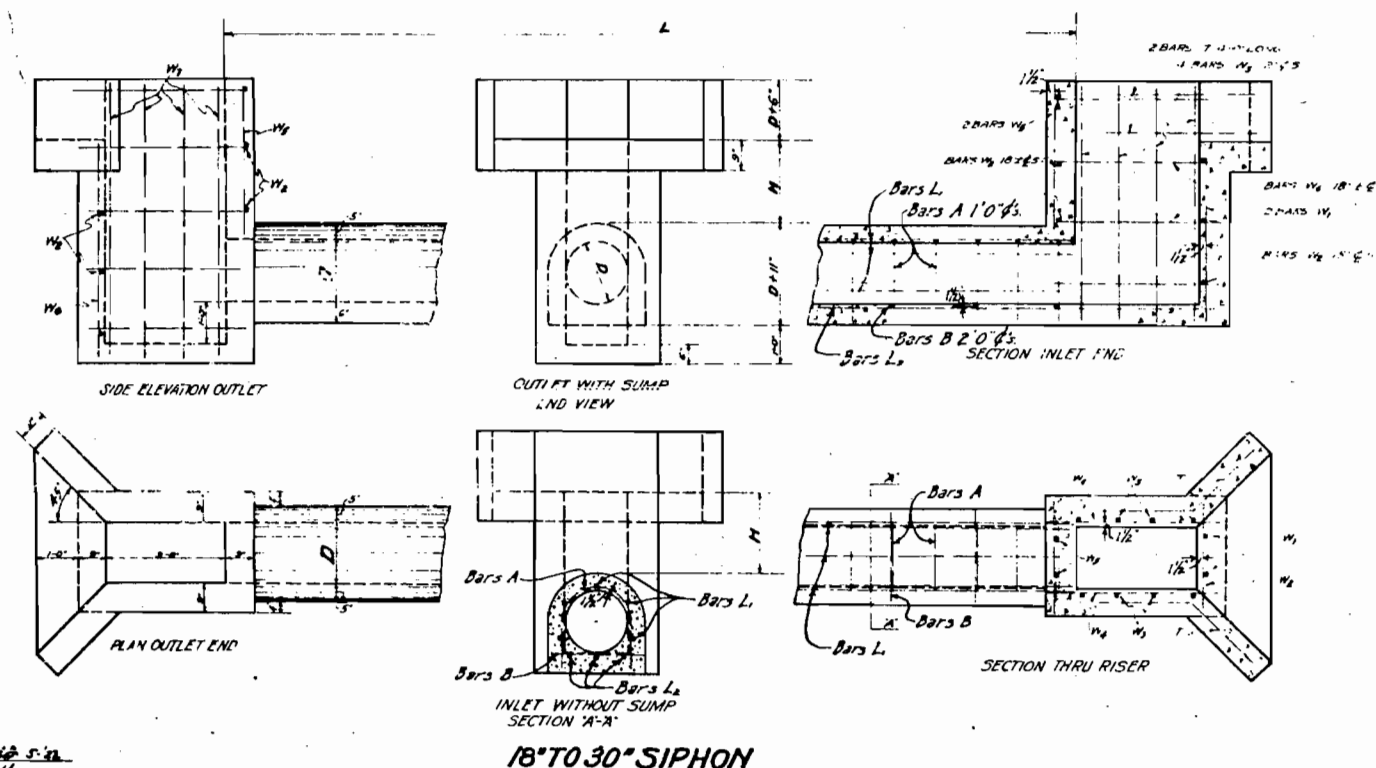
X DRAINAGE STRUCTURES

ITEM	15' SPAN	18' SPAN	24' SPAN	36' SPAN	STANDARD SYMPHONS	H	Class A	Class B
SIZE	15'	18'	24'	36'	15'	18'	24'	36'
15' N°20 PLAIN IP					15'	18'	24'	36'
18' N°20 PLAIN IP					18'	24'	36'	
24' N°20 PLAIN IP					24'	36'		
36' N°20 PLAIN IP					36'			
15" C.M. PIPE								
Overhaul								



DETAILS OF REINFORCING BARS					
SIZE OF PIPE - D		15"	18"	24"	30"
Bars A Arch Bars 		Spacing 1'0"	1'0"	1'0"	1'0"
Number		2	2	2	2
Length		4'3"	4'11"	6'2"	7'6"
Bars B Structural bars under pipe 		Spacing 2'0"	2'0"	2'0"	2'0"
Number		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Length		1'10"	2'1"	2'7"	3'1"
Bars L Longitudinal in arch 		Spacing —	—	—	—
Number		5	5	5	5
Length		L-0'3"	L-0'3"	L-0'3"	L-0'3"
Bars Ls Longitudinal under pipe 		Spacing —	—	—	—
Number		3	3	3	3
Length		L+3'3"	L+3'3"	L+3'3"	L+3'3"
Bars W Vertical wall bars 12" x 12" x $\frac{1}{2}$ " D+H+2"		Spacing 9"	9"	1'0"	1'3"
Number		2	2	2	2
Length		H+2'0"	H+2'3"	H+2'9"	H+3'
Bars Ws Horizontal wall and back wall bars under arch 12" x 12" x $\frac{1}{2}$ " D+10"		Spacing 18"	18"	18"	18"
Number		$\frac{3}{4}$ N+10'	$\frac{3}{4}$ N+11'	$\frac{3}{4}$ N+12'	$\frac{3}{4}$ N+14'
Length		2'3"	2'6"	3'0"	3'6"
Bars Ws Front side wall bars and back wall bars 12" x 12" x $\frac{1}{2}$ " 2H+H+13"		Spacing 1'0"	1'0"	1'0"	1'0"
Number		0	0	0	0
Length		H+3'9"	H+4'3"	H+5'3"	H+6'
Bars Ws Horizontal side wall bars and outlet and 12" x 12" x $\frac{1}{2}$ " D+3"		Spacing 18"	18"	18"	18"
Number		$\frac{3}{4}$ N+16'	$\frac{3}{4}$ N+17'	$\frac{3}{4}$ N+20'	$\frac{3}{4}$ N+22'
Length		4'3"	4'5"	4'5"	4'3"
Bars Ws Vertical side wall bars and outlet and 12" x 12" x $\frac{1}{2}$ " D+H+9"		Spacing 9"	9"	1'0"	1'3"
Number		4	4	4	4
Length		H+2'0"	H+2'3"	H+2'9"	H+3'
Bars Ws Horizontal side wall bars outlet and 12" x 12" x $\frac{1}{2}$ " 2H+1'9"		Spacing 9"	9"	1'0"	1'3"
Number		2	2	2	2
Length		H+3'0"	H+3'3"	H+3'9"	H+4'
Bars Ws Vertical side wall bars outlet and 12" x 12" x $\frac{1}{2}$ " 2H+H+2'3"		Spacing 1'0"	1'0"	1'0"	1'0"
Number		0	0	0	0
Length		H+4'9"	H+5'3"	H+6'3"	H+7'
Bars T Tie bars in wing walls 		Spacing 1'0"	1'0"	1'0"	1'0"
Number		0	0	0	0
Length		4'0"	4'0"	4'0"	4'0"

FORMULAE FOR QUANTITIES <i>(Dimensions to be taken in feet)</i> 15' Siphon		
Concrete Cu. Yds.	$3.55 + .104L + .667H$	
Steel Lbs.	$185.13H + 1.19L + 35.13H +$	Additional for top of siphon 18" x 12" manhole 40 or more 14.17
3" Black Iron Pipe Lin Ft.	L	
18" Siphon		
Concrete Cu. Yds.	$3.70 + .122L + .667H$	
Steel Lbs.	$202.13H + 1.06L + 35.70H +$	Additional for top of siphon 18" x 12" manhole 40 or more 14.17
3" Black Iron Pipe Lin Ft.	L	
24" Siphon		
Concrete Cu. Yds.	$4.77 + .158L + .722H$	
Steel Lbs.	$237.58H + 1.14L + 36.83H +$	Additional for top of siphon 18" x 12" manhole 40 or more 14.17
24" Black Iron Pipe Lin Ft.	L	
30" Siphon		
Concrete Cu. Yds.	$5.45 + .196L + .778H$	
Steel Lbs.	$273.56H + 1.49L + 37.97H +$	Additional for top of siphon 18" x 12" manhole 40 or more 14.17
30" Black Iron Pipe Lin Ft.	L	

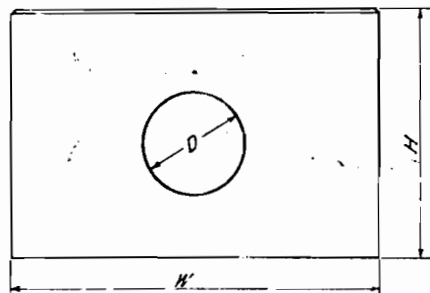
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NOTES

All bars to be $\frac{1}{2}$ " square
 Minimum fill over top of siphon to be 1 ft.
 Minimum distance center of bars in edge of concrete to be $1\frac{1}{2}$ "
 All walls to have forms on both sides.
 Minimum grade of pipe to be 1%
 All concrete to be class "A" (1:2:4)
 All work to be done in accordance with Standard Specifications
 of the Colorado State Highway Department.
 Black iron pipe for centering to be No 20 gauge, single riveted.

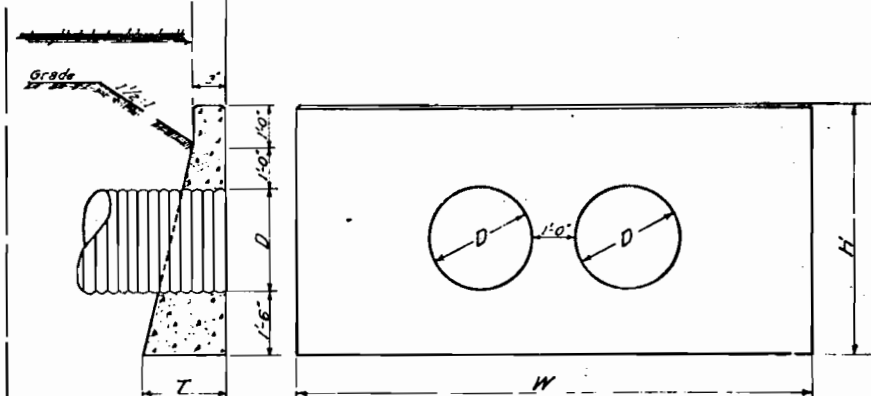
Designed by Ado S. Jr.
Traced by JNLT
Checked by JNLT

COLORADO
STATE HIGHWAY DEPARTMENT
SIPHONS
F.A.P. No. **2000**
SHE 1/2"



TYPE-A

DIMENSIONS & QUANTITIES				
Size of Pipe	Width of Wall	Height of Wall	Thickness of Wall	Concrete & Walls Cu. Yds.
D	W	H	T	
15"	5'3"	4'3"	1'6"	.8
18"	6'0"	5'0"	1'7"	2.3
24"	7'6"	5'6"	1'10"	3.4
36"	9'0"	6'0"	2'0"	4.6
42"	10'6"	6'6"	2'2"	6.1
48"	12'0"	7'0"	2'4"	8.6
60"	13'6"	7'6"	2'7"	10.8
68"	16'6"	8'6"	3'0"	16.6



TYPE-B

DIMENSIONS & QUANTITIES

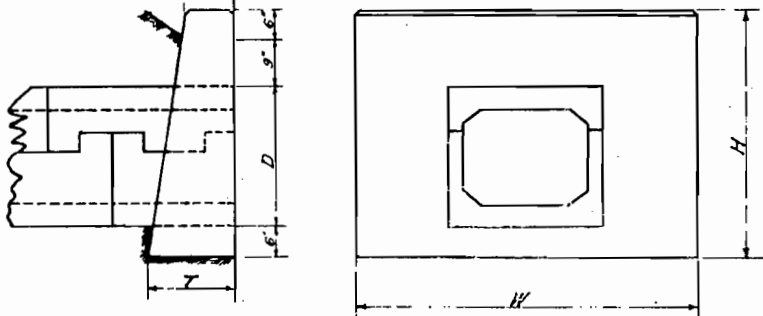
Size of Pipe	Width of Wall	Height of Wall	Thickness of Wall	Concrete & Wall	Cu. Yds.
D	W	H	T		
15"	7.6"	4.9"	1.6"		2.8
18"	8.6"	5.0"	1.7"		3.1
24"	10.6"	5.6"	1.10"		4.5
30"	12.6"	6.0"	2.0"		6.7
36"	14.6"	6.6"	2.5"		10.0
42"	16.6"	7.0"	2.7"		11.5
48"	18.6"	7.6"	3.0"		14.3
60"	22.6"	8.6"	3.0"		21.7

Notes:

All Concrete to be Class "B" (1:2½:5)
Minimum fill over pipe to be 1'-0"
Minimum grade of pipe to be 1%

HEADWALLS FOR CORRUGATED METAL PIPE CULVERTS UNDER MAIN ROAD

HEADWALLS FOR INTERLOCKING CONCRETE CULVERTS PARALLEL TO MAIN ROAD



.../PE-C

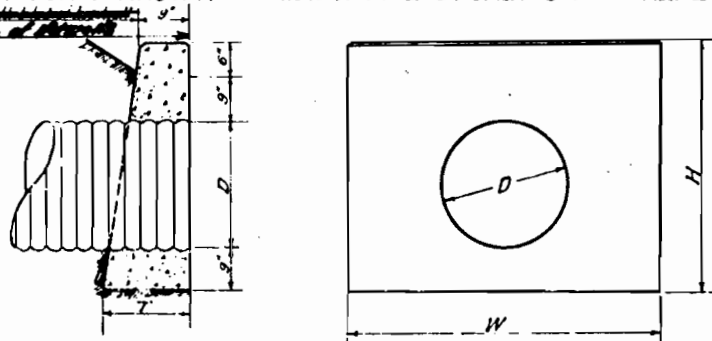
Notes:

All Concrete to be Class "B" (1:2½:5)
Minimum fill over pipe to be 9"
Minimum grade of pipe to be 1%
Quantities are for Headwalls only.

DIMENSIONS & QUANTITIES					
Size of Box	Width of Wall	Height of Wall	Thickness of wall	Concrete 2 Walls	
	D	W	H	T	Cu Yds.
12"x15"	1' 7"	4' 3"	3' 4"	1' 2"	0.8
14"x18"	1' 10"	4' 6"	3' 7"	1' 3"	0.9
18"x24"	2' 3"	5' 0"	4' 0"	1' 5"	1.1

Assigned by P.L.A. 11-130
Checked by M.H.
Traced by M.H.

HEADWALLS FOR CORRUGATED METAL PIPE CULVERTS PARALLEL TO MAIN ROAD



TYPE-M

Notes:

All concrete to be Class "B" (1:2½:5)
Minimum fill over pipe to be 9"
Minimum grade of pipe to be 1%

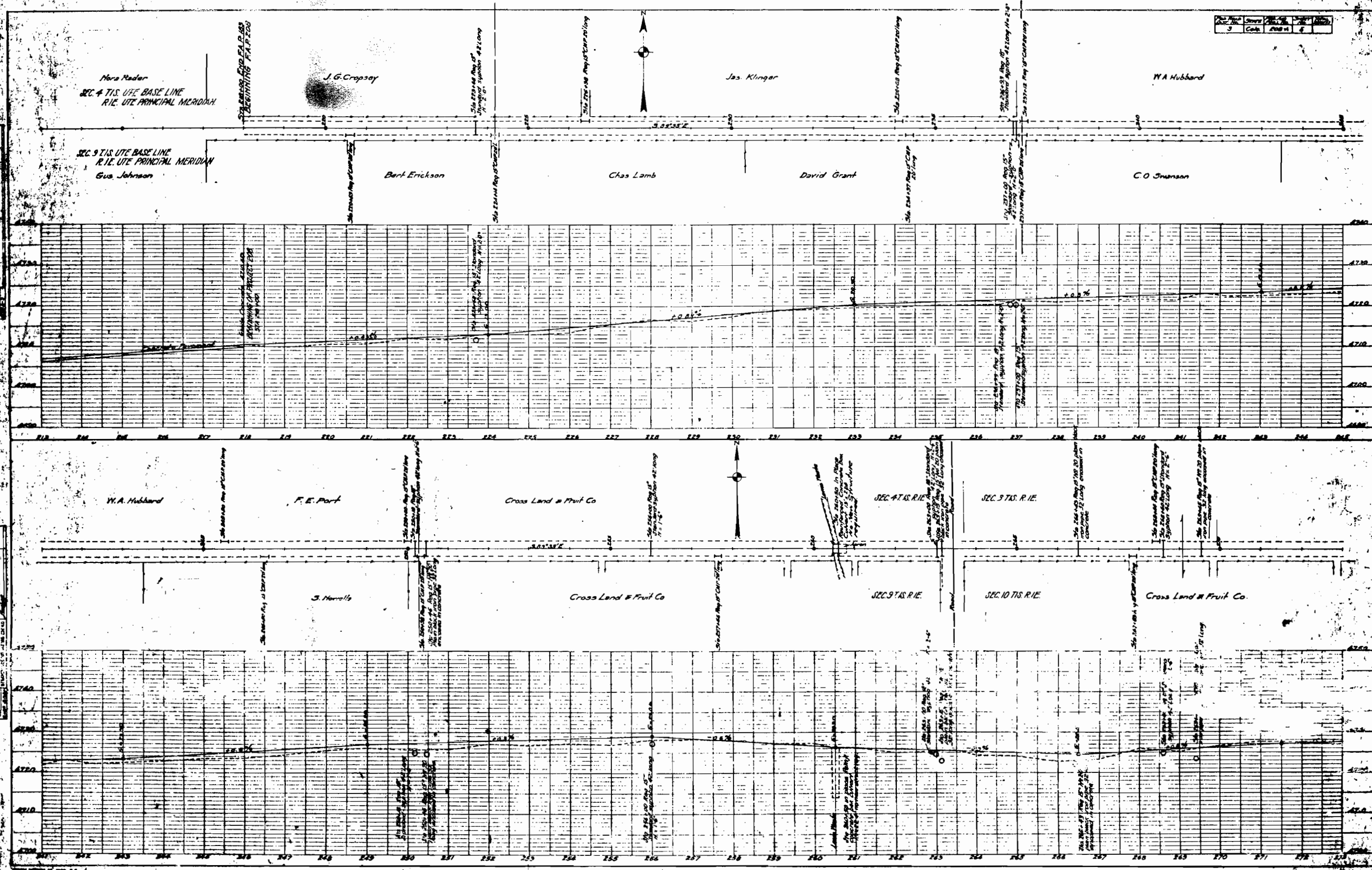
Size of Pipe	Width of Wall	Height of Wall	Thickness of wall	Quantity
<i>D</i>	<i>W</i>	<i>H</i>	<i>T</i>	<i>Cu. Yds.</i>
12"	4' 0"	3' 0"	1' 0"	0.7
15"	4' 3"	3' 3"	1' 2"	0.9
18"	4' 6"	3' 6"	1' 3"	1.1
24"	5' 0"	4' 0"	1' 5"	1.4

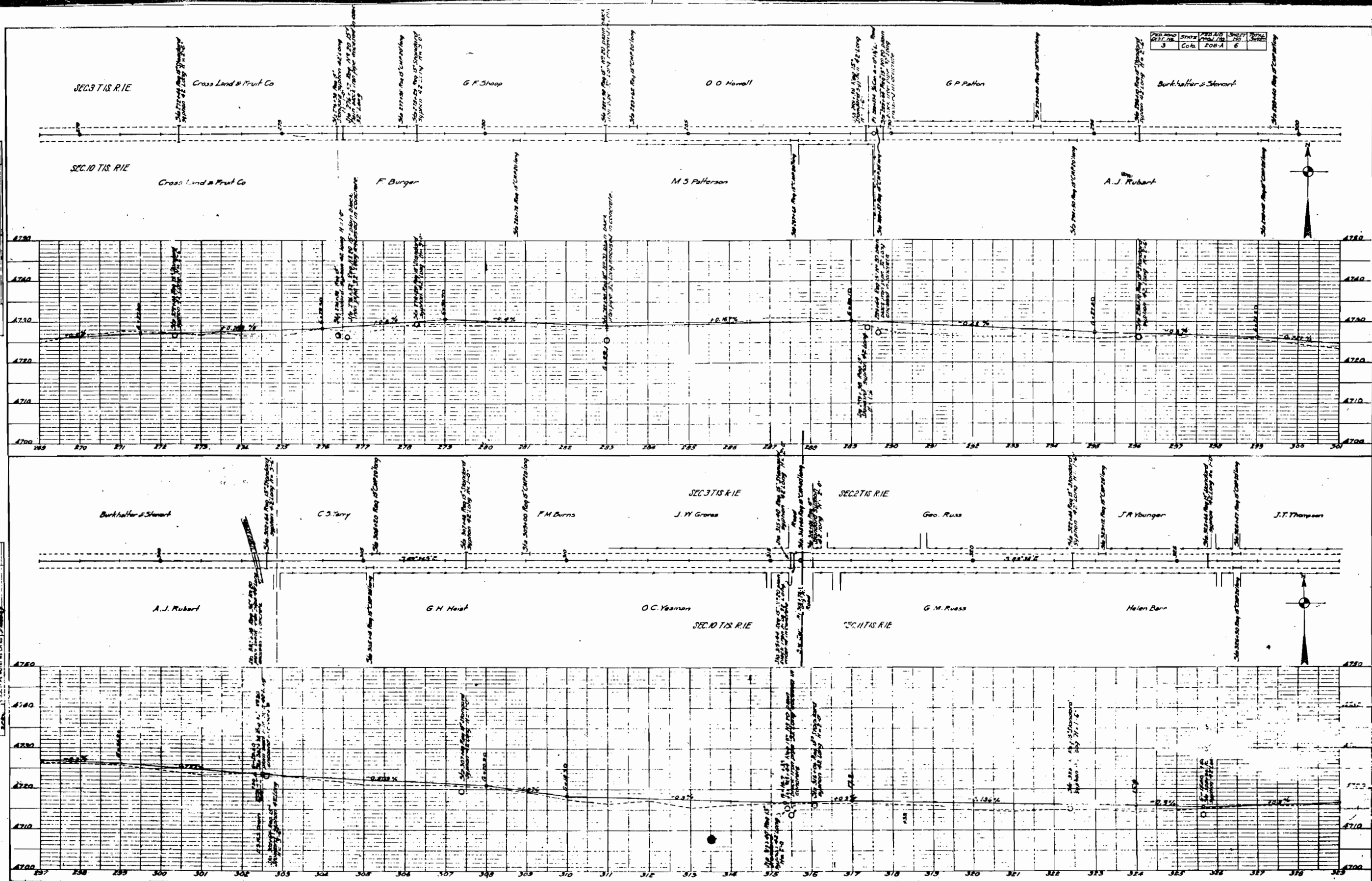
COLORADO
STATE HIGHWAY DEPARTMENT
CULVERT
HEADWALLS
F.A.N. # [REDACTED]
SCALE 1/2" = 1'-0"

PLAN	SECTION	DATE	BY
1	1	1917	J. H. HUBBARD
2	2	1917	J. H. HUBBARD
3	3	1917	J. H. HUBBARD
4	4	1917	J. H. HUBBARD
5	5	1917	J. H. HUBBARD
6	6	1917	J. H. HUBBARD
7	7	1917	J. H. HUBBARD
8	8	1917	J. H. HUBBARD
9	9	1917	J. H. HUBBARD
10	10	1917	J. H. HUBBARD

PROFILE	SECTION	DATE	BY
1	1	1917	J. H. HUBBARD
2	2	1917	J. H. HUBBARD
3	3	1917	J. H. HUBBARD
4	4	1917	J. H. HUBBARD
5	5	1917	J. H. HUBBARD
6	6	1917	J. H. HUBBARD
7	7	1917	J. H. HUBBARD
8	8	1917	J. H. HUBBARD
9	9	1917	J. H. HUBBARD
10	10	1917	J. H. HUBBARD

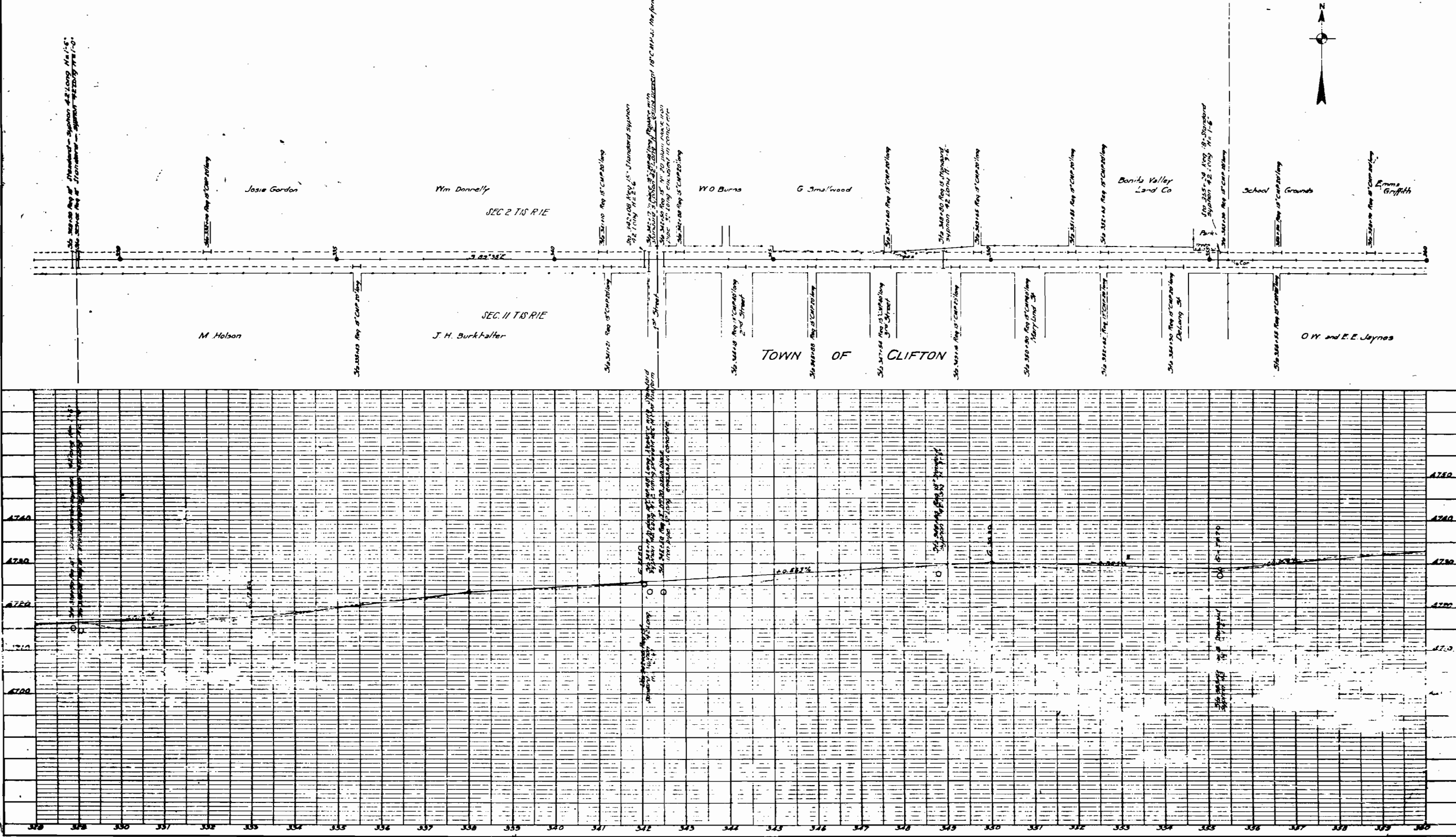
PLAN	SECTION	DATE	BY
1	1	1917	J. H. HUBBARD
2	2	1917	J. H. HUBBARD
3	3	1917	J. H. HUBBARD
4	4	1917	J. H. HUBBARD
5	5	1917	J. H. HUBBARD
6	6	1917	J. H. HUBBARD
7	7	1917	J. H. HUBBARD
8	8	1917	J. H. HUBBARD
9	9	1917	J. H. HUBBARD
10	10	1917	J. H. HUBBARD



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PLAN	DATE	BY	CHKD	APP'D
1	1/1/1910	J. H. BURKHALLER	J. H. BURKHALLER	J. H. BURKHALLER
2	1/1/1910	J. H. BURKHALLER	J. H. BURKHALLER	J. H. BURKHALLER
3	1/1/1910	J. H. BURKHALLER	J. H. BURKHALLER	J. H. BURKHALLER
4	1/1/1910	J. H. BURKHALLER	J. H. BURKHALLER	J. H. BURKHALLER
5	1/1/1910	J. H. BURKHALLER	J. H. BURKHALLER	J. H. BURKHALLER
6	1/1/1910	J. H. BURKHALLER	J. H. BURKHALLER	J. H. BURKHALLER
7	1/1/1910	J. H. BURKHALLER	J. H. BURKHALLER	J. H. BURKHALLER
8	1/1/1910	J. H. BURKHALLER	J. H. BURKHALLER	J. H. BURKHALLER
9	1/1/1910	J. H. BURKHALLER	J. H. BURKHALLER	J. H. BURKHALLER
10	1/1/1910	J. H. BURKHALLER	J. H. BURKHALLER	J. H. BURKHALLER

PLAN	DATE	BY	CHKD	APP'D
1	1/1/1910	J. H. BURKHALLER	J. H. BURKHALLER	J. H. BURKHALLER
2	1/1/1910	J. H. BURKHALLER	J. H. BURKHALLER	J. H. BURKHALLER
3	1/1/1910	J. H. BURKHALLER	J. H. BURKHALLER	J. H. BURKHALLER
4	1/1/1910	J. H. BURKHALLER	J. H. BURKHALLER	J. H. BURKHALLER
5	1/1/1910	J. H. BURKHALLER	J. H. BURKHALLER	J. H. BURKHALLER
6	1/1/1910	J. H. BURKHALLER	J. H. BURKHALLER	J. H. BURKHALLER
7	1/1/1910	J. H. BURKHALLER	J. H. BURKHALLER	J. H. BURKHALLER
8	1/1/1910	J. H. BURKHALLER	J. H. BURKHALLER	J. H. BURKHALLER
9	1/1/1910	J. H. BURKHALLER	J. H. BURKHALLER	J. H. BURKHALLER
10	1/1/1910	J. H. BURKHALLER	J. H. BURKHALLER	J. H. BURKHALLER



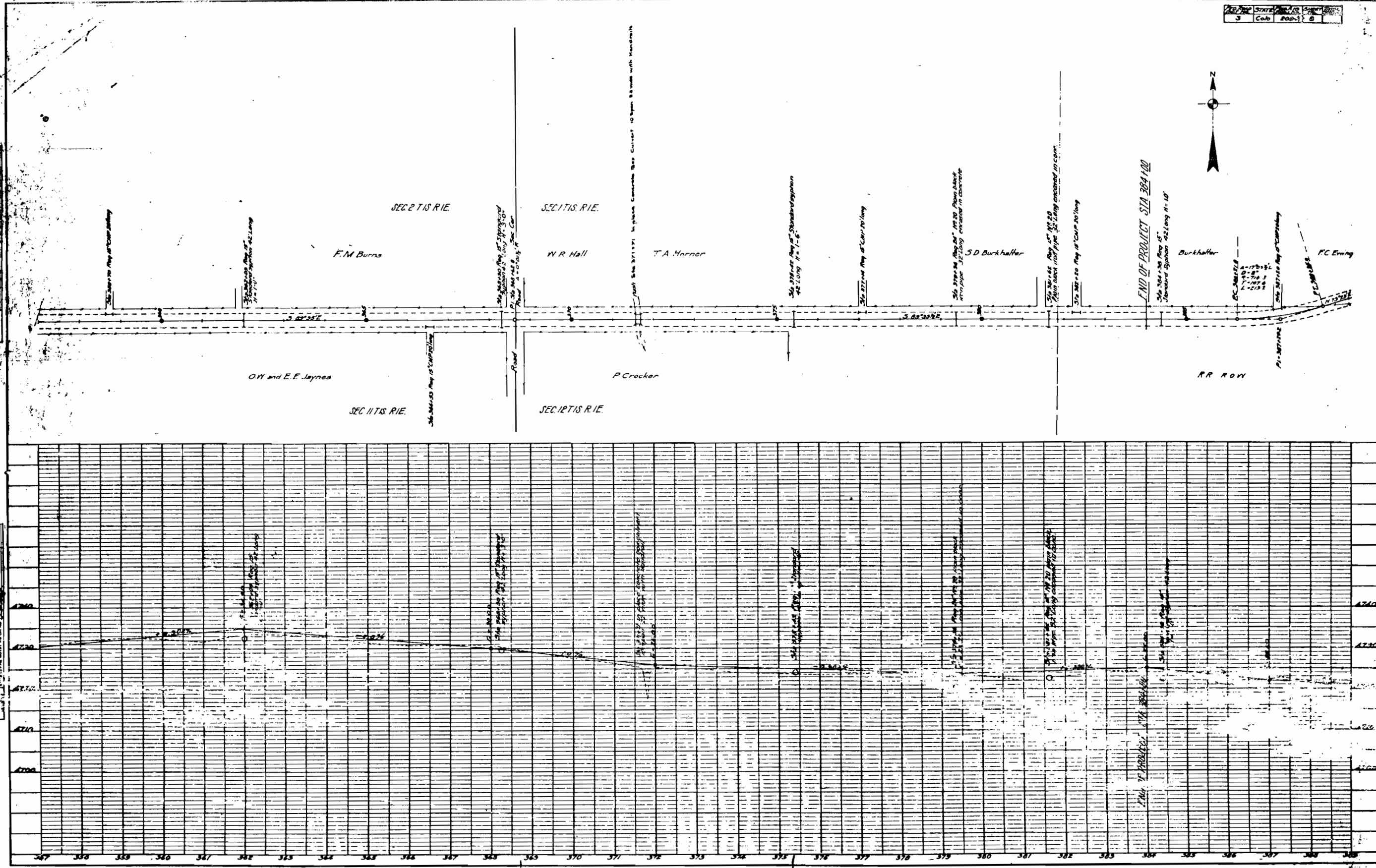
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PLATE 1 - PLAN-PROFILE OF RAIL STATION

