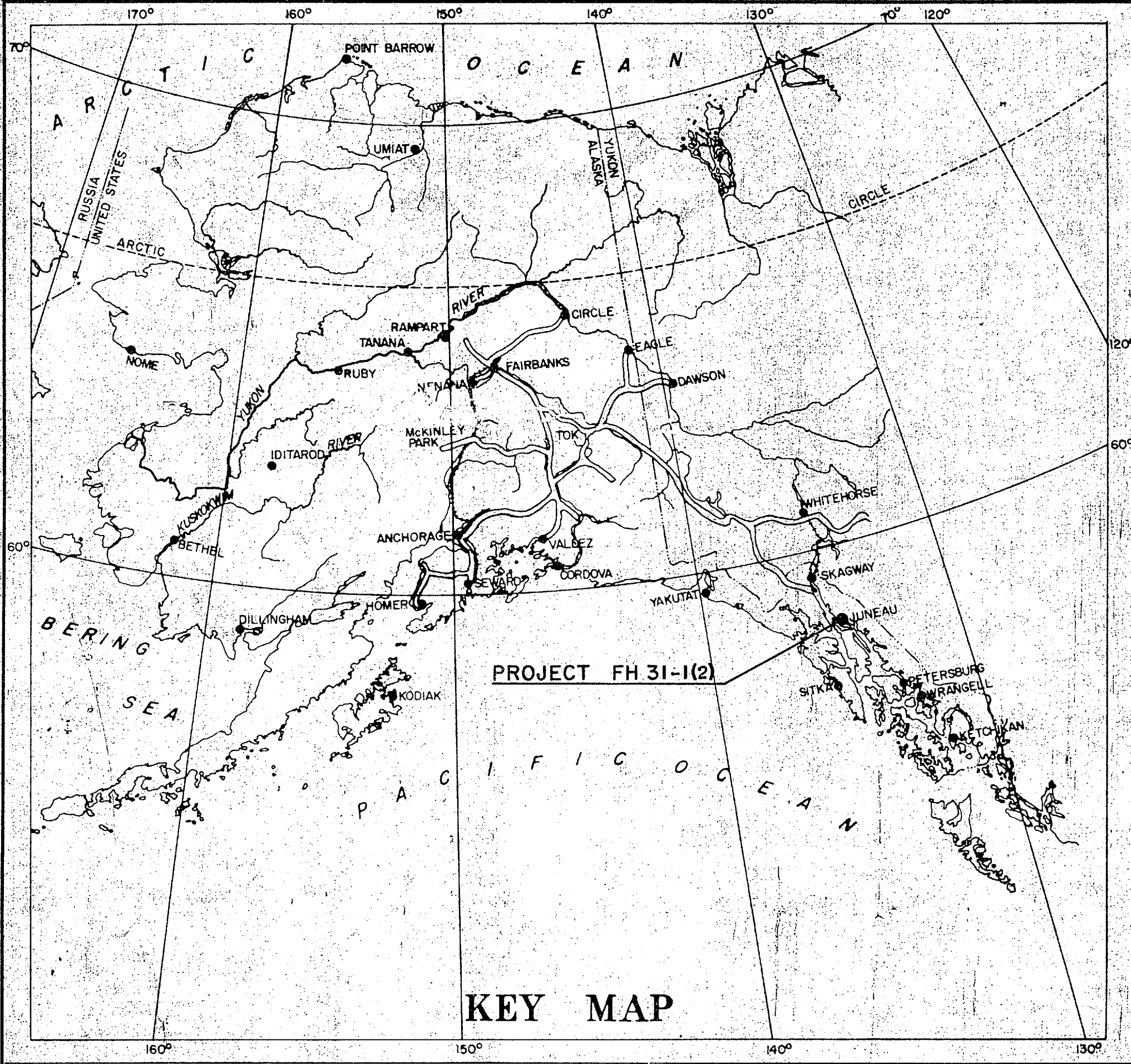


STATE	ROUTE	SECTION	YEAR	SHEET NO.
ALASKA	FH 31	1	1965	1



U. S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
REGION 10

PLAN AND PROFILE
PROPOSED HIGHWAY PROJECT

NO. FH 31-1(2)
GRADING & DRAINAGE

ALASKA FOREST HIGHWAY
NORTH DOUGLAS HIGHWAY
FISH CREEK - OUTER PT.
TONGASS NATIONAL FOREST
ALASKA

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	TYPICAL SECTIONS & MISC. DETAILS
3	ESTIMATE OF QUANTITIES
4-6	CULVERT PIPE SUMMARY
7-13	PLAN AND PROFILE SHEETS
14	CULV. PIPE & CONC. CRADLE DETAILS FOR STA. 509+50 & 530+60
15-16	SUMMARY OF R.O.W. MONUMENTS
17	STANDARD CULVERTS
18-19	STANDARD STEP-BEVEL FOR MULTI-PLATE PIPE & PIPE ARCHES
20	STANDARD BEAM-TYPE GUARDRAIL
21	STANDARD SIGN W6-2, DEAD END
22	STANDARD IDENTIFICATION SIGN

Field investigation soils reports of the foundation materials and detailed cross sections for this project are available for inspection in the Federal Highway Projects Office, Region 10, Bureau of Public Roads in Juneau, Alaska.

PROJECT SUMMARY

WIDTH OF SUBGRADE	34 FT.
LENGTH OF GRADING & DRAINAGE	19,148.7 FT.=3.627 MI.
TOTAL LENGTH OF PROJECT	19,148.7 FT.=3.627 MI.

TYPE 0011 IMPROVEMENT

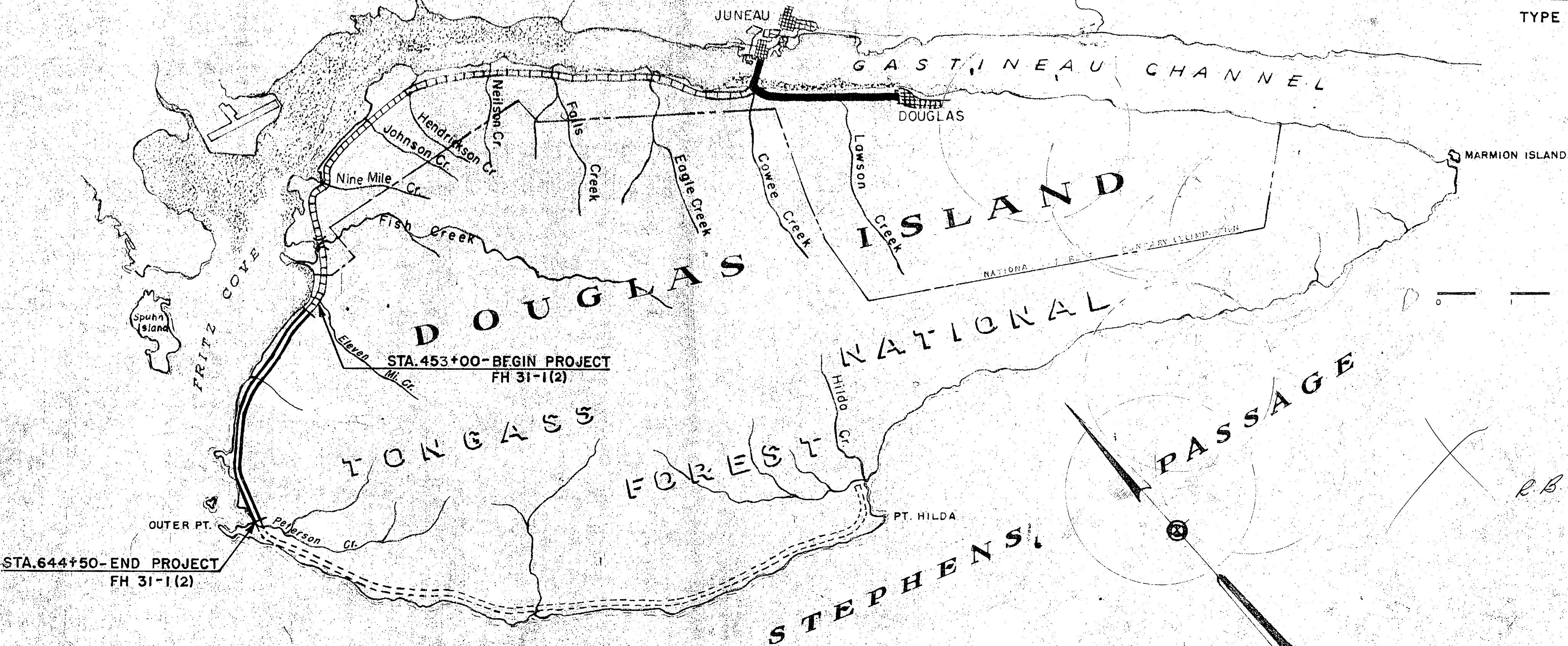
DESIGN	DESIGNATION
ADT	(1965) 90
ADT	(1985) 240
DHV	43
D	65
T	5%
V	50mph

INDEX MAP
Scale
0 1 2 Miles 3 4 5

SCALE

CONVENTIONAL SIGNS

- CULVERT (EXISTING)
- CULVERT (NEW)
- FILL SLOPE
- CUT SLOPE
- LINE TO BE CONSTRUCTED
- WASTE DISPOSAL AREA
- RIGHT-OF-WAY LINE
- APPROX. ROUTE
- GUARDRAIL



APPROVED
REGIONAL ENGINEER
BUREAU OF PUBLIC ROADS
REGION TEN
Date 8/10/65

CULVERT PIPE SUMMARY

CULVERT PIPE SUMMARY											STATE	ROUTE	SECTION	SHEET NO.	TOTAL SHEETS
											ALASKA	31	1	4	22
STATION	GALVANIZED CORRUGATED METAL PIPE						STRUCTURAL PLATE PIPE		STRUCT. PL. PIPE ARCH	REMOVE & DISPOSE	ACCEPTABLE ALTERNATE PIPE		REMARKS		
	24" 14 ga.	36" 12 ga.					72" 10 ga.	7'-0" x 5'-1" 8 ga.		ACCEPTABLE ALTERNATE INDICATED BY REQUIRED GAGE SHOWN BELOW.					
	453(16)	453(11)					455(10)	455(20)	457(1)	ALUMINUM-ALLOY CORRUGATED METAL PIPE	HELICALLY CORRUGATED METAL PIPE				
455+05										60					
456+33										60					
457+00										58					
458+10	78									70	14 Gage	14 Gage			
459+40										126					
460+96	78										14 "	14 "	Ditch In		
464+55	84										14 "	14 "			
466+85	76										14 "	14 "	Ditch In		
467+80	62										14 "	14 "	" "		
471+50	62										14 "	14 "	" "		
472+65	58										14 "	14 "	" "		
473+40	62										14 "	14 "	" "		
473+85		62									12 "	12 "	" " Skew 10° LF		
474+60		66									12 "	12 "	" "		
477+51	60										14 "	14 "	" "		
480+00	68										14 "	14 "	" "		
481+00	66										14 "	14 "	" "		
483+51	66										14 "	14 "	" "		
486+00	60										14 "	14 "	" "		
489+00	60										14 "	14 "	" "		
492+73		58									12 "	12 "	" "		
493+44	56										14 "	14 "	" "		
495+75	60										14 "	14 "	" "		
499+00	58										14 "	14 "	" "		
503+01	58										14 "	14 "	" "		
506+60	66										14 "	14 "	" "		
509+50								62					" " See Sheet 14 for Detail		
511+50		66									12 "	12 "	" "		
514+50	58										14 "	14 "	" "		
517+00	64										14 "	14 "	" "		

CULVERT PIPE SUMMARY

CULVERT PIPE SUMMARY											STATE	ROUTE	SECTION	SHEET NO	TOTAL SHEETS
											ALASKA	31	1	5	22
STATION	GALVANIZED CORRUGATED METAL PIPE						STRUCTURAL PLATE PIPE	STRUCT. PL. PIPE ARCH	REMOVE & DISPOSE	ACCEPTABLE ALTERNATE PIPE		REMARKS			
	24" 14 ga.	36" 12 ga.					72" 10 ga.	7'-0" 5'-1" 8 ga.		ACCEPTABLE ALTERNATE INDICATED BY REQUIRED GAGE SHOWN BELOW.					
	453(1G)	453(1I)					455(1C)	455(2D)	457(1)	ALUMINUM-ALLOY CORRUGATED METAL PIPE	HELICALLY CORRUGATED METAL PIPE				
521+02		76								12 Gage	12 Gage	Ditch In			
522+50	72									14 "	14 "	" "			
523+50	66									14 "	14 "	" "			
527+50		66								12 "	12 "	" "			
530+60							60					See Sheet No.14 for Detail			
536+00		60								12 "	12 "	Ditch In Skew 15°L.F.			
539+00	62									14 "	14 "	" "			
544+29	64									14 "	14 "	" "			
546+40	60									14 "	14 "	" "			
548+35	72									14 "	14 "	" "			
550+00	72									14 "	14 "	" "			
553+00	80									14 "	14 "	" "			
556+50	64									12 "	12 "	" "			
557+25		60								14 "	14 "	" "			
564+50	68									12 "	12 "	" "			
569+86		72								14 "	14 "	" " & Out			
573+25	54									14 "	14 "	" " " " Skew 35°L.F.			
574+75	72									14 "	14 "	" " " "			
576+50	60									14 "	14 "	" " " "			
580+93	58									14 "	14 "	" "			
586+00	62									14 "	14 "				
592+00	76									14 "	14 "				
596+81	66									14 "	14 "	" "			
598+67	64									14 "	14 "	" "			
602+00	70									14 "	14 "	" "			
606+78	60									14 "	14 "	Ditch Out			
609+35	64									14 "	14 "				
611+50	64									14 "	14 "	" In			
614+52	70									14 "	14 "	" " & Out			
616+87	60														

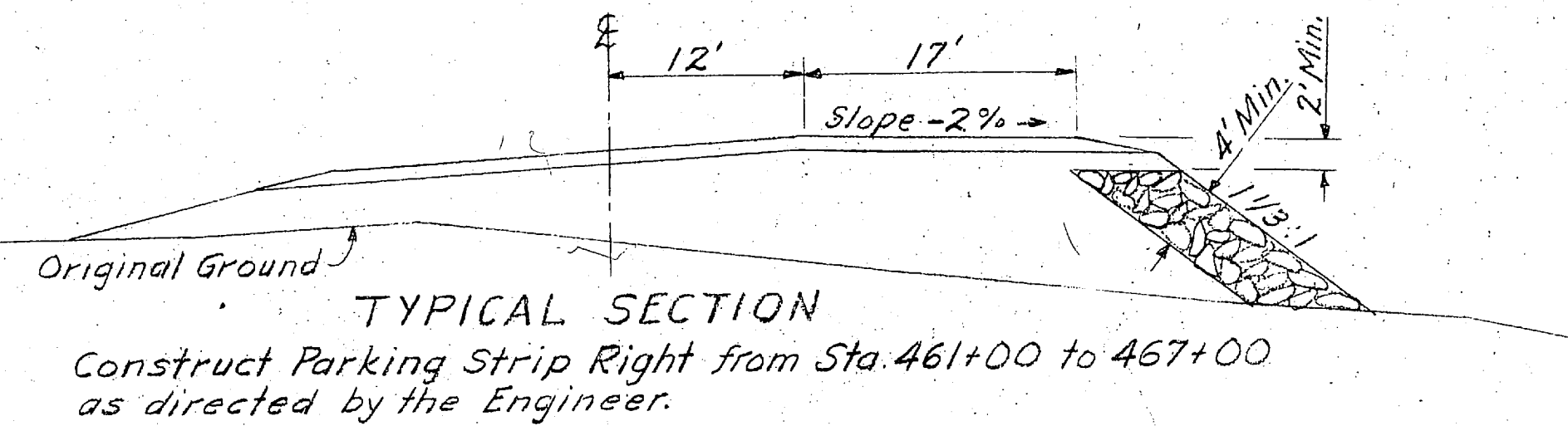
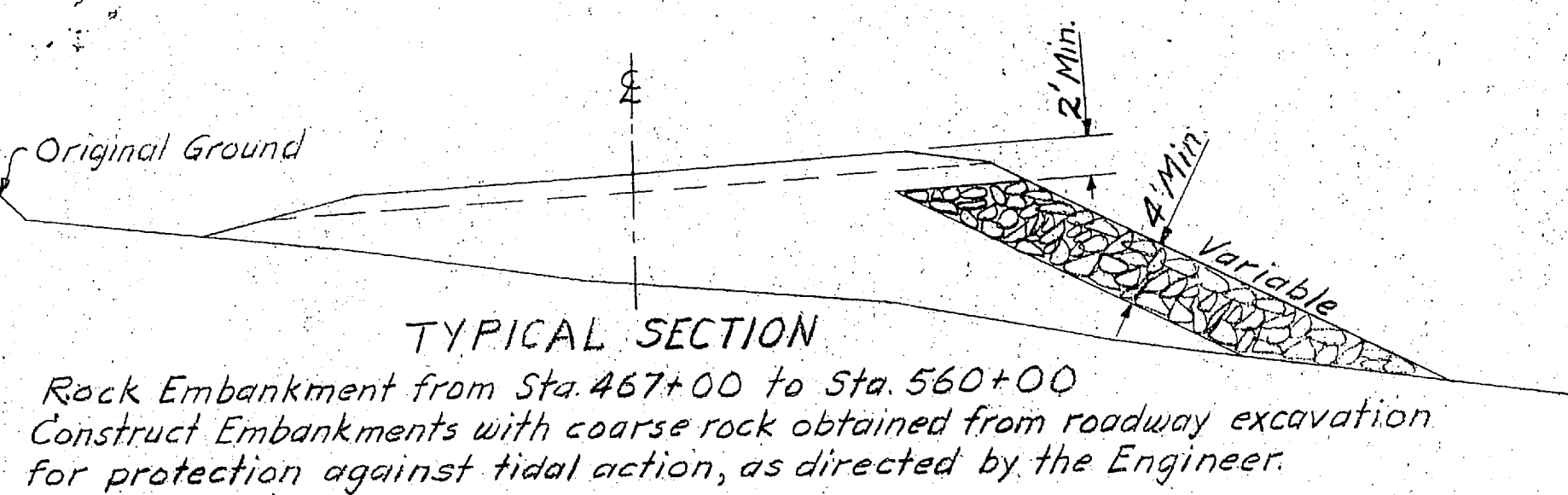
CULVERT PIPE SUMMARY

TOTAL SHEETS	10
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22

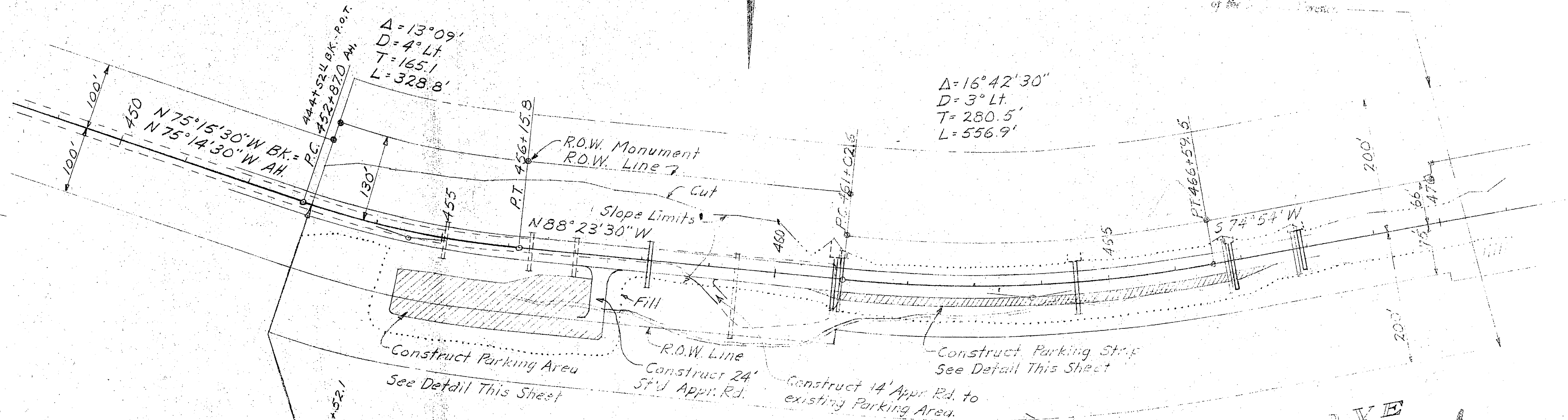
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TONGASS NATIONAL FOREST



Unsuitable Uncl. Exca.
Original Ground

TYPICAL SECTION
Construct Parking Area Right from Sta. 454+50 to 457+50
Parking Area to be constructed with Unsuitable Unclassified Excavation from Lt. of Sta. 453+00 to 459+50, as directed by the Engineer.



NOTE: From Sta. 461+00 to 468+00, Clearing & Grubbing on the left side of E shall be restricted to the area within the slope stakes as set by the engineer. Absolutely no equipment will be allowed beyond the slope stakes in this area.

VE
Original

SUMMARY OF STANDARD SIGNS				
STATION	DIST. FROM E IN FEET		SIGN NO	TYPE OF SIGN
	LEFT	RIGHT		
469+25		19	WI-4R	REVERSE CURVE
490+50	19		WI-4R	" "
517+25		21	WI-2L	CURVE, LEFT
532+00	19		WI-2R	" , RIGHT
555+00		19	WI-2L	" , LEFT
571+50	19		WI-2R	" , RIGHT
639+50		19	WG-2	DEAD END *

NOTE: Minimum length for all sign posts will be 13 feet.
* Message revised as indicated, See Sheet No. 21

Construct Connection to existing road as directed by the Engineer.

Deleted Placed on FH 31-1(3)

Clear & Grub
Uncl. Exc.
Emb.
Overhaul
Borrow
O.H. Borrow
Sp/Subbase

No Payment
16,000 C.Y. (Waste)

See Next Sheet for Quantities
See Next Sheet for Quantities

3151 C.Y. (Incl. 416 C.Y. for Parking Area Sta. 454+50 - 457+50)

PLAN	DATE	BY	NO.
SURVEYED			
NOTED			
PLANNED			
NOTED			
PLANNED			

PROFILE	DATE	BY	NO.
SURVEYED			
NOTED			
PLANNED			
NOTED			
PLANNED			

REVISED 5/3/1966

TONGASS NATIONAL FOREST

"See back line for special treatment occupied and used only upon approval of the National Forester"

TYPICAL SECTION
Rock Embankment from Sta 467+00 to Sta 560+00
Construct Embankments with coarse rock obtained from roadway excavation for protection against tidal action, as directed by the Engineer.

TYPICAL SECTION
Construct Parking Strip Right from Sta 461+00 to 467+00 as directed by the Engineer.

Unsuitable Uncl. Exca.
Original Ground

TYPICAL SECTION
Construct Parking Area Right from Sta 454+50 to 457+50
Parking Area to be constructed with Unsuitable Unclassified Excavation From Lt. of Sta 453+00 to 459+50, as directed by the Engineer.

NOTE: From Sta 461+00 to 468+00, Clearing & Grubbing on the left side of E shall be restricted to the area within the slope stakes as set by the engineer. Absolutely no equipment will be allowed beyond the slope stakes in this area.

SUMMARY OF STANDARD SIGNS			
STATION	DIST FROM E IN FEET LEFT	DIST FROM E IN FEET RIGHT	SIGN NO TYPE OF SIGN
469+25		19	WI-4R REVERSE CURVE
490+50	19		WI-4R " "
517+25		21	WI-2L CURVE, LEFT
532+00	19		WI-2R " , RIGHT
555+00		19	WI-2L " , LEFT
571+50	19		WI-2R " , RIGHT
639+50		19	WG-2 DEAD END *

NOTE: Minimum length for all sign posts will be 13 feet.
* Message revised as indicated, See Sheet No 21

Construct Connection to Existing road as directed by the Engineer.

Deleted, Placed on FH 31-1(3)

Clear & Grub
Uncl. Exc.
Emb.
Overhaul
Borrow
O.H. Borrow
Sp/Subbase

No Payment
16,084 C.Y. (Waste)

See Next Sheet for Quantities
See Next Sheet for Quantity

3151 C.Y. (Incl 416 C.Y. for Parking Area Sta 454+50 - 457+50)

1.897 Acres

6 Cu Yd

STA 453+00 - BEGIN PROJECT FH 31-1(3)

Elev 42.55

455+05 - 18' x 60' CMP in Place
Remove & Dispose

456+38 - 18' x 60' CMP in Place
Remove & Dispose

457+00 - 18' x 58' CMP in Place
Remove & Dispose

457+40 - Construct Appr Rd

458+00 - 24' x 70' CMP in Place
Remove & Dispose

459+00 - 24' x 70' CMP in Place
Remove & Dispose

459+40 - 24' x 70' CMP in Place
Remove & Dispose

460+88 - Install 24' x 70' CMP
Ditch In

464+55 - Install 24' x 70' CMP
Ditch In

466+85 - Install 24' x 70' CMP
Ditch In

467+80 - Install 24' x 70' CMP
Ditch In

468+00 - Install 24' x 70' CMP
Ditch In

469+00 - Install 24' x 70' CMP
Ditch In

470+00 - Install 24' x 70' CMP
Ditch In

471+00 - Install 24' x 70' CMP
Ditch In

472+00 - Install 24' x 70' CMP
Ditch In

473+00 - Install 24' x 70' CMP
Ditch In

474+00 - Install 24' x 70' CMP
Ditch In

475+00 - Install 24' x 70' CMP
Ditch In

476+00 - Install 24' x 70' CMP
Ditch In

477+00 - Install 24' x 70' CMP
Ditch In

478+00 - Install 24' x 70' CMP
Ditch In

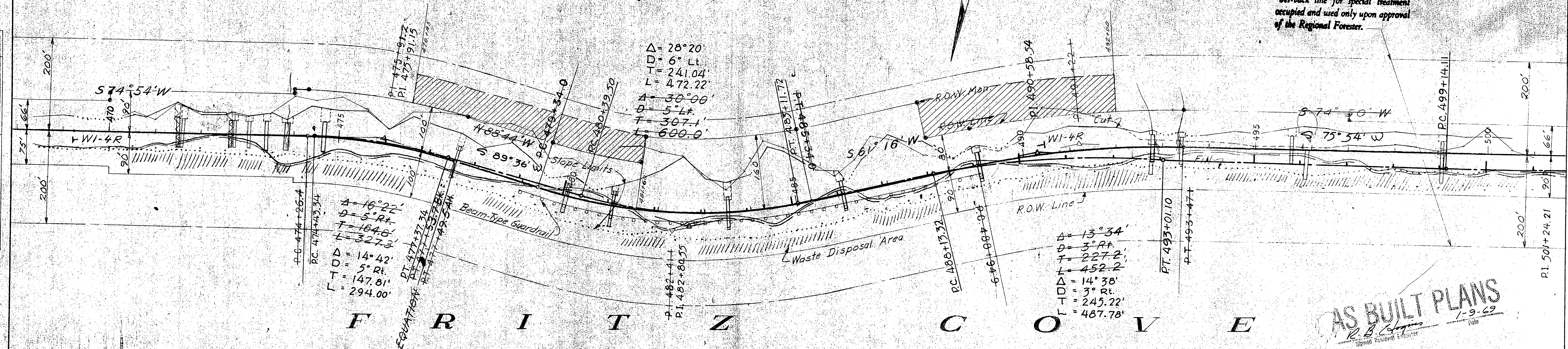
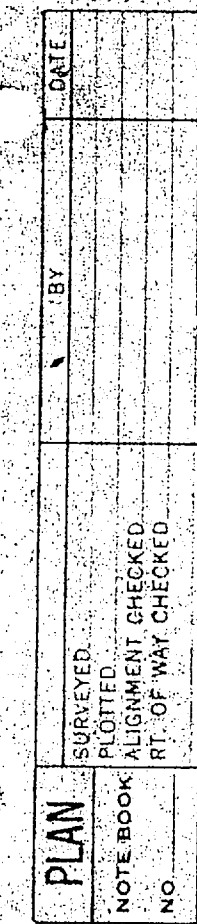
479+00 - Install 24' x 70' CMP
Ditch In

480+00 - Install 24' x 70' CMP
Ditch In

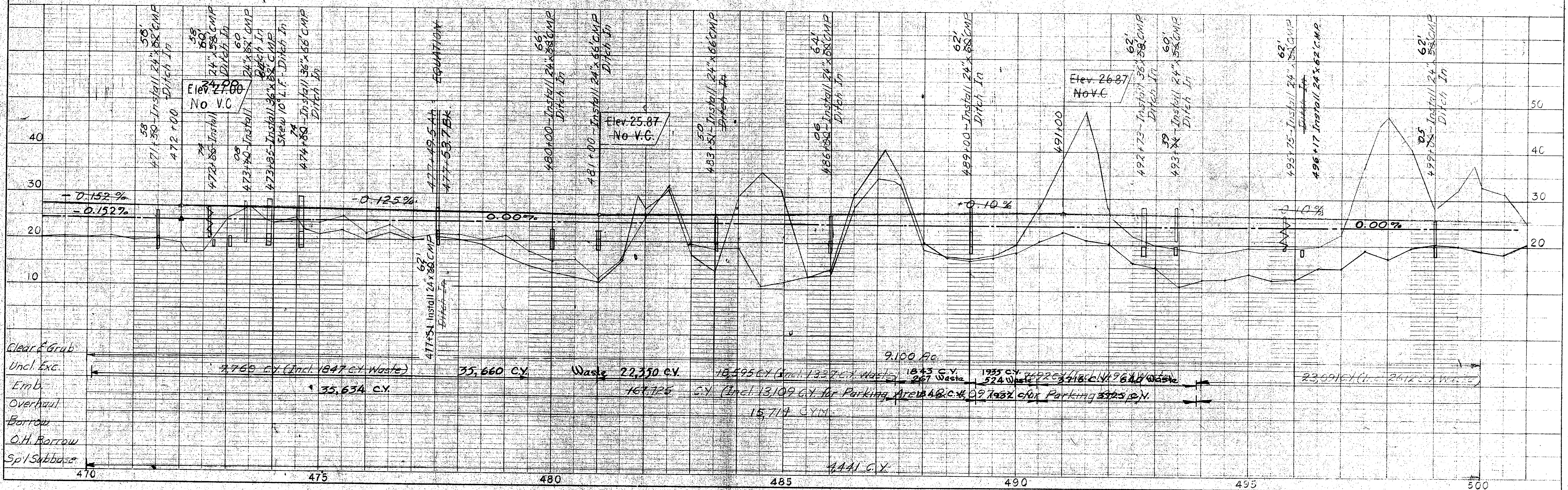
REVISED 5/3/1966

TOYGAH NATIONAL FOREST

"Set-back line for special treatment occupied and used only upon approval of the Regional Forester."



PROFILE	BY	DATE
NO.		
NOTE BOOK		
PLOTTED		
GRADES CHECKED		
B. M. NOTED		
STRUCTURE ROTATIONS		



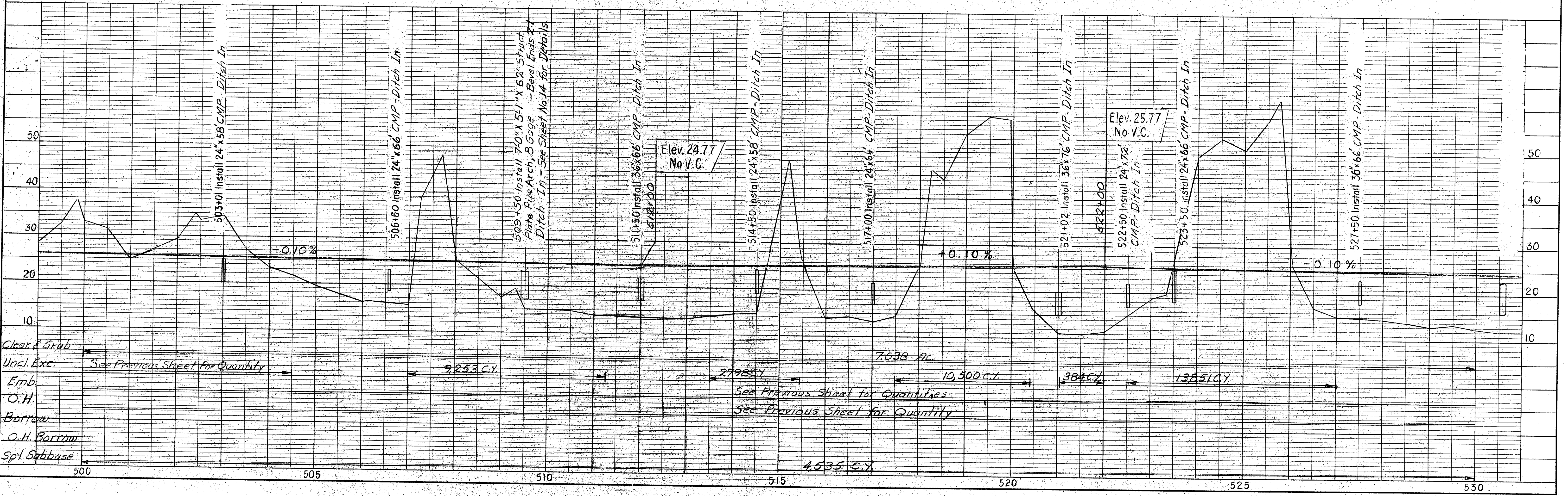
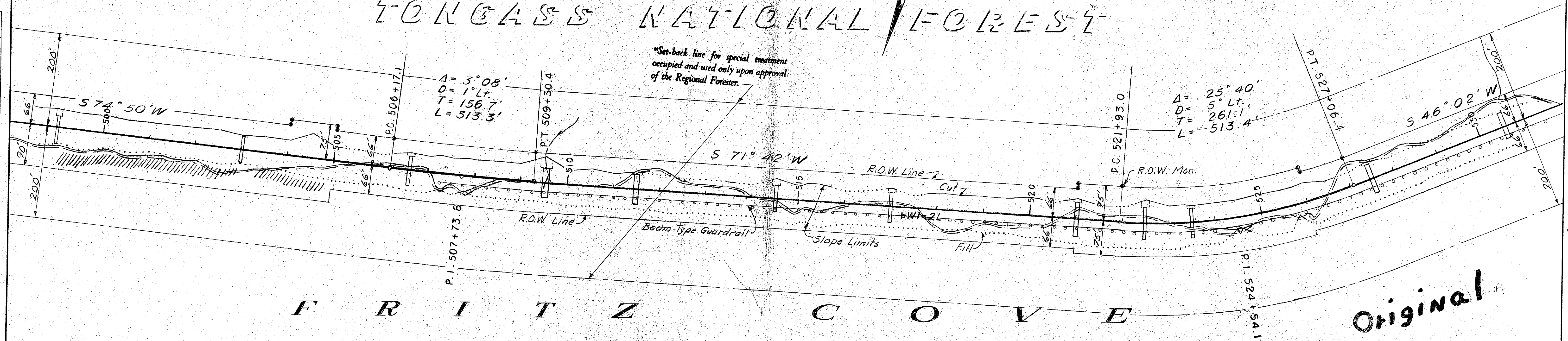
TONGASS NATIONAL FOREST

FRITZ COVE

Original

PLAN	DATE	BY
SURVEYED		
NOTED		
PLOTTED		
CHECKED		
REVIEWED		

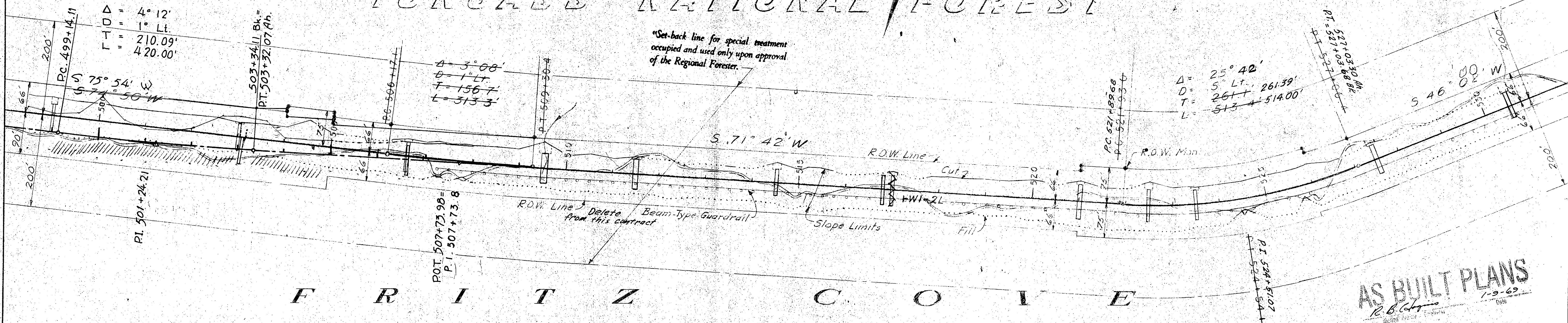
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SURVEYED		
NOTED		
PLOTTED		
CHECKED		
REVIEWED		



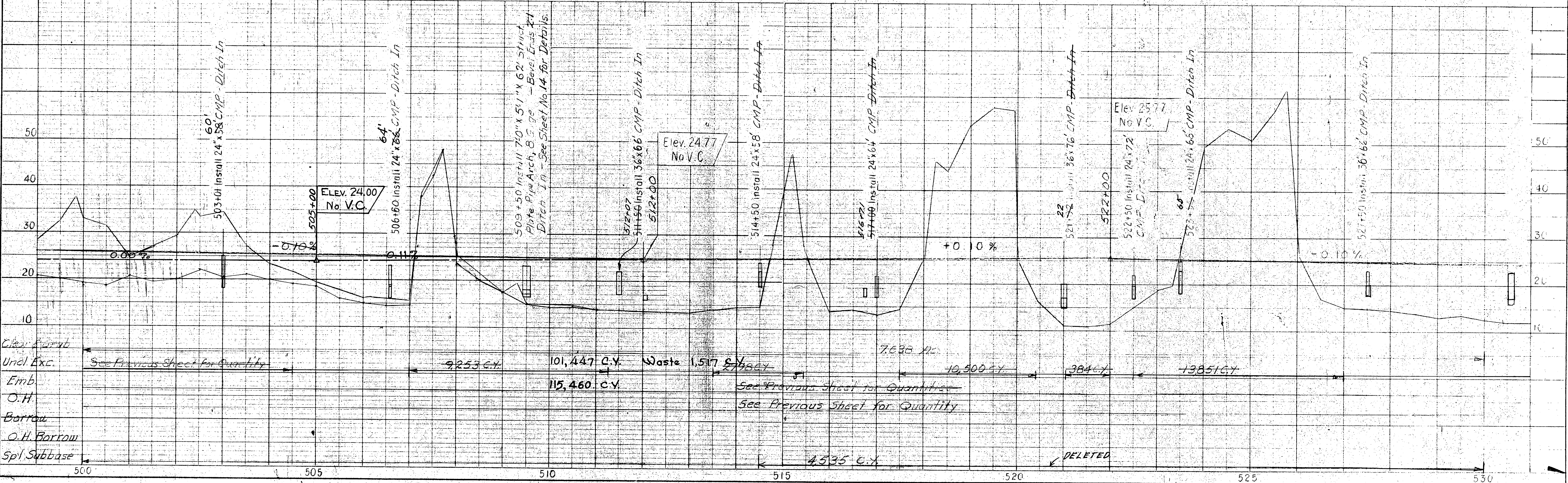
REVISED 5/3/1966

TONGASS NATIONAL FOREST

PLAN
SURVEYED BY
PLOTTED BY
NOTE BOOK ALIGNMENT CHECKED
NO. OF WAY CHECKED



PROFILE
SURVEYED BY
NOTE BOOK
GRADES CHECKED
B. M. NOTED
STRUCTURE NOTATIONS CHD

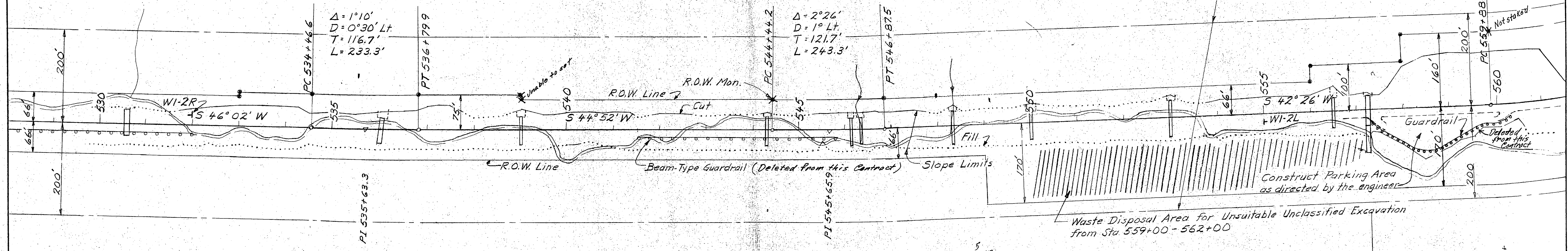


STATE	ROUTE	SECTION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	FH 31	1	1965	10	22

TONCAS NATIONAL FOREST

"Set-back line for special treatment occupied and used only upon approval of the Regional Forester."

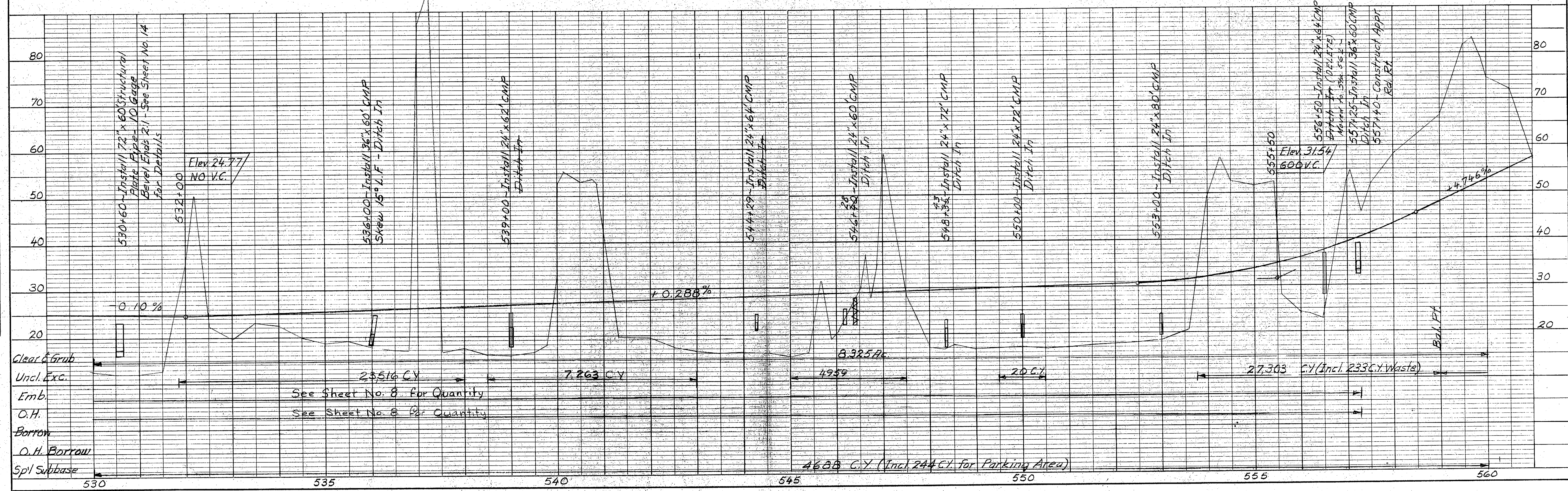
PLAN	SURVEYED	DATE
	NOTED	BY
	ALIGNED	CHECKED
	RT. OF WAY	CHECKED
NO.		



F R I T Z C O V E

END OF PROJECT
R.B.G. 1-9-69

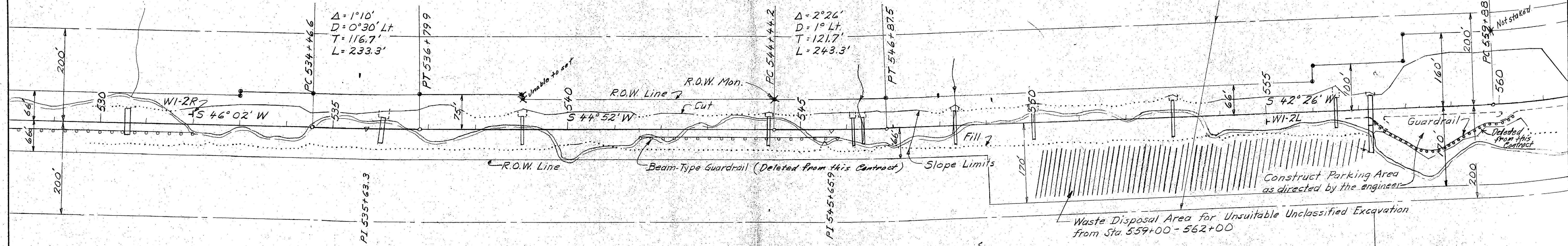
PROFILE	SURVEYED	DATE
	NOTED	BY
	STRUCTURE	NOTATIONS
	CH. NO.	



TONGAS NATIONAL FOREST

"Set-back line for special treatment occupied and used only upon approval of the Regional Forester."

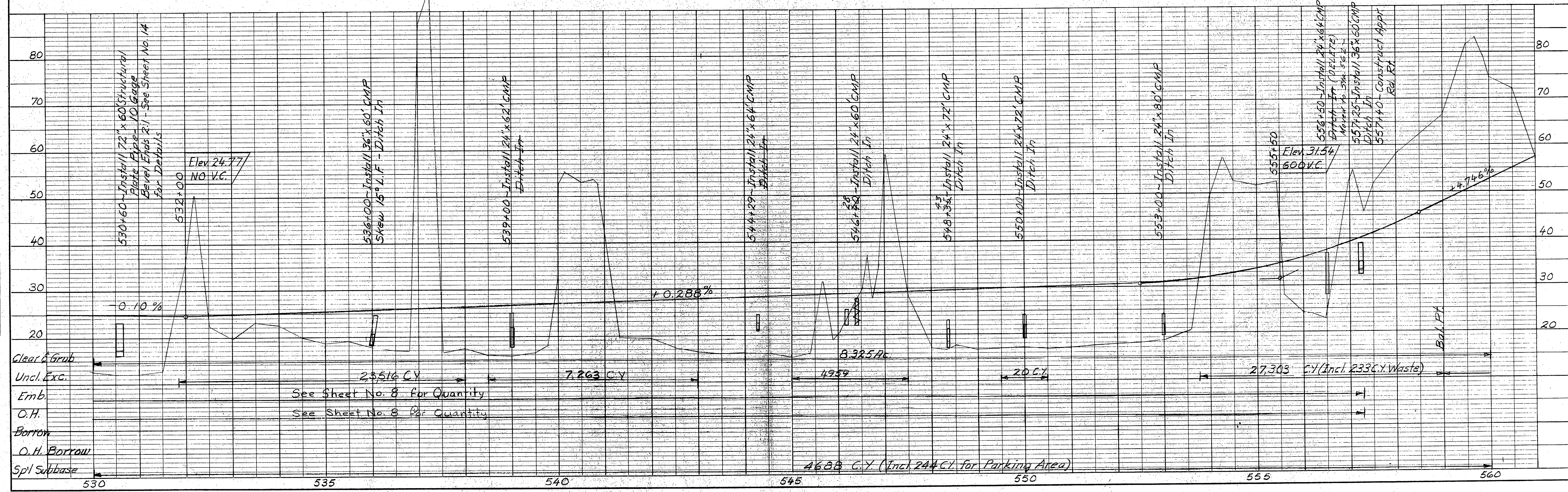
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	BY	
	NOTE BOOK	
	ALIGNMENT CHECKED	
	RT. OF WAY CHECKED	
	NO.	



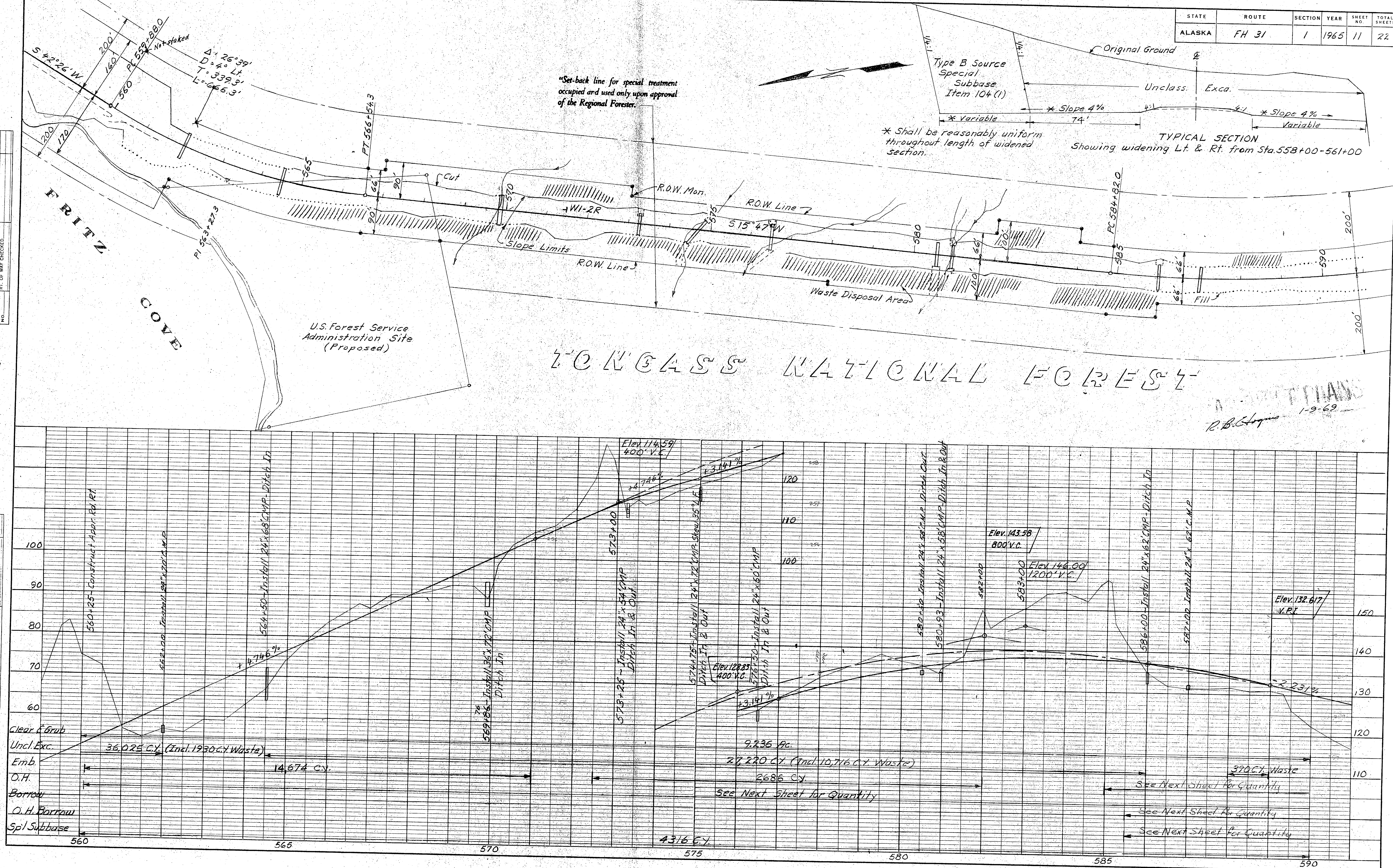
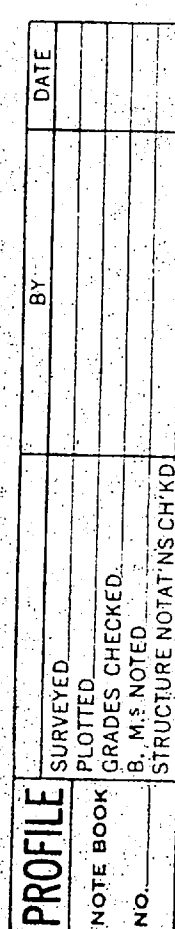
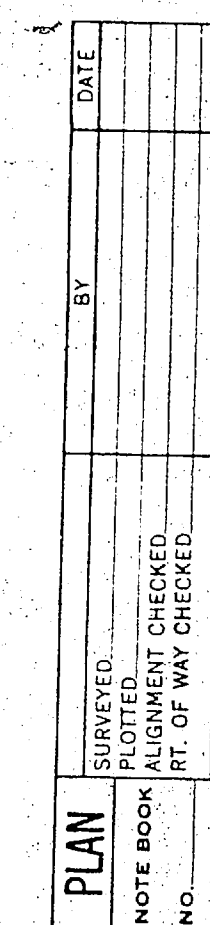
F R I T Z C O V E

END OF PROJECT
R.B.H.
1-9-69

PROFILE	SURVEYED	DATE
	BY	
	NOTE BOOK	
	PLotted CHECKED	
	8. M. NOTED	
	STRUCTURE NOTATIONS CH. NO.	
	NO.	

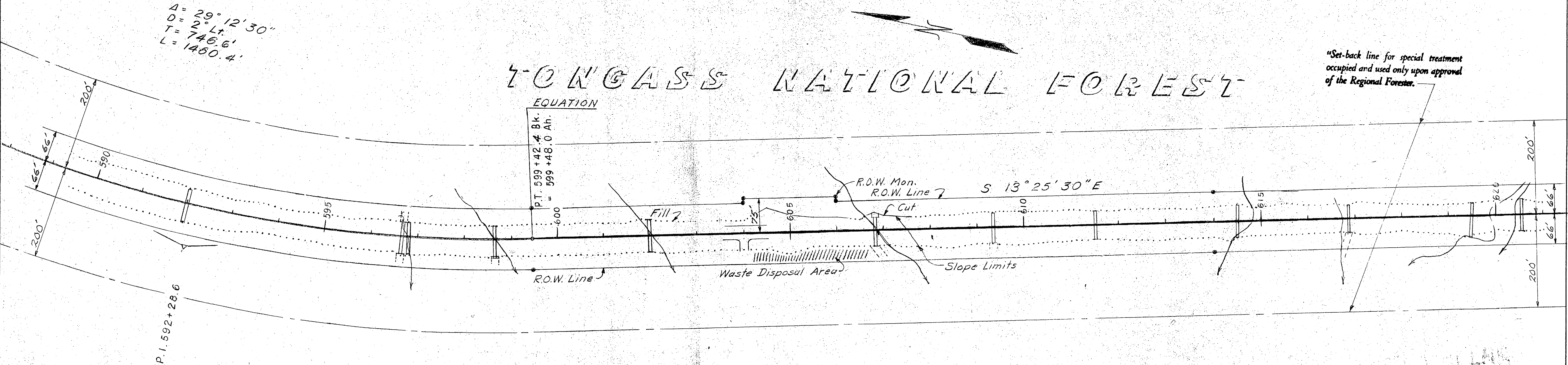


STATE	ROUTE	SECTION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	FH 31	1	1965	11	22



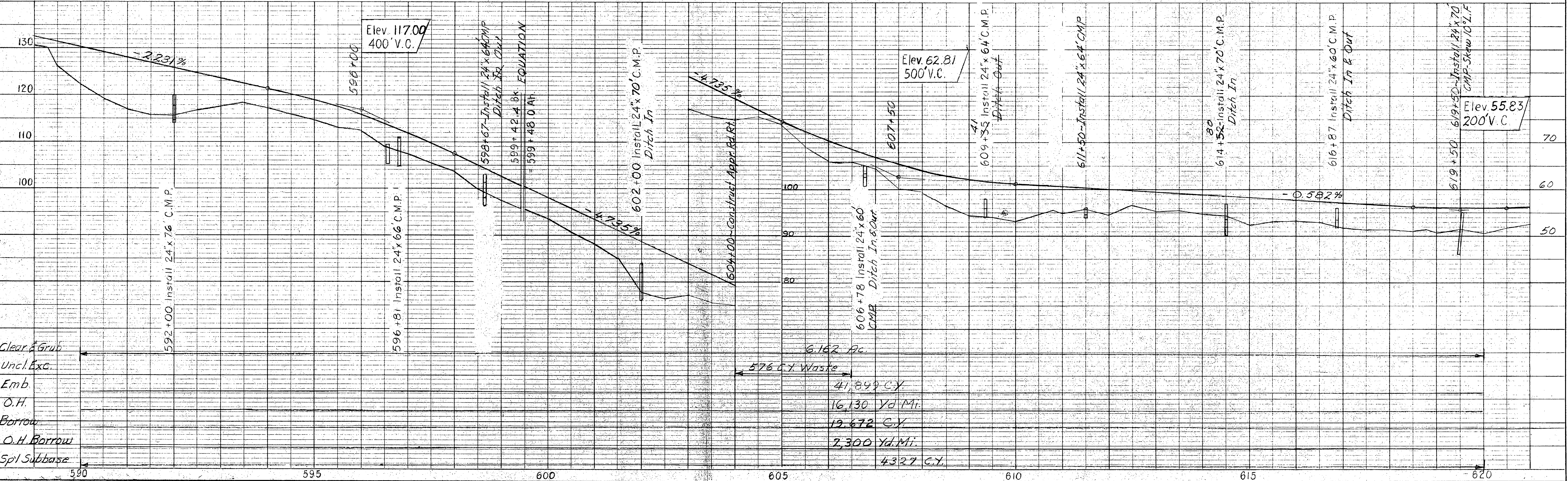
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ALASKA	FH 31	1	1965	12	22

PLAN	NO.	DATE	BY
SURVIVED			
PLOTTED			
ALIGNMENT CHECKED			
RT. OF WAY CHECKED			



R.B. C. 1-9-69

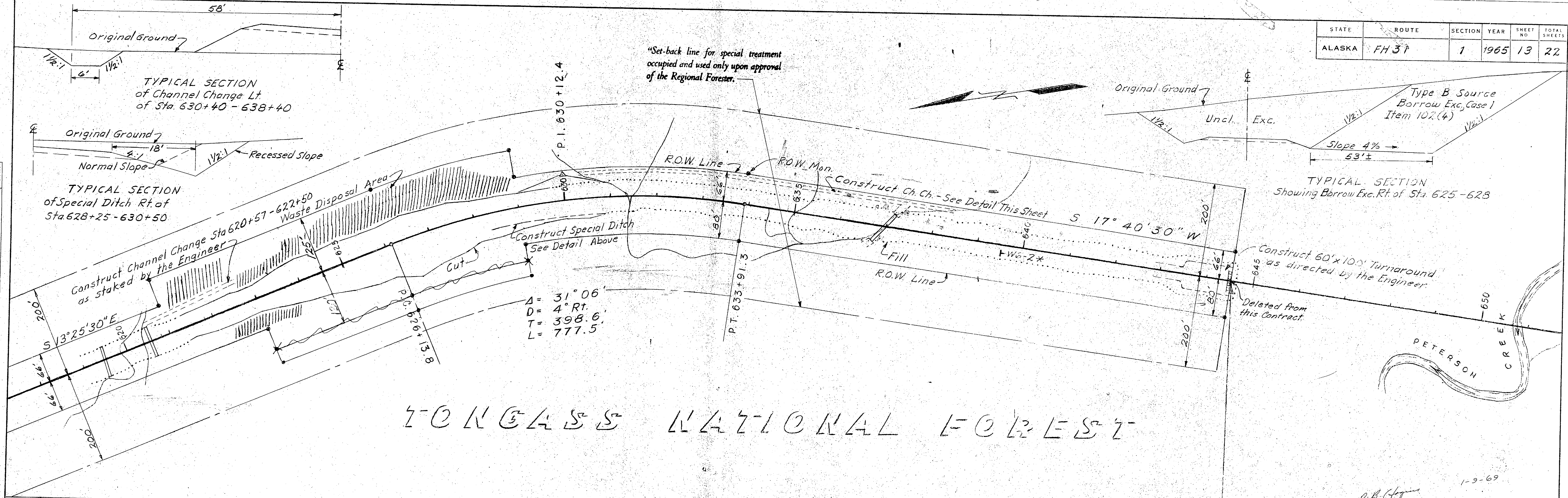
PROFILE	NO.	DATE	BY
SURVIVED			
PLOTTED			
GRADES CHECKED			
STRUCTURE NOTATIONS CHD			



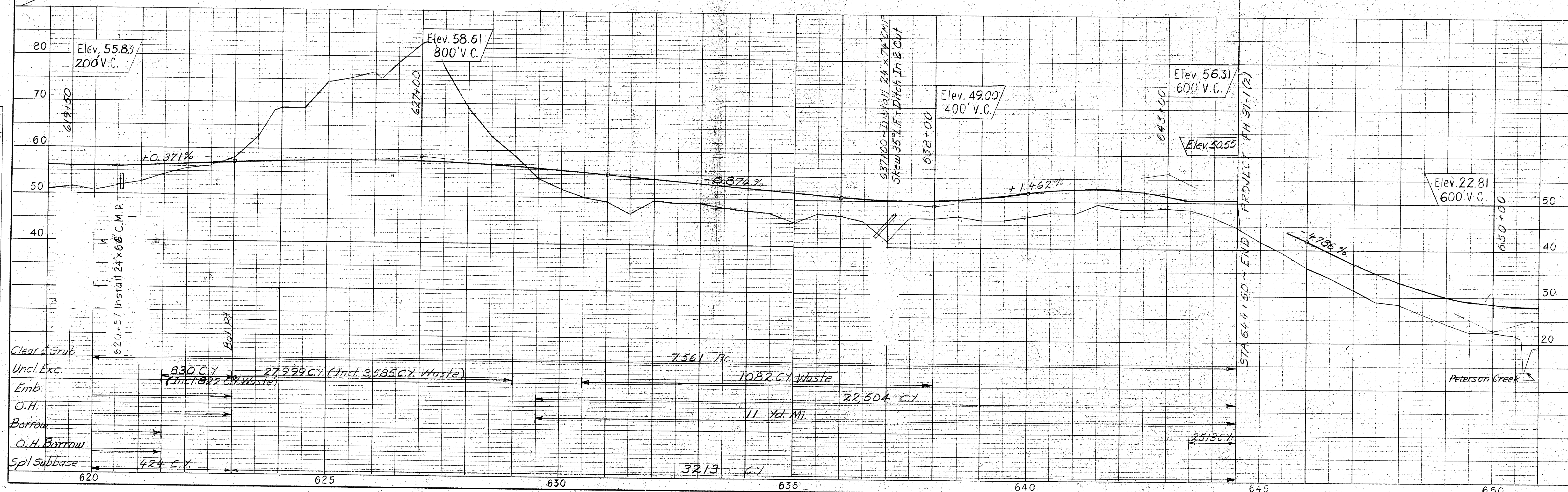
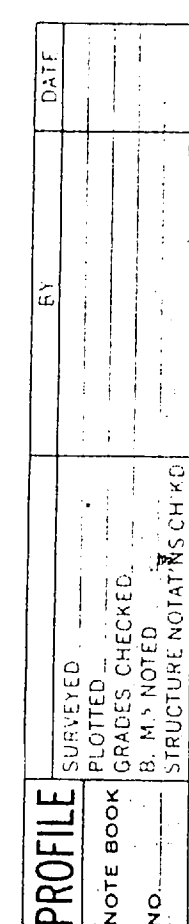
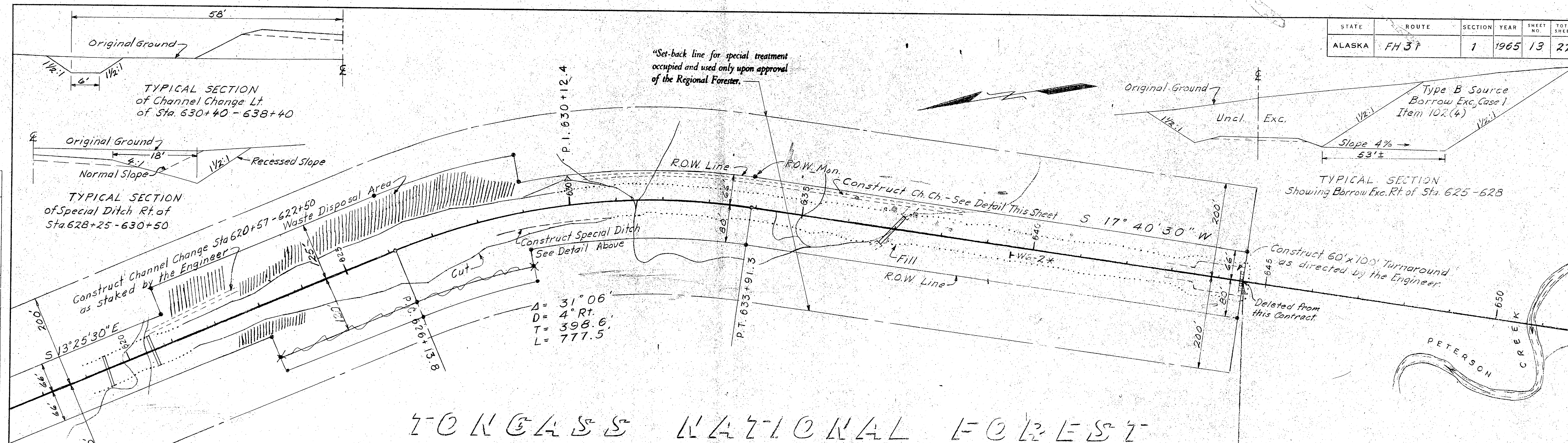
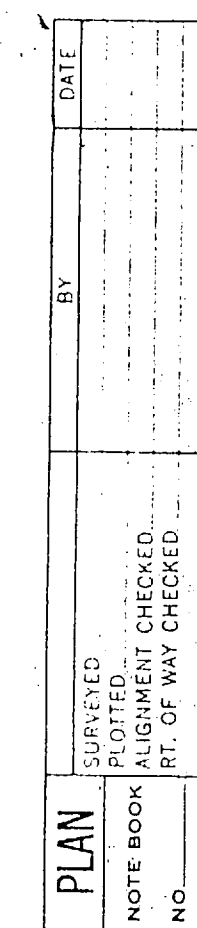
STATE	ROUTE	SECTION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	FH 31	1	1965	13	22

PLAN	DATE	BY
SURVEYED		
PLOTTED		
CHECKED		
NO.		

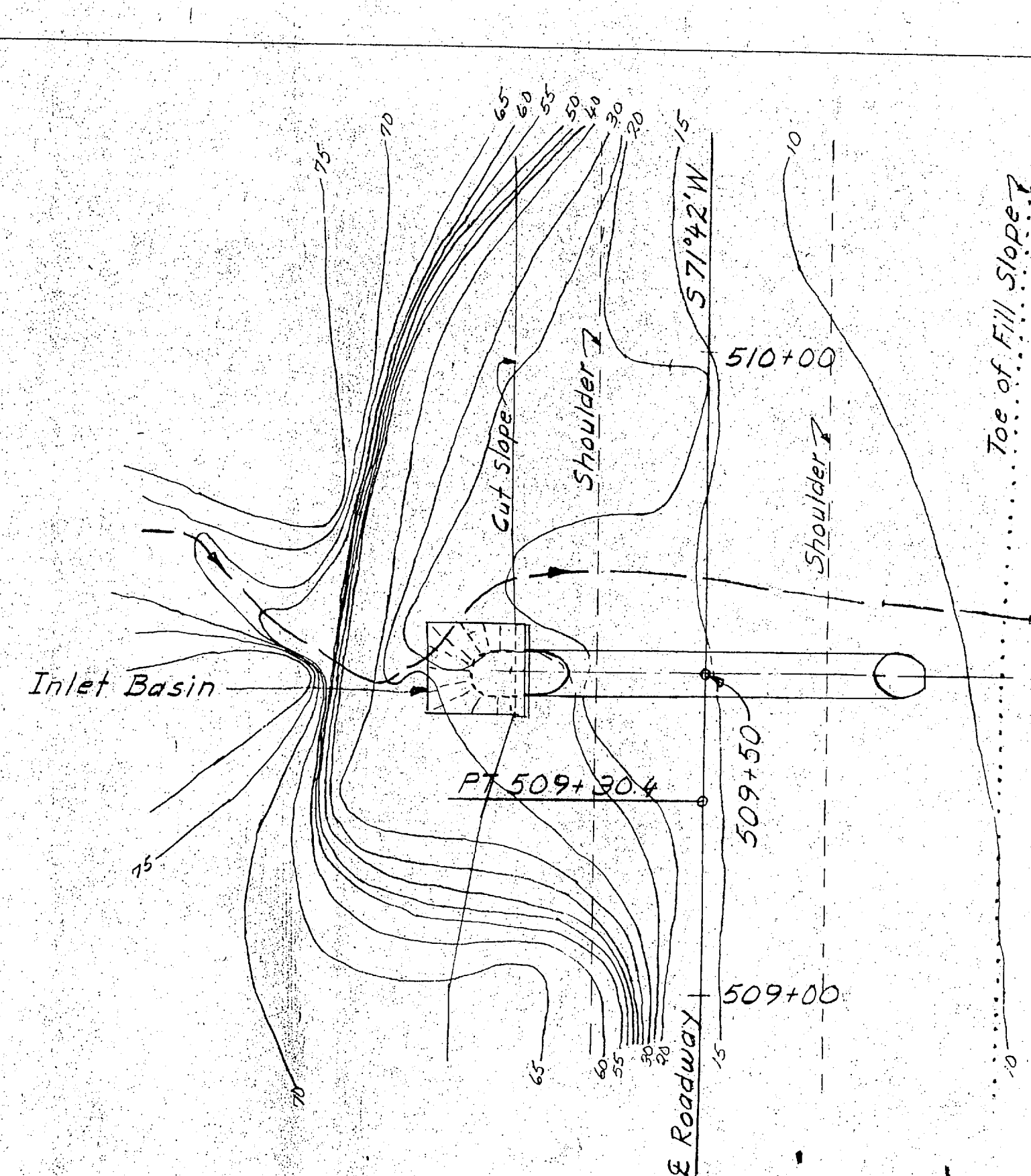
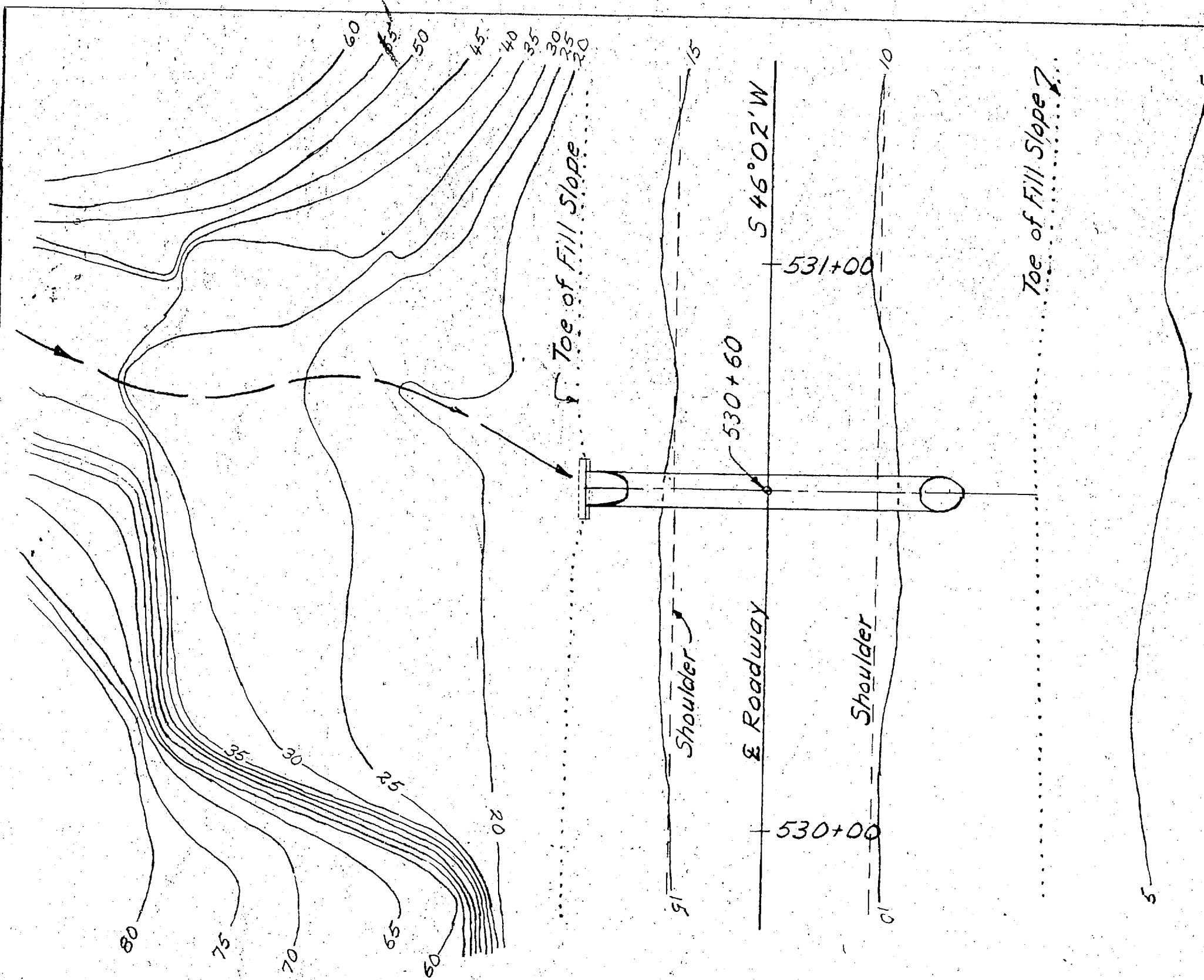
PROFILE	DATE	BY
SURVEYED		
PLOTTED		
CHECKED		
NO.		



STATE	ROUTE	SECTION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	FH 31	1	1965	13	22



AS 1111111111
1-9-69



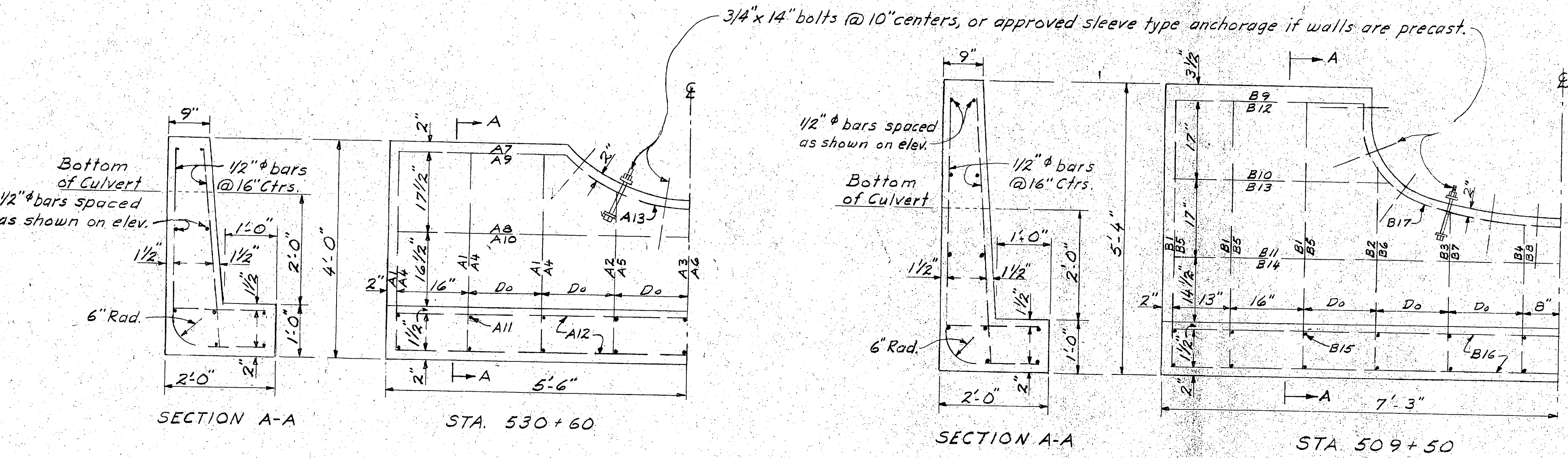
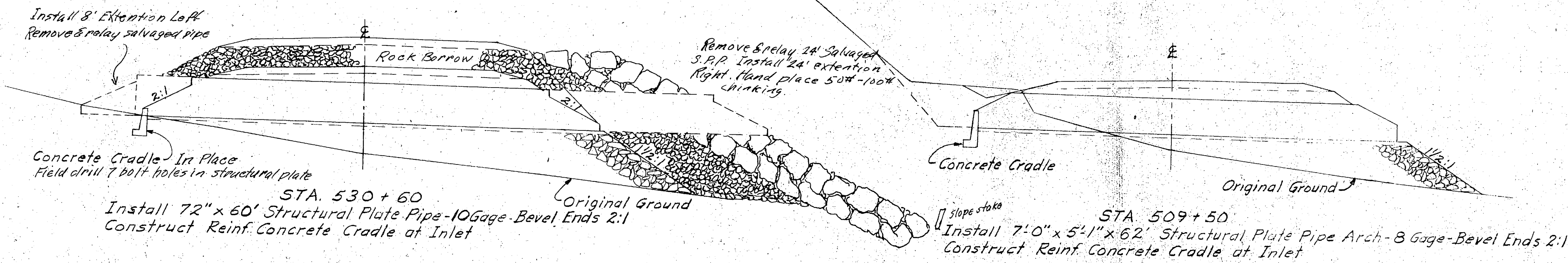
72" S.P.P. AT STA. 530+60

LOCATION	STRAIGHT BARS		BENT BARS		BENDING DIAGRAM All Dimensions as Out to Out
	MARK NO.	LENGTH	MARK NO.	LENGTH	
Back wall, Vertical			A1	6 5'-1 1/2"	
" " "			A2	2 4'-5"	
" " "			A3	1 4'-1 1/2"	
Front wall, Vertical	A4	6 3'-8"			
" " "	A5	2 3'-0"			
" " "	A6	1 2'-8"			
Back wall, Horiz	A7	2 3'-1"			
" " "	A8	1 10'-8"			
Front wall, "	A9	2 3'-1"			
" " "	A10	1 10'-8"			
Footing	A11	9 1'-8"			
"	A12	5 10'-8"			
Arch			A13	2 5'-2"	

NOTE: All bars listed above & below are size no. 4.

7'-0" x 5'-1" S.P.P.A. AT STA. 509+50

LOCATION	STRAIGHT BARS		BENT BARS		BENDING DIAGRAM All Dimensions as Out to Out
	MARK NO.	LENGTH	MARK NO.	LENGTH	
Back wall, Vertical			B1	6 6'-4"	
" " "			B2	2 5'-2 1/2"	
" " "			B3	2 4'-4 1/2"	
" " "			B4	2 4'-1 1/2"	
Front wall, Vertical	B5	6 4'-10 1/2"			
" " "	B6	2 3'-9"			
" " "	B7	2 2'-11"			
" " "	B8	2 2'-8"			
Back wall, Horiz	B9	2 3'-4 1/2"			
" " "	B10	2 3'-11"			
" " "	B11	1 14'-2"			
Front wall, Horiz	B12	2 3'-4 1/2"			
" " "	B13	2 3'-11"			
" " "	B14	1 14'-2"			
Footing	B15	12 1'-8"			
"	B16	5 14'-2"			
Arch			B17	2 9'-9"	



E-2:917

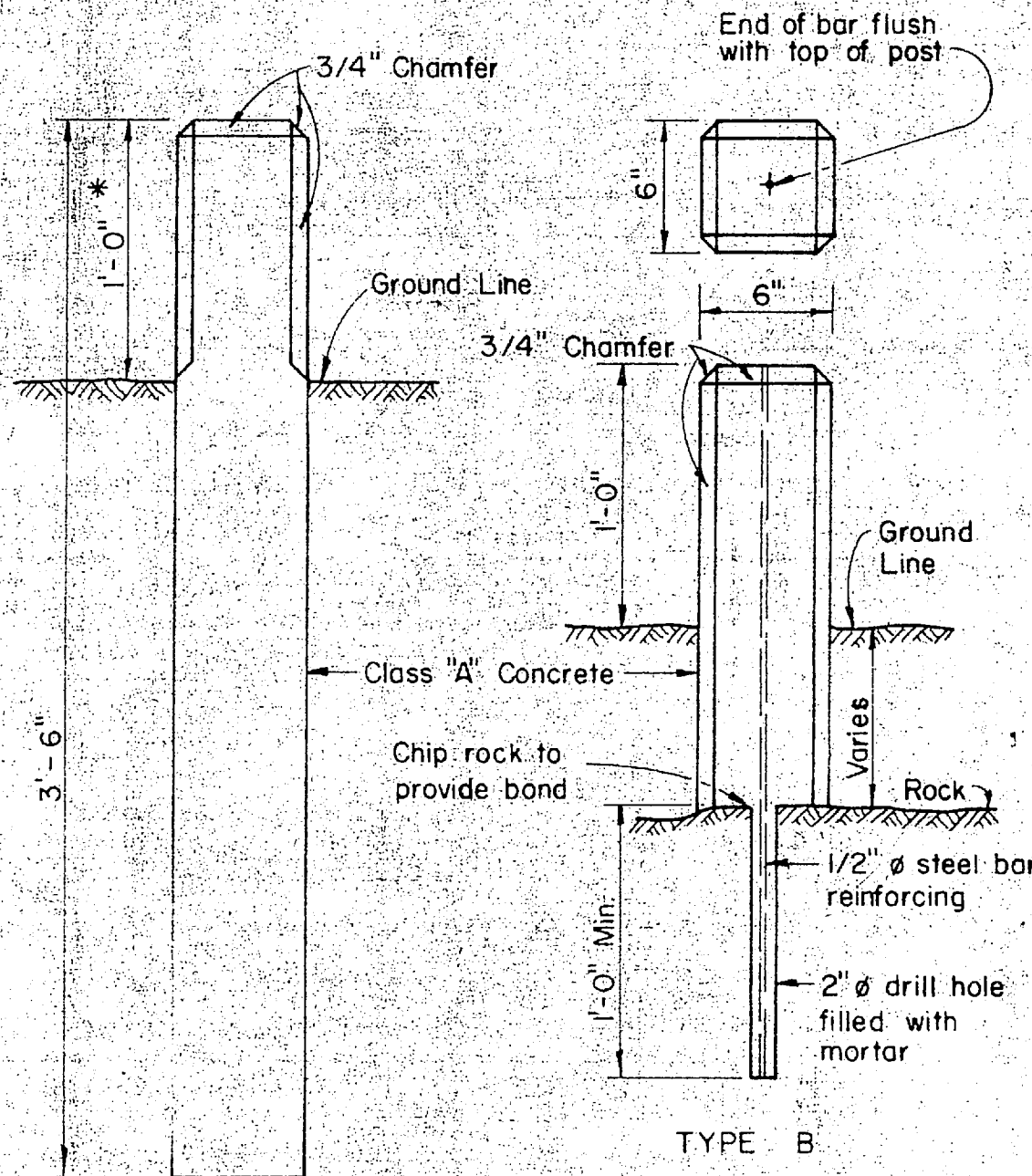
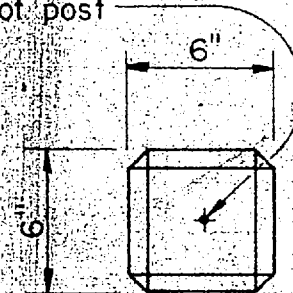
GENERAL NOTES

When solid rock is encountered the contractor shall have the option of furnishing either Type A or Type B monuments.

The portion of the monument projecting above the ground line shall be painted with a field coat of Ready Mix Medium-Chrome-Yellow, Federal Specification TT-P-53a.

* In areas where land use may endanger the monument, the engineer may direct the monuments to be placed flush or slightly below the ground surface.

3/16" copper wire 6" long, cut flush with top of post



TYPE A

TYPE B

RIGHT-OF-WAY MONUMENT

STANDARD CONCRETE RIGHT-OF-WAY MONUMENT

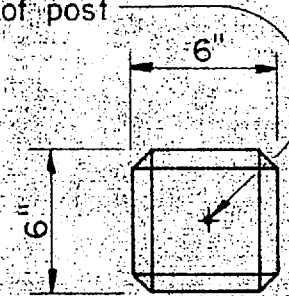
STATE	ROUTE	SECTION	SHEET NO.	TOTAL SHEETS
ALASKA	31	1	15	22

SUMMARY OF RIGHT-OF-WAY MONUMENTS

STATION	Dist. from C in ft.		NO.	REMARKS	STATION	Dist. from C in ft.		NO.	REMARKS
	Left	Right				Left	Right		
453 / 00	100		1		533 / 00	66		1	
453 / 00	130		1		533 / 00	75		1	
456 / 15.8 PT	130		1		534 / 46.6 PC	75		1	
461 / 02.6 PC	130		1		536 / 79.9 PT	75		1	
461 / 02.6 PC	66		1		~~539 / 00~~	~~75~~		~~1~~	
466 / 59.5 PT	66		1		~~539 / 00~~	~~66~~		~~1~~	
470 / 00	66		1		~~544 / 44.2 PC~~	~~66~~		~~1~~	
470 / 00	90		1		546 / 87.5 PT	66		1	
474 / 00	90		1		556 / 00	66		1	
474 / 00	100		1		556 / 00	100		1	
474 / 26.4 PC	100		1		558 / 00	100		1	
476 / 45	100		1		558 / 00	160		1	
477 / 53.7 BK PT	100		1		559 / 88.0 PC	160		1	
477 / 53.7 BK PT	100		1		~~559 / 88.0 PC~~	~~160~~		~~1~~	
477 / 53.7 BK PT	100		1		562 / 00	160	112	2	Rt. approx. location
479 / 34.0 PC	100		1		562 / 00	66	90	2	
480 / 33.50	100		1		566 / 54.3 PT	66	90	2	
481 / 50	160		1		567 / 00	66		1	
485 / 34.0 PT	160		1		567 / 00	90		1	
488 / 00 15.32 PC	160		1		568 / 50		90	1	Approx. location
488 / 00	80		1		573 / 00	90		1	
488 / 94.9 PC	80		1		573 / 00	66		1	
493 / 47.1 PT	80		1		578 / 00		90	1	
492 / 00	80		1		578 / 00		100	1	
497 / 00 493+01 PC	80		1		582 / 00	66		1	
497 / 00	66		1		582 / 00	100		1	
503 / 34.11 PT	66		1		584 / 00	100		1	
504 / 00	75 95		1		584 / 00	66		1	
505 / 00	75 80		1		584 / 82.0 PC	66	100	2	
505 / 00	66		1		586 / 00		100	1	
506 / 17.1 PC	66		1		586 / 00		66	1	
509 / 30.1 PT	66		1		599 / 42.4 BK PT				
521 / 00	66		1		599 / 48.0 AH PT	66	66	2	
521 / 00	75		1		604 / 00	66		1	
521 / 93.0 PC	75		1		604 / 00	75		1	
526 / 00	75		1		606 / 00	75		1	
526 / 00	66		1						
527 / 06.4 PT	66		1						

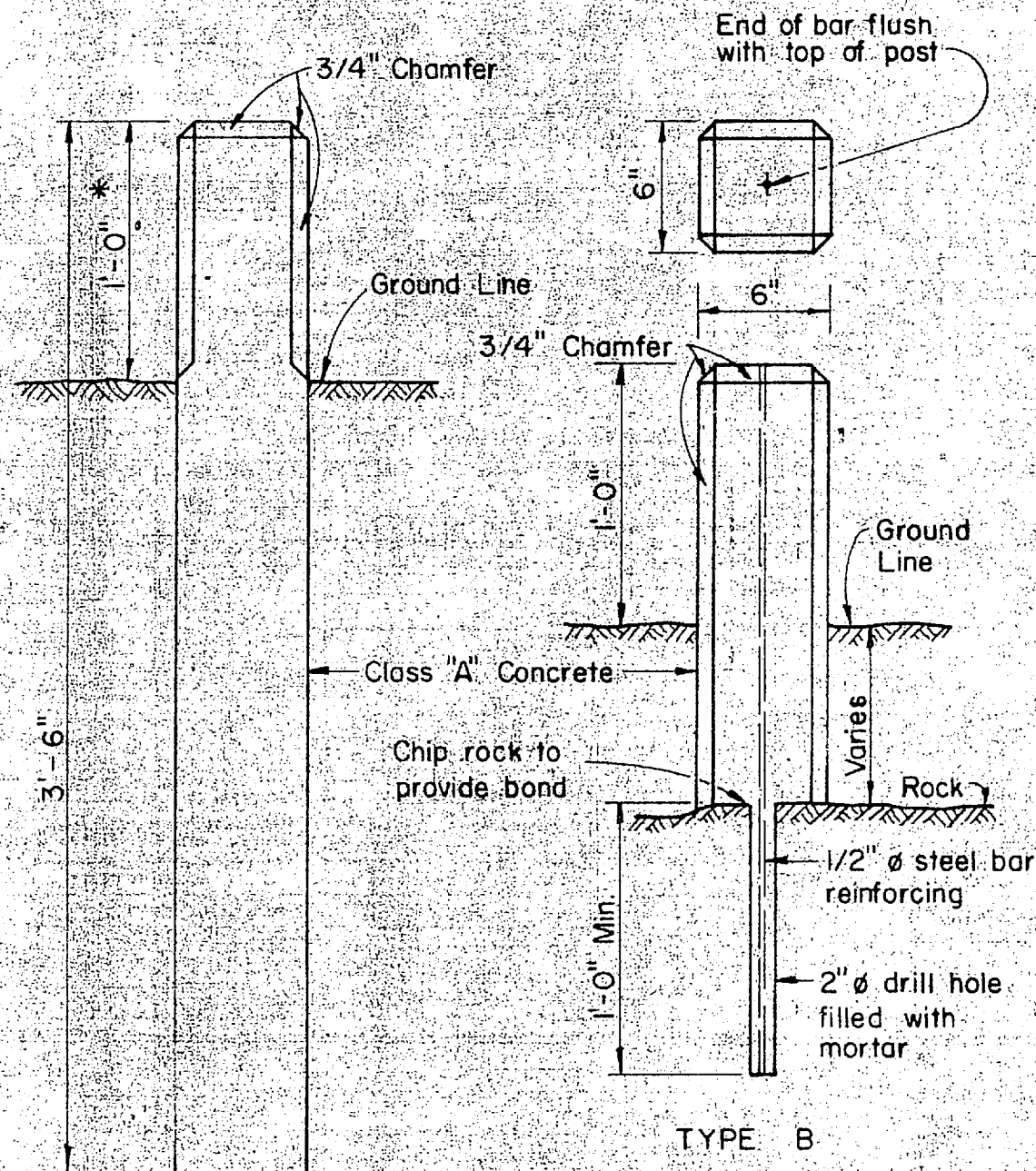
STANDARD CONCRETE RIGHT-OF-WAY MONUMENT

3/16" copper wire 6"
long cut flush with
top of post _____



The portion of the monument projecting above the ground line shall be painted with a field coat of Ready Mix Medium-Chrome-Yellow, Federal Specification TT-P-53a.

* In areas where land use may endanger the monument, the engineer may direct the monuments to be placed flush or slightly below the ground surface.



TYPE A

TYPE B

RIGHT-OF-WAY MONUMENT

SUMMARY OF RIGHT-OF-WAY MONUMENTS

[illegible]

HIGHWAY (H-20) LOADING - CORR. METAL AND CORR. STRUCTURAL PLATE AND PIPE ARCHES.

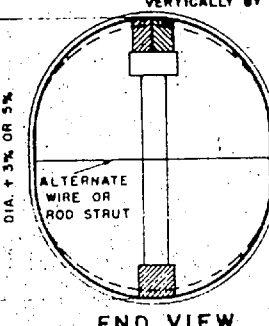
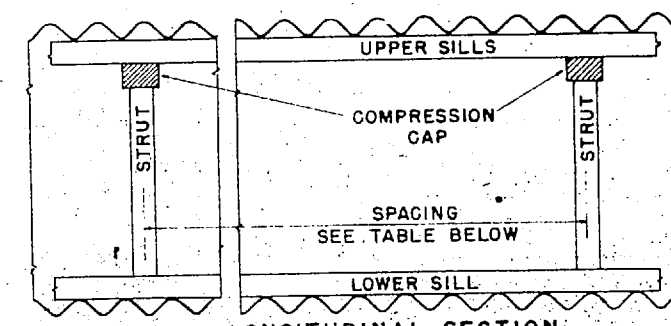
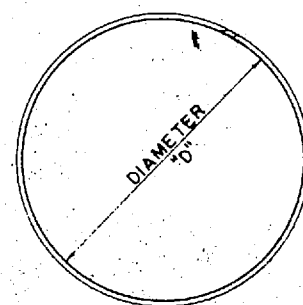
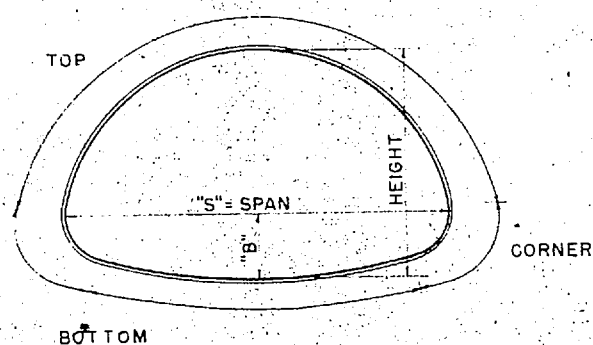


PLATE PIPE CAN BE ELONGATED BY THE USE OF HEAVY JACKS AND TIMBER STRUTS. FACTORY FORMED 8" ELLIPTICAL STRUCTURAL PLATE PIPES CAN BE INSTALLED WITHOUT TIMBER STRUTS UP THROUGH 108 INCH DIAMETER TO 30 FEET OF COVER AND OVER 108 INCH DIAMETER TO 20 FEET OF COVER, WHEN WELL COMPACTED GRANULAR MATERIAL IS USED AS BACKFILL IF BACKFILL IS PLASTIC MATERIAL, SUCH 5" ELLIPSES CAN BE USED WITH TIMBER STRUTS WEDGED IN PLACE WITHOUT FURTHER ELONGATION.

SEE NOTES UNDER TABLES
FOR USE OF ELLIPSED PIPE.

CORRUGATED METAL PIPE-ARCHES
GAGE TABLE FOR H 20 LIVE LOAD

AREA (SQ. FT.)	PIPE DIA. OF EQ. PER (12 INCHES)	SPAN * (12 INCHES)	HEIGHT * (INCHES)	"B" * (INCHES)	HEIGHT OF COVER (FEET)			
					1-2	5-9	10-15	16-20
					RECOMMENDED MINIMUM GAGE			
1.5	1 1/4	19	4 1/2	15	16	16	16	16
1.5	1 1/2	22	5	4 3/4	16	16	16	16
2.2	2	25	5 1/4	16	16	16	16	16
2.2	2 1/4	29	6	17	16	16	14	14
4.4	3	36	7	18	14	14	14	14
6.4	3 1/2	43	7 1/2	19	12	12	12	12
8.7	4	50	8	20	12	12	12	10
11.4	4 1/2	55	8 1/2	21	10	10	10	10
14.3	5	63	9	22	10	10	10	8
17.6	5 1/2	72	10	24	8	8	8	-

* MANUFACTURING TOLERANCE = PLUS OR MINUS .2% OF THE
DIMENSION PLUS ONE (1) INCH.

NOTE: Pipe arches are to be used only under conditions of low fill height.

CORRUGATED METAL PIPE
**GAGE TABLE FOR H-20 LIVE LOAD

AREA (SQ. FT.)	DIAM. (INCHES)	HEIGHT OF COVER ABOVE TOP OF CULVERT (FEET.)													
		1-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-60	61-70	71-80	81-100	
12	15	16	15	16	16	16	16	16	16	16	14	14	12	12	
18	18	16	16	16	16	16	16	16	16	14	14	14	12	12	
24	21	16	16	16	16	16	16	14	14	14	14	12	12	10	
31	24	14	14	14	14	14	14	14	14	12	12	12	10	10	
49	30	14	14	14	14	14	12	12	12	10	10	10	8 *	8 *	
71	36	12	12	12	12	12	10	10	10	8	8	8 *	8 *	8 *	
96	42	12	12	12	12	10	10	8	8	8	8 *	8 *	8 *	8 *	
126	48	12	12	12	10	8	8								
159	54	12	12	10	8	8									
196	60	10	10	8	8										
238	66	10	10	8											
283	72	10	8												

USE STRUTTED CORRUGATED METAL
PIPE FOR THESE TABULAR VALUES

USE STRUTTED CORRUGATED METAL
PIPE FOR THESE TABULAR VALUES

* TRENCH ONE (1) DIAMETER

•• Use this table for conditions on left of heavy line.
Use strutted table for conditions on right of heavy line.

* CORRUGATED STRUCTURAL PLATE PIPE
GAGE TABLE FOR H-20 LIVE LOAD

[illegible]

• Use this table for design conditions on left of heavy line. Use strutted table for conditions on right of heavy line.

STRUTTED CORRUGATED METAL PIPE
• GAGE TABLE FOR H-20 LIVE LOAD

[illegible]

* For conditions left of heavy line use unstrutted table except as shown below.

① 16'-20'-	5% ellipsed pipe without struts - under 16' use unstrutted table.
② 11'-20'-	" " " " " " " 11' "
③ 1'-15'-	" " " " " " " 16' or over, strutted.
④	5% ellipsed pipe unstrutted.

STRUTTED CORRUGATED STRUCTURAL PLATE PIPE
* GAGE TABLE FOR H-20 LIVE LOAD

AREA (SQ. FT.)	DIAM (INCHES)	HEIGHT OF COVER- FEET																		LIMIT FT. OF COVER
		1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-90	91-100			
20	60	12	12	12	12	12	12	12	12	12	12	10	10	8	7	5	5	200		
24	66	12	12	12	12	12	12	12	12	12	12	10	10	8	8	7	5	180		
28	72	12	12	12	12	12	12	12	12	12	10	10	8	8	7	5	3	160		
33	78	12	12	12	12	12	12	12	12	10	10	8	8	8	5	3	1	150		
38	84	12	12	12	12	12	12	12	12	10	10	8	8	7	5	3	1	140		
44	90	12	12	12	12	12	12	12	10	10	8	8	7	5	3	1		130		
50	96	12	12	12	12	12	10	10	10	10	8	7	7	5	3	1		125		
57	102	12	12	12	12	10	10	10	10	8	8	7	5	3	3	1		115		
64	108	12	12	12	10	10	10	10	10	8	7	5	5	3	1			110		
71	114	10	12	10	10	10	10	10	8	8	7	5	5	3	1			105		
78	120	10	12	10	10	10	10	10	8	7	5	5	3	1				100		
87	126	10	12	10	10	10	10	10	8	7	5	3	3	1				95		
95	132	10	10	10	10	10	10	8	8	7	5	3	1					90		
104	138	10	10	10	10	10	10	8	7	5	3	3	1					85		
115	144	10	10	10	10	10	8	8	7	5	3	1						80		
123	150	10	10	10	8	8	8	7	5	3	1							80		
133	156	10	10	10	8	8	8	7	5	3	1							75		
143	162	10	10	10	8	8	7	5	3	1								70		
154	168	10	10	10	8	8	7	5	3	1								65		
165	174	8	10	8	8	8	7	5	3	1								65		
177	180	8	10	8	8	8	7	5	3	1								65		

FOR STRUCTURES IN THIS
ZONE USE 1 GAGE WITH
SIX BOLTS PER FOOT OF
LONGITUDINAL SEAM
WITH HEIGHT OF COVER
LIMITS AS SHOWN IN
COLUMN AT RIGHT

- For conditions left of heavy line "A" use unstrutted table.
- For conditions between lines "A" and "B" use 5% ellipsed pipe without struts.
- For conditions right of heavy line "B" use 5% ellipsed pipe with struts wedged in place.

CORRUGATED STRUCTURAL PLATE PIPE-ARCHES
GAGE TABLE FOR H-20 LIVE LOAD

[illegible]

MULTIPLE INSTALLATIONS



THE GAGES SHOWN ARE THE MINIMUM STRUCTURAL REQUIREMENTS FOR USE WITH ADEQUATE BACKFILL.

BOTTOM PLATES OF STRUCTURAL PLATE STRUCTURES ARE FREQUENTLY DESIGNED OF HEAVIER GAGE TO RESIST WEAR.

GAGES ARE FOR FINISHED CONSTRUCTION; DURING CONSTRUCTION
ADEQUATE COVER MUST BE PROVIDED TO PROTECT THE STRUCTURE FROM
DAMAGE

PLATES FOR STRUCTURAL PLATE STRUCTURES ARE STANDARD 6"x2"
CORRUGATION OF 1-1/8" VALLEY RADIUS WITH FOUR BOLTS PER FOOT IN
IN EACH LONGITUDINAL SEAM.

BOLTS ARE 3/4" DIAMETER, HIGH STRENGTH TO MEET A.S.T.M. A-325-49T AND GALVANIZED TO MEET A.S.T.M. A-153-49

THE LAST COLUMN IN THE GAGE TABLE FOR STRUTTED STRUCTURAL PLATE PIPE SHOWS THE GREATEST HEIGHT OF COVER THAT CAN BE PLACED ON PIPES SPECIALLY FABRICATED TO HAVE SIX BOLTS PER FOOT IN EACH LONGITUDINAL SEAM IN 1-GAGE METAL

RECOMMENDED MINIMUM HEIGHT OF COVER

LOAD	SURFACE	BASE OF MEASUREMENT	ROUND PIPE TO 120" OVER 150"	PIPE ARCH
HIGHWAY. H-20	UNPAVED AND FLEXIBLE PAVEMENTS	TOP OF SURFACE	1/3 DIA 8" MIN	1/40 SPAN 5" MIN
	RIGID PAVEMENTS	TOP OF SLAB	1/7 DIA 1" MIN	1/4 SPAN 1/4" MIN OF 3" CROWN BELOW SLAB

• 12 Min. preferred.

NOTE: TRANSVERSE CAPS AND SILLS SHOULD BE OF SAME SIZE TIMBER AS STRUTS AND PLACED WITH LEAST DIMENSION VERTICAL. LENGTH OF STRUTS SHOULD BE DIAMETER OF PIPE TIMES 1.03 MINUS (3) THREE TIMES THE LEAST DIMENSION OF STRUT. STRUT SPACING COMPUTED FOR FULL DIMENSION (NOT NOMINAL) SOUND STRUCTURAL TIMBER BASED ON A.S.H.O. TIMBER COLUMN FORMULA $P = C(1 - 1/3(L/d)^4)$ USING $C = 3900$, $E = 16 \times 10^6$ FS/L FOR TEMPERED HARDWOOD CONSTRUCTION.

TIMBER STRUTS SHALL BE LEFT IN PLACE UNTIL FILL IS CONSOLIDATED OR SHALL BE REMOVED AT THE DIRECTION OF THE ENGINEER.

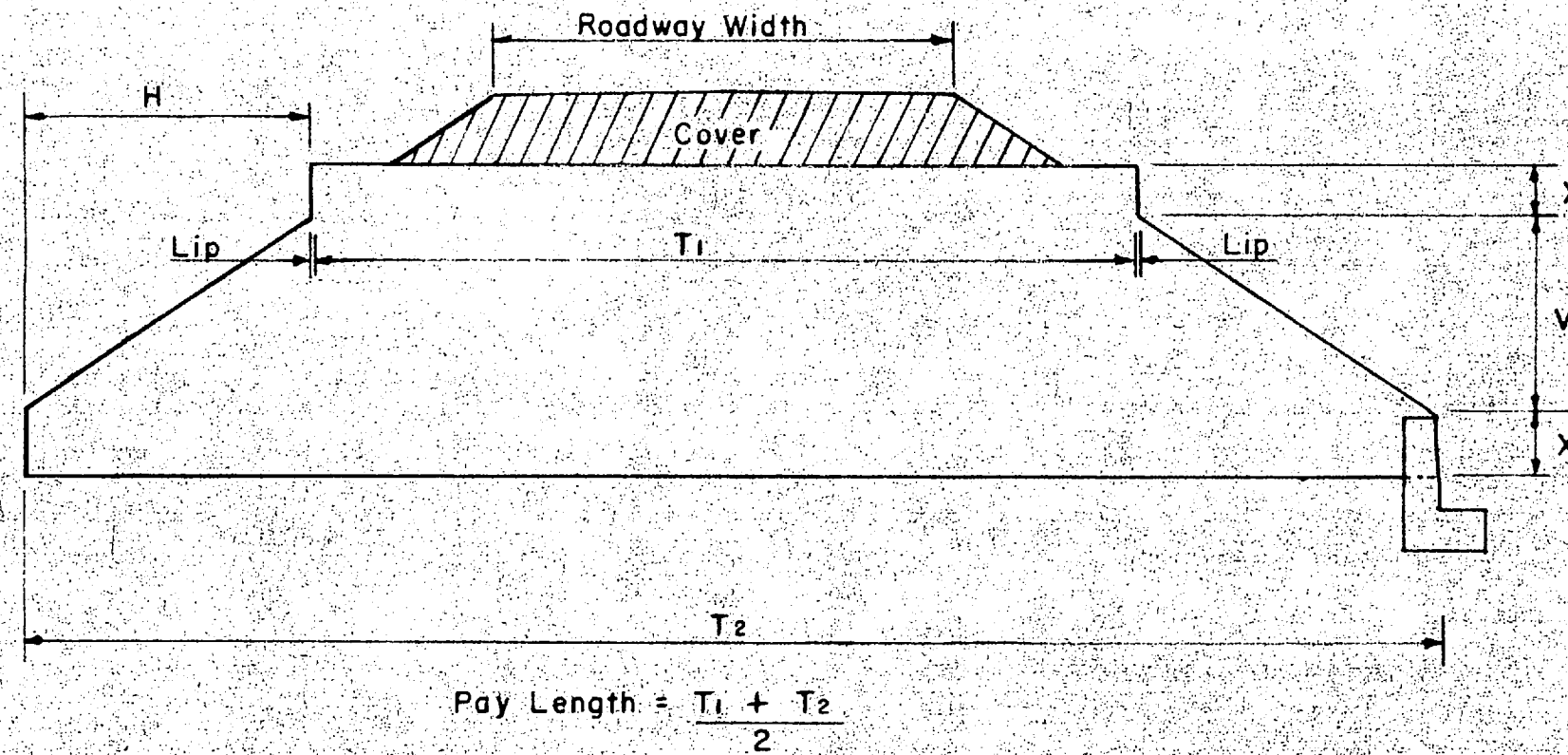
U. S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

REGION 10

STANDARD CULVERTS

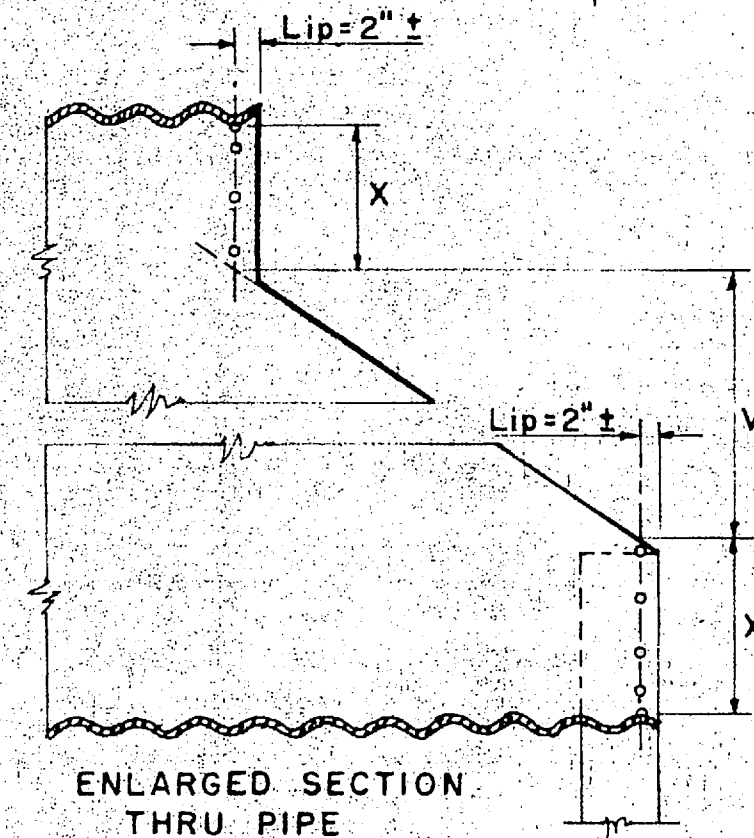
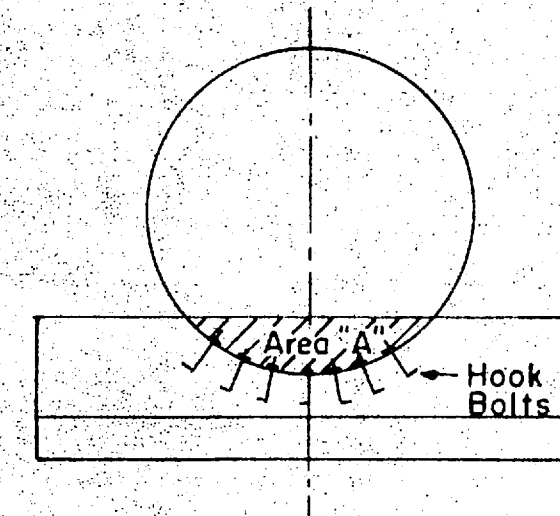
March 10, 1956

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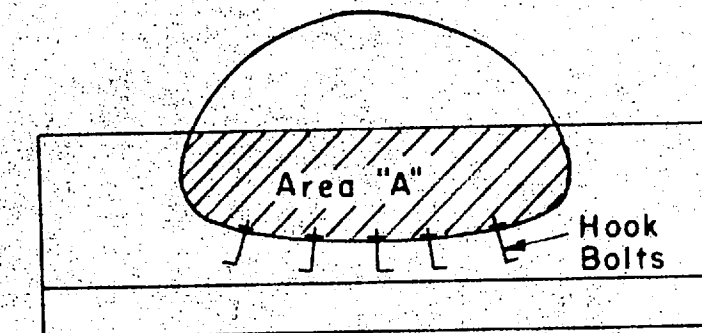
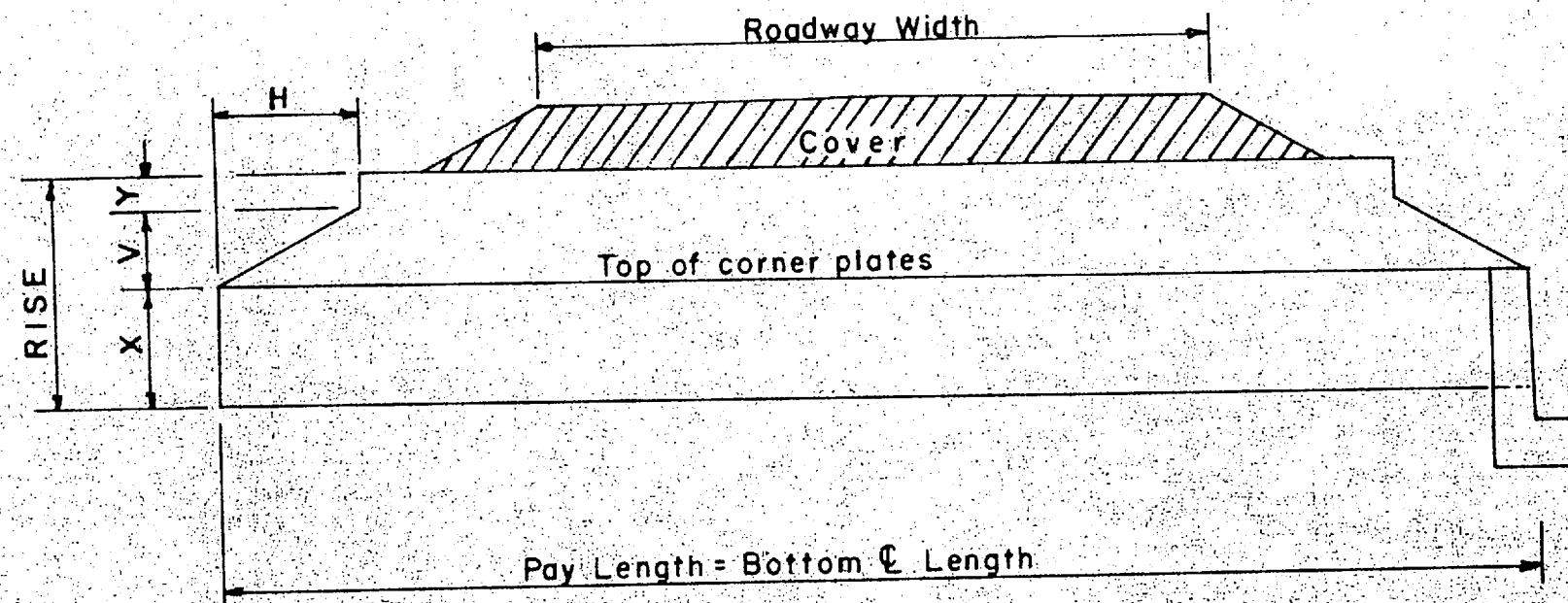


NOTE:

1. For elliptical pipe, increase vertical dimensions by percent of ellipse.
2. For headwall quantities; Area "A" given to top of bottom step.



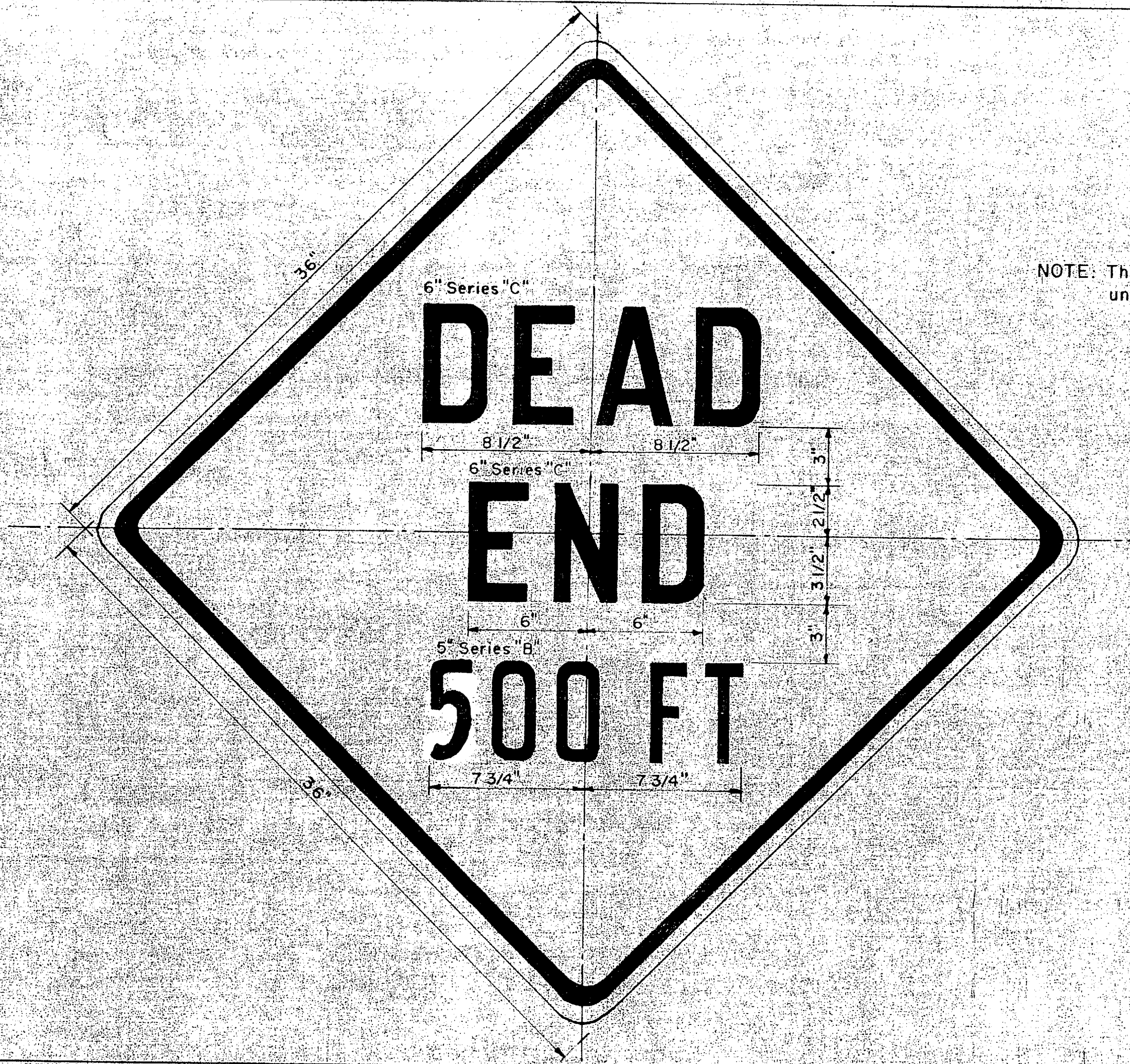
Dia. - In.	"H" in Feet - For Bevels of			"V" in Feet - For Bevels of			"X" in Feet - For Bevels of			Area "A" in square feet		
	11/2:1	2:1	3:1	11/2:1	2:1	3:1	11/2:1	2:1	3:1	11/2:1	2:1	3:1
60	6.0	6.0	8.0	4.0	3.0	2.7	0.5	1.0	1.2	0.7	2.5	3.2
66	6.0	6.0	8.0	4.0	3.0	2.7	0.8	1.2	1.4	1.5	3.7	4.6
72	6.0	8.0	12.0	4.0	4.0	4.0	1.0	1.0	1.0	2.6	3.5	2.8
78	6.0	6.0	12.0	4.0	3.0	4.0	1.2	1.2	1.2	3.9	6.7	4.2
84	6.0	8.0	12.0	4.0	4.0	4.0	1.5	1.5	1.5	5.4	5.6	5.7
90	6.0	8.0	12.0	4.0	4.0	4.0	1.8	1.8	1.8	7.1	7.3	7.5
96	8.0	8.0	16.0	5.3	4.0	5.3	1.4	2.0	1.4	4.9	9.3	5.2
102	8.0	8.0	14.0	5.3	4.0	4.7	1.6	2.2	1.9	6.7	12.0	9.2
108	8.0	8.0	14.0	5.3	4.0	4.7	1.8	2.5	2.2	8.5	13.8	11.4
114	8.0	14.0	14.0	5.3	7.0	4.7	2.1	1.2	2.4	10.7	5.0	13.8
120	8.0	14.0	18.0	5.3	7.0	6.0	2.4	1.5	2.0	13.0	6.8	10.7
126	8.0	14.0	18.0	5.3	7.0	6.0	2.6	1.8	2.2	15.5	8.9	13.1
132	12.0	14.0	18.0	8.0	7.0	6.0	1.5	2.0	2.5	6.9	11.1	15.7
138	12.0	16.0	24.0	8.0	8.0	8.0	1.8	1.8	1.8	9.1	9.3	9.5
144	12.0	12.0	20.0	8.0	6.0	6.7	2.0	3.0	2.6	11.4	21.2	18.2
150	12.0	16.0	24.0	8.0	8.0	8.0	2.2	2.2	2.2	14.0	14.2	14.5
156	12.0	16.0	24.0	8.0	8.0	8.0	2.5	2.5	2.5	16.8	17.0	17.3
162	12.0	16.0	24.0	8.0	8.0	8.0	2.8	2.8	2.8	19.6	20.1	20.4
168	14.0	14.0	22.0	9.3	7.0	7.3	2.4	3.5	3.3	15.8	29.1	27.4
174	14.0	14.0	24.0	9.3	7.0	8.0	2.6	3.8	3.2	18.8	32.8	26.9
180	12.0	16.0	24.0	8.0	8.0	8.0	3.5	3.5	3.5	31.1	30.3	30.7



NOTE :

For headwall quantities = Area "A" given to top of corner plates.

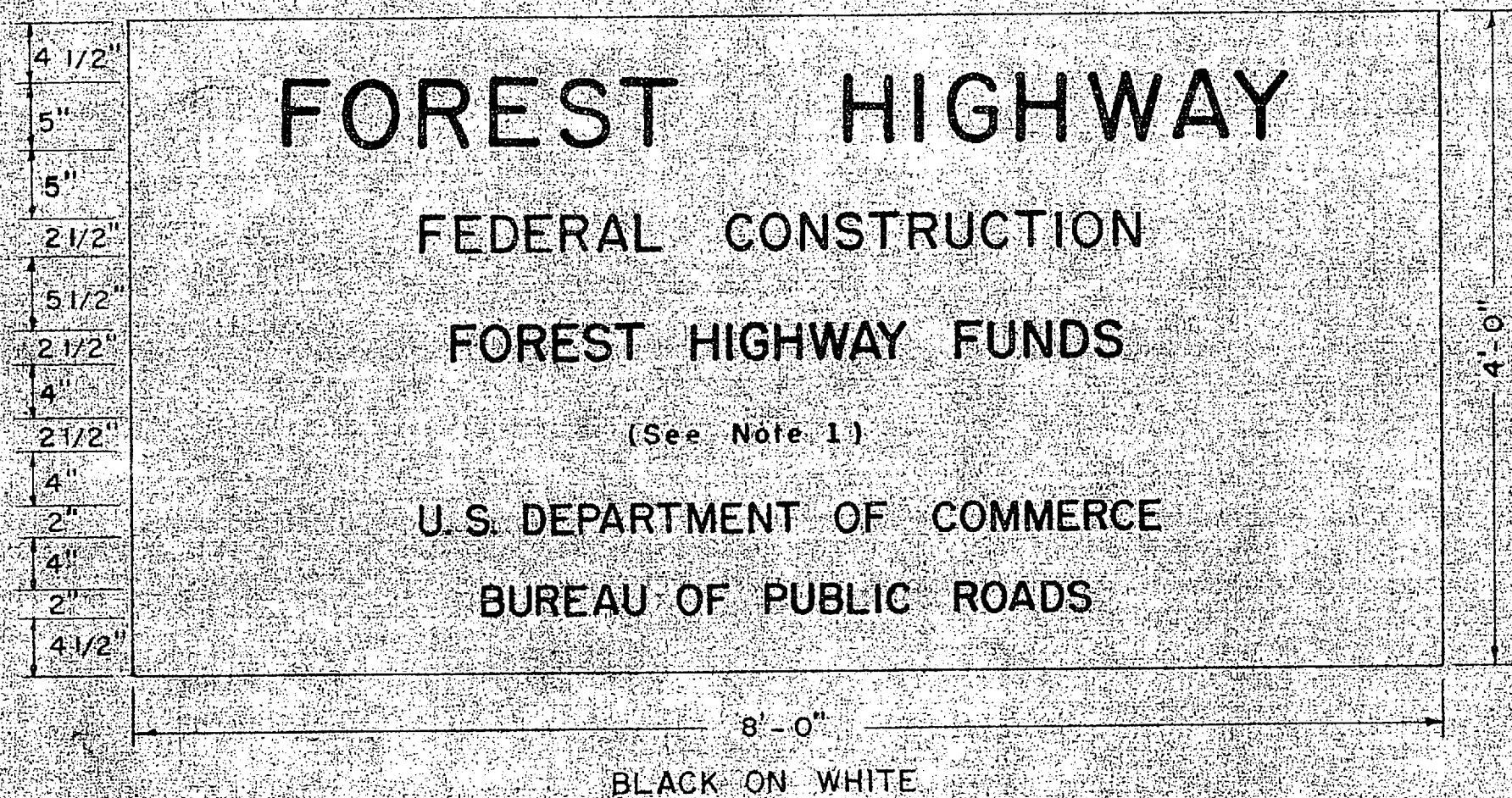
SPAN	RISE	P I	X	"H" in Feet for Bevels of			"Y" in Feet for Bevels of			"V" in Feet for Bevels of			Area "A"
				1 1/2:1	2:1	3:1	1 1/2:1	2:1	3:1	1 1/2:1	2:1	3:1	
6'-1"	4'-7"	66	2.3	3.5	4.7	6	0	0	.3	2.3	2.3	2.0	12
6'-4"	4'-9"	69	2.1	4.0	5.3	6	0	0	.7	2.7	2.7	2.0	11
6'-9"	4'-11"	72	2.4	3.8	5.0	6	0	0	.5	2.5	2.5	2.0	14
7'-0"	5'-1"	75	2.3	4.2	5.7	6	0	0	.8	2.8	2.8	2.0	13
7'-3"	5'-3"	78	2.1	4.8	6	6	0	.2	1.2	3.2	3.0	2.0	14
7'-8"	5'-5"	81	2.3	4.6	6	6	0	.1	1.1	3.1	3.0	2.0	16
7'-11"	5'-7"	84	2.2	5.1	6	6	0	.4	1.4	3.4	3.0	2.0	15
8'-2"	5'-9"	87	2.0	5.6	6	6	0	.8	1.8	3.8	3.0	2.0	15
8'-7"	5'-11"	90	2.3	5.4	6	6	0	.6	1.6	3.6	3.0	2.0	17
8'-10"	6'-1"	93	2.2	5.9	6	6	0	.9	1.9	3.9	3.0	2.0	17
9'-4"	6'-3"	96	2.4	5.7	6	6	0	.9	1.9	3.8	3.0	2.0	19
9'-6"	6'-5"	99	2.3	6	6	6	.1	1.1	2.1	4.0	3.0	2.0	20
9'-9"	6'-7"	102	2.2	6	6	6	.4	1.4	2.4	4.0	3.0	2.0	19
10'-3"	6'-9"	105	2.4	6	6	6	.4	1.4	2.4	4.0	3.0	2.0	22
10'-8"	6'-11"	108	2.8	6	6	6	.1	1.1	2.1	4.0	3.0	2.0	25
10'-11"	7'-1"	111	2.6	6	6	6	.5	1.5	2.5	4.0	3.0	2.0	24
11'-5"	7'-3"	114	2.8	6	6	6	.5	1.5	2.5	4.0	3.0	2.0	27
11'-7"	7'-5"	117	2.7	6	6	8	.7	1.7	2.0	4.0	3.0	2.7	26
11'-10"	7'-7"	120	2.5	6	6	8	1.1	2.1	2.4	4.0	3.0	2.7	26
12'-4"	7'-9"	123	2.8	6	6	8	1.0	1.9	2.3	4.0	3.0	2.7	29
12'-6"	7'-11"	126	2.7	6	6	8	1.2	2.2	2.5	4.0	3.0	2.7	29
12'-8"	8'-1"	129	2.5	6	8	8	1.6	1.6	2.9	4.0	4.0	2.7	27
12'-10"	8'-4"	132	2.3	6	8	8	2.0	2.0	3.3	4.0	4.0	2.7	25
13'-5"	8'-5"	135	2.6	6	8	8	1.8	1.8	3.1	4.0	4.0	2.7	30
13'-11"	8'-7"	138	2.9	6	8	8	1.7	1.7	3.0	4.0	4.0	2.7	34
14'-1"	8'-9"	141	2.8	6	8	8	2.0	2.0	3.2	4.0	4.0	2.7	33
14'-3"	8'-11"	144	2.6	6	8	8	2.3	2.3	3.6	4.0	4.0	2.7	32
14'-10"	9'-1"	147	2.9	6	8	8	2.2	2.2	3.5	4.0	4.0	2.7	37
15'-4"	9'-3"	150	3.2	6	8	8	2.1	2.1	3.4	4.0	4.0	2.7	40
15'-6"	9'-5"	153	3.0	6	8	12	2.4	2.4	2.4	4.0	4.0	4.0	39
15'-8"	9'-7"	156	2.8	6	8	12	2.8	2.8	2.8	4.0	4.0	4.0	38
15'-10"	9'-10"	159	2.7	8	8	14	1.8	3.1	2.4	5.3	4.0	4.7	35
16'-5"	9'-11"	162	3.0	8	8	14	1.6	2.9	2.2	5.3	4.0	4.7	41
16'-7"	10'-1"	165	2.8	8	8	14	2.0	3.3	2.6	5.3	4.0	4.7	40



NOTE: This sign shall conform to the manual on uniform traffic control devices, 1961.

NOTES

1. Show cost rounded to nearest \$1,000.
2. Construction Identification Signs shall be furnished by the contractor and erected at both ends of the project at locations designated by the Engineer.
3. Mounting, transverse location, height and similar features for Construction Identification Signs shall be consistent with practices used for the installation of other informational signs.
4. No direct payment shall be made for furnishing, erecting and maintaining Standard Construction Identification Signs.



U. S. DEPT. OF COMMERCE
BUREAU OF PUBLIC ROADS REGION 10
JUNEAU, ALASKA

STANDARD CONSTRUCTION
IDENTIFICATION SIGN

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