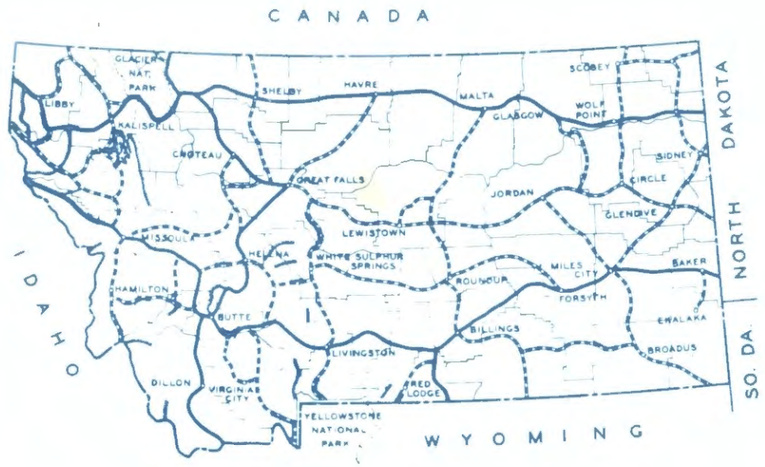
DIST.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	MONT.	19-F	1	15



FOREST HIGHWAY AND FEDERAL AID SYSTEMS

STATE OF MONTANA

FOREST HIGHWAY SYSTEM

FEDERAL AID HIGHWAY SYSTEM — PRIMARY — SECONDARY

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF PUBLIC ROADS

PLANS FOR PROPOSED

PROJECT No. 19-F

GRADING

BITTERROOT-SALMON HIGHWAY

CONNER TO IDAHO STATE LINE AT GIBBONS PASS

24 MILES CLASS I

MONTANA FOREST HIGHWAY SYSTEM

BITTERROOT NATIONAL FOREST

RAVALLI COUNTY

MONTANA

INDEX TO SHEETS

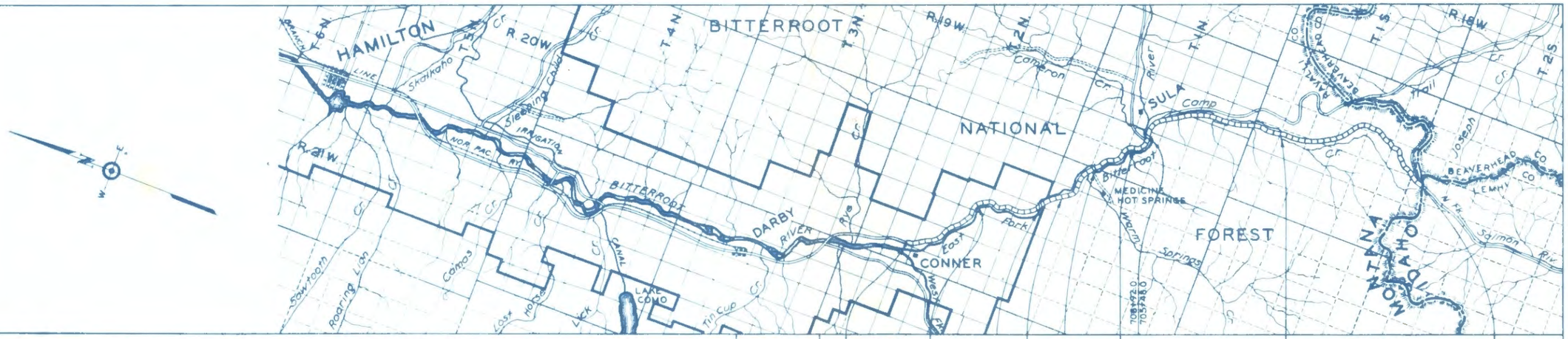
APPROVED

By _____ Date _____

DISTRICT ENGINEER U.S.B.P.R. DIST. No. 1

By _____ Date _____

STATE HIGHWAY ENGINEER



U.S. DEPARTMENT OF AGRICULTURE

BUREAU OF PUBLIC ROADS

ROUTE MAP

BITTERROOT-SALMON HIGHWAY - ROUTE No. 19

MONTANA FOREST HIGHWAY SYSTEM

LEGEND

APPROX. RT. — ESTAB. RT. — CLEARED — GRADED — SURFACED — OILED — PAVED

	19-F	19-E	19-D	NR 19-C	NR 19-A I B
CLEARING	3.0813 M. 26' R. BEG. 1268+88.4 COMP. 1106+20.0	3.514 M. 28' RD. BEG. 1106+20.0 COMP. 918+20.0	3.3875 M. 28' RD. BEG. 918+20.0 COMP. 740+05.0	5.9890 MILES 28' ROBBED BEG. 3-35 COMP. 10-35	7.5861 MILES 22' ROADBED BEG. 11-33 COMP. 10-34
GRADING					
SURFACING					
BRIDGES					
BIT. SURF.					
RECON. GRAD.					
RECON. SURF.					

19-E1: 0.0253 M. 24' W. B C

19-D1: 0.0254 M. 24' B 9-35 C 7-36

FHEC 19-C1: 0.0272 M. 24' WIDE BEG. 3-35 C. 8-35

Scale of Miles: 20 15 10 5 0

DIST. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	Mont.	19-F	2	15

SUMMARY

BITTEROOT SALMON HWY.

GRADING 3.0813 MILES

1937.

GRADING.

STATION	CUBIC YARDS					STA. YDS.
	EXC.	CH. CH.	BORROW	RIP RAP	EMB.	S.O.H.
1106+20						
	317	13928			12386	630
1121+39						
	0	9225			8069	0
1126+31						
	3238				3230	0
1132+16						
	3799				3313	125
1143+29						
	6301	10448			15063	9940
1159+82						
	3627				3194	913
1172+55						
	7707				7707	0
1180+98						
	5290				4807	10652
1199+06						
	5909				5909	715
1211+05						
	5163				5163	0
1219+23						
	32	10592			8860	20
1229+46						
	0	6496			5420	0
1234+97						
	6305	1580			6573	2646
1249+46						
	11029	3806			12072	25386
1268+89.4						
TOTALS	58,717	56,075	1000	3687	101,766	51,027

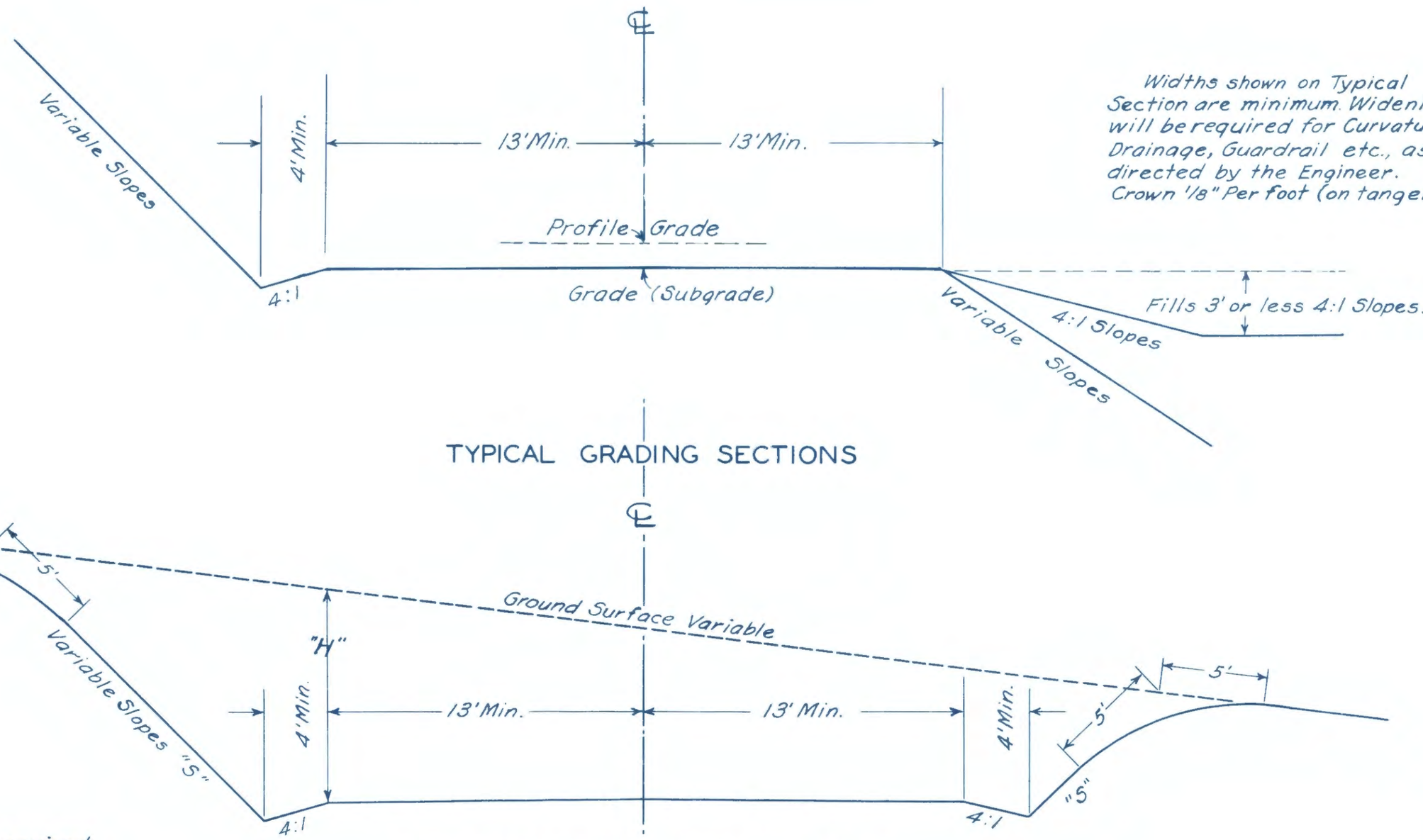
DRAINAGE STRUCTURES.

STATION	LINEAL FEET.							M.B.M.		REMARKS.
	ALTERNATE CONC. OR C.M.P.		REINF. CONC. STAND.	REINF. CONC. EXT. STR	C.M.P.	C.M.P. IRR. P.	TREAT. PILES	TREAT. TIMBER	TREAT. LAM. OR STRIP FLOOR.	
	18"	24"	36"	36"	12"	18"				
1108+50	30									Appr. Road.
1109+50	48									
1119+43.4						150	340	10	3.8	Appr. Road Trestle with Irrig. Pipe Hung Thereon
1123+75			90							
1126+97	64									
1127+50	30									Appr. Road.
1135+85	48									
1156+35				96						
1168+25	46									
1170+75		46								
1186+00	46									
1195+16	38									
1197+00	40									
1206+25	48									
1210+10	40									
1210+25	36									Appr. Road.
1213+35								12		10'x7'x34' Cattle Pass,
1218+70	54									
1244+50	44									
1249+20			48							
1257+00								12		10'x7' Cattle Pass
1259+06		58								
1265+35		80								
TOTALS	612	184	138	96	00	150	340	34	3.8	

DIST. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	Mont.	19-F	3	15

TYPICAL SECTIONS

BITTERROOT - SALMON HIGHWAY



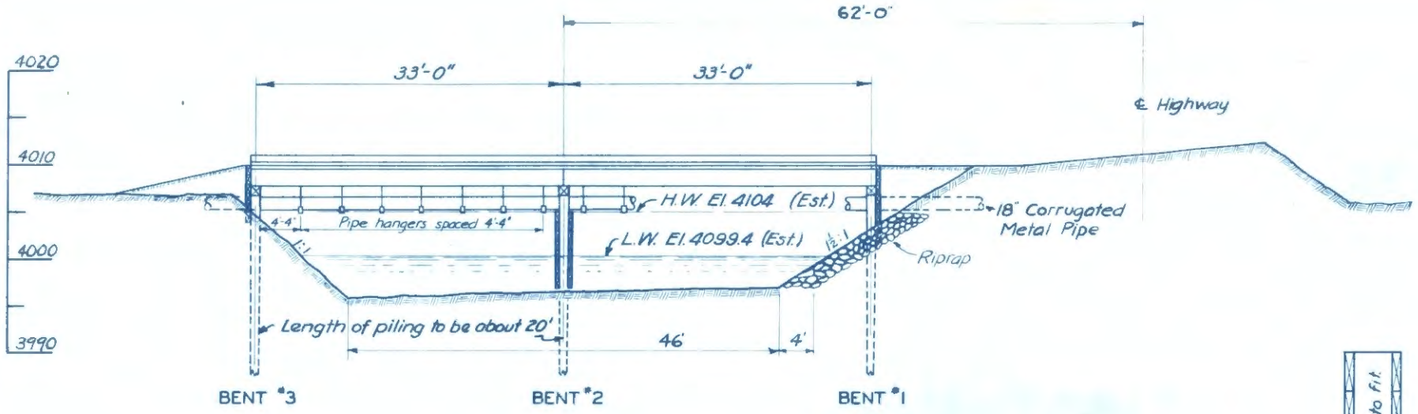
Widths shown on Typical Section are minimum. Widening will be required for Curvature, Drainage, Guardrail etc., as directed by the Engineer. Crown 1/8" Per foot (on tangents).

TYPICAL GRADING SECTIONS

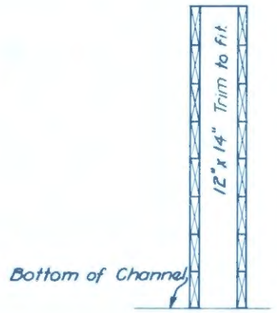
"H"	"S"
0'-5'	2:1
5'-8'	1½:1
8'Over	1:1

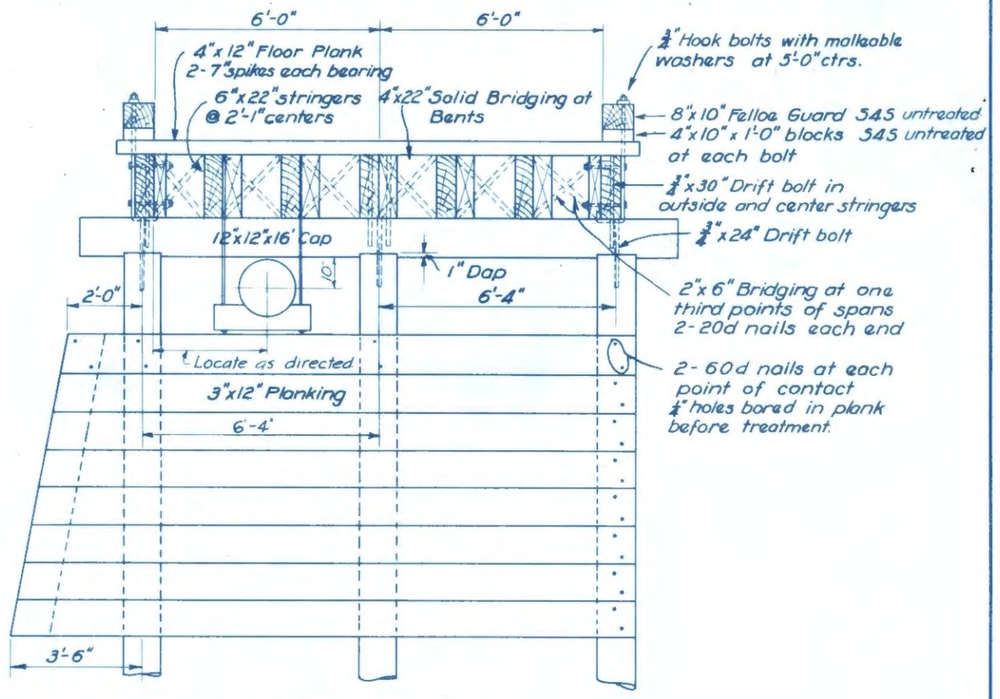
Rounding will be required where ordered by the Engineer.

SLOPE TREATMENT IN EARTH CUTS.

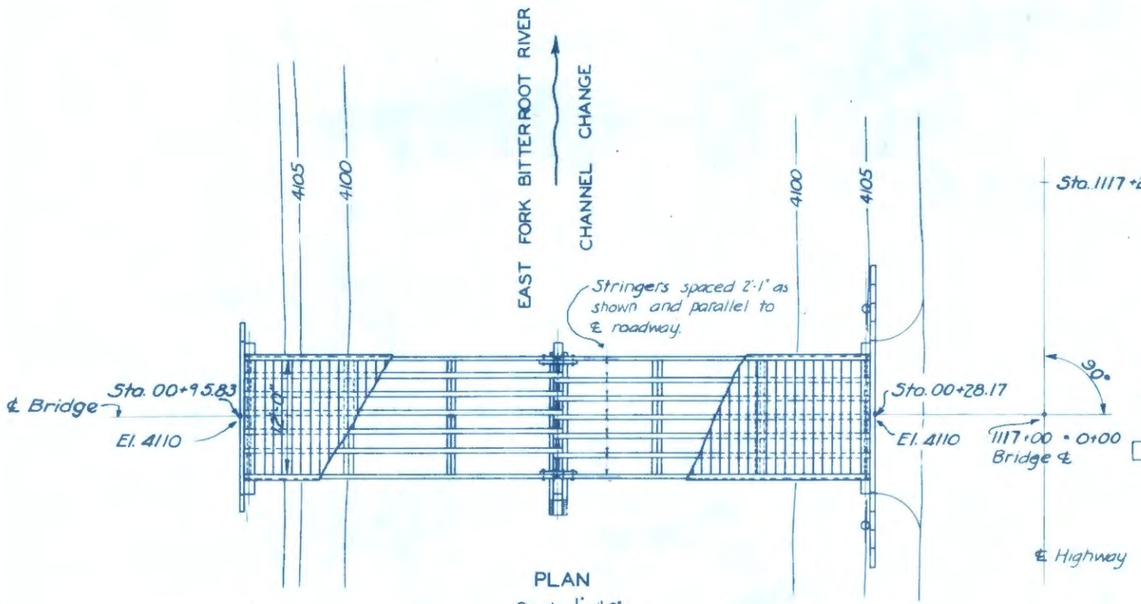


ELEVATION
Scale $\frac{1}{8}$" = 1'-0"

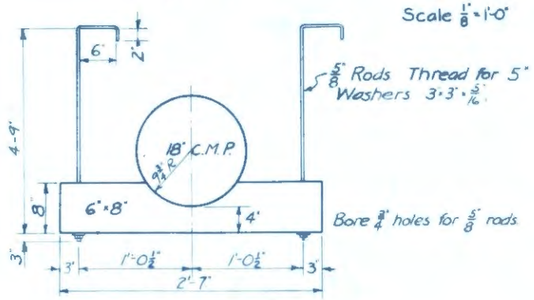




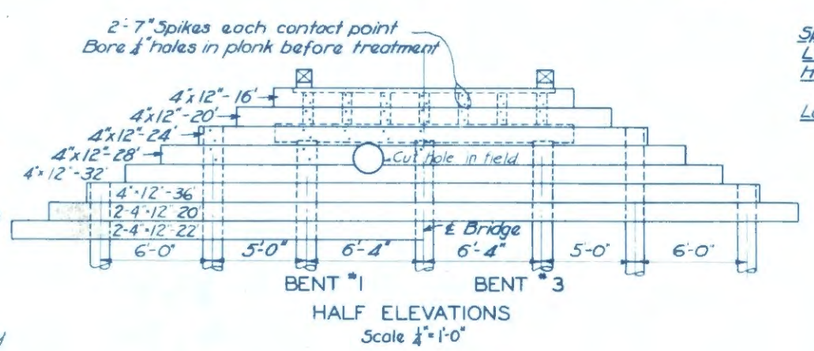
ELEVATION BENT 2
Scale $\frac{1}{2}$" = 1'-0"



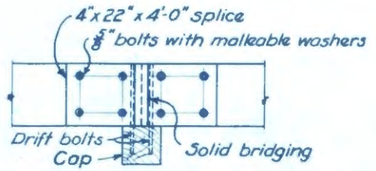
PLAN
Scale $\frac{1}{8}$" = 1'-0"



PIPE HANGER DETAIL
Scale 1" = 1'-0"



HALF ELEVATIONS
Scale $\frac{1}{4}$" = 1'-0"



DETAIL OUTSIDE STRINGER SPLICE
Scale $\frac{1}{2}$" = 1'-0"

GENERAL NOTES

Specifications - Form F.P.50 and Special Provisions
Live Load - 1-H-15 Ton Truck. No Impact
Hardware - All hardware to be galvanized including nails and spikes.
Lumber - All lumber to be Coast Region Douglas Fir.
Treatment - All lumber to be pressure treated with creosote and shall be accurately cut to length, framed, bored and sized for bearing before treatment. Details shall be submitted to the Engineer for approval before fabrication. If necessary to bore holes in the field they shall be treated under prassure with an approved bolt hole treater. Felloe guard to be untreated.
Grading - Rough select structural grade according to the W.C.L.A. rules 1934 Pp. 210, 214 & 218. Stress grade 1600 f. Boxed heart not allowed.
Inspection - Certificates of inspection by West Coast Lumbermen's Association or P.L.I.B. to be furnished.
Size of Holes - Holes shall be exact size of bolts and pins. ¾" holes for spikes in deck and bulkhead plank.
Caps to have full bearing without the use of shims.
Paint - Felloe guard to be painted three coats white.
Piling - Pile head protection Specification F.P.50
Treatment same as for Lumber.
Basis of Payment - Felloe guard to be included in item of treated timber.

ESTIMATE

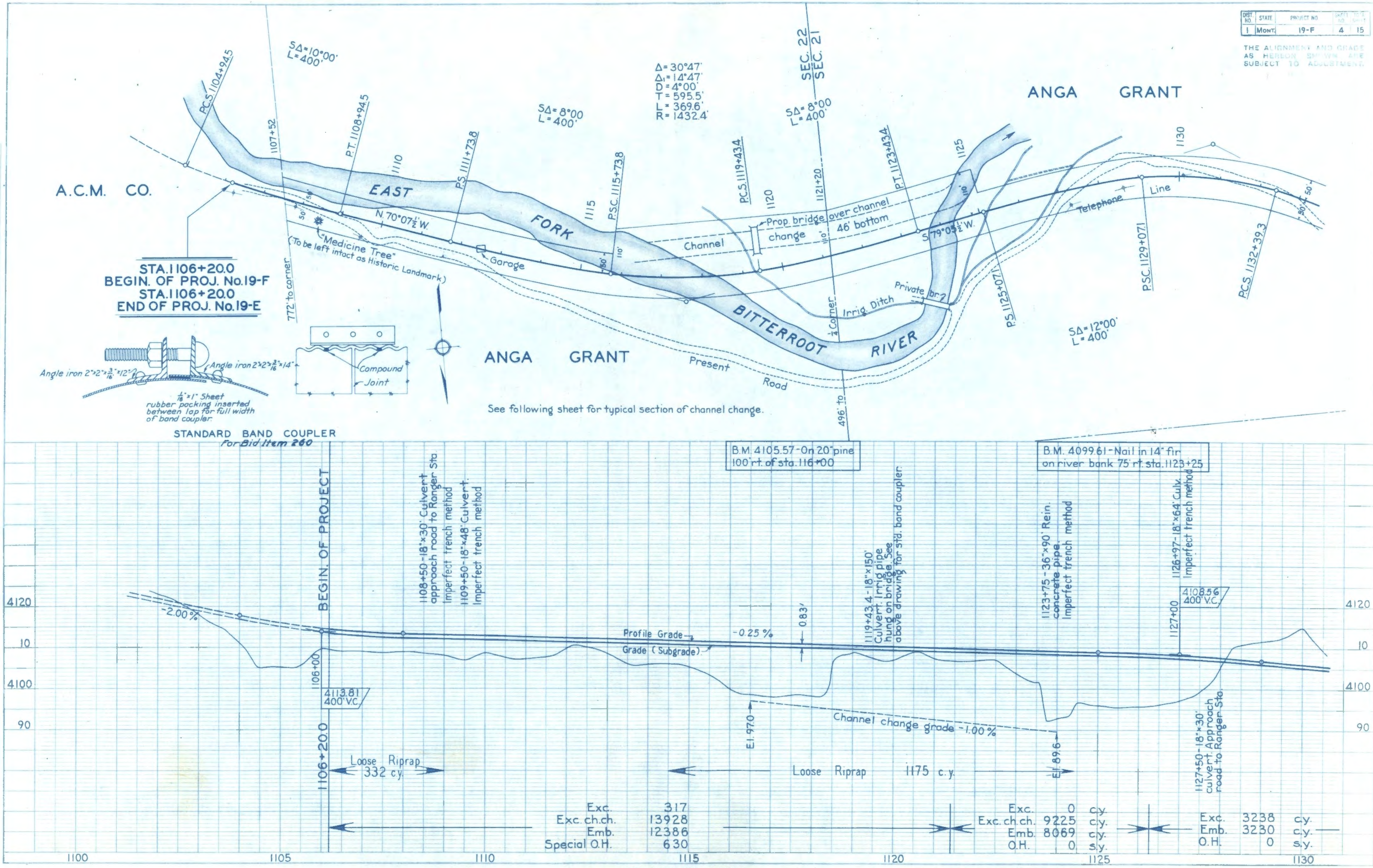
Plank Floor	3.8 M.F.B.M.
Treated Timber	10.0 M. F.B.M.
Treated Piling	340 Lin. Ft.

U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF PUBLIC ROADS PORTLAND, OREGON

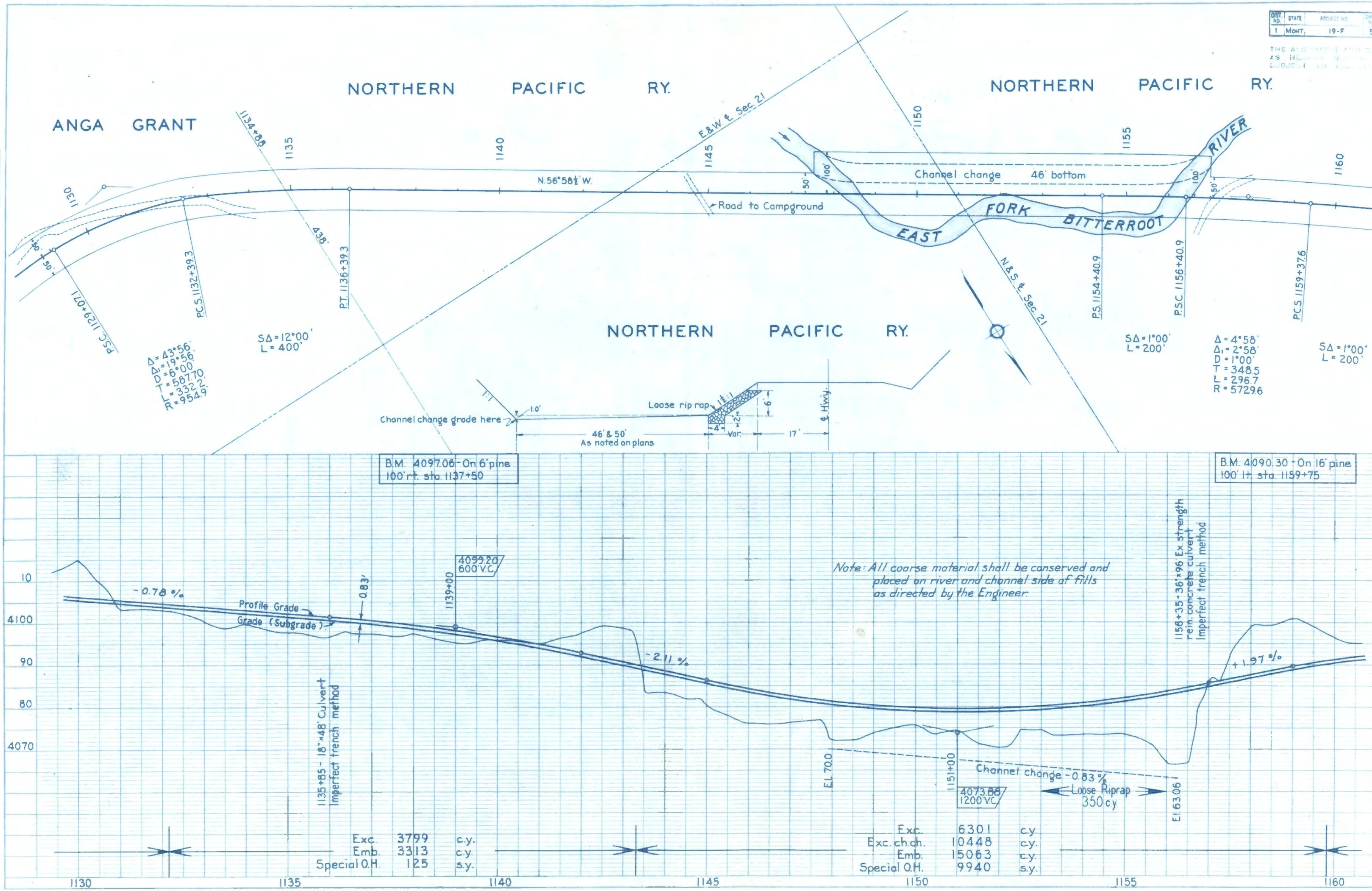
BRIDGE OVER CHANNEL CHANGE EAST FORK BITTERROOT RIVER

BITTERROOT-SALMON HWY. STA. 1120
PROJECT MONTANA 19-F
SCALES AS NOTED JUNE 1935

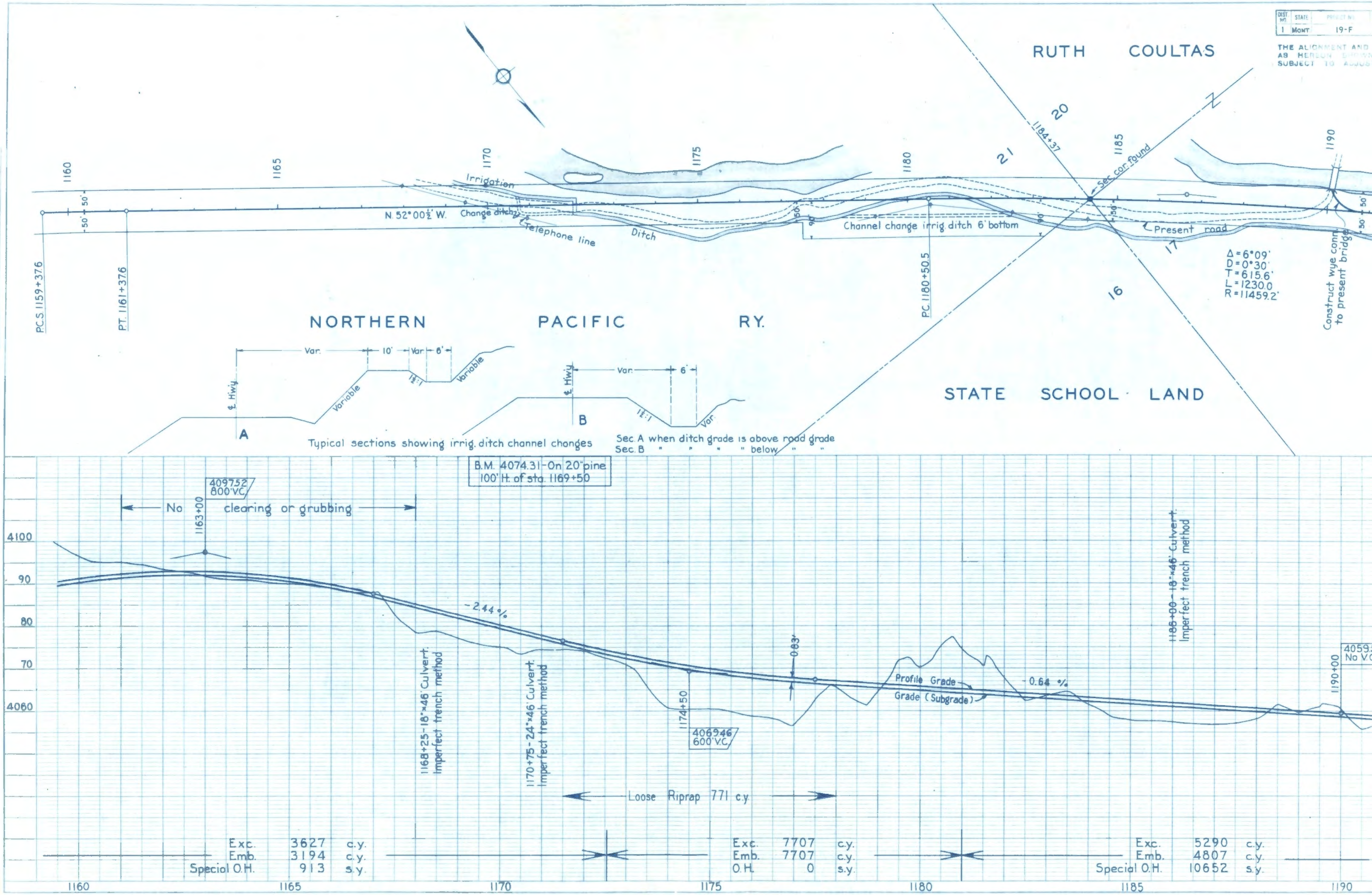
TRACED BY
CHECKED BY



DIST NO. 1 | STATE MONT. | PROJECT NO. 19-F | SHEET NO. 4 | TOTAL SHEETS 15
THE ALIGNMENT AND GRADE AS HEREON SHOWN ARE SUBJECT TO ADJUSTMENT.
A.C.M. CO.
ANGA GRANT
ANGA GRANT
SEC. 22
SEC. 21
EAST FORK BITTERROOT RIVER
STA. 1106+20.0
BEGIN. OF PROJ. No. 19-F
STA. 1106+20.0
END OF PROJ. No. 19-E
P.C.S. 1104+94.5
1107+52
P.T. 1108+94.5
P.S. 1111+73.8
P.S.C. 1115+73.8
P.C.S. 1119+43.4
1121+20
P.T. 1123+43.4
P.S. 1125+07.1
P.S.C. 1129+07.1
P.C.S. 1132+39.3
SΔ=10°00' L=400'
SΔ=8°00 L=400'
Δ=30°47' Δ1=14°47' D=4°00' T=595.5' L=369.6' R=1432.4'
SΔ=8°00 L=400'
SΔ=12°00' L=400'
N. 70°07½' W.
S 79°05½' W.
"Medicine Tree" (To be left intact as Historic Landmark)
Garage
Channel
Prop. bridge over channel change 46' bottom
Private br.
Irrig. Ditch
Telephone Line
Present Road
772' to corner
¼ Corner 496' to
Angle iron 2"×2"×3/16"×12"
Angle iron 2"×2"×3/16"×14"
1/16"×1" Sheet rubber packing inserted between lap for full width of band coupler.
Compound Joint
STANDARD BAND COUPLER For Bid Item 260
See following sheet for typical section of channel change.
B.M. 4105.57-On 20" pine 100' rt. of sta. 116+00
B.M. 4099.61-Nail in 14" fir on river bank 75' rt. sta. 1123+25
BEGIN. OF PROJECT
1108+50-18"×30' Culvert approach road to Ranger Sta. Imperfect trench method
1109+50-18"×48' Culvert. Imperfect trench method
1119+43.4-18"×150' Culvert. Irrig. pipe hung on bridge. See above drawing for std. band coupler.
1123+75-36"×90' Rein. concrete pipe. Imperfect trench method
1126+97-18"×64' Culv. Imperfect trench method
1127+50-18"×30' culvert Approach road to Ranger Sta.
-2.00%
-0.25%
0.83'
Profile Grade
Grade (Subgrade)
106+00
4113.81 400' V.C.
1127+00
4108.56 400' V.C.
El. 97.0
El. 89.6
Channel change grade -1.00%
1106+20.0
Loose Riprap 332 c.y.
Loose Riprap 1175 c.y.
Exc. 317
Exc. ch.ch. 13928
Emb. 12386
Special O.H. 630
Exc. 0 c.y.
Exc. ch.ch. 9225 c.y.
Emb. 8069 c.y.
O.H. 0 s.y.
Exc. 3238 c.y.
Emb. 3230 c.y.
O.H. 0 s.y.
4120
10
4100
90
1100
1105
1110
1115
1120
1125
1130



NORTHERN PACIFIC RY.
ANGA GRANT
NORTHERN PACIFIC RY.
NORTHERN PACIFIC RY.
E&W ℄ Sec. 21
N&S ℄ Sec. 21
N.56°58½' W.
Road to Campground
Channel change 46' bottom
EAST FORK BITTERROOT RIVER
P.S.C. 1129+07.1
P.C.S. 1132+39.3
P.T. 1136+39.3
P.S. 1154+40.9
P.S.C. 1156+40.9
P.C.S. 1159+37.6
Δ = 43°56'
Δ₁ = 19°56'
D = 6°00'
T = 587.70
L = 332.2
R = 954.9
SΔ = 12°00'
L = 400'
SΔ = 1°00'
L = 200'
Δ = 4°58'
Δ₁ = 2°58'
D = 1°00'
T = 348.5
L = 296.7
R = 5729.6
SΔ = 1°00'
L = 200'
Channel change grade here
Loose rip rap
46' & 50'
As noted on plans
℄ Hwy.
B.M. 4097.06 - On 6" pine
100' rt. sta. 1137+50
B.M. 4090.30 - On 16" pine
100' lt. sta. 1159+75
Note: All coarse material shall be conserved and placed on river and channel side of fills as directed by the Engineer.
-0.78 %
Profile Grade
Grade (Subgrade)
0.83'
1139+00
4099.20
600' V.C.
-2.11 %
+1.97 %
1135+85 - 18"×48" Culvert
Imperfect trench method
1156+35 - 36"×96" Ex. strength
rein. concrete culvert
Imperfect trench method
El. 70.0
1151+00
4073.88
1200' V.C.
Channel change -0.83 %
Loose Riprap
350 c.y.
El. 63.06
Exc. 3799 c.y.
Emb. 3313 c.y.
Special O.H. 125 s.y.
Exc. 6301 c.y.
Exc. ch.ch. 10448 c.y.
Emb. 15063 c.y.
Special O.H. 9940 s.y.
4100
4070
1130
1135
1140
1145
1150
1155
1160



DIST. NO. | STATE | PROJECT NO.
1 | MONT | 19-F
THE ALIGNMENT AND ... AS HEREON SHOWN ... SUBJECT TO ADJUSTM...
RUTH COULTAS
NORTHERN PACIFIC RY.
STATE SCHOOL LAND
1160
1165
1170
1175
1180
1185
1190
20
21
17
16
1184+37
Sec. cor. found
P.C.S. 1159+37.6
P.T. 1161+37.6
P.C. 1180+50.5
N. 52°00½' W.
Irrigation
Change ditch
Telephone line
Ditch
Channel change irrig. ditch 6' bottom
Present road
Δ = 6°09'
D = 0°30'
T = 615.6'
L = 1230.0
R = 11459.2'
Construct wye conn. to present bridge
Var.
10'
6'
Variable
℄ Hwy.
A
B
Typical sections showing irrig. ditch channel changes
Sec. A when ditch grade is above road grade
Sec. B " " " " below " "
B.M. 4074.31 - On 20" pine 100' Ht. of sta. 1169+50
4097.52 800' V.C.
1163+00
No clearing or grubbing
4100
90
80
70
4060
- 2.44 %
1168+25 - 18"×46' Culvert. Imperfect trench method
1170+75 - 24"×46' Culvert. Imperfect trench method
1174+50
4069.46 600' V.C.
0.83'
Profile Grade
Grade (Subgrade)
- 0.64 %
1186+00 - 18"×46' Culvert. Imperfect trench method
1190+00
4059.54 No V.C.
Loose Riprap 771 c.y.
Exc. 3627 c.y.
Emb. 3194 c.y.
Special O.H. 913 s.y.
Exc. 7707 c.y.
Emb. 7707 c.y.
O.H. 0 s.y.
Exc. 5290 c.y.
Emb. 4807 c.y.
Special O.H. 10652 s.y.
PLAN
PROFILE

DIST. NO.	STATE	PROJECT NO.
1	MONT.	19-F

THE ALIGNMENT AND GR
AS HEREON SHOWN,
SUBJECT TO ADJUSTM

$\Delta = 28°10'$
$\Delta_1 = 7°55'$
$D = 4°30'$
$T = 545.8'$
$L = 176.0'$
$R = 1273.24'$

$S\Delta = 10°07\frac{1}{2}'$
$L = 450'$

$S\Delta = 10°07\frac{1}{2}'$
$L = 450'$

1190 1195 1200 1205 1210 1215 1220

50' + 50'

P.S. 1200+54.2

P.S.C. 1205+04.2

P.C.S. 1206+80.2

P.T. 1211+30.2

P.S. 1211+58.1

P.S.C. 1215+58.1

50' + 50'

N. 45° 51½' W.

N. 74° 01½' W.

PT. 1192+80.5

50 50 80

Chan. ch. irr. ditch
6' Bottom

N. & S. & Sec. 17

$\Delta = 49°18'$
$\Delta_1 = 33°18'$
$D = 4°00'$
$T = 859.3'$
$L = 832.5'$
$R = 1432.4'$

$S\Delta = 8°00'$
$L = 400'$

RUTH H. COULTAS

Note: See preceding sheet for typical section of channel change

E. & W. & Sec. 17

B.M. 4058.75 - Spike in South side of beam at S.W. cor. of bridge 45' lt. of sta. 1190+00

B.M. 4046.80 - On 8" Cottonwood 80' lt. of sta. 1200+50 on river bank

B.M. 4047.55 - On 36" pine 70' lt. of sta. 1211+70

4059.54
No V.C.

4053.49
No V.C.

4049.88
600' V.C.

4060
50
40
4030

- 0.55 %

Profile Grade

Grade (Subgrade)

0.83'

- 0.38 %

- 1.31 %

1195+16 - 18"×38' Culvert

1197+00 - 18"×40' Culvert
Imperfect trench method

1206+25 - 18"×48' Culvert
Imperfect trench method

1210+10 - 18"×40' Culvert
1210+25 - 18", 36' Culvert
Approach Road.

1213+35 - Treated timber stockpass
10'×7'×34'

1218+70 - 18"×54' Culvert
Imperfect trench method

Loose Riprap
404 c.y.

Exc.	5909	c.y.
Emb.	5909	c.y.
Special O.H.	715	s.y.

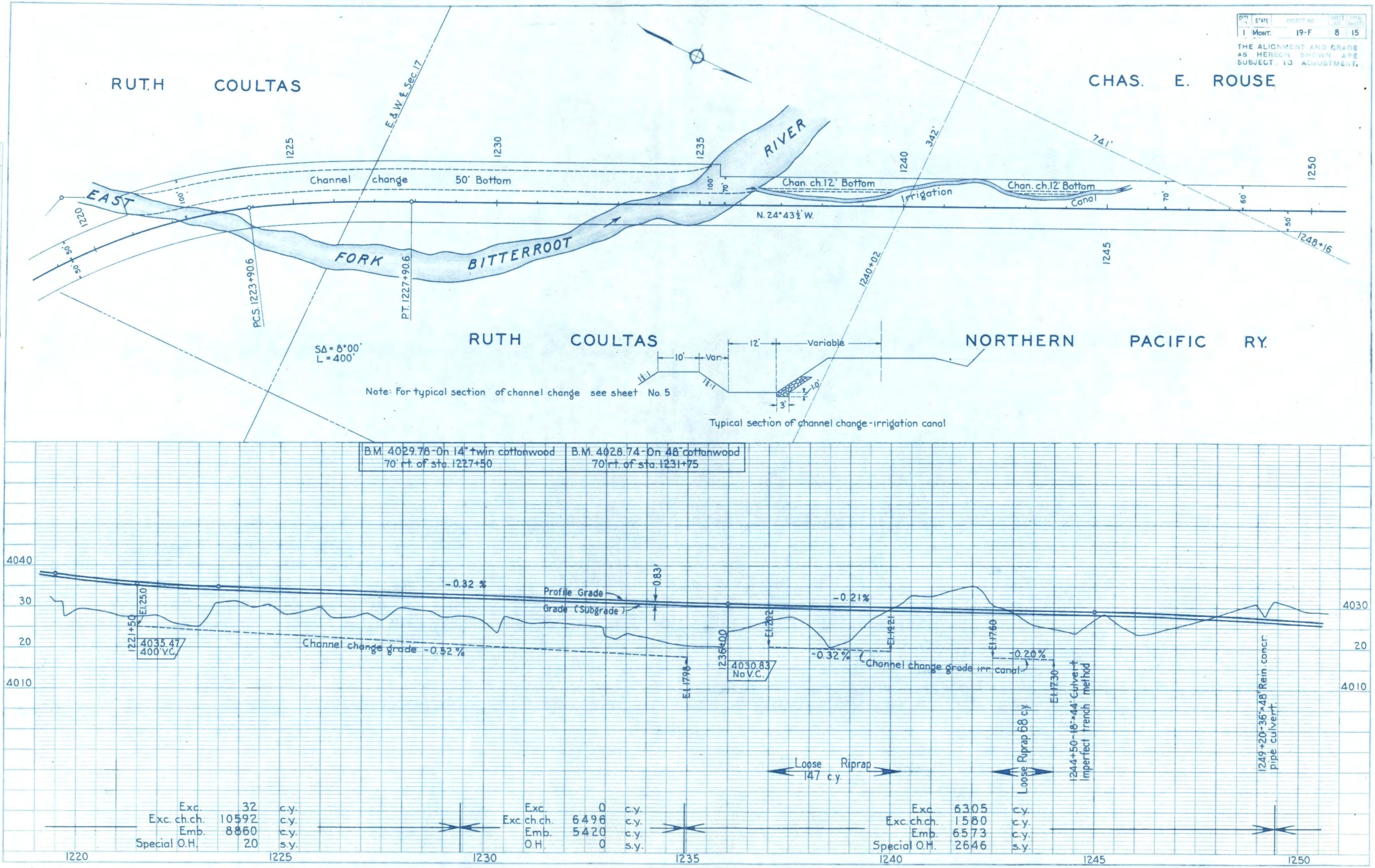
Exc.	5163	c.y.
Emb.	5163	c.y.
O.H.	0	s.y.

1190 1195 1200 1205 1210 1215 1220

PLAT 1 - PLAN-PROFILE U. S. B. R. & U. S. E. STANDARD
KEUFFEL & ESSER CO. NEW YORK

Dist.	State	Project No.	Sheet No.	Total Sheets
1	Mont.	19-F	8	15

THE ALIGNMENT AND GRADE AS HEREON SHOWN ARE SUBJECT TO ADJUSTMENT.


RUTH COULTAS
CHAS. E. ROUSE
E. & W. ℄ Sec. 17
EAST FORK BITTERROOT RIVER
Channel change 50' Bottom
Chan. ch. 12' Bottom
Irrigation Canal
N. 24° 43½' W.
P.C.S. 1223+90.6
P.T. 1227+90.6
1240+02
1248+16
741'
342'
SΔ = 8°00'
L = 400'
RUTH COULTAS
NORTHERN PACIFIC RY.
Note: For typical section of channel change see sheet No. 5
Typical section of channel change - irrigation canal
B.M. 4029.78 - On 14" twin cottonwood 70' rt. of sta. 1227+50
B.M. 4028.74 - On 48" cottonwood 70' rt. of sta. 1231+75
-0.32 %
-0.21%
0.83'
Profile Grade
Grade (Subgrade)
Channel change grade -0.52 %
-0.32 %
Channel change grade irr. canal
0.20 %
1221+50
El. 1250
4035.47
400' V.C.
El. 17.98
1236+00
4030.83
No V.C.
El. 20.2
El. 19.21
El. 17.60
El. 17.30
Loose Riprap 147 c.y.
Loose Riprap 68 c.y.
1244+50 - 18" x 44" Culvert Imperfect trench method
1249+20 - 36" x 48" Rein. concr. pipe culvert.
Exc. 32 c.y.
Exc. ch.ch. 10592 c.y.
Emb. 8860 c.y.
Special O.H. 20 s.y.
Exc. 0 c.y.
Exc. ch.ch. 6496 c.y.
Emb. 5420 c.y.
O.H. 0 s.y.
Exc. 6305 c.y.
Exc. ch.ch. 1580 c.y.
Emb. 6573 c.y.
Special O.H. 2646 s.y.
4040
30
20
4010
1220
1225
1230
1235
1240
1245
1250

DIST. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	MONT.	19-F	9	15

THE ALIGNMENT AND GRADE AS HEREON SHOWN ARE SUBJECT TO ADJUSTMENT.

T. 2 N. R. 20 W.

CHAS. E. ROUSE

SEC. 17
SEC. 8

SEC. 7
SEC. 8

STA. 1268+89.4
END OF PROJ. No. 19-F
= STA. 0+16.0
BEGIN. OF F.A.P. 139-D

1250 1255 1260 1265

Channel change 12' Bottom

Channel change 12' Bottom

Equa. N. 24° 43½' W. - 19-F = N. 22° 09' W. - 139-D

Irrigation ditches

To Hamilton →

60' 50' 60' 50'

PC. 1268+28.3

Δ = 9°26'
D = 0°30'
T = 945.6'
L = 1886.6
R = 11459.2

CHAS. E. ROUSE

Note: For typical sections of channel changes, see sheet No. 8

B.M. 4051.96 - On base of 20" twin pine 160' rt of sta. 1250+00

B.M. 4007.78 - On 24" cottonwood 150' rt. of sta. 1260+75

B.M. F.A.P. 139-D - 4025.51
= F.H.P. 19-F 4003.73 - On 4" cottonwood 100' lt of sta. 0+00

4050
40
30
20
10
4000

1257.00 Treated timber stockpass 10'×7'

1259+06 - 24"×58' Culvert Imperfect trench method

1265+35 - 24"×80' Culvert - on skew. Imperfect trench method

No clearing or grubbing

1251+00

4027.68
1200' V.C.

- 1.62 %

Irr. canal ch.ch. - 0.26 %

El. 08.8

El. 08.0

Loose Riprap 90 c.y

+89 El. 04.5

261+00

4011.48
400' V.C.

Irr. canal channel change - 0.51 %

+65 El. 00.54

Loose Riprap 350 c.y

Profile Grade

Grade (Subgrade)

- 0.12 %

0.83'

END OF PROJECT

1268+89.4

F.A.P. 139-D

= 0+16.0

State const.

4009.24

Exc.	11029	c.y.
Exc.ch.ch.	3806	c.y.
Emb.	12072	c.y.
Special O.H.	25386	s.y.

1250 1255 1260 1265 0 5

PLATE 1 - PLAN-PROFILE U. S. B. R. STANDARD