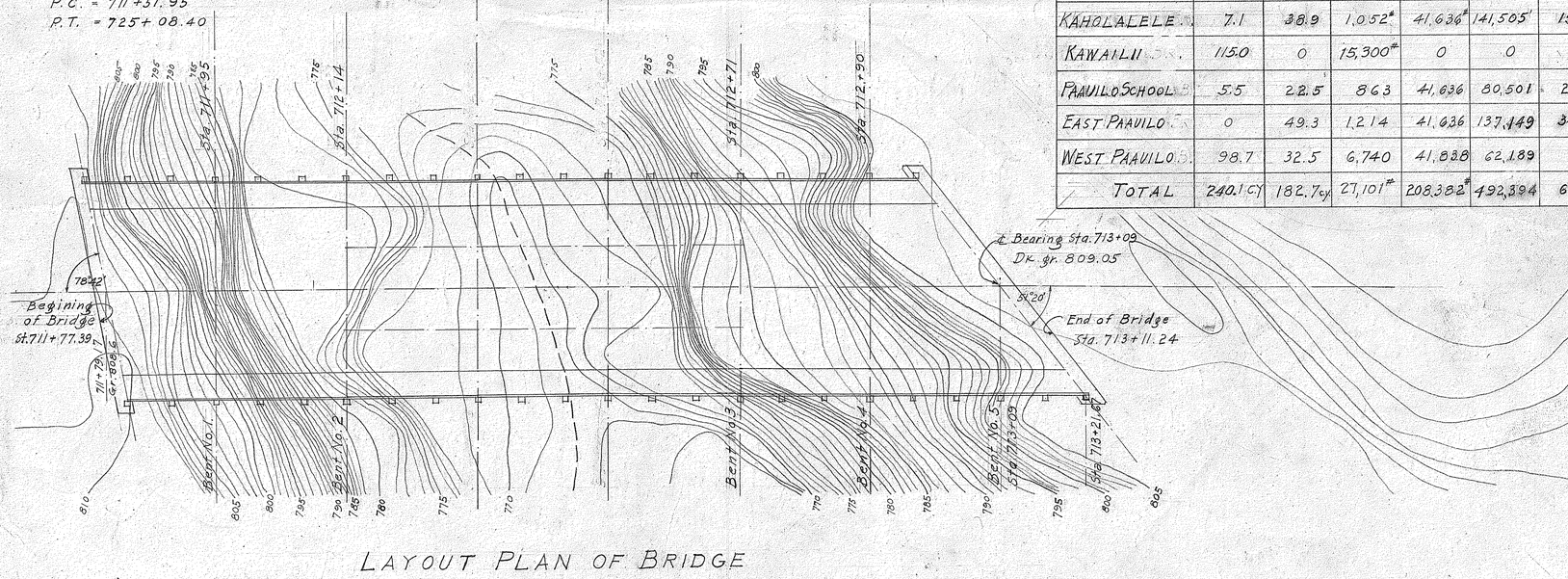
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw.	26-A	1938	14	51

TIMBER BILL OF MATERIAL

MEMBER	No.	SIZE & LENGTH	KIND OF LUMBER	MILL WRK	FT. B.M.
DOUGLAS FIR COAST RGN.					
Solid Bridg.	1	4"x18"x10'-0"	No.1 Dimension	S1E	60
" "	6	4"x18"x18'-0"	"	"	648
" "	2	4"x18"x26'-0	"	"	312
Cross "	28	2"x4"x16'-0"	"	Rough	299
Splice Block	26	6"x18"x3'-0"	Select Structural Joist & Plank	S1E	702
Stringers	1	6"x18"x8'-0"	" Structural Beams & Stringers	Ends cut to 17½° exact	72
"	1	6"x18"x10'-0"	"	"	90
"	2	6"x18"x12'-0"	"	"	216
"	4	6"x18"x14'-0"	"	"	504
"	5	6"x18"x16'-0"	"	"	720
"	6	6"x18"x18'-0"	"	"	972
"	82	6"x18"x20'-0"	"	"	14760
"	2	6"x18"x22'-0"	"	"	396
"	1	6"x18"x24'-0"	"	"	216
"	1	6"x18"x26'-0"	"	"	234
"	1	6"x18"x28'-0"	"	"	252
"	1	6"x18"x30'-0"	"	"	270
Sidewalk Joist Bl.	13	12"x18"x3'-0"	" Structural Posts & Timbers	See detail	702
"	4	8"x18"x4'-0"	"	"	192
Wheel Guard	1	10"x12"x10'-0"	"	S1S1E	100
"	2	10"x12"x14'-0"	"	"	280
"	12	10"x12"x20'-0"	"	"	2400
Wheel Grd. face pc.	1	4"x16"x10'-0"	"	"	53
"	2	4"x16"x14'-0"	"	"	149
"	12	4"x16"x20'-0"	"	"	1280
Guard Rail	1	3"x8"x8'-0"	" Structural Joists & plank	S4S	16
"	2	3"x8"x14'-0"	"	"	56
"	12	3"x8"x20'-0"	"	"	480
"	1	4"x8"x8'-0"	"	"	21
"	2	4"x8"x14'-0"	"	"	75
"	12	4"x8"x20'-0"	"	"	639
Sidewalk End pc.	2	2"x16"x10'-0"	"	Rough	53
Corner Blocking	3	2"x4"x3'-0"	"	S1S	6
"	4	2x4x2'-0"	"	"	5
"	1	2x4"x6'-0	"	"	4
End Timber	2	6"x18"x14'-0"	" Structural Beams & Stringers	S1E	252
"	2	6"x18"x18'-0"	"	"	324
End Timb. Blocks	1	6"x6"x14'-0"	" Structural Posts & Timb.	S1S	42
Wall Plate	1	6"x8"x34'-0"	" Structural Beams & Stringers	"	136
"	2	6"x8"x22'-0	"	"	176
Deck Starter	1	6"x6"x28'	"	S1S1E	84
"	1	6"x6"x34'-0"	"	"	102
Floor Decking	963	2"x6"x26'-0"	" Structural Joist & Plank	"	25038
Sidewalk End pc.	1	8"x12"x18'-0"	" Structural Beams & Stringers	"	144
Sidewalk Planking	14	1"x8"x6'-0"	No.1 Dimension	S1S	56
"	374	1"x8"x4'-0"	"	"	997
"	14	2"x8"x6'-0"	"	"	112
"	374	2"x8"x4'-0"	"	"	1994
Railing Posts	17	8"x8"x8'-0"	Select Structural Beams & Stringers	S4S	725
"	26	8"x8"x6'-0"	"	"	832
Posts	1	12"x12"x8'-0"	" Structural Post & Timbers	Rough	96
"	1	12"x12"x10'-0"	"	"	120
"	1	12"x12"x12'-0"	"	"	144
"	2	12"x12"x14'-0"	"	"	336
"	1	12"x12"x16'-0"	"	"	192
"	6	12"x12"x18'-0"	"	"	1296
"	3	12"x12"x20'-0"	"	"	720
"	5	12"x12"x22'-0"	"	"	1320
Caps	6	12"x12"x34'-0"	" Structural Beams & Stringers	S1S	2448
"	1	12"x12"x16'-0"	"	"	192
Sills	2	12"x12"x34'-0"	" Structural Posts & Timbers	Rough	816
Sill Blocks	20	4"x8"x1'-6"	"	S1S	80
Braces	1	3"x10"x14'-0"	" Structural Joist & plank	Rough	35
"	2	3"x10"x16'-0"	"	"	80
"	3	3"x10"x18'-0"	"	"	135
"	4	3"x10"x20'-0"	"	"	200
"	17	3"x10"x22'-0"	"	"	935
"	10	3"x10"x24'-0"	"	"	600
"	4	3"x10"x26'-0"	"	"	260
"	3	3"x10"x28'-0"	"	"	210
"	3	3"x10"x30'-0"	"	"	225
"	2	3"x10"x36'-0"	"	"	180
"	2	3"x10"x38'-0	"	"	190
Struts	4	4"x12"x28'-0"	"	"	448
Post Scabs	20	6"x12"x6'-0"	" Structural Beams & Stringers	"	720
Solid Br. @ I	8	4"x9"x4'-0"	No.1 Dimension	"	96
"	16	4"x12"x4'-0"	"	"	256
Blocks @ I	16	6"x12"x3'-0"	Select Structural Joist & Plank	S1S	288
"	4	10"x12"x3'-0"	"	See detail	120
Blocks @ Stmts	16	4"x12"x1'-0"	"	Rough	64
				Total	71,050

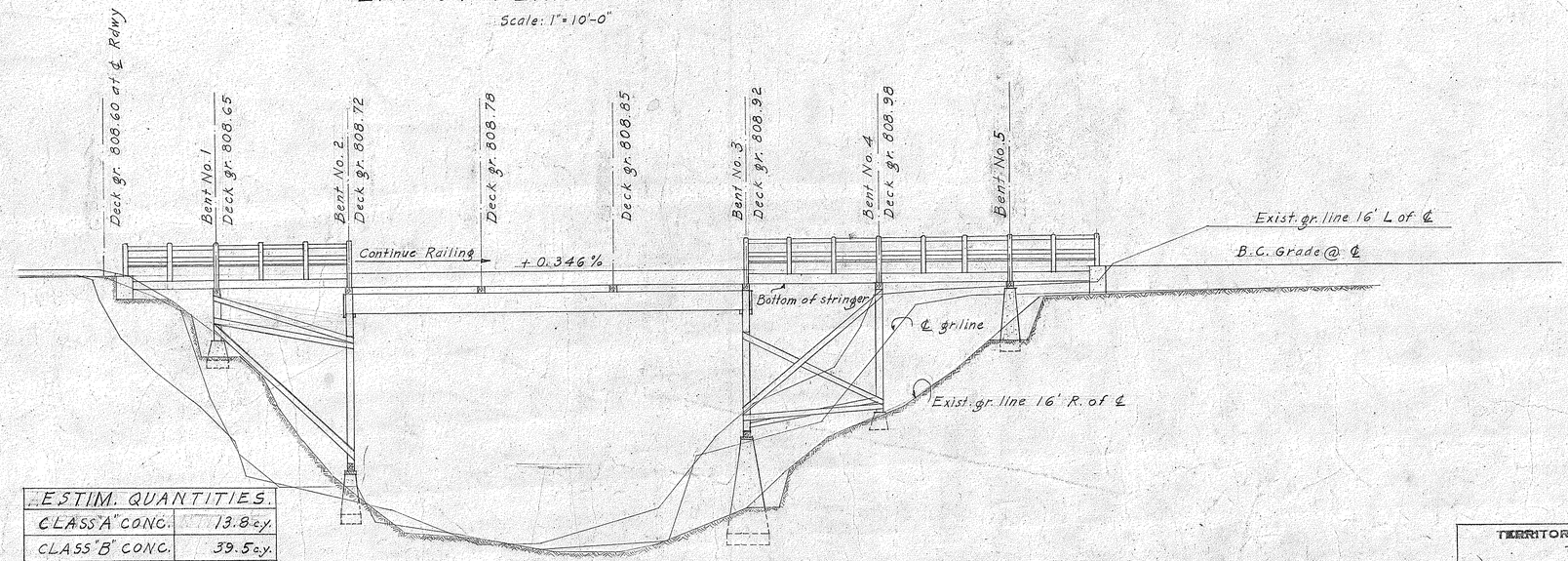
CURVE DATA

Δ = 10°-08'
D = 0°-44'-49"
R = 7669.64'
T = 680.0'
L = 1356.45'
Super = 0.019' per ft.
P.C. = 711+51.95
P.T. = 725+08.40



LAYOUT PLAN OF BRIDGE

Scale: 1" = 10'-0"



DOWNSTREM ELEVATION OF BRIDGE

Scale: 1" = 10'-0"

ESTIM. QUANTITIES.	
CLASS "A" CONC.	13.8 c.y.
CLASS "B" CONC.	39.5 c.y.
REINF. STEEL	1,932 #
STRUCT. STEEL	41,636 #
TREATED TIMBER	71,050 BM.
STRUCT. EXCAV.	160.0 c.y.
UNCLASS. EXCAV.	93.0 c.y.

ESTIMATED QUANTITIES

NAME OF BRIDGE	CLASS A CONCR.	CLASS B CONCR.	REINF. STEEL	STRUCT. STEEL	TREATED TIMBER	TREATED PILING	C.R.M.	STRUCT. EXCAV.	UNCLASS. EXCAV.
KAINEHE	13.8	39.5 c.y.	1,932 #	41,636 #	71,050'	0	0	160.0 c.y.	93.0 c.y.
KAHOLALELE	7.1	38.9	1,052 #	41,636 #	141,505'	150 lin.ft.	0	158.0	96.0
KAWAILII	115.0	0	15,300 #	0	0	0	850 C.Y.	420.0	0
PAAVILO SCHOOL	5.5	22.5	863	41,636	80,501	200	115 c.y.	178.0	65.0
EAST PAAVILO	0	49.3	1,214	41,636	137,149	300	0	185.0	61.0
WEST PAAVILO	98.7	32.5	6,740	41,838	62,189	0	0	209.0	40.0
TOTAL	240.1 C.Y.	182.7 c.y.	27,101 #	208,382 #	492,394	650 lin.ft.	965.0 C.Y.	1,310.0 c.y.	355.0 c.y.

ORIGINAL TRACE — NOTE BOOK No.

DRAWING PLOTTED BY: DATE Jan. 1938
CHECKED BY: W.K. Bartels
DRAWING TRACED BY: W.S. Lanatta
CHECKED BY: " "
DRAWING TRACED BY: " "
CHECKED BY: W.S. Lanatta

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

KAINEHE BRIDGE

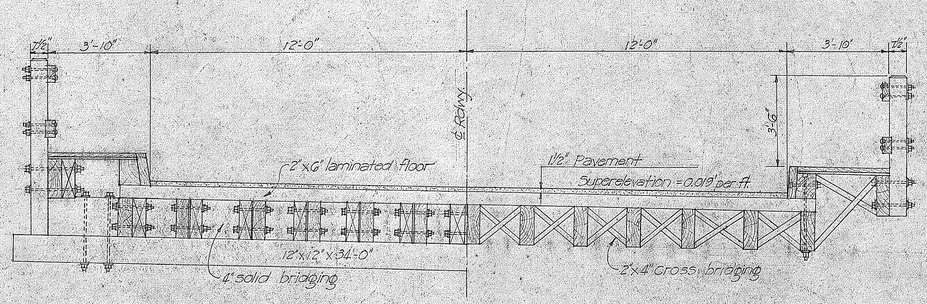
STA. 711+77.39 TO STA. 713+11.24
Hawaii Belt Rd.
F.A.P. 26-A Jan. 1938

SHEET NO. 1 OF 7 SHEETS.

4441-14

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw.	26A	1938	13	51

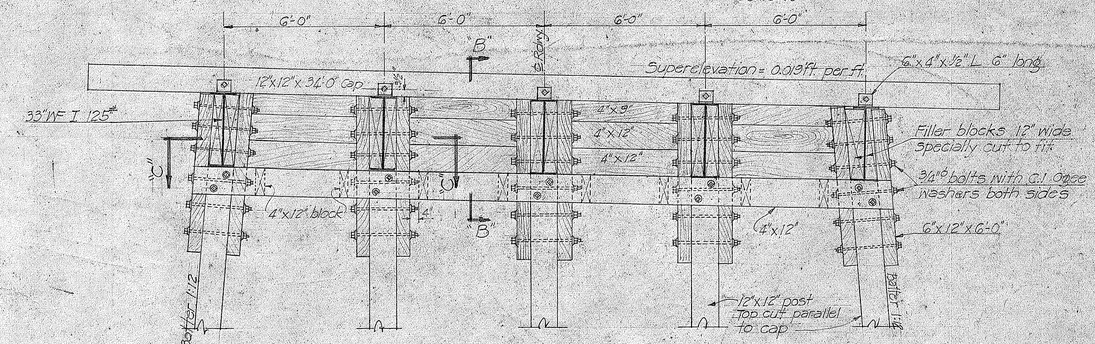
NOTE!
For general notes, etc, see "Standard Details Timber Bridge on Tangent."



HALF SECT AT BENT

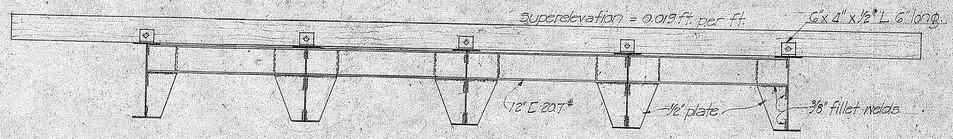
HALF SECT AT CENTER OF SPAN

Scale 3/8"=1'-0"



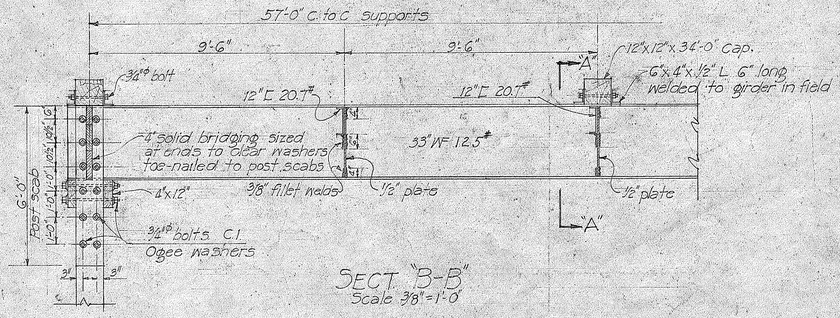
ELEVATION AT BENT 57'-0" STEEL SPAN

Scale 3/8"=1'-0"



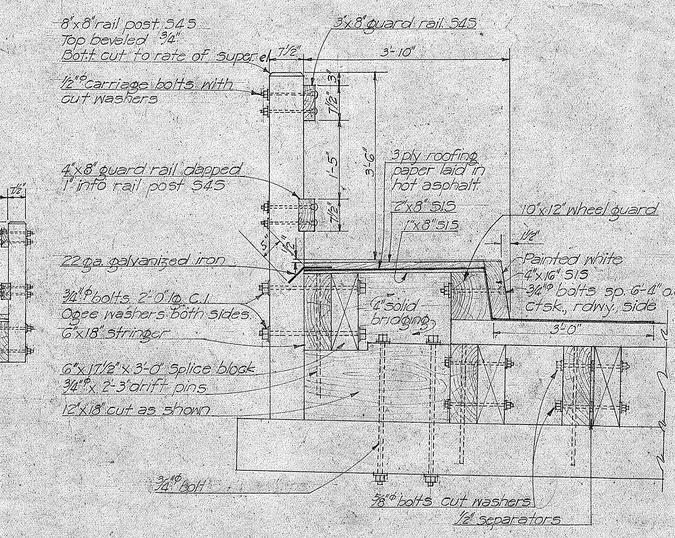
SECT "A-A"

Scale 3/8"=1'-0"

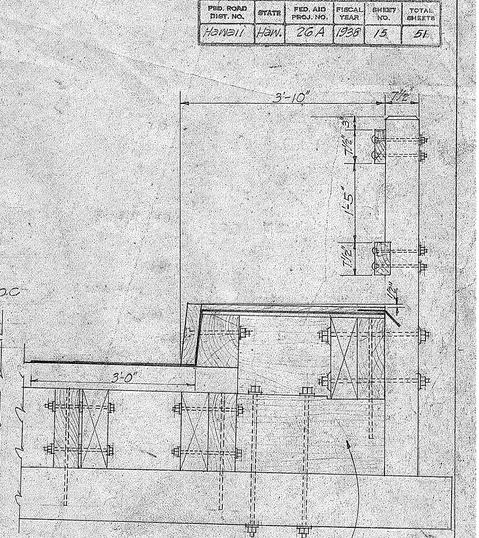


SECT "B-B"

Scale 3/8"=1'-0"



LEFT



RIGHT

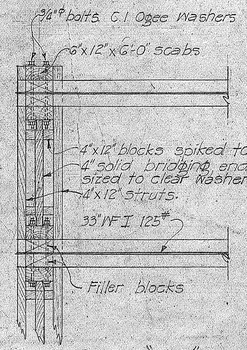
DETAIL OF SIDEWALK AT BENT

Scale 3/4"=1'-0"

FRAMING PLAN OF 57'-0" STEEL SPAN

NOTE! 33"WF I girders be furnished by Steel Co. with 1" camber.

Scale 1/8"=1'-0"



SECT "C-C"

Scale 3/8"=1'-0"

NOTE! For details of scuppers, railing splices, post spacing etc, see "Standard Details Timber Bridge on Tangent."

NOTE! DETAILS ON THIS SHEET ARE COMMON TO BOTH KAINEHE AND KOHALALELE BRIDGE

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

KAINEHE BRIDGE
STA. 711+77.39 to 713+11.24
Hawaii Belt Rd. F.A.P. 26-A
Feb. 1938

SHEET NO. 2 OF 7 SHEETS.

ORIGINAL PLAN
SURVEY PLOTTED BY — DATE 4-'38
DESIGNED BY J.A.F. Dec. 1937
PLANS BY H.E. Wentzell
NOTE BOOK
QUANTITIES BY
No.
CHECKED BY W.E. Wunderlich

4441.15

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	HAW.	26A	1938	16	51

Elev. bottom conc. = 805.52

19'-0"

4" solid bridging

6"x6"x1'-0" block

15 lines 6"x18" stringers

Stream flow

2"x4" Cross bridging

6"x18" end timber

¾"ø x 23" drift pins

12"x18" Sidewalk blocking rests on 12"x12" cap

4" solid bridging rests on 12"x18" sidewalk blocking

Elev. bottom conc. = 804.86

12'-8"

Bent #1

To Hilo

BEG. BR. STA. 711+77.39

Elev. batt. conc. = 805.92

6'-4"

2'-2¾"

17'-8½"

17'-8½"

6"x6"x1'-0" block

END BR. STA. 713+11.24

℄ Rdwy. To Honokaa

¾"ø x 27" drift pins

2"x4" Cross bridging

6"x8" wall plate

4"x18" solid bridging

6"x18" end timber

6"x17½"x3'-0" splice block

6"x17½"x3'-0" splice block

8"x18"

8"x18" ends here

Chamfer corner 4"

Elev. of batt. conc. = 805.27

¾"ø anchor bolt

8"x18" blocking for sidewalk stringer

6"x8" wall plate

9'-6"

19'-0"

6'-4"

6'-4"

12'-8"

3'-2½"

Bent #6

Bent #7

PLAN OF FRAMING AT BEGINNING & END OF BRIDGE

2"x4" blocking

2"x4" spiked to post

8"x12" held by 2-¾"ø anchor bolts. Top of sk.

2"x16"

(Sdwlk. pl. not shown)

(Sdwlk. pl. shown)

BEG. BRIDGE

DETAIL OF SIDEWALK FRAMING DOWNSTREAM SIDE

Scale ⅜"=1'-0"

2"x4" blocking

2"x4" Spiked To post

8"x12" held by 2-¾"ø anchor bolts. Top of sk.

10"x12" Wheelguard

2"x16"

4"x16"

(Sidewalk planking shown)

(Sidewalk planking not shown)

END BRIDGE

4"x16"

10"x12" Wheelguard

8"x12" held by 2-¾"ø bolts Top of sk.

2"x16"

2"x4" blocking Spiked to post & Stringer

(Sidewalk planking shown)

(Sidewalk pl. not shown)

END OF BRIDGE

5'-8"

SECT. "D-D"

8"x12" held by 2-¾"ø anchor bolts. Top of sk.

4"x16"

10"x12" Wheelguard

2"x16"

2"x4" spiked to post

2"x4" blocking

(Sdwlk. pl. not shown)

(Sdwlk. pl. shown)

BEG. BRIDGE

DETAIL OF SIDEWALK FRAMING UPSTREAM SIDE

Scale ⅜"=1'-0"

Elev. Beg. Br. 808.59

Elev. End Br. 809.05

℄ Rdwy.

1'-10½"

2'-9"

13'-1"

13'-1"

2'-9"

1'-10½"

"F"

"F"

17'-8½"

17'-8½"

35'-5"

Abut. #1=804.86

Abut. #2=805.27

ELEVATION OF ABUT. NO.1 RT. ANGLE TO ℄ RDWY.

LOOKING TOWARD HILO

Scale ⅜"=1'-0"

12"x18" sidewalk stringer blocking

4" solid bridging

4"x stringer splice blocks use 4-⅝"ø bolts.

Abut. #1=805.52

Abut. #2=805.92

Stringer

12"x12" cap

SECT. "B-B"

Scale ⅜"=1'-0"

⅝"ø bolts

4" solid bridging

Stringer

12"x12" cap

SECT. "C-C"

Scale ⅜"=1'-0"

6"

3"

⅝"ø MK. 330 12" o.c

⅝"ø MK. 331 12" o.c

2"

2'-6"

SECT. "F-F"

Scale 3/4"=1'-0"

1 layer 3 ply roofing paper

2"x16"

8"x12"

¾"ø bolts

6"x18" end timber

6"x6"x1'-0" blocks Spaces shown on plan

Stringer

6"x8" wall plate

SECT. "E-E"

Scale ¾"=1'-0"

8"x18" blocking for sidewalk Stringer

6"x8" wall plate

SECT. "A-A"

Scale ¾"=1'-0"

TERRITORIAL HIGHWAY DEPARTMENT

TERRITORY OF HAWAII

KAINEHE BRIDGE

STA. 711+77.39 to 713+11.24

Hawaii Belt Road F.A.P. 26A

Jan. 1938

SHEET NO. 3 OF 7 SHEETS.

ORIGINAL PLAN

NOTE BOOK

No.

SURVEY PLOTTED BY

DESIGNED BY

DRAWN BY

TRACED BY

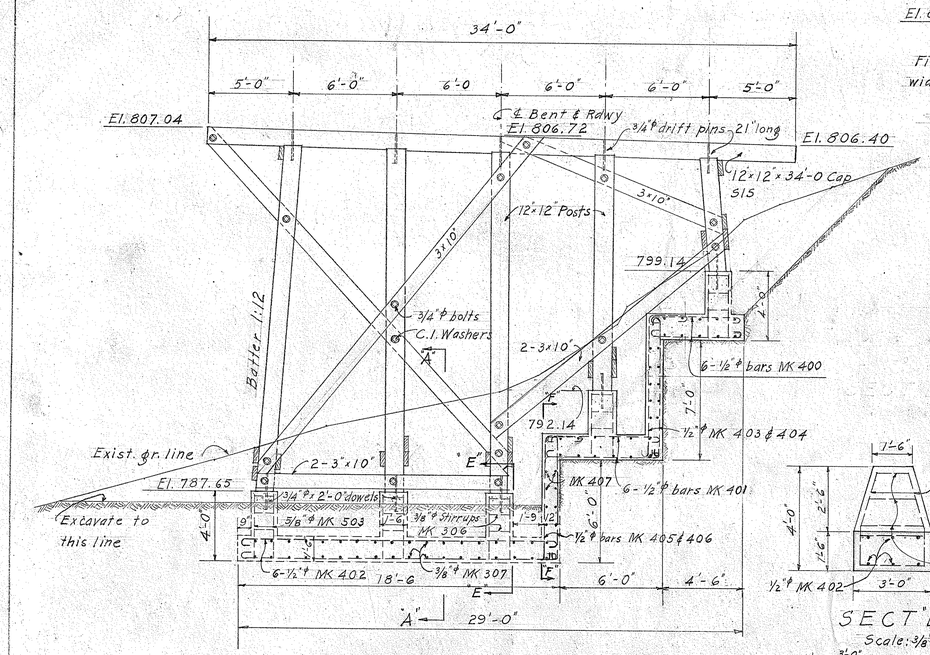
QUANTITIES BY

CHECKED BY

DATE

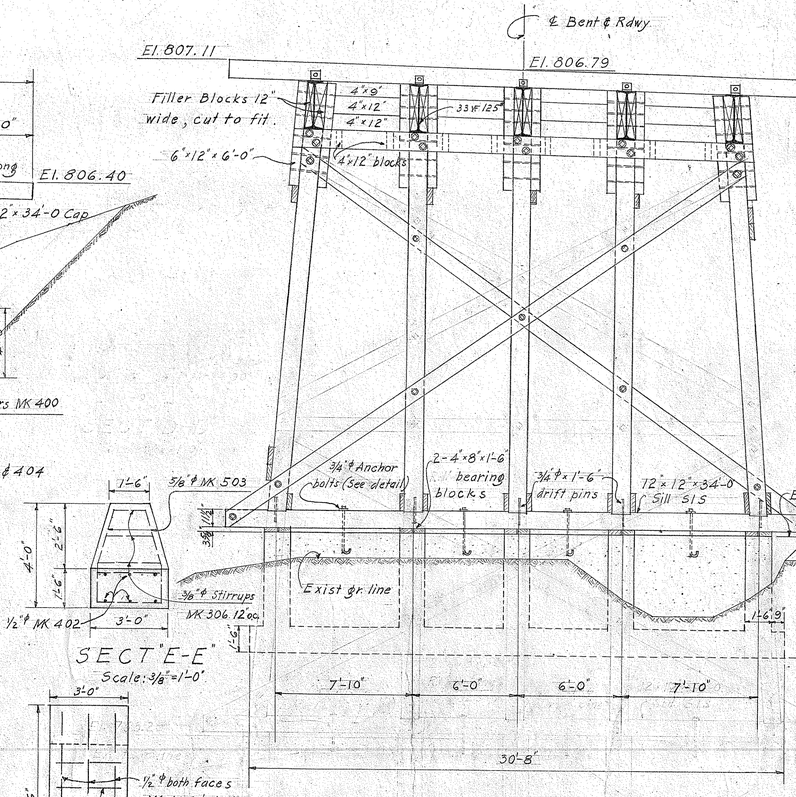
4441.16

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw.	26-A	1938	17	51



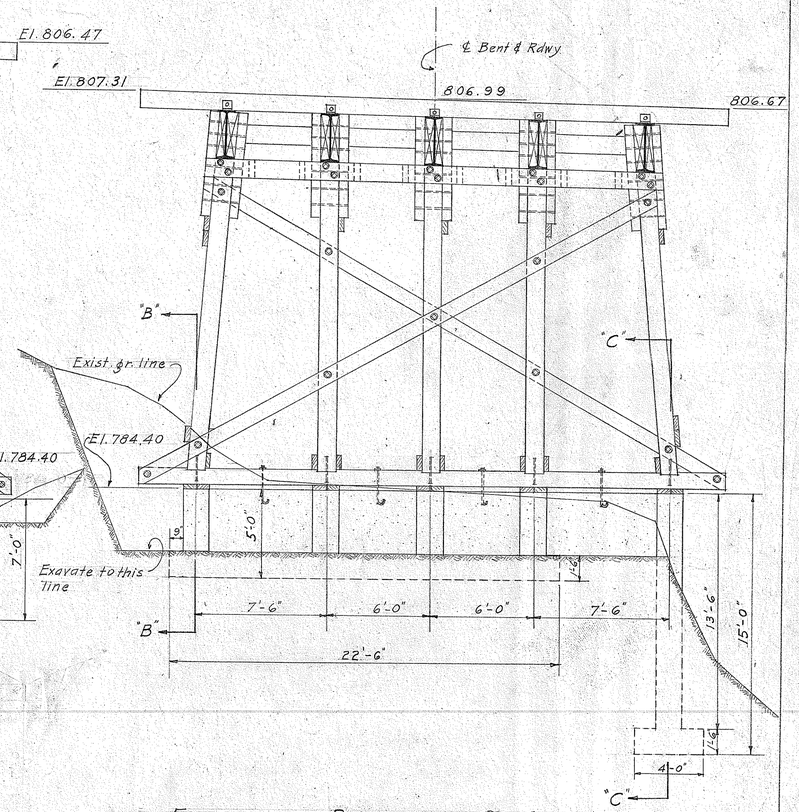
ELEVATION OF BENT NO. 1. STA. 711+95

Scale: 1/4"=1'-0"



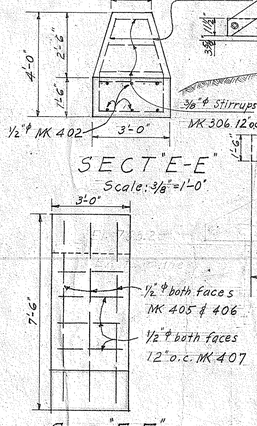
ELEV. OF BENT NO 2. STA. 712+14

Scale: 1/4"=1'-0"



ELEV. OF BENT NO. 3 STA. 712+71

Scale: 1/4"=1'-0"

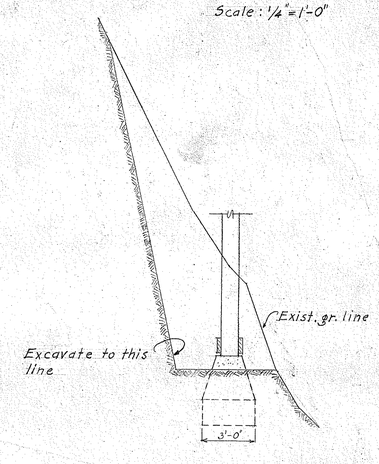


SECT. "E-E"

Scale: 3/8"=1'-0"

SECT. "F-F"

Scale 3/8"=1'-0"

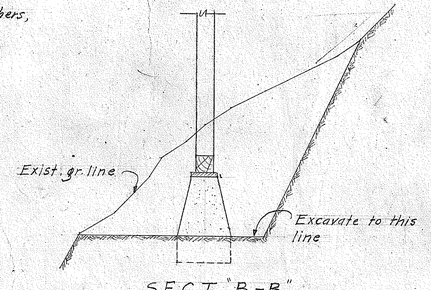


SECT. "A-A"

Scale: 1/4"=1'-0"

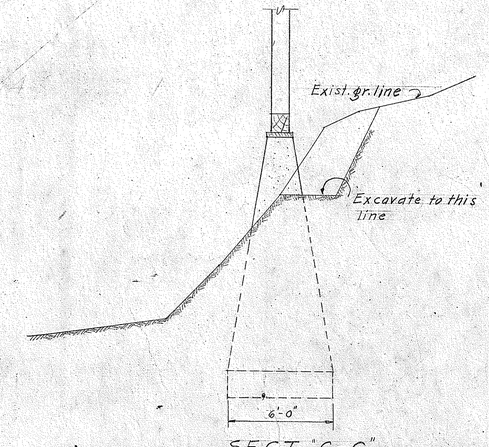
NOTE! All locations where 3"x10" are bolted to cap, sill & outside inclined posts, use 4" Teco Split ring connectors or equal with 3/4" dia. bolts C.I. washers, both ends.

This note applies to all bridges.



SECT. "B-B"

Scale: 1/4"=1'-0"



SECT. "C-C"

Scale: 1/4"=1'-0"

ORIGINAL PLAN
NOTE BOOK
No.

SURVEY PLOTTED BY ..... DATE Jan. 1938
DESIGNED BY W.R. Bartels. " "
DRAWN BY W. Vanatta. " "
TRACED BY W. Vanatta. " "
QUANTITIES BY W. Vanatta. " "
CHECKED BY W. Vanatta. " "

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

KAINEHE BRIDGE

STA. 711+77.39 TO STA. 713+11.24

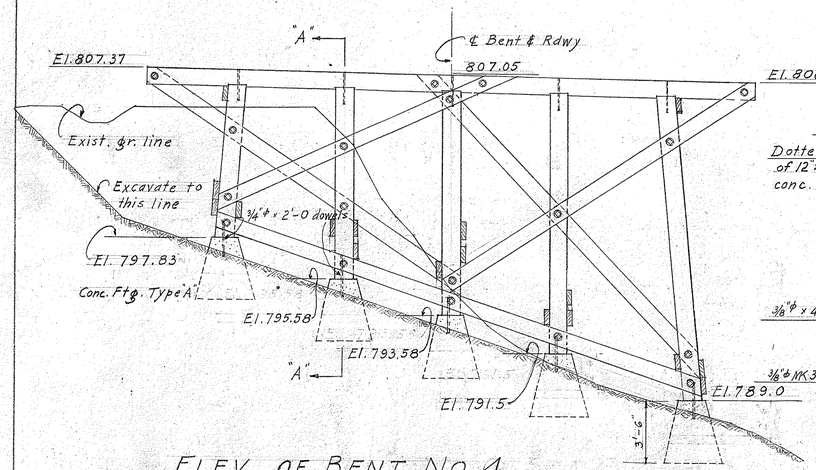
Hawaii Belt Rd.

F.A.P. 26-A Jan. 1938

SHEET NO. 4 OF 7 SHEETS.

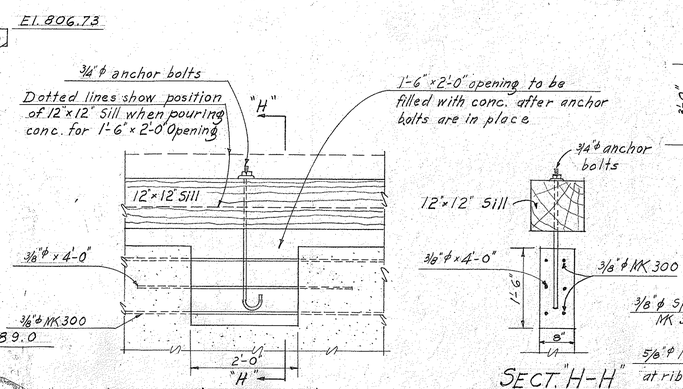
4441.17

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw.	26-A	1938	18	51



ELEV. OF BENT NO. 4 STA. 712+90

Scale: 1/4"=1'-0"

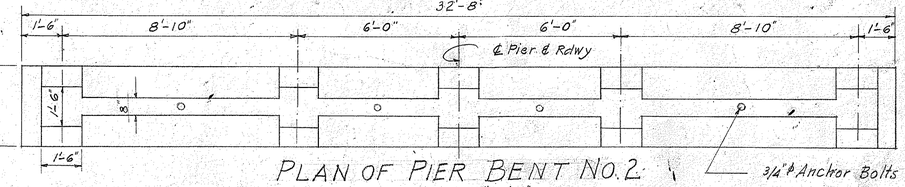


DETAIL SHOWING SUGGESTED METHOD OF PLACING ANCHOR BOLTS.

Scale: 3/4"=1'-0"

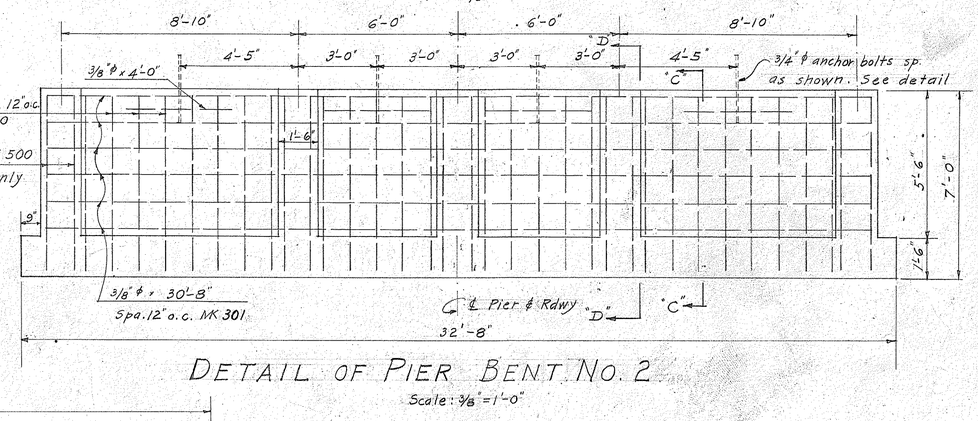
SECT. "H-H"

Scale: 3/4"=1'-0"



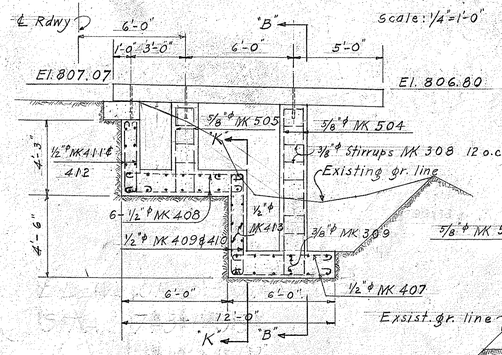
PLAN OF PIER BENT NO. 2.

Scale: 3/8"=1'-0"



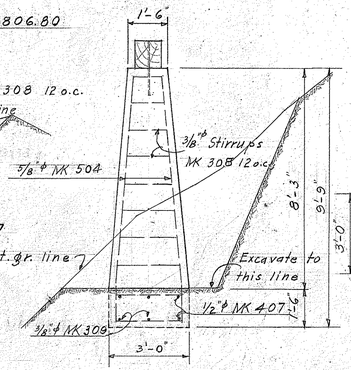
DETAIL OF PIER BENT NO. 2

Scale: 3/8"=1'-0"



ELEV. OF BENT NO. 5 STA. 713+09

Scale: 1/4"=1'-0"



SECT. "B-B"

Scale: 3/8"=1'-0"

PLAN OF PIER BENT NO. 3.

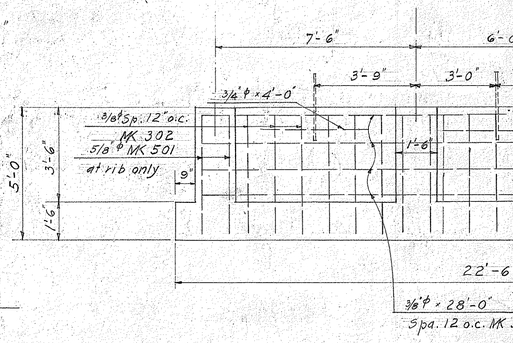
Scale: 3/8"=1'-0"

SECT. "C-C"

Scale: 3/8"=1'-0"

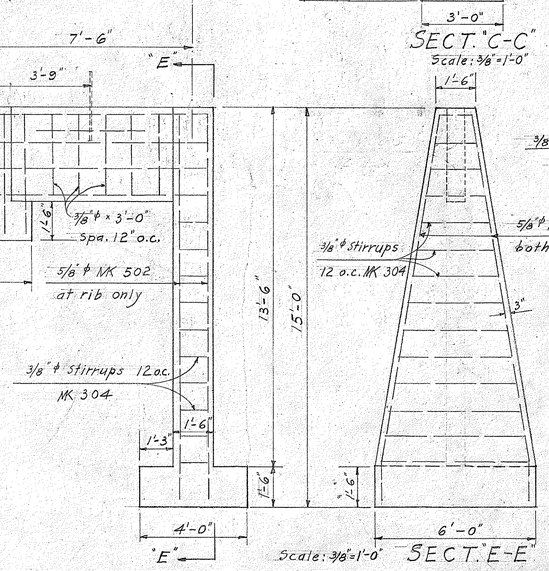
SECT. "D-D"

Scale: 3/8"=1'-0"



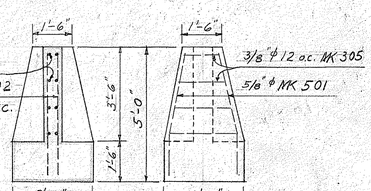
DETAIL OF PIER BENT NO. 3

Scale: 3/8"=1'-0"



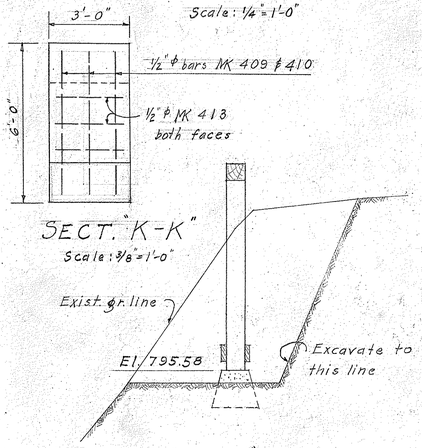
SECT. "E-E"

Scale: 3/8"=1'-0"



SECT. "F-F" SECT. "G-G"

Scale: 3/8"=1'-0"

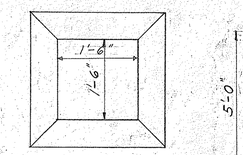


SECT. "K-K"

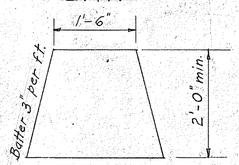
Scale: 3/8"=1'-0"

SECT. "A-A"

Scale: 1/4"=1'-0"



PLAN



ELEVATION

DETAIL OF CONC. FTG. TYPE "A"

Scale: 3/4"=1'-0"

ORIGINAL PLAN	DATE Jan. 1938
	DRAWN BY W. Kondo
	TRACED BY " "
	CHECKED BY V. Tantash
NOTE BOOK	QUANTITIES BY " "
No.	COMPARED BY W. Kondo

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

KAINEHE BRIDGE

STA. 711+77.39 TO STA. 713+11.24

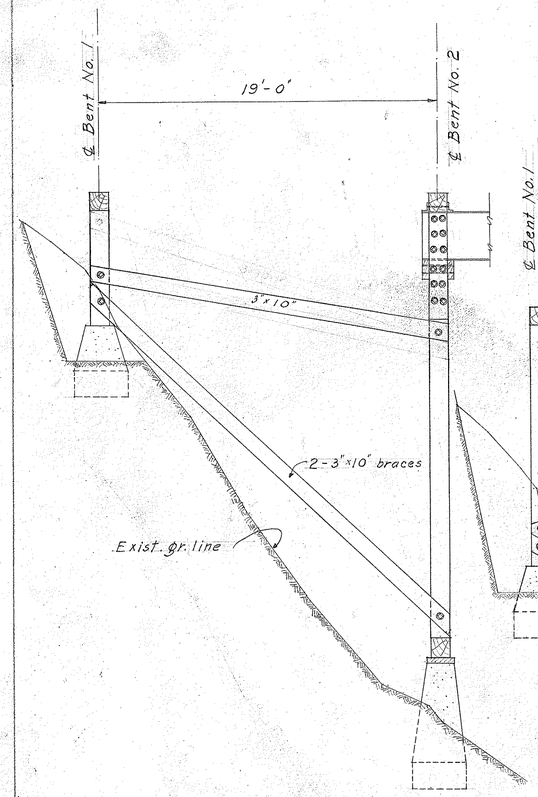
Hawaii Belt Rd.

F.A.P. 26-A Jan. 1938

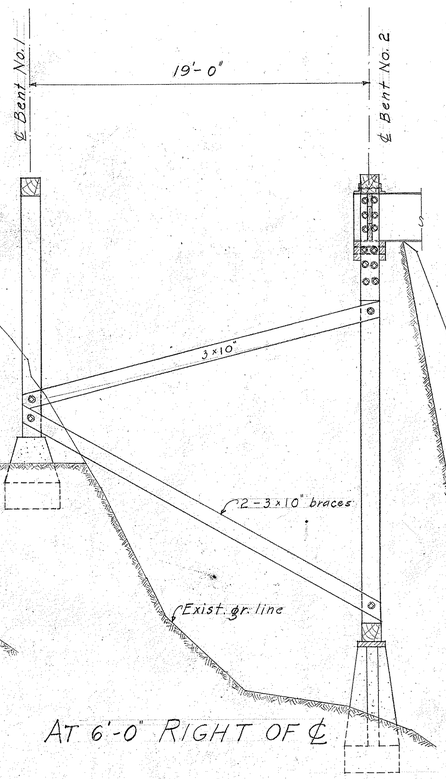
SHEET NO. 5 OF 7 SHEETS.

4441.18

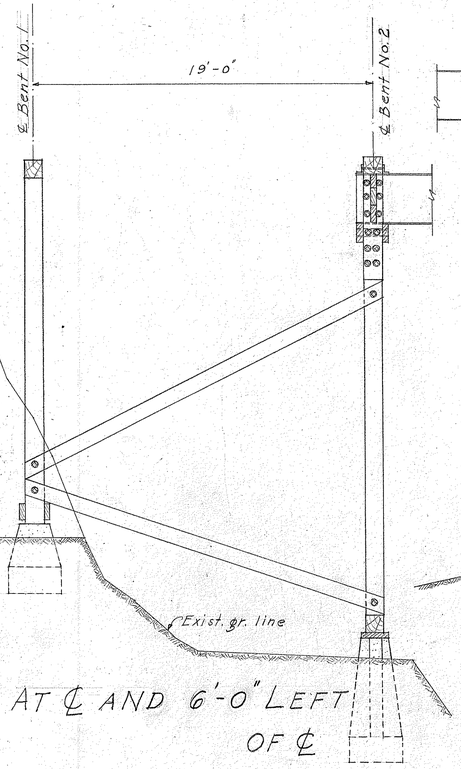
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw.	26-A	1938	19	51



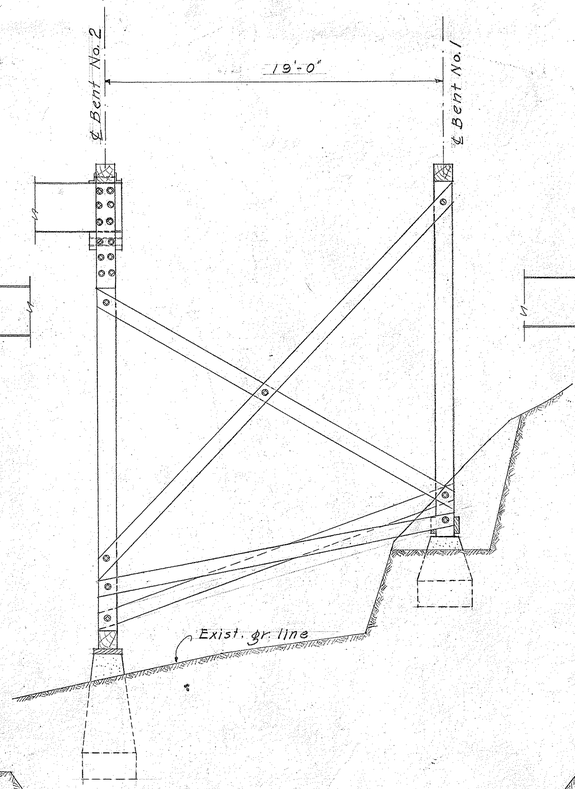
DOWNSTREAM ELEVATION
SHOWING TOWER
BRACING, BENTS #1 TO #2.



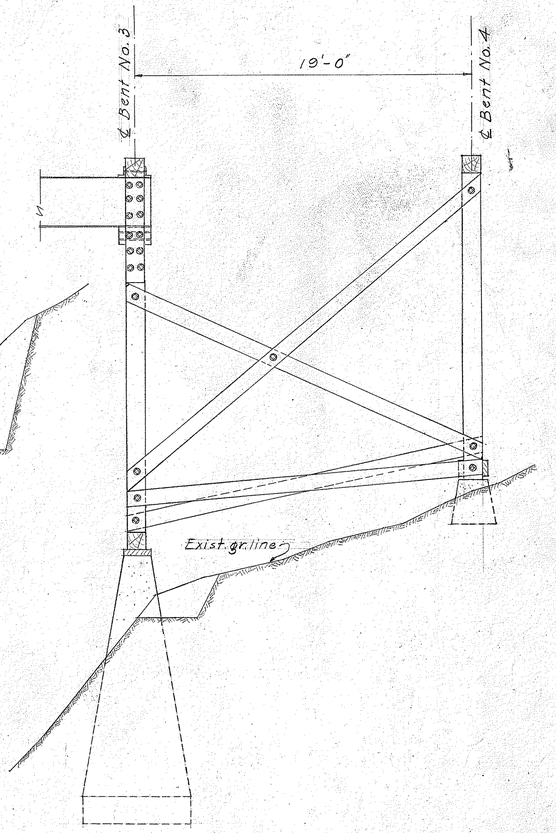
AT 6'-0" RIGHT OF ℄



AT ℄ AND 6'-0" LEFT
OF ℄



UPSTREAM ELEV.
SHOWING TOWER
BRACING, BENTS # 1 TO # 2.
Scale: 1/4"=1'-0"



DOWNSTREAM ELEVATION
SHOWING TOWER
BRACING, BENTS #3 TO #4
Scale: 1/4"=1'-0"

ELEVATIONS SHOWING TOWER BRACING
AT INTERMEDIATE POSTS #1 TO #2
Scale: 1/4"=1'-0"

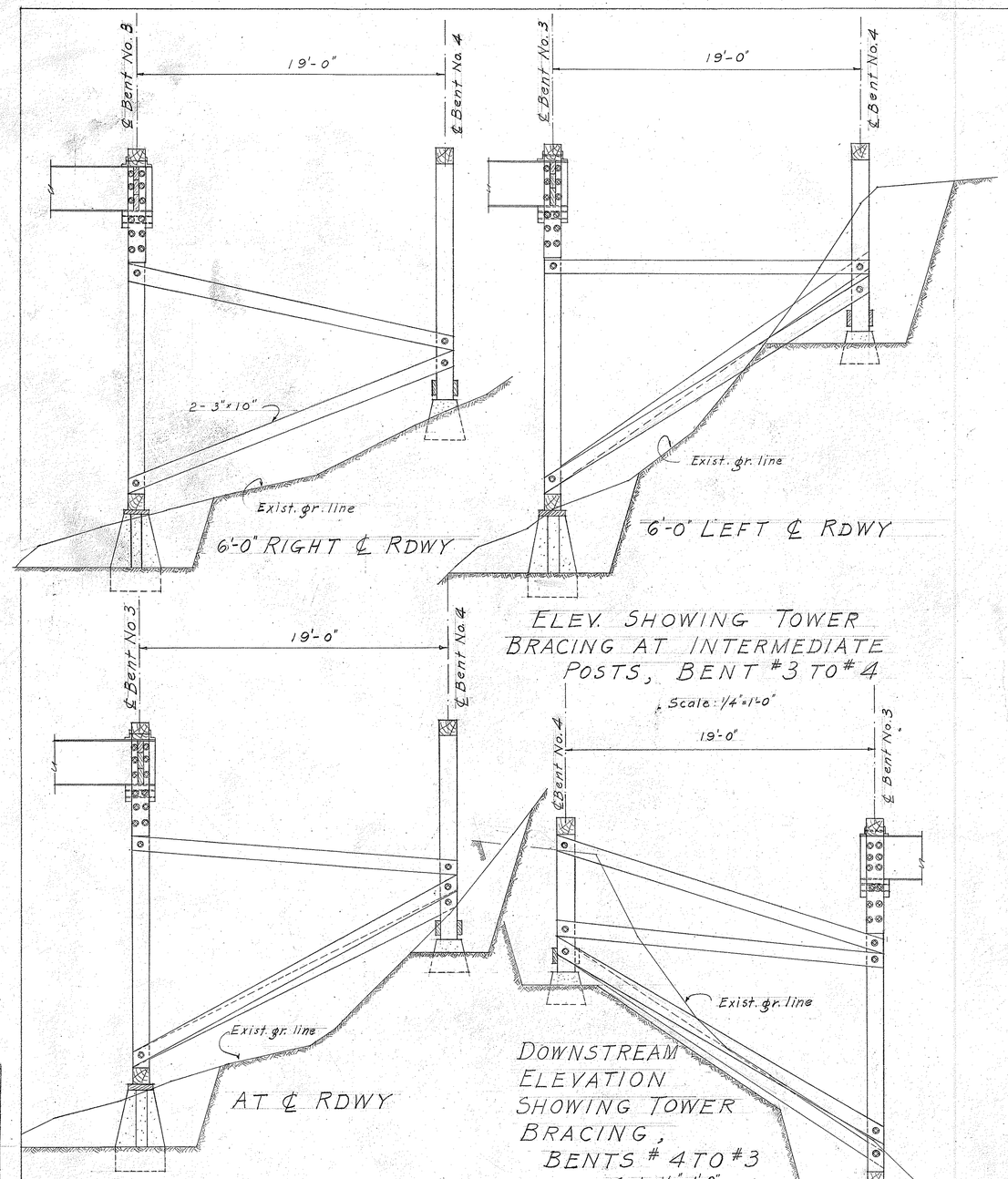
NOTE! All tower bracing 3"x10".
All bolts 3/4"ϕ with C.I.
Washers both ends.
This note applies to all the bridges.

ORIGINAL PLAN
NOTE BOOK No.
DATE Jan. 1938
DESIGNED BY R. Bartels
DETAILED BY W. Vannatta
TRACED BY V. Vanleer
QUANTITIES BY V. Vanleer
CHECKED BY W. Vannatta

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII
KAINEHE BRIDGE
STA. 711+77.39 TO STA. 713+11.24
Hawaii Belt Rd.
F.A.P. 26-A Jan. 1938
SHEET NO. 6 OF 7 SHEETS.

4441.19

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw.	26-A	1938	20	51



ELEVATIONS SHOWING TOWER BRACING AT INTERMEDIATE POSTS BENTS #3 TO #4

Scale: 1/4"=1'-0"

ELEV. SHOWING TOWER BRACING AT INTERMEDIATE POSTS, BENT #3 TO #4

Scale: 1/4"=1'-0"

DOWNSTREAM ELEVATION SHOWING TOWER BRACING, BENTS #4 TO #3

Scale: 1/4"=1'-0"

COMPUTED BY	W. E. Bartels	DATE Jan. 1938
TRACED BY	Wa Yamatta	" "
CHECKED BY	K. Yonekoff	" "
NOTE BOOK	CHECKED BY Wa Yamatta	" "
No.		" "

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

KAINEHE BRIDGE

STA. 711+77.39 TO STA. 713+11.24

Hawaii Belt Rd.

F.A.P. 26-A Jan. 1938

SHEET NO. 7 OF 7 SHEETS.

4441.20

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw	26-A	1938	21	51

CURVE DATA
Δ = 10°-08'
D = 44'-49"
R = 7,669.64
T = 680.0
L = 1356.45
Super elev. = 0.013' per ft.

Overall Length at ℄ = 237'-6"

Sta. 719+92.5 · Sta. 720+11.5 · Sta. 720+30.5 · Sta. 720+49.5 · Sta. 720+68.5 · Sta. 720+87.5 · Sta. 721+44.5 · Sta. 721+63.5 · Sta. 721+82.5 · Sta. 722+01.5 · Sta. 722+20.5

℄ Bearing Beg. Br. Sta. 719+91.67
To Hilo
Beg. of Bridge
Sta. 719+91

Pile Abutment
See Std detail

℄ Bearing

Bent No.1 · Bent No.2 · Bent No.3 · Bent No.4 · Bent No.5 · Bent No.6 · Bent No.7 · Bent No.8 · Bent No.9 · Bent No.10

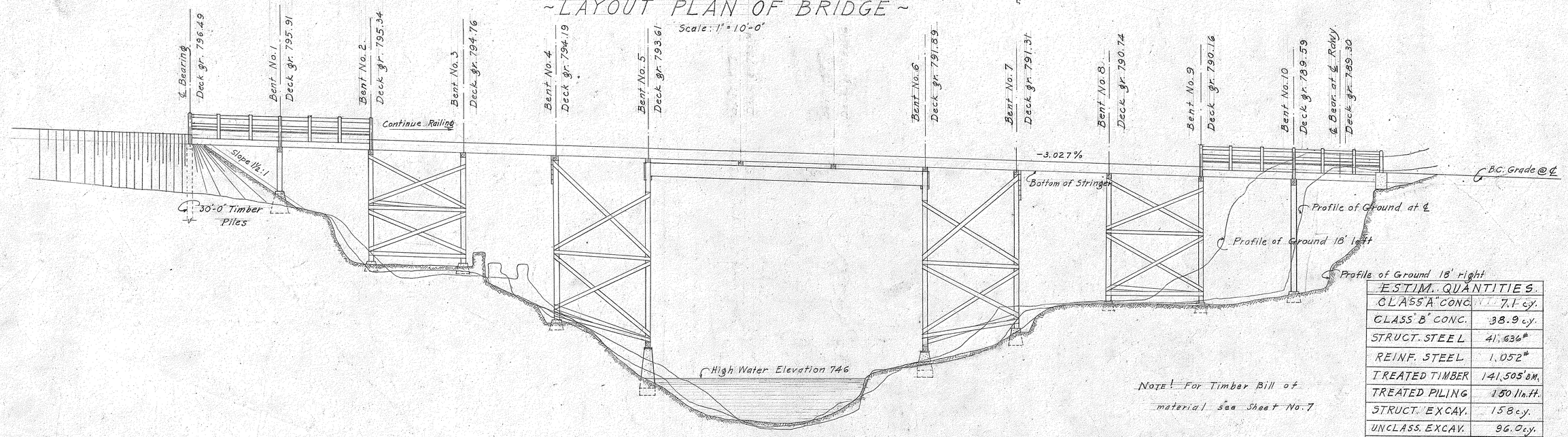
57'-0" Steel Span

℄ Bearing End Br.
Sta. 722+30
To Honokaa

End of Br.
Sta. 722+32.04

~LAYOUT PLAN OF BRIDGE~

Scale: 1" = 10'-0"



DOWNSTREAM ELEVATION OF BRIDGE

Scale: 1" = 10'-0"

ESTIM. QUANTITIES.	
CLASS "A" CONC.	7.1 c.y.
CLASS "B" CONC.	38.9 c.y.
STRUCT. STEEL	41,636#
REINF. STEEL	1,052#
TREATED TIMBER	141,505 B.M.
TREATED PILING	150 l.n.ft.
STRUCT. EXCAV.	158 c.y.
UNCLASS. EXCAV.	96.0 c.y.

Note! For Timber Bill of material see Sheet No. 7

ORIGINAL PLANS	SURVEY PLOTTED BY W.B. Bartels DATE Dec. 1937
	TRACED BY W. Hanaoka " "
	CHECKED BY V. Yonkoff " "
NOTE BOOK	QUANTITIES BY V. Yonkoff " Jan. 1938
No.	CHECKED BY M. Kawachi " "

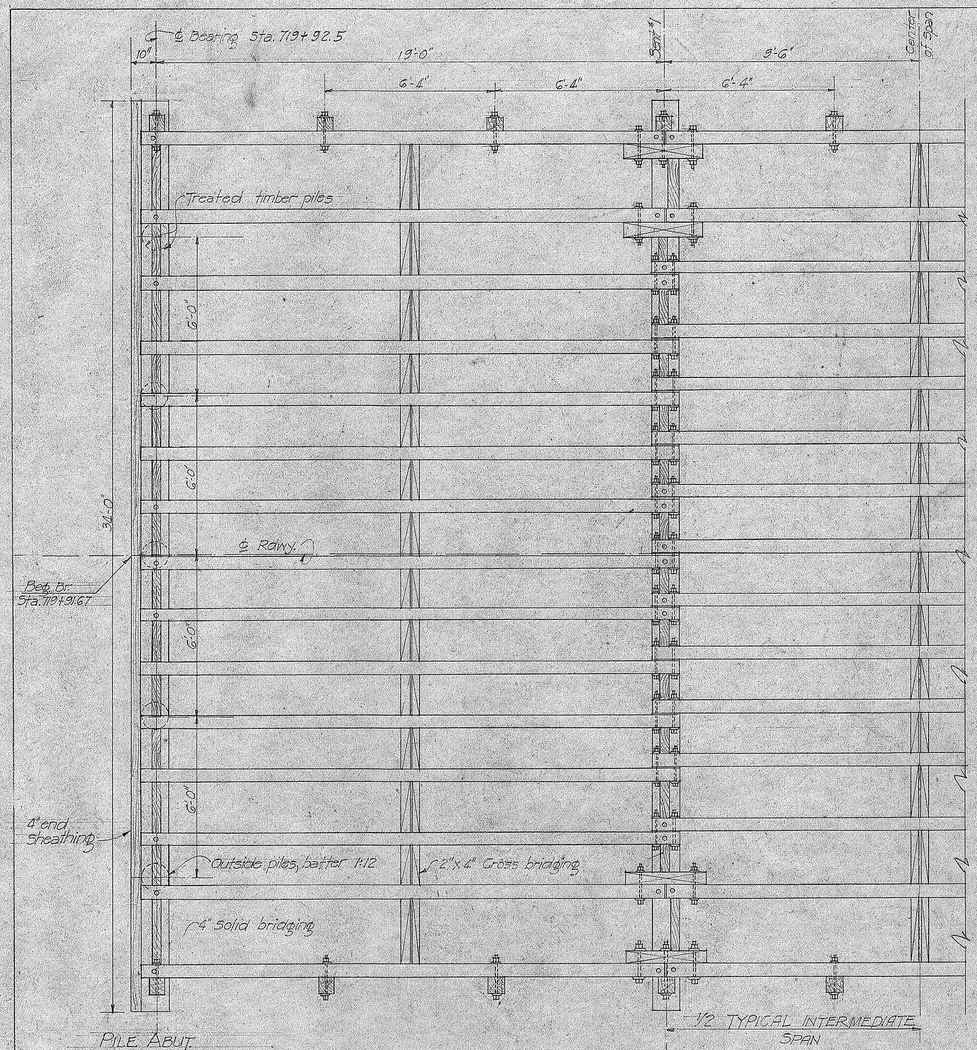
TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

KAHOLALELE BRIDGE
STA. 719+91.67 TO STA. 722+32.04
Hawaii Belt Rd.
F.A.P. 26-A Jan 1938

SHEET NO. 1 OF 7 SHEETS.

4441.21

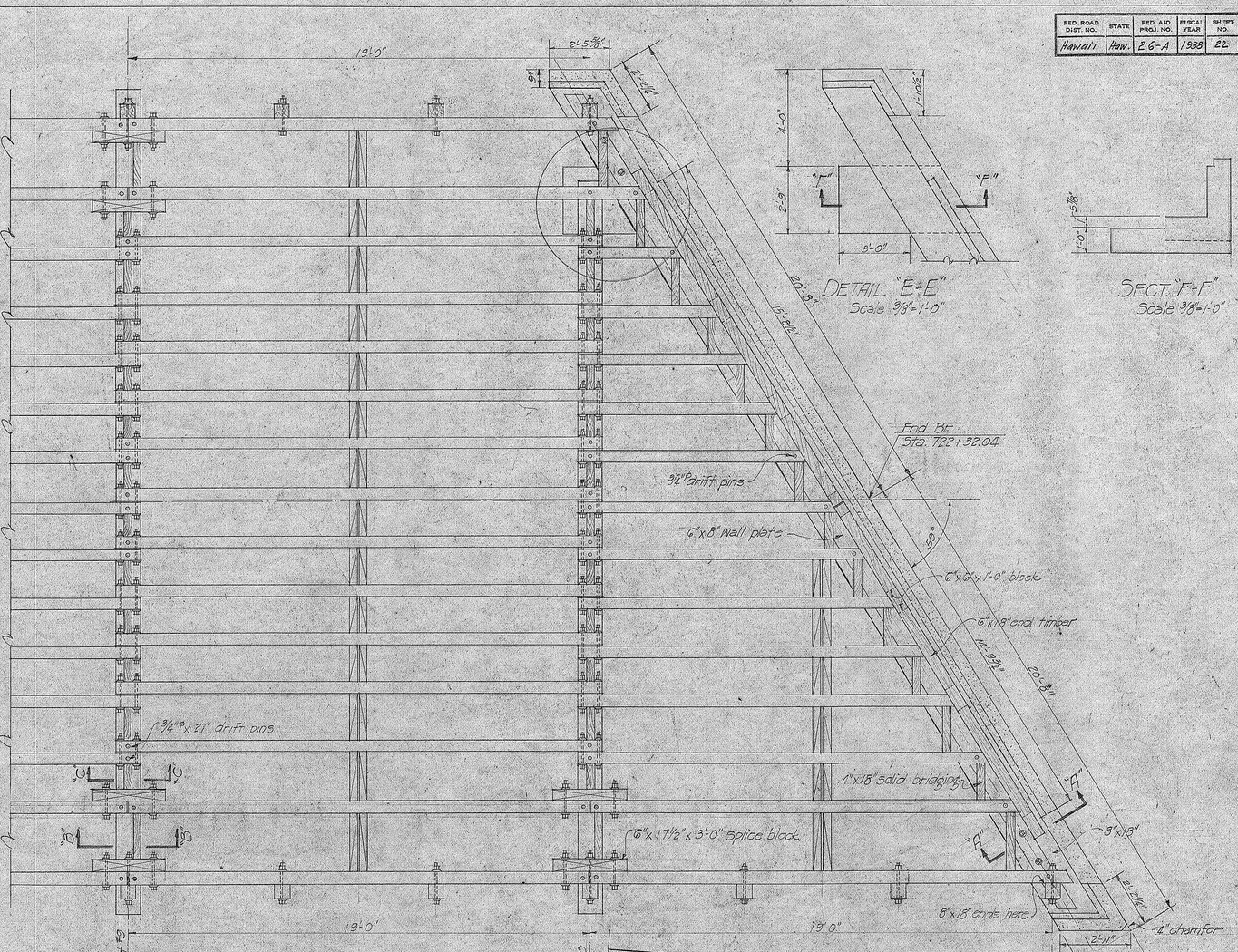
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw.	26-A	1938	22	51

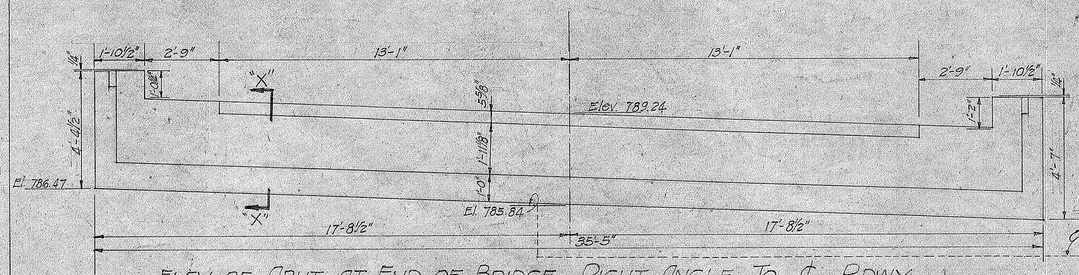


FRAMING PLAN OF BRIDGE

NOTE! - For Sect "A-A", "B-B", "C-C" See Kainehe Bridge Sheet No.

Scale 3/8"=1'-0"

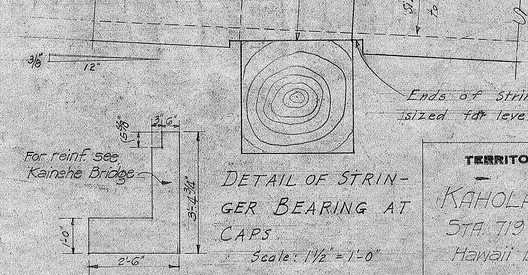




ELEV. OF ABUT. AT END OF BRIDGE. RIGHT ANGLE TO ℄ RDWY.

Scale 3/8"=1'-0"

NOTE!
FOR DETAILS NOT SHOWN
SEE KAINEHE BRIDGE.



DETAIL OF STRINGER BEARING AT CAPS.

Scale: 1½"=1'-0"

SECT. "X-X"

Scale ½"=1'-0"

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

KAHOLALELE' BRIDGE

STA. 719+91.67 - STA. 722+32.04

Hawaii Belt Road F.A.P. 26A

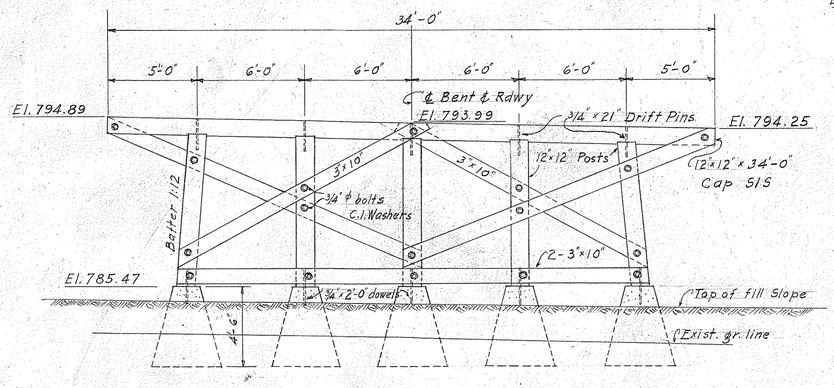
Jan. 1938

SHEET NO. 2 OF 7 SHEETS.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE 12-28
	DESIGNED BY J.A.C. 12-28-37	
	TRACED BY	
	CHECKED BY	
NOTE BOOK	QUANTITIES BY	
No.	CHECKED BY	

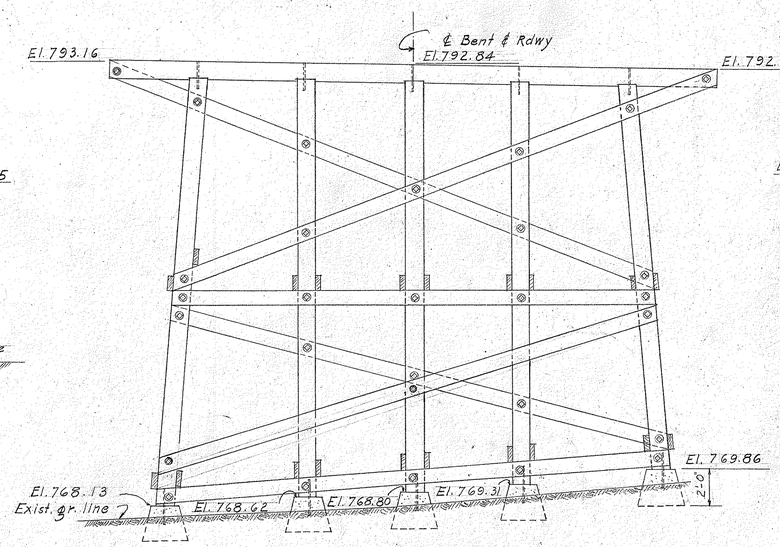
4441.22

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw.	26-A	1938	23	51



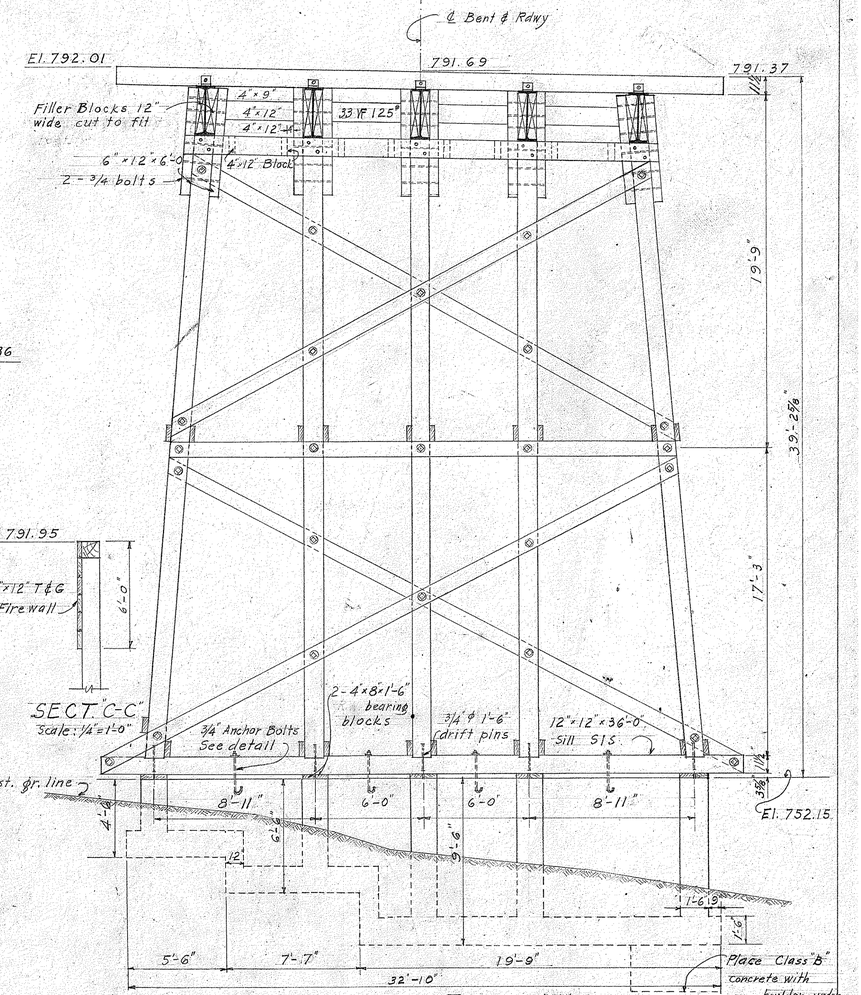
ELEV. OF BENT NO.1 STA. 720+11.5

Scale: 1/4"=1'-0"



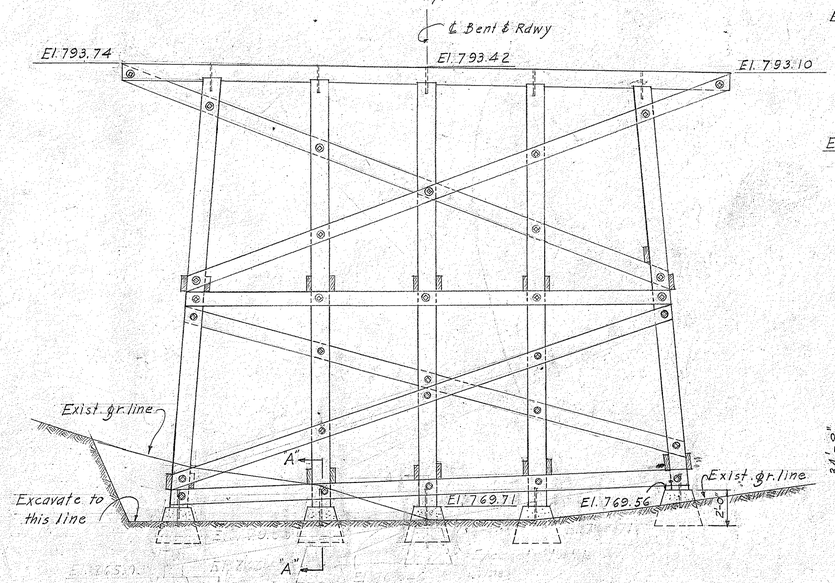
ELEV. OF BENT NO. 3 STA. 720+49.5

Scale: 1/4"=1'-0"



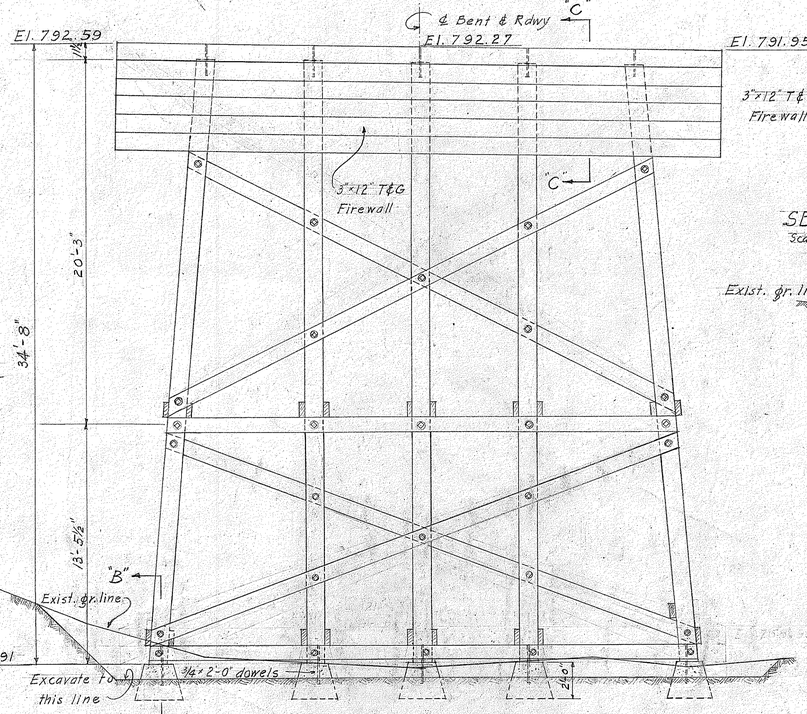
ELEV. OF BENT NO. 5 STA. 720+87.5

Scale: 1/4"=1'-0"



ELEV. OF BENT NO. 2 STA. 720+30.5

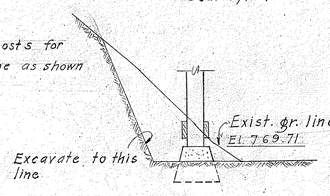
Scale: 1/4"=1'-0"



ELEV. OF BENT NO. 4 STA. 720+68.5

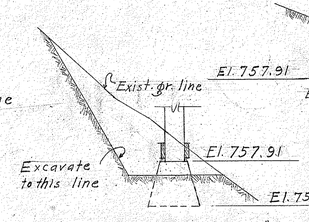
Scale: 1/4"=1'-0"

NOTE! Spacing of posts for other bents are same as shown for bent No.1.



SECT. "A-A"

Scale: 1/4"=1'-0"



SECT. "B-B"

Scale: 1/4"=1'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY		DATE	Dec. 1937
	DESIGNED BY	W. Bartels	"	"
	DRAWN BY	W. Bartels	"	"
	TRACED BY	V. Yankoff	"	"
REVISED PLAN	QUANTITIES BY	V. Yankoff	"	Jan. 1938
	CHECKED BY	J.E. Conradt	"	"

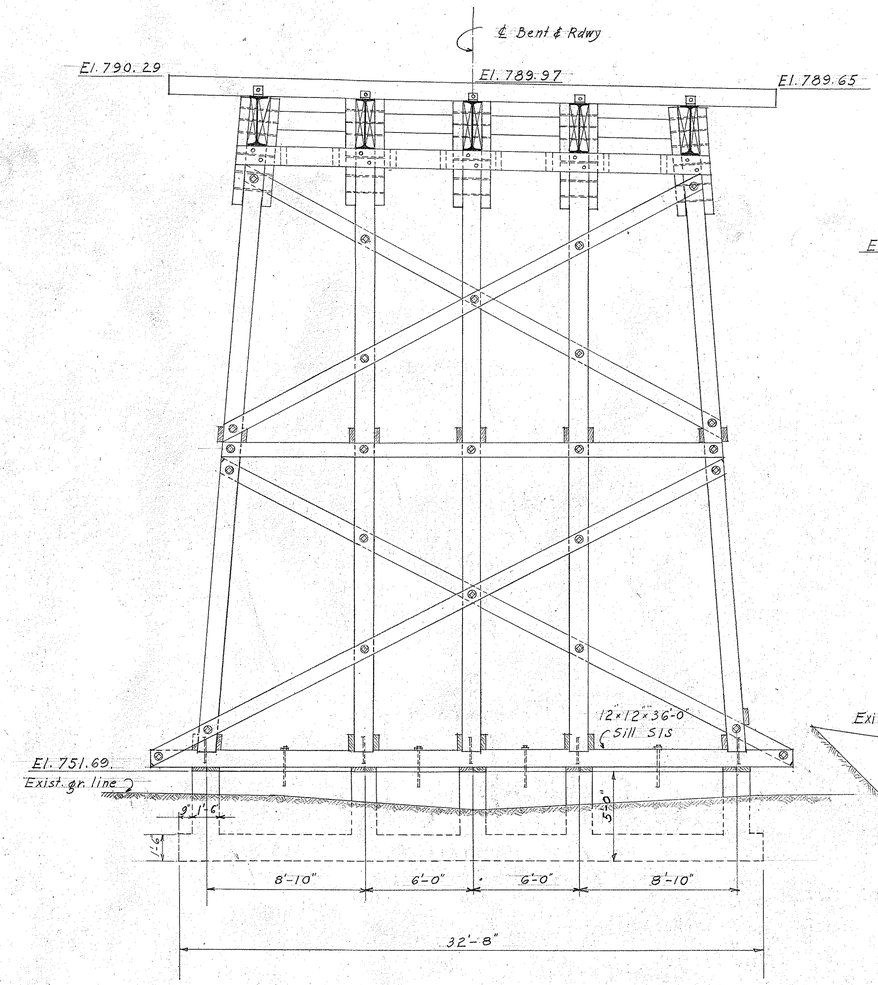
TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

KAHOLALELE BRIDGE
STA. 719+91.67 TO STA. 722+32.04
Hawaii Belt Rd.
F.A.P. 26-A Jan. 1938

SHEET NO. 3 OF 7 SHEETS

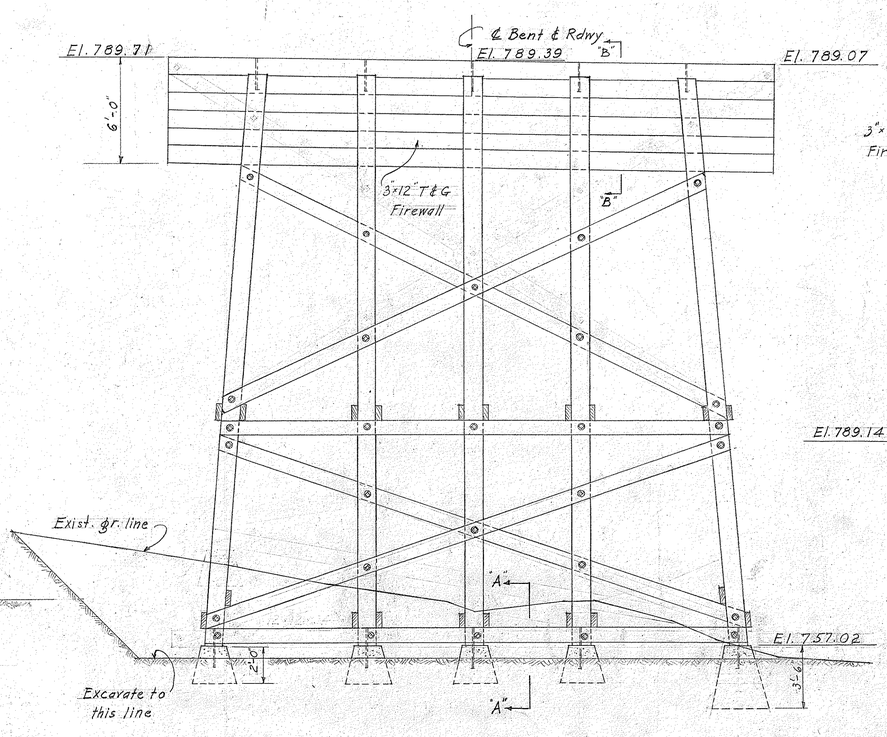
4441.23

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw.	26-A	1938	24	51



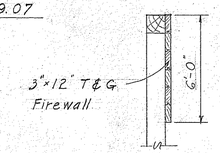
ELEV. OF BENT NO. 6 STA. 721+44.5

Scale: 1/4"=1'-0"



ELEV. OF BENT NO. 7 STA. 721+63.5

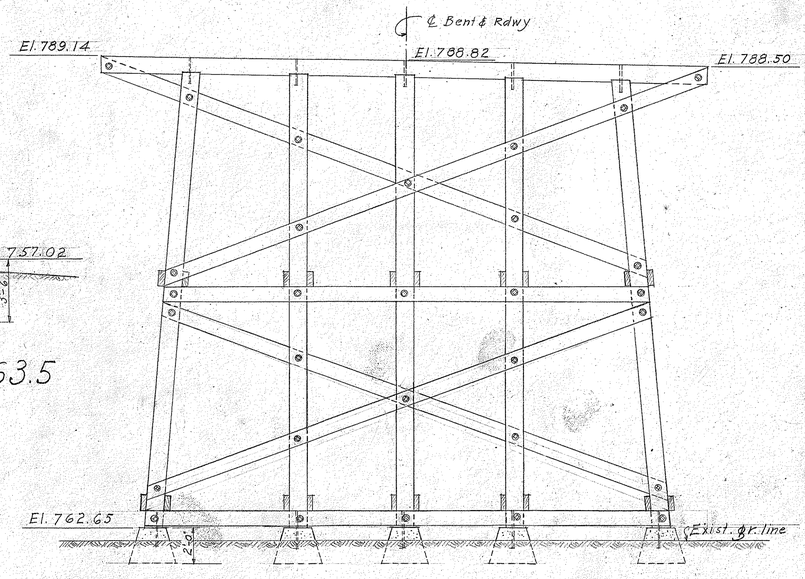
Scale: 1/4"=1'-0"



SECT. "B-B"

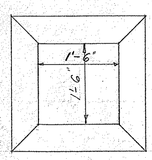
Scale: 1/4"=1-0"

NOTE! All locations where 3"×12" bracing are bolted to cap, sill or outside leaning posts use 3/4 dia. bolts with 2" Teco self-tapping connectors or equal C.I. Ogee washers, both ends.

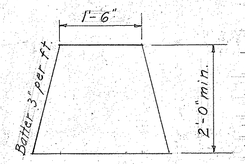


ELEV. OF BENT NO. 8 STA. 721+82.5

Scale: 1/4"=1'-0"



PLAN.



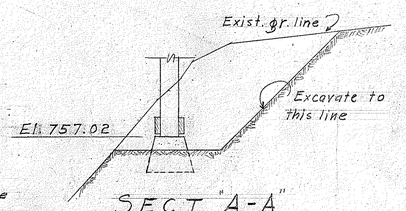
ELEVATION

DETAIL OF CONC. FTG TYPE "A"

Scale: 3/4"=1'-0"

NOTE! Depth of footings below ground depends on foundation and other conditions and shall be determined by the Res. Eng.

Definite vertical dimensions for piers given in these drawings may be altered by the Res. Eng. if local conditions require or permit.



SECT. "A-A"

Scale: 1/4"=1'-0"

ORIGINAL PLANS	DATE
DESIGNED BY H. E. Davis	Dec. 1937
DRAWN BY W. Yonkoff	" "
TRACED BY W. Yonkoff	" "
QUANTITIES BY W. Yonkoff	" "
CHECKED BY H. E. Davis	Jan. 1938
NOTE BOOK	
No.	

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

KAHOLALELE BRIDGE

STA. 719+91.67 to STA 722+32.04

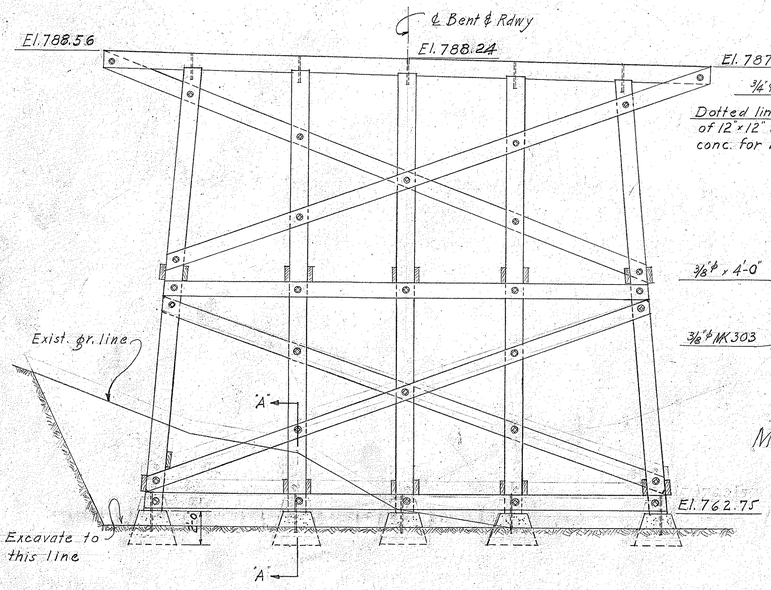
Hawaii Belt Rd.

F.A.P. 26-A Jan. 1938.

SHEET NO. 4 OF 7 SHEETS

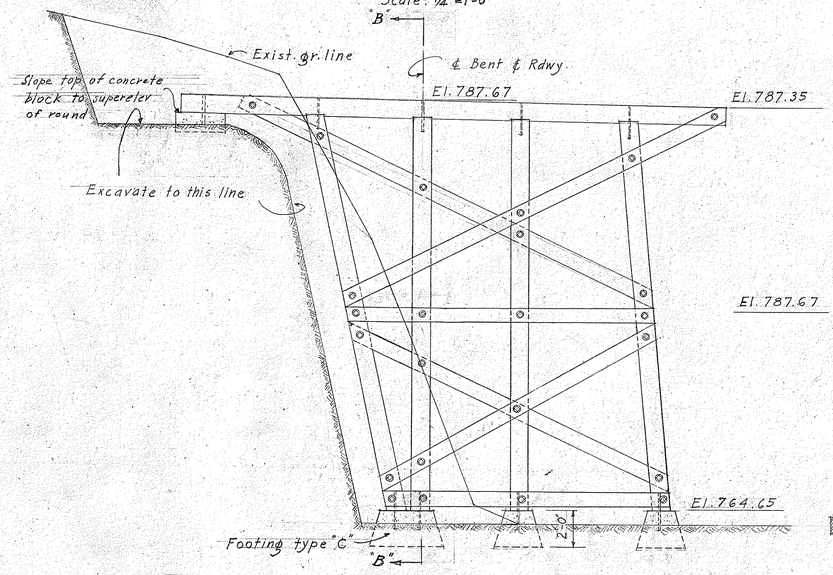
4441.24

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw.	26-A	1938	25	51



ELEV. OF BENT NO. 9 STA. 722+01.5

Scale: 1/4" = 1'-0"



ELEV. OF BENT NO. 10 STA. 722+20.5

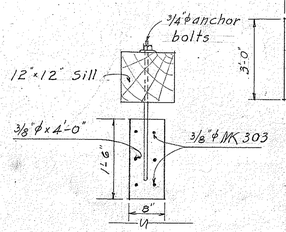
Scale: 1/4" = 1'-0"

SECT. "A-A"

Scale: 1/4" = 1'-0"

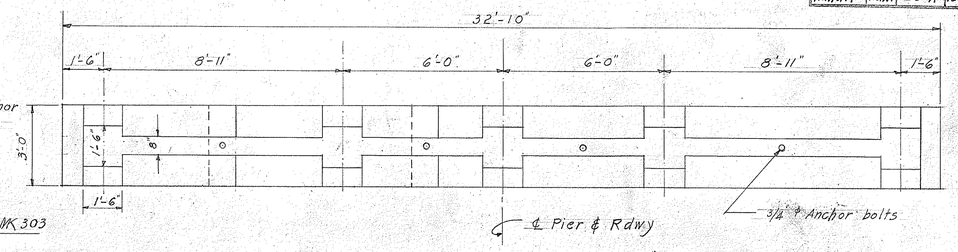
DETAIL SHOWING SUGGESTED METHOD OF PLACING ANCHOR BOLTS.

Scale: 3/4" = 1'-0"



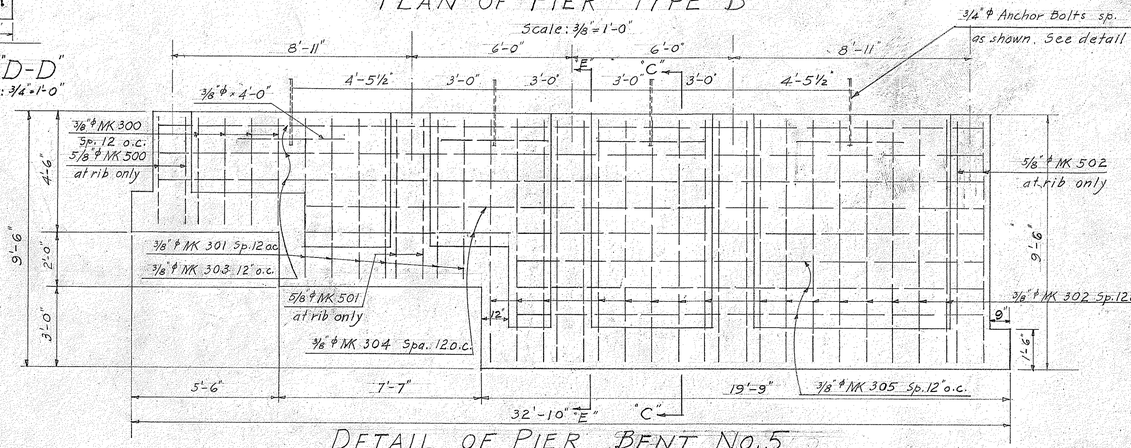
SECT. "D-D"

Scale: 3/4" = 1'-0"



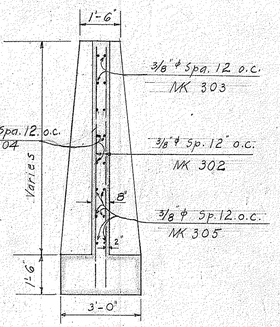
PLAN OF PIER TYPE "B"

Scale: 3/8" = 1'-0"



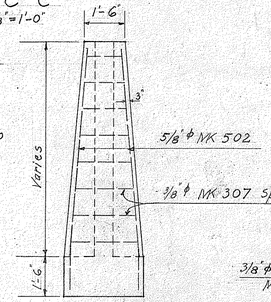
DETAIL OF PIER BENT NO. 5.

Scale: 3/8" = 1'-0"



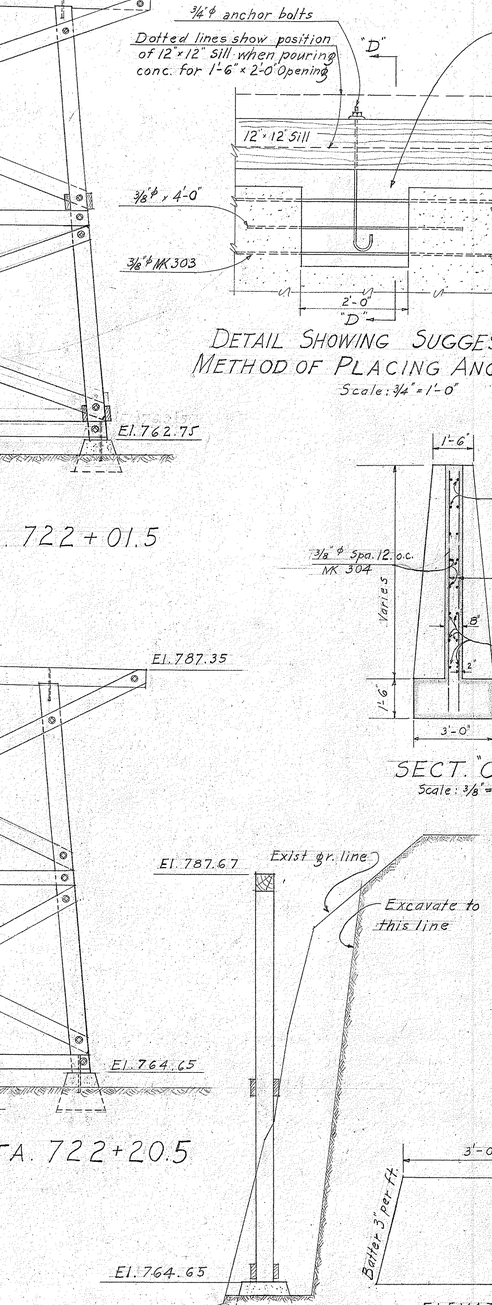
SECT. "C-C"

Scale: 3/8" = 1'-0"



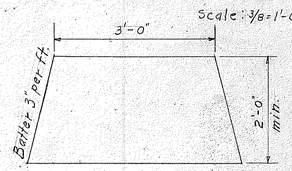
SECT. "E-E"

Scale: 3/8" = 1'-0"

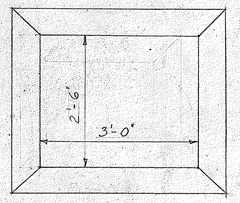


SECT. "B-B"

Scale: 1/4" = 1'-0"



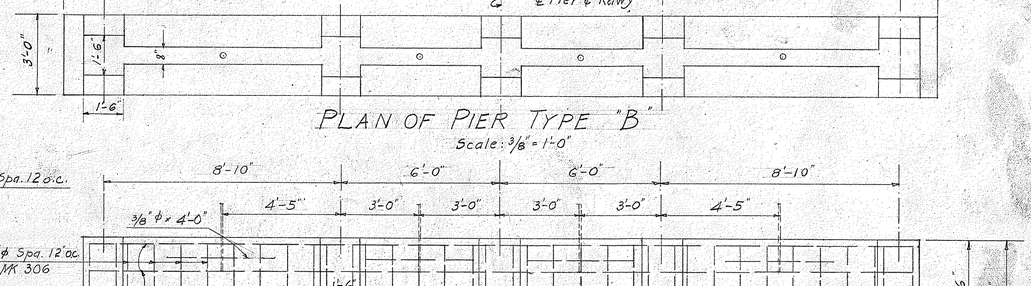
ELEVATION



PLAN

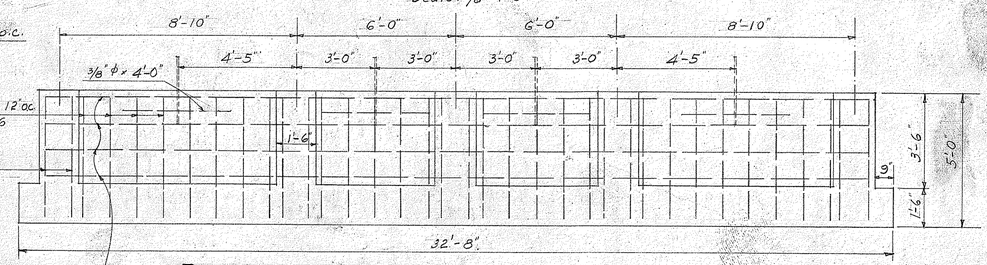
DETAIL OF CONC. FTG. TYPE "C"

Scale: 3/4" = 1'-0"



PLAN OF PIER TYPE "B"

Scale: 3/8" = 1'-0"



DETAIL OF PIER BENT NO. 6

Scale: 3/8" = 1'-0"

3/8"ϕ x 30'-8" MK 308 Spa. 12" o.c.

Normal size of bridge height of footing may be increased by the Engineer.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY W.G. Bartels	Dec. 1937
	TRACED BY " "	" "
	TRACED BY V. Yankoff	" "
	QUANTITIES BY " "	" "
NOTE BOOK	CHECKED BY Joe Kanahele	Jan. 1938
No.		

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

KAHOLALELE BRIDGE

STA. 719+91.67 TO STA 722+32.04

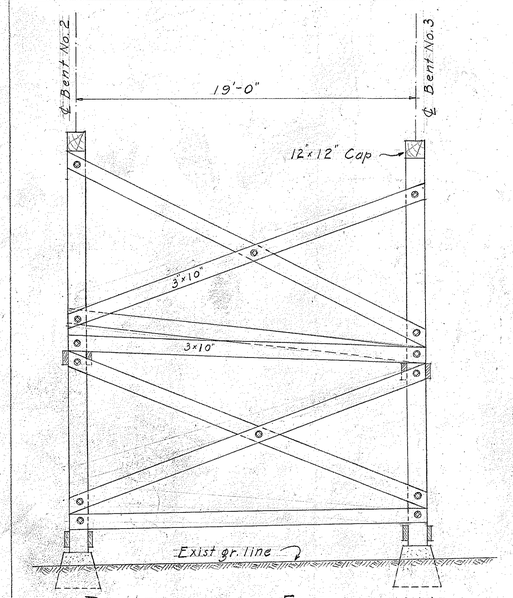
Hawaii Belt Rd.

F.A.P. 26-A Jan. 1938.

SHEET NO. 5 OF 7 SHEETS.

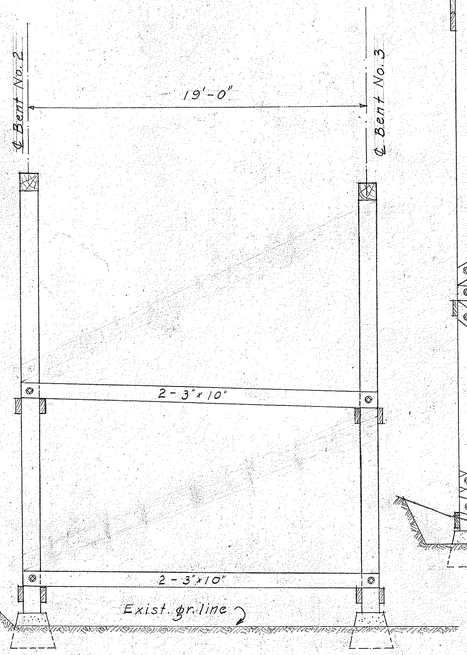
4441.25

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw.	26-A	1938	26	51



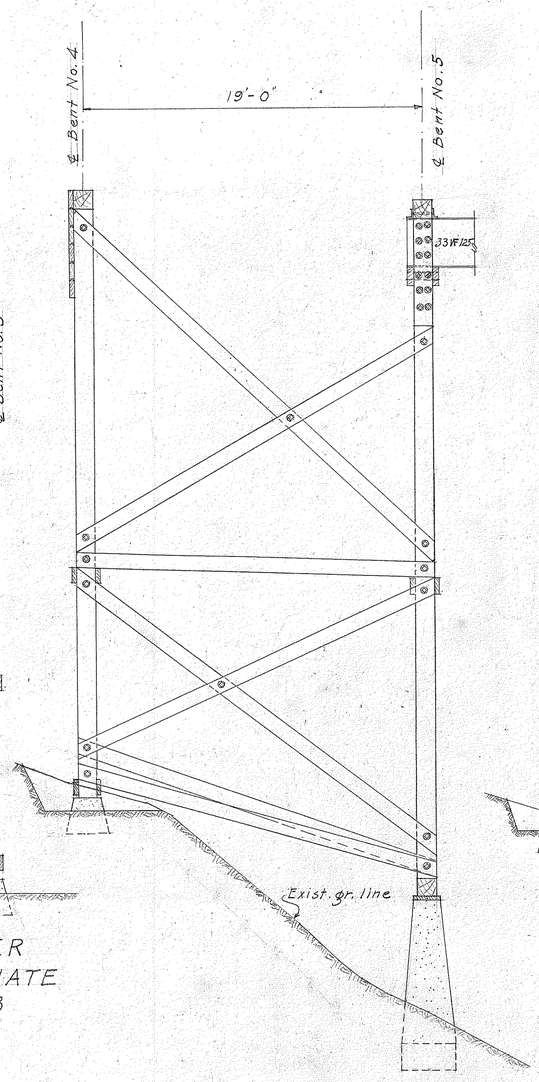
DOWNSTREAM ELEVATION SHOWING TOWER BRACING, BENTS #2 TO 3

Scale: 1/4"=1'-0"



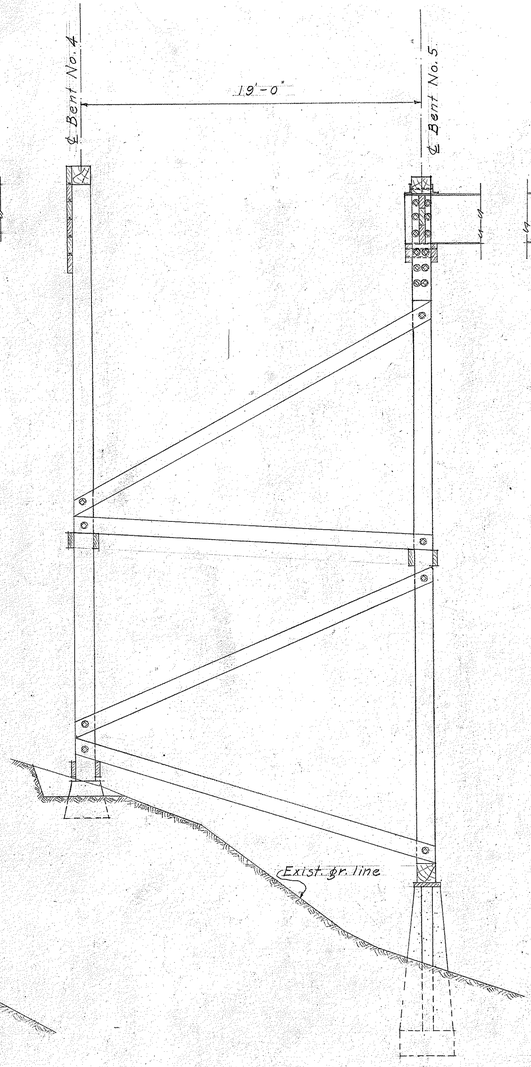
ELEV. SHOWING TOWER BRACING AT INTERMEDIATE POSTS, BENTS #2 TO #3

Scale: 1/4"=1'-0"



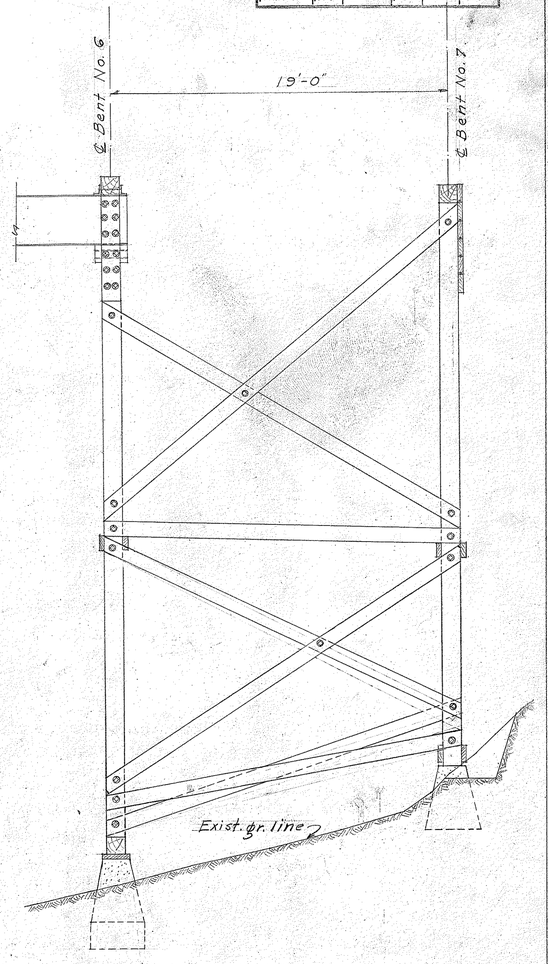
DOWNSTREAM ELEVATION SHOWING TOWER BRACING, BENTS #4 TO #5 (UPSTREAM ELEV. SIMILAR)

Scale: 1/4"=1'-0"



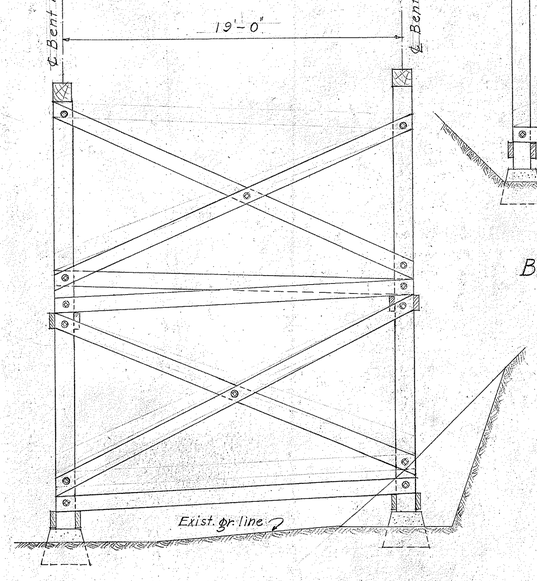
ELEV. SHOWING TOWER BRACING AT INTERMEDIATE POSTS, BENTS #4 TO #5

Scale: 1/4"=1'-0"



DOWNSTREAM ELEVATION SHOWING TOWER BRACING, BENTS #6 TO #7 (UPSTREAM ELEV. SIMILAR)

Scale: 1/4"=1'-0"



UPSTREAM ELEV. SHOWING TOWER BRACING, BENTS #3 TO #2

Scale: 1/4"=1'-0"

ORIGINAL PLAN	DRAWN BY: W. R. Bartels	Dec. 1937
	TRACED BY: M. Yamada	" "
	PLACED BY: V. Vansant	" "
	QUANTITIES BY: E. Haskell	" "
NOTE BOOK	CHECKED BY: M. Alexander	Jan. 1938
No.		

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

KAHOLALELE BRIDGE

STA. 719+91.67 TO STA. 722+32.04

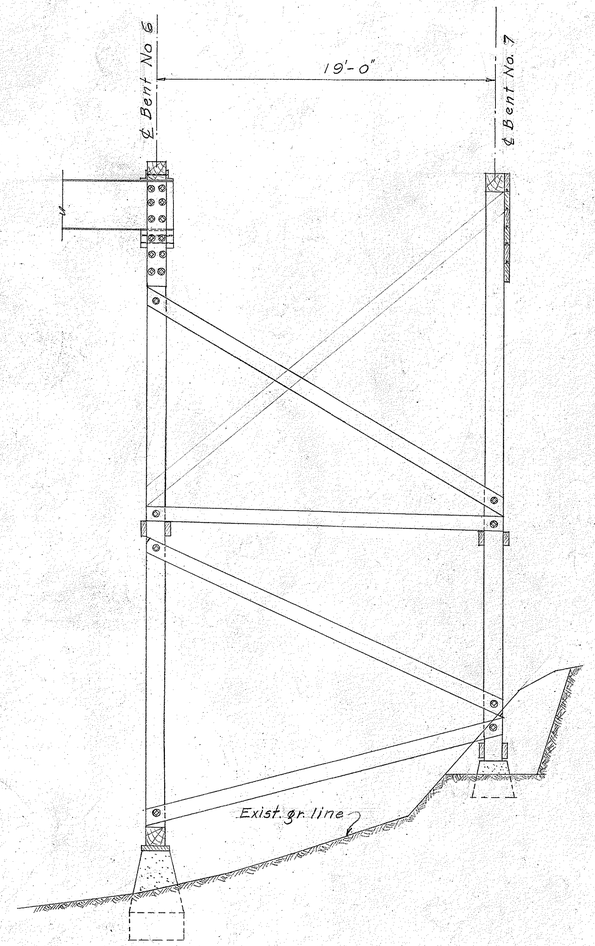
Hawaii Belt Rd.

F.A.P. 26-A Jan. 1938.

SHEET NO. 6 OF 7 SHEETS.

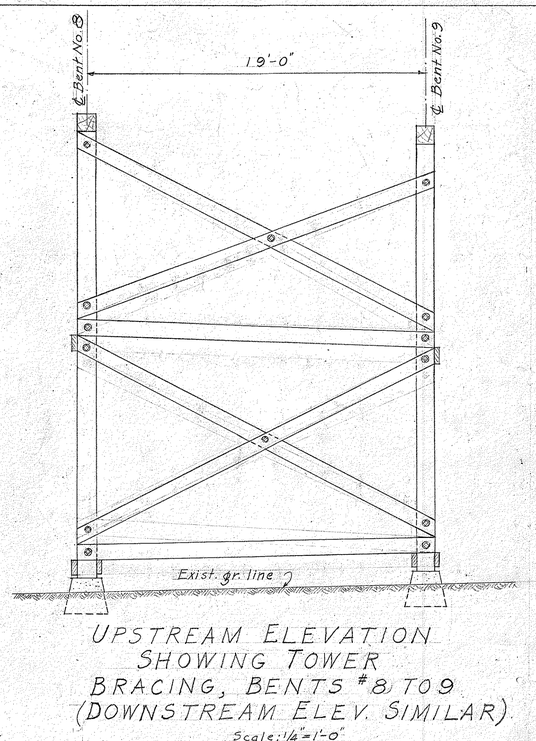
4441.26

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR		TOTAL SHEETS
Hawaii	Haw.	26-A	1938	27	51



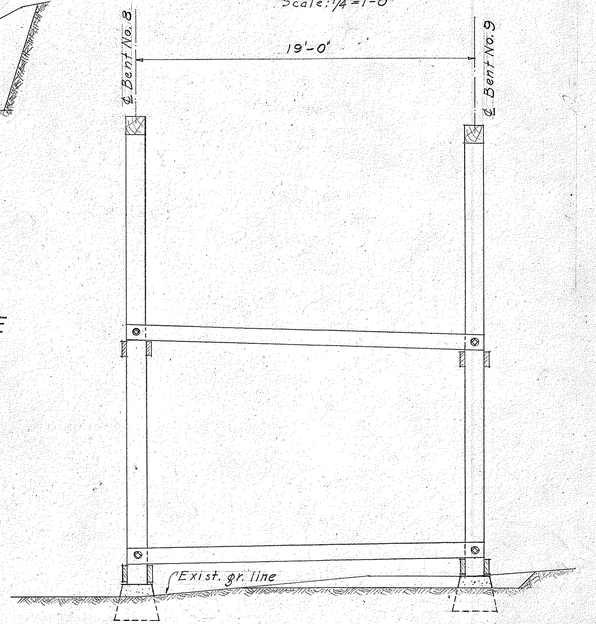
ELEV. SHOWING TOWER BRACING AT INTERMEDIATE POSTS, BENTS # 6 TO # 7

Scale: 1/4" = 1'-0"



UPSTREAM ELEVATION SHOWING TOWER BRACING, BENTS # 8 TO 9 (DOWNSTREAM ELEV. SIMILAR)

Scale: 1/4" = 1'-0"



ELEV. SHOWING TOWER BRACING AT INTERMEDIATE POSTS, BENTS # 8 TO 9.

Scale: 1/4" = 1'-0"

TIMBER BILL OF MATERIAL

MEMBER	No.	SIZE & LENGTH	KIND OF LUMBER	MILL WRK	FT. B.M.
DOUGLAS FIR COAST R&N.					
Solid Bridging	12	4"x18"x18'-0"	No.1 Dimension	SIE	1296
"	2	4"x18"x26'-0"	"	"	312
Cross "	25	2"x4"x32'-0"	"	Rough	533
Splice Block	46	6"x18"x3'-0"	Select Structural Joist & Plank	SIE	1242
Stringers	2	6"x18"x6'-0"	" Structural Beams & Stringers	Ends 45°&48°@1½" exact	108
"	2	6"x18"x8'-0"	"	"	144
"	1	6"x18"x10'-0"	"	"	90
"	2	6"x18"x12'-0"	"	"	216
"	1	6"x18"x14'-0"	"	"	126
"	2	6"x18"x16'-0"	"	"	288
"	2	6"x18"x18'-0"	"	"	324
"	180	6"x18"x20'-0"	"	"	32400
"	1	6"x18"x22'-0"	"	"	198
Sidewalk Joist Bl.	25	12"x18"x3'-0"	" Structural Posts & Timbers	See detail	1350
"	2	8"x18"x4'-0"	"	"	96
Wheel Guard	25	10"x12"x20'-0"	"	SISIE	5000
Wheel Grd. face pc.	25	4"x16"x20'-0"	"	"	2667
Guard Railing	25	3"x8"x20'-0"	" Joist & Plank Structural	S4S	1000
"	25	4"x8"x20'-0"	"	"	1333
Sidewalk End pc.	2	2"x16"x6'-0"	"	Rough	32
"	2	2"x16"x4'-0"	"	"	21
End Sheathing	1	4"x6"x34'-0"	"	"	68
"	1	4"x12"x12'-0"	"	"	48
"	3	4"x12"x34'-0"	"	"	408
Corner Block	3	2"x4"x4'-0"	"	SIS	8
End Timber	2	6"x18"x16'-0"	" Structural Beams & Stringers	SIE	288
Blocks for E.T.	1	6"x6"x8'-0"	" Structural Posts & Timbers	SIS	24
Wall Plate	2	6"x8"x20'-0"	" Structural Beams & Stringers	"	160
Deck Starter	2	6"x6"x16'-0"	"	SISIE	96
Floor Decking	1764	2"x6"x26'-0"	" Structural Joist & Plank	"	45,864
Sidewalk End pc.	1	8"x12"x10'-0"	" Structural Beams & Stringers	"	80
Sidewalk Planking	8	1"x8"x4'-0"	No.1 Dimension	SIS	32
"	688	1"x8"x4'-0"	"	"	1835
"	8	2"x8"x6'-0"	"	"	64
"	688	2"x8"x4'-0"	"	"	3670
Railing Posts	27	8"x8"x8'-0"	Select Structural Beams & Stringers	S4S	1152
"	50	8"x8"x6'-0"	"	"	1600
Posts	5	12"x12"x10'-0"	" Structural Post & Timbers	Rough	600
"	4	12"x12"x22'-0"	"	"	1056
"	10	12"x12"x24'-0"	"	"	2880
"	10	12"x12"x26'-0"	"	"	3120
"	5	12"x12"x32'-0"	"	"	1920
"	10	12"x12"x34'-0"	"	"	4080
"	5	12"x12"x36'-0"	"	"	2160
Caps	12	12"x12"x34'-0"	" Structural Beams & Stringers	SIS	4896
"	1	12"x12"x32'-0"	"	"	384
Sills	2	12"x12"x36'-0"	" Structural Posts & Timbers	Rough	864
Braces	2	3"x10"x16'-0"	" Structural Joist & Plank	"	80
"	5	3"x10"x18'-0"	"	"	225
"	63	3"x10"x20'-0"	"	"	3150
"	35	3"x10"x22'-0"	"	"	1925
"	24	3"x10"x24'-0"	"	"	1440
"	3	3"x10"x26'-0"	"	"	195
"	16	3"x10"x28'-0"	"	"	1120
"	21	3"x10"x30'-0"	"	"	1575
"	15	3"x10"x32'-0"	"	"	1200
"	8	3"x10"x34'-0"	"	"	680
"	4	3"x10"x36'-0"	"	"	360
"	2	3"x10"x38'-0"	"	"	190
Fire Stop	12	3"x12"x34'-0"	No.1 Dimension	T & G	1224
Sill Blocks	20	4"x8"x1'-6"	Select Structural Post & Timbers	SIS	80
Struts	4	4"x12"x28'-0"	" Structural Sills & Blocks	Rough	448
Post Scabs	20	6"x12"x6'-0"	" Structural Beams & Stringers	"	720
Solid Br. @ I	8	4"x9"x4'-0"	No.1 Dimension	"	96
"	16	4"x12"x3'-0"	"	"	192
Blocks @ I	16	6"x12"x3'-0"	Select Structural Joist & Plank	SIS	288
"	4	10"x12"x3'-0"	"	See detail	120
Blocks @ Struts	16	4"x12"x1'-0"	"	Rough	64
				Total	141,505

ORIGINAL PLAN	SURVEY PLOTTED BY		Dec. 1937
	DESIGNED BY W. S. Bartels	"	"
	DRAWN BY W. Tannatta	"	Jan. 1938
	CHECKED BY V. Jankaff	"	"
NOTES ON	QUANTITIES BY V. Jankaff		
No.	CHECKED BY Wm. Vannatta		

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

KAHOLALELE BRIDGE

STA. 719+91.67 TO STA. 722+32.04

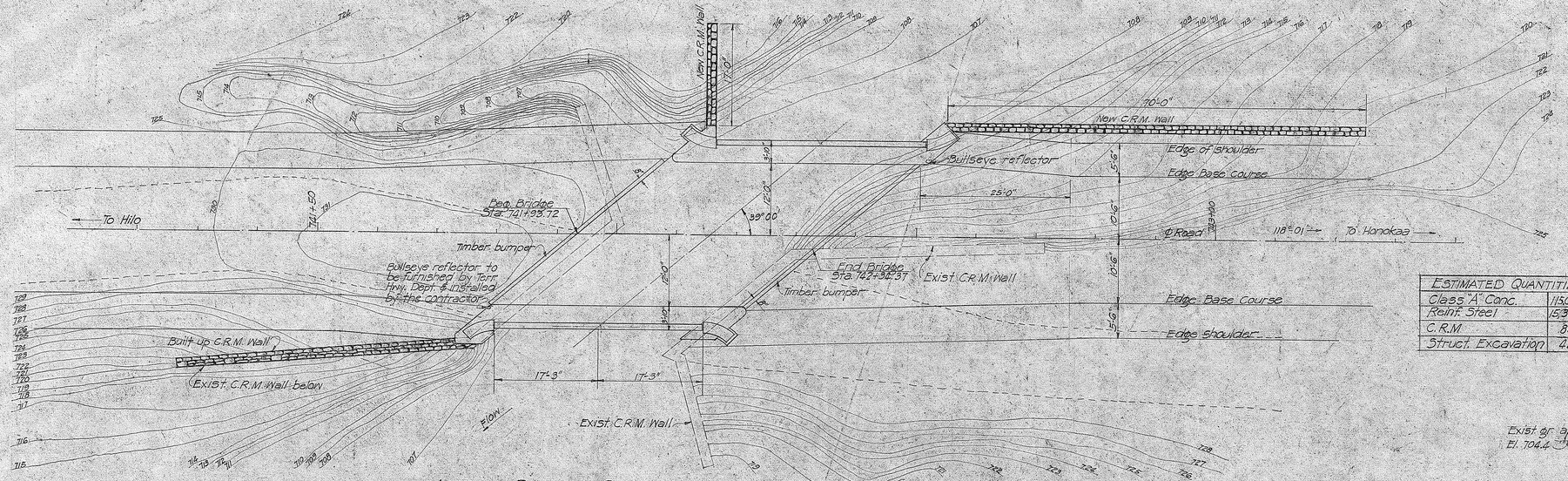
Hawaii Belt Rd.

F.A.P. 26-A Jan. 1938.

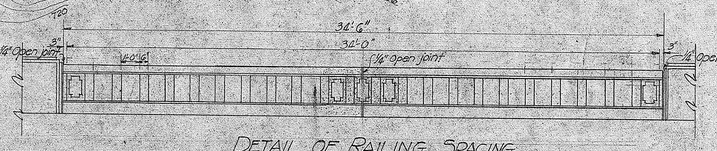
SHEET NO. 7 OF 7 SHEETS.

4441.27

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	26A	1938	29	31

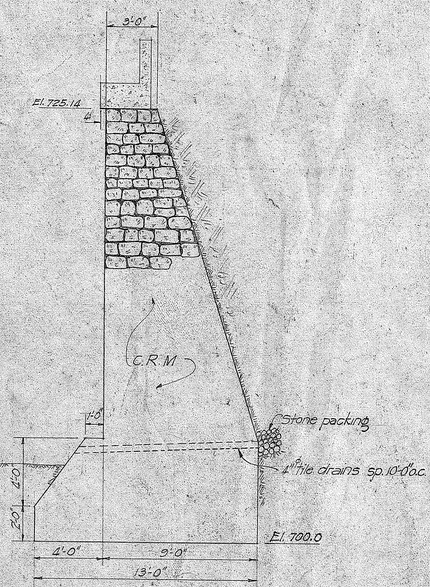


LAYOUT PLAN OF BRIDGE
Scale 1"=10'

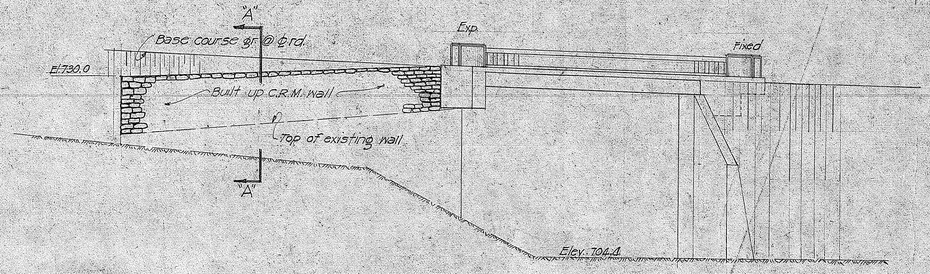


DETAIL OF RAILING SPACING
Scale ¼"=1'-0"

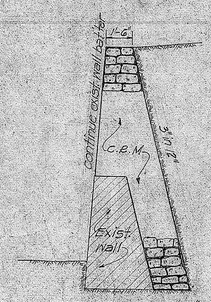
ESTIMATED QUANTITIES	
Class "A" Conc.	1150 C.Y.
Reinf. Steel	15,300 lbs.
C.R.M.	850 C.Y.
Struct. Excavation	420 C.Y.



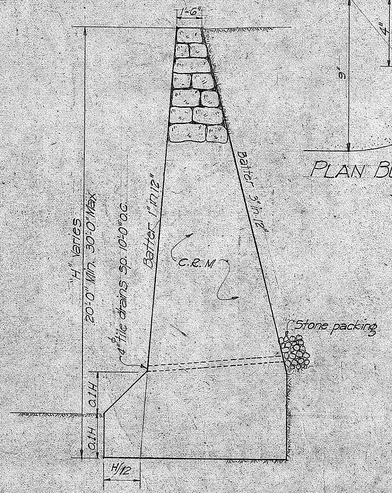
SECT. THRU ABUT. NO. 2
Scale ¼"=1'-0"
Abut. No. 1 is similar



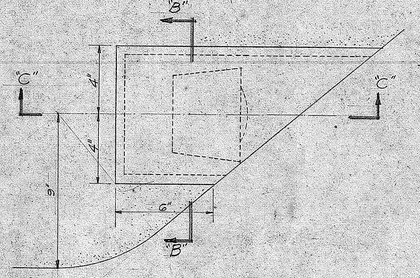
DOWNSTREAM ELEVATION
Scale 1"=10'



SECTION "A-A"
Scale ½"=1'-0"

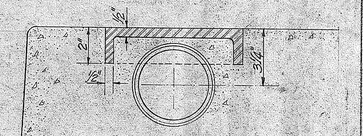


C.R.M. RETAINING WALL OVER 20 FT. HIGH
Scale ¼"=1'-0"



PLAN BULLS-EYE REFLECTOR
Scale 3"=1'-0"

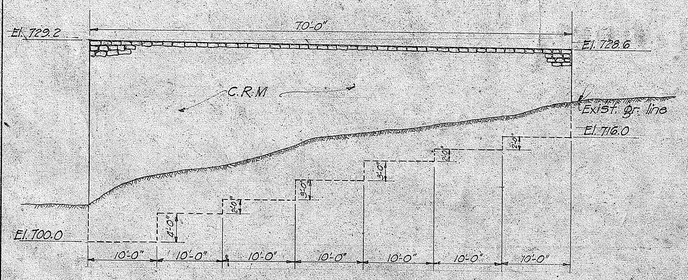
SECT. "C-C"
Scale 3"=1'-0"



SECT. "B-B"
Scale 3"=1'-0"

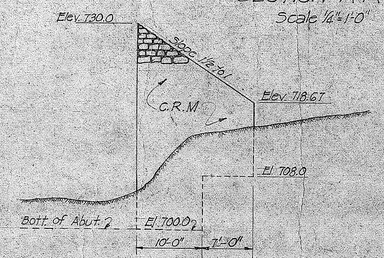
NOTE! Bulls Eye reflector to be furnished by Terr. Hy. Dept. and to be installed by the contractor. Bronze plates to be furnished by the contractor.

NOTE! Material for top plate of bulls-eye reflector to be of phosphor bronze same as bearing plate material



UPSTREAM ELEVATION OF 70 FT. LONG C.R.M. WALL
Scale 1"=10'

NOTE! For walls over 20'-0" high see details. For walls 20'-0" high or less see "Std. Detail Sheet."



ELEV. OF WINGWALL ABUT. NO. 1 LEFT LOOKING TOWARD HILO
Scale 1"=10'

ORIGINAL PLANS
SURVEY PLOTTED BY — DATE 2/27/38
DESIGNED BY H.A. BATES
DRAWN BY H.A. BATES
TRACED BY "
QUANTITIES BY "
NOTE BOOK "
CHECKED BY "
No. "

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

KAWAILII BRIDGE
STA. 141+93.72 - 142+34.37
Hawaii Belt Road F.A.P. 26-A
Jan. 1938

SHEET NO. 2 OF 4 SHEETS.

4441.29

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	26A	1938	30	51

SECT. "C-C"
Scale 3/8"=1'-0"

SECT. E-E
Scale 3/4"=1'-0"

SECT. "D-D"
Scale 3/4"=1'-0"

SPECIFICATION FOR ASPALT FILLER

Melting point 190-200 (A.S.T.M D36-26)
Penetration 30-40 (A.S.T.M D5-25)
Flash point min. 400 (A.S.T.M D93-22)

PART BOTTOM REINF.

PART TOP REINF.

PLAN SHOWING SLAB REINF.
Scale 1/4"=1'-0"

SECT. A-A
Scale 1/2"=1'-0"

SECT. "B-B"
Scale 1/2"=1'-0"

ABUT. No. 1

ABUT. No. 2

SECTION THRU. END BEAMS
Scale 3/4"=1'-0"

END BEAM ABUT. No. 2
Scale 1/4"=1'-0"

NOTE: End beam at Abut #1 is similar

DETAIL GIRDERS G-3 & G-4
Scale 1/2"=1'-0"

DETAIL G-2 & G-5
Scale 1/2"=1'-0"

DETAIL GIRDERS G-1 & G-6
Scale 1/2"=1'-0"

NORMAL SECT. THRU BRIDGE SHOWING SLAB REINF.
Scale 3/8"=1'-0"

PARABOLIC BRIDGE CROWN ORDINATES

G-1 & G-6

G-2 & G-5 SECTION THRU GIRDERS
Scale 3/4"=1'-0"

G-3

G-4

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

KAWAILII BRIDGE
STA. 741+93.72 - 742+34.37
Hawaii Belt Road F.A.P. 26A
Jan. 1938

SHEET NO. 3 OF 4 SHEETS.

4441.30

ORIGINAL PLAN
SURVEY PLOTTED BY
DESIGNED BY
DETAILED BY
TRACED BY
QUANTITIES BY
CHECKED BY
NOTE BOOK
No.
DATE

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	26-A	1939	31	51

SECT. "C-C"
Scale 3/8"=1'-0"

SECT. E-E
Scale 3/8"=1'-0"

SECT. "G-G"
Scale 3/8"=1'-0"

PLAN OF ABUTMENTS PRIOR TO PLACING OF SUPERSTR.
Scale 1/4"=1'-0"

ELEV. "X-X" ABUTMENT No. 1
Scale 1/4"=1'-0"

NOTE: Existing abutments 1 & 2 are in perfect condition.

PART PLAN ABUT. No. 2 (LEFT)
Scale 3/8"=1'-0"

SECT. "D-D"
Scale 3/8"=1'-0"

SECT. "H-H"
Scale 3/8"=1'-0"

SECT. "F-F"
Scale 3/8"=1'-0"

SECT. "K-K"
Scale 3/8"=1'-0"

Note: Timber bumpers to be furnished & installed as an incidental to class 'A' conc.

ELEV. "Y-Y" ABUTMENT No. 2
Scale 1/4"=1'-0"

SECT. "M-M"
Scale 3/4"=1'-0"

PLAN OF GIRDER SEATS. ABUT. No. 1 (EXP)
Scale 3/8"=1'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE Dec. 1938
	TRACED BY	" "
	DRAWN BY	" "
NOTE BOOK	TRACED BY	" "
No.	QUANTITIES BY	" "
	CHECKED BY	" "

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

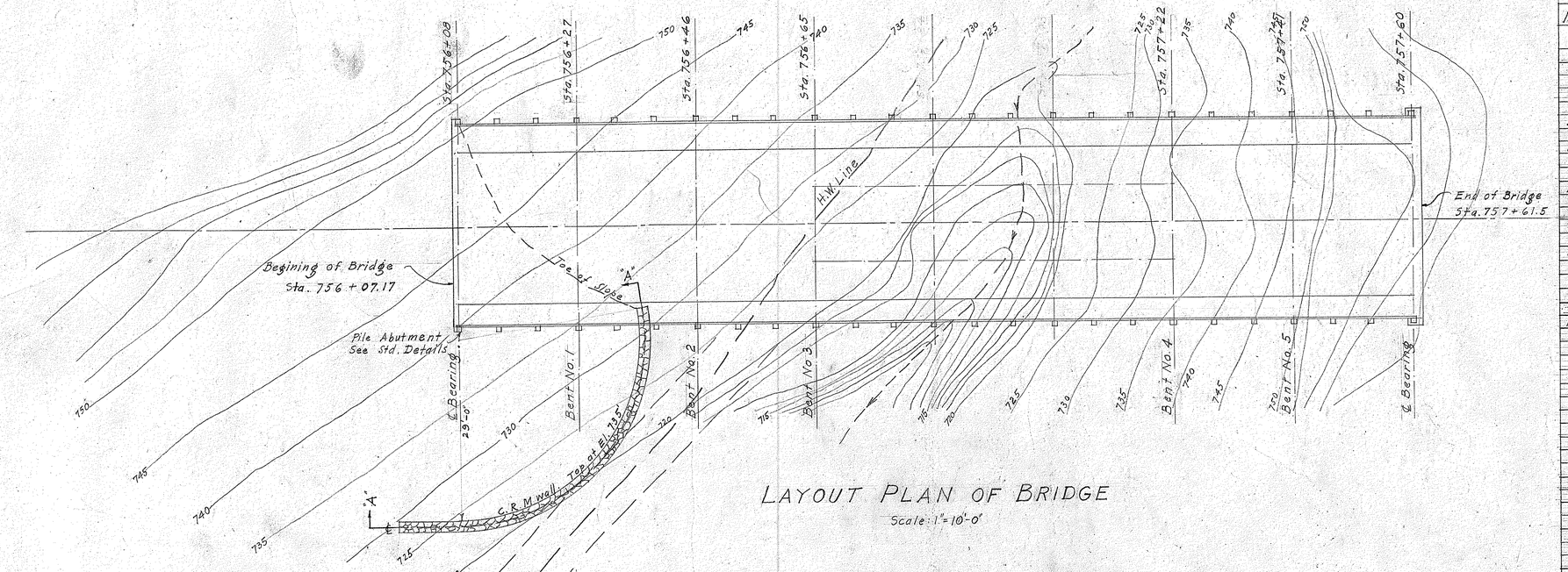
KAWAILII BRIDGE

STA. 741+93.72 – 742+34.37
Hawaii Belt Road F.A.P. 26-A
Jan. 1938

SHEET NO. 4 OF 4 SHEETS.

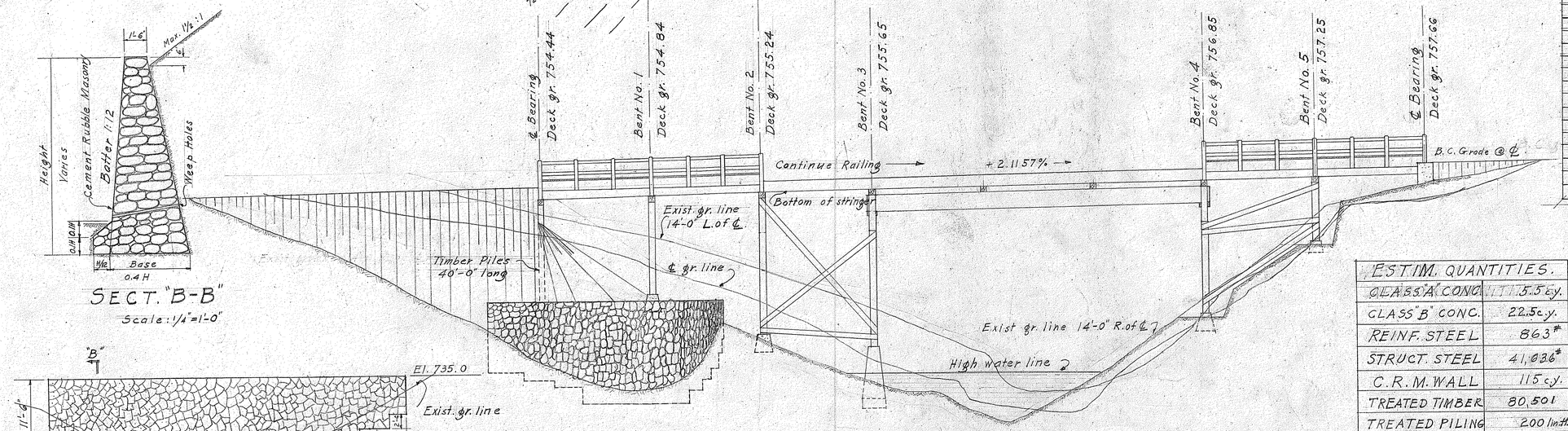
4441.31

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw.	26-A	1938	32	51



LAYOUT PLAN OF BRIDGE

Scale: 1"=10'-0"

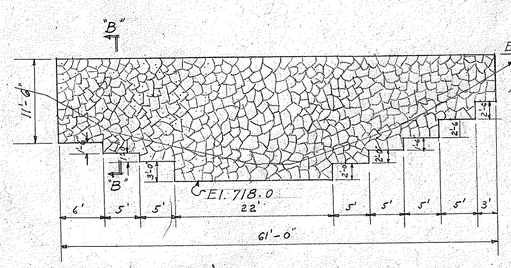


DOWNSTREAM ELEVATION OF BRIDGE

Scale: 1"=10'-0"

SECT. "B-B"

Scale: 1/4"=1'-0"



SECT. "A-A"

Scale: 1"=10'-0"

TIMBER BILL OF MATERIAL

MEMBER	No.	SIZE & LENGTH	KIND OF LUMBER	MILL WRK	FT. B.M.
DOUGLAS FIR COAST RGN.					
Solid Bridging	7	4"×18"×18'-0"	No.1 Dimension	S1E	756
"	2	4"×18"×26'-0"	"	"	312
Cross	16	2"×4"×32'-0"	"	Rough	341
Splice Blocks	28	6"×18"×3'-0"	Select Structural Joist & Plank	S1E	756
Stringers	120	6"×18"×20'-0"	Structural Beams & Stringers	Ends sawed to fits exact	21600
Sidewalk Joist Bt	16	12"×18"×3'-0"	Structural Posts & Timbers	See detail	864
Wheel Guard	16	10"×12"×20'-0"	"	S1S1E	3200
Wheel Grd. face pc.	16	4"×16"×20'-0"	"	"	1707
Guard Railing	16	3"×8"×20'-0"	Structural Joist & Plank	S4S	640
" "	16	4"×8"×20'-0"	"	"	853
End Sheathing	1	4"×6"×34'-0"	"	Rough	68
"	1	4"×12"×12'-0"	"	"	48
"	3	4"×12"×34'-0"	"	"	408
Sidewalk End pc	2	2"×16"×4'-0"	"	"	21
"	2	2"×16"×6'-0"	"	"	32
Corner Blocking	2	2"×4"×1'-6"	"	S1S	2
Deck Starter	1	6"×6"×26'-0"	Structural Beams & Stringers	S1S1E	78
Wall Plate	1	6"×8"×34'-0"	"	S1S	136
Sidewalk Joist Bt	2	8"×18"×3'-0"	Structural Posts & Timbers	See detail	72
" End pc.	2	8"×12"×4'-0"	Structural Beams & Stringers	S1S	64
Floor Decking	1130	2"×6"×26'-0"	Structural Joist & Plank	S1S1E	29380
Sidewalk Plank	8	1"×8"×6'-0"	No.1 Dimension	S1S	32
"	442	1"×8"×4'-0"	"	"	1189
"	8	2"×8"×6'-0"	"	"	64
"	442	2"×8"×4'-0"	"	"	2378
Railing Posts	18	8"×8"×8'-0"	Select Structural Beams & Stringers	S4S	768
"	32	8"×8"×6'-0"	"	"	1024
Posts	1	12"×12"×6'-0"	Structural Posts & Timbers	Rough	72
"	7	12"×12"×10'-0"	"	"	840
"	1	12"×12"×12'-0"	"	"	144
"	1	12"×12"×14'-0"	"	"	168
"	2	12"×12"×16'-0"	"	"	384
"	2	12"×12"×18'-0"	"	"	432
"	7	12"×12"×20'-0"	"	"	1680
"	4	12"×12"×24'-0"	"	"	1152
Caps	8	12"×12"×34'-0"	Structural Beams & Stringers	S1S	3264
Braces	5	3"×10"×16'-0"	Structural Joist & Plank	Rough	200
"	2	3"×10"×18'-0"	"	"	90
"	12	3"×10"×20'-0"	"	"	600
"	10	3"×10"×22'-0"	"	"	550
"	14	3"×10"×24'-0"	"	"	840
"	2	3"×10"×26'-0"	"	"	130
"	2	3"×10"×28'-0"	"	"	140
"	6	3"×10"×30'-0"	"	"	450
"	5	3"×10"×32'-0"	"	"	400
"	1	3"×10"×34'-0"	"	"	85
"	1	3"×10"×38'-0"	"	"	95
Struts	4	4"×12"×28'-0"	"	"	448
Post Scabs	20	6"×12"×6'-0"	Structural Beams & Stringers	"	720
Solid Br. @ I	8	4"×9"×4'-0"	No.1 Dimension	"	96
"	16	4"×12"×4'-0"	"	"	256
Blocks @ I	16	6"×12"×3'-0"	Select Structural Joist & Plank	S1S	288
"	4	10"×12"×3'-0"	"	See detail	120
Blocks @ Struts	16	4"×12"×1'-0"	"	Rough	64
				Total	80,501

ESTIM. QUANTITIES.	
CLASS "A" CONC.	5.5 c.y.
CLASS "B" CONC.	22.5 c.y.
REINF. STEEL	863 #
STRUCT. STEEL	41,036 #
C.R.M. WALL	115 c.y.
TREATED TIMBER	80,501
TREATED PILING	200 lin ft
STRUCT. EXCAV.	178.0 c.y.
UNCLASS. EXCAV.	65.0 c.y.

DATE	Jan. 1938
DESIGNED BY	W.R. Bartels
TRACED BY	W. Yamada
CHECKED BY	V. Vavrek
QUANTITIES BY	V. Vavrek
NOTES BY	W. Yamada
No.	

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

PAAUILO SCHOOL BRIDGE

STA. 756+07.17 TO STA. 757+61.5

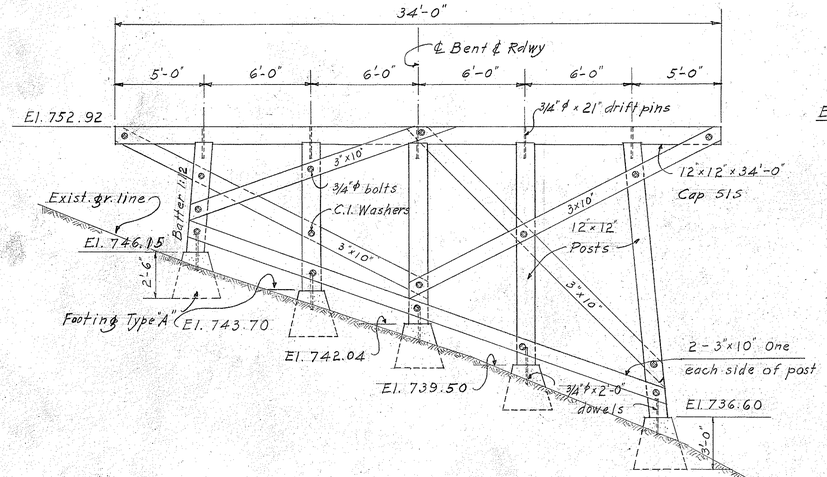
Hawaii Belt Rd.

F.A.P. 26-A Jan. 1938

SHEET NO. 1 OF 3 SHEETS

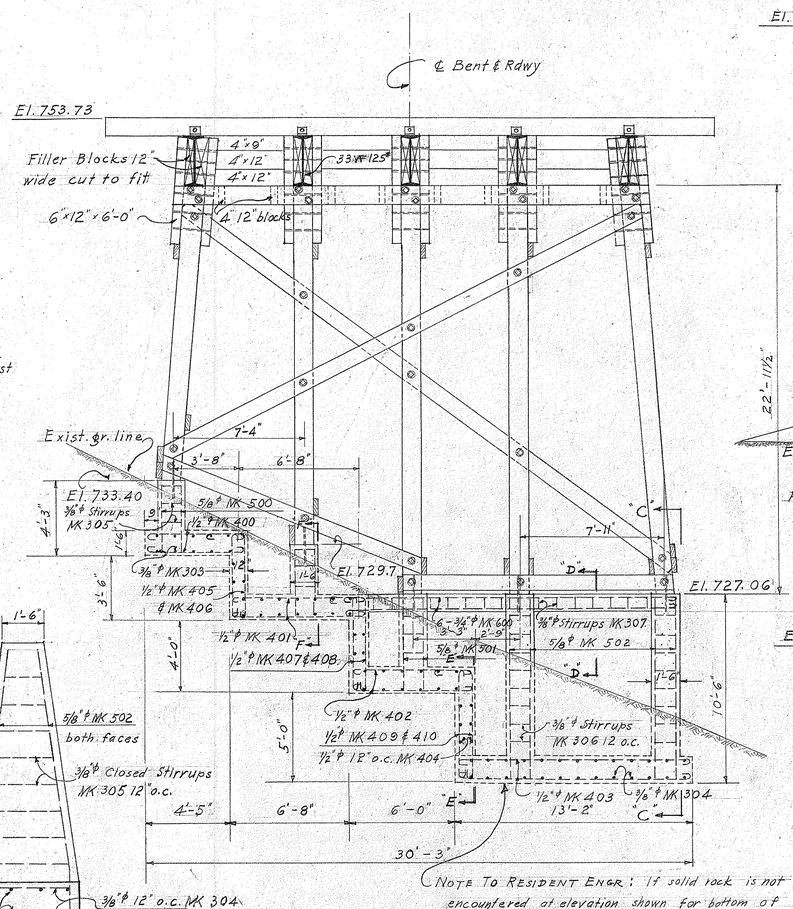
4441.32

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw.	26-A	1938	33	51



ELEV. OF BENT NO. 1 STA. 756+27

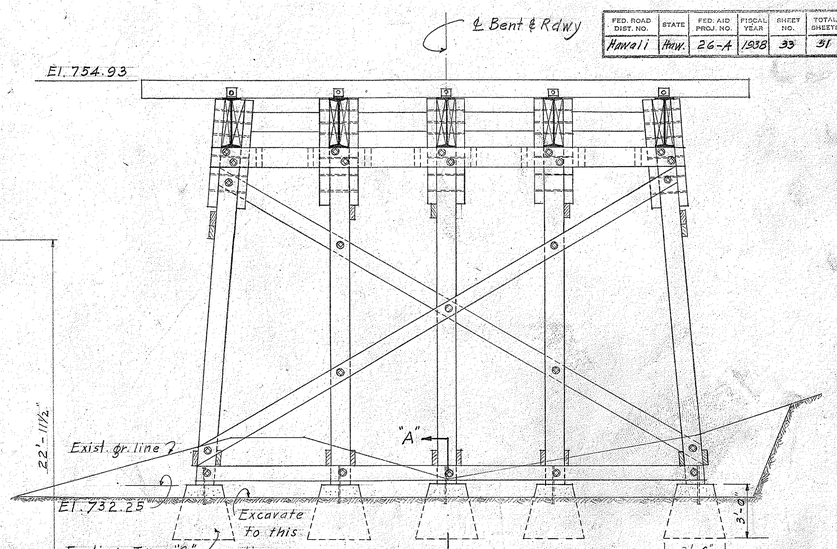
Scale: 1/4"=1'-0"



NOTE TO RESIDENT ENGR: If solid rock is not encountered at elevation shown for bottom of this ftg., use boulder concrete below ftg. to form solid base.

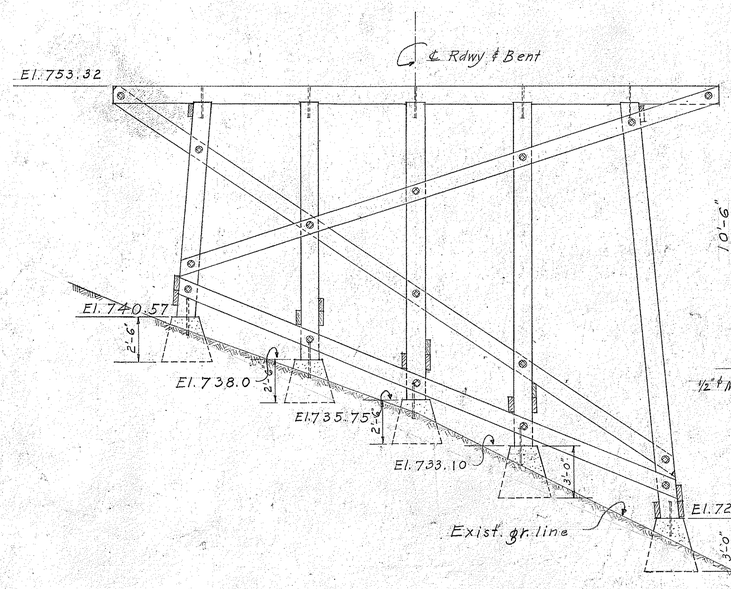
ELEV. OF BENT NO. 3 STA. 756+65

Scale: 1/4"=1'-0"



ELEV. OF BENT NO. 4 STA. 757+22

Scale: 1/4"=1'-0"

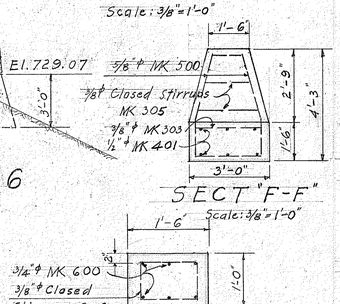


ELEV. OF BENT NO. 2. STA. 756+46

Scale: 1/4"=1'-0"

SECT. "C-C"

Scale: 3/8"=1'-0"

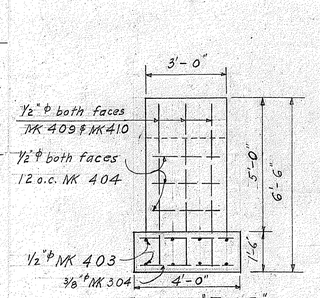


SECT. "F-F"

Scale: 3/8"=1'-0"

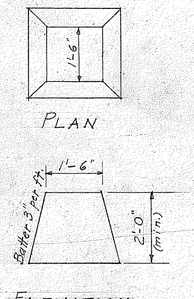
SECT. "D-D"

Scale: 3/4"=1'-0"



SECT. "E-E"

Scale: 3/8"=1'-0"

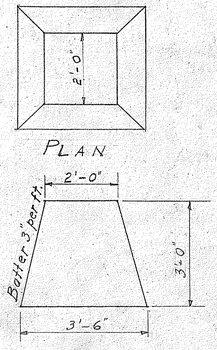


PLAN

ELEVATION

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

DETAIL OF CONC. FTG. TYPE "A"

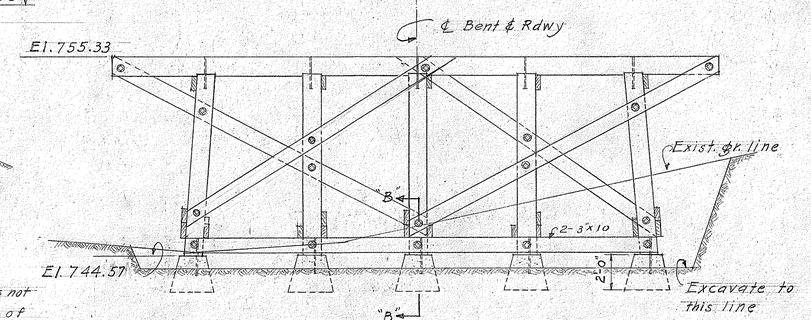


PLAN

ELEVATION

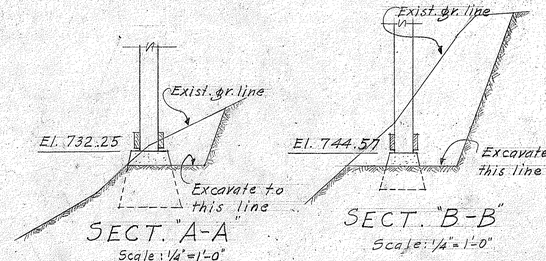
Scale: 1/2"=1'-0"

DETAIL OF CONC. FTG. TYPE "C"



ELEV. OF BENT NO. 5 STA. 757+41

Scale: 1/4"=1'-0"



SECT. "A-A"

Scale: 1/4"=1'-0"

SECT. "B-B"

Scale: 1/4"=1'-0"

NOTE! Spacing of posts for other bents are same as shown for bent No.1.

GENERAL SURVEY PLOTTED BY S. Barthels DATE Jan.1938
DRAWN BY W.Hackett " " "
TRACED BY W.Yanagisaki " " "
QUANTITIES BY W.Yanagisaki " " "
CHECKED BY W.H.Yamashita " " "
NO. REVISION MK DATE
No. " " "

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

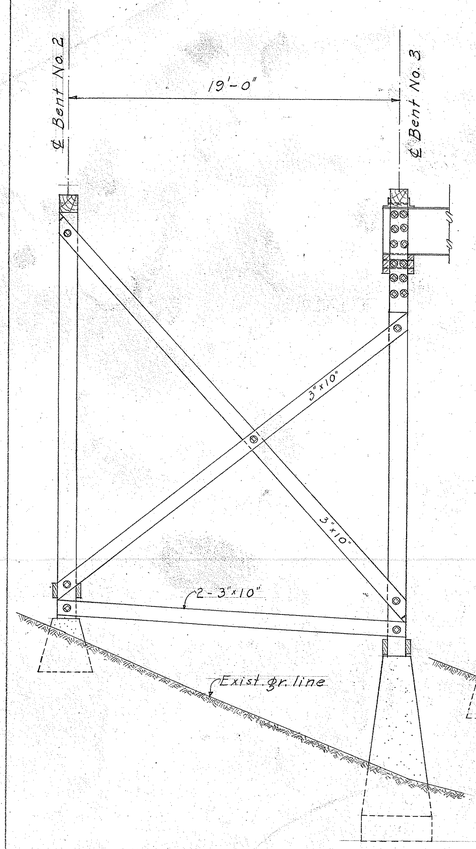
PAAUILO SCHOOL BRIDGE

STA. 756+07.17 TO STA. 757+61.5
Hawaii Belt Rd.
F.A.P. 26-A Jan. 1938

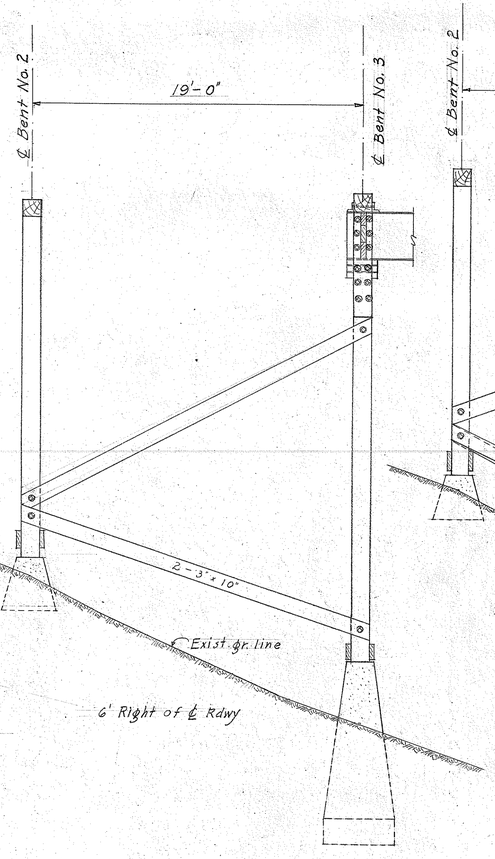
SHEET NO. 2 OF 3 SHEETS.

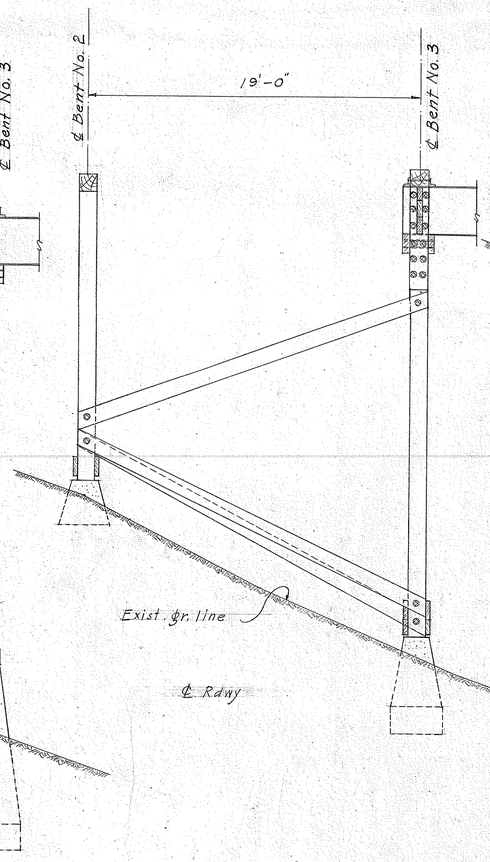
4441.33

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw	26-A	1938	34	51

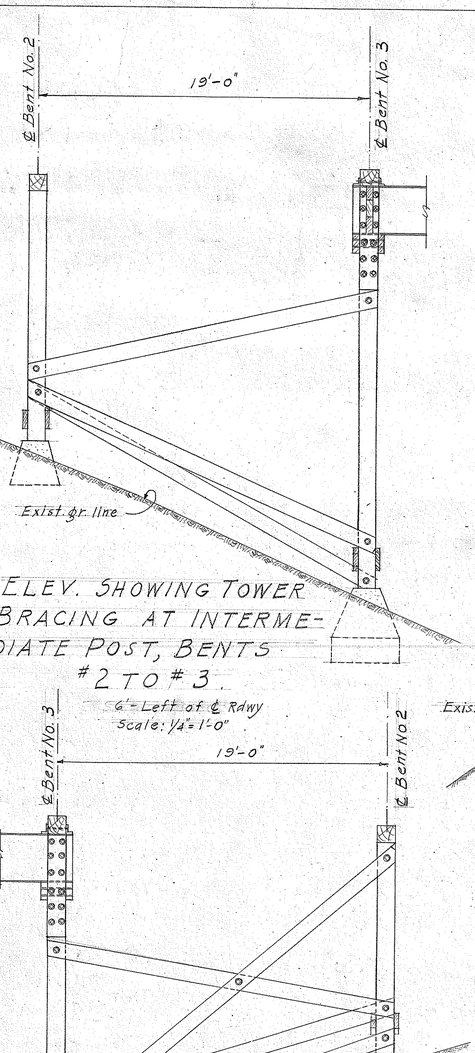


DOWNSTREAM ELEVATION
SHOWING TOWER
BRACING, BENTS #2 TO #3
Scale: 1/4"=1'-0"

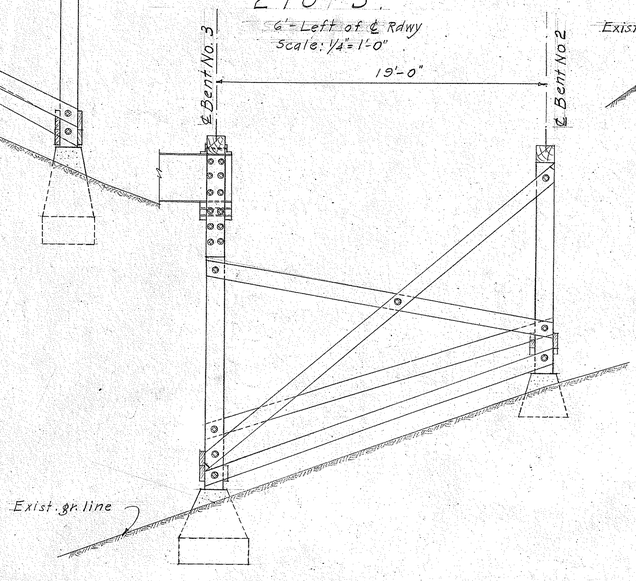




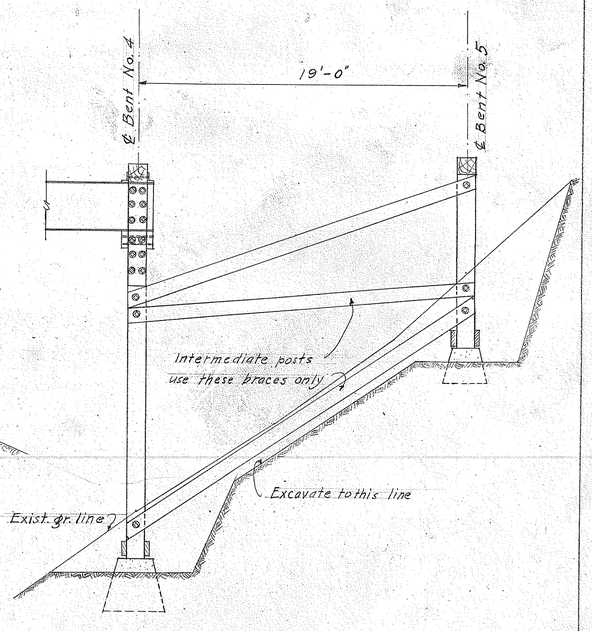
ELEVATIONS SHOWING TOWER BRACING
AT INTERMEDIATE POSTS #2 TO #3
Scale: 1/4"=1'-0"



ELEV. SHOWING TOWER
BRACING AT INTERME-
DIATE POST, BENTS
#2 TO #3.



UPSTREAM ELEVATION
SHOWING TOWER
BRACING, BENTS #2 TO #3
Scale: 1/4"=1'-0"



DOWNSTREAM ELEVATION
SHOWING TOWER
BRACING, BENTS #4 TO #5
(UPSTREAM ELEV. SIMILAR)
Scale: 1/4"=1'-0"

Note: All bolts 3/4" unless C.I.
Washers both ends

CHANGES	DATE
CHECKED BY W. S. Bartell	Jan. 1938
TRACED BY Wm Yamatta	" "
DESIGNED BY Wm Yamatta	" "
COMPUTED BY P. Kokkalis	" "
CHECKED BY Wm Yamatta	" "

NOTE BOOK
No.

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

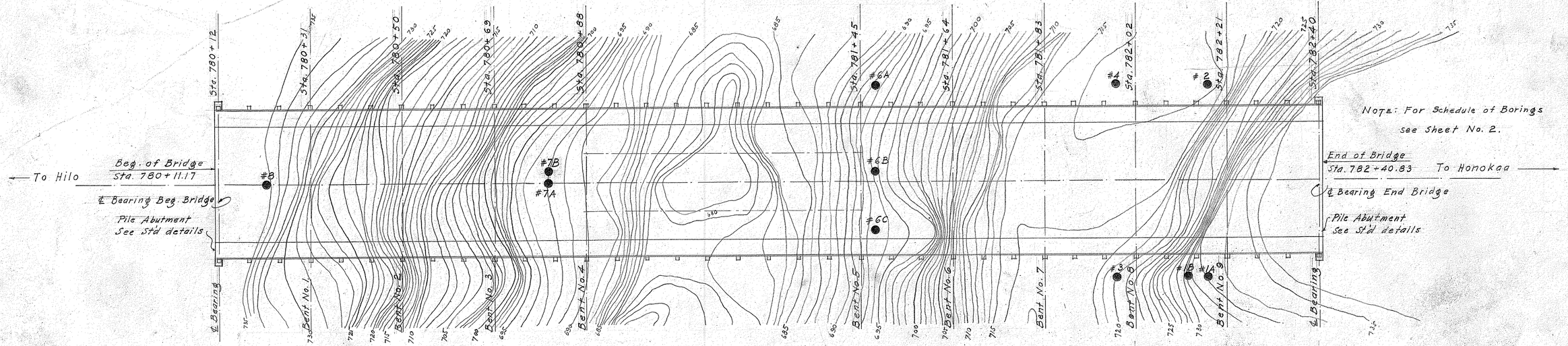
PAAUILO SCHOOL BRIDGE

STA. 756+07.17 TO STA. 757+61.5
Hawaii Belt Rd.
F.A.P. 26-A Jan. 1938

SHEET NO. 3 OF 3 SHEETS.

4441.34

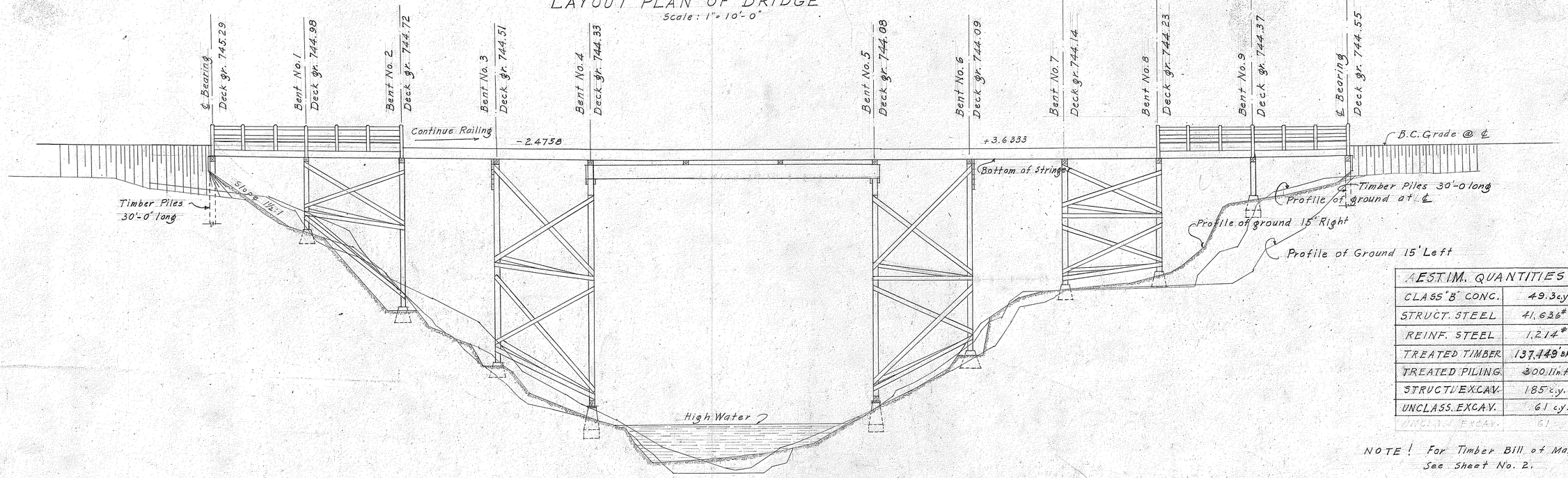
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw.	26-A	1938	35	51



NOTE: For Schedule of Borings see Sheet No. 2.

LAYOUT PLAN OF BRIDGE

Scale: 1"=10'-0"



UPSTREAM ELEVATION OF BRIDGE

Scale: 1"=10'-0"

ESTIM. QUANTITIES	
CLASS "B" CONC.	49.3 c.y.
STRUCT. STEEL	41,636#
REINF. STEEL	1,214#
TREATED TIMBER	137,149 B.M.
TREATED PILING	300 lin. ft.
STRUCT. EXCAV.	185 c.y.
UNCLASS. EXCAV.	61 c.y.

NOTE! For Timber Bill of Material See Sheet No. 2.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE Jan. 1938
	DESIGNED BY W. Bartels	" "
	TRACED BY W. Bartels	" "
NOTE BOOK	TRACED BY K. Nakata	" "
No.	QUANTITIES BY W. Bartels	Feb. 1938
	CHECKED BY M.E. Hamilton	" "

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

EAST PAAUILO BRIDGE

STA. 780+11.17 TO STA. 782+40.83

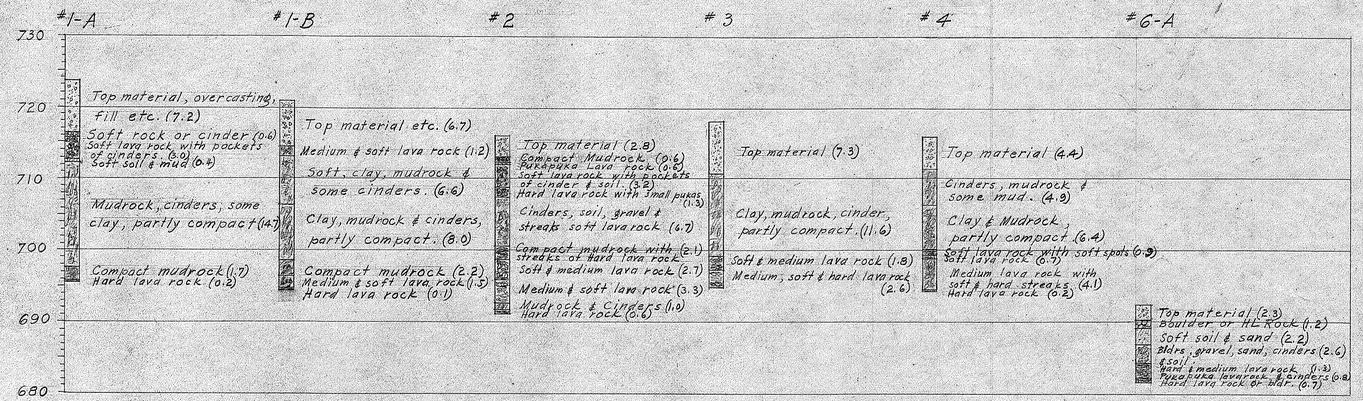
Hawaii Belt Rd.

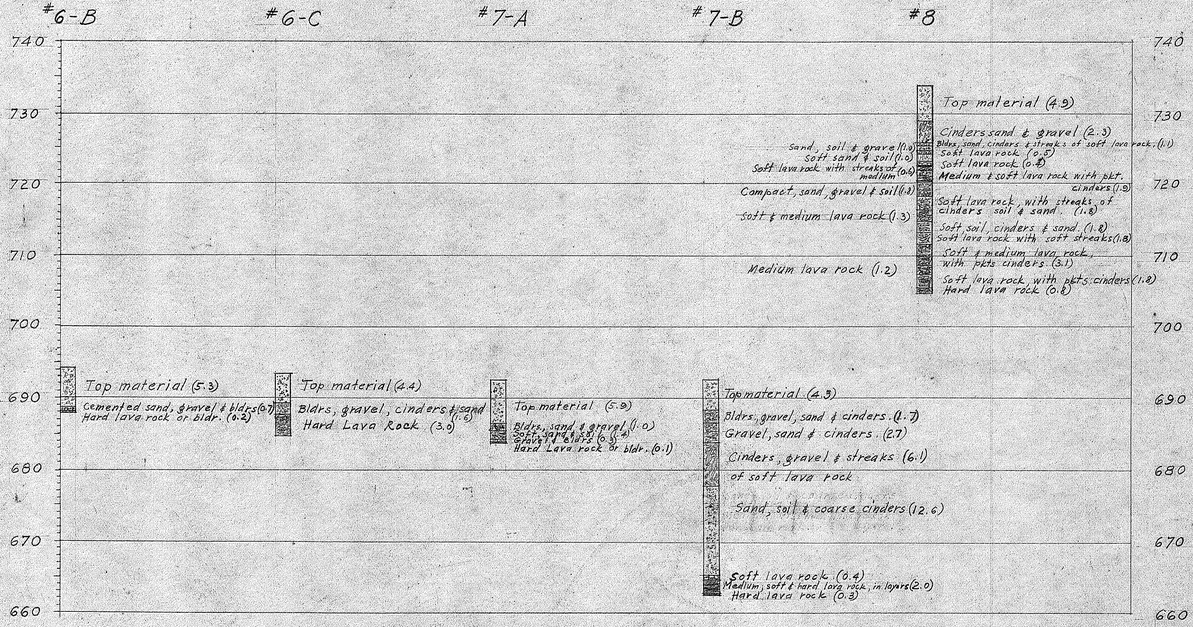
F.A.P. 26-A Feb. 1938

SHEET NO. 1 OF 7 SHEETS.

4441.35

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw.	26-A	1938	36	51





TIMBER BILL OF MATERIAL

MEMBER	No.	SIZE & LENGTH	KIND OF LUMBR	MILL WRK	FT. BM.
DOUGLAS FIR COAST RGN.					
Solid Bridging	11	4"x18"x16'-0"	No.1 Dimension	S1E	1056
"	2	4"x18"x26'-0"	"	"	312
Cross "	24	2"x4"x32'-0"	"	Rough	512
Splice Blocks	44	6"x18"x3'-0"	Select Structural Joist & Plank	S1E	1188
Stringers	180	6"x18"x20'-0"	" Beams & Stringers	Entire Stringers 70% exact	32400
Sidewalk Joist Bk	26	12"x18"x3'-0"	" Structural Post & Timbers	See detail	1404
Wheel Guard	24	10"x12"x20'-0"	" "	S1S1E	4800
Wheel Grd Face pc	24	4"x16"x20'-0"	" "	"	2560
Guard Railing	24	3"x8"x20'-0"	" Structural Joist & Plank	S4S	960
" "	24	4"x8"x20'-0"	" "	"	1280
End Sheathing	2	4"x6"x34'-0"	"	Rough	136
"	2	4"x12"x12'-0"	"	"	96
"	6	4"x12"x34'-0"	"	"	816
Sidewalk End pc.	4	2"x16"x6'-0"	"	"	64
Floor Decking	1685	2"x6"x26'-0	"	S1S1E	43810
Sidewalk Plank	4	1"x8"x6'-0"	No.1 Dimension	S1S	16
"	664	1"x8"x4'-0"	"	"	1771
"	4	2"x8"x6'-0"	"	"	32
"	664	2"x8"x4'-0"	"	"	3541
Railing Posts	26	8"x8"x8'-0"	Select Structural Beams & Stngrs	S4S	1109
" "	48	8"x8"x6'-0"	" "	"	1536
Posts	2	12"x12"x8'-0"	" Structural Post & Timbers	Rough	192
"	1	12"x12"x10'-0"	" "	"	120
"	1	12"x12"x12'-0"	" "	"	144
"	3	12"x12"x14'-0"	" "	"	504
"	1	12"x12"x16'-0"	" "	"	192
"	2	12"x12"x18'-0"	" "	"	432
"	1	12"x12"x22'-0"	" "	"	264
"	6	12"x12"x24'-0"	" "	"	1728
"	5	12"x12"x26'-0"	" "	"	1560
"	1	12"x12"x28'-0"	" "	"	336
"	2	12"x12"x30'-0"	" "	"	720
"	5	12"x12"x38'-0"	" "	"	2280
"	2	12"x12"x40'-0"	" "	"	960
"	3	12"x12"x44'-0"	" "	"	1584
"	10	12"x12"x46'-0"	" "	"	5520
Caps	13	12"x12"x34'-0"	" Structural Beams & Stngrs	S1S	5304
Sills	2	12"x12"x36'-0"	" Structural Post & Timbers	"	864
Braces	2	3"x10"x8'-0"	" Joist & Plank	Rough	40
"	2	3"x10"x10'-0"	" "	"	50
"	1	3"x10"x14'-0"	" "	"	35
"	8	3"x10"x18'-0"	" "	"	190
"	29	3"x10"x20'-0"	" "	"	1450
"	40	3"x10"x22'-0"	" "	"	2200
"	30	3"x10"x24'-0"	" "	"	1800
"	14	3"x10"x26'-0"	" "	"	1910
"	9	3"x10"x28'-0"	" "	"	1630
"	22	3"x10"x30'-0"	" "	"	1650
"	14	3"x10"x32'-0"	" "	"	1120
"	15	3"x10"x34'-0"	" "	"	1275
"	1	3"x10"x36'-0"	" "	"	90
"	2	3"x10"x40'-0"	" "	"	200
"	2	3"x10"x42'-0"	" "	"	210
Fire Stop	12	3"x12"x34'-0	No.1 Dimension	T&G	1224
Struts	4	4"x12"x28'-0	Select Structural Joist & Plank	Rough	448
Blocks @ I	16	6"x12"x3'-0"	"	S1S	288
"	4	10"x12"x3'-0"	"	See detail	120
Blocks @ Struts	16	4"x12"x1'-0"	"	Rough	64
Post Scabs	20	6"x12"x6'-0"	" Structural Beams & Stringers	"	720
Solid Br. @ I	8	4"x9"x4'-0"	No.1 Dimension	"	96
"	16	4"x12"x4'-0"	"	"	256
Bearing Blks	10	4"x8"x3'-0"	Select Structural Post & Timbers	S1S	80
				Total	137,149

SCHEDULE OF BRIDGE BORINGS, PAAUILO, HAWAII, T.H.

STA. 780+22 – 782+17

FOR LOCATION OF BORINGS SEE SHEET NO.1

CONCRETE	SURVEY PLOTTED BY	DATE
	SURVEY CHECKED BY	"
STEEL	LINES & GRADES SET BY	"
	NOTE BOOK	"
No.	QUANTITIES BY	Feb. 1938
	CHECKED BY	"

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

EAST PAAUILO BRIDGE

STA. 780+11.17 TO STA. 782+40.83

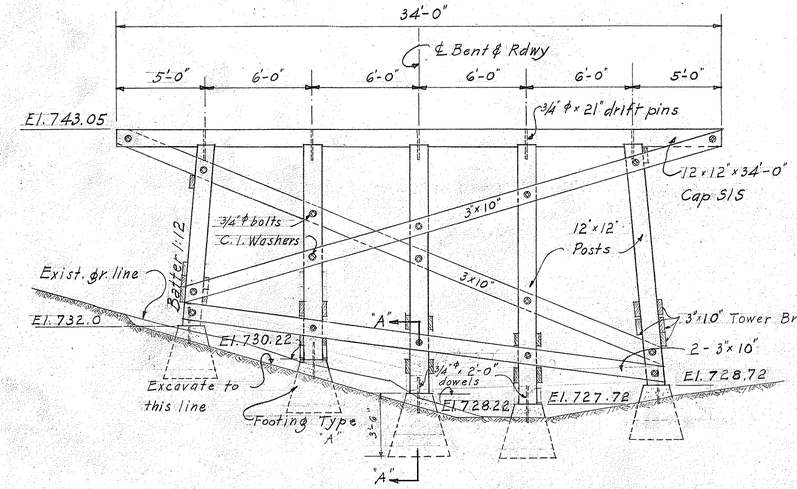
Hawaii Belt Rd.

F.A.P. 26-A Feb. 1938

SHEET NO. 2 OF 7 SHEETS.

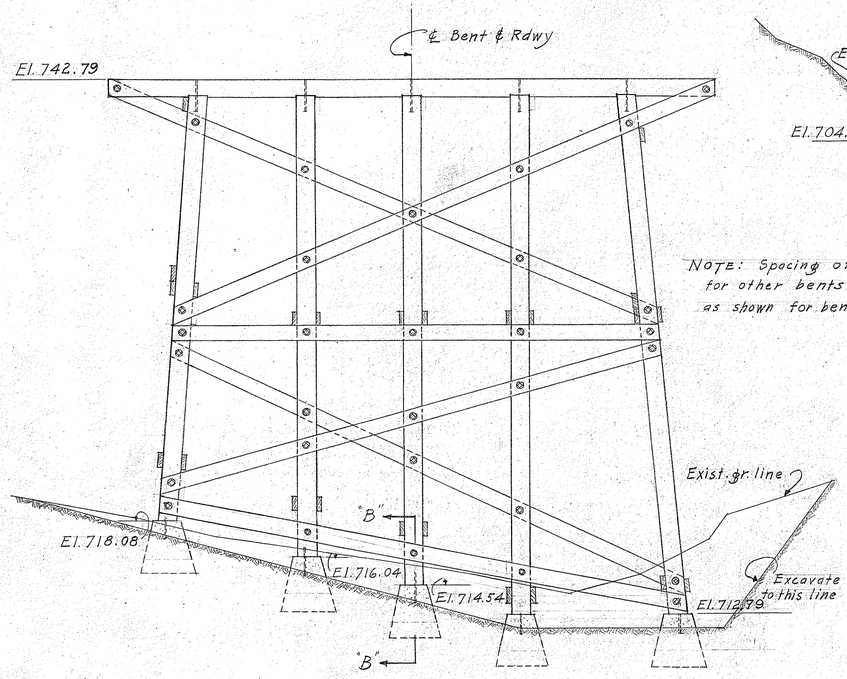
4441.36

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Hawaii	26-A	1938	37	51



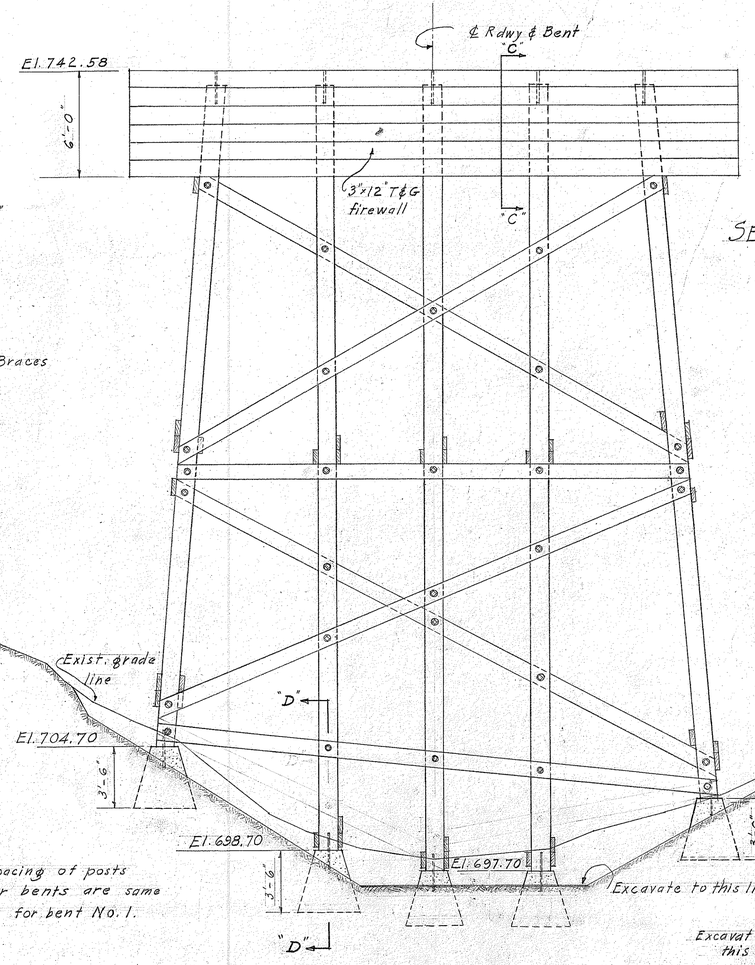
ELEV. OF BENT No. 1 STA. 780+31

Scale: 1/4"=1'-0"



ELEV. OF BENT NO. 2. STA. 780+50

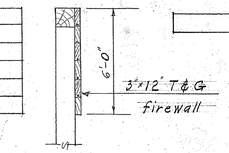
Scale: 1/4"=1'-0"



NOTE: Spacing of posts for other bents are same as shown for bent No. 1.

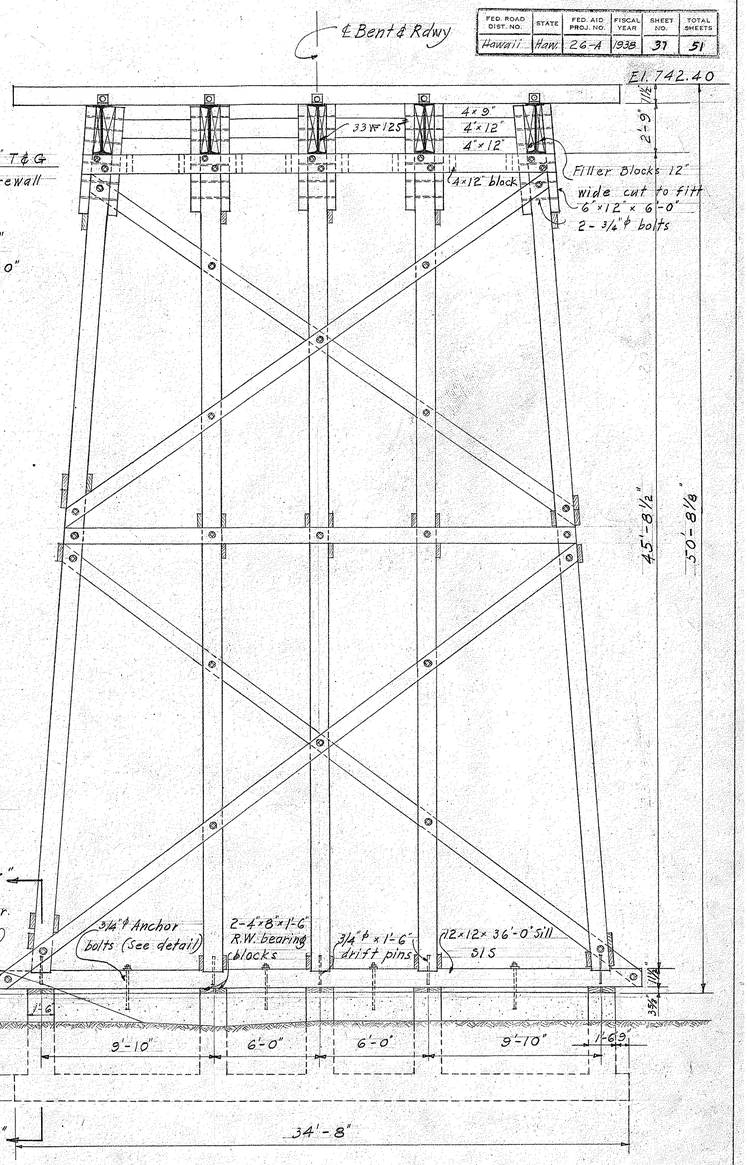
ELEV. OF BENT No 3. STA. 780+69.

Scale: 1/4"=1'-0"



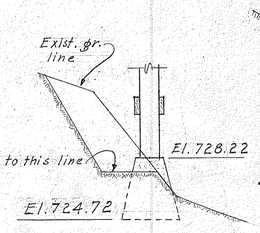
SECT "C-C"

Scale: 1/4"=1'-0"



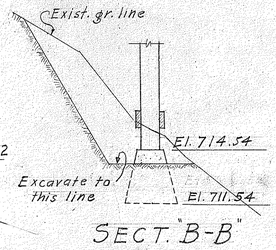
ELEV. OF BENT No. 4 STA. 780+88

Scale: 1/4"=1'-0"



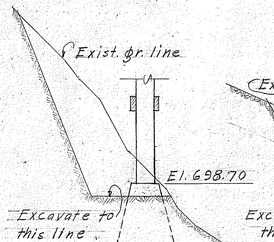
SECT. "A-A"

Scale: 1/4"=1'-0"



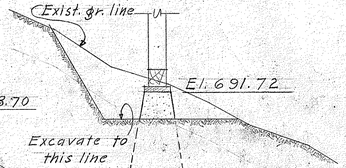
SECT. "B-B"

Scale: 1/4"=1'-0"



SECT. "D-D"

Scale: 1/4"=1'-0"



SECT. "E-E"

Scale: 1/4"=1'-0"

ORIGINAL PLANS	SURVEYED BY	DATE
	DRAWN BY W.R. Bartels	Jan. 1938
	TRACED BY Wm Yamatta	" " "
	CHECKED BY Yamakeet	" " "
NOTE BOOK	QUANTITIES BY Yamakeet	Feb. 1942
No.	CHECKED BY Wm Yamatta	" " "

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

EAST PAAUILO BRIDGE

STA. 780+11.17 TO STA. 782+40.83

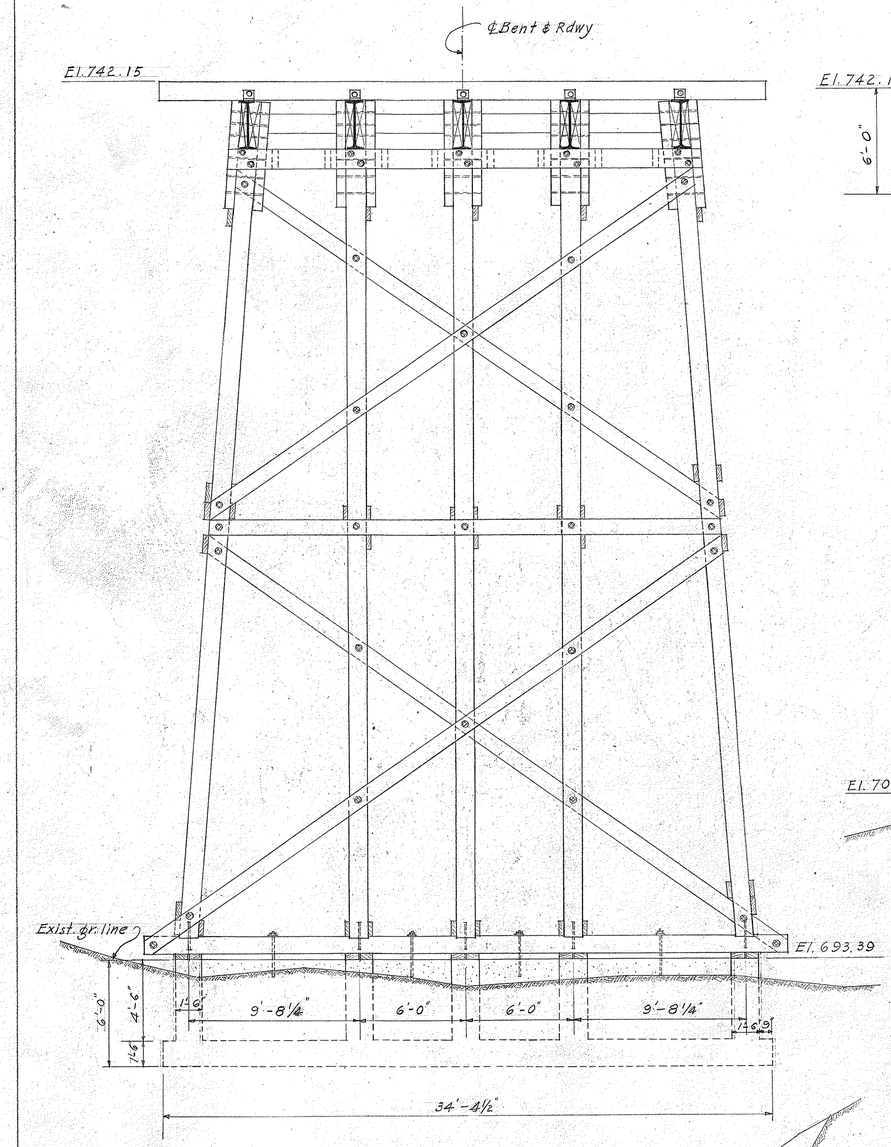
Hawaii Belt Rd.

F.A.P. 26-A Feb. 1938

SHEET NO. 3 OF 7 SHEETS.

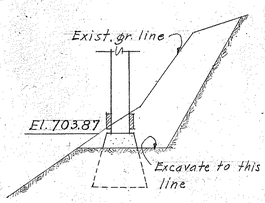
4441.37

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw.	26-A	1938	38	51



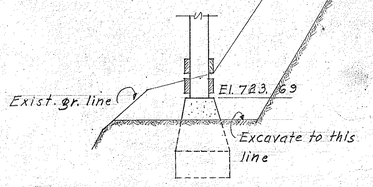
ELEV. OF BENT NO. 5 STA. 781+45

Scale: ¼"=1'-0"



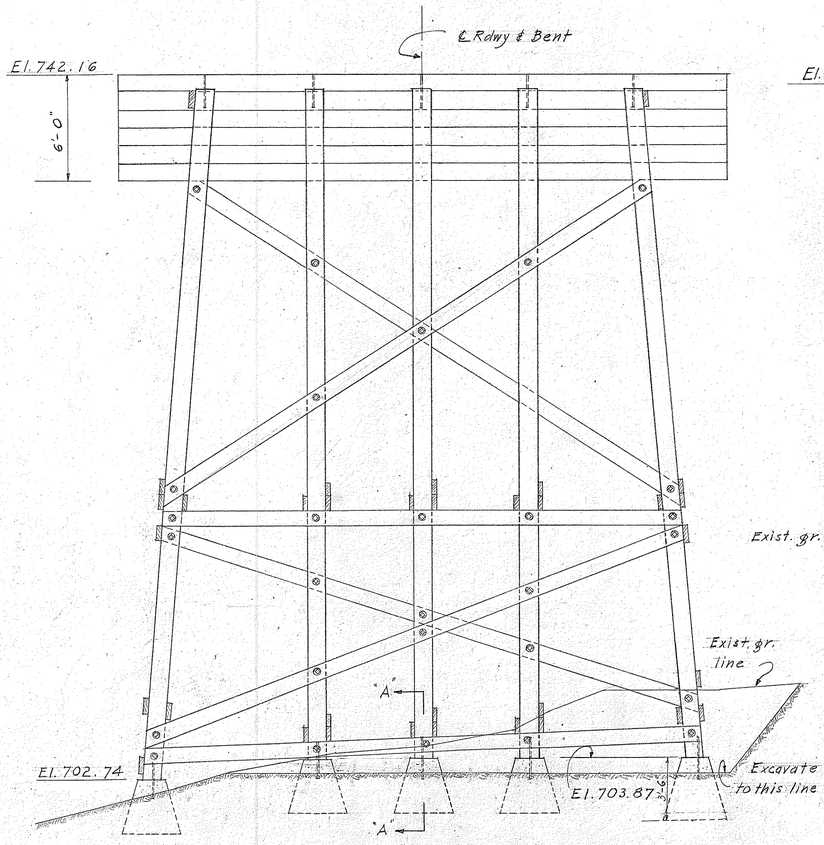
SECT. "A-A"

Scale: ¼"=1'-0"



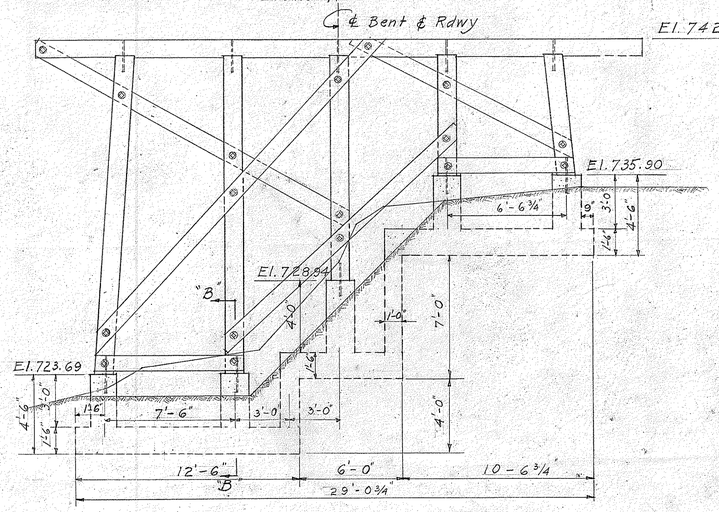
SECT. "B-B"

Scale: ¼"=1'-0"

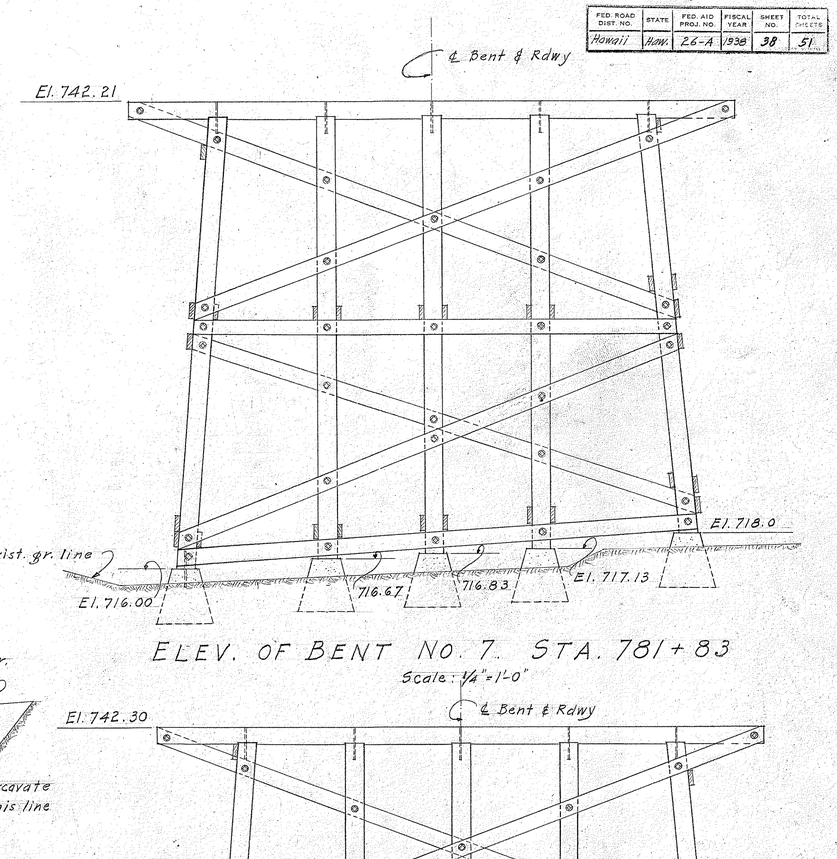


ELEV. OF BENT NO. 6 STA. 781+64

Scale: ¼"=1'-0"

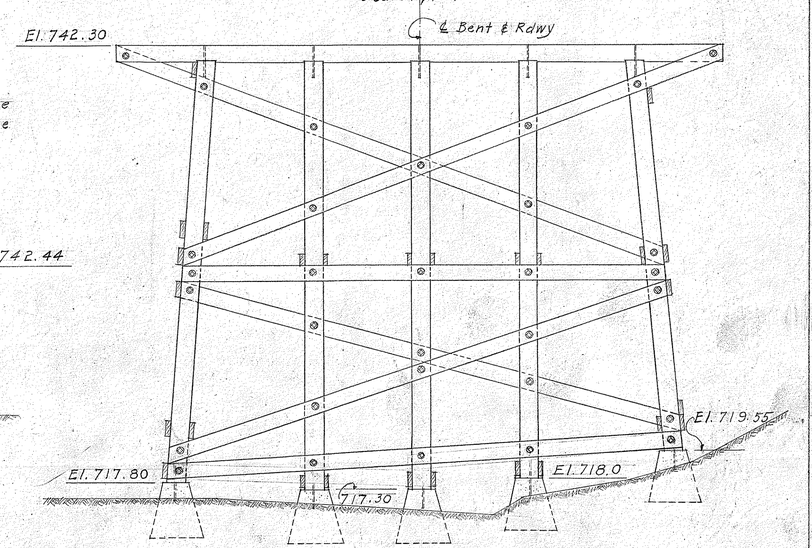


ELEV. OF BENT NO. 9 STA. 782+21



ELEV. OF BENT NO. 7 STA. 781+83

Scale: ¼"=1'-0"



ELEV. OF BENT NO. 8 STA. 782+02

Scale: ¼"=1'-0"

SURVEY PLOTTED BY	W.K. Bartels Jan. 1938
COMPUTED BY	W.B. Jannette " "
DRAWN BY	W.K. Bartels " "
CHECKED BY	W.C. Lockhart " "
APPROVED BY	W.C. Lockhart Feb. 1938
	W.M. Venable " "

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

EAST PAAUILO BRIDGE

STA. 780+11.17 TO STA. 782+40.83

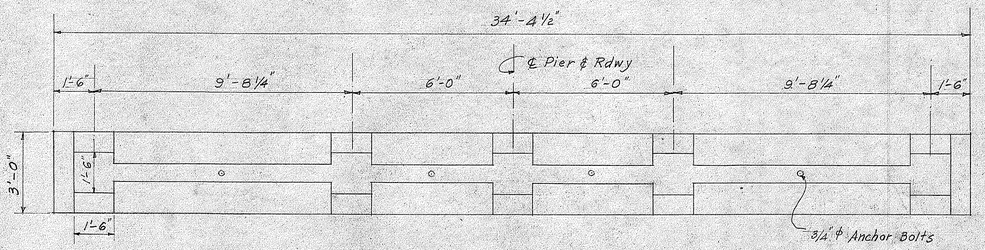
Hawaii Belt Rd.

F.A.P. 26-A Feb. 1938

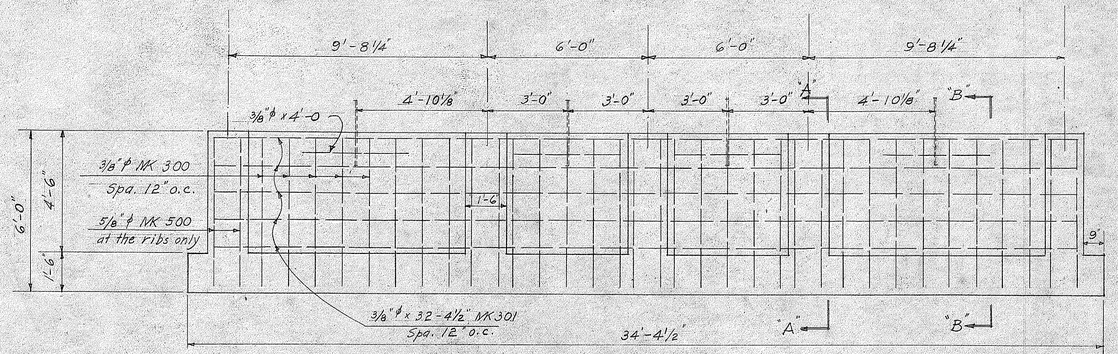
SHEET NO. 4 OF 7 SHEETS.

4441.38

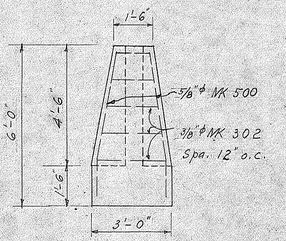
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw.	26-A	1938	39	51



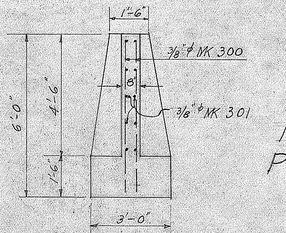
PLAN OF PIER TYPE "B"
Scale: 3/8" = 1'-0"



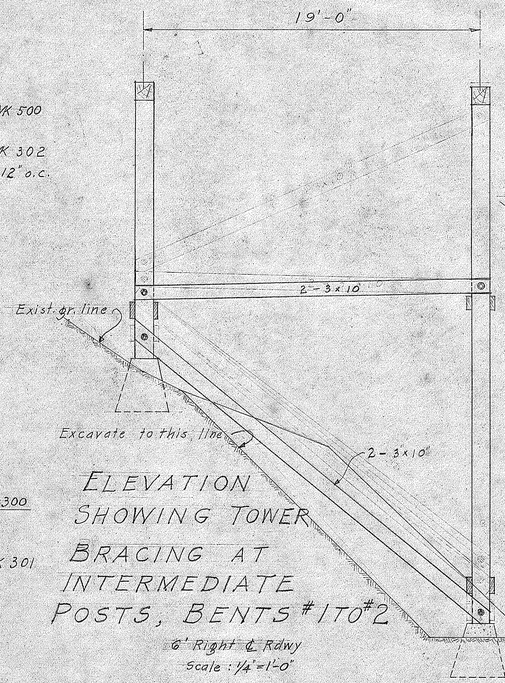
DETAIL OF PIER STA 781+45
Scale: 3/8" = 1'-0"



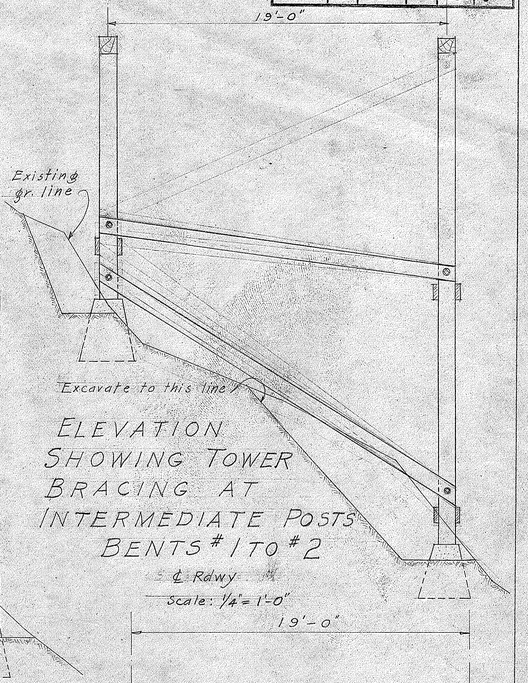
SECT. "A-A"
Scale: 3/8" = 1'-0"



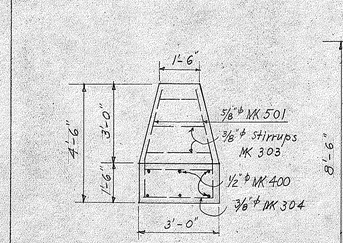
SECT. "B-B"
Scale: 3/8" = 1'-0"



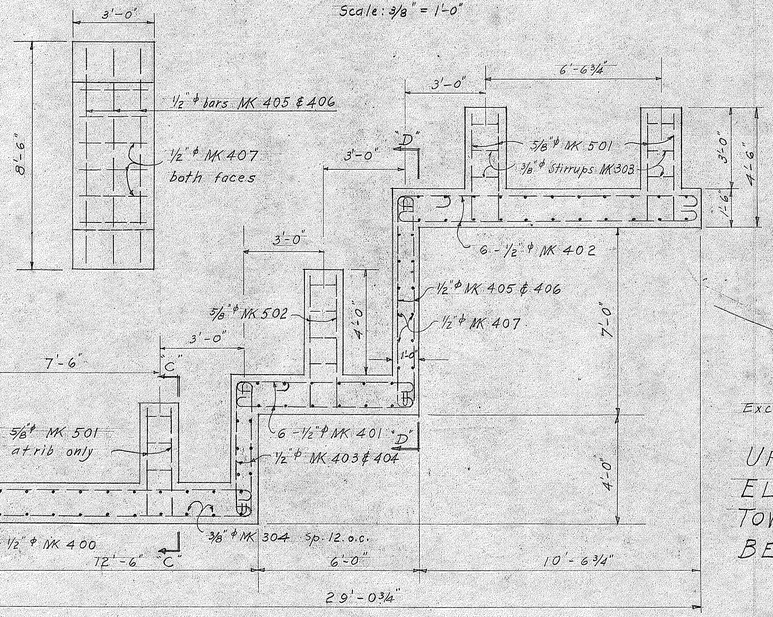
ELEVATION SHOWING TOWER BRACING AT INTERMEDIATE POSTS, BENTS #1 TO #2
6' Right ℄ Rdwy
Scale: 1/4" = 1'-0"



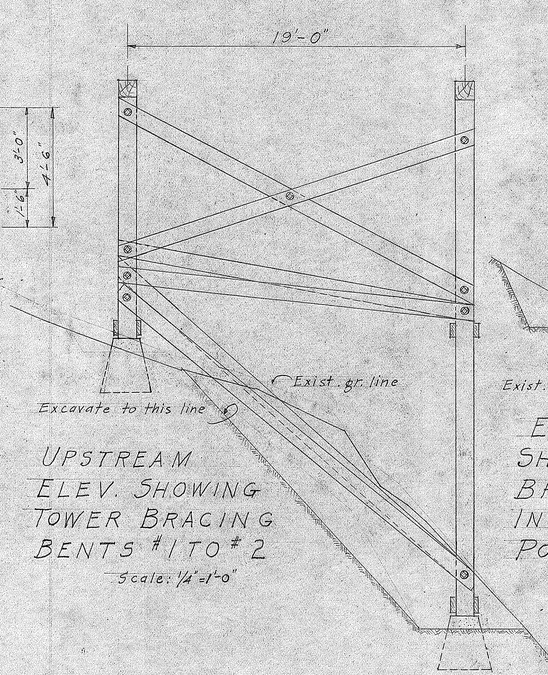
ELEVATION SHOWING TOWER BRACING AT INTERMEDIATE POSTS BENTS #1 TO #2
℄ Rdwy
Scale: 1/2" = 1'-0"



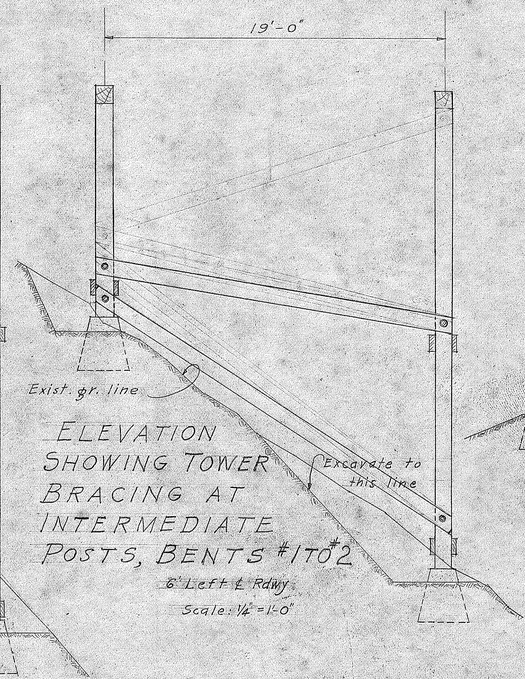
SECT. "C-C"
Scale: 3/8" = 1'-0"



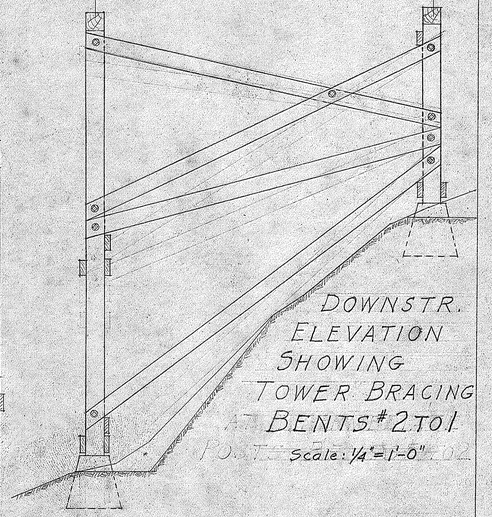
DETAIL OF PIER STA. 782+21
Scale: 3/8" = 1'-0"



UPSTREAM ELEV. SHOWING TOWER BRACING BENTS #1 TO #2
Scale: 1/4" = 1'-0"



ELEVATION SHOWING TOWER BRACING AT INTERMEDIATE POSTS, BENTS #1 TO #2
6' Left ℄ Rdwy
Scale: 1/4" = 1'-0"



DOWNSTR. ELEVATION SHOWING TOWER BRACING BENTS #2 TO #1
Scale: 1/4" = 1'-0"

ORIGINAL	CORRECTED BY	DATE
TRACED BY	W.R. Bartels	Jan. 1938
DESIGNED BY	W. Vannatta	
CHECKED BY	W. Vanna He	
QUANTITIES BY	W. Vannatta	
CHECKED BY	W. Vanna He	
NOTE BOOK		54, 1938
No.		

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

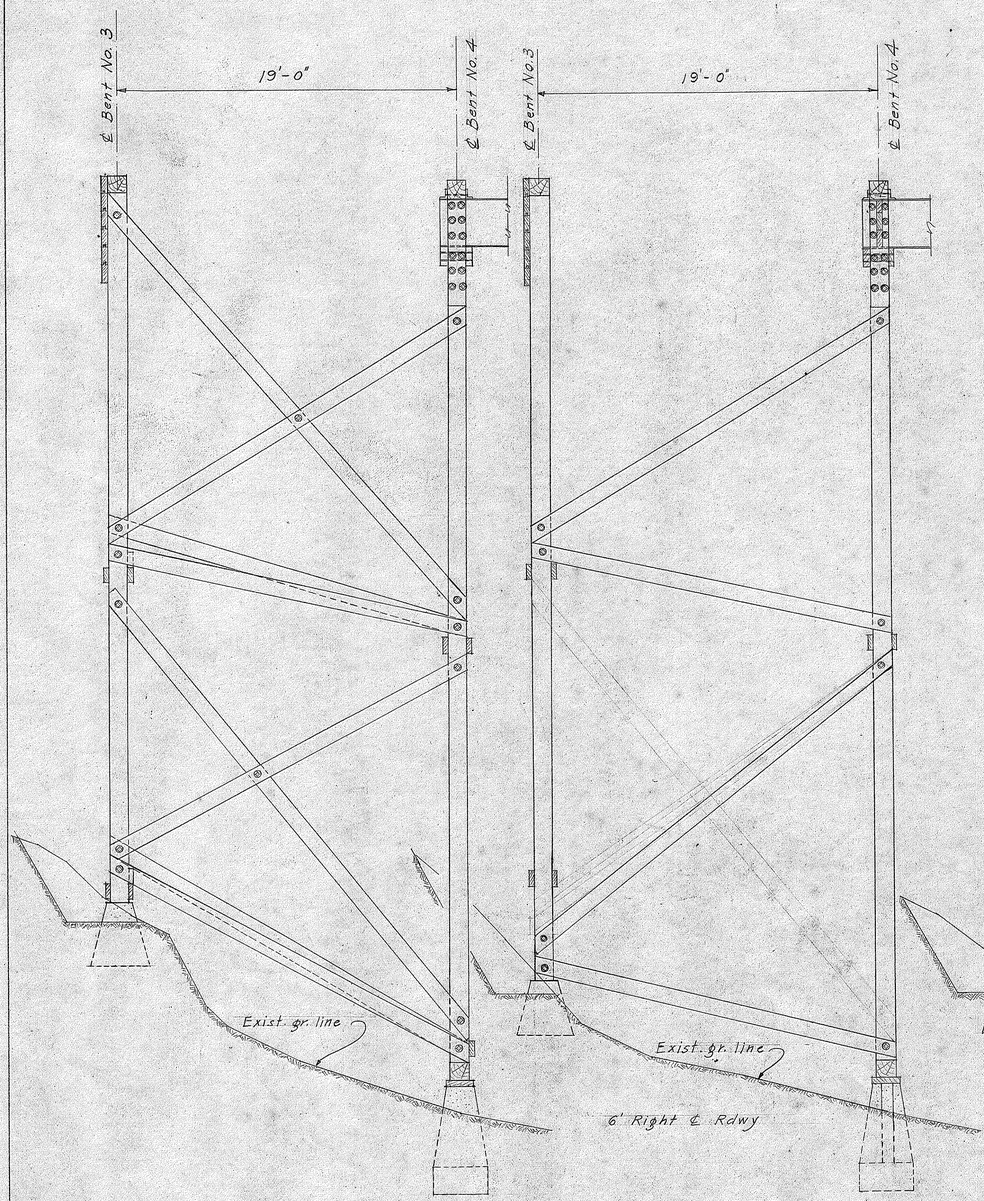
EAST PAAUILO BRIDGE

STA. 780+11.17 TO STA. 782+40.83
Hawaii Belt Rd.
F.A.P. 26-A Feb. 1938

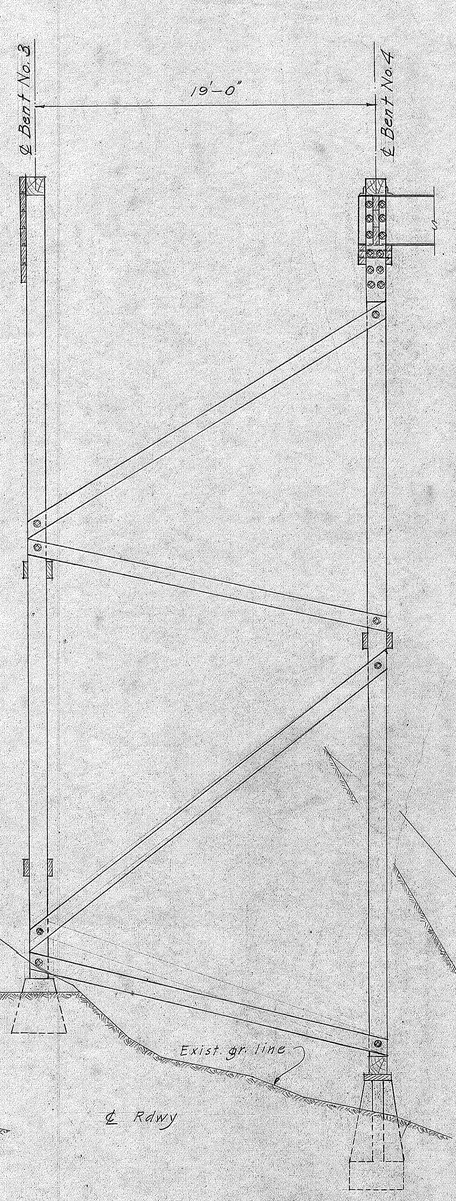
SHEET NO. 5 OF 7 SHEETS.

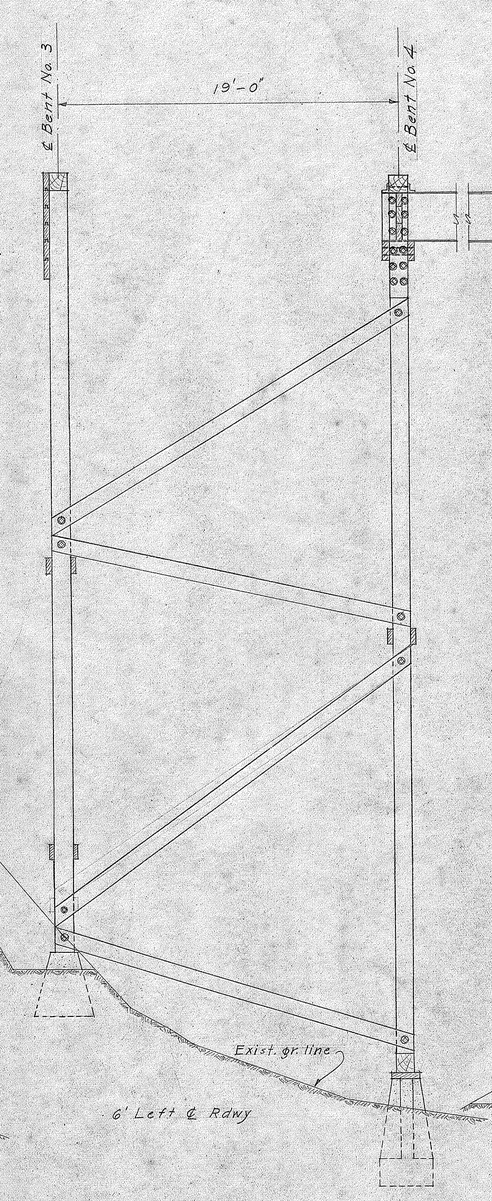
4441.39

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw.	26-A	1938	40	51

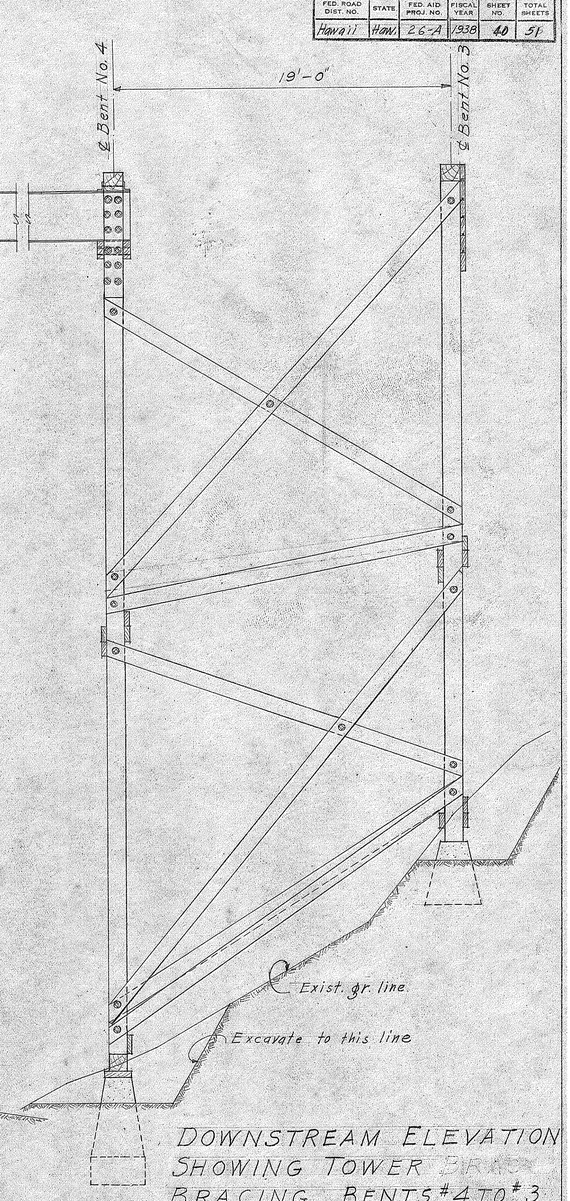


UPSTREAM ELEVATION
SHOWING TOWER
BRACING, BENTS # 3 TO # 4
Scale: 1/4" = 1'-0"





ELEVATIONS SHOWING TOWER BRACING AT INTERMEDIATE POSTS
BENTS # 3 TO # 4
Scale: 1/4" = 1'-0"



DOWNSTREAM ELEVATION
SHOWING TOWER BRACING,
BENTS # 4 TO # 3.
Scale: 1/4" = 1'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE Jan. 1938
	TRACED BY W.A. Bartels	" "
	DESIGN BY W.E. Wilson	" "
	CHECKED BY W.E. Wilson	" "
NOTE BOOK	QUANTITIES BY E. Lankett	" Feb. 1938
No.	CHECKED BY W.E. Wilson	" "

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

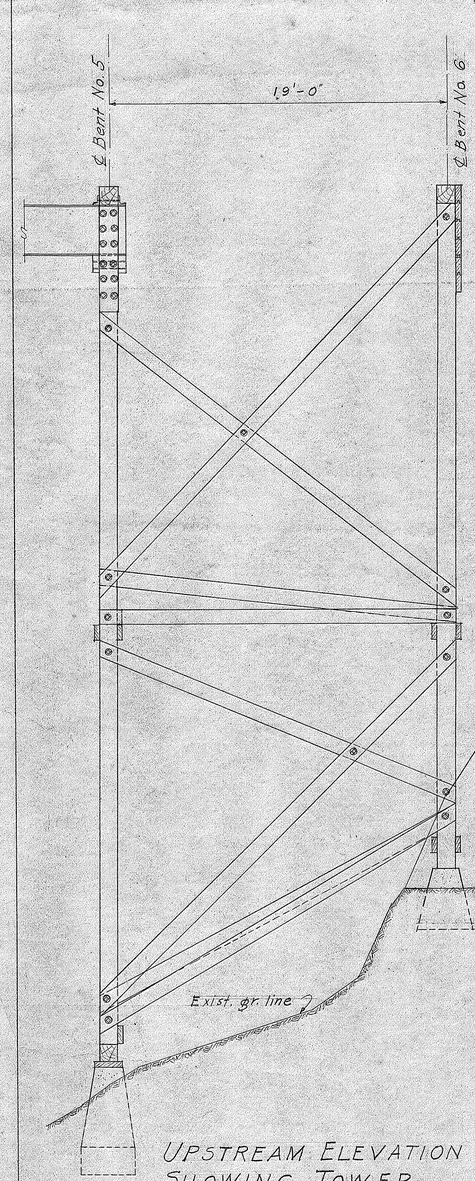
EAST PAAUILO BRIDGE

STA. 780+11.17 TO STA. 782+40.83
Hawaii Belt Rd.
F.A.P. 26-A Feb. 1938

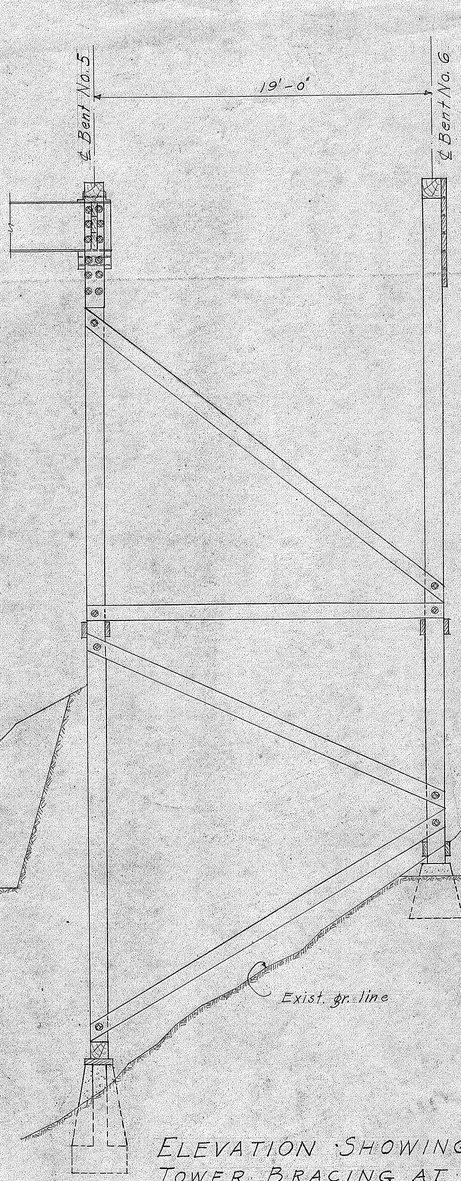
SHEET NO. 6 OF 7 SHEETS.

4441.40

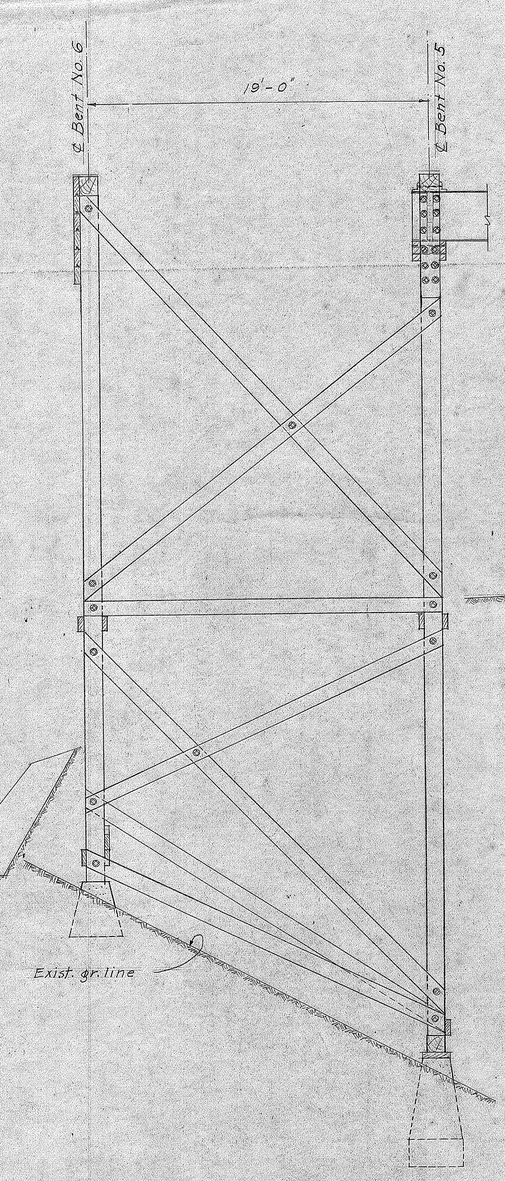
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Hawn.	26-A	1938	41	51



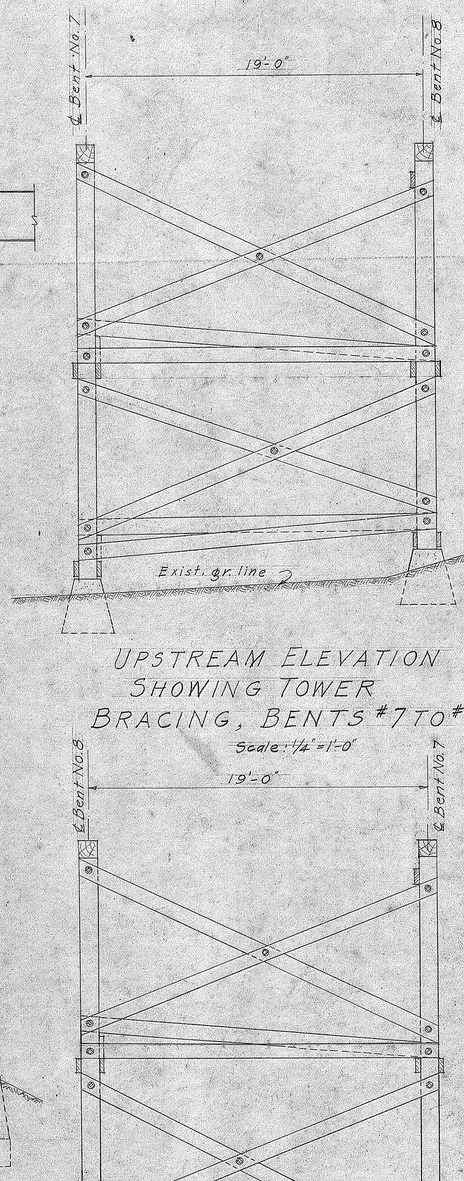
UPSTREAM ELEVATION
SHOWING TOWER
BRACING, BENTS #5 TO #6
Scale: 1/4" = 1'-0"



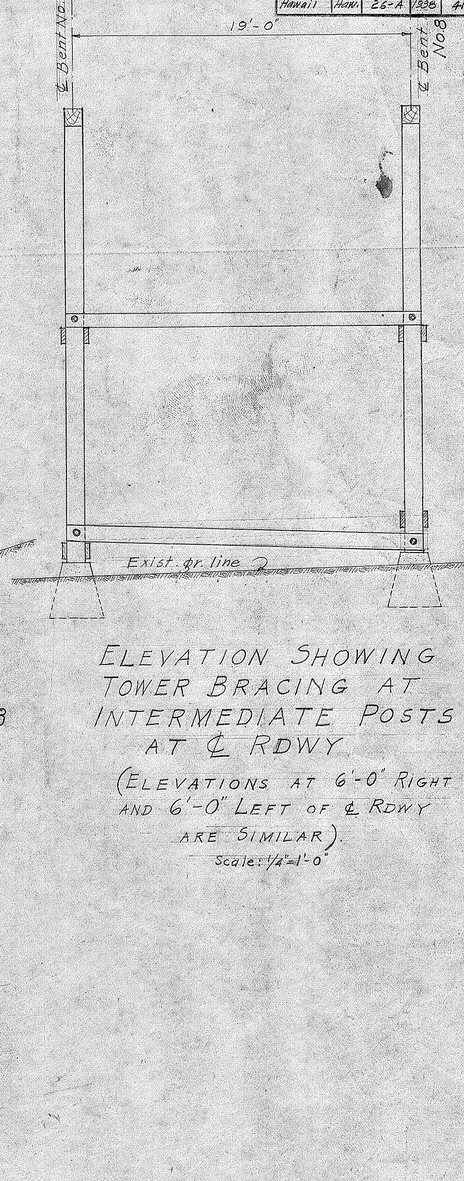
ELEVATION SHOWING
TOWER BRACING AT
INTERMEDIATE POSTS
BENTS #5 TO #6
Scale: 1/4" = 1'-0"



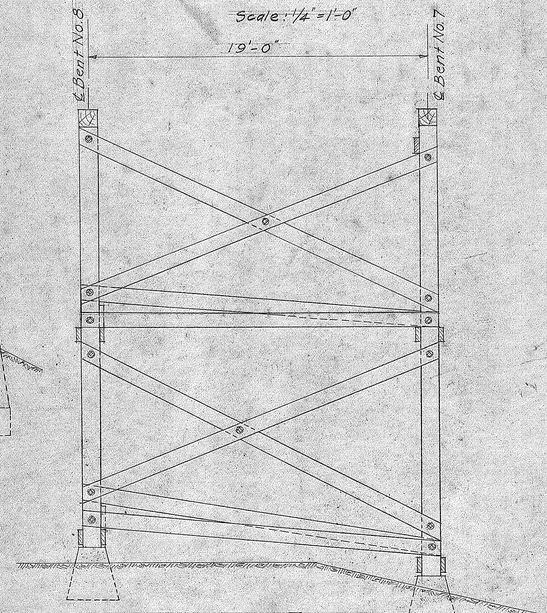
DOWNSTREAM ELEVATION
SHOWING TOWER
BRACING, BENTS # 6 TO # 5
Scale: 1/4" = 1'-0"



UPSTREAM ELEVATION
SHOWING TOWER
BRACING, BENTS #7 TO #8
Scale: 1/4" = 1'-0"



ELEVATION SHOWING
TOWER BRACING AT
INTERMEDIATE POSTS
AT ℄ RDWY
(ELEVATIONS AT 6'-0" RIGHT
AND 6'-0" LEFT OF ℄ RDWY
ARE SIMILAR)
Scale: 1/4" = 1'-0"



DOWNSTREAM ELEV.
SHOWING TOWER
BRACING, BENTS #8 TO #7
Scale: 1/4" = 1'-0"

ORIGINAL TRACING PLOTTED BY	DATE Jan. 1938
TRACED BY W.S. Bartlett	" "
CHECKED BY H.E. Wentworth	" "
DRAWING NO. 1 of 1	" "
QUANTITIES BY V. Yanko ff	Feb. 1938
CHECKED BY H.E. Wentworth	" "

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

EAST PAAUILO BRIDGE
STA. 780+11.17 TO STA. 782+40.83
Hawaii Belt Rd.
F.A.P. 26-A Feb. 1938

SHEET NO. 7 OF 7 SHEETS.

4441.41