FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw.	BRF-019-2(6)	1984	106	126

TIMBER BILL OF MATERIAL

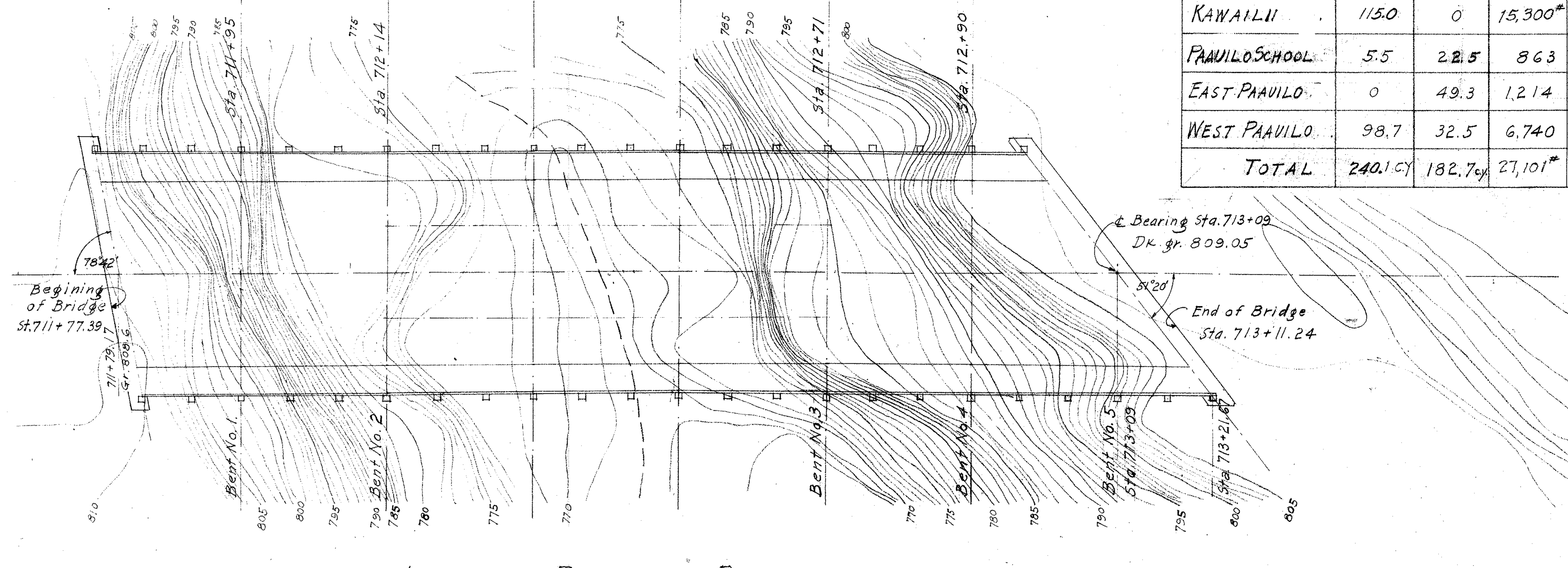
MEMBER	No.	SIZE & LENGTH	KIND OF LUMBR.	MILL WRK.	FT. B.M.
DOUGLAS FIR COAST RGN.					
Solid Bridg.	1	4"x18"x10'-0"	No. 1 Dimension	S1E	60
" "	6	4"x18"x18'-0"	"	"	648
" "	2	4"x18"x26'-0	"	"	312
Cross "	28	2"x4"x16'-0"	"	Rough	299
Splice-Block	26	6"x18"x3'-0"	Select Structural Joist & Plank	S1E	702
Stringers	1	6"x18"x8'-0"	" Structural Beams & Stringr.	Ends seized to 17½" exact.	72
"	1	6"x18"x10'-0"	"	"	90
"	2	6"x18"x12'-0"	"	"	216
"	4	6"x18"x14'-0"	"	"	504
"	5	6x18"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"x8x8'-0"	"	"	21
"	2	4"x8x14'-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 & Stringrs.	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 & Stringrs.	"	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 & Stringrs.	"	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 & Stringr.	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 & Stringrs.	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 & Stringrs.	"	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 @ Struts	16	4"x12"x1'-0"	"	Rough	64
				Total	71,050

CURVE DATA:

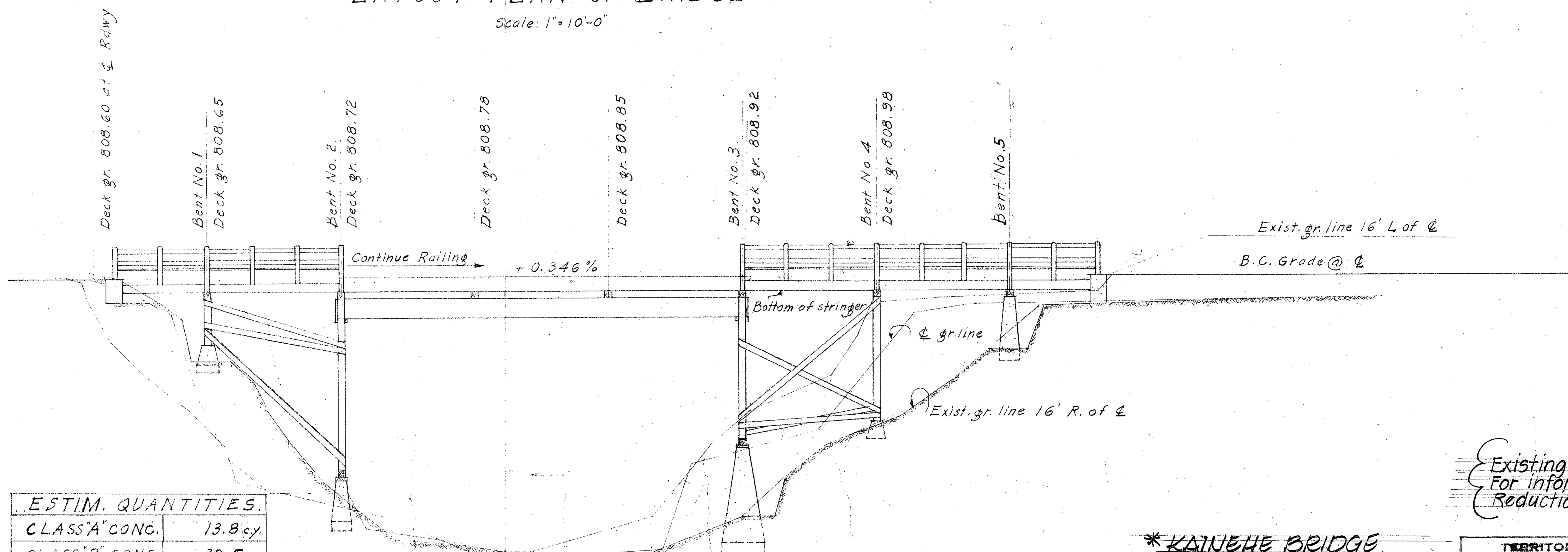
Δ = 10°-08'
D = 0°-44'-49"
R = 7669.64'
T = 680.0'
L = 1356.45'
Super = 0.019' per ft.
P.C. = 711+51.95
P.T. = 725+08.40

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 cy.	1,932#	41,636#	71,050'	0	0	160.0 cy.	93.0 cy.
KAHOLALELE	7.1	38.9	1,052#	41,636#	141,505'	150 lin.f.	0	158.0	96.0
KAWAILII	115.0	0	15,300#	0	0	0	850 cy.	420.0	0
PAAUILO SCHOOL	5.5	22.5	863	41,636	80,501	200	115 cy.	178.0	65.0
EAST PAAUILO	0	49.3	1,214	41,636	137,149	300	0	185.0	61.0
WEST PAAUILO	98.7	32.5	6,740	41,838	62,189	0	0	209.0	40.0
TOTAL	240.1 CY	182.7 cy.	27,101#	208,382#	492,394	650 lin.f.	965.0 cy.	1,310.0 cy.	355.0 cy.



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.

Existing Kainehe Bridge
For information only
Reduction not to scale

* ~~KAINEHE BRIDGE,~~
~~Renamed to:~~
~~KALAPAHAPUU BRIDGE~~

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. E1 OF 8 SHEETS.


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"
2"x6" laminated floor
1 1/2" Pavement
Superelevation = 0.019ft per ft
12"x12"x34'-0"
4" solid bridging
2"x4" cross bridging
ELEVATION AT BENT 57'-0" STEEL SPAN
Scale 3/8"=1'-0"
12"x12"x34'-0" Cap
33"WF I 125#
Superelevation = 0.019ft. per ft.
6"x4"x1/2" L 6" long
Filler blocks 12" wide Specially cut to fit
3/4" bolts with C.I. Ogee washers both sides
6"x12"x6'-0"
4"x12" block
4"x12"
12"x12" post Top cut parallel to cap
Batter 1:12
SECT. "A-A"
Scale 3/8"=1'-0"
Superelevation = 0.019 ft. per ft.
6"x4"x1/2"L 6" long
12"E 20.7#
1/2" plate
3/8" fillet welds
SECT. "B-B"
Scale 3/8"=1'-0"
57'-0" c. to c. supports
12"x12"x34'-0" cap
6"x4"x1/2" L 6" long welded to girder in field
12"E 20.7#
33"WF 125#
4" solid bridging sized at struts to clear washers toe-nailed to post scabs
4"x12"
3/8" fillet welds
1/2" plate
3/4" bolts C.I. Ogee washers
8"x8" rail post
3"x8" guard rail
4"x8" guard rail dapped 1" into rail post
3 ply roofing paper laid in hot asphalt
10"x12" wheel guard
22 ga. galvanized iron
Painted white
4" solid bridging
3/4" bolts 2'-5" lg. C.I. Ogee washers both sides
6"x18" stringer
3/4" bolts sp. 6'-4" o.c. ctsk. rdwy. side
2"x12 1/2"x3'-0" Splice block
3/4" x 2'-3" drift pins
12"x18" cut as shown
5/8" bolts cut washers
1/2" separators
LEFT
RIGHT
DETAIL OF SIDEWALK AT BENT
Scale 3/4"=1'-0"
57'-0"
58'-8"
33"WF 125# 58' 8" long
12"E 20.7#
4" solid bridging
FRAMING PLAN OF 57'-0" STEEL SPAN
Note! 33"WF I girders to be furnished by Steel Co., with 1" camber
Scale 1/8"=1'-0"
SECT. "C-C"
Scale 3/8"=1'-0"
3/4" bolts C.I. Ogee Washers
6"x12"x6'-0" scabs
4"x12" blocks spiked to struts.
4" solid bridging ends sized to clear washers
4"x12" struts.
33"WF I 125#
Filler blocks
NOTE! For details of scuppers, railing splices, post spacing etc., see "Standard Details Timber Bridge on Tangent."
*KAINEHE BRIDGE Renamed to: KALAPAHAPUU BRIDGE
NOTE! DETAILS ON THIS SHEET ARE COMMON TO BOTH KAINEHE AND KOHALALELE BRIDGE
Existing Kainehe Bridge For information only Reduction not to scale
TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII
* KAINEHE BRIDGE
STA. 711+77.33 to 713+11.24
Hawaii Belt Rd. F.A.P. 26-A
Feb. 1938
SHEET No. E2 OF 8 SHEETS
107

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw.	[illegible]	1934	108	126

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.

~~*KAINEHE BRIDGE~~
~~Renamed to:~~
~~KALAPAHAPUU BRIDGE~~

Existing Kainehe Bridge
For information only
Reduction not to scale

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

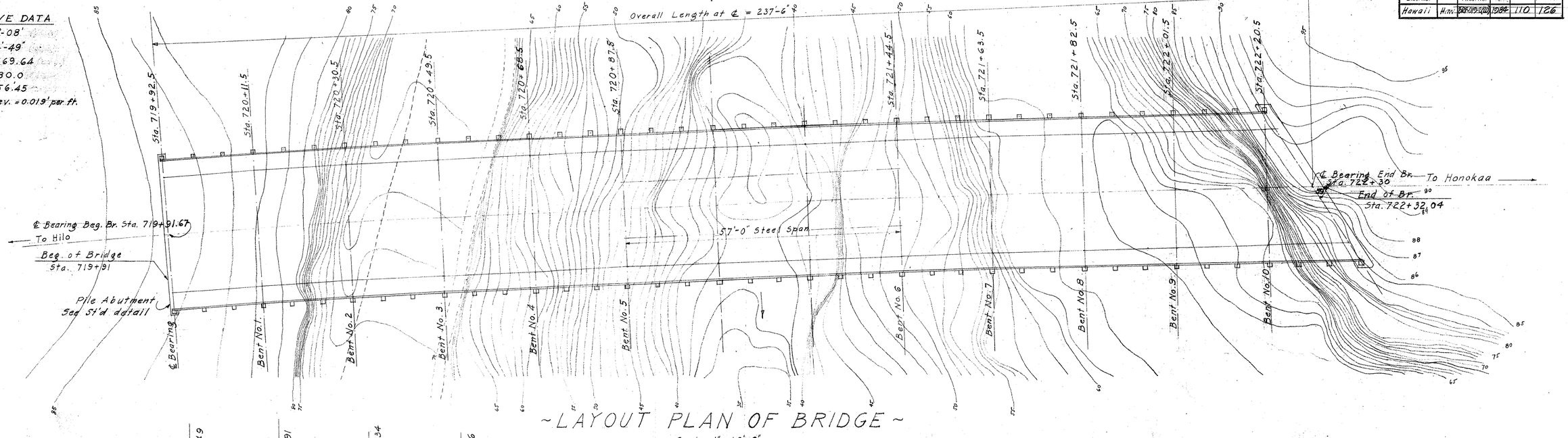
SHEET NO. E3 OF 8 SHEETS.

ORIGINAL PLAN	NOTE BOOK No.	
SURVEY PLOTTED BY		
DESIGNED BY	M.R. Bartels	
DRAWN BY	Wm. Yannatta	
TRACED BY	V. Yankoff	
QUANTITIES BY	V. Yankoff	
CHECKED BY	Wm. Yannatta	DATE Jan. 1938

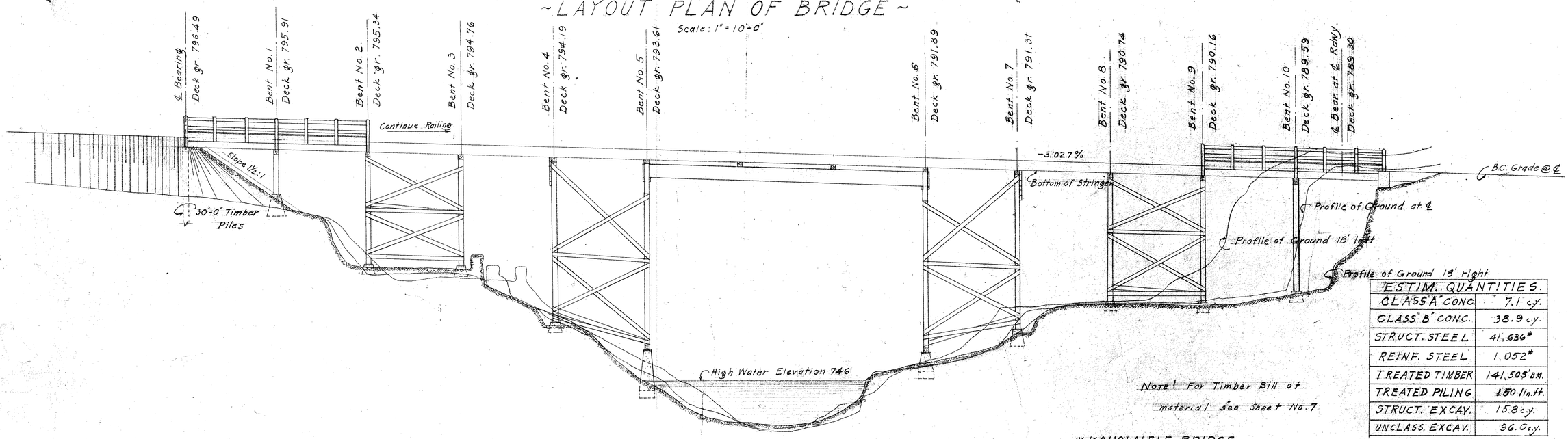
Fed. Road Dist. No. | State | Fed. Aid Proj. No. | Fiscal Year | Sheet No. | Total Sheets
Hawaii | Haw | 1954 | 109 | 126
ELEV. OF BENT NO. 4
Scale: 1/4" = 1'-0"
STA. 712+90
El. 807.37
¢ Bent & Rdwy
807.05
El. 806.73
Exist. gr. line
Excavate to this line
3/4" ϕ x 2'-0 dowels
El. 797.83
Conc. Ftg. Type "A"
El. 795.58
El. 793.58
El. 791.5
El. 789.0
DETAIL SHOWING SUGGESTED METHOD OF PLACING ANCHOR BOLTS.
Scale: 3/4" = 1'-0"
3/4" ϕ anchor bolts
Dotted lines show position of 12" x 12" Sill when pouring conc. for 1'-6" x 2'-0" Opening
1'-6" x 2'-0" opening to be filled with conc. after anchor bolts are in place
12" x 12" Sill
3/8" ϕ x 4'-0"
3/8" ϕ MK 300
SECT. "H-H"
Scale: 3/4" = 1'-0"
3/4" ϕ anchor bolts
PLAN OF PIER BENT NO. 2
Scale: 3/8" = 1'-0"
32'-8"
¢ Pier & Rdwy
3/4" ϕ Anchor Bolts
DETAIL OF PIER BENT NO. 2
Scale: 3/8" = 1'-0"
3/8" ϕ Spa. 12" o.c. MK 300
5/8" ϕ MK 500 at rib only
3/8" ϕ x 30'-8" Spa. 12" o.c. MK 301
3/4" ϕ anchor bolts sp. as shown. See detail
ELEV. OF BENT NO. 5
STA. 713+09
Scale: 1/4" = 1'-0"
El. 807.07
El. 806.80
5/8" ϕ MK 505
5/8" ϕ MK 504
3/8" ϕ Stirrups MK 308 12 o.c.
Existing gr. line
1/2" ϕ MK 411 & 412
6-1/2" ϕ MK 408
1/2" ϕ MK 409 & 410
1/2" ϕ MK 413
3/8" ϕ MK 309
1/2" ϕ MK 407
SECT. "B-B"
Scale: 3/8" = 1'-0"
3/8" ϕ Stirrups MK 308 12 o.c.
5/8" ϕ MK 504
Exsist. gr. line
Excavate to this line
1/2" ϕ MK 407
3/8" ϕ MK 309
PLAN OF PIER BENT NO. 3.
Scale: 3/8" = 1'-0"
30'-6"
¢ Pier & Rdwy
3/4" ϕ Anchor Bolts
SECT. "C-C"
Scale: 3/8" = 1'-0"
3/8" ϕ 12 o.c. MK 301
3/8" ϕ 12 o.c. MK 300
SECT. "D-D"
Scale: 3/8" = 1'-0"
3/8" ϕ 12 o.c. MK 305
5/8" ϕ MK 500
SECT. "K-K"
Scale: 3/8" = 1'-0"
1/2" ϕ bars MK 409 & 410
1/2" ϕ MK 413 both faces
SECT. "A-A"
Scale: 1/4" = 1'-0"
Exist. gr. line
El. 795.58
Excavate to this line
PLAN
ELEVATION
Batter 3" per ft.
2'-0" min.
DETAIL OF CONC. FTG. TYPE "A"
Scale: 3/4" = 1'-0"
DETAIL OF PIER BENT NO. 3
Scale: 3/8" = 1'-0"
3/8" ϕ Spa. 12" o.c. MK 302
5/8" ϕ MK 501 at rib only
3/4" ϕ x 4'-0"
3/8" ϕ x 28'-0" Spa. 12 o.c. MK 303
3/8" ϕ x 3'-0" Spa. 12" o.c.
5/8" ϕ MK 502 at rib only
3/8" ϕ Stirrups 12 o.c. MK 304
SECT. "E-E"
Scale: 3/8" = 1'-0"
3/8" ϕ Stirrups 12 o.c. MK 304
5/8" ϕ MK 502 both faces
SECT. "F-F"
SECT. "G-G"
Scale: 3/8" = 1'-0"
3/8" ϕ MK 303
3/8" ϕ MK 302 Spa. 12" o.c.
3/8" ϕ 12 o.c. MK 305
5/8" ϕ MK 501
* KAINEHE BRIDGE Renamed to: KALAPAHAPUU BRIDGE
Existing Kainehe Bridge For information only Reduction not to scale
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. E4 OF 8 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	PROJ. NO.		
Hawaii	H.I.	[illegible]	[illegible]	110	126

CURVE DATA
Δ = 10°-08'
D = 44'-49"
R = 7,669.64
T = 680.0
L = 1356.45
Super elev. = 0.019' per ft.



~LAYOUT PLAN OF BRIDGE~
Scale: 1" = 10'-0"



DOWNSTREAM ELEVATION OF BRIDGE
Scale: 1" = 10'-0"

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

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 f.b.m.
TREATED PILING	180 l/n.ft.
STRUCT. EXCAV.	158 c.y.
UNCLASS. EXCAV.	96.0 c.y.

*KAHOLALELE BRIDGE renamed to KAINEHE BRIDGE

Existing Kaholalele Bridge For information only Reduction not to scale

ORIGINAL PLAN	DRAWN BY	W. Bartels	DATE	Dec. 1937
	TRACED BY	W. Bartels		
	DESIGN BY	V. Yankoff		Jan. 1938
NOTE BOOK:	LAID OUT BY	V. Yankoff		
No.	QUANTITIES BY	M. Valentine		

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. E5 OF 8 SHEETS.

110

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw.	[illegible]	1984	111	126

Existing Kaholalele Bridge
For information only
Reduction not to scale

* KAHOLALELE BRIDGE renamed to KAINEHE BRIDGE

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

* KAHOLALELE BRIDGE

STA 719+91.67 TO STA 722+32+04

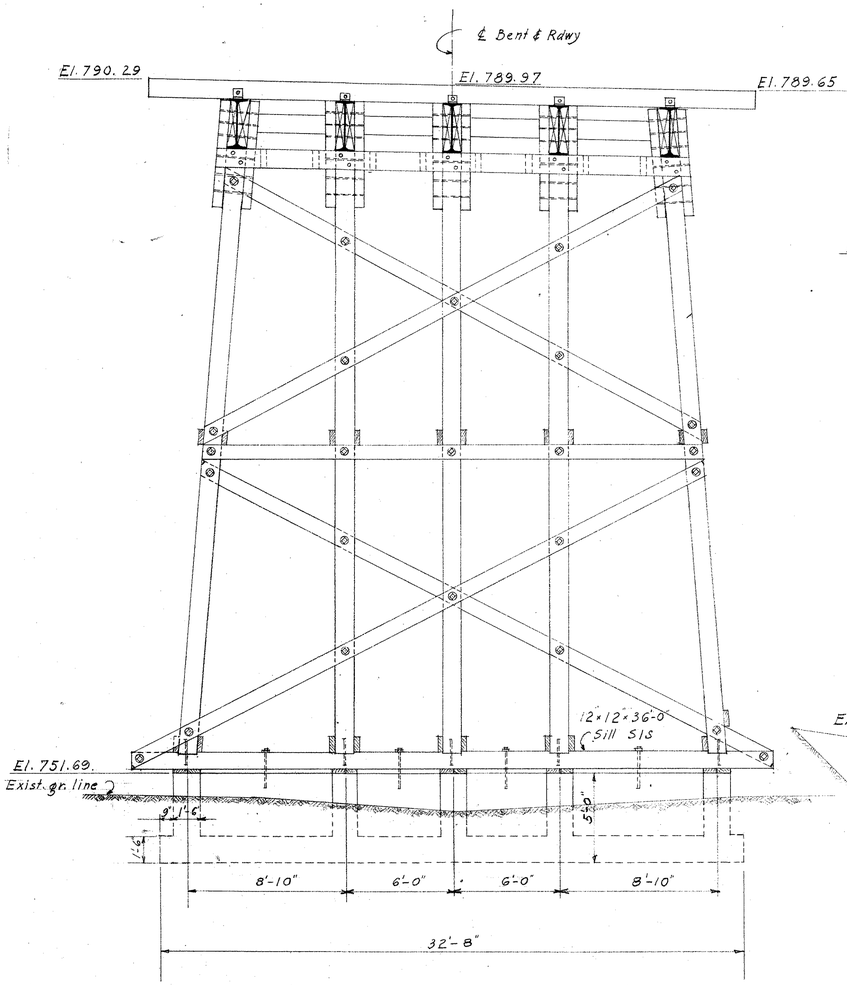
Hawaii Belt Rd.

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

E6 8 SHEETS

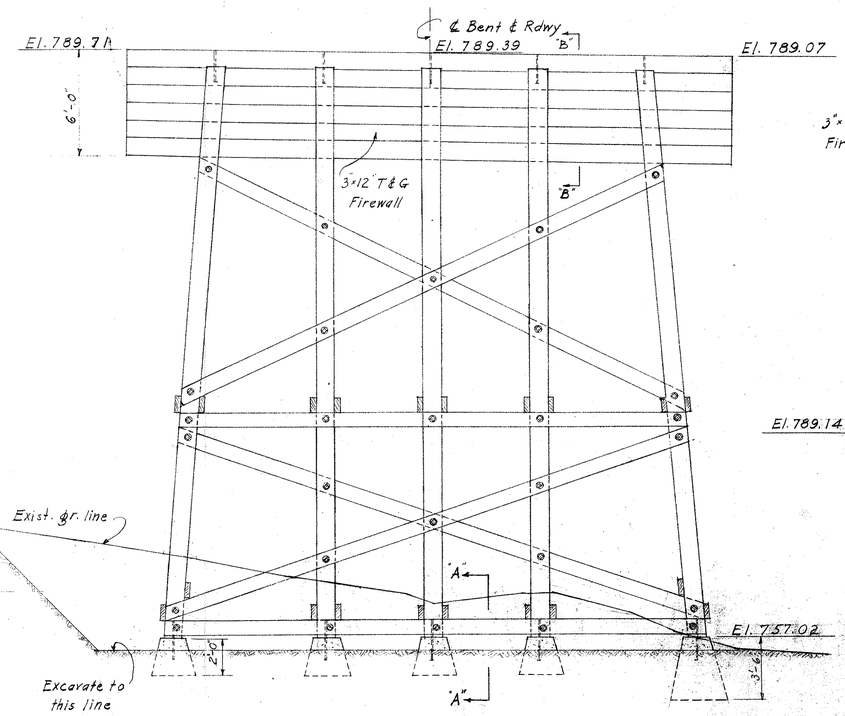
111

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.		
Hawaii	Haw.	RF-049-(2)D	1984	112	126



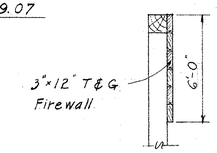
ELEV. OF BENT No. 6 STA. 721+44.5

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



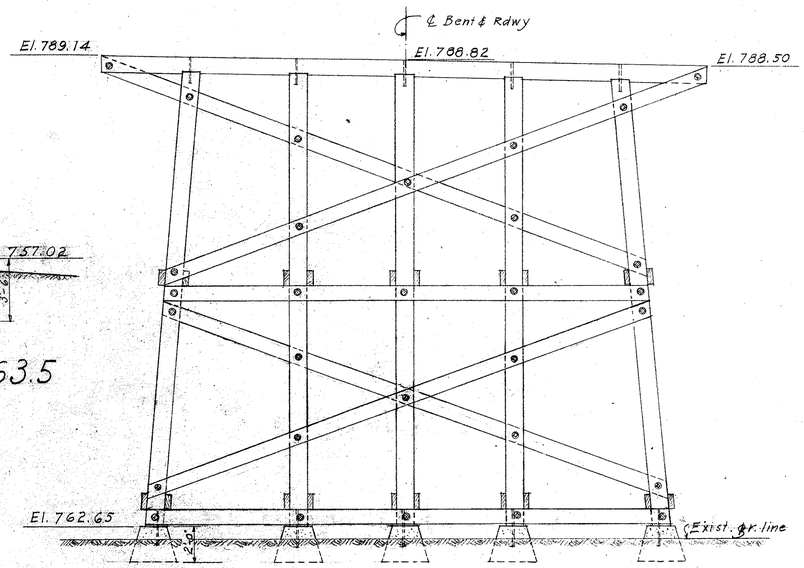
ELEV. OF BENT No. 7 STA. 721+63.5

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



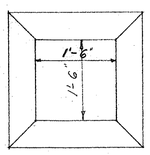
SECT. "B-B"

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

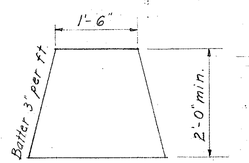


ELEV. OF BENT No. 8 STA. 721+82.5

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



PLAN.



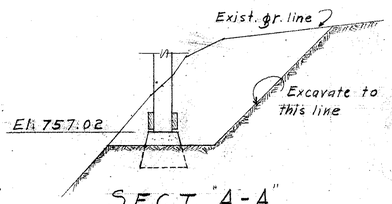
ELEVATION

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"

* KAHOLALELE BRIDGE renamed to KAINEHE BRIDGE

Existing Kaholalele Bridge
For information only
Reduction not to scale

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 7 OF 8 SHEETS

112

FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS
Hawaii | Haw. | | 1934 | 113 | 126
ELEV. OF BENT NO. 9 STA. 722+01.5
Scale: 1/4"=1'-0"
El. 788.56
El. 788.24
El. 787.92
℄ Bent & Rdwy
Exist. gr. line
Excavate to this line
El. 762.75
3/4"⌀ anchor bolts
Dotted lines show position of 12"×12" Sill when pouring conc. for 1'-6"×2'-0" Opening
1'-6"×2'-0" opening to be filled with conc. after anchor bolts are in place
12"×12" Sill
3/8"⌀×4'-0"
3/8"⌀ MK 303
DETAIL SHOWING SUGGESTED METHOD OF PLACING ANCHOR BOLTS.
Scale: 3/4"=1'-0"
SECT. D-D
Scale: 3/4"=1'-0"
ELEV. OF BENT NO. 10 STA. 722+20.5
Scale: 1/4"=1'-0"
Slope top of concrete block to superelev of round
El. 787.67
El. 787.35
Footing type "C"
El. 764.65
SECT. "C-C"
Scale: 3/8"=1'-0"
SECT. "E-E"
Scale: 3/8"=1'-0"
SECT. "A-A"
Scale: 1/4"=1'-0"
El. 762.75
El. 760.75
SECT. "B-B"
Scale: 1/4"=1'-0"
DETAIL OF CONC. FTG. TYPE "C"
ELEVATION
PLAN
Scale: 3/4"=1'-0"
Batter 3" per ft.
2'-0" min.
PLAN OF PIER TYPE "B"
Scale: 3/8"=1'-0"
32'-10"
℄ Pier & Rdwy
3/4"⌀ Anchor bolts
DETAIL OF PIER BENT NO. 5
Scale: 3/8"=1'-0"
3/4"⌀ Anchor Bolts sp. as shown. See detail
3/8"⌀ MK 300 Sp. 12 o.c.
5/8"⌀ MK 500 at rib only
3/8"⌀ MK 301 Sp. 12 o.c.
3/8"⌀ MK 303 12" o.c.
5/8"⌀ MK 501 at rib only
3/8"⌀ MK 304 Spa. 12 o.c.
3/8"⌀ MK 305 Sp. 12" o.c.
3/8"⌀ MK 302 Sp. 12 o.c.
5/8"⌀ MK 502 at rib only
PLAN OF PIER TYPE "B"
Scale: 3/8"=1'-0"
32'-8"
DETAIL OF PIER BENT NO. 6
Scale: 3/8"=1'-0"
3/8"⌀ Spa. 12" oc MK 306
5/8"⌀ MK 503 at rib only
3/8"⌀ × 30'-8" MK 308 Spa. 12" o.c.
3/8"⌀ MK 307 Spa. 12 o.c.
Existing Kaholalele Bridge For information only Reduction not to scale
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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. E8 OF 8 SHEETS
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