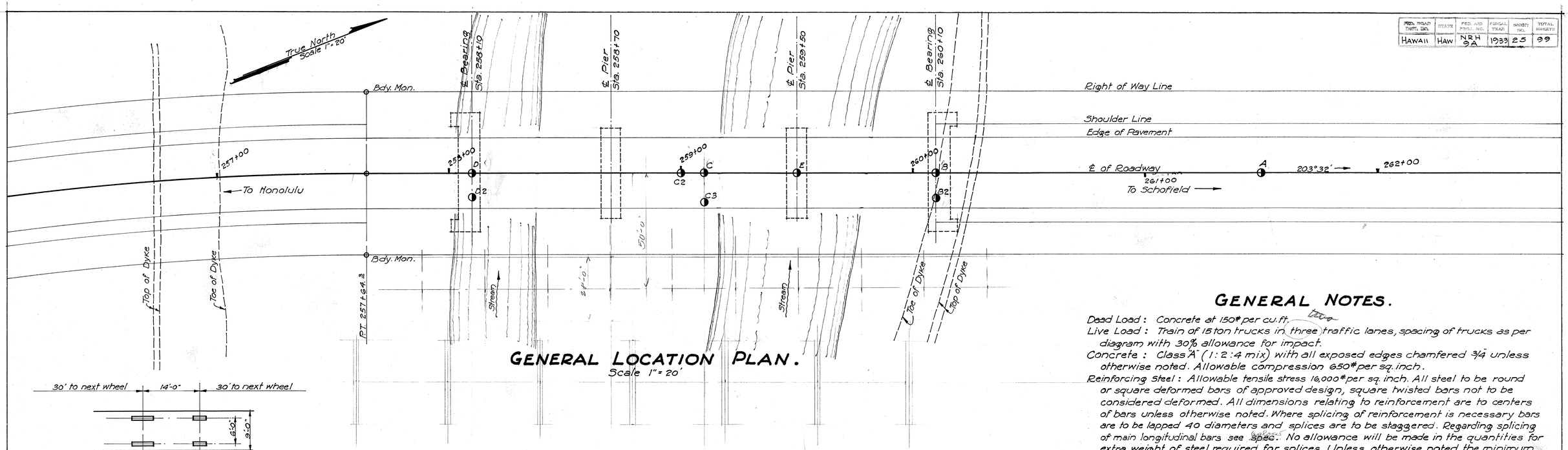
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw	NRH 9A	1933	25	99



GENERAL LOCATION PLAN.

Scale 1" = 20'

DIAGRAM OF TYPICAL 15 TON TRUCK.

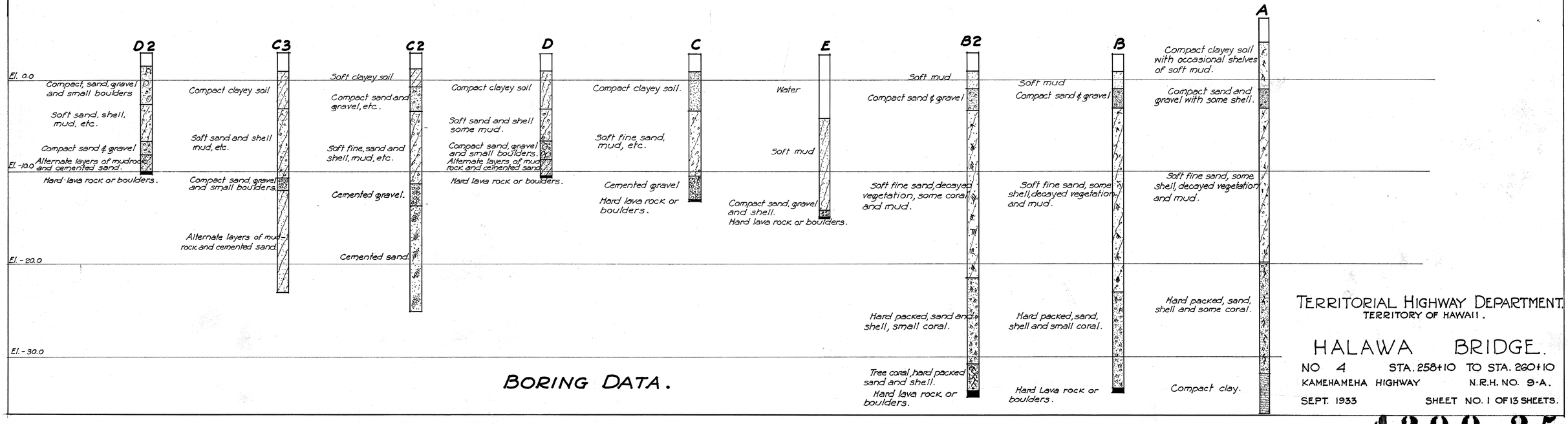
GENERAL NOTES.

Dead Load : Concrete at 150# per cu.ft.

Live Load : Train of 15 ton trucks in three traffic lanes, spacing of trucks as per diagram with 30% allowance for impact.

Concrete : Class "A" (1:2:4 mix) with all exposed edges chamfered 3/4 unless otherwise noted. Allowable compression 650# per sq. inch.

Reinforcing Steel : Allowable tensile stress 16,000# per sq. inch. All steel to be round or square deformed bars of approved design, square twisted bars not to be considered deformed. All dimensions relating to reinforcement are to centers of bars unless otherwise noted. Where splicing of reinforcement is necessary bars are to be lapped 40 diameters and splices are to be staggered. Regarding splicing of main longitudinal bars see spec. No allowance will be made in the quantities for extra weight of steel required for splices. Unless otherwise noted the minimum covering measured from the surface of concrete to the face of any steel shall be not less than 2½" in abutments and abutment footings ; 2" in beams, girders and handrails and 1¼" in slabs. Steel to be held rigidly and accurately in place before and during placing of concrete.



BORING DATA.

ORIGINAL PLAN	DATE
LAYOUT PLOTTED BY	W. R. B. June 1933
DETAILED BY	" " "
TRACED BY	C. F. W. Sept.
CHECKED BY	" " "
QUANTITIES BY	W. R. B.
NOTE BOOK	QUANTITIES BY W. R. B.

TERRITORIAL HIGHWAY DEPARTMENT.
TERRITORY OF HAWAII.

HALAWA BRIDGE.

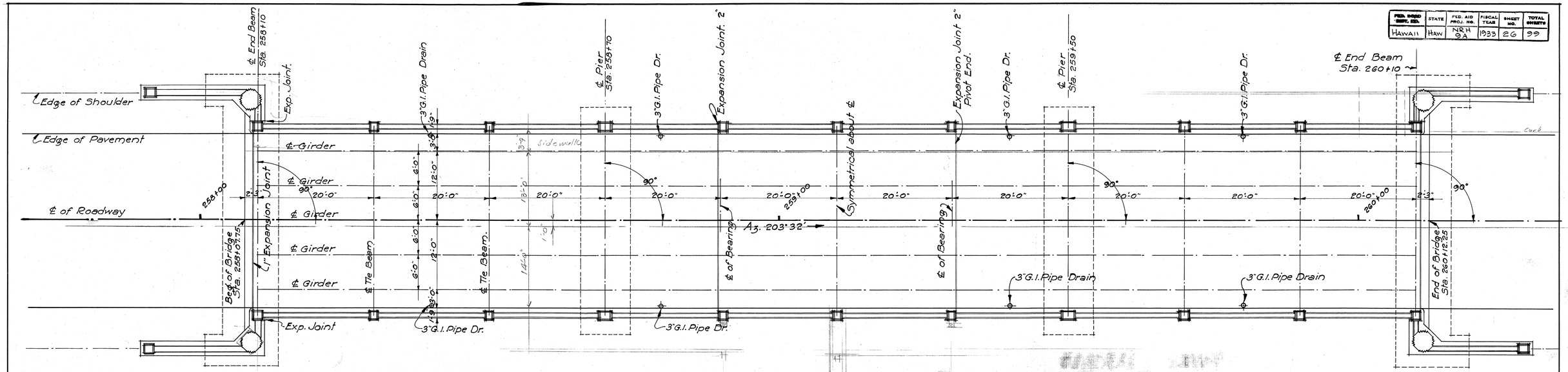
NO 4 STA. 258+10 TO STA. 260+10

KAMEHAMEHA HIGHWAY N.R.H. NO. 9-A.

SEPT. 1933 SHEET NO. 1 OF 13 SHEETS.

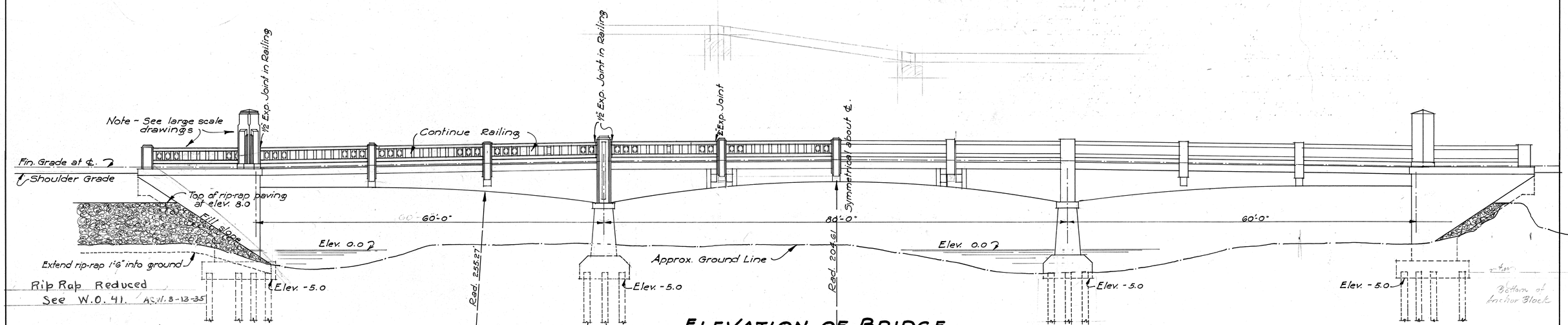
4300.25

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw	NRH 9A	1933	26	99



BRIDGE LAYOUT.

Scale 1/8" = 1'-0"



ELEVATION OF BRIDGE.

Scale 1/8" = 1'-0"

TABLE OF QUANTITIES

Item.	Class "A" Concrete c.y.	Class "B" Concrete c.y.	Reinforcing Steel lbs.	Excavation c.y.	Untreated timber piles lin. ft.	Hand Laid Rip Rap c.y.	Pavement sq. yds.
Abut. Footings.	116.3		9,910.0#	355.0	1710.0		
Pier Footings.		90.0	780.0	145.0	940.0		
Abutments.	205.8		38,483.0				
Piers		97.2	745.0				
Deck	471.6		141,091.0				
Railing & Approaches	46.3		4,964.0				
Totals.	849.0	187.2	195,954.0	500.0	2650.0	170.0	682.0
	831.29	256.29	203062.0	624.0	2,649.0	10.0	

ORIGINAL PLAN	STRUCT. FLOORS BY	W.R.B.	DATE	June 1933
	DESIGNED BY	C.E.N.		
	DRAWN BY	C.E.N.	Sept.	
	TRACED BY	W.R.B.	"	
	QUANTITIES BY	W.R.B.	"	
	CHECKED BY			
	NOTE BOOK			
	No.			

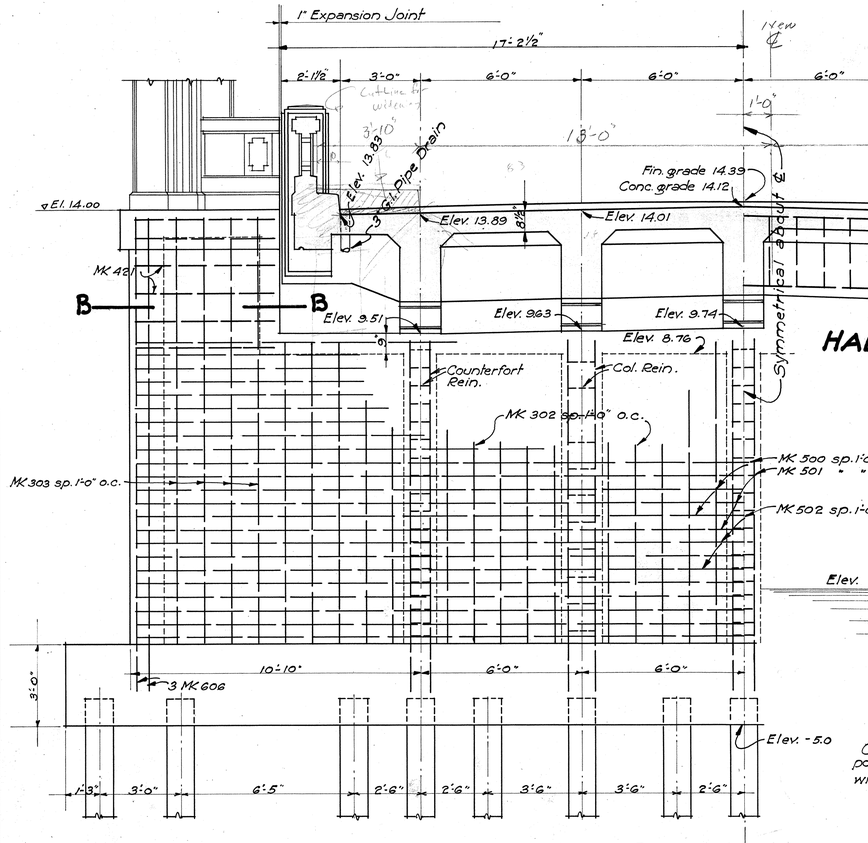
TERRITORIAL HIGHWAY DEPARTMENT.
TERRITORY OF HAWAII.

HALAWA BRIDGE.

NO. 4 STA. 258+10 TO STA. 260+10
KAMEHAMEHA HIGHWAY N.R.H. NO. 9-A.
SEPT. 1933. SHEET NO 2 OF 13 SHEETS.

4300.26

FED. ROAD DIST. NO.	STATE	F.A. NO. PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	NRH 9A	1933	27	99



CHECKED BY	W. R. B.
DRAWN BY	" June, 1933
TRACED BY	C. E. W.
BLUE PRINTED BY	" " "
QUANTITIES BY	W. R. B. & C. E. W.
CROSS SECTIONS BY	W. R. B.
COMPUTED BY	
STRUCTURE DESIGNED BY	
DETAILED BY	
CHECKED BY	
QUANTITIES BY	
APPROVED BY	
HONOLULU HARBOR	
PLANS	

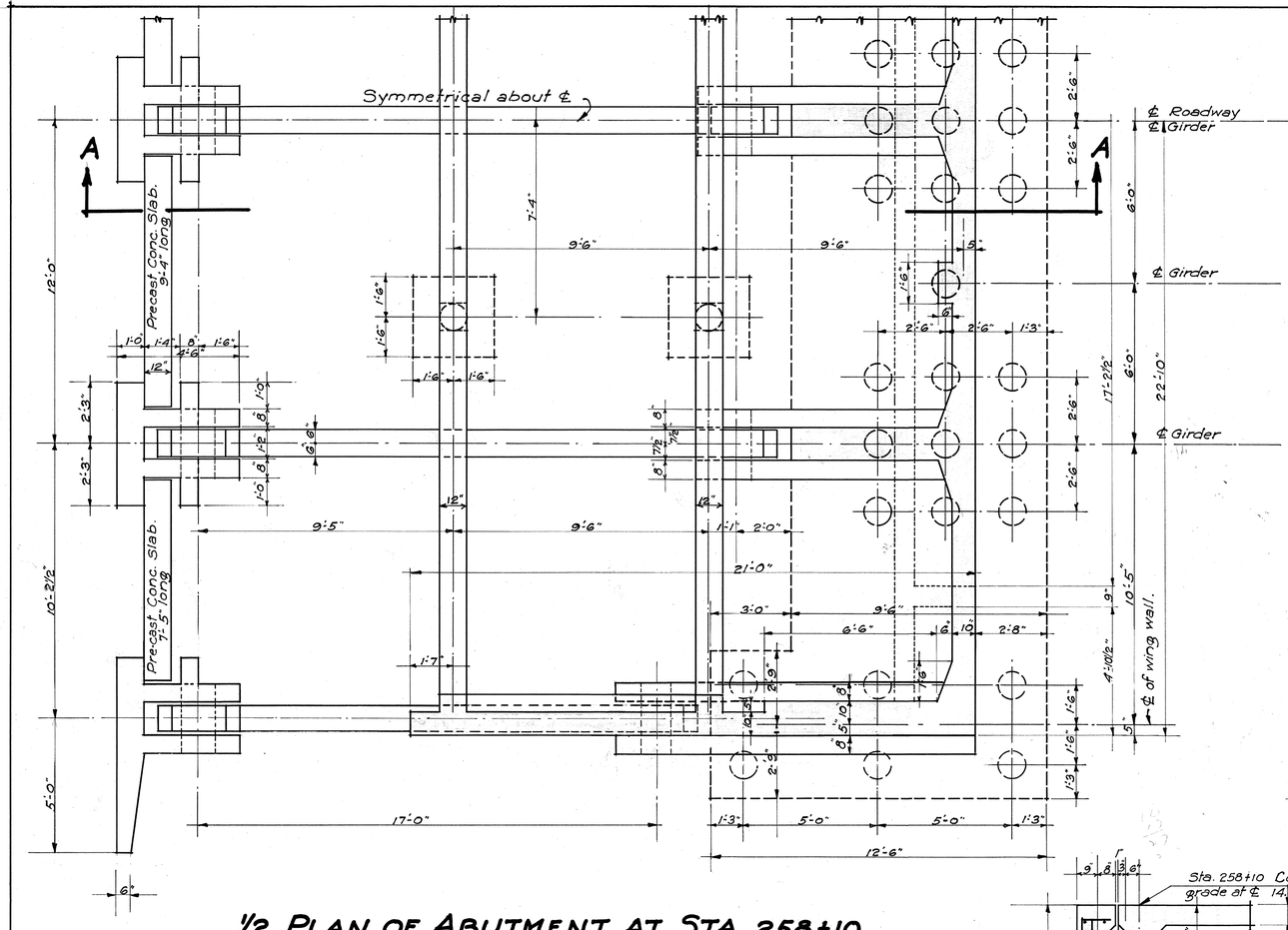
TERRITORIAL HIGHWAY DEPARTMENT.
TERRITORY OF HAWAII.

HALAWA BRIDGE.

NO. 4 STA. 258+10 TO STA. 260+10
KAMEHAMEHA HIGHWAY N.R.H. NO. 9-A.
SEPT. 1933. SHEET NO. 3 OF 13 SHEETS.

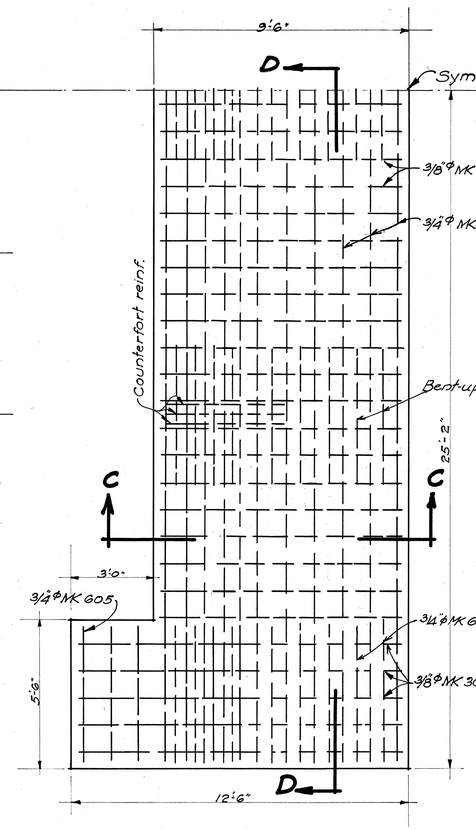
4300.27

FED. ROAD DIST. NO.	STATE	F.A.S. NO.	PROJECT YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	NRH 9A	1933	28	99



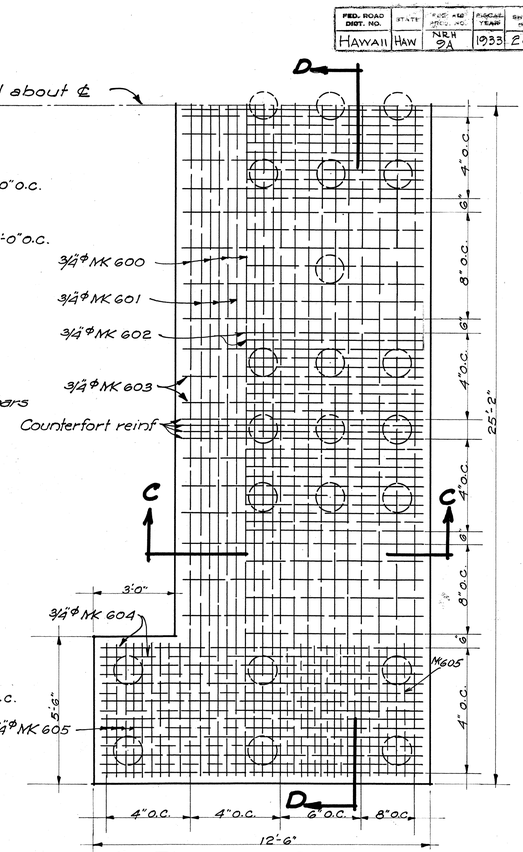
½ PLAN OF ABUTMENT AT STA. 258+10. "OTHER ABUTMENT SIMILAR."

3/8" Scale.



½ FOOTING PLAN SHOWING TOP REINF.

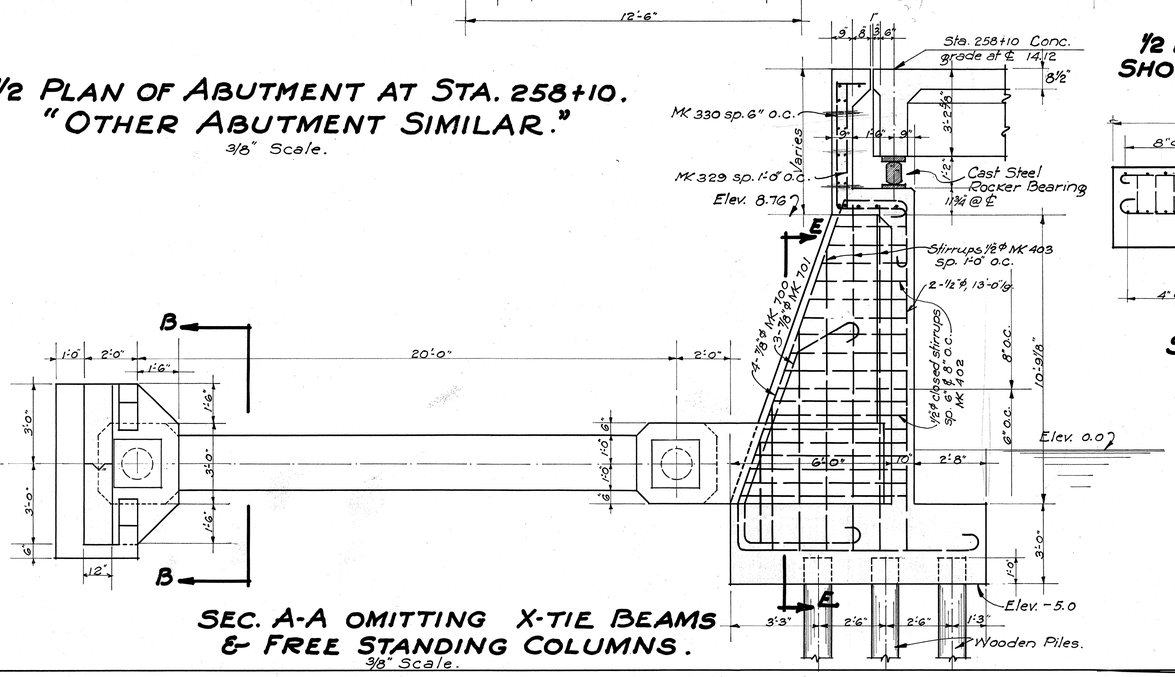
3/8" Scale.



½ FOOTING PLAN SHOWING BOTTOM REINF.

SEC. B-B.

3/8" Scale

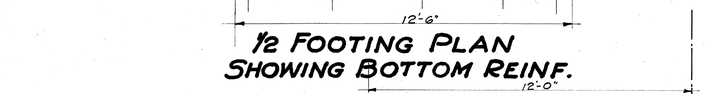


SEC. A-A OMITTING X-TIE BEAMS & FREE STANDING COLUMNS.

3/8" Scale.

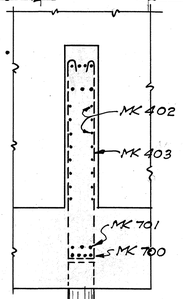
SEC. C-C.

3/8" Scale



SEC. D-D.

3/8" Scale



SECTION E-E.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DESIGNED BY W.R.B.	" " Mch. 1933
	DRAWN BY C.F.W.	" " Sept.
	TRACED BY C.F.W.	" " "
	QUANTITIES BY W.R.B. & C.F.W.	
	CHECKED BY W.R.B.	

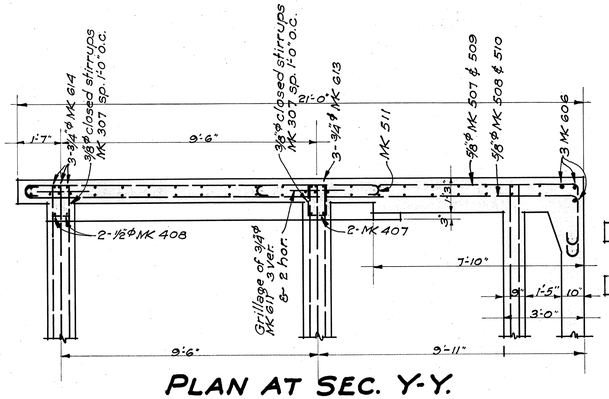
TERRITORIAL HIGHWAY DEPARTMENT.
TERRITORY OF HAWAII.

HALAWA BRIDGE.

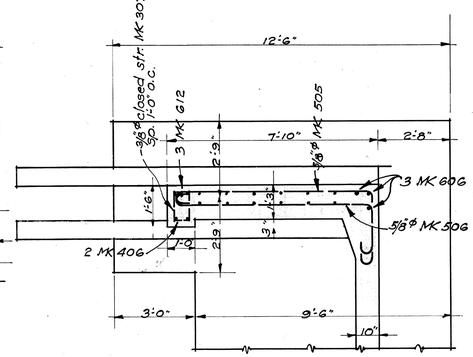
NO. 4 STA. 258+10 TO STA. 260+10
KAMEHAMEHA HIGHWAY. N.R.H. NO. 9-A.
SEPT. 1933 SHEET NO 4 OF 13 SHEETS.

4300.28

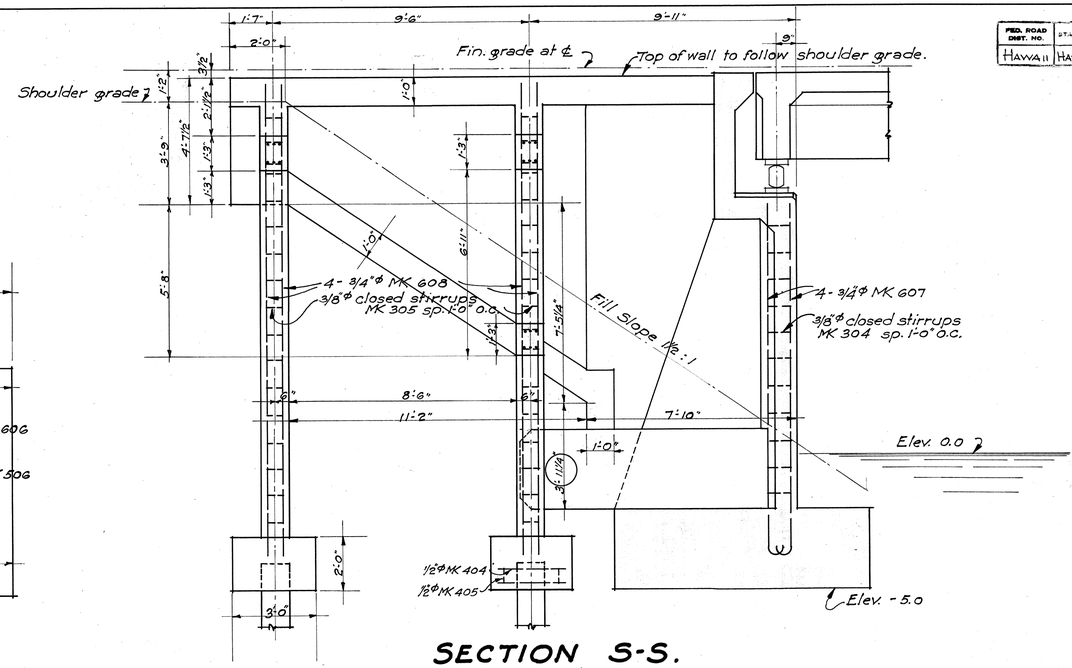
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw	N.R.H 9A	1933	29	99



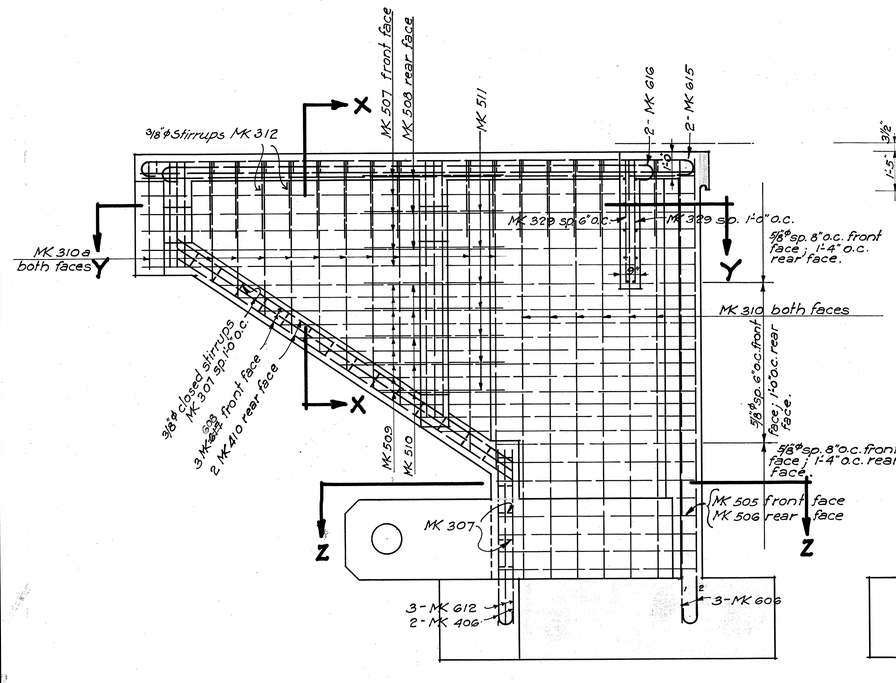
PLAN AT SEC. Y-Y.
⅜" Scale.



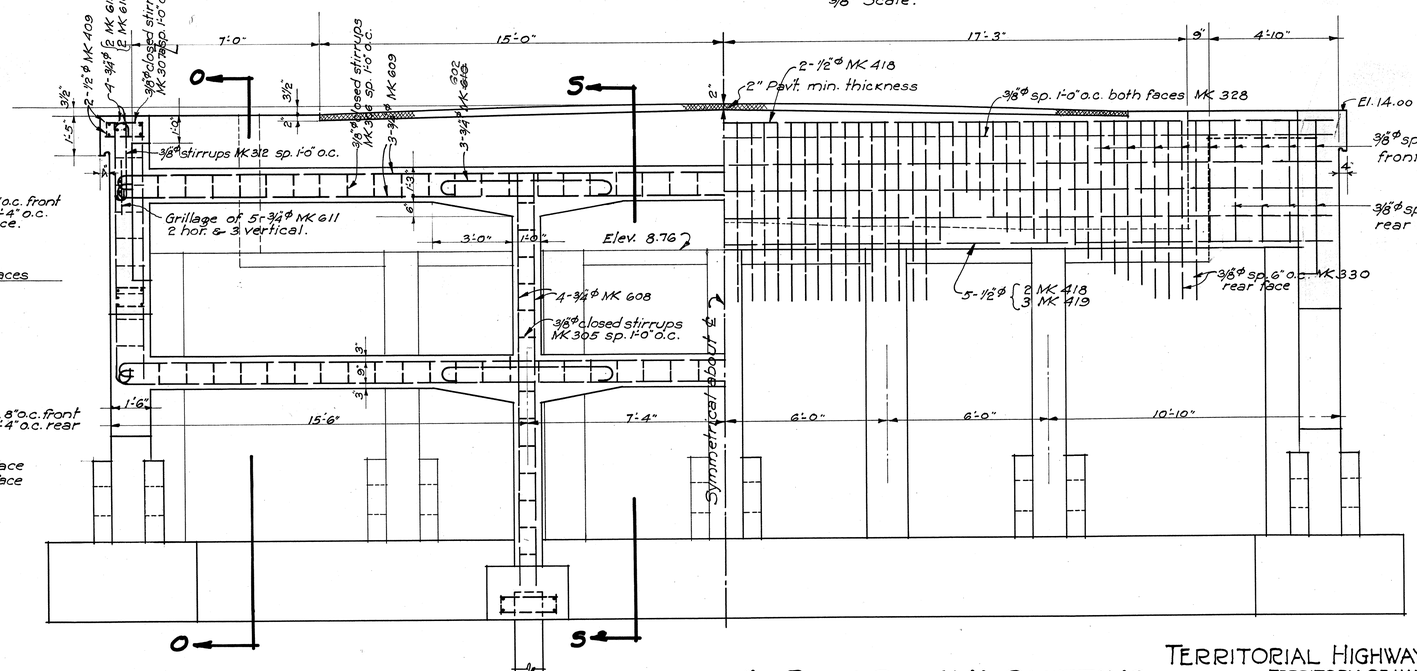
PLAN AT SEC. Z-Z.
⅜" Scale.



SECTION S-S.
⅜" Scale.



ELEV. OF W. WALL AT SEC. O-O.
⅜" Scale.



HALF ELEV. SEC. X-X SHOWING COL. & TIE BEAM REINFORCING.
⅜" Scale.

½ ELEV. SEC. X-X OMITTING COL'S. & BEAMS, SHOWING END WALL REINFORCING.
⅜" Scale.

ORIGINAL PLAN	STRUCTURE DETAILS BY: J.V.R.B. DATE: 2 June 1933
	DETAILED BY: " " "
	CHECKED BY: G.E.W. " "
NOTE BOOK	QUANTITIES BY: W.R.B. & G.E.W. " Sept.
	CHECKED BY: M.R.B. " "

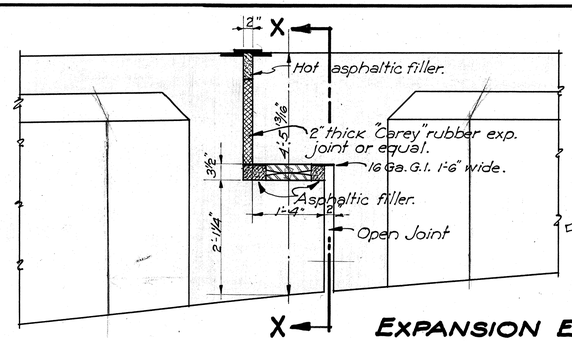
TERRITORIAL HIGHWAY DEPARTMENT.
TERRITORY OF HAWAII.

HALAWA BRIDGE.

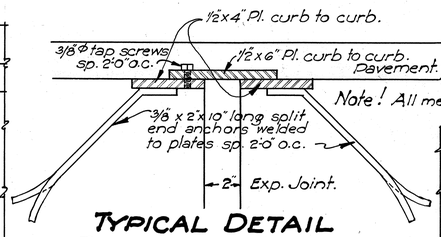
NO. 4 STA. 258+10 TO STA. 260+10.
KAMEHAMEHA HIGHWAY. N.R.H. NO. 9-A.
SEPT. 1933 SHEET NO. 5 OF 13 SHEETS.

4300.29

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	N.R. 9A	1933	30	99

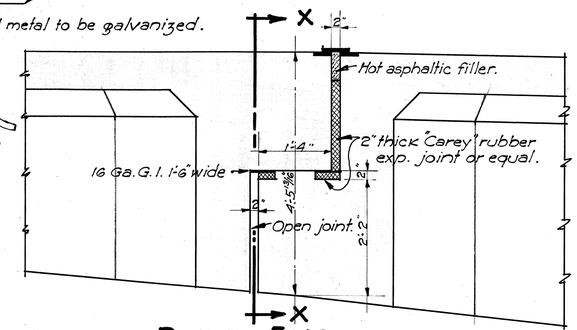


EXPANSION END.
3/4" Scale.

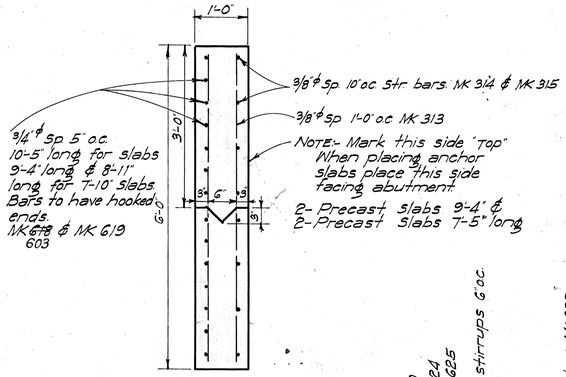


TYPICAL DETAIL EXPANSION JOINT.
3" Scale.

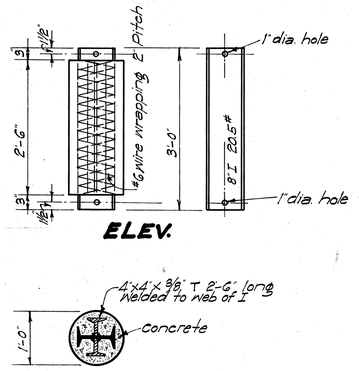
Note! All metal to be galvanized.



PIVOT END.
3/4" Scale.

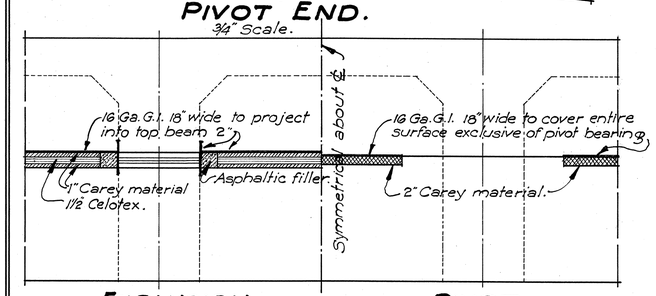


DETAIL OF PRECAST ANCHOR SLABS

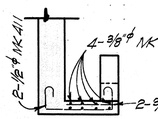


ELEV.

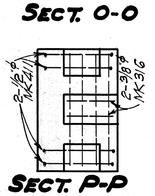
DETAIL OF CONC. CONNECTING PIN
Scale 3/4"=1'-0"



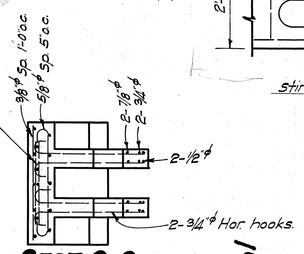
EXPANSION. PIVOT.
SECTION X-X.
3/4" Scale.



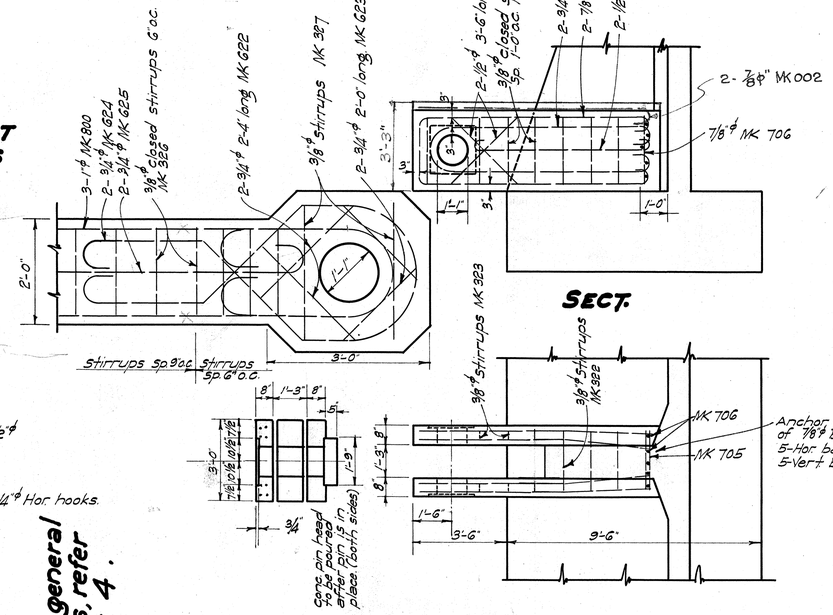
SECT. O-O



SECT. P-P

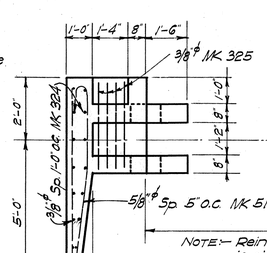


SECT. Q-Q



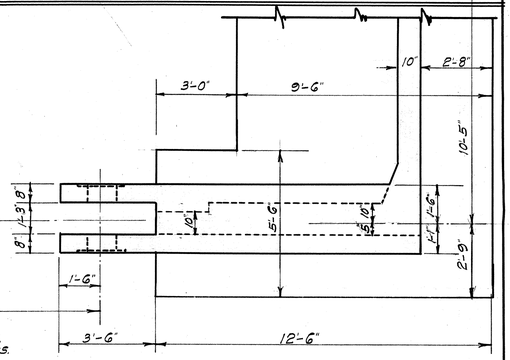
SECT.

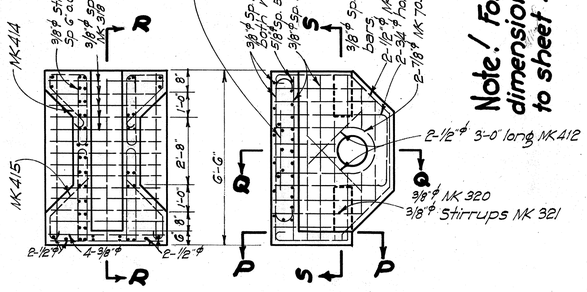
DETAIL OF NORMAL ANCHOR TIE AT ABUTMENT



NOTE:- Reinforcing for all other sections is similar to normal anchor ties except for necessary adjustments.

PLAN OF END ABUTMENT TIE
Scale 3/8"=1'-0"

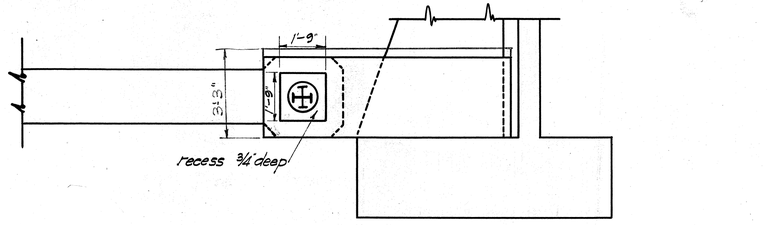




SECT. S-S SECT. R-R

DETAIL OF NORMAL ANCHOR

Note! For general dimensions, refer to sheet # 4.



ELEV. NORMAL ANCHOR

DATE	DESCRIPTION
Sept. 33	
" "	
" "	
" "	
" "	

N.R.B. C.E.W. N.R.B. E.J.S. C.E.W. N.R.B.

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII.

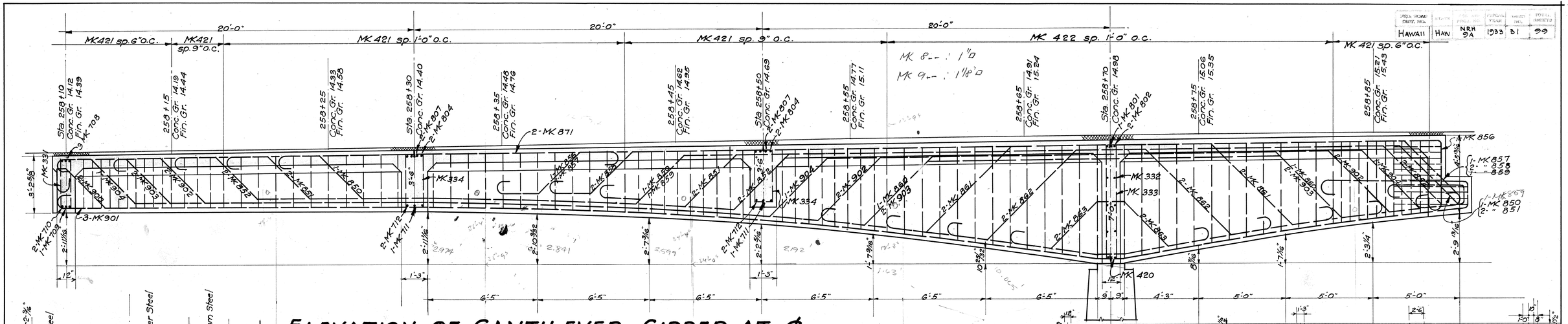
HALAWA BRIDGE.

NO. 4 STA. 258+10 TO STA. 260+10
KAMEHAMEHA HIGHWAY N.R.H. NO. 9-A.
SEPT. 1933. SHEET NO. 6 OF 13 SHEETS.

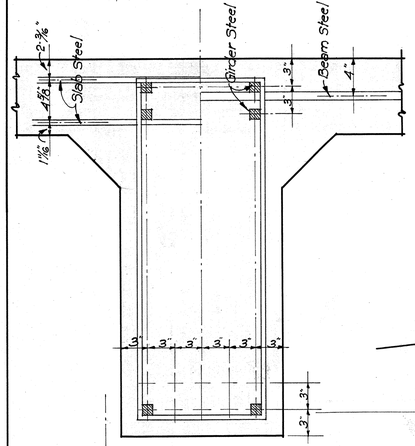
BR.	TRACED	CHECKED	PLAN

4300.30

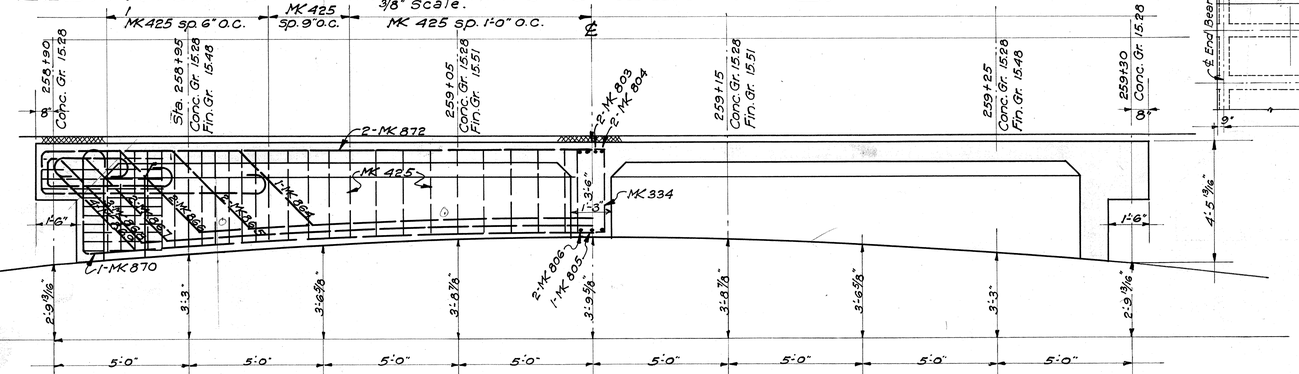
ROUTE	ISLAND	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	NRH 9A	1933	31	99



ELEVATION OF CANTILEVER GIRDER AT ℄.

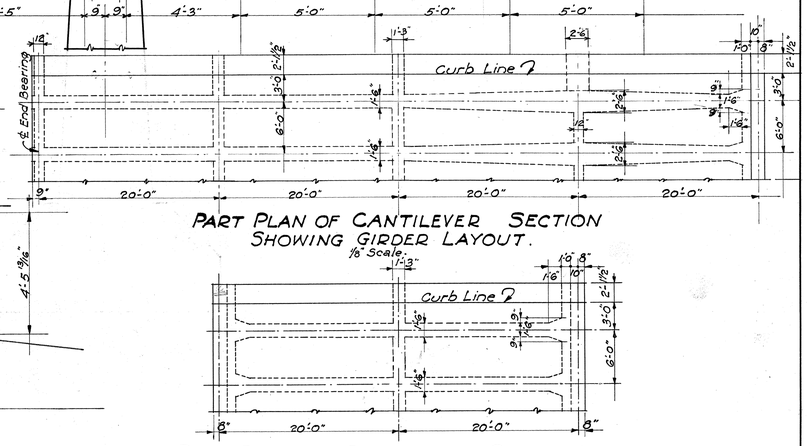


SEC. THRU GIRDER.
1 1/2" Scale.



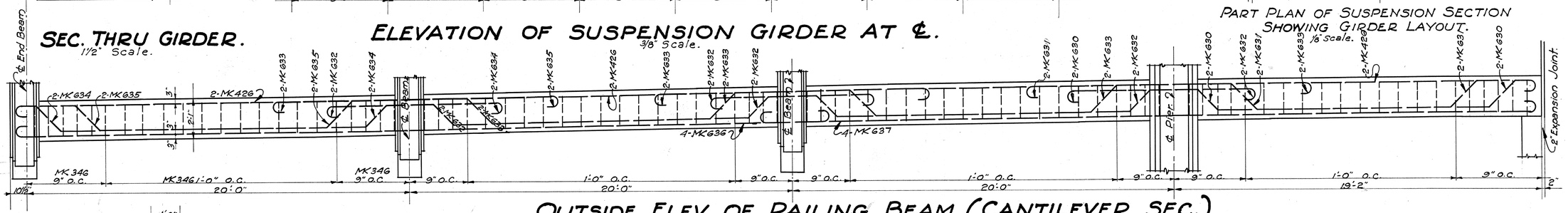
3/8" Scale.

ELEVATION OF SUSPENSION GIRDER AT ℄.

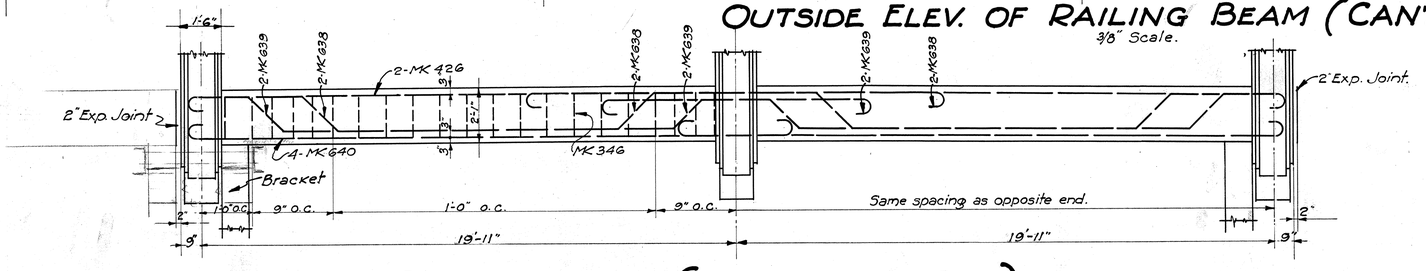


PART PLAN OF CANTILEVER SECTION SHOWING GIRDER LAYOUT.
1/8 Scale.

PART PLAN OF SUSPENSION SECTION SHOWING GIRDER LAYOUT.
1/8 Scale.



OUTSIDE ELEV. OF RAILING BEAM (CANTILEVER SEC.)
3/8" Scale.



RAILING BEAM (SUSPENSION SEC.)
3/8" Scale.

TERRITORIAL HIGHWAY DEPARTMENT.
TERRITORY OF HAWAII.

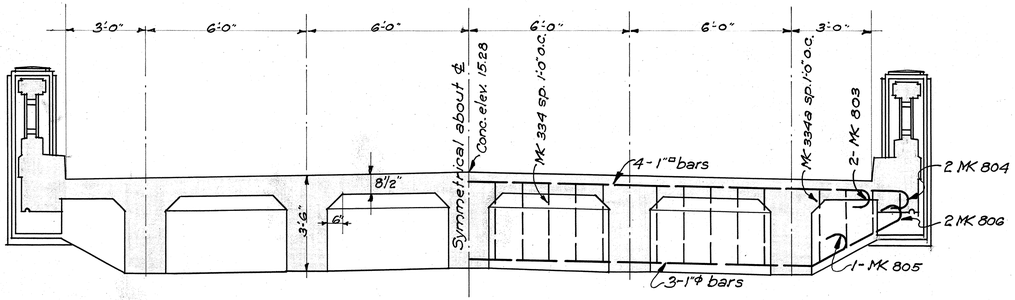
HALAWA BRIDGE

NO. 4 STA. 258+10 TO STA. 260+10.
KAMEHAMEHA HIGHWAY. N.R.H. NO. 9-A.
SEPT. 1933. SHEET NO 7 OF 13 SHEETS.

4300.31

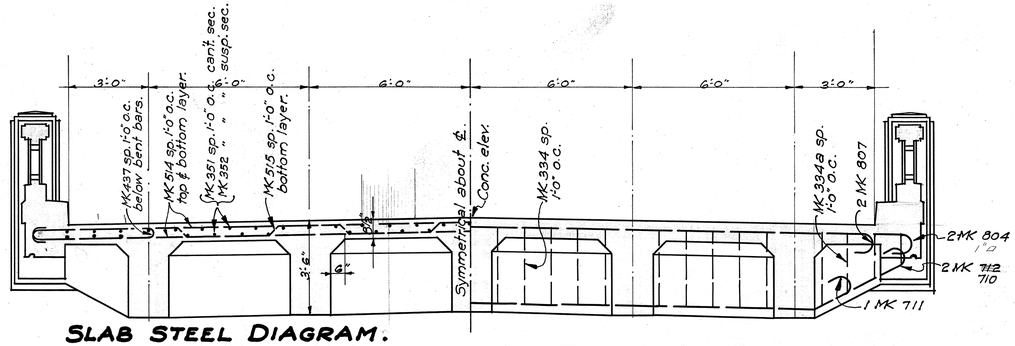
ORIGINAL TRACING PLOTTED BY W.R.B. June 1933
PLAN DRAWN BY C.F.W. Sept.
TRACING CHECKED BY C.F.W.
QUANTITIES BY W.R.B., C.F.W.
CHECKED BY W.C.B.
QUANTITIES CHECKED BY
STRUCTURE BOOK

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw	NEH 9A	1933	32	99



CROSS BEAM IN MIDDLE OF SUSPENSION GIRDER.

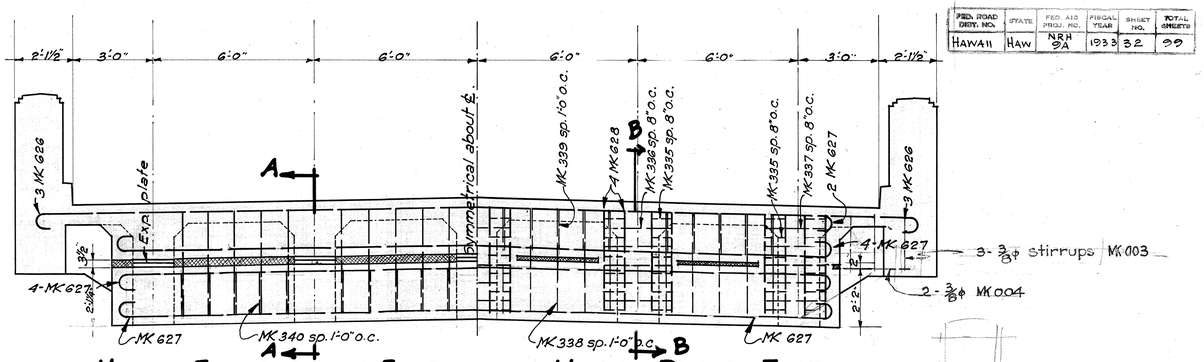
3/8" Scale.



SLAB STEEL DIAGRAM.

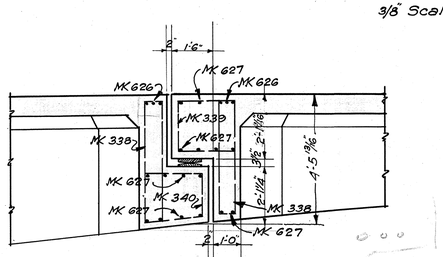
TYPICAL INTERMEDIATE TIE BEAM.

3/8" Scale.



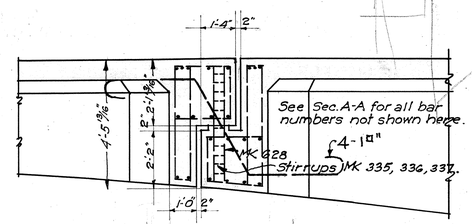
HALF EXPANSION END — HALF PIVOT END EXPANSION JOINT TIE BEAM DETAIL.

3/8" Scale.



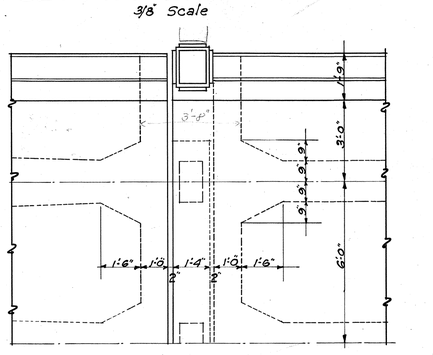
SEC. A-A EXP. END.

3/8" Scale



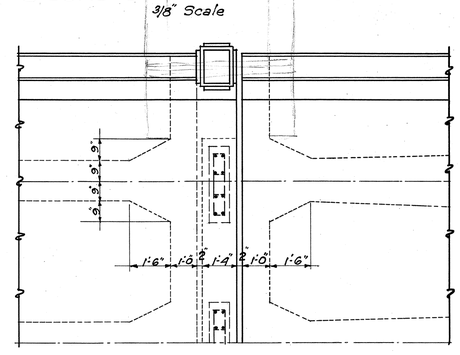
SEC. B-B PIVOT END

3/8" Scale



PLAN AT EXP. END.

3/8" Scale



PLAN AT PIVOT END.

3/8" Scale.

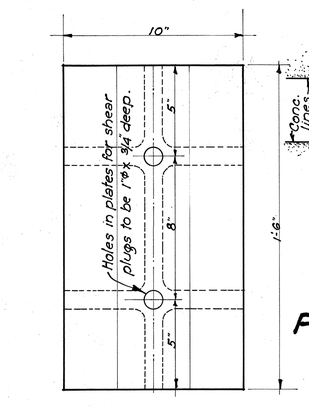
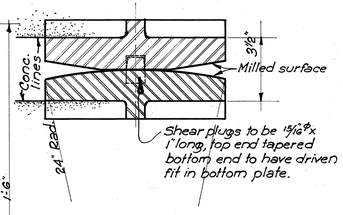
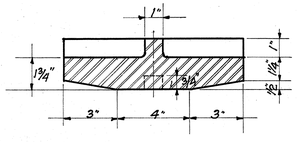
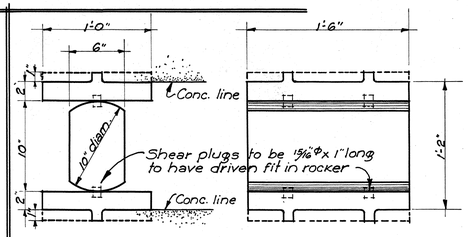


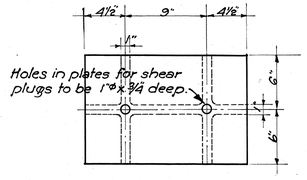
PLATE ROCKER BEARING

To be of Phosphor Bronze.
5 units required.
3" Scale.









ROCKER EXP. BEARING.

To be of steel.
10 Units required.
3/8" Scale.

ORIGINAL	SURVEY PLOTTED BY	W.B.R.	DATE	June, 1933
	TRACED BY	"	"	"
PLAN	DRAWN BY	C.E.N.	"	Sept. "
NOTE BOOK	TRACED BY	C.E.N.	"	"
No.	CHECKED BY	W.B.R.	"	"

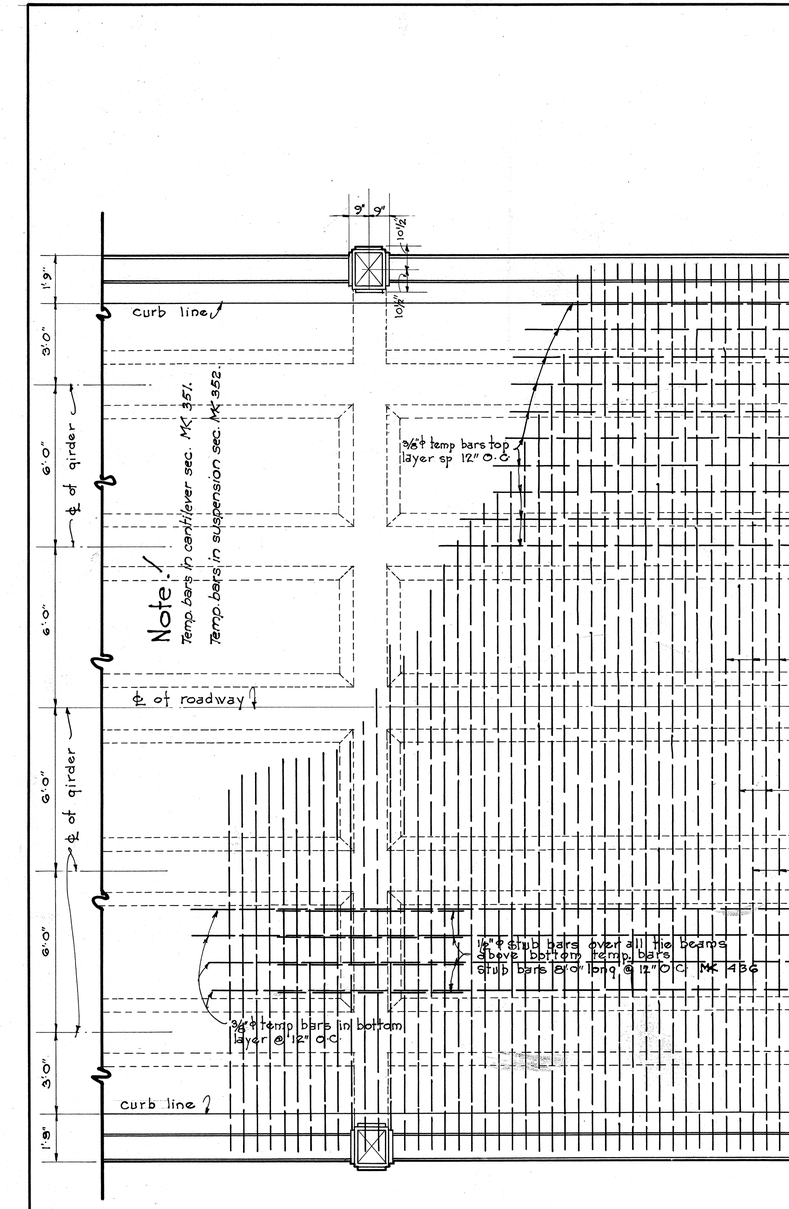
TERRITORIAL HIGHWAY DEPARTMENT.
TERRITORY OF HAWAII.

HALAWA BRIDGE.

NO. 4 STA. 258+10 TO STA. 260+10
KAMEHAMEHA HIGHWAY N.R.H. NO. 9-A.
SEPT. 1933. SHEET NO. 8 OF 13 SHEETS.

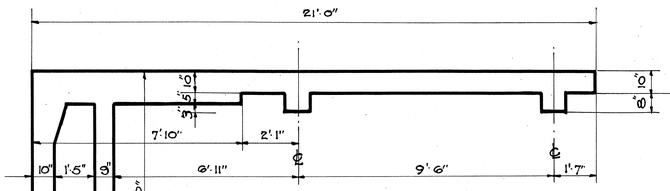
430.32

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw	NRH 9A	1933	33	99

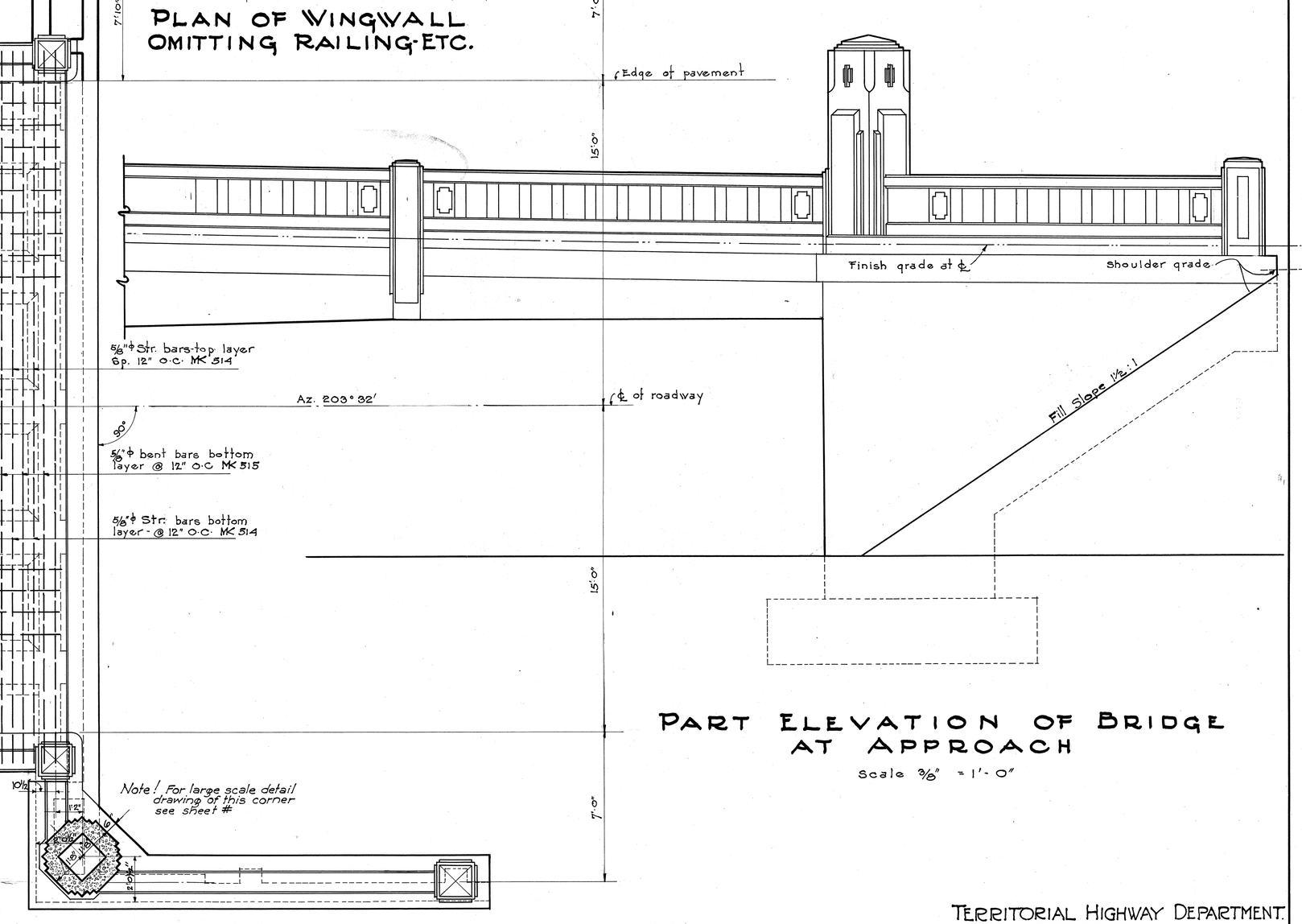


PART PLAN OF BRIDGE

Scale - ⅜" = 1'-0"



PLAN OF WINGWALL OMITTING RAILING-ETC.



PART ELEVATION OF BRIDGE AT APPROACH

Scale ⅜" = 1'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY		DATE
	DESIGNED BY	W.R.B.	" June 1933
	DRAWN BY	C.E.W.	" Sept. "
	TRACED BY	C.E.W.	" " "
NOTE BOOK	QUANTITIES BY	W.R.B. C.E.W.	" " "
	CHECKED BY	W.R.B.	" " "
No.			

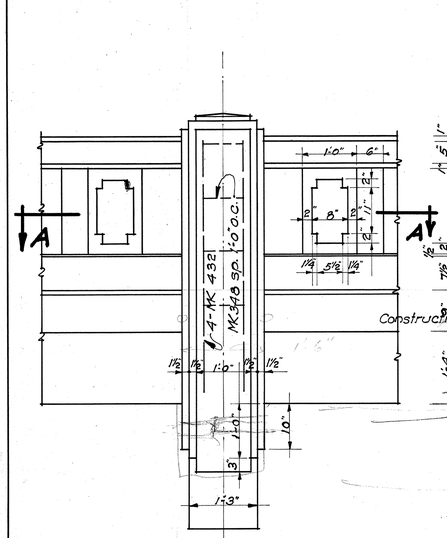
TERRITORIAL HIGHWAY DEPARTMENT.
TERRITORY OF HAWAII.

HALAWA BRIDGE.

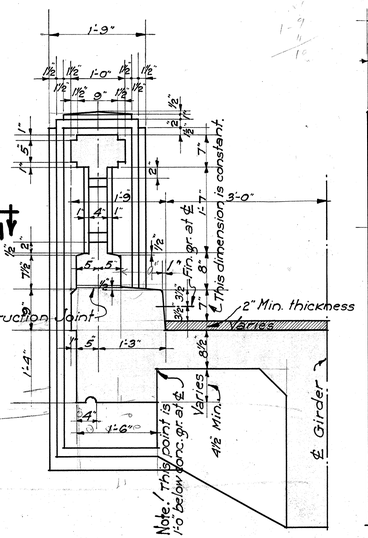
NO. 4 STA. 258+10 TO STA. 260+10
KAMEHAMEHA HIGHWAY N.R.H. NO. 9-A.
SEPT. 1933. SHEET NO 9 OF 13 SHEETS.

430.33

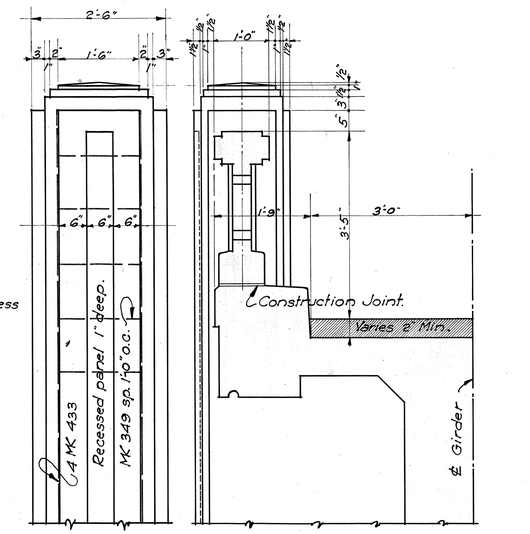
HAWAII | HAW | N.R.H. SA | 1933 | 34 | 99



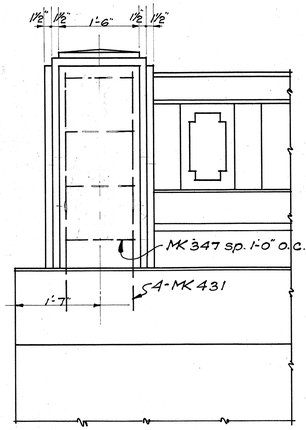
ELEV. INTERMEDIATE POST.
3/4" Scale



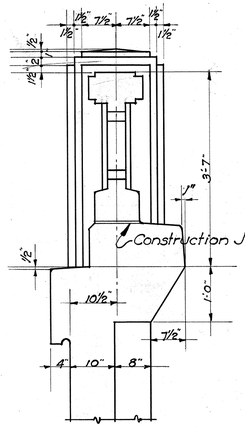
SEC. THRU RAILING.
3/4" Scale.



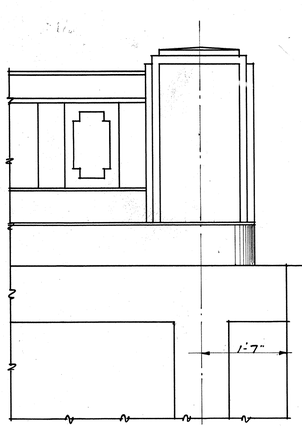
SEC. OVER CENTER PIER.
3/4" Scale.



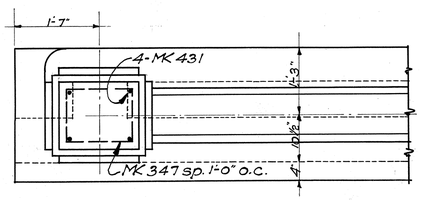
OUTSIDE ELEV.



SECTION

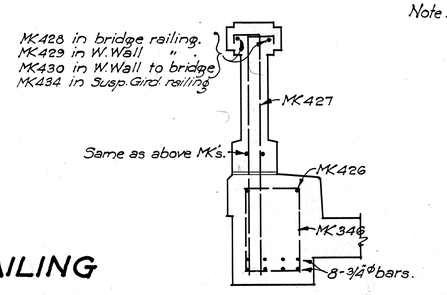


INSIDE ELEV.

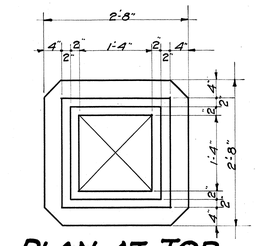


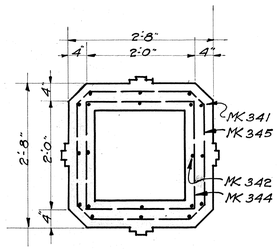
PLAN

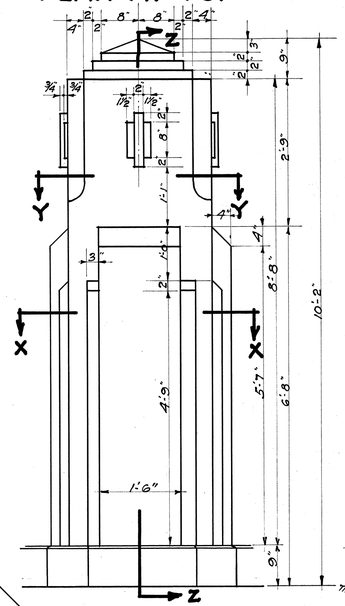
DETAIL OF END POST & RAILING ON TOP OF WING WALL.
3/4" Scale.

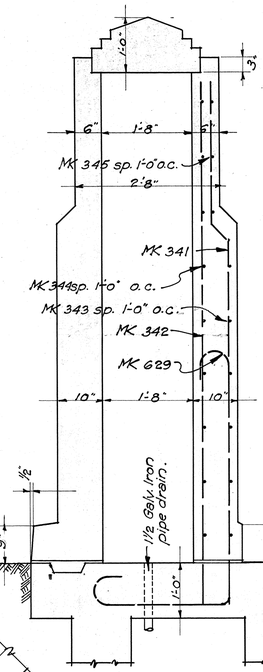


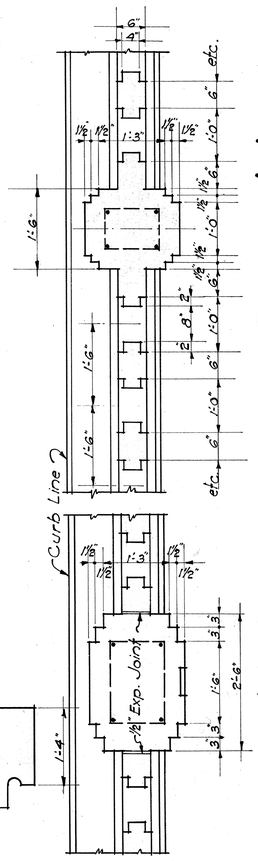
DETAIL OF RAILING REINFORCING.
3/4" Scale.







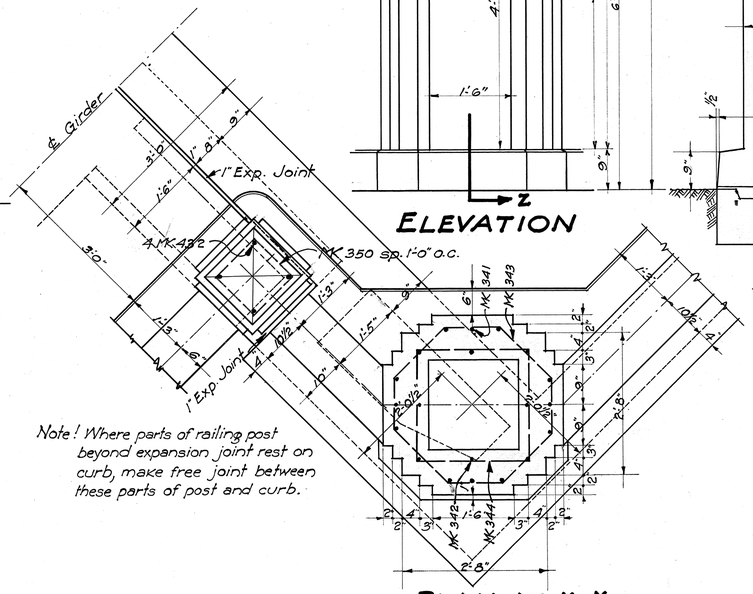




HOR. SECTION - CENTER PIER POST.
3/4" Scale.

SECTION A-A. INTERMEDIATE POST.
3/4" Scale.

Note! Expansion joints in railing not to go thru curb.



Note! Where parts of railing post beyond expansion joint rest on curb, make free joint between these parts of post and curb.

DETAIL OF APPROACH TOWER
This detail is typical for all 4 approach towers.
3/4" Scale.

TERRITORIAL HIGHWAY DEPARTMENT.
TERRITORY OF HAWAII.

HALAWA BRIDGE
NO. 4 STA. 258+10 TO STA. 260+10
KAMEHAMEHA HIGHWAY N.R.H. NO. 9-A.
SEPT. 1933. SHEET NO 10 OF 13 SHEETS.

430.34

DRAWN BY W.R.B. June 1933
TRACED BY C.E.W. "
CHECKED BY C.F.W. Sept. "
QUANTITIES BY W.R.B. "
CHECKED BY C.F.W. "
APPROVED BY W.R.B. "

STEEL SCHEDULE

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	NRH 9A	1933	35	99

MK	DESCRIPTION	LOCATION	SIZE	LENGTH	No of BARS EACH BEAM	No OF BEAMS	TOTAL No OF BARS WANTED	TOTAL LENGTH	WT. PER FT	TOTAL WEIGHT
300	8'-8" 6"	Abutment Footings	3/8"ϕ	9'.8"	40	2	80	772.8	0.38	294 #
301	11'.8" 6"	"	"	12'.8"	10	2	20	253.2	"	96
600	13" 49'.3"	"	3/4"ϕ	51'-5"	10	4	40	2056.8	1.52	3126
601	13" 1'-5½" 1'-5½" 1'-4" 5'-0" 5'-0" 4'-11½" 8'-6⅛" 2'-0⅜"	"	"	54'-8"	10	2	20	1093.2	"	1662
602	13" 5'.10"	" Colm	"	8'-0"	52 3	2 8	104 24	832.0 192.0	"	1265 292
603	13" 8'-5"	Abutment footings} Anchors-pre cast conc slab }	"	10'.7"	32 7	2 4.	64 28	677.1 296.2	"	1029 450
604	13" 11'-5"	"	"	13'.7"	30	2	60	814.8	"	239
605	13" 3" 4'-5"	"	"	6'.7"	60	2	120	789.6	"	1200
400	38'.8"	Center pier footing	½"ϕ	38'.8"	8	2	16	618.6	0.68	421
401	4" 4" 7" 1'.10"	"	"	5'.6"	48	2	96	528.0	"	359
700	2'0" 1'3" 8'4" 12'.0" 1'.9"	Countertort	7/8"ϕ	26'.7"	4	6	24	637.9	2.07	1321
701	2'0" 1'3" 4'0" 6'.0" 1'.6"	"	"	17'.0"	3	6	18	306.0	"	633
402	4" 4" 8" Varies	"	½"ϕ	Varies 11'-4" Aver.	19	6	114	1291.6	0.68	878
403	6" Varies 9"	"	"	Varies 270 lin. ft Aver	7	6	42	1620.0	"	1102
500	11" 12'0" 45'.2"	Abutment	5/8"ϕ	51'.0"	12	2	24	1248.0	1.06	1323
501	1'3" 12" 4½" 3'.0" 1'.9" 3'.0" 1'.9" 5'.5" 3'.0" 1'.9" 1'6" 11" 3'.9" 3'.2" 12"	"	"	30'-0"	11	2	22	660.0	"	700
502	11" 45'.6"	"	"	47'.4"	12	2	24	1135.9	"	1204
503	2'3" 3" 3'.11" 11"	"	"	8'.0"	12	4	48	384.0	"	407
504	9" 3'.11½" 3 11"	"	"	8'.10"	12	6	72	635.8	"	674
302	13'.0"	"	3/8"ϕ	13'.0"	60	2	120	1560.0	0.38	593
303	17'.0"	"	"	17'.0"	8	4	32	544.0	"	207
606	13" 16'.8"	"	3/4"ϕ	18'.10"	3	4	12	225.96	1.52	343
607	12'.7" 13" Colm. reinf.	"	"	13'.8"	4	4	16	218.6	"	332
304	4½" 4½" 11⅛" 8" 13⅜" " "	"	3/8"ϕ	4'.9"	11	4	44	209.0	0.38	794
421	2'.2" 2'.4" 5'.2" Front face	"	½"ϕ	11'.0"	6	4	24	264.0	0.68	180
608	15'.0"	Wingwall Colm	3/4"ϕ	15'.0"	3 4	4 8	12 32	180.0 480.0	1.52	274 730
305	3¾" 3¾" 7⅛" 7⅛"	Colm	3/8"ϕ	3'.0"	13	8	104	312.0	0.38	119

Total 23,247.0#

MK	DESCRIPTION	LOCATION	SIZE	LENGTH	No of BARS EACH BEAM	No OF BEAMS	TOTAL No OF BARS WANTED	TOTAL LENGTH	WT. PER FT.	TOTAL WEIGHT
609	13" 44'.7"	Col'm	3/4"ϕ	46'-9"	6	8	48	2244.0	1.52	3411 #
611	2'.0"	Grillage bars in wingwall & Col. tie beams	"	2'.0"	5	8	40	80.0	"	122
306	3¾" 3¾" 7⅛" 10⅛" Free standing	Col. tie beams	3/8"ϕ	3'.6"	43	8	344	1204.0	0.38	458
404	2'.6" "	Colm. fty	½"ϕ	2'.6"	4	8	32	80.0	0.68	54
405	5" 7" 2'.0" "	"	"	6'.0"	2	8	16	96.0	"	65
612	13" 6'.3"	Wingwall Col. toward abut.	3/4"ϕ	7'-4"	5	4	20	146.6	1.52	223
307	3¾" 3¾" 7⅛" 1'.1⅛"	Wingwall Beam " Colm " Col. 2 " " 3	3/8"ϕ	4'-0"	14 5 6 3	4 4 4 4	56 20 24 12	224.0 100.0 96.0 48.0	0.38	85 38 36 18
406	8" 6'.4"	Wingwall Col toward abut.	½"ϕ	7'-0"	2	4	8	56.0	0.68	38
613	8'.9" 18"	Wingwall Colm # 2	3/4"ϕ	9'.10"	3	4	12	117.9	1.52	179
407	9'.0"	"	½"ϕ	9'.0"	2	4	8	72.0	0.68	49
614	13" 3'.0"	Wingwall Colm # 3	3/4"ϕ	4'.1"	3	4	12	49.0	1.52	74
408	3'-3"	"	½"ϕ	3'.3"	2	4	8	26.0	0.68	18
615	13" 19'.10"	Cap of Wingwall	3/4"ϕ	22'.0"	2	4	8	176.0	1.52	268
616	12" 17'.7"	"	"	19'.9"	2	4	8	158.0	"	240
505	11" 7'.1" 21"	Wingwall Lower part	5/8"ϕ	11'.0"	4	8	32	352.0	1.06	373
507	11" 20'.8" 11"	Wingwall Front horiz	"	24'.0"	6	4	24	576.0	"	611
509	11" Varies 2'-0"	Wingwall	"	Varies 17'.0 Aver.	12	4	48	816.0	"	865
511	11" 4'.2"	Wingwall at center Col	"	6'.0"	7	4	28	168.0	"	178
310	15'.6"	" @ Corners vert. bars	3/8"ϕ	15'.6	12	4	48	744.0	0.38	283
310a	Varies	Wingwall Cap	"	Varies 7'.1" Aver.	22	4	88	623.0	"	237
312	5" 2'.9½" 9"	"	5/8"ϕ	7'.0"	16	4	64	448.0	"	170
409	20'.6"	"	½"ϕ	20'.6"	4	4	16	328.0	0.68	223
307a	3" 5" 1'.4⅞" 7⅛"	"	3/8"ϕ	4'.6"	18	4	72	324.0	0.38	123
410	15'.0"	"	½"ϕ	15'.0"	2	4	8	120.0	0.68	82
313	2'.6"	Anchor-pre cast conc slab	3/8"ϕ	2'.6"	20 16	(9'.6") 4 4 (7'.10")	80 64	360.0	0.38	137
314	9'.0"	"	"	9'.0"	4	4	16	144.0	"	55
315	7'-0"	"	"	7'.0"	4	4	16	112.0	"	43

Total = 8,756.0#

MK	DESCRIPTION	LOCATION	SIZE	LENGTH	No of BARS EACH BEAM	No OF BEAMS	TOTAL No OF BARS WANTED	TOTAL LENGTH	WT PER FT	TOTAL WEIGHT
619	13" 6'.9"	Anchor-pre cast conc slab	3/4"ϕ	8'-11"	7	4	28	249.8	1.52	380 #
316	1'.9" Sect. "F.P."	Floating Anchor } End anchor	5/8"ϕ	1'.9"	2 2	6 4	16 8	21.0 14.0	0.38	8 4
317	4'-0"	" Normal floating anchor-horiz }	"	4'.0"	8 6	6 6	48 36	192.0 144.0	"	73 55
411	8" 7" 2'.6"	Floating anchor } End anchor	½"ϕ	5'.0"	4 2	6 4	24 8	120.0 40.0	0.68	82 27
318	6'-0" Vert rear & front	"	3/8"ϕ	6'.0"	10	6	60	360.0	0.38	137
512	11" 3'.6" Horiz front	"	5/8"ϕ	5'.4"	13	6	78	415.7	1.06	441
702	3'.0" 1'.3" Grillage	Floating anchor } End anchor	7/8"ϕ	3'.0"	10 10	6 4	60 40	180.0 120.0	2.07	372 248
703	1'.6" 2'.9" 9½"R. 2'.5¾"	Floating anchor } End anchor	"	13'.6"	4 4	6 4	24 16	324.0 216.0	"	671 447
620	3'.9" 13" Horiz hook 1'.1"	Floating anchor } End anchor	3/4"ϕ	12'.3"	4 4	6 4	24 16	294.0 196.0	1.52	447 298
412	3'.0"	Floating anchor } End anchor	½"ϕ	3'.0"	8 8	6 4	48 32	144.0 96.0	0.68	98 65
413	2'.0" 2'.9" 2'.5" 3" 2'.7" 2'.4"	Floating anchor } End anchor	"	13'.8"	4 4	6 4	24 16	327.8 218.5	"	223 149
320	8" Varies	Floating anchor } End anchor	3/8"ϕ	60 lin. ft each		6 4		360.0 240.0	0.38	137 91
321	3" Varies 4¼" Horiz stirrups	Anchor End anchor	"	Varies 163 lin. ft each		6 4		978.0 652.0	"	372 248
414	2'.6" 1'.4" 1'.9" 8" 4" Fins	Anchor End anchor	½"ϕ	7'.3"	4 2	6 4	24 8	174.0 58.0	0.68	118 39
415	1'.11" 9" 8" 12"	Anchor End anchor	"	5'.0"	4 2	6 4	24 8	120.0 40.0	"	82 27
704	8'.3" 4'.3" 4'.0" 2'.6" 2'.0" Top view	Anchor & Counterforts	7/8"ϕ	21'.6"	4	10	40	860.0	2.07	1780
621	7'.0" 2'.5¾" 9½"R. 5'.0" 2'.0" Top view	"	3/4"ϕ	18'.8"	4	10	40	746.4	1.52	1135.
416	3'.6"	"	½"ϕ	3'.6"	8	10	80	280.0	0.68	190
417	8" 6'.2"	"	"	7'.6"	4	10	40	600.0	"	408
322	3" 2'.7¼" 2'.2¼" Max Min Ave	"	3/8"ϕ	10'.0"	4	10	40	400.0	0.38	152
323	3" 2'.7¼" 5¾"	"	"	6'.7"	6	10	60	394.8	"	150
705	2'.3" Grillage	"	7/8"ϕ	2'.3"	5	10	50	112.5	2.07	233
706	2'.8"	"	"	2'.8"	5	10	50	133.0	"	275
324	6'.9"	End Anchor	3/8"ϕ	6'.9"	6	4	24	162.0	0.38	62

Total = 9,724.0#

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

HALAWA BRIDGE

No 4 STA. 258+10 To STA 260+10
KAMEHAMEHA HIGHWAY N. R. H. No 9-A
SEPT. 1933 SHEET No 11 of 13 SHEETS

430.35

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE 9-33
	DESIGNED BY	" " "
	DRAWN BY	" " "
NOTE BOOK	TRACED BY	" " "
No.	QUANTITIES BY	" " "
	CHECKED BY	" " "

REVISED

STEEL SCHEDULE

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw	NRH 9A	1933	36	99

MK	DESCRIPTION	LOCATION	SIZE	LENGTH	No of Bars Each Beam	No of Beams	Total No of Bars Wanted	Total Length	Wt. per Foot	Total Weight
513	6" 1" 3'-6" 3'-0" 11"	End Anchor	5/8"ϕ	7'-5"	13	4	52	385.8	1.06	409.0#
325	3'-0"	In slab in place of #317 End Anchor grillage	3/8"ϕ	3'-0"	8"	4	32	96'-0"	0.38	36
622	2'-4"	Anchor Arm 20' Arm	3/4"ϕ	2'-4"	4	6	24	56.9"	1.52	85
623	2'-0"	"	"	2'-0"	4	6	24	48.0	"	73
800	20'-0" 6" 1½R. 2'-0¼" 12" 2'-5¾"	"	1"ϕ	31'-10"	6	6	36	1145.9	2.70	3,094
624	13" 2'-0" 1'-3" 10" 3'-11¾"	"	3/4"ϕ	17'-0"	4	6	24	408.0	1.52	620
625	17'-10" 13"	"	"	20'-0"	2	6	12	240.0	"	365
326	3¼" 3¼" 1'-7⅜" 7⅜"	"	3/8"ϕ	5'-0"	26	6	156	780.0	0.38	296
327	3¼" 3¼" 2'-7⅜" 7⅜"	"	"	7'-0"	4	6	24	168.0	"	64
328	45'-4"	End Curtain wall back of Abut @ top	"	45'-4"	8	2	16	725.3	"	276
329	4'-6"	"	"	4'-6"	55	2	110	495.0	"	188
418	45'-4"	"	½"ϕ	45'-4"	2	2	4	181.3	0.68	123
419	35'-6"	End Curtain Wall	"	35'-6"	3	2	6	213.0	"	145
330	12" 2'-7" 2'-0" 4'-6" 6"	"	3/8"ϕ	10'-7"	71	2	142	1502.4	"	571
707	6'-6" 15"	Center pier	7/8"ϕ	9'-0"	4	10	40	360.0	2.07	745
708	32'-2" 18"	End beam	"	34'-8"	3	2	6	207.9	"	430
709	15" 2'-6" 1'-3" 15"	"	"	30'-6"	1	2	2	61.0	"	126
710	15" 2'-6" 3'-6" 15"	End beam Int. tie beams	"	35'-0"	2 2	2 4	4 8	140.0 280.0	"	290 580
331	3" 3" 2'-7⅞" 7¼"	End beam	⅜"ϕ	7'-0"	20	2	40	280.0	0.38	106
331 a	3" 3" Varies 7¼" Bracket	"	"	Varies 5'-8" Aver.	8	2	16	90.6	"	34
801	28'-2" 17"	Center pier beams	1"ϕ	31'-0"	1	2	2	62.0	2.70	167
802	32'-1" 17"	"	"	34'-11"	2	2	4	139.7	"	377
332	26'-0"	Center pier beams	⅜"ϕ	26'-0"	6	2	12	312.0	0.38	119
420	25'-7" 8"	"	½"ϕ	26'-11"	2	2	4	107.7	0.68	73
333	4½" 4½" 6'-5¾" 7¾"	"	⅜"ϕ	15'-0"	16	2	32	480.0	0.38	182
803	29'-2" 17"	Cross beam ℄ of Suspen. girder	1"□	32'-0"	2	1	2	64.0	3.44	220
805	17" 25'-6" 17"	"	"	31'-0"	1	1	1	31'-0"	2.70	84

Total = 9878.0#

MK	DESCRIPTION	LOCATION	SIZE	LENGTH	No of Bars Each Beam	No of Beams	Total No of Bars Wanted	Total Length	Wt. per Ft.	Total Weight
806	17" 25'-6" 5'-6"	Cross beam ℄ of suspen. girder	1"ϕ	35'-4"	2	1	2	70'-6"	2.70	191 #
334	4¼" 4¼" 2'-11⅜" 1'-1⅜"	" Int tie beams	⅜"ϕ	8'	20 20	1 4	20 80	176.6 708.4	0.38	67 268
334 a	4½" 4¼" Varies 1'-1⅜"	Cross beam ℄ of sus. girders Int. tie beams	"	Varies 6'-6" Aver	8 8	1 4	8 32	52.0 208.0	"	20 79
807	29'-2" 17"	Int. tie beams	1"ϕ	32'-0"	2	4	8	256.0	2.70	691
804	32'-1" 17"	Int. tie beams Cross beam ℄ Suspen. girder	1"□	34'-11"	2 2	4 1	8 2	279.4 69.8	3.44	961 240
711	5" 25'-6" 1'-6"	"	⅞"ϕ	31'-0"	1	4	4	124.0	2.07	257
626	32'-3" 13"	Exp. beam (top) - Pivot & Exp.	¾"ϕ	34'-5"	6	2	12	413.0	1.52	628
627	25'-10" 13"	"	"	28'-0"	16	2	32	896.0	"	1362
628	Varies	Exp beams Pivot end	"	Varies 4'-0" Aver.	40	1	40	160.0	"	243
335	2¾" 2¾" 10⅛" 5⅛"	"	⅜"ϕ	3'-0"	6	10	60	180.0	0.38	68
336	2¾" 2¾" 2'-7⅛" 5⅛" 8 Center lugs	"	"	6'-6"	5	3	15	97.5	"	37
337	2¾" 2¾" 2'-4⅛" 5⅛" 2 End lugs	"	"	6'-0"	5	2	10	60.0	"	23
338	4⅝" 4⅝" Varies 8⅛" tall Stirrups	"	"	Varies 10'-0" Aver.	40	2	80	800.0	"	304
339	3½" 3½" 2'-11⅛" Varies 1'-7¼" Av. Top	"	"	Varies 8'-0" Aver	20	2	40	320.0	"	122
340	1'-6¾" 5⅜" 5⅜" 2'-11⅛" 1'-4¼" Bottom	"	"	8'-0"	20	2	40	320.0	"	122
341	Bent to fit on jab	End Br. tower	"	10'-0"	12	4	48	480.0	"	182
342	9'-8"	"	"	9'-8"	8	4	32	309.1	"	117
343	12" 1'-5" 12" 1'-5" 12" 1'-5½" 12"	"	"	10'-8"	6	4	24	255.8	"	97
344	2" 2'-2" 2'-2"	"	"	9'-0"	9	4	36	324.0	"	123
345	15" 1'-10" 15" 1'-4" 14"	"	"	8'-6"	6	4	12	102.0	"	39
629	13" 2'-3" 4'-7"	"	3/4"ϕ	9'-0"	8	4	32	288.0	1.52	438
850	2'-0" 3'-6" 3'-10" 41'-0" 15'-8" 4'-4" 4'-0" 9½"	Cantilever Girder	1"□	78'-9"	1	10	10	785.8	3.44	2703
851	2'-0" 3'-5⅝" 4'-11⅛" 38'-0" 21'-6" 4'-4" 14'-0" 9½"	"	"	81'-10"	2	10	20	1633.2	"	5618
852	2'-0" 3'-5" 27'-3" 4'-6¼" 34'-1" 4'-6¼" 6"	"	"	79'-5"	2	10	20	1588.4	"	5464
902	5'-7½" 3'-7" 35'-2" 5'-1" 25'-8" 5'-0" 8'-8"	"	1⅛"□	86'-11"	2	10	20	1738.4	4.35	7562
903	3'-7" 3'-6¾" 39'-9" 5'-6" 20'-2" 5'-4" 6'-6"	"	"	87'-6"	2	10	20	1750.0	"	7613
904	11'-6" 3'-6" 36'-4" 4'-9" 30'-8" 4'-9¾" 2'-0"	"	"	86'-7"	1	10	10	865.8	"	3766

Total = 39405#

MK	DESCRIPTION	LOCATION	SIZE	LENGTH	No of Bars Each Beam	No of Beams	Total No of Bars Wanted	Total Length	Wt. per Foot	Total Weight
856	17" 3'-4" 49'-4" 2'-0" 3'-8"	Cantilever girder	1"□	61'-2"	1	10	10	611.7	3.44	2104#
857	17" 3'-4" 47'-3" 2'-0" 1'-9" 9½"	"	"	62'-2"	1	10	10	621.7	"	2139
858	17" 3'-5" 44'-3" 2'-0" 2'-3" 1'-9" 9½"	"	"	59'-3"	2	10	20	1185.0	"	4076
859	17" 3'-6" 41'-3" 2'-0" 1'-9" 9½"	"	"	56'-4"	1	10	10	563.3	"	1938
860	17" 5'-2" 20'-3" 2'-0" 5'-0" 2'-0"	"	"	37'-3"	1	10	10	372.5	"	1281
861	17" 6'-11" 11'-6" 2'-0" 6'-9" 2'-0"	"	"	31'-11"	2	10	20	638.4	"	2196
862	17" 7'-3" 4'-0" 2'-0" 2'-0" 2'-0"	"	"	25'-1"	2	10	20	501.6	"	1725
863	17" 3'-3" 1'-6" 3'-7" 2'-0" 8'-0"	"	"	15'-8"	2	10	20	313.2	"	1077
900	6" 3'-2" 12" 19" 57'-0" 19'-10" 8'-0" 1'-8"	"	1⅛"□	95'-10"	2	10	20	1917.6	4.35	8342
901	9" 20'-8½" 59'-4" 1'-6" 19'-10" 8'-0" 1'-8"	"	"	93'-6"	3	10	30	2805.0	"	12,202
421	4⅜" 4⅜" Varies 3'-9" Av. 1'-9" 1½"	"	1½"ϕ	Varies 10'-6" Aver.	65	10	650	6825.0	0.68	4641
422	3⅜" 3⅜" 10⅜" Varies 5'-8" Av.	Each 13'-9" long - double = 27'-6"	"	Varies 27'-6" Aver.	24	10	240	6600.0	"	4488
423	3½" 3½" 1'-2½" 2'-9" At Exp. joint	"	"	8'-6"	7	20	140	1190.0	"	809
424	3½" 3½" 1'-2½" 4'-3" "	"	"	11'-6	4	20	80	920.0	"	626
871	17" 2'-8" 2" Tie bar	"	1"ϕ	31'-0"	2	10	20	620.0	2.70	1674
864	1'-6" 17" 7'-4" 3'-10" 20'-10"	Suspension Girder	1"□	65'-4"	1	5	5	326.0	3.44	1124
865	17" 4'-10" 1'-8" 25'-6" 8'-0"	"	"	65'-4"	2	5	10	653.3	"	2247
866	17" 1'-2" 2'-10" 1'-8" 29'-8" 8'-0"	"	"	65'-5"	2	5	10	654.2	"	2250
867	9" 4'-4" 9" 17" 31'-8"	"	"	44'-8"	2	5	10	446.0	"	1534
868	17" 9½" 1'-8" 4'-3" 33'-6"	"	"	56'-8"	3	5	15	849.9	"	2924
869	17" 9½" 4'-0" 34'-0"	"	"	50'-5"	4	5	20	1008.4	"	3469
870	15'-5" 17" 37'-10"	"	"	47'-6"	1	5	5	237.5	"	817
425	4½" 4½" Varies 3'-6" Aver 1'-1½"	"	½"ϕ	Varies 10'-0" Aver.	50	5	250	2500.0	0.68	1700
424	3½" 3½" 1'-2½" 4'-3"	"	"	11'-6"	4	5	20	230.0	"	156

Total = 65,539.0#

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

HALAWA BRIDGE

No 4 STA. 258+10 TO STA 260+10

KAMEHAMEHA HIGHWAY N.R.H. No 9-A

SEPT. 1933 SHEET No 12 OF 13 SHEETS

4300.36

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

FED. ROAD PROJ. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	NRH 9A	1933	37	99

STEEL SCHEDULE

MK	DESCRIPTION	LOCATION	SIZE	LENGTH	No. of bars in each unit	No. of units	Total no. of bars wanted	Total Length	Weight per foot	Total Weight
423	2'-9" 3½" 1'-2½"	Suspension Girder.	½"ø	8'-6"	6	5	30	255.0	0.68	173.00
872	36'-2" 1:5	" "	1"ø	39'-0"	2	5	10	390.00	2.70	1053.00
630	6'-6" 1:6½ 1'-10½" 9" 1:1 14'-2" 1:4	Railing Beam	¾"ø	27'-0"	2	4	8	216.00	1.52	328.0
631	10'-5" 1'-10½" 2'-9" 1:4 9'-11"	"	"	29'-0"	2	4	8	232.00	"	353.0
632	5'-8½" 1:6½ 5'-2½" 1:1 15'-4"	"	"	31'-0"	2	8	16	496.0	"	754.0
633	9'-10½" 1'-10½" 9'-10½" 1:4 11'-4"	"	"	37'-0"	2	8	16	592.0	"	900.0
634	8" 1'-10½" 5'-2½" 1:6½ 1:4 15'-10½" 1:1	"	"	28'-0"	2	4	8	224.0	"	340.0
635	2'-9" 1'-10½" 10'-5½" 1:4 11'-10½"	"	"	31'-0"	2	4	8	248.0	"	377.0
636	41'-10"	"	"	44'-0"	4	4	16	704.0	"	1070.0
637	39'-10"	"	"	42'-0"	4	4	16	672.0	"	1021.0
426	16'-0"	"	½"ø	16'-0"	2	24	48	768.0	0.68	522.0
346	1'-8⅛" 3¾" 1'-1⅛"	"	⅜"ø	6'-2"	85 21	4 4	424	2616.08	0.38	994.0
638	3'-11" 1'-10½" 10'-6" 1:4 10'-6"	"	¾"ø	31'-0"	2	4	8	248.0	1.52	377.0
639	1'-11" 1'-10½" 1'-6⅝" 6'-0" 1:4 14'-6" 1:1	"	¾"ø	28'-0"	2	4	8	224.0	"	341.0
640	21'-10"	"	"	24'-0"	4	4	16	384.0	"	584.0
427	4'-4" 6"	Railing	½"ø	5'-0"	26 2 20	20 4 4	608	3040.0	0.68	2067.0
428	60'-0"	"	"	60'-0"	4	4	16	960.0	"	653.0
429	17'-0"	"	"	17'-0"	4	4	16	272.0	"	185.0
430	3'-0"	"	"	3'-0"	4	4	16	48.0	"	33.0
434	41'-0"	"	"	41'-0"	4	2	8	328.0	"	223.0
431	4'-4"	" End Post W.W.	"	4'-4"	4	4	16	69.28	"	47.0
347	1'-4" 4" 1'-4"	" " "	⅜"ø	6'-0"	4	4	16	96.0	0.38	37.0
432	5'-8"	" Normal Post	½"ø	5'-8"	4	14	56	316.96	0.68	216.0
348	1'-1" 4" 10"	" "	⅜"ø	4'-6"	4	14	56	252.0	0.38	96.0
433	7'-6"	" Post over Pier	½"ø	7'-6"	4	4	16	120.0	0.68	82.0
349	1'-7" 4" 1'-1"	" " "	⅜"ø	6'-0"	5	4	20	120.0	0.38	46.0
432	5'-8"	End " Post	½"ø	5'-8"	4	4	16	90.56	0.68	62.0

12,934.0#

MK	DESCRIPTION	LOCATION	SIZE	LENGTH	No. of bars in each unit	No. of units	Total no. of bars wanted	Total Length	Weight per foot	Total Weight.
350	1'-1" 4" 1'-1"	Railing End Post	⅜"ø	5'-0"	4	4	16	80.0	0.38	30.0
435	17'-8"	Railing	½"ø	17'-8"	4	4	16	282.56	0.68	192.0
514	32'-4" 11"	Slab.	⅝"ø	34'-2"	402	1	402	13,736.34	1.06	14,560.0
515	3'-3¾" 1'-6⅞" 2'-2¾" 11" 4⅞" 3'-0"	"	"	35'-5"	119	1	119	4,215.0	"	4,468.0
351	79'-6"	"	⅜"ø	79'-6"	53	2	106	8,427.0	0.38	3,202.0
436	5'-8½" 8" 5¾"	"	½"ø	8'-0"	16	7	112	896.0	0.68	609.0
352	41'-0"	"	⅜"ø	41'-0"	53	1	53	2,173.0	0.38	826.0
437	8" 4'-2"	"	½"ø	5'-6"	201	2	402	2,211.0	0.68	1,504.0
506	11" 7'-1" 2'-1"	Wing Wall	⅝"ø	11'-0"	8	4	32	352.0	1.06	373.0
508	11" 20'-3" 1'-11"	" "	⅝"ø	24'-0"	3	4	12	288.0	"	305.0
510	11" Varies 13'-9" Aver. 2'-0"	" "	"	Varies 17'-0" Av.	6	4	24	408.0	"	432.0

26,501.0#

GRAND TOTAL 195984.0#

ORIGINAL PLAN	SURVEY NOTE BOOK	DATE Sept. 1933
	DES. BY R.W.B.	
	TRACED BY C.E.W.	
	CHK. BY " "	
	QUANTITIES BY " "	
	CHK. QUANTITIES BY " "	

TERRITORIAL HIGHWAY DEPARTMENT.
TERRITORY OF HAWAII.

HALAWA BRIDGE

NO. 4 STA. 258+10 TO STA. 260+10
KAMEHAMEHA HIGHWAY. N.R.H. NO. 9-A.
SEPT. 1933. SHEET NO. 13 OF 13 SHEETS.

4300.37