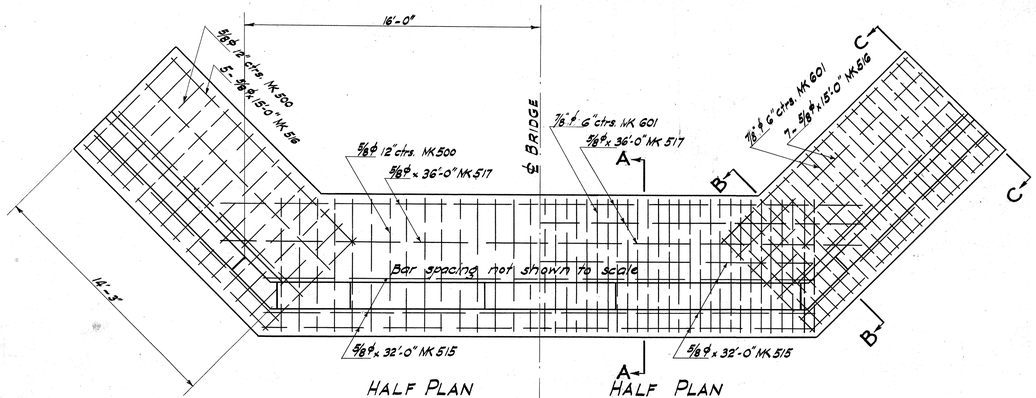
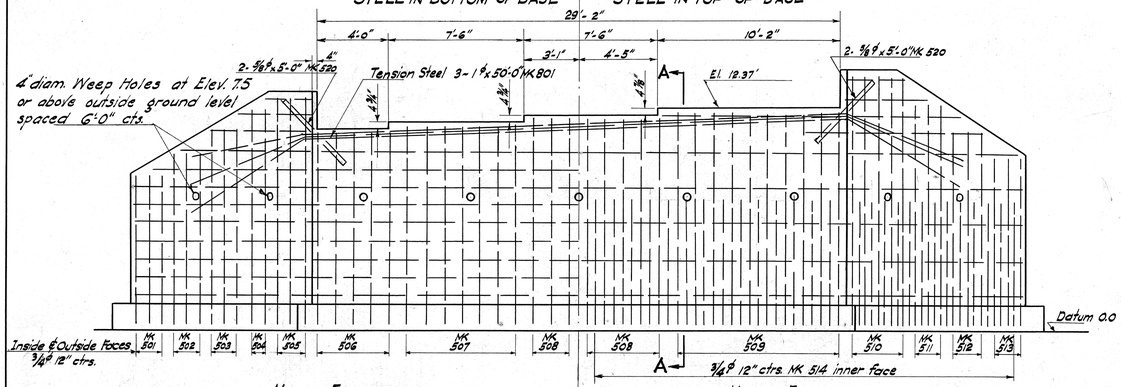
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1 C	1931	8	15



HALF PLAN
STEEL IN BOTTOM OF BASE

HALF PLAN
STEEL IN TOP OF BASE



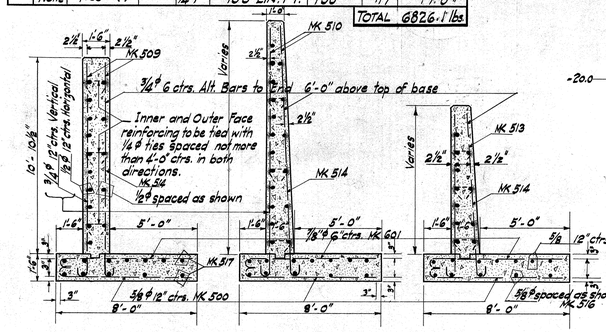
HALF ELEVATION
SHOWING STEEL IN OUTER FACE

HALF ELEVATION
SHOWING STEEL IN INNER FACE

ELEVATION SOUTH ABUTMENT

NORTH ABUTMENT SIMILAR
SCALE: 1/4" = 1'-0"

	MK.	SHAPE	SIZE	No. Pcs.	LENGTH	TOTAL LGTH.	WT. Ft.	TOTAL WT.
BENT STEEL	500	7'-6"	5/8φ	60	8'-2"	490'-0"	1.05	514.5 lbs.
	501	8'-3"	3/4φ	6	8'-11"	53'-6"	1.52	81.3 "
	502	9'-6"	do	6	10'-2"	61'-0"	do	92.7 "
	503	11'-0"	do	6	11'-8"	70'-0"	do	106.4 "
	504	12'-3"	do	4	12'-11"	51'-8"	do	78.5 "
	505	12'-6"	do	6	13'-2"	79'-0"	do	120.1 "
	506	10'-6"	do	10	11'-2"	111'-8"	do	169.7 "
	507	11'-0"	do	14	11'-8"	163'-4"	do	248.3 "
	508	11'-6"	do	16	12'-2"	194'-8"	do	295.9 "
	509	12'-0"	do	20	12'-8"	253'-4"	do	385.1 "
	510	14'-0"	do	10	14'-8"	146'-8"	do	222.9 "
	511	12'-3"	do	6	12'-11"	77'-6"	do	117.8 "
	512	10'-9"	do	6	11'-5"	68'-6"	do	104.1 "
	513	9'-9"	do	6	10'-5"	62'-6"	do	95.0 "
	514	7'-3"	do	57	7'-11"	451'-3"	do	685.9 "
	520		5/8φ	4	5'-0"	20'-0"	1.05	21.0 "
	601	7'-6"	7/8φ	121	8'-6"	1028'-6"	2.06	2118.7
	801		1φ	3	50'-0"	150'-0"	2.69	403.5 lbs.
STRAIGHT STEEL	515		5/8φ	7	32'-0"	224'-0"	1.05	235.2 "
	516		5/8φ	24	15'-0"	360'-0"	do	378.0 "
	517		5/8φ	5	36'-0"	180'-0"	do	189.0 "
	None	Temperature Steel	1/2φ	1000	LIN. FT.	1000'	.66	660.0 "
	None	Ties	1/4φ	100	LIN. FT.	100'	.17	17.0 "
							TOTAL	6826.1 lbs



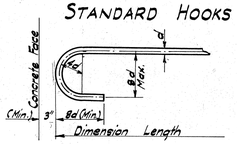
SECTION A-A

SECTION B-B

SECTION C-C

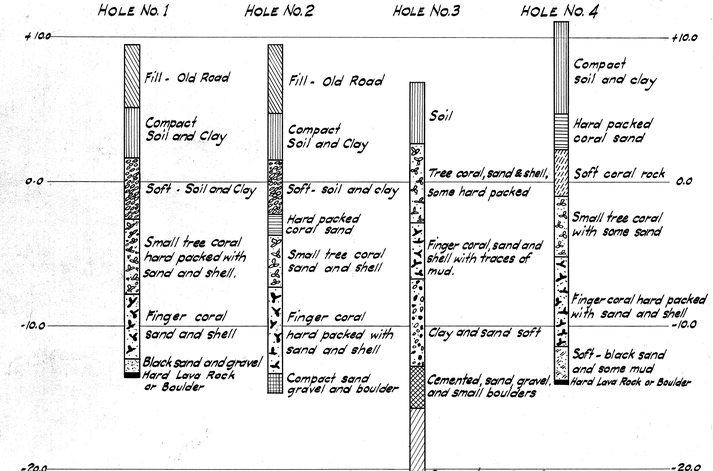
SIZE OF DEFORMED BARS USED IN THIS ABUTMENT ARE 1/4", 1/2", 5/8", 3/4" and 1" ALL ROUND BARS 1/4"φ MAY BE PLAIN BARS.

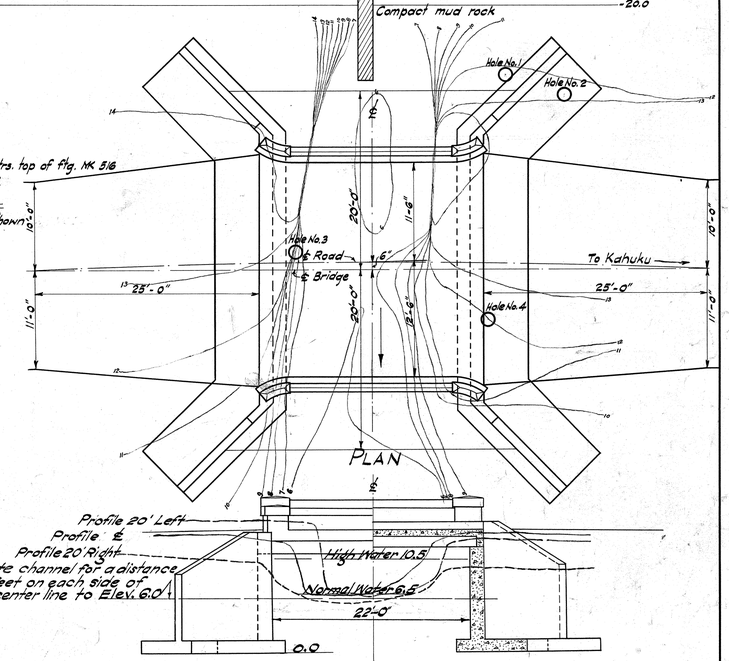
STANDARD HOOKS



LENGTH OF HOOKED BARS		
SIZE d	TOTAL LENGTH WITH ONE HOOK	
3/8φ	Dimension Length	+ 6"
1/2φ	do	+ 6"
5/8φ	do	+ 9"
3/4φ	do	+ 9"
7/8φ	do	+ 1'-0"
1φ	do	+ 1'-0"
1 1/8□	do	+ 1'-3"
1 1/4□	do	+ 1'-3"

WASH BORING DATA



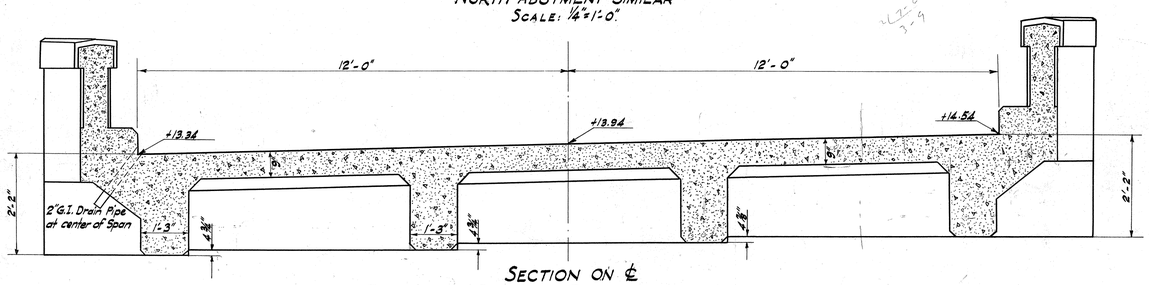


ELEVATION

ARRANGEMENT OF REINFORCED CONCRETE BRIDGE No. 17-A
Standard Deck Girder Superstructure
22'-0" Clear Span, 24'-0" Roadway
Scale: 1/8" = 1'-0"

July 1932

Lace

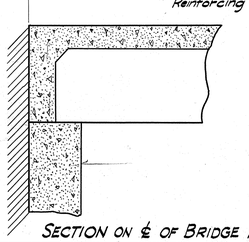


SECTION ON ℄
REINFORCED CONCRETE BRIDGE SUPERSTRUCTURE

Reinforcing Steel not shown
Scale: 1/2" = 1'-0"

Notes and Dimensions omitted, same as shown on Sheet 10 for Standard 22'-0" Clear Span, 24'-0" Roadway Deck Girder.
Reinforcing Steel same as shown on Sheet 10 for Standard 22'-0" Clear Span, 24'-0" Roadway Deck Girder.

	CONCRETE CLASS "A"	REINFORCING STEEL	STRUCTURE EXCAVATION
South Abutment	57.0 Cu. Yds.	6826.1 lbs.	256 Cu. Yds.
North Abutment	57.0 Cu. Yds.	6826.1 lbs.	252 Cu. Yds.
Superstructure	33.0 Cu. Yds.	6697.7 lbs.	
Total	147.0 Cu. Yds.	20343.9 lbs.	508 Cu. Yds.



SECTION ON ℄ OF BRIDGE NORTH ABUTMENT

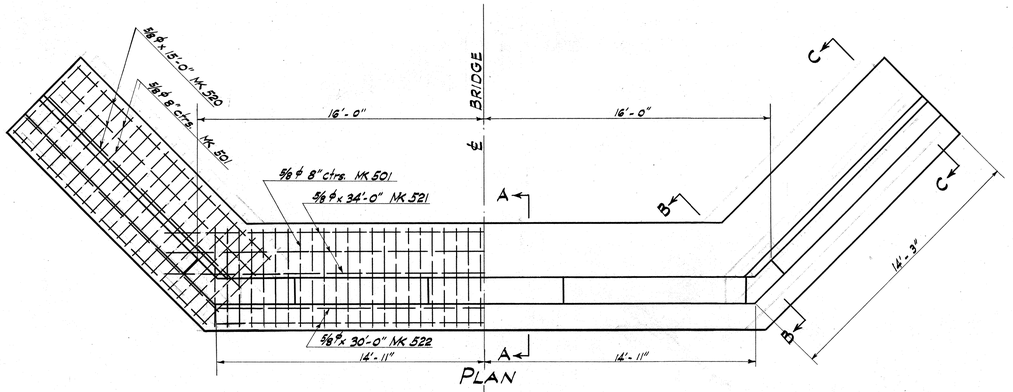
as per Div. Pub. Roads' comments by Angwin dated Jan. 13, 1932. JCM

BRIDGE 17-A
STATION 1289+65
LOCATION PLAN AND ABUTMENT DETAILS

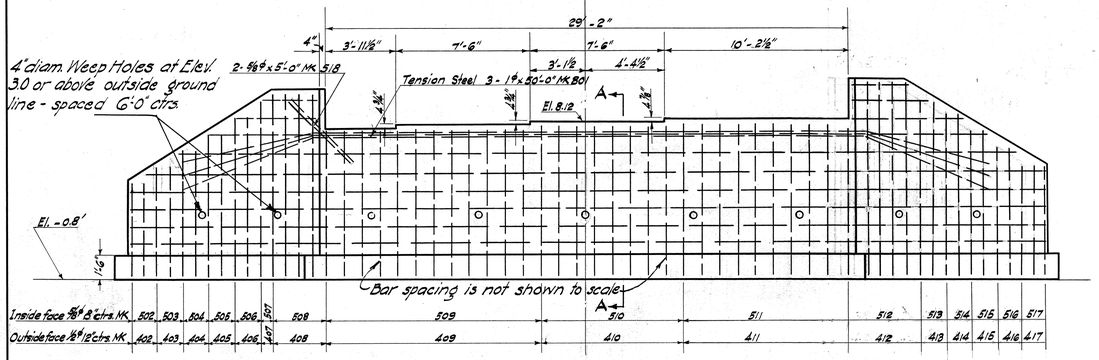
4236.8

6 18 2

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1C	1931	9	15



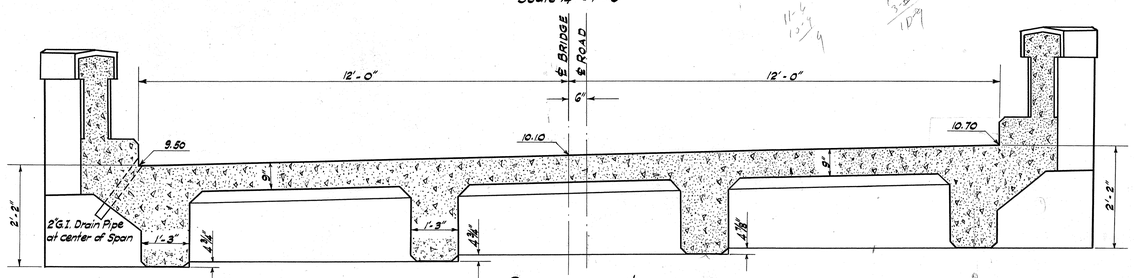
PLAN



SOUTH ABUTMENT

NORTH ABUTMENT SIMILAR

Scale ¼" = 1'-0"



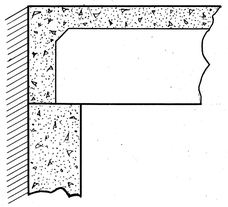
SECTION ON ℄

REINFORCED CONCRETE BRIDGE SUPERSTRUCTURE

Reinforcing Steel not shown

Scale ½" = 1'-0"

Notes and Dimensions omitted, same as shown on Sheet 10 for Standard 22'-0" Clear Span, 24'-0" Roadway Deck Girder.
Reinforcing Steel same as shown on Sheet 10 for Standard 22'-0" Clear Span, 24'-0" Roadway Deck Girder.



SECTION ON ℄ OF BRIDGE SOUTH ABUTMENT

	CONCRETE CLASS "A"	REINFORCING STEEL	STRUCTURE EXCAVATION
South Abutment	42.2 Cu. Yds.	3851.9 lbs.	124.0 Cu. Yds.
North Abutment	42.2 Cu. Yds.	3851.9 lbs.	116.0 Cu. Yds.
Superstructure	33.0 Cu. Yds.	6697.7 lbs.	
Total	117.4 Cu. Yds.	14401.5 lbs.	240.0 Cu. Yds.

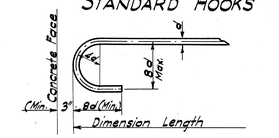
BILL OF STEEL FOR ONE ABUTMENT

MK	SHAPE	SIZE	NO. PCS.	LENGTH	TOTAL LGTH.	WT. FT.	TOTAL WT.
501	8'-0"	5/8"φ	92	11'-6"	1058'-0"	1.05	1110.9
502	8'-3"	do	1	6'-0"	6'-0"	do	6.3
503	6'-0"	do	4	6'-9"	27'-0"	do	28.4
504	7'-0"	do	2	7'-9"	15'-6"	do	16.3
505	8'-0"	do	3	8'-9"	26'-3"	do	27.6
506	9'-0"	do	4	9'-9"	39'-0"	do	41.0
507	10'-0"	do	1	10'-9"	10'-9"	do	11.3
508	10'-3"	do	6	11'-0"	66'-0"	do	69.3
509	8'-3"	do	17	9'-0"	153'-0"	do	160.7
510	8'-6"	do	12	9'-3"	111'-0"	do	116.6
511	8'-9"	do	15	9'-6"	142'-6"	do	149.6
512	10'-9"	do	6	11'-6"	69'-0"	do	72.5
513	9'-9"	do	4	10'-6"	42'-0"	do	44.1
514	8'-0"	do	3	9'-9"	29'-3"	do	30.7
515	8'-0"	do	3	8'-9"	26'-3"	do	27.6
516	7'-0"	do	3	7'-9"	23'-3"	do	24.4
517	6'-3"	do	2	7'-0"	14'-0"	do	14.7
518		do	4	5'-0"	20'-0"	do	21.0
801		1"φ	3	50'-0"	150'-0"	2.69	403.5
520		5/8"φ	20	15'-0"	300'-0"	1.05	315.0
521		do	6	34'-0"	204'-0"	do	214.2
522		do	4	30'-0"	120'-0"	do	126.0

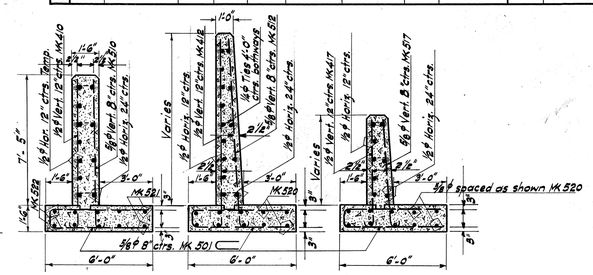
BILL OF STEEL CONTINUED

MK	SHAPE	SIZE	NO. PCS.	LENGTH	TOTAL LGTH.	WT. FT.	TOTAL WT.
402	5'-3"	½"φ	2	5'-9"	11'-6"	0.66	7.6
403	6'-0"	do	2	6'-6"	13'-0"	do	8.6
404	7'-0"	do	2	7'-6"	15'-0"	do	9.9
405	8'-0"	do	2	8'-6"	17'-0"	do	11.2
406	9'-0"	do	2	9'-6"	19'-0"	do	12.5
407	10'-0"	do	1	10'-6"	10'-6"	do	6.9
408	10'-3"	do	4	10'-9"	43'-0"	do	28.4
409	8'-3"	do	11	8'-9"	96'-3"	do	63.5
410	8'-6"	do	8	9'-0"	72'-0"	do	47.5
411	8'-9"	do	9	9'-3"	83'-3"	do	54.9
412	10'-9"	do	4	11'-3"	45'-0"	do	29.7
413	9'-9"	do	2	10'-3"	20'-6"	do	13.5
414	9'-0"	do	2	9'-6"	19'-0"	do	12.5
415	8'-0"	do	2	8'-6"	17'-0"	do	11.2
416	7'-0"	do	2	7'-6"	15'-0"	do	9.9
417	6'-3"	do	3	6'-9"	20'-3"	do	13.4
None	Temperature Steel	½"φ	700	Lin. Ft.		0.66	462.0
None	Ties	¼"φ	100	Lin. Ft.		0.17	17.0
						TOTAL	3851.9

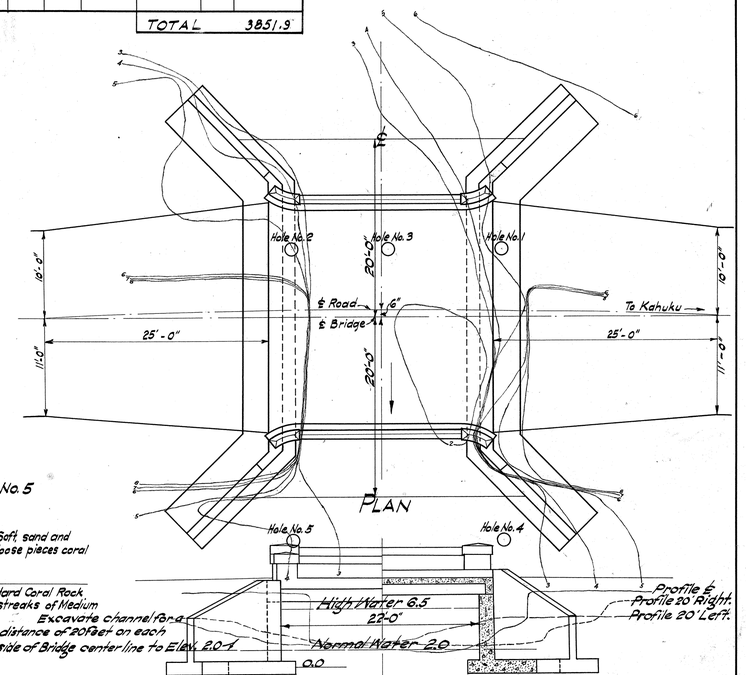
STANDARD HOOKS



LENGTH OF HOOKED BARS	
SIZE d	TOTAL LENGTH WITH ONE HOOK
5/8"φ	Dimension Length + 6"
½"φ	do + 6"
5/8"φ	do + 9"
¾"φ	do + 9"
7/8"φ	do + 1'-0"
1"φ	do + 1'-0"
1⅛"□	do + 1'-3"
1¼"□	do + 1'-3"



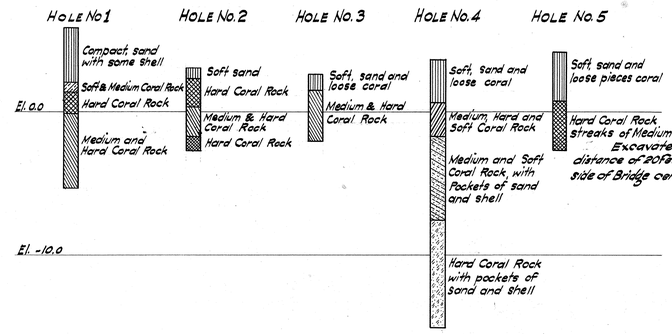
SECTION A-A SECTION B-B SECTION C-C



PLAN

ELEVATION

WASH BORING DATA



ARRANGEMENT OF REINFORCED CONCRETE BRIDGE No. 20

Standard Deck Girder Superstructure

22'-0" Clear Span, 24'-0" Roadway

Scale: ⅛" = 1'-0"

July 1932

Lai Loa

BRIDGE 20

STATION 1376+70

LOCATION PLAN AND ABUTMENT DETAILS

as per Bu. Pub. Roads' comments by Angwin dated Jan. 13, 1932. J.C.M.

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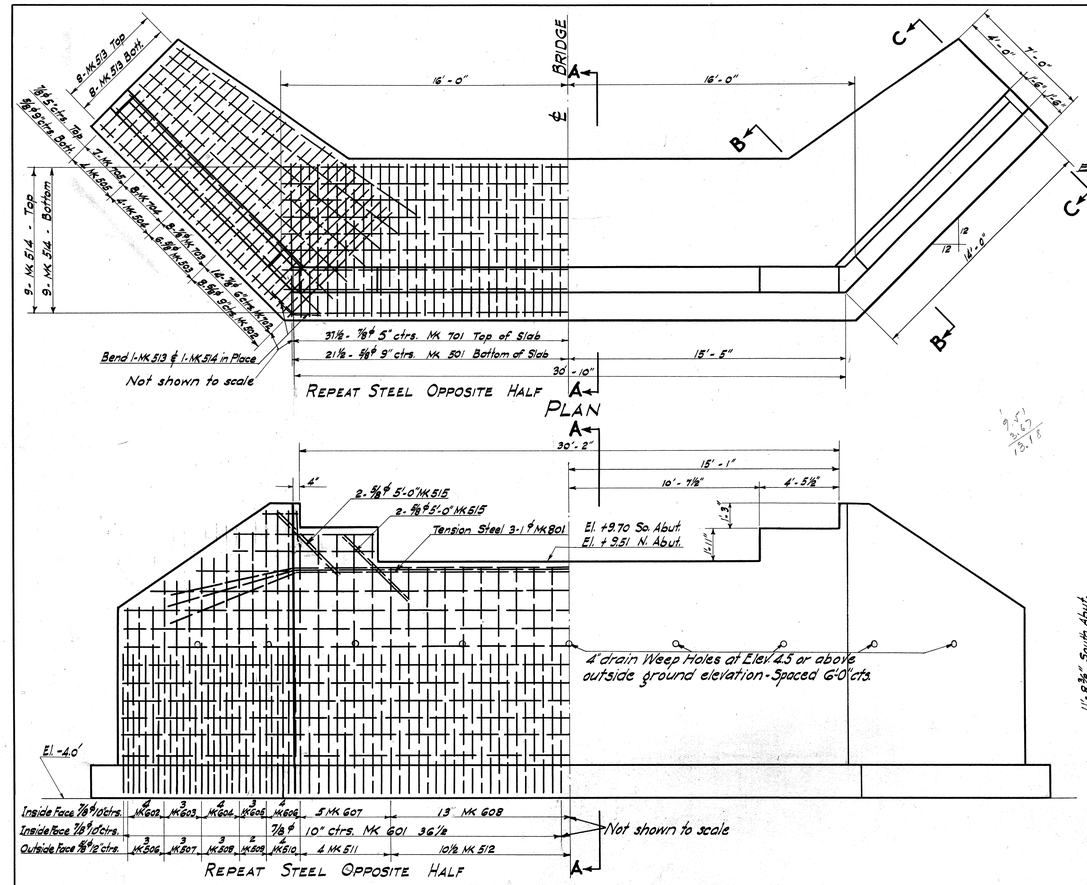
4236.9

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1 C	1931	11	15



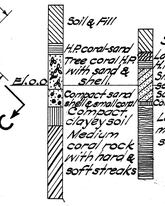
SOUTH ABUTMENT

NORTH ABUTMENT SIMILAR (except as noted)

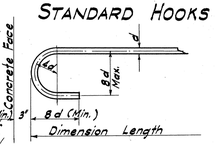
Scale ¼" = 1'-0"

WASH BORING DATA

HOLE "A" HOLE "C"



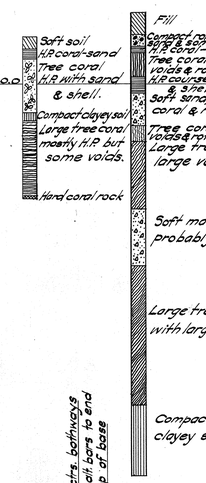
STANDARD HOOKS

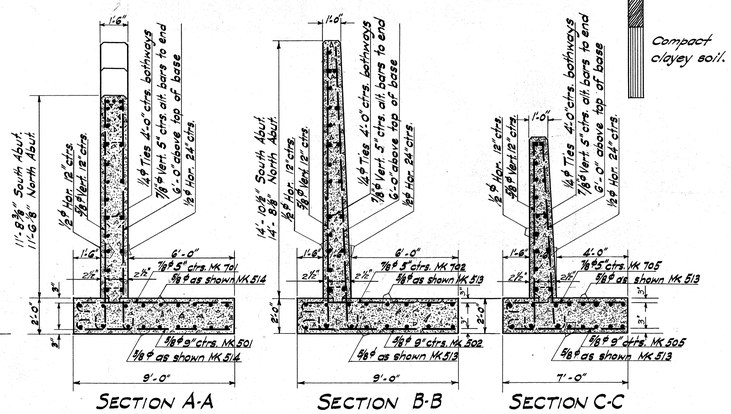


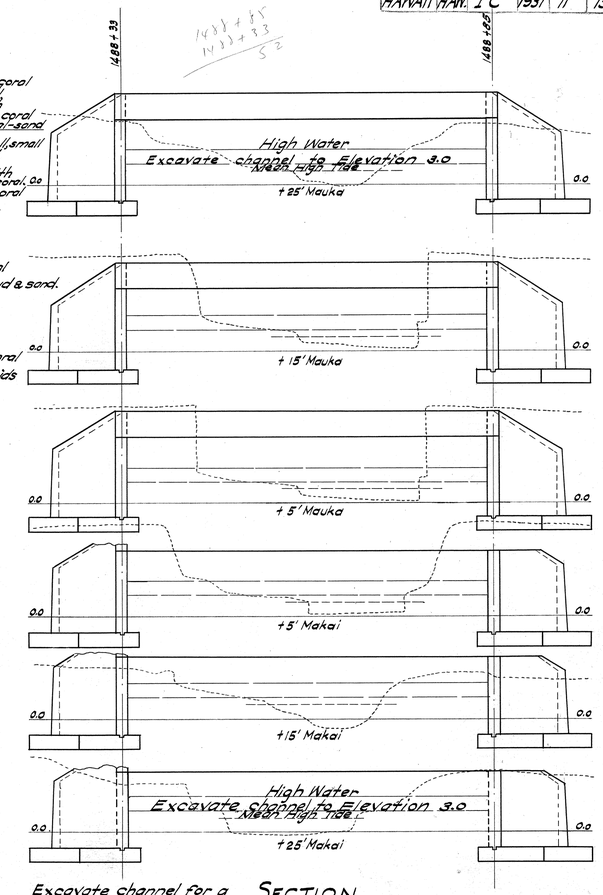
LENGTH OF HOOKED BARS		
SIZE ϕ	TOTAL LENGTH WITH ONE HOOK	
3/8" ϕ	Dimension Length +	6"
1/2" ϕ	do +	6"
5/8" ϕ	do +	9"
3/4" ϕ	do +	9"
7/8" ϕ	do +	1'-0"
1" ϕ	do +	1'-0"
1⅛" □	do +	1'-3"
1¼" □	do +	1'-3"

WASH BORING DATA

HOLE "D" HOLE "B"







Excavate channel for a distance of 25 feet on each side of Bridge center line to Elev. 3.0.

SECTION

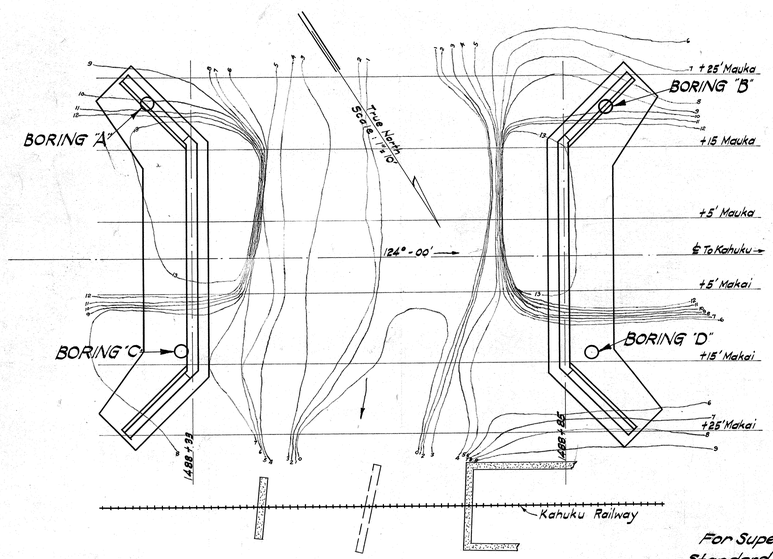
Scale : 1" = 10'-0"

BILL OF STEEL FOR ONE ABUTMENT

NK	SHAPE		SIZE	No. Pcs.	LENGTH	TOTAL LENGTH	Wt. Ft.	TOTAL WT.
501	8'-6"	Horiz.	5/8" ϕ	43	9'-3"	397'-9"	1.05	418
502	8'-0"	do	do	16	8'-9"	140'-0"	do	147
503	7'-6"	do	do	12	8'-3"	99'-0"	do	104
504	7'-0"	do	do	8	7'-9"	62'-0"	do	65
505	6'-6"	do	do	8	7'-3"	58'-0"	do	61
506	10'-6"	Vert.	do	6	11'-3"	67'-6"	do	71
507	11'-9"	do	do	6	12'-6"	75'-0"	do	79
508	13'-0"	do	do	6	13'-9"	82'-6"	do	87
509	16'-6"	do	do	4	15'-3"	61'-0"	do	64
510	15'-9"	do	do	8	16'-6"	132'-0"	do	139
511	14'-6"	do	do	8	15'-3"	122'-0"	do	128
512	12'-6"	do	do	21	13'-3"	278'-3"	do	292
513	16'-0"	Horiz.	do	32	16'-0"	512'-0"	do	538
514	32'-0"	Horiz.	do	18	32'-0"	576'-0"	do	605
515		Diag.	do	8	5'-0"	40'-0"	do	42
801		Horiz.	1" ϕ	3	50'-0"	150'-0"	2.69	404
TEMP		do	½" ϕ		1000 Lin. Feet		0.66	660
TIES		do	¼" ϕ		100 Lin. Feet		0.17	17

BILL OF STEEL CONTINUED

NK	SHAPE		SIZE	No. Pcs.	LENGTH	TOTAL LGTH	Wt. Ft.	TOTAL WT.
601	7'-9"	Vert.	7/8" ϕ	73	8'-9"	638'-9"	2.06	1316
602	10'-6"	do	do	8	11'-6"	92'-0"	do	190
603	11'-9"	do	do	6	12'-9"	76'-6"	do	158
604	13'-0"	do	do	8	14'-0"	112'-0"	do	231
605	14'-6"	do	do	6	15'-6"	93'-0"	do	192
606	15'-9"	do	do	8	16'-9"	134'-0"	do	276
607	14'-6"	do	do	10	15'-6"	155'-0"	do	319
608	12'-6"	do	do	26	13'-6"	351'-0"	do	723
701	8'-6"	Horiz.	7/8" ϕ	75	9'-6"	712'-6"	2.06	1468
702	8'-0"	do	do	28	9'-0"	252'-0"	do	519
703	7'-6"	do	do	16	8'-6"	136'-0"	do	280
704	7'-0"	do	do	16	8'-0"	128'-0"	do	264
705	6'-6"	do	do	14	7'-6"	105'-0"	do	216
						Total		10073



PLAN

Scale 1" = 10'-0"

	CONCRETE CLASS "A"	REINFORCING STEEL	STRUCTURE EXCAVATION
South Abutment	73.4 Cu. Yds.	10107 lbs.	345.0 Cu. Yds.
North Abutment	72.2 Cu. Yds.	10073 lbs.	325.0 Cu. Yds.
Superstructure	101.0 Cu. Yds.	24240 lbs.	
Total	246.6 Cu. Yds.	44420 lbs.	670.0 Cu. Yds.

Malaie Kekua

BRIDGE 22

STA. 1488+59

LOCATION PLAN & ABUTMENT DETAILS

For Superstructure see details Standard Deck Girder Superstructure Span 52'-0" Roadway 24'-0"

as per Bu. Pub. Roads' comments by Angwin dated Jan. 13, 1932. J.C.M.

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Red Book Page Number	Year	Month	Day	Sheet Number	Total Sheets
HAWAII HAW. 1 C	1931	12	15		

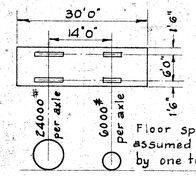
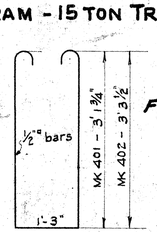
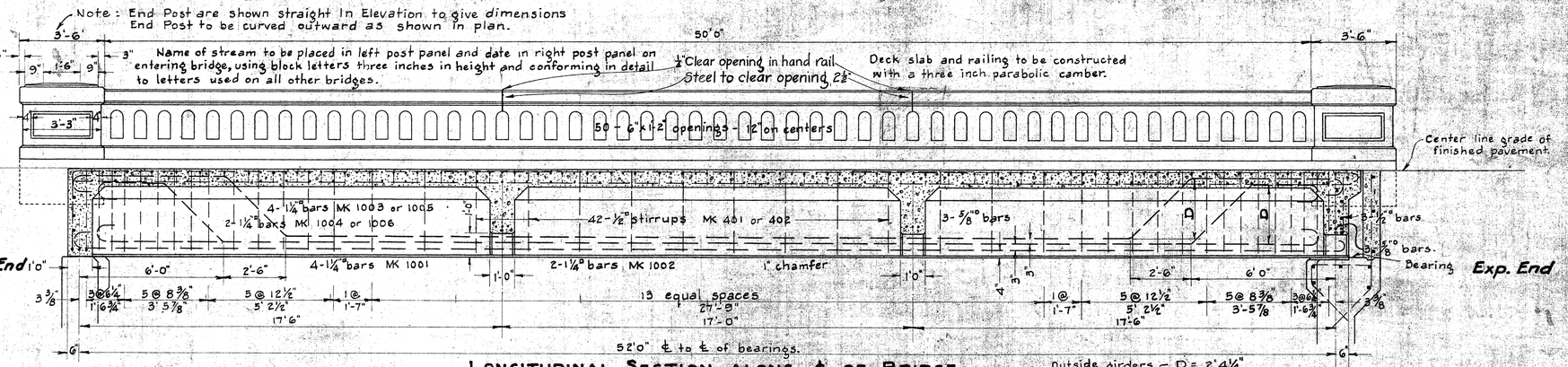


DIAGRAM - 15 TON TRUCK

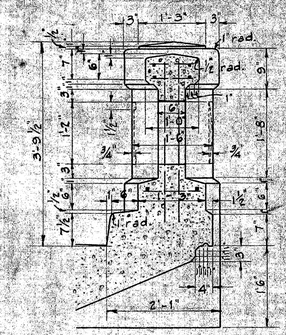


STIRRUPS

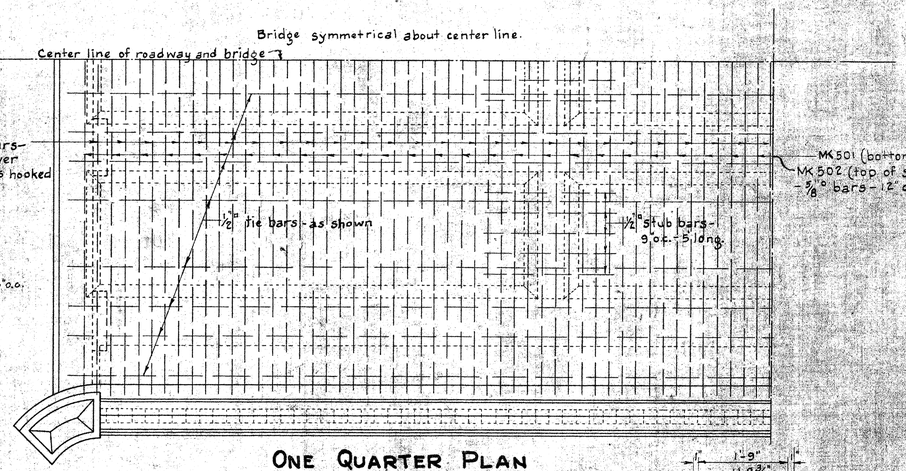


LONGITUDINAL SECTION ALONG ℄ OF BRIDGE
Scale ⅜"=1'-0"

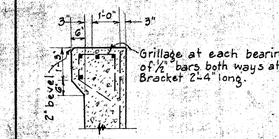
Outside girders - D = 2'4¼"
Inside girders - D = 2'6"



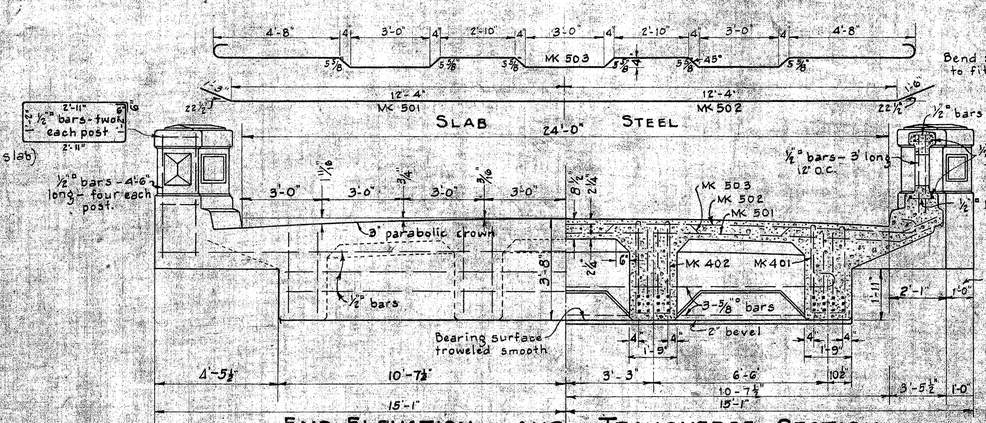
DETAIL OF RAIL AND END POST
Scale ¾"=1'-0"



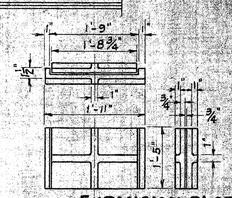
ONE QUARTER PLAN
Scale ⅜"=1'-0"



FIXED END



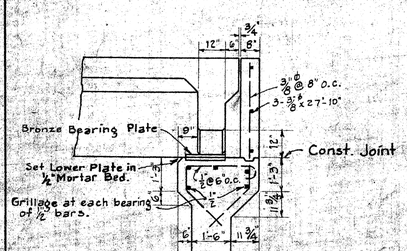
END ELEVATION AND TRANSVERSE SECTION
Scale ⅜"=1'-0"



EXPANSION PLATES
Phosphor Bronze
Scale 1"=1'-0"
4-Pairs Req'd.

GENERAL NOTES

Dead Load:
Concrete at 150# per cubic foot
Live Load:
Two 15 ton trucks with 30% allowance for impact.
Concrete:
All Class "A" (1:2:4 mix) with all exposed corners chamfered ¾" unless otherwise noted. Allowable compression 650#/□".
Reinforcing Steel:
Allowable tensile stress 16000#/□". All steel to be round or square deformed bars - square twisted bars not to be considered deformed. All dimensions relating to reinforcement are to centers of bars. Where location of bars is not given they are to be placed three inches from adjacent concrete surface. Lengths of all bars unless given, are to be such as to reach a point three inches from the concrete face at their ends. Splices shall be approved by the Engineer and shall have a lap of forty diameters with splices staggered. Main longitudinal bars in girders cannot be spliced. No allowance has been made in quantities for extra weight of steel required for splices.



DETAIL OF BEARING AT EXP. JOINT END OF BRIDGE
Scale ⅜"=1'-0"

THIS SUPERSTRUCTURE USED

BRIDGE NO.	PROJECT NO.
22	VC-PART 3

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII
STANDARD DECK GIRDER SUPERSTRUCTURE
SPAN 52'-0" ℄ TO ℄ OF BEARING
ROADWAY 24'-0"

APPROVED Lane H. Wright
TERRITORIAL HIGHWAY ENGINEER
Dec. 1931

4236.12