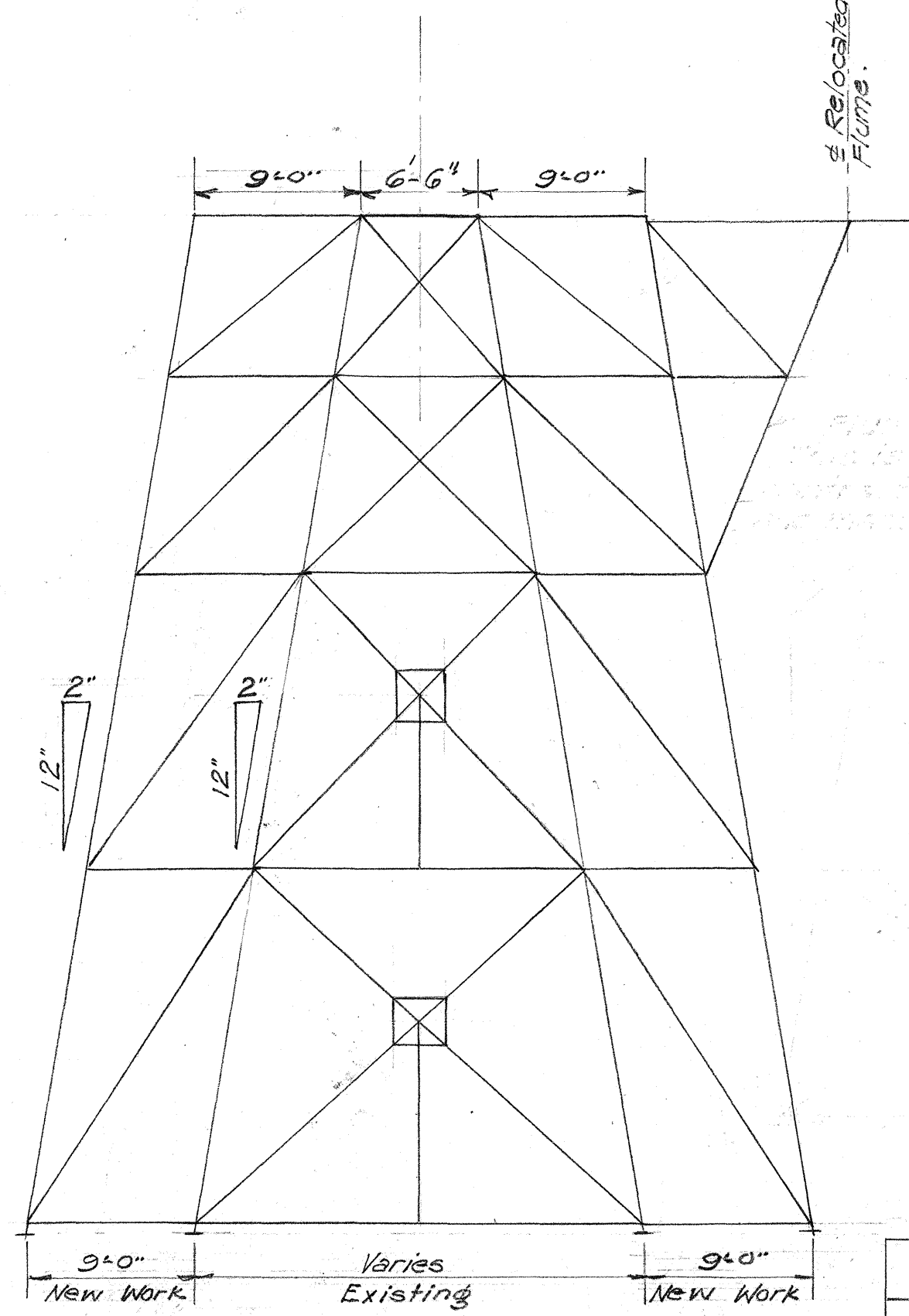


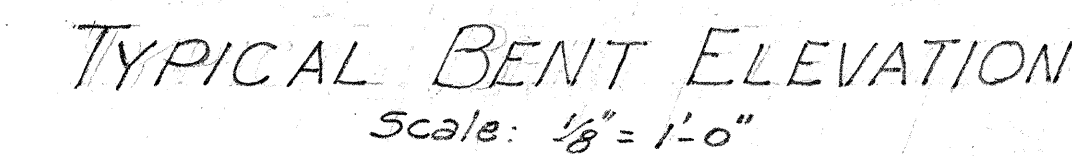
Revision: 4-5-51. Quantity for
cleaning, fabricating and erect-
ing salvaged steel changed.

Revision: 5-16-51. Reinf. Steel
quant. changed. Hooks elimi-
nated. Bottom rail reinf. rev.
All bar deformations must
conform to ASTM-A305.

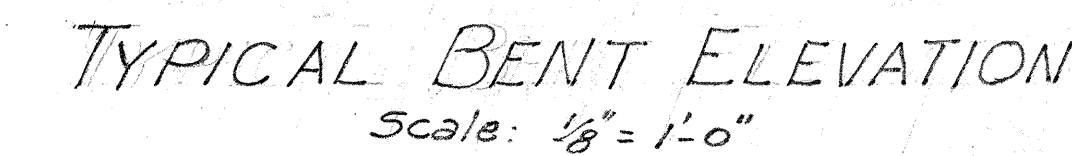
End parapet wall added at
Abut. #1 Left.



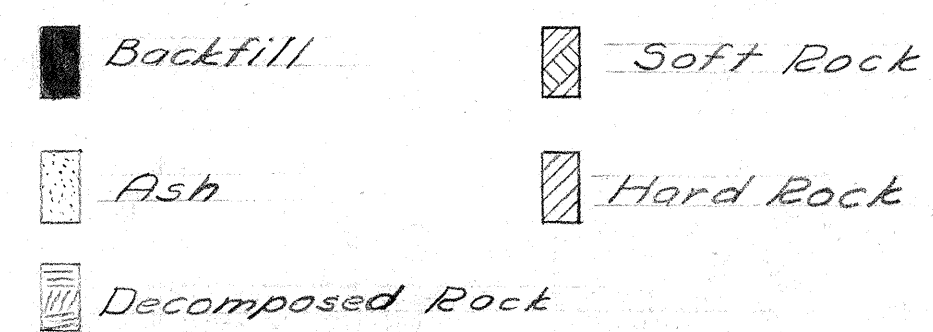
TYPICAL BENT ELEVATION
Scale: $\frac{1}{8}'' = 1'-0''$



PROFILE
Scale: 1" = 20'-0"



ESTIMATED QUANTITIES (Continued)						
Item	Super-Structure	Railing & End Posts	Abutments		PIERS	TOTAL
			Na 1	Na 2		
Class A-1 Conc.	321 cu.yds.	38 cu.yds.	112 c.y. 112 cu.yds.			471 c.y. 469 cu.yds.
Class B-2 Conc.					196 cu. yds.	196 cu. yds.
Class C-1 Conc.				50 cu. yds.		50 cu. yds.
Class C-1 Cyclopedon Concrete				73 cu. yds.		73 cu. yds.
Struct. Ex.			448 cu.yds.	200 cu.yds.	344 cu.yds.	992 cu.yds.
Reinf. Steel	59,147 lbs.	6,753 lbs.	12,302 lbs.	1,128 lbs.	22,44 lbs.	81,574 lbs.
Dry Rubble Masonry				75 cu. yds.	6 cu. yds.	135 cu. yds.
Hand placed Pock Fill				20 cu.yds.	8.5 cu.y.	28.5 cu. yds.
A.C. Paving	43.79					43.79 tons
Reinf. Steel	56,465 lbs.	6,762 lbs.	10,899 lbs.	1,087 lbs.	22,44 lbs.	77,457 lbs.



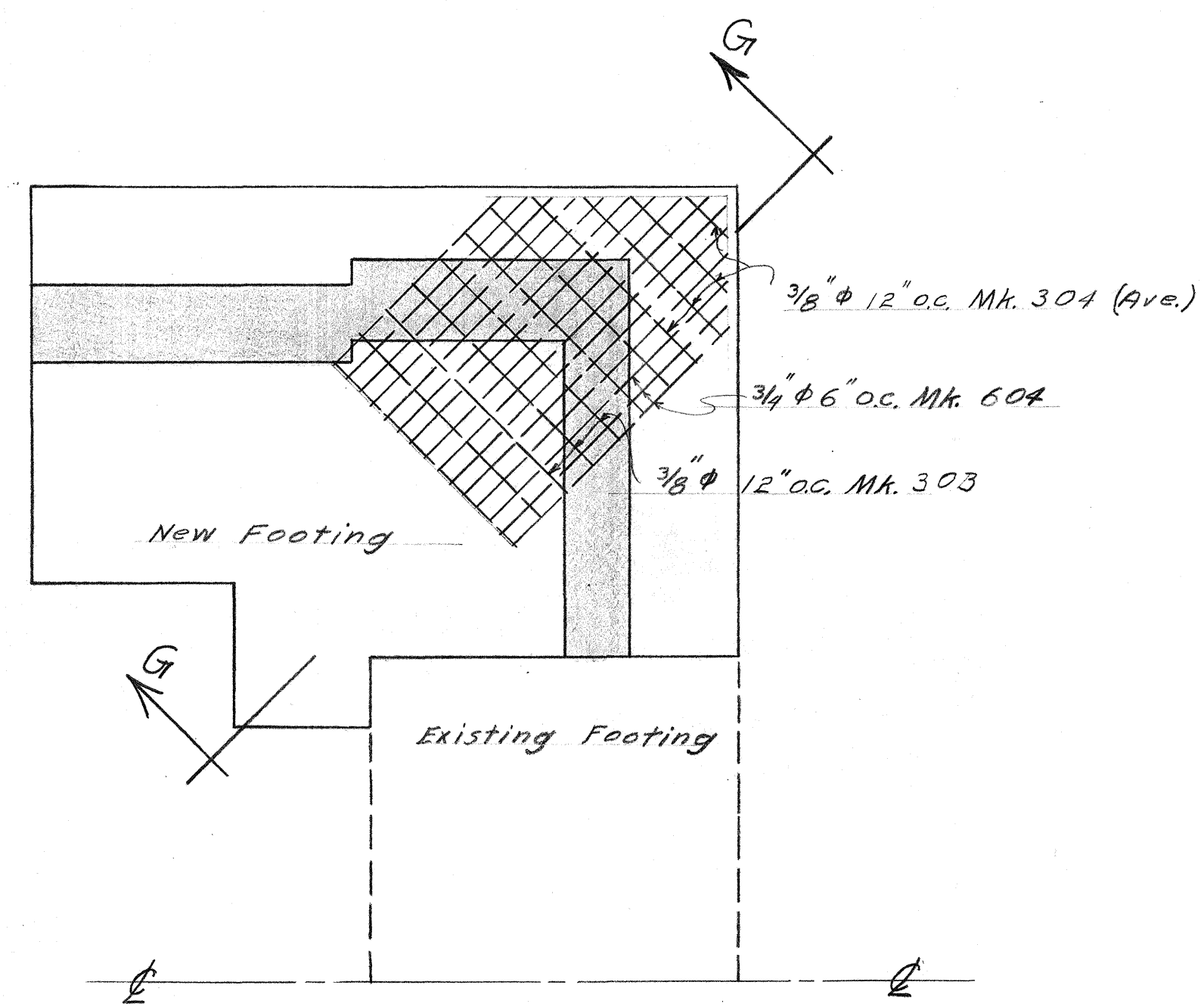
Note: BORING LEGEND
Zero (0) shown on the borings is the ground surface elevation of each boring.

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII
UMAUMA BRIDGE
Sta. 100+45.56 to 103+26.55
HAWAII BELT ROAD SDR 3(13)
Apr. 1949

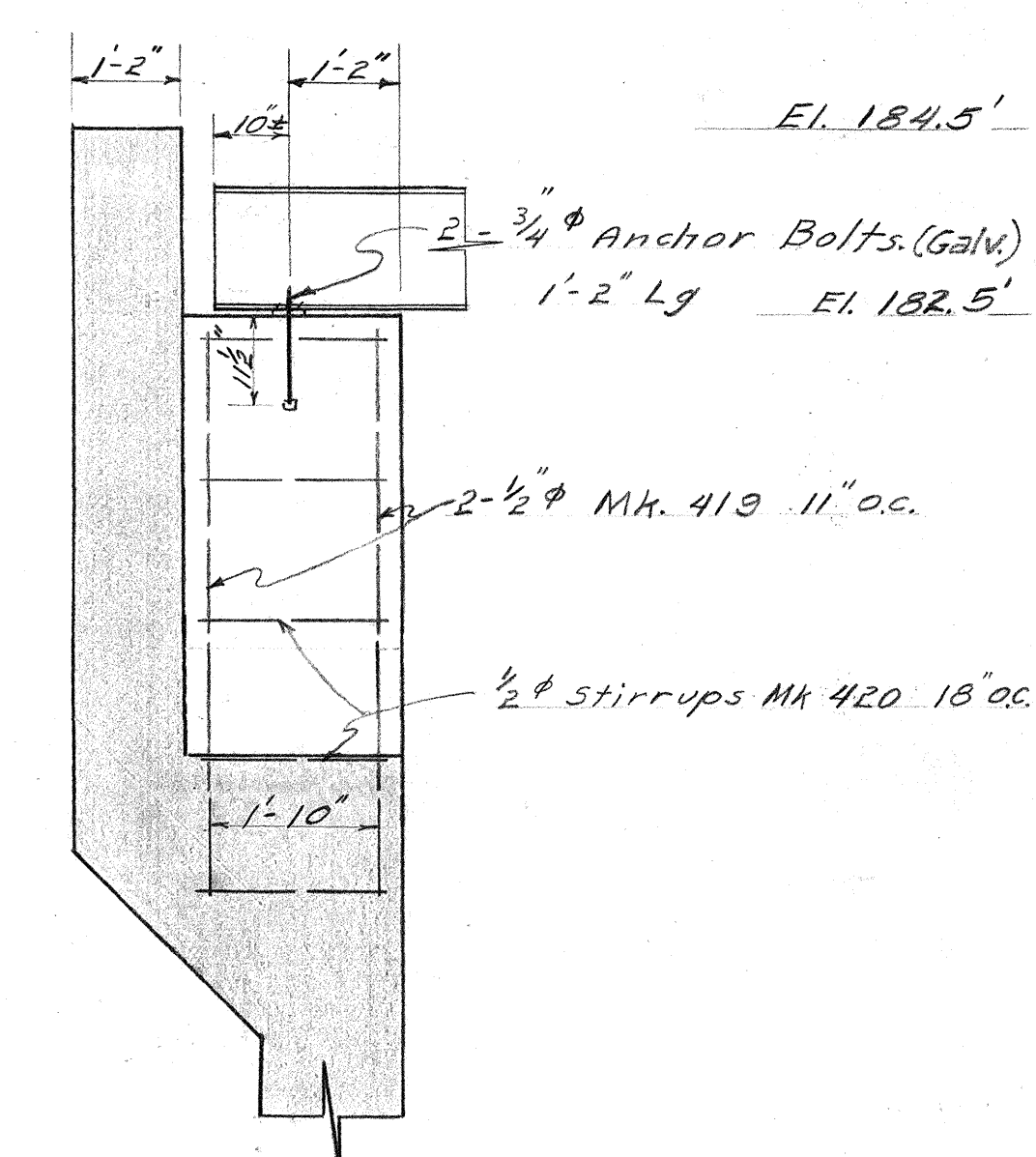
SHEET No. / OF 12 SHEETS

5 4 6 8 . 1 4 3 ¹⁰

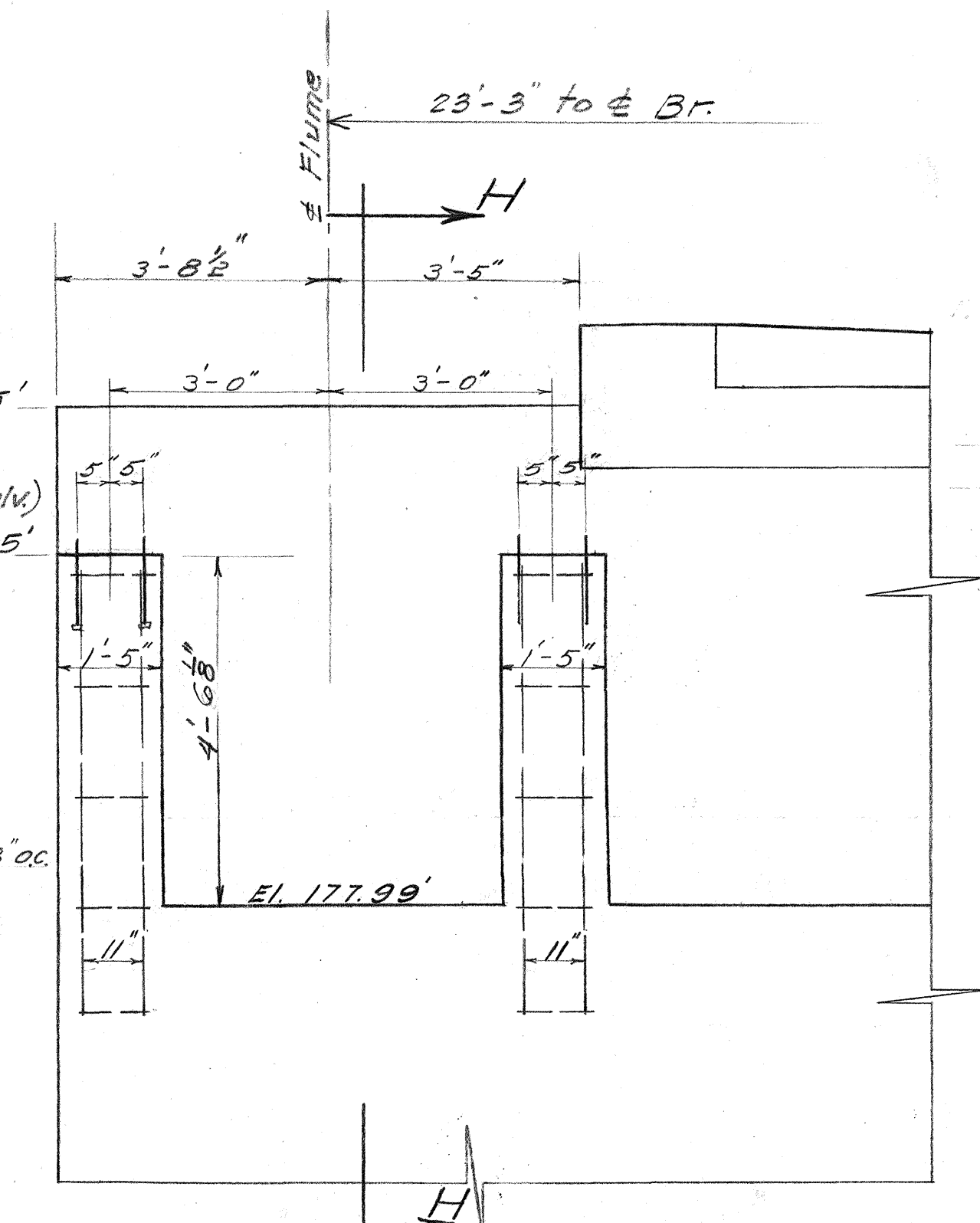
ORIGINAL PLAN	SURVEY PLOTTED BY DESIGNED BY DRAWN BY TRACED BY QUANTITIES BY QUANTITIES CHECKED BY CHECKED BY	<i>N. S. Bartels</i> <i>T. Umehara</i> <i>A. Van Der Werf</i> <i>P. Yamashita</i>	DATE " 3-29 " 4-29 " " " 1-2
NOTE BOOK	No.		



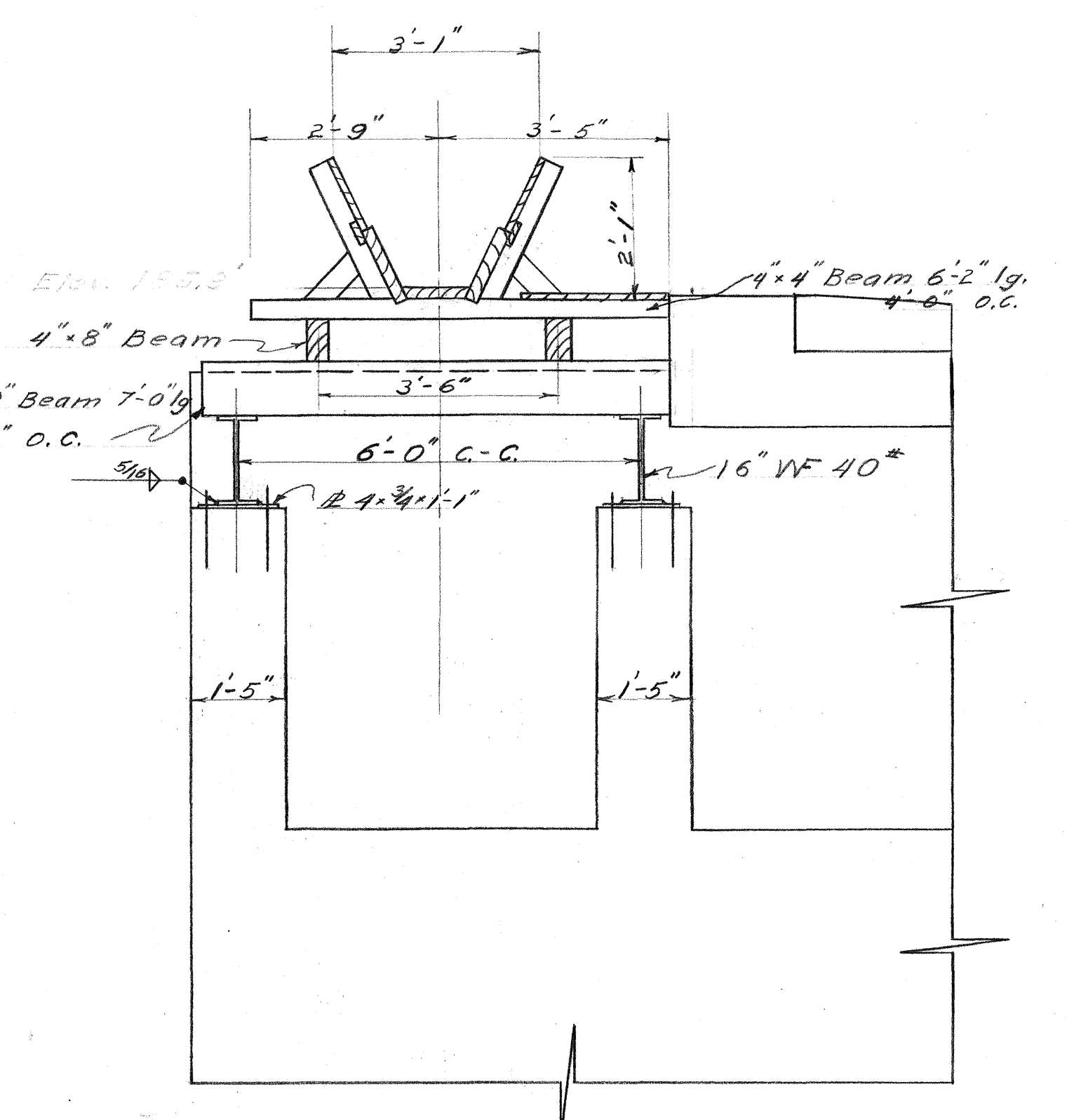
HALF PLAN OF FOOTING ABUT. NO. 1.
SHOWING BOTTOM FACE REINF.
1/4" = 1 FT.



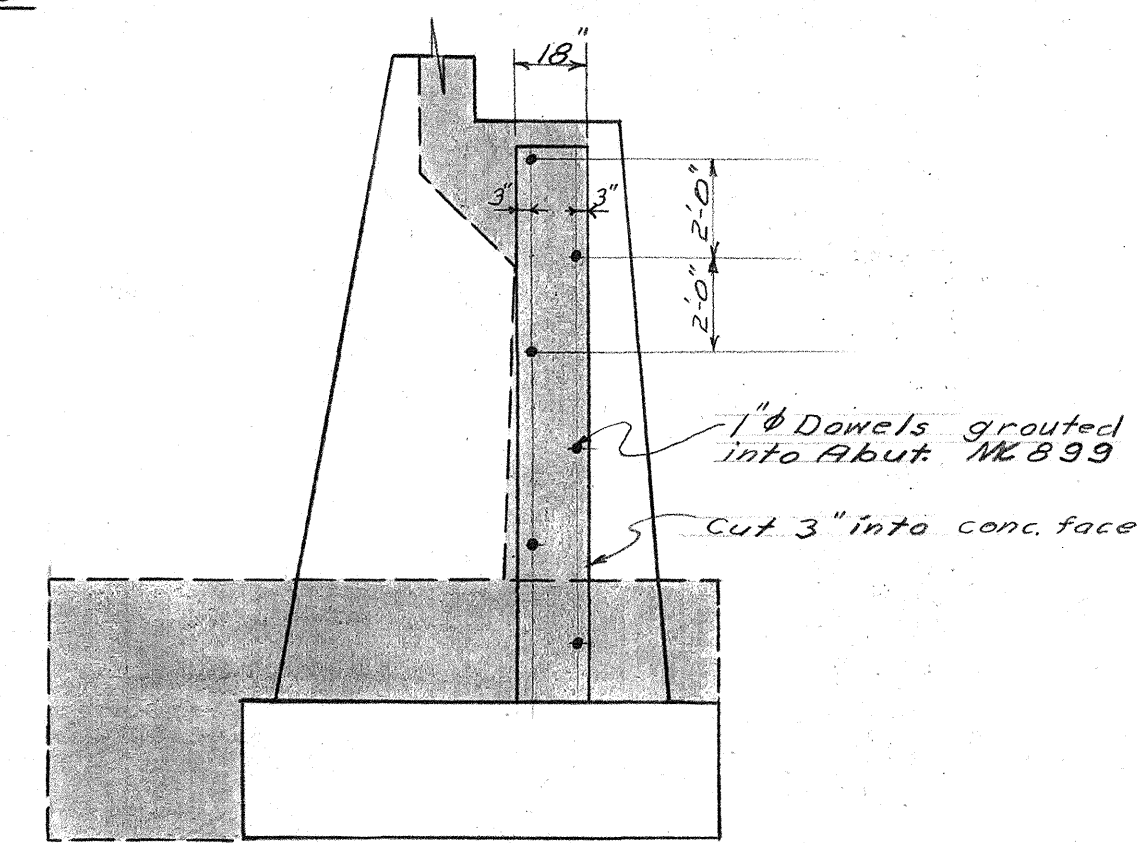
SECTION H-H



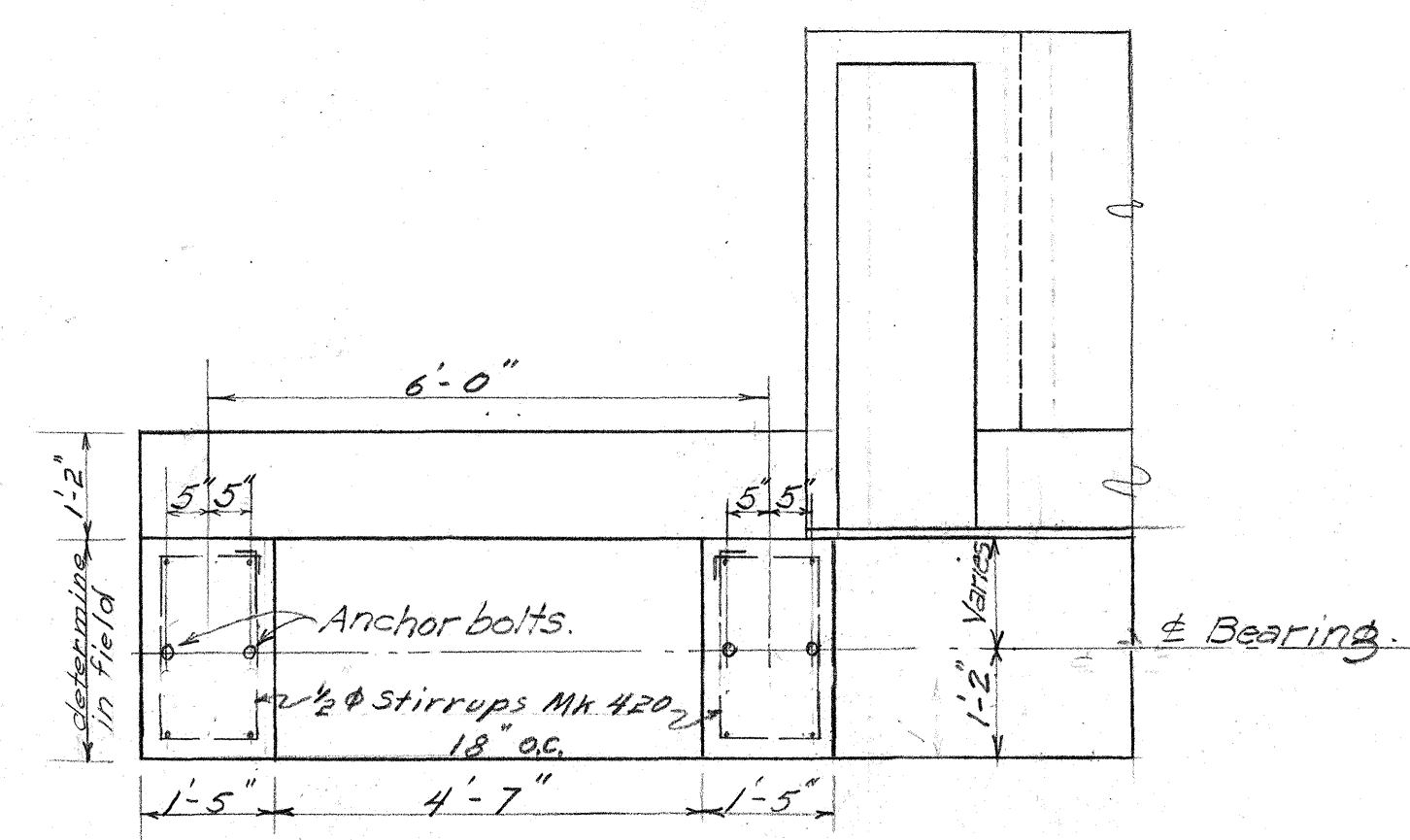
FRONT ELEVATION



CANE FLUME DETAIL
1/2" = 1 FT.

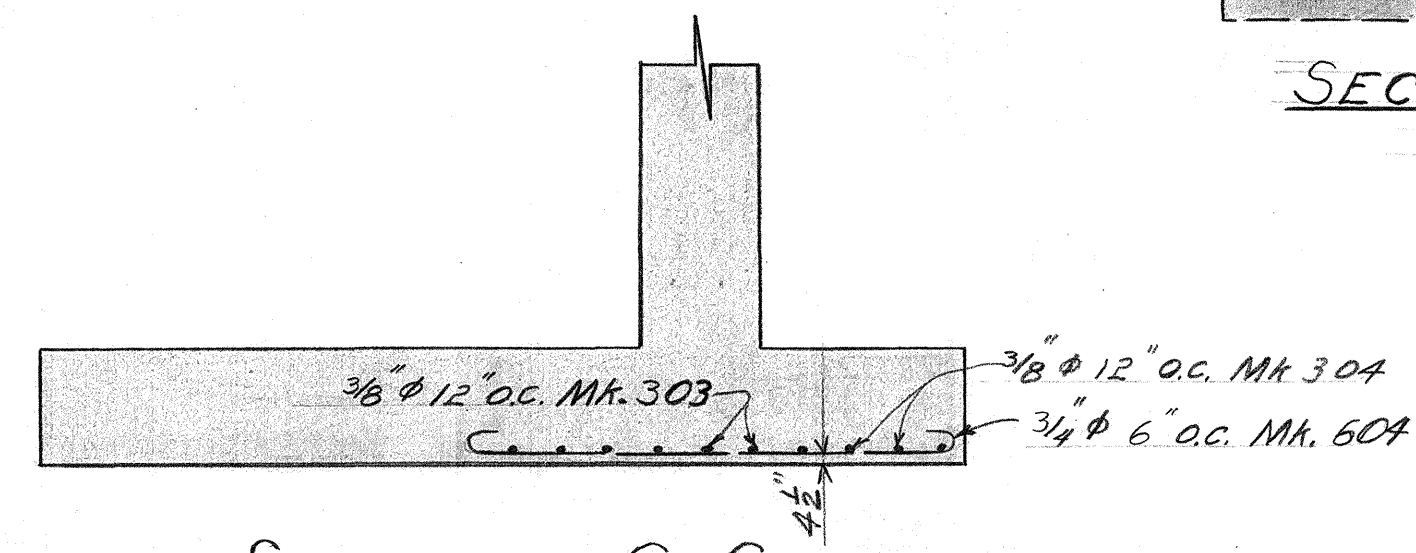


SECTION X-X (See Sht. #2)
1/4" = 1 FT.

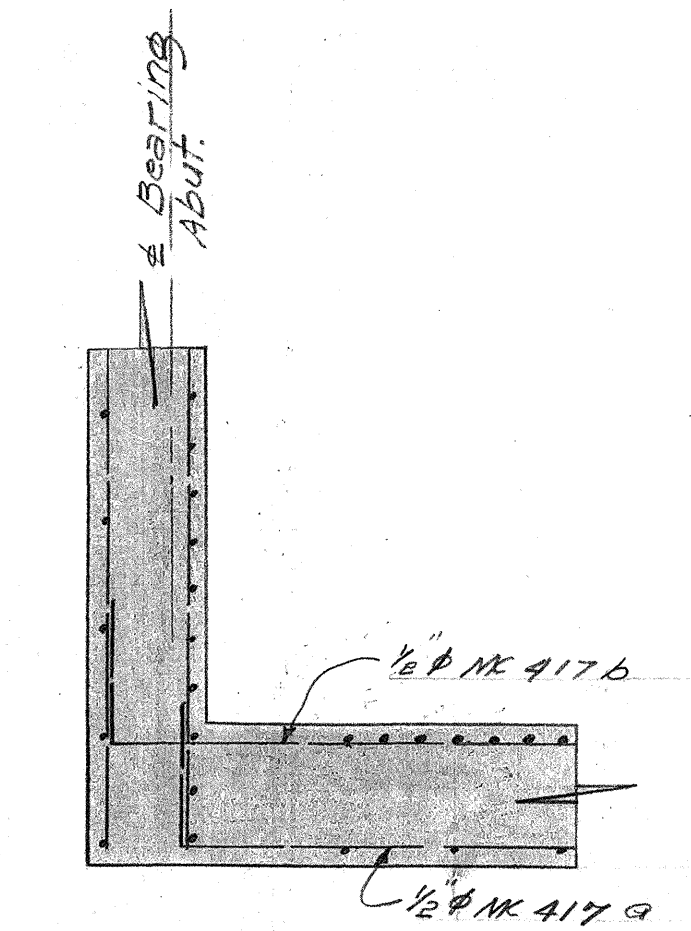


PLAN

DETAILS OF ANCHORAGE
FOR CANE FLUME GIRDERS
1/2" = 1 FT.



SECTION G-G
1/4" = 1 FT.



SECTION J-J (See Sht. #2)
3/8" = 1 FT.

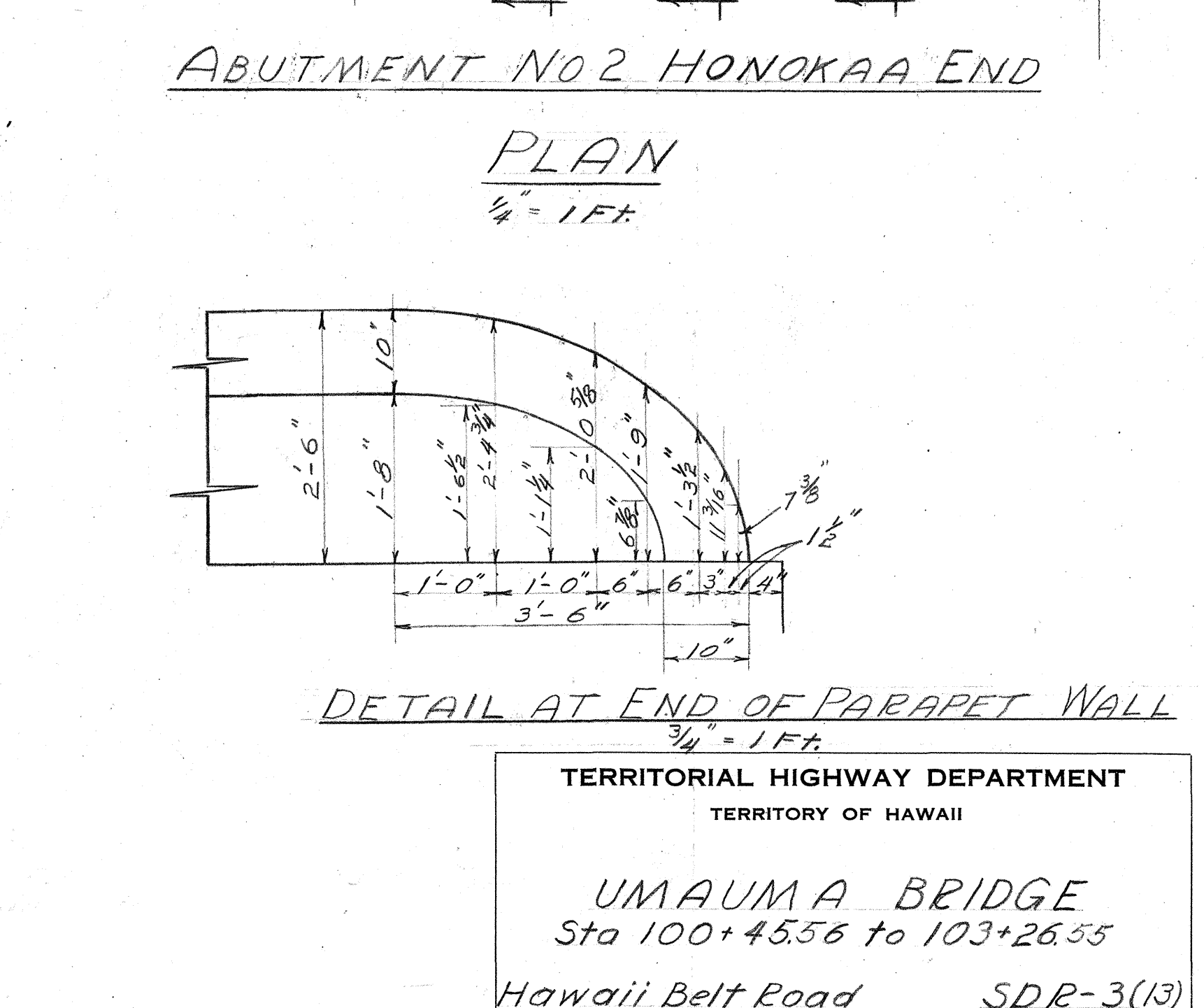
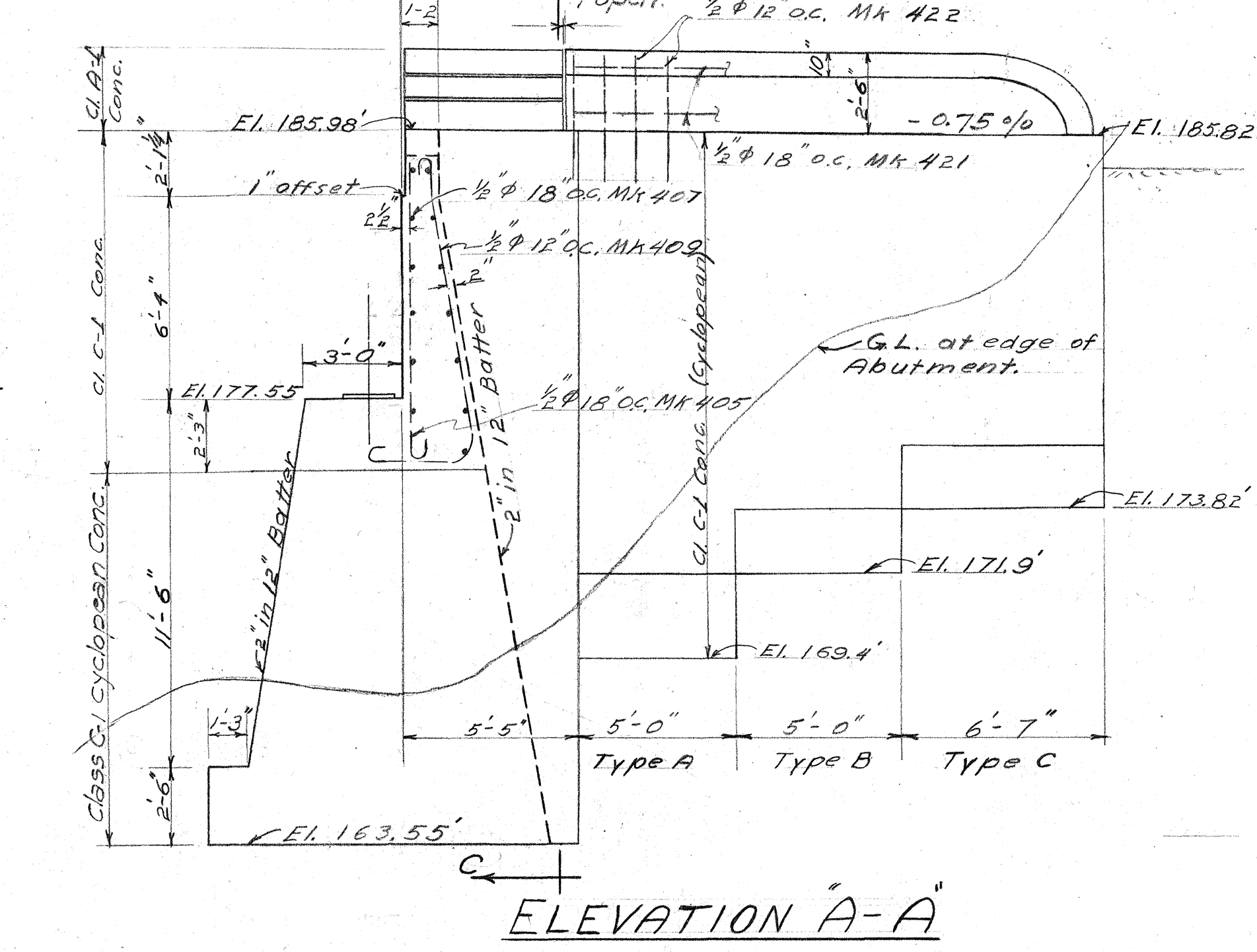
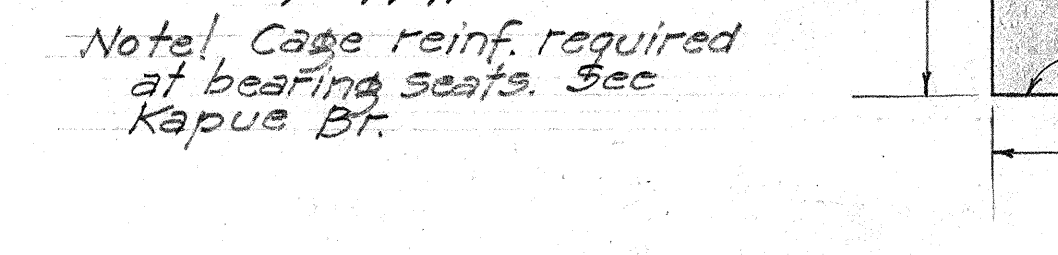
TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

UMAUMA BRIDGE
Sta. 100+45.56 to 103+26.55
Hawaii Belt Road SDR-3(13)
May 1949

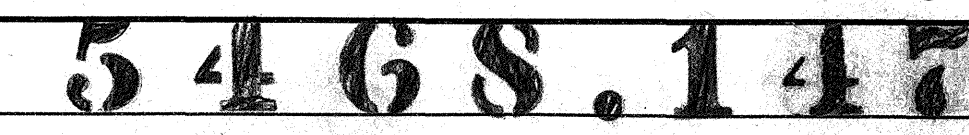
SHEET No. 3 OF 12 SHEETS

5468.145 12

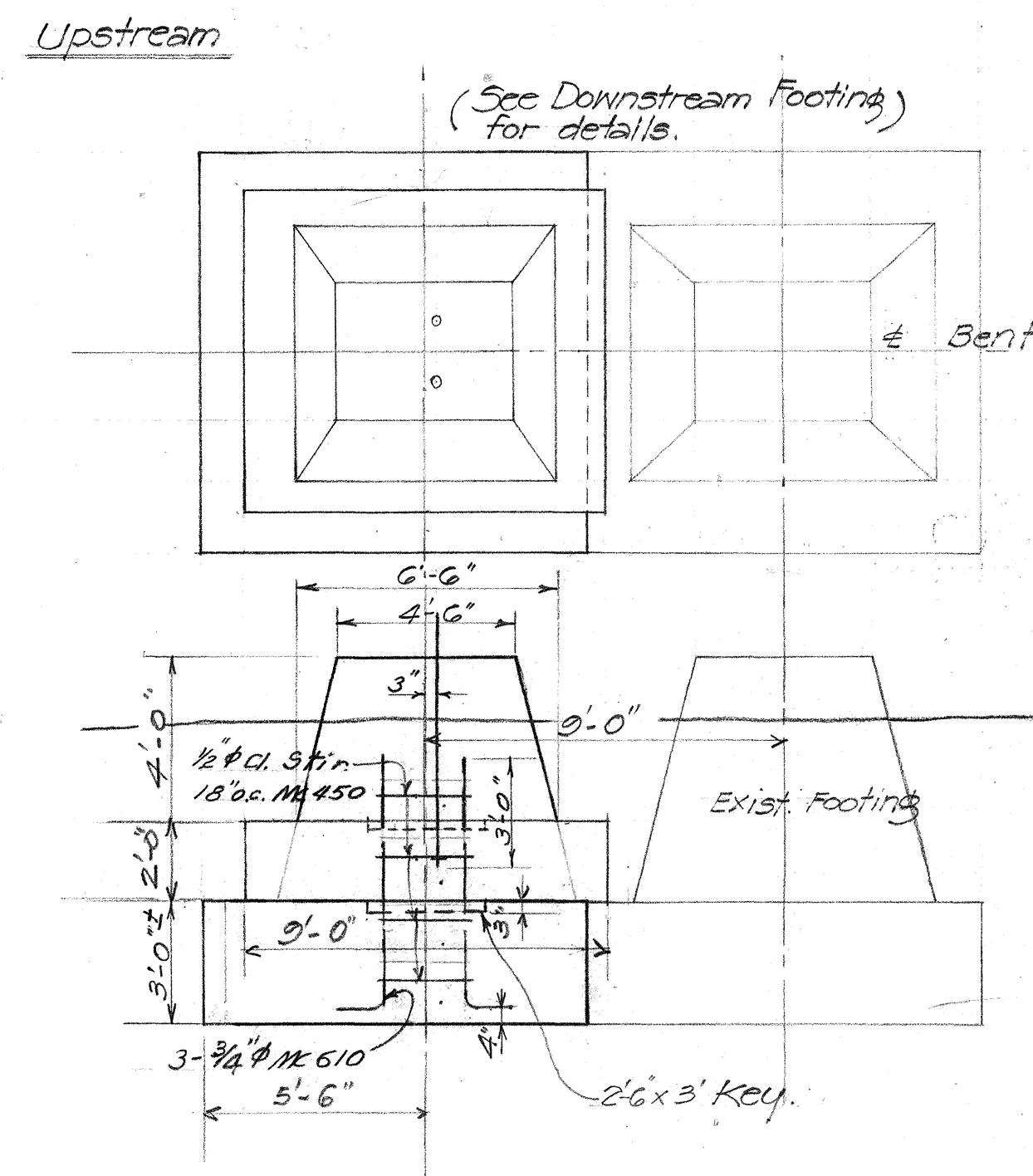
DATE: 5-19-49
DESIGNED BY: W.L. Bartholomew
TRACED BY: W.L. Bartholomew
QUANTITIES BY: W.L. Bartholomew
CHECKED BY: W.L. Bartholomew
NOTE BOOK No.



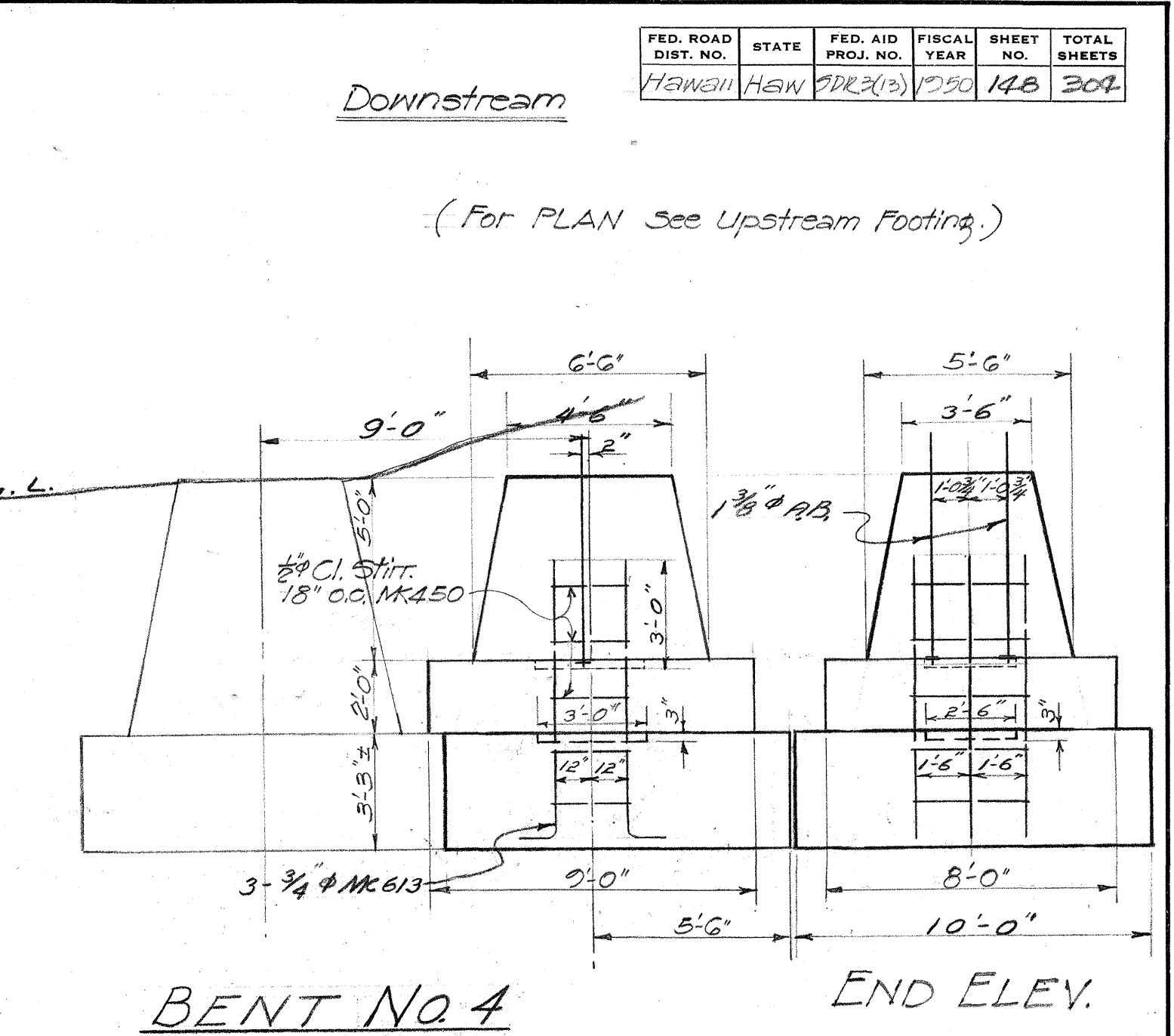
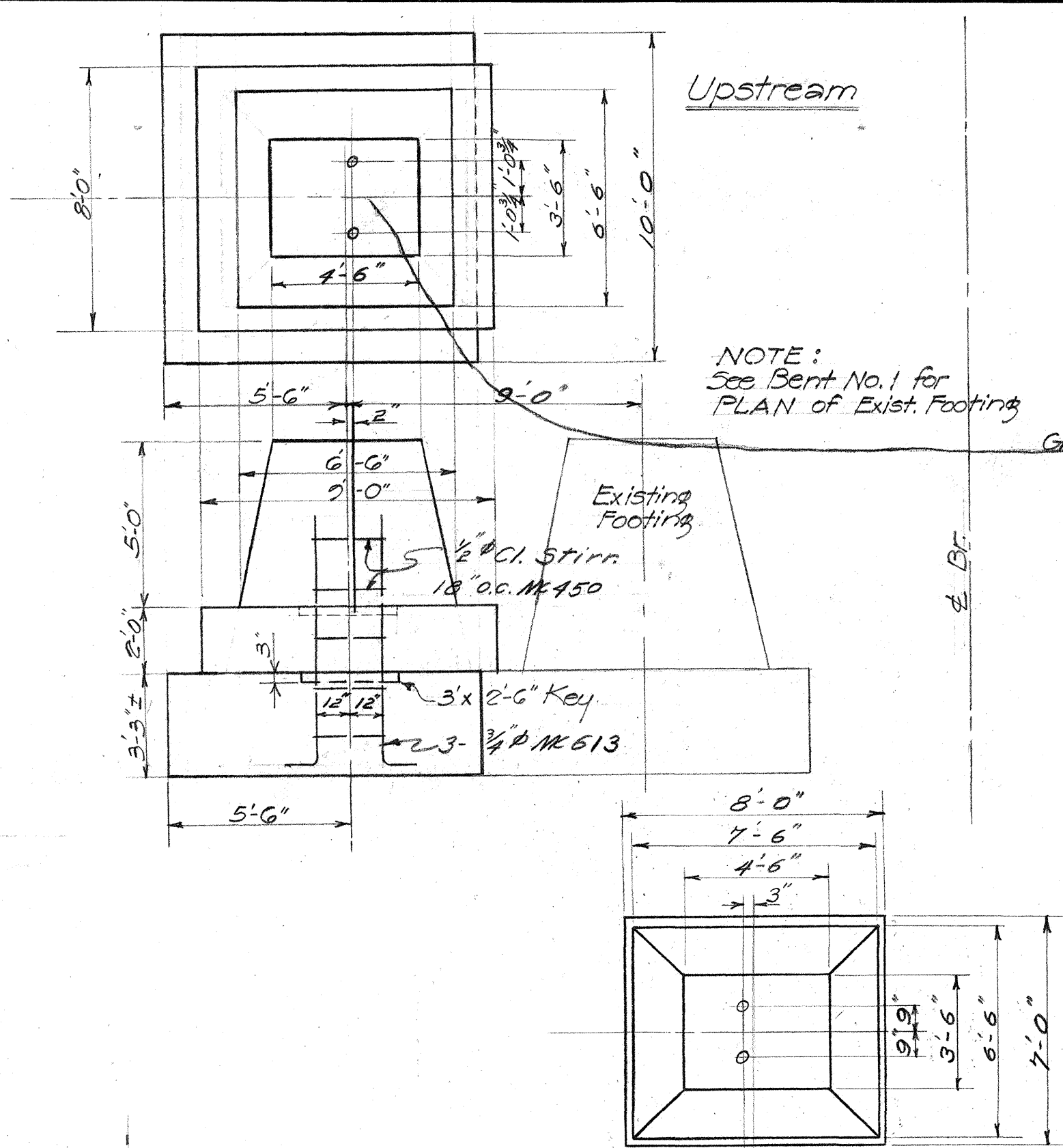
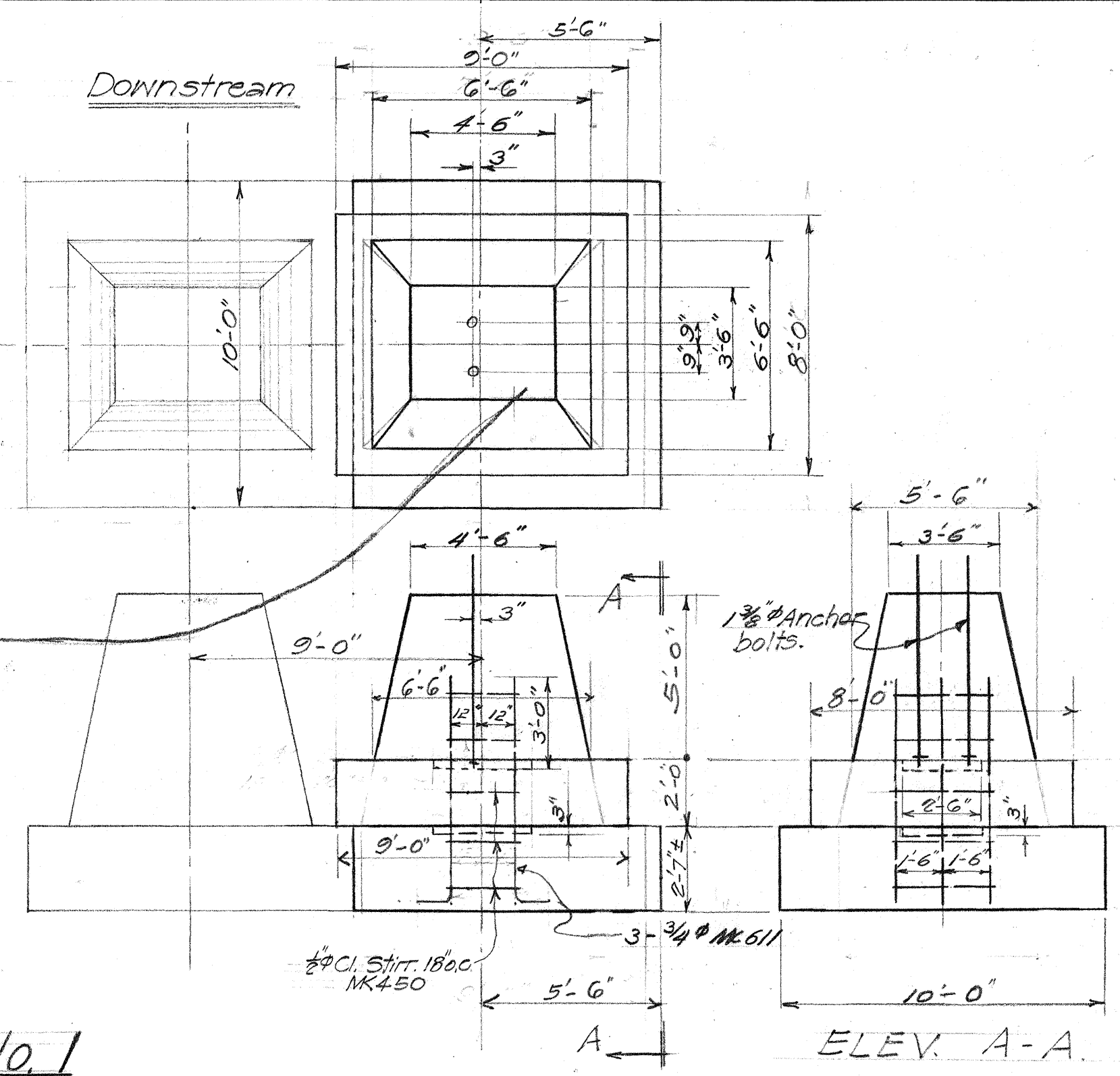
REV. 5-16-'51 : Railing Posts shortened 2
Bottom Rail revised.



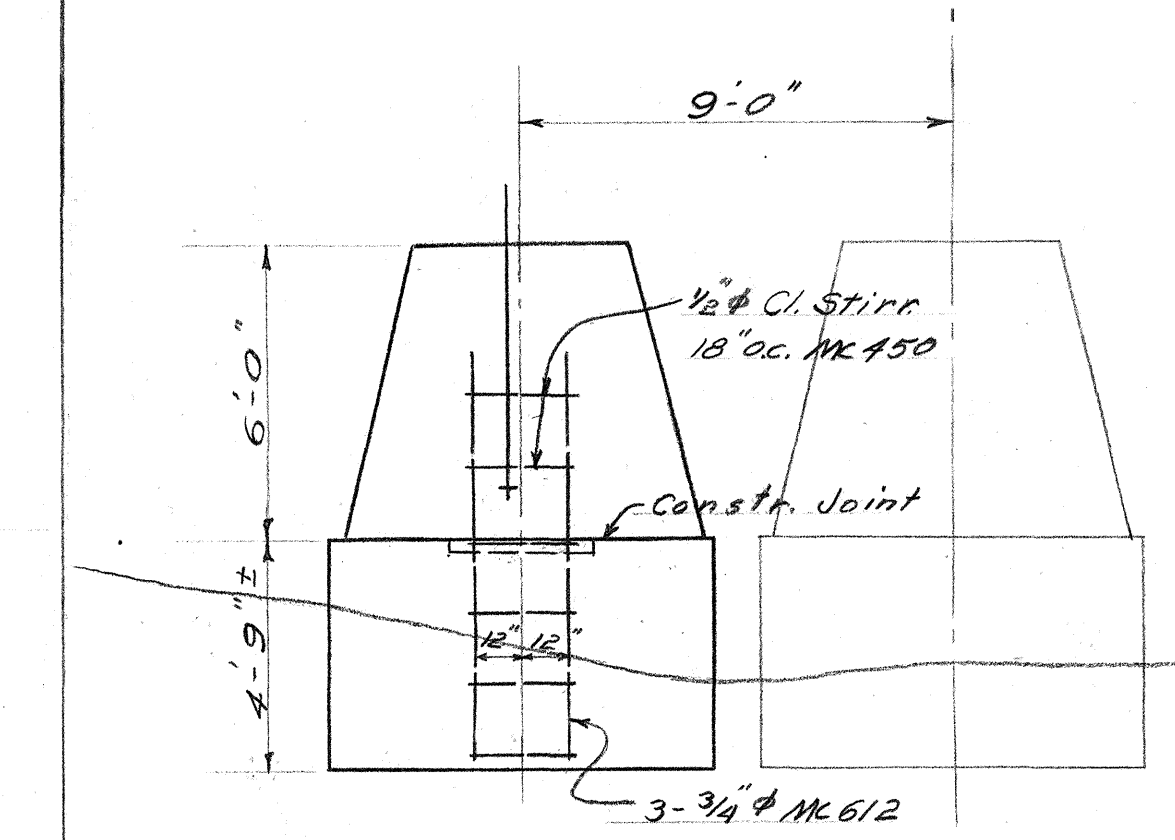
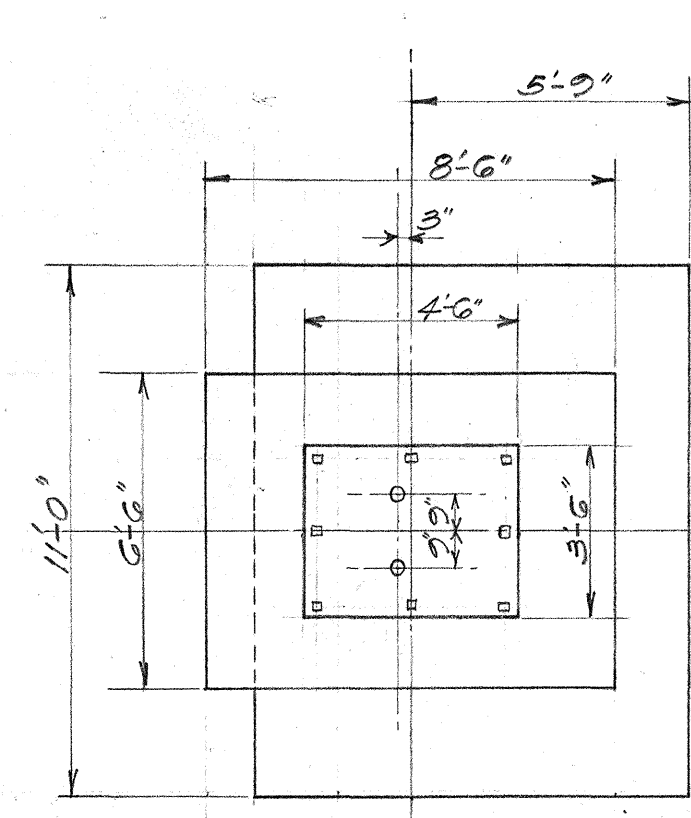
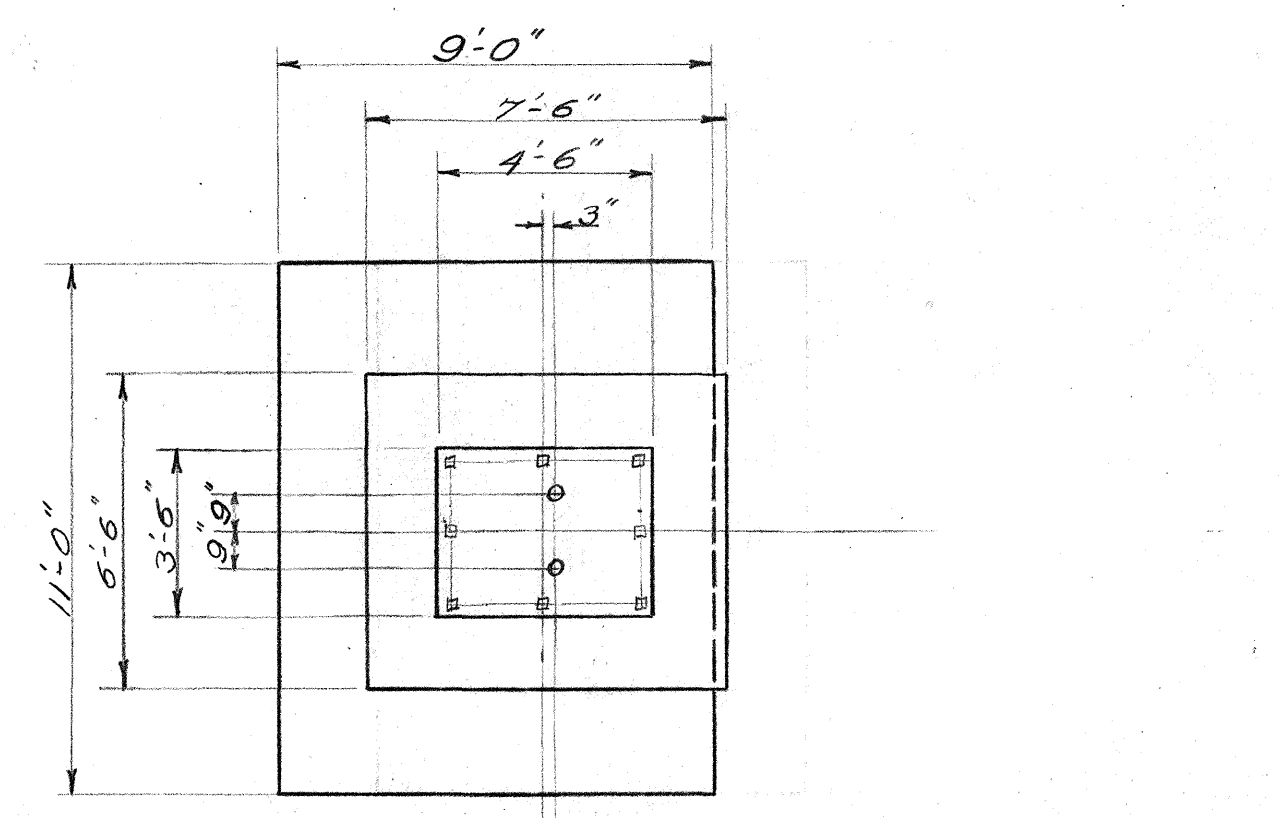
ORIGINAL PLAN	SURVEY PLOTTED BY _____	DATE _____
	DESIGNED BY <i>W. E. Bockel</i>	<i>3-50</i>
	TRACED BY <i>A. W. Lee, Jr.</i>	<i>3-50</i>
NOTE BOOK	QUANTITIES BY _____	"
No. _____	QUANTITIES CHECKED BY _____	"
	CHECKED BY _____	"



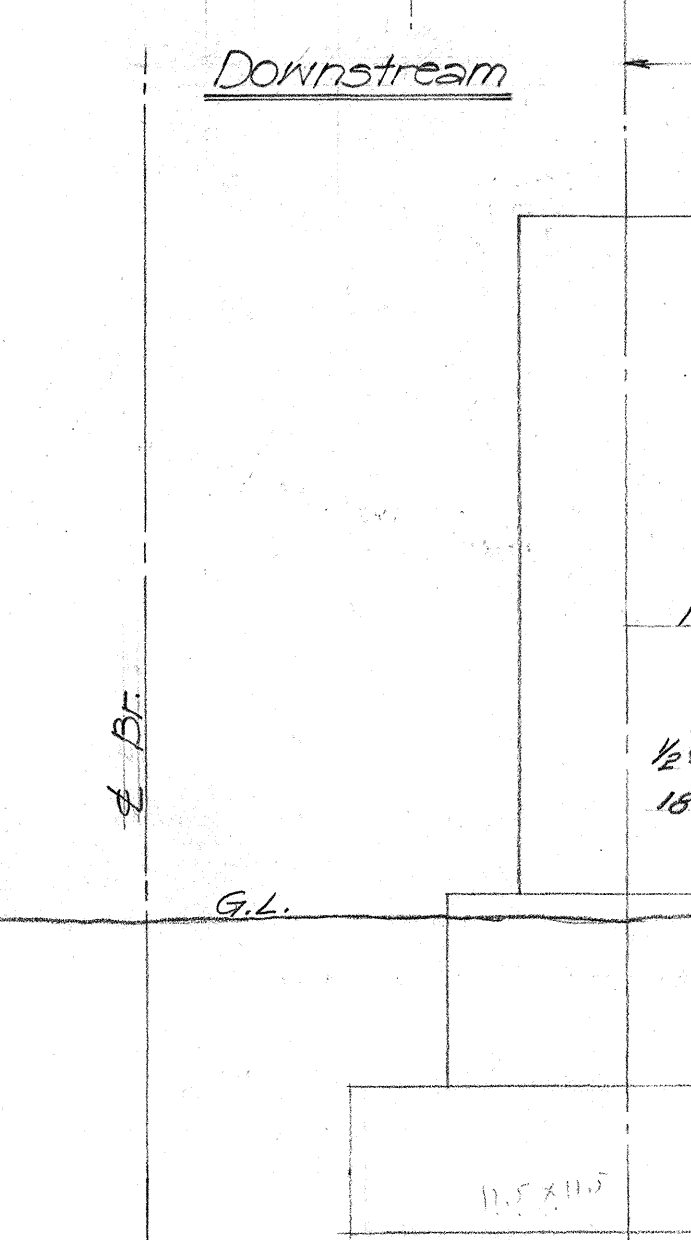
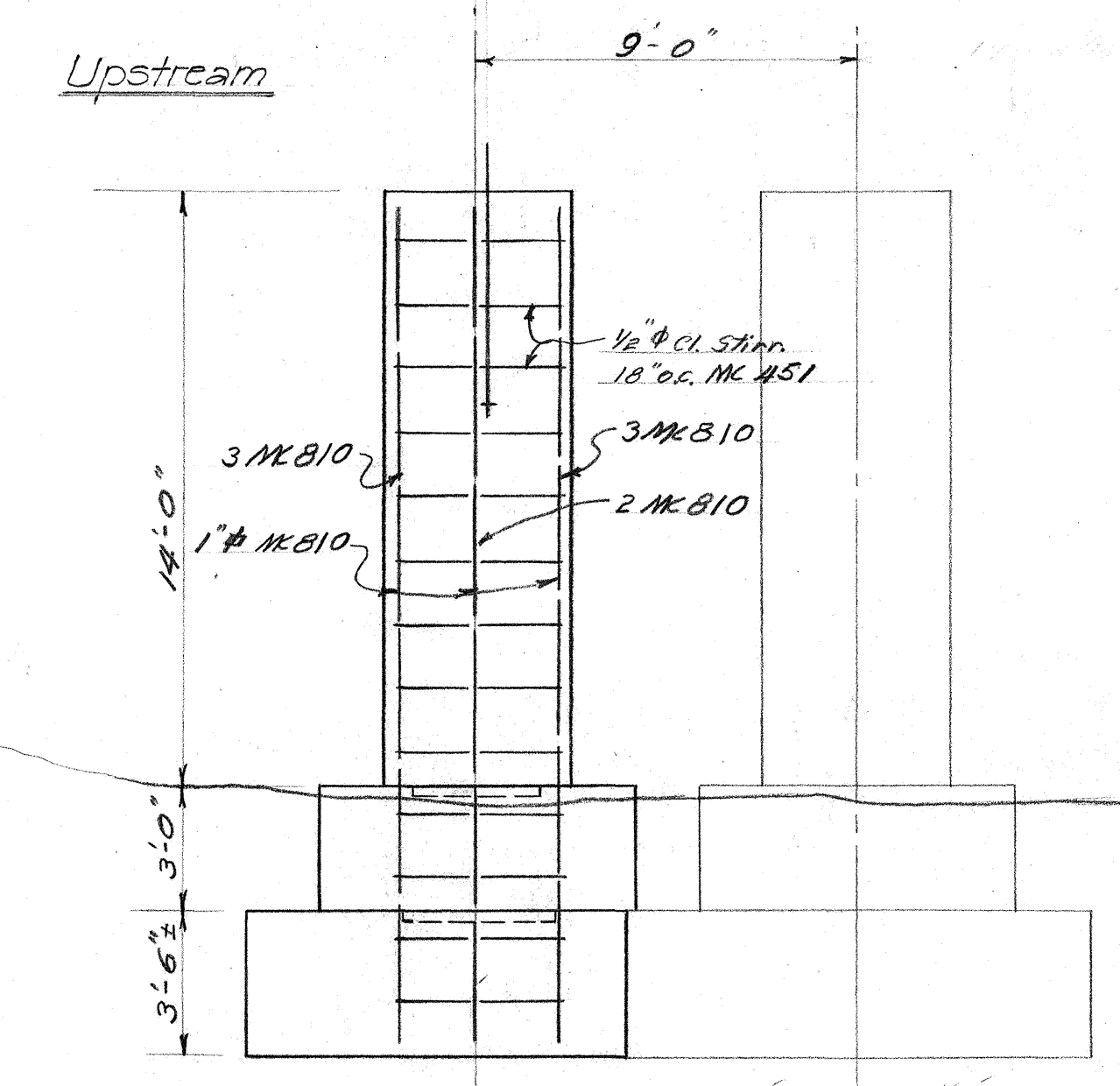
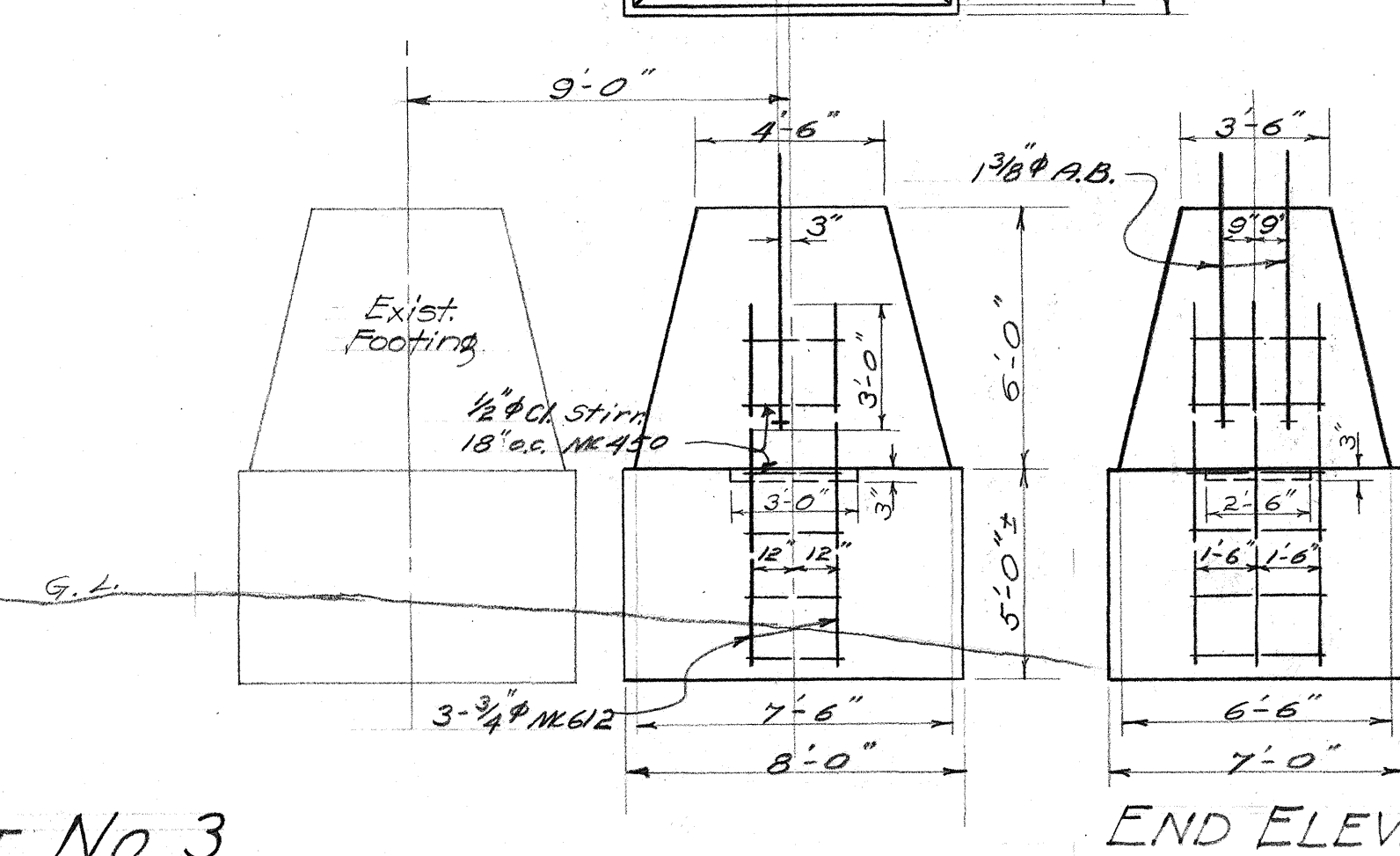
BENT No. 1
1/4" = 1'-0"



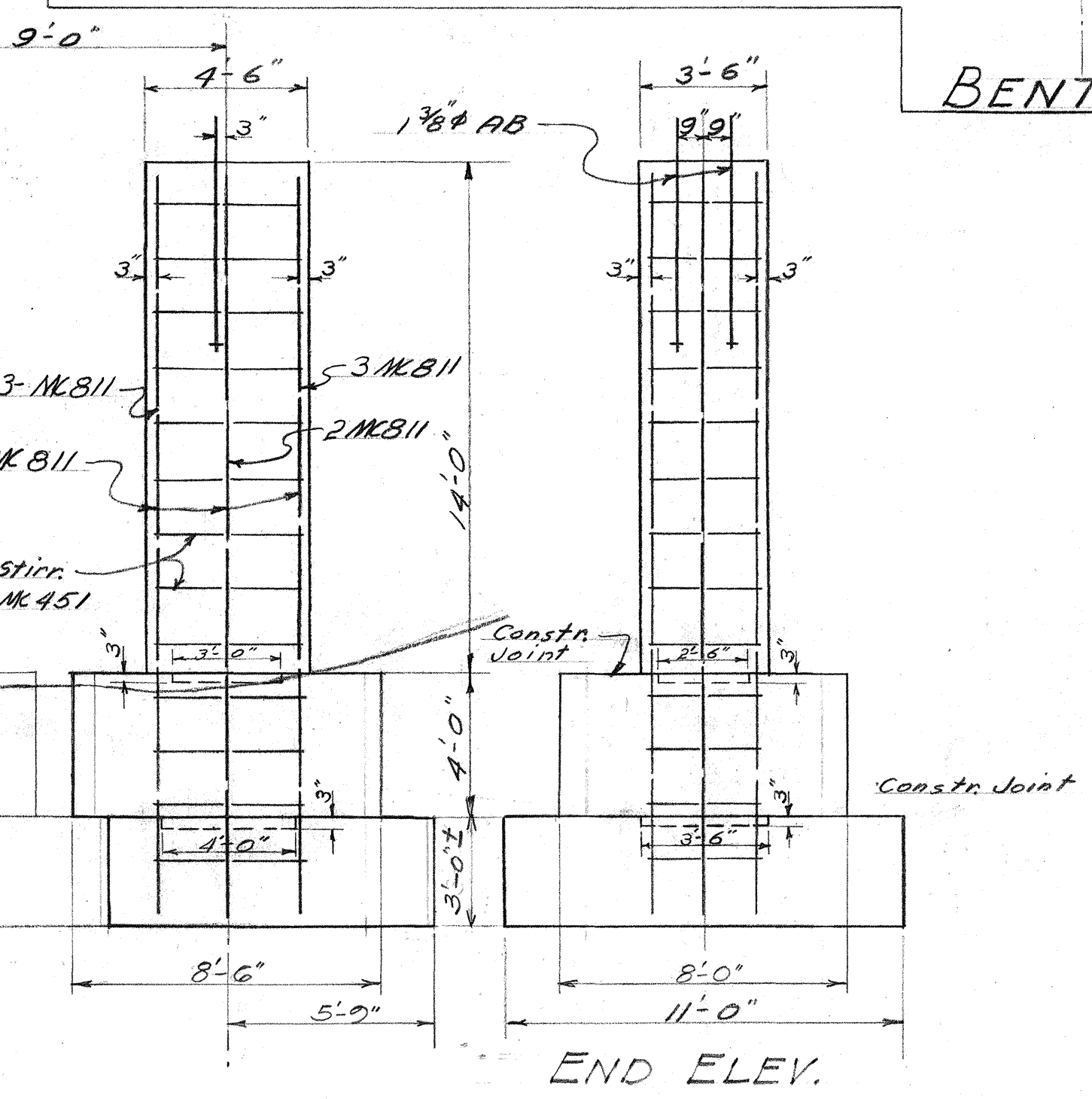
BENT No. 4



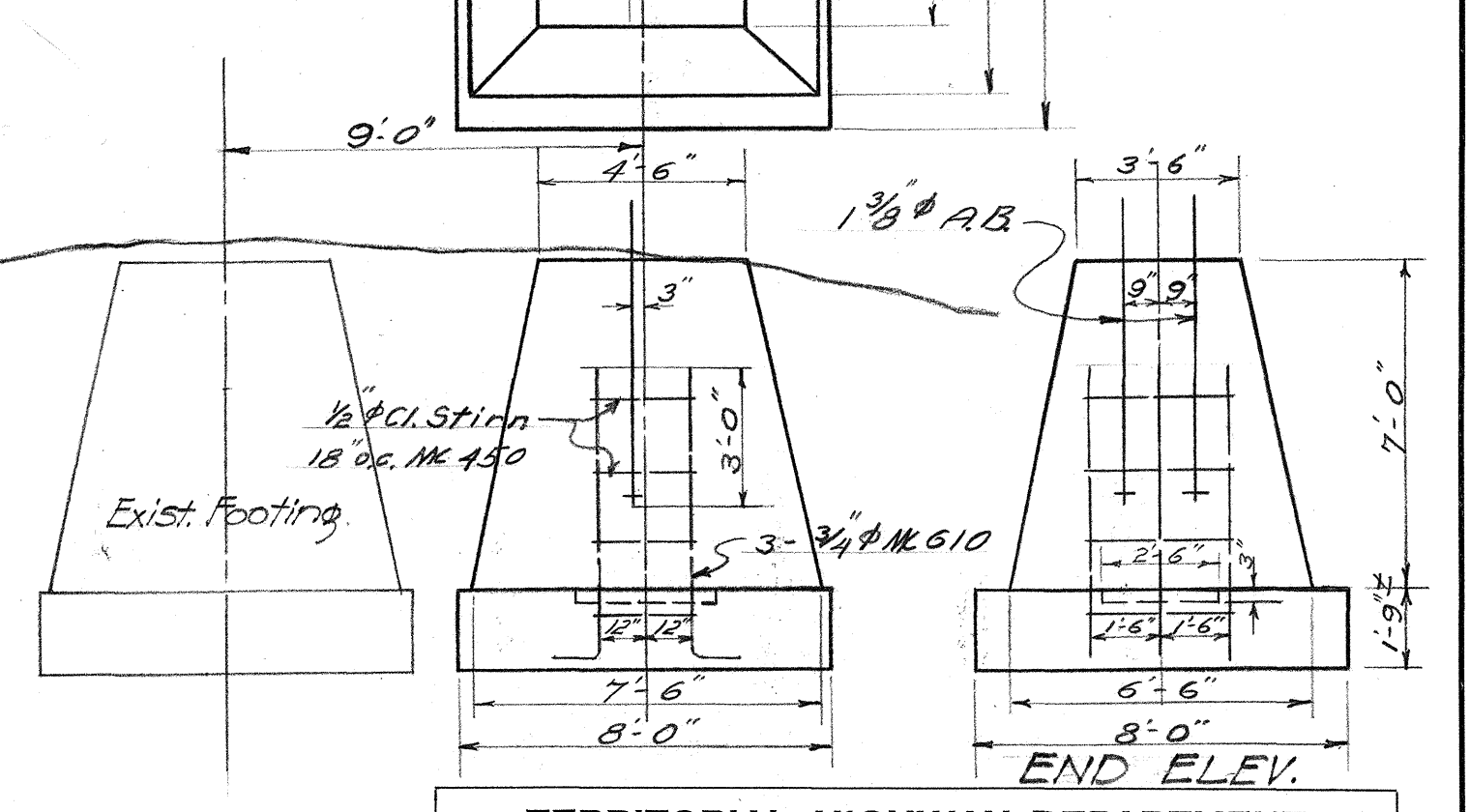
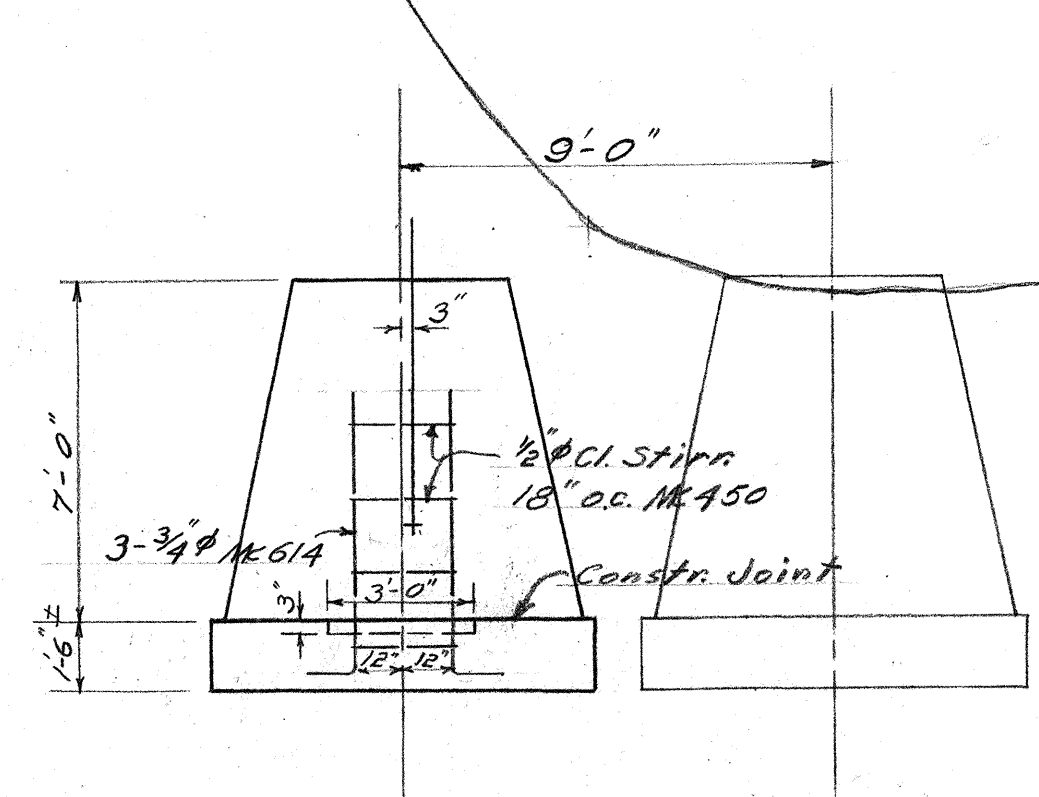
BENT No. 3



BENT No. 2



BENT No. 5



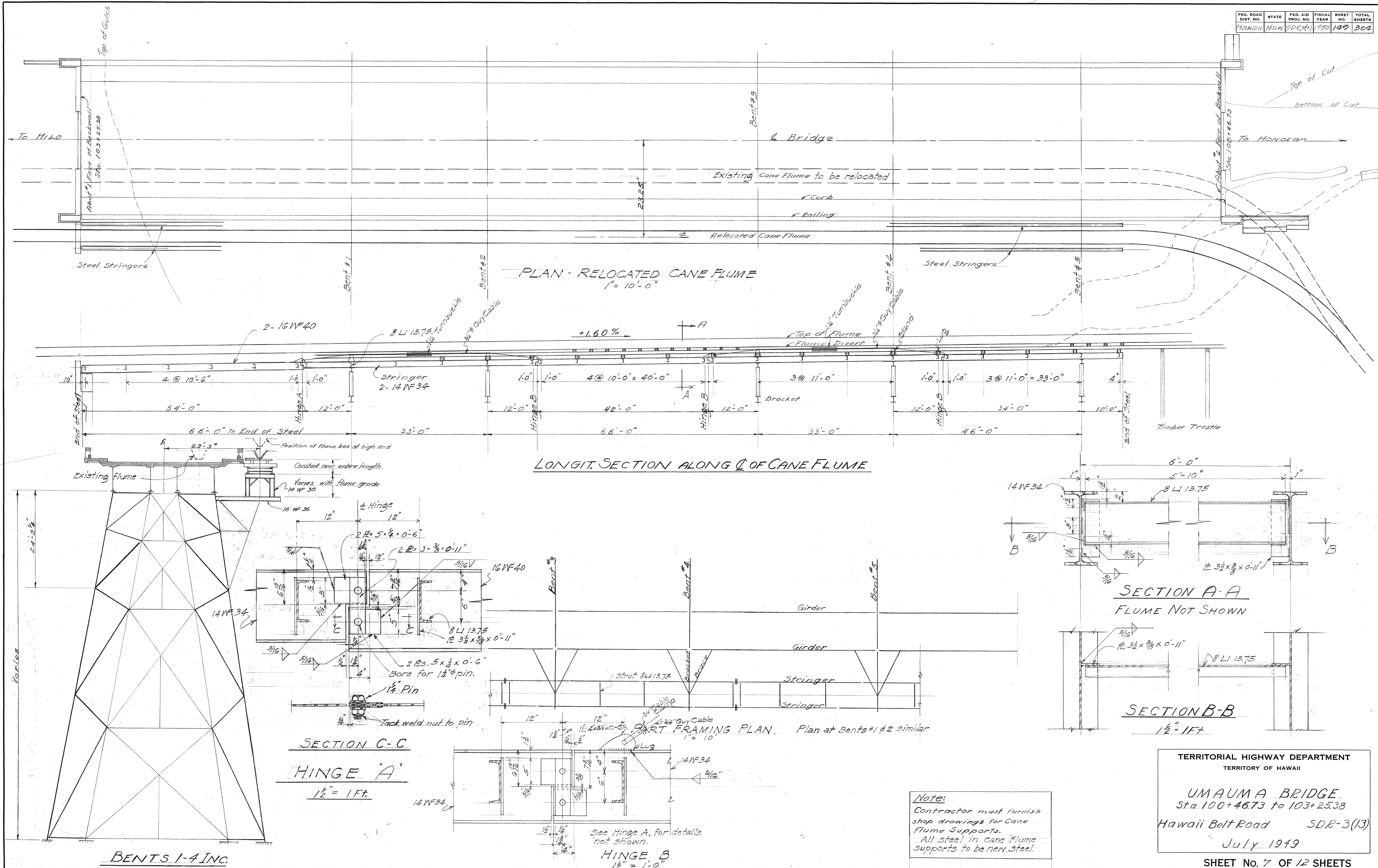
Note: All concrete in Piers to be Class B-2.

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

UMAUM A BRIDGE
Sta 100+45.56 to 103+26.55
Hawaii Belt Road SDR-3(13)
March 1950

SURVEY PLOTTED BY DATE
DESIGNED BY
TRACED BY
QUANTITIES BY
CHECKED BY

PLAN
NOTE/BOOK
No.



TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

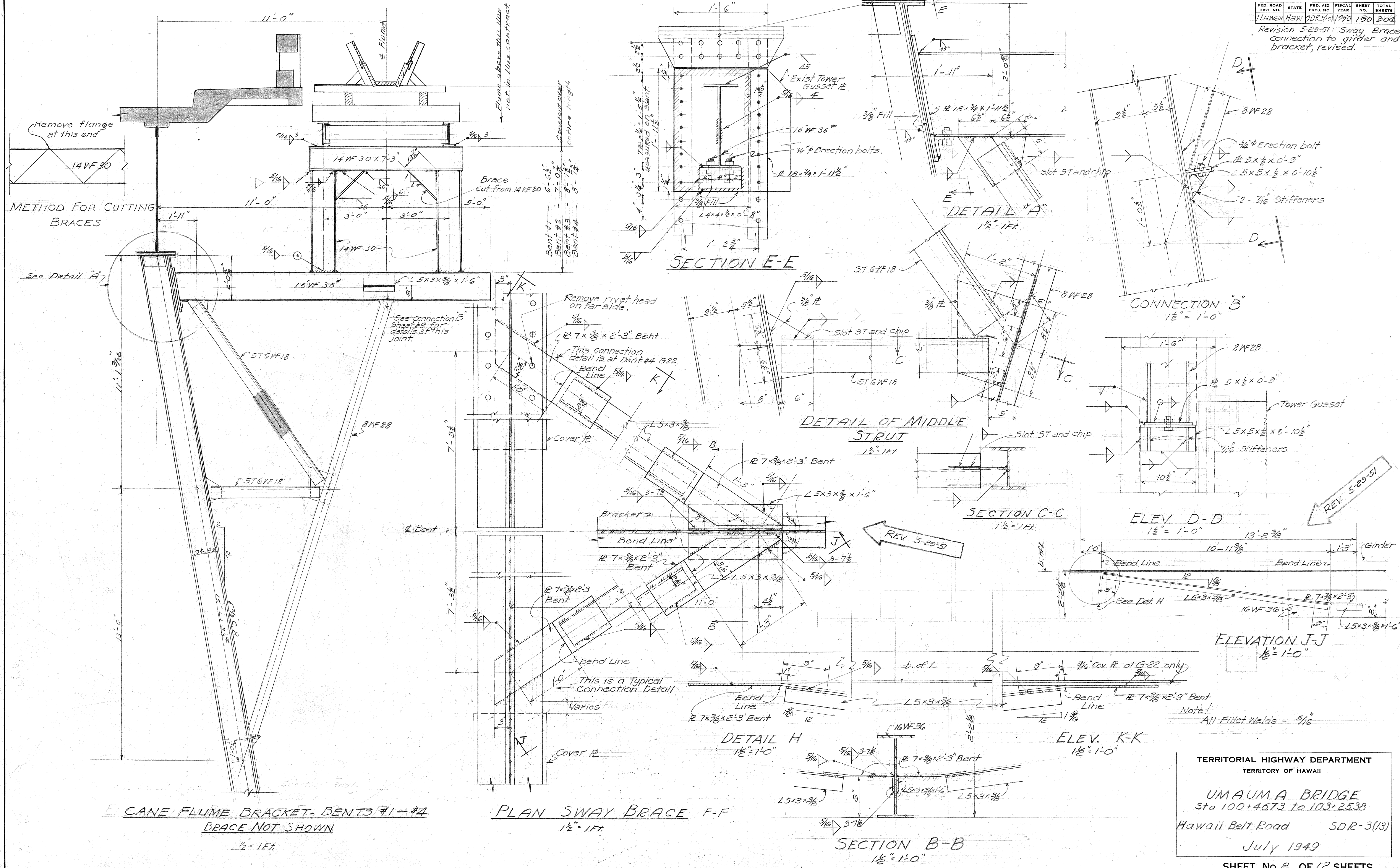
UMAUMA BRIDGE
Sta 100+46.73 to 103+25.38
Hawaii Belt Road SDR-3(13)
July 1949

SHEET No. 7 OF 12 SHEETS

5468.149

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	SDR-3(13)	1940	150	300

Revision 5-29-51: Sway Brace connection to girder and bracket, revised.



DESIGNED BY	DATE
TRACED BY	7-29
QUANTITIES BY	7-29
CHECKED BY	7-29
NO.	

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

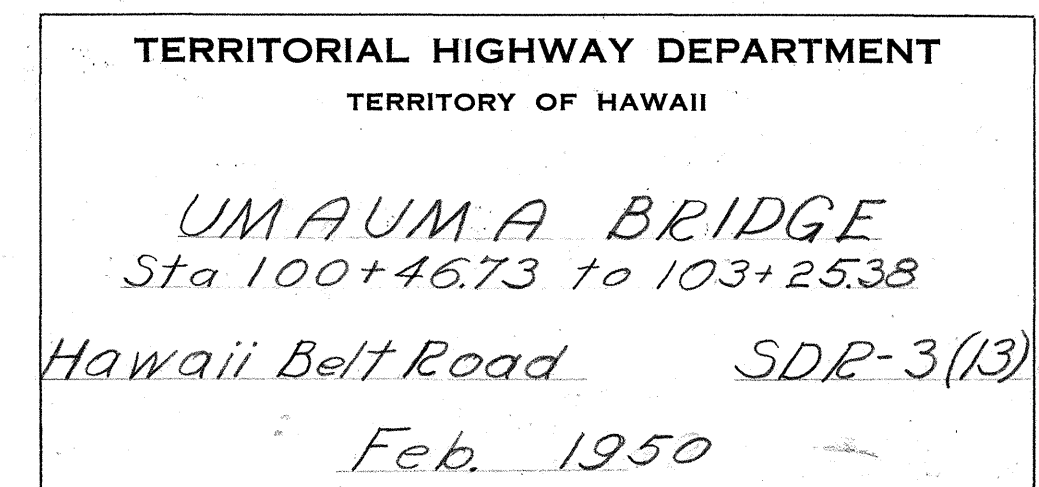
UMAUMA BRIDGE
Sta 100+46.73 to 103+25.38
Hawaii Belt Road SDR-3(13)
July 1949

SHEET No. 8 OF 12 SHEETS

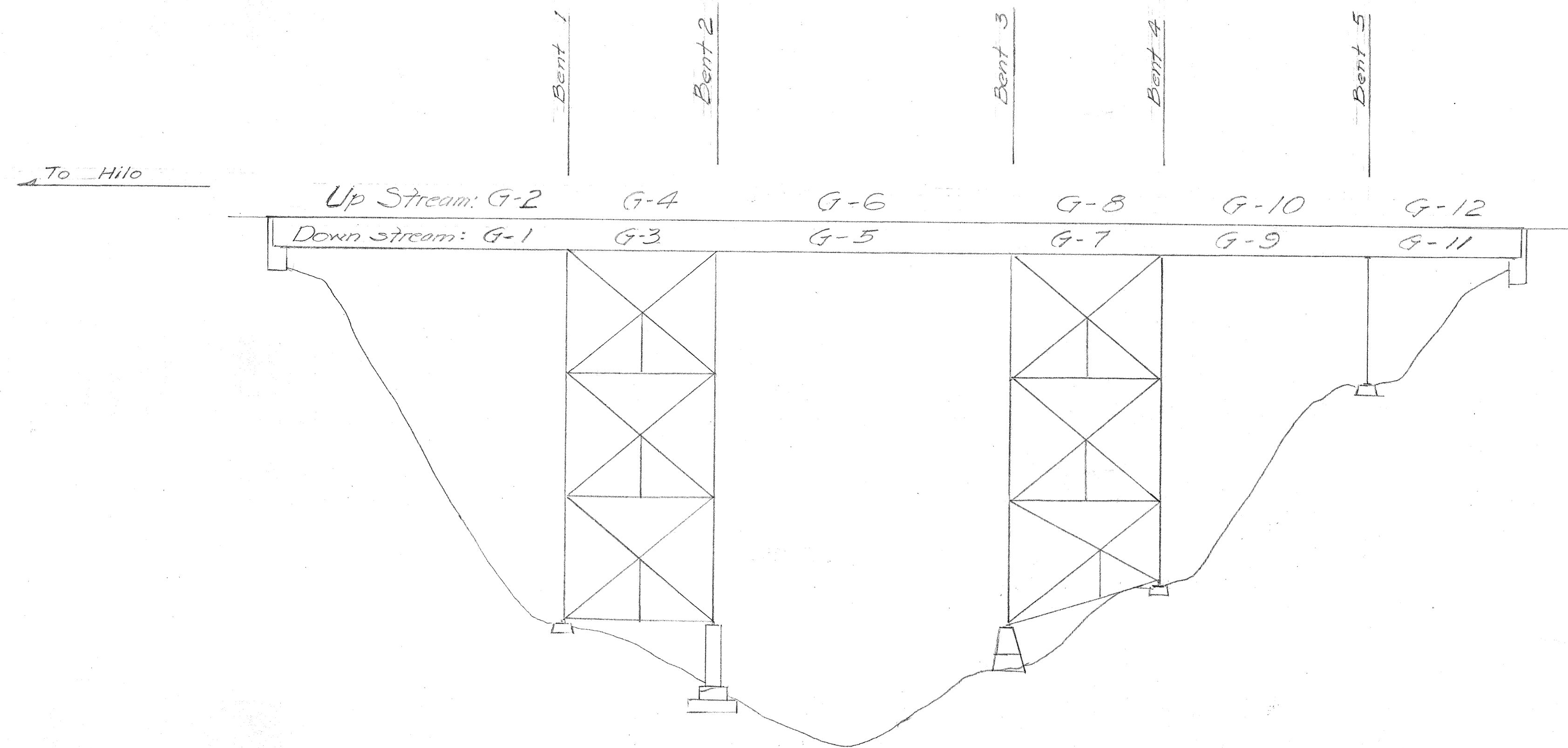
5468.150

Revision 5-29-51: Brace connection revised

Revision 5-29-51: Brace connection revised



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	SDR 3(13)	1950	152	204



ELEVATION - LOOKING UP STREAM

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

Condition survey of Bridge

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

UMAUMA BRIDGE
Sta 100+45.55 to 103+26.55
HAWAII BELT ROAD SDR 3(13)
May 1950

SHEET No. 10 OF 12 SHEETS

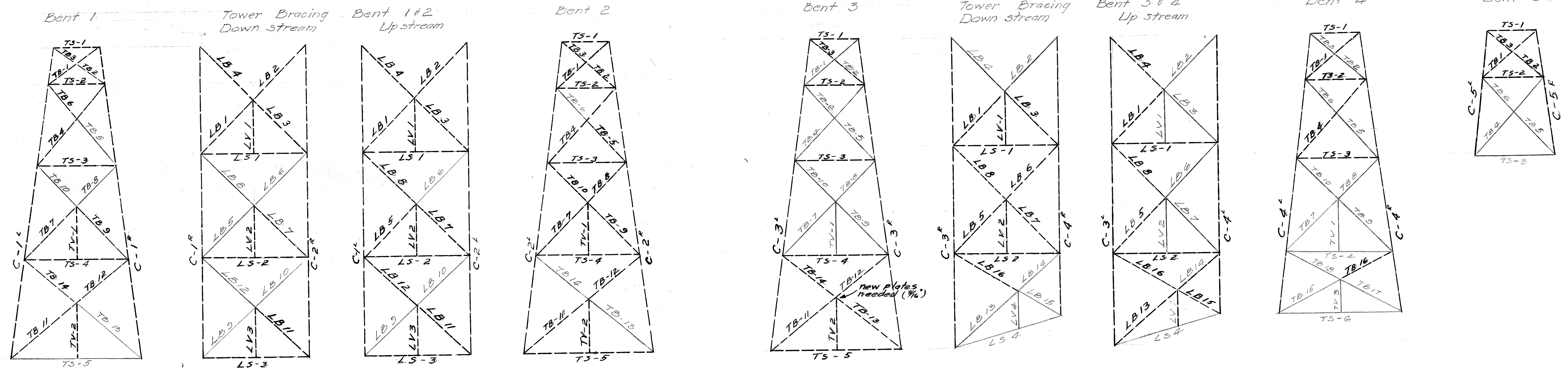
5468.152

Umauma

Bents: Looking Honokaa
Tower Bracings: Looking Up stream

TO HILO

To Honokaa



LIST OF CONDEMNED MEMBERS & PARTS:

Bent 1			Down stream			Up stream			Bent 2			Bent 3			Down stream			Up stream			Bent 4		
TS-1	7 rivets	3/4" - 1" grip	LB-1	4 rivets	3/4" - 3/4" grip	LB-1	7 rivets	3/4" - 3/4" grip	TS-1	7 rivets	3/4" dia 1" grip	TS-1	20 rivets	3/4" dia 1" grip	LB-1	15 rivets	3/4" dia 3/4" grip	LB-1	10 rivets	3/4" dia 3/4" grip	TS-1	15 rivets	3/4" dia 3/4" grip
TS-2	1 "	"	LB-2	20 "	"	LB-2	4 "	"	TS-2	2 "	"	TS-2	10 "	"	LB-3	10 "	"	LB-4	15 "	"	TS-2	10 "	"
TS-3	5 lattice bars	"	LB-3	10 "	"	LB-3	2 "	"	TS-3	5 lattice bars	"	TS-3	14 "	"	LB-5	15 "	"	LB-5	15 "	"	TS-3	14 "	"
TS-4	2 "	"	LB-4	2 "	"	LB-4	5 "	"	TS-4	1 "	"	TS-4	Corroded at connections	"	LB-6	6 "	"	LB-6	6 "	"	TS-4	10 "	3/4" 3/4" grip
TS-5	10 rivets	3/4" - 1" grip	LB-5	20 "	"	LB-5	20 "	"	TS-5	16 rivets	3/4" - 1" grip	TS-5	12 lattice bars	"	LB-7	6 "	"	LB-7	6 "	"	TS-5	25 "	"
TB-1	8 "	3/4" - 3/4" grip	LB-6	6 "	"	LB-6	8 "	"	TB-1	10 "	3/4" dia 3/4" grip	TB-1	10 rivets	3/4" - 3/4" grip	LB-8	15 "	"	LB-8	15 "	"	TS-6	10 "	"
TB-2	8 "	"	LB-7	5 "	"	LB-7	10 "	"	TB-2	5 "	"	TB-2	10 "	"	LB-9	25 "	"	LB-9	25 "	"	TS-6	10 "	"
TB-3	10 "	"	LB-8	15 "	3/4" - 1" grip	LB-8	10 "	"	TB-3	6 "	"	TB-3	10 "	"	LB-10	20 "	"	LB-10	20 "	"	TS-6	10 "	"
TB-4	5 "	"	LB-9	20 "	"	LB-9	8 "	"	TB-4	6 "	"	TB-4	10 "	"	LB-11	6 "	"	LB-11	6 "	"	TS-6	10 "	"
TB-5	Member Slightly bent	"	LB-10	10 "	"	LB-10	10 "	"	TB-5	10 "	"	TB-5	10 "	"	LB-12	20 "	"	LB-12	20 "	"	TS-6	10 "	"
TB-6	2 rivets	3/4" - 3/4" grip	LB-11	5 "	3/4" - 1 1/2" grip	LB-11	10 "	"	TB-6	10 "	"	TB-6	10 "	"	LB-13	20 "	"	LB-13	20 "	"	TS-6	10 "	"
TB-7	2 rivets	3/4" - 3/4" grip	LB-12	20 "	"	LB-12	10 "	"	TB-7	6 "	"	TB-7	10 "	"	LB-14	20 "	"	LB-14	20 "	"	TS-6	10 "	"
TB-8	3 "	"	LB-13	10 "	3/4" - 1 1/2" grip	LB-13	10 "	"	TB-8	10 "	"	TB-8	10 "	"	LB-15	20 "	"	LB-15	20 "	"	TS-6	10 "	"
TB-9	Member Slightly bent	"	LB-14	20 "	"	LB-14	10 "	"	TB-9	10 "	"	TB-9	10 "	"	LB-16	20 "	"	LB-16	20 "	"	TS-6	10 "	"
TB-10	new gusset plate	"	LB-15	10 "	3/4" - 1 1/2" grip	LB-15	10 "	"	TB-10	10 "	"	TB-10	10 "	"	LB-17	20 "	"	LB-17	20 "	"	TS-6	10 "	"
TB-11	3 rivets	3/4" - 3/4" grip	LB-16	20 "	"	LB-16	10 "	"	TB-11	10 "	"	TB-11	10 "	"	LB-18	20 "	"	LB-18	20 "	"	TS-6	10 "	"
TB-12	3 rivets	3/4" - 3/4" grip	LB-17	10 "	3/4" - 1 1/2" grip	LB-17	10 "	"	TB-12	10 "	"	TB-12	10 "	"	LB-19	20 "	"	LB-19	20 "	"	TS-6	10 "	"
TB-13	3 "	"	LB-18	20 "	"	LB-18	10 "	"	TB-13	10 "	"	TB-13	10 "	"	LB-20	20 "	"	LB-20	20 "	"	TS-6	10 "	"
TB-14	3 "	"	LB-19	10 "	3/4" - 1 1/2" grip	LB-19	10 "	"	TB-14	10 "	"	TB-14	10 "	"	LB-21	20 "	"	LB-21	20 "	"	TS-6	10 "	"
TV-1	3 "	"	LB-20	20 "	"	LB-20	10 "	"	TV-1	3 "	"	TV-1	3 "	"	LB-22	20 "	"	LB-22	20 "	"	TS-6	10 "	"
TV-2	2 "	"	LB-21	10 "	3/4" - 1 1/2" grip	LB-21	10 "	"	TV-2	12 "	"	TV-2	12 "	"	LB-23	20 "	"	LB-23	20 "	"	TS-6	10 "	"
CIL	23 "	3/4" - 1 1/2" grip	LB-22	10 "	3/4" - 1 1/2" grip	LB-22	10 "	"	CIL	100 "	3/4" - 1 1/2" grip	CIL	100 "	3/4" - 1 1/2" grip	LB-24	20 "	"	LB-24	20 "	"	TS-6	10 "	"
CIR	14 "	3/4" - 1 1/2" grip	LB-23	10 "	3/4" - 1 1/2" grip	LB-23	10 "	"	CIR	70 "	"	CIR	70 "	"	LB-25	20 "	"	LB-25	20 "	"	TS-6	10 "	"

Note: For details of condemned members see sheet #11 of Nanue Bridge.

Condition survey of Bridge

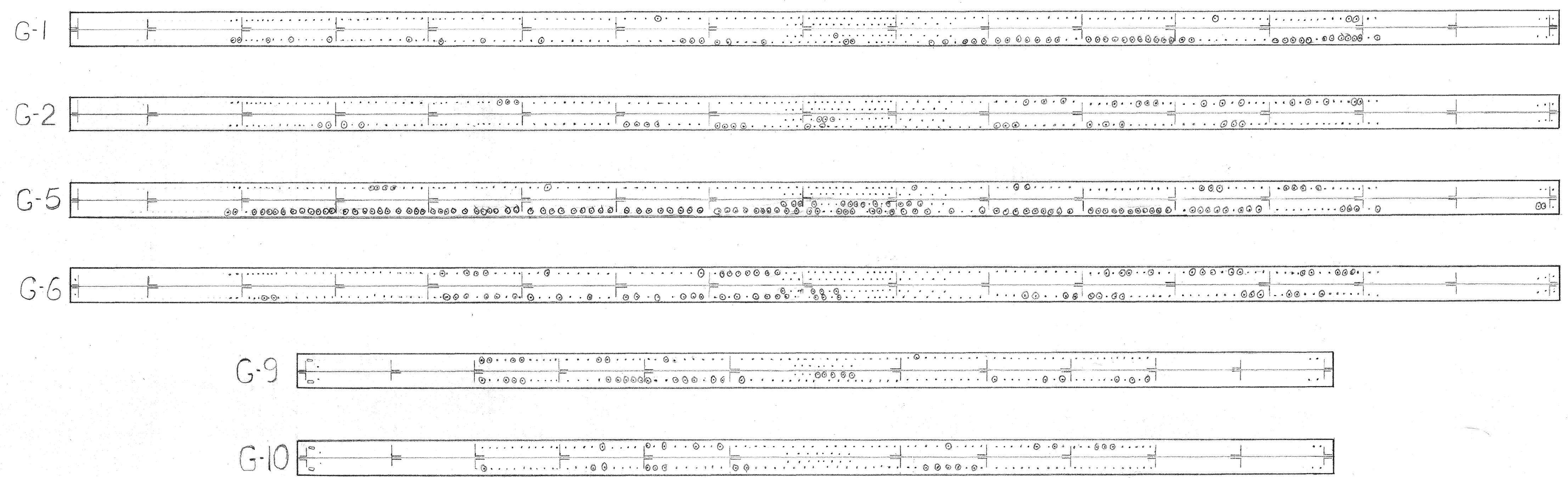
TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

UMAUMA BRIDGE
Sta 100+45.56 to 103+26.55
HAWAII BELT ROAD SDR 3(13)
MAY 1950

SHEET No. 11 OF 12 SHEETS

PLAN - BOTTOM FLANGE

← TO HILO



SUMMARY OF RIVETS TO BE REPLACED

Dia.	Length	Grip	No.	Say:
7/8"	2 5/8"	1 5/8"	150	200
7/8"	3 1/4"	1 5/8"	155	200
7/8"	3 7/8"	2 1/2"	36	50
7/8"	4"	2 1/4"	17	30
7/8"	5 1/8"	3/4"	27	40

Use Last Col. (Say) for estimating in Contract

All Rivets and Bolts at base plates of girders at Column connections on entire structure must be replaced. (these are not shown)

Approximate no. of rivets for Col. to Girder Connection

Dia.	Length	Grip	No.
7/8"	3"	1 3/8"	80

The top flanges rivets are not readily accessible to inspection but they are assumed to be entirely bad and should be figured on being replaced. approximate quantities are:

Dia.	Length	Grip	No.
7/8"	2 3/4"	1 3/8"	600
7/8"	3 1/4"	1 3/8"	550
7/8"	3 7/8"	2 1/2"	100
7/8"	4"	2 1/4"	180
7/8"	5 1/8"	3/4"	112

- Legend -

- (dot) indicates rivet
- ◉ (circled dots) indicates condemned rivet

Girders not shown have no cover plates - no rivets -

Condition survey of Bridge

TERRITORIAL HIGHWAY DEPARTMENT

TERRITORY OF HAWAII

UMAUMA BRIDGE

Sta 100+45.56 to 103+26.55

HAWAII BELT ROAD

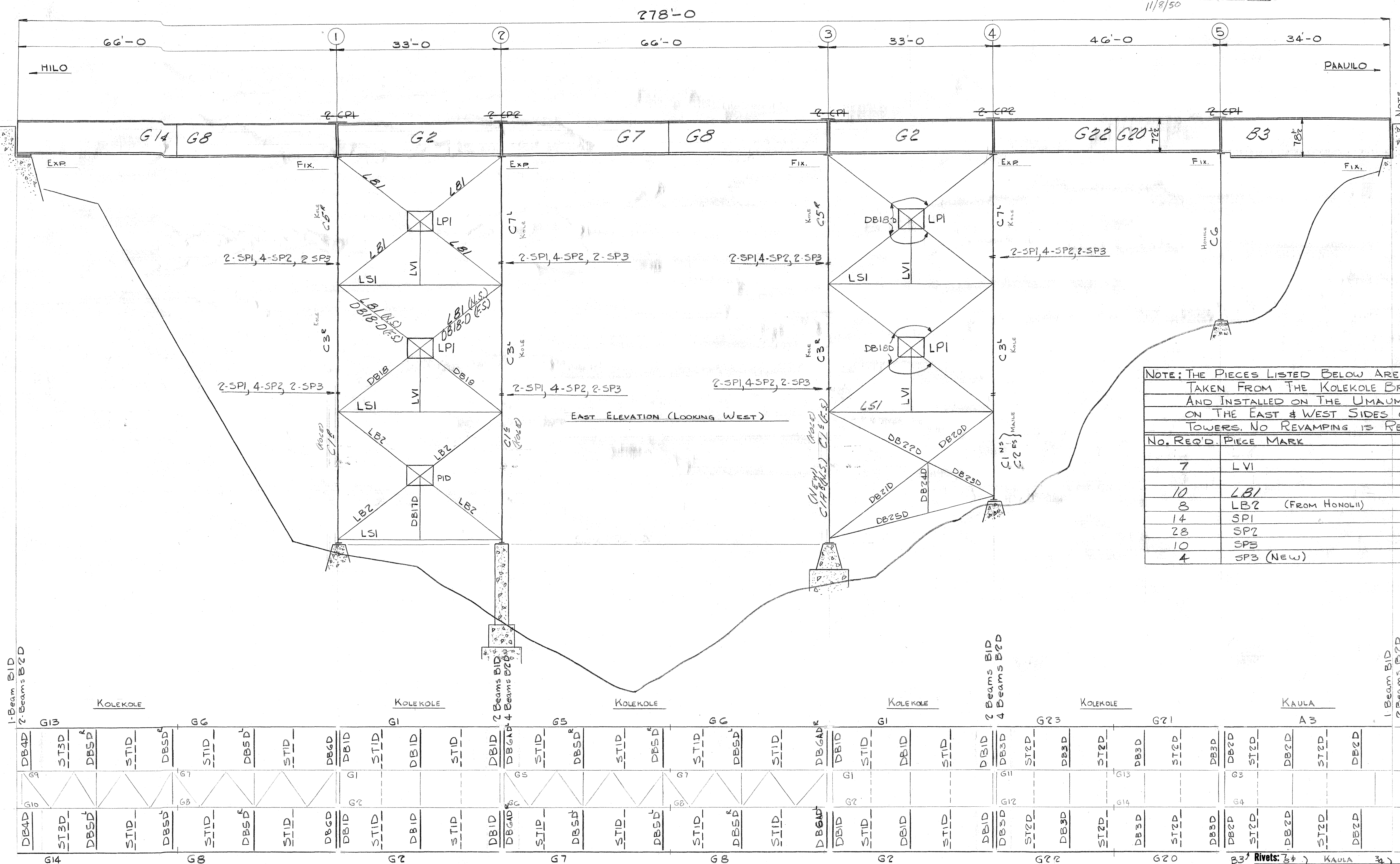
SDR 3(13)

MAY 1950

SHEET No. 12 OF 12 SHEETS

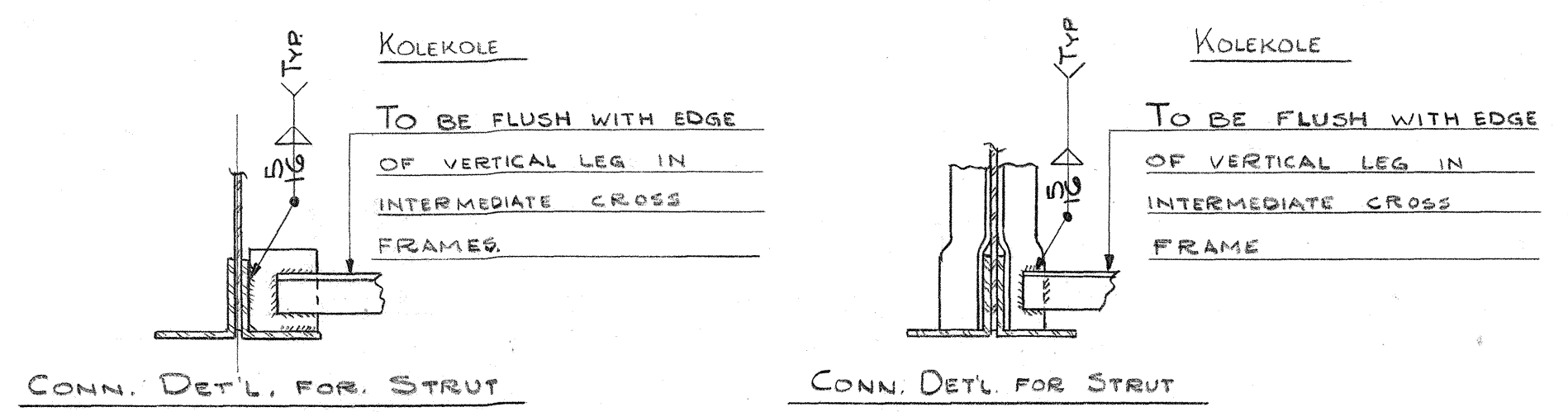
5468.134

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



NOTE: THE PIECES LISTED BELOW ARE TO BE TAKEN FROM THE KOLEKOLE BRIDGE AND INSTALLED ON THE UMAUMA BRIDGE ON THE EAST & WEST SIDES OF THE TOWERS. NO REVAMPING IS REQUIRED.

No. REQ'D.	PIECE MARK
7	LVI
10	LB1
8	LB2 (FROM HONOLULU)
14	SP1
28	SP2
10	SP3
4	SP3 (NEW)



PLAN AT BOTTOM CHORD

Rivets: 3/4" KAULA
Holes: 1 1/2" GIRDERS
Paint: 1/2" TOWERS

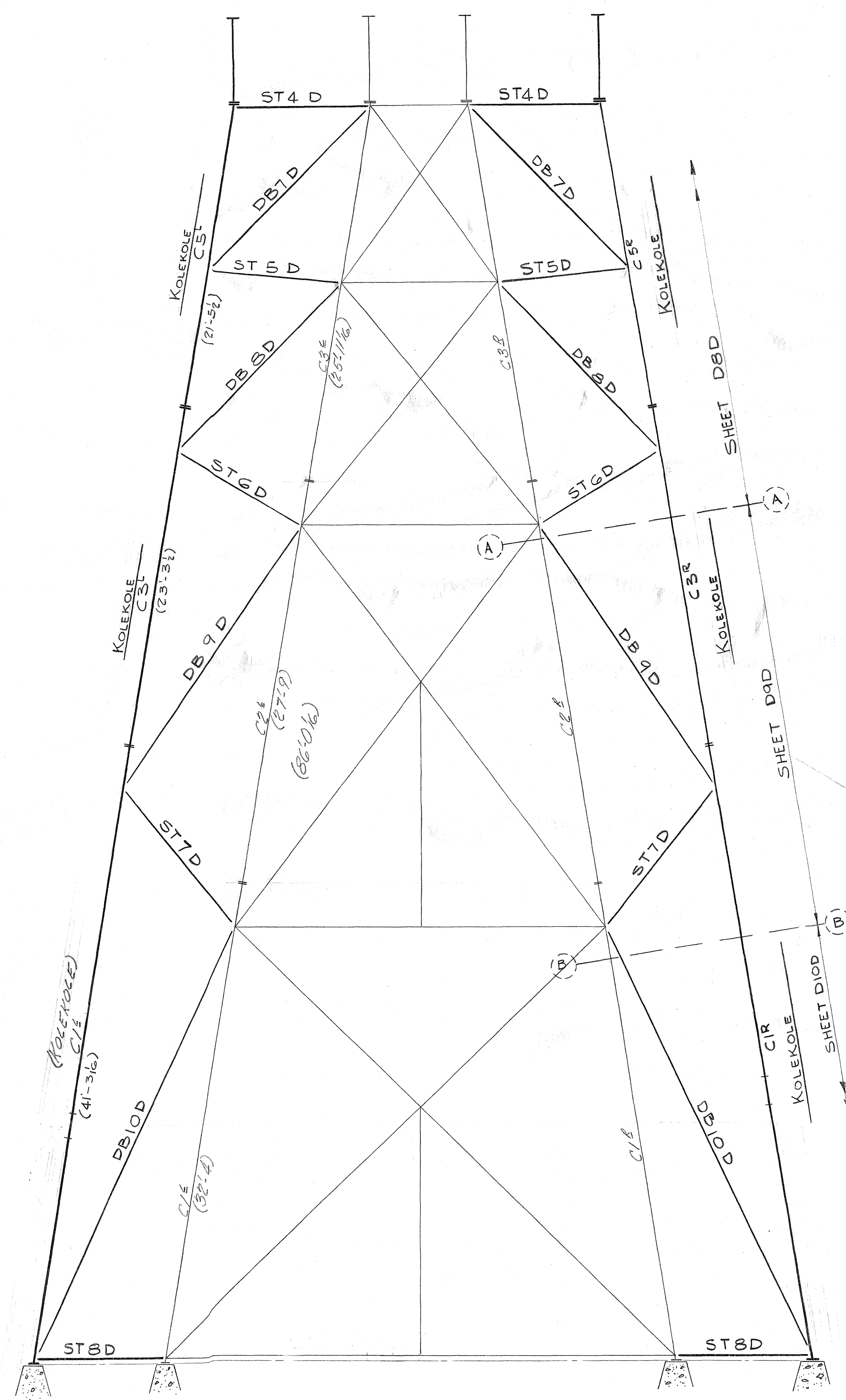
INDUSTRIAL DEV. CO.
ADDITION TO UMAUMA BRIDGE
HAWAII

INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.

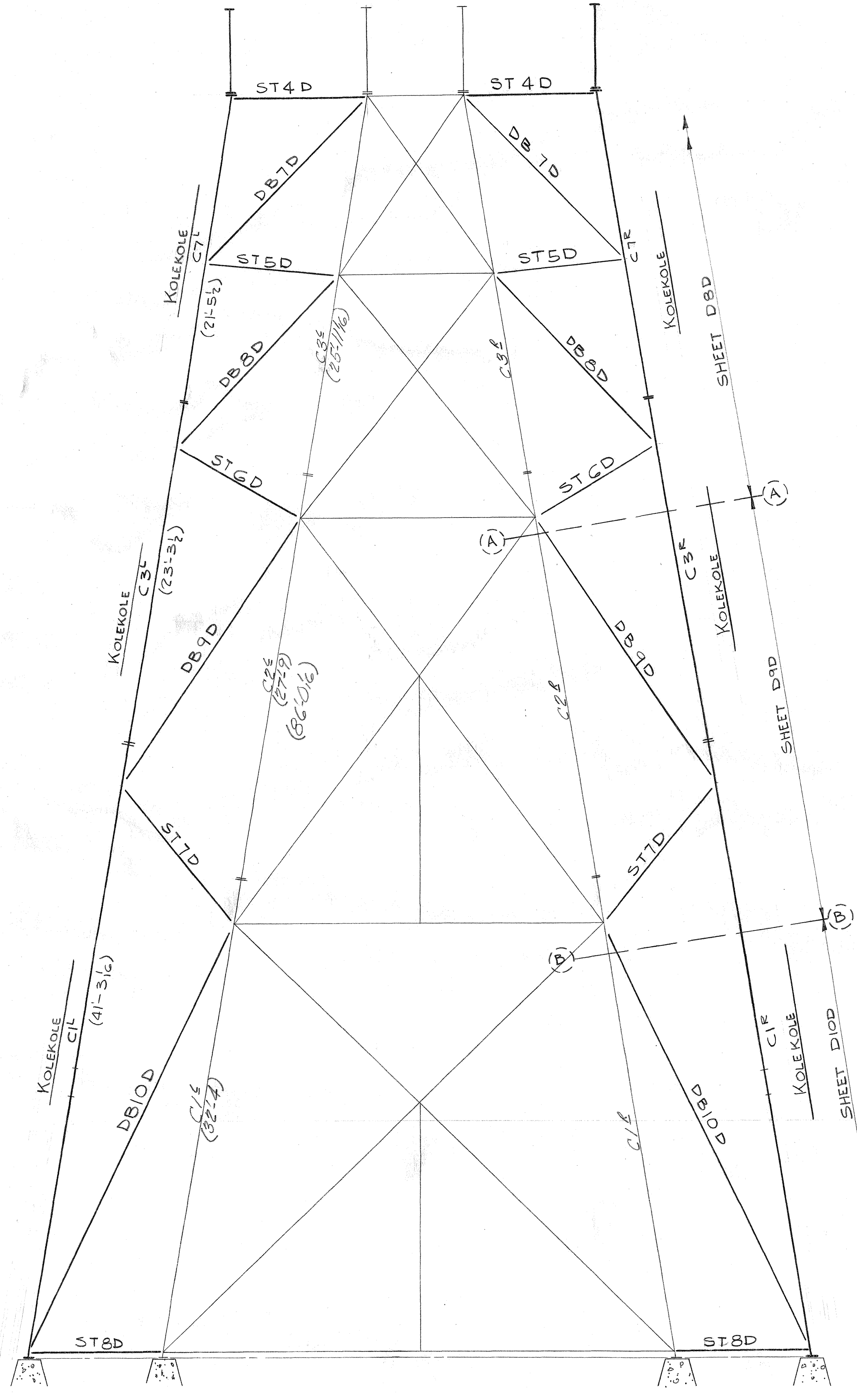
MADE BY	DAL	11-14-49	ORDER NO.	3807
CHECKED BY	DM	1-16-50	SHEET NO.	E1D

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	DDC-103	1950	156	300

Order No. 3807 Sheet No. E2-D



BENT #1
(LOOKING NORTH)



BENT #2
(LOOKING SOUTH)

Rivets: 3/4" x 1/2" ED UN.
Holes: 1/8" x 1/2" ED UN.
Paint:

INDUSTRIAL DEV. CO.
ADDITION TO THE UMAUNA
BRIDGE - HAWAII -

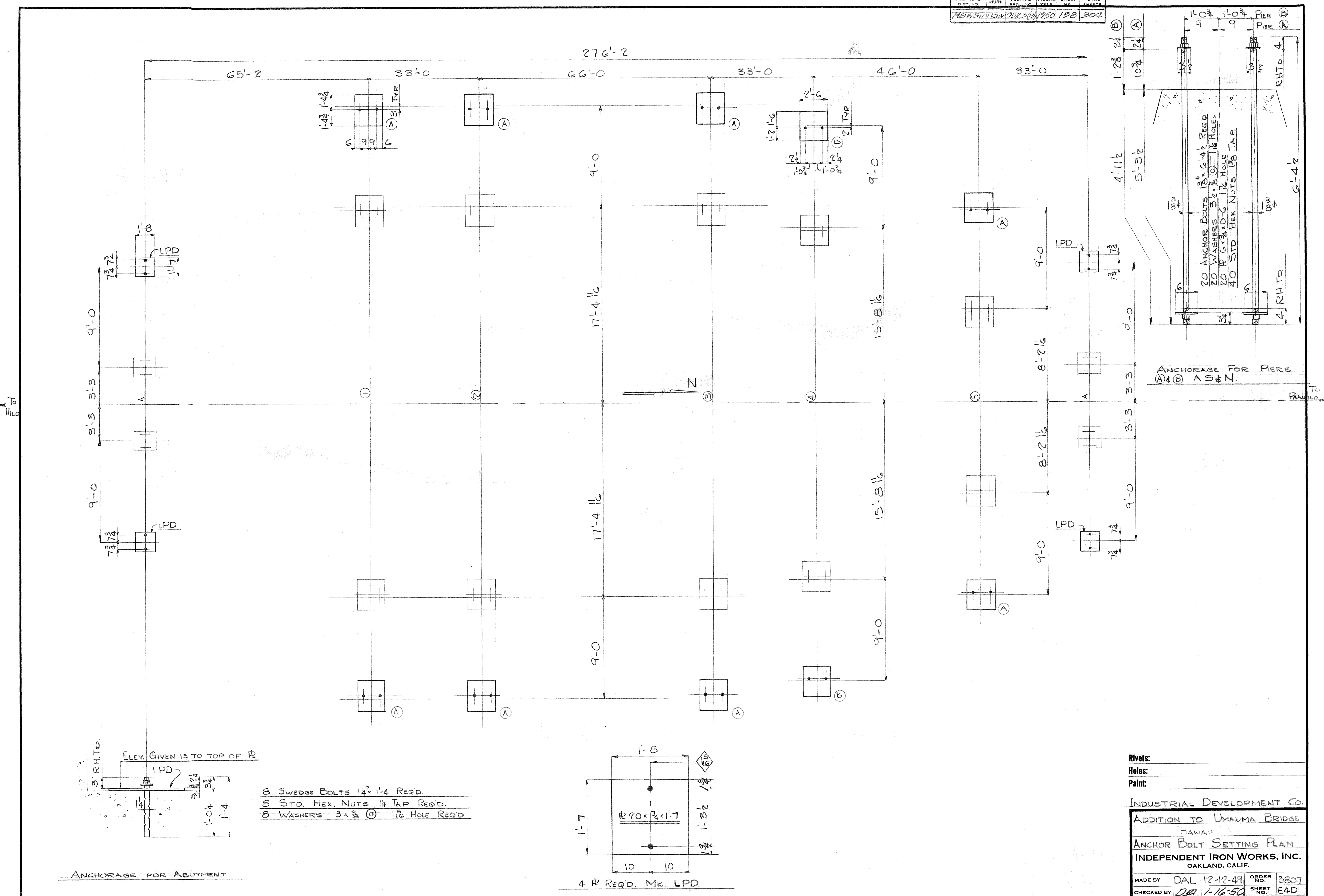
INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.

MADE BY	DD	12-2-49	ORDER NO.	3807
CHECKED BY	V	1-13-50	SHEET NO.	E2-D

5468.156

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HI	20R 2(12)	1950	158	301

Order No. 3807 Sheet No. E4D



Rivets:
Holes:
Paint:

INDUSTRIAL DEVELOPMENT CO.

ADDITION TO UMAUMA BRIDGE

HAWAII

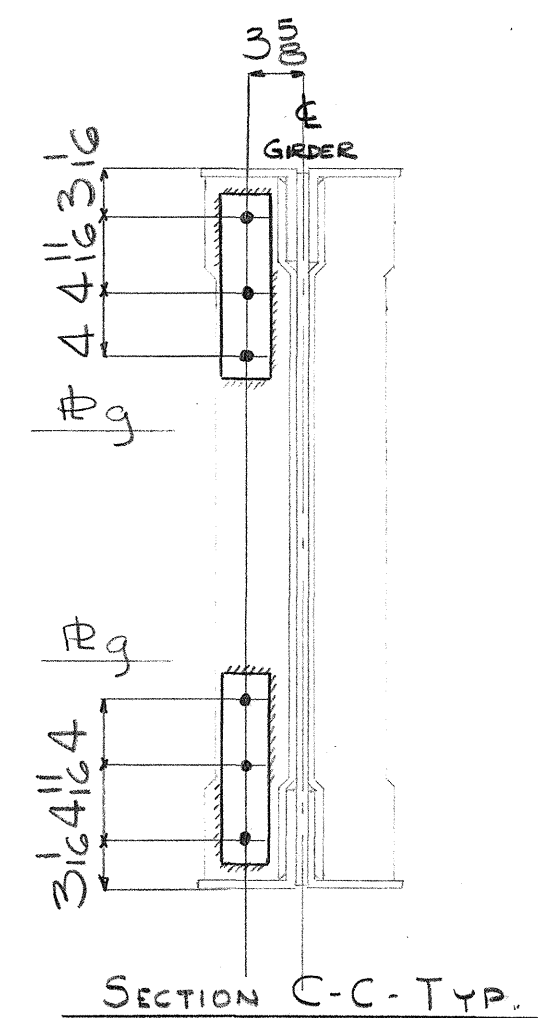
ANCHOR BOLT SETTING PLAN

INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.

MADE BY DAL 12-12-49 NO. 3807
CHECKED BY 1-16-50 SHEET NO. E4D

158 3468.158 25 161

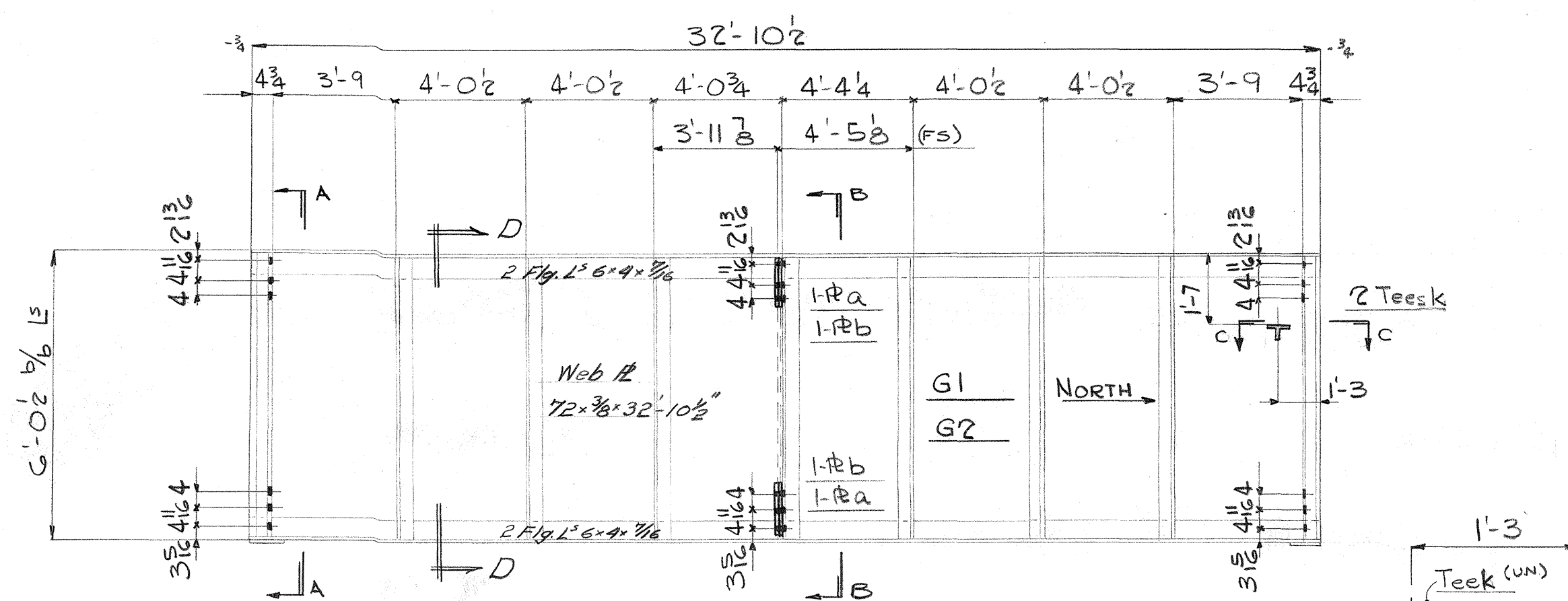
No.	Description	Length		Mark	REMARKS
		Fl.	Ins.		
2	EXISTING GIRDERS			G104G8	
	REVAMP AS ON DET'L.				
2	EXISTING GIRDERS			G94G7	
	REVAMP AS ON DET'L.				
2	SALVAGE GIRDERS			G134G6	} TO BE TAKEN FROM THE KOLEKOLE BRIDGE
	REVAMP AS ON DET'L.				
2	SALVAGE GIRDERS			G144G8	
	REVAMP AS ON DET'L.				
6	S.T. 6w f???	0	6	a	Plain - New
4	10' 4 x $\frac{3}{8}$	0	10 4	b	Temp
4	6 x $\frac{3}{8}$	0	10	c	} }
2	6 x $\frac{3}{8}$	0	9 $\frac{3}{8}$	d	
2	6 x $\frac{3}{8}$	0	10	f	
16	6 x $\frac{3}{8}$	0	11 $\frac{3}{8}$	g	
4	5 x $\frac{3}{8}$	0	7	h	
2	L 4 x 4 x $\frac{3}{8}$	8	6 4	ST 3D	SALVAGE SEE SHD. 07D



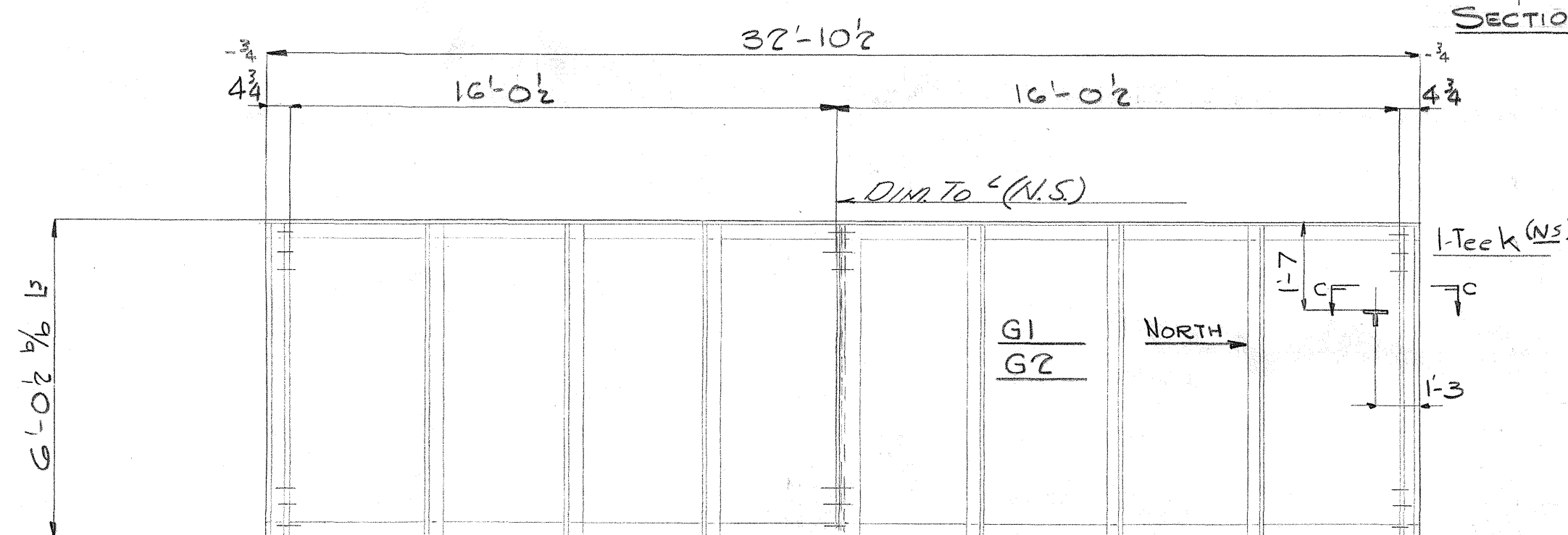
Rivets:	74
Holes:	154
Paint:	
INDUSTRIAL DEV. CO.	
ADDITION TO THE UMAUMA BRIDGE — HAWAII	
INDEPENDENT IRON WORKS, INC. OAKLAND, CALIF.	
MADE BY	DAL 11-15-49
CHECKED BY	00 1-5-50
ORDER NO.	3307
SHEET NO.	DID

BILL OF MATERIAL INDUS. DEV. CO.

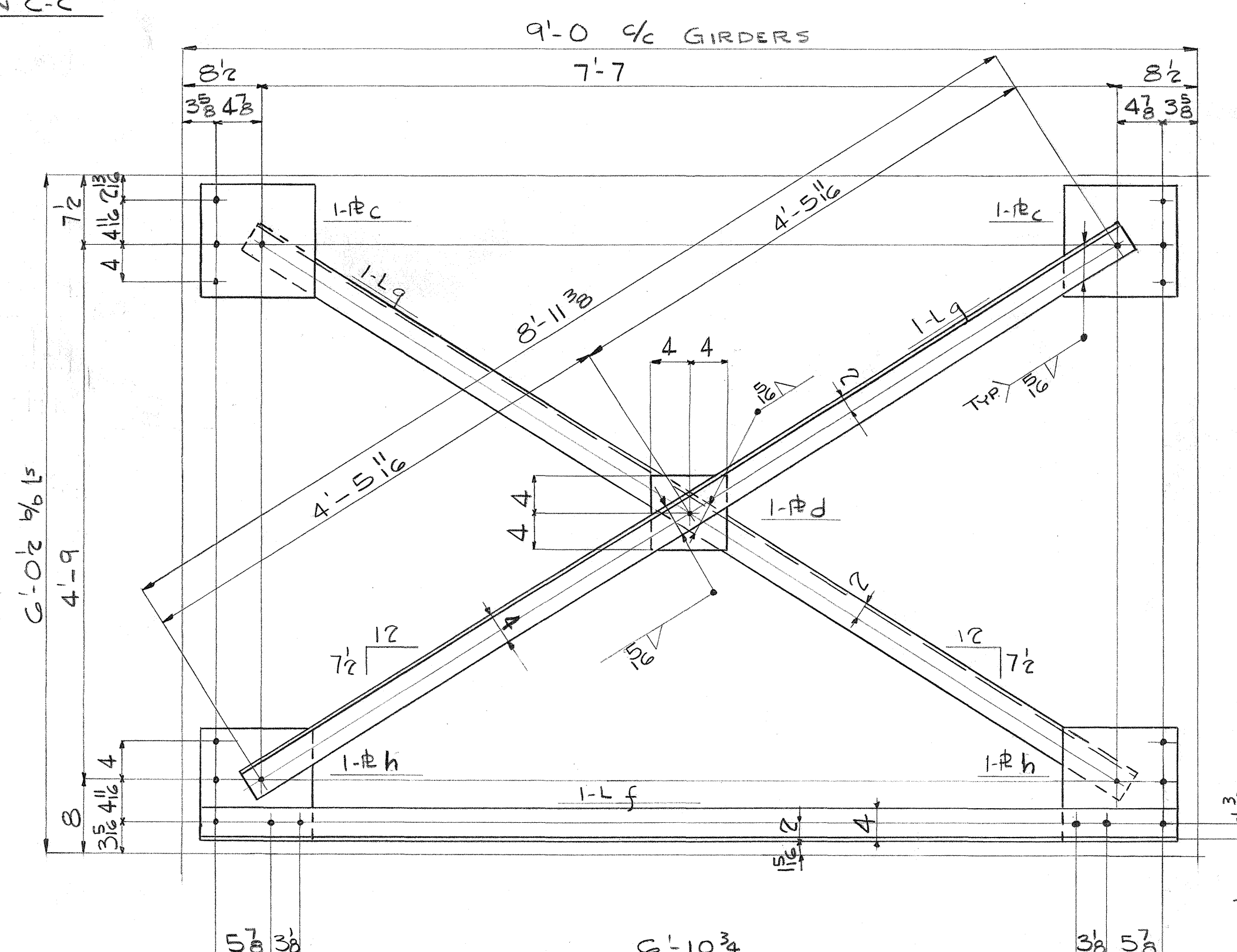
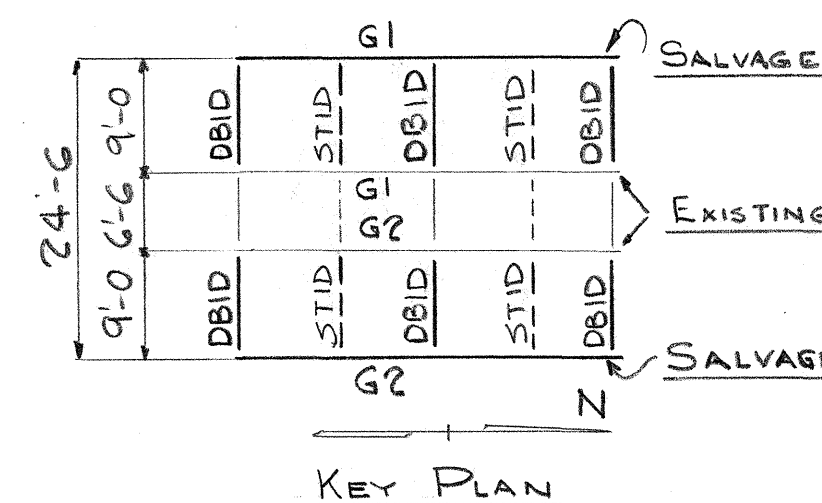
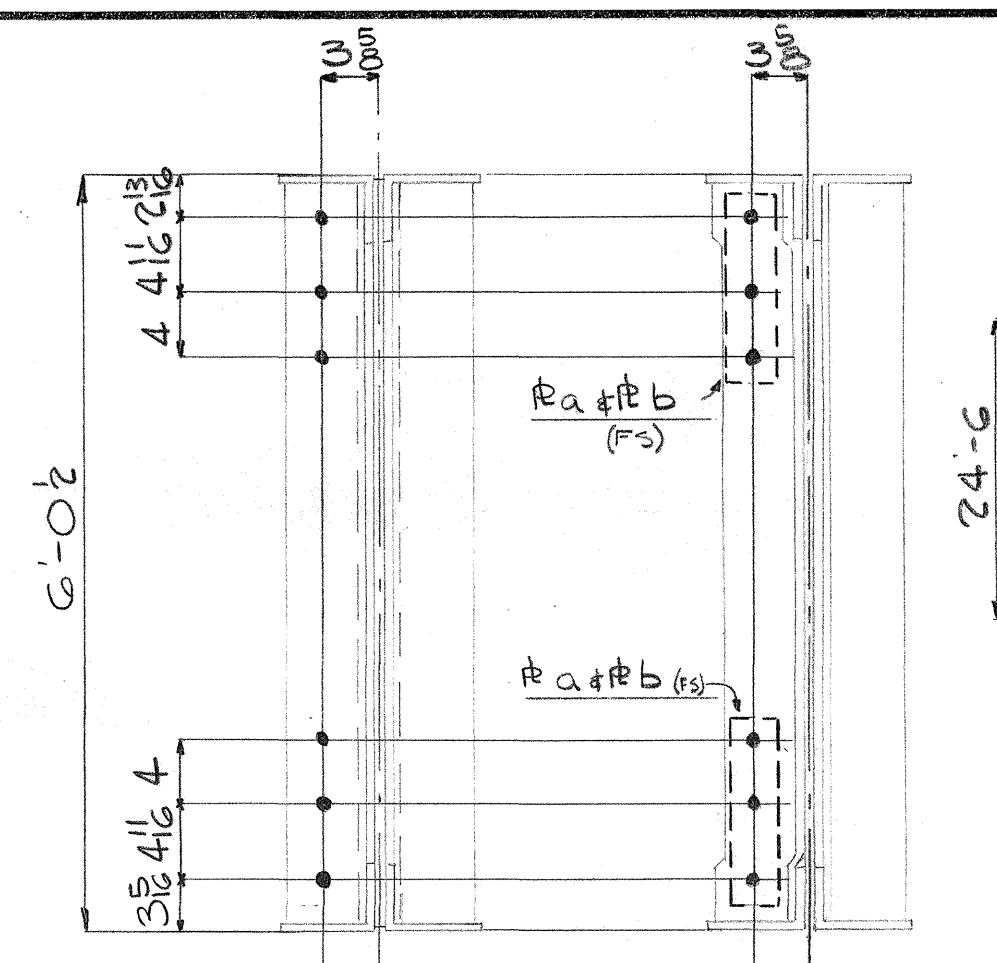
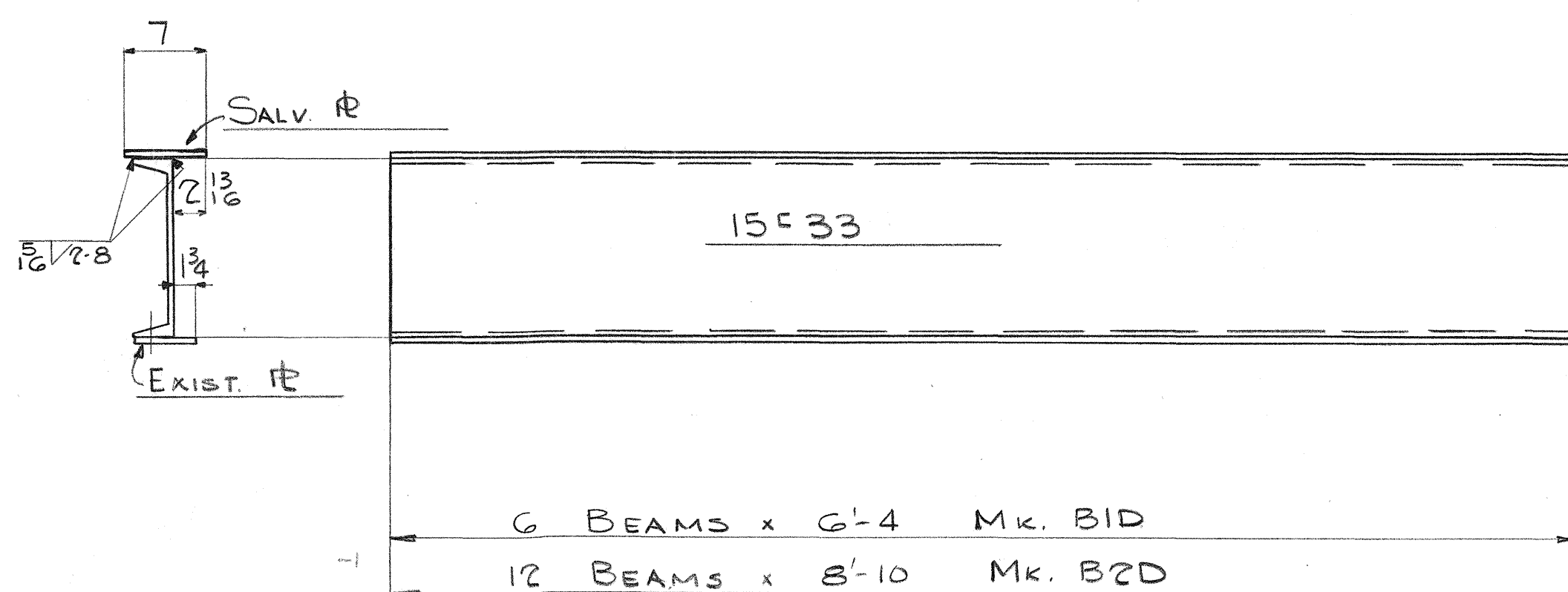
No.	Description	Length Ft.	Ins.	Mark	REMARKS
4	EXISTING GIRDERS G1&G2				REVAMP AS ON DETL.
4	SALVAGE GIRDERS G1&G2				FROM THE REVAMP AS ON DETL. KOLEKOLE BRIDGE
8	# 3 x 2	0	11 3/4	a	Temp New
8	# 3 x 3	0	11 3/4	b	
24	# 12 x 3	1	0	c	
12	# 8 x 3	0	8	d	
24	# 12 x 3	1	0	h	
12	STG w/ 22.5	0	6	k	Plain
6	BEAMS	6	4	BID	
12	BEAMS	8	10	B2D	
	SALVAGE FROM COLUMN SECTIONS				(SEE SHEET D7D)
12	DIAG. BRACE			DBID	FROM LOWER BRACING SEE SHEET D7D
22	L 4 x 3 x 3/8	8	10	STID	(PLAIN - NOT DET'D)
12	L 4 x 3 x 5/16	8	7 3/4	f	
24	L 4 x 3 x 3/8	9	2 3/8	g	



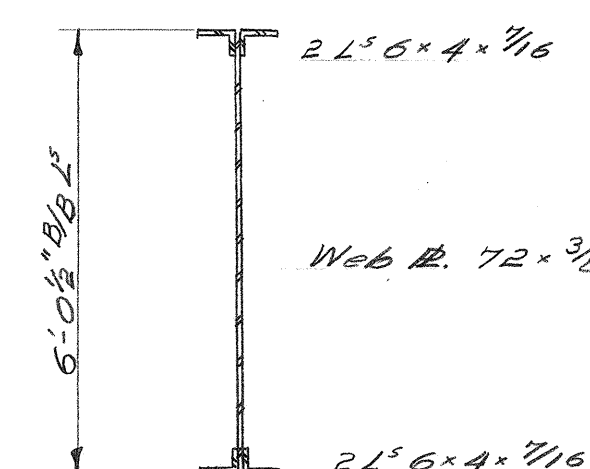
REVAMP 2 EXISTING GIRDERS AS&N Mk G2
REVAMP 2 EXISTING GIRDERS OH&N Mk G1



REVAMP 2 SALVAGE GIRDERS AS&N Mk G1 FROM THE KOLEKOLE BRIDGE
REVAMP 2 SALVAGE GIRDERS OH&N Mk G2



MAKE 12 DIAGONAL BRACES - Mk. DBID



SECTION D-D

Rivets: 3/8"
Holes: 1 5/8"
Paint:

INDUSTRIAL DEV. CO.

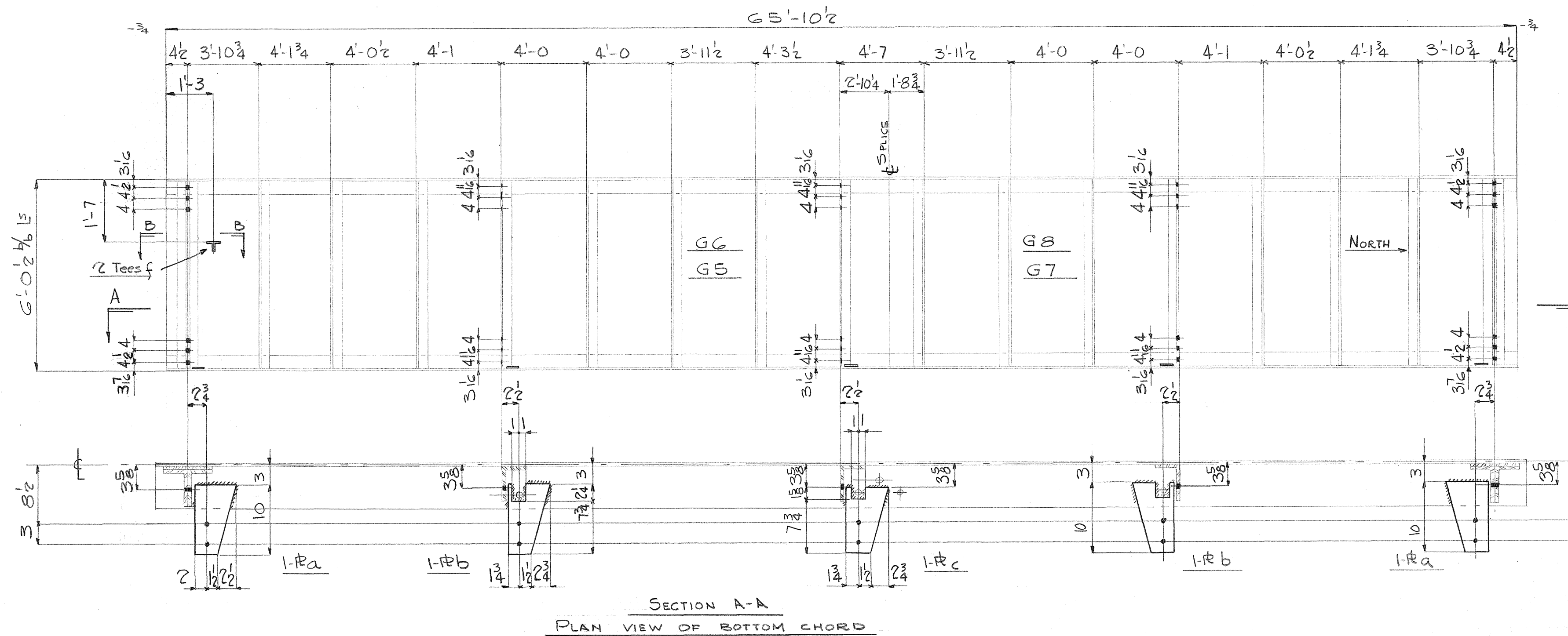
ADDITION TO THE UMAUMA
BRIDGE - HAWAII

INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.

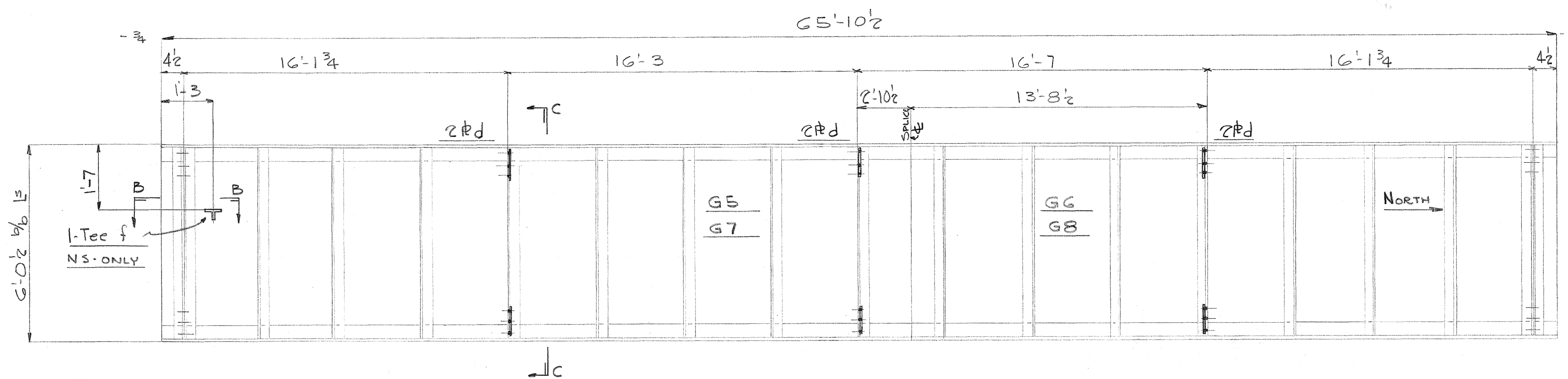
MADE BY	DAL	11-16-49	ORDER NO.	3807
CHECKED BY	DM	1-5-50	SHEET NO.	D20

BILL OF MATERIAL INDUS. DEV. CO.

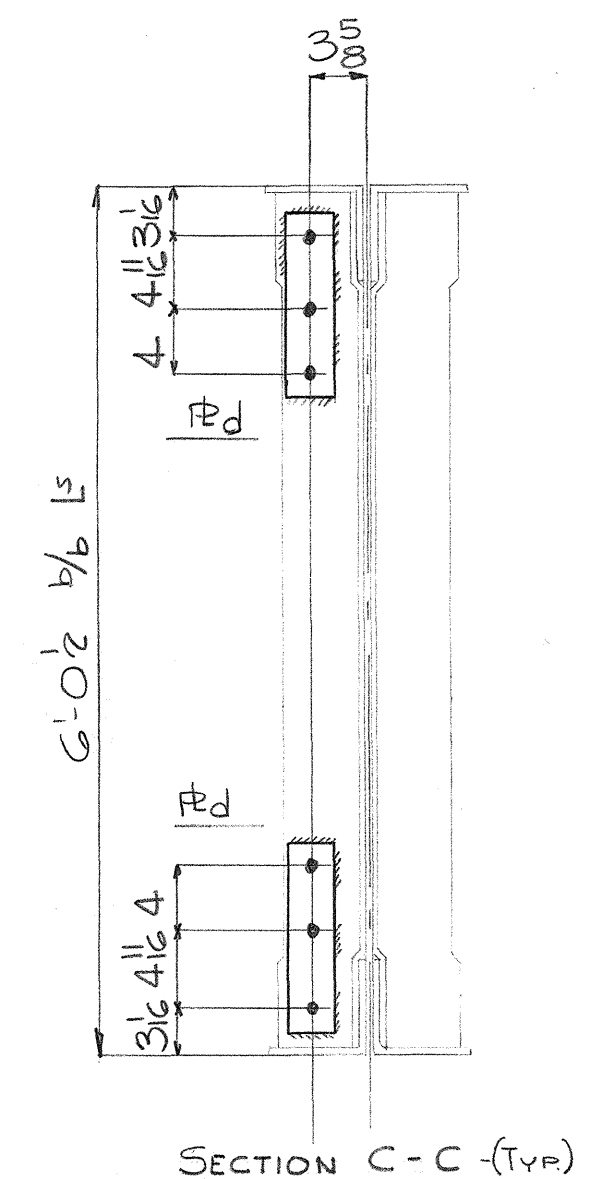
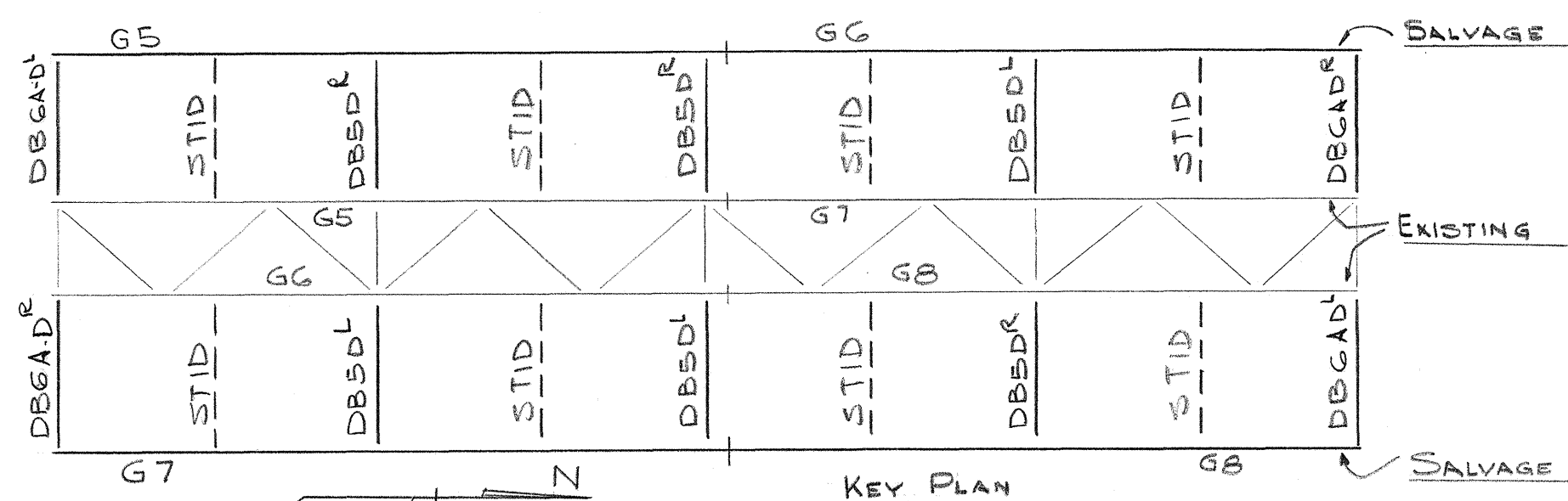
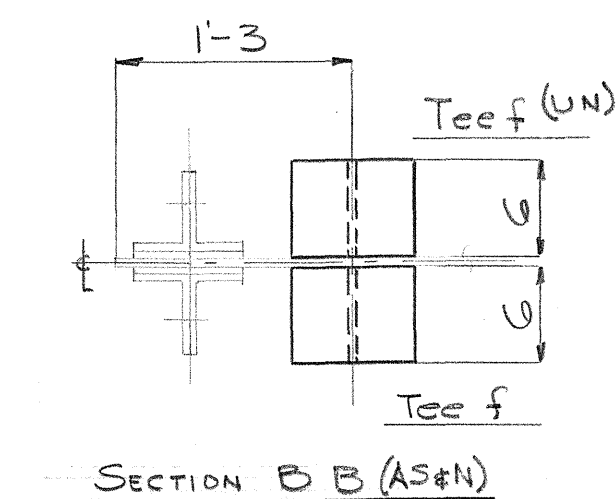
No.	Description	Length Ft.	Ins.	Mark	REMARKS
2	EXISTING GIRDERS			GG#G8	
	REVAMP AS ON DET'L.				
2	EXISTING GIRDERS			G5#G7	
	REVAMP AS ON DET'L.				
2	SALVAGE GIRDERS			G5#G6	TO BE TAKEN FROM THE KOLEKOLE BRIDGE
	REVAMP AS ON DET'L.				
2	SALVAGE GIRDERS			G7#G8	TO BE TAKEN FROM THE KOLEKOLE BRIDGE
	REVAMP AS ON DET'L.				
4	6x8	0	10	a	Temp New
4	6x8	0	10	b	
2	6x8	0	9	c	
12	3x4	0	11	d	
6	STG 22.5	0	6	f	Plain



REVAMP 2 EXISTING GIRDERS AS & N Mk. GG & G8 } ONE EACH
REVAMP 2 EXISTING GIRDERS OH & N Mk. G5 & G7 } ONE EACH



REVAMP 2 SALVAGE GIRDERS AS & N Mk. G5 & G6 } FROM KOLEKOLE BRIDGE
REVAMP 2 SALVAGE GIRDERS OH & N Mk. G7 & G8 } ONE EACH

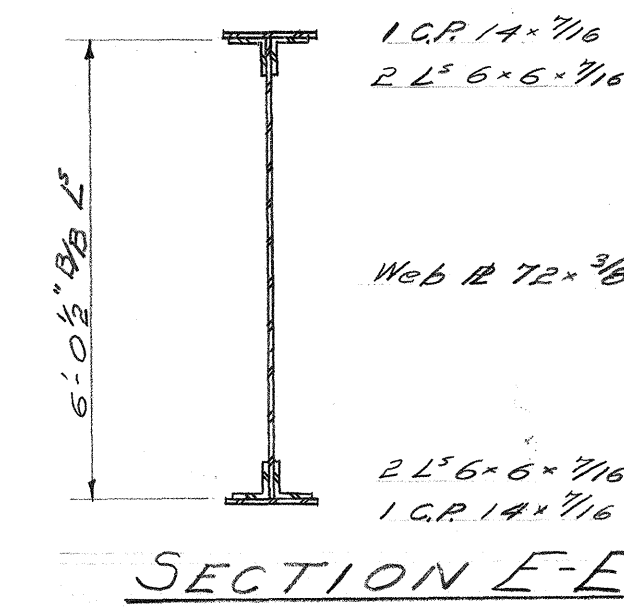
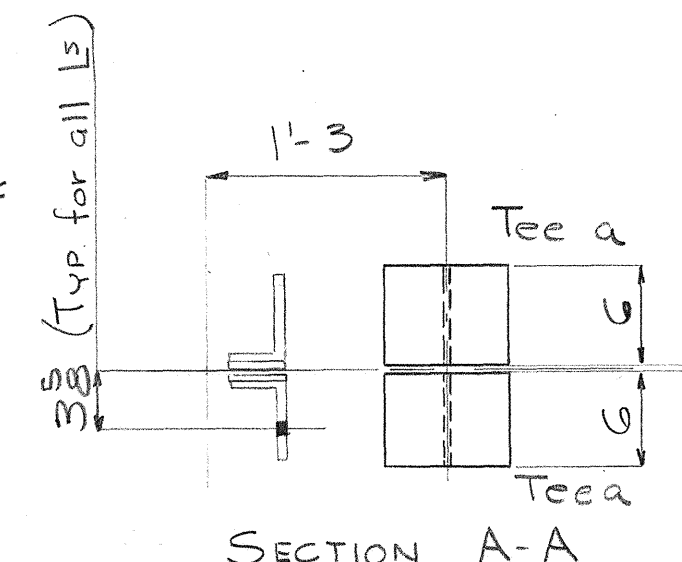
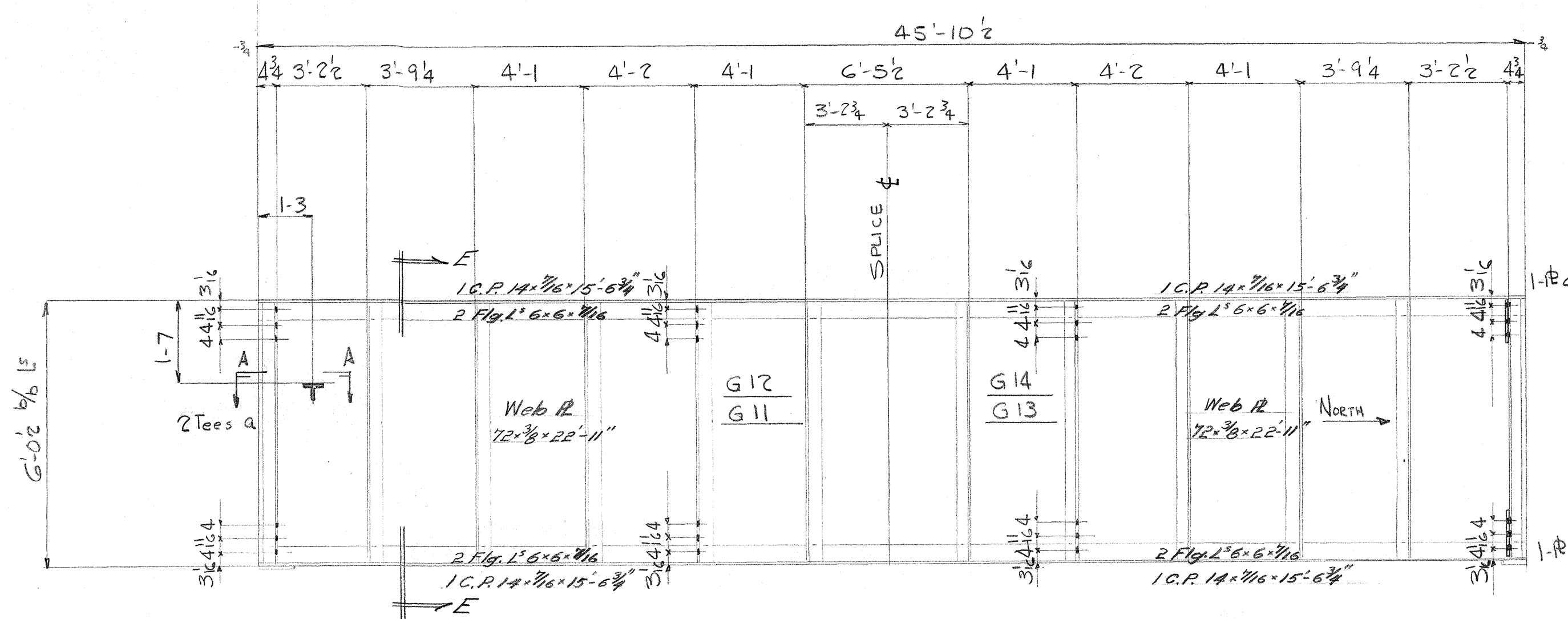


Rivets: 3/4
Holes: 1 1/8
Paint:

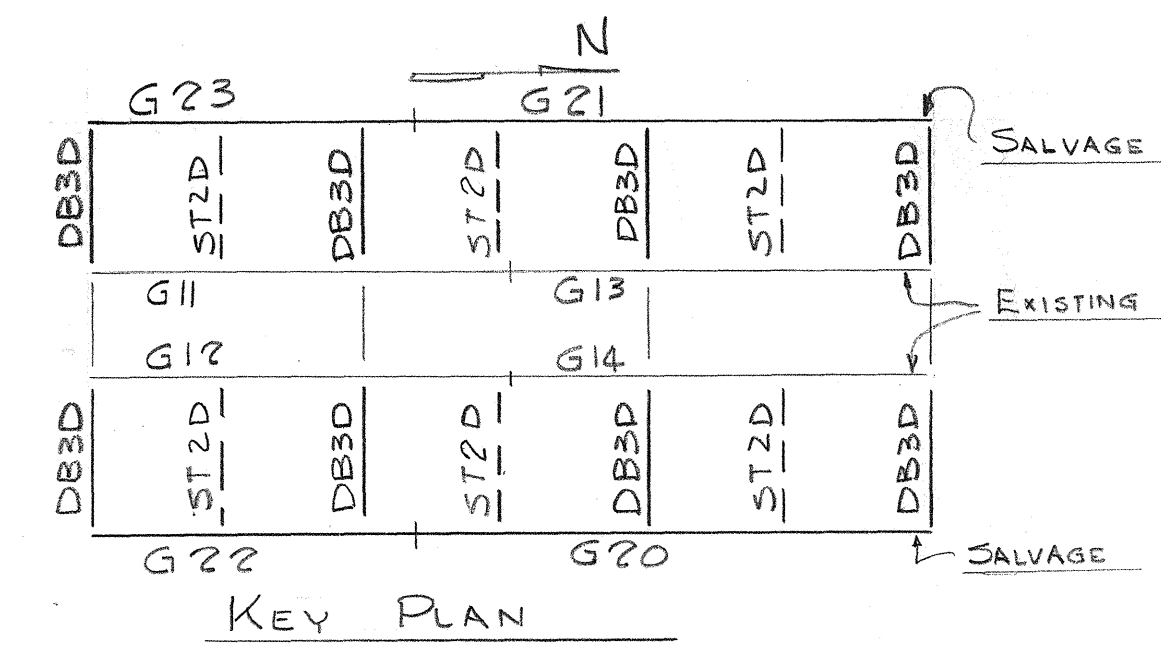
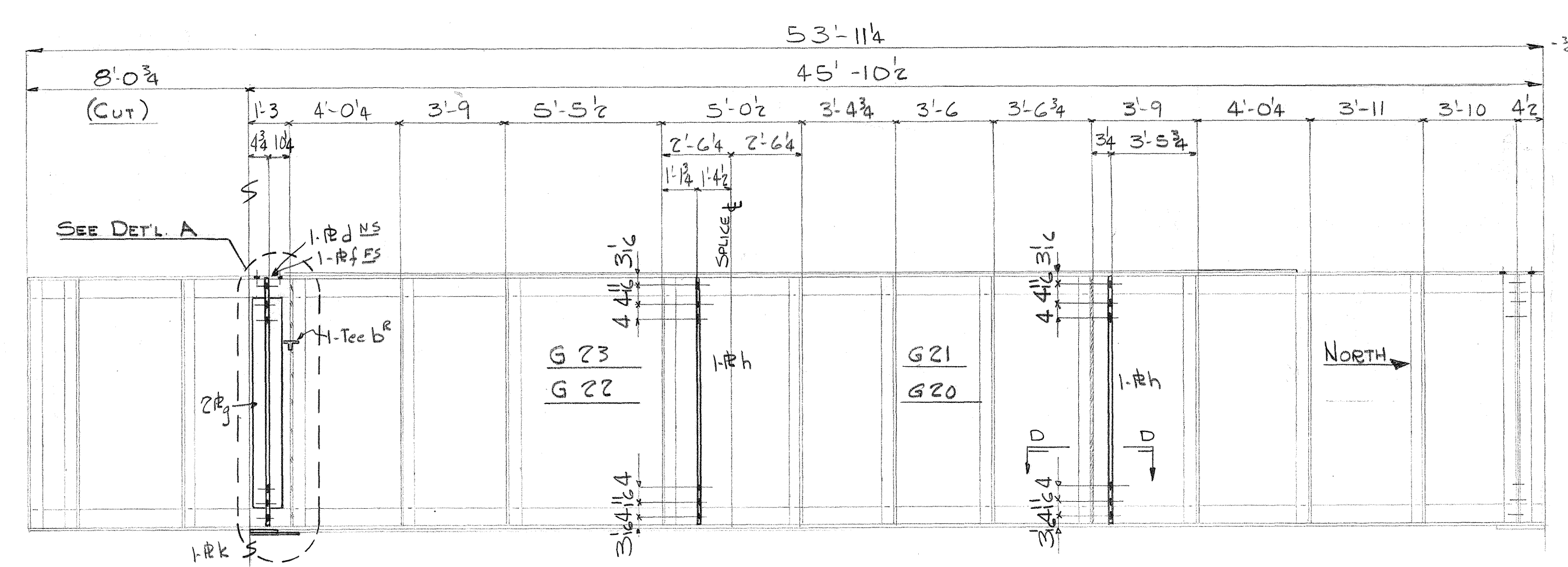
INDUSTRIAL DEVELOPMENT CO.
ADDITION TO UMAUMA BRIDGE
HAWAII
INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.
MADE BY DAL 11-17-49 ORDER NO. 3807
CHECKED BY DM 1-5-50 SHEET NO. D3D

BILL OF MATERIAL

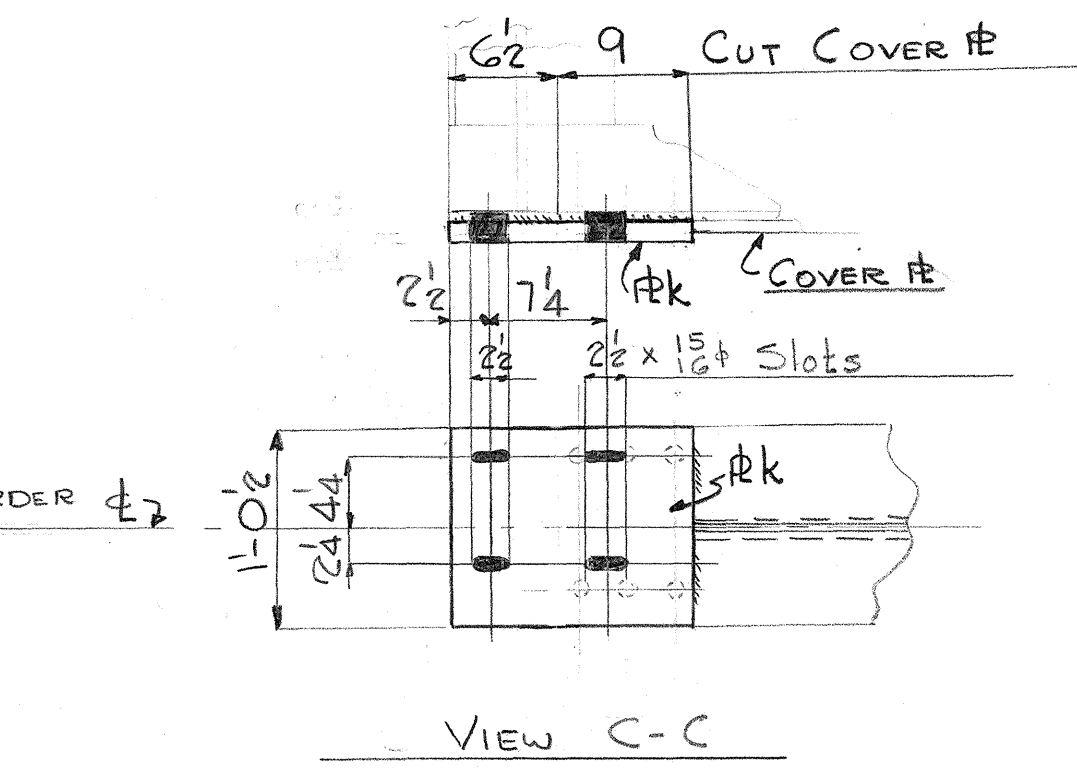
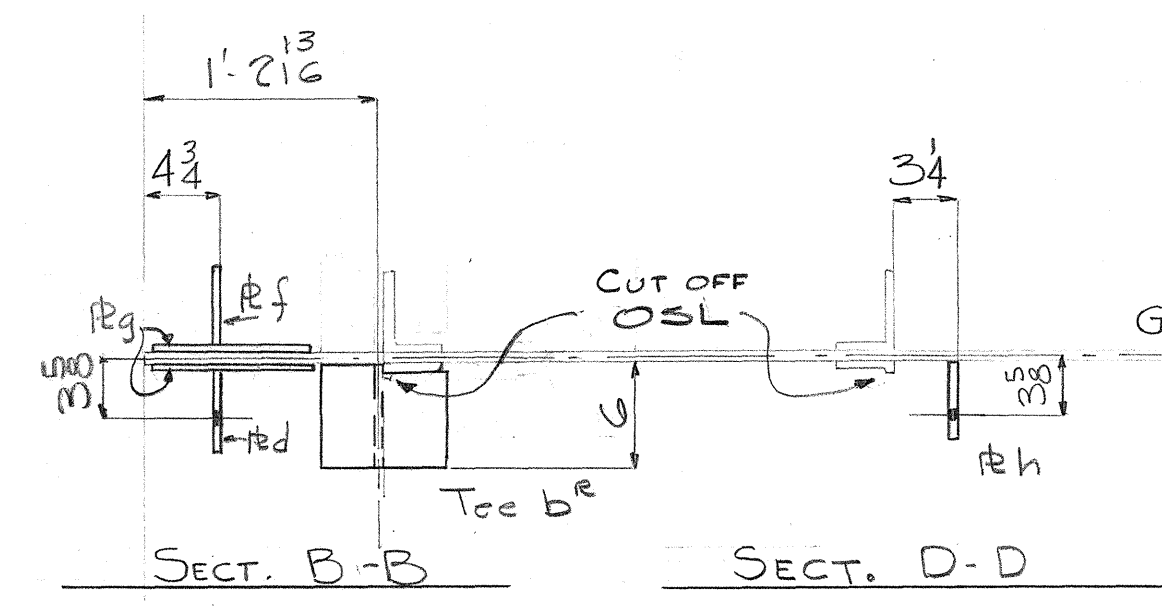
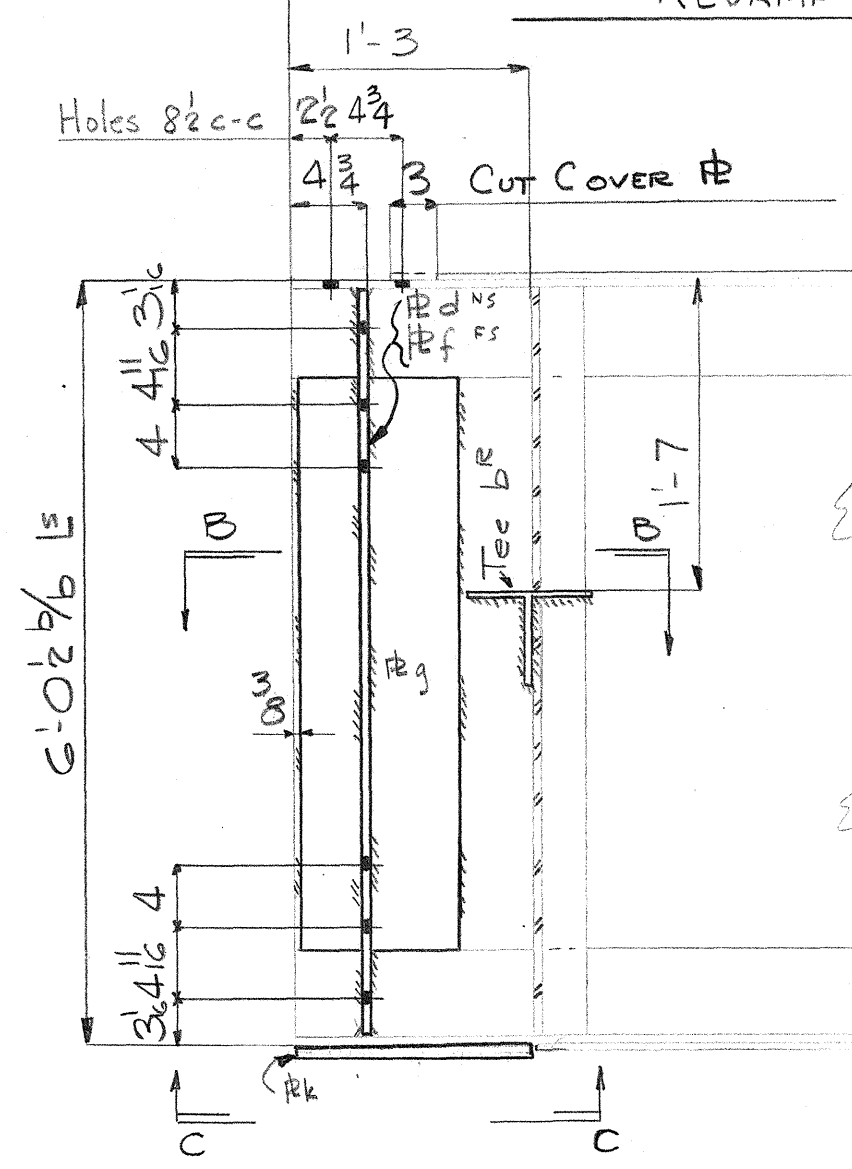
No.	Description	Length Ft. In.	Mark	REMARKS
2	EXISTING GIRDERS G12 & G14			
	REVAMP AS ON DET'L.			
2	EXISTING GIRDERS G11 & G13			
	REVAMP AS ON DET'L.			
2	SALVAGE GIRDERS G23 & G21			FROM THE KOLE KOLE BRIDGE
	REVAMP AS ON DET'L.			
2	SALVAGE GIRDERS G20 & G22			
	REVAMP AS ON DET'L.			
4	Tee 6w22 ^s	0 6	a	Plain New
2	Tee 6w22 ^s	0 6	b ^r	Temp Do
4	R 3 x 1/2	0 11 3/4	c	Do
2	R 4 1/2 x 3/4	5 11 1/8	d	
2	R 4 3/8 x 3/4	5 11 1/8	f	Plain
4	R 10 x 1/6	5 0 4	g	Plain
4	R 5 x 3/8	5 11 1/8	h	
2	R 12 1/2 x 3/4	1 3	k	Temp



REVAMP 2 EXISTING GIRDERS AS & N MK G12 & G14 } ONE EACH
 REVAMP 2 EXISTING GIRDERS OH & N MK G11 & G13 } ONE EACH



REVAMP 2 SALVAGE GIRDERS AS & N MK G23 & G21 } FROM THE KOLE KOLE BRIDGE - ONE EACH
 REVAMP 2 SALVAGE GIRDERS OH & N MK G22 & G20 } FROM THE KOLE KOLE BRIDGE - ONE EACH



NOTE:
 PLUG WELD ALL EXISTING HOLES BEFORE COVERING
 WITH FILL R² OR SOLE R²s.

Rivets: 3 φ
 Holes: 1/2 φ U.N.
 Paint:

INDUSTRIAL DEVELOPMENT CO.
 ADDITION TO UMAUMA BRIDGE
 HAWAII
 INDEPENDENT IRON WORKS, INC.
 OAKLAND, CALIF.
 MADE BY DAL 11-18-49 ORDER NO. 3807
 CHECKED BY DP 1-6-50 SHEET NO. D4D

BILL OF MATERIAL INDUSTRIAL DEVELOPMENT

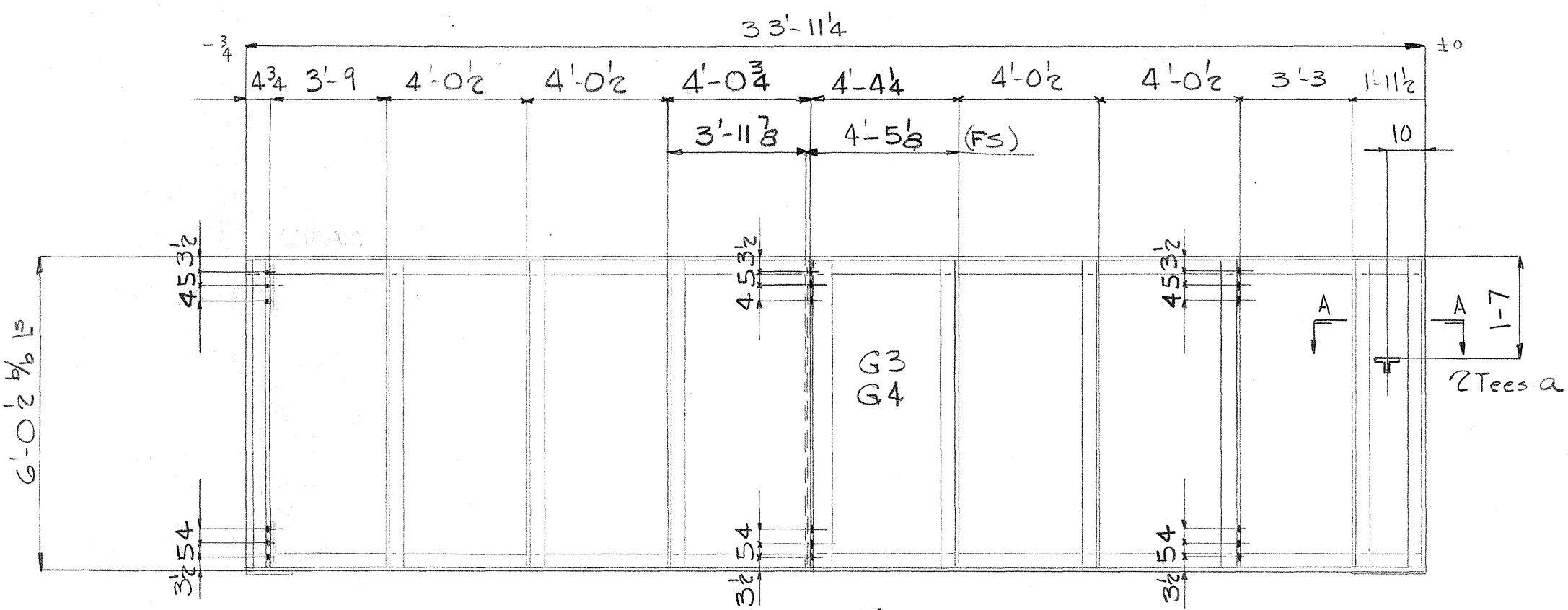
No.	Description	Length Ft.	Ins.	Mark	REMARKS
2	EXISTING GIRDERS			G3 & G4	
	REVAMP AS ON DET'L.				
2	SALVAGE GIRDERS			A3 & B3	SALV. FROM KAULA BRIDGE
	REVAMP AS ON DET'L.				
6	Tee Gus 225	0	6	a	Plain New
2	R 4 3/4 x 3/4	5	11	b	Plain
2	R 4 3/4 x 3/4	5	11	c	Plain
4	R 10 x 5/8	5	2 3/8	d	Plain
4	R 5 x 3/8	6	5 3/8	f	
2	L 6 x 6 x 3/8	3	2	g	
2	L 6 x 6 x 3/8	3	2	h	
4	R 5 x 3/8	6	5 3/8	k	
2	R 20 x 3/4	2	0	m	Temp
2	R 12 x 3/4	1	3	p	Temp
10	R 5 x 3/8	0	7	s	
12	R 12 x 3/8	1	0	t	Temp
6	R 8 x 3/8	0	8	v	Temp
2	R 11 x 3/8	6	6 1/2	ab	Plain
12	R 12 x 3/8	1	0	ac	Temp
6	DIAG. BRACE			DB2D	
10	L 4 x 3 x 5/16	8	8	ST2D	
6	L 4 x 3 x 5/16	8	7 3/4	w	
12	L 4 x 3 x 5/16	9	0 1/2	aa	

SALVAGE FROM KAULA BRIDGE
TOWER BRACING
SEE SHEET D7

Note:
Section thru G3 & G4 same as Sec. D-D, shd. D2-D

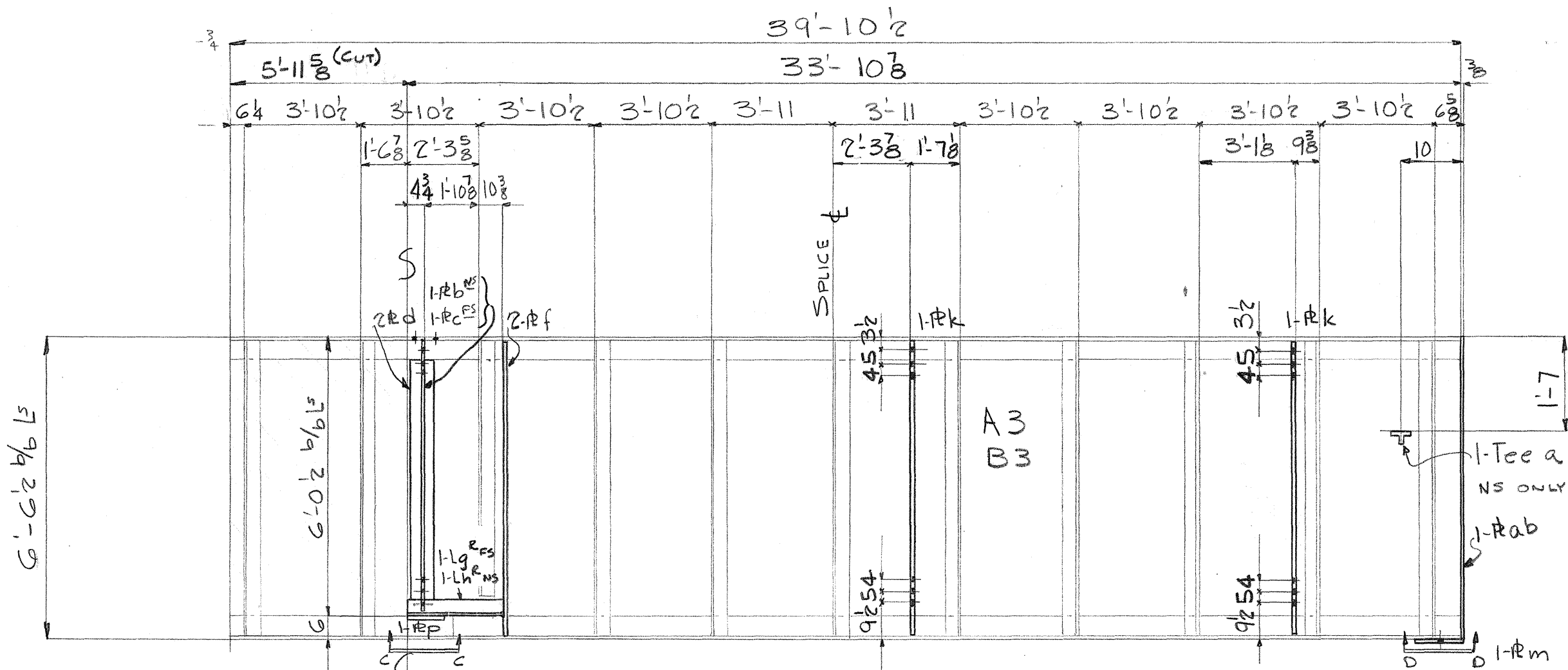
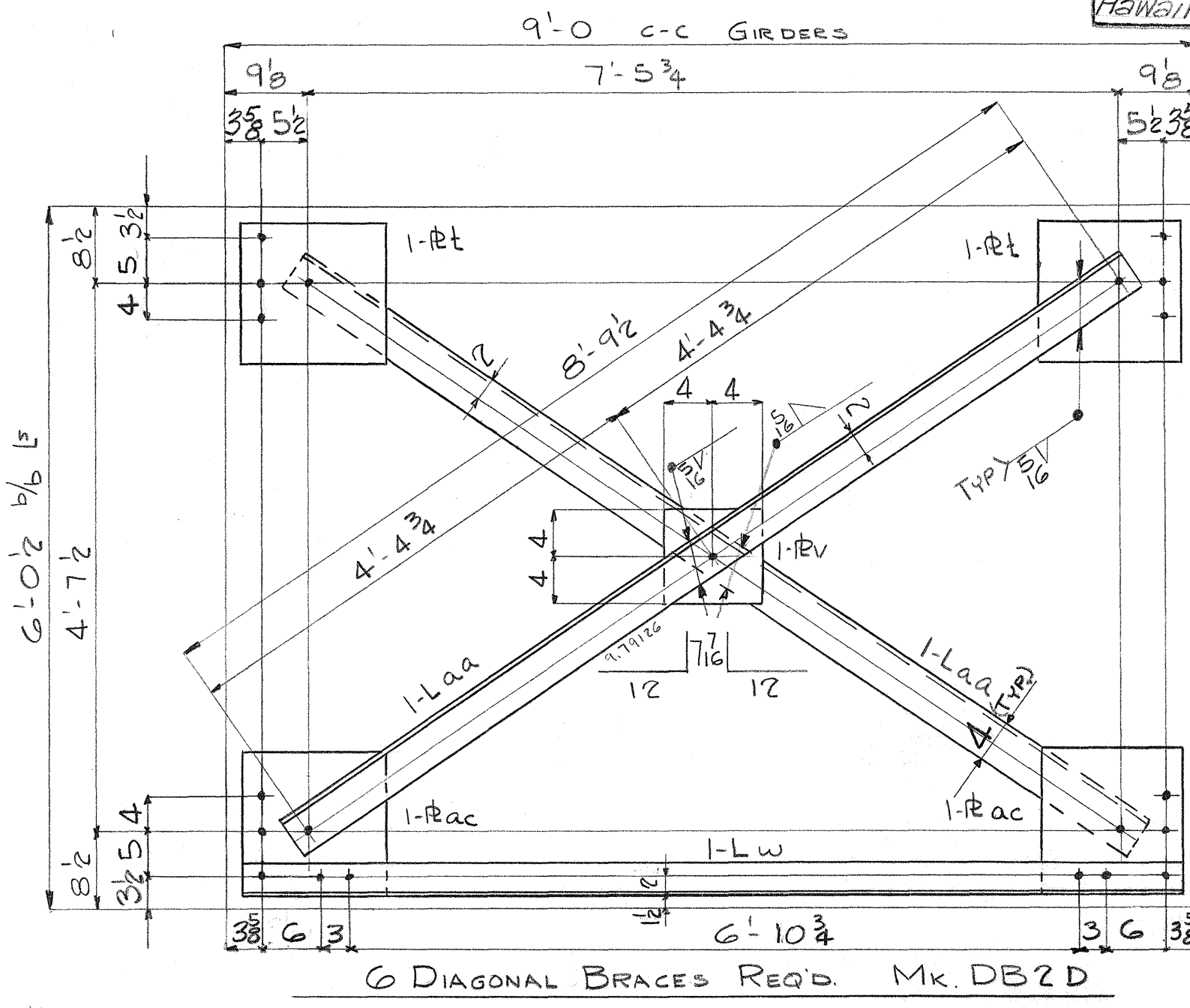
Rivets: 3/8
Holes: 1 1/8 UN
Paint:

INDUSTRIAL DEVELOPMENT CO.
ADDITION TO UMAUMA BRIDGE
HAWAII
INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.
MADE BY DAL 11-21-49 ORDER NO. 3807
CHECKED BY DD 1-6-50 SHEET NO. D5D



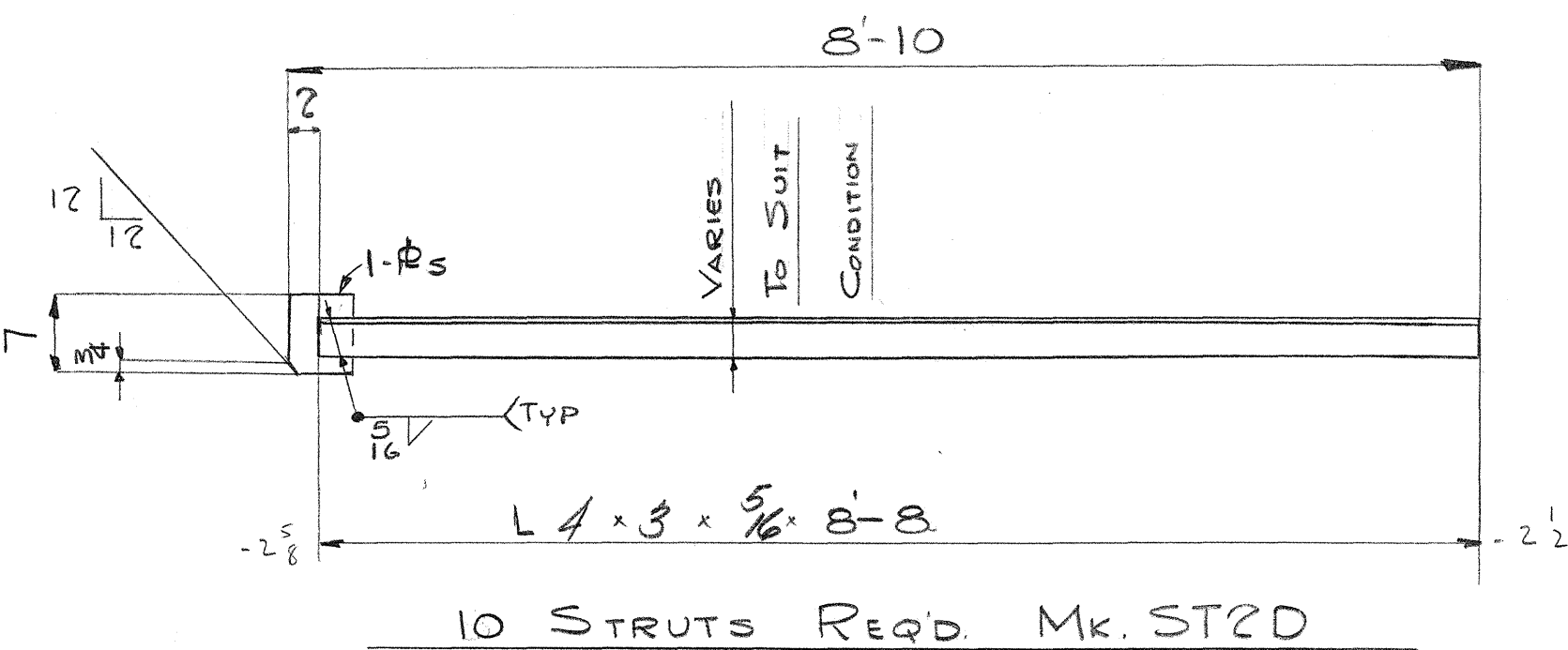
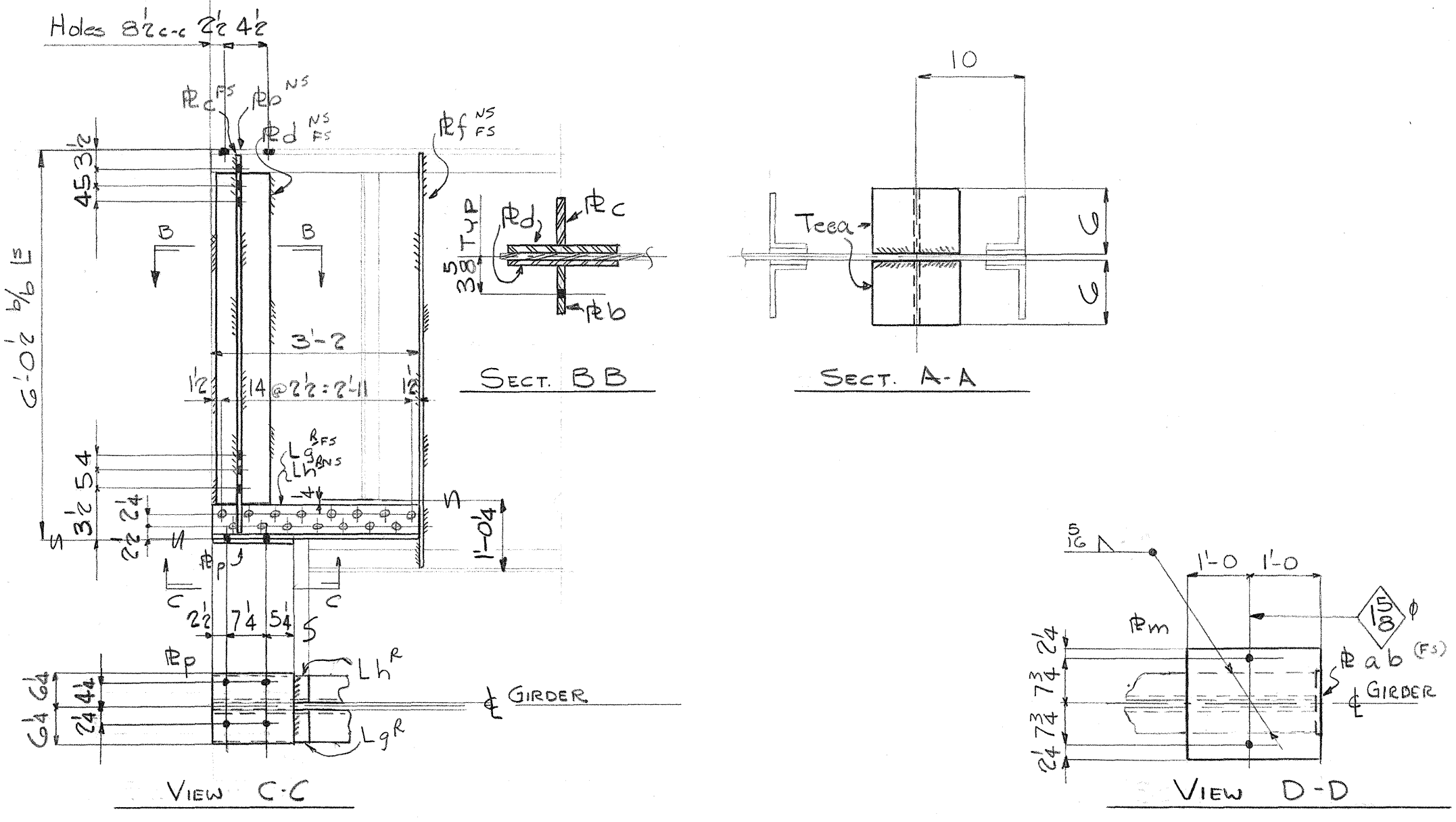
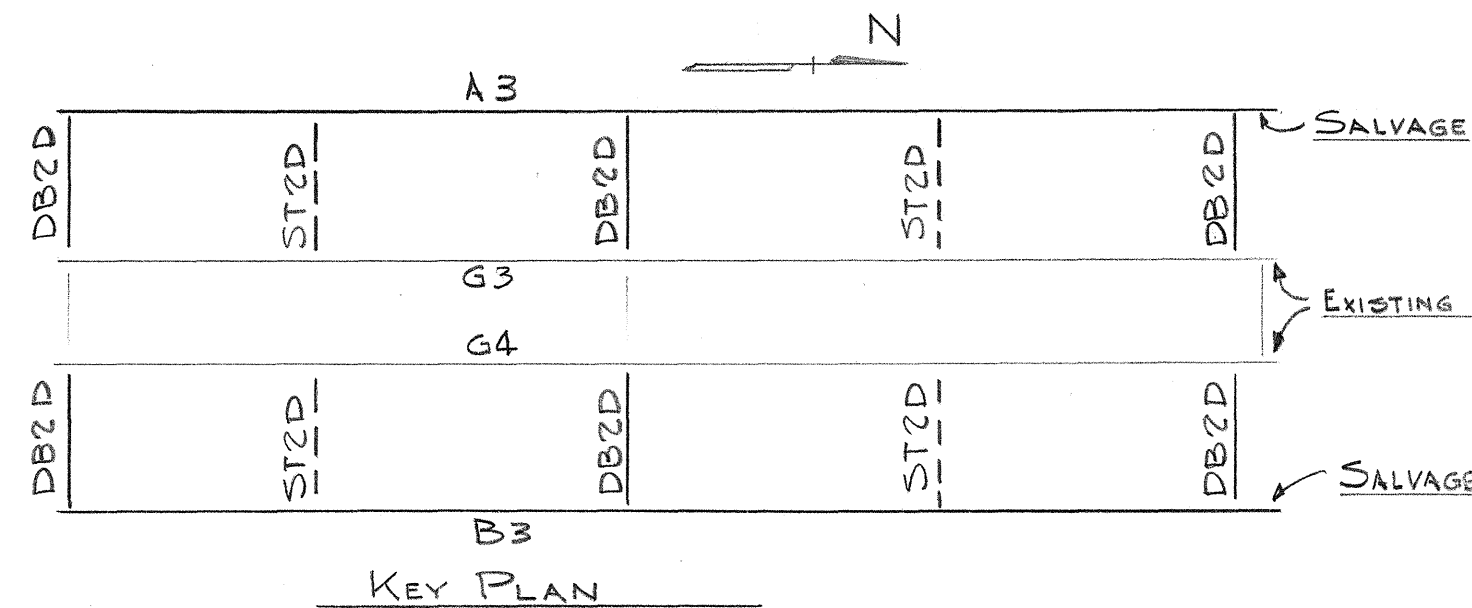
ALL NEW HOLES ARE 3/8" OFF & A.S.

REVAMP ONE EXISTING GIRDER AS & N Mk. G4
REVAMP ONE EXISTING GIRDER OH & N Mk. G3



REVAMP ONE SALVAGE GIRDER AS & N Mk. A3
REVAMP ONE SALVAGE GIRDER OH & N Mk. B3

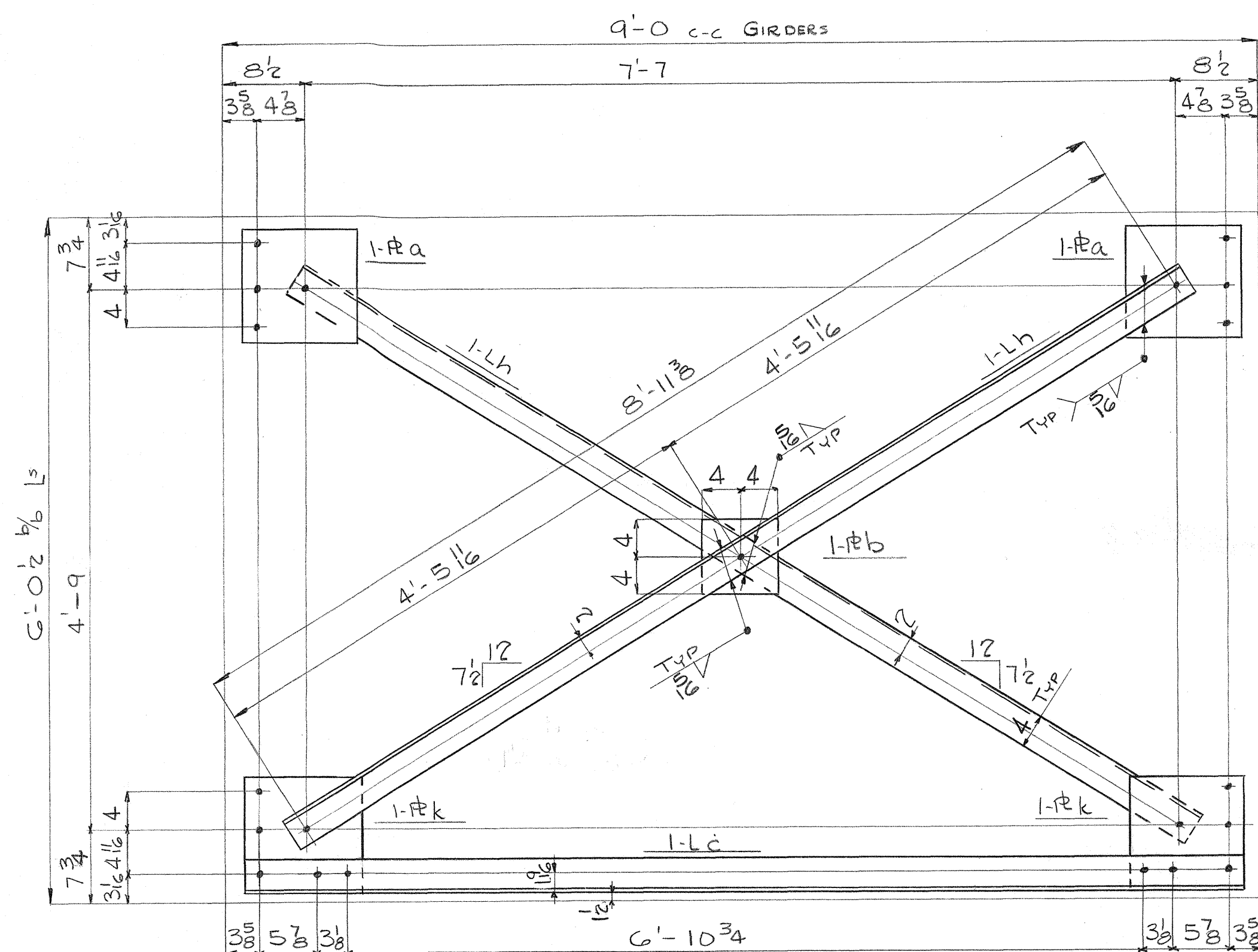
FROM KAULA BRIDGE



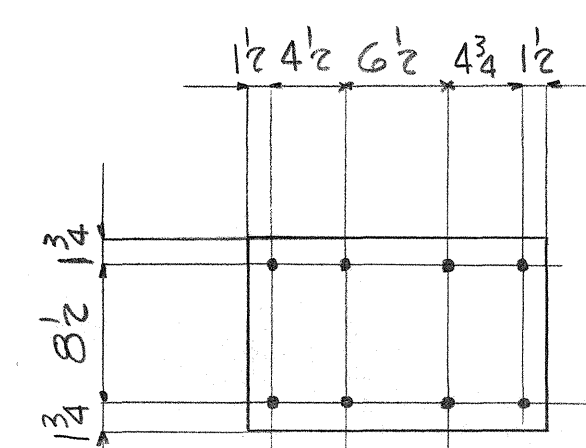
5468.163

BILL OF MATERIAL INDUSTRIAL DEV. CO.

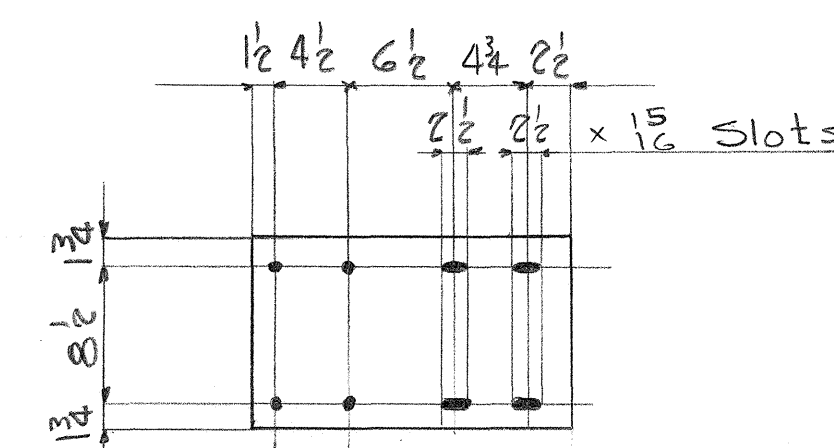
No.	Description	Length Ft. In.	Mark	REMARKS
8	DIAG. BRACES		DB3D	
2	D _o D _o		DB4D	
12	D _o D _o		DB5D ^L	
2	D _o D _o		DB6D	
4	D _o D _o		DB6AD ^L	
4	#11 3/4 x 3/8	1 0	s	Temp New
4	#11 3/4 x 3/8	1 0	t	Temp New
6	#12 x 3/8	1 6 3/4	CP1	Temp New
4	#12 x 3/8	1 7 3/4	CP2	Temp New
52	#11 3/4 x 3/8	1 0	a	Temp New
28	#8 x 3/8	0 8	b	Temp New
16	#11 3/4 x 3/8	1 0	k	Temp New
36	#11 3/4 x 3/8	1 0	p	Temp New
8	L4 x 3 x 5/16	8 7 3/4	c	SALVAGE FROM TOWER BRACING SEE SHEET D7
2	L4 x 3 x 5/16	8 7 3/4	d	
12	L4 x 3 x 5/16	8 7 3/4	f ^R	
2	L4 x 3 x 5/16	8 7 3/4	g	
56	L4 x 3 x 5/16	9 2 3/8	j	
4	L4 x 3 x 5/16	8 7 3/4	m ^R	



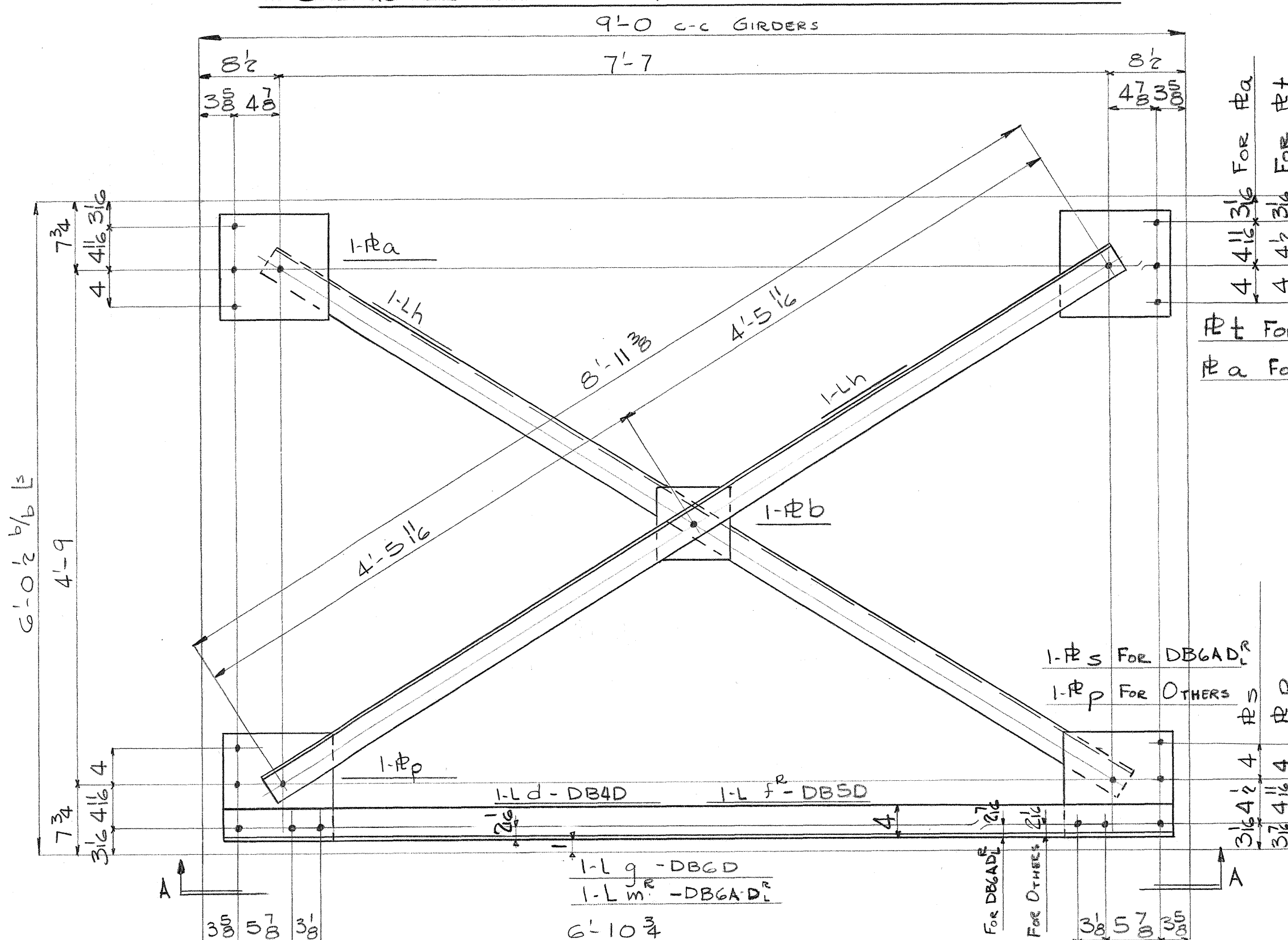
8 DIAGONAL BRACES REQ'D. MK. DB3D



6 #5 REQ'D. MK. CP1

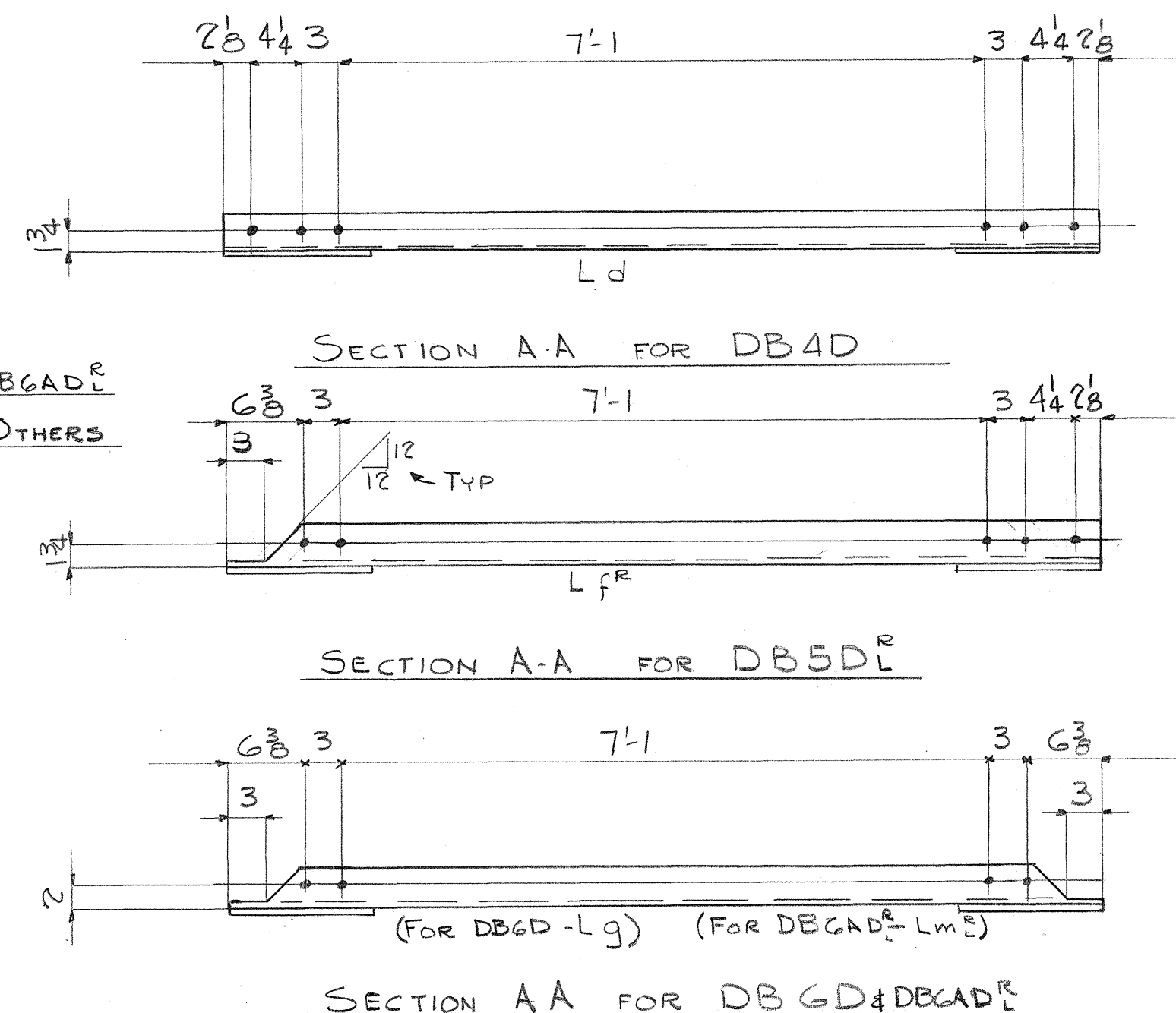


4 #5 REQ'D. MK. CP2



2 DIAGONAL BRACES REQ'D. AS#N MK. DB4D

6	D _o	D _o	D _o	AS#N	Mk. DB5D ^L
6	D _o	D _o	D _o	OH#N	Mk. DB5D ^L
2	D _o	D _o	D _o	AS#N	Mk. DB6D
2	D _o	D _o	D _o	AS#N	Mk. DB6AD ^L
2	D _o	D _o	D _o	OH#N	Mk. DB6AD ^L



Rivets: 3/8"
Holes: 1 1/8" U.N.
Paint:

INDUSTRIAL DEVELOPMENT CO.
ADDITION TO UMAUMA BRIDGE
HAWAII

INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.

MADE BY DAL 11-23-49 ORDER NO. 3807
CHECKED BY DP 1-6-50 SHEET NO. D6D

[illegible]

Rivets: 7 ϕ
Holes: 15 ϕ UN
Paint:

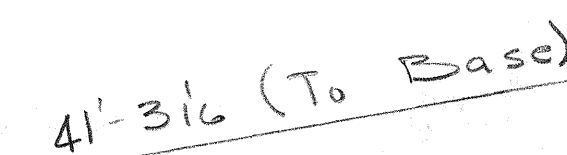
INDUSTRIAL DEV. CO.
ADDITION TO UMAUMA BRIDGE
HAWAII

INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.

MADE BY	<i>DM</i>	<i>12-6-49</i>	ORDER NO.	<i>580</i>
CHECKED BY	<i>V</i>	<i>1-6-50</i>	SHEET NO.	<i>P7D</i>

5468.165

11/8/50



41-516

COLUMN CIR-AS-BENTS (1)(2)

COLUMN CIL-OH-BENT (1)(2)

11. 5206

23'-3½ (To Splice)
20'-3½ (To WP)
COLUMN C3R - AS-BENTS ① ② # ③
COLUMN C3L - OH BENTS ① ② # ③

EXISTING	

KOLEKOLE

20-88

2L 3' 2" 2' 2" 5' 16" 20' 11"

ST

254 ST7E

EXISTING COLS

EXISTING COLS.

EXISTING SPICE

32'-4 (To Base)

24-9
27-9 (To Splice)

Diagram of a rectangular frame with dimensions and material specifications:

- Top horizontal dimension: $10\frac{3}{4}"$
- Left vertical dimension: $15" \times 50^{th}$ L3
- Material specifications for top and bottom bars: $F Latt. Bars 2\frac{1}{2} \times \frac{3}{8} \times 1'-8\frac{1}{2}"$
- Material specifications for left and right bars: $Latt Bars 2\frac{1}{2} \times \frac{3}{8} \times 1'-8\frac{1}{2}"$

SECTION C-C

FOR BILL OF MAT'L. SEE DIOID

Rivets: 34
Holes: 13
Paint: 2.00

INDUSTRIAL DEVELOPMENT CO.
ADDITION TO UMAUMA BRIDGE
HAWAII

INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.

MADE BY	DAL	12-6-49	ORDER NO.	3807
CHECKED BY	DD	1-13-50	SHEET NO.	D9D

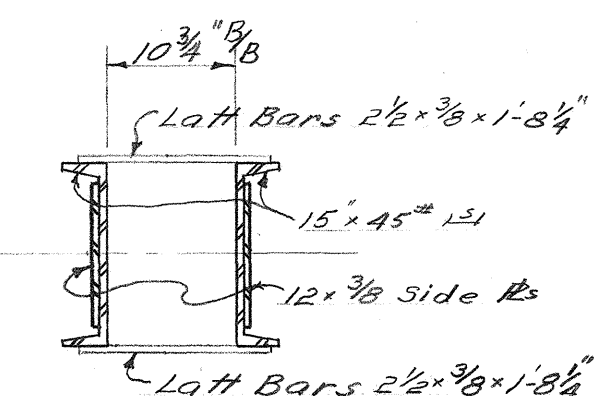
5468.165

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HA	DR 213	1950	168	304

BILL OF MATERIAL

No.	Description	Length Ft.	Mark	REMARKS
4	COLUMNS		C7E	KOLEKOLE
2	Do		CSE	Do
10	Do		C3E	Do
5	COLUMNS		C1E-8	KOLEKOLE
10	STRUT	7 5 3	ST4D	
8	Do	7 3	ST5D	
8	Do	7 7	ST6D	
6	Do	9 9 1/2	ST7D	
8	Do	7 5	ST8D	
6	R 3/4 x 8	0 8 1/4	w	TEMP NEW
8	DIAG BRACE	13 0	DB7D	
8	Do	14 5 1/2	DB8D	
6	Do	20 11 1/2	DB9D	
6	Do	30 4 1/2	DB10D	
5	R 1 1/2 x 3/8	3 7 1/2	ba	
4	R 1 1/4 x 3/8	1 6 1/2	ab	TEMP NEW
6	R 1 1/4 x 3/8	1 6	ac	Do Do
16	R 1 1/2 x 3/8	1 0 1/4	a	Temp New
16	R 9 x 3/8	1 8 1/2	b	Do Do
8	R 1 1/4 x 3/8	1 8 1/2	c	
16	R 1 1/2 x 3/8	1 4	d	
12	R 9 x 3/8	1 7 1/2	f	
5	R 1 1/2 x 3/8	3 7 1/2	g	
20	R 1 1/2 x 3/8	3 7 1/2	h	
12	R 1 1 x 3/8	0 11	k	
10	1 5 L 40	1 8 1/2	m	
8	R 1 3/4 x 3/8	1 6	p	
6	R 1 3/4 x 3/8	2 0 1/2	s	
6	R 9 x 1	0 10 3/4	t	Plain
5	R 1 1/2 x 3/8	1 8 1/2	ch	TEMP
200	F 2 1/2 x 3/8	1 8	ad	Do
3	F 2 1/2 x 3/8	1 8	y	Do
8	R 2 1/2 x 3/8	3 4 1/4	ck	TEMP
8	R 2 3/4 x 3/8	3 0	cm	Do

NOTE: SEE SHEETS D18D-D30D INC. FOR DETAILS OF DIAG BRACES & STRUTS.



SECTION E-E

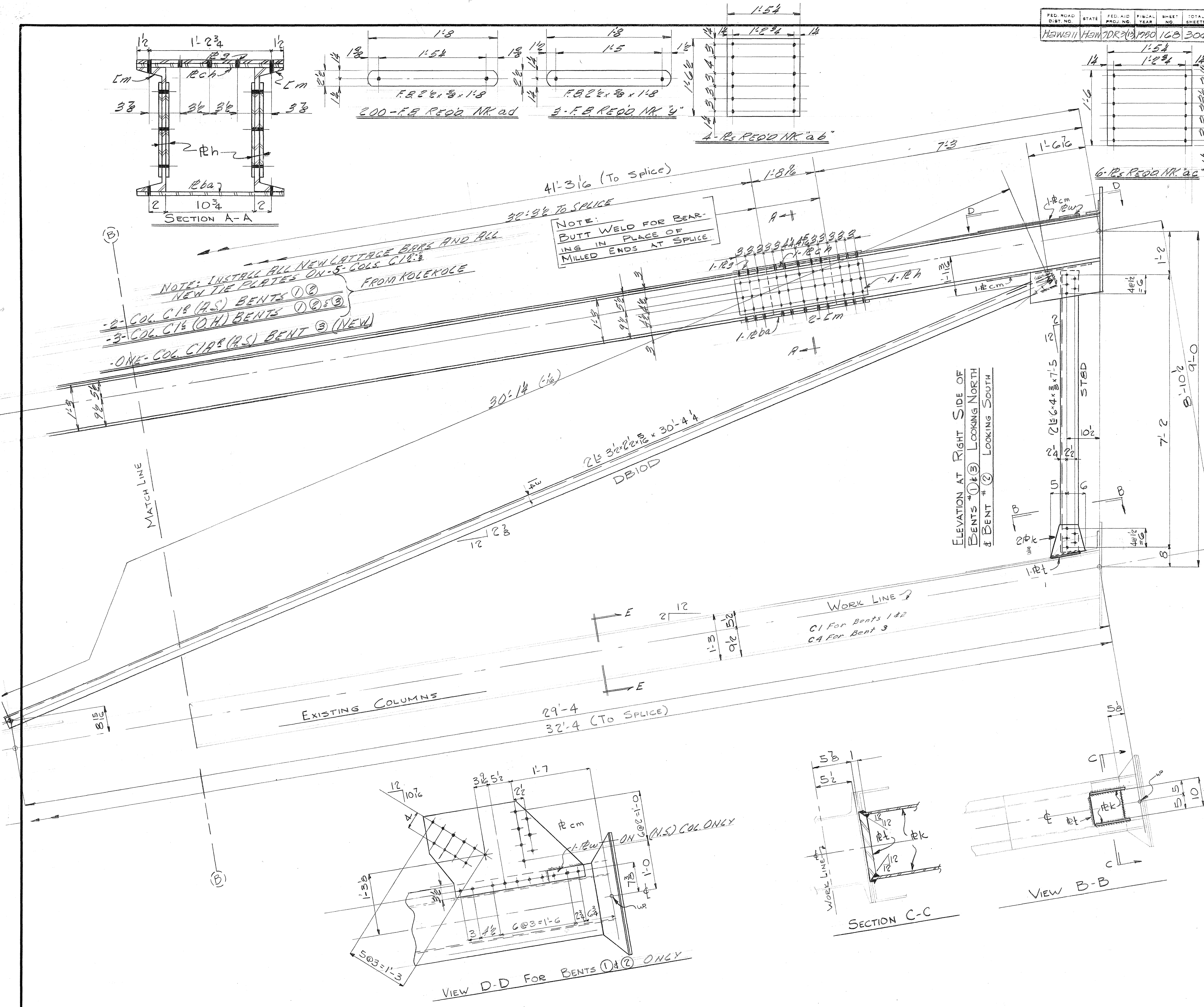
Rivets: 34
Holes: 1 3/8" 1 1/2" ED UN.
Paint:

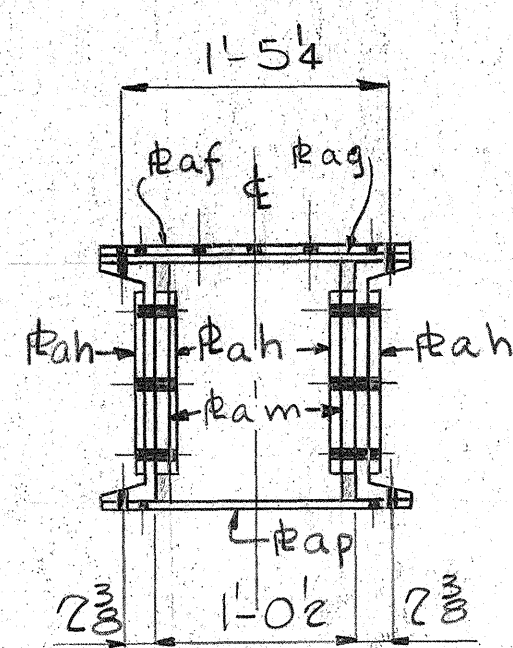
INDUSTRIAL DEVELOPMENT CO.
ADDITION TO UMAUMA BRIDGE
HAWAII

INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.

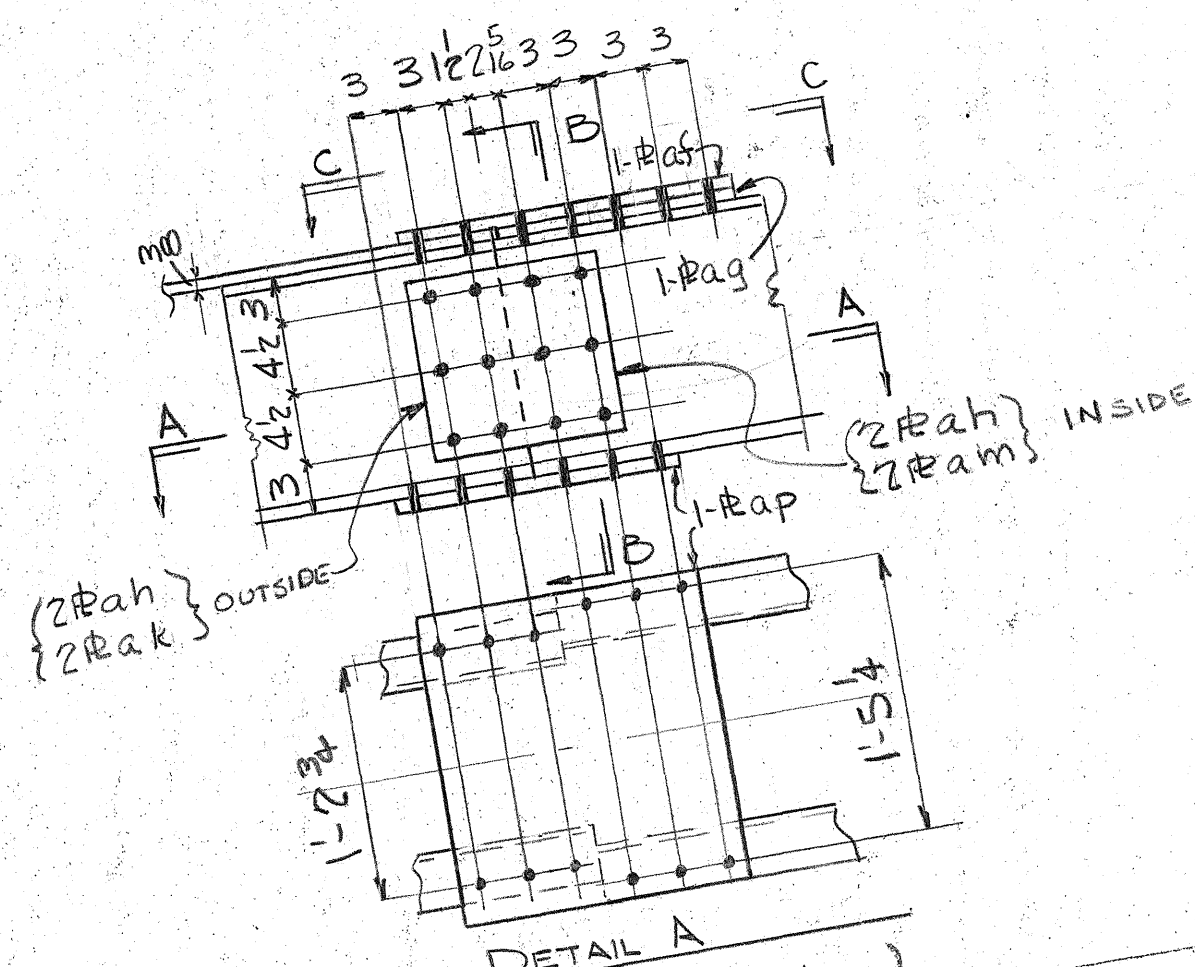
MADE BY DAL 12-7-49 ORDER NO. 3807
CHECKED BY DM 1-13-50 SHEET NO. D10D

3468.168



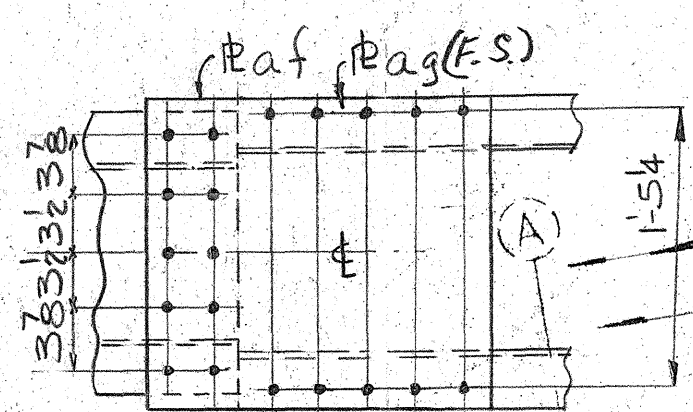


SECTION BB

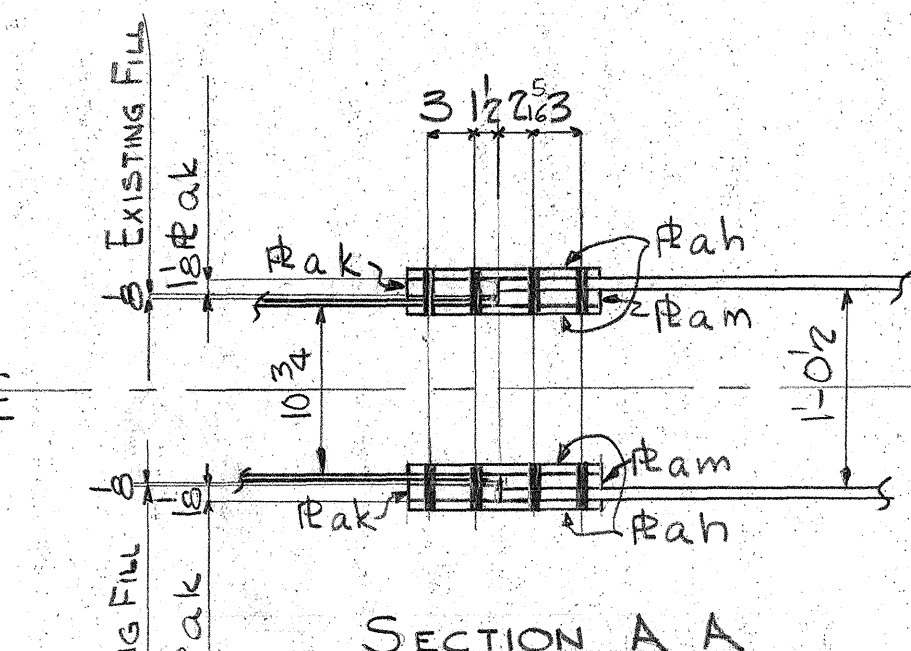


DETAIL A

23'-3 1/2" (To Splice)
20'-3 1/2" (To up)



VIEW C-C



SECTION A-A

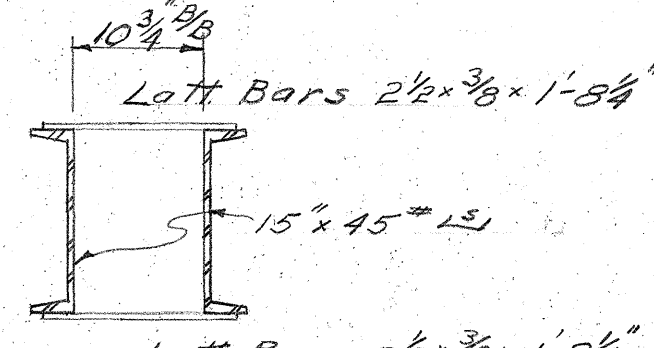
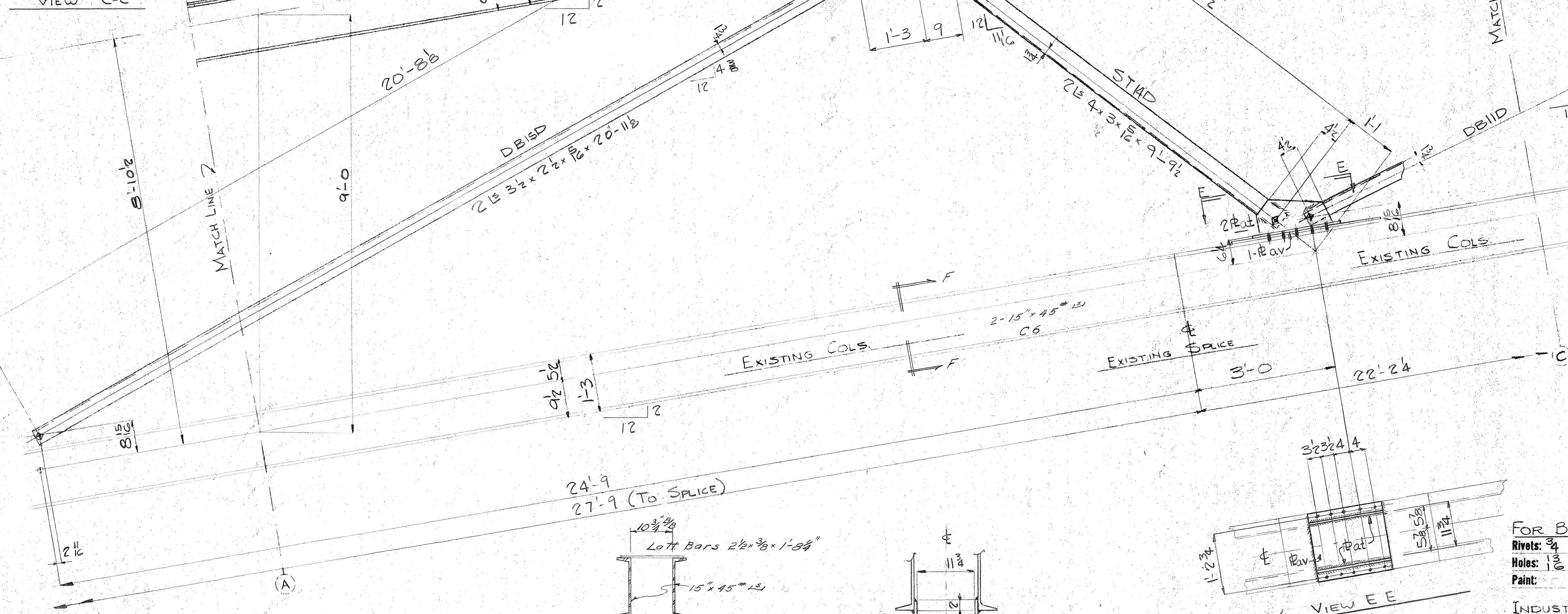
NOTE: SPICE IS TO BE BUTT WELDED IN PLACE OF MILLED ENDS

COL. C3R FROM KOLEKOLE

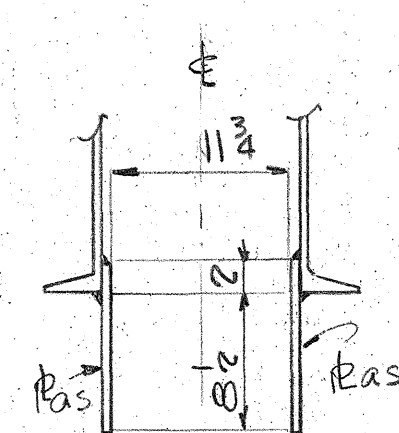
COL. C2 FROM MAILE

MATCH LINE

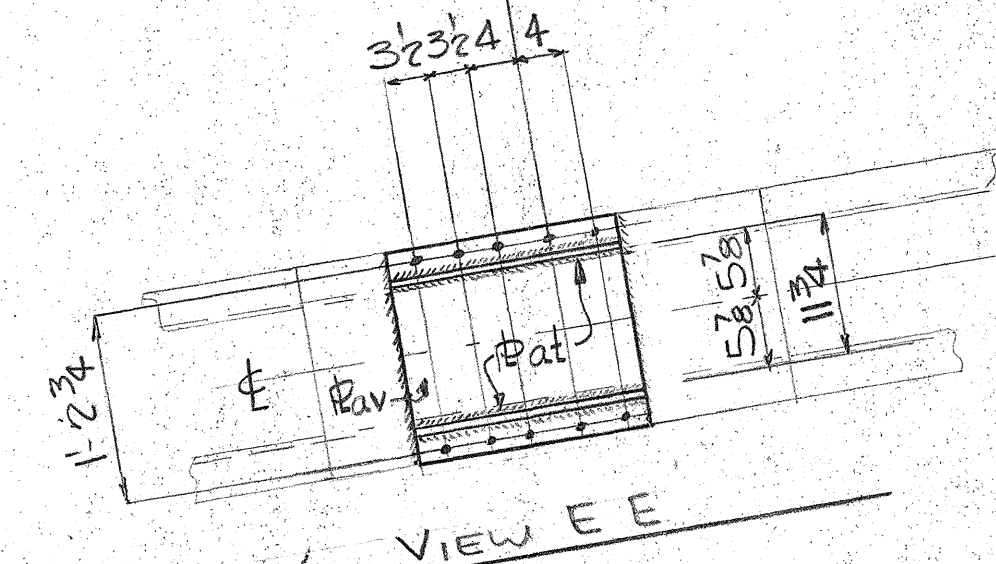
ELEVATION AT RIGHT SIDE OF
BENT #4 LOOKING SOUTH



SECTION F-F



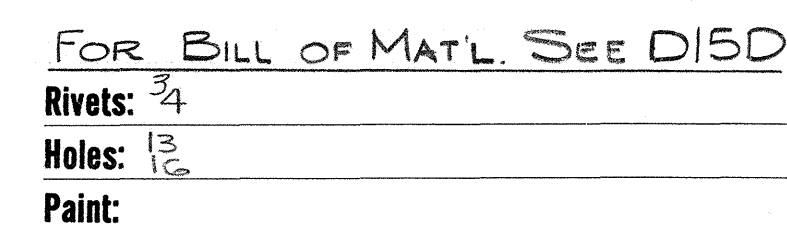
SECTION D-D



VIEW EE

FOR BILL OF MATL. SEE D15D
Rivets: 3/4
Holes: 1/8
Paint:
INDUSTRIAL DEVELOPMENT CO.
ADDITION TO UHAIWA BRIDGE
HAWAII
INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.
MADE BY: CAL 12-9-49 ORDER NO: 3807
CHECKED BY: DP 1-16-50 SHEET NO: D11 D

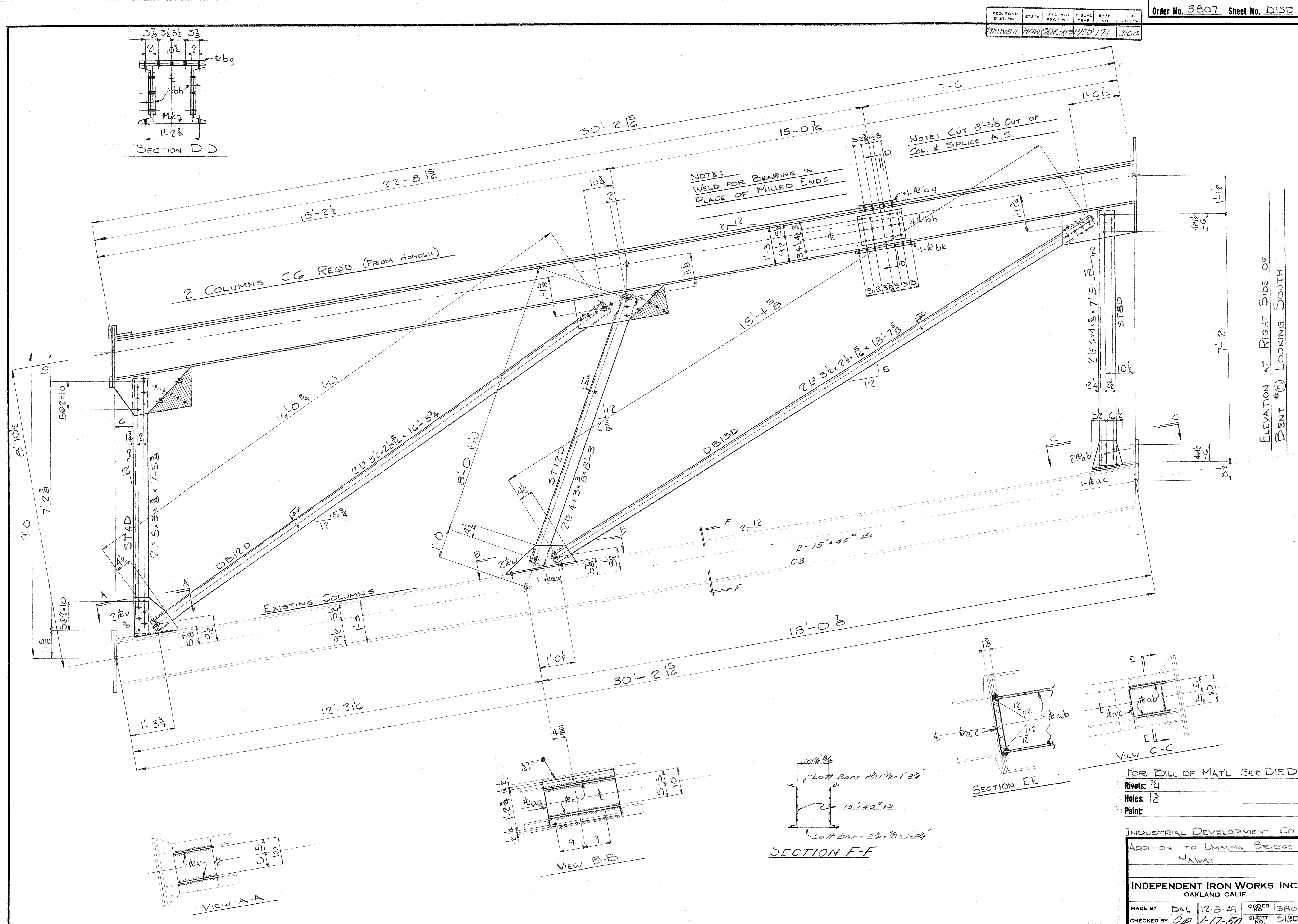
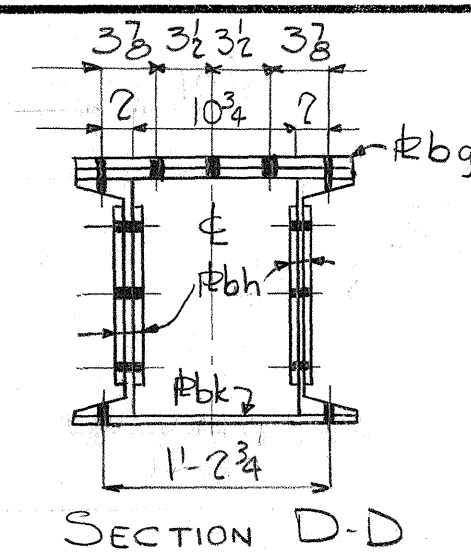
5468.169

[illegible]

INDUSTRIAL DEVELOPMENT CO
ADDITION TO UMAUMA BRIDGE
HAWAII

INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.

MADE BY	DAL	12-9-49	ORDER NO.	3807
CHECKED BY	DM	1-16-50	SHEET NO.	D12D



ELEVATION AT RIGHT SIDE OF
BENT #5 LOOKING SOUTH

FOR BILL OF MAT'L SEE D15D

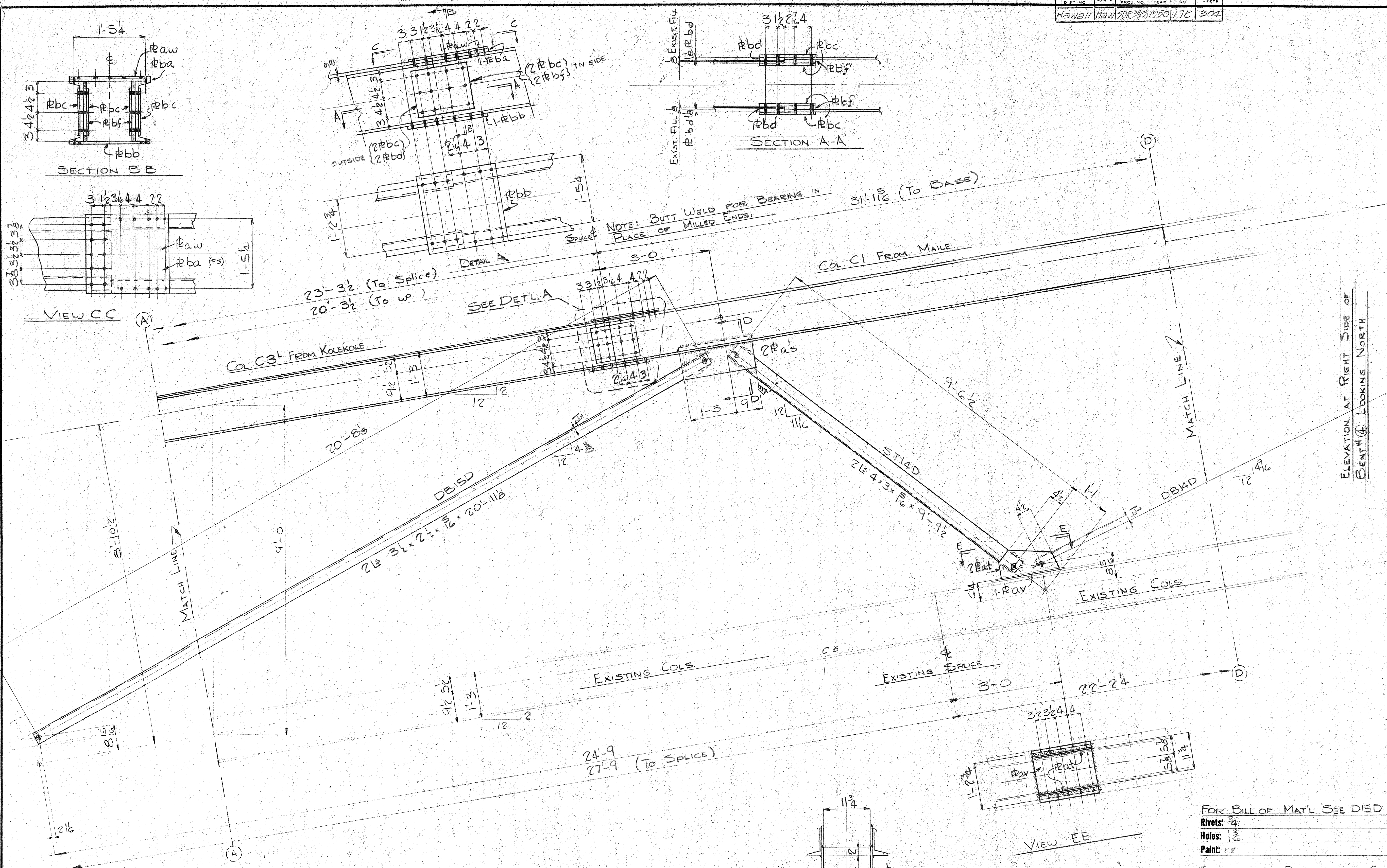
Rivets: 34
Holes: 12
Paint:

INDUSTRIAL DEVELOPMENT CO.
ADDITION TO UMAUMA BRIDGE
HAWAII

INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.

MADE BY	DAL	12-8-49	ORDER NO.	3807
CHECKED BY	DD	1-17-50	SHEET NO.	D13D

5468.171



ELEVATION AT RIGHT SIDE OF
BENT #4 LOOKING NORTH

FOR BILL OF MAT'L. SEE D15D

Rivets: 4
Holes: 13
Paint: 100 sq ft

INDUSTRIAL DEVELOPMENT CO.
ADDITION TO UMAUMA BRIDGE
HAWAII

INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.

MADE BY	DAL	12-12-49	ORDER NO.	3807
CHECKED BY	DD	1-16-50	SHEET NO.	D14D

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	7022(13)	1950	173	304

BILL OF MATERIAL INDUS. DEV. CO.

No.	Description	Length Ft.	Ins.	Mark	REMARKS
1	COLUMN			C1	MAILE
2	COLUMNS			C6	HONOLULU
1	COLUMN			C2	MAILE
1	STRUT	7 5/8		ST9D	
1	Do	7 5/8		ST10D	
2	Do	8 3/8		ST12D	
2	Do	9 9/8		ST14D	
1	DIAG. BRACE	20 1/8		DB11D	
2	Do	16 3/4		DB12D	
2	Do	18 7/8		DB13D	
1	Do	20 1/8		DB14D	
2	Do	20 11/8		DB15D	
4	#13/4 x 3/8	1	4	V	Temp New
4	#10 x 3/8	2	0 1/2	w	Do Do
2	#17/4 x 3/8	2	0 1/2	a q	
4	#12 x 3/8	1	0 1/2	a b	
2	#10 1/4 x 1	0	10 3/4	a c	
2	#11 x 1/2	0	11 1/2	a d	
1	#19 3/4 x 3/8	1	9 1/4	a f	
1	#15 1/2 x 3/8	1	7 3/4	a g	
4	#11 1/2 x 3/8	1	0 1/4	a h	
2	#5 3/4 x 1/8	0	11 1/2	a k	
2	#6 3/4 x 7/8	0	11 1/2	a m	
1	#18 1/4 x 3/8	1	7 3/4	a p	
4	#10 1/2 x 3/8	2	0	a s	
4	#7 1/2 x 3/8	1	6 3/4	a t	
2	#17 3/4 x 3/8	1	6 3/4	a v	
1	#22 x 3/8	1	7 3/4	a w	
1	#16 1/4 x 3/8	1	7 3/4	b a	
1	#19 1/2 x 3/8	1	7 3/4	b b	
4	#11 1/2 x 3/8	1	1 1/2	b c	
2	#5 3/4 x 1/8	0	11 1/2	b d	
2	#7 3/4 x 3/8	0	11 1/2	b f	
2	#12 3/8 x 3/8	1	5 1/4	b g	
3	#11 1/2 x 3/8	1	3 3/8	b h	
2	#17 1/4 x 3/8	1	9 3/8	b k	
2	#11 x 1/2	0	11	b m	
2	#11 x 1"	1	6 3/4	b p	

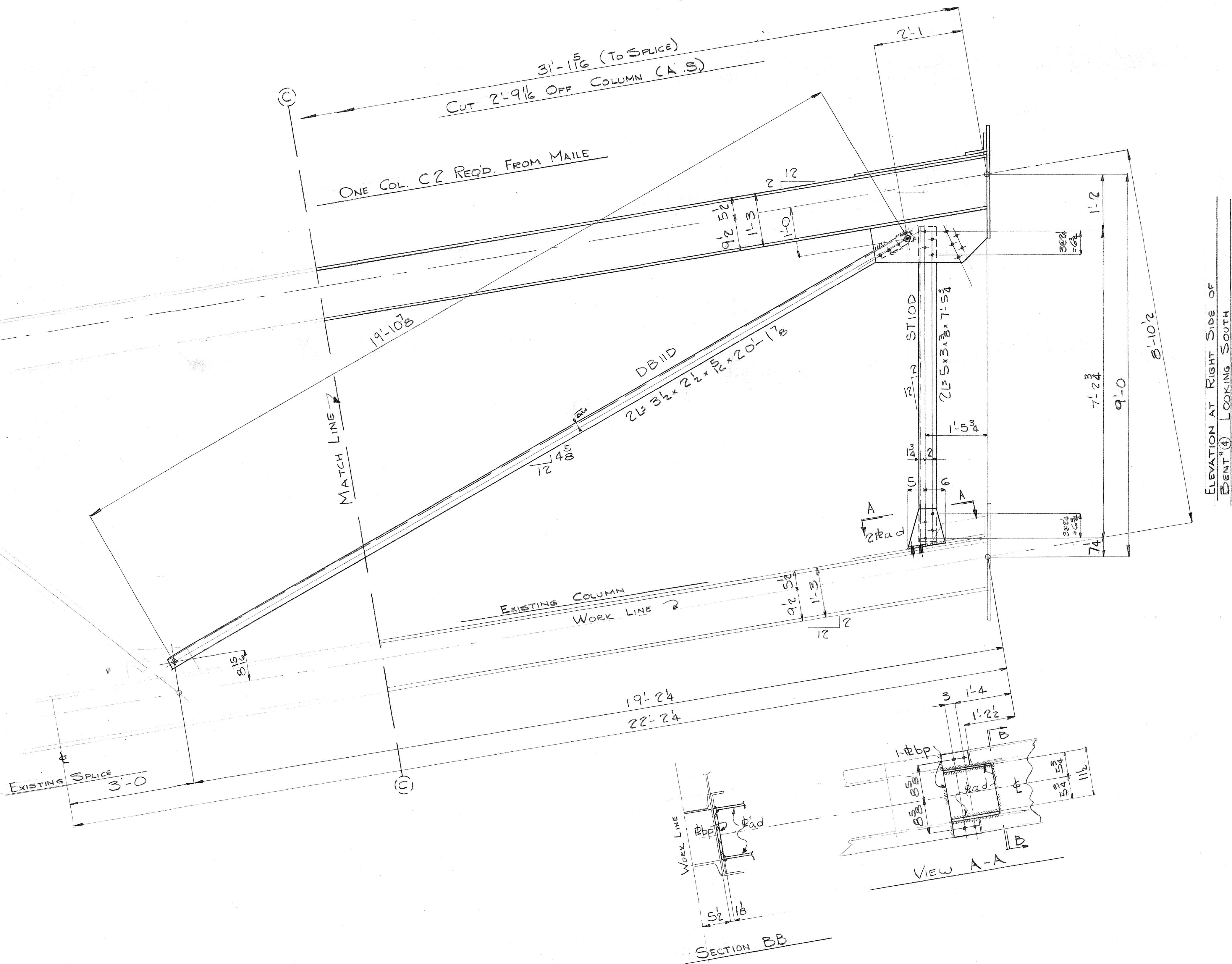
NOTE: SEE SHEETS D150-D150D INC FOR DETAILS OF DIAGONAL BRACES & STRUTS.

Rivets: 34
Holes: 130
Paint:

INDUSTRIAL DEVELOPMENT CO.
ADDITION TO UMAUMA BRIDGE
HAWAII

INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.

MADE BY DAL 12-9-49 ORDER NO. 3807
CHECKED BY D.D. 1-16-50 SHEET NO. D150

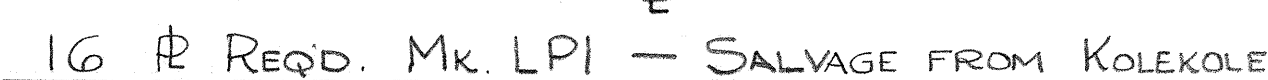


Rivets: 34
Holes: 13 1/2 ED. UN
Paint:

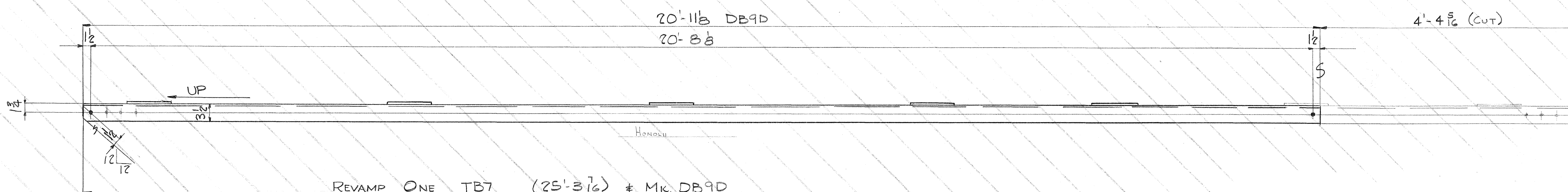
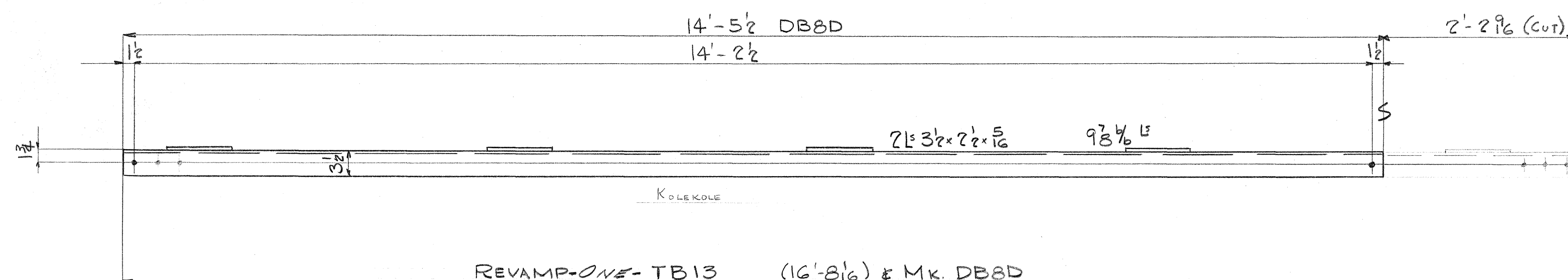
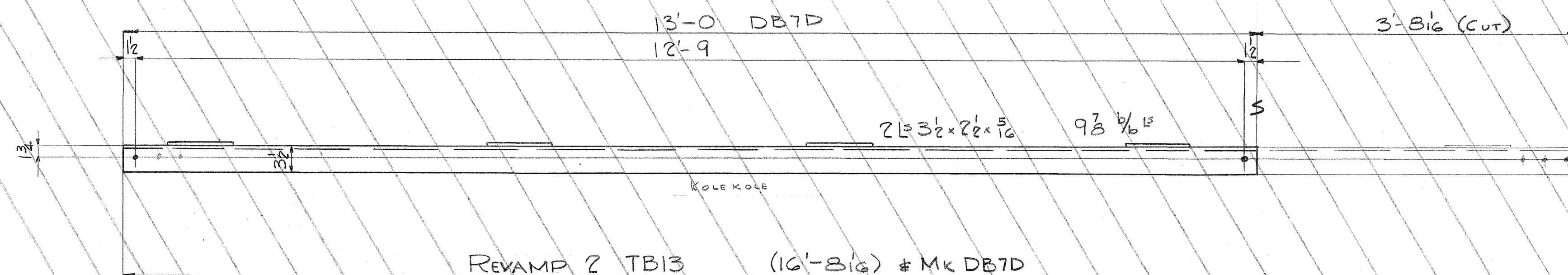
INDUSTRIAL DEVELOPMENT CO.
ADDITION TO UMAUMA BRIDGE
HAWAII

INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.

MADE BY	DAL	12-13-49	ORDER NO.	3807
CHECKED BY	<i>DA</i>	1-16-50	SHEET NO.	D16D



BILL OF MATERIAL INDUSTRIAL
DEV. CO.

[illegible]

Rivets: 34

Holes: 13/16" 1/2 ED. 1111

Paint:

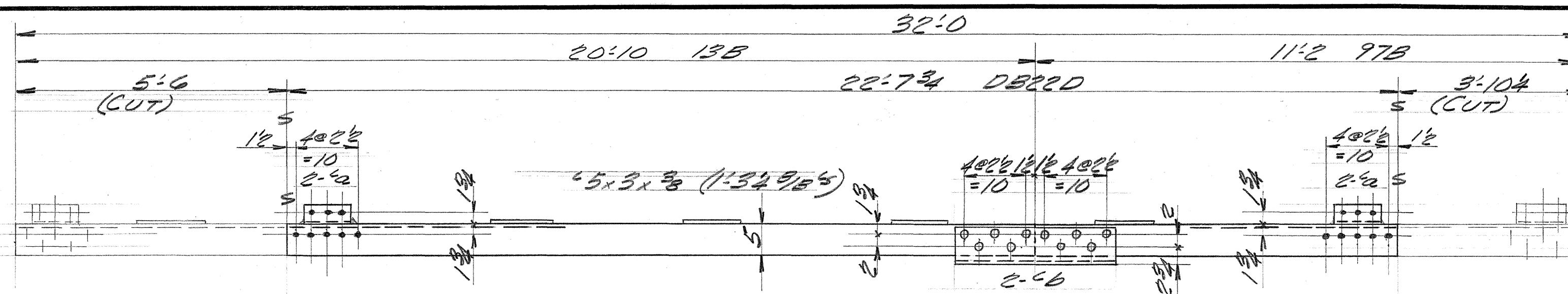
INDUSTRIAL DEVELOPMENT COMPANY
ADDITION TO UMAUMA BRIDGE
HAWAII

INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.

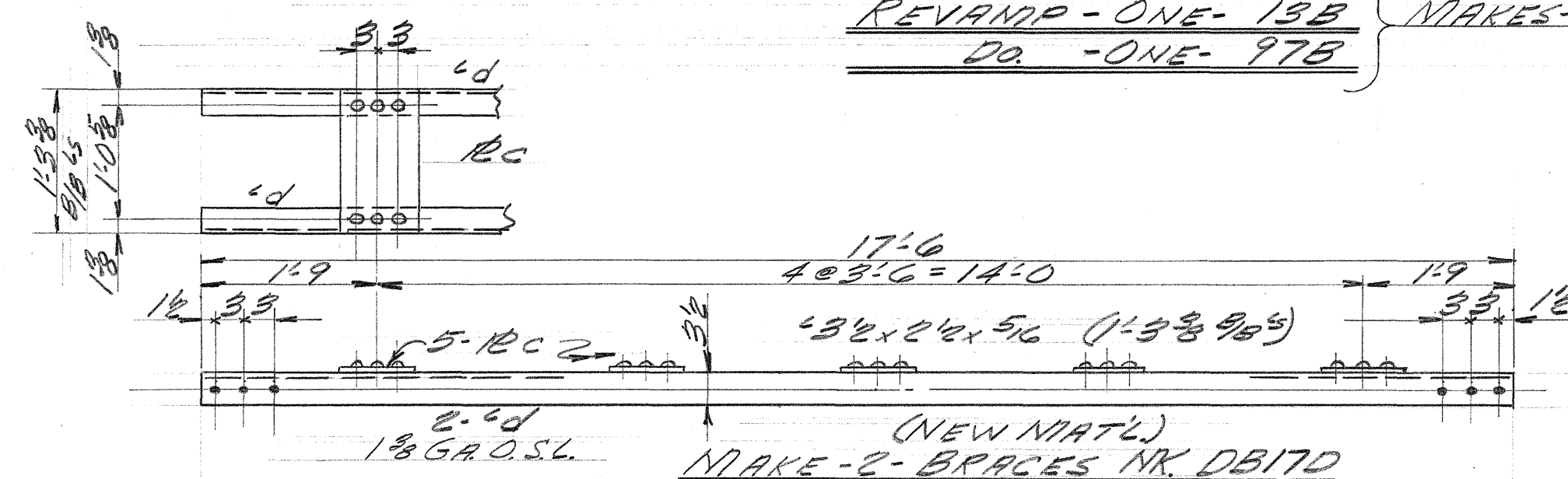
MADE BY	DAL	12-21-49	ORDER NO.	3807
CHECKED BY	DM	1-17-50	SHEET NO.	D185

5468.176

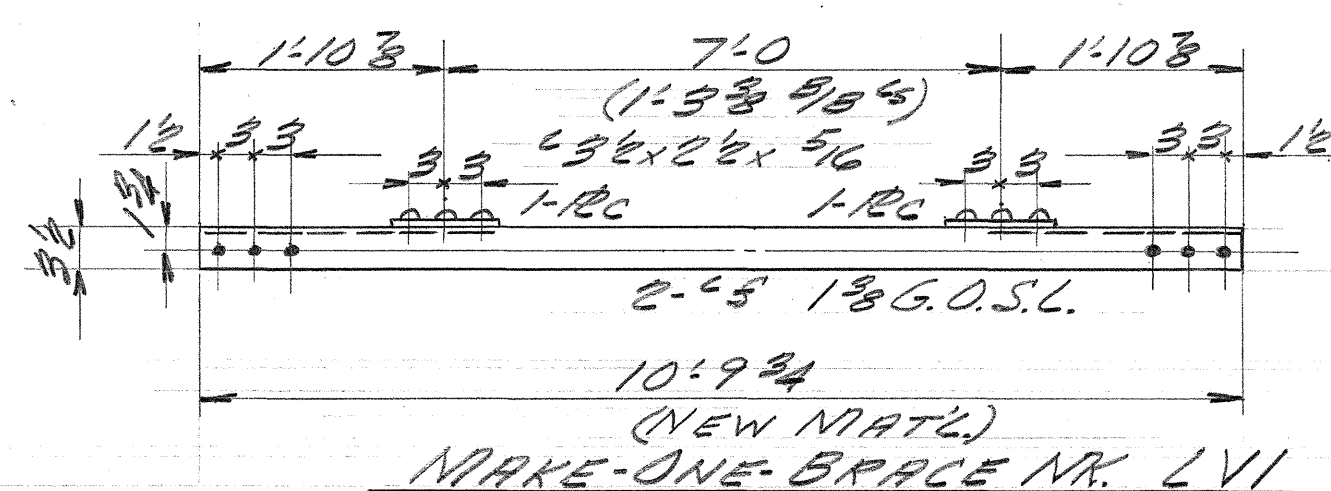
No.	Description	Length		Mark	REMARKS
		Ft.	Inch.		
<i>NOTE: REPAIR THE PIECES LISTED BELOW AS SHOWN ON THE DETAILS</i>					
1	BRACE			18B	
1	Do			97B	
<i>NEW MATERIAL IS LISTED BELOW</i>					
2	BRACES			DB17D	
1	Do			LY1	
10	STRUTS			L51	
4	"3x3x $\frac{3}{8}$	0	8 $\frac{1}{2}$	a	TEMP
2	"6x4x $\frac{3}{8}$	2	2	b	Do.
12	R 8x $\frac{1}{2}$ x $\frac{1}{2}$	1	5 $\frac{3}{4}$	c	Do.
4	"3 $\frac{1}{2}$ x2 $\frac{1}{2}$ x $\frac{3}{8}$	17	6	d	
2	"3 $\frac{1}{2}$ x2 $\frac{1}{2}$ x $\frac{3}{8}$	10	9 $\frac{1}{2}$	f	
20	R 14 $\frac{1}{2}$ x $\frac{1}{2}$	1	2 $\frac{1}{2}$	g	TEMP
20	R 3x $\frac{3}{8}$	1	0 $\frac{3}{4}$	h	Do.
20	"6x4x $\frac{3}{8}$	31	3	k	
490	F.B 2 $\frac{1}{2}$ x $\frac{3}{8}$	1	1 $\frac{1}{2}$	m	
752 34 ¹⁰ RIVETS				(SHOP)	



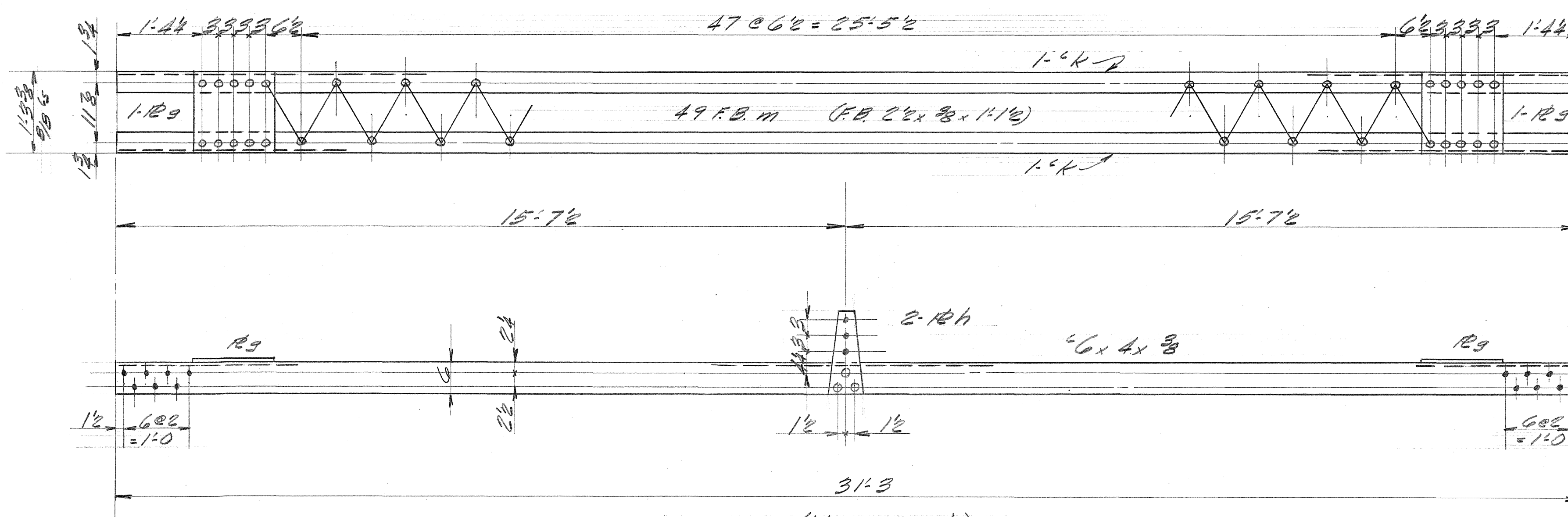
REVAMP - ONE - 13B } MAKES - ONE - DB22D
DO. - ONE - 97B



(NEW MAT'L)
MAKE-2-BRACES NR DB170



(NEW MATL.)
MAKE-ONE-BRACE NR. LVI



(NEW MAT'L)
MAKE-10-STRUTS NR LSI

Rivets: 34"
Holes: 13"
Paint: (SEE SPECS)

INDUSTRIAL DEV. CO.

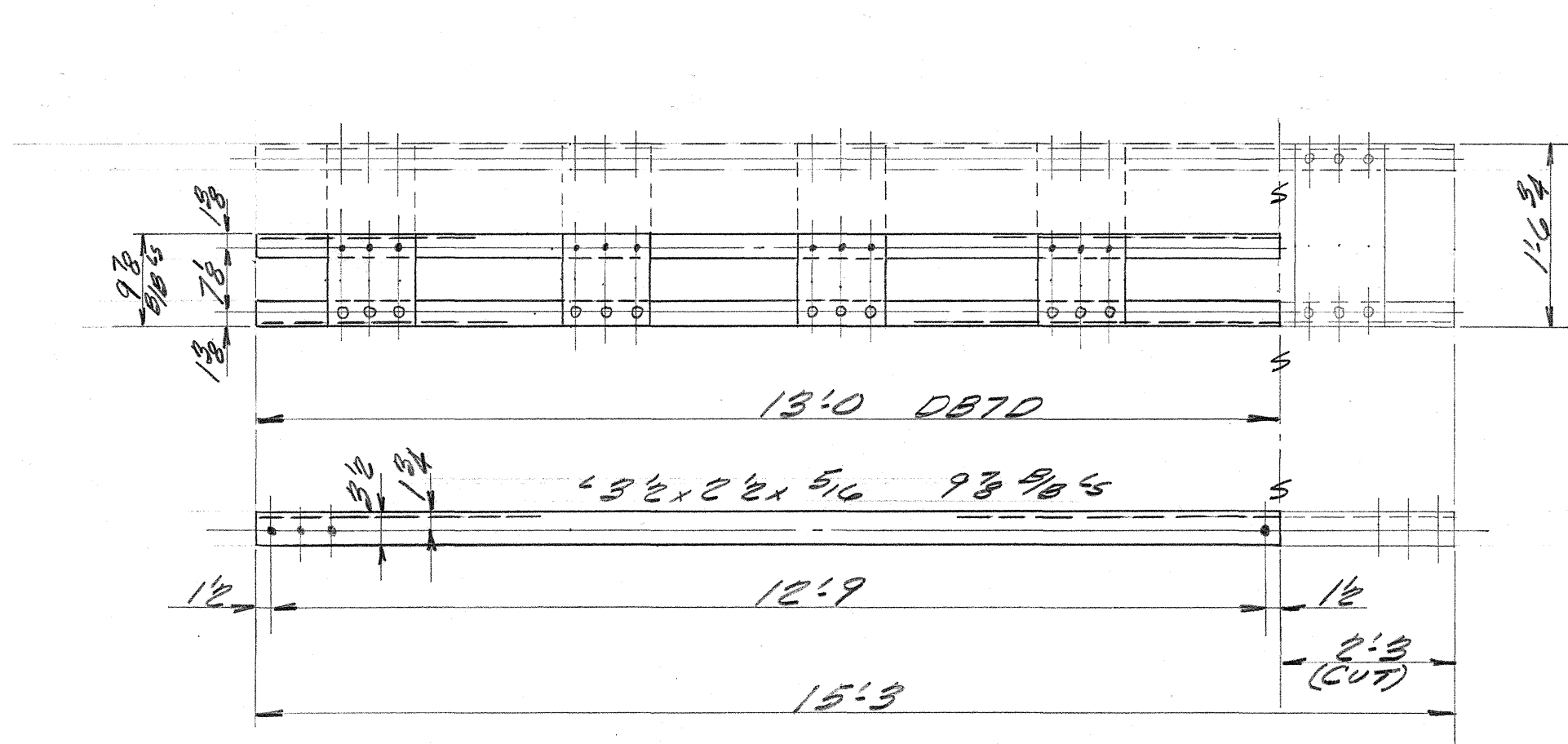
ADDITION TO THE
UNDAUNED BRIDGE
-HAWAII-

INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.

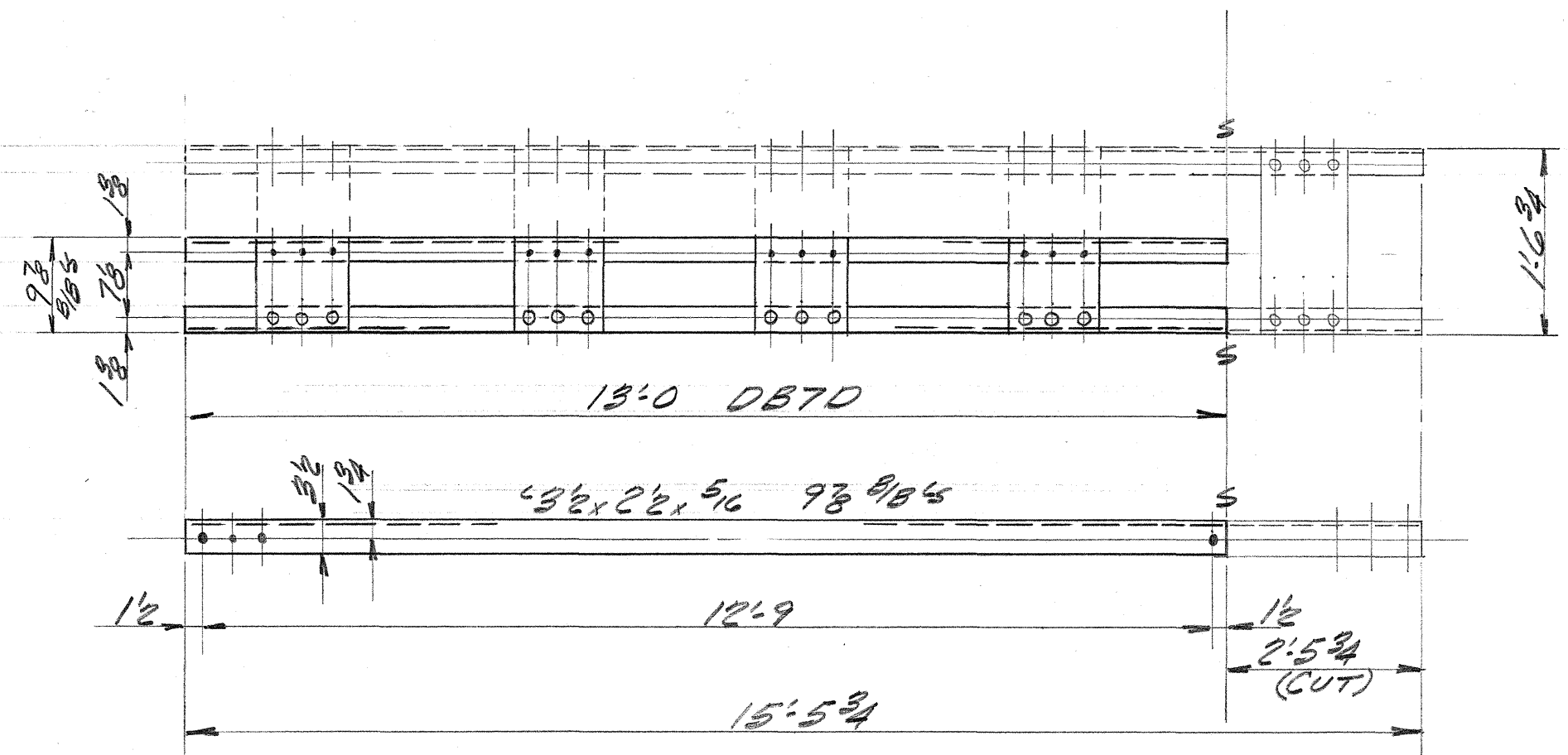
MADE BY	<i>DM</i>	8-22-50	ORDER NO.	3807
CHECKED BY			SHEET NO.	D190

BILL OF MATERIAL *UNAIUNA BRIDGE*

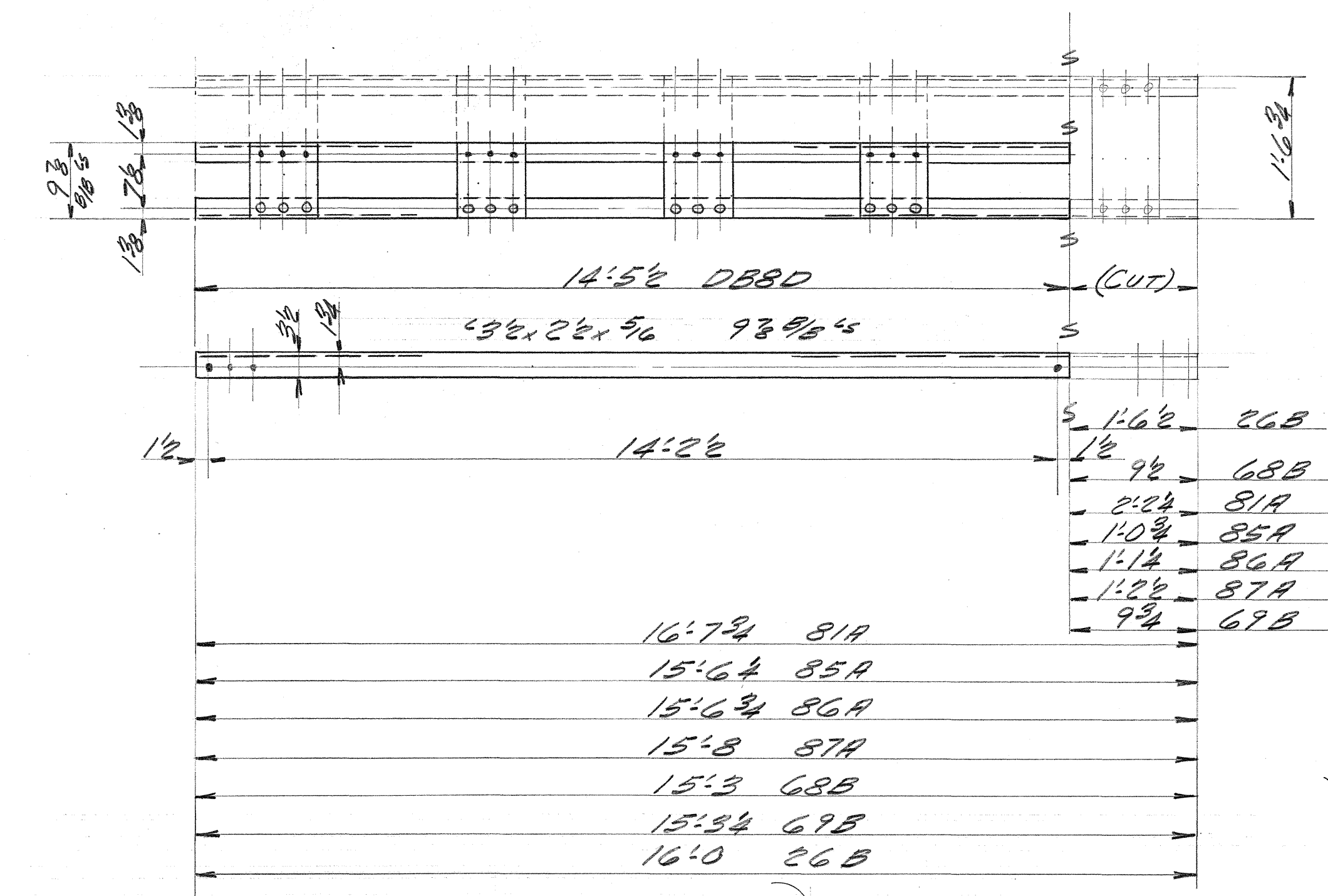
No.	Description	Length		Mark	REMARKS
		Ft.	In.		
NOTE: REVAMP THE BRACES LISTED BELOW AS SHOWN ON THE DETAILS					
3	BRACES			82A	
3	Do			83A	
1	Do			84A	
1	Do			74B	
1	Do			75B	
1	Do			81A	
1	Do			85A	
1	Do			86A	
1	Do			87A	
1	Do			68B	
1	Do			69B	
1	Do			26B	
2	4x3x4	1	6	a	TEMP
	(NEW MARK)				



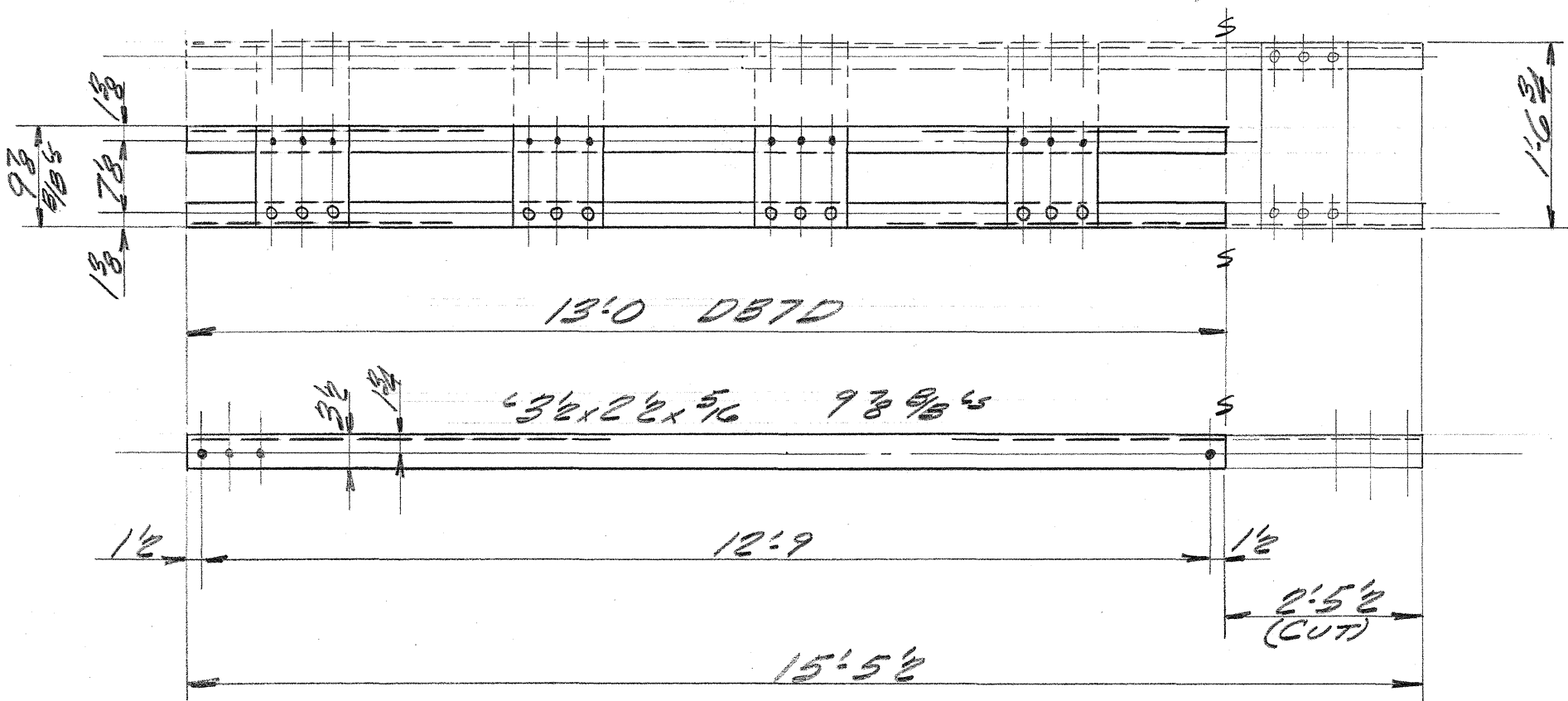
REVAMP-3-82A (MAKES 3 DBTD)



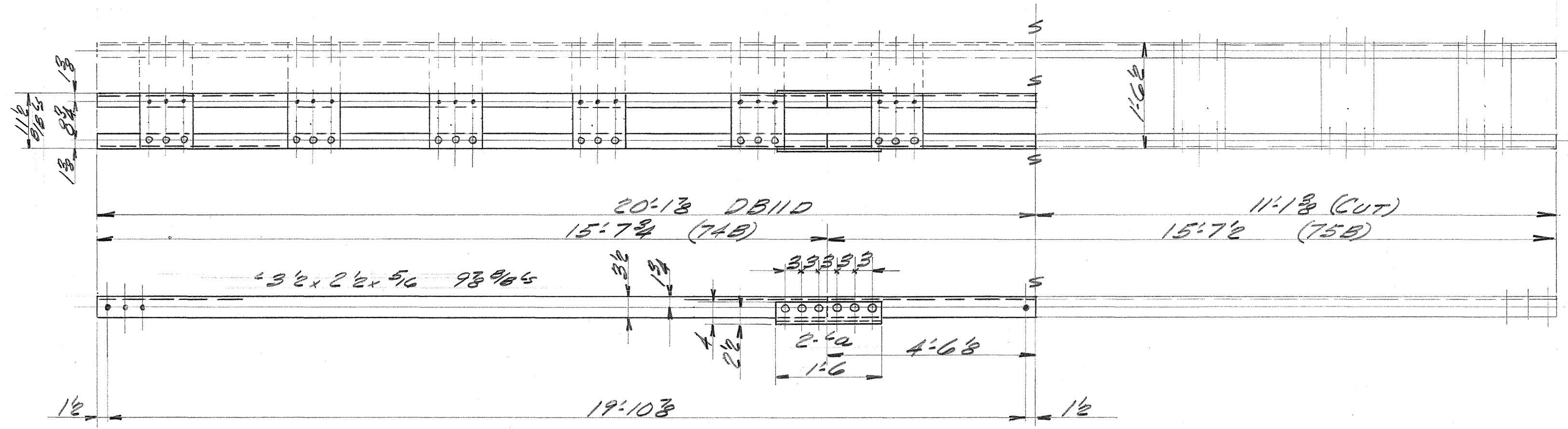
REVAMP-3-83A (MAKES 3 DBTD)



REVAMP-ONE-81A
DO DO 85A
DO DO 86A
DO DO 87A
DO DO 68B
DO DO 69B
DO DO 26B
MAKES 7 DBBD



REVAMP-ONE-84A (MAKES ONE DBTD)



REVAMP-ONE-74B
DO -ONE-75B
MAKES-ONE-DBIID

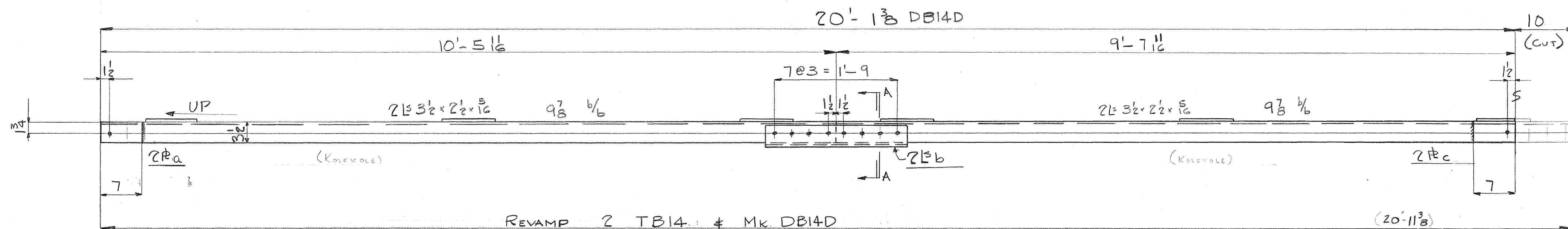
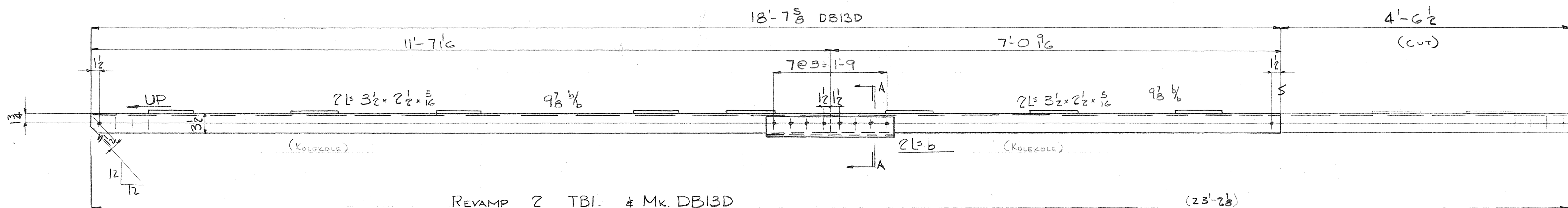
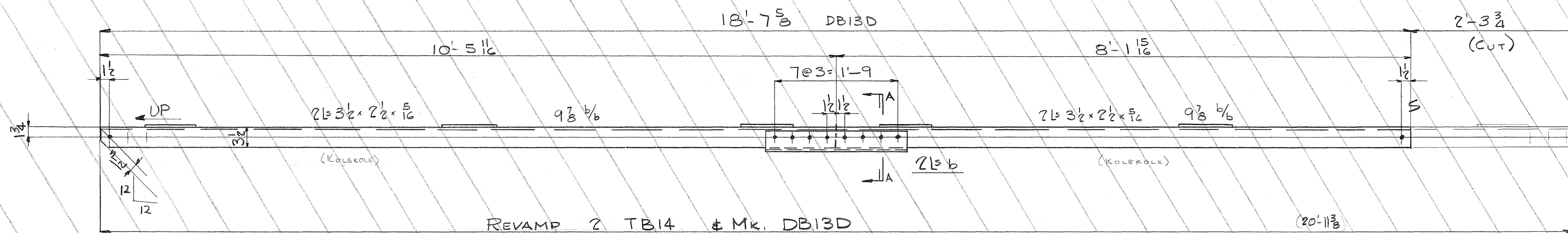
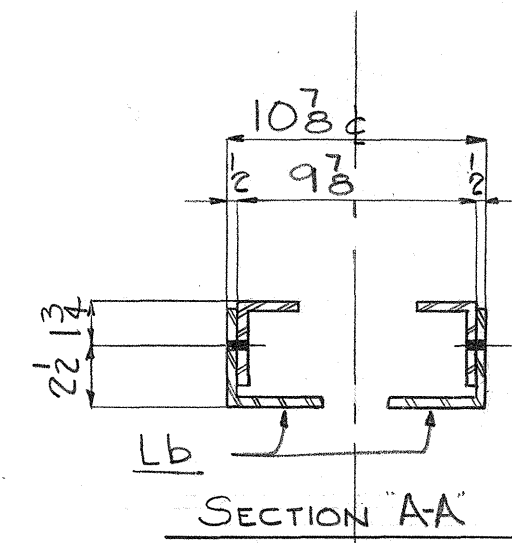
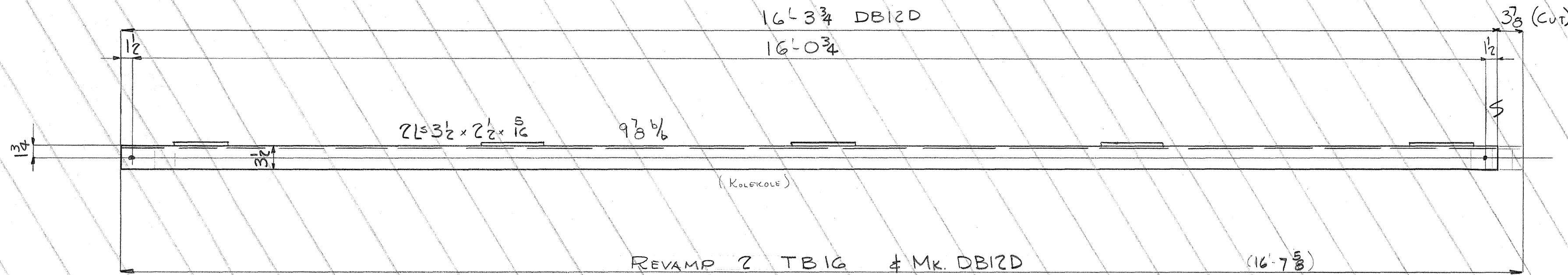
Rivets: 3/4" #
Holes: 1 1/8" #
Paint: (SEE SPEC'S)

INDUSTRIAL DEV. CO.
ADDITION TO THE
UNAIUNA BRIDGE
-HAWAII-
INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.
MADE BY *DI* 8-1950 ORDER NO. 3807
CHECKED BY SHEET NO. 0200

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HI	201-113	1950	179	304

BILL OF MATERIAL INDUSTRIAL Dev. G

No.	Description	Length Ft.	Ins.	Mark	REMARKS
NOTE: BRACES LISTED BELOW ARE TO BE REVAMPED AS SHOWN ON DETAILS					
2	BRACE	11	7 1/2	TB1	SAV. FROM KOLEKOLE
2	Do	10	5 1/2	TB14	Do
2	#3 1/2 x 3	0	7	a	Temp-New
4	L 4 x 4 x 1/2	2	0	b	Temp-New
2	#3 1/2 x 3	0	7	c	Temp-New



Rivets: 3/4
Holes: 1 3/8 1 1/2 ED.
Paint:

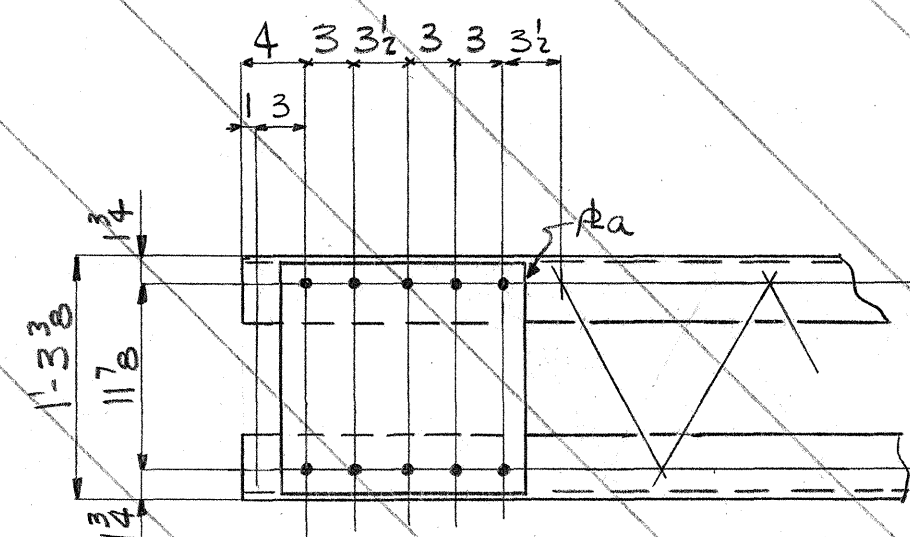
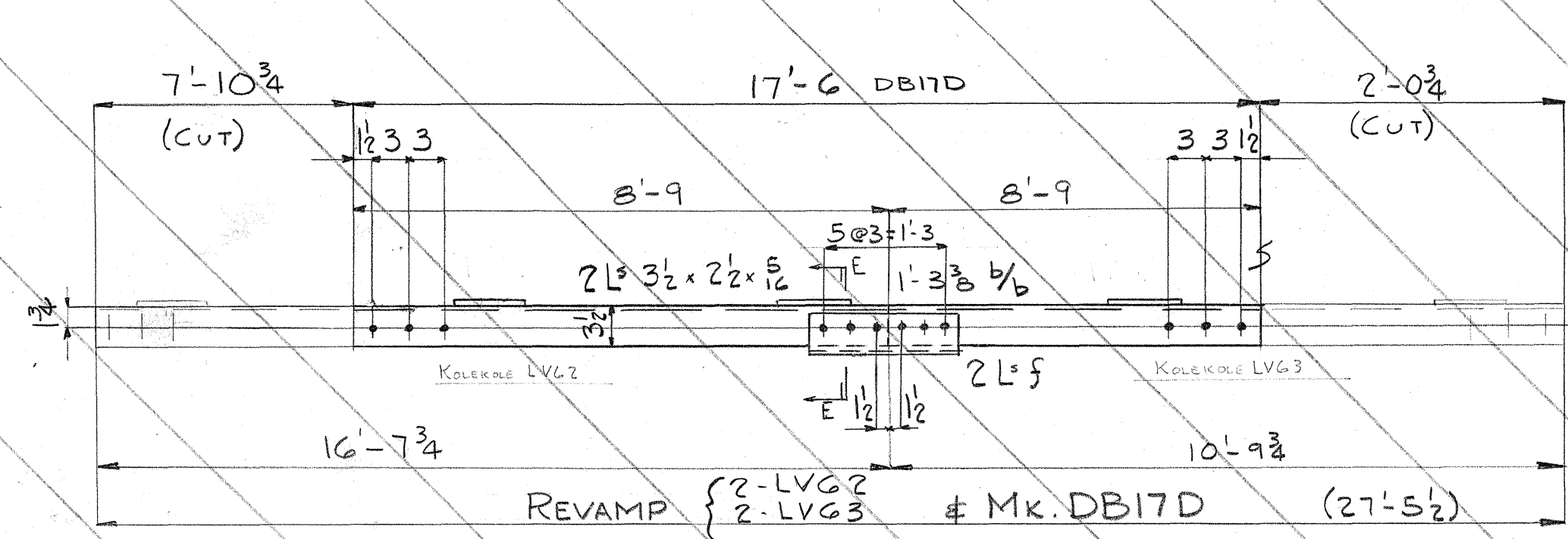
INDUSTRIAL DEVELOPMENT CO.
ADDITION TO UMAUMA BRIDGE
HAWAII

INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.

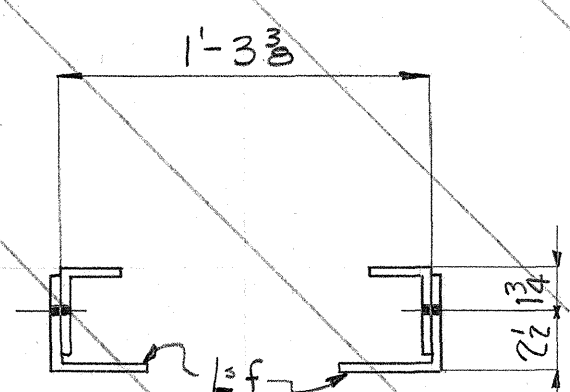
MADE BY	DAL	12-23-49	ORDER NO.	3807
CHECKED BY	DM	1-18-50	SHEET NO.	D21D

BILL OF MATERIAL INDUSTRIAL DEVELOPMENT CO.

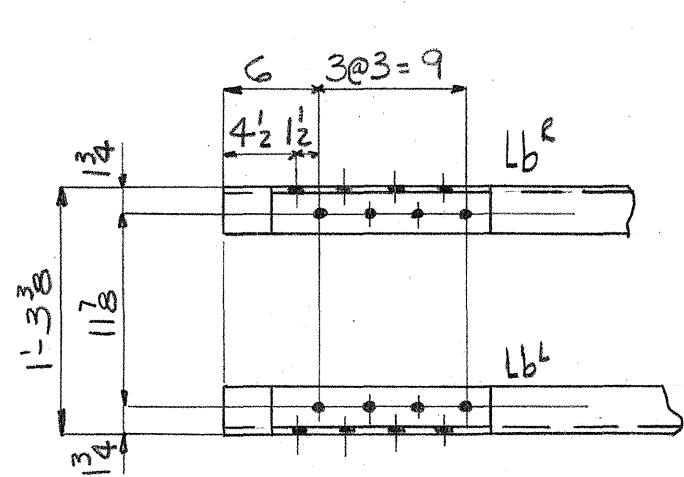
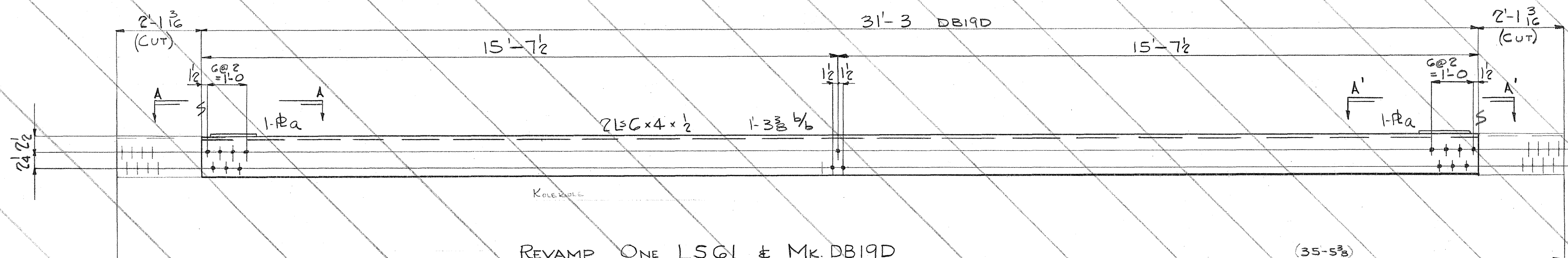
No.	Description	Length		Mark	REMARKS
		Ft.	In.		
NOTE: BRACES LISTED BELOW ARE TO BE REVAMPED AS SHOWN ON DETAILS					
					SALV FROM
2	BRACES	23	6 3/8	LB1	KAWAII
4	L 3x3x 3/8	1	12	b ^R c ^L	TEMP NEW
4	L 3x3x 3/8	1	1	c ^R c ^L	Do Do



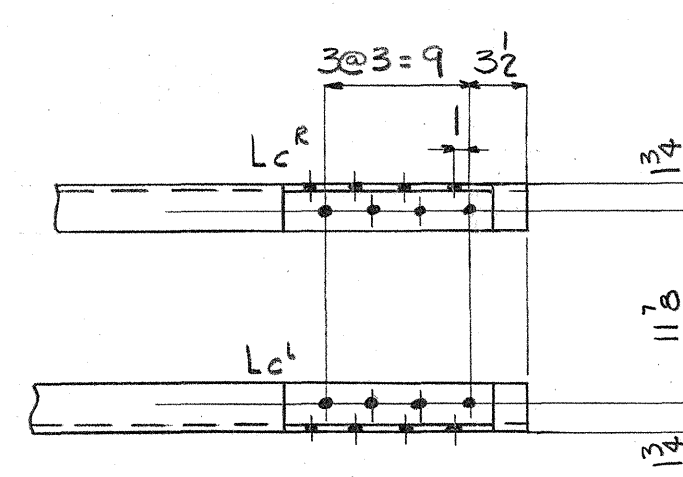
VIEW A-A-AS
VIEW A-A-OH



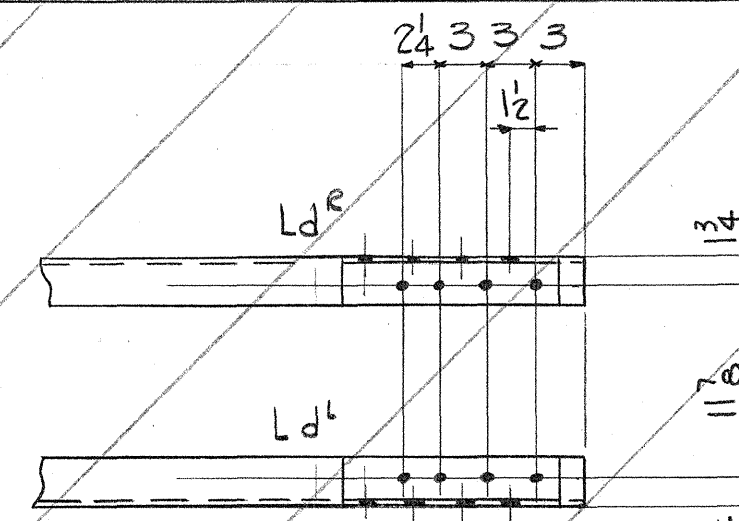
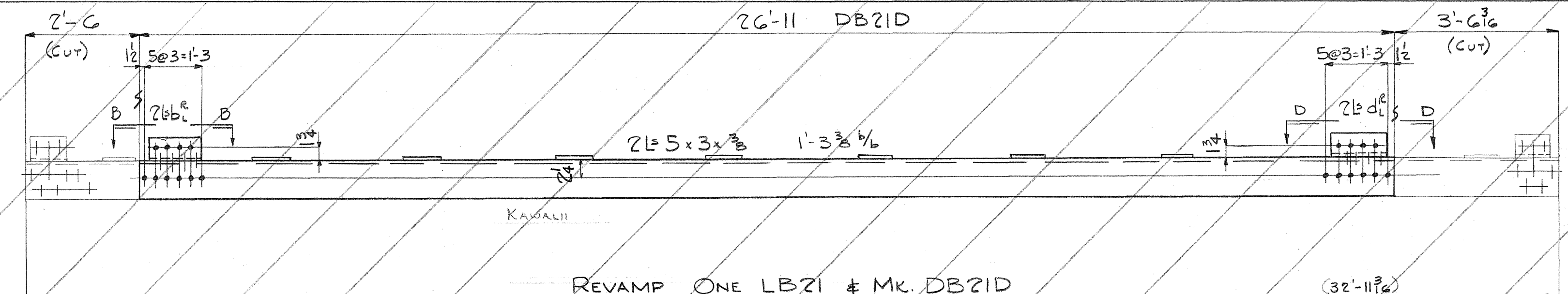
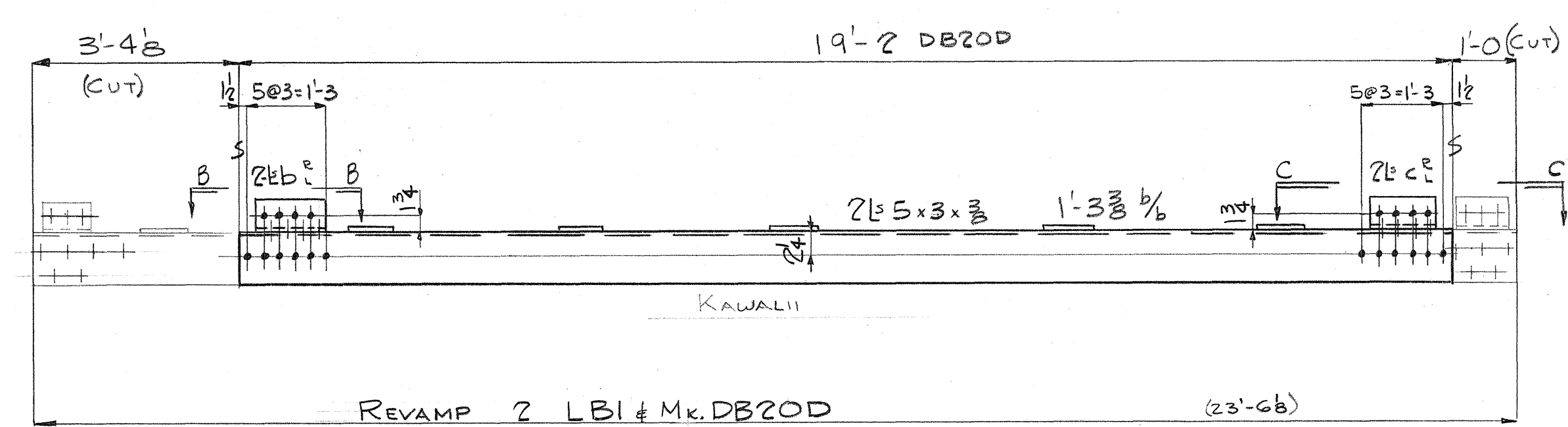
SECTION E-E



VIEW BB



VIEW CC



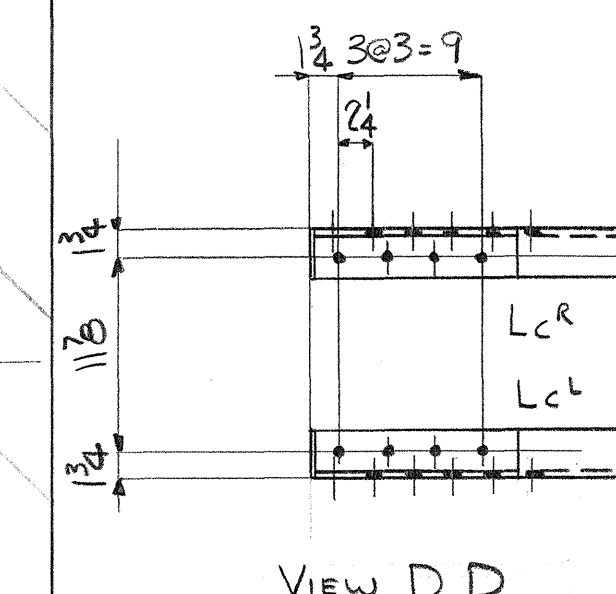
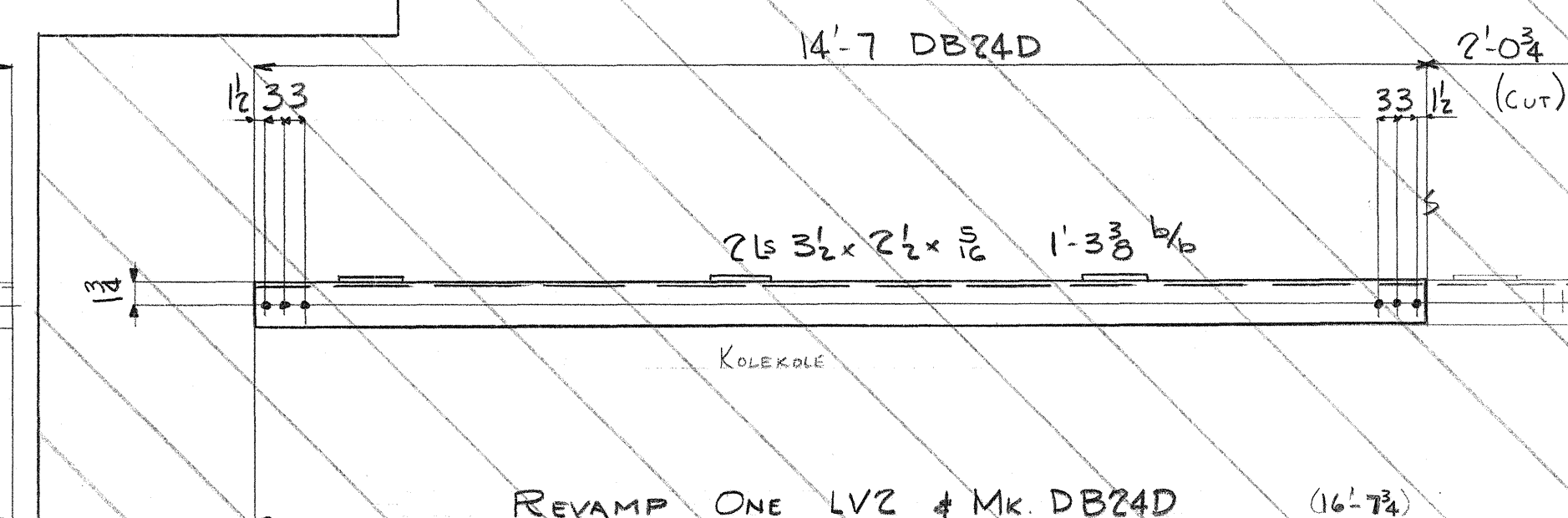
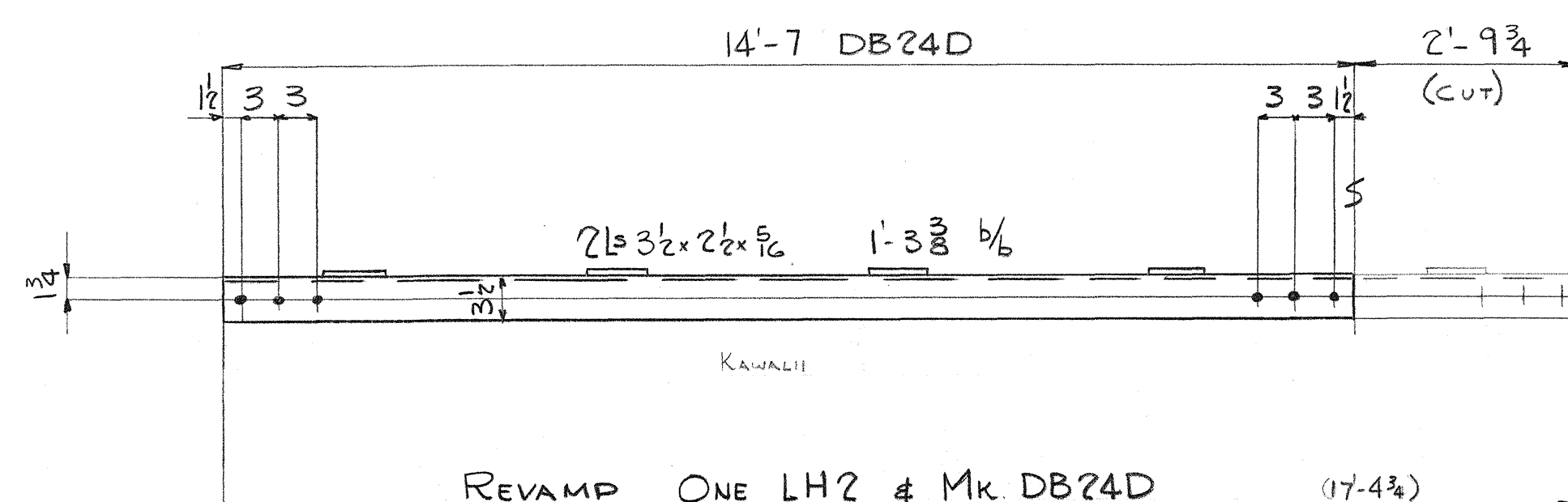
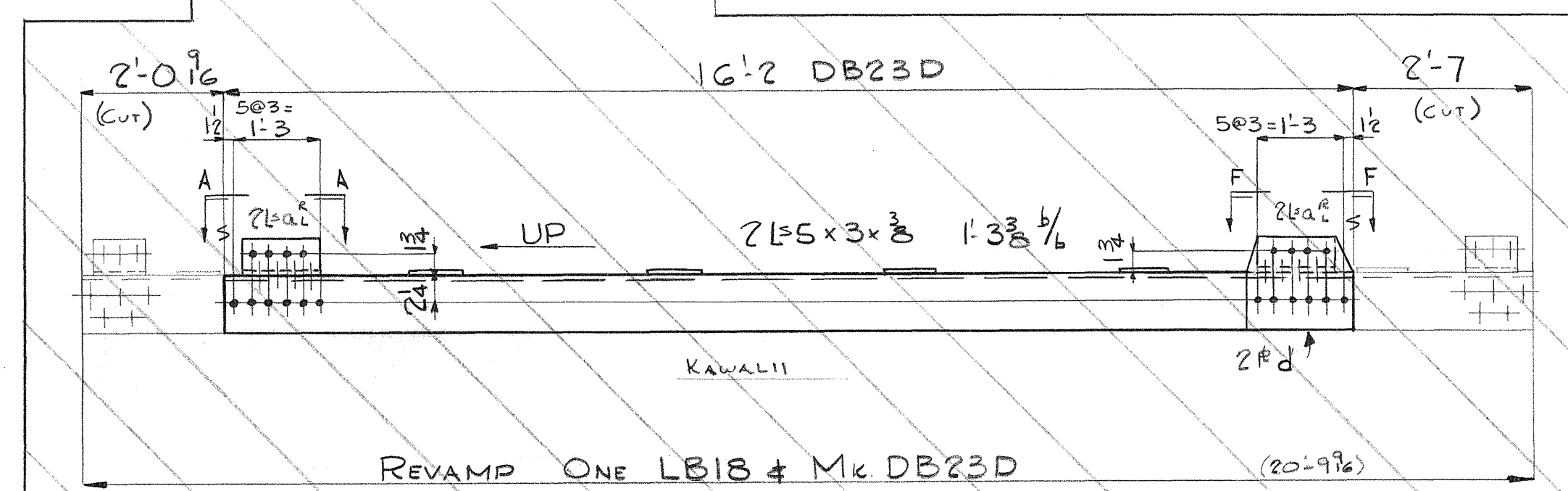
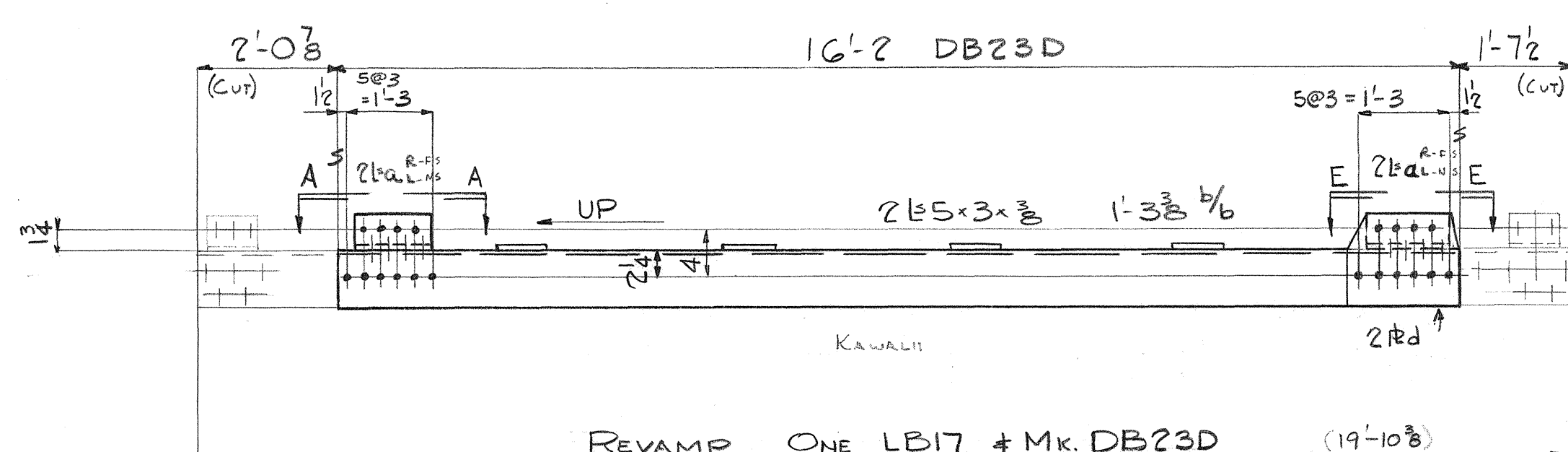
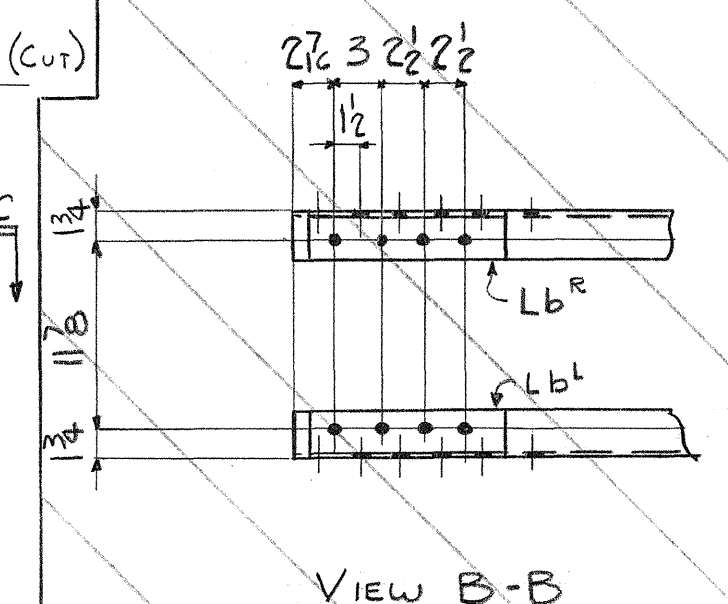
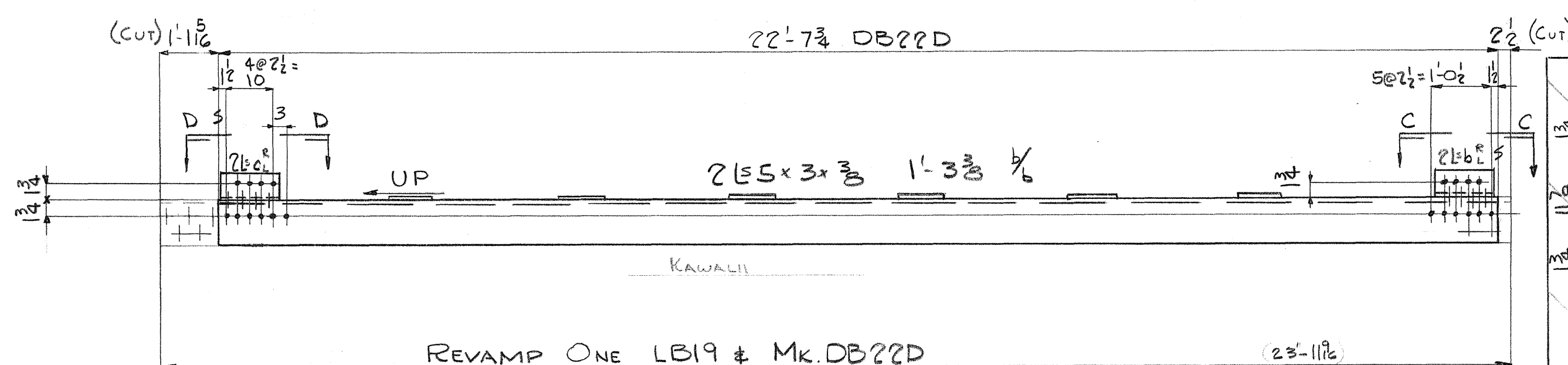
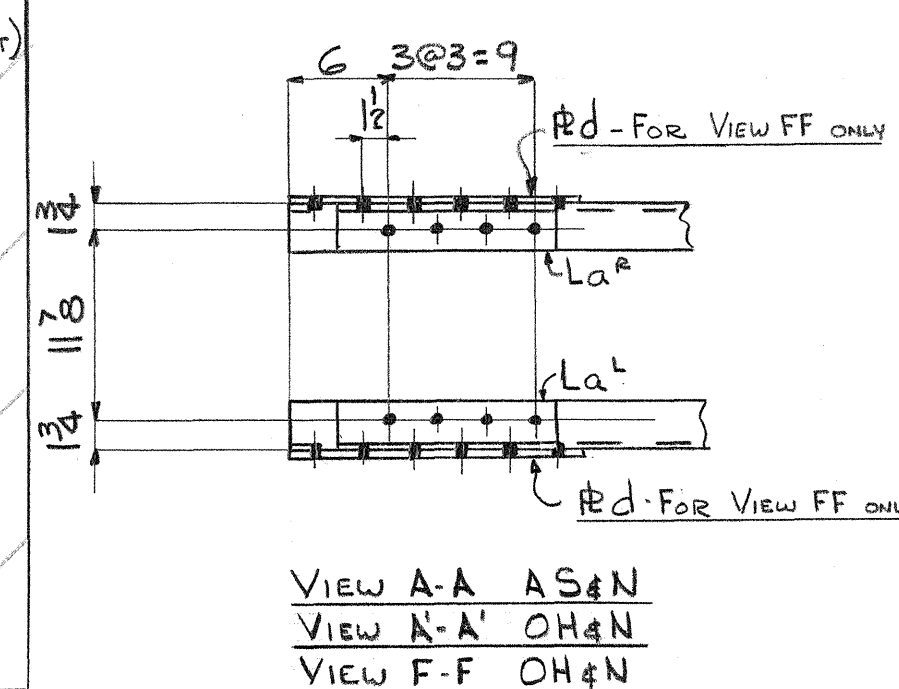
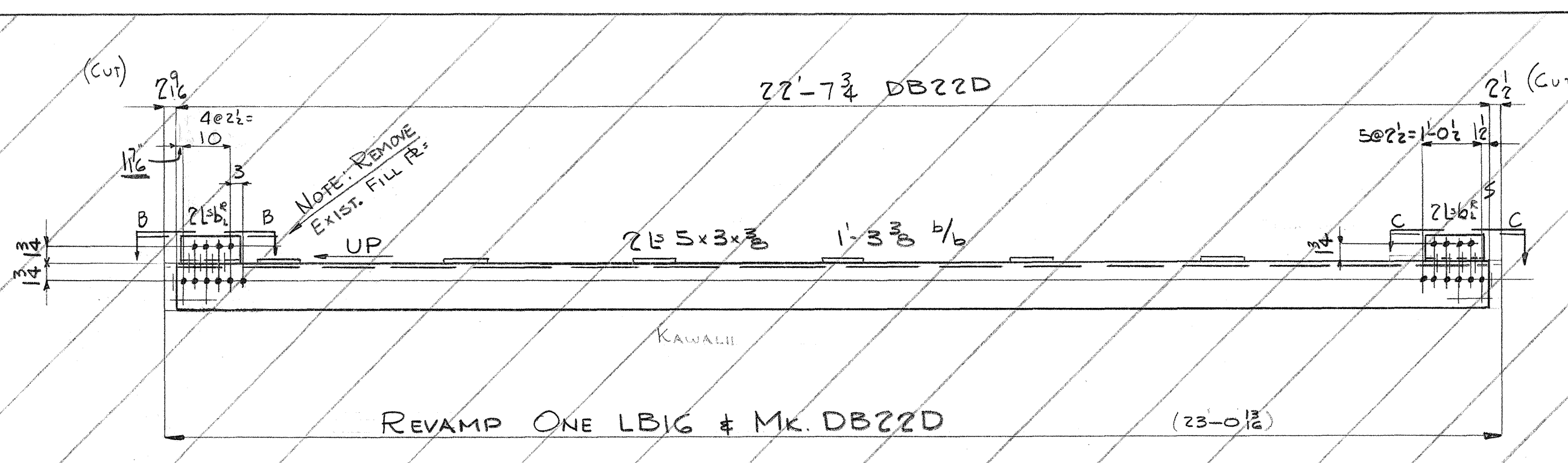
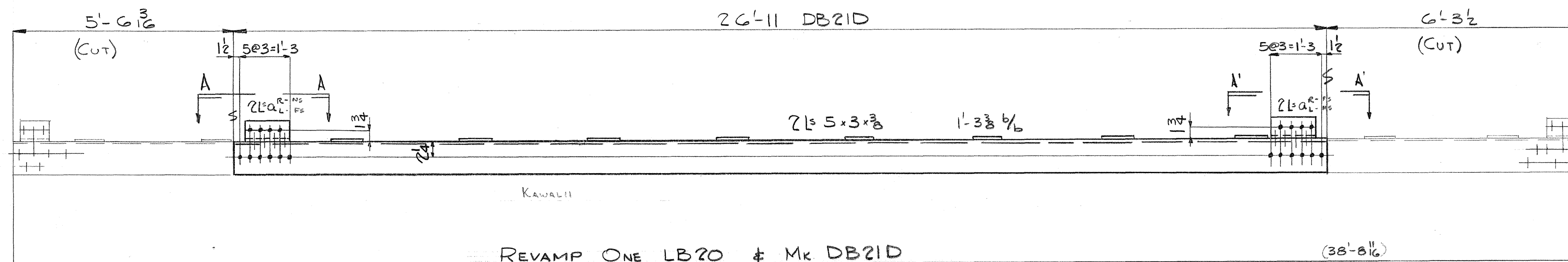
VIEW D-D

Rivets: 3/4"
Holes: 1 1/8"
Paint: 1 1/2 ED UN

INDUSTRIAL DEVELOPMENT CO.
ADDITION TO UMAUMA BRIDGE
HAWAII
INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.
MADE BY DAL 12-27-49 ORDER NO. 3807
CHECKED BY DM 1-18-50 SHEET NO. D22D

BILL OF MATERIAL INDUSTRIAL DEVELOPMENT CO.

No.	Description	Length Ft.	Ins.	Mark	REMARKS
NOTE: BRACES LISTED BELOW ARE TO BE REVAMPED AS SHOWN ON DETAILS					
1	BRACE	38	8 1/4	LB20	SAV. FROM KAWAII
1	Do	23	11 1/2	LB19	Do
1	Do	19	10 3/8	LB17	}
1	Do	17	4 3/4	LH2	
8	L3x3x3/8	1	1 1/2	a	Temp-New
2	L3x3x3/8	1	0	b	Do Do
2	L3x3x3/8	1	0 3/4	c	}
2	LB x 4	1	6	d	



Rivets: 3/4"
Holes: 1 1/2"
Paint: 1/2 ED UN

INDUSTRIAL DEVELOPMENT CO.
ADDITION TO UMAUMA BRIDGE
HAWAII

INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.

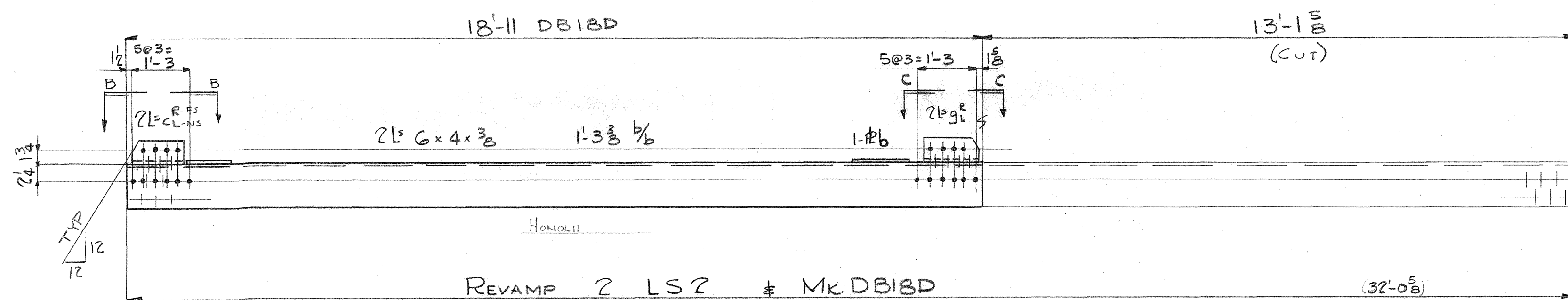
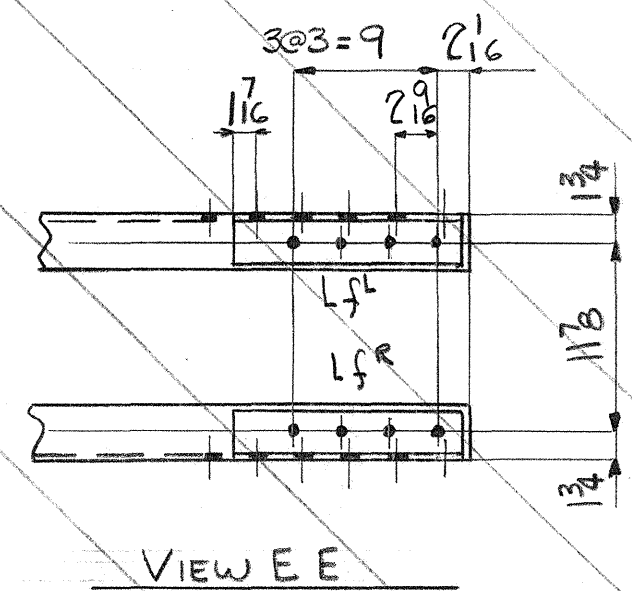
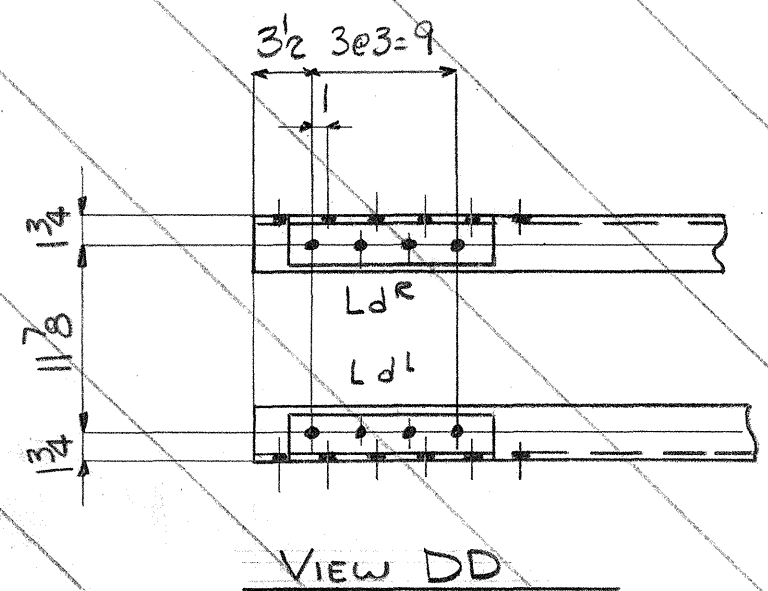
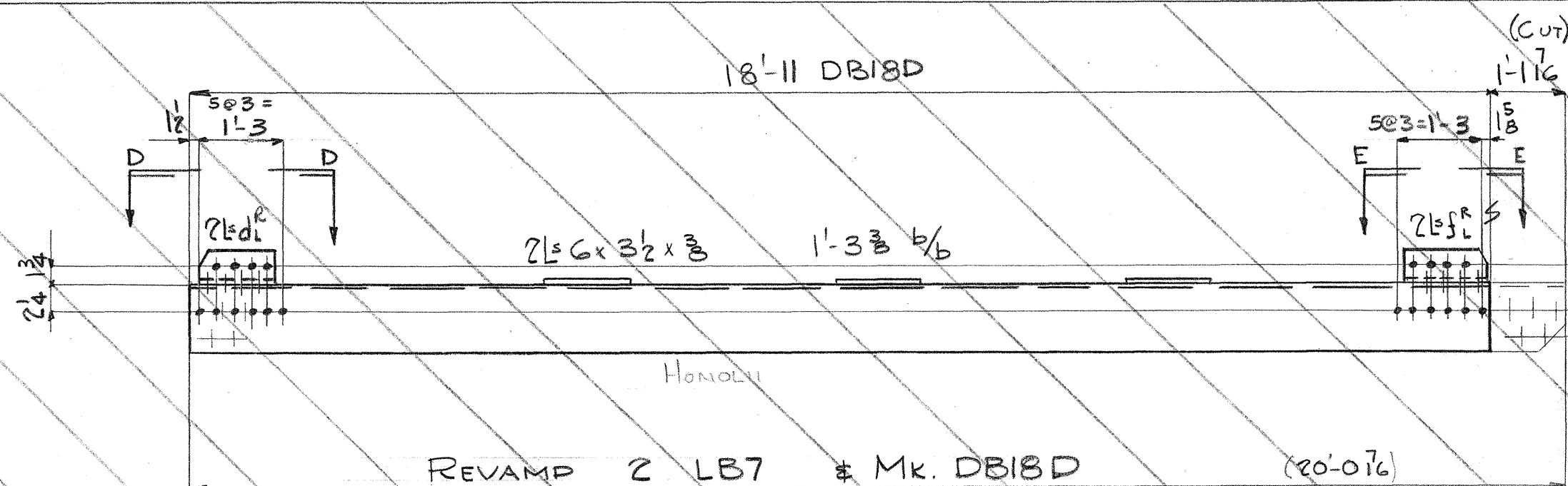
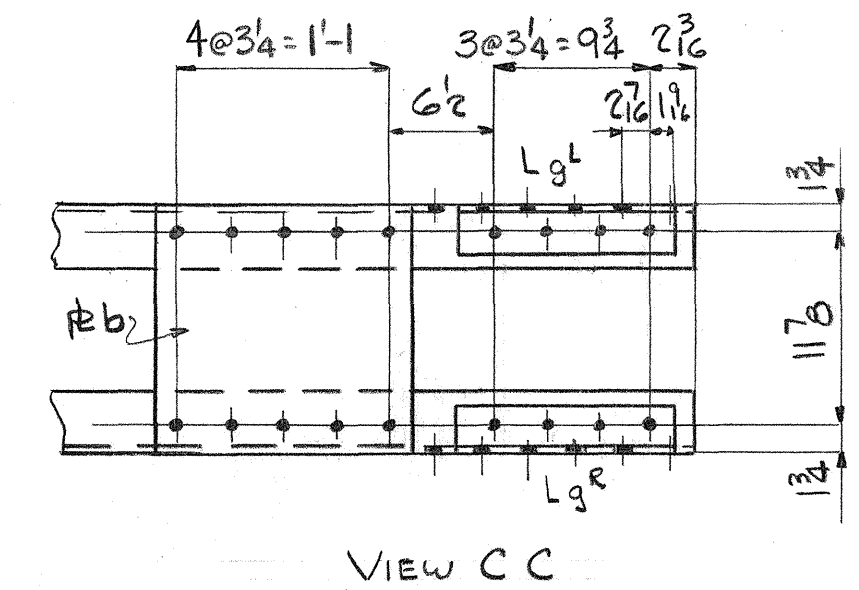
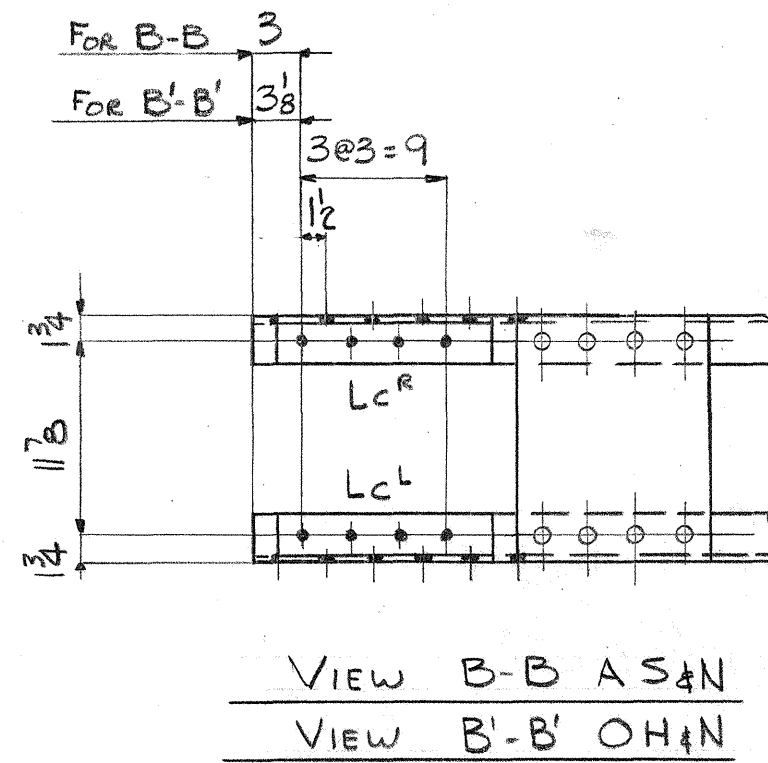
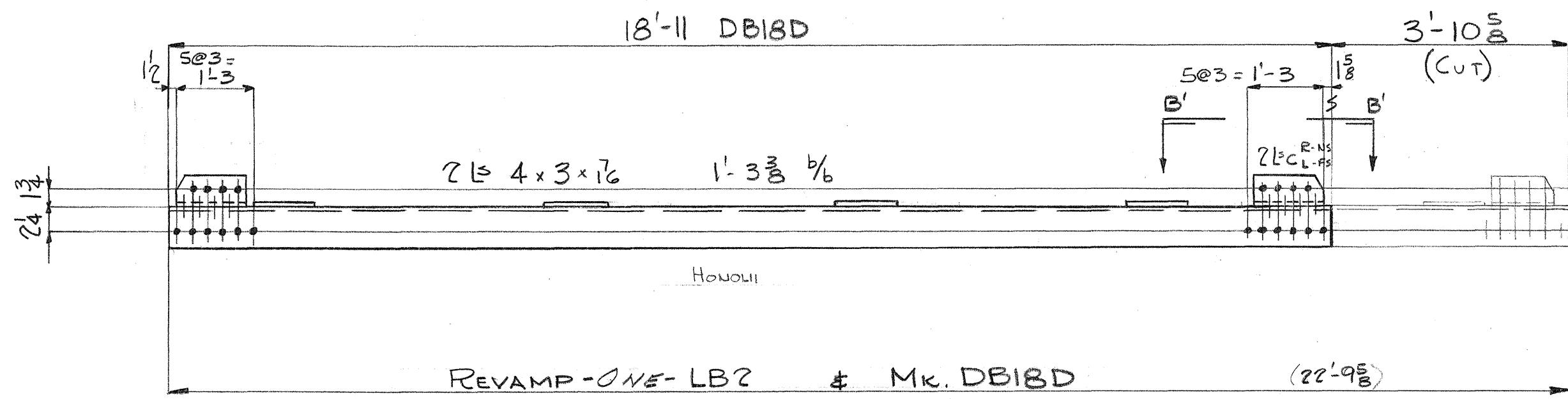
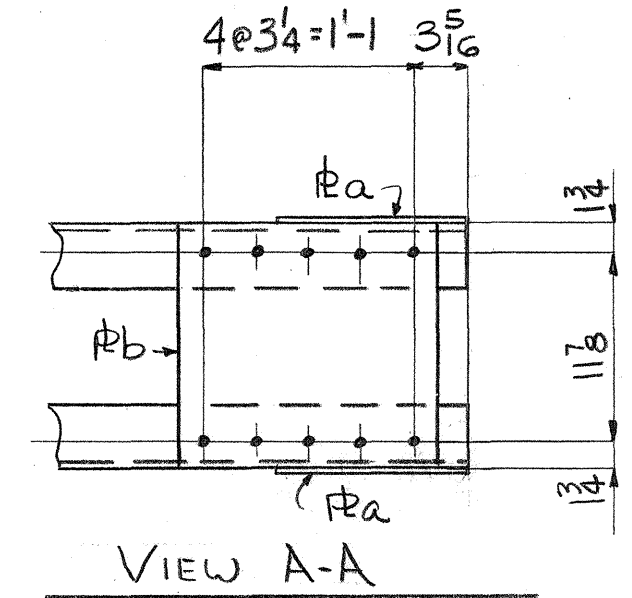
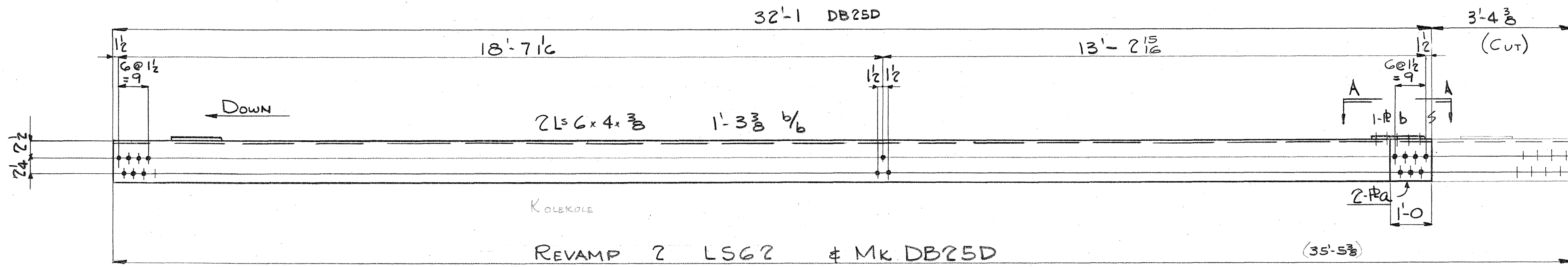
MADE BY: DAL 12-28-49 ORDER NO.: 3807
CHECKED BY: DP 1-18-50 SHEET NO.: D23D

5468.181

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HA	SDR 2(2) 1950	1950	182	301

BILL OF MATERIAL INDUSTRIAL DEVELOPMENT CO.

No.	Description	Length Ft.	Inch.	Mark	REMARKS
NOTE: BRACES LISTED BELOW ARE TO BE REVAMPED AS SHOWN ON DETAILS.					
2	BRACES	35	5 3/8	LSG2	SALV. FROM KOLEKOLE
1	Do	22	9 3/8	LB2	HONOLULU
2	Do	32	0 5/8	LS2	HONOLULU
4	6 x 4	1	0	a	Temp New
4	15 3/8 x 3	1	4	b	Do Do
6	L3 x 3 x 3/8	1	1 1/2	c	
4	L3 x 3 x 3/8	1	2 1/2	g	



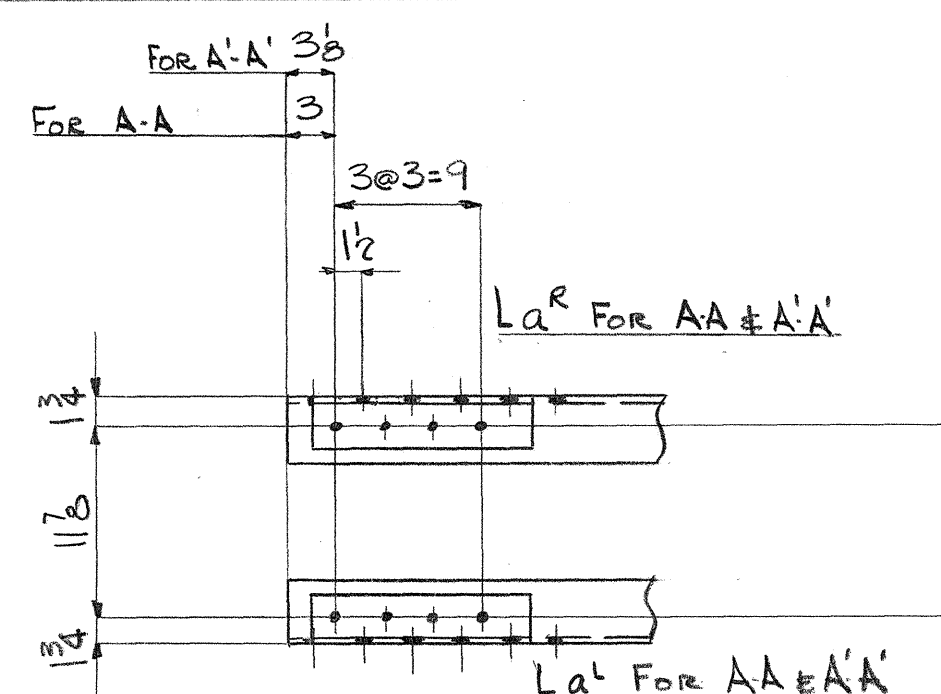
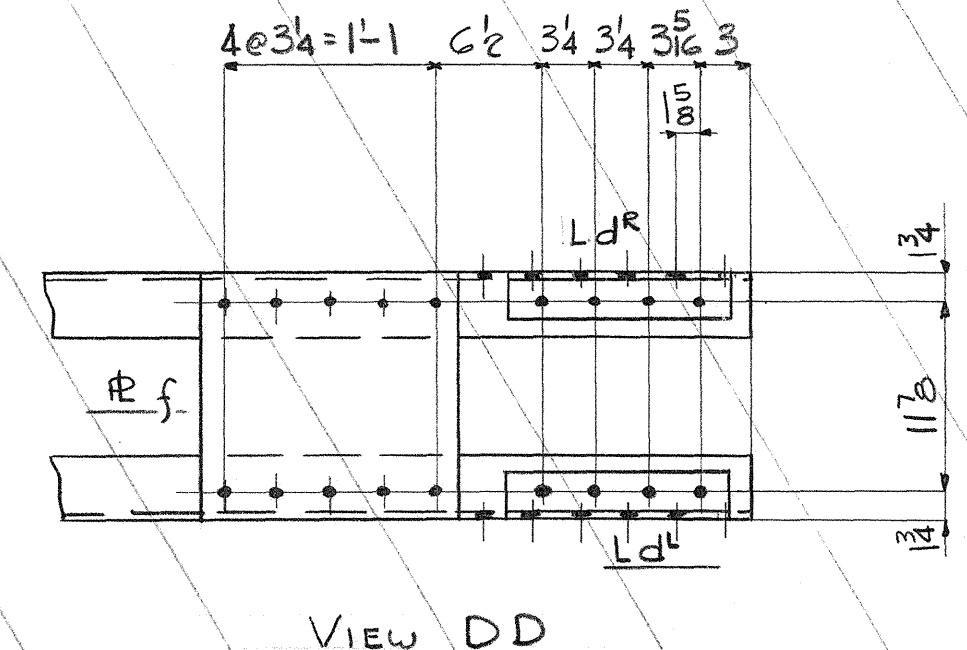
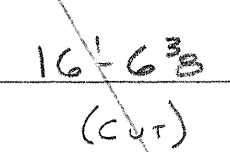
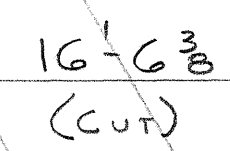
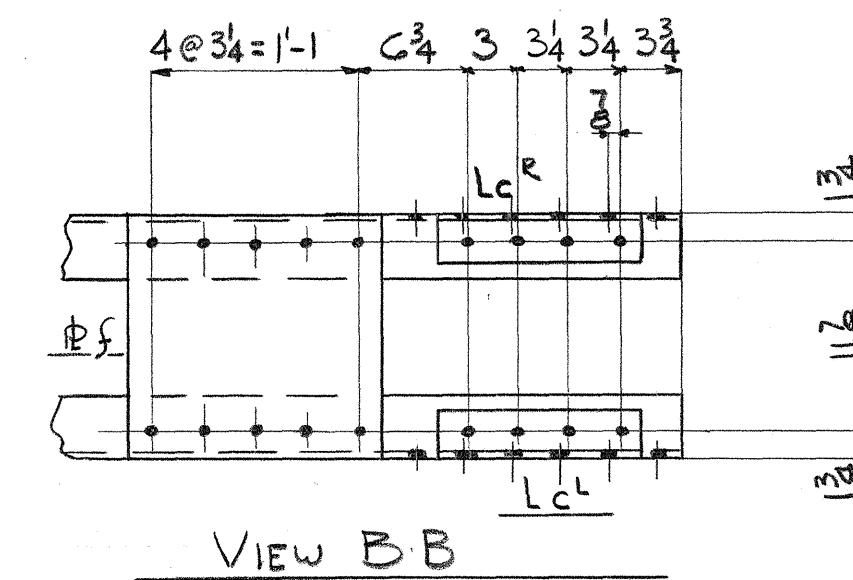
Rivets: 3/4
Holes: 1 1/2
Paint: 1 1/2 ED UN

INDUSTRIAL DEVELOPMENT COMPANY
ADDITION TO THE UMAUMA BRIDGE
HAWAII

INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.

MADE BY: DAL 12-30-49 ORDER NO.: 3807
CHECKED BY: DM 1-18-50 SHEET NO.: D24D

No.	Description	Length		Mark	REMARKS
		Ft.	In.		
NOTE: BRACES LISTED BELOW ARE TO BE REVAMPED AS SHOWN ON DETAILS.					
4	BRACES	31	3	LSI	SALV FROM HONOLULU
1	Do	23	6 1/2	LB2	KAWAII
12	3x3x3/8	1	12	a _L	Temp New
8	3x3x3/8	1	0 1/2	c _L	Do Do
7	15 3/8 x 3/8	1	4	f	Do Do



VIEW A-A AS & N
VIEW A'-A' OH & N

Rivets: $\frac{3}{4} \phi$

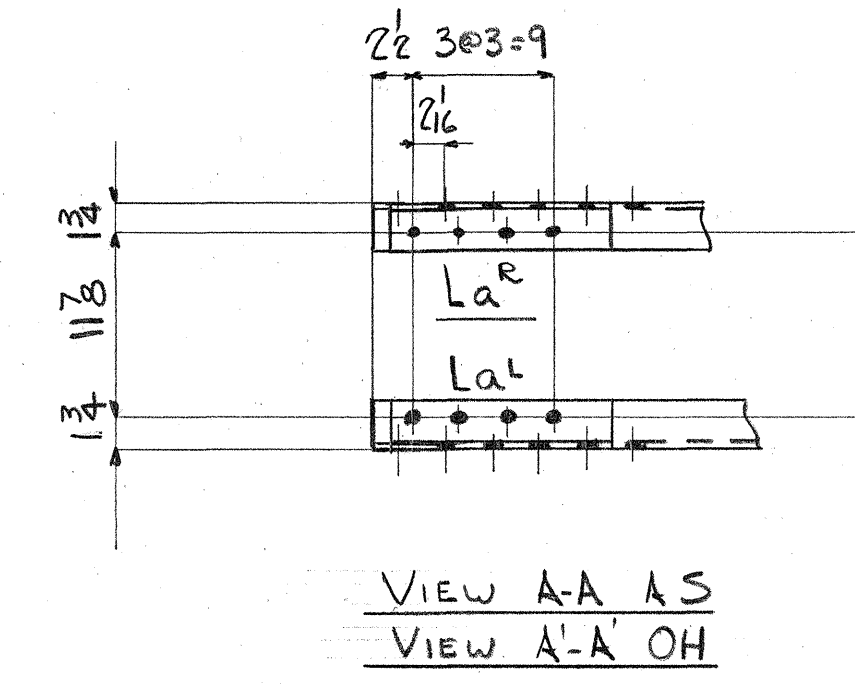
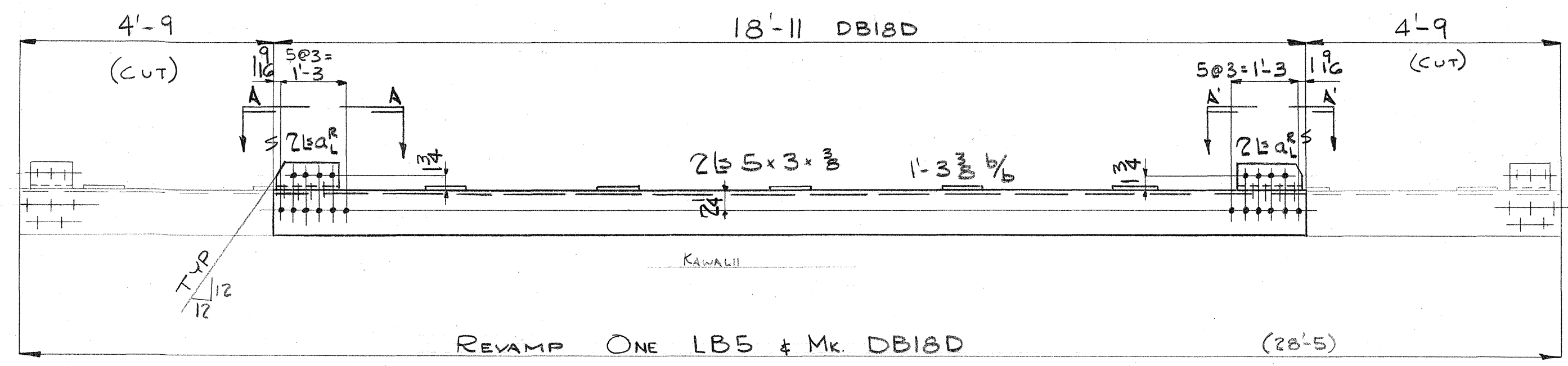
Holes: $\frac{13}{16} \phi$ $1\frac{1}{2}$ ED UN

Paint:

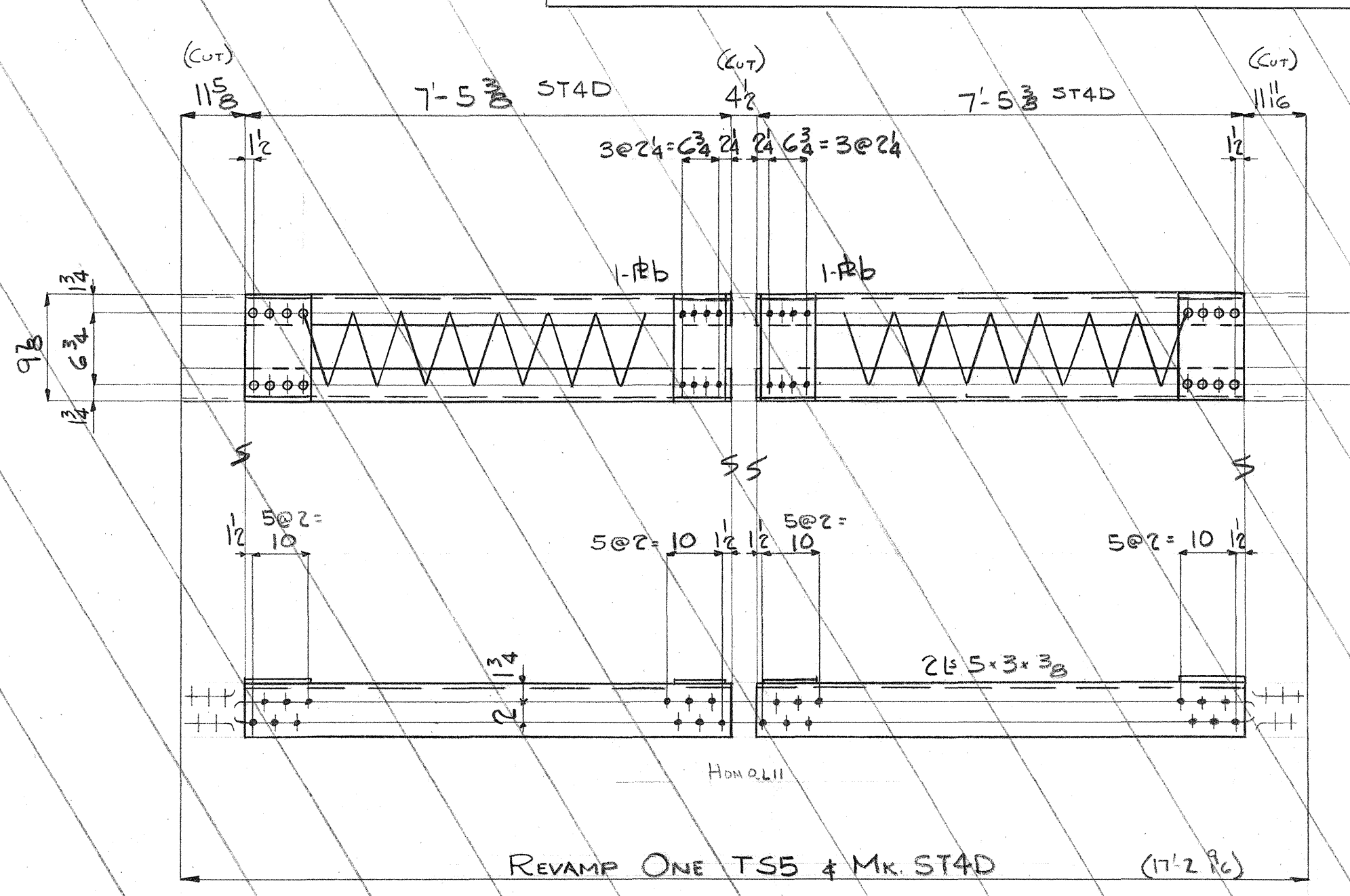
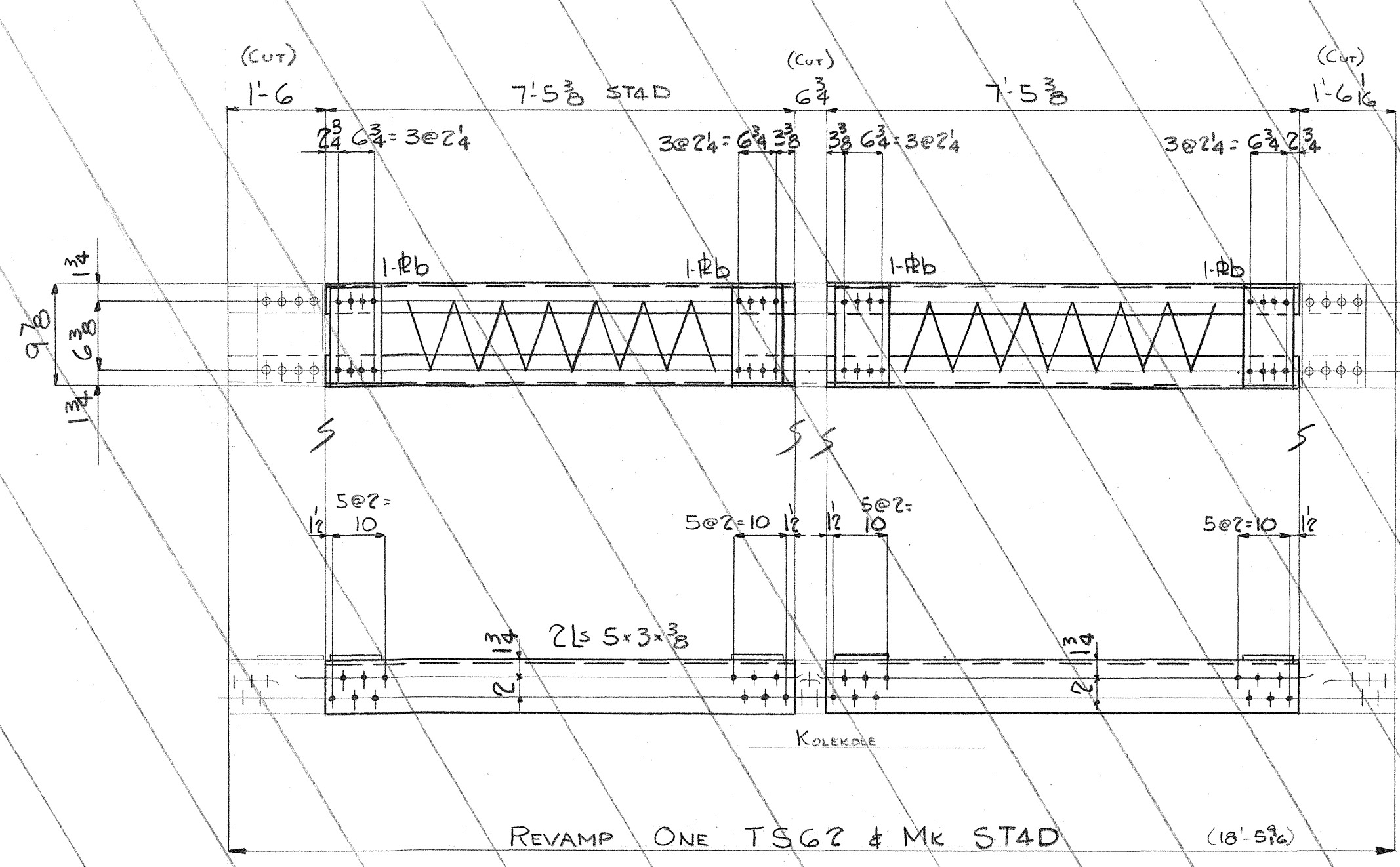
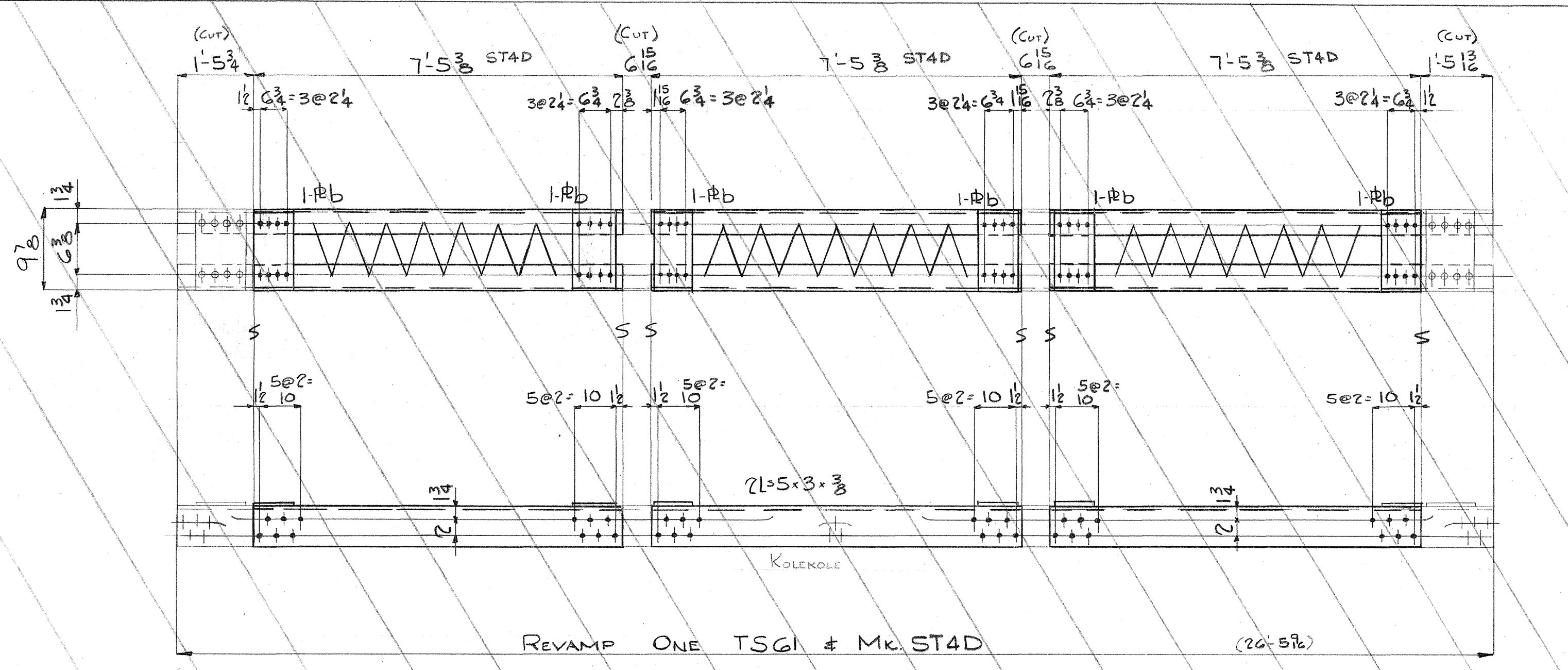
INDUSTRIAL DEVELOPMENT COMPANY
ADDITION TO UMAUMA BRIDGE
HAWAII

INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.

MADE BY	DAL	1-3-50	ORDER NO.	3807
CHECKED BY	DM	1-18-50	SHEET NO.	D250



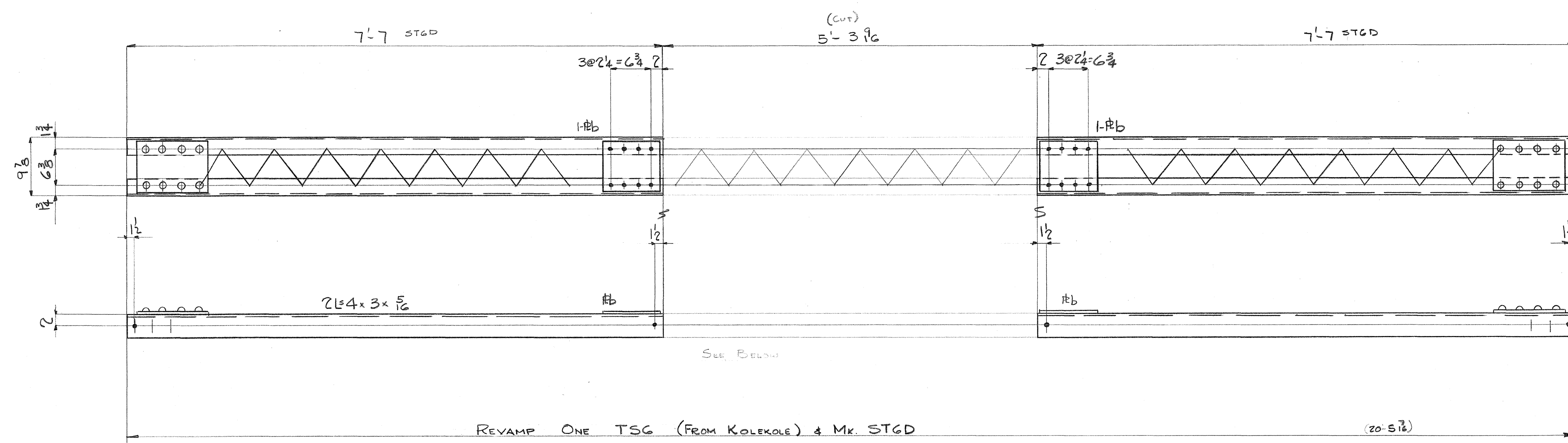
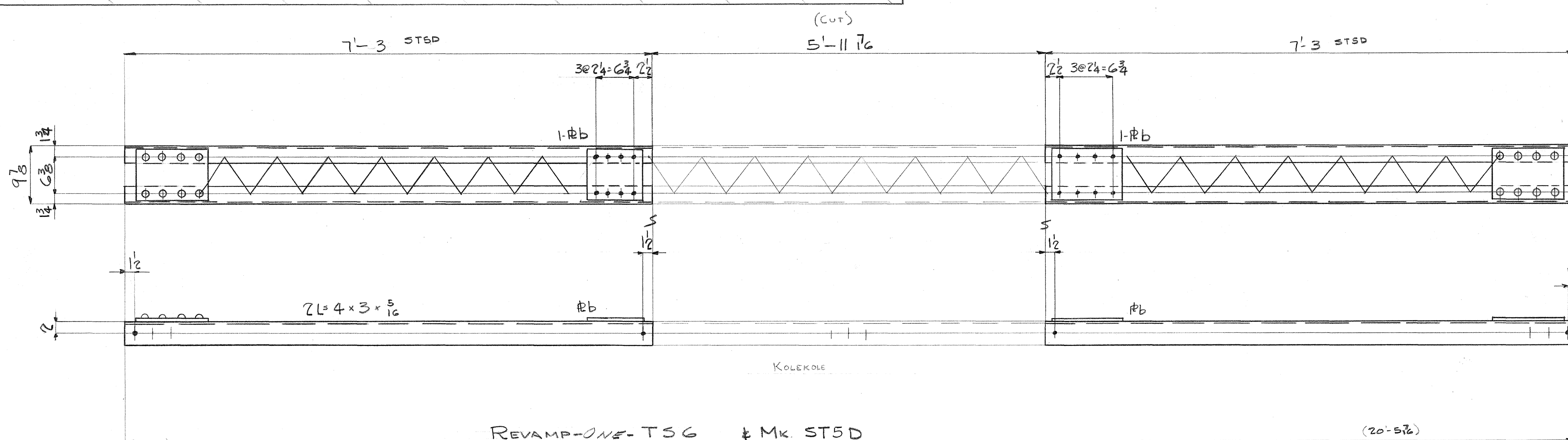
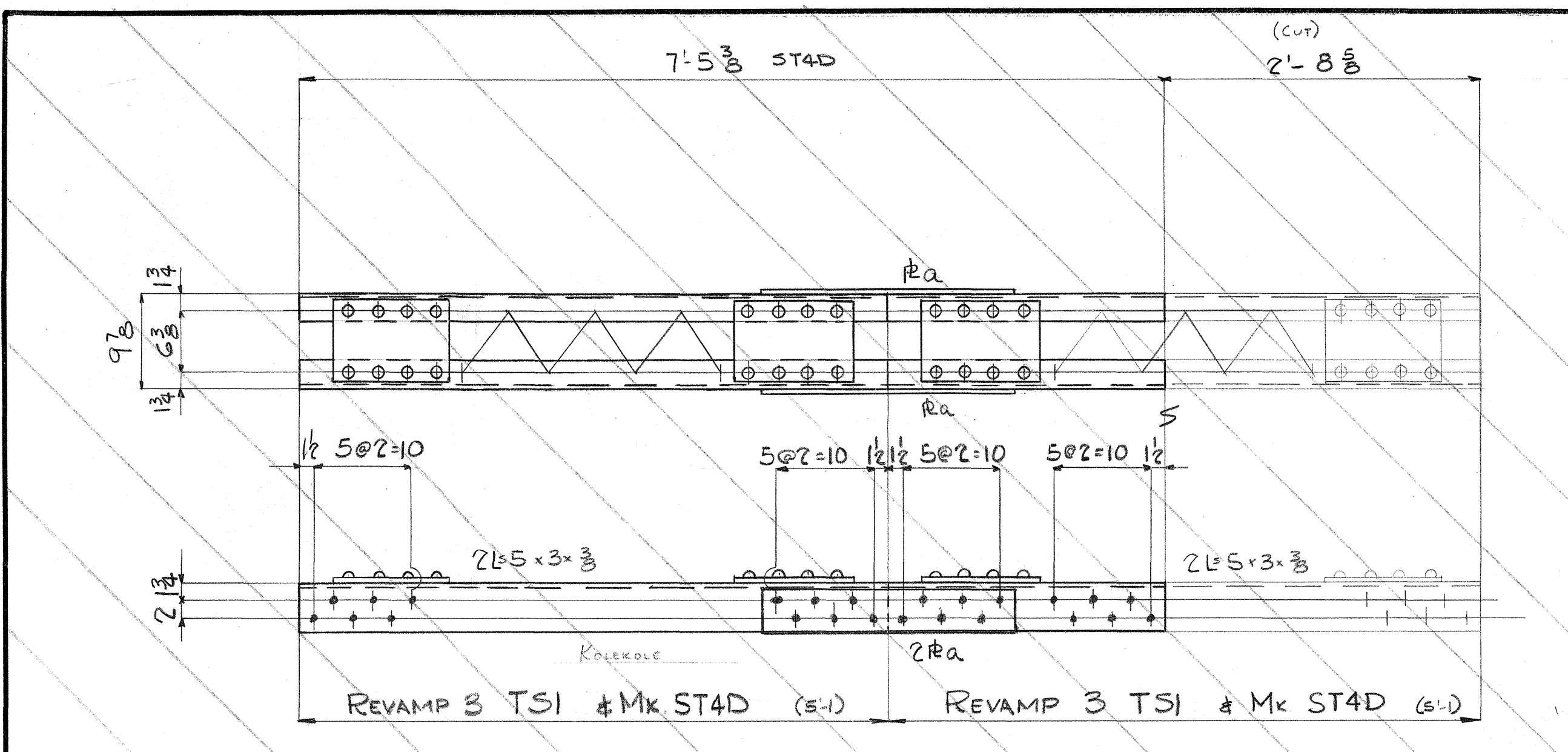
BILL OF MATERIAL INDUSTRIAL DEVELOPMENT CO.				
No.	Description	Length Ft.	Ins.	REMARKS
NOTE: BRACES LISTED BELOW ARE TO BE REVAMPED AS SHOWN ON DETAIL				
1	BRACE	28	5	LB5 SALV. FROM KAWAII
4	L3x3x3	1	1/2	Q1 Temp-New



Rivets: 3/4"
 Holes: 1 1/2" ED UN
 Paint:
 INDUSTRIAL DEVELOPMENT COMPANY
 ADDITION TO UMAUMA BRIDGE
 HAWAII
 INDEPENDENT IRON WORKS, INC.
 OAKLAND, CALIF.
 MADE BY DAL 1-4-50 ORDER NO. 3807
 CHECKED BY DP 1-19-50 SHEET NO. D26D

BILL OF MATERIAL

No.	Description	Length Ft. In.	Mark	REMARKS
NOTE: BRACES LISTED BELOW ARE TO BE REVAMPED AS SHOWN ON DETAILS.				
SALV. FROM:				
1	BRACES	20 5 1/2	TSG	KOLEKOLE
1	Do.	20 5 1/2	TSG	HONOLULU
4	# 9 1/2 x 3/8	0 9 3/4	b	TEMP (NEW)



Rivets: 3/4
Holes: 1 3/4 1/2 ED UN.
Paint:

INDUSTRIAL DEVELOPMENT COMPANY
ADDITION TO UMAUMA BRIDGE
HAWAII

INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.

MADE BY DAL 1-5-50 ORDER NO. 3807
CHECKED BY DD 1-19-50 SHEET NO. D270

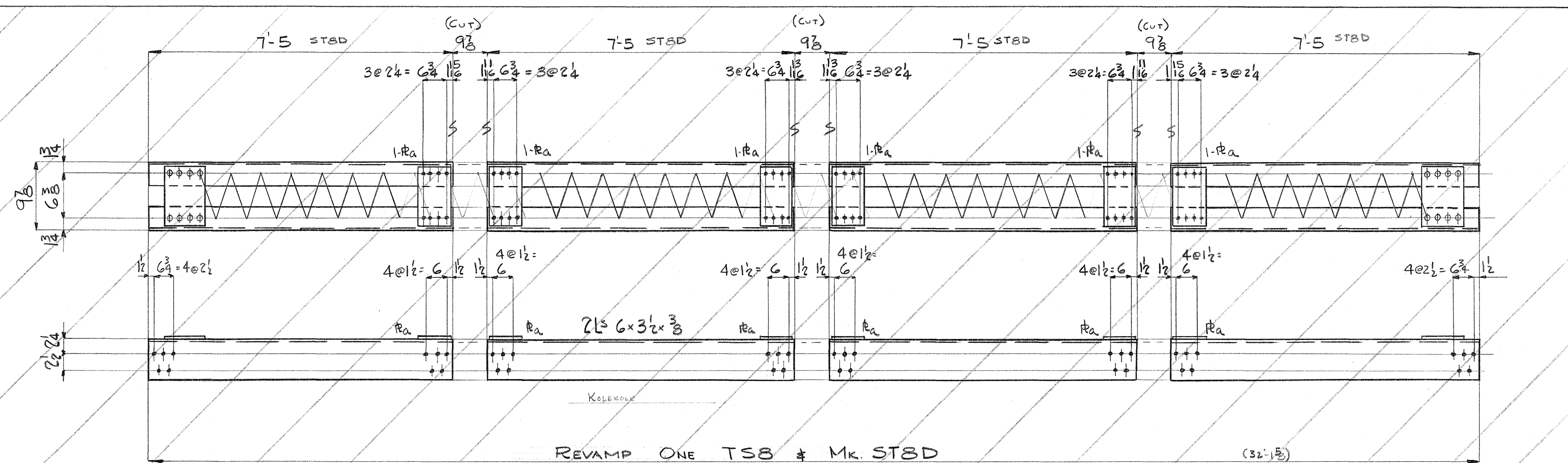
Rivets: $3_4 \phi$
Holes: $1\frac{3}{16} \phi$ $1\frac{1}{2}$ ED UN
Paint:

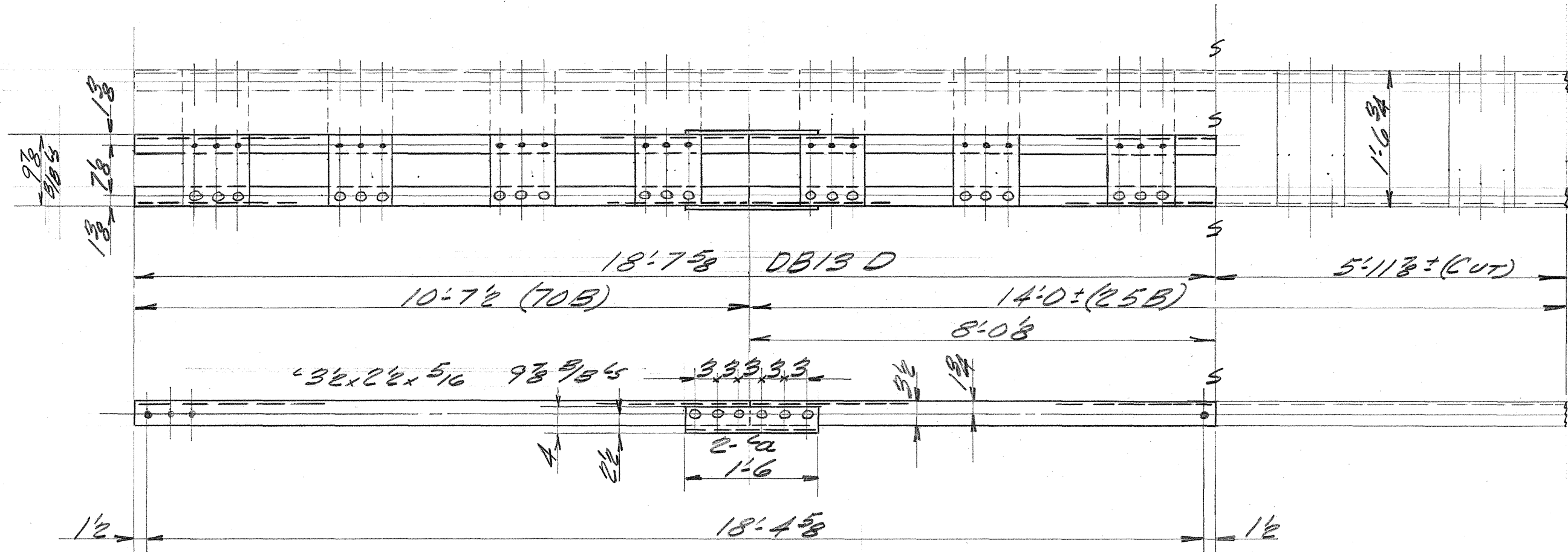
INDUSTRIAL DEVELOPMENT COMPANY
ADDITION TO UMAUMA BRIDGE
HAWAII

INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.

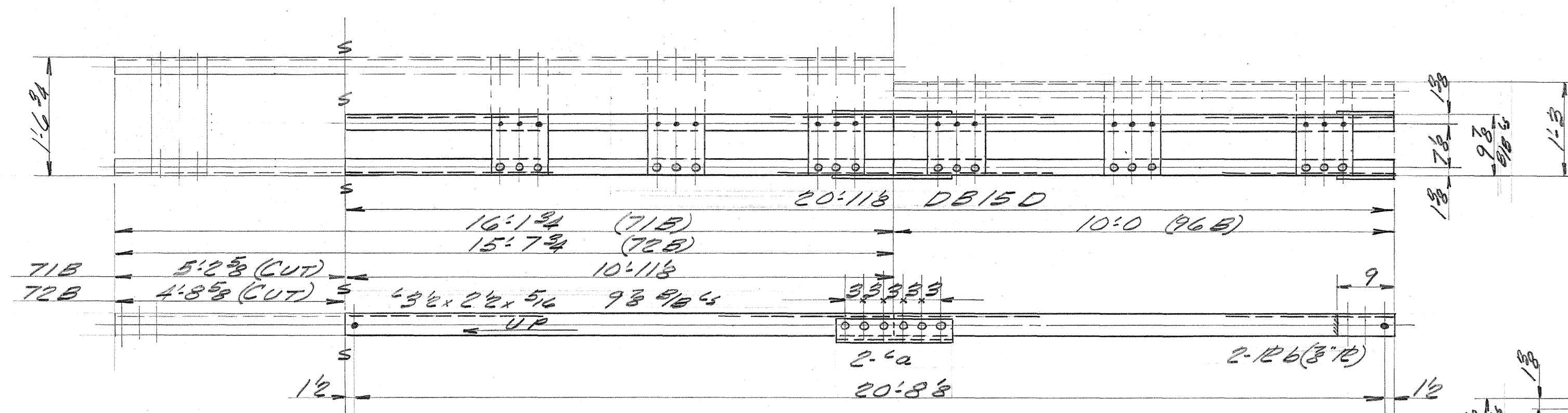
MADE BY	DAL	1-6-50	ORDER NO.	3807
CHECKED BY	DP	1-19-50	SHEET NO.	D280

5468.186 *FS 189*

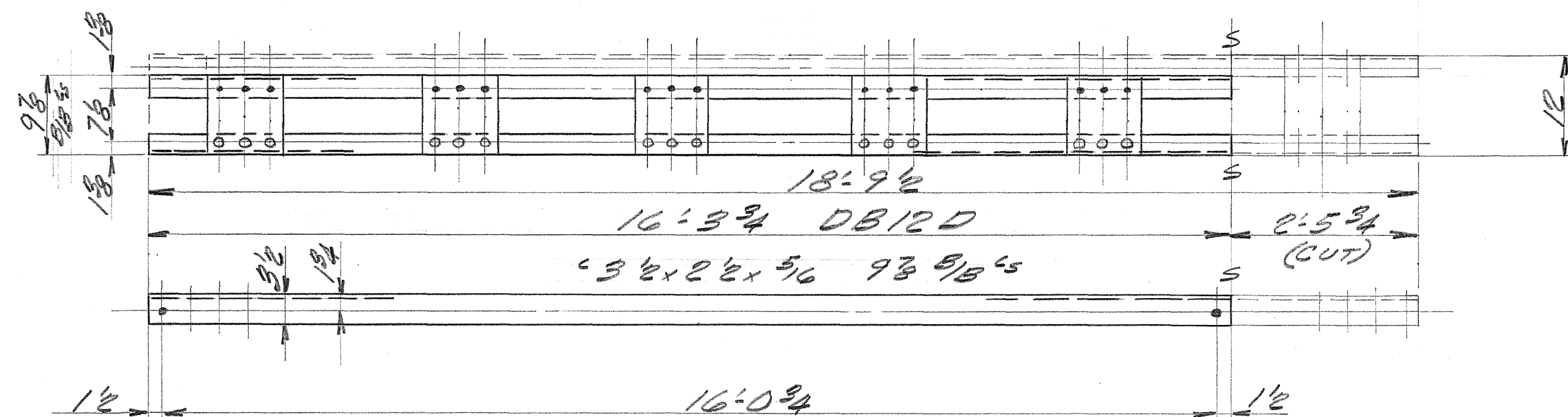




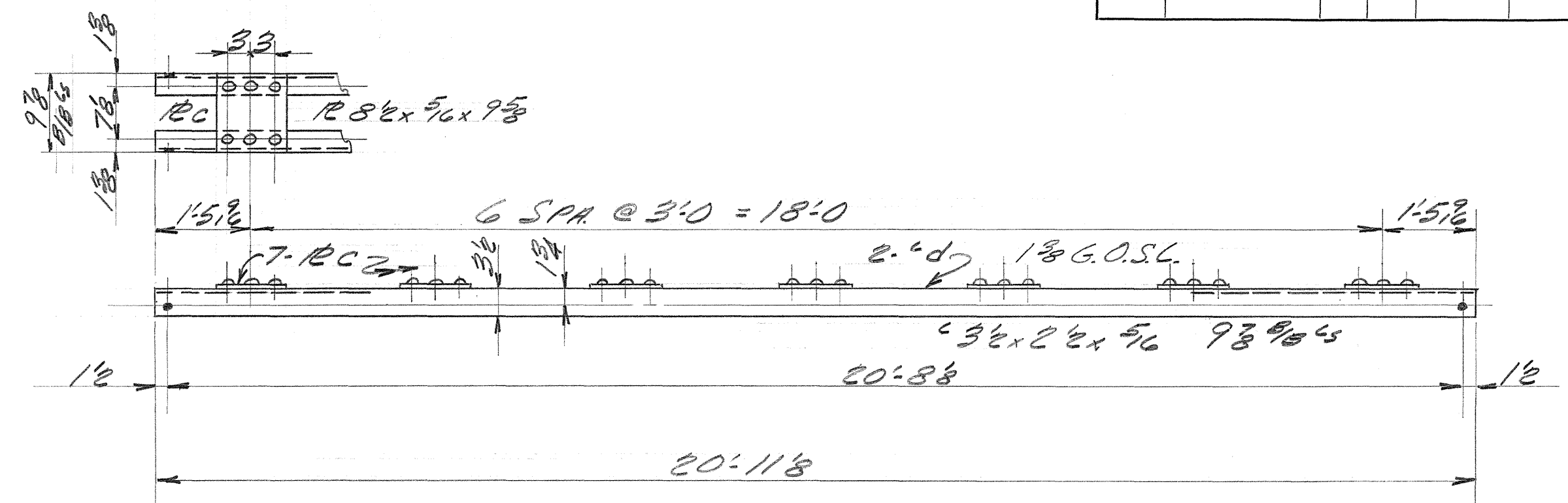
REVAMP-ONE-70B } MAKES-ONE-DB13D
DO. -ONE-25B }



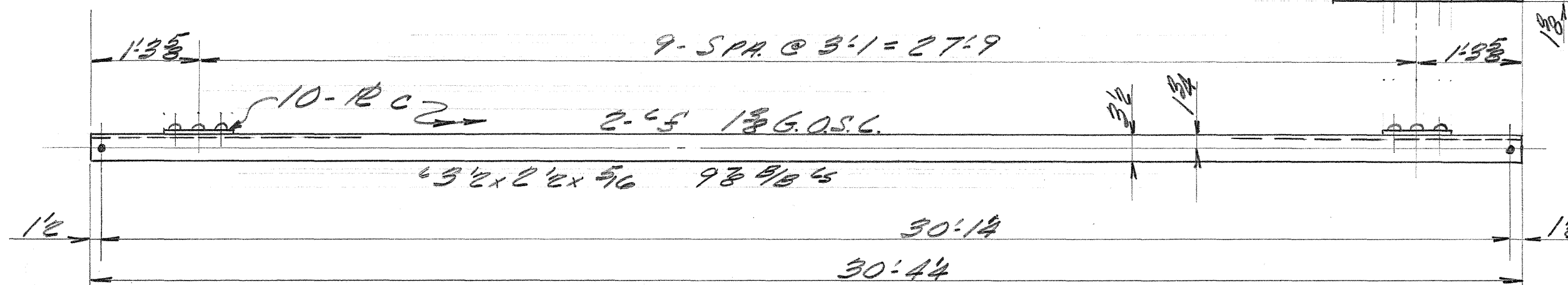
REVAMP - 2- 96B
DO. - ONE- 71B
DO. ONE- 72B } MAKES - 2- DB/SD



REVAMP-2-185 } NAKES-2-DB12D



MAKE-6-BRACES NR DB9D (NEW NAT'L)



NAKE-6-BRACES NR. DB10D (NEW NAT'L)

No.	Description	Length		Mark	REMARKS
		Ft.	In.		
NOTE: BRACE THE PEICES LISTED BELOW AS SHOWN ON THE DETAILS					
1	BRACE			70B	
1	Do.			25B	
2	Do.			96B	
1	Do.			71B	
1	Do.			72B	
2	Do.			18B	
NEW MATL IS LISTED BELOW					
6	BRACES			DB9D	
6	Do.			DB10D	
6	4x3x $\frac{3}{8}$	1	6	a	TENR
4	R3 $\frac{1}{2}$ x $\frac{3}{8}$	0	9	b	Do.
100	R3 $\frac{1}{2}$ x $\frac{3}{8}$	0	9 $\frac{3}{8}$	c	Do.
12	3 $\frac{1}{2}$ x2 $\frac{1}{2}$ x $\frac{3}{8}$	20	11 $\frac{1}{2}$	d	
12	3 $\frac{1}{2}$ x2 $\frac{1}{2}$ x $\frac{3}{8}$	30	4	e	
735	$\frac{3}{4}$ " ¹¹⁰ RIVETS	(SHOP)			

Rivets: 3/4"
 Holes: 1 3/8"
 Paint: (SEE SPECS)

INDUSTRIAL DEV. CO.
ADDITION TO THE
UNRAUMA BRIDGE
- HAWAII -
INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.

MADE BY	<i>DM</i>	<i>8-20-50</i>	ORDER NO.	<i>3807</i>
CHECKED BY			SHEET NO.	<i>0292</i>

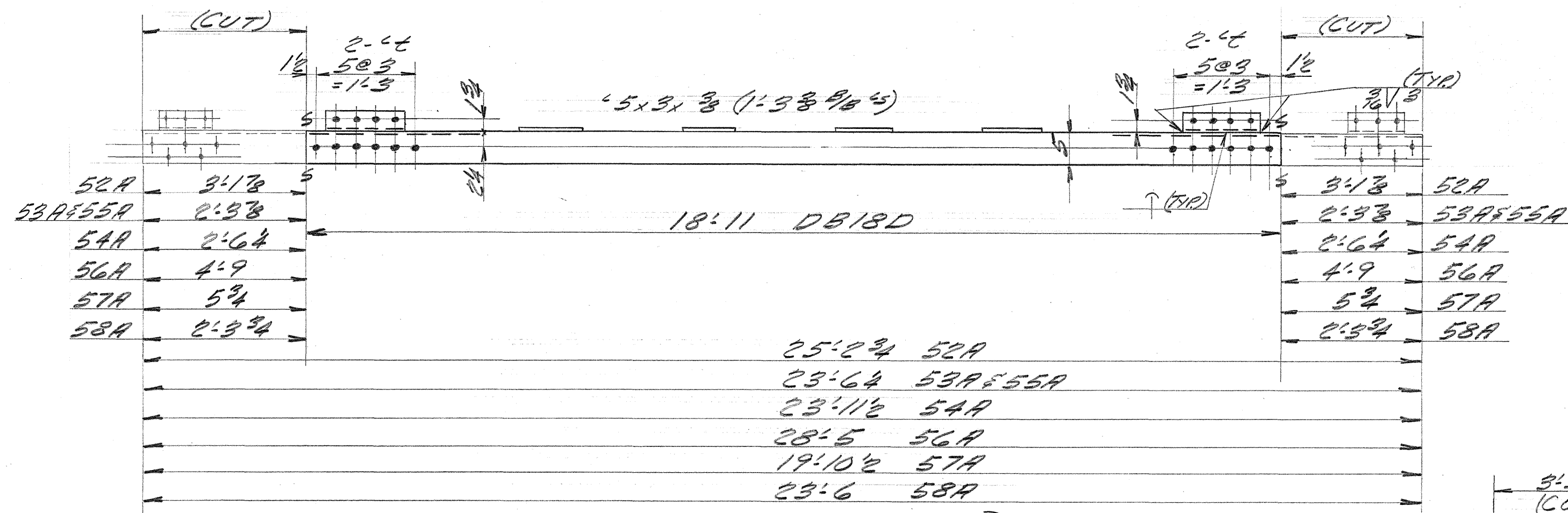
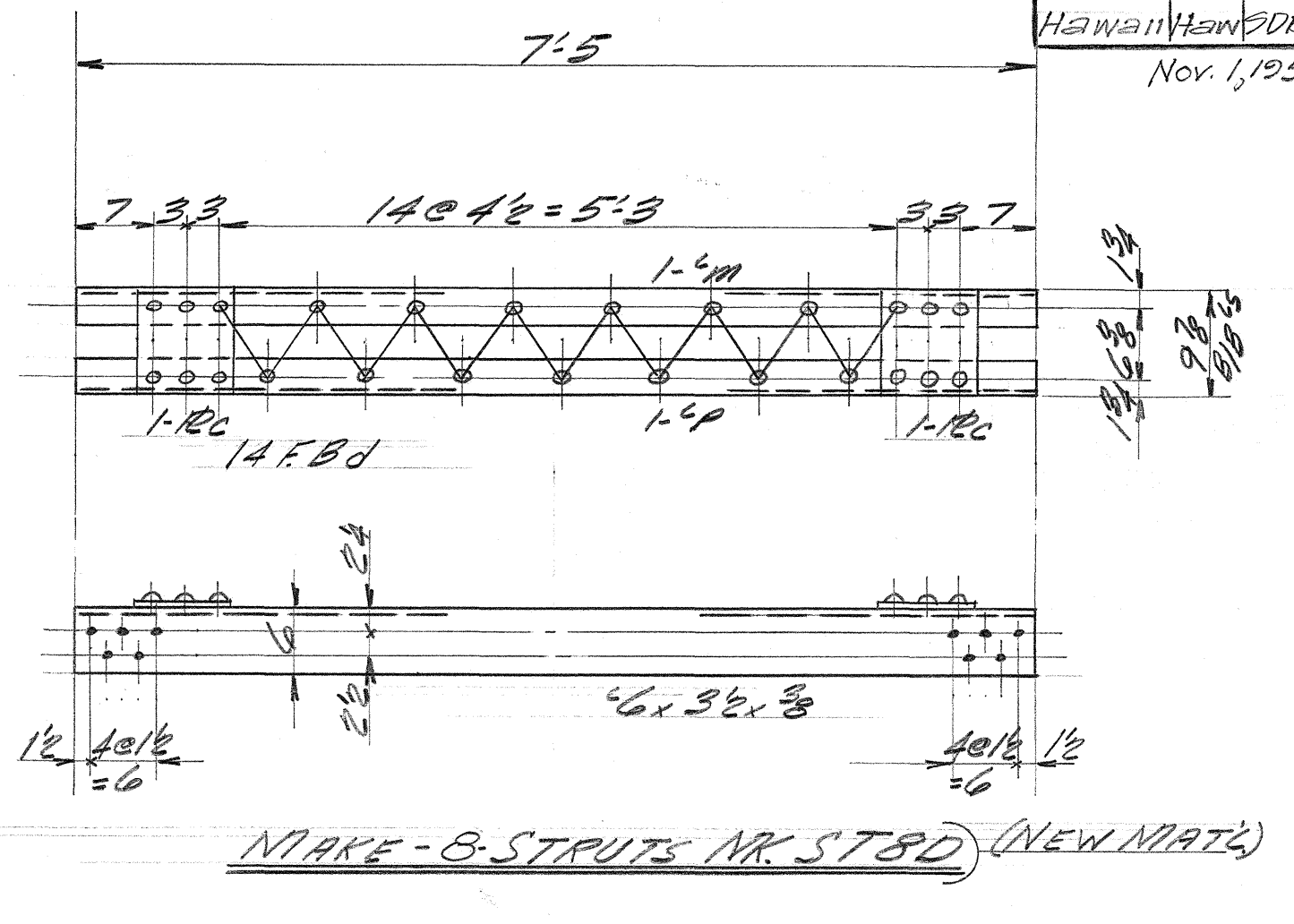
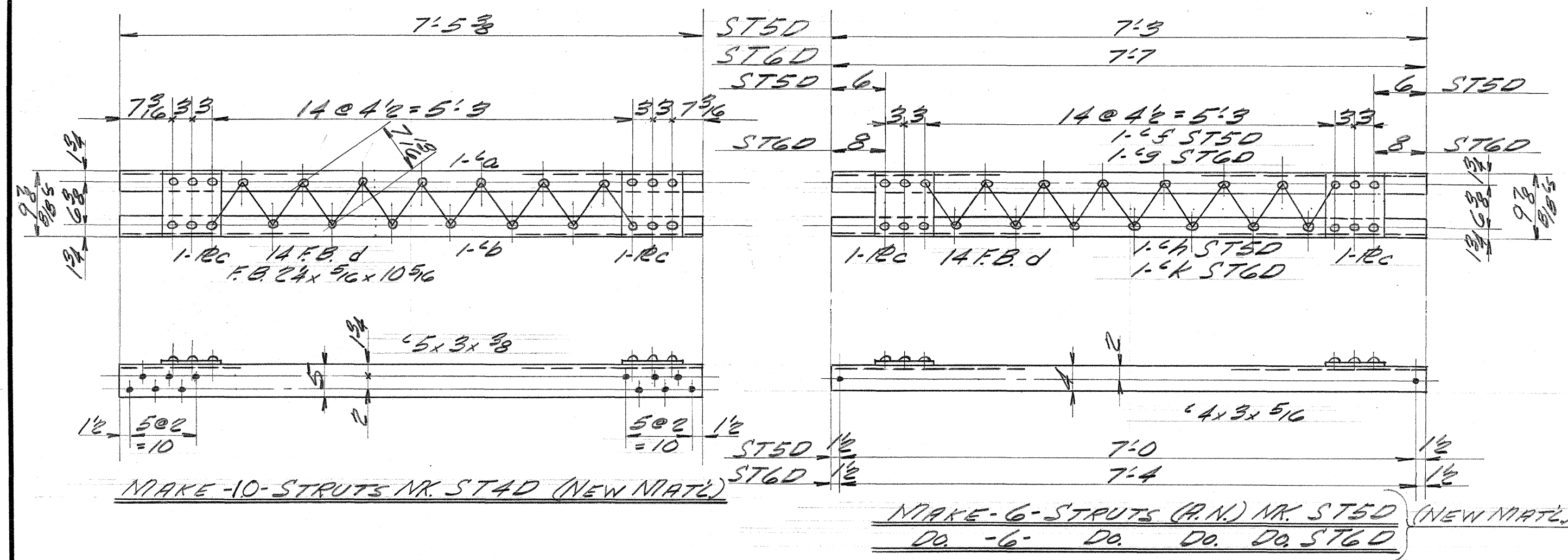
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MADE BY	DAL	1-6-50	ORDER NO.	380
CHECKED BY	<i>DD</i>	1-19-50	SHEET NO.	D300

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	DD-13	1950	187	301

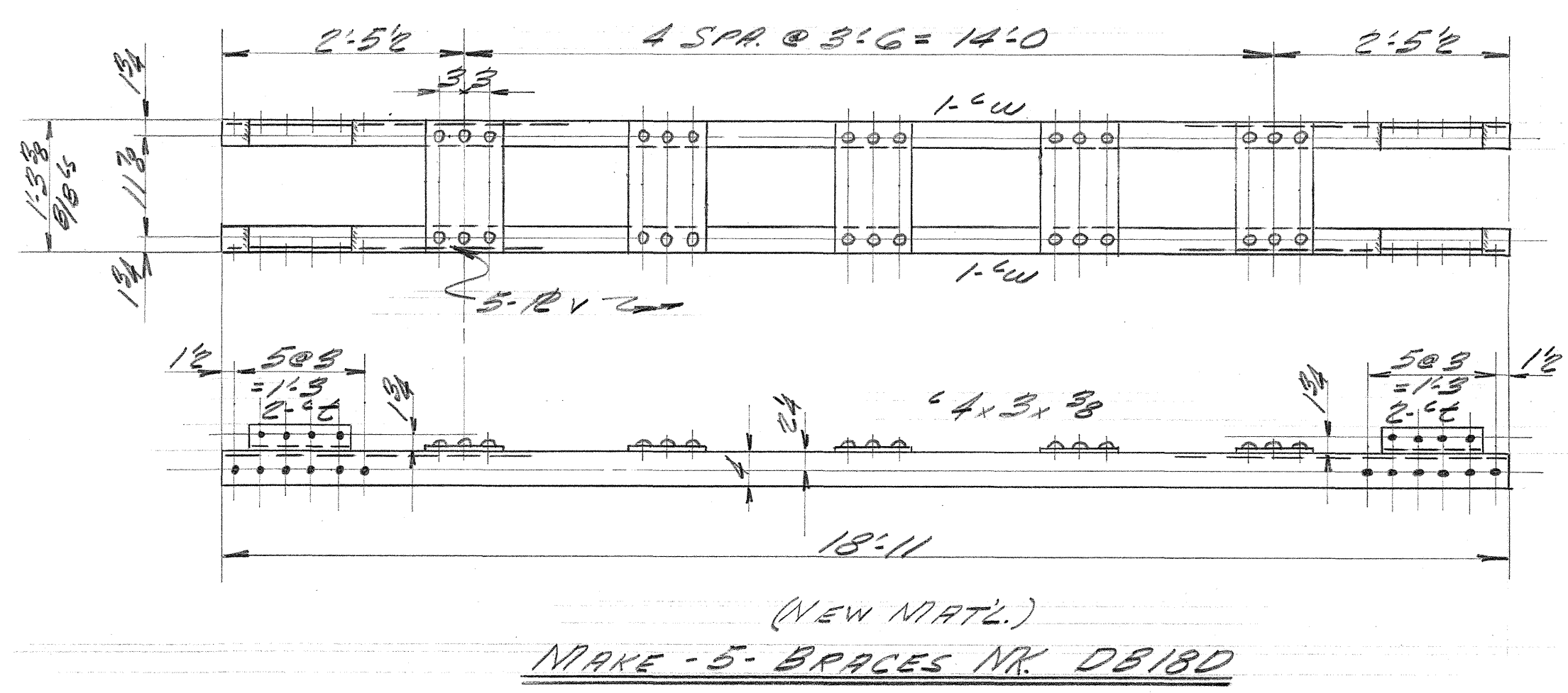
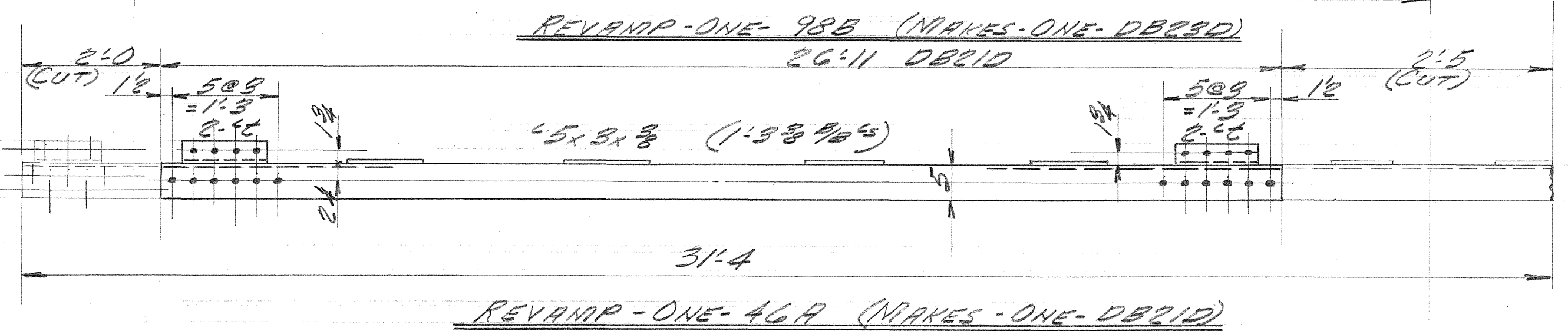
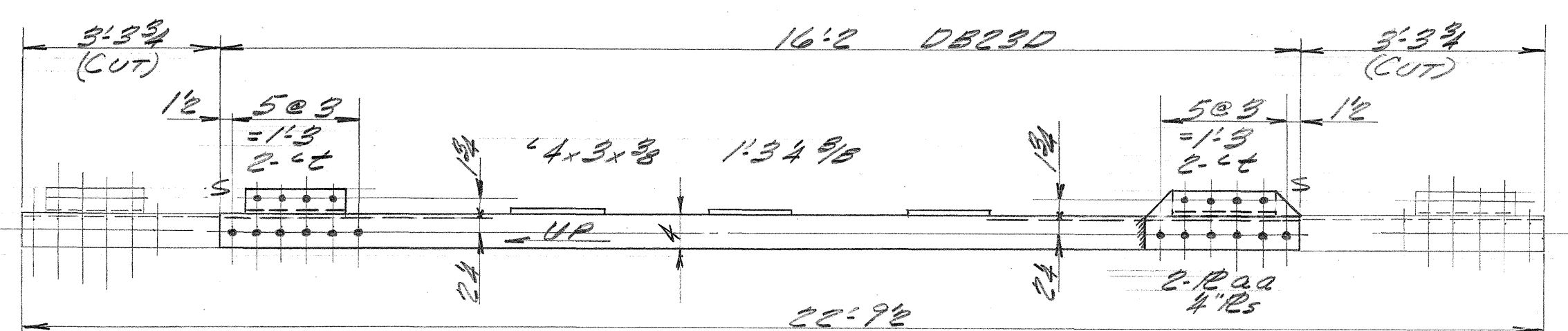
BILL OF MATERIAL
UMAUNA BRIDGE

No.	Description	Length Ft.	Ins.	Mark	REMARKS
NOTE: REVAMP THE BRACES LISTED BELOW AS SHOWN ON THE DETAIL					
1	BRACE			52A	
2	Do			53A	
1	Do			54A	
1	Do			55A	
1	Do			56A	
1	Do			57A	
1	Do			58A	
1	Do			98B	
1	Do			46A	
NEW MATERIAL LISTED BELOW					
10	STRUTS			STAD	
6	Do			STSD	
6	Do			STGD	
8	Do			STBD	
5	BRACES			DB18D	
300	3/4" RIVETS			(SHOP)	
10	5x3x3/8	7	5/8	a	
10	5x3x3/8	7	5/8	b	
60	18x2x3/8	0	8/8	c	TEMP.
120	F524x3/8	0	10/8	d	SHOP TEMP.
6	4x3x5/8	7	3	f	
6	4x3x5/8	7	7	g	
6	4x3x5/8	7	3	h	
6	4x3x5/8	7	7	k	
8	6x3x3/8	7	5	m	
8	6x3x3/8	7	5	p	
60	3x3x3/8	1	0	t	TEMP.
25	18x2x5/8	1	2/8	v	Do
10	4x3x3/8	18	11	w	
2	18x4	1	6	aa	TEMP.



REVAMP - ONE - 52A (R.N.)	
Do -2- 53A Do	
Do -ONE- 54A Do	
Do -ONE- 55A Do	
Do -ONE- 56A Do	
Do -ONE- 57A Do	
Do -ONE- 58A Do	

MAKES-8-DB18D



Rivets:	34
Holes:	12 1/2
Paint:	(SEE SPECS)
INDUSTRIAL DEV. CO.	
ADDITION TO THE	
UMAUNA BRIDGE	
-HAWAII-	
INDEPENDENT IRON WORKS, INC.	
OAKLAND, CALIF.	
MADE BY	DA 8-21-50
CHECKED BY	
ORDER NO.	3807
SHEET NO.	D31D

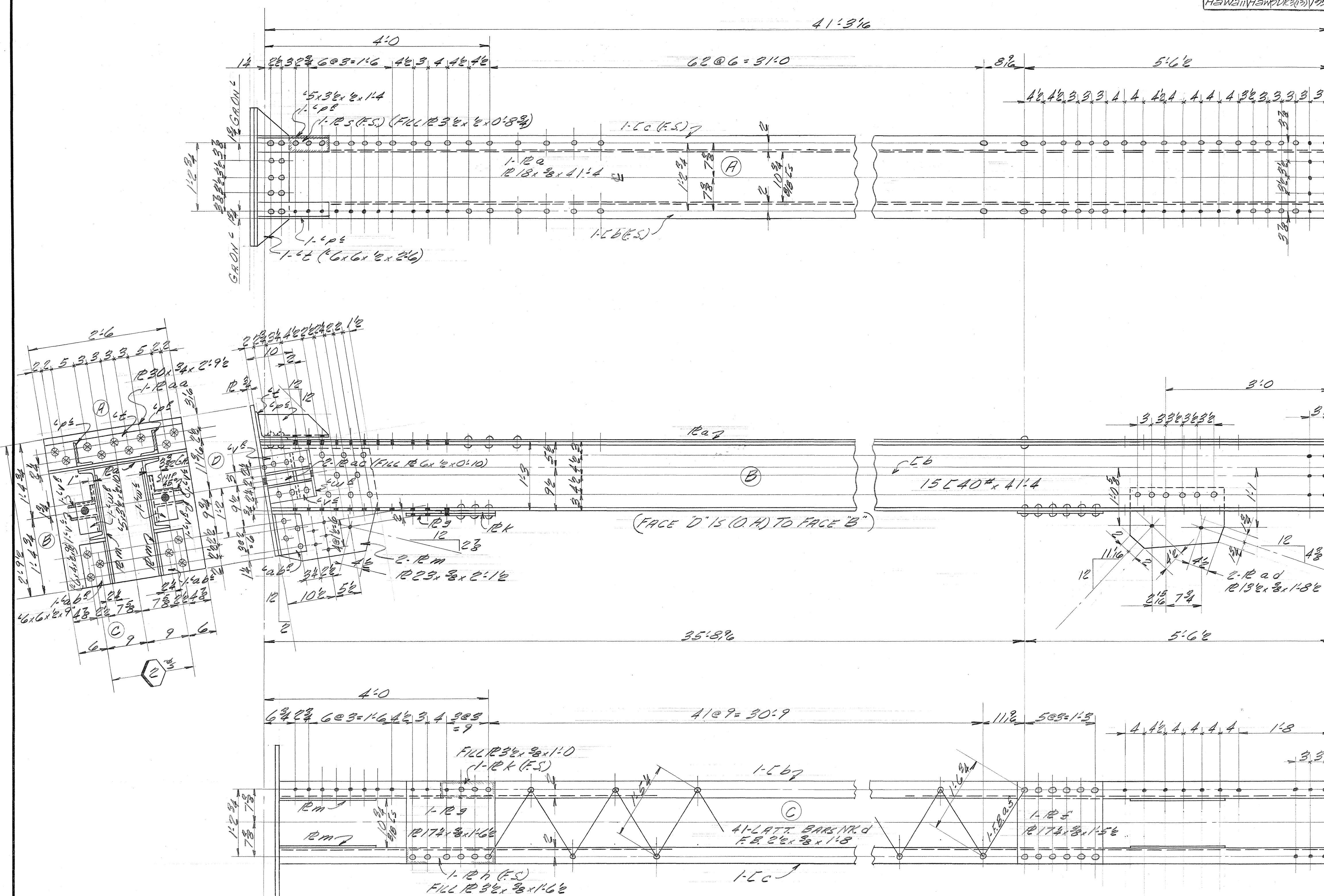
5468.189

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	23(12)	1950	170	304

Order No. 3807 Sheet No. 032D

BILL OF MATERIAL UNARUNA BRIDGE

No.	Description	Length Ft.	Ins.	Mark	REMARKS
1	COLUMN			CIA ^B	(NEW)
1	R18 ³ / ₈	41	4	a	SHORTENED
1	15L40 [#]	41	4	b	DO DO
1	15L40 [#]	41	4	c	DO DO
41	FB2 ² / ₈	1	8	d	
1	R17 ³ / ₈	1	54	e	TENON
1	R17 ³ / ₈	1	62	g	DO
1	R3 ² / ₈	1	62	h	DO
1	R3 ² / ₈	1	0	k	DO
2	R23 ³ / ₈	2	12	m	DO
2	5x3 ² / ₈	1	4	p	DO
1	R3 ² / ₈	0	82	s	DO
1	6x6	2	6	t	DO
4	6x4	0	92	v	DO
2	5x3 ² / ₈	0	10	w	DO
1	R30 ³ / ₈	2	92	aa	DO
2	6x6	0	9	ab	DO
2	R6 ¹ / ₂	0	10	ac	DO
2	R13 ² / ₈	1	82	ad	DO
1	FB2 ² / ₈	1	94	as	DO
335	3/4" RIVETS				(SHOP)



MAKE-ONE COL. NR. CIA^B (A.S.)

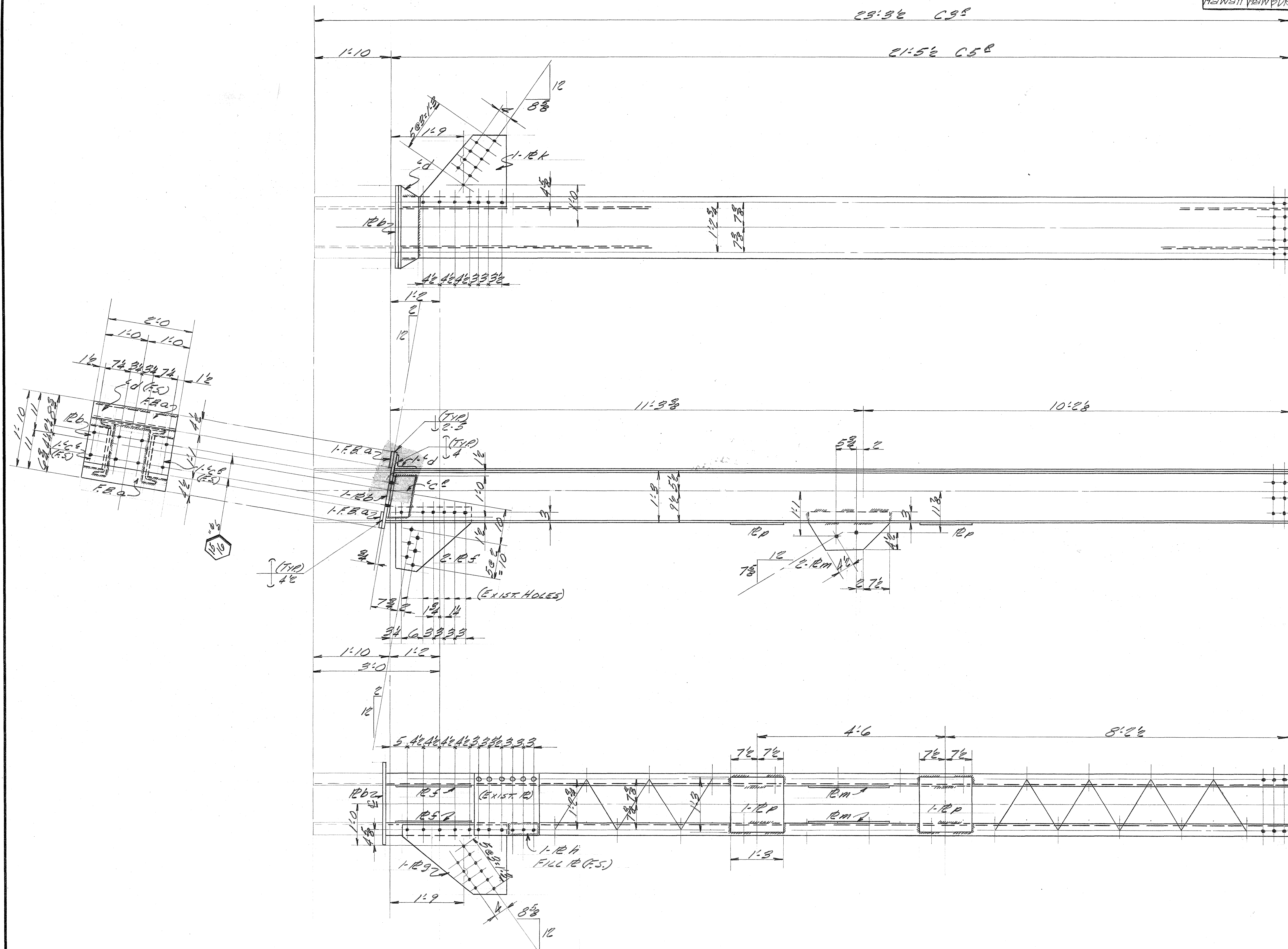
Rivets: 3/4"
Holes: 1 1/8" U.N.
Paint: (SEE SPECS)

INDUSTRIAL DEV. CO.
ADDITION TO THE
UNARUNA BRIDGE
-HAWAII-
INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.
MADE BY: DM 8-18-50
CHECKED BY: [Signature]
ORDER NO. 3807
SHEET NO. 032D

5468.190

BILL OF MATERIAL *UNAUINA BRIDGE*

No.	Description	Length Ft. In.	Mark	REMARKS
2	COLUMNS	C3E		KOLEKOLE (REVAMP A.S. ON DET.)
NEW MATERIAL LISTED BELOW				
4	FB4x3	2 0 a		PLAIN
2	R22x3	2 0 b		TEMP
4	6x6x2	0 11 c		Do
2	6x4x2	2 0 d		Do
4	R18x3	1 10 e		Do
2	R20x3	2 6 f		Do
2	FB3x3	0 8 g		Do
2	R20x3	2 1 k		Do
4	R12x3	1 11 m		Do
4	R15x3	1 3 p		PLAIN
— FINAL DRAWING —				



REVAMP - 2 COLS C3E FROM KOLEKOLE
MAKES - 2 COLS C5E (A.S.)

Rivets: 3/8
Holes: 1 1/8" O.N.
Paint: (SEE SPECS)

INDUSTRIAL DEV. CO.
ADDITION TO THE
UNAUINA BRIDGE
- HAWAII -
INDEPENDENT IRON WORKS, INC.
OAKLAND, CALIF.

MADE BY	RD	10-4-50	ORDER NO.	3807
CHECKED BY			SHEET NO.	033 D

5468.191