

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0460(5)	1985	5	46

① Sta. 2+10
Remove: Existing 36" CMP
Install: New 36" Culvert
Construct: Conc. Drop Inlet & Conc. Headwall at Outlet
For Plan & Profile, See Plan Sht. No. 28

& Sta. 0+00 to Sta. 4+00 Lt.
Remove 280± LF Exist. Wooden G.R. w/ Conc. Posts.
Install 440± LF New Metal G.R. Type 3, Single w/ Steel Posts (400 LF straight guardrail, 40 LF radius rail, R=20')
Install Modified Type "G" Flare

② Sta. 7+68
Remove: Existing 24" CMP
Install: New 30" or 36" Culvert
Construct: Conc. Headwall with Conc. Drop Inlet and Conc. Outlet Structure
For Plan & Profile, See Plan Sht. No. 29

Sta. 11+00± Lt. to Sta. 14+00± Lt.
Install 210± LF New Metal G.R. Type 3, Single w/ Steel Posts

④ Sta. 16+59.79
Remove: Existing 24" CMP
Install: New 30" or 36" Culvert
Construct: Conc. Headwall at Inlet & Conc. Outlet Structure
For Plan & Profile, See Plan Sht. No. 31

& CURVE DATA
Δ = 106°-24'-42.4"
Dc = 38°-12'
R = 150.00'
Ts = 200.35'
Ls = 278.57'
G.E. = 0.10'/ft.

③ Sta. 13+04
Remove: Existing 2-30" CMP
Install: New 4-36" or 42" Culvert
Construct: Conc. Headwalls at Inlet & Outlet & Conc. Drop Inlet
For Plan & Profile, See Plan Sht. No. 30

Sta. 12+70± Rt. to Sta. 14+10± Rt.
Install 135± LF New Metal G.R. Type 3, Single w/ Steel Posts (95 LF straight guardrail, 40 LF radius rail, R=20')

& CURVE DATA
Δ = 57°-27'-33.7"
Dc = 4°-00'
R = 1432.40'
Ts = 1237.38'
Ls = 886.35'
L.T. = 200.00'
G.T. = 133.37'
G.L. = 66.70'
G.E. = 4°-00'
G.E. = 0.06'/ft.

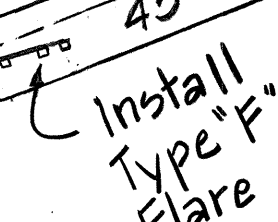
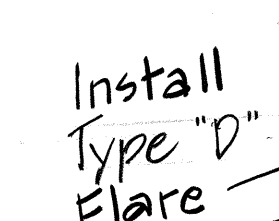
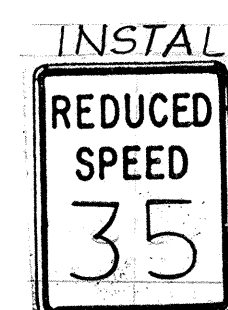
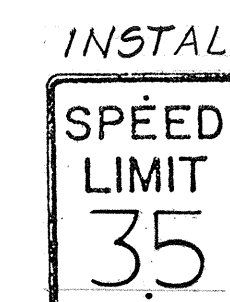
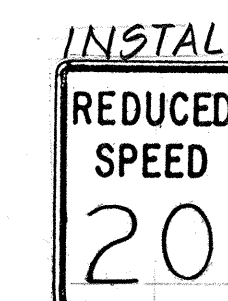
& CURVE DATA
Δ = 42°-40'-19"
Dc = 4°-00'
R = 1432.40'
Ts = 766.74'
Ls = 710.48'
L.T. = 300.00'
G.T. = 200.11'
G.L. = 100.10'
G.E. = 6°-00'
G.E. = 0.06'/ft.

Sta. 50+00± Lt. to Sta. 50+50± Lt.
Install 650± LF New Metal G.R. Type 3, Single w/ Steel Posts

& CURVE DATA
Δ = 37°-28'-45"
Dc = 3°-00'
R = 1707.86'
Ts = 1065.97'
Ls = 810.81'
Ls = 250.00'
L.T. = 166.70'
G.T. = 83.37'
G.L. = 83.37'
G.E. = 3°-45'
G.E. = 0.05'/ft.

⑤ Sta. 39+00
Remove: Existing 24" CMP
Install: New 3-36" Culvert
Construct: Conc. Headwalls at Inlet & Outlet, Grooved End and Concrete Drop Inlet
For Plan & Profile, See Plan Sht. No. 32

⑥ Sta. 41+42
Remove: Existing 60" CMP
Install: New 60" Culvert
Construct: Conc. Headwalls at Inlet & Outlet, & GRP Apron at Outlet
For Plan & Profile, See Plan Sht. No. 33



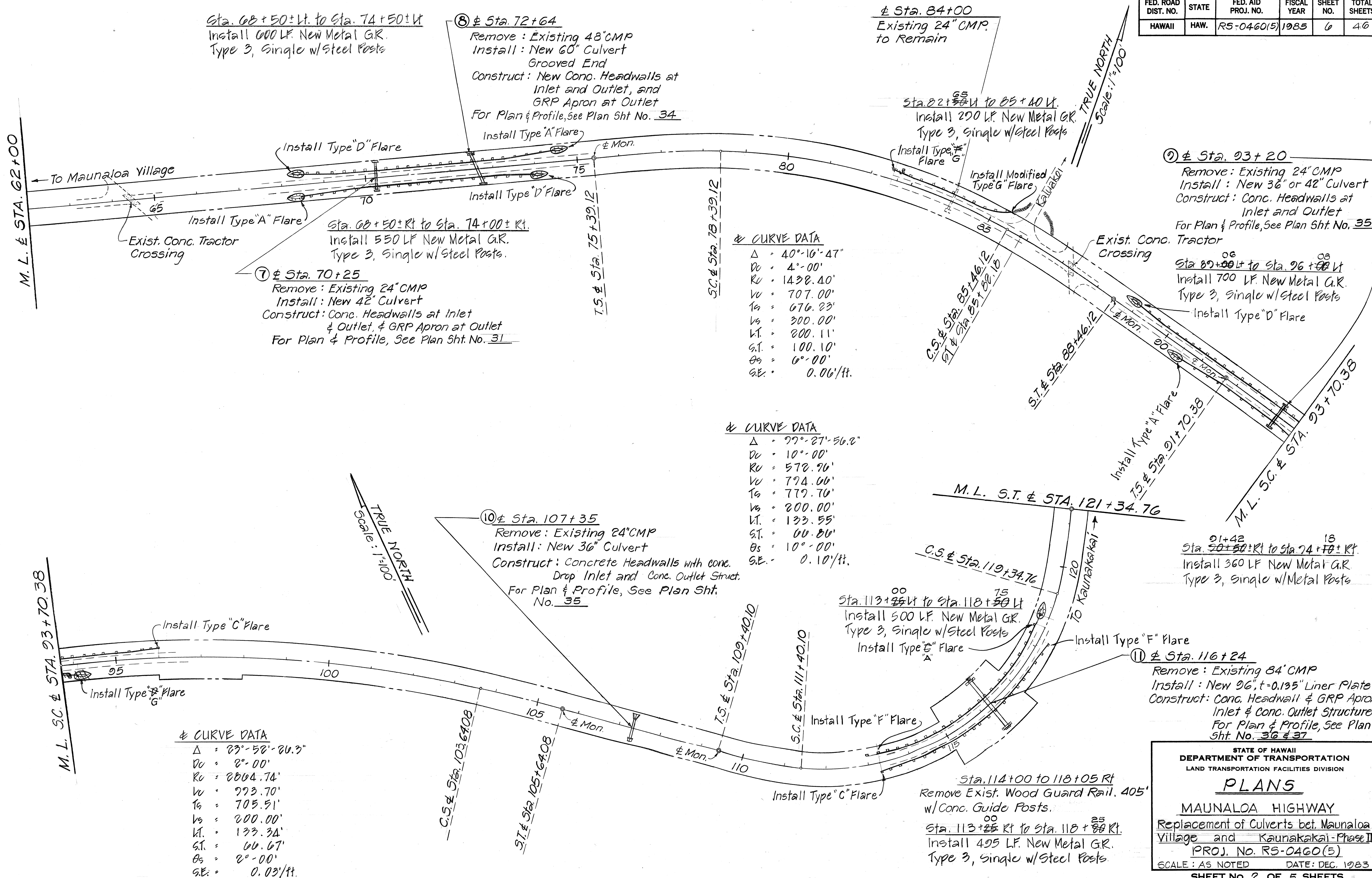
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

PLANS

MAUNALO A HIGHWAY
Replacement of Culverts bet. Maunaloa Village and Kaunakakai - Phase II

PROJ. NO. RS-0460(5)
SCALE: AS NOTED DATE: DEC. 1983
SHEET NO. 1 OF 5 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0460(5)	1985	6	46



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

PLANS

MAUNALOA HIGHWAY
Replacement of Culverts bet. Maunaloa Village and Kaunakakai - Phase II
PROJ. No. RS-0460(5)
SCALE: AS NOTED DATE: DEC. 1983
SHEET NO. 2 OF 5 SHEETS

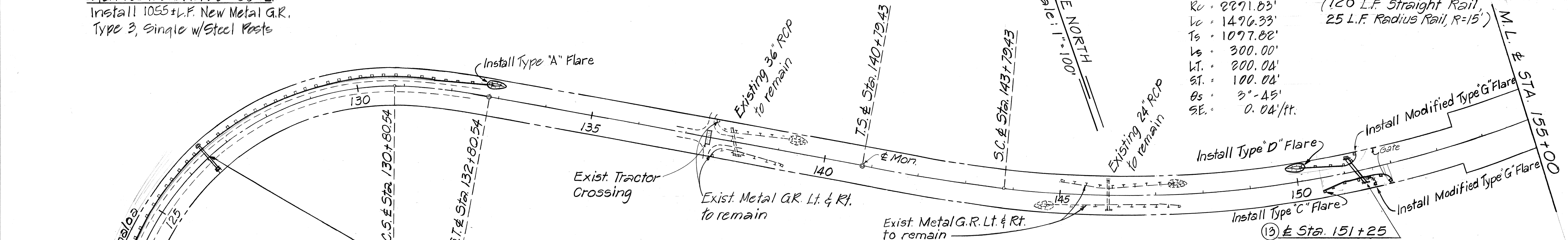
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0460(5)	1985	7	40

Sta. 123+00± Lt. to 132+00± Lt.
Remove Exist. Wood G.R. - 900'
w/Conc. Posts

Sta. 122+25± Lt. to 132+80± Lt.
Install 1055± L.F. New Metal G.R.
Type 3, Single w/Steel Posts

4 CURVE DATA
 $\Delta = 44^\circ 54' 30''$
 $D_c = 2^\circ 00'$
 $R_c = 2271.83'$
 $L_c = 1476.33'$
 $T_s = 1077.82'$
 $L_s = 300.00'$
 $L.T. = 200.04'$
 $S.T. = 100.04'$
 $\theta_s = 3^\circ 45'$
 $S.E. = 0.04'/ft.$

Sta. 150+70± Lt. to 151+30± Lt.
Install 145 L.F. New Metal Guard Rail
Type 3, Single w/Steel Posts.
(120 L.F. Straight Rail, 25 L.F. Radius Rail, R=15')



4 CURVE DATA
 $\Delta = 88^\circ 54' 33.7''$
 $D_c = 10^\circ 00'$
 $R_c = 572.76'$
 $L_c = 688.73'$
 $T_s = 604.71'$
 $L_s = 200.00'$
 $L.T. = 133.55'$
 $S.T. = 66.86'$
 $\theta_s = 10^\circ 00'$
 $S.E. = 0.10'/ft.$

12 ± Sta. 126+50
 Remove: Existing 24" CMP
 Install: New 36" Culvert
 Construct: Conc. Drop Inlet and
 Conc. Headwall at Outlet
 and GRP Apron at Outlet
 For Plan & Profile, See Plan Sht. No. 38

Sta. 150+50± Rt. to 151+50± Rt.
 Install 135± L.F. New Metal G.R.
 Type 3, Single w/Steel Posts
 (110 L.F. Straight Rail, 25 L.F.
 Radius Rail, R=15')

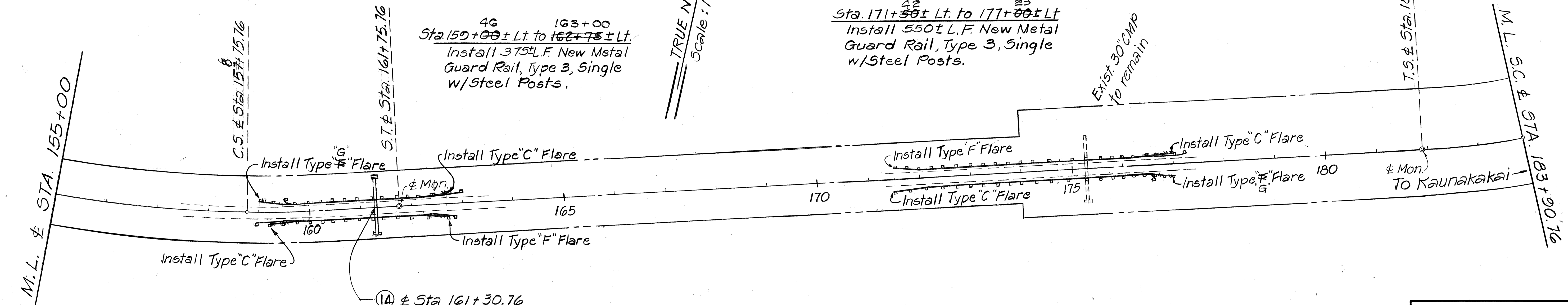
13 ± Sta. 151+25
 Remove: Existing 36" CMP
 Install: New 60" Culvert
 Construct: Conc. Headwalls at Inlet &
 Outlet, & GRP Apron at Outlet
 For Plan & Profile, See Plan Sht. No. 33

Sta. 171+50± Lt. to 177+00± Lt.
 Install 550± L.F. New Metal
 Guard Rail, Type 3, Single
 w/Steel Posts.

Sta. 150+00± Lt. to 162+75± Lt.
 Install 375± L.F. New Metal
 Guard Rail, Type 3, Single
 w/Steel Posts.

Sta. 171+50± Rt. to 176+00± Rt.
 Install 550± L.F. New Metal Guard Rail
 Type 3, Single w/Steel Posts.

14 ± Sta. 161+30.76
 Remove: Existing 48" CMP
 Install: New 78" t=0.135
 Liner Plate
 Construct: Conc. Headwalls, GRP Aprons
 at Inlet and Outlet
 For Plan & Profile, See Plan Sht. No. 39



Sta. 150+20± Rt. to 162+75± Rt.
 Install 355± L.F. New Metal Guard Rail
 Type 3, Single w/Steel Posts.

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MAUNALO A HIGHWAY
 Replacement of Culverts bet. Maunaloa
 Village and Kaunakakai - Phase II
 PROJ. NO. RS-0460(5)
 SCALE: AS NOTED DATE: DEC. 1983
 SHEET NO. 3 OF 5 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0460(5)	1985	8	46

± CURVE DATA

Δ = 60°-00'-41.2"
Dc = 10°-00'
Rc = 572.96'
Lc = 400.12'
Ts = 432.45'
Ls = 200.00'
Lt = 133.55'
St = 66.86'
Bs = 10°-00'
SE = 0.10'/ft

Sta. 184+30±Lt. to Sta. 189+75±Lt.
Install 545±LF New Metal G.R. Type 3, Single w/ Steel Posts

± CURVE DATA

Δ = 36°-20'-50.5"
Dc = 3°-30'
Rc = 1637.02'
Lc = 738.51'
Ts = 688.12'
Ls = 300.00'
Lt = 200.09'
St = 100.08'
Bs = 5°-15'
SE = 0.06'/ft

± CURVE DATA

Δ = 28°-43'-41.5"
Dc = 10°-00'
Rc = 572.96'
Lc = 87.88'
Ts = 247.38'
Ls = 200.00'
Lt = 133.55'
St = 66.86'
Bs = 10°-00'
SE = 0.10'/ft

± CURVE DATA

Δ = 23°-50'-22.5"
Dc = 10°-00'
Rc = 572.96'
Lc = 688.40'
Ts = 742.37'
Ls = 250.00'
Lt = 167.08'
St = 83.71'
Bs = 12°-30'
SE = 0.10'/ft

± CURVE DATA

Δ = 43°-55'-41.2"
Dc = 7°-00'
Rc = 818.51'
Lc = 427.54'
Ts = 430.87'
Ls = 200.00'
Lt = 133.44'
St = 66.76'
Bs = 7°-00'
SE = 0.10'/ft

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
DRAWN BY	DESIGNED BY	
NOTED BY	CHECKED BY	
NO.		

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

PLANS

MAUNALOA HIGHWAY

Replacement of Culverts bet. Maunaloa Village and Kaunakakai-Phase II

PROJ. NO. RS-0460(5)

SCALE: AS NOTED DATE: DEC. 1983

SHEET No. 4 OF 5 SHEETS

± CURVE DATA

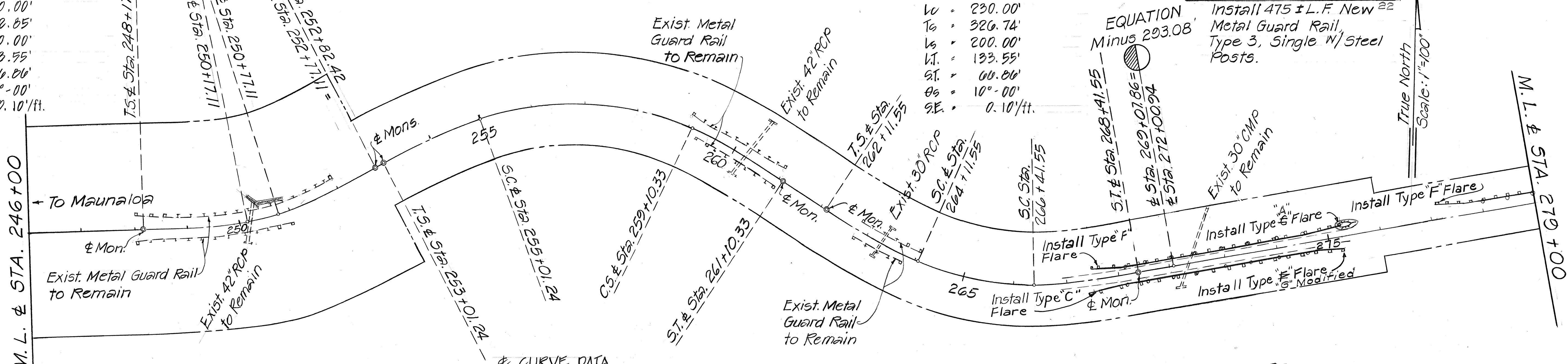
Δ = 26°-00'
 Dc = 10°-00'
 Rc = 572.96'
 Lc = 60.00'
 Ts = 232.65'
 Ls = 200.00'
 Lt = 133.95'
 St = 66.86'
 θs = 10°-00'
 SE = 0.10'/ft.

EQUATION
 Minus 5.31'

± CURVE DATA

Δ = 43°-00'
 Dc = 10°-00'
 Rc = 572.96'
 Lc = 230.00'
 Ts = 326.74'
 Ls = 200.00'
 Lt = 133.55'
 St = 66.86'
 θs = 10°-00'
 SE = 0.10'/ft.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	RS-0460(5)	1985	9	46

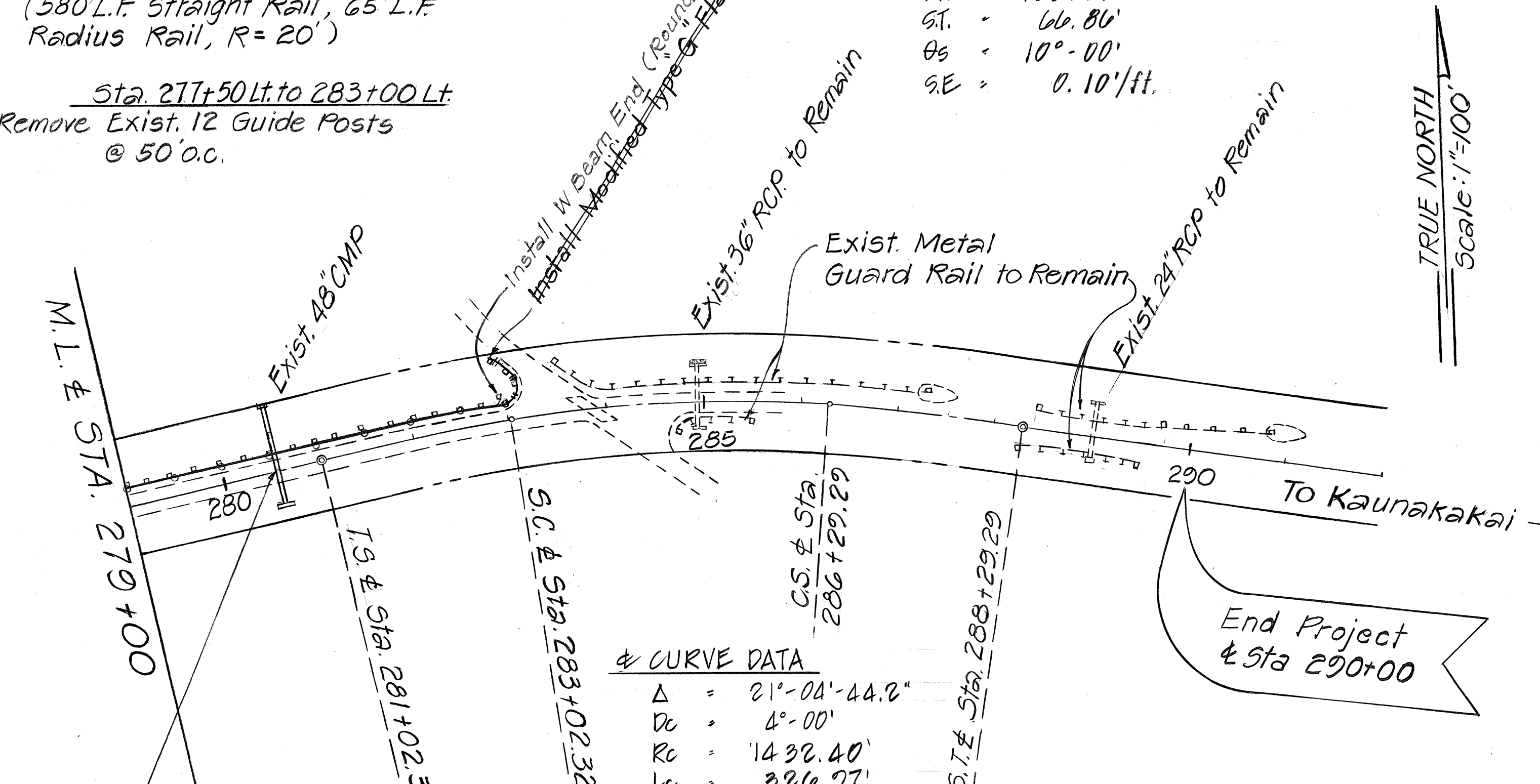


Sta. 277+20 ± Lt. to 283+00 ± Lt.
 Install 645 ± L.F. New Metal Guard Rail
 Type 3, Single w/ Steel Posts.
 (580 L.F. Straight Rail, 65 L.F.
 Radius Rail, R=20)

Sta. 277+50 Lt. to 283+00 Lt.
 Remove Exist. 12 Guide Posts
 @ 50' o.c.

± CURVE DATA

Δ = 60°-54'-30.6"
 Dc = 10°-00'
 Rc = 572.96'
 Lc = 409.09'
 Ts = 438.49'
 Ls = 200.00'
 Lt = 133.95'
 St = 66.86'
 θs = 10°-00'
 SE = 0.10'/ft.



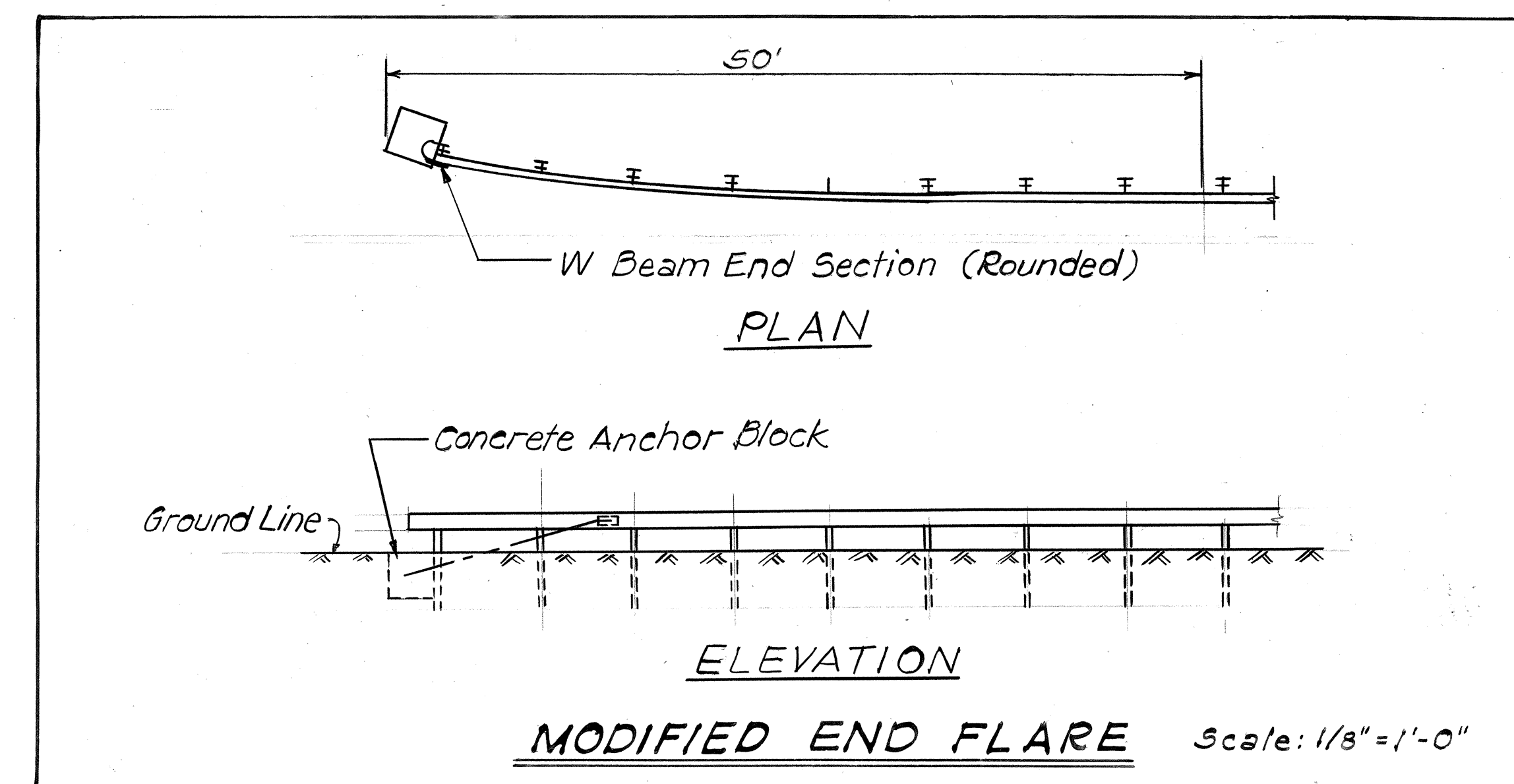
± CURVE DATA

Δ = 21°-04'-44.2"
 Dc = 4°-00'
 Rc = 1432.40'
 Lc = 326.77'
 Ts = 366.70'
 Ls = 200.00'
 Lt = 133.37'
 St = 66.70'
 θs = 4°-00'
 SE = 0.06'/ft.

⑫ ± Sta. 280+50
 Remove: Existing CRM Headwall & Conc. Apron
 Install: New 48" RCP, CI. III
 Construct: New Conc. Headwall
 For Details, See Plan Sht. No. 40

Sta. 267+50 ± Rt. to 275+25 ± Rt.
 Install 475 ± L.F. New Metal Guard Rail
 Type 3, Single w/ Steel Posts

Sta. 268+00 Lt. to 274+50 Lt.
 Remove Exist. 8 Guide Posts
 @ 50' o.c.



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PLANS

MAUNALO A HIGHWAY
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 Village and Kaunakakai - Phase II
 PROJ. NO. RS-0460(5)
 SCALE: AS NOTED DATE: DEC. 1983
 SHEET NO. 5 OF 5 SHEETS

DATE	SURVEY PLOTTED BY
PLAN	DRAWN BY
NOTE BOOK	QUANTITIES BY
No.	CHECKED BY