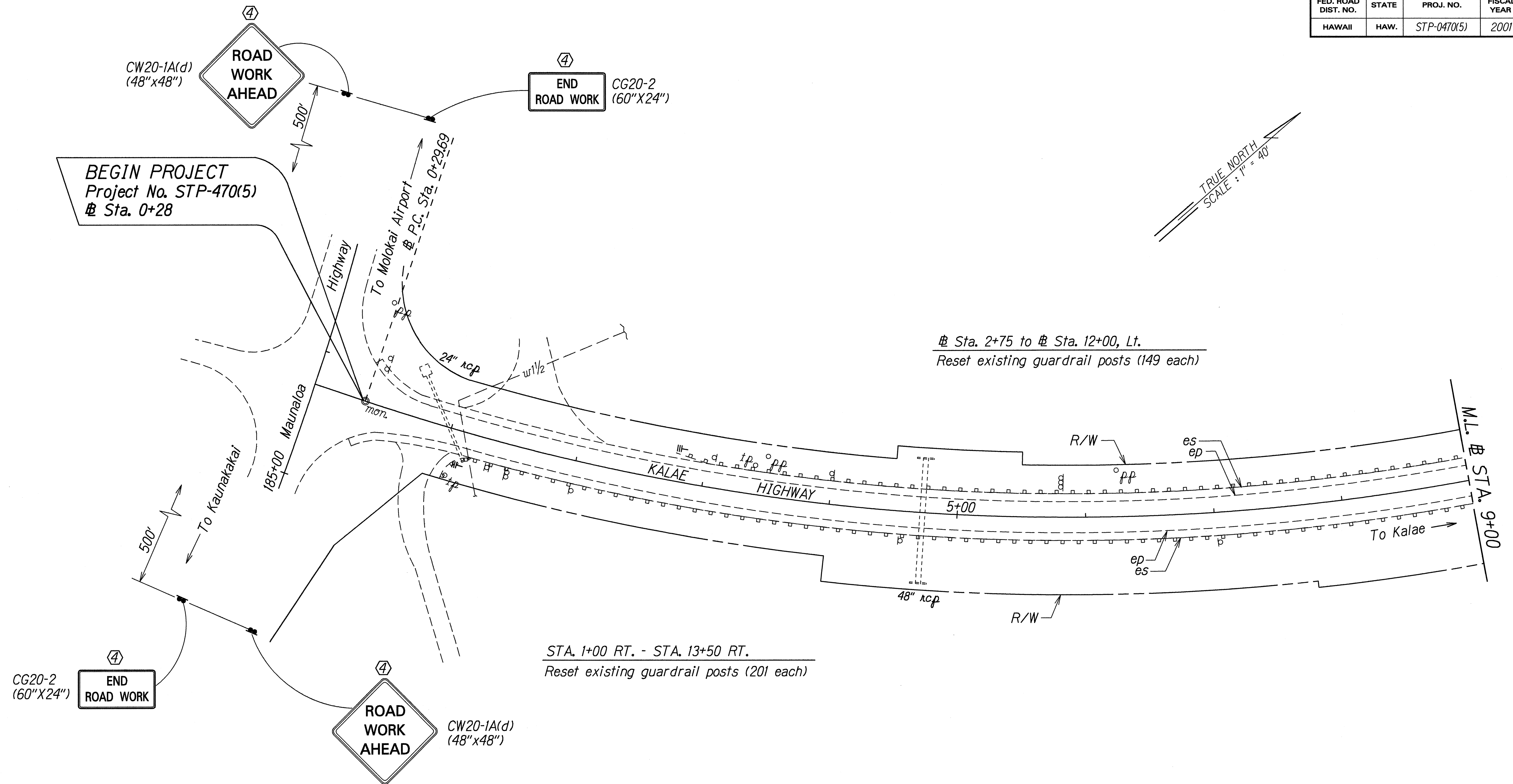


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0470(5)	2001	16	30



ORIGINAL PLAN	SURVEY PLOTTED BY _____	DATE <u>Feb. 2000</u>
NOTE BOOK log in: <u>lay</u> <u>4k1amp1dgn</u> N _o .	DRAWN BY <u>lg</u>	*
	TRACED BY _____	*
	DESIGNED BY <u>cl</u>	*
	QUANTITIES BY _____	*
	CHECKED BY _____	

KEY:

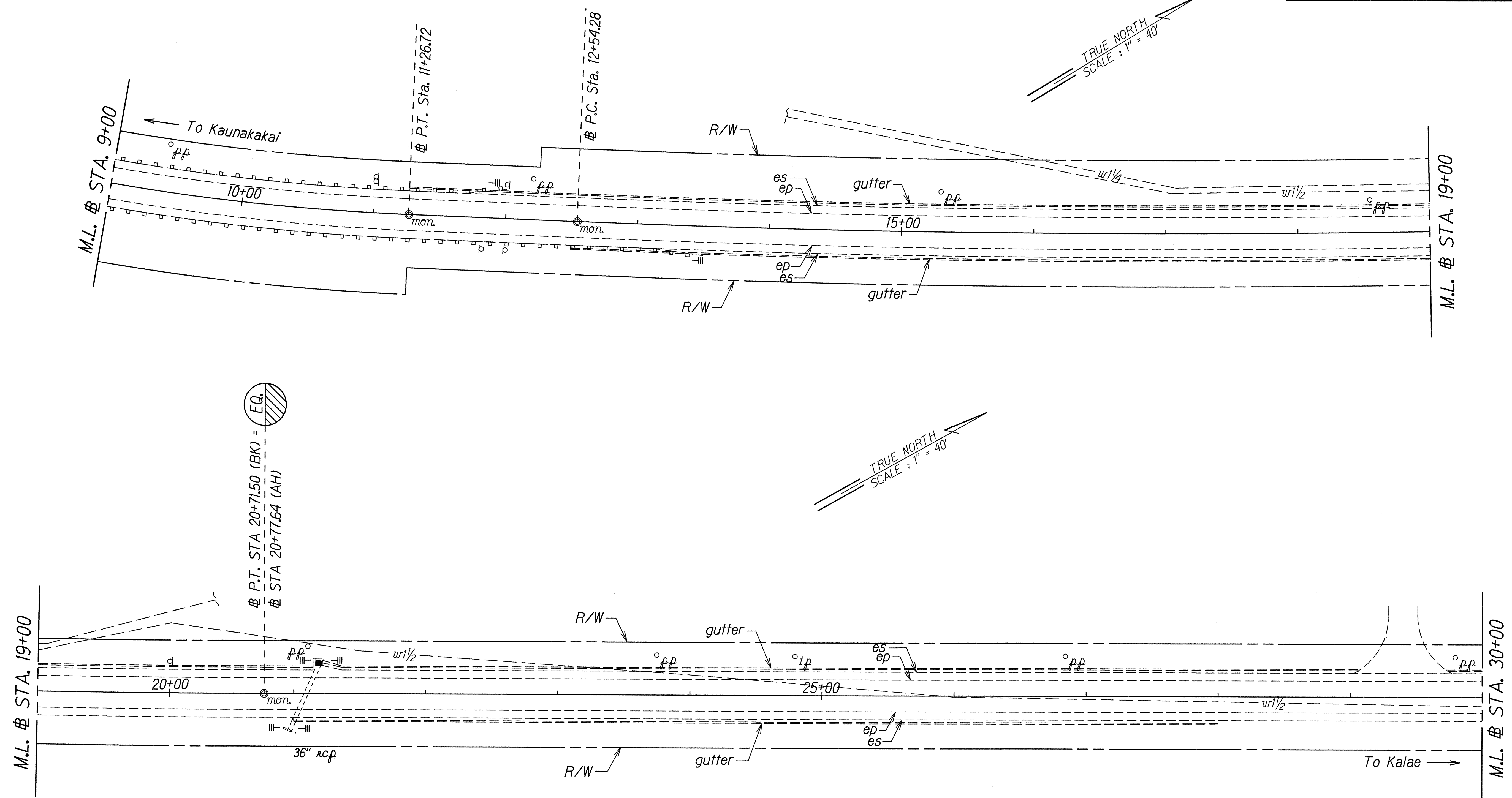
- ① Exist. Sign(s) $\neq$ Post(s) to Remain
- ② Remove Exist. Sign(s) $\neq$ Post(s)
- ③ Remove Exist. $\neq$ Install New Sign(s) $\neq$ Post(s)
- ④ Install New Sign(s) $\neq$ Post(s)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN
KALAE HIGHWAY
GUARDRAIL & SHOULDER IMPROVEMENTS
Maunaloa Highway to
Kalaupapa Lookout Parking Lot
Fed. Aid Project No. STP-0470(5)
Scale: 1" = 40' Date: July, 2000

SHEET No. 1 OF 15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0470(5)	2001	17	30



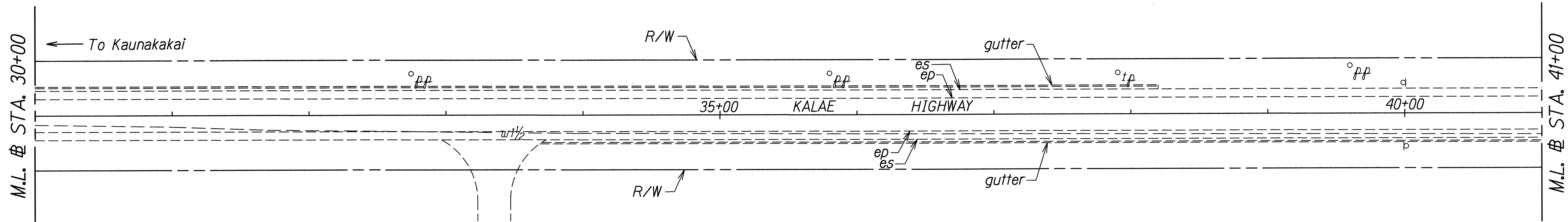
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	Feb. 2000
DESIGNED BY	CHECKED BY	
QUANTITIES BY		
CHECKED BY		

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

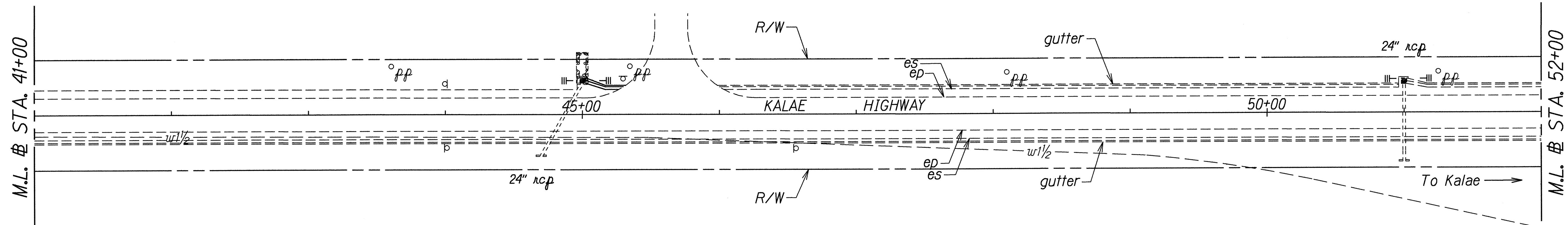
ROADWAY PLAN
KALAE HIGHWAY
GUARDRAIL & SHOULDER IMPROVEMENTS
Maunaloa Highway to
Kalaupapa Lookout Parking Lot
Fed. Aid Project No. STP-0470(5)
Scale: 1" = 40' Date: July, 2000

SHEET No. 2 OF 15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0470(5)	2001	18	30



STA. 44+90 LT. - STA. 45+40 LT.
Demolish existing concrete gutter and replace
30 L.F. gutter Type 2 (61616)



ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	Feb. 2000
LOG IN: JAY	TRACED BY	
4/16/00/3/00	DESIGNED BY	
	CHECKED BY	

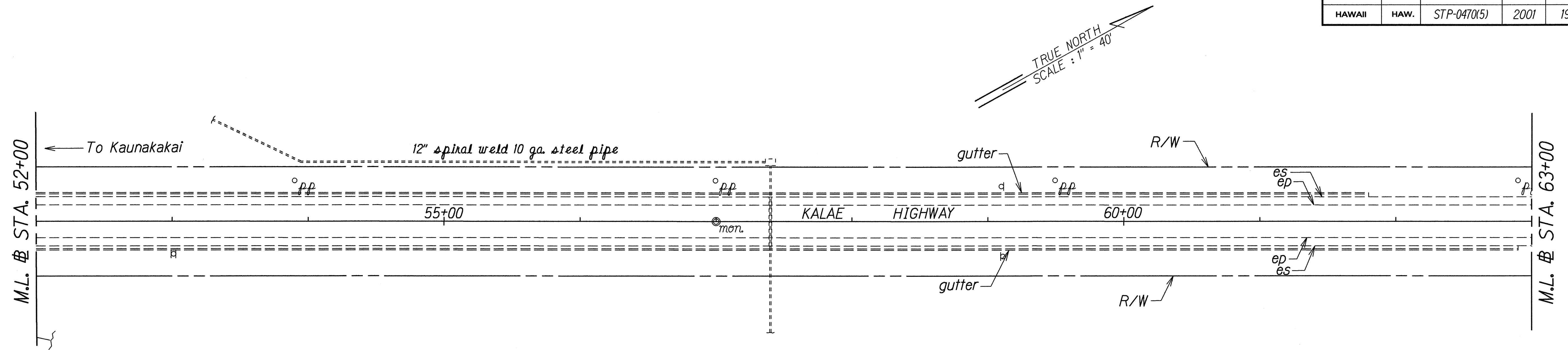
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN
KALAE HIGHWAY
GUARDRAIL & SHOULDER IMPROVEMENTS
Maunaloa Highway to
Kalaupapa Lookout Parking Lot
Fed. Aid Project No. STP-0470(5)

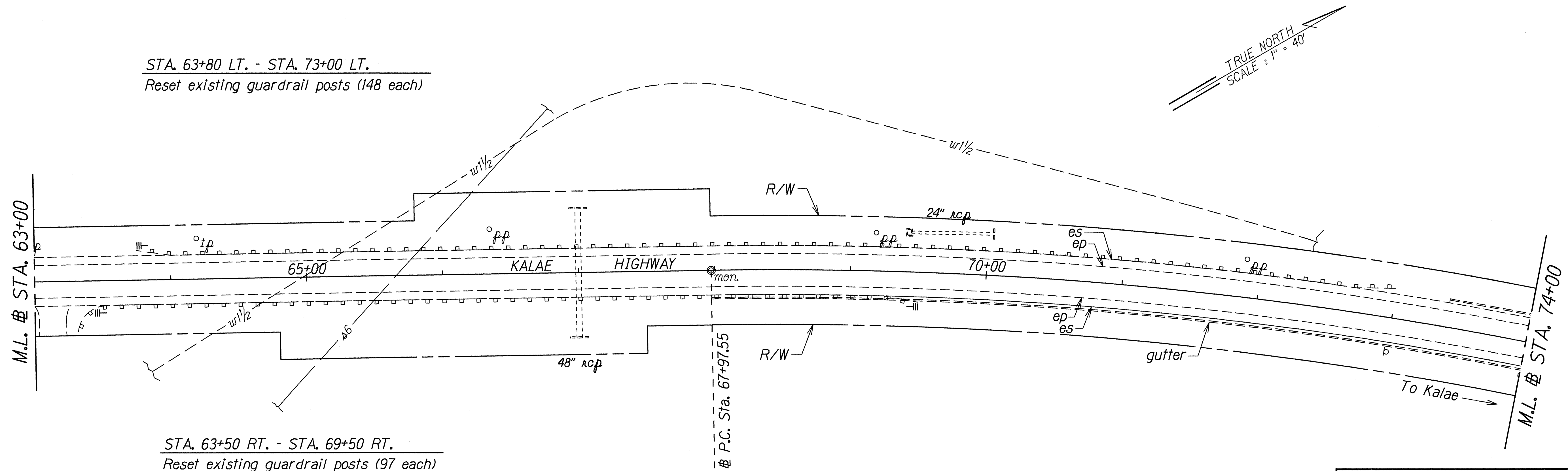
Scale: 1" = 40' Date: July, 2000

SHEET No. 3 OF 15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0470(5)	2001	19	30



STA. 63+80 LT. - STA. 73+00 LT.
Reset existing guardrail posts (148 each)



STA. 63+50 RT. - STA. 69+50 RT.
Reset existing guardrail posts (97 each)

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	5/20/1999
log in day	TRACED BY	
1/25/2000	QUANTITIES BY	
	CHECKED BY	

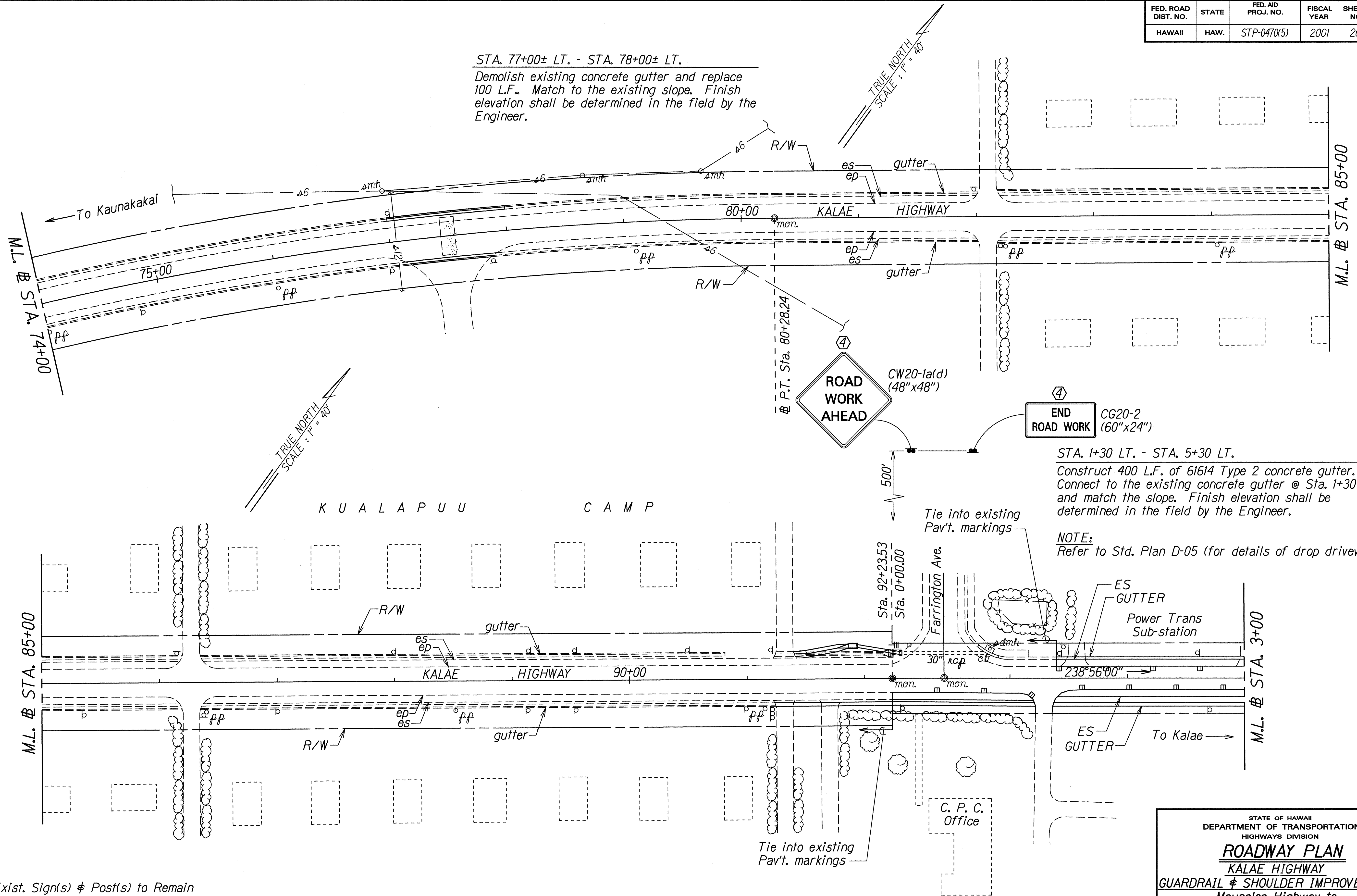
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN
KALAE HIGHWAY
GUARDRAIL & SHOULDER IMPROVEMENTS
Maunaloa Highway to
Kalaupapa Lookout Parking Lot
Fed. Aid Project No. STP-0470(5)

Scale: 1" = 40' Date: July, 2000

SHEET No. 4 OF 15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0470(5)	2001	20	30



KEY:

- ① Exist. Sign(s) & Post(s) to Remain
- ② Remove Exist. Sign(s) & Post(s)
- ③ Remove Exist. & Install New Sign(s) & Post(s)
- ④ Install New Sign(s) & Post(s)

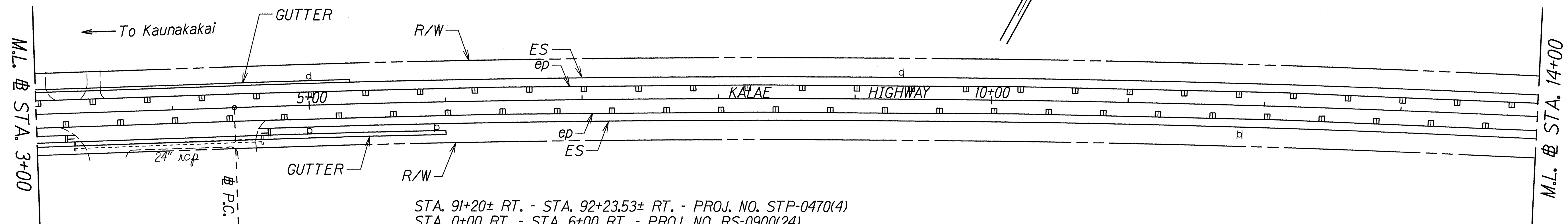
SURVEY PLOTTED BY	DATE
DRAWN BY	16a 2000
TRACED BY	
NOTED BY	
QUANTITIES BY	
CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN
KALAE HIGHWAY
GUARDRAIL & SHOULDER IMPROVEMENTS
Maunaloa Highway to
Kalaupapa Lookout Parking Lot
Fed. Aid Project No. STP-0470(5)
Scale: 1" = 40' Date: July, 2000

SHEET No. 5 OF 15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0470(5)	2001	21	30



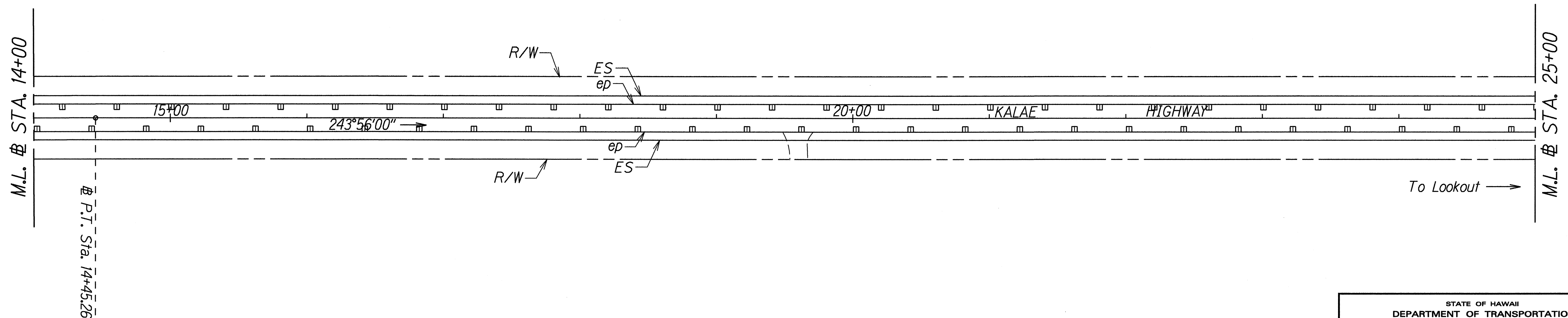
STA. 91+20± RT. - STA. 92+23.53± RT. - PROJ. NO. STP-0470(4)
 STA. 0+00 RT. - STA. 6+00 RT. - PROJ. NO. RS-0900(24)

Construct 705 L.F. of 61614 Type 2 concrete gutter. Connect to the existing concrete gutter @ Sta. 91+20± Rt. and match the slope. Finish elevation shall be determined in the field by the Engineer.

NOTE:
 Refer to Std. Plan D-05 (for details of drop driveway)

STA. 3+25± RT. - STA. 4+60± RT.

Demolish abandoned 24" RCP prior to constructing concrete gutter Type 2. This work shall be considered incidental to Item No. 203.0000 (Roadway Excavation)



ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	16th 2000
log/in jay	DESIGNED BY	
checked by	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN

KALAE HIGHWAY

GUARDRAIL & SHOULDER IMPROVEMENTS

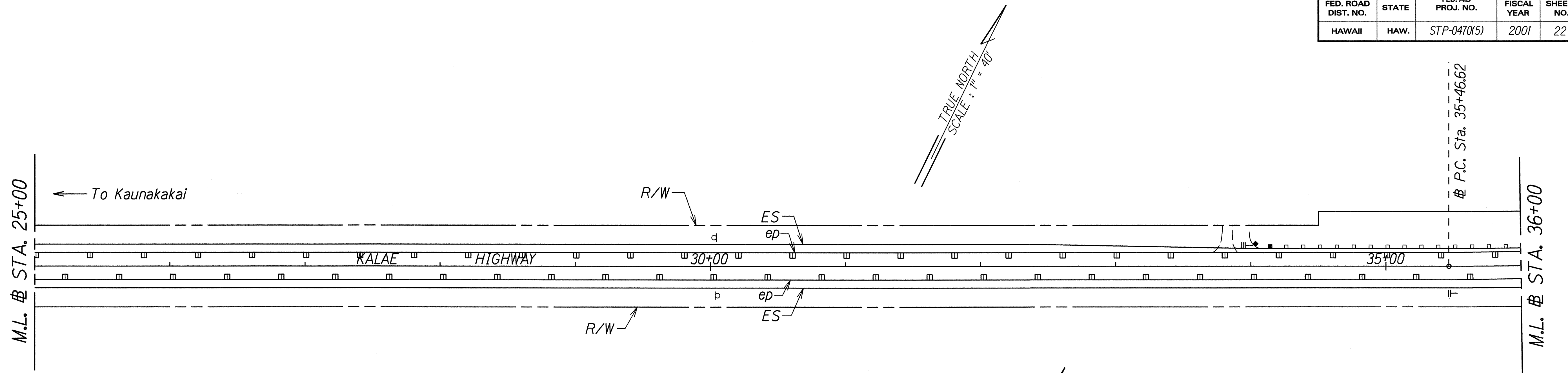
Maunaloa Highway to
Kalaupapa Lookout Parking Lot

Fed. Aid Project No. STP-0470(5)

Scale: 1" = 40' Date: July, 2000

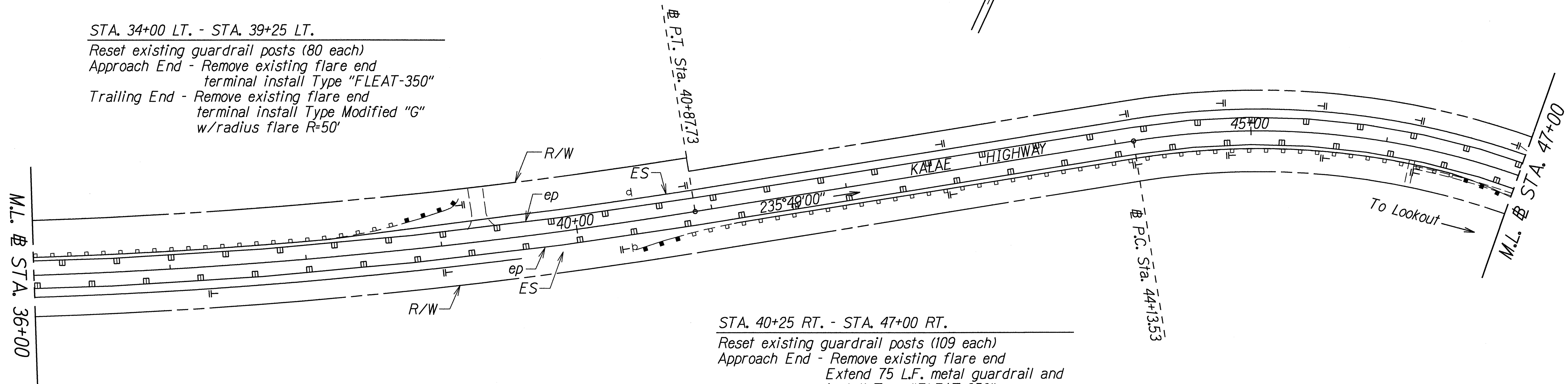
SHEET No. 6 OF 15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0470(5)	2001	22	30



STA. 34+00 LT. - STA. 39+25 LT.

Reset existing guardrail posts (80 each)
 Approach End - Remove existing flare end
 terminal install Type "FLEAT-350"
 Trailing End - Remove existing flare end
 terminal install Type Modified "G"
 w/radius flare R=50'



STA. 40+25 RT. - STA. 47+00 RT.

Reset existing guardrail posts (109 each)
 Approach End - Remove existing flare end
 Extend 75 L.F. metal guardrail and
 install Type "FLEAT-350"
 Trailing End - Remove existing Type "F" terminal
 Install Type "A"

ORIGINAL PLAN	DATE
SURVEY PLOTTED BY	July 2000
DRAWN BY	
TRACED BY	
NOTED BY	
QUANTITIES BY	
CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN
KALAE HIGHWAY
GUARDRAIL & SHOULDER IMPROVEMENTS
Maunaloa Highway to
Kalaupapa Lookout Parking Lot
Fed. Aid Project No. STP-0470(5)
Scale: 1" = 40' Date: July, 2000

SHEET No. 7 OF 15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0470(5)	2001	ADD.23	30

STA. 47+00± LT. - STA. 52+30± LT.

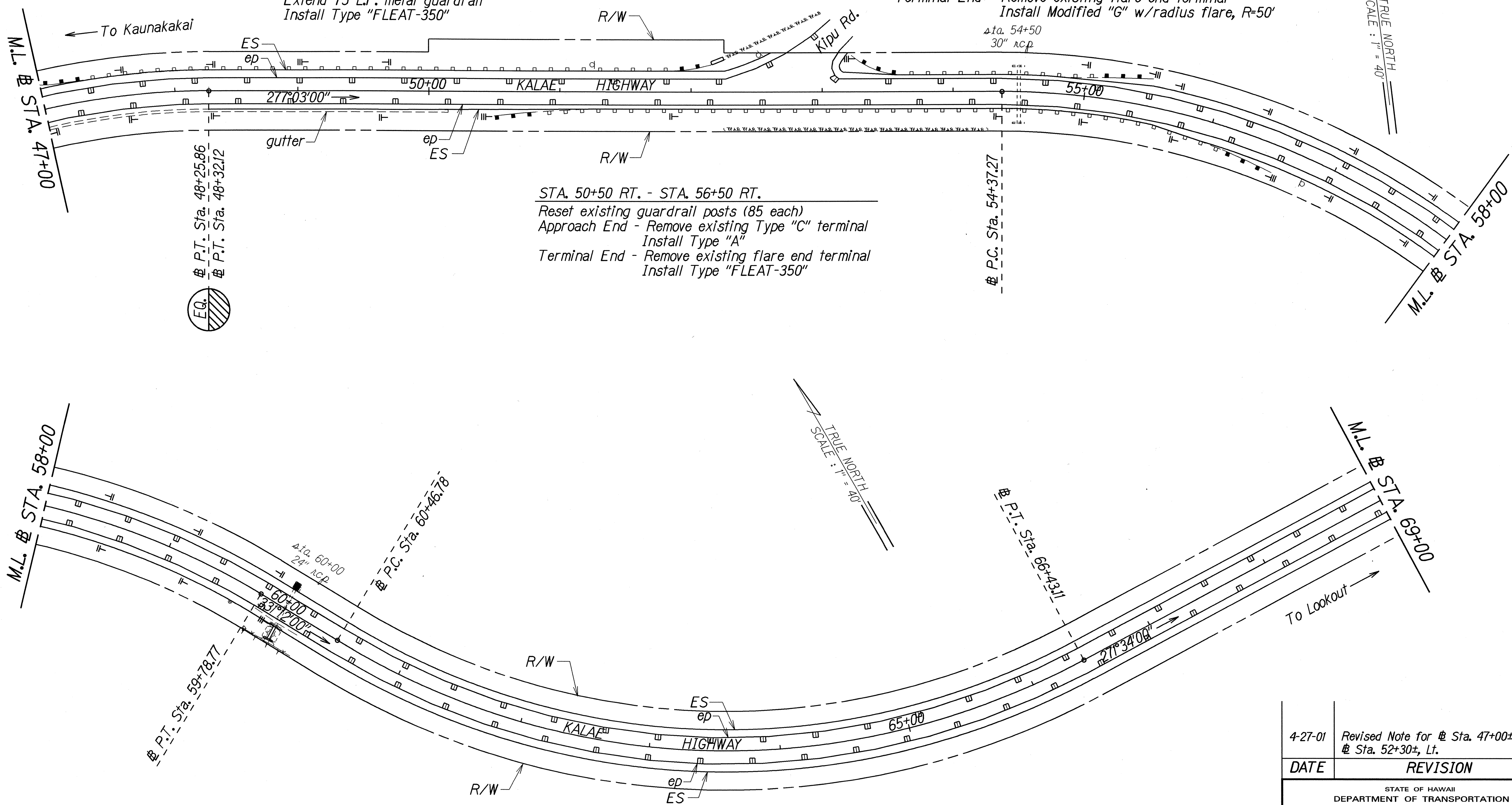
Reset existing guardrail posts (61 each)
 Approach End - Remove existing flare end terminal
 Install 25 L.F. guardrail Type 3 Thrie Beam and Type "A" End Post (See detail on Sht. No. ADD 30S-3), R=75'
 Terminal End - Remove existing flare end terminal
 Extend 75 L.F. metal guardrail
 Install Type "FLEAT-350"

STA. 53+00 LT. - STA. 55+50 LT.

Reset existing guardrail posts (35 each)
 Approach End - Remove existing flare terminal
 Extend 75 L.F. metal guardrail
 Install Type "FLEAT-350"
 Terminal End - Remove existing flare end terminal
 Install Modified "G" w/radius flare, R=50'

STA. 50+50 RT. - STA. 56+50 RT.

Reset existing guardrail posts (85 each)
 Approach End - Remove existing Type "C" terminal
 Install Type "A"
 Terminal End - Remove existing flare end terminal
 Install Type "FLEAT-350"

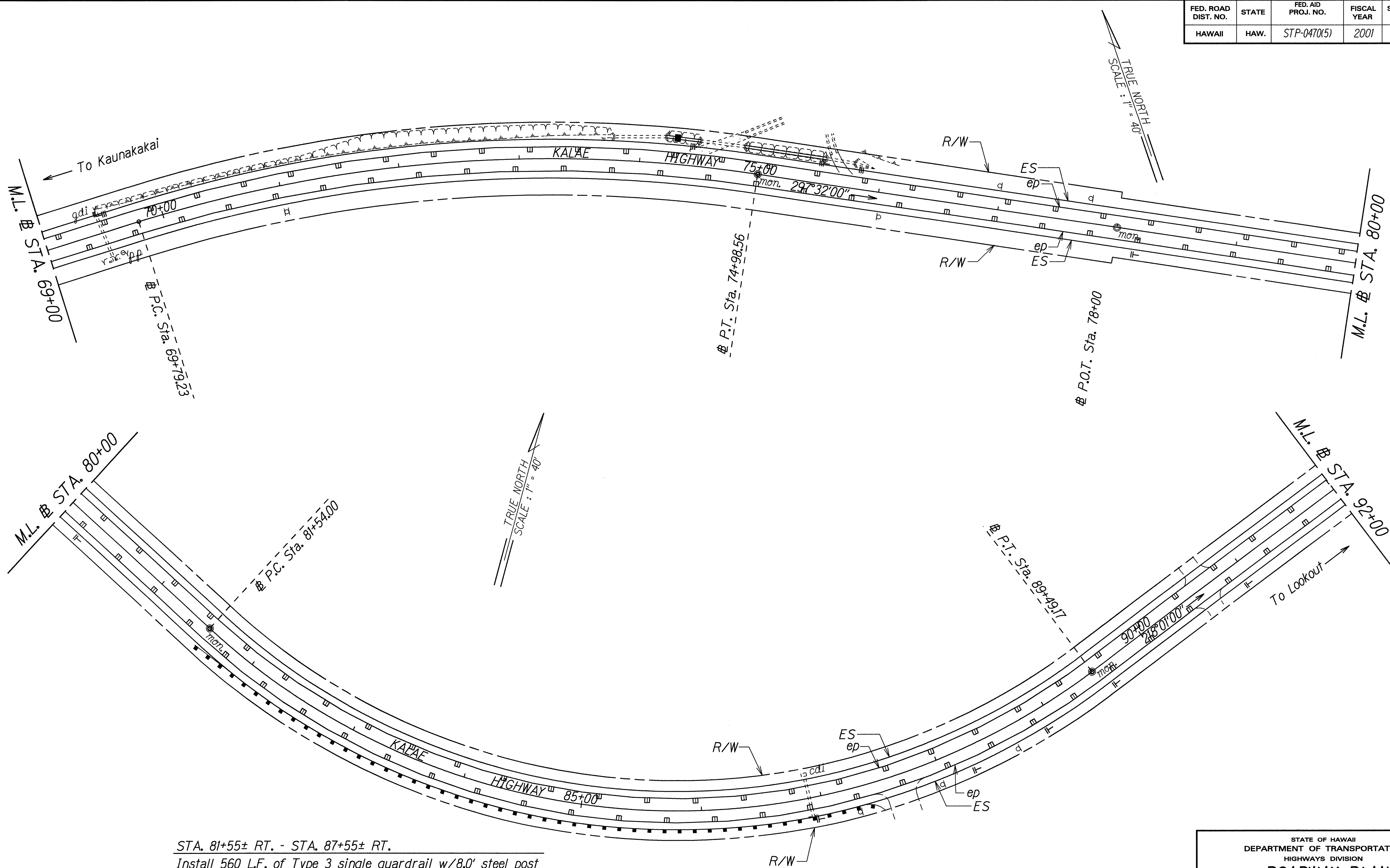


ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	Feb. 2000
DESIGNED BY	TRACED BY	
CHECKED BY	CHECKED BY	

4-27-01	Revised Note for # Sta. 47+00± to # Sta. 52+30±, Lt.
DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION ROADWAY PLAN KALAE HIGHWAY GUARDRAIL & SHOULDER IMPROVEMENTS Maunaloa Highway to Kaupapa Lookout Parking Lot Fed. Aid Project No. STP-0470(5) Scale: 1" = 40' Date: July, 2000	
SHEET No. 8 OF 15 SHEETS	

ADD.23

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0470(5)	2001	24	30



STA. 81+55± RT. - STA. 87+55± RT.
Install 560 L.F. of Type 3 single guardrail w/8.0' steel post
Approach End - Install Type "FLEAT-350"
Trailing End - Install Modified Type "G"
w/radius flare, R=50'

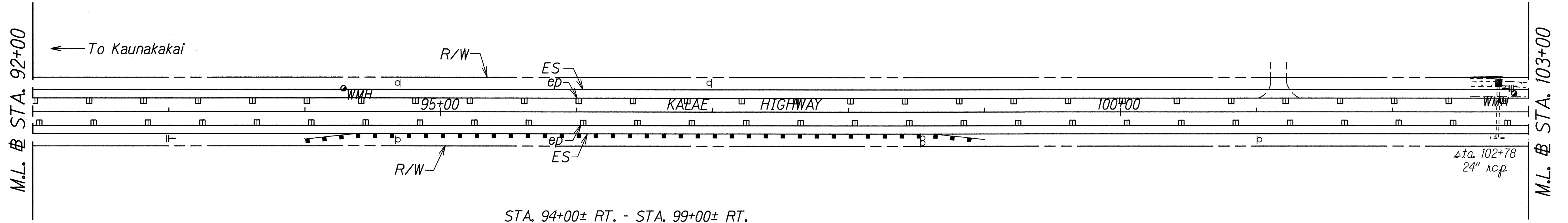
Note: 4-0' Width of Shoulder

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	Feb. 2000
log in: Jay	TRACED BY	
checked by	QUANTITIES BY	
	CHECKED BY	

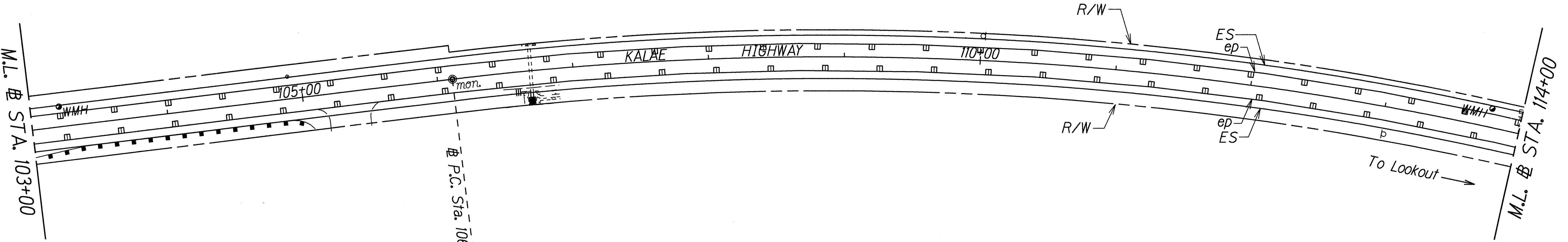
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
ROADWAY PLAN
KALAE HIGHWAY
GUARDRAIL & SHOULDER IMPROVEMENTS
Maunaloa Highway to
Kalaupapa Lookout Parking Lot
Fed. Aid Project No. STP-0470(5)
Scale: 1" = 40' Date: July, 2000

SHEET No. 9 OF 15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0470(5)	2001	25	30



STA. 94+00± RT. - STA. 99+00± RT.
 Install 420 L.F. of Type-3 single guardrail w/steel posts
 Approach & Trailing Ends - Install Type "FLEAT-350" (2 each)



STA. 103+00 RT. - STA. 105+00 RT.
 Install 160 L.F. of Type 3 single guardrail w/steel posts
 Approach End - Install Type "FLEAT-350"
 Trailing End - Install Modified Type "G"
 w/radius flare, R=50'

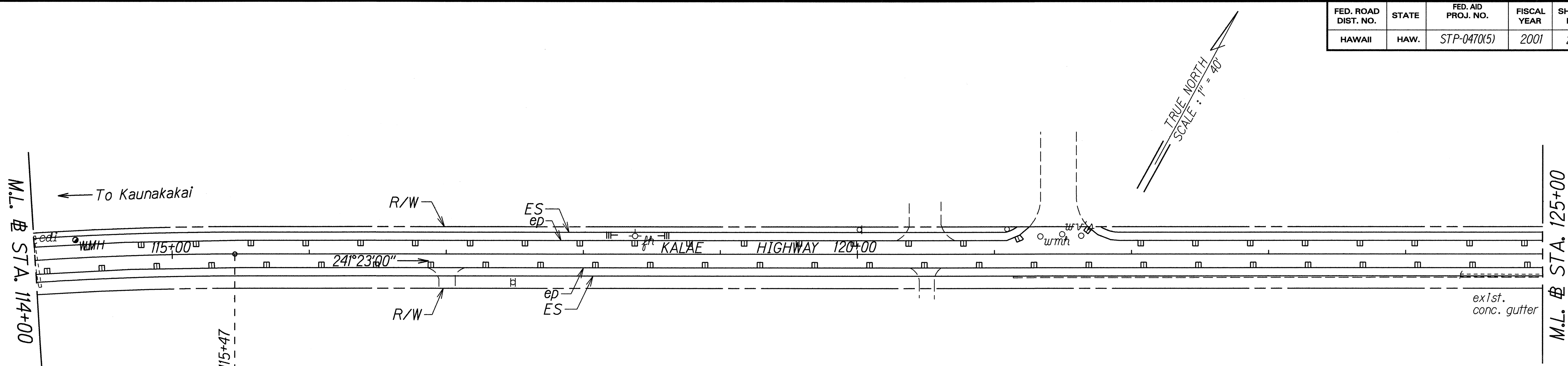
ORIGINAL PLAN	DATE: Feb. 2000
SURVEY PLOTTED BY	
DRAWN BY	
TRACED BY	
QUANTITIES BY	
CHECKED BY	
NOTE BOOK	
log in: Jay	
Stamp: Jay	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

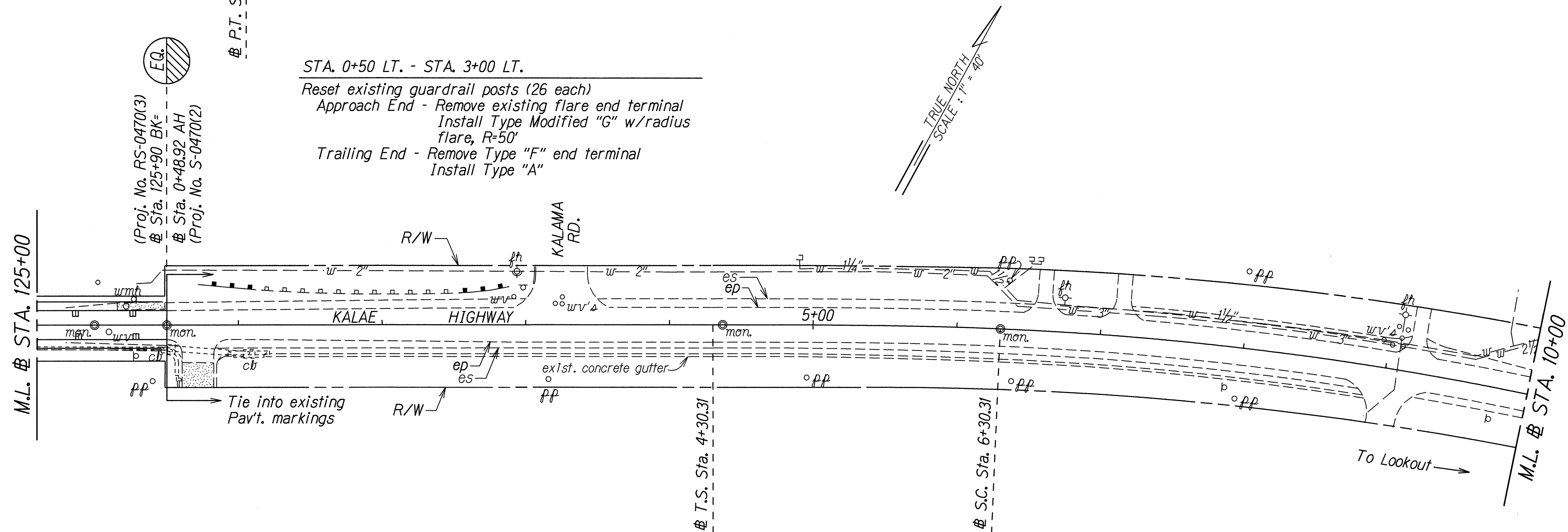
ROADWAY PLAN
KALAE HIGHWAY
GUARDRAIL & SHOULDER IMPROVEMENTS
Maunaloa Highway to
Kalaupapa Lookout Parking Lot
Fed. Aid Project No. STP-0470(5)
Scale: 1" = 40' Date: July, 2000

SHEET No. 10 OF 15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0470(5)	2001	26	30



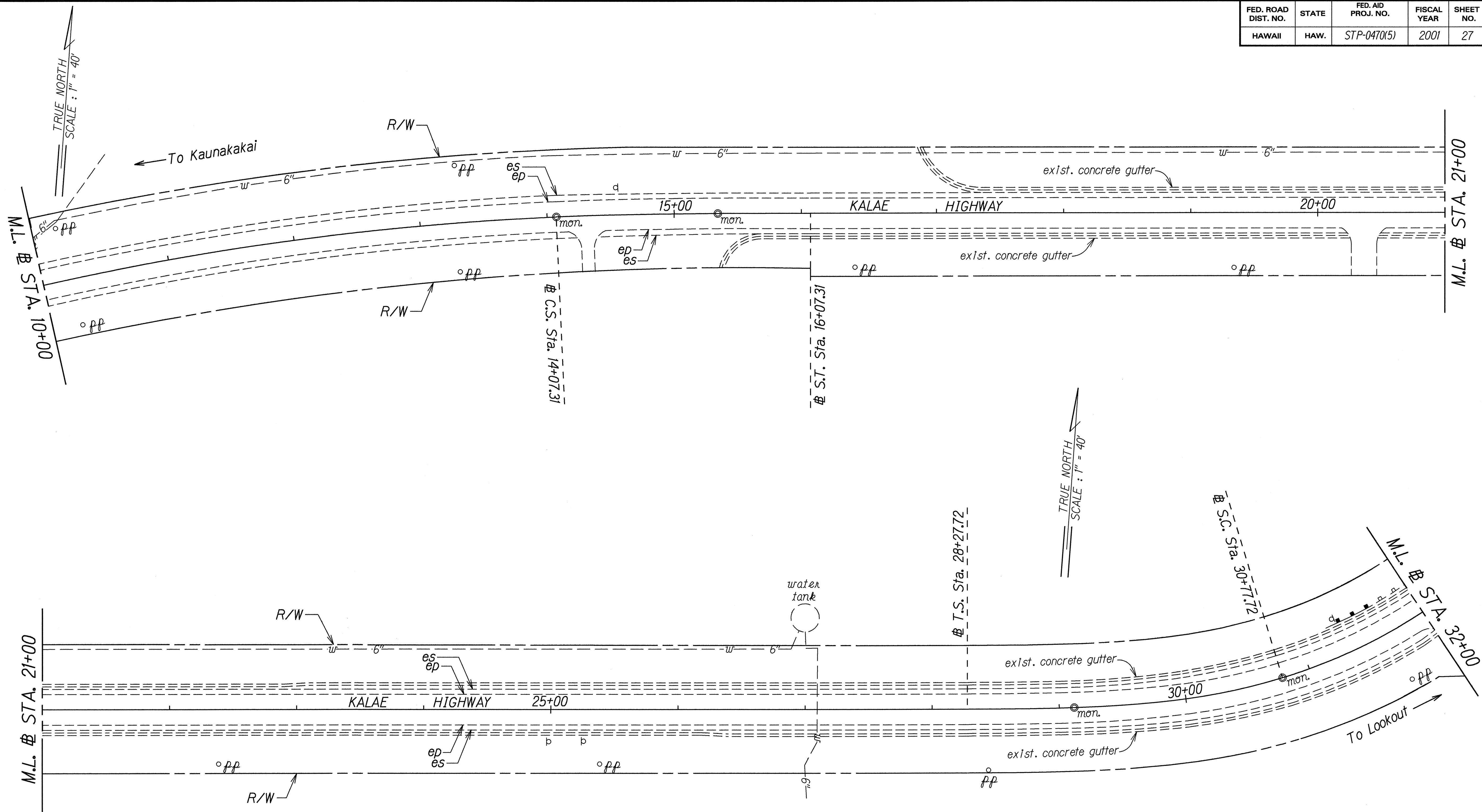
STA. 0+50 LT. - STA. 3+00 LT.
 Reset existing guardrail posts (26 each)
 Approach End - Remove existing flare end terminal
 Install Type Modified "G" w/radius flare, R=50'
 Trailing End - Remove Type "F" end terminal
 Install Type "A"



ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	July 2000
log in: Jay	TRACED BY	
14/11/00/00	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
ROADWAY PLAN
 KALAE HIGHWAY
 GUARDRAIL & SHOULDER IMPROVEMENTS
 Maunaloa Highway to
 Kalaupapa Lookout Parking Lot
 Fed. Aid Project No. STP-0470(5)
 Scale: 1" = 40' Date: July, 2000
 SHEET No. 11 OF 15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0470(5)	2001	27	30



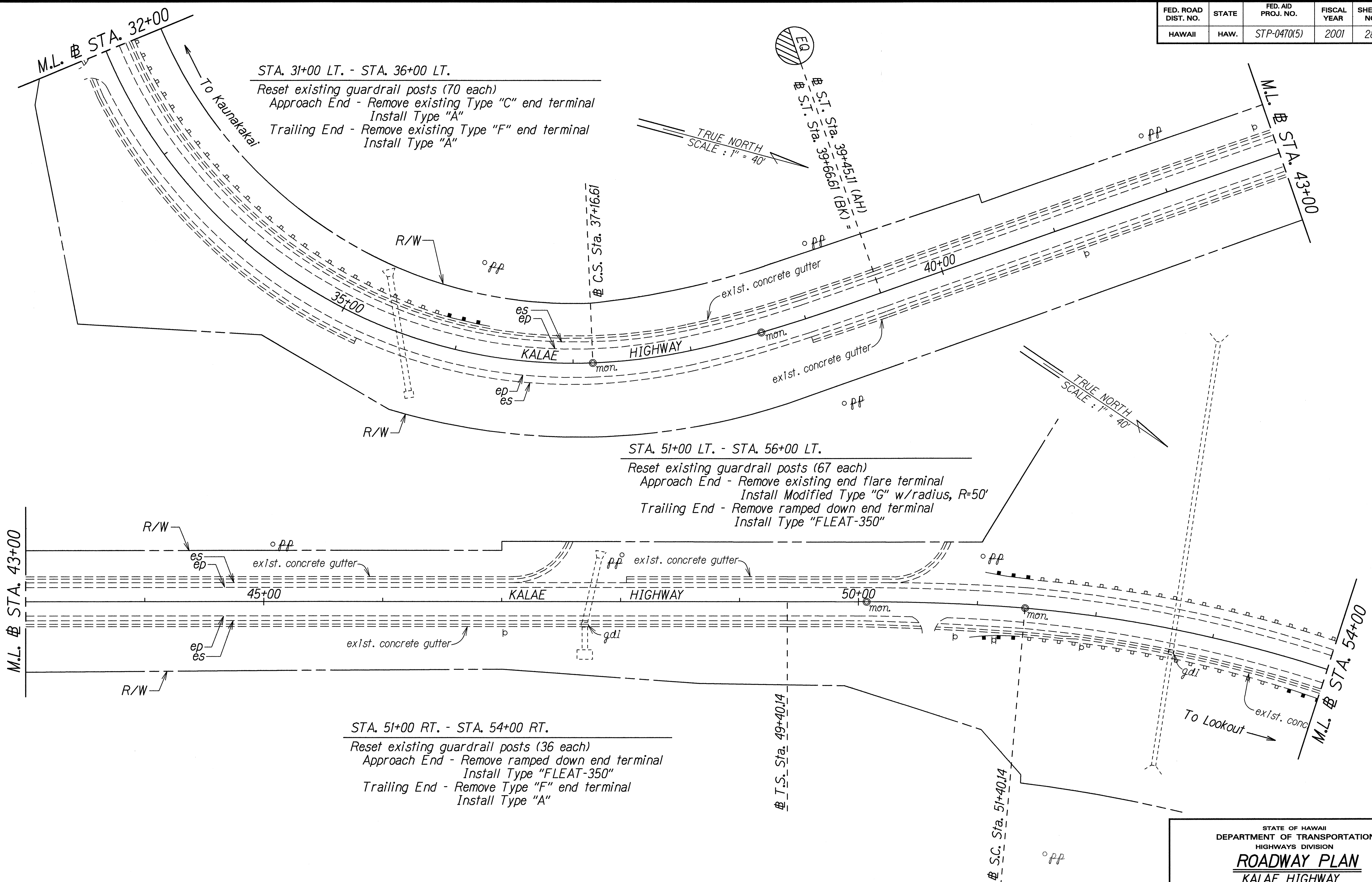
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	Feb. 2000
log in: jay	TRACED BY	
checked by	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN
KALAE HIGHWAY
GUARDRAIL & SHOULDER IMPROVEMENTS
Maunaloa Highway to
Kalaupapa Lookout Parking Lot
Fed. Aid Project No. STP-0470(5)
Scale: 1" = 40' Date: July, 2000

SHEET No. 12 OF 15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0470(5)	2001	28	30



SURVEY PLOTTED BY	DATE
DRAWN BY	Feb. 2000
TRACED BY	
QUANTITIES BY	
CHECKED BY	

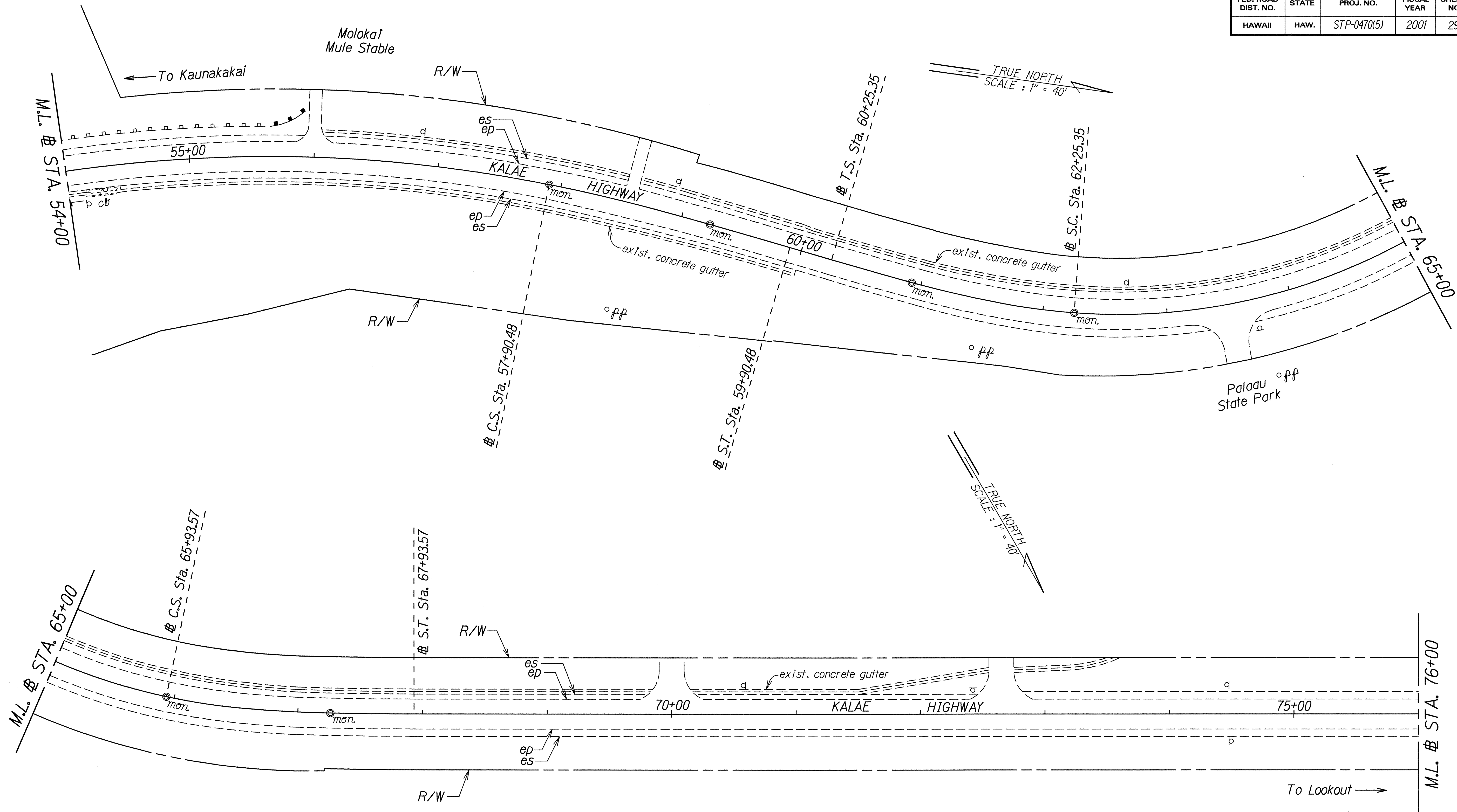
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

ROADWAY PLAN
KALAE HIGHWAY
GUARDRAIL & SHOULDER IMPROVEMENTS
 Maunaloa Highway to
 Kalaupapa Lookout Parking Lot
 Fed. Aid Project No. STP-0470(5)

Scale: 1" = 40' Date: July, 2000

SHEET No. 13 OF 15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0470(5)	2001	29	30



ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	Feb. 2000
loglin, jay	TRACED BY	
SA/temple/dgn	QUANTITIES BY	
	CHECKED BY	

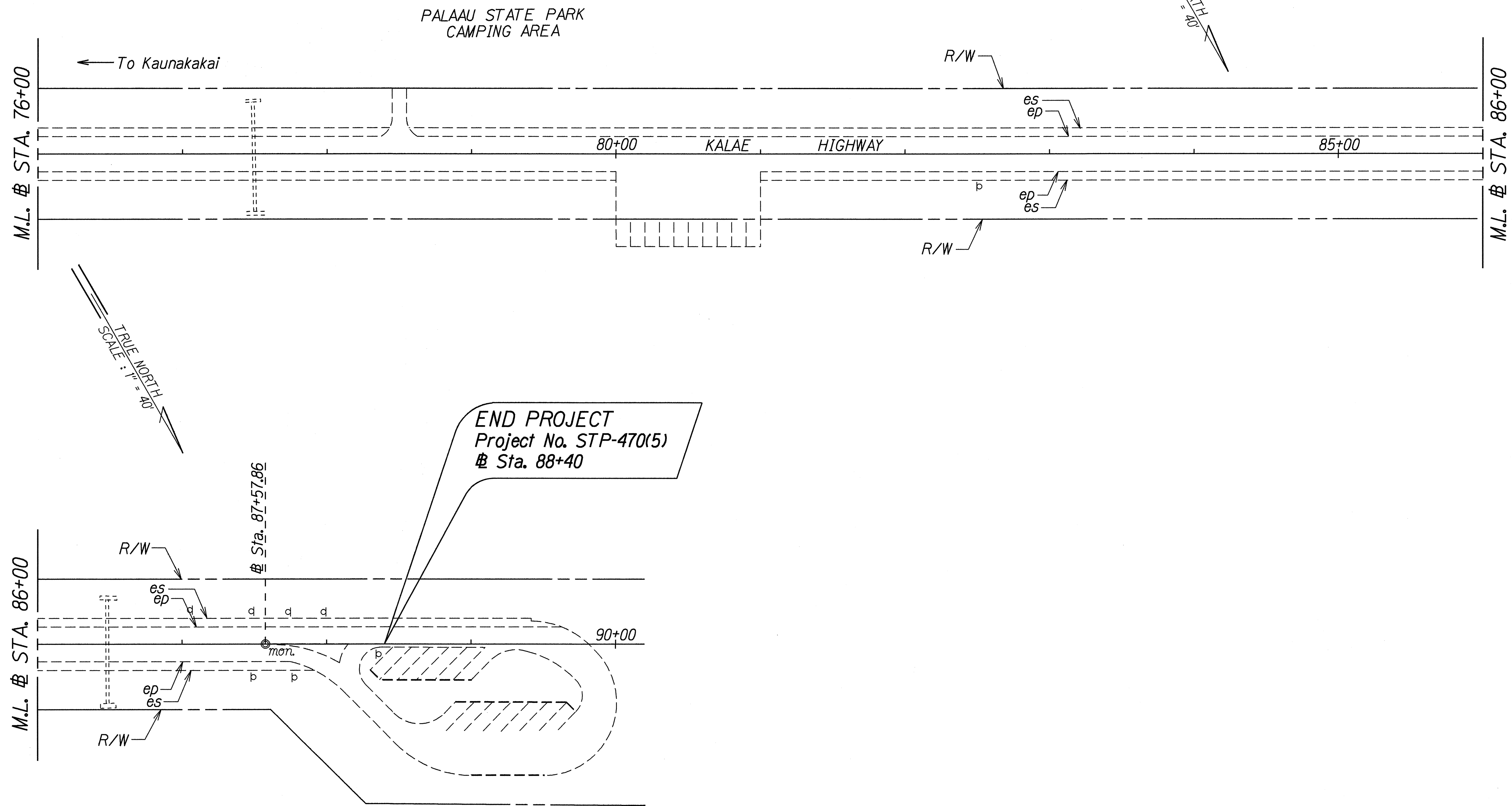
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN
KALAE HIGHWAY
GUARDRAIL & SHOULDER IMPROVEMENTS
Maunaloa Highway to
Kalaupapa Lookout Parking Lot
Fed. Aid Project No. STP-0470(5)

Scale: 1" = 40' Date: July, 2000

SHEET No. 14 OF 15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0470(5)	2001	30	30



ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	7/24/2000
log-in: jey	CHECKED BY	
at		
QUANTITIES BY		
CHECKED BY		

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY PLAN
KALAE HIGHWAY
GUARDRAIL & SHOULDER IMPROVEMENTS
Maunaloa Highway to
Kalaupapa Lookout Parking Lot
Fed. Aid Project No. STP-0470(5)
Scale: 1" = 40' Date: July, 2000

SHEET No. 15 OF 15 SHEETS

INDEX TO DRAWINGS	
SHEET	DESCRIPTION
Q1	INDEX, GENERAL NOTES, ABBREVIATIONS, ESTIMATED QUANTITIES AND SYMBOLS
Q2	TYPE "A" END POST AND GUARDRAIL CONNECTION DETAILS
Q3	TYPE "A" END POST DETAILS
Q4	METAL GUARDRAIL TYPE 3 THRIE BEAM AND APPURTENANCES DETAILS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0470(5)	2001	ADD. 30S-1	30

DESIGN SPECIFICATIONS--AASHTO:

1. AASHTO LRFD Bridge Design Specifications, 1998, with subsequent revisions.

1. Reinforced concrete: $f'c = 3,000$ psi
2. Reinforcing steel: ASTM A 615, Grade 60.
3. Admixture in concrete: See Special Provisions
4. All expansion and premolded joint filler shall be incidental to concrete and will not be paid for separately.
5. All structural steel shall be ASTM A 36 hot-dip galvanized after fabrication.
6. All anchor bolts, washers and nuts shall be AASHTO M 164, hot-dip galvanized after fabrication, unless noted otherwise.
7. All welding shall be in accordance with the current edition of Structural Steel Welding Code AWS D 1.1. Welding electrodes for structural steel shall be E 70.

1. Refer to Hawaii Standard Specifications for Road, Bridge and Public Works Construction, 1994 Edition and Special Provisions.
2. Except as noted otherwise, all dimensions are measured plumb.
3. For concrete finish, see Special Provisions.
4. Steel reinforcing shall be supported, bent and placed as per the ACI Detailing Manual, 1994.
5. The minimum cover measured from the surface of the concrete to the face of any reinforcing bar shall be as follows, except as noted otherwise:
 - a. Concrete cast or finished to a smooth surface: 2"
 - b. Concrete cast against and permanently exposed to earth: 3"
6. At time concrete is placed, reinforcing shall be free from mud, oil, laitance or other coatings adversely affecting bond capacity.
7. Reinforcement, dowels and other embedded items shall be positively secured before pouring.
8. Any damage to any existing structures due to the Contractor's operation or negligence shall be repaired at his expense with no additional cost to the State, and to the satisfaction of the Engineer.
9. All dimensions relating to reinforcing bars (e.g. spacing of bars, etc.) are to centers of bars unless noted otherwise.
10. All existing reinforcing that can be incorporated in the new work shall be cleaned before being utilized in the new work.
11. All footings shall bear on firm undisturbed natural soils or properly compacted structural fill.
12. Excavation for all footings and footing keys shall be accomplished by maintaining as near a vertical cut as possible. In the event of over-excavation, the space between the footing or footing key and ground shall be filled with a minimum of Class D concrete at the Contractor's expense and as directed by the Engineer.

1. Refer to Standard Plans for additional details and notes not covered by details and typical drawings.

1. All items noted incidental will not be paid for separately.
2. The Contractor shall verify the locations of all existing utility lines and notify their respective owners before commencing with any work.
3. The Contractor shall verify all grades and dimensions in the field before commencing with any work.
4. The Contractor shall be solely responsible for the protection of adjacent property, utilities and existing and new structures from damage due to construction. Repairing any damage shall be at the Contractor's own expense, to the satisfaction of the Engineer. He shall conduct his work in such a manner and provide such temporary shoring or other measures as may be necessary to insure the safety of all concerned and to protect existing structures.
5. Unless noted otherwise, chamfer all exposed concrete edges three-quarters ($\frac{3}{4}$) of an inch.
6. The Contractor, at his own expense, shall keep the project area free from dust nuisance. The work shall be in conformance with the air pollution control standards and regulations of the State of Hawaii Department of Health.

AB	Anchor Bolt	FF	Front Face	PL	Plate
Abut.	Abutment	Fin.	Finish		
Alum.	Aluminum			R	Radius
Approx.	Approximate	Ga.	Gage, gauge	Rdwy.	Roadway
		Galv.	Galvanized	Ref.	Reference
Ⓐ	Baseline	Gr.	Grade	Req'd	Required
Bal.	Balance			Reinf.	Reinforcing
Beg.	Begin, Beginning	Horiz.	Horizontal		
Bm.	Beam	HS	High Strength	Sect.	Section
Brg., Brgs.	Bearing, Bearings	IB	Inbound	Shld.	Shoulder
Ⓒ	Center line	Jt.	Joint	Sht.	Sheet
Cl.	Clear			Spcs.	Spaces
Col.	Column	L	Length	Spog.	Spacing
Conc.	Concrete	LC	Length of Curve	Sta.	Station
Cont.	Continuous	Lg.	Long	Std.	Standard
CR	Corrosion Resistant	Longit.	Longitudinal	Struct.	Structural
				Str.	Structure
Def.	Detail	Max.	Maximum	T#B	Top and Bottom
Dia.	Diameter	Min.	Minimum	Thk.	Thick
Diag.	Diagonal			TS	Tubular Steel
				Typ.	Typical
Ea.	Each	No.	Number		
EF	Each Face	NIC	Not In Contract		
Eq.	Equal	oc	On Center	Vert.	Vertical
Exist.	Existing	OB	Outbound		
Exp.	Expansion	OD	Outside Dimension	w/	with
E.W.	Each Way				

Detail or section designation →

Sheet number section is cut or detail section →

Sheet number detail is drawn on →

ESTIMATED QUANTITIES			
ITEM NO.	ITEM DESCRIPTION	UNIT	QTY.
507.7600	Type "A" End Post Upgrade	EA.	1
606.3112	Guard Rail, Type 3 Thrie Beam	L.F.	25

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	Apr 2001
DESIGNED BY	TRACED BY	Apr 2001
QUANTITIES BY	DESIGNED BY	Apr 2001
CHECKED BY	QUANTITIES BY	Apr 2001
PS	CHECKED BY	Apr 2001

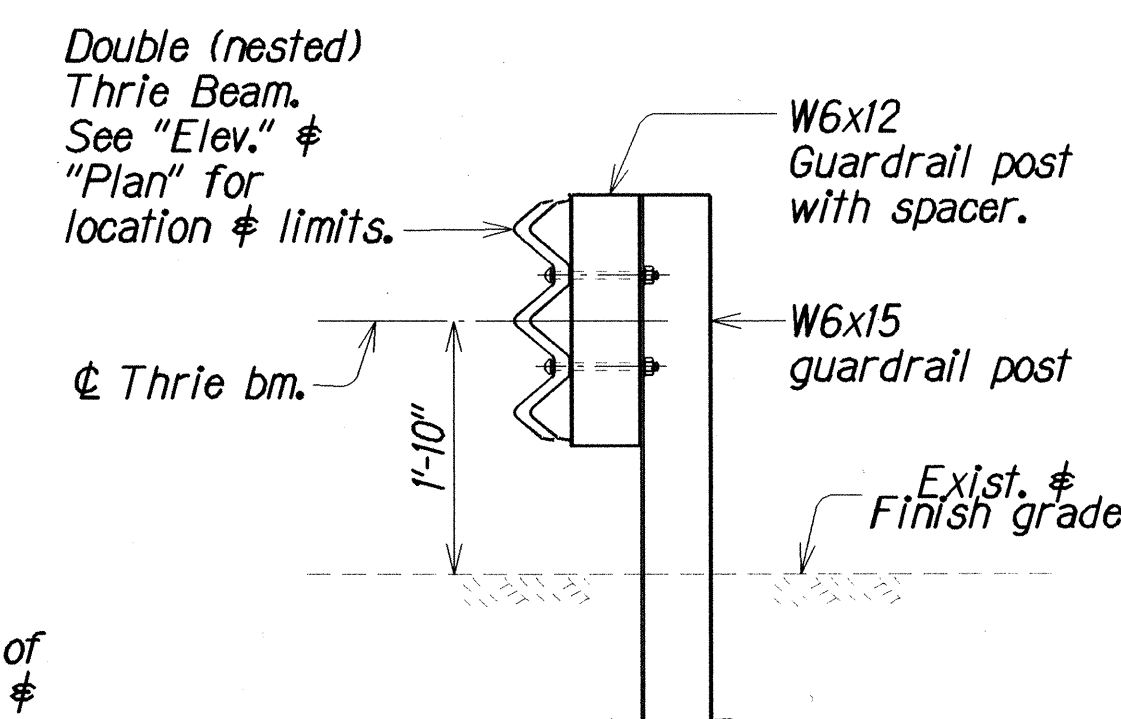
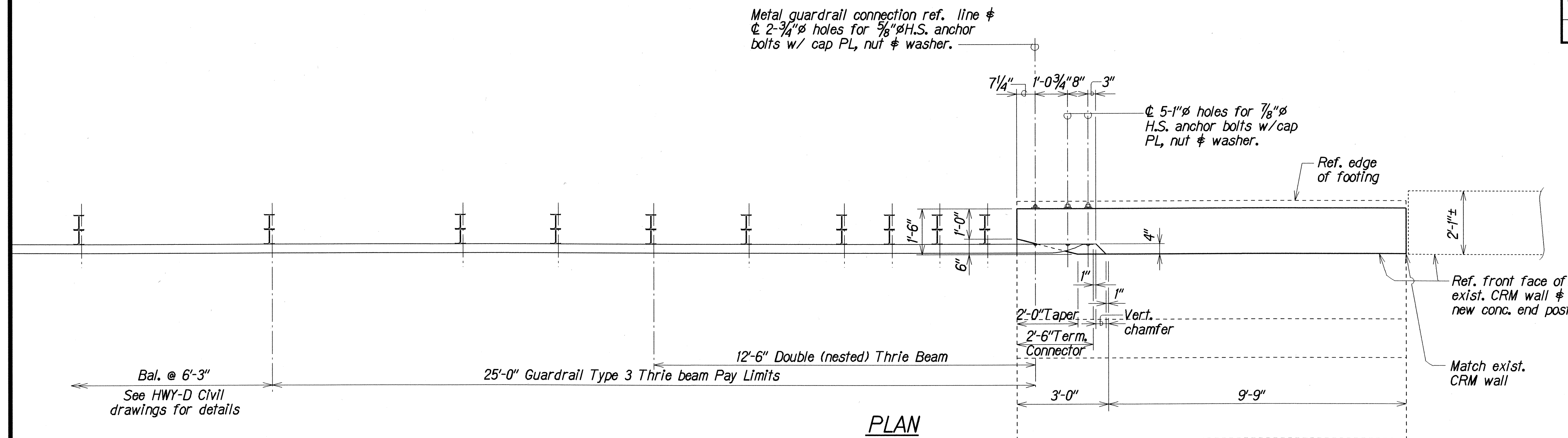
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

INDEX, GENERAL NOTES, ESTIMATED
QUANTITIES, ABBREVIATIONS AND SYMBOLS

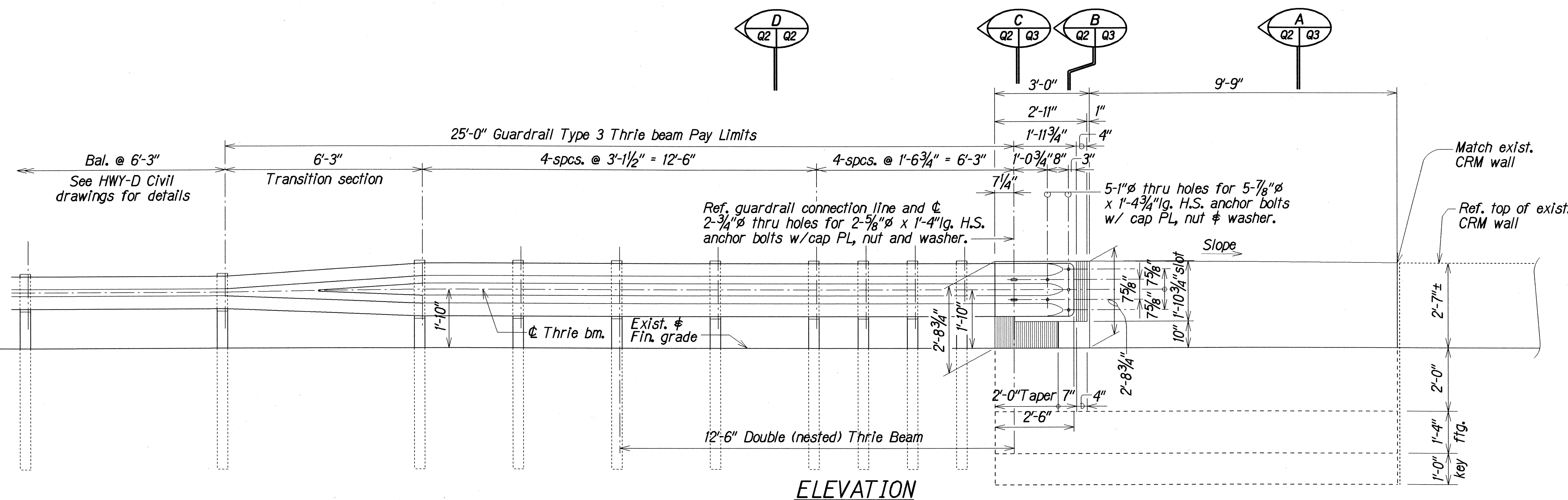
KALAE HIGHWAY
GUARDRAIL & SHOULDER IMPROVEMENTS
Maunaloa Highway to Kalaupapa Lookout Parking Lot
Fed. Aid Project No. STP-0470(5)

Scale: As Noted Date: Apr. 2001

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0470(5)	2001	ADD. 30S-2	30



SECTION D
Scale: $\frac{3}{4}$ " = 1'-0"



TYPE "A" END POST AND GUARDRAIL CONNECTION DETAILS

Scale: $\frac{1}{2}$ " = 1'-0"

NOTES:

- The work necessary to connect guardrail to concrete endpost shall include all labor, materials, tools, equipment and incidentals necessary to complete the work and shall be incidental to Item No. 606.3112, Guardrail Type 3 Thrie Beam on Steel Post and will not be paid for separately.
- See "General Notes" on Sht. Q1 for additional guardrail and drilling information.
- All anchor bolts shall be high strength bolts conforming to the requirements of AASHTO M 164. See Special Provisions.
- Anchor bolt length shall be such that a snug fit of the elements and full thread engagement plus $\frac{1}{4}$ " (max) is attained.
- Terminal connector, Thrie Beam Metal Guardrail and Transition Section shall be fabricated from 10 gauge steel conforming to the requirements of AASHTO M 180 and shall be hot-dip galvanized after fabrication.
- Guardrail post and spacer block including all anchor bolts, cap PL, bolts, nuts, and washers shall be hot-dip galvanized after fabrication.
- Cap PL shall be fabricated from ASTM A 36.
- First 25'-0" of guardrail adjoining "Terminal Connector" shall be galvanized steel and supports spaced as shown on the detail drawings. This section of rail shall be placed on tangent to end post or parallel to roadway, unless conditions at site renders it impossible to do so. Flare point to be determined in field.
- Double (nest 1st panel) thrie beam elements at all end post connections.
- Where double (nested) beam occur, 12" "Back-up Plate" not required.
- Heads of through anchor bolts shall be placed on the traffic side of the rail.
- Drilling of through holes shall be done in such a manner as to prevent cone puncturing of the daylighting end.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**TYPE "A" END POST AND
GUARDRAIL CONNECTION DETAILS**

KALAE HIGHWAY
GUARDRAIL & SHOULDER IMPROVEMENTS
Maunaloa Highway to Kalaupapa Lookout Parking Lot
Fed. Aid Project No. STP-0470(5)

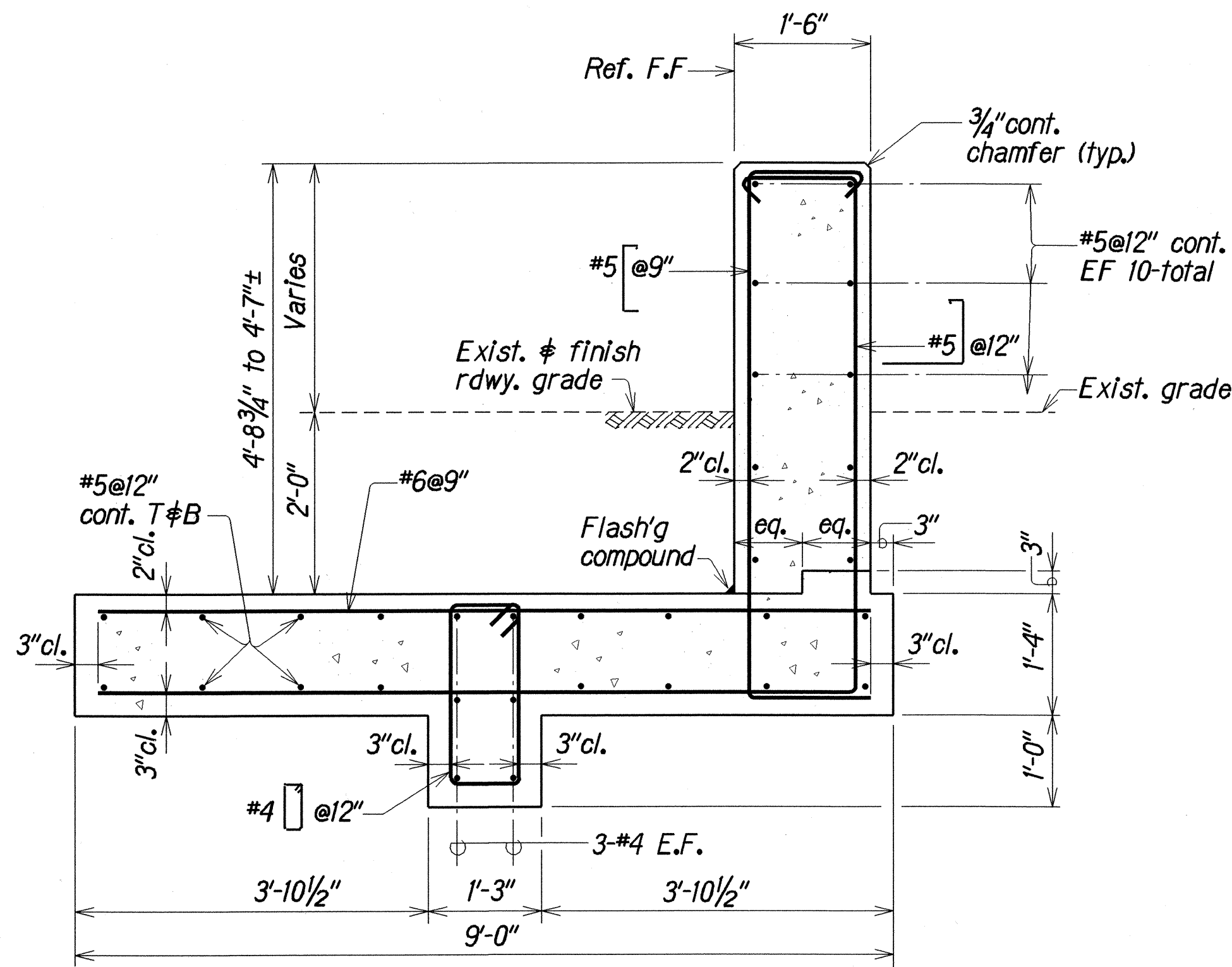
Scale: As Noted Date: Apr, 2001

SHEET No. Q2 OF 4 SHEETS

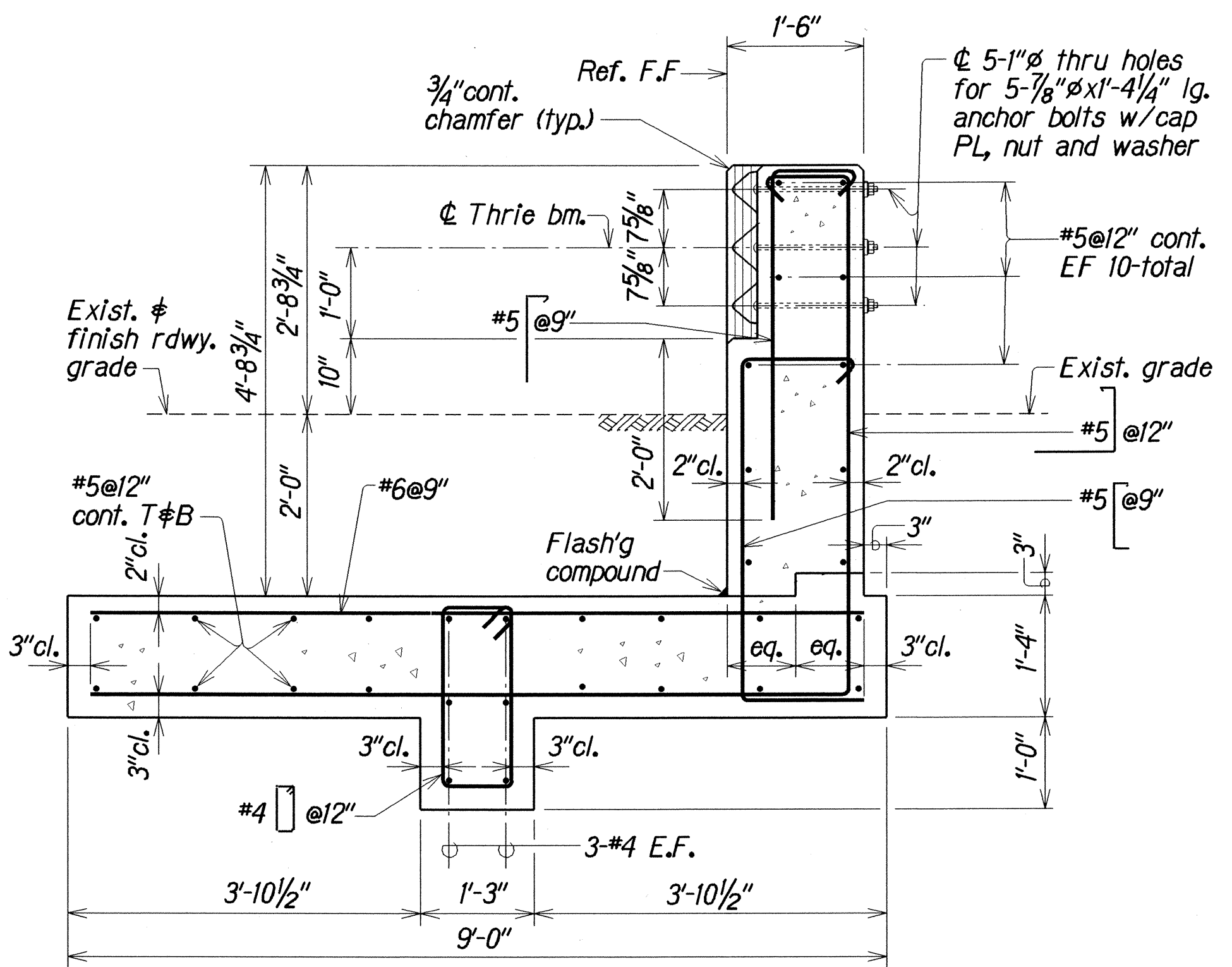
ADD. 30S-2

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	APR 2001
DESIGNED BY	LEU	APR 2001
CHECKED BY	LEU	APR 2001
	PS	APR 2001

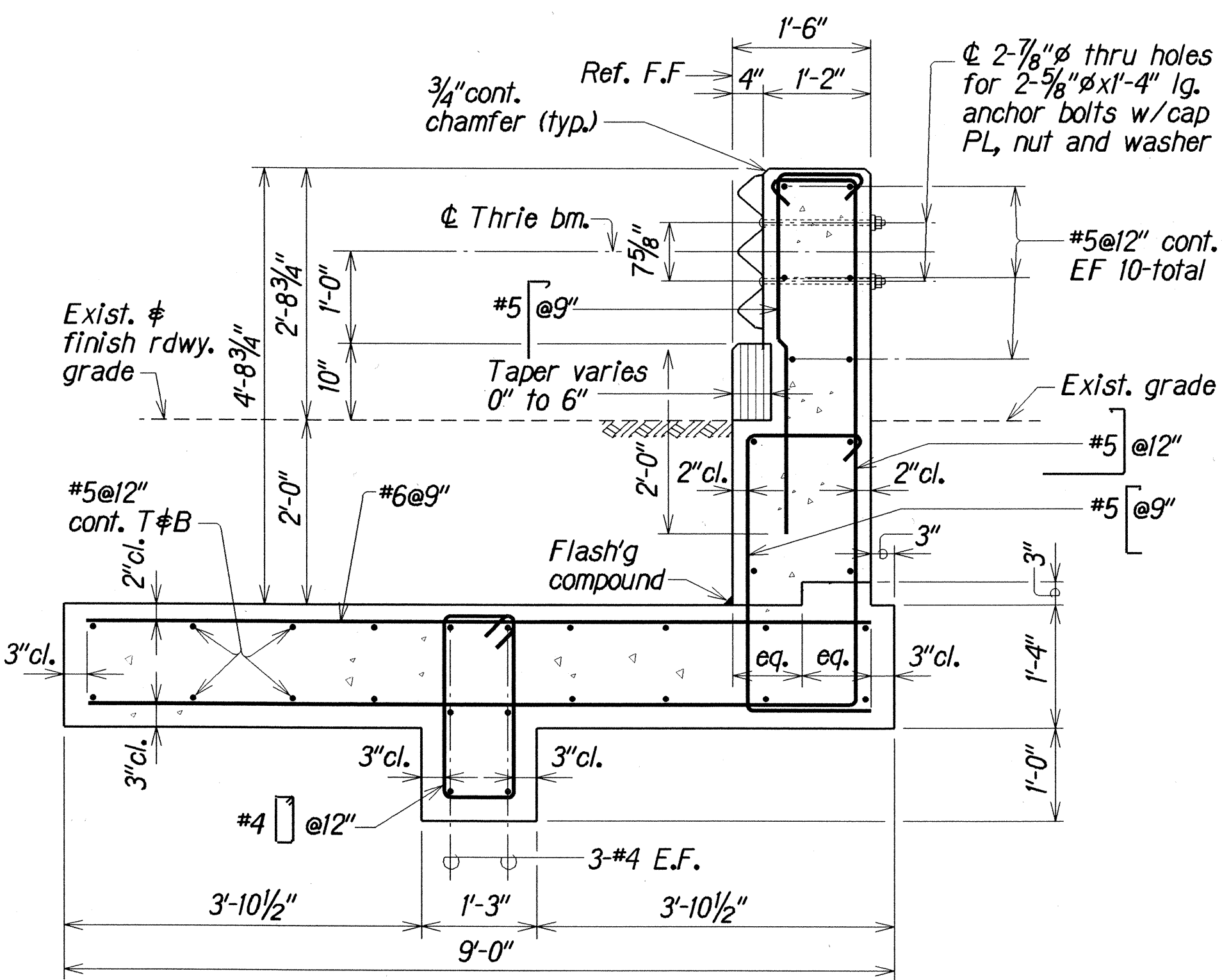
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0470(5)	2001	ADD. 30S-3	30



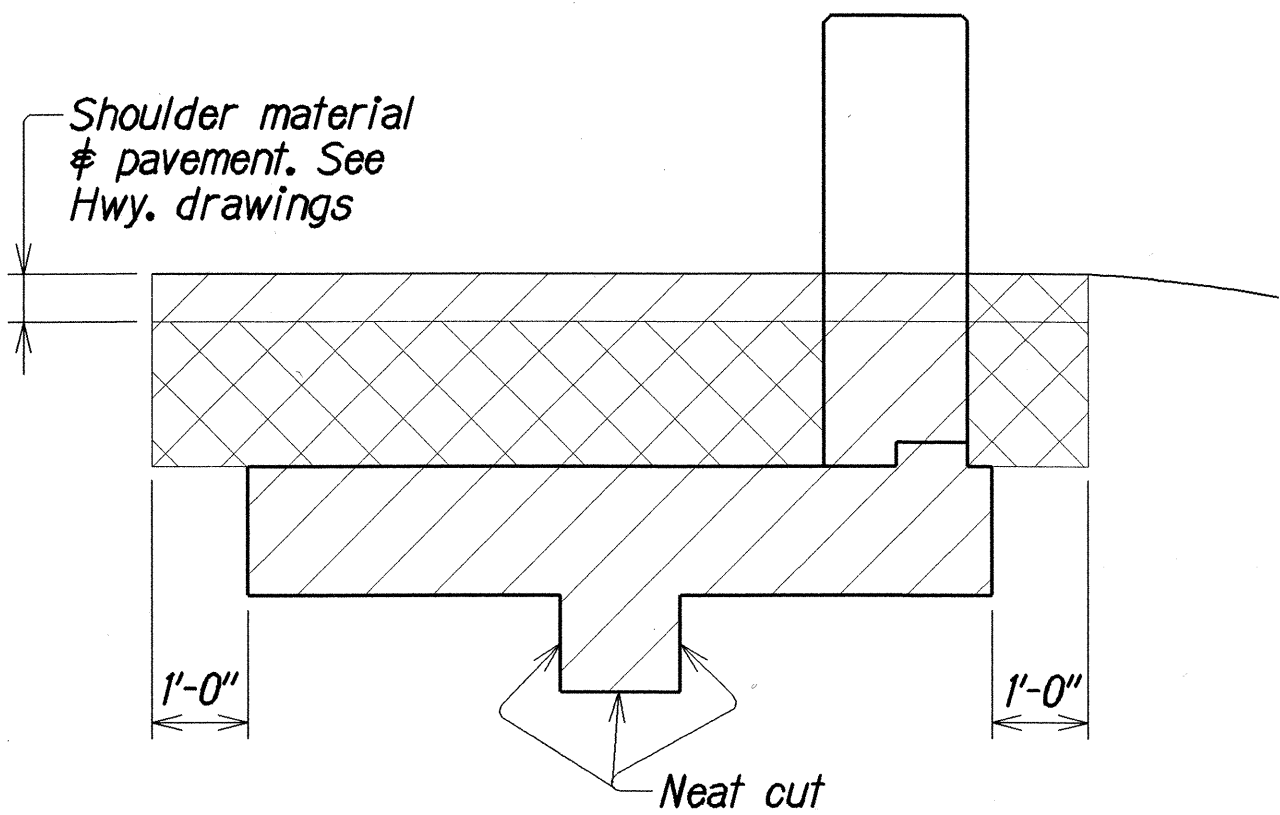
SECTION A
Scale: 3/4" = 1'-0"



SECTION B
Scale: 3/4" = 1'-0"



SECTION C
Scale: 3/4" = 1'-0"



Shoulder material & pavement. See Hwy. drawings

Neat cut

Structure Excavation

Structure Backfill

Structure backfill material shall conform to glassphalt base course. See Standard Specifications, Section 312

TYPICAL STRUCTURE EXCAVATION AND BACKFILL
Not to Scale

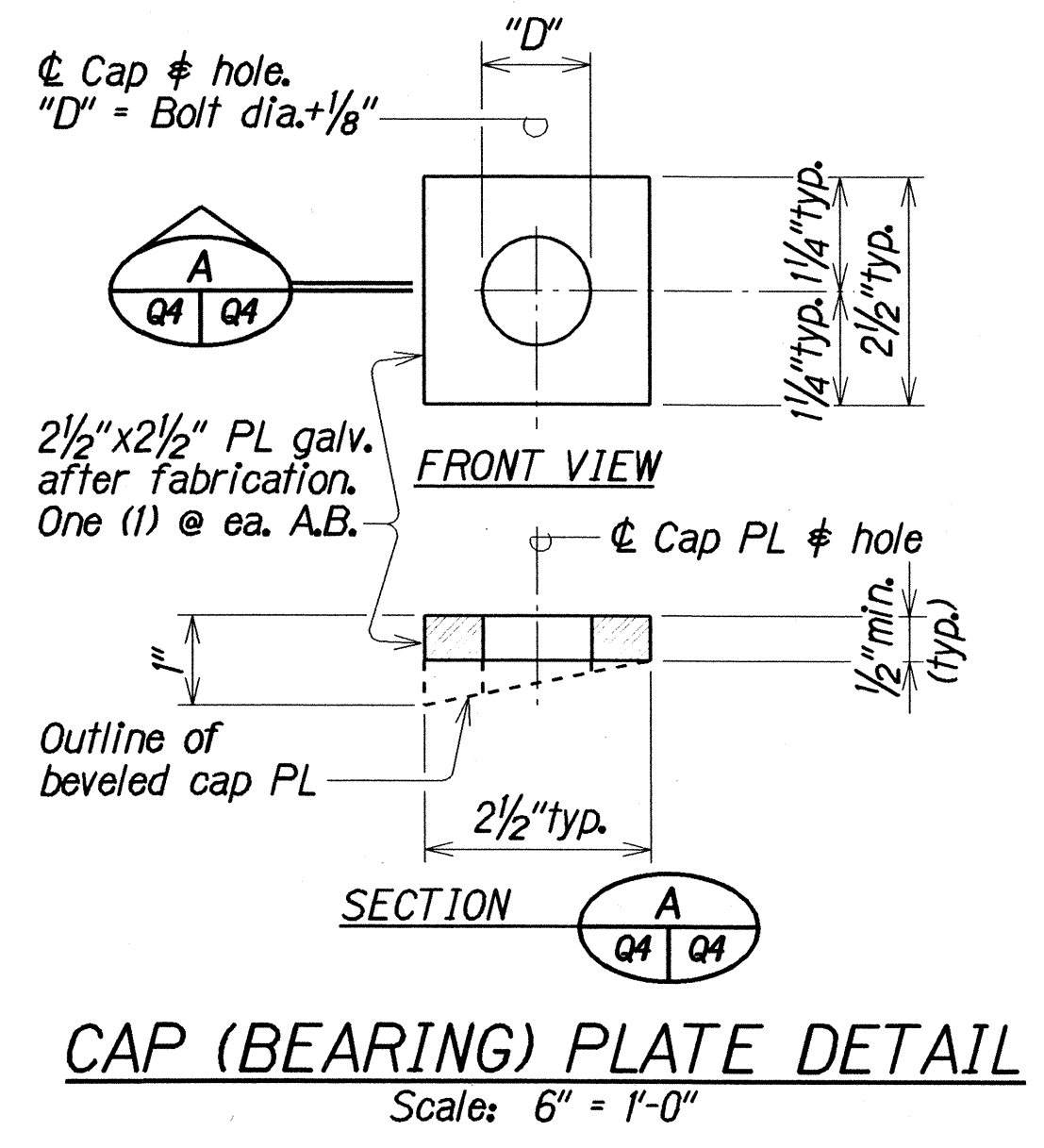
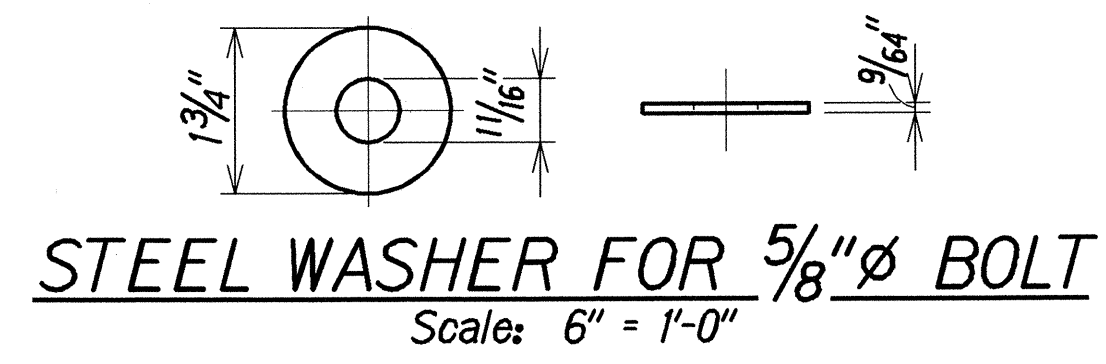
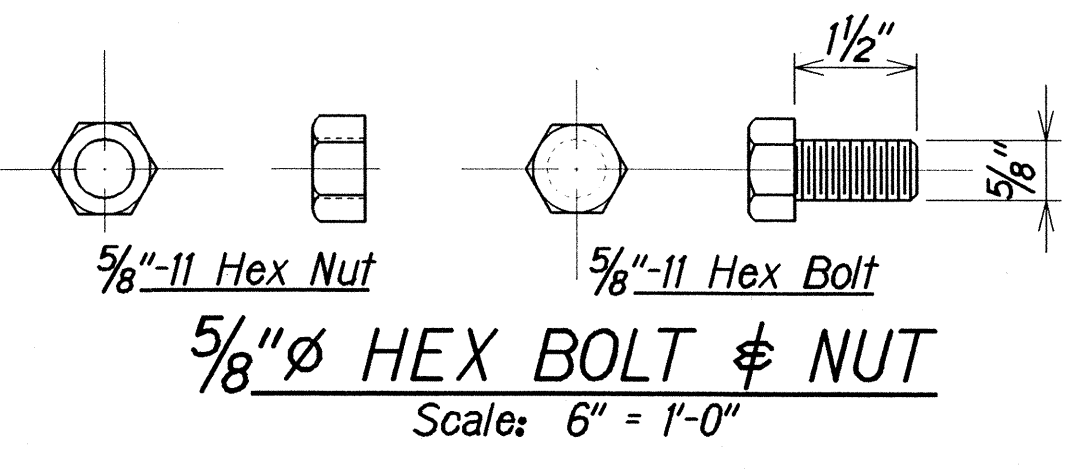
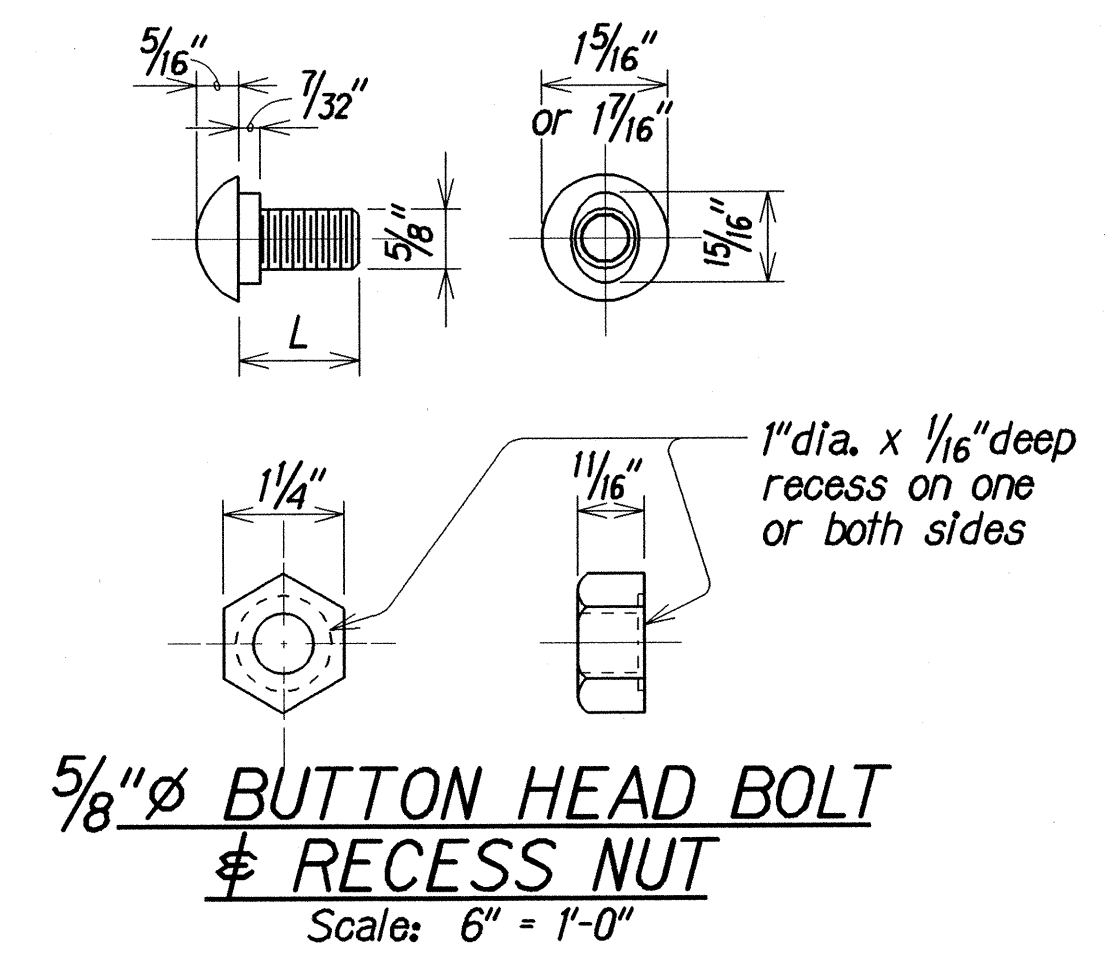
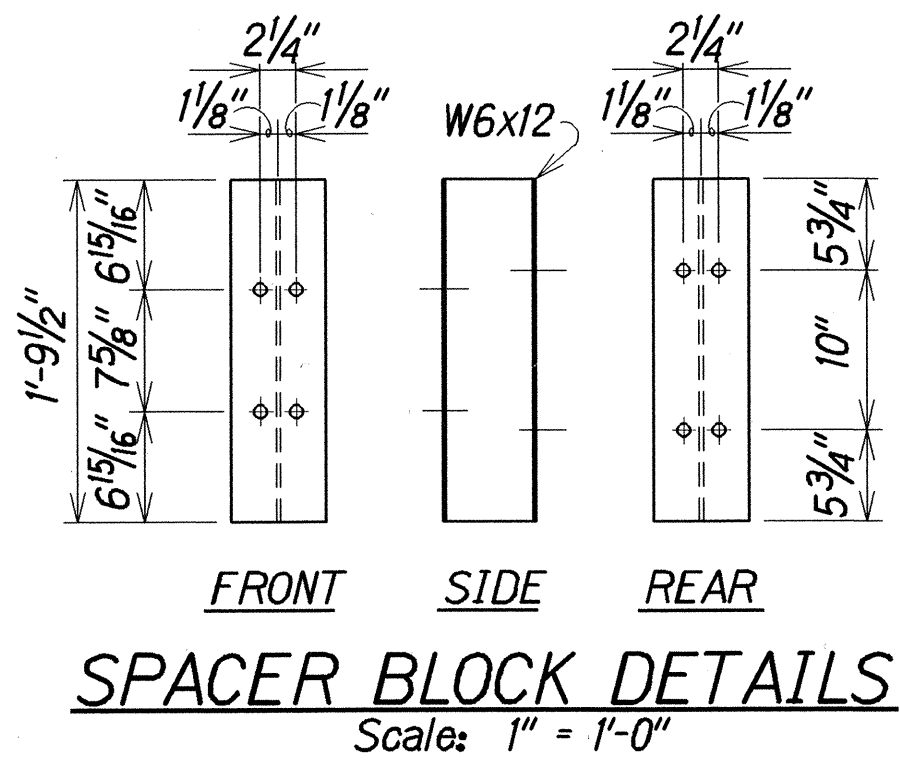
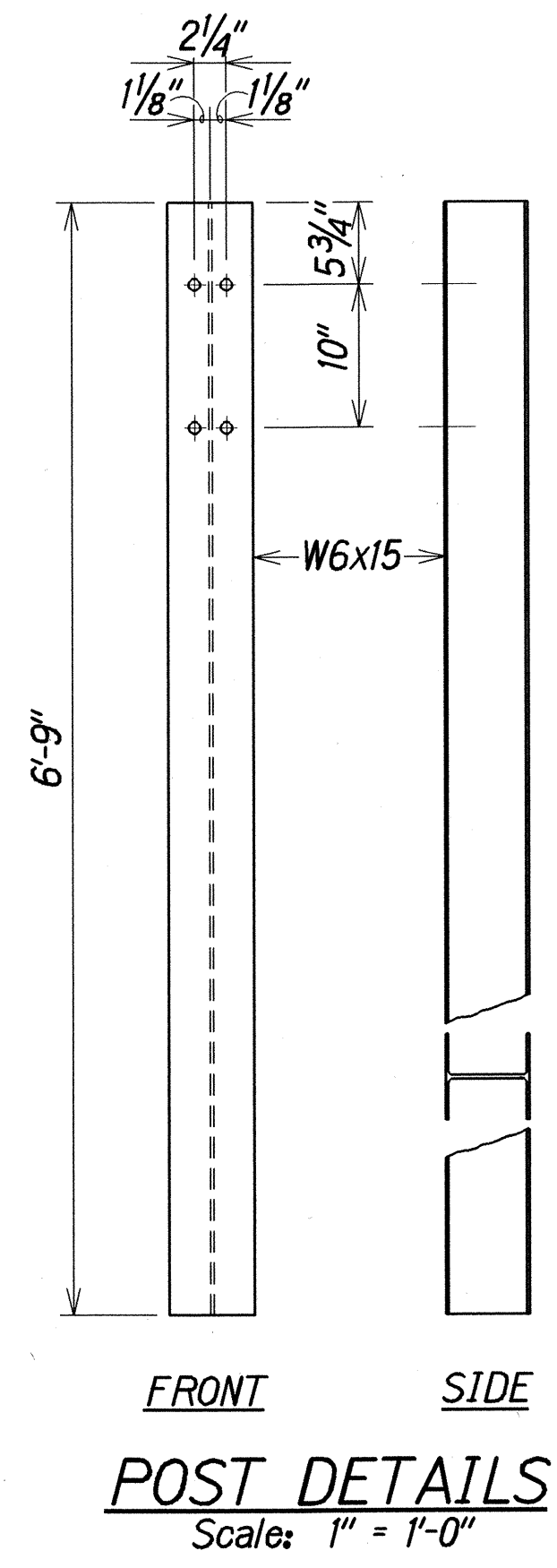
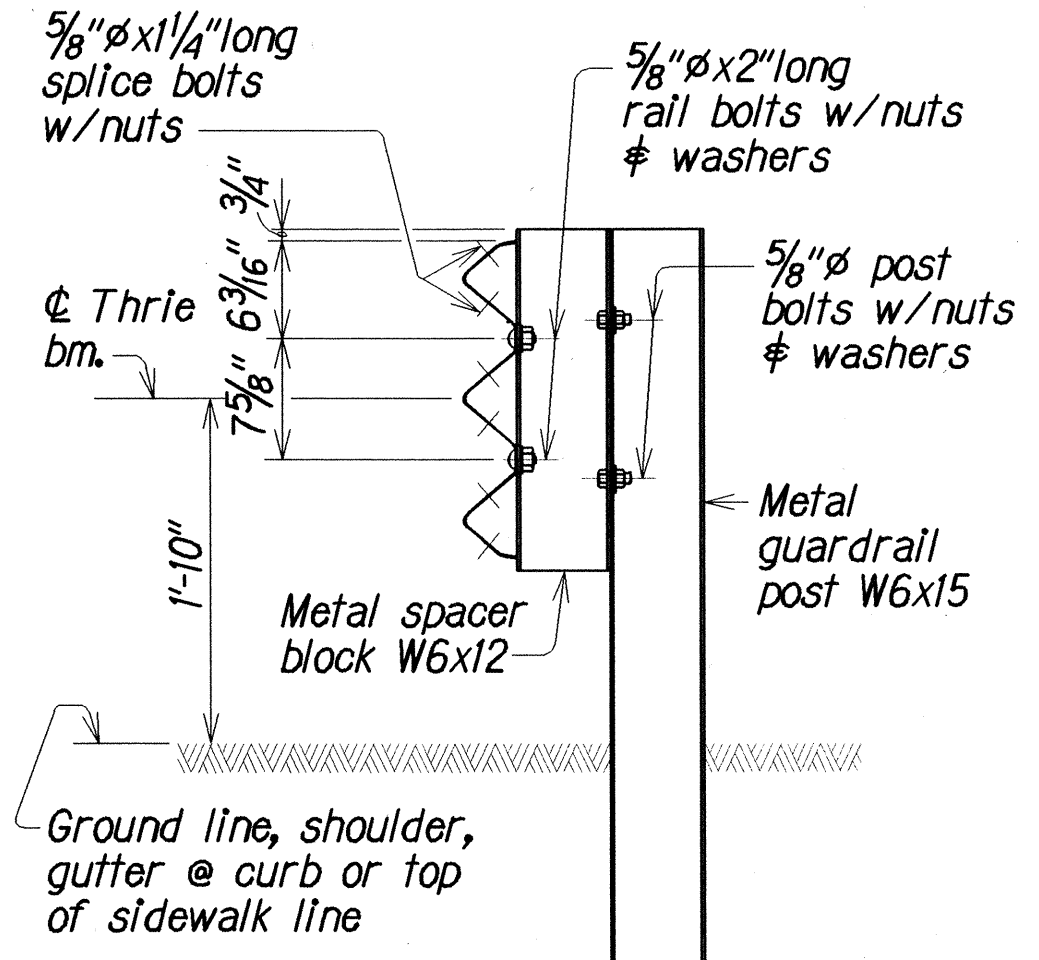
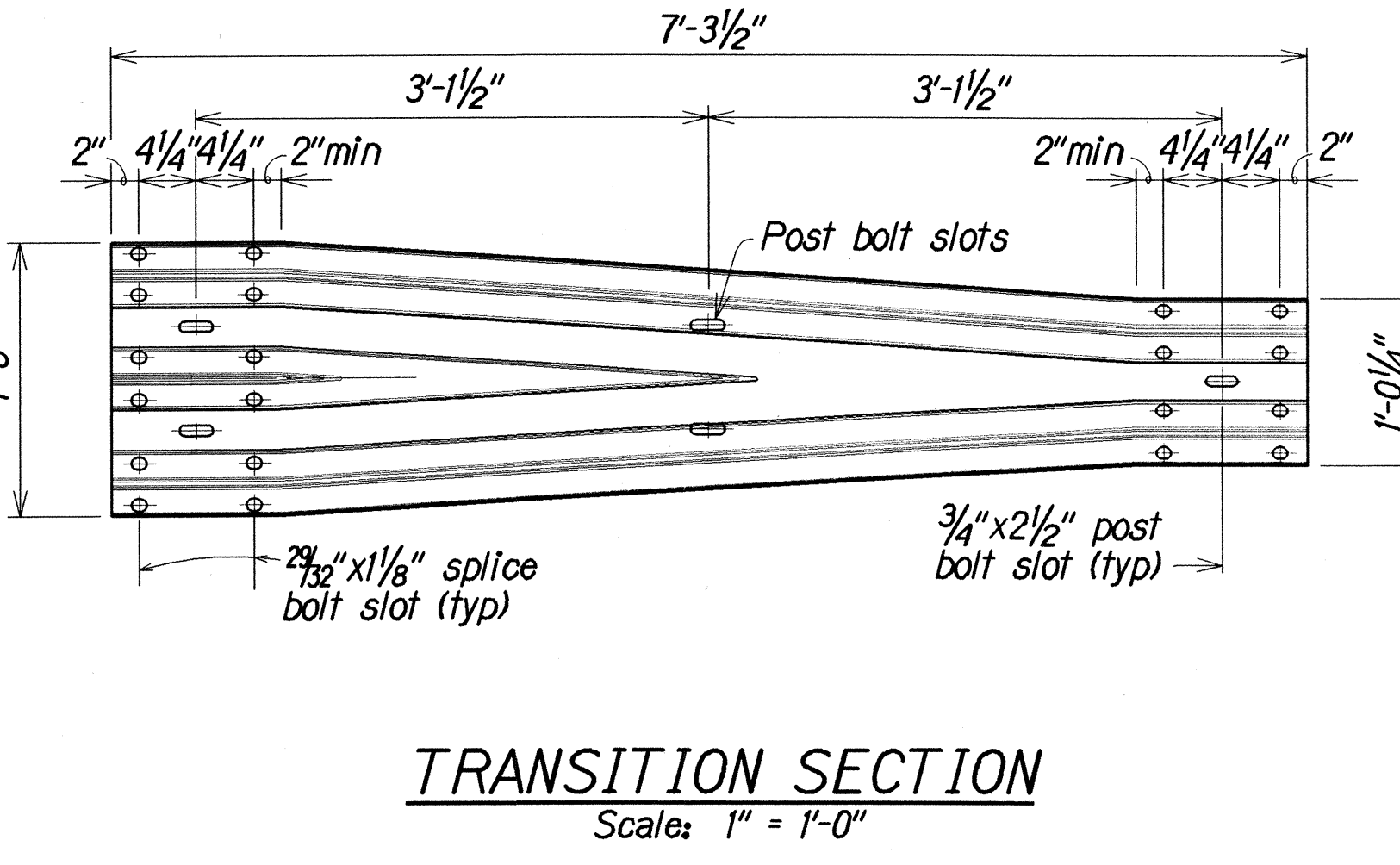
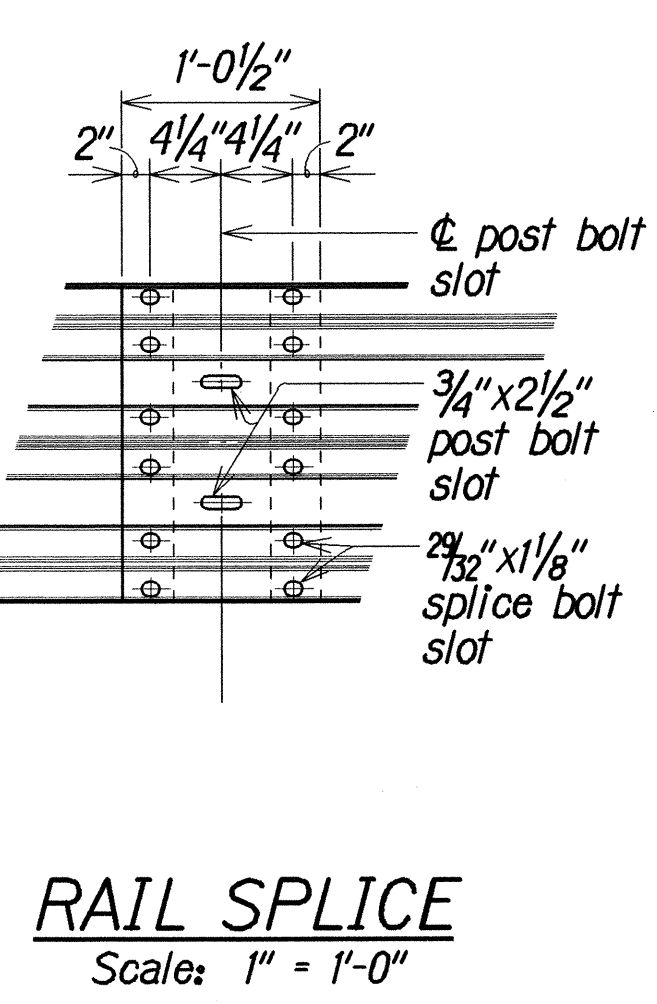
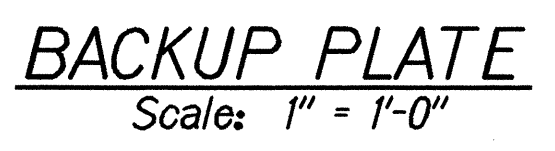
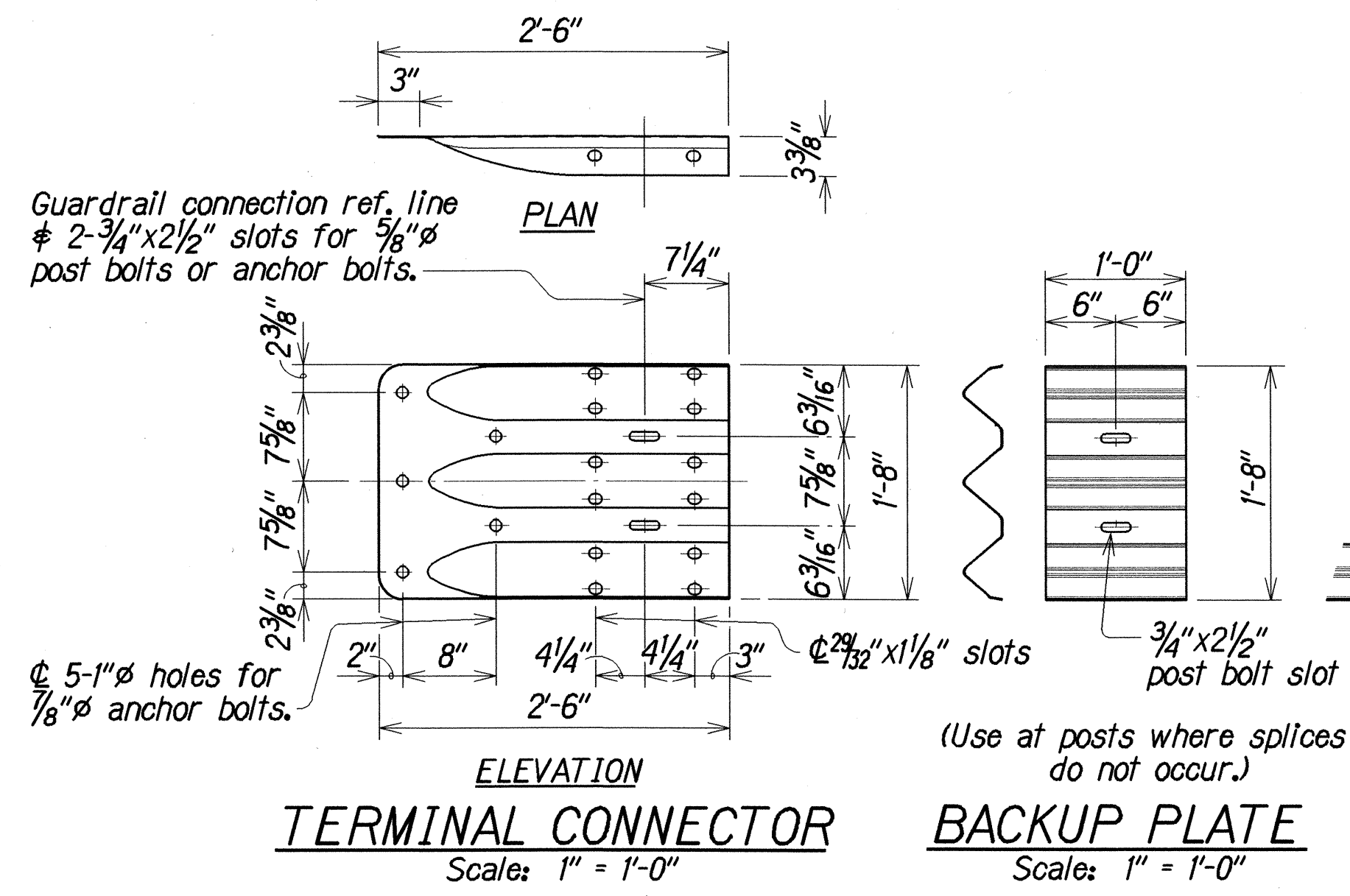
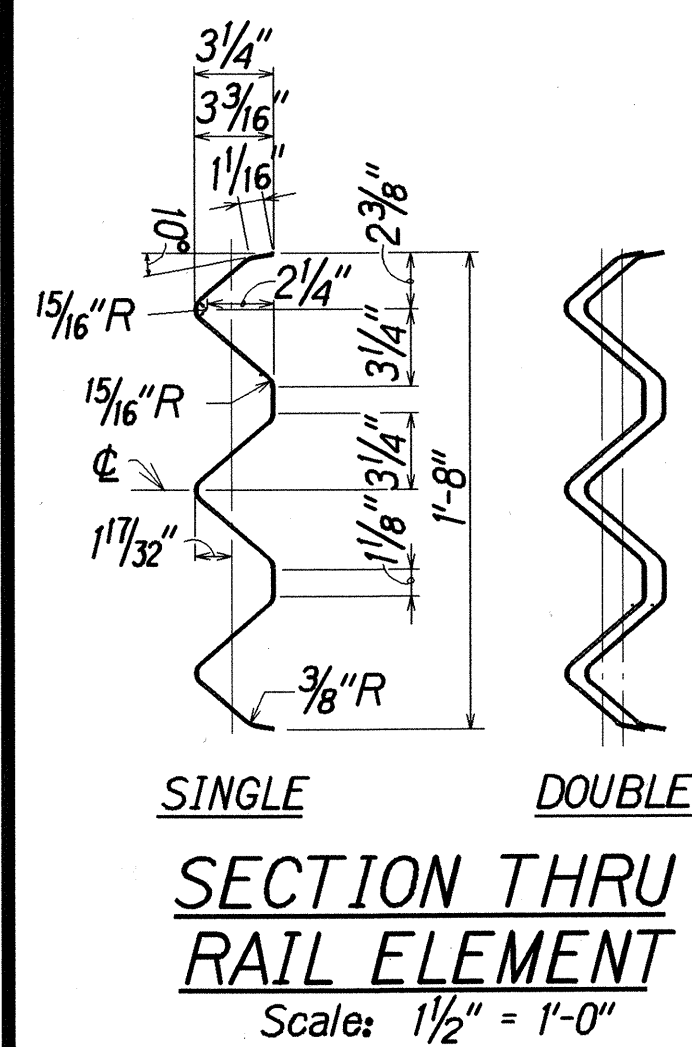
ORIGINAL PLAN	DATE
DRAWN BY	MM
DESIGNED BY	MM
CHECKED BY	MM
NOTED BY	MM
DATE	MM

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE "A" END POST DETAILS
KALAE HIGHWAY
GUARDRAIL & SHOULDER IMPROVEMENTS
Maunaloa Highway to Kalaupapa Lookout Parking Lot
Fed. Aid Project No. STP-0470(5)

Scale: As Noted
Date: Apr. 2001

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0470(5)	2001	ADD. 30S-4	30



METAL GUARDRAIL TYPE 3 THRIE BEAM AND APPURTENANCES DETAILS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**METAL GUARDRAIL TYPE 3 THRIE BEAM
AND APPURTENANCES DETAILS**

KALAE HIGHWAY
GUARDRAIL & SHOULDER IMPROVEMENTS
Maunaloa Highway to Kalaupapa Lookout Parking Lot
Fed. Aid Project No. STP-0470(5)

Scale: As Noted
Date: Apr. 2001

SHEET No. Q4 OF 4 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	APR 2001
	DESIGNED BY	APR 2001
	CHECKED BY	APR 2001
		APR 2001