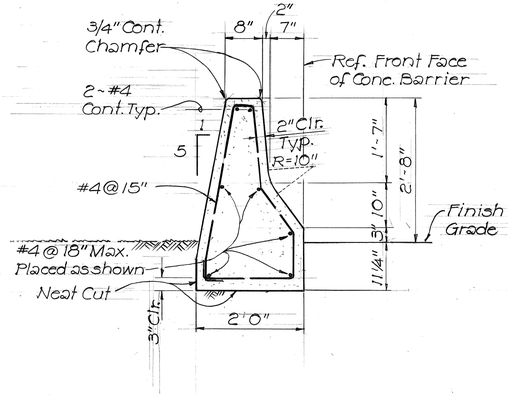
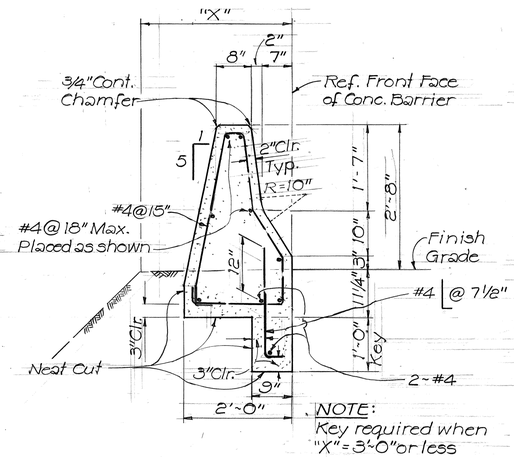
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 20 | 197 |



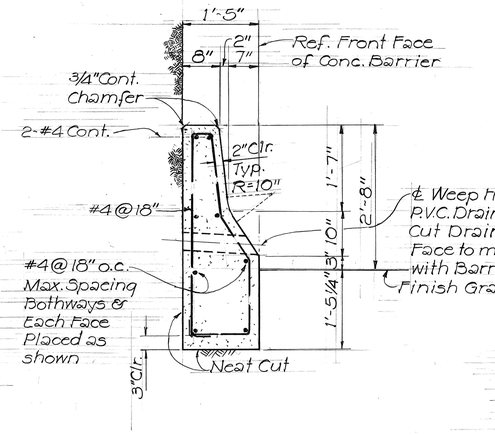

## GUARD RAIL TYPE 4F CONCRETE RIGID BARRIER

SCALE: 3/4"=1'-0"



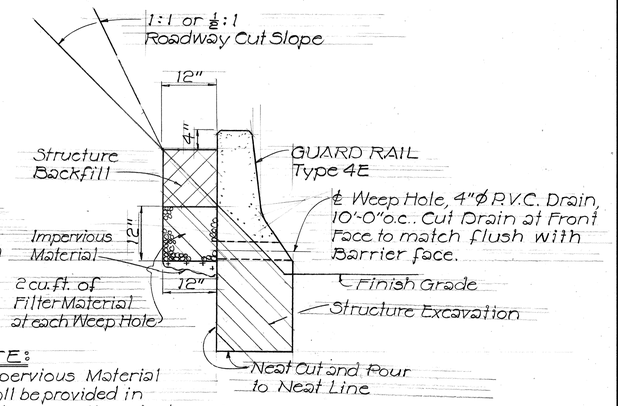

## GUARD RAIL TYPE 4F CONCRETE RIGID BARRIER WITH KEY

SCALE: 3/4"=1'-0"



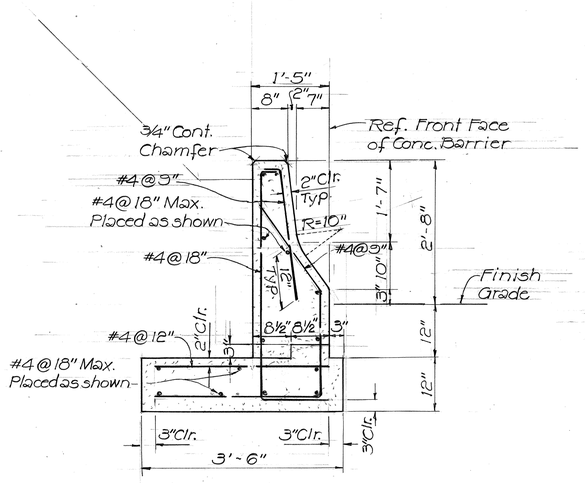

## GUARD RAIL TYPE 4E CONCRETE RIGID BARRIER

SCALE: 3/4"=1'-0"



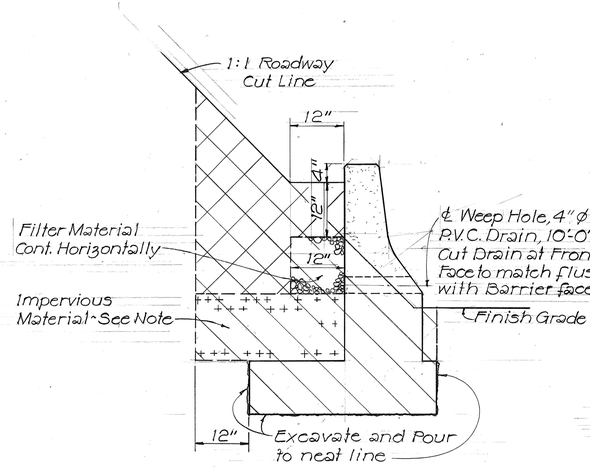

## GUARD RAIL TYPE 4E, CONCRETE RIGID BARRIER AT LOCATIONS WHERE ROADWAY CUT SLOPE IS 1:1 OR 1/2:1

SCALE: 3/4"=1'-0"




## GUARD RAIL TYPE 4EF CONCRETE RIGID BARRIER

SCALE: 3/4"=1'-0"




NOTE:

HATCHED AREA

1. Hatched area shown thus \\\\ denotes limits of structure excavation. All other excavation shall be roadway excavation.
2. Hatched area shown thus ///// denotes limits of Structure Backfill.

IMPERVIOUS MATERIAL

1. Impervious material as selected by the Engineer shall be incidental to roadway excavation.
2. The subgrade upon which filter material is to be placed shall be made as impervious as possible by pneumatic tamping or other approved methods.

## STRUCTURE EXCAVATION & DRAINAGE DETAIL GUARD RAIL TYPE 4EF - CONCRETE RIGID BARRIER

SCALE: 3/4"=1'-0"

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

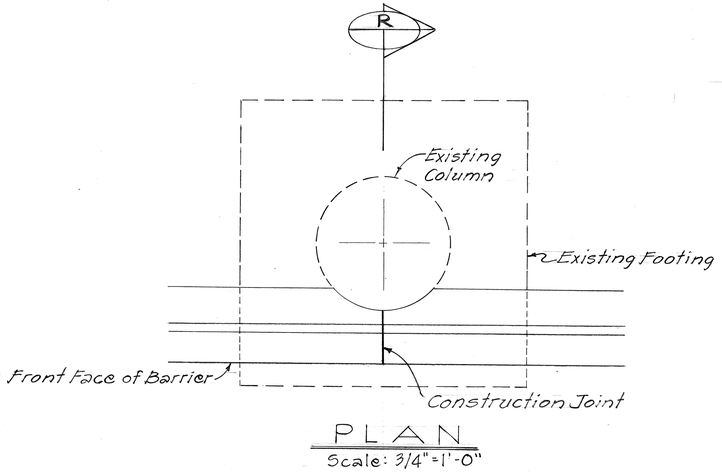
# GUARD RAIL TYPE 4

CONCRETE RIGID BARRIER DETAILS
INTERSTATE ROUTE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
WESTBOUND LANES
F.A.I. PROJ. NO. I-HI-1(187)

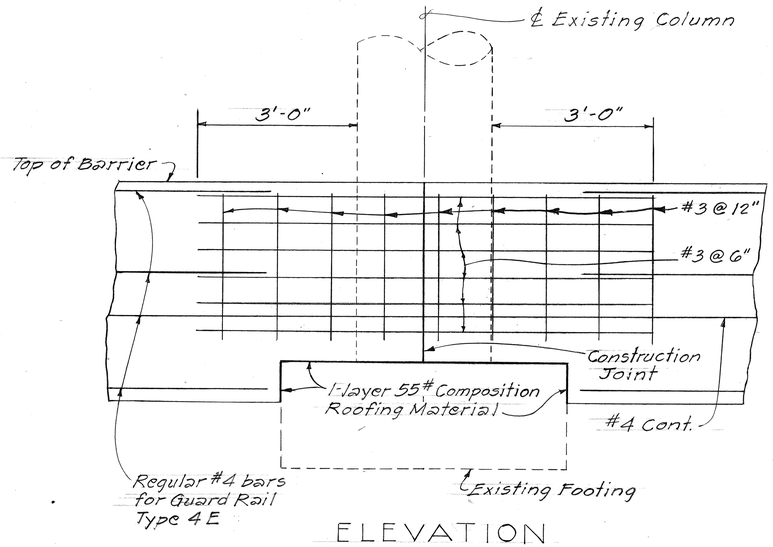
SCALE: As Shown

SHEET No. 1 OF 10 SHEETS

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 21 | 197 |

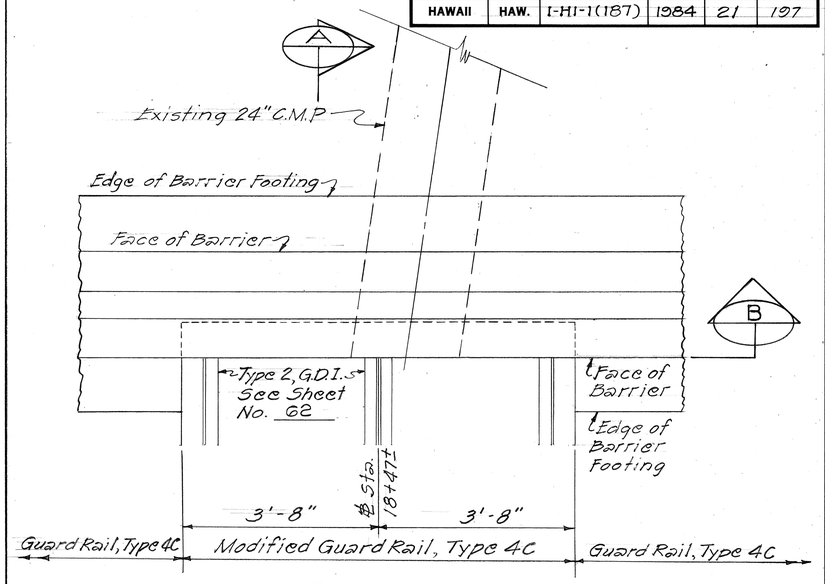



PLAN
Scale: 3/4" = 1'-0"

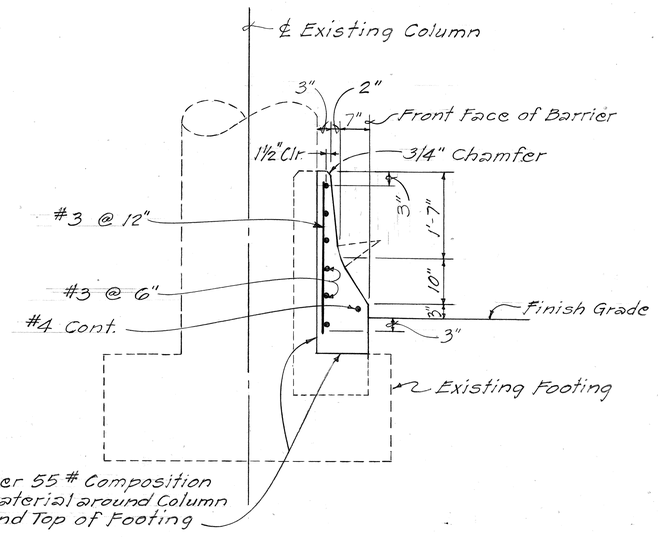



ELEVATION
Scale: 3/4" = 1'-0"

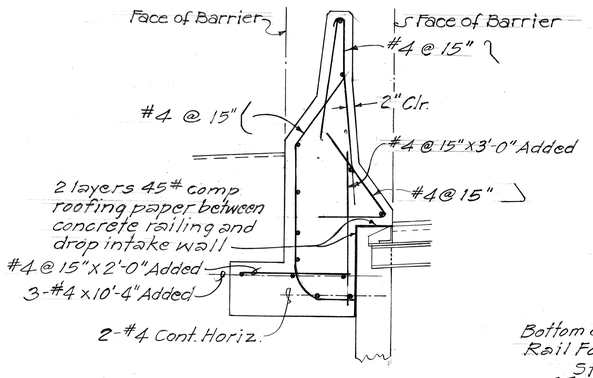
# GUARD RAIL TYPE 4E AT EXISTING PIER COLUMN



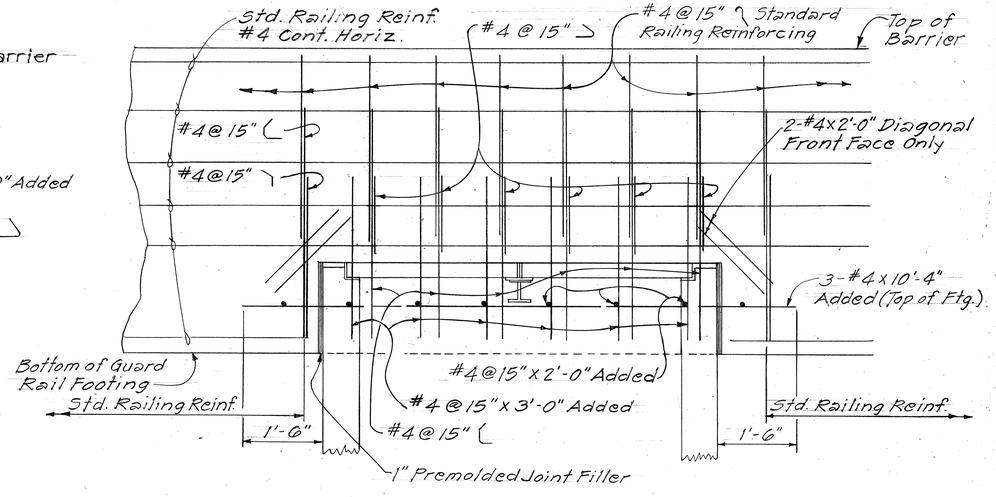

PLAN
Scale: 3/4" = 1'-0"




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




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




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

# MODIFIED GUARD RAIL, TYPE 4C ~ ℄ STA. 18+47±

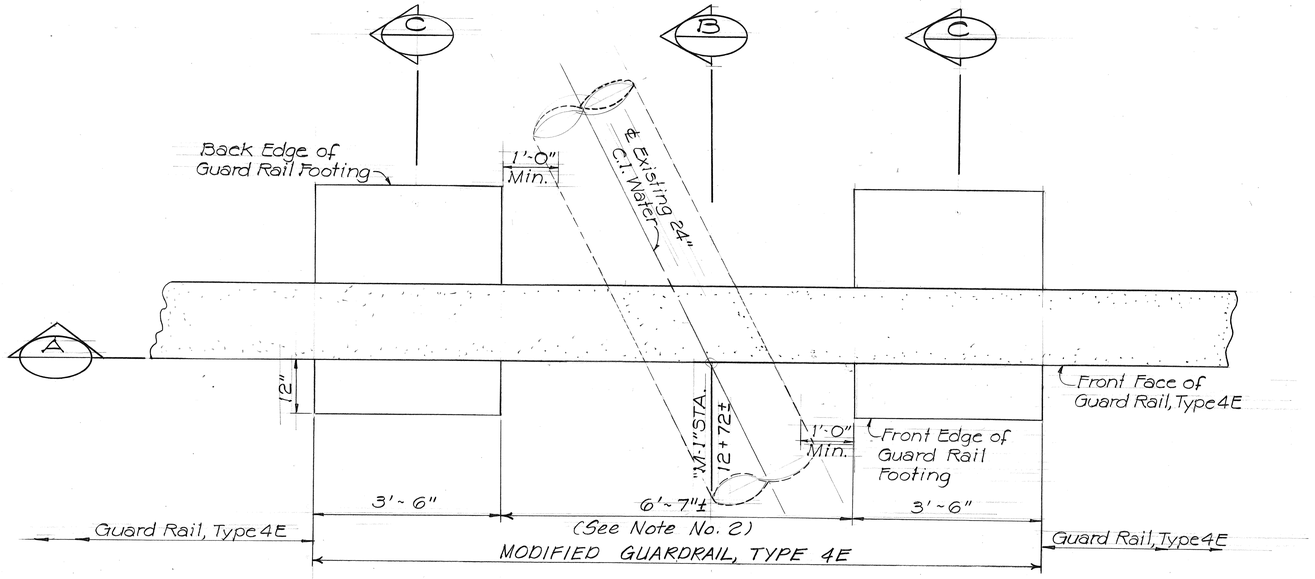
| ORIGINAL PLAN | SURVEY PLOTTED BY | DATE |
|---|---|---|
| | DRAWN BY | |
| | TRACED BY | |
| NOTE BOOK | DESIGNED BY | |
| | QUANTITIES BY | |
| No. | CHECKED BY | |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

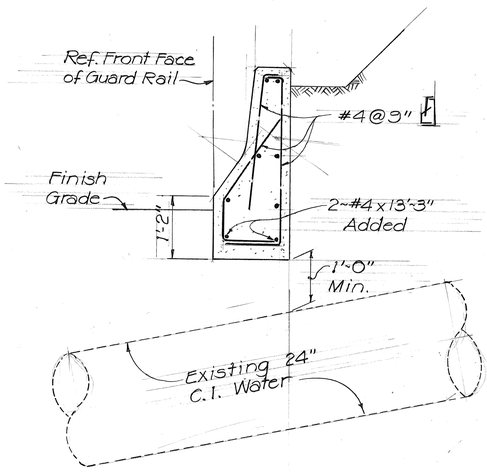
GUARD RAIL TYPE 4
CONCRETE RIGID BARRIERS
INTERSTATE ROUTE H-1
IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
WESTBOUND LANES
F.A.I. PROJECT NO. I-HI-1(187)
SCALE: AS SHOWN DATE

SHEET No. 2 OF 10 SHEETS

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 22 | 197 |



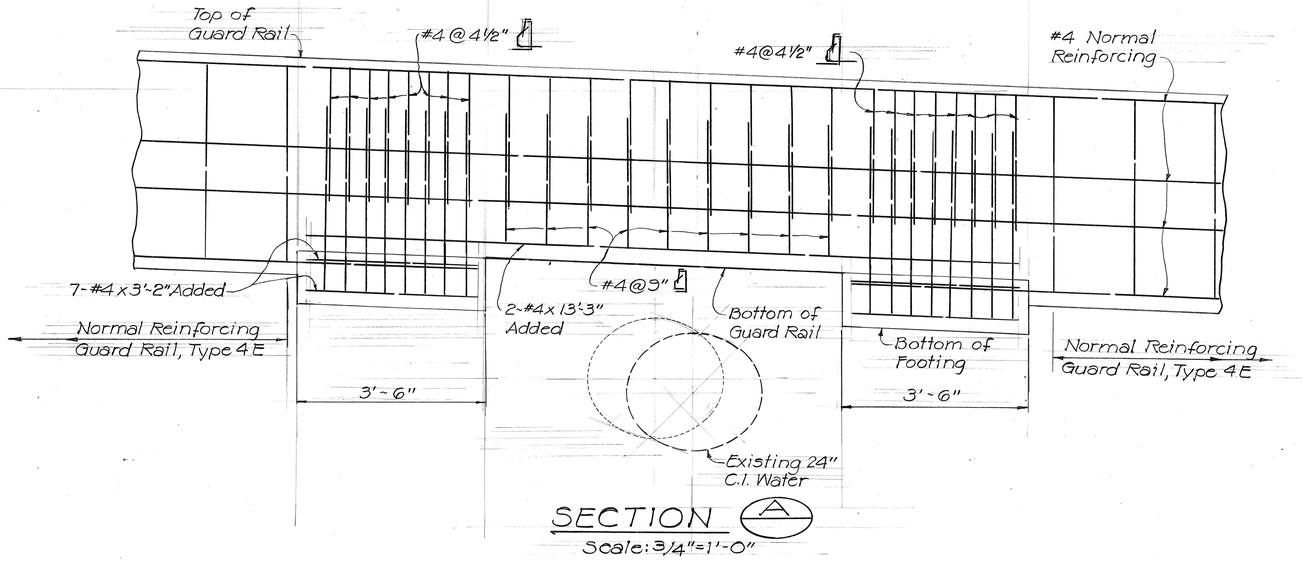

PLAN
Scale: 3/4"=1'-0"



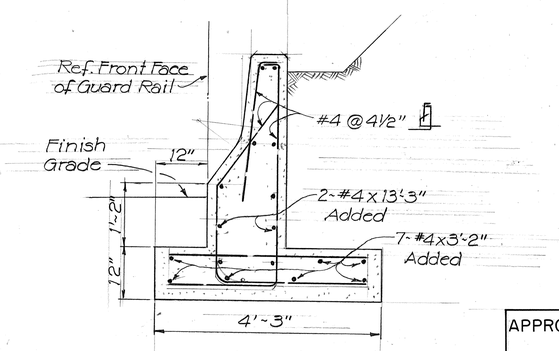

SECTION B
Scale: 3/4"=1'-0"

## NOTES:

1. See Sheet No. 18 for General Water Notes.
2. The Maximum spacing between footings shall be 10 feet. If spacing must exceed this dimension, the Contractor shall notify the Engineer for redesign.




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




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

## MODIFIED GUARD RAIL, TYPE 4E ~ "M-1" STA. 12+72± RT.

APPROVED: DATE 7-12-84

R Nagata
for CHIEF, PLANNING & ENGINEERING, BWS

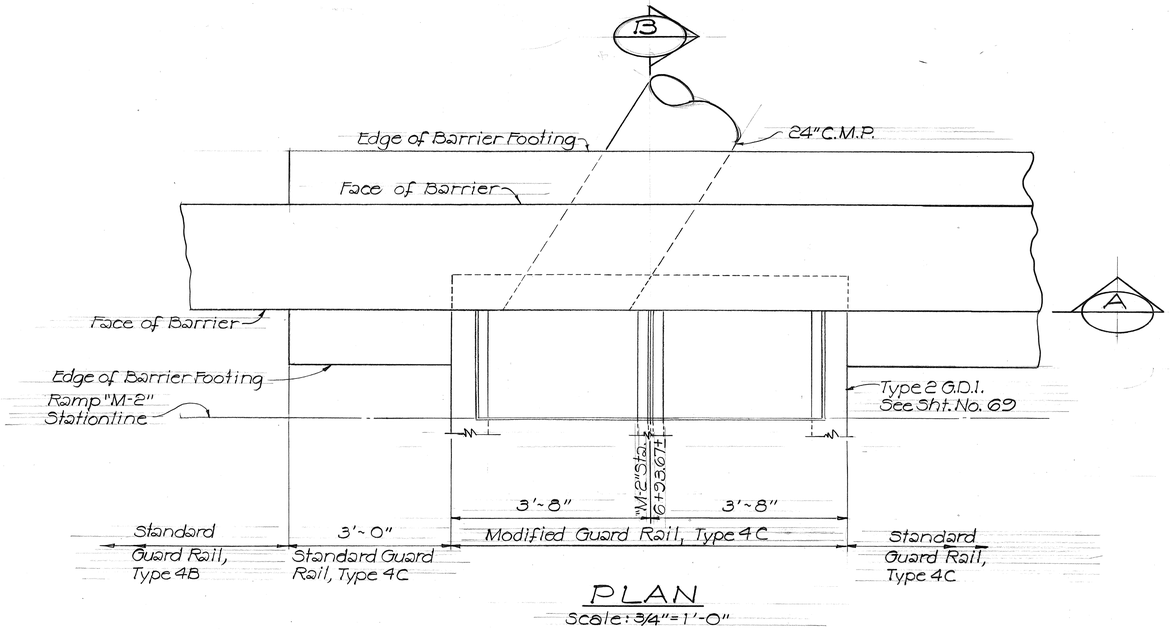
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GUARD RAIL TYPE 4, CONCRETE RIGID BARRIER DETAILS
INTERSTATE ROUTE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
WESTBOUND LANES
F.A.I. PROJ. No. I-HI-1(187)
Scale: As Shown

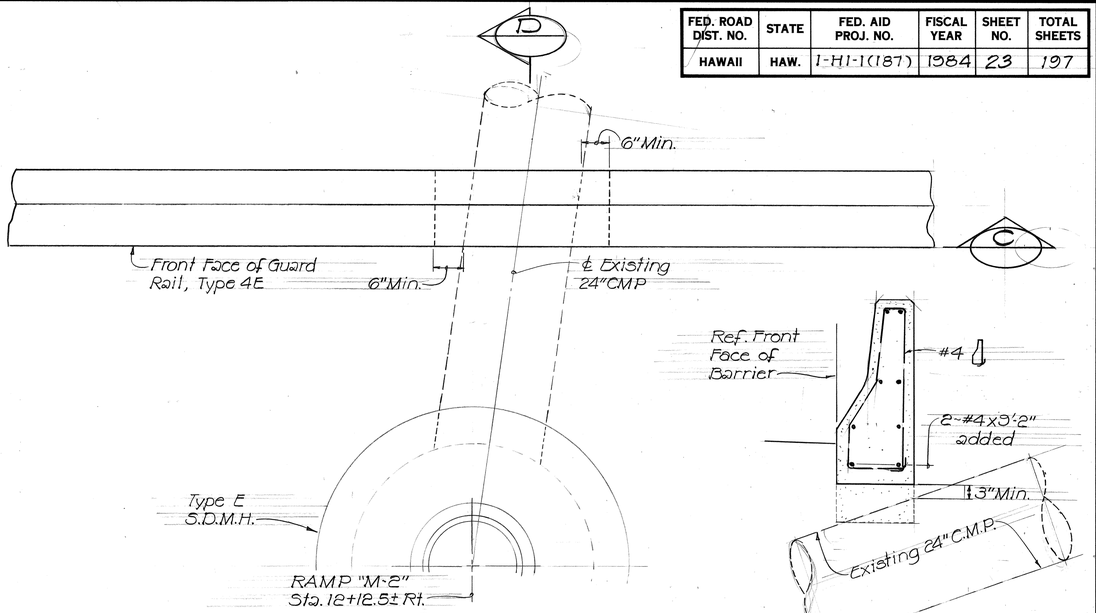
SHEET No. 3 OF 10 SHEETS

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

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 23 | 197 |

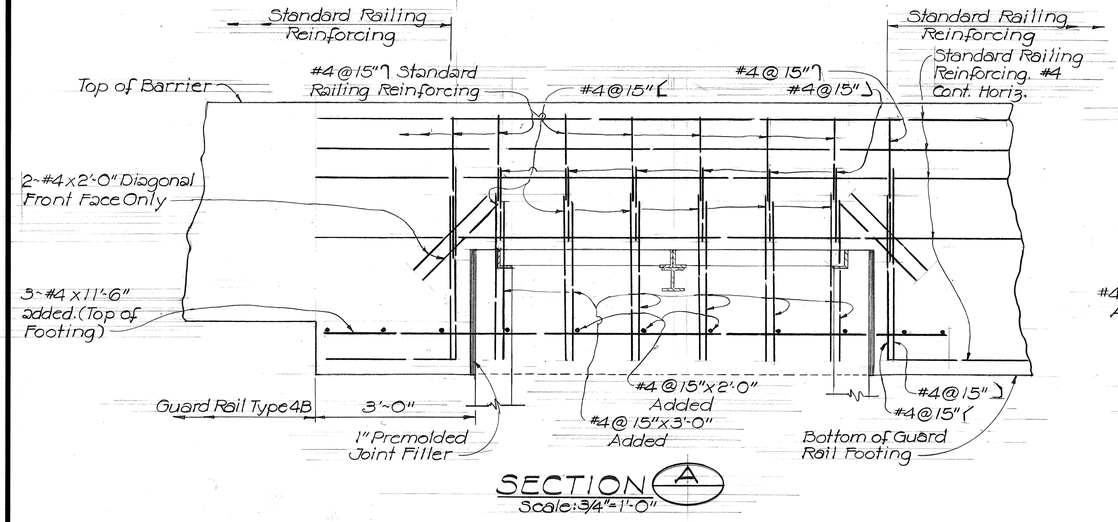



PLAN
Scale: 3/4" = 1'-0"

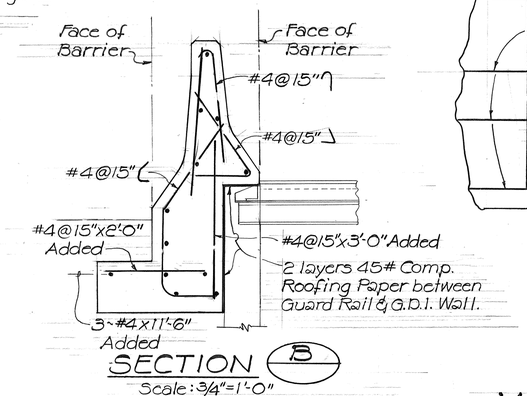



PLAN
Scale: 3/4" = 1'-0"

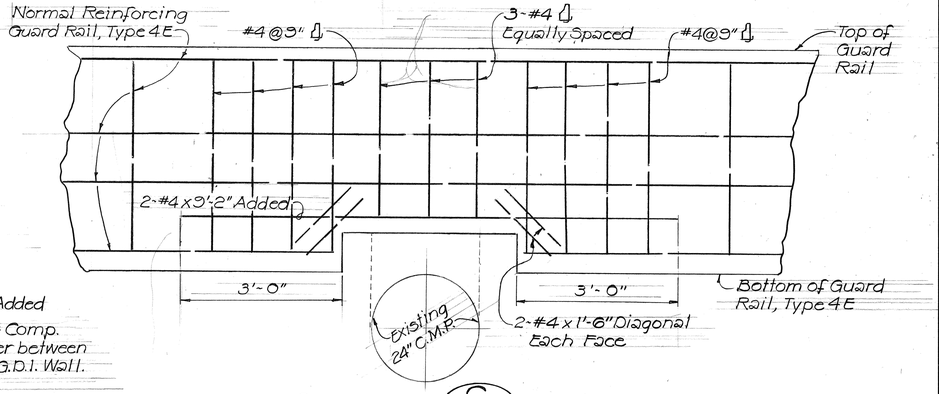
SECTION D
Scale: 3/4" = 1'-0"




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




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




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

## MODIFIED GUARD RAIL, TYPE 4C ~ "M-2" STA. 6+93.67± LT.

## MODIFIED GUARD RAIL, TYPE 4E "M-2" STA. 12+12.5± RT.

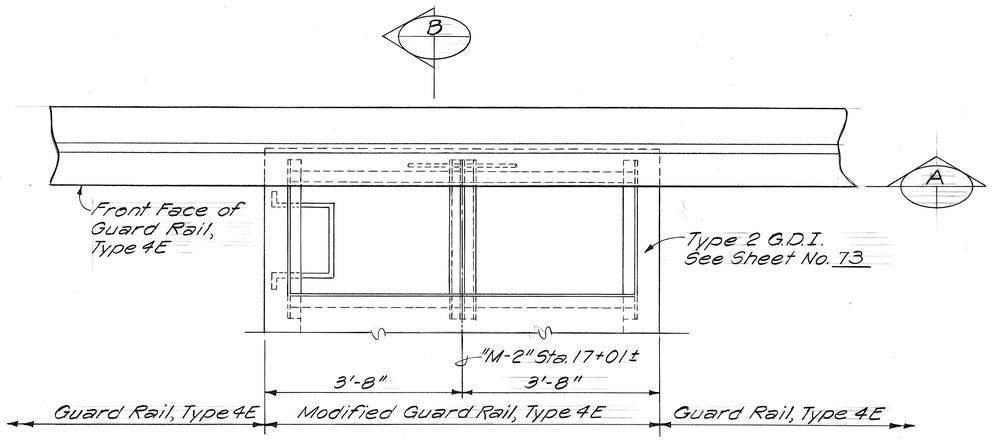
ORIGINAL PLAN
NOTE BOOK No.
SURVEY PLOTTED BY DATE
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

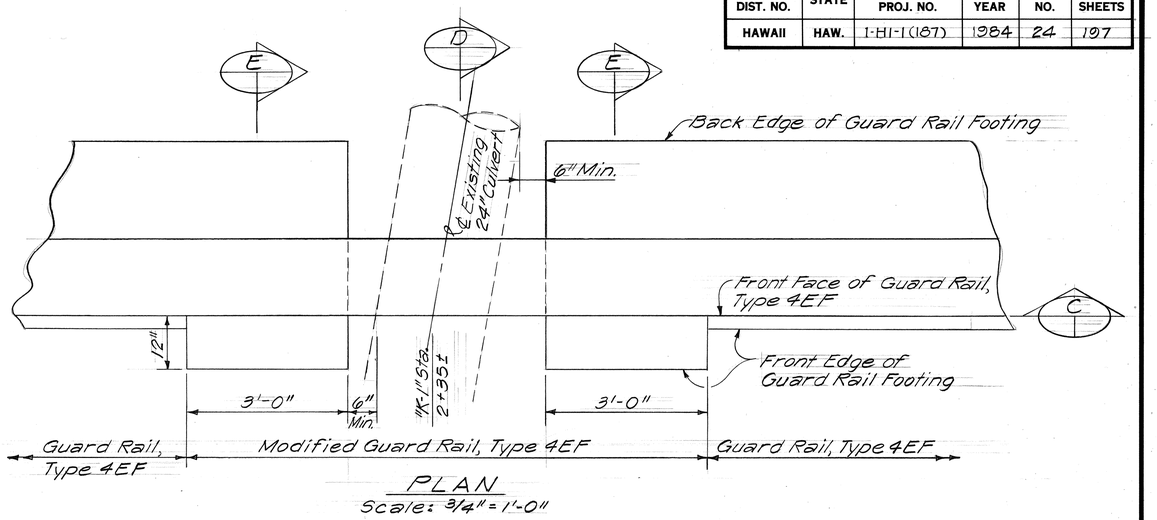
GUARD RAIL TYPE 4
CONCRETE RIGID BARRIER DETAILS
INTERSTATE ROUTE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
WESTBOUND LANES
F.A.I. PROJ. NO. I-HI-1(187)
SCALE: As Shown

SHEET No. 4 OF 10 SHEETS

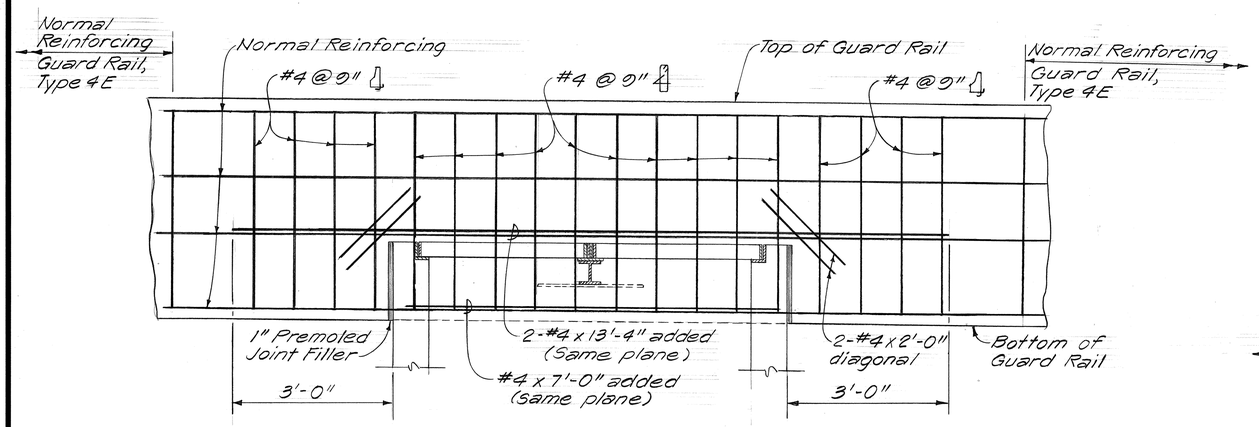
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 24 | 197 |



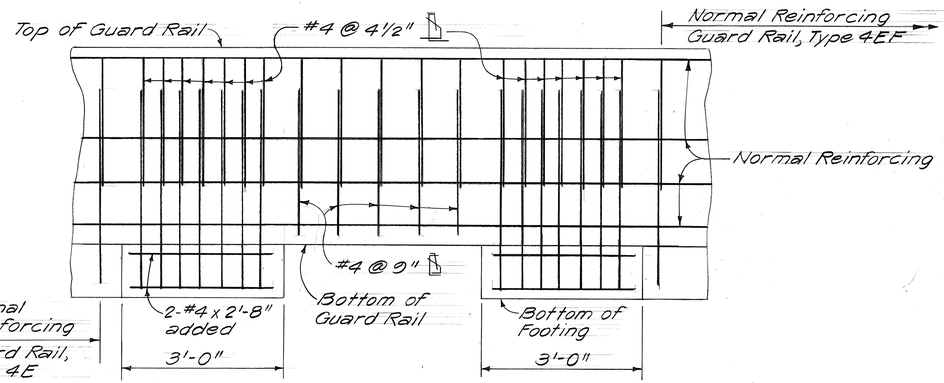

PLAN
Scale: 3/4" = 1'-0"



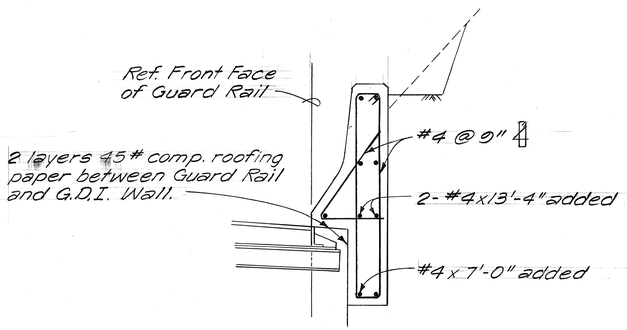

PLAN
Scale: 3/4" = 1'-0"



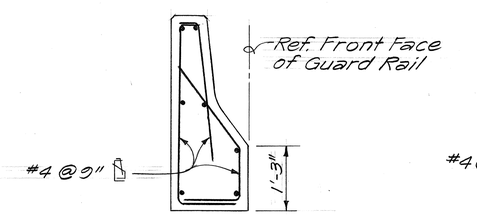

SECTION A
Scale: 3/4" = 1'-0"



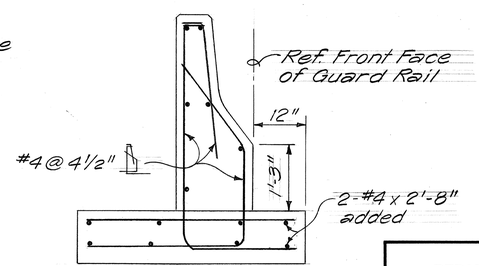

SECTION C
Scale: 3/4" = 1'-0"




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




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




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

MODIFIED GUARD RAIL, TYPE 4E - "M-2" STA. 17+01± Rt.

MODIFIED GUARD RAIL, TYPE 4EF
"K-1" STA. 2+35± Lt.

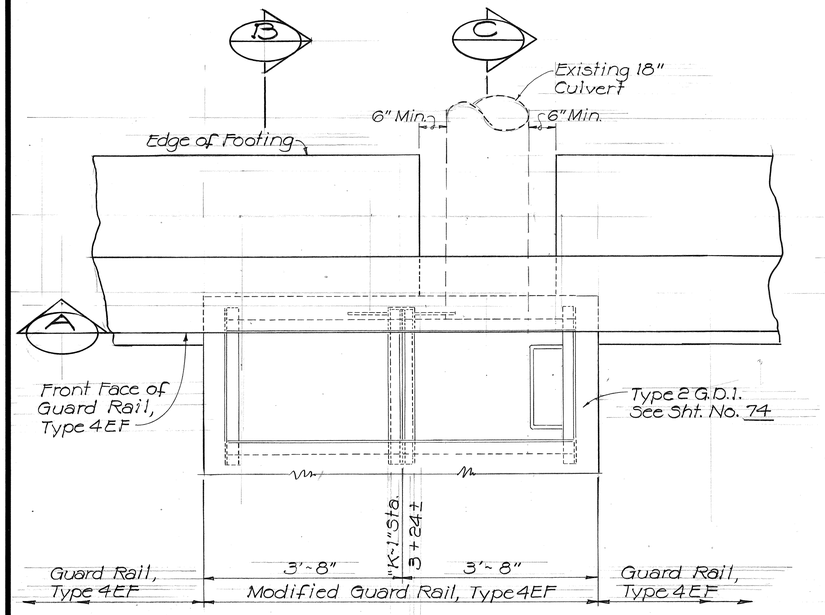
| ORIGINAL PLAN | SURVEY PLOTTED BY | DATE |
|---|---|---|
| | DRAWN BY | |
| NOTE BOOK | TRACED BY | |
| | DESIGNED BY | |
| No. | QUANTITIES BY | |
| | CHECKED BY | |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

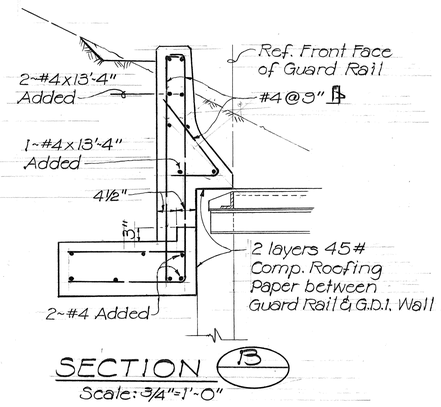
GUARD RAIL TYPE 4
CONCRETE RIGID BARRIER DETAILS
INTERSTATE ROUTE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
WESTBOUND LANES
F.A.I. PROJ. NO. I-HI-1(187)
SCALE: As Shown

SHEET No. 5 OF 10 SHEETS

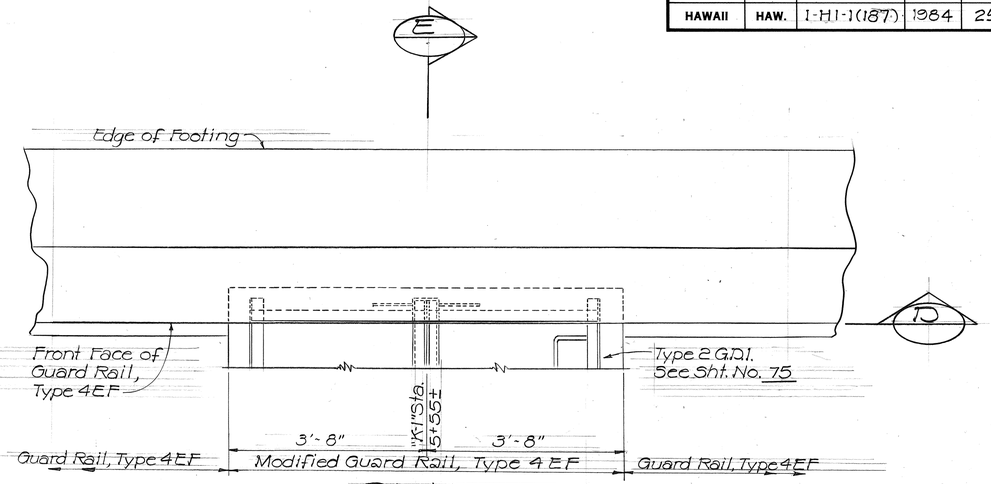
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 25 | 197 |



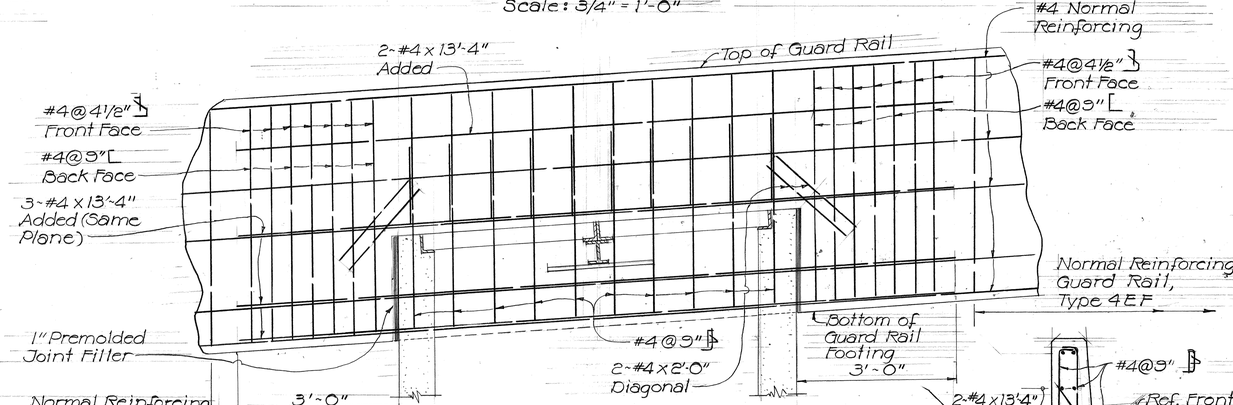

PLAN
Scale: 3/4"=1'-0"



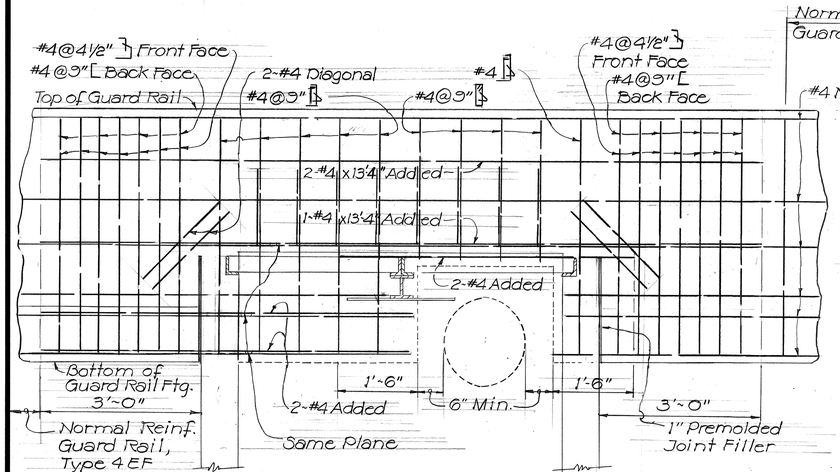

SECTION B
Scale: 3/4"=1'-0"



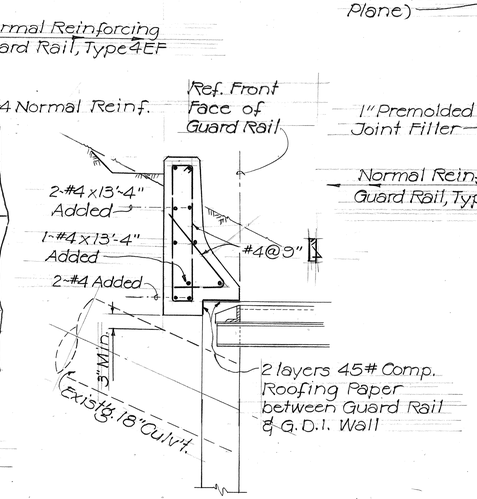

PLAN
Scale: 3/4" = 1'-0"



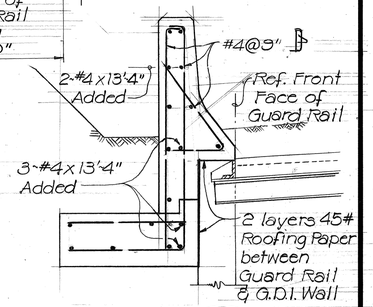

SECTION D
Scale: 3/4"=1'-0"




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




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




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

## MODIFIED GUARD RAIL, TYPE 4EF "K-1" STA. 3+24± LT.

## MODIFIED GUARD RAIL, TYPE 4EF "K-1" STA. 5+55± LT.

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

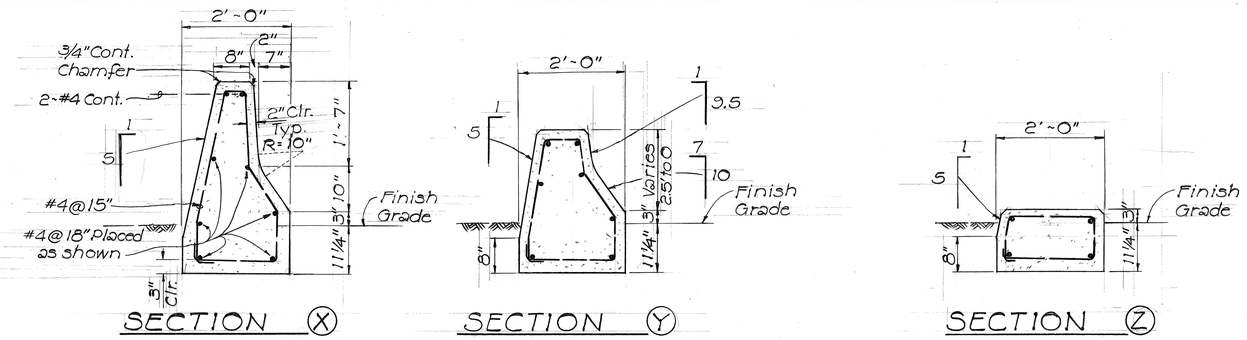
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

# GUARD RAIL TYPE 4

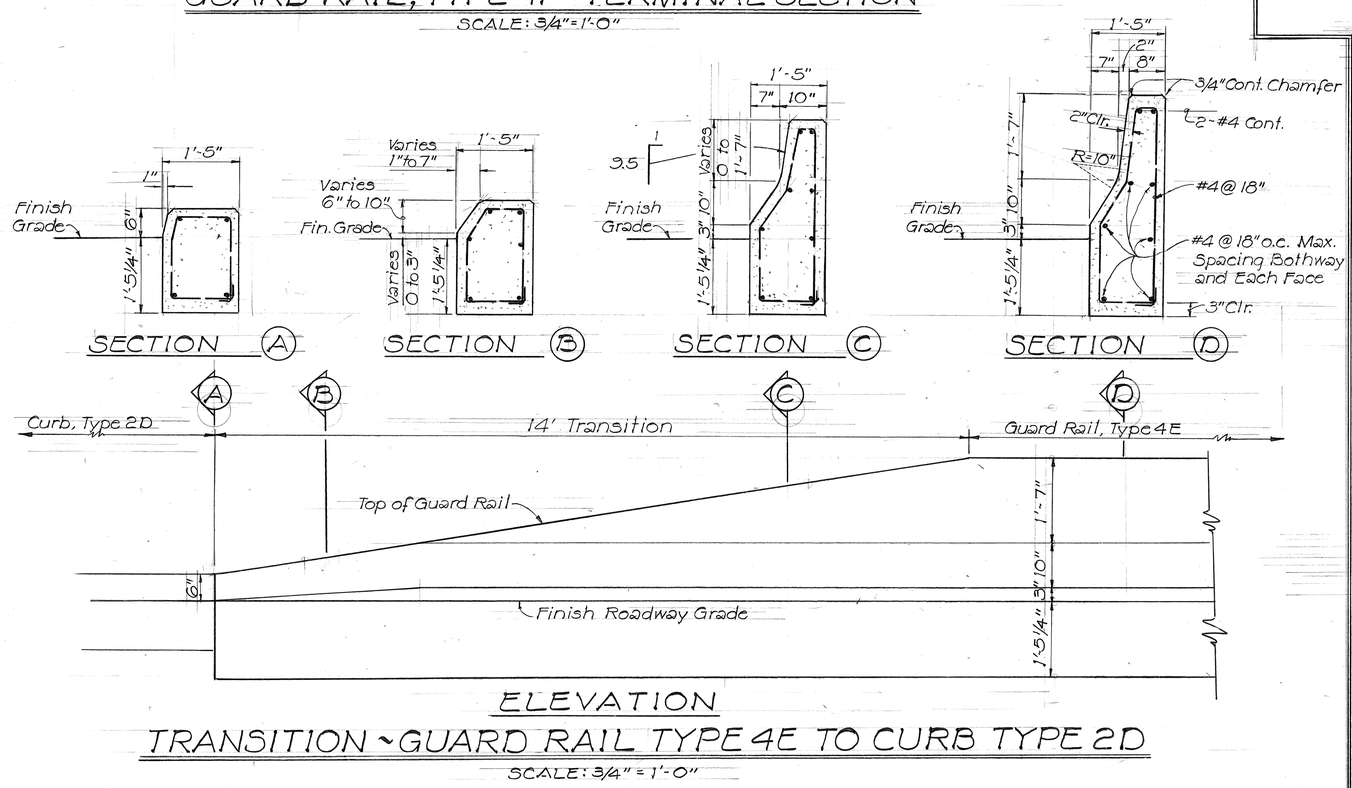
CONCRETE RIGID BARRIER DETAILS
INTERSTATE ROUTE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
WESTBOUND LANES
F.A.I. PROJ. NO. I-HI-1(187)
SCALE: As Shown

SHEET No. 6 OF 10 SHEETS

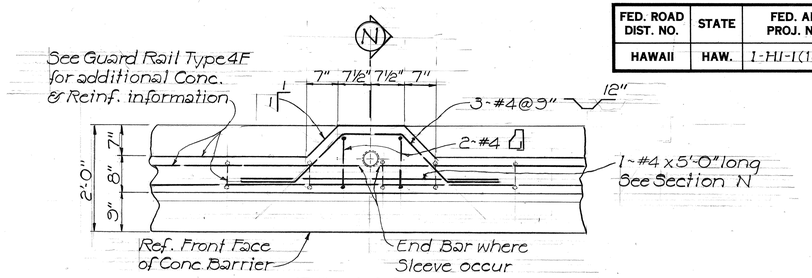
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 26 | 197 |



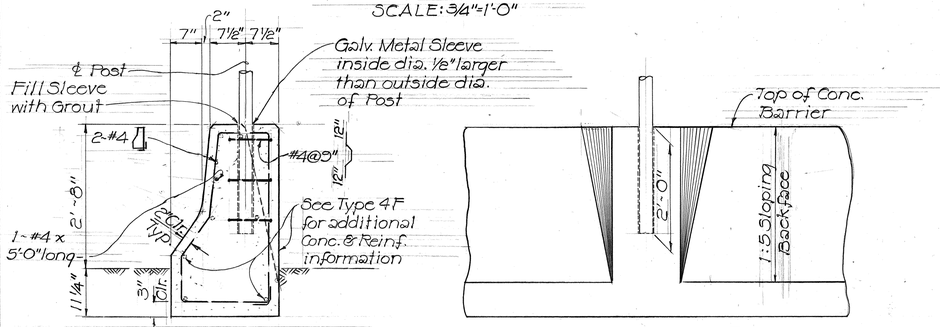

## ELEVATION
## GUARD RAIL, TYPE 4F ~ TERMINAL SECTION
SCALE: 3/4" = 1'-0"



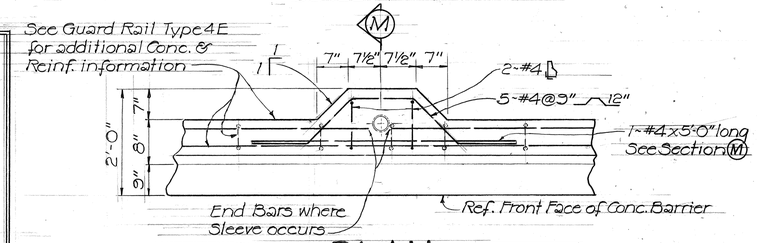

## ELEVATION
## TRANSITION ~ GUARD RAIL TYPE 4E TO CURB TYPE 2D
SCALE: 3/4" = 1'-0"



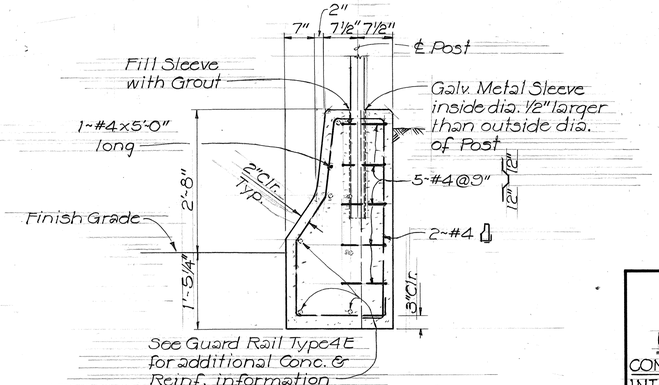

## PLAN
SCALE: 3/4" = 1'-0"




## SECTION N — ELEVATION AT BACK OF BARRIER
## CHAIN LINK FENCE POST ON GUARD RAIL TYPE 4F
SCALE: 3/4" = 1'-0"




## PLAN




## SECTION M
## CHAIN LINK FENCE POST ON GUARD RAIL TYPE 4E
SCALE: 3/4" = 1'-0"

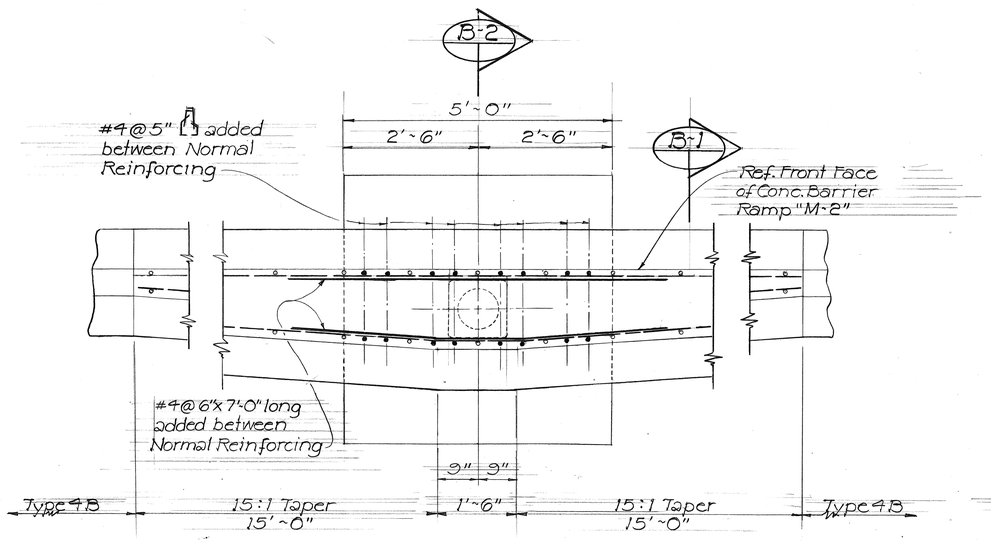
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

## GUARD RAIL TYPE 4
CONCRETE RIGID BARRIER DETAILS
INTERSTATE ROUTE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
WESTBOUND LANES
F.A.I. PROJ. NO. I-HI-1(187)
SCALE: As Shown

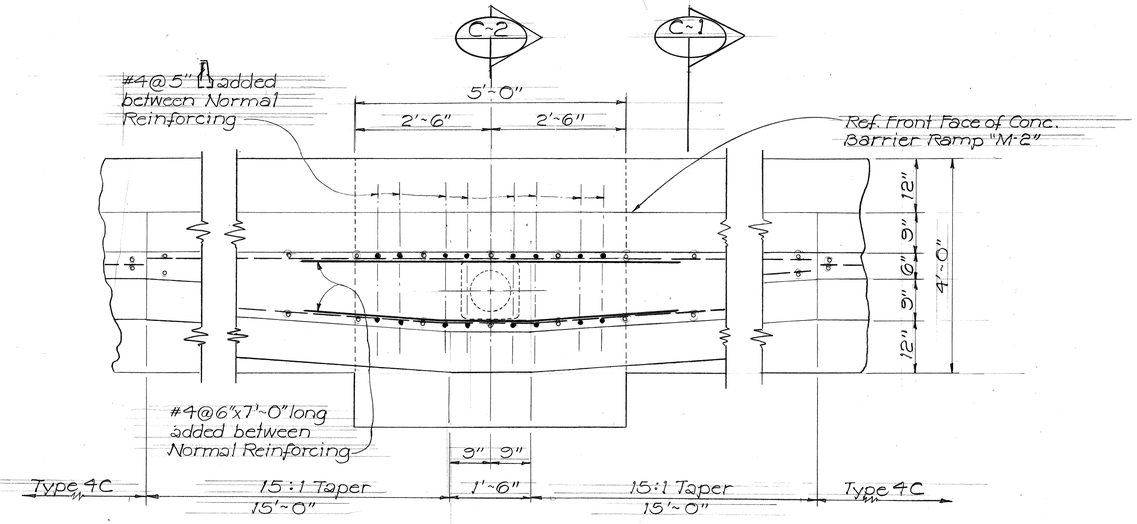
SHEET No. 7 OF 10 SHEETS

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

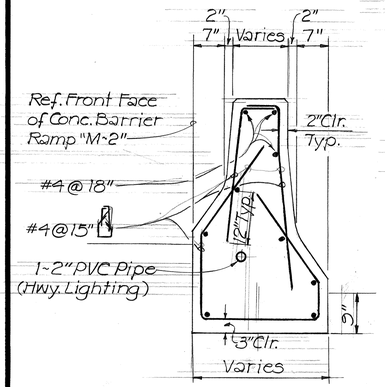
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-I(187) | 1984 | 27 | 107 |



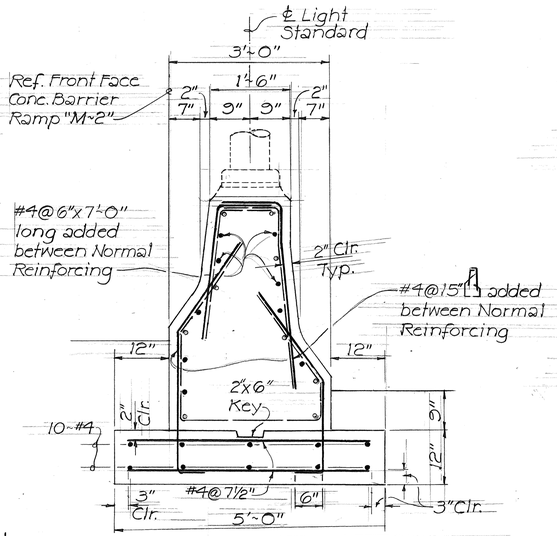

PLAN




PLAN




TYPICAL SECTION AT FLARE B-1

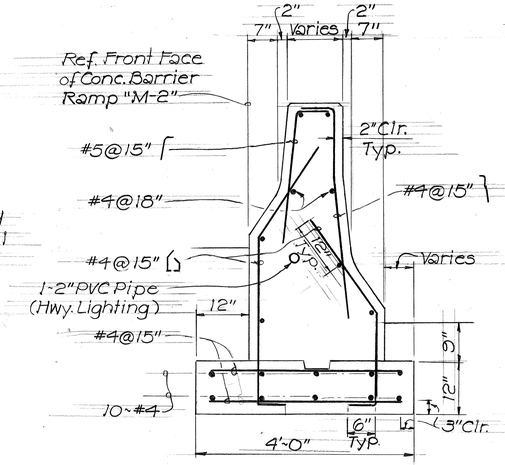



SECTION AT LIGHT STANDARD B-2

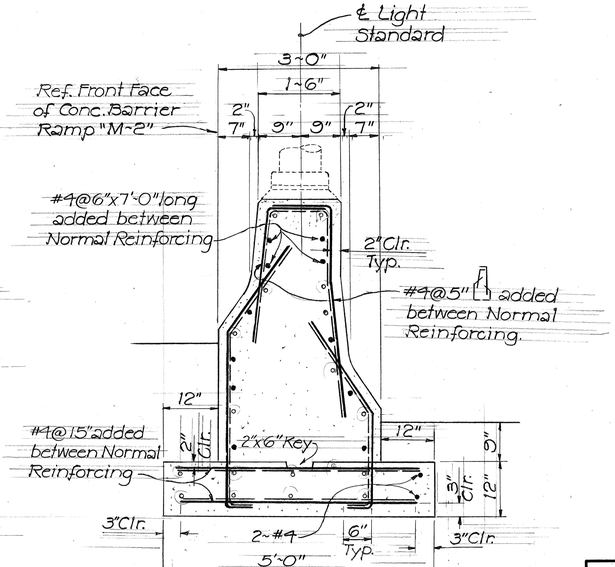
LIGHT STANDARD ON GUARD RAIL

TYPE 4B

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




SECTION AT FLARE C-1




SECTION AT LIGHT STANDARD C-2

LIGHT STANDARD ON GUARD RAIL

TYPE 4C

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

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

GUARD RAIL TYPE 4, CONCRETE RIGID BARRIER DETAILS

INTERSTATE ROUTE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
WESTBOUND LANES
F.A.I. PROJ. No. I-HI-I(187)

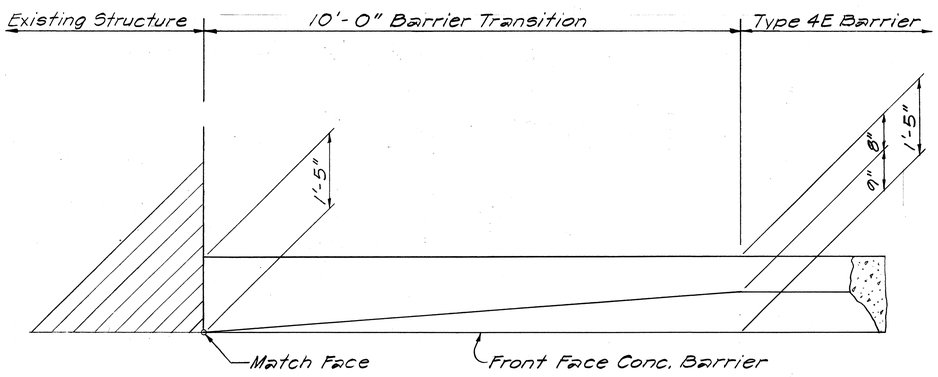
Scale: As Shown

SHEET No. 8 OF 10 SHEETS

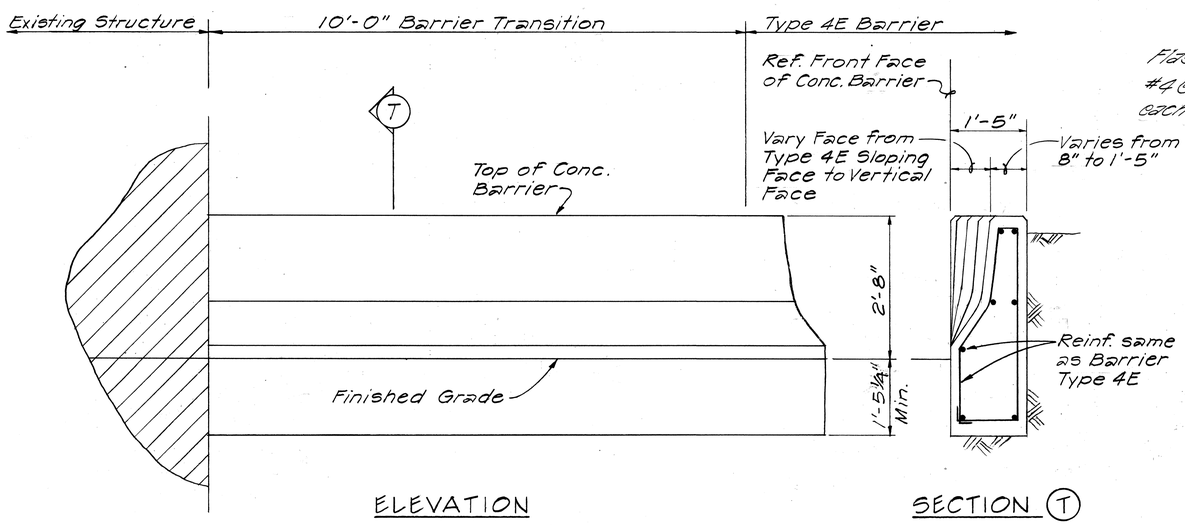


LIGHT STD ON GR TYPE 4B - 4C

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 28 | 197 |




PLAN



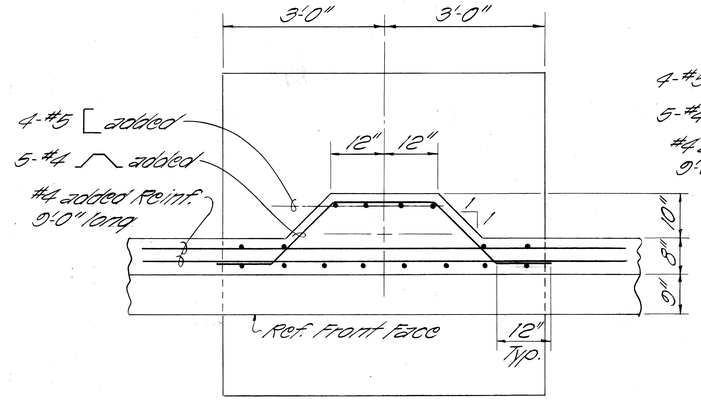

ELEVATION

SECTION (T)

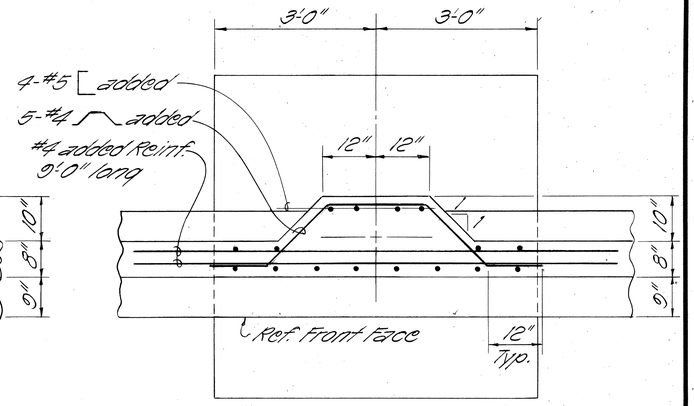
NOTE: See Typical Section thru Type 4E Barrier for additional information.

## TYPICAL CONCRETE BARRIER TRANSITION DETAILS

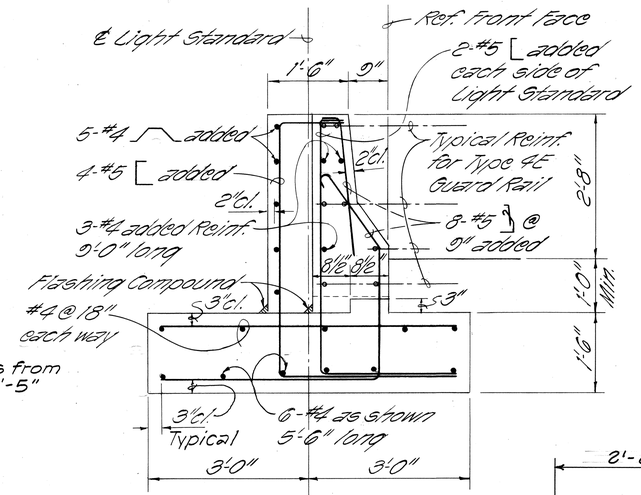
SCALE: 3/4"=1'-0"




PLAN



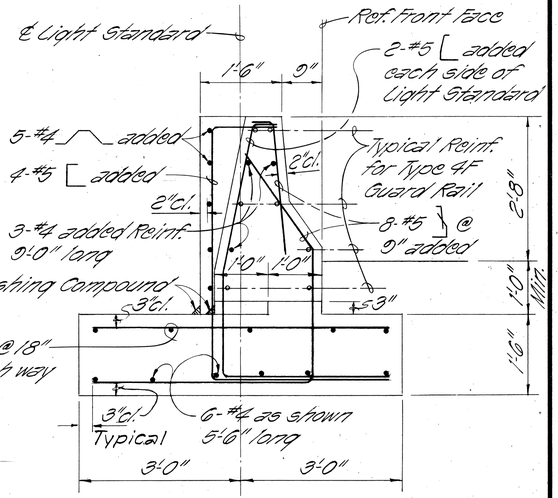

PLAN




SECTION

## LIGHT STANDARD ON TYPE 4E GUARD RAIL

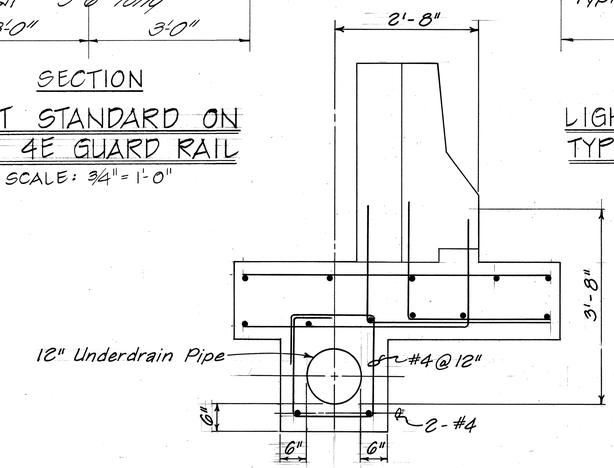
SCALE: 3/4"=1'-0"




SECTION

## LIGHT STANDARD ON TYPE 4F GUARD RAIL

SCALE: 3/4"=1'-0"




## LIGHT STANDARD SECTION AT UNDERDRAIN

SCALE: 3/4"=1'-0"

| ORIGINAL PLAN | SURVEY PLOTTED BY: | DATE |
|---|---|---|
| | DRAWN BY | |
| | TRACED BY | |
| NOTE BOOK | DESIGNED BY | |
| | QUANTITIES BY | |
| No. | CHECKED BY | |

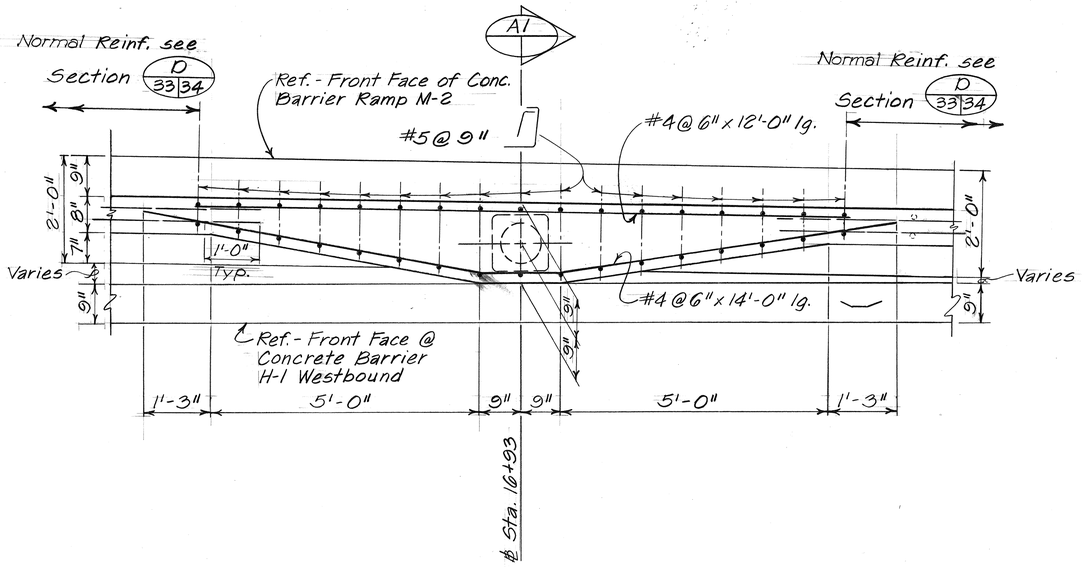
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

## GUARD RAIL TYPE 4, CONCRETE RIGID BARRIER DETAILS

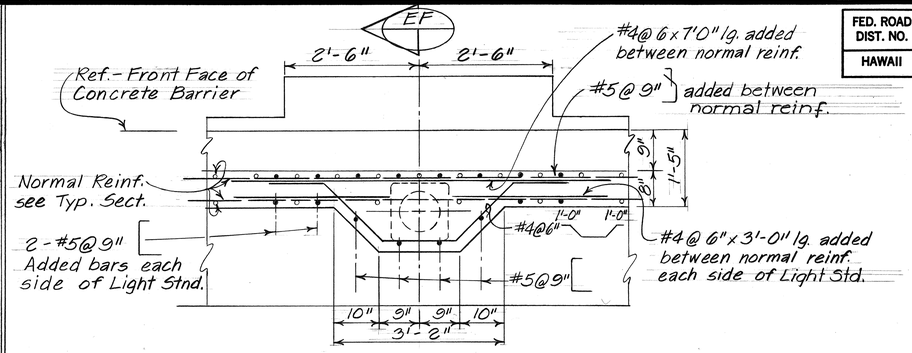
INTERSTATE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
WESTBOUND LANES
F.A.I. PROJECT NO. I-HI-1(187)
Scale: As Shown Date: August, 1983

SHEET No. 9 OF 10 SHEETS

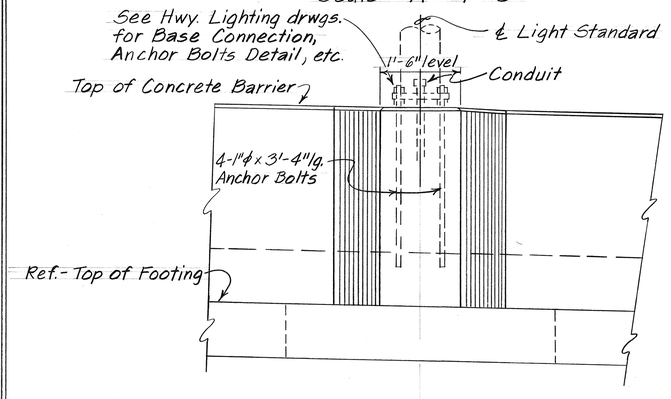
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 29 | 197 |




PLAN
Scale: 3/4" = 1'-0"



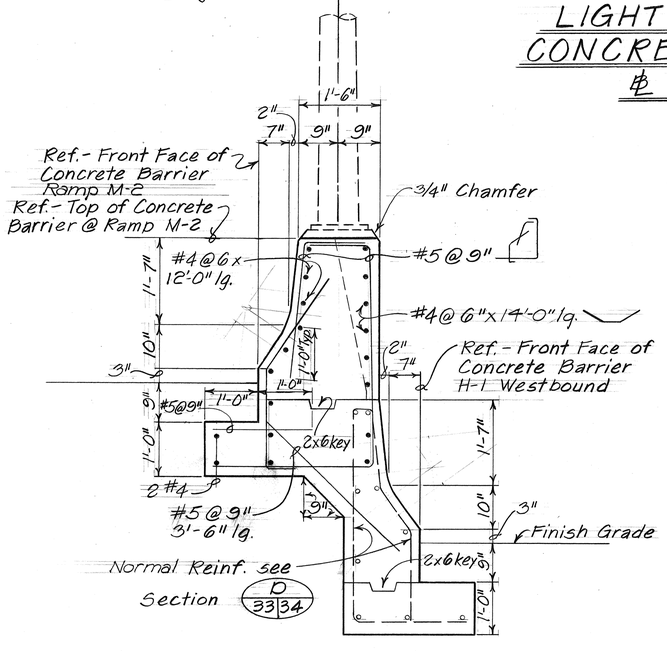

PLAN
Scale: 3/4" = 1'-0"



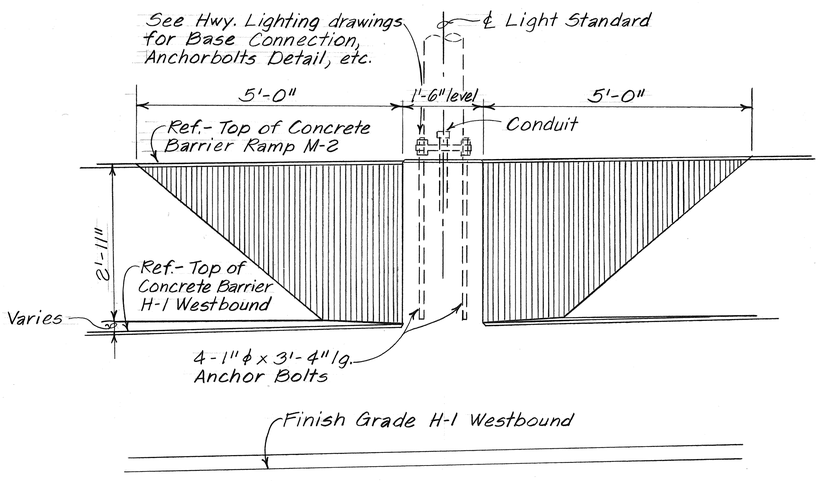

ELEVATION
Scale: 3/4" = 1'-0"

# LIGHT STANDARD ON GUARD RAIL TYPE 4EF

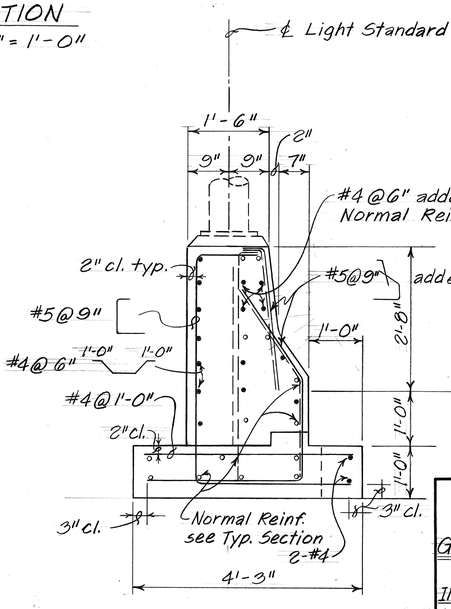
# LIGHT STANDARD ON CONCRETE BARRIER "A" ℄ STA. 16+93




SECTION A1
Scale: 3/4" = 1'-0"




ELEVATION
Scale: 3/4" = 1'-0"




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

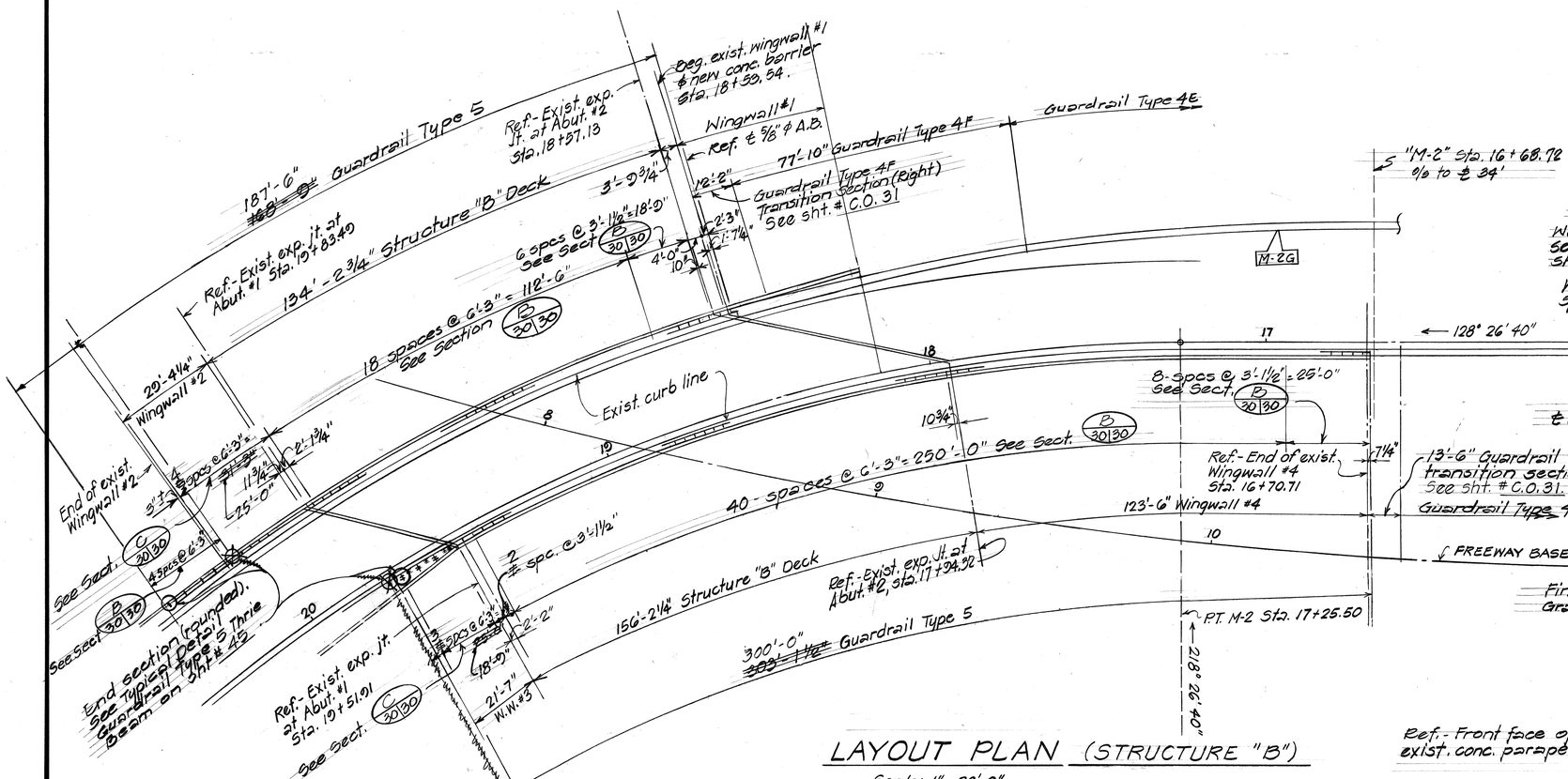
| ORIGINAL PLAN | SURVEY PLOTTED BY | DATE |
|---|---|---|
| | DRAWN BY | |
| NOTE BOOK | TRACED BY | |
| No. | DESIGNED BY | |
| | QUANTITIES BY | |
| | CHECKED BY | |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

GUARD RAIL TYPE 4, CONCRETE RIGID BARRIER DETAILS
INTERSTATE ROUTE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
WESTBOUND LANES
F.A.I. PROJ. No. I-HI-1(187)
Scale: As Shown

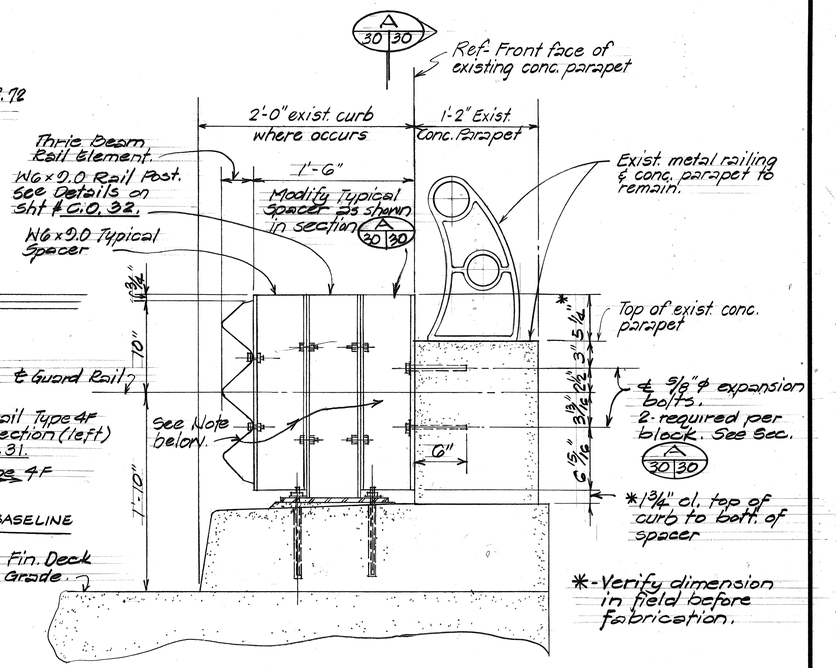
SHEET No. 10 OF 10 SHEETS

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 30 | 197 |



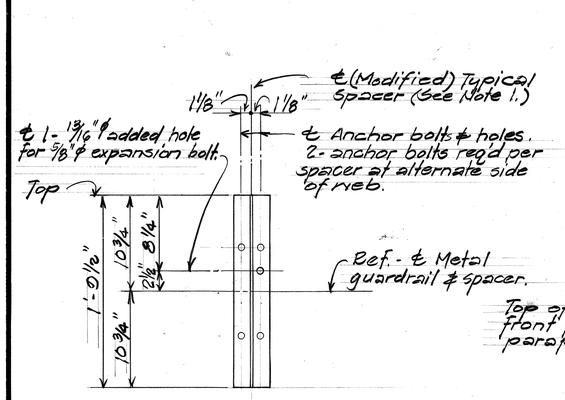

## LAYOUT PLAN (STRUCTURE "B")

Scale: 1" = 20'-0"

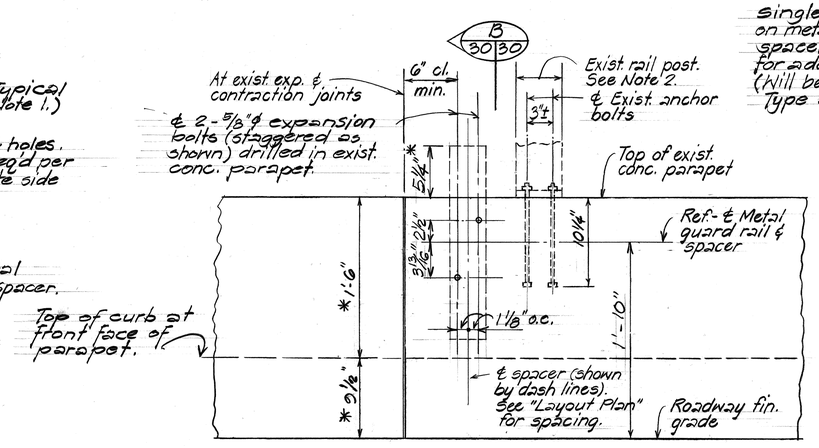



## SECTION B 30|30

Scale: 1½" = 1'-0"




## SECTION A 30|30

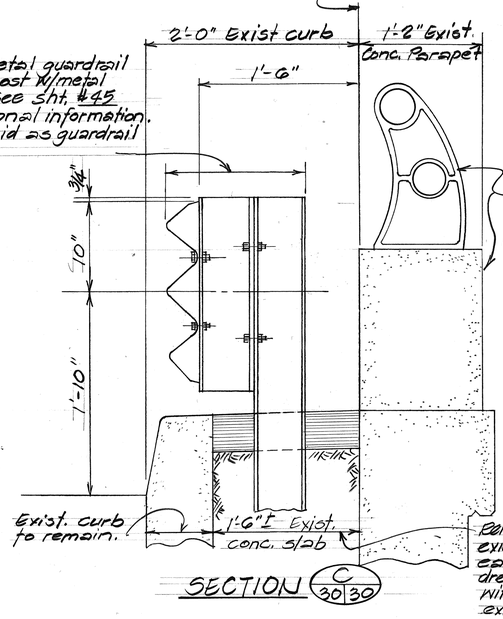



## FRONT VIEW

## TYPICAL SPACER AND PLACEMENT DETAIL

Scale: 1½" = 1'-0"

Ref.- Front face of exist. conc. parapet.




## SECTION C 30|30

Notes:

1. For additional Thrie Beam details and information, see Sht # 45.
2. Care shall be taken when drilling next to existing rail post so as not to damage the existing anchor bolts.

| Date | Revision |
|---|---|
| 6/12/84 | W Beam metal guardrail changed to Thrie Beam, and alignment, spacing & mounting of guardrail revised. Also Section C 30|30 added. |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

# GUARDRAIL TYPE 5

## LAYOUT PLAN & DETAILS

INTERSTATE HI IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
WESTBOUND LANES
F.A.I. PROJ. NO. I-HI-1(187)

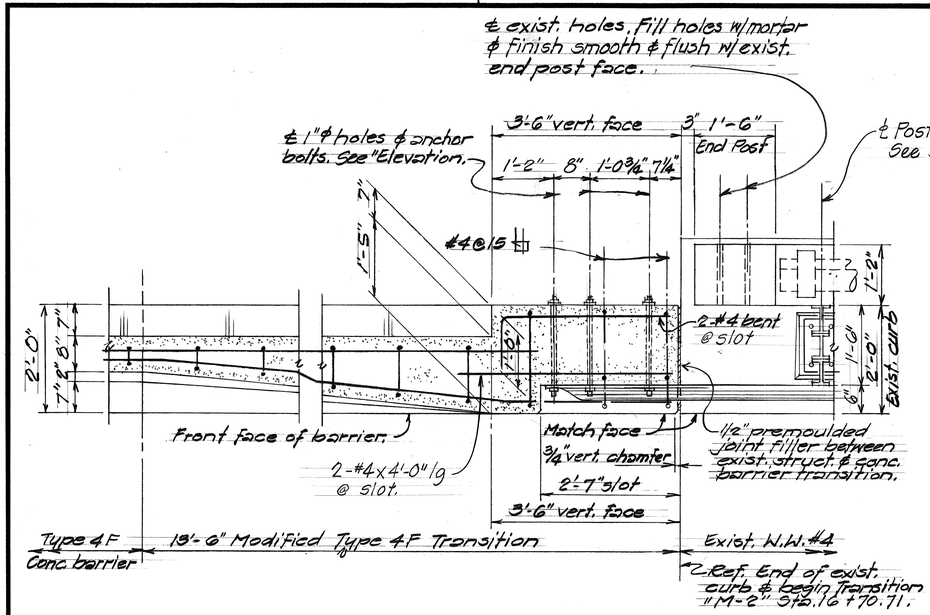
Scale: As Shown. Date: June 1983

SHEET No. OF SHEETS

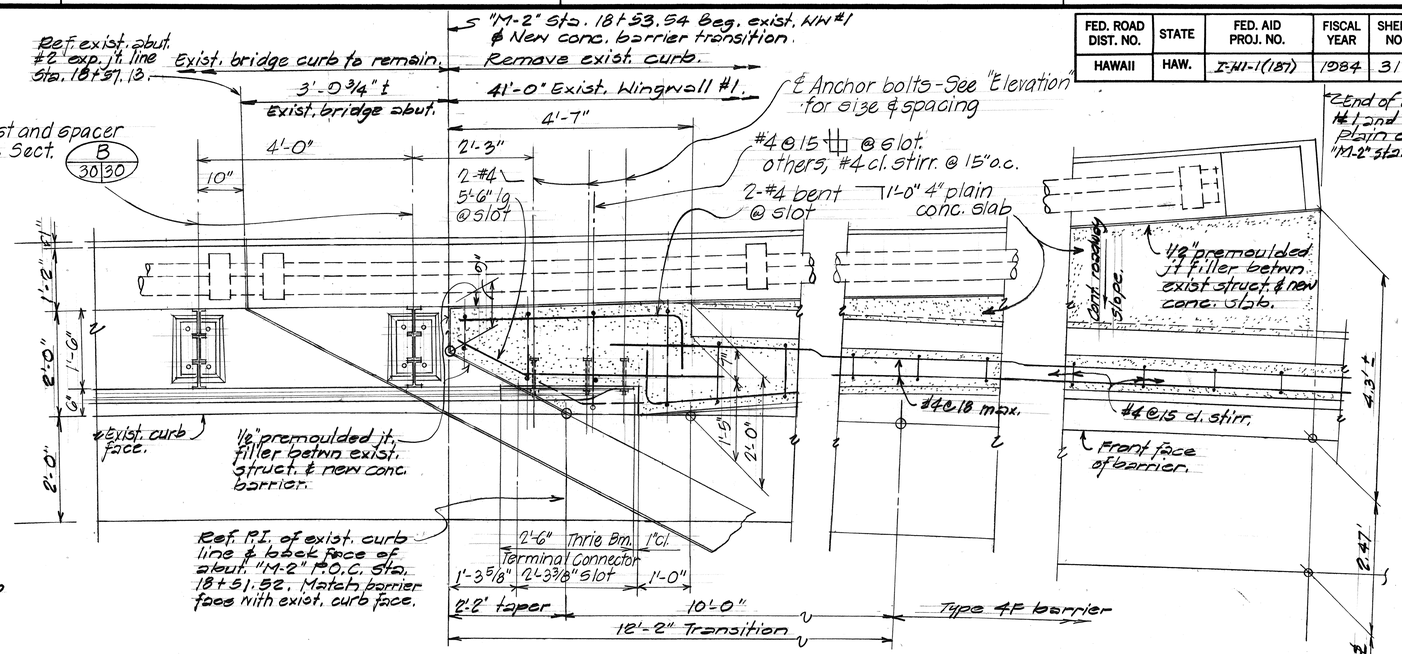
| ORIGINAL PLAN | | DATE |
|---|---|---|
| | SURVEY PLOTTED BY | 6/83 |
| | DRAWN BY KK | 6/83 |
| | TRACED BY LKM | 6/83 |
| NOTE BOOK | DESIGNED BY FS | 6/83 |
| | QUANTITIES BY FS | 6/83 |
| No. | CHECKED BY LA | 6/83 |

C.O. 30

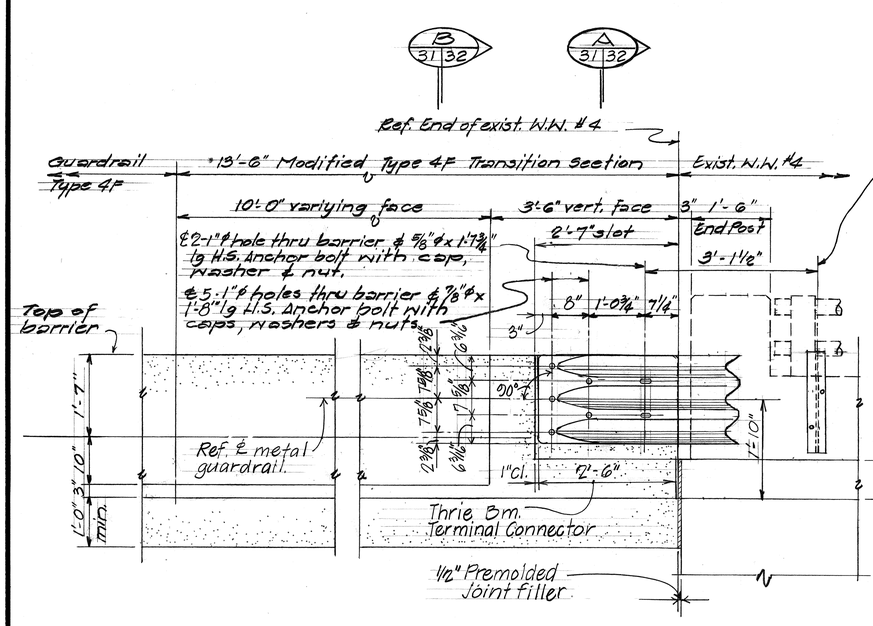
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 31 | 197 |



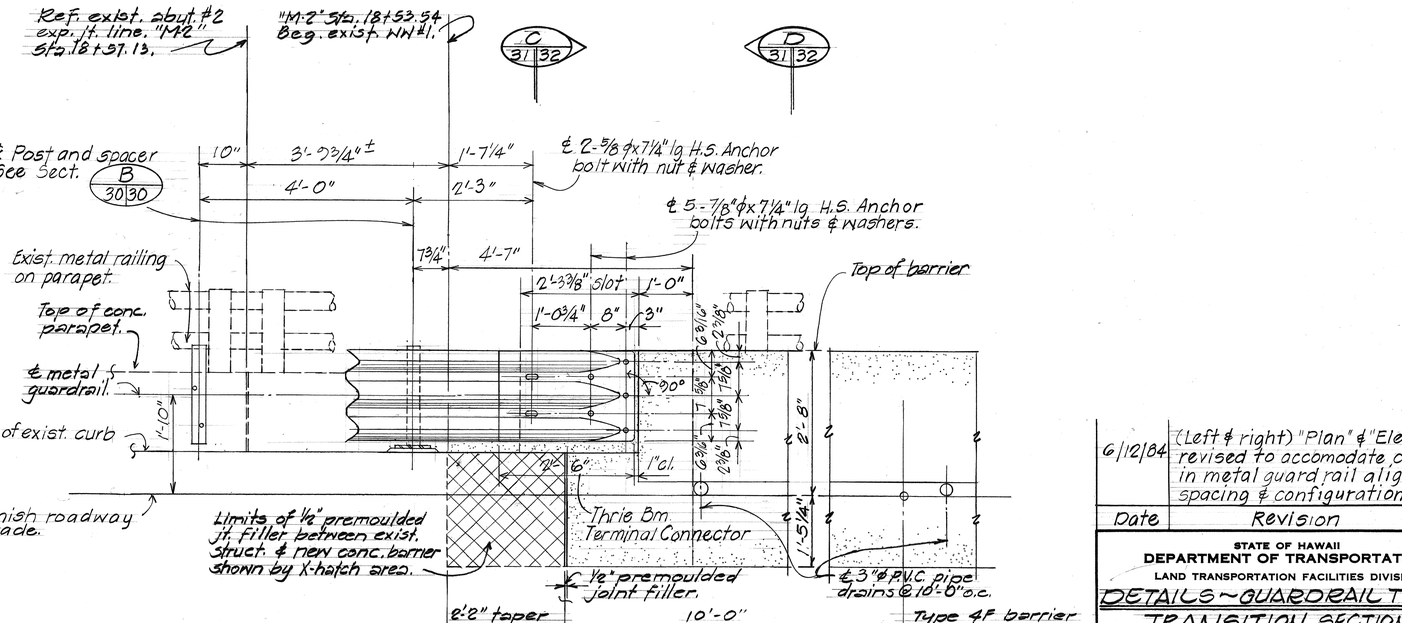

PLAN ~ (LEFT)




PLAN ~ (RIGHT)




ELEVATION ~ (LEFT)




ELEVATION ~ (RIGHT)

# DETAILS ~ GUARDRAIL TYPE 4F TRANSITION SECTION ("M-2" STA. 16+70± & 18+51±) scale: ¾"=1'-0"

| ORIGINAL PLAN | | DATE |
|---|---|---|
| | SURVEY PLOTTED BY | 6/82 |
| | DRAWN BY S.Y. | 6/82 |
| | TRACED BY T.S. | 6/82 |
| NOTE BOOK | DESIGNED BY T.S. | 6/82 |
| | QUANTITIES BY T.S. | 6/82 |
| No. | CHECKED BY K.L. | 6/82 |

| Date | Revision |
|---|---|
| 6/12/84 | (Left & right) "Plan" & "Elevation" revised to accomodate change in metal guard rail alignment, spacing & configurations. |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

DETAILS ~ GUARDRAIL TYPE 4F TRANSITION SECTION

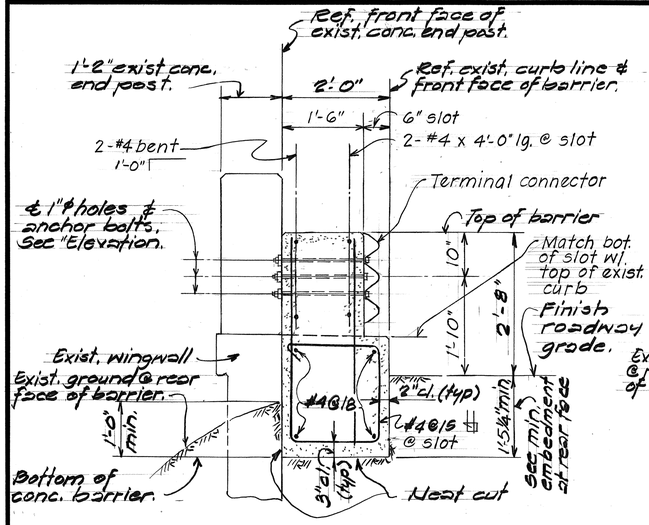
INTERSTATE HI IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
WESTBOUND LANES
F.A.I. PROJ. NO. I-HI-1(187)

Scale: ¾"=1'-0" Date: June 1983

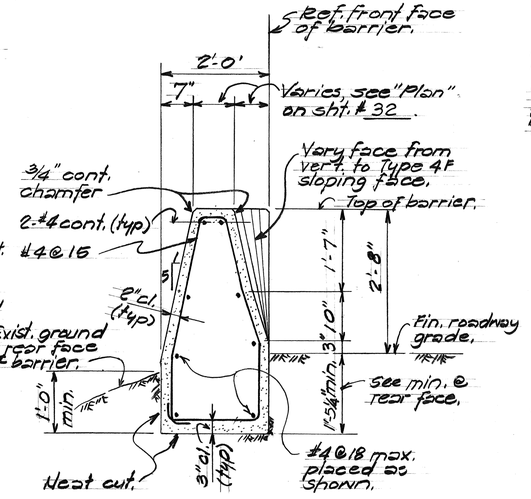
SHEET No. OF SHEETS

C.O. 31

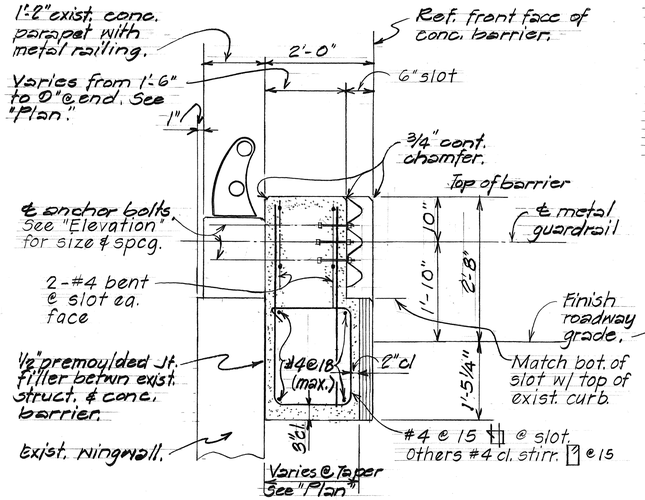
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1084 | 32 | 197 |



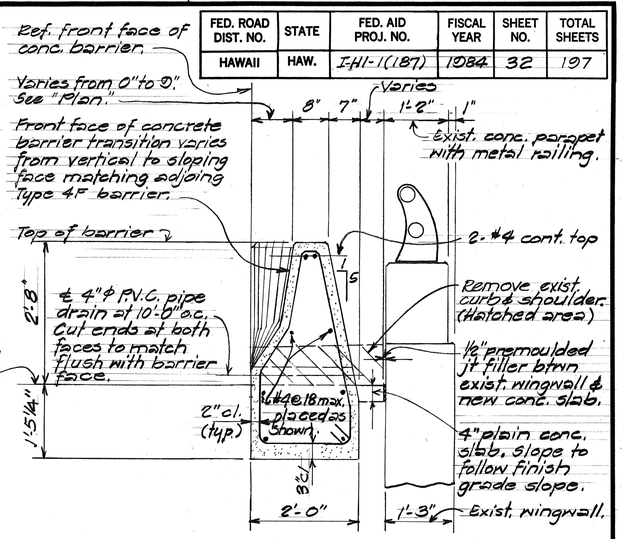

SECTION A 31|32
Scale: 3/4" = 1'-0"



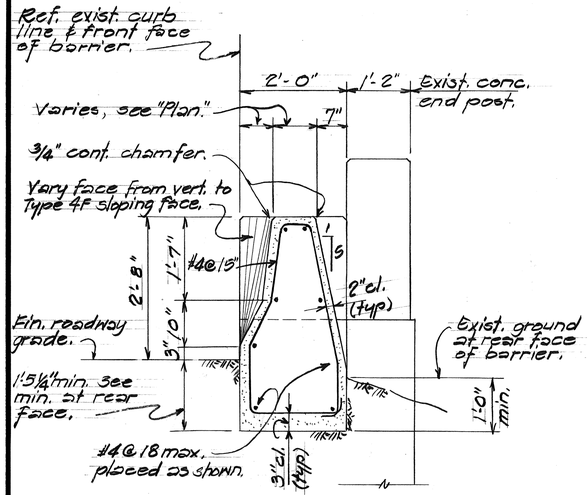

SECTION B 31|32
Scale: 3/4" = 1'-0"



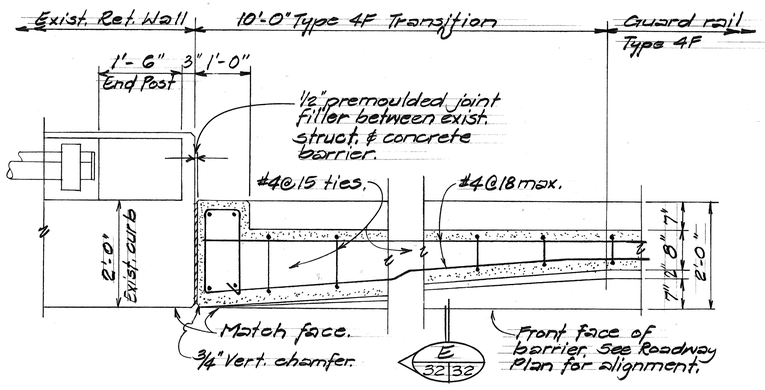

SECTION C 31|32
Scale: 3/4" = 1'-0"




SECTION D 31|32
Scale: 3/4" = 1'-0"

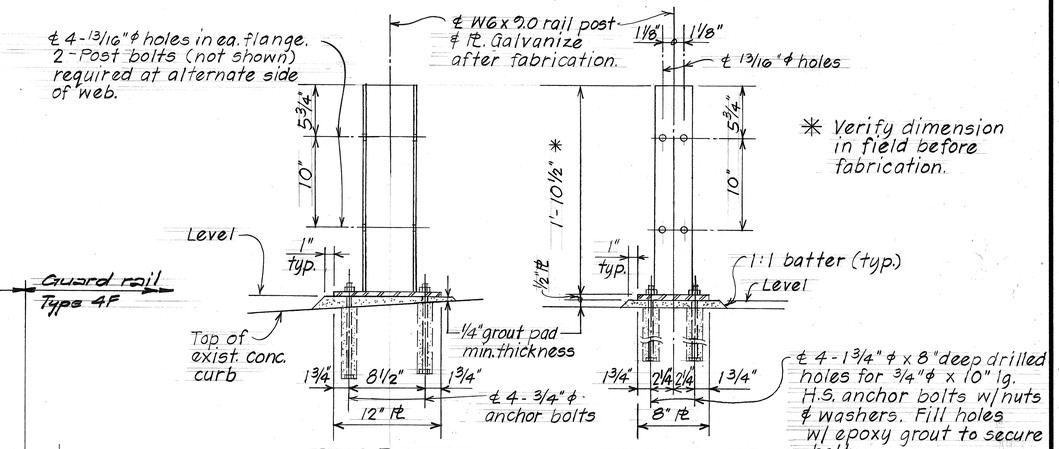


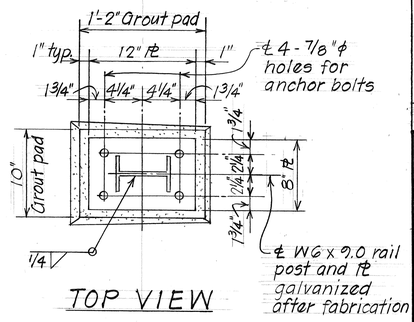

SECTION E 32|32




E 32|32

PLAN




RAIL POST DETAILS Scale: 1½" = 1'-0"

# GUARDRAIL TYPE 4F TRANSITION SECTION

(RAMP "K-2" STA. 2+60 ±)

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

| Date | Revision |
|---|---|
| 6/13/84 | Section A 31\|32 & C 31\|32 revised to accomodate change in metal guard rail alignment, spacing and configuration. Added - Rail post details |

| ORIGINAL PLAN | | DATE |
|---|---|---|
| | SURVEY PLOTTED BY | G/83 |
| | DRAWN BY S.Y. | 6/83 |
| | TRACED BY " " | 6/83 |
| | DESIGNED BY T.S. | 6/83 |
| NOTE BOOK | QUANTITIES BY T.S. | 6/83 |
| No. | CHECKED BY L.A. | 6/83 |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

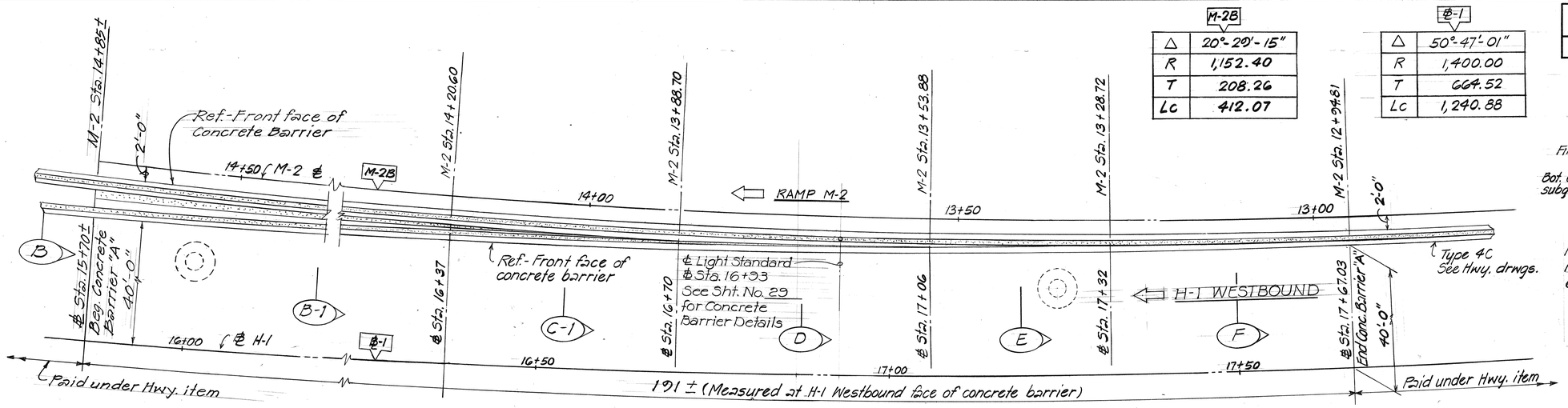
DETAILS - GUARDRAIL TYPE 4F
TRANSITION SECTION
INTERSTATE HI IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
WESTBOUND LANES
FAI. PROJ. NO. I-HI-1(187)

Scale: 3/4" = 1'-0" Date: June 1983

SHEET No. OF SHEETS

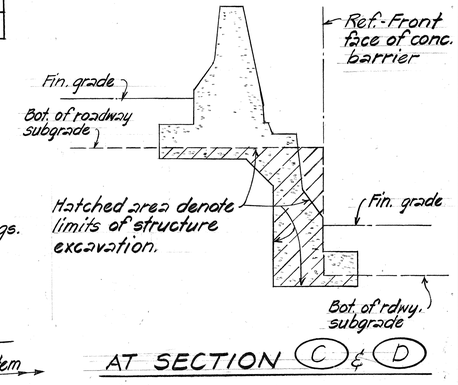
C.O. 32

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 33 | 197 |

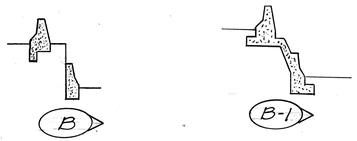



PLAN

Scale: 1/8"=1'-0"

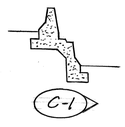


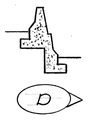

AT SECTION C & D

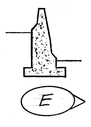


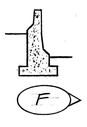


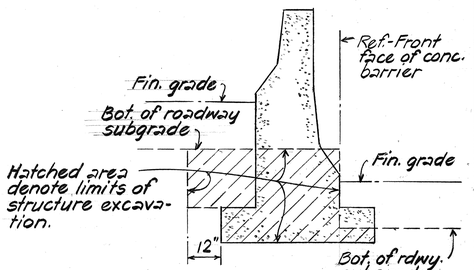




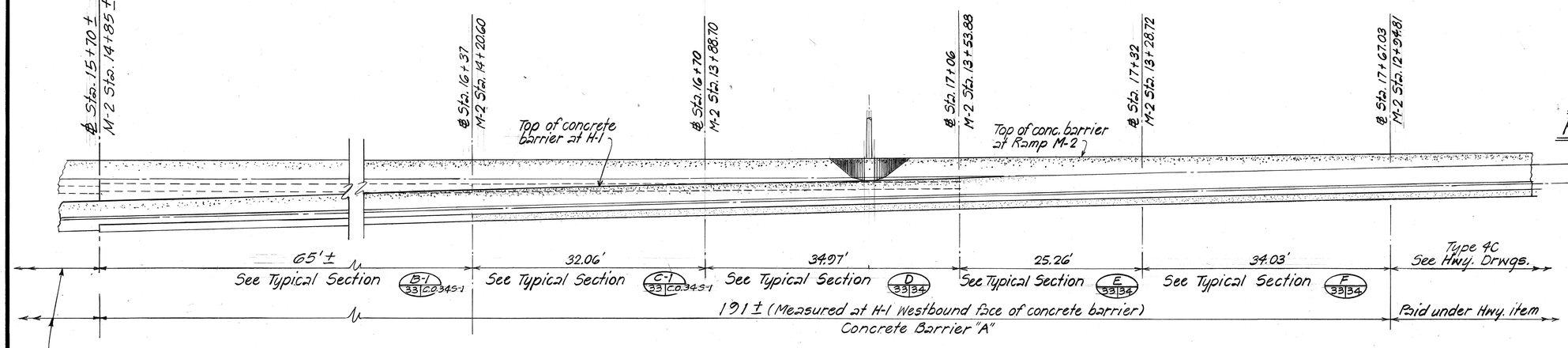




AT SECTION E & F

STRUCTURE EXCAVATION PAY LIMITS AT CONC. BARRIER

Not to Scale




ELEVATION

Scale: 1/8"=1'-0"

## ESTIMATED QUANTITIES

| ITEM NO. | ITEM | UNIT | QUANTITY |
|---|---|---|---|
| 606.4160 | Concrete Barrier "A" | L.F. | 191 |
| 206.9200 | Structure Excavation for Concrete Barrier "A" | C.Y. | 85 |

## CONCRETE BARRIER "A"

℄ STA. 15+70± TO STA. 17+67.03

M-2 STA. 14+85± TO STA. 12+94.81

| DATE | REVISION |
|---|---|
| 8-1-84 | Concrete Barrier "A" extended approximately 65 linear feet. Typical Sections from ℄ Sta. 15+70± to 16+70 revised. |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

CONCRETE BARRIER "A"

INTERSTATE HI IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
WESTBOUND LANES

F.A.I. PROJ. NO. I-HI-1(187)

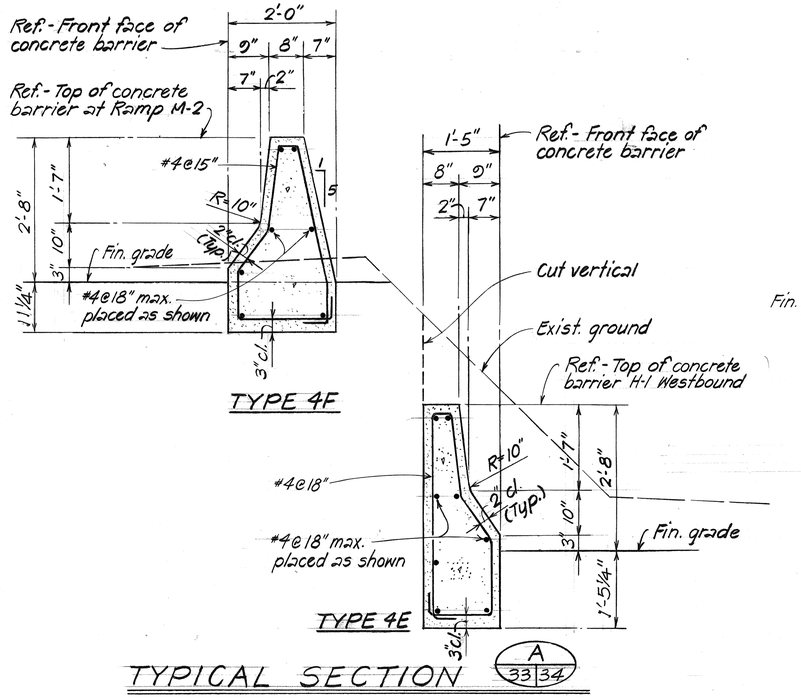
Scale: As Shown Date:

SHEET NO. 1 OF 2 SHEETS

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

C.O. 33

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 34 | 197 |

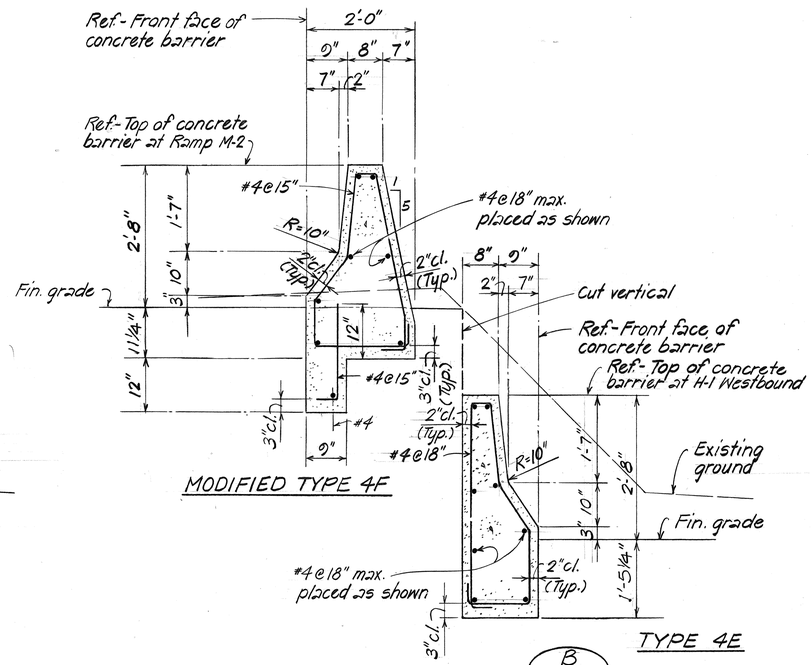



## TYPICAL SECTION

SEE HWY. DRAWINGS

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

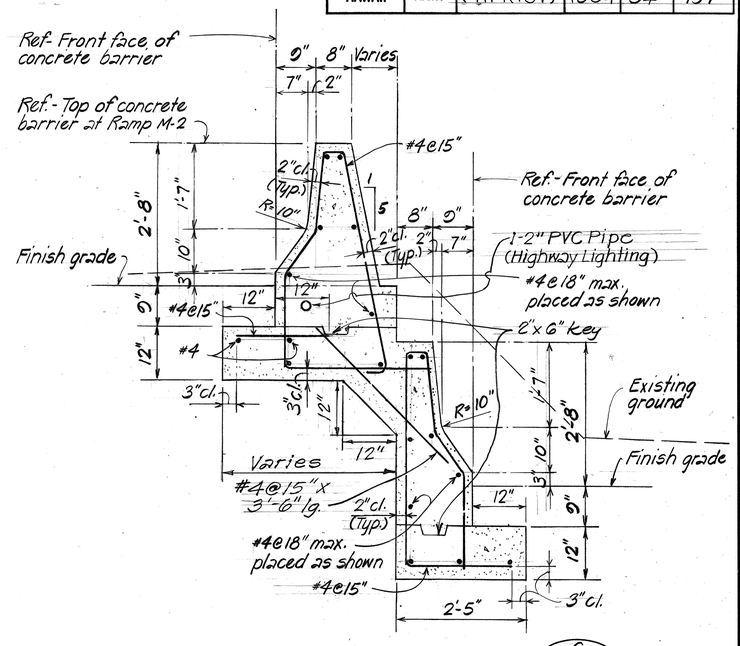
A 33|34




## TYPICAL SECTION

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

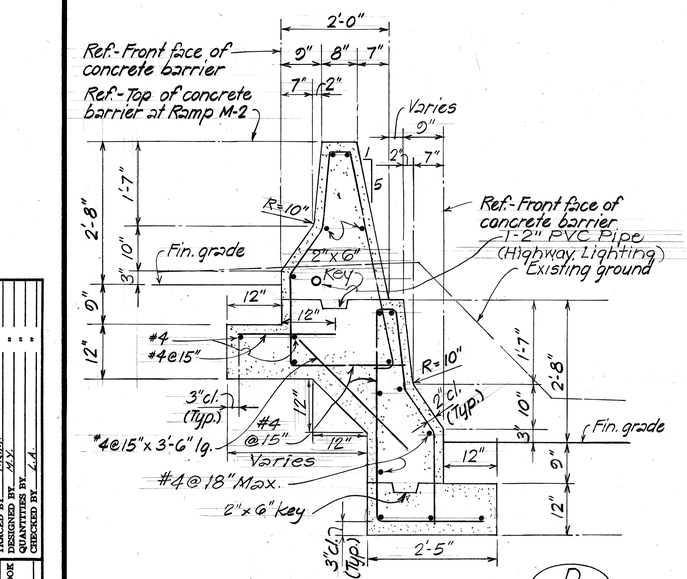
B 33|34




## TYPICAL SECTION

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

C 33|34



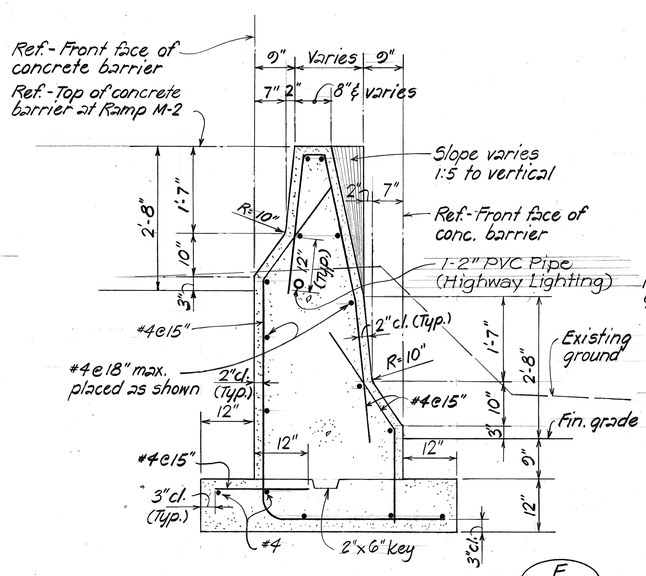

## TYPICAL SECTION

₵ STA. 16+70 TO ₵ STA. 17+06

M-2 STA. 13+88.70 TO M-2 STA. 13+53.88

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

D 33|34



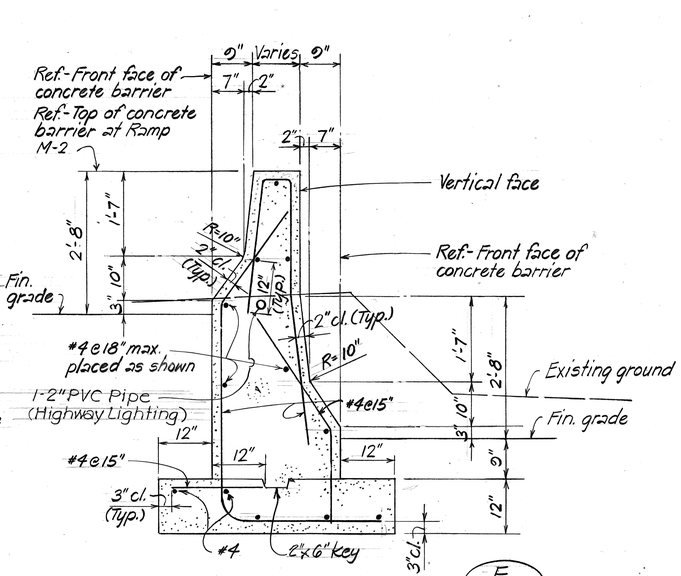

## TYPICAL SECTION

₵ STA. 17+06 TO ₵ STA. 17+32

M-2 STA. 13+53.88 TO M-2 STA. 13+28.72

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

E 33|34




## TYPICAL SECTION

₵ STA. 17+32 TO ₵ STA. 17+67.03

M-2 STA. 13+28.72 TO M-2 STA. 12+94.81

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

F 33|34

| DATE | REVISION |
|---|---|
| 8-1-84 | Fillet between adjoining Barrier Sections shown on Typical Section "C" and "D" revised from 9" to 12". See Sheet No. C.O.34.5-1 for Revised Typical Sections from ₵ Sta. 15+70± to 16+70. |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

# CONCRETE BARRIER "A"

INTERSTATE HI IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
WESTBOUND LANES

F.A.I. PROJ. NO. I-HI-1(187)

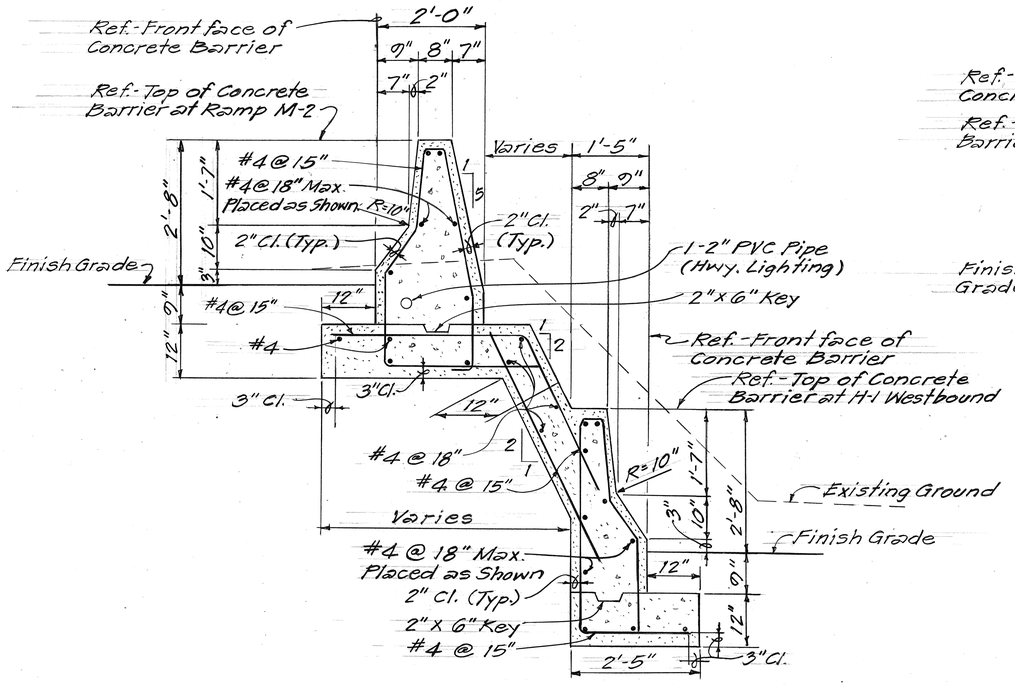
Scale: As Shown Date:

SHEET No. 2 OF 2 SHEETS

| ORIGINAL PLAN | SURVEY PLOTTED BY | DATE |
|---|---|---|
| | DRAWN BY K.Kam | |
| | TRACED BY T.K.M. | |
| NOTE BOOK | DESIGNED BY M.Y. | |
| No. | QUANTITIES BY | |
| | CHECKED BY L.A. | |

C.O. 34

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 345-1 | 197 |

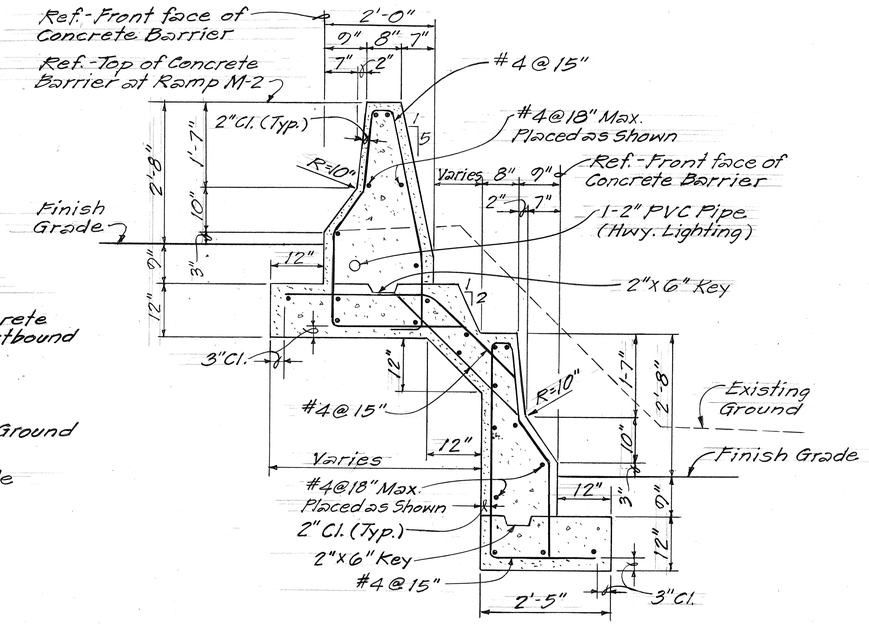



TYPICAL SECTION (B-1 / 33 C.O.) 345-1

℄ STA. 15+70± TO ℄ STA. 16+37

M-2 STA. 14+85± TO M-2 STA. 14+20.60

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




TYPICAL SECTION (C-1 / 33 C.O.) 345-1

℄ STA. 16+37 TO ℄ STA. 16+70

M-2 STA. 14+20.60 TO M-2 STA. 13+88.70

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

| DATE | REVISION |
|---|---|
| 8-1-84 | Revised Typical Sections from ℄ Sta. 15+70± to 16+70 added. |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONCRETE BARRIER "A"

INTERSTATE HI IMPROVEMENTS

MIDDLE STREET TO KALIHI INTERCHANGE

WESTBOUND LANES

F.A.I PROJ. NO. I-HI-1(187)

Scale: As Shown Date:

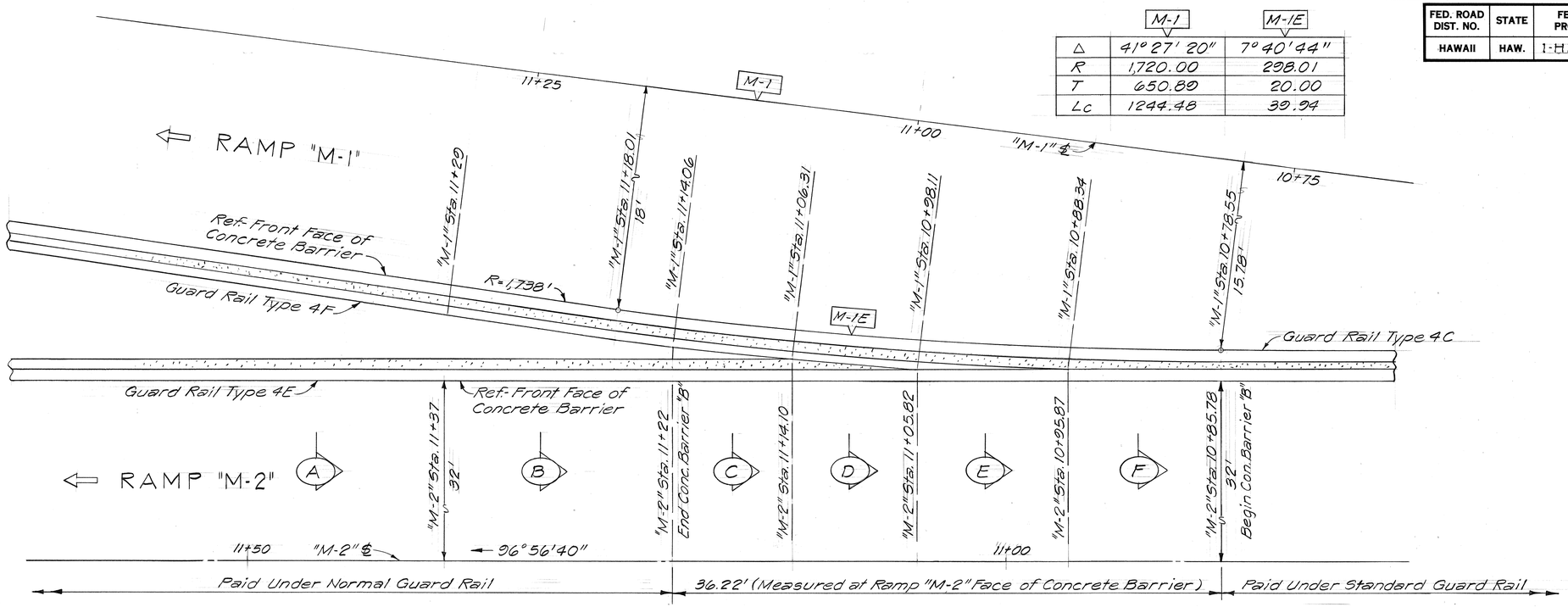
SHEET NO. OF SHEETS

C.O. 34 S-1

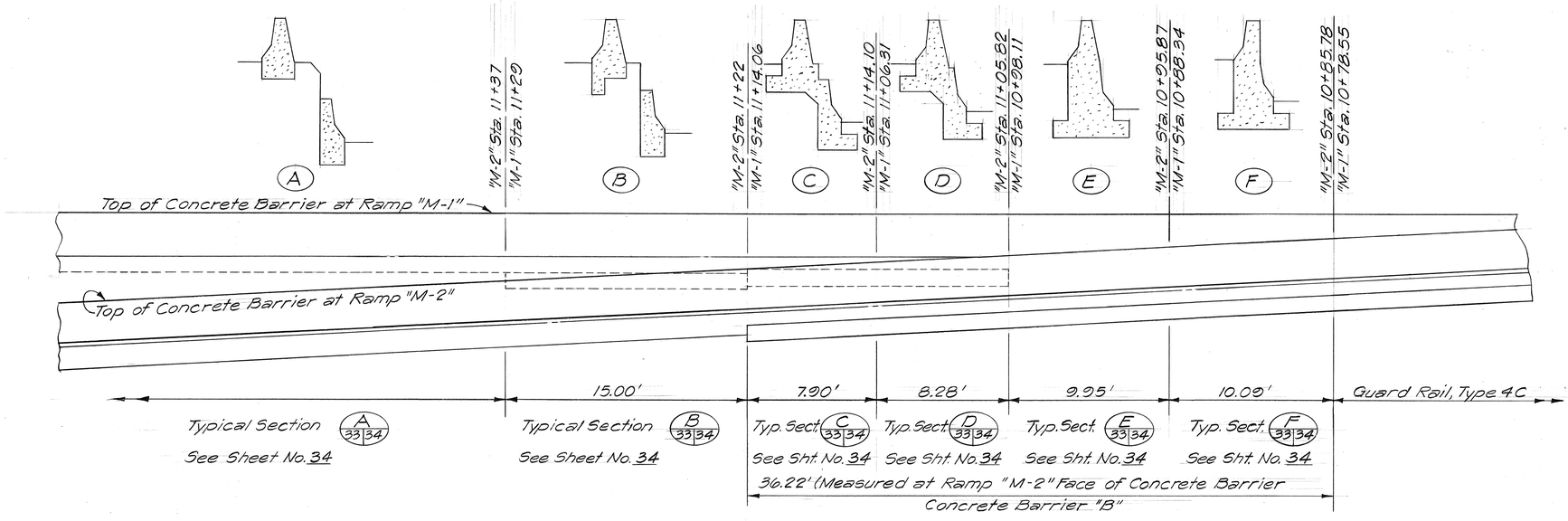
ORIGINAL PLAN | NOTE BOOK No.
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 35 | 197 |

| | M-1 | M-1E |
|---|---|---|
| Δ | 41° 27' 20" | 7° 40' 44" |
| R | 1,720.00 | 298.01 |
| T | 650.80 | 20.00 |
| Lc | 1244.48 | 39.94 |




PLAN
Scale: 1/4" = 1'-0"




ELEVATION
Scale: 1/4" = 1'-0"

# CONCRETE BARRIER "B"

"M-2" STA. 10+85.78 TO "M-2" STA. 11+22
"M-1" STA. 10+78.55 TO "M-1" STA. 11+14.06

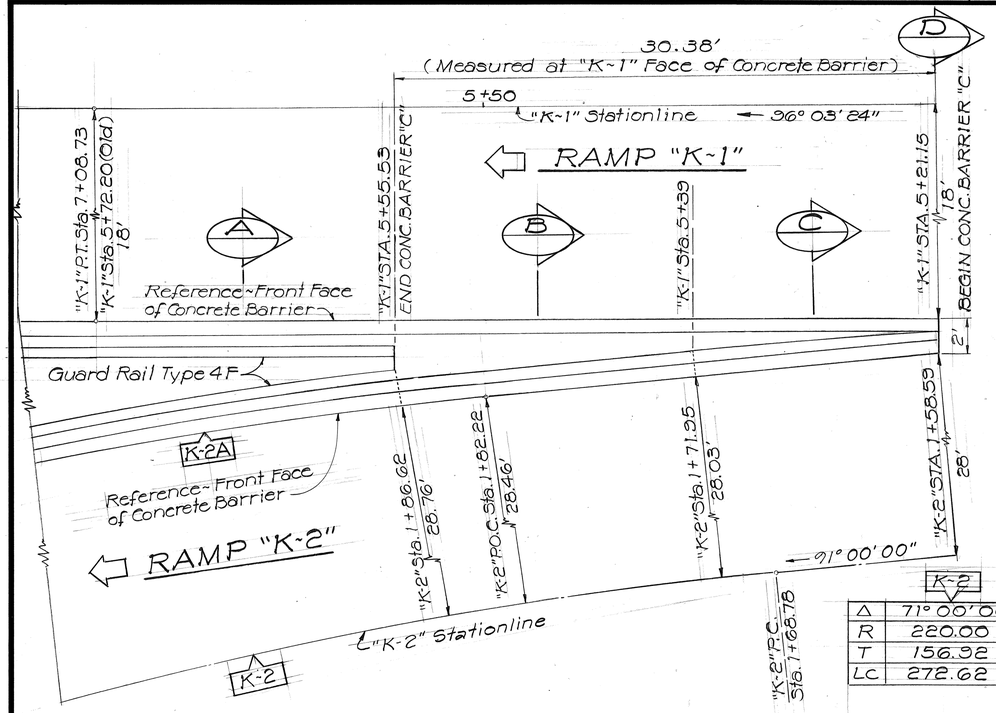
ORIGINAL PLAN
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE
NOTE BOOK
No.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONCRETE BARRIER "B"
INTERSTATE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
WESTBOUND LANES
F.A.I. PROJ. NO. I-HI-1(187)
Scale: As Shown Date:

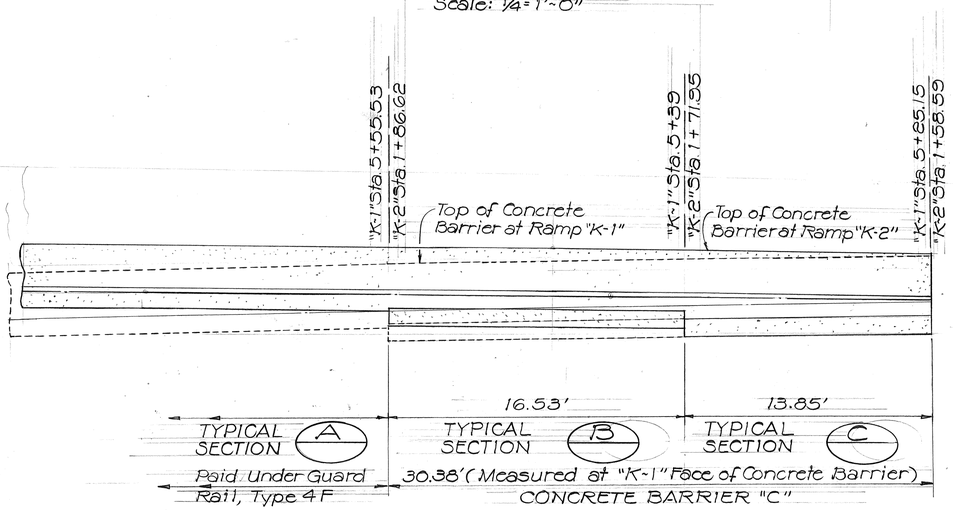
SHEET No. 1 OF 1 SHEETS

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 36 | 197 |

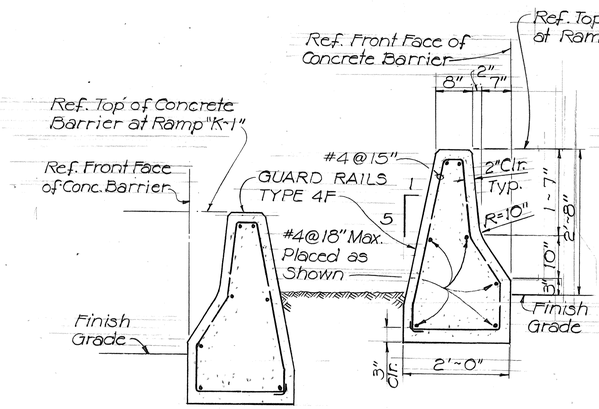



| | K-2 | K-2A |
|---|---|---|
| Δ | 71° 00' 00" | 13° 19' 43" |
| R | 220.00 | 222.14 |
| T | 156.32 | 25.96 |
| LC | 272.62 | 51.68 |

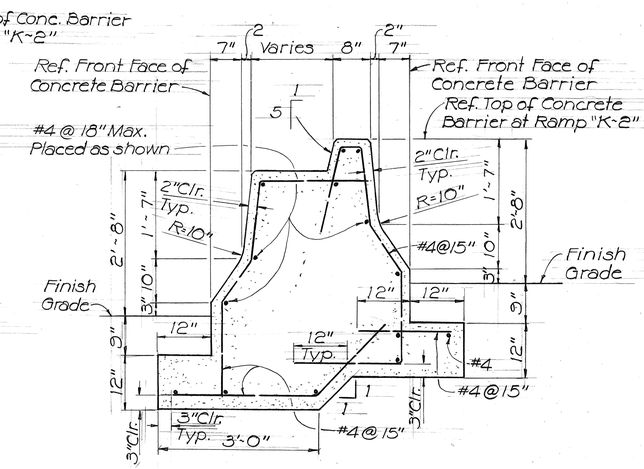
PLAN
Scale: 1/4" = 1'-0"



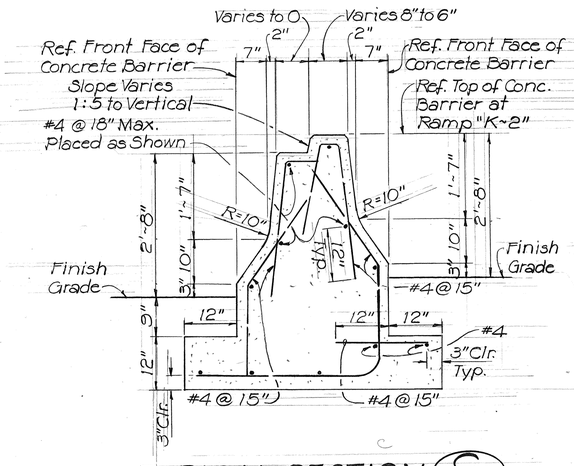

ELEVATION
Scale: 1/4" = 1'-0"



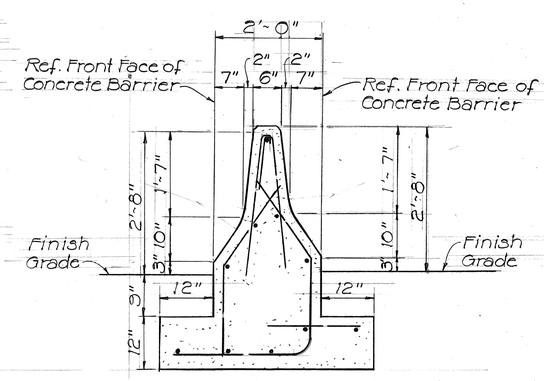

TYPICAL SECTION A
Scale: 3/4" = 1'-0"




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




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




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

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

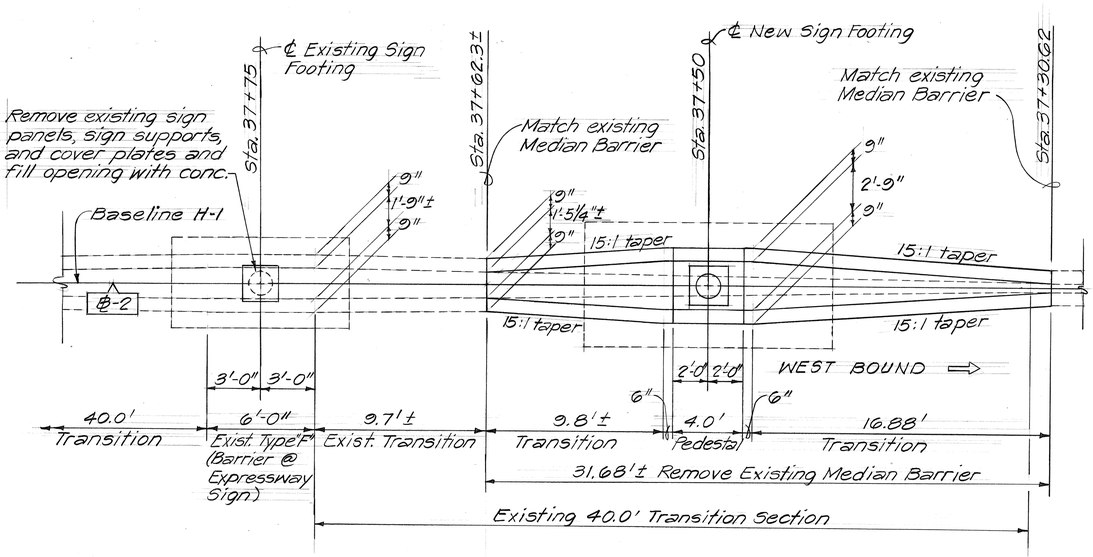
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONCRETE BARRIER "C"
INTERSTATE ROUTE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
WESTBOUND LANES
F.A.I. PROJ. NO. I-HI-1(187)
SCALE: As Shown

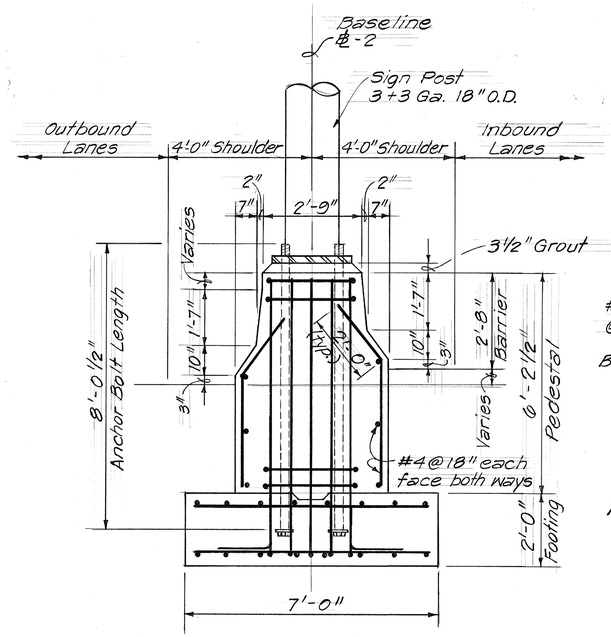
SHEET No. / OF / SHEETS

# CONCRETE BARRIER "C"
## "K-1" STA. 5 + 25.15 TO "K-1" STA. 5 + 55.53
## "K-2" STA. 1 + 58.59 TO "K-2" STA. 1 + 86.62

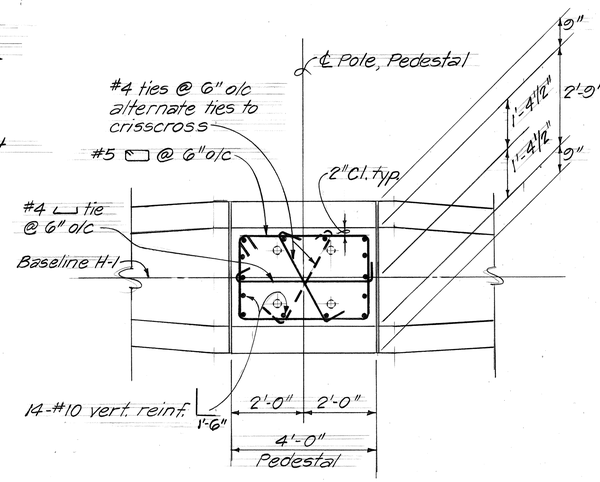
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | C0.36S-1 | |



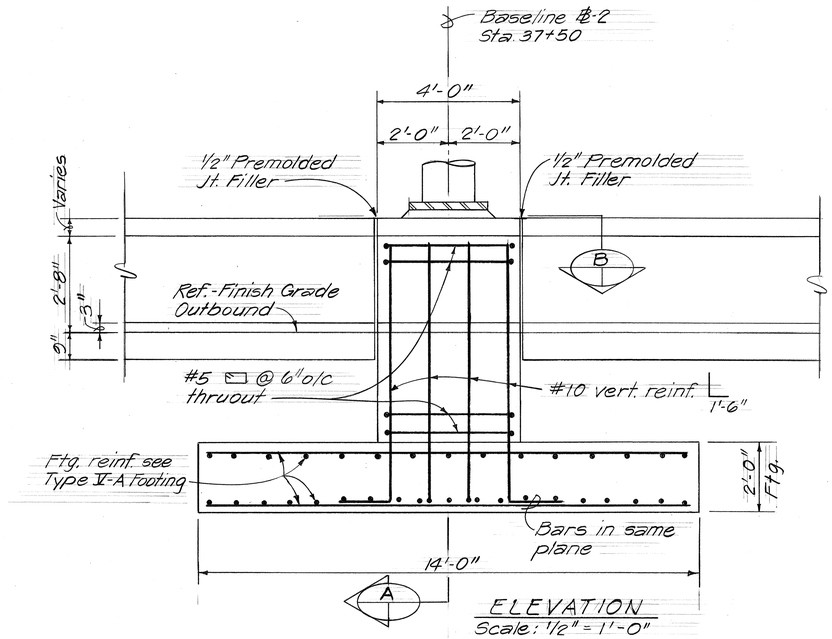

PLAN
Scale: ¼" = 1'-0"




SECTION (A)
Scale: ½" = 1'-0"

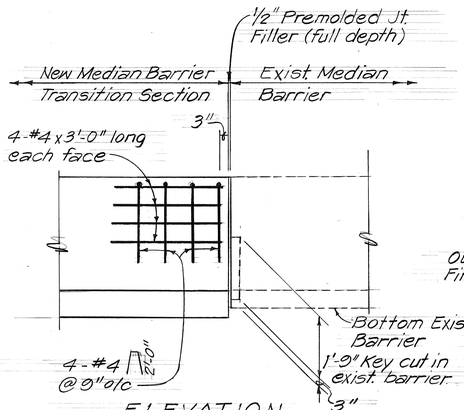



SECTION (B)
Scale: ½" = 1'-0"

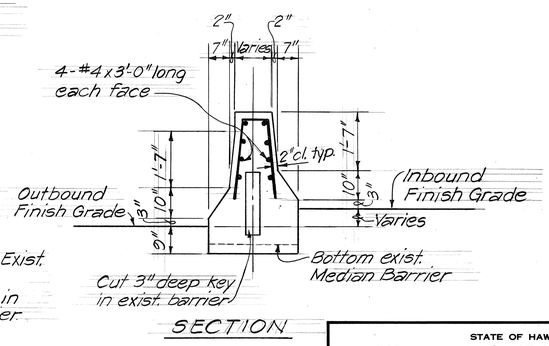



ELEVATION
Scale: ½" = 1'-0"

# ℄ STA. 37+30.62 TO ℄ STA. 37+62.30±
# GUARD RAIL TYPE 4B TRANSITION SECTION, SIGN PEDESTAL AND SIGN FOOTING DETAILS




ELEVATION




SECTION

## EXPANSION JOINT DETAIL @ MEDIAN BARRIER
Scale: ½" = 1'-0"

| DATE | REVISION |
|---|---|
| 4-4-84 | Detail for Guard Rail Type 4B Transition Section added, ℄ Sta. 37+30.62 to ℄ Sta. 37+62.3±. Revised Sign Pedestal and Anchor Bolt Detail. |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL PLAN

℄ STA. 37+30.62 TO ℄ STA. 37+62.3±

INTERSTATE ROUTE H1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
WESTBOUND LANES
F.A.I. PROJ. No. I-HI-1(187)

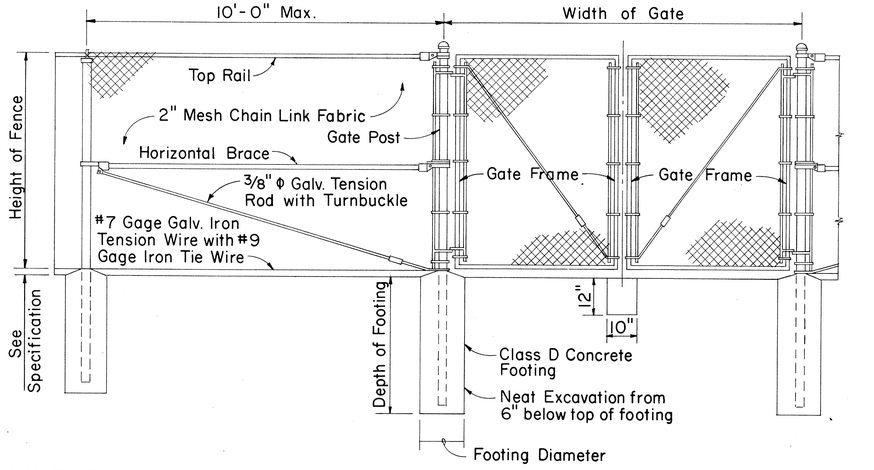
Scale: As Noted Date: Apr. 1984

SHEET No. OF SHEETS

C0.36S-1

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

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 37 | 197 |



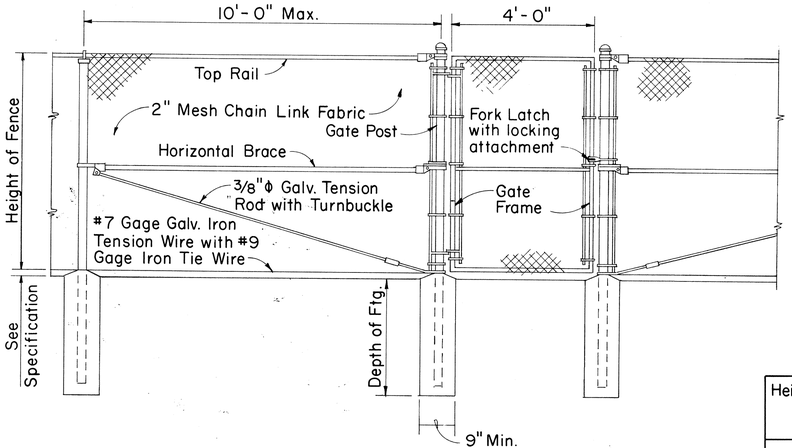

LINE POST GATE POST GATE POST

## DETAIL OF CHAIN LINK GATE

NOTE: 1. Gate fork latch and lock, flush plate and anchor, and plunger shall be installed with Gates, and shall be considered as incidental to Chain Link Fence Gate.

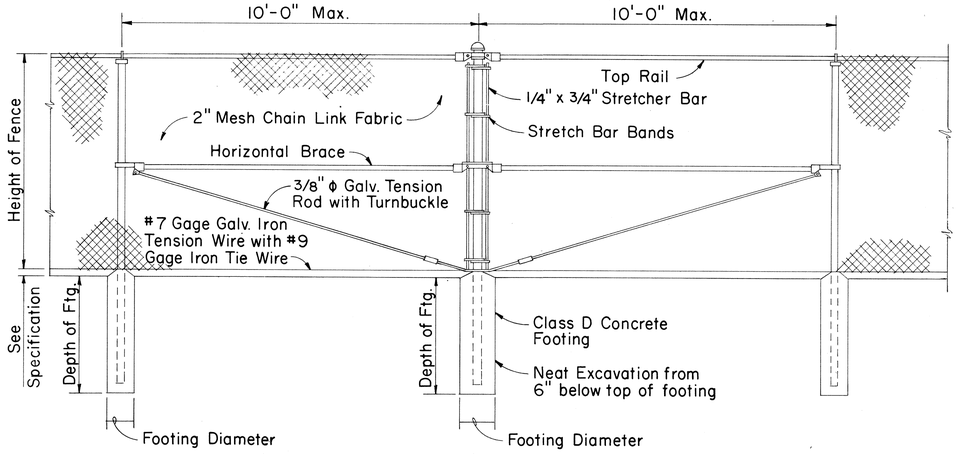
2. Gate frames shall be mitered and welded at corners.

3. Fence detail not shown shall be in accordance with the Standard Specifications.

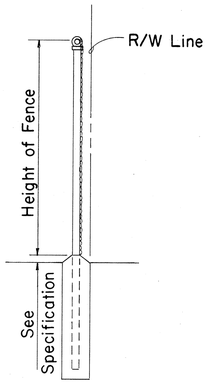



LINE POST GATE POST GATE POST

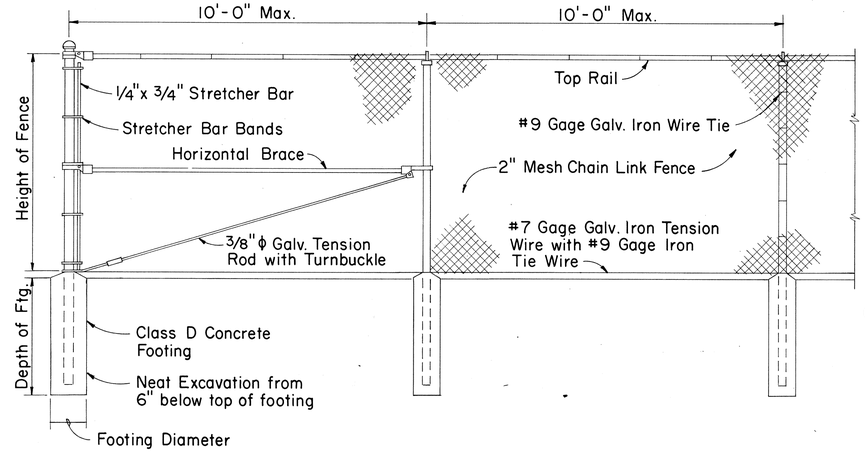
## DETAIL OF 4 FT. CHAIN LINK GATE



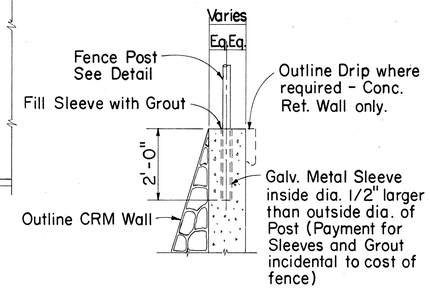

LINE POST PULL POST LINE POST




TYPICAL SECTION (WITH CONCRETE FOOTING)




END POST LINE POST LINE POST




TYPICAL SECTION (ON CRM & CONC. RET. WALL)

## CHAIN LINK FENCE DETAILS

| Height of Fence | Minimum Depth of Footing | | Minimum Footing Diameter | |
|---|---|---|---|---|
| | Line Post | Corner, Pull, End and Gate Posts | Line Post | Corner, Pull and End Posts |
| 3' | 2'-0" | 2'-6" | 8" | 8" |
| 4' | 2'-6" | 2'-6" | 8" | 8" |
| 5' | 3'-0" | 3'-0" | 8" | 8" |
| 6' | 3'-0" | 3'-0" | 8" | 9" |

APPROVAL RECOMMENDED:
M. Hirano — HIGHWAY DESIGN ENGINEER — 12-4-69 DATE

APPROVED:
Charles E. Bodell — ASSISTANT CHIEF, ENGINEERING — 12-10-69 DATE

| NO | REVISION | APPROVED BY | DATE |
|---|---|---|---|
| | | | |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

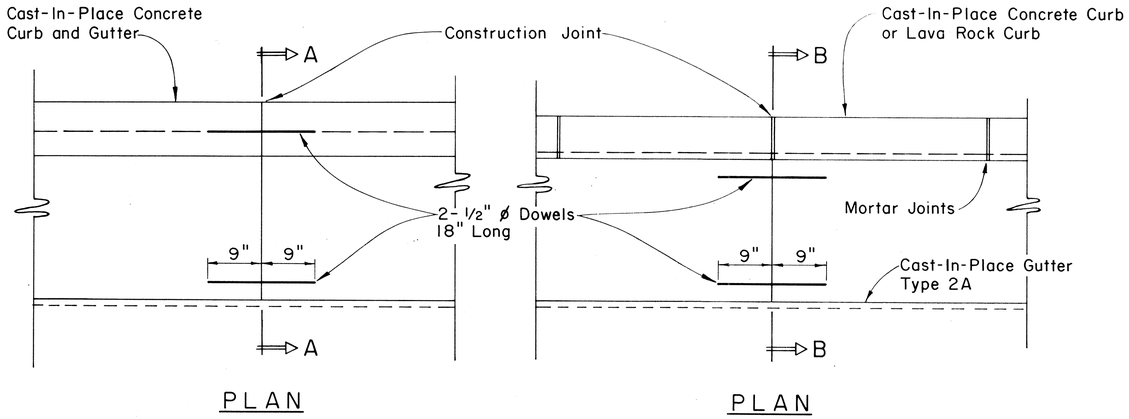
CHAIN LINK FENCE (WITH TOPRAIL)

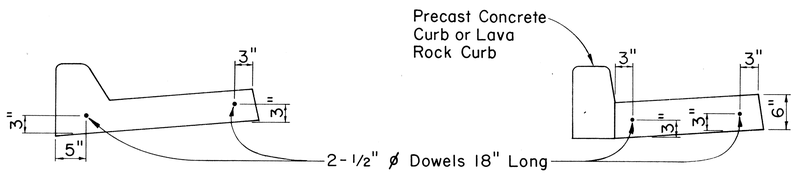
Scale: 1/2" = 1'-0" Date:

SHEET No. OF SHEETS DD 607.1

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

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 38 | 197 |



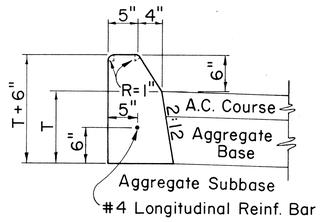




## CAST-IN-PLACE CURB & GUTTER

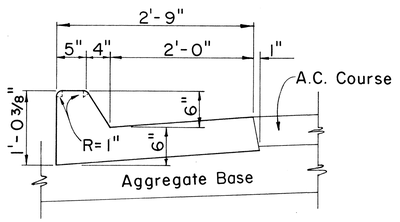
## CAST-IN-PLACE GUTTER

# CONSTRUCTION JOINT DETAIL

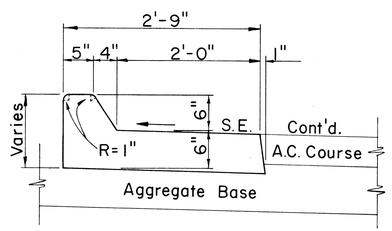
Scale: 1" = 1'-0"



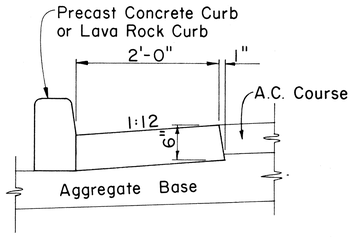

## CURB, TYPE 2A



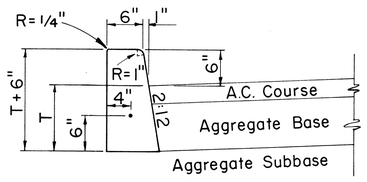

## CURB & GUTTER, TYPE 2AG



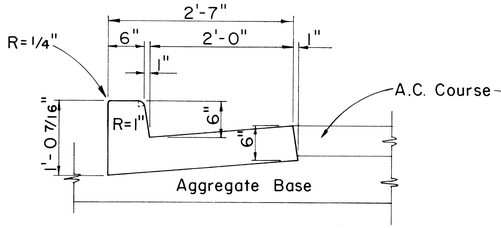

## CURB & GUTTER, TYPE 2AGM



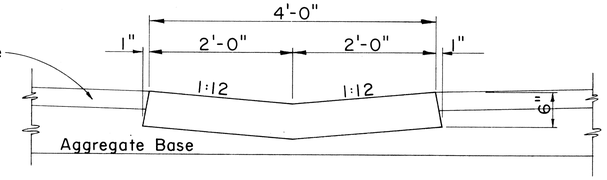

## GUTTER, TYPE 2A




## CURB, TYPE 2D



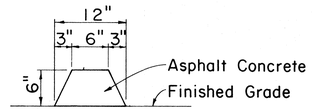

## CURB & GUTTER, TYPE 2DG




## GUTTER, TYPE 2G

# CAST-IN-PLACE CONCRETE CURBS AND/OR GUTTERS

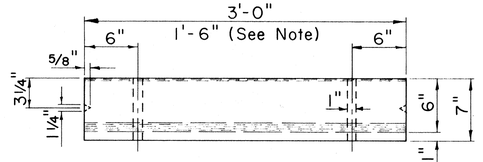
Scale: 1" = 1'-0"

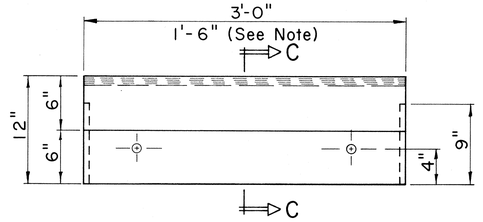


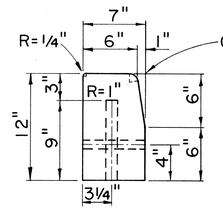

## CURB, TYPE 6

# BITUMINOUS CURB

Scale: 1 1/2" = 1'-0"




NOTE:
For curb returns use 1'-6" pre-cast concrete curbs.

SECTION C-C

## CURB, TYPE 3D

# PRE-CAST CONC. CURB

Scale: 1 1/2" = 1'-0"

APPROVAL RECOMMENDED:
M. Hirozawa
HIGHWAY DESIGN ENGINEER — 12-4-69 DATE

APPROVED:
Edward Q. Sakoda
ASSISTANT CHIEF, ENGINEERING — 12-10-69 DATE

| NO. | REVISION | APPROVED BY | DATE |
|---|---|---|---|
| | | | |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

# STANDARD DETAILS

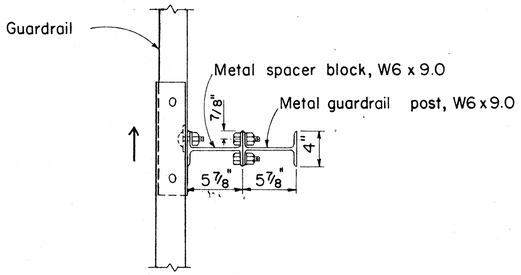
# TYPICAL DETAILS OF CURB AND/OR GUTTERS

Scale: As Shown

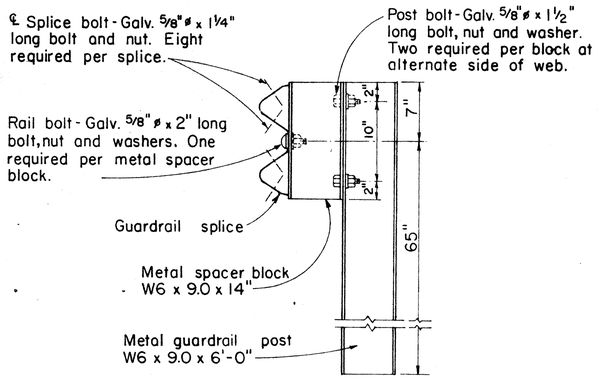
SHEET No. OF SHEETS | DD 609.1

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

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 39 | 197 |



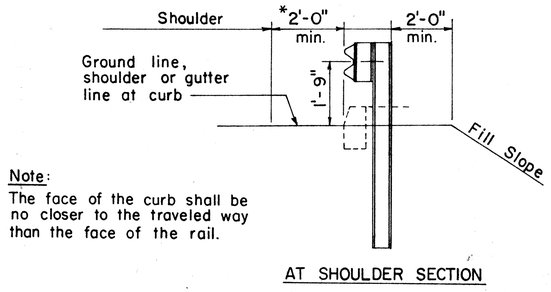

PLAN




ELEVATION

## SINGLE METAL GUARDRAIL ON METAL POST WITH METAL SPACER BLOCK

SCALE: 1 1/2" = 1'-0"

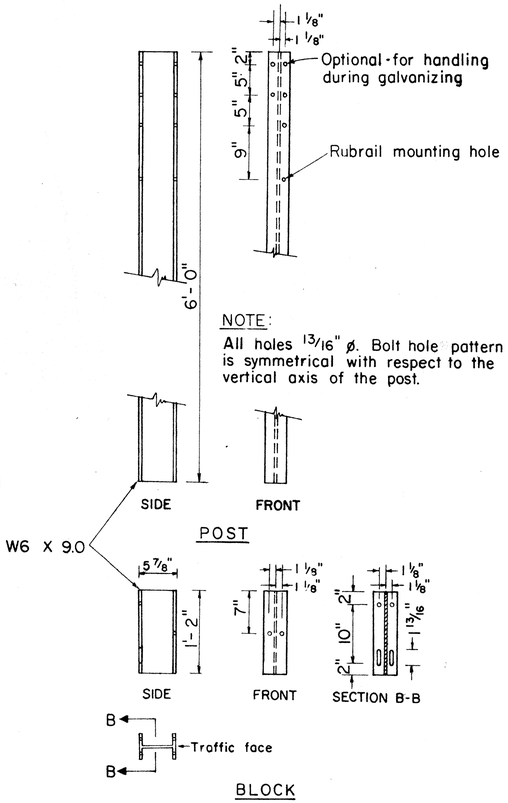



Note:
The face of the curb shall be no closer to the traveled way than the face of the rail.

AT SHOULDER SECTION

## TYPICAL METAL GUARDRAIL DETAIL

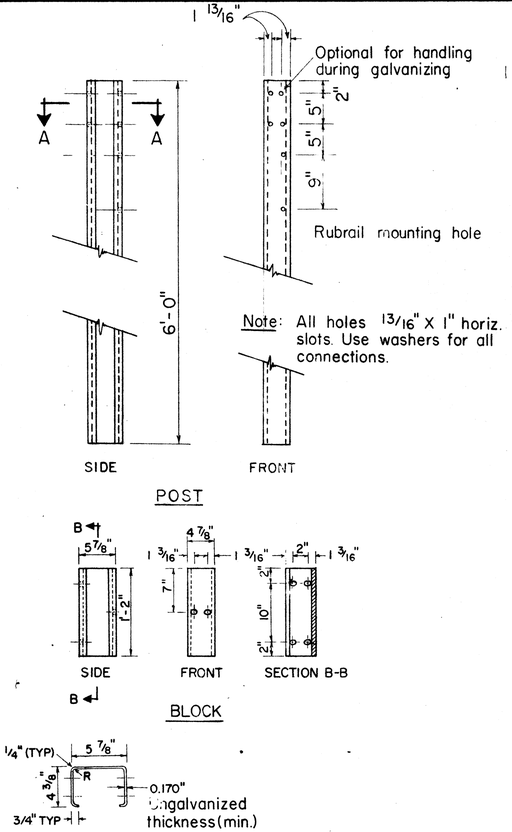
SCALE: 1/2" = 1'-0"




NOTE:
All holes 13/16" ø. Bolt hole pattern is symmetrical with respect to the vertical axis of the post.

## STRUCTURAL SHAPE POST AND BLOCK

SCALE: 1" = 1'-0"

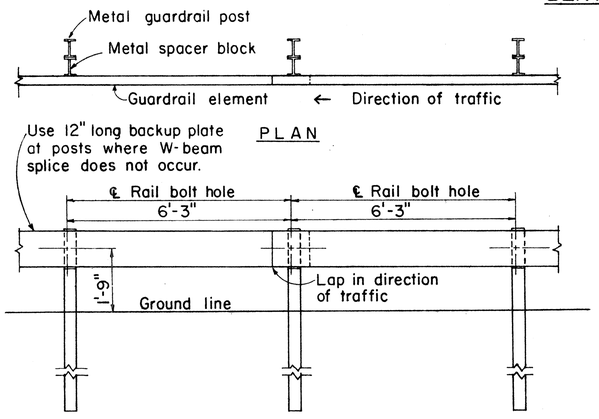



Note: All holes 13/16" X 1" horiz. slots. Use washers for all connections.

SECTION A-A
N.T.S.

## BENT PLATE POST AND BLOCK

SCALE: 1" = 1'-0"




ELEVATION

## METAL GUARDRAIL ON METAL POST WITH METAL SPACER BLOCK

SCALE: 1/2" = 1'-0"

## GENERAL NOTES

1. Both of the alternate type posts may be used on any one project however, only one type of post shall be used in any single run of guardrail.
2. All hardware, posts and blocks shall be galvanized. No punching, drilling or cutting will be permitted after galvanizing.
3. Connection details for bent plate post and block shall be similar to the details shown for structural shape post, and block.
4. Where conditions require, special post lengths in increments of 6 inches may be specified.
5. For details of rail elements, bolts and nuts, see sheet DT 501.

APPROVAL RECOMMENDED:
Eiichi Tanaka — TRAFFIC ENGINEER — 9/7/82 DATE

APPROVED:
Hubert Sakishi — ASSISTANT CHIEF, ENGINEERING — 9/22/82 DATE

| NO. | REVISION | APPROVED BY | DATE |
|---|---|---|---|
| 1 | Supersedes sht. DT 500 approved 12/30/69. | H.F. | 9/22/82 |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

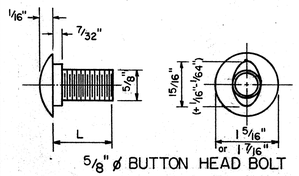
# STANDARD DETAILS
## METAL GUARDRAIL

Scale: As Shown — July, 1982

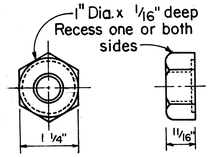
SHEET No. OF SHEETS DT 500

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

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 40 | 197 |



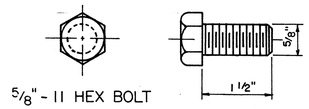

5/8" ø BUTTON HEAD BOLT



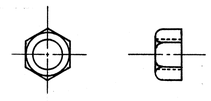

5/8" ø RECESS NUT

| L | Thread Length | Intended Use |
|---|---|---|
| 1 1/4" | Full length thread | Splice rail elements |
| 2" | 1 1/2" min. thread len. | Fasten rails to posts |

## 5/8" BUTTON HEAD BOLT AND RECESS NUT
Scale: N.T.S

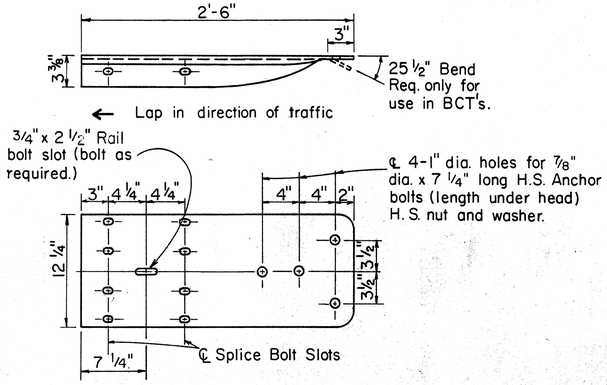



5/8"-11 HEX BOLT

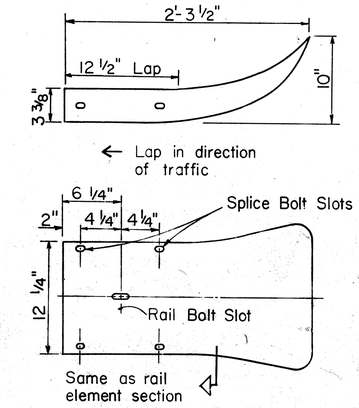


5/8"-11 HEX NUT

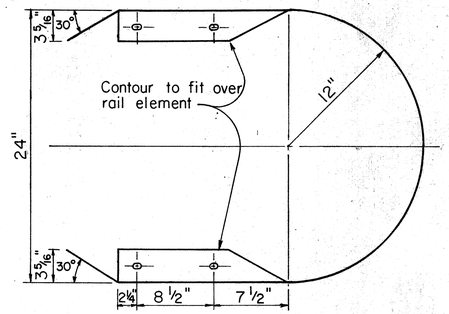
## 5/8" HEX POST BOLT AND NUT
Scale: N.T.S.

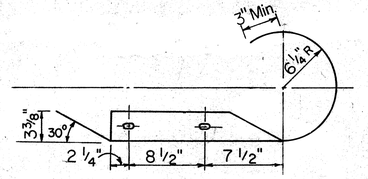


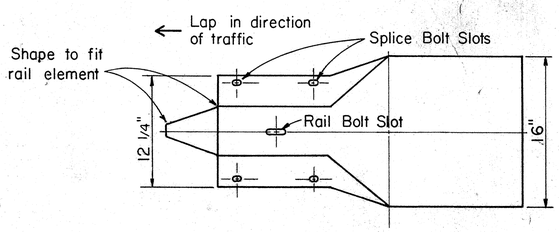

## W BEAM TERMINAL CONNECTOR
Scale: 1 1/2" = 1'-0"



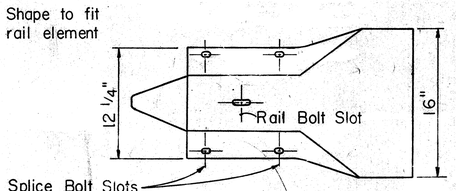

## W BEAM END SECTION (FLARED)
Scale: 1 1/2" = 1'-0"



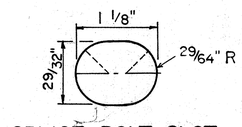

## W BEAM END SECTION (BUFFER)
Scale: 1 1/2" = 1'-0"



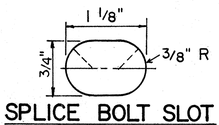

## W BEAM END SECTION (ROUNDED)
Scale: 1 1/2" = 1'-0"




## RAIL ELEMENT SECTION
Scale: 6" = 1'-0"




## SPLICE BOLT SLOT




## SPLICE BOLT SLOT FOR ALL ENDS

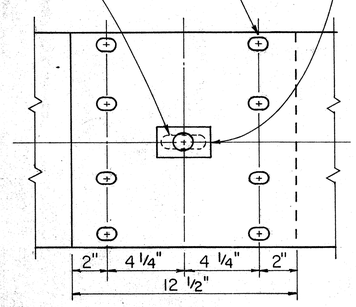
Scale: Full Size




## RAIL BOLT SLOT




## RAIL BOLT WASHER




## RAIL SPLICE
Scale: 3" = 1'-0"

APPROVAL RECOMMENDED:
Eiichi Tanaka — TRAFFIC ENGINEER — 9/20/82 DATE

APPROVED:
Herbert Sakahira — ASSISTANT CHIEF, ENGINEERING — 9/22/82 DATE

| NO. | REVISION | APPROVED BY | DATE |
|---|---|---|---|
| 1 | Supersedes sht. DT 501 approved 12/30/69 | H.F. | 9/22/82 |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

# STANDARD DETAILS
## METAL GUARDRAIL

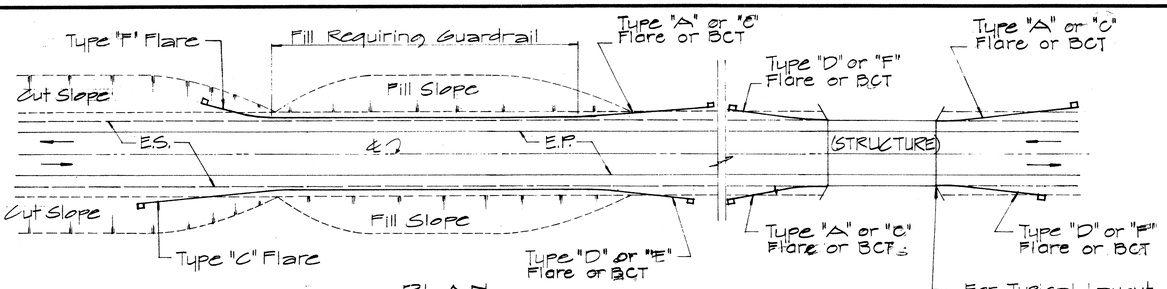
Scale: As Noted — July, 1982

SHEET No. OF SHEETS DT 501

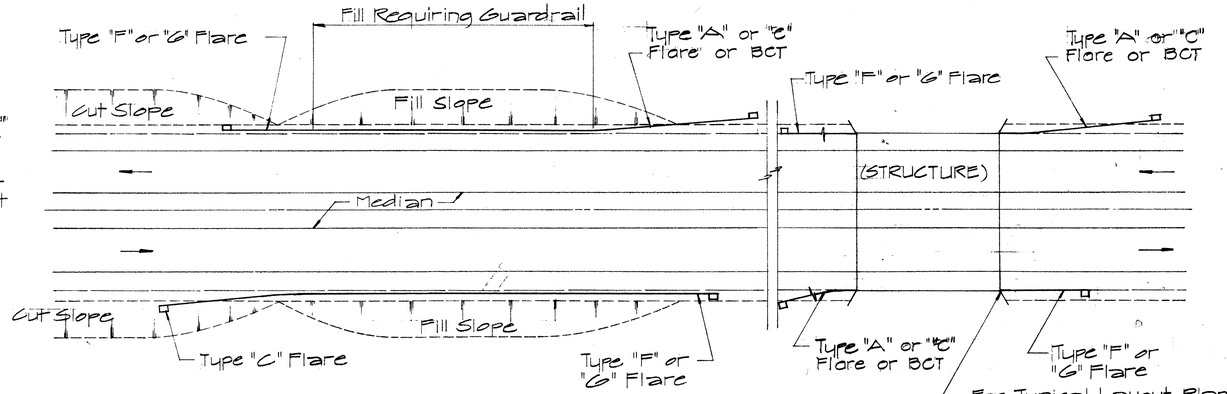
SURVEY PLOTTED BY — DATE
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
ORIGINAL PLAN
NOTE BOOK
No.

NOTE:
1. Metal guard rail connection to structures requires End Post Connection. See structure plans.
2. For detail of Breakaway Cable Terminal (BCT) See Sheet No. DT 519

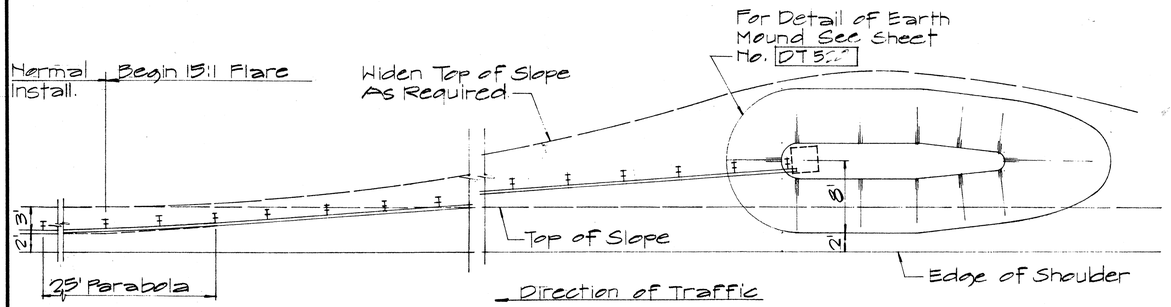
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 41 | 197 |



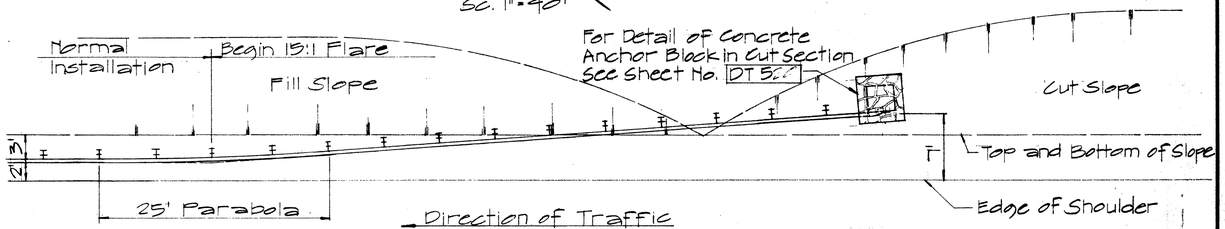

PLAN
TWO WAY ROADWAY
Sc. 1" = 40'



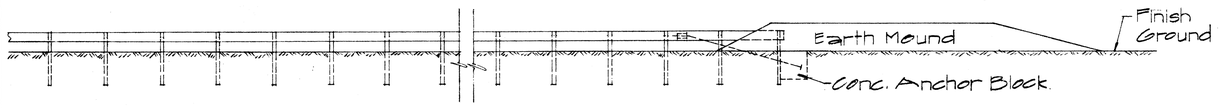

PLAN
ONE WAY ROADWAY (DIVIDED HIGHWAY)
Sc. 1" = 40'



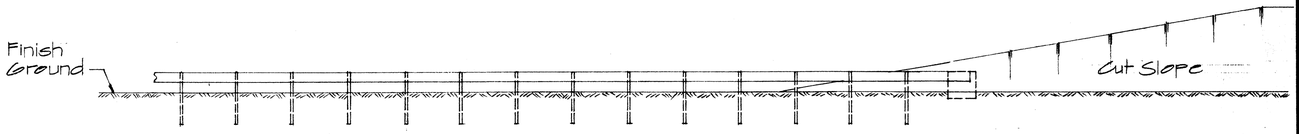

PLAN




PLAN




ELEVATION
TYPE "A" FLARE
Sc. 1/8" = 1'-0"




ELEVATION
TYPE "C" FLARE
Sc. 1/8" = 1'-0"

APPROVAL RECOMMENDED:
Eiichi Tanaka — TRAFFIC ENGINEER — 12/29/69 DATE

APPROVED:
[signature] — ASSISTANT CHIEF, ENGINEERING — 12-30-69 DATE

| NO. | REVISION | APPROVED BY | DATE |
|---|---|---|---|
| 1 | Delete Type "B" Flare and Type "E" Flare " " | H.T. | 6/15/78 |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

# STANDARD DETAILS OF APPROACH END FLARE - ONE & TWO WAY ROADWAY

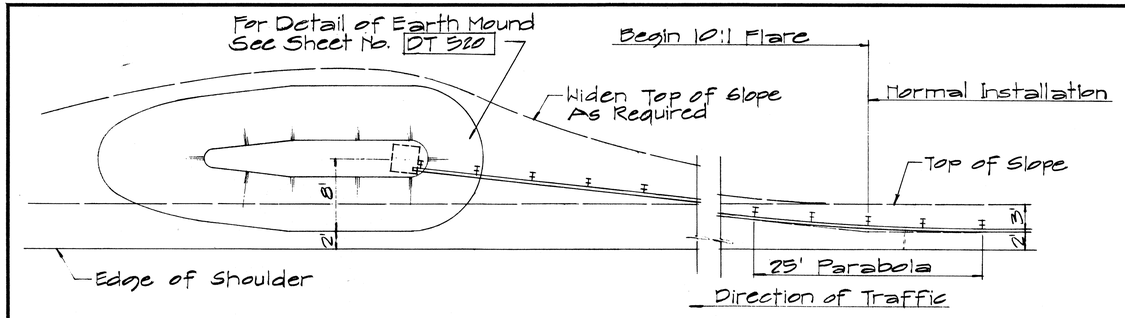
Sc. As Noted — April 1969

SHEET No. OF SHEETS DT 516

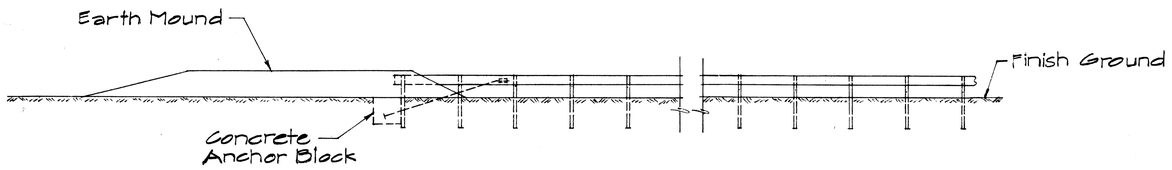
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
NOTE BOOK | No.

PRINTED ON NO. 1000H CLEARPRINT

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 42 | 197 |



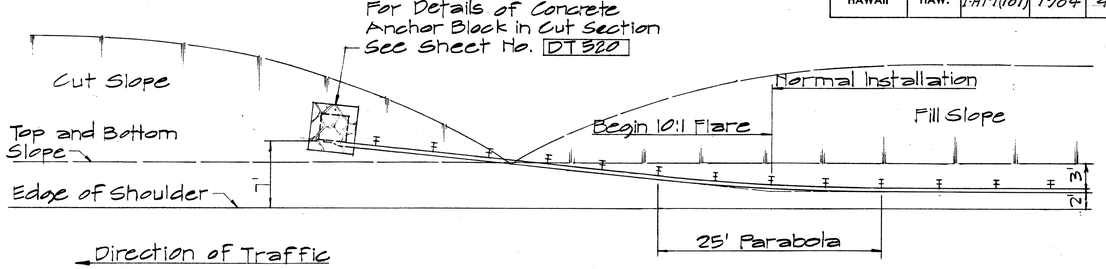

PLAN



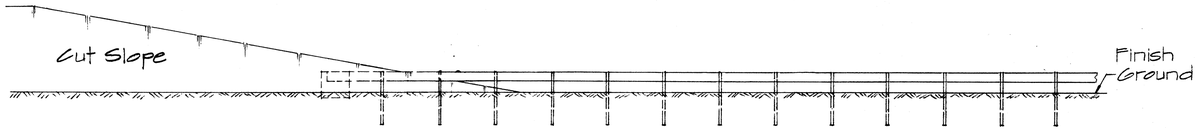

ELEVATION

TYPE "D" FLARE

Sc. 1/8" = 1'-0"



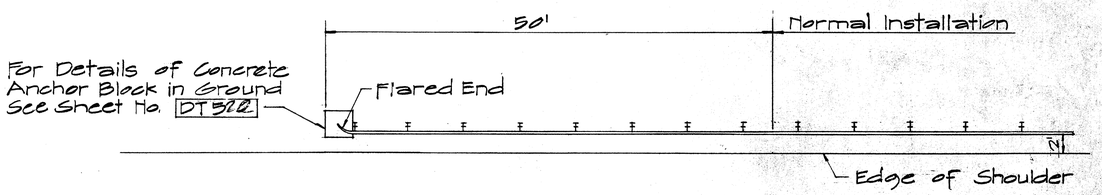

PLAN



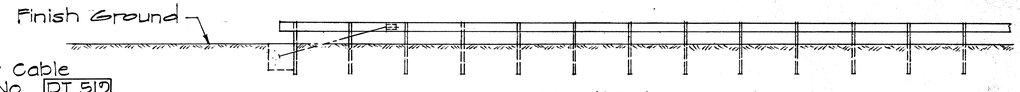

ELEVATION

TYPE "F" FLARE

Sc. 1/8" = 1'-0"




PLAN



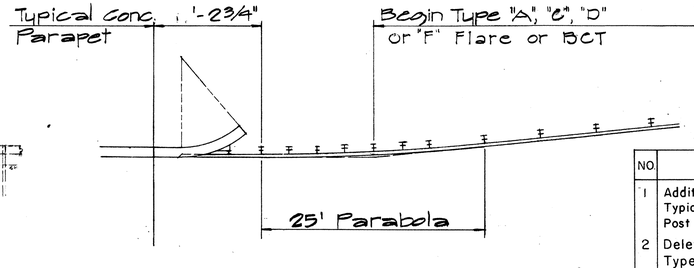

NOTE:

For detail of Breakaway Cable Terminal (BCT) See Sheet No. DT 519

ELEVATION

TYPE "G" FLARE

Sc. 1/8" = 1'-0"




TYPICAL LAYOUT PLAN OF END POST CONNECTION

Sc. 1/8" = 1'-0"

APPROVAL RECOMMENDED:

Eiichi Tanaka — TRAFFIC ENGINEER — 12/29/69 DATE

APPROVED:

[signature] — ASSISTANT CHIEF, ENGINEERING — 12-30-69 DATE

| NO. | REVISION | APPROVED BY | DATE |
|---|---|---|---|
| 1 | Additional Posts Added to Typical Layout Plan Of End Post Connection | H.T. | 4-12-72 |
| 2 | Delete Type "B" Flare and Type "E" Flare | H.T. | 6-15-78 |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

# STANDARD DETAILS TRAILING END FLARE - ONE & TWO WAY ROADWAY

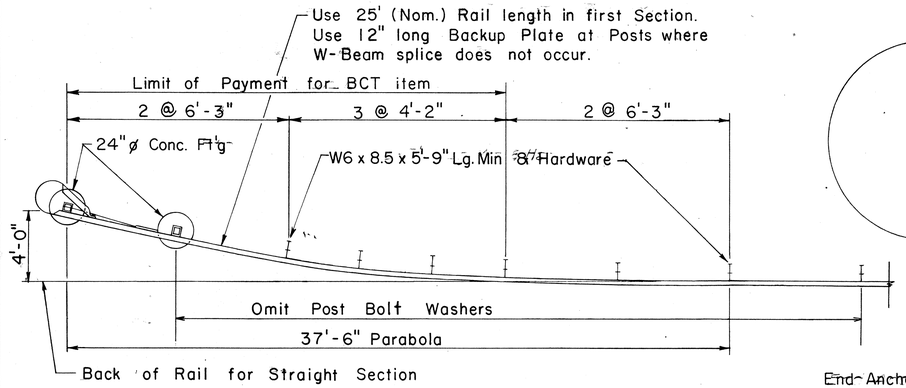
Scale: As Noted — April 1969

SHEET No. OF SHEETS DT 517

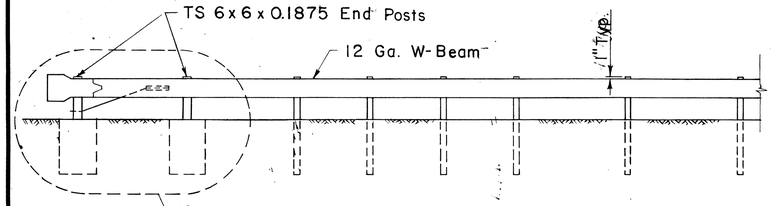
| ORIGINAL PLAN | SURVEY PLOTTED BY | DATE |
|---|---|---|
| | DRAWN BY | |
| | TRACED BY | |
| NOTE BOOK | DESIGNED BY | |
| | QUANTITIES BY | |
| No. | CHECKED BY | |

PRINTED ON NO. 1000H CLEARPRINT

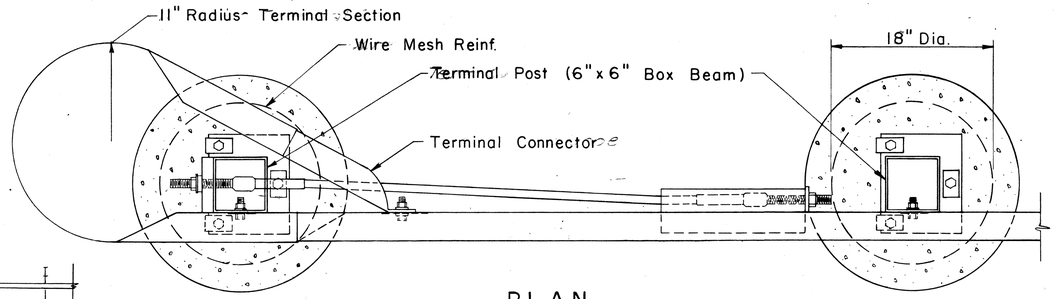
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 43 | 137 |



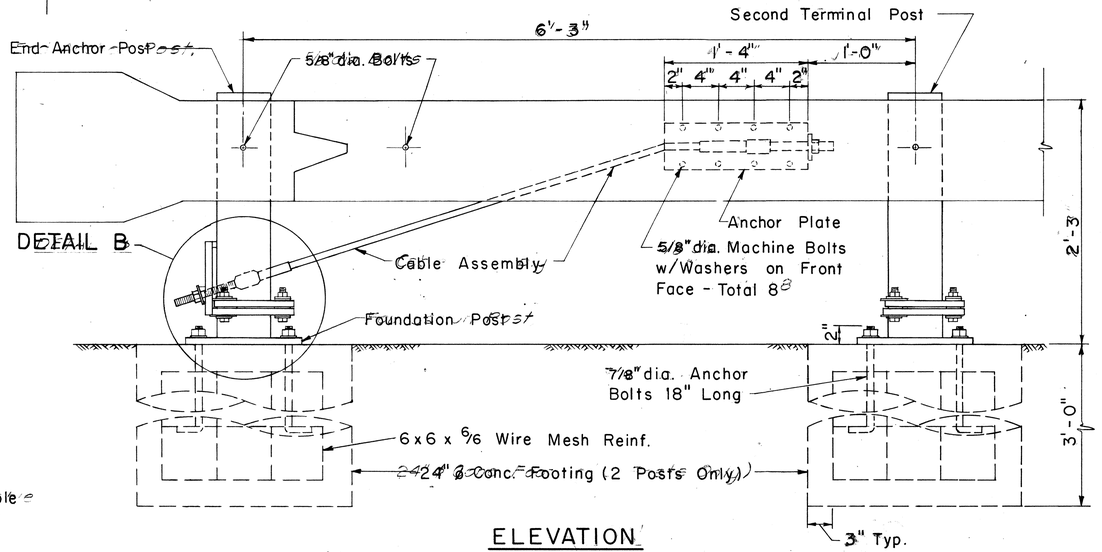

PLAN
Scale: 1/4" = 1'-0"



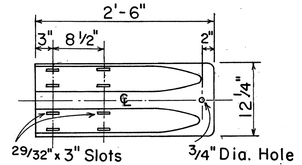

ELEVATION
Scale: 1/4" = 1'-0"




PLAN



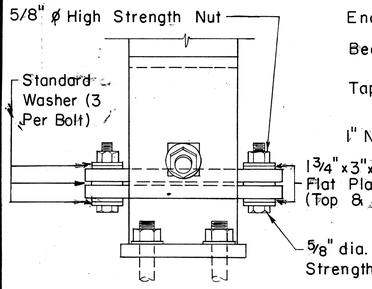

ELEVATION
DETAIL A
Scale: 1 1/2" = 1'-0"



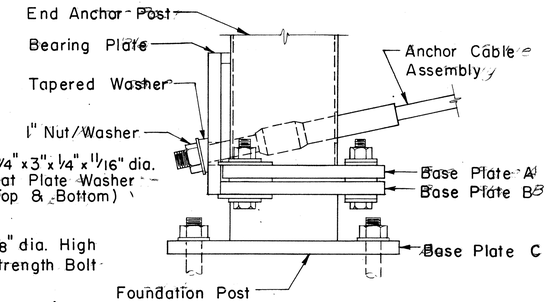

TERMINAL CONNECTOR
Scale: 1" = 1'-0"

## NOTES:

1. Anchor Plate and Anchor Cable Assembly (Standard Swaged Fitting and Stud). See Standard Detail Sheet No. DT 520.
2. Other Anchor Cable Assemblies may be used. Minimum breaking strength of assembly should be 40,000 lbs.
3. Second Terminal Post does not require holes to accomodate Anchor Cable.
4. Slip Base Load shall be controlled with a Calibrated Torque Wrench - Torque 155 - 170 ft. lbs.
5. Concrete shall be Class A.
6. B.C.T. Hardware has been superceded by "A Guide Standardized Highway Barrier Rail Hardware," A report prepared and approved by the AASHTO-AGC-ARTBA joint cooperation committee. All hardware shall conform to above mentioned publication and as revised from time to time.

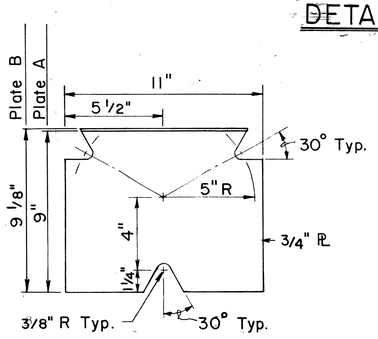



SIDE ELEVATION

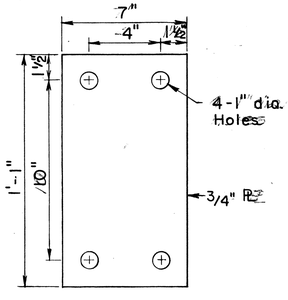



FRONT ELEVATION

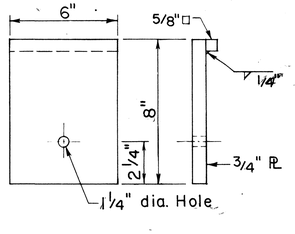
DETAIL B



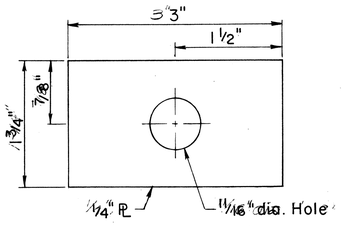

BASE PLATES A & B
Scale: 3" = 1'-0"



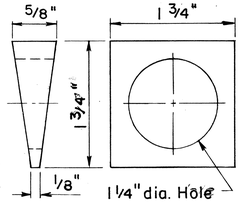

BASE PLATE C
Scale: 3" = 1'-0"



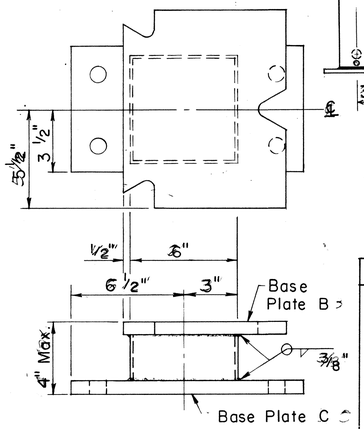

BEARING PLATE
Scale: 3" = 1'-0"



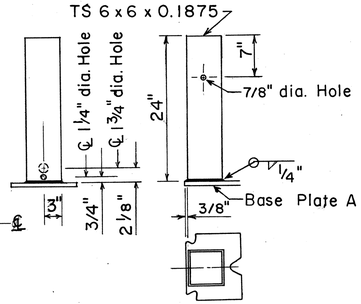

FLAT PLATE WASHER
Scale: Full Size




TAPERED WASHER
Scale: Full Size




FOUNDATION POST
Scale: 3" = 1'-0"




TERMINAL POST
Scale: 1" = 1'-0"

APPROVAL RECOMMENDED:

Eiichi Tanaka — TRAFFIC ENGINEER — 6/14/78 DATE

APPROVED:

Herbert Sakiyama — ASSISTANT CHIEF, ENGINEERING — 6/15/78 DATE

| NO. | REVISION | APPROVED BY | DATE |
|---|---|---|---|
| 1 | Supersedes Sht. DT 519 Approved 12/30/69 | H.T. | 6/15/78 |
| 2 | Added Note 6 | H.T. | 12/17/80 |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

# STANDARD DETAIL

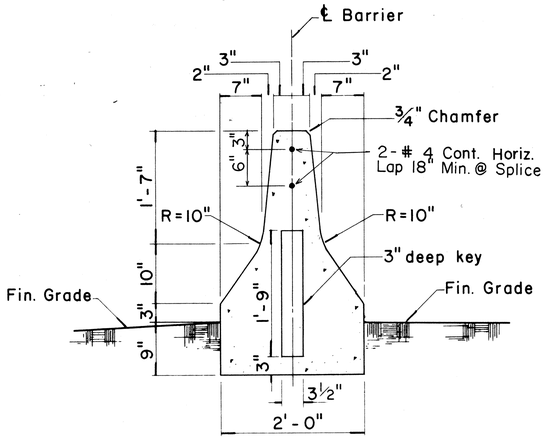
## BREAKAWAY CABLE TERMINAL (BCT)

Scale: As Shown — Date: June 1978

SHEET No. OF SHEETS DT 519

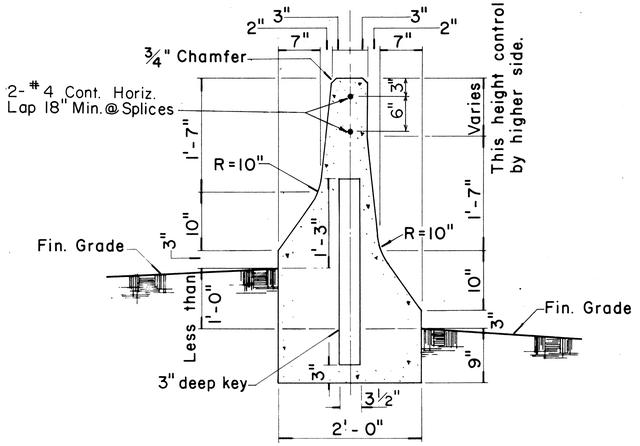
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE | NOTE BOOK | No.

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 44 | 197 |



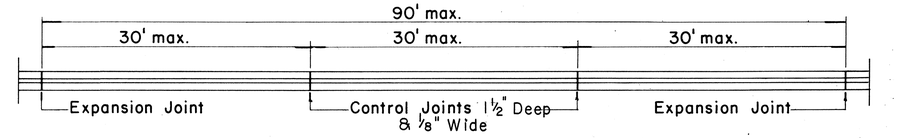

## TYPE 4A

Scale: 1" = 1'-0"



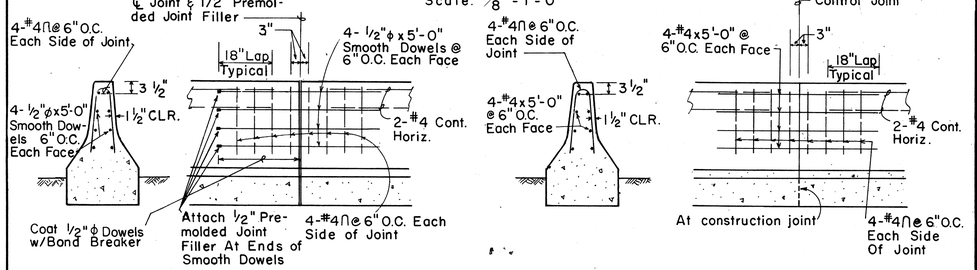

## TYPE 4B

Scale: 1" = 1'-0"




## PLAN

Scale: ⅛" = 1'-0"

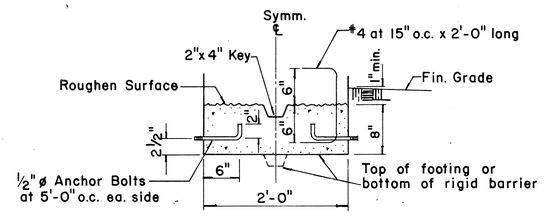



## EXPANSION JOINT DETAIL

SCALE: 1/2" = 1'-0"

## CONSTRUCTION & CONTROL JOINT DETAIL

SCALE: 1/2" = 1'-0"

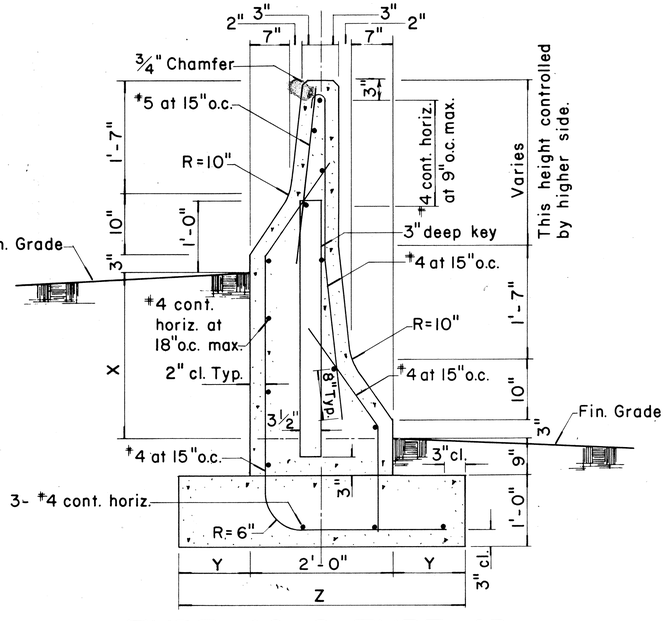



## OPTIONAL CONSTRUCTION JOINT DETAILS

Scale: 1" = 1'-0"

NOTE:

The intent of the optional construction joint details for the Type 4 Rigid Barrier Guard Rail is to provide a method of securing the forms and preventing uplift so that the barrier will have a uniform and presentable appearance.
The Contractor may submit an alternate method of constructing the barrier for the approval of the Engineer and for use on a trial basis. Any unsatisfactory work shall be removed or corrected as directed by the Engineer and at the Contractor's expense.




## TYPE 4C & TYPE 4D

Scale: 1" = 1'-0"

| TYPE | DIFFERENCE IN FIN. GRADE | FOOTING | |
|---|---|---|---|
| | X | Y | Z |
| 4C | 1'-0" min., 2'-4" max. | 1'-0" | 4'-0" |
| 4D | Greater than 2'-4", 4'-4" max. | 1'-3" | 4'-6" |

NOTE:

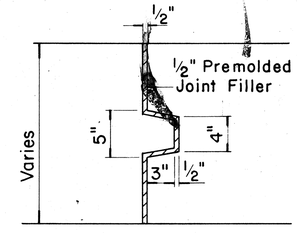
Except where noted all dimensions shall be the same for Type 4C and Type 4D.

## GENERAL NOTES

1. Precast Rigid Barrier Guard Rail may be installed as an option to cast-in-place Type 4 Rigid Barrier Guard Rail. Contractor shall submit shop drawings to Engineer for approval.
2. Expansion Joints shall be constructed at ninety-foot (90 ft.) maximum intervals and at existing expansion joints of structures. (Use ½" premolded joint filler, incidental to Type 4 Rigid Barrier Guard Rail). Control Joints shall be placed between expansion joints at 30' maximum. Shear keys shall be required at all construction joints.
3. The exterior surface and vertical alignment of the Type 4 Rigid Barrier Guard Rail shall be constructed to give a uniform and presentable appearance. Variation of more than ¼" in 20' max. and ½" in 40' or more will be considered objectionable. The Engineer will determine the acceptability of the work.
During the course of the work, samples may be tested and measurements made to establish whether or not the specified values or dimensions are being met. If the specified values or dimensions are not being met, the Engineer will determine the degree of the non-conformance, the effect on the serviceability of the project, whether the work be accepted and remain in place and, if so, the amount to be paid for such work, or whether the work shall be removed and replaced or otherwise corrected at the Contractor's expense.

| NO. | REVISION | APPROVED BY | DATE |
|---|---|---|---|
| 1 | Supersede Sht. DT 521 Approved 2-18-72 | H.I. | 3/21/84 |

NOTE: 1/2" PREMOLDED JOINT FILLER IS NOT REQUIRED AT CONSTRUCTION JOINTS.




## SECTION THRU KEY AT EXPANSION JOINT

Scale: 1½" = 1'-0"

APPROVAL RECOMMENDED:
Euchi Tanaka — TRAFFIC ENGINEER — 1/20/81 DATE

APPROVED:
Hardison Takeishi — ASSISTANT CHIEF, ENGINEERING — 1/21/81 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

## STANDARD DETAILS

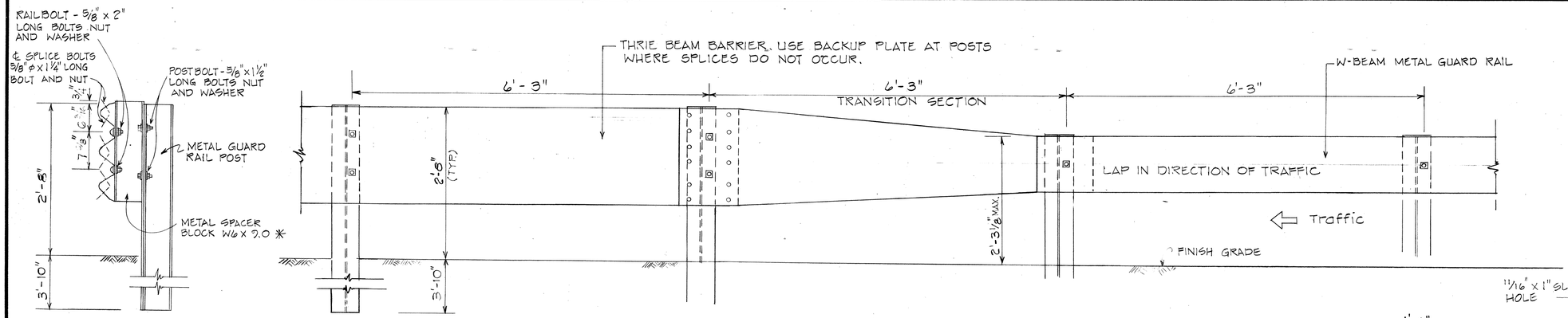
# GUARD RAIL TYPE 4 (RIGID BARRIER)

Scale: As Shown

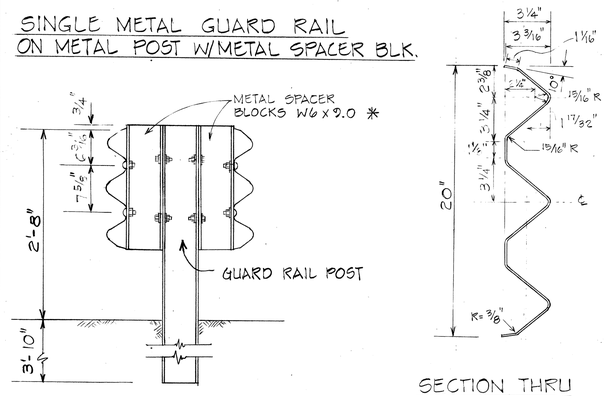
SHEET No. OF SHEETS | DT 521

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

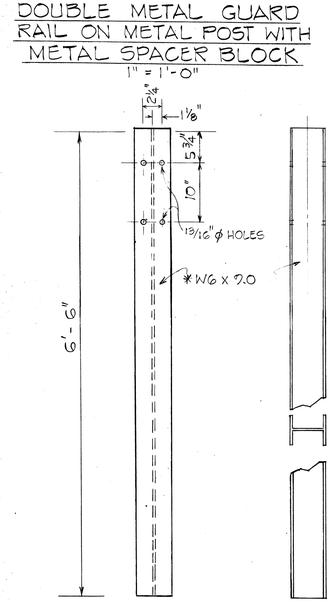
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 45 | 197 |




## TRANSITION SECTION
Scale: 1"=1'-0"



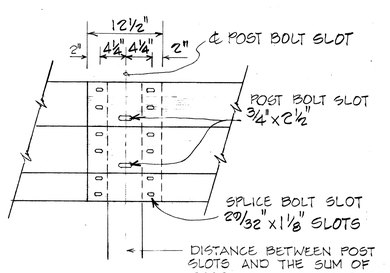

## SINGLE METAL GUARD RAIL ON METAL POST W/METAL SPACER BLK.



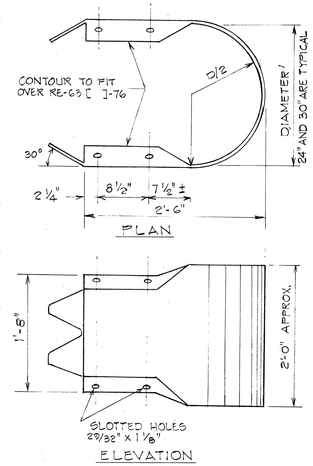

## POST DETAILS
1" = 1'-0"



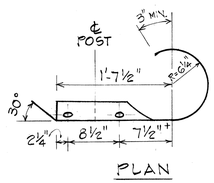

## SECTION THRU RAIL ELEMENT
Not to Scale

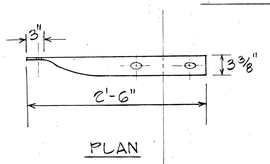


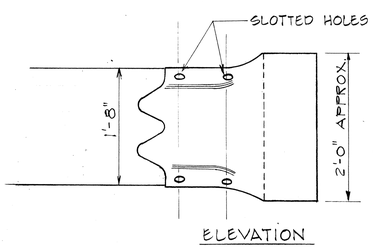

## RAIL SPLICE
1" = 1'-0"



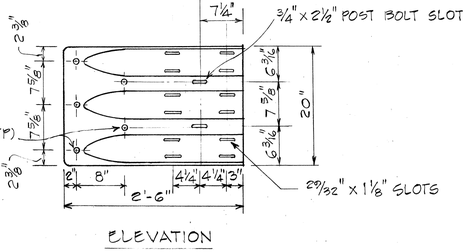

## END SECTION (BUFFER)
Scale: 1"=1'-0"



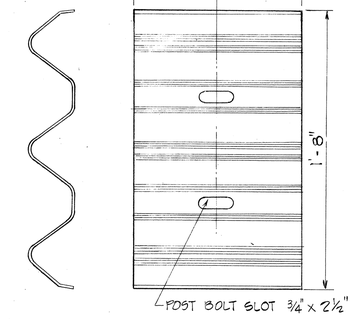



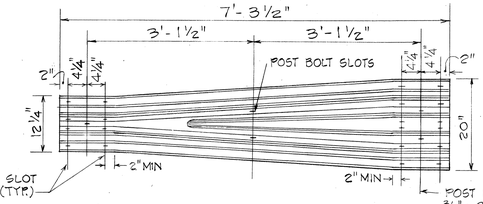

## END SECTION (ROUNDED)
1" = 1'-0"



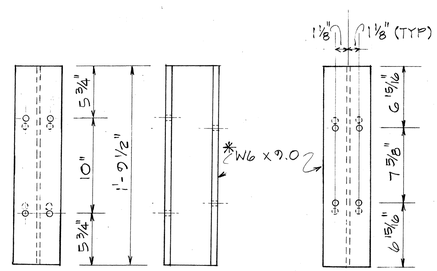

## TERMINAL CONNECTOR
1" = 1'-0"



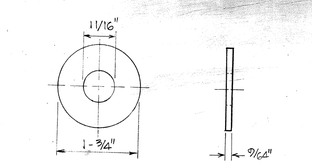

## BACKUP PLATE



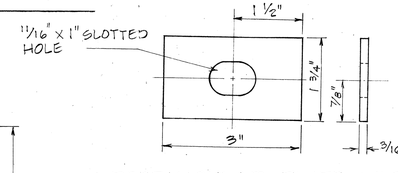

## TRANSITION SECTION



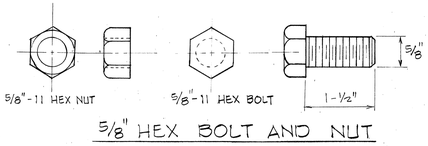

## SPACER BLOCK



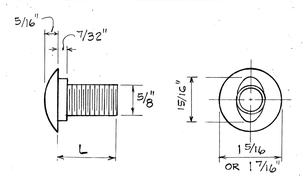

## STEEL WASHER FOR 5/8" BOLT



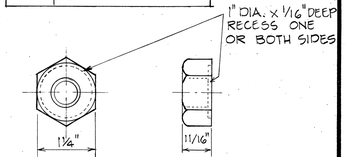

## RECTANGULAR PLATE WASHER




## 5/8" HEX BOLT AND NUT




| L | THREAD LENGTH |
|---|---|
| 1 ¼" | FULL THREAD |
| 2" | 1½" MIN THREAD LENGTH |




## 5/8" BUTTON HEAD BOLTS AND RECESS NUT

* REPLACED W6 x 8.5, WHICH IS ACCEPTABLE AS AN ALTERNATE.

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

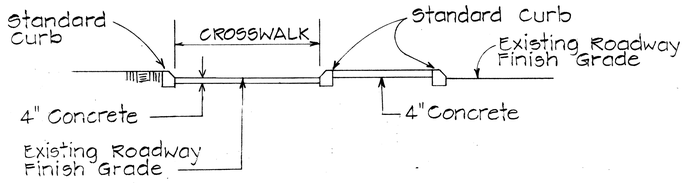
STATE OF HAWAII
**DEPARTMENT OF TRANSPORTATION**
LAND TRANSPORTATION FACILITIES DIVISION

# TYPICAL DETAIL
## GUARD RAIL TYPE 3 THRIE BEAM

Scale: As Shown  Date: April, 1980

SHEET No. 1 OF 1 SHEETS

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 46 | 197 |

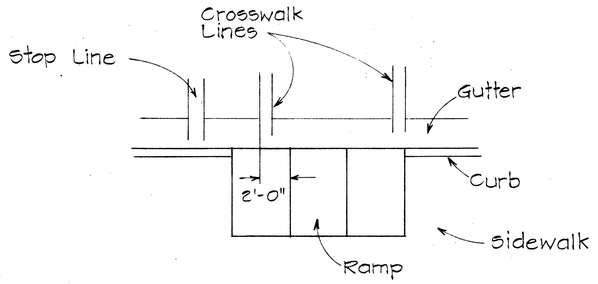



SECTION "A-A"

Use at Median Nose Crossings

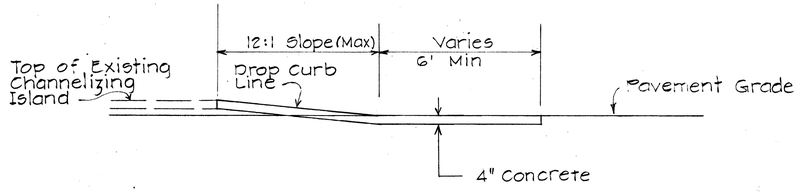
Scale: 1" = 5'

For Additional Details, See Type C Wheel Chair Ramp




TYPICAL INSTALLATION AT CROSSWALKS

Scale: 1" = 5'



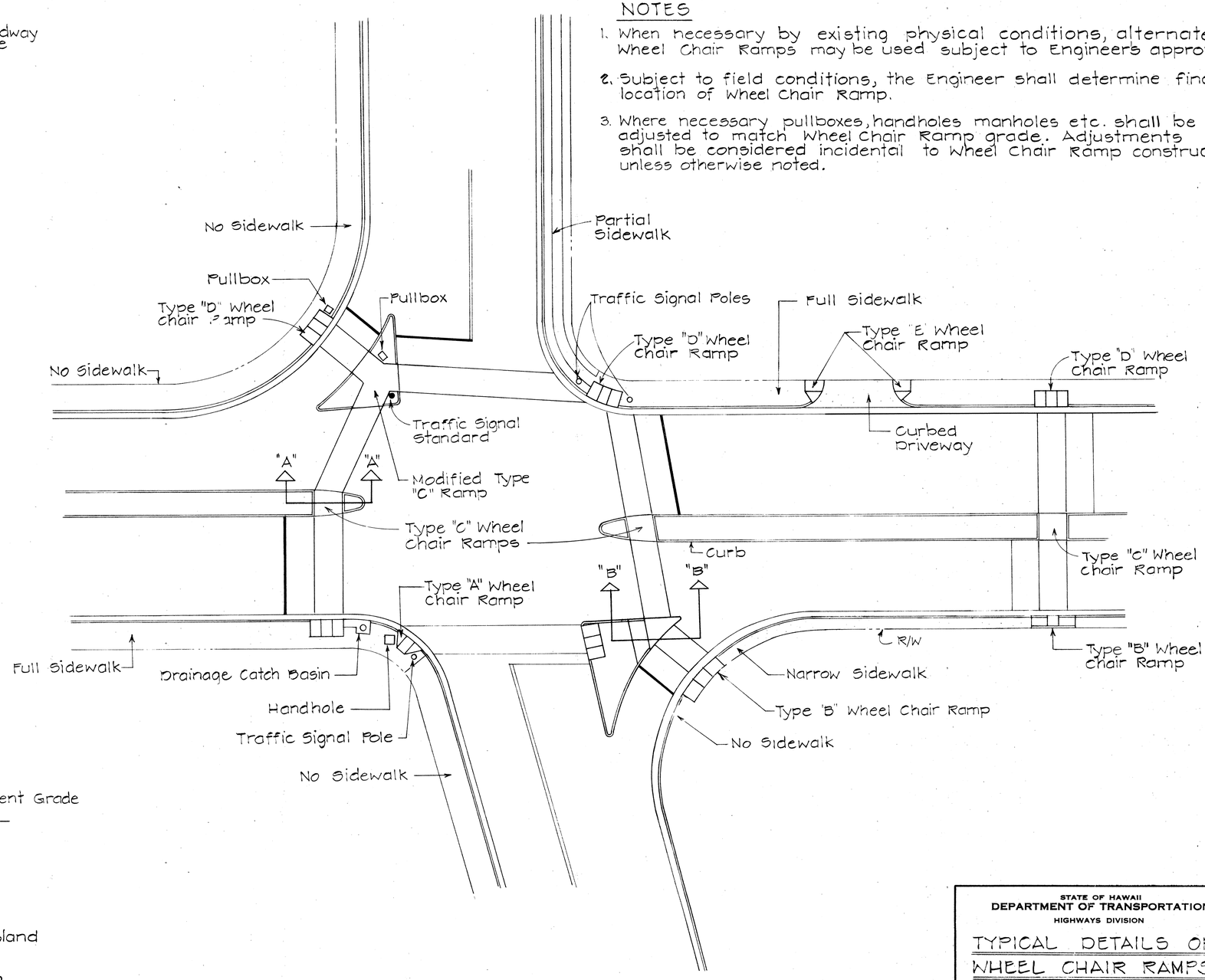

SECTION "B-B"

TYPE "B" MODIFIED WHEEL CHAIR RAMP

Use at Intersection of 2 Crosswalks On Channelizing Island

Scale: 3/8" = 1'

For Additional Details See Type "B" Wheelchair Ramp




TYPICAL WHEELCHAIR RAMPS

Scale: 1" = 20'

NOTES

1. When necessary by existing physical conditions, alternate Wheel Chair Ramps may be used subject to Engineer's approval.
2. Subject to field conditions, the Engineer shall determine final location of Wheel Chair Ramp.
3. Where necessary pullboxes, handholes manholes etc. shall be adjusted to match Wheel Chair Ramp grade. Adjustments shall be considered incidental to Wheel Chair Ramp construction, unless otherwise noted.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

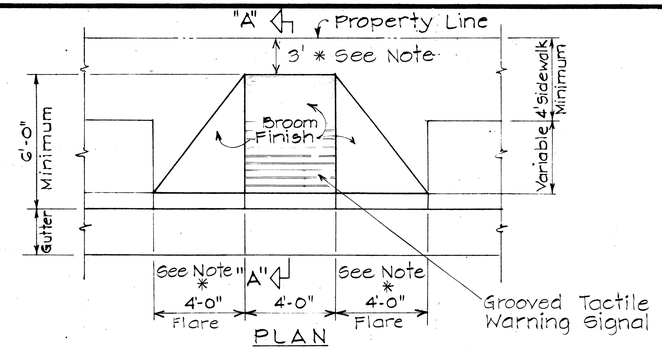
TYPICAL DETAILS OF WHEEL CHAIR RAMPS

Scale: As Shown May, 1978

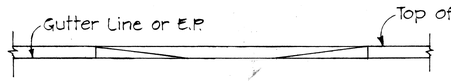
SHEET No. 1 OF 2 SHEETS

| ORIGINAL PLANS | SURVEY PLOTTED BY | DATE |
|---|---|---|
| NOTE BOOK | DRAWN BY | |
| No. | TRACED BY | |
| | DESIGNED BY | |
| | QUANTITIES BY | |
| | CHECKED BY | |

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 47 | 197 |

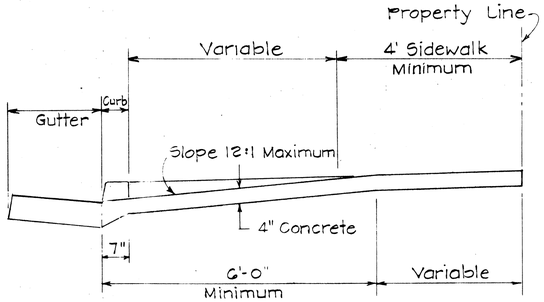



PLAN




ELEVATION

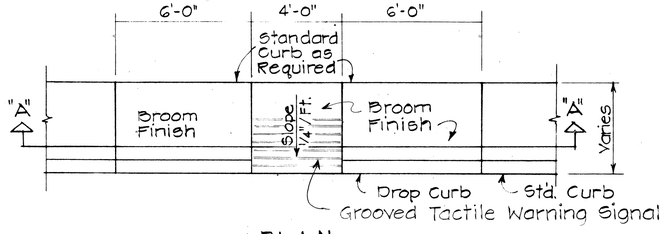
* Where dimension is less than 3', Flare width shall be 5'



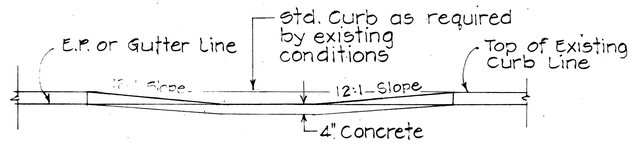

SECTION "A-A"

## WHEELCHAIR RAMP - TYPE "A"

USE WHERE OBSTRUCTIONS EXIST



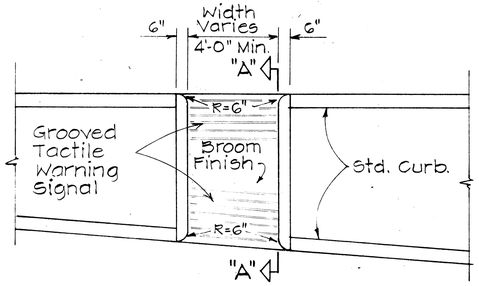

PLAN



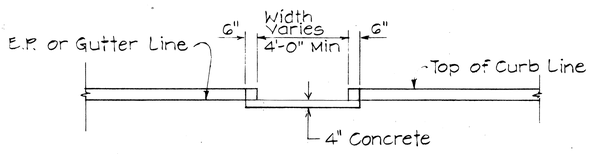

ELEVATION
SECTION "A-A"

## WHEELCHAIR RAMP - TYPE "B"

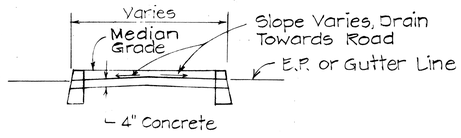
USE AT SIDEWALKS WITH LESS THAN 6'-0" WIDTH




PLAN



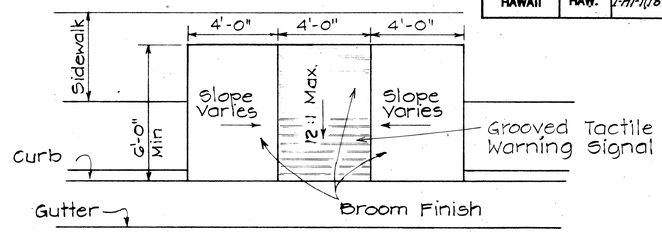

ELEVATION



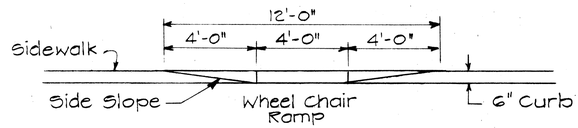

SECTION "A-A"

## WHEELCHAIR RAMP - TYPE "C"

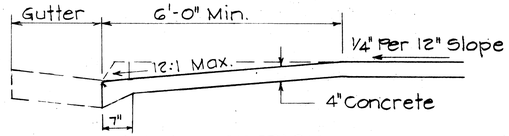
USE AT MEDIAN CROSSINGS, ISLANDS




PLAN
Scale: 3/8" = 1'-0"



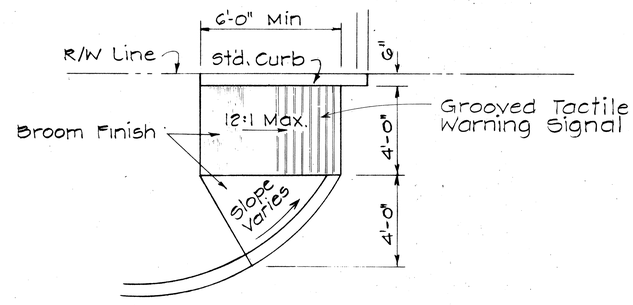

ELEVATION
Scale: 3/8" = 1'-0"




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

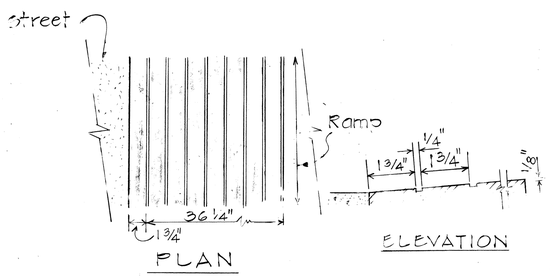
## WHEELCHAIR RAMP - TYPE "D"

USE WHEN IDEAL CONDITIONS EXIST




## WHEELCHAIR RAMP - TYPE "E"

USE AT CURBED DRIVEWAYS
Scale: 3/8" = 1'-0"




PLAN ELEVATION

## GROOVED TACTILE WARNING SIGNAL

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

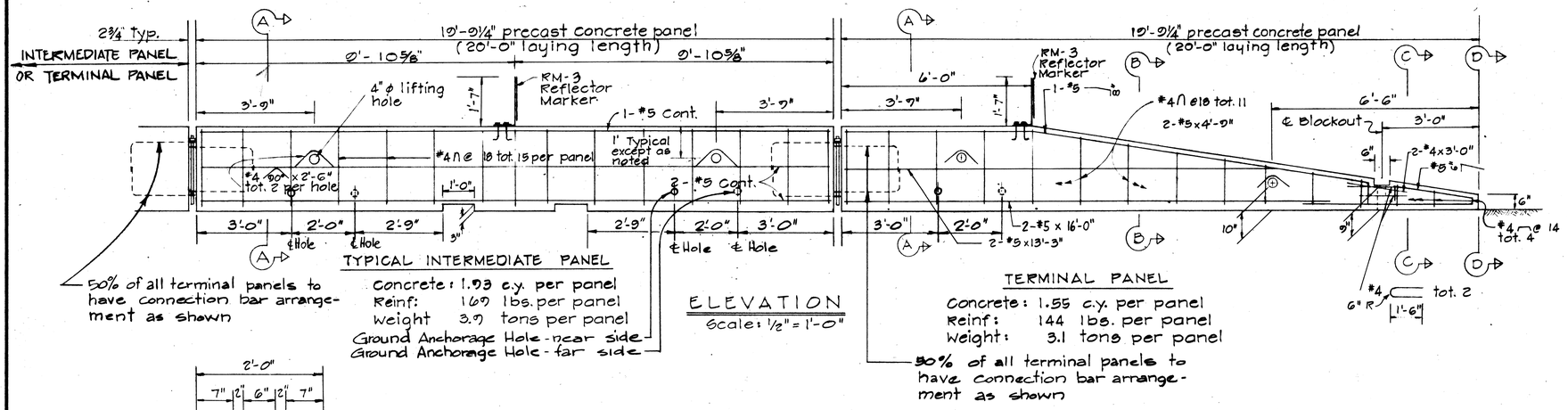
# TYPICAL DETAILS OF WHEEL CHAIR RAMPS

Scale: As Shown May, 1978

SHEET No. 2 OF 2 SHEETS

47

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(187) | 1984 | 48 | 197 |



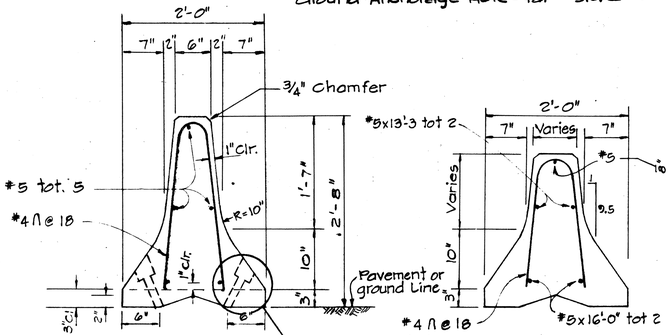

50% of all terminal panels to have connection bar arrangement as shown

TYPICAL INTERMEDIATE PANEL
Concrete: 1.93 c.y. per panel
Reinf: 169 lbs. per panel
Weight 3.9 tons per panel
Ground Anchorage Hole - near side
Ground Anchorage Hole - far side

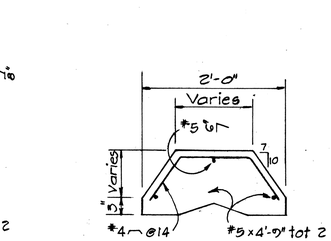
ELEVATION
Scale: ½" = 1'-0"

TERMINAL PANEL
Concrete: 1.55 c.y. per panel
Reinf: 144 lbs. per panel
Weight: 3.1 tons per panel

50% of all terminal panels to have connection bar arrangement as shown



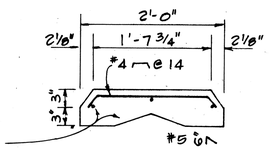

SECTION "A-A"




SECTION "B-B"

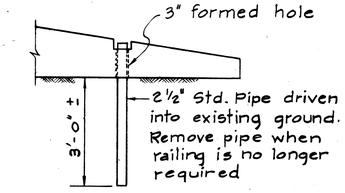



SECTION "C-C"




SECTION "D-D"

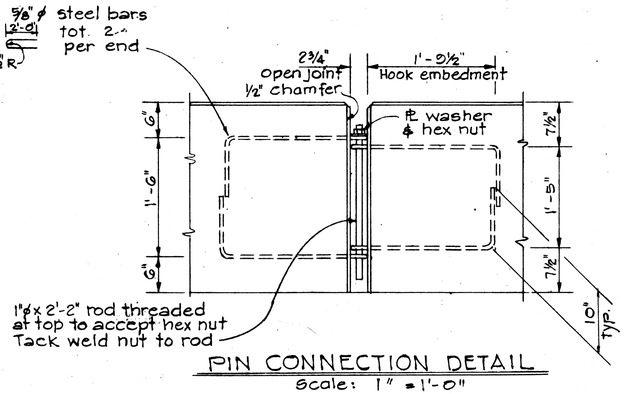
SECTIONS
Scale: 1" = 1'-0"



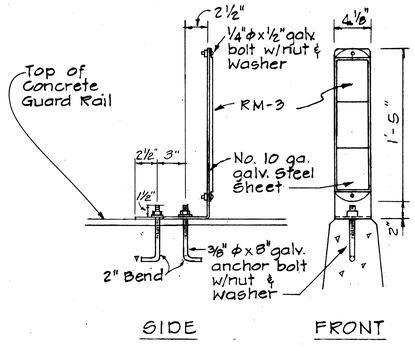

GROUND ANCHORAGE FOR RAMPED END OF TERMINAL PANEL
Scale: ½" = 1'-0"

## NOTES

1. For details not shown in Sections B-B, C-C, & D-D, see Section A-A
2. Reflector Marker shall not be paid for separately but shall be considered incidental to "Portable Concrete Guard Rail."
3. Concrete shall be Class "A".
4. All bolts to have cut washers unless otherwise noted.

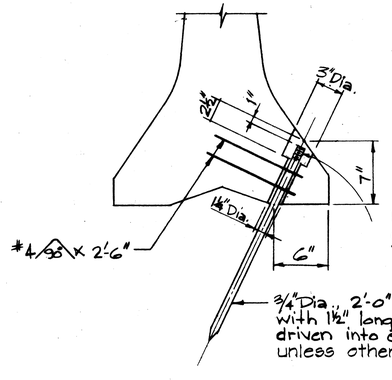



PIN CONNECTION DETAIL
Scale: 1" = 1'-0"




SIDE FRONT

REFLECTOR MARKER MOUNTING DETAIL
Scale: 1½" = 1'-0"




Protect threaded head with cap when driving steel pin. Threaded Head to facilitate pin removal.

DETAIL A - GROUND ANCHORAGE
Scale: 1½" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PORTABLE CONCRETE GUARD RAIL TYPICAL DETAILS

Scale: As Noted Date:

SHEET No. OF SHEETS

48

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

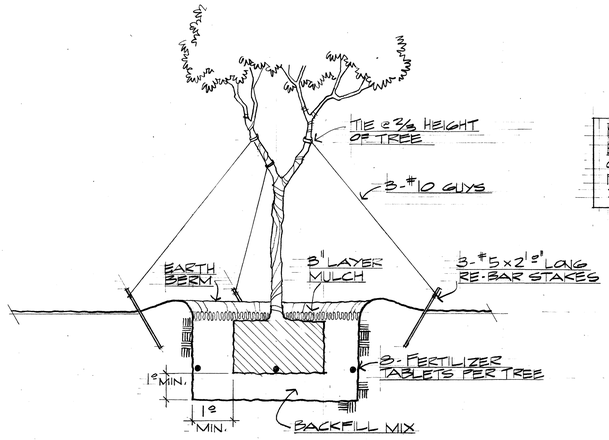
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | ~~I-HI-1(187)~~ | 1984 | ADD 48S-1 | 197 |

## PLANT LIST (EXCLUDING PLANTS TO BE RELOCATED)

| QUANTITY | NAME | SIZE |
|---|---|---|
| 8 | GOLD TREE - TABEBUIA DONNELL-SMITHII | 25 g.c., 8' HIGH |
| ~~13~~ | ~~SILVER TRUMPET - TABEBUIA ARGENTEA~~ | ~~25 g.c., 8' HIGH~~ |
| ~~5~~ | ~~WILI-WILI - ERYTHRINA SANDWICENSIS~~ | ~~5 g.c., 4' HIGH~~ |
| ~~4~~ | ~~RAINBOW SHOWER - CASSIA JAV. x C. FIST.~~ | ~~25 g.c., 8' HIGH~~ |
| ~~9~~ | ~~AFRICAN TULIP - SPATHODEA CAMPANULATA~~ | ~~5 g.c., 4' HIGH~~ |
| ~~63~~ | ~~BE STILL - THEVETIA PERUVIANA~~ | ~~5 g.c., 4' HIGH~~ |
| ~~12~~ | ~~BOTTLE BRUSH - CALLISTEMON LANCEOLATUS~~ | ~~10 g.c., 5' HIGH~~ |
| ~~33~~ | ~~AREGA PALM - CHRYSALIDOCARPUS LUTESCENS~~ | ~~5 g.c., 4' HIGH CLUMP~~ |
| ~~250~~ | ~~RED OLEANDER - NERIUM OLEANDER~~ | ~~1 g.c., 2' HIGH~~ |
| ~~35~~ | ~~PINK OLEANDER - NERIUM OLEANDER~~ | ~~1 g.c., 2' HIGH~~ |
| ~~35~~ | ~~ORANGE OLEANDER - NERIUM OLEANDER~~ | ~~1 g.c., 2' HIGH~~ |
| 64 | BOUGAINVILLEA SP. | 2½ GC 2' LONG STEM |
| ~~37~~ | ~~HUAPALA VINE - PYROSTEGIA IGNEA~~ | ~~2½ g.c., 2' LONG STEM~~ |
| ~~64~~ | ~~RED BAUHINA VINE - BAUHINA GALPINI~~ | ~~1 g.c., 18" LONG STEM~~ |
| ~~2300~~ | ~~LANTANA "SUNBURST" - LANTANA SP.~~ | ~~1 dt. @ 18" o.c.~~ |
| ~~3530±S.F.~~ | ~~TRAILING LANTANA - LANTANA SELLOWIANA~~ | ~~1 dt. @ 18" o.c.~~ |
| 8660±S.F. | WEDELIA - WEDELIA TRILOBATA | 9" LONG ROOTED CUTTINGS @ 9" o.c. |
| ~~2770±S.F.~~ | ~~MANIENIE - CYNODON DACTYLON~~ | ~~SEED OR SPRIG~~ |
| ~~11500±SF~~ | ~~BEACH NEED - DIMORPHOTHECA SPP~~ | ~~4" POTS @ 1' O.C.~~ |

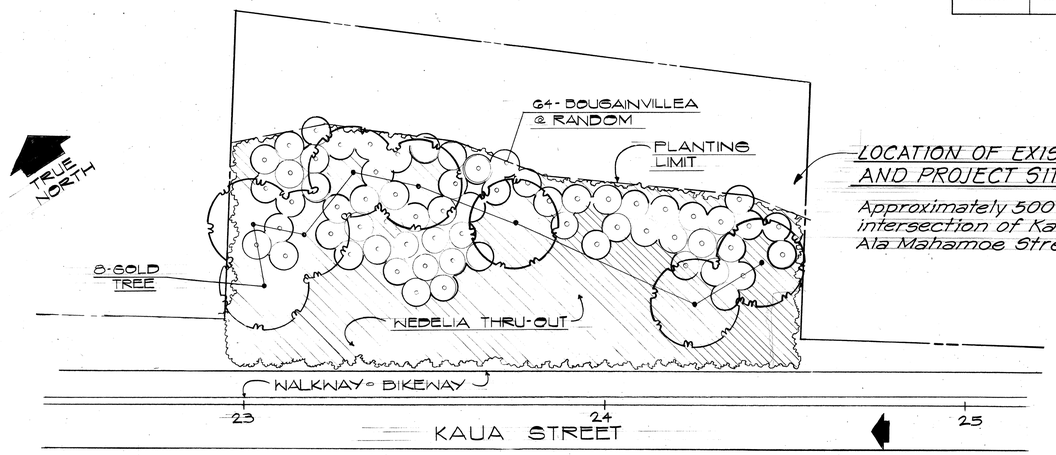
NOTE:

- CONTRACTOR SHALL VERIFY ALL QUANTITIES, MEASUREMENTS & SITE CONDITIONS.
- GROUND COVER PLANTING:
  PRIOR TO PLANTING NEW PLANTS, ERADICATE ALL EXISTING VEGETATION WITH "ROUNDUP" HERBICIDE OR APPROVED EQUAL. COST SHALL BE INCIDENTIAL TO VARIOUS CONTRACT ITEMS.
- VERIFY EXISTING SIZES & LOCATIONS OF ALL TREES TO BE RELOCATED.
- MINIMUM CLEARANCE FROM EDGE OF PAVEMENT LINE SHALL BE 30 FEET FOR TREES AND 15 FEET FOR SHRUBS. WHERE THERE ARE SLOPES, BARRIERS, DEFLECTORS, CURB & GUTTERS, DEVIATION FROM THESE REQUIREMENTS SHALL BE APPROVED BY THE ENGINEER.




NOTE:
BACKFILL MIX SHALL CONSIST OF 4 PARTS SOIL & 1 PART MANURE, FERTILIZER TABLETS SHALL BE 20-10-15 ANALYSIS, 21 GRAM SIZE.

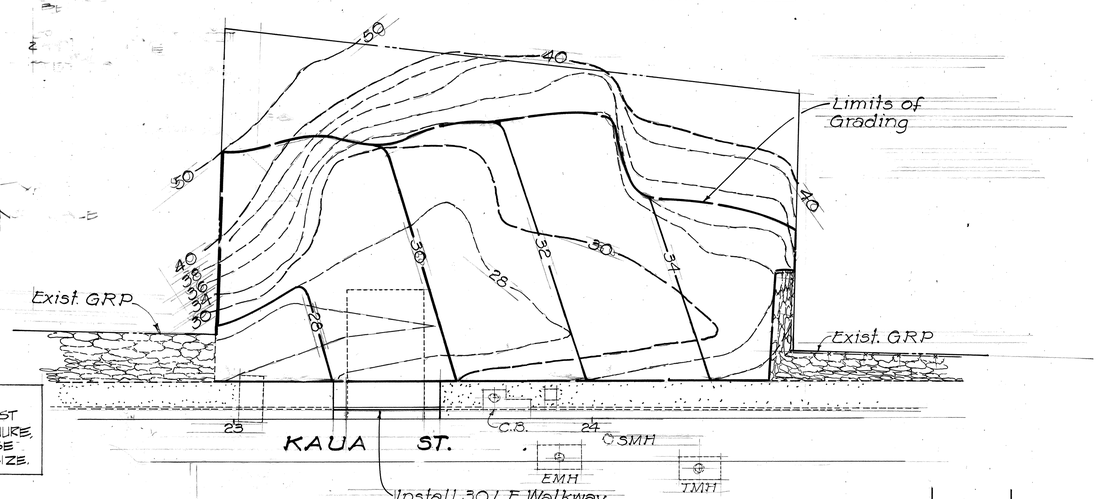
TYP. PLANTING DETAIL FOR 25 G.C. & RELOCATED TREES
NO SCALE




LOCATION OF EXISTING FIELD OFFICE AND PROJECT SITE LABORATORY

Approximately 500 feet west of the intersection of Kaua Street and Ala Mahamoe Street.

PLANTING PLAN




GRADING PLAN
Scale: 1" = 20'

| DATE | REVISION |
|---|---|
| 12-1-83 | Grading Plan added |
| 11-21-83 | Landscaping work added for existing project field office site. |

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PLANTING PLAN
INTERSTATE ROUTE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
WESTBOUND LANES
F.A.I. PROJ. NO. I-HI-1(187)

SCALE: 1" = 20' NO. 078

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

SHEET No 1 OF 7 SHEETS

ADD 48 S-1