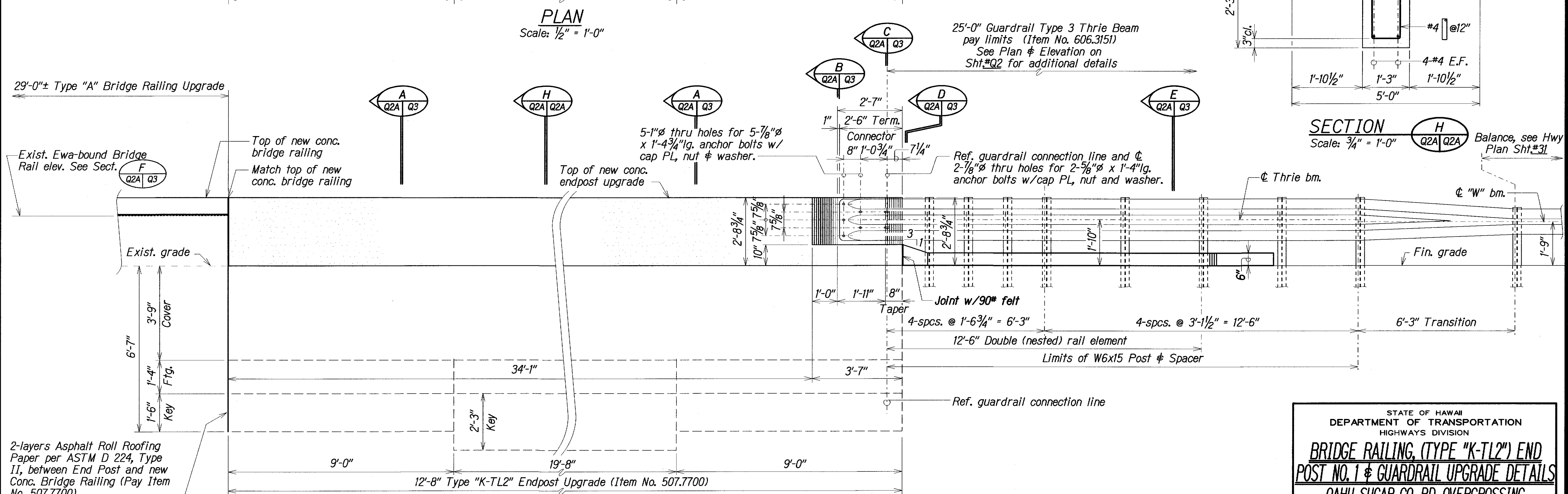
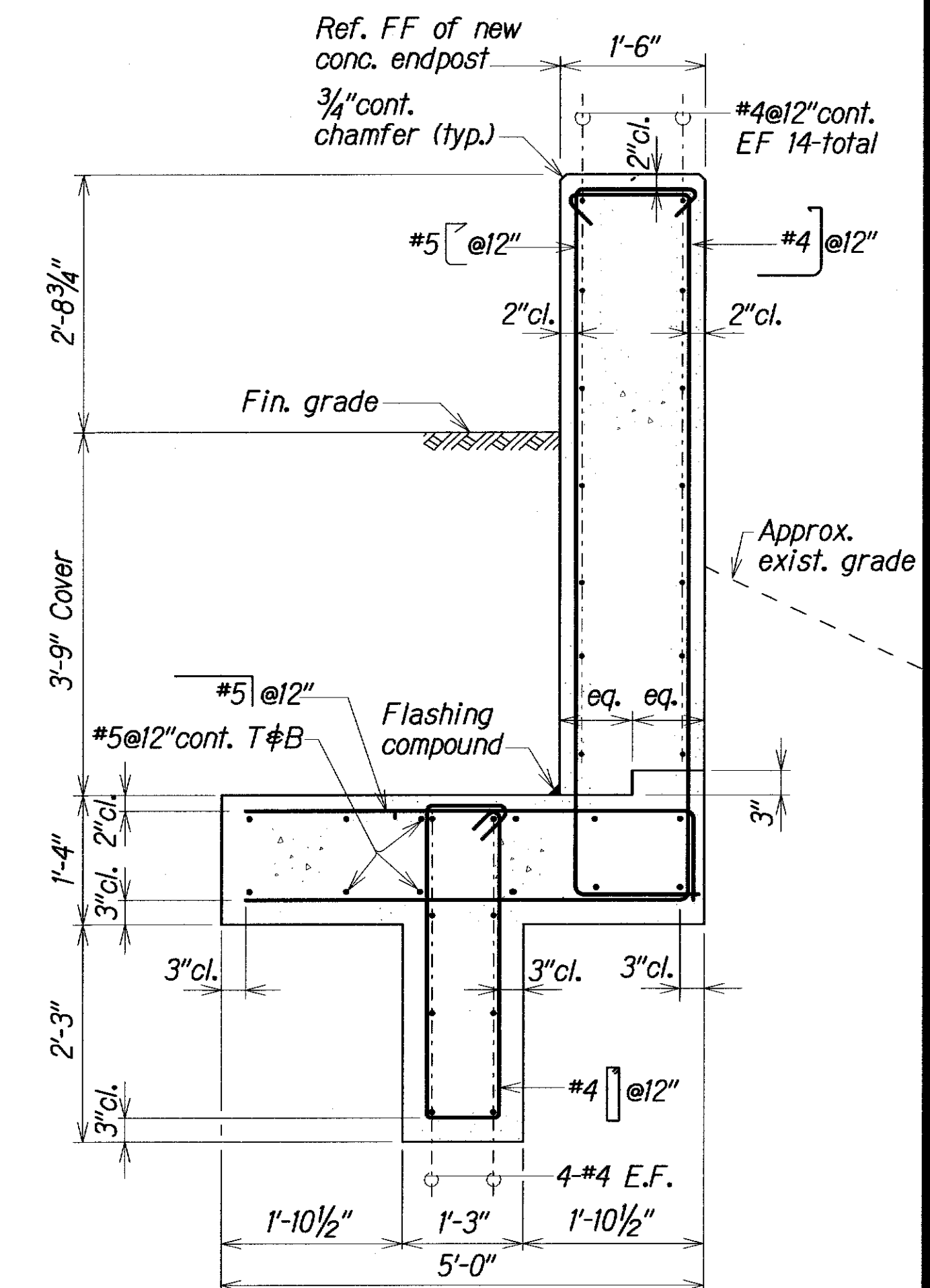
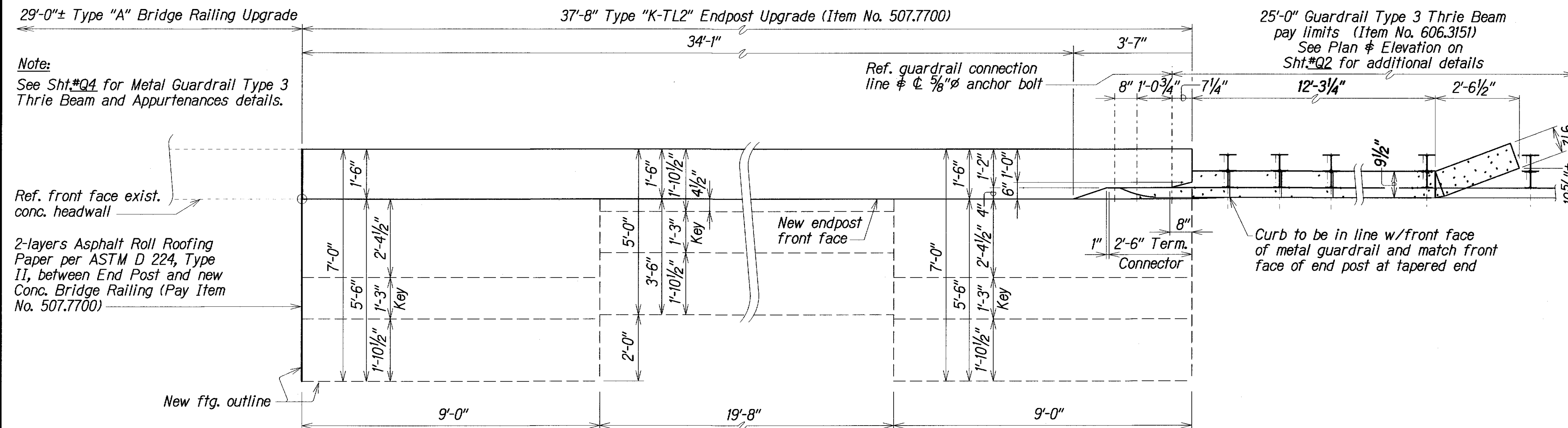


C.O. 46

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7101A-01-04M	2006	C.O.46S-1	74



BRIDGE RAILING, (TYPE "K-TL2") END POST NO. 1 & GUARDRAIL UPGRADE DETAILS

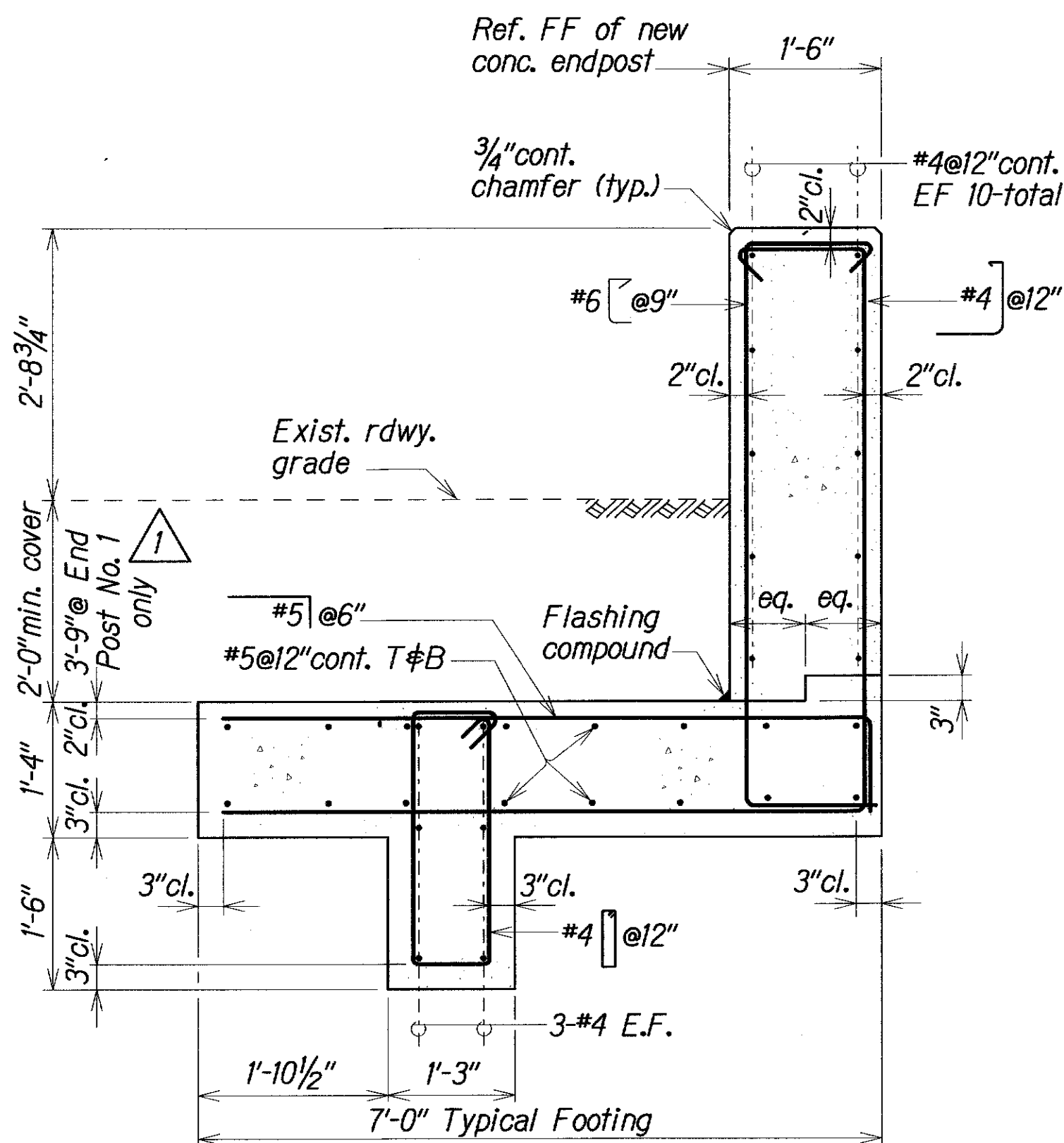
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE RAILING, (TYPE "K-TL2") END
POST NO. 1 & GUARDRAIL UPGRADE DETAILS

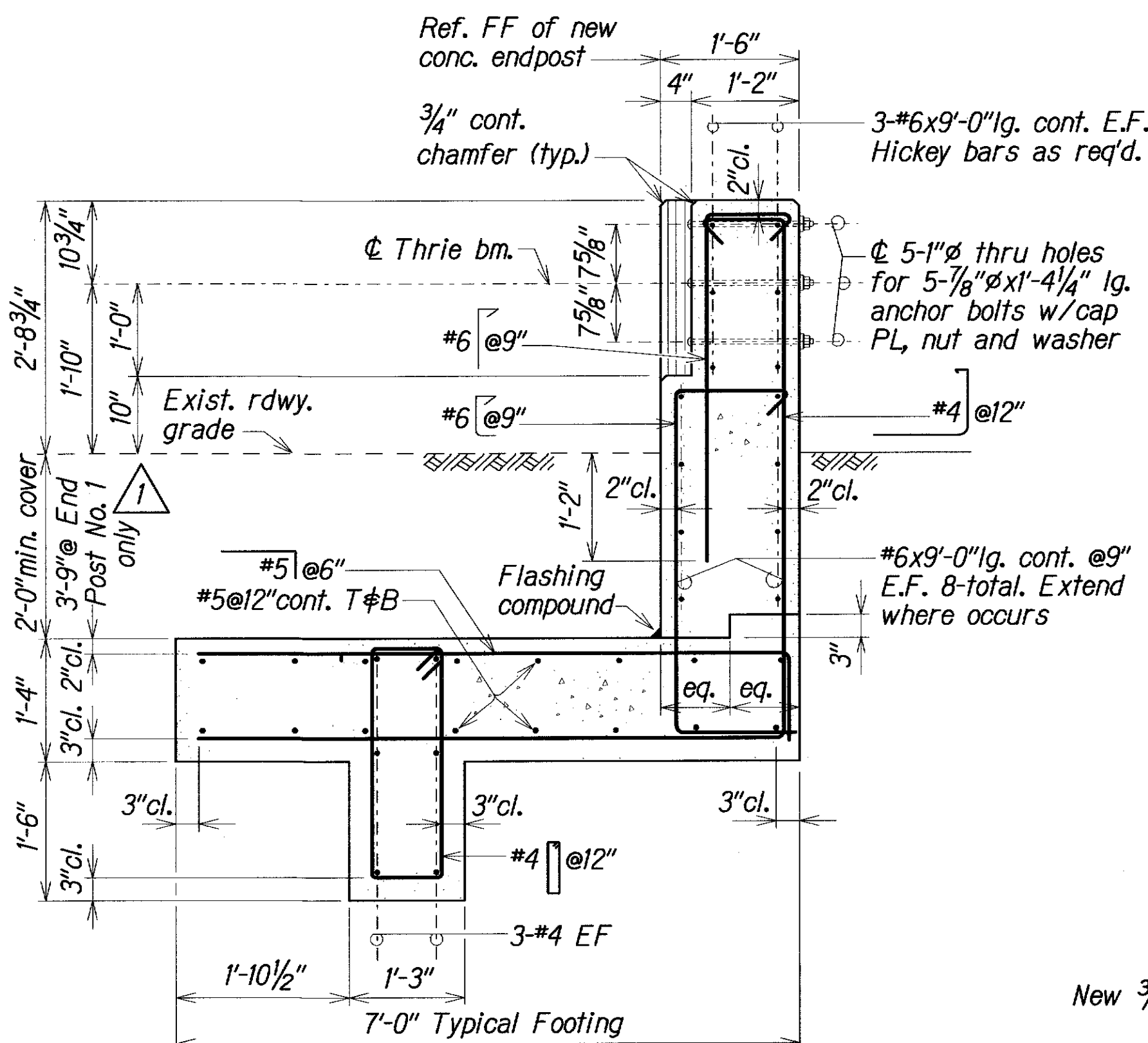
OAHU SUGAR CO. RD. OVERCROSSING
*Farrington Highway Rehabilitation,
Vicinity of Old Fort Weaver Road to Kamehameha Highway*
Project No. 7101A-01-04M

Scale: As Noted Date: June, 2006

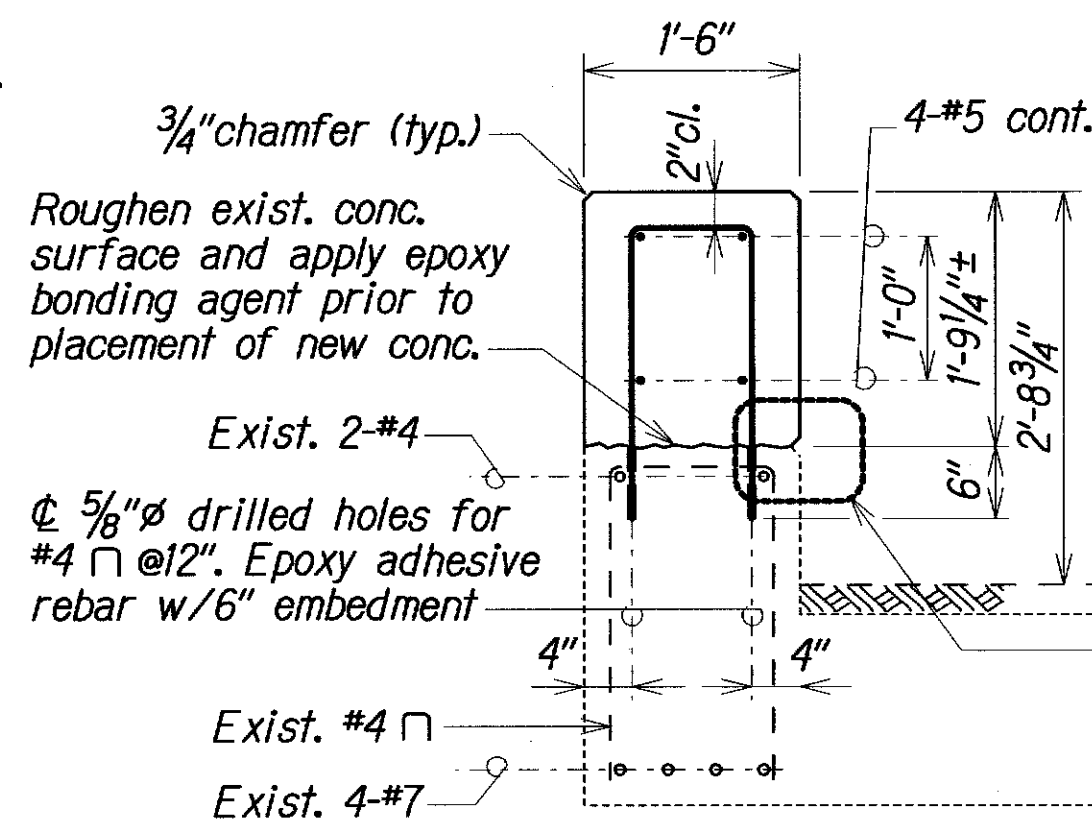
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7101A-01-04M	2006	C.O. 47	74



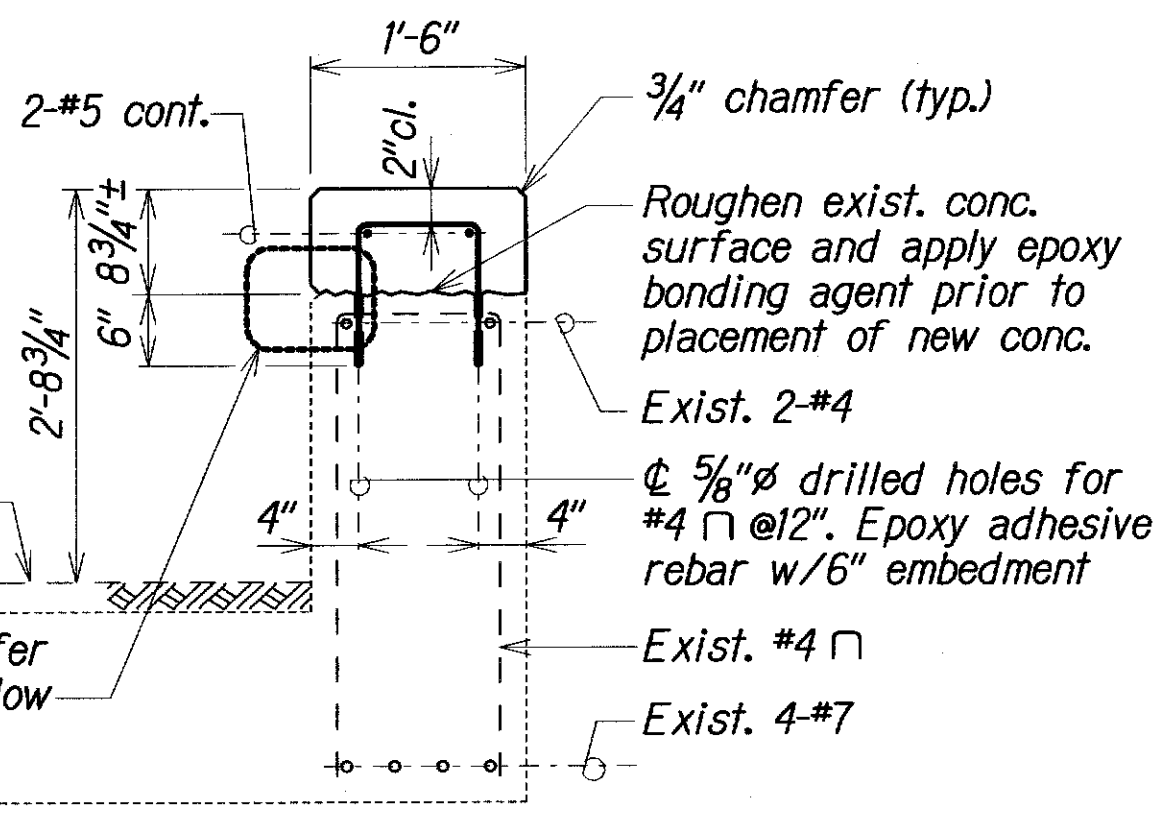
SECTION A
Scale: 3/4" = 1'-0"



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

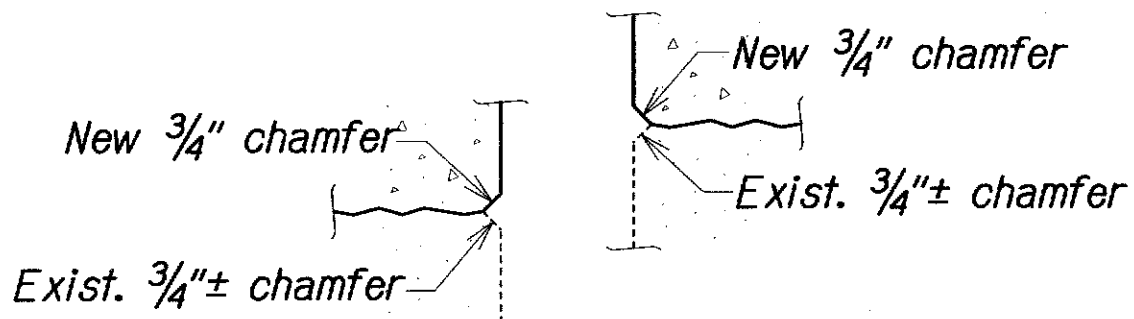


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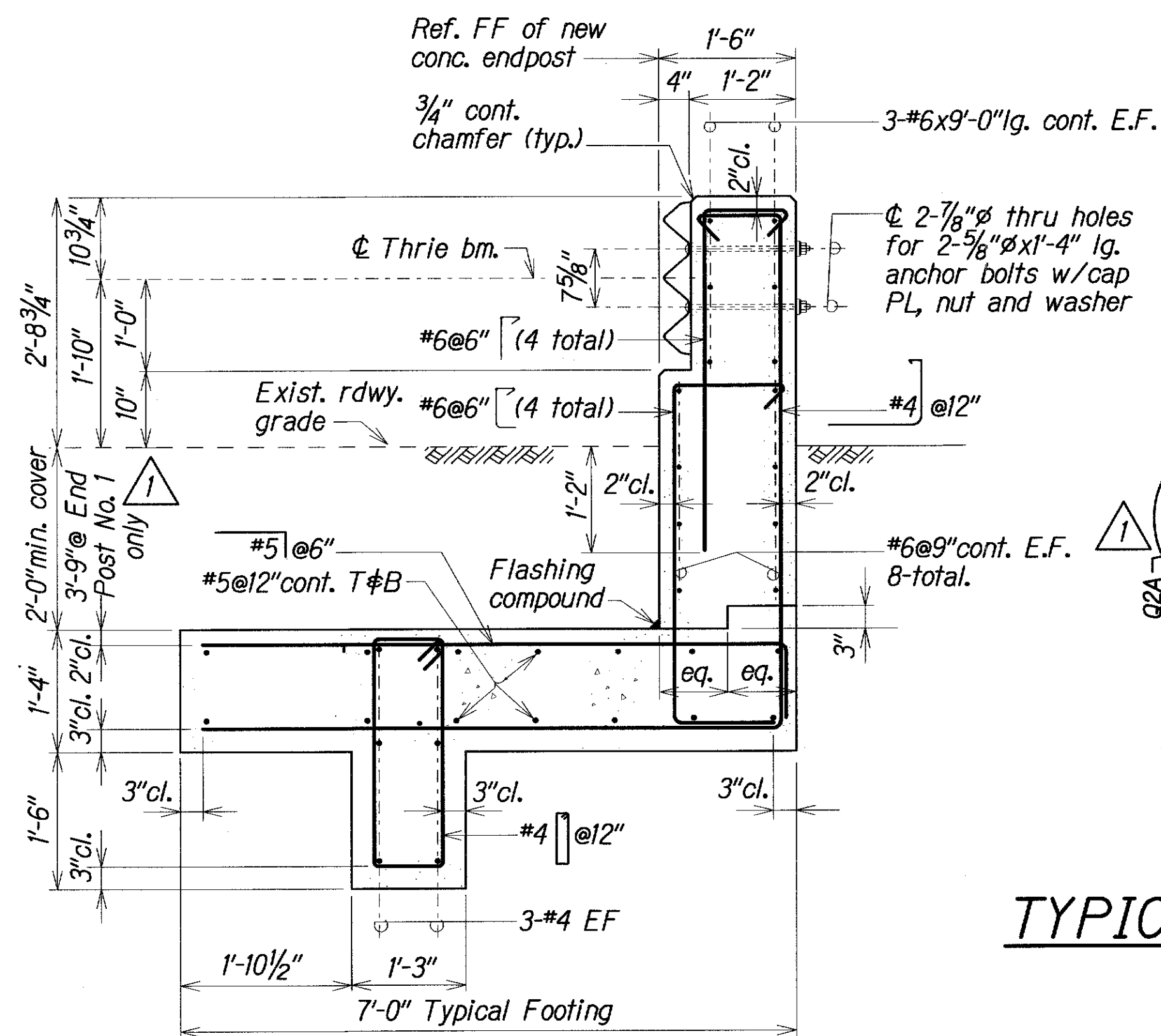


SECTION G
Scale: 3/4" = 1'-0"

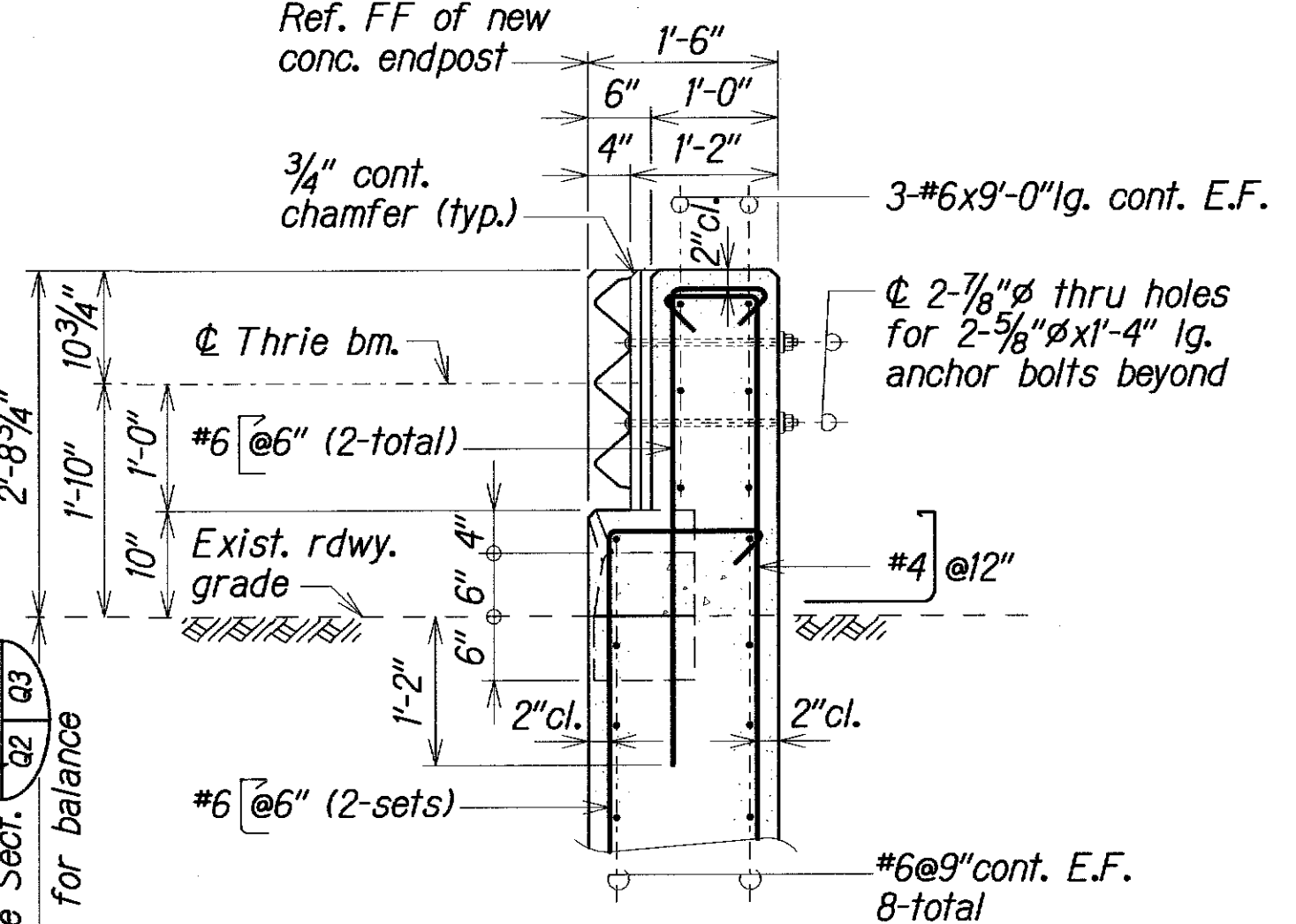
TYPICAL SECTIONS - BRIDGE RAILING



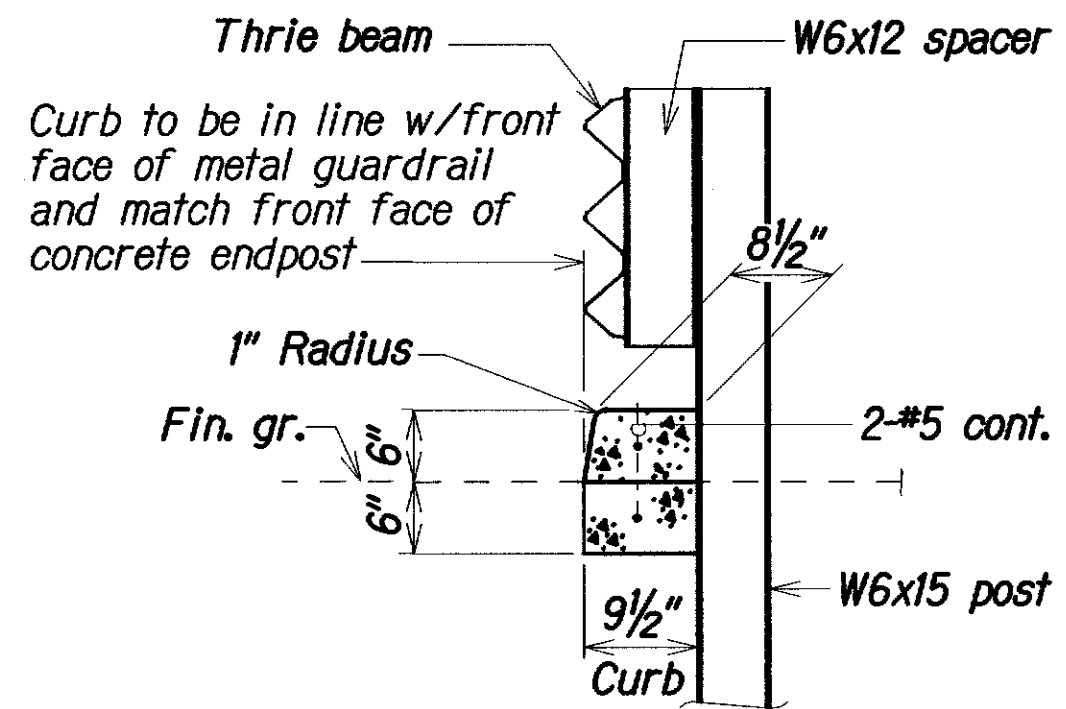
CHAMFER DETAILS



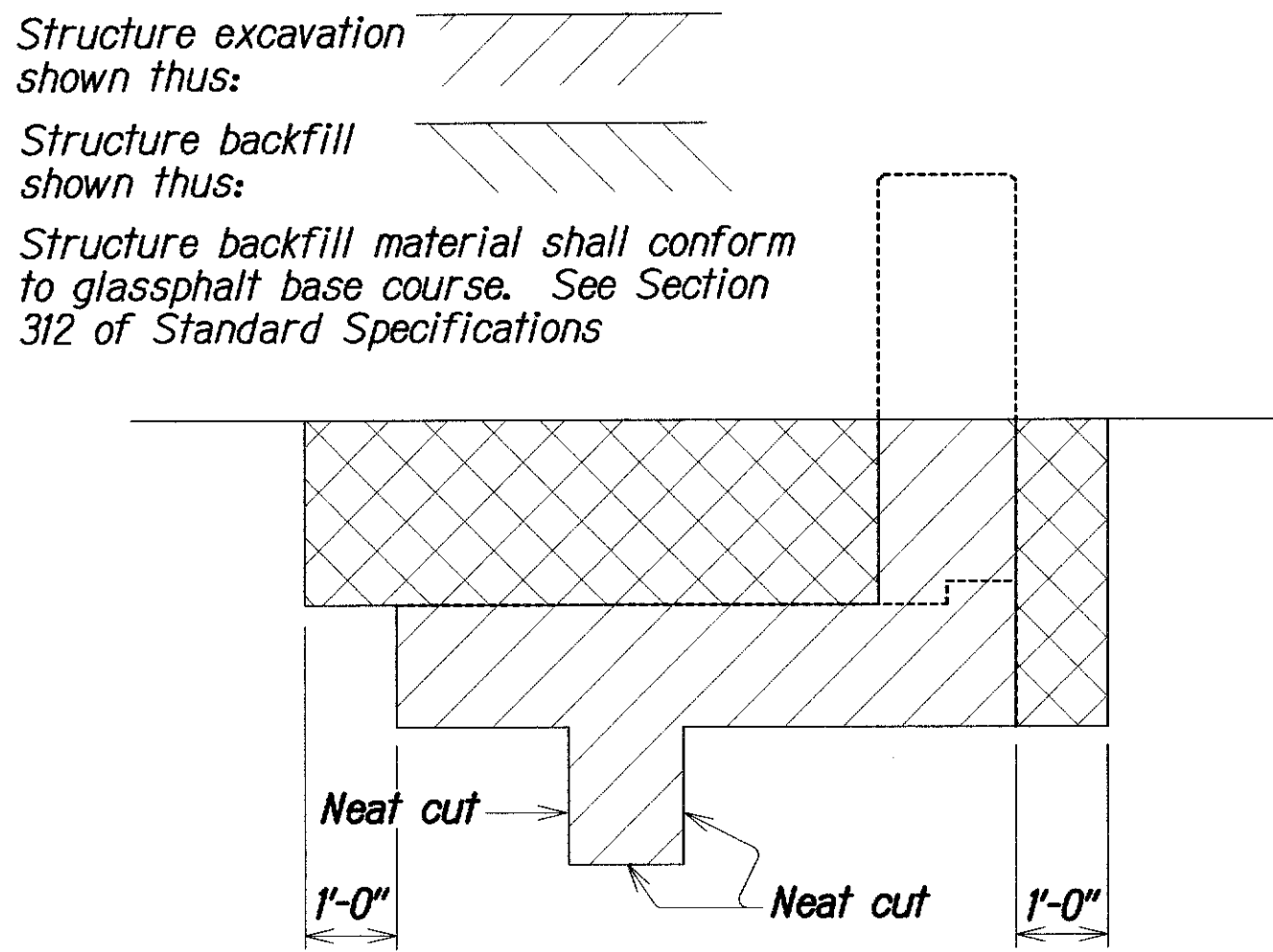
SECTION C
Scale: 3/4" = 1'-0"



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



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



TYPICAL STRUCTURE EXCAVATION and BACKFILL

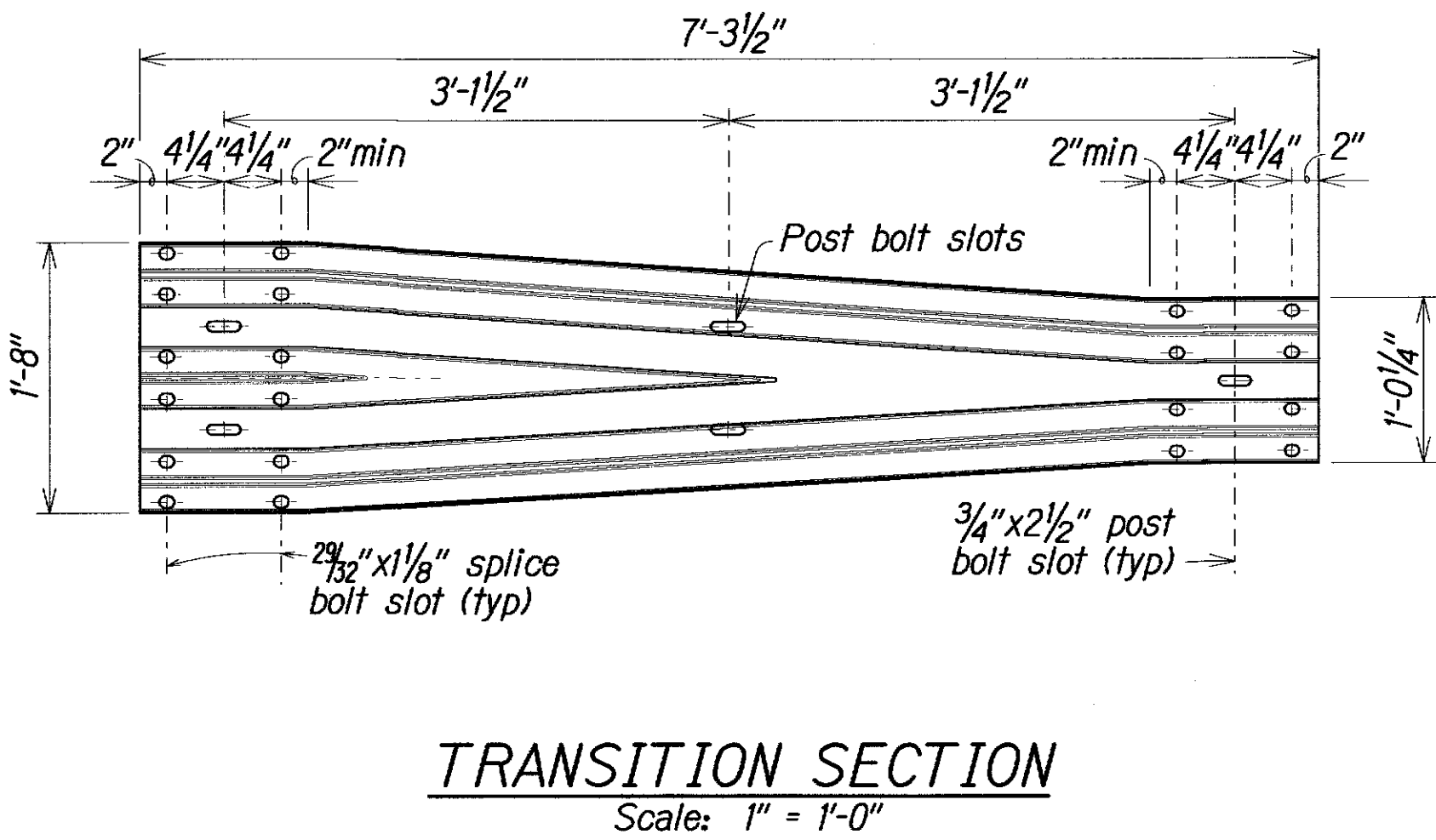
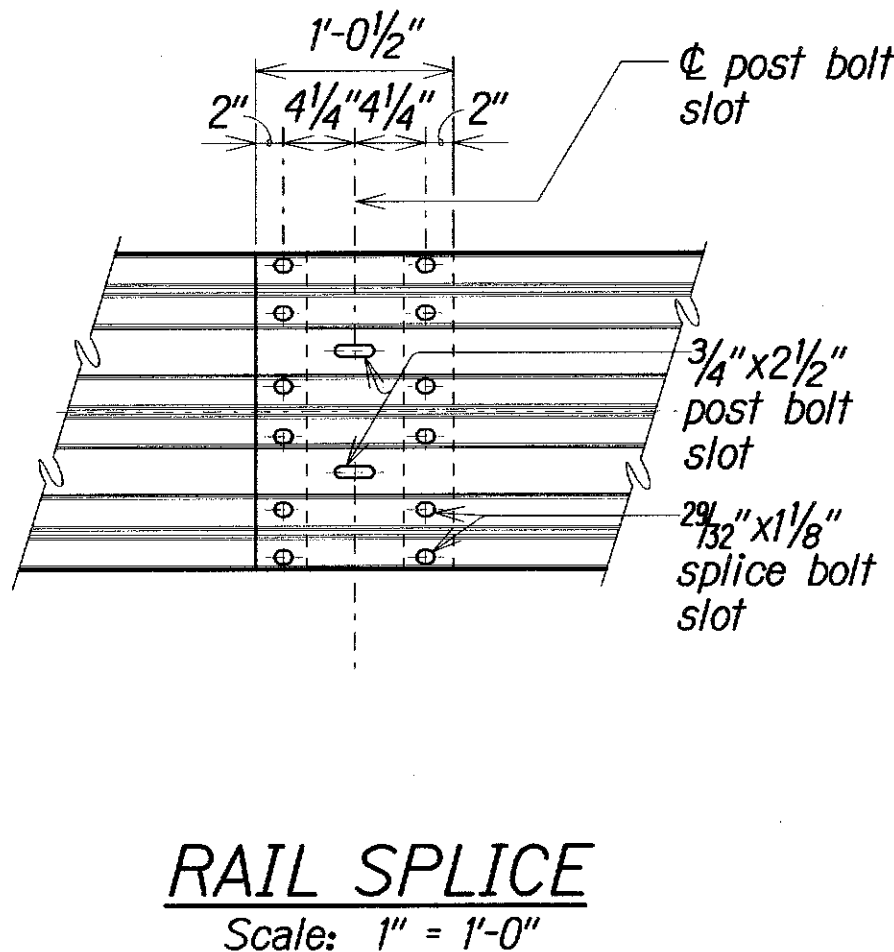
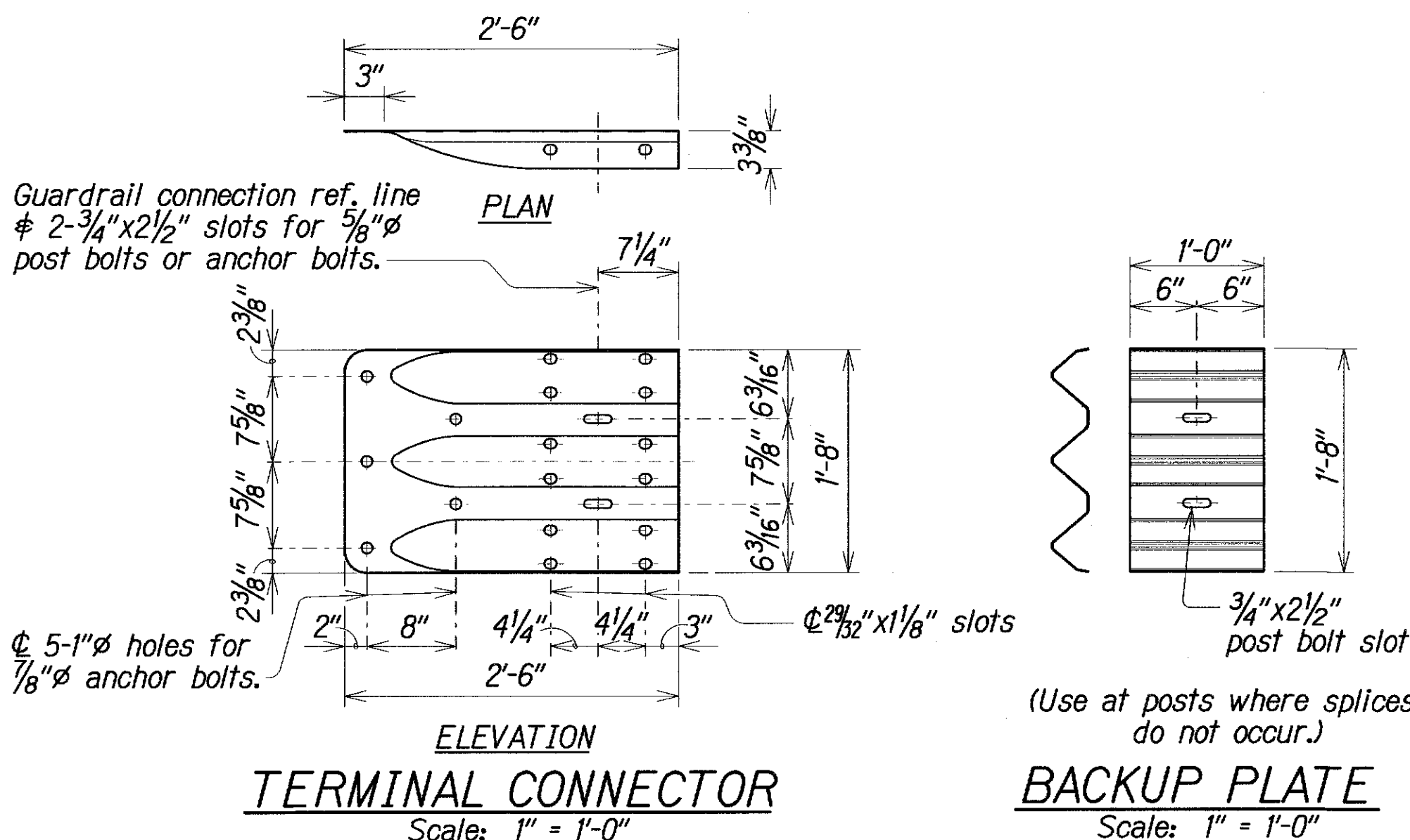
DESIGNED BY	DATE
DRAWN BY	DATE
CHECKED BY	DATE
IN CHARGE	DATE

1	6/1/06	End Post No. 1 redesigned
DATE	REVISION	

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION TYPICAL SECTIONS BRIDGE RAILING AND END POST UPGRADES OAHU SUGAR CO. RD. OVERCROSSING Farrington Highway Rehabilitation, Vicinity of Old Fort Weaver Road to Kamehameha Highway Project No. 7101A-01-04M Scale: As Noted Date: July, 2005
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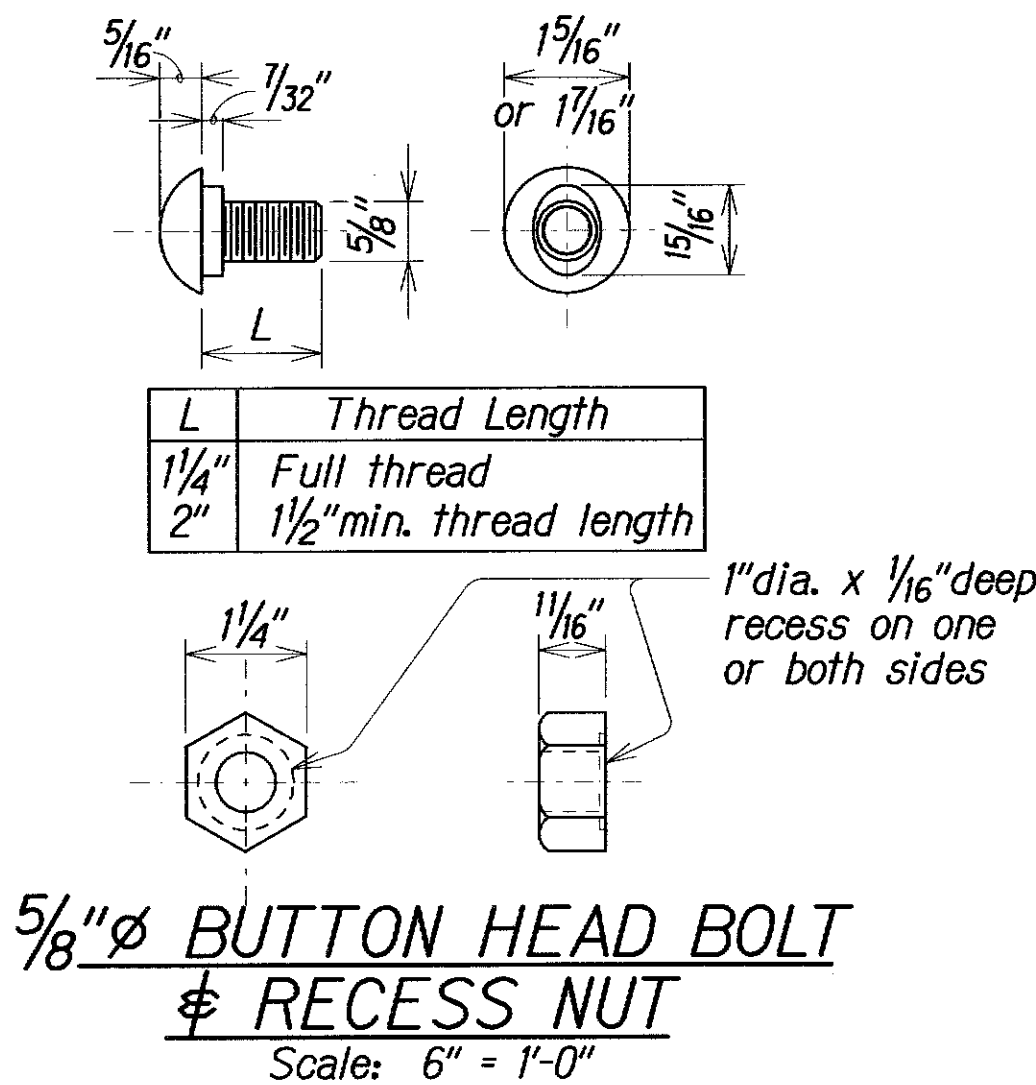
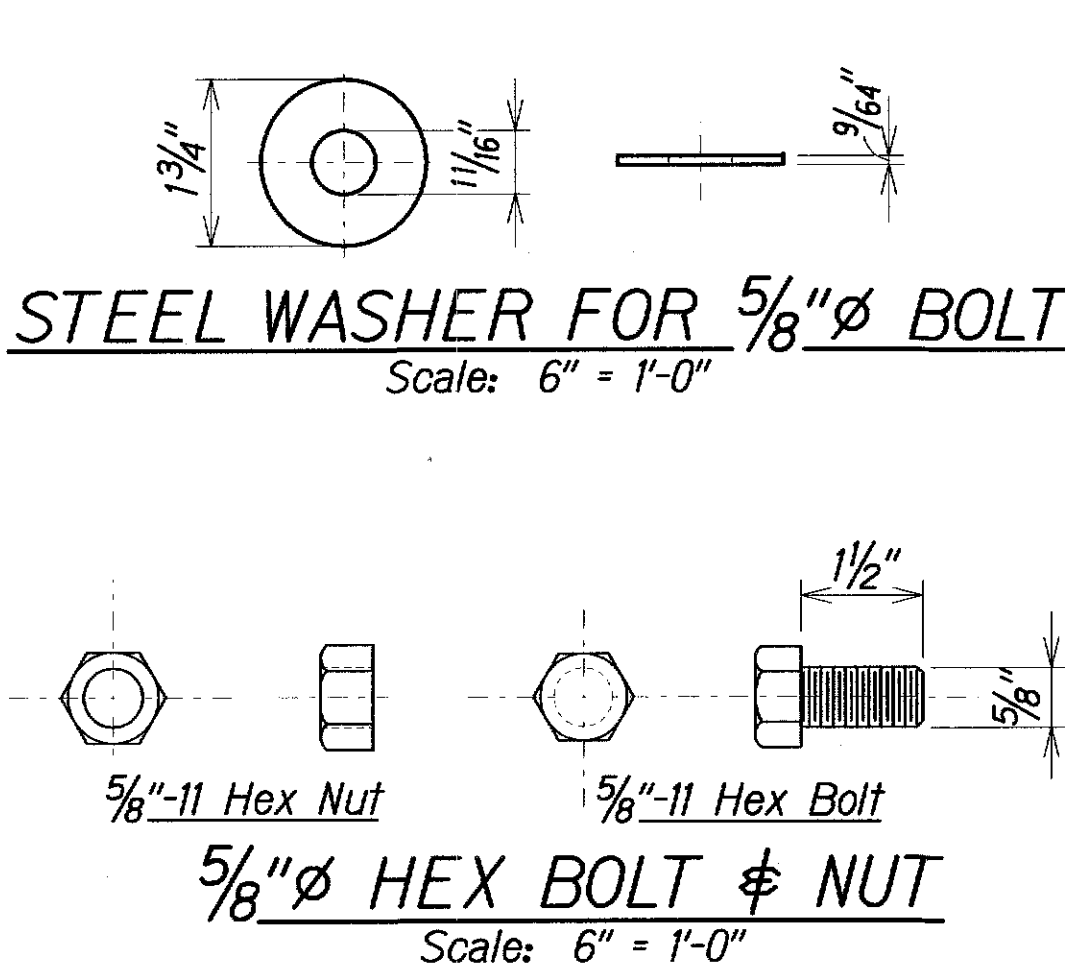
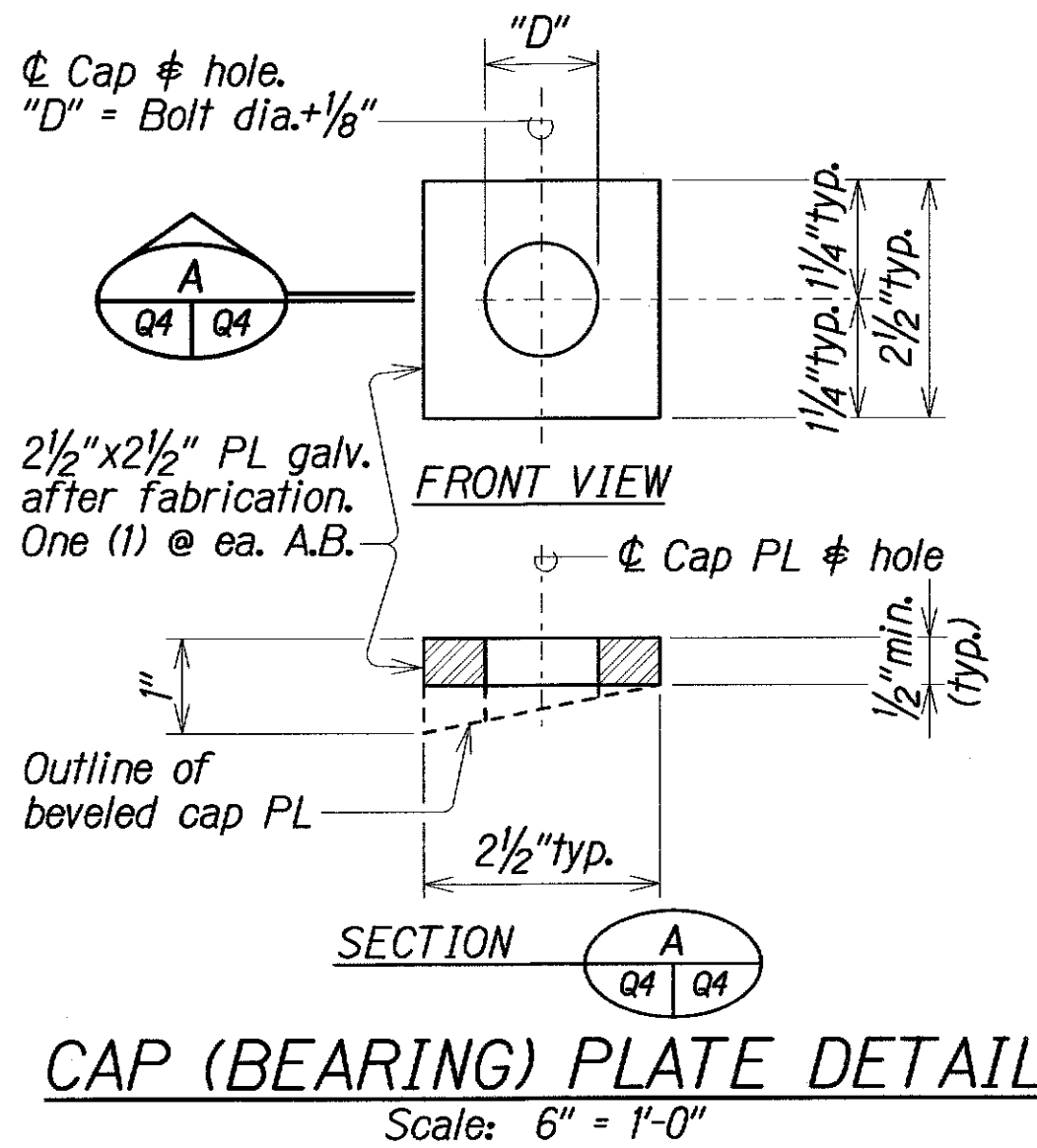
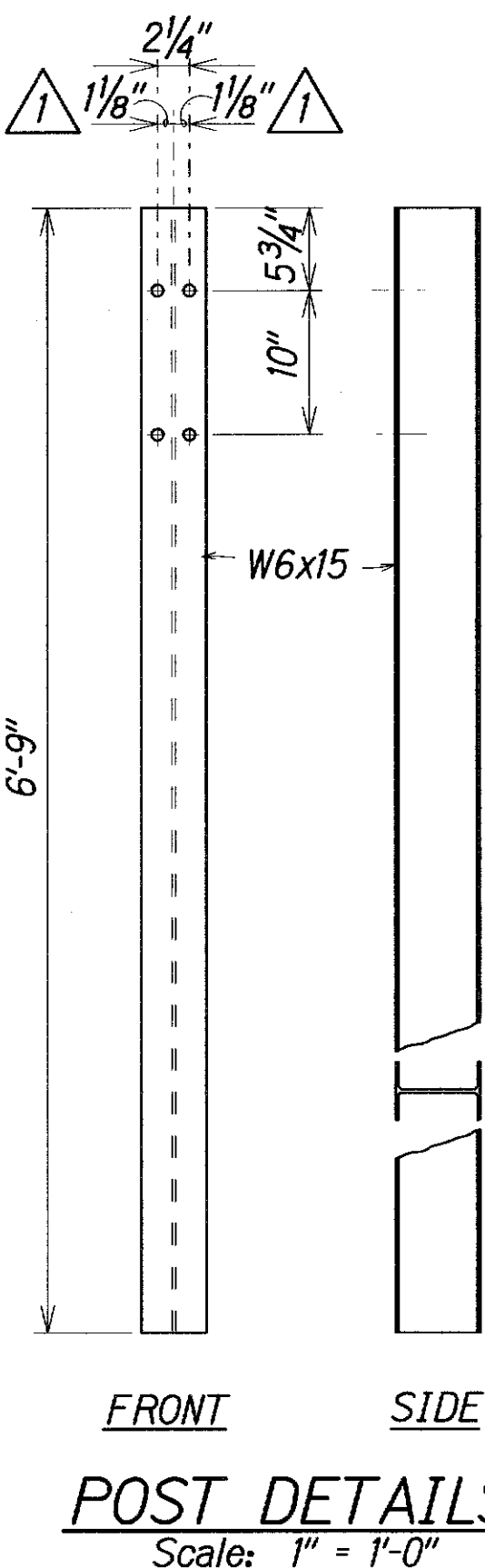
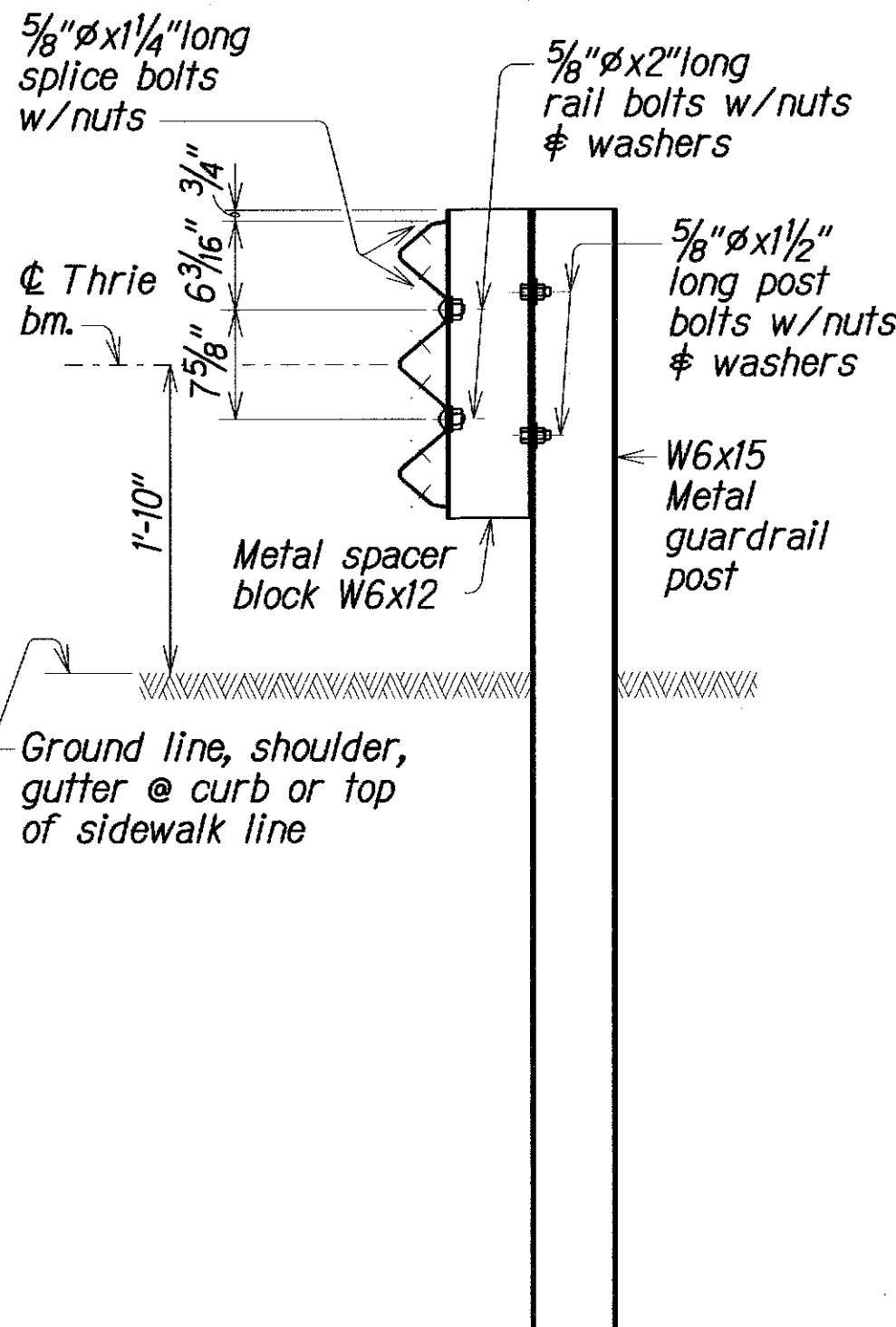
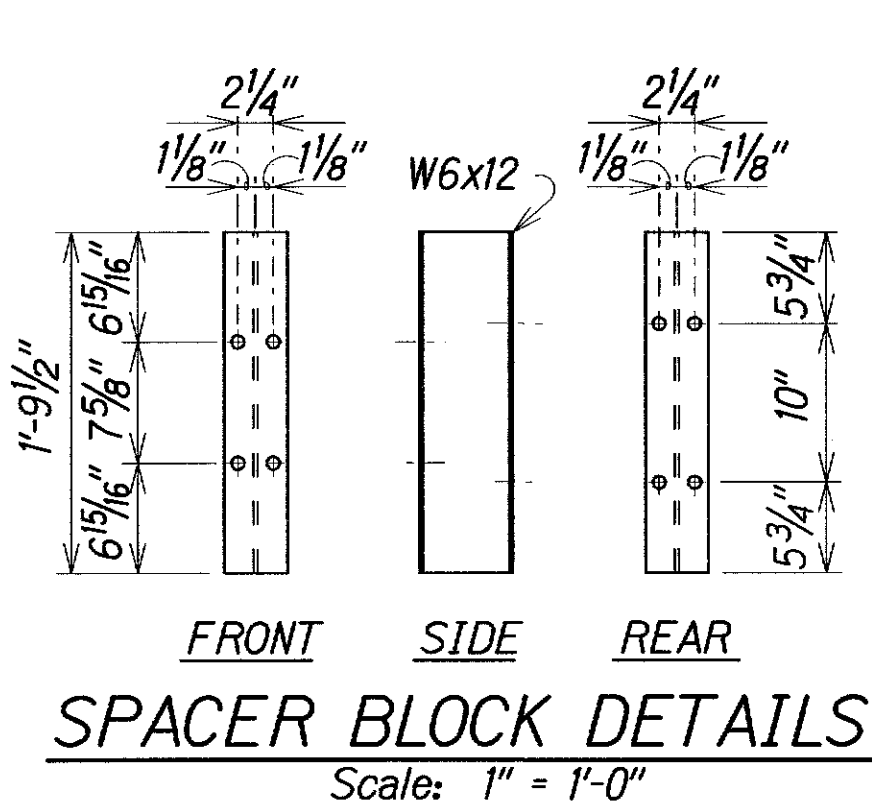
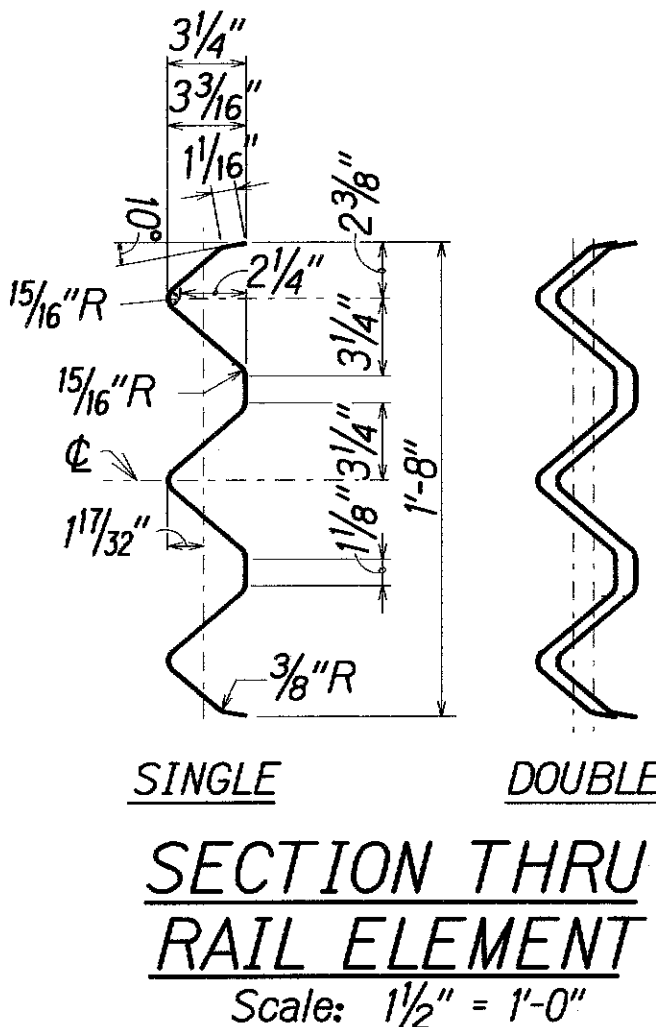
SHEET No. Q3 OF 6 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7101A-01-04M	2006	C.O. 48	74



NOTES:

- The work necessary to connect guardrail to concrete end post shall include all labor, materials, tools, equipment and incidentals necessary to complete the work and will not be paid for separately.
- Lap terminal connector and rail element in direction of traffic to prevent snagging.
- All anchor bolts shall be high strength bolts conforming to the requirements of ASTM 325 and Standard Specification, Section 713.04.
- Anchor bolt length shall be such that a snug fit of the elements and full thread engagement plus 1/4" (max) is attained.
- "Terminal Connector", "Transition Section" and thrie beam shall be fabricated from 10gauge steel conforming to the requirements of AASHTO M 180, Type II, Class B.
- "Terminal Connector" and standard spacer, including all anchor bolts, cap PL, nuts and washers, shall be hot-dip galvanized after fabrication.
- Cap PL shall be fabricated from ASTM A 36.
- First 25'-0" of guardrail adjoining "Terminal Connector" shall be galvanized steel and supports spaced as shown on the detail drawings. This section of rail shall be placed on tangent to end post or parallel to roadway, unless conditions at site renders it impossible to do so. Flare point to be determined in field.
- Double (nest 1st panel) thrie beam elements at all end post connections, except on highways with one-way traffic pattern, use single thrie beam elements at end post on trailing end only.
- Where double (nested) beam occur, 12" "Back-up Plate" not required.
- Heads of through anchor bolts shall be placed on the traffic side of the rail.
- All steel shapes, rails and plates shall conform to ASTM A 36 specifications.



METAL GUARDRAIL TYPE 3 THRIE BEAM AND APPURTENANCES DETAILS

SURVEY PLOTTED BY	DATE
DESIGNED BY	JUL 2005
TRACED BY	JUL 2005
DESIGNED BY	JUL 2005
QUANTITIES BY	JUL 2005
CHECKED BY	JUL 2005

6/1/06	Revised bolt hole spacing
DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
METAL GUARDRAIL TYPE 3 THRIE BEAM and APPURTENANCES DETAILS	
OAHU SUGAR CO. RD. OVERCROSSING	
Farrington Highway Rehabilitation, Vicinity of Old Fort Weaver Road to Kamehameha Highway Project No. 7101A-01-04M	
Scale: As Noted	Date: July, 2005
SHEET No. Q4 OF 6 SHEETS	

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7101A-01-04M	2006	49	74

GENERAL:

- All work shown on this sheet shall be paid for under Item No. 607.0160.
- All work involving chain link fence construction shall conform to Section 607 - Chain Link Fences And Gates and Section 674 - Concrete Retrofit.

MATERIALS:

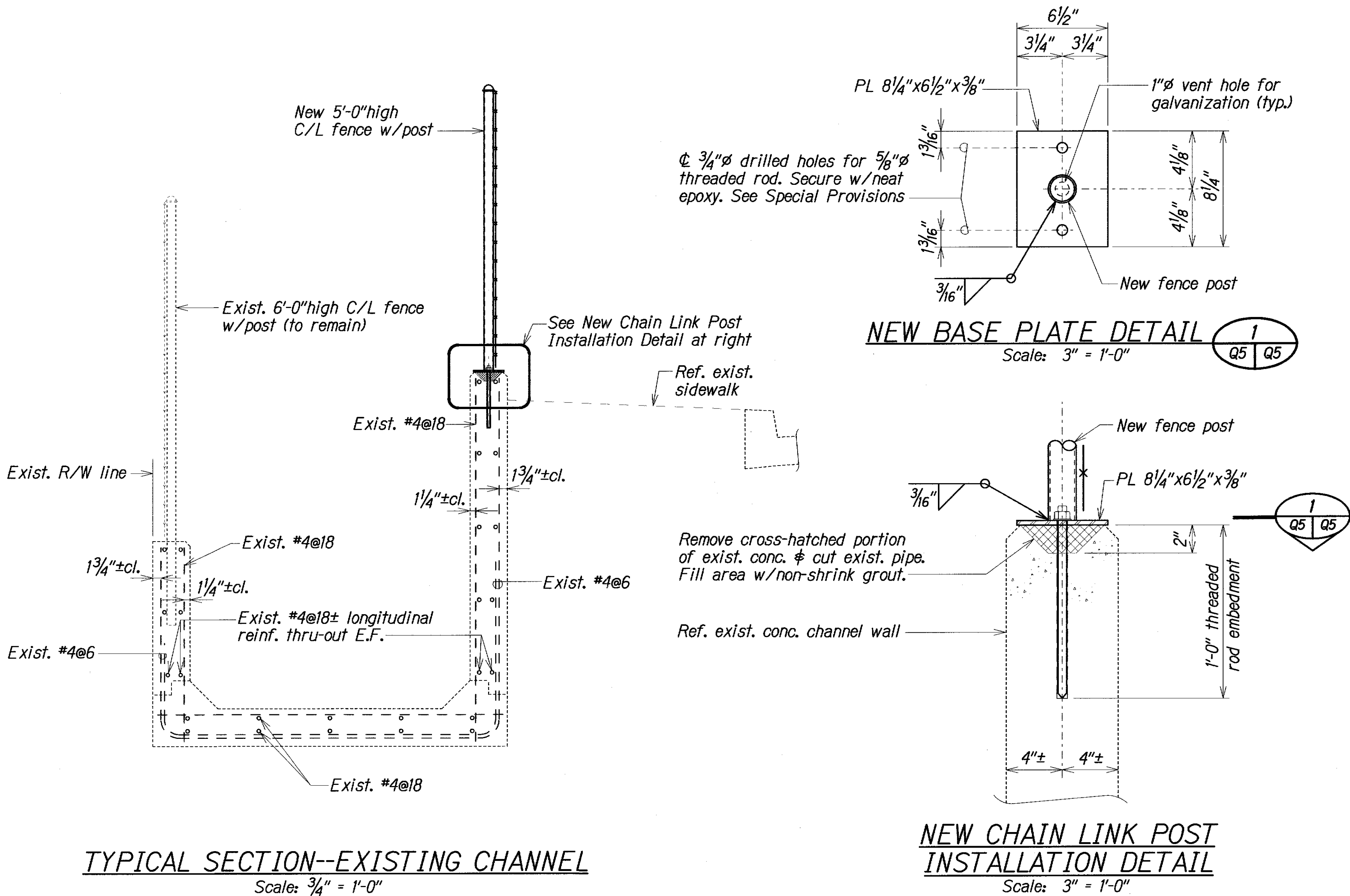
- All structural steel shall be ASTM A 36, hot-dip galvanized after fabrication.
- All threaded rods, washers and nuts shall be ASTM 449, Type 1, hot-dip galvanized after fabrication, unless noted otherwise. See Special Provisions.
- All welding shall be in accordance with the current edition of Structural Welding Code-Steel AWS D 1.1. Welding electrodes for structural steel shall be E 70.
- Epoxy shall be "Double Cartridge" type with static mixer. Epoxies that require manual measuring or mixing will not be allowed. Epoxy shall meet the requirements of ASTM C 881, Type IV, Grade 3, Class C.

CONSTRUCTION METHODS:

- The Contractor shall verify the locations of all existing utility lines and notify their respective owners before commencing with any work.
- The Contractor shall verify all grades and dimensions in the field before commencing with any work.
- Except as noted otherwise, all dimensions are measured plumb.
- Limits of removal of existing structure shown by cross-hatched lines. Removal shall be done in such a manner as to preclude any damage to the existing reinforcing and concrete to remain. Large vibratory type of equipment will not be permitted in the removal operation, nor for drilling of holes. Only small vibratory hand tools approved by the Engineer will be allowed. Any damage to the existing structure due to the Contractor's operation or negligence shall be repaired at his expense with no additional cost to the State and to the satisfaction of the Engineer.
- Large impacting or vibratory type equipment will not be permitted in the drilling of holes.
- The Contractor shall be solely responsible for the protection of adjacent property, utilities and existing and new structures from damage due to construction. Repairing any damage shall be at the Contractor's expense, to the satisfaction of the Engineer. He shall conduct his work in such a manner and provide such temporary shoring or other measures as may be necessary to insure the safety of all concerned and to protect existing structures.
- Unless noted otherwise, chamfer all exposed concrete edges three-quarters (¾) of an inch.

REFERENCE:

- Refer to Standard Plans for additional details and notes not covered by details and typical drawings.
- Refer to Hawaii Standard Specifications for Road, Bridge and Public Works Construction, 1994 Edition and Special Provisions.



NEW CHAIN LINK FENCE at EXISTING CONCRETE INTERCEPTING CHANNEL FARRINGTON HIGHWAY @ STA. 139+35± to @ STA. 148+90±

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	JUL 2005
DESIGNED BY	DESIGNED BY	JUL 2005
CHECKED BY	CHECKED BY	JUL 2005
APPROVED BY	APPROVED BY	JUL 2005

db4/jul21/ksc/pw/po.supt. 06/08/05

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

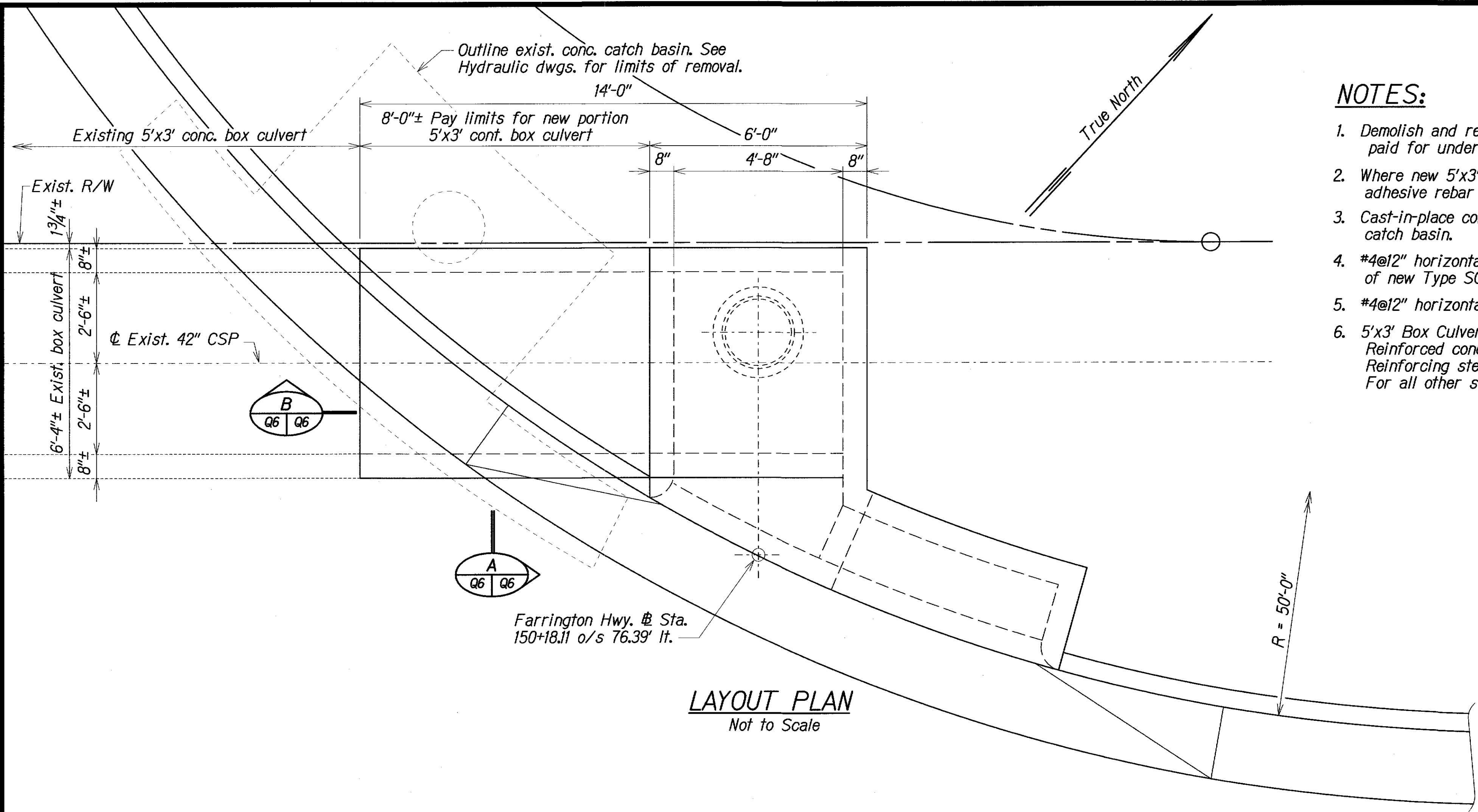
**NEW CHAIN LINK FENCE at EXISTING
CONCRETE INTERCEPTING CHANNEL**
FARRINGTON HIGHWAY @ STA. 139+35± to @ STA. 148+90±
Farrington Highway Rehabilitation,
Vicinity of Old Fort Weaver Road to Kamehameha Highway
Project No. 7101A-01-04M

Scale: As Noted
Date: July, 2005

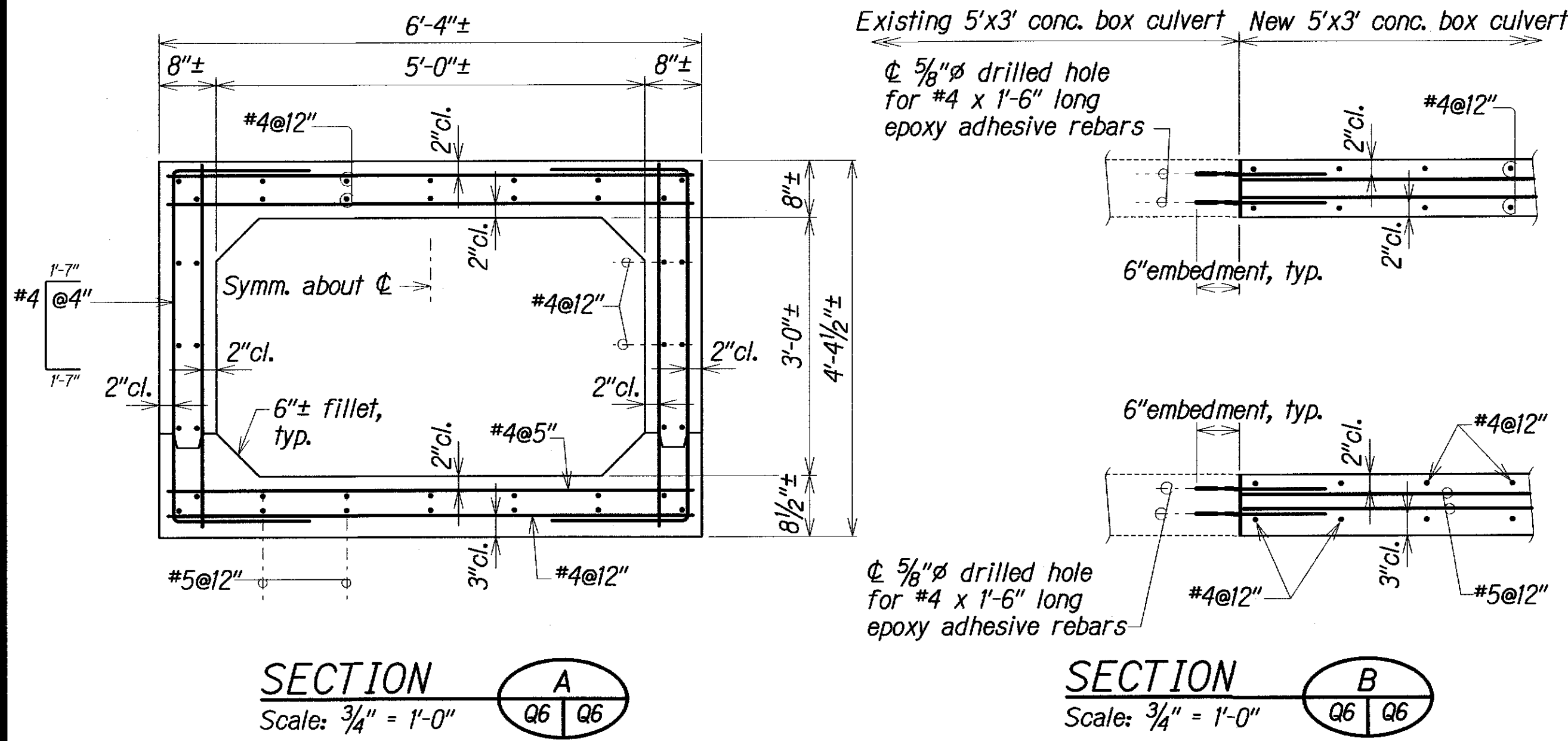
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7101A-01-04M	2006	50	74

NOTES:

- Demolish and remove existing catch basin and 8'-0"± of existing 5'x3' box culvert. Payment for this work shall be paid for under Item No. 503.1092 and will not be paid for separately.
- Where new 5'x3' box culvert meets existing 5'x3' box culvert, drill $\frac{5}{8}$ "Ø holes into existing concrete for #4 epoxy adhesive rebar dowels. Embed #4 x 1'-6" long dowels 6" into existing concrete.
- Cast-in-place concrete for 5'x3' box culvert bottom slab and wall shall be placed monolithically with new Type SC catch basin.
- #4@12" horizontal bottom slab reinforcing (top and bottom) for 5'x3' box culvert shall be continuous into bottom slab of new Type SC catch basin.
- #4@12" horizontal wall reinforcing for 5'x3' box culvert shall be continuous with new Type SC catch basin.
- 5'x3' Box Culvert:
Reinforced concrete, f'c = 4,000 psi
Reinforcing steel, Grade 60
For all other structural notes, see General Notes on Plan Sht. #Q1.



LAYOUT PLAN
Not to Scale



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

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

NEW 5'x3' CONCRETE BOX CULVERT and CONNECTION DETAILS to EXISTING at FARRINGTON HIGHWAY @ STA. 150+18.11 o/s 76.39' It.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

NEW 5'x3' CONCRETE BOX CULVERT and CONNECTION DETAILS to EXISTING at FARRINGTON HWY @ Sta. 150+18.11 o/s 76.39' It.
Farrington Highway Rehabilitation
Vicinity of Old Fort Weaver Road to Kamehameha Highway
Project No. 7101A-01-04M
Scale: As Noted Date: July, 2005