FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(072)	2015	52	107

GENERAL NOTES

DESIGN SPECIFICATIONS:

A. AASHTO LRFD Bridge Design Specifications, 7th Edition 2014 including all interim revisions.

B. State of Hawaii, Department of Transportation, Highways Division, "Design Criteria for Bridges and Structures", August 8, 2014.

MATERIALS:

A. Structural Concrete for concrete slabs shall be Very Early Strength Latex Modified Concrete (VESLMC) (or approved equal) and shall attain f'c=3,000 psi in three (3) hours and f'c=4,000 psi in 28 days. Structural Concrete for curbs, end posts, and bridge railings shall be a minimum f'c=4,000 psi in 28 days and is not required to be VESLMC.

B. Reinforcing Steel: deformed reinforcing bars for concrete reinforcement shall meet the requirements of AASHTO M31M/M31-07 Grade 60 (ASTM A615, Grade 60).

C. Structural Steel: W-beam structural steel shapes shall conform to ASTM A992. Structural steel plates and bars shall conform to ASTM A36. All structural steel shall be hot-dip galvanized in accordance with ASTM A123.

D. Guardrail bolts and recessed nuts shall conform to FBB-01-5 from "A Guide to Standardized Highway Barrier Hardware" AASHTO-AGC-ARTBD Joint Committee Task Force 13 Report.

E. Carriage bolts and nuts shall conform to FBC10-20 from "A Guide to Standardized Highway Barrier Hardware" AASHTO-AGC-ARTBD Joint Committee Task Force 13 Report.

F. High strength bolts (heavy hex structural bolts) shall conform to ASTM A325, Type 3 unless otherwise specified and hot-dip galvanized in accordance with ASTM A153, Class C.

G. Bolts (hex and heavy hex bolts) shall conform to ASTM A307 unless otherwise specified and hot-dip galvanized in accordance with ASTM A153, Class C.

H. Anchor rods shall conform to ASTM F1554, Grade 105, Class 2A and hot-dip galvanized in accordance with ASTM A153, Class C.

I. Nuts for ASTM A325 bolts and ASTM F1554 anchor rods shall conform to AASHTO M291 (ASTM A5633), Grade DH and hot-dip galvanized in accordance with ASTM A153, Class C.

J. Nuts for ASTM A307 (hex and heavy hex) bolts shall conform to AASHTO M291 (ASTM A563), Hex Grade A and Heavy Hex Grade A and hot dip galvanized in accordance with ASTM A153, Class C.

K. Washers for bolts shall conform to ASTM F436, Type I and hot dip galvanized in accordance with ASTM A153, Class C.

L. Couplers shall satisfy the requirements of Hawaii Standards Specifications For Road And Bridge Construction, 2005 Edition, Section 602.03(E)(3)(b)(3)

M. Epoxy shall be "Glass Vial" or "Double Cartridge" type. Epoxies that require manual measuring or mixing will not be allowed. Epoxy shall meet the requirements of ASTM C881, Type IV, Grade 3, Class C.

N. All welding shall be in accordance with the current edition of Bridge Welding Code ANSI/AASHTO/AWS D1.5.

O. Polyethylene plastic sheeting under concrete slab shall be a minimum of 6 mil thick. Cost for polyethylene plastic sheeting shall be incidental to Very Early Strength Latex Modified Concrete (VESLMC).

P. Stainless steel reinforcing bars shall be AISI 316L Grade and conform to ASTM A955, Grade 60.

Q. All stainless steel pipes, plates, threaded rods and nuts for metal railing shall be Type 316L. All Stainless Steel welding shall be in accordance with the current edition of Structural Welding Code - Stainless Steel AWS D1.6.

REFERENCE:

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

GENERAL:

A. The Contractor 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.

B. In the event of over-excavation, the space between the footing or footing key and ground shall be filled with a minimum of Class D concrete at the Contractor's expense at no cost to the State.

C. Unless noted otherwise, chamfer all exposed concrete edges three-quarters (3/4) of an inch.

D. The Contractor shall verify all dimensions & grades in the field before commencing with work.

E. The Contractor shall verify the location of all existing utility lines near the work and notify their respective owners before commencing with work.

F. All items noted incidental will not be paid for separately.

CONSTRUCTION REQUIREMENTS:

A. Refer to Hawaii Standard Specifications for Road and Bridge Construction, 2005 edition and Special Provisions.

B. Except as noted otherwise, all vertical dimensions are measured plumb.

C. For steel reinforcing , stagger all splices where possible.

D. Steel reinforcing shall be supported, bent and placed as per LFRD Bridge Design Specifications.

E. For cast-in-place concrete, minimum reinforcement cover:
Concrete cast against earth: 3"
Curbs and Railings: 2"
Slab top: 2"

F. At time concrete is placed, reinforcing shall be free from mud, oil laitance or other coatings adversely affecting bond capacity.

G. Reinforcement, dowels & other embedded items shall be positively secured before pouring.

H. Minimum clear spacing between parallel bars shall be one and one-half (1½) times the diameter of the bars (for non-bundled bars), but in no case shall the clear distance between the bars be less than one and one-half (1½) times the maximum size of the coarse aggregate.

I. All dimensions relating to reinforcing bars (e.g. spacing of bars, etc.) are to centers of bars unless noted otherwise.

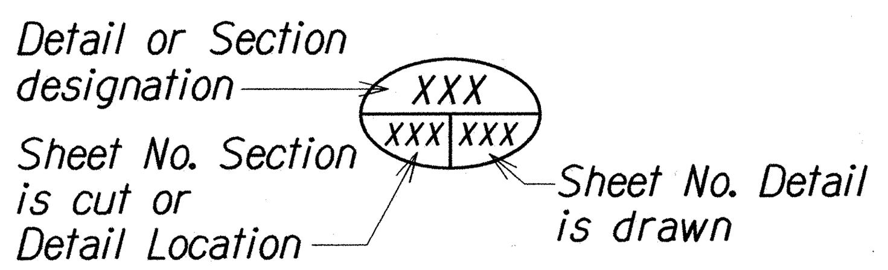
J. All footings and concrete slabs shall bear on firm undisturbed natural soils or properly compacted structural fill.

K. Contractor shall verify the slope and elevations of the top slab, box culvert Sta. 560+82 headwalls & wingwalls. Based on the slope & elevations determined, contractor shall verify the finish elevations on Plan Sht.#Q12. The engineer shall be notified of any discrepancies in the finish elevations. Finish elevations may need to be revised to account for discrepancies.

L. New Approach Slab work shall be completed in phases to ensure that one lane of traffic is open at all times. A recommended phasing procedure is shown on Plan Sht.#Q12. The Contractor shall decide on a phasing plan for Waialee and Kuilima-Oio Stream Bridges and shall submit a work plan and details for acceptance by the Engineer. See Special Provisions, Section 645, for Allowable Lane Closure Times.

M. The vertical riding surface drop-off between adjacent surfaces shall not exceed three (3)-inches. This shall include differences in height between adjacent pavement surfaces, cold-planed surfaces, bridge decks and new concrete slabs. If a vertical riding surface drop-off exists at the end of each day's work, the Contractor shall provide temporary transition tapers with maximum slopes of 48:1 for travel in the longitudinal direction and 6:1 for transverse movements. This work shall be considered incidental to various contract items.

SYMBOLS AND ABBREVIATIONS



(XX) - ℄ Bearing Abutment Seat Line

- Boring No. & Designation

Abut.	Abutment
AC	Asphaltic Concrete
Adj.	Adjacent
Alt.	Alternate
Approx.	Approximate
Az.	Azimuth
℄ (B)	Baseline
Bal.	Balance
Bet., Btwn.	Between
B.F.	Both faces
B.F.E.	Bottom Footing Elevation
Bk.	Back
Blt.	Bolt
Bm.	Beam
B, Bot., Bott.	Bottom
Br.	Bridge
Brg., Brgs.	Bearing, Bearings
B.V.C.	Beginning of Vertical Curve
℄	Center Line
Cant.	Cantilever
C.F.	Cubic Feet
CiP	Cast in Place
C.I.P.	Cast Iron Pipe
C.I.P.	Cast Iron Pipe
C.J.	Construction Joint
Cl., Clr.	Clear
Col.	Column
Conc.	Concrete
Conn.	Connection
Const.	Construction
Cont.	Continuous
CRM	Cement Rubble Masonry
C.Y., Cu. Yd.	Cubic Yards
Det.	Detail
Dia., ø	Diameter
Dim.	Dimension
Dwg., Dwgs.	Drawing, Drawings
EA, Ea., ea.	Each
E.F.	Each Face
Elec.	Electrical
El., Elev.	Elevation
Emb.	Embankment
E.P.	Edge of Pavement
Eq.	Equal
Est.	Estimated
E.W.	Each Way
Exc.	Excavation
Exist.	Existing
Exp., (E)	Expansion
Ext.	Exterior
(F)	Fixed
F'c	Specified Strength of Concrete
F'ci	Strength of Concrete at Time of Initial Prestress
F.F.	Front Face
Fig.	Figure
Fin.	Finish
Fin. Gr.	Finish Grade
Ftg.	Footing
Ga.	Gage, Gauge
Galv.	Galvanized
Gir., G	Girder
G.R.P.	Grouted Rubble Paving
Gr.	Grade
Grd.	Ground
(H)	Hinge
Horiz.	Horizontal
HS	High Strength
Ht.	Height
Hwy.	Highway
I.B.	Inbound
I.F.	Inside Face
In.	Inch
Int.	Interior
Inv.	Invert
Jt.	Joint
L	Length
LBS., lb., lbs.	Pound, Pounds
L.F., Lin. Ft.	Linear Feet
Lg.	Long
Longit.	Longitudinal
L.S.	Lump Sum
Lt.	Left
Ltg. Std.	Lighting Standard
Max.	Maximum
Mech.	Mechanical
Min.	Minimum
Misc.	Miscellaneous
N	North
N.B.	Northbound
N.F.	Near Face
No., #	Number
N.T.S.	Not To Scale
O.B.	Outbound
o.c.	On Center
O.G.	Outside Girder
Opn'g	Opening
o/s, O/S	Offset
P.B.	Pull Box
P.C.	Point of Curvature
P.C.C.	Portland Cement Concrete
Perf.	Perforated
PG-( )	Prestressed Girder-(Type)
PL	Plate
P/S	Prestressed Strands
Pvmt.	Pavement
R	Radius
Rdwy	Roadway
Ref.	Reference
Reinf.	Reinforcement
Ret.	Retaining
Req'd	Required
R.F.	Rear Face
Rt.	Right
R/W	Right Of Way
S	South
S.B.	Southbound
Sect.	Section
SF	Square Feet
Shldr.	Shoulder
Sht.	Sheet
Spc.	Space
Spcd.	Spaced
Spcg.	Spacing
Spec.	Specification
Sprd.	Spread
Sta.	Station
Std.	Standard
Stirr.	Stirrup
Str.	Straight
Struct.	Structural
Symm.	Symmetrical
T	Top
Temp.	Temporary
Thk.	Thick, Thickness
T.O.D.	Top Of Deck
Tot.	Total
Transv.	Transverse
Typ.	Typical
Var.	Varies
V.C.	Vertical Curve
Vert.	Vertical
W	West
w/	With
W.W.	Wingwall

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GENERAL NOTES, SYMBOLS and ABBREVIATIONS

KAMEHAMEHA HIGHWAY RESURFACING

DAIRY ROAD to LAIEWAI BRIDGE
Federal Aid Project No. NH-083-1(072)

Scale: As Noted   Date: May, 2015

SHEET No. Q1 OF 20 SHEETS

ORIGINAL PLAN | NOTE BOOK | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
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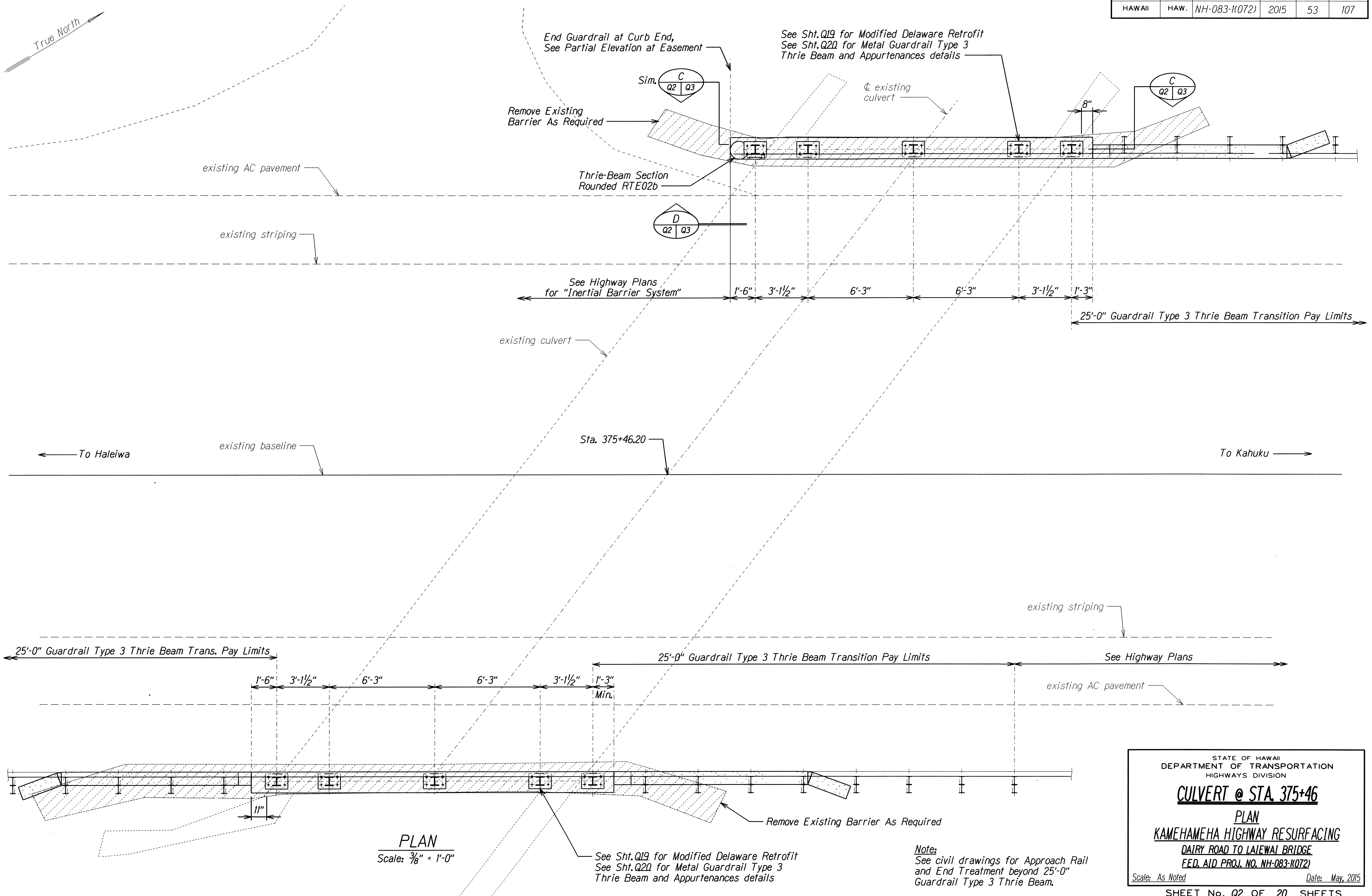
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(072)	2015	53	107



PLAN

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

Note:
See civil drawings for Approach Rail and End Treatment beyond 25'-0" Guardrail Type 3 Thrie Beam.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CULVERT @ STA. 375+46

PLAN

KAMEHAMEHA HIGHWAY RESURFACING

DAIRY ROAD TO LAIEWAI BRIDGE
FED. AID PROJ. NO. NH-083-1(072)

Scale: As Noted | Date: May, 2015

SHEET No. Q2 OF 20 SHEETS

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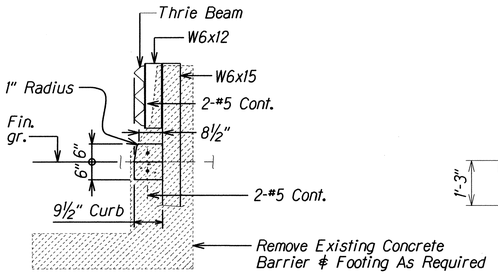
HAWAII	HAW.	NH-083-1(072)	2015	54	107



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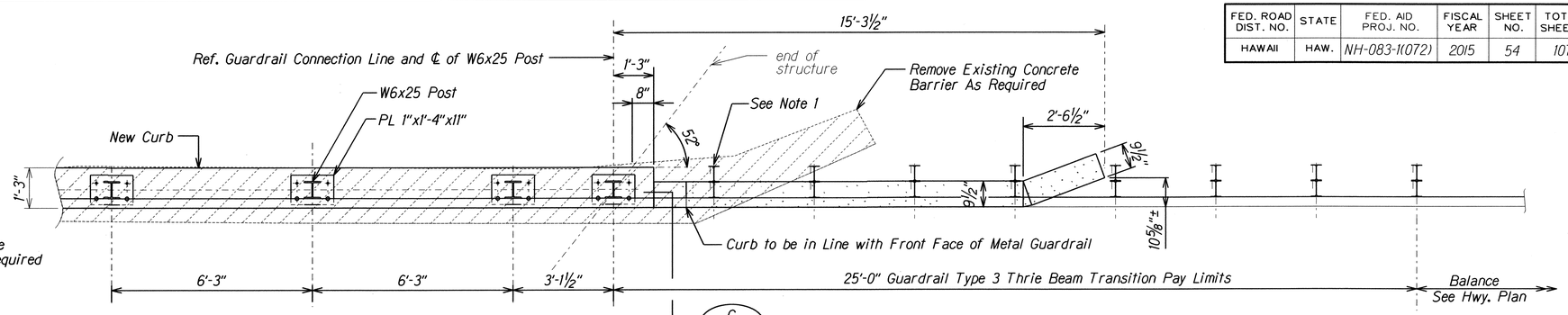

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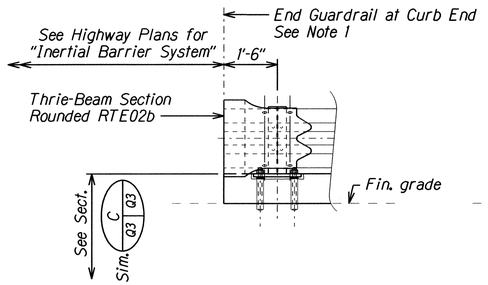

PARTIAL ELEVATION AT EASEMENT (D Q2|Q3)
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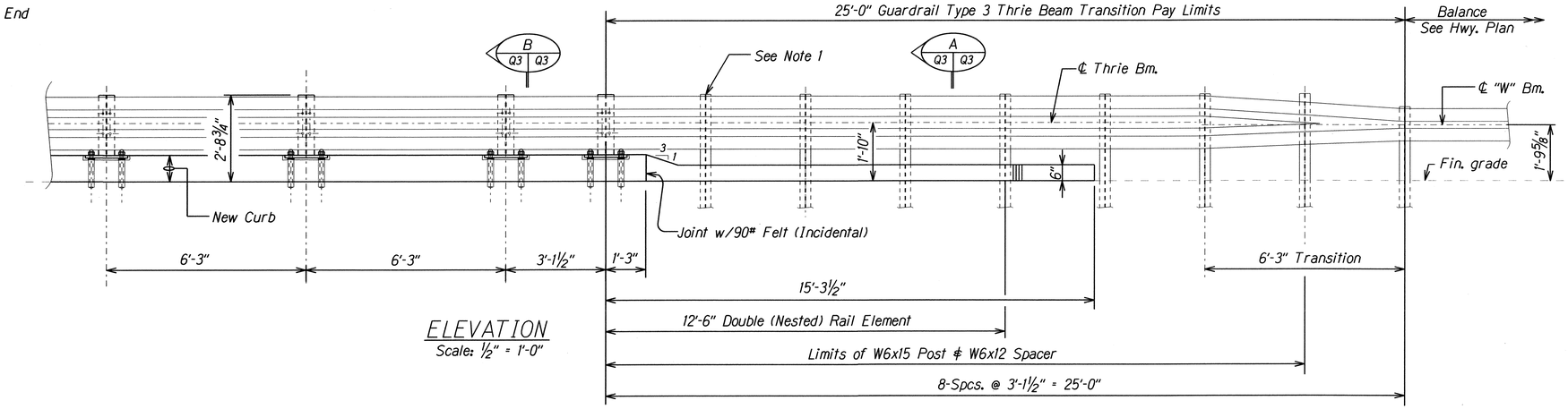

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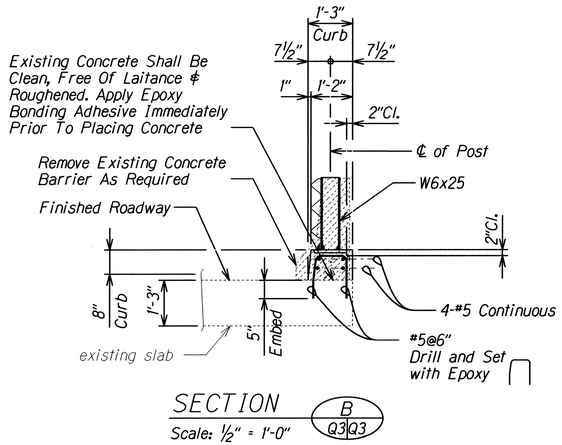

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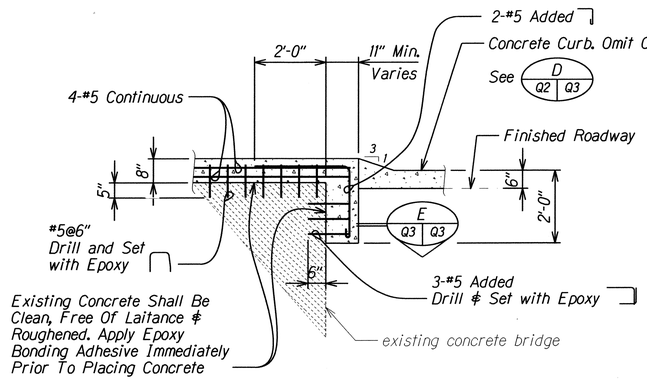

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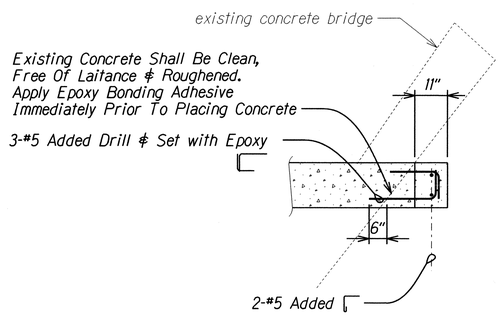

SECTION (E Q3|Q3)
Scale: ½" = 1'-0"

NOTES:

1. See Sht. Q19 for Modified Delaware Retrofit. See Sht. Q20 for Metal Guardrail Type 3 Thrie Beam and Appurtenances details.
2. Reinforcing bars in the existing bridge deck shall not be cut or damaged.

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
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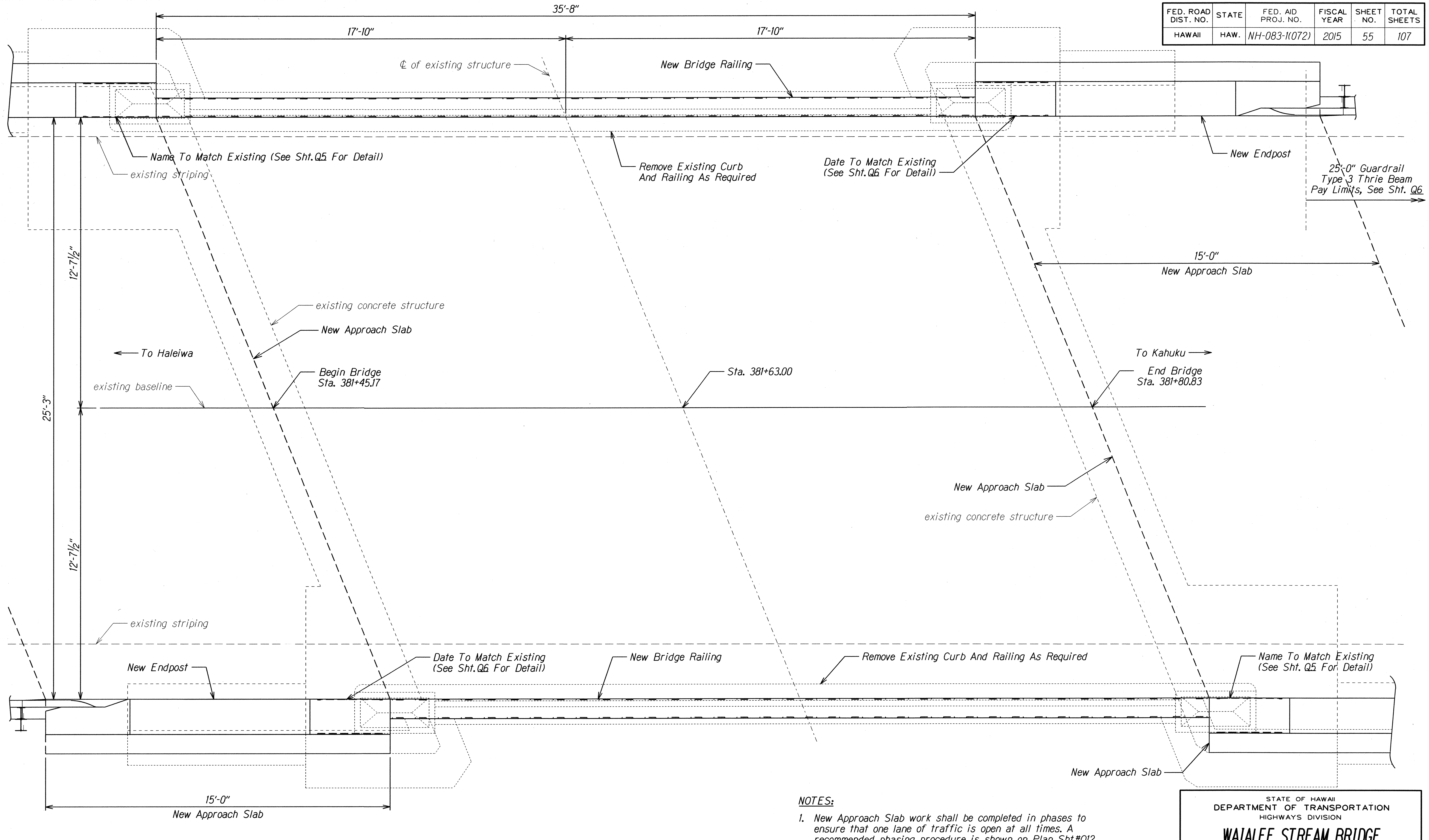
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
CULVERT @ STA. 375+46
MODIFIED DELAWARE RETROFIT
PLAN, ELEVATION & SECTION
KAMEHAMEHA HIGHWAY RESURFACING
DAIRY ROAD TO LAIEWAI BRIDGE
FED. AID PROJ. NO. NH-083-1(072)
Scale: As Noted | Date: May, 2015

SHEET No. Q3 OF 20 SHEETS

MODIFIED DELAWARE RETROFIT ENDPOST PLAN, ELEVATION & SECTION

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(072)	2015	55	107



PLAN
Scale: ½" = 1'-0"

NOTES:

1. New Approach Slab work shall be completed in phases to ensure that one lane of traffic is open at all times. A recommended phasing procedure is shown on Plan Sht.#Q12. The Contractor shall decide on a phasing plan for Waialee and Kuilima-Oio Stream Bridges and shall submit a work plan and details for acceptance by the Engineer. See Special Provisions, Section 645, for Allowable Lane Closure Times.
2. See Civil drawings for approach rail and end treatment beyond 25'-0" Guardrail Type 3 Thrie Beam.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

WAIALEE STREAM BRIDGE
PLAN
KAMEHAMEHA HIGHWAY RESURFACING
DAIRY ROAD TO LAIEWAI BRIDGE
FED. AID PROJ. NO. NH-083-1(072)

Scale: As Noted   Date: May, 2015

SHEET No. Q4 OF 20 SHEETS

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
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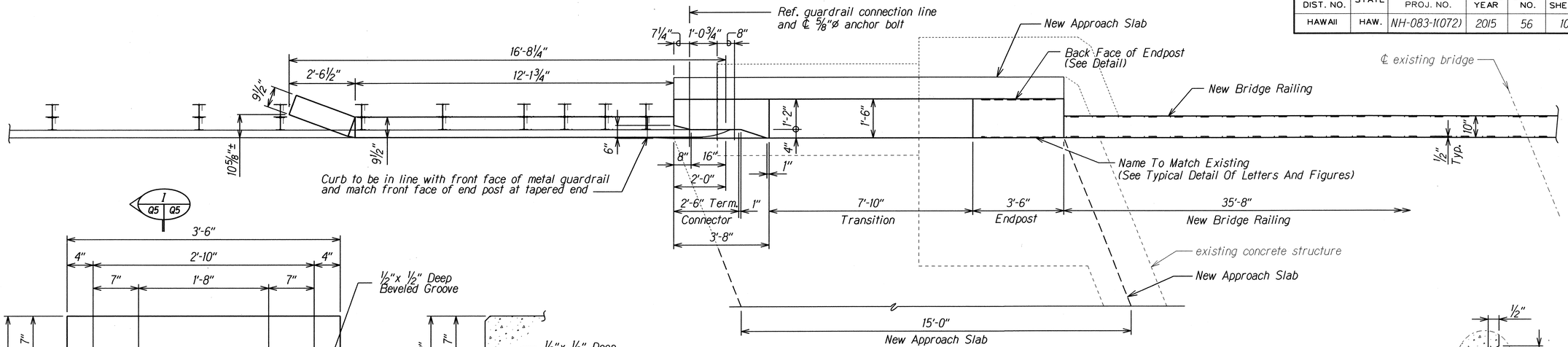
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(072)	2015	56	107



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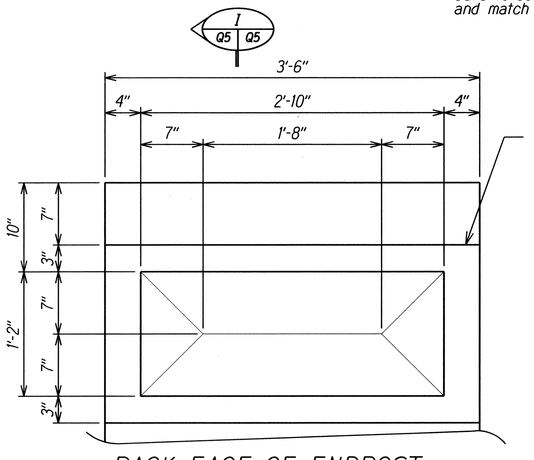
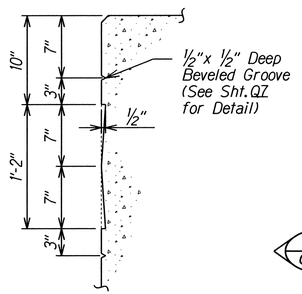


BACK FACE OF ENDPOST

Scale: 1½" = 1'-0"



SECTION I Q5 Q5

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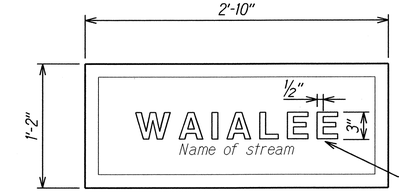
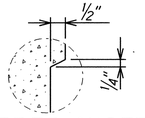


TYPICAL DETAIL OF LETTERS AND FIGURES

Scale: 1½" = 1'-0"



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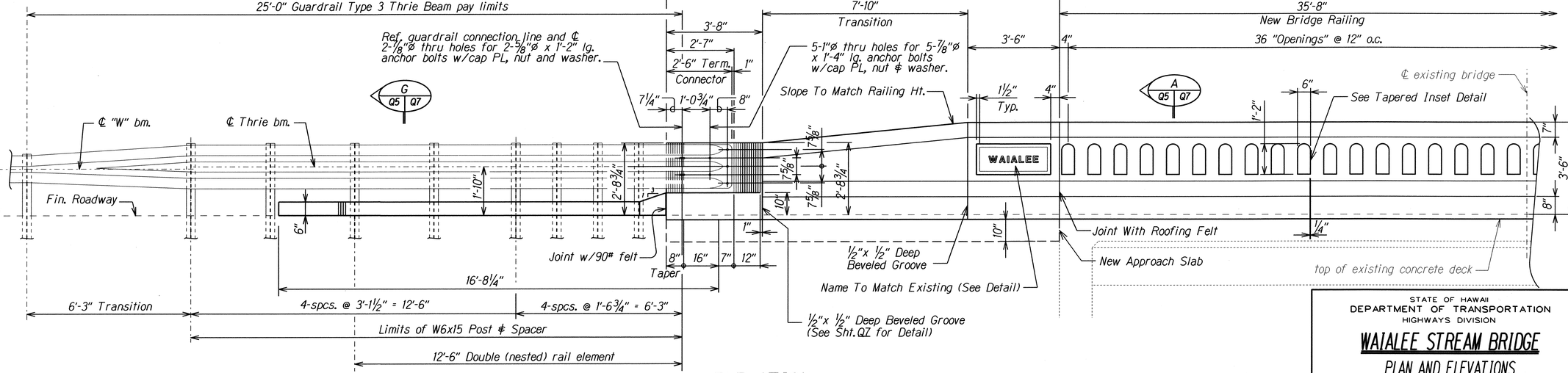

ELEVATION

Scale: ½" = 1'-0"

NOTES:

1. See Sht. Q19 for Modified Delaware Retrofit. See Sht. Q20 for Metal Guardrail Type 3 Thrie Beam and Appurtenances details.
2. See civil drawings for Approach Rail and End Treatment beyond 25'-0" Guardrail Type 3 Thrie Beam.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

WAIALEE STREAM BRIDGE

PLAN AND ELEVATIONS
KAMEHAMEHA HIGHWAY RESURFACING
DAIRY ROAD TO LAIEWAI BRIDGE
FED. AID PROJ. NO. NH-083-1(072)

Scale: As Noted — Date: May, 2015

SHEET No. Q5 OF 20 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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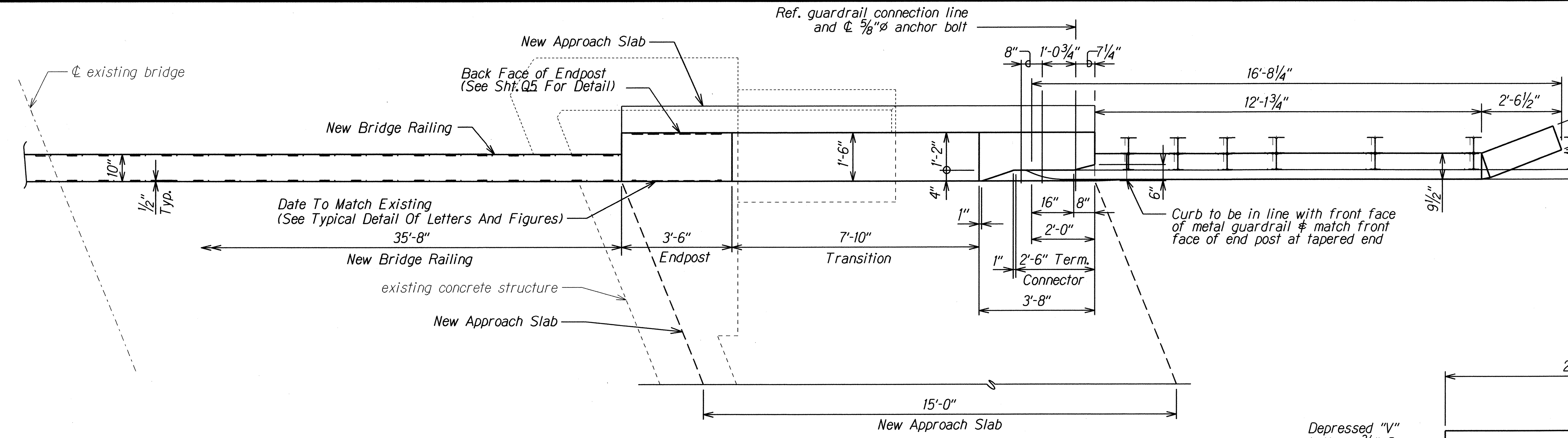
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(072)	2015	57	107



PLAN
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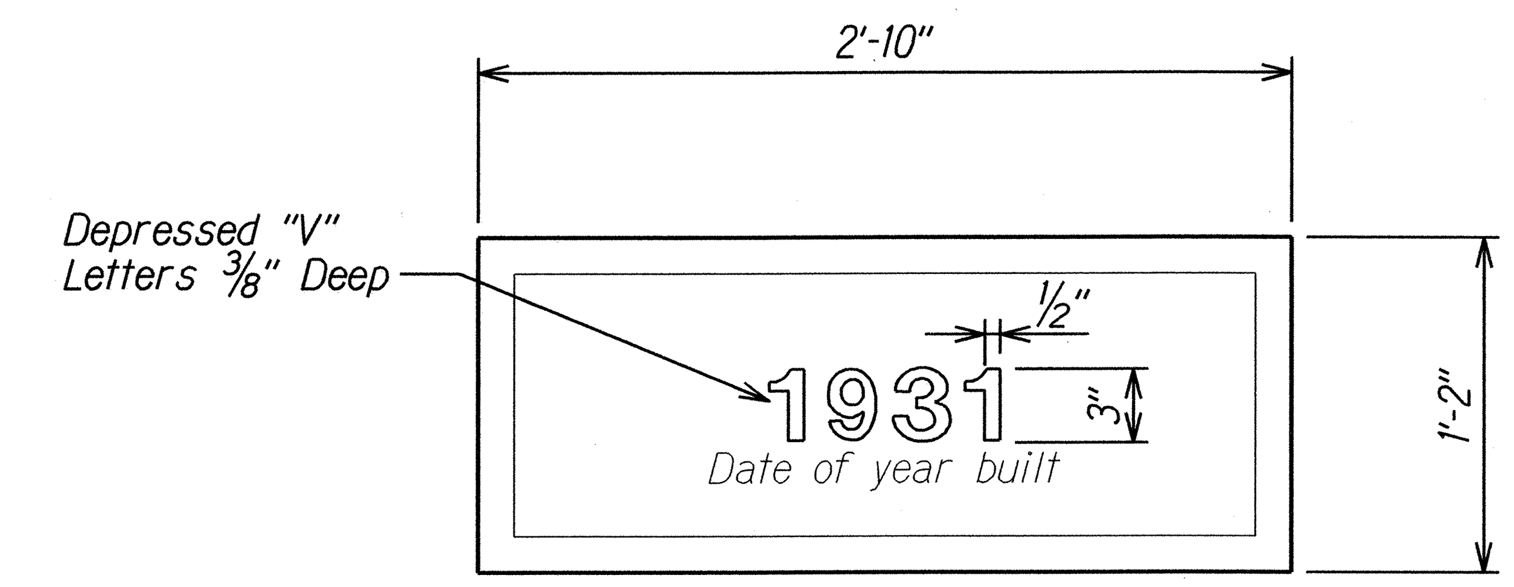

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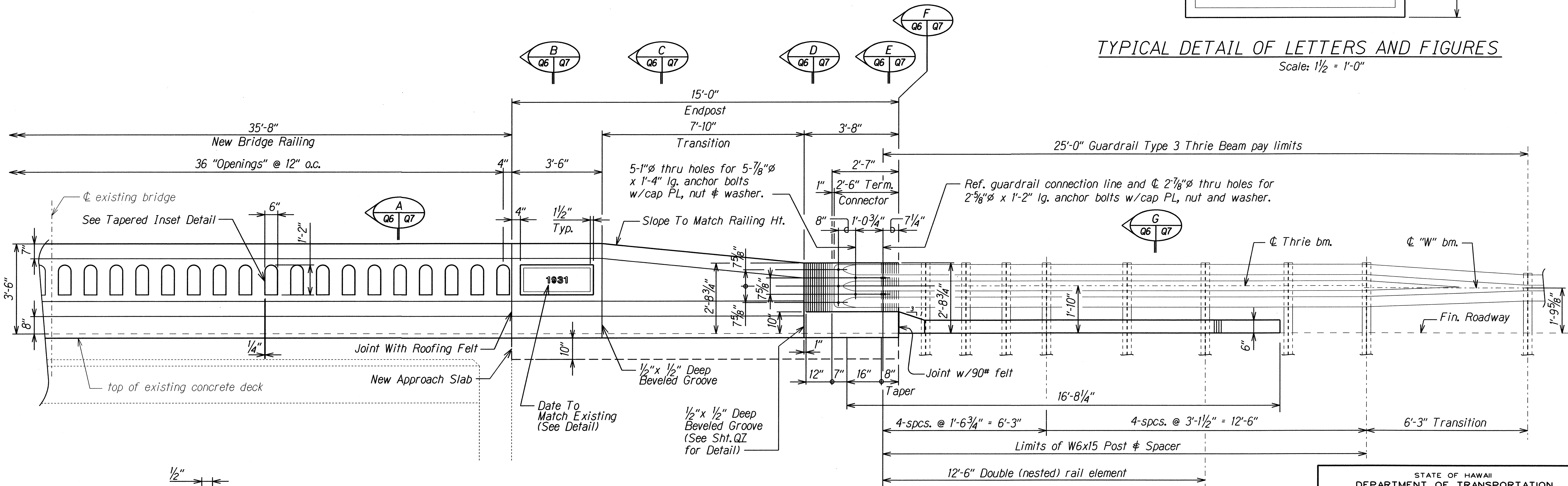

ELEVATION
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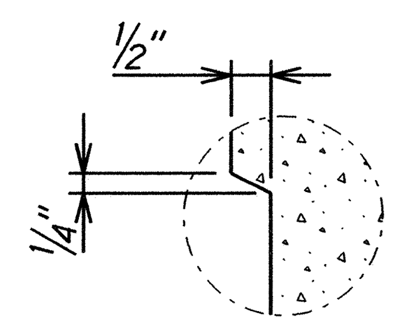

TAPERED INSET
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NOTES:

1. See Sht. Q19 for Modified Delaware Retrofit. See Sht. Q20 for Metal Guardrail Type 3 Thrie Beam and Appurtenances details.
2. See civil drawings for Approach Rail and End Treatment beyond 25'-0" Guardrail Type 3 Thrie Beam.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

WAIALEE STREAM BRIDGE

PLAN AND ELEVATIONS

KAMEHAMEHA HIGHWAY RESURFACING

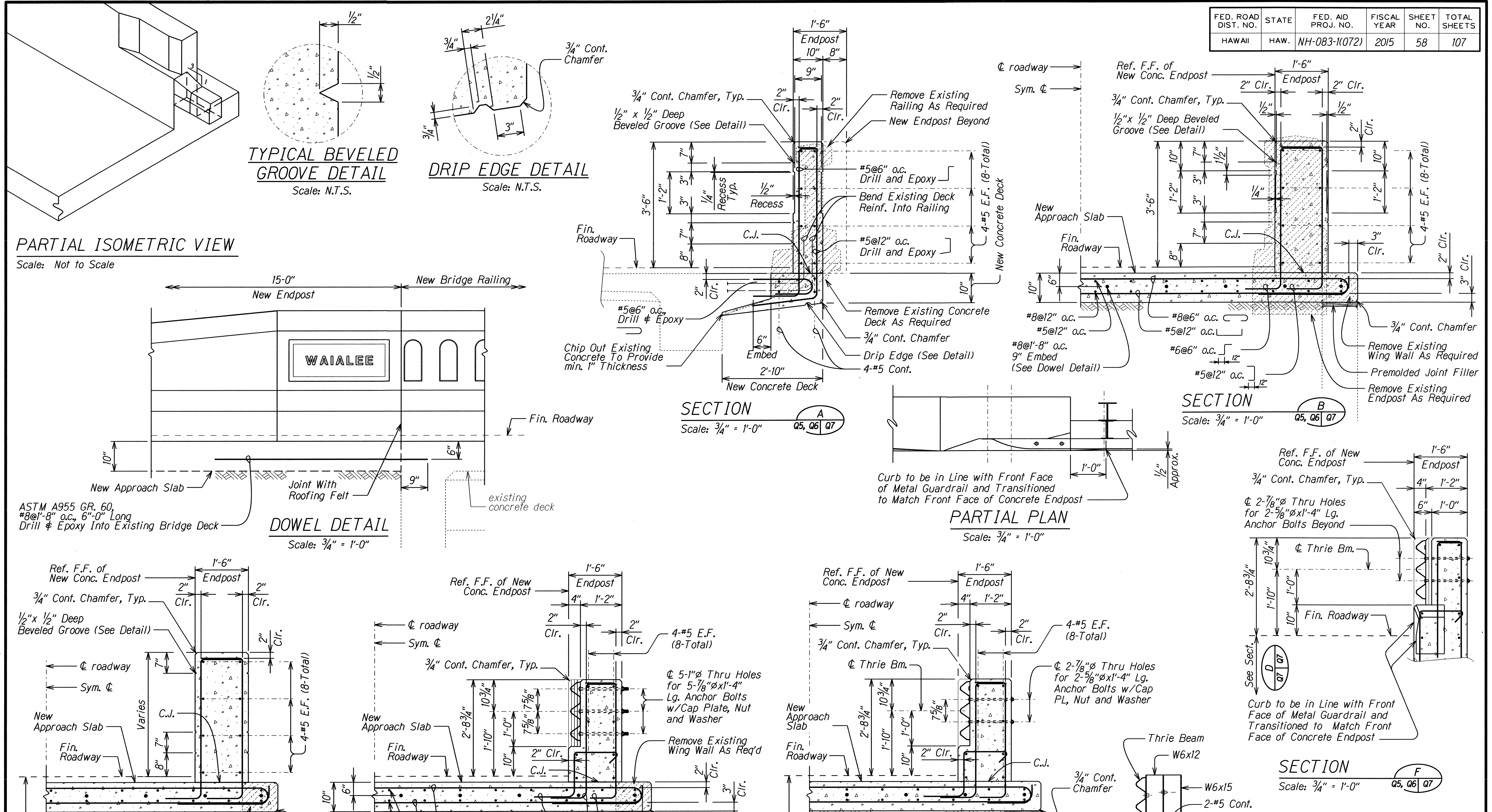
DAIRY ROAD TO LAIEWAI BRIDGE

FED. AID PROJ. NO. NH-083-1(072)

Scale: As Noted   Date: May, 2015

SHEET No. Q6 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(072)	2015	58	107



TYPICAL SECTIONS - ENDPOST DETAILS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

WAIALEE STREAM BRIDGE

TYPE "D2" ENDPOST DETAILS

PARTIAL ISOMETRIC VIEW & TYP. SECTIONS

KAMEHAMEHA HIGHWAY RESURFACING

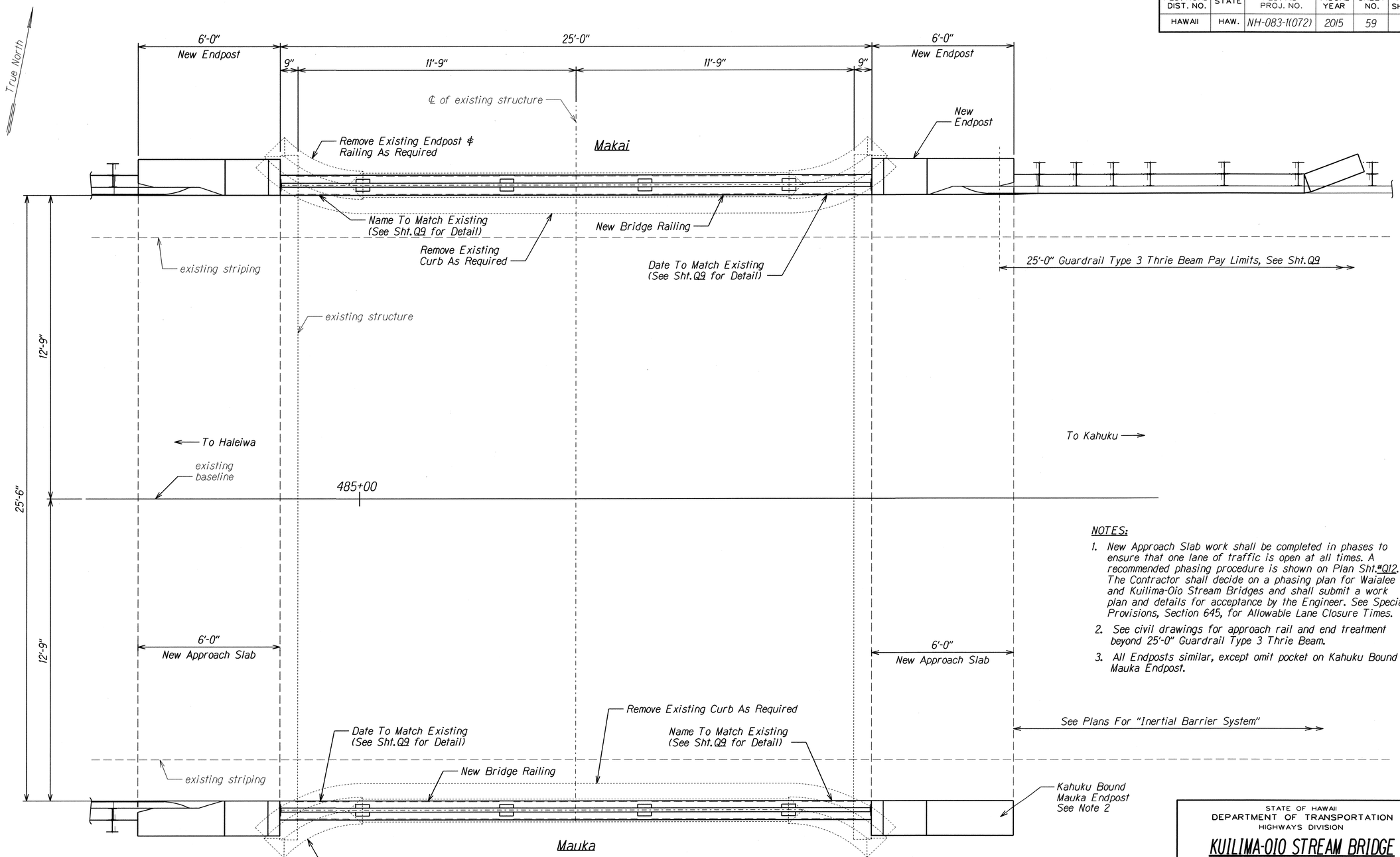
DAIRY ROAD TO LAIEWAI BRIDGE

FED. AID PROJ. NO. NH-083-1(072)

Scale: As Noted   Date: May, 2015

SHEET No. Q7 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(072)	2015	59	107



PLAN

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

NOTES:

1. New Approach Slab work shall be completed in phases to ensure that one lane of traffic is open at all times. A recommended phasing procedure is shown on Plan Sht. Q12. The Contractor shall decide on a phasing plan for Waialee and Kuilima-Oio Stream Bridges and shall submit a work plan and details for acceptance by the Engineer. See Special Provisions, Section 645, for Allowable Lane Closure Times.
2. See civil drawings for approach rail and end treatment beyond 25'-0" Guardrail Type 3 Thrie Beam.
3. All Endposts similar, except omit pocket on Kahuku Bound Mauka Endpost.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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db4/usr2/ksoj/lwn/DairyRoad

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

KUILIMA-OIO STREAM BRIDGE

PLAN

KAMEHAMEHA HIGHWAY RESURFACING

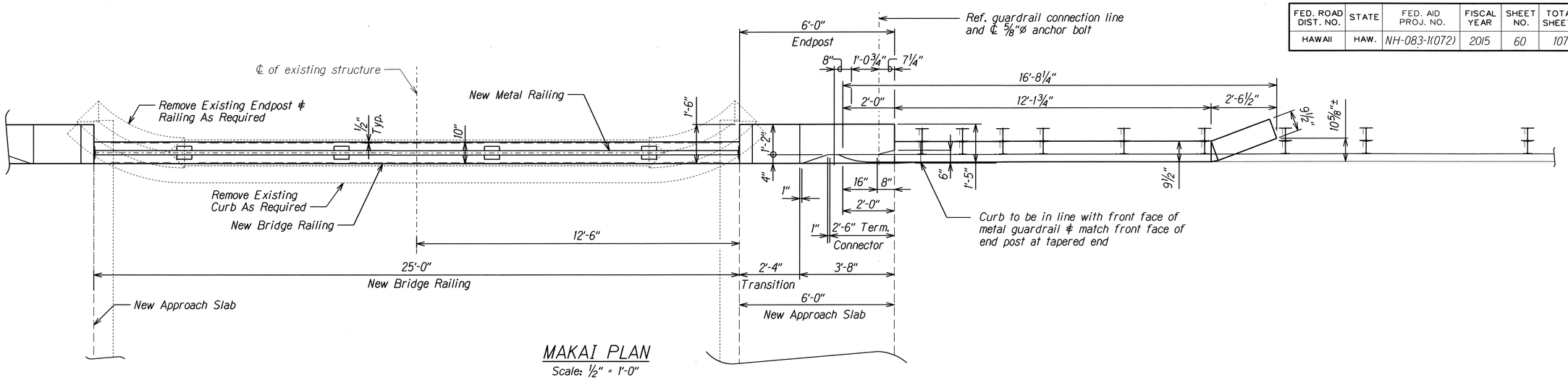
DAIRY ROAD TO LAIEWAI BRIDGE

FED. AID PROJ. NO. NH-083-1(072)

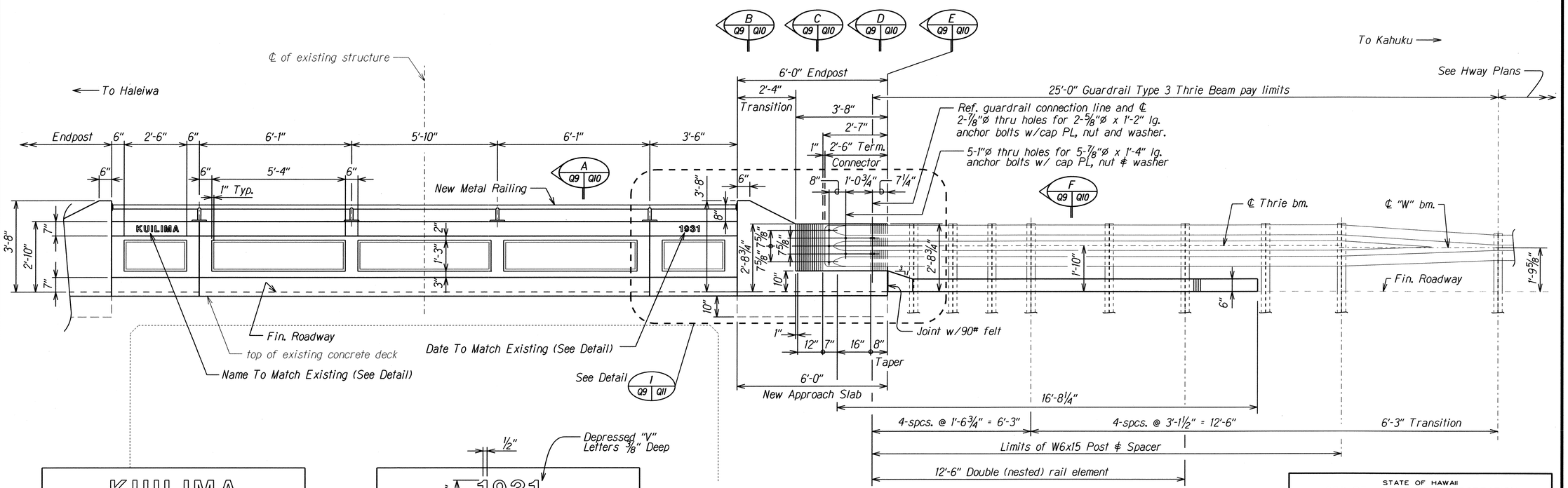
Scale: As Noted Date: May, 2015

SHEET No. Q8 OF 20 SHEETS

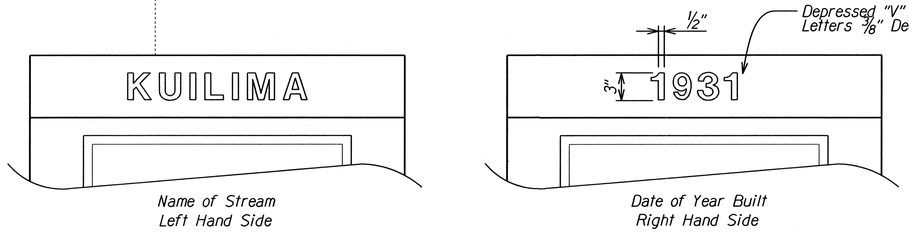
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(072)	2015	60	107



MAKAI PLAN
Scale: ½" = 1'-0"



MAKAI FRONT FACE ELEVATION
Scale: ½" = 1'-0"



TYPICAL DETAIL OF LETTERS AND FIGURES
Scale: 1½" = 1'-0"

Notes:

1. Inset Detail on Exterior Face similar.
2. All Endposts similar except omit pocket on Kahuku Bound Mauka Endpost.
3. See Sht. Q19 for Modified Delaware Retrofit. See Sht. Q20 for Metal Guardrail Type 3 Thrie Beam and Appurtenances details.
4. See civil drawings for Approach Rail and End Treatment beyond 25'-0" Guardrail Type 3 Thrie Beam.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

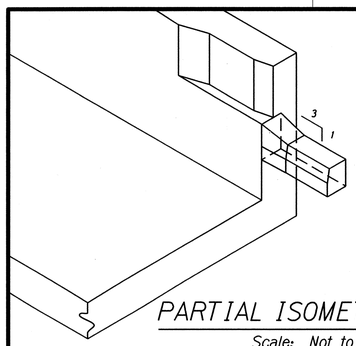
KUILIMA-010 STREAM BRIDGE

PLAN AND ELEVATIONS
KAMEHAMEHA HIGHWAY RESURFACING
DAIRY ROAD TO LAIEWAI BRIDGE
FED. AID PROJ. NO. NH-083-1(072)

Scale: As Noted Date: May, 2015

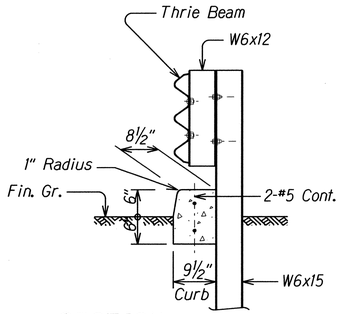
SHEET No. Q9 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(072)	2015	61	107



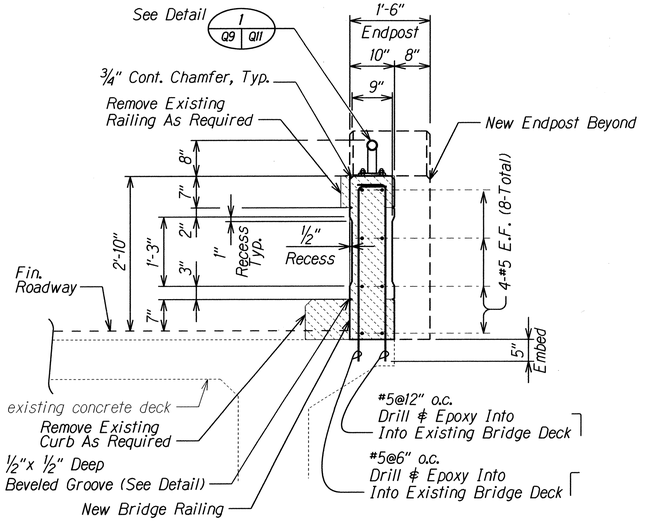
PARTIAL ISOMETRIC VIEW

Scale: Not to Scale



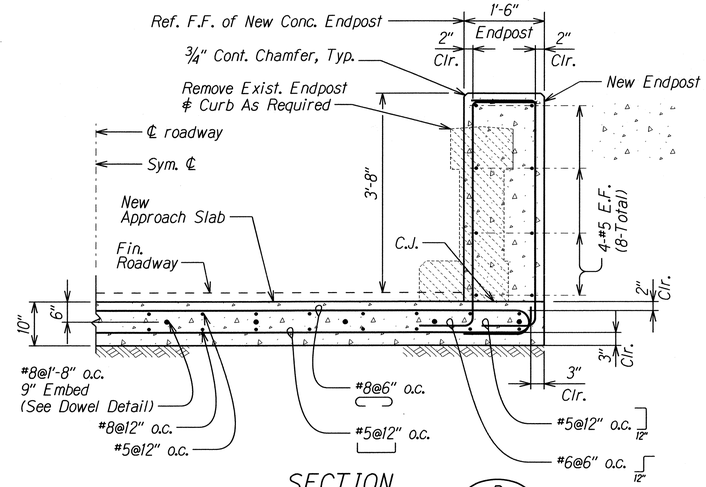
SECTION (F Q9 | Q10)

Scale: ¾" = 1'-0"



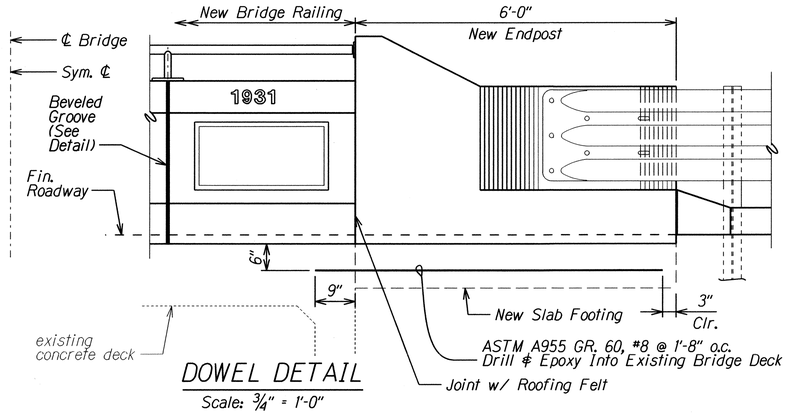
SECTION (A Q9 | Q10)

Scale: ¾" = 1'-0"



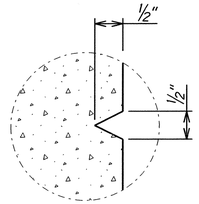
SECTION (B Q9 | Q10)

Scale: ¾" = 1'-0"



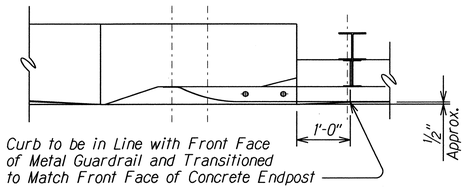
DOWEL DETAIL

Scale: ¾" = 1'-0"



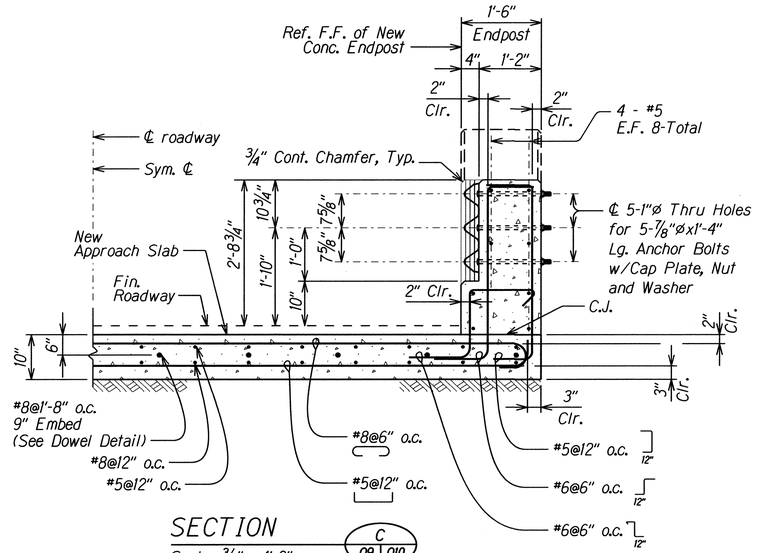
TYPICAL BEVELED GROOVE DETAIL

Scale: N.T.S.



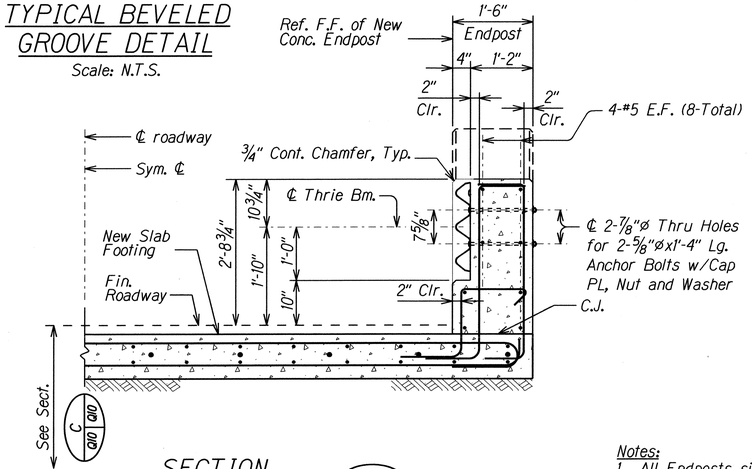
PARTIAL PLAN

Scale: ¾" = 1'-0"



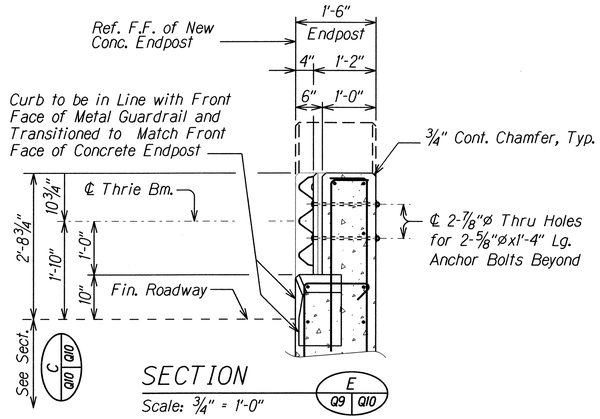
SECTION (C Q9 | Q10)

Scale: ¾" = 1'-0"



SECTION (D Q9 | Q10)

Scale: ¾" = 1'-0"



SECTION (E Q9 | Q10)

Scale: ¾" = 1'-0"

TYPICAL SECTIONS - ENDPOST DETAILS

Notes:

1. All Endposts similar, except omit pocket on Kahuku Bound Mauka Endpost.
2. At Kahuku Bound Mauka Endpost, reinforcing shall be similar to Section D Q9 | Q10
3. ▨ Denotes removal.

ORIGINAL PLAN	SURVEY PLOTTED BY
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NOTE BOOK	DESIGNED BY
	QUANTITIES BY
	CHECKED BY
	DATE

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

KUILIMA-010 STREAM BRIDGE

TYPE "D2" ENDPOST DETAILS

PARTIAL ISOMETRIC VIEW & TYP. SECTIONS

KAMEHAMEHA HIGHWAY RESURFACING

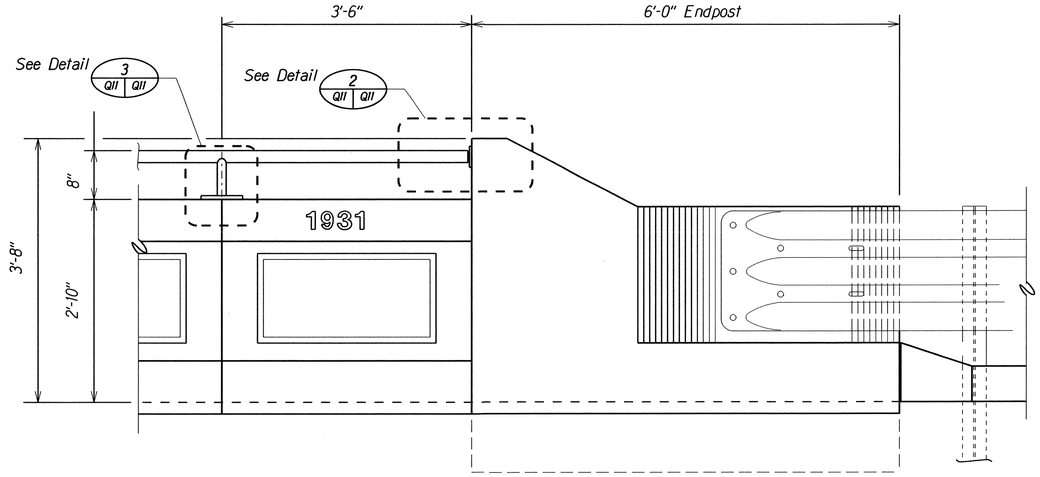
DAIRY ROAD TO LAIEWAI BRIDGE

FED. AID PROJ. NO. NH-083-1(072)

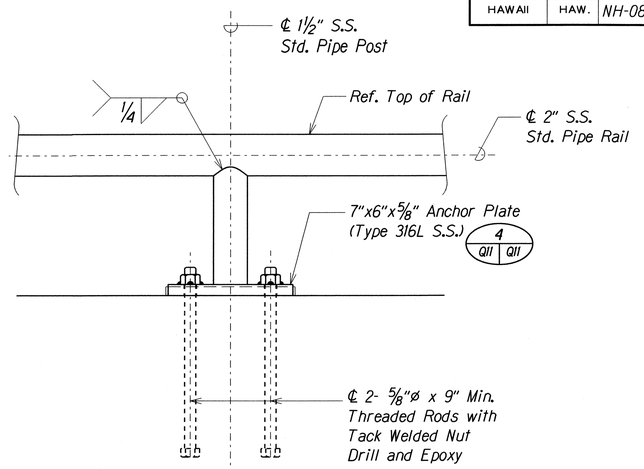
Scale: As Noted Date: May, 2015

SHEET No. Q10 OF 20 SHEETS

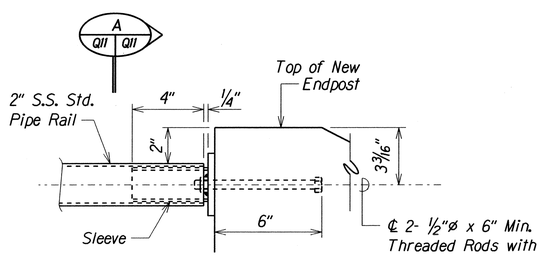
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(072)	2015	62	107



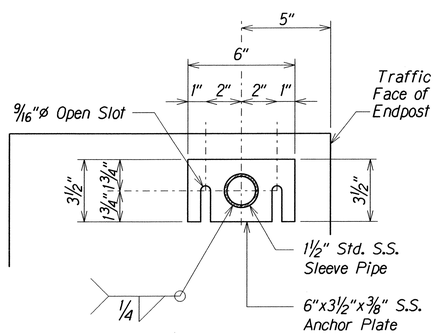
DETAIL
Scale: 1" = 1'-0"
1 Q9 Q11



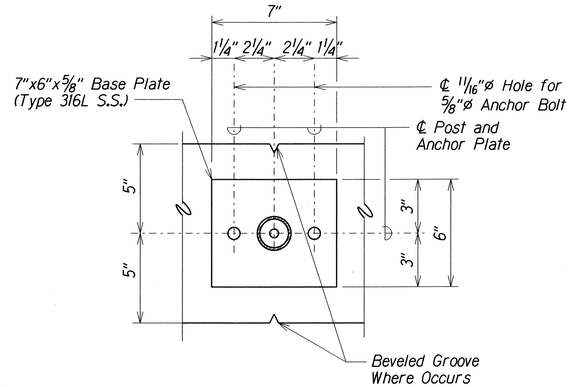
DETAIL
Scale: 3" = 1'-0"
3 Q11 Q11



DETAIL
Scale: 3" = 1'-0"
2 Q11 Q11



SECTION
Scale: 3" = 1'-0"
A Q11 Q11



ANCHOR PLATE DETAIL
Scale: 3" = 1'-0"
4 Q11 Q11

ORIGINAL PLAN
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

KUILIMA-010 STREAM BRIDGE

TYPICAL BRIDGE METAL RAILING DETAILS

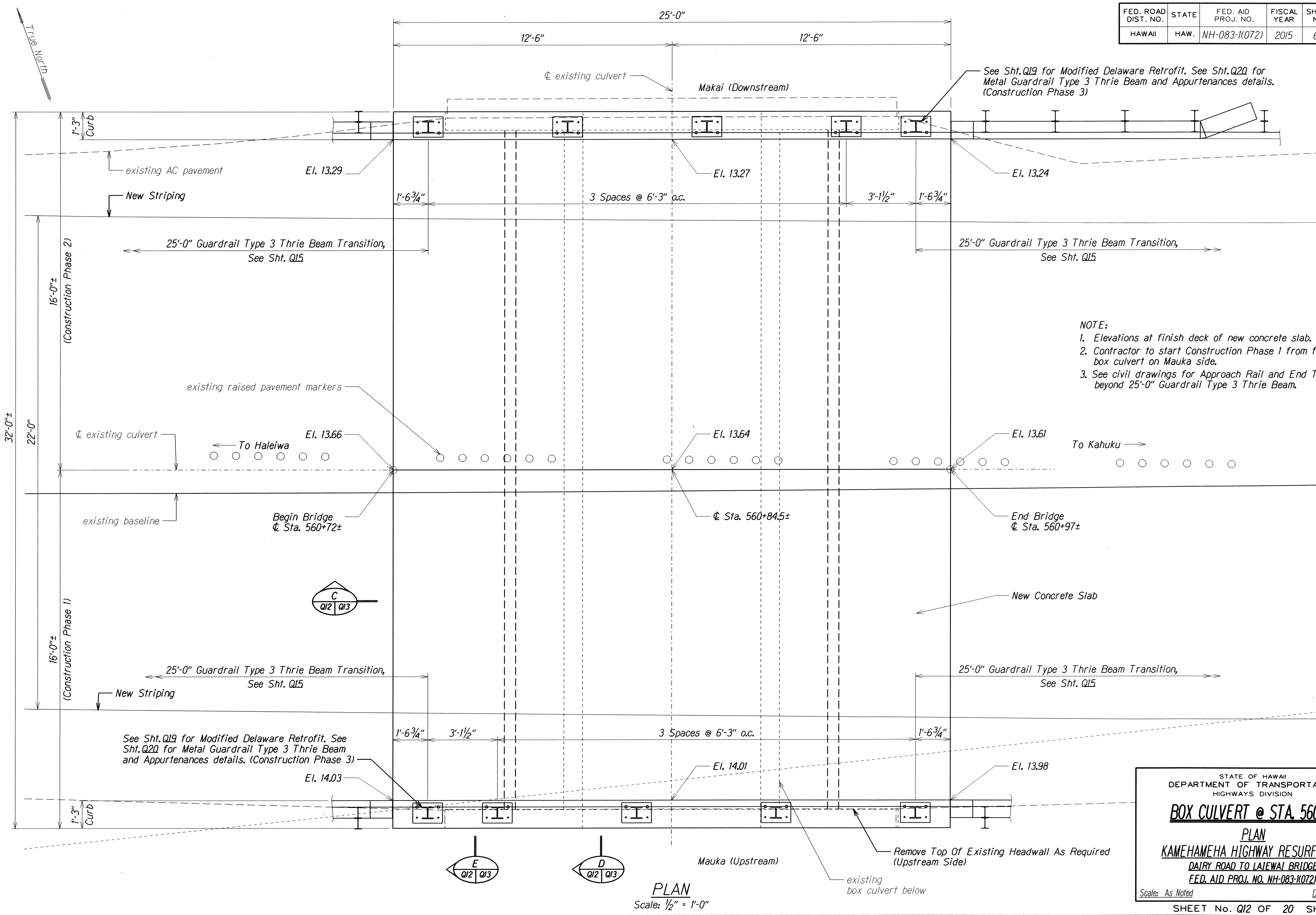
KAMEHAMEHA HIGHWAY RESURFACING

DAIRY ROAD TO LAIEWAI BRIDGE
FED. AID PROJ. NO. NH-083-1(072)

Scale: As Noted
Date: May, 2015

SHEET No. Q11 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(072)	2015	63	107



PLAN
Scale: ½" = 1'-0"

NOTE:
1. Elevations at finish deck of new concrete slab.
2. Contractor to start Construction Phase 1 from face of box culvert on Mauka side.
3. See civil drawings for Approach Rail and End Treatment beyond 25'-0" Guardrail Type 3 Thrie Beam.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BOX CULVERT @ STA. 560+82

PLAN

KAMEHAMEHA HIGHWAY RESURFACING

DAIRY ROAD TO LAIEWAI BRIDGE

FED. AID PROJ. NO. NH-083-1(072)

Scale: As Noted | Date: May, 2015

SHEET No. Q12 OF 20 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
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NOTE BOOK	DESIGNED BY	
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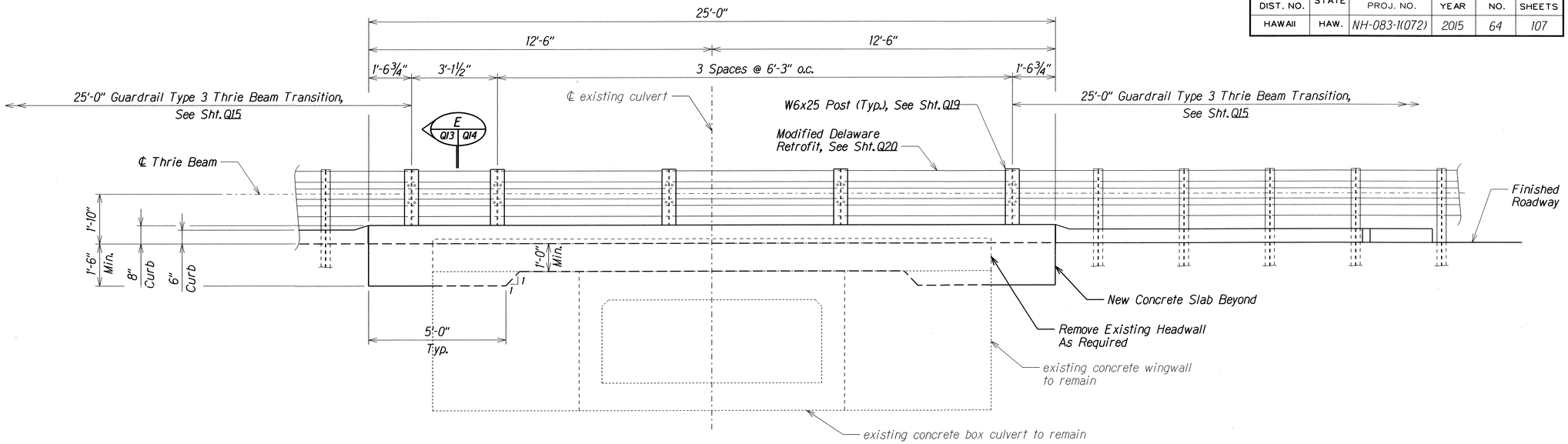
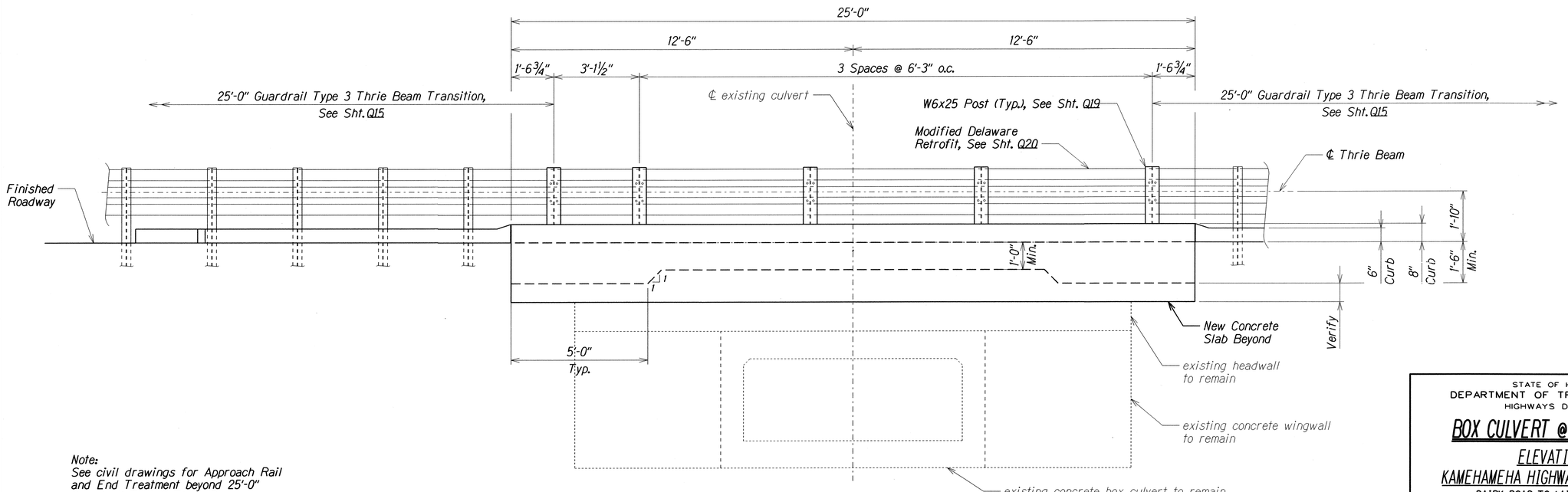
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(072)	2015	64	107



MAUKA ELEVATION - UPSTREAM

Scale: ½" = 1'-0"



MAKAI ELEVATION - DOWNSTREAM

Scale: ½" = 1'-0"

Note:
See civil drawings for Approach Rail and End Treatment beyond 25'-0" Guardrail Type 3 Thrie Beam.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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NOTE BOOK	DESIGNED BY	
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BOX CULVERT @ STA. 560+82

ELEVATIONS

KAMEHAMEHA HIGHWAY RESURFACING

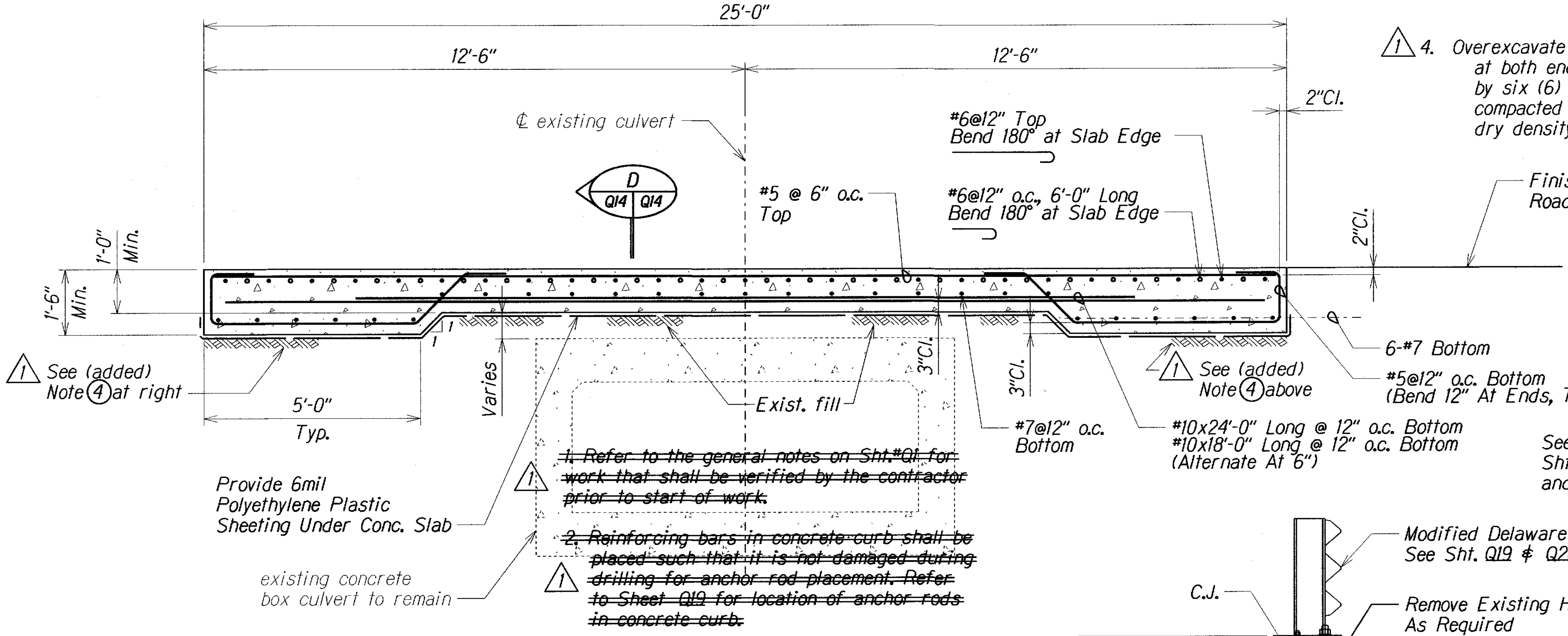
DAIRY ROAD TO LAIEWAI BRIDGE

FED. AID PROJ. NO. NH-083-1(072)

Scale: As Noted Date: May, 2015

SHEET No. Q13 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(072)	2015	ADD.65	107

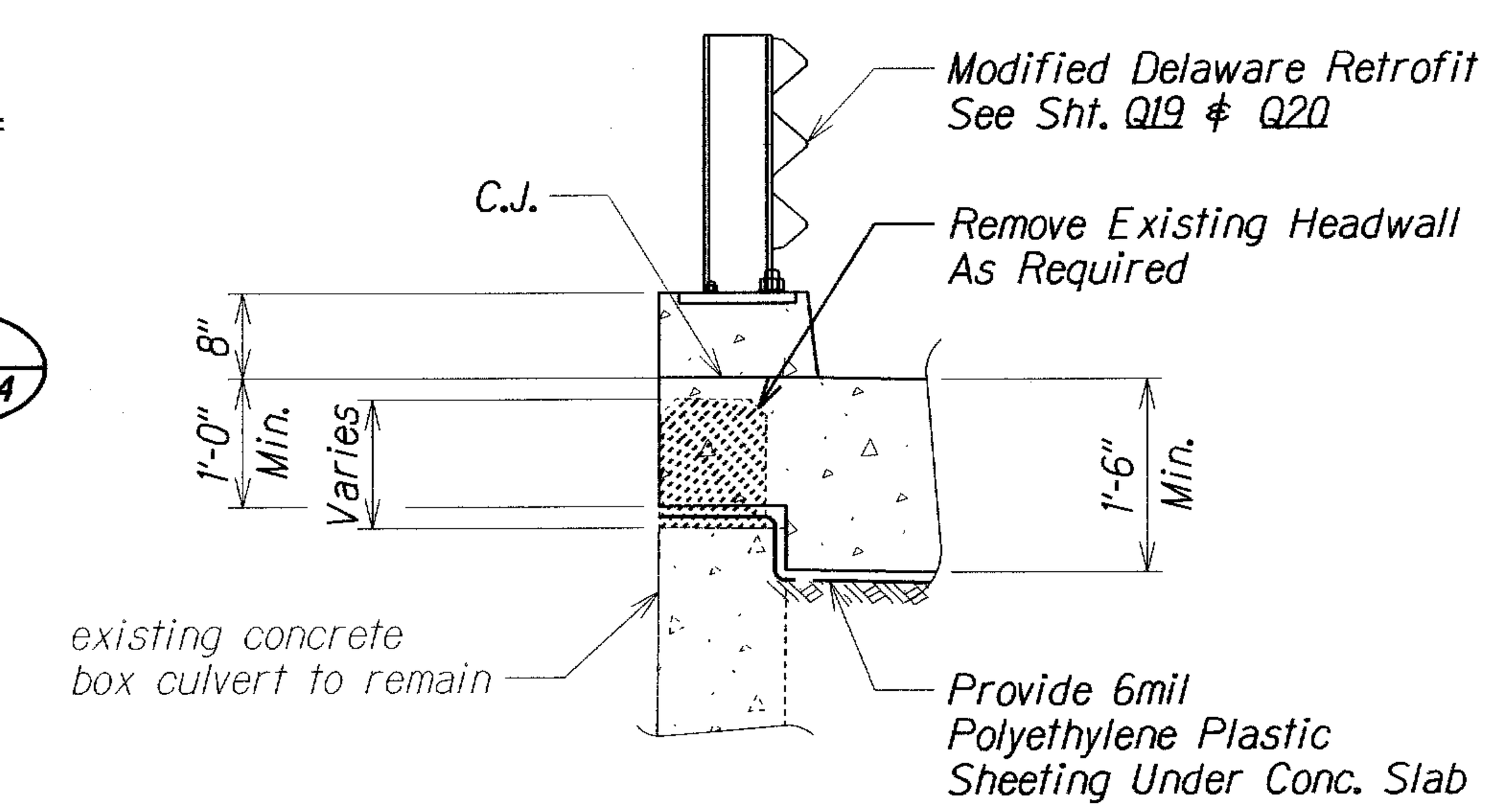


4. Overexcavate six (6) inches under the footing at both ends, place geotextile (716.06), followed by six (6) inches Aggregate Base Course compacted to at least 95% of its maximum dry density as determined by AASHTO T180.

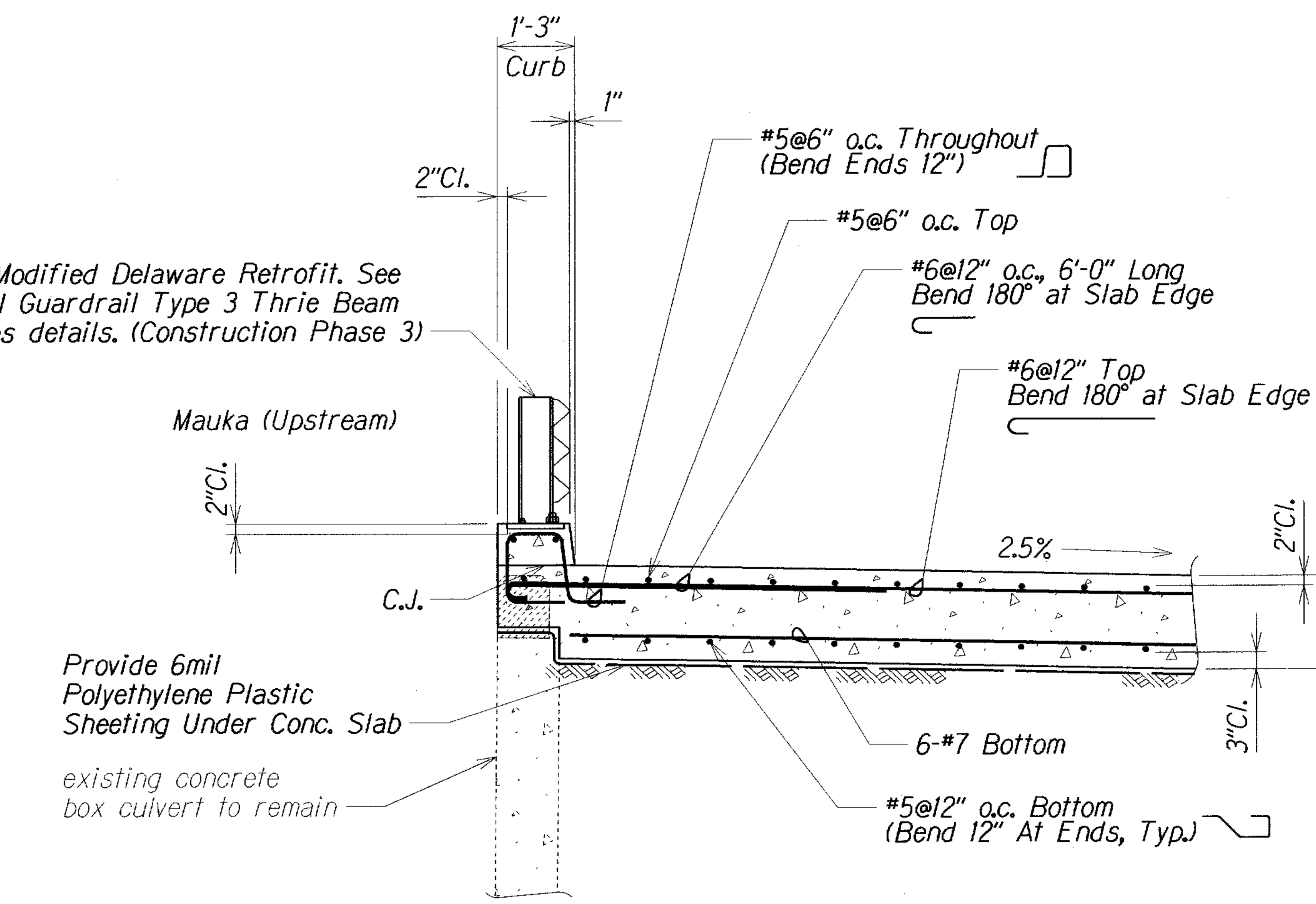
TYPICAL SLAB SECTION (C, Q12 | Q14)
Scale: ½" = 1'-0"

NOTES:

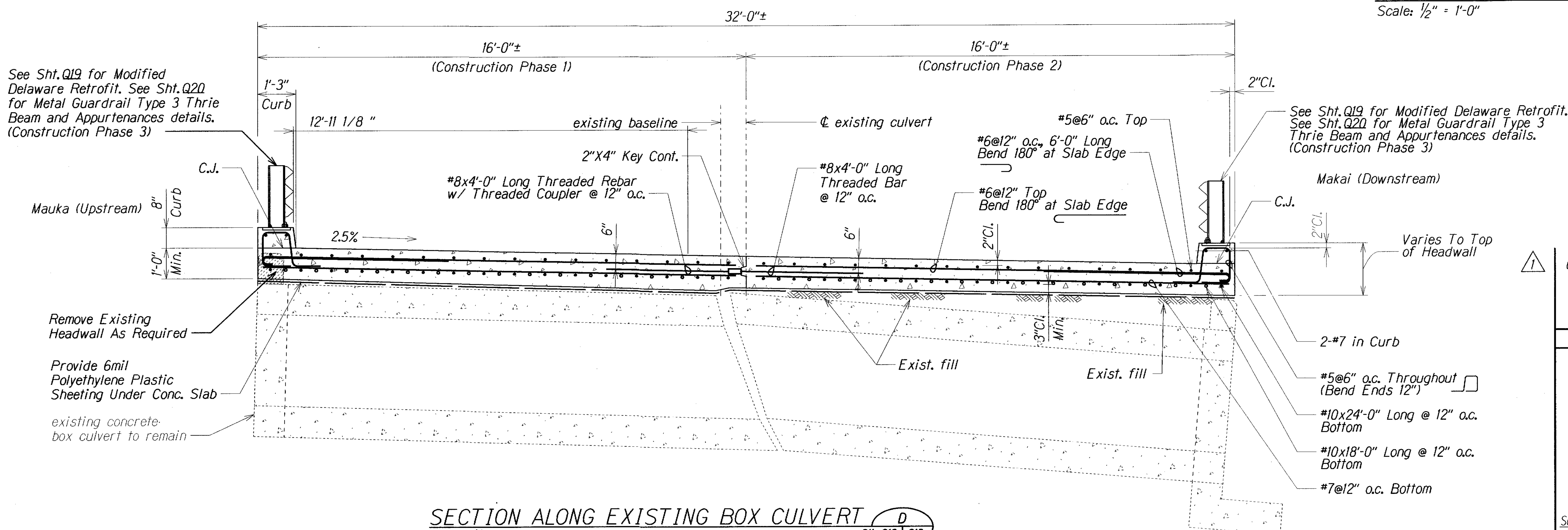
1. The finish deck elevations for the new concrete slab are higher than the existing roadway pavement elevations. During construction of the new concrete slab, the vertical riding surface drop-off between adjacent surfaces shall not exceed three (3)-inches as indicated in the General Notes on Sht.#Q1. Contractor shall submit a construction and phasing plan for review by the Engineer.
2. Refere to the General Notes on Sht.#Q1 for work that shall be verified by the Contractor prior to start of work.
3. Reinforcing bars in concrete curb shall be placed such that it is not damaged during drilling for anchor rod placement. Refer to Sht.#Q19 for location of anchor rods in concrete curb.



HEADWALL DETAIL - MAUKA (UPSTREAM)
Scale: ⅜" = 1'-0"



SECTION AT EXISTING BOX CULVERT HEADWALL/WINGWALL (E, Q12, Q13 | Q14)
Scale: ½" = 1'-0"



SECTION ALONG EXISTING BOX CULVERT (D, Q11, Q13 | Q13)
Scale: ½" = 1'-0"

DATE	REVISION
6/1/15	Added Note 4 re: Overexcavate. Delete Notes 1 & 2 in Typical Slab Section "C", (repeat of Notes 2 & 3 below Section "C").

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BOX CULVERT @ STA. 560+82

SECTION & DETAILS

KAMEHAMEHA HIGHWAY RESURFACING

DAIRY ROAD TO LAIEWAI BRIDGE

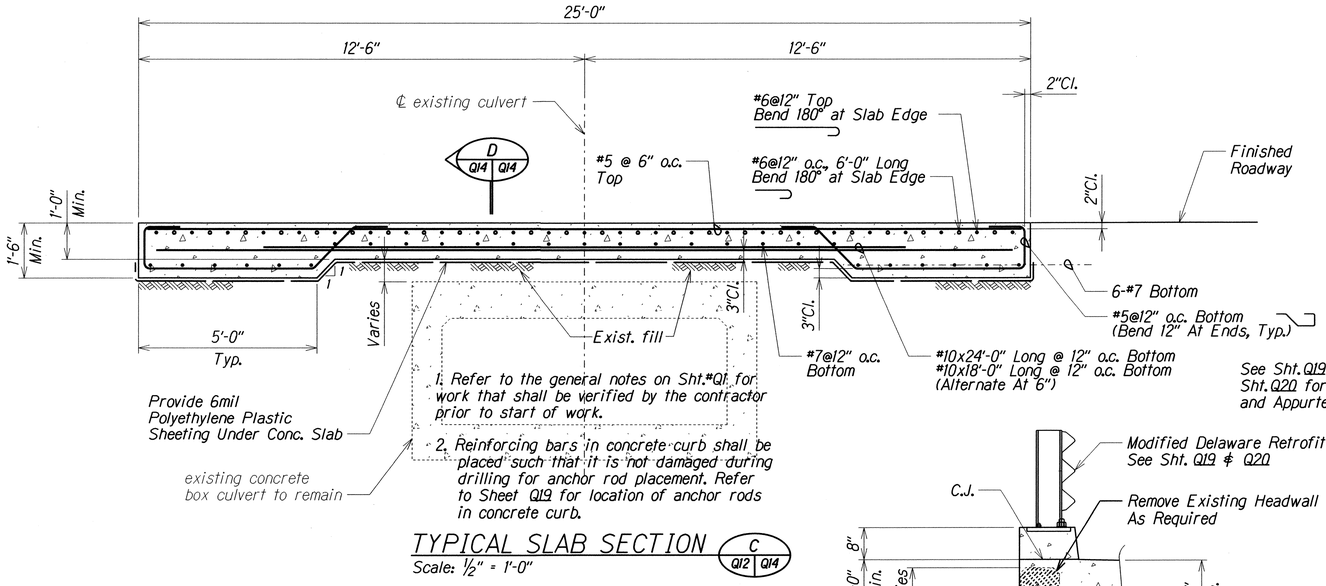
FED. AID PROJ. NO. NH-083-1(072)

Scale: As Noted — Date: May, 2015

SHEET No. Q14 OF 20 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY / DRAWN BY / TRACED BY / DESIGNED BY / QUANTITIES BY / CHECKED BY	DATE
NOTE BOOK	kam_q14_add	db4/usr2/ksg/jwm/DairyRoad

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(072)	2015	65	107



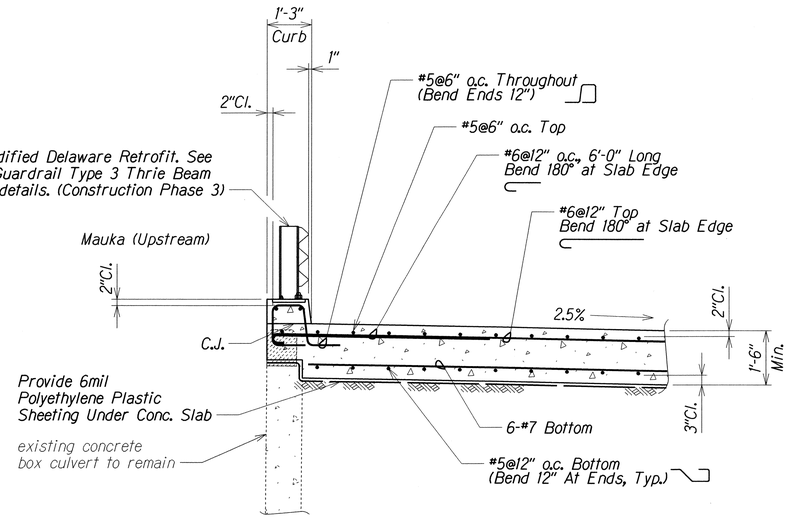
TYPICAL SLAB SECTION

C Q12 | Q14

Scale: ½" = 1'-0"

HEADWALL DETAIL - MAUKA (UPSTREAM)

Scale: ⅜" = 1'-0"



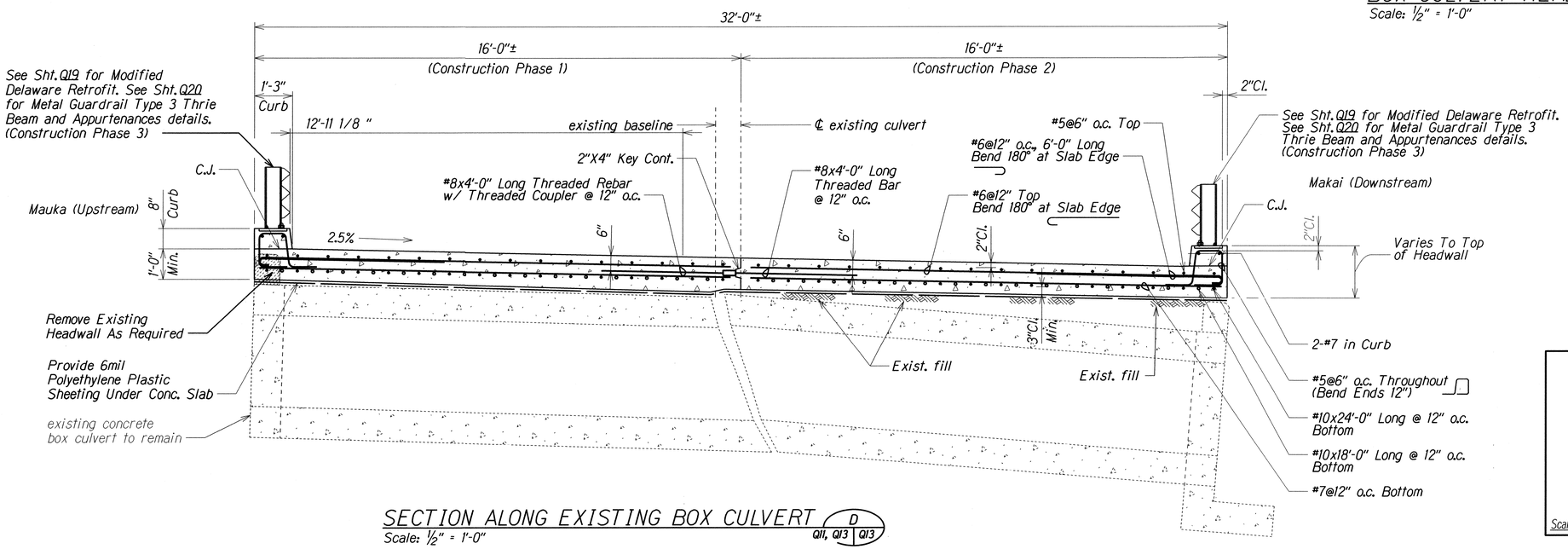
SECTION AT EXISTING BOX CULVERT HEADWALL/WINGWALL

E Q12, Q13 | Q14

Scale: ½" = 1'-0"

NOTES:

1. The finish deck elevations for the new concrete slab are higher than the existing roadway pavement elevations. During construction of the new concrete slab, the vertical riding surface drop-off between adjacent surfaces shall not exceed three (3)-inches as indicated in the General Notes on Sht.#Q1. Contractor shall submit a construction and phasing plan for review by the Engineer.
2. Refere to the General Notes on Sht.#Q1 for work that shall be verified by the Contractor prior to start of work.
3. Reinforcing bars in concrete curb shall be placed such that it is not damaged during drilling for anchor rod placement. Refer to Sht.#Q19 for location of anchor rods in concrete curb.



SECTION ALONG EXISTING BOX CULVERT

D Q11, Q13 | Q13

Scale: ½" = 1'-0"

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
NOTE BOOK
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BOX CULVERT @ STA. 560+82

SECTION & DETAILS

KAMEHAMEHA HIGHWAY RESURFACING

DAIRY ROAD TO LAIEWAI BRIDGE

FED. AID PROJ. NO. NH-083-1(072)

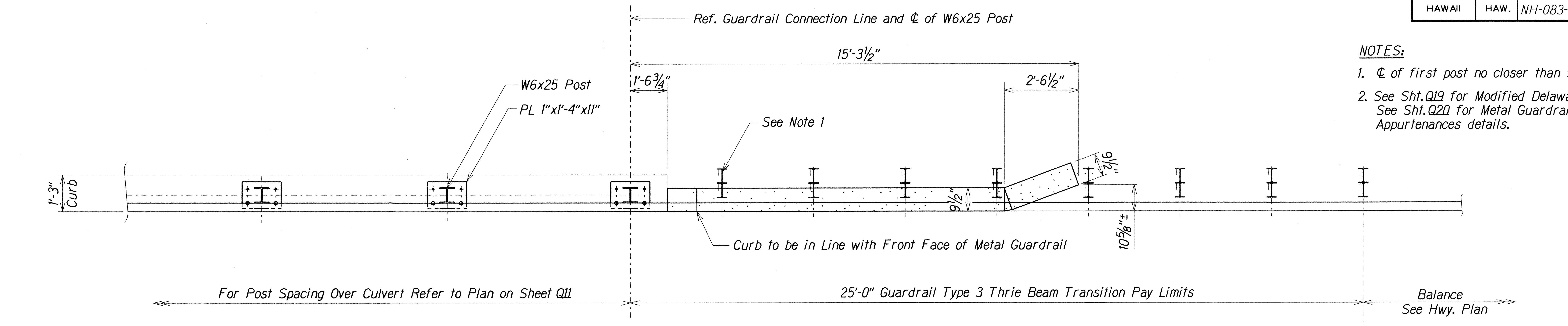
Scale: As Noted | Date: May, 2015

SHEET No. Q14 OF 20 SHEETS

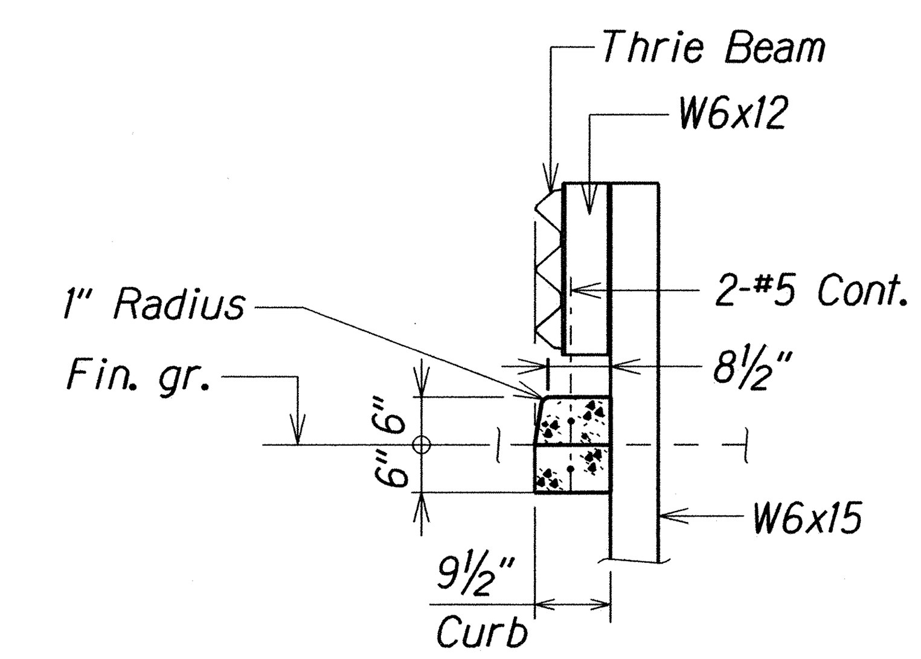
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(072)	2015	66	107

NOTES:

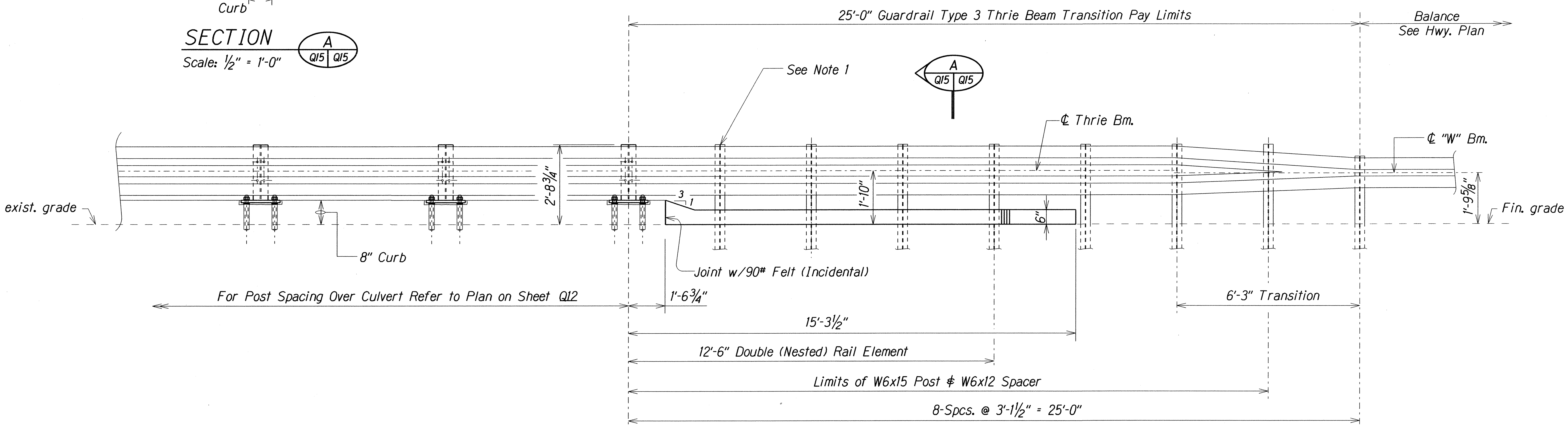
1. ℄ of first post no closer than 9" to end of curb.
2. See Sht. Q19 for Modified Delaware Retrofit. See Sht. Q20 for Metal Guardrail Type 3 Thrie Beam and Appurtenances details.



PLAN
Scale: ½" = 1'-0"



SECTION A Q15 Q15
Scale: ½" = 1'-0"



ELEVATION
Scale: ½" = 1'-0"

MODIFIED DELAWARE RETROFIT ENDPOST PLAN, ELEVATION & SECTION

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
NOTE BOOK No. kam_q15.dgn
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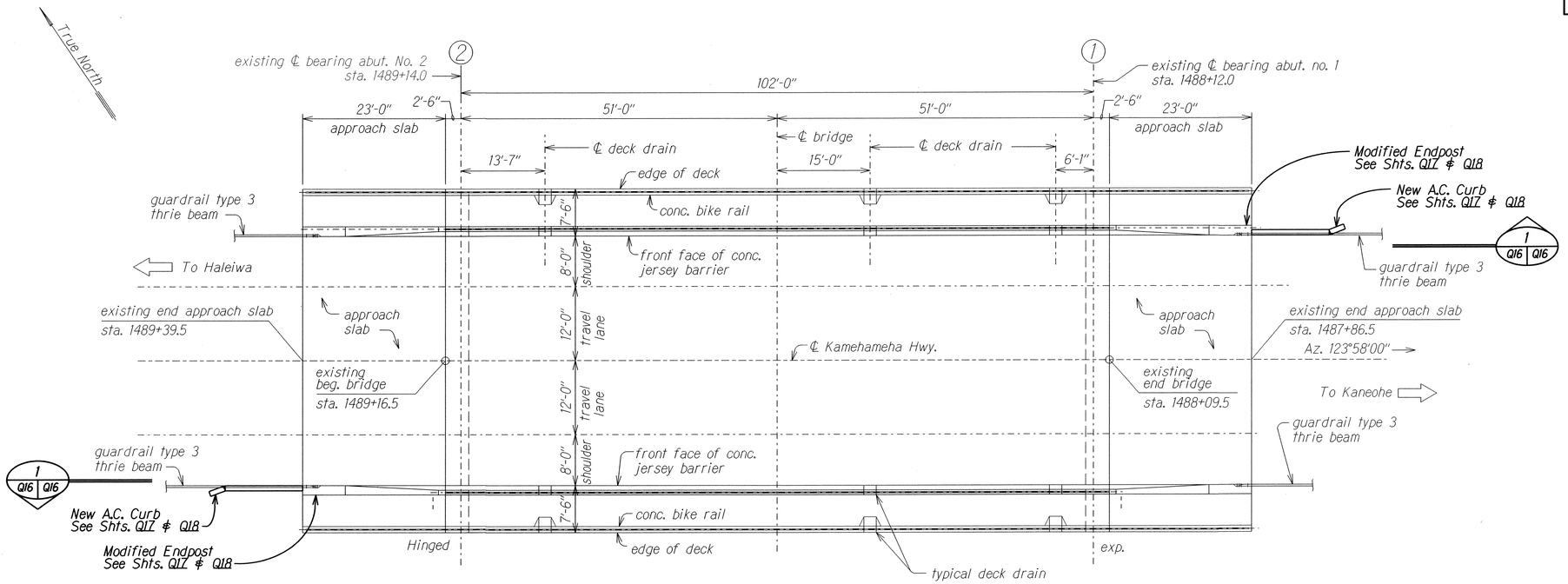
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BOX CULVERT @ STA. 560+82
MODIFIED DELAWARE RETROFIT
PLAN, ELEVATION & SECTION
KAMEHAMEHA HIGHWAY RESURFACING
DAIRY ROAD TO LAIEWAI BRIDGE
FED. AID PROJ. NO. NH-083-1(072)

Scale: As Noted   Date: May, 2015

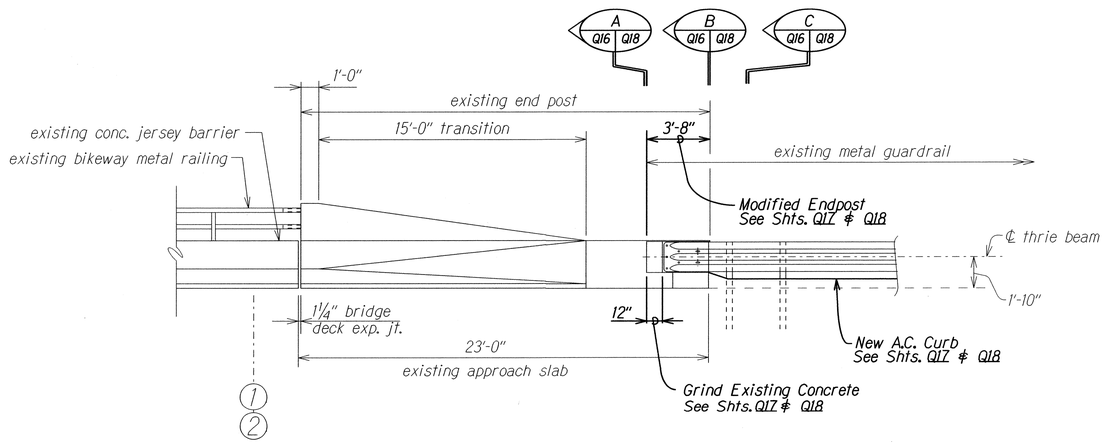
SHEET No. Q15 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(072)	2015	67	107



PLAN

Scale: 1"=10'-0"



CONCRETE JERSEY BARRIER ELEVATION

1 Q16 | Q16

Scale: ¼" = 1'-0"

Notes:

1. Cost for modified endpost work at approach only, including grinding existing concrete and cutting existing reinforcing, and new A.C. curb shall be considered incidental to hot-mix asphalt (HMA) pavement.
2. Work is for modifying existing endpost and construction of new A.C. curb. See Sht.#QI7 for Modified Endpost Plan and Elevation, and Sht.#Q18 for Endpost Details.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	TRACED BY	
NOTE BOOK	DESIGNED BY	
kam_q16.dgn	QUANTITIES BY	
	CHECKED BY	

@4 /usr2/ksg/wm/DairyRoad/

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

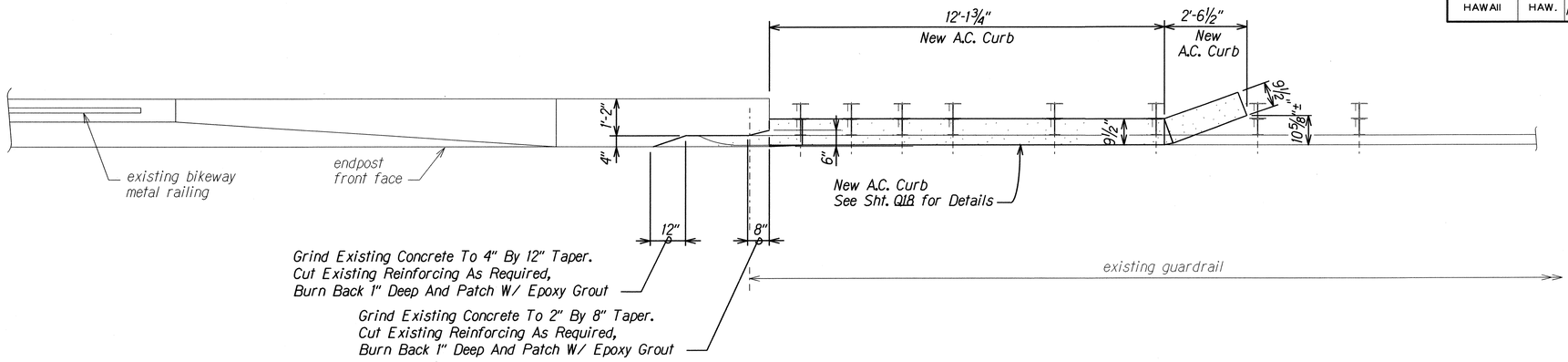
MALAEKAHANA STREAM BRIDGE

PLAN AND ELEVATION
KAMEHAMEHA HIGHWAY RESURFACING
DAIRY ROAD TO LAIEWAI BRIDGE
FED. AID PROJ. NO. NH-083-1(072)

Scale: As Noted Date: May, 2015

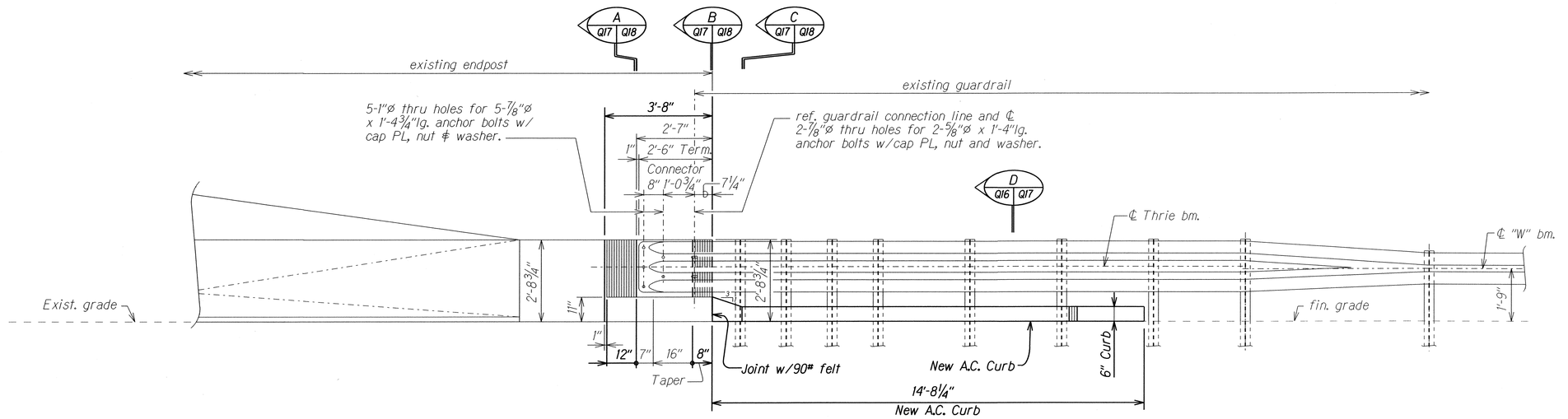
SHEET No. Q16 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(072)	2015	68	107



PLAN

Scale: ½" = 1'-0"



ELEVATION

Scale: ½" = 1'-0"

MODIFIED ENDPOST PLAN AND ELEVATION

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	TRACED BY	
NOTE BOOK	DESIGNED BY	
kam_q17.dgn	QUANTITIES BY	
No.	CHECKED BY	

db4:/usr2/hsy/lwn/DairyRoad/

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

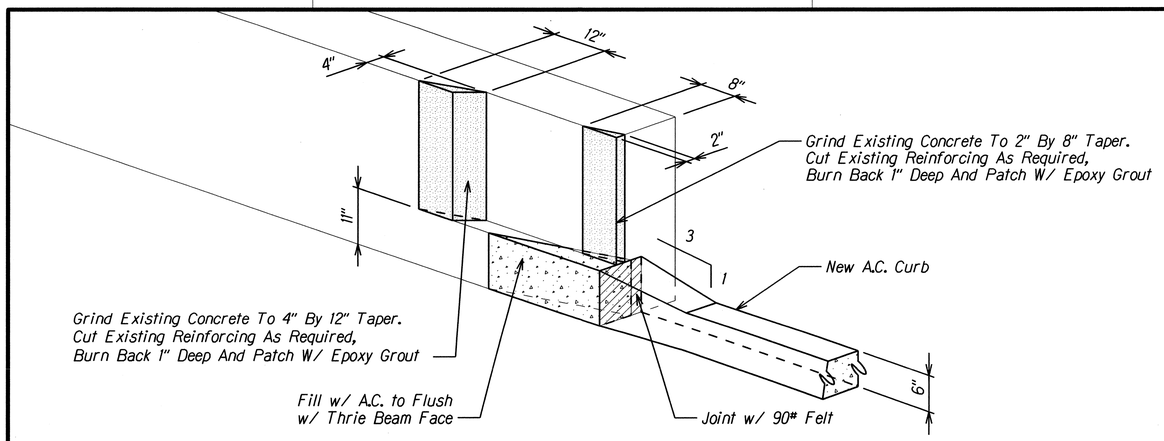
MALAEKAHANA STREAM BRIDGE

PLAN AND ELEVATION
KAMEHAMEHA HIGHWAY RESURFACING
DAIRY ROAD TO LAIEWAI BRIDGE
FED. AID PROJ. NO. NH-083-1(072)

Scale: As Noted Date: May, 2015

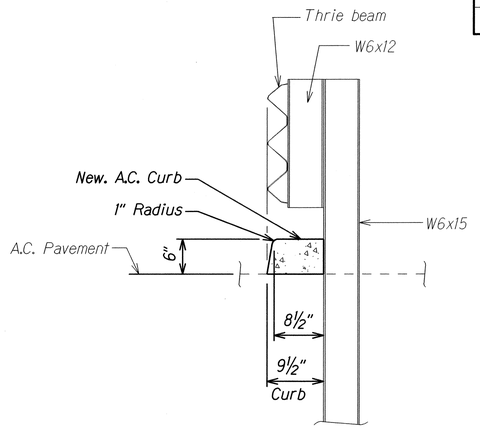
SHEET No. Q17 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(072)	2015	69	107

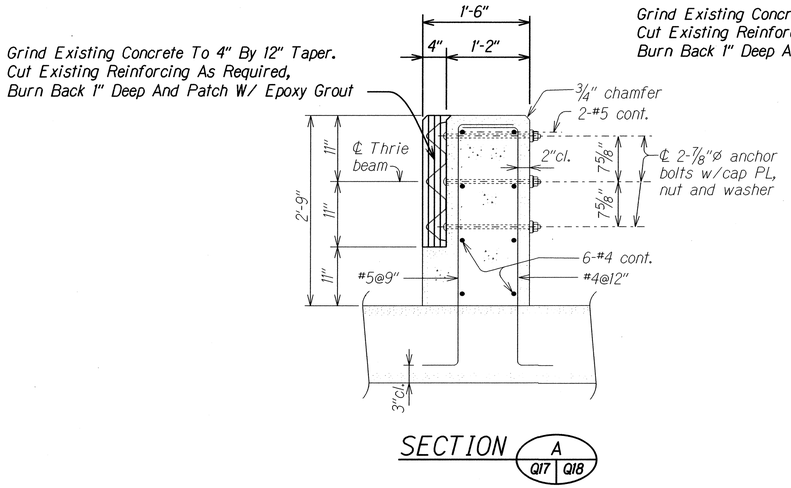


PARTIAL ISOMETRIC VIEW MODIFIED ENDPOST

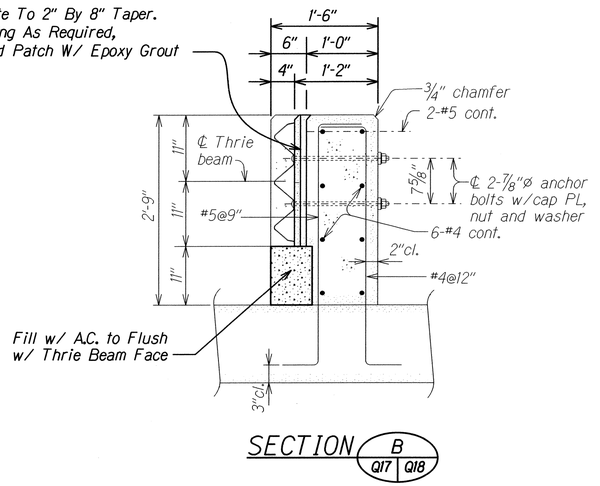
Not to Scale



SECTION D (Q17 | Q18)



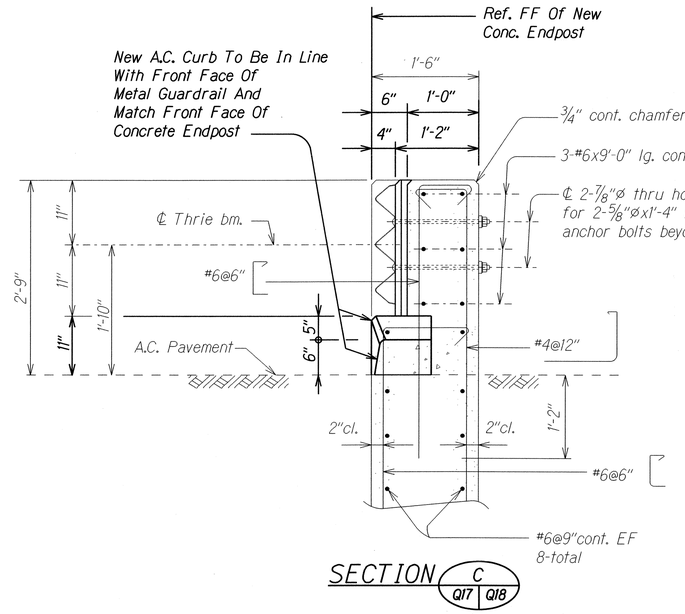
SECTION A (Q17 | Q18)



SECTION B (Q17 | Q18)

END POST DETAILS

Scale: 1"=1'-0"



SECTION C (Q17 | Q18)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

MALAEKAHANA STREAM BRIDGE

CONCRETE BIKE RAIL & CONCRETE JERSEY BARRIER ELEVATION, END POST DETAILS

KAMEHAMEHA HIGHWAY RESURFACING
DAIRY ROAD TO LAIEWAI BRIDGE
FED. AID PROJ. NO. NH-083-1(072)

Scale: As Noted Date: May, 2015

SHEET No. Q18 OF 20 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	TRACED BY	
NOTE BOOK	DESIGNED BY	
kam_q18.dgn	QUANTITIES BY	
	CHECKED BY	

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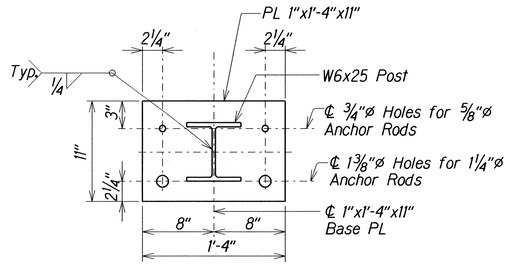
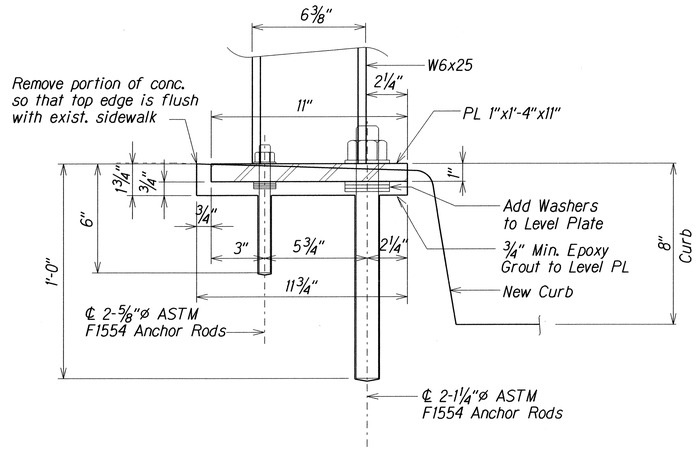
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(072)	2015	70	107

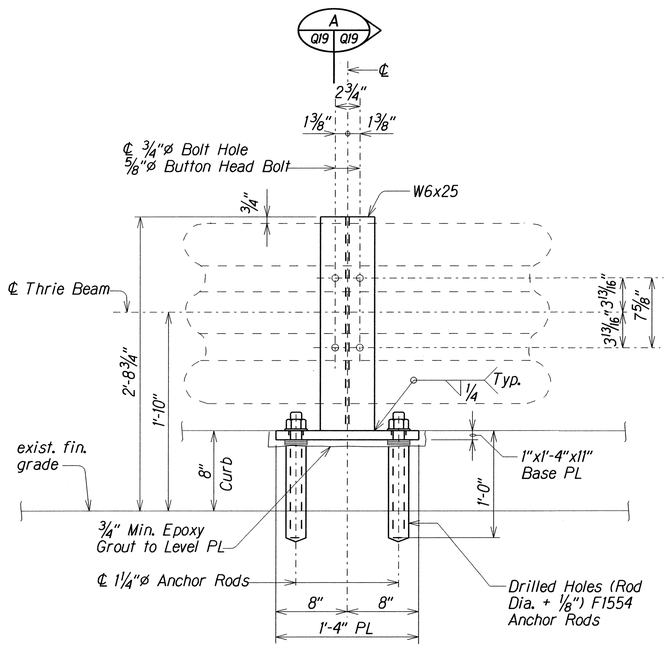


PLAN

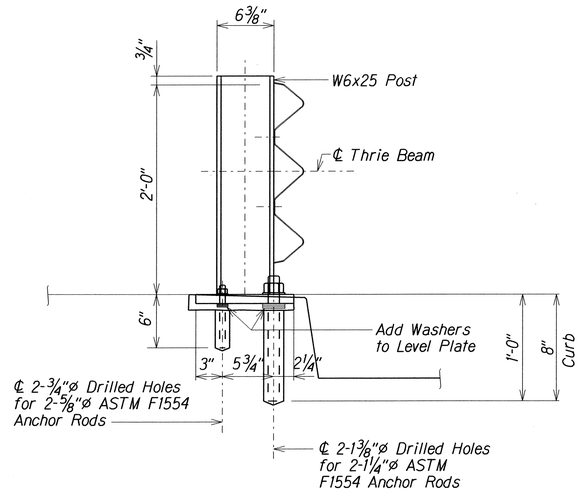


TYPICAL THRIE BEAM POST DETAIL

Scale: 3"=1'-0"



ELEVATION



SECTION A (Q19 | Q19)

BASE PL DETAIL

Scale: 1½"=1'-0"

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

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

MODIFIED DELAWARE RETROFIT
BASE PLATE AND THRIE BEAM POST DETAILS
KAMEHAMEHA HIGHWAY RESURFACING
DAIRY ROAD TO LAIEWAI BRIDGE
FED. AID PROJ. NO. NH-083-1(072)

Scale: As Noted Date: May, 2015

SHEET No. Q19 OF 20 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(072)	2015	71	107

NOTES:

A. The work necessary to construct the Modified Delaware Retrofit shall include all labor, materials, tools, equipment and incidentals necessary to complete the work and will not be paid for separately.

B. Lap terminal connector and rail element in direction of traffic to prevent snagging.

C. All anchor bolts shall be high strength bolts conforming to the requirements of ASTM 325 and Standard Specifications, Section 713.04.

D. Anchor bolt length shall be such that a snug fit of the elements and full thread engagement plus 1/4" (max) is attained.

E. "Terminal Connector", "Transition Section" and thrie beam shall be fabricated from 10 gauge steel conforming to the requirements of AASHTO M180, Type II, Class B.

F. "Terminal Connector" and standard spacer, including all anchor bolts, cap PL, nuts and washers, shall be hot-dip galvanized after fabrication.

G. Cap PL shall be fabricated from ASTM A36.

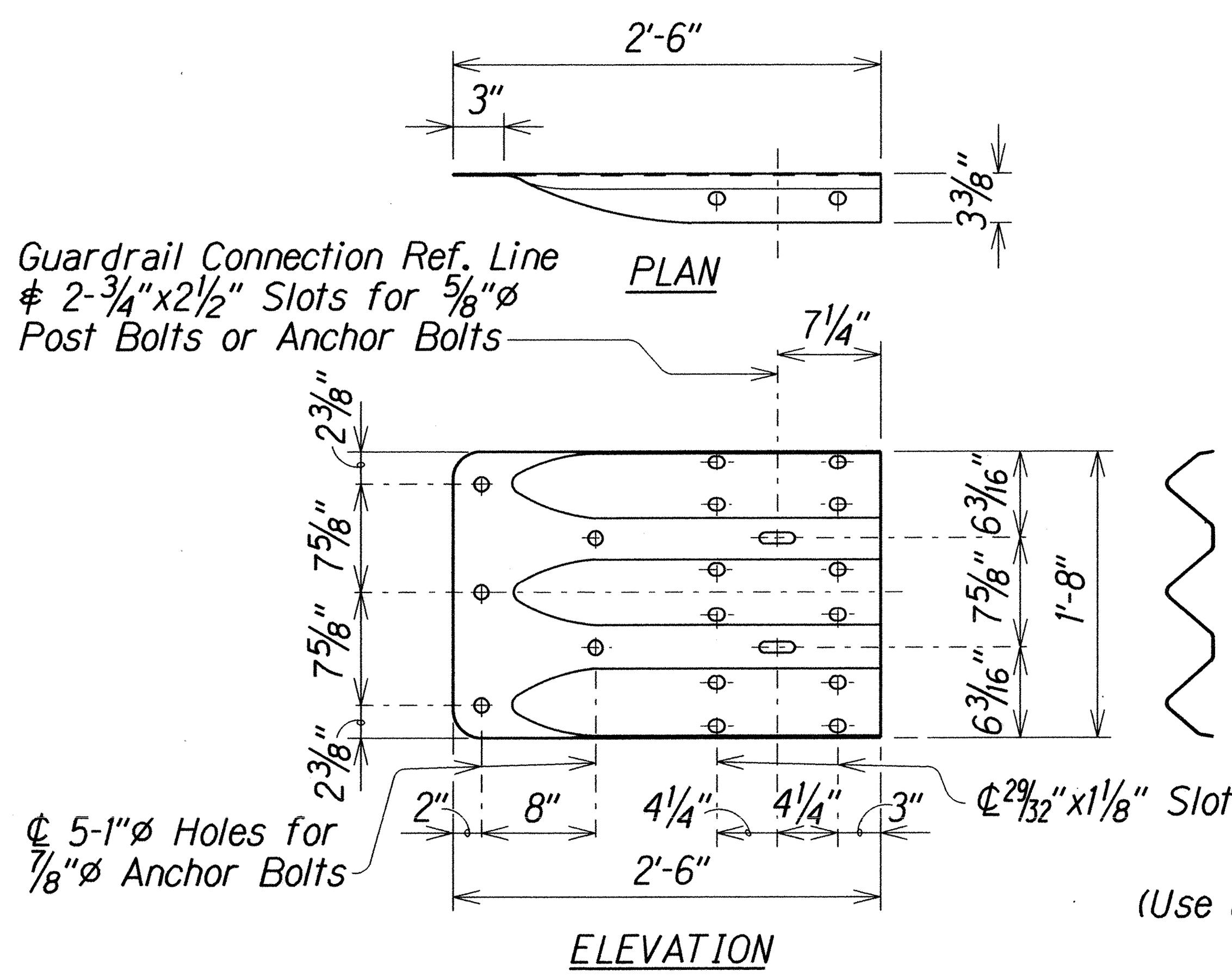
H. First 25'-0" of guardrail adjoining "Terminal Connector" shall be galvanized steel and supports spaced as shown on the detail drawings. This section of rail shall be placed on tangent to end post or parallel to roadway, unless conditions at site render it impossible to do so. Flare point to be determined in field.

I. 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.

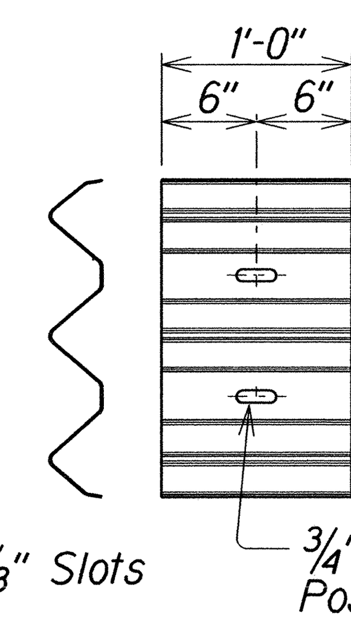
J. Where double (nested) beam occurs, 12" "Back-up Plate" not required.

K. Heads of through anchor bolts shall be placed on the traffic side of the rail.

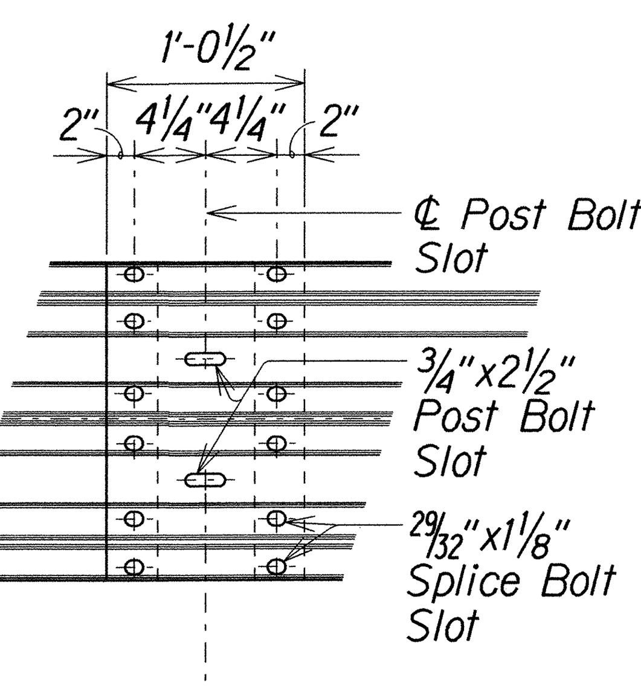
L. All steel shapes, rails and plates shall conform to ASTM A36 specifications.



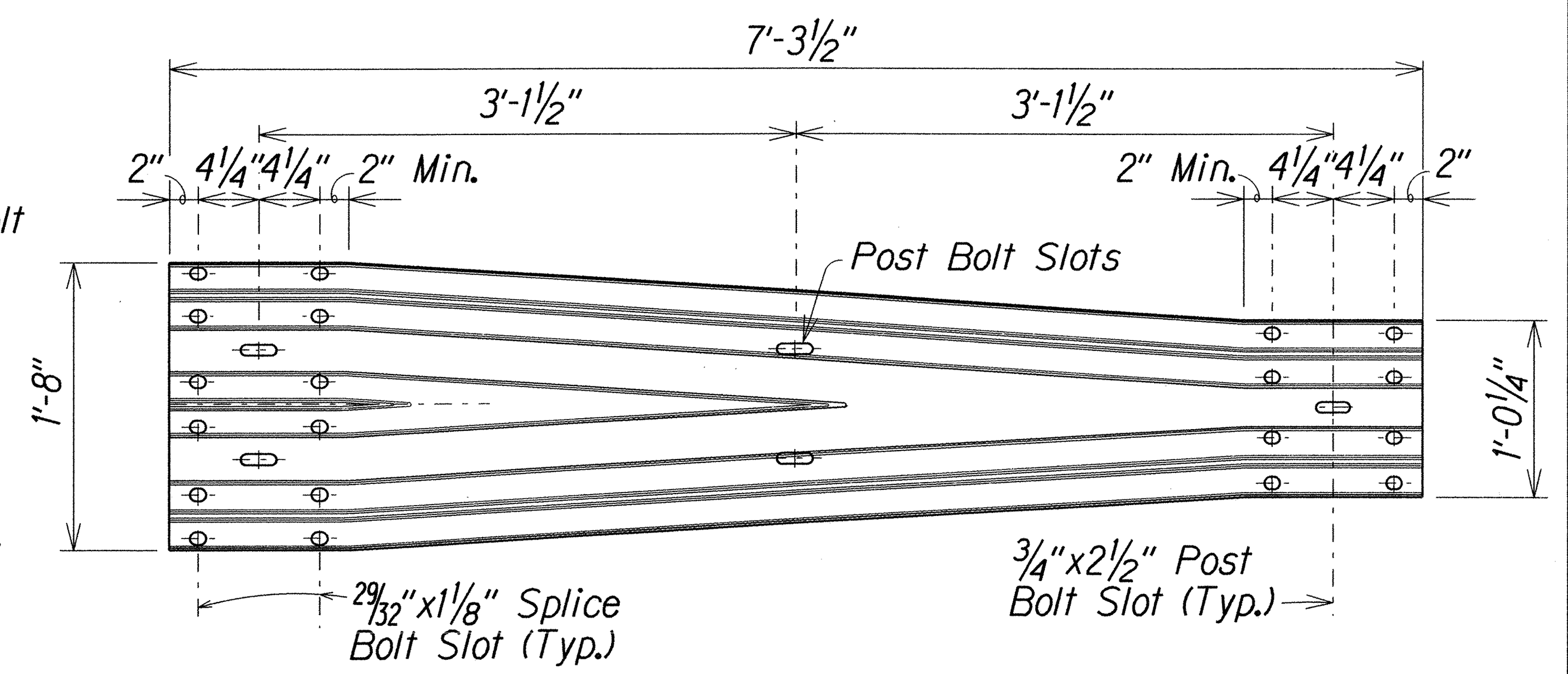
TERMINAL CONNECTOR
Scale: 1" = 1'-0"



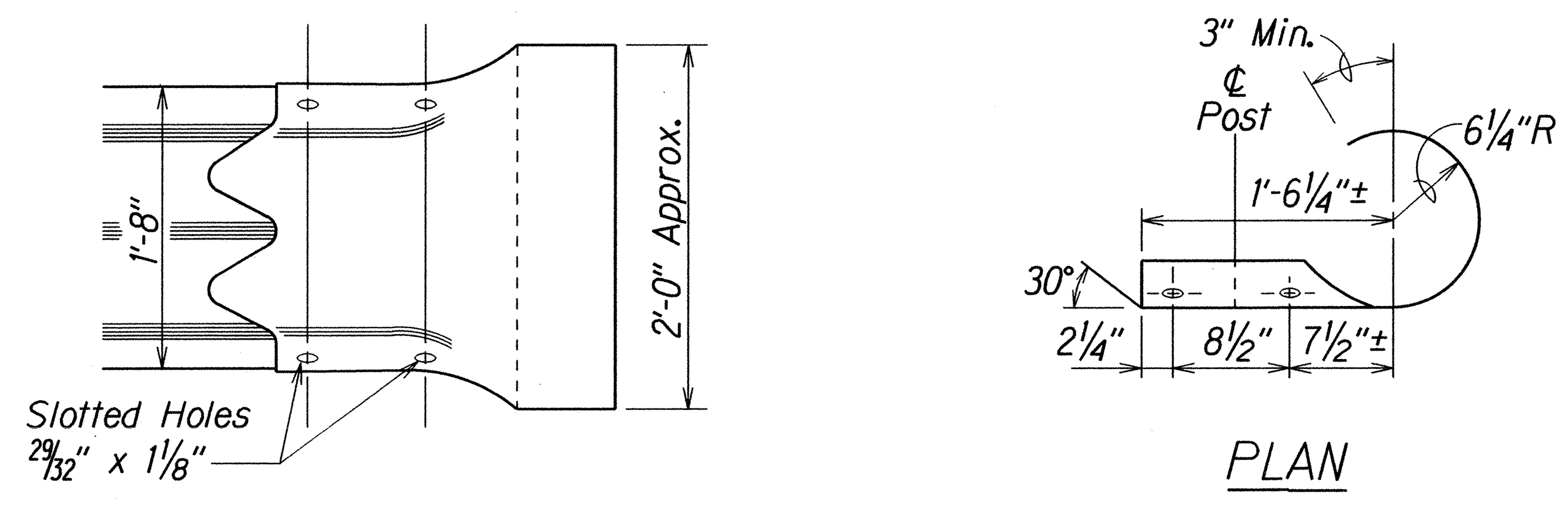
BACKUP PLATE
Scale: 1" = 1'-0"



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

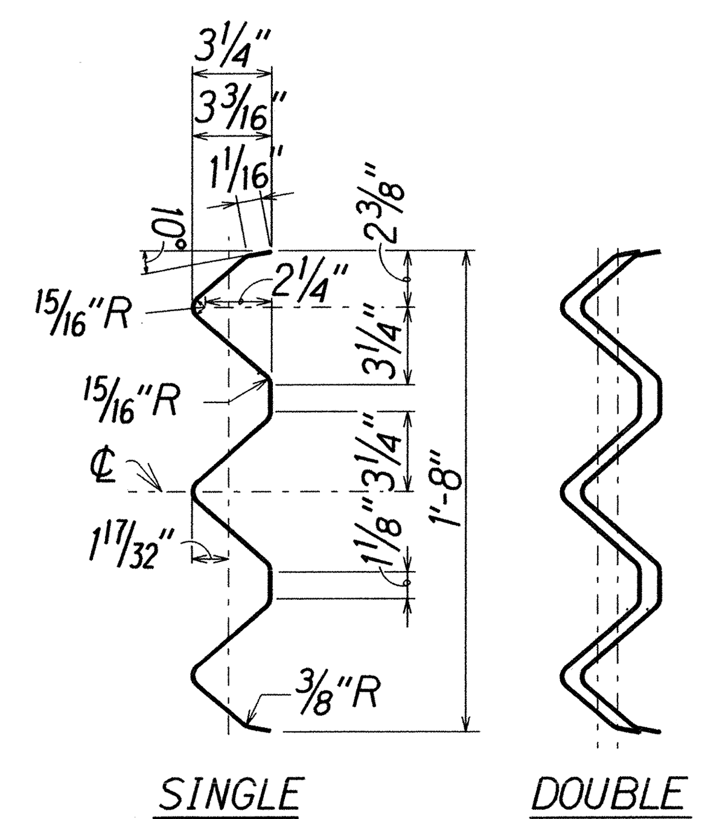


TRANSITION SECTION
Scale: 1" = 1'-0"

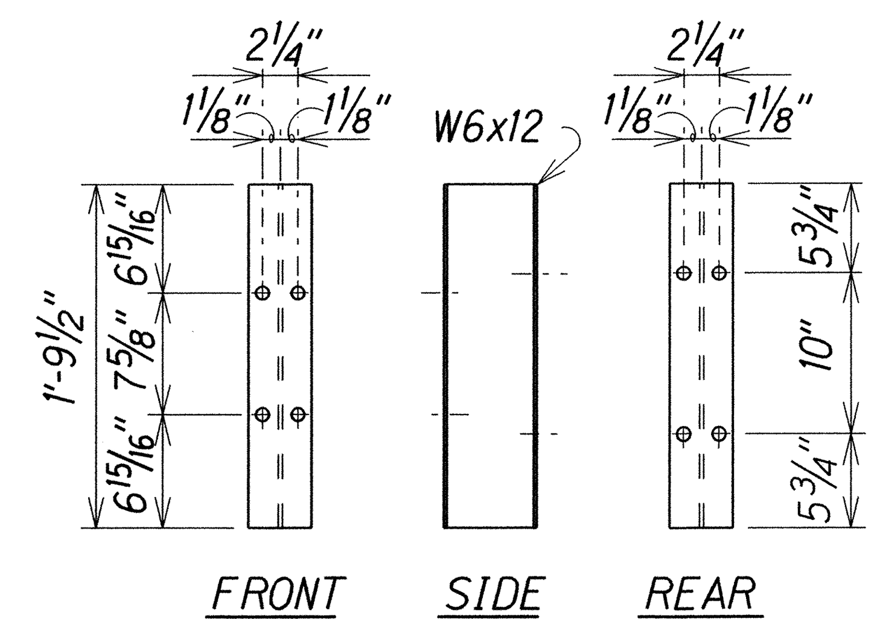


DESIGNATOR	BASE METAL THICKNESS
RTE02b	10 Gauge

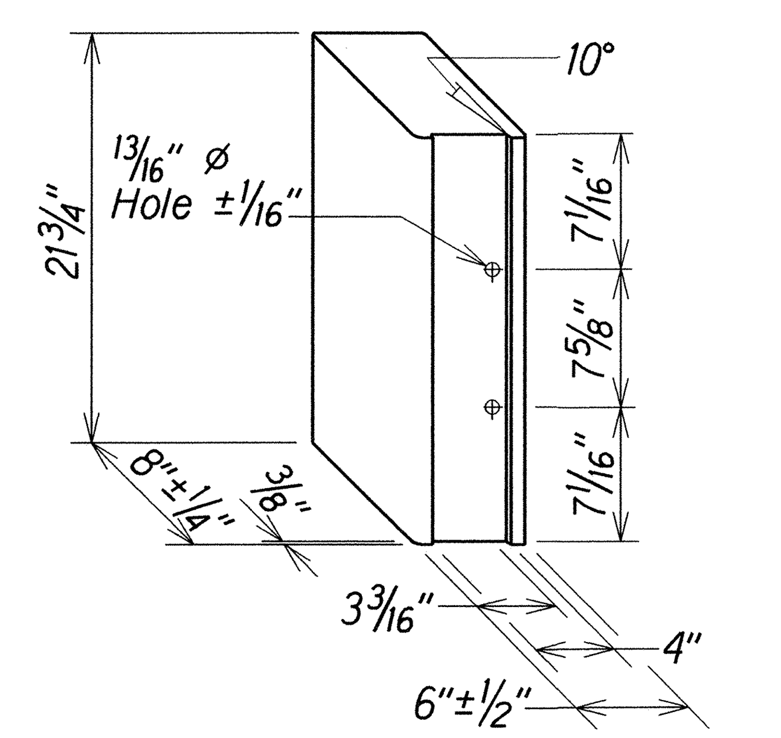
THRIE-BEAM SECTION (ROUNDED) (RTE02b)
Scale: 1" = 1'-0"



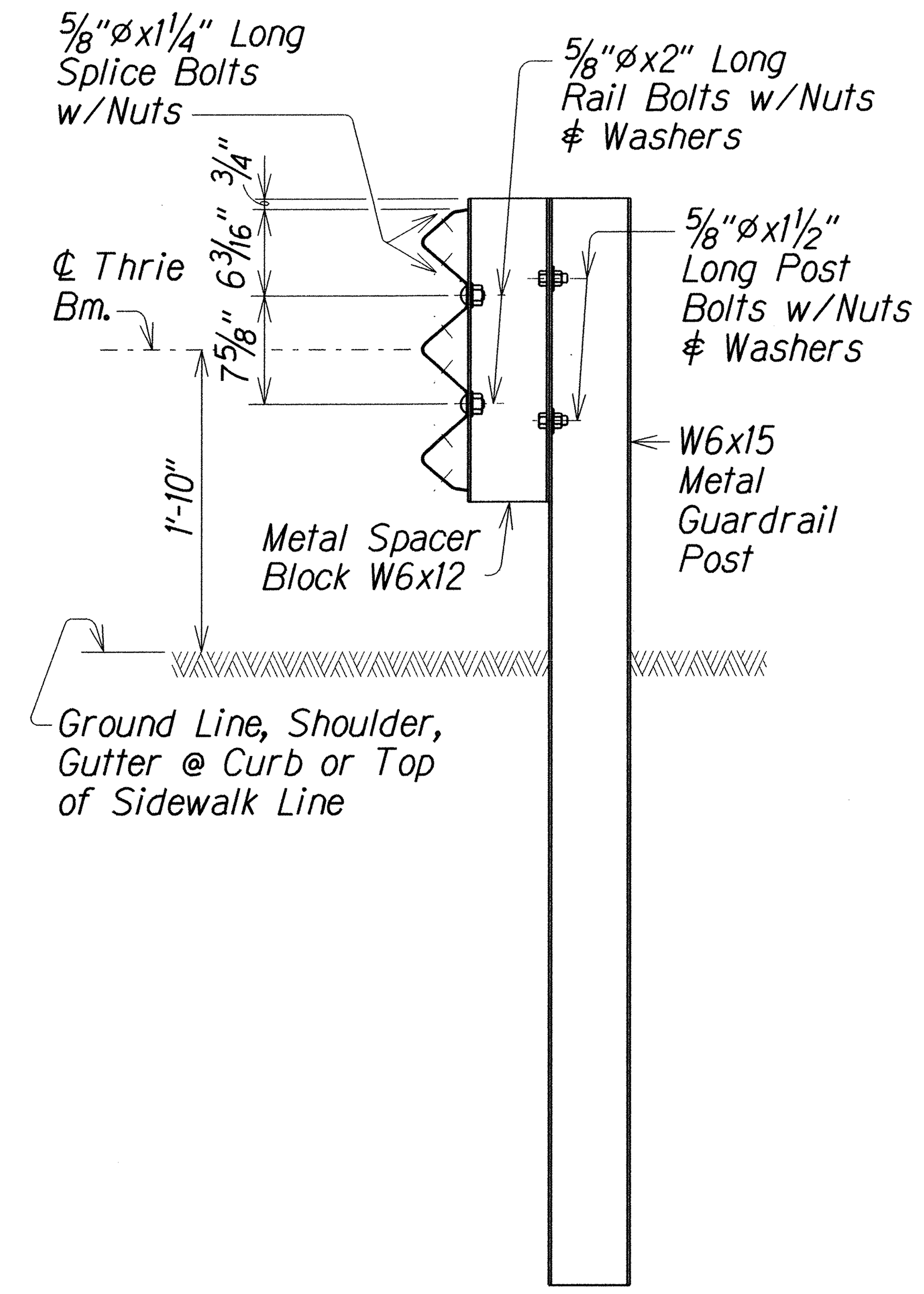
SECTION THRU RAIL ELEMENT
Scale: 1 1/2" = 1'-0"



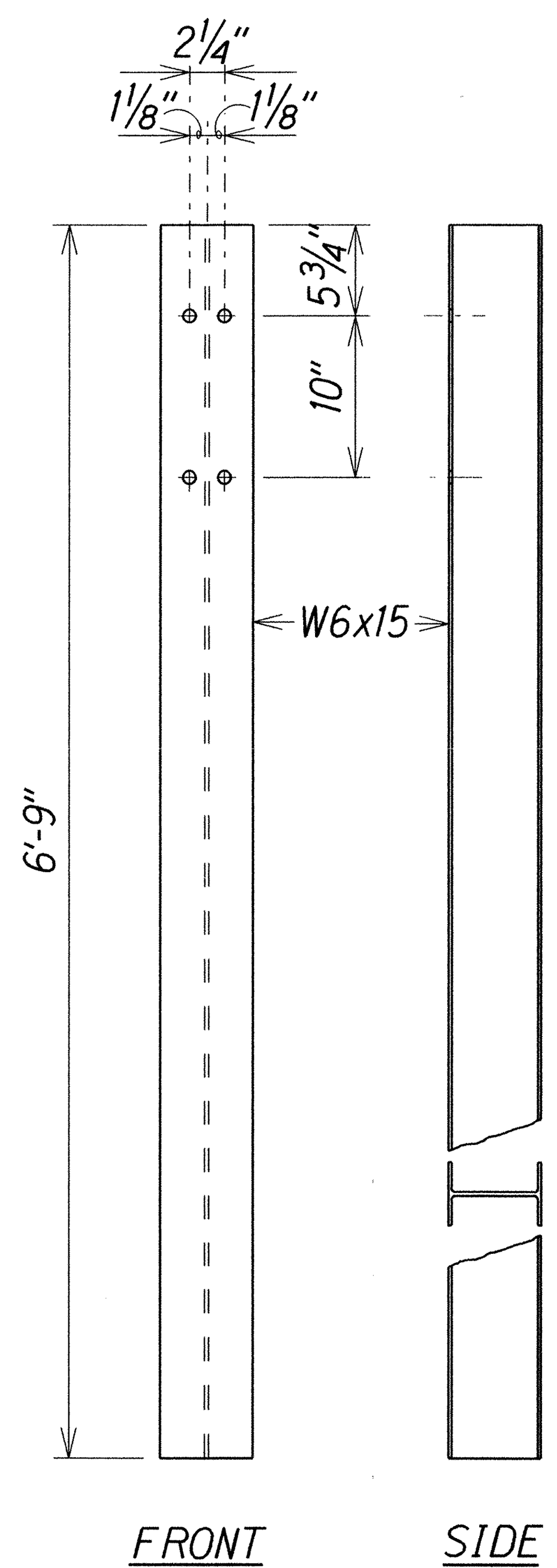
SPACER BLOCK DETAILS
Scale: 1" = 1'-0"



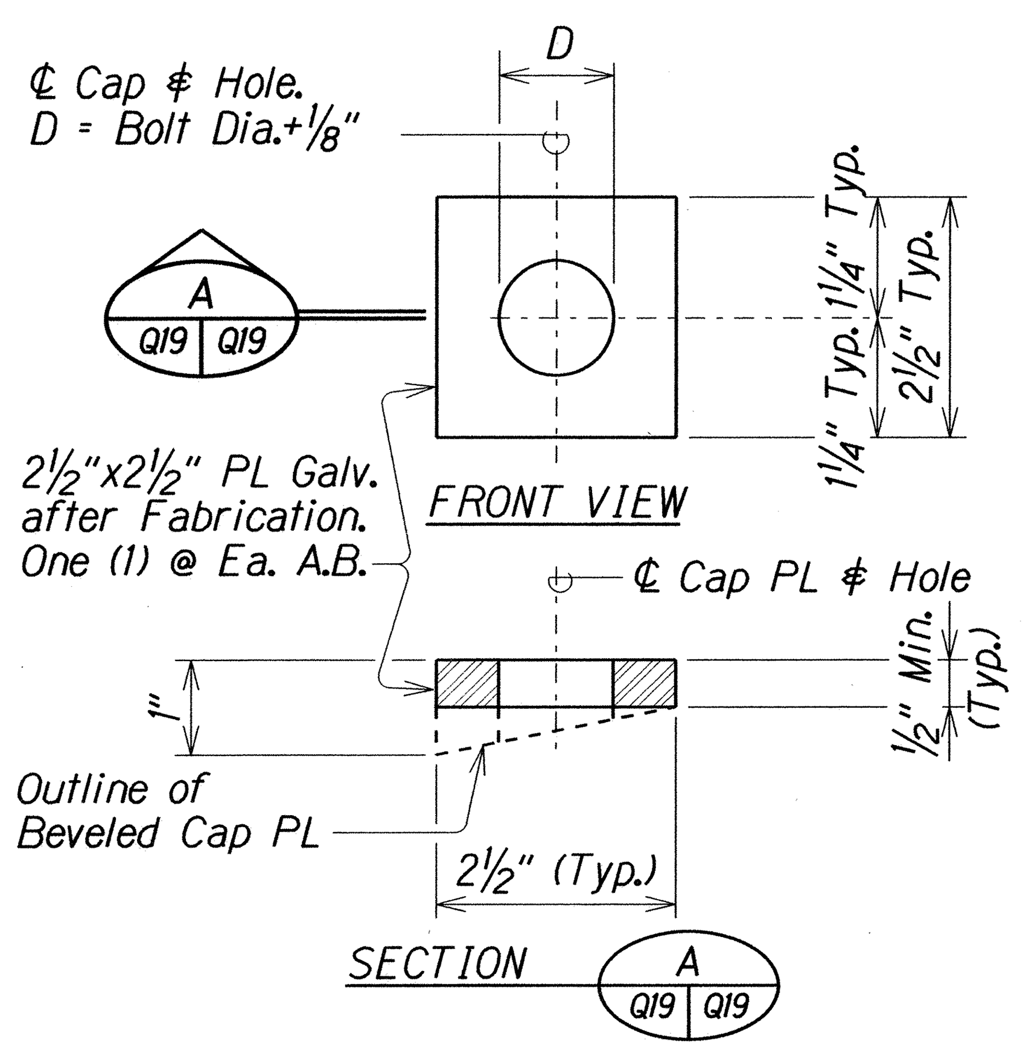
RECYCLED POLYETHYLENE THRIE-BEAM OFFSET BLOCK (TYPE II - THRIE)
N.T.S.



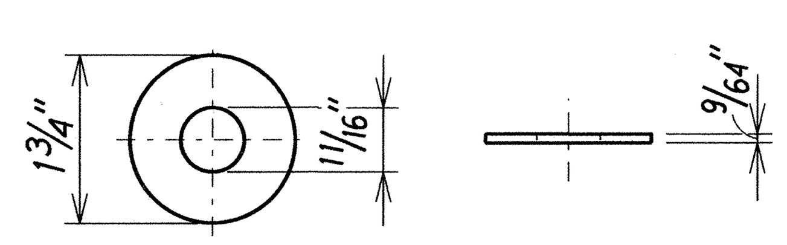
TYPICAL SECTION
METAL GUARDRAIL ON METAL POST WITH METAL SPACER BLOCK
Scale: 1" = 1'-0"



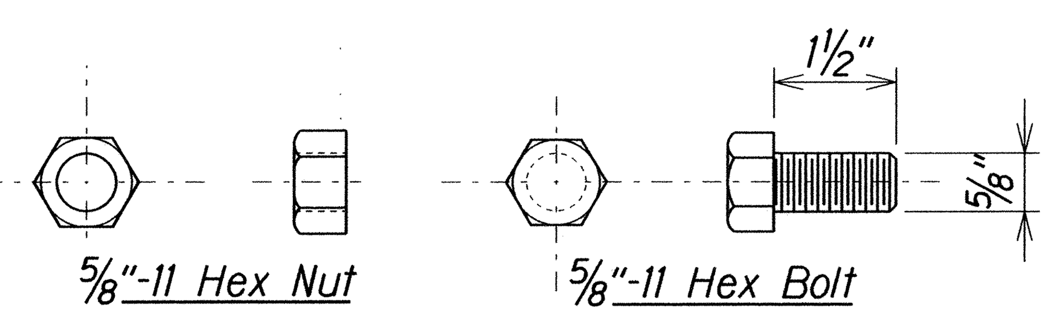
POST DETAILS
Scale: 1" = 1'-0"



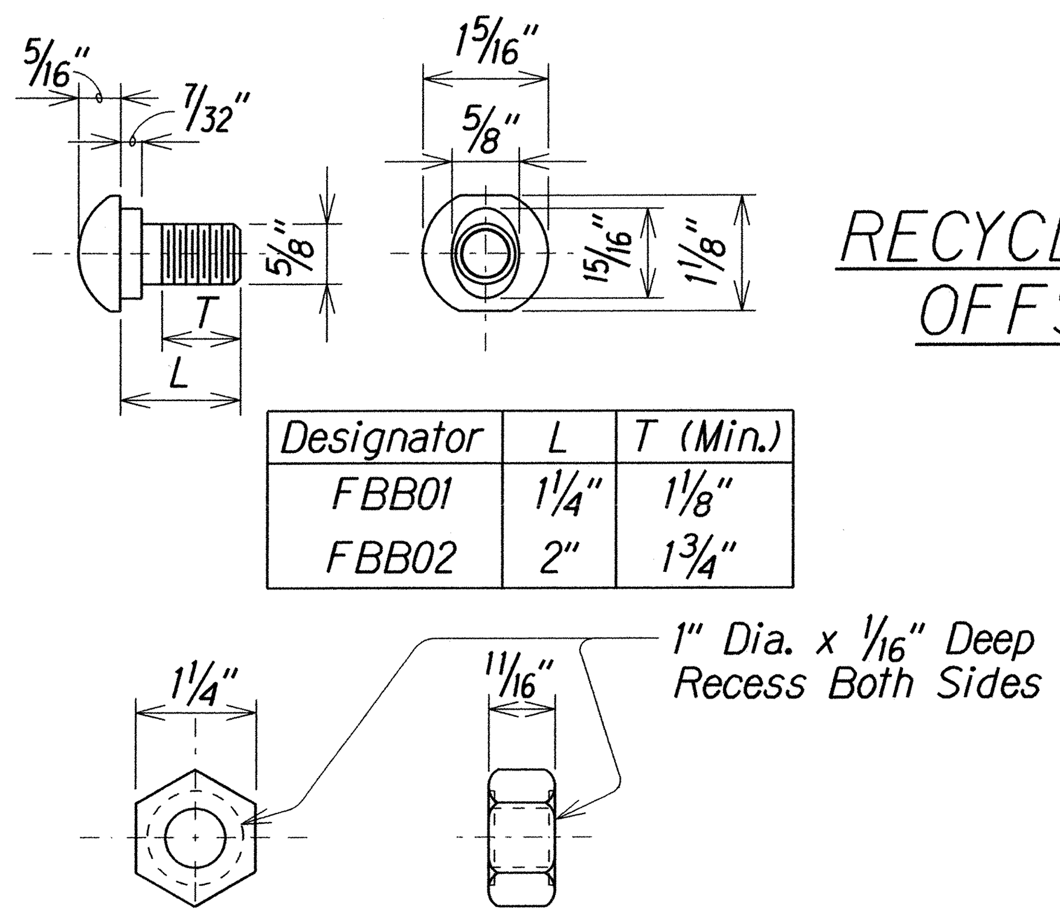
CAP (BEARING) PLATE DETAIL
Scale: 6" = 1'-0"



STEEL WASHER FOR 5/8"ø BOLT
Scale: 6" = 1'-0"

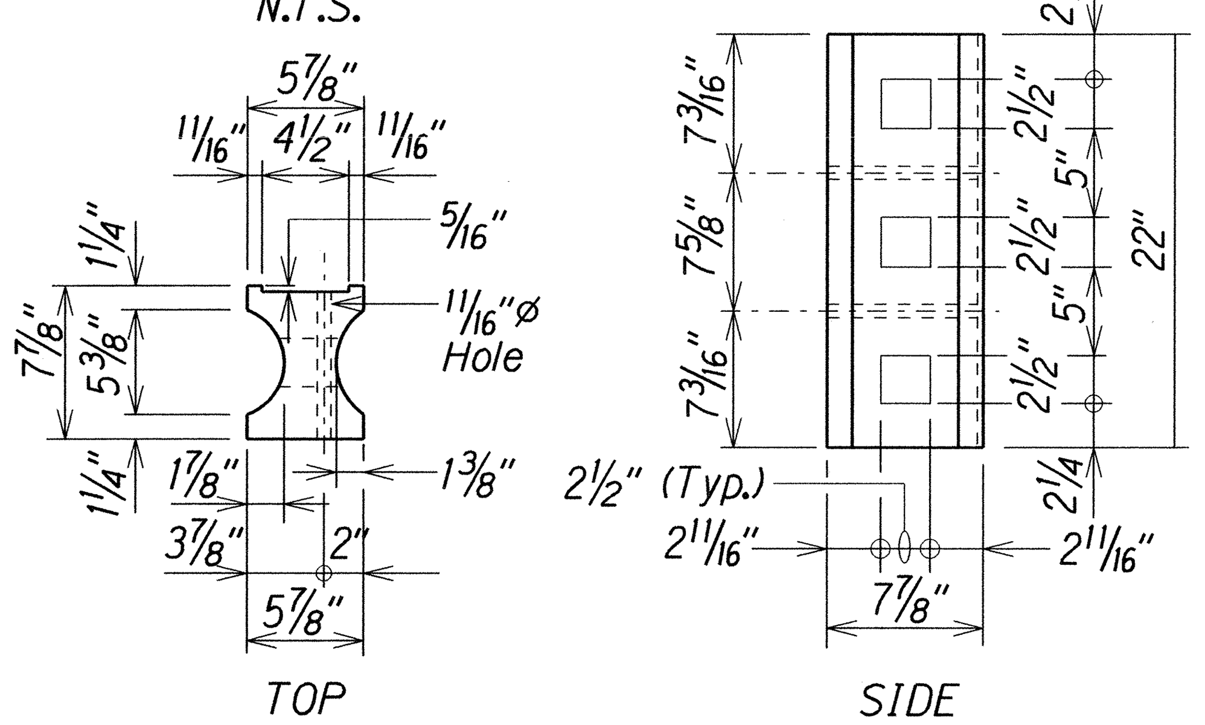


5/8"ø HEX BOLT & NUT
Scale: 6" = 1'-0"



Designator	L	T (Min.)
FBB01	1 1/4"	1 1/8"
FBB02	2"	1 3/4"

5/8"ø GUARDRAIL BOLT & RECESSED NUT
Scale: 6" = 1'-0"



MODIFIED 6X8X22 PLASTIC BLOCKOUT (TYPE I-THRIE) N.T.S.

METAL GUARDRAIL TYPE 3 THRIE BEAM AND APPURTENANCES DETAILS

ORIGINAL PLAN	DATE
SURVEY PLOTTED BY	
DRAWN BY	
TRACED BY	
DESIGNED BY	
QUANTITIES BY	
NOTE BOOK / CHECKED BY	

N: kam_q20.dgn
db4/usr2/ksg/wn/DairyRoad/

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

MODIFIED DELAWARE RETROFIT
METAL GUARDRAIL TYPE 3 THRIE BEAM
KAMEHAMEHA HIGHWAY RESURFACING
DAIRY ROAD TO LAIEWAI BRIDGE
FED. AID PROJ. NO. NH-083-1(072)

Scale: As Noted | Date: May, 2015

SHEET No. Q20 OF 20 SHEETS