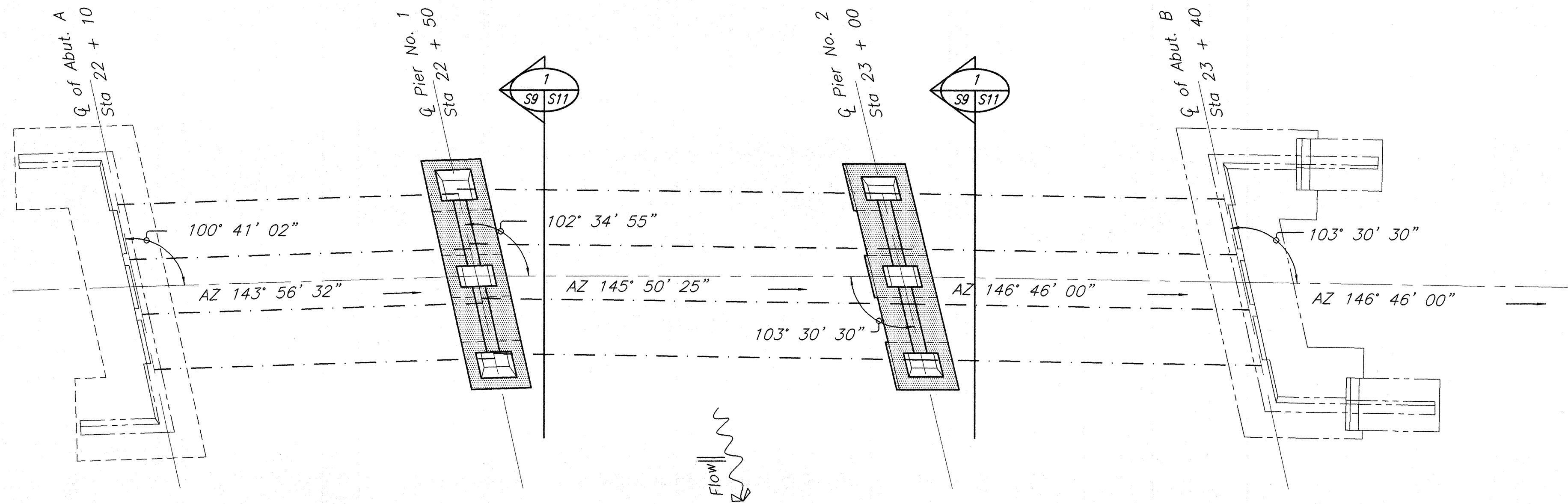


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(47)	1999	13	20

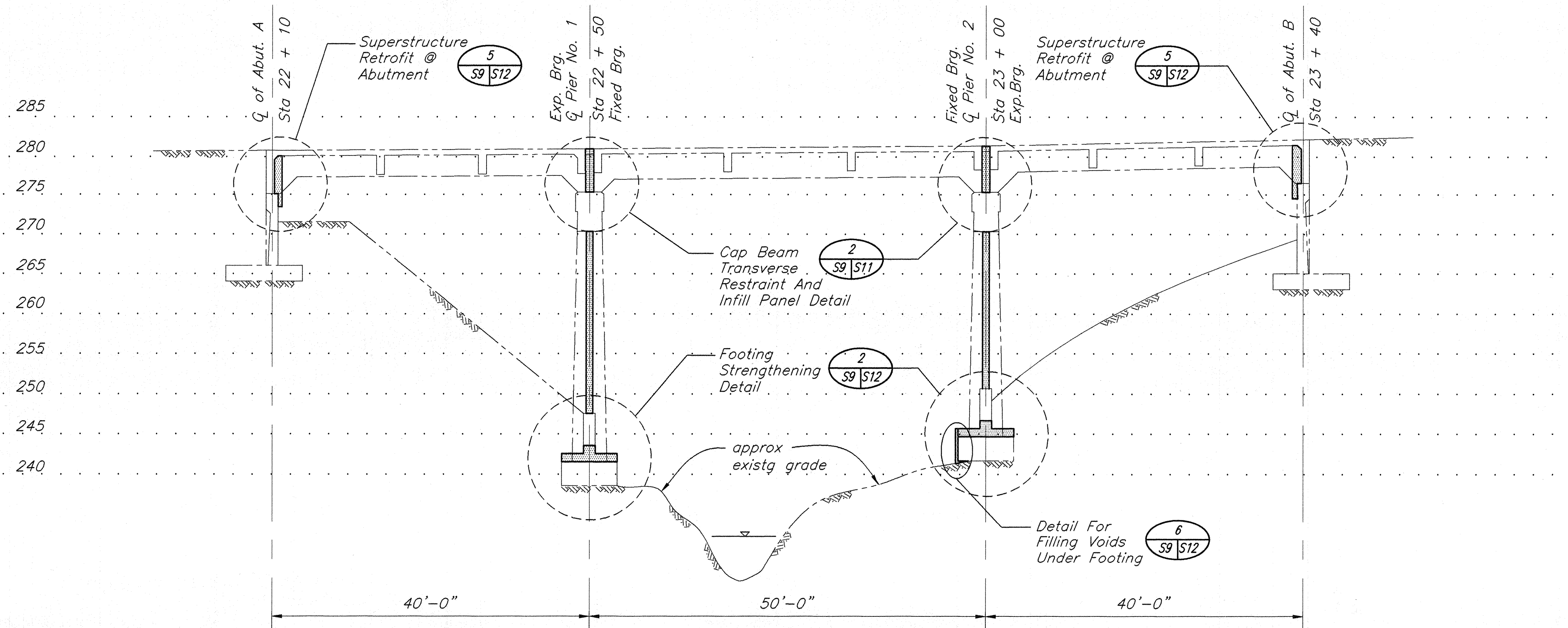
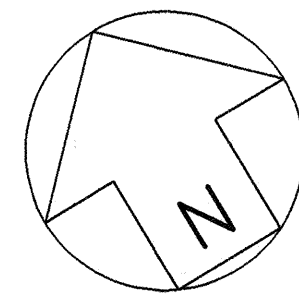


### FOUNDATION PLAN

SCALE : 1"=10'

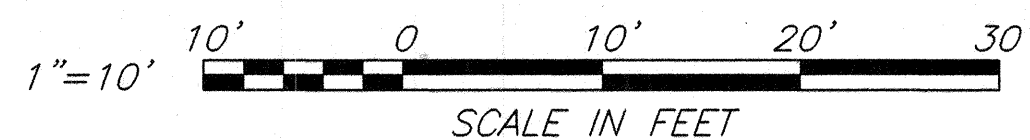
#### Note:

All finish elevations, stations and azimuths are approximate only. They are based on the original contract drawings dated March 1933. Contractor shall verify elevations, stations and azimuths as required.



### LONGITUDINAL SECTION

SCALE : 1"=10'



#### GENERAL:

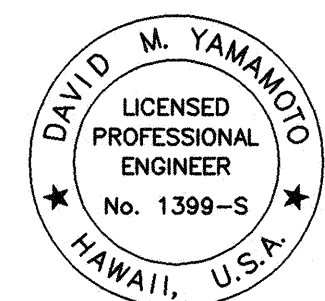
- The Existing Bridge Information Shown In This Drawings Was Obtained From The Original Bridge Drawings And Is Presented For Reference Purposes Only. No Responsibility Is Assumed For The Accuracy Of The Existing Information Presented. It Is The Contractor's Responsibility To Verify Independently All Of The As-Built Information.
- The Contractor Shall Visit The Construction Site And Shall Verify All Dimensions And Conditions Prior To Starting Any Work And Shall Be Responsible For Coordination Of All Work And Materials Including Those Furnished By Sub-Contractors. The Hawaii Department Of Transportation (D.O.T.) Representative Shall Be Notified Immediately Of Any Discrepancies Found.
- The Contract Structural Drawings And Specifications Represent The Finished Structure. They Do Not Indicate The Method Of Construction. The Contractor Shall Provide All Measures Necessary To Protect The Structure During Construction.
- The Contractor Shall Provide Adequate Shoring For All Existing Adjacent Structures. Shoring For Construction Loads Shall Be Designed By A Hawaii Licensed Structural Engineer Experienced In This Kind Of Work.

#### BASIS FOR SEISMIC RETROFIT:

- The Proposed Retrofit Work Addresses Two Apparent Weaknesses:
  - The Possibility Of The Superstructure Sliding Transversely Off The Substructure During An Earthquake
  - The Possibility Of The Superstructure Sliding Longitudinally At Abutment.
- The Goal Of The Proposed Retrofit Work Is To Reduce The Risk Of Collapse During An Earthquake And Not The Prevention Of All Structural And Non-Structural Damage.
- The Earthquake Loading Considered Is The ARS Curve For 5% Damping At 0 Feet To 10 Feet By Caltrans With An Expected Maximum Acceleration At Bedrock Of  $A = 0.4g$ .
- The Design Methodology Is Per The Bridge Memo To Designers By The California Department Of Transportation, December 31, 1995.

#### GENERAL NOTES:

- General Specifications: Hawaii Department Of Transportation Standard Specification For Road, Bridge And Public Works Construction, 1994 Together With Special Provisions Prepared For This Contract.
- Design Specifications: AASHTO, Standard Specifications For Highway Bridges, 16th Edition (1996)
- Caltrans Memo To Designers 20-4.
- Seismic Loading:
  - Seismic Performance Category . . . . . D
  - Acceleration Coefficient . . . . . 0.40
- Concrete:
  - Existing:
    - All Concrete. (Assumed) . . . . .  $f_c' = 3,300$  psi
  - New:
    - Walls . . . . .  $f_c' = 4,000$  psi
    - Footings . . . . .  $f_c' = 3,000$  psi
- Reinforcing Steel:
  - Existing:
    - All Reinforcing Steel (Assumed) . . . . .  $f_y = 44,000$  psi
  - New:
    - All Bars, Dowels & Stirrups . . . . .  $f_y = 60,000$  psi



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

### KAPEHU BRIDGE-FOUNDATION PLAN AND LONGITUDINAL SECTION

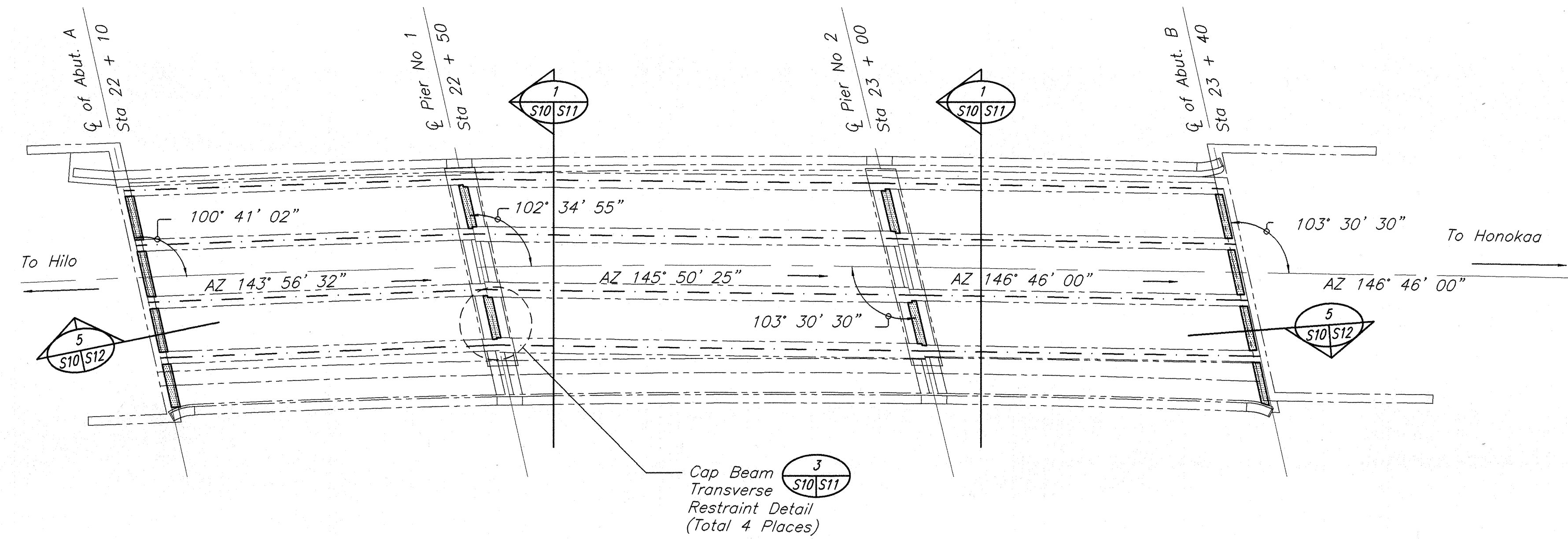
HAWAII BELT ROAD, SEISMIC RETROFIT OF VARIOUS BRIDGES,  
WEST OF NINOLE

FEDERAL AID PROJECT NO. BR-019-2(47)

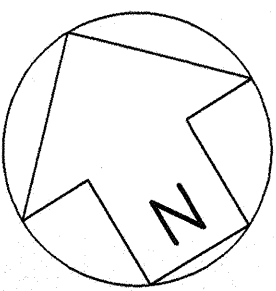
SCALE: AS NOTED DATE: November 1998

SHEET No. 59 OF 16 SHEETS

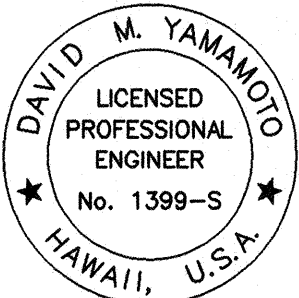
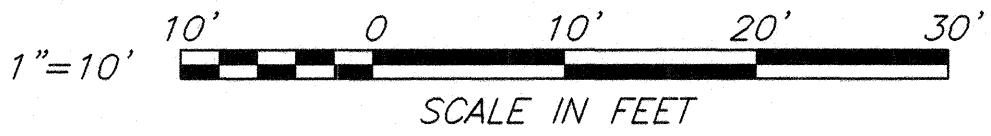
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(47)	1999	14	20



**FRAMING PLAN**  
 SCALE : 1"=10'



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



THIS WORK WAS PREPARED BY  
 ME OR UNDER MY SUPERVISION

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

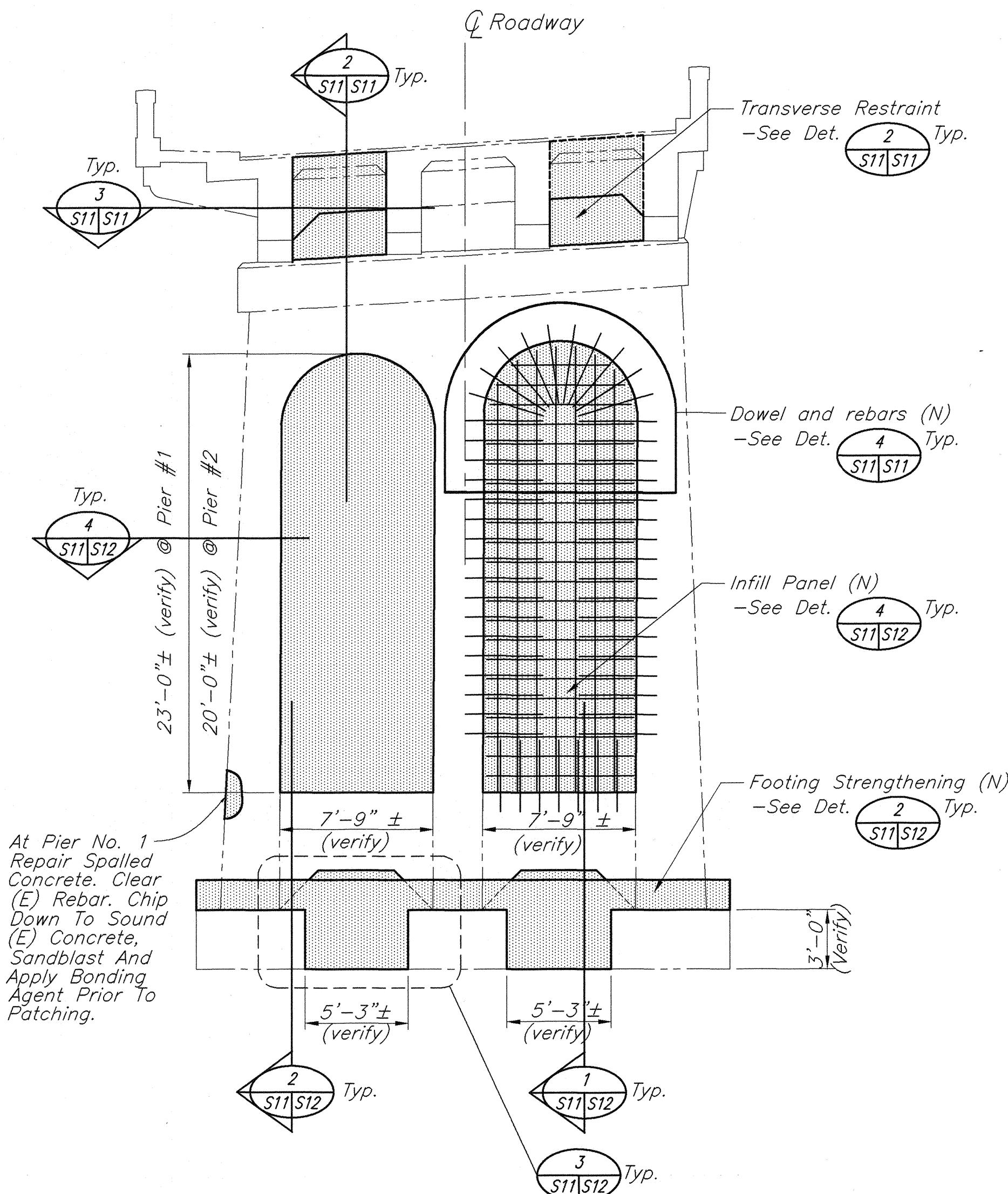
**KAPEHU BRIDGE - FRAMING PLAN**

HAWAII BELT ROAD, SEISMIC RETROFIT OF VARIOUS BRIDGES,  
WEST OF NINOLE  
FEDERAL AID PROJECT NO. BR-019-2(47)  
SCALE: AS NOTED      DATE: November 1998

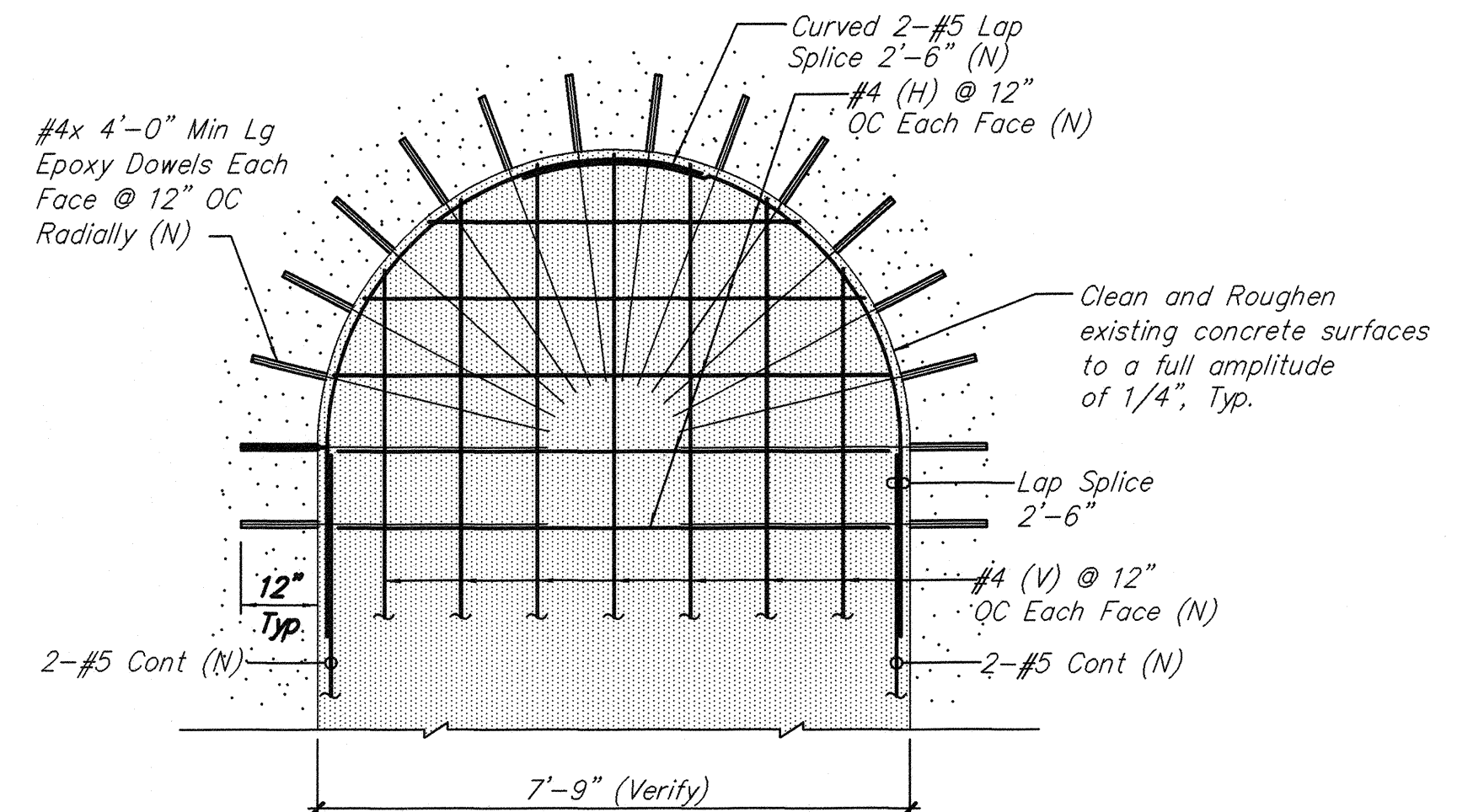
SHEET No.    S10    OF    16    SHEETS



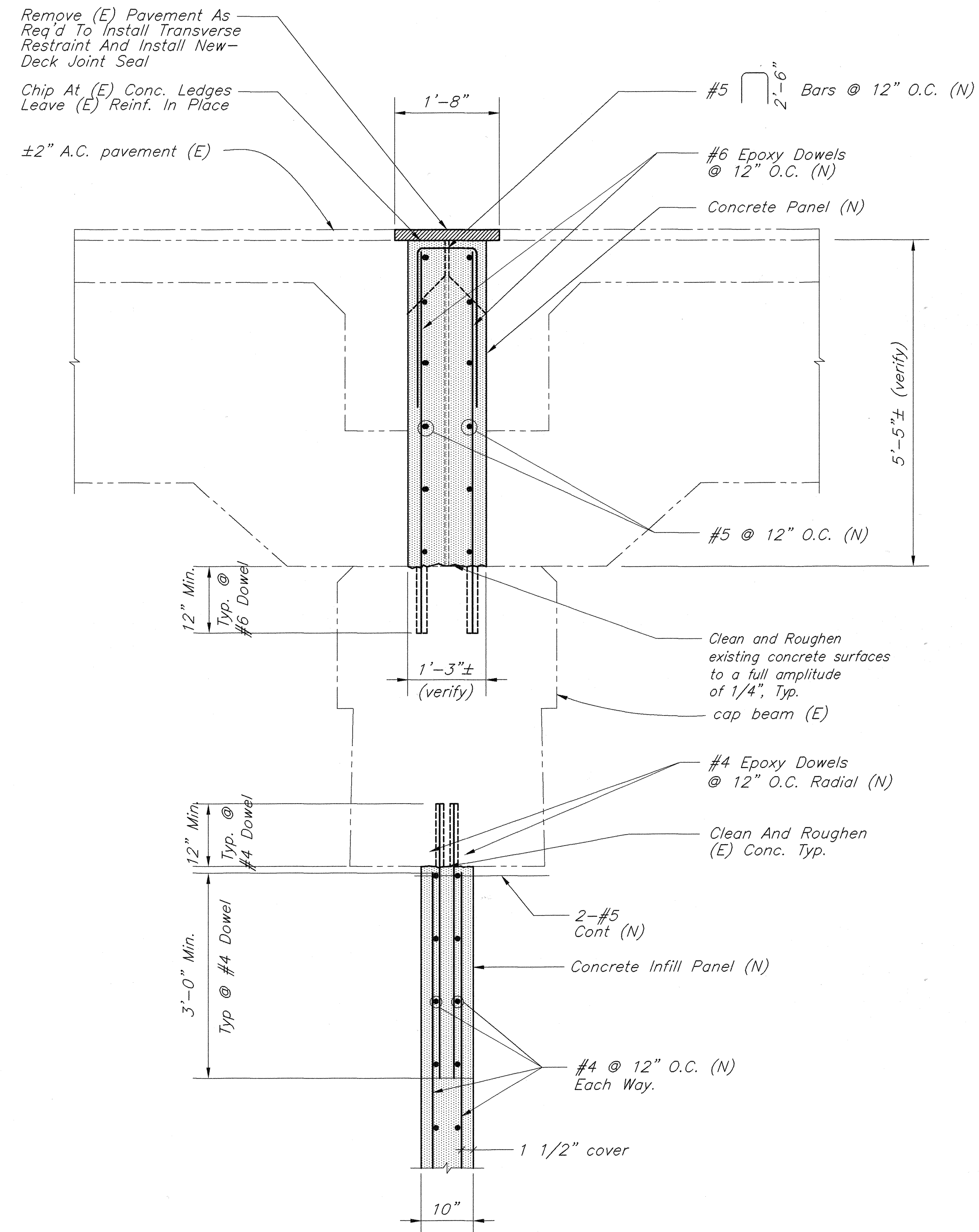
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(47)	1999	15	20



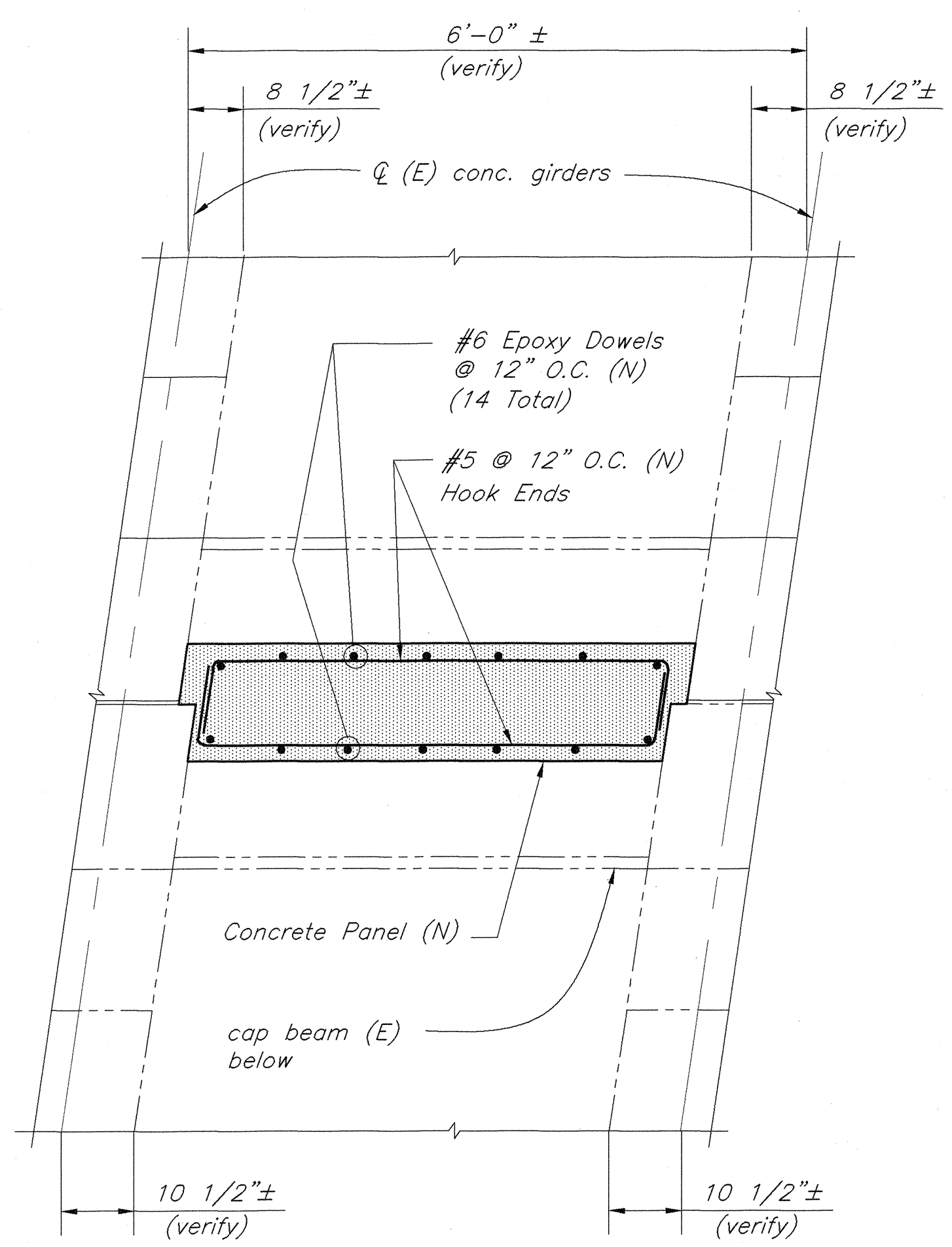
PIER ELEVATION  
SCALE : 3/16"=1'-0" (Total 2 Piers)  
S10



DOWELING / REINFORCING DETAIL  
SCALE : 1/2"=1'-0"  
S15

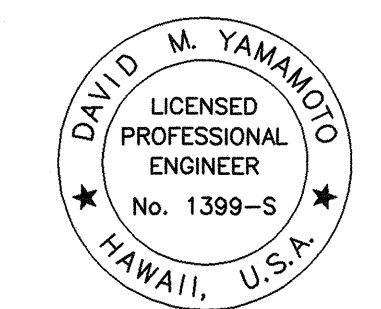


TRANSVERSE RESTRAINT & INFILL PANEL SECTION  
SCALE : 3/4"=1'-0"  
S11



TRANSVERSE RESTRAINT PLAN  
SCALE : 3/4"=1'-0"  
S11

(N) = New  
(E) = Existing



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DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**KAPEHU BRIDGE - PIER ELEVATION AND RETROFIT DETAILS**

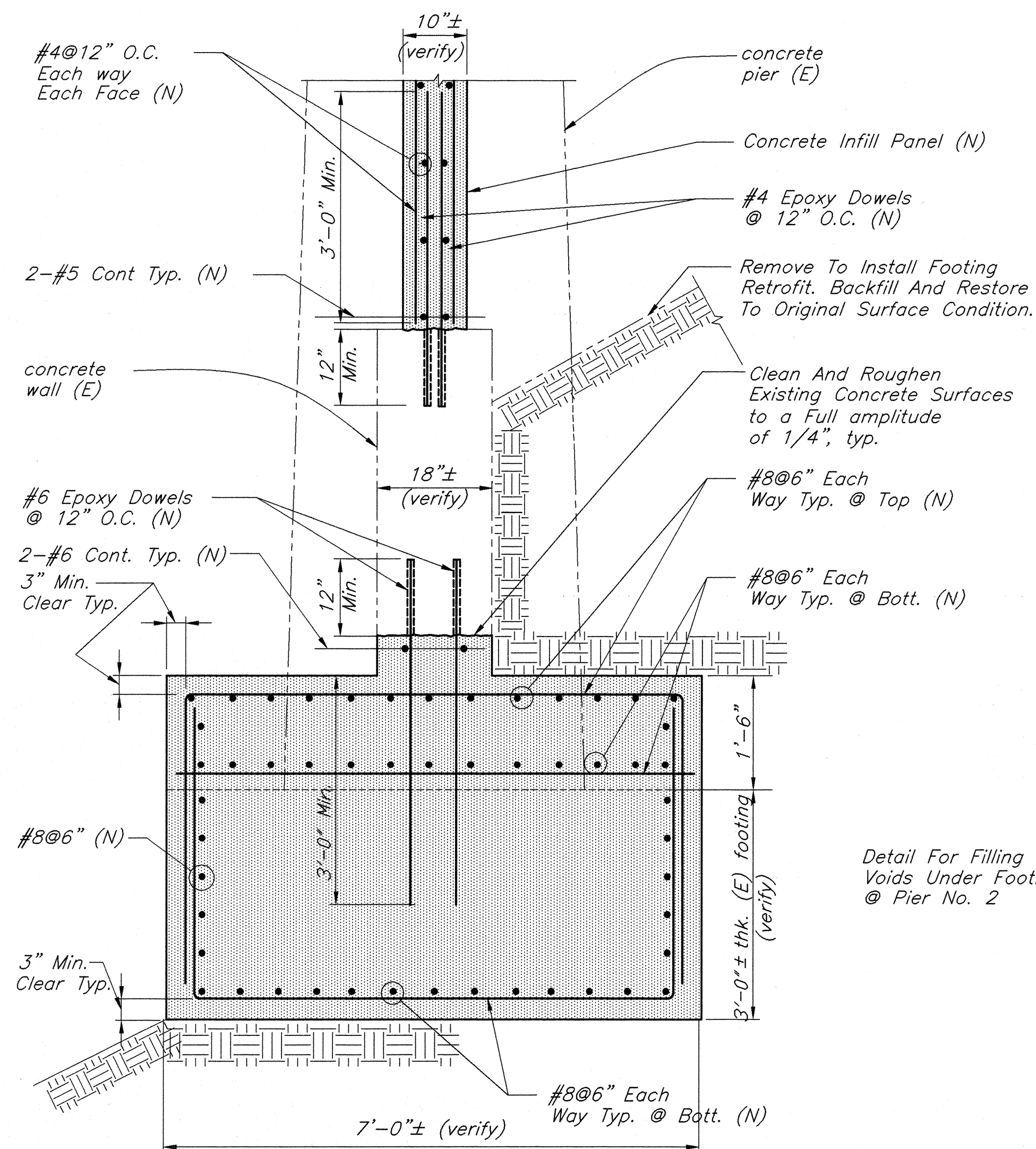
HAWAII BELT ROAD, SEISMIC RETROFIT OF VARIOUS BRIDGES, WEST OF NINOLE  
FEDERAL AID PROJECT NO. BR-019-2(47)  
SCALE: AS NOTED  
DATE: November 1998

SHEET No. S11 OF S16 SHEETS

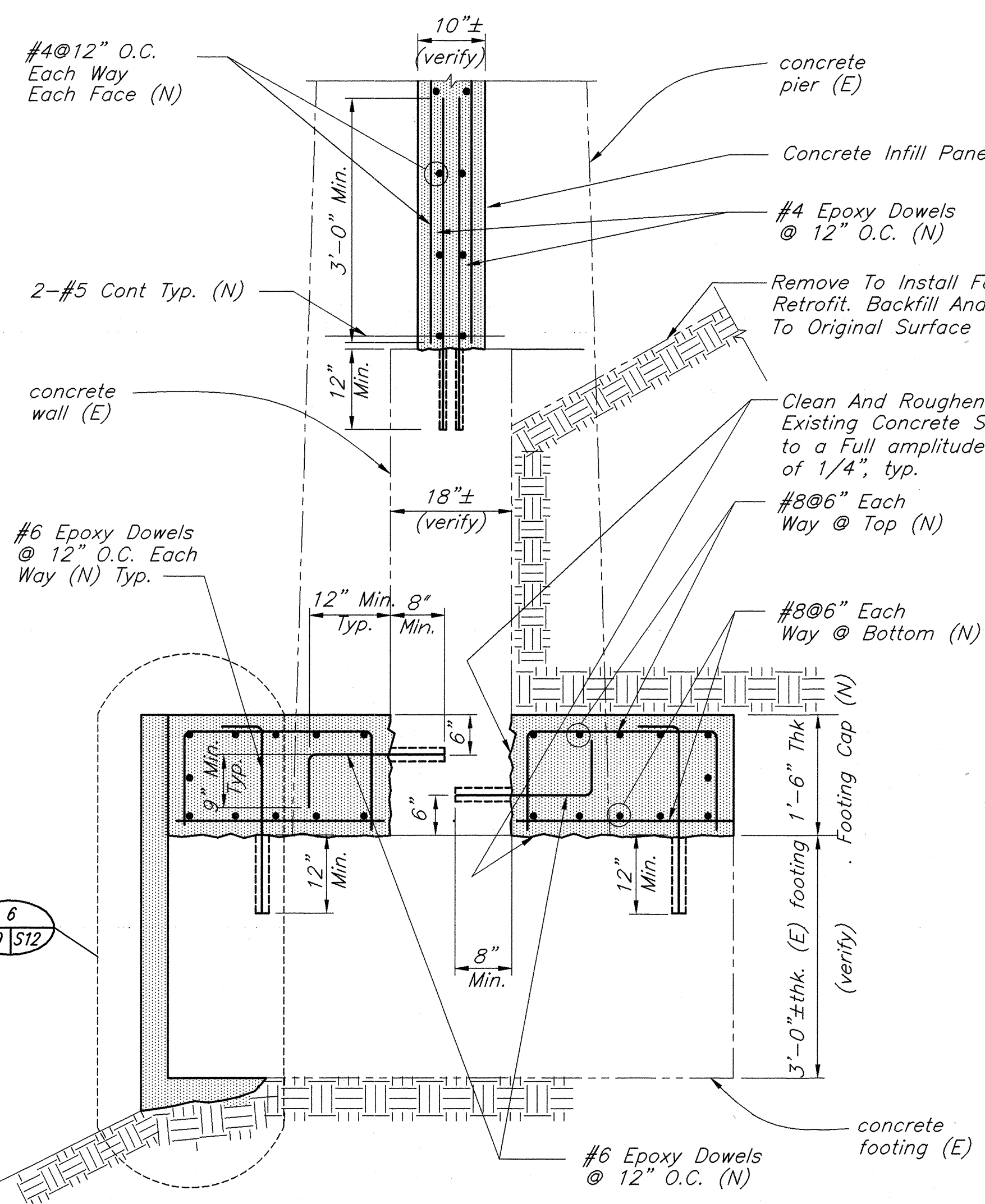
SURVEY PLOTTED BY	DATE
DRAWN BY	
TRACED BY	
QUANTITIES BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
No.	



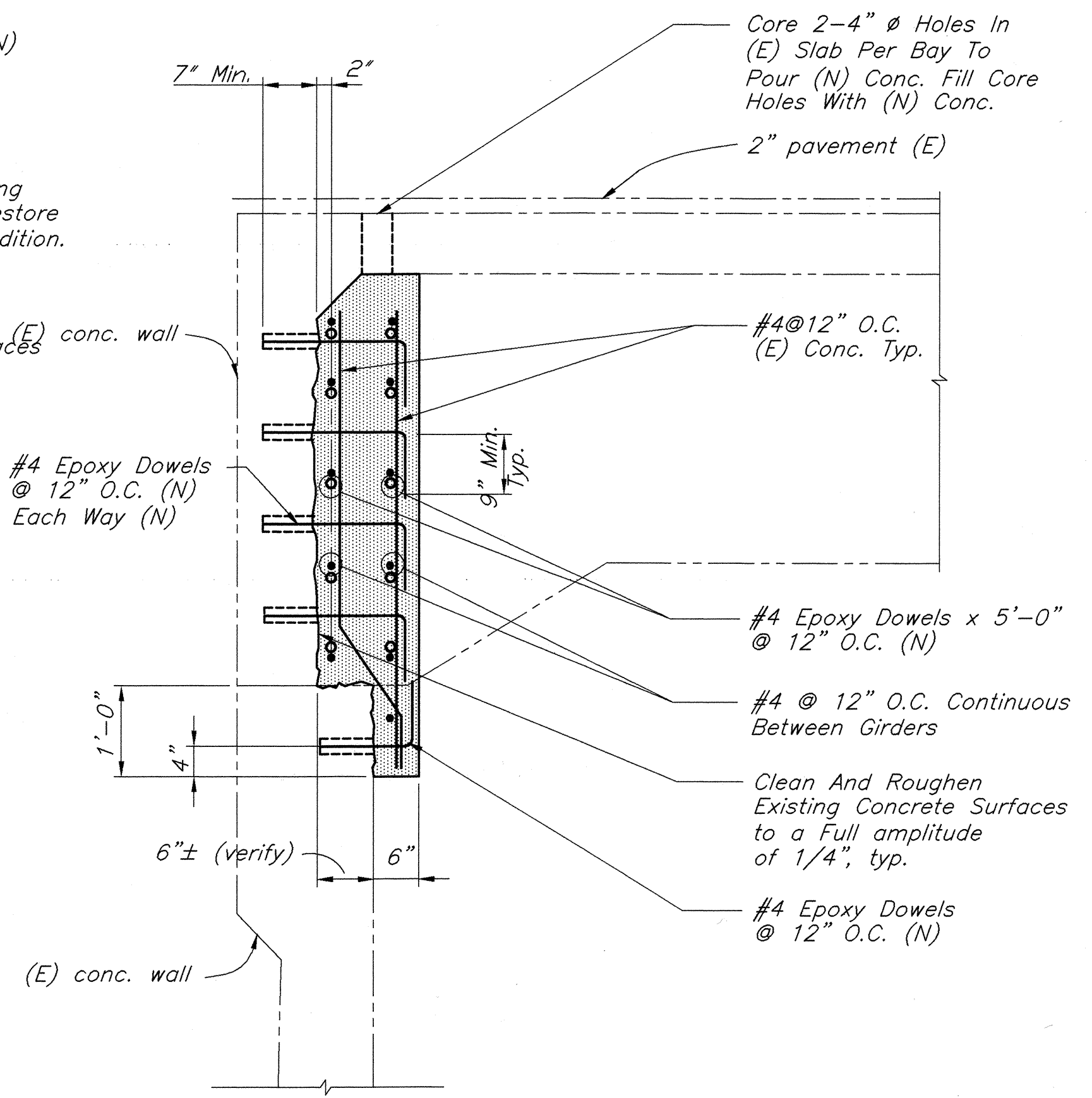
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HAWAII	HAW.	BR-019-2(47)	1999	16	20



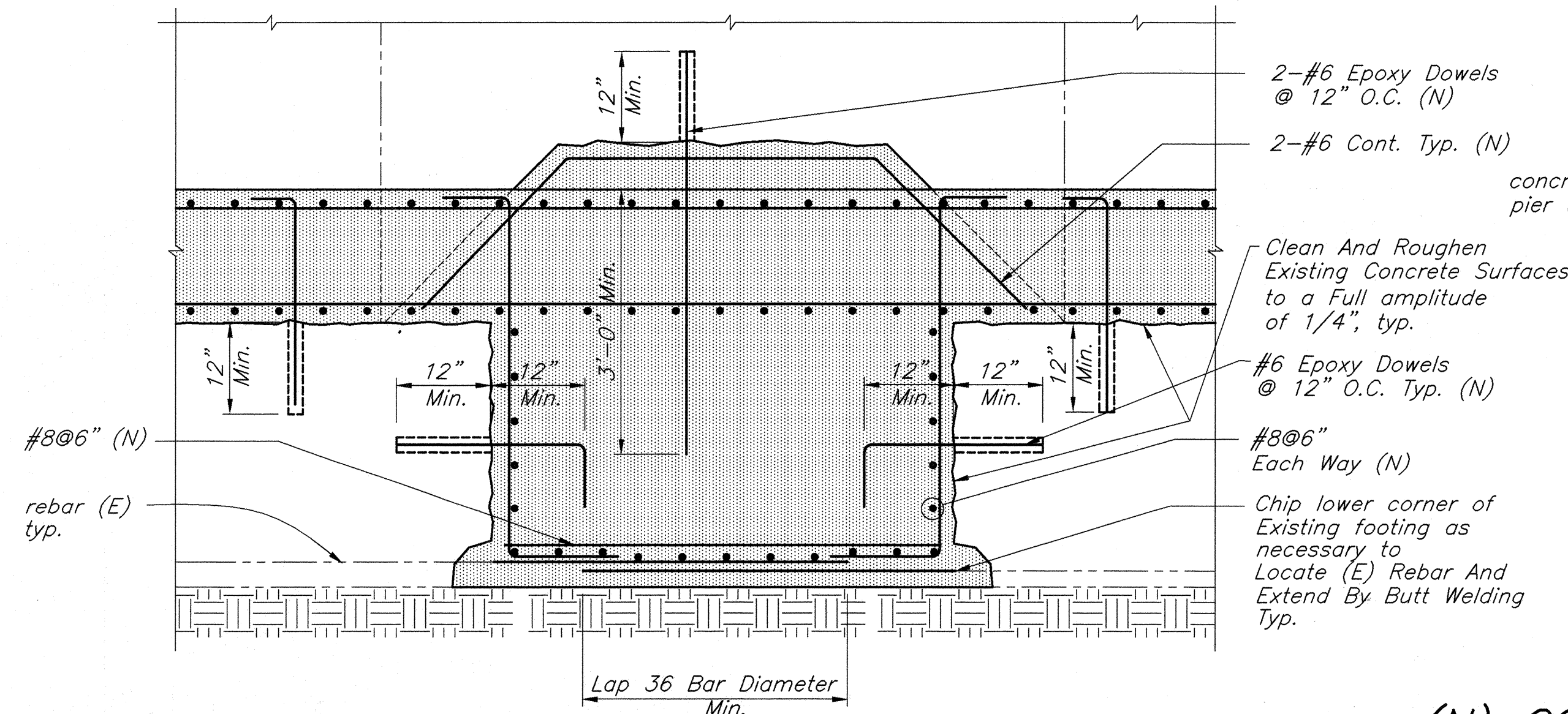
**FOOTING STRENGTHENING SECTION 1**  
SCALE : 3/4"=1'-0"



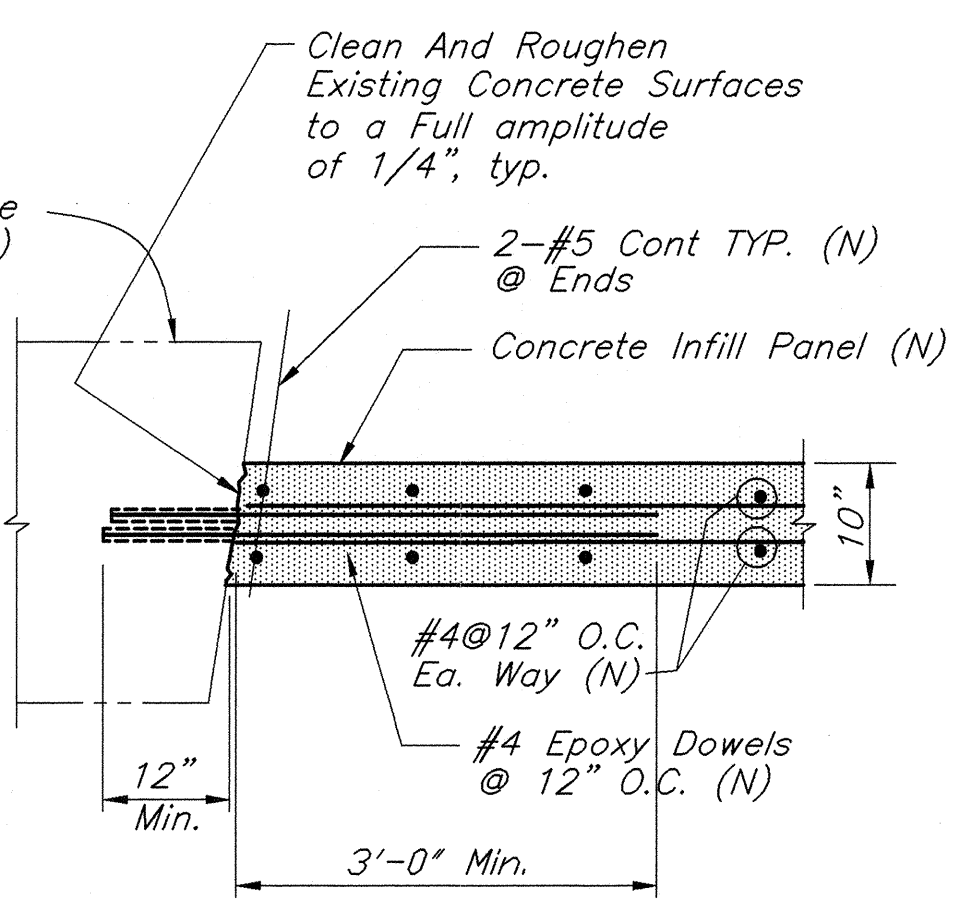
**FOOTING STRENGTHENING SECTION 2**  
SCALE : 3/4"=1'-0"



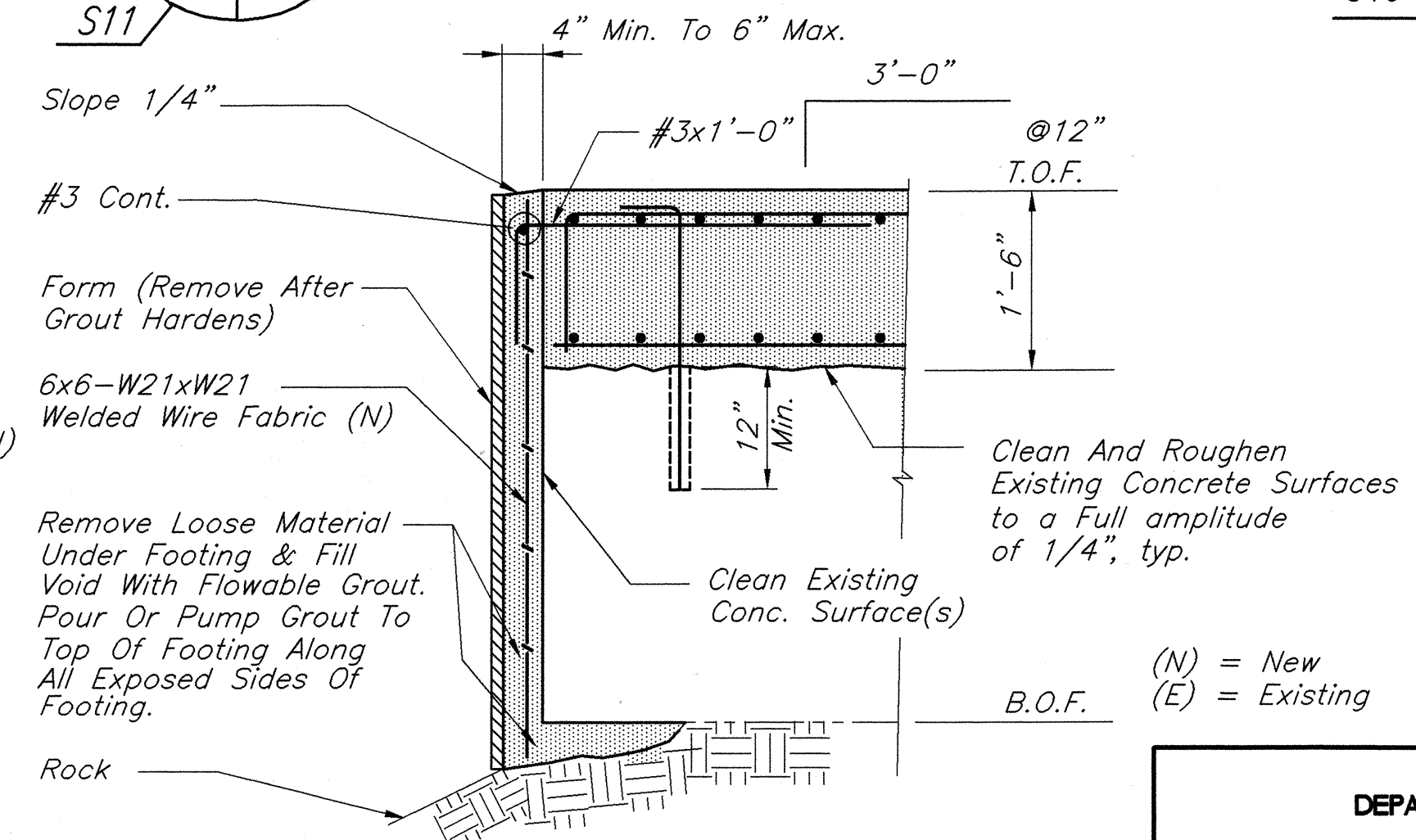
**SUPERSTRUCTURE RETROFIT AT ABUTMENT 5**  
SCALE : 3/4"=1'-0"



**FOOTING STRENGTHENING ELEVATION 3**  
SCALE : 3/4"=1'-0"



**(N) CONC. INFILL PANEL TO (E) PIER SECTION 4**  
SCALE : 3/4"=1'-0"



**FOOTING STRENGTHENING SECTION 6**  
SCALE : 3/4"=1'-0"

DAVID M. YAMAMOTO  
LICENSED PROFESSIONAL ENGINEER  
No. 1399-S  
HAWAII, U.S.A.

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**KAPEHU BRIDGE - RETROFIT DETAILS**  
HAWAII BELT ROAD, SEISMIC RETROFIT OF VARIOUS BRIDGES, WEST OF NINOLE  
FEDERAL AID PROJECT NO. BR-019-2(47)  
SCALE: AS NOTED DATE: November 1998  
SHEET No. S12 OF 16 SHEETS