

SURVEY PLOTTED BY	DATE
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QUANTITIES BY	
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ORIGINAL PLAN	
NOTE BOOK	
No.	

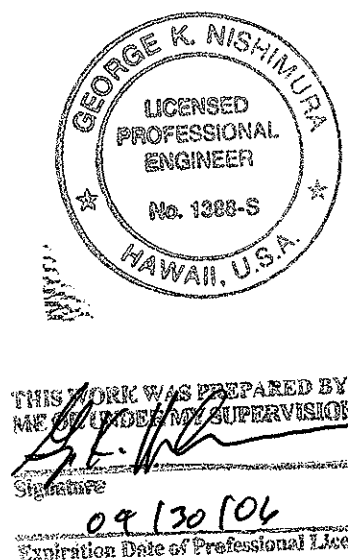
ABBREVIATIONS

#	NUMBER OR POUND	SECT.	SECTION
±	APPROXIMATELY	SHT.	SHEET
A.B.	ANCHOR BOLT	SIM.	SIMILAR
ABUT.	ABUTMENT	SPC., SP.	SPACE
A.C.	ASPHALT CONCRETE,	SPCG., SP.	SPACING
AZ.	AZIMUTH	SQ.	SQUARE
		STA.	STATION
		STIRR.	STIRRUP
BAL.	BALANCE	STL.	STEEL
BOT., BOTT., B	BOTTOM	STRUCT.	STRUCTURAL
		SYMM.	SYMMETRICAL
CL	CENTERLINE		
CLR., CL.	CLEAR	THK., TH.	THICK
COL.	COLUMN	TYP.	TYPICAL
CONC.	CONCRETE		
COND.	CONDITION	VERT., V	VERTICAL
CONN.	CONNECTION		
CONSTR.	CONSTRUCTION		
CONT.	CONTINUOUS		
DET.	DETAIL		
DIA., DIAM.	DIAMETER		
DIAG.	DIAGONAL		
DIR.	DIRECTOR		
DIST.	DISTRICT		
DWG.	DRAWING		
E.F.	EACH FACE		
E.J.	EXPANSION JOINT		
ELEV., EL.	ELEVATION		
EMBED.	EMBEDMENT		
EQ.	EQUAL		
EXIST.	EXISTING		
FED.	FEDERAL		
FT.	FOOT, FEET		
FTG.	FOOTING		
GALV.	GALVANIZED		
GIRD., G	GIRDER		
HORIZ., H	HORIZONTAL		
IN.	INCH		
MAX.	MAXIMUM		
MIN.	MINIMUM		
MISC.	MISCELLANEOUS		
N.	NORTH		
NO., #	NUMBER		
N.T.S.	NOT TO SCALE		
O.C.	ON CENTER		
PCF	POUNDS PER CUBIC FEET		
PROJ.	PROJECT		
PSF	POUNDS PER SQUARE FEET		
PSI	POUNDS PER SQUARE INCH		
PVC.	POLYVINYL CHLORIDE		
R, RAD.	RADIUS		
REBAR	REINFORCING BAR		
REF.	REFERENCE		
REINF.	REINFORCED, REINFORCING, REINFORCEMENT		

SUMMARY OF ESTIMATED QUANTITIES

Item No.	Contract Item	Quantity	Unit
206B.6000	Structure Excavation	L.S.	L.S.
206B.7000	Structure Backfill	L.S.	L.S.
503.1000	Concrete Work At Pier No. 1 – Honolii Bridge	L.S.	L.S.
681.1000	Furnishing Specialty Equipment	L.S.	L.S.
681.2000	Permanent Soil Anchors	220	Lin. Ft.
681.3000	Reinstallation Of Soil Anchors Due To Grout Loss	F.A.	F.A.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(56)	2005	4	11



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
ABBREVIATIONS AND QUANTITIES

HAWAII BELT ROAD
SEISMIC RETROFIT OF VARIOUS BRIDGES
VICINITY OF HILO – PHASE 2
Federal Aid Project No. BR-019-2(56)
Scale: As Noted Date: Nov. 2005

SHEET No. S-1 OF 11 SHEETS

SURVEY PLOTTED BY: _____ DATE: _____
DRAWN BY: _____
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NOTE BOOK: _____
QUANTITIES BY: _____
CHECKED BY: _____
No. _____

STRUCTURAL NOTES

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(56)	2005	5	11

I. GENERAL SPECIFICATIONS: HAWAII STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND PUBLIC WORKS CONSTRUCTION, 1994, TOGETHER WITH SPECIAL PROVISIONS PREPARED FOR THIS CONTRACT.

II. DESIGN SPECIFICATIONS: AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 2nd EDITION, 1998, INCLUDING SUBSEQUENT INTERIM SPECIFICATIONS.

III. DESIGN CRITERIA:

(NOTE: DESIGN CRITERIA BASED ON CONTRACT PLANS TITLED "HAWAII BELT ROAD, SEISMIC RETROFIT OF VARIOUS BRIDGES, VICINITY OF HILO, FEDERAL AID PROJECT NO. BR-019-2(42)" FOR THE STATE OF HAWAII, DEPARTMENT OF TRANSPORTATION, HIGHWAYS DIVISION.)

- A. ACCELERATION COEFFICIENT = 0.42
- B. SEISMIC PERFORMANCE ZONE = 4
- C. SOIL PROFILE TYPE I
- D. SOIL PARAMETERS:
 - 1. ULTIMATE SOIL BEARING RESISTANCE (EXTREME EVENT) = 20,000 PSF
 - 2. ULTIMATE PASSIVE RESISTANCE:
 - SOIL = 200 PCF
 - ROCK = 1,500 PCF
 - 3. COEFFICIENT OF FRICTION (ROCK) = 0.80

IV. MATERIALS:

- A. ALL CONCRETE SHALL BE 4,000 PSI (AT 28 DAYS) MINIMUM, UNLESS OTHERWISE NOTED. THE MAXIMUM W/C RATIO SHALL BE 0.49.
- B. ALL REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60, UNLESS OTHERWISE NOTED.
- C. ALL MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36 AND BE HOT-DIP GALVANIZED AFTER FABRICATION, UNLESS OTHERWISE NOTED.
- D. ALL PIPE SECTIONS SHALL CONFORM TO ASTM A53 (TYPE E), GRADE B, AND BE HOT-DIP GALVANIZED AFTER FABRICATION.
- E. ALL WELDING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF AWS D1.1 "STRUCTURAL WELDING CODE". WELDS SHALL HAVE A MINIMUM ULTIMATE STRENGTH OF 70,000 PSI.
- F. TETRAGUARD AS20 SHRINKAGE REDUCING ADMIXTURE, ECLIPSE PLUS SHRINKAGE REDUCING ADMIXTURE, OR AN APPROVED EQUAL, SHALL BE INCLUDED IN THE CONCRETE MIX. THE REQUIRED DOSAGE SHALL BE 96 OUNCES PER CUBIC YARD OF CONCRETE. ADDITION OF SHRINKAGE REDUCING ADMIXTURE SHALL BE AS RECOMMENDED BY THE MANUFACTURER.
- G. HIGH-STRENGTH THREADED BARS, ANCHOR NUTS, ANCHOR PLATES AND OTHER ACCESSORIES FOR SOIL ANCHORS SHALL BE AS SUPPLIED BY DYWDAG SYSTEMS INTERNATIONAL, WILLIAMS FORM ENGINEERING CORP., OR AN APPROVED EQUAL AND SHALL BE THE PRODUCT OF A SINGLE MANUFACTURER. HIGH-STRENGTH THREADED BARS SHALL CONFORM TO ASTM A722, TYPE II WITH AN ULTIMATE STRENGTH (fpu) OF 150 KSI. ANCHOR PLATES SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153.

V. REINFORCEMENT:

- A. UNLESS OTHERWISE NOTED, THE COVERING MEASURED FROM THE SURFACE OF THE CONCRETE TO THE FACE OF ANY REINFORCING BARS SHALL BE AS FOLLOWS:
 - 1. FORMED SURFACES EXPOSED TO EARTH AND WEATHER = 2" CLEAR
 - 2. BOTTOM AND SIDES OF FOOTINGS AND WHERE CONCRETE DEPOSITED ON GRADE = 3" CLEAR
- B. MINIMUM CLEAR SPACING BETWEEN PARALLEL BARS SHALL BE 1-1/2 TIMES THE DIAMETER OF THE BAR (FOR NON-BUNDLED BARS) OR 1-1/2 TIMES THE DIAMETER DERIVED FROM THE EQUIVALENT TOTAL AREA OF THE BARS (FOR BUNDLED BARS), BUT IN NO CASE SHALL THE CLEAR DISTANCE BETWEEN THE PARALLEL BARS BE LESS THAN 1-1/2 TIMES THE MAXIMUM SIZE OF THE COARSE AGGREGATE OR 1-1/2 INCHES.
- C. ALL DIMENSIONS RELATING TO REINFORCING BARS (E.G. SPACING OF BARS, ETC.) ARE TO CENTER OF BARS, UNLESS OTHERWISE NOTED.
- D. ALL DIMENSIONS RELATING TO NEW REINFORCING BARS WERE DETERMINED BASED ON THE LOCATION OF THE EXISTING REINFORCING BARS AS INDICATED ON THE EXISTING DRAWINGS. CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING REINFORCING BARS PRIOR TO DRILLING FOR EPOXY EMBEDMENT OF NEW REINFORCING BARS.
- E. EXISTING REINFORCING BARS SHALL NOT BE CUT, UNLESS OTHERWISE NOTED.
- F. ALL DRILLED HOLES IN THE EXISTING STRUCTURE SHALL BE CLEANED, FILLED WITH EPOXY, AND REINFORCING BARS SET IN PLACE WITHIN AN EIGHT (8) HOUR WORK DAY.
- G. ALL SPLICES IN REINFORCING BARS SHALL BE WITH A MECHANICAL CONNECTOR, UNLESS OTHERWISE NOTED.
- H. REINFORCING BARS SHALL BE DETAILED IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 2ND EDITION, 1998, INCLUDING SUBSEQUENT INTERIM REVISIONS, UNLESS OTHERWISE NOTED.
- I. REINFORCING BARS SHALL BE SECURELY TIED AT ALL INTERSECTIONS AND LAP SPLICES EXCEPT WHERE THE SPACING OF INTERSECTIONS IS LESS THAN 12 INCHES IN EACH DIRECTION, IN WHICH CASE ALTERNATE INTERSECTIONS SHALL BE TIED.

VI. GENERAL CONSTRUCTION NOTES:

- A. SEE STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.
- B. ALL ITEMS NOTED INCIDENTAL WILL NOT BE PAID FOR SEPARATELY.
- C. STANDARD DETAIL DRAWINGS REFER TO ALL STRUCTURES IN GENERAL, EXCEPT FOR MODIFICATIONS AS MAY BE REQUIRED FOR SPECIAL CONDITIONS. FOR SUCH MODIFICATIONS, REFER TO THE CORRESPONDING DETAILED DRAWINGS.
- D. THE CONTRACTOR SHALL COMPLY WITH ALL CONSTRUCTION PERMITS FOR THIS PROJECT. IN ADDITION, THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LAWS OF THE FEDERAL, STATE AND COUNTY GOVERNMENTS.
- E. UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE MEASURED PLUMB.
- F. THE CONTRACTOR SHALL VERIFY ALL SITE CONDITIONS BEFORE COMMENCING WITH WORK.
- G. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UNDERGROUND UTILITY LINES AND NOTIFY THE RESPECTIVE OWNERS BEFORE COMMENCING WITH THE WORK OF EXCAVATION AND DRILLING FOR SOIL ANCHORS.
- H. THE CONTRACTOR SHALL REFER TO THE EXISTING DRAWINGS FOR THE APPROXIMATE LOCATION AND SIZE OF ALL EXISTING REINFORCING BARS PRIOR TO DRILLING.
- I. THE CONTRACTOR SHALL OFFSET NEW REINFORCING BARS AS REQUIRED TO AVOID EXISTING REINFORCING BARS. EXISTING REINFORCING BARS SHALL NOT BE CUT DURING DRILLING OPERATIONS.
- J. FOR CONCRETE FINISH, SEE STANDARD SPECIFICATIONS.
- K. UNLESS OTHERWISE NOTED, ALL EXPOSED 90° CONCRETE EDGES SHALL BE CHAMFERED 3/4" X 3/4".
- L. WHERE NEW REINFORCING BARS TERMINATE AT THE EXISTING STRUCTURE, DRILL AND EPOXY REINFORCING BARS INTO EXISTING WITH 12 INCHES MINIMUM EMBEDMENT, UNLESS OTHERWISE NOTED.
- M. DRILLED HOLES IN EXISTING CONCRETE SHALL BE CLEANED, FILLED WITH EPOXY, AND REINFORCING BAR SET IN PLACE WITHIN AN EIGHT (8) HOUR WORK DAY. ELEVATIONS AND DIMENSIONS SHOWN ARE BASED ON THE EXISTING DRAWINGS AND ARE FOR REFERENCE ONLY. ACTUAL ELEVATIONS AND DIMENSIONS SHALL BE DETERMINED OR VERIFIED BY THE CONTRACTOR.
- O. LARGE IMPACTING OR VIBRATORY TYPE OF EQUIPMENT WILL NOT BE PERMITTED IN THE DRILLING OF HOLES FOR SOIL ANCHORS.
- P. THE CONTRACTOR SHALL BE AWARE OF WORK BEING DONE ON STEEP SLOPES. TEMPORARY MEASURES MAY BE REQUIRED TO STABILIZE THE SLOPES.

VII. SURFACE PREPARATION OF EXISTING CONCRETE:

- A. ALL EXISTING CONCRETE SURFACES WHERE FRESH CONCRETE IS TO BE PLACED AGAINST SHALL BE ROUGHENED BY SAND-BLASTING ONLY. ONLY IMMEDIATE SURFACE NEEDS TO BE REMOVED SUCH THAT SURFACE IS NOT SMOOTH.
- B. PRIOR TO PLACEMENT OF REINFORCING STEEL AND FRESH CONCRETE, EXISTING CONCRETE SURFACES SHALL BE CLEANED AND FREE OF LAITANCE.
- C. EXISTING CONCRETE SURFACES SHALL BE DAMPENED WITH CLEAN POTABLE WATER PRIOR TO PLACEMENT OF FRESH CONCRETE. HOWEVER, FRESH CONCRETE SHALL NOT BE PLACED IN FREESTANDING OR PUDDLED WATER.
- D. CONCRETE SURFACES TO RECEIVE AN EPOXY BONDING ADHESIVE PRIOR TO PLACEMENT OF FRESH CONCRETE SHALL BE PREPARED AS RECOMMENDED BY THE MANUFACTURER.

VIII. PLACEMENT OF REINFORCING TIES:

- A. PLACEMENT OF REINFORCING TIES SHALL BE SUCH THAT THE BEND IN THE TIES ARE IN CONTACT WITH THE VERTICAL REINFORCING BARS OF THE COLUMN. REFER TO "TYPICAL HOOK TIE DETAIL" FOR CLARIFICATION.
- B. ONLY TWO (2) ADJACENT FACES OF EXISTING COLUMNS SHALL BE DRILLED AT A TIME FOR DRILL AND EPOXY PLACEMENT OF REINFORCING TIES.
- C. DRILLED HOLES IN EXISTING COLUMNS SHALL BE CLEANED, FILLED WITH EPOXY, AND REINFORCING TIES SET IN PLACE WITHIN AN EIGHT (8) HOUR WORK DAY.

IX. FOUNDATION:

- A. THESE FOUNDATION NOTES WERE BASED ON RECOMMENDATIONS CONTAINED IN A GEOTECHNICAL ENGINEERING EXPLORATION REPORT BY HIRATA & ASSOCIATES, INC., TITLED "ADDITIONAL SERVICES, SEISMIC RETROFIT OF VARIOUS BRIDGES, HONOLULU BRIDGE, SOUTH HILO DISTRICT, HAWAII" DATED MARCH 16, 2005. THE REPORT SHALL BE CONSIDERED A PART OF THE CONSTRUCTION DOCUMENTS AND ITS RECOMMENDATIONS SHALL BE IMPLEMENTED, UNLESS OTHERWISE DIRECTED BY THE GEOTECHNICAL ENGINEER. THE CONTRACTOR MAY OBTAIN A COPY OF THE REPORT AT THE STATE OF HAWAII, DEPARTMENT OF TRANSPORTATION - HIGHWAYS DIVISION UPON REQUEST.
- B. SOIL DESIGN PARAMETERS:
 - 1. HORIZONTAL EARTH PRESSURE:
 - FREESTANDING (ACTIVE) = 40 PCF
 - RESTRAINED (AT-REST) = 55 PCF
 - 2. SOIL ANCHOR ADHESION = 2,000 PSF

C. STRUCTURAL BACKFILL:

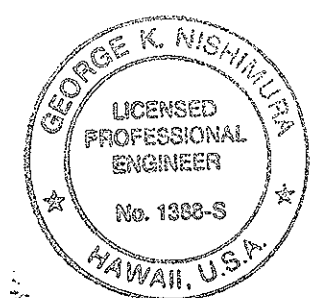
- 1. UNLESS OTHERWISE NOTED ON THE PLANS FOR CLSM BACKFILL, STRUCTURAL BACKFILL SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS FOR STRUCTURE BACKFILL MATERIAL A AS INDICATED IN SECTION 703.20 OF THE HAWAII STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND PUBLIC WORKS CONSTRUCTION, 1994 AND THE SPECIAL PROVISIONS.
- 2. PLACEMENT OF THE STRUCTURAL BACKFILL SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND THE SPECIAL PROVISIONS.

CONSTRUCTION SEQUENCE

- 1. EXCAVATE AT EXISTING CURTAIN WALL AND COLUMNS AS REQUIRED TO CONSTRUCT NEW SOIL ANCHOR FOOTING, NEW CURTAIN WALL, AND NEW BUILT-UP COLUMNS. CONTRACTOR SHALL PROVIDE SHORING AS REQUIRED DURING EXCAVATION. COST FOR SHORING SHALL BE CONSIDERED INCIDENTAL TO STRUCTURE EXCAVATION.
- 2. CONSTRUCT SOIL ANCHOR FOOTING. PROVIDE 1'-4" SQUARE BLOCKOUTS AND 9" DIAMETER HOLES FOR CONSTRUCTION OF SOIL ANCHORS.
- 3. CONSTRUCT BUILT-UP COLUMNS AND BEAM.
- 4. CONSTRUCT FIRST 6'-0" LIFT OF NEW CURTAIN WALL. PROVIDE GROOVE IN WALL AT CONSTRUCTION JOINT.
- 5. AFTER NEW CURTAIN WALL HAS ATTAINED ITS REQUIRED CONCRETE COMPRESSIVE STRENGTH, POUR CLSM BACKFILL BEHIND EXISTING CURTAIN WALL. CLSM BACKFILL SHALL BE PLACED IN MAXIMUM 3'-0" HIGH LIFTS. CURING TIME FOR CLSM BACKFILL SHALL BE A MINIMUM OF 48 HOURS BETWEEN LIFTS. POUR CLSM BACKFILL TO 1-FOOT BELOW FIRST LIFT OF NEW CURTAIN WALL.
- 6. REPEAT STEPS (3) AND (4) FOR SECOND, THIRD, AND FOURTH LIFTS OF NEW CURTAIN WALL.
- 7. CONSTRUCT SOIL ANCHORS.
 - A. DRILL HOLE TO REQUIRED DEPTH.
 - B. INSTALL SOIL ANCHOR.
 - C. GROUT HOLE TO INITIAL GROUT LEVEL.
 - D. STRESS SOIL ANCHORS TO LOCK-OFF LOAD OF 23 KIPS EACH AFTER INITIAL LOSSES.
 - E. GROUT REMAINDER OF SOIL ANCHOR HOLE.
- 8. CONSTRUCT CREEP BLOCK.

CONSTRUCTION SEQUENCE NOTES:

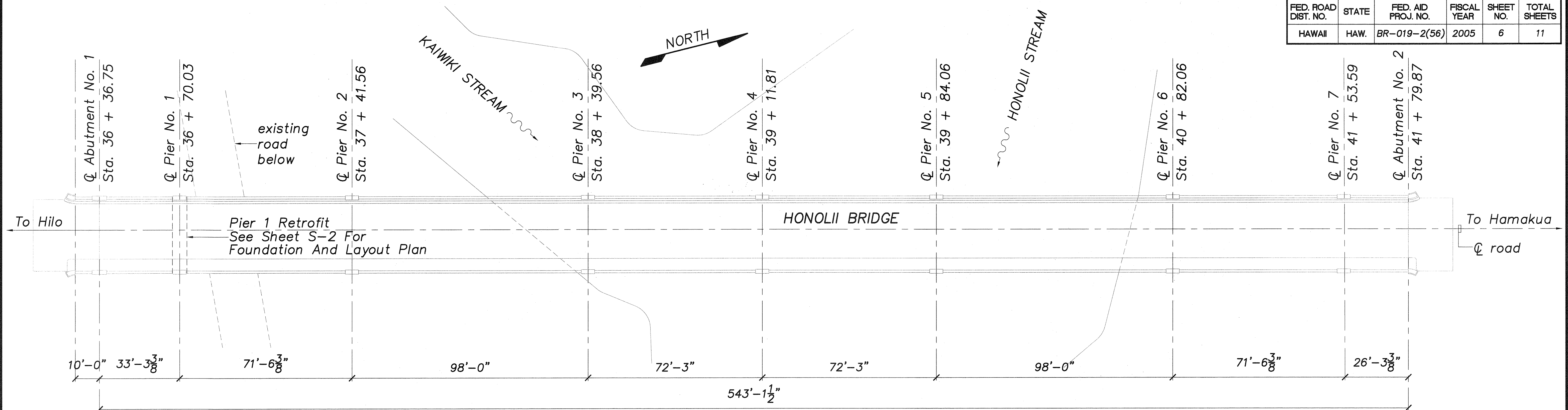
- 1. CONSTRUCTION WORK ON STEPS (6A) THRU (6C) MAY BE DONE CONCURRENTLY WITH STEPS (2) THRU (5).
- 2. STRESSING OF SOIL ANCHORS TO LOCK-OFF LOAD SHALL BE AFTER NEW CURTAIN WALL HAS BEEN CONSTRUCTED AND HAS ATTAINED ITS REQUIRED CONCRETE COMPRESSIVE STRENGTH AND FINAL LIFT OF CLSM BACKFILL HAS BEEN ALLOWED TO CURE FOR A MINIMUM OF 48 HOURS.



THIS WORK WAS PREPARED BY
THE ENGINEER IN ACCORDANCE WITH THE
PROVISIONS OF THE HAWAIIAN
ENGINEERING ACT
04/30/06
Expiration Date of Professional License

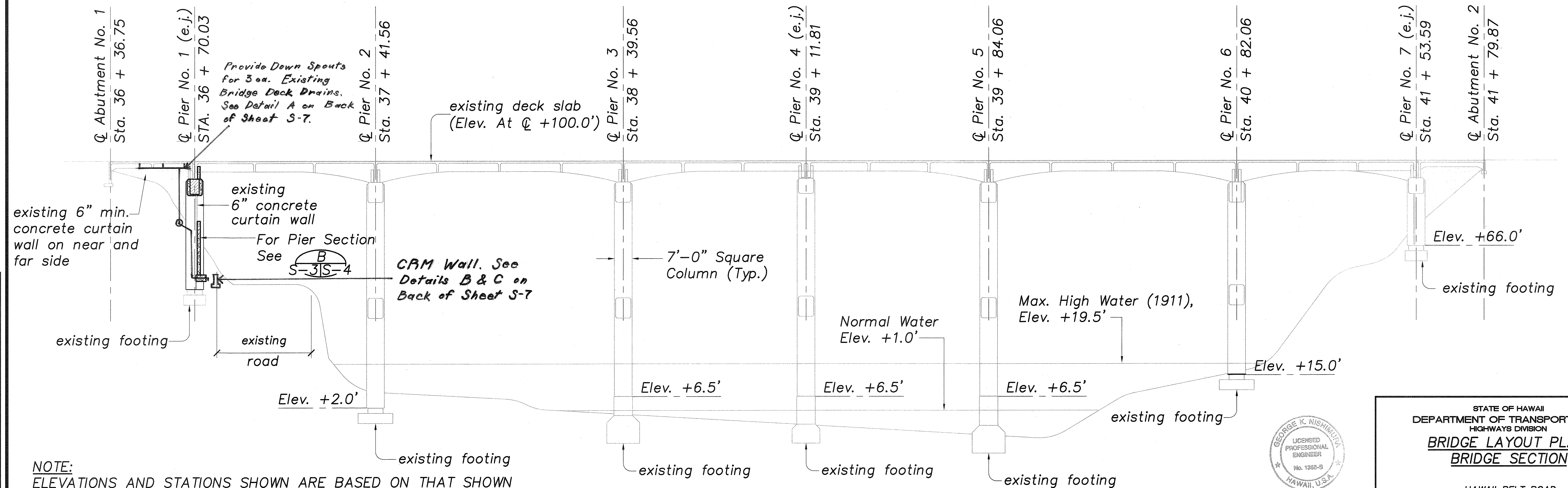
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STRUCTURAL NOTES
CONSTRUCTION SEQUENCE
HAWAII BELT ROAD
SEISMIC RETROFIT OF VARIOUS BRIDGES
VICINITY OF HILO - PHASE 2
Federal Aid Project No. BR-019-2(56)
Scale: As Noted Date: Nov. 2005
SHEET No. S-2 OF 11 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(56)	2005	6	11



BRIDGE LAYOUT PLAN

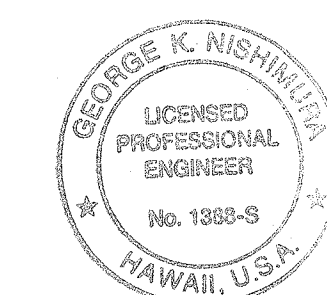
Scale: 1"=20'-0"



NOTE:
ELEVATIONS AND STATIONS SHOWN ARE BASED ON THAT SHOWN ON EXISTING DRAWINGS FOR THIS BRIDGE AND ARE FOR REFERENCE ONLY. ACTUAL ELEVATIONS AND DIMENSIONS SHALL BE DETERMINED BY THE CONTRACTOR.

BRIDGE SECTION ALONG CENTERLINE

Scale: 1"=20'-0"



THIS WORK WAS PREPARED BY
HAWAIIAN ENGINEERING & SURVEYING
Signature: *[Signature]*
Date: 02/20/06
Expiration Date of Professional License: 12/31/2009

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**BRIDGE LAYOUT PLAN,
BRIDGE SECTION**

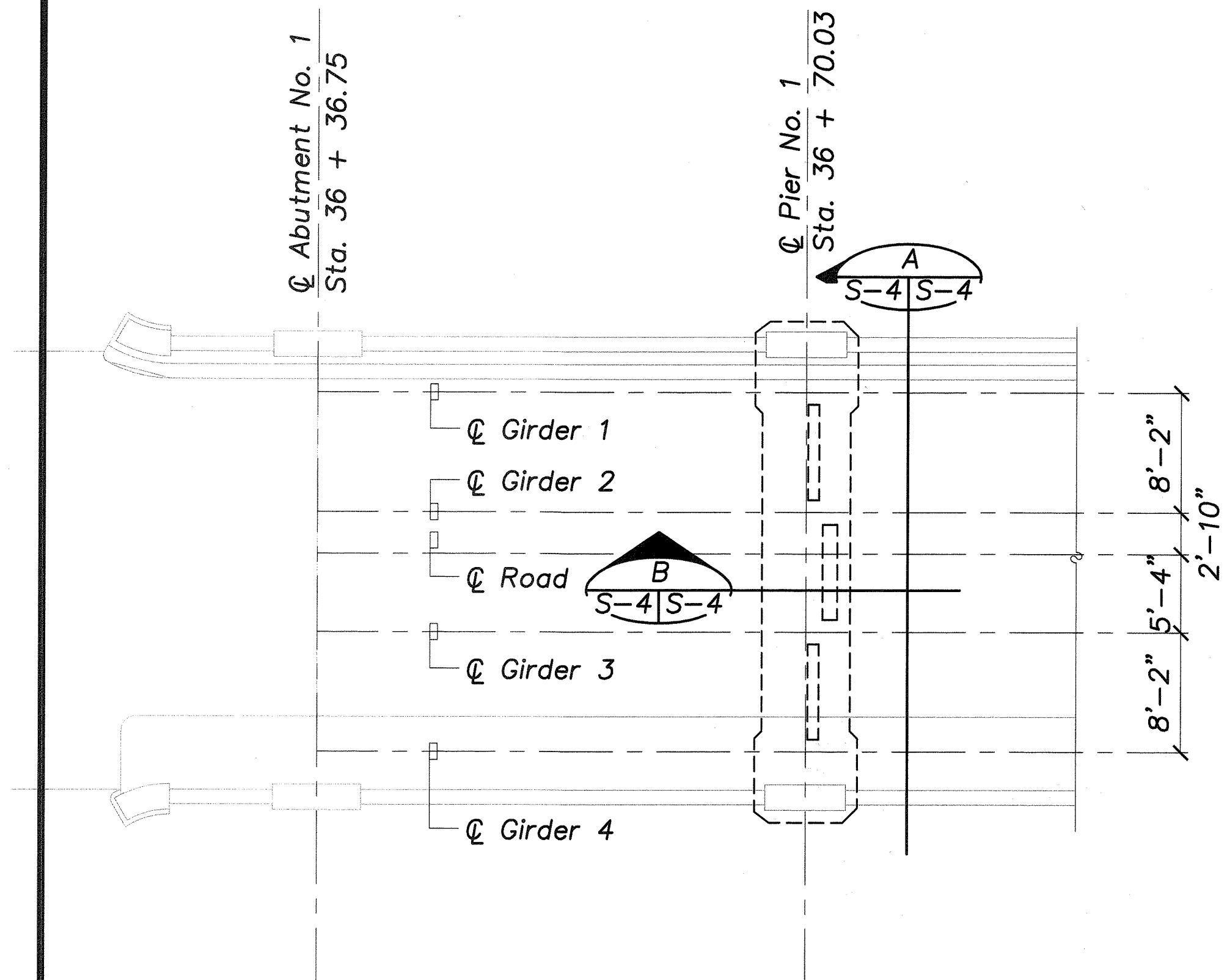
HAWAII BELT ROAD
SEISMIC RETROFIT OF VARIOUS BRIDGES
VICINITY OF HILO - PHASE 2
Federal Aid Project No. BR-019-2(56)

Scale: As Noted Date: Nov. 2005

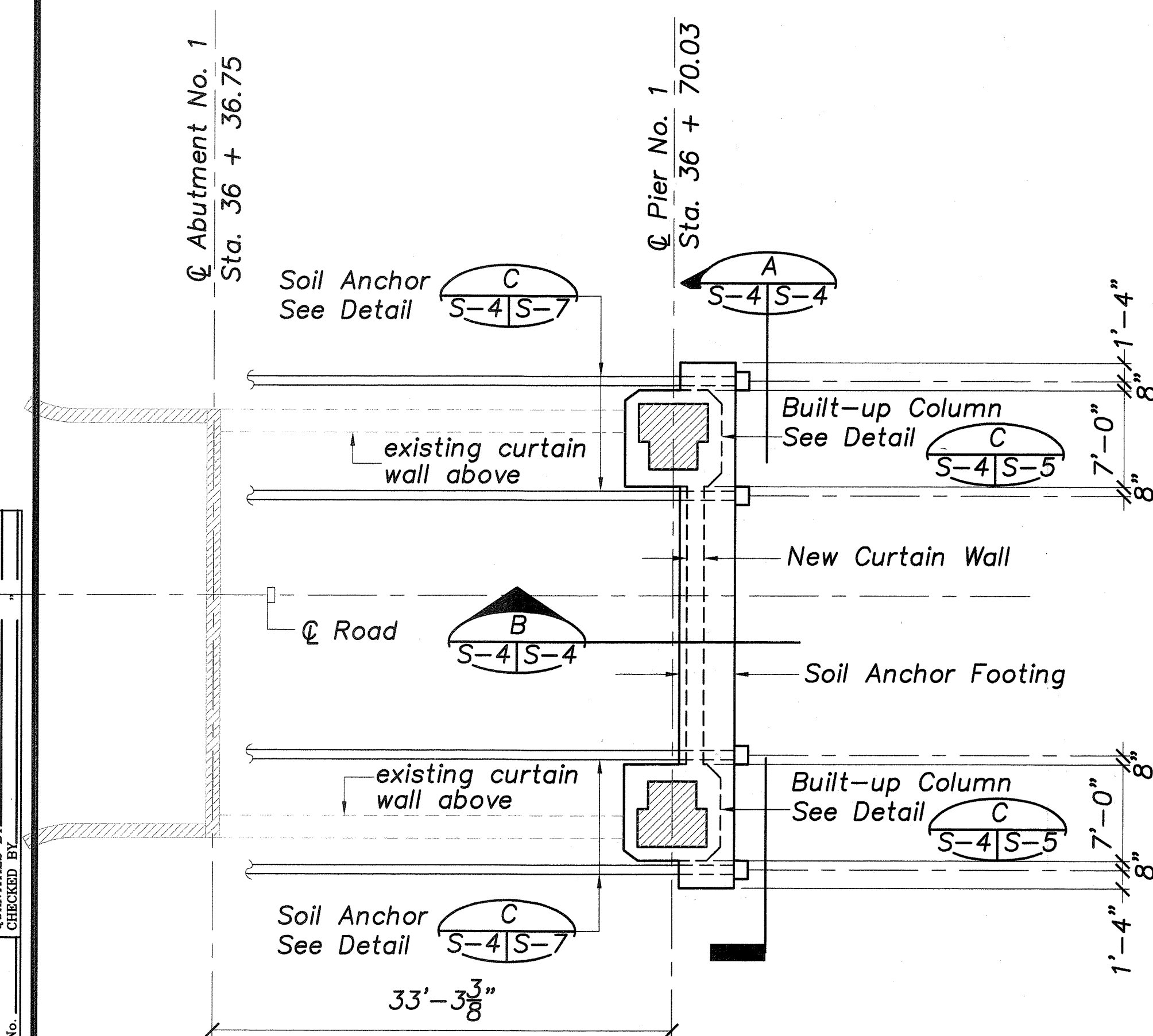
SHEET No. S-3 OF 11 SHEETS

"AS-BUILT"

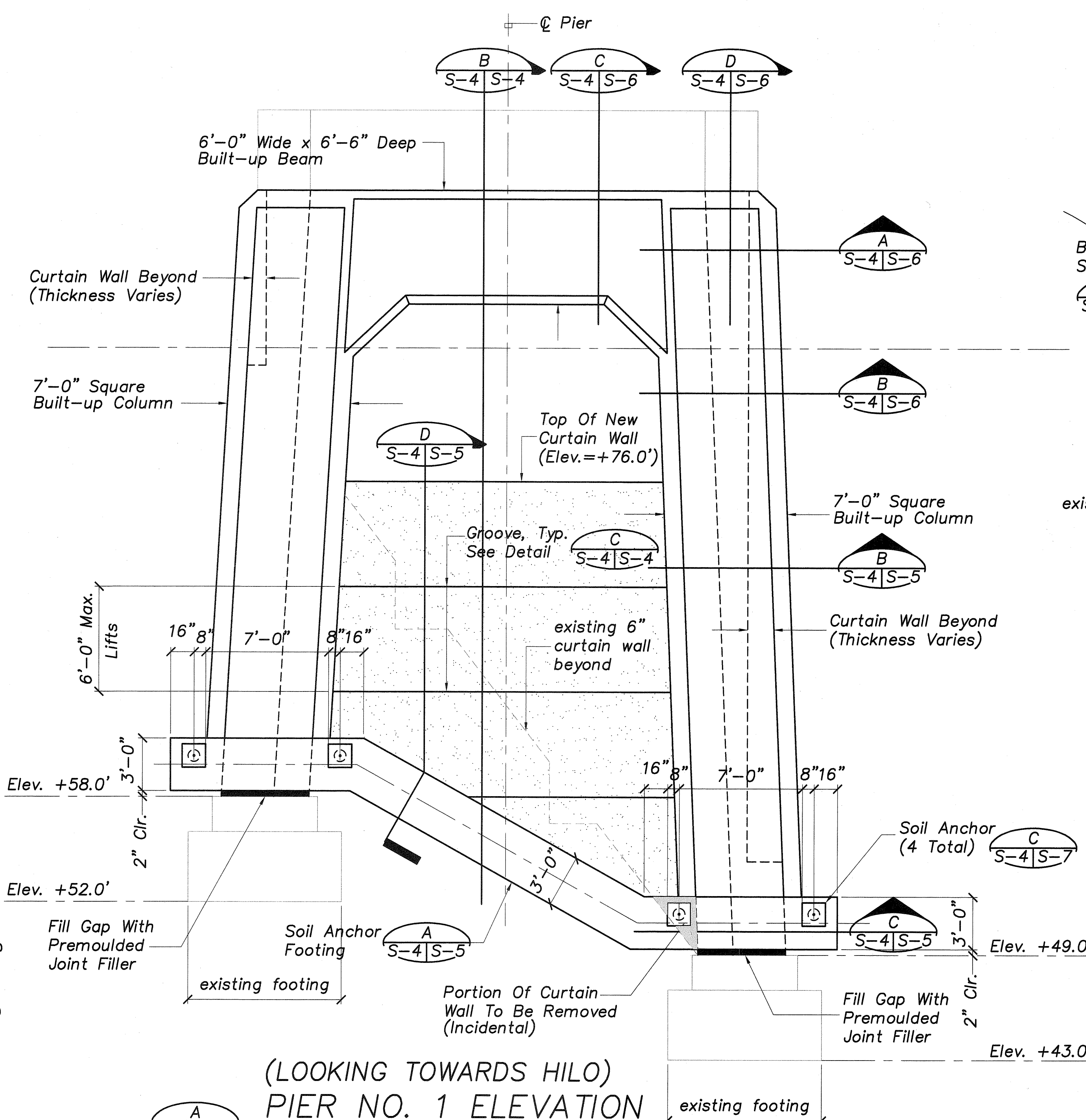
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HAWAII	HAW.	BR-019-2(56)	2005	7	11



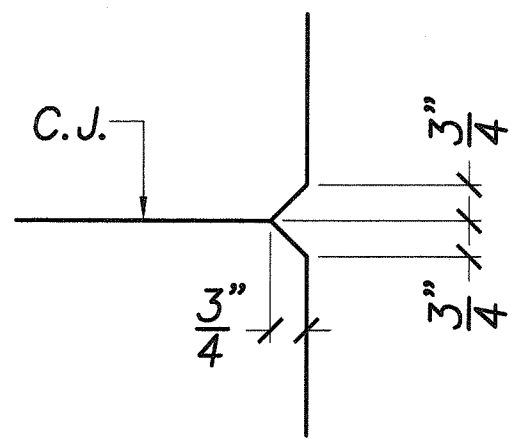
PARTIAL LAYOUT PLAN
Scale: 1/8"=1'-0"



PARTIAL FOUNDATION PLAN
Scale: 1/8"=1'-0"



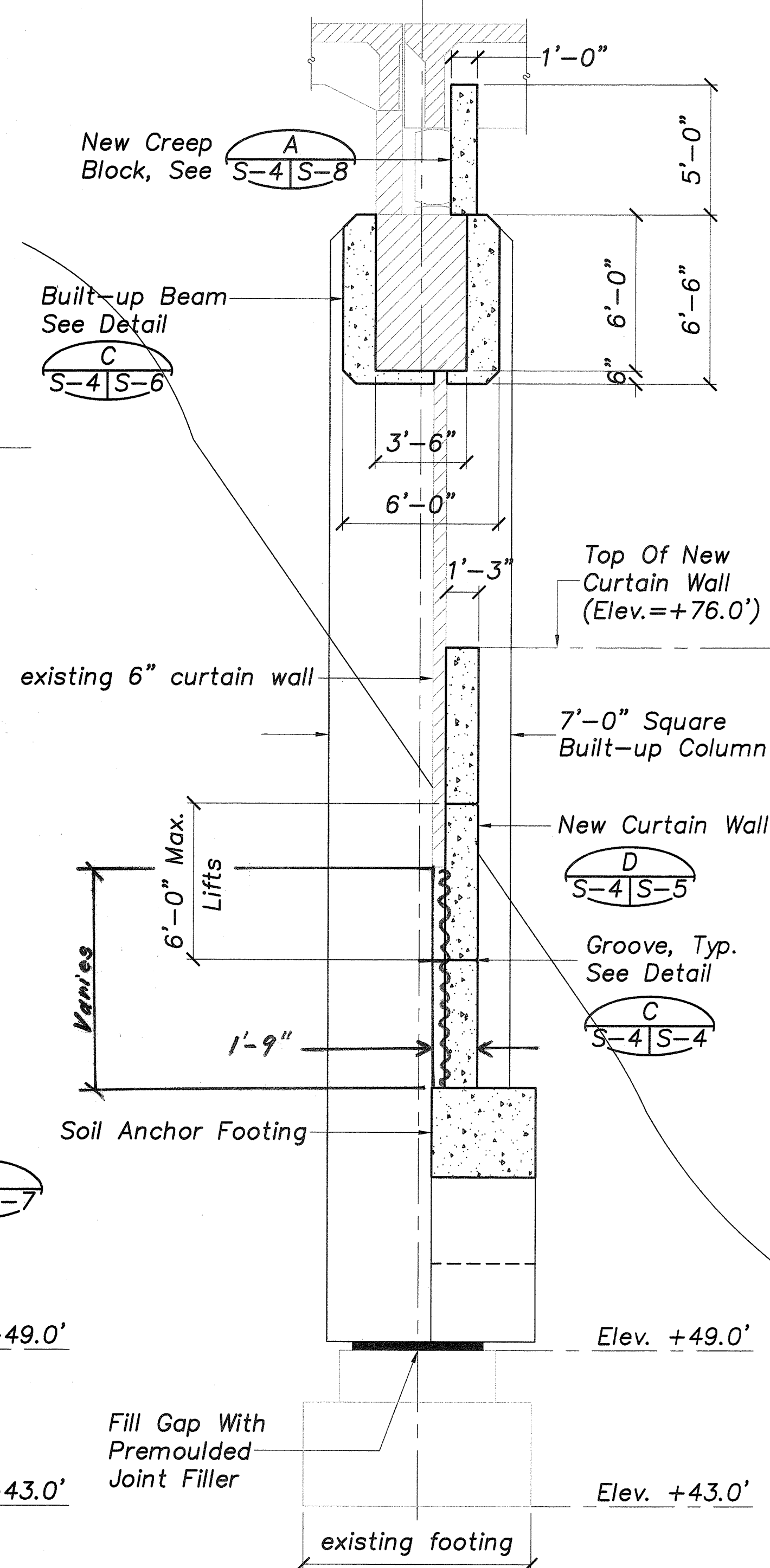
PIER NO. 1 ELEVATION
Scale: 1/4"=1'-0"



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

Note:
Elevations And Dimensions Shown Are Based On The Existing Drawings And Are For Reference Only. Actual Elevations And Dimensions Shall Be Determined Or Verified By The Contractor.

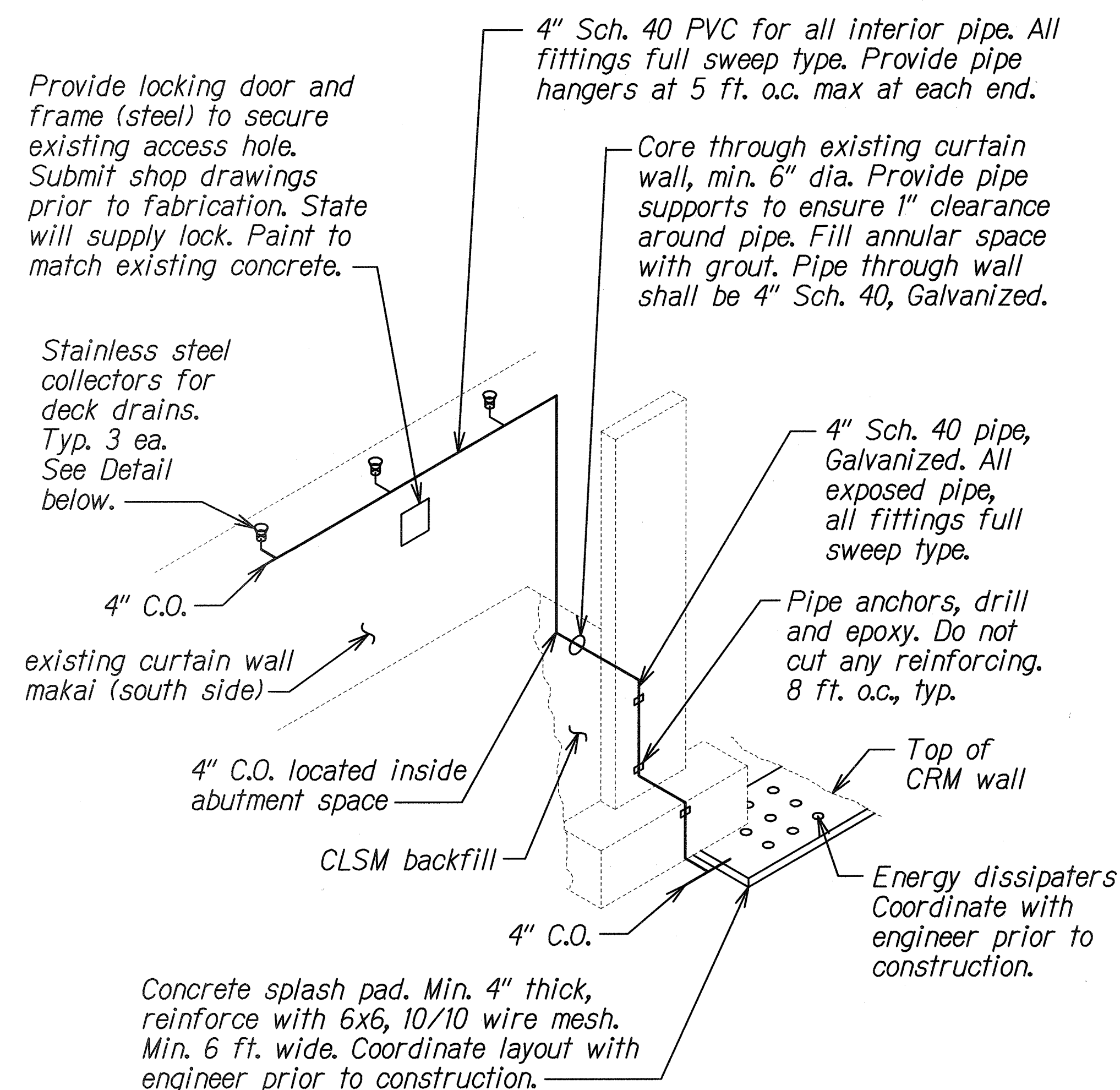
GEORGE K. NISHIMURA
LICENSED PROFESSIONAL ENGINEER
No. 1288-S
HAWAII, U.S.A.
04/30/06
Expiration Date of Professional Engineer



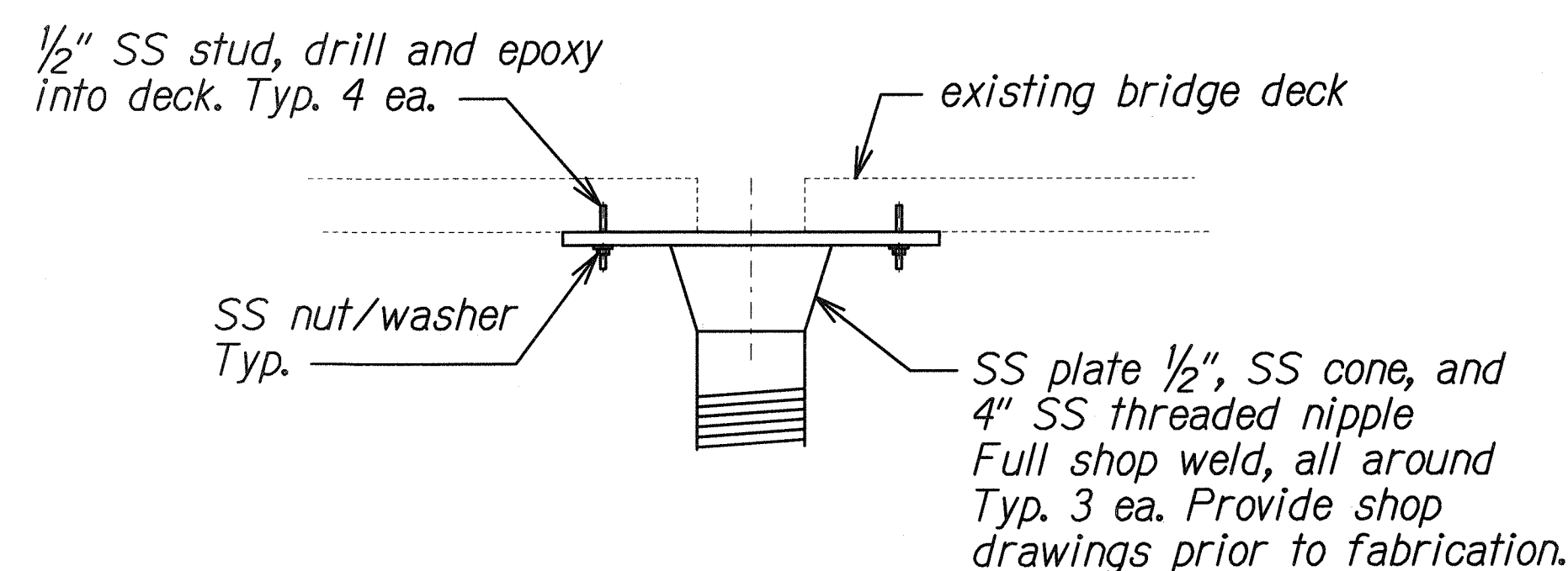
PIER SECTION
Scale: 1/4"=1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
PARTIAL FOUNDATION AND LAYOUT PLAN, PIER ELEVATION AND PIER SECTION
HAWAII BELT ROAD
SEISMIC RETROFIT OF VARIOUS BRIDGES
VICINITY OF HILO - PHASE 2
Federal Aid Project No. BR-019-2(56)
Scale: As Noted Date: Nov. 2005

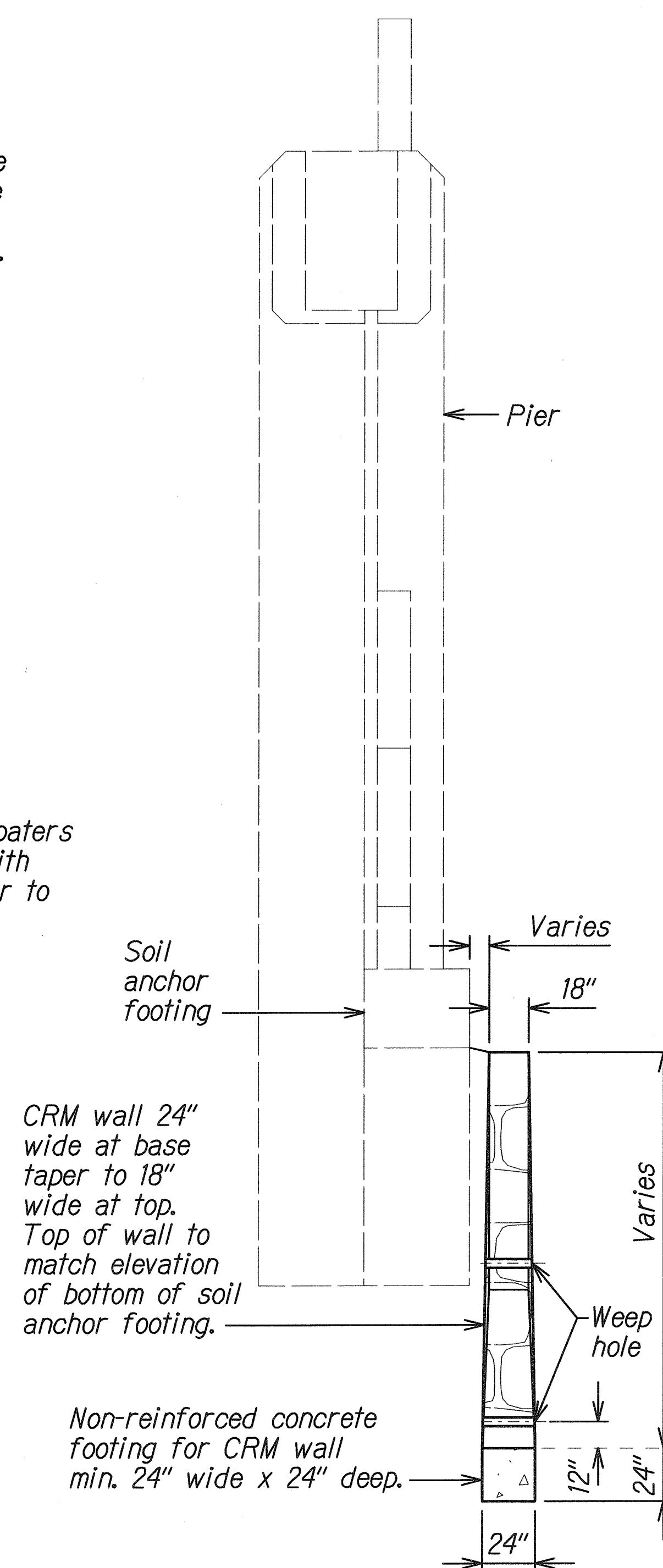
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HAWAII	HAW.	BR-019-2(56)	2005	7 S-1	11



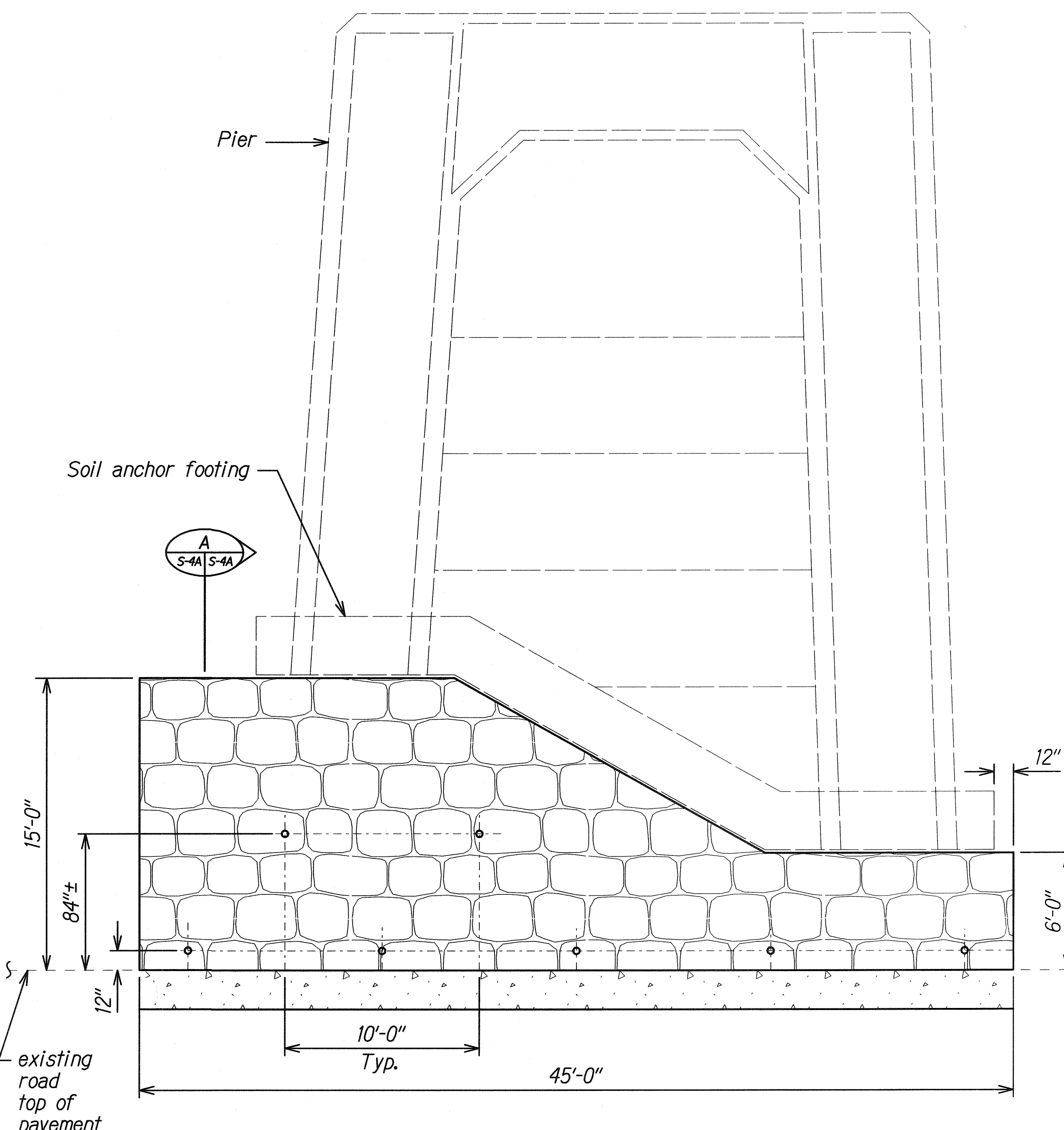
BRIDGE DECK DRAINS
NTS



STAINLESS STEEL COLLECTOR FOR DECK DRAINS DETAIL
NTS



SECTION A
S-4A S-4A



ELEVATION

CRM WALL
NTS

Note: This tracing prepared during "As-Built" posting.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CRM WALL AND DETAILS

HAWAII BELT ROAD
SEISMIC RETROFIT OF VARIOUS BRIDGES
VICINITY OF HILO - PHASE 2
Federal Aid Project No. BR-019-2(56)

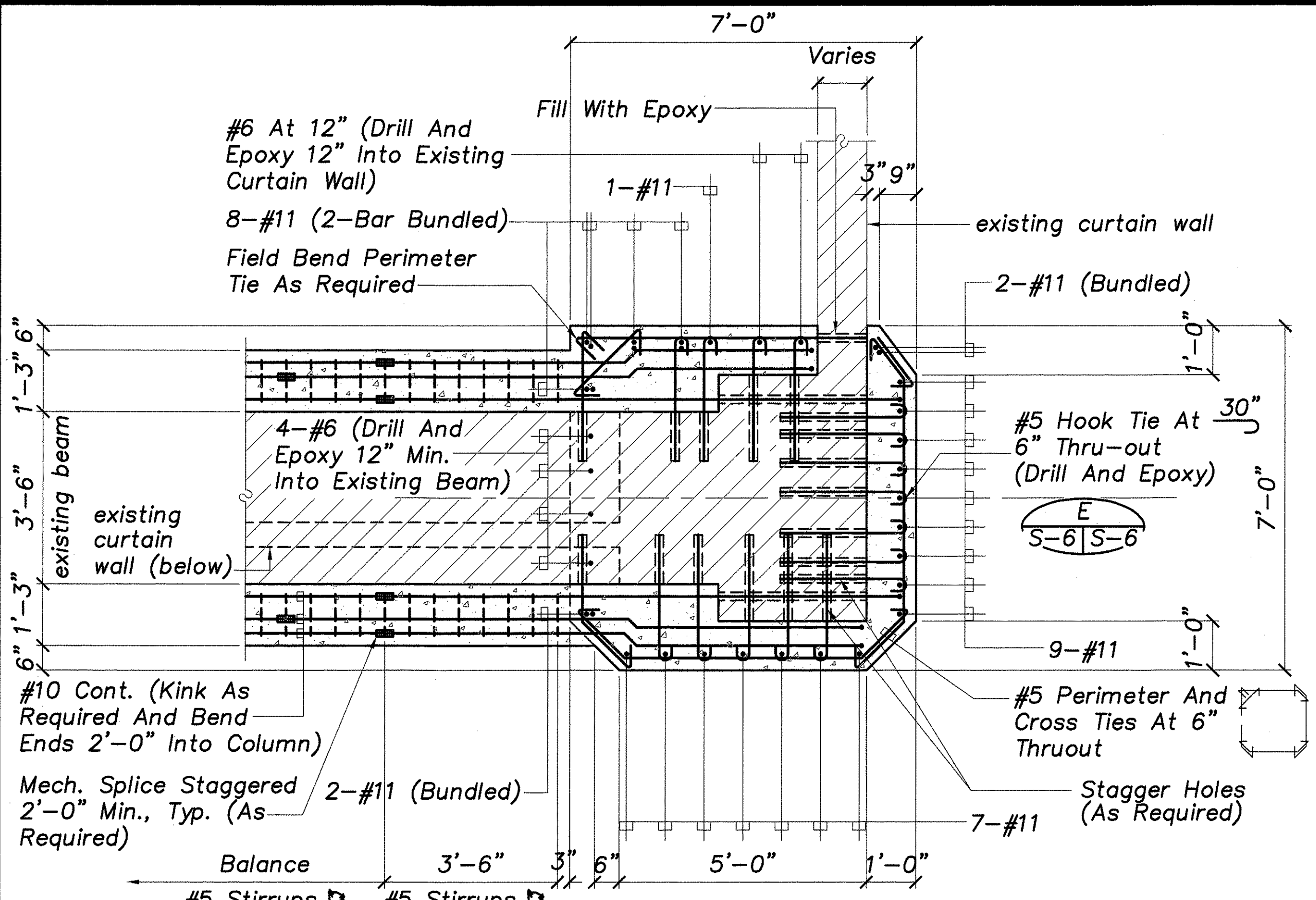
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SHEET No. S-4A OF 11 SHEETS

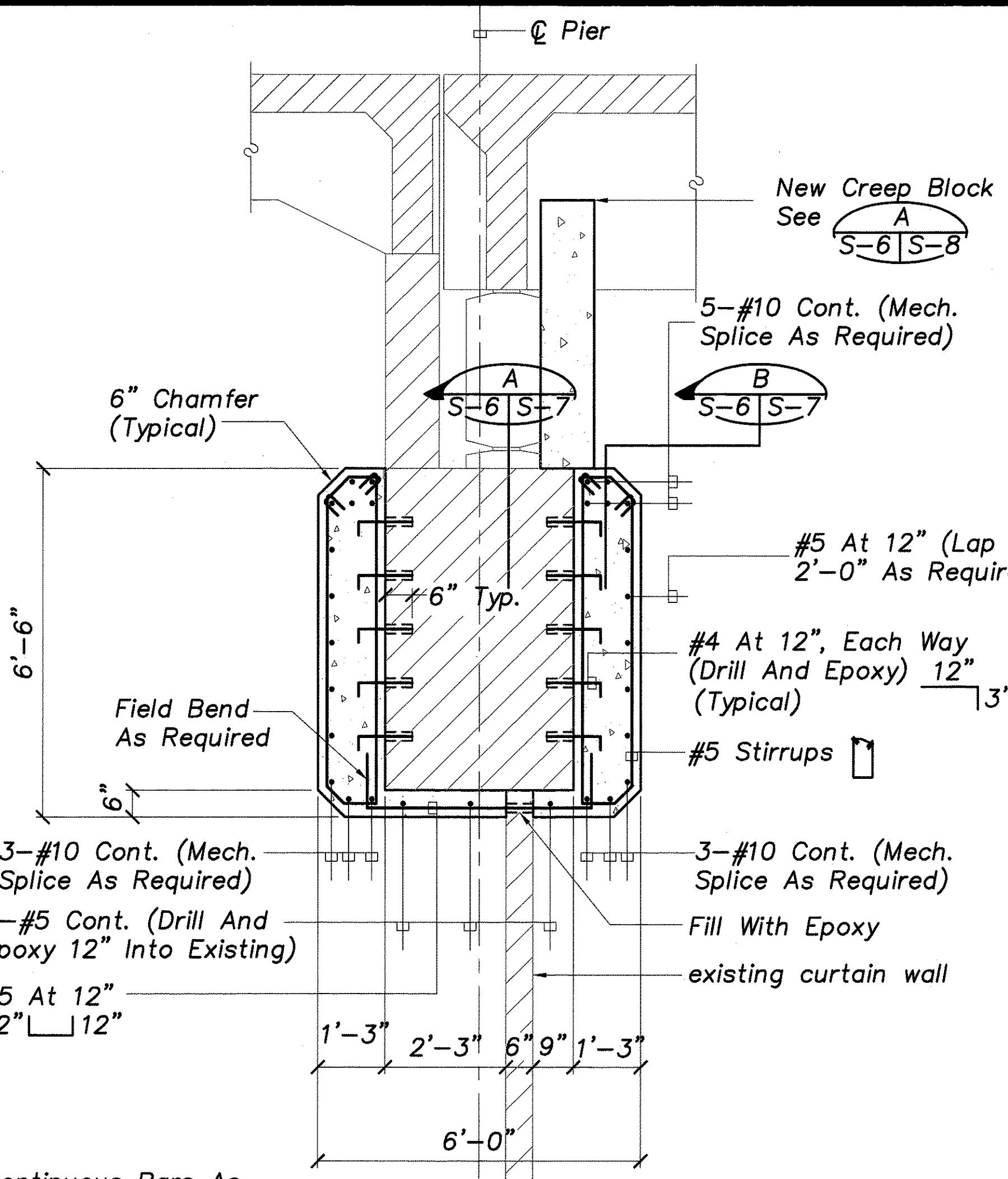
"AS-BUILT"

7 S-1

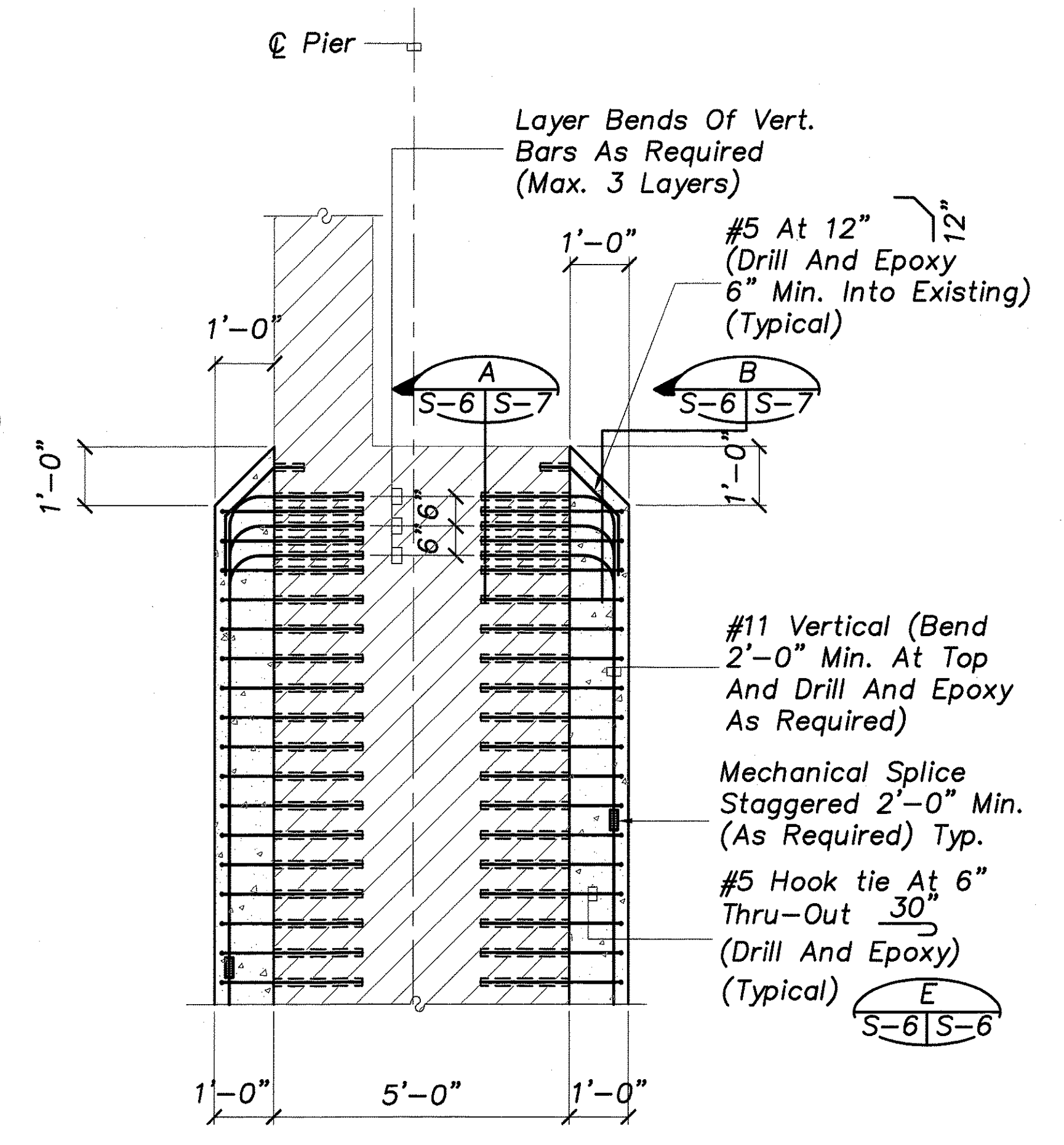
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(56)	2005	9	11



COLUMN SECTION A
Scale: 1/2"=1'-0"



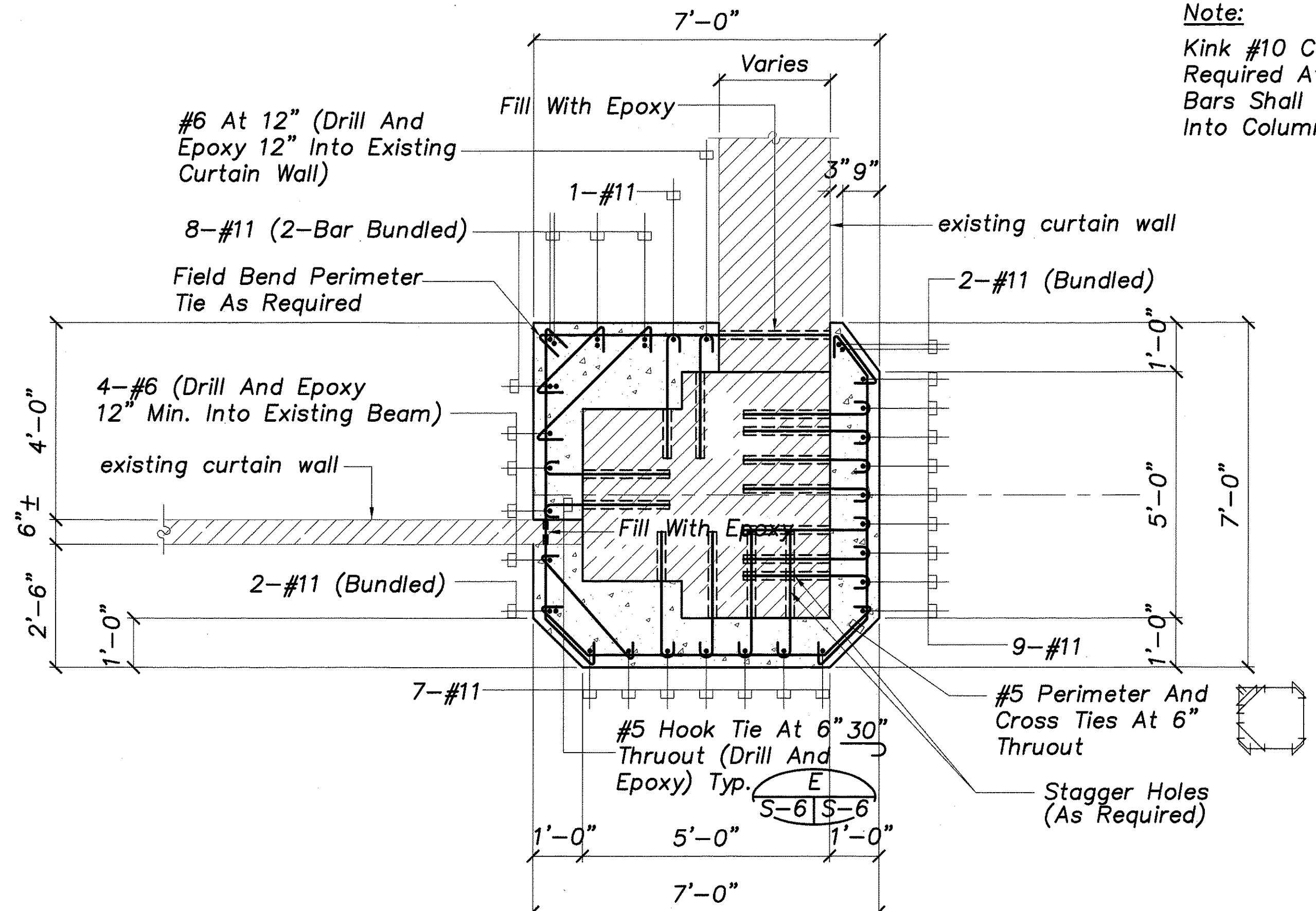
SECTION C
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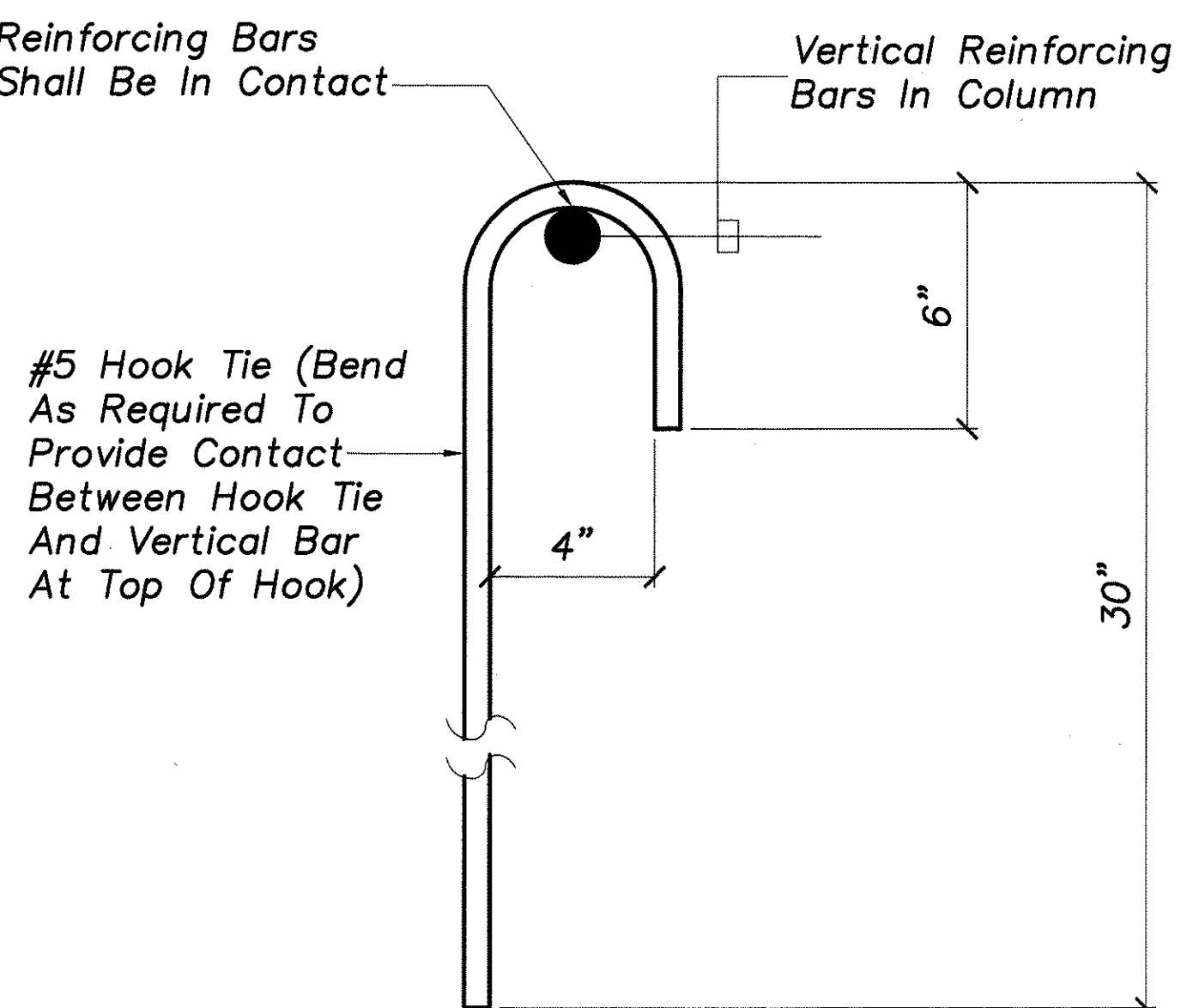
SECTION D
Scale: 1/2"=1'-0"

Note:
Kink #10 Continuous Bars As Required At Columns. Continuous Bars Shall Be Bent 2'-0" Minimum Into Column.

Note:
Dimensions Shown Are Based On The Existing Drawing And Are For Reference Only. Actual Dimensions Shall Be Determined Or Verified By The Contractor.

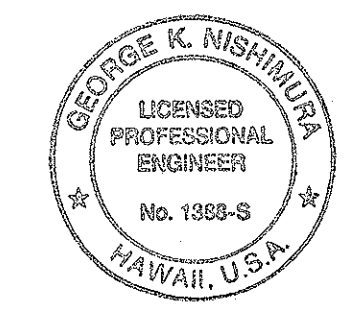


COLUMN SECTION B
Scale: 1/2"=1'-0"



TYPICAL HOOK TIE DETAIL
Scale: 3"=1'-0"

SURVEY PLOTTED BY	DATE
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CHECKED BY	
No.	



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

COLUMN AND BEAM DETAILS

HAWAII BELT ROAD
SEISMIC RETROFIT OF VARIOUS BRIDGES
VICINITY OF HILO - PHASE 2
Federal Aid Project No. BR-019-2(56)

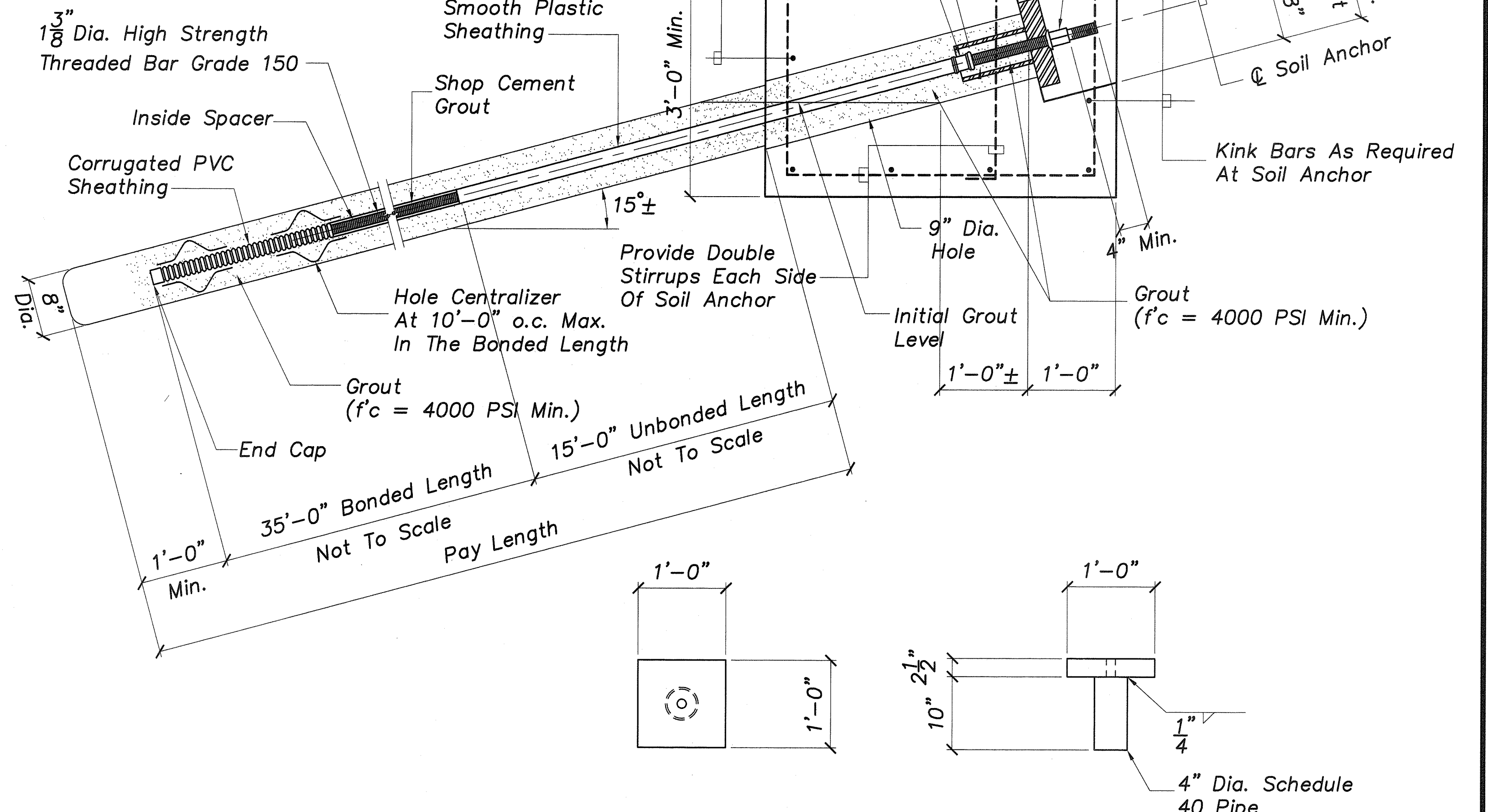
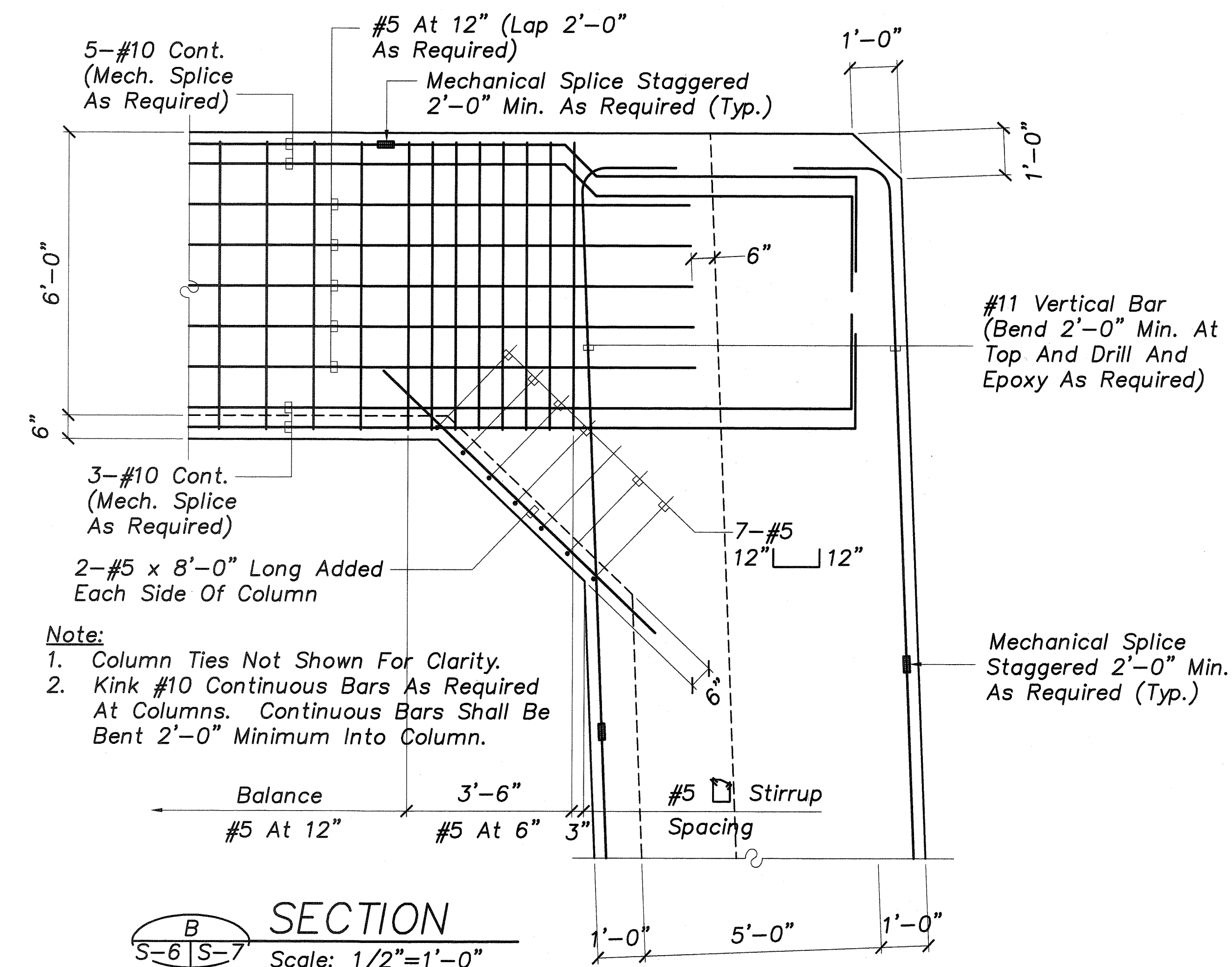
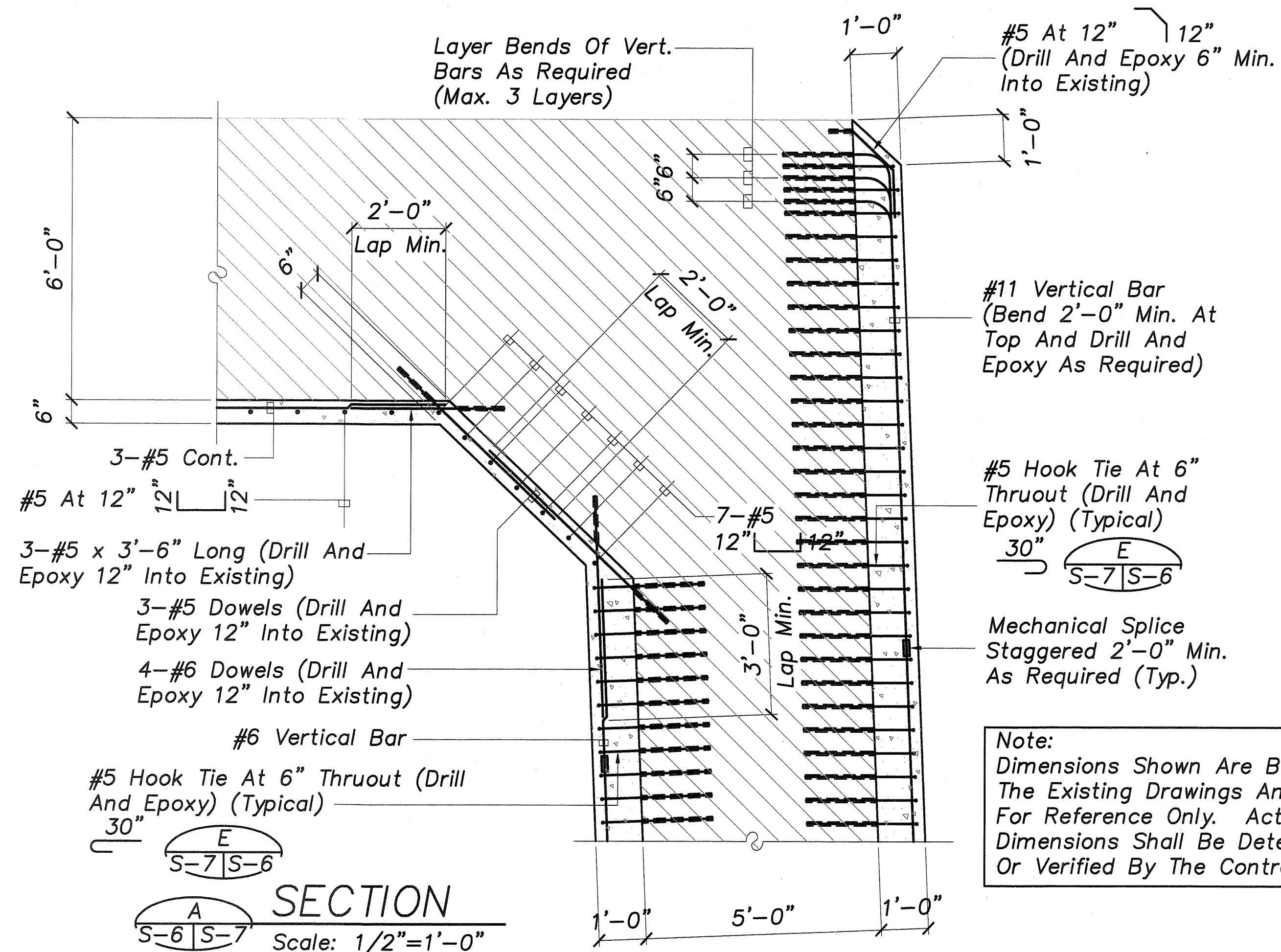
Scale: As Noted Date: Nov. 2005

SHEET No. S-6 OF 11 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(56)	2005	10	11

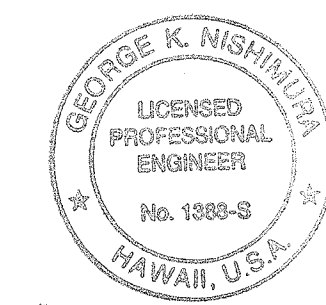
Note:

- Soil Anchor Design Load (P), =137 KIPS
Soil Anchor Lock-Off Load = 23 KIPS
- Grout Tubes Shall Be Placed Thru The 2 1/2" x 12" x 12" Steel Plate. Size And Locations Shall Ensure Full Grouting Of Hole. The Contractor Shall Submit Grouting Details For Review To The Engineer.
- Caution:
 - Do Not Weld To Bar.
 - Do Not Use Bar As Ground Connection For Welding.
 - Do Not Allow Hot Slag Or Sparks To Touch Bar.
 - Do Not Damage Bar Surface.
 - Do Not Use Bars With Kinks Or Sharp Bends.
 - Failure To Heed This Warning Could Cause Bar To Break Resulting In Injury Or Damage.



GALVANIZED PLATE DETAIL

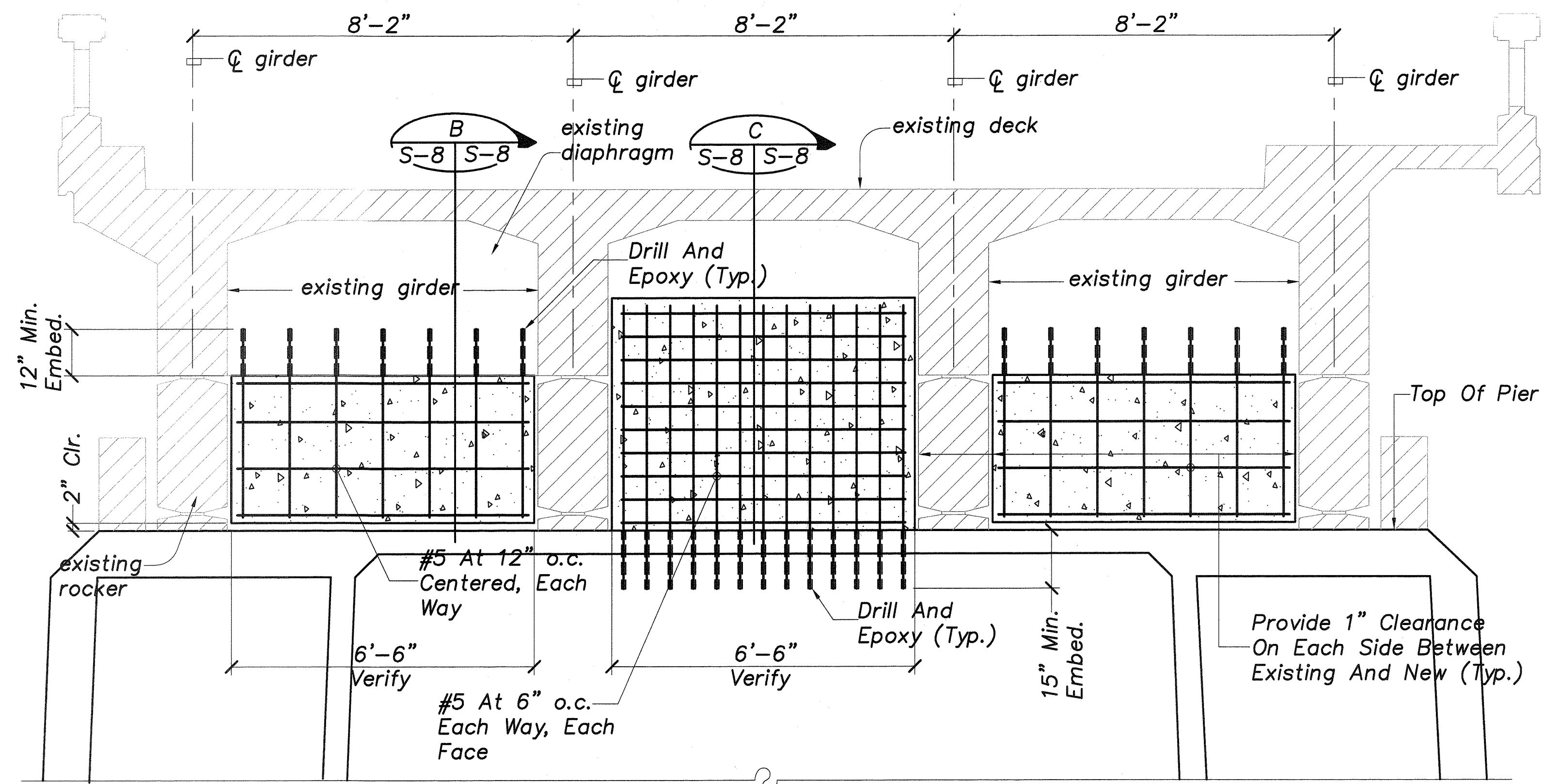
SOIL ANCHOR DETAILS Not To Scale



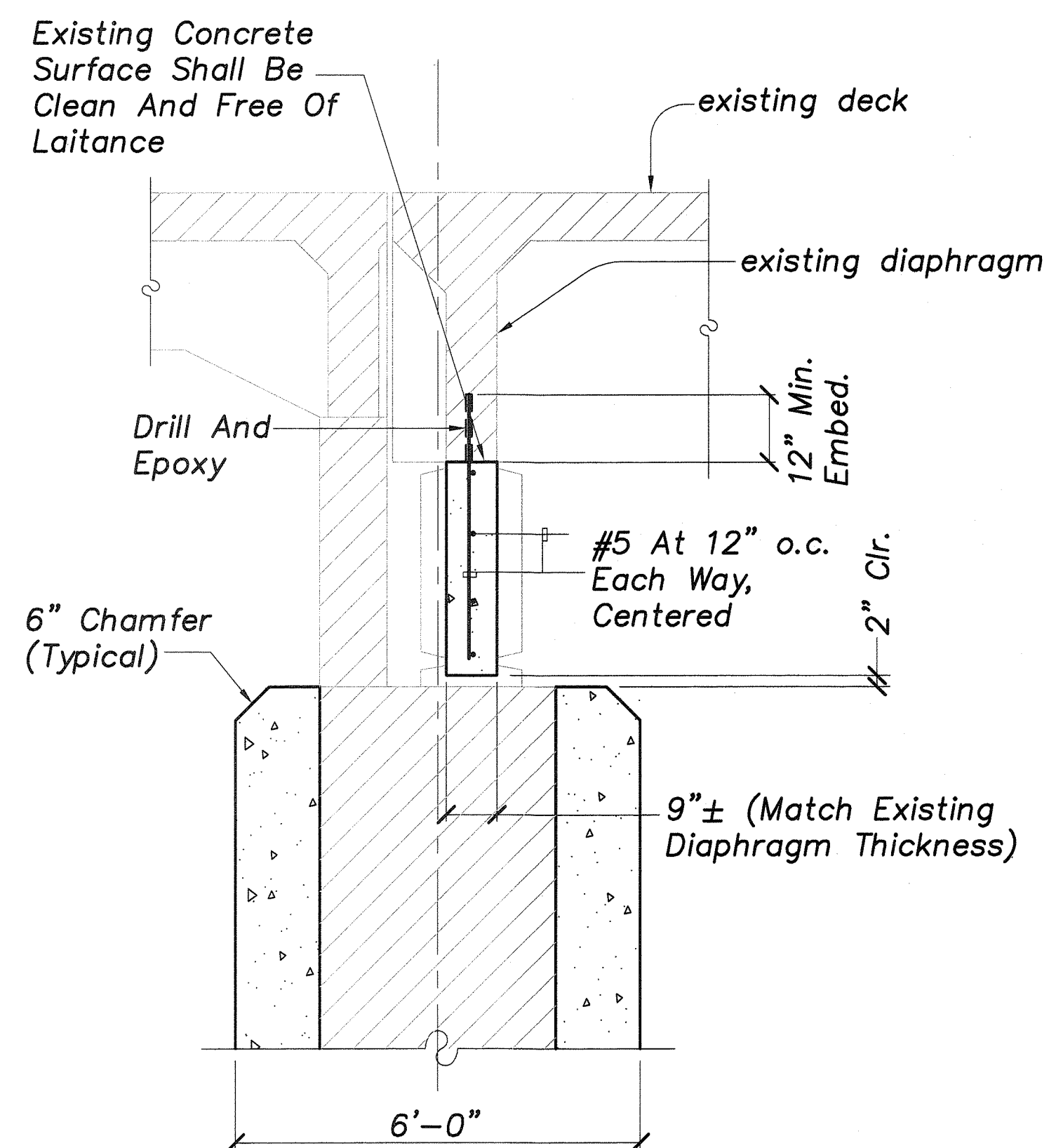
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**BEAM DETAILS,
SOIL ANCHOR DETAIL**
HAWAII BELT ROAD
SEISMIC RETROFIT OF VARIOUS BRIDGES
VICINITY OF HILO - PHASE 2
Federal Aid Project No. BR-019-2(56)
Scale: As Noted Date: Nov. 2005
SHEET No. S-7 OF 11 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-019-2(56)	2005	11	11

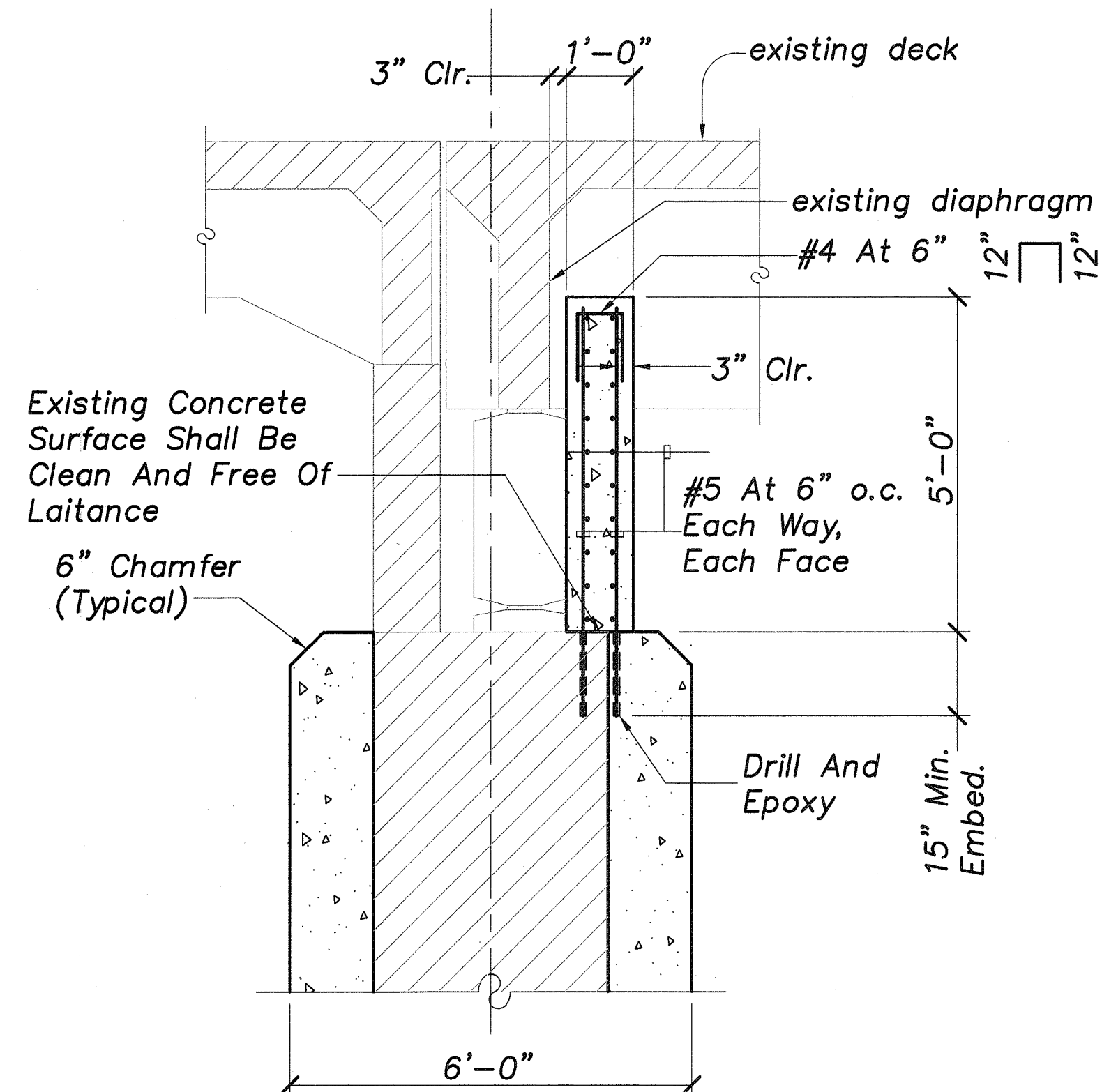
Note:
Dimensions Shown Are Based On The Existing Drawings And Are For Reference Only. Actual Dimensions Shall Be Determined Or Verified By The Contractor.



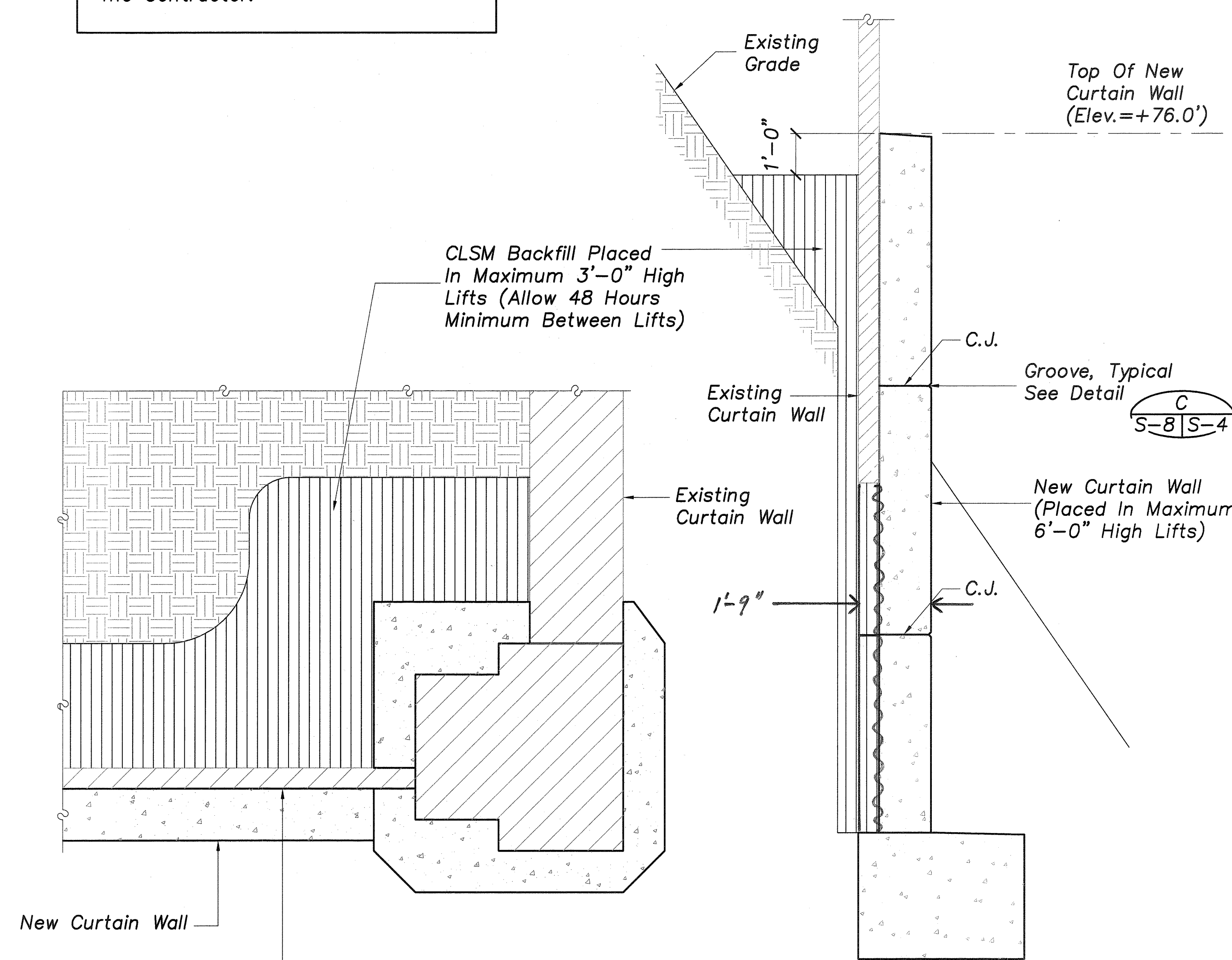
CREEP BLOCK ELEVATION
S-4, S-6, S-8 Scale: 1/2"=1'-0"



SECTION B
S-8, S-10 Scale: 1/2"=1'-0"

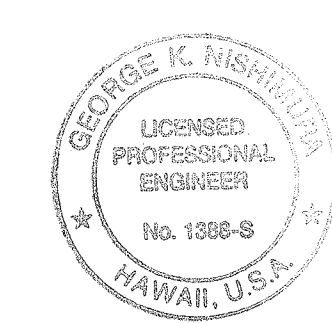


SECTION C
S-8, S-10 Scale: 1/2"=1'-0"



BACKFILL DETAILS
S-8 Scale: 1/2"=1'-0"

Note:
Contractor Shall Provide Shoring As Required During Excavation. Cost For Shoring Shall Be Considered Incidental To Structural Excavation.



Signature: *[Signature]*
Date: 6/17/06
Expiration Date of Professional License

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**CREEP BLOCK DETAILS,
BACKFILL DETAILS**
HAWAII BELT ROAD
SEISMIC RETROFIT OF VARIOUS BRIDGES
VICINITY OF HILO - PHASE 2
Federal Aid Project No. BR-019-2(56)
Scale: As Noted Date: Nov. 2005
SHEET No. S-8 OF 11 SHEETS

"AS-BUILT"