#### General:

- Workmanship and materials shall conform to the building code of the City and County of Honolulu (amended UBC, 1994 edition). However, where reference is made to performance conforming to other standards the more stringent shall apply.
- B. The Contractor shall compare all the contract documents with each other and report in writing to the engineer all inconsistencies and omissions.
- C. The Contractor shall take field measurements and verify field conditions and shall compare such field measurements and conditions with the drawings before commencing work. Report in writing to the Engineer all inconsistencies and omissions.
- D. The Contractor shall be responsible for methods of construction, workmanship and job safety. The Contractor shall provide temporary shoring and bracing as required for stability of structural members and systems.
- E. Construction loading shall not exceed design live load unless special shoring is provided. Allowable loads shall be reduced in areas where the structure has not attained full design strength.
- F. The Contractor shall be responsible for protection of the adjacent properties, structures, streets and utilities during the construction period.
- G. Details noted as typical on the Structural drawings shall apply in all conditions unless specifically shown or noted.

#### <u>Design Criteria:</u>

1	A. Seismic	——Zone 2A
	B. Basic wind speed and exposure ————————————————————————————————————	oh, Exposure C
	c. Offices ————————————————————————————————————	20 psf 125 psf 50 psf 100 psf 100 psf 125 psf
	D. Allowable foundation bearing capacities a. Dead Load + Live Load ————————————————————————————————————	2,000 psf 2,700 psf
	E. Retaining walls a. Active earth pressure (unrestrained) ————————————————————————————————————	——— 40 pcf ——— 55 pcf

### <u>Foundation:</u>

c. Passive earth pressure

d. Coefficient of friction

- A. Foundation design is based on the foundation investigation by Ernest K. Hirata & Associates, inc., dated April 23, 1999.
- B. Contractor shall provide for de—watering of excavation from either surface water, ground water or seepage.
- C. Contractor shall provide for design and installation of all cribbing, sheeting, and shoring necessary to preserve excavations and earth banks.

- Footings shall be founded on the medium stiff, surface silty clay with sand and gravel. The bottom of footing excavations shall be thoroughly tamped and cleaned of loose material prior to placement of reinforcing steel and concrete.
- E. Excavations for footings shall be observed by a qualified Geotechnical Engineer prior to placement of concrete and reinforcing.
- F. Footings located on or near the top of slopes shall be embedded such that a Reinforcing Steel: minimum horizontal distance of 5 feet is maintained between the bottom edge of the footing and the slope face.
- G. Slabs-on-grade shall be underlain by at least 12 inches of imported granular fill, placed in 8 inch loose lifts compacted to 95% compaction as determined by ASTM D 1557. The imported fill shall consist of well-graded, non-expansive granular material. Before placing the fill, the existing ground shall be scarified to a depth of 6 inches, moistened to slightly above optimum moisture content, and compacted to a minimum 90% compaction as determined by ASTM D 1557.
- H. Contractor shall brace or protect all walls from lateral loads until supporting roofs and/or floors are completely in place and have attained their full design strength.

#### <u>Concrete:</u>

300 pcf

- A. Concrete construction shall conform to American Concrete Institute ACI *318*R-*95*.
- B. Concrete shall be hard rock concrete and shall have the following minimum 28 day compressive strengths: a. Footings, grade beams, tie beams -3,000 psi

- 4,500 psi b. Slabs on grade c. Concrete topping over metal deck --3,000 psi d. All other concrete --3,000 psi

- C. Concrete delivery tickets shall record all free water in the mix: at batching by plant, for consistency by driver, and any additional request by Contractor if permitted by the mix design.
- D. All inserts, anchor bolts, plates, and other items to be cast in the concrete shall be hot-dipped galvanized unless otherwise noted.
- E. Reinforcing bars, anchor bolts, inserts, and other items to be cast in the concrete shall be secured in position prior to placement of concrete.
- F. Conduits, pipes, and sleeves passing through a slab or footing and not conforming to typical details shall be located and submitted to the Engineer for approval.
- G. Conduits, pipes, and sleeves embedded within a slab or wall (other than those merely passing through) shall be:
  - a. No larger in outside dimensions than one third the overall slab or wall thickness in which they are embedded.
  - b. Placed in the middle one third of slab or wall thickness
  - c. Spaced no closer than three diameters or widths on center.
- H. Conduits, pipes, and sleeves shall not be placed through or embedded in a beam unless specifically detailed.
- I. The Contractor shall locate construction joints so as not to impair the strength of the structure and to minimize shrinkage stresses. Submit location of construction joints to the Engineer for approval, unless otherwise noted.

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-05-98	2000	47	116

- J. See Architectural drawings for chamfers, edge radii, drips, reglets, finishes and other non-structural items not shown or specified on the structural drawings.
- K. Non-shrink grout shall be a premixed non-metallic formula, capable of developing a minimum compressive strength of 3,000 psi in 1 day and 5,000 psi in 28 days.

- A. Reinforcing steel shall be deformed bars conforming to ASTM A615, Grade 60.
- B. Welded wire fabric shall conform to ASTM A185, galvanized.
- C. Clear concrete cover for reinforcing bars shall be as follows, unless otherwise
  - a. Footings, grade beams, etc. cast against earth b. Footings, grade beams, etc. formed and exposed to earth or weather -
  - c. Walls 1. Faces exposed to earth or weather #5 bars and smaller — #6 bars and larger —
  - 2. Interior faces d. Beams and columns
- Primary reinforcement, stirrups, ties and spirals e. Structural slabs 1. Faces exposed to earth or weather -
- 2. Interior faces
- D. Clear distance between the surface of a bar and any surface of a masonry unit shall be not less than 1/2 inch, unless otherwise noted.
- E. Reinforcing steel shall be spliced where indicated on plans. Provide lap splice length per typical details and schedule, unless otherwise noted.
- . Welded wire fabric shall be lapped 8 inches or one full mesh plus 2 inches. whichever is greater.
- G. Mechanical splice connectors shall develop in tension 125 percent of the specified minimum yield strength of reinforcing bars.
- H. Bar bends and hooks shall be "standard hooks" in accordance with ACI 318.

LICENSED PROFESSIONAL ENGINEER

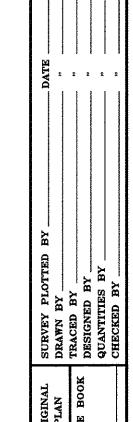
*S1.0* 

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION GENERAL NOTES

OAHU DISTRICT BASEYARD **FACILITIES** Project No. HWY-0-05-98

SCALE: AS NOTED

DATE: APRIL 2000 SHEET No. S1.0 OF 16 SHEETS



#### Concrete Masonry Units (CMU):

- A. Concrete masonry units shall be Type II, normal weight hollow load—bearing units conforming to ASTM C-90 and have a minimum compressive strength of 1,500 psi.
- B. Mortar shall be Type "M" conforming to ASTM C270 and have a minimum compressive strength of 2,500 psi at 28 days.
- C. Grout shall conform to ASTM C476 and have a minimum compressive strength of 2,500 psi at 28 days.
- D. All cells and bond courses with reinforcement and inserts shall be solid grouted. Cleanouts shall be provided for all grout pours over 5'-4" in height.
- E. When grouting is stopped for one hour or longer, horizontal construction joints shall be formed by stopping the grout pour 1 1/2 inches below the top of the uppermost unit.
- F. The Contractor shall locate construction joints so as not to impair the strength of the structure and to minimize shrinkage stresses. Submit location of construction joints to the Engineer for approval, unless otherwise noted. Maximum spacing between construction joints shall be 25 feet.
- G. Walls shall be constructed in conventional running bond, unless otherwise noted.
- H. See Architectural drawings for laying pattern, height of units, surface texture, and joint type.
- Open—ended blocks may be substituted for standard concrete masonry units.

#### Structural Steel:

- A. Fabrication and erection of structural steel shall conform to the American Institute of Steel Construction Manual of Steel Construction, Ninth Edition.
- B. Structural steel shall conform to ASTM A36 unless otherwise noted.
- C. Steel wide flange sections shall conform to ASTM A572, Grade 50 per AISC Technical Bulletin #3.
- D. Steel pipes shall conform to ASTM A53, Grade B.
- E. Steel tubes shall conform to ASTM 500, Grade B.
- Bolts shall conform to ASTM A307, Grade A unless otherwise noted.
- G. High-strength bolts shall conform to ASTM A325, Type N. Use load indicator washers.
- H. Welds and welding procedures shall conform to the structural welding code AWS D1.1 of the American Welding Society.
- Welding shall be performed by welders prequalified for welding procedures to be used.
- Welding electrodes shall be E70XX.
- All steel shall be prime painted in the shop.

#### Metal Deck:

- A. Metal deck and accessories shall be of the profile and gage shown on the drawings.
- B. Accessories shall be the same gage as the adjoining decking.
- C. Metal deck and accessories shall be formed from steel sheets conforming to ASTM 653 SQ Grade 33; minimum yield strength 38 ksi, with G60 galvanized coating.
- D. Metal deck and accessories shall be three span continuous where possible. Do not locate single spans at edges or corners.
- E. Minimum bearing of decking on supports shall be 2 inches.
- F. Welding of metal deck shall be performed by certified light gage steel welders.

#### Cold-Formed Steel Purlins & Girts:

- A. Fabrication and erection of gage metal structures shall be in accordance with the American Iron and Steel Institute Specifications, Latest Edition.
- B. Cold-formed steel purlins, girts and accessories shall be of the profile and gage shown on the drawings.
- C. Cold formed steel purlins shall have the following minimum section properties:
- D. Cold-formed steel purlins shall comply with the requirements of ASTM A 570. Minimum yield strength of steel shall be 55,000 psi.
- E. Contractor shall submit shop drawings to the Engineer for approval prior to fabrication. Shop drawings shall indicate layout, framing and supports with dimensions, sections, type and location of attachments and details of accessories.

#### Pre-Engineered Metal Buildings:

- A. Design of the pre-engineered metal building shall conform to the 1994 Uniform Building Code as adopted and/or amended by the City and County of Honolulu or the Metal Building Manufacturer's Association (MBMA) "Design Practices Manual", whichever is more restrictive.
- B. Shop drawings, structural design calculations and a letter of certification shall be submitted to the Engineer for review and approval a minimum of four (4) weeks prior to fabrication. These drawings, calculations and letter shall be stamped and signed by a Structural Engineer licensed to practice in the State of Hawaii. Two Sets of plans and structural calculations stamped and signed by a Structural Engineer licensed to practice in the State of Hawaii shall be submitted to the City and County of Honolulu, Department of Planning and Permitting - Building Division for approval installation.
- C. The letter of certification shall include a brief description of the metal building dimensions, roof slopes, and frame types, all codes and specifications used for the design of the metal building system, all load assumptions which must meet or exceed the criteria specified in the contract documents, and a statement that the metal building system was designed and supplied in accordance with the contract documents.
- D. The bases of the frames for the pre-engineered metal building shall be assumed to be pinned.

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-05-98	2000	C.O. 68	116

E. Basic minimum design loads:

a. Dead loads include structural framing, ceiling framing, and mechanical, electrical, and plumbing loads.

125 psf b. Mezzanine live load ————— c. Roof live load ----20 psf

d. Wind loads Basic wind speed —— - 80 mph Exposure ————— Building "A" type \_\_\_\_\_ - Partially enclosed Building "B" type \_\_\_\_\_\_ — Unenclosed Importance factor —

UBC Method 1 (Normal Force Method) e. Seismic loads Seismic zone ----

f. Building drift shall be limited to H/500.

q. Deflection of members shall be limited to L/360.

h. Load combinations

1. Dead Load + Roof Live Load

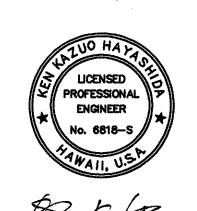
2. Dead Load + Wind Load

3. Dead Load + Seismic Load

E. Building "A"

- a. Rigid frame Rf-1 shall be designed to be braced by the Mezzanine at both columns.
- b. Rigid frame Rf-2, Rf-3, and Rf-4 shall be designed to be braced by the Mezzanine at Line A.

7-20-00 | Bldg Department Comments 6-07-00 Revised Title Block DATE REVISION



WORK WAS PREPARED BY

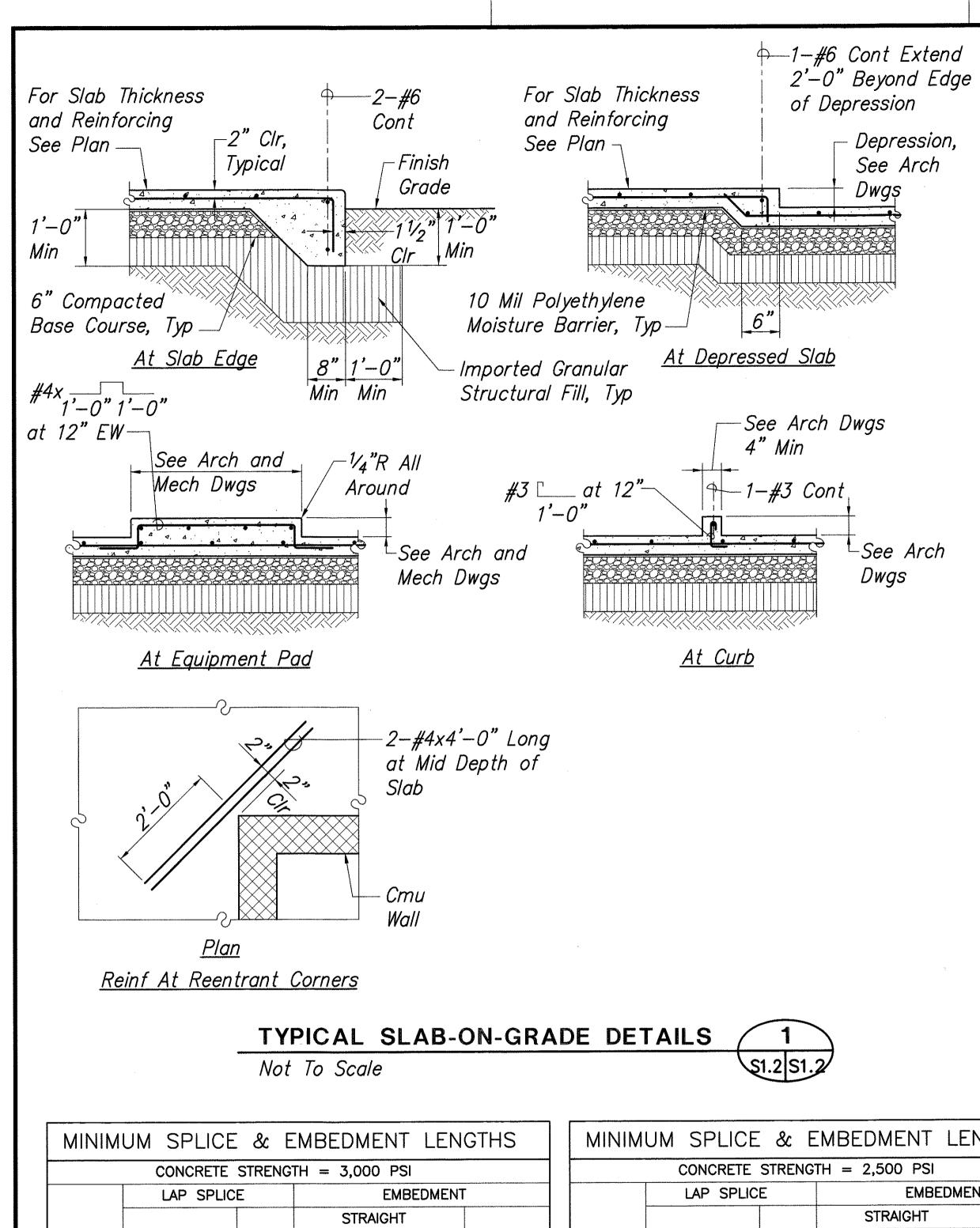
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION GENERAL NOTES

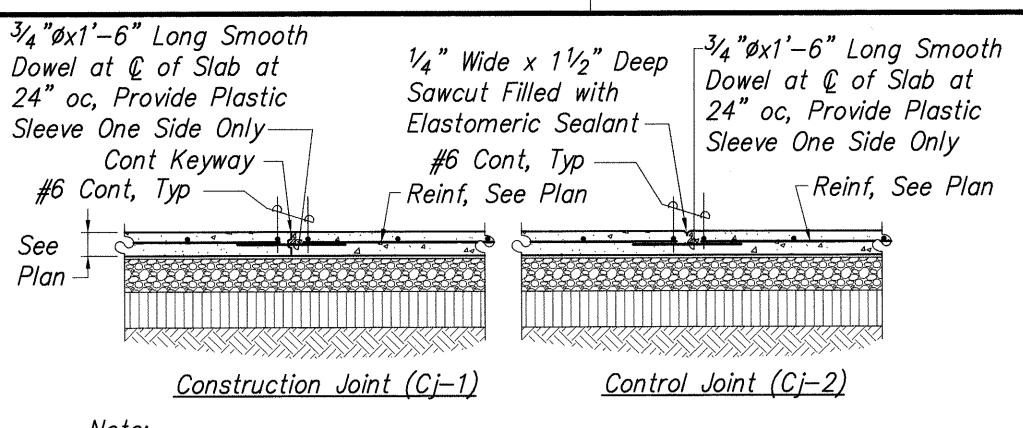
OAHU DISTRICT WAREHOUSE BUILDING Project No. HWY-0-05-98

SCALE: AS NOTED

SHEET No. S1.1 OF 116 SHEETS

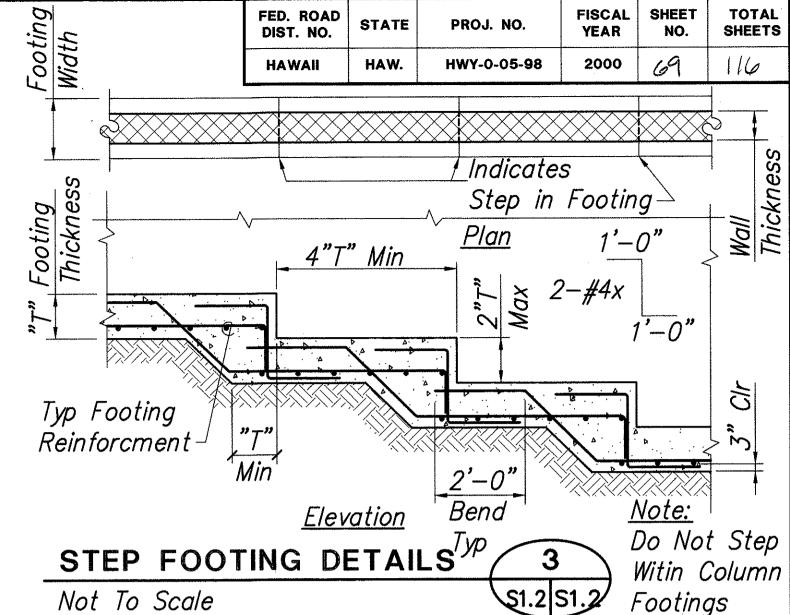
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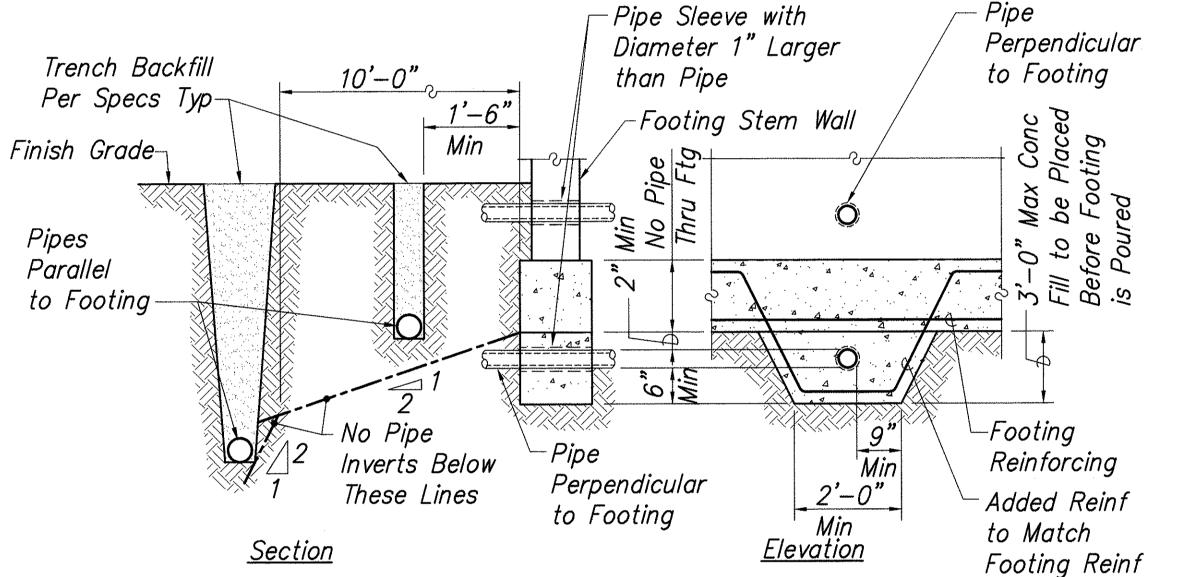


Saw Cutting shall occur as soon as concrete surface is firm enough to not be torn by cutting blade and before shrinkage cracking occurs, but no later than 12 hours after concrete has been poured.

TYPICAL SLAB JOINT DETAILS \$1.2 S1.2 Not To Scale



Not To Scale



#### <u>Notes:</u>

- For pipe perpendicular to footing more than 3'-0" below bottom of footing, trench may be backfilled with compacted fill, See specifications.
- 2. Depth of footing may be affected by location of pipes. General Contractor shall determine exact depth and location of pipes prior to excavation for footings.

TYPICAL PIPE AT FOOTING DETAIL

Not To Scale

\$1.2 \$1.2

IM	UM SPLICE	& E	MBEDMEN	T LEN	GTHS	MINIM	IUM SPLICI	E & E	MBEDMEN	T LEN	GTHS					
	CONCRETE	STRENG	TH = 3,000 P	SI	*****		CONCRETE	STRENG	TH = 2,500 P	SI		<b>F</b>				
	LAP SPLICE EMBEDM		BEDMEN	T		LAP SPLICE		EMBEDMENT			₽ 12d de 1					
				STRAIGH	STRAIGHT			T				A CONTRACTOR OF THE CONTRACTOR	STRAIGH	T		
	BOT BAR OR WALL BAR	TOP BAR	BOT BAR OR WALL BAR	TOP BAR	W/ STD HOOK	BAR SIZE	BOT BAR OR WALL BAR	TOP BAR	BOT BAR OR WALL BAR	TOP BAR	W/ STD HOOK	<u>90° Bend</u>				
	24"	28"	17"	22"	8"	#3	24"	32"	18"	24"	9"	$D = 6d_b$ FOR #8 AN $D = 8d_b$ FOR #9 TO				
	24"	28"	17"	22"	8"	#4	32"	42"	24"	32"	12"	$D = 8d_b FOR #9 TO$				
	28"	36"	21"	27"	10"	#5	39"	51"	30"	39"	15"	SPLICE				
	32"	42"	25"	32"	12"	#6	47"	62"	36"	47"	18"	LENGTH				
	38"	50"	29"	38"	14"	#7	55"	72"	42"	55"	21"					

63"

72"

89"

#8

#9

#10

#11

82"

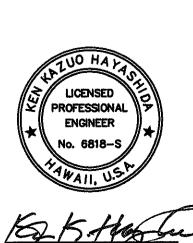
104"

115"

180° Bend AND SMALLER TO #11 6" (MIN) -1.5db MAX OR PLACE BARS IN CONTACT WIRE TOGETHER Bar Lap

<u>Notes:</u> 1. Length are for concrete with rebar spaced 6 bar diameters min oc. Increase bar length 25% for bars spaced less than 6 bar diameters oc.

"Top Bars" are horizontal bars with 12" or more of concrete cast below.



*S1.2* STATE OF HAWAII DEPARTMENT OF TRANSPORTATION TYPICAL DETAILS

> OAHU DISTRICT BASEYARD **FACILITIES**

Project No. HWY-0-05-98 DATE: APRIL 2000 SCALE: AS NOTED SHEET No. S1.2 OF W/ SHEETS

TYPICAL REBAR SPLICE AND EMBEDMENT LENGTH SCHEDULE Not To Scale

22"

43"

48"

58"

71"

33"

55"

93"

BAR SIZE

#3

#5

#6

#7

#8

#11

\$1.2 \$1.2

63"

71"

80"

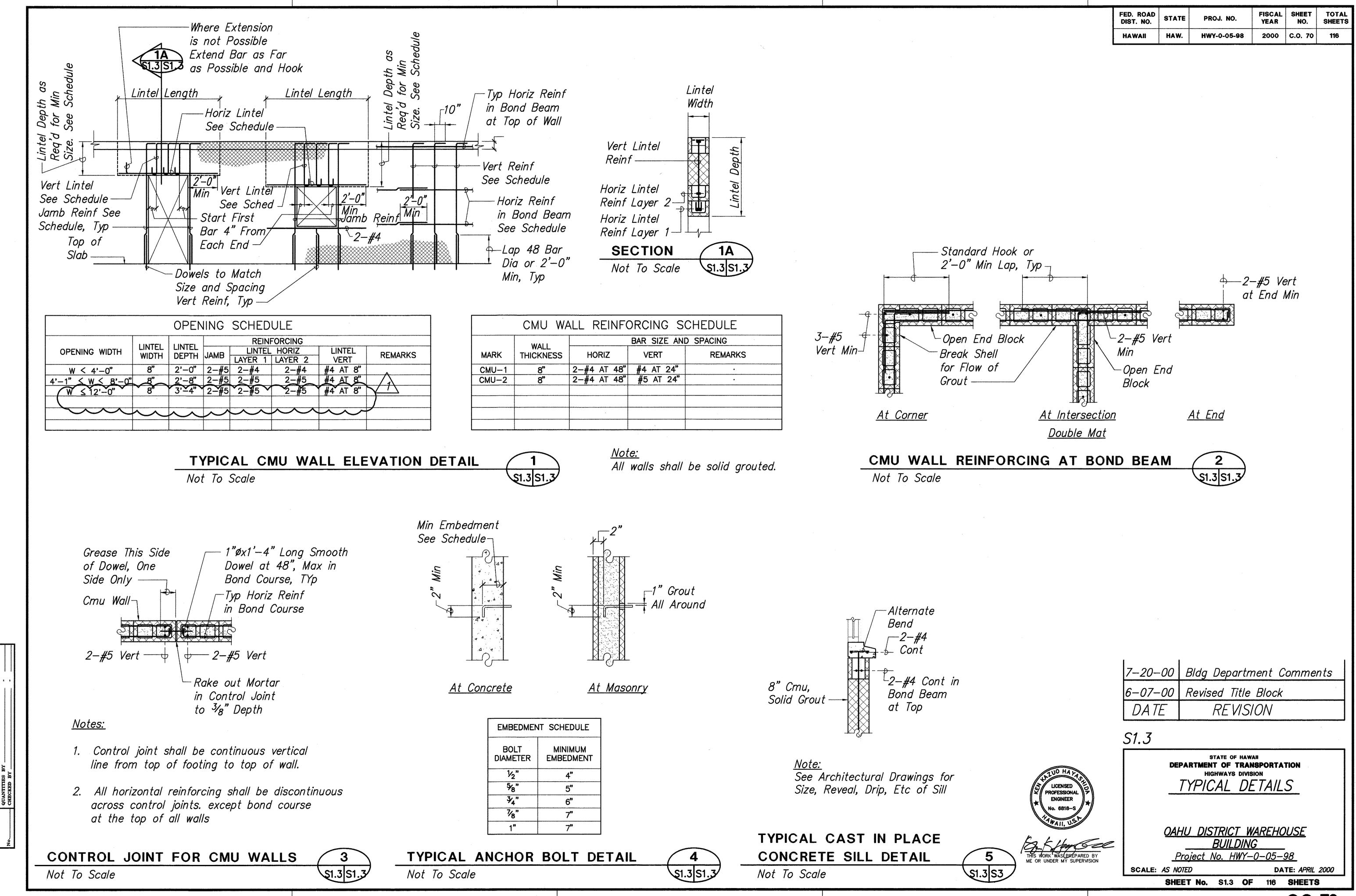
88"

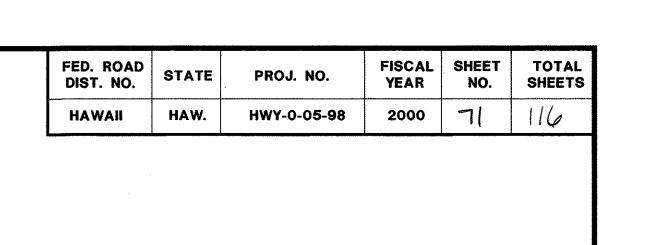
24"

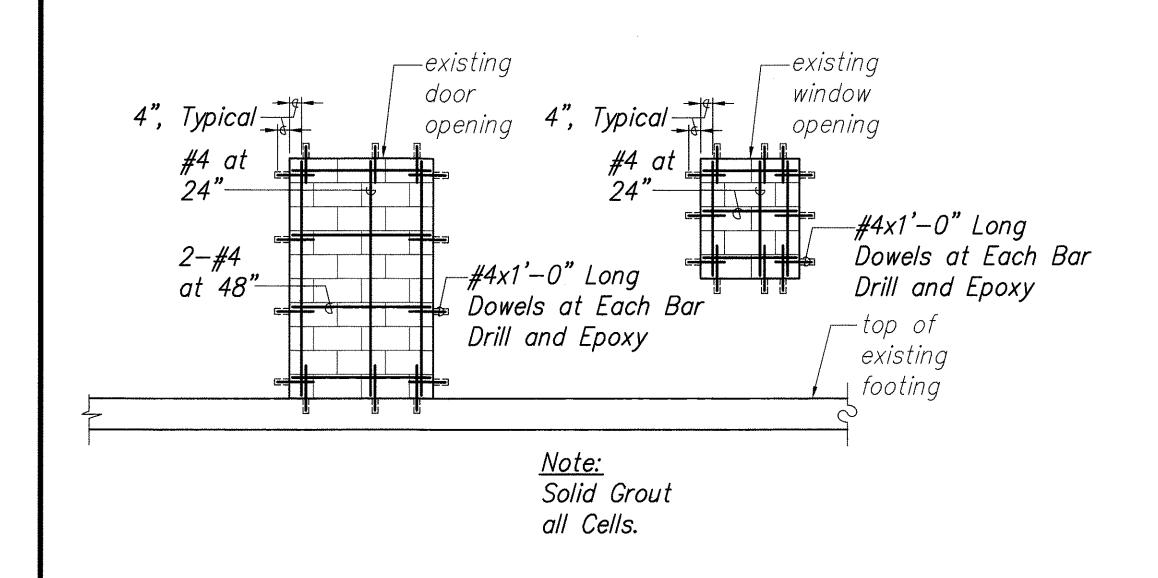
28"

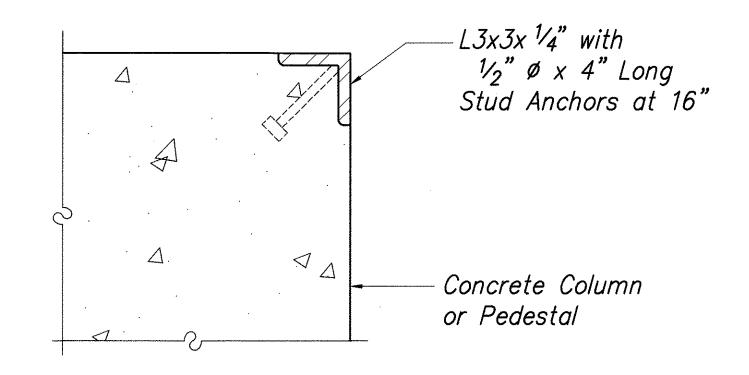
31"

34"

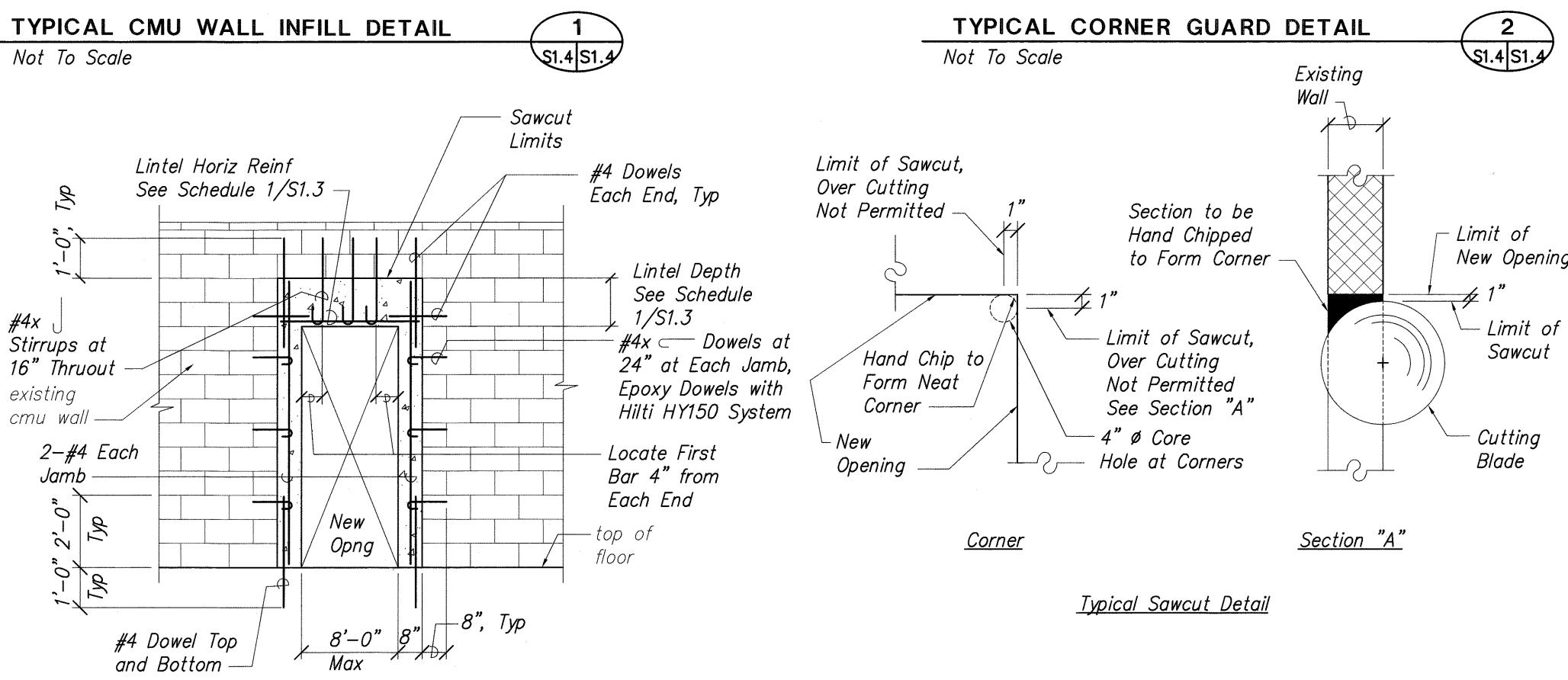


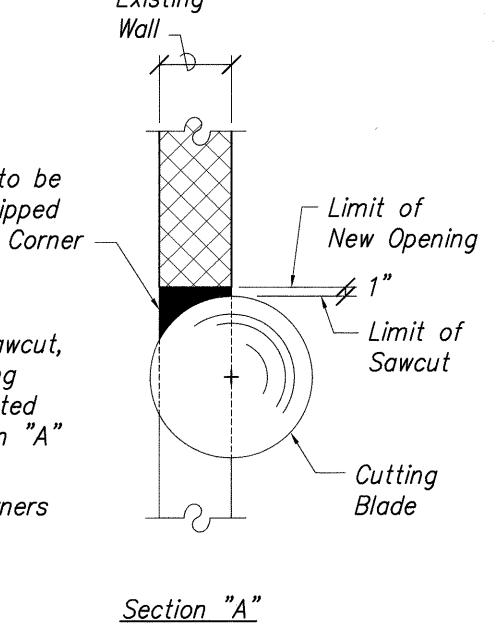






Note: See Architectural Drawings for Location and Length of Corner Guard.

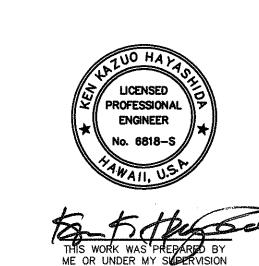




TYPICAL NEW OPENING IN EXISTING CMU WALL

Not To Scale





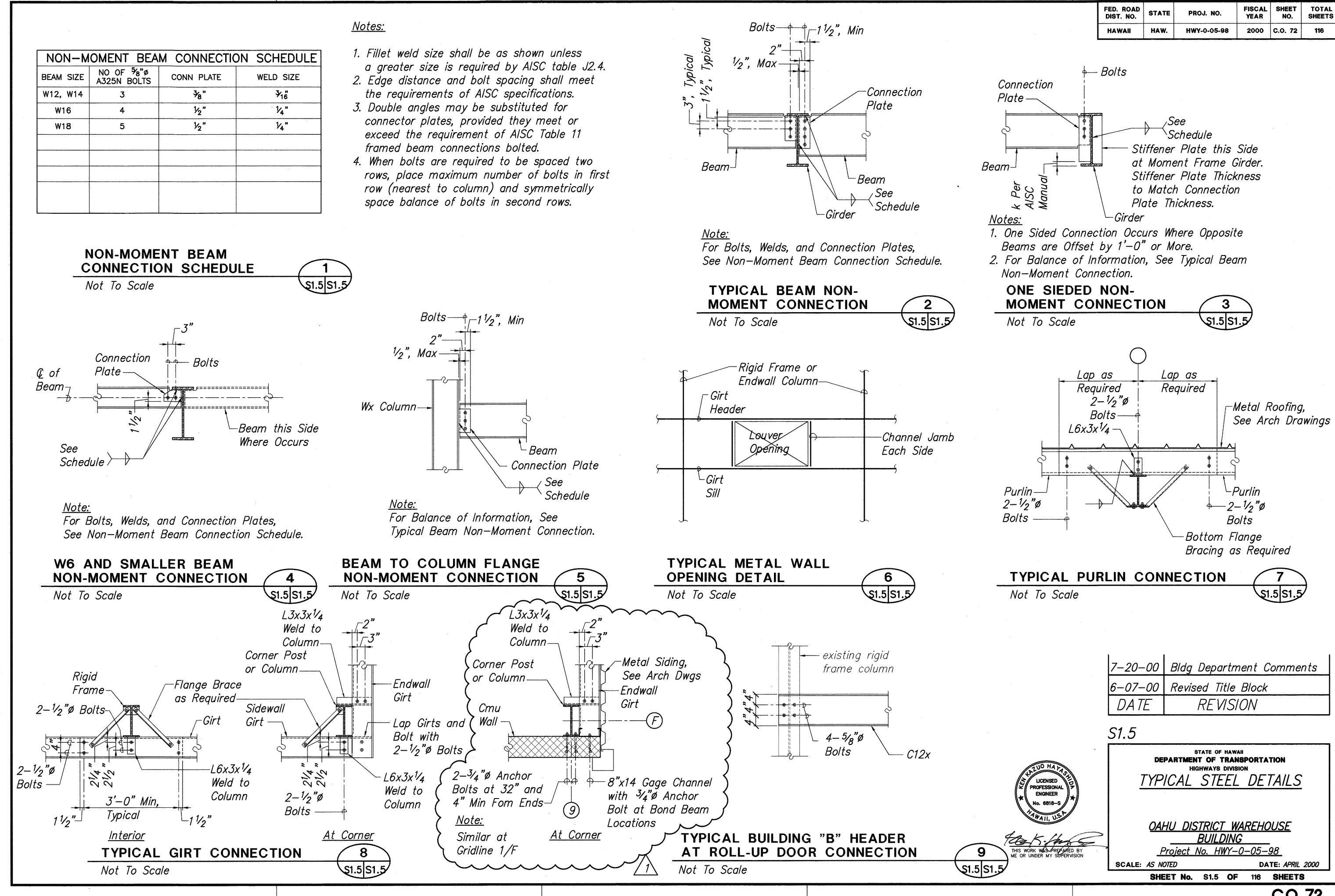
*S1.4* 

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION TYPICAL DETAILS

OAHU DISTRICT BASEYARD **FACILITIES** 

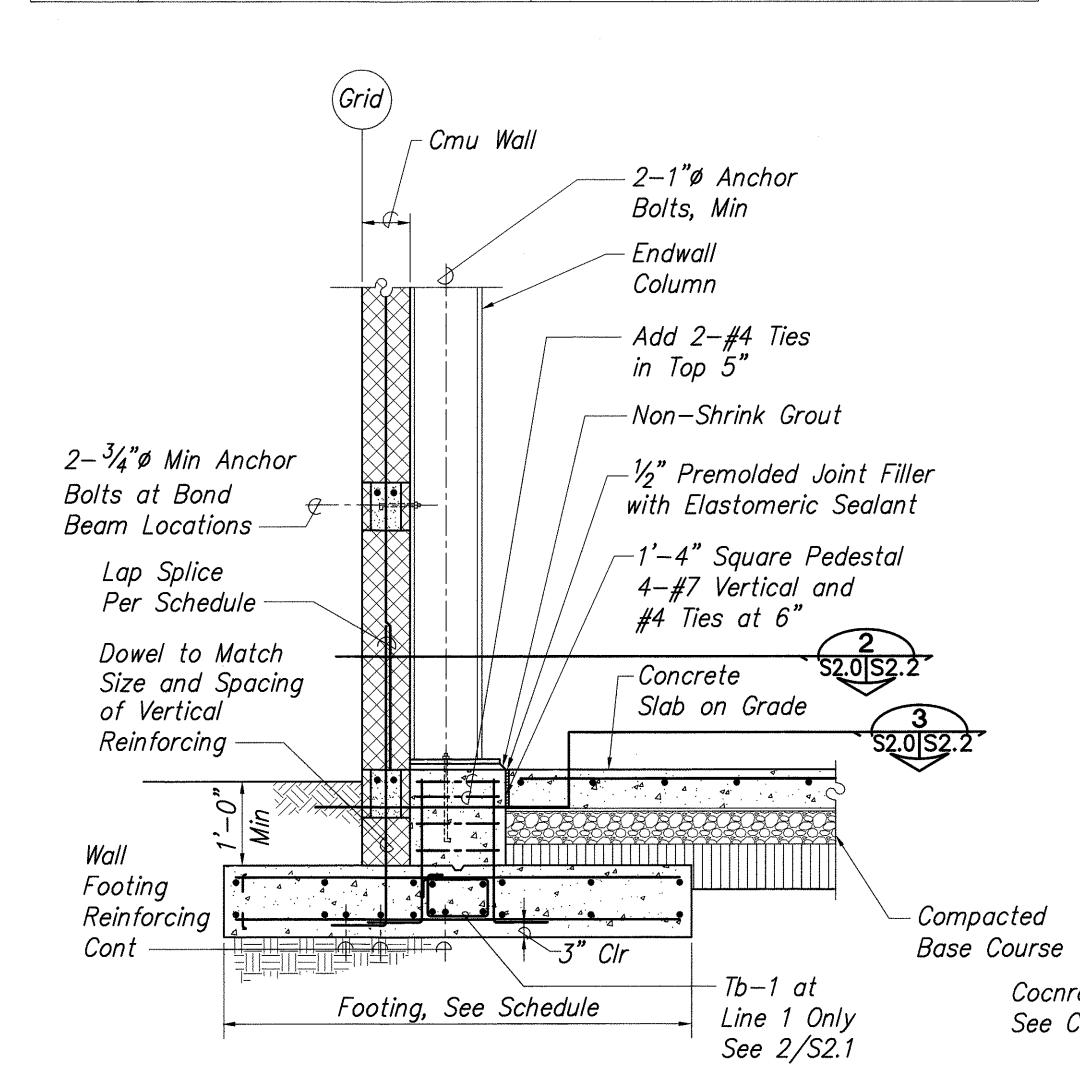
Project No. HWY-0-05-98 SCALE: AS NOTED

DATE: APRIL 2000 SHEET No. S1.4 OF 16 SHEETS



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DESIGNED BY
QUANTITIES BY

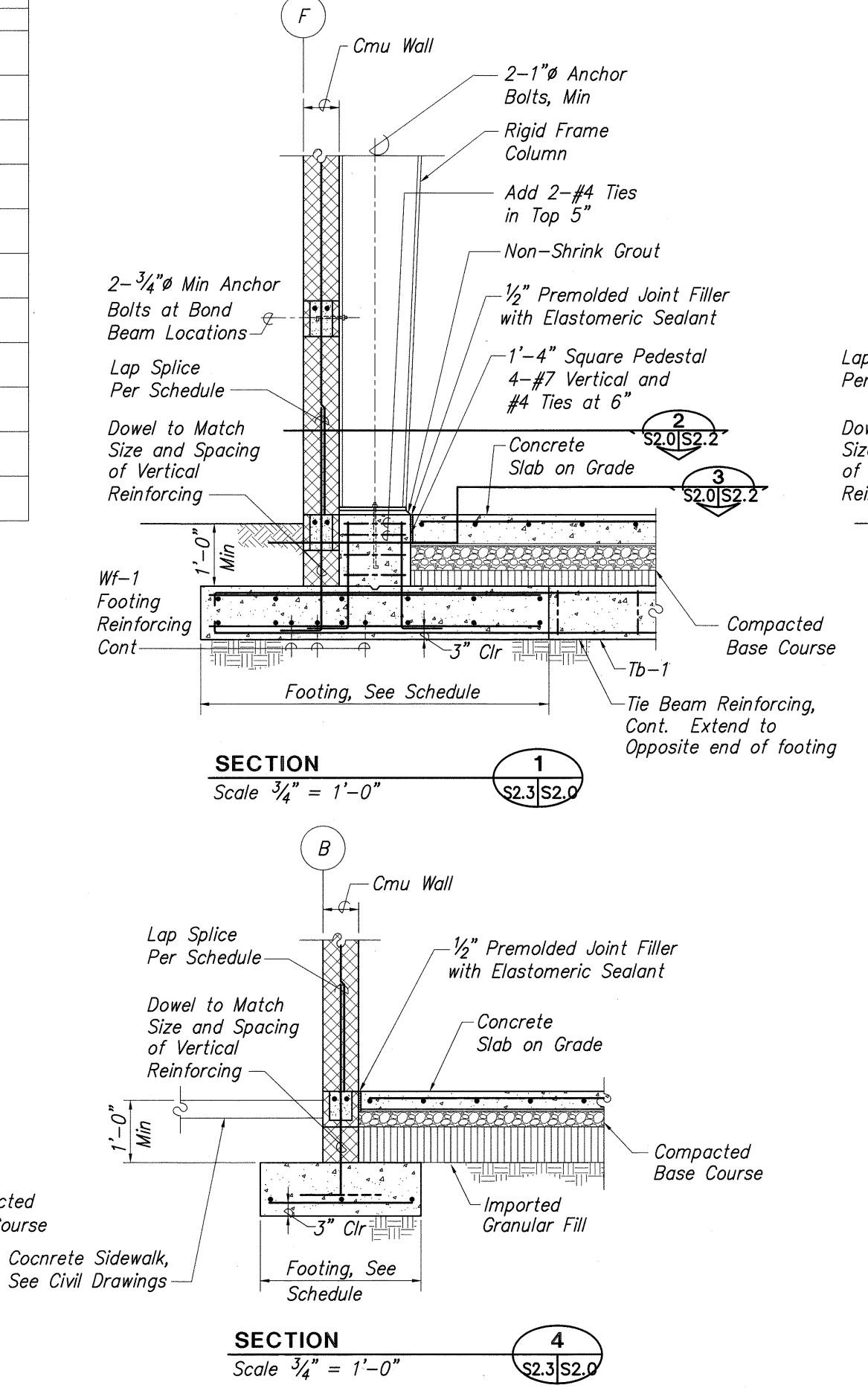
MARK       SIZE $F-1$ $6'-6"$ Square $x$ 1'-0" Thick $F-2$ $6'-0"$ Square $x$ 1'-0" Thick $F-3$ $5'-0"$ Square $x$ 1'-0" Thick $F-4$ $3'-6"$ Square $x$ 1'-0" Thick $F-5$ $5'-0"$ Square $x$ 1'-0" Thick $F-6$ $4'-0"$ Square $x$ 1'-0" Thick	REINFORCEMENT 6-#6 Bottom Each Way 6-#6 Top and Bottom Each Way 6-#5 Top and Bottom Each Way 5-#4 Bottom Each Way 6-#5 Bottom Each Way
F-2 6'-0" Square x 1'-0" Thick  F-3 5'-0" Square x 1'-0" Thick  F-4 3'-6" Square x 1'-0" Thick  F-5 5'-0" Square x 1'-0" Thick	6-#6 Top and Bottom Each Way 6-#5 Top and Bottom Each Way 5-#4 Bottom Each Way
F-3 5'-0" Square x 1'-0" Thick  F-4 3'-6" Square x 1'-0" Thick  F-5 5'-0" Square x 1'-0" Thick	6—#5 Top and Bottom Each Way 5—#4 Bottom Each Way
F-4 3'-6" Square x 1'-0" Thick  F-5 5'-0" Square x 1'-0" Thick	5—#4 Bottom Each Way
F-5 5'-0" Square x 1'-0" Thick	
<b>'</b>	6-45 Rottom Each Way
F-6 4'-0" Square x 1'-0" Thick	0-#3 Docton Lach way
	4—#5 Bottom Each Way
Wf-1 2'-0" Wide x 1'-0 Thick	3-#4 Bottom Cont with #4 at 12"
Wf-2 3'-0" Wide x 1'-0 Thick	4-#4 Bottom Cont with #4 at 12"
Wf-3 1'-4" Wide x 1'-0 Thick	2-#4 Bottom Cont with #4 at 12"
WI D I T WILL X I TO IIICK	2 #+ DOCCOIN CONC WICH #+ OC 12

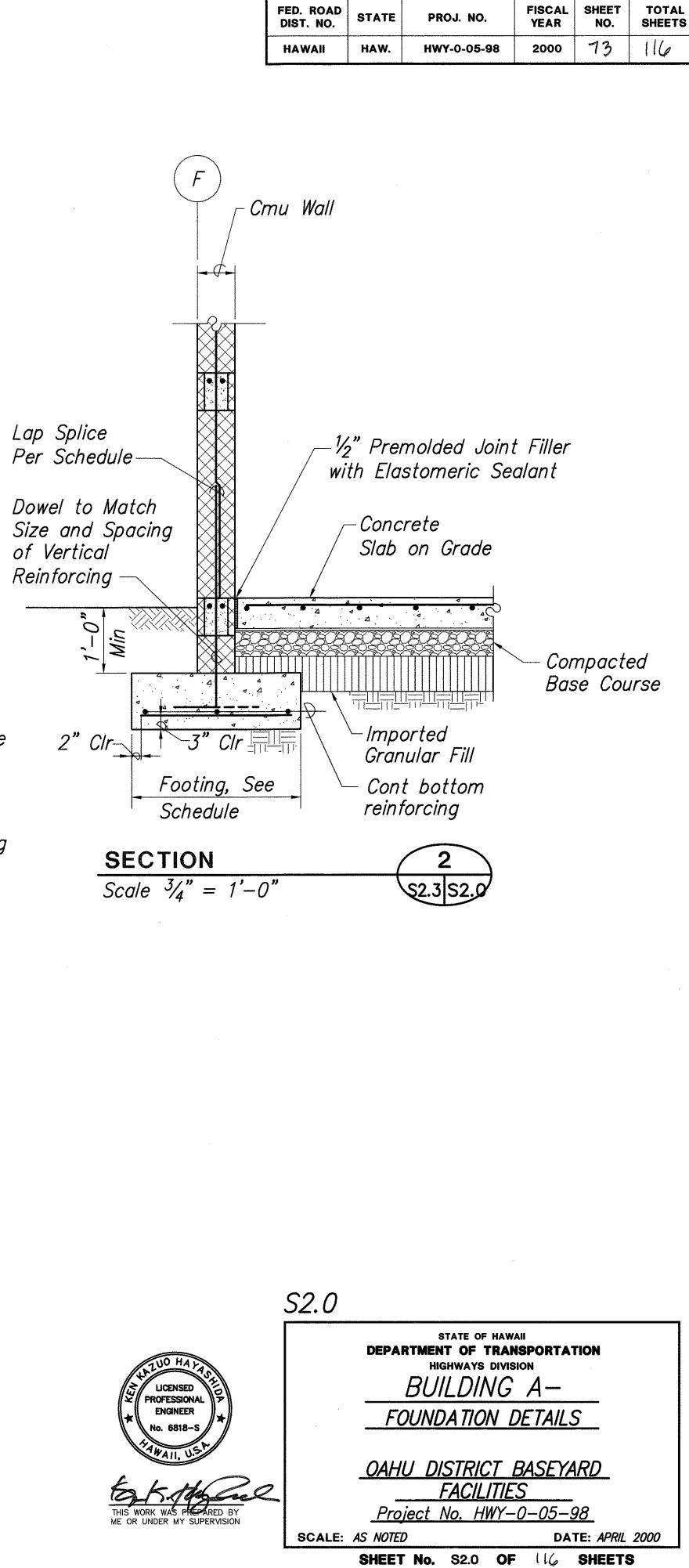


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**SECTION** 

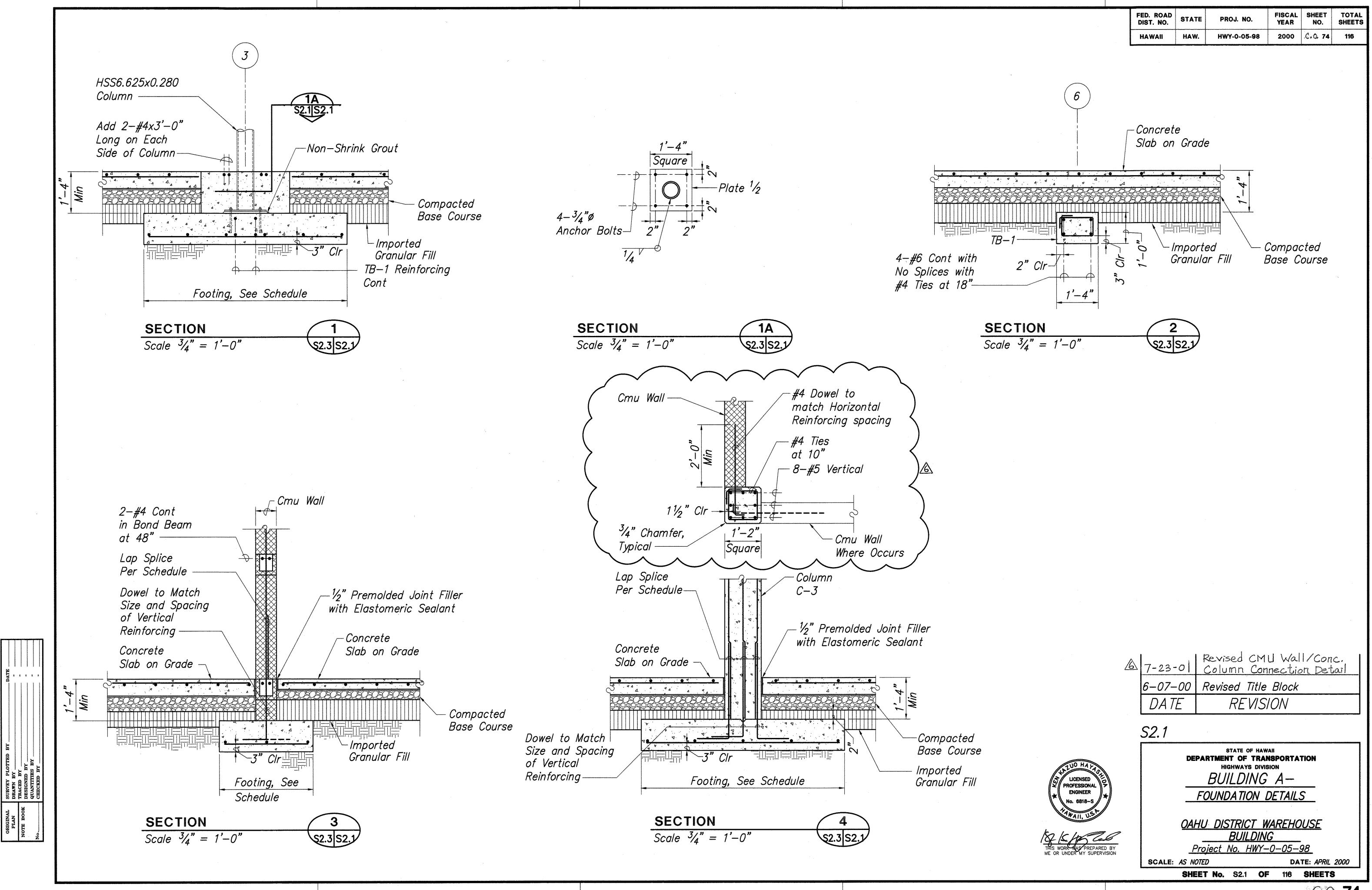
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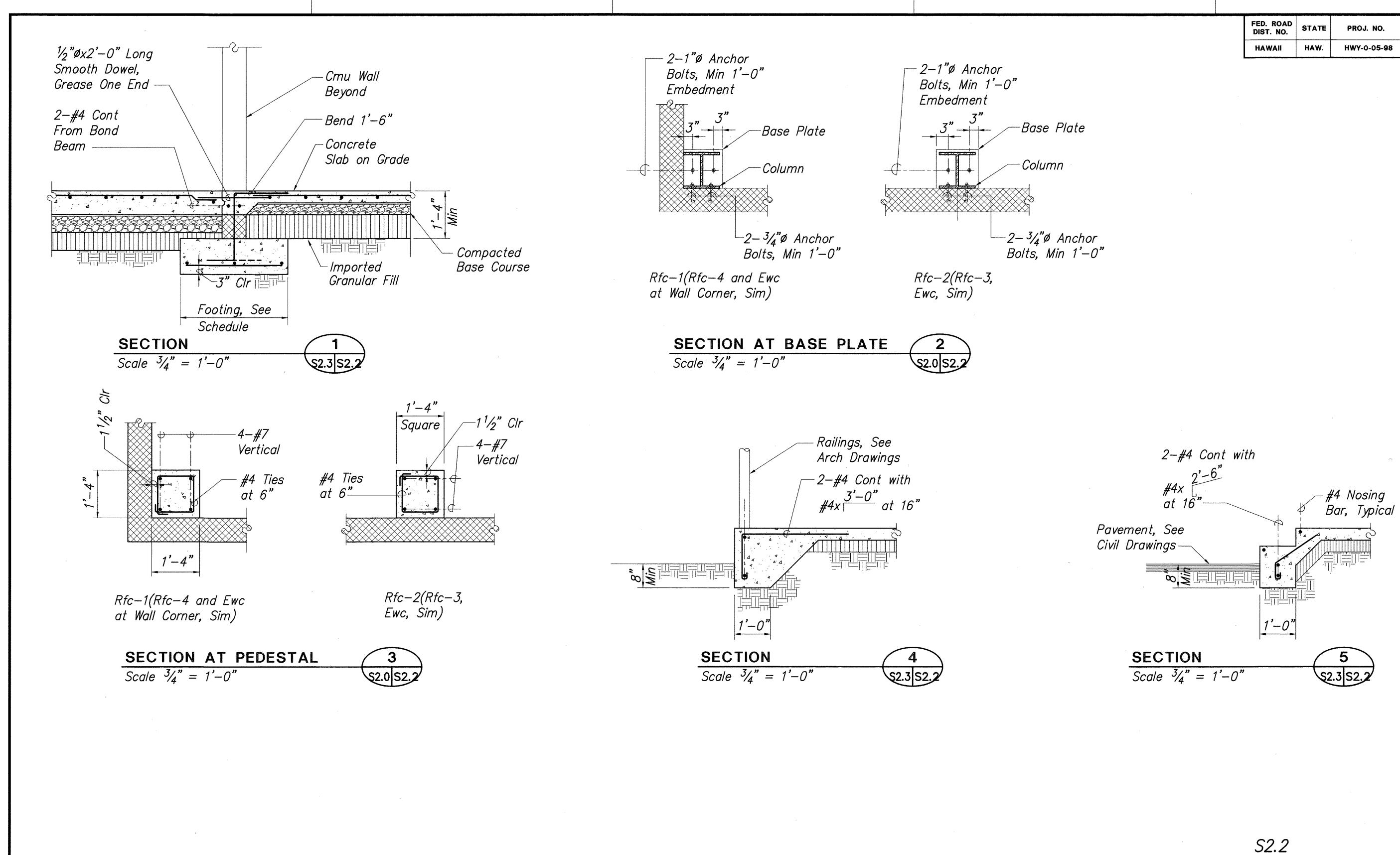




PROJ. NO.

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DESIGNED BY
QUANTITIES BY
CHECKED BY





STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

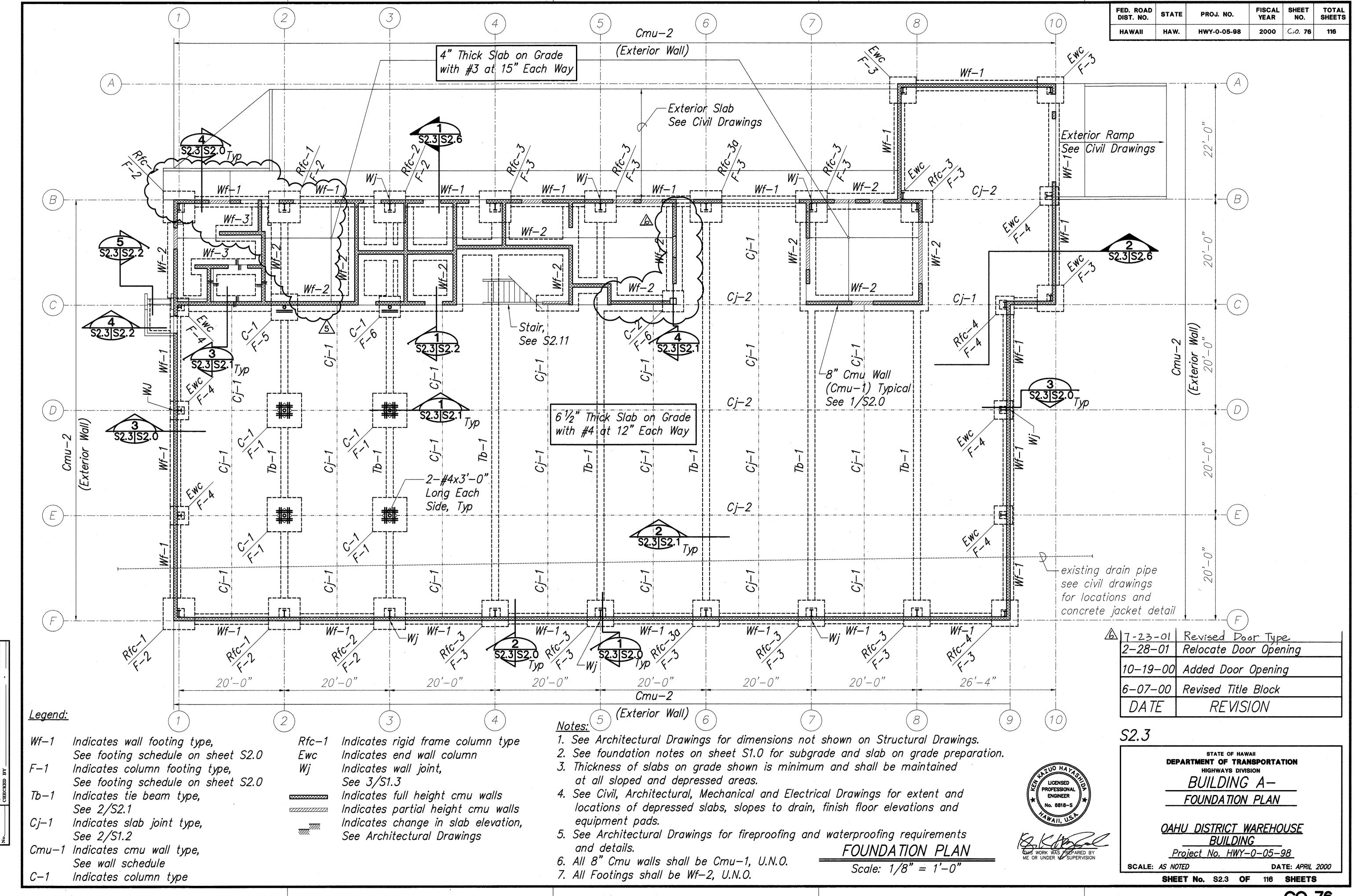
BUILDING A—

FOUNDATION DETAILS

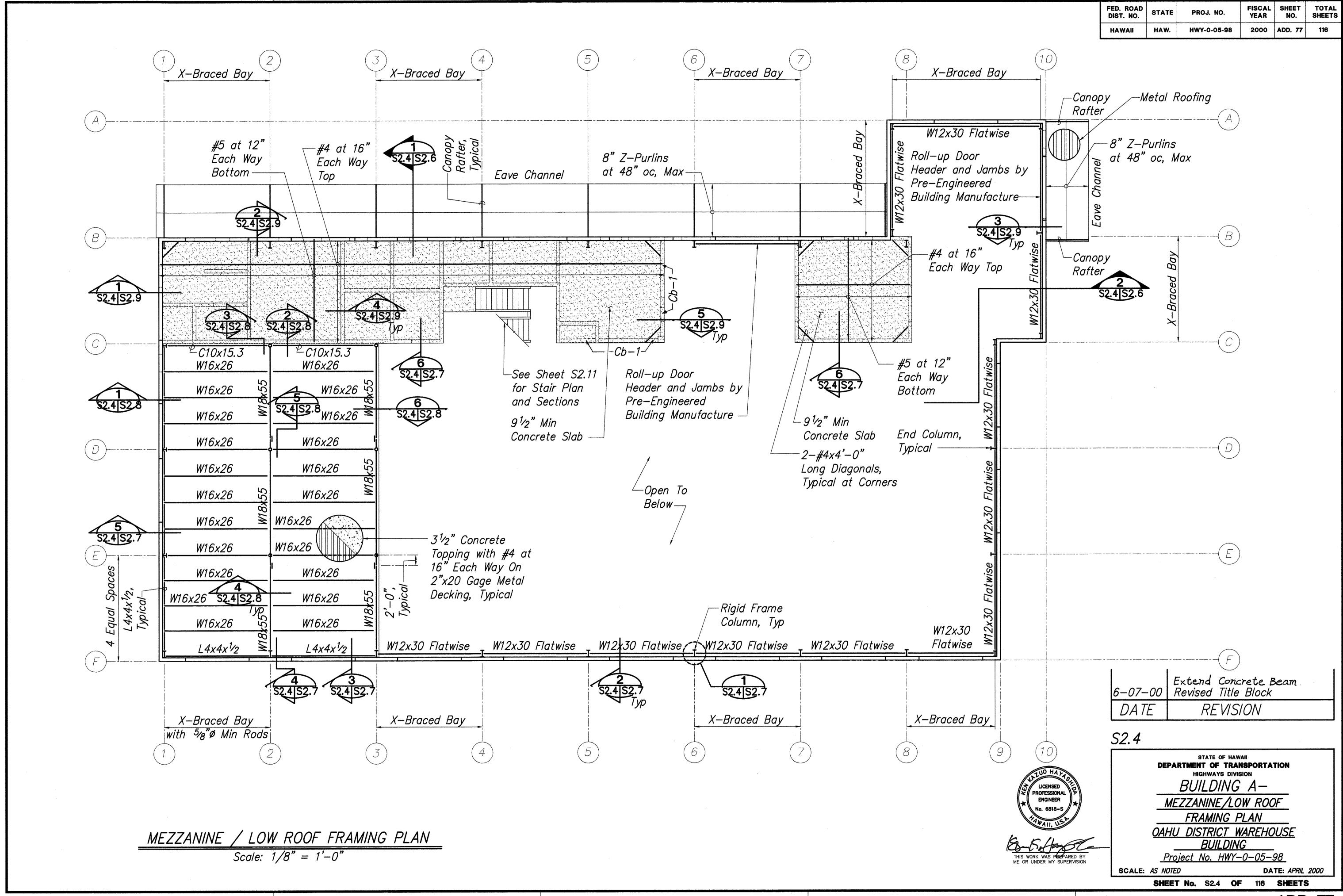
OAHU DISTRICT BASEYARD FACILITIES
Project No. HWY-0-05-98

SCALE: AS NOTED DATE: APRIL 2000 SHEET No. S2.2 OF 116 SHEETS

FISCAL SHEET TOTAL YEAR NO. SHEETS

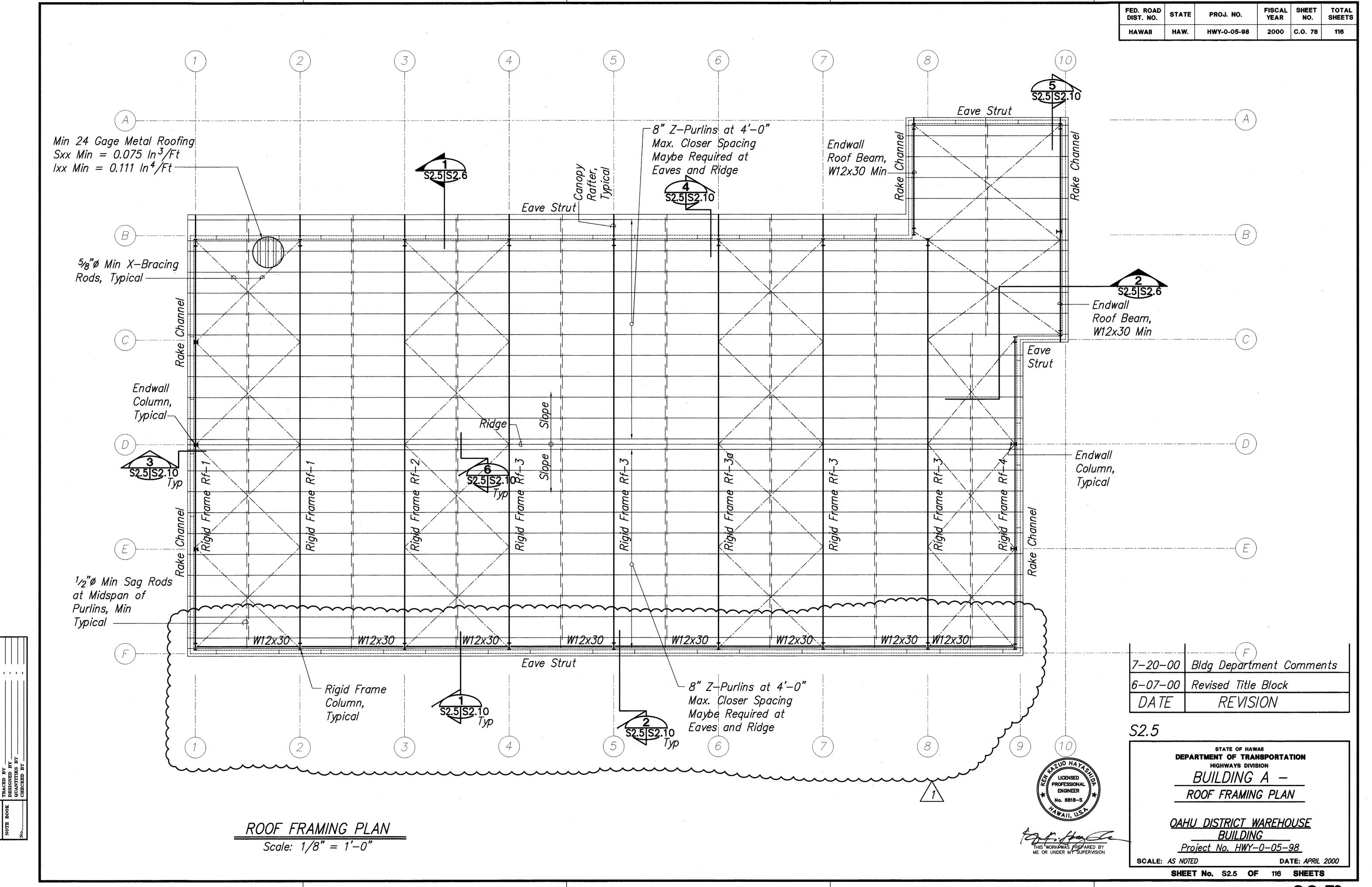


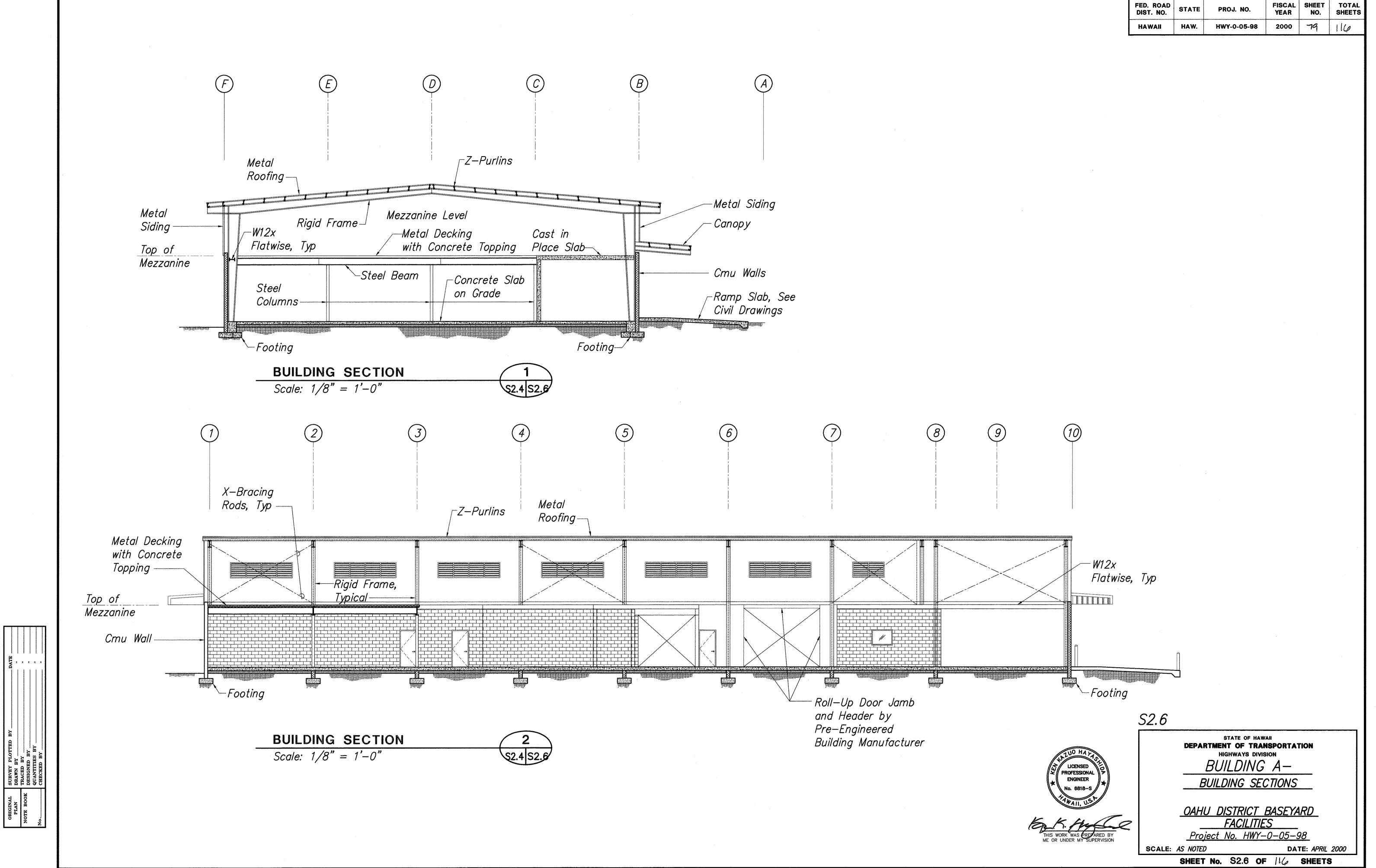
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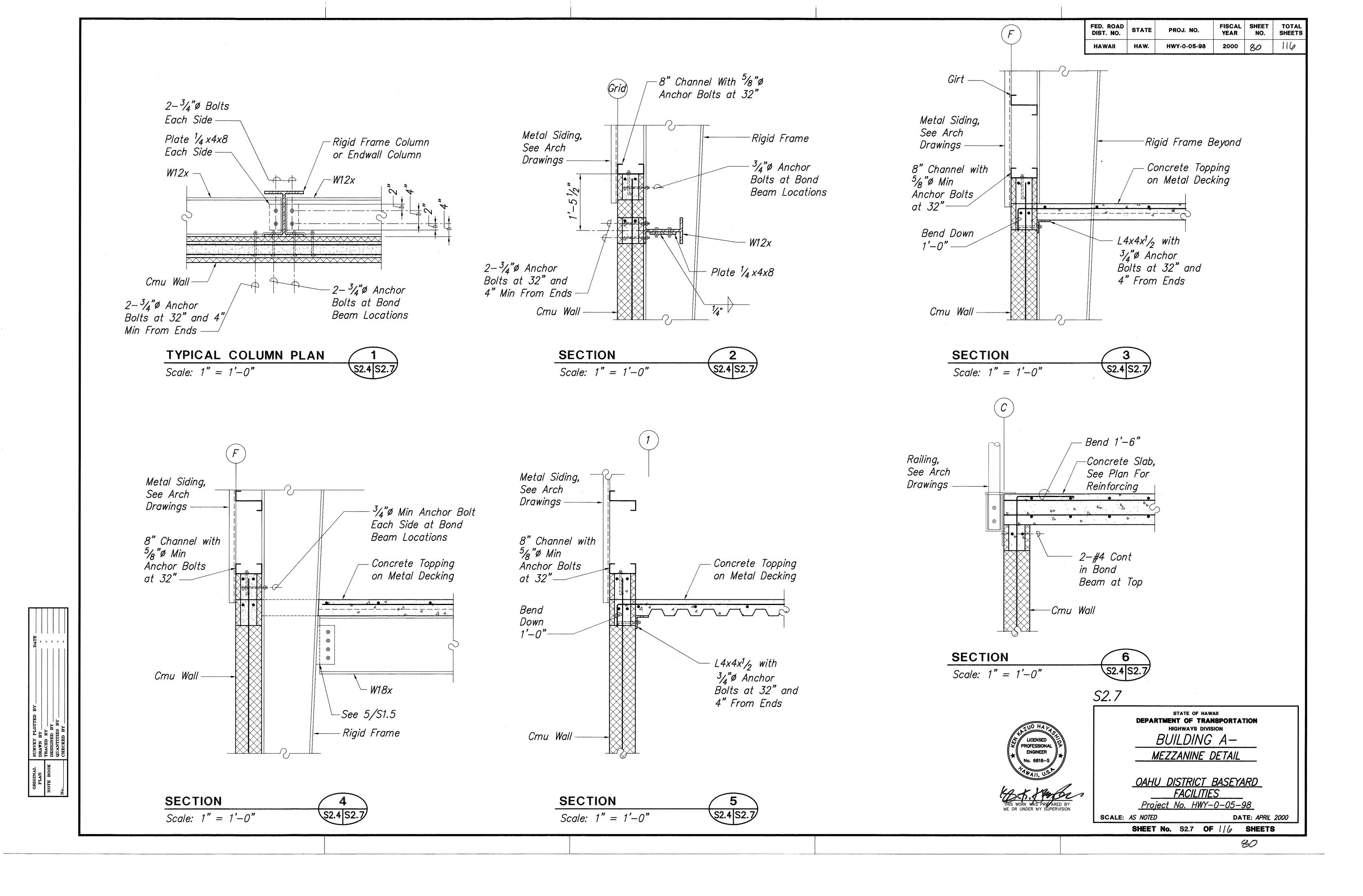


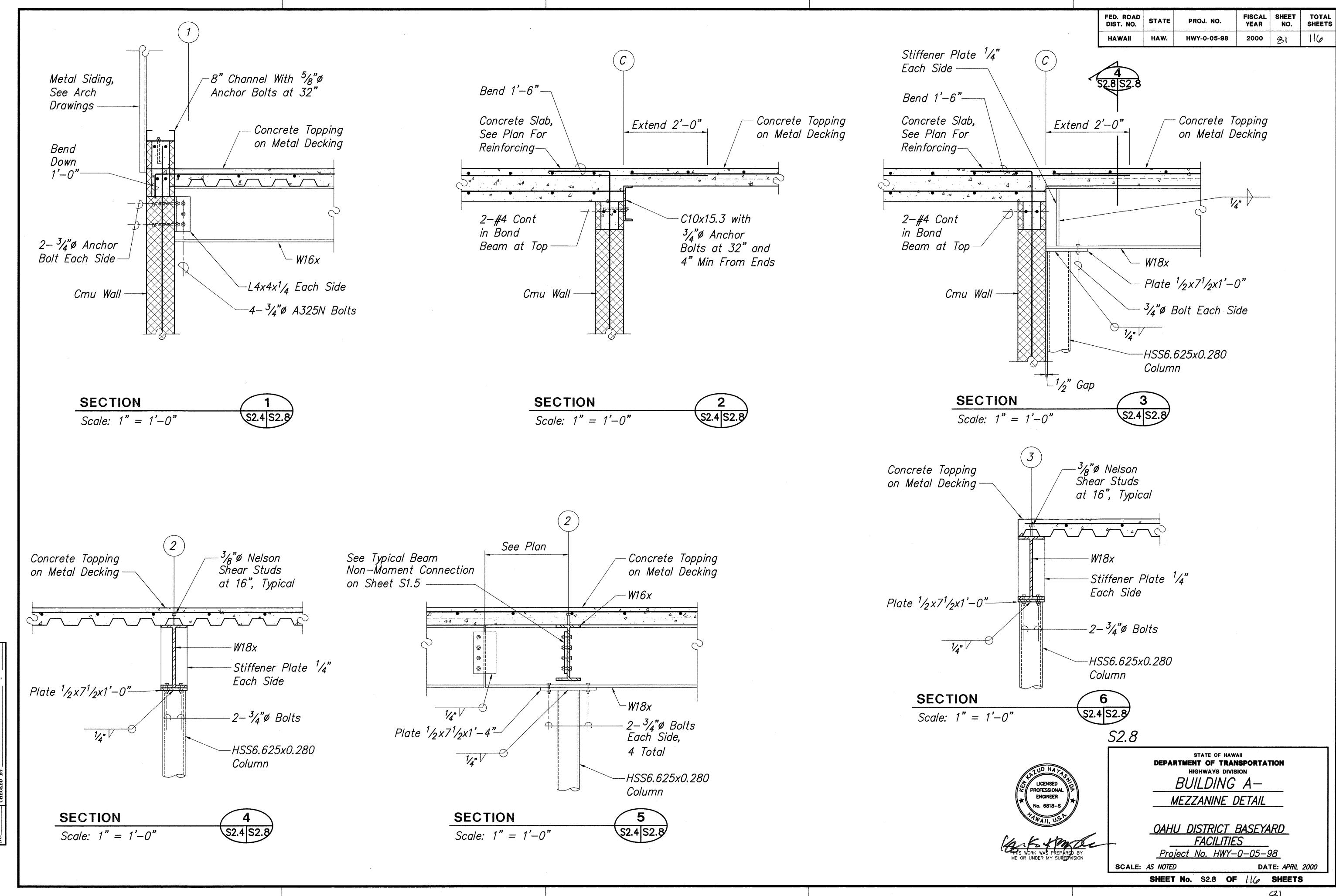
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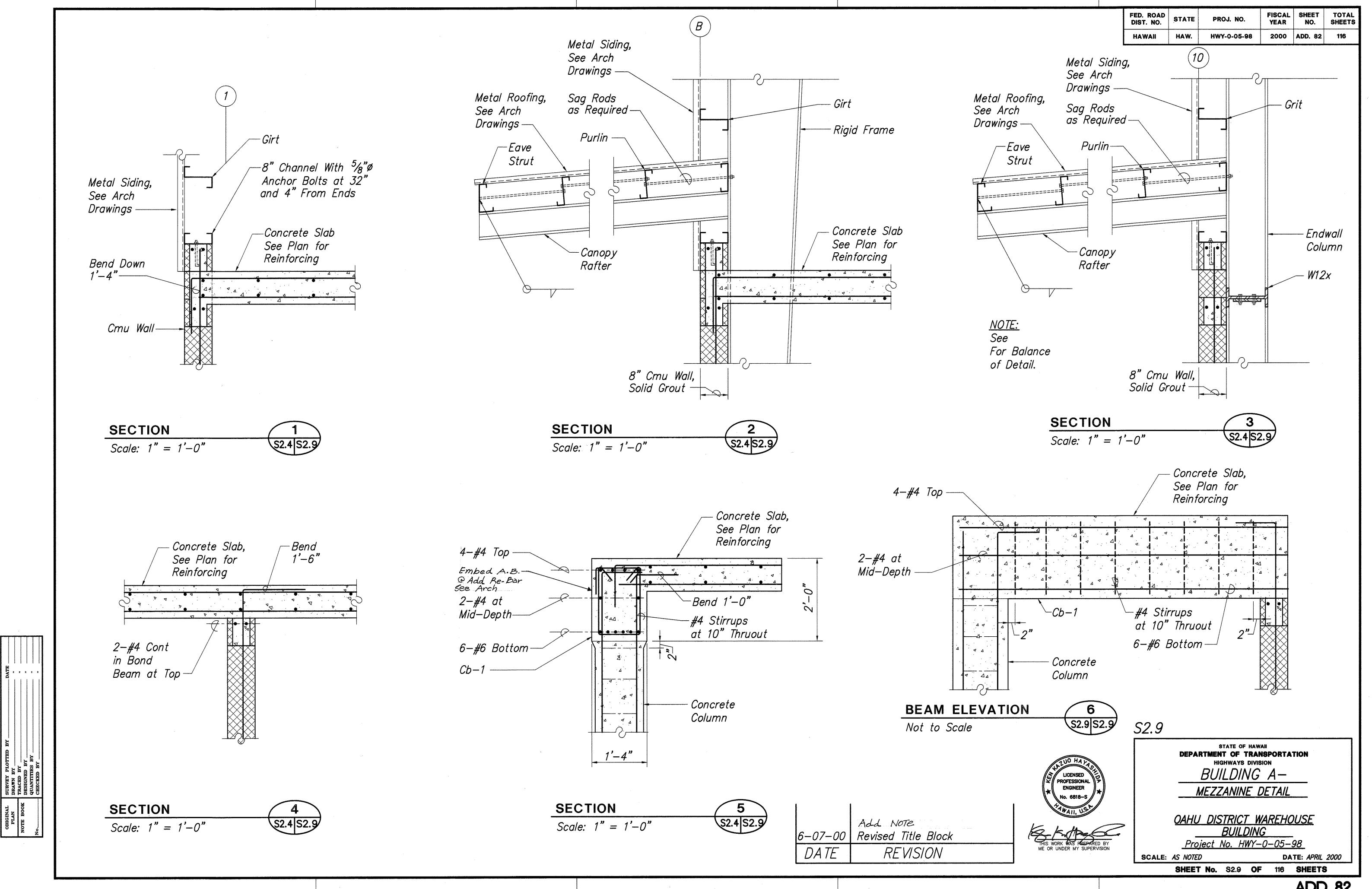
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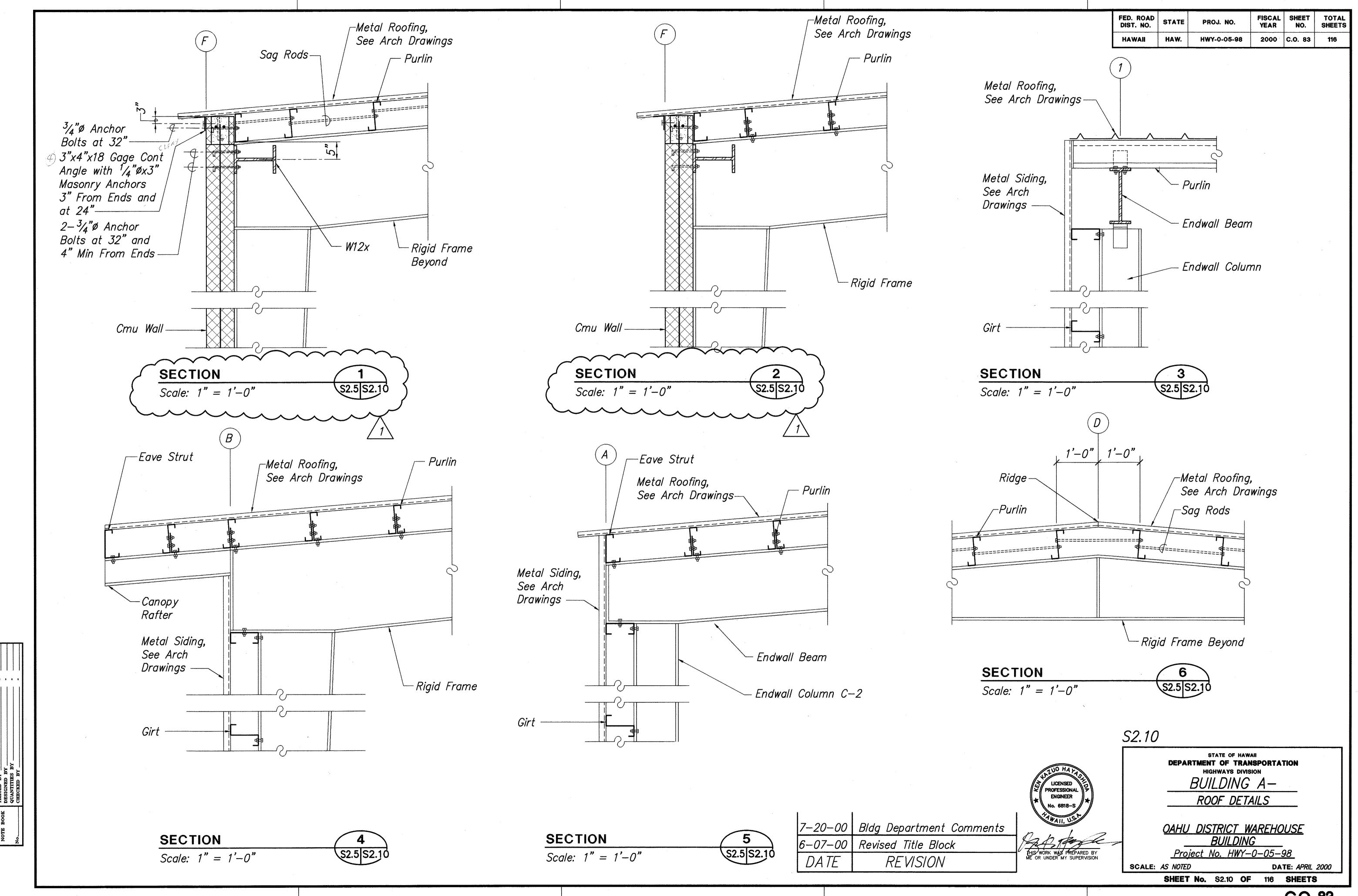


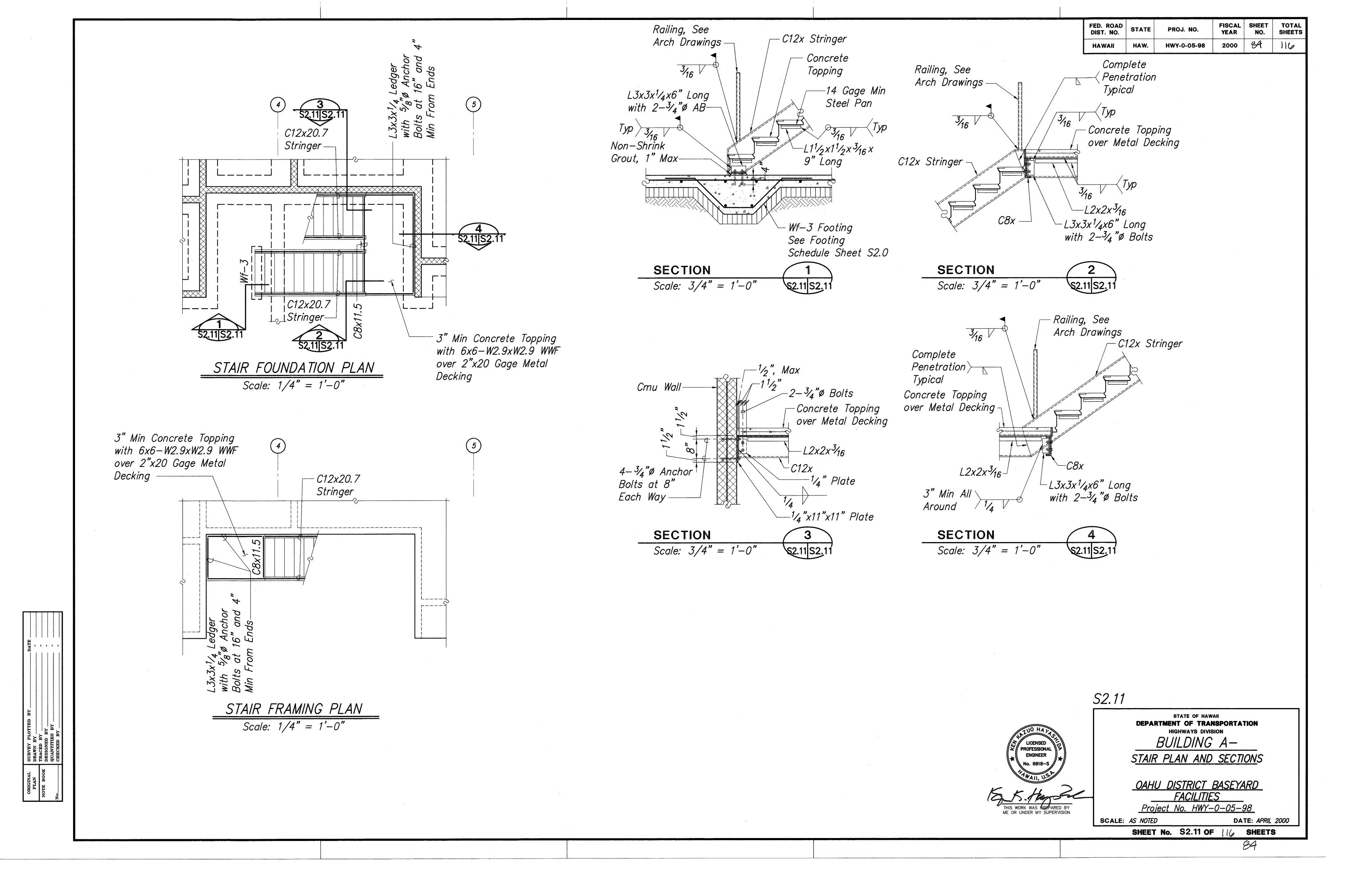




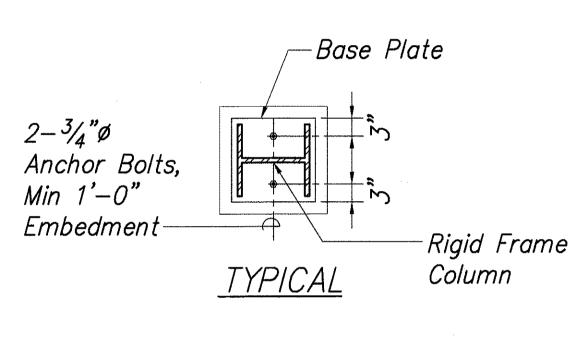


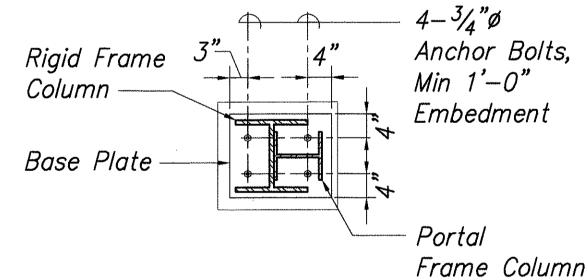
**ADD. 82** 



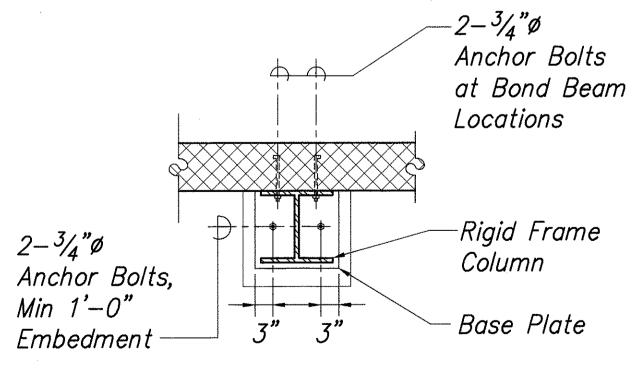


	FOOTING S	CHEDULE				
MARK	SIZE	REINFORCEMENT				
F-1	5'-6" Square x 1'-0" Thick	5—#6 Top and Bottom Each Way				
F-2	5'-6" x 6'-6" x 1'-0" Thick	5—#6 Top and Bottom Long Way 6—#6 Top and Bottom Short Way				
F-3	6'-6" Square x 1'-0" Thick	6—#6 Top and Bottom Each Way				
F-4	5'-0" x 8'-0" x 1'-0" Thick	5—#6 Top and Bottom Long Way 7—#6 Top and Bottom Short Way				
F-5	5'-0" x 14'-0" x 1'-0" Thick	5—#6 Top and Bottom Long Way 12—#6 Top and Bottom Short Way				
Wf—1	2'-0" Wide x 1'-0" Thick	2-#4 Cont with #4 at 12"				



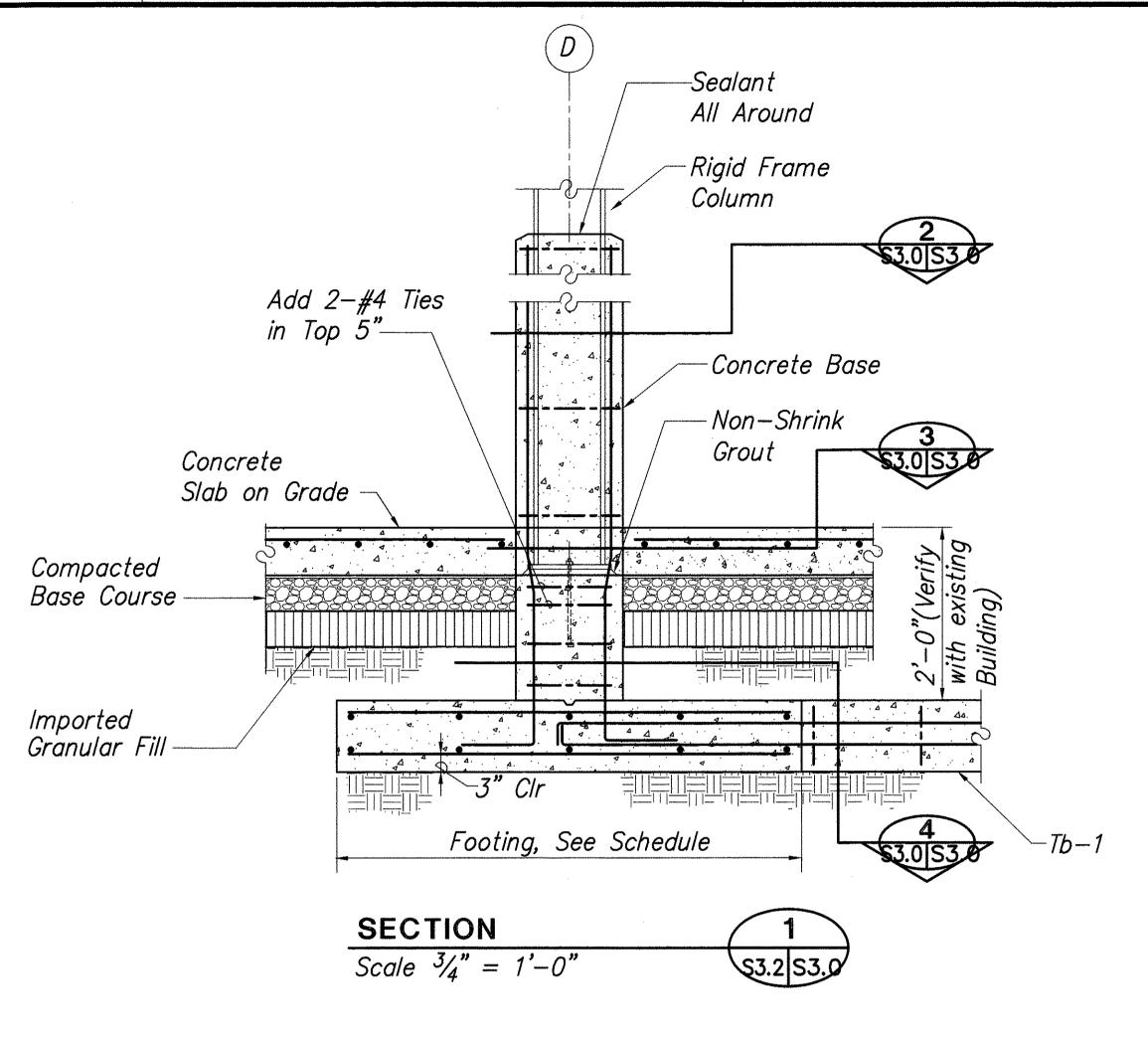


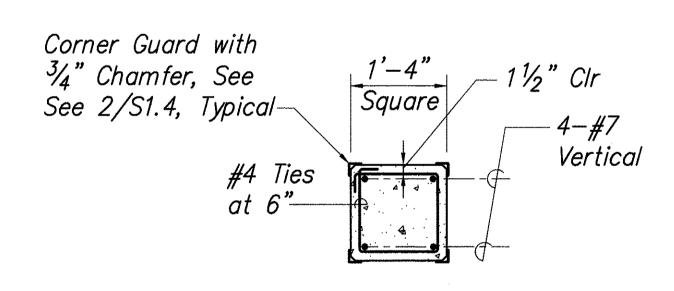
## AT PORTAL FRAME



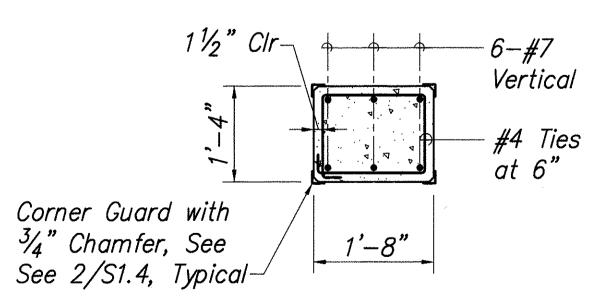
AT LINE 6/A





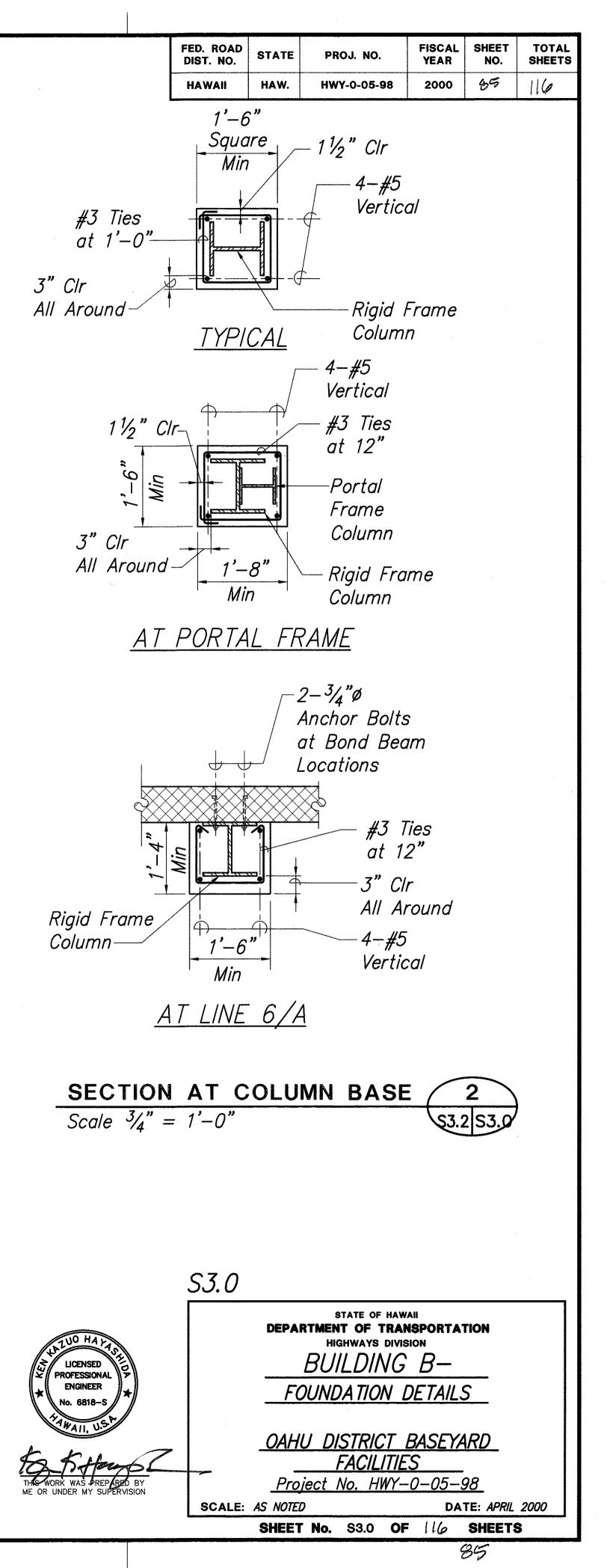


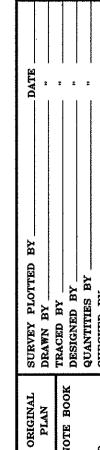
# <u>TYPICAL</u>

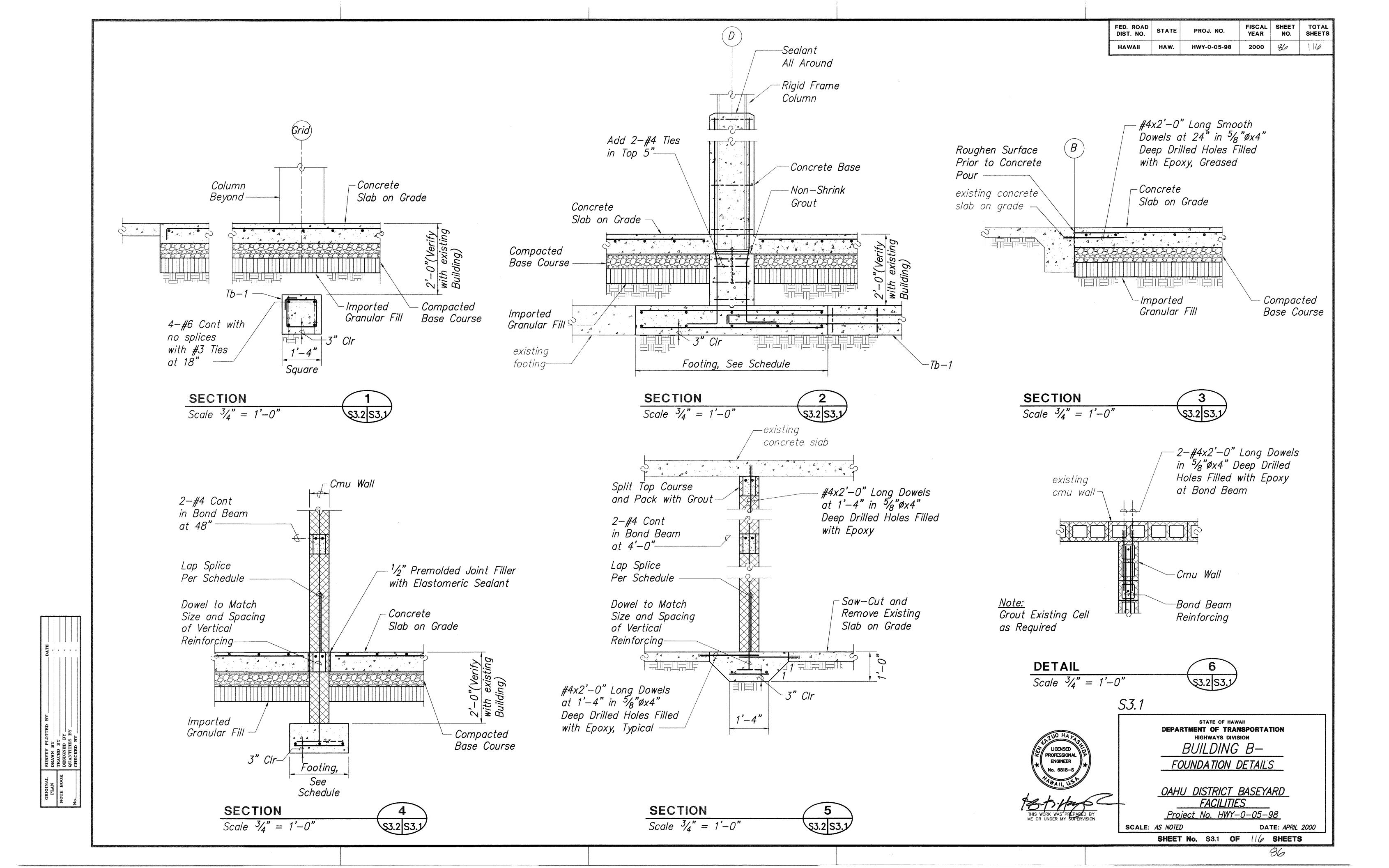


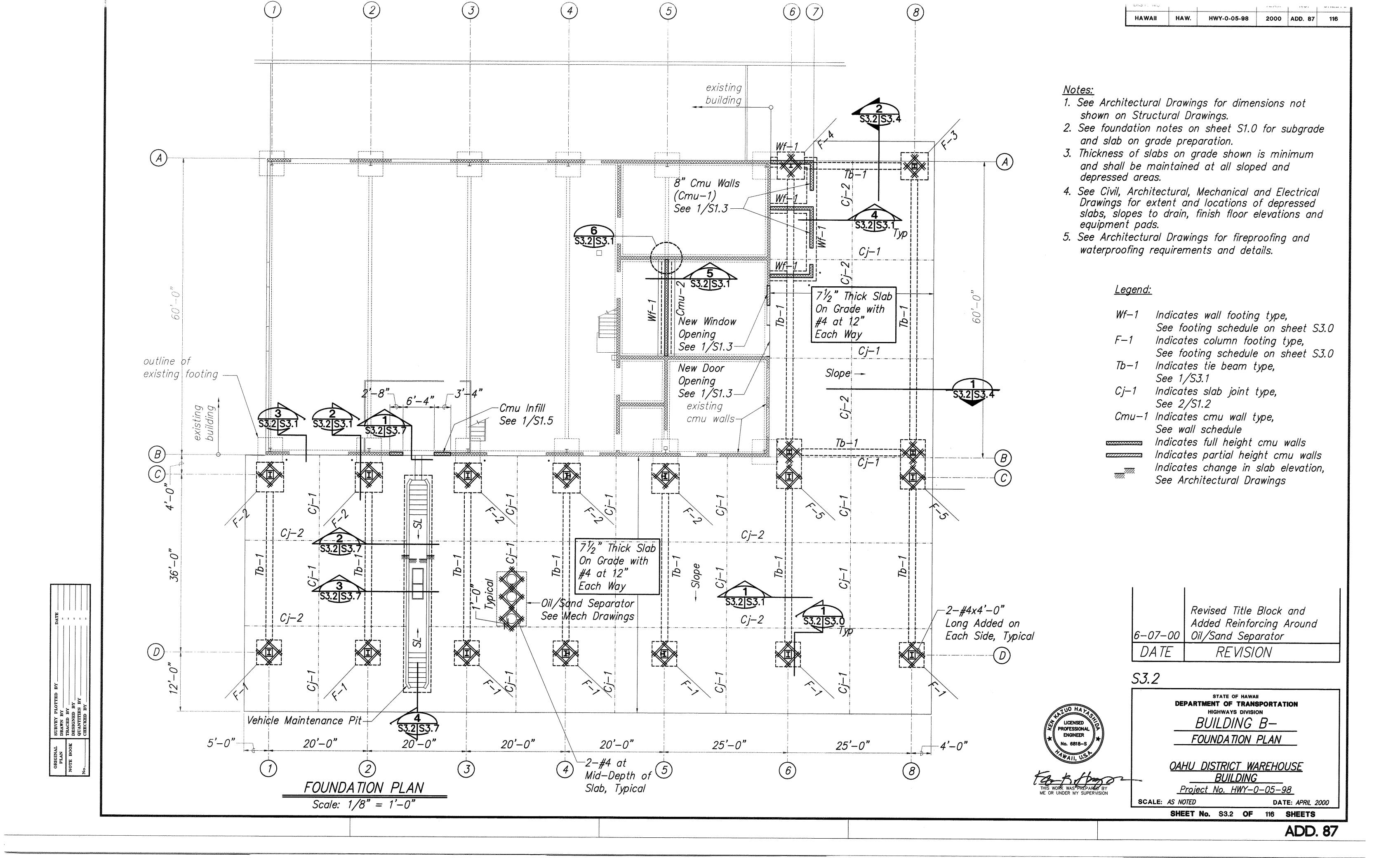
AT PORTAL FRAME

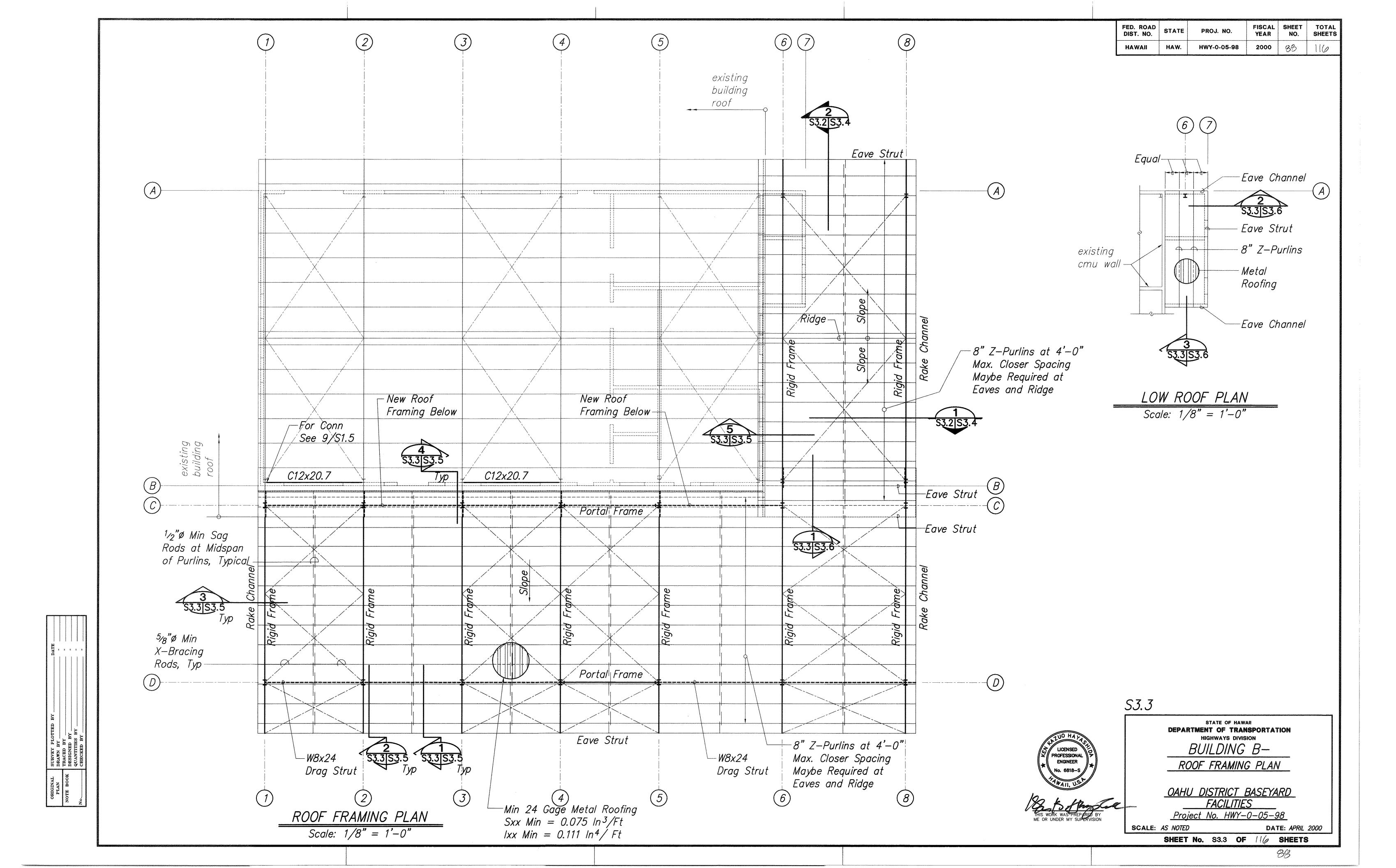


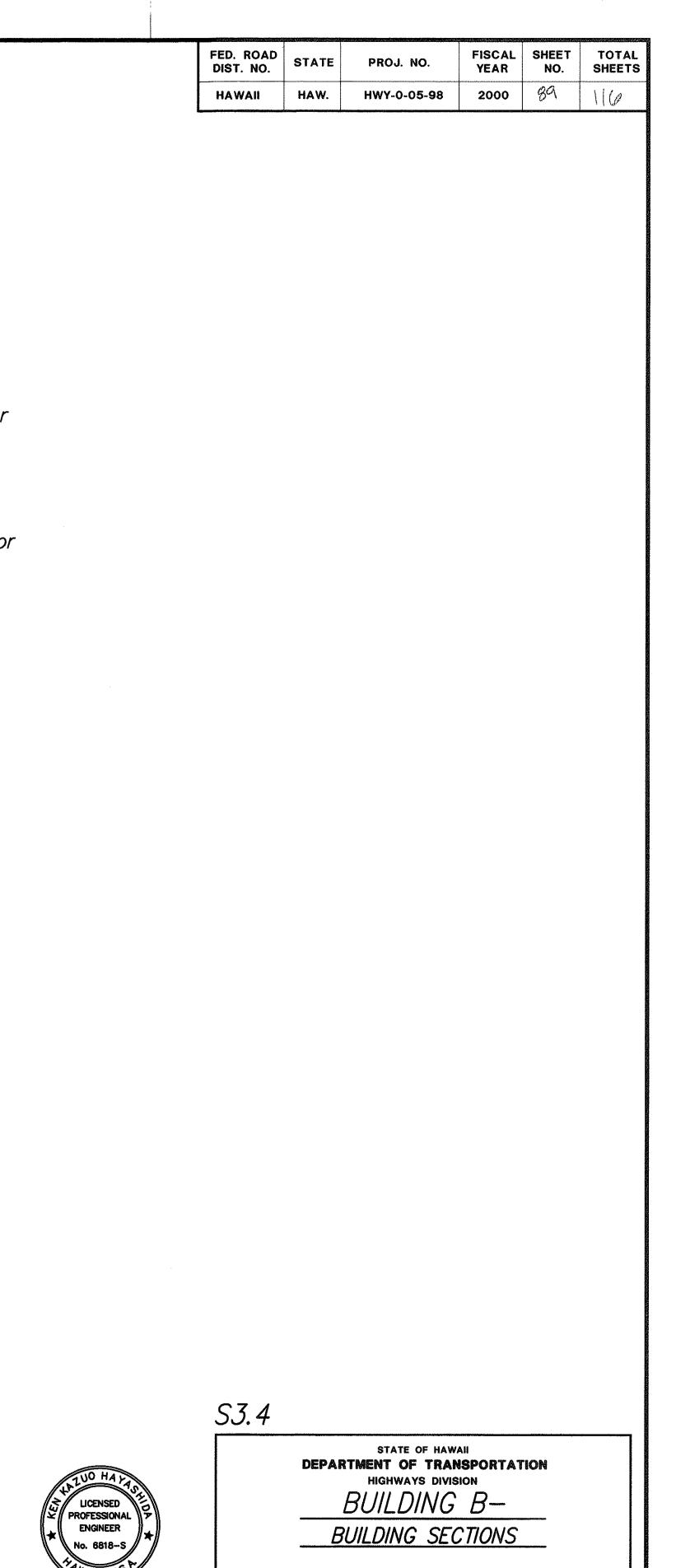


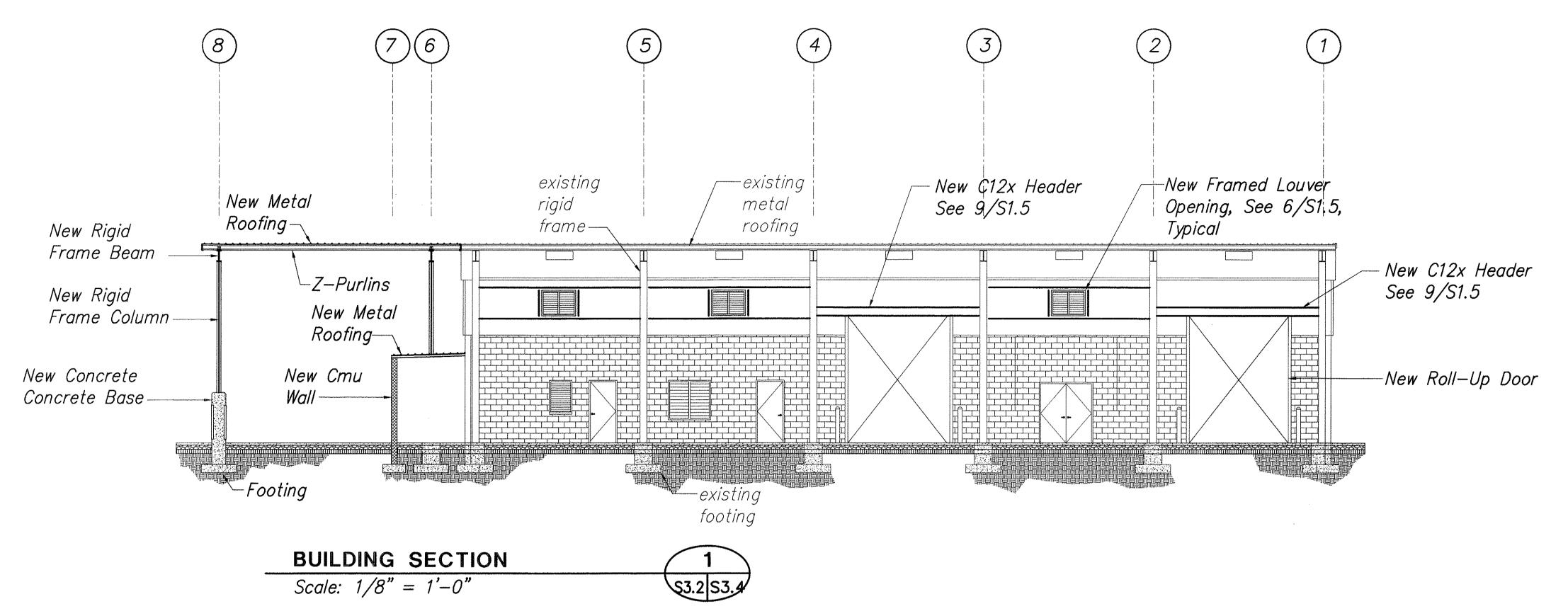


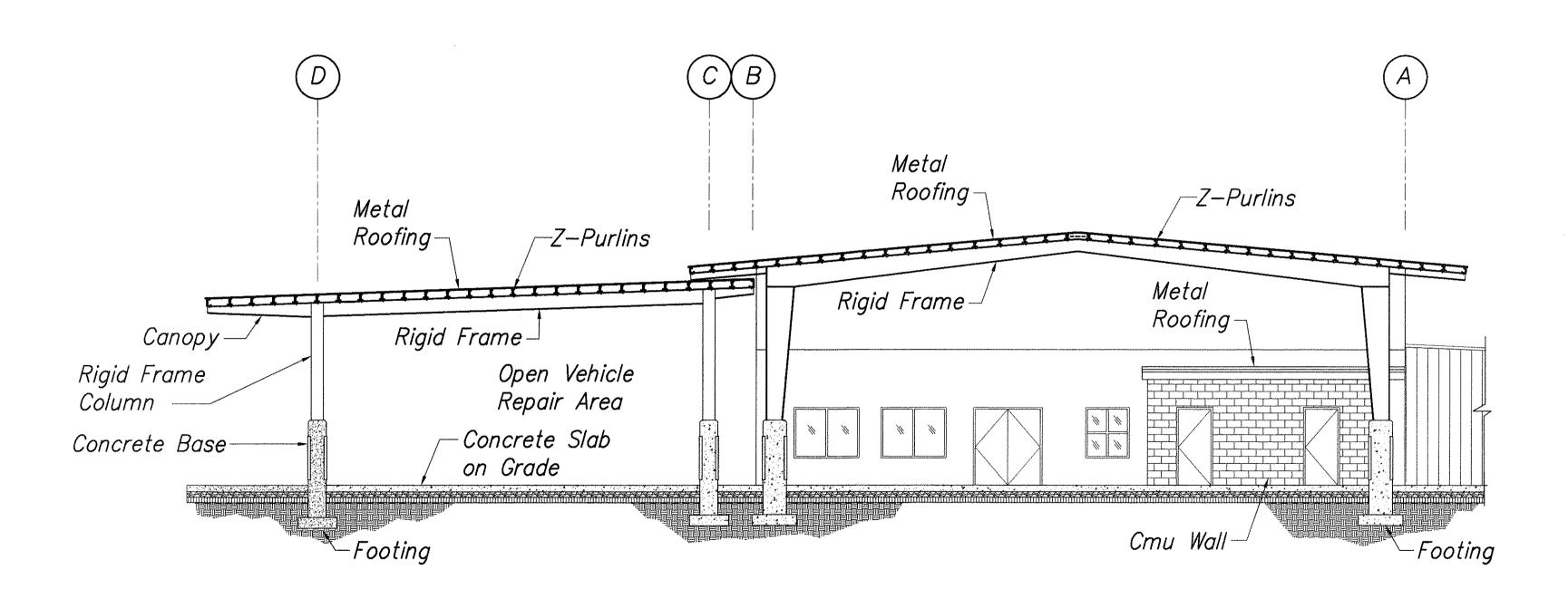


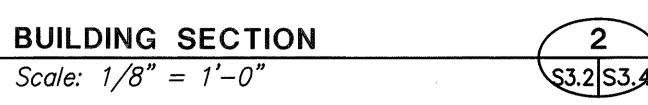












ORIGINAL SURVEY PLOTTED
PLAN DRAWN BY
NOTE BOOK DESIGNED BY
QUANTITIES BY
CHECKED BY
CHECKED BY

OAHU DISTRICT BASEYARD **FACILITIES** Project No. HWY-0-05-98

SCALE: AS NOTED

DATE: APRIL 2000 SHEET No. S3.4 OF 16 SHEETS

