FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(082)	2022	85	99

STRUCTURAL GENERAL NOTES

1. Standard Specifications and Plans:

A. Hawaii Department of Transportation (HDOT), Hawaii Standard Specifications for Road and Bridge Construction, 2005.

B. HDOT Highways Division Design Branch - Standard Plans dated 2008.

2. Design Specifications:

A. American Association of State Highway and Transportation Officials (AASHTO) 2020 "LRFD Bridge Design Specifications", 9th Edition as amended by HDOT document dated August 8, 2014 with subject title "Design Criteria for Bridges and Structures".

B. HDOT Document dated August 8, 2014 with subject title "Design Criteria for Bridges and Structures" and HDOT memorandum dated January 8, 2018 with subject title "Changes to Design Criteria for Bridges and Structures".

C. AASHTO 2015 "LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals", 1st Edition including all subsequent interim revisions and editions as amended by the HDOT document dated August 8, 2014 with subject title "Design Criteria for Bridge and Structures".

D. AASHTO 1995 Guide Design Specifications for Bridge Temporary Works, 1st Edition, including the 2008 interim revision edition.

3. Wind Loads:

A. See sheet S2.1.

4. Concrete:

A. All concrete shall have a minimum 28-day compressive strength f'c = 4000 psi, maximum W/C ratio of 0.45, and a maximum cementitious material content of 615 (lbs/cyd) unless otherwise noted.

B. For drilled shaft concrete see sheet S2.1.

5. Steel Reinforcing:

A. All reinforcing steel shall be ASTM A615 Grade 60 deformed bars unless otherwise noted.

B. Reinforcing steel shall be ASTM A706 where welded connections are required.

C. The cover measuring from the surface of the concrete to the face of any reinforcing bars shall be as follows, except as otherwise shown.

1). Concrete cast against and permanently exposed to earth = 3" unless otherwise noted

2). All others unless otherwise noted = 2"

D. Reinforcing bars shall be detailed in accordance with the latest edition of the American Concrete Institute (ACI) Detailing Manual, unless otherwise noted.

1. Steel Reinforcing (Cont.):

E. Minimum clear spacing between parallel bars shall be 1 1/2" times the diameter of bars (for non-bundled bars). In no case shall the clear distance between the bars be less than either 1 1/2" times the maximum size of the coarse aggregate or 1 1/2".

F. All dimensions relating to reinforcing bars are to centers of bars unless otherwise noted.

G. Reinforcing bars shall be securely tied at all intersections and lap splices except where the spacing of intersections is less than one foot in each directions, in which case alternate intersections shall be tied.

6. Glass Fiber Reinforced Polymer Rebar:

A. Glass fiber reinforced polymer (GFRP) rebar shall have a minimum tensile strength of 110 ksi for #4 bar and smaller. All others shall have a minimum tensile strength of 95 ksi. The allowable stress is equal to 1/4 of the tensile strength.

B. The modulus of elasticity of the GFRP bar shall be a minimum of 5,900,000 psi.

C. Minimum concrete cover for the GFRP bars shall be 3/4" unless otherwise noted.

D. Minimum lap splice lengths for the GFRP bars shall be 42 bar diameters unless otherwise noted.

E. All GFRP bars shall be securely tied in place.

F. The GFRP bars may be cut in the field with a masonry or diamond blade.

G. All work including materials and bends shall follow Manufacturer's recommendations.

7. Concrete Masonry Units (CMU Blocks):

A. Concrete block shall be hollow masonry units with f'm = 1,500 psi conforming to ASTM C-90 and built-in running bond unless otherwise shown.

B. Block walls shall be doweled to slabs at bottom. Dowels shall match vertical wall reinforcing.

C. All cells shall be filled solidly with 3,000 psi grout. All grout shall be consolidated at the time of pouring by vibrating and then reconsolidated again by pudling later, before elasticity is lost. MCI-2005 NS corrosion inhibitor or equivalent shall be added to the grout. Follow all manufacturer's recommendations for this corrosion inhibitor.

D. When the grouting is stopped for one (1) hour or longer, horizontal construction joints shall be formed by stopping the pour of grout 1-1/2 inches below the top of the uppermost unit.

8. Construction Notes:

A. The Contractor shall verify all dimensions and site conditions and shall report any discrepancies in writing to the Engineer before commencing work or ordering materials.

B. The Contractor shall verify all site conditions and not rely upon these plans for existing dimensions, elevations and azimuths. Roadway location, gutters, curbs and sidewalks, etc., conditions may differ from those shown.

C. The Contractor shall be solely responsible for the protection of adjacent properties, utilities and existing and new structures from damage due to construction. Repairing any damage shall be at the Contractor's own expense, to the satisfaction of the Engineer.

D. The Contractor shall verify the location of all utility lines and notify the respective owners before commencing with excavation, and any temporary piling or sheeting.

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

F. For concrete finish see Standard Specifications.

G. Construction joints may be relocated or additional ones added subject to the acceptance of the Engineer.

H. Unless otherwise noted, all exposed concrete edges shall be chamfered 3/4" x 3/4".

I. Aluminum members and dissimilar metals in contact with structural steel shall be isolated with Neoprene material as approved by the Engineer.

J. Anchor bolts shall be installed using a template to ensure proper layout. Anchor bolts shall be installed with misalignments of less than 1:40 from vertical. After installation, firm contact shall exist between the anchor bolt nuts, washers, and base plate on any anchor bolt installed in a misaligned position.

K. Existing pavement, concrete, riprap, etc. shall be restored to its original condition after completion of work.

9. Geotechnical Notes:

A. See Foundation Report by Geolabs, Inc. dated March 26, 2020 for geotechnical requirements.

DATE
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CHECKED BY
ORIGINAL PLAN
NOTE BOOK
No.

DRAWING NAME: Z:\00 ONGOING\20-017-KAHEKILI ROUNDABOUT-WSP\01 CAD\08-03-22\KKH-S0001 GENNOTES.DWG PLOT TIME: 08-02-22, 4:08 PM

CALVIN T. MIYAHARA
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NO. 8133-S
HAWAII, U.S.A.

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SIGNATURE — EXPIRATION DATE OF THE LICENSE: 4-30-24

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STRUCTURAL GENERAL NOTES

KAMEHAMEHA HIGHWAY
INTERSECTION IMPROVEMENTS
AT KAHEKILI HIGHWAY
F.A.P. No. NH-083-1(082)

Scale: As Shown Date: Aug. 2022

SHEET No. S0.1 OF 1 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(082)	2022	86	99

Retaining Wall 1
See Shts. S2.2 to S2.4

Retaining Wall 2
See Shts. S2.2 to S2.4

LAYOUT PLAN
Scale: 1'-0" = 10'-0"

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

DRAWING NAME: Z:\OD ENGINEERING\25-017-KAHEKILI ROUNDABOUT-WSP\01 CAD\08-03-22\KKH-S0101 LAYOUT PLAN.DWG PLOT TIME: 08-02-22, 4:09 PM

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4-30-24
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LAYOUT PLAN

KAMEHAMEHA HIGHWAY
INTERSECTION IMPROVEMENTS
AT KAHEKILI HIGHWAY
F.A.P. No. NH-083-1(082)

Scale: As Shown Date: Aug. 2022

SHEET No. S1.1 OF 1 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(082)	2022	87	99

LIGHT STANDARD FOUNDATION GENERAL NOTES:

1. Design Specifications:

   A. American Association of State Highway and Transportation Officials (AASHTO) 2020 LRFD Bridge Design Specifications, 9th Edition, as amended by Hawaii Department of Transportation (HDOT) document dated August 8, 2014 with subject title "Design Criteria for Bridges and Structures" and HDOT memorandum dated January 8, 2018 with subject title "Changes to Design Criteria for Bridges and Structures".

   B. Design shall conform with the AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, First Edition 2015 with 2020 Interim Revisions.

   C. See Structural General Notes on Sheet S0.1 for additional information.

2. Loads:

   A. Basic Wind Speed: 145 mph.

   B. Recurrence Interval of 1700 years.

3. Materials:

   A. Concrete for traffic signal foundation shall develop a minimum 28-day compressive strength of 4,500 psi with a maximum w/c ratio of 0.45.

   B. All concrete shall contain a water-based amine carboxylate migrating corrosion inhibitor or approved equal. Dosage shall be 24 ounces per cubic yard of concrete or recommended by the manufacturer.

   C. All reinforcing steel shall be ASTM A615 Grade 60 deformed bars unless otherwise noted.

   D. All connection bolts shall be AASHTO M164 bolts and anchor bolts shall be AASHTO M314-105 bolt.

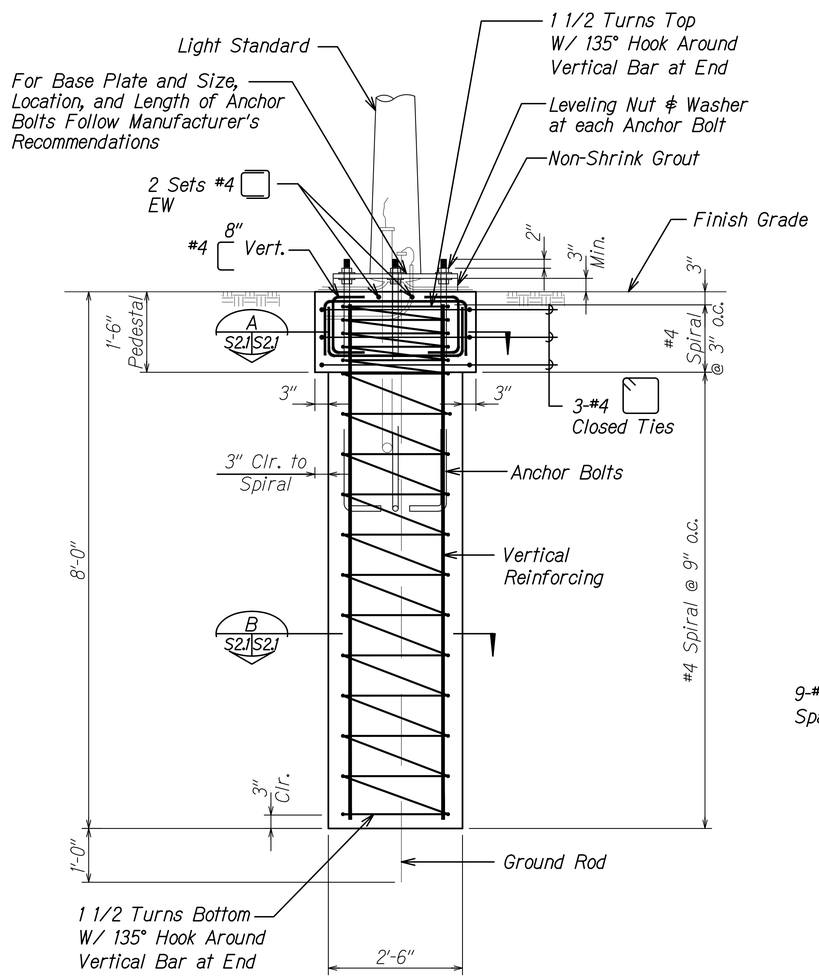
   E. Aluminum members and surfaces in contact with structural steel shall be isolated with neoprene material as approved by the Engineer.

4. General:

   A. The recommendations of the light standard pole manufacturer shall be followed. Manufacturer shall select pole, anchor bolts, etc. based on criteria given in the contract documents. The Contractor shall submit catalog cuts and calculations to the Engineer for approval.

   B. The Contractor shall use templates while installing the anchor bolts. Anchor bolts shall be vertical.

   C. The Contractor shall adjust the spiral vertical spacing to allow installation of anchor bolts and plates.



SECTION
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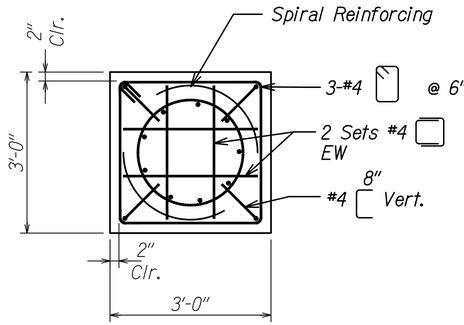

SECTION A S2.1 S2.1
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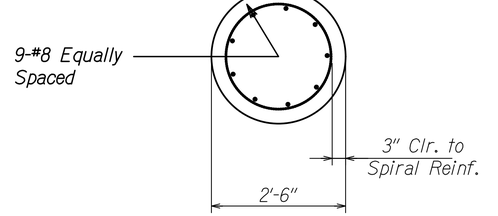

SECTION B S2.1 S2.1
Scale: 3/4" = 1'-0"

Note:

Detail of conduits, anchor bolts, etc, are approximate only. Manufacturer's recommendatons shall be followed. Contractor shall submit catalog cuts to the Engineer for approval.

ORIGINAL PLAN | NOTE BOOK No.

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DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

DRAWING NAME: Z:\OD ONGONGA\20-017-KAHEKILI ROUNDABOUT-WSP\01 CAD\08-03-22\KKH-S0201 LT POLE FDN.DWG PLOT TIME: 08-02-22, 4:09 PM

CALVIN T. MIYAHARA LICENSED PROFESSIONAL ENGINEER NO. 8133-S HAWAII, U.S.A.

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4-30-24
SIGNATURE EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

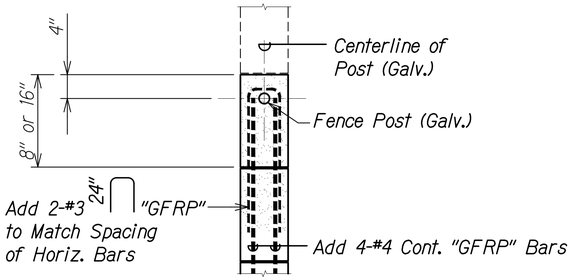
TYPICAL LIGHT STANDARD FOUNDATION, NOTES & SECTIONS

KAMEHAMEHA HIGHWAY
INTERSECTION IMPROVEMENTS
AT KAHEKILI HIGHWAY
F.A.P. No. NH-083-1(082)

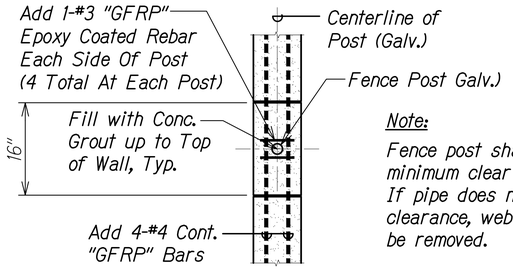
Scale: As Shown Date: Aug. 2022

SHEET No. S2.1 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(082)	2022	88	99



AT END OR CONTROL JOINTS

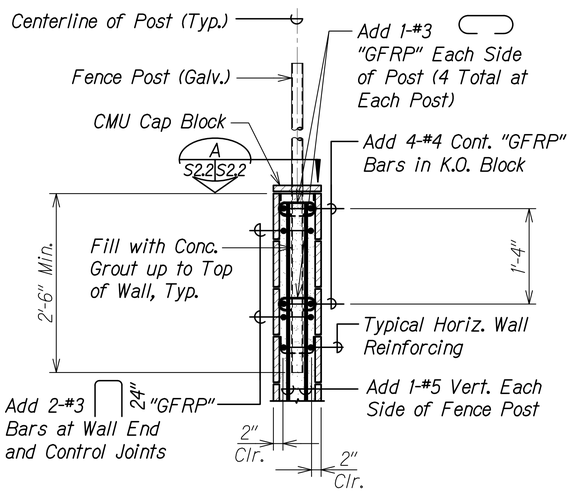


Note:
Fence post shall have a 1 1/2" minimum clear to web or end walls. If pipe does not have minimum clearance, web or end walls shall be removed.

INTERMEDIATE

TYPICAL FENCE POST SECTION PLAN (A S2.2 | S2.2)

Scale: 1" = 1'-0"



TYPICAL FENCE POST SECTION (B S2.2 | S2.2)

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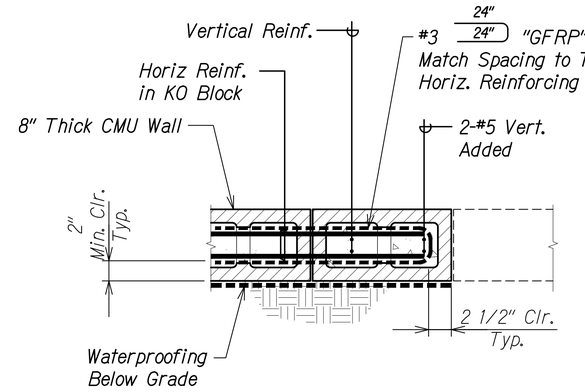
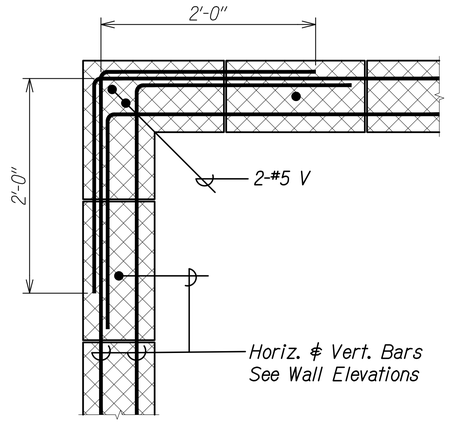


AT END OR CONTROL JOINTS

CMU WALL DETAIL (1 S2.2 | S2.2)

Not to Scale



AT CORNER

CMU WALL DETAIL (2 S2.2 | S2.2)

Not to Scale

LAP LENGTH OF VERT. REINF. IN CMU WALL**

BAR SIZE	Ld (IN.)
#4	3'-0"
#5	3'-9"
#6	4'-6"
#7	5'-3"

** Unless Otherwise Noted

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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HIGHWAYS DIVISION

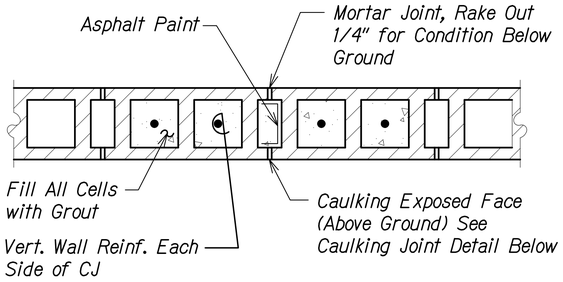
TYPICAL CMU WALL SECTIONS AND DETAILS

KAMEHAMEHA HIGHWAY
INTERSECTION IMPROVEMENTS
AT KAHEKILI HIGHWAY
F.A.P. No. NH-083-1(082)

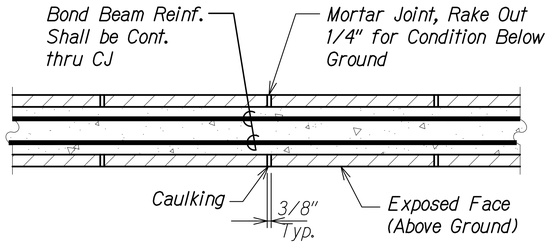
Scale: As Shown Date: Aug. 2022

SHEET No. S2.2 OF 4 SHEETS

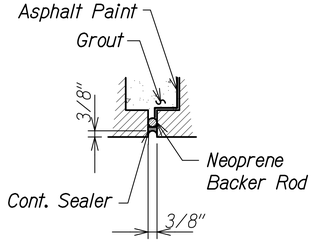
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(082)	2022	89	99



CJ AT TYPICAL CMU WALL



CJ AT BOND BEAM



CJ AT CAULKING JOINT (EXPOSED FACE)

Note:

Unless noted otherwise space control joint at 16'-0" oc (Max.).

TYPICAL MASONRY WALL CONTROL JOINT (WCJ) DETAILS

1 S2.3 | S2.3

Not to Scale

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STATE OF HAWAII
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HIGHWAYS DIVISION

TYPICAL CMU WALL DETAILS

KAMEHAMEHA HIGHWAY
INTERSECTION IMPROVEMENTS
AT KAHEKILI HIGHWAY
F.A.P. No. NH-083-1(082)

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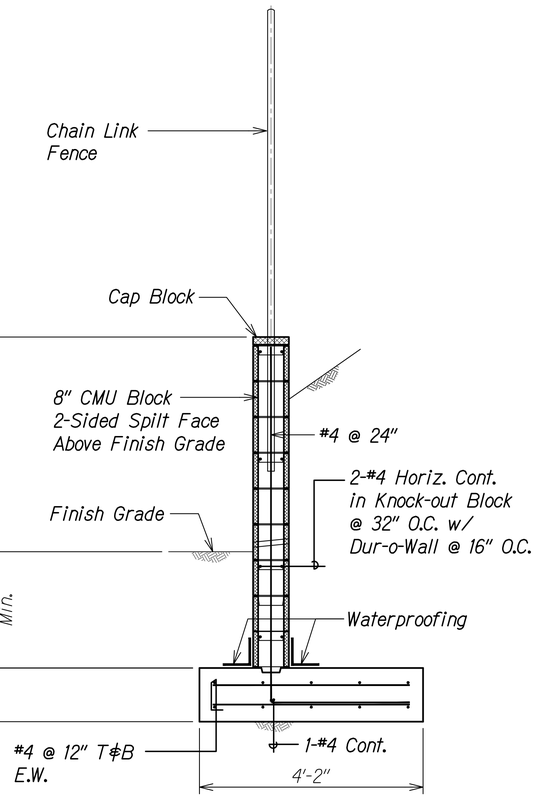
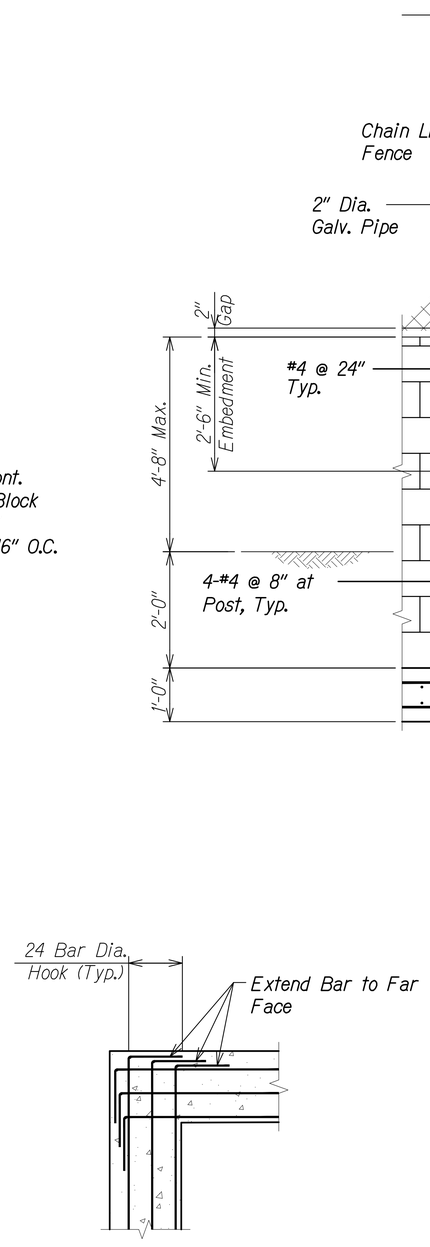
SHEET No. S2.3 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-083-1(082)	2022	90	99



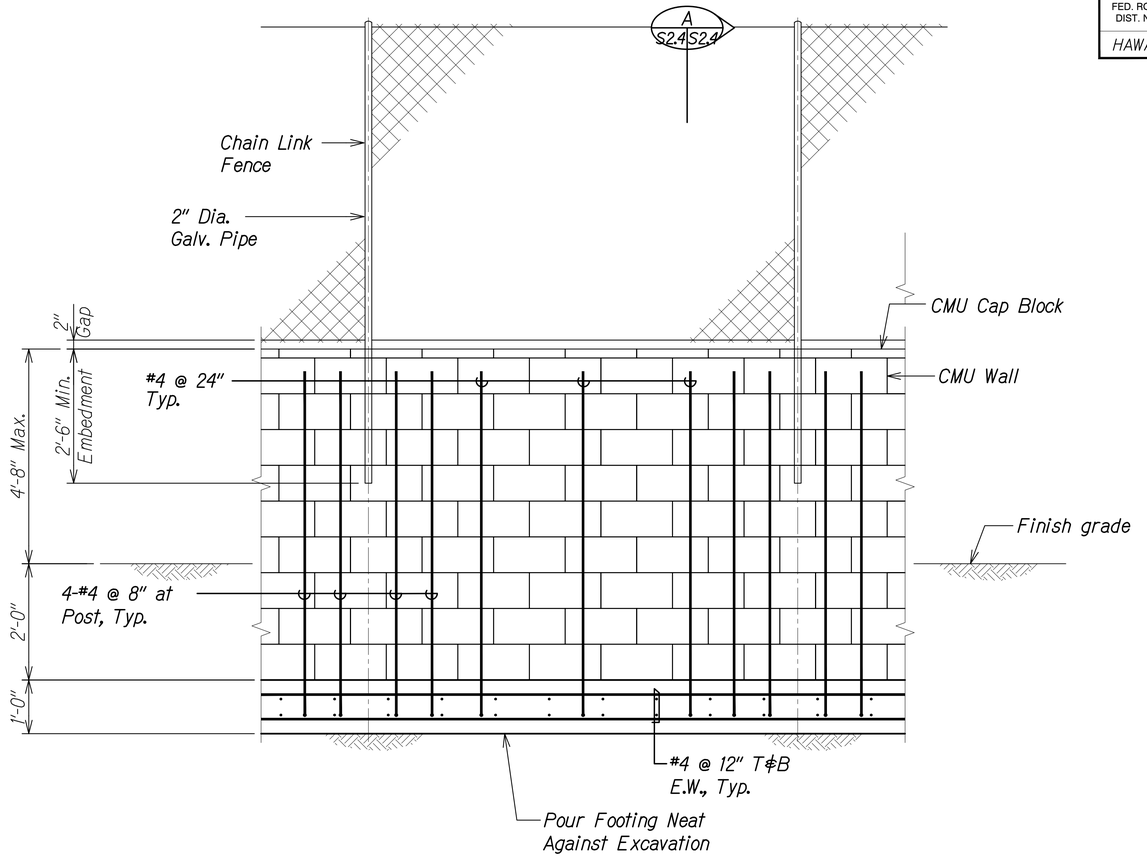
Note:
For Waterproofing, See State of Hawai'i Department of Transportation Standard Detail Sheet B-01.

SECTION A
Scale: 3/4" = 1'-0" S2.4 | S2.4



AT CORNERS

TYPICAL WALL FOOTING DETAIL 1
Scale: 3/4" = 1'-0" S2.4 | S2.4



TYPICAL CMU WALL WITH VINYL LATTICE FENCE ELEVATION B
Scale: 3/4" = 1'-0" S2.4 | S2.4

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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL CMU WALL ELEVATION AND DETAIL

KAMEHAMEHA HIGHWAY
INTERSECTION IMPROVEMENTS
AT KAHEKILI HIGHWAY
F.A.P. No. NH-083-1(082)

Scale: As Shown Date: Aug. 2022

SHEET No. S2.4 OF 4 SHEETS