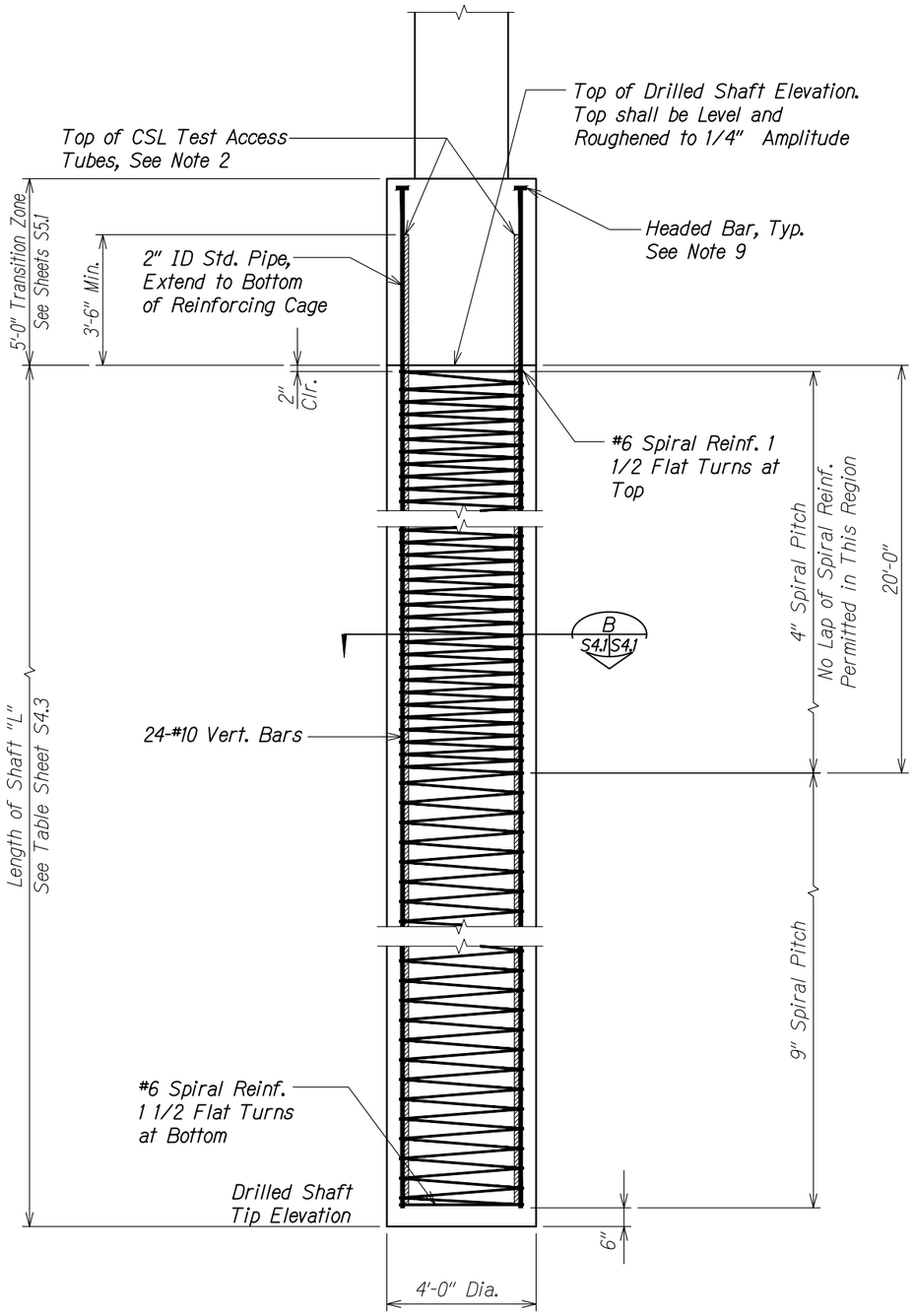
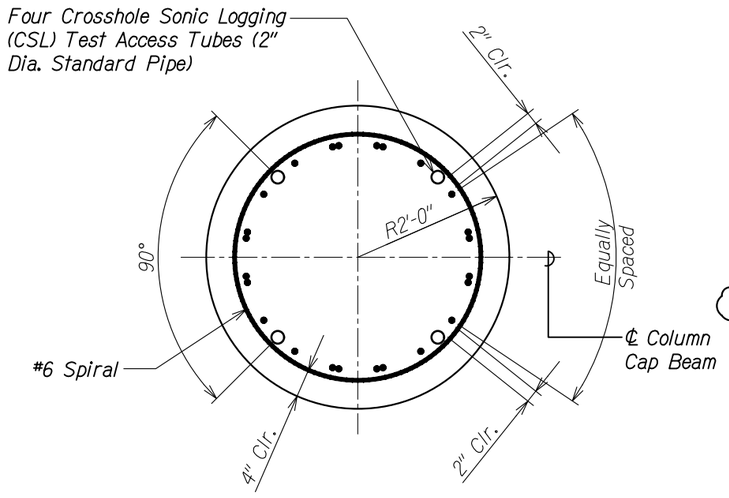
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-22(002)	2019	ADD 41	94



DRILLED SHAFT 1 AND 2 ELEVATION

A S4.1 S4.1

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



24-#10 Vert. Bars
(2x8 Bundles 8 Single Bars)

SECTION

B S4.1 S4.1

Scale: 1" = 1'-0"

NOTES:

1. Crosshole Sonic Logging (CSL) testing shall be performed on every drilled shaft. Shafts indicating irregular CSL readings may be subjected to additional testing.
2. After CSL testing, a portion of the CSL test access tubes shall be removed in the transition zone to one inch above top of the drilled shaft elevation. Tubes shall be completely filled with non-shrink, non-metallic, cementitious grout of at least equal strength as drilled shaft prior to pouring the transition zone. See Structural General Note 4.K. 1
3. Lap splice length for #10 vert. bar shall be 6'-6". No lap splices of vert. bars are allowed in the upper 40'-0" of the drilled shaft.
4. Lapped splices shall have a minimum of 2'-0" vertically between splice points.
5. Staggered splice points for longitudinal reinforcing shall not be more than 50% of the total at any section normal to the axis of the shaft.
6. Lap splice length for #6 spirals shall be 3'-6" min. with a 135° hook bend at each end.
7. Each end of the spiral shall have 1 1/2 extra turns with a 135° hook around a vertical reinforcing bar.
8. Concrete or other non-corrosive spacing devices shall be used to maintain the reinforcement cage in position within the shaft.
9. Bundled bars in the transition zone may consist of one headed vertical bar and one unheaded vertical bar.

DATE	REVISION
5/24/19	1 Revised Notes

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRILLED SHAFT

PALI HIGHWAY
LANDSLIDE MITIGATION PROJECT
FAP Proj. No. ER-22(002)

Scale: As Noted Date: May 6, 2019

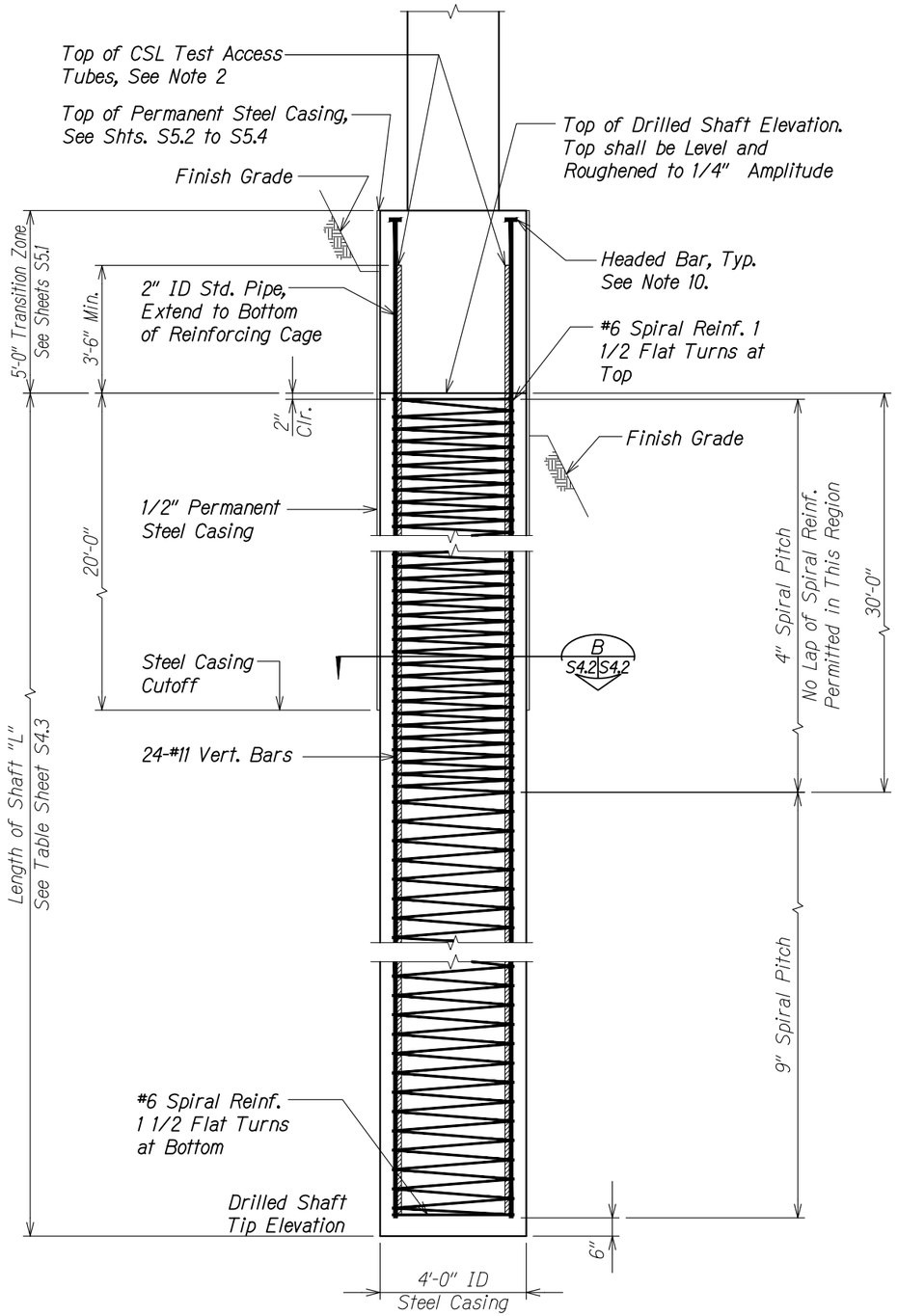
SHEET No. S4.1 OF 3 SHEETS

ADD 41

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

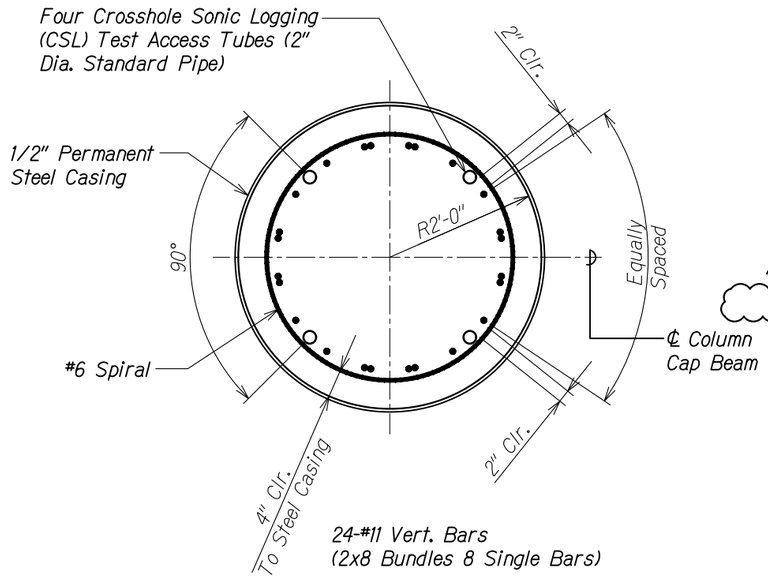
DRAWING NAME: Z:\00 ONGOING\19-014.1 PALI ROOF SHED-WSP TM\01 CAD\05-24-19 PH 2\PLM-S0401 DSHAFT.DWG PLOT TIME: 06-03-19, 11:19 AM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-22(002)	2019	ADD 42	94



DRILLED SHAFT 3 ELEVATION (A S4.2 S4.2)

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



SECTION (B S4.2 S4.2)

Scale: 1" = 1'-0"

NOTES:

1. Crosshole Sonic Logging (CSL) testing shall be performed on every drilled shaft. Shafts indicating irregular CSL readings may be subjected to additional testing.
2. After CSL testing, a portion of the CSL test access tubes shall be removed in the transition zone to one inch above top of the drilled shaft elevation. Tubes shall be completely filled with non-shrink, non-metallic, cementitious grout of at least equal strength as drilled shaft prior to pouring the transition zone. See Structural General Note 4.K. (1)
3. Lap splice length for #11 vert. bar shall be 8'-0". No lap splices of vert. bars are allowed in the upper 40'-0" of the drilled shaft.
4. Lapped splices shall have a minimum of 2'-0" vertically between splice points.
5. Staggered splice points for longitudinal reinforcing shall not be more than 50% of the total at any section normal to the axis of the shaft.
6. Lap splice length for #6 spirals shall be 3'-6" min. with a 135° hook bend at each end.
7. Each end of the spiral shall have 1 1/2 extra turns with a 135° hook around a vertical reinforcing bar.
8. Concrete or other non-corrosive spacing devices shall be used to maintain the reinforcement cage in position within the shaft.
9. Finish grade shown for illustrative purpose. See civil sheets.
10. Bundled bars in the transition zone may consist of one headed vertical bar and one unheaded vertical bar.

DATE	REVISION
5/24/19	(1) Revised Notes

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRILLED SHAFT

PALI HIGHWAY
LANDSLIDE MITIGATION PROJECT
FAP Proj. No. ER-22(002)

Scale: As Noted Date: May 6, 2019

SHEET No. S4.2 OF 3 SHEETS

ADD 42

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

DRAWING NAME: Z:\00 ONGOING\19-014.1 PALI ROOF SHED-WSP TNA\01 CAD\05-24-19 PH 2\PLW-S0402 DSHAFT.DWG PLOT TIME: 06-03-19, 11:19 AM

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-22(002)	2019	43	94

DRILLED SHAFT SCHEDULE

Drilled Shaft Mark	1	2	3
Drilled Shaft Diameter	4'-0"	4'-0"	4'-0"
Top of Shaft Elevation	982.60	979.00	975.00
Estimated Drilled Shaft Tip Elevation	952.60	949.00	935.00
Estimated Length of Shaft (L)	30'-0"	30'-0"	40'-0"
Strength Limit State Compression Demand (kips)	1451	1522	500
Strength Limit State Compression Capacity (kips)	1540	1540	660
Extreme Event Limit State Compression Demand (kips)	1928	1988	1150
Extreme Event Limit State Compression Capacity (kips)	2800	2800	1200
Non-Redundant Single Shaft Compression Capacity (kips)	3500	3500	1500

Notes:

1. *For 4'-0" dia. drilled shafts details see Shts. S4.1 and S4.2.*
2. *For Foundation Plan see Sht. S1.4.*
3. *All excavation and drilling operations for foundations shall be monitored by Geolabs, Inc.*
4. *Drilling of adjacent shafts within three drilled shaft diameters shall not commence until the shaft concrete has cured a minimum of 24 hours.*
5. *Drilled shaft tip elevations are estimated. The actual length of the shaft and drilled shaft tip elevations will be determined by Geolabs, Inc.*
6. *Drilled shaft tip elevations shall be verified by Geolabs, Inc. prior to placing reinforcement and concrete. Concrete shall be placed within 24 hours after drilling, but shall not be placed without prior approval of Geolabs, Inc.*

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

DRAWING NAME: Z:\00 ONGOING\19-014.1 PALI ROOF SHED-WSP TMK\01 CAD\05-06-19 TOPO\PLM-S0403 DSHAFT SCHED.DWG PLOT TIME: 05-06-19, 11:45 PM)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

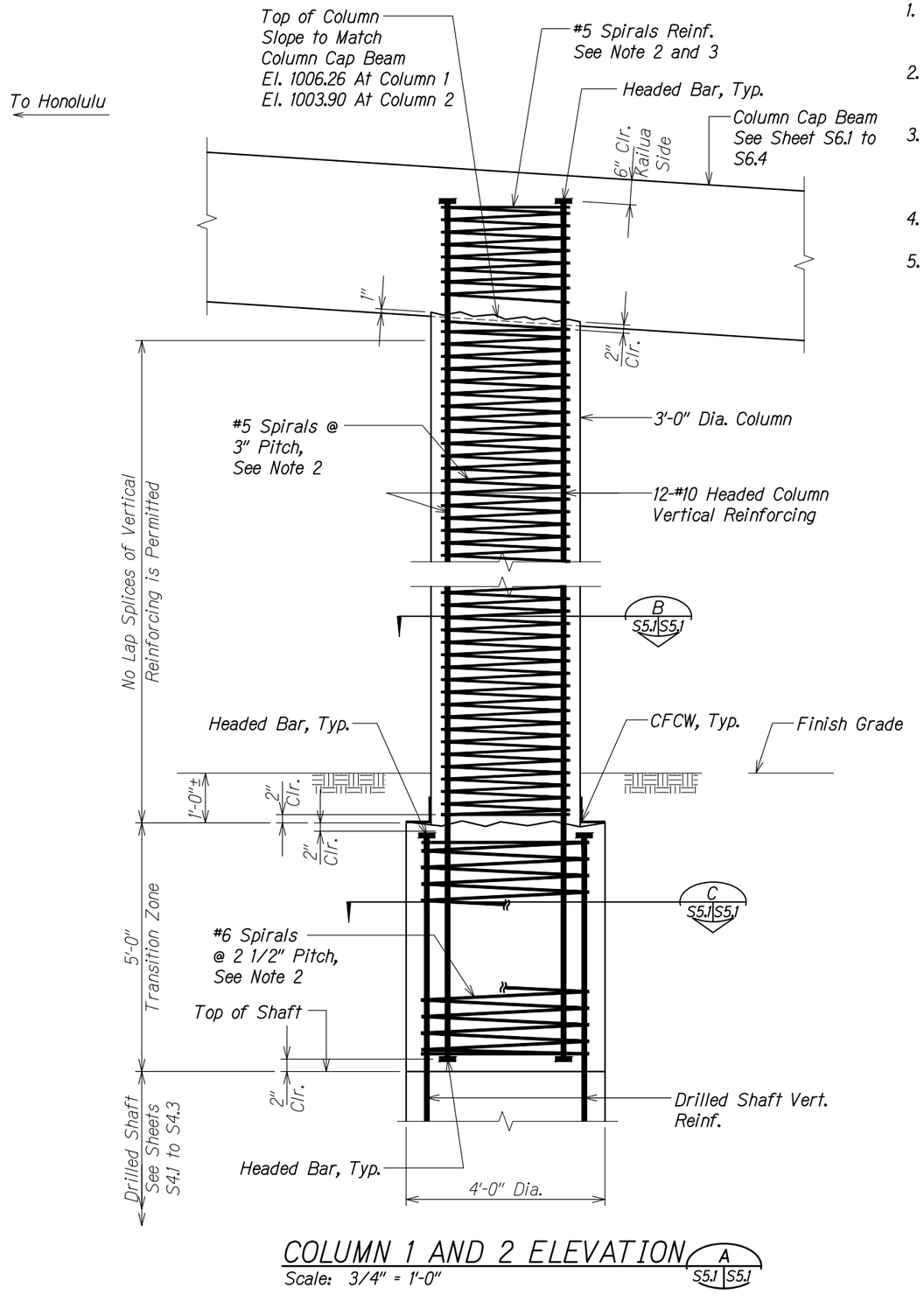
DRILLED SHAFT SCHEDULE

PALI HIGHWAY
LANDSLIDE MITIGATION PROJECT
FAP Proj. No. ER-22(002)

Scale: None Date: May 6, 2019

SHEET No. S4.3 OF 3 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-22(002)	2019	44	94

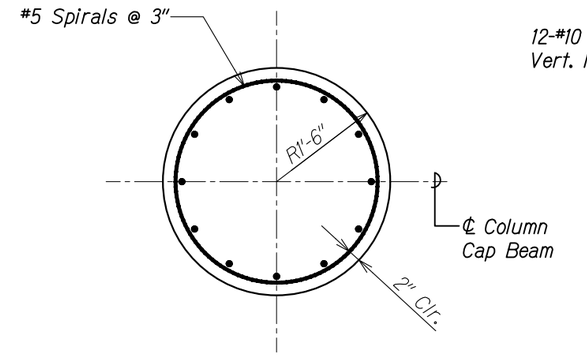


COLUMN 1 AND 2 ELEVATION (A S5.1 | S5.1)

Scale: 3/4" = 1'-0"

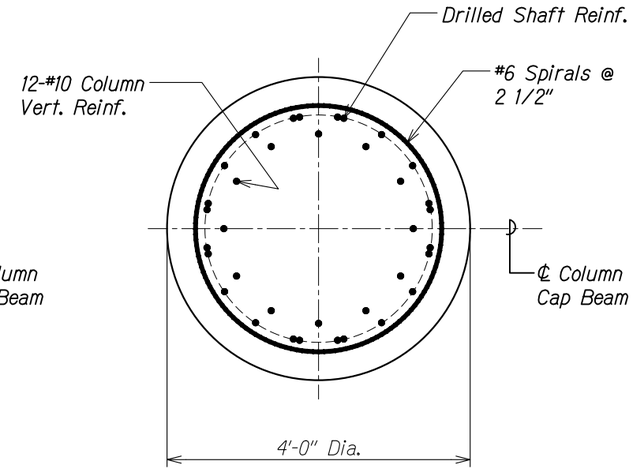
Notes:

1. All construction joints shall be cleaned and roughen to 1/4" Amplitude.
2. Each end of the spiral shall have 1 1/2" extra turns with 135° hook around a vertical bar.
3. Spirals may be discontinuous at the column cap beam to allow for placement of the horizontal reinforcement in the column cap beam.
4. Top of column elevation shall be taken at ℄ column.
5. The Contractor shall provide template including details showing exact location of rebars so that no interference will occur between column vertical reinforcement and column cap beam horizontal reinforcement.



COLUMN SECTION (B S5.1 | S5.1)

Scale: 1" = 1'-0"



TRANSITION ZONE SECTION (C S5.1 | S5.1)

Scale: 1" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

COLUMN 1 AND 2 ELEVATION AND SECTIONS

PALI HIGHWAY
LANDSLIDE MITIGATION PROJECT
FAP Proj. No. ER-22(002)

Scale: As Noted Date: May 6, 2019

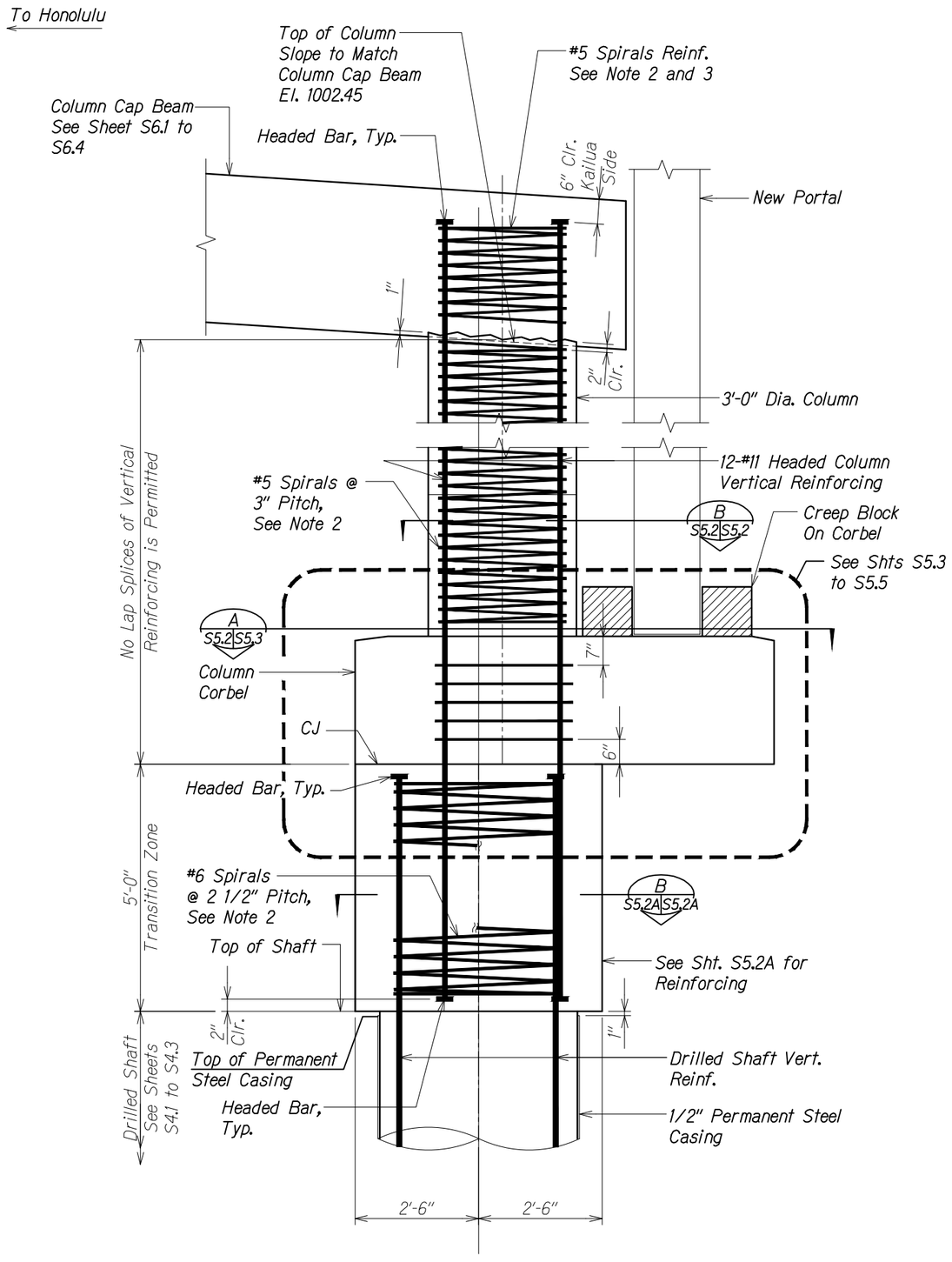
SHEET No. S5.1 OF 5 SHEETS

44

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

DRAWING NAME: Z:\00 ONGOING\19-014.1 PALI ROOF SHED-WSP TM\01 CAD\05-06-19 TOPO\PLM-S0501 COL.DWG PLOT TIME: 05-06-19, 11:46 PM)

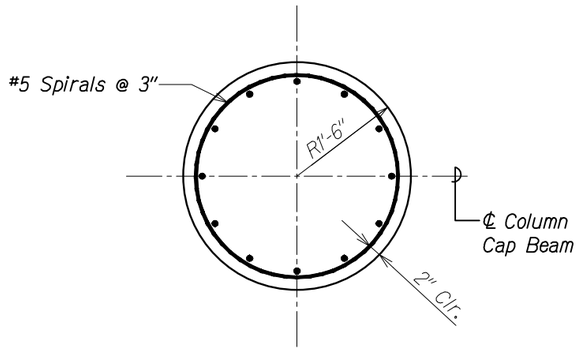
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-22(002)	2019	ADD 45	94



COLUMN 3 ELEVATION (A S5.2|S5.2)
Scale: 3/4" = 1'-0"

Notes:

1. All construction joints shall be cleaned and roughen to 1/4" Amplitude.
2. Each end of the spiral shall have 1 1/2" extra turns with 135° hook around a vertical bar.
3. Spirals may be discontinuous at the column cap beam to allow for placement of the horizontal reinforcement in the column cap beam.
4. Top of column elevation shall be taken at ℄ column.
5. The Contractor shall provide template including details showing exact location of rebars so that no interference will occur between column vertical reinforcement and column cap beam horizontal reinforcement.



COLUMN SECTION (B S5.2|S5.2)
Scale: 1" = 1'-0"

DATE	REVISION
6/6/19	2 Revised Section Based on As-Built Conditions
5/24/19	1 Revised Section

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

COLUMN 3 ELEVATION AND SECTIONS

PALI HIGHWAY
LANDSLIDE MITIGATION PROJECT
FAP Proj. No. ER-22(002)

Scale: As Noted Date: May 6, 2019

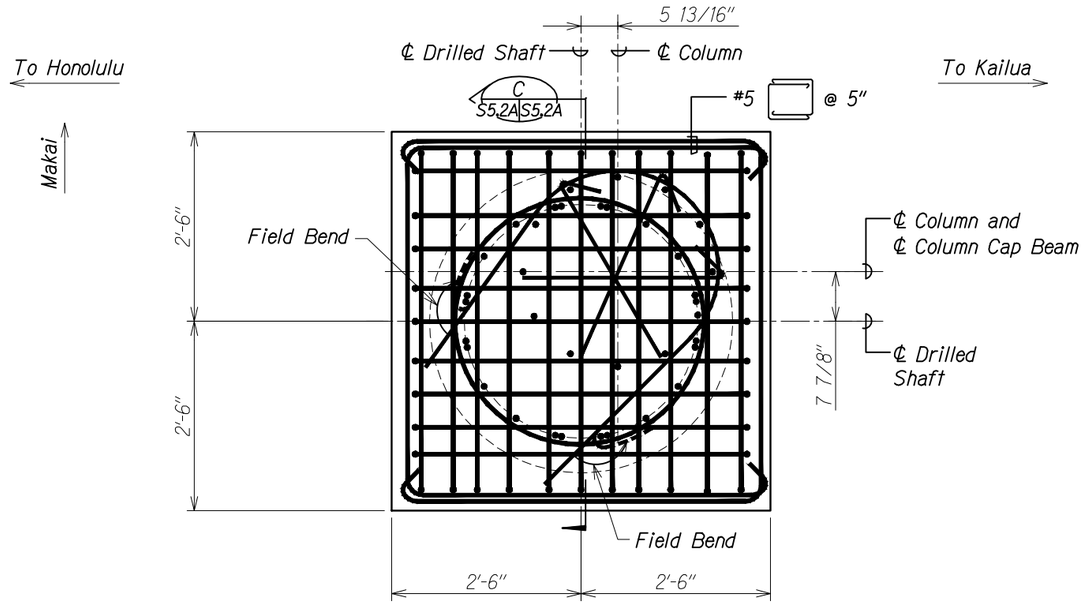
SHEET No. S5.2 OF 5 SHEETS

ADD 45

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

DRAWING NAME: Z:\OD ONGOING\19-014.1 PALI ROOF SHED-WSP TM\01 CAD\06-06-19 COL3 ASB\PLM-S0501 ADD1 ASB COL.DWG PLOT TIME: 06-06-19, 9:36 AM)

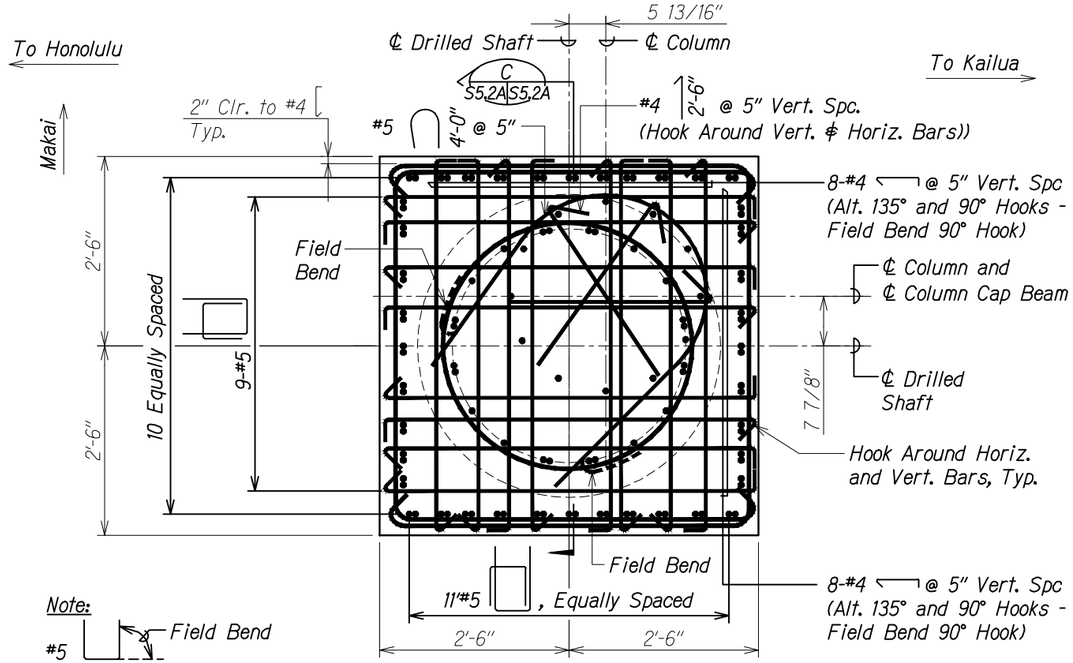
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-22(002)	2019	ADD 45S-1	94



TRANSITION ZONE SECTION AT TOP AND BOTTOM

Scale: 1" = 1'-0"

A S5.2A | S5.2A



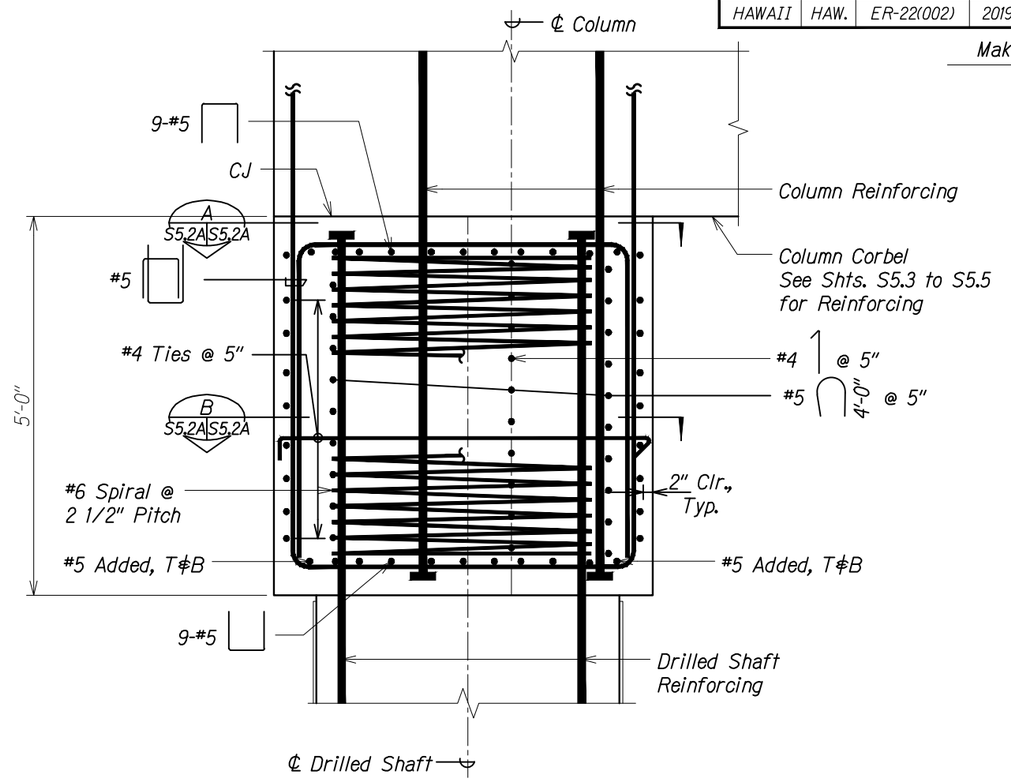
Note:

after inserting L through drilled shaft spirals.

TRANSITION ZONE SECTION AT MID-HEIGHT

Scale: 1" = 1'-0"

B S5.2A | S5.2A



TRANSITION ZONE SECTION

Scale: 1" = 1'-0"

C S5.2A | S5.2A

DATE	REVISION
6/6/19	2 New Sheet Based on As-Built Conditions
5/24/19	1 Revised Section

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

COLUMN 3
TRANSITION ZONE SECTIONS

PALI HIGHWAY
LANDSLIDE MITIGATION PROJECT
FAP Proj. No. ER-22(002)

Scale: As Noted Date: May 6, 2019

SHEET No. S5.2A OF 5 SHEETS

ADD 45S-1

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

DRAWING NAME: Z:\00 ONGOING\19-014.1 PALI ROOF SHED-WSP TNA\01 CAD\06-06-19 COL3 ASB\PLM-S0501 ADD1 ASB COL.DWG PLOT TIME: 06-06-19, 10:00 AM