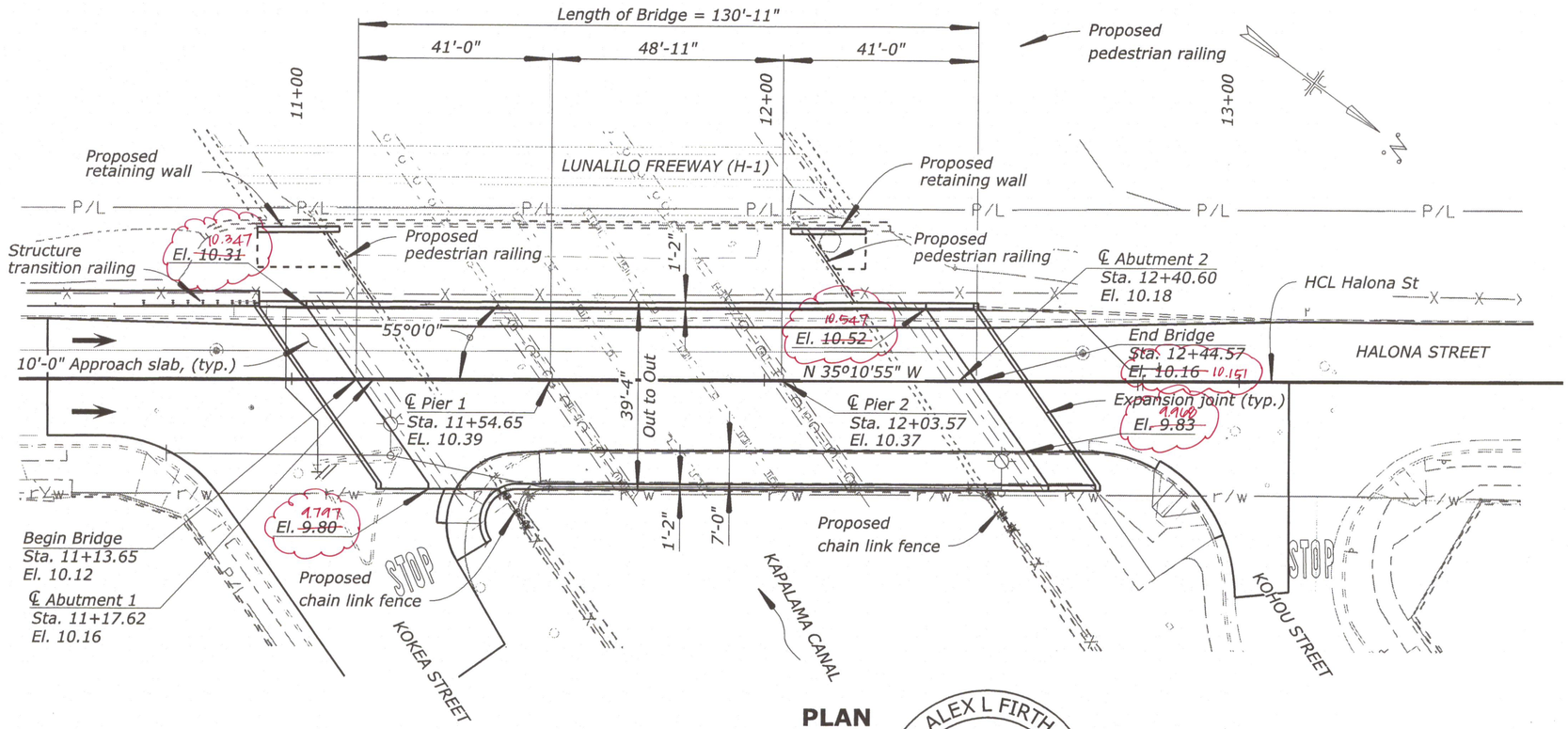
STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S1



PLAN

BRIDGE LOAD RATING			
	Rating	Location	Live Load Distribution Factor
HL-93 Inv.	1.65 T	Span 2, Slab A mid-span	0.627
HL-93 Oper.	1.98 F	Span 2, Slab A interior support	0.627
Permit Oper.	1.00 T	Span 2, Slab A mid-span	0.627

F Denotes rating controlled by flexure
T Denotes rating controlled by concrete tension
S Denotes rating controlled by shear
P Denotes rating controlled by prestress tendon stress

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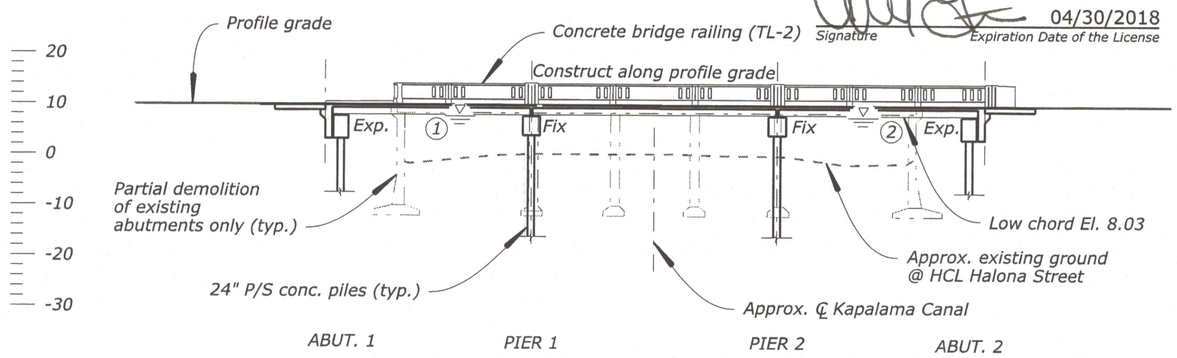
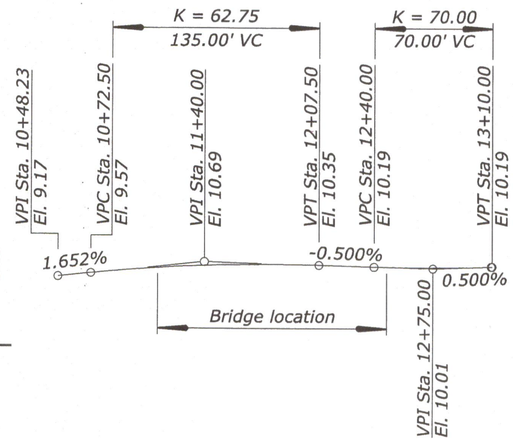


ELEVATION



Elevations are at Profile Grade (Top of concrete deck) @ HCL Halona St.

PROFILE GRADE DIAGRAM

No Scale

① Q_{50} WS El. 7.58 (upstream face)
② Q_{100} WS El. 7.90 (upstream face)

DRAWING INDEX:

HYDRAULIC DATA			
	Q ft³/sec.	V ft/sec.	WS El.
Q_5	787	2.06	4.32
Q_{10}	1,170	2.74	4.92
Q_{50}	2,350	3.81	7.57
Q_{100}	3,000	4.53	8.54
Q_{200}	3,700	5.59	8.29

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FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HALONA STREET BRIDGE

HALONA STREET

HONOLULU COUNTY, HAWAII

PLAN & ELEVATION

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	G. McGINN	B. LUEBBERS	1" = 30'-0"	J. ROHNER	1 of 35	SEPTEMBER 2016	RG3077-A

12/29/2016 10:41:12 AM \\denpwp01\pwicsjobs596\251860\205368_2\501_RG3077_PE.dgn

STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S2

GENERAL NOTES:

SPECIFICATIONS:

Design:
In accordance with AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014 with current interims and Hawaii Department of Transportation Division of Highway Design Criteria for Bridges and Structures, 2014.

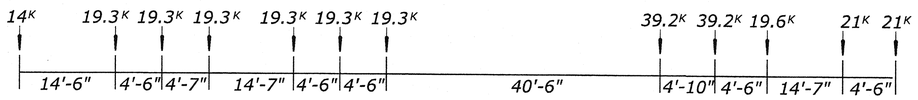
Construction:
Federal Highway Administration Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects, FP-14, U.S. customary units.

DESIGN LOADS:

Dead Loads:
CIP Concrete: 160 pcf
Future wearing surface allowance: 25 psf
Existing utilities = 150 plf
Future utilities allowance = 150 plf each side
Lateral Earth Pressure: equivalent fluid unit weight of soil, 40 pcf (active)
Vertical earth: unit weight of existing soil = 115 pcf.
unit weight of GRS backfill = 125 pcf.

Live Load:
HL-93. Maximum Dynamic Load Allowance (Impact), IM = 33%.

Permit truck requested by Hawaiian Electric, 12 axles:



DESIGN CRITERIA:

Serviceability stresses limited to current AASHTO specification values for reinforced concrete elements and precast prestressed concrete elements with the exception that no tension stress is allowed in the precompressed tensile zone of the prestressed concrete beams after all losses.

SEISMIC DESIGN CRITERIA

In accordance with AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014.
Peak Ground Acceleration (PGA = 0.174g), modified by the Site Coefficient (F_{PGA} = 1.45) to give a spectrum acceleration, A_s = 0.253g. Short period acceleration at 0.2 seconds (S_s = 0.398g) modified by the Site Coefficient (F_a = 1.48) to give the short period spectrum acceleration, S_{DS} = 0.590g. Long period acceleration at 1.0 seconds (S_1 = 0.109g) modified by the Site Coefficient (F_v = 2.36) to give the long period spectrum acceleration, S_{D1} = 0.258g. Site Class = D. Seismic Zone = 2.

MATERIALS:

Concrete:
All superstructure (bridge deck, end diaphragm, fin walls, approach slab, and sleeper beam) cast-in-place concrete shall be structural class A with a minimum 28 day compressive strength f'c = 4,500 psi. Barriers, retaining walls, sidewalks and approach slabs shall be structural class A cast-in-place concrete with a minimum 28 day compressive strength f'c = 4,000 psi. All abutments, piers, and wingwalls shall be structural class A with a minimum 28 day compressive strength f'c = 4,000 psi. Type II low alkali cement shall be used. A shrinkage reducing admixture (SRA) (see SCR 711.03(b)) shall be added to the concrete mix for all cast-in-place concrete. The minimum dosage requirement shall be 128 ounces per cubic yard of concrete. A migrating corrosion inhibitor amine carboxylate water-based admixture (see SCR 711.03(a)) shall be added to the concrete mix for all cast-in-place concrete. The minimum dosage requirement shall be 1.5 pints per cubic yard of concrete. Concrete for the bridge deck, end diaphragm, fin walls, approach slab, and sleeper beam shall contain 13 lbs./cuyd of alkali resistant glass macrofiber. The fiber shall be 1½" long minimum and have an aspect ratio of 67. The use of any calcium chloride in any concrete is prohibited. Chamfer exposed edges of all concrete ¾", unless noted otherwise on the plans. Preformed expansion joint filler shall meet the requirements of AASHTO M213. Preformed flexible cellular joint filler shall meet the requirements of ASTM D1056, Type 2, Grade 2, 3, 4 or 5. Bituminous joint filler shall meet the requirements of AASHTO M33.

Reinforcing Steel:
All reinforcing steel shall conform to AASHTO M31 or M322, grade 60 deformed. The minimum concrete cover to the face of any bar shall be 2", unless shown otherwise on the plans. Minimum splice length for all bars sizes shall be as shown on the plans. Bar splices other than those shown on the plans shall not be paid for.

Prestressing Steel:
Prestressing steel shall be grade 270, 0.6" dia., seven wire, uncoated, low-relaxation, prestressing strand conforming to AASHTO M203. Each strand shall be pretensioned to a total load of 43,943 lbs. at which f'si = 0.75 (f's) = 202,500 psi.

Prestressed Concrete Girders:
All concrete for prestressed concrete plank girders shall be Class P or Class P (AE), with a minimum 28-day strength, f'c = 8,500 psi and initial strength f'ci = 7,000 psi. A migrating corrosion inhibitor amine carboxylate water-based admixture (see SCR 711.03(a)) shall be added to the concrete mix for precast concrete plank girders. The minimum dosage requirement shall be 1.5 pints per cubic yard of concrete. the use of any calcium chloride in any concrete is prohibited. Structural metal for bearing plates shall conform to ASTM 36. Welding for welded anchors shall conform to ANSI/AASHTO/AWS D1.5, Chapter 7.

ESTIMATE

Item No.	Item	Quantity:	Unit:	Notes:
15214-1000	Survey and staking, bridge	1	LPSM	
20304-2000	Removal of bridge	1	LPSM	
20435-2000	Backfill, granular	138	CUYD	(1)
20720-0300	Reinforcement geosynthetic, type 3	921	SQYD	(1)
20801-0000	Structure excavation	1,870	CUYD	(1)
20803-0000	Structural backfill	1,570	CUYD	(1)
20810-0000	Shoring and bracing	1	LPSM	(5)
20815-0000	Cofferdams	1	LPSM	(4)
25801-0300	Reinforced concrete retaining wall, 8 feet	198	SQFT	(1)
55101-0300	Precast prestressed concrete pile, in place	1,855	LNFT	
55104-1000	Dynamic pile load test	4	EACH	(1)
55115-1000	Preboring	820	LNFT	
55201-0100	Structural concrete, class A	350	CUYD	(1)(3)
55235-0000	Expansion joints	96	LNFT	(1)
55302-0300	Precast, prestressed concrete slabs, 48-inch non-voided	1,089	LNFT	(1)
55401-1000	Reinforcing steel	61,400	LB	(1)
55601-0500	Bridge railing, concrete	290	LNFT	(1)(2)
61707-0000	Structure transition railing	25	LNFT	(1)
61901-1300	Fence, chain link	19	LNFT	(1)
63610-1600	Conduit, 2-inch, PVC	100	LNFT	
63610-2200	Conduit, 3-inch, PVC	148	LNFT	
63610-2800	Conduit, 4-inch, PVC	283	LNFT	
64604-3000	Fixture, pedestrian railing	35	LNFT	(1)

ESTIMATE NOTES:

(1) *Contract Quantity.*

(2) *Includes cost of concrete, reinforcing steel, endblock concrete, and endblock reinforcing steel.*

(3) *Includes cost of furnishing and installing bearing related items, and all joint fillers.*

(4) *Cofferdams are shown on the "Suggested Construction Staging" sheets, but other means or methods may be used to divert half of the channel, such as a portadam. The contractor shall determine the means and method for channel diversion. This item includes all work required for channel diversion, including multiple installations if needed and any dewatering.*

(5) *Shoring and bracing includes any shoring or bracing needed to construct the GRS backfill and retaining walls against H-1 and maintain the integrity and stability of the H-1 bridge.*

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HALONA STREET BRIDGE

HALONA STREET

HONOLULU COUNTY, HAWAII

GENERAL NOTES & ESTIMATE

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	G. McGINN	B. LUEBBERS	NO SCALE	J. ROHNER	2 of 35	SEPTEMBER 2016	RG3077-B

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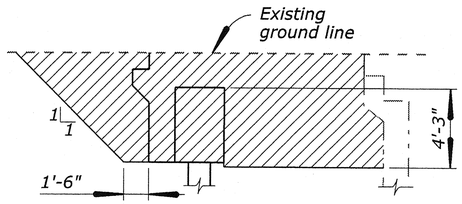
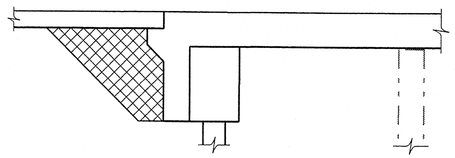
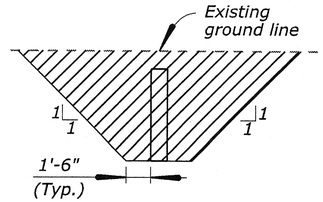
STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S3



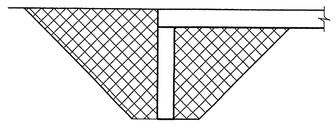
ABUTMENT



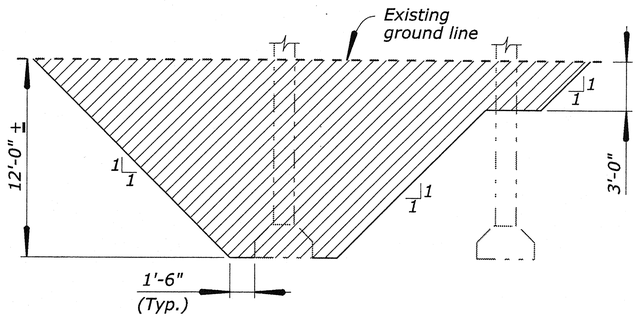
ABUTMENT



FINWALL



FINWALL

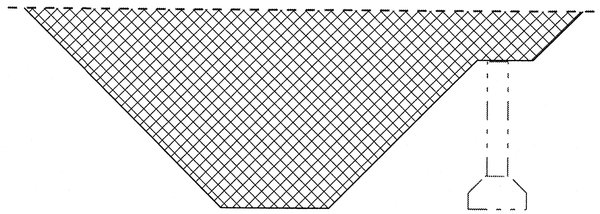


EXISTING PIERS 1 & 4

EXISTING PIERS 2 & 3

STRUCTURE EXCAVATION

Not to Scale

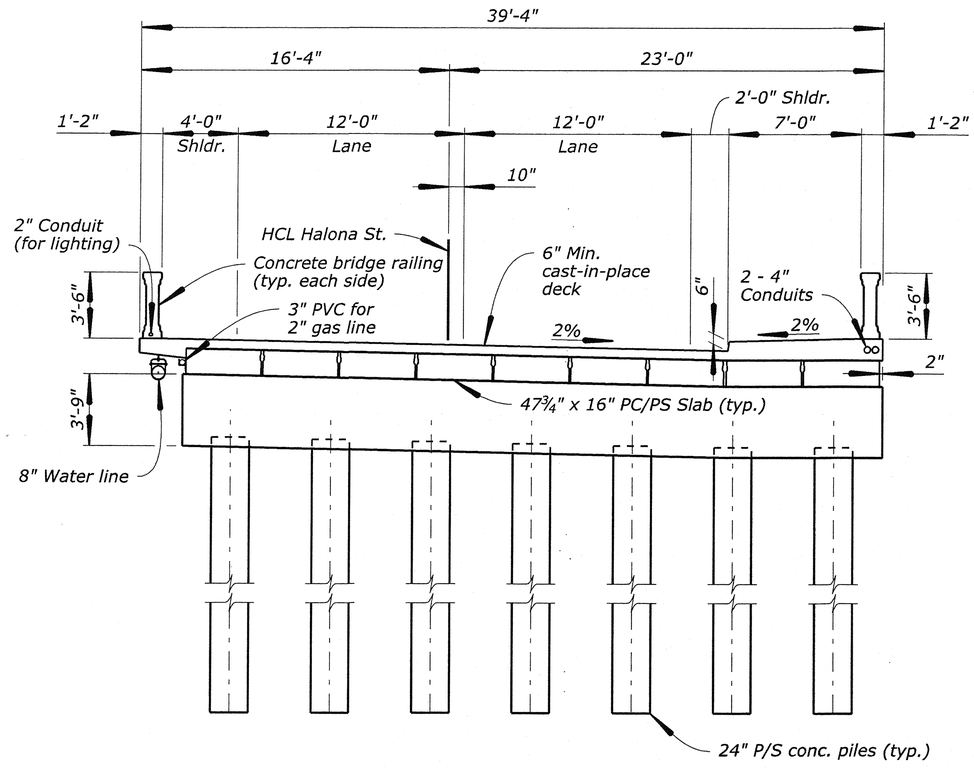


EXISTING PIERS 1 & 4

EXISTING PIERS 2 & 3

STRUCTURAL BACKFILL

Not to Scale



TYPICAL SECTION AT THE PIER

Scale: ⅛" = 1'-0"

LEGEND

- *Pay limits of structure excavation*
- *Pay limits of structural backfill*

NOTES:

1. *Structural backfill at existing piers does not need to meet the material requirements of specification 208 but still needs to follow the construction requirements. The material that was excavated to remove the piers may be used to backfill the same area.*
2. *If shoring is required to excavate for removal of existing piers, the cost of this shoring will not be paid for separately, but will be incidental to structure excavation.*

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

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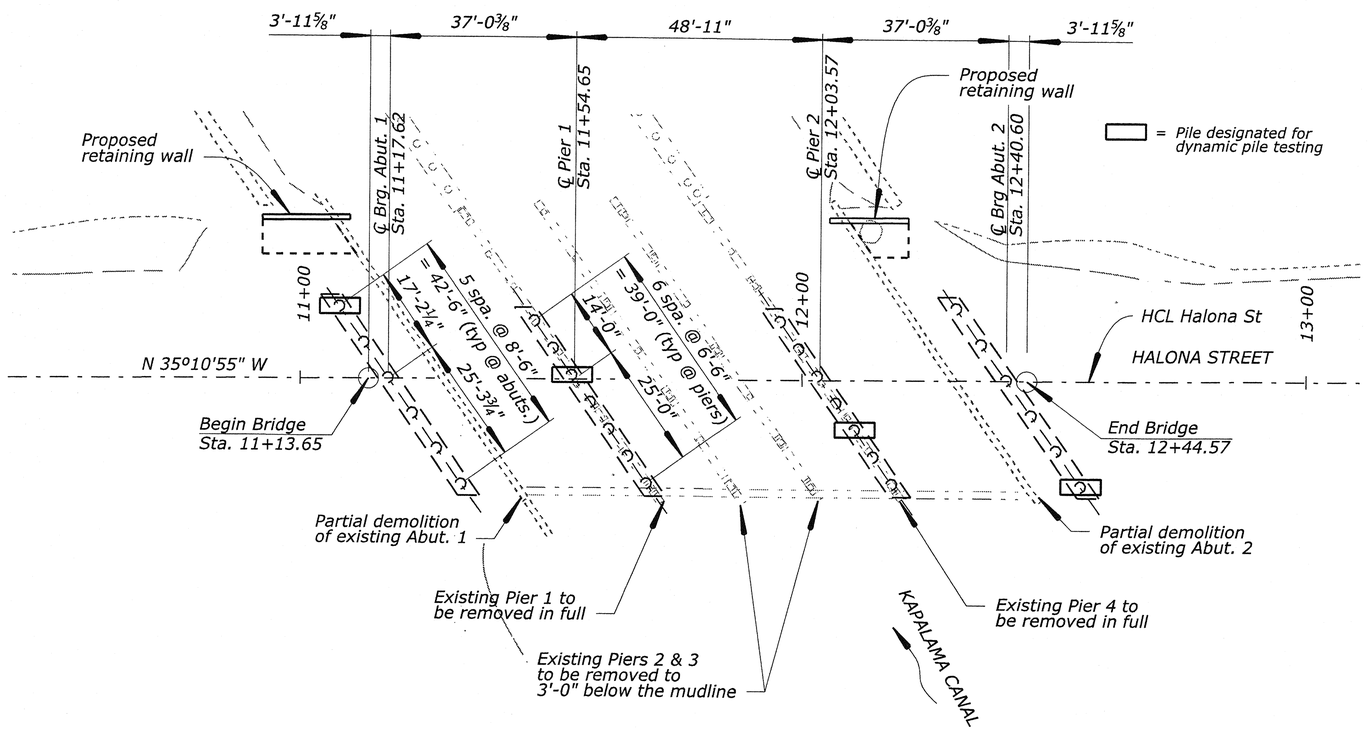
HALONA STREET

HONOLULU COUNTY, HAWAII

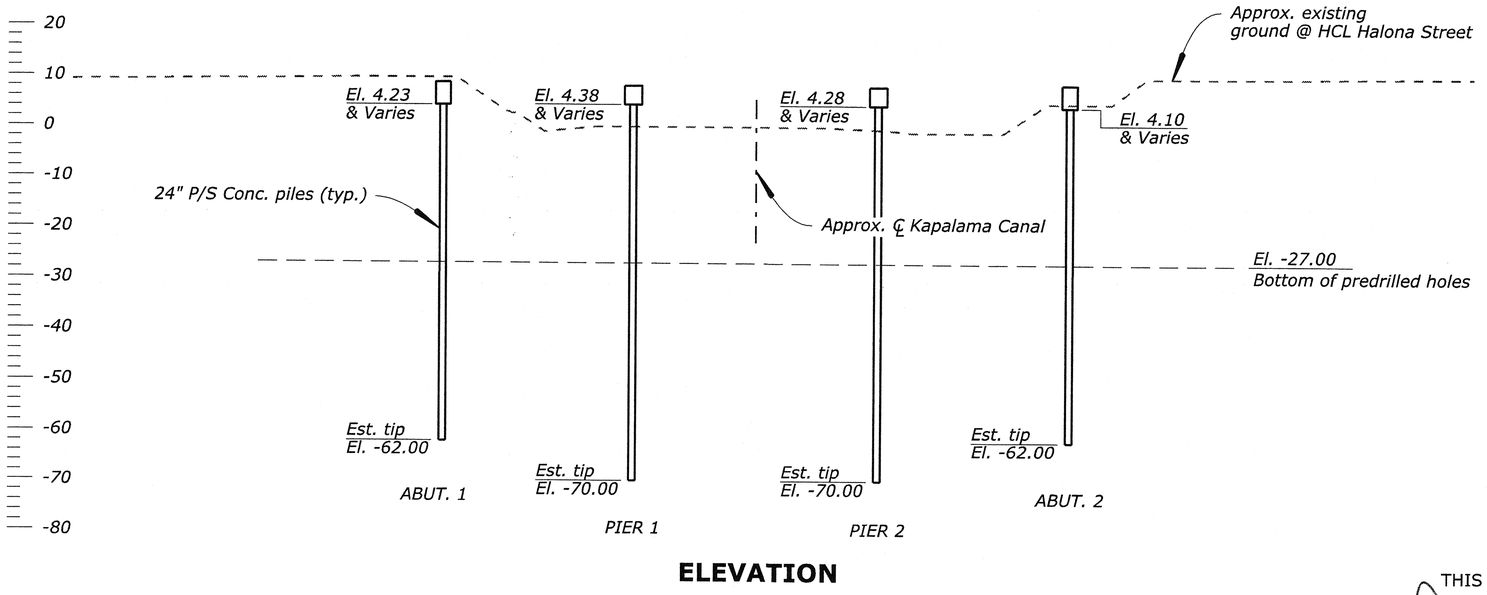
TYPICAL SECTION AND EXCAVATION AND BACKFILL LIMITS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	G. McGINN	B. LUEBBERS	⅛" = 1'-0"	J. ROHNER	3 of 35	SEPTEMBER 2016	RG3077-C

STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S4



PLAN



ELEVATION

NOTES:

1. Predrill holes using an auger with a 19"-22" diameter to elevation -27.0 for all pile locations.
2. The resistance factors (Ø) used to determine the pile capacity are 1.00 for Service I, 1.00 for Extreme Event I, and 0.65 for Strength I.
3. The strength resistance factor (Ø) of 0.65 assumes dynamic load tests will be performed to confirm pile axial resistance.
4. For further pile capacity and driving information, see final geotechnical report, Jan. 2016, prepared by Hirata & Associates, Inc.

PILE DATA

LOCATION	SERVICE 1 LOAD (k)	STRENGTH 1 LOAD (k)	EXTREME EVENT 1 LOAD (k)	NOMINAL RESISTANCE (k)	DESIGN TIP ELEVATION (ft)
ABUT. 1	147	211	94	330	-62.00 (a) -39.00 (b)
PIER 1	177	255	124	400	-70.00 (a) -62.00 (b)
PIER 2	177	255	124	400	-70.00 (a) -62.00 (b)
ABUT. 2	147	211	94	330	-62.00 (a) -43.00 (b)

Note: Design tip elevations are controlled by: (a) axial load or (b) lateral load. Test piles shall be driven to estimated tip elevation shown in the elevation view. Pile quantities on sheet S2 are based on lowest tip elevations given. It is anticipated that the piles will need to be driven to the estimated tip based on geotechnical report. No piles will be accepted with pile tips that are above the lateral load design tip elevation.

100-YR SCOUR DATA TABLE

LOCATION	GROUND ELEV. (FT)	SCOUR DEPTH (FT)	SCOUR ELEV. (FT.)
PIER 1	-0.10	9.36	-9.46
PIER 2	-0.70	9.36	-10.06

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HALONA STREET BRIDGE

HALONA STREET

HONOLULU COUNTY, HAWAII

FOUNDATION PLAN

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS

DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
A. PLANKIS	G. McGINN	B. LUEBBERS	1" = 30'-0"	J. ROHNER	4 of 35	SEPTEMBER 2016	RG3077-D

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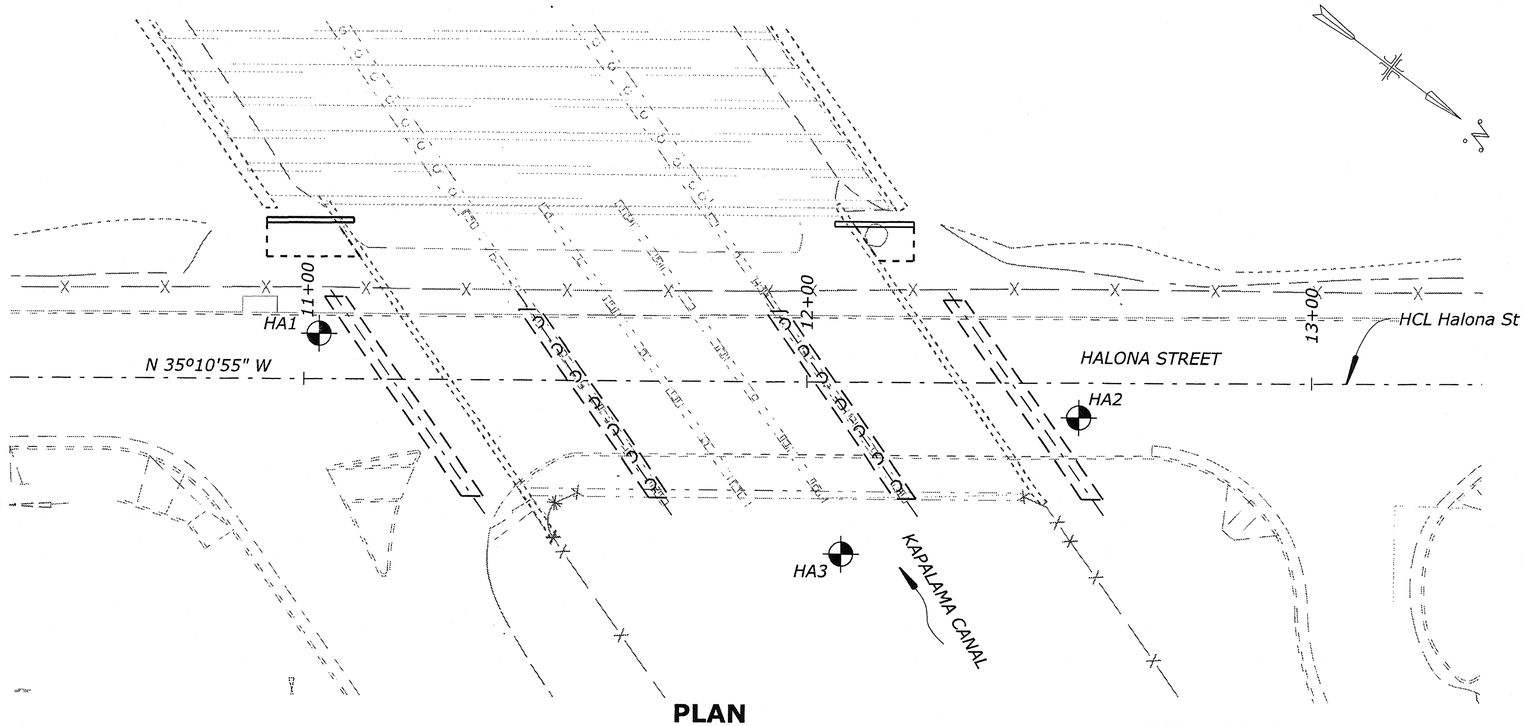
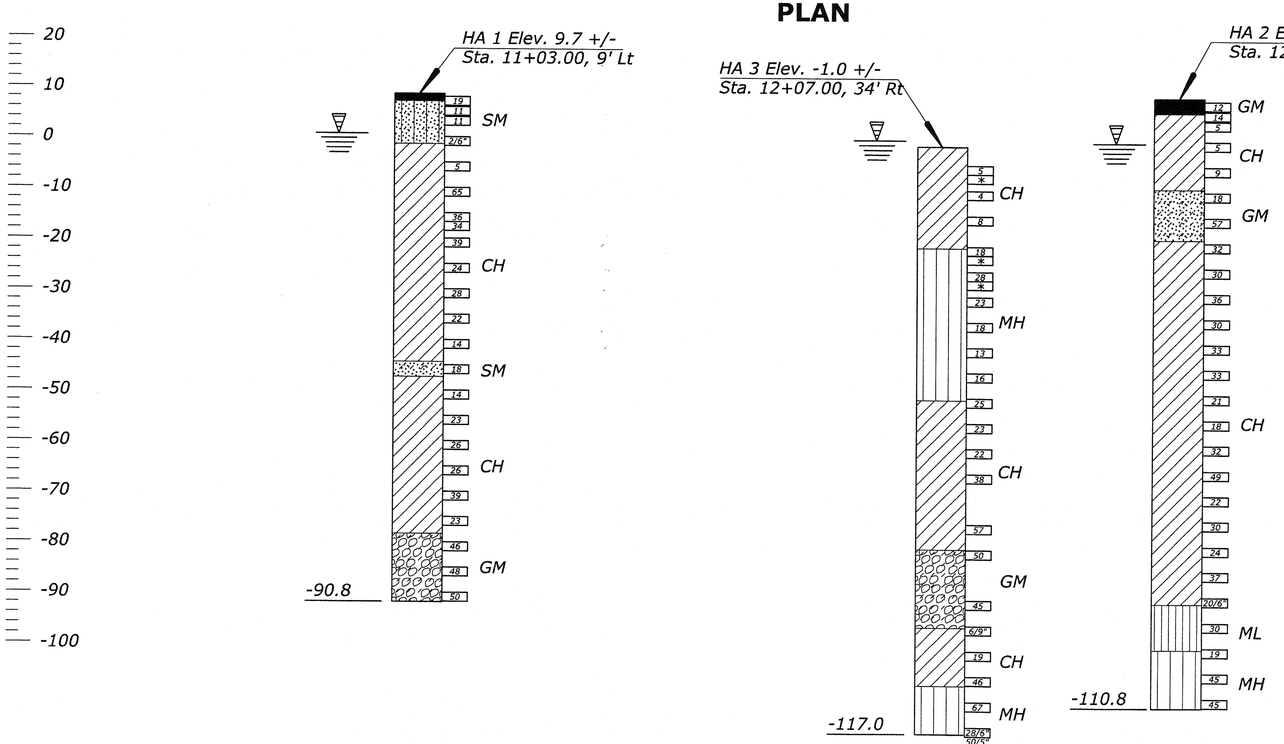
STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S5



PLAN



ELEVATION

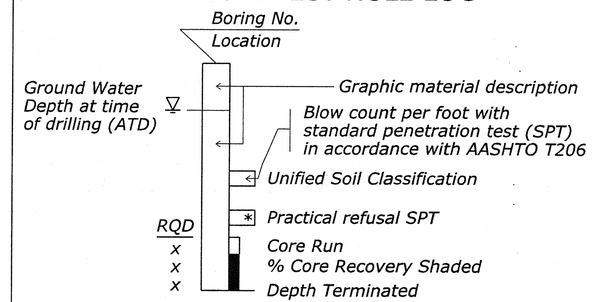
LEGEND

SM	Silty sand with gravel
MH	Silt
CH	Silty Clay
GM	Silty Coralline Gravel
ML	Clayey Silt

TYPICAL TEST HOLE SYMBOL

Plan View
Location of any sampled hole

TYPICAL TEST HOLE LOG



This is only a summary of the boring logs. For full boring log details and additional information, refer to Geotechnical Report, Jan. 2016 prepared by Hirata & Associates, Inc.

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HALONA STREET BRIDGE

HALONA STREET

HONOLULU COUNTY, HAWAII

SUMMARY OF BORING LOGS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS

DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
A. PLANKIS	G. McGINN	B. LUEBBERS	1" = 30'-0"	J. ROHNER	5 of 35	SEPTEMBER 2016	RG3077-E

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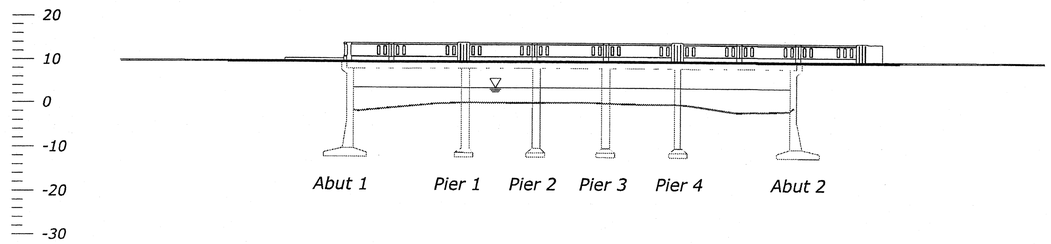
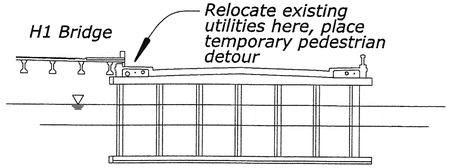
STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S6

Step 2.

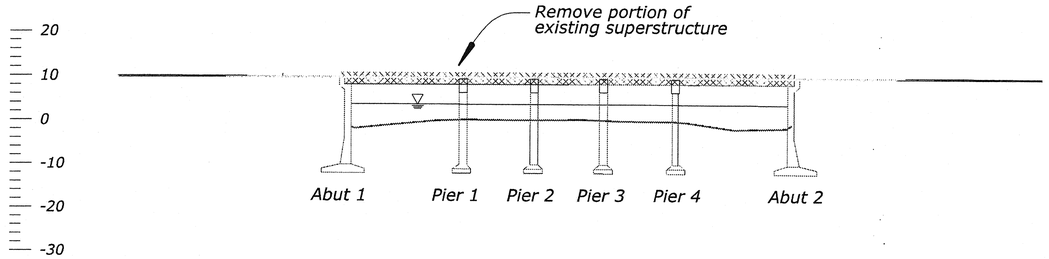


ELEVATION

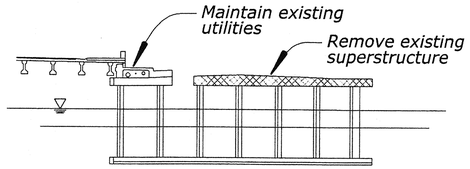


TYPICAL SECTION

Steps 4.

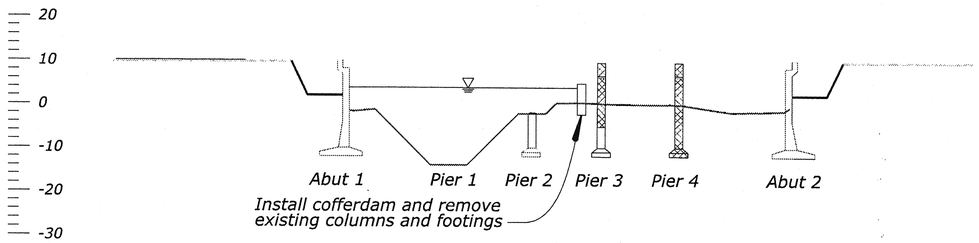


ELEVATION

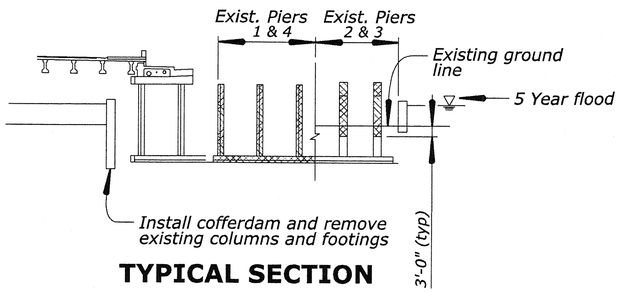


TYPICAL SECTION

Steps 5, 6, 7 & 8

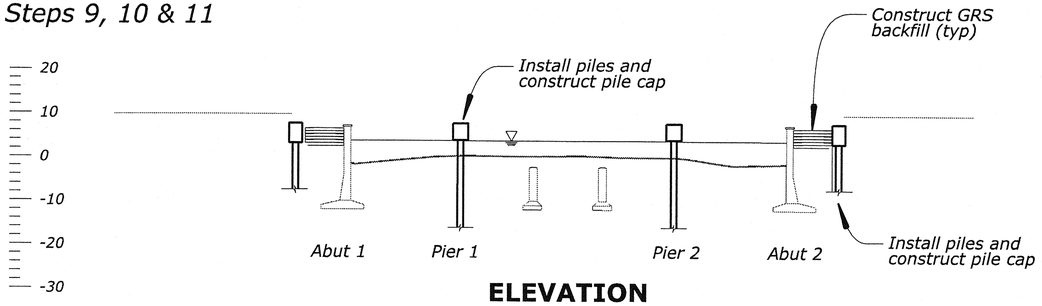


ELEVATION

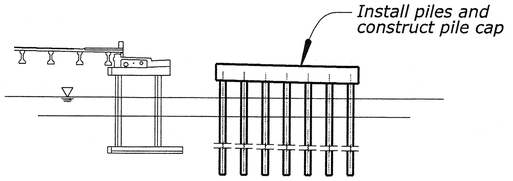


TYPICAL SECTION

Steps 9, 10 & 11



ELEVATION



TYPICAL SECTION

SUGGESTED SEQUENCE OF CONSTRUCTION:

1. *Prepare and submit detailed demolition plan for approval.*
2. *Temporarily relocate the 8" water line and the 1½" gas line to the area under the existing bridge that has the abandoned 12" waterline, on the makai side of the bridge.*
3. *Divert traffic to the approved detour route and establish the temporary pedestrian detour above the relocated utilities.*
4. *Excavate behind the existing abutments, then remove the existing superstructure and top portion of existing abutment as shown, except for the portion of the bridge that is supporting the relocated utilities and pedestrians.*
5. *Install cofferdam to divert half of the canal. Provide a minimum freeboard of 1 foot above the 5 year storm elevation. The cofferdam must accommodate the 5 year storm event without overtopping.*
6. *Excavate and remove the pier columns and footings to the limits as shown on the plans. The columns and footings that support the portion of the bridge with the temporarily relocated utilities will be removed after the utilities have been permanently installed on the new structure.*
7. *Restore the bottom of the stream channel to the original elevation after the columns and/or footing(s) have been removed.*
8. *Remove and reinstall the cofferdam to block opposite half of canal and repeat steps 6 and 7 to excavate and remove pier columns and footings as indicated.*
9. *Install piles and construct pile caps for the proposed piers.*
10. *Install abutment piles and pile caps at each end of the bridge.*
11. *Fill between existing abutment and new abutment with geosynthetic reinforced soil (GRS) to the limits indicated on the plans.*

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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HALONA STREET BRIDGE

HALONA STREET

HONOLULU COUNTY, HAWAII

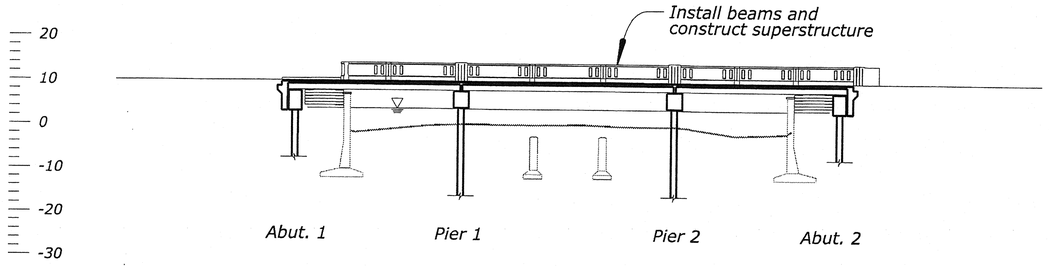
SUGGESTED CONSTRUCTION PHASING PLAN 1 OF 2

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	G. McGINN	B. LUEBBERS	NO SCALE	J. ROHNER	6 of 35	SEPTEMBER 2016	RG3077-F

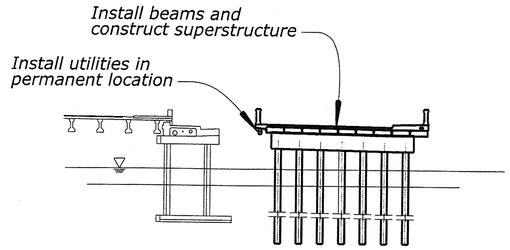
12/29/2016 10:40:23 AM \\denpwp01\pwicsjobs596\251860\205368_25\S06_RG3077_Staging_1.dgn

STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S7

Steps 12, 13

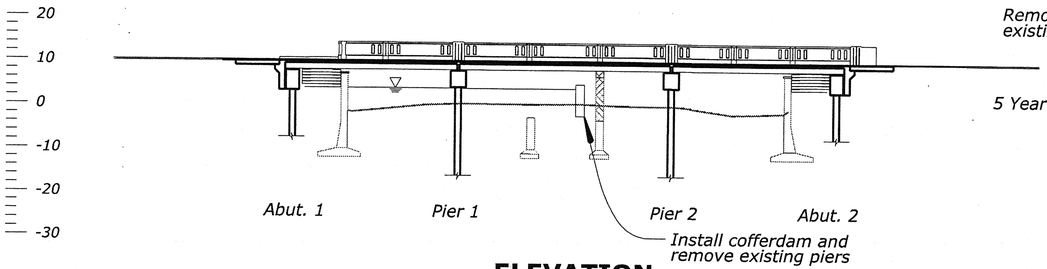


ELEVATION

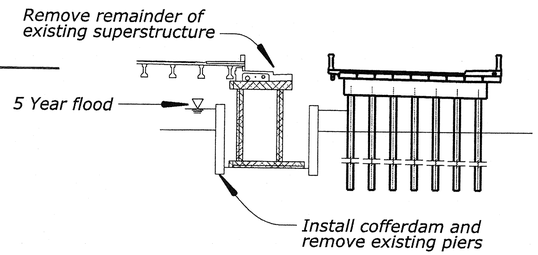


TYPICAL SECTION

Steps 14, 15 & 16



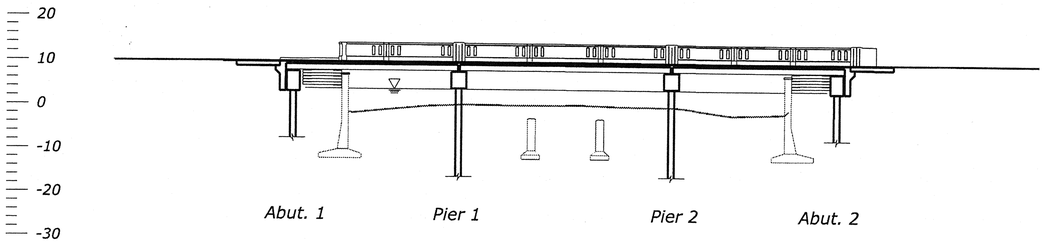
ELEVATION



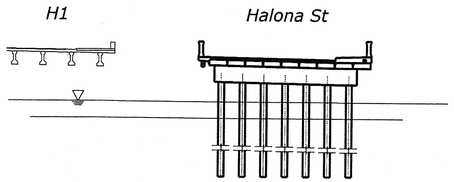
TYPICAL SECTION

(Removal at Piers 1 and 4 shown, at Piers 2 and 3 only remove to 3' below mud line)

Steps 17 & 18



ELEVATION



TYPICAL SECTION

SUGGESTED SEQUENCE OF CONSTRUCTION (CONTINUED):

12. Place beams and construct new superstructure.
13. Install utilities in permanent location on the new superstructure, and under approach roadways as needed to connect to existing facilities.
14. Construct approach slabs and sidewalks along the approach roadways. Reroute pedestrians onto new bridge.
15. Excavate behind the existing abutments between the new bridge and the H-1 bridge, then remove the portion of the existing superstructure adjacent to the H1 bridge that was used to support the temporary utility relocation.
16. Install cofferdam, as above, and remove the remainder of the existing pier columns and footings as indicated. Restore the bottom of the stream channel to the original elevation.
17. Construct the retaining walls at the H1 abutments. Replace existing fill material with GRS to the limits shown on the plans.
18. Grade soil on top of the GRS and restore the area between the two bridges.
19. Reopen Halona Street to normal traffic and remove the detour route.

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FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HALONA STREET BRIDGE

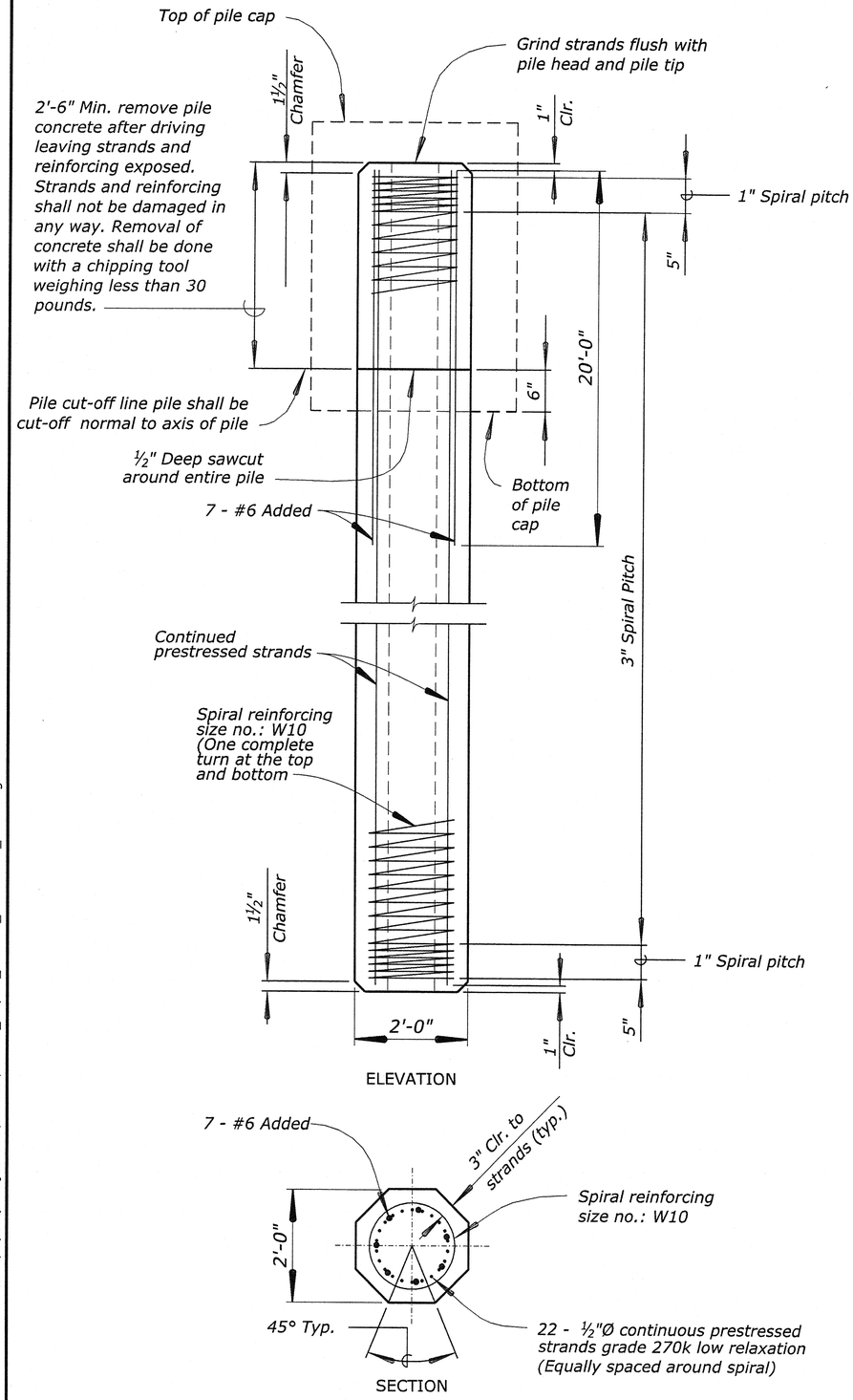
HALONA STREET

HONOLULU COUNTY, HAWAII

SUGGESTED CONSTRUCTION PHASING PLAN 2 OF 2

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	G. McGINN	B. LUEBBERS	NO SCALE	J. ROHNER	7 of 35	SEPTEMBER 2016	RG3077-G

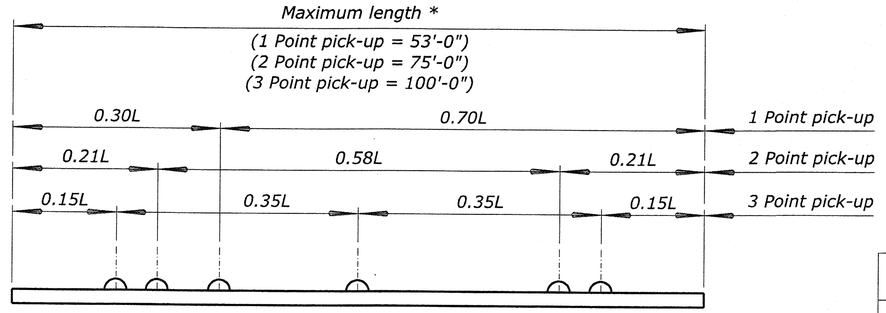
STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S8



ELEVATION

SECTION

PRESTRESSED CONCRETE PILE DETAILS



* The length "L" is the distance end to end of pile.

PRESTRESSED CONCRETE PILE PICK-UP POINTS

NOTES:

1. The 7 - #6 bars shall have a minimum of 2'-6" embeded into the pile cap and extending a minimum of 10'-0" below the bottom of pile cap.
2. Top end of strands, #6 bars, and spirals may be cut off to maintain minimum concrete cover.
3. The minimum effective force in the prestressed steel for each pile shall be 561 kips.
4. Piles accepted by the Contracting Officer (CO) shall not be damaged. Damaged piles shall be replaced or repaired as directed by the CO, at the Contractor's expense.
5. Work of cutting off prestressed concrete piles or cast-in-place pile extensions shall be performed in such as to avoid spalling or damaging of the pile below cut-off. Damaged portions shall be removed and pile cut-off elevation lowered as directed by the CO. Additional costs resulting from this shall be borne by the Contractor.
6. Top of pile at cut-off line shall be comply with Specification Section 551.14.
7. Pile splice will not be permitted, except for pile length in excess of 100 feet, unless otherwise approved by the CO .
8. The in-place length of pile above the splice shall be approximately 50 percent of the total length of pile driven, unless location of splice is indicated in the plans or specification.
9. Concrete shall be Class P or Class P (AE). Piles and cast-in-place pile extensions may be driven after the concrete attained a compressive strength of 5,000 psi., but not earlier than 7 days after the concrete is poured.
10. See Specification 715.03 for handling and transportation of prestressed concrete piles.
11. For pile length ≤ 75'-0", place supports at 2 point pick-up locations. For pile lengths > 75'-0" and ≤ 100'-0", place supports at 3 point pick-up locations.

PILE LENGTH DATA

Pile Location		Top of	Est. Tip	Min. Pile	Actual Pile Tip Elevation
Support	Offset	Pile Elev.	Elev.	Length (ft)	
Abut 1	14.08' L	7.60	-62.00	69.60	-68.90
	7.12' L	7.51	-62.00	69.51	-65.01
	0.16' L	7.41	-62.00	69.41	-62.74
	6.81' R	7.32	-62.00	69.32	-64.67
	13.77' R	7.22	-62.00	69.22	-62.74
	20.73' R	7.21	-62.00	69.21	-61.35
Pier 1	11.47' L	7.79	-70.00	77.79	-63.88
	6.15' L	7.70	-70.00	77.70	-64.81
	0.83' L	7.62	-70.00	77.62	-63.79
	4.50' R	7.53	-70.00	77.53	-64.79
	9.82' R	7.44	-70.00	77.44	-68.63
	15.15' R	7.36	-70.00	77.36	-63.71
	20.47' R	7.36	-70.00	77.36	-63.52
Pier 2	11.47' L	7.82	-70.00	77.82	-61.40
	6.15' L	7.70	-70.00	77.70	-61.40
	0.83' L	7.59	-70.00	77.59	-61.40
	4.50' R	7.48	-70.00	77.48	-62.40
	9.82' R	7.36	-70.00	77.36	-61.40
	15.15' R	7.26	-70.00	77.26	-63.40
	20.47' R	7.26	-70.00	77.26	-61.40
Abut 2	14.08' L	7.76	-62.00	69.76	-56.70
	7.12' L	7.60	-62.00	69.60	-56.55
	0.16' L	7.43	-62.00	69.43	-56.50
	6.81' R	7.27	-62.00	69.27	-60.94
	13.77' R	7.11	-62.00	69.11	-55.80
	20.73' R	7.09	-62.00	69.09	-55.69

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FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HALONA STREET BRIDGE

HALONA STREET

HONOLULU COUNTY, HAWAII

FOUNDATION DETAILS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	G. McGINN	B. LUEBBERS	NO SCALE	J. ROHNER	8 of 35	SEPTEMBER 2016	RG3077-H

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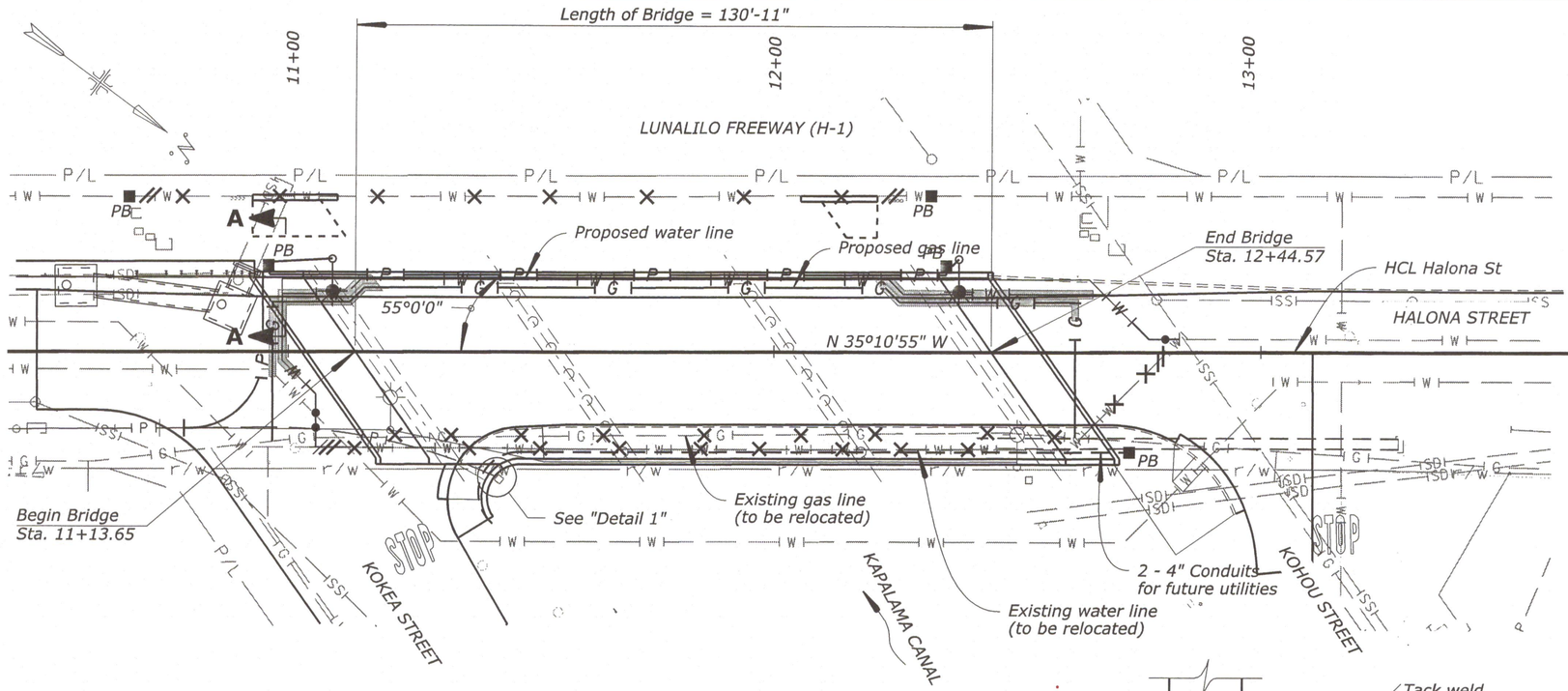
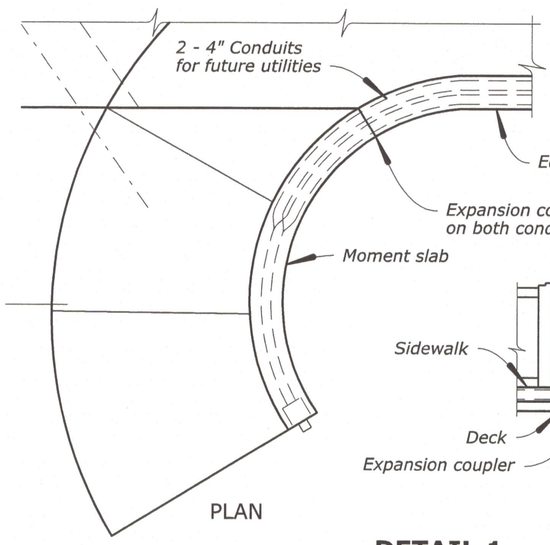
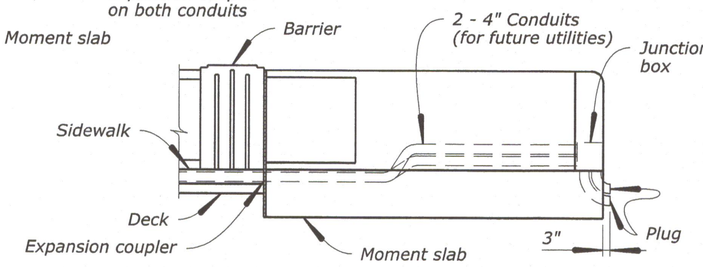
STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S9

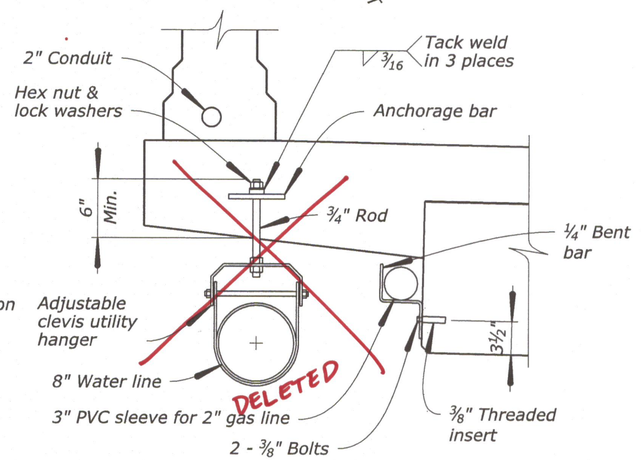


PLAN
Scale: 1"= 30'-0"

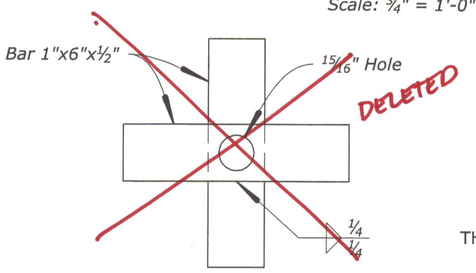




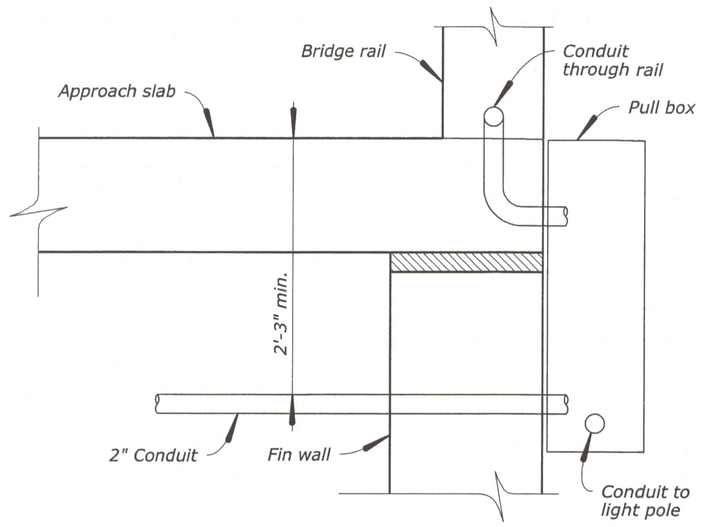
DETAIL 1
Scale: 3/16" = 1'-0"



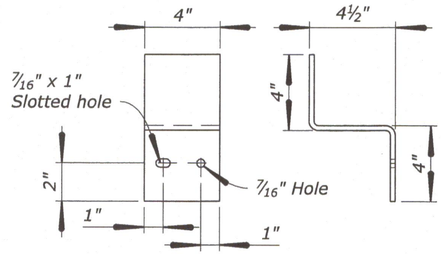
UTILITY HANGER DETAIL
Scale: 3/4" = 1'-0"



ANCHORAGE BAR DETAIL
Scale: 3" = 1'-0"



SECTION A-A
(Abutment 1 side shown, abutment 2 similar)



BENT BAR DETAIL
Scale: 1 1/2" = 1'-0"

NOTES:

1. Space water line utility hangers per manufacturer's recommendation.
2. The cost of the water line utility hangers shall be incidental to item 552 structural concrete.
3. The cost of the gas line bracket supports and threaded inserts shall be incidental to item 553 precast, prestresssed concrete slabs.
4. The 8" water line and 2" gas line will be paid for under utility items. See utility plans for details and items.
5. The moment slab quantities are included in 552 structural concrete and 554 reinforcing steel items.

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HALONA STREET BRIDGE

HALONA STREET

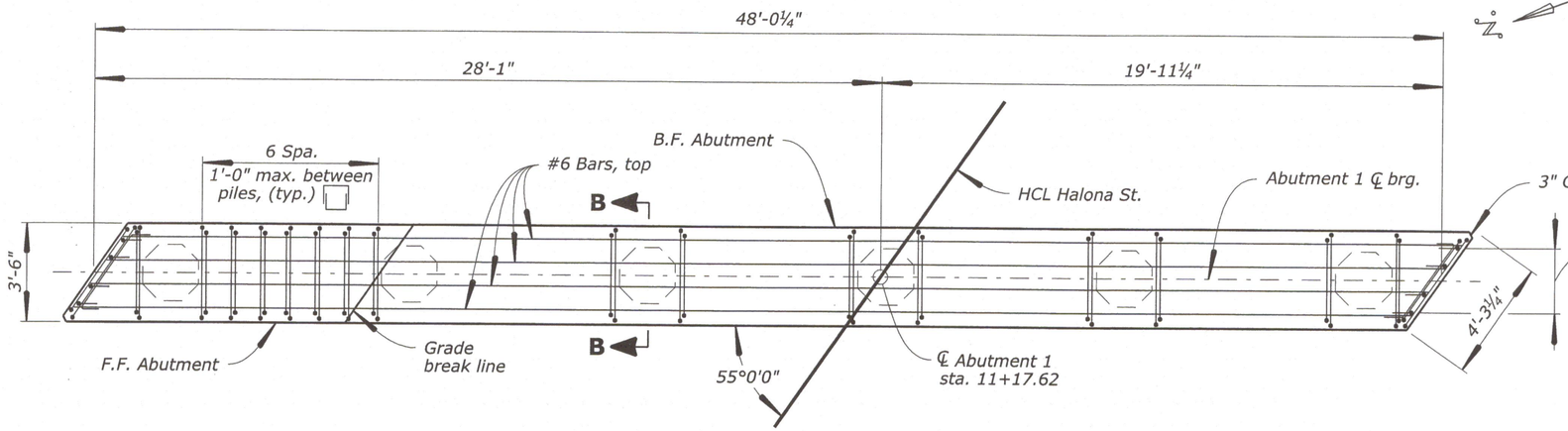
HONOLULU COUNTY, HAWAII

UTILITY LAYOUT

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS

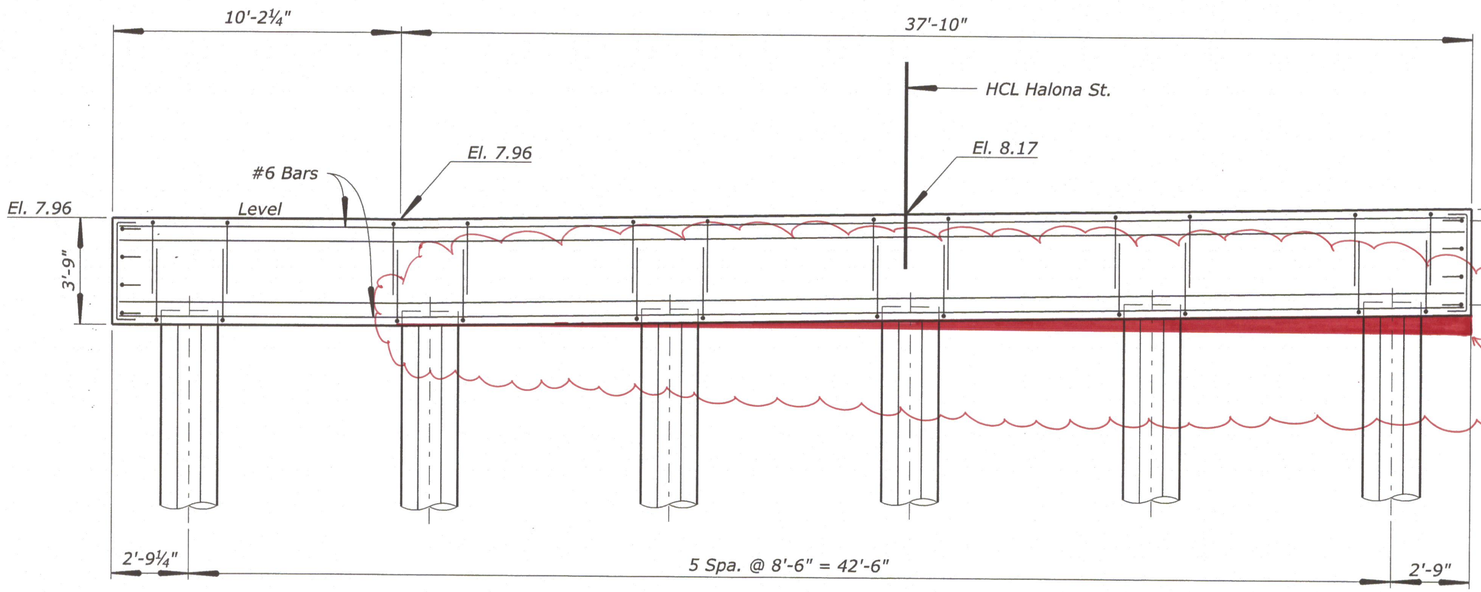
DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
A. PLANKIS	K. SCHNEIDER	B. LUEBBERS	1" = 30' UNLESS NOTED	J. ROHNER	9 of 35	SEPTEMBER 2016	RG3077-I

STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S10



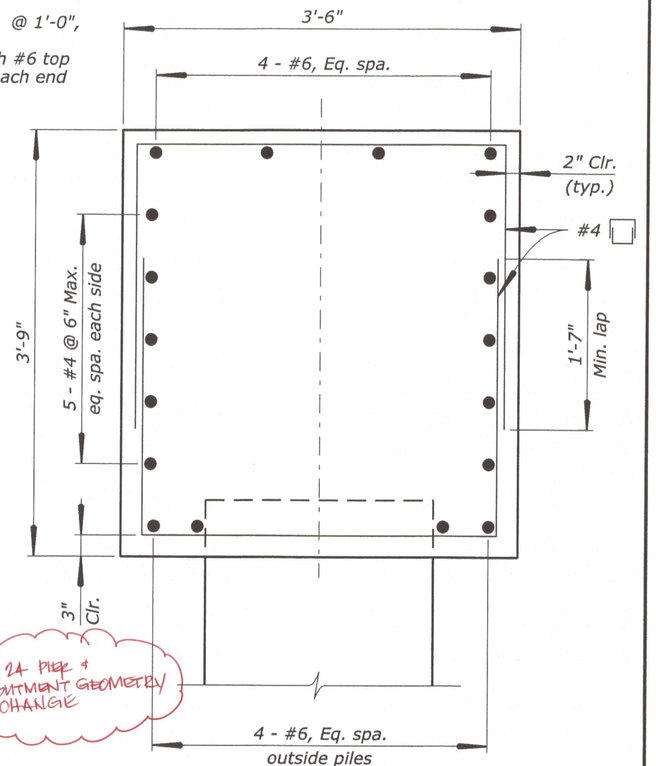
PLAN

Scale: 3/16" = 1'-0"



ELEVATION

Scale: 3/16" = 1'-0"



SECTION B-B

Scale: 1" = 1'-0"

NOTES:

1. *Top of cap shall be level across the section in the direction parallel to the HCL.*

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HALONA STREET BRIDGE

HALONA STREET

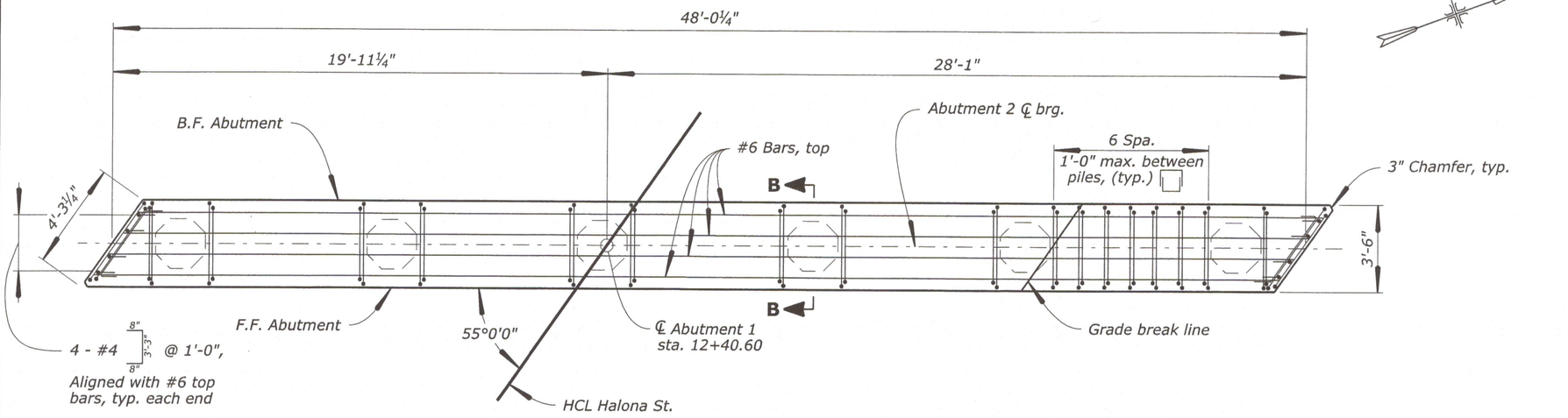
HONOLULU COUNTY, HAWAII

ABUTMENT 1

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS

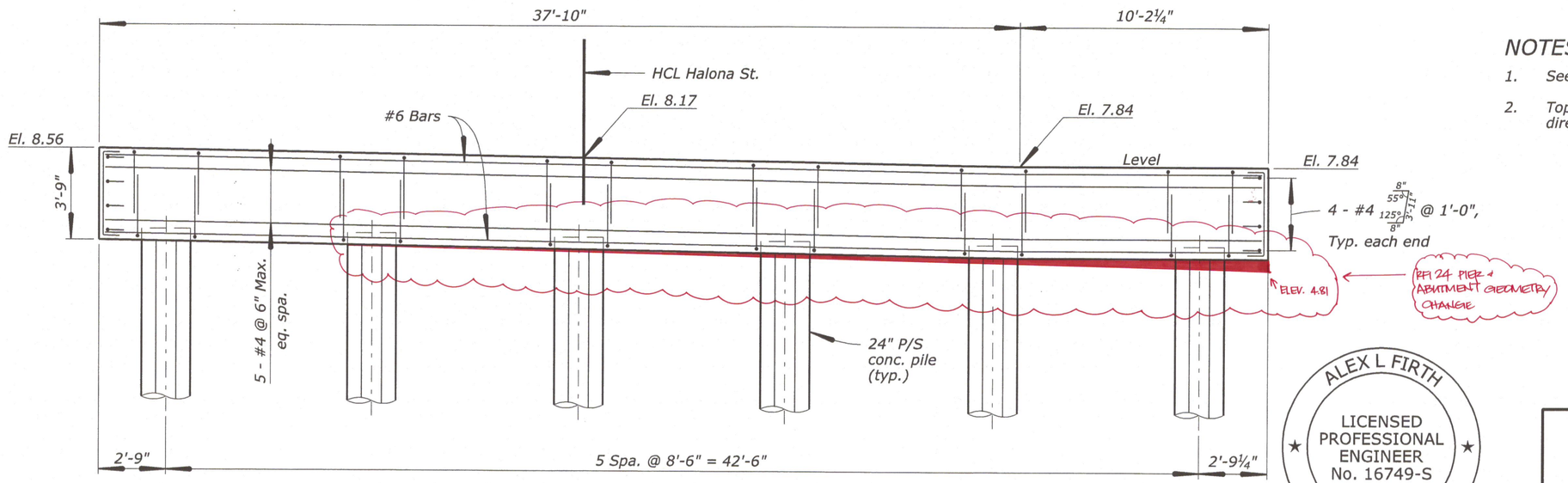
DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
A. PLANKIS	G. McGINN	B. LUEBBERS	NO SCALE	J. ROHNER	10 of 35	SEPTEMBER 2016	RG3077-J

STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S11



PLAN

Scale: 3/16" = 1'-0"



ELEVATION

Scale: 3/16" = 1'-0"

NOTES:

1. *See "Abutment 1" for section B-B details.*
2. *Top of cap shall be level across the section in the direction parallel to the HCL.*

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HALONA STREET BRIDGE

HALONA STREET

HONOLULU COUNTY, HAWAII

ABUTMENT 2

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	G. McGINN	B. LUEBBERS	NO SCALE	J. ROHNER	11 of 35	SEPTEMBER 2016	RG3077-K

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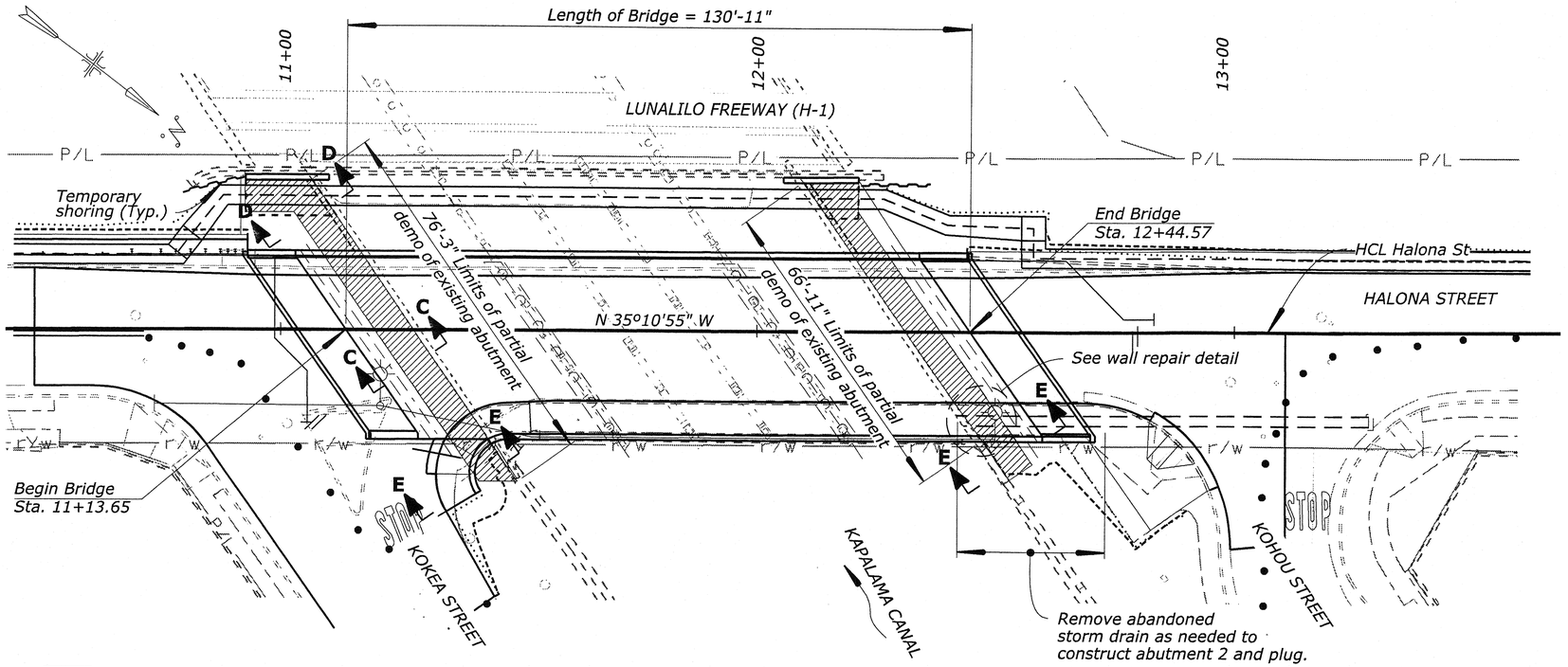
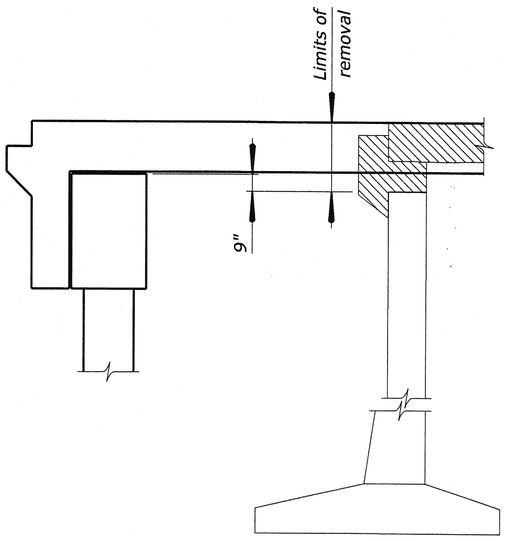
STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S12



PLAN

Limits of GRS backfill and geosynthetic reinforcement

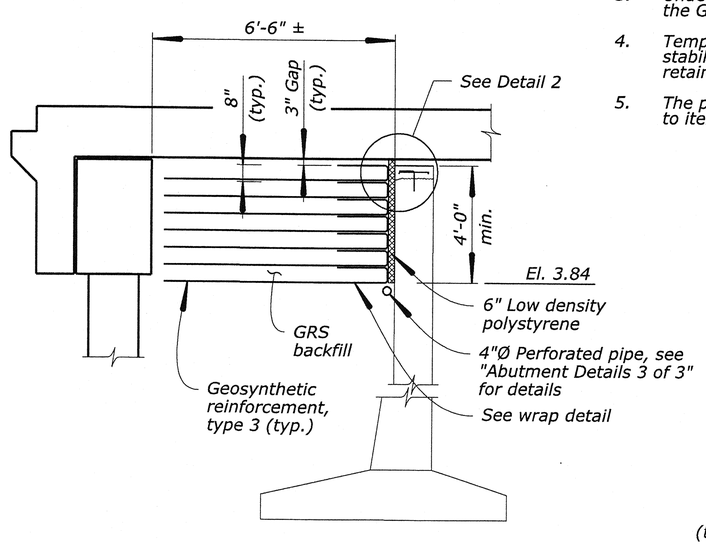
Limits of concrete removal



LIMITS OF REMOVAL FOR EXISTING ABUTMENT

Not to Scale

(Abutment 1 shown, abutment 2 similar)



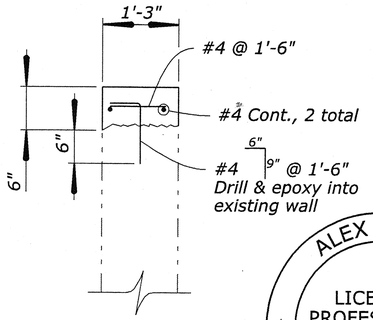
SECTION C-C

Not to Scale

(Abutment 1 shown, abutment 2 similar)

NOTES:

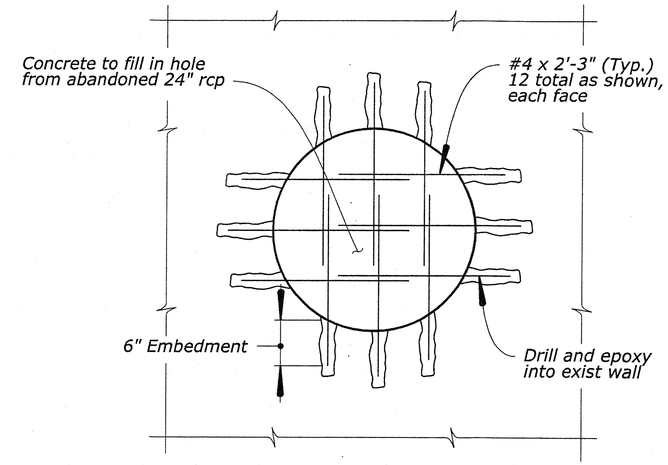
1. *See "Abutment Details 2 of 2" for section D-D and section E-E details.*
2. *Contractor shall submit drill and epoxy connection details to CO for approval.*
3. *Underneath the bridge, rock or gravel can be used instead of topsoil above the GRS backfill.*
4. *Temporary shoring shall be used as needed to maintain the integrity and stability of the H-1 bridge when excavating behind canal walls, constructing retaining walls, and placing GRS backfill.*
5. *The pipe penetration and top of wall (Detail 2) repair work shall be incidental to item 204 backfill, granular.*



DETAIL 2

Not to Scale

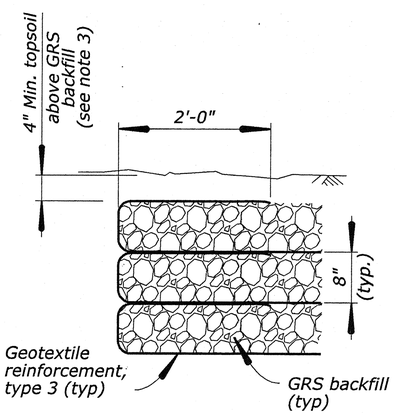
(to provide smooth top of wall finish after partial removal)



PIPE PENETRAION REPAIR DETAIL

Not to Scale

(to repair hole in canal wall from abandoned 24" RCP pipe penetration that will be removed)



WRAP DETAIL

Not to Scale

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HALONA STREET BRIDGE

HALONA STREET

HONOLULU COUNTY, HAWAII

ABUTMENT DETAILS 1 OF 2

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	K. SCHNEIDER	B. LUEBBERS	1" = 30' UNLESS NOTED	J. ROHNER	12 of 35	SEPTEMBER 2016	RG3077-L

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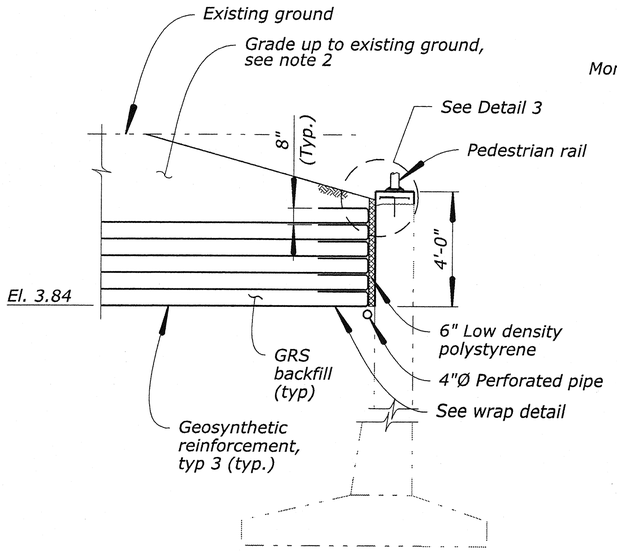
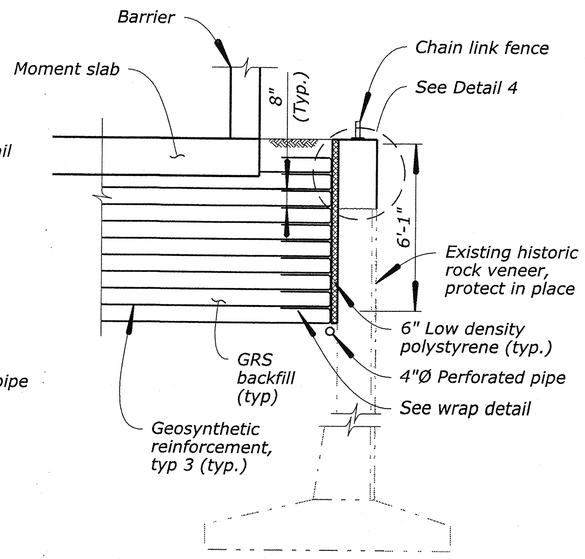
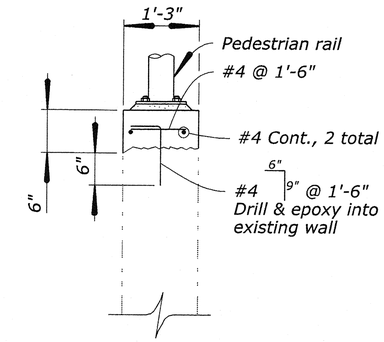
STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S13



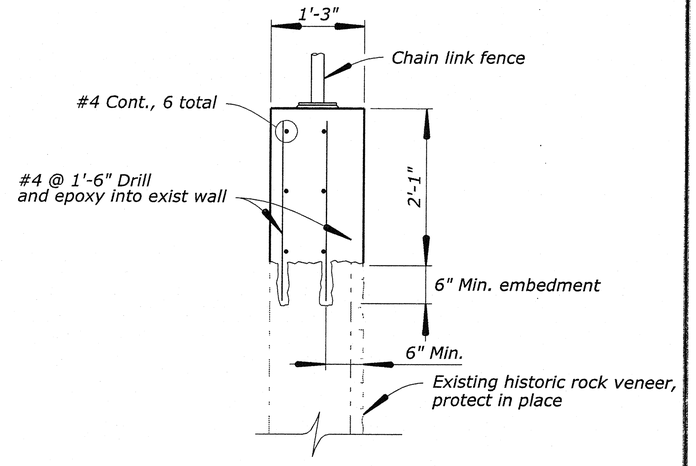
SECTION D-D
(Abutment 1 shown, abutment 2 similar)



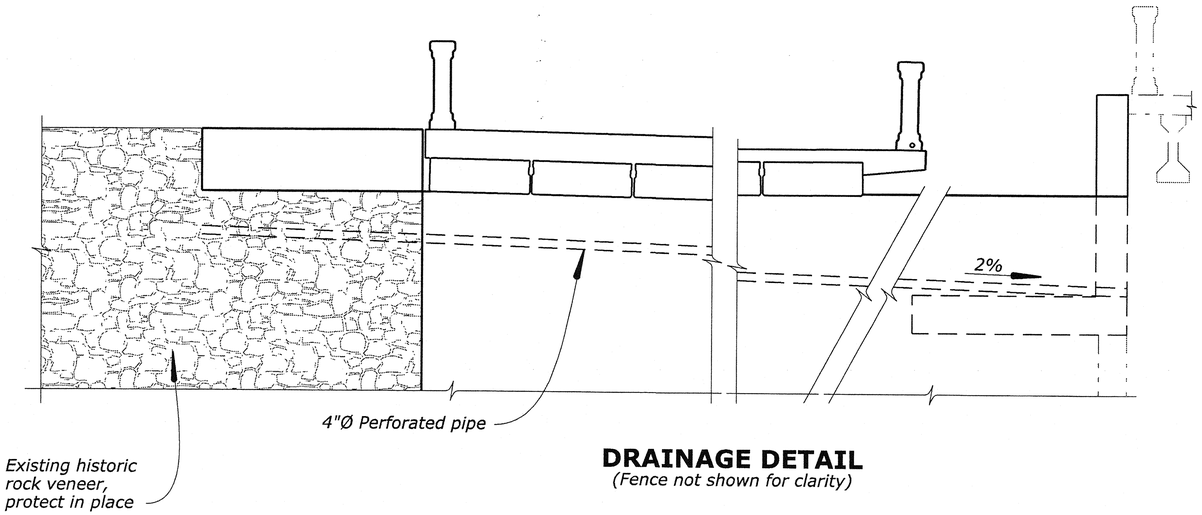
SECTION E-E



DETAIL 3
(To provide smooth top of wall finish after partial removal and to protect any pedestrians from falling)



DETAIL 4
(To provide smooth top of wall finish after partial removal and to bring wall height up to top of grade behind bridge rail)



DRAINAGE DETAIL
(Fence not shown for clarity)

NOTES:

1. *See "Abutment Details 1 of 2" for Detail 1 and wrap detail.*
2. *See roadway plans for grading details between Halona St and H-1.*
3. *See "Pedestrian Railing" and "Fence Chain Link" sheets for fence and railing connection details to the top of wall.*
4. *Canal walls upstream of the bridge have a historic rock veneer that must be protected in place. If veneer is damaged by the Contractor during construction, it must be repaired or replaced to its original state at the Contractor's expense.*
5. *Remove portions of the existing abutment and canal walls in accordance with Section 203 of the SCR's. Construct concrete sections on top of the existing abutment and canal walls in accordance with Section 258 of the SCR's.*
6. *Detail 3 work shall be incidental to item 646, pedestrian rail.*
7. *Detail 4 work shall be incidental to item 619, fence chain link.*

ALEX L FIRTH
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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HALONA STREET BRIDGE

HALONA STREET

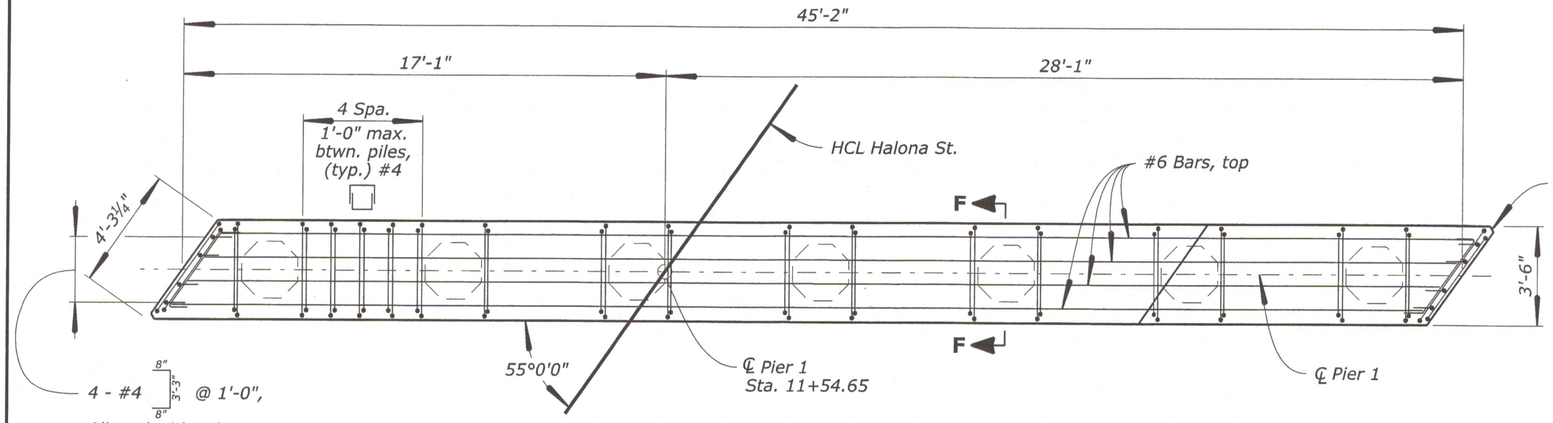
HONOLULU COUNTY, HAWAII

ABUTMENT DETAILS 2 OF 2

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	K. SCHNEIDER	B. LUEBBERS	NO SCALE	J. ROHNER	13 of 35	SEPTEMBER 2016	RG3077-M

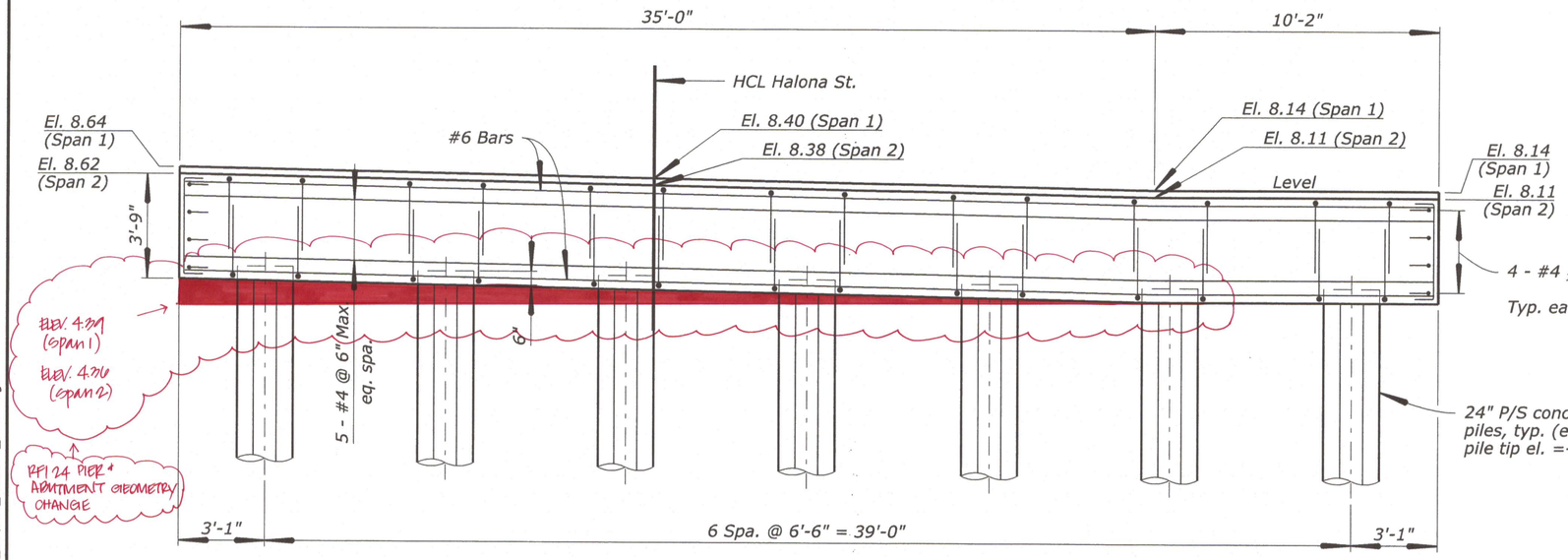
12/29/2016 10:40:27 AM \\denpwp01\pwicsjobs596\251860\205368_35\513_RG3077_AbutDetail_2.dgn

STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S14



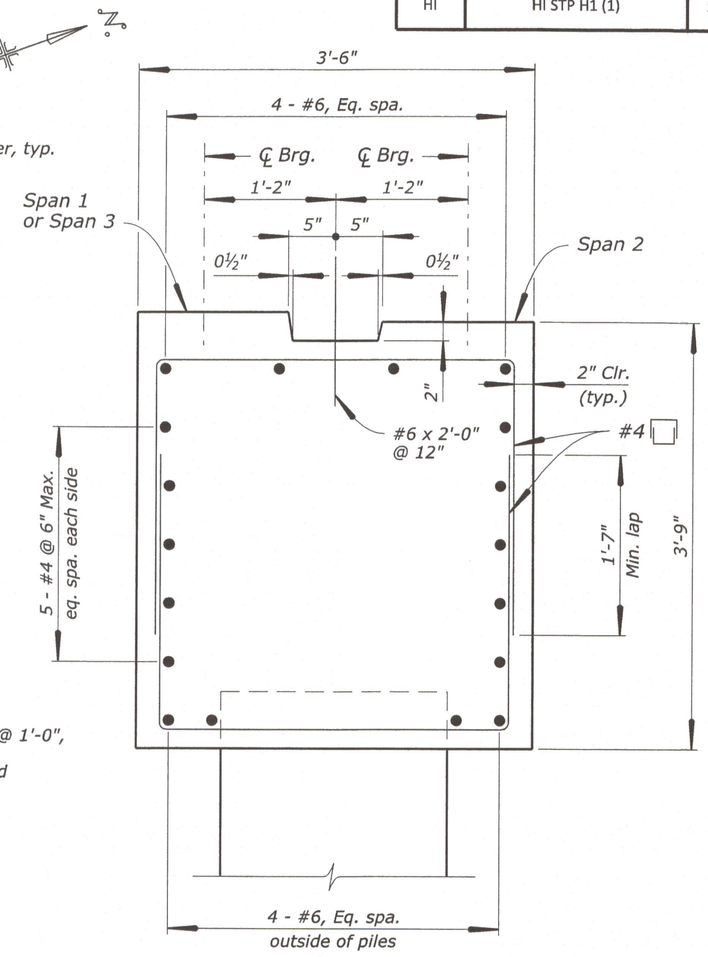
PLAN

Scale: 3/16" = 1'-0"



ELEVATION

Scale: 3/16" = 1'-0"



SECTION F-F

Scale: ¾" = 1'-0"

NOTES:

1. See "Pier 2" for bearing details and pier diaphragm details.
2. Elevations shown are consistent across half of the cap, parallel to the HCL or edge of cap, for the respective span.

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HALONA STREET BRIDGE

HALONA STREET

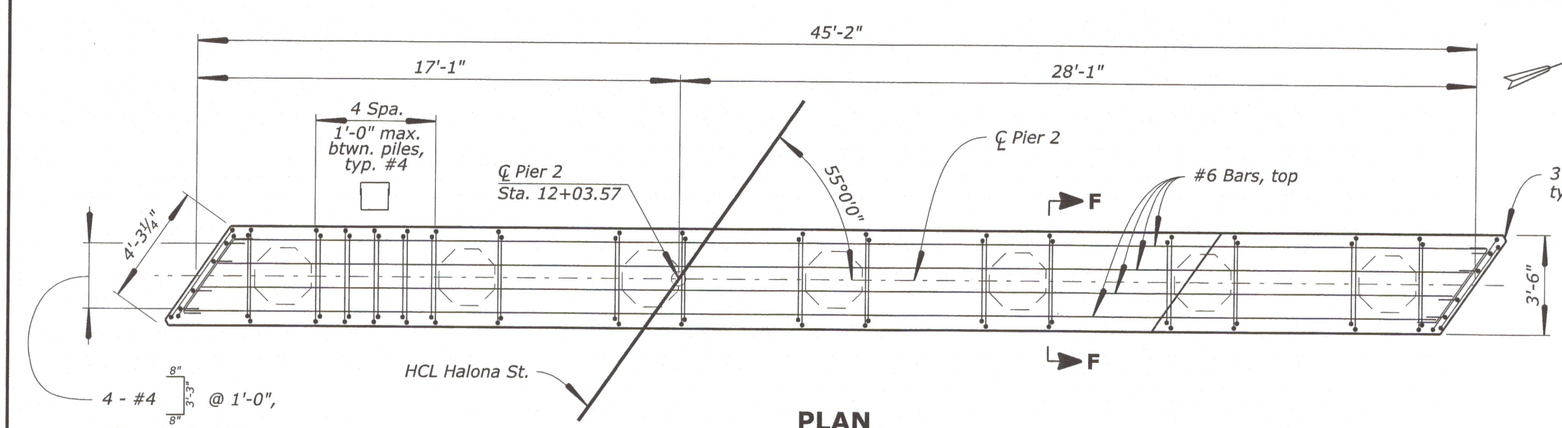
HONOLULU COUNTY, HAWAII

PIER 1

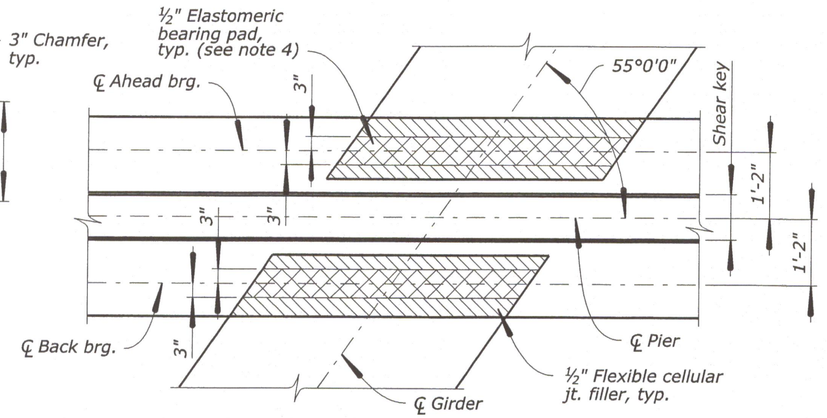
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS

DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
A. PLANKIS	G. McGINN	B. LUEBBERS	NO SCALE	J. ROHNER	14 of 35	SEPTEMBER 2016	RG3077-N

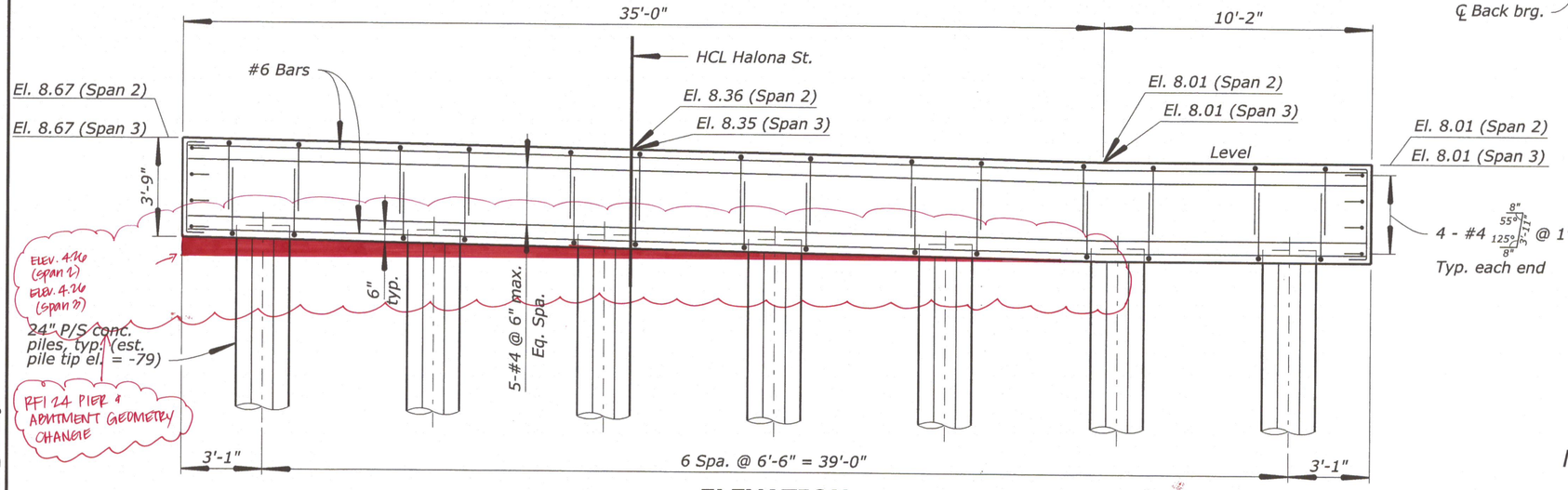
STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S15



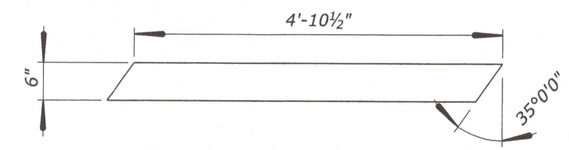
PLAN
Scale: 3/16" = 1'-0"



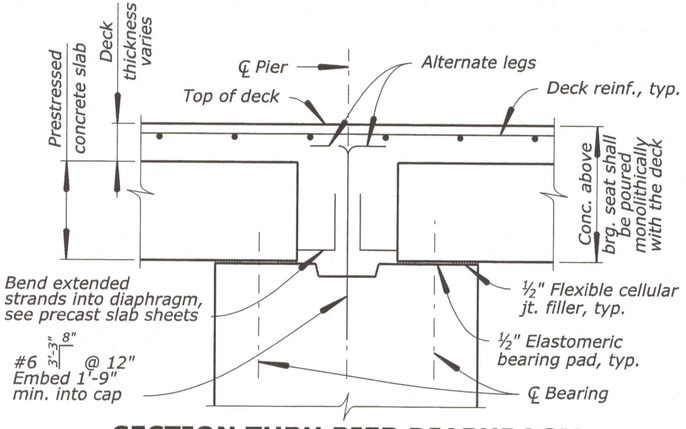
BEARING DETAIL
(Reinforcement not shown for clarity)
Scale: 3/8" = 1'-0"



ELEVATION
Scale: 3/16" = 1'-0"



ELASTOMERIC PAD DIMENSIONS
Scale: ½" = 1'-0"



SECTION THRU PIER DIAPHRAGM
Scale: ½" = 1'-0"

NOTES:

1. See "Pier 1" for section F-F details.
2. Elevations shown are consistent across half of the cap, parallel to the HCL or edge of cap, for the respective span.
3. Elastomeric pad dimensions and location with respect to the ℄ of bearing are typical for pier and abutment bearings.
4. Elastomeric bearing pad shall conform to AASHTO M251 with 50 durometer hardness.

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HALONA STREET BRIDGE

HALONA STREET

HONOLULU COUNTY, HAWAII

PIER 2

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS

DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
A. PLANKIS	G. McGINN	B. LUEBBERS	3/16"=1'-0" UNLESS NOTED	J. ROHNER	15 of 35	SEPTEMBER 2016	RG3077-O

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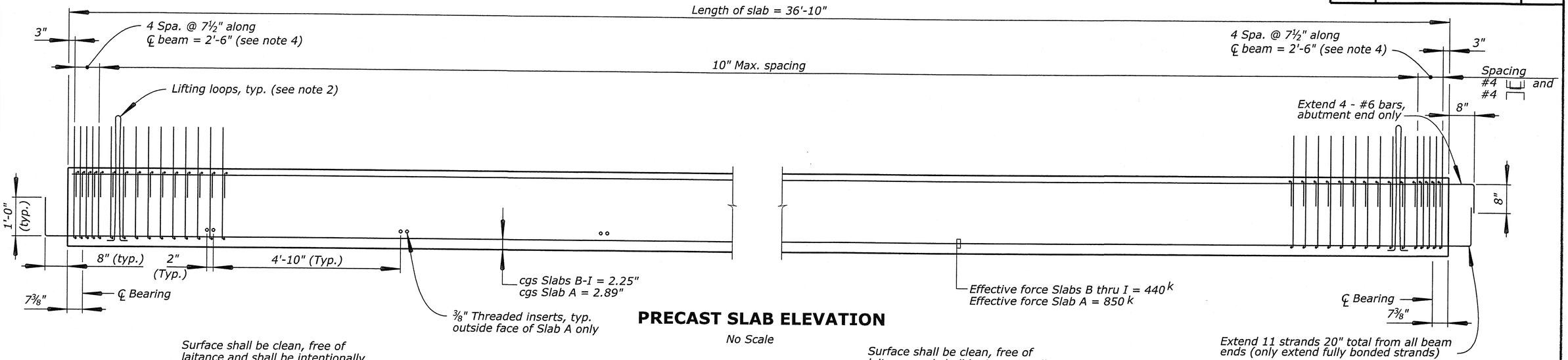
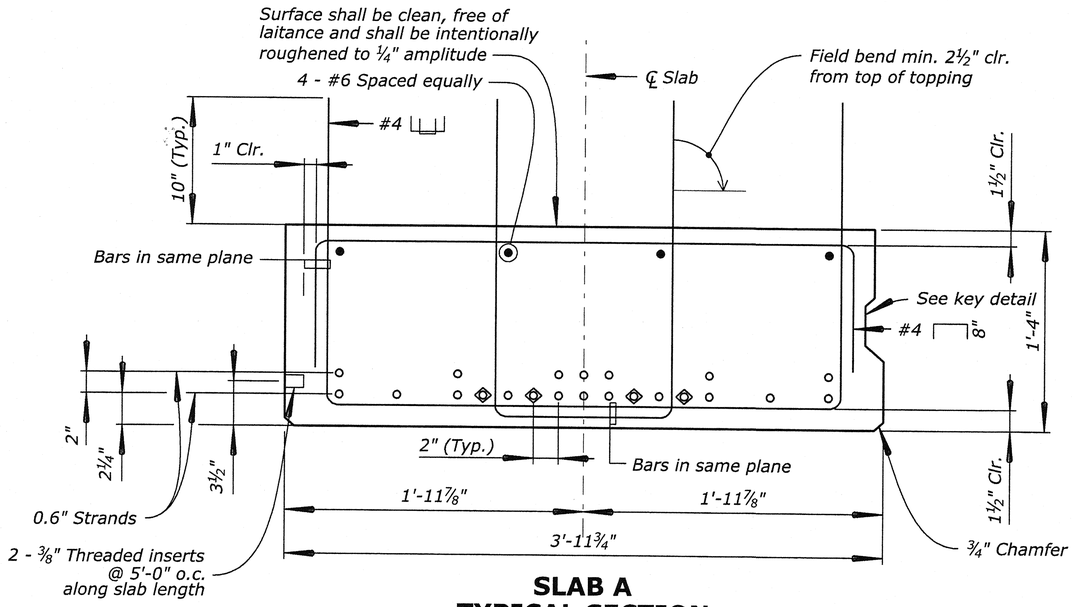
STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S16



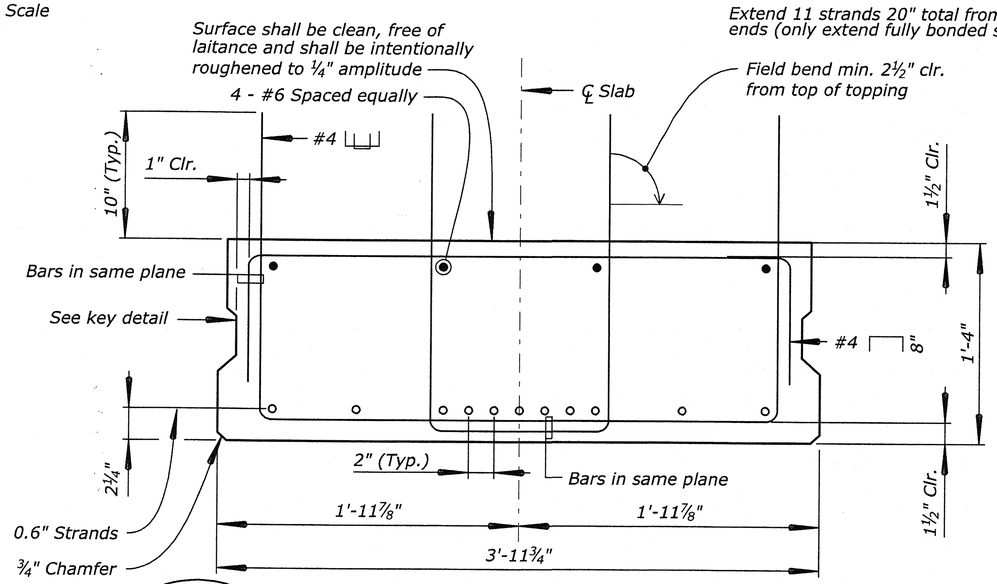
PRECAST SLAB ELEVATION

No Scale



SLAB A TYPICAL SECTION

Scale: 1" = 1'-0"



SLABS B - I TYPICAL SECTION

Scale: 1" = 1'-0"

NOTES:

1. ◇ Indicates debonded strands. Debond 4 strands total in the bottom row of Slab A only as follows: 2 strands 3'-0" and 2 strands 6'-0" from end of the slab.
2. Contractor to design and install lifting embedments in accordance with the standard specifications.
3. Increase plan length as necessary to compensate for shortening due to prestress.
4. Fan stirrups at ends. See "End Detail Plan" on sheet RG3077-R.
5. Exterior face of Slabs A and I shall have no shear key.
6. ⅜" Threaded inserts shall provide 2,000 lb pullout strength.

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

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HONOLULU COUNTY, HAWAII

PRECAST SLAB SPANS 1 & 3

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	G. McGINN	B. LUEBBERS	NO SCALE	J. ROHNER	16 of 35	SEPTEMBER 2016	RG3077-P

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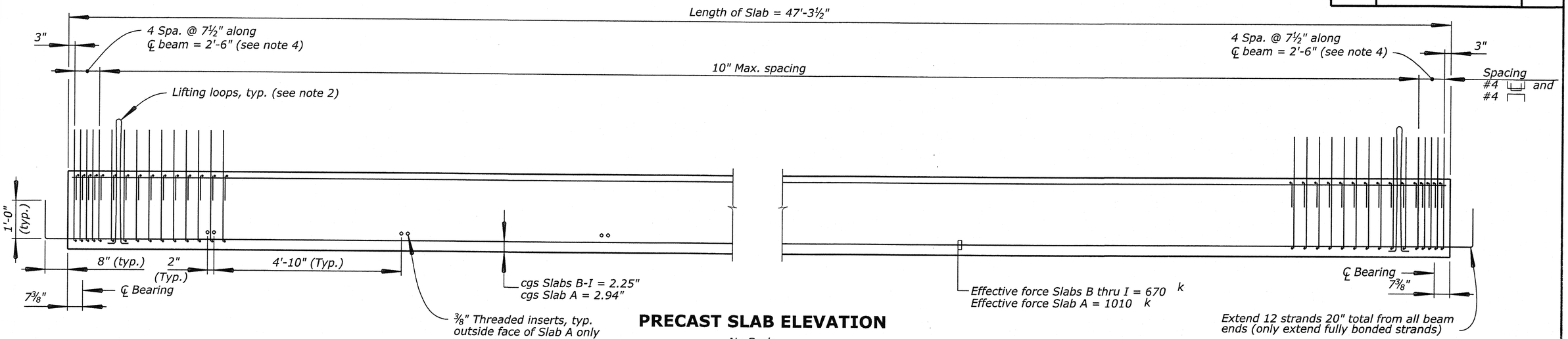
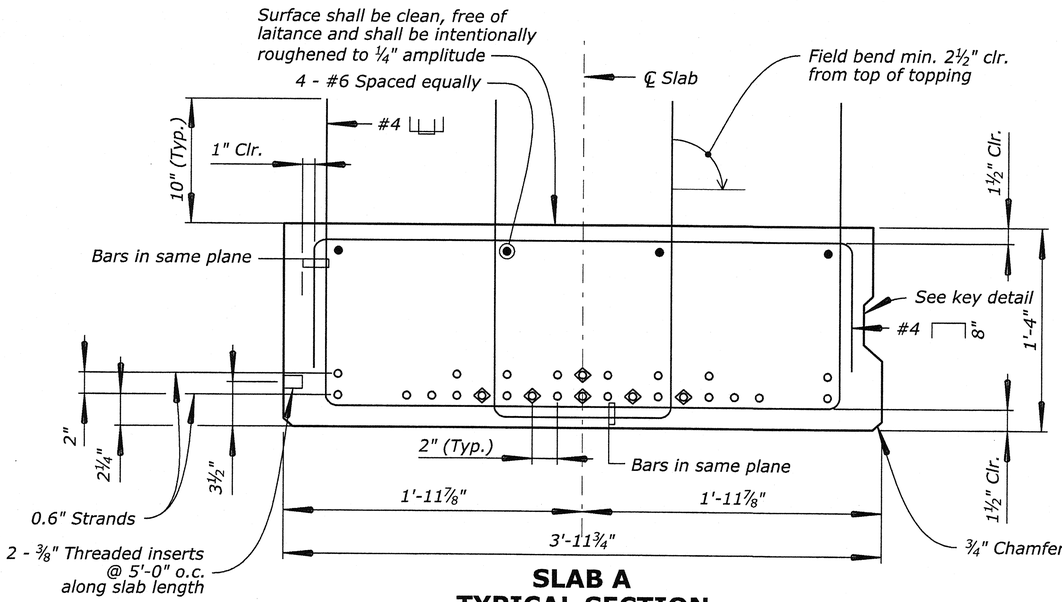
STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S17



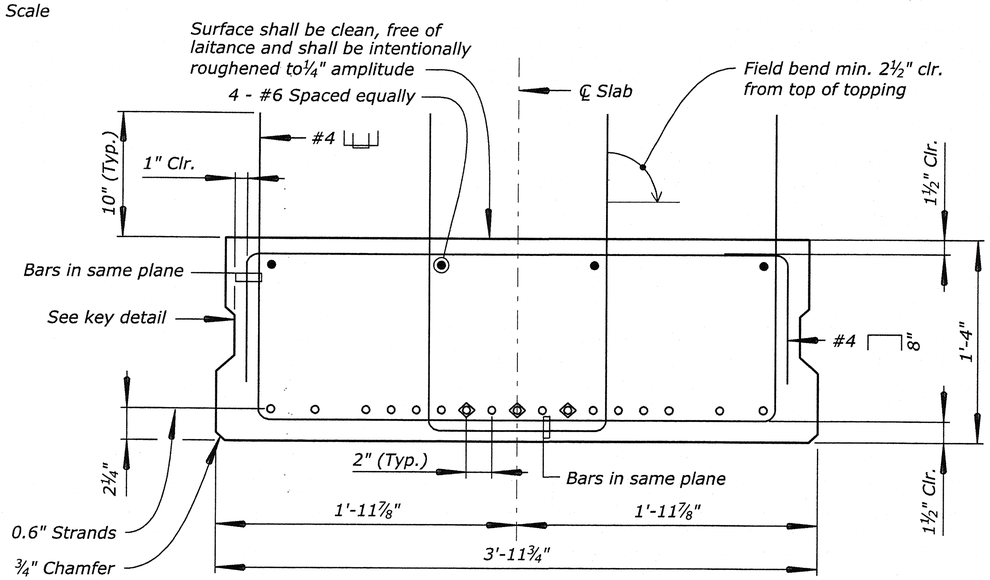
PRECAST SLAB ELEVATION

No Scale



SLAB A TYPICAL SECTION

Scale: 1" = 1'-0"



SLABS B - I TYPICAL SECTION

Scale: 1" = 1'-0"

NOTES:

1. ◇ *Indicates debonded strands. Debond 6 strands total in Slab A as follows: 3 strands in bottom row 3'-0", 2 strands in bottom row 6'-0", and 1 strand in top row 6'-0" from the end of the slab. Debond 3 strands total in Slabs B thru I 3'-0" from the end of slab.*
2. *Contractor to design and install lifting embedments in accordance with the standard specifications.*
3. *Increase plan length as necessary to compensate for shortening due to prestress.*
4. *Fan stirrups at ends. See "End Detail Plan" on sheet RG3077-R.*
5. *Exterior face of Slabs A and I shall have no shear key.*
6. *⅜" Threaded inserts shall provide 2,000 lb pullout strength.*

ALEX L FIRTH
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HALONA STREET BRIDGE

HALONA STREET

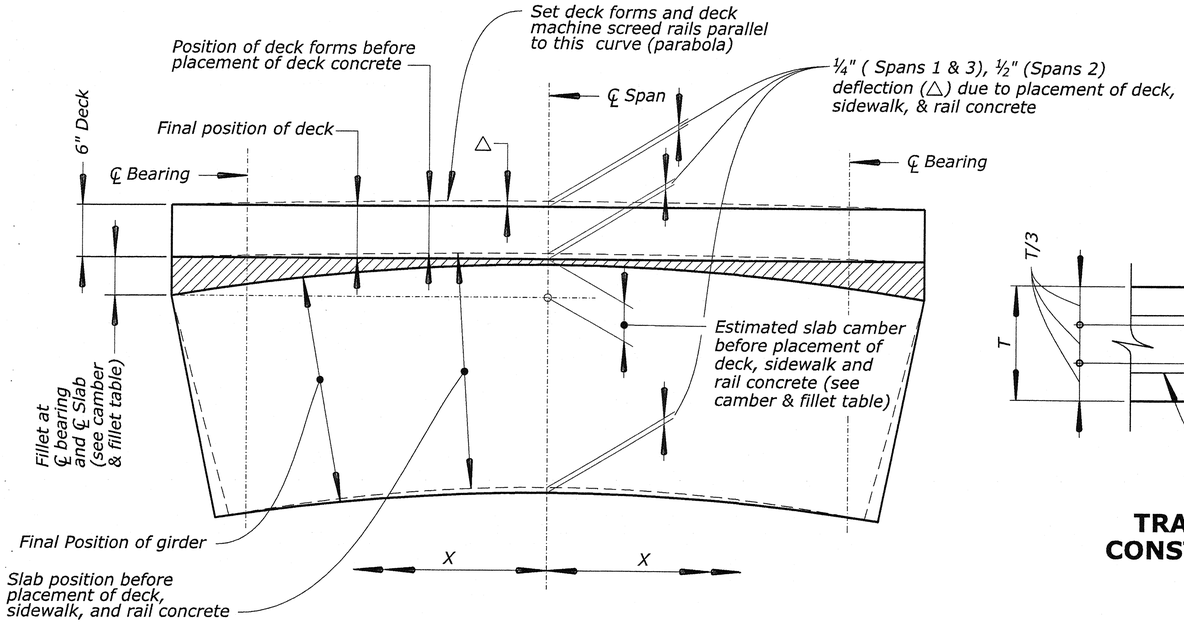
HONOLULU COUNTY, HAWAII

PRECAST SLAB SPAN 2

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS

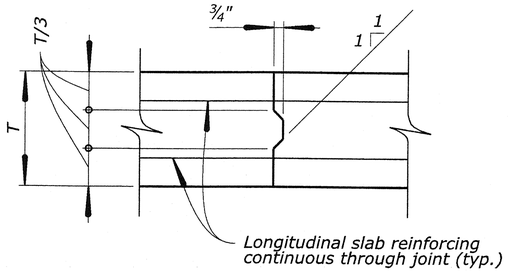
DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
A. PLANKIS	G. McGINN	B. LUEBBERS	NO SCALE	J. ROHNER	17 of 35	SEPTEMBER 2016	RG3077-Q

STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S18

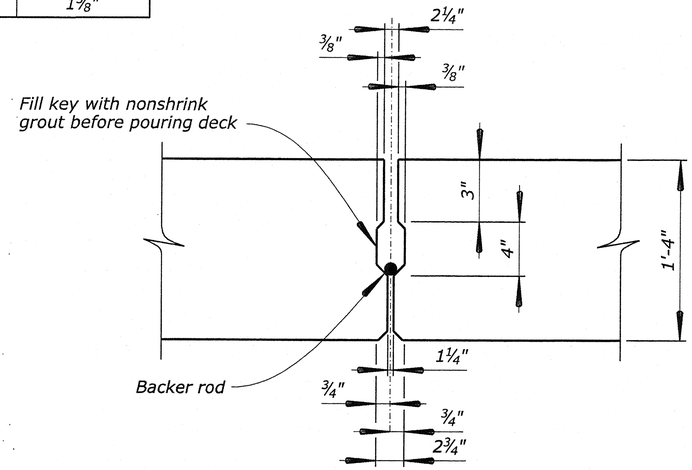


CAMBER & FILLET TABLE

Span	Girder	Est. Camber	Fillet
1	A	2"	1⅜"
	B thru I	¾"	1⅜"
2	A	3"	1¾"
	B thru I	1¾"	1¾"
3	A	2"	1⅝"
	B thru I	¾"	1⅝"

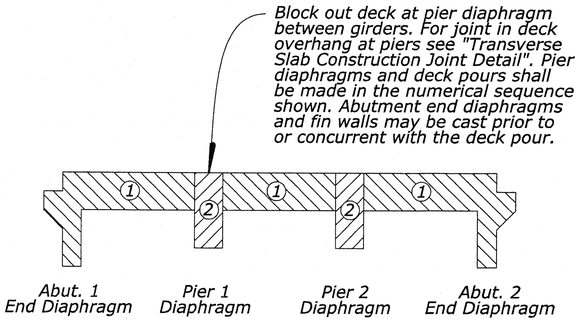


TRANSVERSE SLAB CONSTRUCTION JOINT



KEY DETAIL

Note: Maintain 1¼" gap at bottom between slabs, including where beam seat grade changes



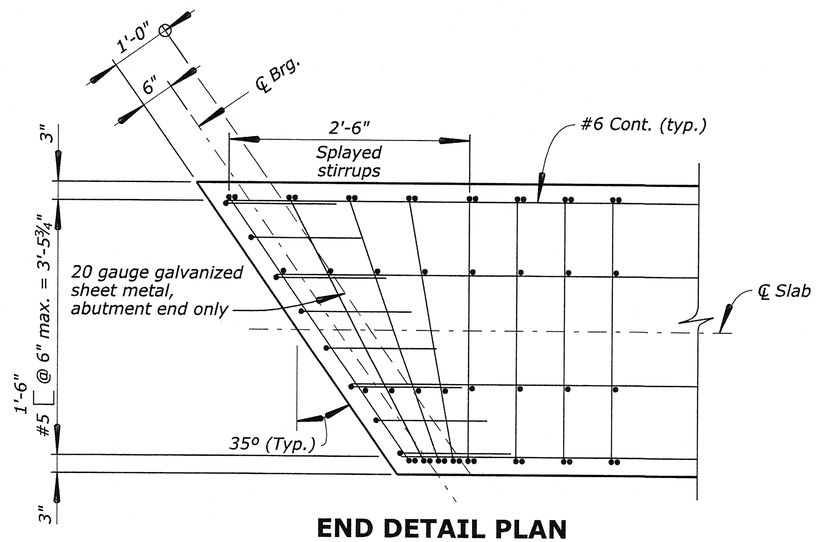
DECK POURING DIAGRAM

REQUIRED ACTIONS:

1. Measure slab camber prior to setting deck forms. If it exceeds the estimated slab camber (see camber table) by more than 1", the fillet will have to be increased by raising profile grade as directed by the CO.

2. Set the deck forms and camber the deck machine screed rails to offset the slab deflections due to deck, sidewalk, and rail placement.

DECK FORM SETTING DIAGRAM



END DETAIL PLAN

Deflection Equation

$\triangle = 0.25 - \frac{X^2}{1270}$ Spans 1 & 3 $\qquad \triangle = 0.75 - \frac{X^2}{707}$ Span 2

Where △ = Deflection, in inches, of girder at any point caused by the weight of deck.
and X = Distance, in feet, measured from midspan (See diagram).

Note: △ max = ¼" at X=0 (midspan)
△ min = 0 at 17'-9½" (℄ bearing)] Spans 1 & 3

△ max = ¾" at X=0 (midspan)
△ min = 0 at X= 23'-0½" (℄ bearing)] Span 2

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FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HALONA STREET BRIDGE

HALONA STREET

HONOLULU COUNTY, HAWAII

PRECAST SLAB DETAILS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	G. McGINN	B. LUEBBERS	NO SCALE	J. ROHNER	18 of 35	SEPTEMBER 2016	RG3077-R

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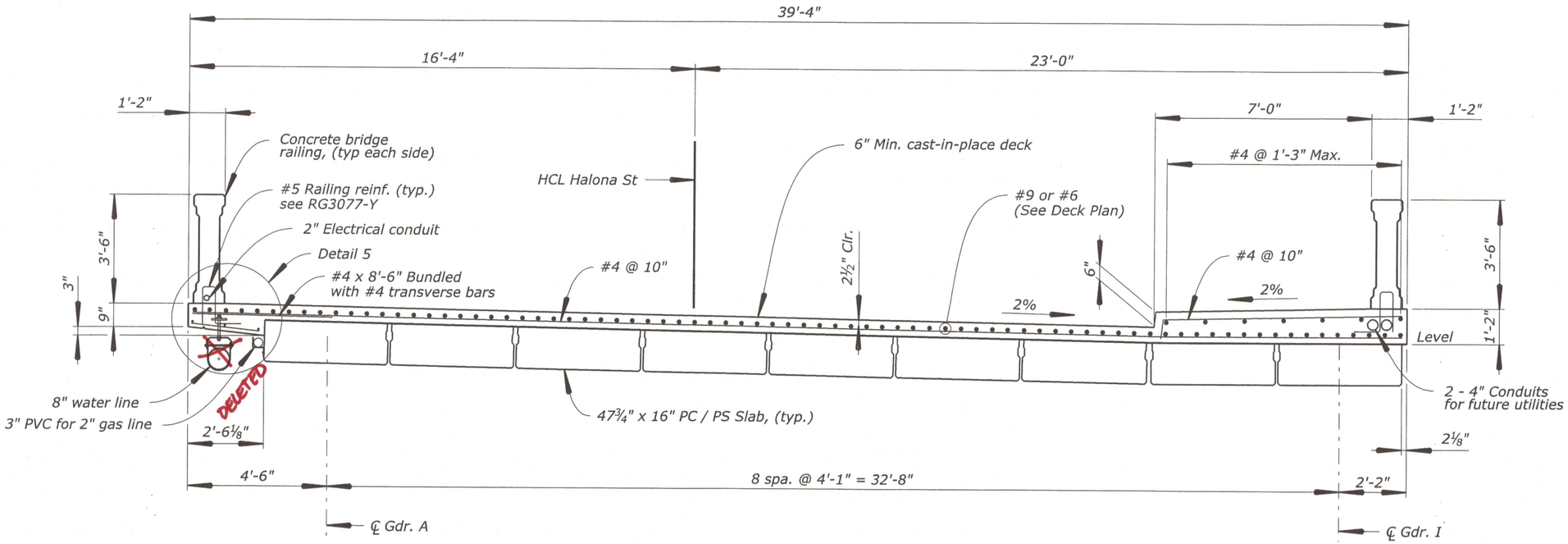
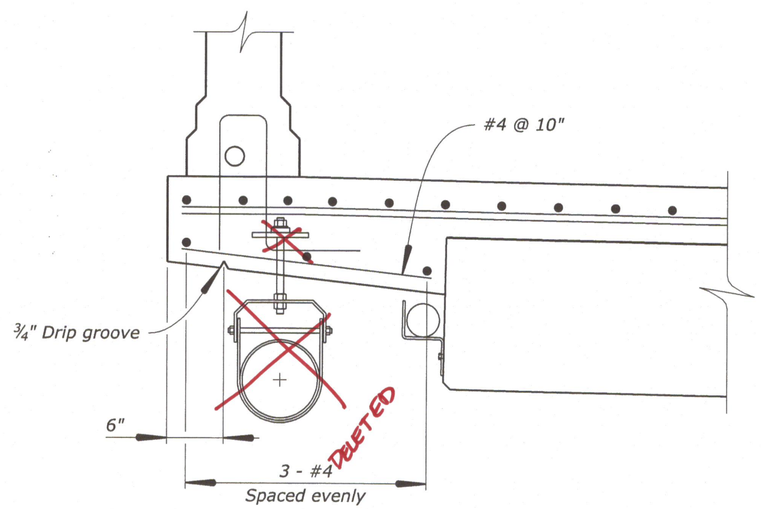
STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S19



TYPICAL SECTION

(Looking ahead stationing)



DETAIL 5

Scale: ¾" = 1'-0"

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HAWAII U.S.A.

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HALONA STREET BRIDGE

HALONA STREET

HONOLULU COUNTY, HAWAII

SUPERSTRUCTURE SECTION

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	G. McGINN	B. LUEBBERS	¼" = 1'-0" UNLESS NOTED	J. ROHNER	19 of 35	SEPTEMBER 2016	RG3077-S

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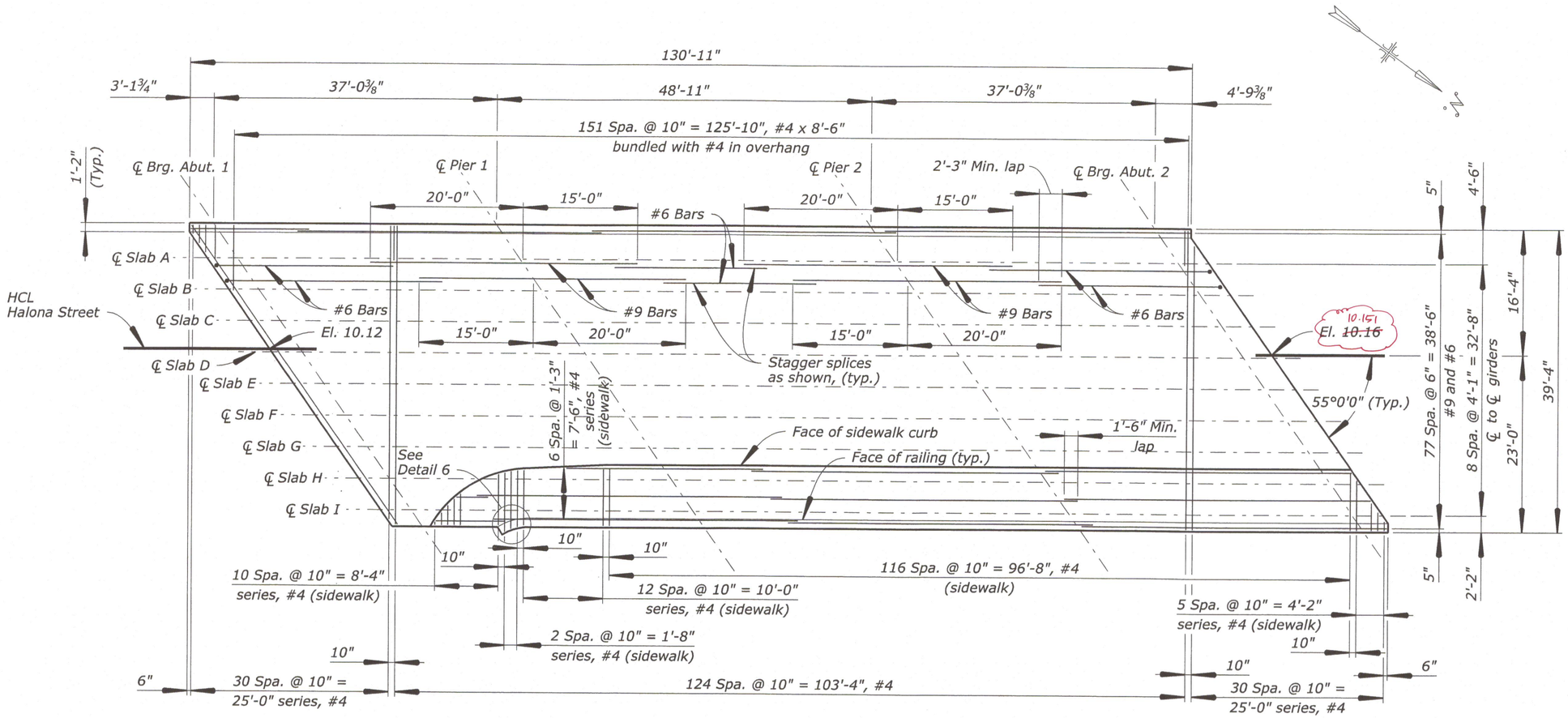
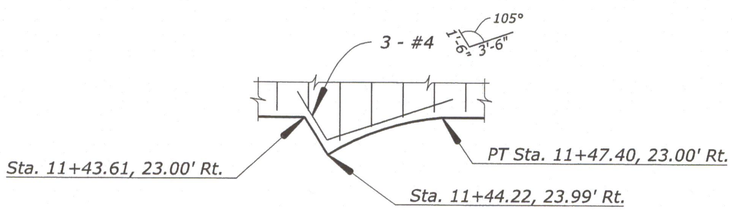
STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S20



DECK AND FRAMING PLAN



DETAIL 6

No Scale

ALEX L FIRTH
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No. 16749-S
HAWAII U.S.A.

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HALONA STREET BRIDGE

HALONA STREET

HONOLULU COUNTY, HAWAII

DECK AND FRAMING PLAN

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	G. McGINN	B. LUEBBERS	1/16" = 1'-0"	J. ROHNER	20 of 35	SEPTEMBER 2016	RG3077-T

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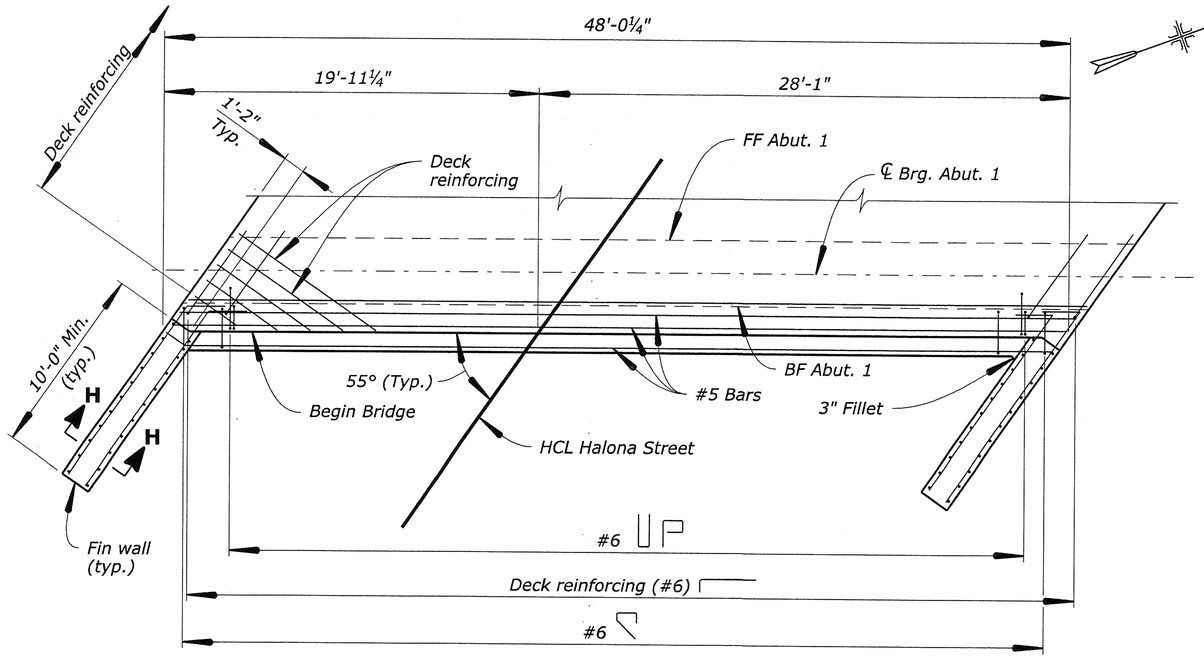
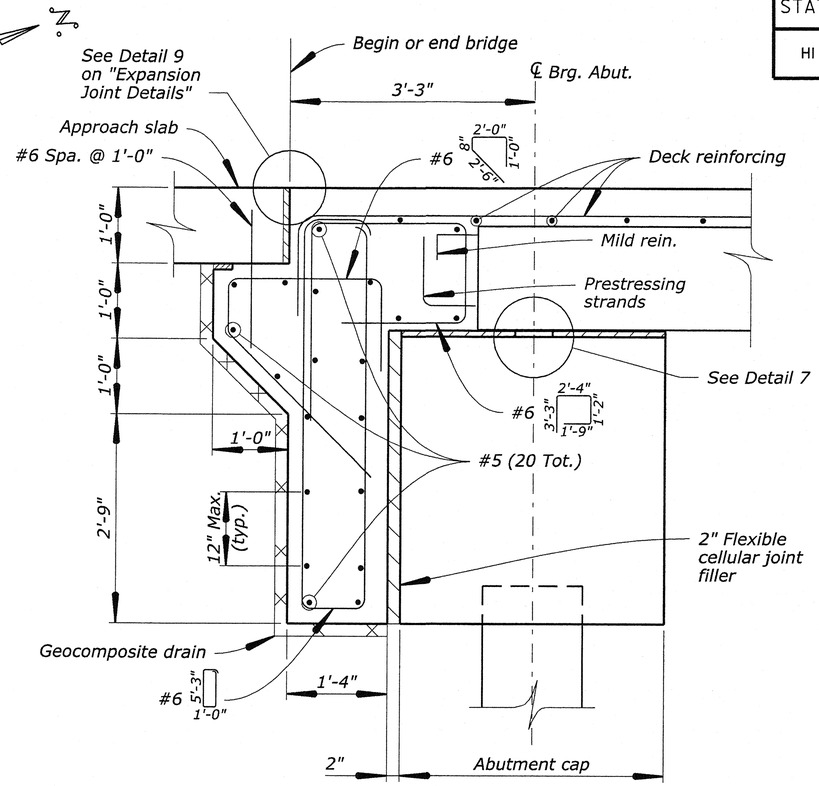
STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S21



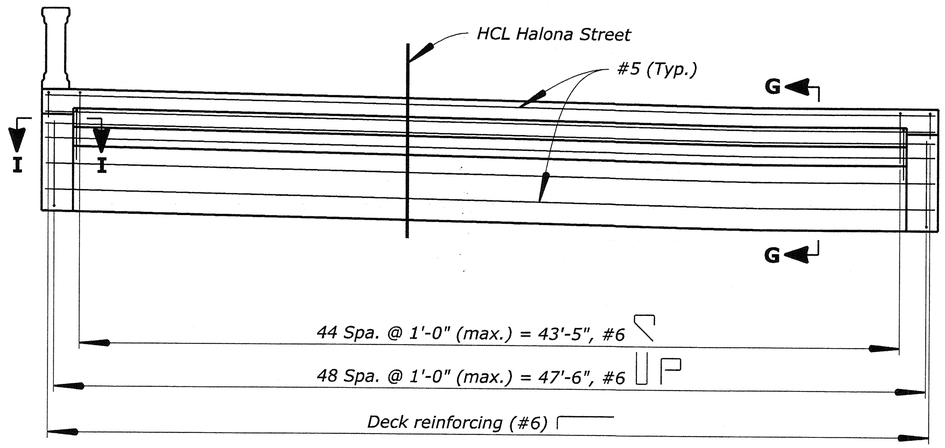
ABUTMENT 1 - END DIAPHRAGM PLAN

(Precast slabs not shown for clarity)
Scale: ⅛" = 1'-0"



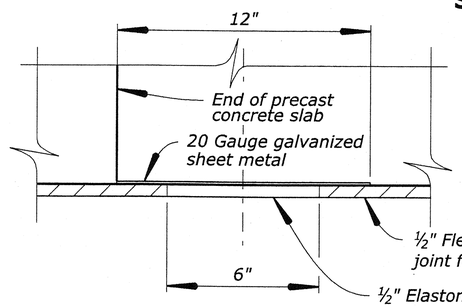
SECTION G-G

Scale: ½" = 1'-0"



ABUTMENT 1 - END DIAPHRAGM SECTION

(Taken along BF abutment)
Scale: ⅛" = 1'-0"



DETAIL 7

No Scale

ELASTOMERIC BEARING PAD NOTES:

1. *Cost of all bearing related items, including 20 gauge galvanized sheet metal, shall be included in cost of structural concrete, class A.*
2. *Grease top surface of bearing liberally with molybdenum disulfide lubricant. Solid film lubricants shall conform to ASTM D2625*
3. *Place 20 gauge galvanized sheet metal centered over elastomeric pad before placing precast beams. Sheet metal shall be same length and skew as elastomeric pad.*
4. *Glue bearing to abutment seat using an approved single component polyurethane adhesive.*
5. *See "Pier 2" sheet for elastomeric pad dimensions. Elastomeric pad shall conform to AASHTO M251 with 50 durometer hardness.*

NOTES:

1. *Fin wall reinforcing not shown for clarity on elevation views.*
2. *See "End Diaphragm Details 2 of 3" for Section H-H details and fin wall elevation view.*
3. *See "End Diaphragm Details 3 of 3" for Section I-I.*

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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HALONA STREET BRIDGE

HALONA STREET

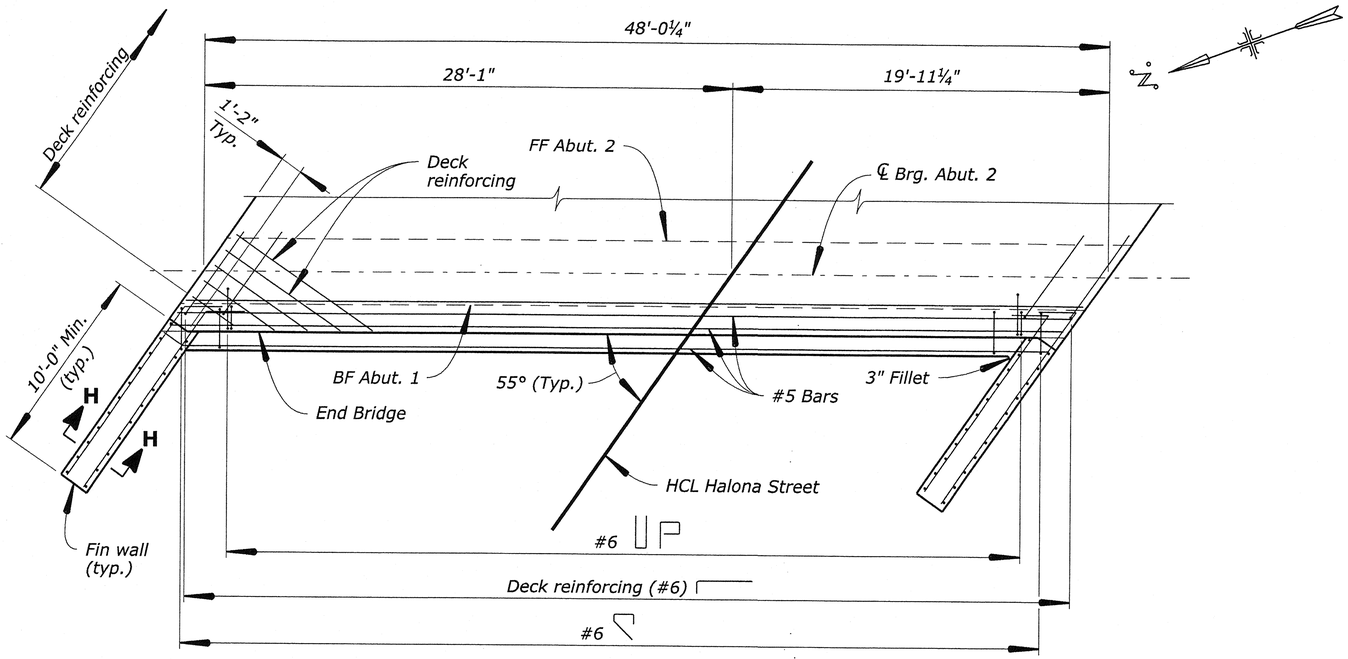
HONOLULU COUNTY, HAWAII

END DIAPHRAGM DETAILS 1 OF 3

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	G. McGINN	B. LUEBBERS	⅛" = 1'-0" UNLESS NOTED	J. ROHNER	21 of 35	SEPTEMBER 2016	RG3077-U

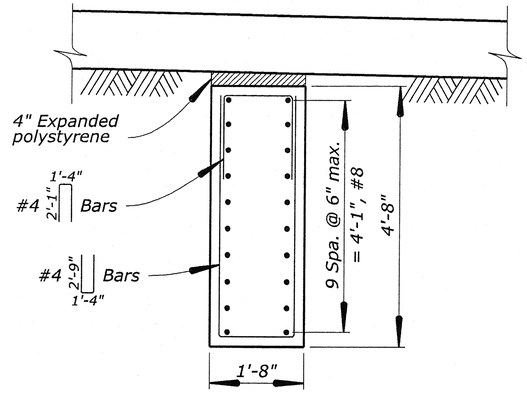
12/29/2016 10:40:21 AM \\denpwp01\pwicsjobs596\251860\205368_13\S21_RG3077_End_Dia_1.dgn

STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S22



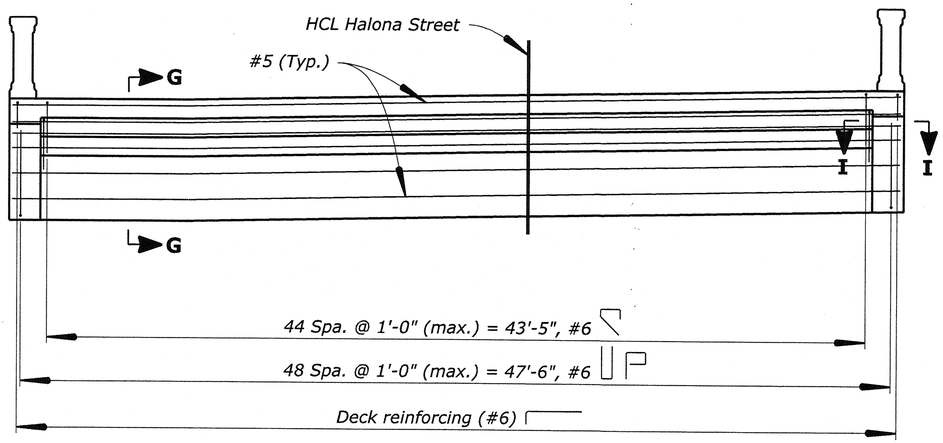
ABUTMENT 2 - END DIAPHRAGM PLAN

Scale: ⅛ " = 1'-0"



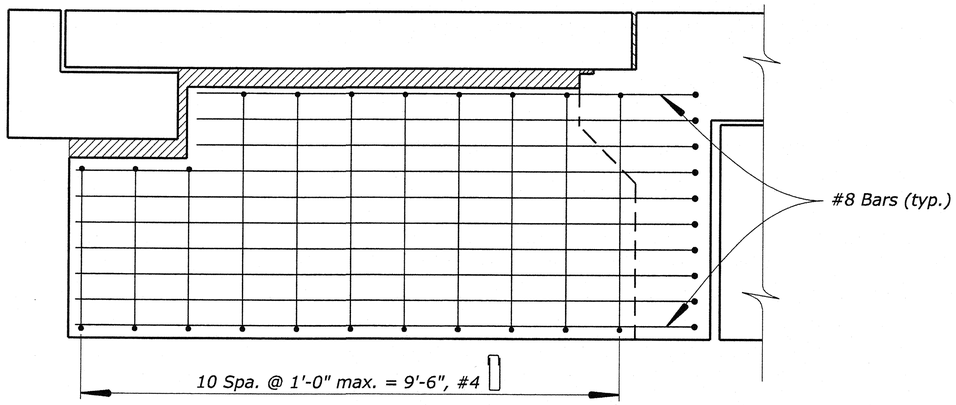
SECTION H-H (FINWALL SECTION)

Scale: ⅜" = 1'-0"



ABUTMENT 2 - END DIAPHRAGM SECTION

(Taken along BF abutment)
Scale: ⅛ " = 1'-0"



FIN WALL ELEVATION

Scale: ⅜" = 1'-0"

NOTES:

1. *Fin wall reinforcing not shown for clarity on elevation views.*
2. *See "End Diaphragm Details 1 of 3" for Section G-G details and fin wall elevation view.*
3. *See "End Diaphragm Details 3 of 3" for Section I-I.*

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HALONA STREET BRIDGE

HALONA STREET

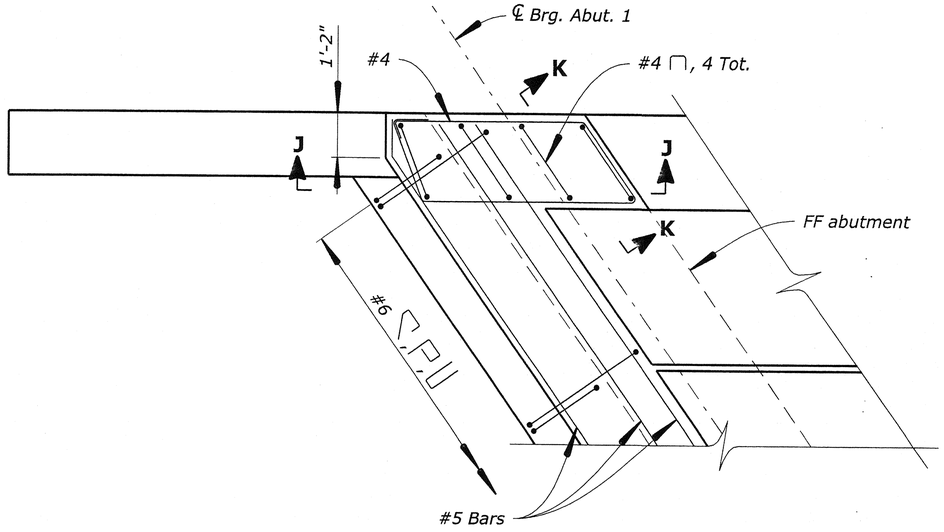
HONOLULU COUNTY, HAWAII

END DIAPHRAGM DETAILS 2 OF 3

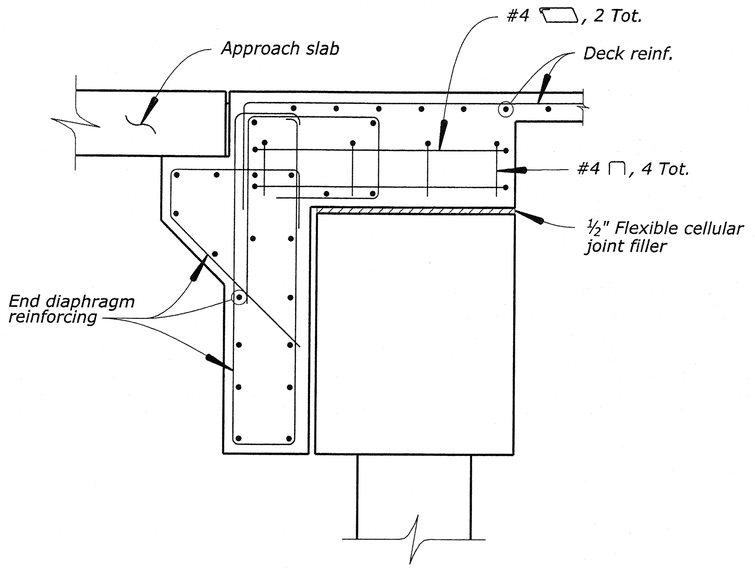
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	G. McGINN	B. LUEBBERS	⅛" = 1'-0" UNLESS NOTED	J. ROHNER	22 of 35	SEPTEMBER 2016	RG3077-V

12/29/2016 10:40:26 AM \\denpwp01\pwicsjobs596\251860\205368_16\S22_RG3077_End_Dia_2.dgn

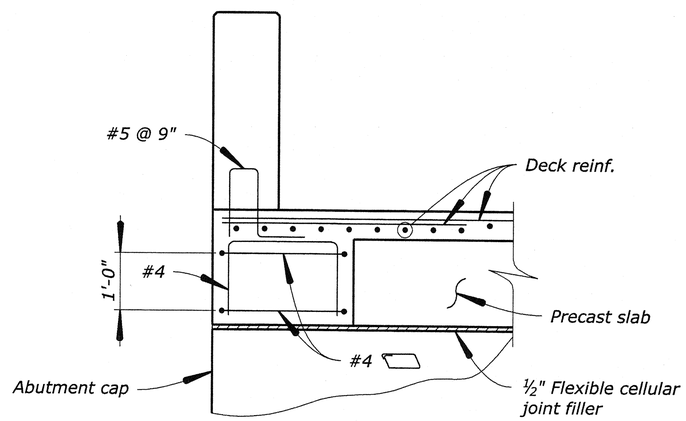
STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S23



SECTION I-I
Scale: ¼" = 1'-0"



SECTION J-J
Scale: ⅜" = 1'-0"



SECTION K-K
Scale: ⅜" = 1'-0"

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HONOLULU COUNTY, HAWAII

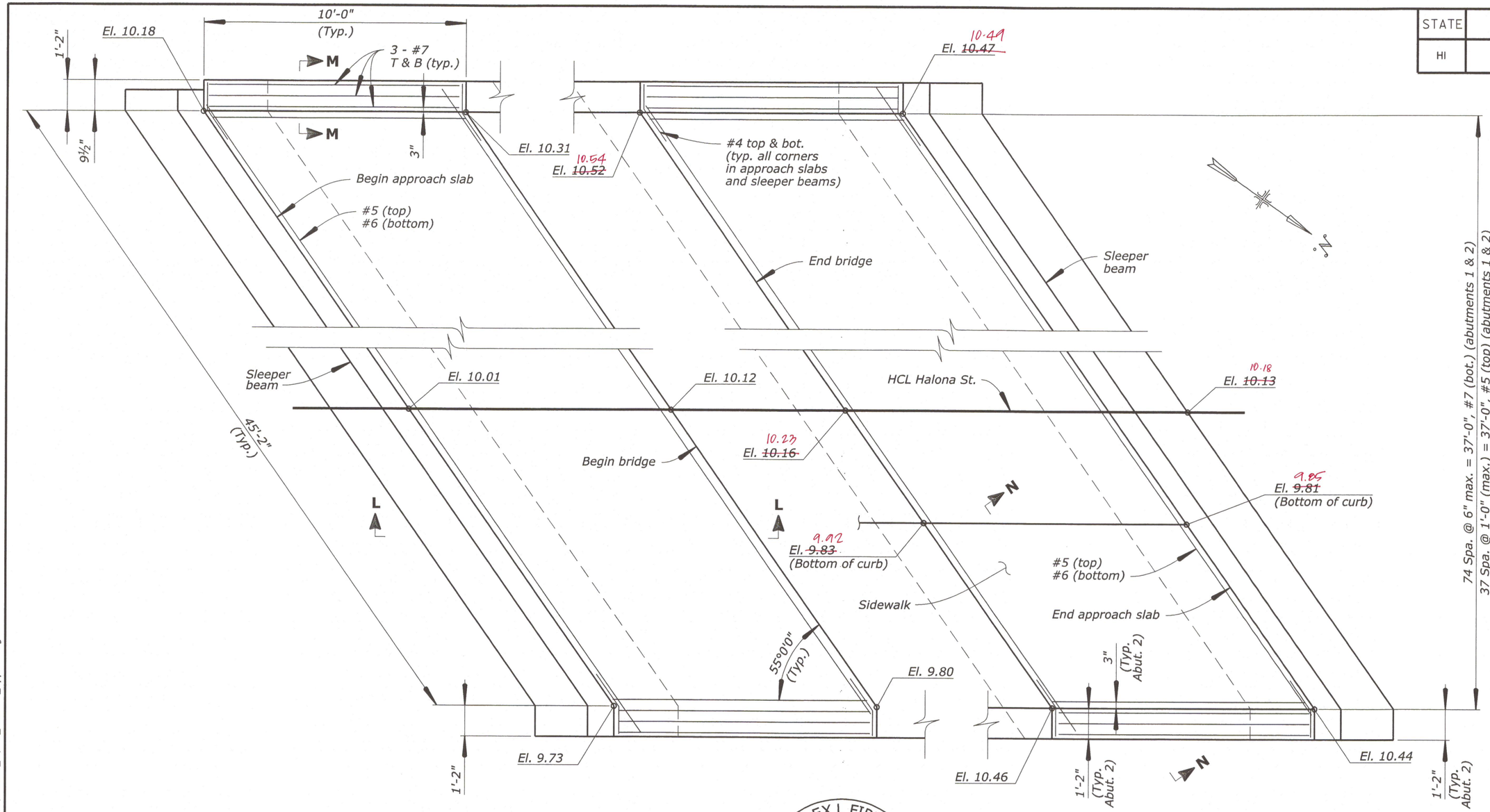
END DIAPHRAGM DETAILS 3 OF 3

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS

DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
A. PLANKIS	K. SCHNEIDER	B. LUEBBERS	⅜" = 1'-0" UNLESS NOTED	J. ROHNER	23 of 35	SEPTEMBER 2016	RG3077-W

12/29/2016 10:40:43 AM \\denpwp01\pwicsjobs596\251860\205368_341S23_RG3077_End_Dia_3.dgn

STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S24



PLAN - ABUTMENT 1
(Sleeper beam reinforcing not shown for clarity)

PLAN - ABUTMENT 2
(Sidewalk and sleeper beam reinforcing not shown for clarity)

NOTES:

1. *See "Approach Slab Details" for sections L-L, M-M, and N-N.*

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HALONA STREET

HONOLULU COUNTY, HAWAII

APPROVAL SLAB PLAN

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	G. McGINN	B. LUEBBERS	¼" = 1'-0" UNLESS NOTED	J. ROHNER	24 of 35	SEPTEMBER 2016	RG3077-X

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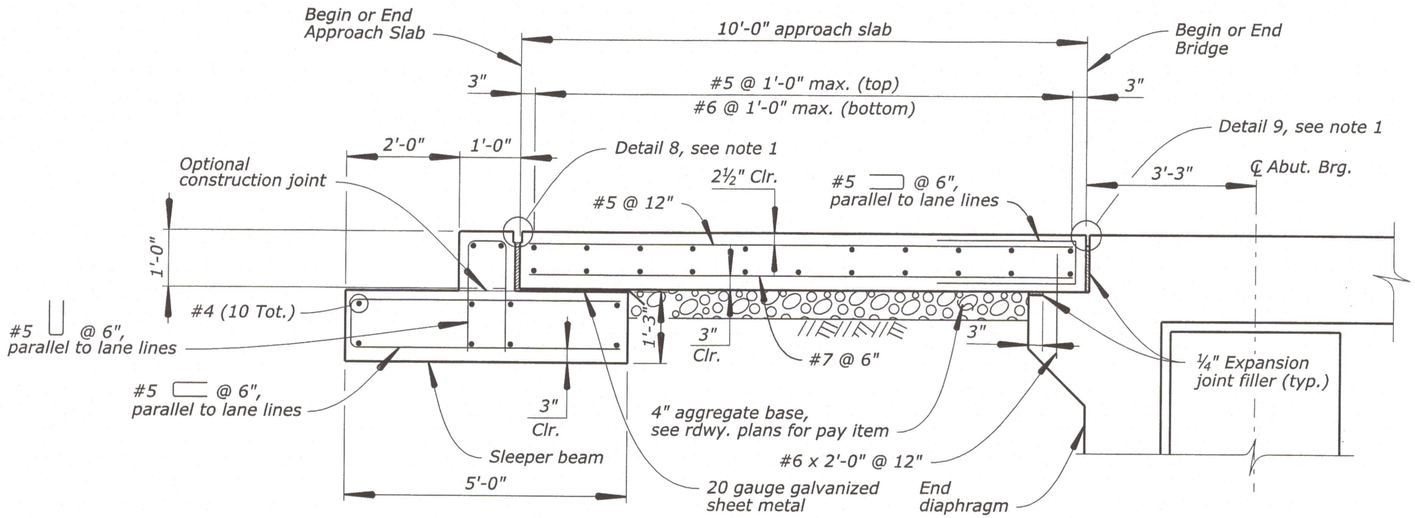
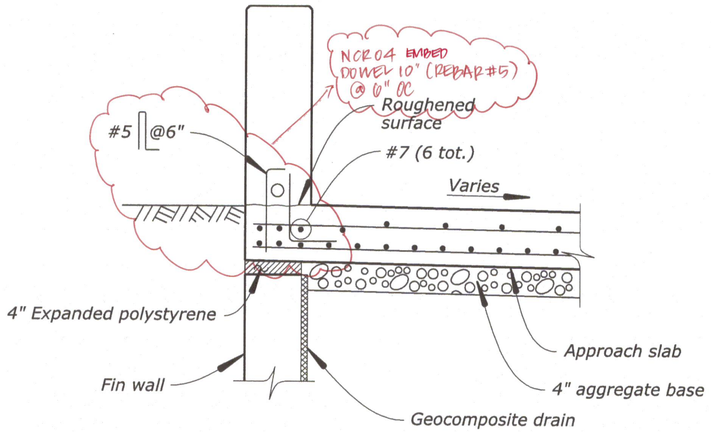
STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S25



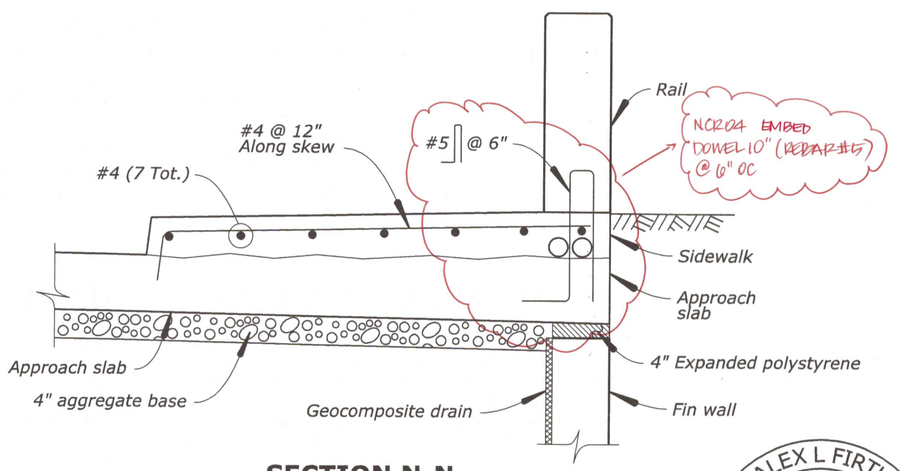
SECTION L-L

NOTES:

1. For Joint Seal Details 8 & 9, see "Expansion Joint Details".



SECTION M-M



SECTION N-N

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HALONA STREET BRIDGE

HALONA STREET

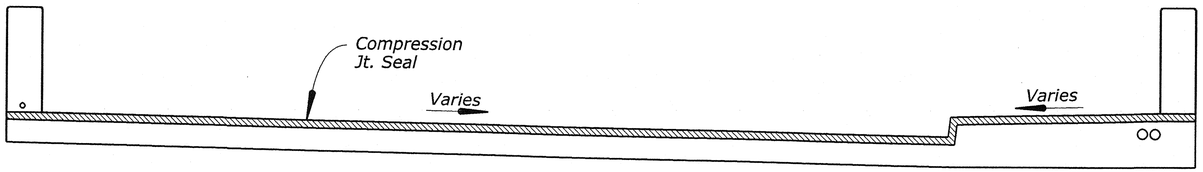
HONOLULU COUNTY, HAWAII

APPROACH SLAB DETAILS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	G. McGINN	B. LUEBBERS	⅜" = 1'-0"	J. ROHNER	25 of 35	SEPTEMBER 2016	RG3077-Y

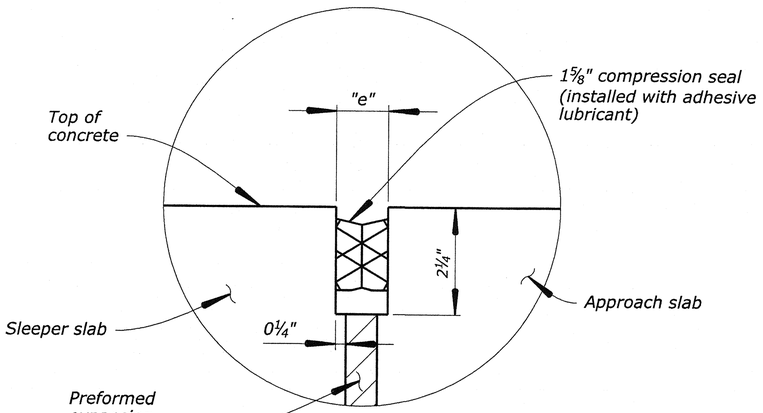
12/29/2016 10:40:33 AM \\denpwp01\pwicsjobs596\251860\205368_76\S25_RG3077_AppSlab2.dgn

STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S26

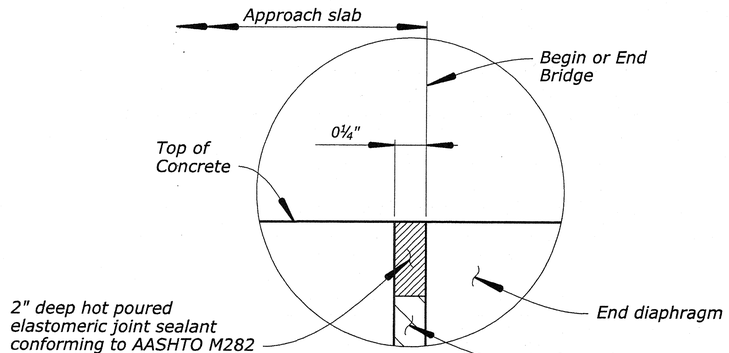


SECTION AT EXPANSION JOINT

(North joint shown, south joint similar but does not have sidewalk joint turns)



DETAIL 8
No Scale



DETAIL 9
No Scale

JOINT OPENING	
Temperature (°f)	e (in.)
40	1.18
50	1.12
60	1.06
70	1.00
80	0.94
90	0.88
100	0.82

JOINT DATA	
Joint Data	Abut. 1 & 2
Joint Type	1⅝" Compression
Joint Size	1⅝" x 1⅞"
Movement Rating	0.60" min
"e" @ Mean Temp. of 70°	1.00"
Opening Adjustment per 10°F	0.06"

COMPRESSION SEAL NOTES:

1. Joint seals shall be one of the following or an approved equal:
   A. D.S. Brown Co. CV-1625
   B. Watson Bowman Acme Corp. WA-162
2. Joint seals other than those listed above may be submitted for approval provided they are similar to that shown and can demonstrate by test the specified joint design movements.
3. Seals shall conform to the requirements of AASHTO M297 for Preformed Polychloroprene Elastomeric Joint Seals.
4. Submit seal certification of performance, installation width and height information, detailed set of manufacturer's instructions for seal installation, and method of assuring proper joint width at time of installation to CO prior to end diaphragm and abutment top slab construction.
5. Joint upturns and downturns shall follow manufacturer's recommendations.

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HALONA STREET BRIDGE

HALONA STREET

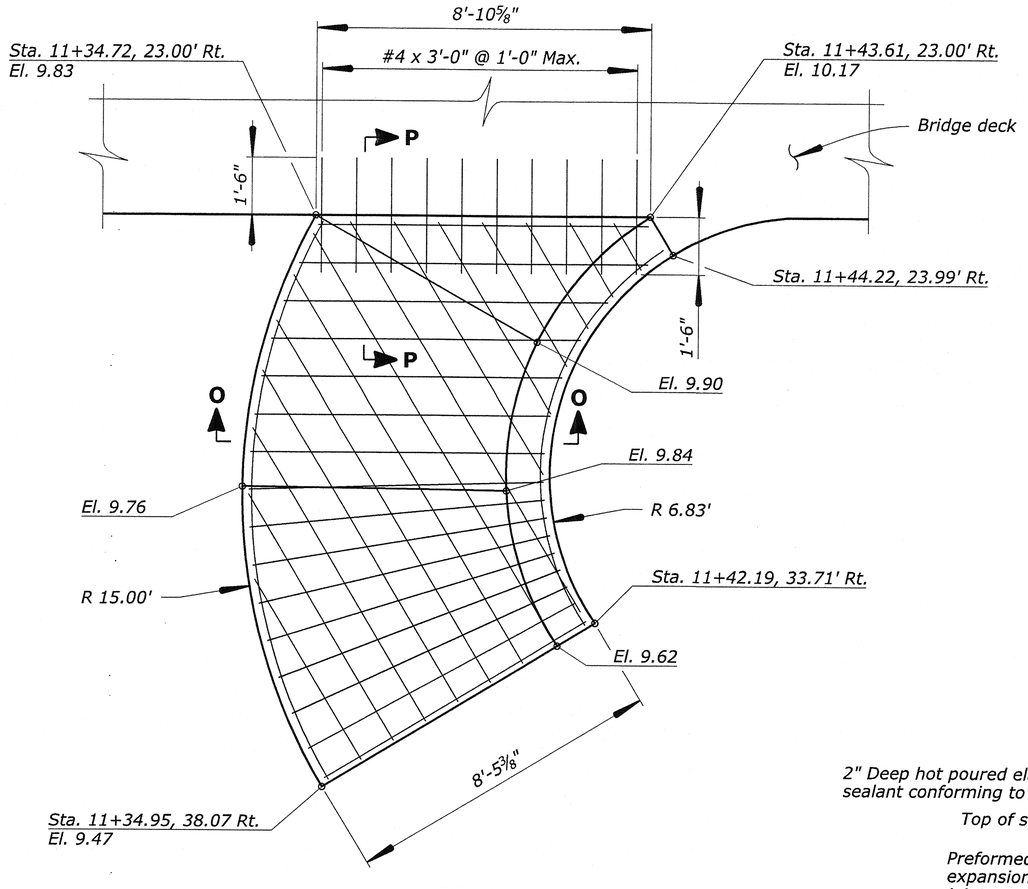
HONOLULU COUNTY, HAWAII

EXPANSION JOINT DETAILS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	G. McGINN	B. LUEBBERS	NO SCALE	J. ROHNER	26 of 35	SEPTEMBER 2016	RG3077-Z

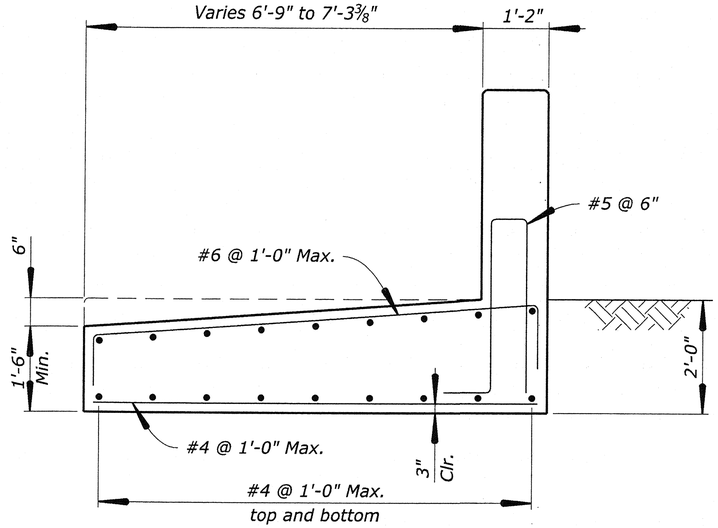
12/29/2016 10:40:23 AM \\denpwp01\pwicsjobs596\251860\205368_12\S26_RG3077_Expansion_Jt.dgn

STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S27



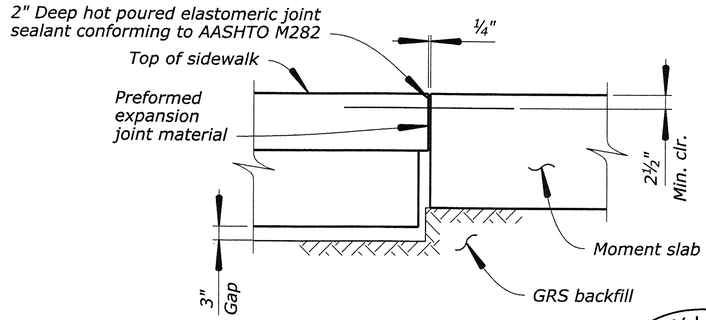
PLAN

(Bottom mat reinforcing shown, top mat similar but most bars end at curb face)
Scale: ¼" = 1'-0"



SECTION O-O

Scale: ⅜" = 1'-0"



SECTION P-P

Scale: ⅜" = 1'-0"

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HALONA STREET BRIDGE

HALONA STREET

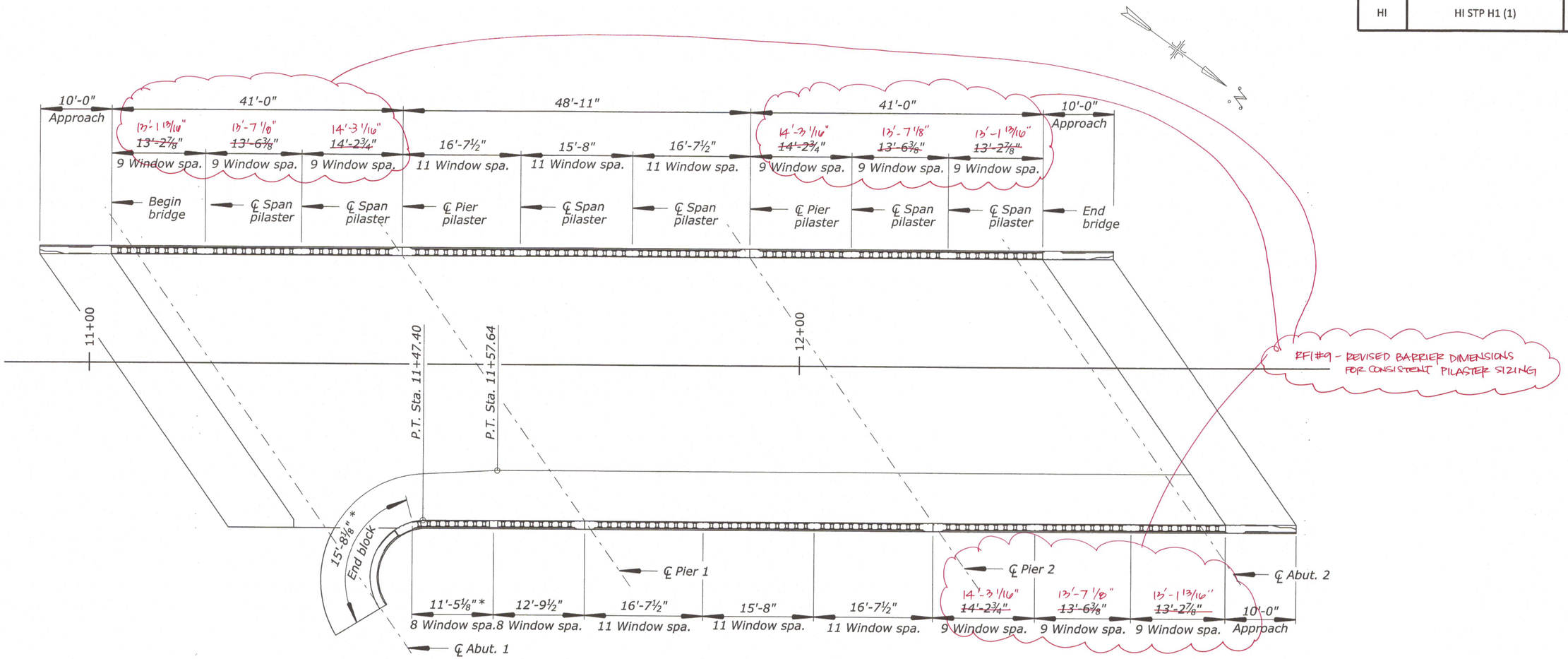
HONOLULU COUNTY, HAWAII

MOMENT SLAB DETAILS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	K. SCHNEIDER	B. LUEBBERS	⅜" = 1'-0" UNLESS NOTED	J. ROHNER	27 of 35	SEPTEMBER 2016	RG3077-AA

12/29/2016 10:40:55 AM \\denpwp01\pwicsjobs596\251860\205368_36\S27_RG3077_Moment Slab.dgn

STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S28



* Measured along front face of barrier

PLAN

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HALONA STREET BRIDGE

HALONA STREET

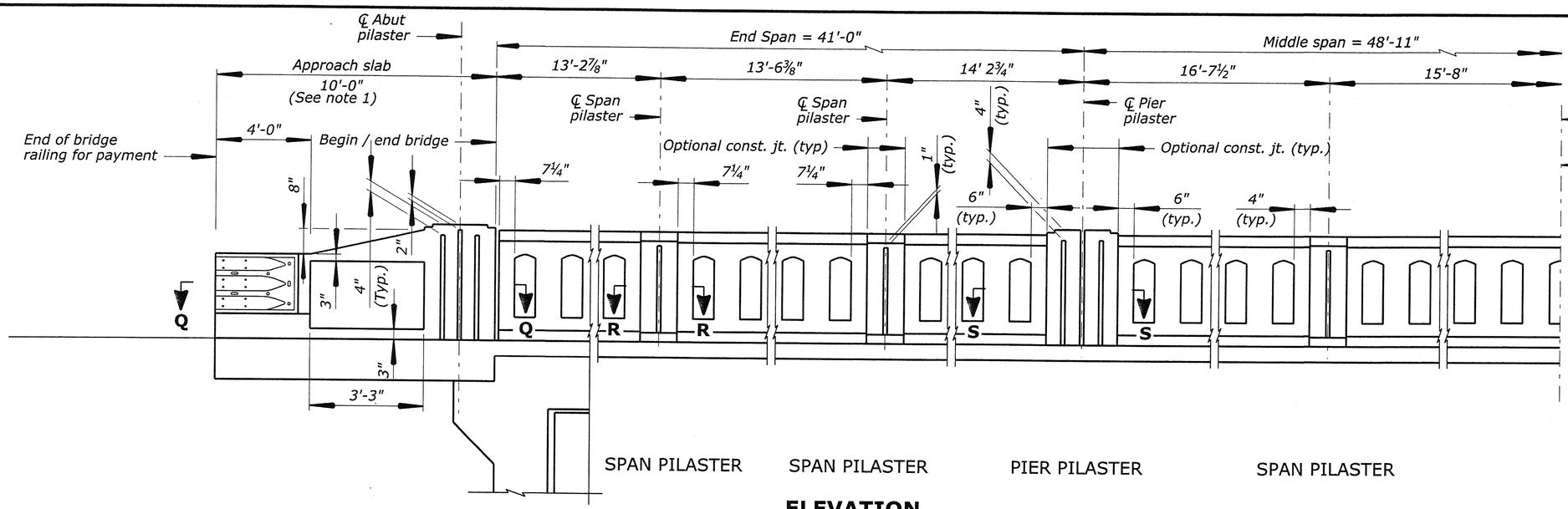
HONOLULU COUNTY, HAWAII

BRIDGE RAILING PLAN

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	G. McGINN	B. LUEBBERS	NO SCALE	J. ROHNER	28 of 35	SEPTEMBER 2016	RG3077-BB

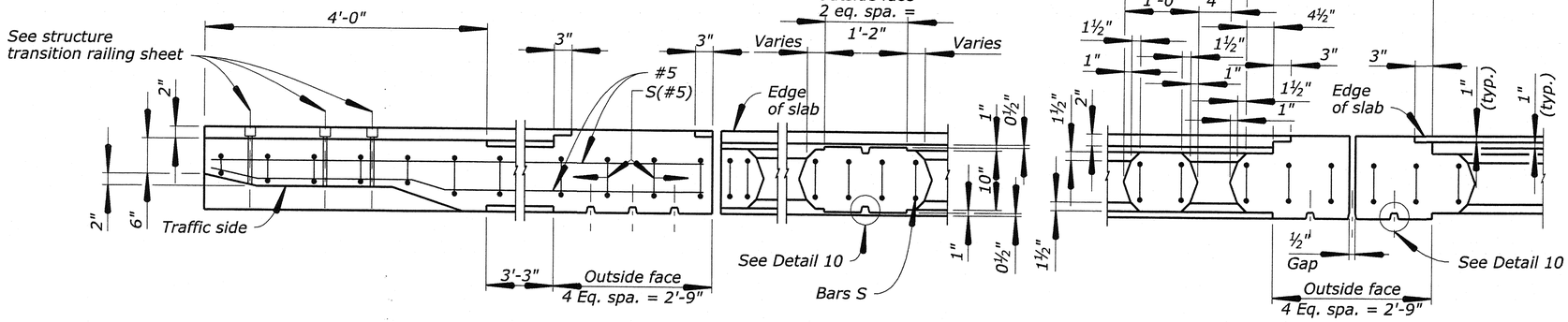
12/29/2016 10:40:23 AM \\denpwp01\pwicsjobs596\251860\205368_17\S28_RG3077_Railing Plan.dgn

STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S29



ELEVATION

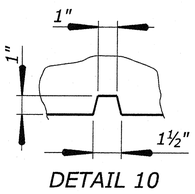
(West railing shown, East side similar except span 1, see note 2)



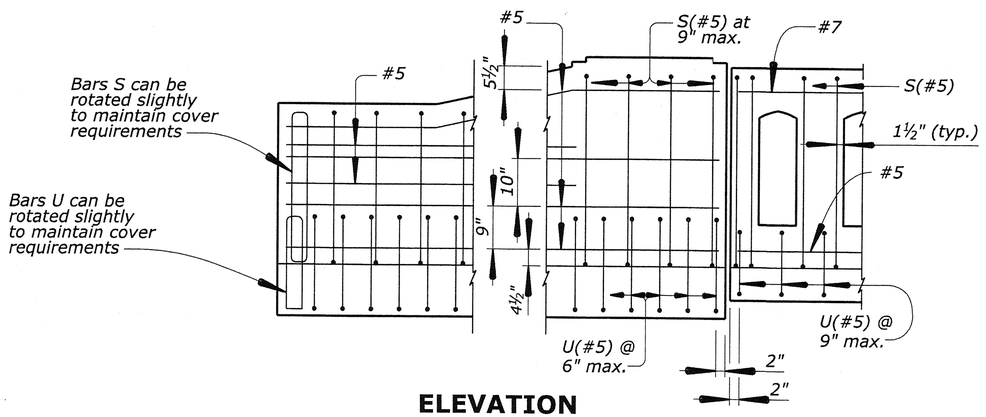
SECTION Q-Q

SECTION R-R

SECTION S-S



DETAIL 10



ELEVATION

(Showing without raised sidewalk)

NOTES:

1. *This rail origintated from the Texas Department of Transportation Type C411 Bridge Rail which meets NCHRP Report 350 guidelines for TL-2.*
2. *End Block length and details shown apply to all corners except curved southeast corner. See "Bridge Railing 3 of 3" for details of that corner.*
3. *Pilaster and window spacing are symmetrical about ℄ of middle span with the exception of the north side of span 1. See "Bridge Railing 3 of 3" for spacing details in that section.*
4. *The 3'-3" insert is intended for placement of the bridge name and date. See "Bridge Identification Detail" on "Bridge Railing 3 of 3".*

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HALONA STREET BRIDGE

HALONA STREET

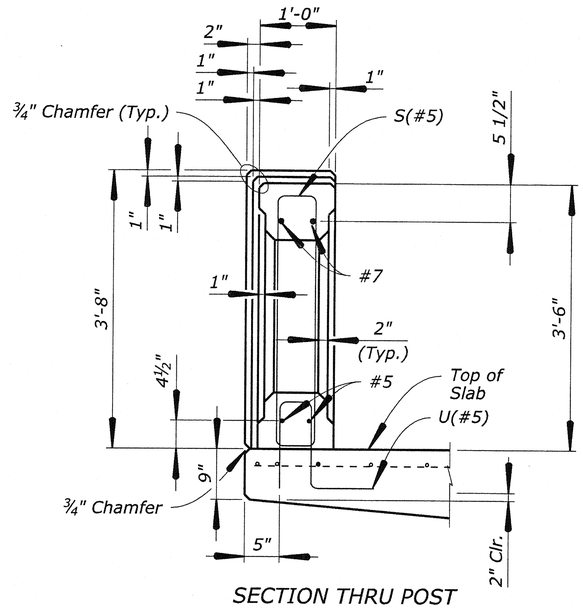
HONOLULU COUNTY, HAWAII

BRIDGE RAILING 1 OF 3

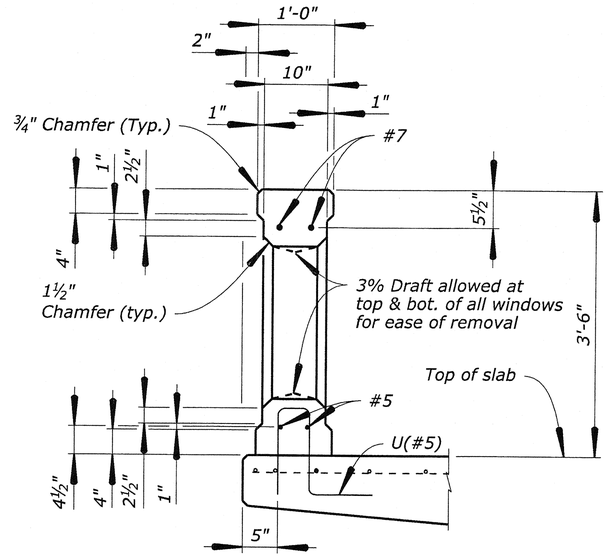
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	G. McGINN	B. LUEBBERS	NO SCALE	J. ROHNER	29 of 35	SEPTEMBER 2016	RG3077-CC

12/29/2016 10:40:10 AM \\denpwp01\pwicsjobs596\251860\205368_5\S29_RG3077_Railing_1.dgn

STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S30

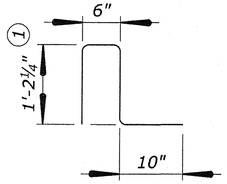


SECTION THRU POST
(Showing pilaster)

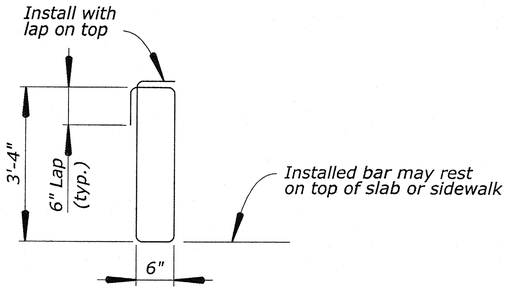


SECTION THRU WINDOW

SECTIONS THRU RAIL WITHOUT SIDEWALK

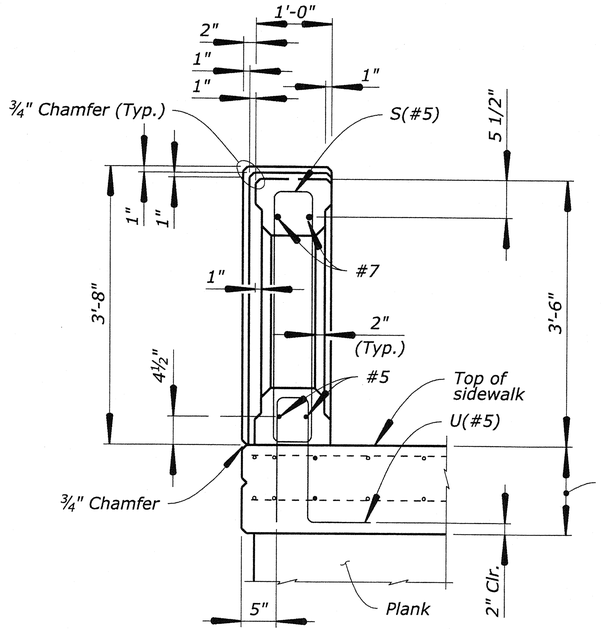


BARS U (#5)

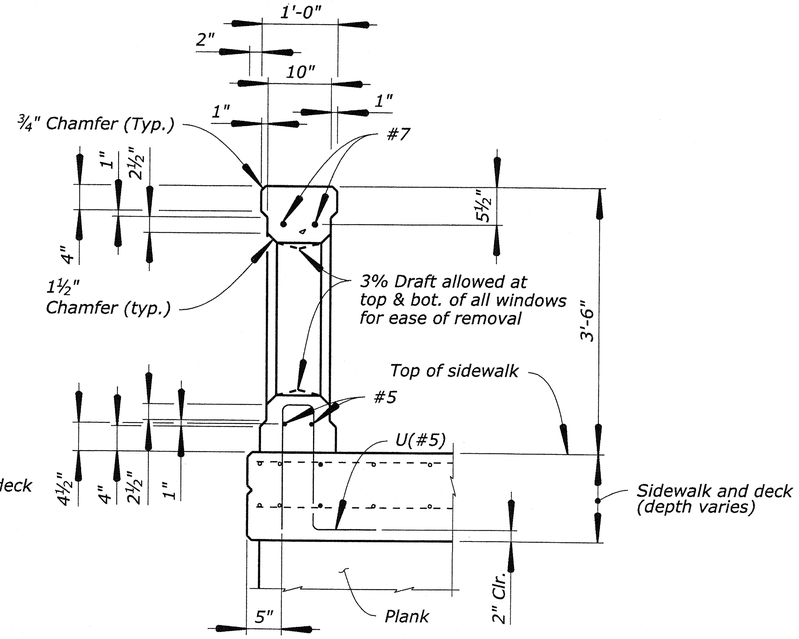


BARS S (#5)

(1) *Increase height by 6" at sidewlk.*



SECTION THRU POST
(Showing pilaster)



SECTION THRU WINDOW

SECTIONS THRU RAIL WITH SIDEWALK

ALEX L FIRTH
LICENSED PROFESSIONAL ENGINEER
No. 16749-S
HAWAII U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature — Expiration Date of the License: 04/30/2018

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HALONA STREET BRIDGE

HALONA STREET

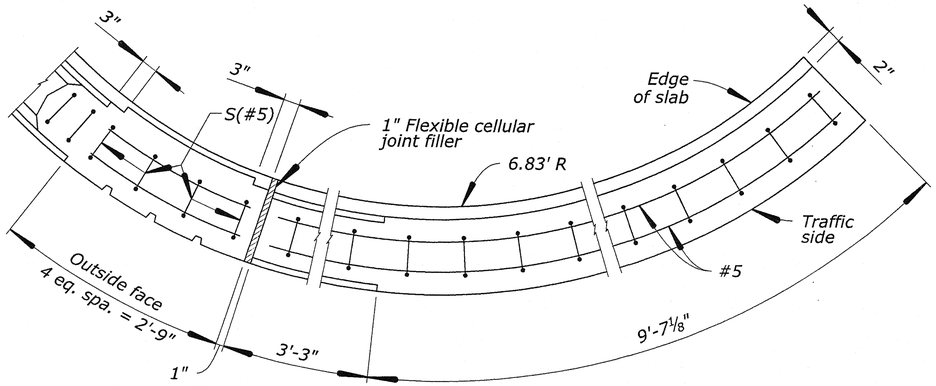
HONOLULU COUNTY, HAWAII

BRIDGE RAILING 2 OF 3

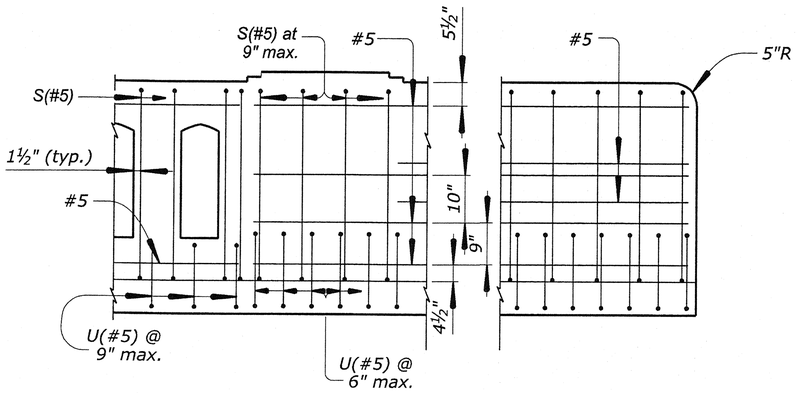
NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	G. McGINN	B. LUEBBERS	½" = 1'-0"	J. ROHNER	30 of 35	SEPTEMBER 2016	RG3077-DD

12/29/2016 10:40:14 AM \\denpwp01\pwicsjobs596\251860\205368_6\S30_RG3077_Railing_2.dgn

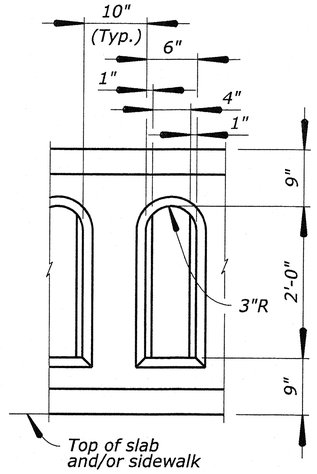
STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S31



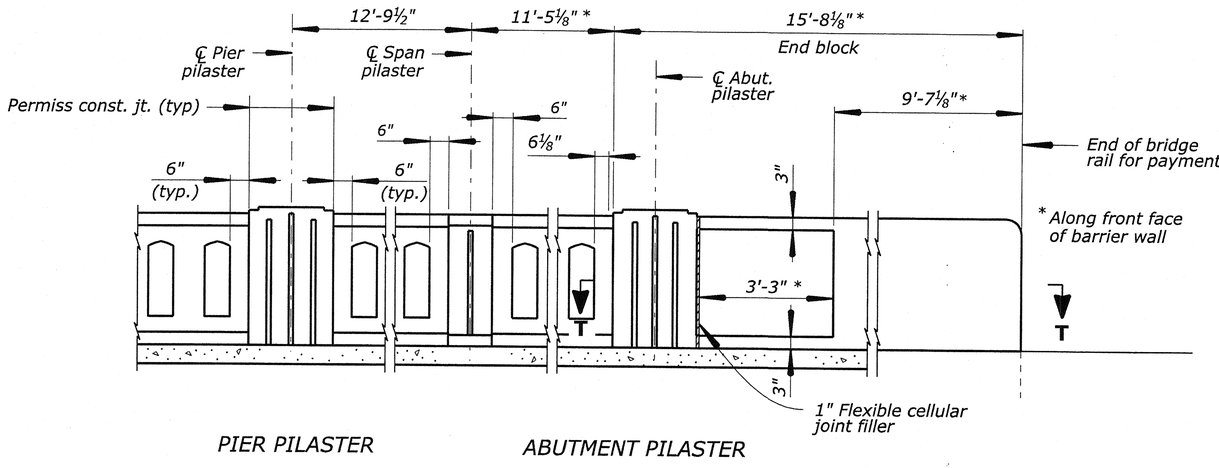
SECTION T-T



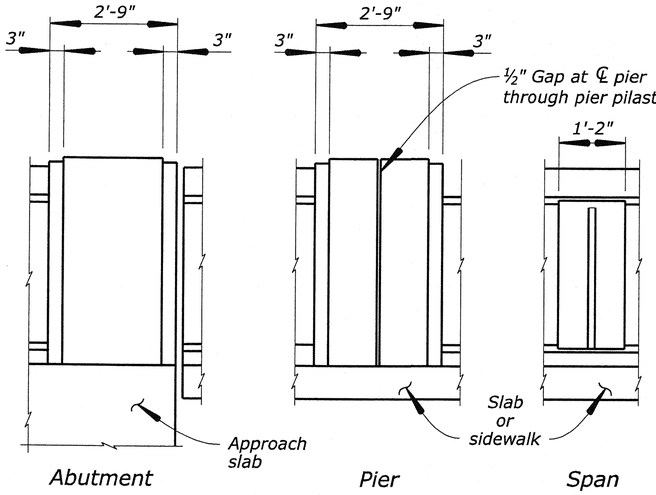
ELEVATION
(Showing without raised sidewalk)



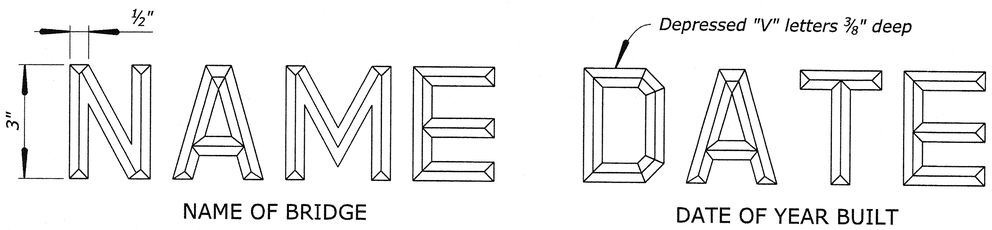
WINDOW



SPAN 1 RIGHT SIDE ELEVATION



EXTERIOR PILASTER ELEVATIONS
(Showing without sidewalk)



BRIDGE IDENTIFICATION DETAIL

NOTES:

1. *Exact details and spacing of letter and location shall be as directed by the CO. Gothic letters and figures approximating the dimensions shown will be acceptable if approved by the CO.*
2. *Name and date shall be placed on the trailing (exit) end post on each side of bridge.*
3. *Unless otherwise directed by the CO, the name of the bridge shall be "HALONA STREET BRIDGE". The year shall be the year at completion.*

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04/30/2018

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HALONA STREET BRIDGE

HALONA STREET

HONOLULU COUNTY, HAWAII

BRIDGE RAILING 3 OF 3

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	G. McGINN	B. LUEBBERS	NO SCALE	J. ROHNER	31 of 35	SEPTEMBER 2016	RG3077-EE

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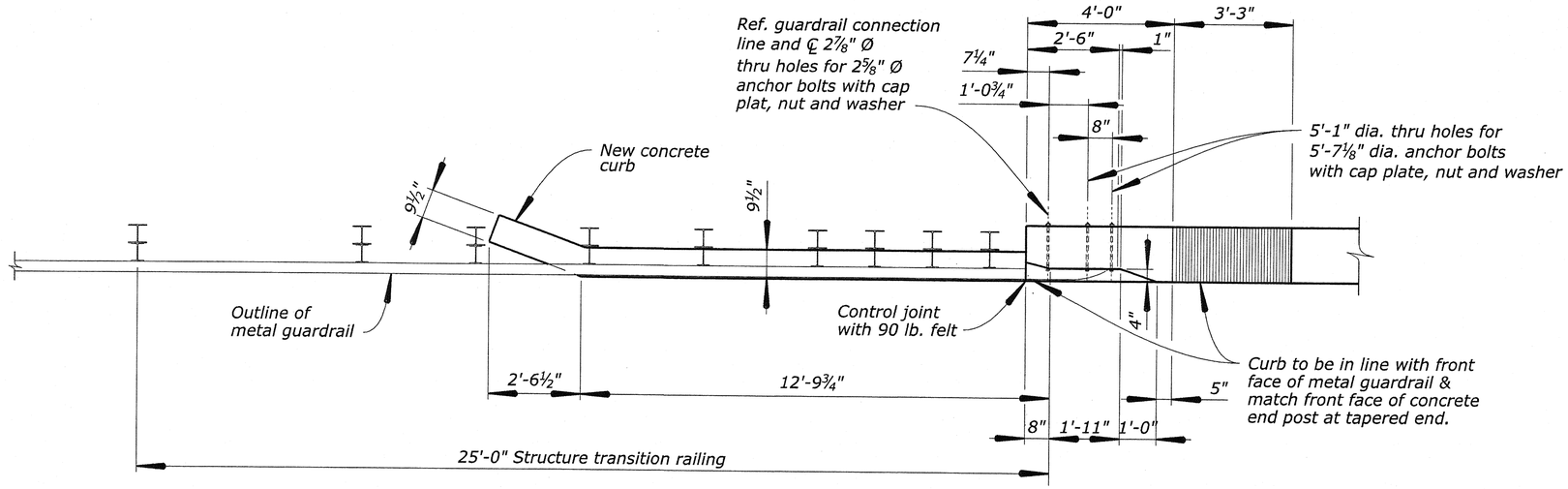
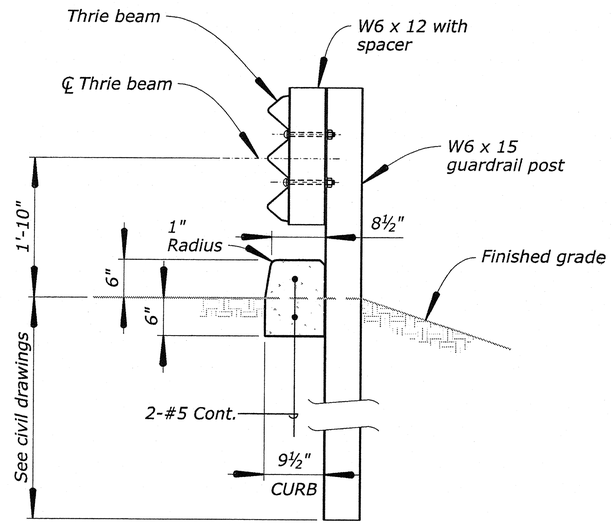
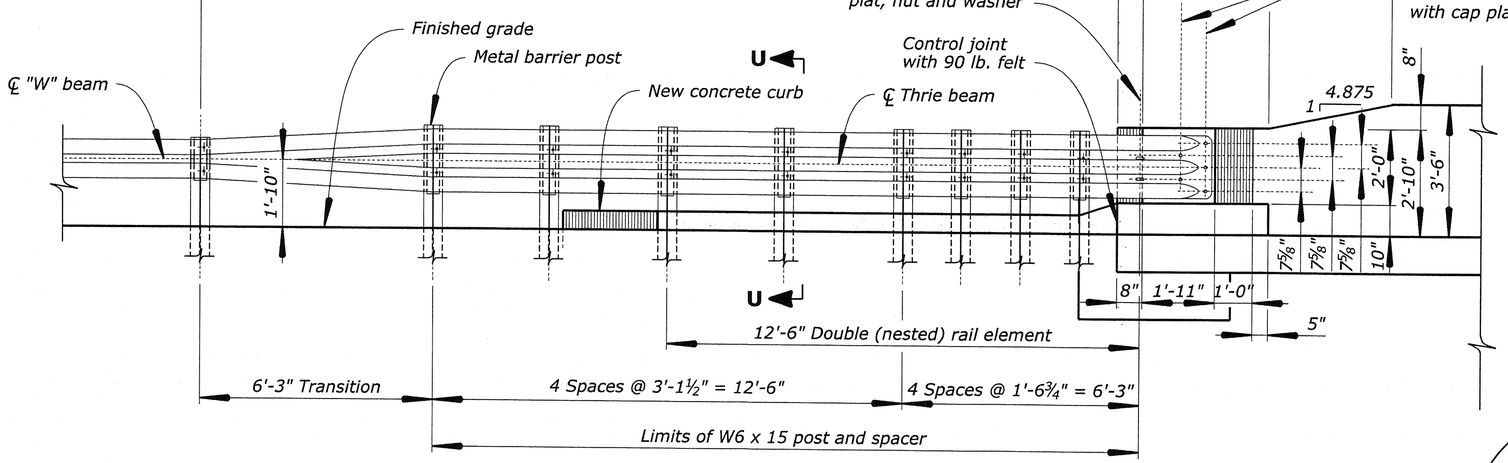
STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S32



PLAN



SECTION U-U



ELEVATION

NOTES:

1. Lap terminal connector and rail element in direction of traffic to prevent snagging.
2. Terminal connector "Transition section" and thrie beam shall be fabricated from 10 gauge steel conforming to the requirements of AASHTO M180, Type II, Class B.
3. "Terminal connector" and standard spacer, including all anchor bolts, cap plate, nuts and washers, shall be hot-dip galvanized after fabrication.
4. Double (nest of panel) thrie beam elements at all end post connections.
5. Where double (nested) beam occur, 12" "Back-up plate" not required.
6. Heads of through anchor bolts shall be placed on the traffic side of the rail.

ALEX L FIRTH
LICENSED PROFESSIONAL ENGINEER
No. 16749-S
HAWAII U.S.A.

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Signature — Expiration Date of the License: 04/30/2018

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HALONA STREET BRIDGE

HALONA STREET

HONOLULU COUNTY, HAWAII

STRUCTURE TRANSITION RAILING

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	G. McGINN	B. LUEBBERS		J. ROHNER	32 of 35	SEPTEMBER 2016	RG3077-FF

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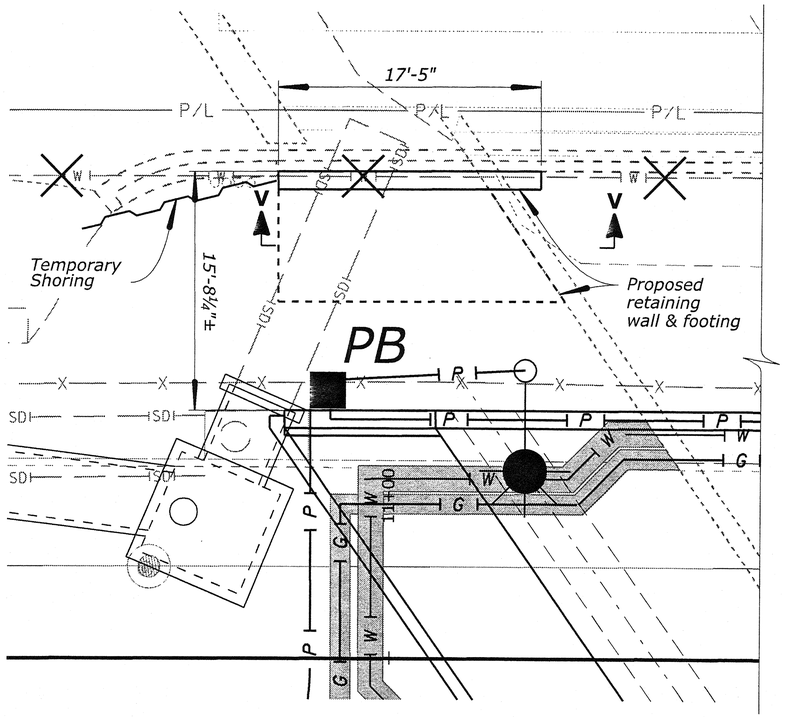
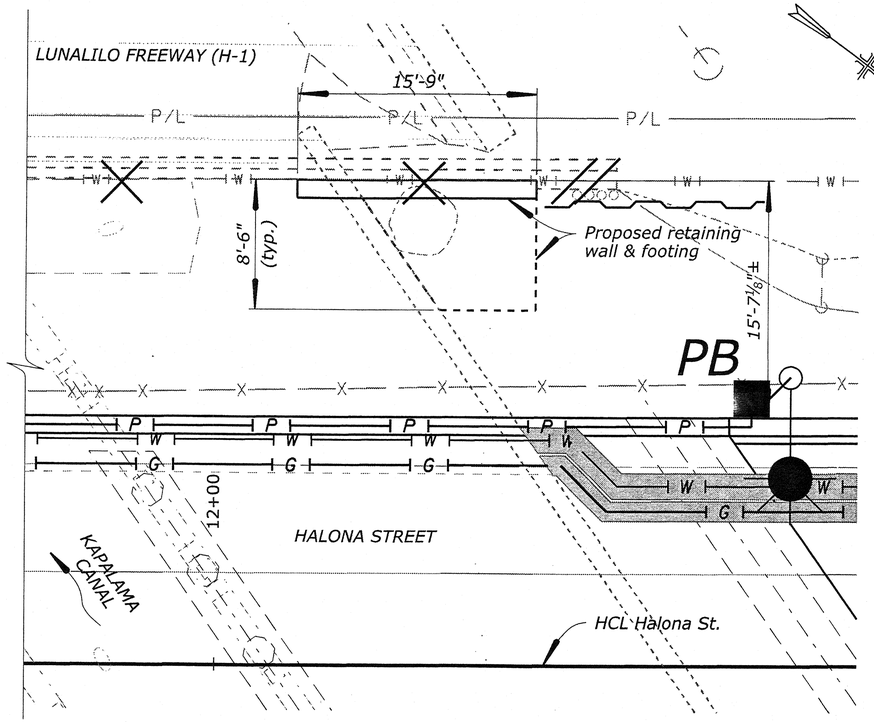
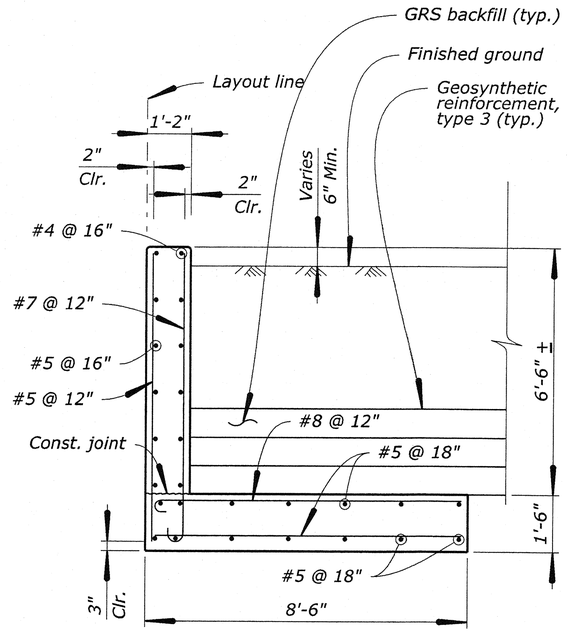
STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S33

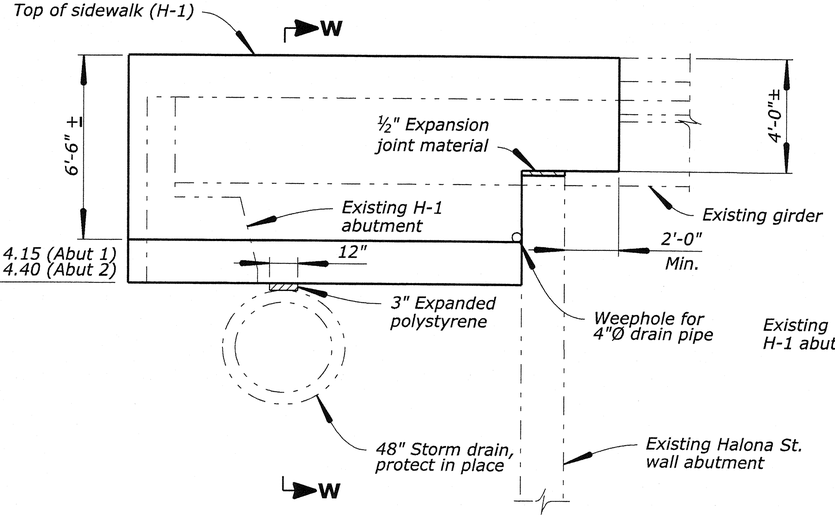




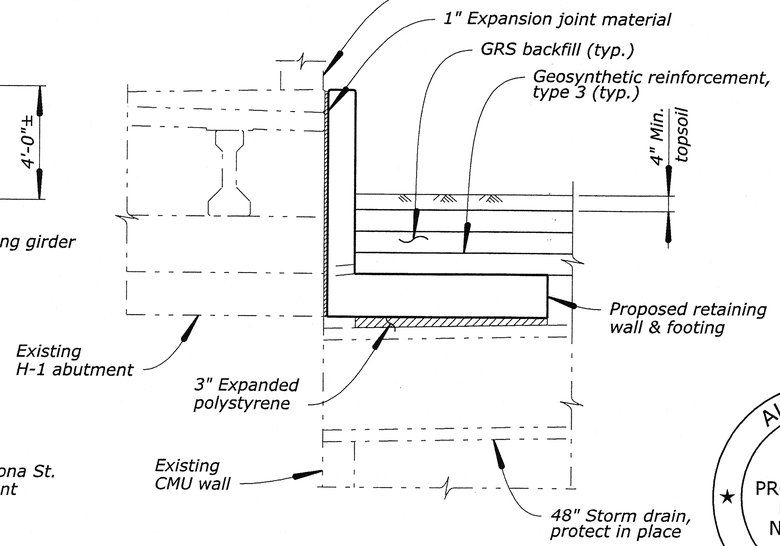
PLAN
Scale: 1" = 10'-0"



REINFORCEMENT DETAIL
Scale: ¼" = 1'-0"



SECTION V-V
Scale: 3/16" = 1'-0"
(Abutment 2 wall shown, Abutment 1 wall similar)



SECTION W-W
Scale: 3/16" = 1'-0"

NOTES:

1. *Contractor shall verify distance from H-1 bridge to new Halona Street bridge.*
2. *See "Abutment Details 1 of 2" for GRS backfill details.*
3. *Top of retaining wall shall match bottom of H-1 barrier. The contractor shall verify the elevation before fabricating reinforcing steel or beginning wall construction.*
4. *Temporary shoring shall be used as needed to maintain the integrity and stability of the H-1 bridge when excavating behind the canal walls and constructing the retaining walls and placing GRS backfill.*

ALEX L FIRTH
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HAWAII U.S.A.

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Signature *Expiration Date of the License* 04/30/2018

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HALONA STREET BRIDGE

HALONA STREET

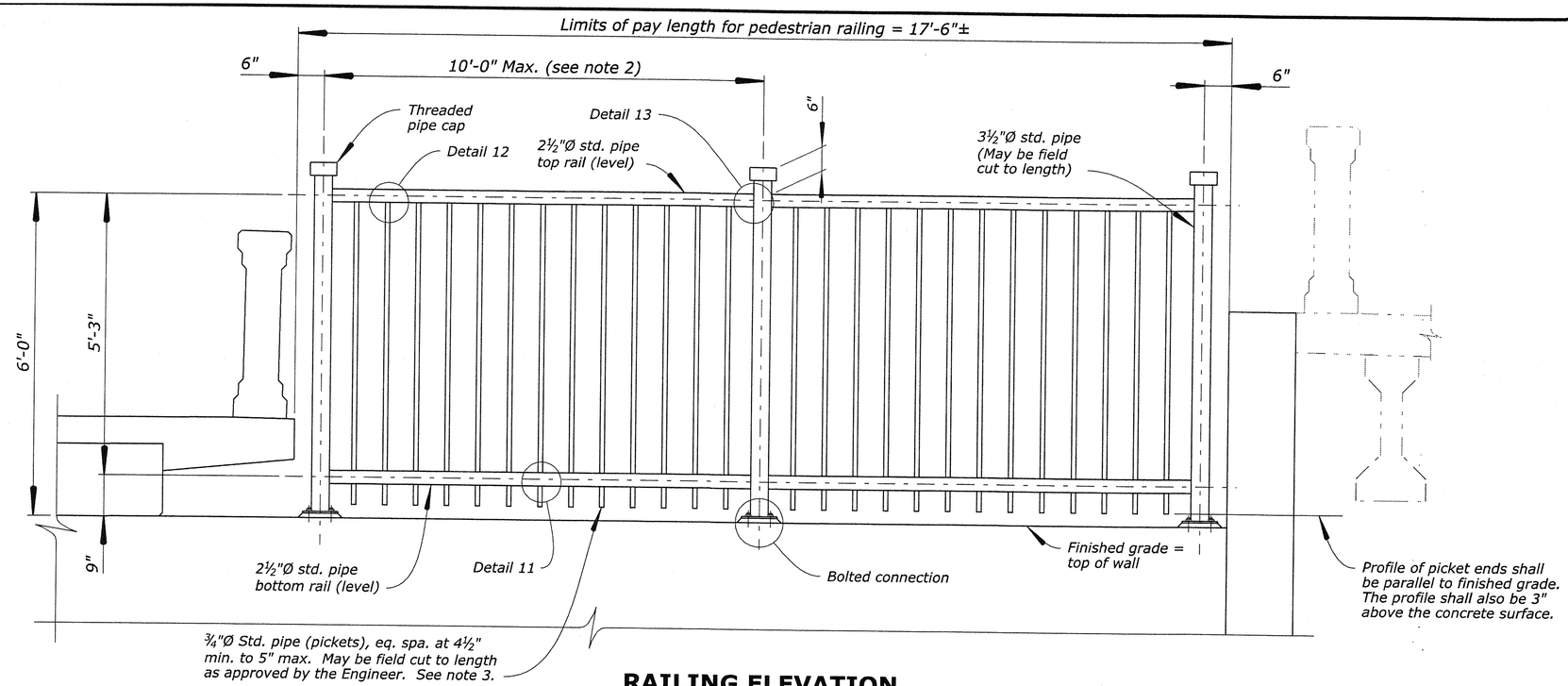
HONOLULU COUNTY, HAWAII

RETAINING WALL DETAILS

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	K. SCHNEIDER	B. LUEBBERS	1" = 10'-0" UNLESS NOTED	J. ROHNER	33 of 35	SEPTEMBER 2016	RG3077-GG

12/29/2016 10:40:46 AM \\denpwp01\pwicsjobs596\251860\205368_21\S33_RG3077_RetWall_1.dgn

STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S34

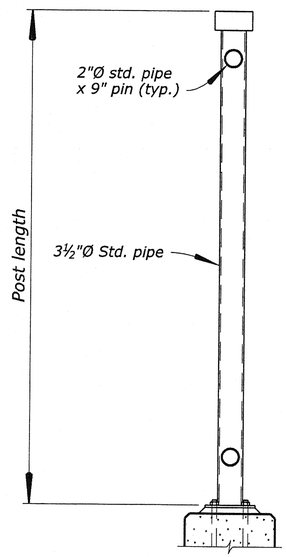


RAILING ELEVATION

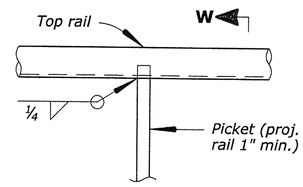
(Looking from channel, Abutment 1 shown, Abutment 2 similar)

NOTES:

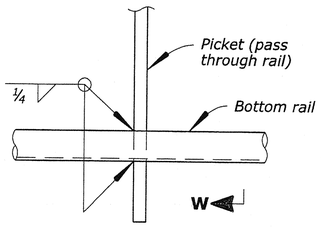
1. Posts may be field fabricated as approved by the Engineer. No detail changes will be allowed to field fabricate posts. Posts with misaligned pins will be rejected.
2. All railing panels shall be shop fabricated.
3. Seal picket ends with threaded pipe caps when not installed next to a curb. Field cut ends, without pipe caps, shall be ground smooth to preclude personal injury to the general public.
4. All pipe shall meet the requirements in ASTM A53 for Grade B steel and all plates and bars shall meet the requirements in AASHTO M270 for Grade 36 steel.
5. Holes in rails, for pickets, and holes in posts, for pins, shall be drilled.
6. Railing components shall be galvanized in accordance with ASTM A123, and then painted black with Class 2 paint in accordance with Section 563 of the specifications.



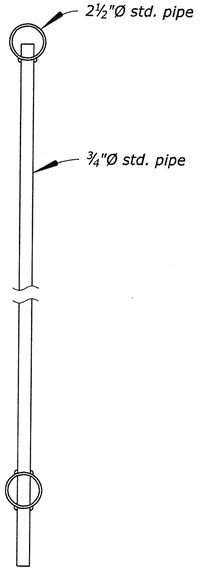
POST DETAIL



DETAIL 12
(See note 5)

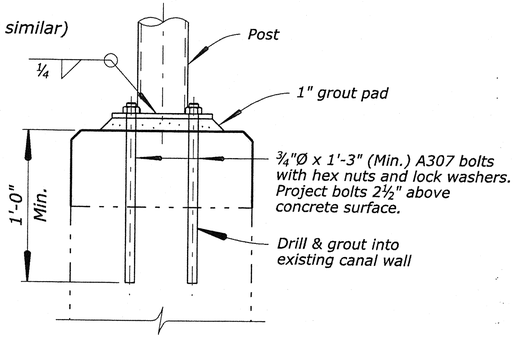


DETAIL 11
(See note 5)

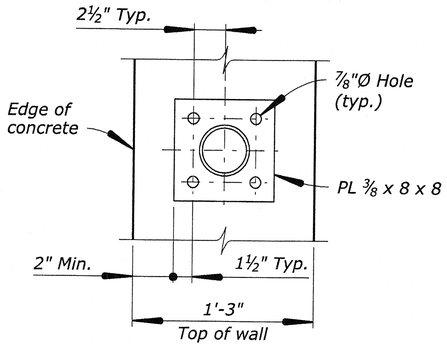


SECTION W-W

RAILING PANEL DETAIL

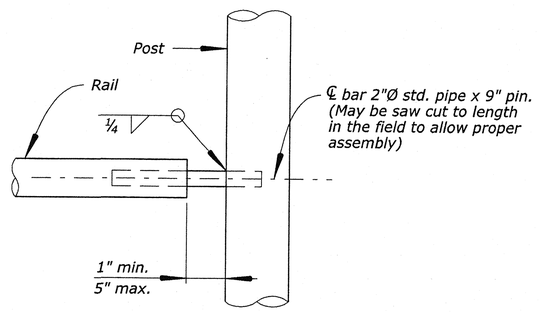


ELEVATION



PLAN

BOLTED CONNECTION



DETAIL 13
(See note 5)

ALEX L FIRTH
LICENSED PROFESSIONAL ENGINEER
No. 16749-S
HAWAII U.S.A.

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Signature

04/30/2018
Expiration Date of the License

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FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HALONA STREET BRIDGE

HALONA STREET

HONOLULU COUNTY, HAWAII

PEDESTRIAN RAILING

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	K.SCHNEIDER	B. LUEBBERS	NO SCALE	J. ROHNER	34 of 35	SEPTEMBER 2016	RG3077-HH

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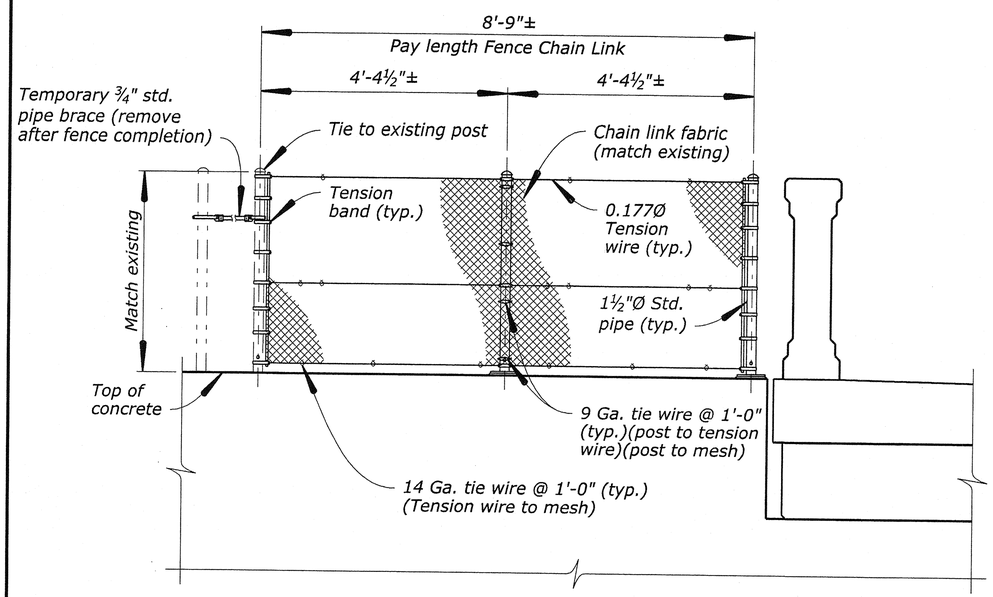
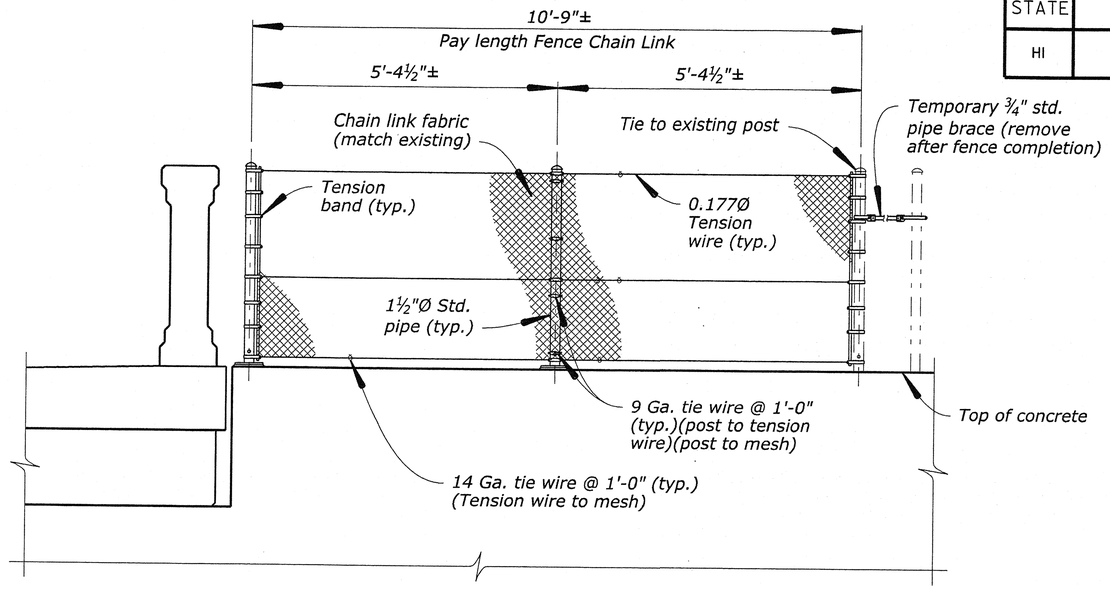
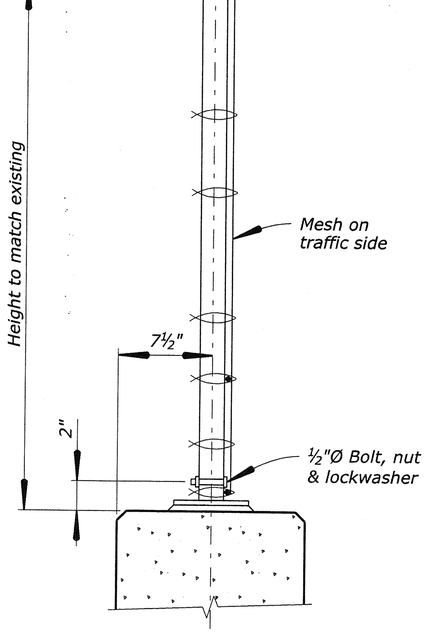
STATE	PROJECT	SHEET NO.
HI	HI STP H1 (1)	S35



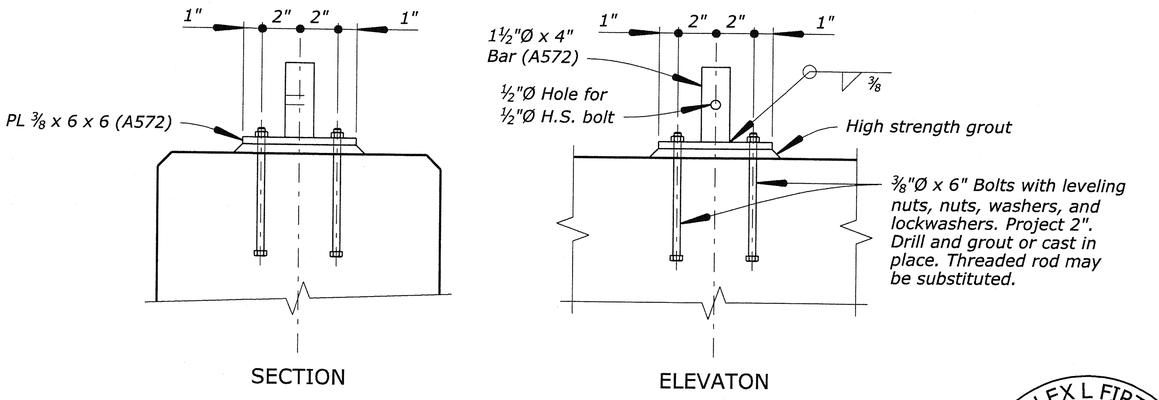
FENCE ELEVATION AT ABUTMENT 1
(Looking from channel)



FENCE ELEVATION AT ABUTMENT 2
(Looking from channel)



TYPICAL SECTION



ANCHORAGE DETAILS

NOTES:

1. Anchorage assembly shall be galvanized after fabrication.
2. Tension rods and wires shall have turnbuckles.
3. Posts shall be vertical.
4. Pipe shall conform to ASTM A53 Type E or S, Grade B.
5. Assume existing fence height is 4'-0" or less.

ALEX L FIRTH
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HAWAII U.S.A.

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FEDERAL HIGHWAY ADMINISTRATION
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HALONA STREET BRIDGE

HALONA STREET

HONOLULU COUNTY, HAWAII

FENCE CHAIN LINK

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								A. PLANKIS	K.GUNDERSON	B. LUEBBERS	NO SCALE	J. ROHNER	35 of 35	SEPTEMBER 2016	RG3077-II

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