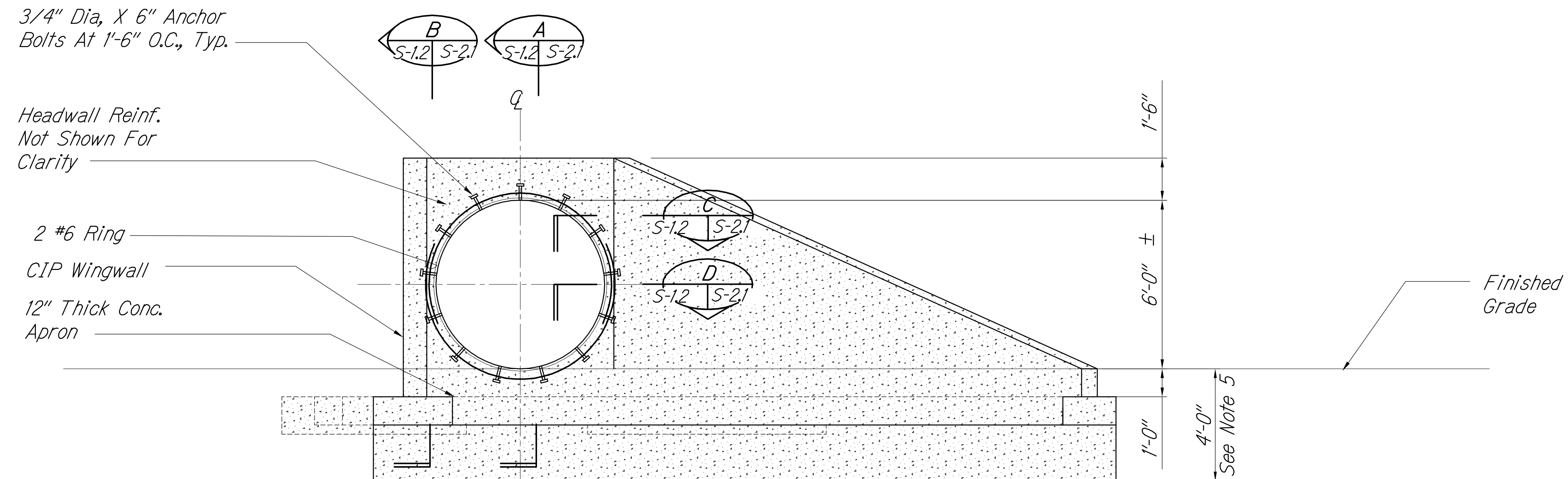


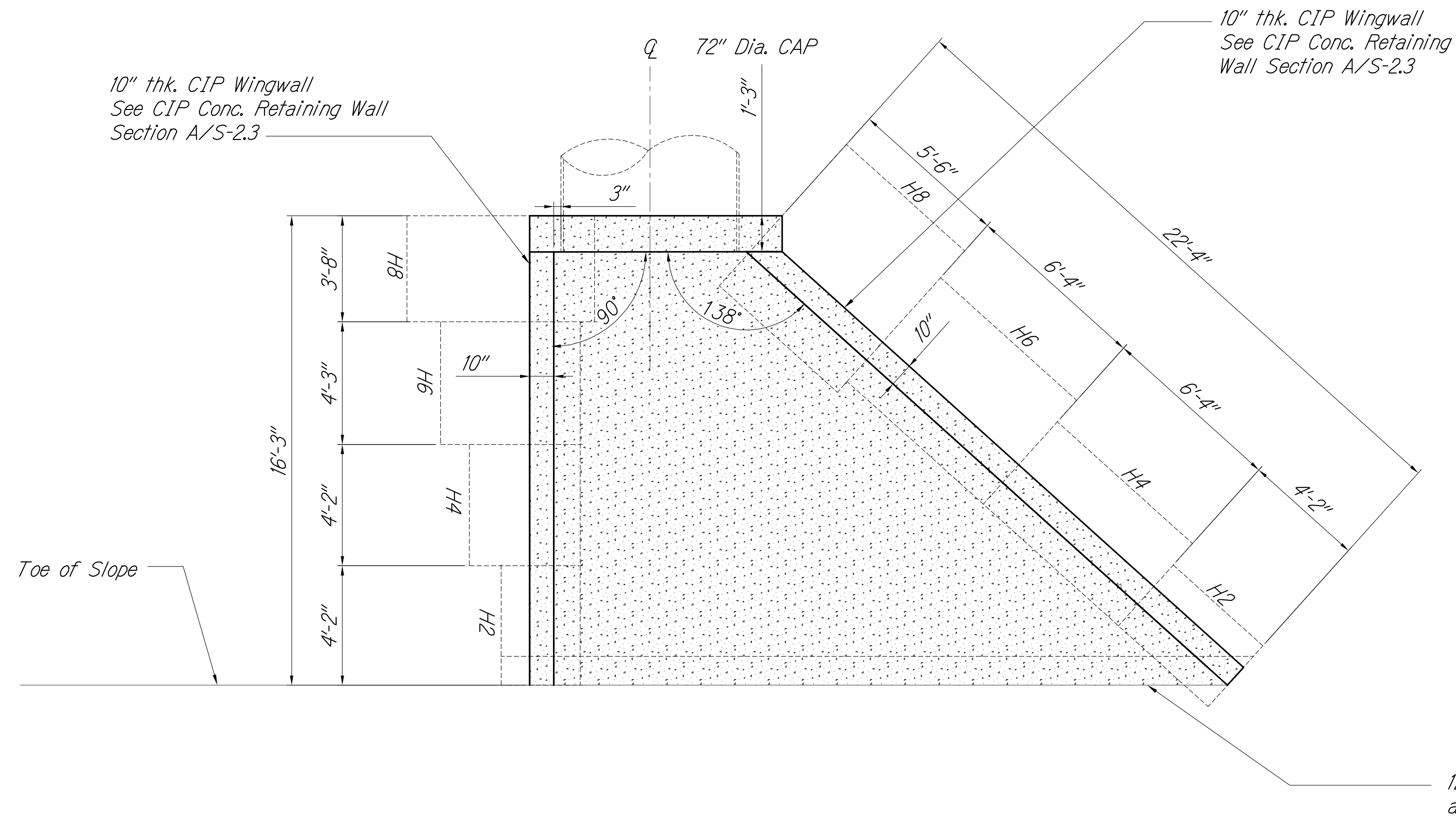
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-019-1(38)P	2016	495	528 522



ELEVATION - NEW HEADWALL FOR 72" DIA. CAP CULVERT
Scale: 3/8" = 1'-0"

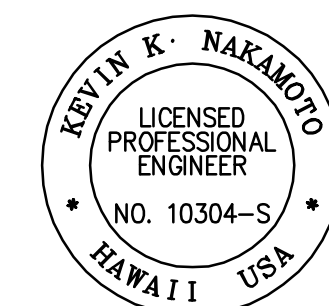
Notes:

1. *Stud Bolts Shall Be Stainless Steel (See C/S-24). Hot Dip Galvanized Bolts with Neoprene Washers and Sleeves are Acceptable, Provided it Does Not Affect the Manufacturer's Warranty.*
2. *Contractor Shall Coordinate Minimum Cover Over CAP Culvert Required For Construction Equipment Used With Culvert Manufacturer.*
3. *Heavy Compacting Equipment Shall Not Be Used Directly Over CAP Culvert.*
4. *Balance Culvert Backfill Per Manufacturer's Instructions*
5. *Cutoff Wall Depth Shall be 4' as Shown or to Solid Basalt, Whichever is Less, But Not Less Than 2'.*




PLAN - NEW HEADWALL FOR 72" DIA. CAP CULVERT
Scale: 3/8" = 1'-0"

12" Thk. Conc. Apron
and Cutoff Wall




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CONSTRUCTION OF THIS PROJECT
WILL BE UNDER MY OBSERVATION.

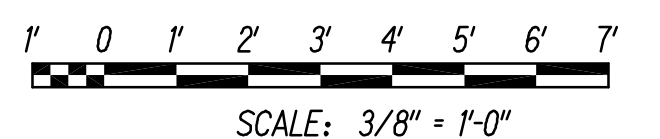
 APRIL 30, 2018

SIGNATURE EXPIRATION DATE
OF THE LICENSE

LEGEND FOR AS-BUILT POSTINGS

- | | |
|---|-------------------------------------|
|  | Squiggly line for as-built deletion |
| 100.00 | Double line for as-built deletion |
| Roadway | Text for as-built posting |

GRAPHIC SCALES



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CULVERT E - 72" CAP
PLAN AND ELEVATION

QUEEN KAAHUMANU HIGHWAY WIDENING

Kealahou Pkwy. To Keahole Airport Rd. (Ph. 2)
Federal Aid Project No. NH-019-1(38)R

Scale: AS NOTED Date: AUGUST 2016

SHEET No. S-12 OF 18 SHEETS

M:\2008\2008_003.001 GBI Queen K Hwy Award\G Drawings\Contract Documents\Structural\S-1_2 Culvert E Outlet.dwg 8/16/2016 2:32 PM

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-019-1(38)R	2016	496	528

HDPE/LDPE Composite Membrane, Lay Flat or to Match Backfill Slope, Extend to Edge of Footing Heel

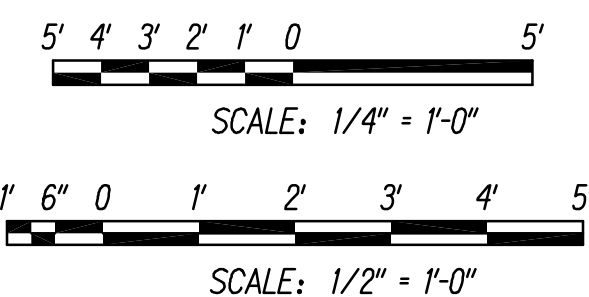
Structural Backfill Type A

Square Screen At Weephole Opening With 1 Cu. Ft. (min) Of Gravel (No. 67 Gradation) Wrapped With A Permeable Separator

Flashing Compound or Continuous ADEKA KBA-1510FP Water Stop (or Approved Equal) Installed in Joint with 1" Minimum Concrete Clear Cover

LEGEND FOR AS-BUILT POSTINGS	
	Squiggly line for as-built deletion
	Double line for as-built deletion
	Text for as-built posting

GRAPHIC SCALES



DATE	REVISION
7/13/16	Added Wing Wall Section and Schedule and revised callout for waterproofing at joint. Revised Wing Wall Schedule and Wing Wall Section.
1/22/15	Modified Dimension of Headwall Height in Elevation View

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CULVERT L - DOUBLE 96" CAP
PLAN, ELEVATION AND SECTION

QUEEN KAAHUMANU HIGHWAY WIDENING
Kealahke Pkwy. To Keahole Airport Rd. (Ph. 2)
Federal Aid Project No. NH-019-1(38)R

Scale: AS NOTED Date: AUGUST 2016

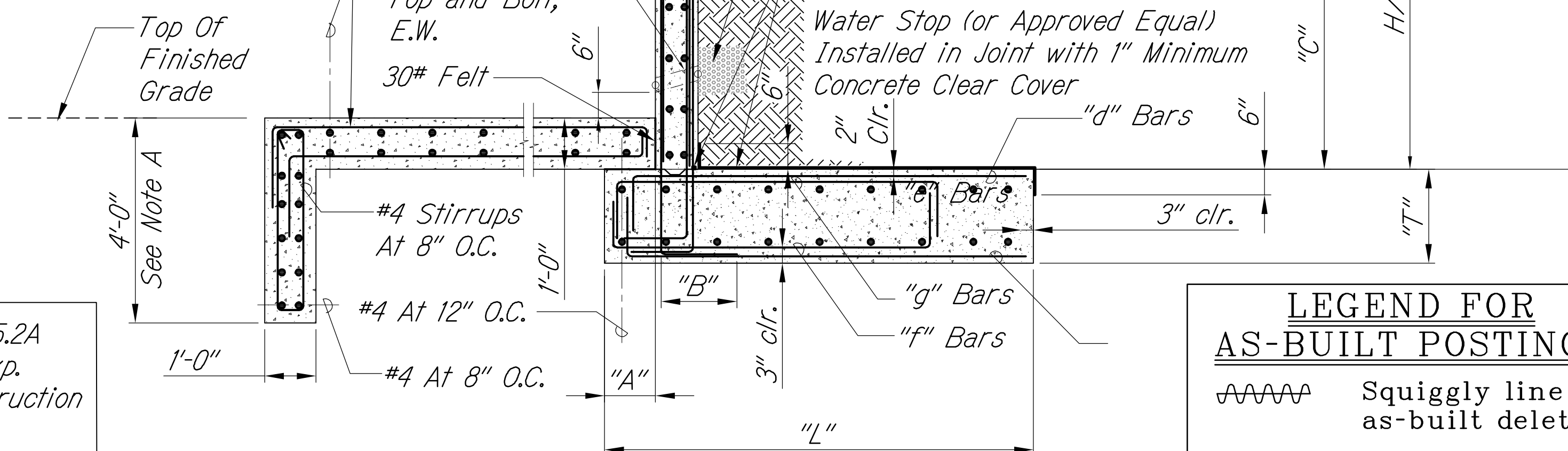
SHEET No. S-1.3 OF 18 SHEETS



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SIGNATURE: [Signature] EXPIRATION DATE OF THE LICENSE: APRIL 30, 2018

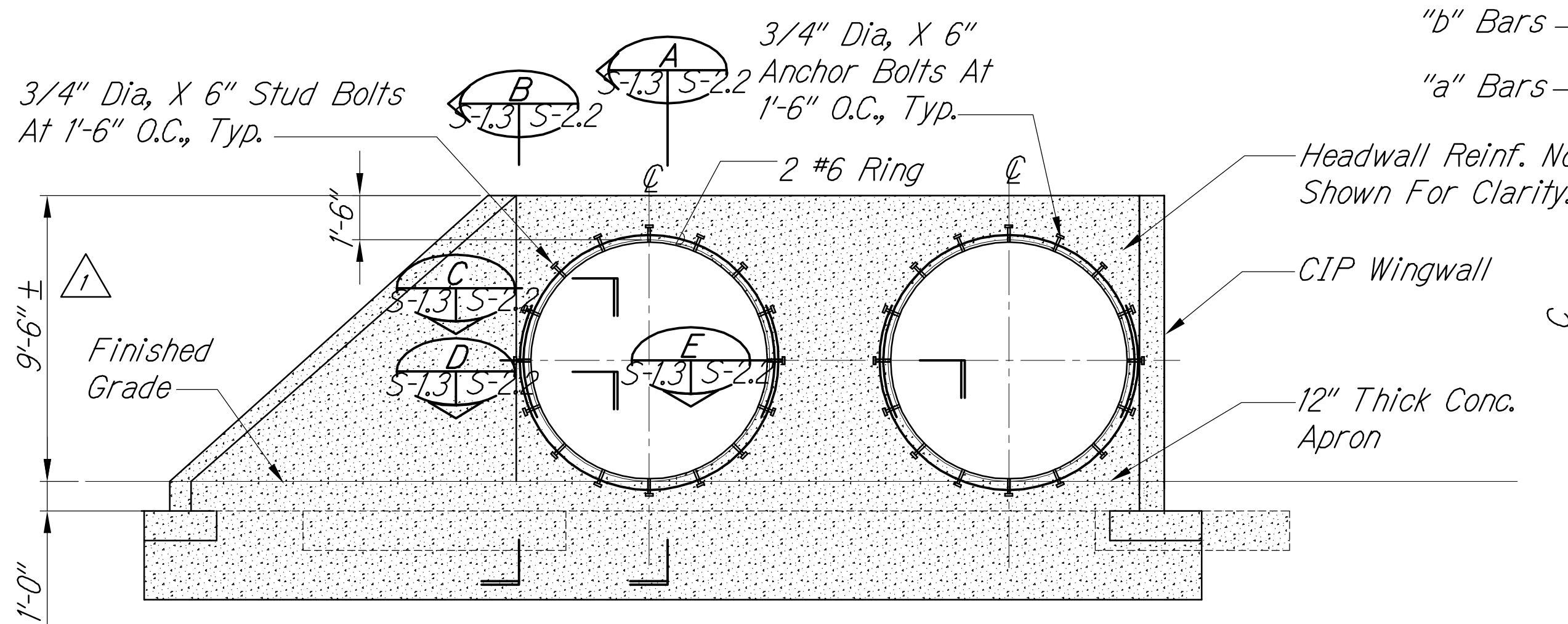
TYPICAL LAYOUT OF BARS "a", "b"
NOT TO SCALE



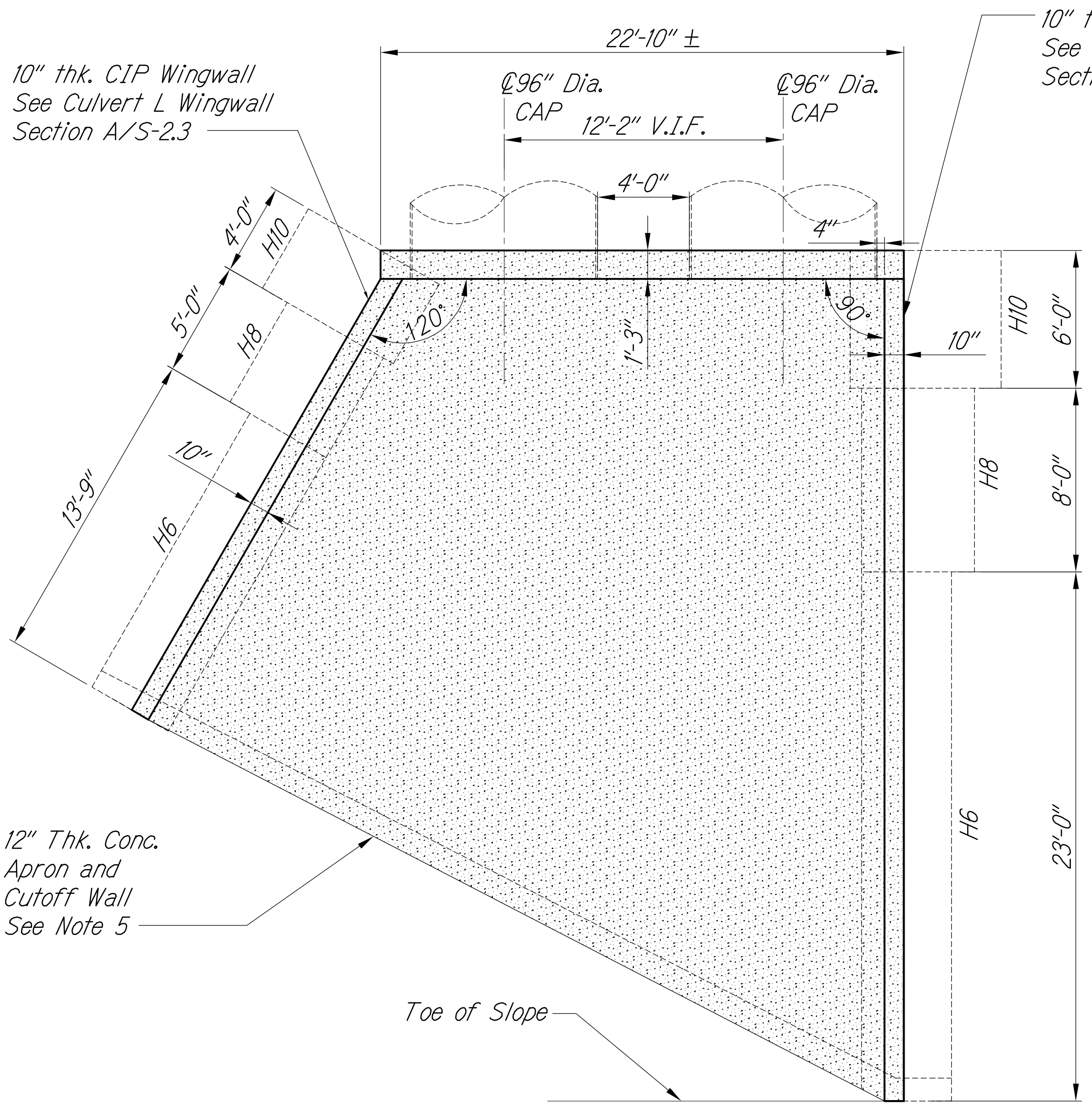
CULVERT L WINGWALL SECTION
Scale: 1/2" = 1'-0"

Wall Mark	"H" (Max)	T	L	A	B	C	a	b	d	e	f	g
H6	6'	12"	6'-0"	1'-0"	10"	2'-8"	#5@8"	#4@8"	#5@9"	#4@12"	#4@12"	#5@9"
H8	8'	16"	7'-0"	1'-0"	10"	2'-8" (#5), 3'-2" (#6)	#5@8", #6@8"	#5@8"	#5@6"	#4@12"	#4@12"	#5@6"
H10	10'	16"	7'-8"	1'-6"	12"	2'-8" (#5), 3'-2" (#6)	#5@6", #6@6"	#4@6"	#6@9"	#4@12"	#6@12"	#6@9"

- Notes:
- Stud Bolts Shall Be Stainless Steel (See C/S-2.4). Hot Dip Galvanized Bolts with Neoprene Washers and Sleeves are Acceptable, Provided it Does Not Affect the Manufacturer's Warranty.
 - Contractor Shall Coordinate Minimum Cover Over CAP Culvert Required For Construction Equipment Used With Culvert Manufacturer.
 - Heavy Compacting Equipment Shall Not Be Used Directly Over CAP Culvert.
 - Balance Culvert Backfill Per Manufacturer's Instructions
 - Cutoff Wall Depth Shall be 4' as Shown or to Solid Basalt, Whichever is Less, But Not Less Than 2'.



ELEVATION - NEW HEADWALL FOR DOUBLE 96" DIA. CAP CULVERT
Scale: 1/4" = 1'-0"

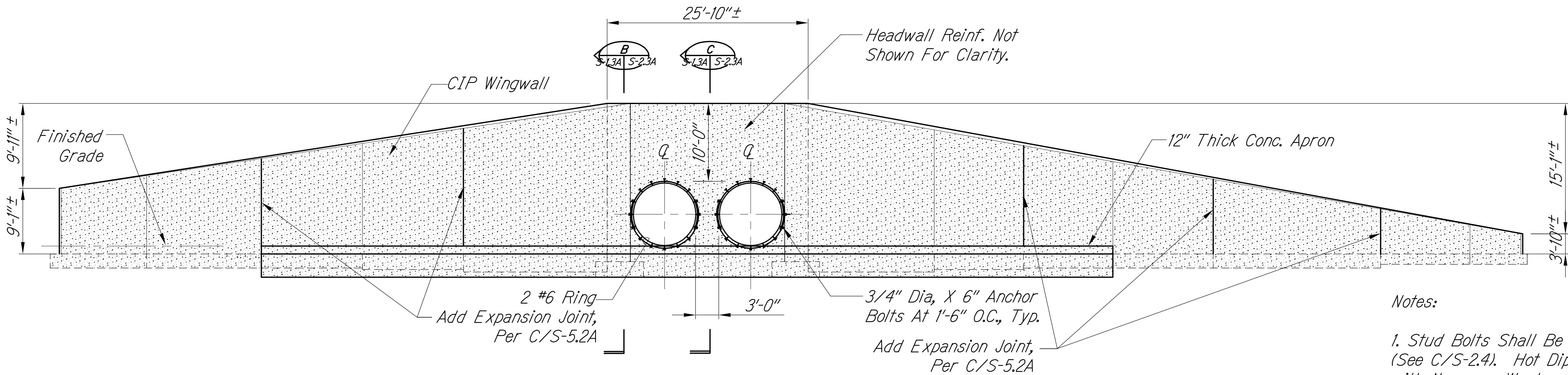


PLAN - NEW HEADWALL FOR DOUBLE 96" DIA. CAP CULVERT
Scale: 1/4" = 1'-0"

DESIGNED BY	DATE
NOTED BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
No.	

M:\2008\2008_003.002 GBI Queen K Hwy Redesign\G Dwg\Contract Documents\Structural\S-1_3 Culvert L Outlet.dwg 8/16/2016 2:15 PM

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-019-1(38)R	2016	C.O. 496S-1	528 522

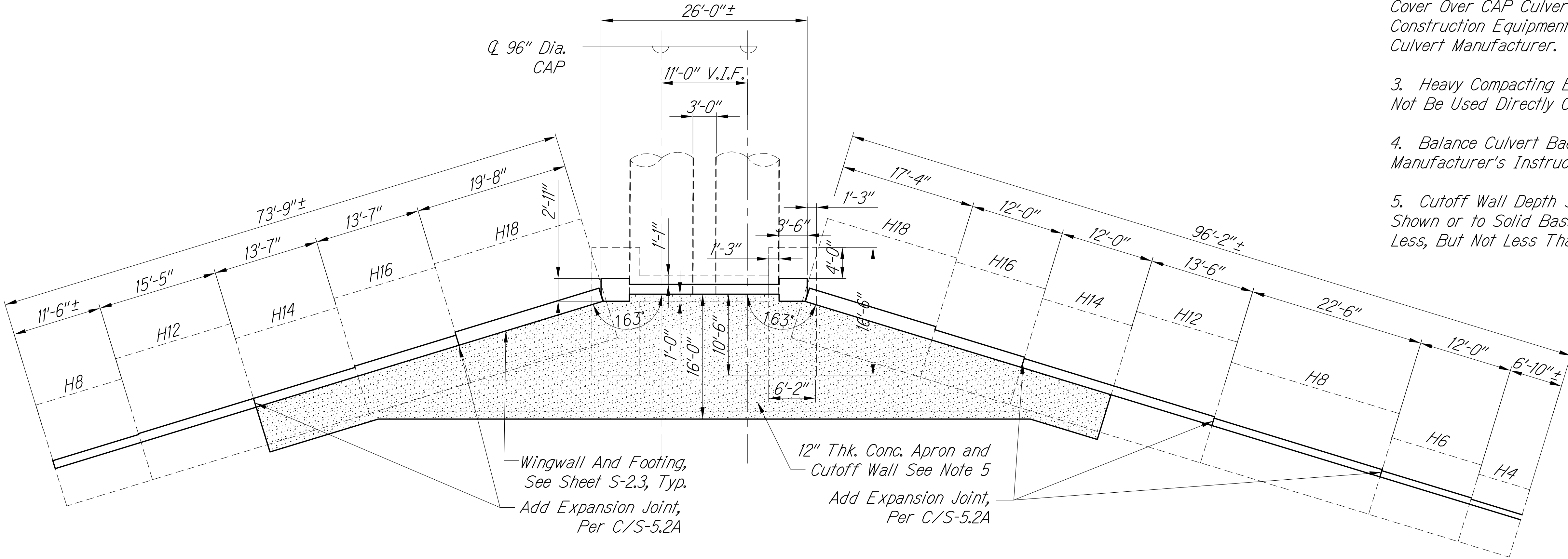


ELEVATION - NEW HEADWALL FOR DOUBLE 96" DIA. CAP CULVERT
Scale: 1/8" = 1'-0"

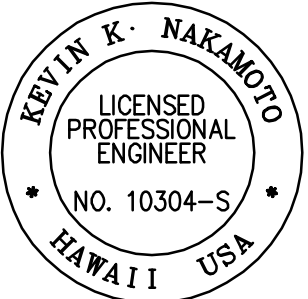
Notes:

1. Stud Bolts Shall Be Stainless Steel (See C/S-2.4). Hot Dip Galvanized Bolts with Neoprene Washers and Sleeves are Acceptable, Provided it Does Not Affect the Manufacturer's Warranty.
2. Contractor Shall Coordinate Minimum Cover Over CAP Culvert Required For Construction Equipment Used With Culvert Manufacturer.
3. Heavy Compacting Equipment Shall Not Be Used Directly Over CAP Culvert.
4. Balance Culvert Backfill Per Manufacturer's Instructions
5. Cutoff Wall Depth Shall be 4' as Shown or to Solid Basalt, Whichever is Less, But Not Less Than 2'.

LEGEND FOR AS-BUILT POSTINGS	
	Squiggly line for as-built deletion
	Double line for as-built deletion
Roadway	Text for as-built posting



PLAN - NEW HEADWALL FOR DOUBLE 96" DIA. CAP CULVERT
Scale: 1/8" = 1'-0"

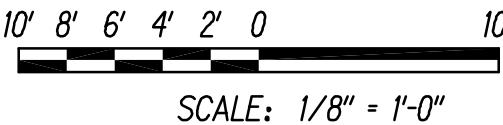


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SIGNATURE

APRIL 30, 2018
EXPIRATION DATE OF THE LICENSE

GRAPHIC SCALES



12/16/16		Updated Graphics to Reflect Changed Dimensions on Schedule. Added Expansion Joint Call-Outs. Replaced H10 Wall with H12. Modified Apron.
1/22/16		Sheet added to show the plan and profile of culvert D headwall and wing walls
DATE	REVISION	

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
CULVERT B - DOUBLE 96" CAP	
PLAN AND ELEVATION	
QUEEN KAAHUMANU HIGHWAY WIDENING	
Kealahke Pkwy. To Keahole Airport Rd. (Ph. 2)	
Federal Aid Project No. NH-019-1(38)R	
Scale: AS NOTED	Date: AUGUST 2016
SHEET No. S-1.3A OF 18 SHEETS	

"AS-BUILT"

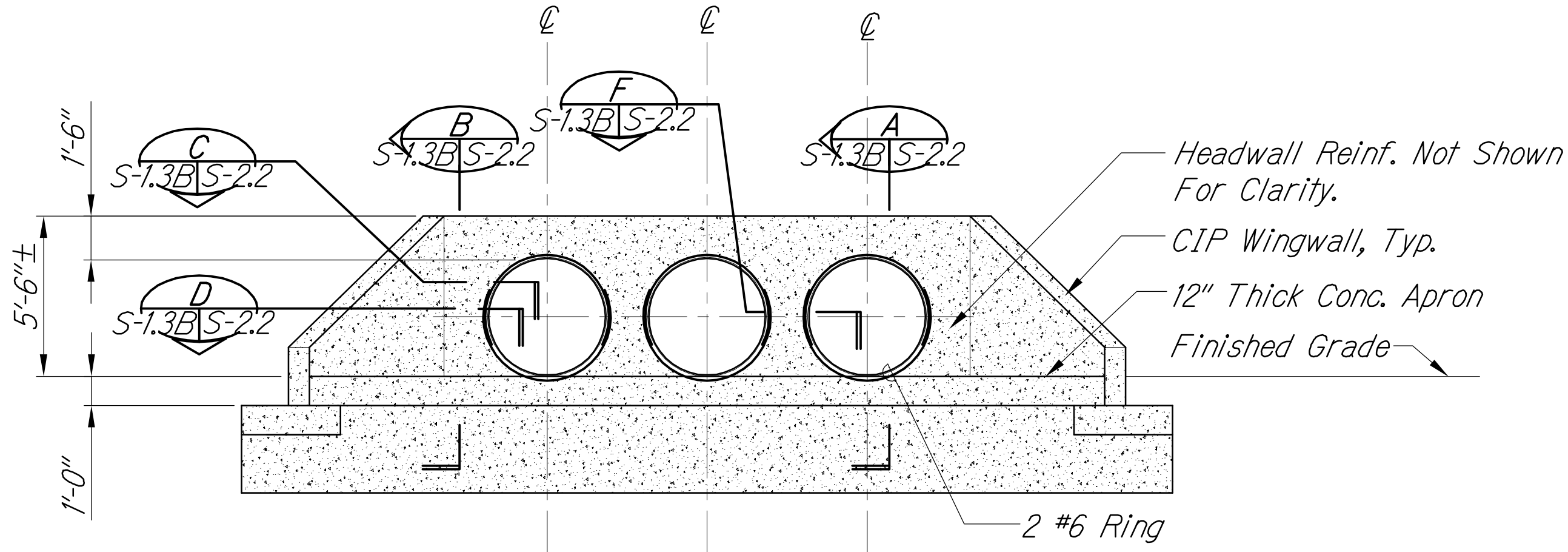
2/1/2017 10:04 AM

C.O. 496 S-1

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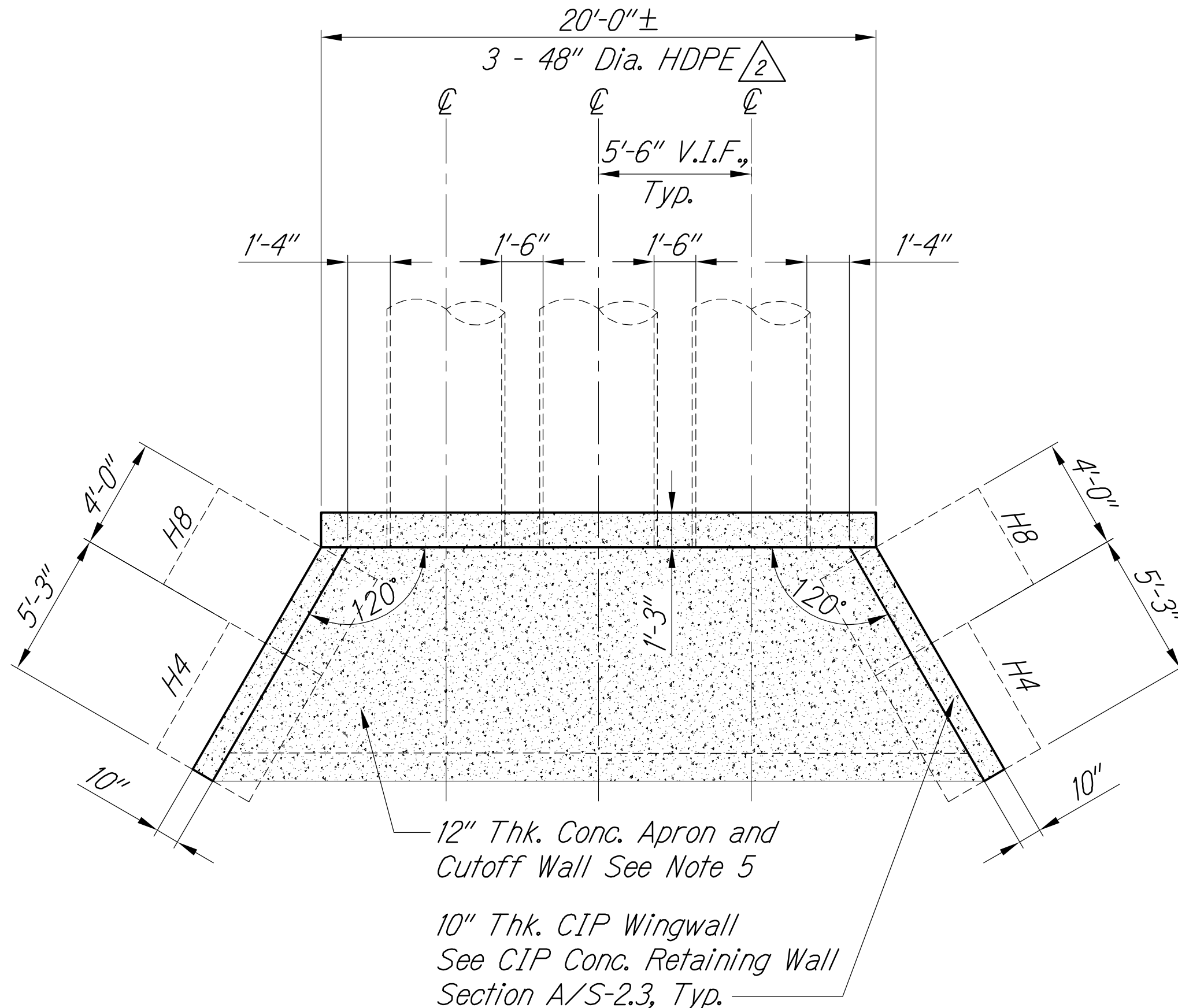
ORIGINAL PLAN	DATE
NOTED BY	
DESIGNED BY	
CHECKED BY	
NO.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-019-1(38)P	2016	C.O. 496S-2	528 522



ELEVATION - NEW HEADWALL FOR TRIPLE 48" DIA. HDPE CULVERT

Scale: $1/4'' = 1'-0''$



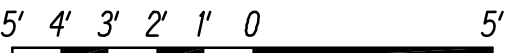
PLAN - NEW HEADWALL FOR TRIPLE 48" DIA. HDPE CULVERT

Scale: $1/4'' = 1'-0''$



-  Notes:

1. Contractor Shall Coordinate Minimum Cover Over HDPE Culvert Required For Construction Equipment Used With Culvert Manufacturer.
2. Heavy Compacting Equipment Shall Not Be Used Directly Over HDPE Culvert.
3. Balance Culvert Backfill Per Manufacturer's Instructions
4. Cutoff Wall Depth Shall be 4' as Shown or to Solid Basalt, Whichever is Less, But Not Less Than 2'.
5. For HDPE Culvert to Headwall Connection, Refer to Similar Details on Sheet S-2.2. Stud Bolts Not Required for HDPE Pipes

GRAPHIC SCALES



SCALE: $1/4" = 1'-0"$

2/23/16	 Changed CAP pipe to HDPE pipe and removed stud bolts
1/22/16	 Sheet added to show the plan and profile of Culvert D headwall and wingwalls
DATE	REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION


CULVERT D - TRIPLE 48" HDPE
PLAN AND ELEVATION

QUEEN KAAHUMANU HIGHWAY WIDENING
Kealahkeke Pkwy. To Keahole Airport Rd. (Ph. 2)
Federal Aid Project No. NH-019-1(38)R

Scale: AS NOTED Date: AUGUST 2016

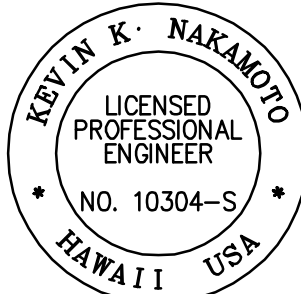
SHEET No. *S-13B* OF 18 SHEETS

LEGEND FOR AS-BUILT POSTINGS


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as-built deletion

~~100.00~~ Double line for
as-built deletion

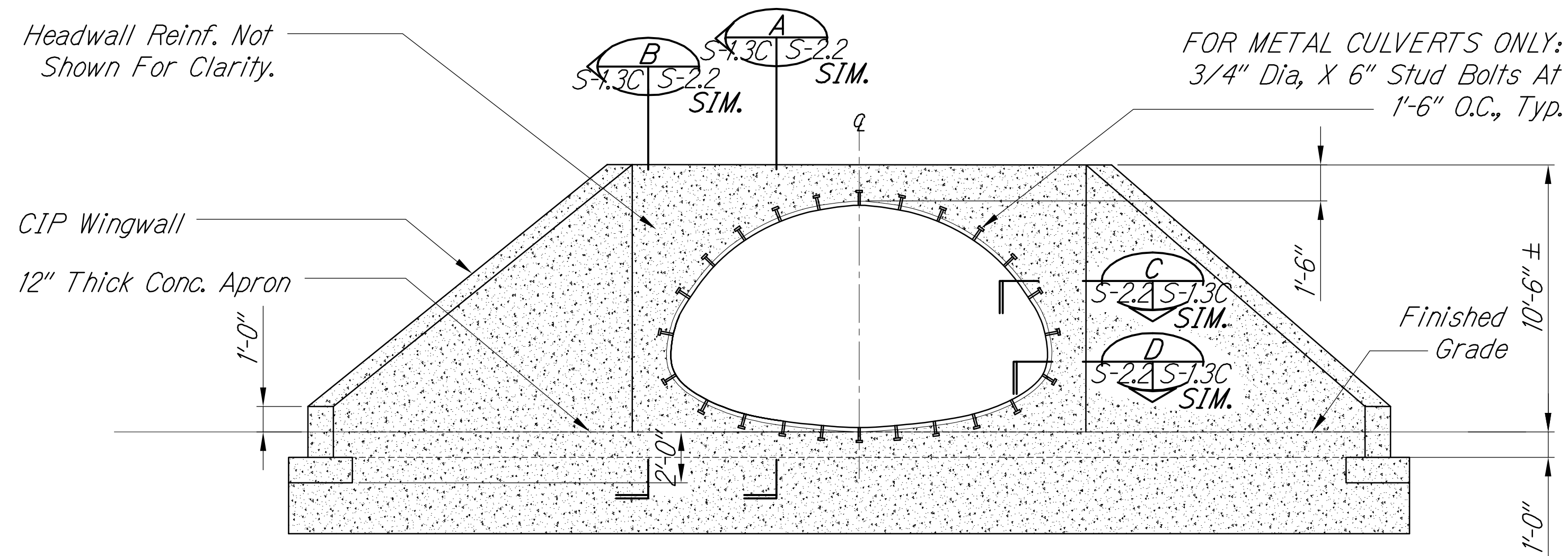
Roadway	Text for as-built posting
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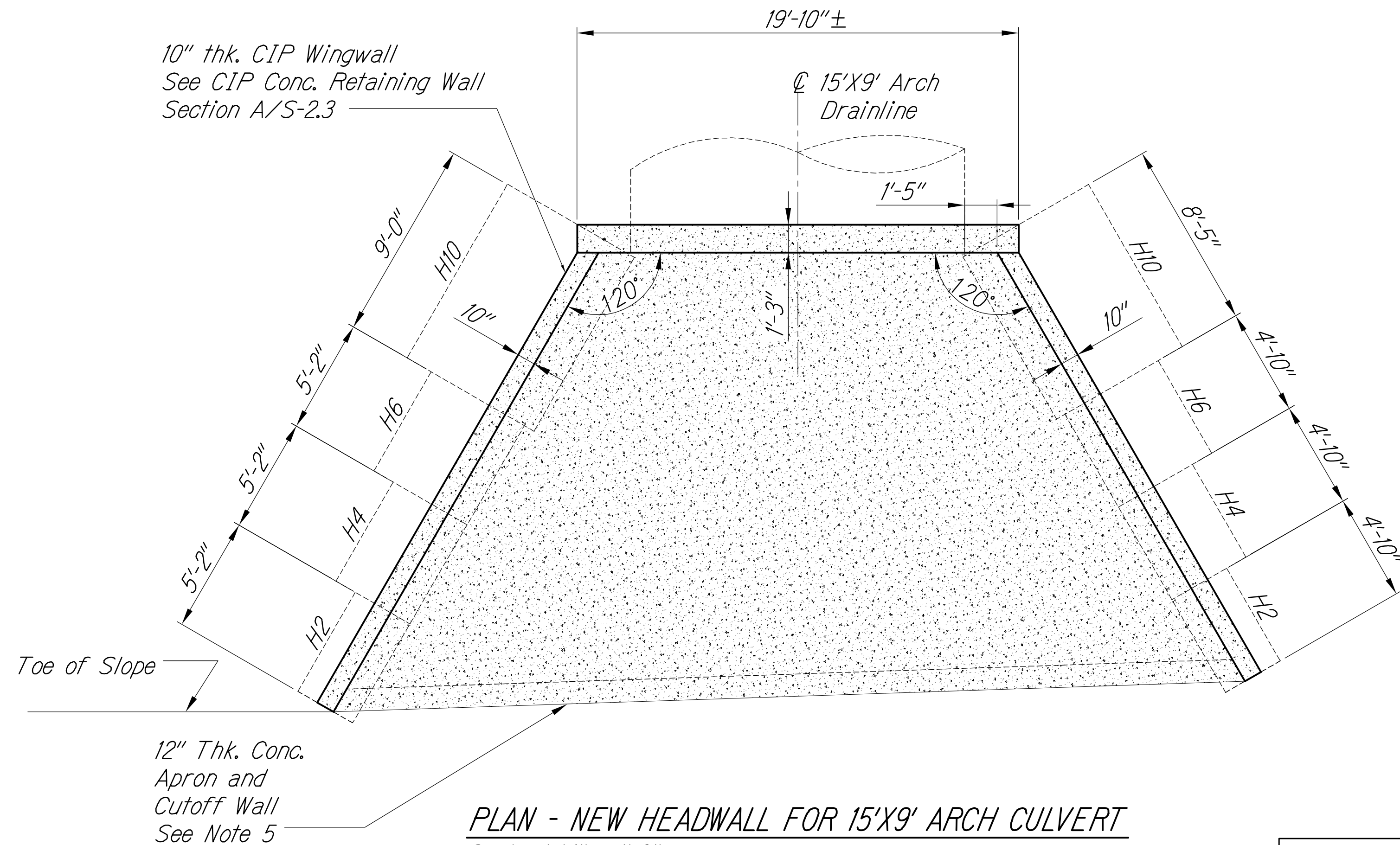
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CONSTRUCTION OF THIS PROJECT
WILL BE UNDER MY OBSERVATION.

 APRIL 30, 2018
SIGNATURE EXPIRATION DATE
OF THE LICENSE

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-019-1(38)R	2016	C.O. 496S-3	528 522



ELEVATION - NEW HEADWALL FOR 15'X9' ARCH CULVERT
Scale: 1/4" = 1'-0"



PLAN - NEW HEADWALL FOR 15'X9' ARCH CULVERT
Scale: 1/4" = 1'-0"

- Notes:

1. Stud Bolts Shall Be Stainless Steel with Neoprene Washers and Sleeves (See C/S-2.4). Hot Dip Galvanized Bolts with Neoprene Washers and Sleeves are Acceptable, Provided it Does Not Affect the Manufacturer's Warranty.

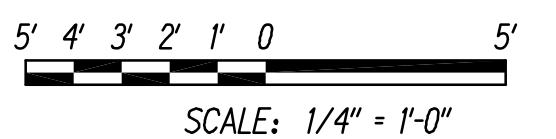
2. Contractor Shall Coordinate Minimum Cover Over CAP Culvert Required For Construction Equipment Used With Culvert Manufacturer.

3. Heavy Compacting Equipment Shall Not Be Used Directly Over CAP Culvert.

4. Balance Culvert Backfill Per Manufacturer's Instructions

5. Cutoff Wall Depth Shall be 4' as Shown or to Solid Basalt, Whichever is Less, But Not Less Than 2'.

GRAPHIC SCALES



1/22/16	<div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center;"> <div style="border-left: 1px solid black; border-right: 1px solid black; width: 10px; height: 10px; margin: 0 auto;"></div> </div> Sheet added to show the plan and profile of Culvert G headwall and wingwalls
DATE	REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CULVERT G - 15'X9' ARCH

PLAN AND ELEVATION

QUEEN KAAHUMANU HIGHWAY WIDENING
Kealakehe Pkwy. To Keahole Airport Rd. (Ph. 2)
Federal Aid Project No. NH-019-1(38)R

Scale: AS NOTED Date: AUGUST 2016

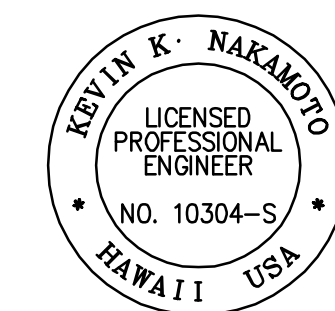
SHEET No. *S-13C* OF 18 SHEETS

LEGEND FOR
AS-BUILT POSTINGS


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as-built deletion

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as-built deletion

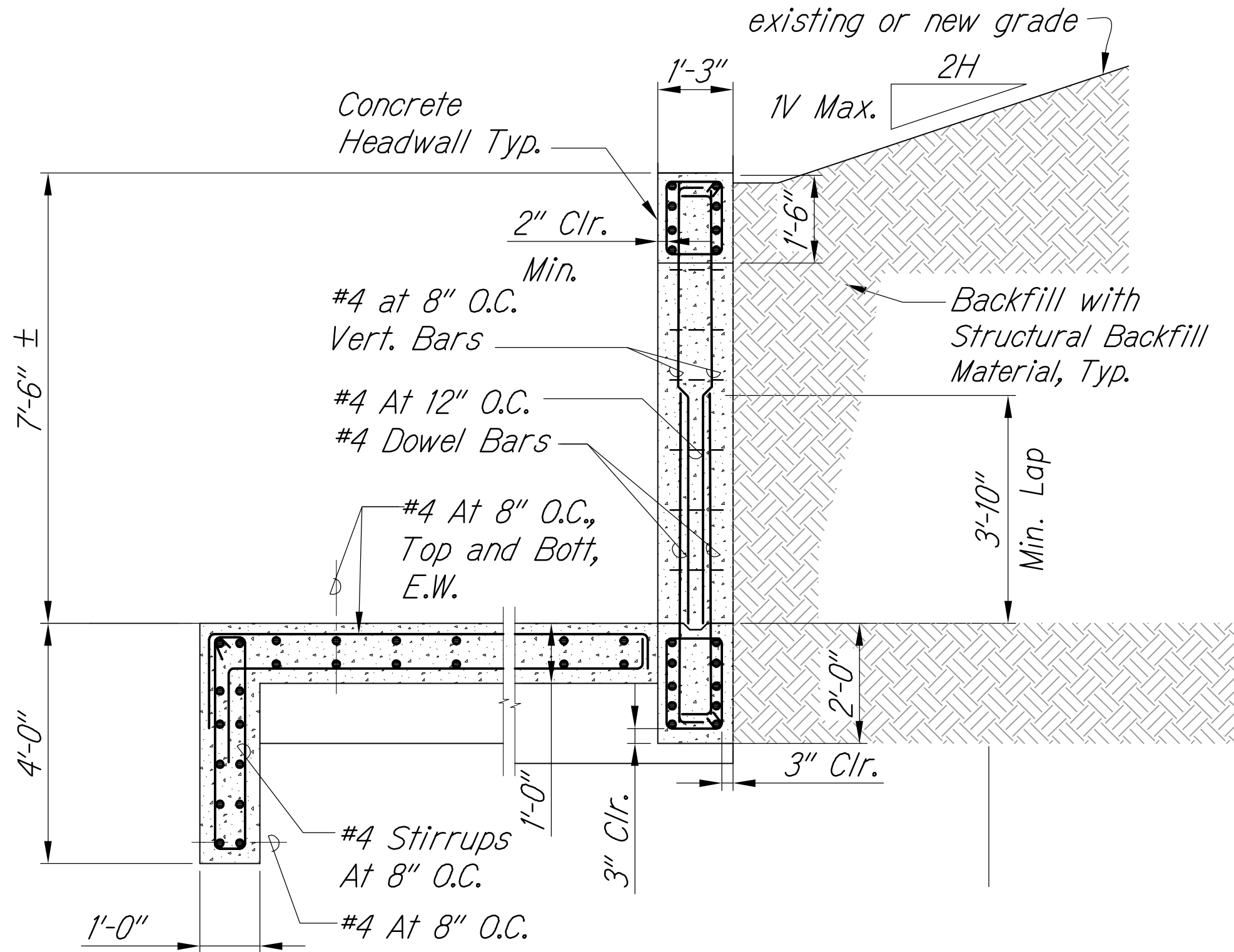
Roadway	Text for as-built posting
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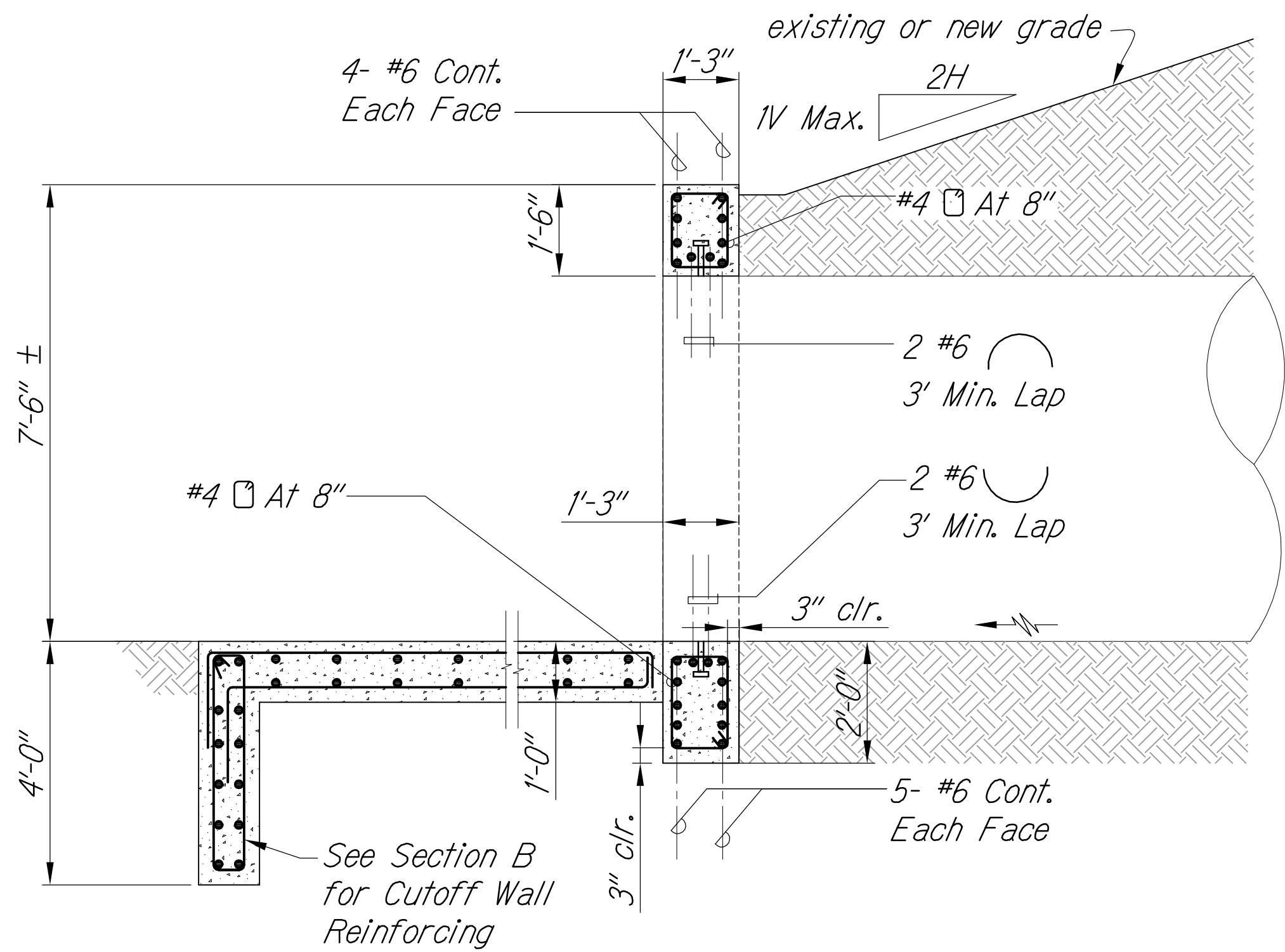
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WILL BE UNDER MY OBSERVATION.

 APRIL 30, 2018
SIGNATURE EXPIRATION DATE
OF THE LICENSE

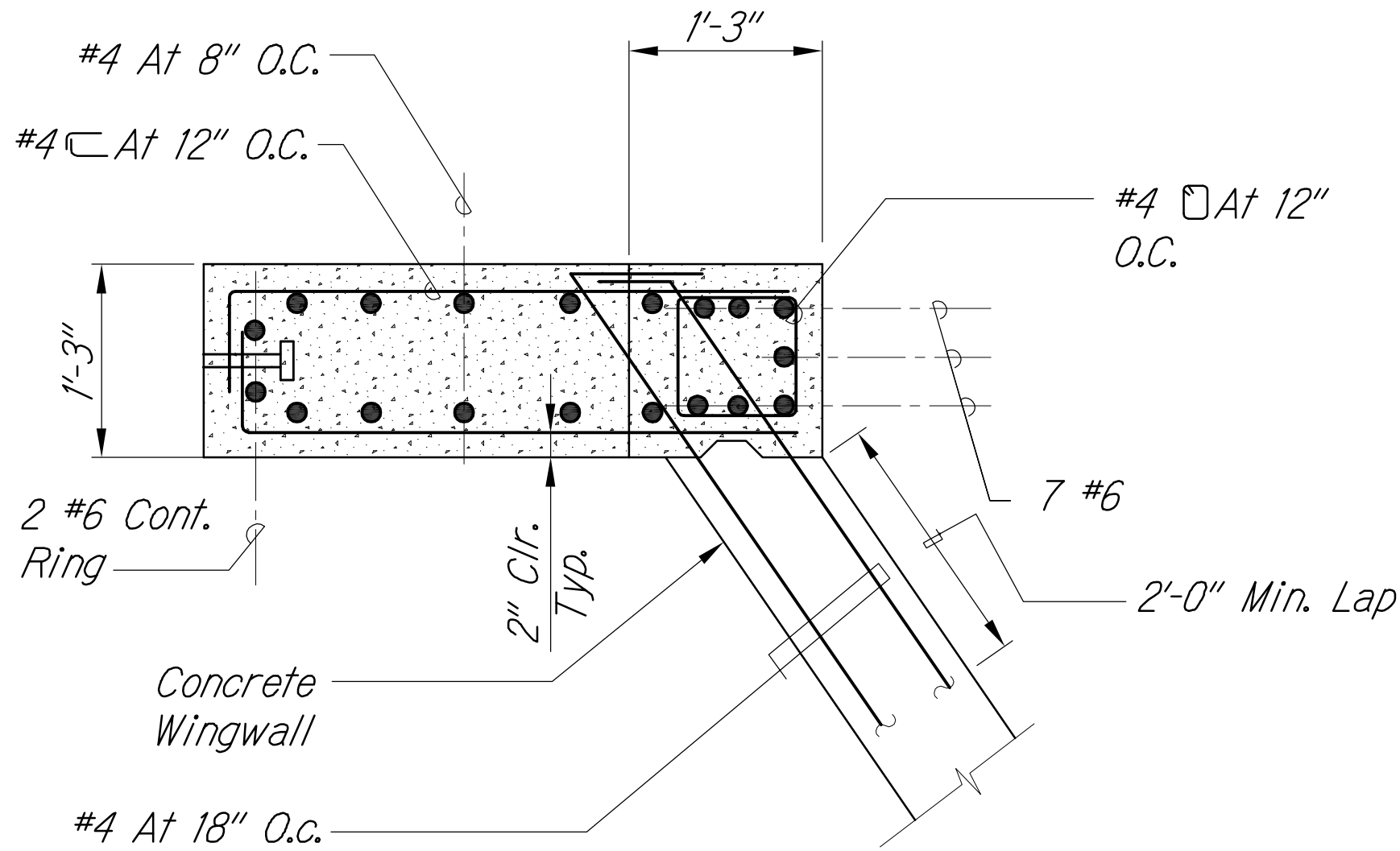
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-019-1(38)R	2016	497	528 522



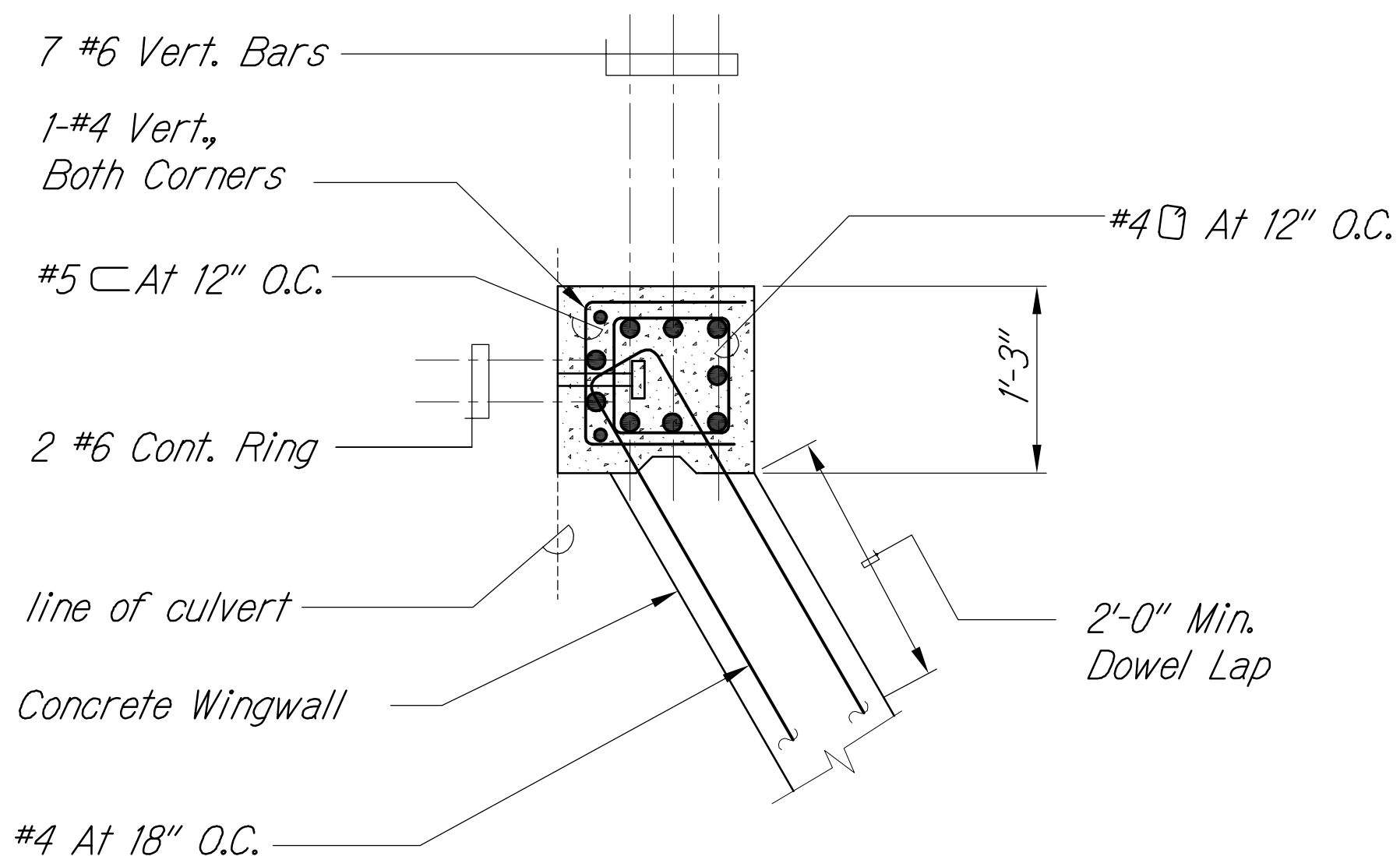
SECTION B
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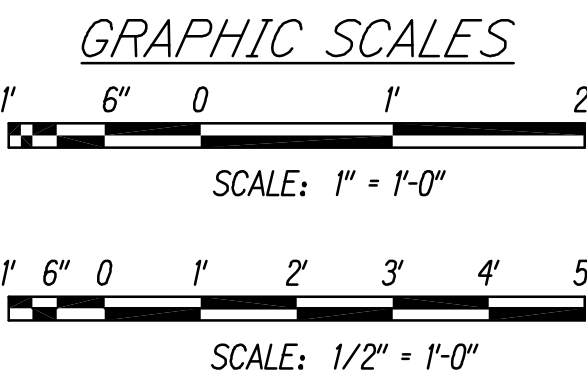
SECTION A
Scale: 1/2" = 1'-0"



SECTION C
Scale: 1" = 1'-0"



SECTION D
Scale: 1" = 1'-0"



LEGEND FOR AS-BUILT POSTINGS

Squiggly line for as-built deletion

Double line for as-built deletion

Roadway Text for as-built posting

KEVIN K. NAKAMOTO
LICENSED PROFESSIONAL ENGINEER
NO. 10304-S
HAWAII USA

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SIGNATURE: [Signature] APRIL 30, 2018
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CULVERT E
SECTION AND DETAILS

QUEEN KAAHUMANU HIGHWAY WIDENING
Kealahou Pkwy. To Keahole Airport Rd. (Ph. 2)
Federal Aid Project No. NH-019-1(38)R

Scale: AS NOTED Date: AUGUST 2016

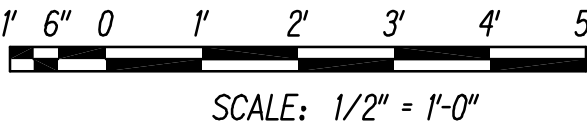
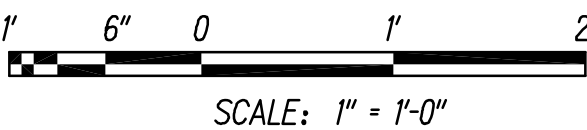
SHEET No. S-2/ OF 18 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-019-1(38)R	2016	498	528

LEGEND FOR
AS-BUILT POSTINGS

- ~~~~~ Squiggly line for as-built deletion
- ~~100.00~~ Double line for as-built deletion
- Roadway Text for as-built posting

GRAPHIC SCALES



1/22/16	<div><div></div><div>Modified dimensions in details A, B, D, E and F. Modified rebar hook in detail D. New Detail F added. Modified dimensions in details A, B, C and E/S-2.2.</div></div>
DATE	REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL HEADWALL
SECTION AND DETAILS

QUEEN KAAHUMANU HIGHWAY WIDENING
Kealahou Pkwy. To Keahole Airport Rd. (Ph. 2)
Federal Aid Project No. NH-019-1(38)R

Scale: AS NOTED Date: AUGUST 2016

SHEET No. S-2.2 OF 18 SHEETS

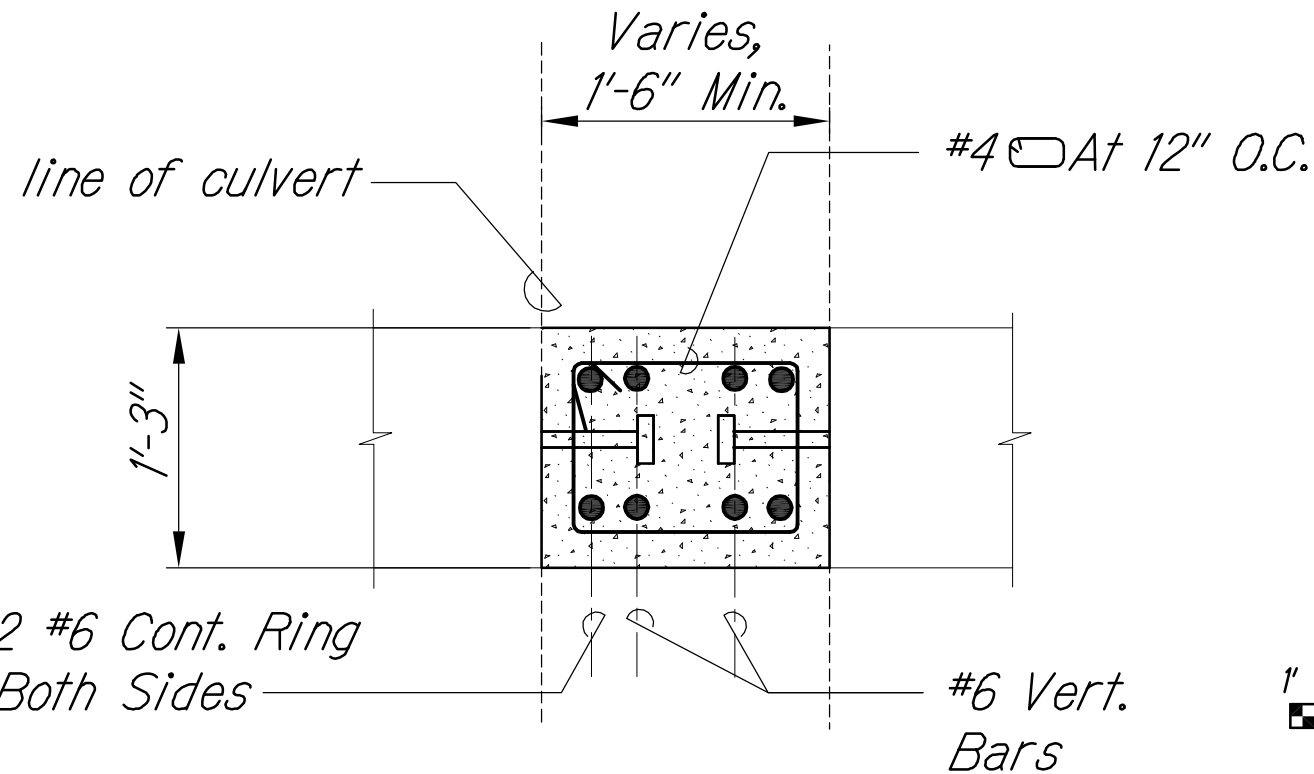


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WILL BE UNDER MY OBSERVATION.

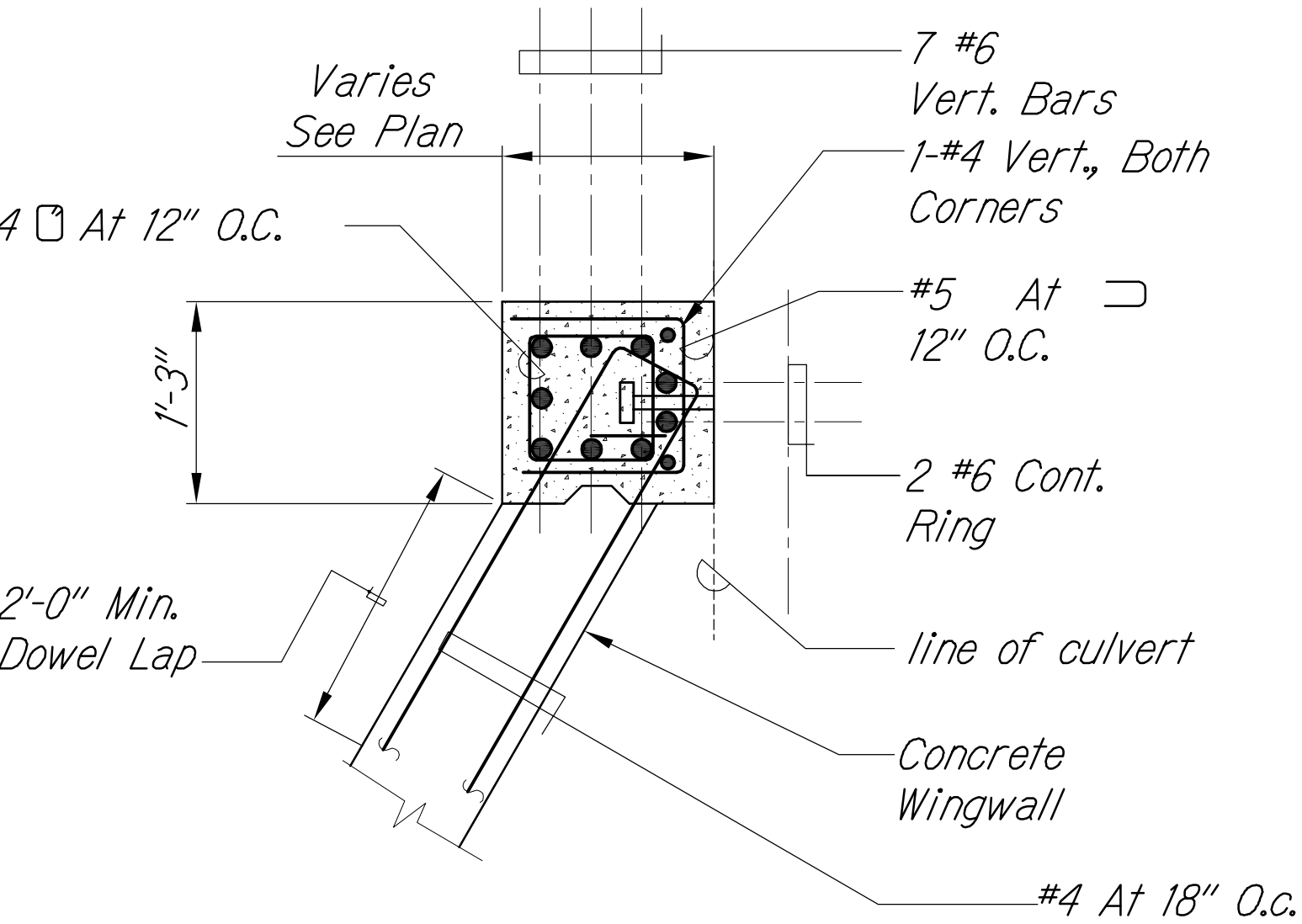
SIGNATURE

APRIL 30, 2018
EXPIRATION DATE
OF THE LICENSE

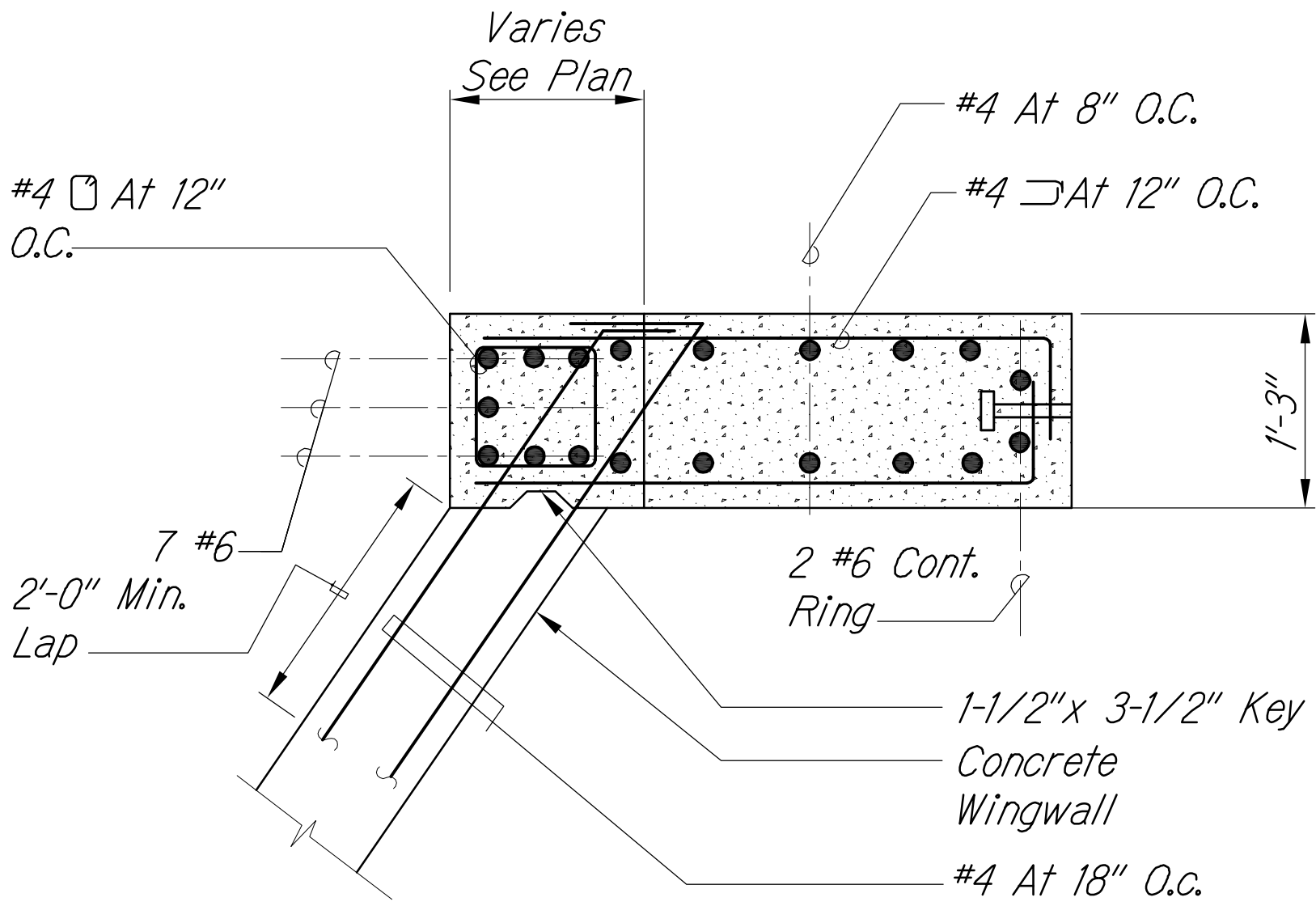
SECTION F
Scale: 1" = 1'-0" S-1.3 S-2.2



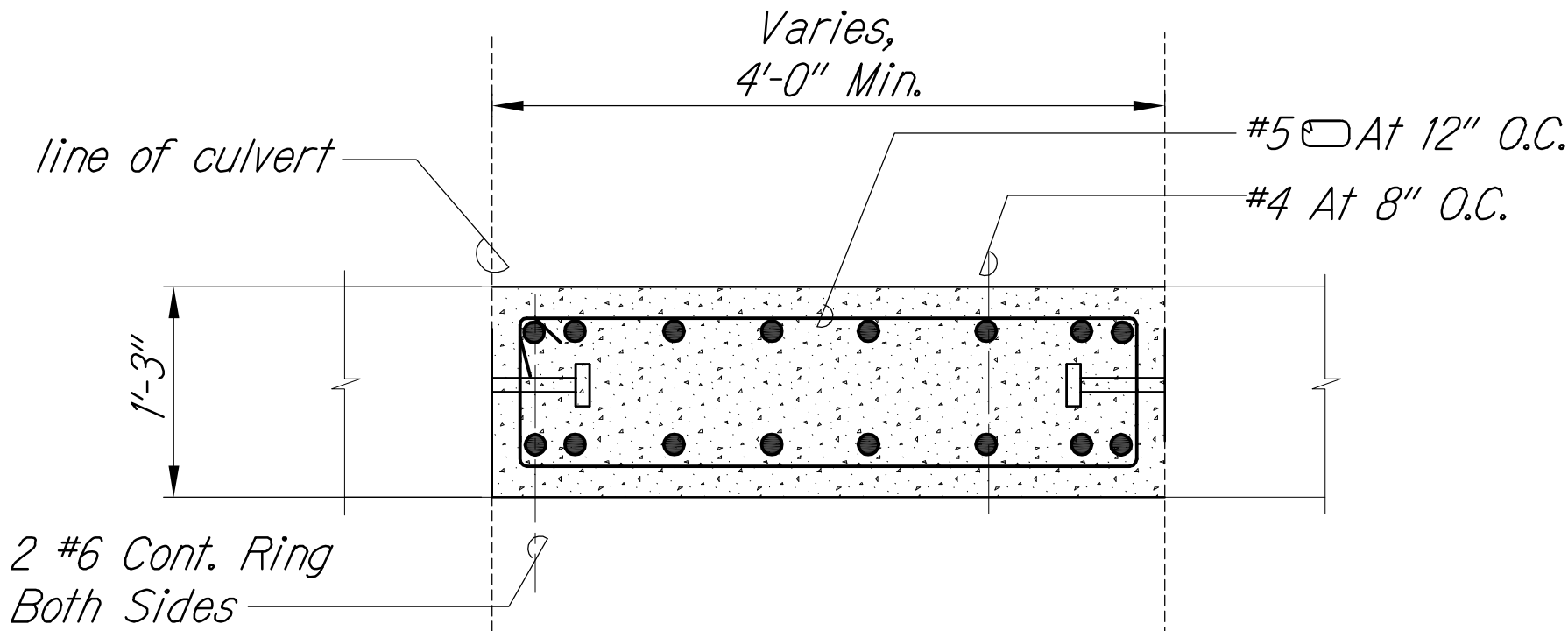
SECTION D
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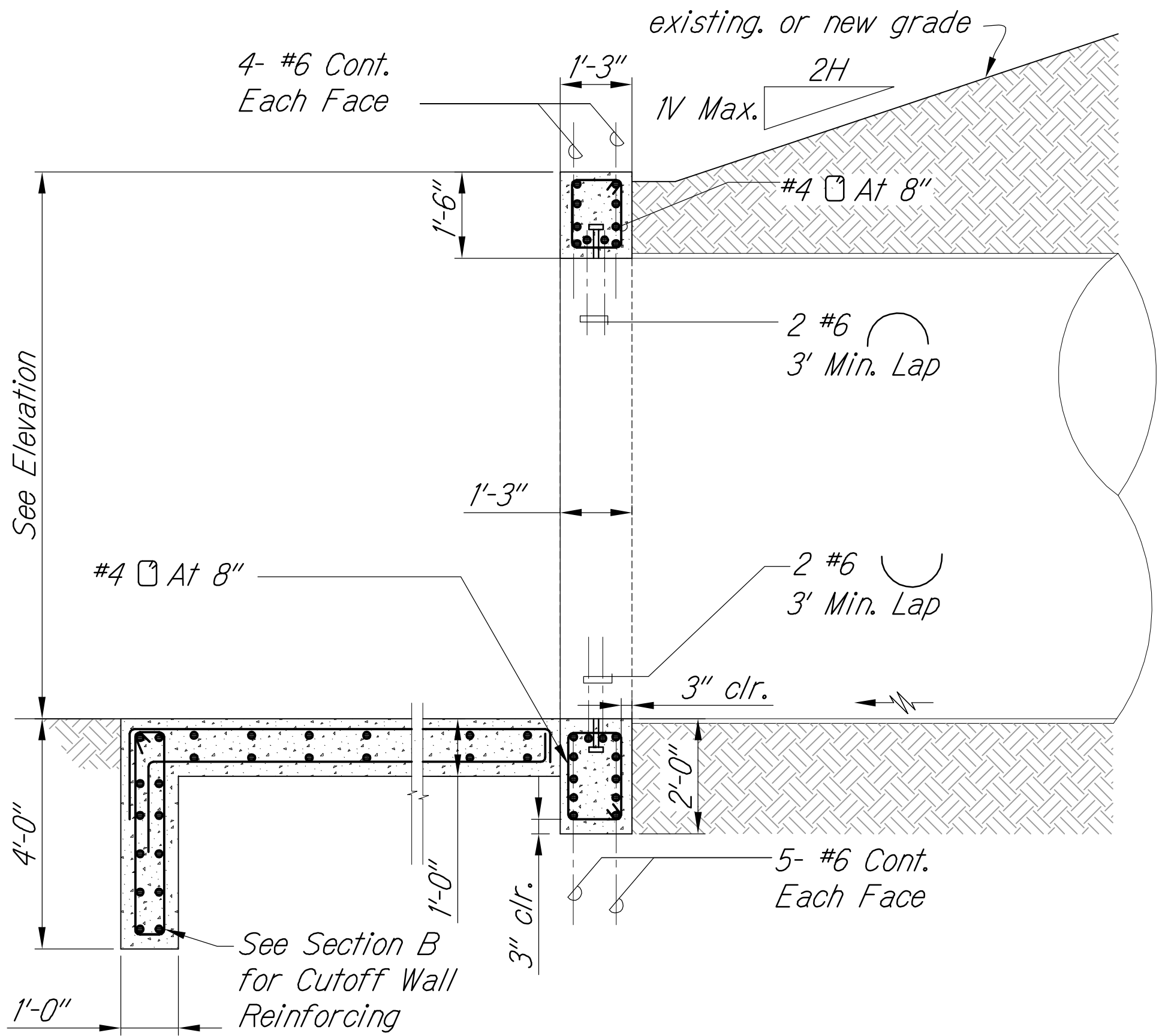
SECTION C
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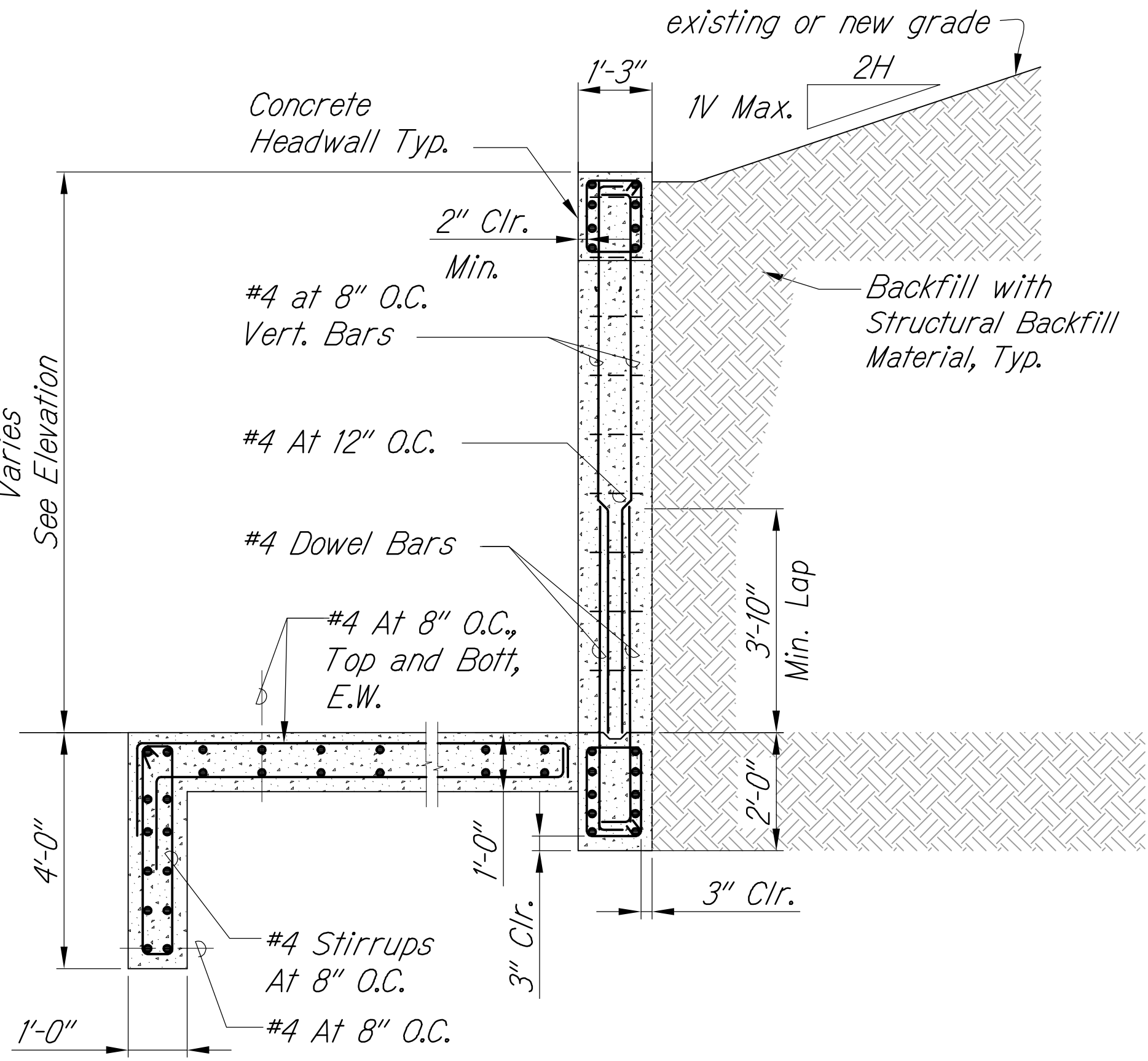
SECTION E
Scale: 1" = 1'-0" S-1.3 S-2.2



SECTION B
Scale: 1/2" = 1'-0" S-1.3 S-2.2



SECTION A
Scale: 1/2" = 1'-0" S-1.3 S-2.2



"AS-BUILT"

8/19/2016 10:10 AM

498

M:\2008\2008_003\002 GBI Queen K Hwy Redesign\G Dwg\Contract Documents\160817 FINAL CAD to DOT Superceeds all other CAD Files\S-2.2 Typical Headwall Section and Details.dwg 8/19/2016 10:10 AM

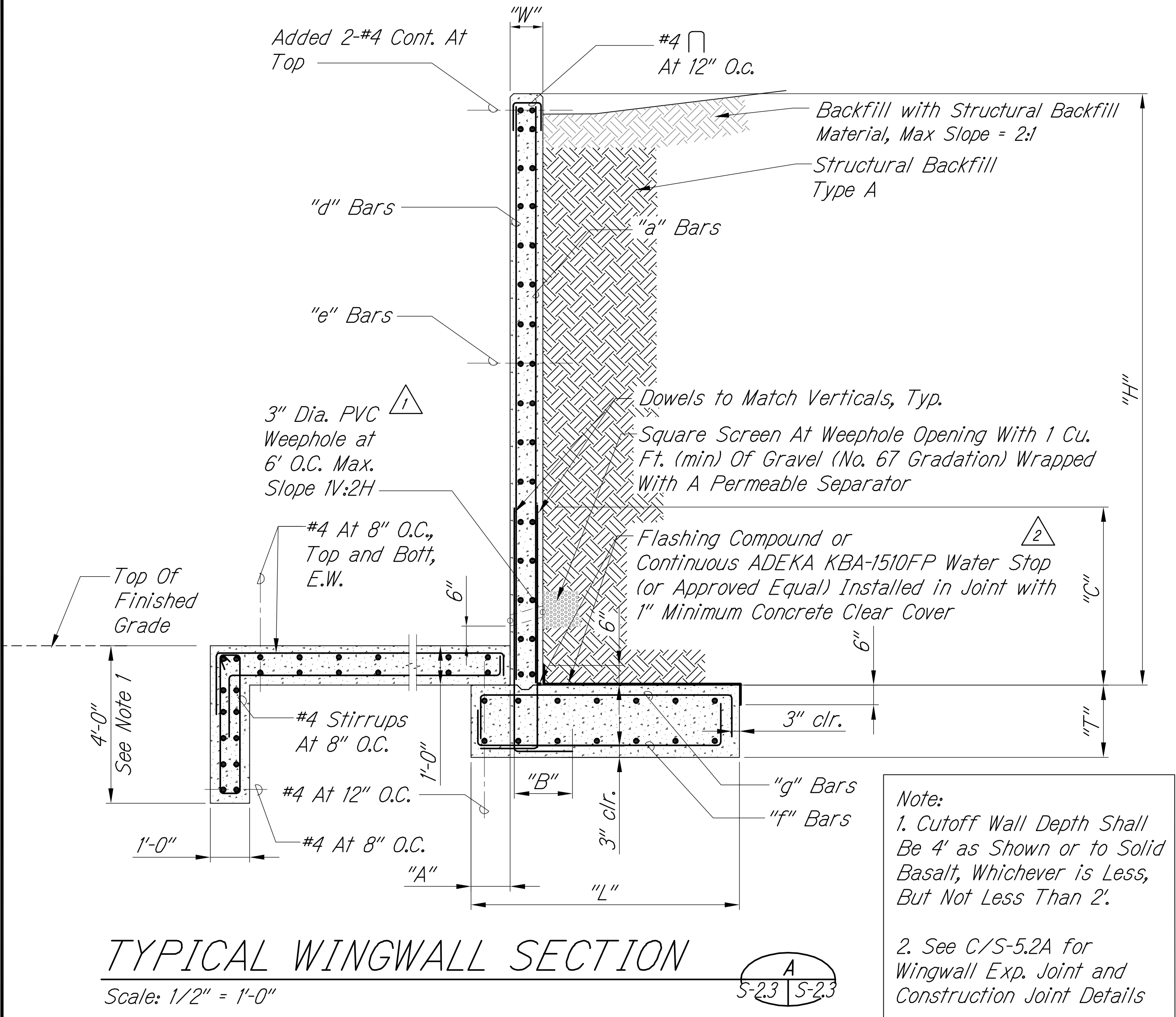
DESIGNED BY	DATE
TRACED BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	

ORIGINAL PLAN

NOTE BOOK

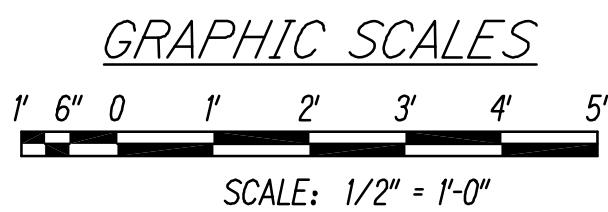
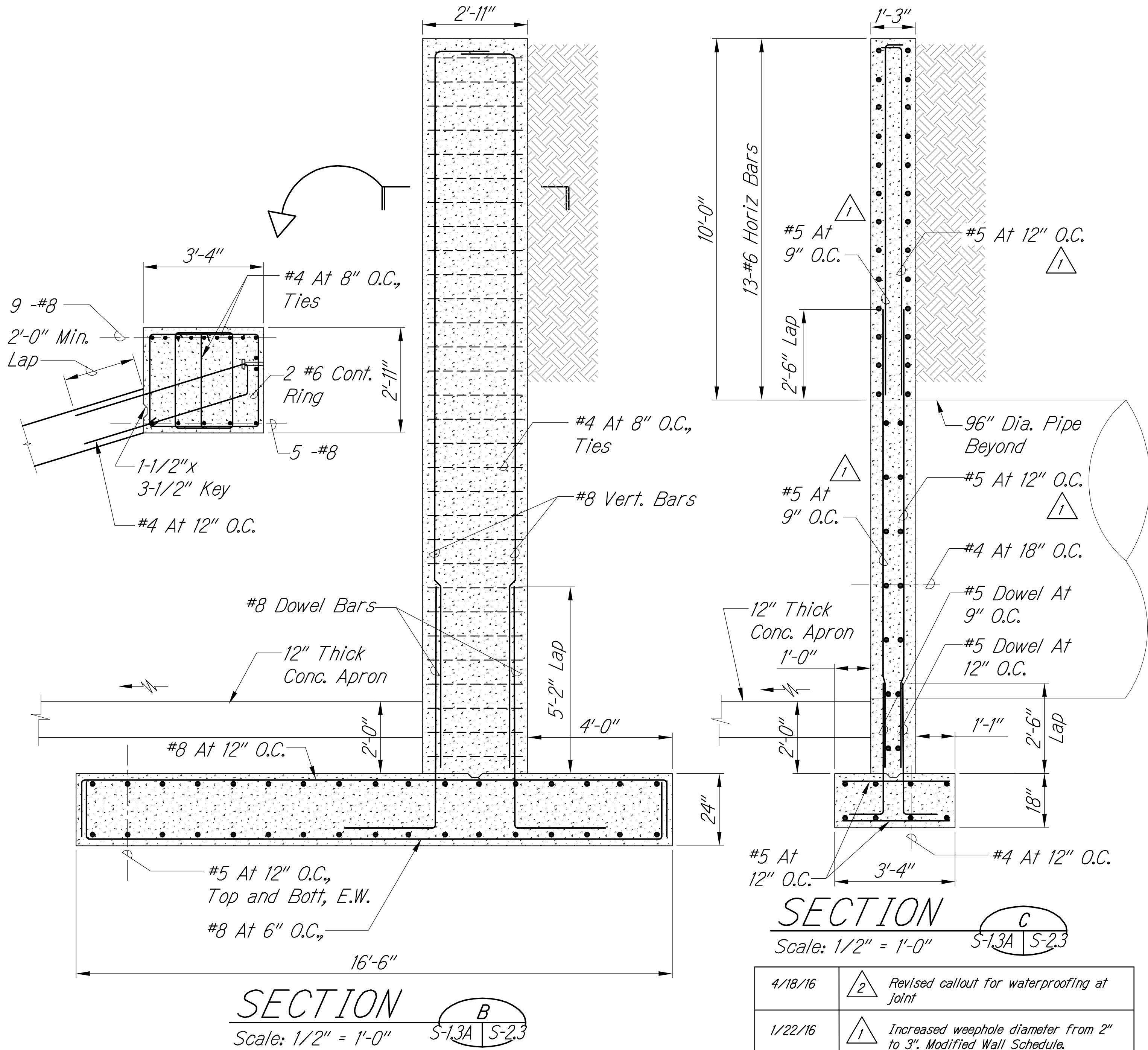
No.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-019-1(38)R	2016	C.O. 499	528 522



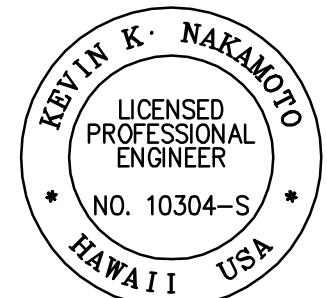
WINGWALL SCHEDULE OF DIMENSIONS AND REINFORCING

Wall Mark	H2	H4	H6	H8	H10	H12	H14	H16	H18
"H" (Max)	3'	5'	7'	10.75'	11.5'	13'	15'	17'	20'
W	10"	10"	10"	10"	10"	10"	10"	14"	14"
T	12"	12"	12"	16"	16"	18"	18"	18"	18"
L	2' 10"	3' 10"	4' 10"	6' 4"	6' 10"	9' 6"	11' 0"	13' 6"	16' 0"
A	1' 0"	1' 0"	1' 0"	1' 6"	1' 6"	1' 6"	2' 0"	2' 6"	2' 6"
B	10"	10"	10"	1'-0"	1'-0"	1'-4"	1'-4"	1'-4"	1'-4"
C	2'-8"	2'-8"	2'-8"	3'-2"	3'-2"	5'-2"	5'-2"	5'-2"	5'-2"
a	#5@12"	#5@12"	#5@12"	#6@12"	#6@12"	#8@10"	#8@6"	#8@6"	#8@4"
d	#4@16"	#4@16"	#4@16"	#4@16"	#4@16"	#4@16"	#4@16"	#4@10"	#4@10"
e	#4@18"	#4@18"	#4@18"	#4@18"	#4@18"	#4@18"	#4@18"	#4@12"	#4@12"
f	#4@12"	#4@12"	#4@12"	#4@12"	#4@12"	#6@8"	#6@8"	#6@12"	#6@12"
g	#4@12"	#4@12"	#4@12"	#4@12"	#4@12"	#6@8"	#6@8"	#7@10"	#7@6"



LEGEND FOR AS-BUILT POSTINGS

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Roadway Text for as-built posting



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SIGNATURE: [Signature] EXPIRATION DATE OF THE LICENSE: APRIL 30, 2018

### SECTION

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

| DATE    | REVISION                                                                                                                                                                                                            |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4/18/16 | 2 Revised callout for waterproofing at joint                                                                                                                                                                        |
| 1/22/16 | 1 Increased weep hole diameter from 2" to 3". Modified Wall Schedule. Modified Section C Wall Reinforcing. Modified/Added Dimensions, Sections To Detail S-2.3 And Added H10 To H18 Type Wall To Wing Wall Schedule |

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**CIP WINGWALL SECTION AND DETAILS**

QUEEN KAAHUMANU HIGHWAY WIDENING  
Kealahou Pkwy. To Keahole Airport Rd. (Ph. 2)  
Federal Aid Project No. NH-019-1(38)R  
Scale: AS NOTED Date: AUGUST 2016

SHEET No. S-2.3 OF 18 SHEETS

"AS-BUILT"

8/16/2016 2:25 PM

C.O. 499



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

4. Concrete Apron Shall be Constructed Prior to Backfilling the Retaining Walls.

#4 At 8" O.C.,  
Top and Bott,  
E.W. = 1 2

—Compacted Fill, Typ.

Diagram of a semi-circular arch with a horizontal span of 4.6m. The arch is supported by two vertical columns, each labeled 'S-2.3A'. The arch is labeled 'A' and 'V'.

|                  |           |           |           |            |            |            |            |
|------------------|-----------|-----------|-----------|------------|------------|------------|------------|
| <i>Wall Mark</i> | <i>H4</i> | <i>H6</i> | <i>H8</i> | <i>H12</i> | <i>H14</i> | <i>H16</i> | <i>H18</i> |
| "H" (Max)        | 5'        | 7'        | 10.75'    | 13'        | 15'        | 17'        | 19'        |
| <i>W</i>         | 10"       | 12"       | 16"       | 18"        | 18"        | 22"        | 24"        |
| <i>T</i>         | 16"       | 16"       | 18"       | 18"        | 18"        | 22"        | 28"        |
| <i>L</i>         | 9'-0"     | 10'-9"    | 15'-0"    | 17'-0"     | 14'-6"     | 16'-0"     | 16'-4"     |
| <i>A</i>         | 5'-0"     | 5'-0"     | 5'-0"     | 5'-0"      | 5'-0"      | 5'-0"      | 5'-0"      |
| <i>B</i>         | 10"       | 10"       | 1'-0"     | 1'-4"      | 1'-4"      | 1'-4"      | 1'-4"      |
| <i>C</i>         | 1'-10"    | 1'-10"    | 2'-8"     | 3'-4"      | 5'-2"      | 5'-2"      | 5'-2"      |
| <i>a</i>         | #5@10"    | #5@6"     | #7@6"     | #8@5"      | #9@6"      | #9@5"      | #9@5"      |
| <i>d</i>         | #4@16"    | #4@16"    | #4@16"    | #4@12"     | #4@12"     | #4@10"     | #4@9"      |
| <i>e</i>         | #4@18"    | #4@18"    | #4@16"    | #4@12"     | #4@12"     | #4@10"     | #4@9"      |
| <i>f</i>         | #4@12"    | #4@12"    | #4@8"     | #6@16"     | #6@12"     | #6@12"     | #6@10"     |
| <i>g</i>         | #4@12"    | #4@12"    | #4@6"     | #6@8"      | #6@8"      | #7@8"      | #7@8"      |
| <i>h</i>         | #4@12"    | #4@12"    | #4@8"     | #6@16"     | #6@12"     | #6@12"     | #6@10"     |
| <i>i</i>         | #4@12"    | #4@12"    | #4@6"     | #6@8"      | #6@8"      | #7@8"      | #7@8"      |
| <i>x</i>         | □ #4@16"  | □ #4@16"  | □ #4@16"  | □ #4@12"   | □ #4@12"   | □ #4@10"   | □ #4@9"    |



1' 6" 0      1'    2'    3'    4'

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

SIGNATURE

APRIL 30, 2018  
EXPIRATION DATE  
OF THE LICENSE

**SECTION C**

Scale:  $\frac{1}{2}" = 1'-0"$

S-1.3A S-2.3A

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

CIP CULVERT B WINGWALL DETAILS

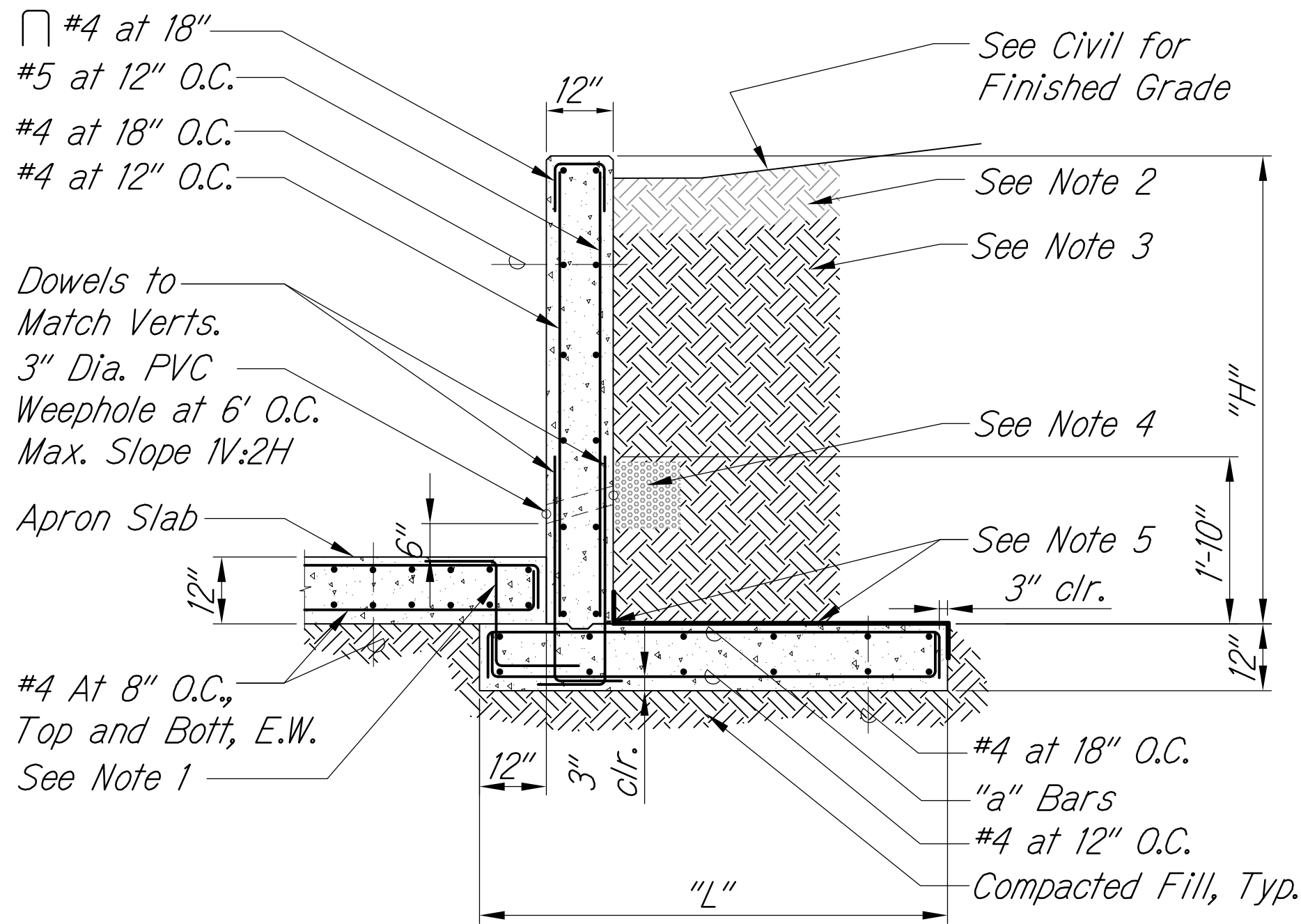
QUEEN KAAHUMANU HIGHWAY WIDENING  
Keolakehe Pkwy. To Keahole Airport Rd. (Ph. 2)  
Federal Aid Project No. NH-019-1(38)R

Scale: AS NOTED      Date: AUGUST 2016

SHEET No. S-234 OF 18 SHEETS

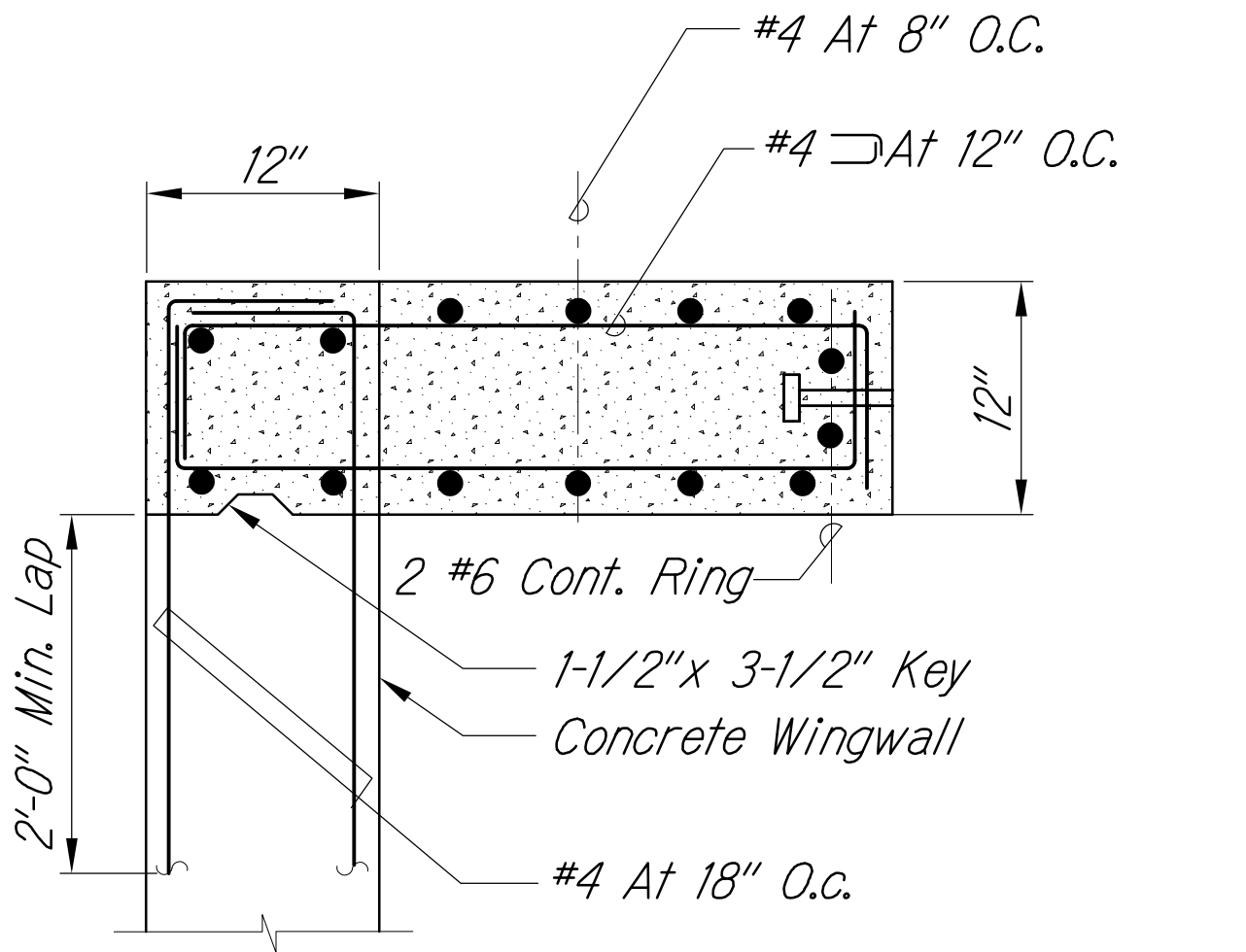


|                     |       |                    |             |             |              |
|---------------------|-------|--------------------|-------------|-------------|--------------|
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO.   | TOTAL SHEETS |
| HAWAII              | HAW.  | NH-019-1(38)R      | 2016        | C.O. 499S-2 | 528<br>522   |



| CULV. C WINGWALL SCHED. |        |        |       |
|-------------------------|--------|--------|-------|
| Wall Mark               | W2     | W5     | W7    |
| "H" (Max)               | 2'-0"  | 5'-0"  | 7'-0" |
| L                       | 4'-3"  | 5'-6"  | 7'-0" |
| a                       | #4@12" | #5@12" | #5@9" |

- Notes:
- Added #4 at 18" O.C. 9"  
Varies  
9"
  - Backfill with Structural Backfill Material, Max. Slope = 2:1
  - Structural Backfill Type A
  - Square Screen At Weephole Opening With 1 Cu. Ft. (min) Of gravel (No. 67 Gradation) Wrapped With A Permeable Separator
  - Flashing Compound or Continuous ADEKA KBA-1510FP Water Stop (or Approved Equal) Installed in Joint with 1" Minimum Concrete Clear Cover
  - Added #4 at 18" O.C. 9"
  - Cutoff Wall Depth Shall Be 4' as Shown or to Solid Basalt, Whichever is Less, But Not Less Than 2'.
  - Concrete Apron Shall be Constructed Prior to Backfilling the Retaining Walls.

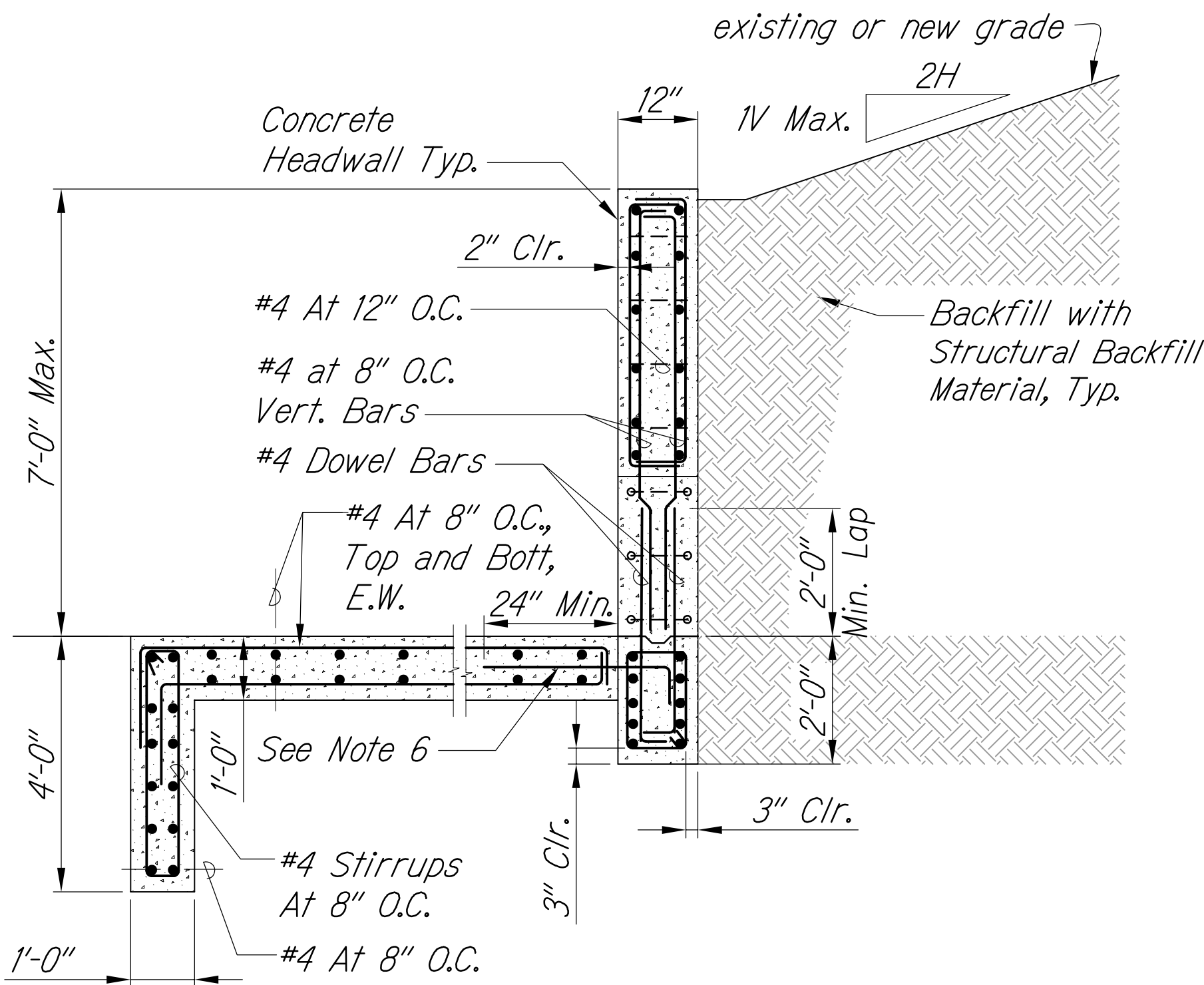


WINGWALL TO HEADWALL PLAN D  
S-2.3C | S-2.3B

Scale: 1" = 1'-0"

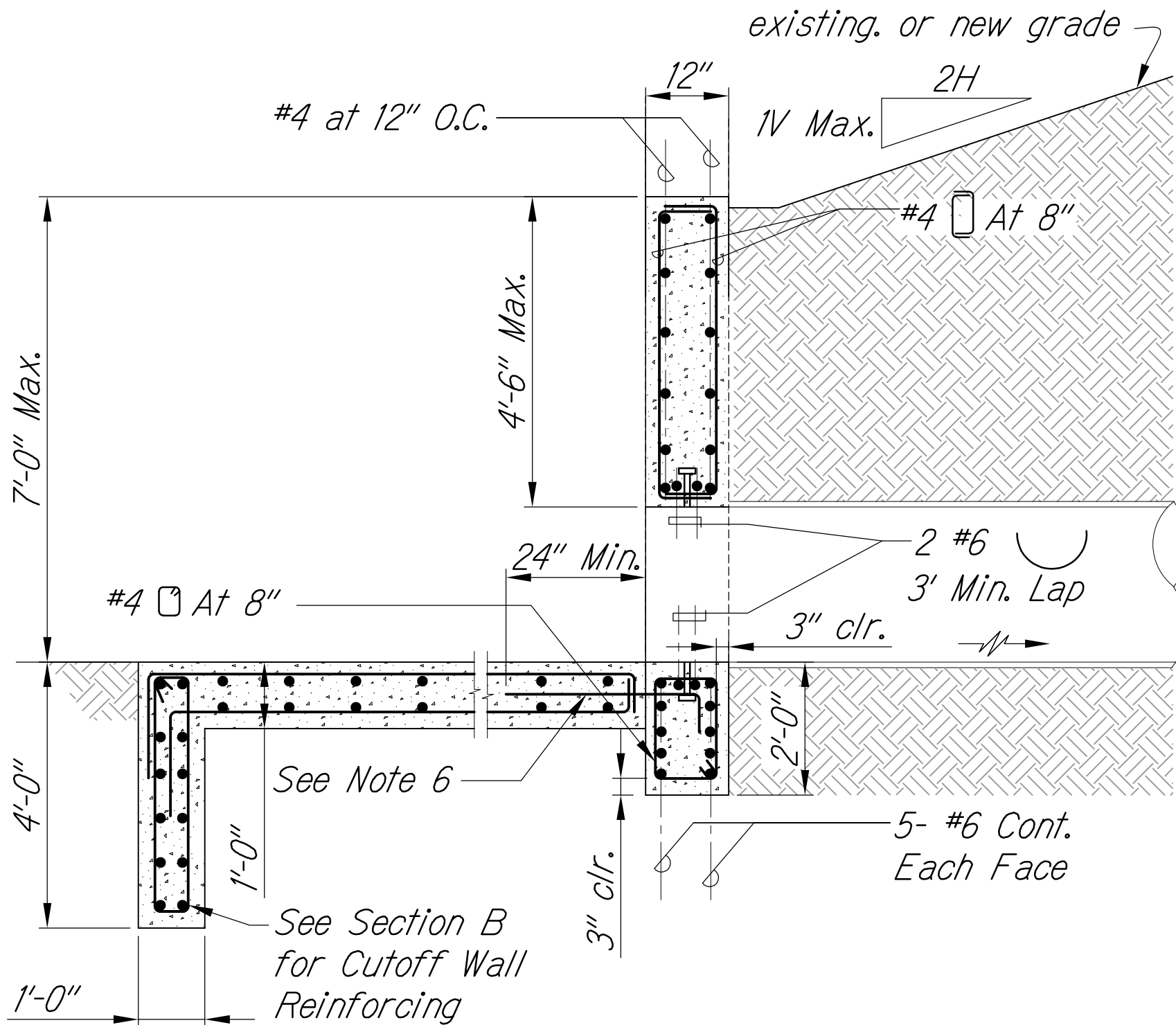
CULVERT C WINGWALL SECTION A  
S-2.3C | S-2.3B

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



SECTION THRU HEADWALL B  
S-2.3C | S-2.3B

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



SECTION THRU CULVERT C  
S-2.3C | S-2.3B

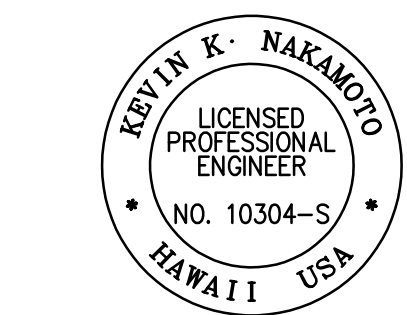
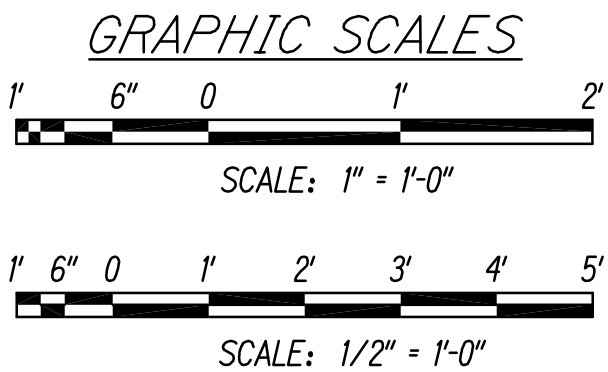
Scale: 1/2" = 1'-0"

**LEGEND FOR AS-BUILT POSTINGS**

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Double line for as-built deletion

Roadway Text for as-built posting



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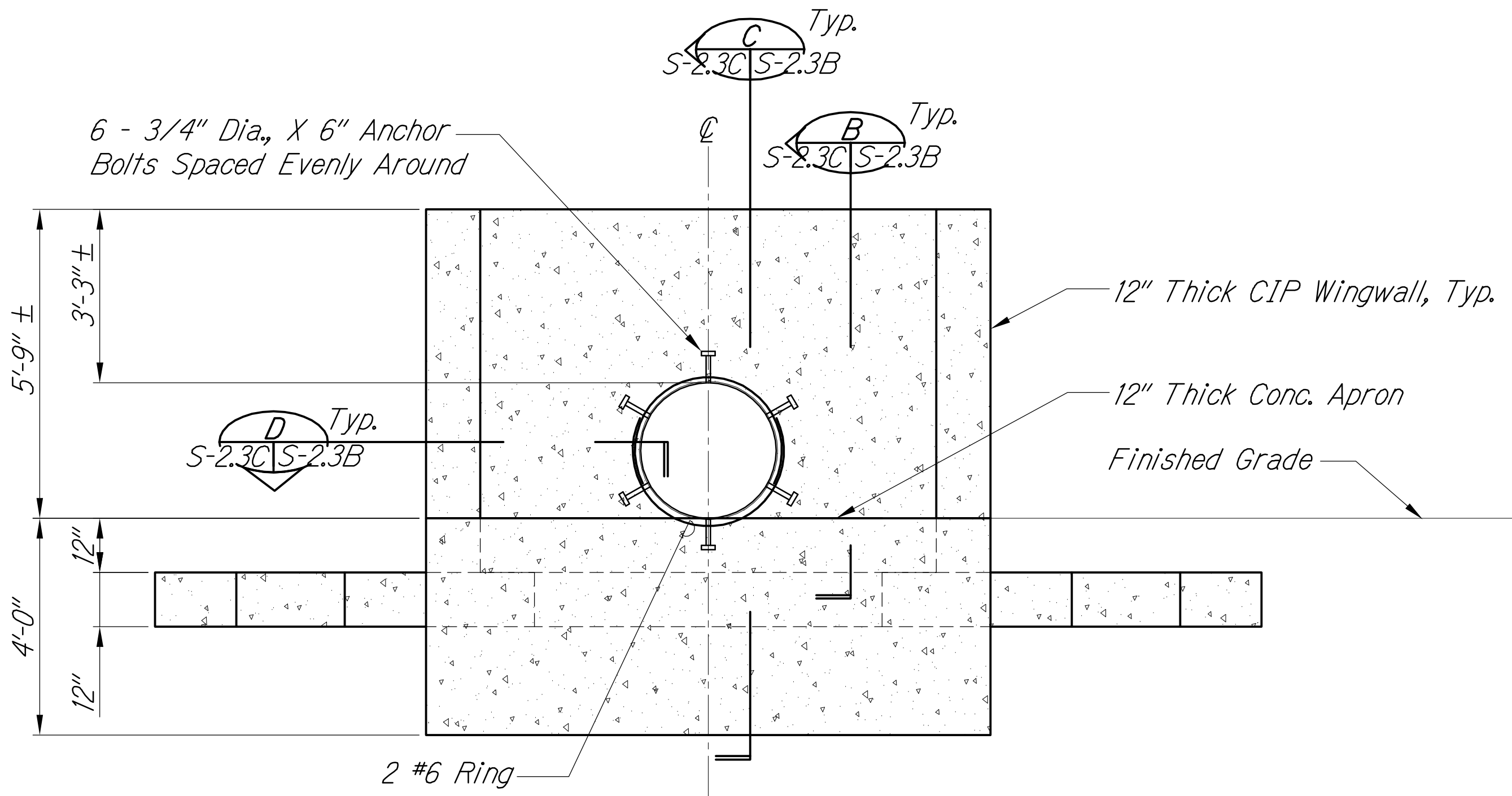
*[Signature]* APRIL 30, 2018  
SIGNATURE EXPIRATION DATE OF THE LICENSE

|                                                                                                                            |                                            |
|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| 2/5/18                                                                                                                     | 3 Sheet added to show Culvert C Inlet Wall |
| DATE                                                                                                                       | REVISION                                   |
| STATE OF HAWAII<br>DEPARTMENT OF TRANSPORTATION<br>HIGHWAYS DIVISION                                                       |                                            |
| CIP CULVERT C DETAILS                                                                                                      |                                            |
| QUEEN KAAHUMANU HIGHWAY WIDENING<br>Kealahou Pkwy. To Keahole Airport Rd. (Ph. 2)<br>Federal Aid Project No. NH-019-1(38)R |                                            |
| Scale: AS NOTED                                                                                                            | Date: AUGUST 2016                          |
| SHEET No. S-2.3B OF 18 SHEETS                                                                                              |                                            |

"AS-BUILT"



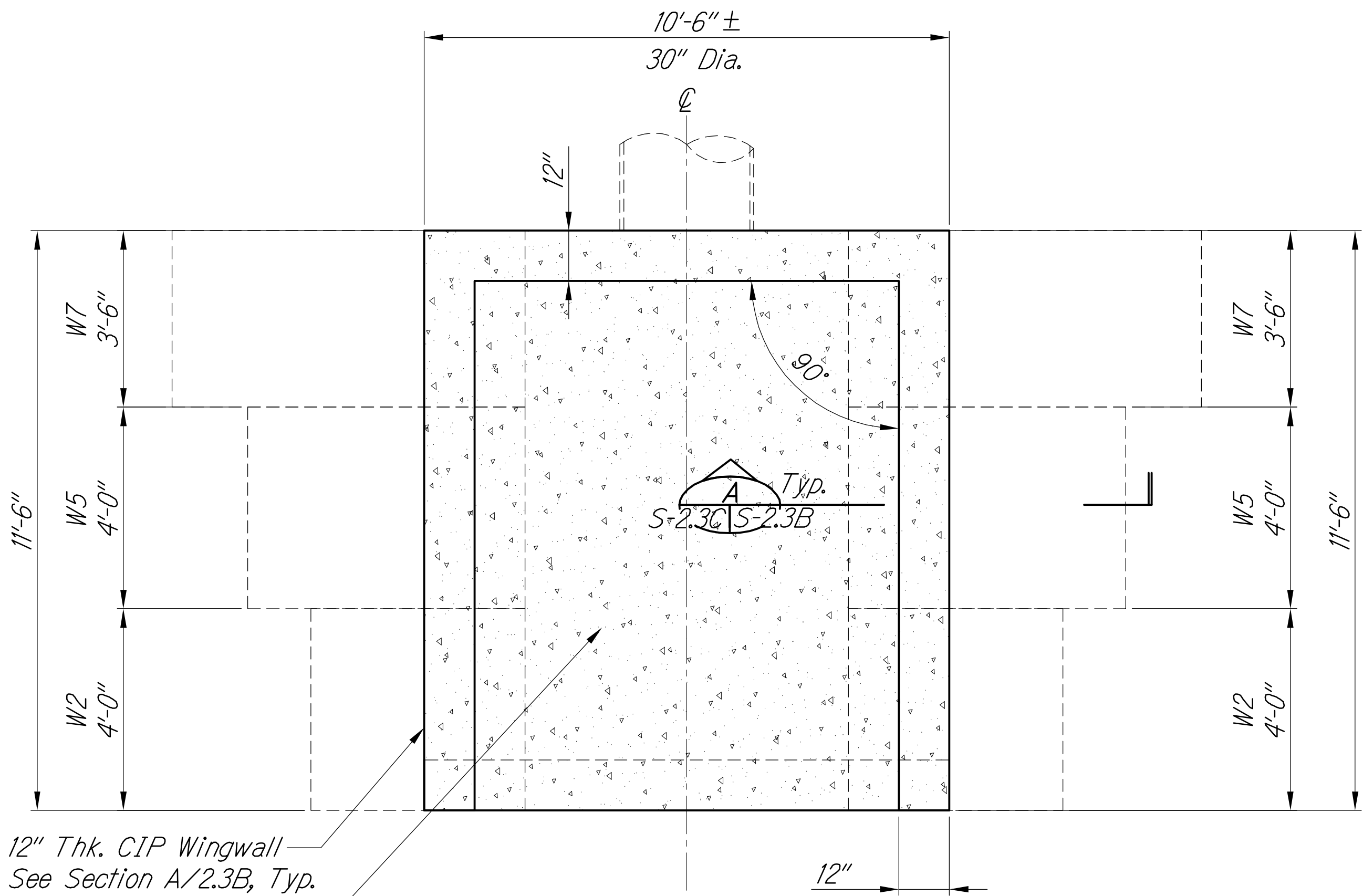
|                        |       |                       |                |                |                 |
|------------------------|-------|-----------------------|----------------|----------------|-----------------|
| FED. ROAD<br>DIST. NO. | STATE | FED. AID<br>PROJ. NO. | FISCAL<br>YEAR | SHEET<br>NO.   | TOTAL<br>SHEETS |
| HAWAII                 | HAW.  | NH-019-1(38)R         | 2016           | C.O.<br>499S-3 | 528<br>522      |



Note:

Stud Bolts Shall Be Stainless Steel (See C/S-2.4). Hot Dip Galvanized Bolts with Neoprene Washers and Sleeves are Acceptable, Provided it Does Not Affect the Manufacturer's Warranty.

ELEVATION - NEW HEADWALL FOR 30" DIA. CULVERT  
Scale: 1/2" = 1'-0"



12" Thk. CIP Wingwall  
See Section A/2.3B, Typ.

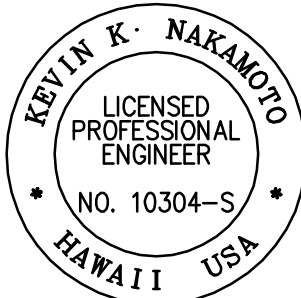
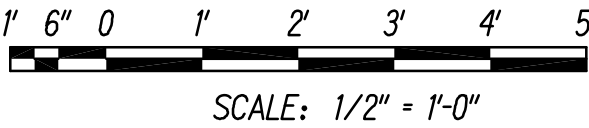
12" Thk. CIP Apron  
and Cutoff Wall  
See Civil for Elevation

PLAN - NEW HEADWALL FOR 30" DIA. CULVERT  
Scale: 1/2" = 1'-0"

LEGEND FOR  
AS-BUILT POSTINGS

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- Text for as-built posting

GRAPHIC SCALES



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APRIL 30, 2018  
EXPIRATION DATE  
OF THE LICENSE

|                                                                                                                                                                                                                                                                                                   |                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| 2/5/18                                                                                                                                                                                                                                                                                            | Sheet added to show Culvert C Inlet Wall |
| DATE                                                                                                                                                                                                                                                                                              | REVISION                                 |
| STATE OF HAWAII<br>DEPARTMENT OF TRANSPORTATION<br>HIGHWAYS DIVISION<br><b>CULVERT C INLET WALL</b><br><b>PLAN AND PROFILE</b><br>QUEEN KAAHUMANU HIGHWAY WIDENING<br>Kealahou Pkwy. To Keahole Airport Rd. (Ph. 2)<br>Federal Aid Project No. NH-019-1(38)R<br>Scale: AS NOTED Date: AUGUST 2016 |                                          |
| SHEET No. S-2.3C OF 18 SHEETS                                                                                                                                                                                                                                                                     |                                          |

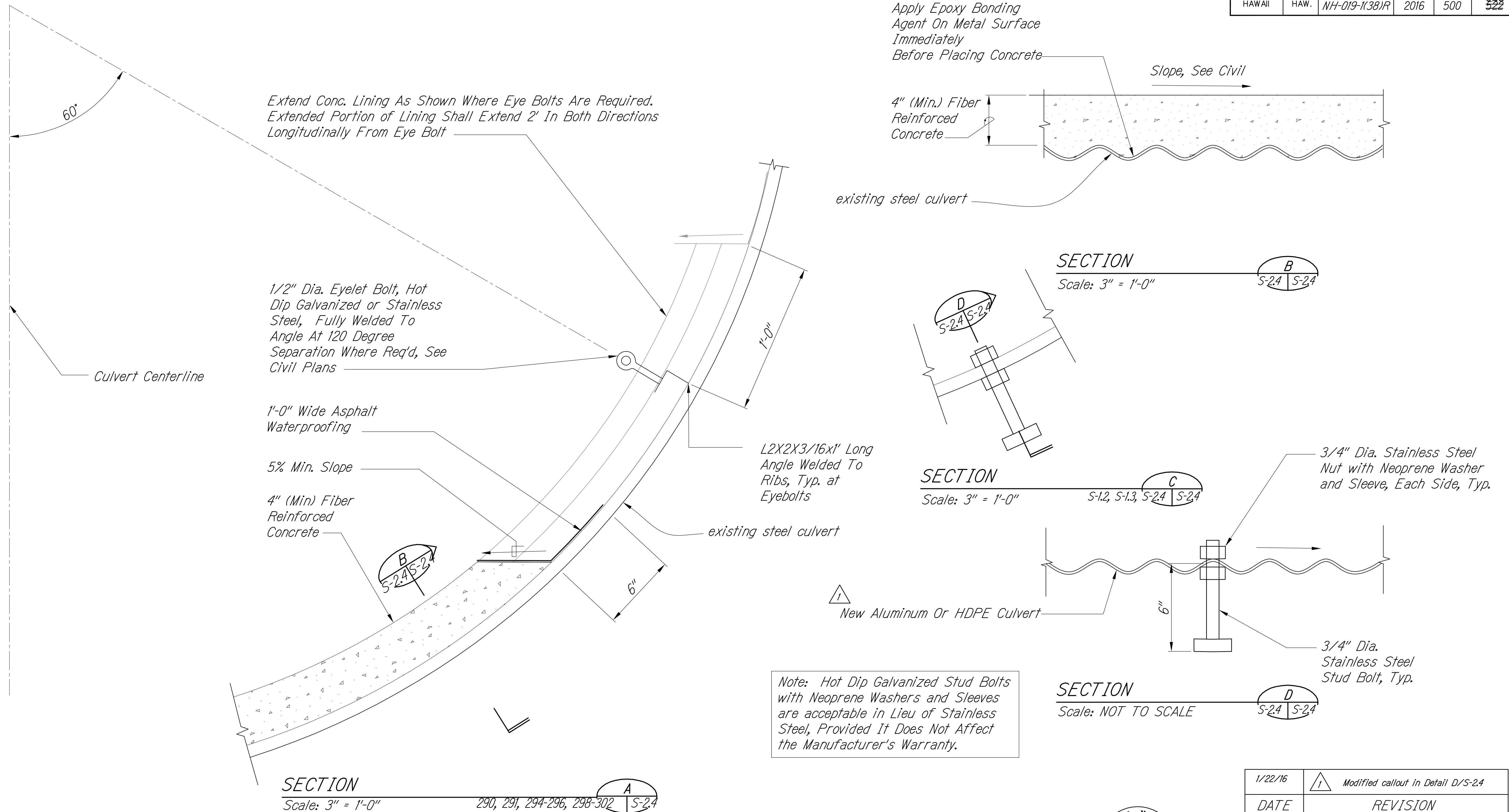
"AS-BUILT"

3/20/2018 3:22 PM

C.O. 499S-2 S-3



| FED. ROAD<br>DIST. NO. | STATE | FED. AID<br>PROJ. NO. | FISCAL<br>YEAR | SHEET<br>NO. | TOTAL<br>SHEETS       |
|------------------------|-------|-----------------------|----------------|--------------|-----------------------|
| HAWAII                 | HAW.  | NH-019-1(38)P         | 2016           | 500          | <del>528</del><br>522 |



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

M:\2008\2008\_003.002 GBI Queen K Hwy Redesign\G Dwgs\Contract Documents\Structural\160817 FINAL CAD to DOT Superceeds all other CAD Files\S-2\_4 Concrete Lining Details.dwg 8/19/2016 10:11 AM

|         |                                   |
|---------|-----------------------------------|
| 1/22/16 | Modified callout in Detail D/S-24 |
| DATE    | REVISION                          |

STATE OF HAWAII  
 DEPARTMENT OF TRANSPORTATION  
 HIGHWAYS DIVISION

CONCRETE LINING DETAILS  
SECTION AND DETAILS

QUEEN KAAHUMANU HIGHWAY WIDENING  
Kealahoe Pkwy. To Keahole Airport Rd. (Ph. 2)  
Federal Aid Project No. NH-019-1(38)R

Scale: AS NOTED
Date: AUGUST 1966

SHEET No. *S-24* OF *18* SHEETS

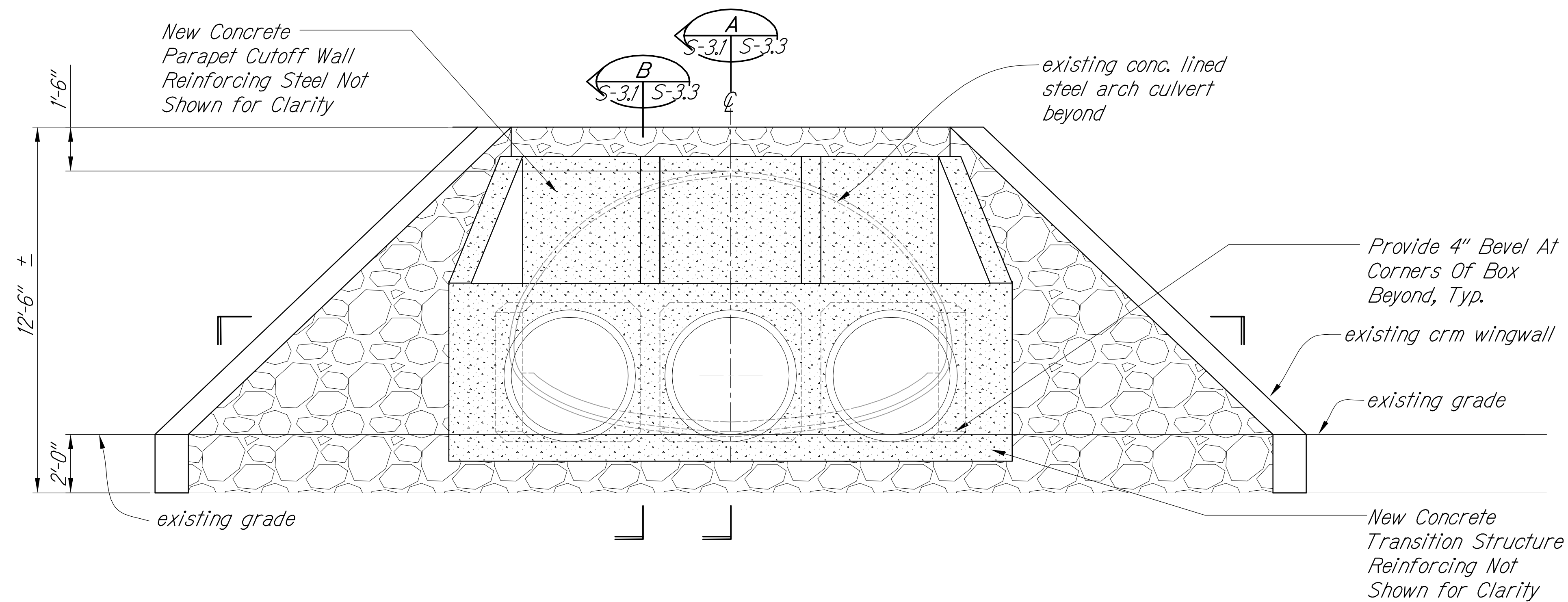
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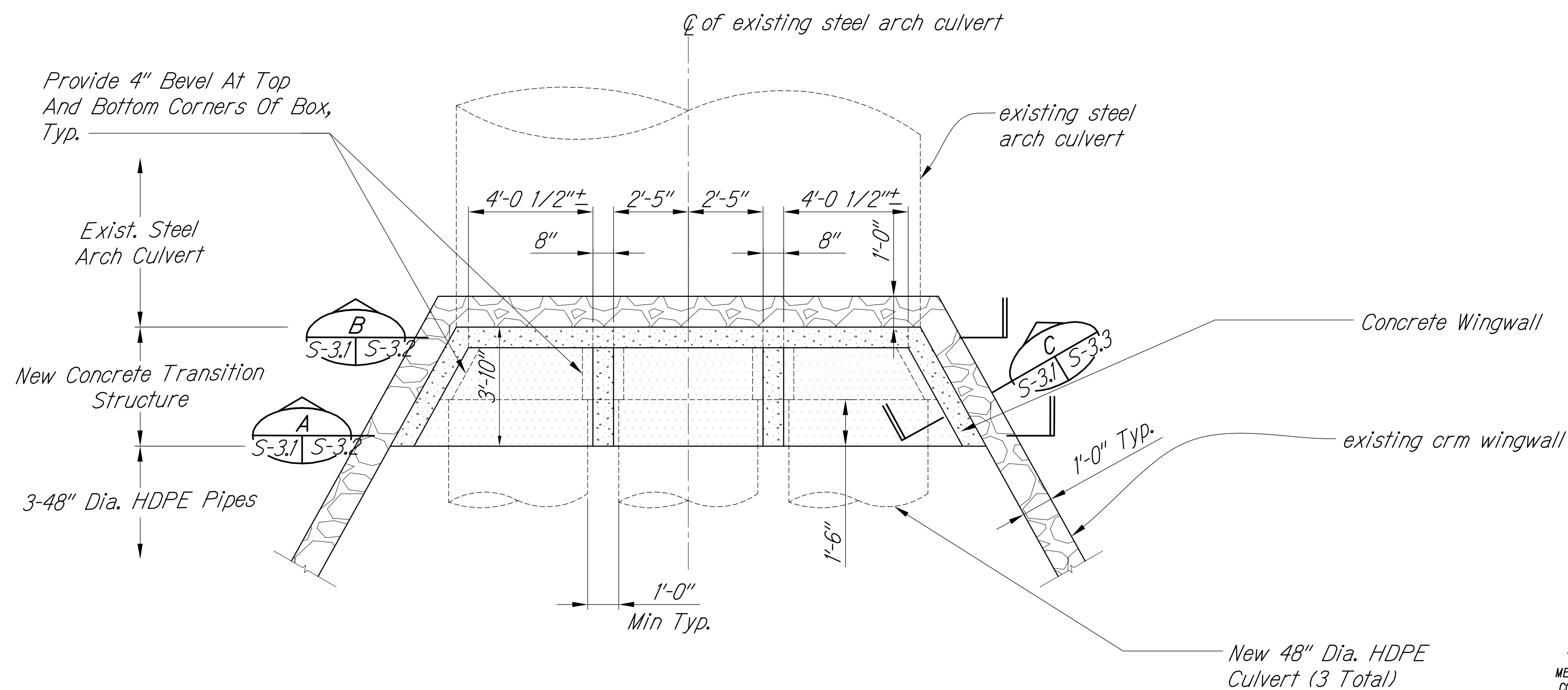
# 500



| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS          |
|---------------------|-------|--------------------|-------------|-----------|-----------------------|
| HAWAII              | HAW.  | NH-019-1(38)R      | 2016        | 501       | 528<br><del>522</del> |



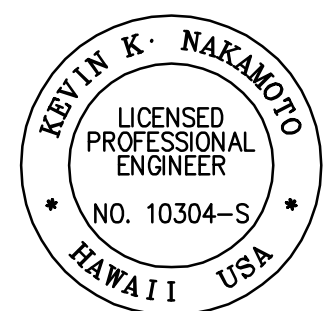
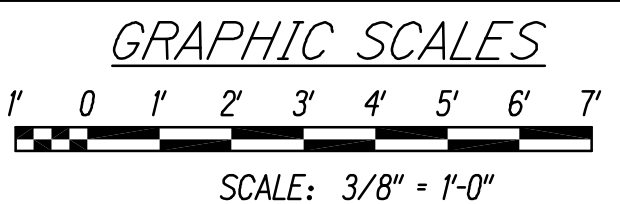
**ELEVATION - NEW ARCH TO TRIPLE CULVERT TRANSITION STRUCTURE**  
Scale: 3/8" = 1'-0"



**PLAN - NEW ARCH TO TRIPLE CULVERT TRANSITION STRUCTURE**  
Scale: 3/8" = 1'-0"

**LEGEND FOR AS-BUILT POSTINGS**

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STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**STRUCTURAL ARCH TO TRIPLE TRANSITION STRUCTURE**  
**PLAN AND ELEVATION**

QUEEN KAAHUMANU HIGHWAY WIDENING  
Kealahou Pkwy. To Keahole Airport Rd. (Ph. 2)  
Federal Aid Project No. NH-019-1(38)R

Scale: AS NOTED Date: AUGUST 2016

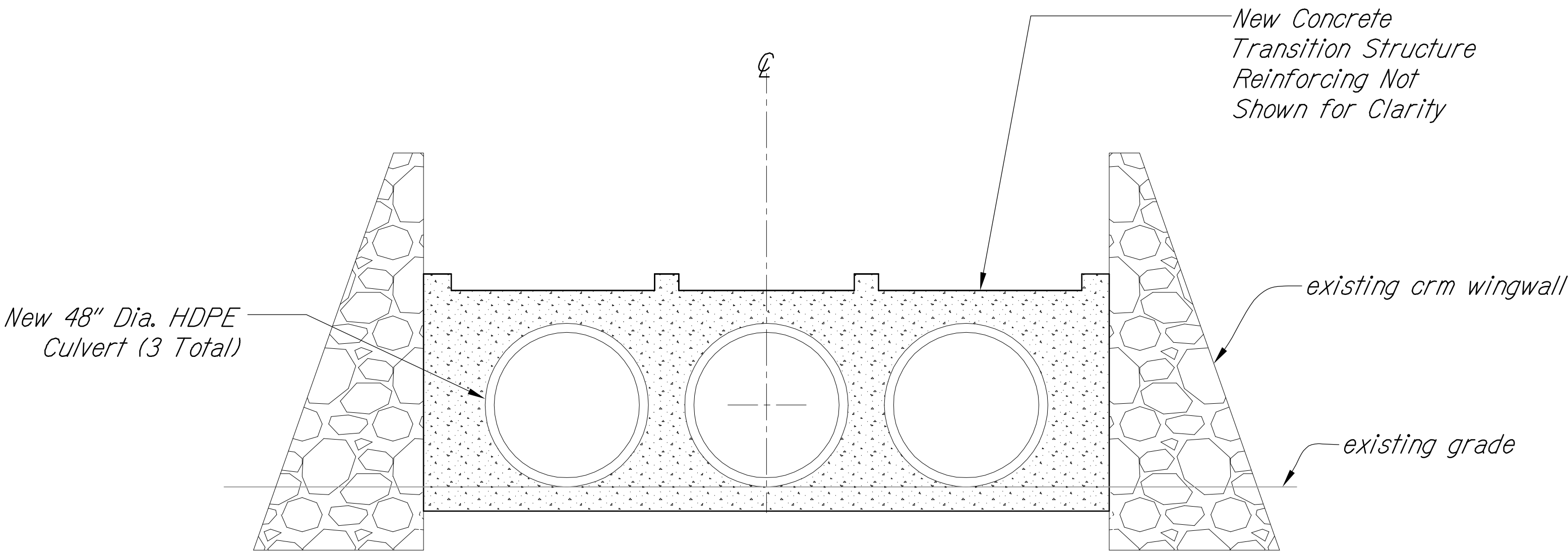
SHEET No. S-3/ OF 18 SHEETS

|               |      |
|---------------|------|
| DESIGNED BY   | DATE |
| NOTED BY      |      |
| CHECKED BY    |      |
| QUANTITIES BY |      |
| DESIGNED BY   |      |
| NOTED BY      |      |
| CHECKED BY    |      |
| QUANTITIES BY |      |

M:\2008\2008\_003\001 GBI Queen K Hwy Award\G Drawings\Contract Documents\Structural\S-3\_1 Arch to Triple Plan.dwg 8/16/2016 2:35 PM

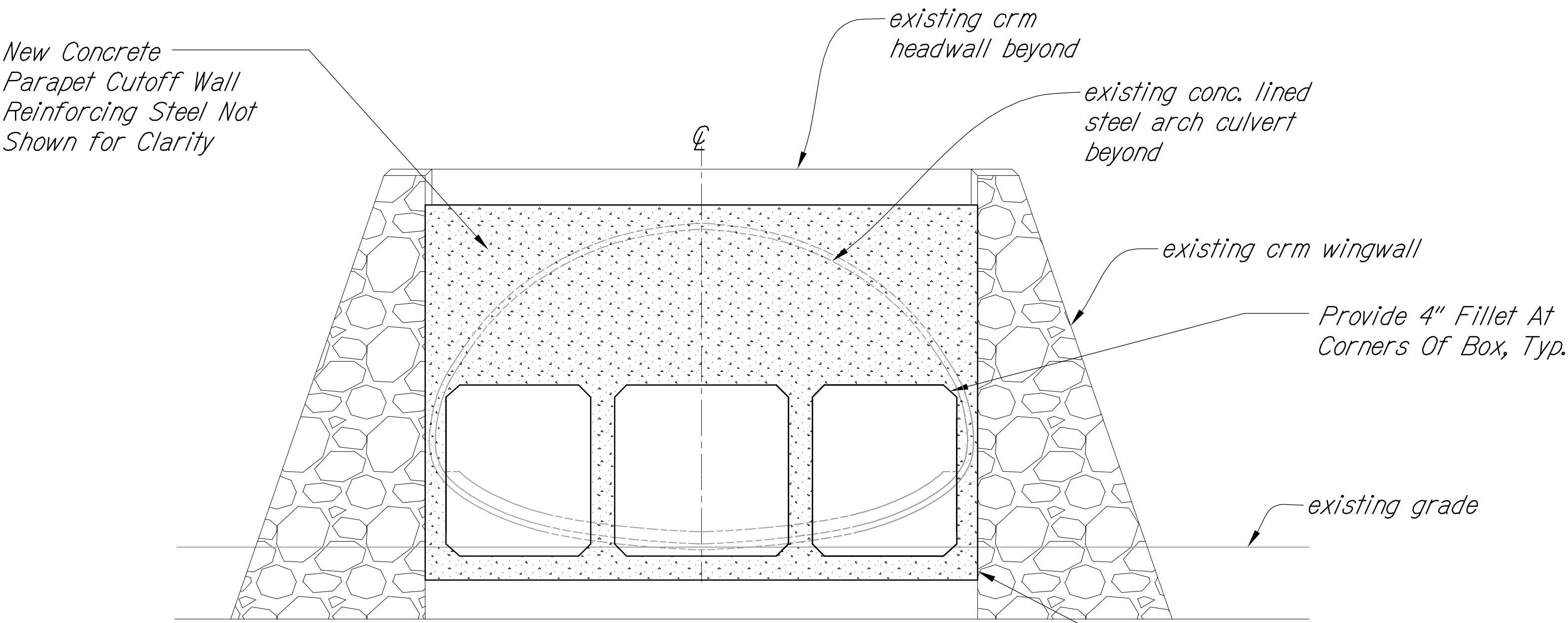


| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | NH-019-1(38)R      | 2016        | 502       | 528          |



SECTION  
Scale: 3/8" = 1'-0"

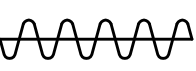
S-3.1 | S-3.2

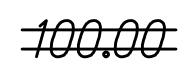


SECTION  
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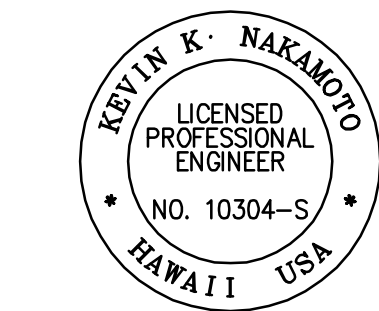
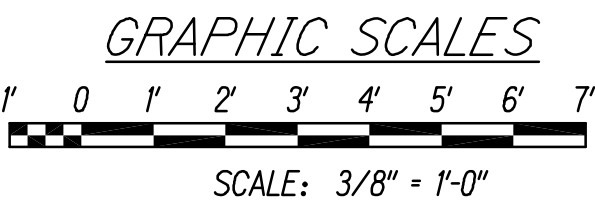
S-3.1 | S-3.2

LEGEND FOR  
AS-BUILT POSTINGS

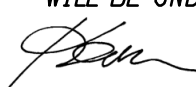
 Squiggly line for as-built deletion

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Roadway Text for as-built posting



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STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

STRUCTURAL ARCH TO TRIPLE TRANSITION STRUCTURE

SECTIONS

QUEEN KAAHUMANU HIGHWAY WIDENING  
Kealahou Pkwy. To Keahole Airport Rd. (Ph. 2)  
Federal Aid Project No. NH-019-1(38)R

Scale: AS NOTED Date: AUGUST 2016

SHEET No. S-3.2 OF 18 SHEETS

"AS-BUILT"

|               |      |
|---------------|------|
| DESIGNED BY   | DATE |
| TRACED BY     |      |
| DESIGNED BY   |      |
| QUANTITIES BY |      |
| CHECKED BY    |      |

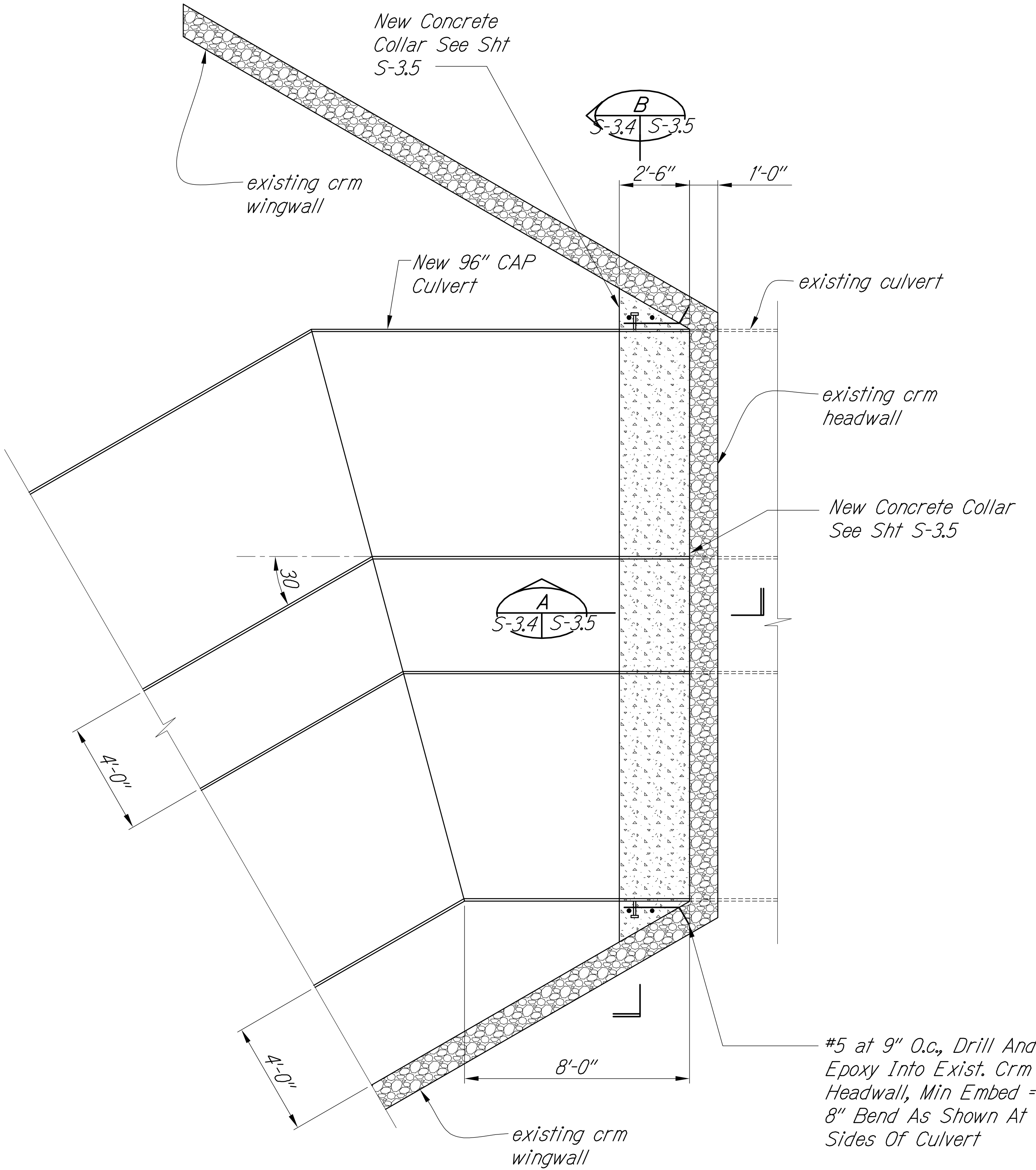
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| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS          |
|---------------------|-------|--------------------|-------------|-----------|-----------------------|
| HAWAII              | HAW.  | NH-019-1(38)R      | 2016        | 504       | 528<br><del>522</del> |

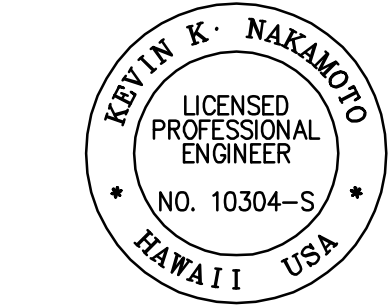


**PLAN**  
Scale: 3/8" = 1'-0"

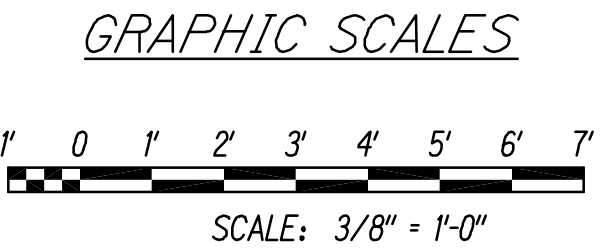
**Notes:**

1. Stud Bolts Shall Be Stainless Steel (See C/S-2.4).  
Hot Dip Galvanized Bolts with Neoprene Washers and Sleeves are Acceptable,  
Provided it Does Not Affect the Manufacturer's Warranty.

| LEGEND FOR AS-BUILT POSTINGS |                                     |
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|                              | Double line for as-built deletion   |
| Roadway                      | Text for as-built posting           |



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APRIL 30, 2018  
EXPIRATION DATE  
OF THE LICENSE



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

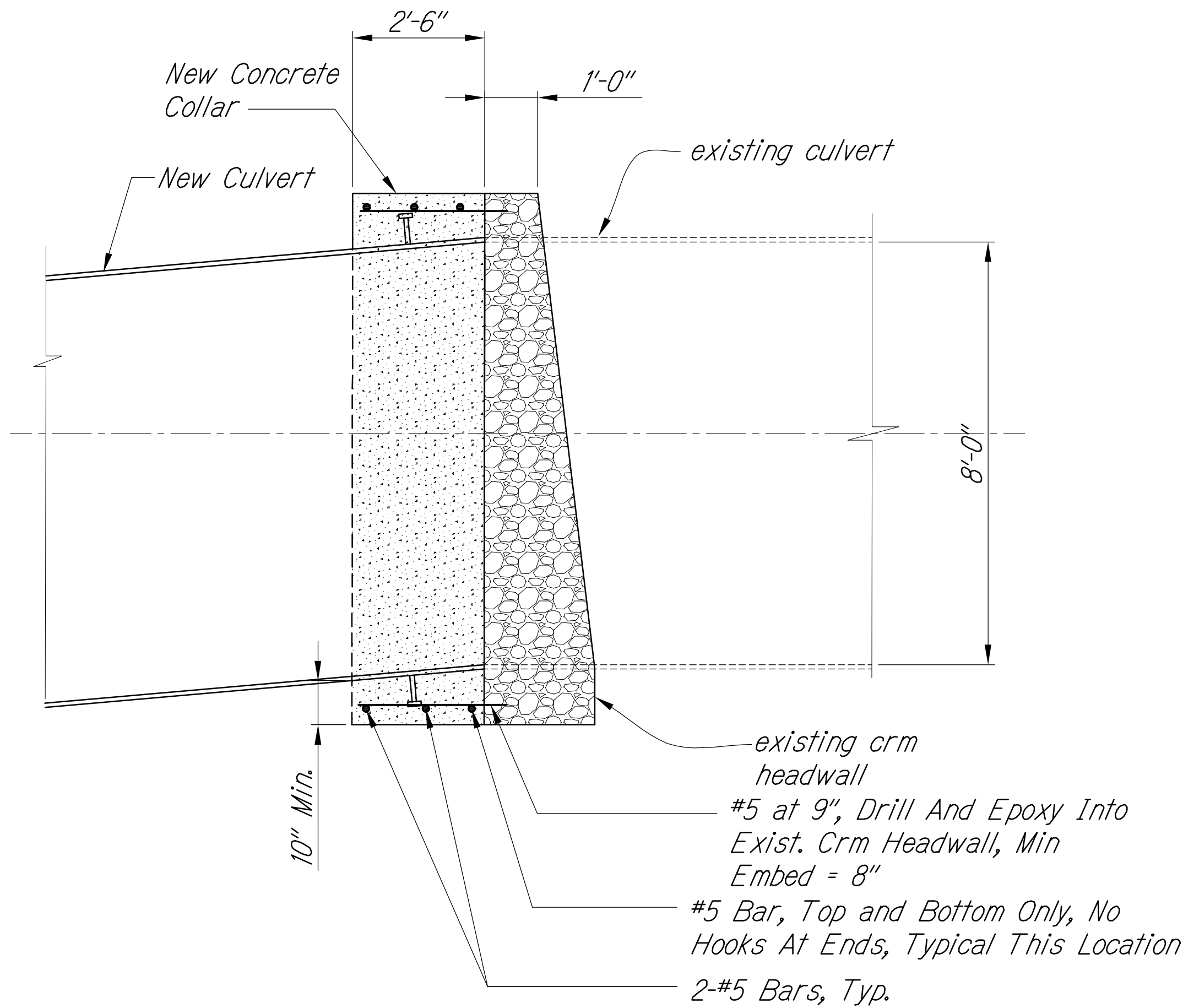
**CULVERT L CONCRETE COLLAR**  
**PLAN**

QUEEN KAAHUMANU HIGHWAY WIDENING  
Kealahou Pkwy. To Keahole Airport Rd. (Ph. 2)  
Federal Aid Project No. NH-019-1(38)R  
Scale: AS NOTED Date: AUGUST 2016

SHEET No. S-3.4 OF 18 SHEETS



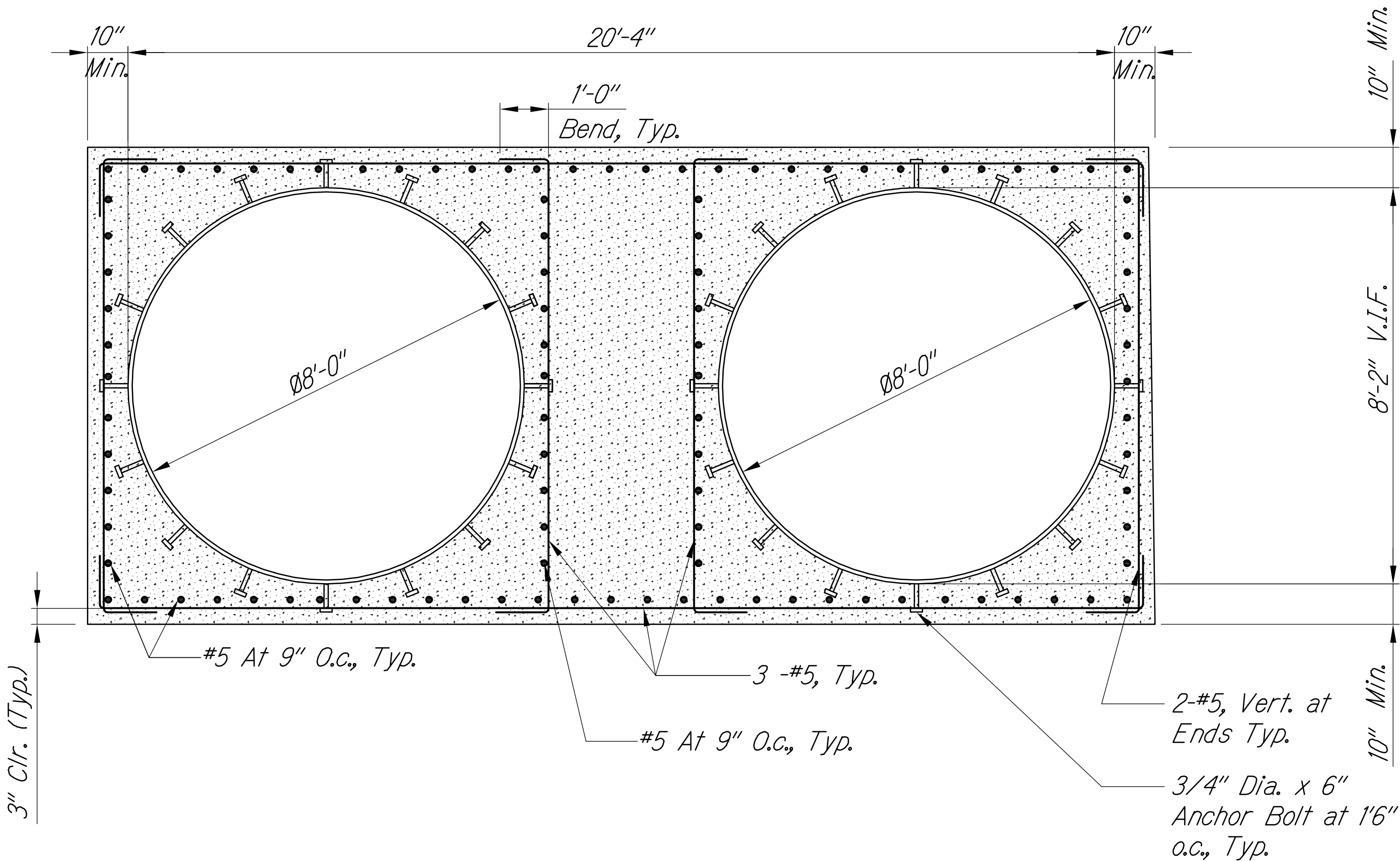
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS          |
|---------------------|-------|--------------------|-------------|-----------|-----------------------|
| HAWAII              | HAW.  | NH-019-1(38)R      | 2016        | 505       | 528<br><del>522</del> |



**SECTION WITH EXISTING HEADWALL**  
Scale: 1/2" = 1'-0"

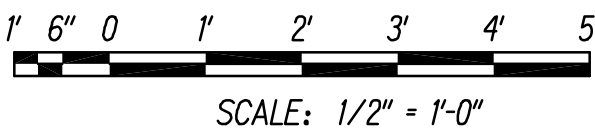
Note:

1. Stud Bolts Shall Be Stainless Steel (See C/S-2.4). Hot Dip Galvanized Bolts with Neoprene Washers and Sleeves are Acceptable, Provided it Does Not Affect the Manufacturer's Warranty.



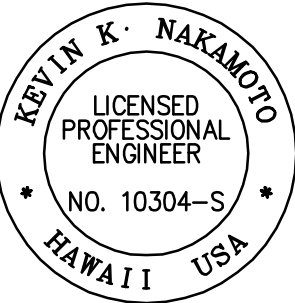
**SECTION**  
Scale: 1/2" = 1'-0"

GRAPHIC SCALES



**LEGEND FOR AS-BUILT POSTINGS**

- Squiggly line for as-built deletion
- Double line for as-built deletion
- Text for as-built posting



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APRIL 30, 2018  
EXPIRATION DATE OF THE LICENSE

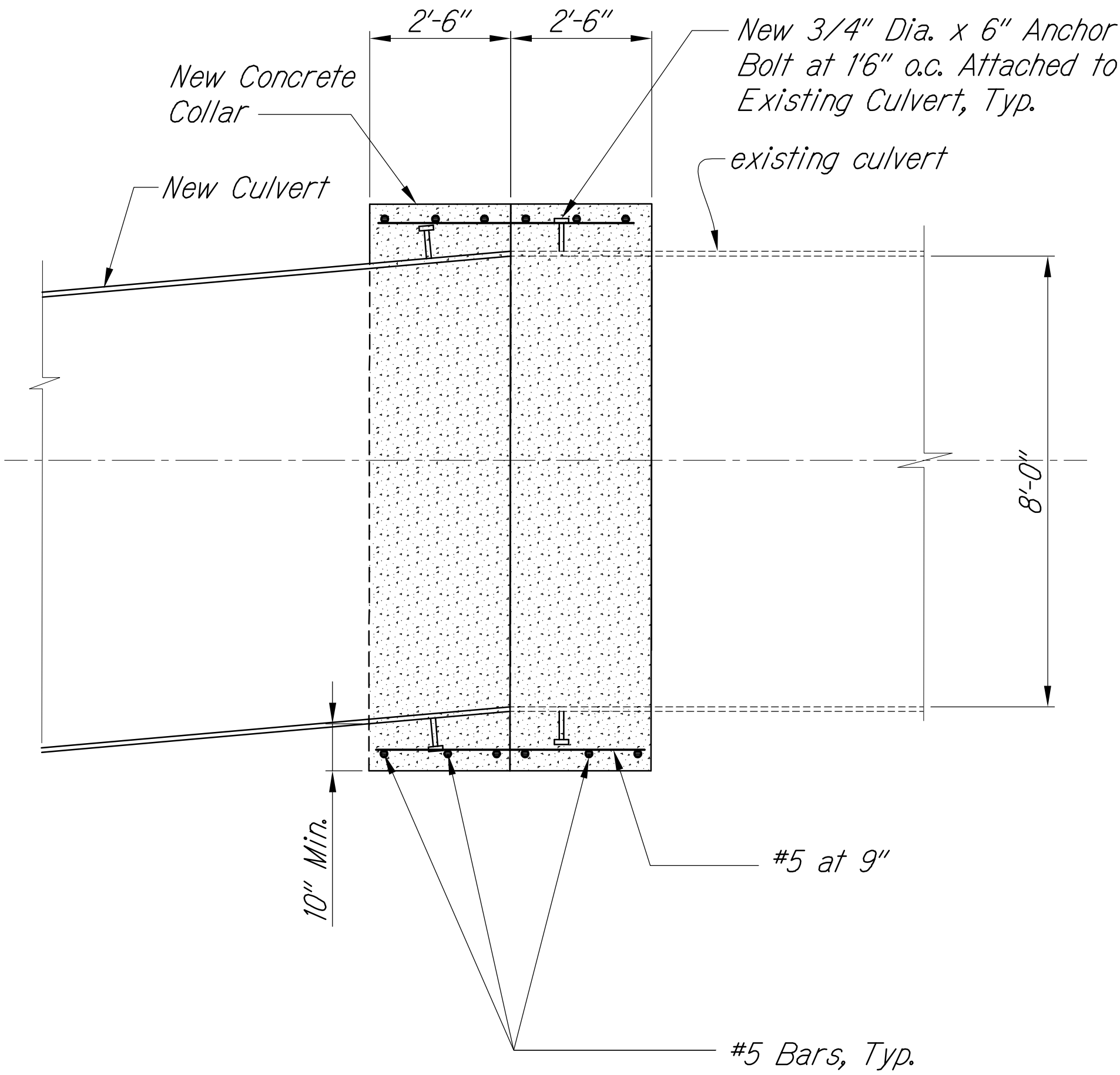
|                                                                                                                                                                                                                                                                                                                                 |                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| 02/18/16                                                                                                                                                                                                                                                                                                                        | Modified title for Section A |
| DATE                                                                                                                                                                                                                                                                                                                            | REVISION                     |
| STATE OF HAWAII<br>DEPARTMENT OF TRANSPORTATION<br>HIGHWAYS DIVISION<br><b>REINFORCED CONCRETE COLLAR AT DUAL 96" CULVERT</b><br><b>SECTIONS AND DETAILS</b><br>QUEEN KAAHUMANU HIGHWAY WIDENING<br>Kealahou Pkwy. To Keahole Airport Rd. (Ph. 2)<br>Federal Aid Project No. NH-019-1(38)R<br>Scale: AS NOTED Date: AUGUST 2016 |                              |
| SHEET No. S-35                                                                                                                                                                                                                                                                                                                  | OF 18 SHEETS                 |

"AS-BUILT"

505



| FED. ROAD<br>DIST. NO. | STATE | FED. AID<br>PROJ. NO. | FISCAL<br>YEAR | SHEET<br>NO.   | TOTAL<br>SHEETS |
|------------------------|-------|-----------------------|----------------|----------------|-----------------|
| HAWAII                 | HAW.  | NH-019-1(38)R         | 2016           | C.O.<br>505S-1 | 528<br>522      |



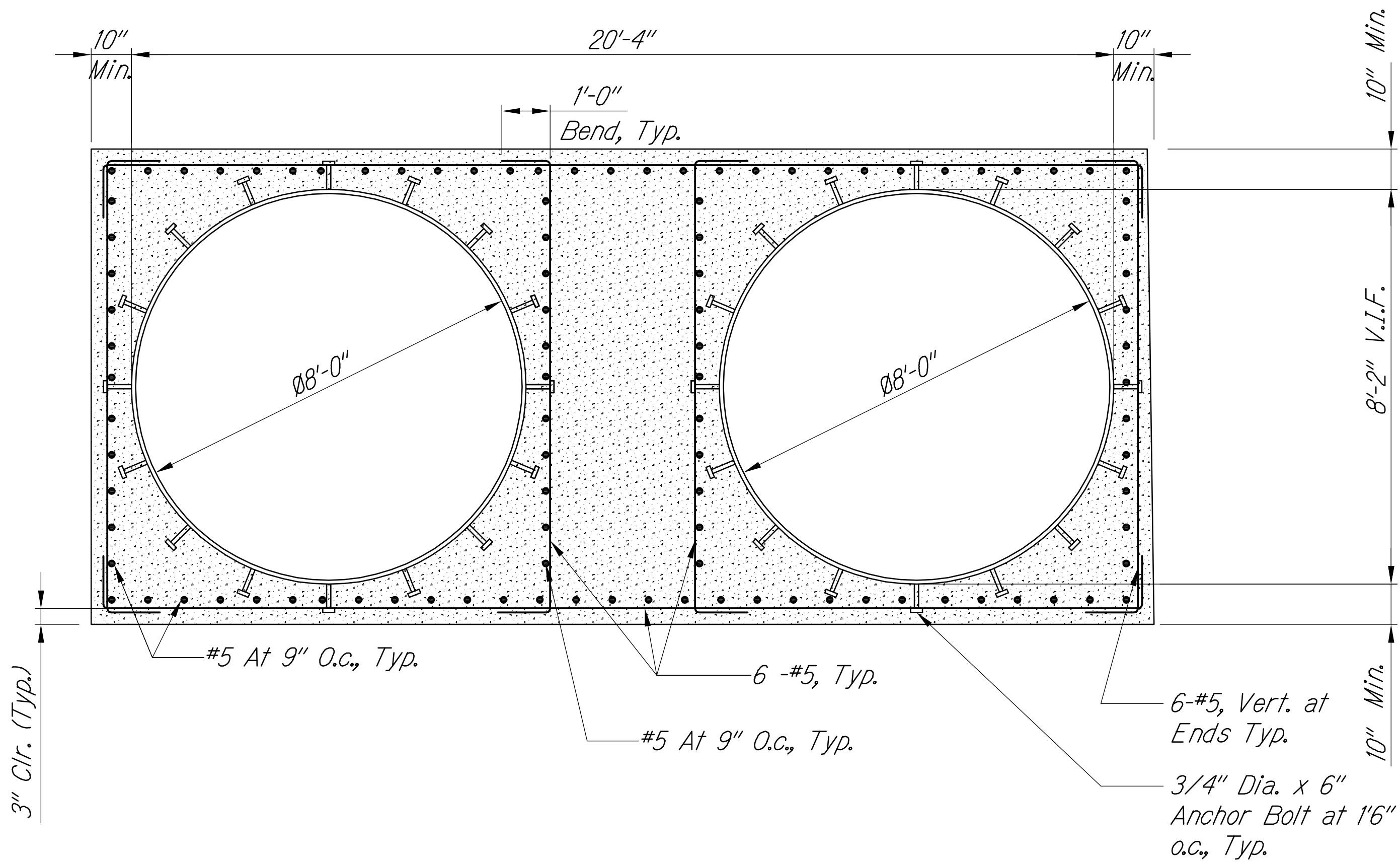
SECTION WITH NO EXISTING HEADWALL

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

The diagram shows a cross-section of a bridge deck. It consists of a central rectangular section labeled 'A' with a width of 3.4 feet. This central section is flanked by two side sections, each with a width of 3.5 feet. The total width of the deck is 10.4 feet. The diagram is a simple line drawing with no shading or texture.

*Note:*


- 1. Stud Bolts Shall Be Stainless Steel (See C/S-2.4). Hot Dip Galvanized Bolts with Neoprene Washers and Sleeves are Acceptable, Provided it Does Not Affect the Manufacturer's Warranty.*



SECTION



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

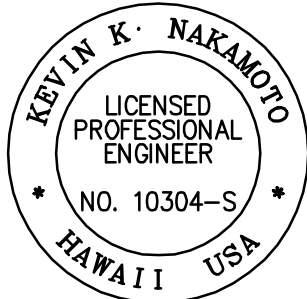
S-3.4 S-3.5A



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

\\m:\2008\2008\_003.002 GBI Queen K Hwy Redesign\G Dwg\Contract Documents\Structural\160817 FINAL CAD to DOT Superceeds all other CAD Files\S-3.5A Conc Collar Details.dwg 8/19/2016 10:28 AM

| LEGEND FOR<br>AS-BUILT POSTINGS                                                       |                                        |
|---------------------------------------------------------------------------------------|----------------------------------------|
|  | Squiggly line for<br>as-built deletion |
|  | Double line for<br>as-built deletion   |
| Roadway                                                                               | Text for as-built<br>posting           |

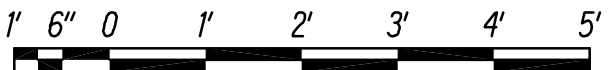


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APRIL 30, 2018  
EXPIRATION DATE  
OF THE LICENSE

## GRAPHIC SCALES



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

|          |          |                                                                     |
|----------|----------|---------------------------------------------------------------------|
| 02/18/16 |          | <i>Sheet added to show the concrete collar detail for Culvert B</i> |
| DATE     | REVISION |                                                                     |

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**REINFORCED CONCRETE COLLAR AT DUAL 96" CULVERT**

**SECTIONS AND DETAILS**

QUEEN KAAHUMANU HIGHWAY WIDENING

Kealahoke Pkwy. To Keahole Airport Rd. (Ph. 2)

Federal Aid Project No. NH-019-1(38)R

Scale: AS NOTED                      Date: AUGUST 2016

SHEET No.    S-354 OF    18    SHEETS

## "AS-BUILT"

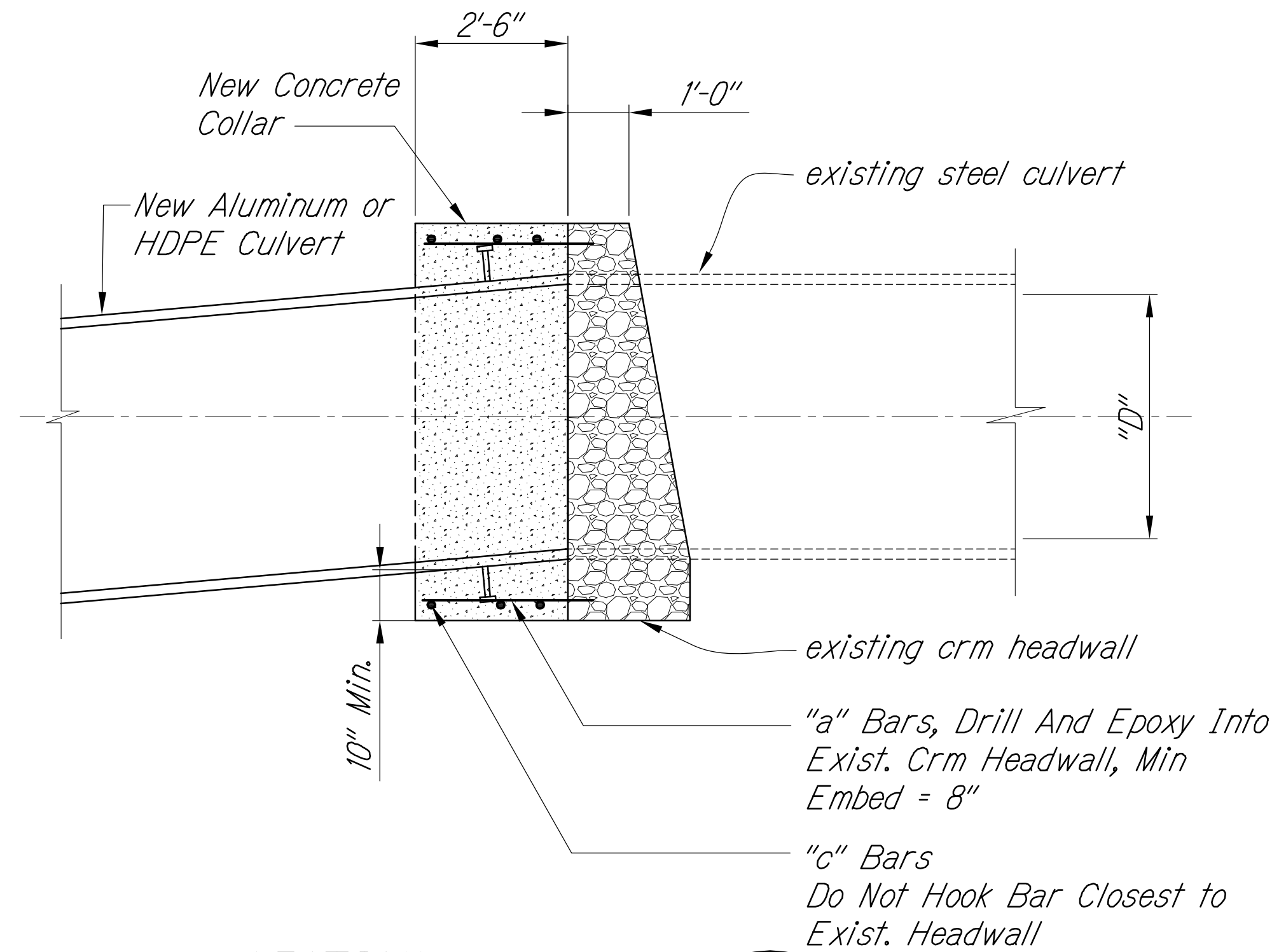
**C.O. 505 S-1**







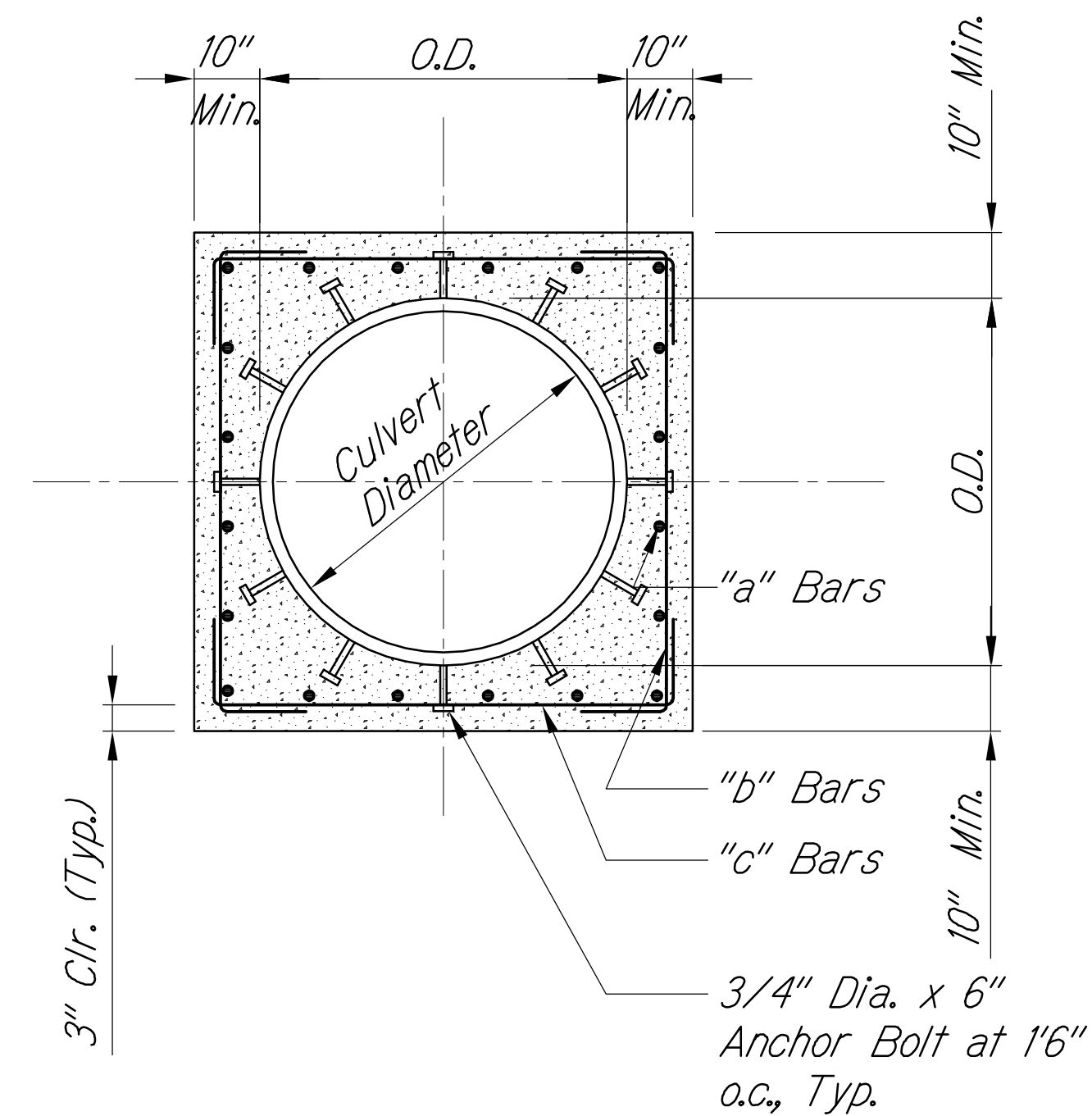
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS          |
|---------------------|-------|--------------------|-------------|-----------|-----------------------|
| HAWAII              | HAW.  | NH-019-11(38)R     | 2016        | 507       | 528<br><del>522</del> |



*SECTION*

*Scale: NOT TO SCALE*

A diagram showing a cross-section of a pipe. A horizontal line represents the centerline. Above the line, the word "SECTION" is written. Below the line, the text "Scale: NOT TO SCALE" is written. To the right of the line, there is a circle representing the pipe's cross-section. A vertical line from the centerline to the top of the circle is labeled "5.37". The area inside the circle is labeled "A".



*SECTION*

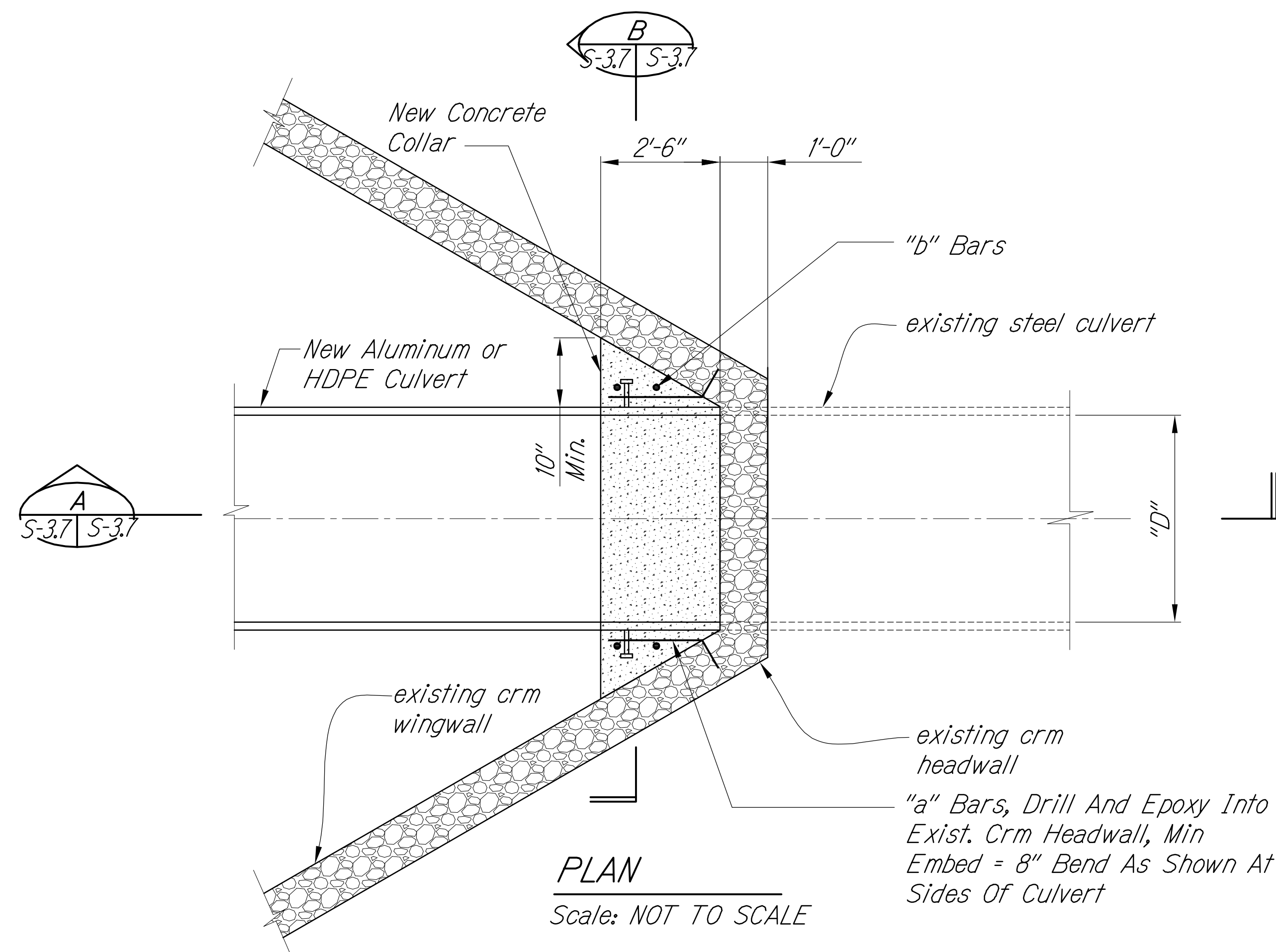
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*Scale: NOT TO SCALE*



*Note:*



*1. Stud Bolts Shall Be Stainless Steel (See C/S-2.4). Hot Dip Galvanized Bolts with Neoprene Washers and Sleeves are Acceptable, Provided it Does Not Affect the Manufacturer's Warranty.*



PLAN  
Scale: NOT TO SCALE


| <i>Culvert<br/>Diameter "D"</i> | <i>"a" Bars</i> | <i>"b" Bars</i> | <i>"c" Bars</i> |
|---------------------------------|-----------------|-----------------|-----------------|
| <i>18" to 30"</i>               | <i>#4 at 9"</i> | <i>2 - #3</i>   | <i>3 - #3</i>   |
| <i>60" and Larger</i>           | <i>#5 at 9"</i> | <i>2 - #5</i>   | <i>3 - #5</i>   |

## LEGEND FOR AS-BUILT POSTINGS

|                                                                                       |                                     |
|---------------------------------------------------------------------------------------|-------------------------------------|
|  | Squiggly line for as-built deletion |
|  | Double line for as-built deletion   |
| Roadway                                                                               | Text for as-built posting           |



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 APRIL 30, 2018  
SIGNATURE EXPIRATION DATE  
OF THE LICENSE

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

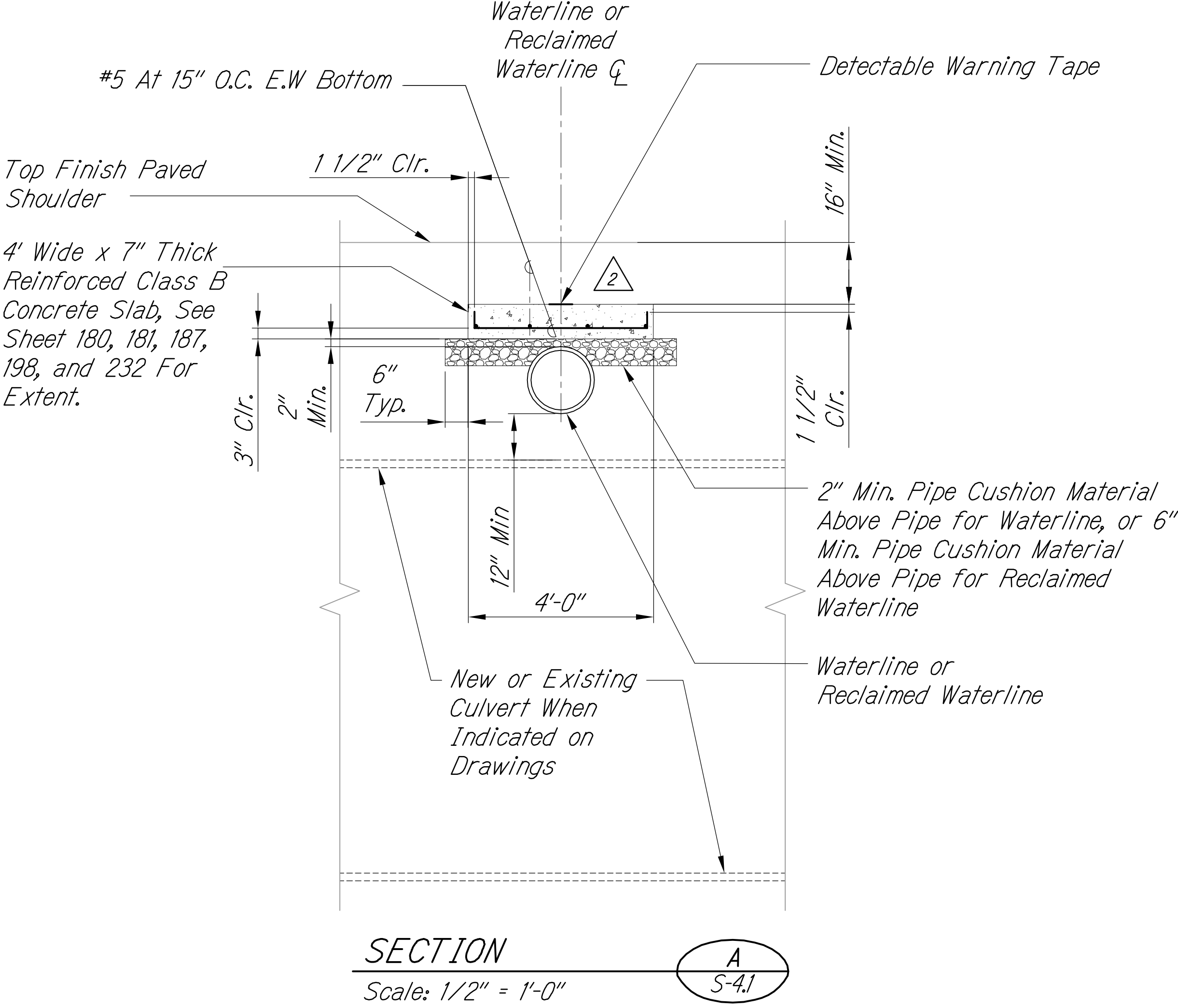
REINFORCED CONCRETE COLLAR AT EXIST WINGWALLS  
PLAN AND SECTION

QUEEN KAAHUMANU HIGHWAY WIDENING  
Kealahou Pkwy. To Keahole Airport Rd. (Ph. 2)  
Federal Aid Project No. NH-019-1(38)R  
 Scale: AS NOTED                      Date: AUGUST 2016

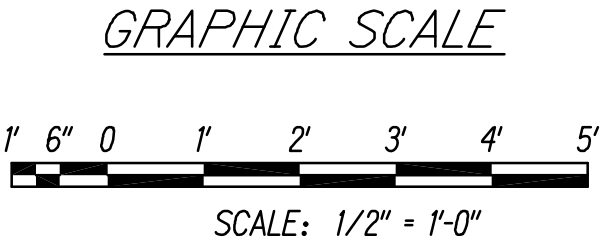
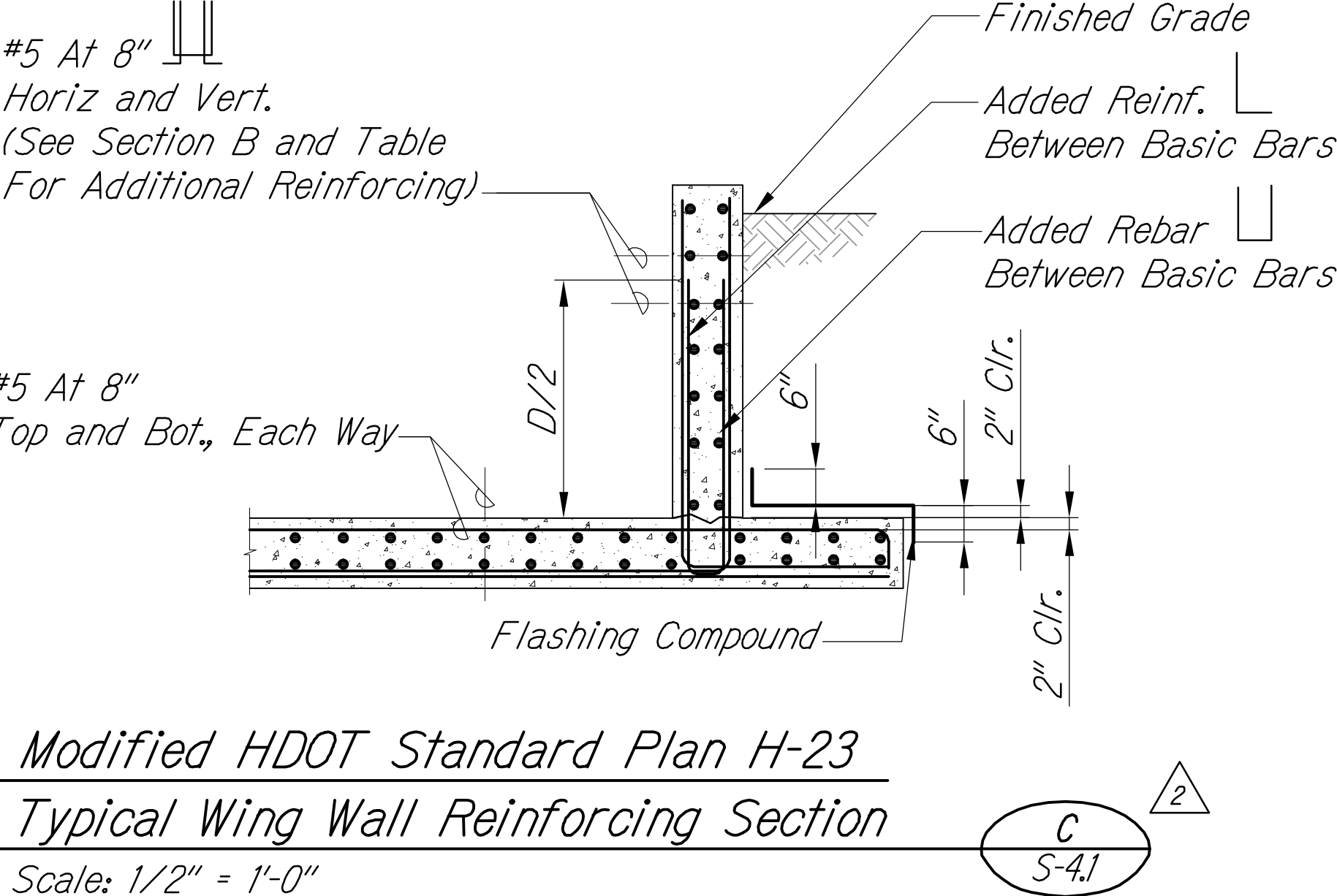
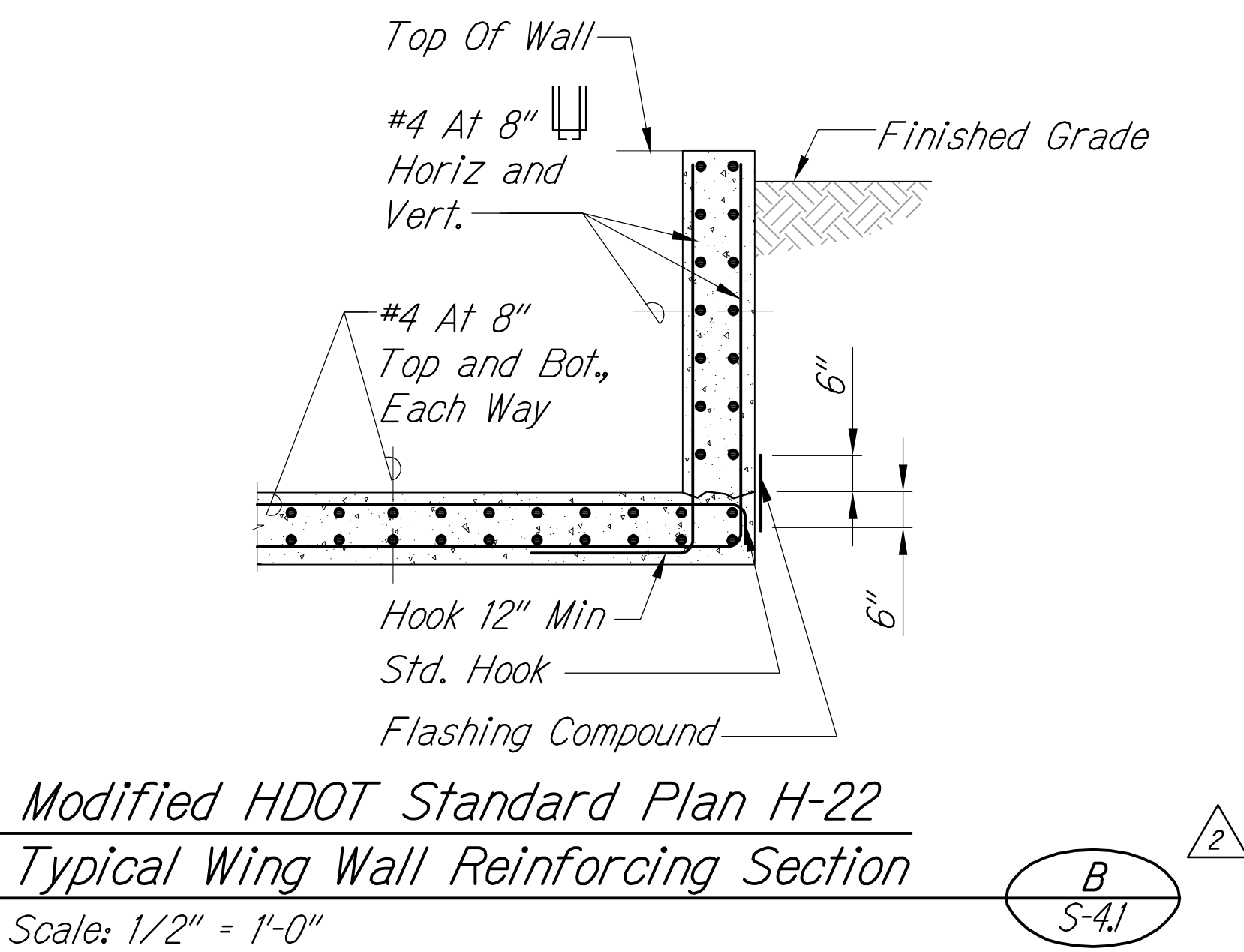
SHEET No. *S-3.7* OF *18* SHEETS



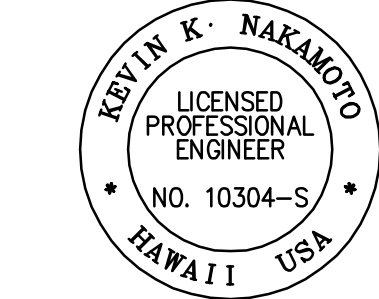
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | NH-019-1(38)R      | 2016        | 508       | 528          |



- Notes:
1. Top of Concrete Slab Shall Be Below Aggregate Base Course.
  2. Detail Shall Be Used Only When 3 Foot Minimum Cover Above Waterline or Reclaimed Waterline Cannot Be Met.



| LEGEND FOR AS-BUILT POSTINGS |                                     |
|------------------------------|-------------------------------------|
|                              | Squiggly line for as-built deletion |
|                              | Double line for as-built deletion   |
| Roadway                      | Text for as-built posting           |



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SIGNATURE: [Signature] APRIL 30, 2018 EXPIRATION DATE OF THE LICENSE

|         |                                                                                                                                                                                                             |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4/18/16 | <div>2</div> <p>Added HDOT Wingwall Reinforcing Details. Added Modified HDOT Wingwall Details and Waterproofing Detail for Construction Joints. Modified Section A Drawing and Callouts and Added Notes</p> |
| DATE    | REVISION                                                                                                                                                                                                    |

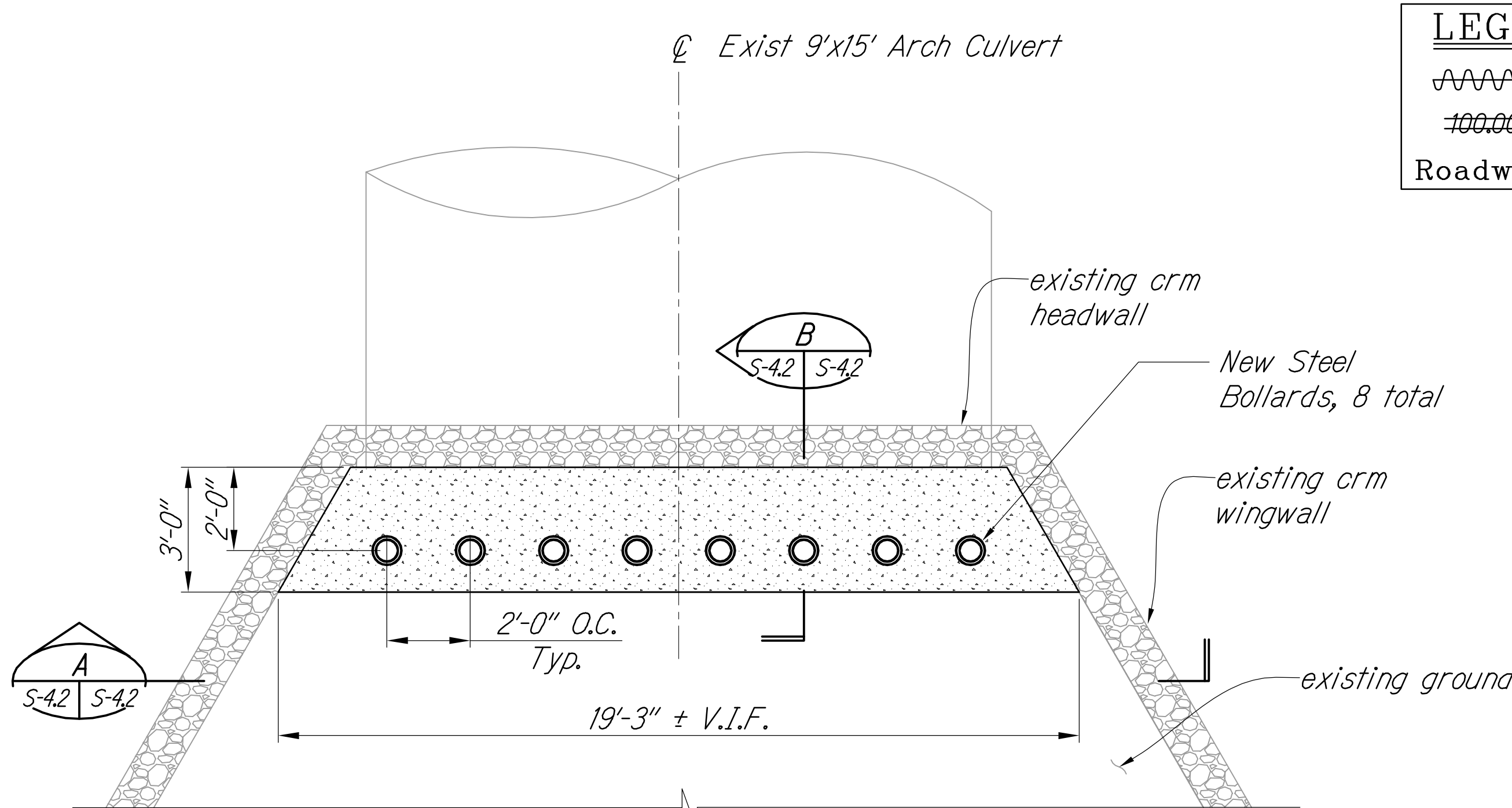
|                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>STATE OF HAWAII<br/>DEPARTMENT OF TRANSPORTATION<br/>HIGHWAYS DIVISION</p> <p><u>MISCELLANEOUS STRUCTURAL</u><br/><u>DETAILS</u></p> <p><u>QUEEN KAAHUMANU HIGHWAY WIDENING</u><br/><u>Kealahou Pkwy. To Keahole Airport Rd. (Ph. 2)</u><br/><u>Federal Aid Project No. NH-019-1(38)R</u></p> <p>Scale: AS NOTED      Date: AUGUST 2016</p> <p>SHEET No. S-4/ OF 18 SHEETS</p> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

"AS-BUILT"

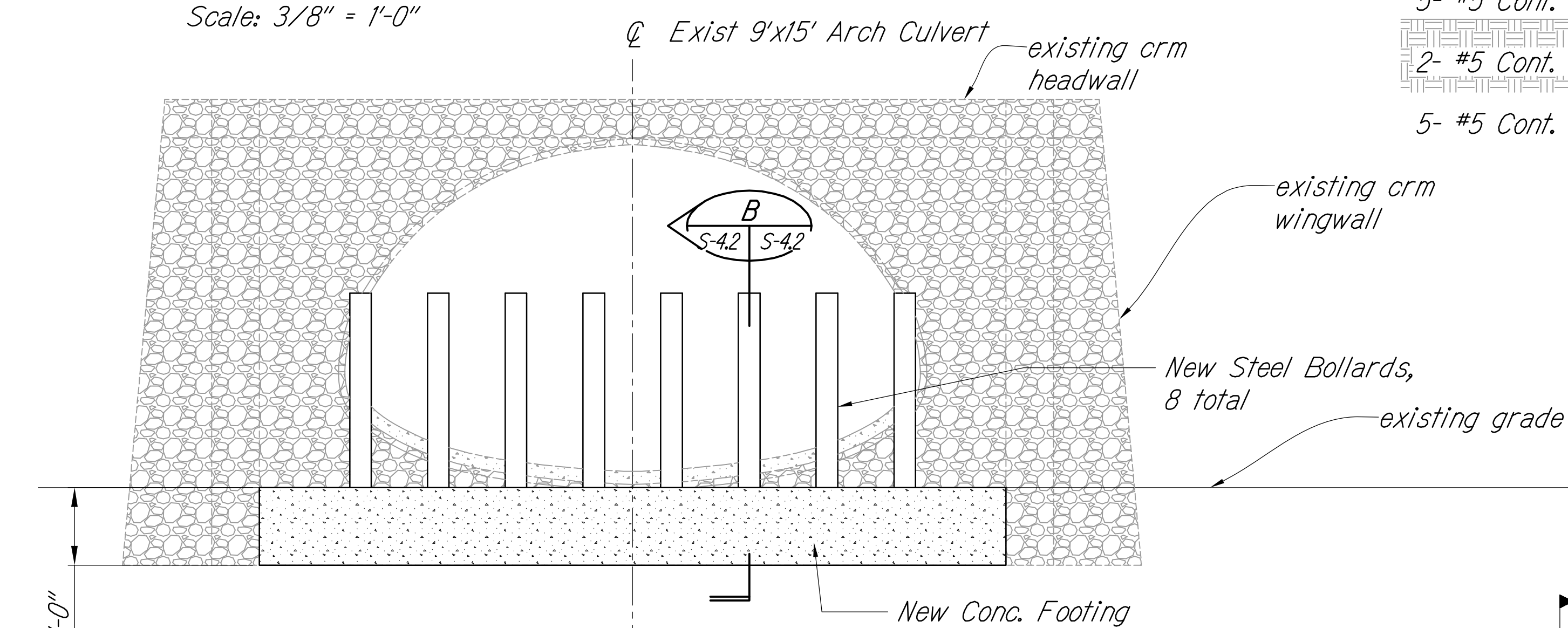


| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | NH-019-1(38)R      | 2016        | 509       | 528          |

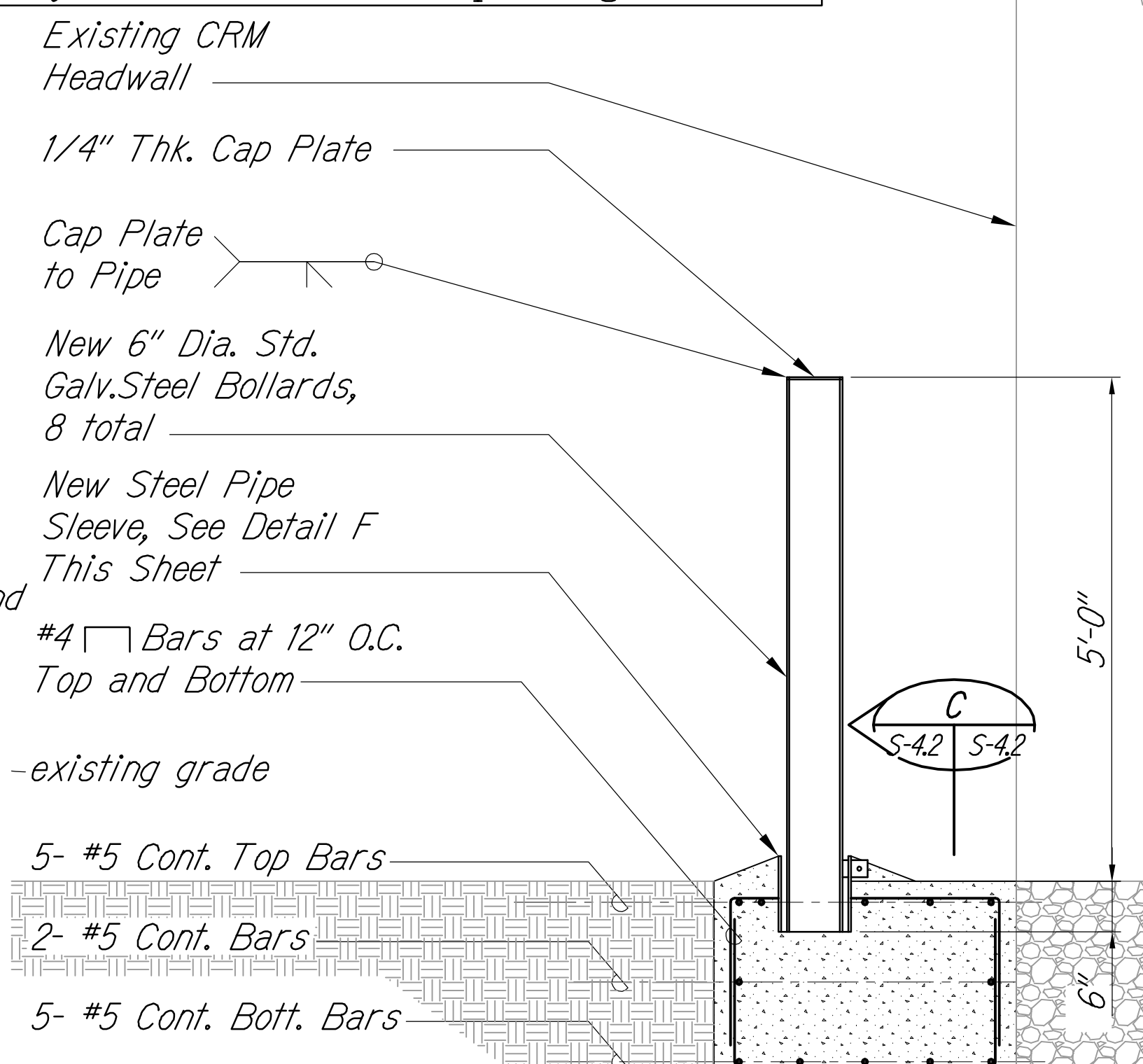
**LEGEND FOR AS-BUILT POSTINGS**  
~~~~~ Squiggly line for as-built deletion  
~~100.00~~ Double line for as-built deletion
Roadway Text for as-built posting



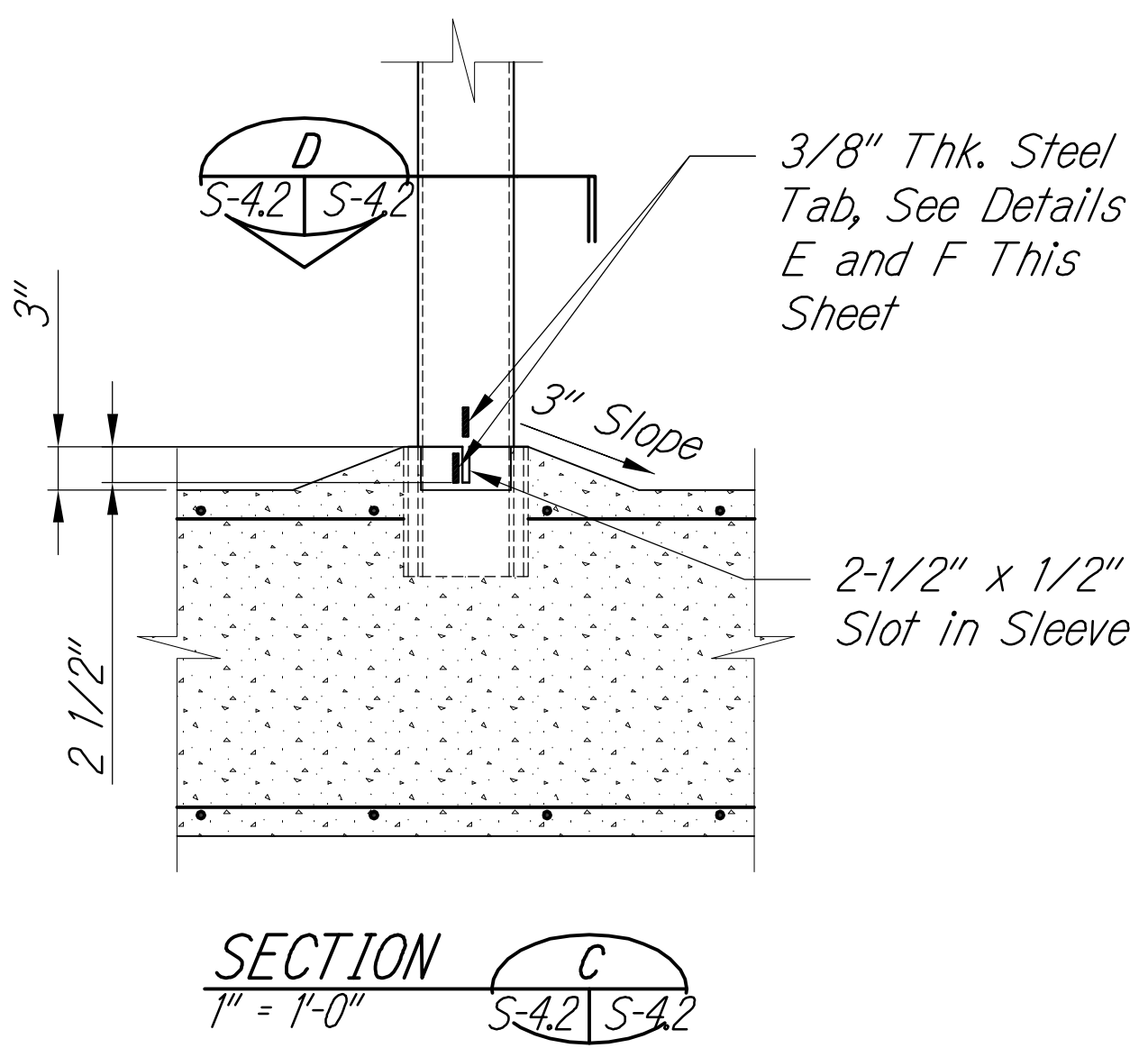
PLAN - BOLLARDS AT CULVERT D INLET
Scale: 3/8" = 1'-0"



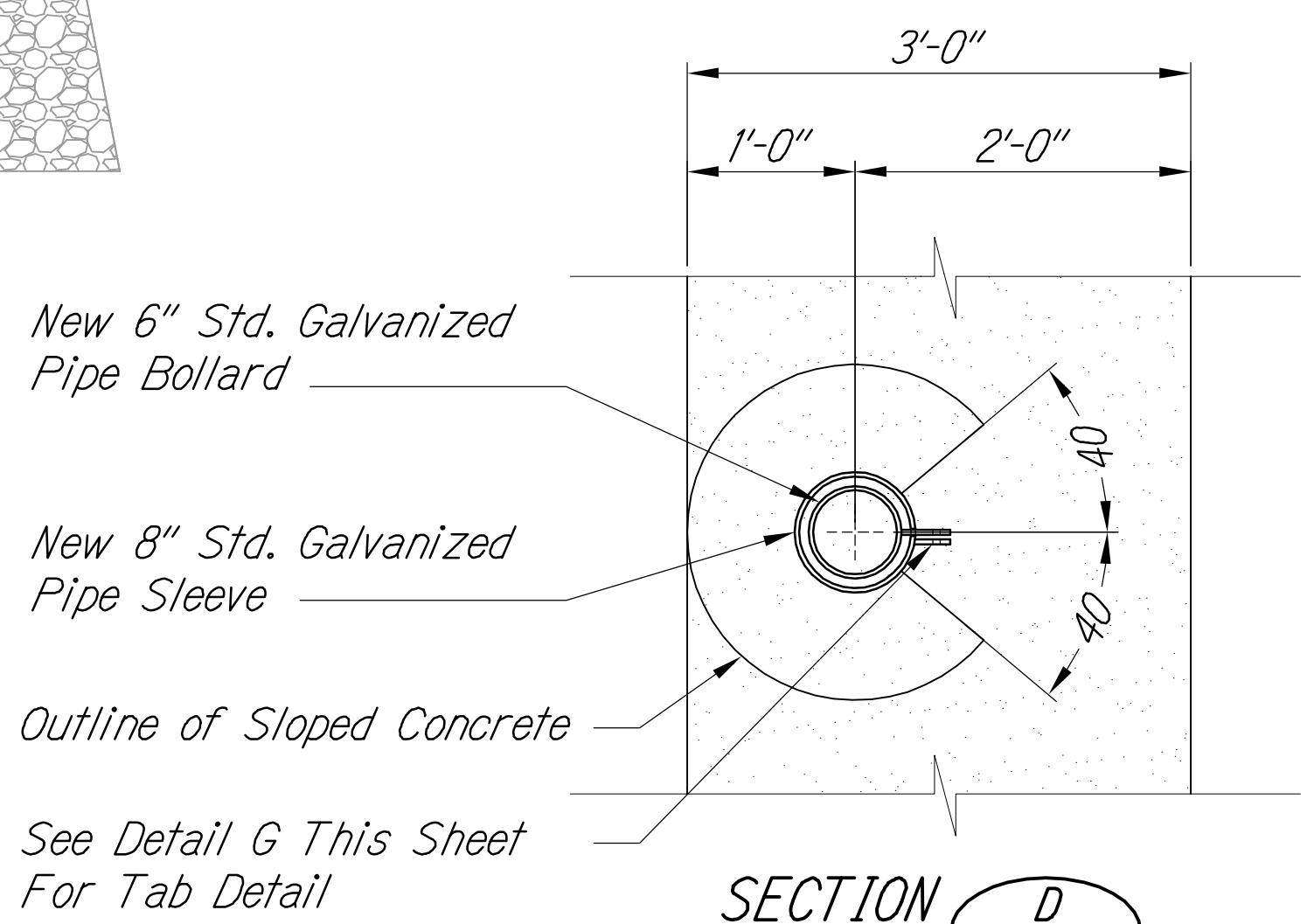
ELEVATION
3/8" = 1'-0"



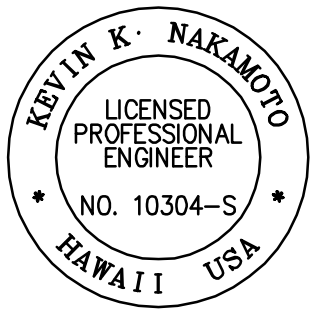
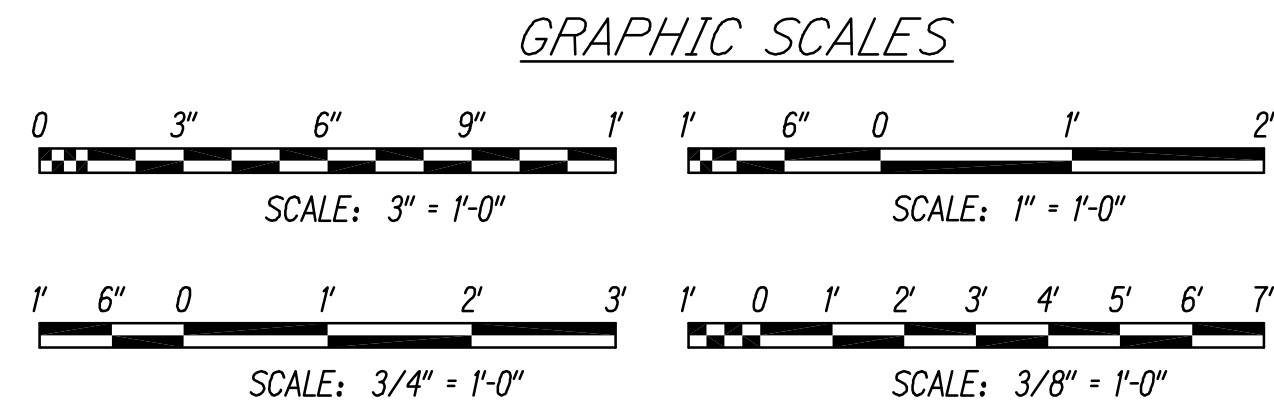
SECTION B
3/4" = 1'-0"



SECTION C
1" = 1'-0"



SECTION D
1" = 1'-0"



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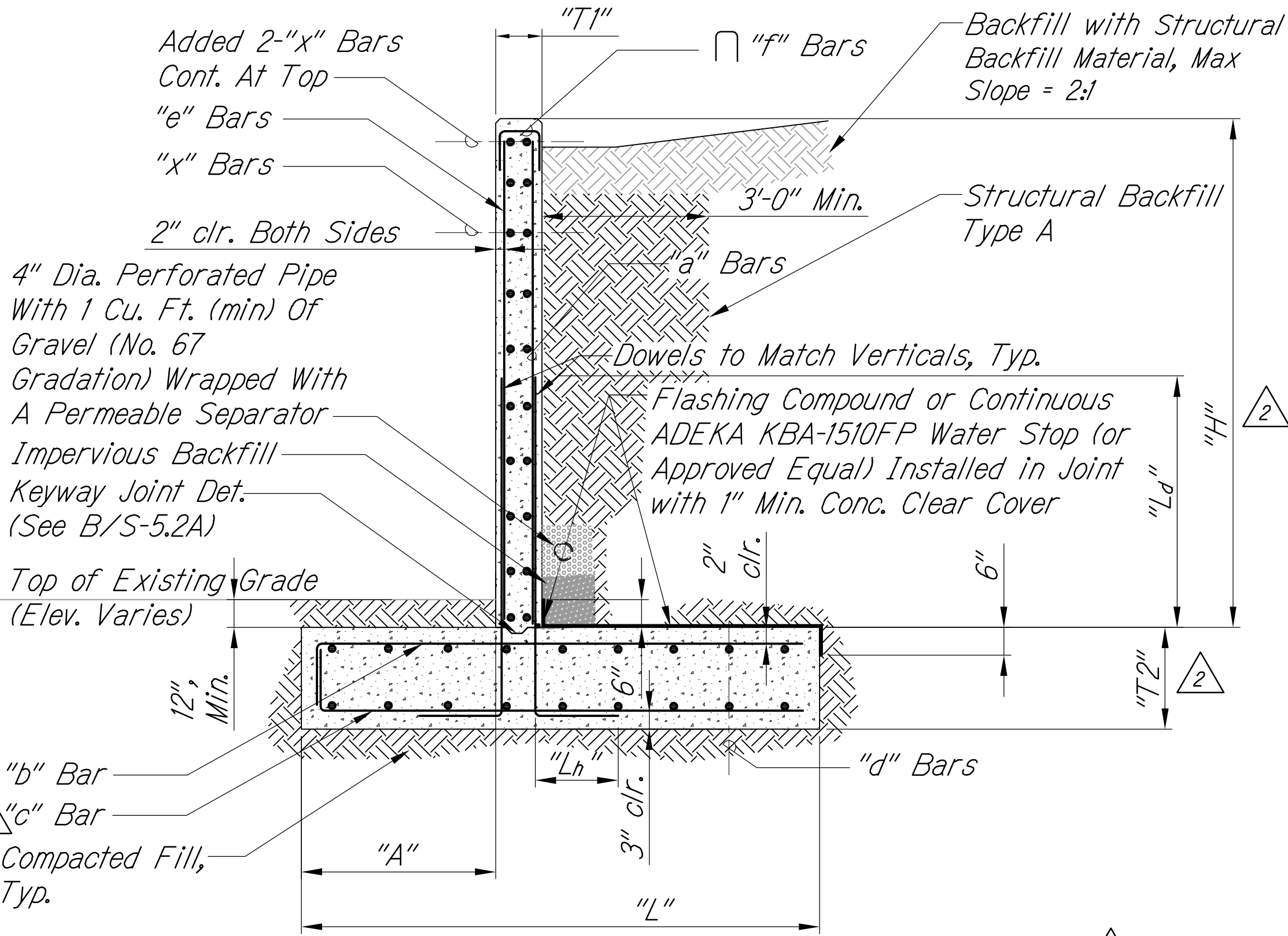
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
TYPICAL BOLLARD DETAILS
QUEEN KAAHUMANU HIGHWAY WIDENING
Kealahou Pkwy. To Keahole Airport Rd. (Ph. 2)
Federal Aid Project No. NH-019-1(38)R
Scale: AS NOTED Date: AUGUST 2016
SHEET No. S-4.2 OF 18 SHEETS

"AS-BUILT"

| | |
|---------------|------|
| DESIGNED BY | DATE |
| NOTED BY | |
| CHECKED BY | |
| QUANTITIES BY | |
| DESIGNED BY | |
| NOTED BY | |
| CHECKED BY | |
| QUANTITIES BY | |

M:\2008\2008_003\001 GBI Queen K Hwy Award\G Drawings\Contract Documents\Structural\S-4.2 Bollard Details.dwg 8/16/2016 2:40 PM

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-------------|--------------|
| HAWAII | HAW. | NH-019-1(38)R | 2016 | C.O. 511S-1 | 528
522 |

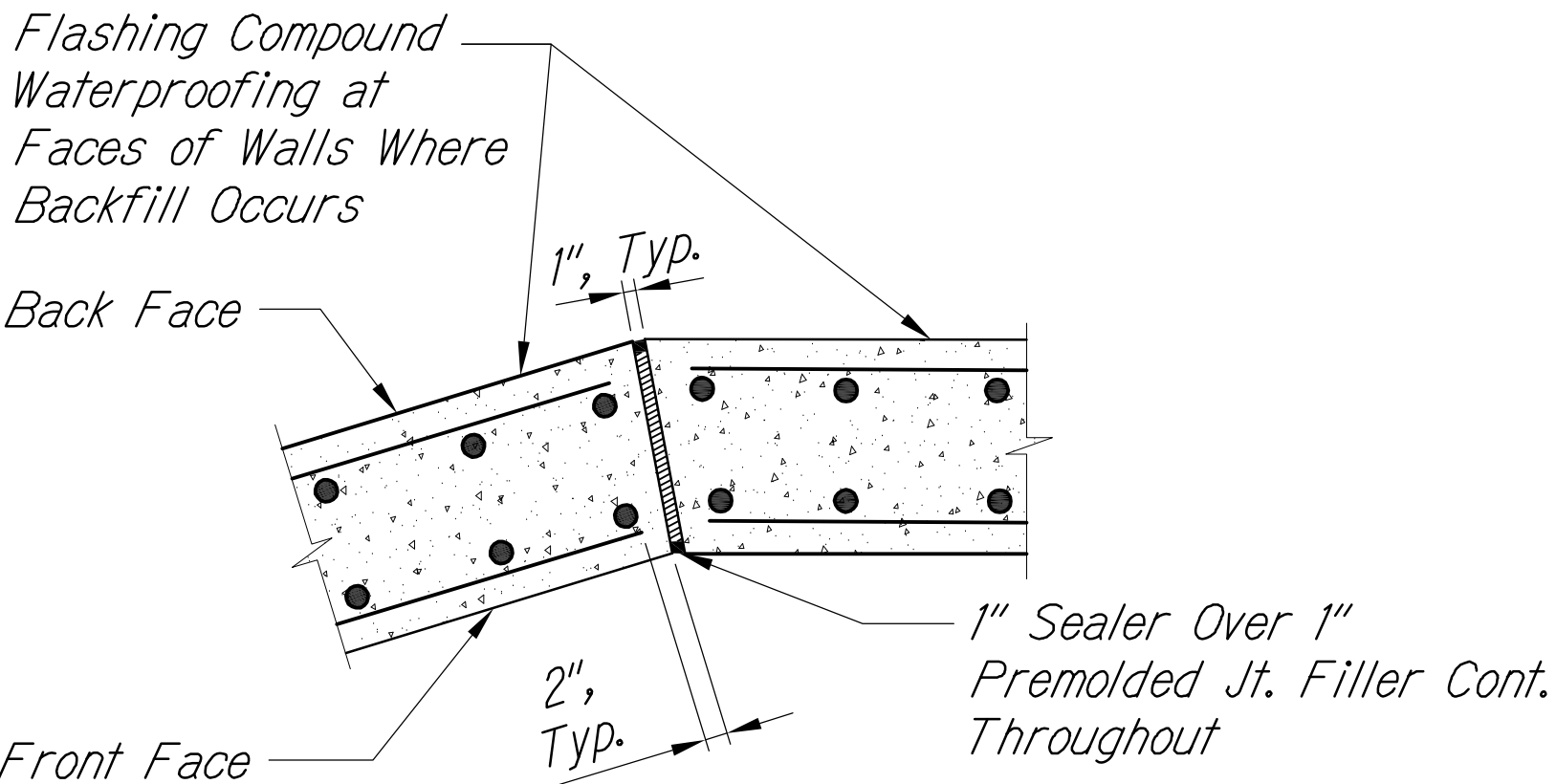


TYPICAL RETAINING WALL SECTION

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

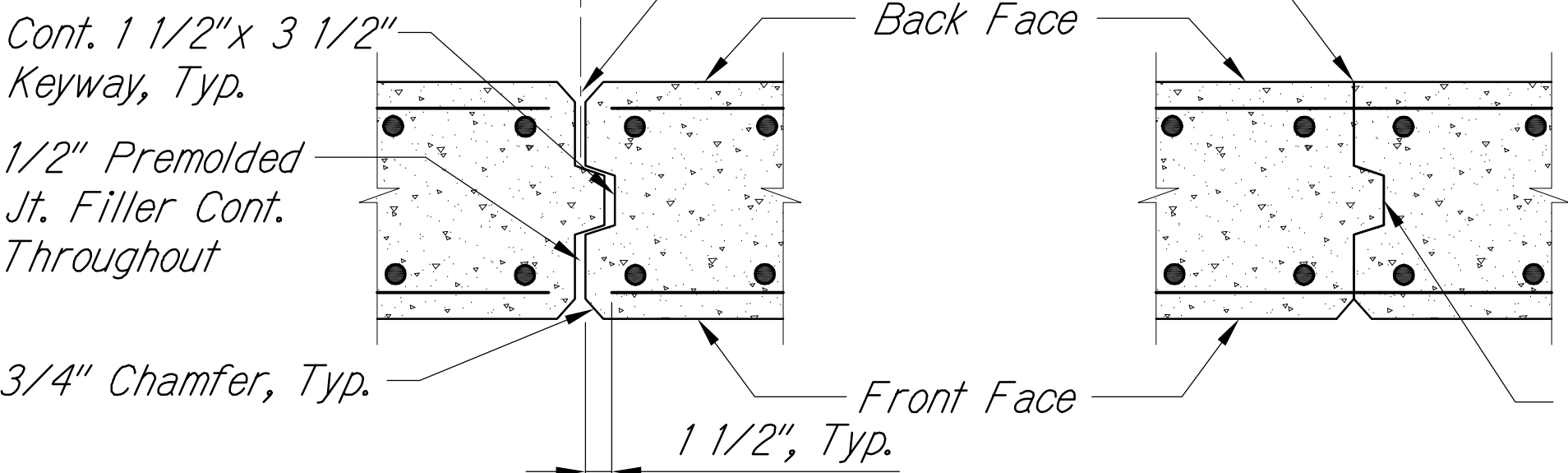
A
S-5.2A | S-5.2A

| RETAINING WALL A SCHEDULE | | | | |
|---------------------------|--------|--------|--------|--------|
| Wall Mark | W8 | W12 | W16 | W20 |
| "H" (Max) | 8' | 12' | 16' | 20' |
| T1 | 16" | 18" | 22" | 30" |
| T2 | 16" | 20" | 24" | 32" |
| L | 12' 6" | 14' 6" | 15' 3" | 17' 3" |
| A | 3' 9" | 3' 9" | 3' 9" | 3' 9" |
| a | #6@9" | #7@6" | #9@6" | #10@6" |
| b | #6@9" | #7@8" | #7@5" | #10@9" |
| c | #6@12" | #6@12" | #7@12" | #8@12" |
| d | #4@12" | #5@12" | #5@12" | #6@12" |
| e | #4@12" | #4@12" | #4@10" | #4@8" |
| f | #4@12" | #4@12" | #4@10" | #4@8" |
| x | #4@12" | #4@12" | #5@12" | #6@12" |
| L _d | 25" | 54" | 70" | 79" |
| L _h | 12" | 14" | 21" | 23" |



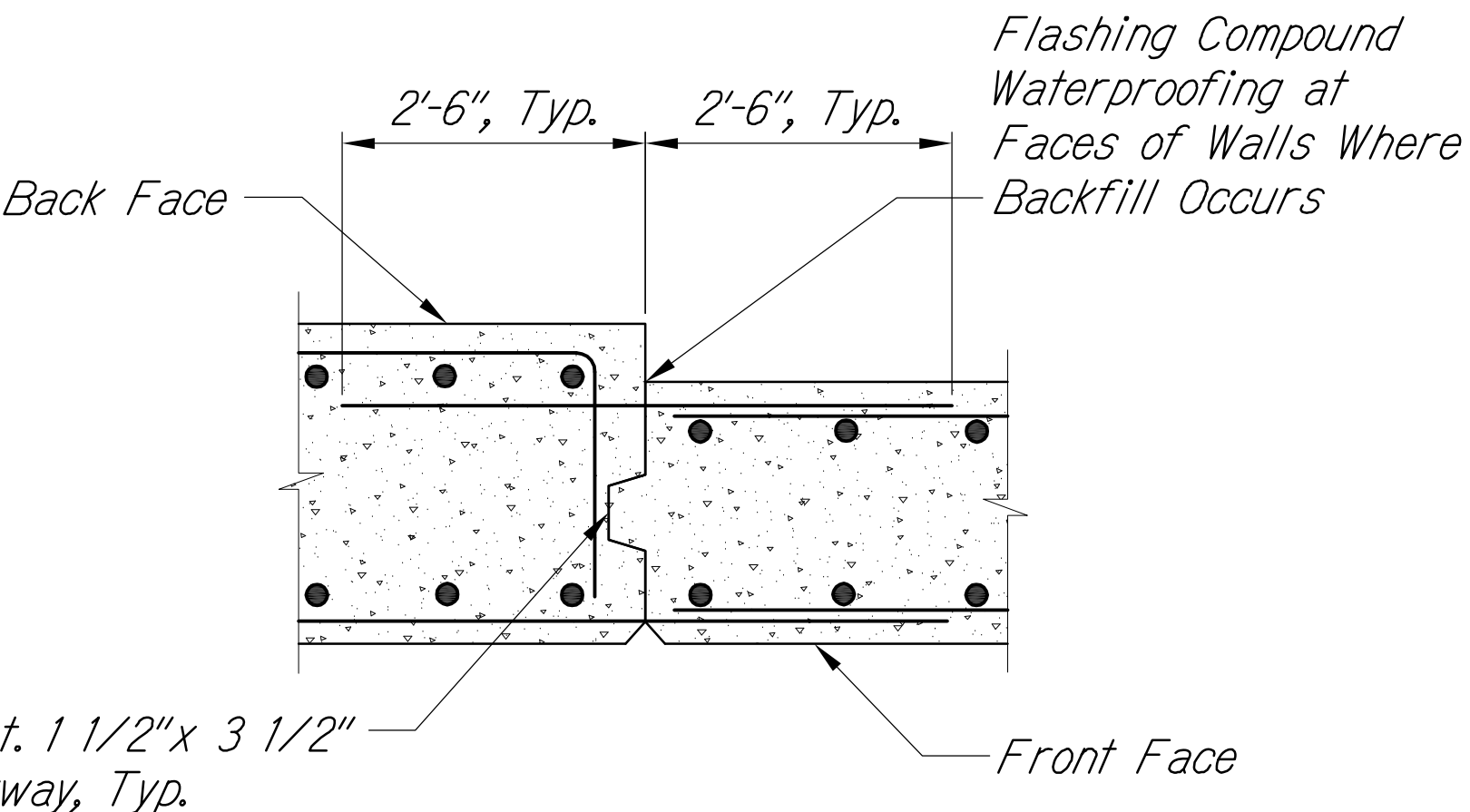
TYPICAL RETAINING WALL EXPANSION JOINT AT WALL INTERSECTION

30'-0" O.C. Max. 30'-0" O.C. Max.



EXPANSION JOINT

CONSTRUCTION JOINT

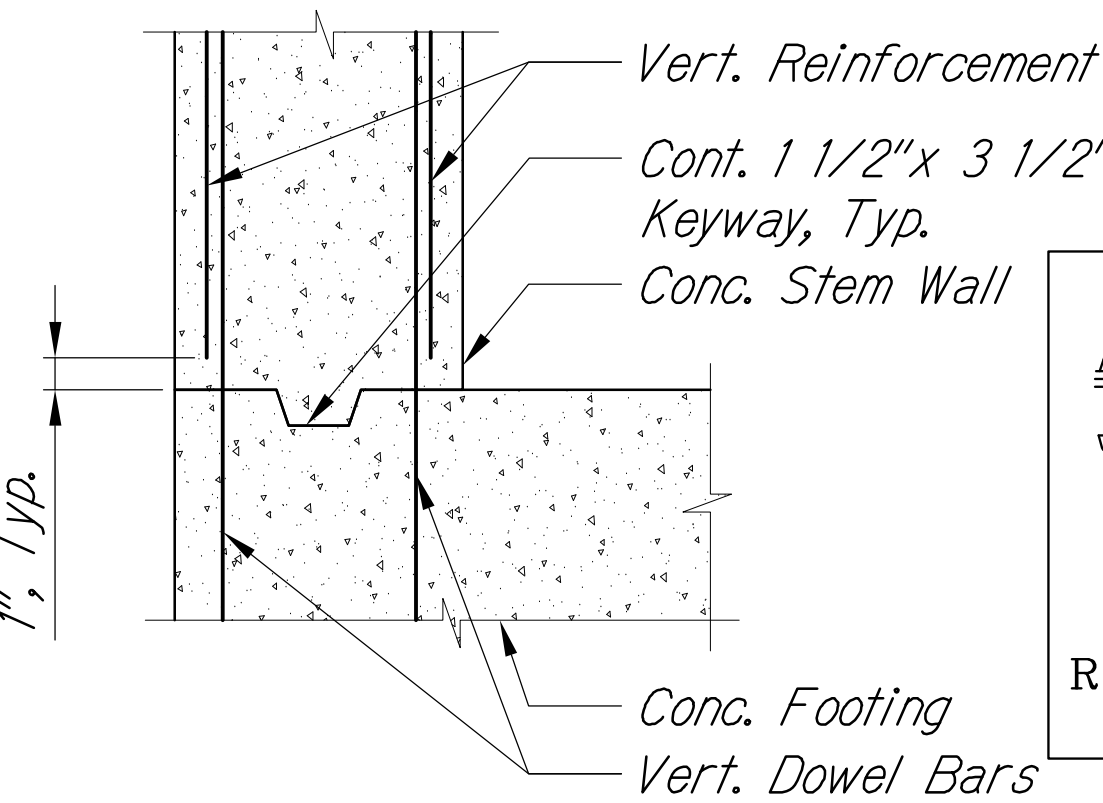


CONSTRUCTION JOINT AT TRANSITION

EXPANSION AND CONSTRUCTION JOINT DETAIL

Scale: No Scale

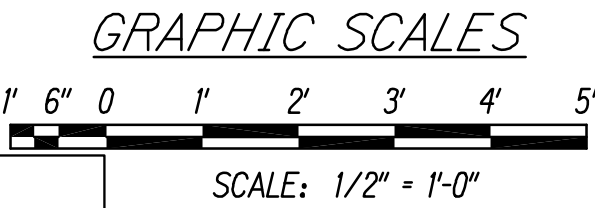
C
S-5.2A | S-5.2A



KEYWAY JOINT DETAIL

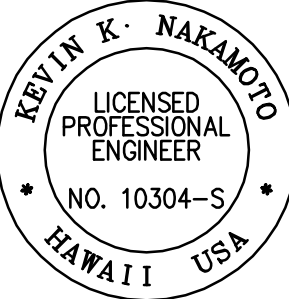
Scale: No Scale

B
S-5.2A | S-5.2A



LEGEND FOR AS-BUILT POSTINGS

- Squiggly line for as-built deletion
- Double line for as-built deletion
- Roadway Text for as-built posting



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APRIL 30, 2018
EXPIRATION DATE OF THE LICENSE

| 12/16/16 | 3 | Removed Typical Ret. Wall Schedule and replaced with Ret. Wall A Schedule. Added Toe to Front of Footing. Added Joint Detail at Wingwall to Pier Interface. Modified Expansion Joint Spacing Requirements. |
|----------|----------|--|
| 4/18/16 | 2 | Modified retaining wall dimension "H" and Retaining Wall Schedule and revised callout for waterproofing of joint |
| 1/22/15 | 1 | Sheet added to show the section and details of the typical retaining wall and detail for construction joint at a transition in wall thickness. |
| DATE | REVISION | |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
TYPICAL RETAINING WALL SECTION AND DETAILS
QUEEN KAAHUMANU HIGHWAY WIDENING
Kealahou Pkwy. To Keahole Airport Rd. (Ph. 2)
Federal Aid Project No. NH-019-1(38)R
Scale: AS NOTED Date: AUGUST 2016
SHEET No. S-5.2A OF 18 SHEETS

"AS-BUILT"

1/25/2017 11:28 AM

C.O. 511S-1

M:\2008\2008_003.002 GBI Queen K Hwy Redesign\G Dwg\Contract Documents\Structural\161026 UPDATED CAD New Seis Ret Wall Loads - Superceeds all other CAD\S-5.2A Ret Wall Details.dwg 1/25/2017 11:28 AM

| | |
|---------------|------|
| ORIGINAL PLAN | DATE |
| DESIGNED BY | |
| NOTED BY | |
| CHECKED BY | |
| NO. | |

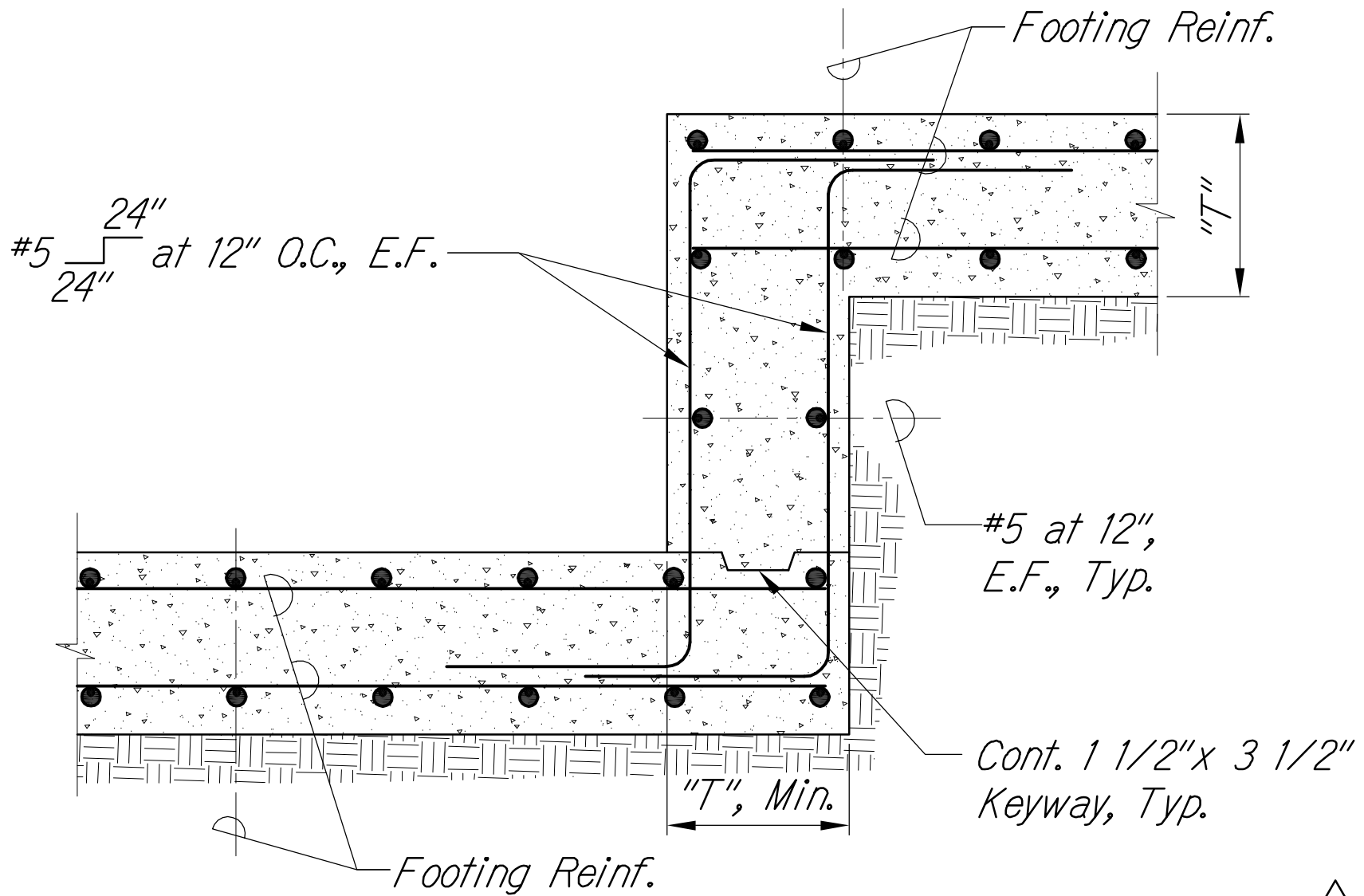
| | | |
|---------------|-------------------|------|
| ORIGINAL PLAN | SURVEY PLOTTED BY | DATE |
| NOTE BOOK | DESIGNED BY | |
| No. | CHECKED BY | |

M:\2008\2008_003.002 GBI Queen K Hwy Redesign\G Dwgs\Contract Documents\Structural\161026 UPDATED CAD New Seis Ret Wall Loads - Superceeds all other CAD\S-5_2B Ret Wall Schedules.dwg 2/27/2017 2:53 PM

| RETAINING WALL E SCHEDULE | | | | |
|---------------------------|----------|----------|----------|---------|
| Wall Mark | W8 | W12 | W16 | W20 |
| "H" (Max) | 8' | 12' | 16' | 20' |
| T1 | 16" | 20" | 24" | 34" |
| T2 | 16" | 20" | 24" | 36" |
| L | 10' 9" | 12' 9" | 14' 9" | 20' 6" |
| A | 4' 0" | 4' 0" | 4' 0" | 4' 6" |
| a | #6@11" | #8@11" | #9@8" | #9@5" |
| b | #6@12" | #8@12" | #9@11" | #9@6" |
| c | #6@12" | #6@12" | #7@12" | #8@12" |
| d | #4@12" | #4@12" | #5@12" | #6@12" |
| e | #4@12" | #4@12" | #4@10" | #4@6" |
| f | □ #4@12" | □ #4@12" | □ #4@10" | □ #4@6" |
| x | #4@12" | #5@12" | #5@12" | #6@12" |
| L _d | 31" | 60" | 70" | 70" |
| L _h | 12" | 16" | 20" | 20" |

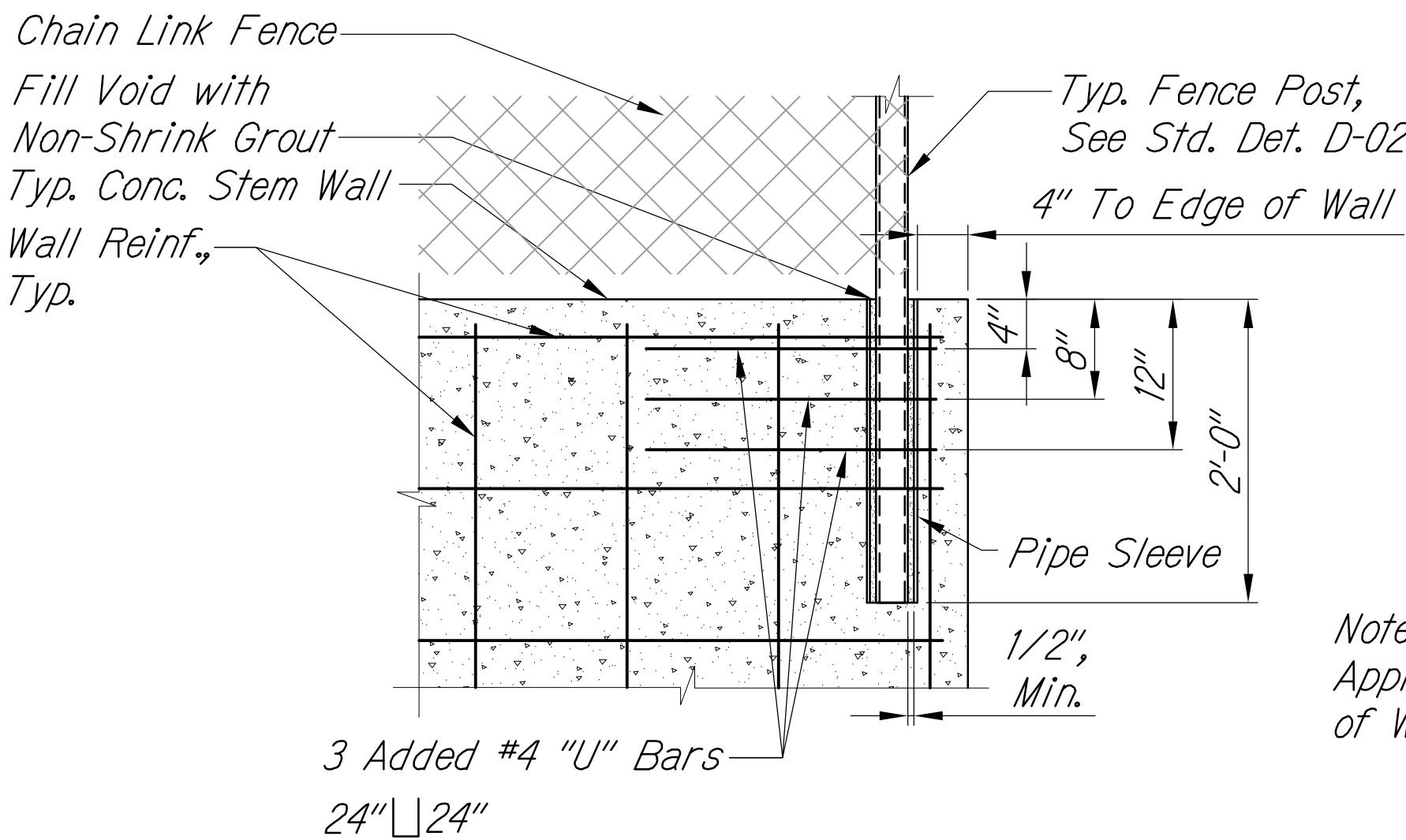
| RETAINING WALL G SCHEDULE | | |
|---------------------------|----------|----------|
| Wall Mark | W6 | W10 |
| "H" (Max) | 6' | 10' |
| T1 | 14" | 14" |
| T2 | 20" | 20" |
| L | 10' 0" | 12' 4" |
| A | 3' 6" | 3' 6" |
| a | #5@10" | #5@4" |
| b | #5@8" | #5@5" |
| c | #4@12" | #6@12" |
| d | #4@12" | #4@12" |
| e | #4@12" | #4@12" |
| f | □ #4@12" | □ #4@12" |
| x | #4@12" | #4@12" |
| L _d | 25" | 25" |
| L _h | 10" | 10" |

Note: Refer to Sheet S-5.2A for Typical Retaining Wall Section



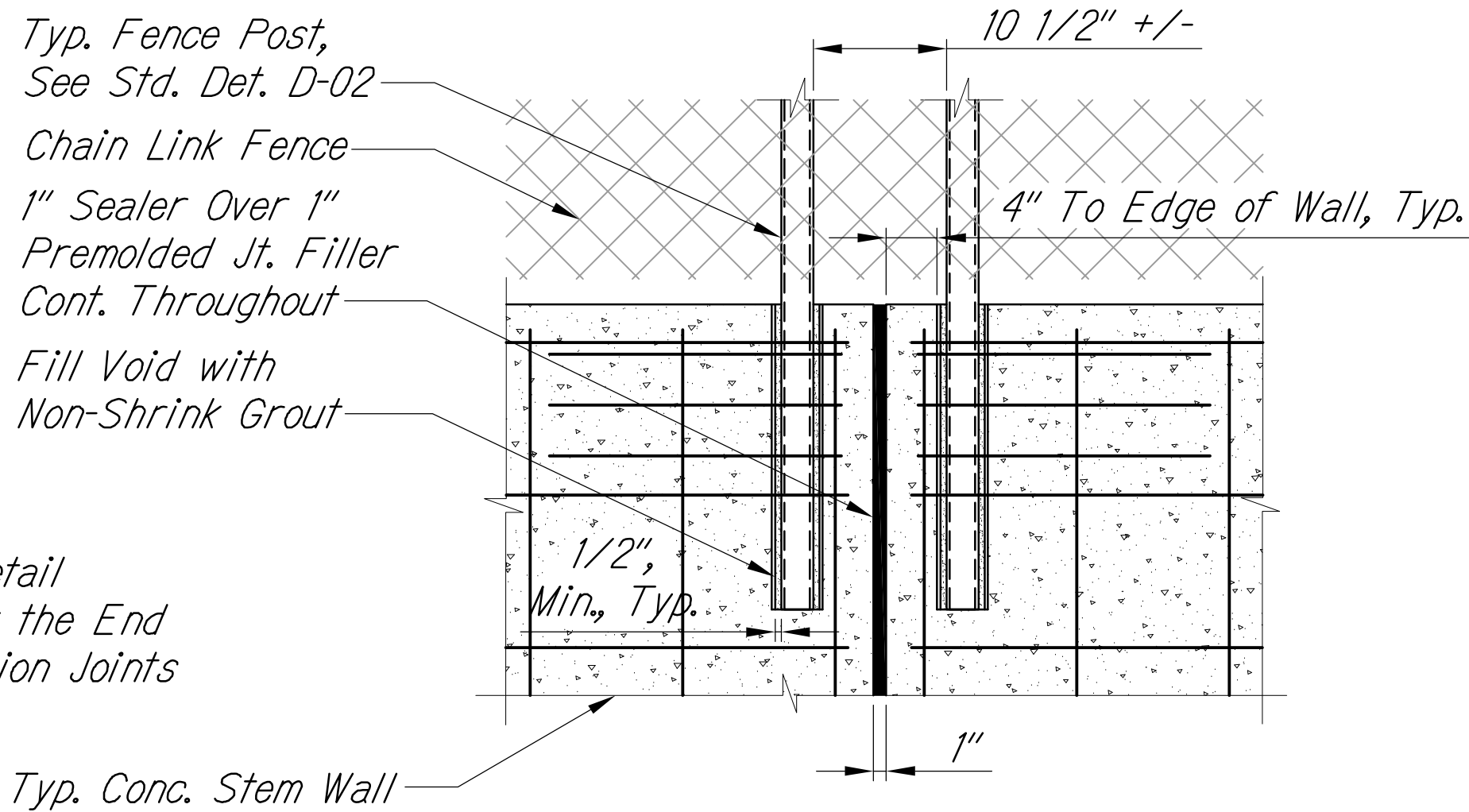
TYPICAL STEP FOOTING DETAIL

Scale: No Scale



ADDED REINFORCEMENT FOR FENCE POST DETAIL

Scale: No Scale



FENCE POST DETAIL AT CORNER

Scale: No Scale

LEGEND FOR AS-BUILT POSTINGS

- Squiggly line for as-built deletion
- Double line for as-built deletion
- Roadway Text for as-built posting



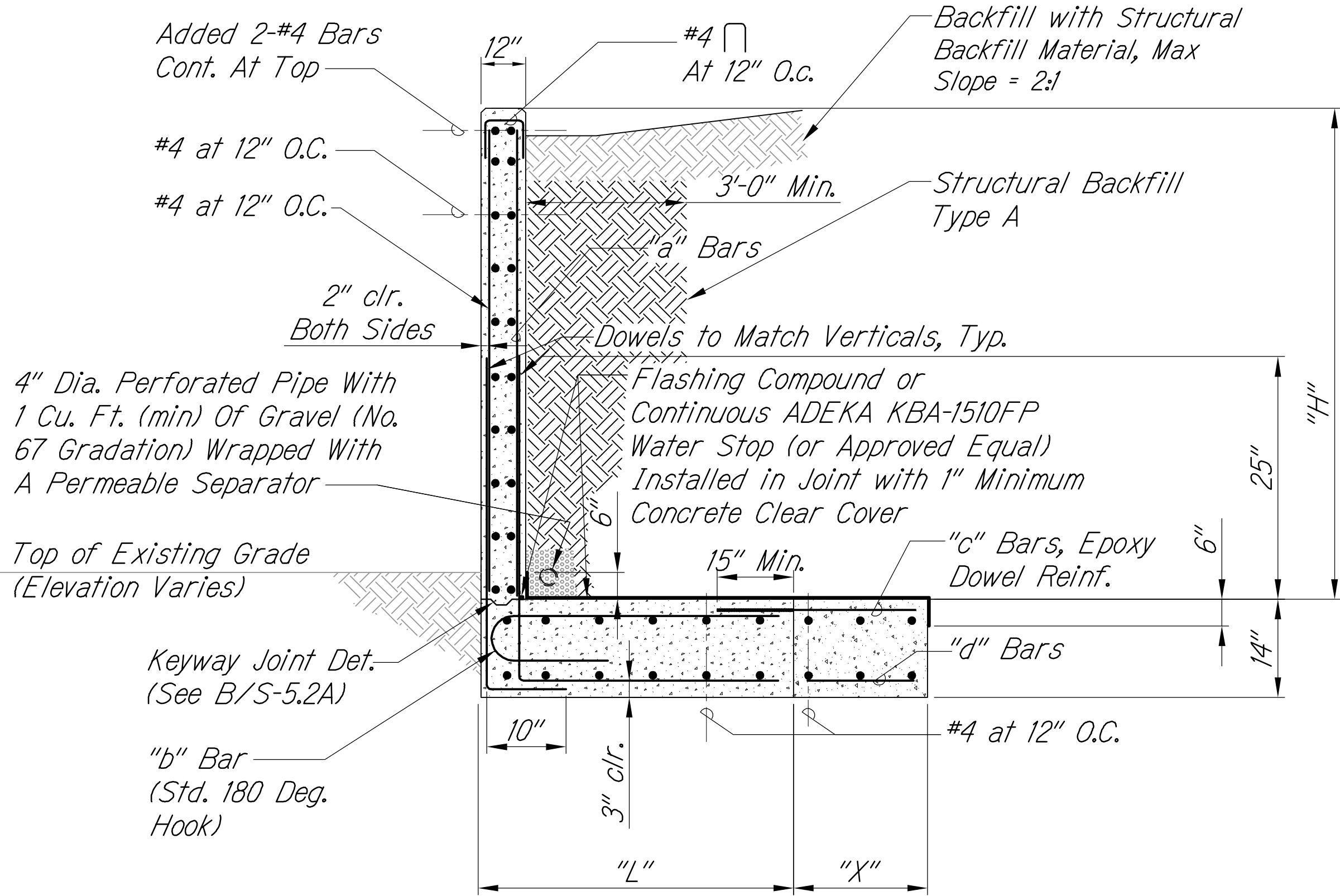
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.
APRIL 30, 2018
EXPIRATION DATE OF THE LICENSE

| | |
|---|--|
| 10/26/16 | Sheet added to show separate schedules for each retaining wall. Details added for stepped footings and added reinforcement for fence posts at wall ends. |
| DATE | REVISION |
| STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
RETAINING WALL SCHEDULES
QUEEN KAAHUMANU HIGHWAY WIDENING
Kealahou Pkwy. To Keahole Airport Rd. (Ph. 2)
Federal Aid Project No. NH-019-1(38)R
Scale: AS NOTED Date: AUGUST 2016
SHEET No. S-5.2B OF 18 SHEETS | |

"AS-BUILT"

C.O. 511S-2

| | | | | | |
|---------------------|-------|--------------------|-------------|-------------|--------------|
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII | HAW. | NH-019-1(38)R | 2016 | C.O. 511S-3 | 528
522 |



RETAINING WALL F SECTION WITH RETROFIT

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

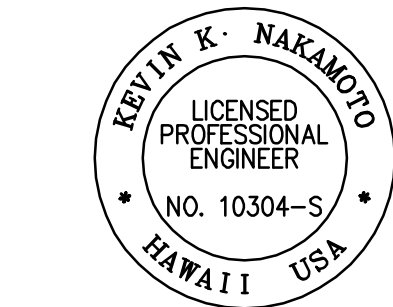
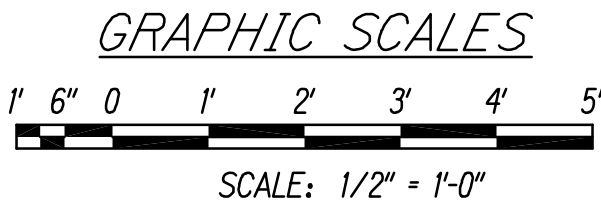
| RETAINING WALL F SCHEDULE | | |
|---------------------------|--------|--------|
| Wall Mark | W6 | W10 |
| "H" (Max) | 6' | 10' |
| L | 3' 9" | 6' 3" |
| X | 2' 5" | 2' 6" |
| a | #5@12" | #5@6" |
| b | #5@12" | #5@5" |
| c | #6@10" | #6@16" |
| d | #5@12" | #5@18" |

LEGEND FOR AS-BUILT POSTINGS

Squiggly line for as-built deletion

Double line for as-built deletion

Roadway Text for as-built posting



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APRIL 30, 2018

SIGNATURE EXPIRATION DATE OF THE LICENSE

| | |
|---------|--|
| 2/27/17 | Sheet added to show the retrofit of Retaining Wall F after it was constructed. |
| DATE | REVISION |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**RETAINING WALL F RETROFIT
SECTION AND DETAILS**

QUEEN KAAHUMANU HIGHWAY WIDENING
Kealahou Pkwy. To Keahole Airport Rd. (Ph. 2)
Federal Aid Project No. NH-019-1(38)R

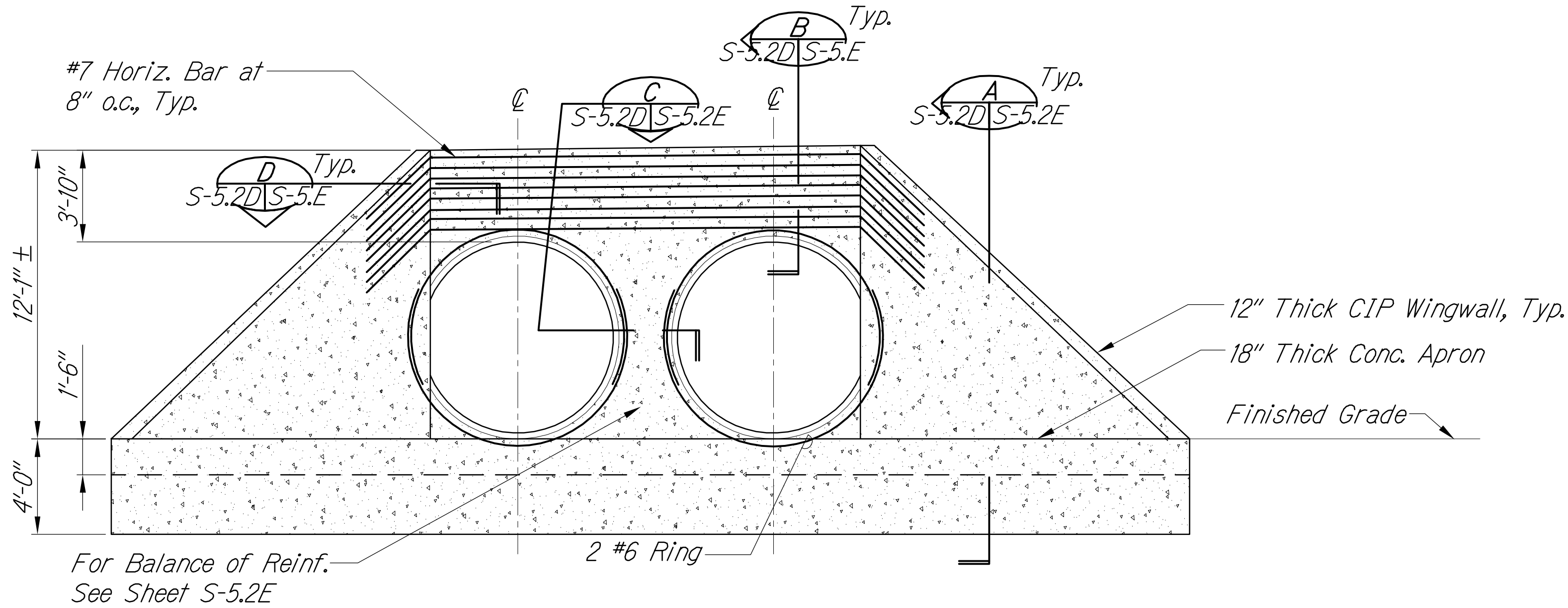
Scale: AS NOTED Date: AUGUST 2016

SHEET No. S-5.2C OF 18 SHEETS

"AS-BUILT"

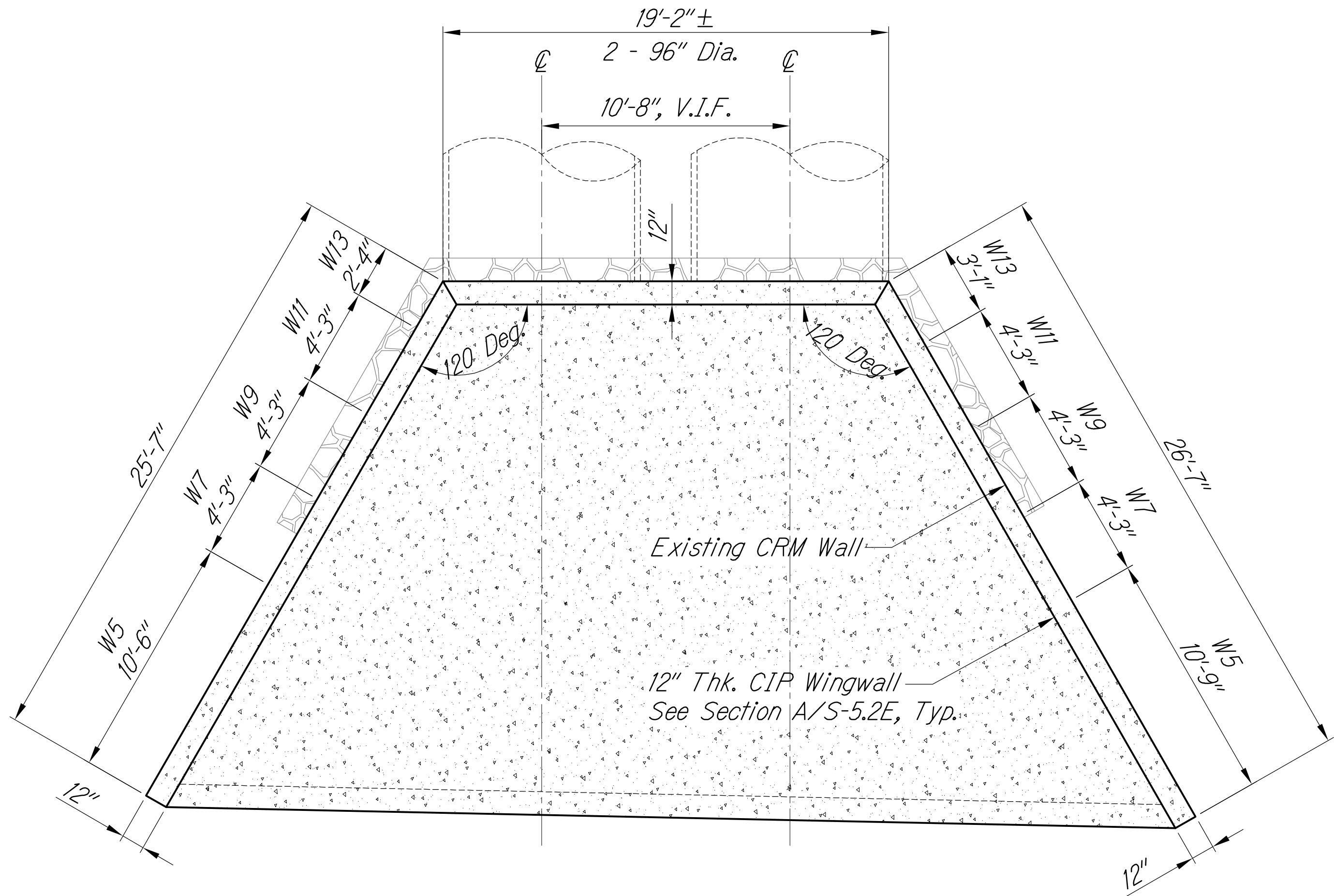
| | |
|-------------------|------|
| ORIGINAL PLAN | DATE |
| NOTE BOOK | |
| No. | |
| SURVEY PLOTTED BY | |
| DESIGNED BY | |
| QUANTITIES BY | |
| CHECKED BY | |

| | | | | | |
|------------------------|-------|-----------------------|----------------|----------------|-----------------|
| FED. ROAD
DIST. NO. | STATE | FED. AID
PROJ. NO. | FISCAL
YEAR | SHEET
NO. | TOTAL
SHEETS |
| HAWAII | HAW. | NH-019-1(38)R | 2016 | C.O.
511S-4 | 528
522 |



ELEVATION - NEW HEADWALL FOR DOUBLE 96" DIA. CULVERT
Scale: 1/4" = 1'-0"

Note:
Stud Bolts Shall Be Stainless Steel
(See C/S-2.4). Hot Dip Galvanized
Bolts with Neoprene Washers and
Sleeves are Acceptable, Provided it
Does Not Affect the Manufacturer's
Warranty.



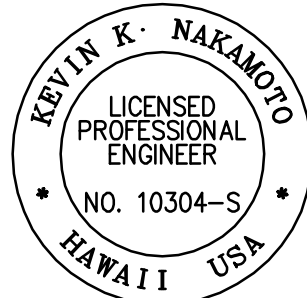
PLAN - NEW HEADWALL FOR DOUBLE 96" DIA. CULVERT
Scale: 1/4" = 1'-0"

LEGEND FOR
AS-BUILT POSTINGS

- ~~~~~ Squiggly line for
as-built deletion
- ~~100.00~~ Double line for
as-built deletion
- Roadway Text for as-built
posting

3/12/18 3 Sheet added to show Culvert B Inlet
Wall

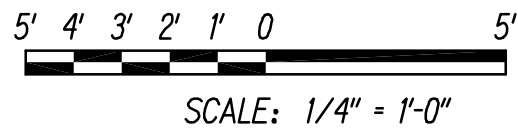
DATE REVISION



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WILL BE UNDER MY OBSERVATION.

SIGNATURE EXPIRATION DATE
APRIL 30, 2018
OF THE LICENSE

GRAPHIC SCALES



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CULVERT B INLET WALL
SECTION AND DETAILS

QUEEN KAAHUMANU HIGHWAY WIDENING
Kealahou Pkwy. To Keahole Airport Rd. (Ph. 2)
Federal Aid Project No. NH-019-1(38)R
Scale: AS NOTED Date: AUGUST 2016

SHEET No. S-5.2D OF 18 SHEETS

C.O. 511S-4

3/20/2018 3:22 PM

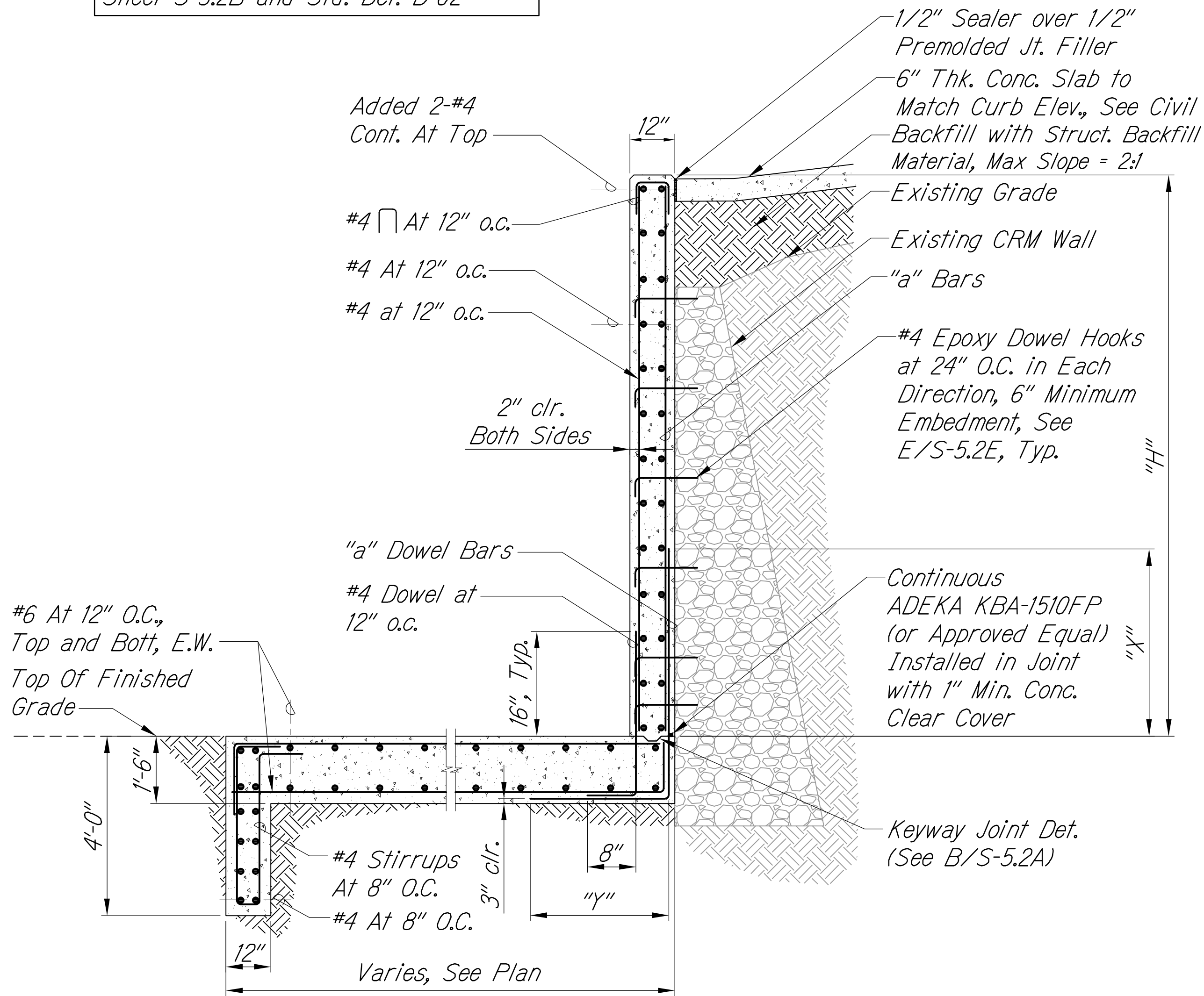
"AS-BUILT"

M:\2008\2008_003.002 GBI Queen K Hwy Redesign\G Dwgs\Contract Documents\Structural\161026 UPDATED CAD New Seis Ret Wall Loads - Superceeds all other CAD\S-5.2D Culvert B Inlet.dwg 3/20/2018 3:22 PM

| | | |
|------------------|-------------------|------|
| ORIGINAL
PLAN | SURVEY PLOTTED BY | DATE |
| NOTE BOOK | DRAWN BY | |
| | DESIGNED BY | |
| | QUANTITIES BY | |
| | CHECKED BY | |

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-------------|--------------|
| HAWAII | HAW. | NH-019-1(38)R | 2016 | C.O. 511S-5 | 528
522 |

Note: For Fence Post Detail at Top of Wall, Refer to Details B and C of Sheet S-5.2B and Std. Det. D-02

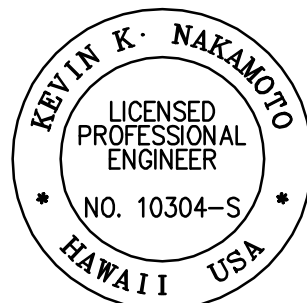
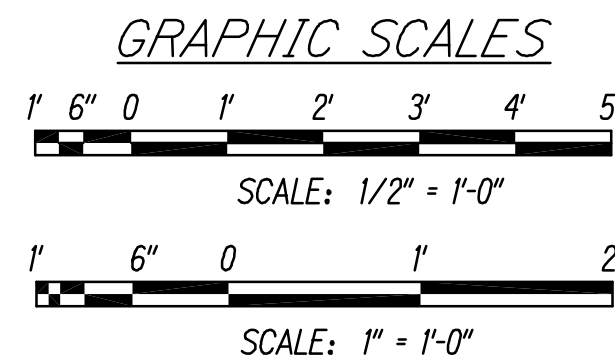


| CULVERT B INLET WALL SCHEDULE | | | | | |
|-------------------------------|--------|--------|--------|-------|--------|
| Wall Mark | H5 | H7 | H9 | H11 | H13 |
| "H" (Max) | 5' | 7' | 9' | 11' | 13' |
| a | #5@12" | #6@12" | #6@10" | #7@8" | #8@6" |
| X | 2'-6" | 3'-0" | 3'-0" | 3'-6" | 4'-0" |
| Y | 1'-10" | 2'-2" | 6'-0" | 8'-0" | 10'-0" |

CULVERT B INLET WALL SECTION
Scale: 1/2" = 1'-0"

LEGEND FOR
AS-BUILT POSTINGS

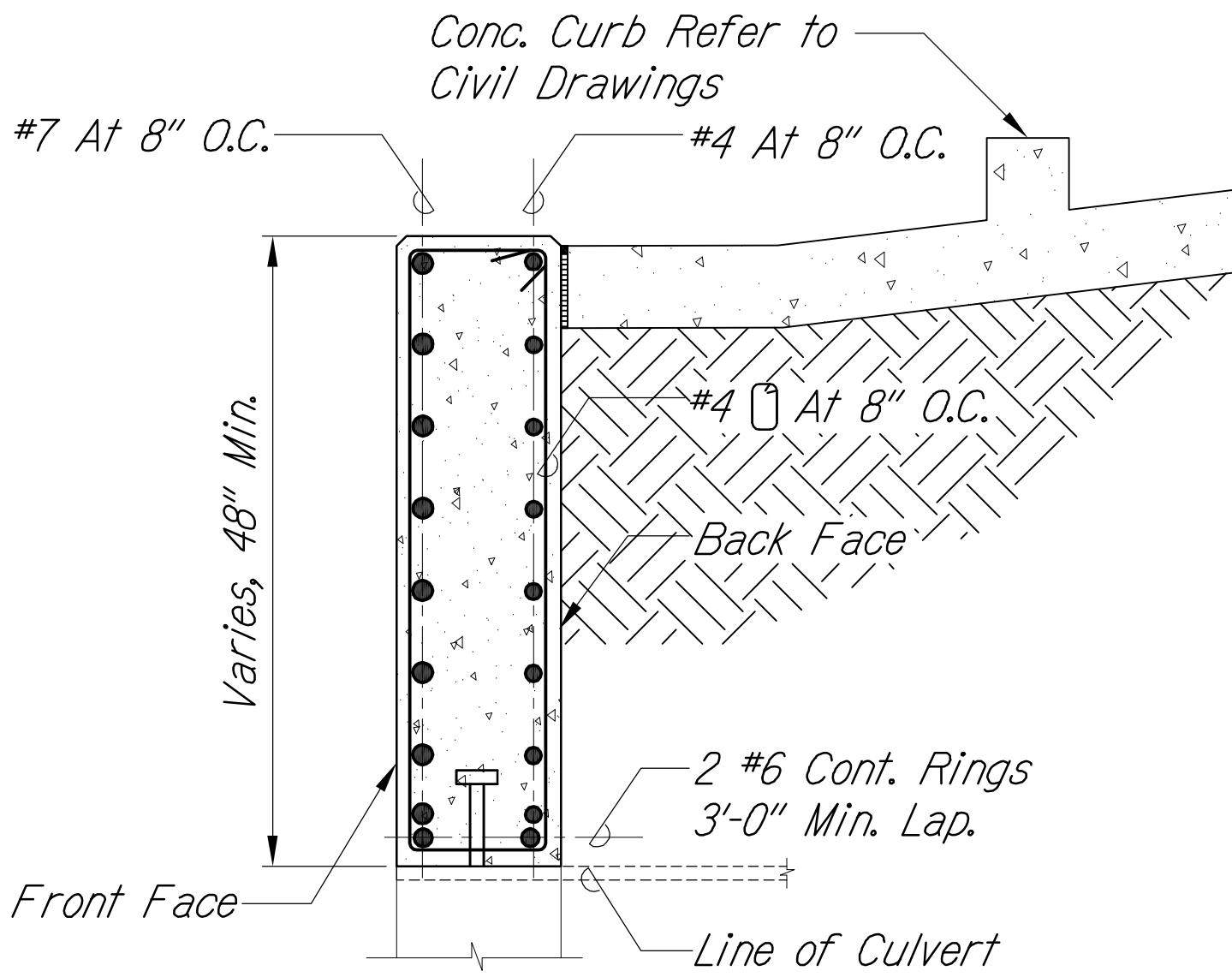
- ~~~~~ Squiggly line for as-built deletion
- ~~100.00~~ Double line for as-built deletion
- Roadway Text for as-built posting



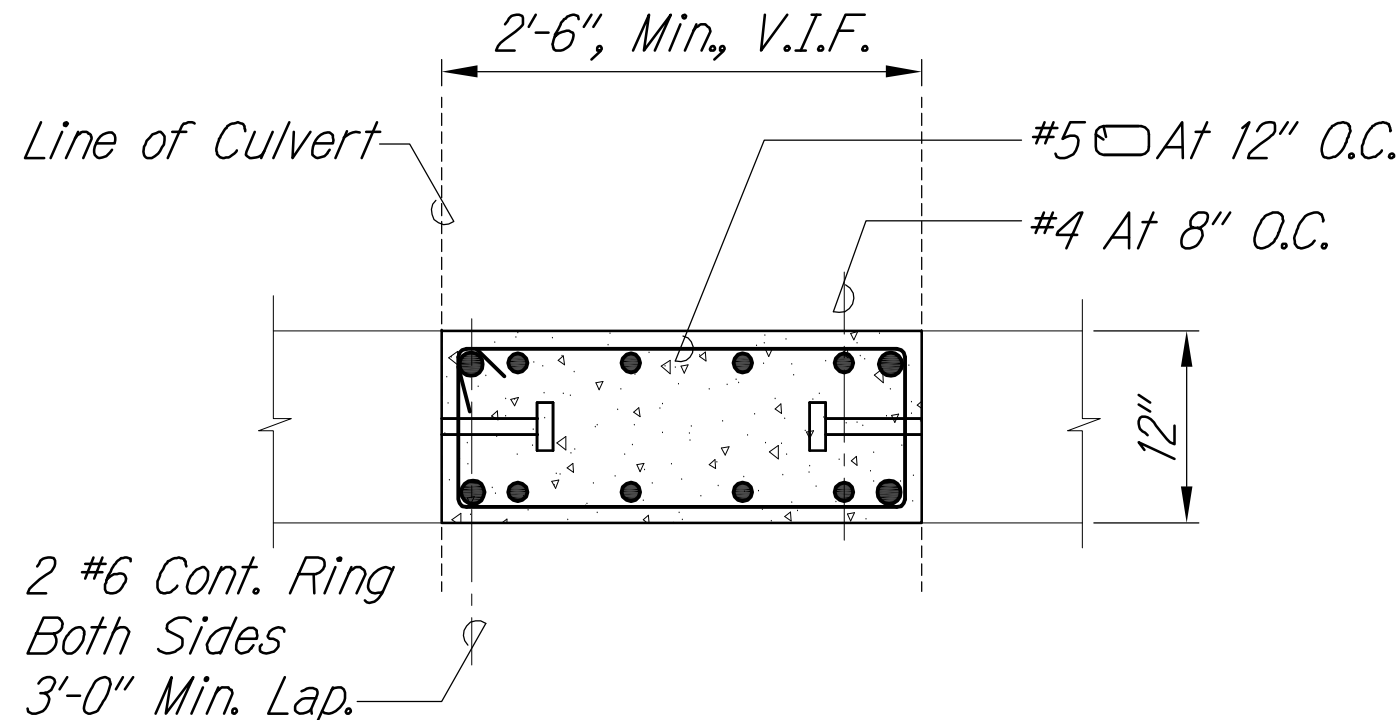
THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION AND
CONSTRUCTION OF THIS PROJECT
WILL BE UNDER MY OBSERVATION.

SIGNATURE: [Signature] APRIL 30, 2018
EXPIRATION DATE OF THE LICENSE

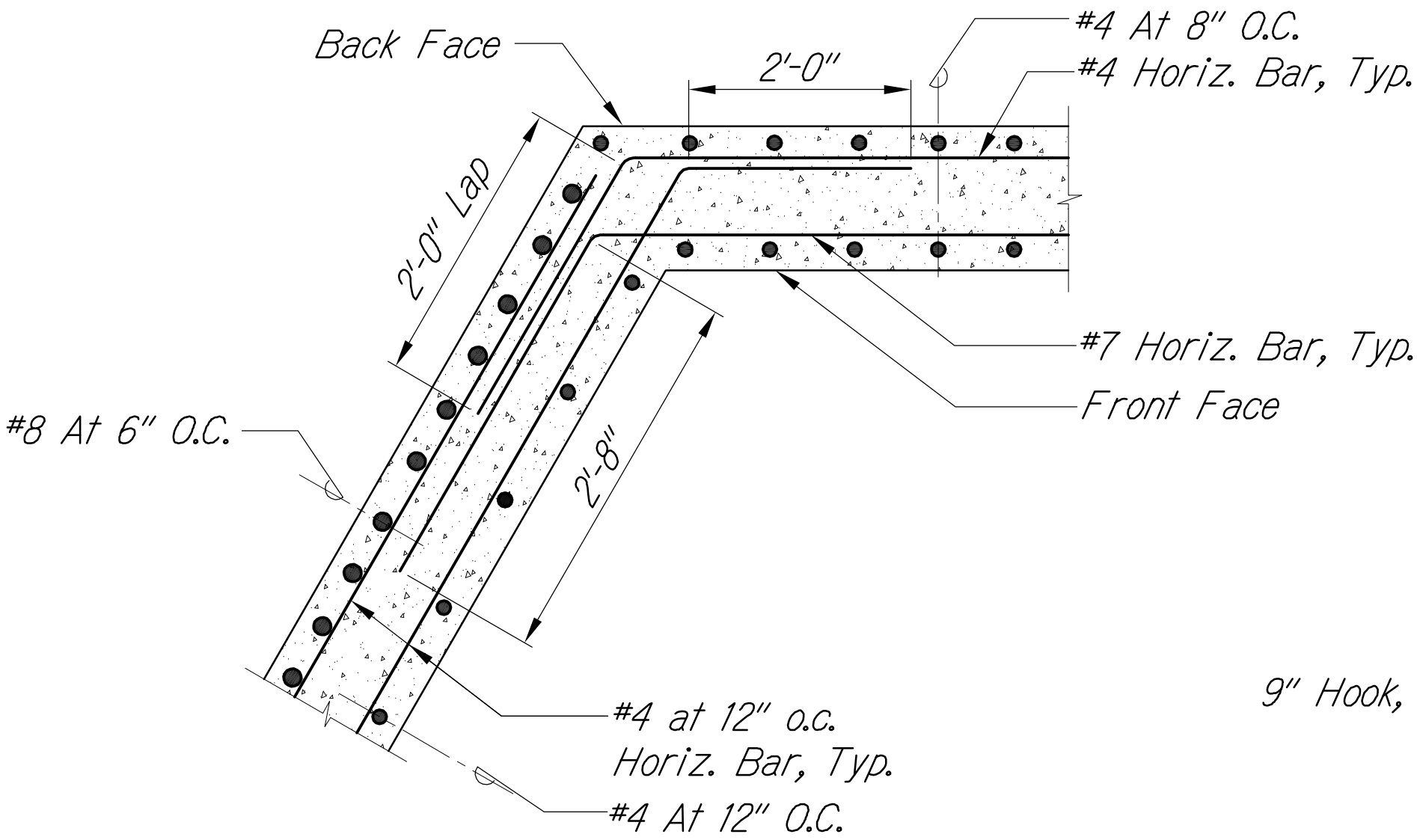
| | |
|---|--|
| 2/5/18 | 3 Sheet added to show the section and details for the Culvert B Inlet Wall |
| DATE | REVISION |
| STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
CULVERT B INLET WALL
SECTION AND DETAILS
QUEEN KAAHUMANU HIGHWAY WIDENING
Kealahou Pkwy. To Keahole Airport Rd. (Ph. 2)
Federal Aid Project No. NH-019-1(38)R
Scale: AS NOTED Date: AUGUST 2016
SHEET No. S-5.2E OF 18 SHEETS | |



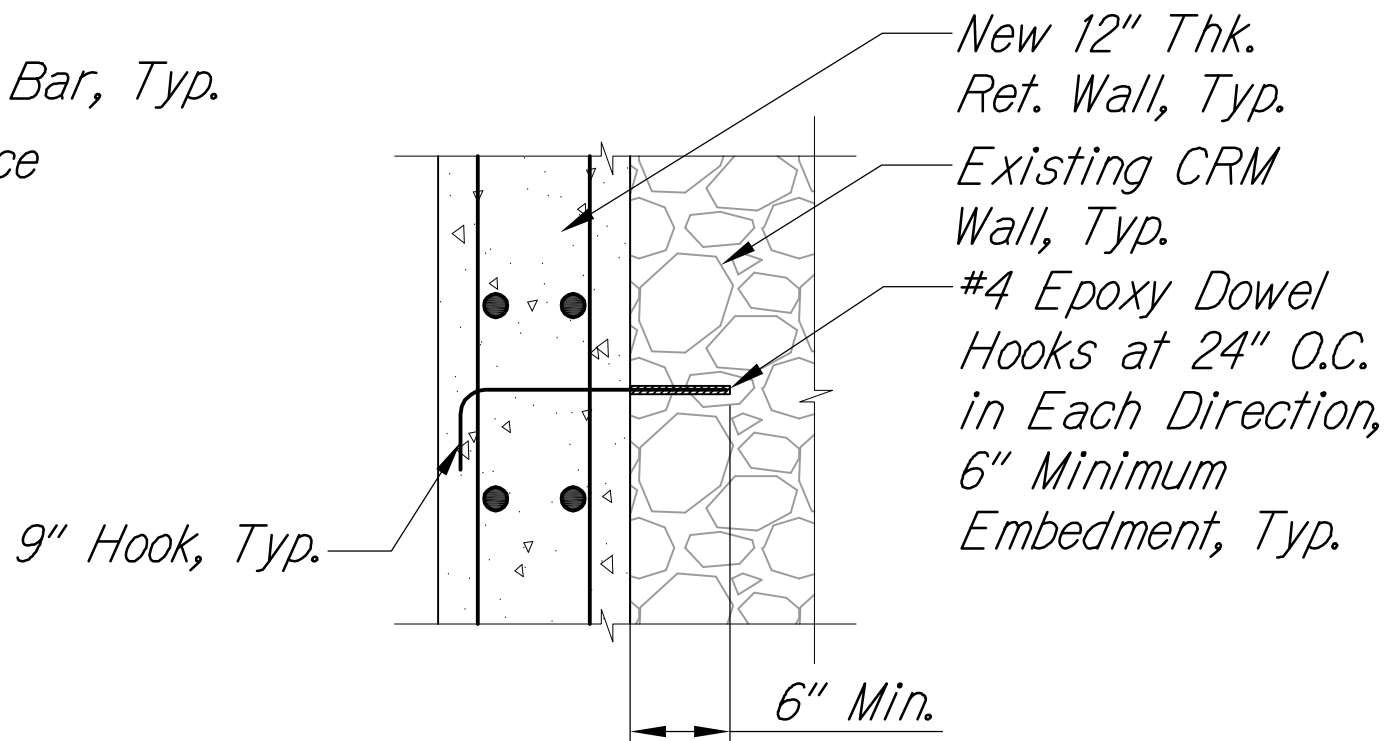
SECTION B
Scale: 1" = 1'-0"



PLAN C
Scale: 1" = 1'-0"



PLAN D
Scale: 1" = 1'-0"



SECTION E
Scale: 1" = 1'-0"

M:\2008\2008_003.002 GBI Queen K Hwy Redesign\G Dwg\Contract Documents\Structural\161026 UPDATED CAD New Seis Ret Wall Loads - Superceeds all other CAD\S-5.2E Culvert B Inlet Details.dwg 3/20/2018 3:20 PM

| | |
|---------------|------|
| ORIGINAL PLAN | DATE |
| DESIGNED BY | |
| NOTED BY | |
| CHECKED BY | |