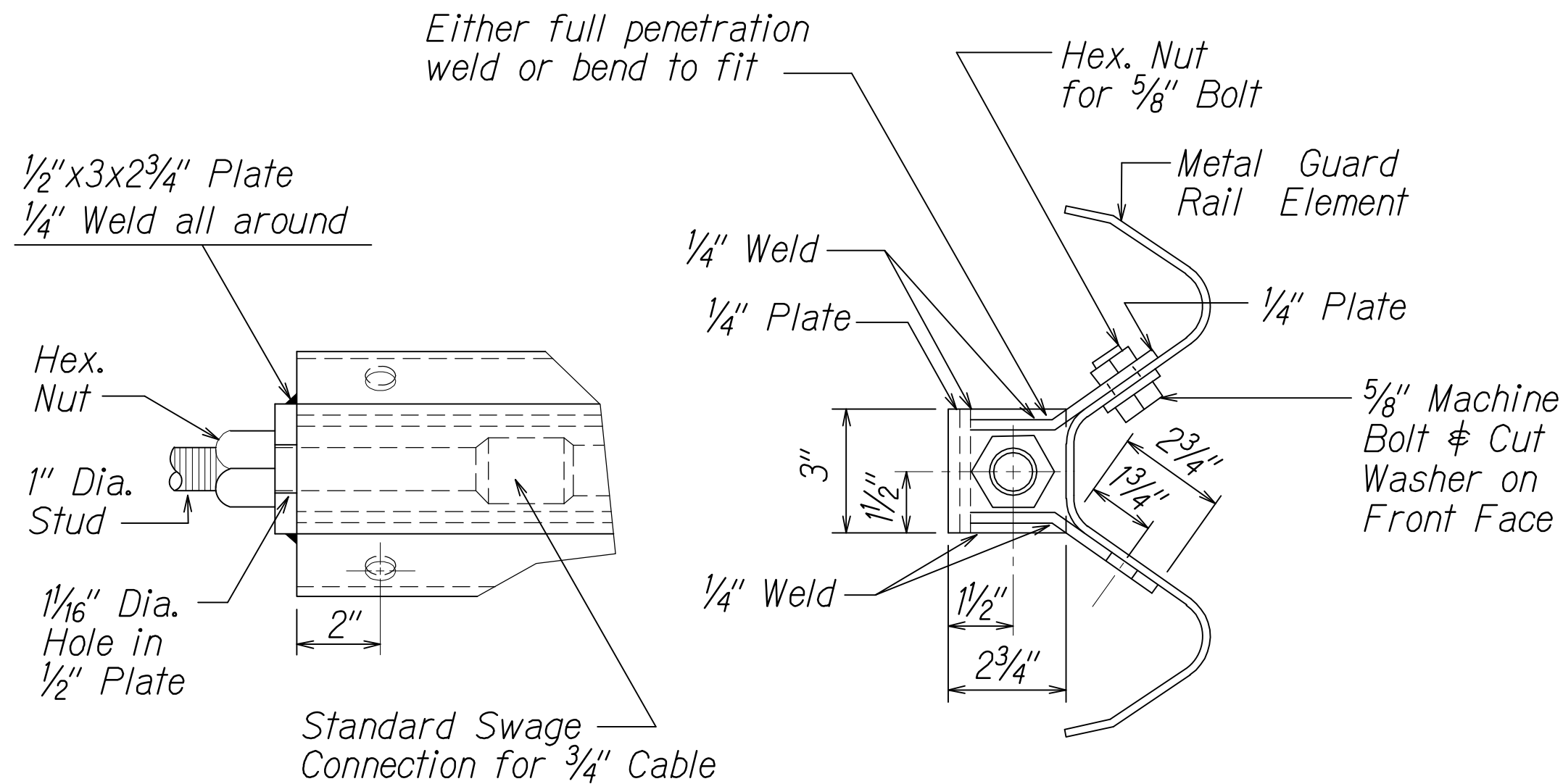
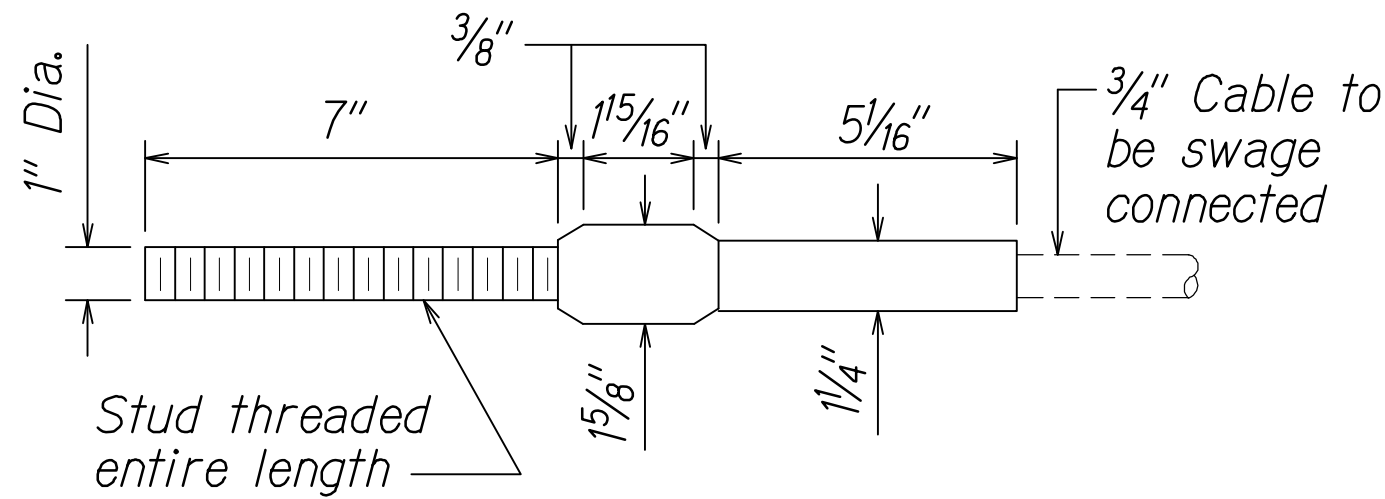


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-019-1(38)R	2016	525 519	528 522



ANCHOR PLATE DETAILS

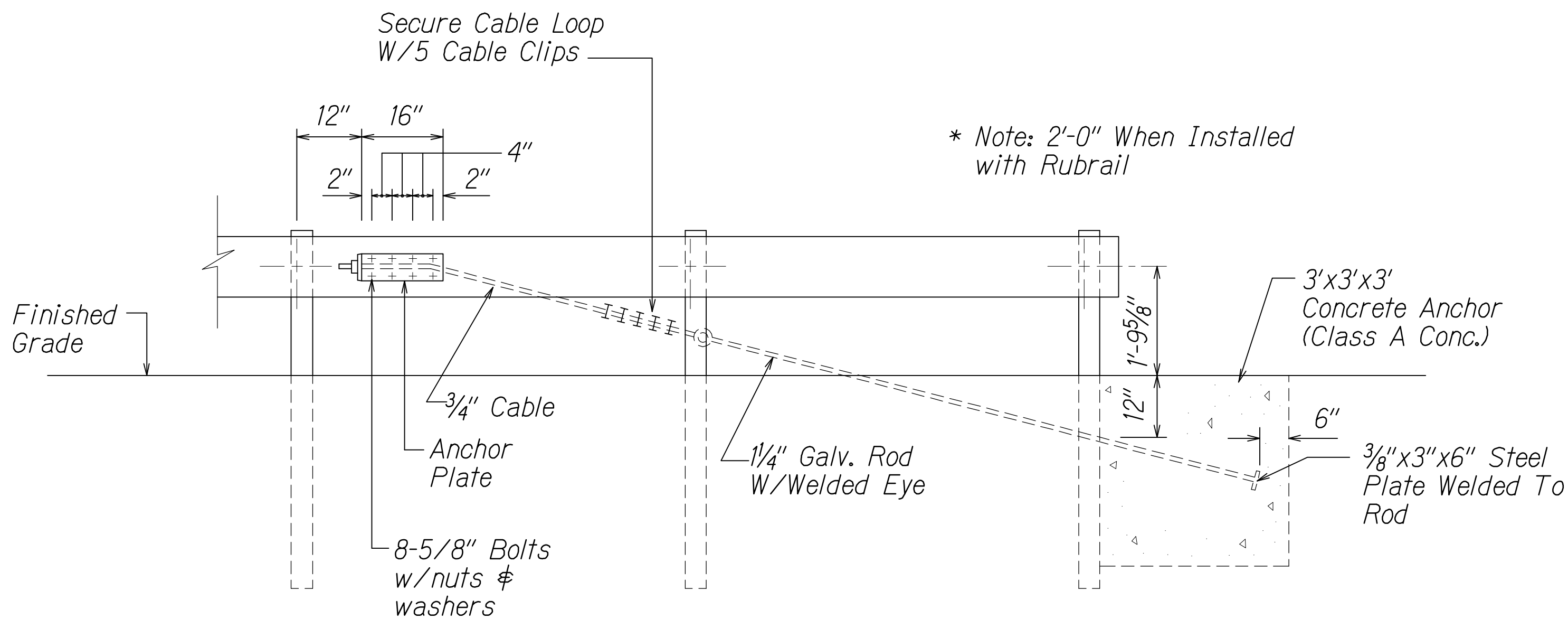
Scale: N.T.S.



STANDARD SWAGED FITTING

AND STUD

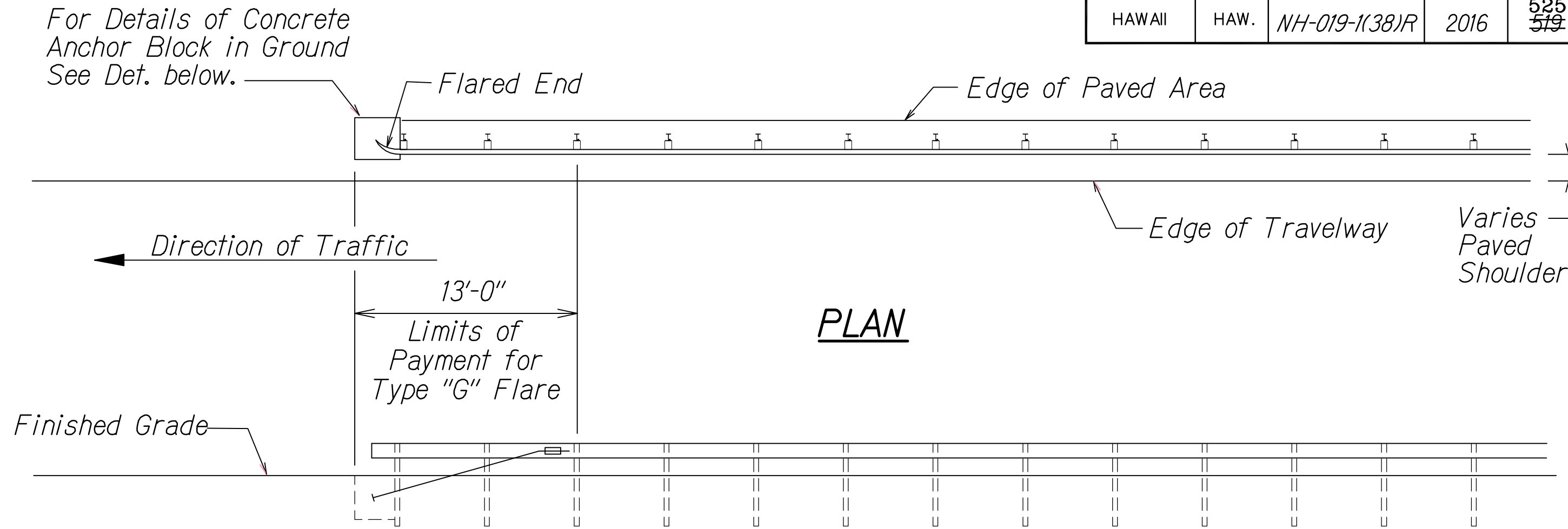
Scale: N.T.S.



ANCHOR BLOCK DETAIL

Scale: N.T.S.

- Concrete, G.R.P., excavation, anchor rod and miscellaneous appurtenances necessary to anchor the guardrail ends shall be incidental to metal guardrail.



ELEVATION

TYPE "G" FLARE END TERMINAL

Scale: N.T.S.

NOTE:

Type "G" Modified End Terminal is a site specific end terminal with a taper and radial termini. A site specific detailed drawing is required for all Type "G" Modified End Terminal and must receive Engineer's approval. The taper (flare rate) of the guardrail shall follow the latest edition of AASHTO'S Roadside Design Guide (currently, Table 5.6 - Suggested Flare Rate for Barrier Design, page 5-21, Jan. 1996 edition). The radius of the radial termini is an Engineer's judgement based on the site evaluation. The Engineer shall consider safety (minimize the spearing & blunt end situation); degree and potential seriousness of the hazard; bicycle and pedestrian accessibility; maintenance equipment accessibility; Right-of-Way availability; the smallest radii the metal w-beam/thrie-beam railing can be constructed (check with supplier/contractor); posted speed limit; angle of vehicle impact; and aesthetics when designing the Type "G" Modified End Terminal. During construction, the Contractor shall layout the proposed Type "G" Modified End Terminal and receive approval from the Construction Engineer prior to installation.

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

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

### GUARDRAIL 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: APRIL 2016

SHEET No. 1 OF 4 SHEETS

"AS-BUILT"

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519 525

WA\_CIVIL 3D PROJECTS\2008\_003\_001\_GBI\_QUEEN K HWY WIDENING\01 CIVIL DRAWINGS\519\_521 GUARDRAIL DETAILS AND NOTES.DWG 4/18/2016 4:58 PM

|               |      |
|---------------|------|
| DESIGNED BY   | DATE |
| NOTED 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        | 526<br><del>520</del> | 528<br><del>522</del> |

**GENERAL NOTES:**

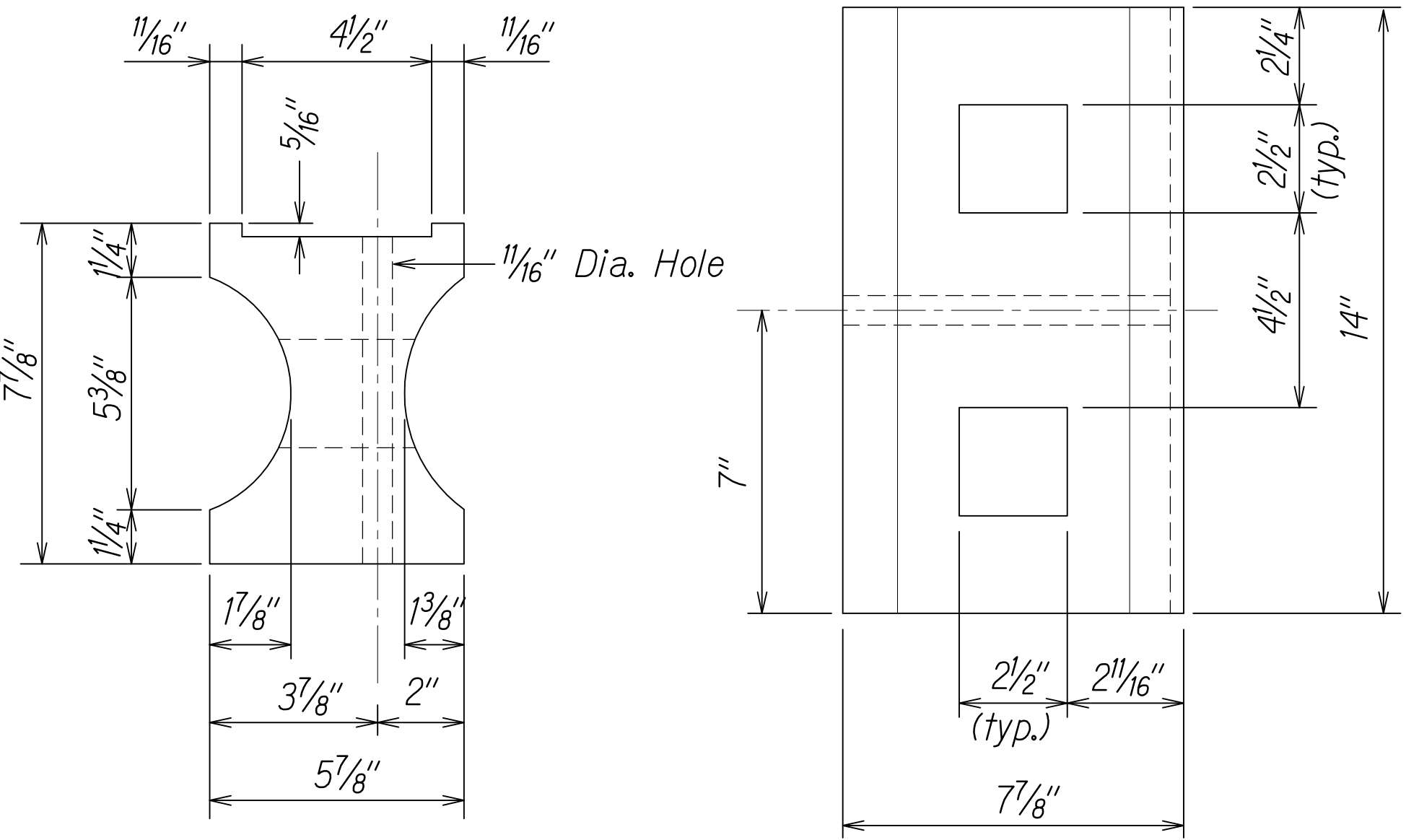
- All hardware, posts and fasteners shall be hot-dip zinc coated galvanized after fabrication. No punching, drilling or cutting will be permitted after galvanizing.
- Where conditions require, special post lengths in increments of 6 inches may be specified.
- All fasteners, posts, and rail elements (i.e. FBB03, PWE01, RWM02b, etc.) shall conform to the latest edition and amendments of "A Guide to Standardized Highway Barrier Rail Hardware", a report prepared and approved by the AASHTO-AGC-ARTBA Joint Cooperative Committee, Subcommittee On New Highway Materials, Task Force 13 Report. Dimensions of fastners, posts and rail elements have been converted from metric units into their present form.
- The Recycled Plastic Block or Offset Block shall be approved by the State.
- All new guardrail systems (system consists of total length of guardrail including both end treatments) shall include the Additional Paved Area.
- After the guardrail posts are installed in the paved area, the Contractor shall fill/seal around each guardrail post and all cracks in the paved area caused during the guardrail post installation. If required by the inspector/engineer, the Contractor shall tamper the paved area around the guardrail post prior to filling/sealing. All costs associated with this work shall not be paid for separately, but shall be considered incidental to the various guardrail items.
- When standards for the fill slope area cannot be met, a site specific, engineer approved design may be used.
- New A.C. pavement at guardrails shall extend 6 feet longitudinally beyond terminal ends.
- Reflector Markers (RM-5) mounted on guardrails shall be spaced every 25 feet. RM-5's shall not be installed on Terminal Sections. Furnishing and installing of each RM-5 shall be considered incidental to the adjacent guardrail system.

| GUARDRAIL TYPE                  | DIMENSION                          |       |
|---------------------------------|------------------------------------|-------|
|                                 | H                                  | A     |
| Strong Post W-Beam              | 1'-9 <sup>5</sup> / <sub>8</sub> " | 1'-6" |
| Strong Post Rubrail (W-Beam)    | 2'-0"                              | 1'-6" |
| Strong Post Thrie-Beam          | 1'-9 <sup>5</sup> / <sub>8</sub> " | 1'-6" |
| Strong Post Modified Thrie-Beam | 2'-0"                              | 2'-0" |

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

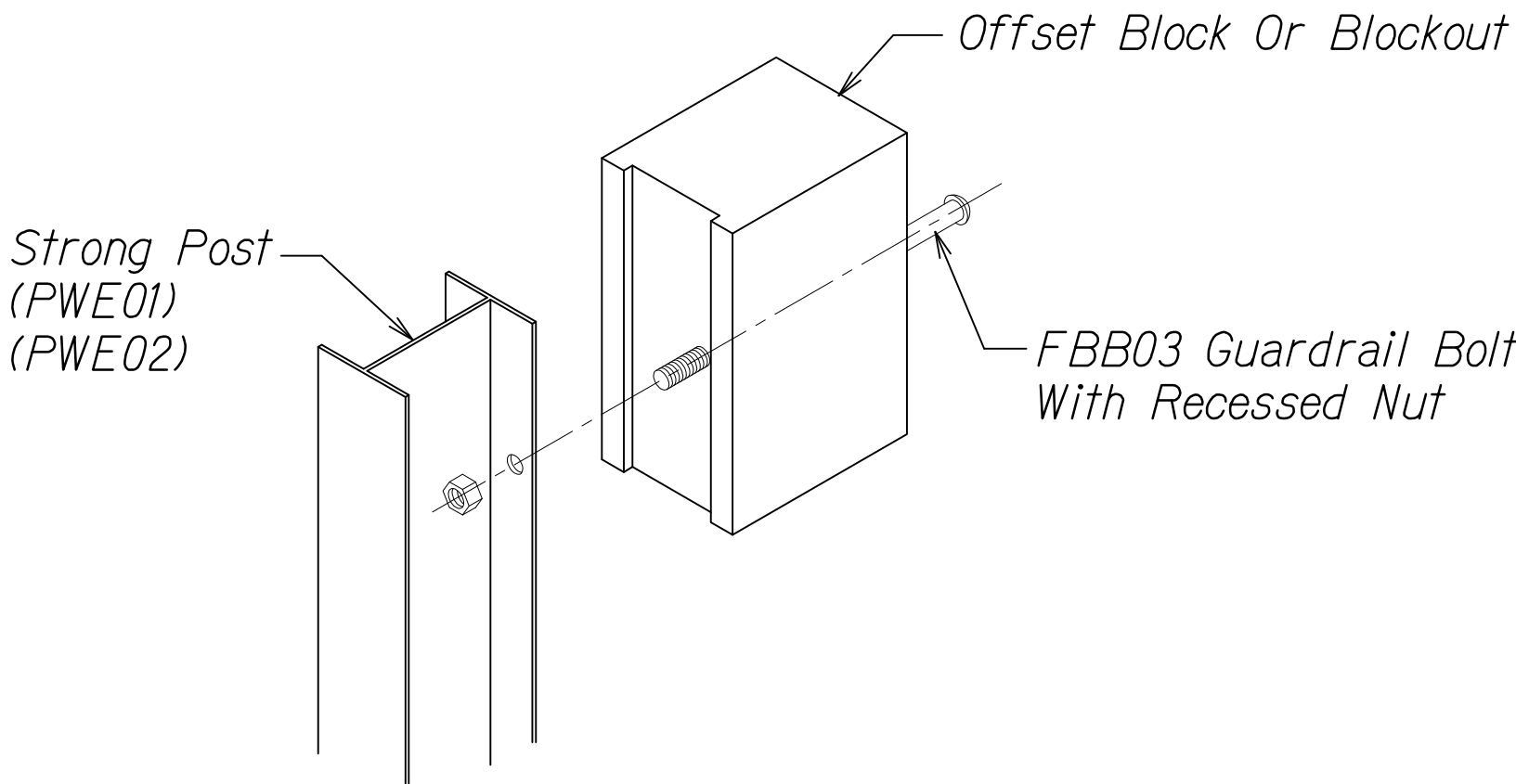
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**GUARDRAIL DETAILS & NOTES**  
  
**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: JULY 2016



**RECYCLED PLASTIC BLOCKOUT (TYPE I)**

Scale: N.T.S.

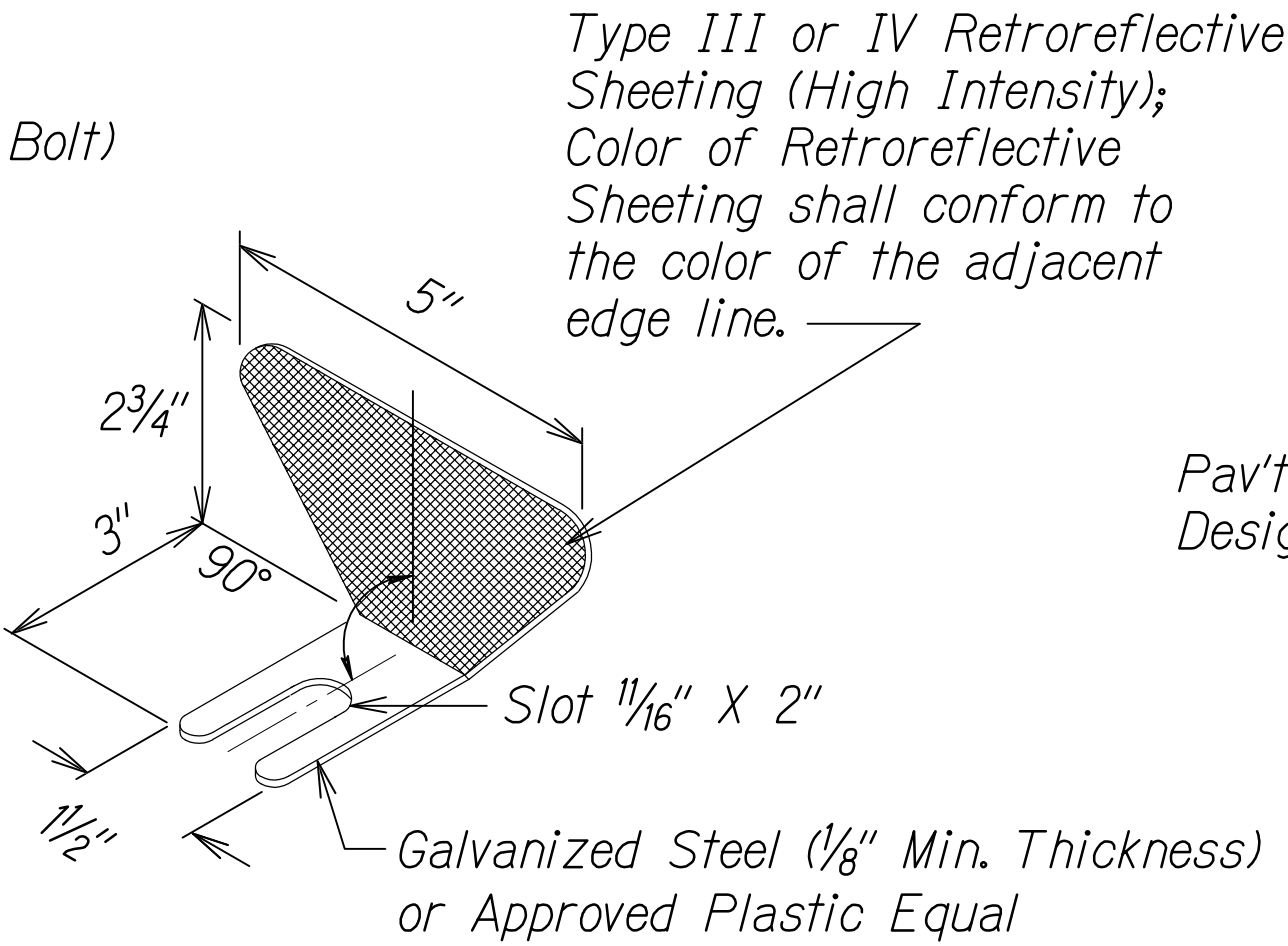
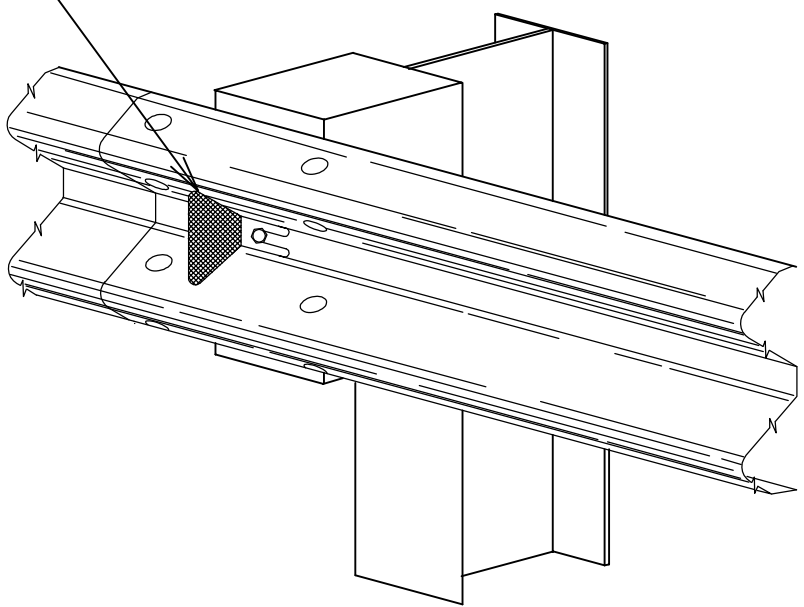


Exploded View  
(Rail and washer not shown)

**STEEL POST AND BLOCK DETAIL**

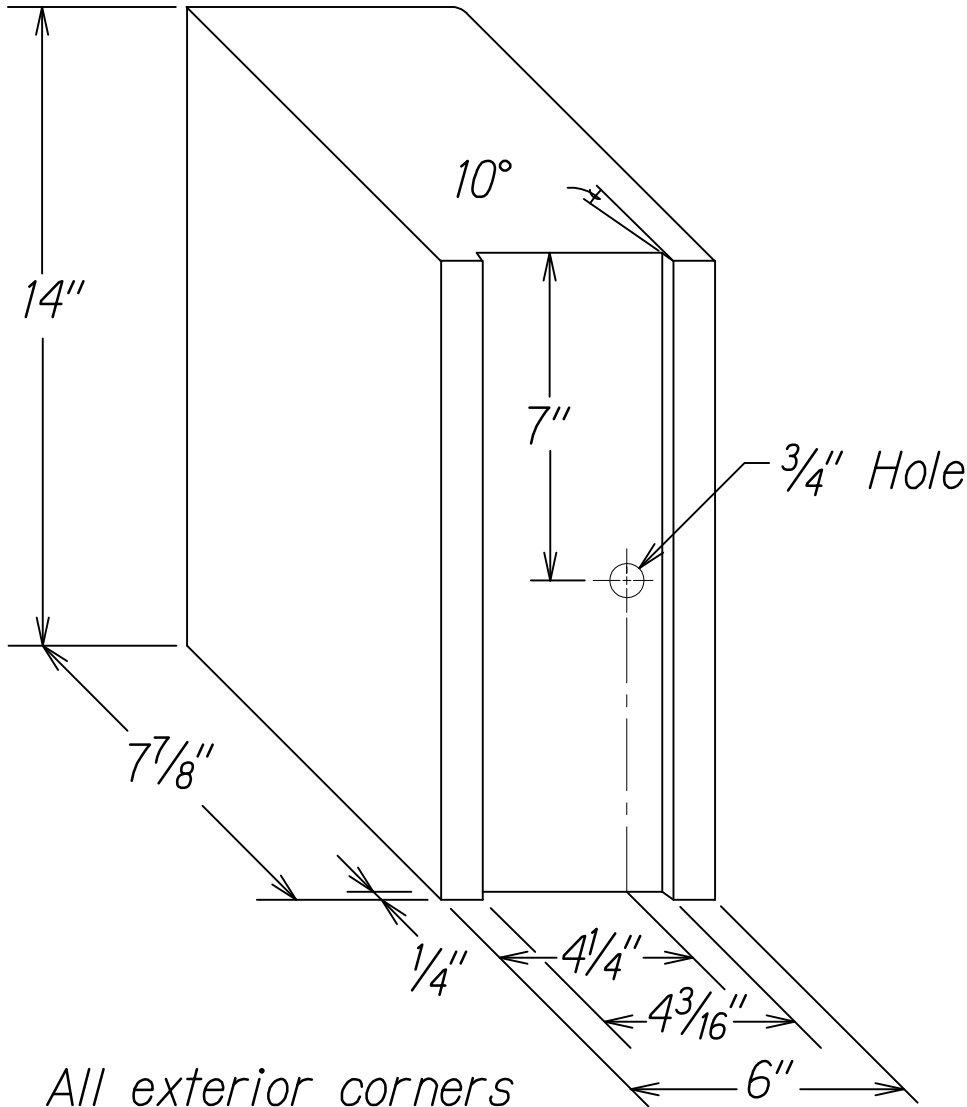
Scale: N.T.S.

Reflector Marker (RM-5) - Reflector Facing Traffic (Mounted On Guardrail Bolt)



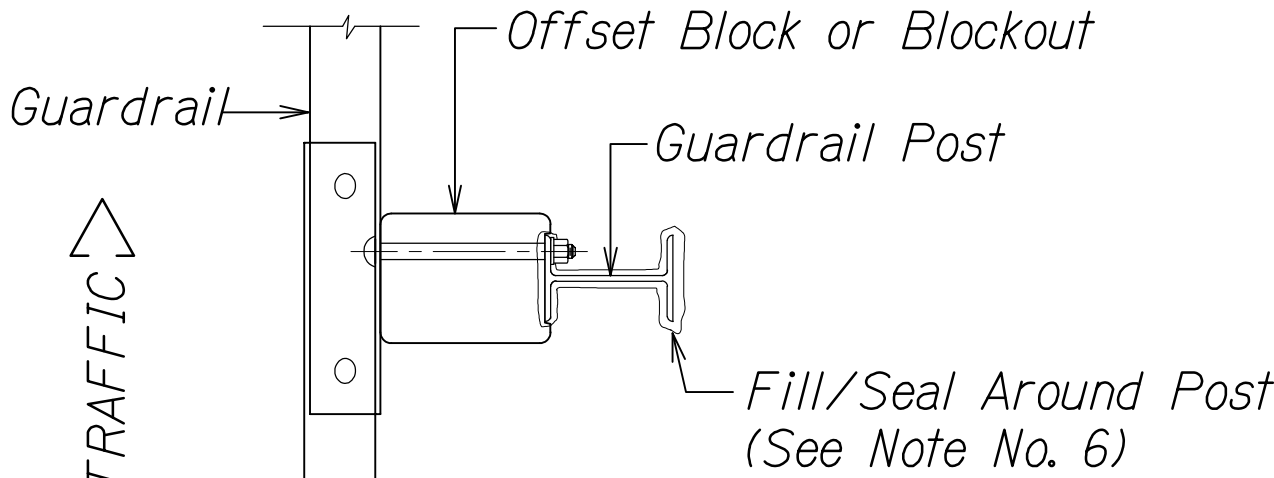
**REFLECTOR MARKER (RM-5) DETAIL AND TYPICAL INSTALLATION**

Scale: N.T.S.

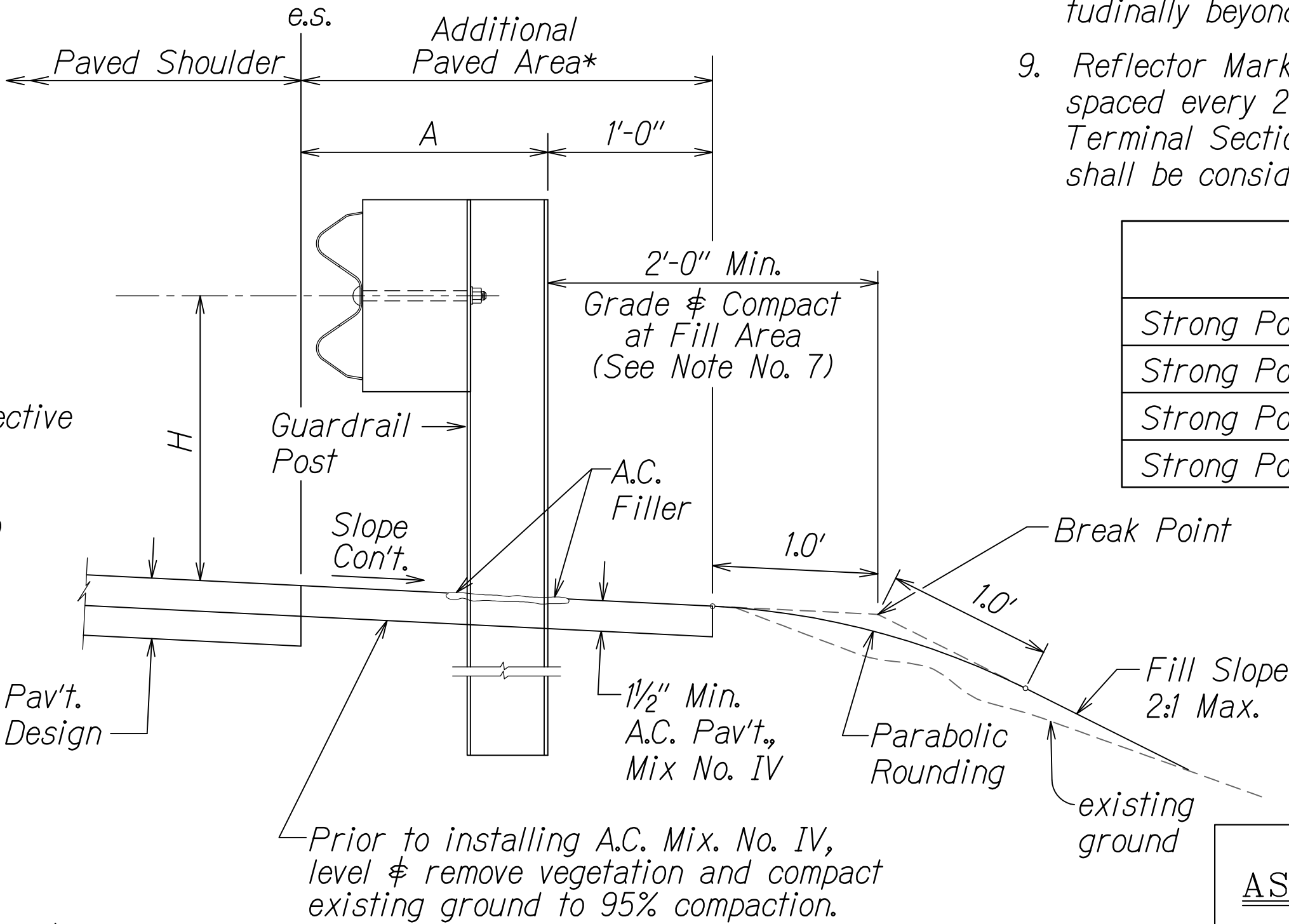


**RECYCLED POLYETHYLENE OFFSET BLOCK (TYPE II)**

Scale: N.T.S.



**PLAN**



**ELEVATION**

**TYPICAL GUARDRAIL INSTALLATION**

Scale: N.T.S.

WA\_CIVIL 3D PROJECTS\2008\_003\_001\_GBI\_QUEEN K HWY WIDENING\01\_CIVIL DRAWINGS\519\_521\_GUARDRAIL DETAILS AND NOTES.DWG 7/6/2016 9:37 AM

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

526

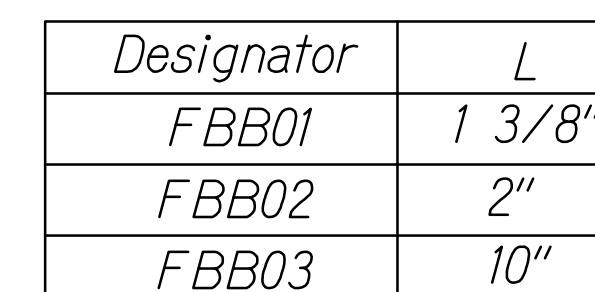
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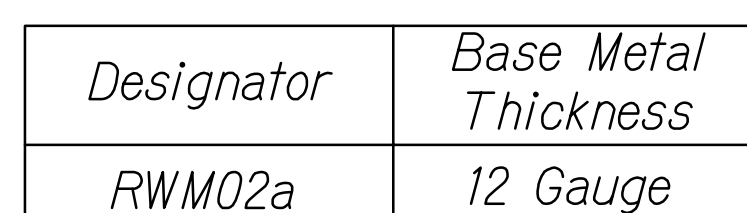
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*SIDE*

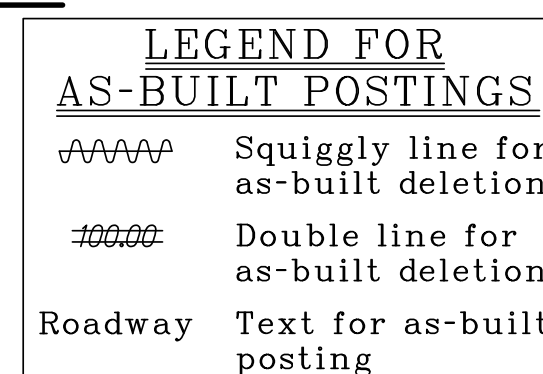
Scale: NTS



Scale: NTS



Scale: NTS



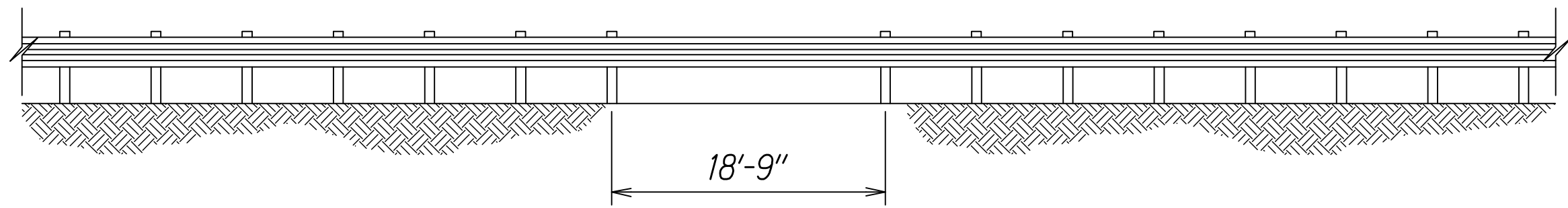
STATE OF HAWAII  
 DEPARTMENT OF TRANSPORTATION  
 HIGHWAYS DIVISION

GUARDRAIL DETAILS (STRONG  
POST W-BEAM GUARDRAIL)

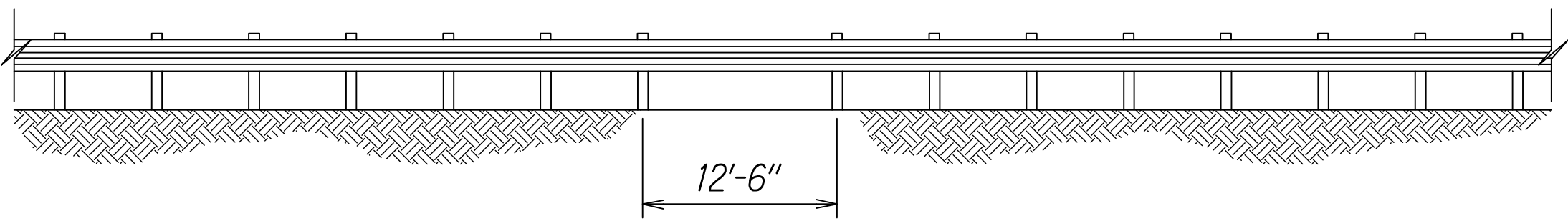
Scale: AS NOTED Date: AUGUST 2016

SHEET No. 2A OF 4 SHEETS

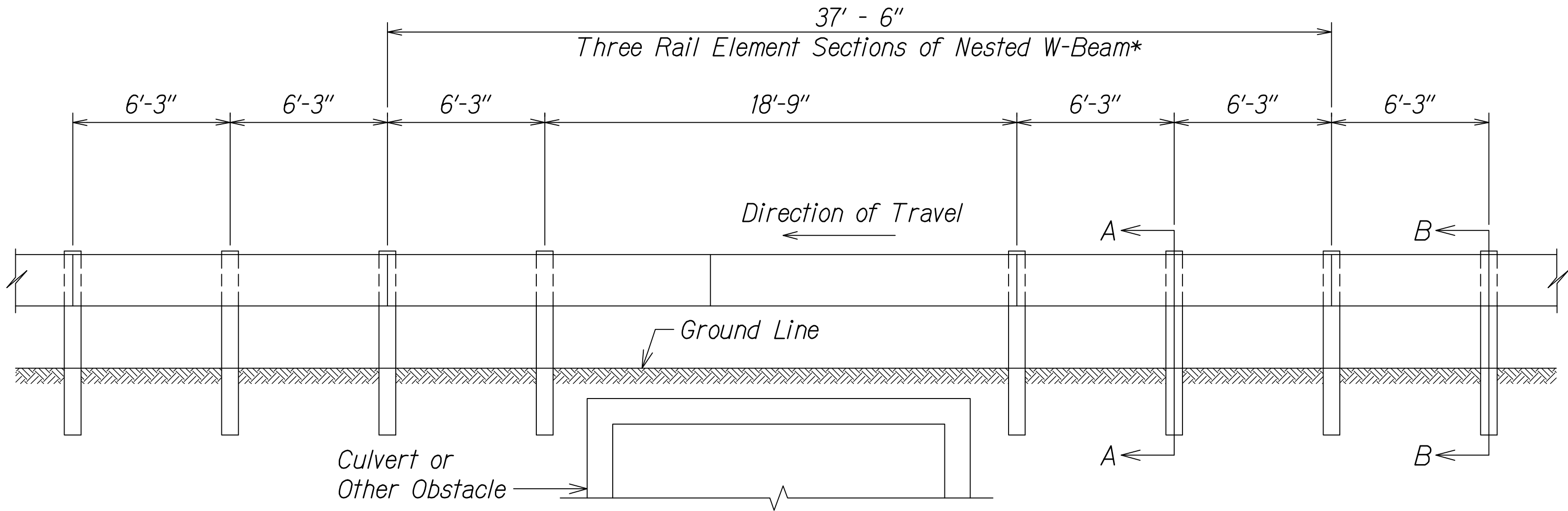
|                     |       |                    |             |                |              |
|---------------------|-------|--------------------|-------------|----------------|--------------|
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO.      | TOTAL SHEETS |
| HAWAII              | HAW.  | NH-019-1(38)R      | 2016        | C.O.<br>526S-2 | 528          |



LONG SPAN OVER CULVERT

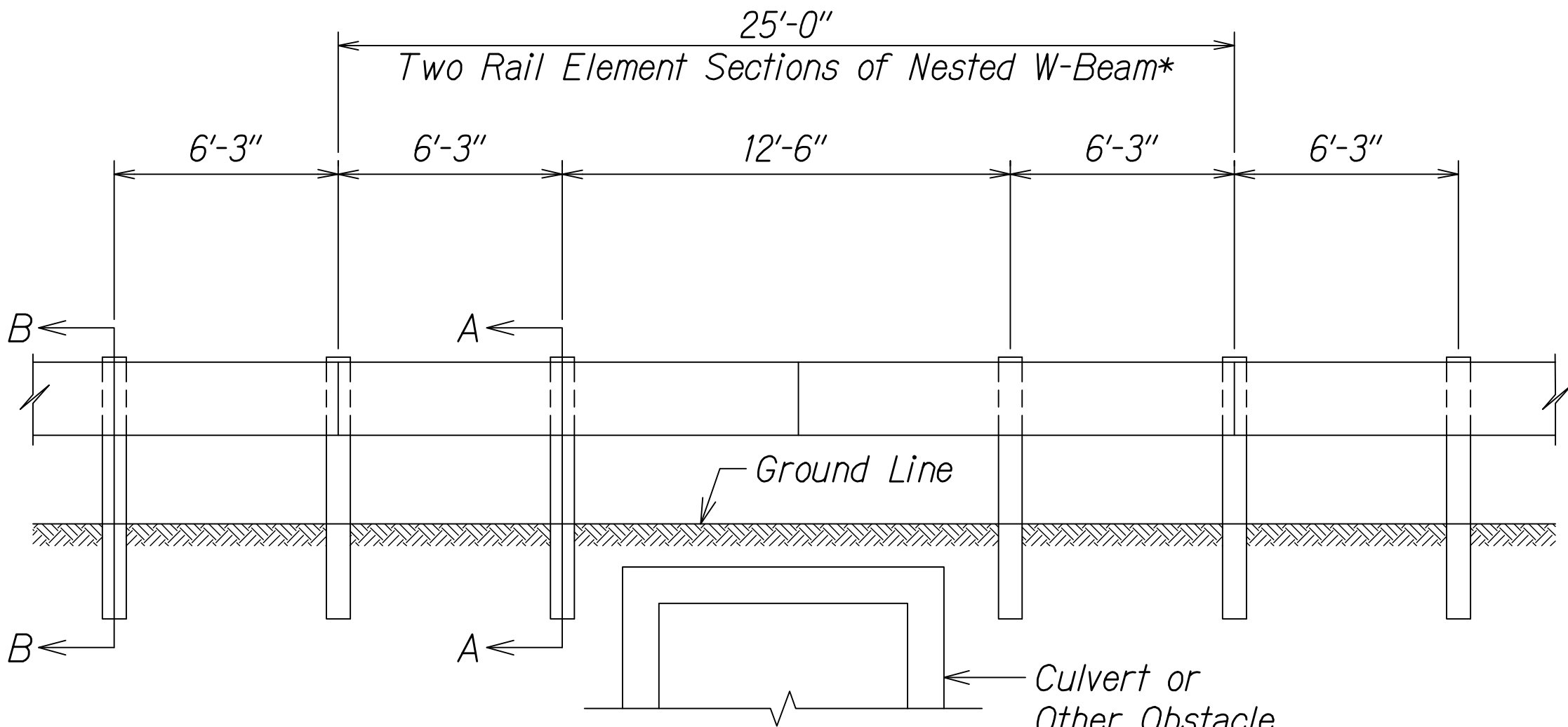


LONG SPAN OVER CULVERT



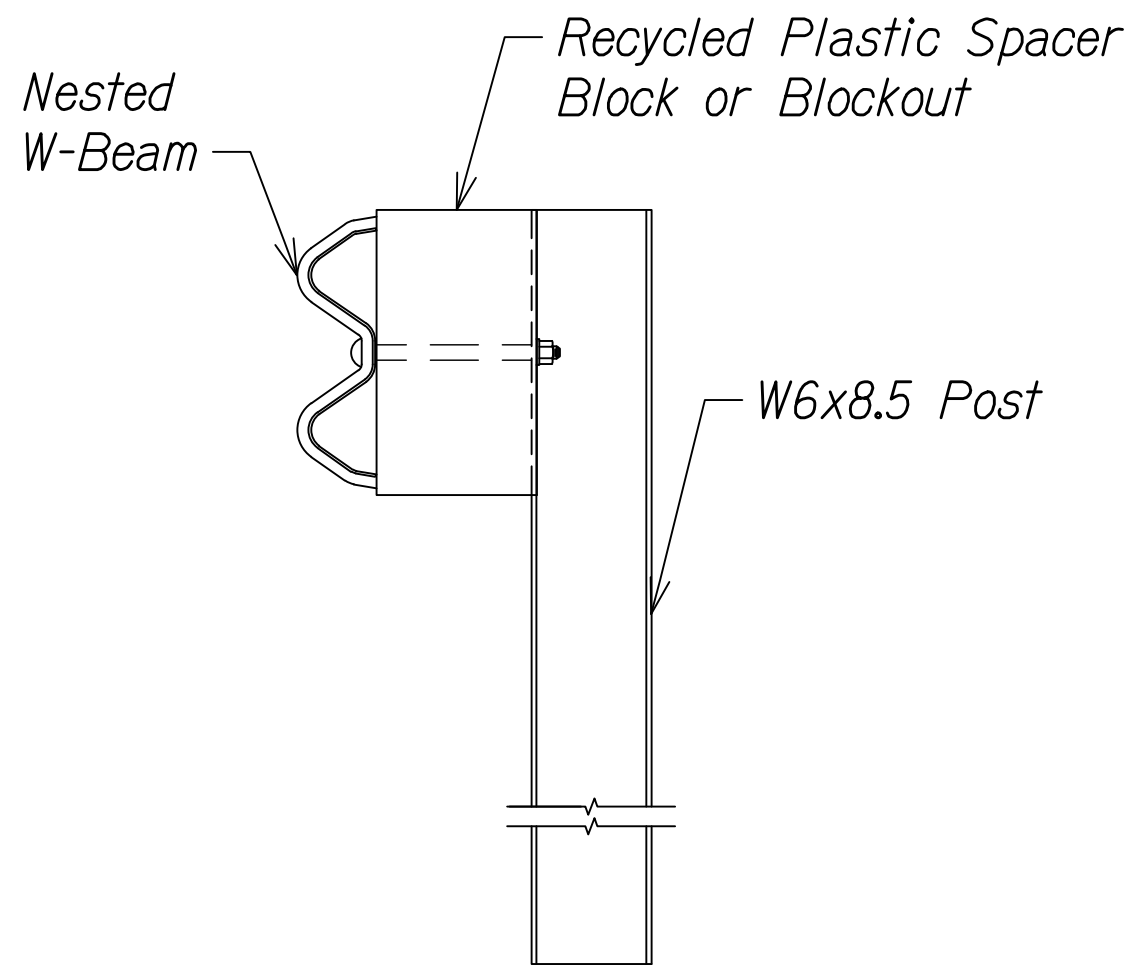
(SPlice IN CENTER OF 12'-6" SPACING)

NESTED LONG SPAN STRONG POST  
W-BEAM GUARDRAIL OVER 18'-9" CULVERT  
(MAXIMUM DYNAMIC DEFLECTION OF 3.2 FT.)  
Scale: N.T.S.

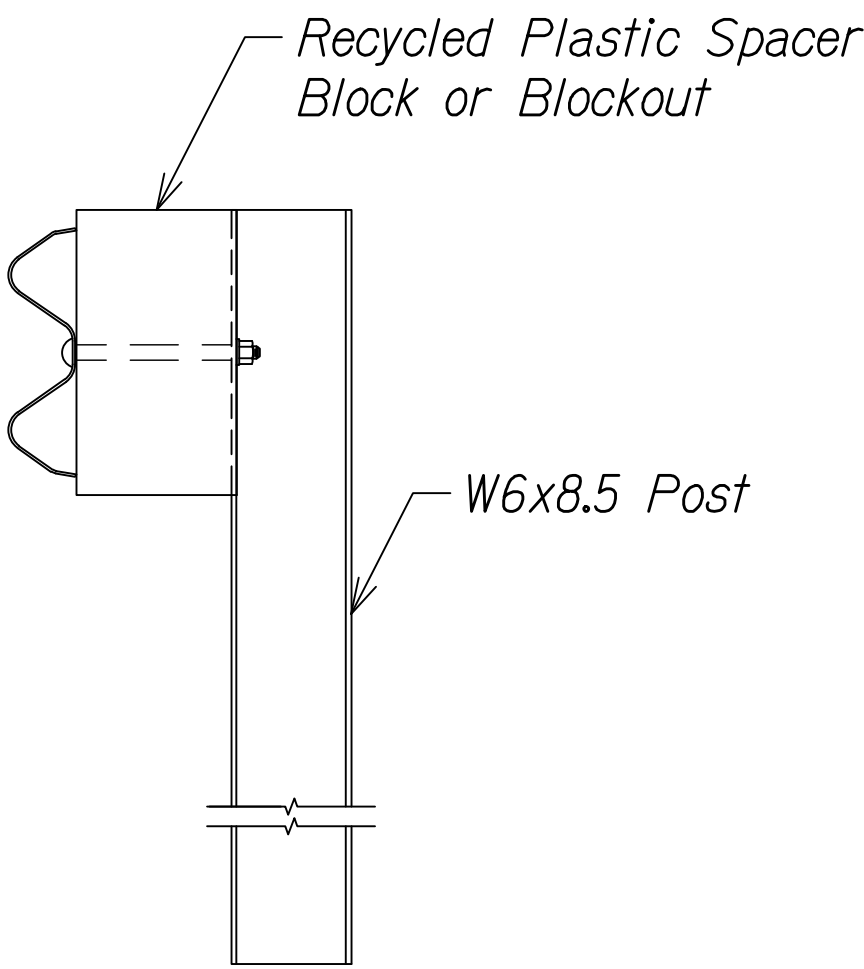


(SPlice IN CENTER OF 12'-6" SPACING)

NESTED LONG SPAN STRONG POST  
W-BEAM GUARDRAIL OVER 12'-6" CULVERT  
(MAXIMUM DYNAMIC DEFLECTION OF 3.1 FT.)  
Scale: N.T.S.



SECTION A-A



SECTION B-B

NOTES:

- All Nested W-Beam splice points shall be staggered.
- All rail elements sections are 12'-6" and all posts are 6' long.

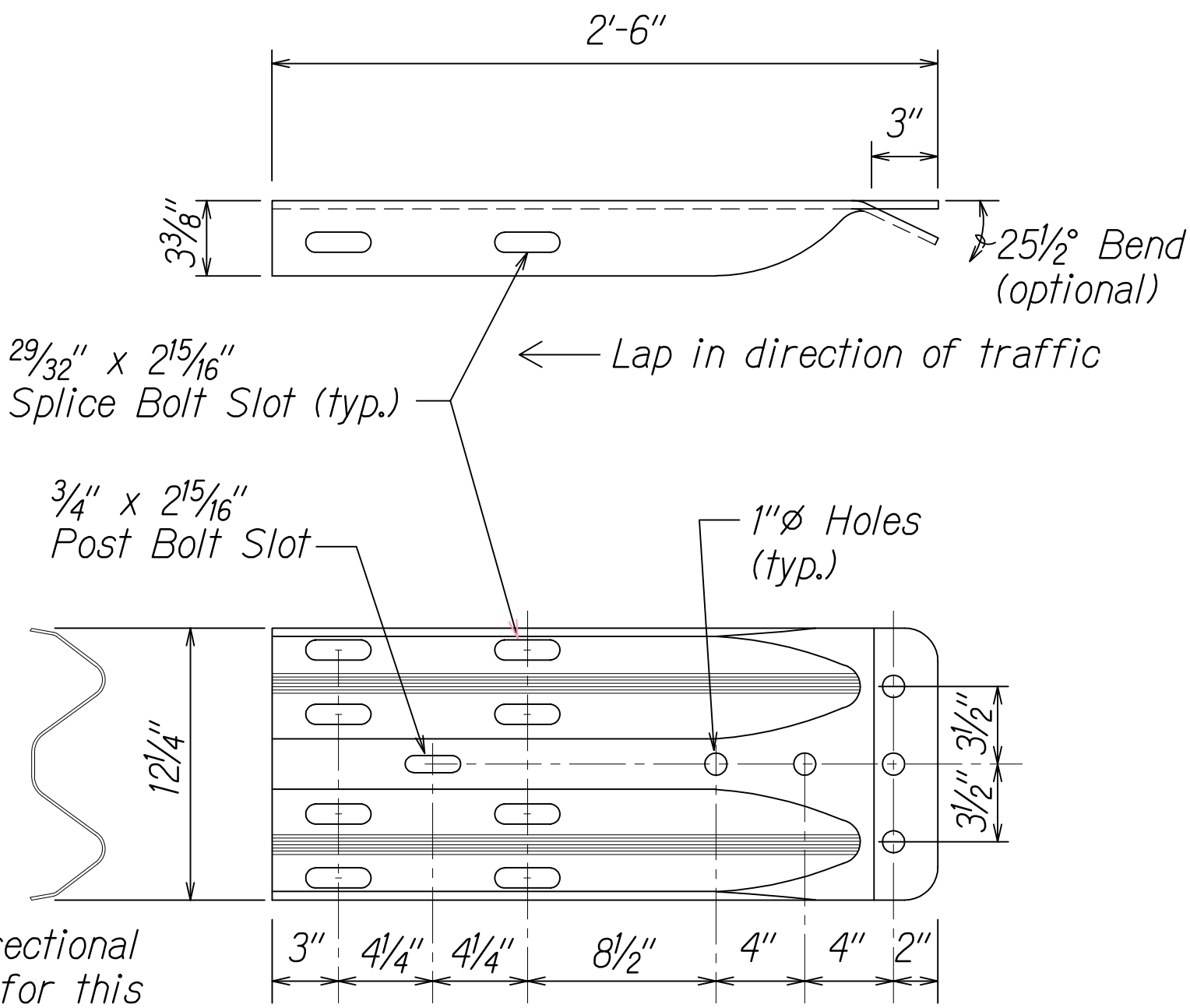
|                                                                                   |                     |
|-----------------------------------------------------------------------------------|---------------------|
| 11/13/17                                                                          | Added sheet         |
| 4                                                                                 |                     |
| DATE                                                                              | REVISION            |
| STATE OF HAWAII<br>DEPARTMENT OF TRANSPORTATION<br>HIGHWAYS DIVISION              |                     |
| GUARDRAIL DETAILS<br>(DOUBLE NESTED W-BEAM)                                       |                     |
| QUEEN KAAHUMANU HIGHWAY WIDENING<br>Kealakehe Pkwy. To Keahole Airport Rd.(Ph. 2) |                     |
| Federal Aid Project No. NH-019-1(38)R                                             |                     |
| Scale: AS NOTED                                                                   | Date: DECEMBER 2016 |
| SHEET No. 2B OF 4 SHEETS                                                          |                     |

C.O. 526S-2

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

W:\\_CIVIL\_3D\_PROJECTS\2008\_003\_001\_GBI\_QUEEN\_K\_HWY\_WIDENING\01\_CIVIL\_DRAWINGS\526S-2 DOUBLE NESTED W-BEAM.DWG 11/17/2017 4:01 PM

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | NH-019-1(38)R      | 2016        | 527       | 528          |

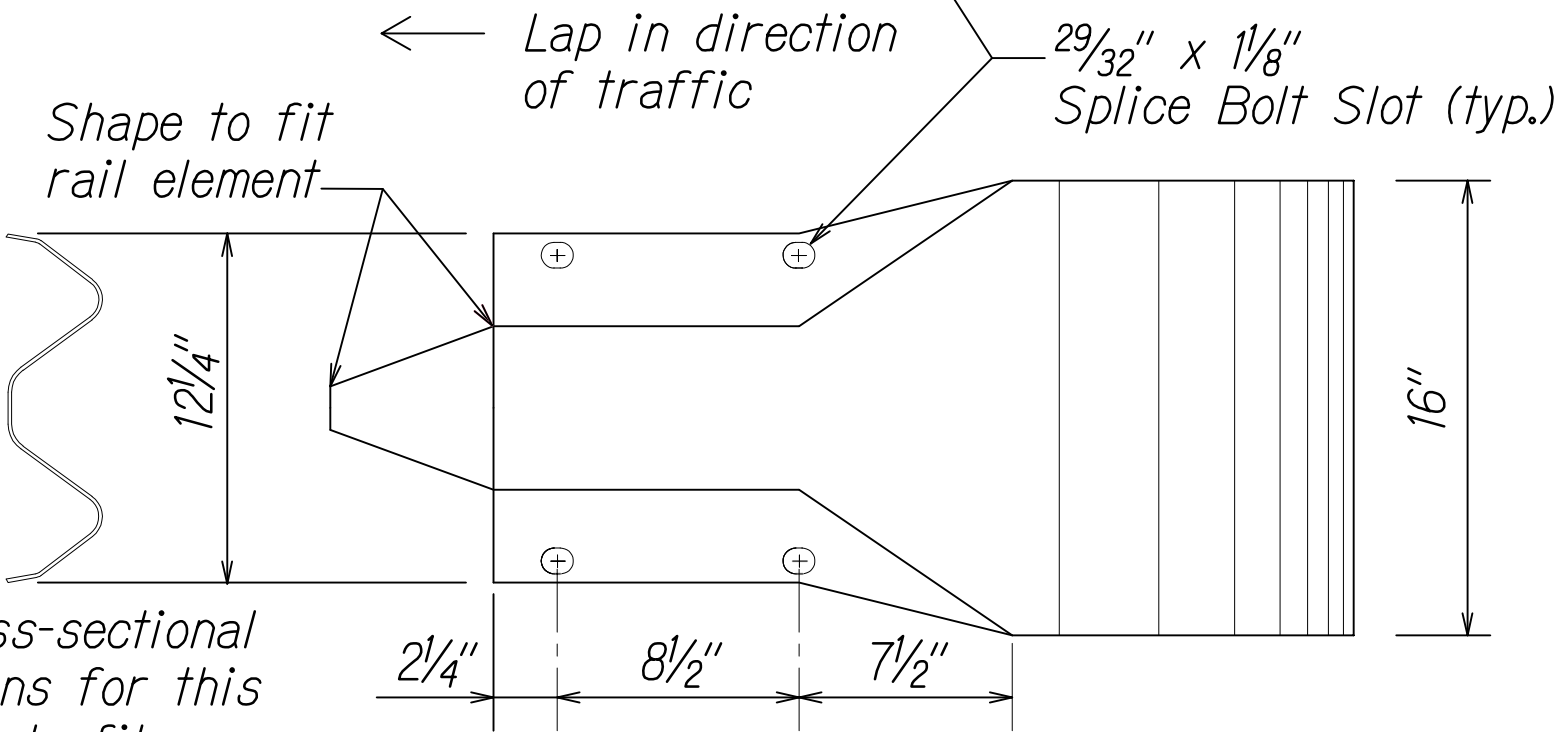
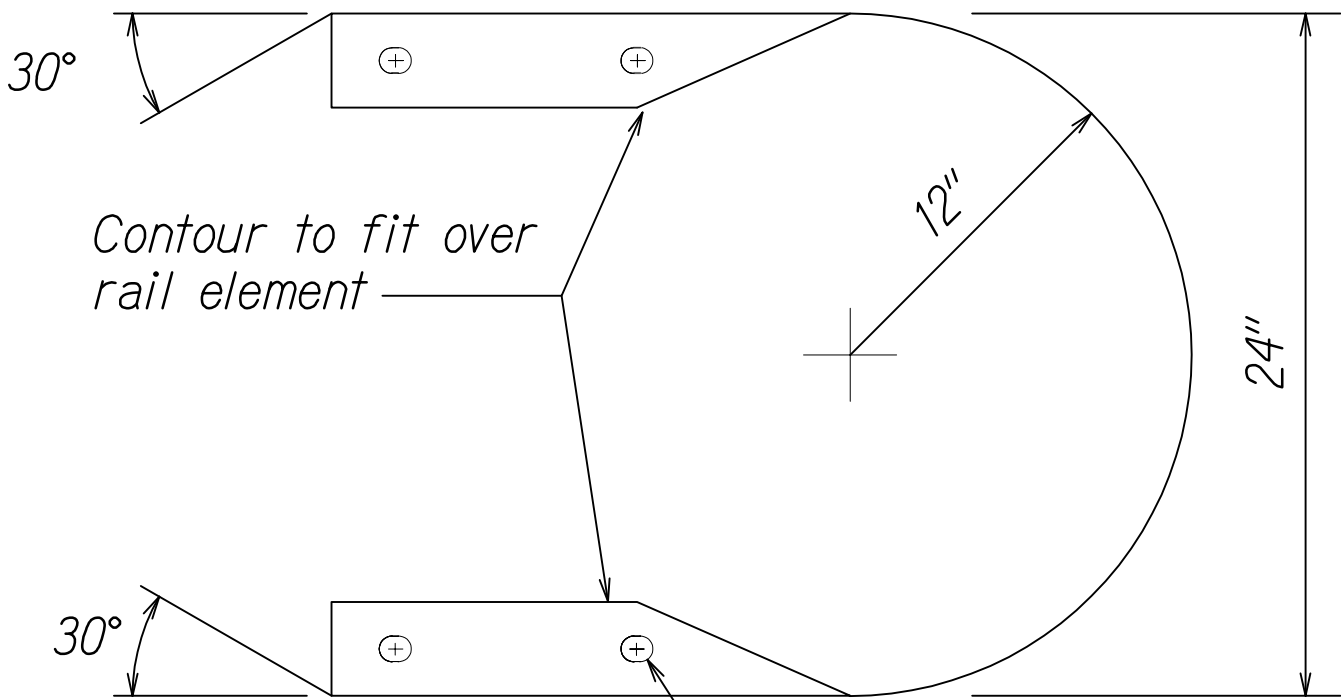


The cross-sectional dimensions for this part are to fit over part RWM02a on the approach end and under part RWM02a on the trailing end.

| Designator | Base Metal Thickness |
|------------|----------------------|
| RWE02b     | 10 Gauge             |

**W-BEAM TERMINAL CONNECTOR (RWE02b)**

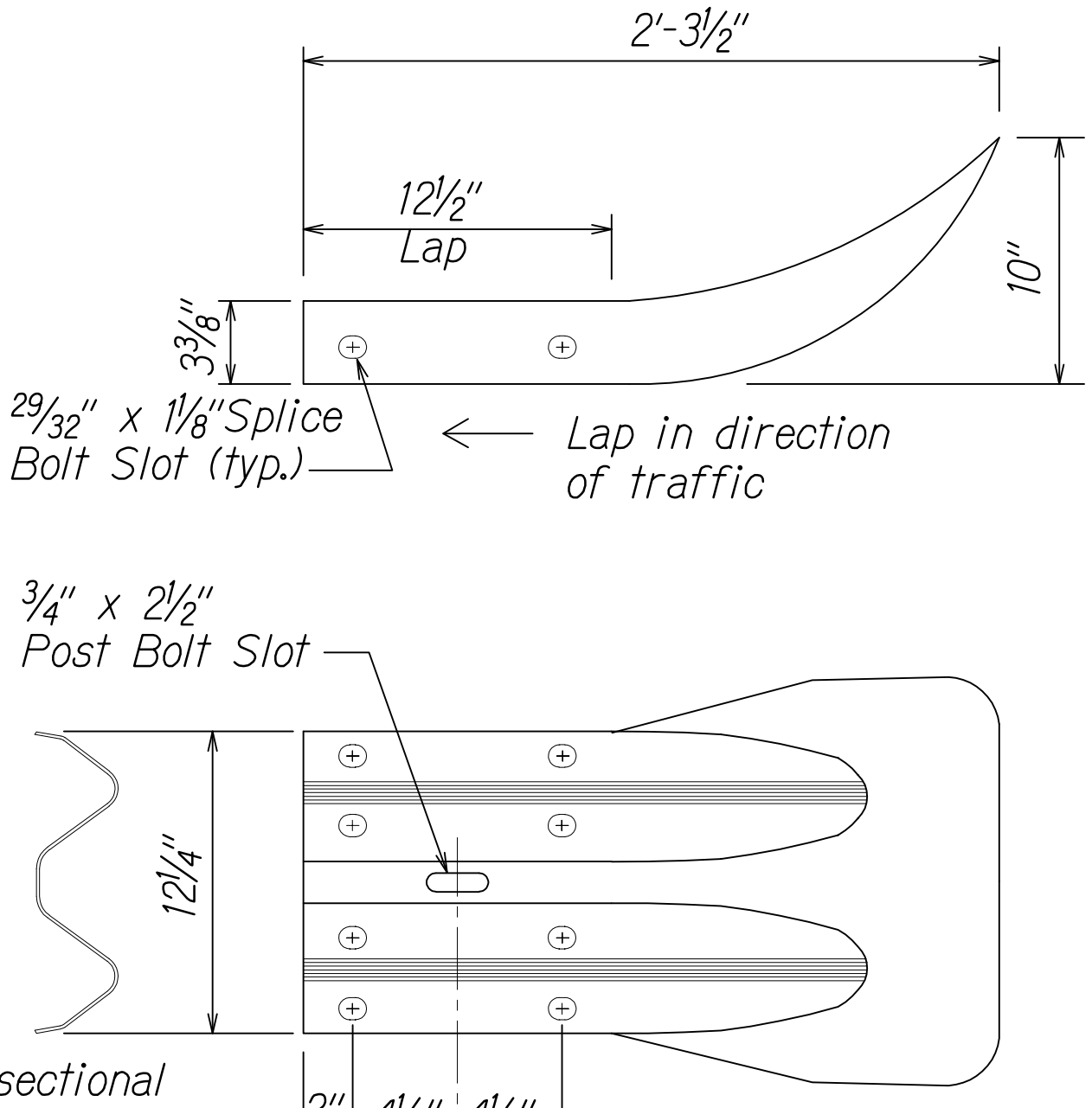
Scale: N.T.S.



The cross-sectional dimensions for this part are to fit over part RWM02a

| Designator | Base Metal Thickness |
|------------|----------------------|
| RWE06a     | 12 Gauge             |

**W-BEAM END SECTION (BUFFER RWE06a)**

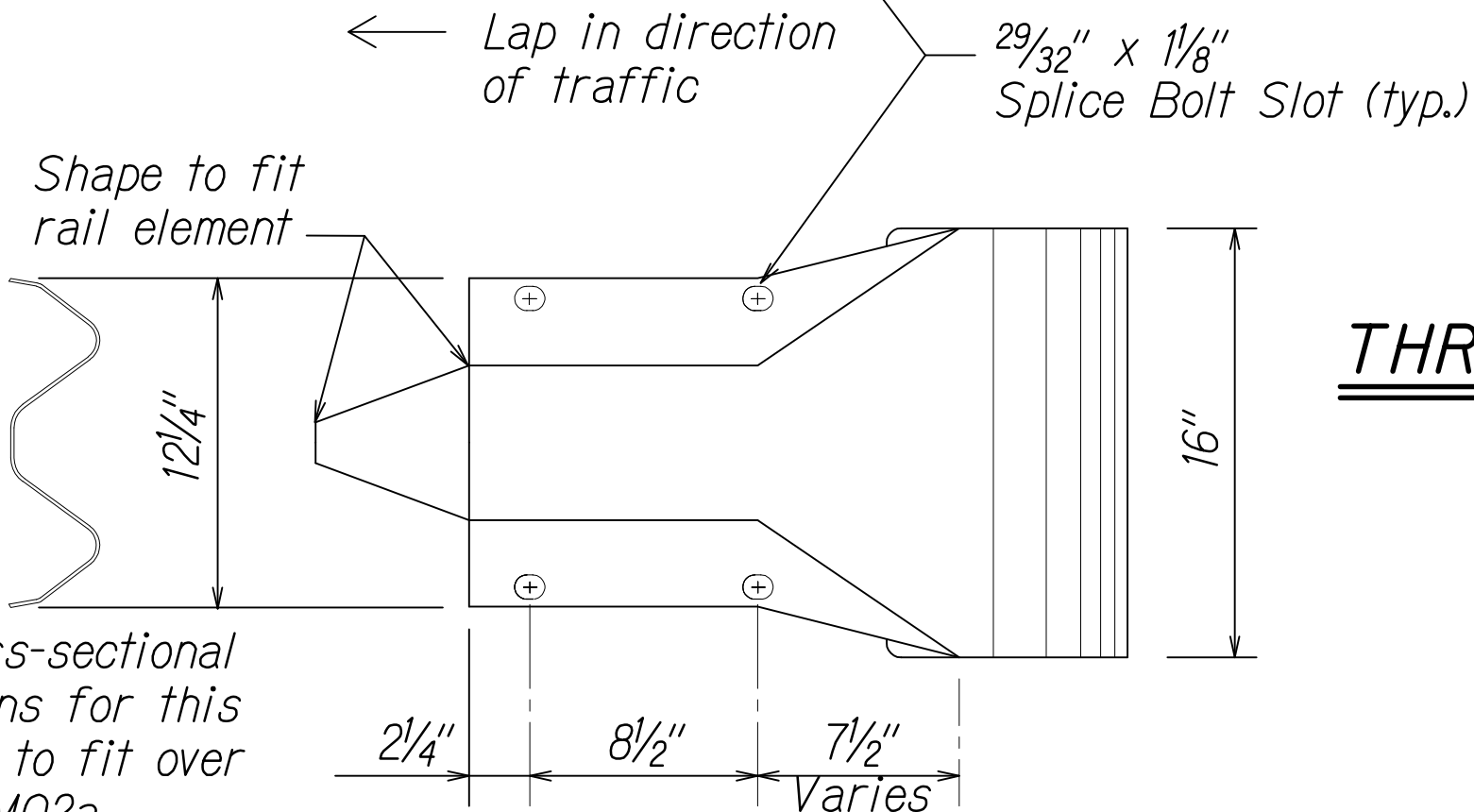
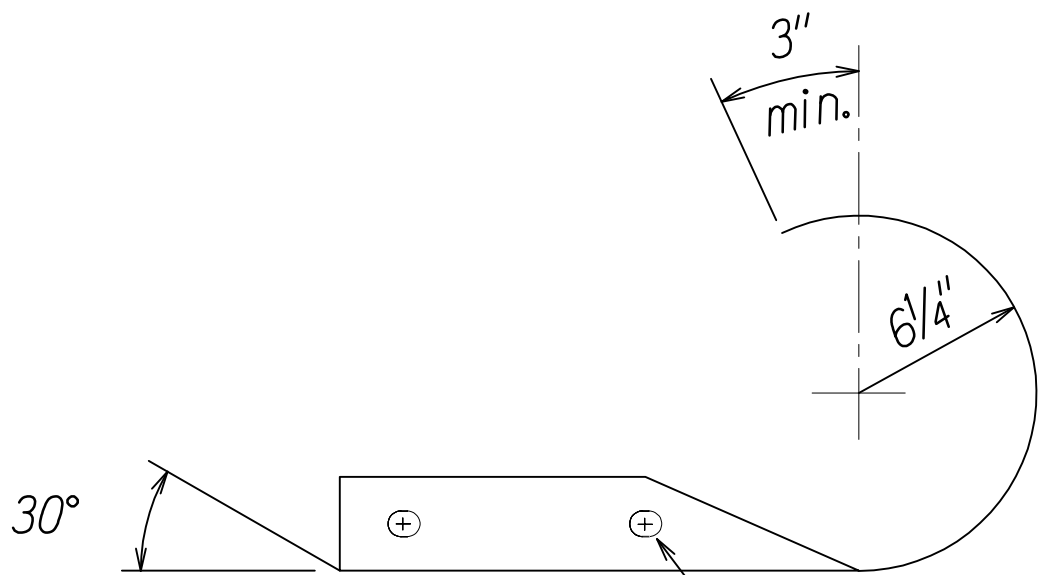


The cross-sectional dimensions for this part are to fit over part RWM02a on the approach end and under part RWM02a on the trailing end.

| Designator | Base Metal Thickness |
|------------|----------------------|
| RWE01a     | 12 Gauge             |

**W-BEAM END SECTION (FLARED RWE01a)**

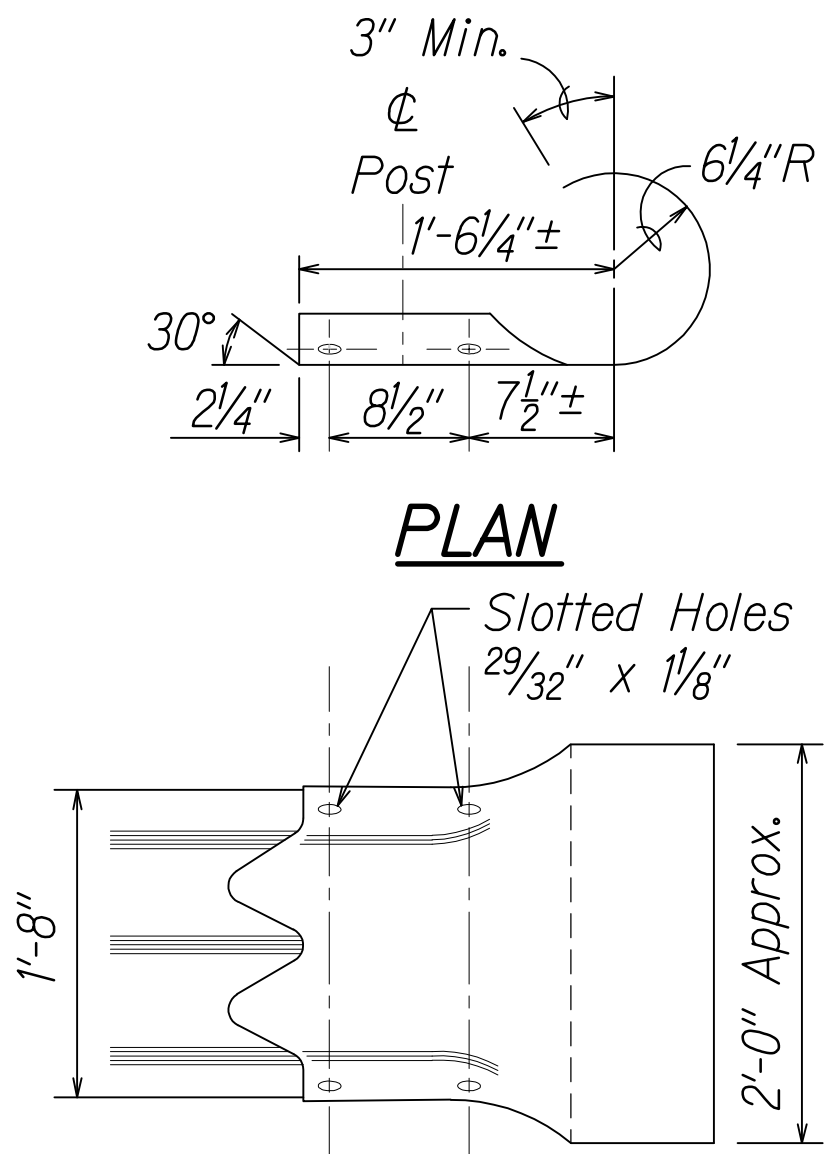
Scale: N.T.S.



The cross-sectional dimensions for this part are to fit over part RWM02a

| Designator | Base Metal Thickness |
|------------|----------------------|
| RWE03a     | 12 Gauge             |

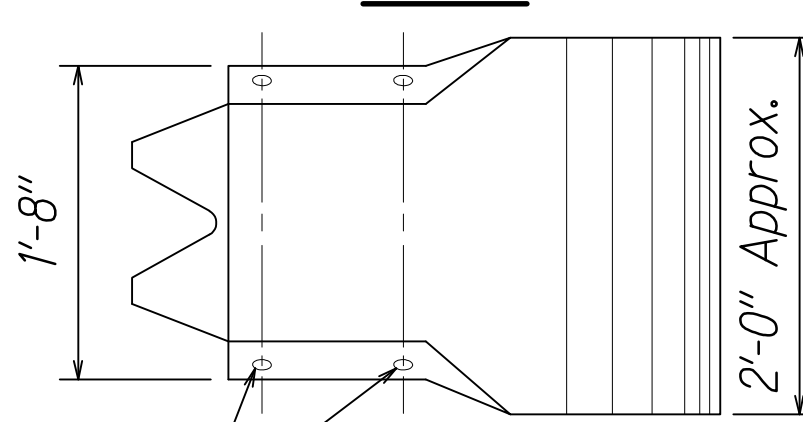
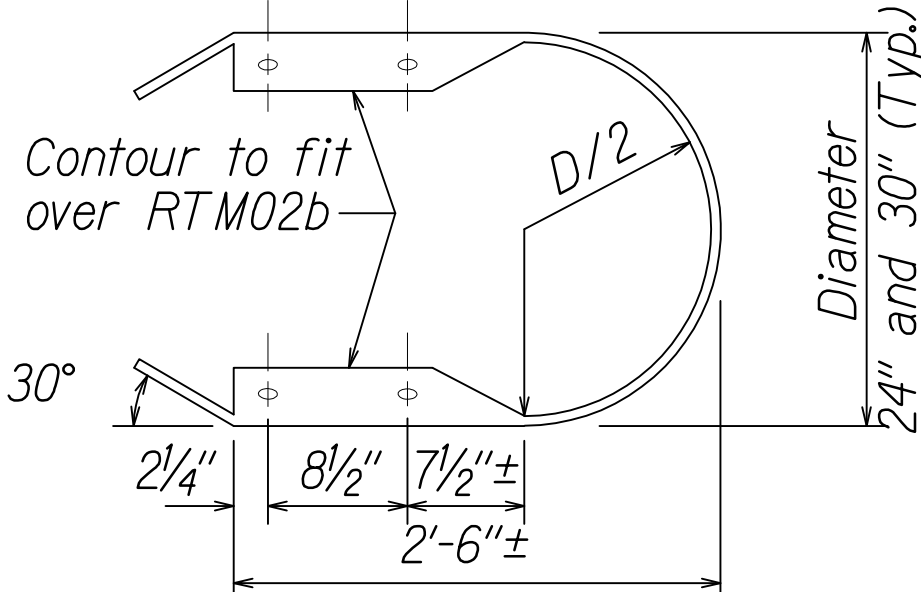
**W-BEAM END SECTION (ROUNDED RWE03a)**



| Designator | Base Metal Thickness |
|------------|----------------------|
| RTE02b     | 10 Gauge             |

**THRIE-BEAM SECTION (ROUNDED RTE02b)**

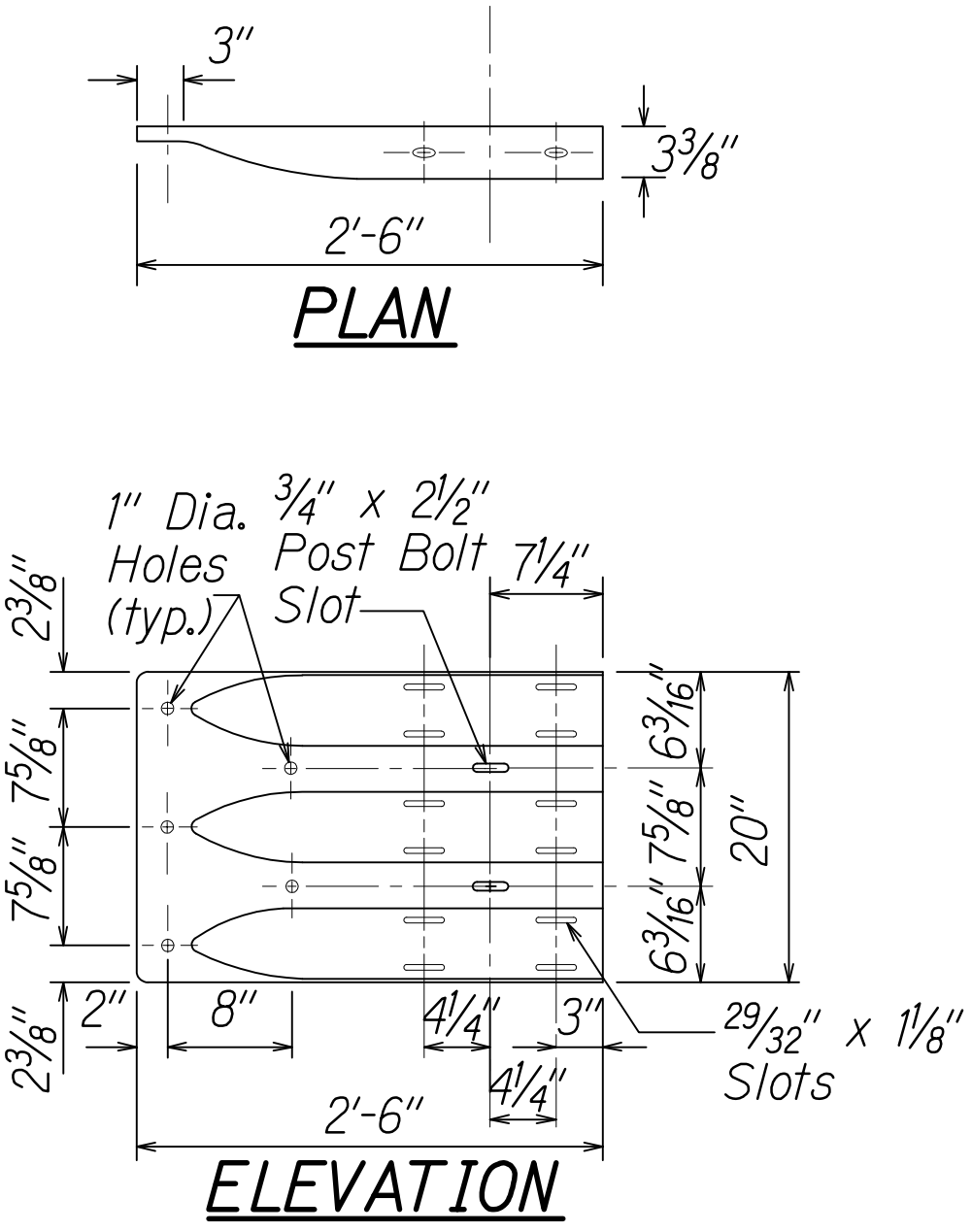
Scale: N.T.S.



**THRIE-BEAM END SECTION (BUFFER RTE03b OR RTE04b)**

Scale: N.T.S.

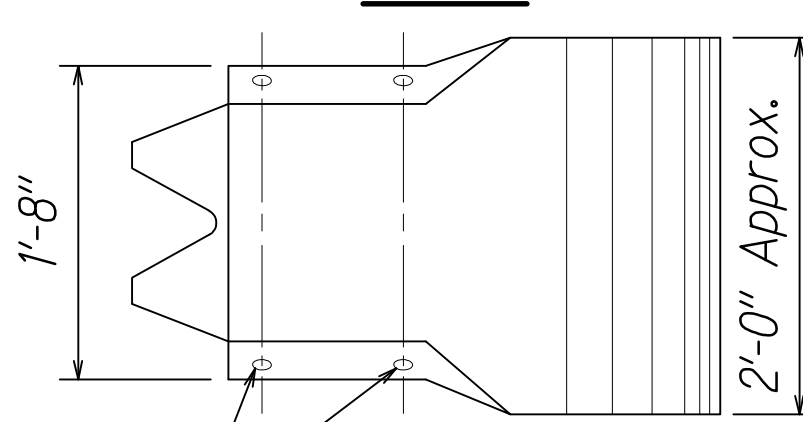
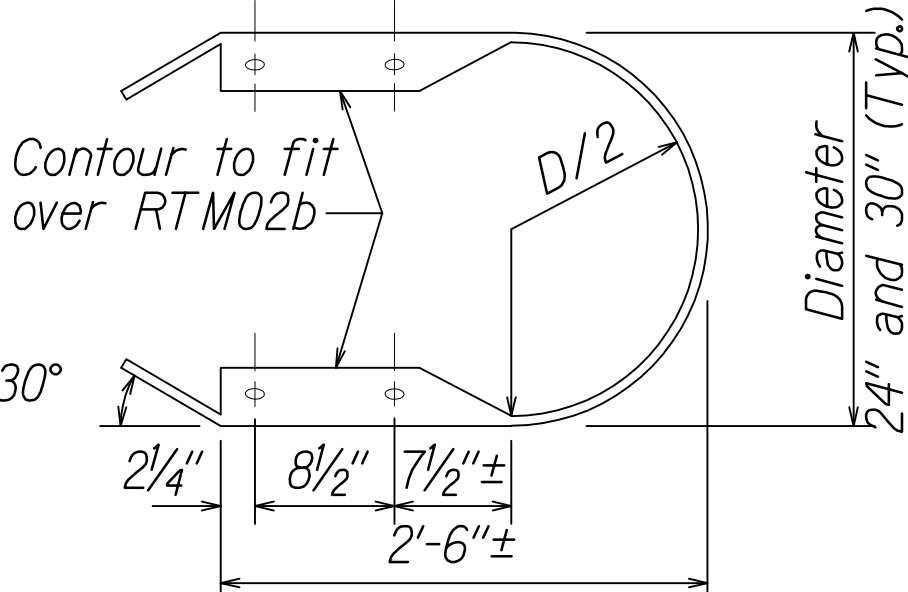
| Designator      | Base Metal Thickness |
|-----------------|----------------------|
| RTE03b & RTE04b | 10 Gauge             |



| Designator | Base Metal Thickness |
|------------|----------------------|
| RTE01b     | 10 Gauge             |

**THRIE-BEAM TERMINAL CONNECTOR (RTE01b)**

Scale: N.T.S.



Scale: N.T.S.

**THRIE-BEAM END SECTION (BUFFER RTE03b OR RTE04b)**

Scale: N.T.S.

| Designator      | Base Metal Thickness |
|-----------------|----------------------|
| RTE03b & RTE04b | 10 Gauge             |

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**GUARDRAIL TERMINAL CONNECTORS & END 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: JULY 2016

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

GENERAL NOTES:

- Breakaway steel posts are required with the FLEAT Terminal.
- All bolts, nuts, cable assemblies, cable anchors and bearing plates shall be galvanized.
- The soil tubes shall not protrude more than 4" above ground (measured along a 5' cord). Site grading may be necessary to meet this requirement.
- The soil tubes may be driven with an approved driving head. Soil tubes shall not be driven with the post in the tube. If the tubes are placed in drilled holes, the backfill material must be satisfactorily compacted to prevent settlement.
- When rock is encountered during excavation, a 12" Dia. post hole, 20" deep may be used if approved by the Engineer. Granular material will be placed in the bottom of the hole approx. 2½" deep to provide drainage. The soil tubes will be field cut to length, placed in the hole and backfilled with adequately compacted material excavated from the hole.
- The breakaway cable assembly must be taut. A locking device, (vice grips or channel lock pliers) should be used to prevent the cable from twisting when tightening nuts.

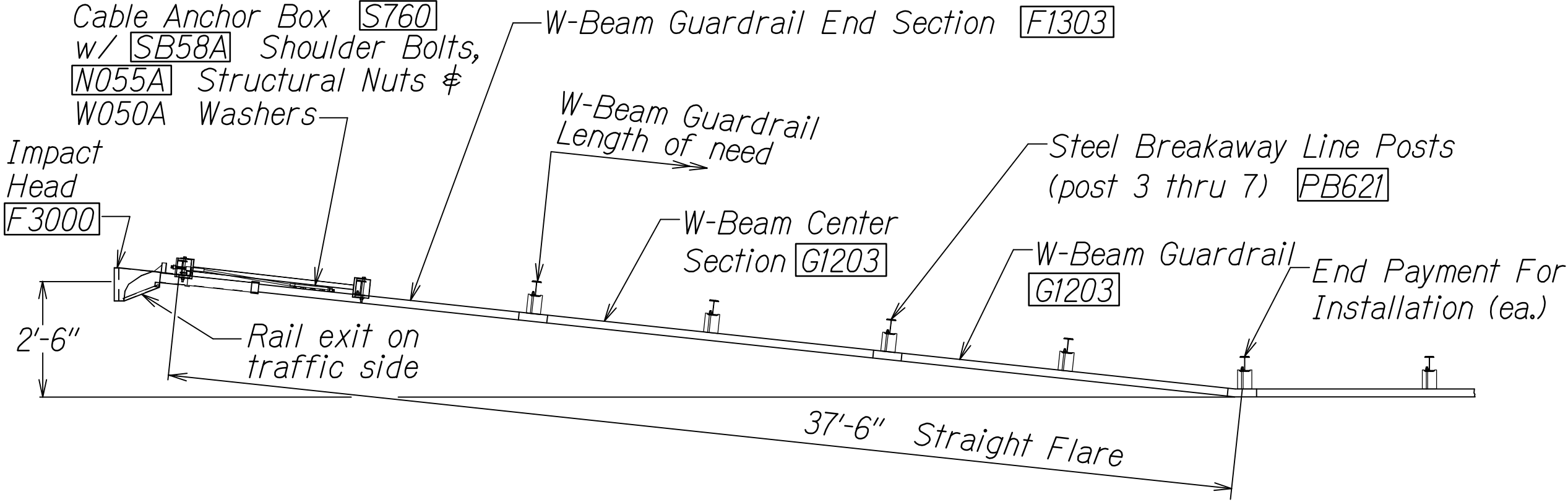
- (R) or (L) indicates right or left Impact Head Reflector Marker (IHRM). Providing and installing of IHRM shall be considered incidental to end treatment.
- The stripes for IHRM shall slope downward at an angle of 45° towards the side of the end treatment that traffic is to pass.

| ITEM NO. | QTY. | BILL OF MATERIALS                                                |
|----------|------|------------------------------------------------------------------|
| F3000    | 1    | IMPACT HEAD                                                      |
| F1303    | 1    | W-BEAM GUARDRAIL END SECTION, 12 GA.                             |
| G1203    | 2    | W-BEAM GUARDRAIL, 12 GA.                                         |
| S730     | 2    | *FOUNDATION SOIL TUBE, 6" x 8" x 72"                             |
| E750     | 1    | BEARING PLATE                                                    |
| S760     | 1    | CABLE ANCHOR BOX                                                 |
| E770     | 1    | BCT CABLE ANCHOR ASSEMBLY                                        |
| E780     | 1    | GROUND STRUT                                                     |
| PB620    | 2    | STEEL BREAKAWAY END POST                                         |
| PB621    | 5    | STEEL BREAKAWAY LINE POST                                        |
|          | 5    | RECYCLED PLASTIC BLOCKOUT OR OFFSET BLOCK                        |
|          | 1    | IMPACT HEAD REFLECTOR MARKER - IHRM (R) OR (L)                   |
|          |      | HARDWARE                                                         |
| B580122  | 25   | 5/8" Dia. x 1/4" SPLICE BOLT, POST #2                            |
| B580754  | 2    | 5/8" Dia. x 7 1/2" HEX BOLT                                      |
| B341004  | 2    | 3/4" Dia. x 10" HEX BOLT                                         |
| B581002  | 5    | 5/8" Dia. x 10" H.G.R. BOLT (POST 3 THRU 7)                      |
| N050     | 32   | 5/8" Dia. H.G.R. NUT (SPLICE 24, SOIL TUBES 2, POST 2 THRU 7, 6) |
| N030     | 2    | 3/4" Dia. HEX NUT                                                |
| W050     | 6    | H.G.R. WASHER                                                    |
| W030     | 4    | 3/4" ID WASHER                                                   |
| N100     | 2    | 1" ANCHOR CABLE HEX NUT                                          |
| W100     | 2    | 1" ANCHOR CABLE WASHER                                           |
| B140404  | 2    | 1/4" x 4" HEX BOLT                                               |
| N014     | 2    | 1/4" HEX NUT                                                     |
| W014     | 4    | 1/4" WASHER                                                      |
| SB58A    | 8    | CABLE ANCHOR BOX SHOULDER BOLT                                   |
| N055A    | 8    | 1/2" A325 STRUCTURAL NUT                                         |
| W050A    | 16   | 1 1/16" OD x 9/16" ID A325 STR. WASHER                           |

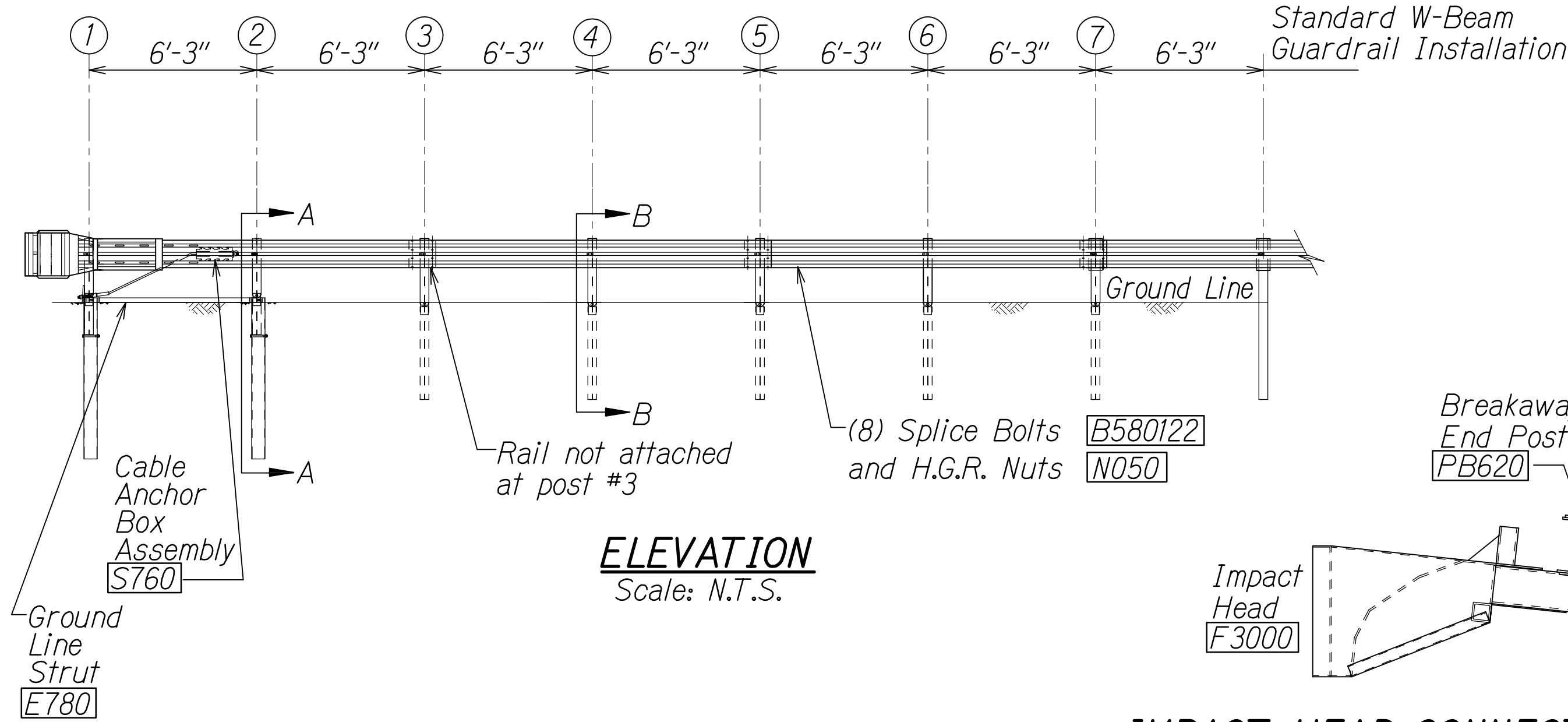
Foundation Tube Options For Posts 1 & 2  
\*6'-0" Split Foundation Tubes S730  
\*6'-0" Solid Foundation Tubes E731  
\*5'-0" Foundation Tubes S735 W/Soil Plates SP600  
\*4'-6" Foundation Tubes E735 W/Soil Plates SP600

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

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**FLEAT-350 FLARED ENERGY  
ABSORBING TERMINAL**  
QUEEN KAAHUMANU HIGHWAY WIDENING  
Kealahake Pkwy. To Keahole Airport Rd.(Ph. 2)  
Federal Aid Project No. NH-019-1(38)R  
Scale: AS NOTED Date: JULY 2016

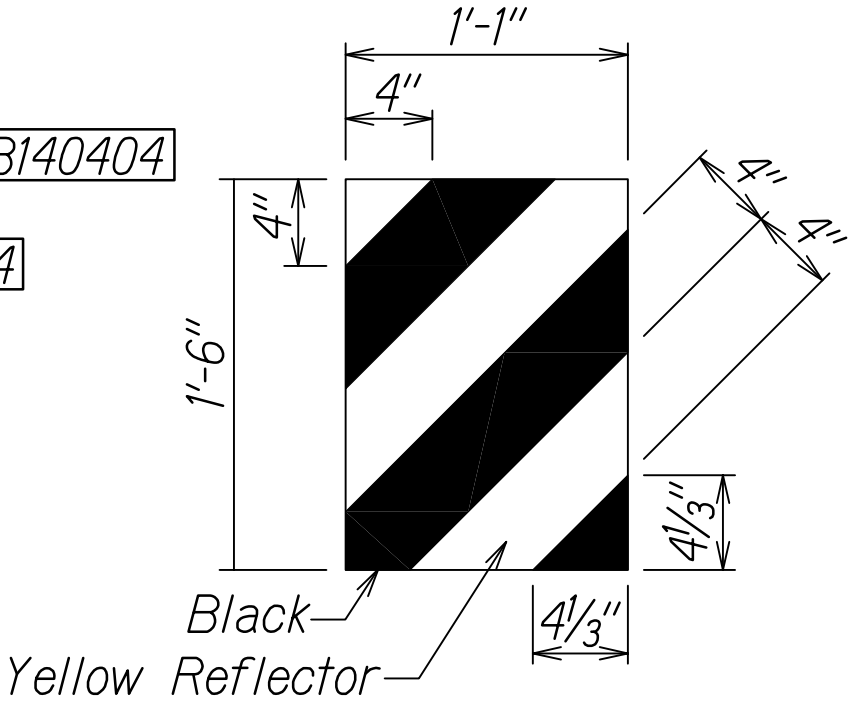


PLAN  
Scale: N.T.S.

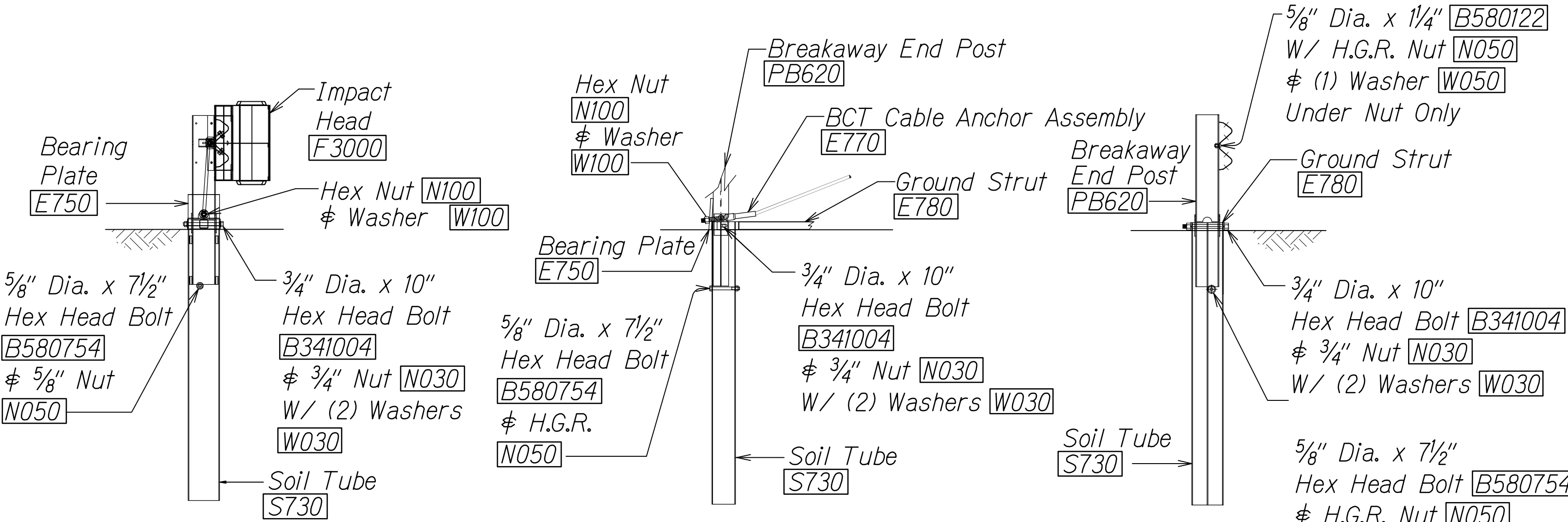


ELEVATION  
Scale: N.T.S.

IMPACT HEAD CONNECTING DETAIL  
Scale: N.T.S.



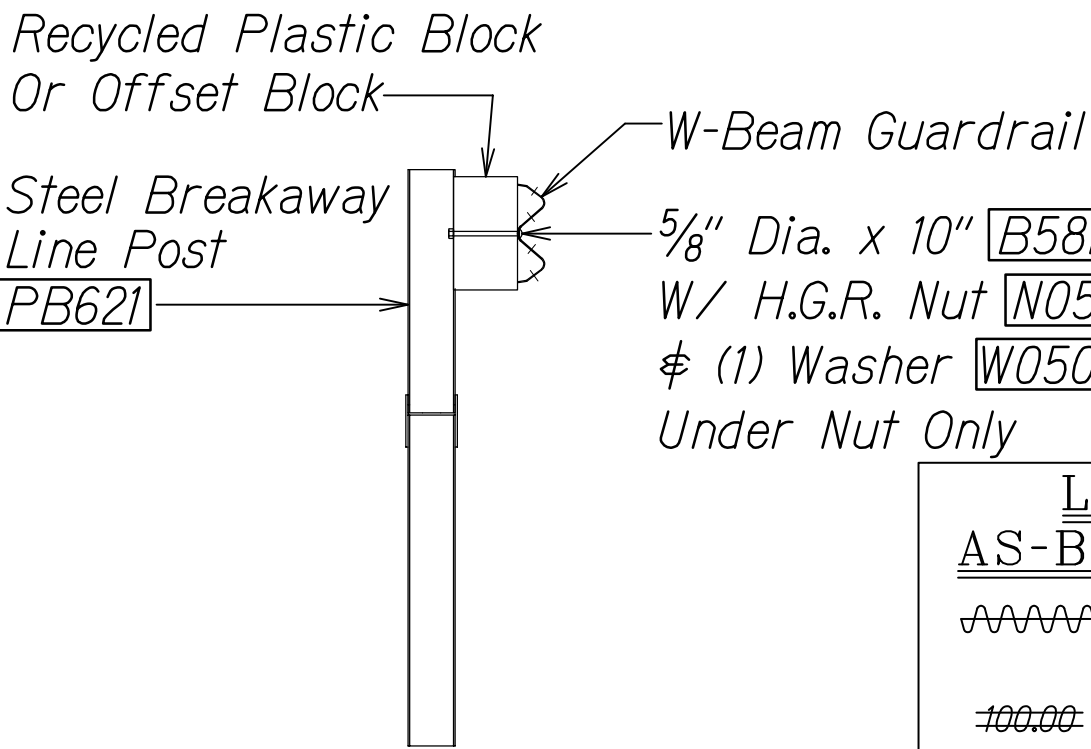
IHRM(R)  
IMPACT HEAD REFLECTOR  
MARKER INSERT DETAIL  
Scale: N.T.S.



FRONT VIEW OF POST 1  
Scale: N.T.S.

PARTIAL VIEW OF POST 1  
Scale: N.T.S.

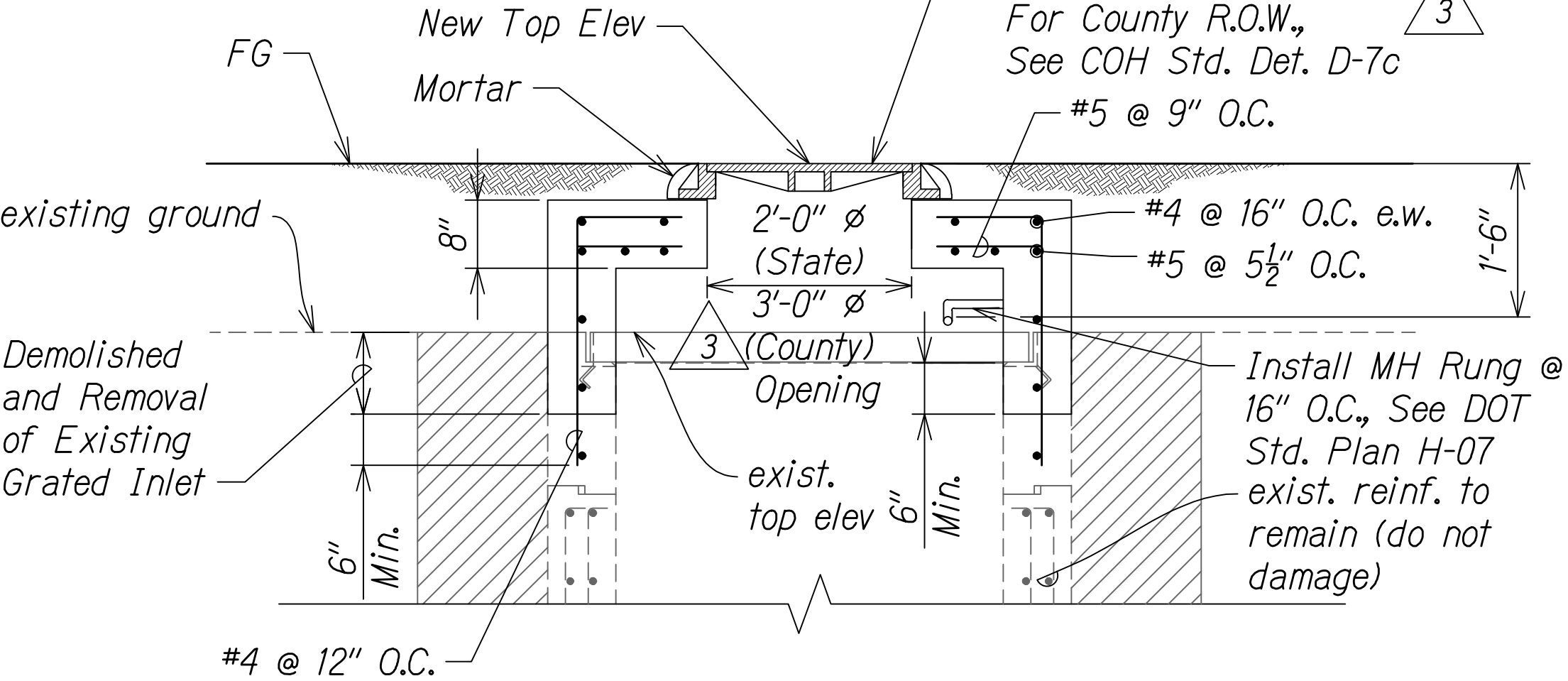
SECTION A-A  
at Post #2  
Scale: N.T.S.



SECTION B-B  
(Typical @ Post 3 - 7)  
NOTE: RAIL NOT BOLTED @ POST #3  
Scale: N.T.S.

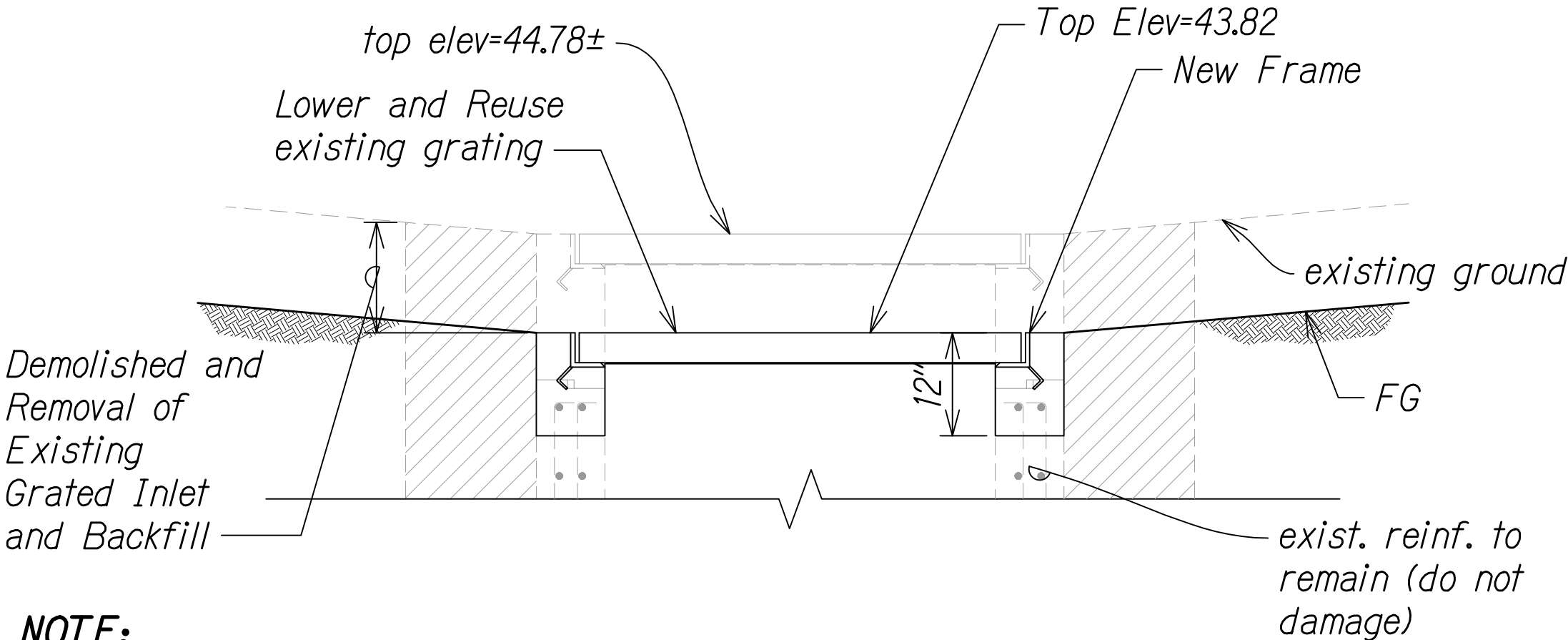
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO.   | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-------------|--------------|
| HAWAII              | HAW.  | NH-019-1(38)R      | 2016        | C.O. 528S-1 | 528          |

**NOTE:**  
Contractor to verify exist. conditions prior to reconstruction.



**EXISTING DRYWELL TO SDM RECONSTRUCTION DETAIL**

Scale: Not to Scale

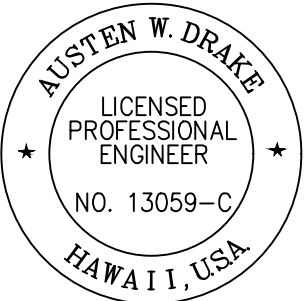


**NOTE:**  
Contractor to verify exist. conditions prior to adjustment.

**ADJUST TOP OF EXISTING DRAIN INLET/DRYWELL DETAIL**

Scale: Not to Scale

|         |          |                                                      |
|---------|----------|------------------------------------------------------|
| 8/30/17 | 3        | Added side slope; Revised MH cover for County R.O.W. |
| 8/1/16  | 2        | Sheet added                                          |
| DATE    | REVISION |                                                      |



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

*Austen W. Drake*  
SIGNATURE  
APRIL 30, 2018  
EXPIRATION DATE OF THE LICENSE

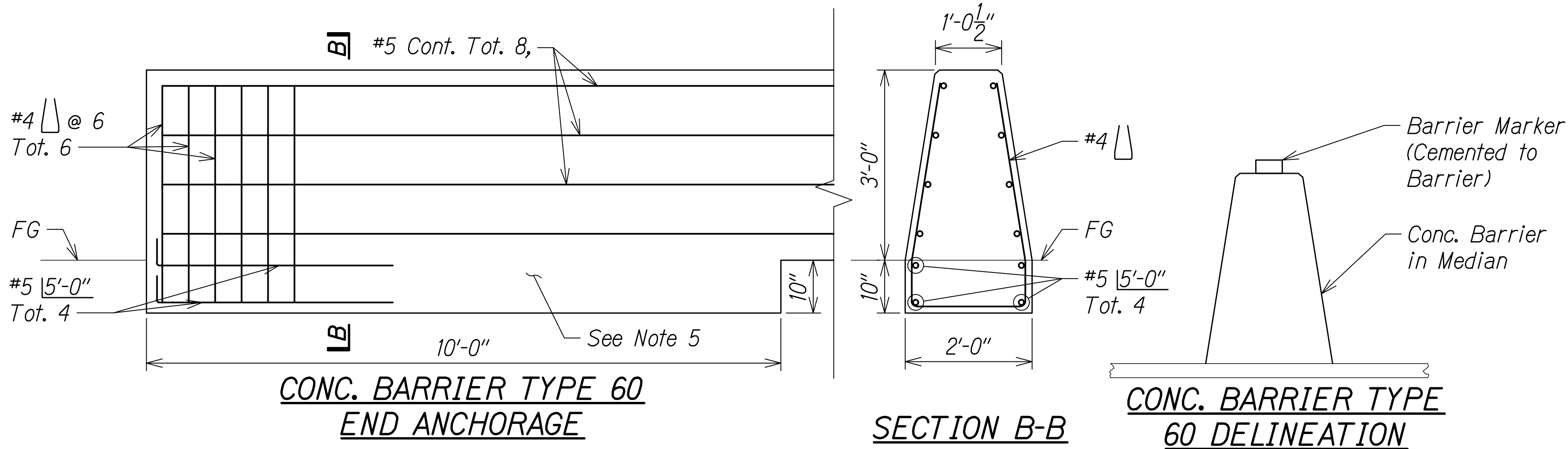
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**MEDIAN BARRIER & DRAINAGE DETAILS**

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

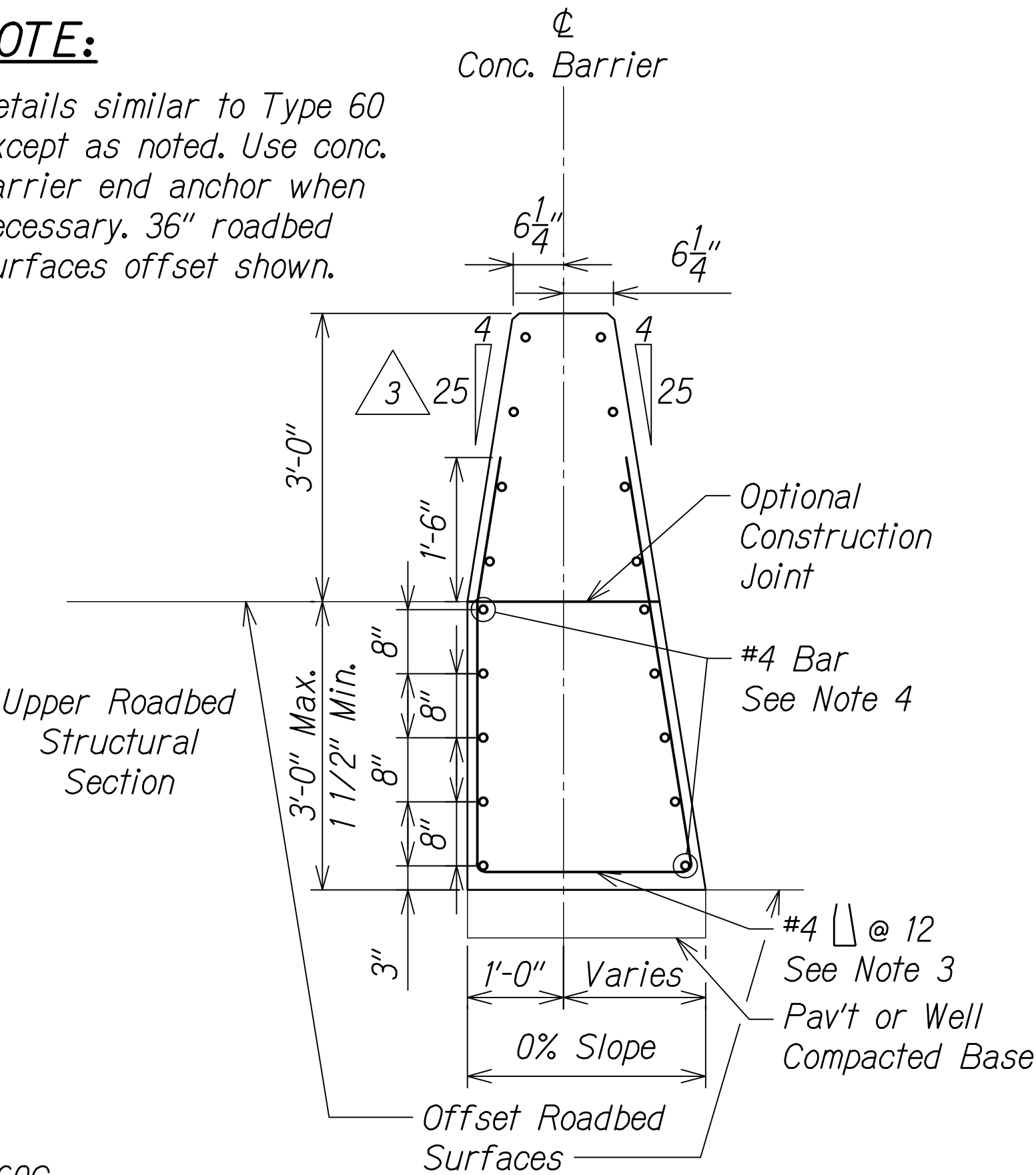
Scale: AS NOTED Date: DECEMBER 2016

SHEET No. 1 OF 1 SHEETS

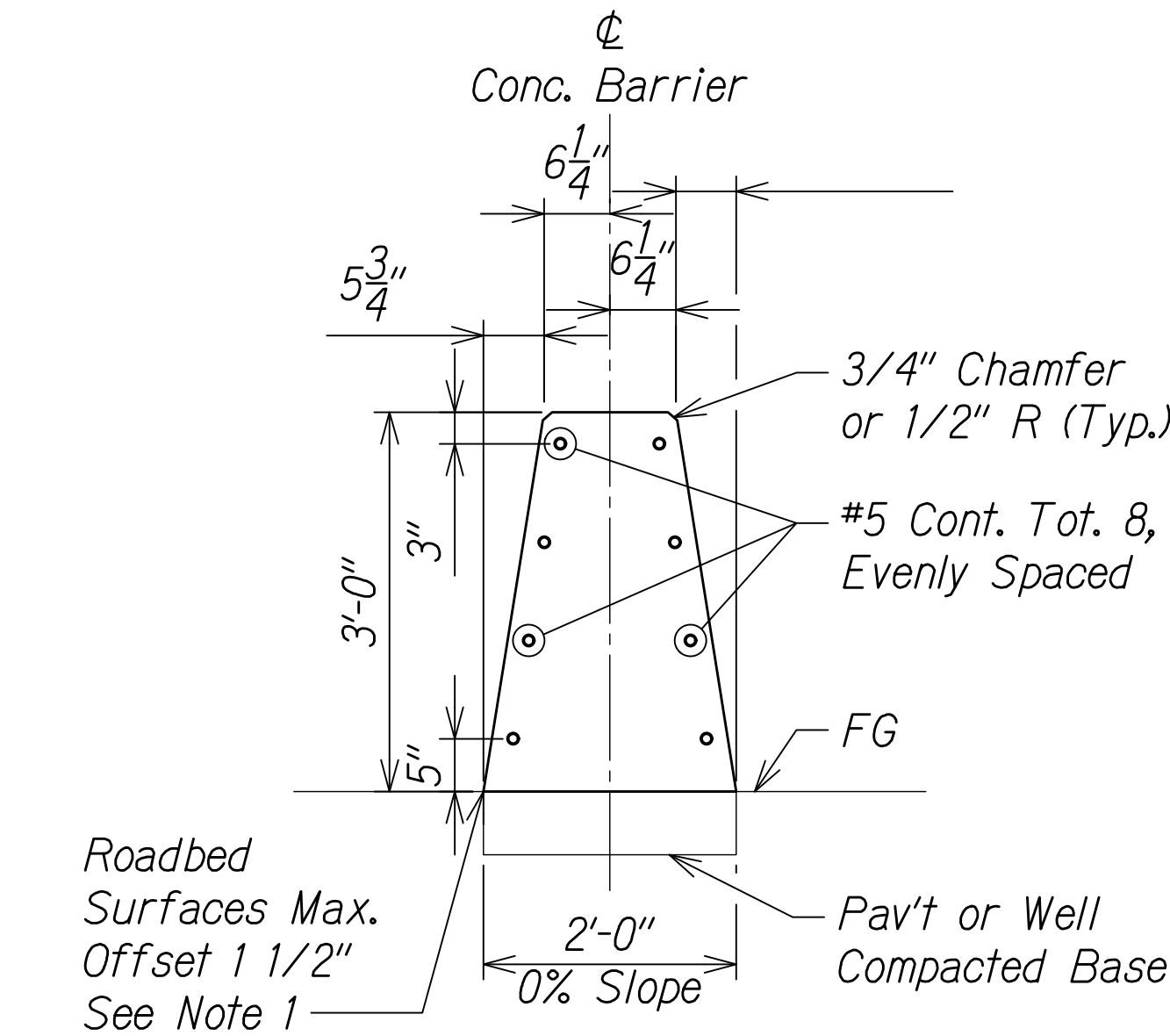


**NOTE:**

Details similar to Type 60 except as noted. Use conc. barrier end anchor when necessary. 36" roadbed surfaces offset shown.



**CONC. BARRIER TYPE 60C**



**CONC. BARRIER TYPE 60**

**NOTES:**

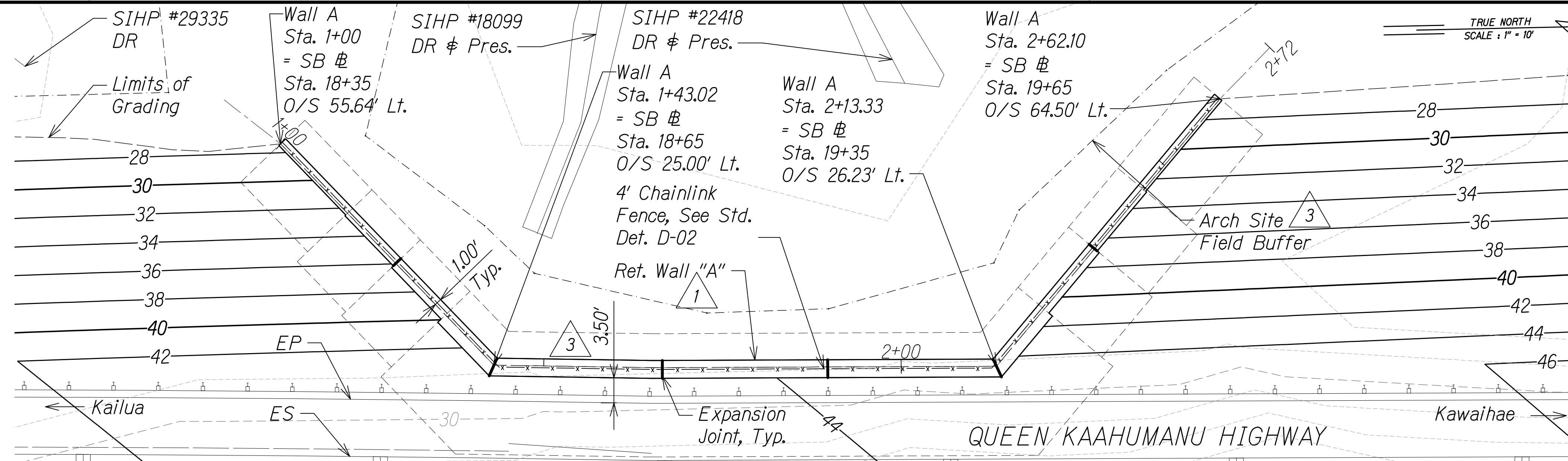
- Where roadbed offset is greater than 1 1/2", see Conc. Barrier Type 60C.
- See Project Plans for barrier delineation locations.
- Reinforcing stirrup not required for roadbed offsets less than 1'-0".
- For roadbed surfaces offset greater than 1 1/2" and less than or equal to 3", no reinforcement required. For roadbed surfaces offset greater than 3" and less than or equal to 8", use two #4 reinforcement at 3" above the lower roadbed surface. For roadbed surfaces offset greater than 8" and less than or equal to 12", use two #4 reinforcement at 3" above the lower roadbed surface and two #4 reinforcement at 8" above the lower roadbed surface. For roadbed surfaces offset greater than 12" and less than or equal to 36", use two #4 reinforcement at 3" above the lower roadbed surface and two #4 reinforcement at every 8" increment vertical spacing above the first two #4 reinforcement.
- Footing monolithic or doweled with 2-#8 x 8" @ 2-0". The footing is required at concrete barrier ends and at interruptions in concrete barrier.

**MEDIAN BARRIER DETAILS**

Scale: Not to Scale

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

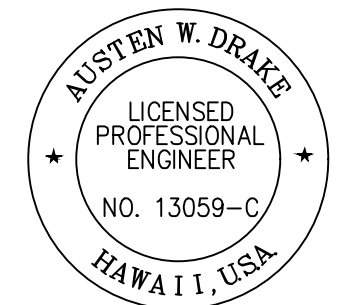
W:\\_CIVIL 3D PROJECTS\2008\_003\_001 GBI QUEEN K HWY WIDENING\01 CIVIL DRAWINGS\528S-1 MED BARRIER AND DRAIN DET.DWG 8/30/2017 5:04 PM



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

- NOTES:**
- For Ret. Walls Det., See Structural Plans.
  - For Expansion Joint, See Det. C Sht. 511S-1.
  - Fence post sleeves shall be 4" Min. From Edge of Wall or Expansion Joint, Typ.

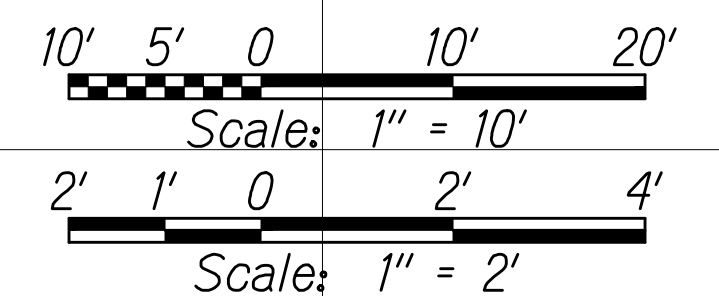
- LEGEND:**
- DR
  - Pres.
  - Data Recovery Preservation (Avoid During Construction)
  - Limits of Grading
  - Wall Footing (Plan)
  - Arch Site Buffer



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

**RET. WALL "A" PLAN**  
Scale: 1" = 10'

**GRAPHICAL SCALE:**



| DATE     | REVISION                                                          |
|----------|-------------------------------------------------------------------|
| 12/21/16 | 3 Revised wall due to Arch Site field buffers and Structural Det. |
| 8/1/16   | 2 Added Bot. of Ftg. Sta. & Elev.                                 |
| 1/22/16  | 1 Sheet Added; Added Walls                                        |

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**RETAINING WALL  
PLAN AND PROFILE**

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: DECEMBER 2016

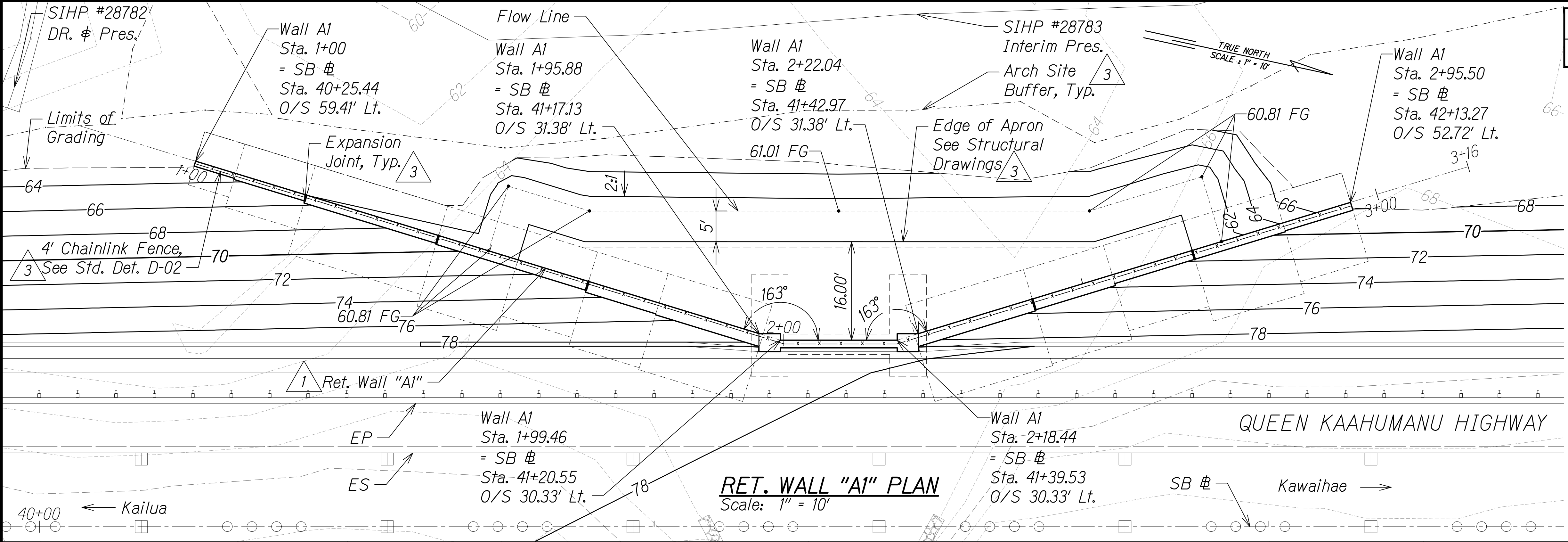
SHEET No. 1 OF 6 SHEETS

**C.O. 528S-2**

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

WA\_CIVIL\_3D\_PROJECTS\2008\_003\_001\_GBI\_QUEEN\_K\_Hwy\_WIDENING\01\_CIVIL\_DRAWINGS\528S-2\_RET\_WALL\_PP\_01.DWG 1/13/2017 8:22 PM

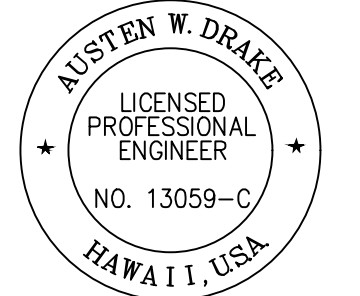
1/18/2017 10:01 AM



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

- NOTES:**
- For Ret. Walls Det., See Structural Plans.
  - For Expansion Joint, See Det. C Sht. 511S-1.
  - Fence post sleeves shall be 4" Min. From Edge of Wall or Expansion Joint, Typ.

- LEGEND:**
- DR Pres.
  - Data Recovery Preservation (Avoid During Construction)
  - Limits of Grading
  - Wall Footing (Plan)
  - Arch Site Buffer

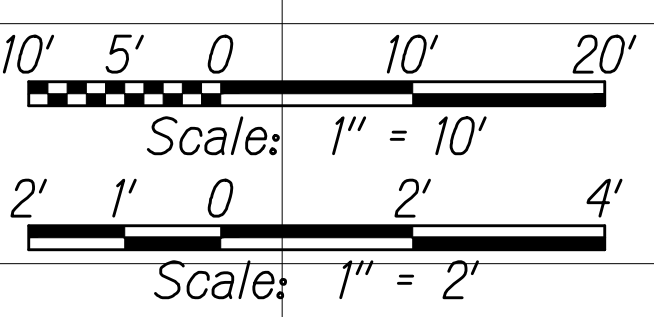


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Signature: Austin W. Drake  
Date: APRIL 30, 2018  
Expiration Date of the License

**RET. WALL "A1" PLAN**  
Scale: 1" = 10'

**RET. WALL "A1" PROFILE**  
Scale: Horiz. 1" = 10'  
Vert. 1" = 2'

**GRAPHICAL SCALE:**



| DATE     | REVISION                                                                                                      |
|----------|---------------------------------------------------------------------------------------------------------------|
| 12/19/16 | 3 Updated wall and apron per revised wall schedule; Updated Arch site location and added field buffer & fence |
| 8/1/16   | 2 Added Bot. of Ftg. Sta. & Elev.; Revised height                                                             |
| 1/22/16  | 1 Sheet Added; Added Walls                                                                                    |

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**RETAINING WALL  
PLAN AND PROFILE**

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: DECEMBER 2016

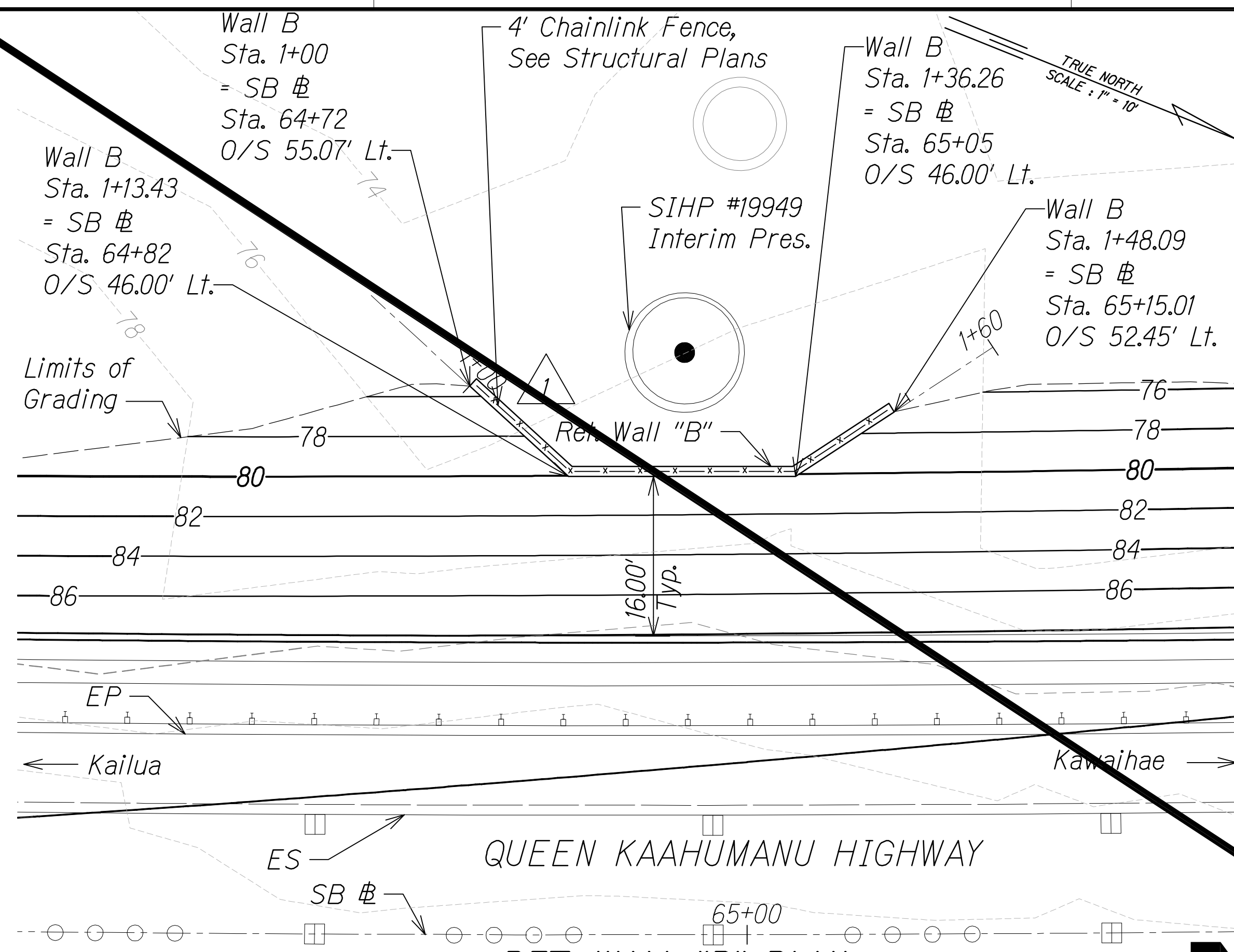
|               |      |
|---------------|------|
| ORIGINAL PLAN | DATE |
| DESIGNED BY   |      |
| TRACED BY     |      |
| NOTE BOOK     |      |
| QUANTITIES BY |      |
| CHECKED BY    |      |

WA\_CIVIL\_3D\_PROJECTS\2008\_003\_001\_CBI\_QUEEN\_K\_Hwy\_WIDENING\01\_CIVIL\_DRAWINGS\528S-3\_RET\_WALL\_PP\_02.DWG 1/17/2017 7:47 PM

| 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>528-4 | 528             |

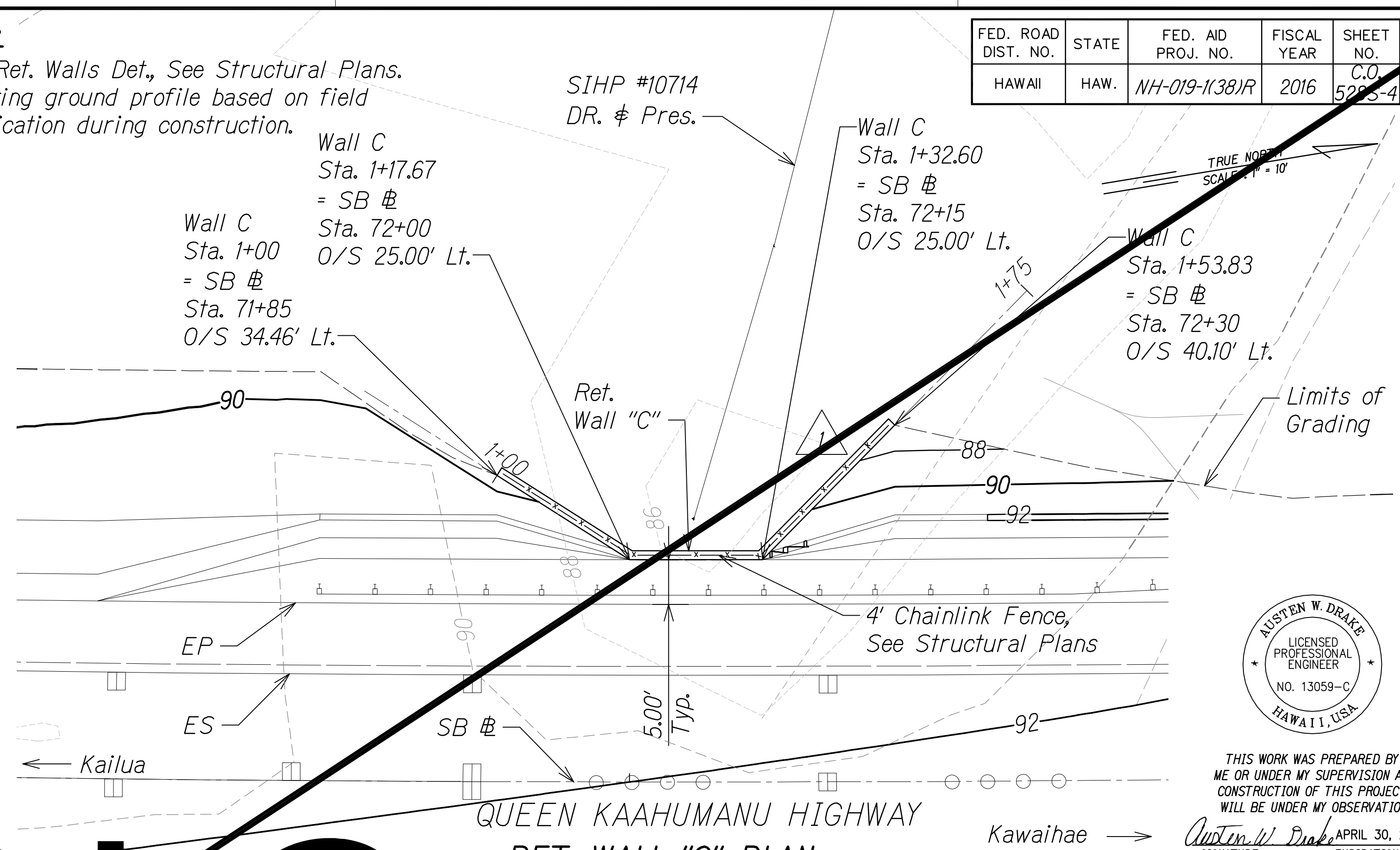
NOTES:

1. For Ret. Walls Det., See Structural Plans.
2. Existing ground profile based on field verification during construction.



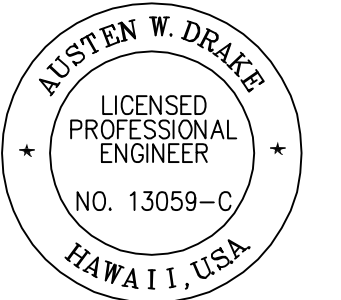
RET. WALL "B" PLAN

Scale:  $1'' = 10'$



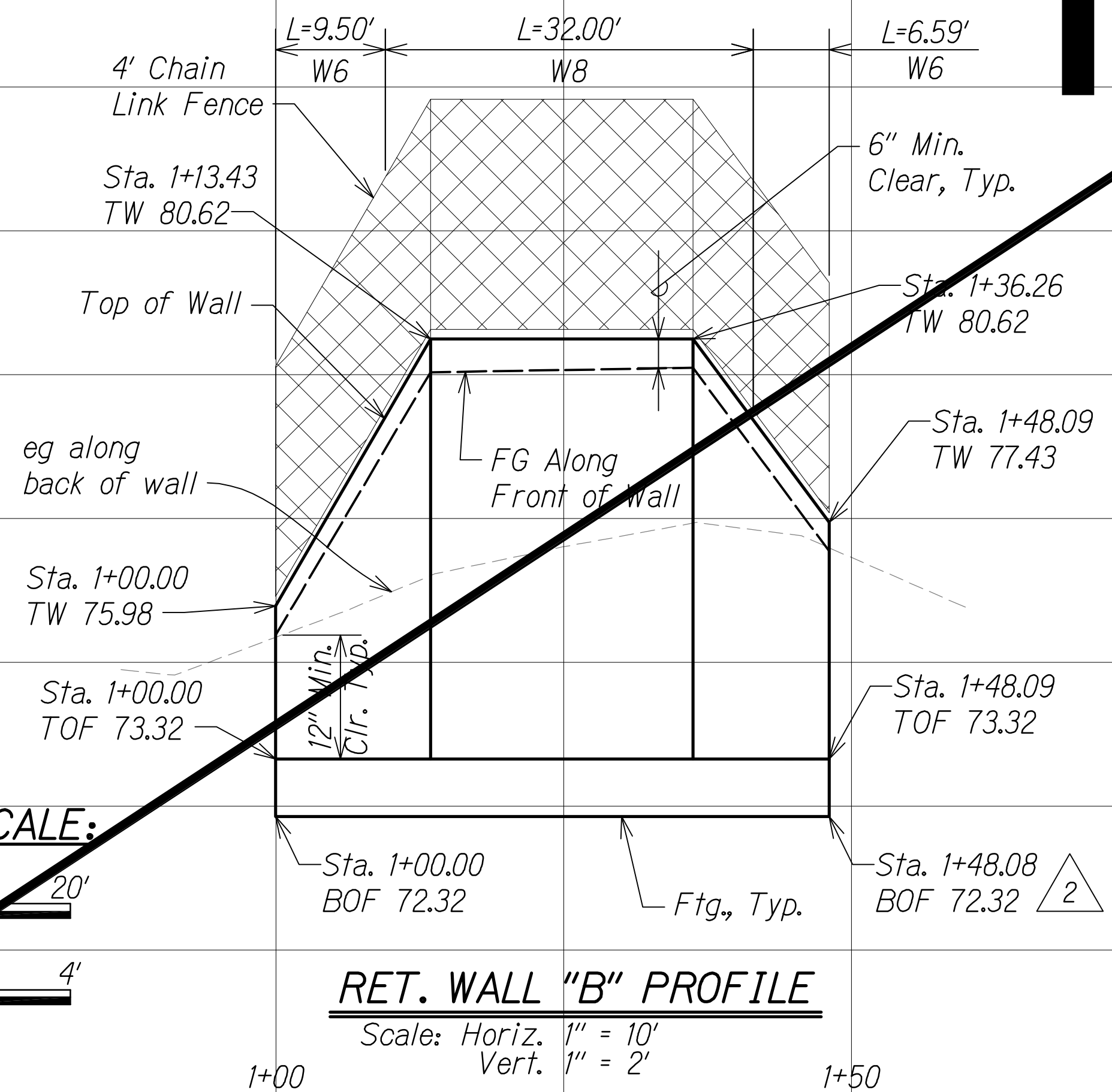
RET. WALL "C" PLAN

Scale:  $1'' = 10'$



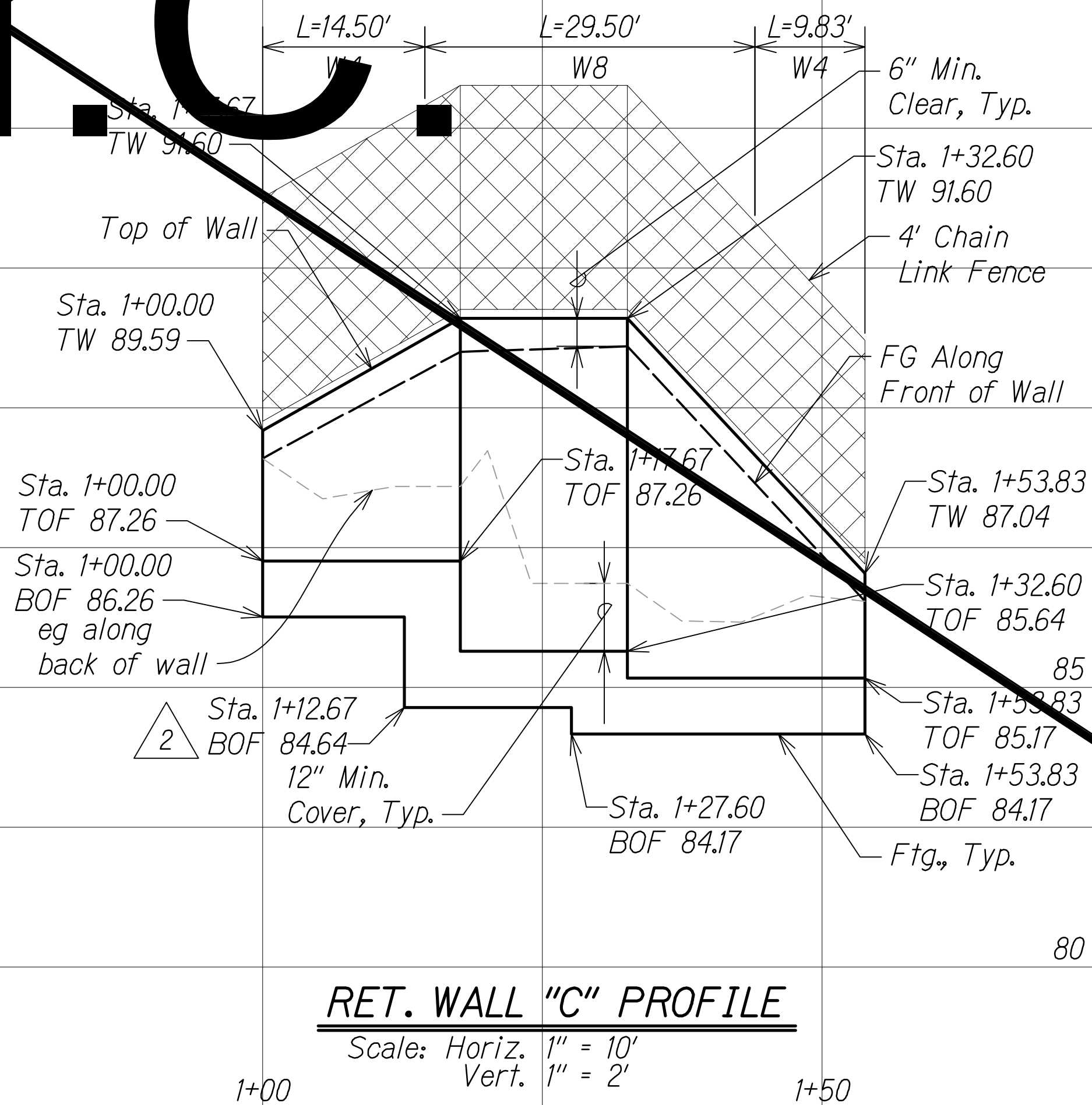
THIS WORK WAS PREPARED BY  
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CONSTRUCTION OF THIS PROJECT  
WILL BE UNDER MY OBSERVATION.

Ten W. Drake APRIL 30, 2018  
SIGNATURE EXPIRATION DATE  
OF THE LICENSE



RET. WALL "B" PROFILE

|               |             |
|---------------|-------------|
| Scale: Horiz. | $1'' = 10'$ |
| Vert.         | $1'' = 2'$  |



RET. WALL "C" PROFILE

|               |             |
|---------------|-------------|
| Scale: Horiz. | $1'' = 10'$ |
| Vert.         | $1'' = 2'$  |

|         |                                                                                       |                                                 |
|---------|---------------------------------------------------------------------------------------|-------------------------------------------------|
| 10/7/16 |  | Removed Wall per revised Arch Site field buffer |
| 8/1/16  |  | Added Bot. of Ftg. Sta. & Elev.                 |
| 1/22/16 |  | Sheet Added; Added Walls                        |
| DATE    | REVISION                                                                              |                                                 |

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

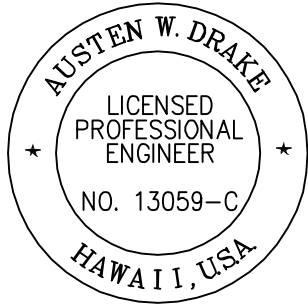
~~RETAINING WALL~~  
~~PLAN AND PROFILE~~

QUEEN KAAHUMANU HIGHWAY WIDENING  
Kealahou Pkwy. To Keahole Airport Rd.(Ph. 2)  
Federal Aid Project No. NH-019-1(28)R  
Scale: AS NOTED Date: AUGUST 2016

w:\\_CIVIL 3D PROJECTS\2008\_003\_001 GBI QUEEN K HWY WIDENING\01 CIVIL DRAWINGS\522S-4 RET WALL PP 03.DWG 4/19/2016 5:15 PM

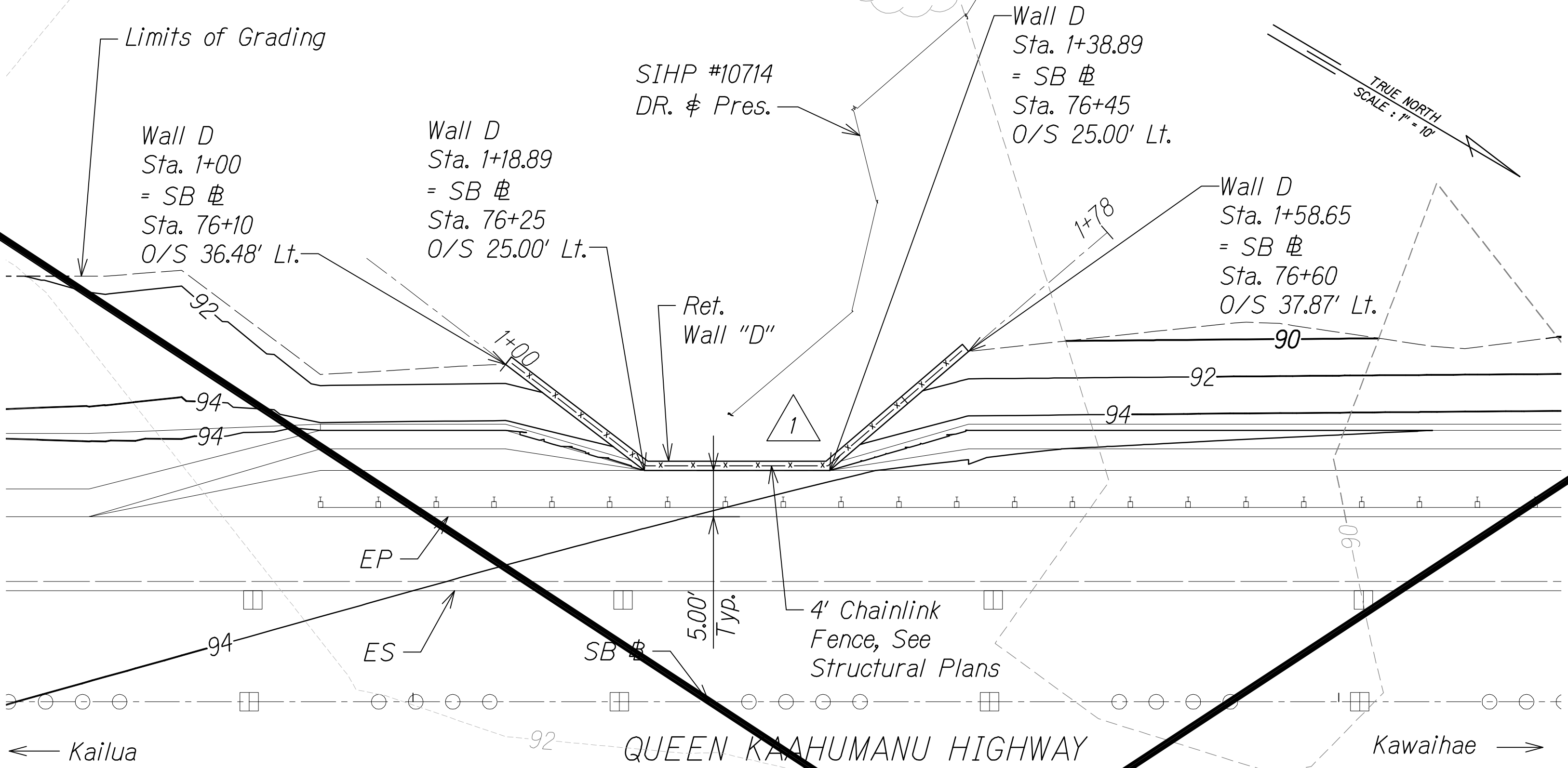
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | NH-019-1(38)R      | 2016        | 528S-5    | 528          |

- NOTES:**
- For Ret. Walls Det., See Structural Plans.
  - Existing ground profile based on field verification during construction.

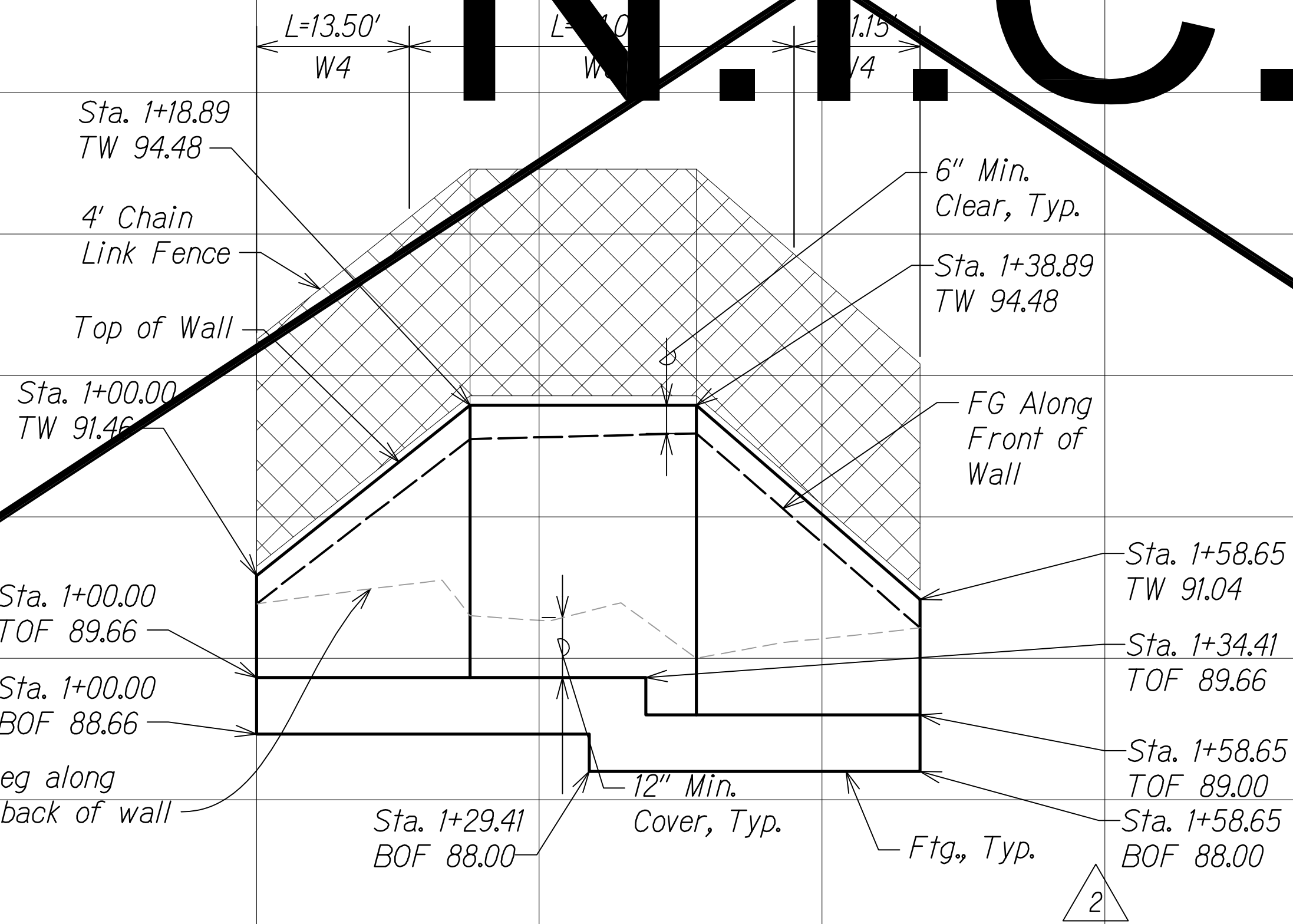


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*Austen W. Drake* APRIL 30, 2018  
SIGNATURE EXPIRATION DATE OF THE LICENSE

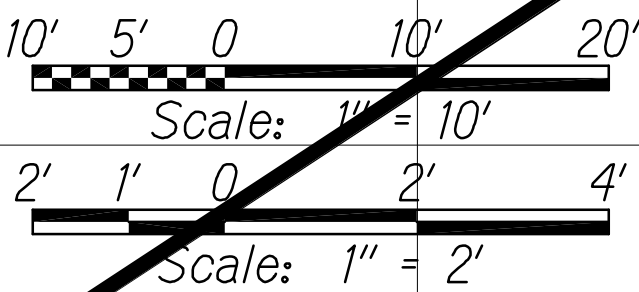


**RET. WALL "D" PLAN**  
Scale: 1" = 10'



**RET. WALL "D" PROFILE**  
Scale: Horiz. 1" = 10'  
Vert. 1" = 2'

**GRAPHICAL SCALE**



| DATE    | REVISION                                          |
|---------|---------------------------------------------------|
| 10/7/16 | 3 Removed Wall per revised Arch Site field buffer |
| 8/1/16  | 2 Added Bot. of Ftg. Sta. & Elev.                 |
| 1/22/16 | 1 Sheet Added; Added Walls                        |

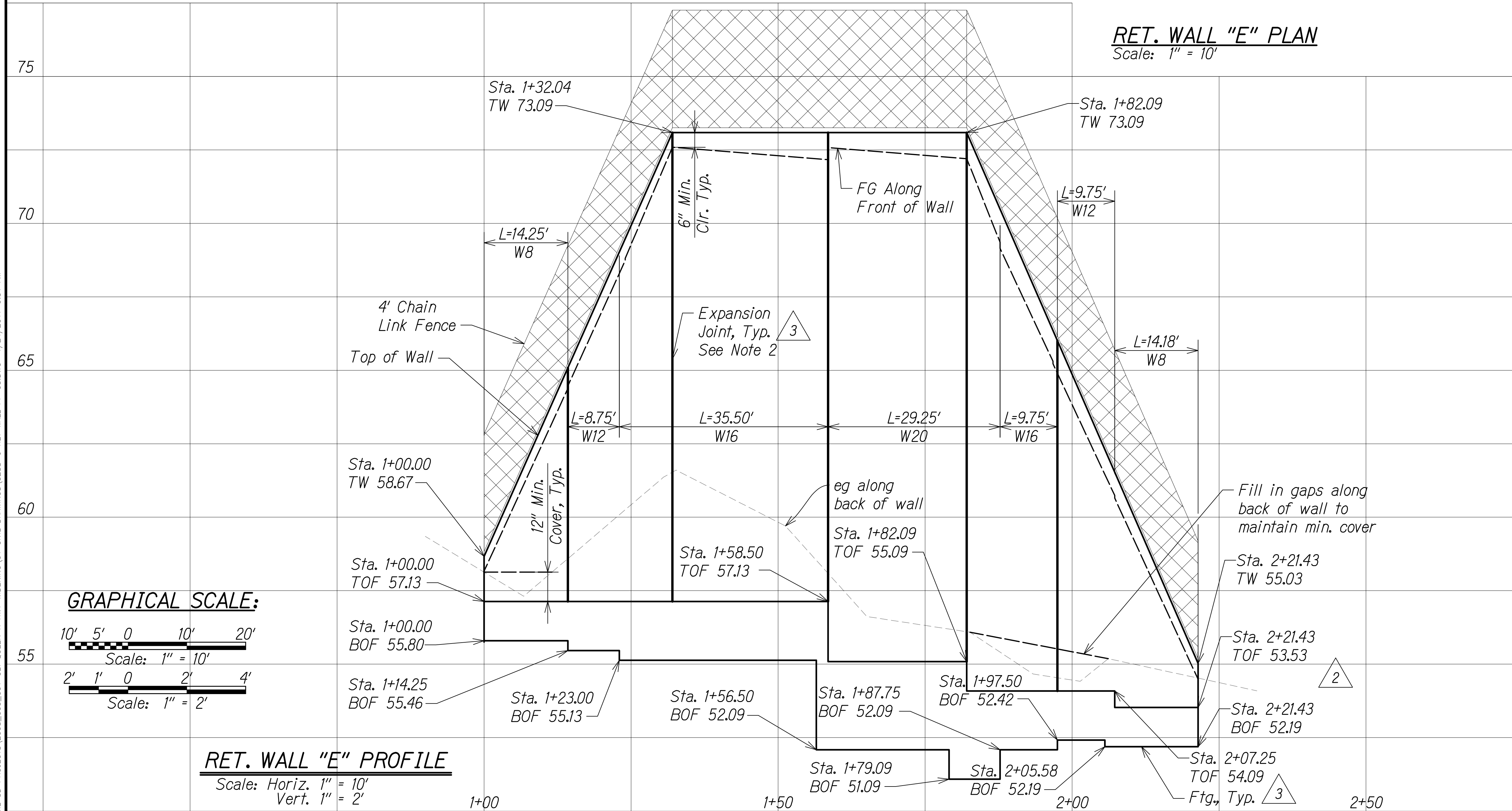
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**RETAINING WALL  
PLAN AND PROFILE**

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 2016

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

WA\_CIVIL\_3D\_PROJECTS\2008\_003\_001\_GBI\_QUEEN\_K\_Hwy\_WIDENING\01\_CIVIL\_DRAWINGS\528S-6\_RET\_WALL\_PP\_05.DWG 1/24/2017 9:31 AM



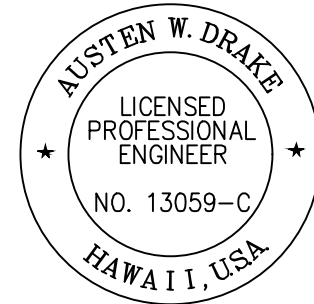
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO.   | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-------------|--------------|
| HAWAII              | HAW.  | NH-019-1(38)R      | 2016        | C.O. 528S-6 | 528          |

- NOTES:**
- For Ret. Walls Det., See Structural Plans.
  - For Expansion Joint, See Det. C Sht. 511S-1.
  - Fence post sleeves shall be 4" Min. From Edge of Wall or Expansion Joint, Typ.

**LEGEND:**

- DR
- Pres.
- Limits of Grading
- Wall Footing (Plan)
- Arch Site Buffer

Data Recovery Preservation (Avoid During Construction)



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*Austin W. Drake* APRIL 30, 2018  
SIGNATURE EXPIRATION DATE OF THE LICENSE

| DATE     | REVISION                                                         |
|----------|------------------------------------------------------------------|
| 12/21/16 | 3 Redesigned wall due to Arch Site field buffers and Struc. Det. |
| 8/1/16   | 2 Added Bot. of Ftg. Sta. # Elev.                                |
| 1/22/16  | 1 Sheet Added; Added Walls                                       |

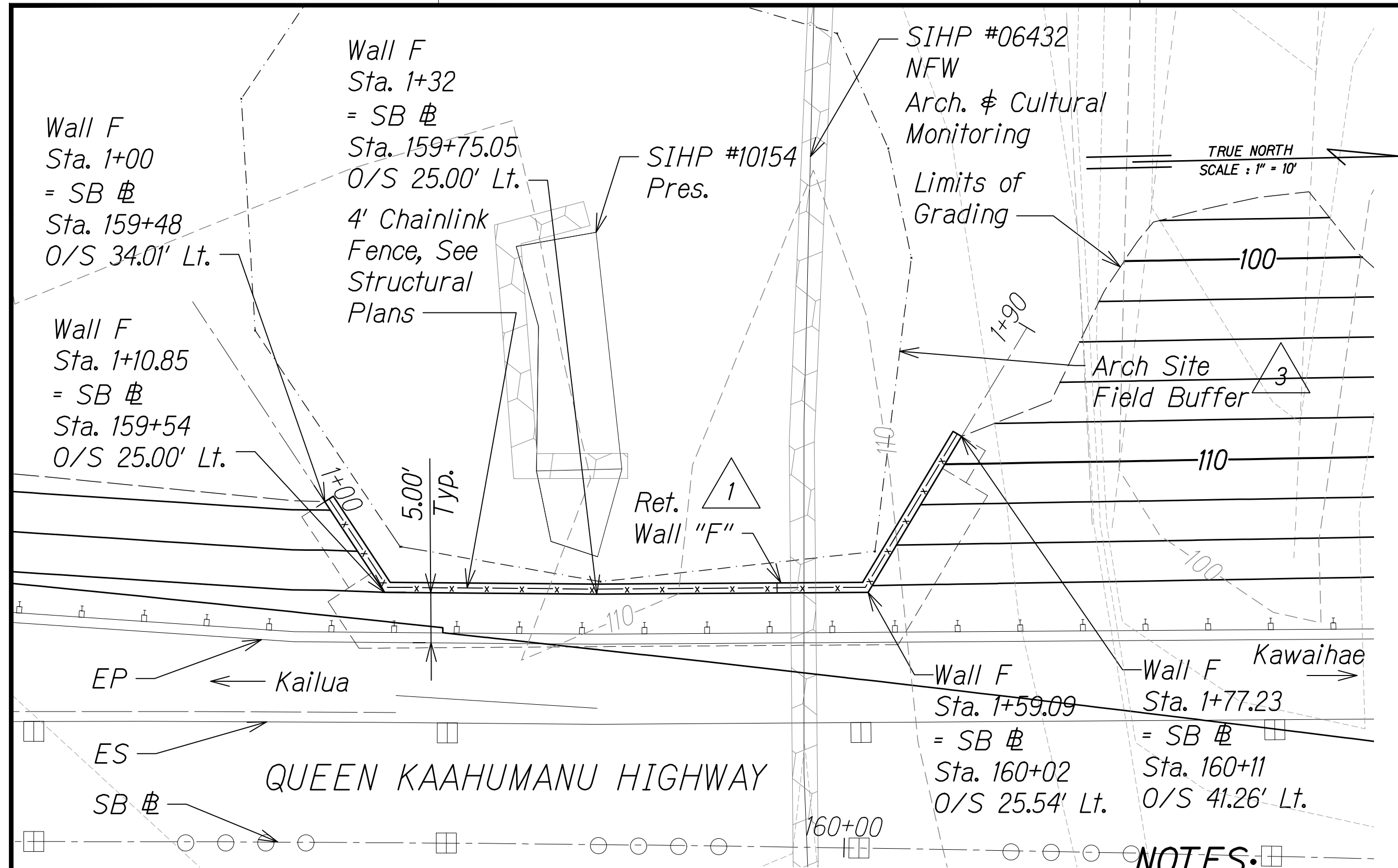
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**RETAINING WALL  
PLAN AND PROFILE**

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: DECEMBER 2016

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

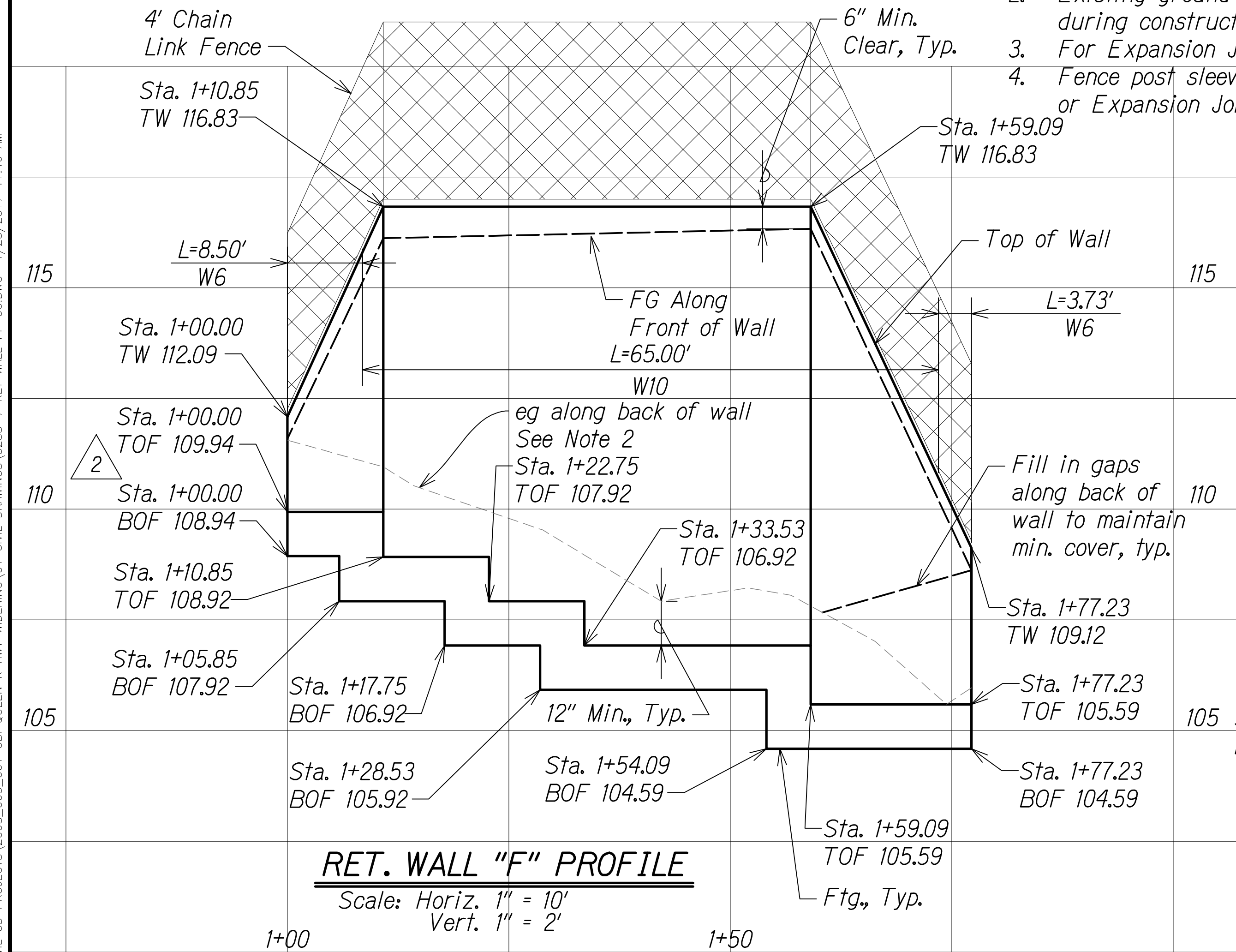
WA\_CIVIL\_3D\_PROJECTS\2008\_003\_001\_GBI\_QUEEN\_K\_Hwy\_WIDENING\01\_CIVIL\_DRAWINGS\528S-7\_RET\_WALL\_PP\_06.DWG 1/25/2017 11:46 AM



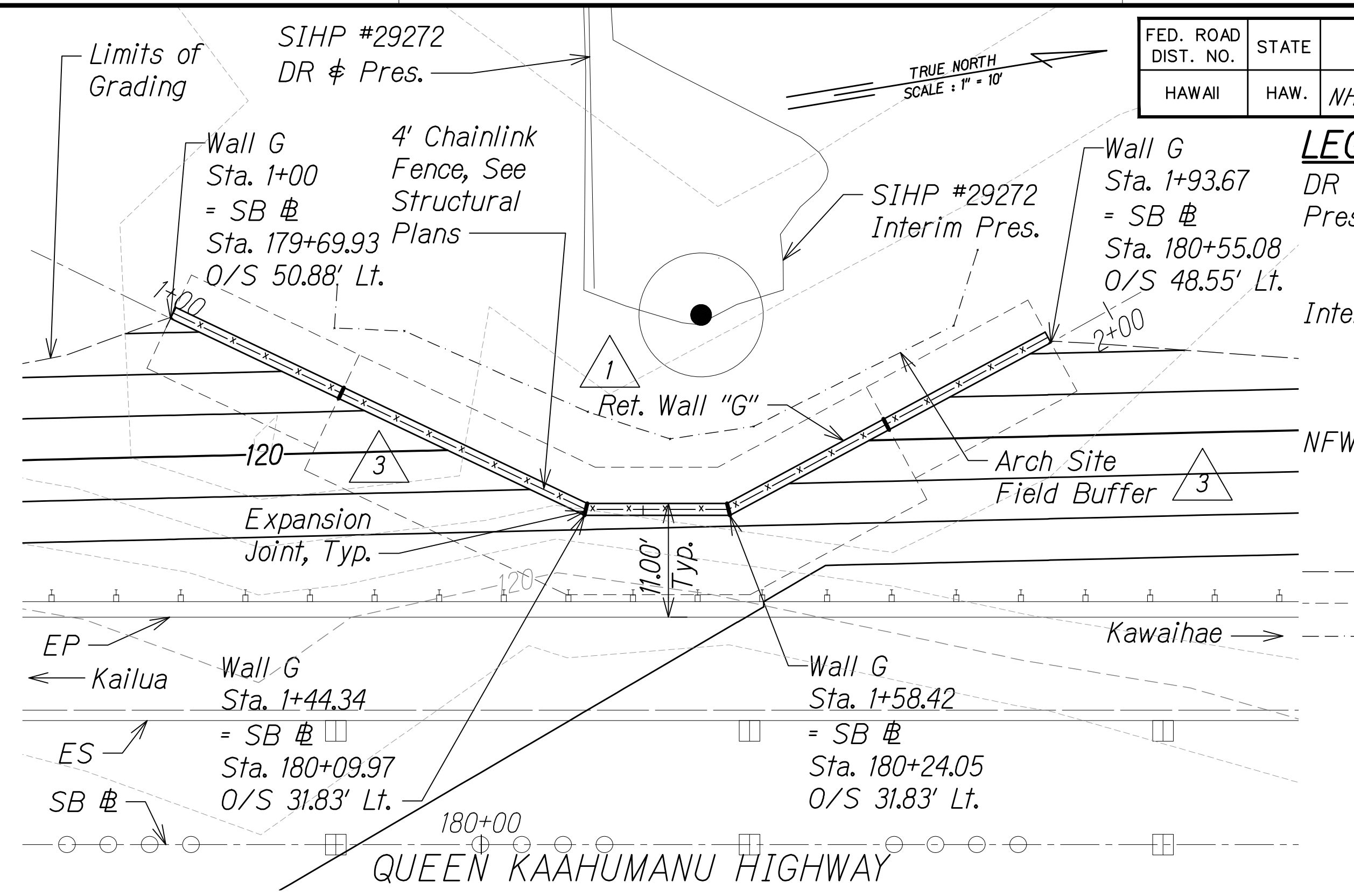
**RET. WALL "F" PLAN**  
Scale: 1" = 10'

**NOTES:**

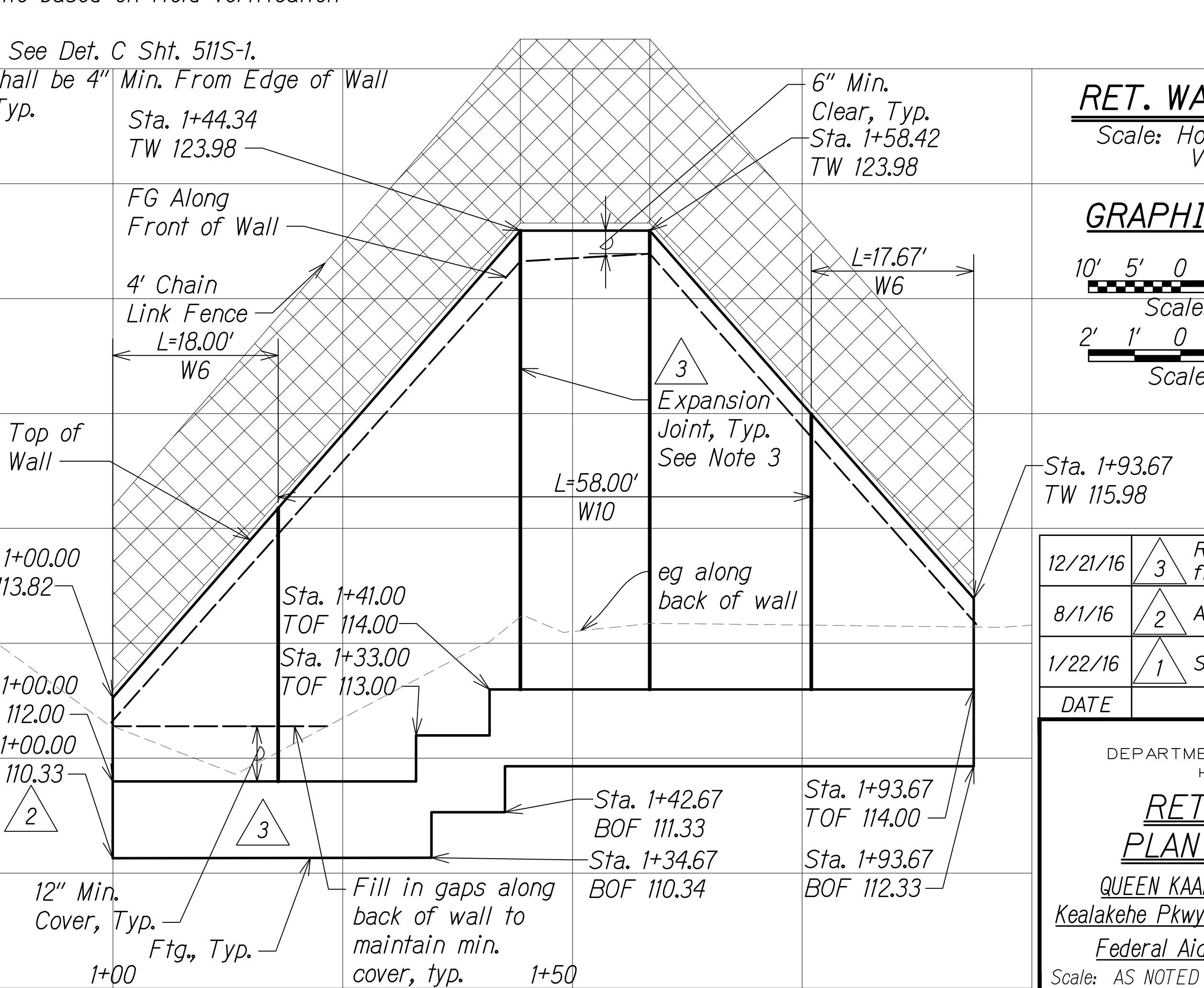
- For Ret. Walls Det., See Structural Plans.
- Existing ground profile based on field verification during construction.
- For Expansion Joint, See Det. C Sht. 511S-1.
- Fence post sleeves shall be 4" Min. From Edge of Wall or Expansion Joint, Typ.



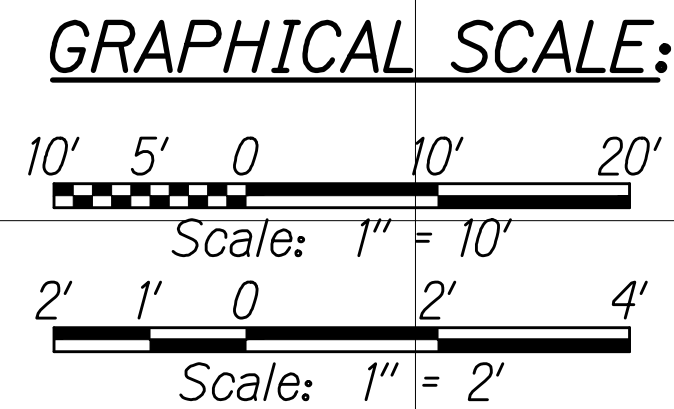
**RET. WALL "F" PROFILE**  
Scale: Horiz. 1" = 10'  
Vert. 1" = 2'



**RET. WALL "G" PLAN**  
Scale: 1" = 10'



**RET. WALL "G" PROFILE**  
Scale: Horiz. 1" = 10'  
Vert. 1" = 2'



| DATE     | REVISION                                                          |
|----------|-------------------------------------------------------------------|
| 12/21/16 | 3 Redesigned Wall G due to Arch Site field buffer and Struc. Det. |
| 8/1/16   | 2 Added Bot. of Ftg. Sta. & Elev.                                 |
| 1/22/16  | 1 Sheet Added; Added Walls                                        |

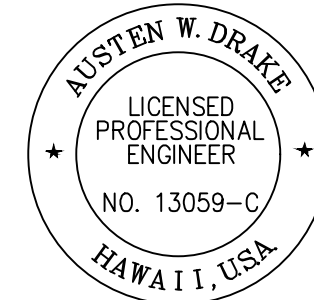
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**RETAINING WALL  
PLAN AND PROFILE**

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: DECEMBER 2016

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | NH-019-1(38)R      | 2016        | 528S-7    | 528          |

- LEGEND:**
- DR Pres.
  - Interim Pres.
  - No Further Work (Archaeological and Cultural Monitoring)
  - Limits of Grading
  - Wall Footing (Plan)
  - Arch Site Buffer



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