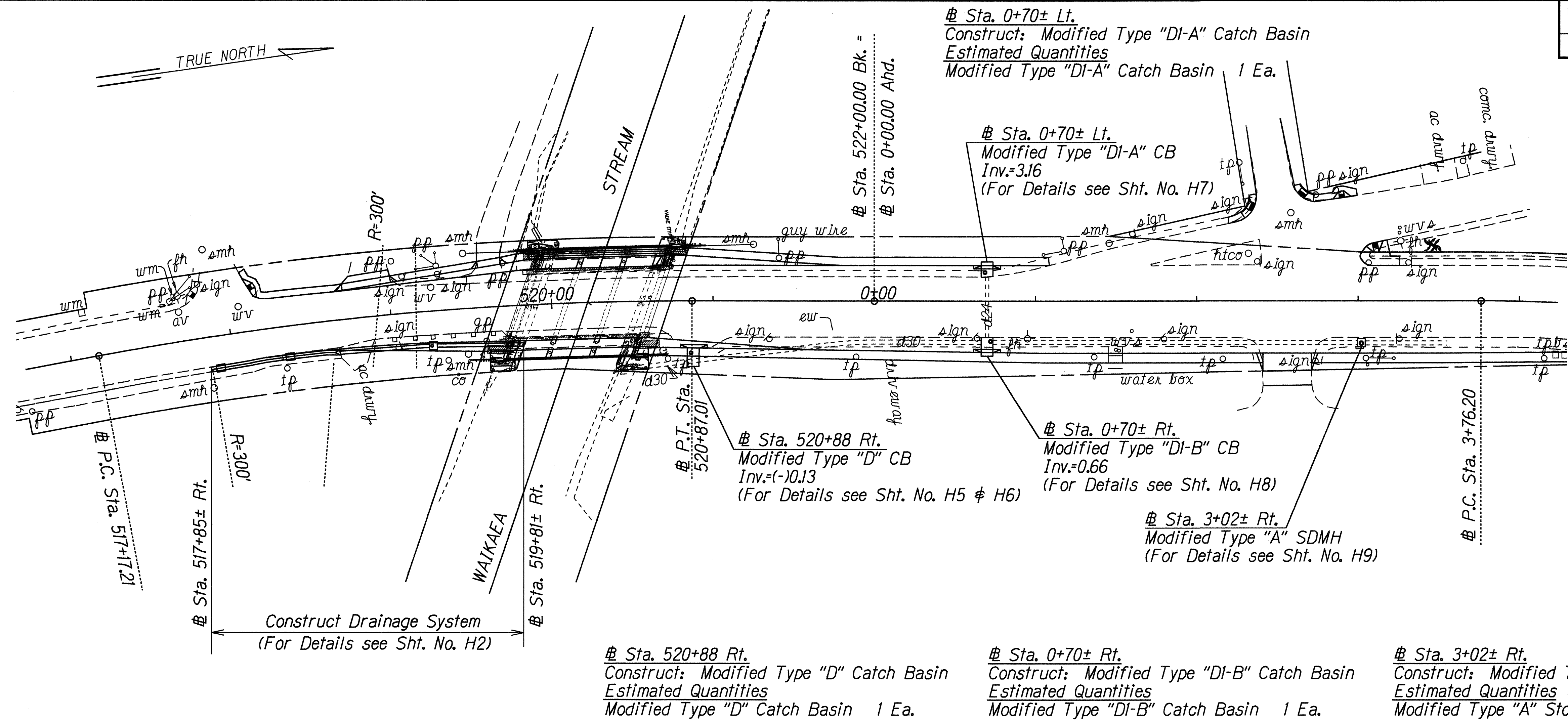


| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | BR-STP-056-1(35)   | 2000        | 56        | 70           |



PLAN

DRAINAGE NOTES

- Existing drainage systems will be functional at all times during construction. The Contractor is to furnish materials, equipment, labor, tools and incidentals necessary to accomplish maintenance of flow. The cost shall be incidental to the various Contract Items.
- The Contractor shall verify the locations of all existing culverts and utilities in the field. Any existing culverts and utilities damaged during construction shall be repaired or replaced by the Contractor at his own expense.
- Only non-pneumatic type of drill as approved by the Engineer will be permitted for drilling holes in concrete. Where indicated on Plans, the approximate diameter of drilled holes for installation of dowels shall be 1 1/4", and voids after installing dowels shall be filled with epoxy grout as directed by the Engineer.
- Demolishing, removing, and disposing portions of existing catch basins and storm drain manholes shall not be paid for separately, but shall be considered incidental to the various Contract Items.

NPDES GENERAL NOTES

- Discharges into Waikaea Stream from dewatering and/or hydrotesting activities require NPDES Permit(s) from the Department of Health (DOH). If the Contractor options to discharge dewatering and/or hydrotesting effluent into receiving waters, the Contractor shall be responsible to obtain the required NPDES Permit(s) from DOH.
- No dewatering and/or hydrotesting activities will be authorized until the receipt of the NPDES Permits from DOH.
- Progress payment will not be authorized until receipt of the BMPs and the Quality of Discharge Test results.
- Any citation (fine) received by the State for non-compliance of the NPDES Permit requirements shall be deducted from the progress payment.

|               |          |
|---------------|----------|
| ORIGINAL PLAN | DATE     |
| DESIGNED BY   | 12/11/98 |
| TRACED BY     |          |
| DESIGNED BY   |          |
| QUANTITIES BY |          |
| CHECKED BY    |          |

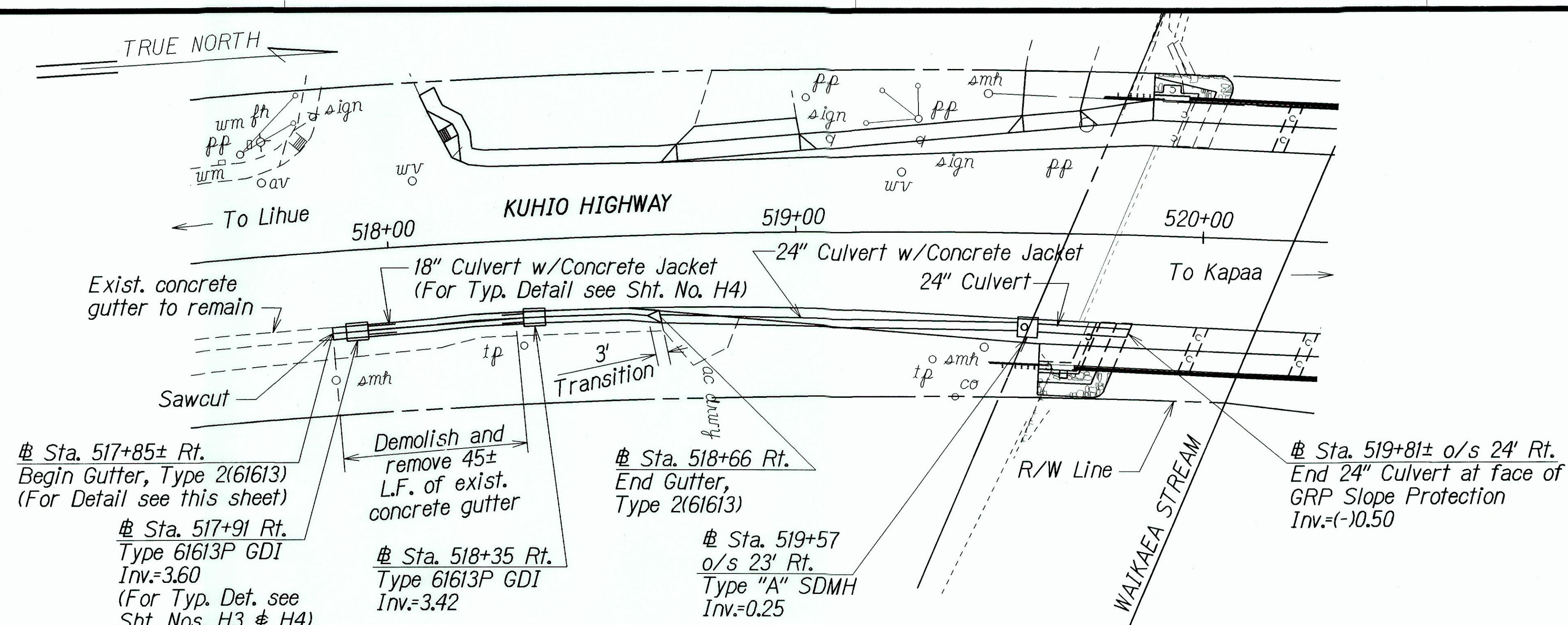
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**DRAINAGE PLAN**  
**KUHIO HIGHWAY**  
**Waikaea Bridge Widening**  
**Fed. Aid Proj. No. BR-STP-056-1(35)**

Scale: 1"=40'  
Date: Aug. 1998

SHEET No. 56 OF 70 SHEETS

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | BR-STP-056-1135    | 2000        | 57        | 70           |



Sta. 517+85± Rt.  
 Begin Gutter, Type 2(61613)  
 (For Detail see this sheet)  
 Sta. 517+91 Rt.  
 Type 61613P GDI  
 Inv.=3.60  
 (For Typ. Det. see  
 Sht. Nos. H3 & H4)

Demolish and  
 remove 45±  
 L.F. of exist.  
 concrete gutter  
 Sta. 518+35 Rt.  
 Type 61613P GDI  
 Inv.=3.42

Sta. 518+66 Rt.  
 End Gutter,  
 Type 2(61613)  
 Sta. 519+57  
 o/s 23' Rt.  
 Type "A" SDMH  
 Inv.=0.25

Sta. 519+81± o/s 24' Rt.  
 End 24" Culvert at face of  
 GRP Slope Protection  
 Inv.=(-10.50)

Sta. 517+91 Rt.  
 Construct: Type 61613P GDI

Sta. 518+35 Rt.  
 Construct: Type 61613P GDI

Sta. 519+25 o/s 21' Rt.  
 Construct: Type "A" SDMH

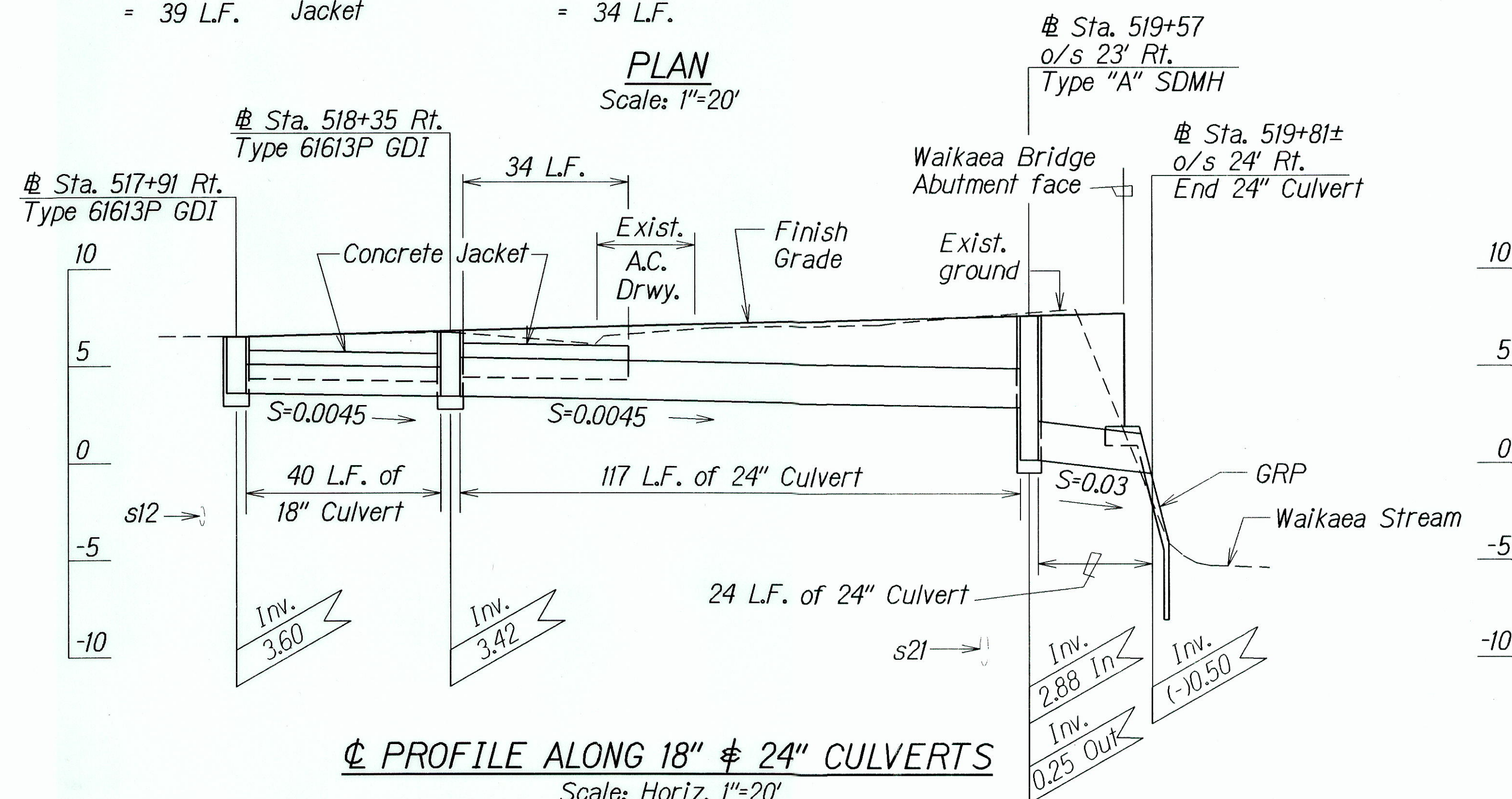
Sta. 517+85± Rt. to Sta. 518+66 Rt.  
 Construct: Gutter, Type 2(61613)

Estimated Quantities  
 Structure Excavation = 27 C.Y.  
 Bed Course Material = 7 C.Y.  
 18" Culvert = 40 L.F.  
 Type 61613 GDI  
 2.00 ft. to 2.99 ft. = 1 EA.  
 Reinforced Concrete  
 Jacket = 39 L.F.

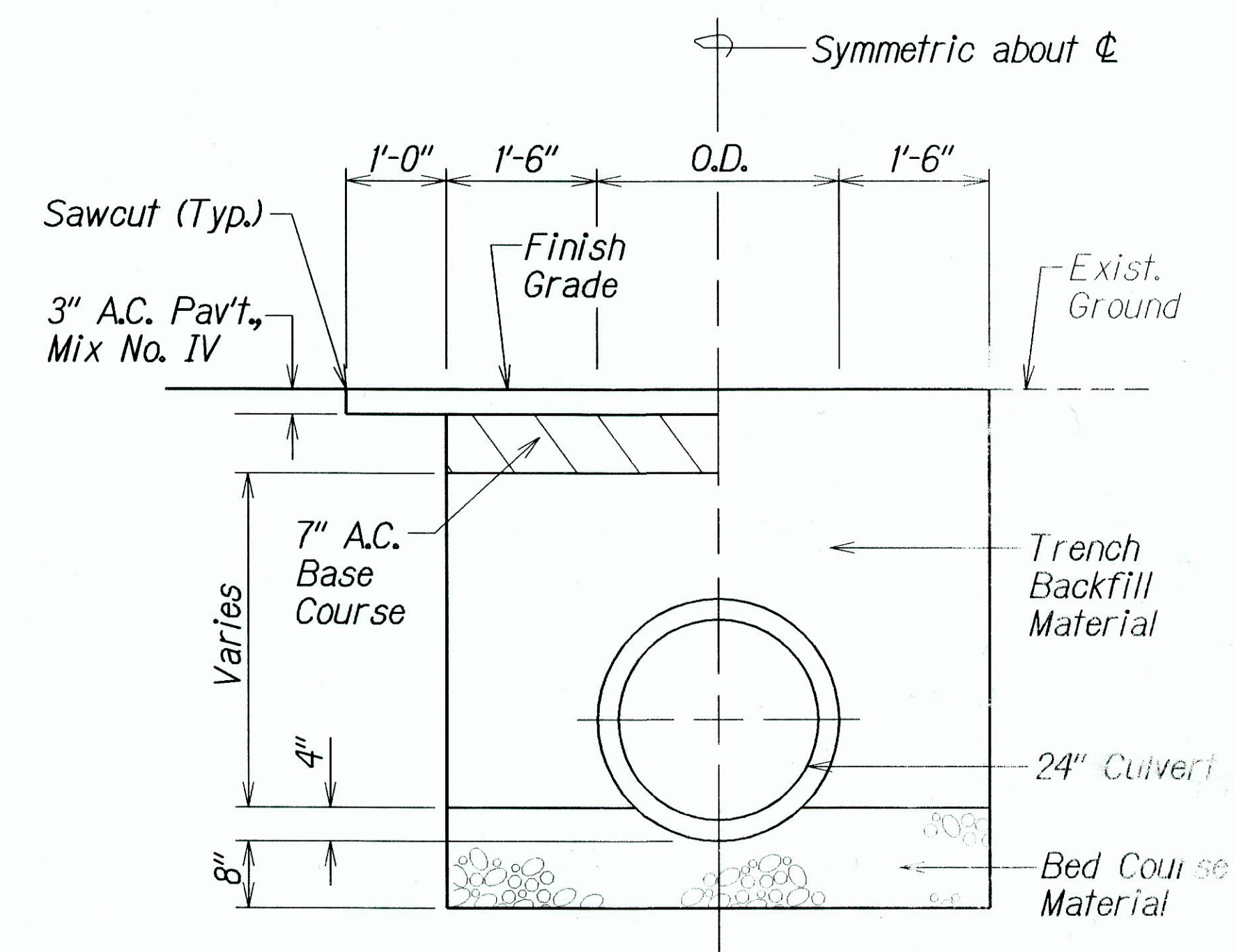
Estimated Quantities  
 Structure Excavation = 114 C.Y.  
 Bed Course Material = 23 C.Y.  
 24" Culvert = 117 L.F.  
 Type 61613 GDI  
 3.00 ft. to 3.99 ft. = 1 EA.  
 Reinforced Concrete  
 Jacket = 34 L.F.

Estimated Quantities  
 Structure Excavation = 23 C.Y.  
 Bed Course Material = 5 C.Y.  
 24" Culvert = 24 L.F.  
 Type "A" SDMH  
 7.00 ft. to 7.99 ft. = 1 EA.

Estimated Quantities  
 Gutter, Type 2(61613) = 81 L.F.

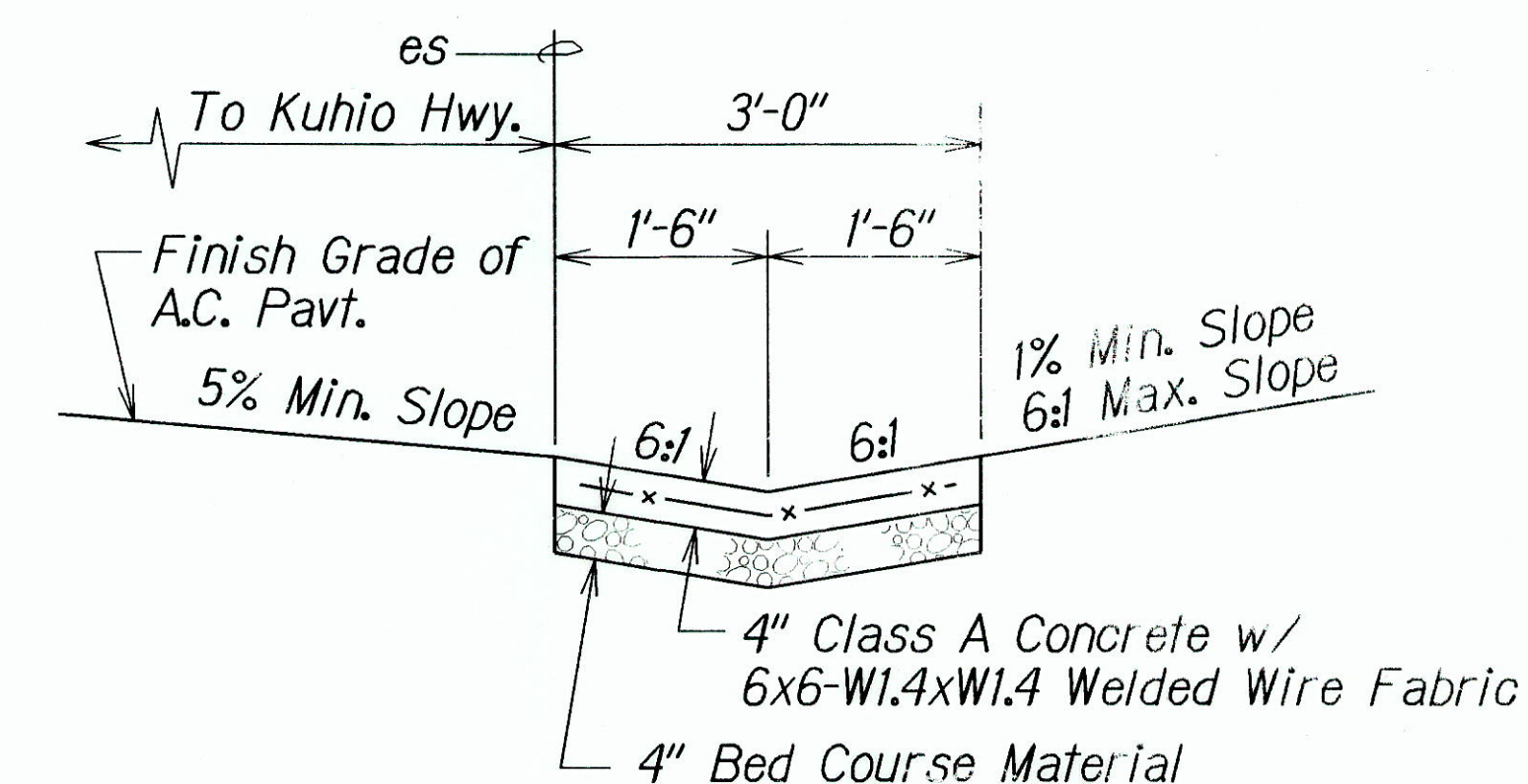


PROFILE ALONG 18" & 24" CULVERTS  
 Scale: Horiz. 1"=20'  
 Vert. 1"=5'



TYPICAL DETAILS OF CULVERT  
 TRENCH RESTORATION

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



TYPICAL DETAIL OF  
 GUTTER, TYPE 2(61613)

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

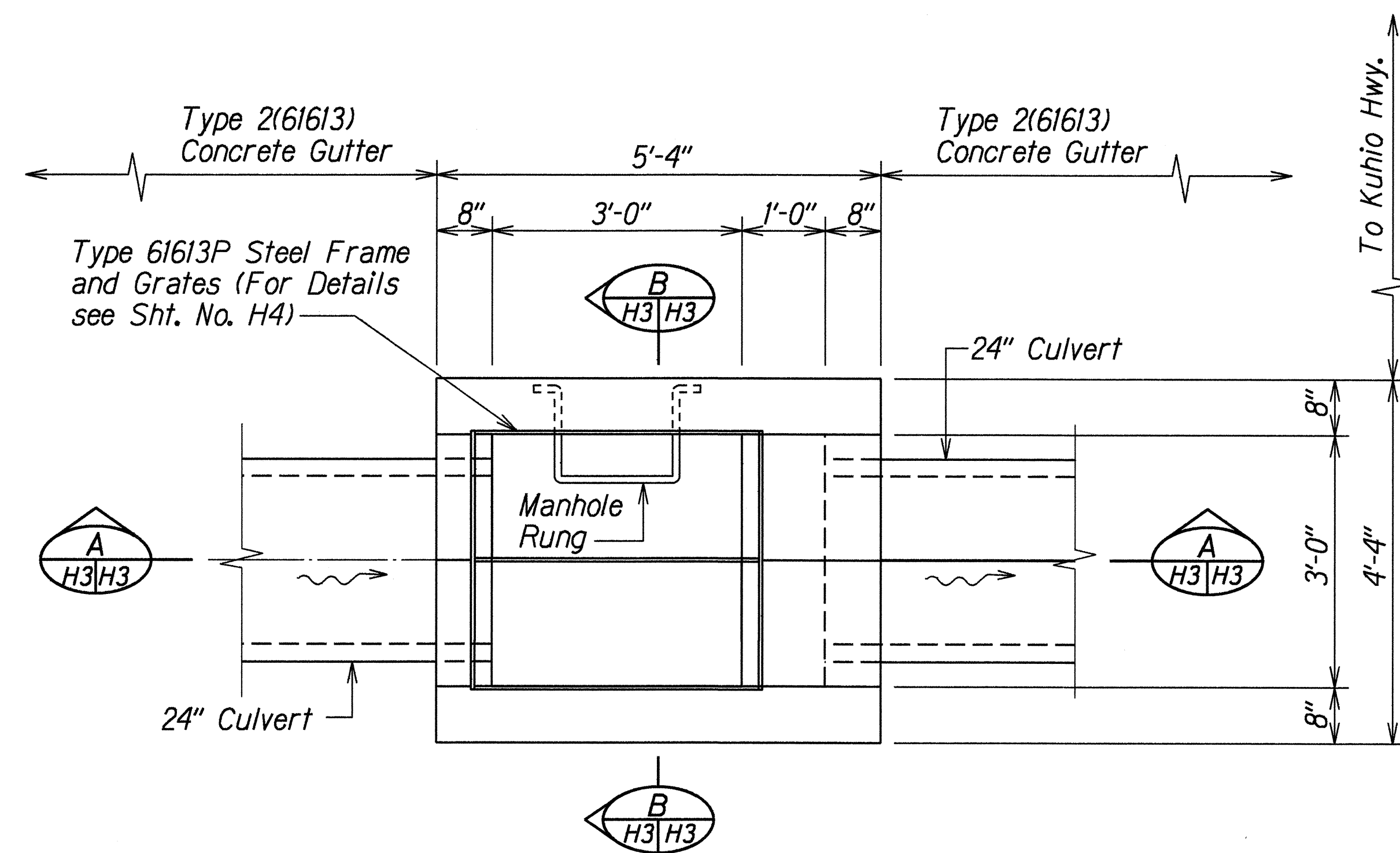
|                   |      |         |
|-------------------|------|---------|
| SURVEY PLOTTED BY | DATE | 8/26/99 |
| DRAWN BY          |      |         |
| DESIGNED BY       |      |         |
| CHECKED BY        |      |         |
| NOTED BY          |      |         |
| QUANTITIES BY     |      |         |
| CHECKED BY        |      |         |

DETAIL OF DRAINAGE SYSTEM AT STA. 517+85± RT. TO STA. 519+81± RT.

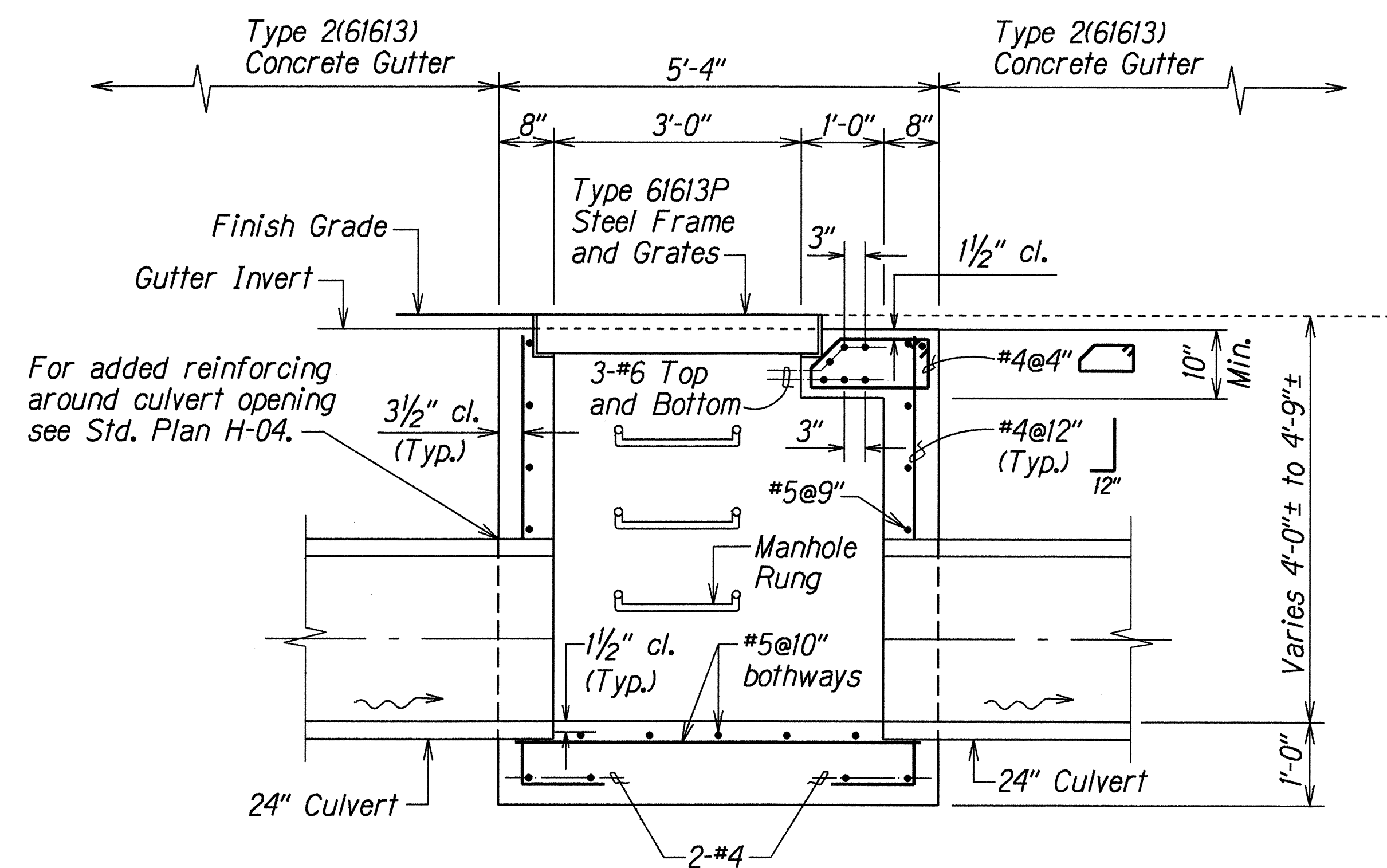
|        |                           |
|--------|---------------------------|
| 4/2/01 | Revised Plan and Profile. |
| DATE   | REVISION                  |

|                                                                                |
|--------------------------------------------------------------------------------|
| STATE OF HAWAII<br>DEPARTMENT OF TRANSPORTATION<br>HIGHWAYS DIVISION           |
| <b>DRAINAGE DETAILS</b>                                                        |
| KUHIO HIGHWAY<br>Waikaea Bridge Widening<br>Fed. Aid Proj. No. BR-STP-056-1135 |
| Scale: As Shown Date: Aug. 1998                                                |
| SHEET No. H2 OF 9 SHEETS                                                       |

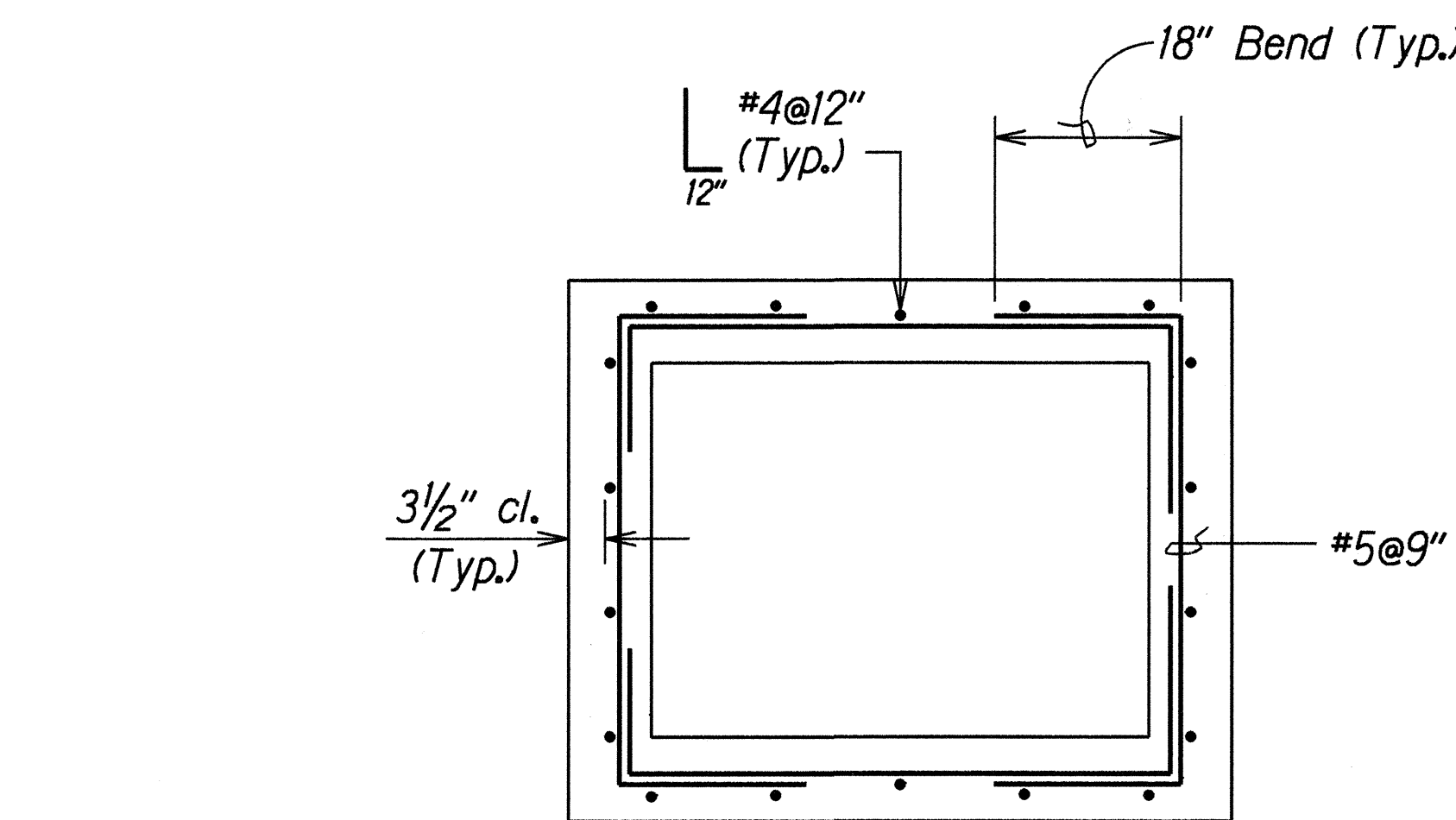
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | BR-STP-056-1(35)   | 2000        | 58        | 70           |



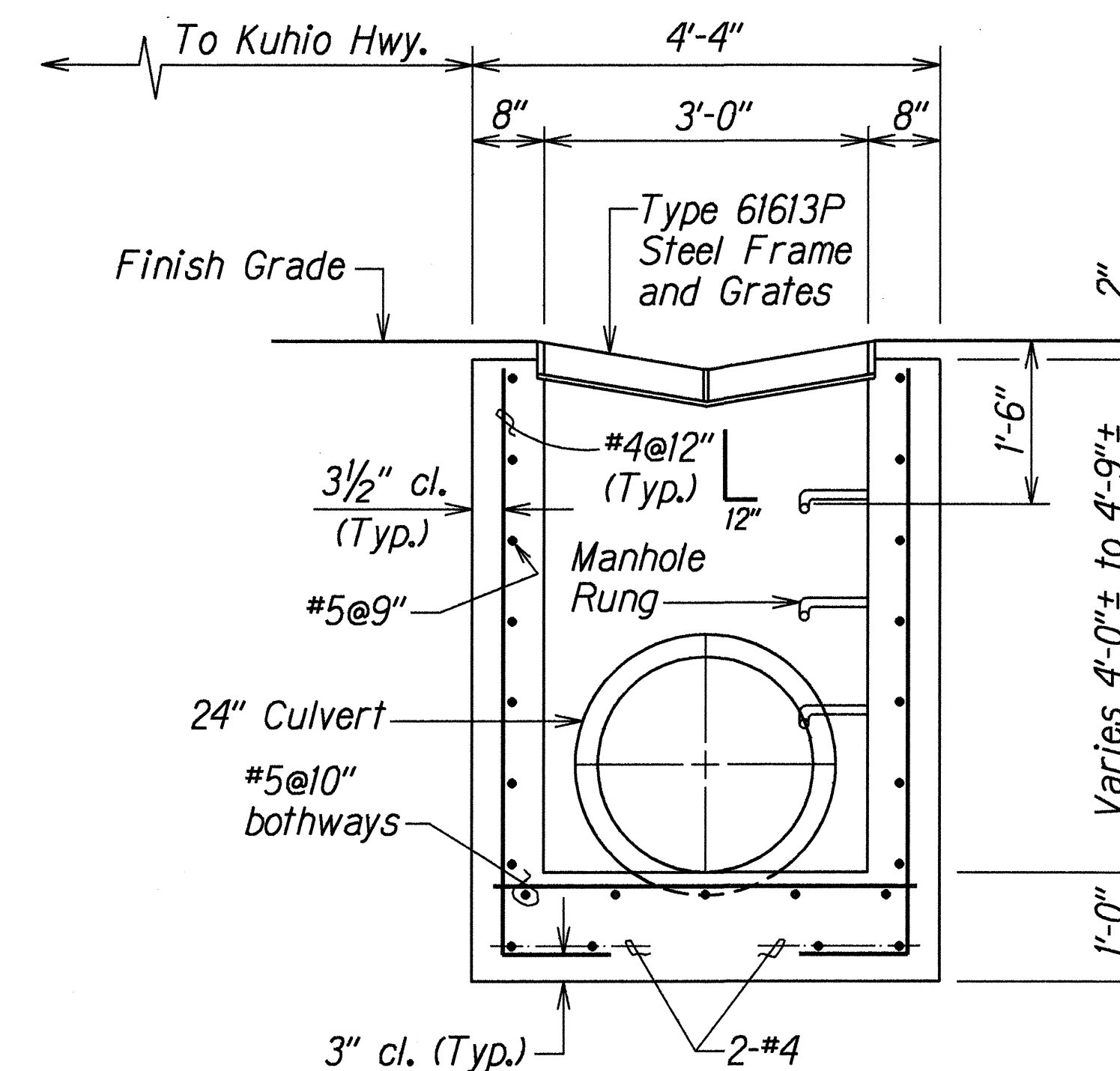
PLAN



SECTION A-A



PLAN VIEW OF WALL SECTION



SECTION B-B

# TYPICAL DETAILS OF TYPE 61613P GRATED DROP INLET

|             |                                                                     |
|-------------|---------------------------------------------------------------------|
| DATE        | 7/23/97                                                             |
| DESIGNED BY | B. Loda                                                             |
| CHECKED BY  | 4/11/07 d/g                                                         |
| NOTES       | 1. For added reinforcing around culvert opening see Std. Plan H-04. |

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

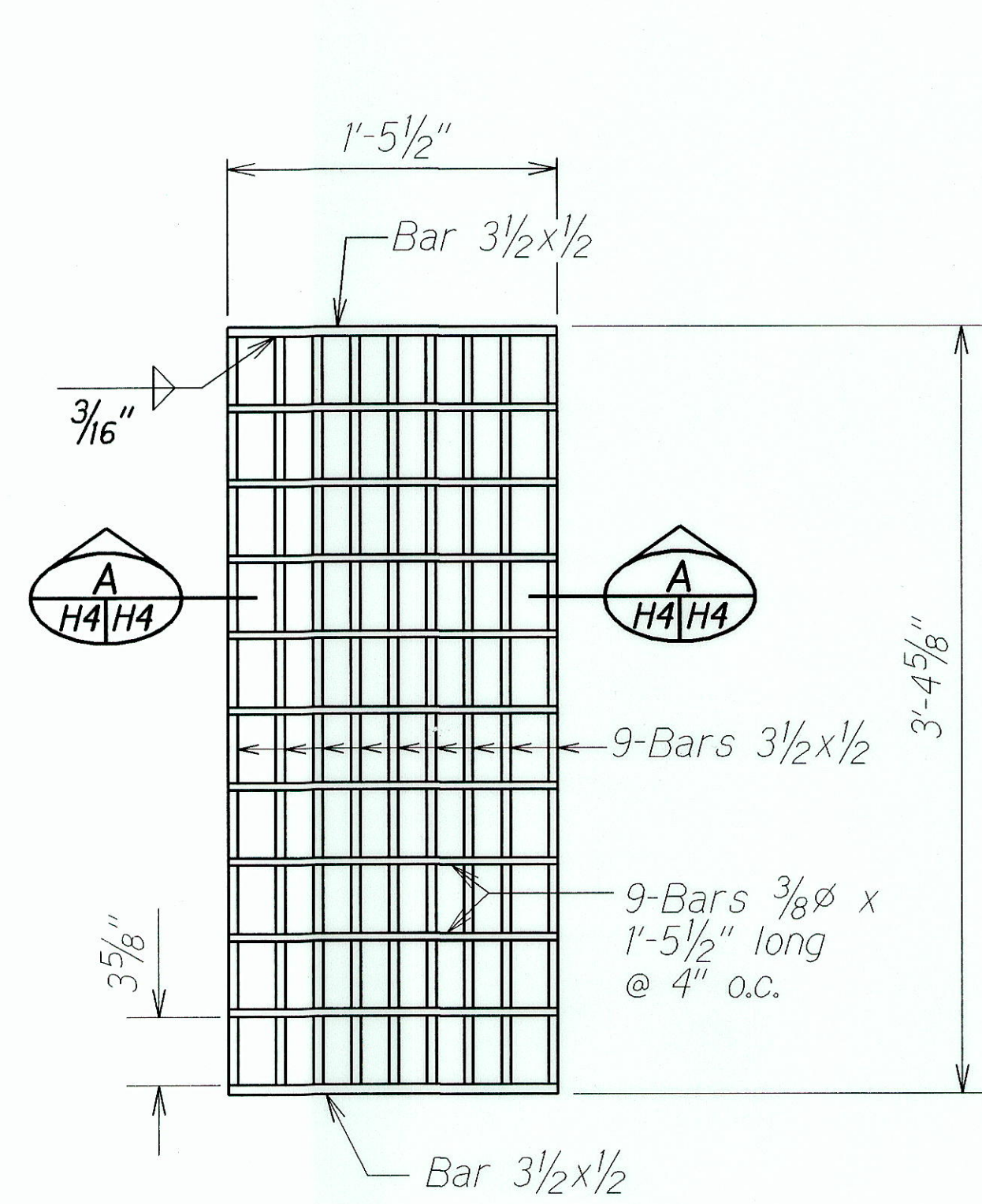
**DRAINAGE DETAILS**

KUHIO HIGHWAY  
Waikaea Bridge Widening  
Fed. Aid. Proj. BR-STP-056-1(35)

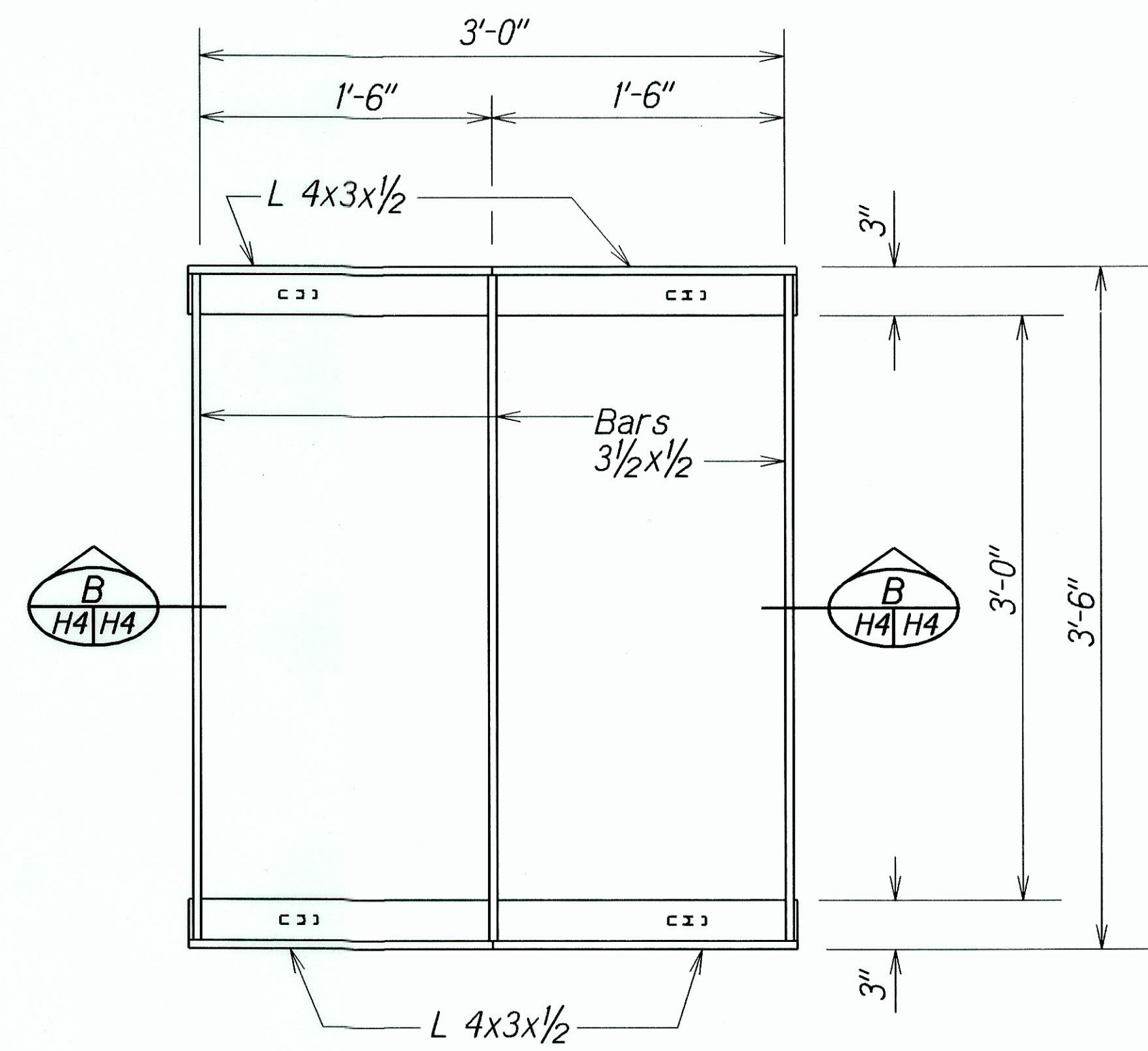
Scale: 3/4"=1'-0" Aug. 1998

SHEET No. H3 OF 9 SHEETS

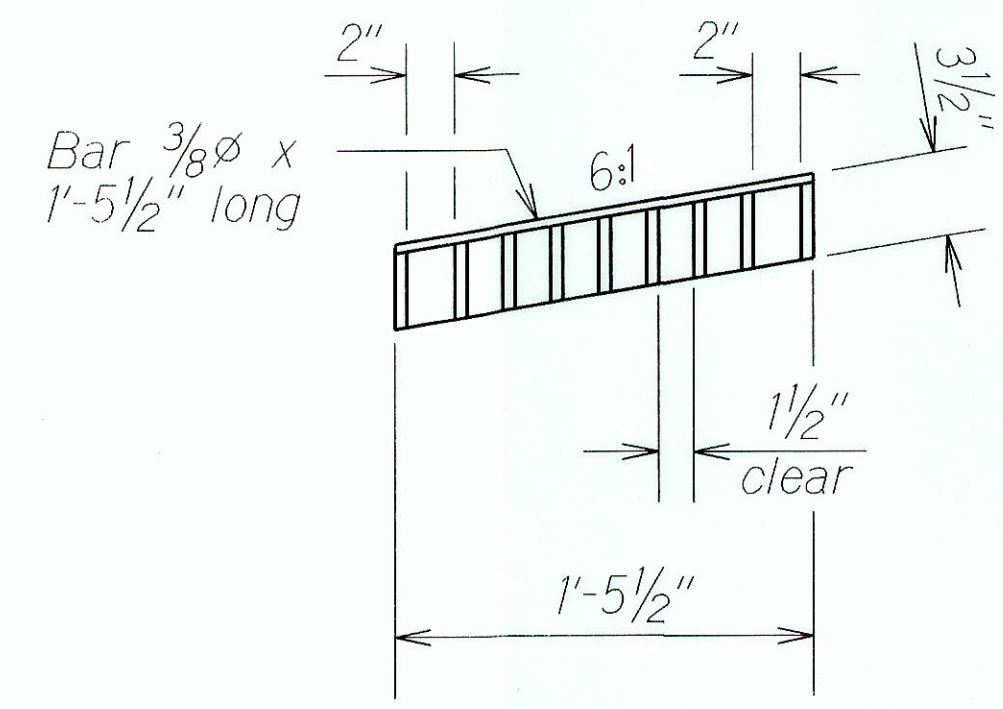
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | BR-STP-056-1(35)   | 2000        | 59        | 70           |



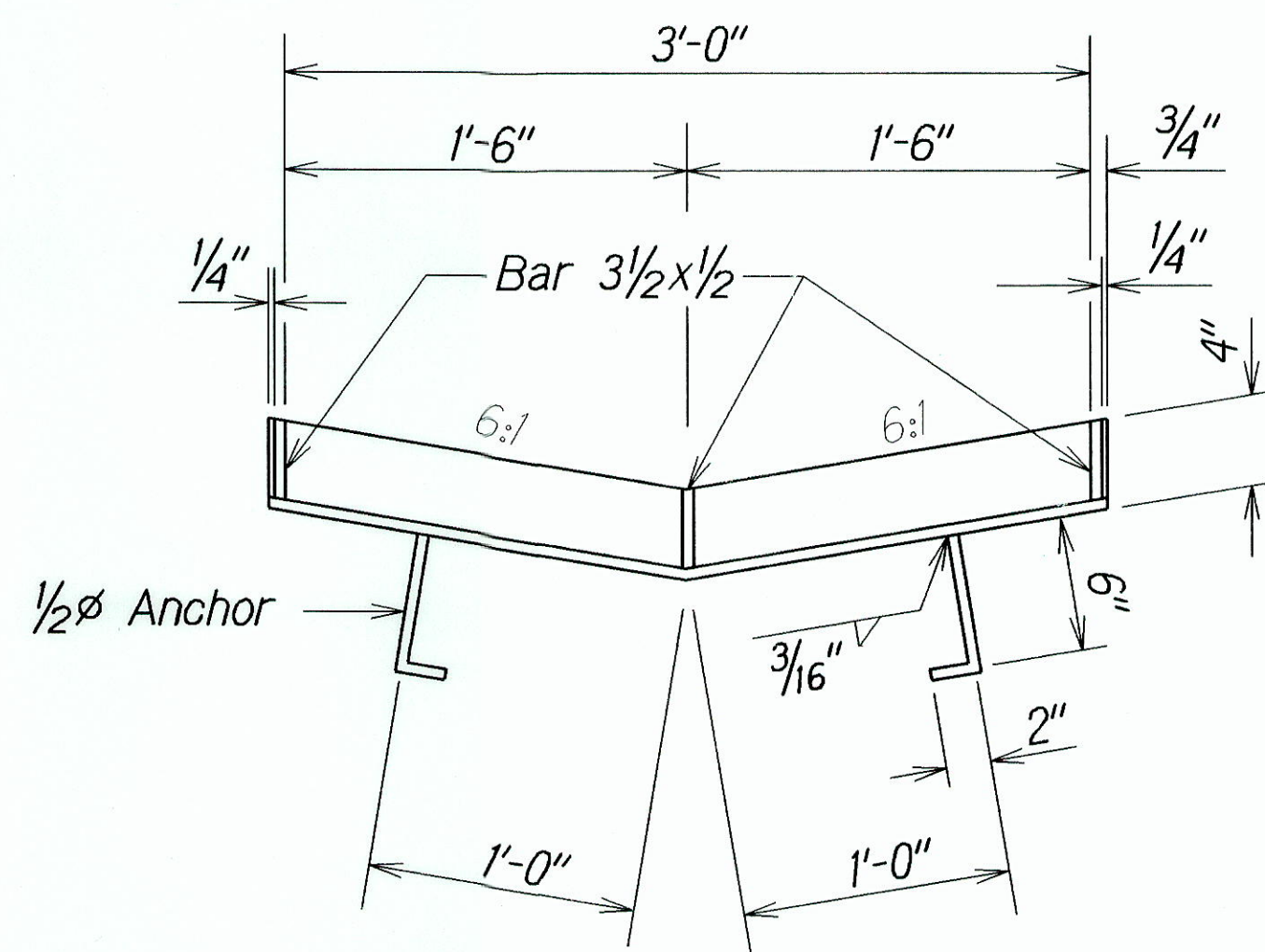
PLAN



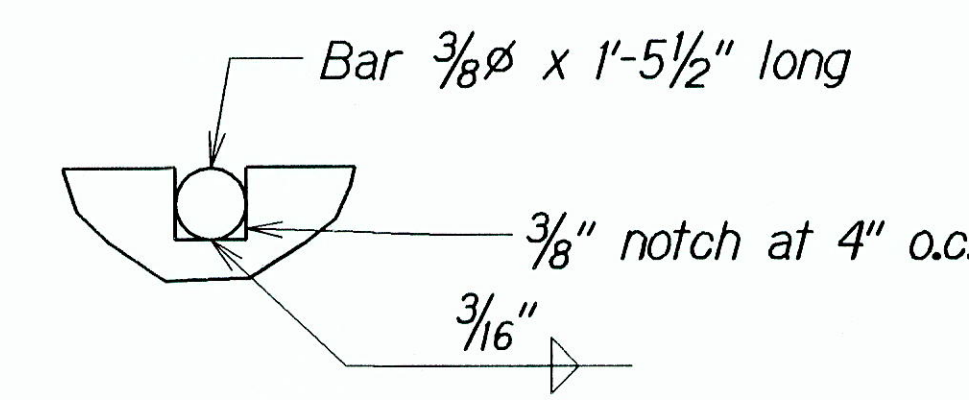
PLAN



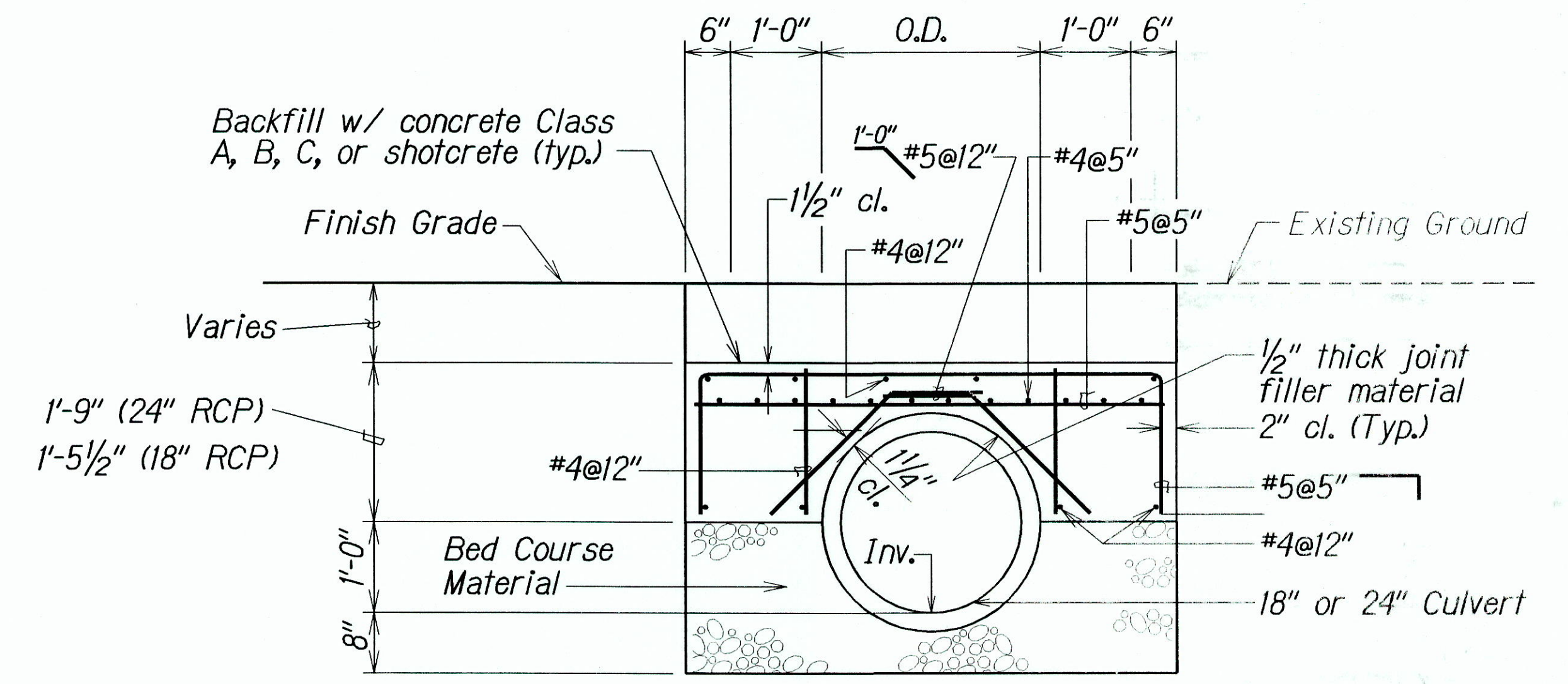
SECTION A  
GRATE



SECTION B  
FRAME



NOTCH DETAIL  
Full Size



TYPICAL DETAIL OF REINFORCED CONCRETE JACKET  
Scale: 3/4"=1'-0"

DETAILS OF TYPE 61613P STEEL FRAME AND GRATES

| DATE   | REVISION                                       |
|--------|------------------------------------------------|
| 4/2/01 | Add detail to show Reinforced Concrete Jacket. |

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

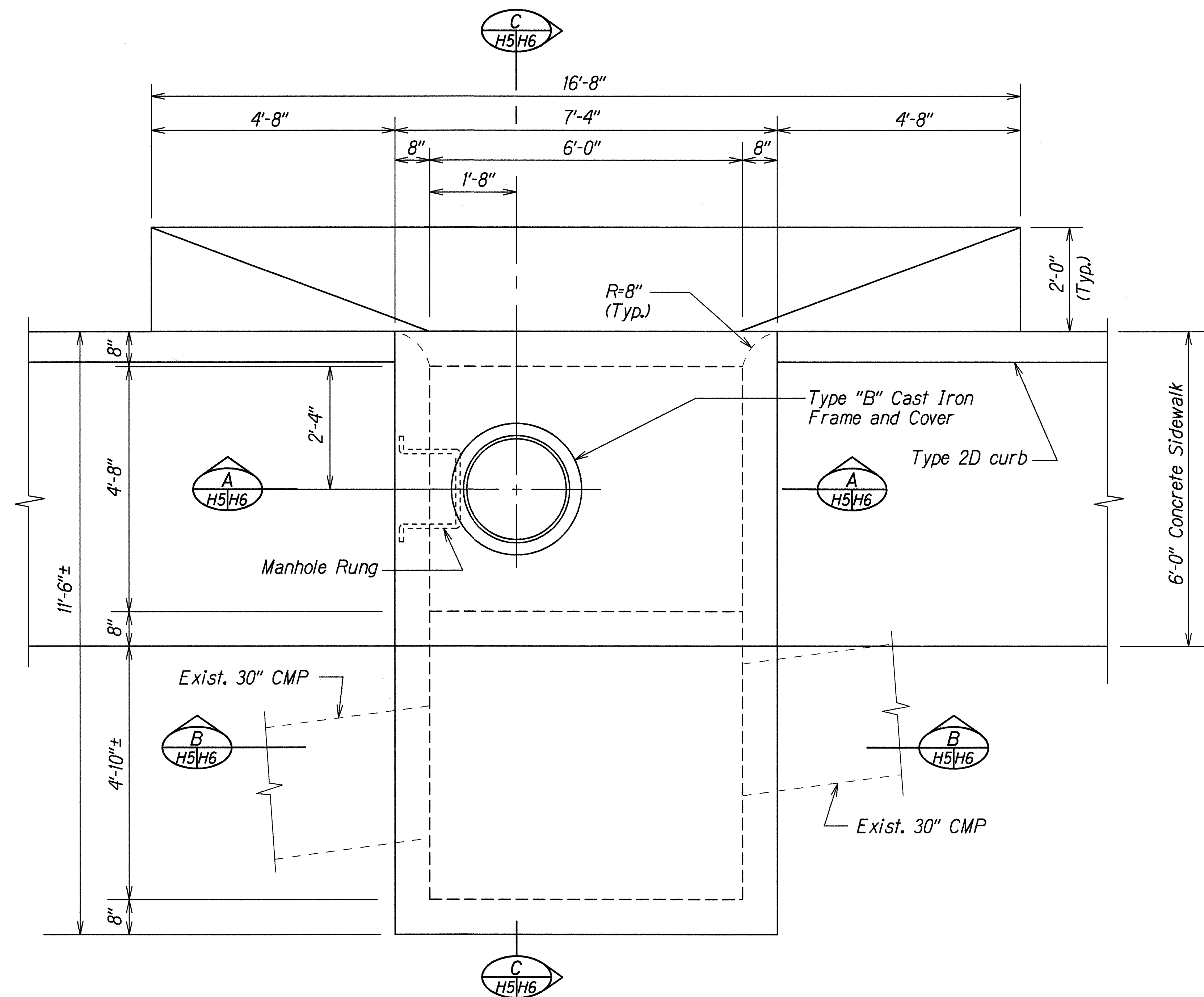
**DRAINAGE DETAILS**

KUHIO HIGHWAY  
Waikaea Bridge Widening  
Fed. Aid Proj. No. BR-STP-056-1(35)

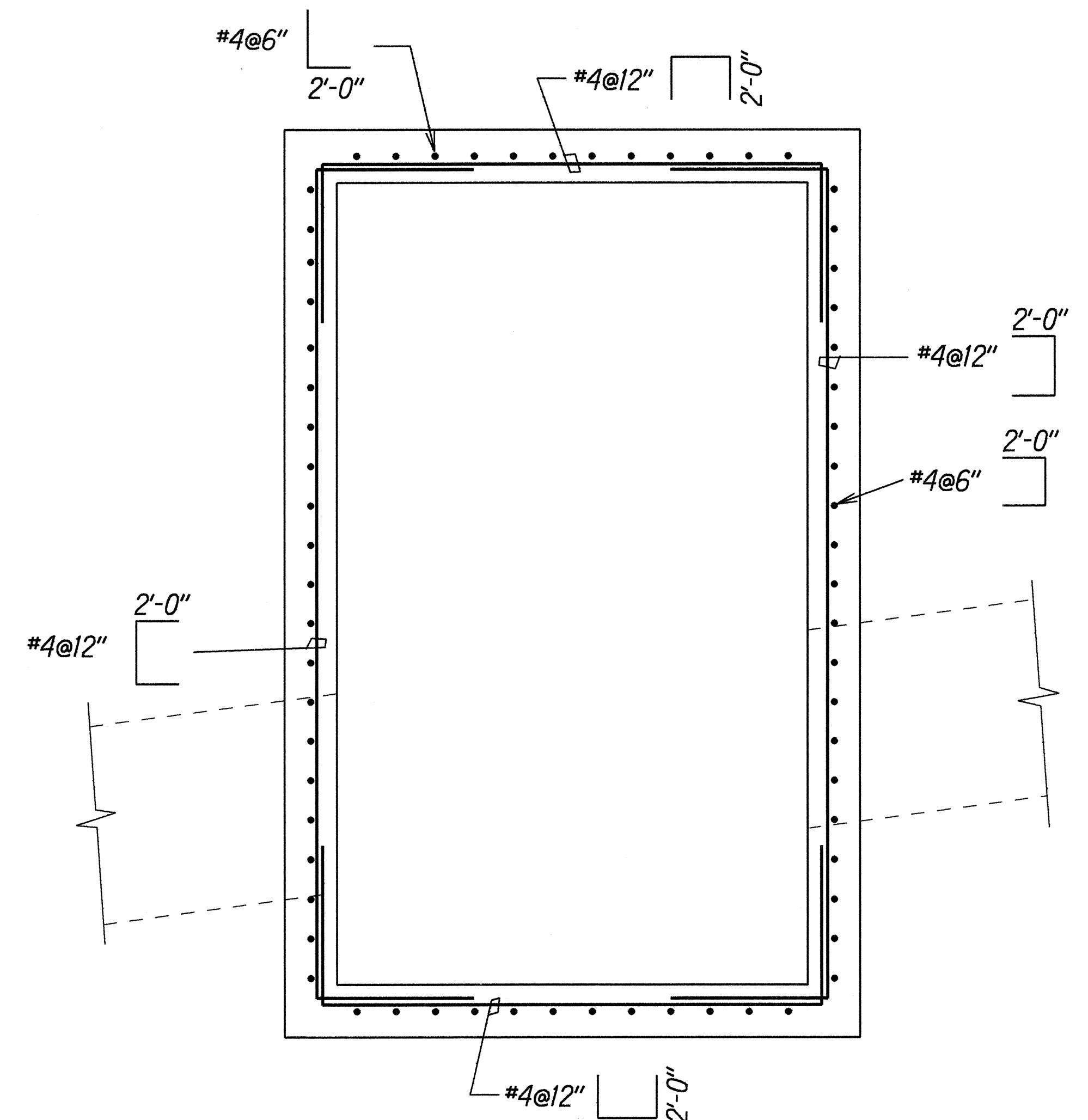
Scale: 1/2"=1'-0" Date: Aug 1998

SHEET No. H4 OF 9 SHEETS

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | BR-STP-056-1(35)   | 2000        | 60        | 70           |



PLAN

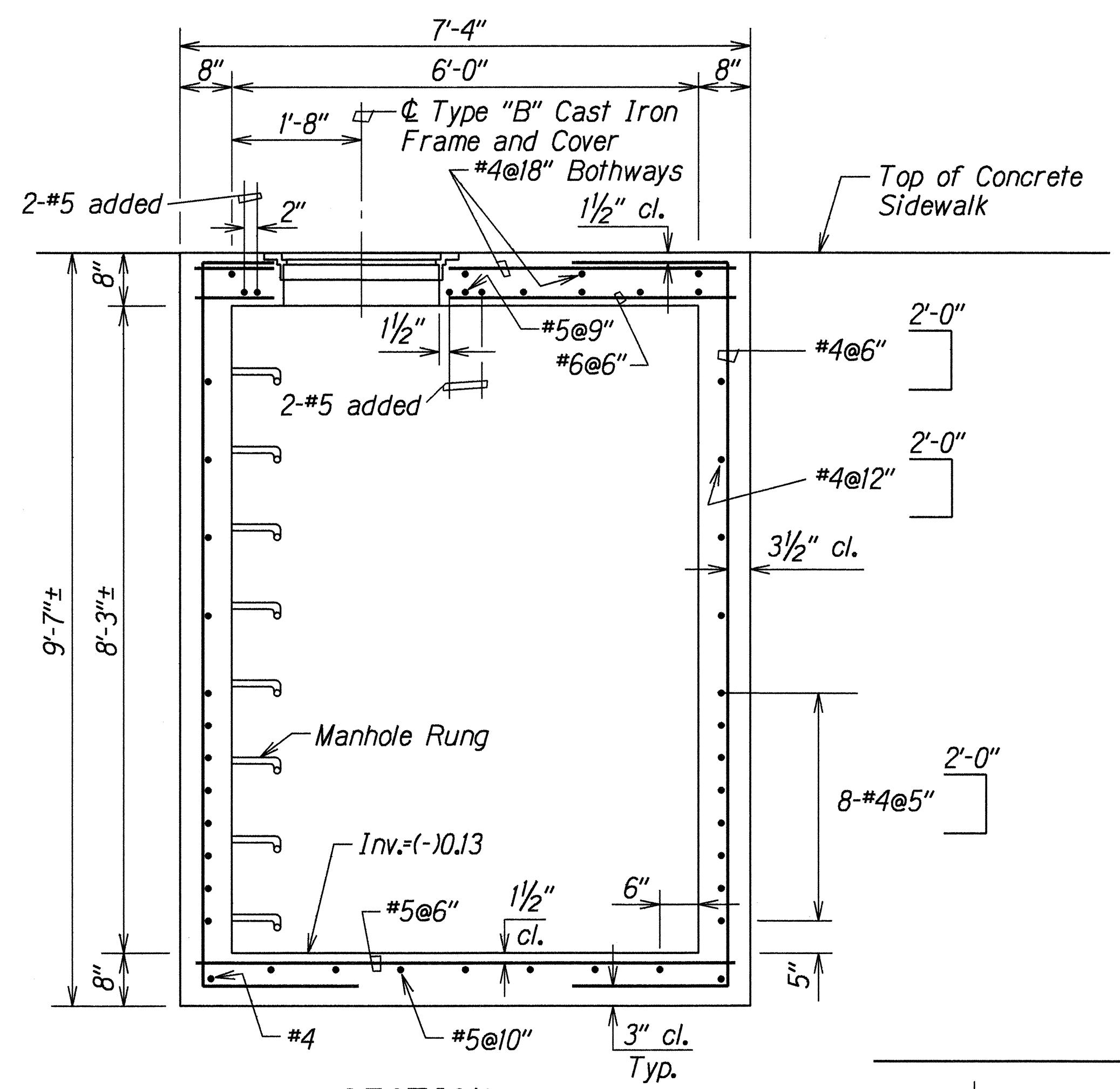


DETAIL OF WALL REINFORCING

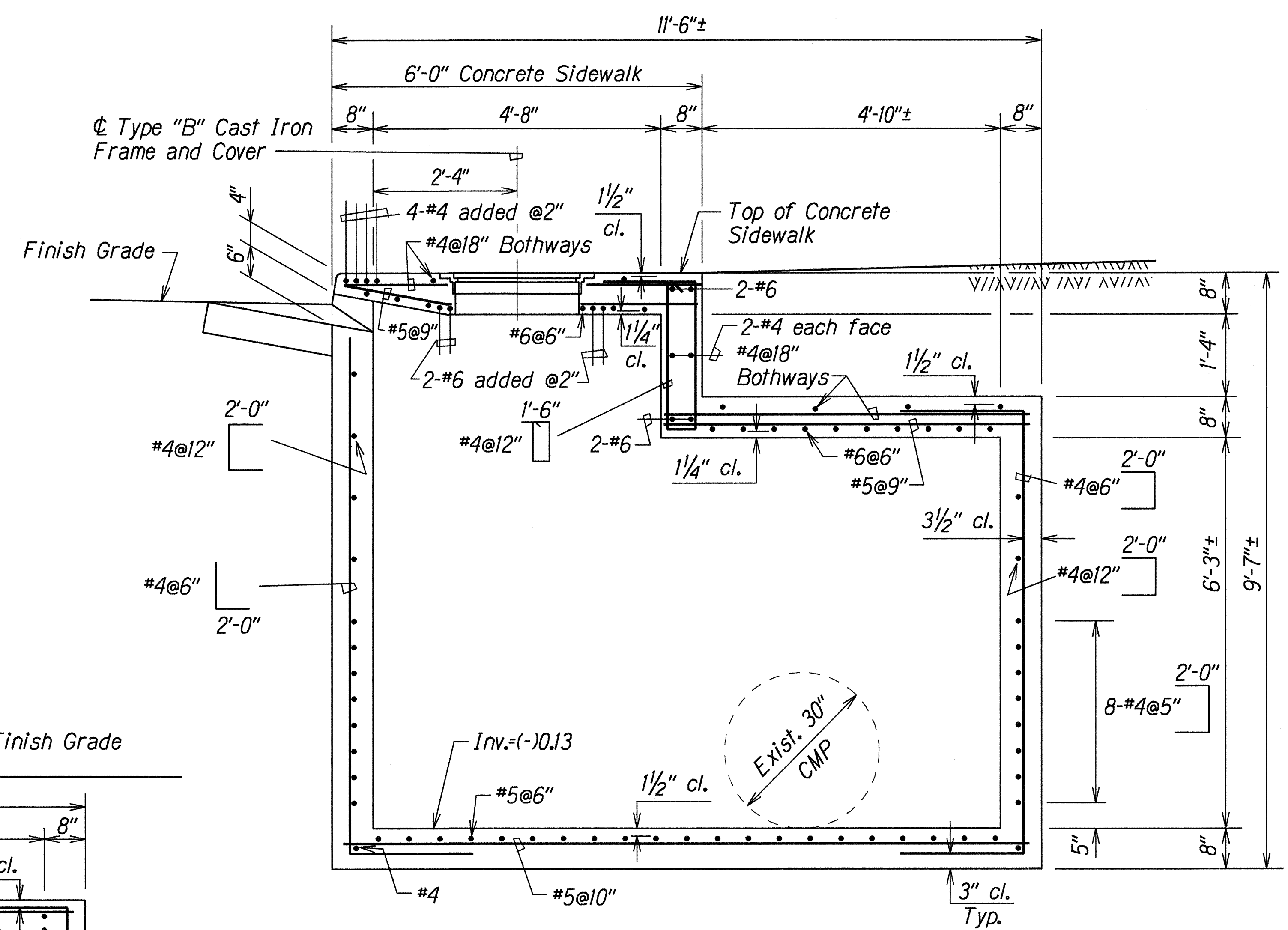
MODIFIED TYPE "D" CATCH BASIN AT # STA. 520+88 RT.

|                  |                               |                |
|------------------|-------------------------------|----------------|
| ORIGINAL<br>PLAN | SURVEY PLOTTED BY _____       | DATE _____     |
| NOTE BOOK        | DRAWN BY <i>A. Noma</i>       | <i>2/27/98</i> |
|                  | DESIGNED BY <i>C. Matsuda</i> | _____          |
|                  | QUANTITIES BY _____           | _____          |
|                  | CHECKED BY _____              | _____          |

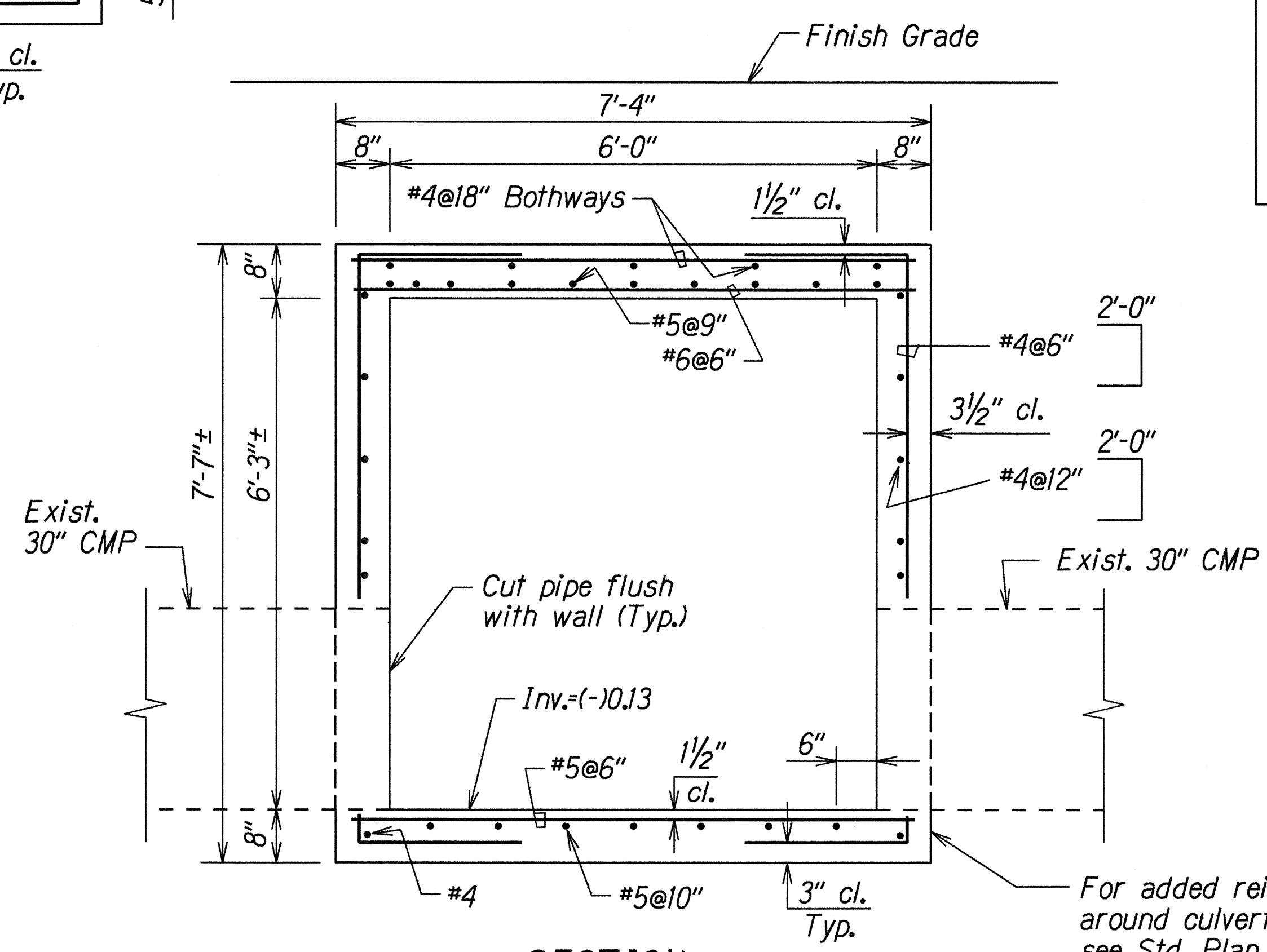
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | BR-STP-056-1(35)   | 2000        | 61        | 70           |



SECTION A  
H5/H6



SECTION C  
H5/H6



SECTION B  
H5/H6

For added reinforcing around culvert opening see Std. Plan H-04

**MODIFIED TYPE "D" CATCH BASIN AT STA. 520+88 RT.**

|                        |         |
|------------------------|---------|
| ORIGINAL PLAN          | DATE    |
| SURVEY PLATTED BY      | 2/27/96 |
| DRAWN BY A. Mamiya     |         |
| NOTED BY C. Matsuda    |         |
| DESIGNED BY C. Matsuda |         |
| CHECKED BY             |         |

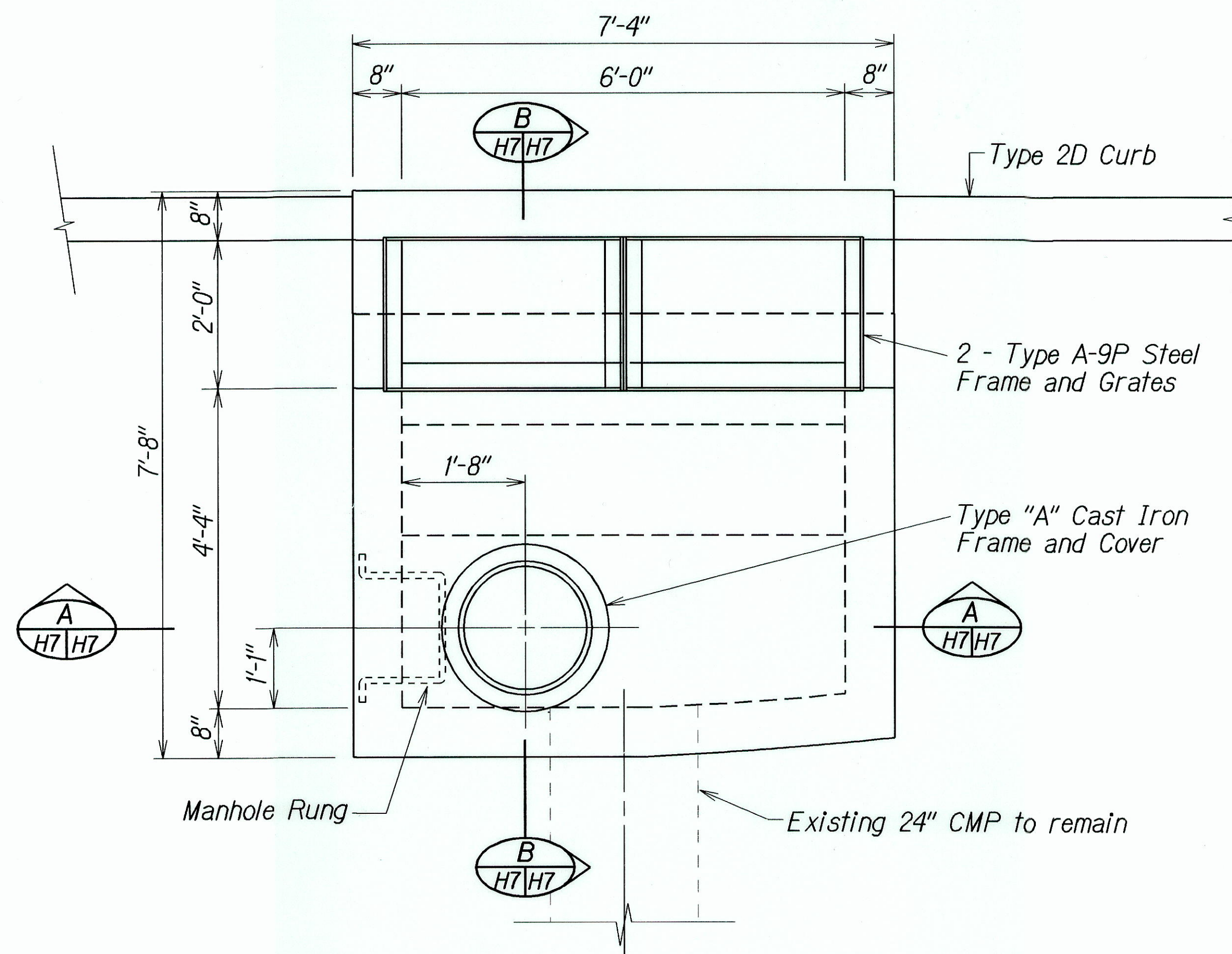
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**DRAINAGE DETAILS**  
  
**KUHIO HIGHWAY**  
**Waikaea Bridge Widening**  
**Fed. Aid Project No. BR-STP-056-1(35)**

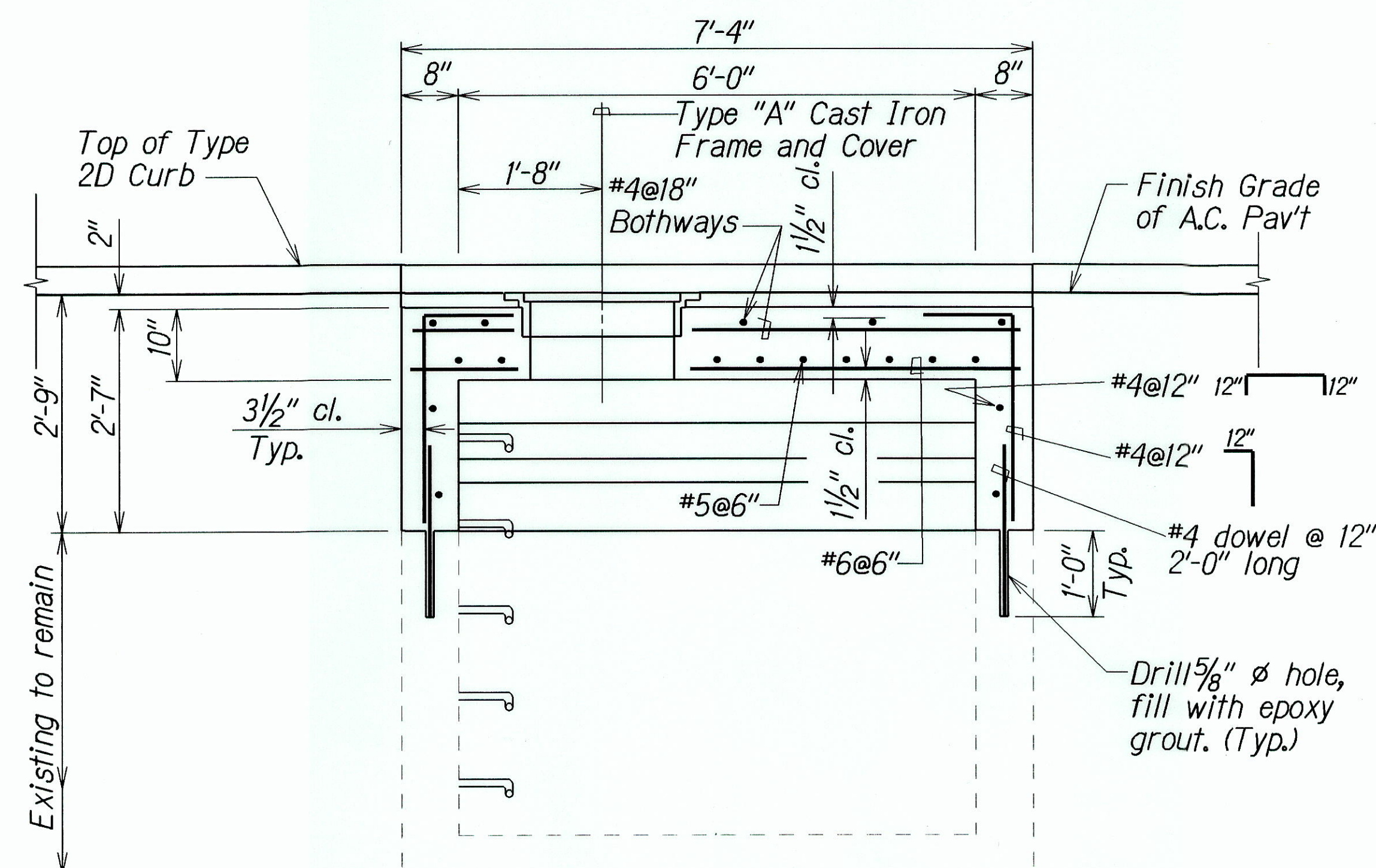
Scale: 3/4"=1'-0"  
SHEET No. H6 OF 9 SHEETS

Date: Aug. 1998

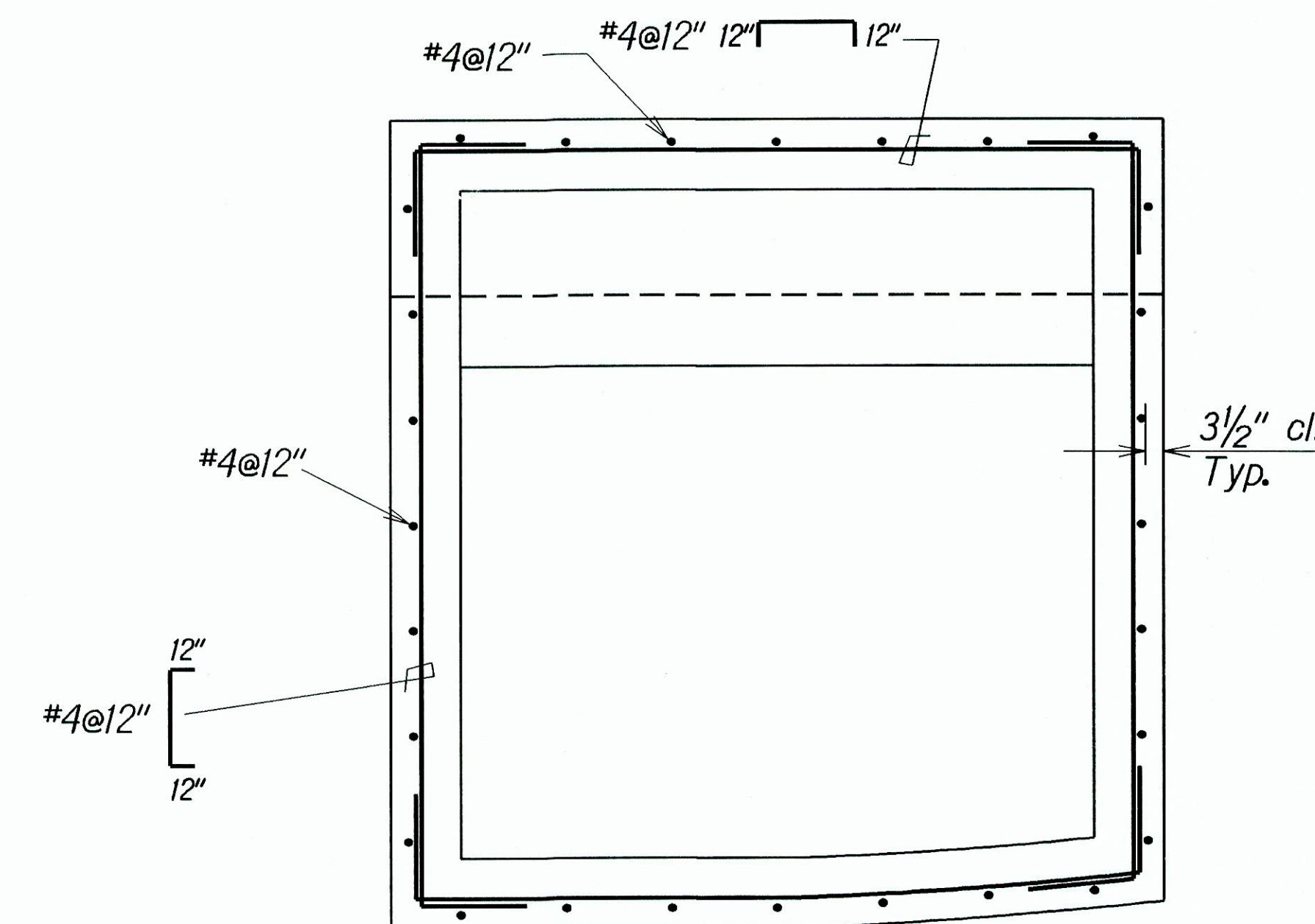
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | BR-STP-056-1(35)   | 2000        | 62        | 70           |



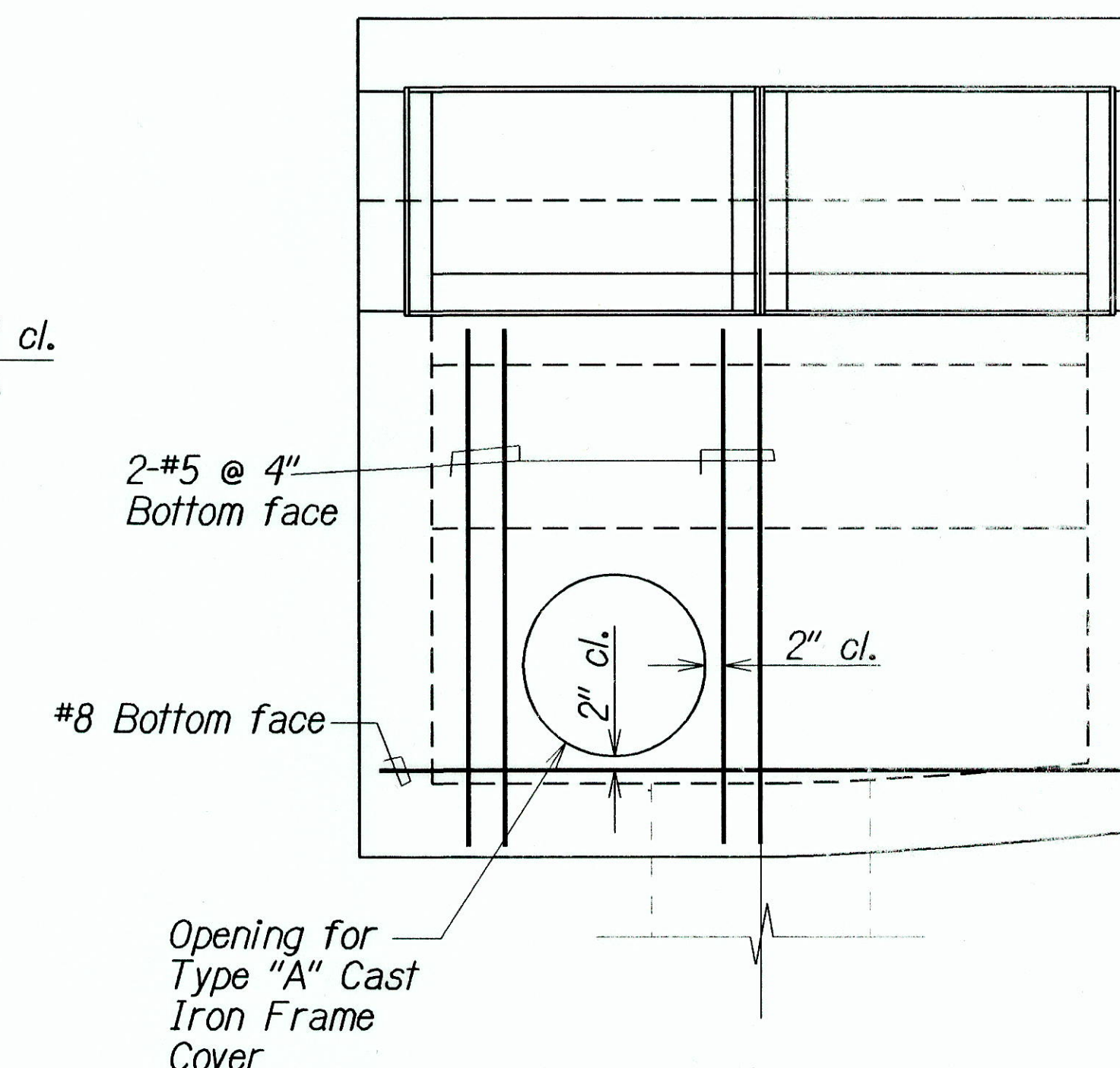
PLAN



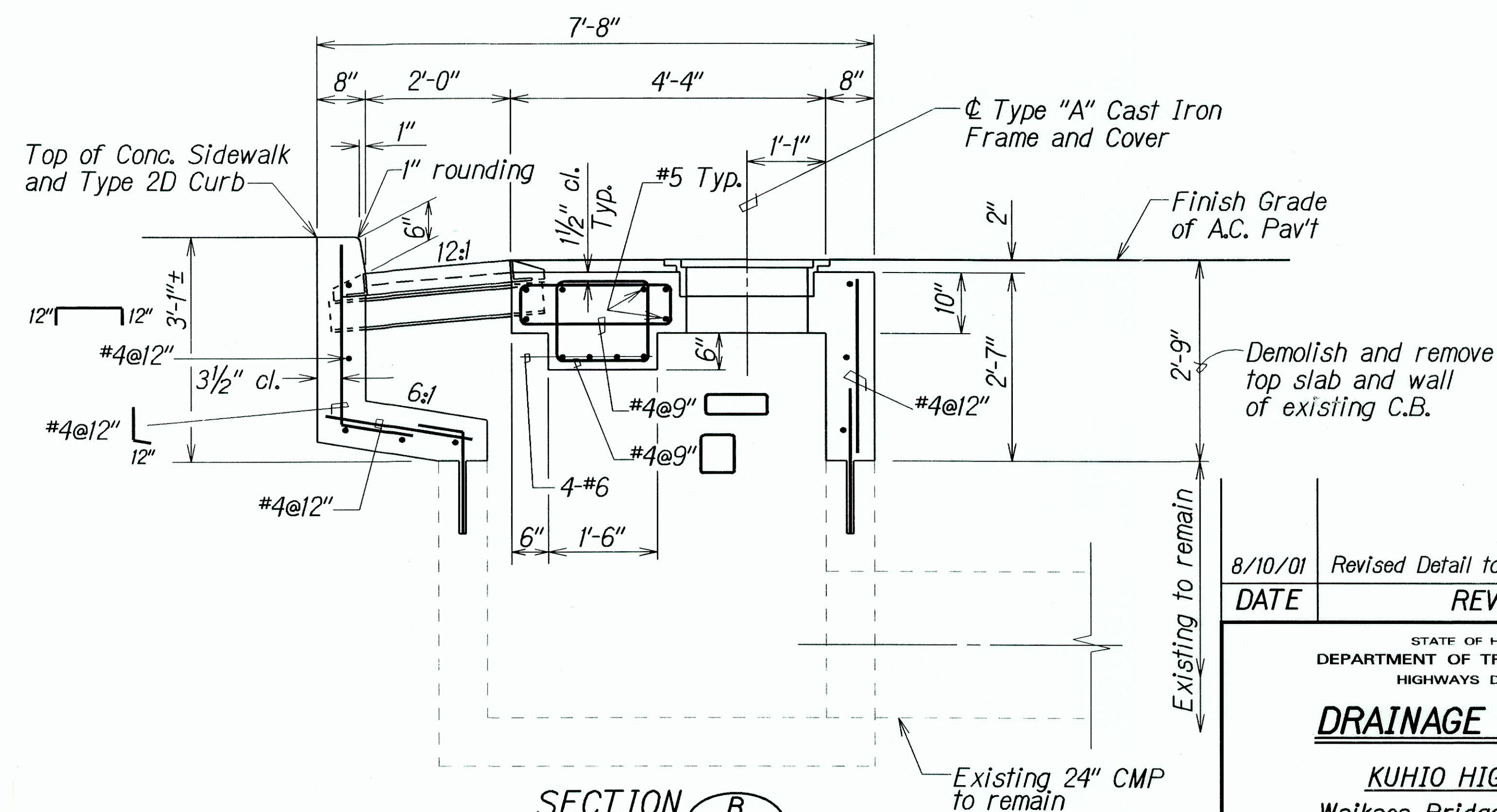
SECTION A  
H7/H7



PLAN VIEW OF WALL REINFORCING



ADDED REINFORCING  
FOR MANHOLE OPENING



SECTION B  
H7/H7

MODIFIED TYPE "D1-A" GRATED DROP INLET AT STA. 0+70± LT.

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

8/10/01 Revised Detail to a GDI.

DATE REVISION

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**DRAINAGE DETAILS**

KUHIO HIGHWAY  
Waikaea Bridge Widening  
Fed. Aid Proj. No. BR-STP-056-1(35)

Scale: 3/4"=1'-0" Date: Aug. 1998

SHEET No. H7 OF 9 SHEETS

C.O. 62



