

Drainage Notes:

- Existing drainage system 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.
- Demolishing, removing and disposing existing structures and culverts shall not be paid for separately, but shall be considered incidental to the various contract items.
- The Contractor shall verify the locations of all culverts and utilities in the field. Any affected culvert or utilities shall be repaired or replaced by the Contractor at his expense.
- Concrete shall be Class A unless otherwise noted.
- Chamfer all exposed concrete edges 1".
- The exact location and length of all standard concrete spillways shall be determined by the Engineer in the field.
- For added reinforcing at culvert openings, see Standard Plan H-65, Detail "A".
- Connection of 60" Liner Plate Pipe to existing box culvert shall not be paid for separately, but shall be considered incidental to 60" Liner Plate Pipe.

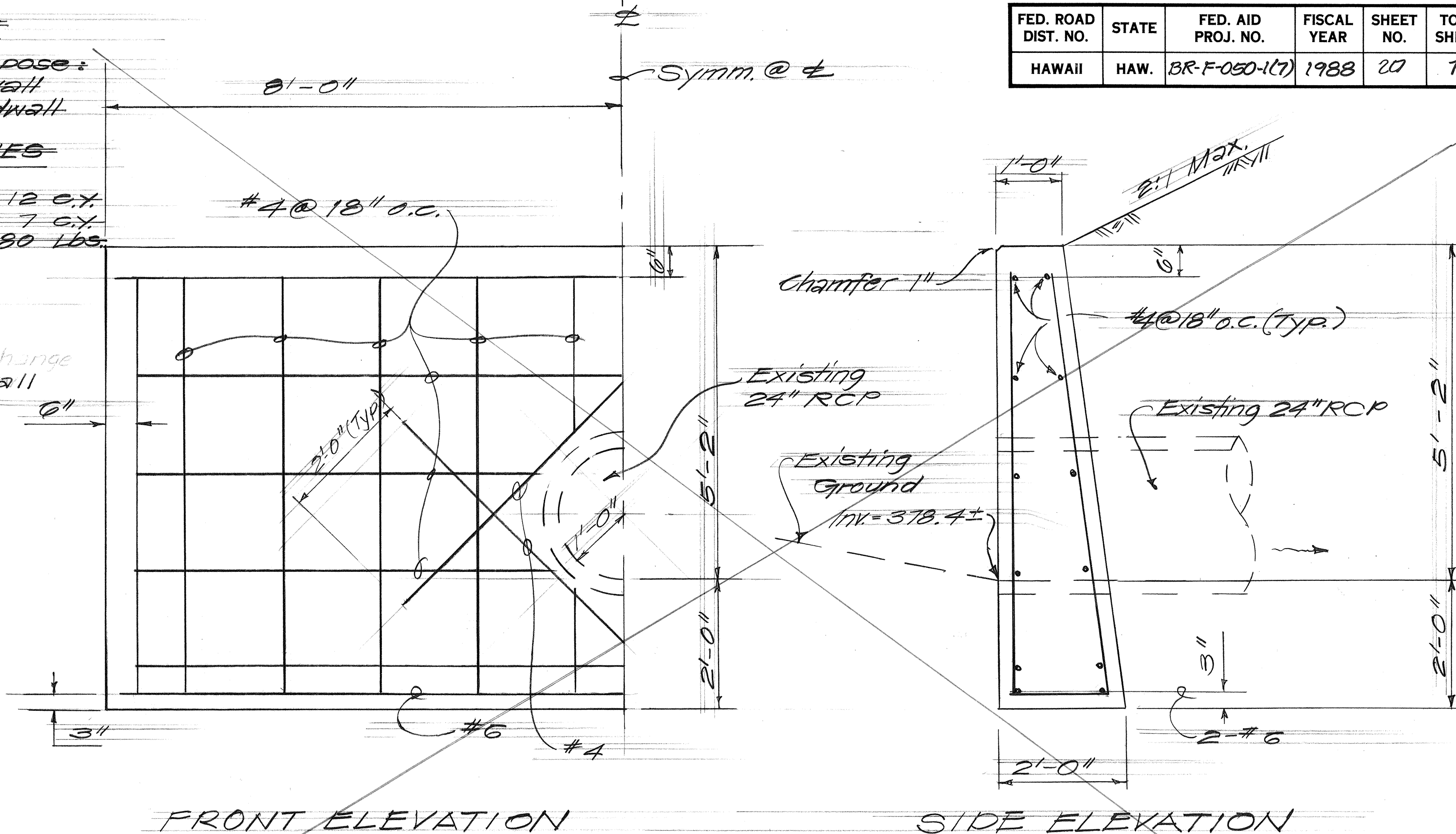
Sta. 242+99 ± RT.

Demolish, Remove and Dispose:
Existing Concrete Headwall
Construct: Concrete Headwall.

ESTIMATED QUANTITIES

Structural Exc. 12 c.y.
Class A Concrete 7 c.y.
Reinforcing Steel 180 Lbs.

Note:
Deleted under Contract Change Order No. 9 - Install a new 30-inch drainage system.



FRONT ELEVATION

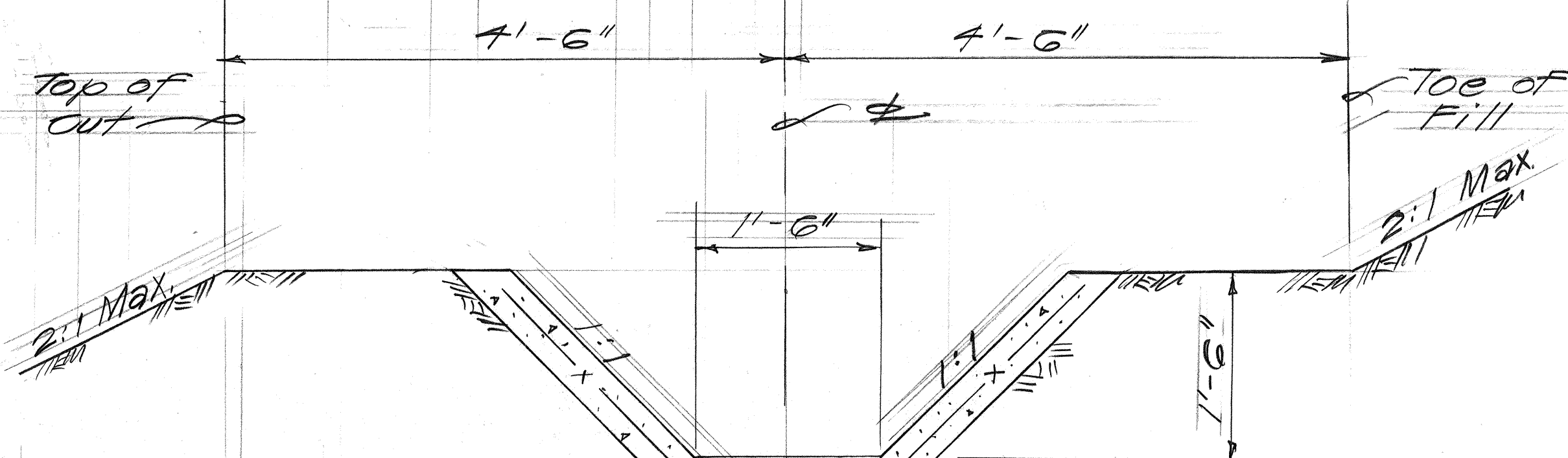
SIDE ELEVATION

CONCRETE HEADWALL AT # STA. 242+99 ± RT.

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

ESTIMATED QUANTITIES FOR STANDARD CONCRETE SPILLWAYS

STA. 255+50 ± RT. 224.80 L.F.
STA. 256+00 ± LT. 112.00 L.F.
STA. 262+50 ± LT. 101.20 L.F.
STA. 263+50 ± RT. 52.50 L.F.
STA. 273+50 ± RT. 30 L.F.



Sta. 244+50 RT to 250+00 RT
Sta. 267+75 LT to 271+80 LT

Construct: 1.5' x 1.5' (SS 1/1)
Lined Trapezoidal
Drainage Ditch

4" Thick Class B Concrete
or Shotcrete W1.4 x W1.4
W1.4 x W1.4 Welded Wire Fabric

ESTIMATED QUANTITIES

Ditch and channel Exc. 402
1.5' x 1.5' (SS 1/1) Lined 974.00
Trapezoidal Drainage Ditch 955 L.F.

1.5' x 1.5' (SS 1/1) LINED TRAPEZOIDAL DRAINAGE DITCH

Scale: 1" = 1'-0"

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-F-050-1(7)	1988	20	75

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

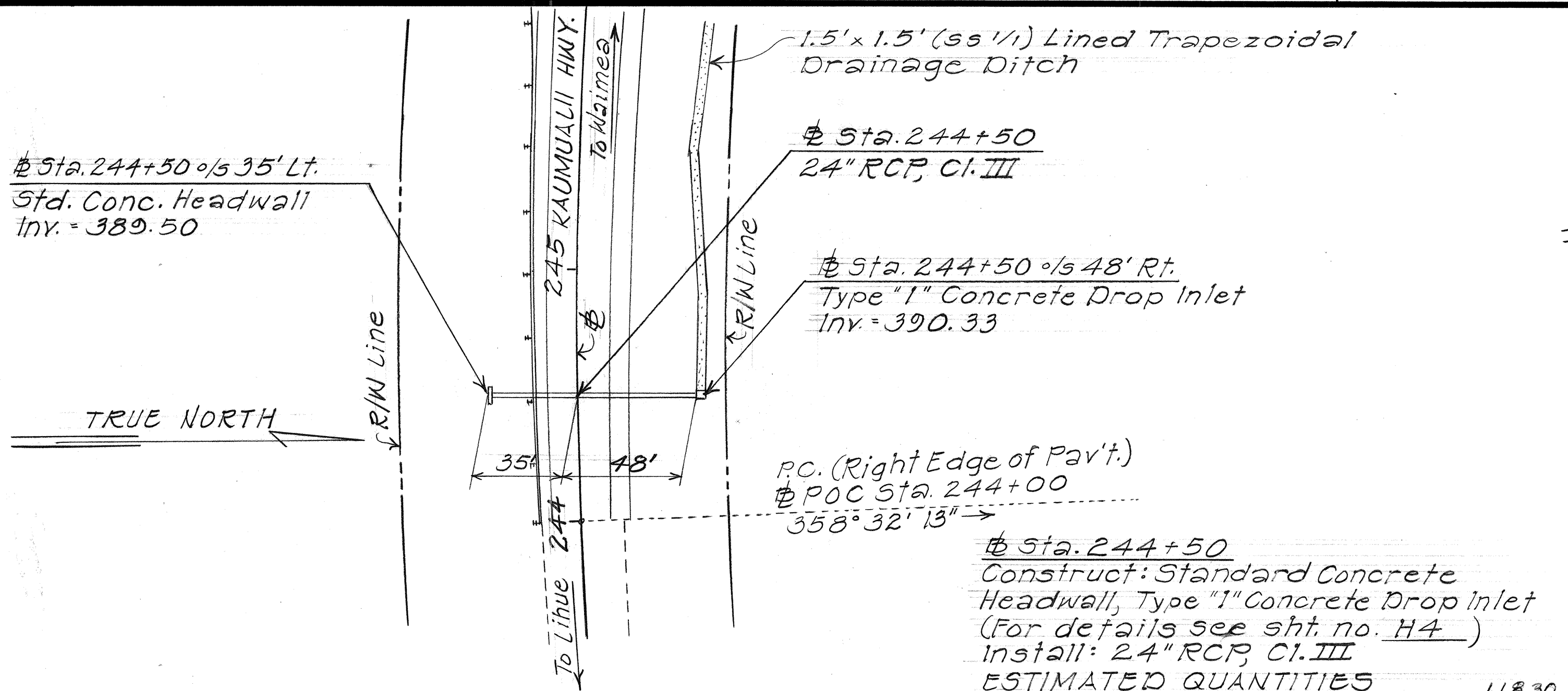
DRAINAGE DETAILS

KAUMUALII HIGHWAY
Huleia Bridge Replacement & Approaches
F.A. Proj. No. BR-F-50-1(7)

Scale: As shown Date: Nov. 1987

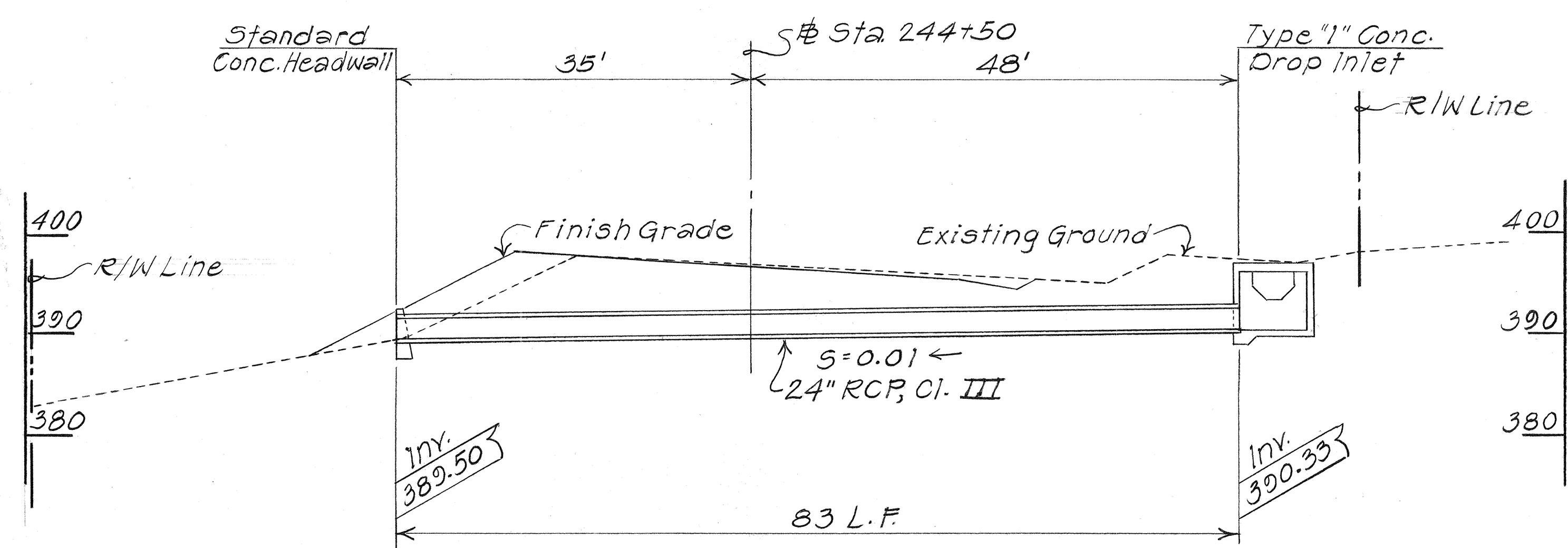
SHEET No. 11 OF 5 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-F-050-1(7)	1988	21	75

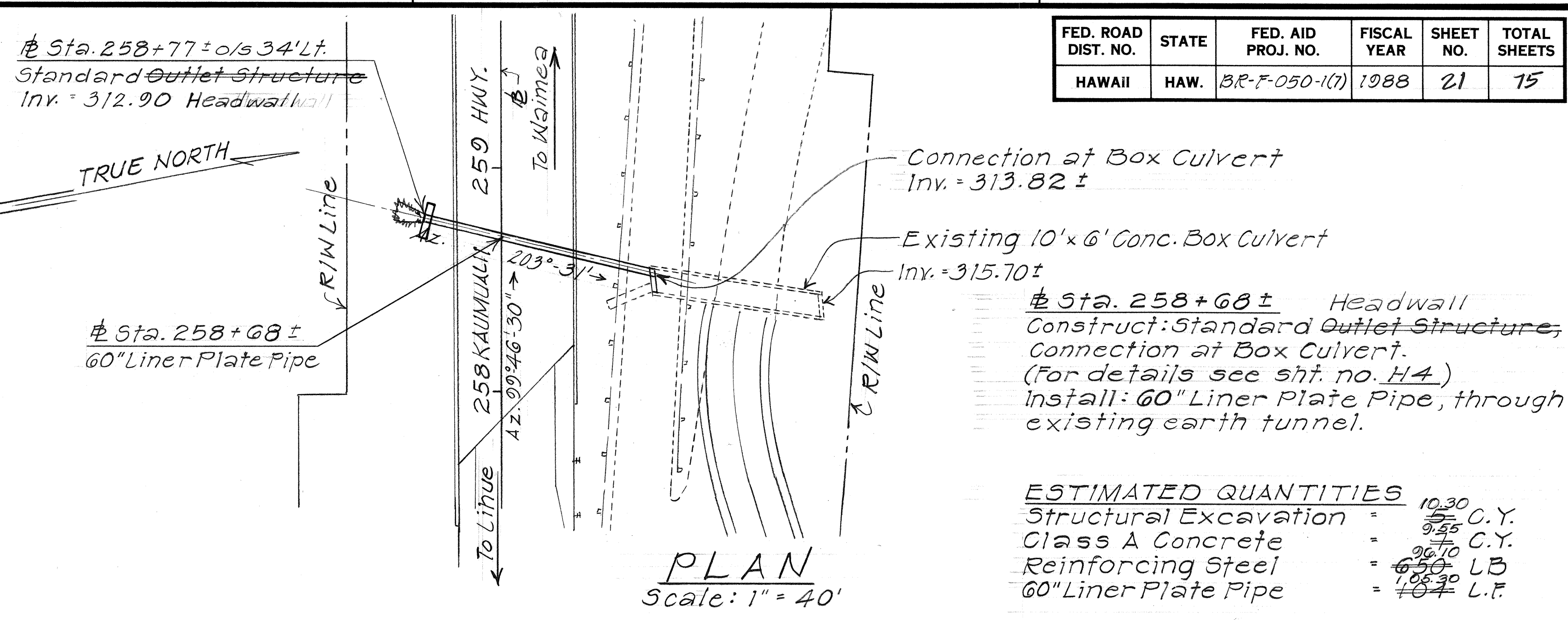


PLAN
Scale: 1" = 40'

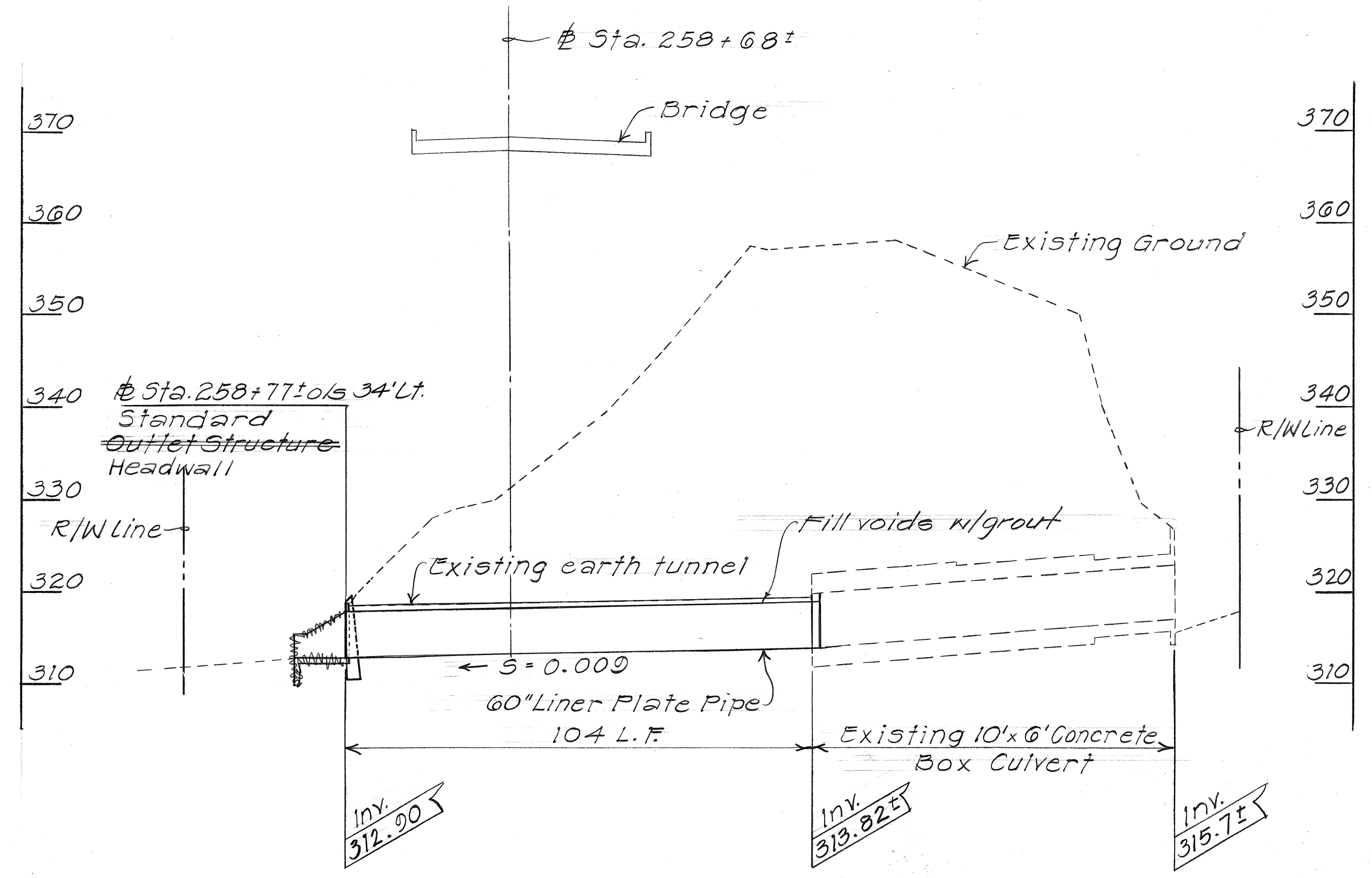
ESTIMATED QUANTITIES
 Structural Excavation = 118.30 C.Y.
 Class A Concrete = 1.67 C.Y.
 Reinforcing Steel = 42.45 LB
 Bed Course Material for Culvert = 1390.14 C.Y.
 24" RCP, CI. III = 77.83 L.F.
 Type "I" Concrete Drop Inlet = 1 Ea
 6.00 feet to 6.99 feet



PROFILE ALONG & CULVERT
 Scale: 1" = 10'
 24" CULVERT @ STA. 244+50



ESTIMATED QUANTITIES
 Structural Excavation = 10.30 C.Y.
 Class A Concrete = 9.35 C.Y.
 Reinforcing Steel = 650 LB
 60" Liner Plate Pipe = 104 L.F.



PROFILE ALONG & CULVERT
 Scale: Horz. 1" = 20'
 Vert. 1" = 10'
 60" CULVERT @ STA. 258+68

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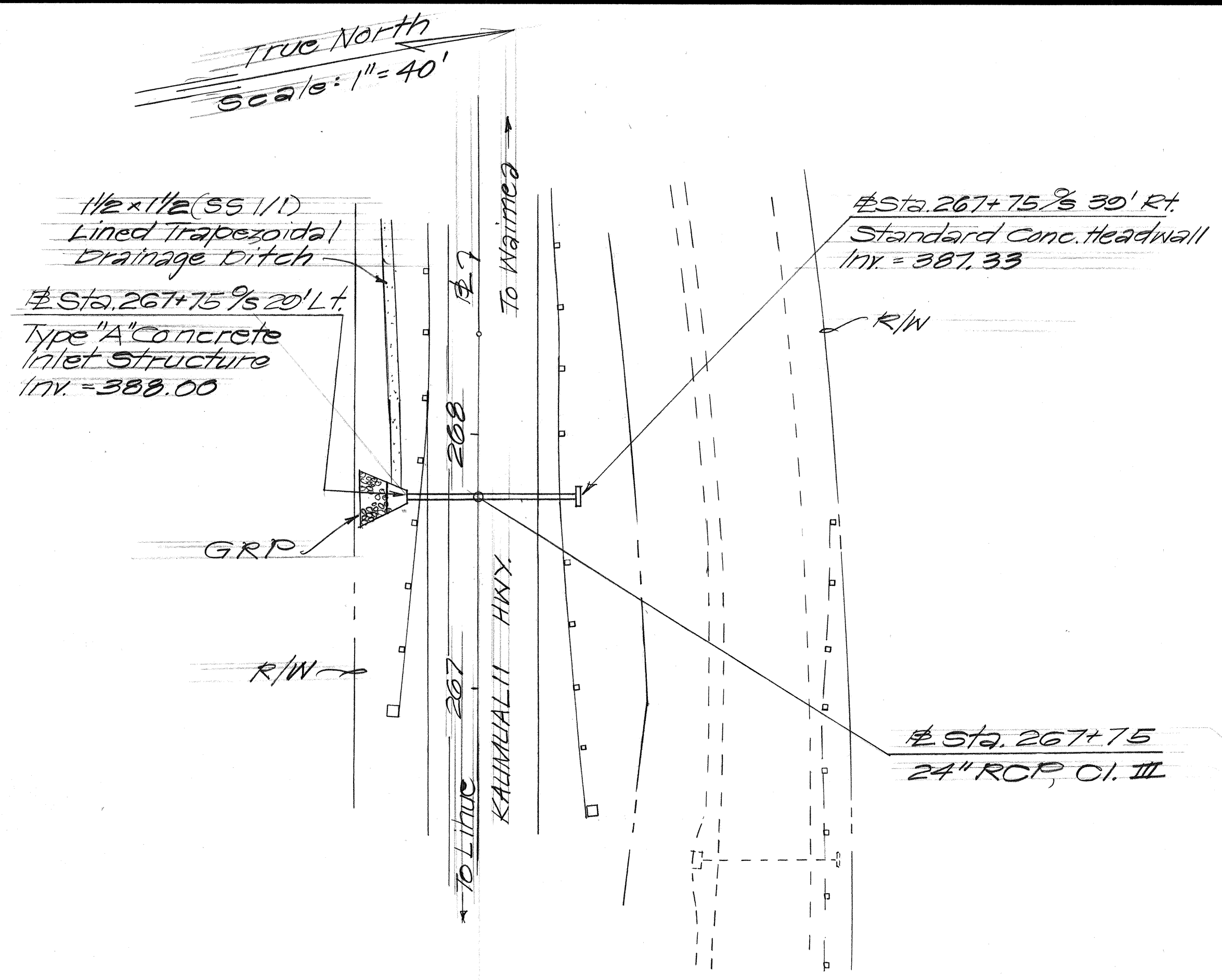
DRAINAGE PLAN & PROFILES
 KAUMUALII HIGHWAY
 Huleia Bridge Replacement & Approaches
 F.A. Proj. No. BR-F-50-1(7)
 Scale: As Shown Date: Nov. 1987
 SHEET No. 21 OF 5 SHEETS

ORIGINAL PLAN	DATE
DRAWN BY	
DESIGNED BY	
CHECKED BY	
NO.	

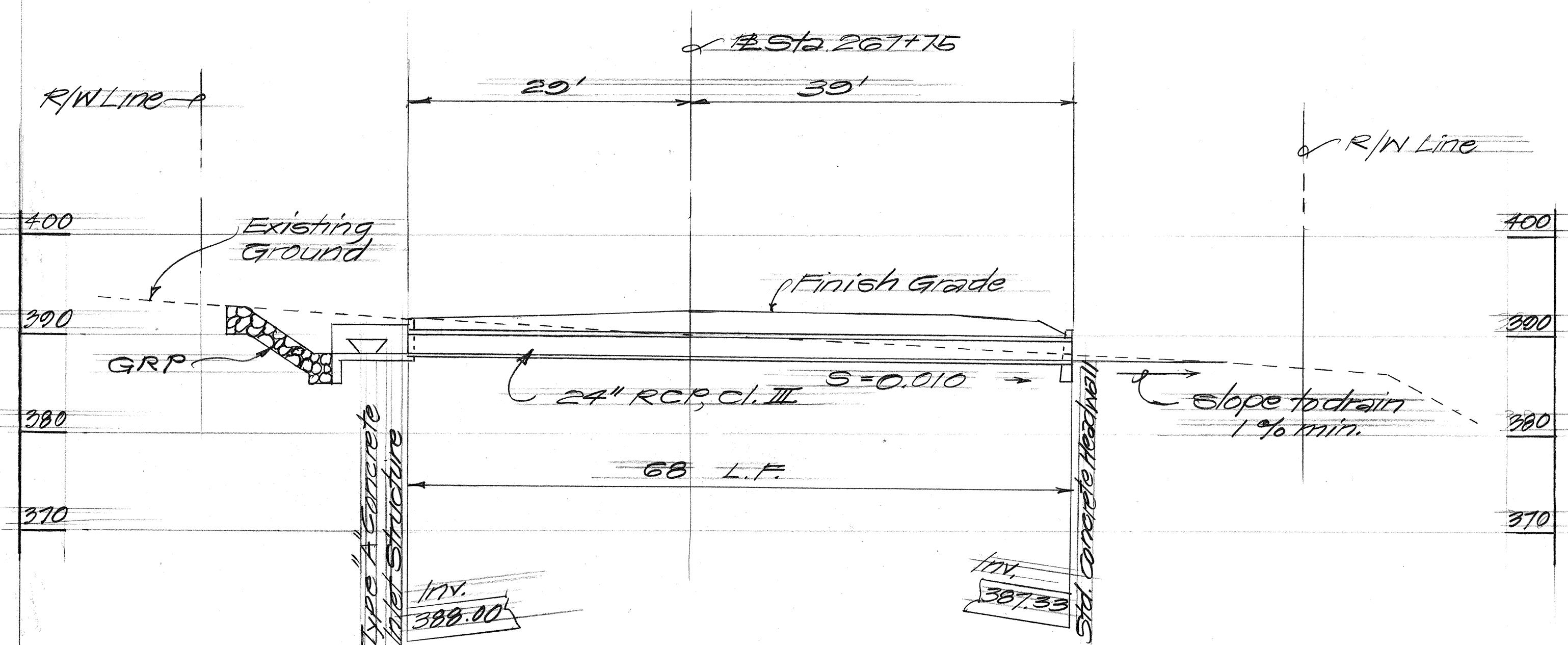
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-F-050-1(7)	1988	22	15

#Sta 267+75
Construct: Standard Concrete Headwall
Type "A" Concrete Inlet Structure
(For detail, see sht. no. H5)
Grouted Rubble Paving
(For detail, see sht. no. H5)
Install: 24" RCP, Cl. III

ESTIMATED QUANTITIES
Structural Excavation 19.60 ~~74~~ C.Y.
Class A Concrete 0.67 ~~7~~ C.Y.
Reinforcing Steel 538 ~~350~~ Lbs.
Bed Course Material
For Culverts 10.90 ~~12~~ C.Y.
24" RCP Cl. III 10.10 ~~68~~ L.F.
Grouted Rubble Paving 20.80 ~~74~~ C.Y.



PLAN
STA. 267+75



PROFILE ALONG ϕ CULVERT AT # STA. 267+75
Scale: 1" = 10'

SURVEY PLOTTED BY	DATE
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DESIGNED BY	
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ORIGINAL PLAN	
NOTE BOOK	
No.	

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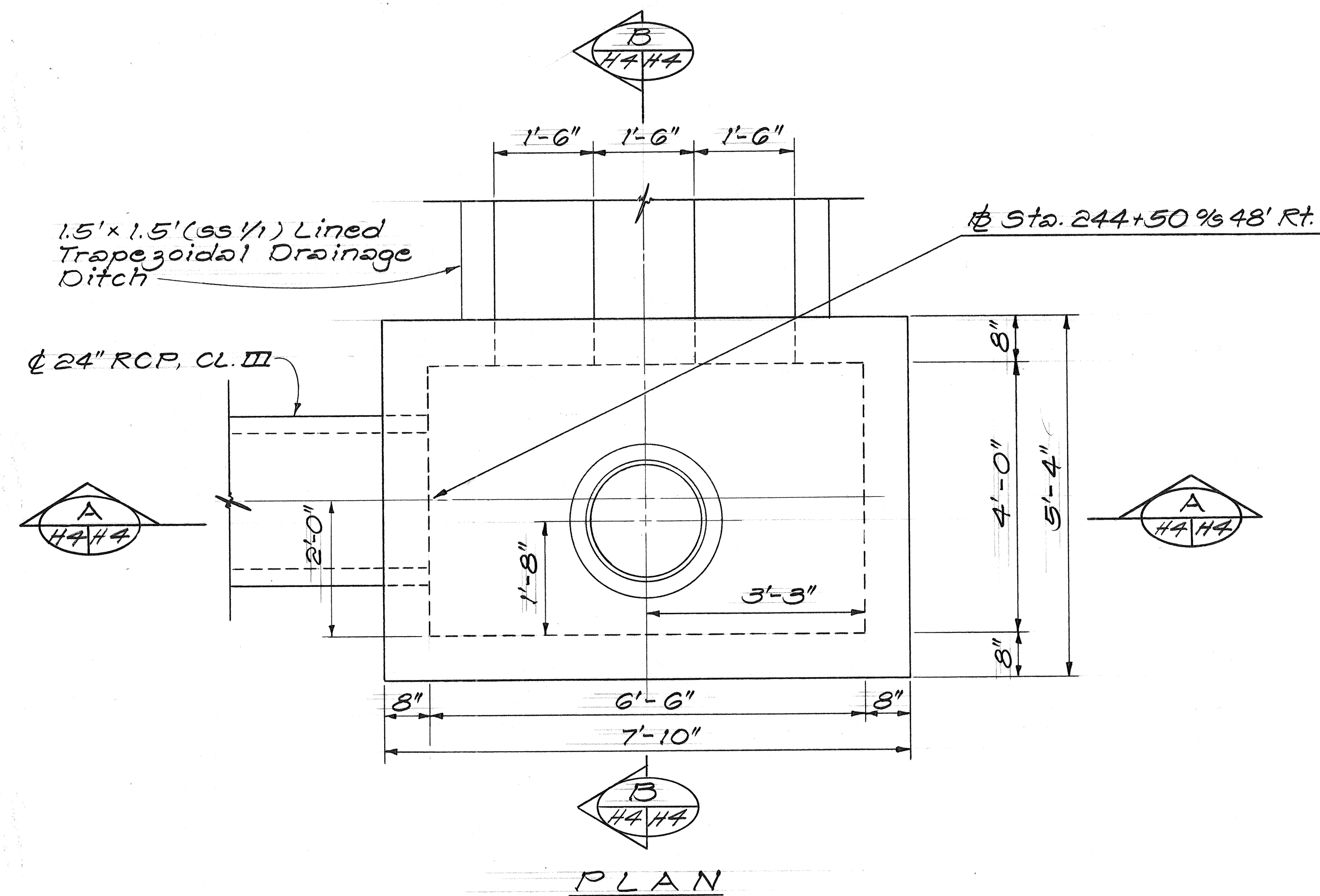
DRAINAGE PLAN & PROFILE

KAUMUALII HIGHWAY
Huleia Bridge Replacement & Approaches
F.A. Proj. No. BR-F-050-1(7)

Scale: As Shown Date: Nov. 1987

SHEET No. 43 OF 5 SHEETS

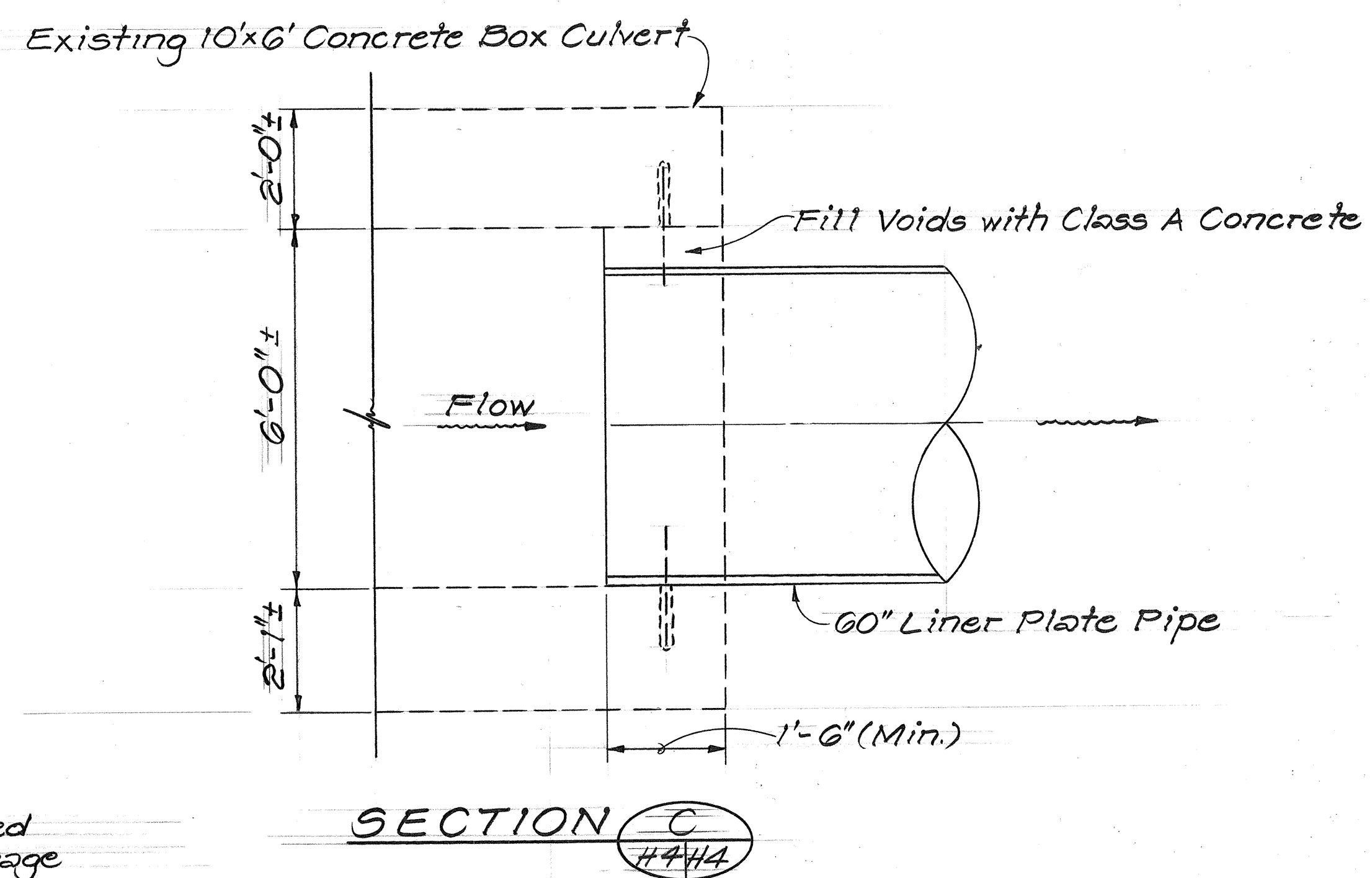
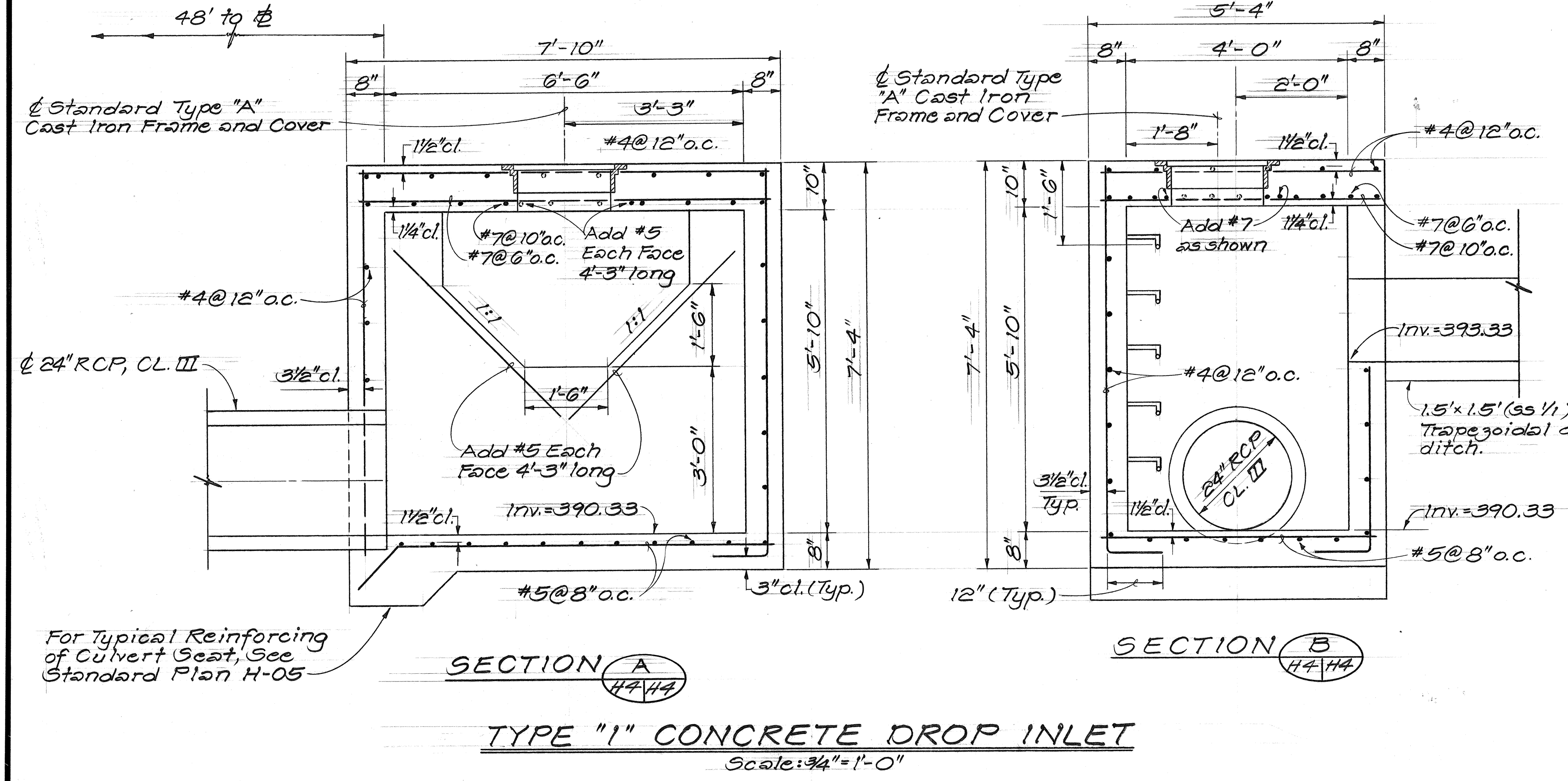
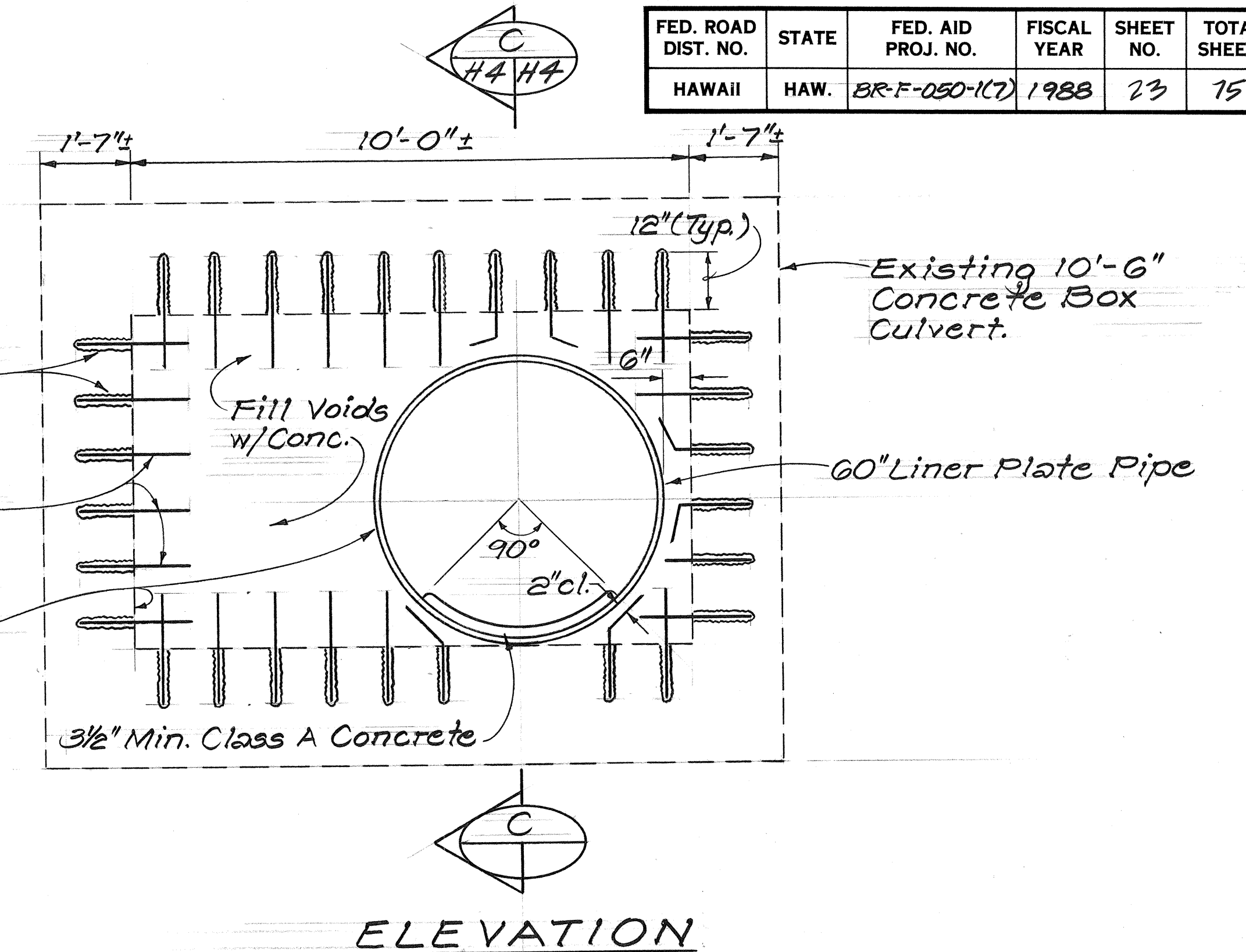
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-F-050-1(7)	1988	23	15



Suitable Non-Metallic, Moisture Insensitive, Non-Shrink Grout or Epoxy-Resin System Placed in Hole Size Recommended by Manufacturer. (Typical)

#5 bar 12" o.c. 2'-0" Long Bend as Required (Typical)

Apply Suitable Bonding System at Interface



CONNECTION DETAILS AT EXISTING CONCRETE BOX CULVERT

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

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DRAINAGE DETAILS

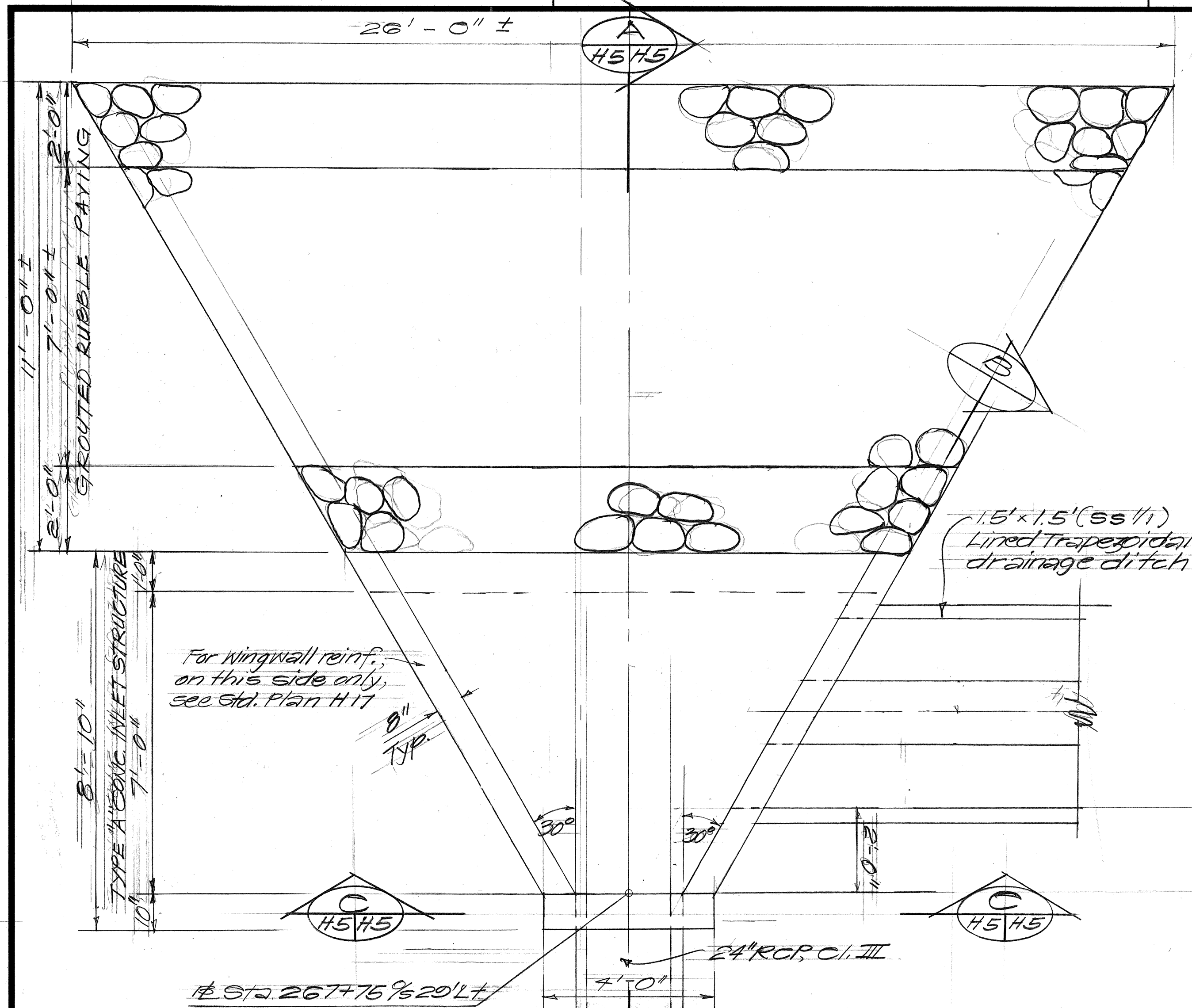
KAUMUALII HIGHWAY
Huleia Bridge Replacement & Approaches
F.A. Proj. No. BR-F-50-1(7)

Scale: As Shown Date: Nov. 1987

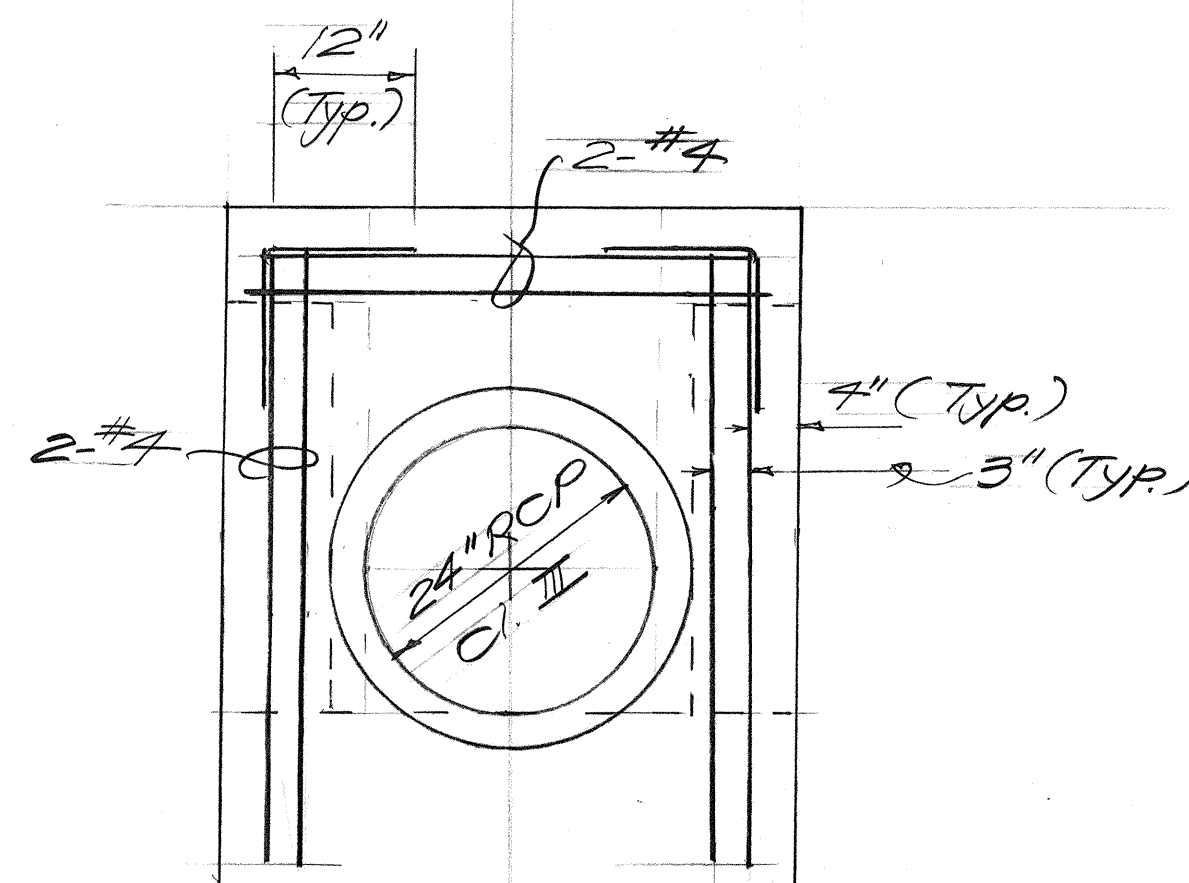
SHEET No. H4 OF 5 SHEETS

ORIGINAL PLAN	DATE
SURVEY PLOTTED BY	
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	

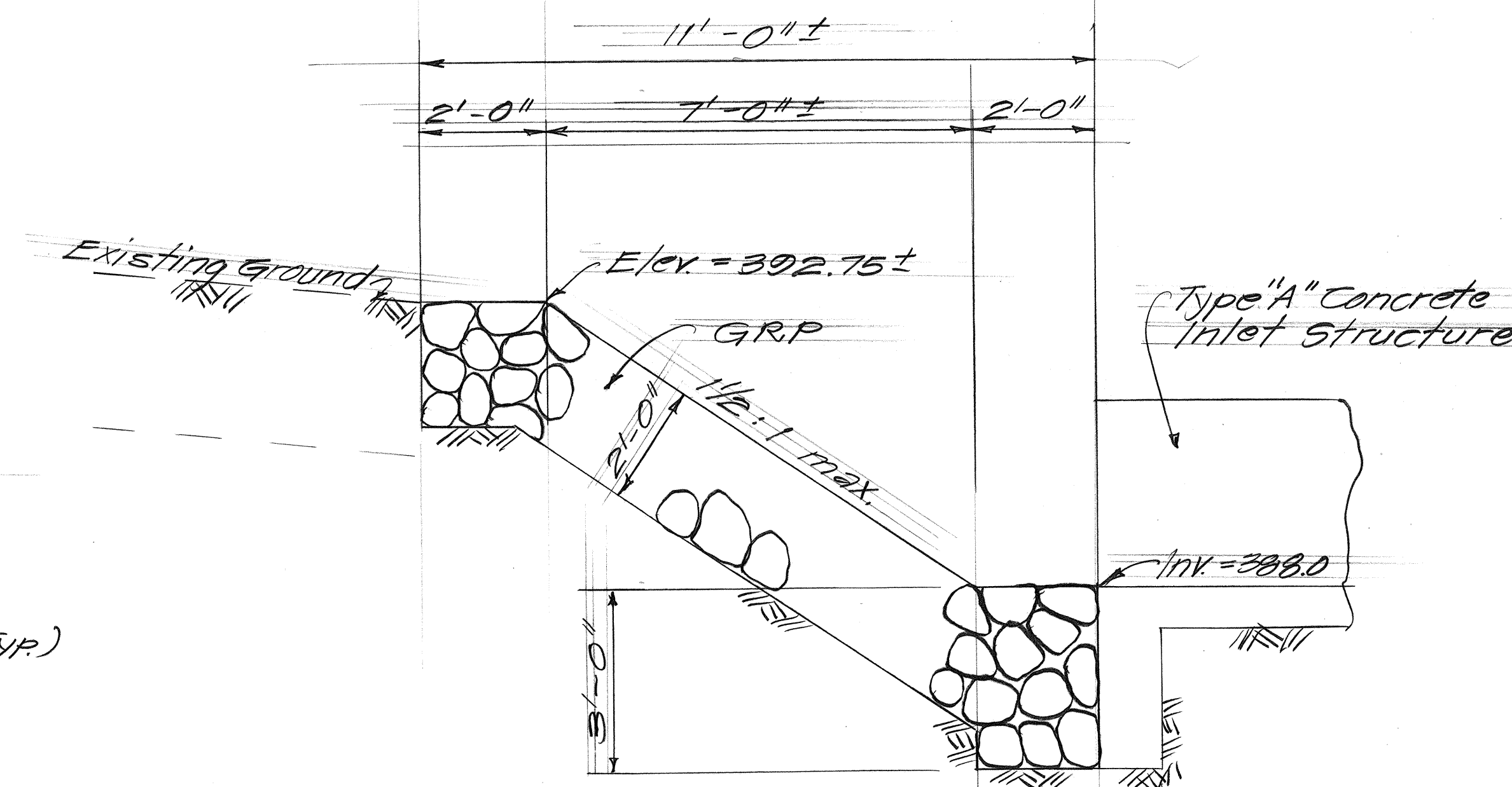
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-F-050-1(7)	1988	24	75



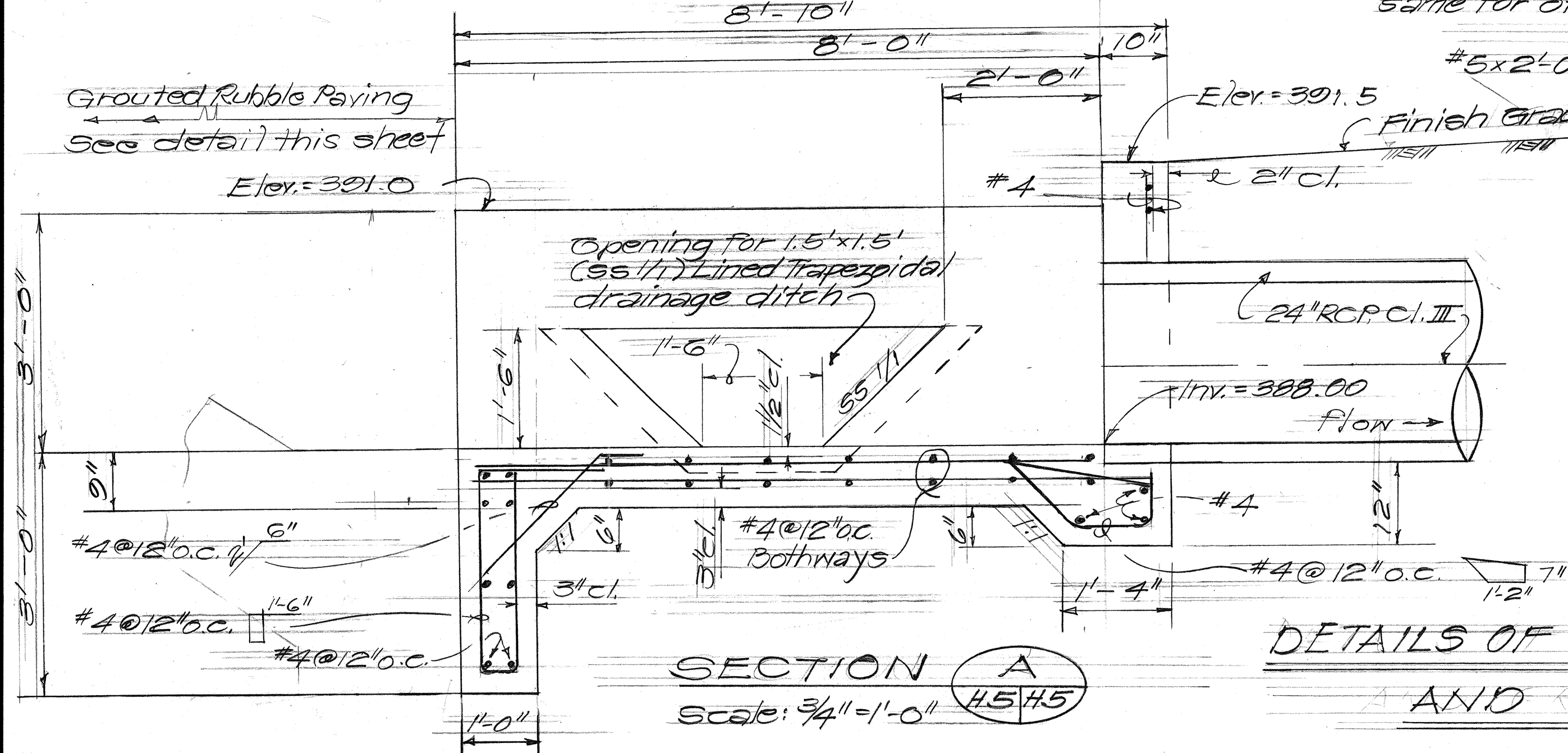
PLAN
Scale: 1/2" = 1'-0"



SECTION C
H5/H5
REINFORCING AT HEADWALL
Scale: 3/4" = 1'-0"

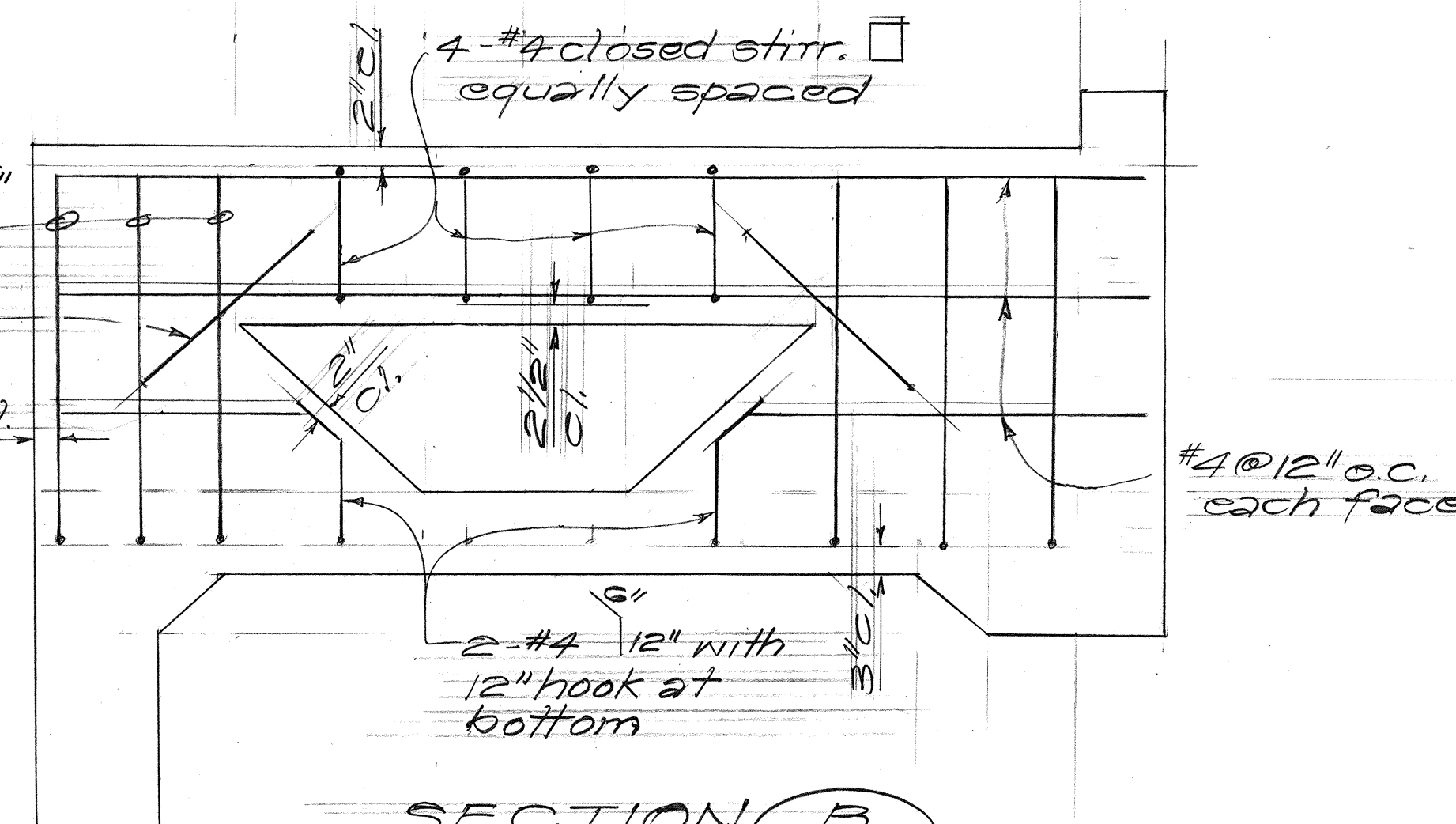


DETAILS OF GROUTED RUBBLE PAVING AT STA. 267+75 LT.
Scale: 1/2" = 1'-0"



SECTION A
H5/H5
Scale: 3/4" = 1'-0"

DETAILS OF TYPE "A" CONCRETE INLET STRUCTURE AND GROUTED RUBBLE PAVING



SECTION B
H5/H5
REINFORCING AT WINGWALL
Scale: 3/4" = 1'-0"

DATE: _____

REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

KAUMUALII HIGHWAY
Huleia Bridge Replacement & Approaches
F.A. Proj. No. BR-F-50-1(7)

Scale: As Shown Date: Nov. 1987

SHEET NO. 45 OF 5 SHEETS

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ORIGINAL PLAN	
NOTE BOOK	
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