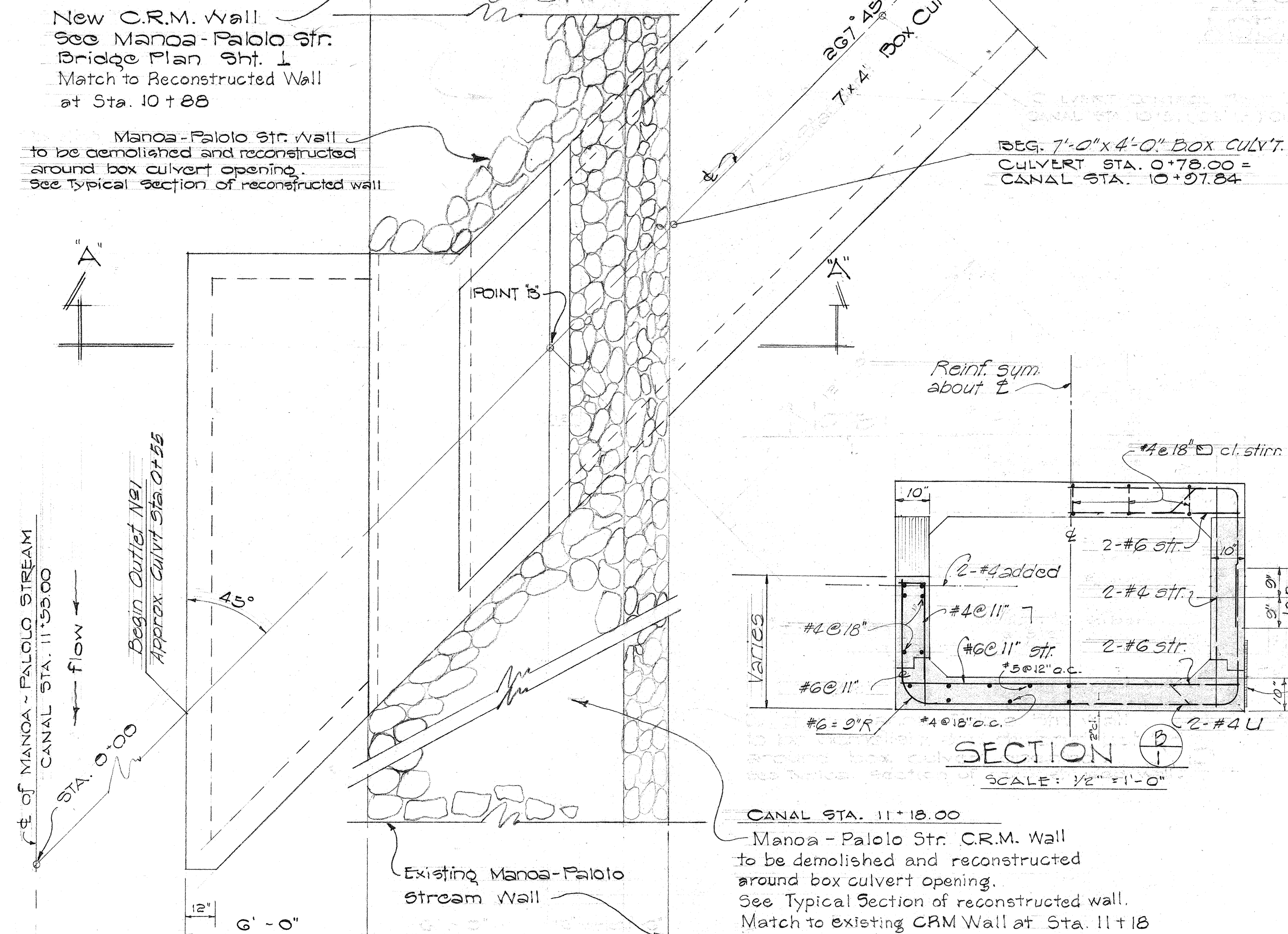


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-411(5)-24 Unif 1	1964	10	34

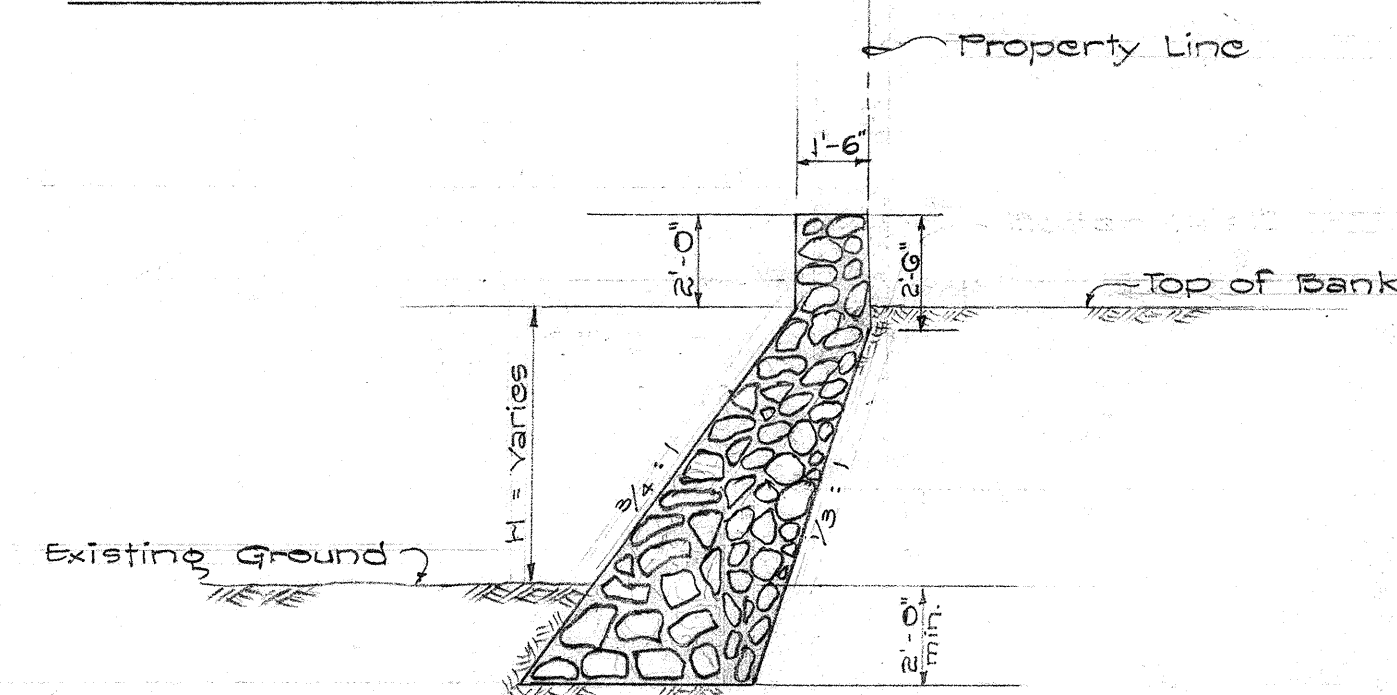
NOTE:

Demolishing of Manoa-Palolo Stream
C.R.M. Wall from Sta. 10+88 to Sta. 11+18
to be incidental to unit price of C.R.M.



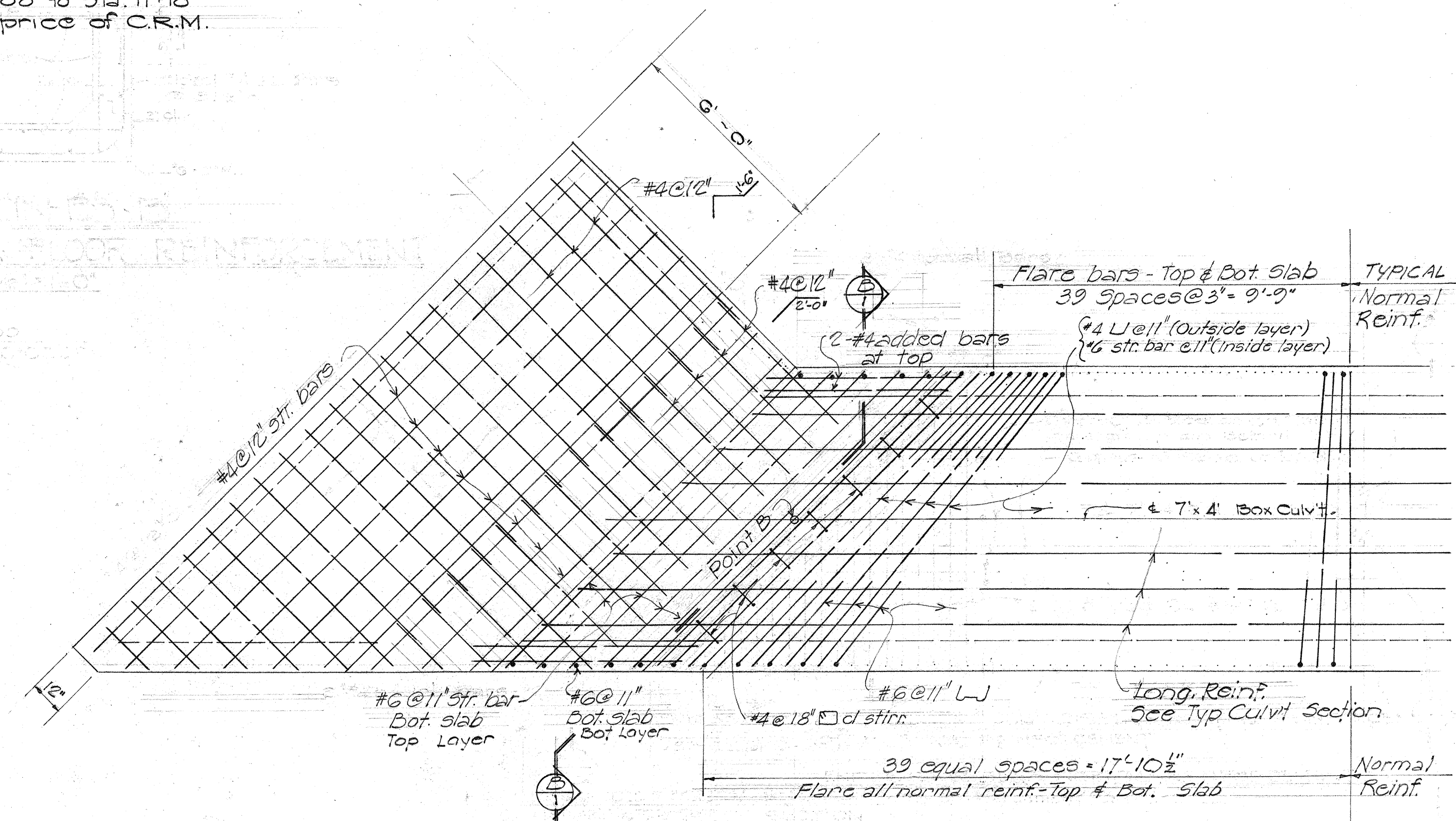
PLAN ~ OUTLET NO 1 AND BOX CULVERT

SCALE : $3/8" = 1' - 0"$



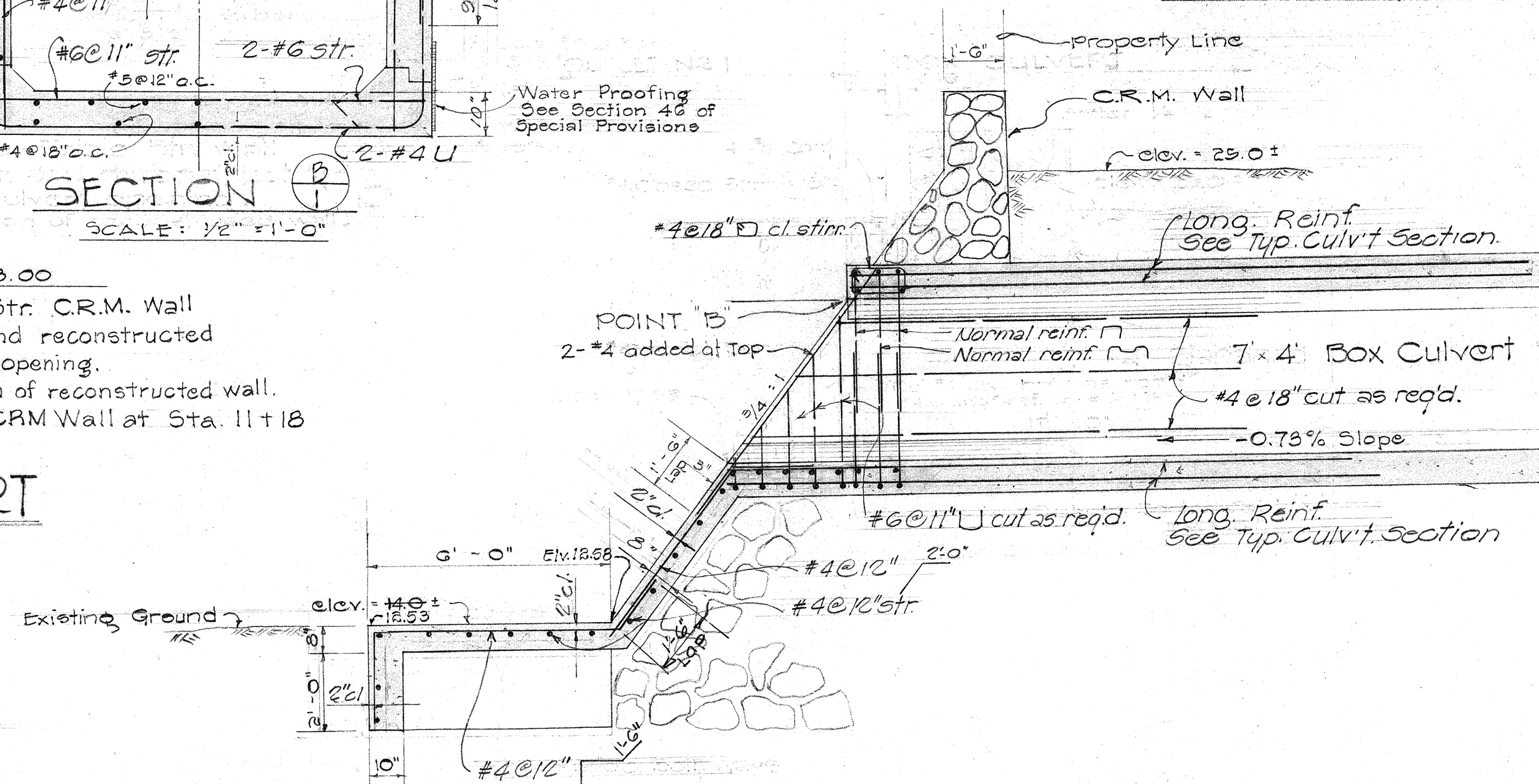
TYPICAL SECTION OF RECONSTRUCTED C.R.M. WALL

SCALE: $\frac{1}{4}" = 1'-0"$



PLAN - PARTIAL REINFORCEMENT

SCALE : $3/8" = 1' - 0"$



SECTION "A-A"

SCALE: 3/8" = 1'-0"

GENERAL NOTES FOR DRAINAGE STRUCTURES

1. All concrete for Drainage Structures shall be class "A-1" conc. unless otherwise noted.
2. All brick and mortar used to plug holes for future pipe connections shall be considered as incidental to the various contract items in the Proposal Schedule and no separate payment will be made for this work.
3. All Standard M. H. Runes for Drainage Structures to be incidental to class "A-1" concrete.
4. Cement Mortar for plastering exterior surface of brick walls to be incidental to "brick walls for S.D.M.H. #6 and S.D.M.H. #5".

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL DETAILS FOR DRAINAGE STRUCTURES

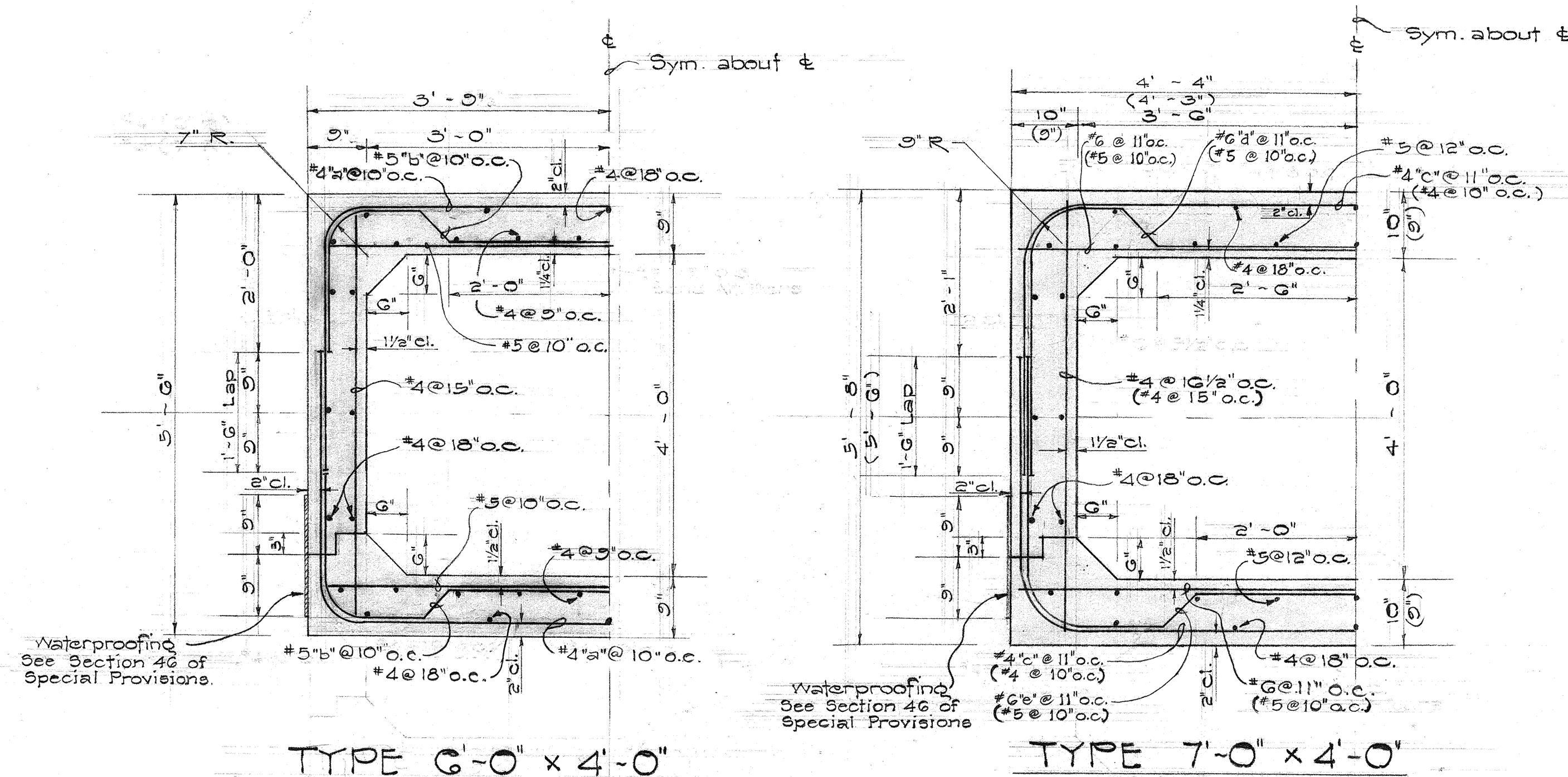
OUTLET & STREAM WALL DETAIL

INTERSTATE HIGHWAY
Proj. No. I-41-1(5): 24 Unit 1

Scale: As shown Date: April, 1964

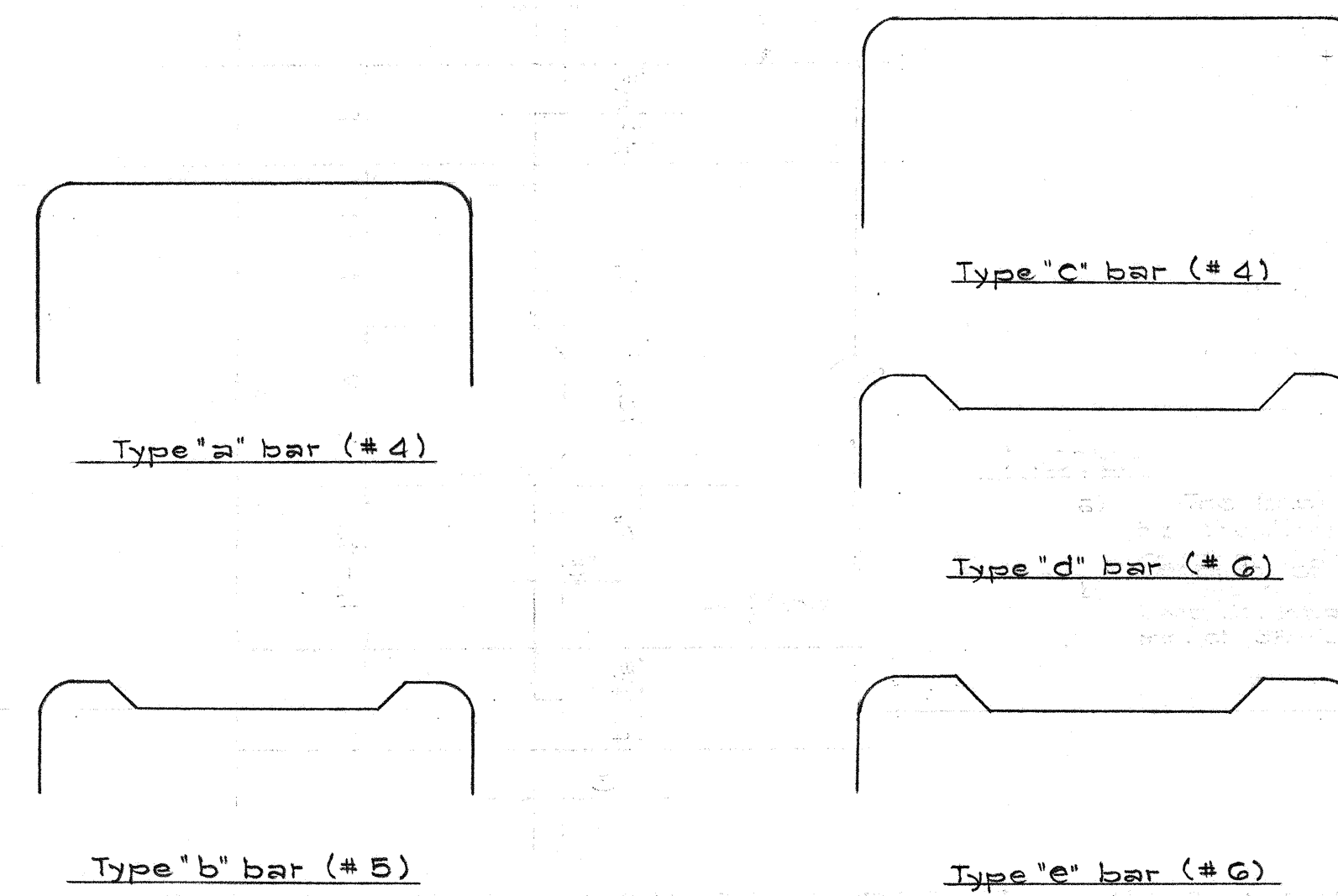
SHEET No. 1 OF 8 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5)24 Unit 1	1964	11	34

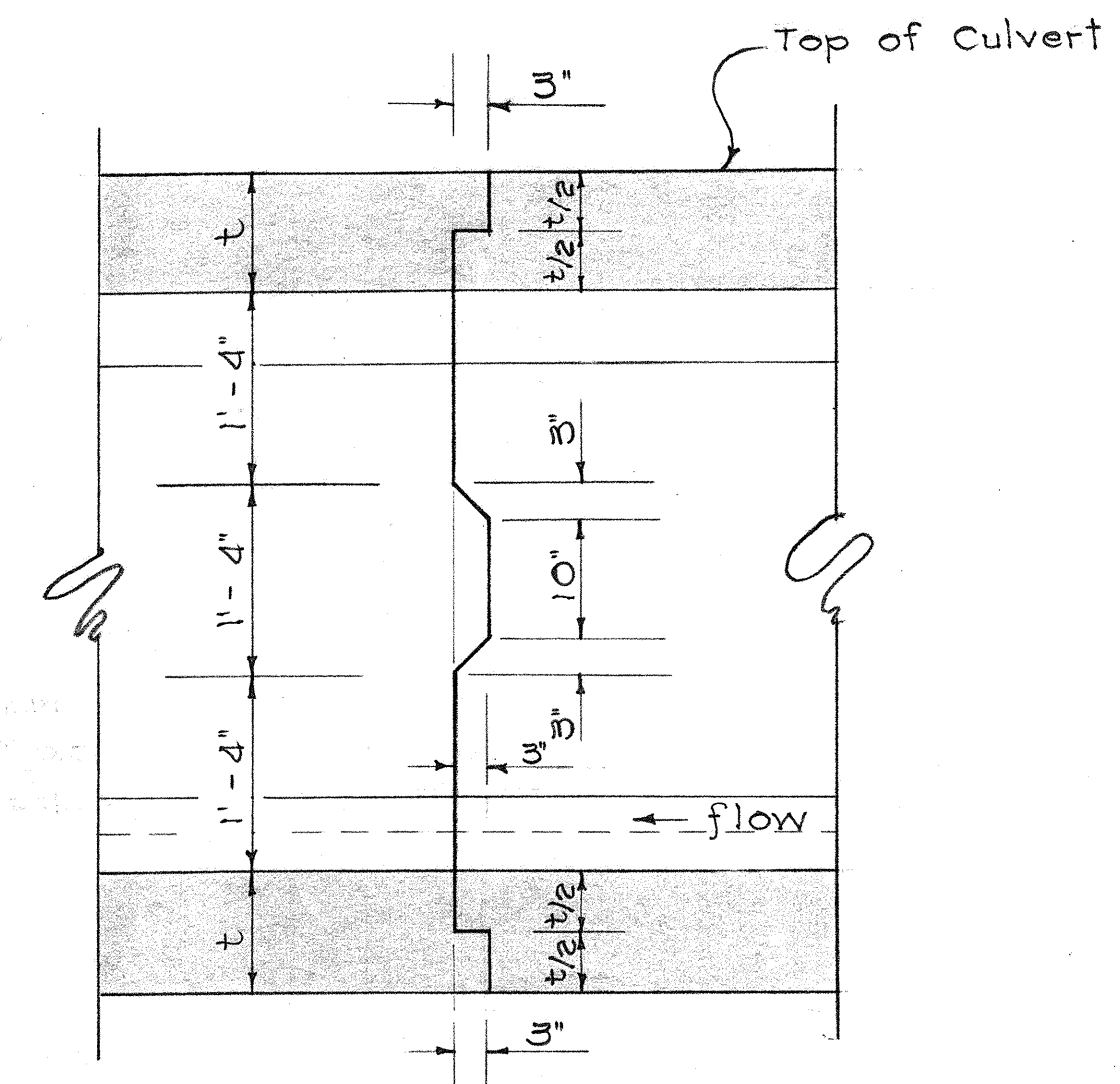


BOX CULVERTS
SCALE: 3/4" = 1'-0"

NOTE: From beginning of 7'-0' x 4'-0' Type Box Culvert to Station 3+50 as shown above. Use figures in parenthesis for Station 3+50 to Station 3+87.68.

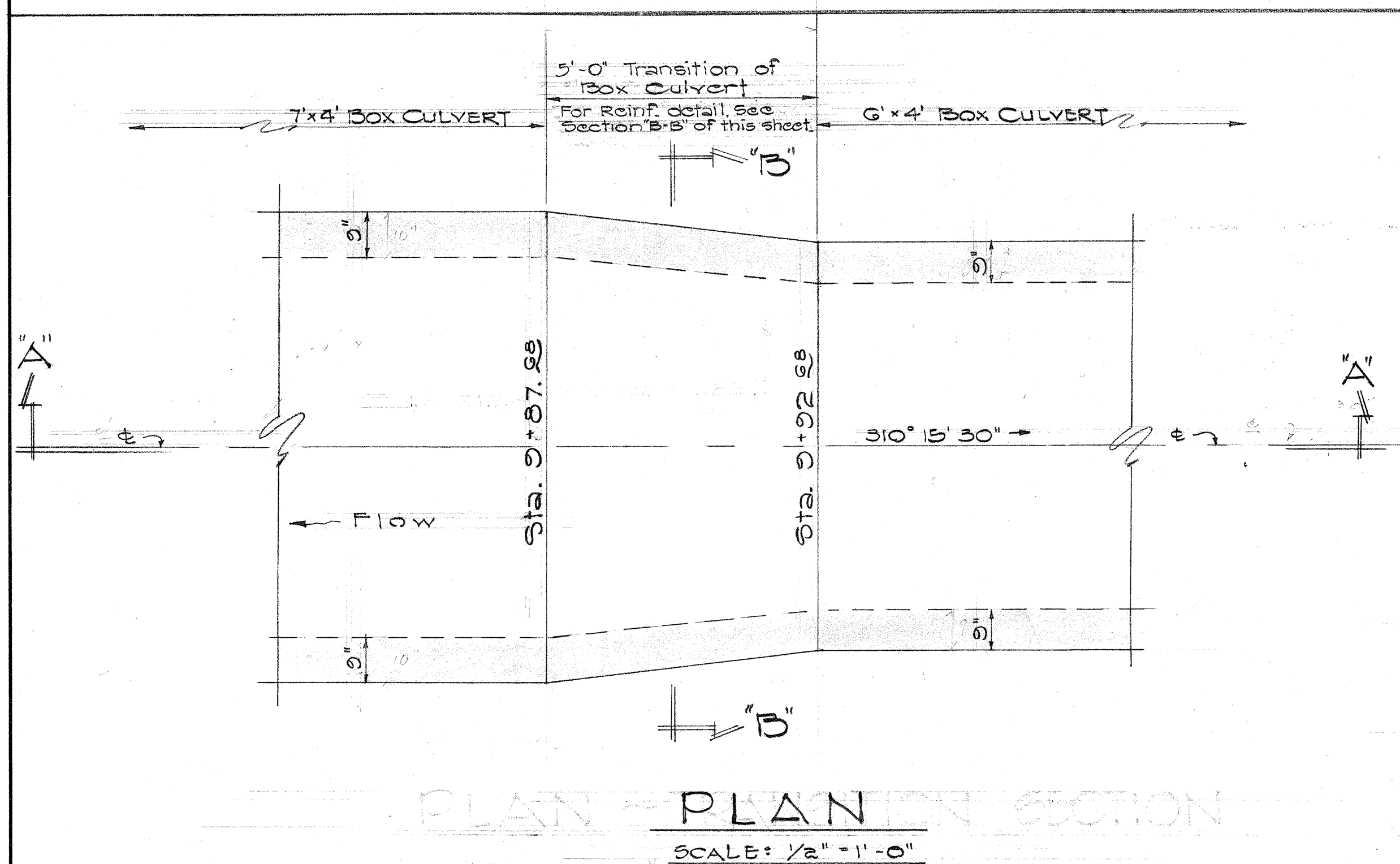


TYPICAL BENT BARS
NOT TO SCALE

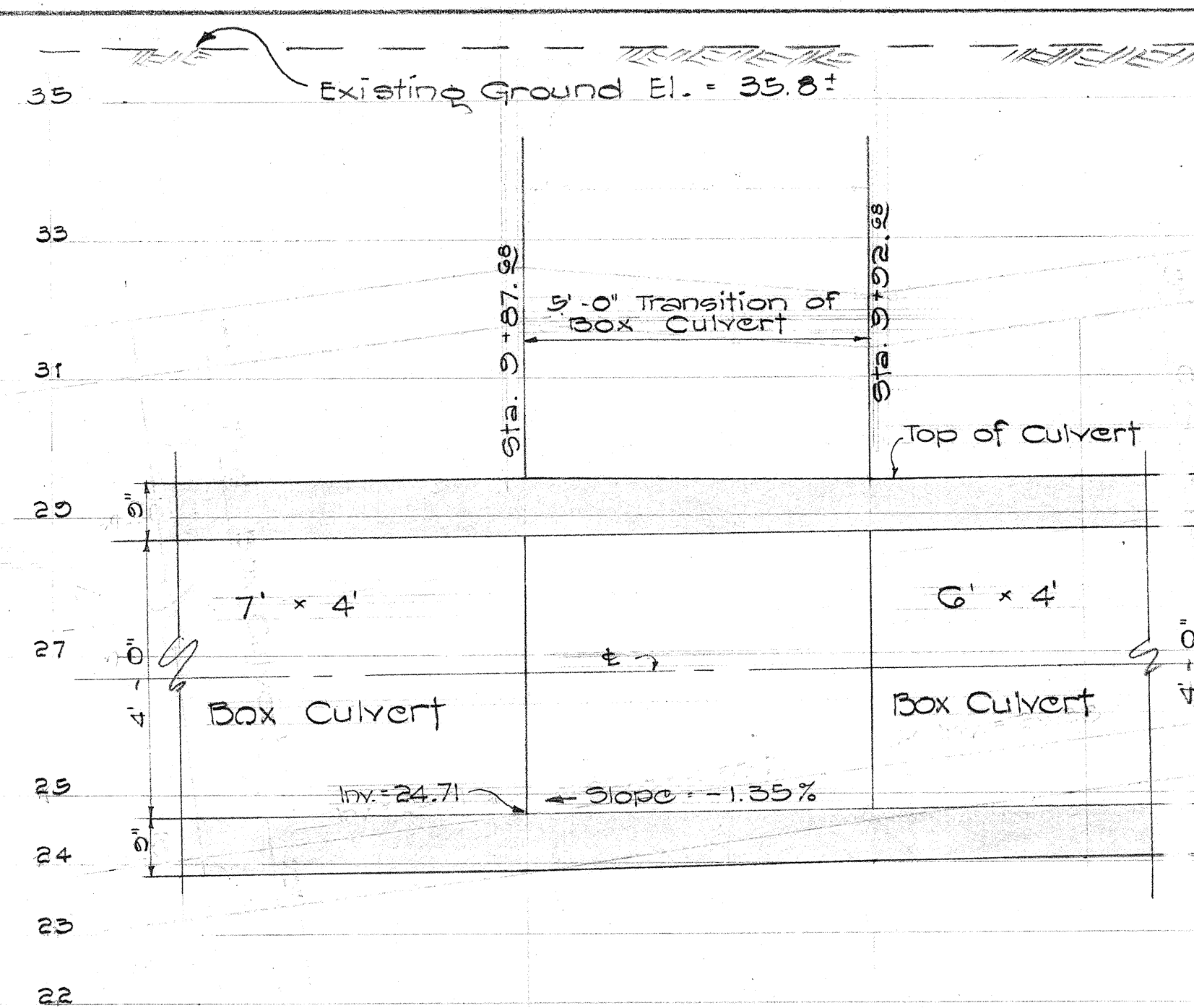


NOTE:
(a) The Engineer shall determine the location of all joints. Maximum spacing of joints shall be 30' o.c.
(b) Extend all longitudinal reinforcing bars through construction joints with a min. of 32 x bar diameter.

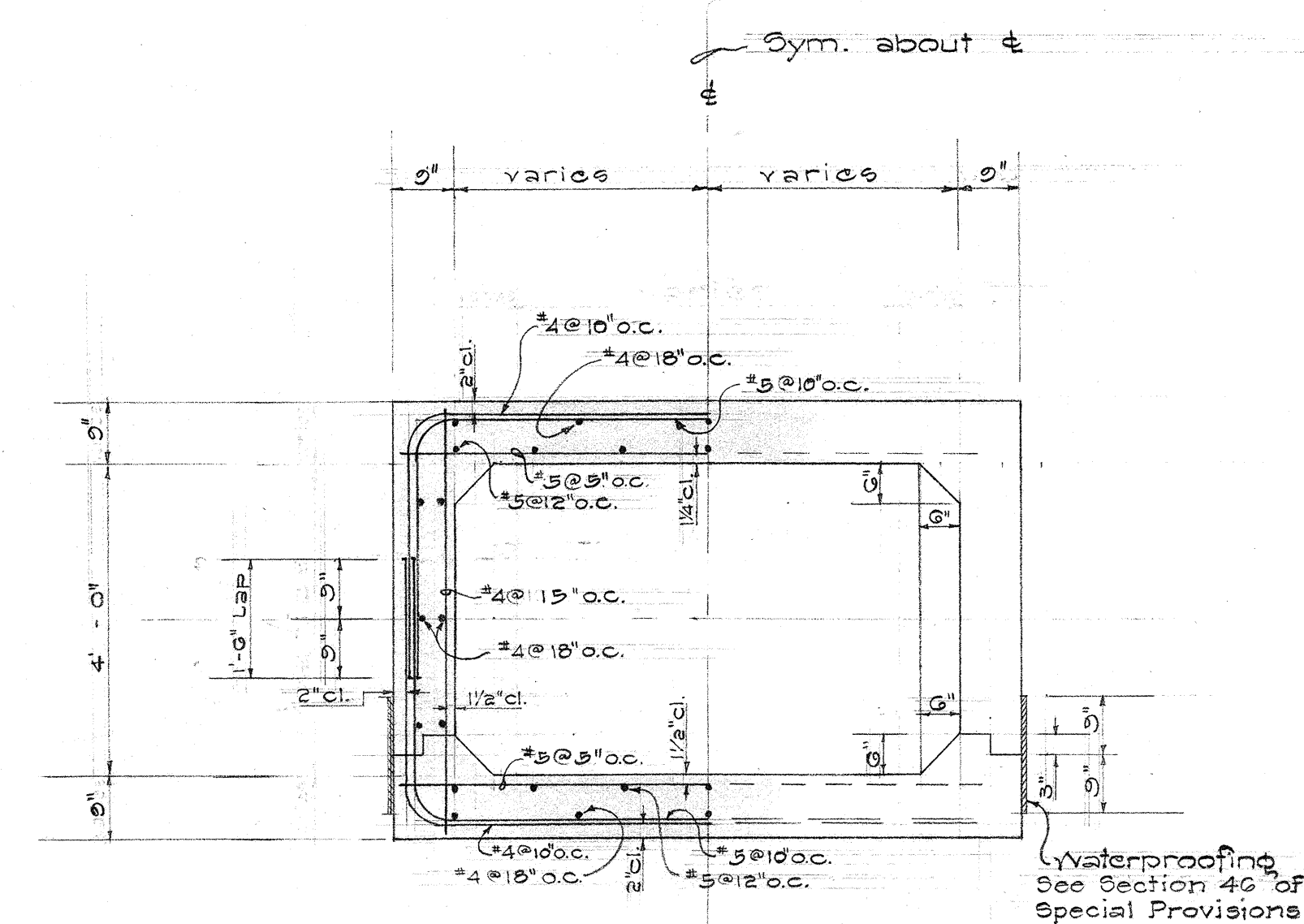
ELEVATION VIEW OF CONSTRUCTION JOINT DETAIL TYPICAL FOR 6' x 4' AND 7' x 4' BOX CULVERTS
SCALE: 3/4" = 1'-0"



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



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



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

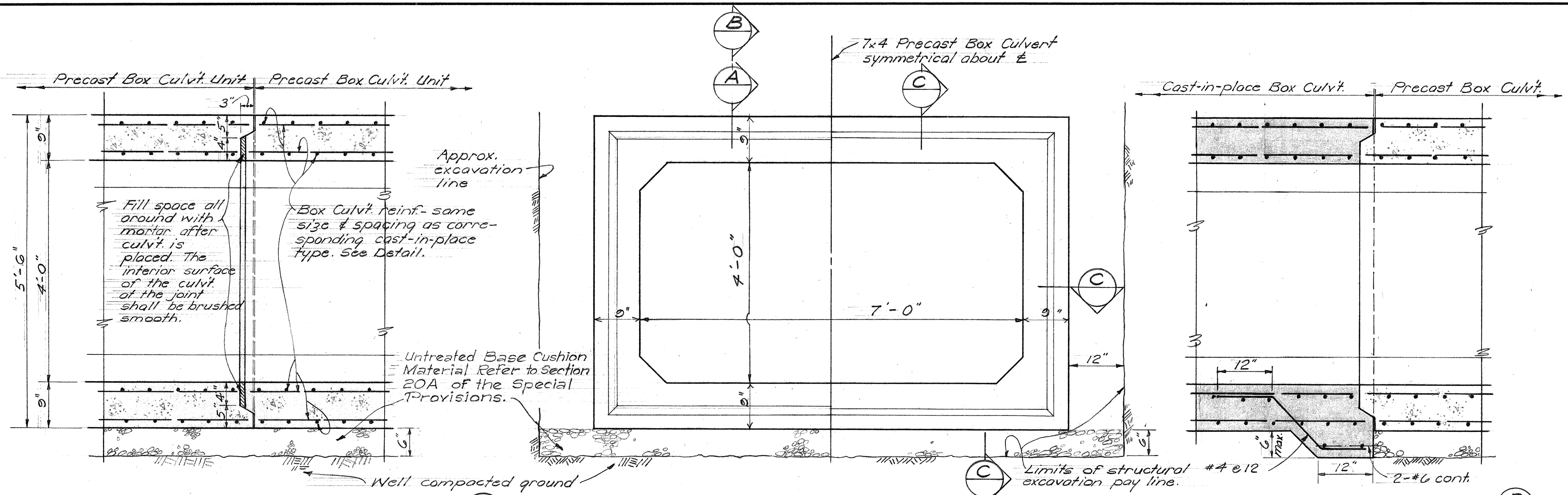
TRANSITION SECTION @ STA. 3+87.68 TO STA. 3+92.68
SCALE: 1/2" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL DETAILS FOR DRAINAGE STRUCTURES
BOX CULVERT AND TRANSITION
INTERSTATE HIGHWAY
Proj. No. I-HI-1(5) 24 Unit 1
Scale: As Shown Date: April, 1964
SHEET No. 2 OF 8 SHEETS

DATE	DESIGNED BY
10/1/63	DRIVEN BY
10/1/63	CHECKED BY
10/1/63	NOTED BY
10/1/63	NO.

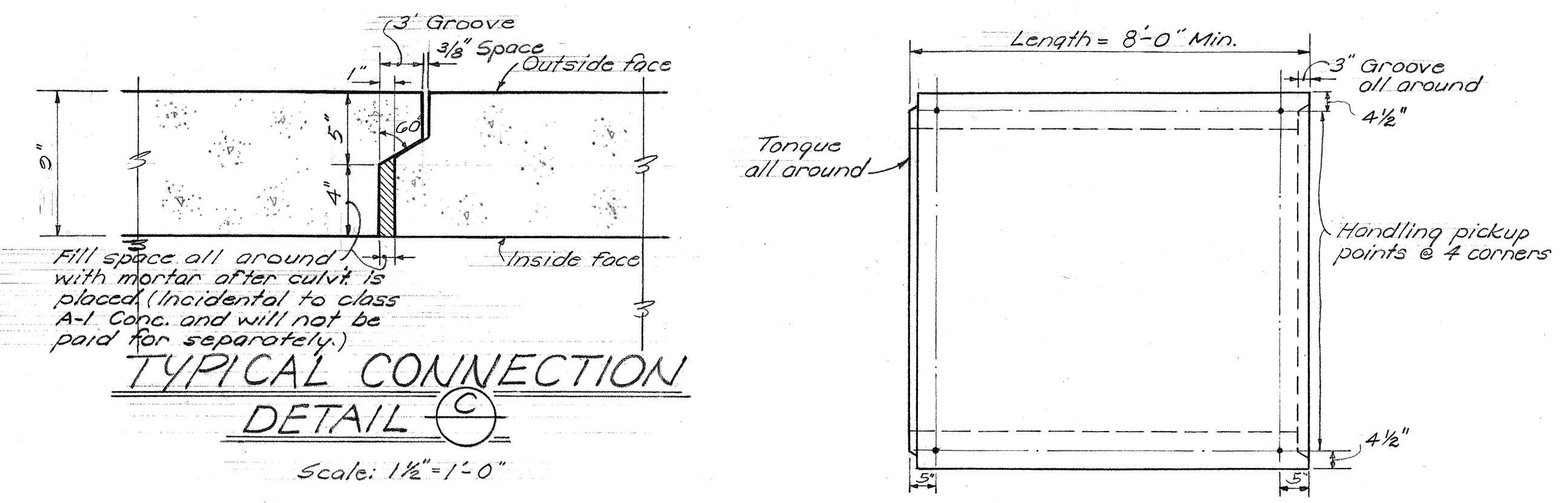
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(B)-24 Unit 1	1964	12	34



ASSEMBLAGE SECTION (A) HALF TONGUE END HALF GROOVE END
Scale: 3/4" = 1'-0"

TYPICAL END ELEVATION
Scale: 3/4" = 1'-0"

TYPICAL SECTION (B) CONNECTION DETAIL AT CAST-IN-PLACE CONCRETE
Scale: 3/4" = 1'-0"



TYPICAL CONNECTION DETAIL (C)
Scale: 1 1/2" = 1'-0"

TOP PLAN-TYPICAL PRECAST BOX CULVERT UNIT
Scale: 3/8" = 1'-0"

NOTE: Contractor to determine maximum length and pickup points and submit 4 sets of shop drawings for approval by the Engineer.

TYPICAL PRECAST BOX CULVERT CONNECTION DETAILS
SEE GENERAL NOTES ON SHEET 1 FOR LIMITS OF PRECAST BOX CULVERT

SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
NO.	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL DETAILS FOR
DRAINAGE STRUCTURES

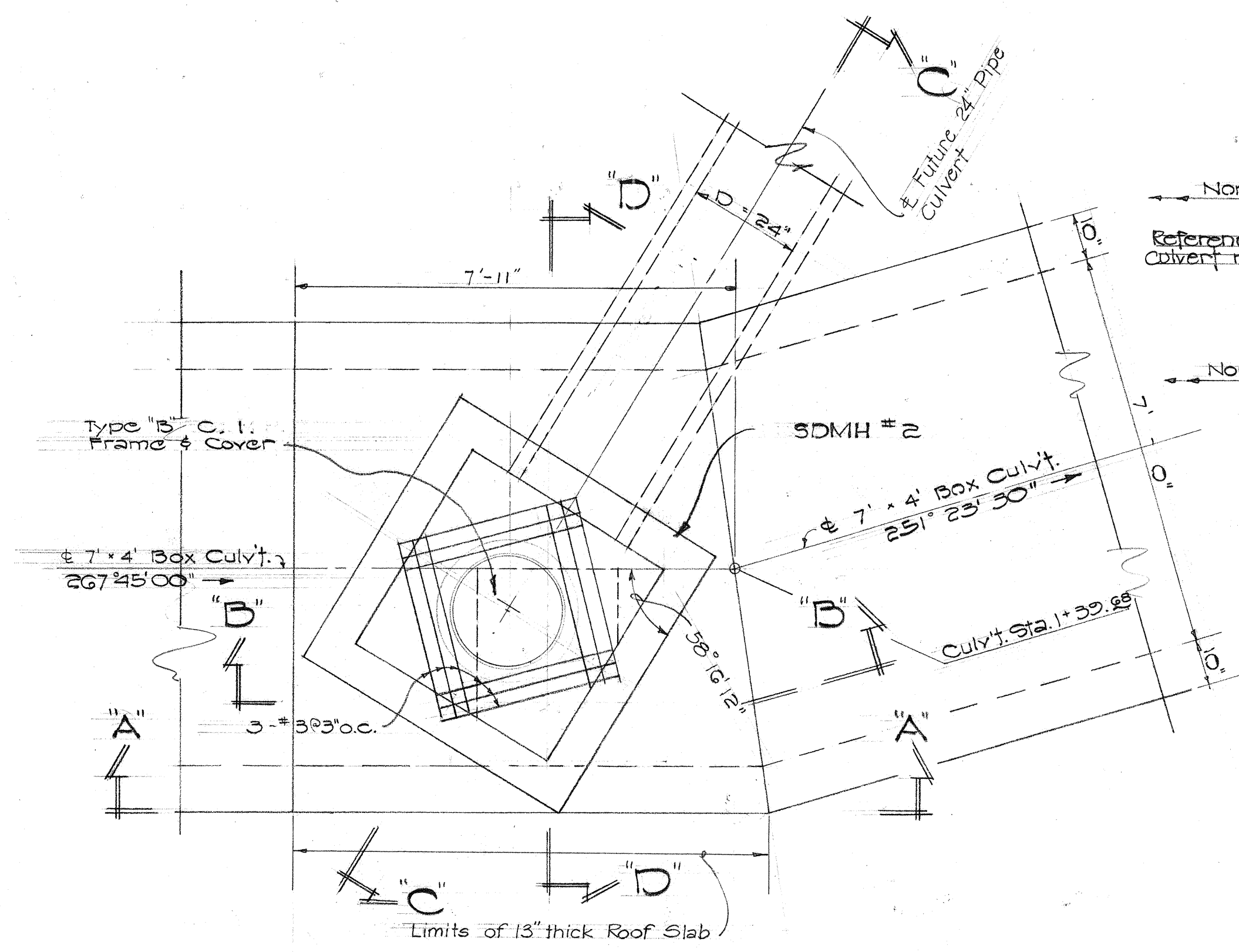
PRE-CAST BOX CULVERT

INTERSTATE HIGHWAY
Proj. No. I-H-1(B)-24 Unit 1

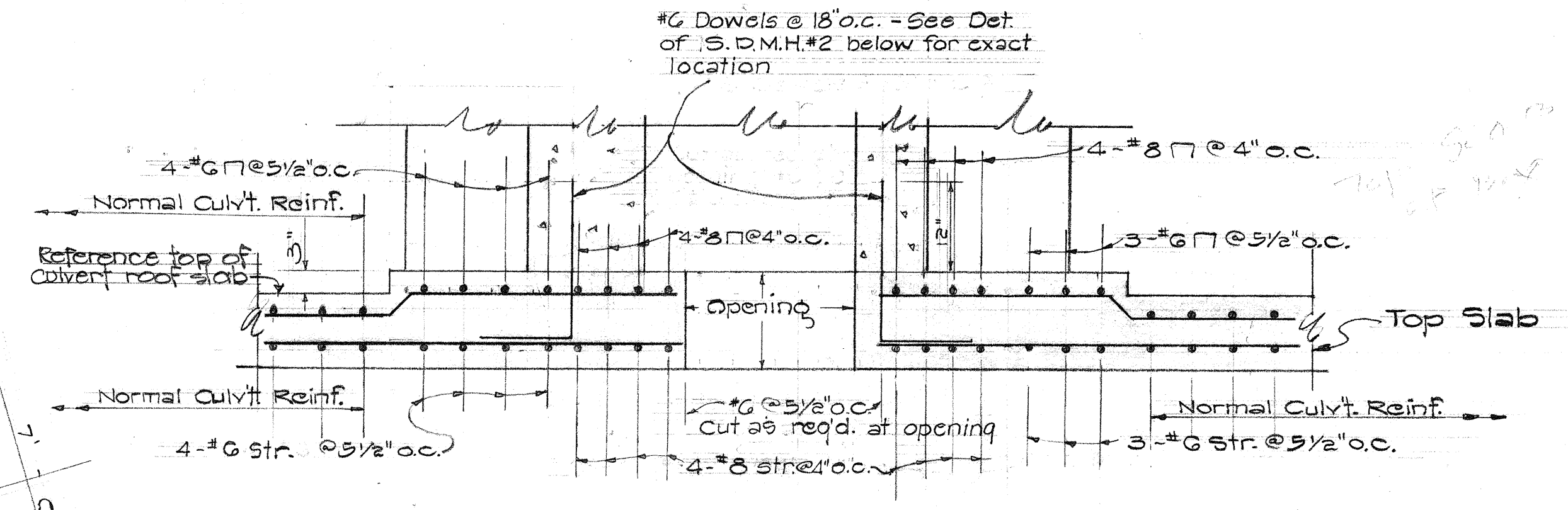
Scale: As Shown Date: May 1964

SHEET No. 3 OF 8 SHEETS

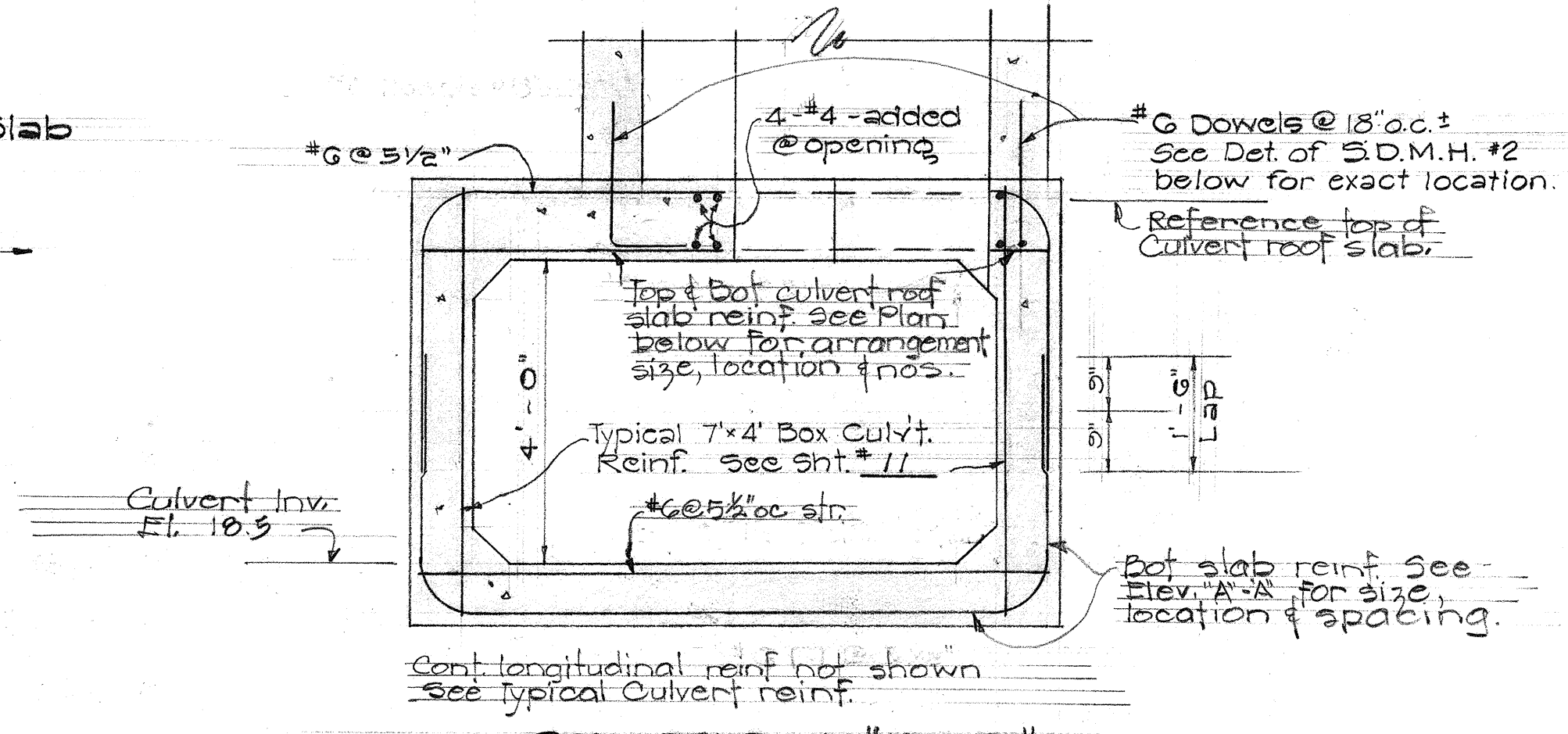
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-11(15) 24 Unit 1	1964	13	34



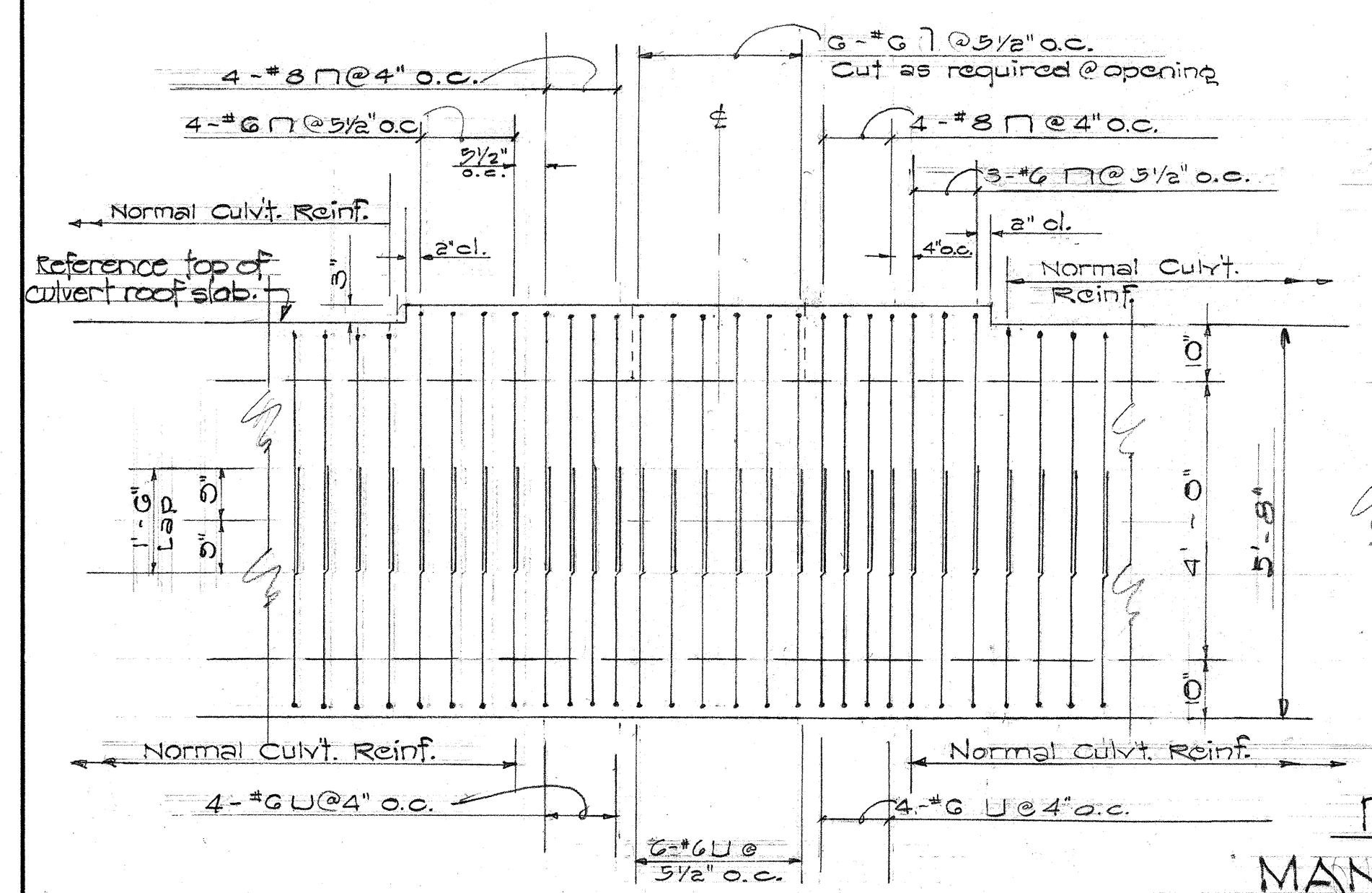
PLAN
SCALE: 1/2" = 1'-0"



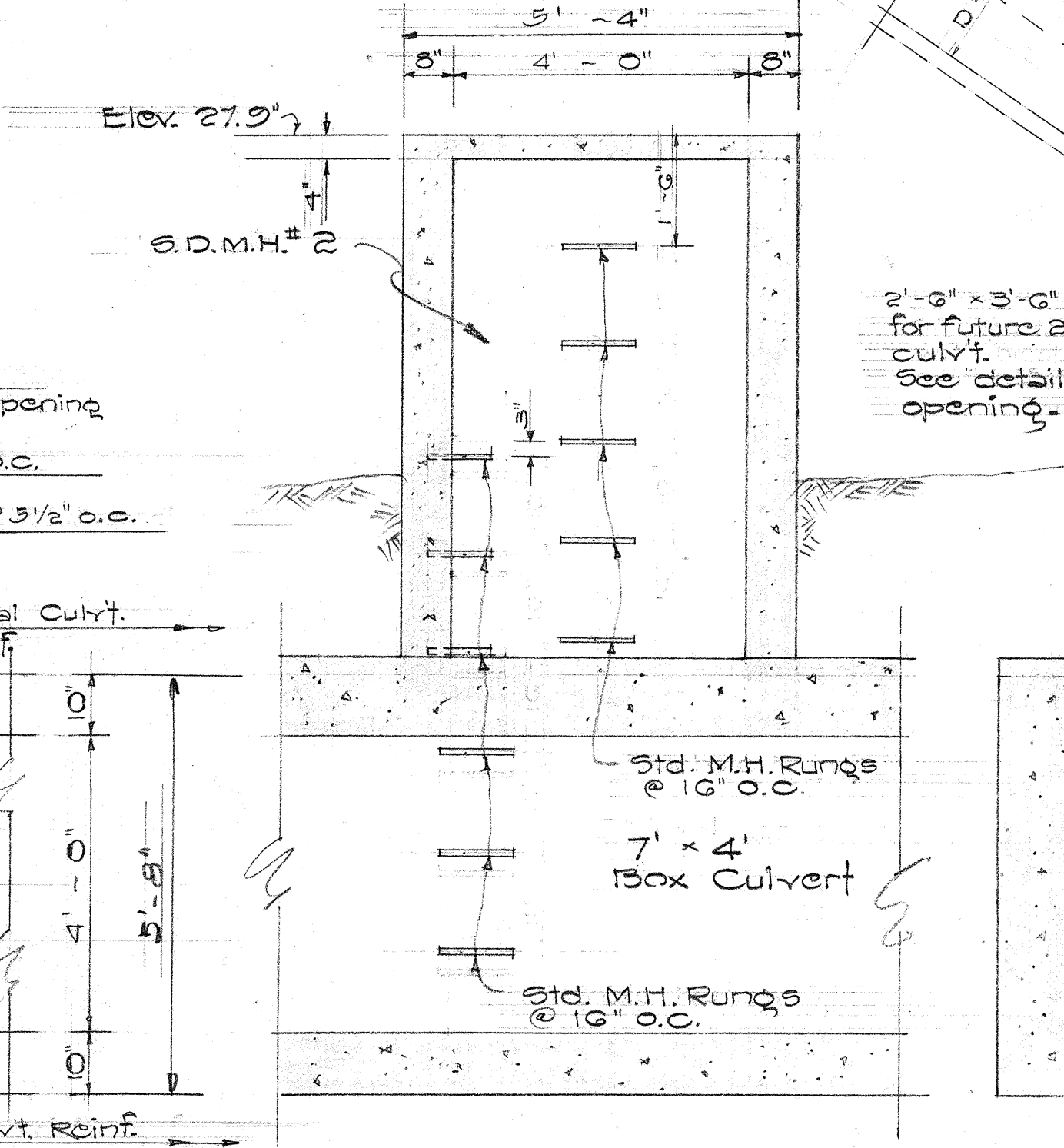
SECTION "B-B"
SCALE: 3/4" = 1'-0"



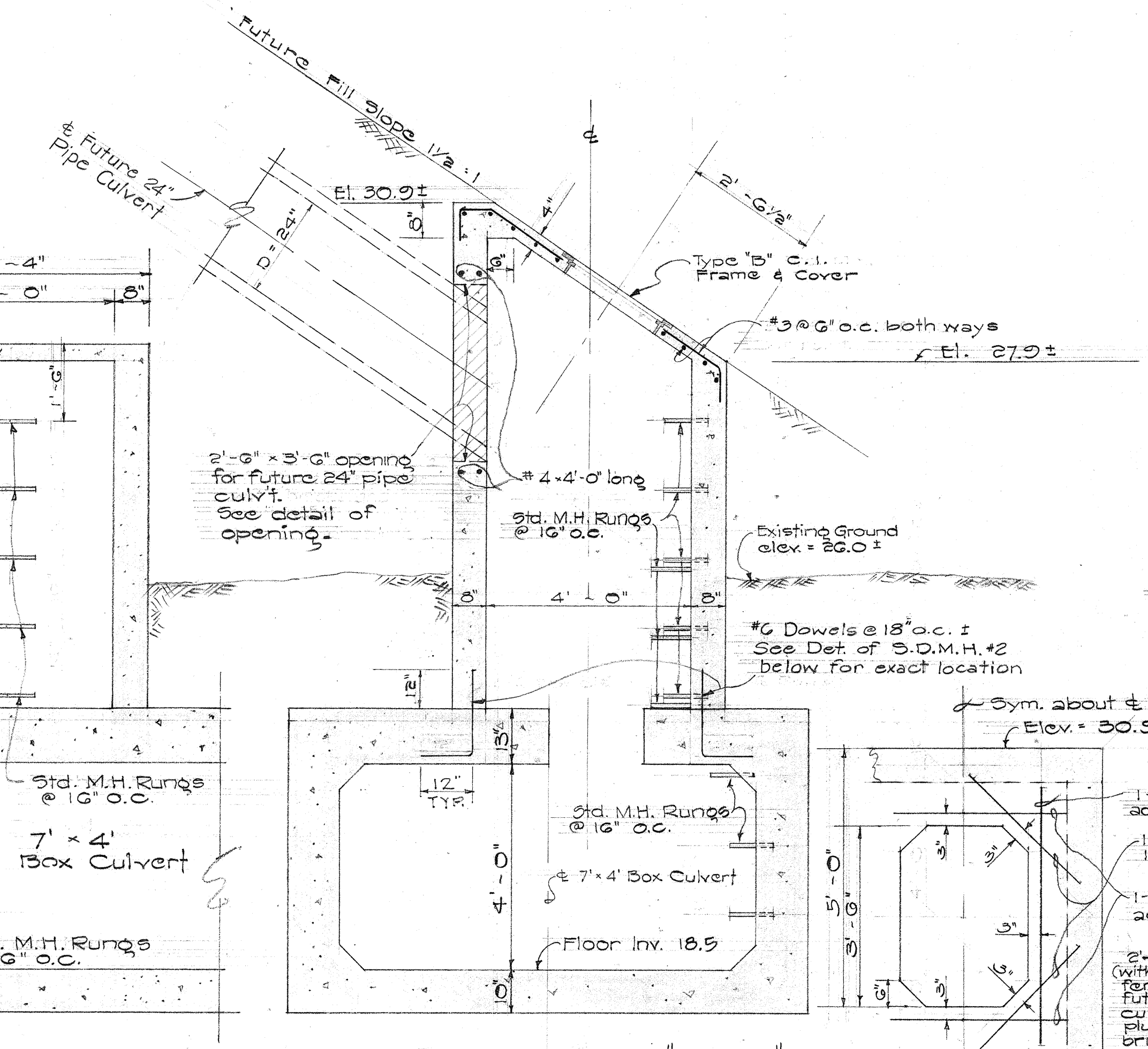
SECTION "D-D"
SCALE: 1/2" = 1'-0"



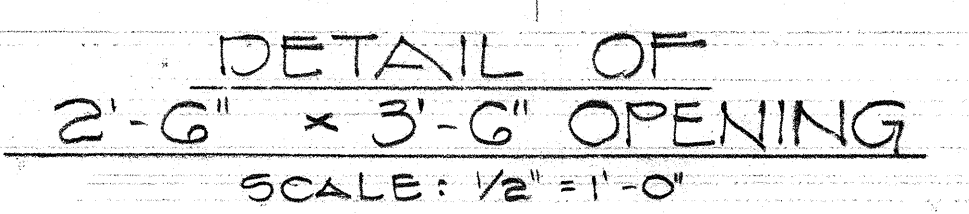
SECTION "A-A"
SCALE: 1/2" = 1'-0"



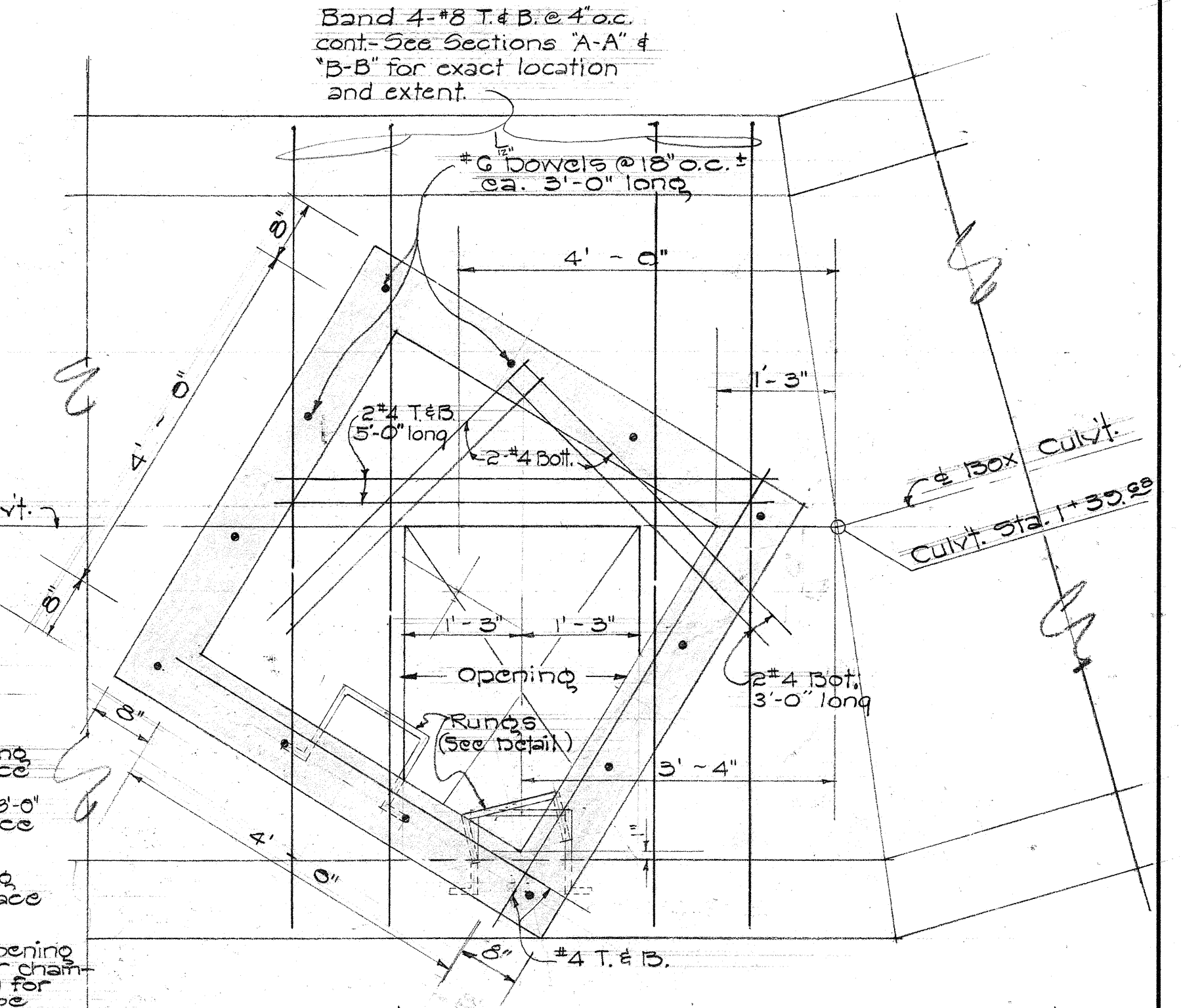
**DETAIL OF STANDARD
MANHOLE RUNGS LOCATION**
SCALE: 1/2" = 1'-0"



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



**DETAIL OF
2'-6" x 3'-6" OPENING**
SCALE: 1/2" = 1'-0"



**PLAN - CULV'T. ROOF SLAB AT S.D.M.H. #2
SHOWING ARRANGEMENT OF ADDED REINF.**
SCALE: 3/4" = 1'-0"

DETAIL OF S.D.M.H. #2
Scale: As Noted

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL DETAILS FOR
DRAINAGE STRUCTURES

S.D.M.H. No. 2
INTERSTATE HIGHWAY
Proj. No. I-11(15) 24 Unit 1

Scale: As Shown Date: April, 1964
SHEET No. 4 OF 8 SHEETS

ORIGINAL PLAN	DATE
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
No.	

A cross-sectional diagram of a box culvert. The culvert is a rectangular structure with a thick, textured wall. Inside the culvert, the text "BOX CULVERT" is written. The culvert is supported by a base layer of "Untreated Base Cushion Material", which is represented by a hatched pattern. A dimension line on the right side of the culvert indicates a 12-inch gap between the culvert wall and the base material. A note at the bottom right states "Minimum" with a downward arrow pointing to the 12-inch dimension.

NOTE:

1. If unsuitable Material is uncovered, additional excavation below the box culvert and backfilling with untreated base cushion material will be ordered by the Engineer.
2. For the pre-cast sections of the box culvert, untreated base cushion material (minimum depth of 6 inches) as shown above will be required whether unsuitable material is uncovered or not.

NOTES:

- Excavation below the pipe culvert and back-filling with untreated base cushion material for pipe foundation will be ordered by the Engineer if unsuitable material is uncovered.*
- H - Vertical limit of structure excavation from original ground or existing pavement surface to bottom of the pipe or the bottom of untreated base pipe foundation if ordered by the Engineer.*
- † - When soft, spongy or other unsuitable material is uncovered, thickness of untreated base shall be determined by the Engineer.*
 - Where solid rock is encountered, thickness under the pipe shall be not less than one-half inch ($\frac{1}{2}$ ") per foot of height of fill over the top of the pipe, with a minimum allowable thickness of eight inches (8").*

TYPICAL SECTION SHOWING PAYMENT LIMITS FOR
STRUCTURE EXCAVATION FOR PIPE CULVERTS AND
UNTREATED BASE FOR PIPE FOUNDATION
SCALE: $\frac{1}{2}" = 1' - 0"$

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

IH-1-1(2)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-11-1(5) Unit 1	1964	15	34

Type "C" standard C.B. over Box Culvert. See Sht. # 18 for details.

Limits of 12" thick culvert roof slab. See detail below.

± Culv't Sta. 8+03.55
Inv. = 22.15
TOP EL. 33.0 ±

KAPIOLANI BLYD.

± Culv't Sta. 9+04.92
Inv. = 23.52

Future Type "B" standard C.B. over Box Culvert. (N.I.C.)

Dowels for Future C.B. connection to be installed. See details below.

Provide opening (with reinf. conc. cover) in culvert roof slab for future C.B. connection. See details of reinf. conc. cover below.

± 7'x4' Box Culvert
Az. 310° 15' 30"

M.H. Rungs in Box Culvert to be installed.

Limits of 12" thick culvert roof slab. See detail below.

CATCH BASIN No. 4
Scale: 3/8" = 1'-0"

FUTURE TYPE "B" C.B. No. 5
Scale: 3/8" = 1'-0"

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

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

PLAN
Scale: 1" = 1'-0"

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

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

DETAILS OF TEMPORARY REINF. CONC. COVER FOR OPENING @ LOCATION OF FUTURE TYPE "B" C.B. No. 5

NOTE

Cost of concrete and steel for the construction of temporary cover for Future Catch Basin No. 5 shall be incidental to and paid for under the respective lump sum contract items for the drainage box culverts.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL DETAILS
FOR DRAINAGE STRUCTURES

CATCH BASIN No. 4 AND FUTURE
TYPE "B" CATCH BASIN No. 5

INTERSTATE HIGHWAY
Proj. No. 1-11-1(5) Unit 1

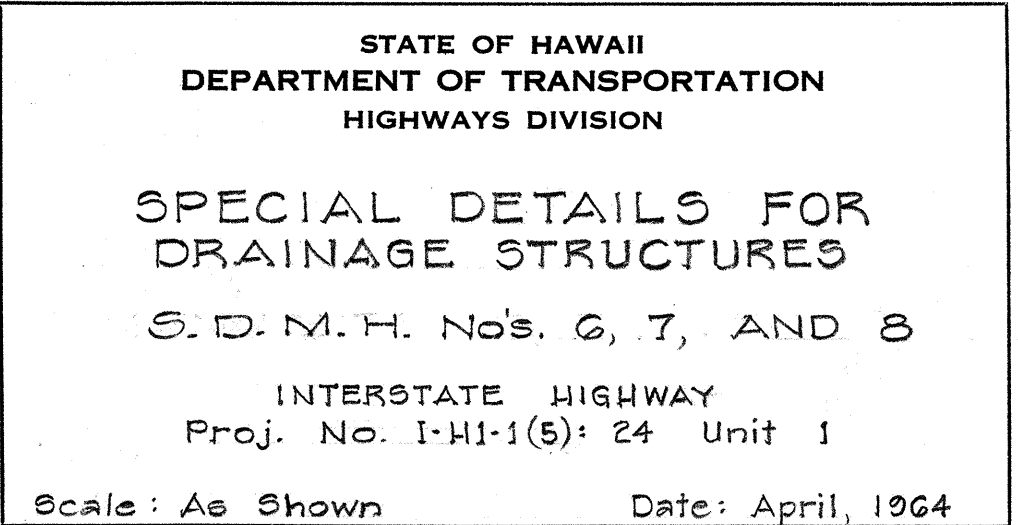
Scale: As Shown Date: April, 1964

SHEET No. 6 OF 8 SHEETS

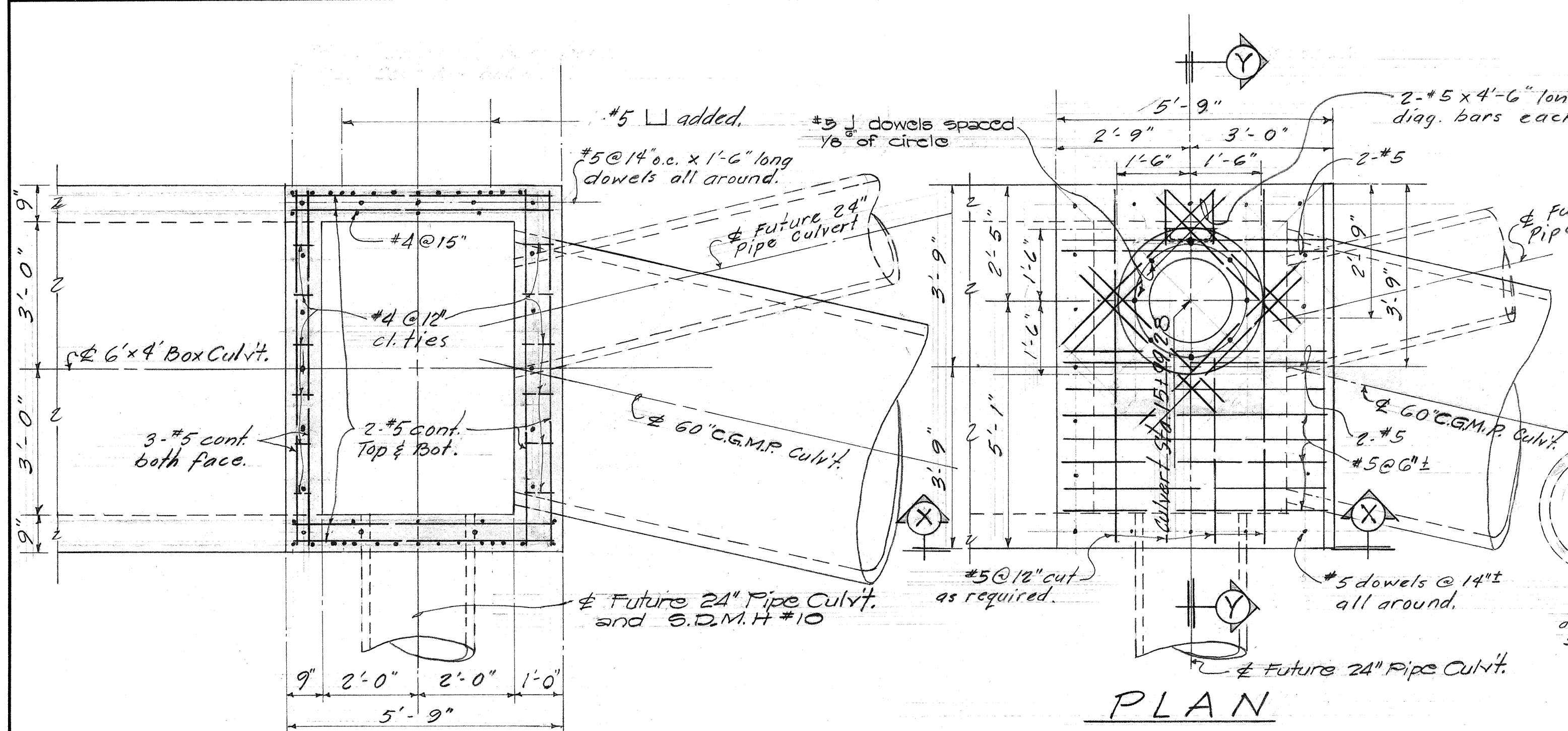
ELEVATION "A-A"
Scale: 1/2" = 1'-0"

CULVERT ROOF REINF. PLAN AT C.B. No. 4 & @ LOCATION OF FUTURE TYPE "B" C.B. No. 5
Scale: 1/2" = 1'-0"

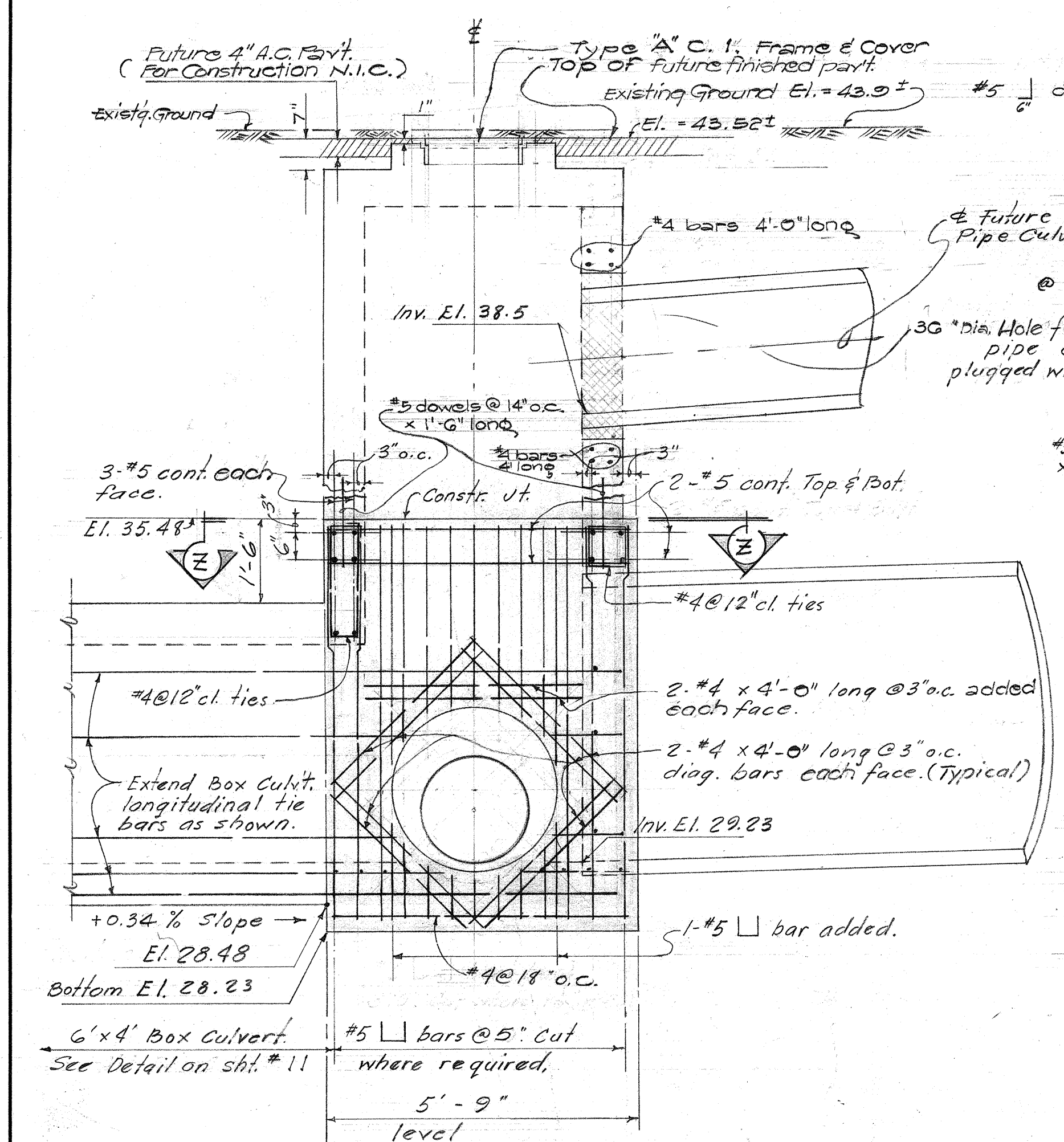
SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
NOTE BOOK	
No.	



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-151(5) Unit 1	1964	17	34

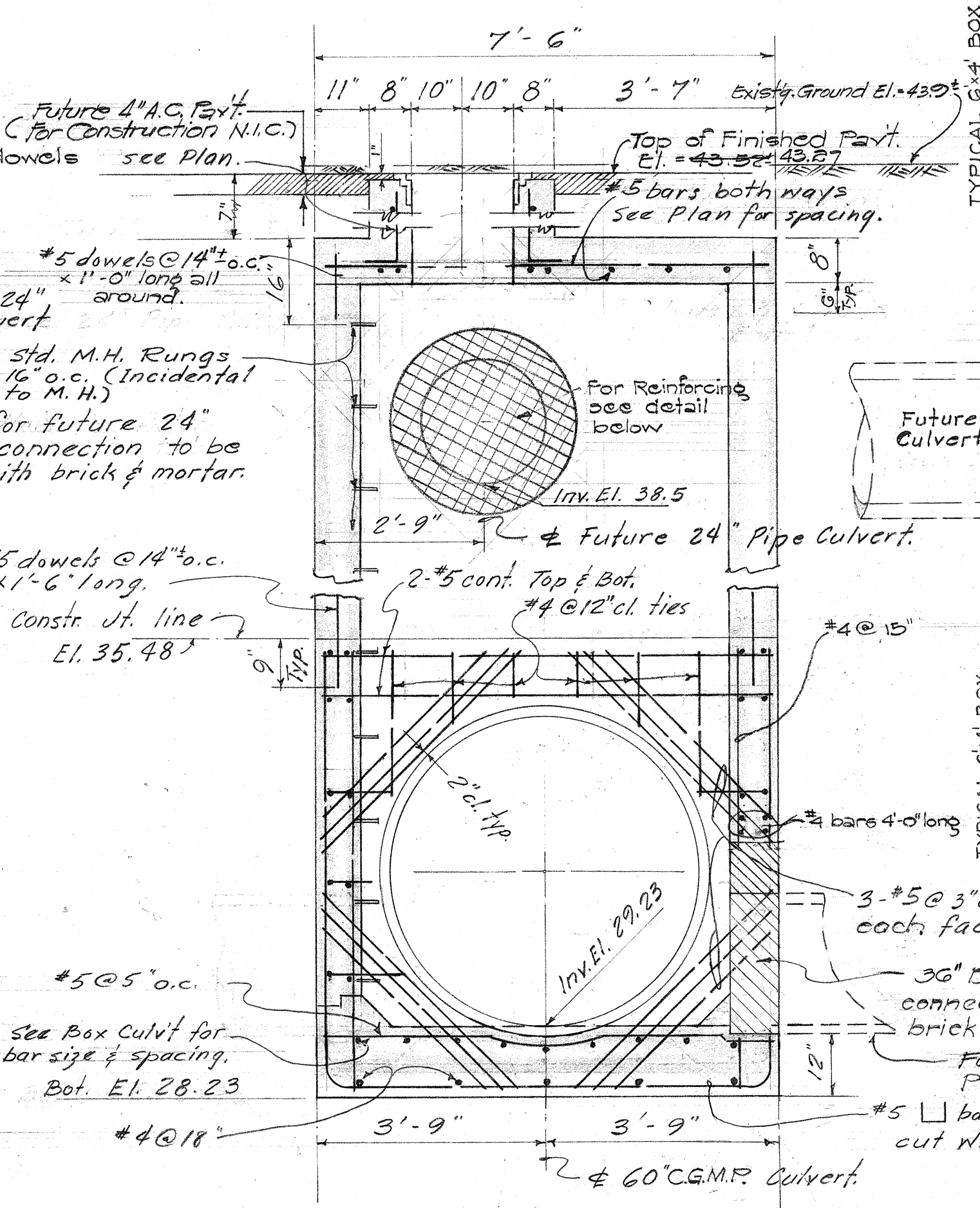


REINF. PLAN "Z-Z"



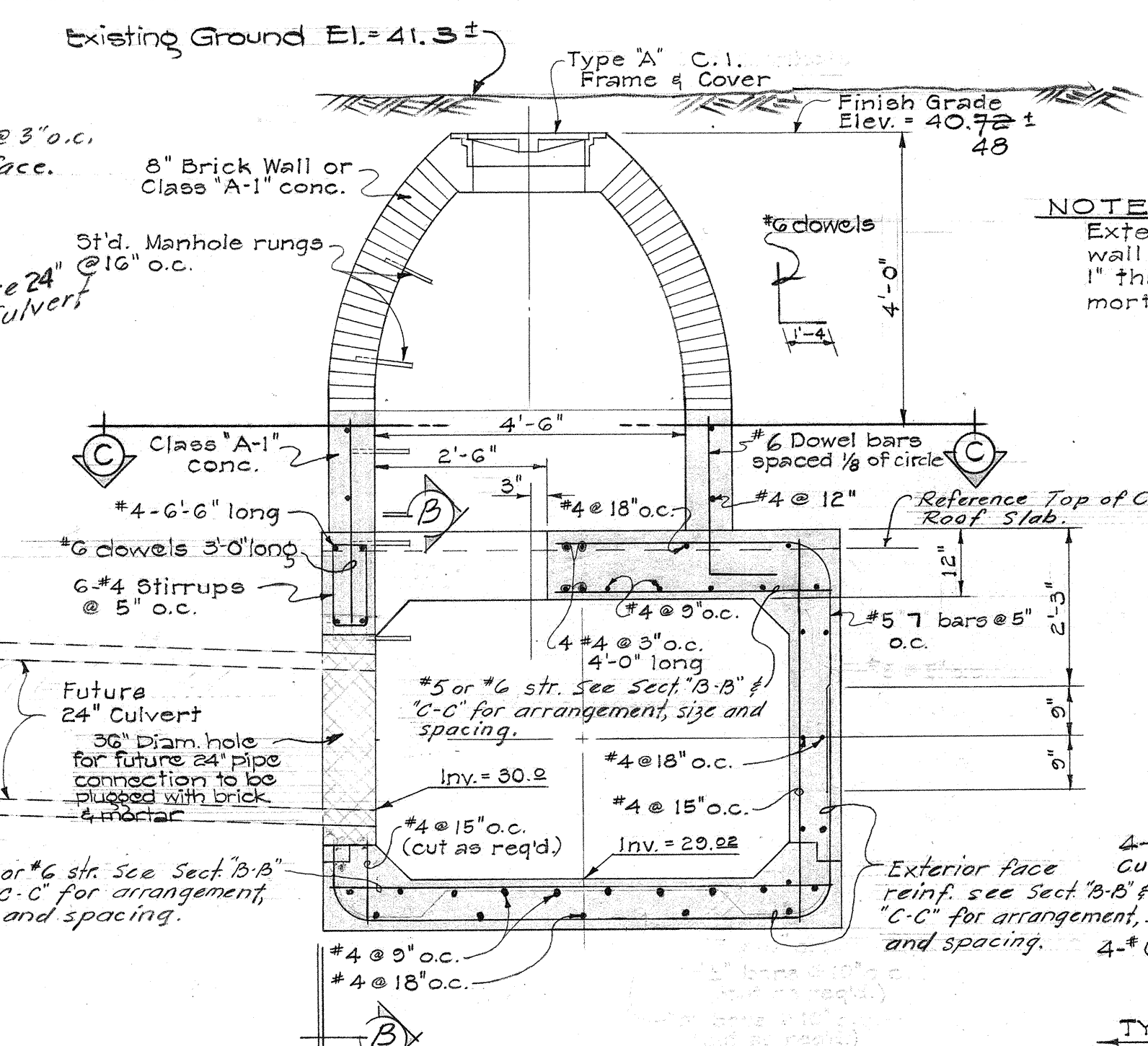
SECTION "X-X"

DETAIL OF S.D.M.H. No 10
AT CULVERT STA. 15+99.28
Scale: 1/2" = 1'-0"

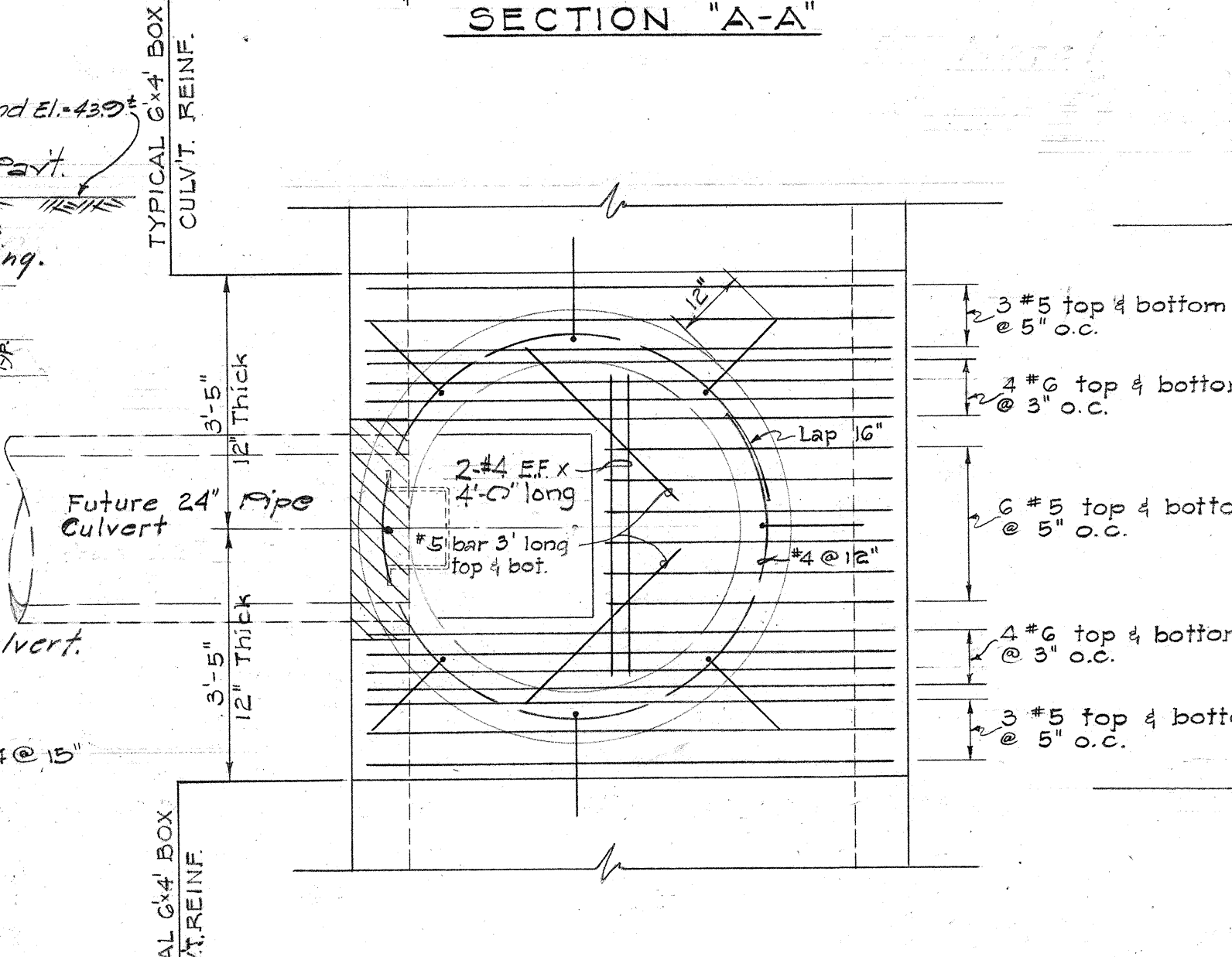


SECTION "Y-Y"

Note! See adjacent corresponding Section "X-X" and "Type G" 6'x4' Box Culvert detail on sht. #11 for additional reinf. information.

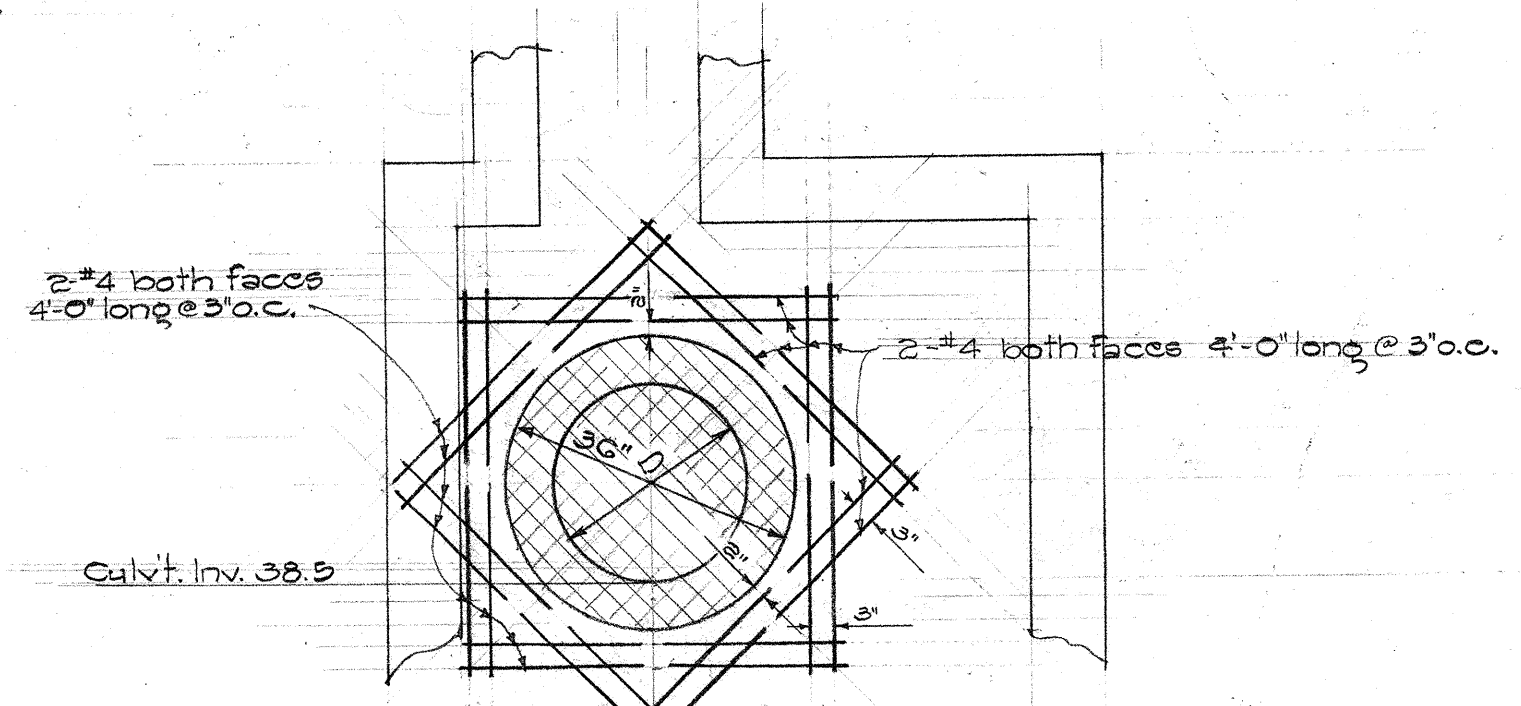


SECTION "A-A"

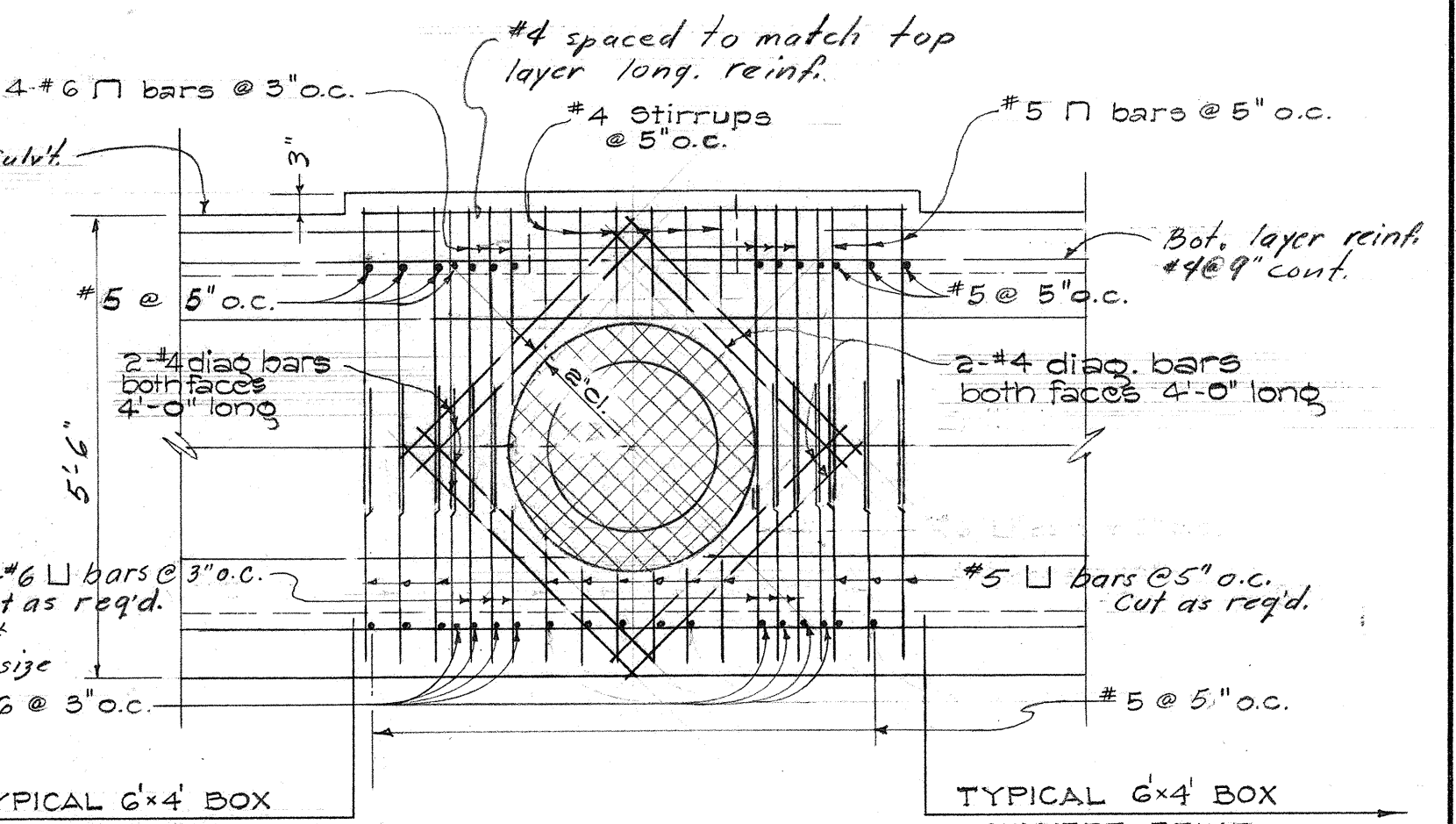


SECTION "C-C"

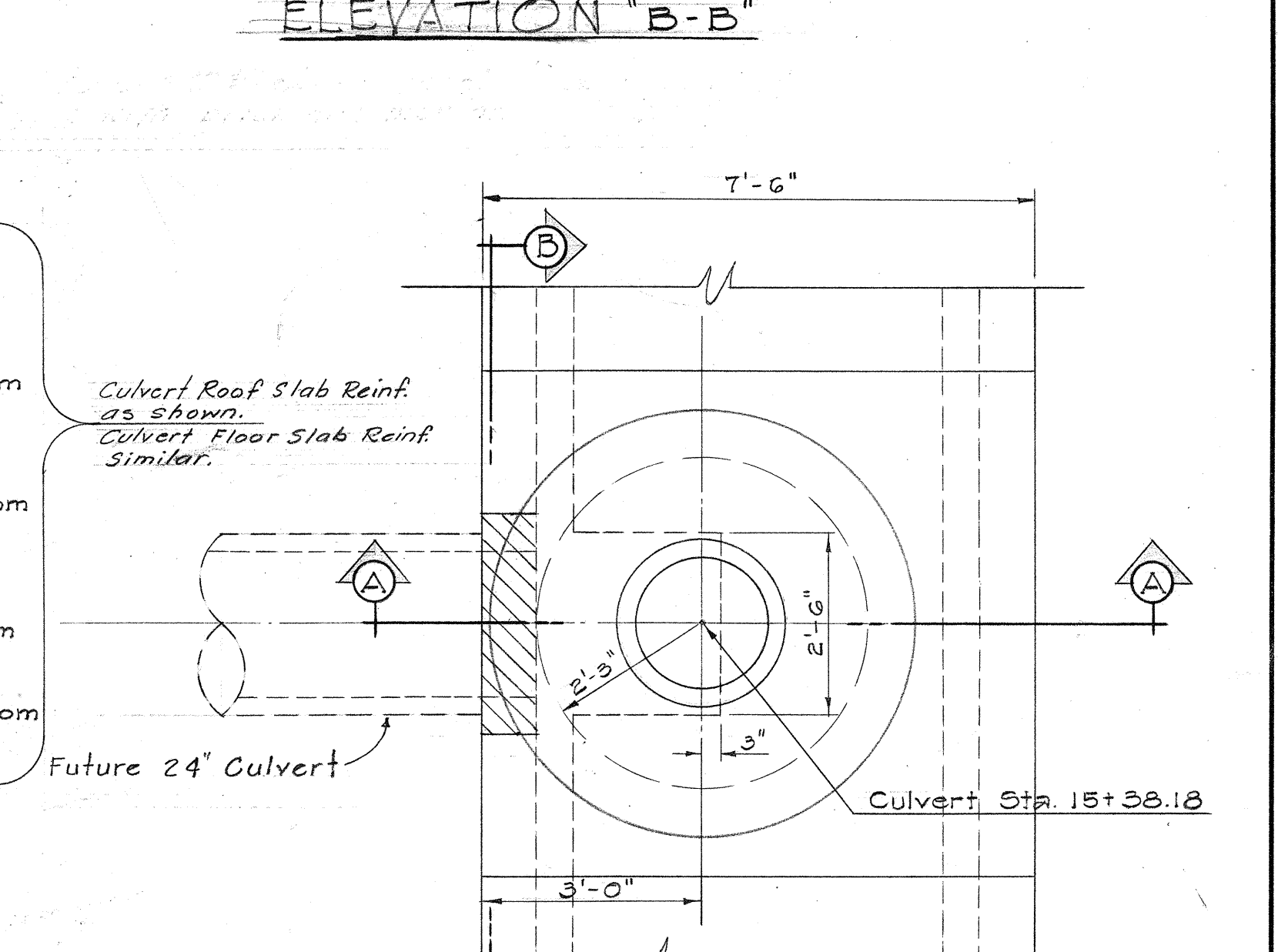
DETAIL OF S.D.M.H. No 9
AT CULVERT STA. 15+38.18
Scale: 1/2" = 1'-0"



ADDITIONAL REINFORCEMENT FOR OPENING OF 24" PIPE CULVT. @ S.D.M.H. No. 10



ELEVATION "B-B"



PLAN

NOTE:
Exterior surface of brick wall shall be plastered with 1" thickness of 1:2 cement mortar.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL DETAILS FOR
DRAINAGE STRUCTURES

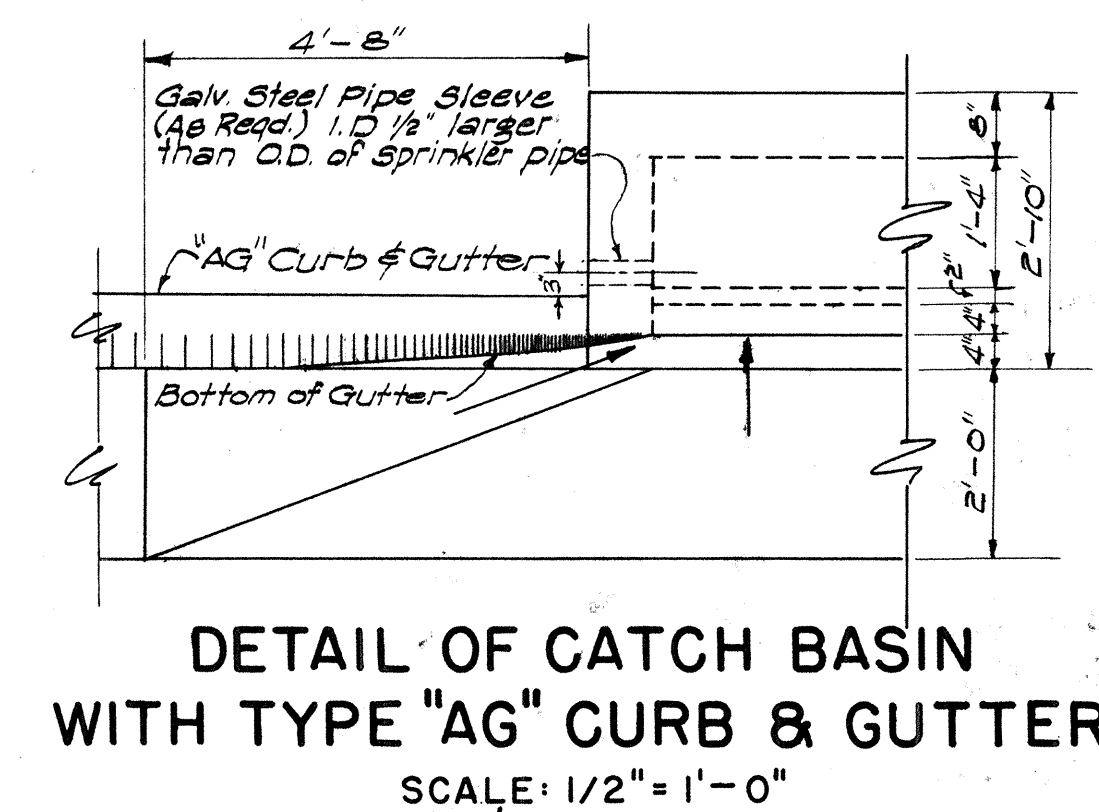
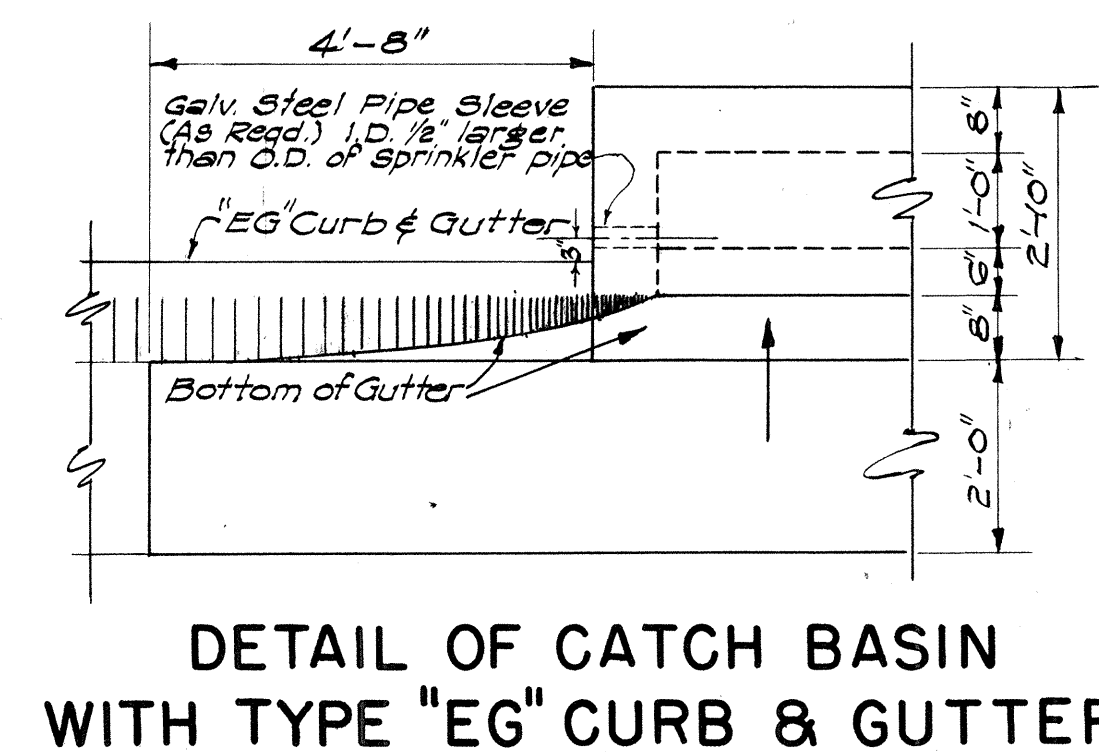
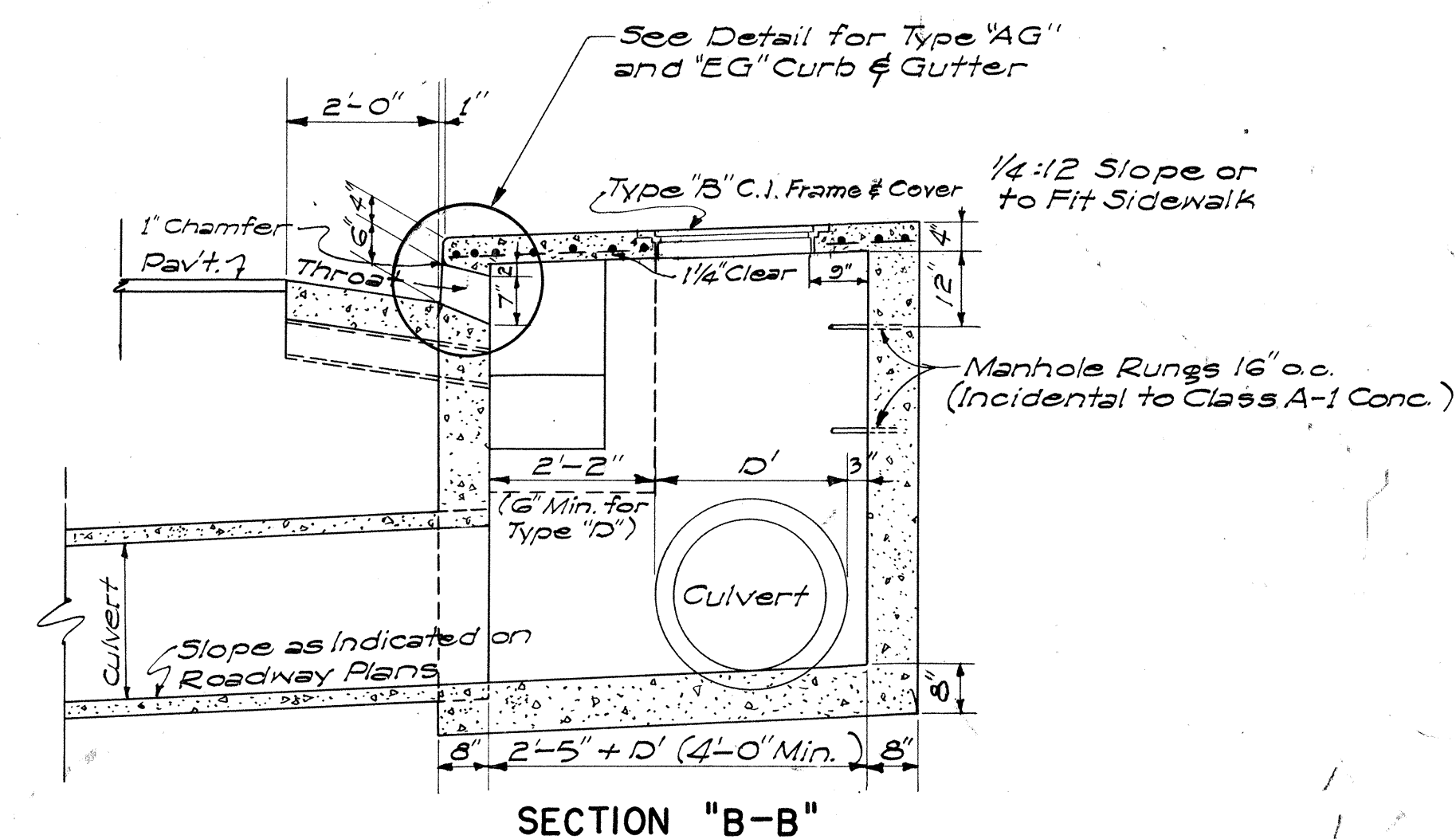
S.D.M.H. No. 9 AND 10

INTERSTATE HIGHWAY
Proj. No. I-151(5) Unit 1

Scale: As Shown Date: April, 1964

SHEET No. 8 OF 8 SHEETS

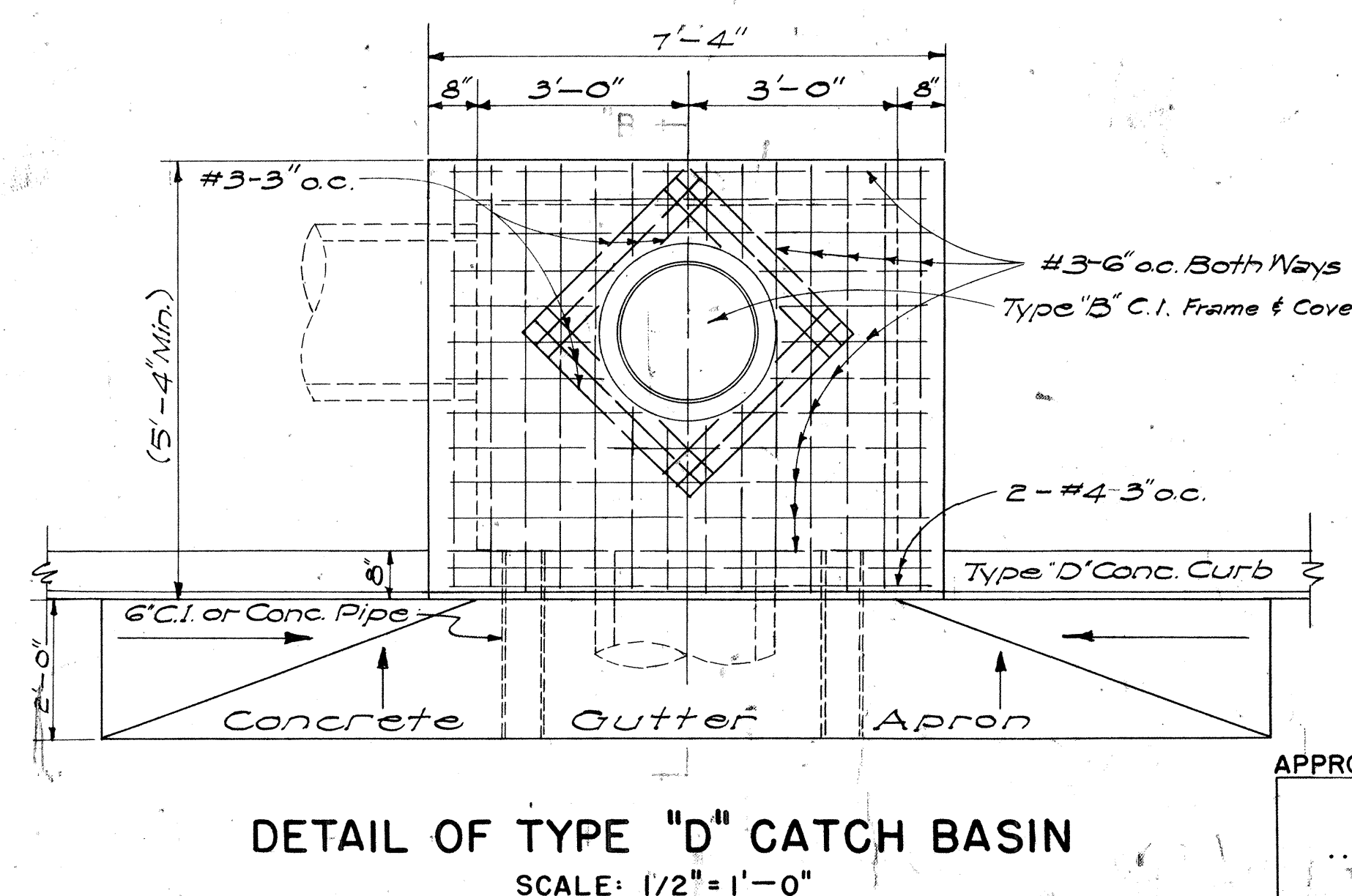
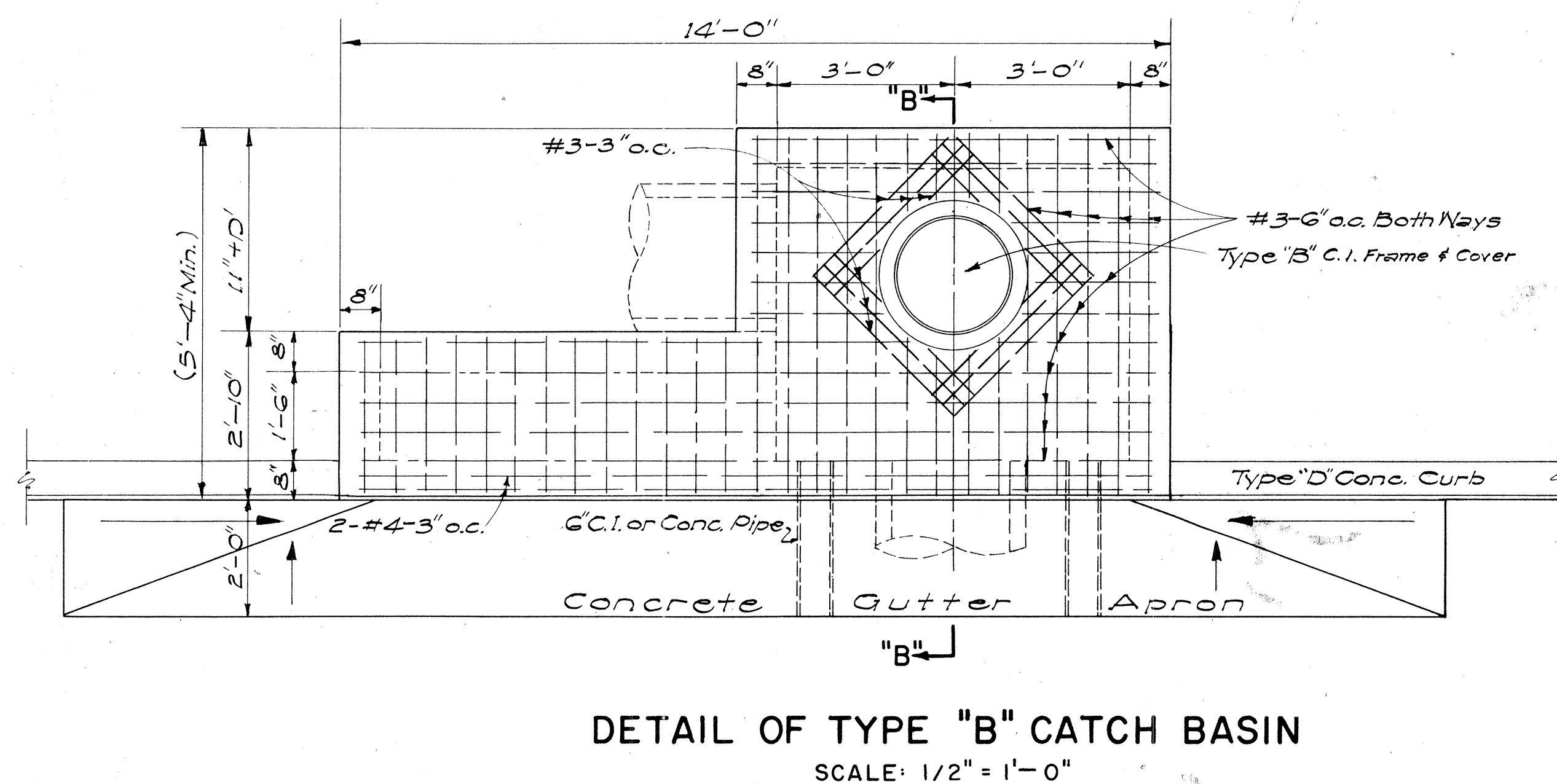
SURVEY PLOTTED BY	DATE
DESIGNED BY	
NOTED BY	
CHECKED BY	



Type	Class A-1 Conc.	Struct. Exc.	Reinf. Steel	Gutter Length
"A" 	7.5 c.y.	24.7 c.y.	145 lb.	30'-0"
"B" 	6.0 c.y.	21.5 c.y.	108 lb.	23'-4"
"C" 	6.0 c.y.	21.5 c.y.	108 lb.	23'-4"
"D" 	4.9 c.y.	16.5 c.y.	77 lb.	16'-8"

NOTES:

1. Quantities based on $d = 5.75'$ and $D = 30'$
2. Quantities do not include concrete for Gutter Apron.
3. The Contractor shall install two 6" Cast Iron or Concrete Pipes as incidental to Class A-1 Concrete for Construction Drainage.
4. Culvert shall leave C.B. from any position and any direction indicated by plans or ordered by the Engineer. Culvert may both enter and leave C.B. so that C.B. will also act as Manhole.
5. The Contractor shall install Galvanized Steel Pipe sleeves and Straps as incidental to Sprinkler System.



APPROVED: _____ DATE Aug 26, 1958

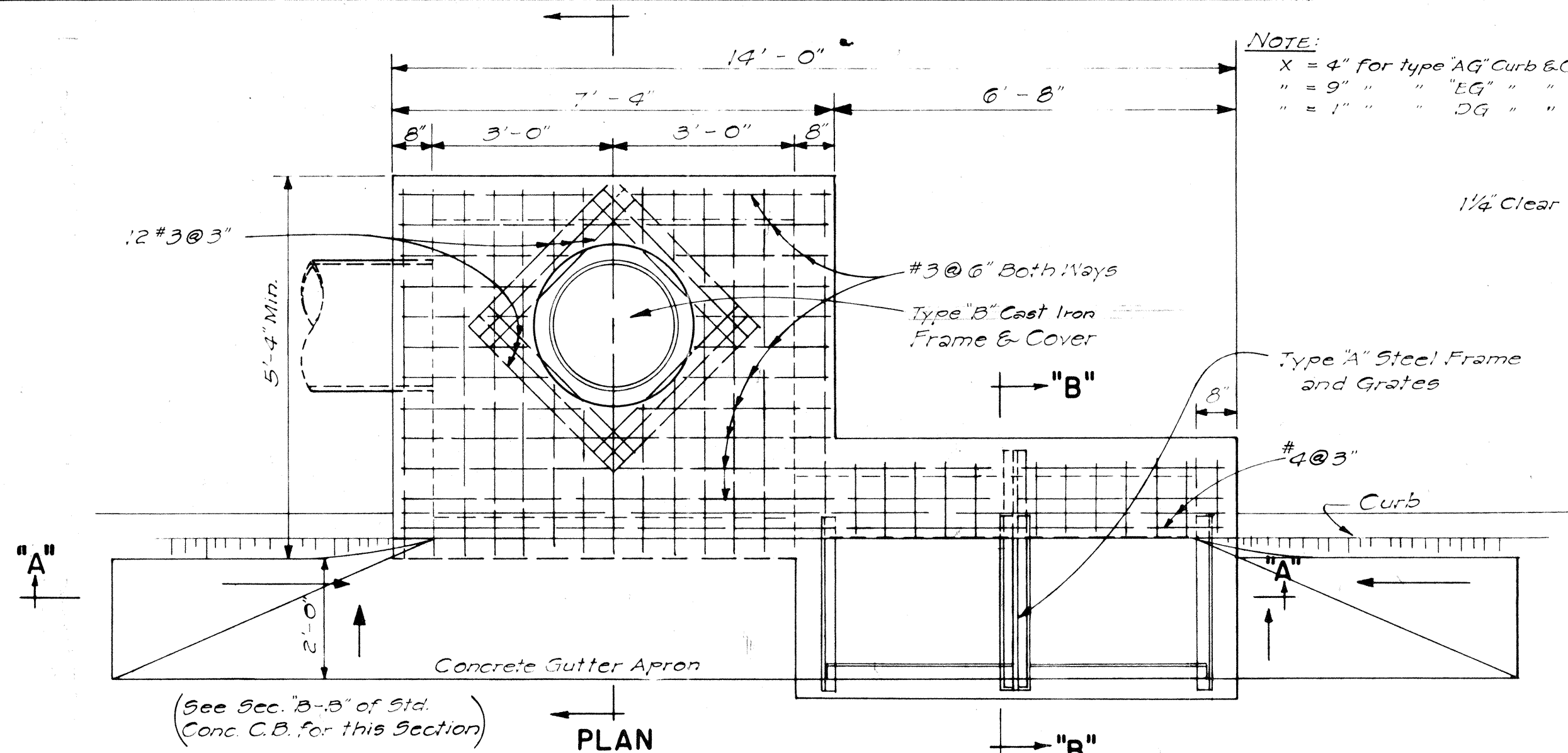
 STATE HIGHWAY ENGINEER

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
CATCH BASINS

SCALES AS NOTED

SHEET NO 8 OF 4 SHEETS

REVISED: SEPT. 1, 1961



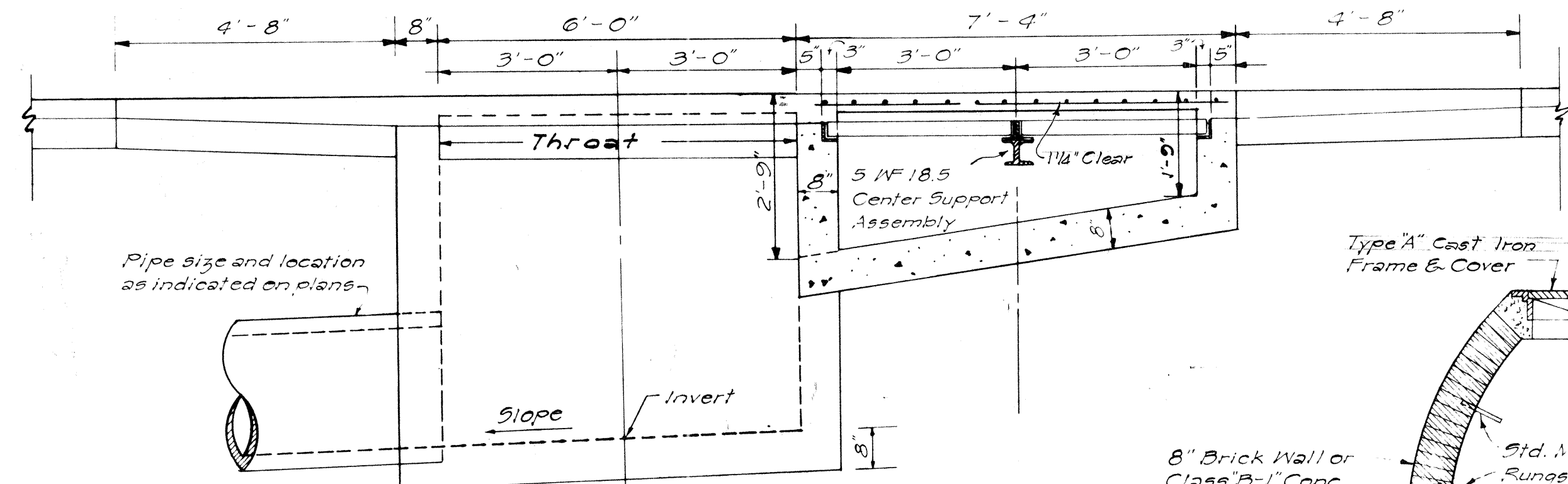
PLAN

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

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

PLAN
SCALE: 1" = 1'-0"

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



DETAIL OF TYPE "CG" CATCH BASIN

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

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

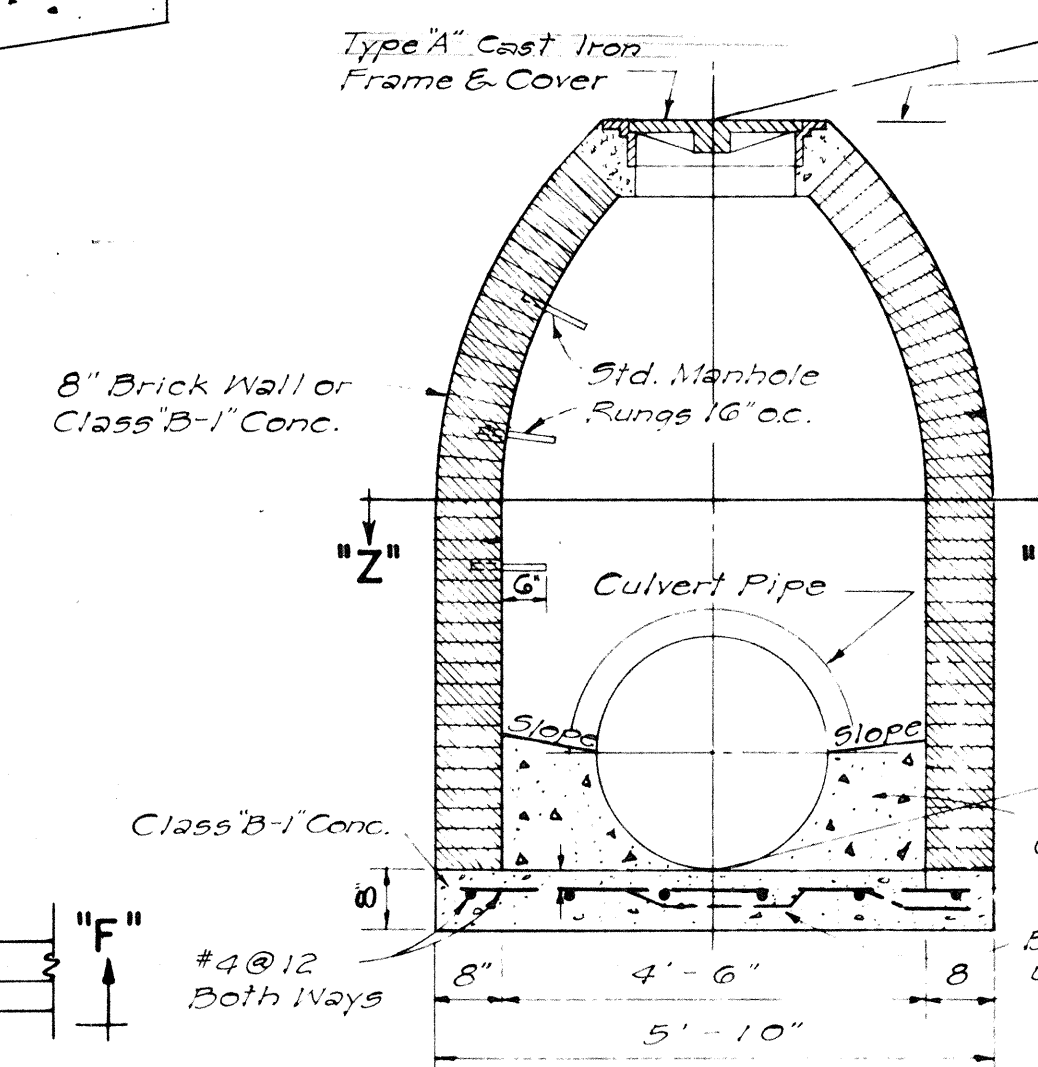
END SPACER
SCALE: 1" = 1'-0"

GRATE BARS
SCALE: 1" = 1'-0"

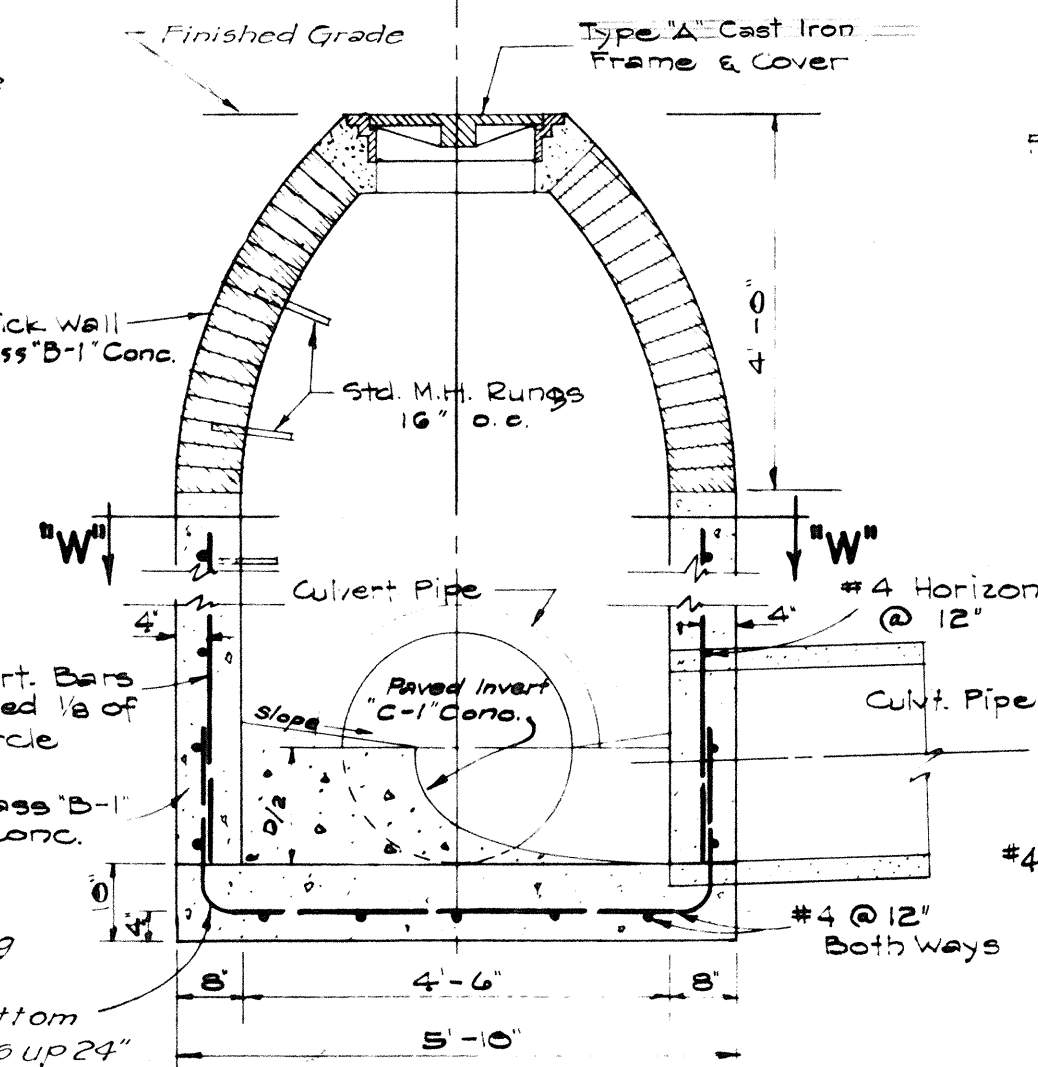
SECTION "D-D"
SCALE: 1" = 1'-0"

DETAIL OF TYPE "A" STEEL FRAME AND GRATES

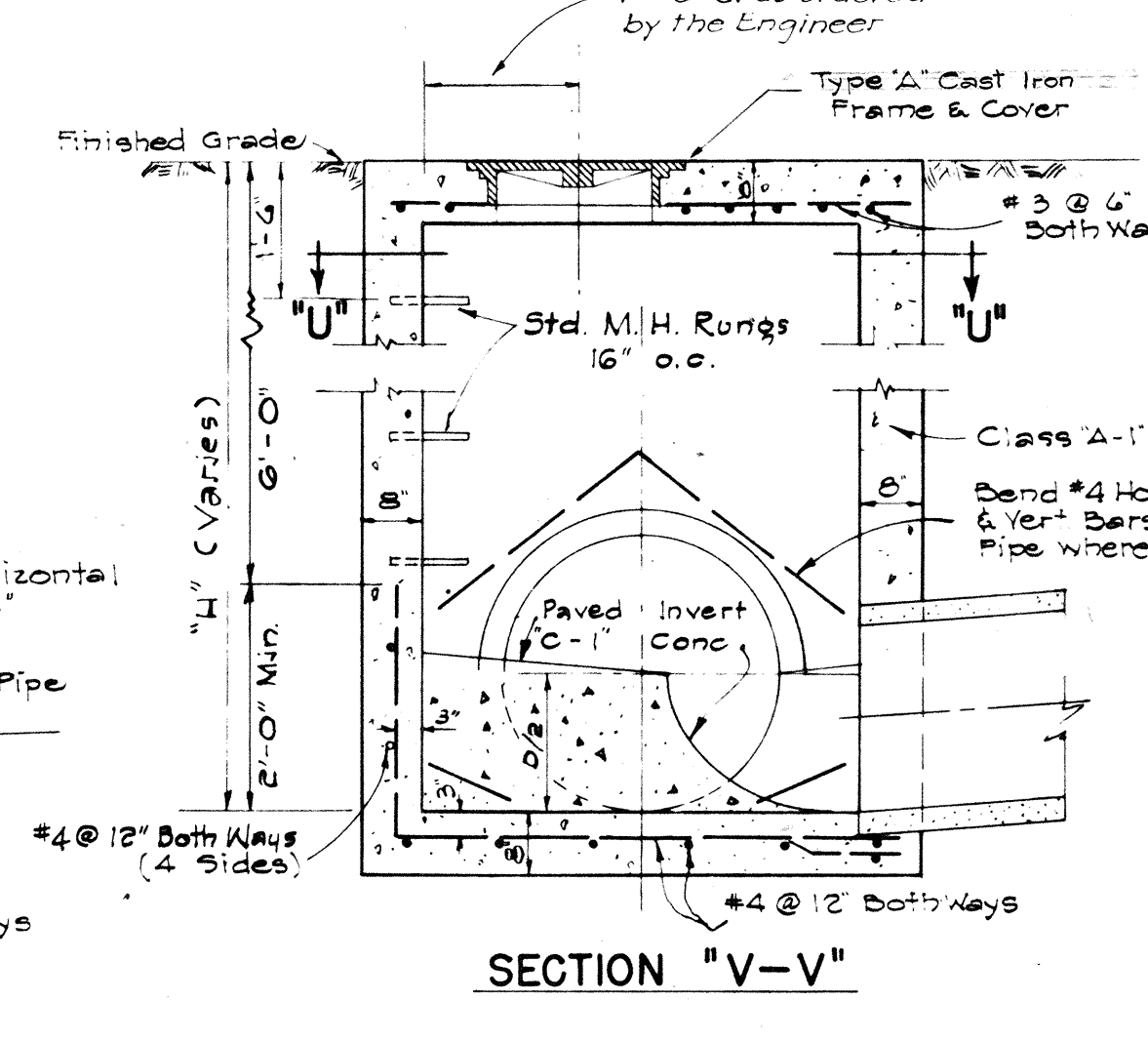
- NOTE:
- All welds 3/16" unless otherwise noted.
 - All steel shall be structural grade.
 - Grates and frame shall be hot dip galvanized after fabrication in accordance with Section 44(1) of the Standard Specifications.



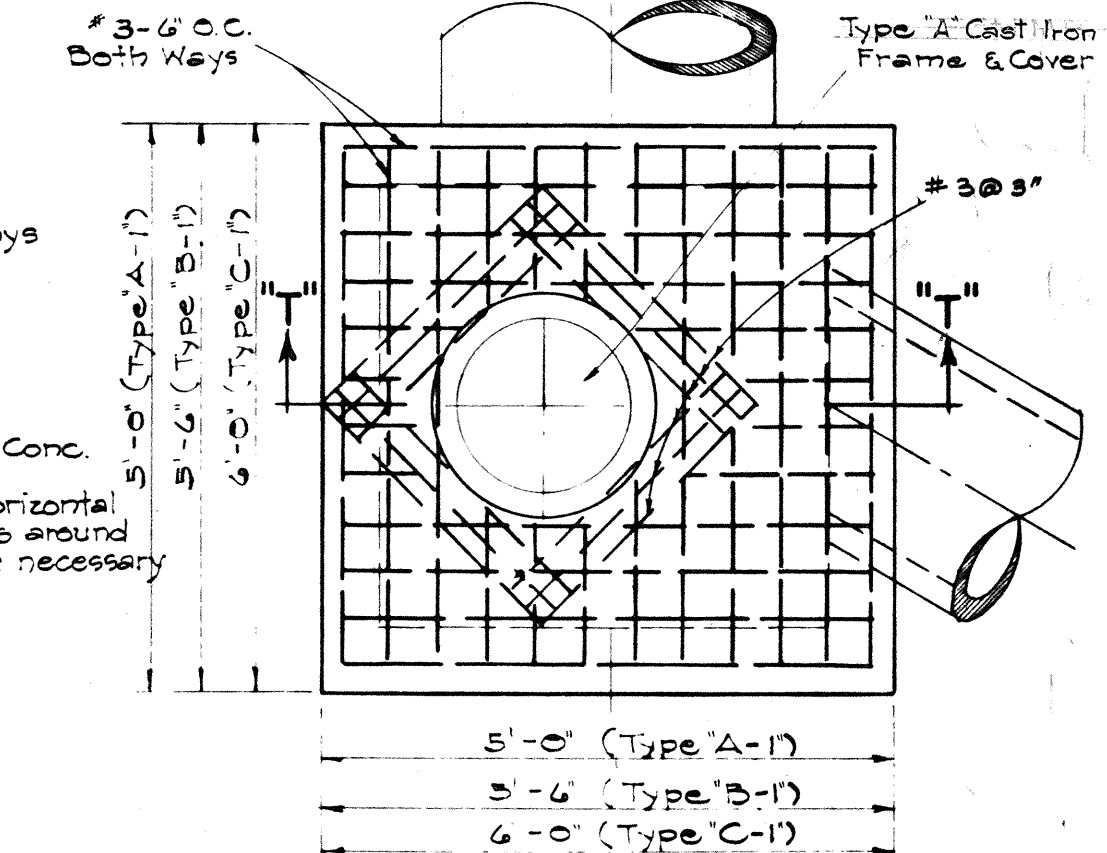
SECTION "Y-Y"



SECTION "X-X"

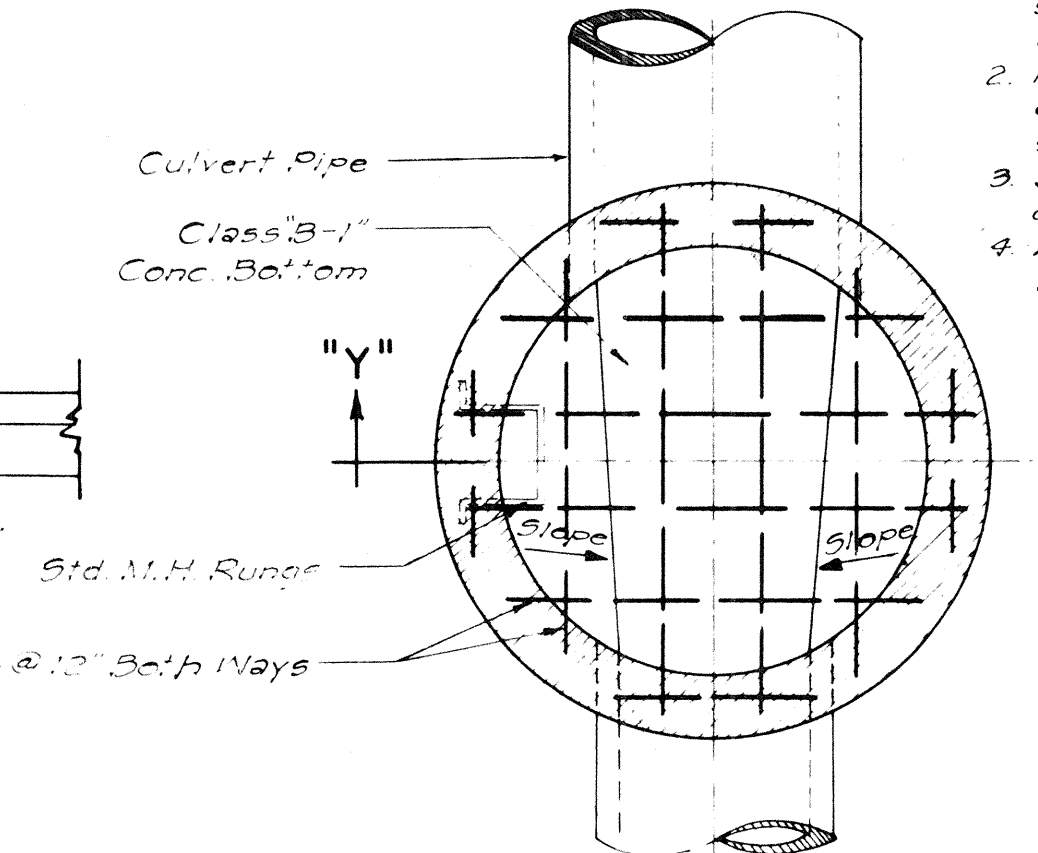


SECTION "V-V"



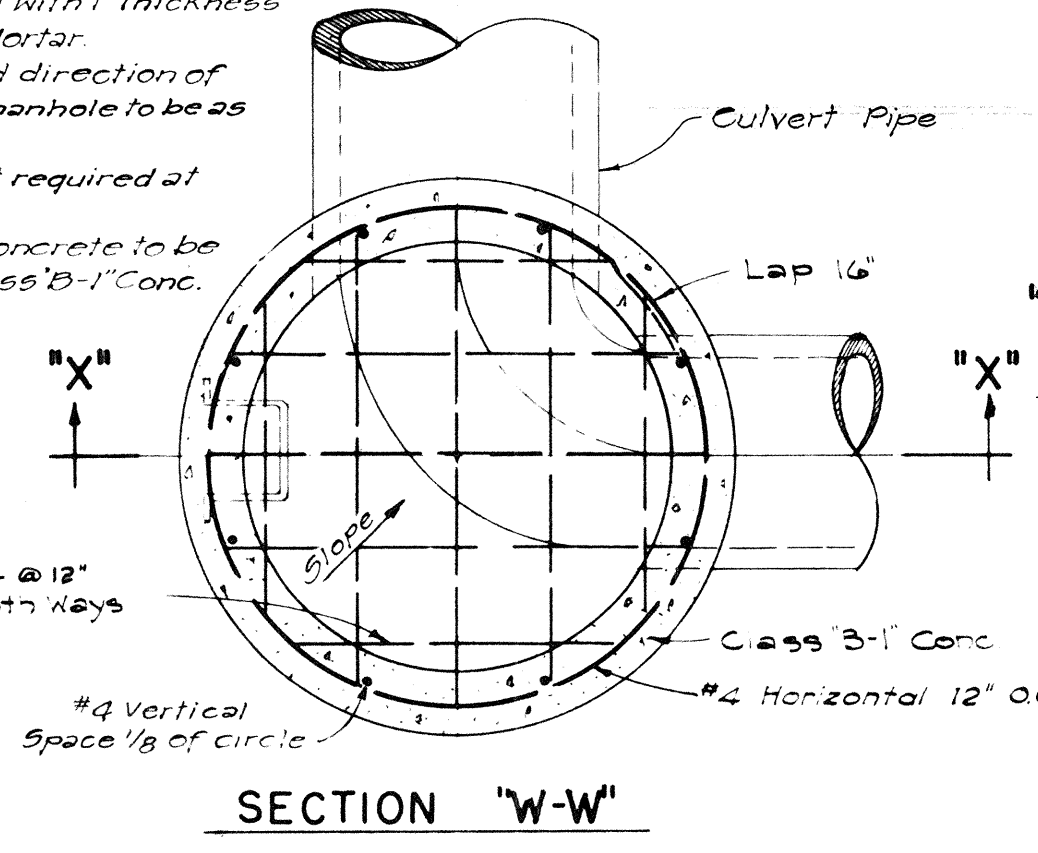
PLAN

- NOTE:
- Exterior surface of brick wall shall be plastered with 1" thickness of 1:2 Cement Mortar.
 - Number, size and direction of culvert pipes at manhole to be as shown on plans.
 - Paved invert not required at drop manholes.
 - All Class C-1 Concrete to be incidental to Class B-1 Conc.



SECTION "Z-Z"
TYPE "D" STORM DRAIN MANHOLE

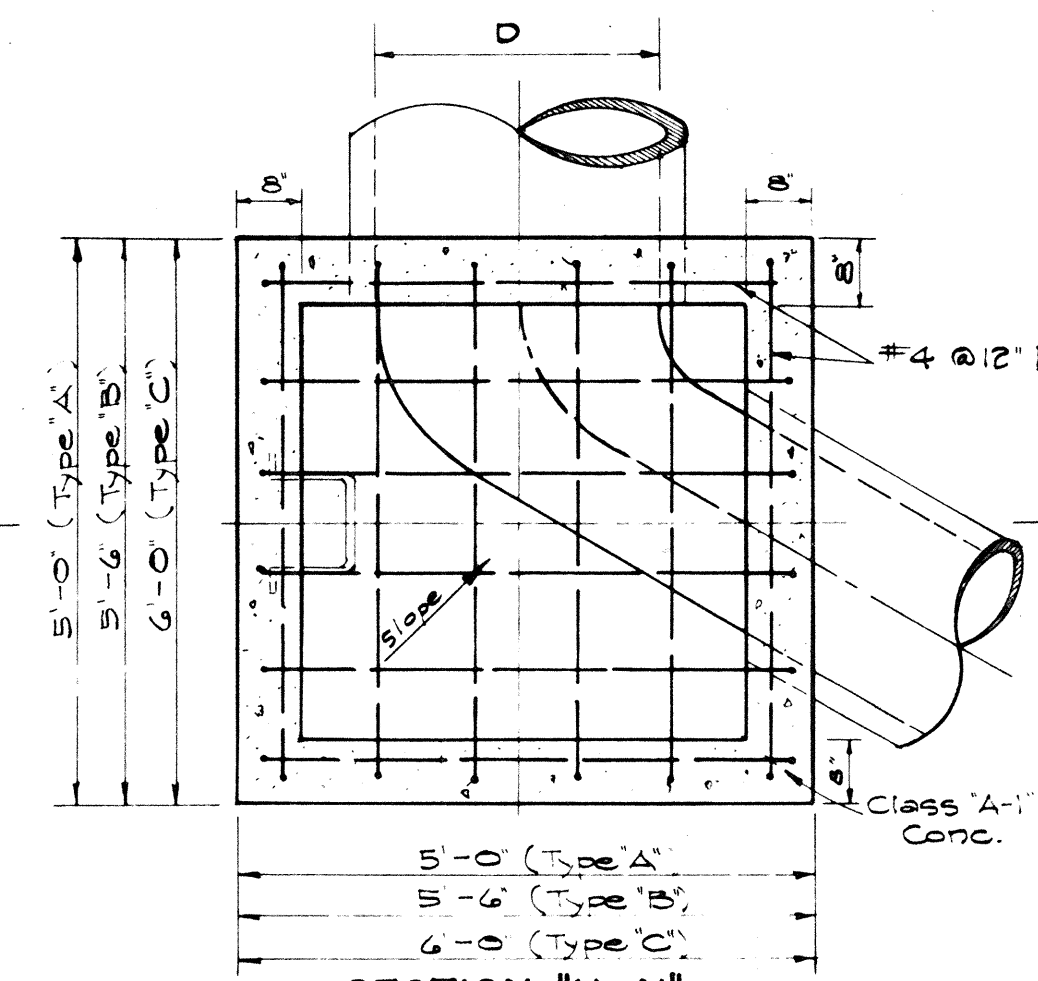
SCALE: 1/2" = 1'-0"



SECTION "W-W"

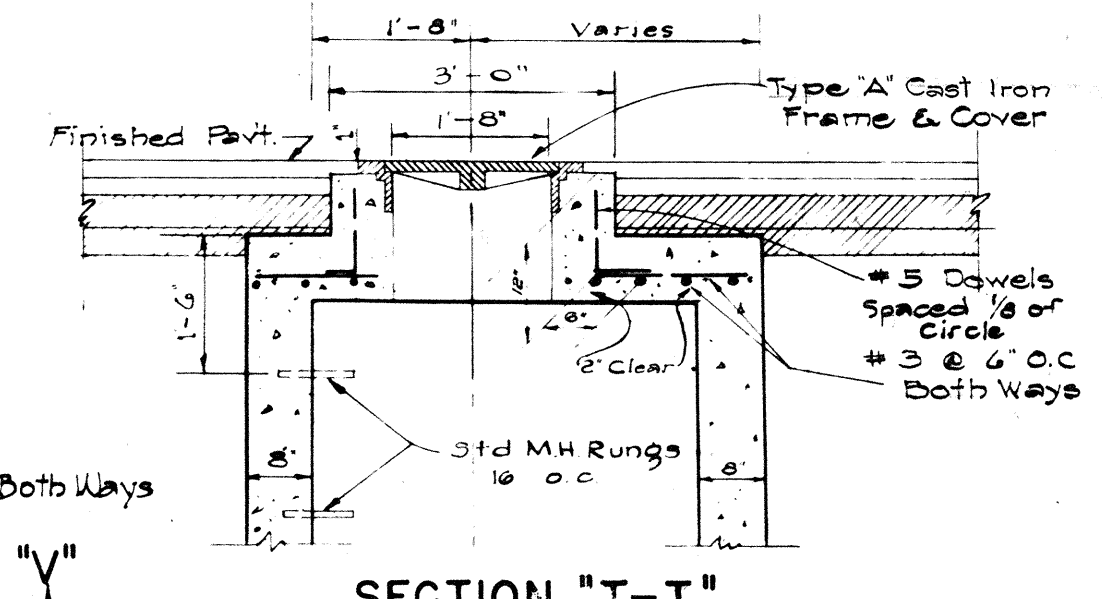
TYPE "E" STORM DRAIN MANHOLE

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



SECTION "U-U"
TYPE "A", "B", & "C" S.D.M.H.

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



SECTION "T-T"

TYPE "A-I", "B-I", & "C-I" S.D.M.H.

TOP DETAIL UNDER PAVEMENT

(BOTTOM DETAIL SIMILAR TO TYPE "A", "B", & "C")

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

DATE: May 57
DESIGNED BY: G. M.
DRAWN BY: M. M.
CHECKED BY: M. M.
ORIGINAL PLAN
NOTE BOOK
No.

DETAIL OF TYPE "DG" CATCH BASIN

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

APPROVED: *[Signature]* DATE: Aug. 26, 1959
STATE HIGHWAY ENGINEER

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS

GRADED CATCH BASINS &
STORM DRAIN MANHOLES
SCALES AS NOTED
SHEET NO. 2 OF 4 SHEETS

