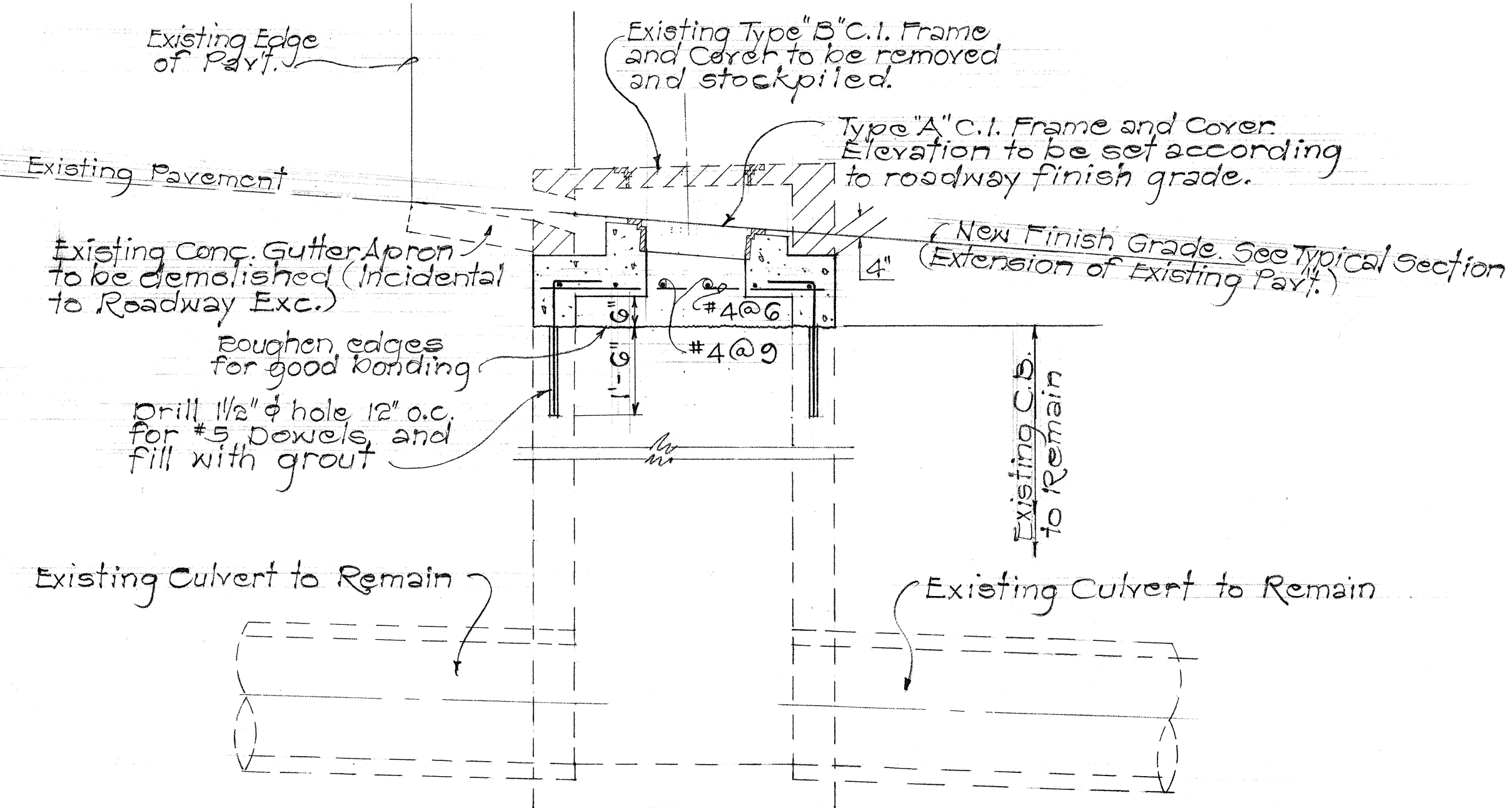
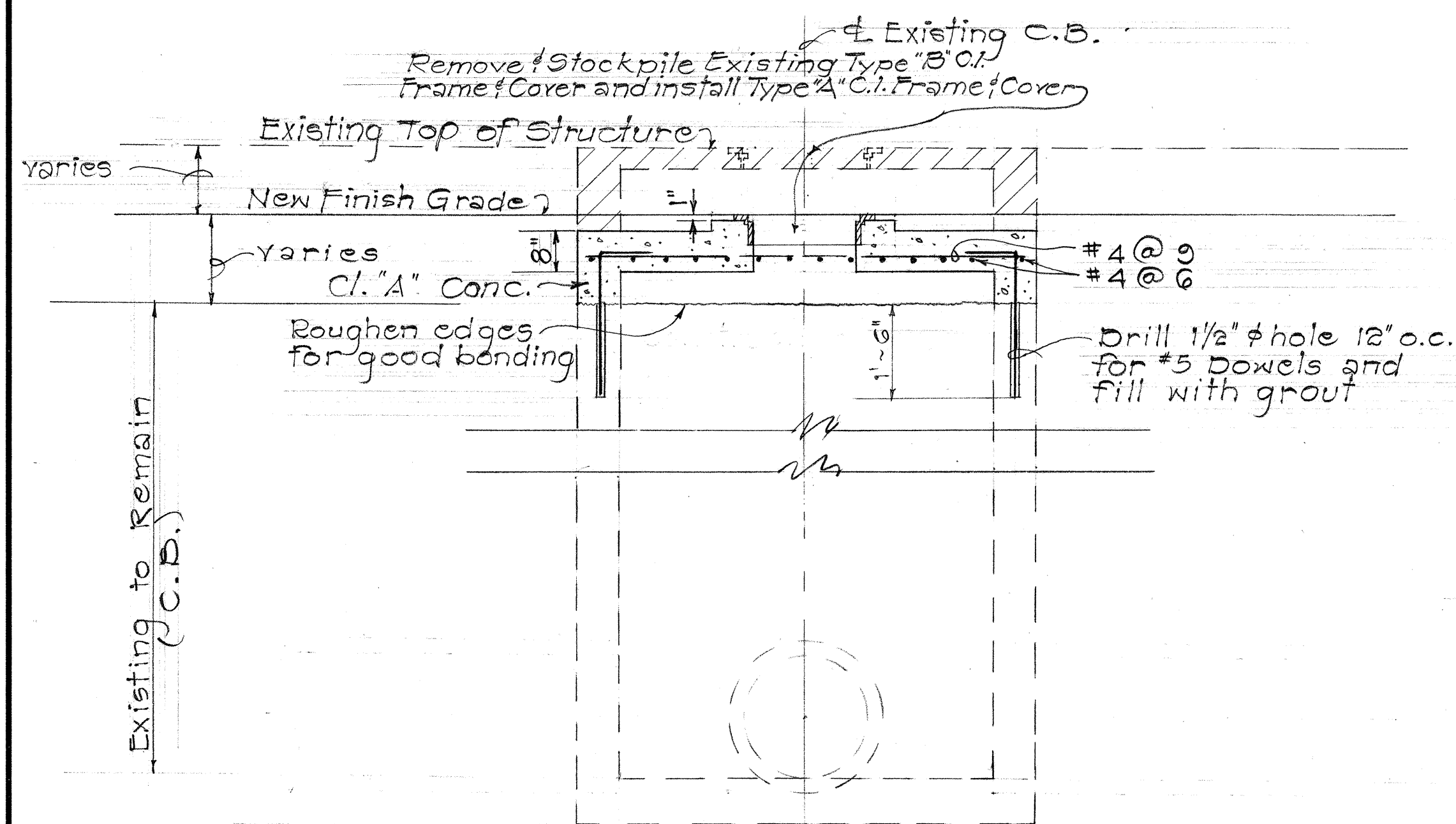
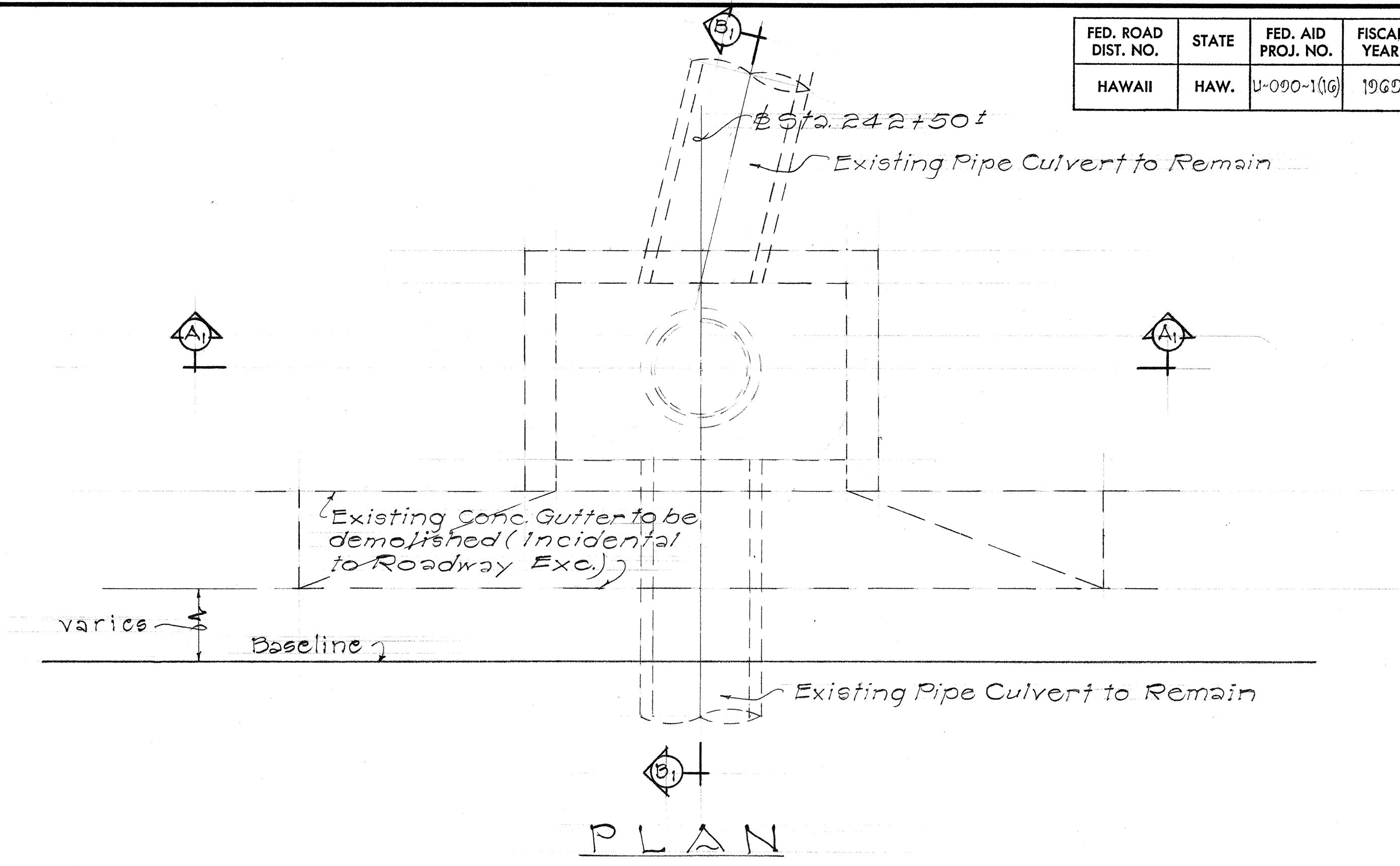
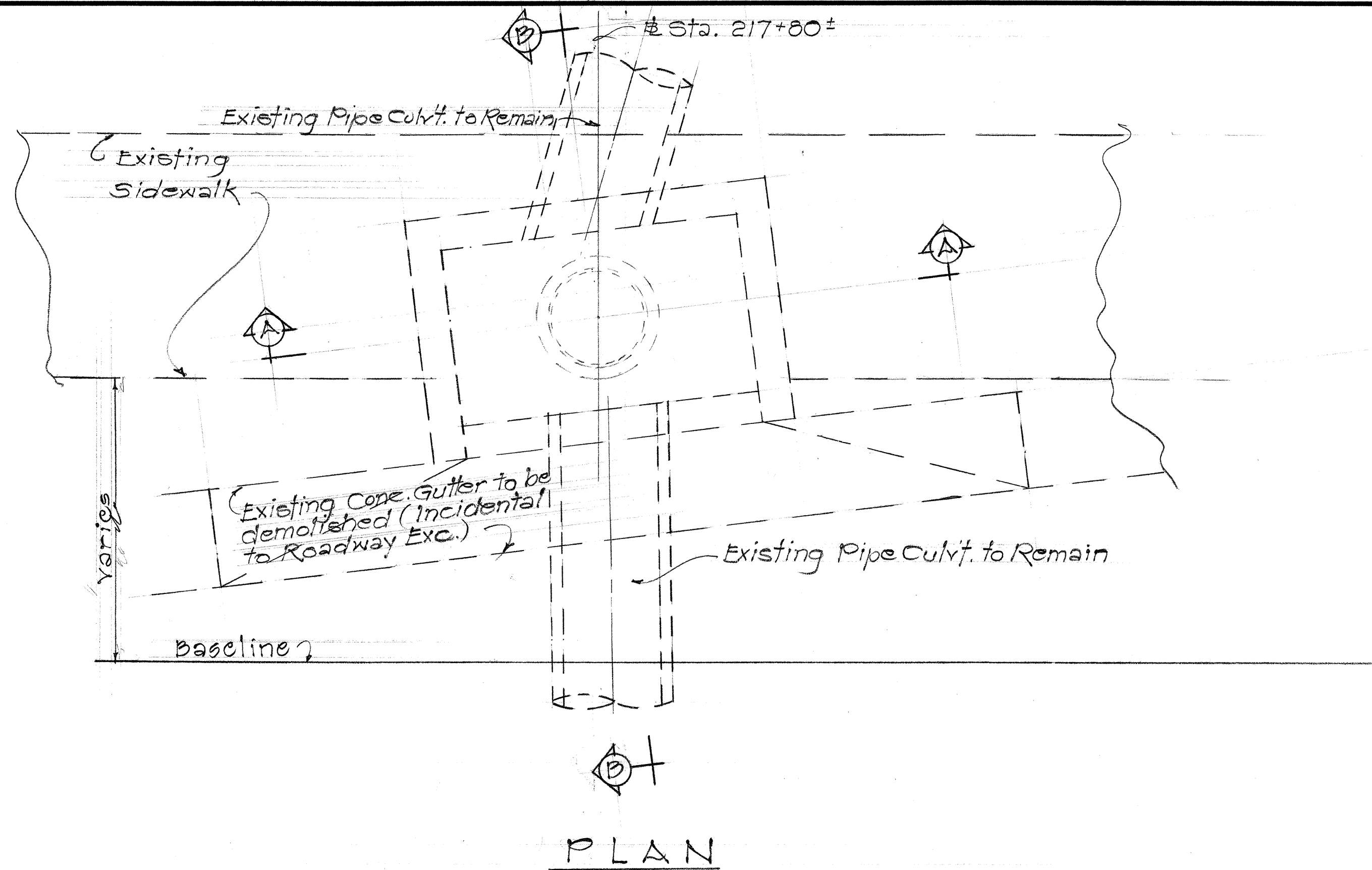


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-090-1(16)	1969	23	50



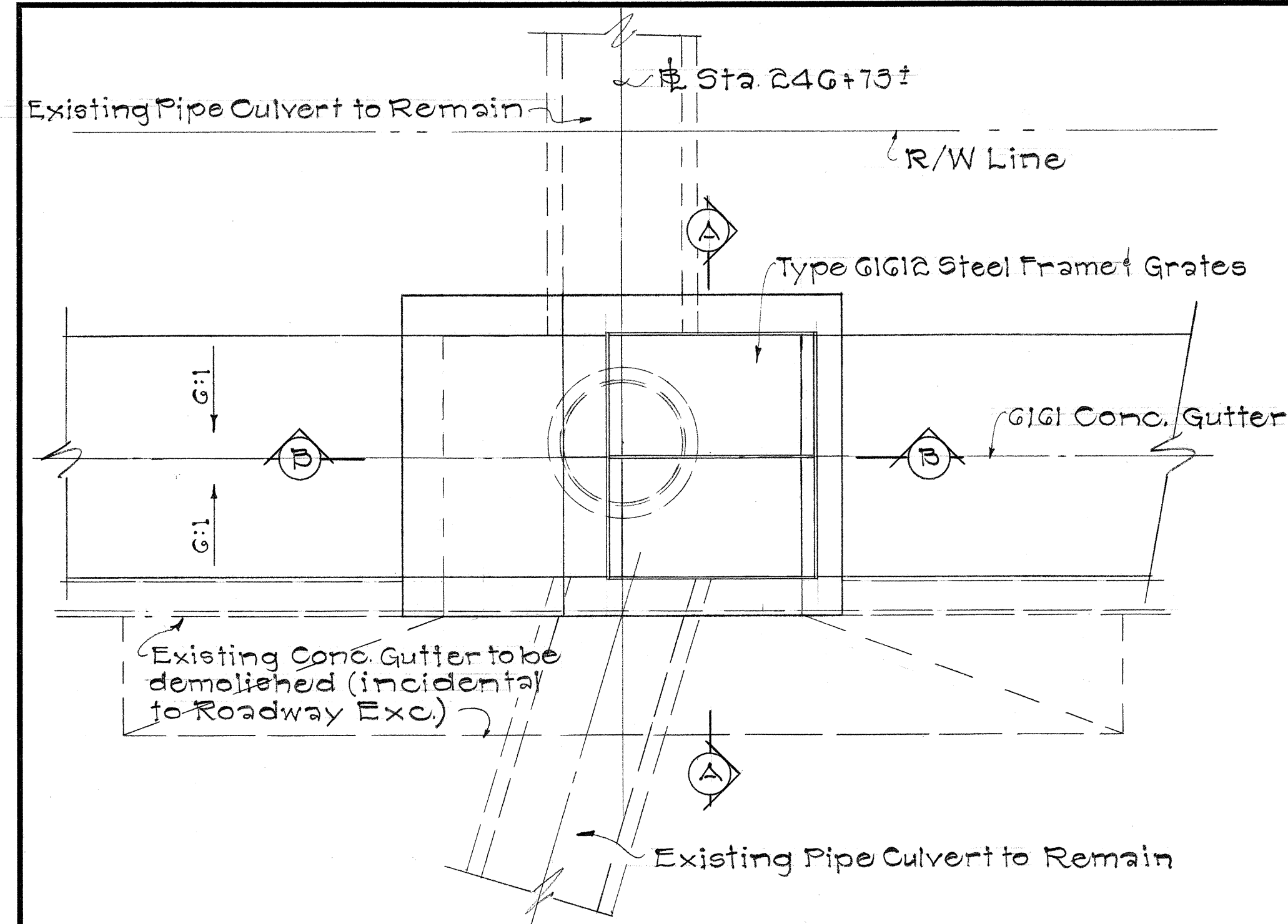
MODIFICATION DETAIL OF C.B. @ STA. 217+80 ± & 242+50

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

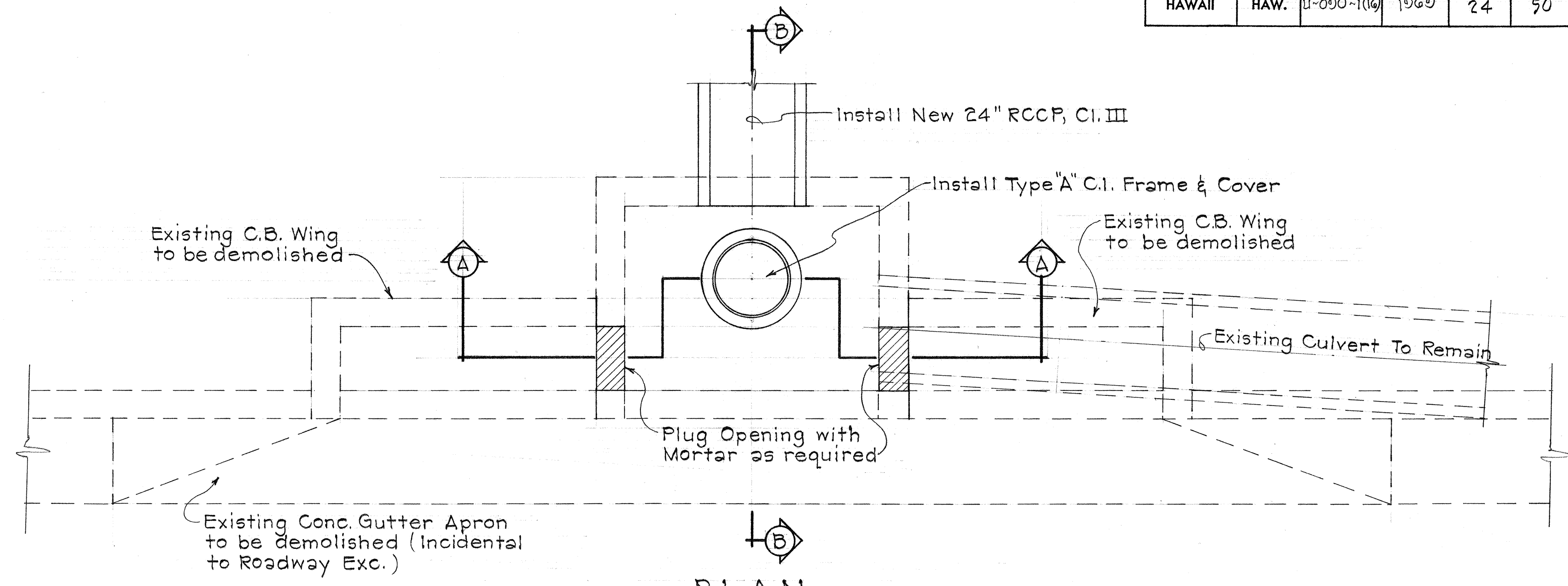
Note:
Hatch Area denotes portion of Existing Catch Basins to be demolished and Modified into Storm Drain Manhole (S.D.M.H.)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
MODIFICATION OF C.B.
AT STA. 217+80 ± AND 242+50
PROJ. NO. U-090-1(16)
Scale: 1/2" = 1'-0" Date: July, 1969
SHEET No. 1 OF 6 SHEETS

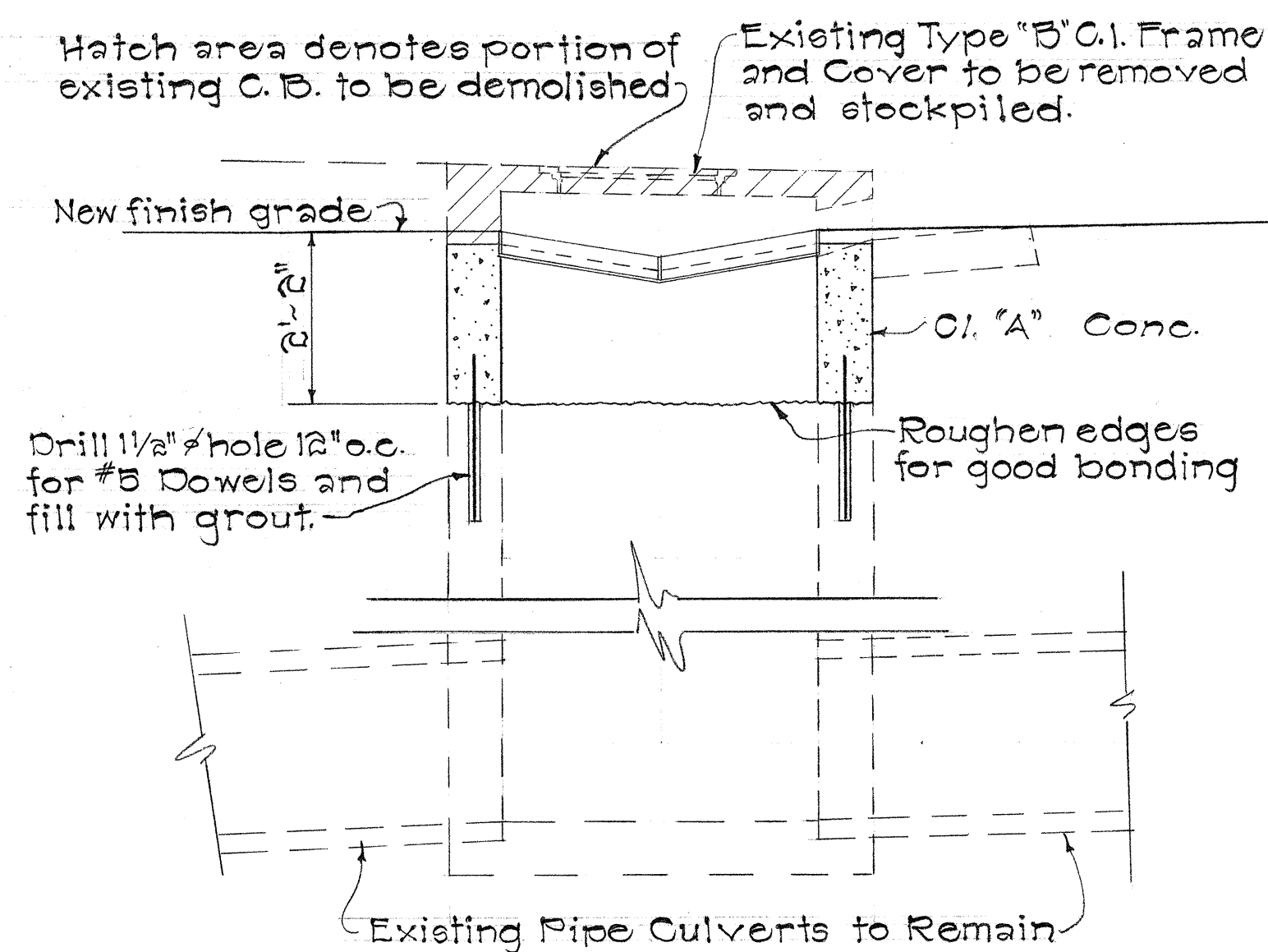
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-090-1(16)	1969	24	50



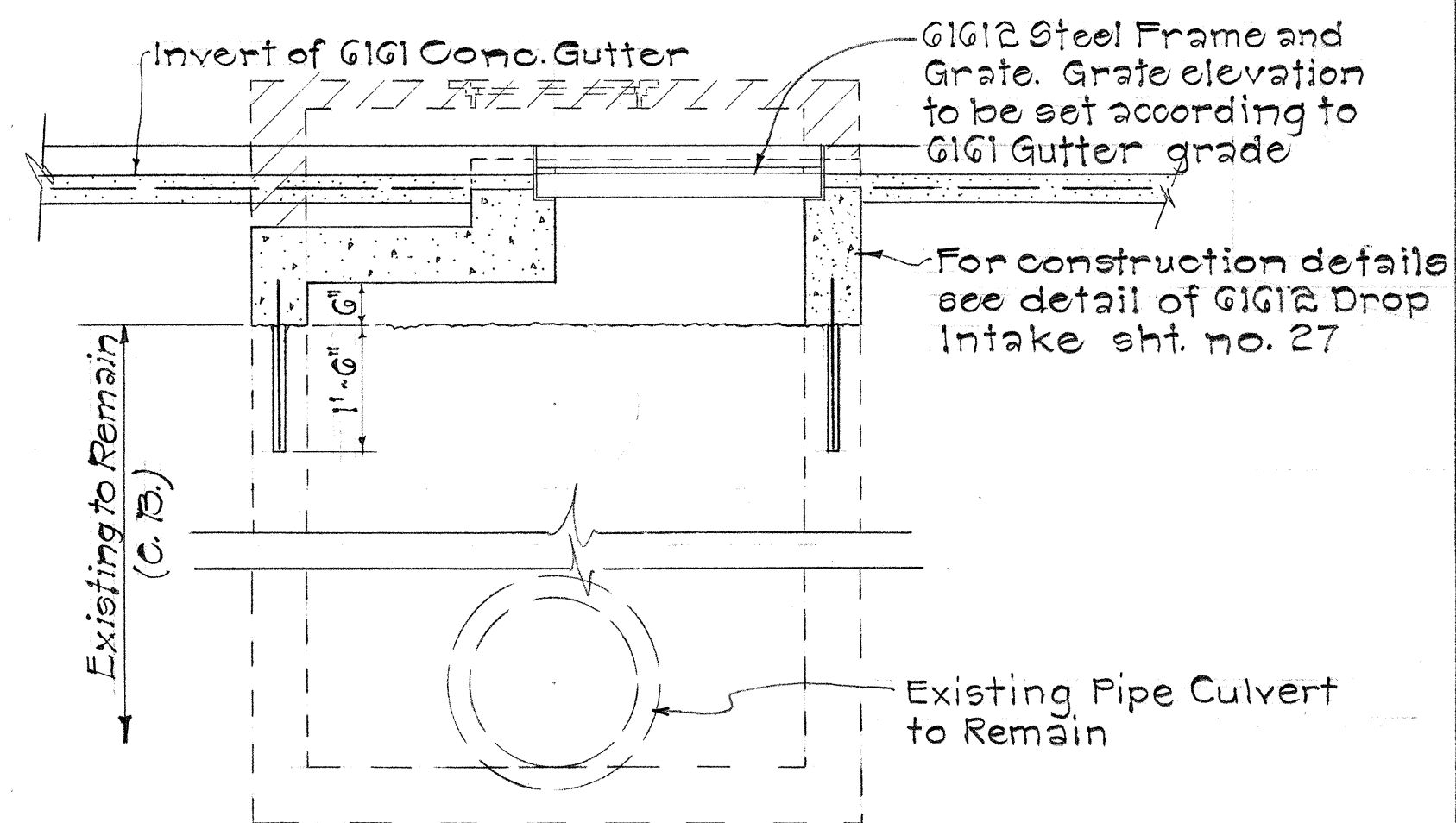
PLAN



PLAN

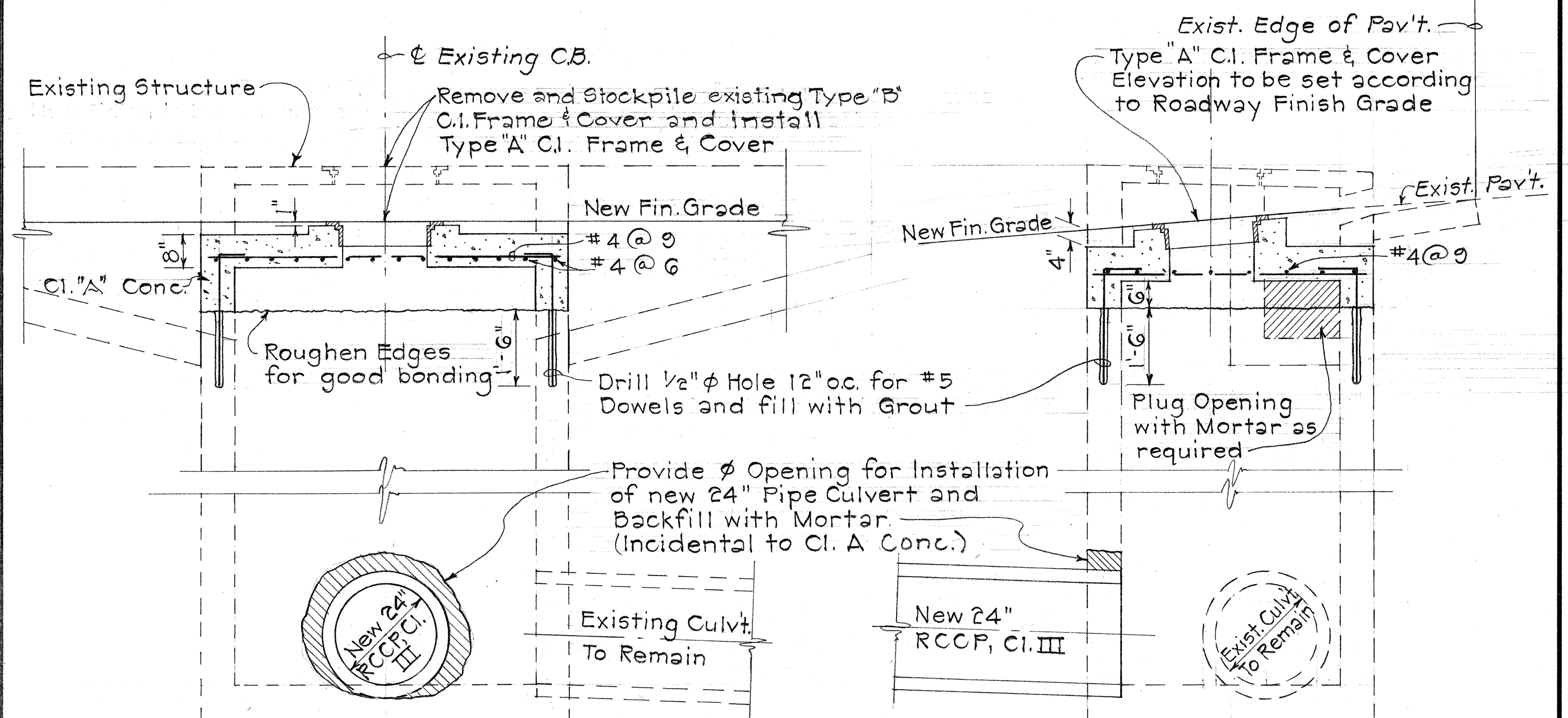


SECTION "A-A"



SECTION "B-B"

MODIFICATION DETAIL OF C.B. AT STA. 246+73.1
Scale: 1/2" = 1'-0"



SECTION "A-A"

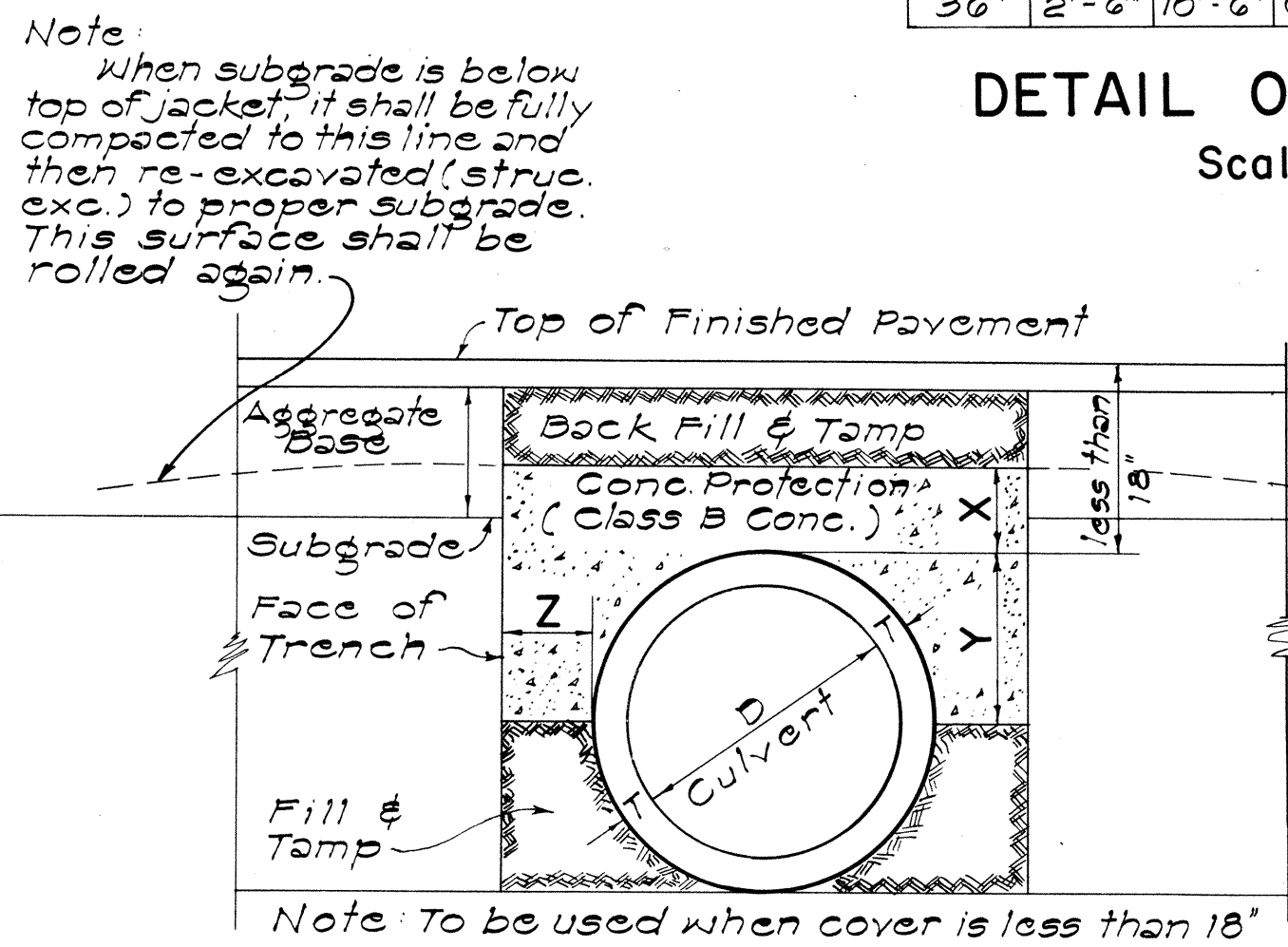
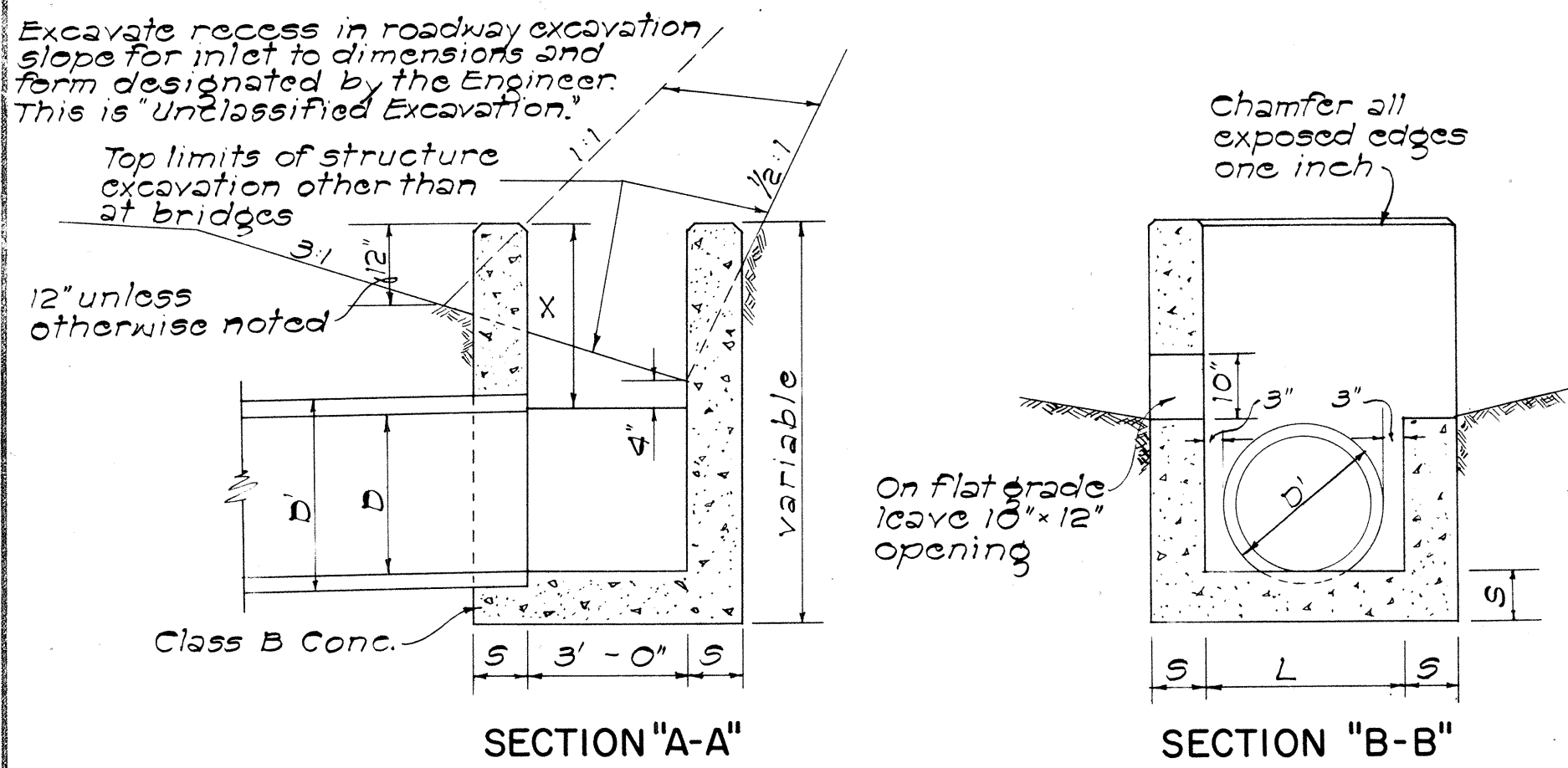
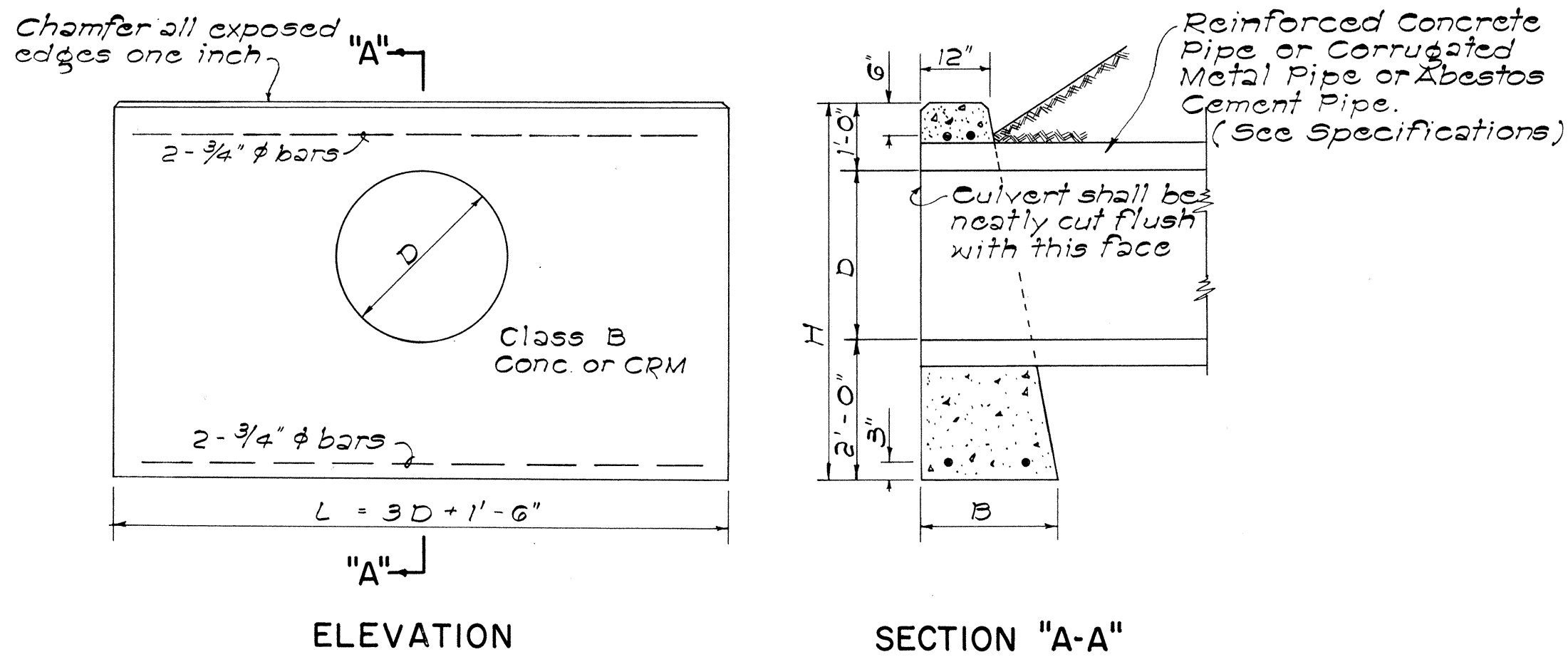
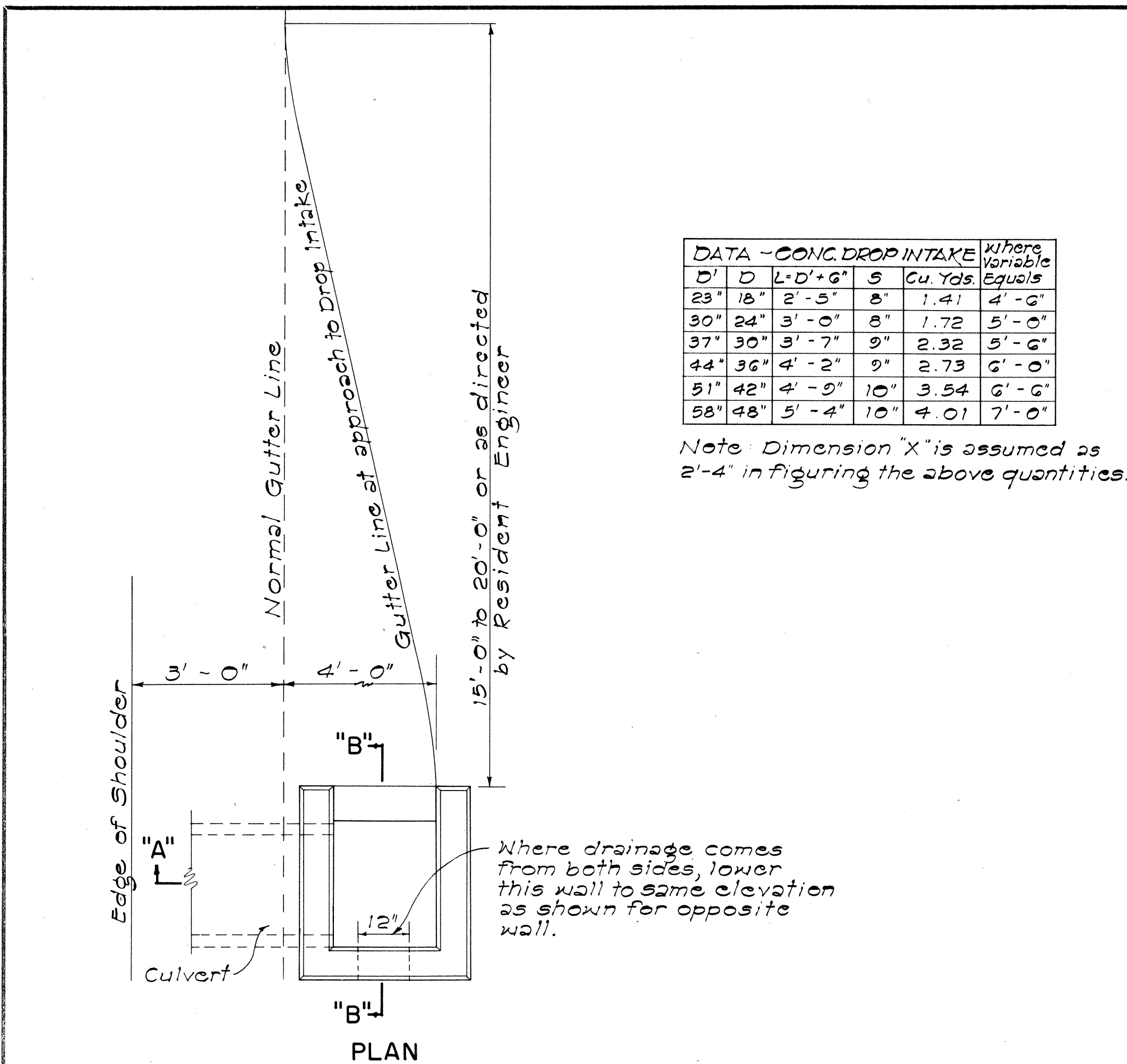
SECTION "B-B"

MODIFICATION DETAIL OF C.B. AT STA. 249+50
Scale: 1/2" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
MODIFICATION OF C.B.
AT STA. 246+73.1 AND 249+50
PROJ. NO. U-090-1(16)
Scale: 1/2" = 1'-0" Date: July, 1969
SHEET No. 2 OF 6 SHEETS

DATE: _____
SURVEY BY: _____
DRAWN BY: _____
DESIGNED BY: _____
CHECKED BY: _____
ORIGINAL PLAN NO. _____
NOTE BOOK NO. _____

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-090-1(16)	1960	26	50



DETAIL OF CONCRETE DROP INTAKE
Scale: 1/2" = 1'-0"

DETAIL OF HEADWALL
Scale: 1/2" = 1'-0"

DATA FOR CONCRETE PROTECTION OVER CULVERTS		
X	Y	Z
6" for 18" D	$\frac{D}{2} + T$	Z must be from pipe to face of trench
7" for 24" D		Minimum = X
8" for 30" D		Maximum pay quantity will be Z = 12"
9" for 36" D		
10" for 42" D		
11" for 48" D		
12" for 54" D		

SECT. OF CULVERT WITH CONG. PROTECTION
Scale: 1" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
DROP INTAKE, HEADWALL &
CONCRETE PROTECTION

Scale: As Shown Date: Aug. 1967
SHEET No. 4 OF 6 SHEETS

GENERAL NOTES

1. Grates and Frames shall be hot dip galvanized after fabrication, see specifications.
2. All welds $\frac{3}{8}$ " unless otherwise noted.
3. Refer to "Spacing Table" for Types 6I6I2 & 6I6I3 Drop Intake and Frame & Grates dimensions.
4. The Frame & Grate materials shall conform to the specifications of ASTM Designation Structural Steel A283, Grade D and the Standard Specifications.
5. Culvert shall leave Drop Intake from any position and any direction indicated by plans or ordered by the Engineer. Culverts may both enter and leave Drop Intake so that Drop Intake will act as manhole.

1. Grates and Frames shall be hot dip galvanized after fabrication, see specifications.
2. All welds $\frac{3}{8}$ " unless otherwise noted.
3. Refer to "Spacing Table" for Types 616I2 & 616I3 Drop Intake and Frame & Grates dimensions.
4. The Frame & Grate materials shall conform to the specifications of ASTM Designation Structural Steel A283, Grade D and the Standard Specifications.
5. Culvert shall leave Drop Intake from any position and any direction indicated by plans or ordered by the Engineer. Culverts may both enter and leave Drop Intake so that Drop Intake will act as manhole.

2A+1'-4"

8"

A

A

8"

Std. M. H. Rungs
(Incidental to
Cl. A Conc.)

2 - Removable Grates

#5 @ 12" Dowels

8"

3'-0"

*12"

Varies

0" to 3'-0" Max.

3'-0" Min. - 6'-0" Max.

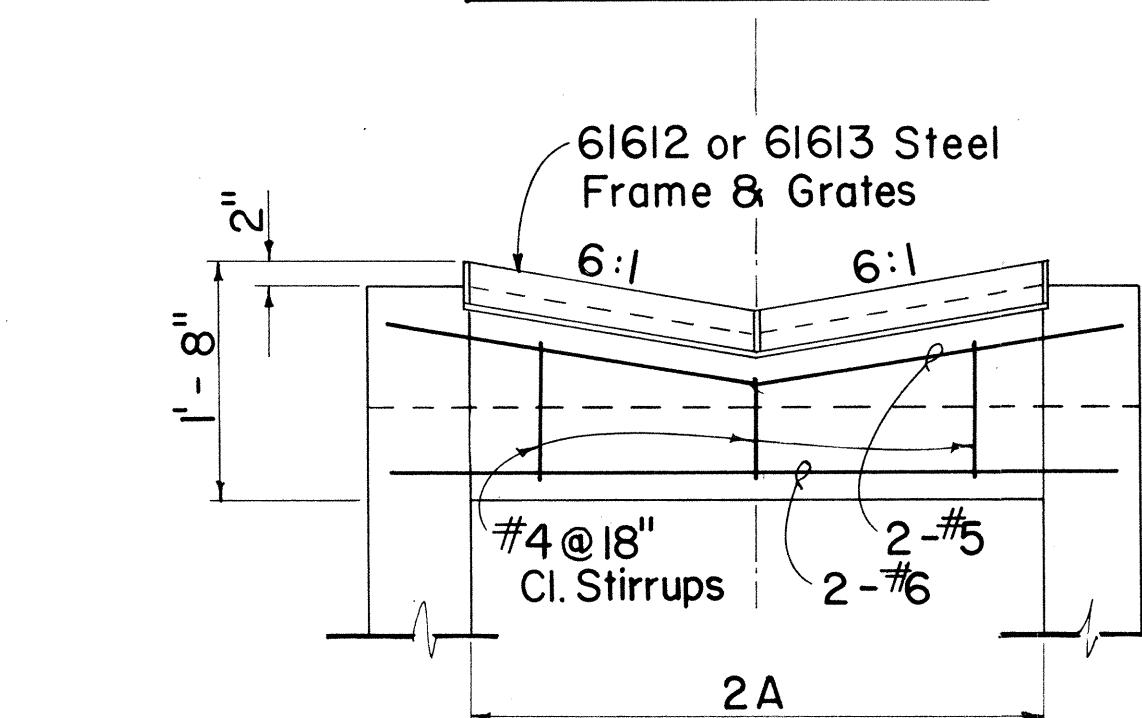
Install 6I62 or 6I63 Steel
Frame & Grates

B

A

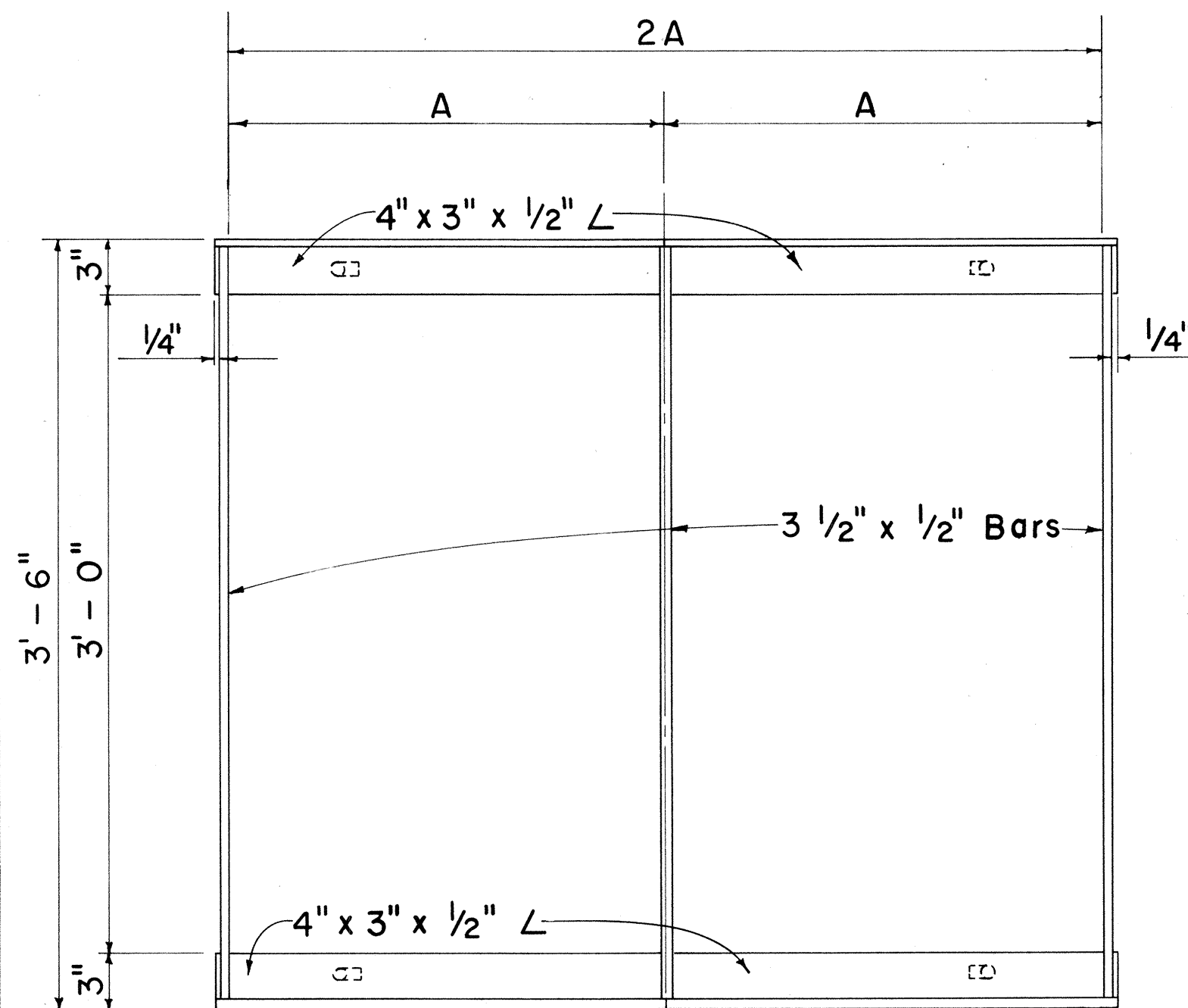
Diagram illustrating the cross-section of a concrete wall with reinforcement details. The wall is shown with a central opening. Reinforcement includes:

- Top Reinforcement:** 2-#5 Top bars.
- Bottom Reinforcement:** 2-#6 Bott. bars.
- Stirrups:** #4 @ 18" Cl. Stirrups (top), #4 @ 9" (right), and #4 @ 6" (bottom).
- Dowels:** #5 @ 12" Dowels (right).
- Bottom Reinforcement:** #4 @ 12" Bothways (bottom).
- Opening Dimensions:** The opening is 3'-0" wide and 8" high. The distance from the left edge to the opening is 1'-6". The distance from the opening to the right edge is 8".
- Reinforcement Spacing:** M.H. Rungs @ 16" o.c. (vertical spacing).
- Concrete Type:** Cl. A Conc. (Concrete).
- Overall Dimensions:** The total width is 8" + *Varies* + 8". The total height is 8" + 8" = 16".

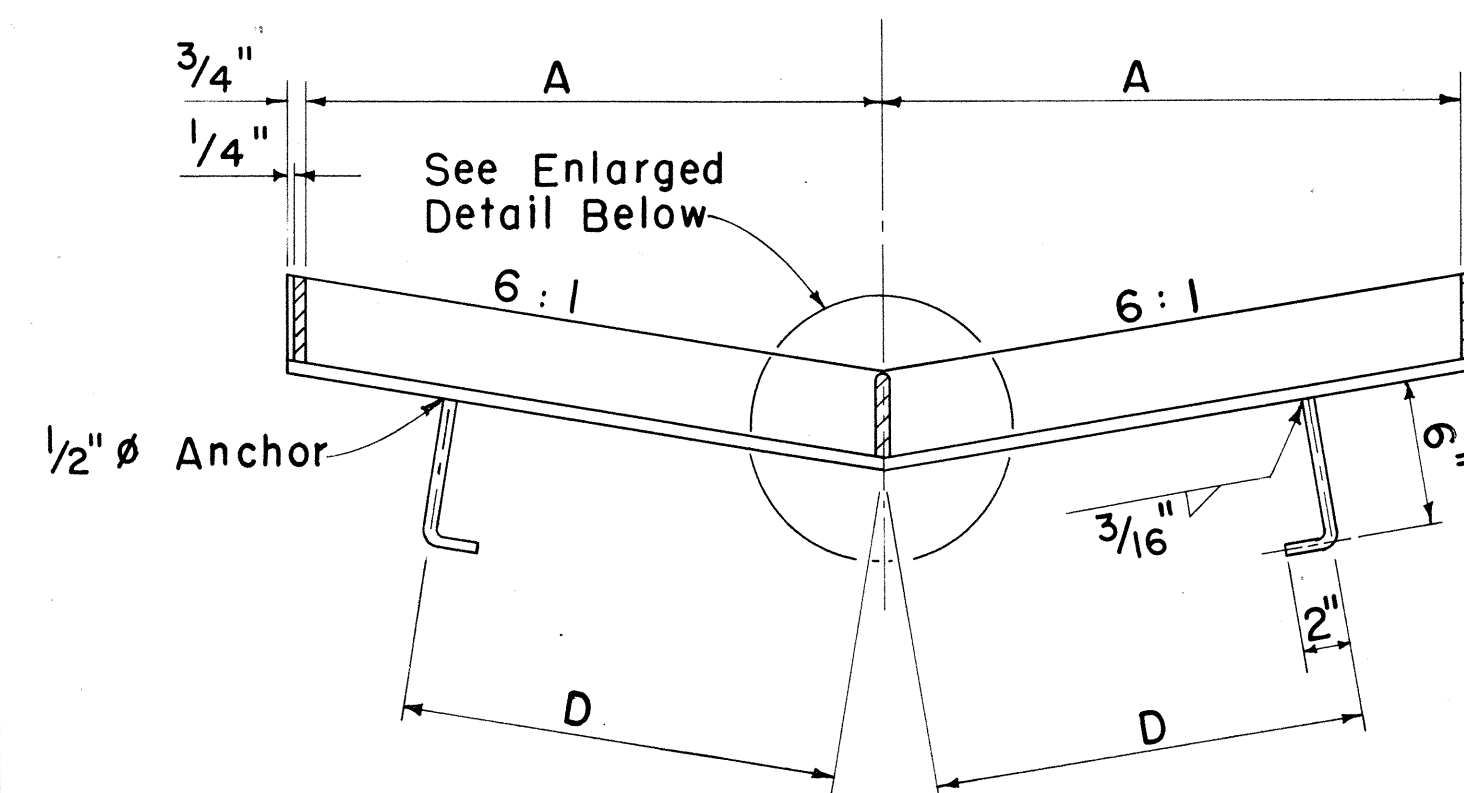


DETAILS OF 61612 OR 61613 DROP INTAKE

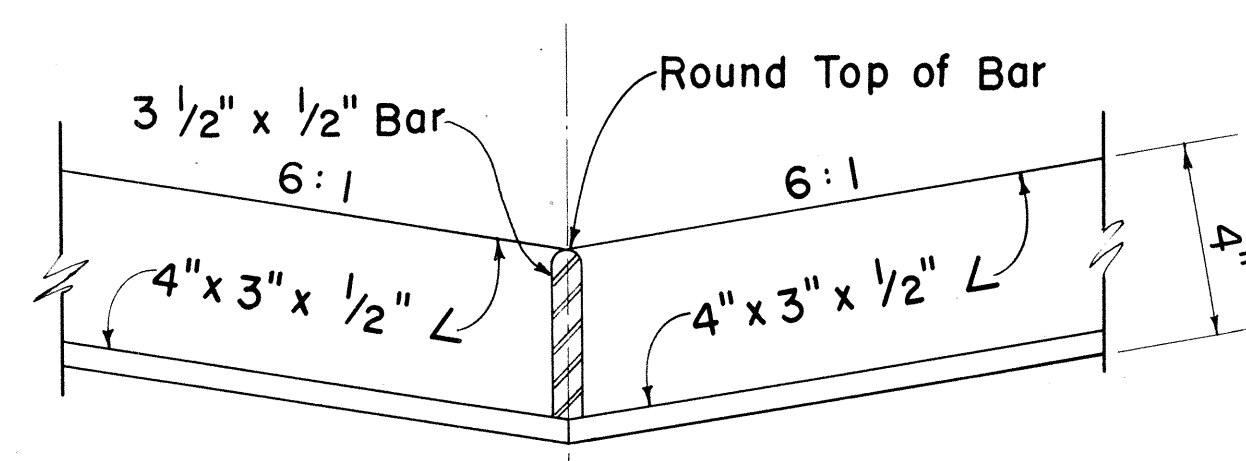
*For Minimum size box of 3'-0", use 8" and eliminate reinforcing steel shown in the top portion.
 **For Culverts larger than 30", the minimum dimension shall be D'.



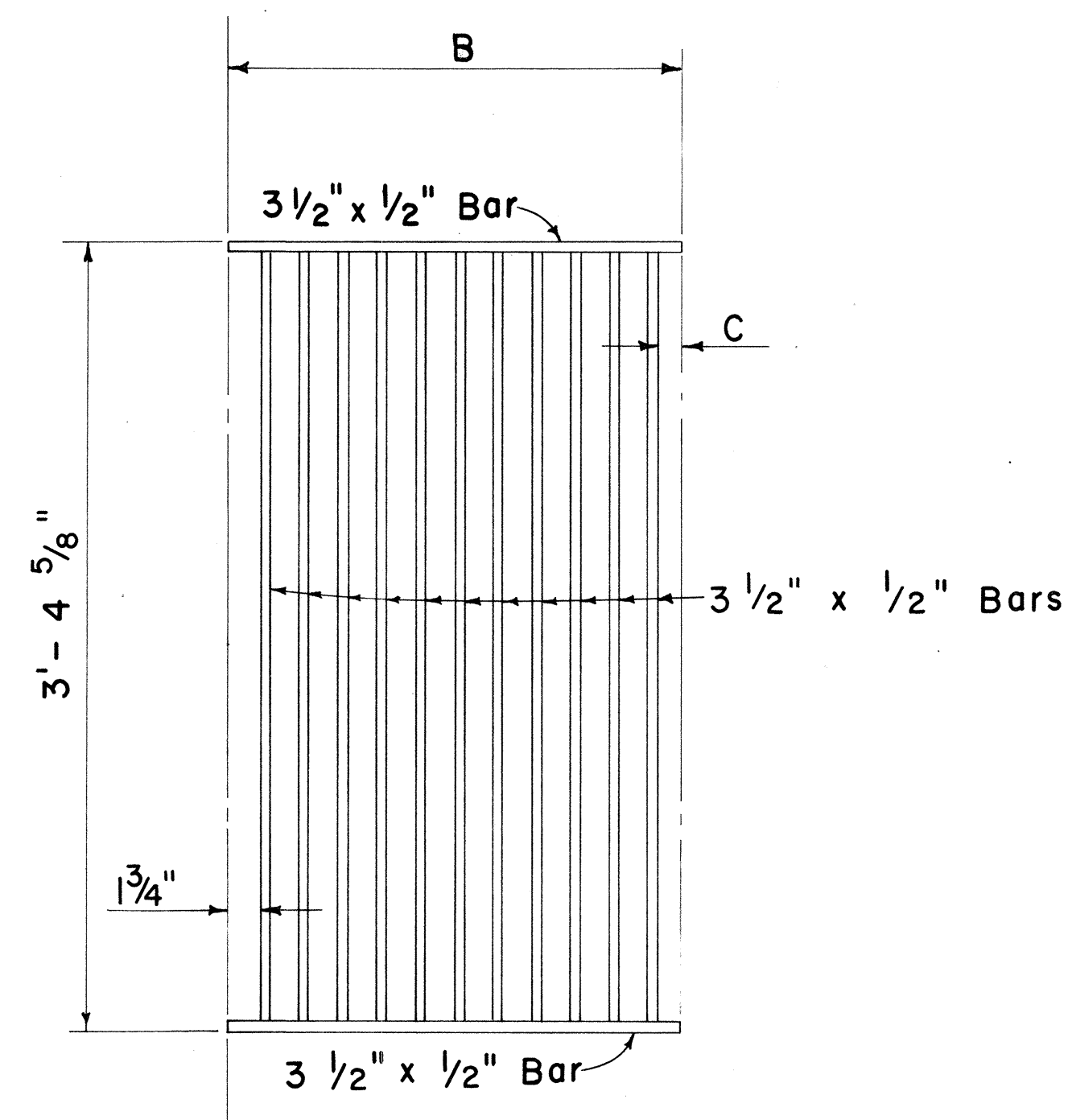
Scale: $1\frac{1}{2}'' = 1' - 0''$



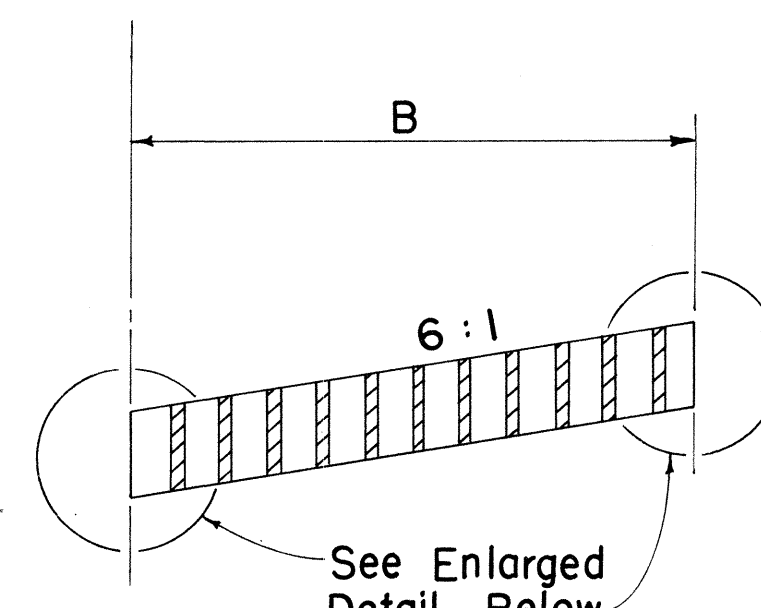
Scale: $1\frac{1}{2}" = 1'-0"$



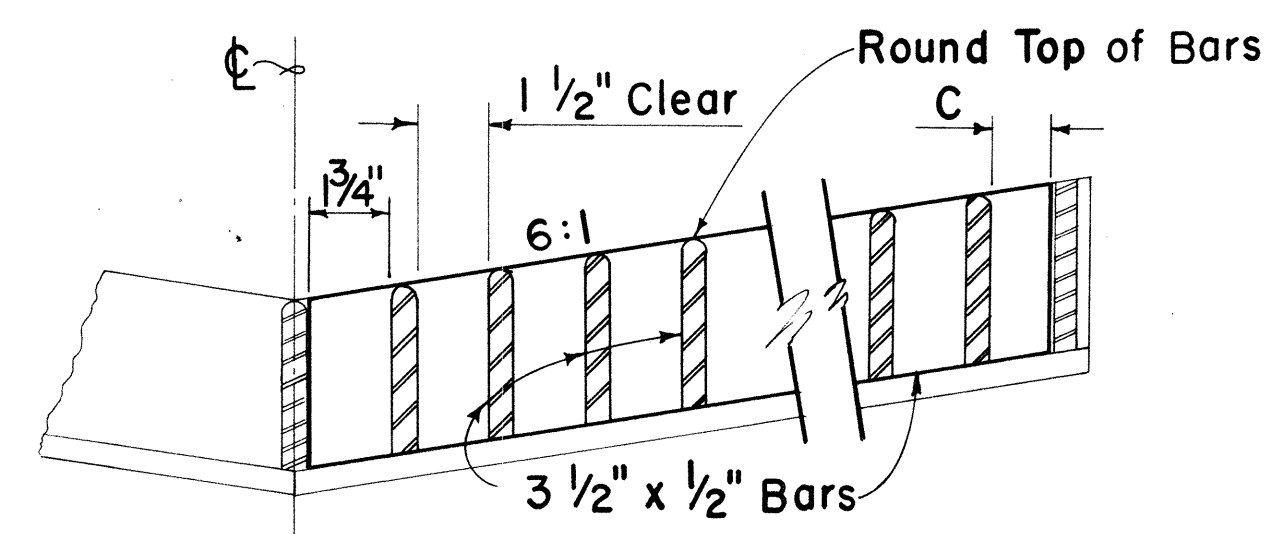
Scale: 3" = 1' - 0"



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



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



Scale: 3" = 1' - 0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
TYPE 61612 & 61613
GRATED DROP INTAKES

Scales: As Noted

Date: Feb. 1969

SHEET No. 5 OF 6 SHEETS

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

Technical drawing of a mechanical part, likely a flange or base plate, showing dimensions and tolerances. The drawing includes a top view and a side view.

Top View Dimensions:

- Overall diameter: 25" Dia.
- Inner hole diameter: 2 1/8" Dia. Cover
- Distance from center to left edge: 4"
- Distance from center to right edge: 4"
- Distance from center to the start of the cutout: 3 1/2"
- Distance from the start of the cutout to the end: 2 1/2"
- Distance from the end of the cutout to the right edge: 4"
- Distance from center to the start of the cutout: 3"
- Distance from the start of the cutout to the end: 2 1/8"
- Distance from the end of the cutout to the right edge: 4"

Side View Dimensions:

- Overall height: 6"
- Height of the central raised section: 1 1/2"
- Height of the cutout: 1 1/8"
- Height of the base: 1 1/8"
- Height of the central raised section: 1 1/2"
- Height of the cutout: 1 1/8"
- Height of the base: 1 1/8"

Tolerances:

- ± .005" (on the 2 1/8" Dia. Cover)
- ± .005" (on the 3" dimension)
- ± .005" (on the 2 1/8" dimension)
- ± .005" (on the 4" dimension)
- ± .005" (on the 4" dimension)
- ± .005" (on the 3 1/2" dimension)
- ± .005" (on the 2 1/2" dimension)
- ± .005" (on the 4" dimension)
- ± .005" (on the 1 1/2" dimension)
- ± .005" (on the 1 1/8" dimension)
- ± .005" (on the 1 1/8" dimension)

SHEET N^o 6 OF 6 SHEETS

Technical drawings of a rectangular frame, showing side and top views with dimensions.

Side View (Left):

- Overall width: $2'-10"$
- Central opening width: $2'-5"$
- Height: $2'-2"$
- Material: *Cast Iron*

Top View (Right):

- Overall width: $3'-1\frac{1}{2}"$
- Central opening width: $2'-8"$
- Height: $2'-4\frac{1}{2}"$
- Material: *Frame Cast Iron*

Technical drawing of a mechanical part, likely a valve or plug, showing dimensions and a hole. The drawing includes the following dimensions and features:

- Overall width: $2\frac{1}{4}$ Dia.
- Top left corner: $\frac{1}{4}$ inch radius.
- Top left horizontal segment: $3\frac{1}{16}$ inch.
- Top center horizontal segment: 1 inch.
- Top right horizontal segment: $3\frac{1}{16}$ inch.
- Right side vertical segment: $\frac{1}{2}$ inch.
- Bottom right corner: $\frac{1}{8}$ inch radius.
- Bottom horizontal segment: $3\frac{1}{2}$ inch.
- Internal hole: $\frac{7}{8}$ Hole.
- Internal hole diameter: $1\frac{1}{8}$ inch.

Technical drawing of a wheel with spokes. The wheel has a diameter of 16 inches (16" R). The spokes are arranged in a circular pattern. The dimensions for the spokes are as follows:

- Spoke 1 (top): 10 3/4" D, 1/4" thick.
- Spoke 2 (top-right): 9" R, 1/4" thick.
- Spoke 3 (bottom-right): 2 1/4" D, 1/4" thick.
- Spoke 4 (bottom): 1 1/4" thick.
- Spoke 5 (bottom-left): 1 1/4" thick.
- Spoke 6 (top-left): 3 1/4" thick.

A circular cast iron manhole cover. It features concentric rings. The word "SANTARIA" is embossed in an arc across the top, and "SEWER" is embossed in an arc across the bottom. In the center is a crosshair design. A small circular hole is visible on the left side. A line points from the text "Cast Iron" to the cover.

[illegible]

Cast Iron

8 Ribs spaced equally

$\frac{3}{4}"$

Technical drawing of a mechanical part, likely a bracket or support. The drawing shows a side view with the following dimensions:

- Overall width: $30 \frac{3}{8}''$
- Overall height: $24 \frac{1}{2}''$
- Top flange thickness: $\frac{1}{4}''$
- Top flange width (left): $1''$
- Top flange width (right): $1''$
- Vertical distance from top flange to main body: $2''$
- Vertical distance from main body to base: $2''$
- Base thickness: $\frac{1}{4}''$
- Horizontal distance from left edge to main body: $10''$
- Horizontal distance from main body to right edge: $10''$

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

A circular diagram of a storm drain cover. The cover is divided into a grid of squares. The word "STORM" is written across the top half, and "DRAIN" is written across the bottom half. A 1-inch diameter hole is indicated on the right side.

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

• •

THE TYPE "S" CAST IRON FRAME AND COVER SHOWN
ON THIS SHEET IS EQUIVALENT TO THE CITY AND
COUNTY OF HONOLULU, DIVISION OF SEWERS' TYPE
"SA" CAST IRON MANHOLE FRAME AND COVER.

THE TYPE "W" CAST IRON FRAME AND COVER SHOWN ON THIS SHEET IS EQUIVALENT TO THE CITY AND COUNTY OF HONOLULU, BOARD OF WATER SUPPLY'S CAST IRON MANHOLE FRAME AND COVER, 20" SIZE.