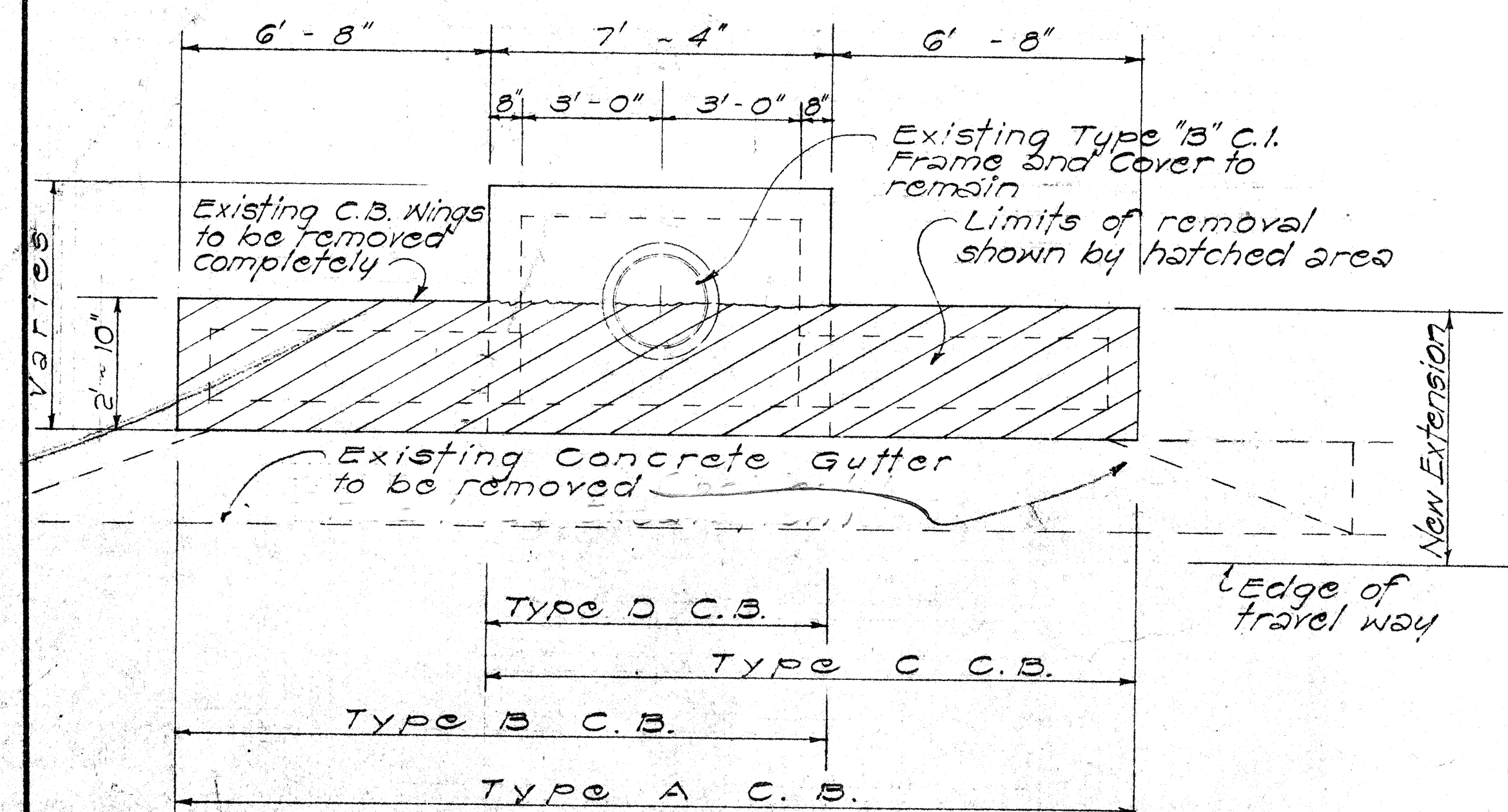


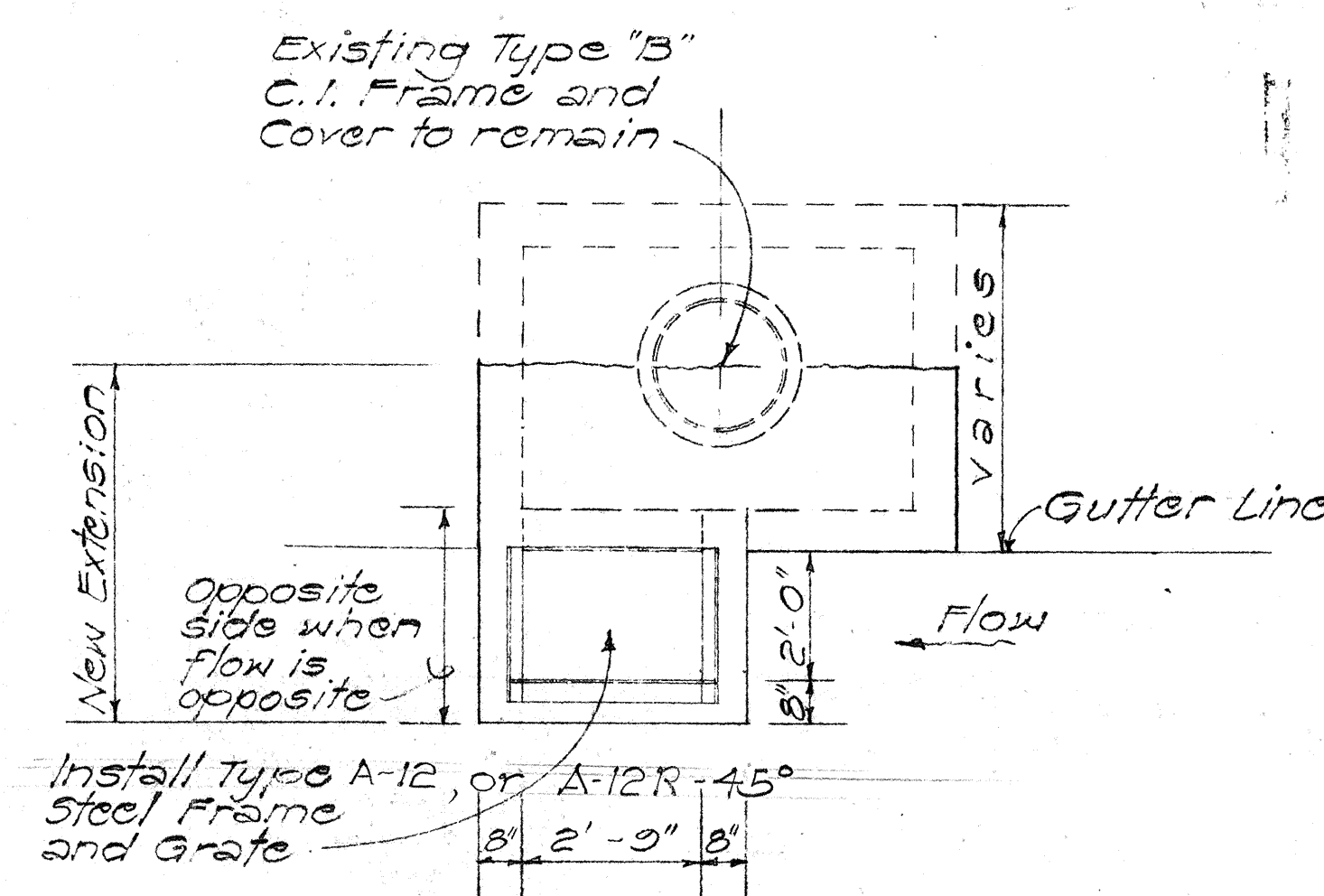
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	018C-01-77M	1978	C.O.15 S-1	15

GENERAL NOTES

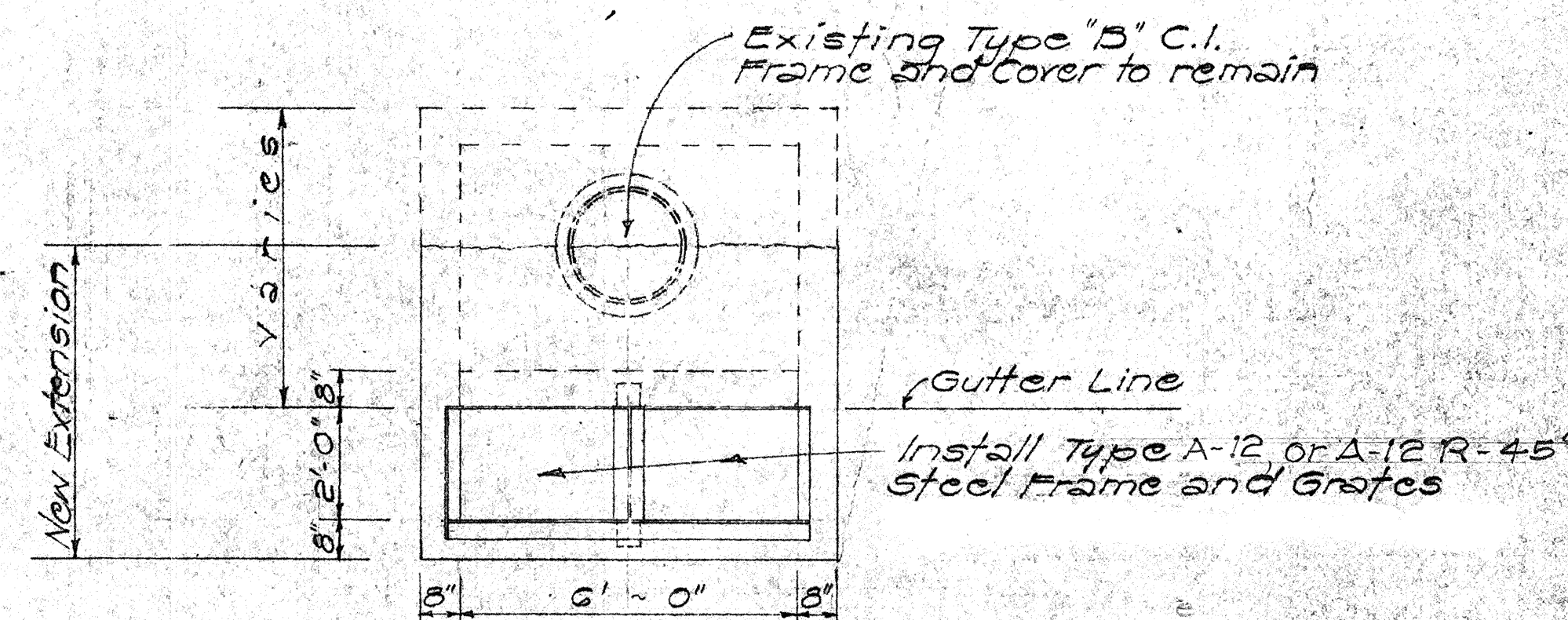
- Demolishing and removing a portion of the existing structure and A.C. shall not be paid for separately, but shall be considered incidental to structural concrete.
- Unnecessary culvert lengths within the catch basins shall be neatly cut flush with the face of the wall.
- Contractor shall reuse salvaged manhole rungs and also provide new manhole rungs whenever necessary and ordered by the Engineer. Manhole Rungs shall be considered incidental to structural concrete.
- Exposed portion of C.I. frame shall be cleaned before pouring concrete for top slab.
- Damage to other existing facilities during construction shall be repaired or replaced by the Contractor at his expense.
- Reconstruction of existing Concrete Curb and Gutter shall be considered incidental to structural concrete.
- Only non-pneumatic type of drill as approved by the Engineer will be permitted for drilling holes in concrete.
- Contractor shall use structural concrete for all modified intakes.



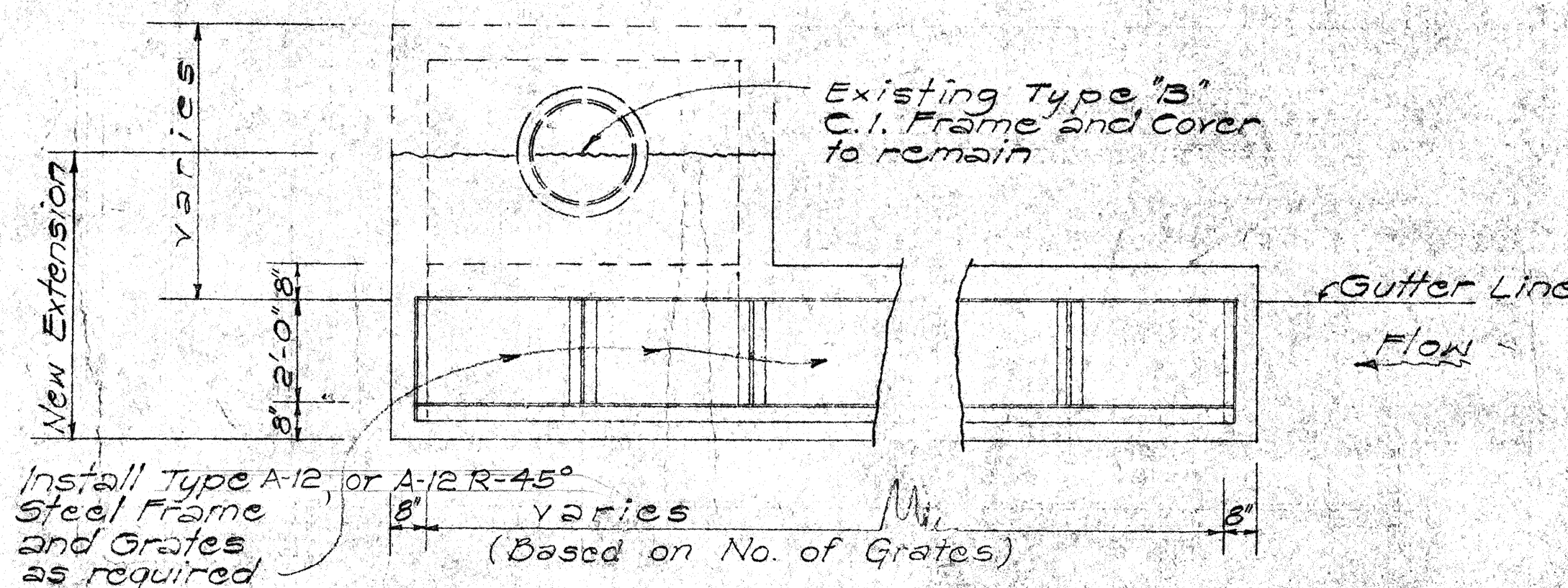
PLAN



PLAN MODIFICATION FOR 1 GRATE

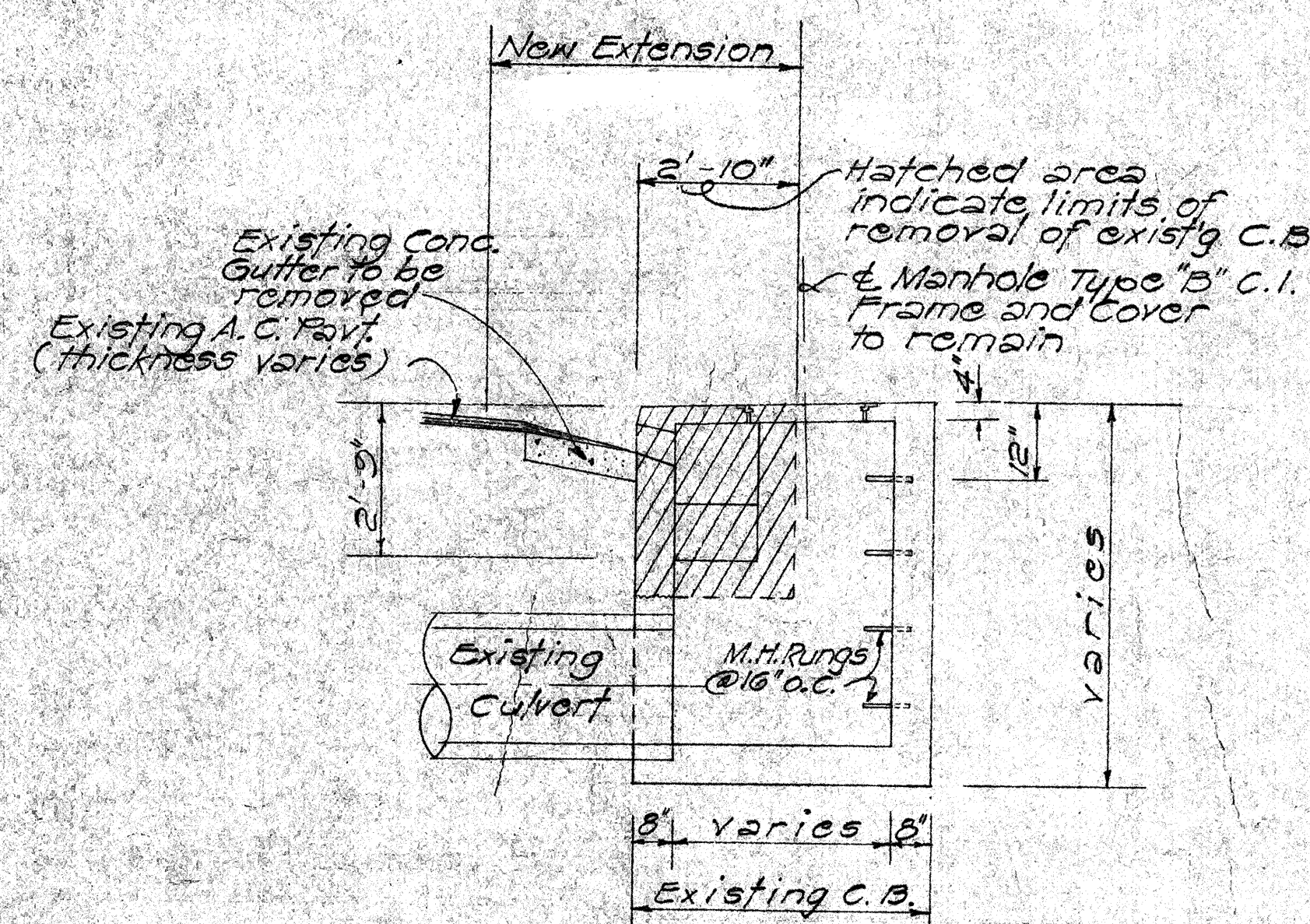


PLAN MODIFICATION FOR 2 GRATES



PLAN MODIFICATION FOR 3 OR MORE GRATES

PLAN VIEW OF MODIFICATIONS TO CONVERT EXISTING CATCH BASINS TO USE ONE OR MULTIPLE GRATES



SECTION

DETAILS - REMOVAL OF EXISTING CATCH BASINS

10/7/77 Sheet added to show Catch Basin details.

DATE REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

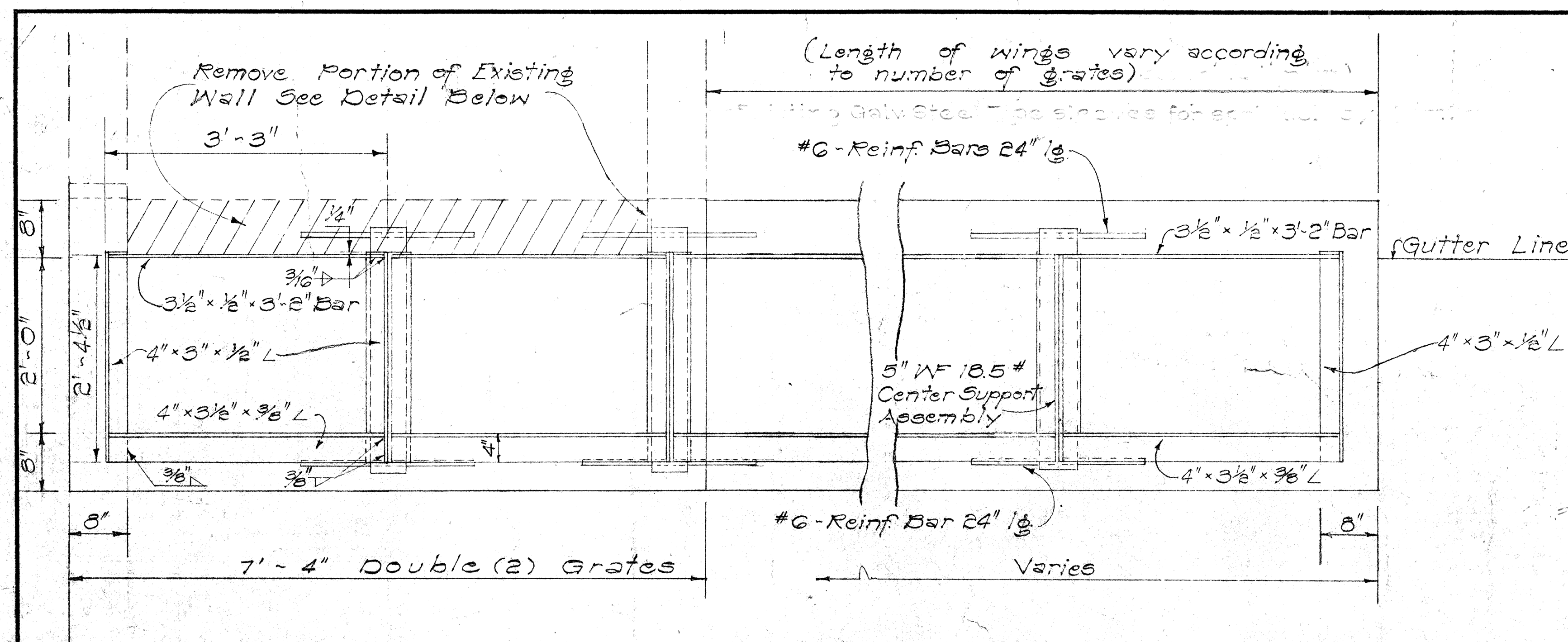
Modification of Catch Basins with Grated Inlet within an Existing Gutter
KALANIANA'OLE HIGHWAY RESURFACING
CASTLE JUNCTION TO KAWAINUI BRIDGE
PROJ. NO. 018C-01-77M
Scale: 3/8" = 1'-0" Date: Sept. 1977

SHEET No. 7 OF 4 SHEETS

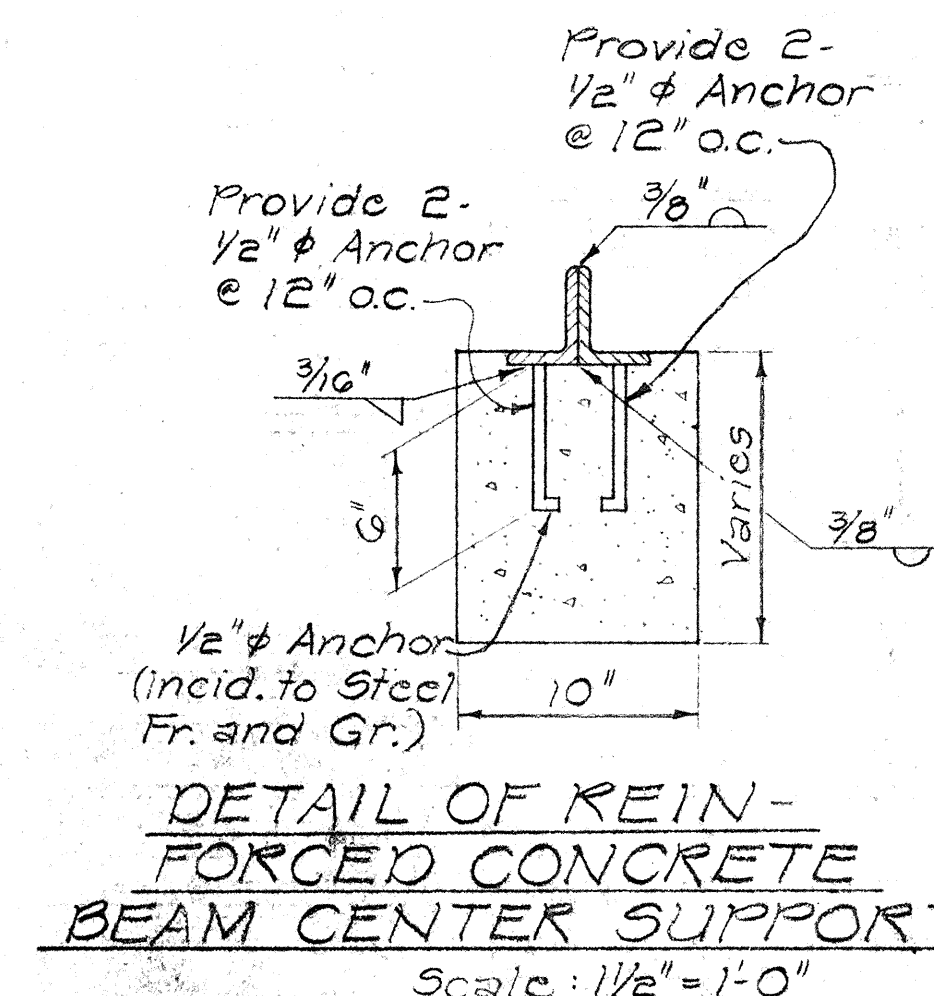
C.O.15 S-1

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
ORIGINAL PLAN	
NO. BOOK	
NO.	

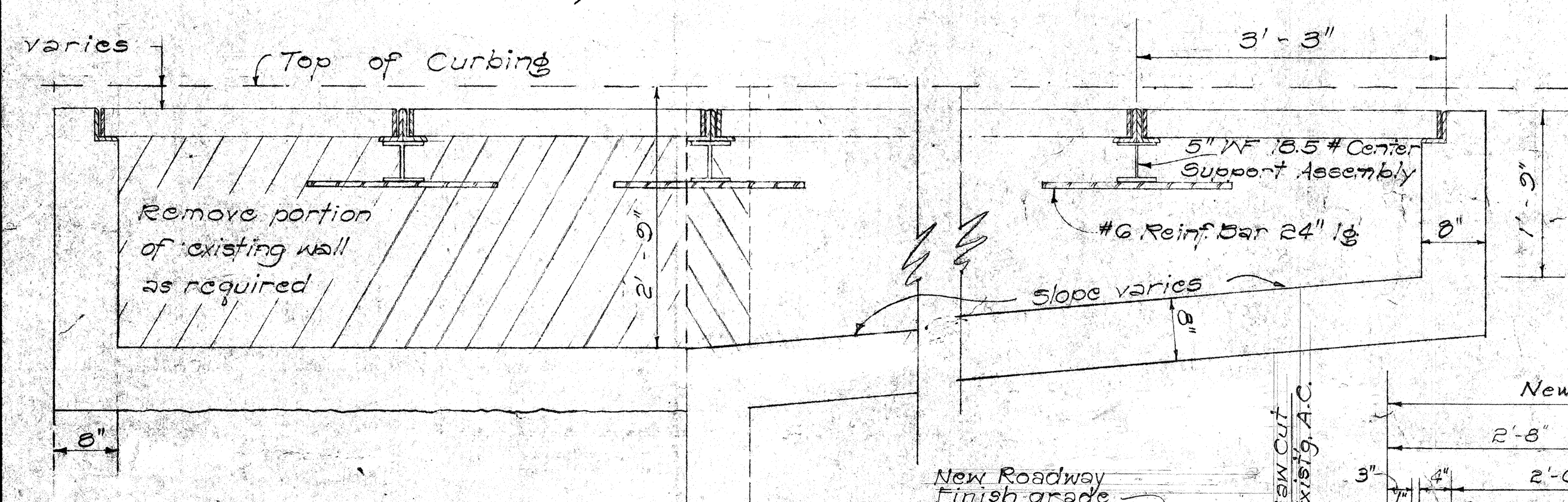
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	61BC-01-77M	1978	C.O.15 S-2	15



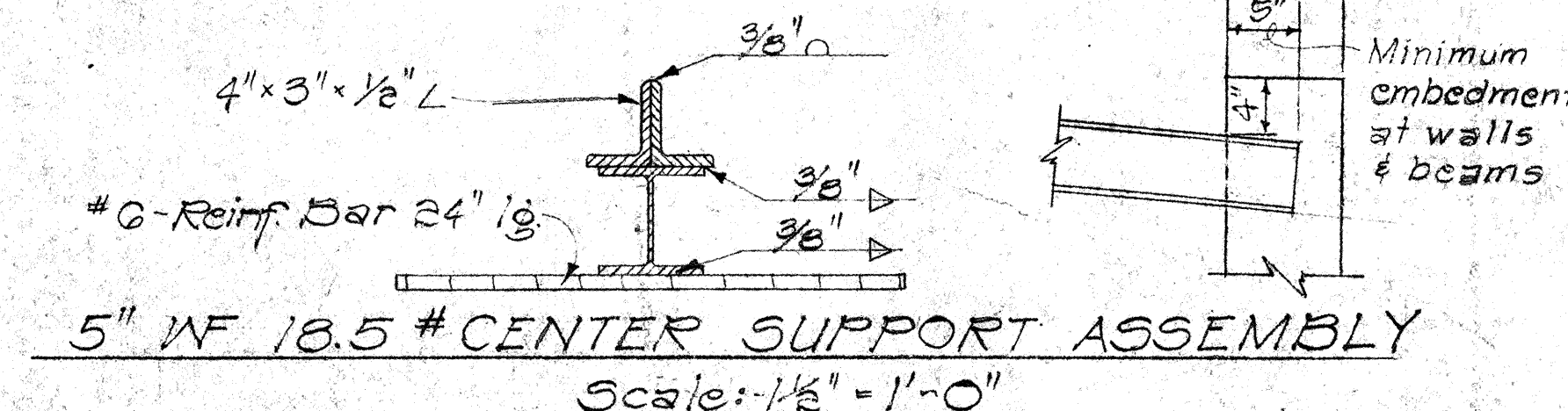
PLAN
Scale: 1" = 1'-0"



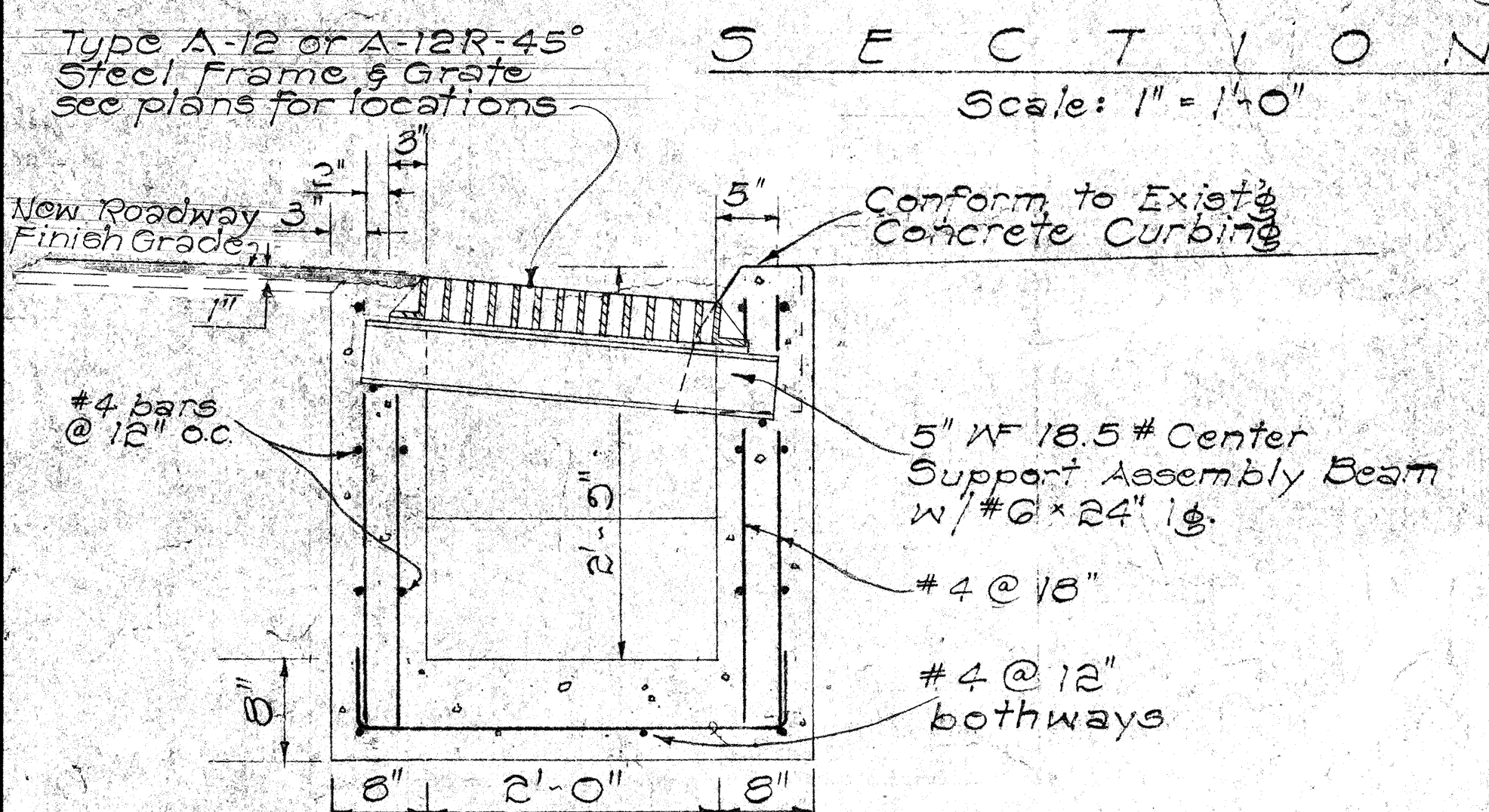
DETAIL OF REINFORCED CONCRETE BEAM CENTER SUPPORT
Scale: 1/2" = 1'-0"



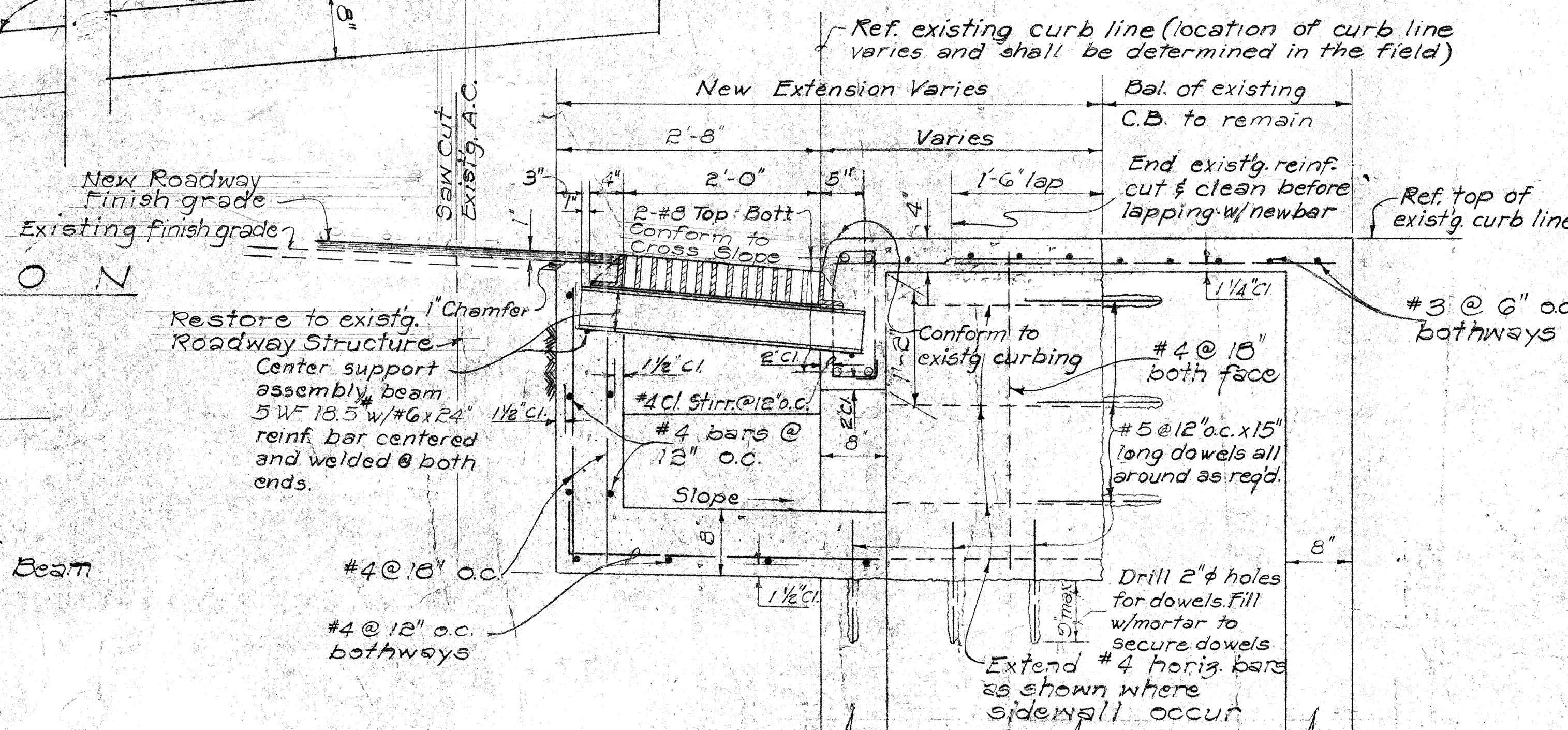
SECTION
Scale: 1" = 1'-0"



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



TYPICAL SECTION OF NEW C.B. WING
Scale: 1" = 1'-0"



TYPICAL SECTION THRU MODIFIED C.B.
Scale: 1" = 1'-0"

DATE	REVISION
10/7/77	Sheet added to show Catch Basin details.

Two or more Gratings are specified, Center Support Assembly shall not be paid for separately but shall be considered as incidental to Type "S" Steel Frame and Grate. All welds 1/8" unless noted otherwise. Grate and Frame shall be hot dip galvanized after fabrication, see specifications. The various materials shall conform to the specifications of ASTM as listed in the following tabulation and the Std. Specifications.

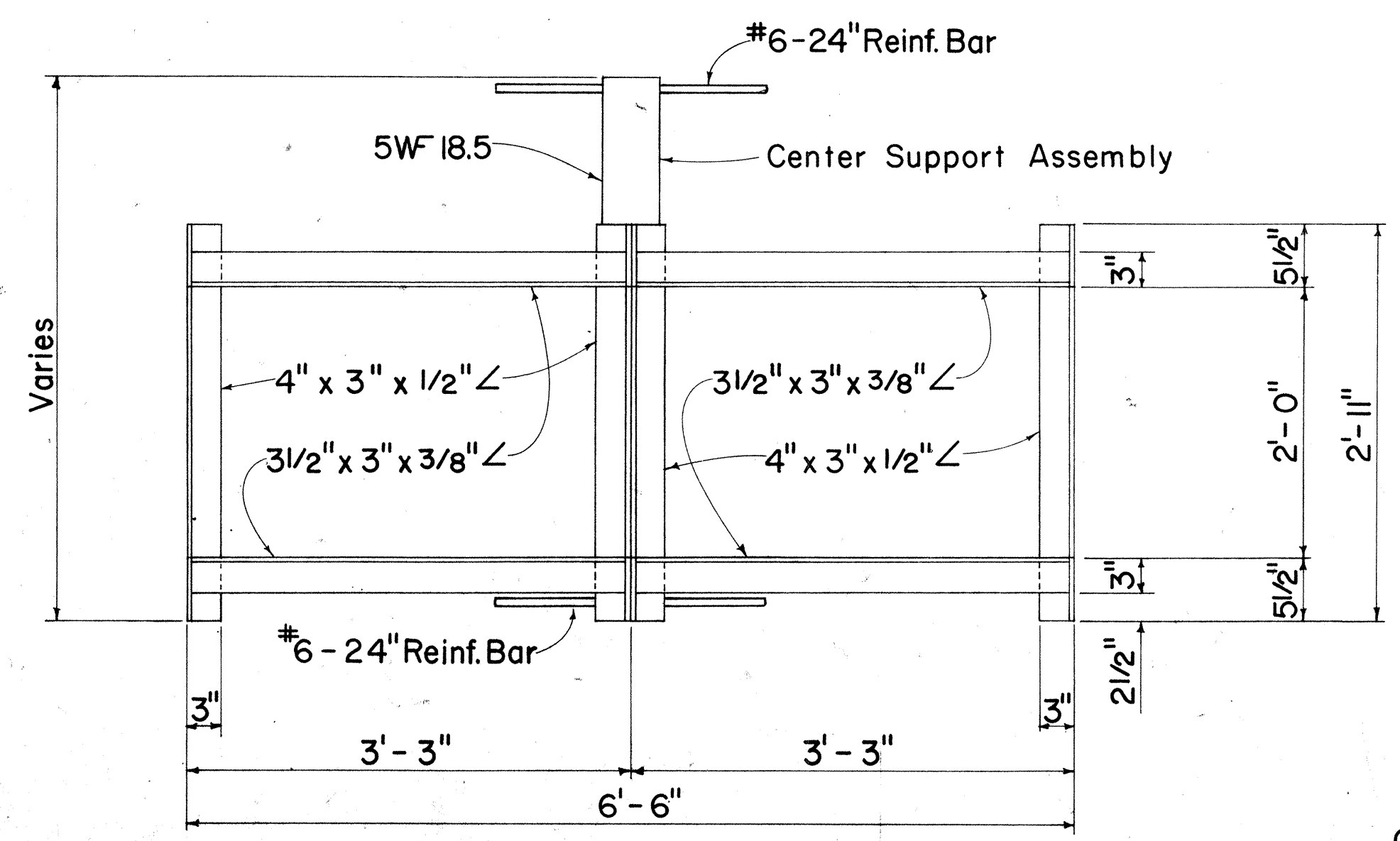
Material	ASTM Designation
Structural Steel	A253, Grade D
Cast Steel	A27, Grade 65-35
Malleable Iron Casting	A47, Grade No 35018

Contractor has the option of using cast malleable iron, cast steel, welded, bolted, cast malleable iron and block or cast steel and block grate. Frames & Grates shall have edges ground smooth.

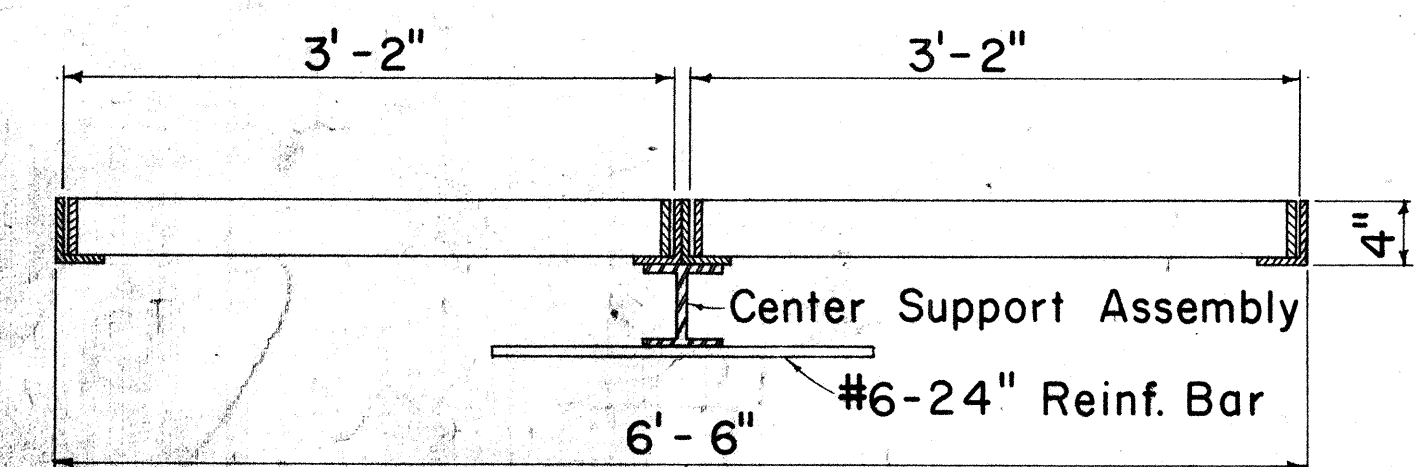
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
DRAINAGE DETAILS
MODIFICATIONS OF C.B. WITH GRA TED INLET WITHIN EXISTING GUTTER
KALANIANAOLE HIGHWAY RESURFACING CASTLE JUNCTION TO KAWAII BRIDGE PROJ. NO. GIBC-01-77M Scale: As Noted. Date: Sept. 1977
SHEET No. 2 OF 4 SHEETS

C.O.15 S-2

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	218C-01-77M	1978	C.O. 155-3	15

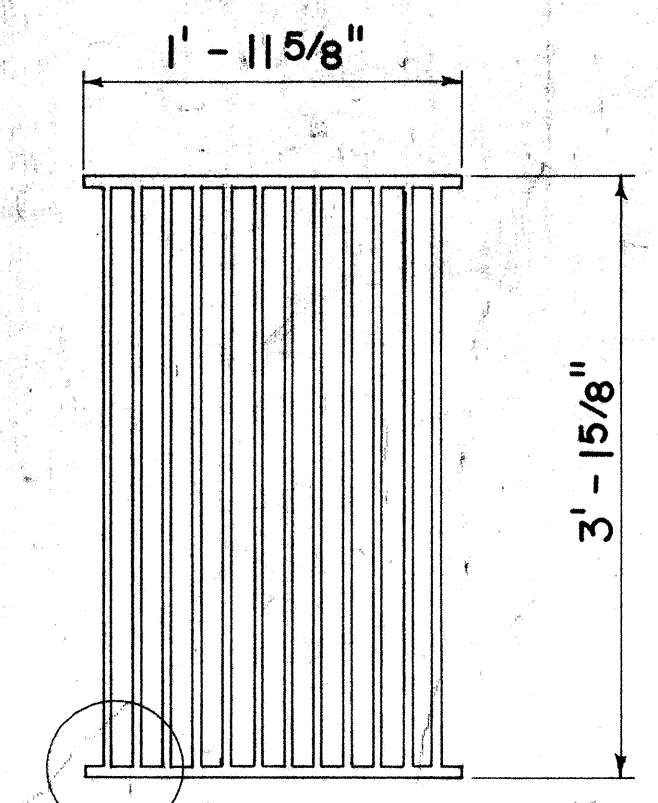


PLAN
(Two or More Grates)



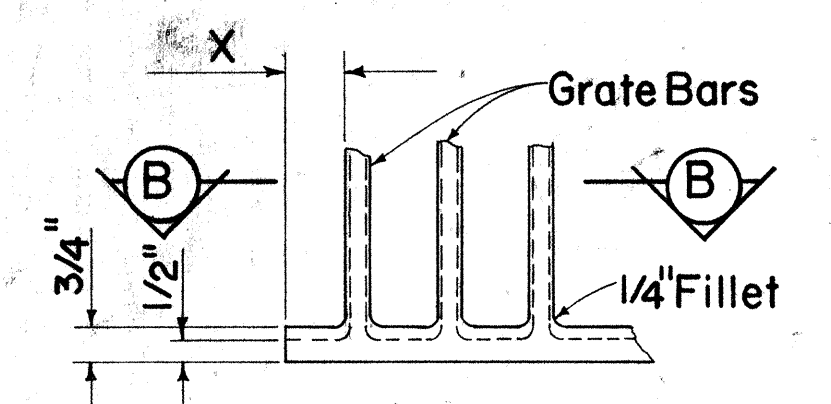
LONGITUDINAL SECTION
(Thru Frame & Gate)

FRAME DETAILS
Scale: 1" = 1'-0"

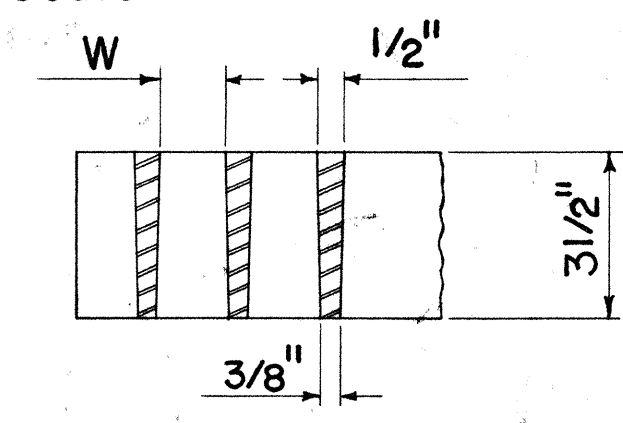


PLAN
Scale: 1" = 1'-0"

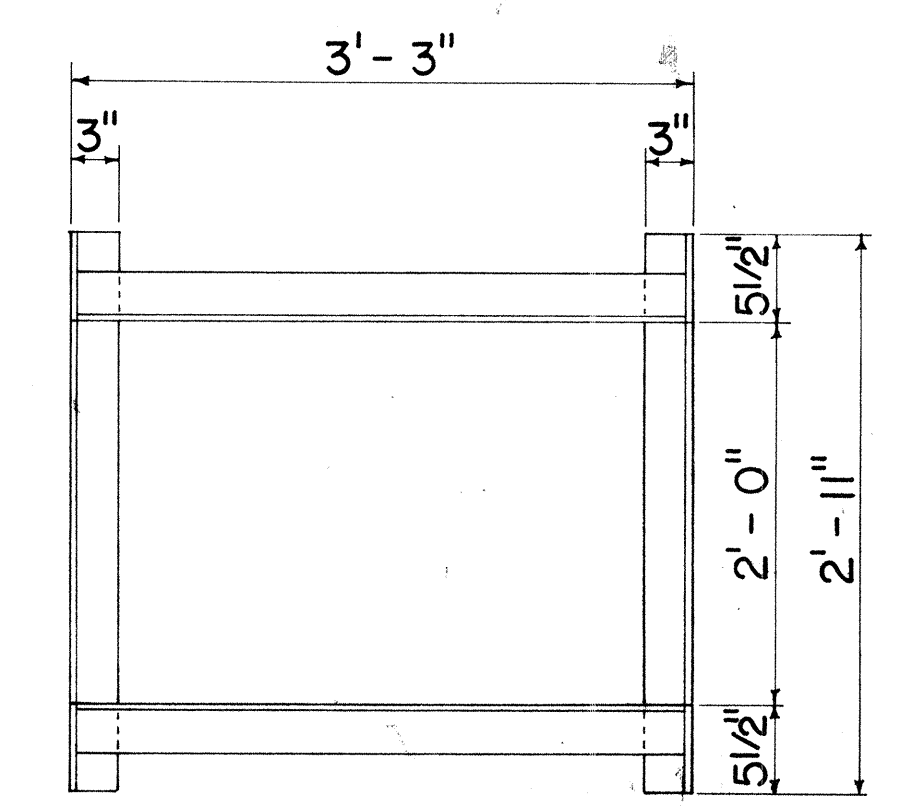
**ALTERNATIVE CAST MALLEABLE IRON
OR CAST STEEL GRATE**



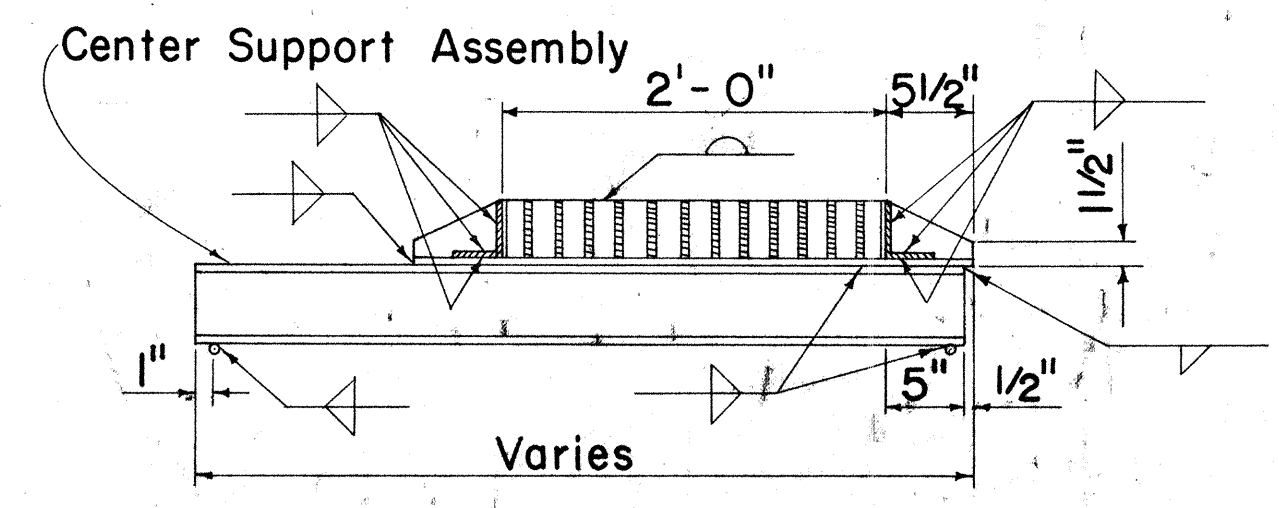
DETAIL "A"
Scale: 3" = 1'-0"



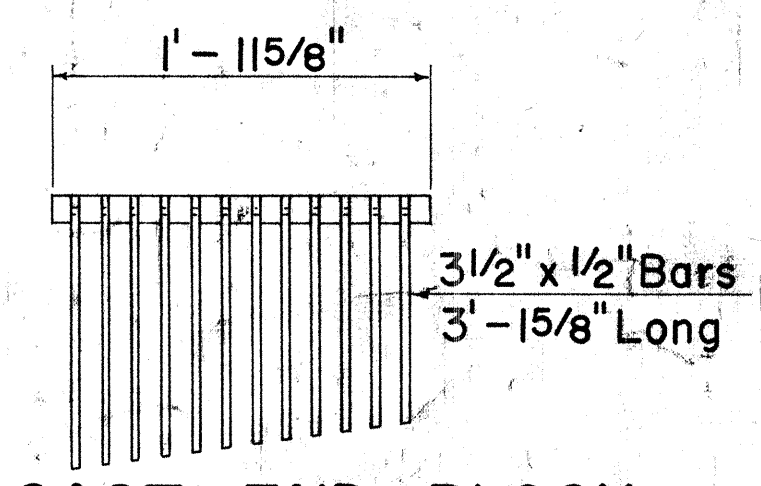
SECTION "B-B"
Scale: 3" = 1'-0"



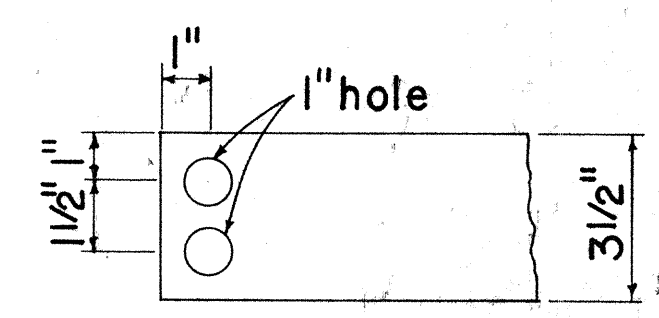
PLAN
(Single Grate)



CROSS SECTION
(Thru Frame & Gate)

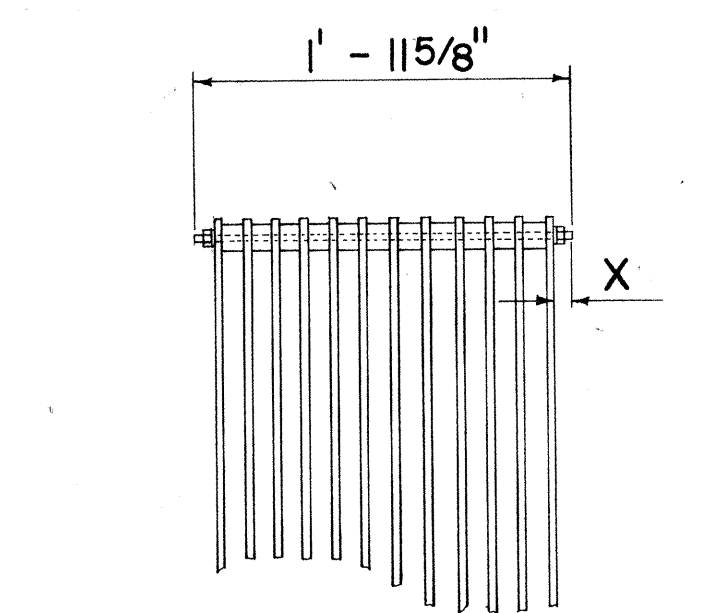


CAST END BLOCK
Scale: 1" = 1'-0"

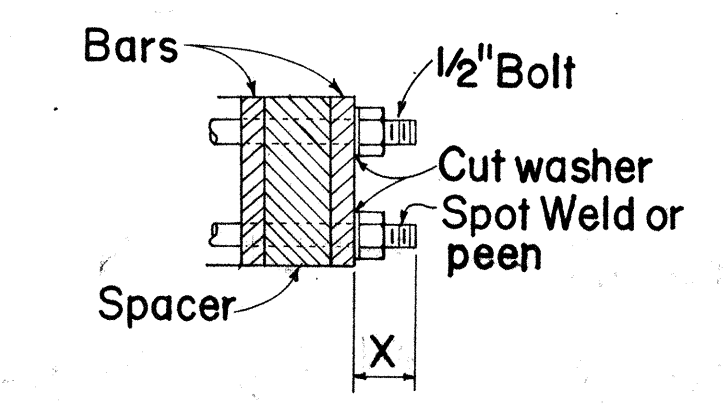


END OF BAR
Scale: 3" = 1'-0"

**ALTERNATIVE CAST MALLEABLE IRON
OR CAST STEEL END BLOCK GRATE**

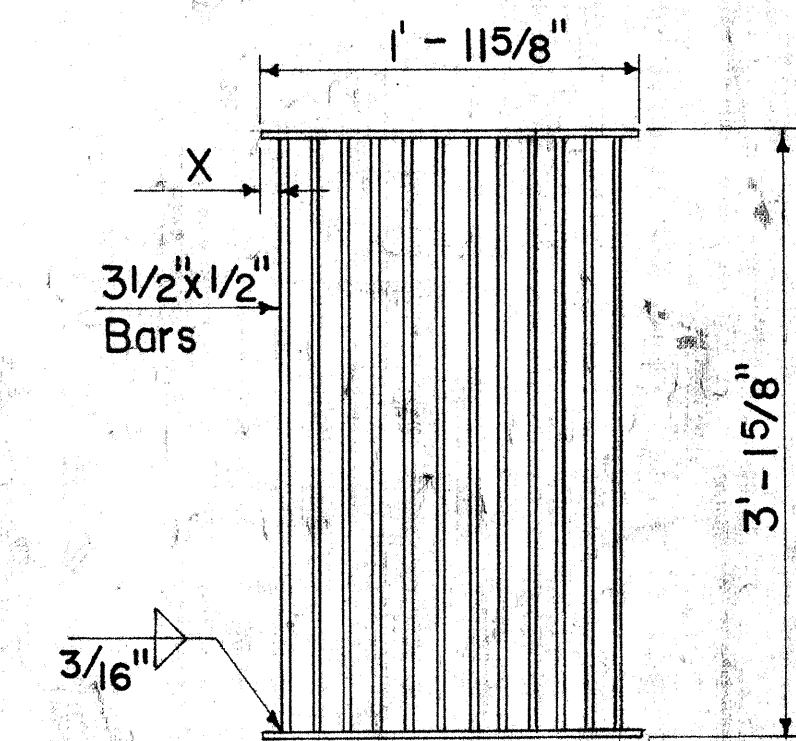


BOLTED END BLOCK
Scale: 1" = 1'-0"

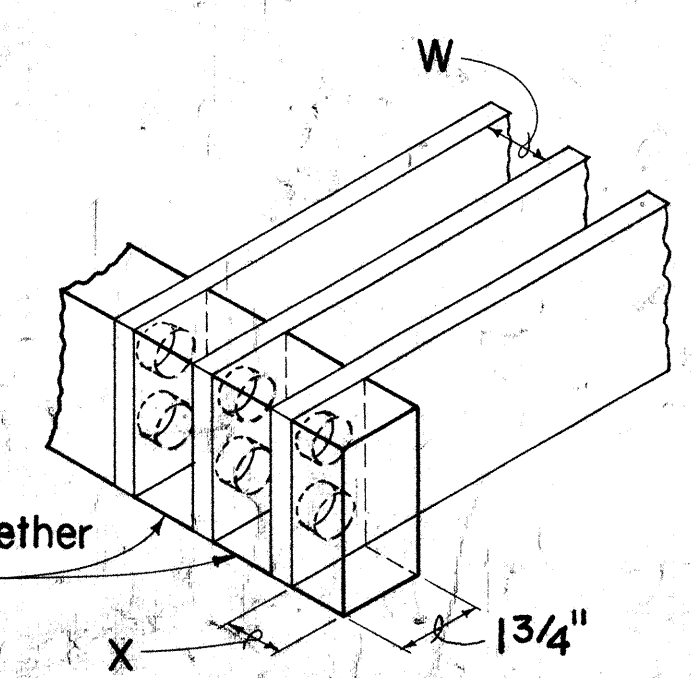
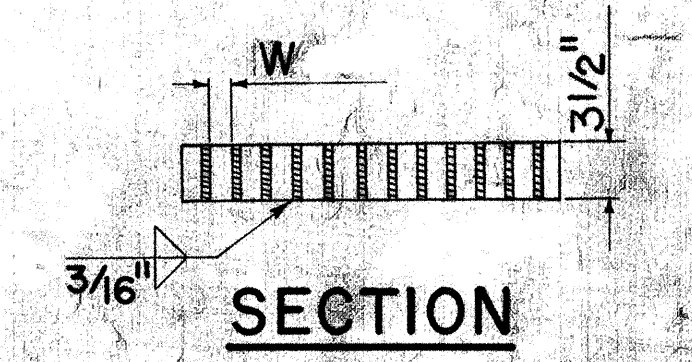


BOLTING DETAIL
Scale: 3" = 1'-0"

ALTERNATIVE BOLTED GRATE

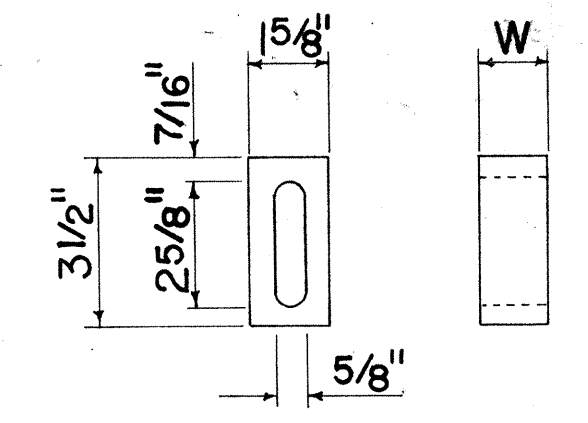


PLAN
ALTERNATIVE BOLTED GRATE
Scale: 1" = 1'-0"

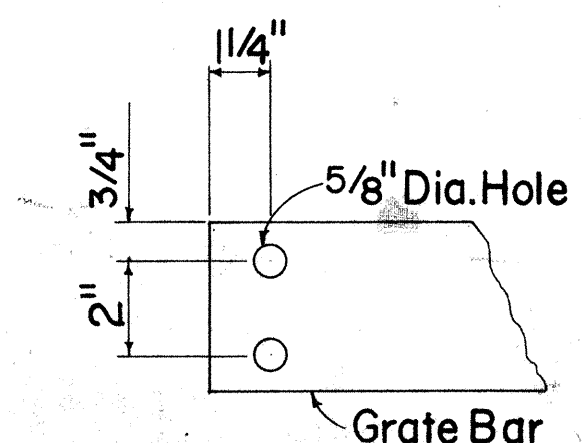


10/7/77	Sheet added to show frame and grate details.
DATE	REVISION

NO.	REVISION	APPROVED BY	DATE
1			



BAR SPACER
Scale: 3" = 1'-0"



END OF BAR
Scale: 3" = 1'-0"

ALTERNATIVE WELDED GRATE

- GENERAL NOTES**
- Contractor has the option of using cast malleable iron, cast steel, welded, bolted, cast malleable iron end block or cast steel end block grate.
 - Grates and Frames shall be hot dip galvanized after fabrication, see specifications.
 - All welds 3/8" unless otherwise noted.
 - Center support assembly shall be used when two or more grates are specified. Incidental to Types A-9 or A-12 Frame and Grates.
 - Refer to "Grate Bar Spacing Table" for Types A-9 and A-12 Grate dimensions.
 - The various materials shall conform to the specifications of ASTM as listed in the following tabulation and the Std. Specifications.
- | Material | ASTM Designation |
|------------------------|--------------------|
| Structural Steel | A283, Grade D |
| Cast Steel | A27, Grade 65-35 |
| Malleable Iron Casting | A47, Gr. No. 35018 |

GRATE BAR SPACING TABLE

TYPE	NO. BARS	CLEAR BAR SPACING-W	X
A-9	9	2"	1 9/16"
A-12	12	1 3/8"	1 1/4"

- NOTE:**
- Type A-9 - Use in locations off the roadbed on all types of highways.
 - Type A-12 - Use within the roadbed on all types of highways.

APPROVAL	RECOMMENDED
<i>[Signature]</i>	<i>[Signature]</i>
HYDRAULIC DESIGN ENGINEER	DATE
APPROVED:	DATE
<i>[Signature]</i>	<i>[Signature]</i>
ASSISTANT CHIEF, ENGINEERING	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

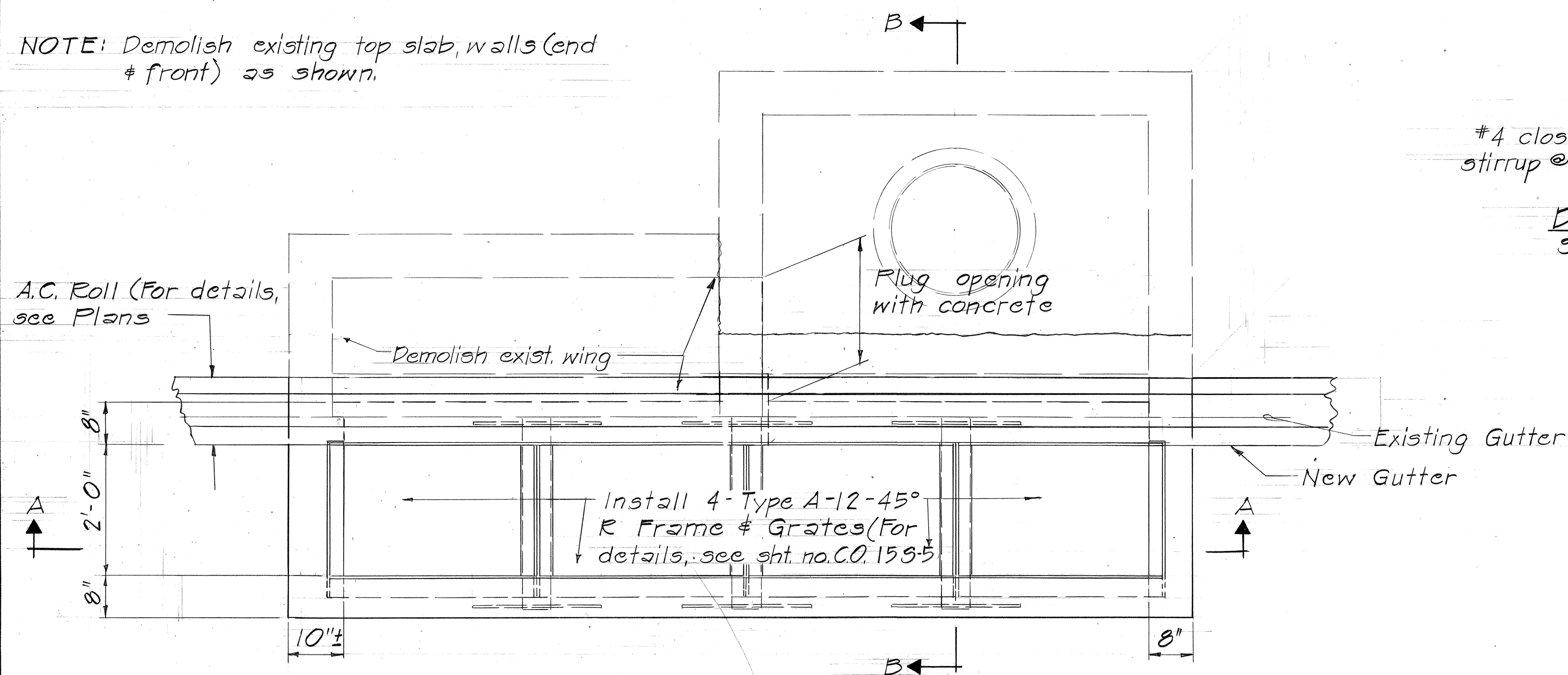
STANDARD DETAILS

TYPE A-9 AND A-12
FRAMES AND GRATES

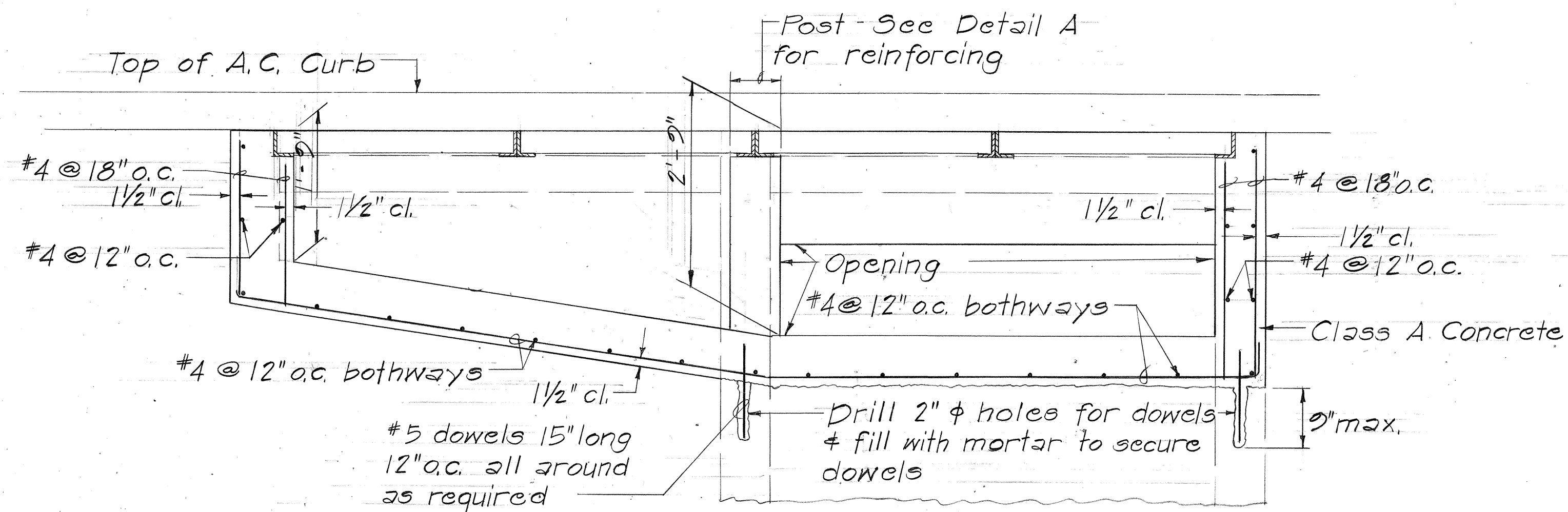
Scales: As Noted Date: Aug. 1968

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	618C-01-77M	1977	C.O. 153-4	15

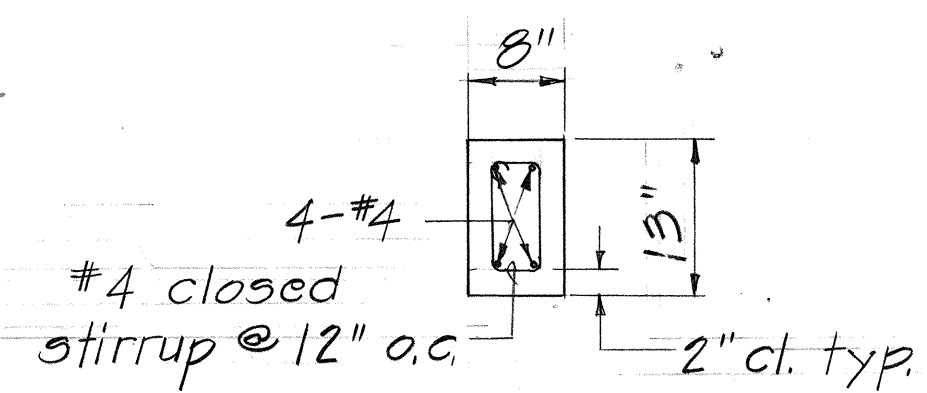
NOTE: Demolish existing top slab, walls (end & front) as shown.



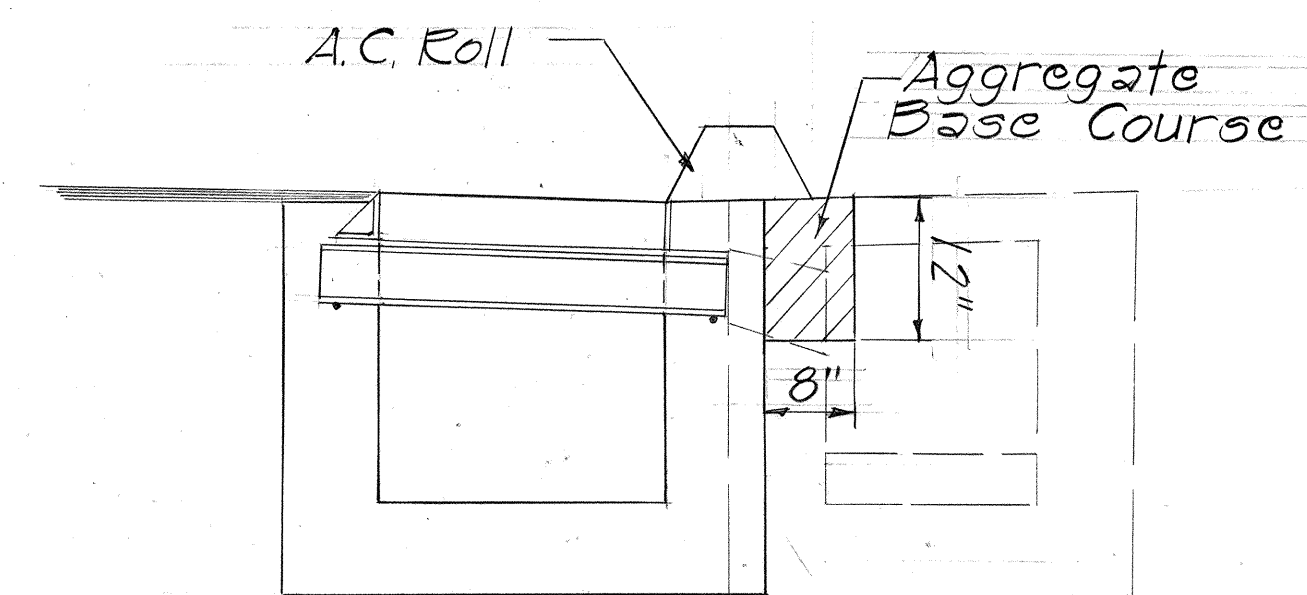
PLAN
Scale: 3/4"=1'-0"



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

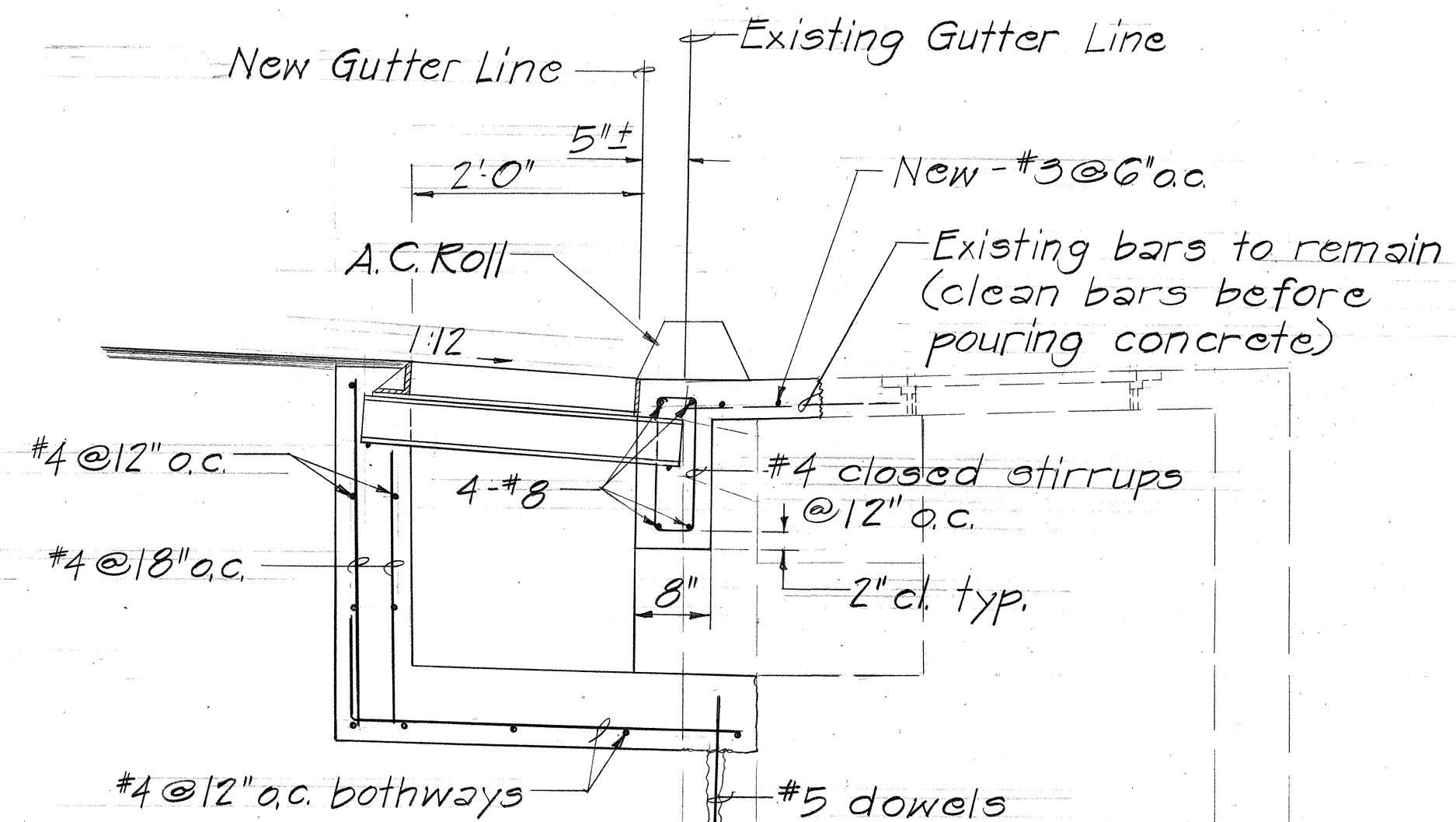


DETAIL A
Scale: 3/4"=1'-0"



Note: For reinforcing, see Typical Section of New C.B. Wing on sht. no. C.O. 153-2

TYPICAL SECTION OF NEW C.B. WING
Scale: 3/4"=1'-0"



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

MODIFIED CATCH BASIN

10-12-77 Modification of exist. C.B.
DATE REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

DRAINAGE DETAILS

KALANIANA'OLE HWY. RESURFACING
Castle Junction to Kawaiauli Bridge
Proj. No. 618C-01-77M

Scale: As Shown Date: Oct., 1977

SHEET NO. OF SHEETS

C.O. 153-4

ORIGINAL PLAN	DATE
SURVEY PLOTTED BY	
DRAWN BY	
TRACED BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
NO.	