

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(34)-A	1990	30	186

ABBREVIATIONS

<i>abn</i>	ABANDONED
AC	ASPHALT CONCRETE
ACB	ASPHALT CONCRETE BASE
Aggr.	AGGREGATE
<i>B</i>	BASELINE
<i>C</i>	CENTERLINE
<i>cb</i>	EXISTING CATCH BASIN
CB	PROPOSED CATCH BASIN
CI	CAST IRON
Cl.	CLASS, CLEAR
CMU	CONCRETE MASONRY UNITS
Conc.	CONCRETE
<i>ct</i>	EXISTING CABLE TELEVISION DUCT BANK
CT	PROPOSED CABLE TELEVISION DUCT BANK
C.I.P.	CAST-IN-PLACE
<i>d</i>	EXISTING DRAIN
D	PROPOSED DRAIN
Det.	DETAIL
DI	DROP INTAKE
<i>e</i>	EXISTING ELECTRICAL DUCT BANK
E	PROPOSED ELECTRICAL DUCT BANK
Eq. Sp.	EQUAL SPACING
Exp. Jt.	EXPANSION JOINT
E.F.	EACH FACE
E.W.	EACH WAY
F & C	FRAME AND COVER
<i>f'c</i>	28-DAY CONCRETE COMPRESSION STRENGTH
<i>g</i>	EXISTING GAS LINE
G	PROPOSED GAS LINE
GR.	GRADE
Inv.	INVERT
I.D.	INSIDE DIAMETER
Jt.	JOINT
LF	LINEAR FEET
Lt.	LEFT
MH	MANHOLE
o.c.	ON CENTER
<i>P</i>	PLATE
Pavt.	PAVEMENT
PCC	PORTLAND CEMENT CONCRETE
Proj.	PROJECTION
Pt.	POINT
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
Rt.	RIGHT
R/W	RIGHT-OF-WAY
<i>s</i>	EXISTING SEWER PIPE
<i>sc</i>	EXISTING SIGNAL CORPS CABLE
<i>sl</i>	EXISTING STREET LIGHTING DUCT
<i>t</i>	EXISTING TELEPHONE DUCT BANK
T	PROPOSED TELEPHONE DUCT BANK
T & B	TOP AND BOTTOM
<i>ts</i>	EXISTING TRAFFIC SIGNAL DUCT
TS	RELOCATED TRAFFIC SIGNAL DUCT
Typ.	TYPICAL
Var.	VARIES
ϕ	DIAMETER

LEGEND

EXISTING	PROPOSED	
		DRAINLINE WITH FLOW DIRECTION
		MANHOLE
		CATCH BASIN
		DROP INTAKE
		UTILITY OR DRAIN CROSSING
		UTILITY WITH CONCRETE JACKET
*		NO RECORD OF UTILITY LINE ELEVATION AVAILABLE

GENERAL DRAINAGE NOTES

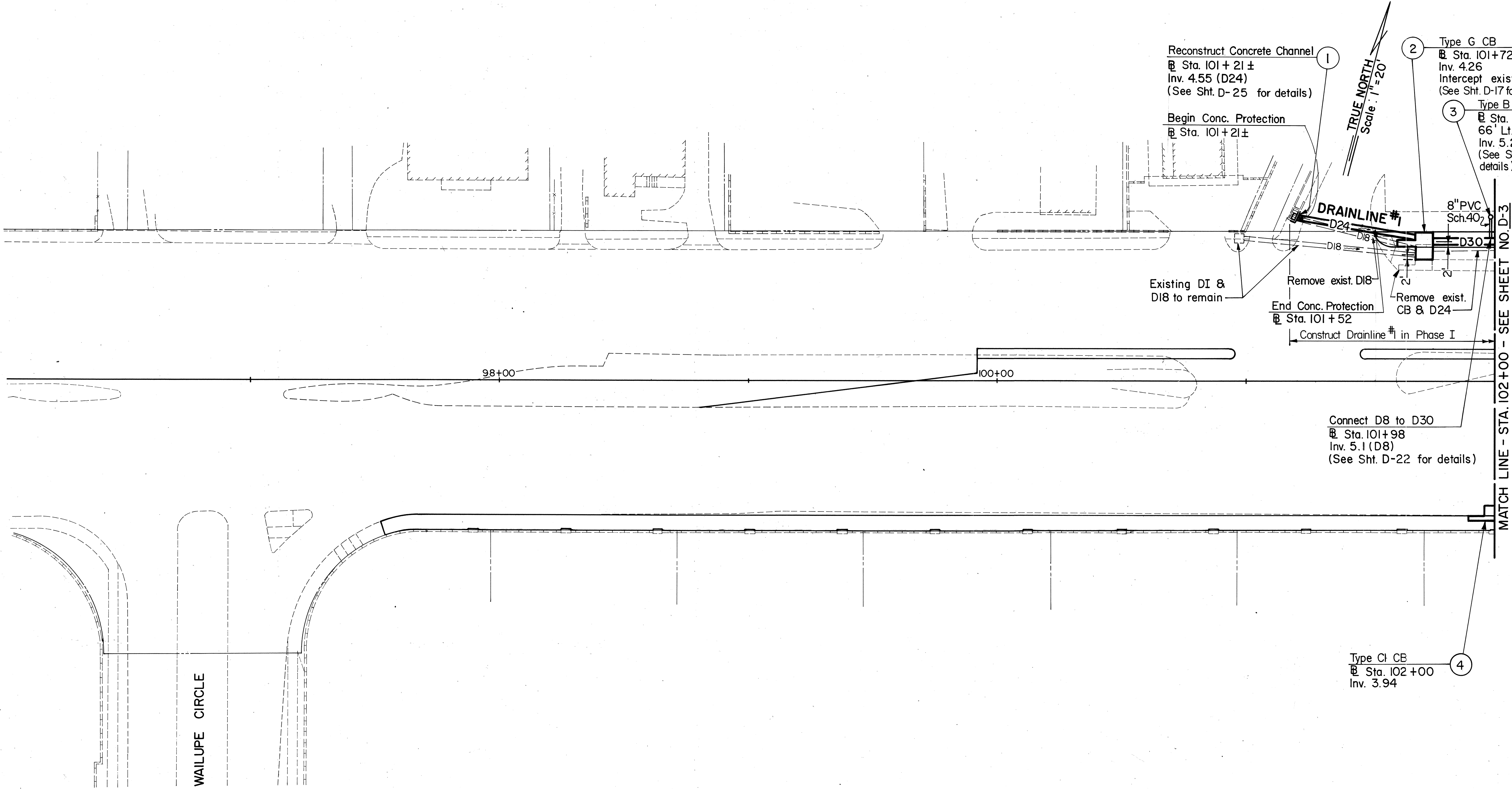
- PAYMENT FOR COMPLETE OR PARTIAL REMOVAL OF STRUCTURES AND CULVERTS, AND SEALING OF ABANDONED PIPES WILL BE CONSIDERED INCIDENTAL TO VARIOUS CONTRACT ITEMS. DRAINAGE PIPES TO BE ABANDONED SHALL BE REMOVED AS NECESSARY TO FACILITATE CONSTRUCTION.
- WHEN EXCAVATING IN CLOSE PROXIMITY OF WALLS, FENCES, UTILITY POLES, TRAFFIC SIGNAL POLES AND OTHER IMPROVEMENTS, THE CONTRACTOR SHALL PROTECT, SUPPORT, SECURE AND TAKE ALL OTHER NECESSARY PRECAUTIONS TO PREVENT DAMAGING THESE FACILITIES AND IMPROVEMENTS.
- CONTRACTOR SHALL SEQUENCE CONSTRUCTION SUCH THAT EXIST. FACILITIES REMAIN IN SERVICE UNTIL NEW FACILITIES ARE IN SERVICE OR SHALL PROVIDE AND MAINTAIN, AS IS NECESSARY, TEMPORARY WATER DIVERSION FACILITIES.
- THE CONTRACTOR SHALL VERIFY LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITY LINES AND NOTIFY RESPECTIVE OWNERS BEFORE COMMENCING EXCAVATION WORK FOR DRAINLINES.
- CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF PRE-CAST DRAINAGE STRUCTURES TO THE ENGINEER FOR APPROVAL. CONTRACTOR SHALL VERIFY LOCATION OF EXIST. UTILITIES PRIOR TO MANUFACTURING PRE-CAST BOX CULVERTS TO ENSURE CONFLICTS WITH PROPOSED DRAINAGE STRUCTURE DO NOT EXIST.
- ALL DRAINAGE PIPES SHALL BE SPIRAL RIB ALUMINUM PIPE, SHEET THICKNESS, 0.079 INCH OR RCP, CLASS III UNLESS OTHERWISE SPECIFIED ON PLANS.
- CULVERTS WITH LESS THAN 24" COVER IN ROADWAY SHALL BE PROTECTED AS SHOWN IN DETAIL ON SHT. D-25.
- THE REFERENCE POINT FOR LOCATING DRAINAGE STRUCTURES BY STATION AND OFFSETS IS AT THE CENTER OF THE MAIN BODY, EXCEPT THAT AT CATCH BASINS THE REFERENCE POINT IS AT THE CENTERLINE OF THE MAIN BODY AT FACE OF CURB.
- CATCH BASIN GUTTERS LOCATED WITHIN A PROPOSED PCC SLAB SHALL NOT BE CONSTRUCTED. THE PCC SLAB SHALL BE SHAPED AND FINISHED AS SHOWN IN THE DETAIL ON SHEET D10.
- CONSTRUCT CONCRETE GUTTERS, FRAME AND COVERS OR GRATES AT FUTURE FINISH GRADE ELEVATIONS, WHERE APPLICABLE. PLACE TEMPORARY TRANSITION PAVEMENT IN ACCORDANCE WITH ROADWAY CONSTRUCTION DETAIL ON SHT. C-7.
- EXISTING DRAINAGE FACILITIES TO REMAIN AND LOCATED WITHIN PROJECT LIMITS SHALL BE CLEANED OF SILT AND DEBRIS. PAYMENT SHALL BE CONSIDERED INCIDENTAL TO VARIOUS CONTRACT ITEMS.
- EXCEPT IN AREAS WHERE NEW PAVEMENT STRUCTURE IS BEING CONSTRUCTED, EXISTING PAVEMENT DAMAGED BY TRENCHING OR OTHER ACTIVITIES SHALL BE RESTORED IN ACCORDANCE WITH DETAIL SHOWN ON SHT. C-7.
- STEEL PLATES FOR COVERING TRENCHES SHALL HAVE SKID RESISTANT SURFACE.



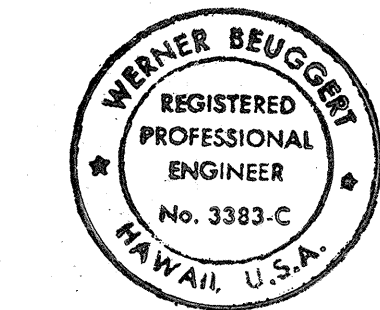
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Werner Beugert

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE
GENERAL NOTES, LEGEND
& ABBREVIATIONS
KALANIANA'OLE HIGHWAY
Waiupe Circle to East Hind Drive
F.A. PROJECT NO. F-072-1(34)-A
SCALE: DATE: June 30, 1990
SHEET No. D-1 OF 37 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(34)-A	1990	31	186



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

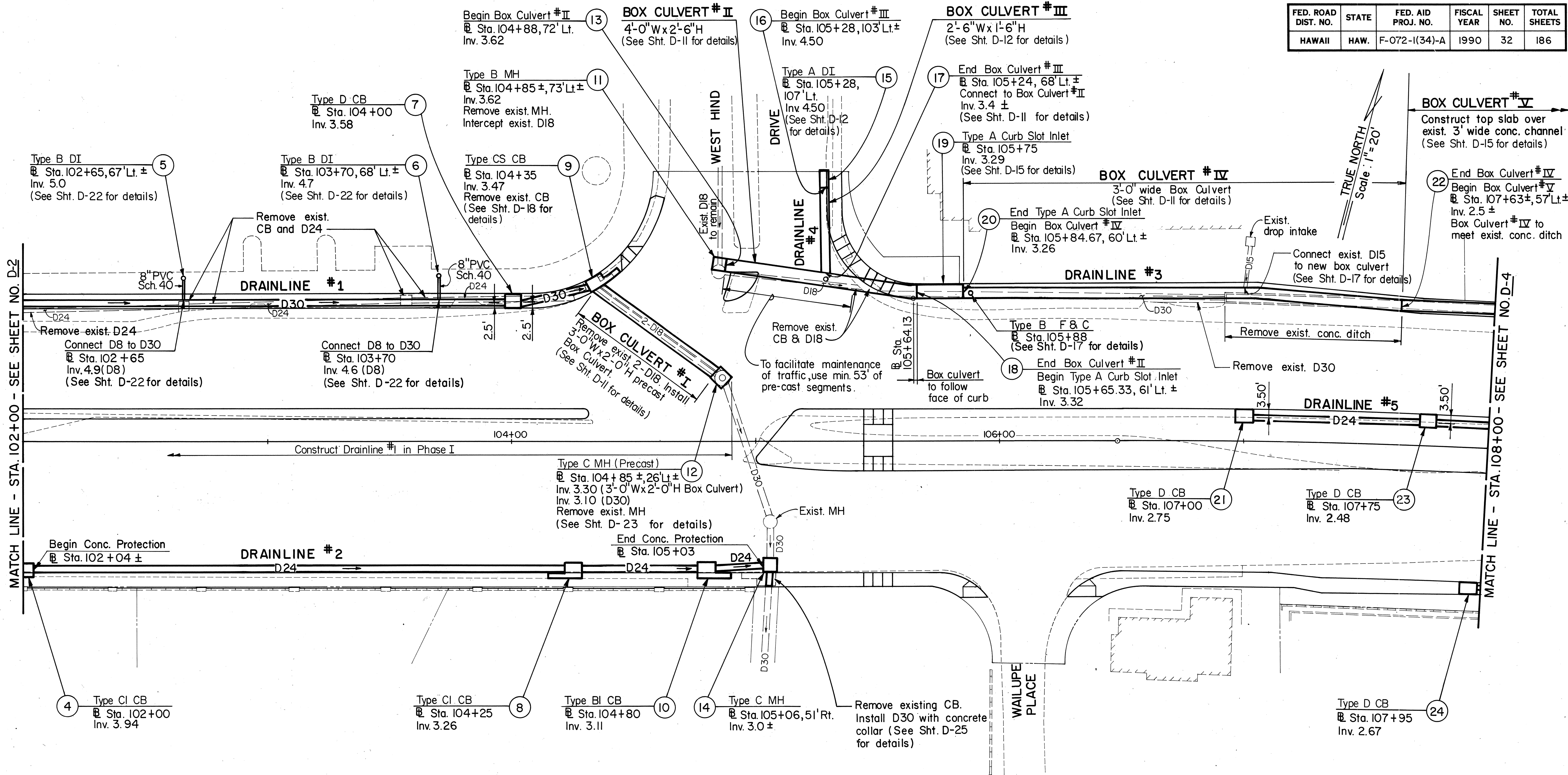


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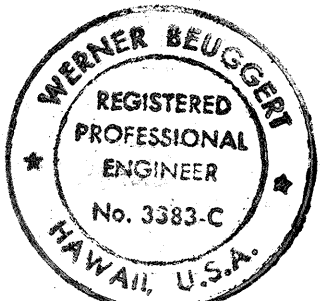
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE
STA. 96+00 TO 102+00
KALANIANA'OLE HIGHWAY
Wailupe Circle to East Hind Drive
FA. Project No. F-072-1(34)-A
SCALE: 1" = 20' DATE: JUNE 30, 1990
SHEET No. D-2 OF 37 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(34)-A	1990	32	186



ORIGINAL PLAN	DATE
DRAWN BY	
DESIGNED BY	
NOTED BY	
CHECKED BY	



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE

STA. 102+00 TO 108+00

KALANIANAʻOLE HIGHWAY
Wailupe Circle to East Hind Drive
F.A. Project No. F-072-1(34)-A

SCALE: 1" = 20' DATE: JUNE 30, 1990
SHEET No. D-3 OF 37 SHEETS

3/11/91	1. Added Type B Drop Intake at approx. Sta. 109 + 60 Rt. Connected Drop Intake to D24 with D8. 2. Deleted Drainage Slot note from Drainage Structures (41) & (42).
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DATE	REVISION
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DRAINAGE

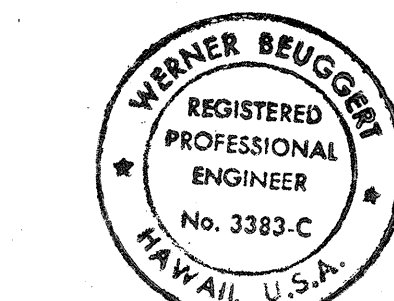
Wailupe Circle to East Hind Drive

F.A. Project No. F-072-1(34)-A

SCALE: 1" = 20' DATE: JUNE 30, 1990

SHEET No.D-4 OF 37 SHEETS

C.O. 33



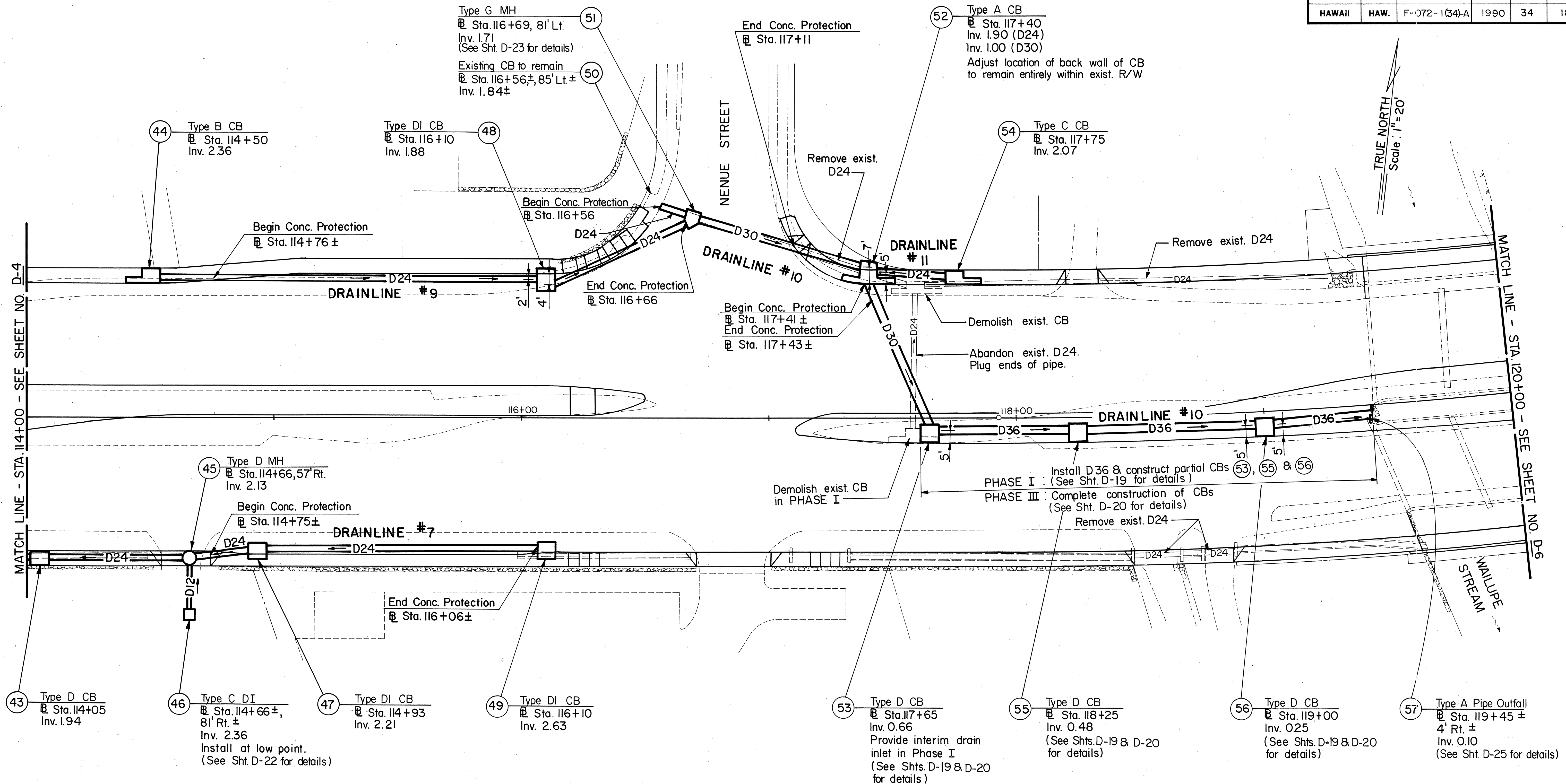
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OF UNDER MY SUPERVISION.

Donald Leggett

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(34)-A	1990	34	186



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

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Werner Bruggen

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE

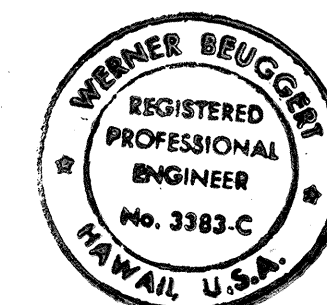
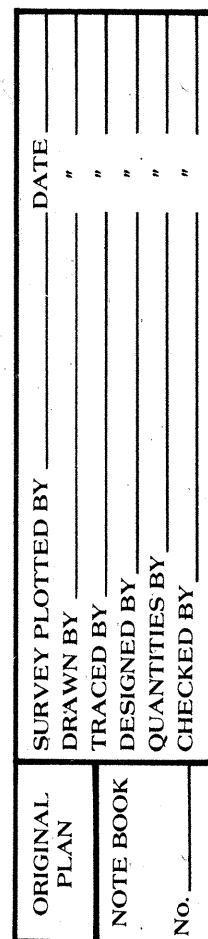
Sta. 114+00 TO 120+00

KALANIANA'OLE HIGHWAY
Wailupe Circle to East Hind Drive
FA Project No. F-072-1(34)-A

SCALE: 1" = 20' DATE: JUNE 30, 1990

SHEET No. D-5 OF 37 SHEETS

TRUE NORTH
Scale: 1" = 20'

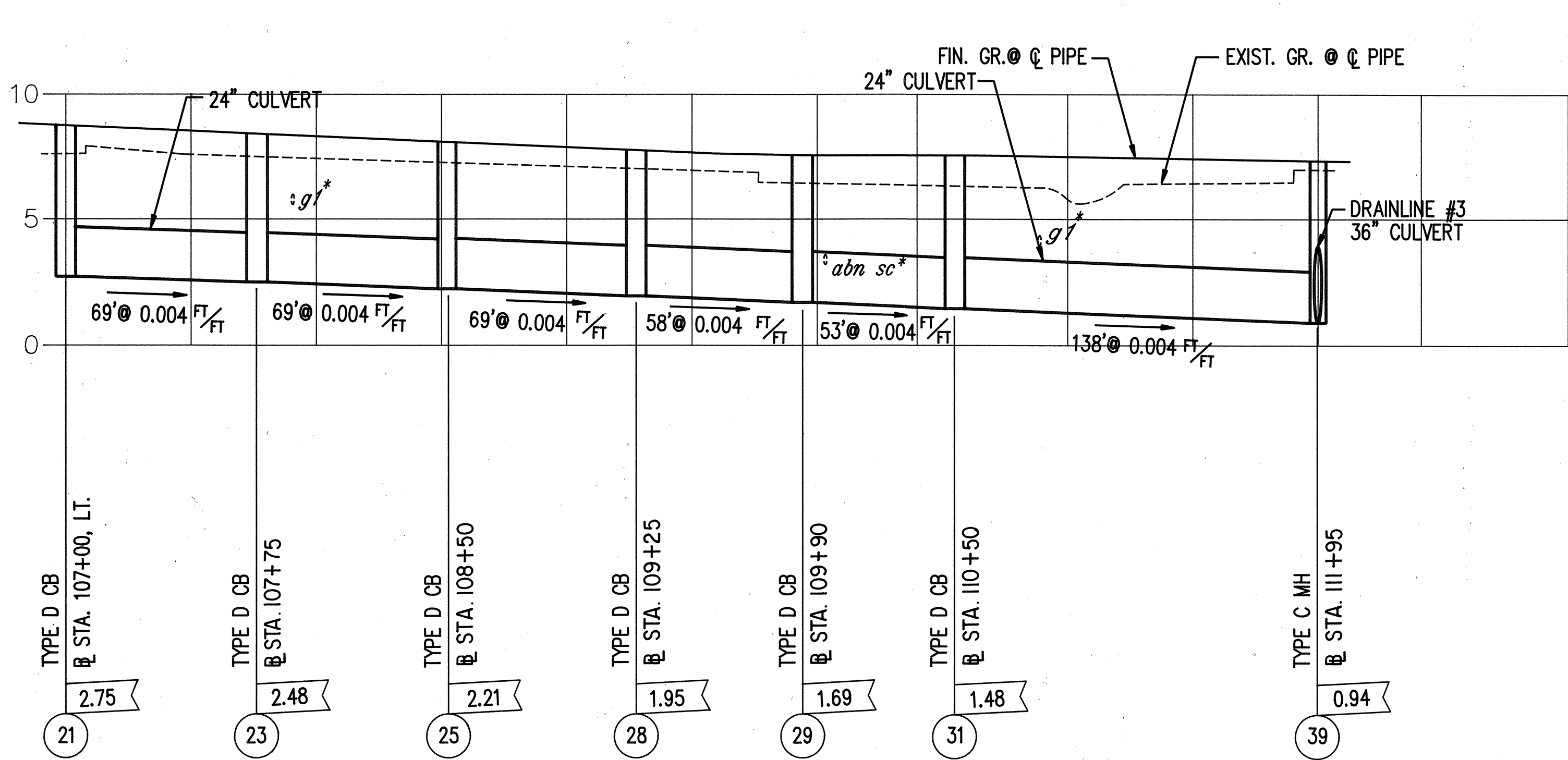


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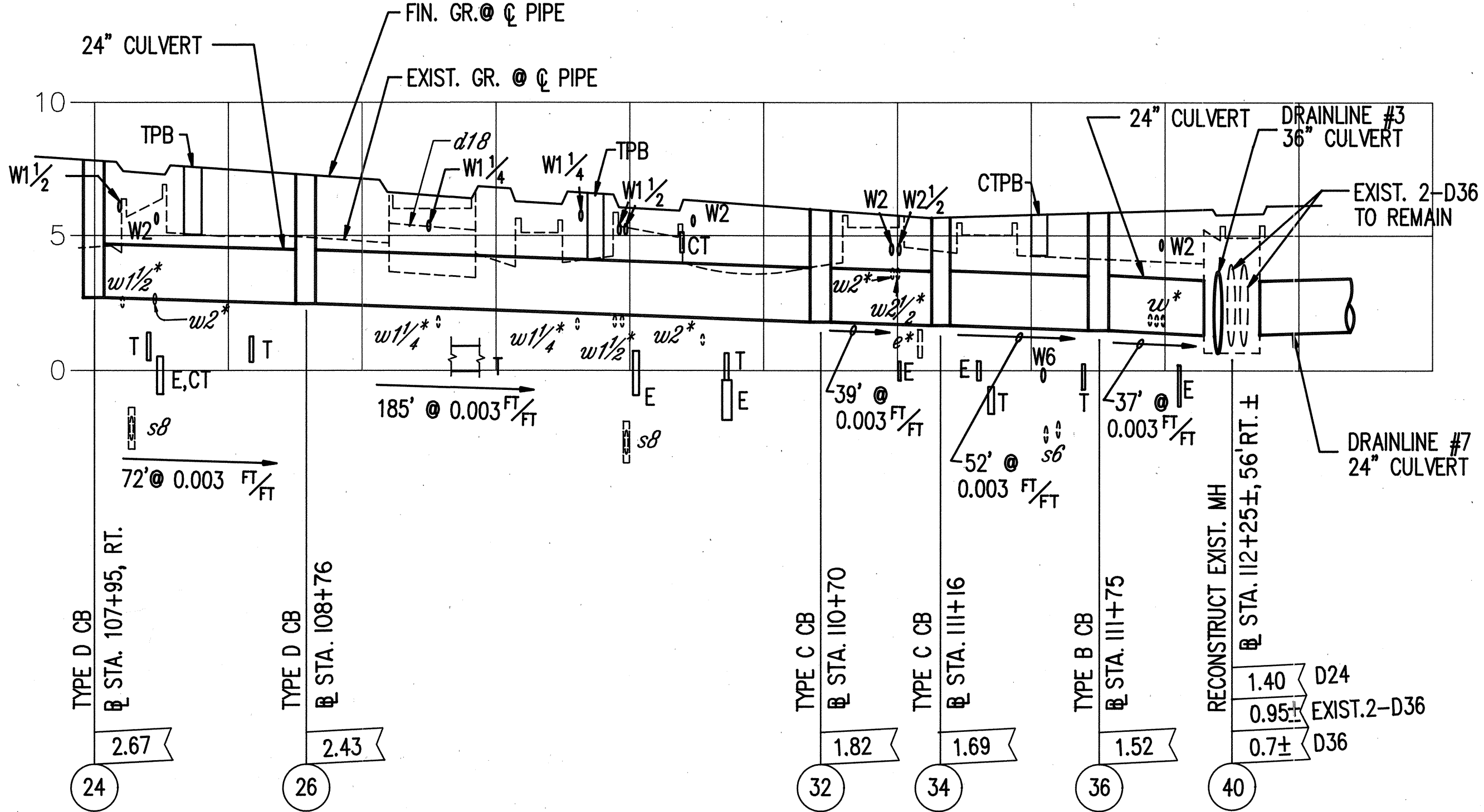
Helen Sussman

SHEET No.D-6 OF SHEETS

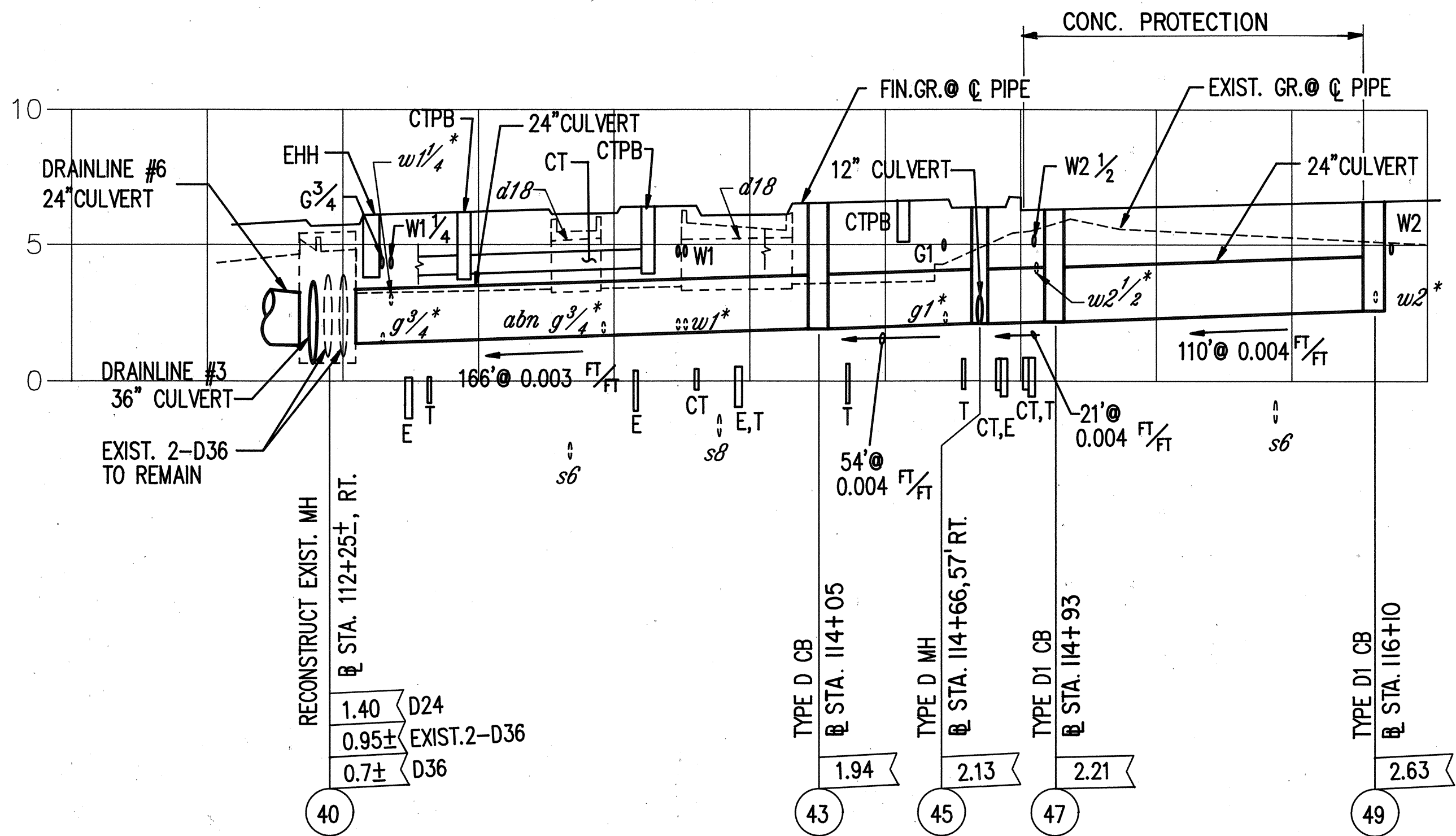
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(34)-A	1990	37	186



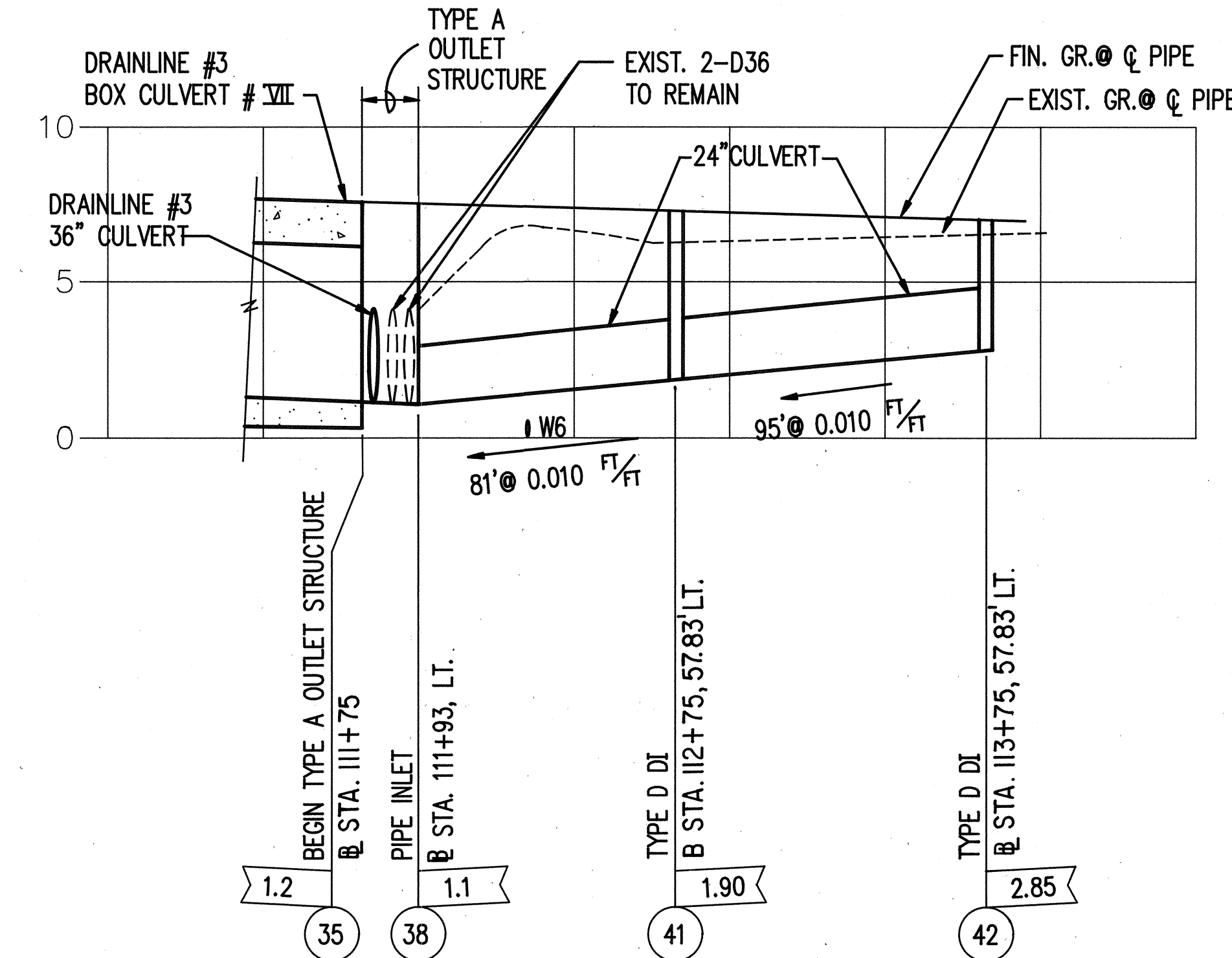
DRAINLINE #5



DRAINLINE #6



DRAINLINE #7



DRAINLINE #8



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAIN PROFILES

KALANIANA'OLE HIGHWAY
Wailupe Circle to East Hind Drive
F.A. PROJECT NO. F-072-1(34)-A

VERT. 1"=4'
SCALE: HORIZ. 1"=40'

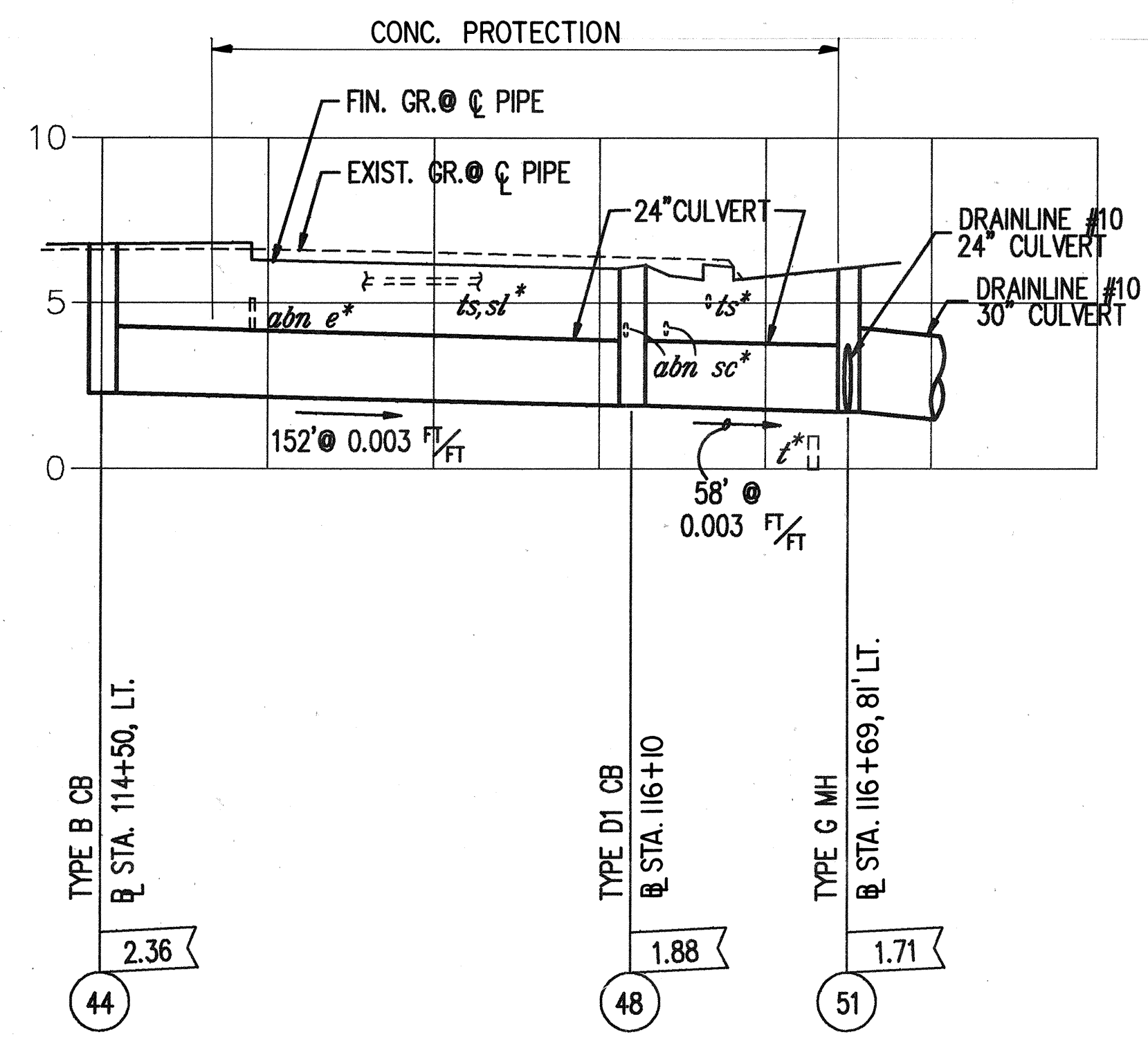
DATE: June 30, 1990

SHEET No. D-8 OF 37 SHEETS

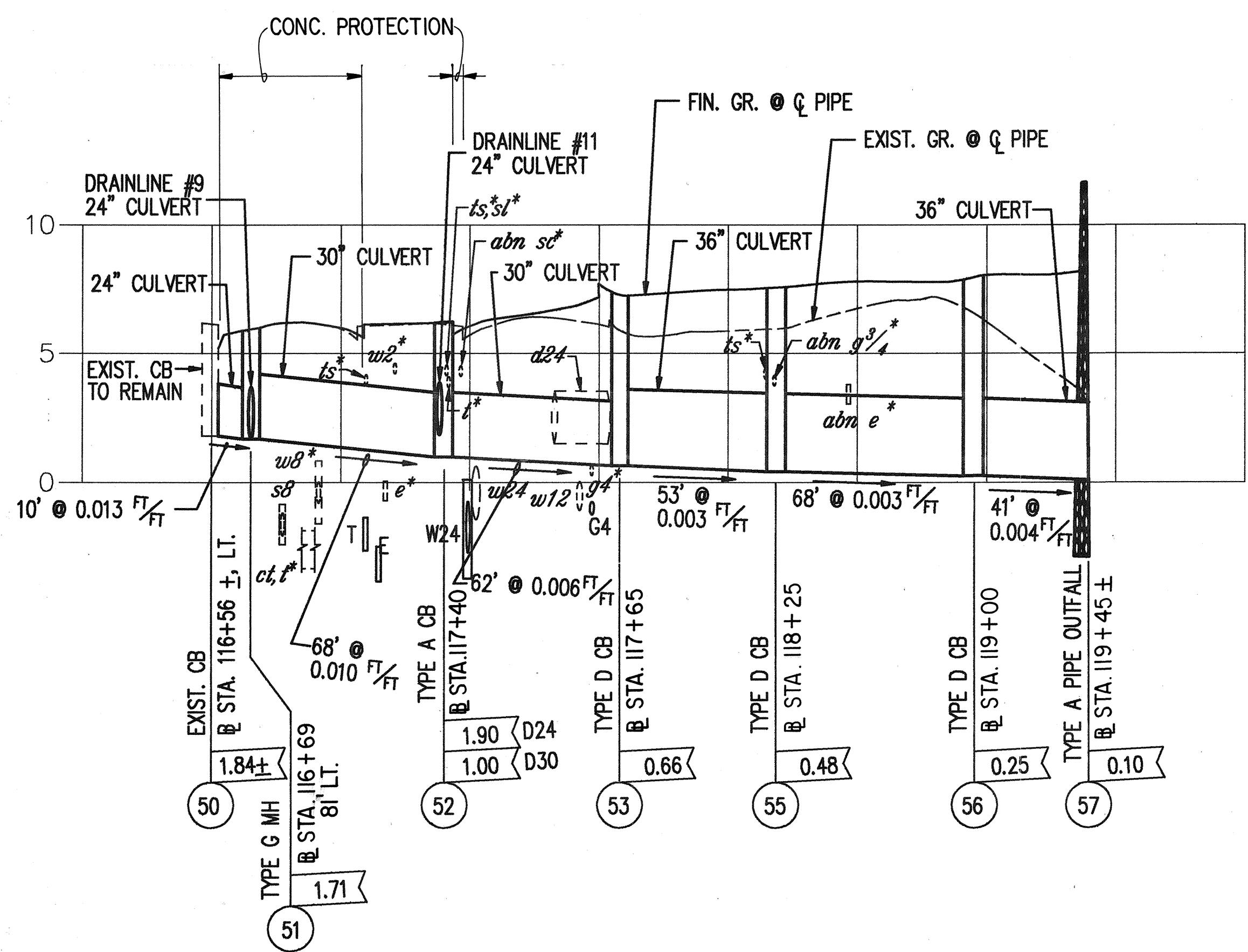
APPROVED: *[Signature]* 7/9/90
Chief, Div. of W.W.M., D.P.W. Date

ORIGINAL PLAN	DATE
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	

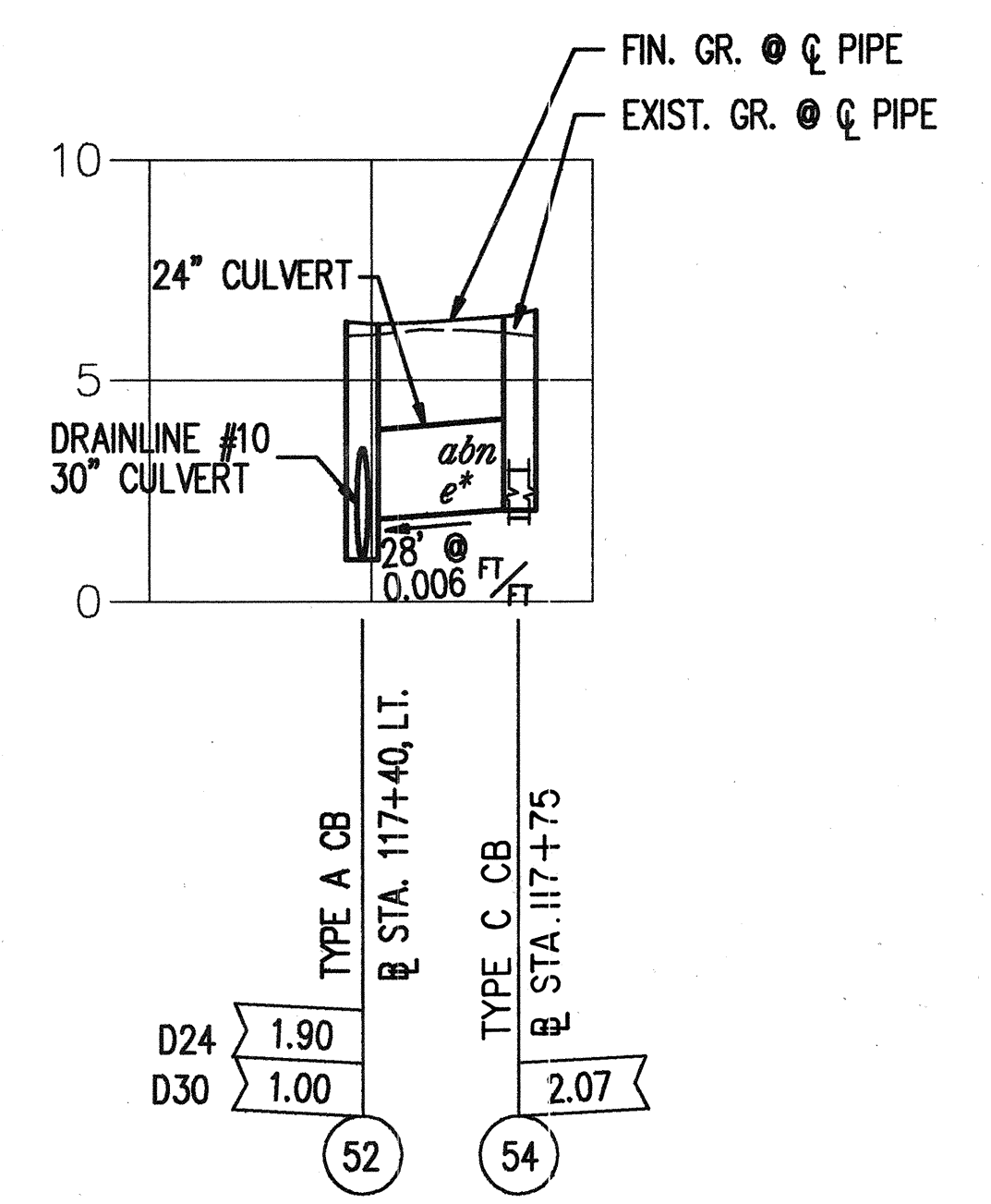
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(34)-A	1990	38	186



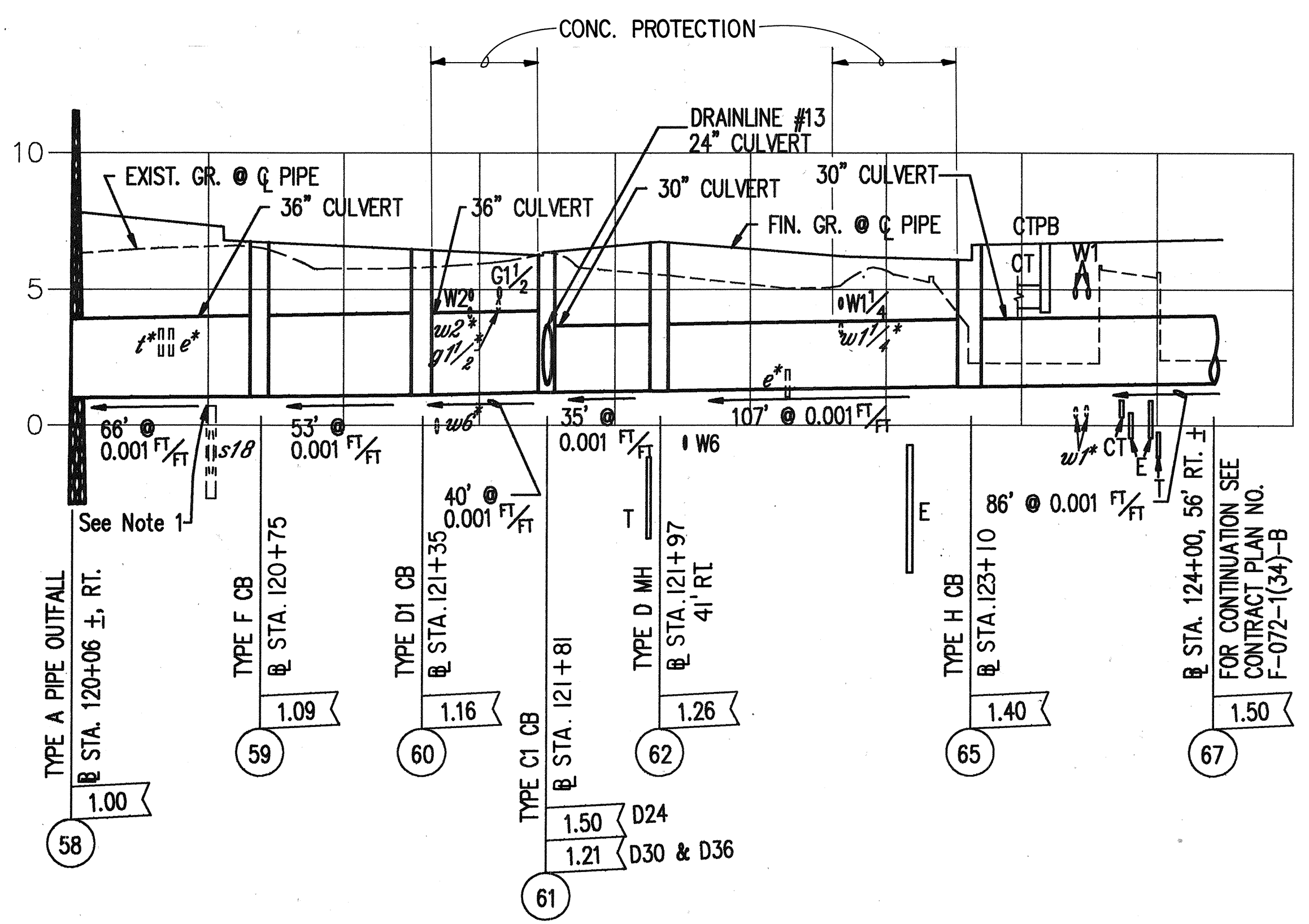
DRAINLINE #9



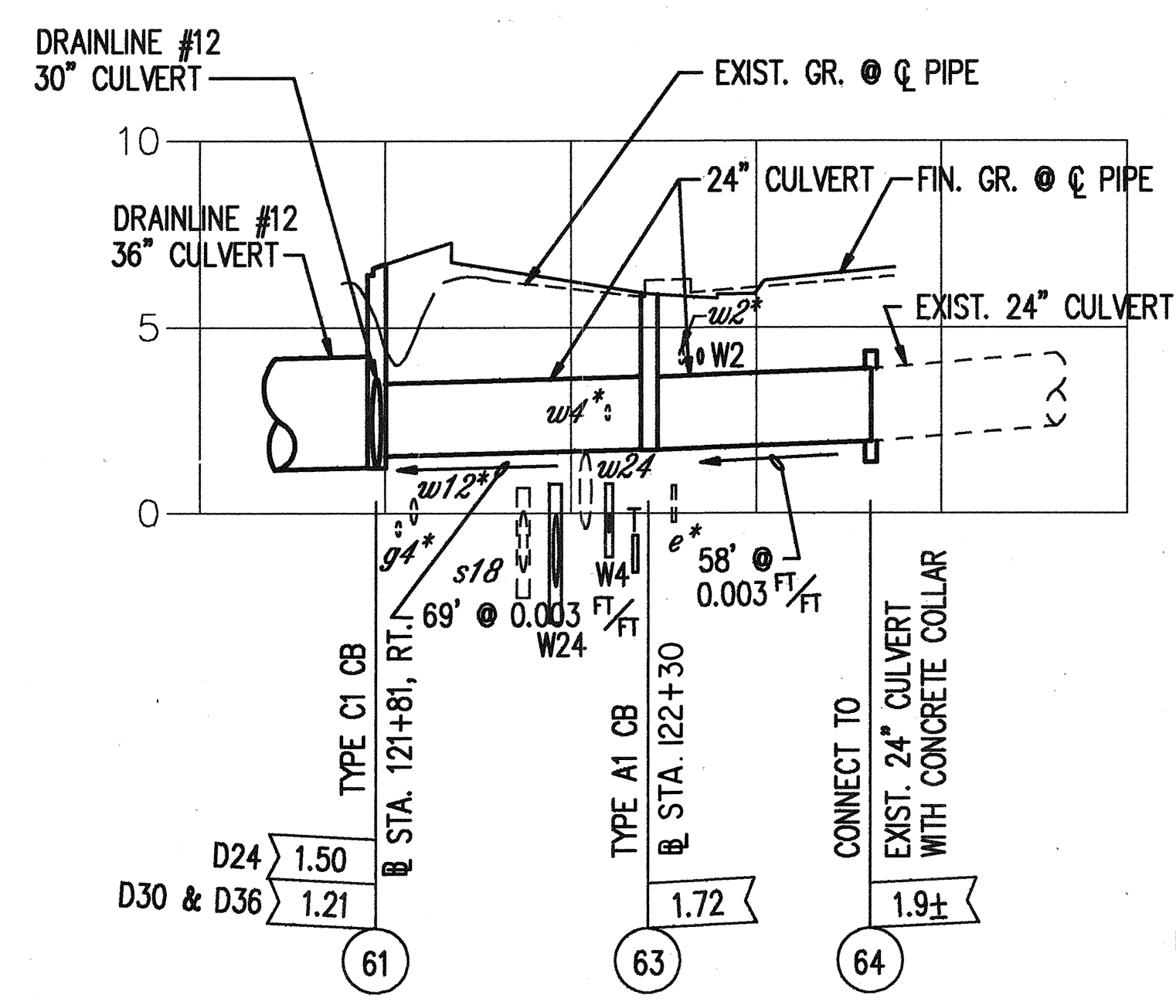
DRAINLINE #10



DRAINLINE #11

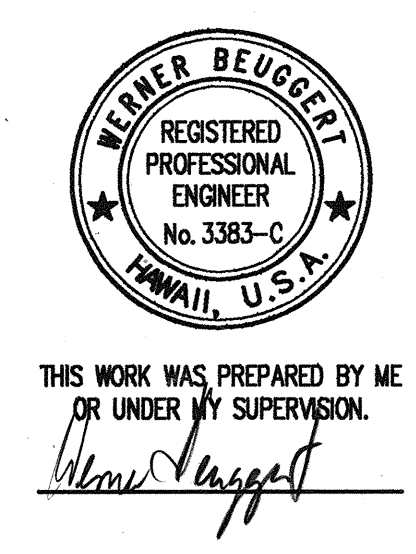


DRAINLINE #12



DRAINLINE #13

NOTE
1. Provide non-bonding felt material between jacket and drainline. Payment incidental to various contract items.



APPROVED: *[Signature]* 7/9/90
Chief, Div. of W.W.M., D.P.W. Date *u*

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

DRAIN PROFILES

KALANIANA'OLE HIGHWAY

Wailupe Circle to East Hind Drive

F.A. PROJECT NO. F-072-1(34)-A

VERT. 1"=4'

SCALE: HORIZ. 1"=40'

DATE: June 30, 1990

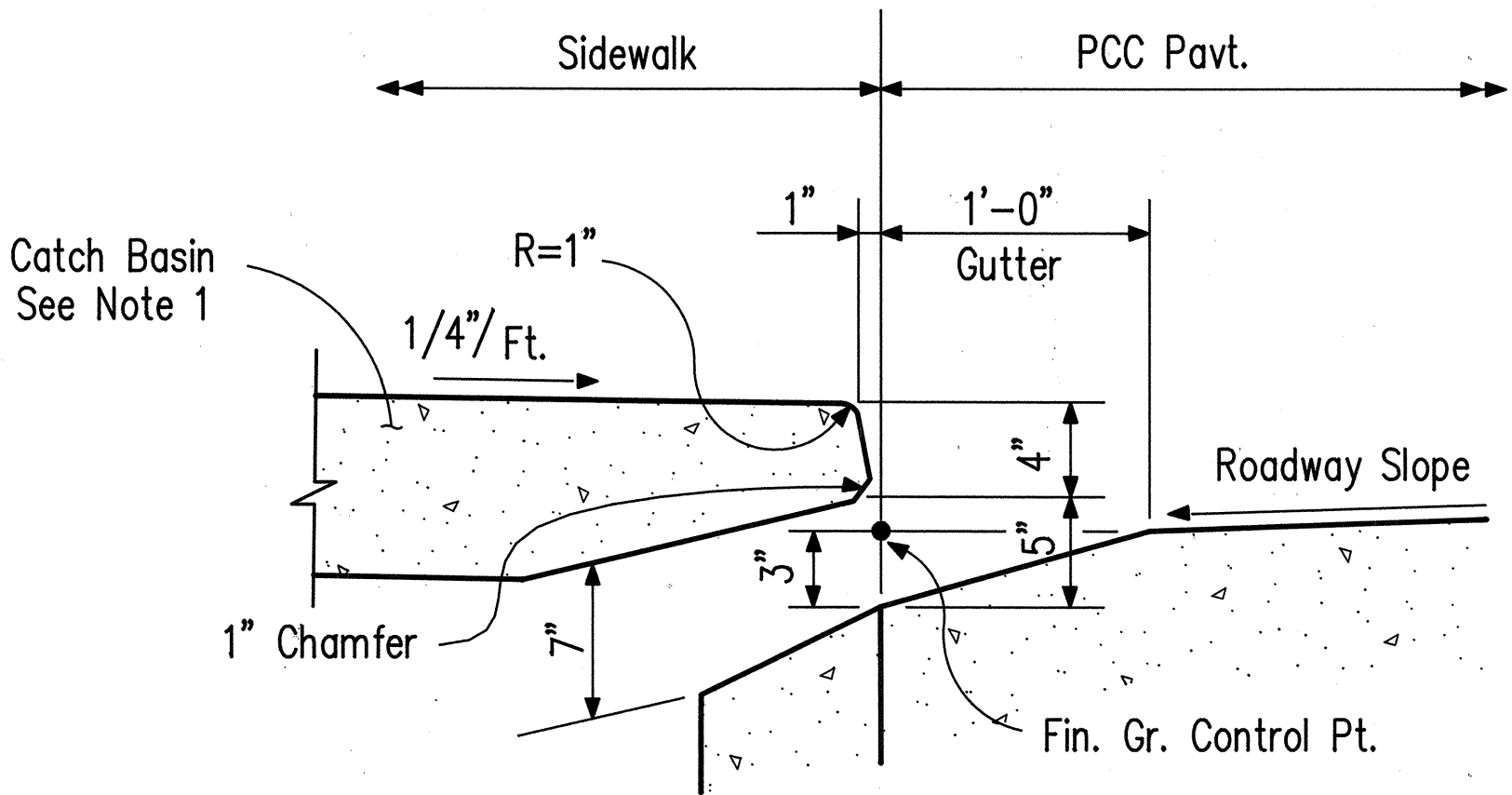
SHEET No. 9 OF 37 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(34)-A	1990	39	186

GENERAL NOTES FOR DRAINAGE STRUCTURES

1. MATERIALS:
(a) ALL REINFORCING STEEL SHALL BE ASTM DESIGNATION A615 GRADE 40.
(b) ALL CONCRETE SHALL BE CLASS A, UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS RELATING TO REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE NOTED. STAGGER SPLICES AS APPROVED BY THE ENGINEER. REINFORCEMENT CLEARANCE FROM WALL OR SLAB FACE EXPOSED TO SOIL, BACKFILL, ETC. SHALL BE 2" MIN. REINFORCEMENT CLEARANCE FROM ALL OTHER WALL OR SLAB FACES SHALL BE 1-1/2" MIN. EXCEPT AS OTHERWISE SHOWN.
3. EXCEPT AS OTHERWISE INDICATED, PROVIDE 3/4" CHAMFER AT ALL EXPOSED CORNERS OF STRUCTURES.
4. EXCEPT AS OTHERWISE INDICATED, SURFACES OF EXISTING STRUCTURES AGAINST WHICH CONCRETE IS TO BE PLACED SHALL BE ROUGHENED TO A FULL AMPLITUDE OF APPROXIMATELY 1/4" AND SHALL BE THOROUGHLY CLEANED OF SURFACE LAITANCE AND OTHER MATERIAL FOREIGN TO CONCRETE. WHERE APPLICABLE, EXISTING REBARS SHALL BE CLEANED OF ALL CONCRETE AND EXCESSIVE RUST BUILD-UP.
5. PAYMENT FOR CONCRETE GUTTER AT CATCH BASINS AND OTHER DRAINAGE STRUCTURES WILL BE CONSIDERED INCIDENTAL TO THE DRAINAGE STRUCTURE EXCEPT WHEN GUTTER IS SHOWN ON ROADWAY CONSTRUCTION PLANS.
6. EXCEPT AS OTHERWISE INDICATED AND WHERE SUITABLE, CONTRACTOR HAS THE OPTION OF PLACING PRE-CAST BOX CULVERTS IN LIEU OF CAST-IN-PLACE CULVERTS. SHOP DRAWINGS OF PRE-CAST BOX CULVERTS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. (SEE GENERAL NOTE ON SHT. D-1.)

BOX CULVERT ESTIMATED QUANTITIES														
	BOX CULVERT # I (Drainline #1)		BOX CULVERT # II (Drainline #3)		BOX CULVERT # III (Drainline #4)		BOX CULVERT # IV (Drainline #3)		BOX CULVERT # V (Drainline #3)		BOX CULVERT # VI (Drainline #3)		BOX CULVERT # VII (Drainline #3)	
Item No.; Pay Unit	604.8010		604.8020		604.8030		604.8040		604.8050		604.8060		604.8070	
ITEMS	Unit	Quantity	Unit	Quantity	Unit	Quantity	Unit	Quantity	Unit	Quantity	Unit	Quantity	Unit	Quantity
Structure Excavation	C.Y.	65	C.Y.	105	C.Y.	27	C.Y.	245	C.Y.	20	C.Y.	36	C.Y.	100
Class A Concrete	C.Y.	22	C.Y.	35	C.Y.	10	C.Y.	105	C.Y.	80	C.Y.	30	C.Y.	75
Reinforcing Steel	LB.	2,730	LB.	5,000	LB.	1,020	LB.	10,650	LB.	7,800	LB.	3,470	LB.	9,830
Type B Frame & Cover	EA.	—	EA.	—	EA.	—	EA.	1	EA.	1	EA.	—	EA.	—
Type P Frame & Cover	EA.	—	EA.	1	EA.	—	EA.	—	EA.	—	EA.	—	EA.	—



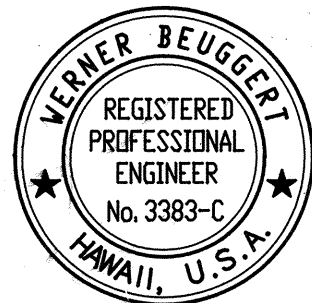
GUTTER & THROAT DETAIL FOR CATCH BASINS*

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

* Applicable only to Drainage Structure Nos. (4) , (7) , (8) , (10) , (24) , (26) , (32) , (34) ,
(36) , (43) , (44) , (47) , (48) , (49) , (52) , (54) & (63) .

NOTE :

1. For Catch Basin dimensions & reinforcing details not shown, see Std. Plans H-01, H-02 & H-04.



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

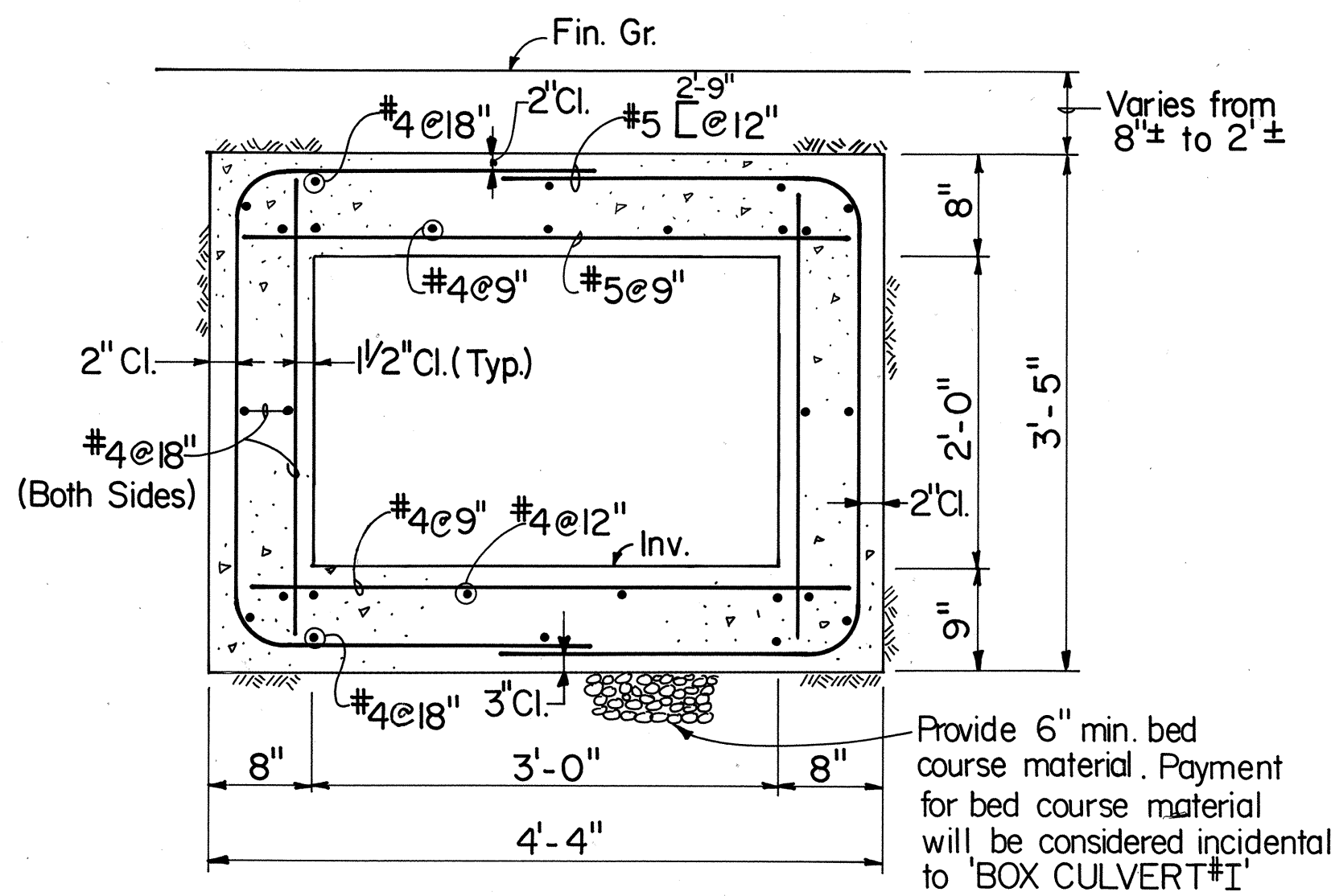
**DRAINAGE STRUCTURE NOTES &
BOX CULVERT QUANTITIES**

KALANIANA'OLE HIGHWAY
Wailupe Circle to East Hind Drive
F.A. PROJECT NO. F-072-1(34)-A

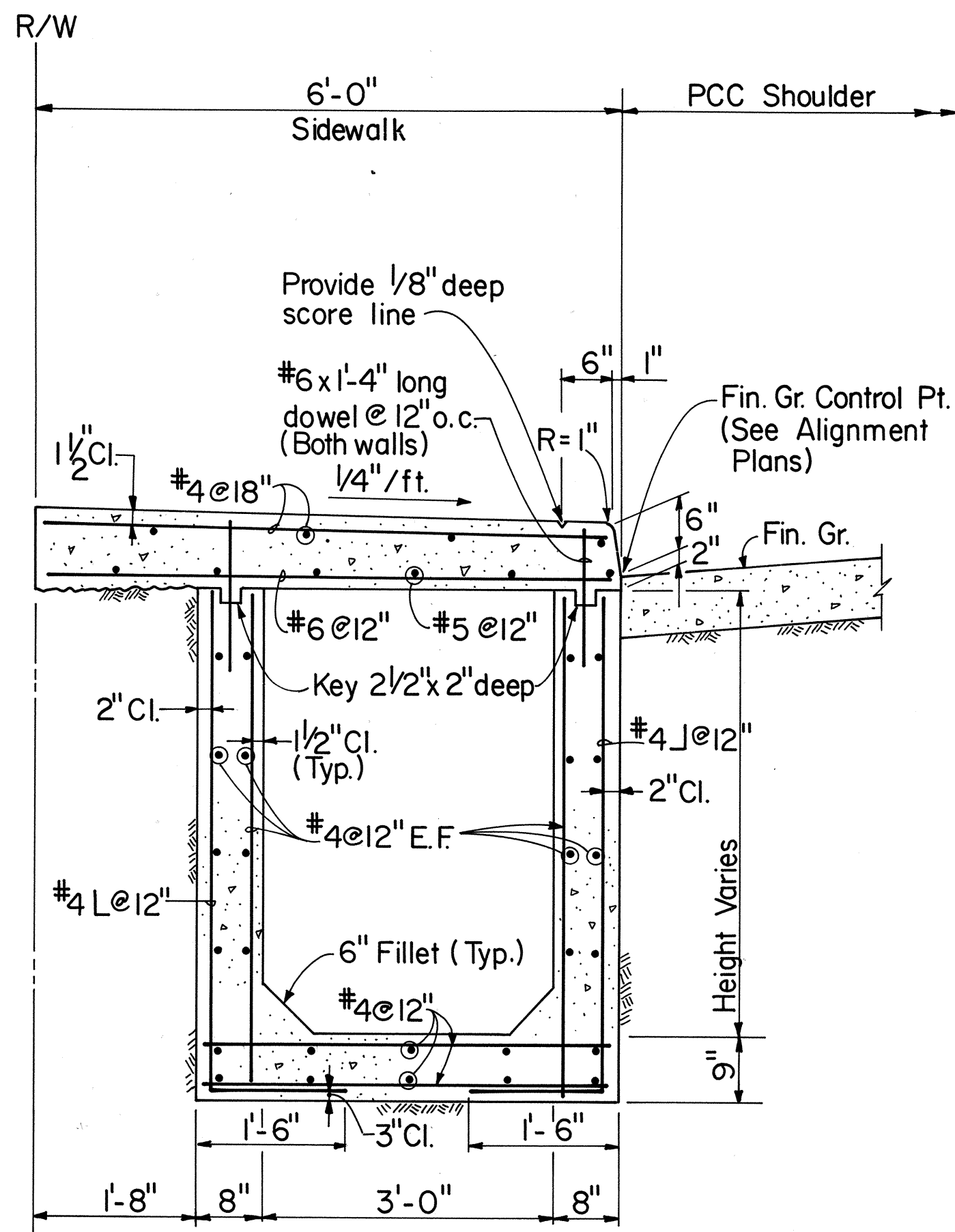
SCALE: DATE: June 30, 1990

SHEET No. D-10 OF 37 SHEETS

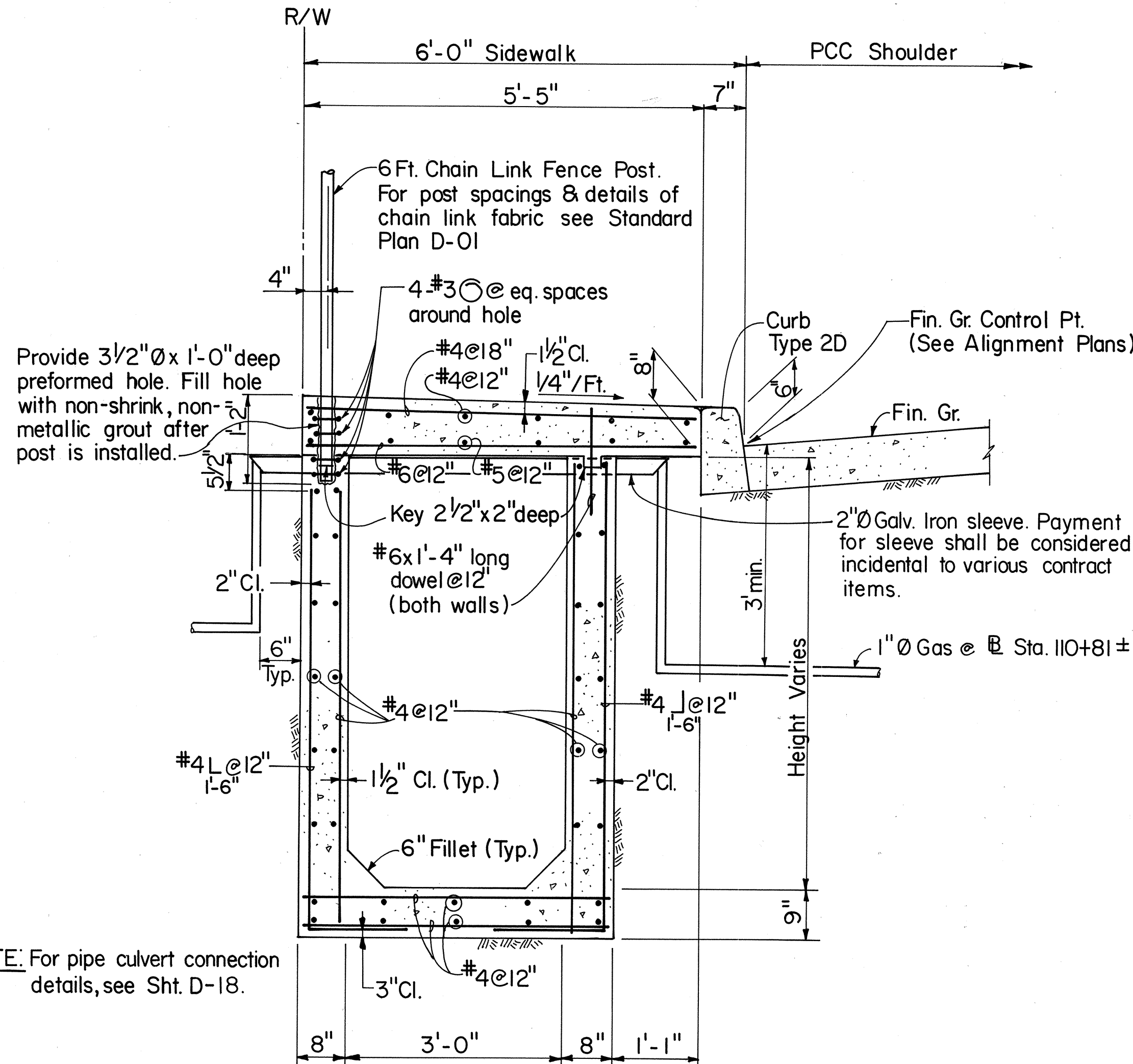
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(34)-A	1990	40	186



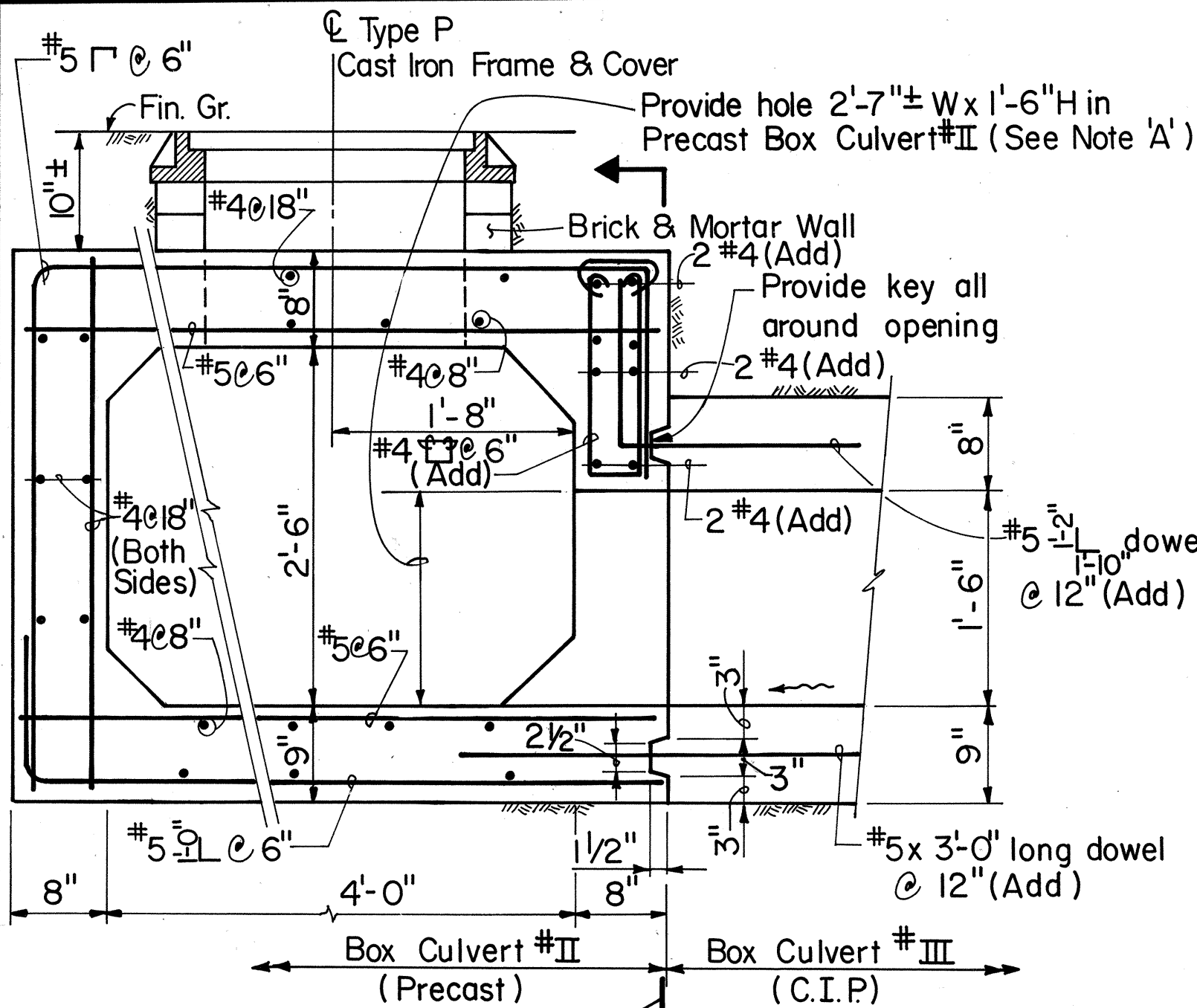
TYPICAL SECTION
BOX CULVERT #I
Scale: 1"=1'-0"



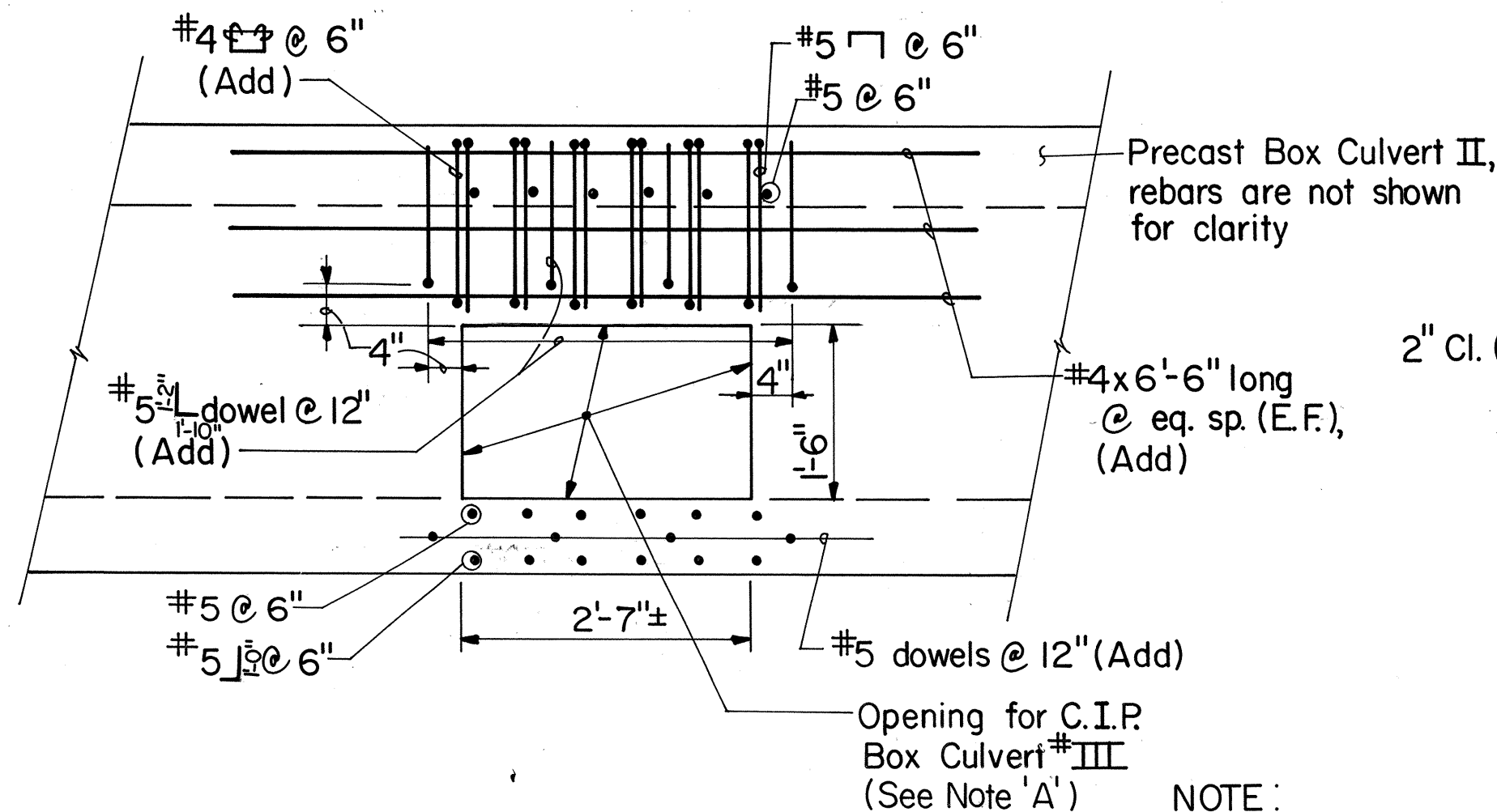
TYPICAL SECTION
BOX CULVERT #IV
Scale: 3/4"=1'-0"



TYPICAL SECTION
BOX CULVERT #VI
Scale: 3/4"=1'-0"

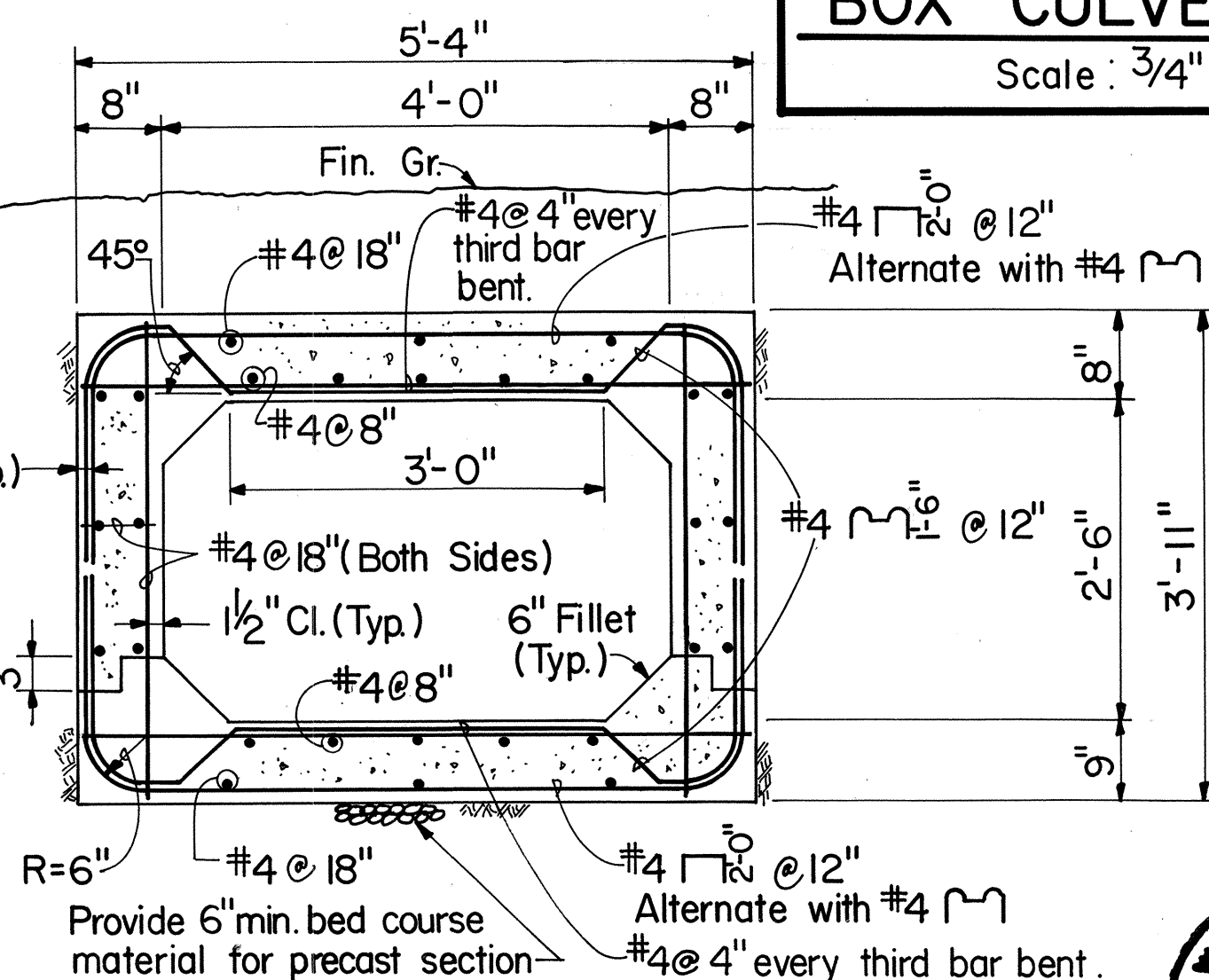


DETAIL - BOX CULVERT CONNECTION
Scale: 1"=1'-0"

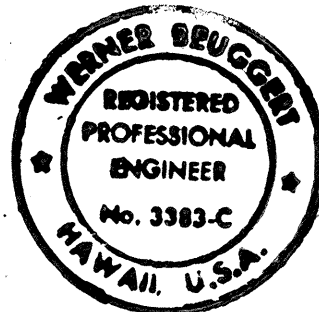


SECTION A
Scale: 3/4"=1'-0"

NOTE:
Payment for bed course material will be considered incidental to 'BOX CULVERT #II'.



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



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HIGHWAYS DIVISION

BOX CULVERT #I, #II, #IV & #VI

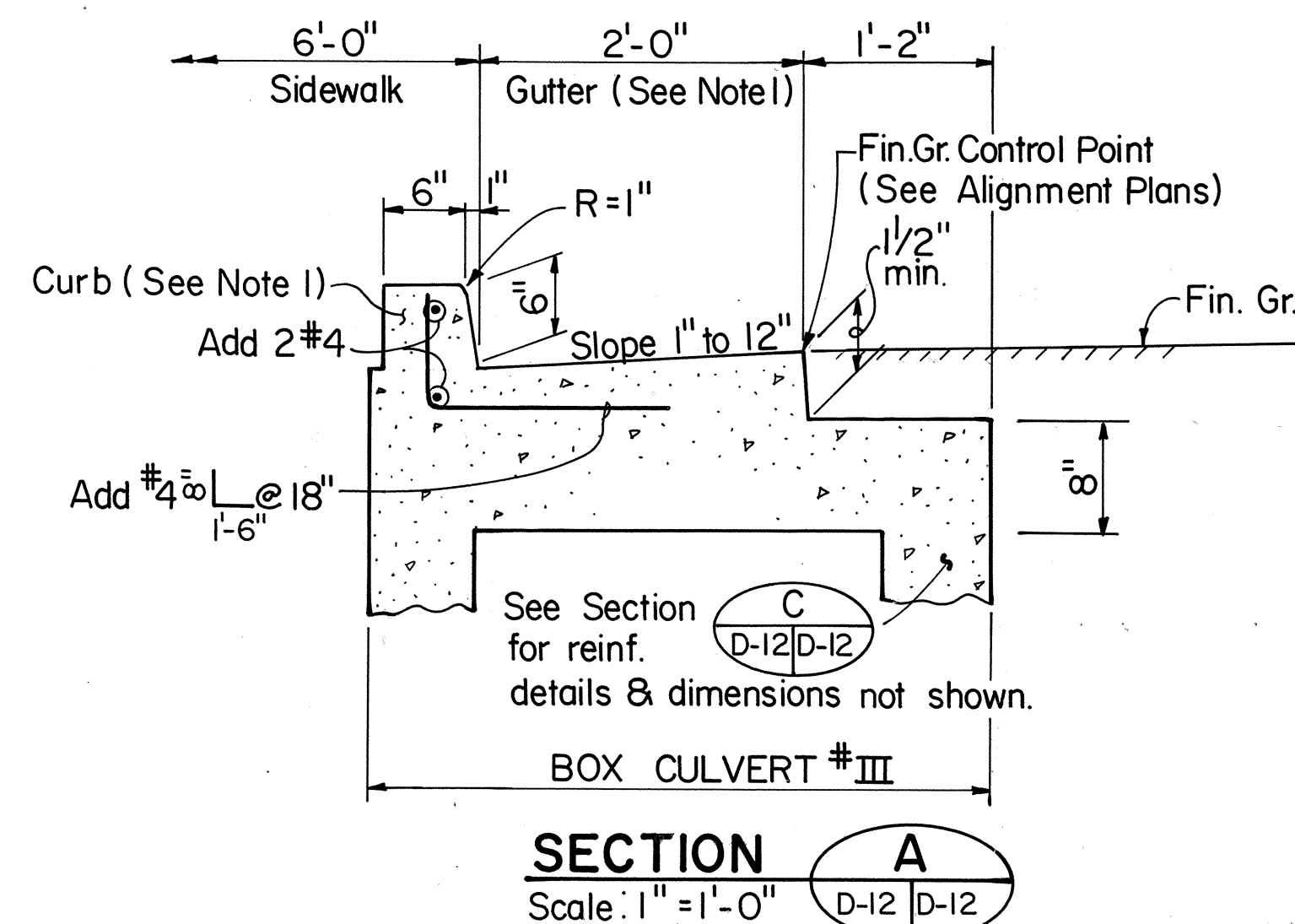
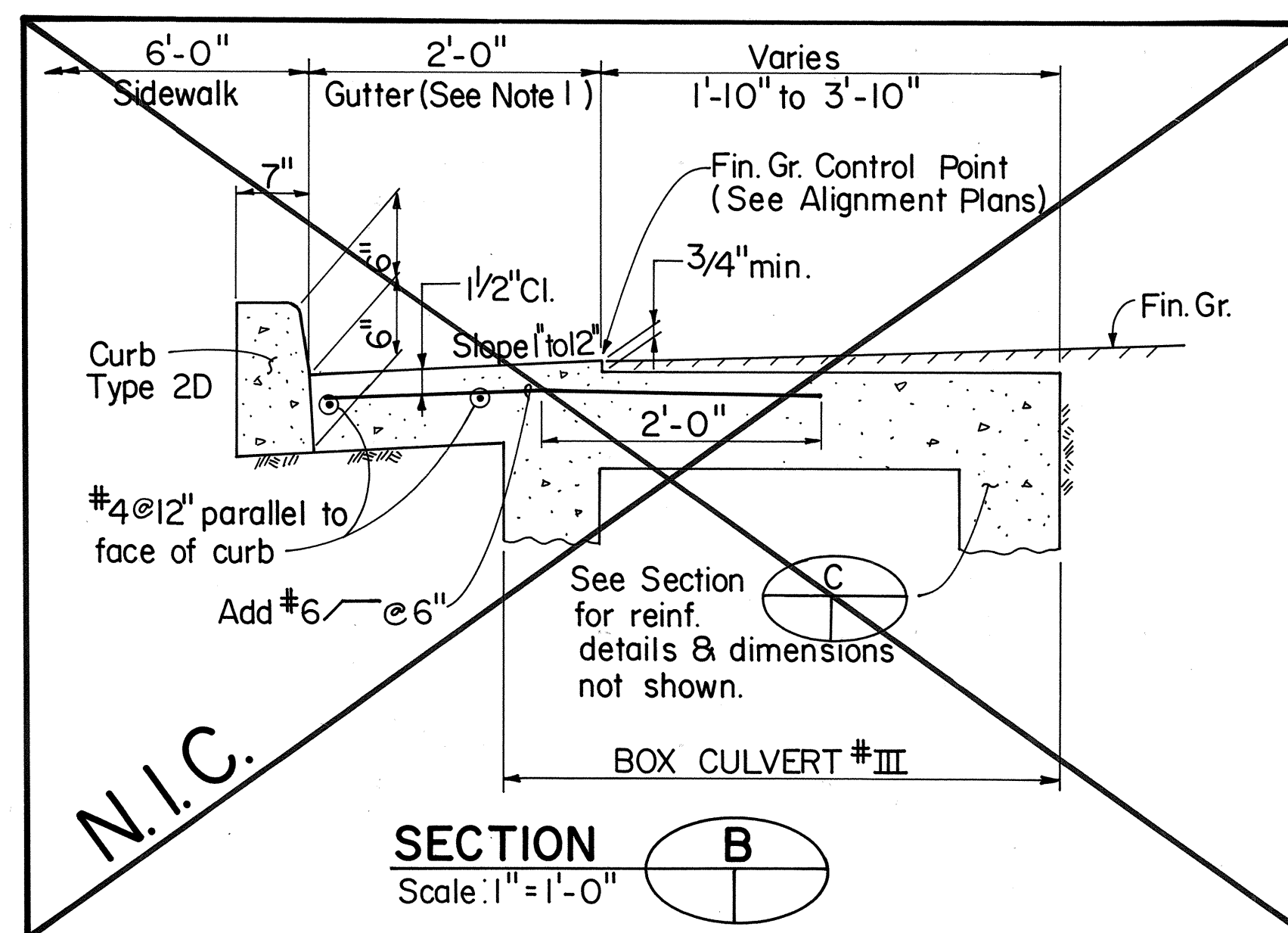
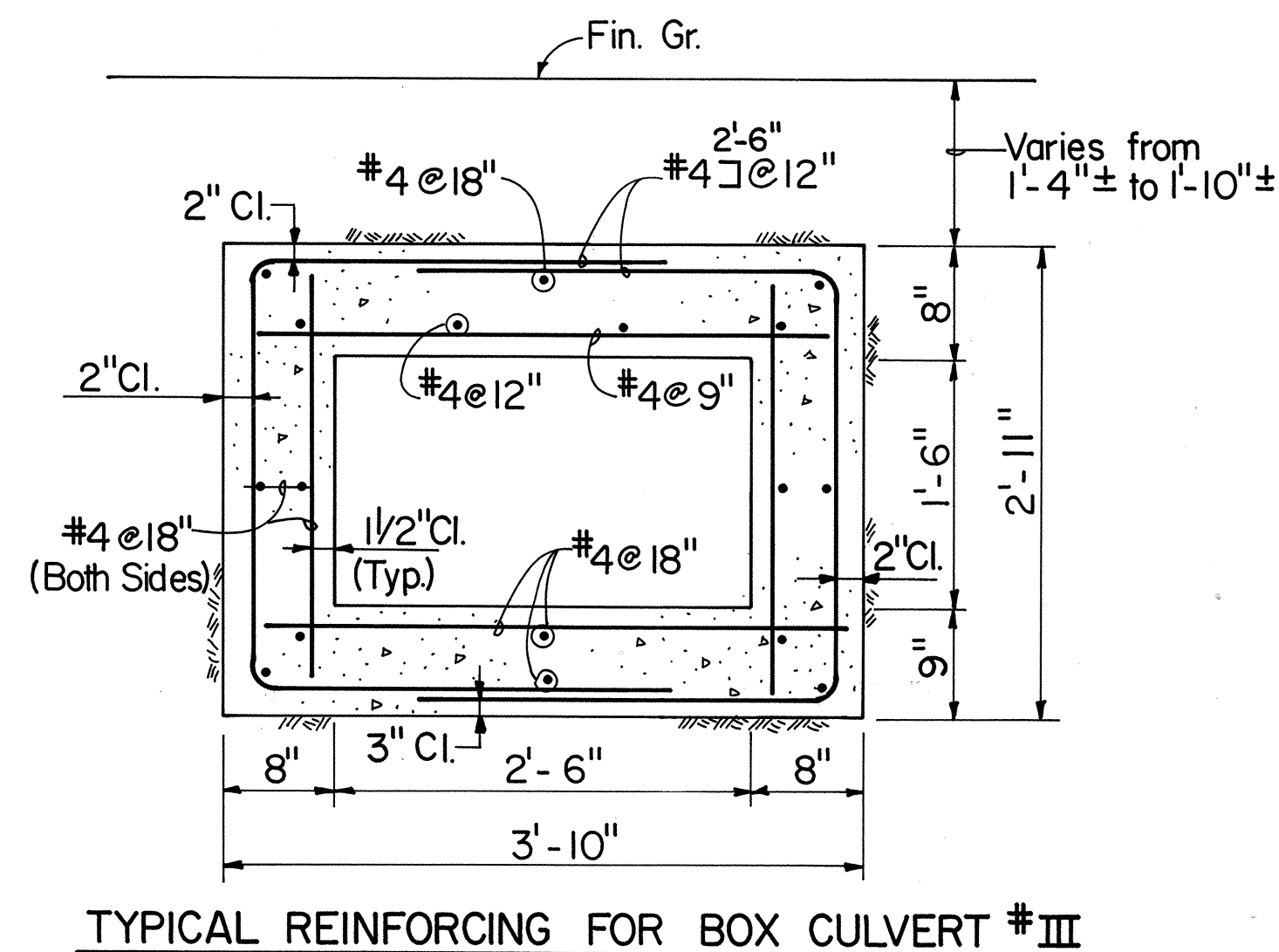
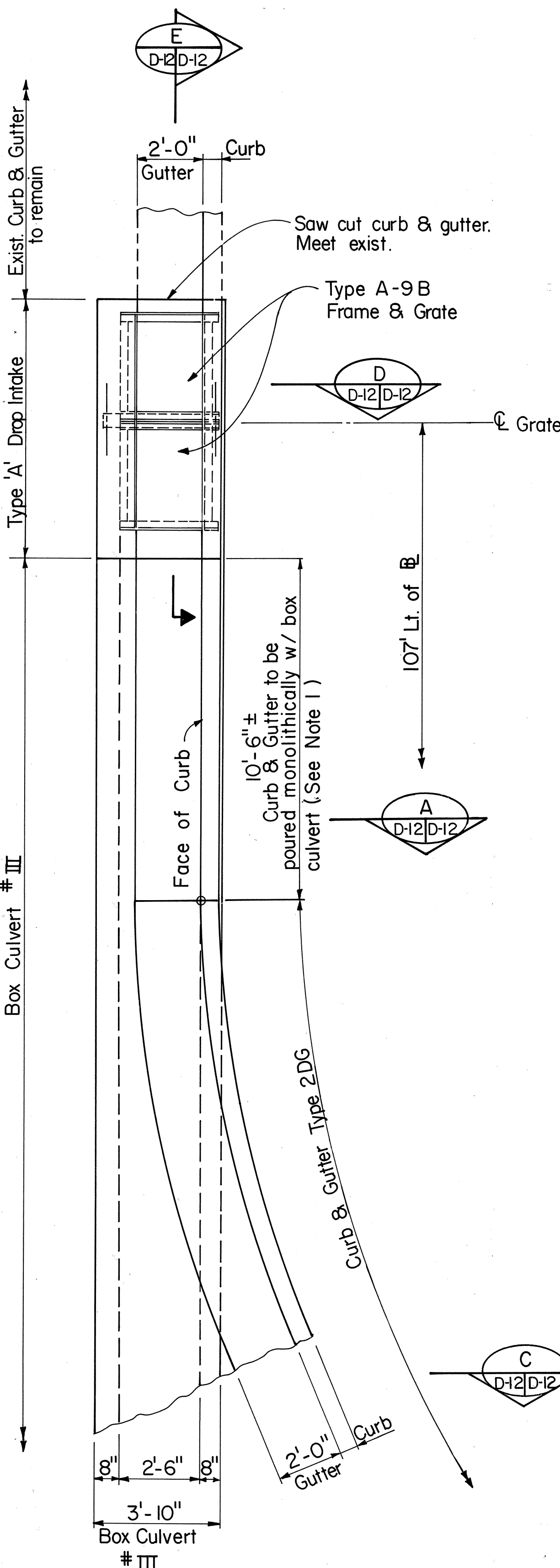
KALANIANA'OLE HIGHWAY
Waiupe Circle to East Hind Drive
F.A. Project No. F-072-1(34)-A
SCALE: As shown DATE: JUNE 30, 1990
SHEET No. D-II OF 37 SHEETS

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

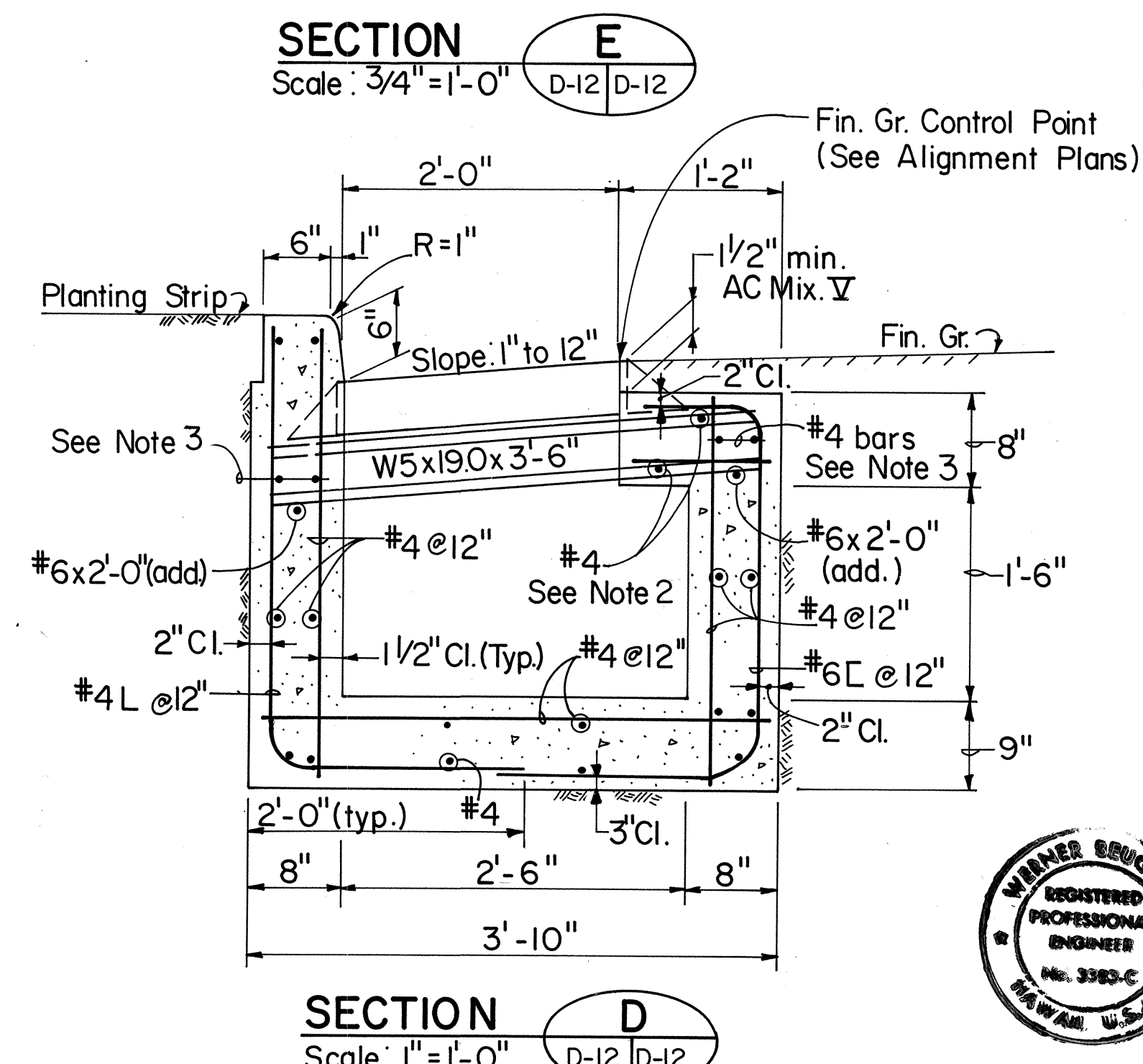
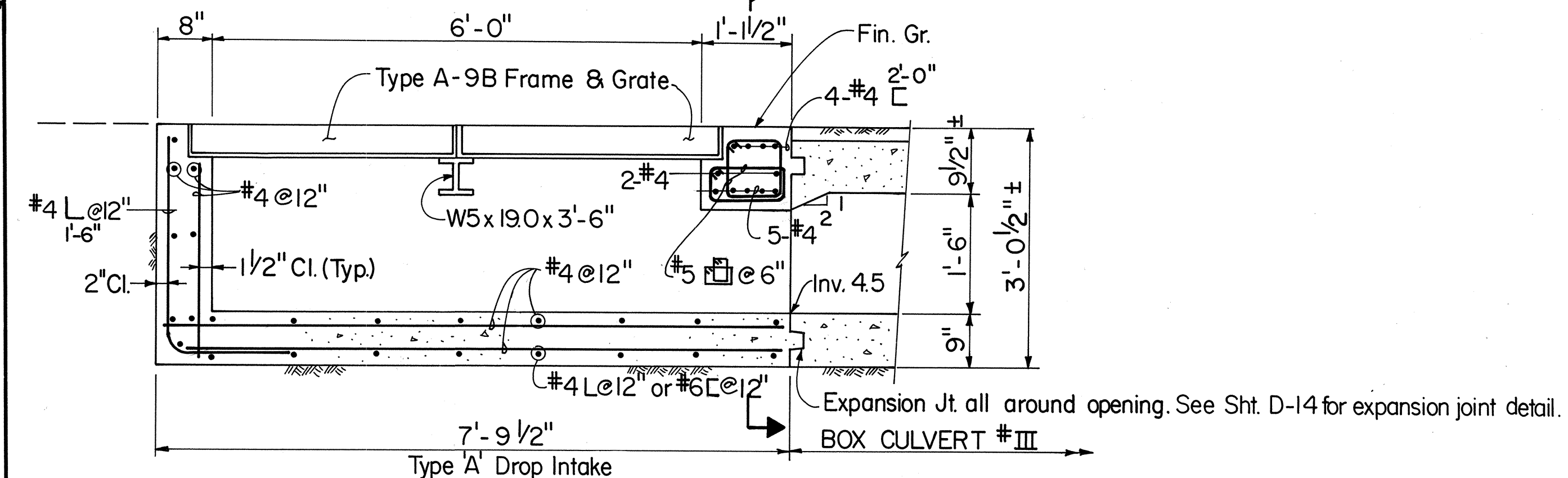
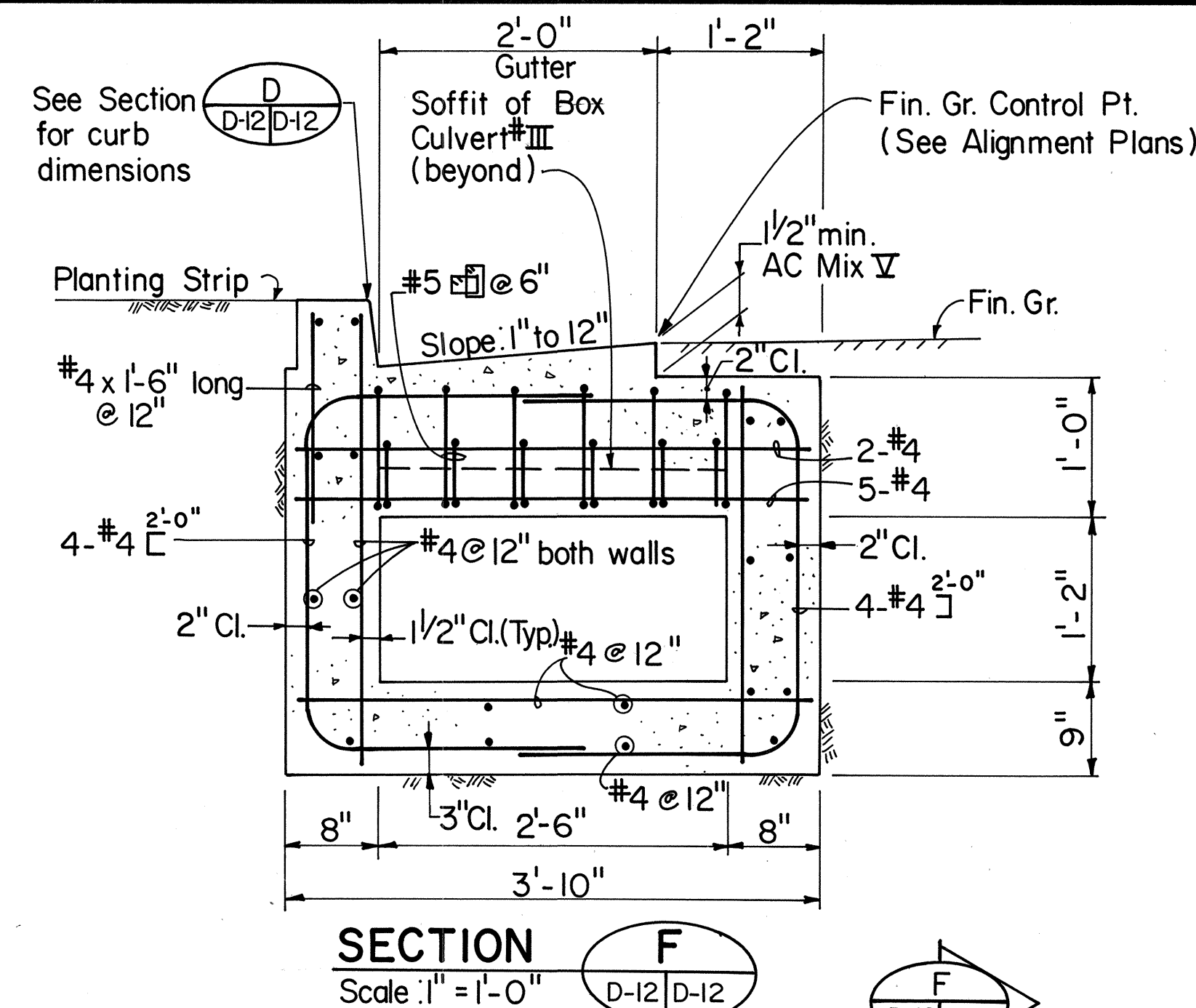
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(34)-A	1990	41	186

NOTES:

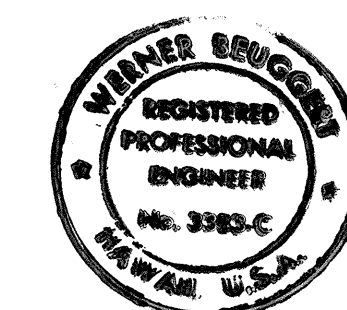
1. Payment for monolithic Curb and/or Gutter shall be considered incidental to Box Culvert #III.
2. Cut flange of steel beam to fit rebars.
3. Drill holes in web of steel beam to fit rebars.
4. For details of Type A-9B Frame & Grate, see Std. Plan H-10.



BOX CULVERT # III



TYPE 'A' DROP INTAKE
DRAINAGE STRUCTURE NO. 15
STA. 105+28, LT.



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Wm. J. Huggins

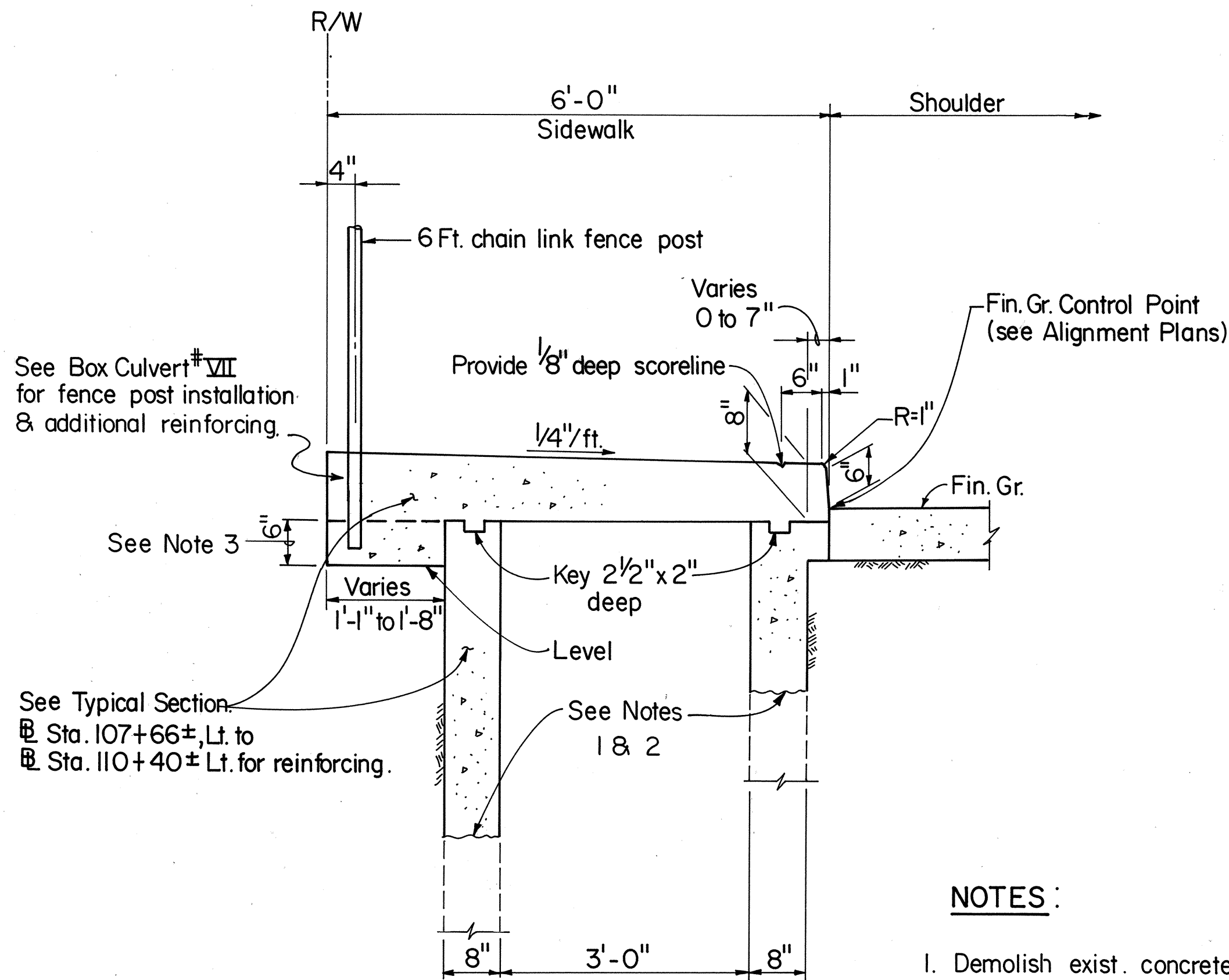
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BOX CULVERT #III
TYPE 'A' DROP INTAKE

KALANIANA'OLE HIGHWAY
Waiupe Circle to East Hind Drive
F.A. Project No. F-072-1(34)-A

SCALE: As shown
DATE: JUNE 30, 1990
SHEET No. D-12 OF 37 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(34)-A	1990	42	186



TYPICAL SECTION

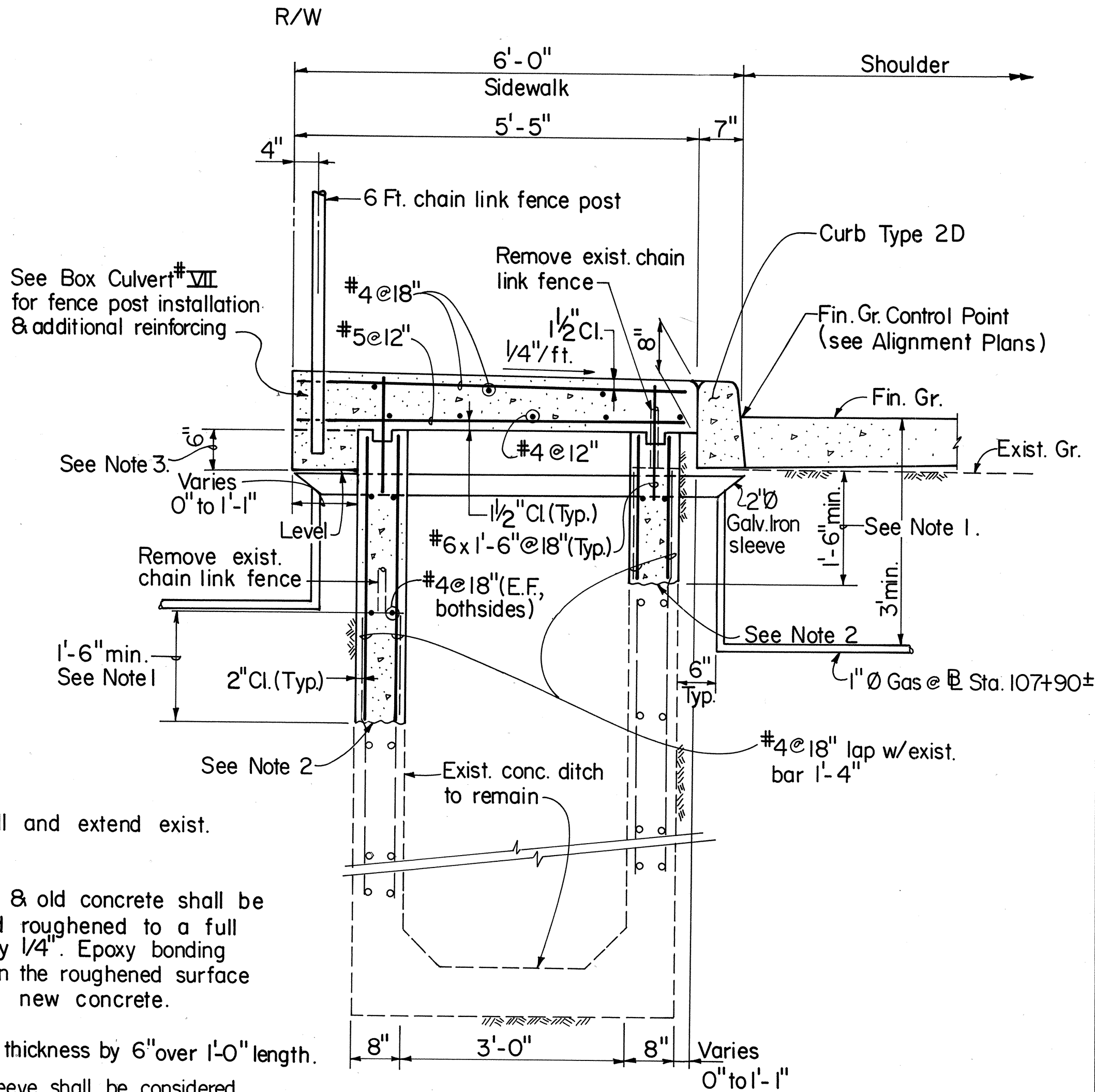
Sta. 107+63 ±, LT. TO Sta. 107+66 ±, LT.

NOTES:

- Demolish exist. concrete wall and extend exist. reinf. into new concrete.
- The interface between new & old concrete shall be clean, free of laitance and roughened to a full amplitude of approximately 1/4". Epoxy bonding material shall be coated on the roughened surface immediately prior to pouring new concrete.
- At fence posts increase slab thickness by 6" over 1'-0" length.
- Payment for galvanized iron sleeve shall be considered incidental to various contract items.

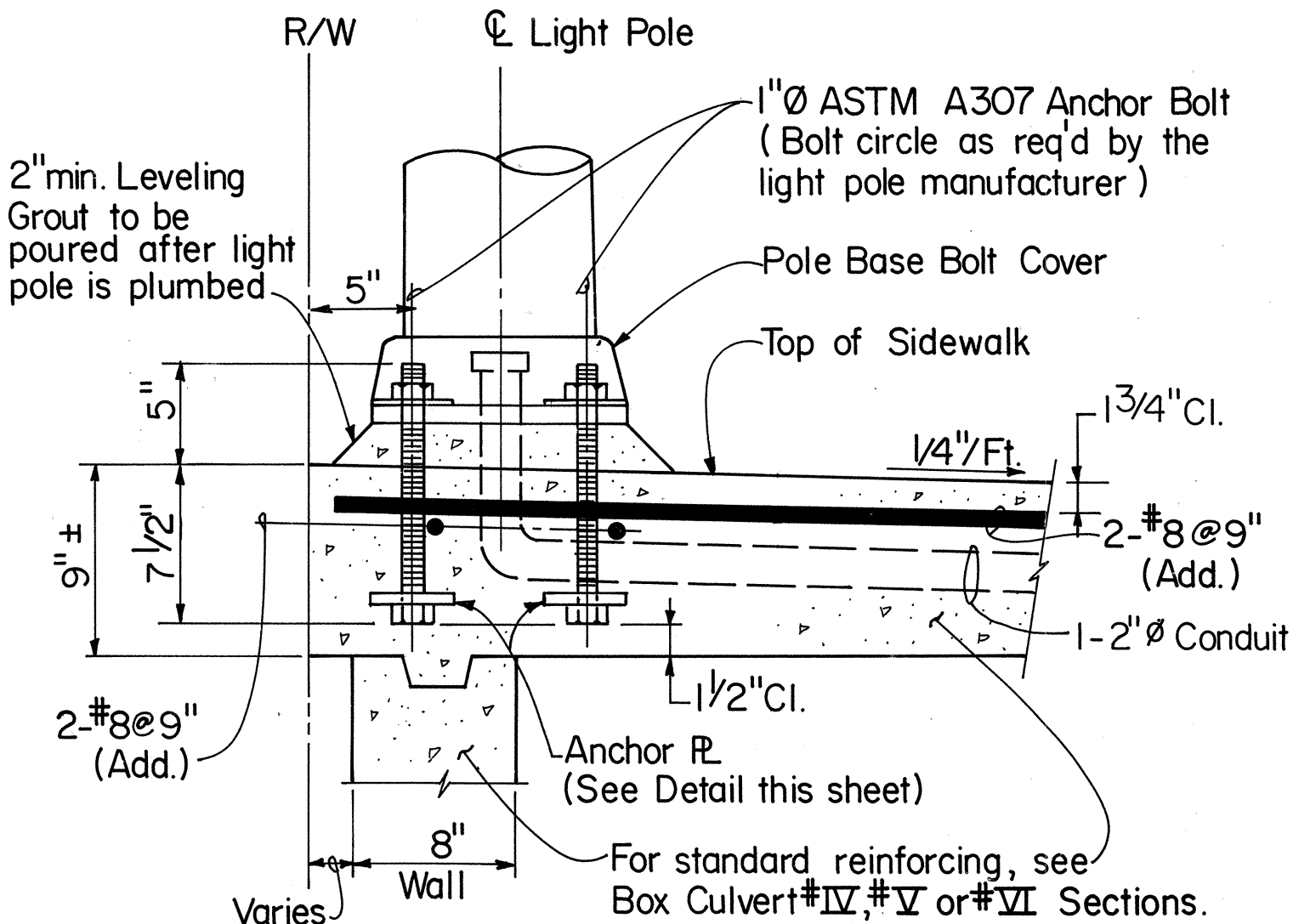
BOX CULVERT #V

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



TYPICAL SECTION

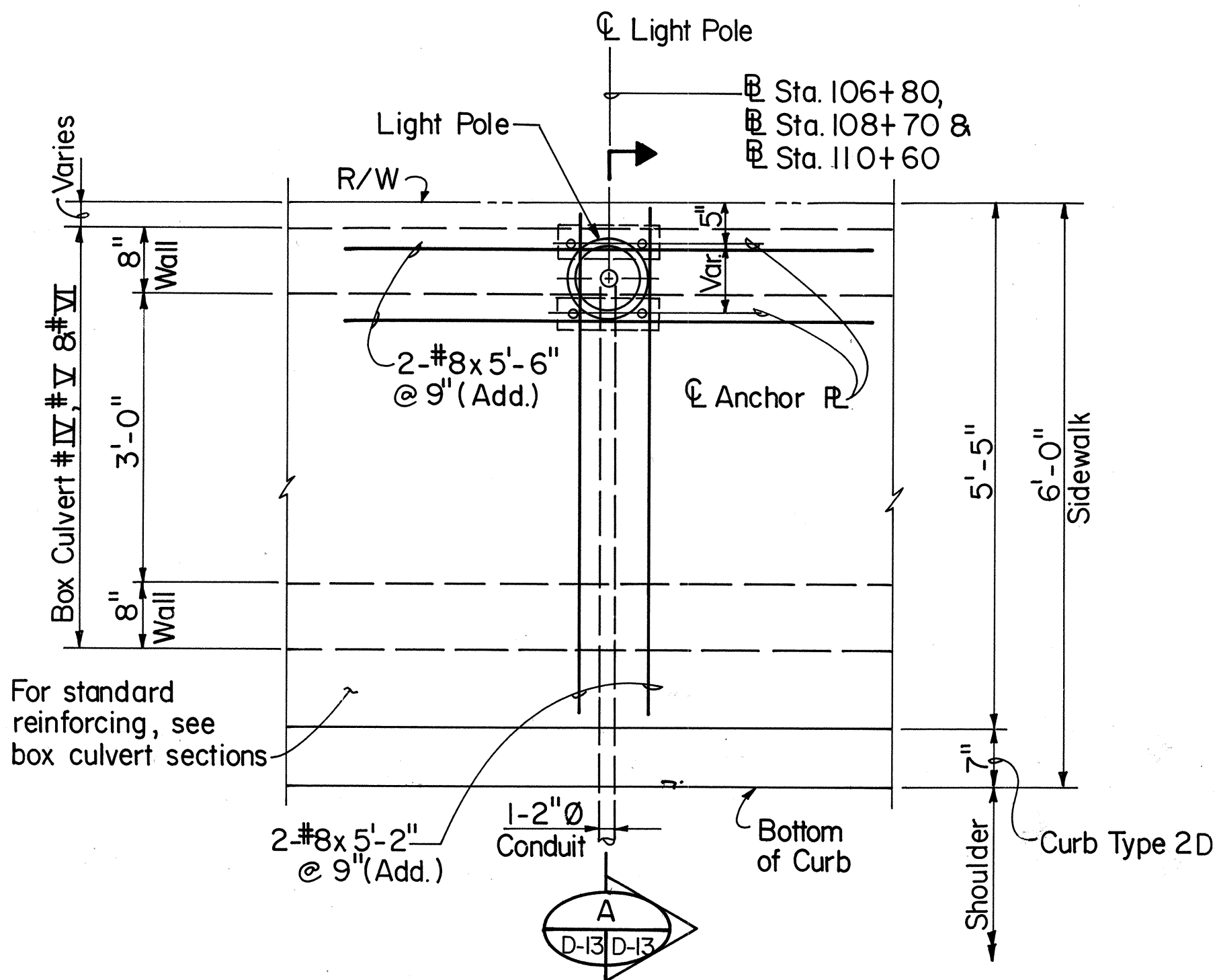
Sta. 107+66 ±, LT. TO Sta. 110+40 ±, LT.



SECTION A

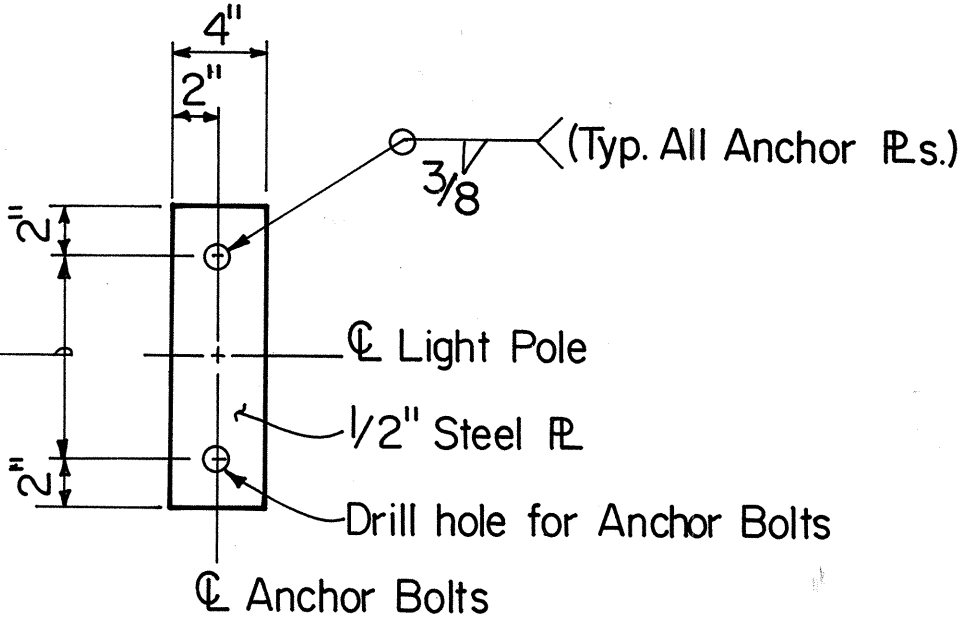
Scale: 1/2" = 1'-0"

ANCHOR DETAIL FOR LIGHT POLE



PLAN @ LIGHT POLE

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

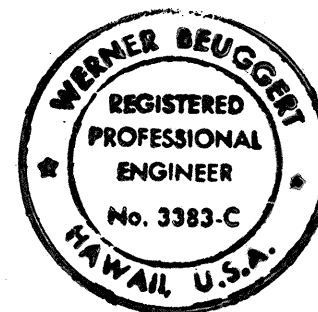


ANCHOR PLATE DETAIL

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

NOTE:

Payment for Light Pole Anchor shall be considered incidental to the box culvert.



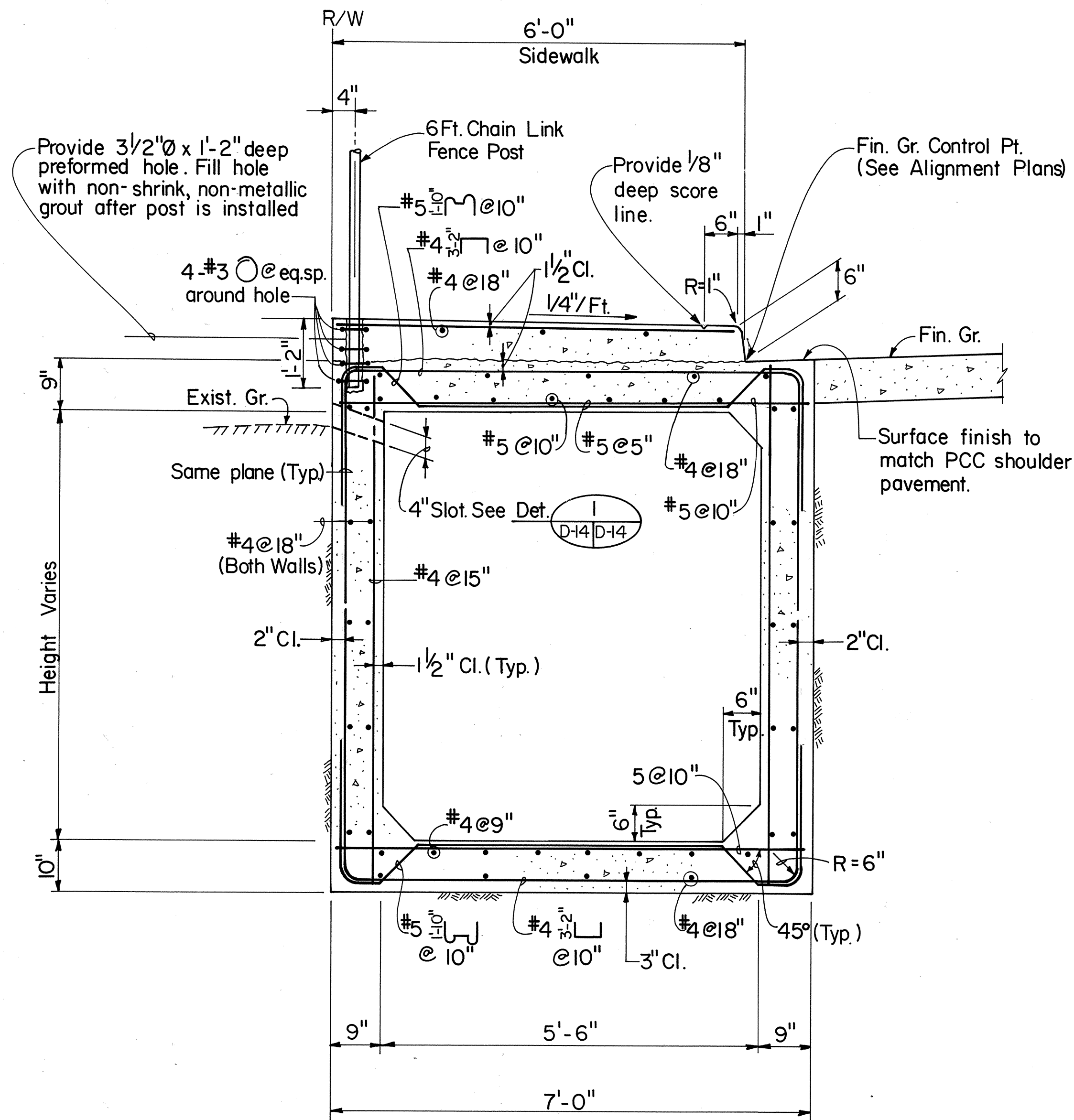
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Werner Beugnot

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
BOX CULVERT #V
ANCHOR DETAIL FOR
LIGHT POLE
KALANIANA'OLE HIGHWAY
Waiupe Circle to East Hind Drive
FA Project No. F-072-1(34)-A

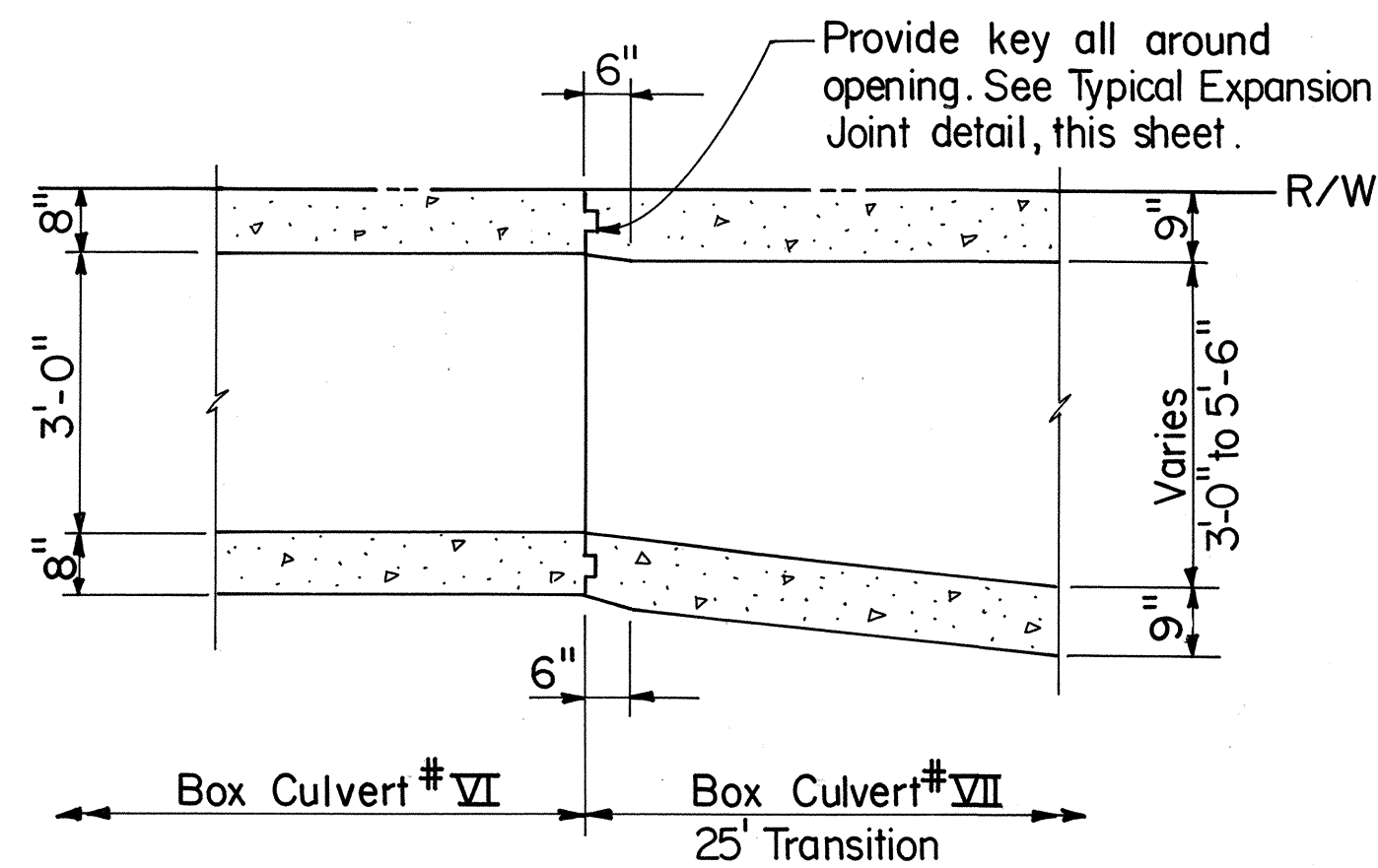
SCALE: As shown
DATE: JUNE 30, 1990
SHEET No. D-13 OF 37 SHEETS

DATE	
DESIGNED BY	
CHECKED BY	
NOTED BY	
ORIGINAL PLAN	

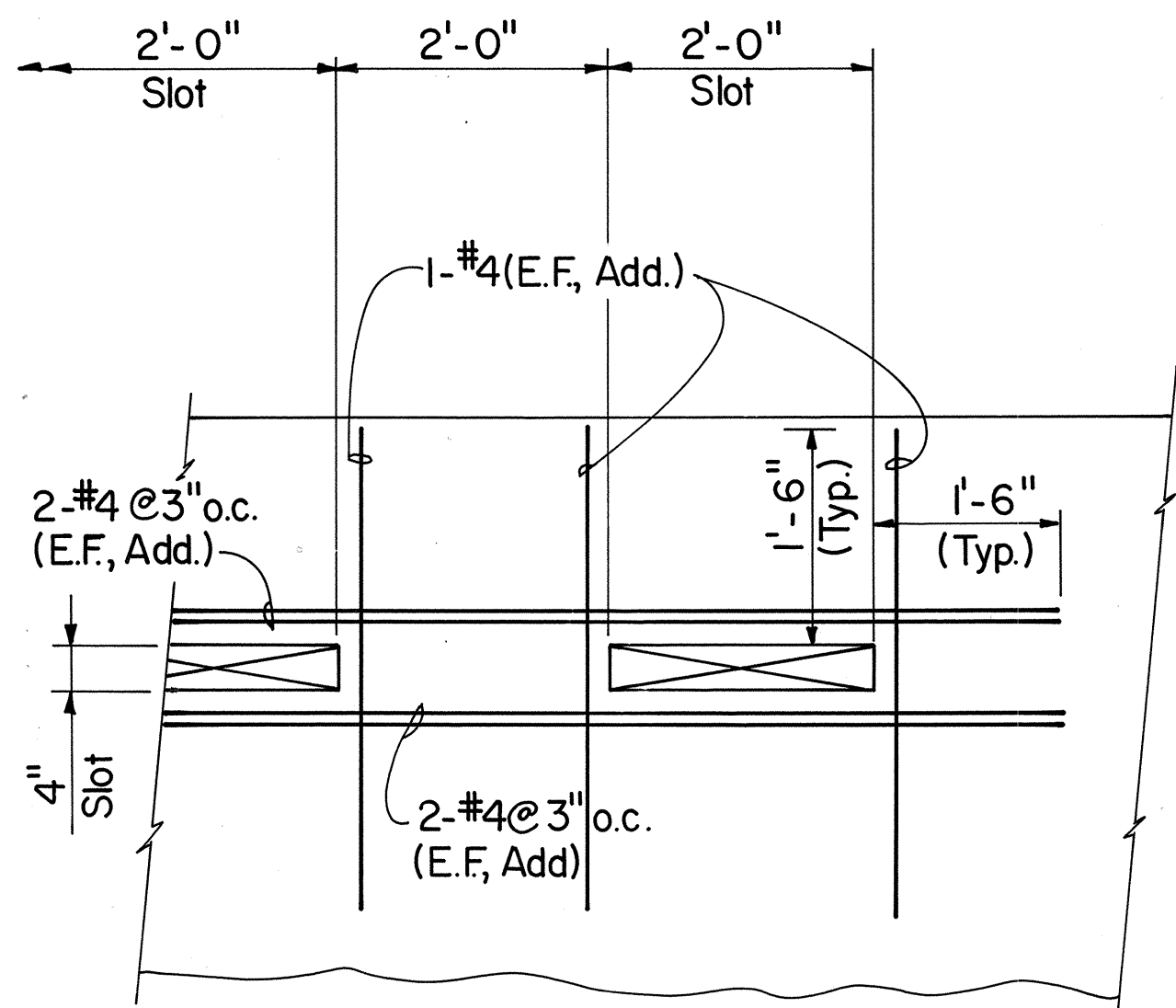
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(34)-A	1990	43	186



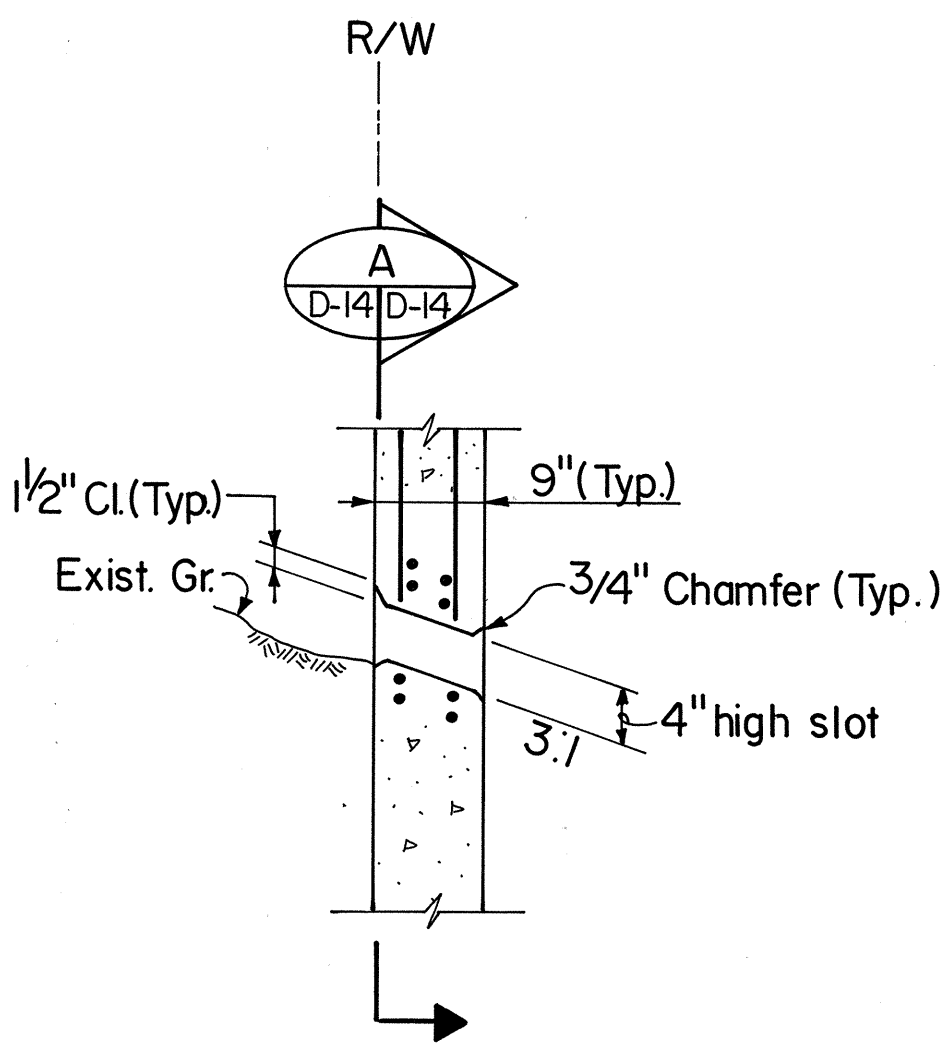
TYPICAL SECTION
Scale: 3/4"=1'-0"



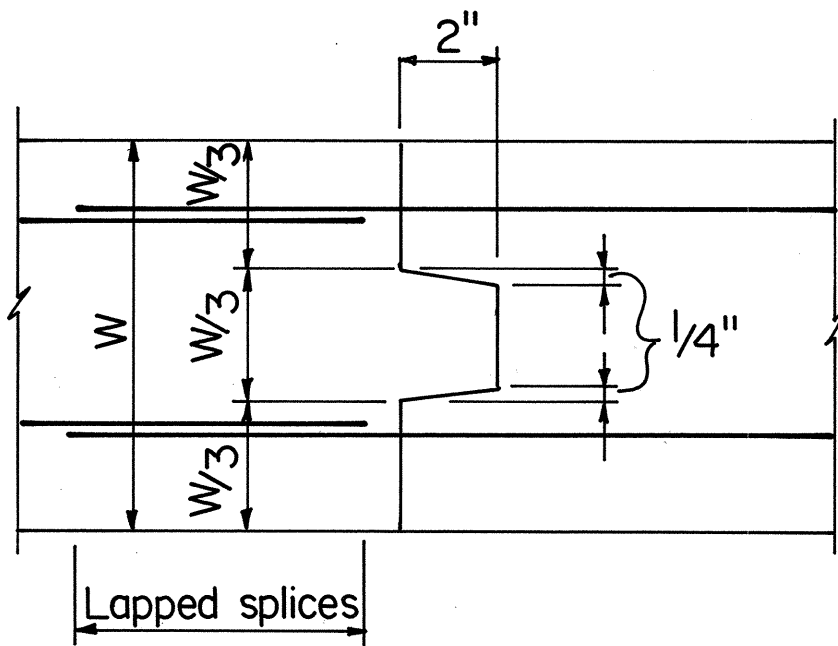
PLAN DETAIL - BOX CULVERT WALL TRANSITION
Scale: 1/2"=1'-0"



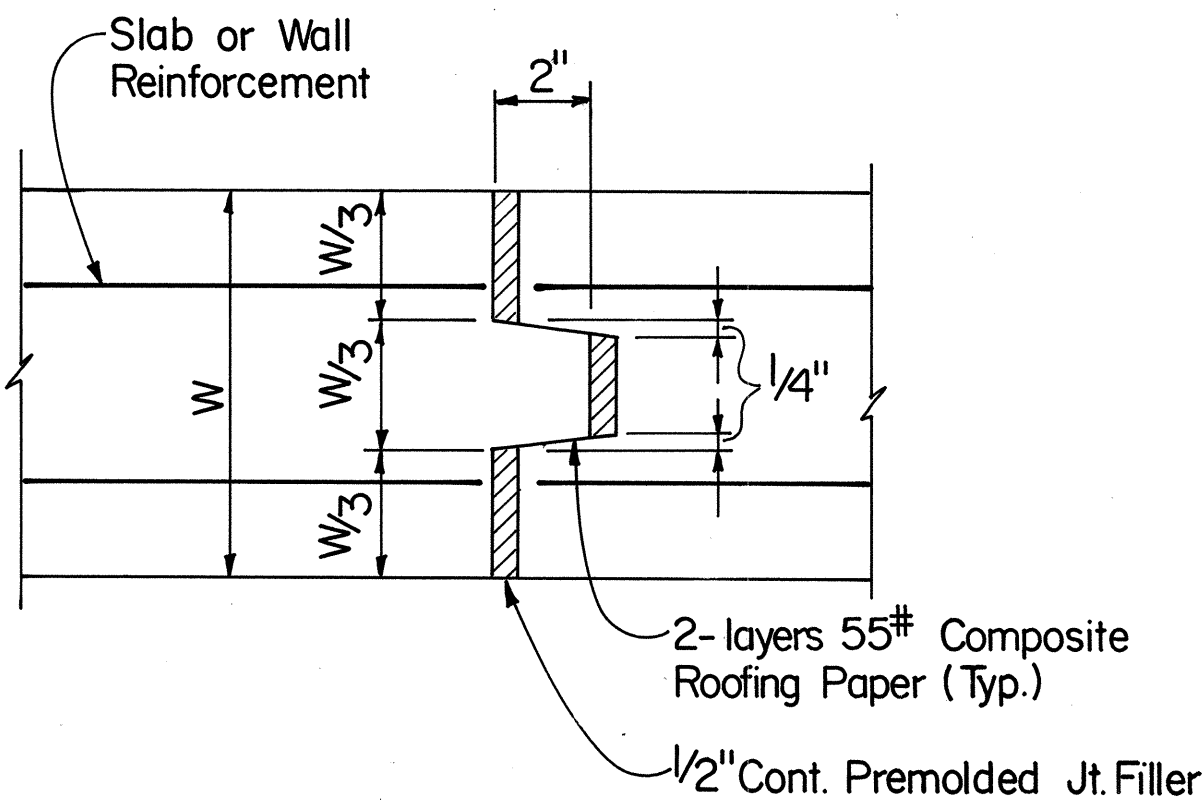
SECTION A
Scale: 3/4"=1'-0"



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

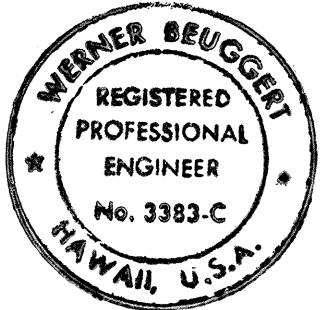


TYPICAL CONSTRUCTION JOINT
Not to Scale



TYPICAL EXPANSION JOINT
Not to Scale

ORIGINAL PLAN	DATE
DESIGNED BY	
CHECKED BY	
NOTED BY	
QUANTITIES BY	
CHECKED BY	



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BOX CULVERT #VII

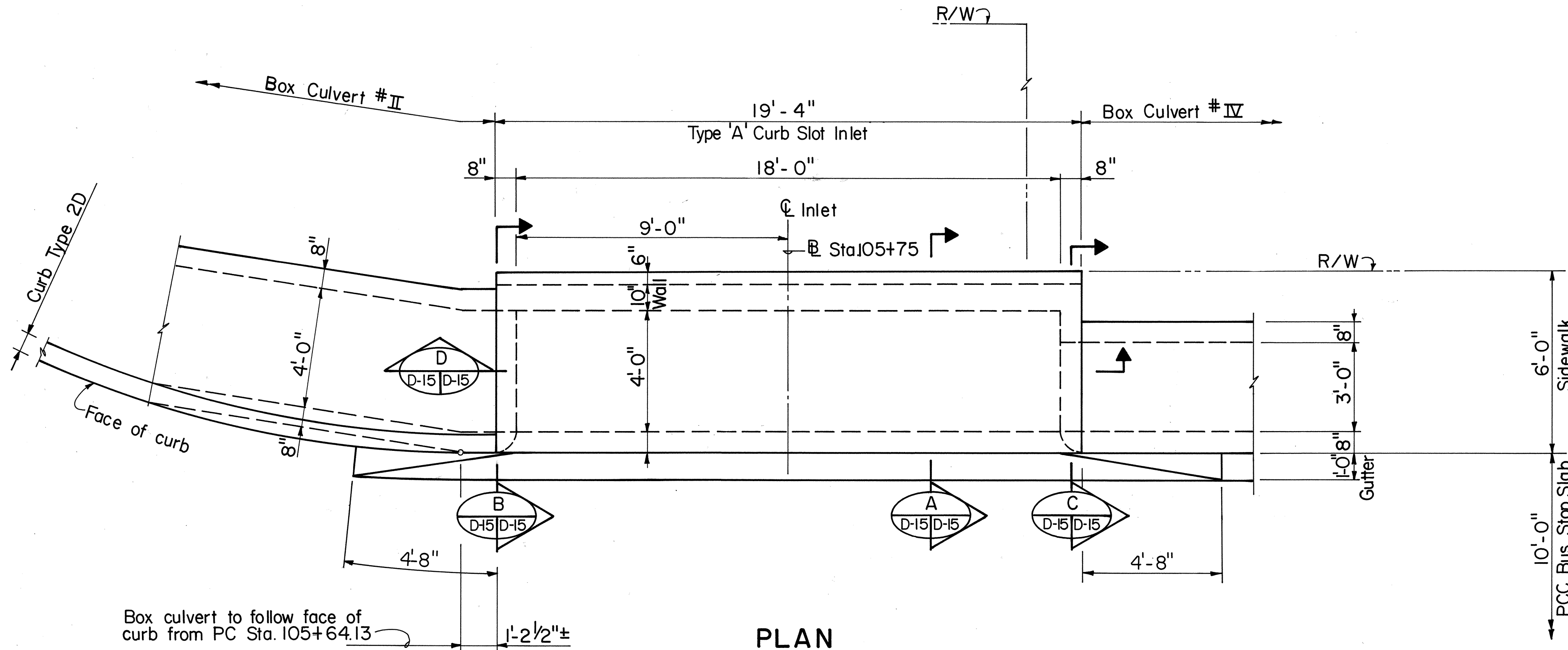
MISCELLANEOUS BOX CULVERT DETAILS

KALANIANA'OLE HIGHWAY
Waiupe Circle to East Hind Drive
F.A. Project No. F-072-1(34)-A

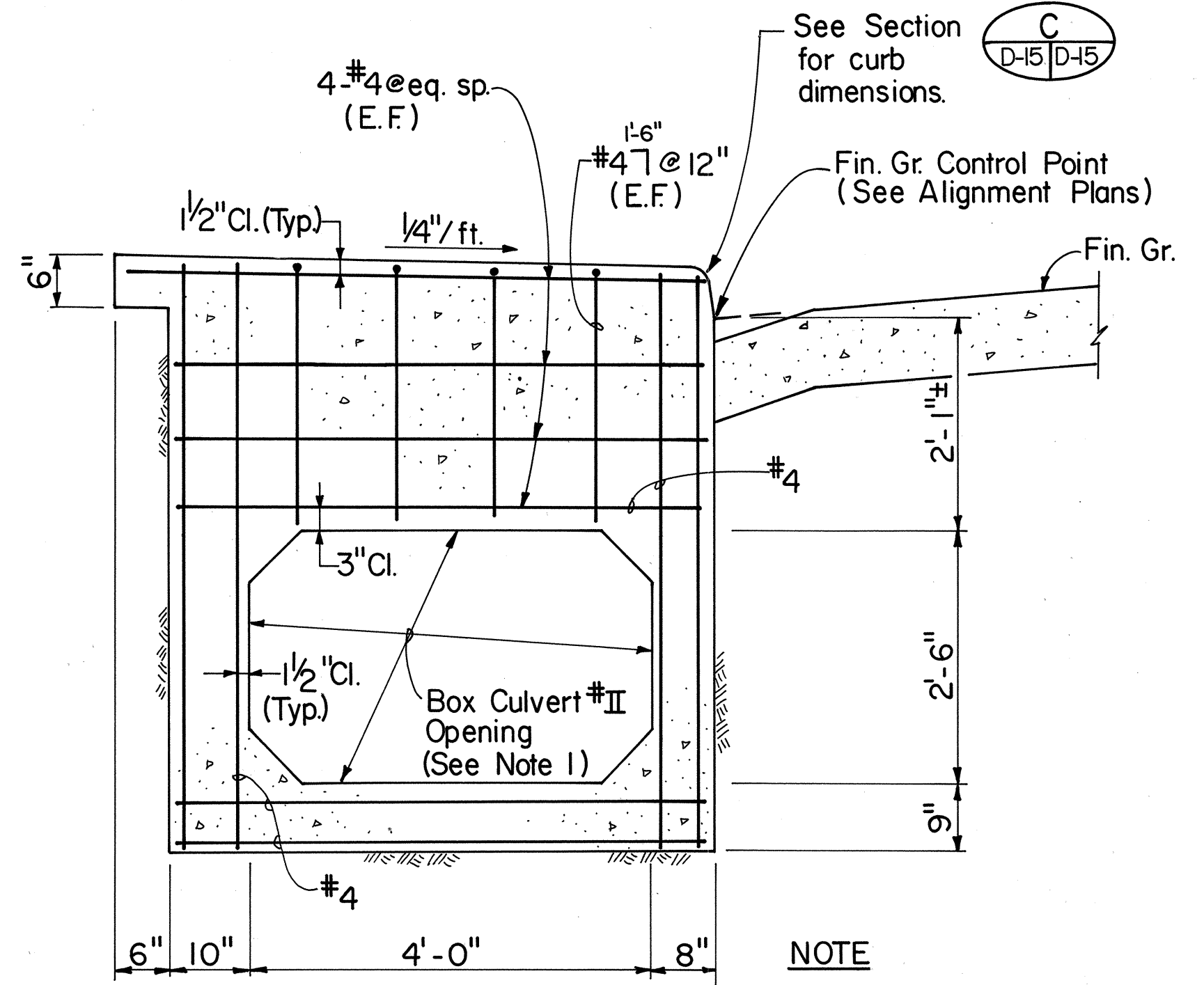
SCALE: As shown
DATE: JUNE 30, 1990

SHEET No.D-14 OF 37 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(34)-A	1990	44	186

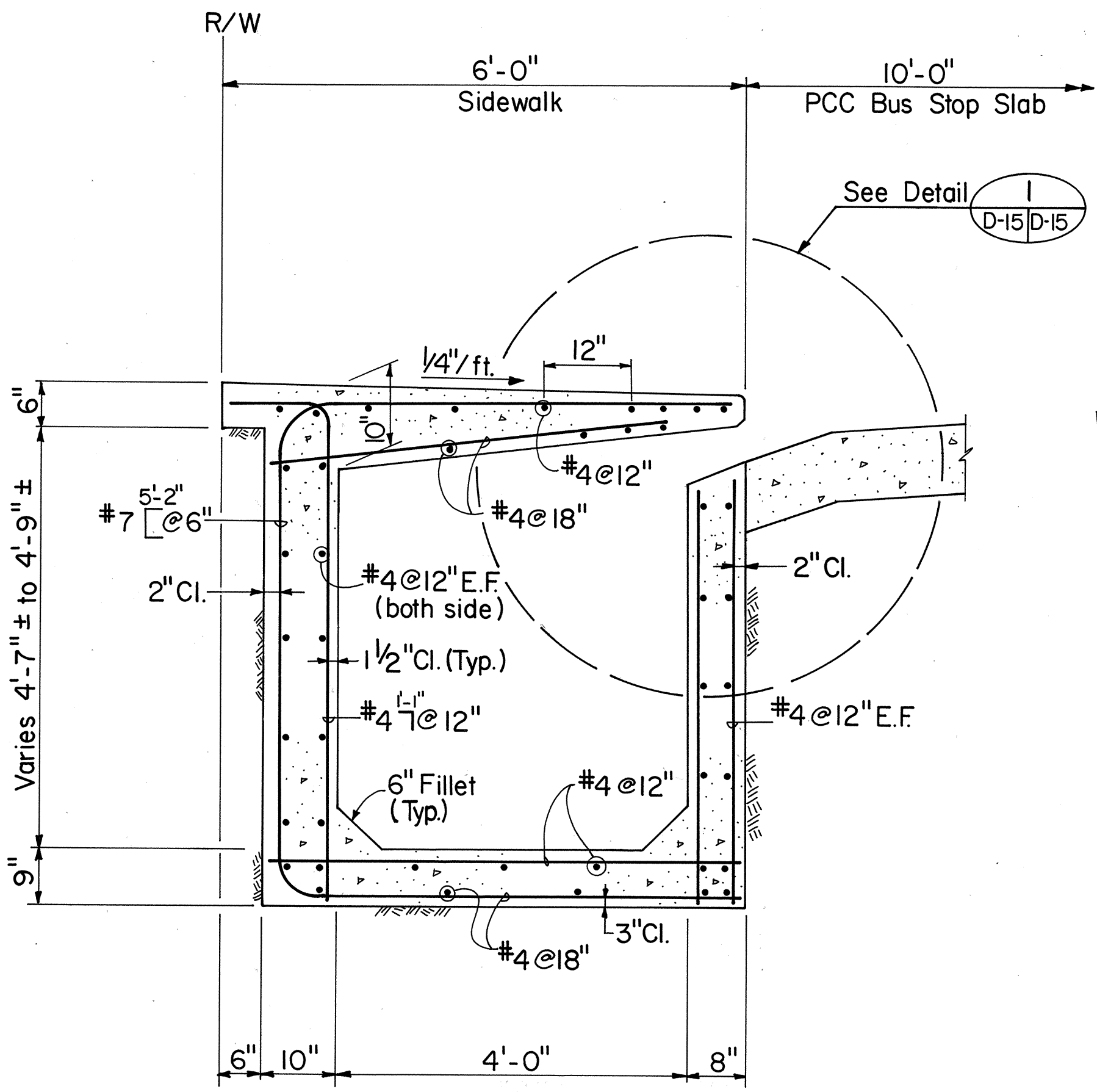


PLAN
Scale: 3/8"=1'-0"

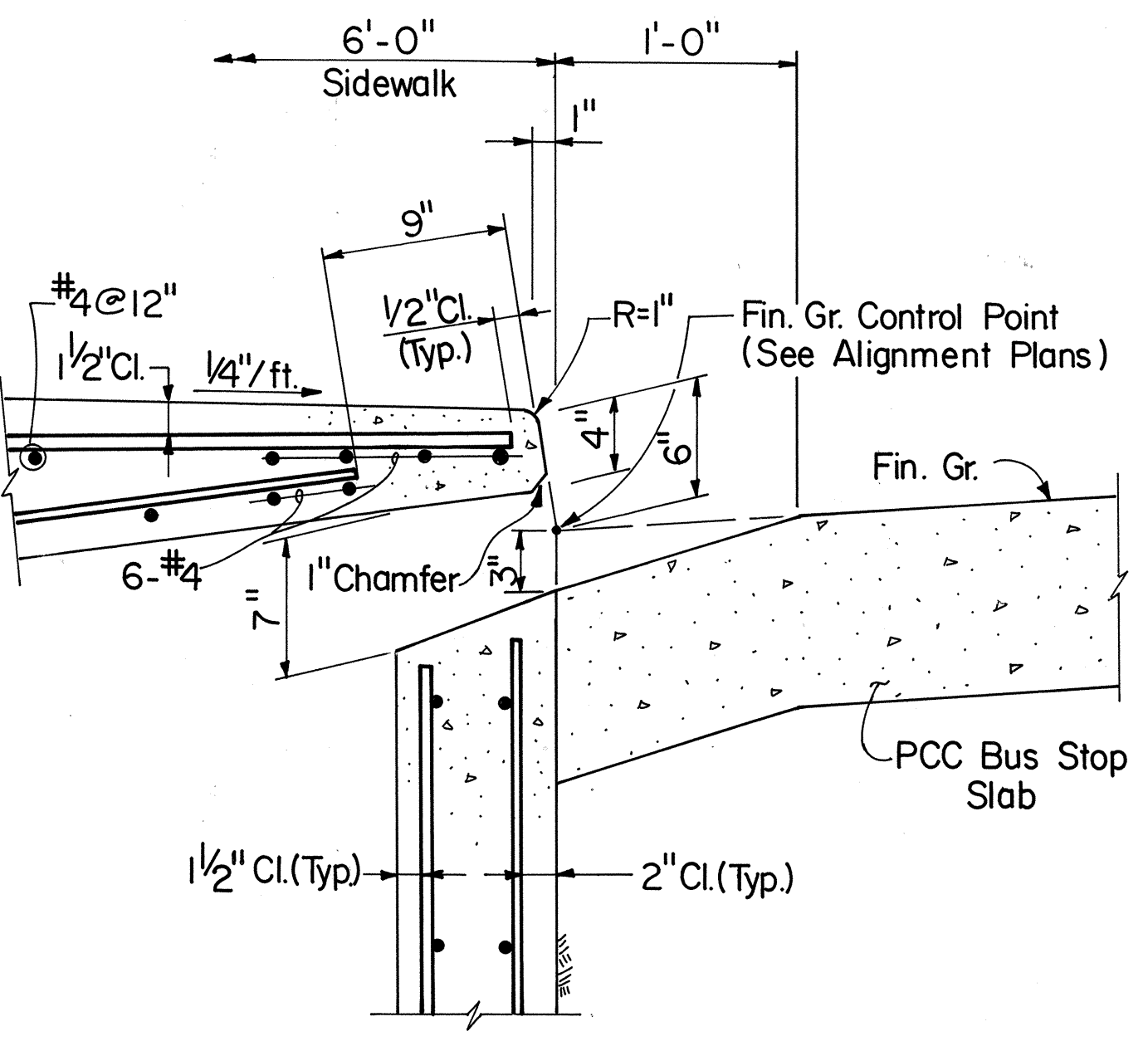


SECTION B
Scale: 3/4"=1'-0"

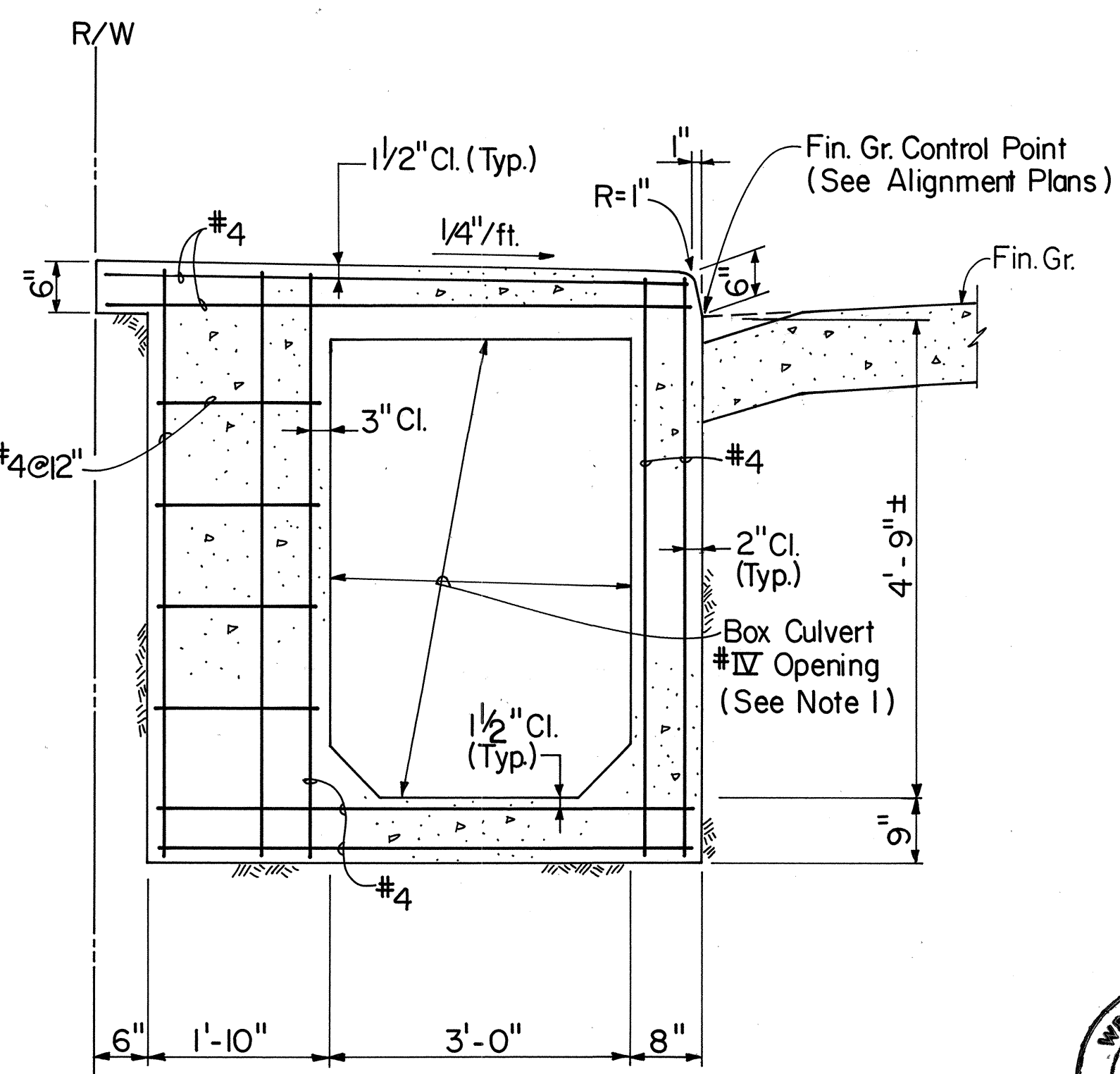
NOTE
1. Provide key all around opening for box culvert / curb inlet connection. See Sht. D-14 for expansion joint detail.



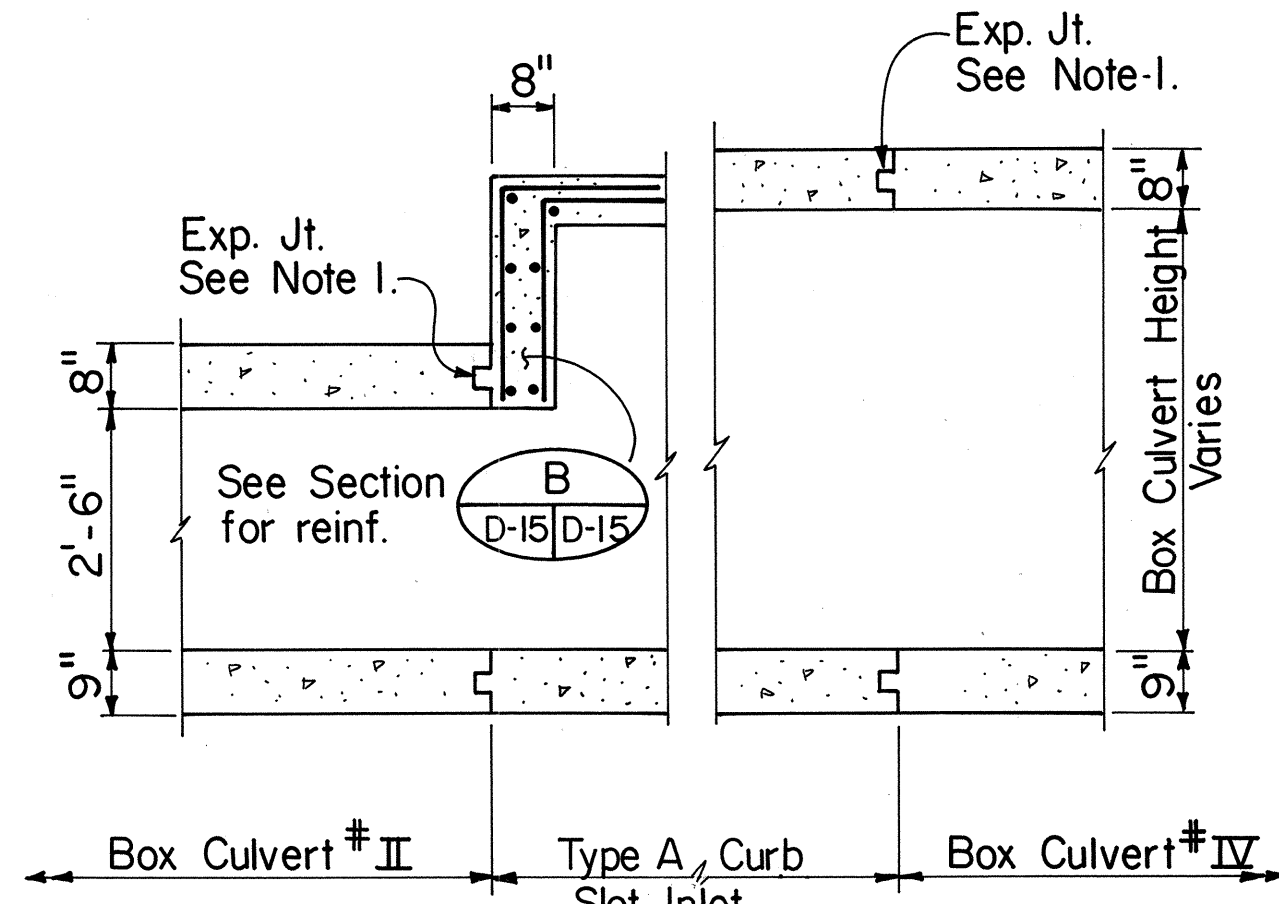
SECTION A
Scale: 3/4"=1'-0"



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



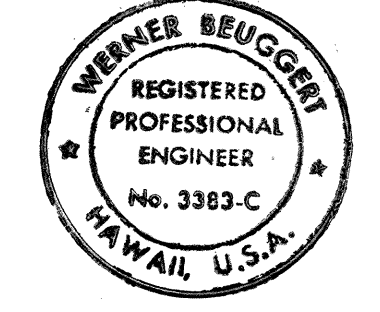
SECTION C
Scale: 3/4"=1'-0"



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

ORIGINAL PLAN	DATE
DRAWN BY	
DESIGNED BY	
CHECKED BY	
NO.	

DRAINAGE STRUCTURE NO. 19
Sta. 105+75, Lt.



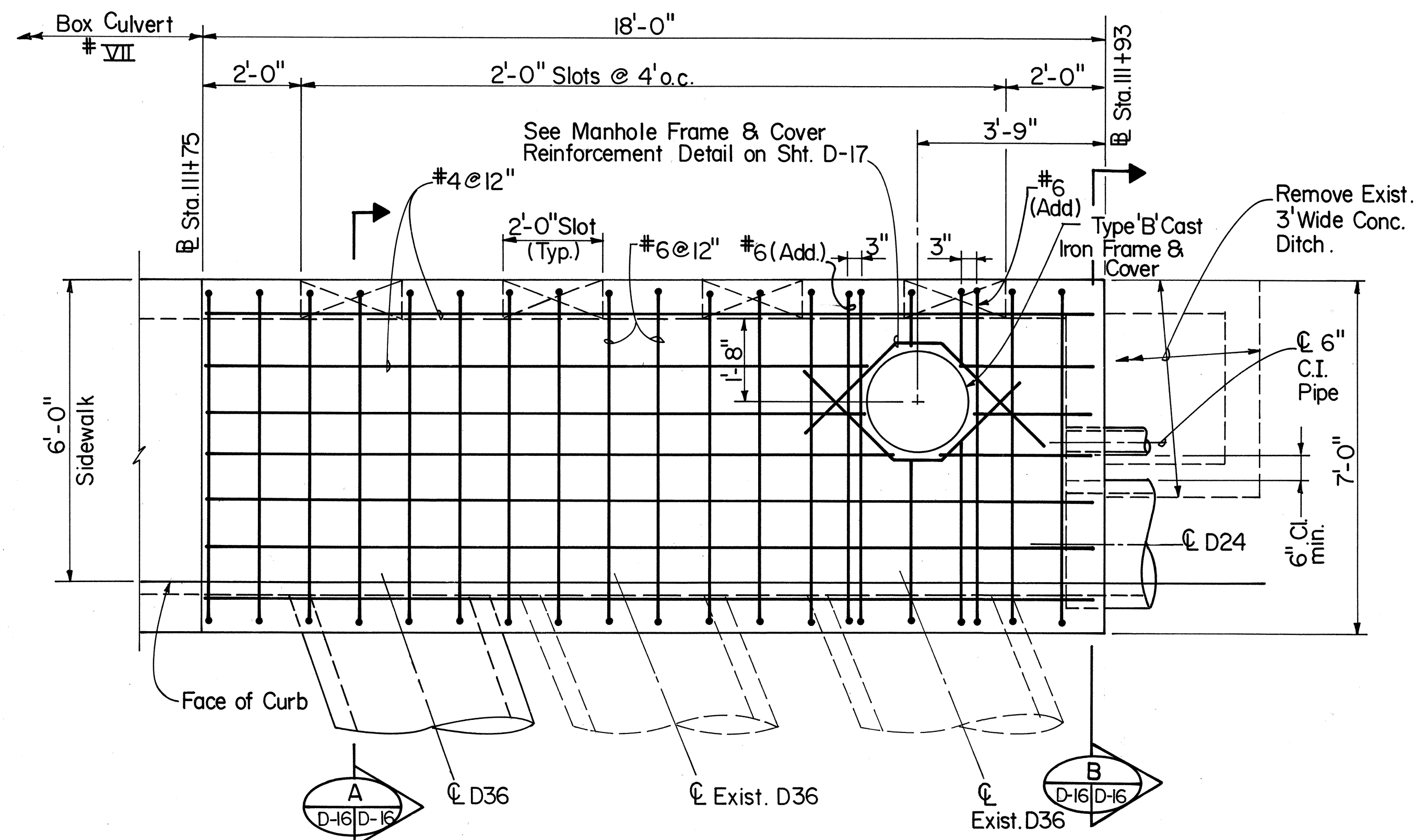
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

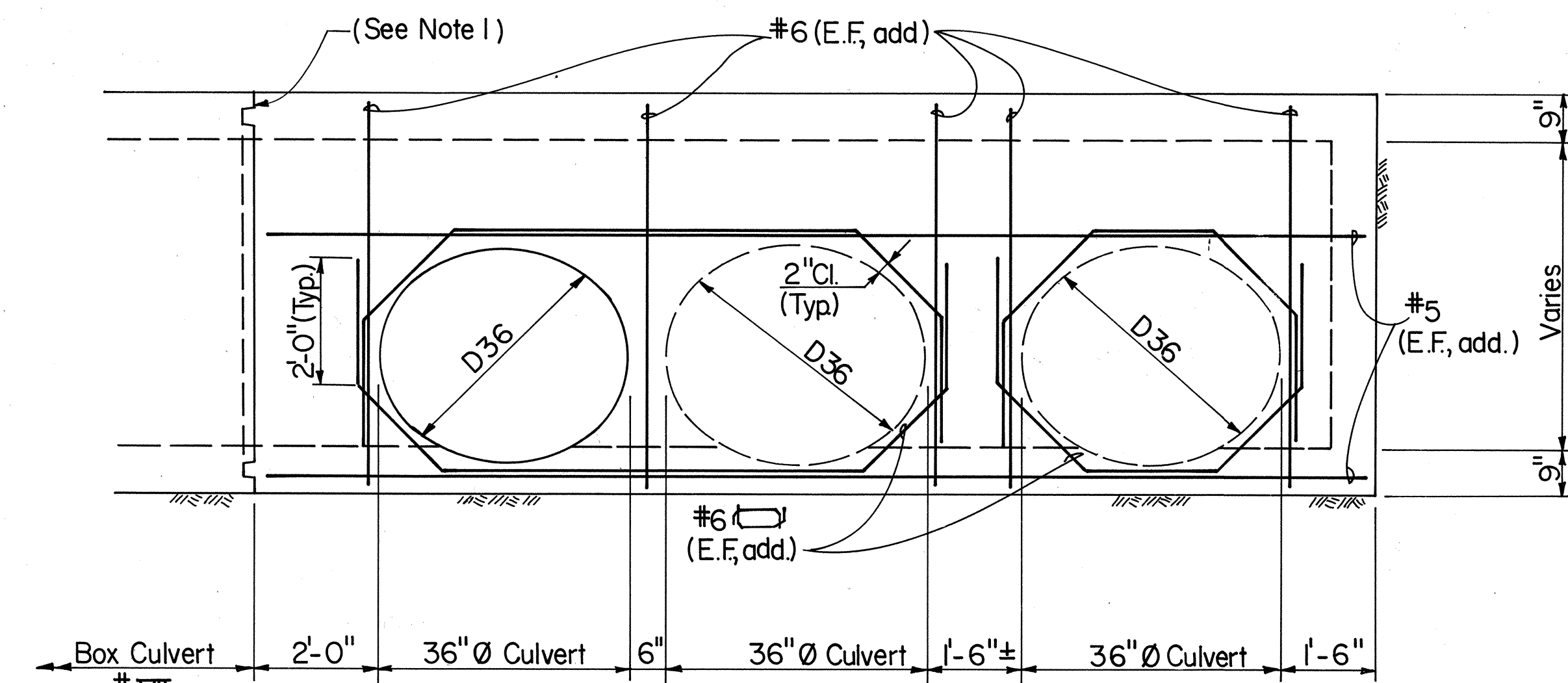
TYPE 'A' CURB SLOT INLET

KALANIANA'OLE HIGHWAY
Wailupe Circle to East Hind Drive
F.A. Project No. F-072-1(34)-A
SCALE: As shown DATE: JUNE 30, 1990
SHEET NO. D-15 OF 37 SHEETS

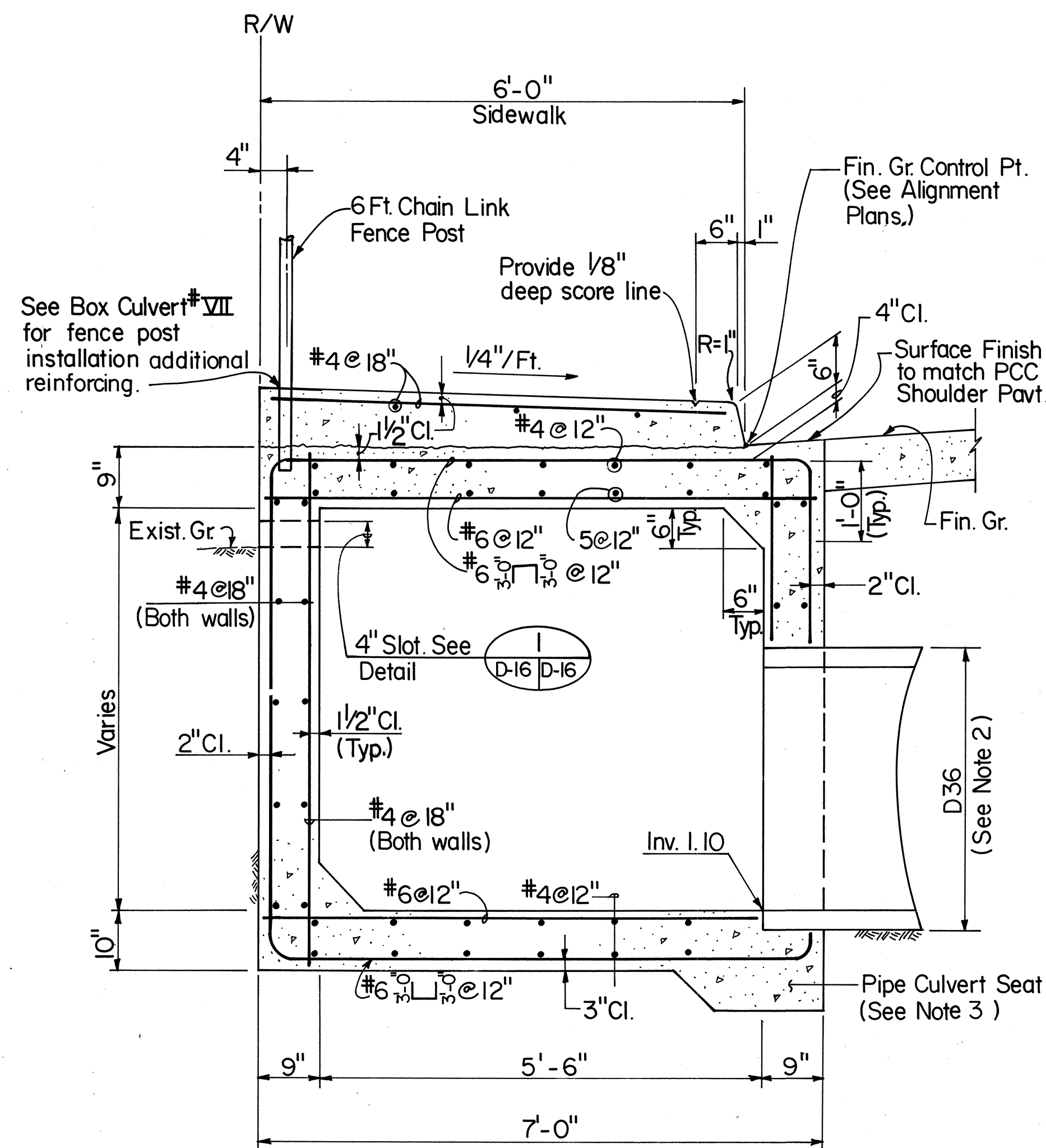
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(34)-A	1990	45	186



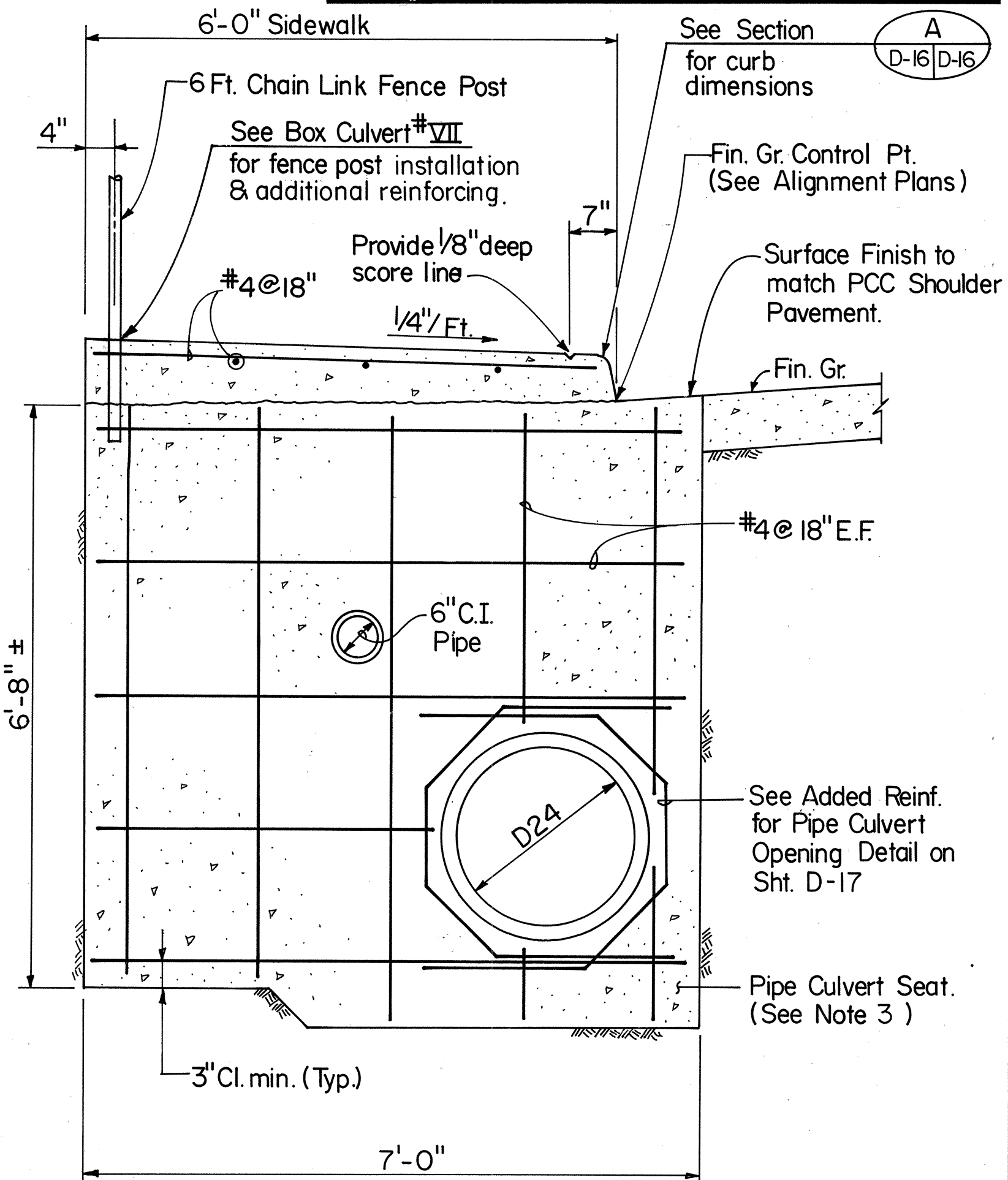
PLAN
Scale: 1/2"=1'-0"



ADDITIONAL REINFORCING
ELEVATION
Scale: 1/2"=1'-0"



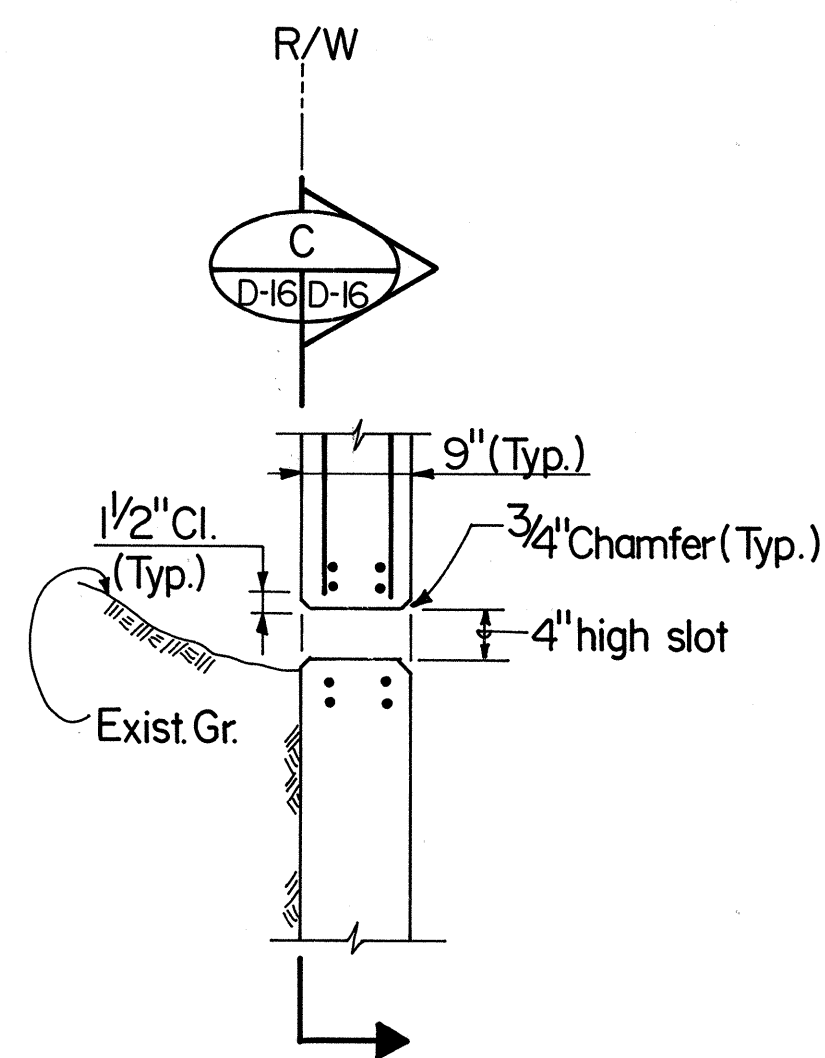
SECTION A
Scale: 3/4"=1'-0"



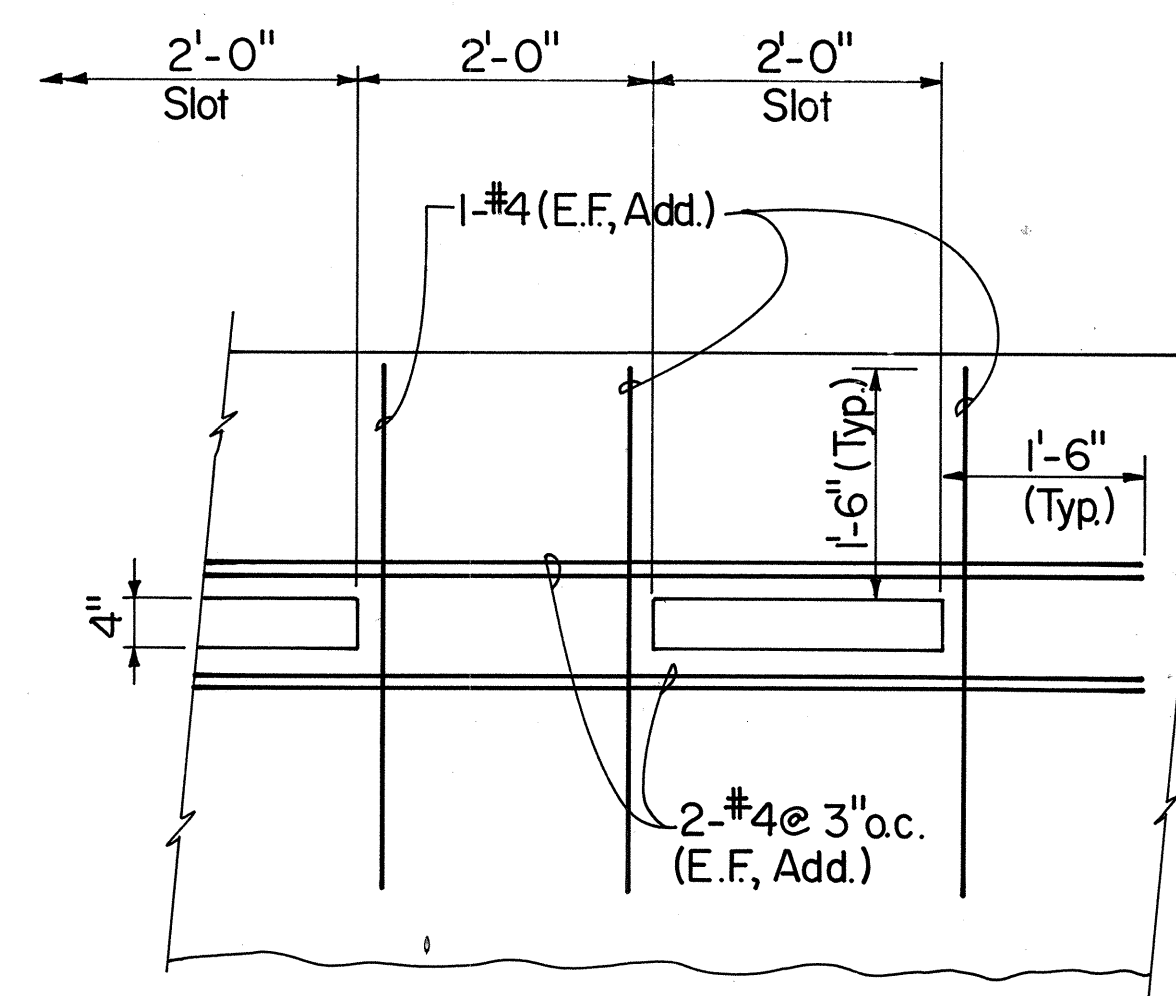
SECTION B
Scale: 3/4"=1'-0"

NOTES:

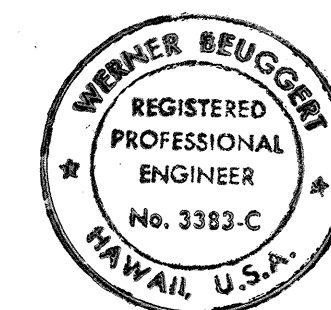
1. Provide key all around opening. See Sht. D-14 for Details.
2. For Added Reinforcement for Pipe Opening, see Detail on Sht. D-17.
3. For Detail of Culvert Seat, see Detail on Sht. D-17.
4. Contractor shall sequence construction such that exist. facilities remain in service until new facilities are in service, or shall provide & maintain, as is necessary, temporary water diversion facilities.



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



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



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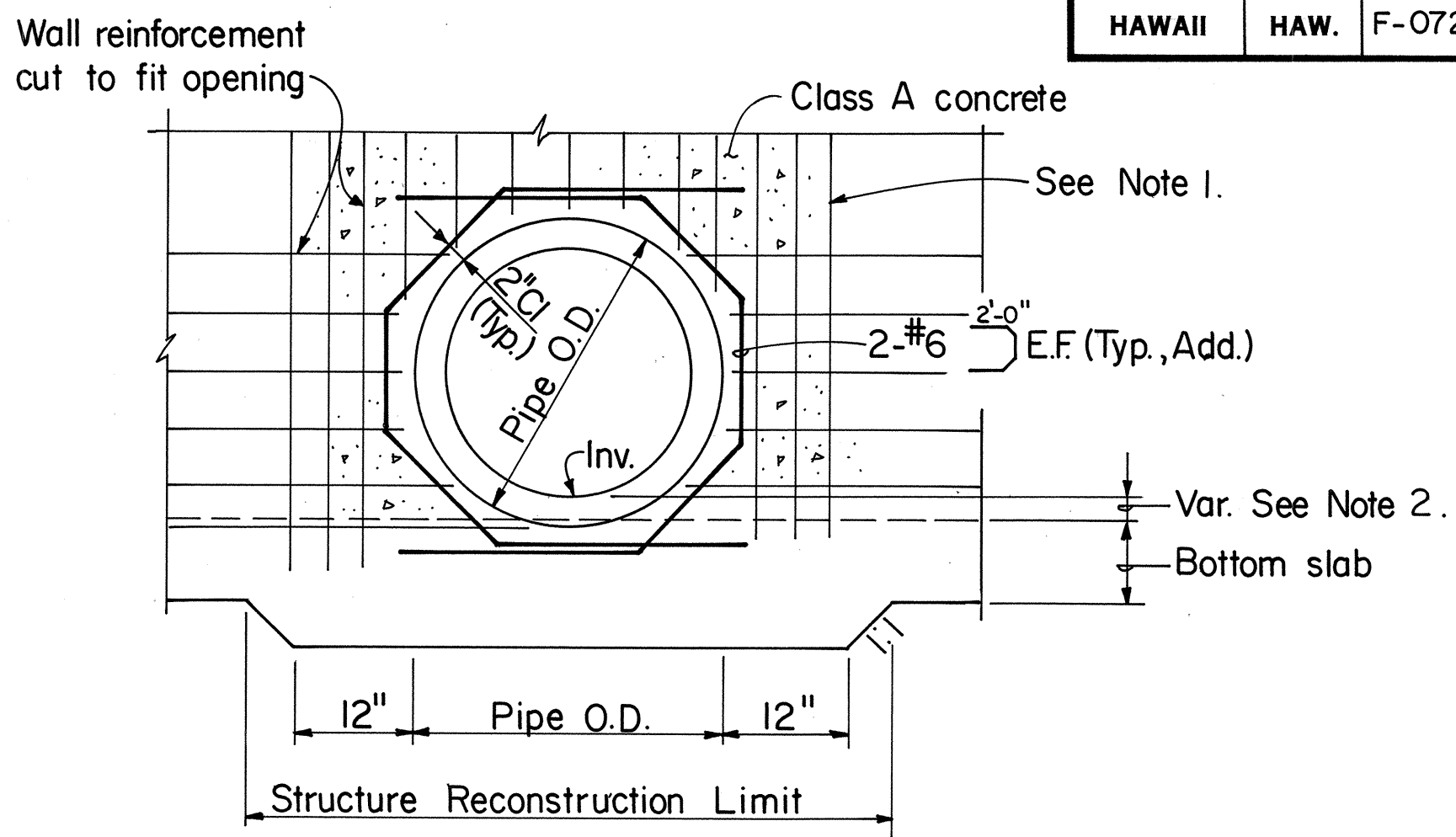
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE 'A' OUTLET STRUCTURE

KALANIANA'OLE HIGHWAY
Waiupe Circle to East Hind Drive
F.A. Project No. F-072-1(34)-A

SCALE: As shown DATE: JUNE 30, 1990
SHEET No. D-16 OF 37 SHEETS

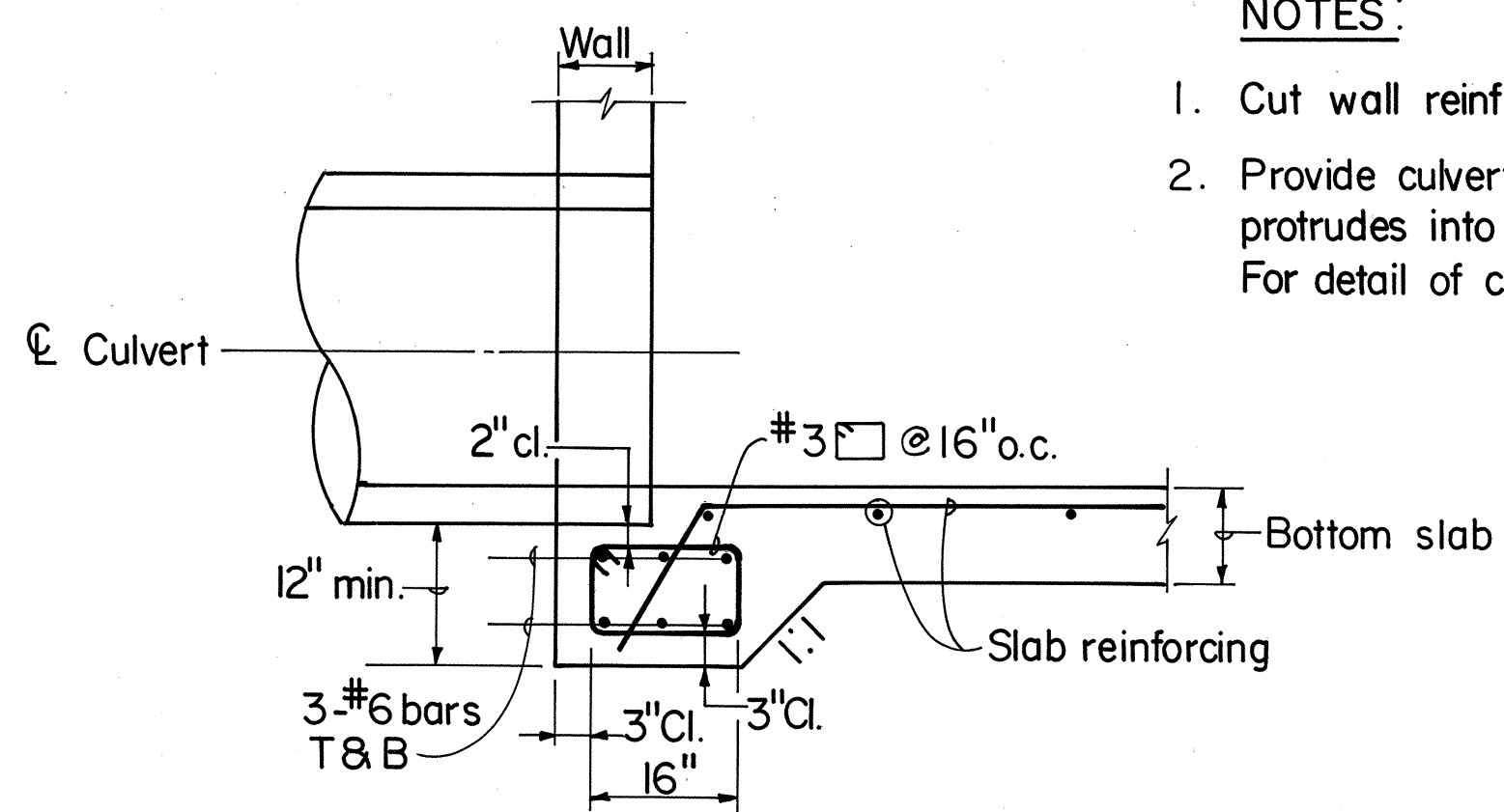
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(34)-A	1990	46	186



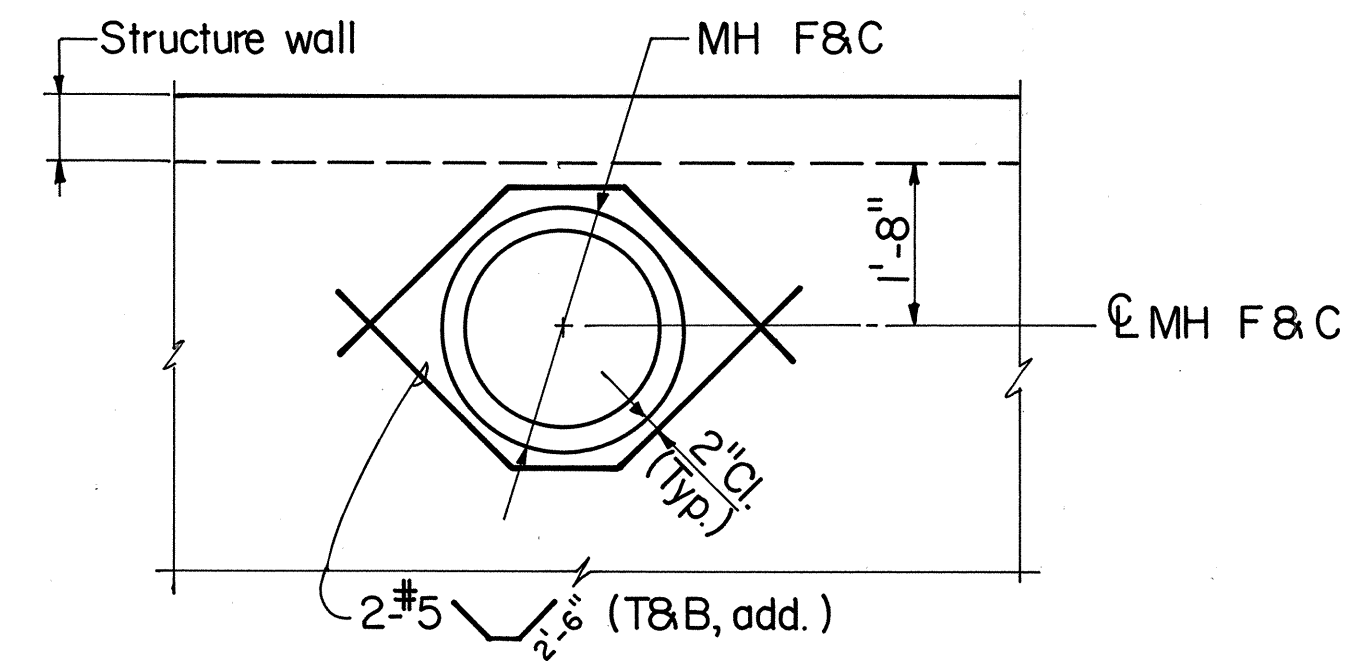
ADDED REINFORCING FOR PIPE OPENING
N.T.S.

NOTES:

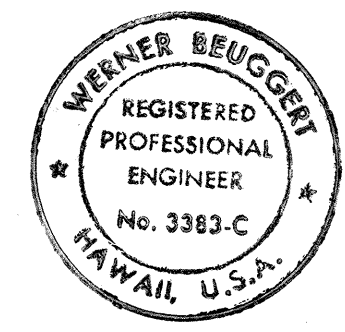
1. Cut wall reinf. as necessary to install pipe.
2. Provide culvert seat only when wall of pipe protrudes into bottom slab of box structure. For detail of culvert seat, see this sheet.



DETAIL OF CULVERT SEAT
N.T.S.



ADDED REINFORCING FOR MANHOLE FRAME AND COVER
N.T.S.



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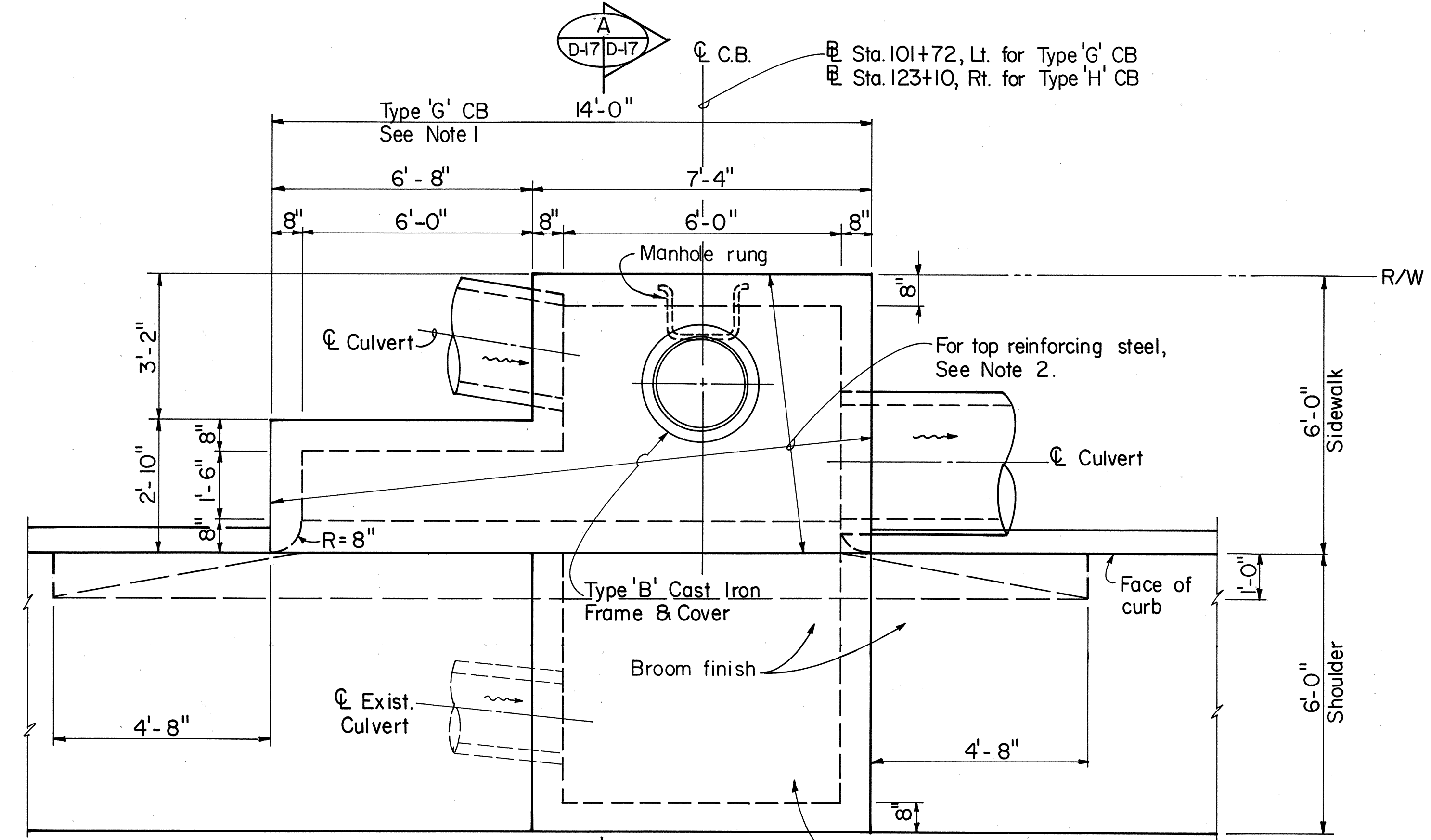
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE 'G' & 'H' CATCH BASIN
MISCELLANEOUS DRAINAGE DETAILS

KALANIANA'OLE HIGHWAY
Waiupe Circle to East Hind Drive
FA Project No. F-072-1(34)-A

SCALE: As shown
DATE: JUNE 30, 1990

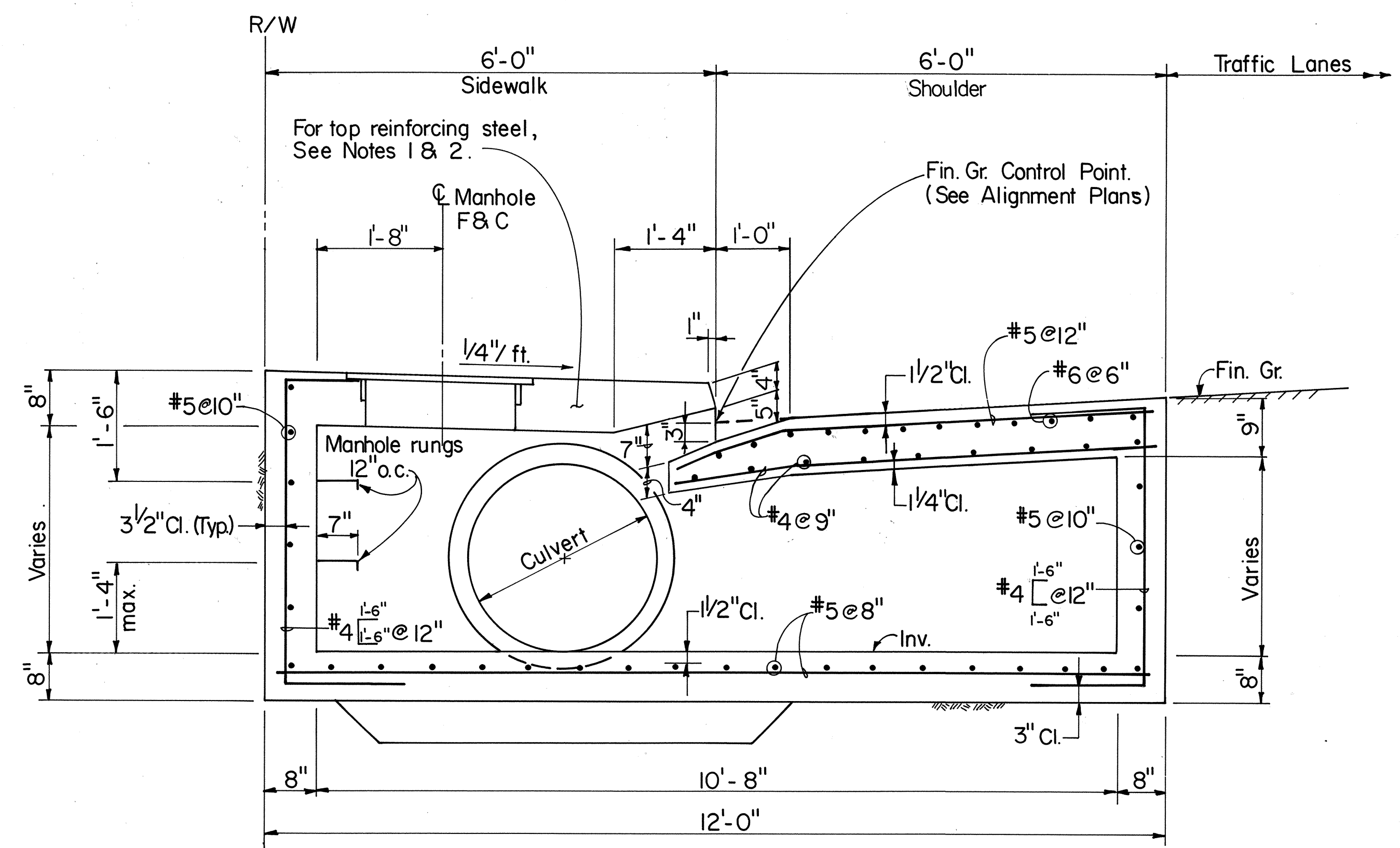
SHEET No. D-17 OF 37 SHEETS



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

NOTES:

1. Type 'G' Catch Basin as shown. Type 'H' Catch Basin similar except opposite hand.
2. For details not shown, See Type 'B' or Type 'C' Catch Basin, Std. Plans H-01 & H-04.

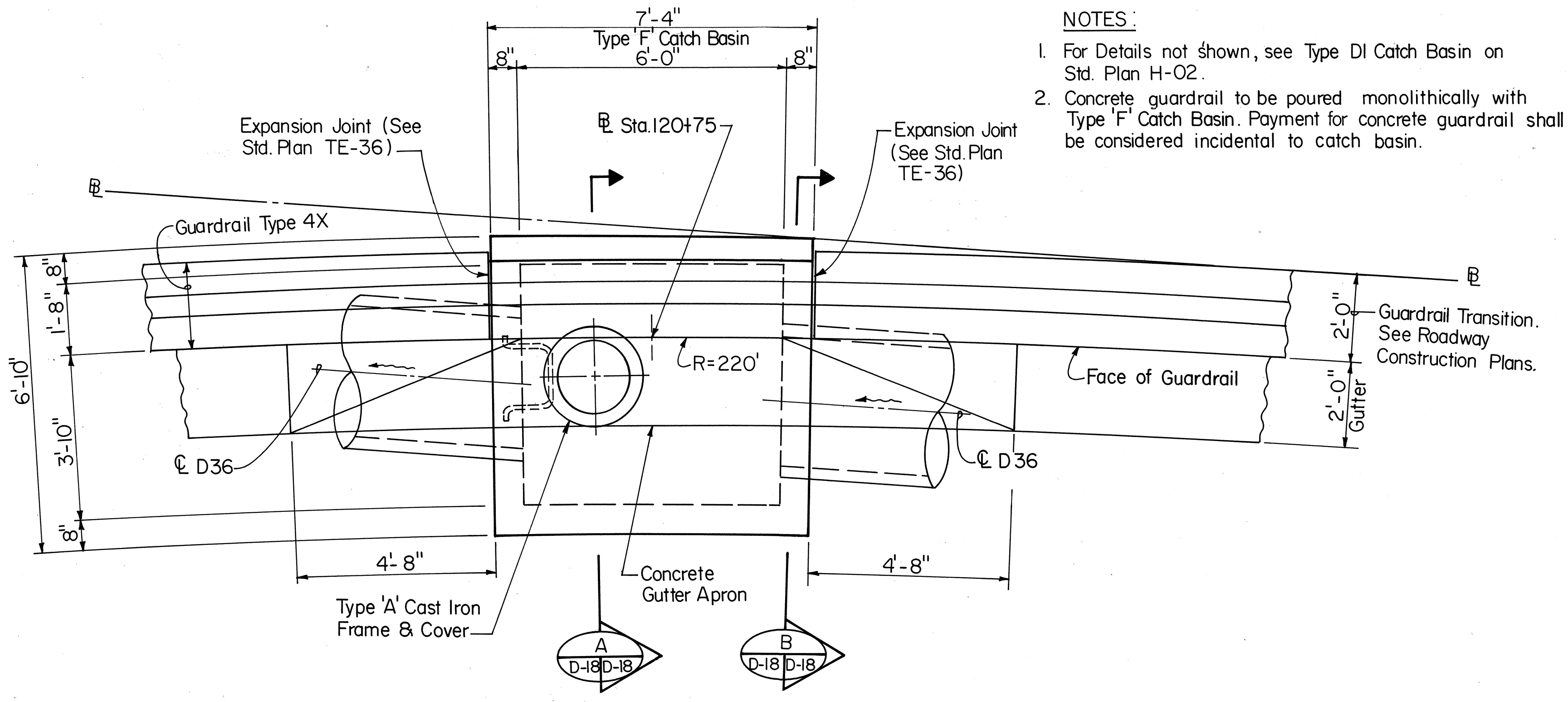


SECTION A
Scale: 3/4" = 1'-0"

TYPE 'G' & 'H' CATCH BASIN
DRAINAGE STRUCTURE NOS. 2 & 65

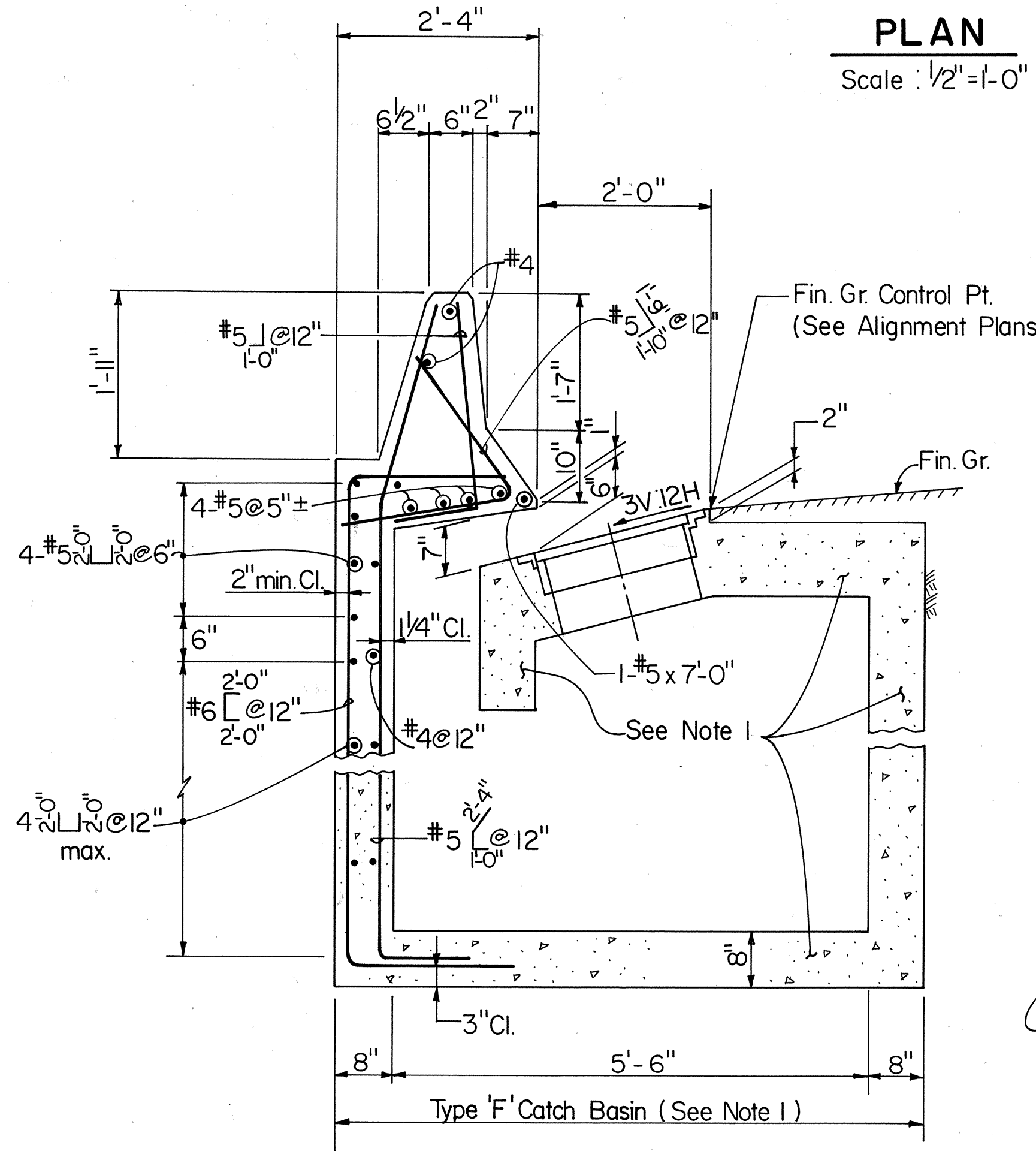
ORIGINAL PLAN	DATE
DRAWN BY	
DESIGNED BY	
NOTED BY	
CHECKED BY	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-(134)-A	1990	47	186

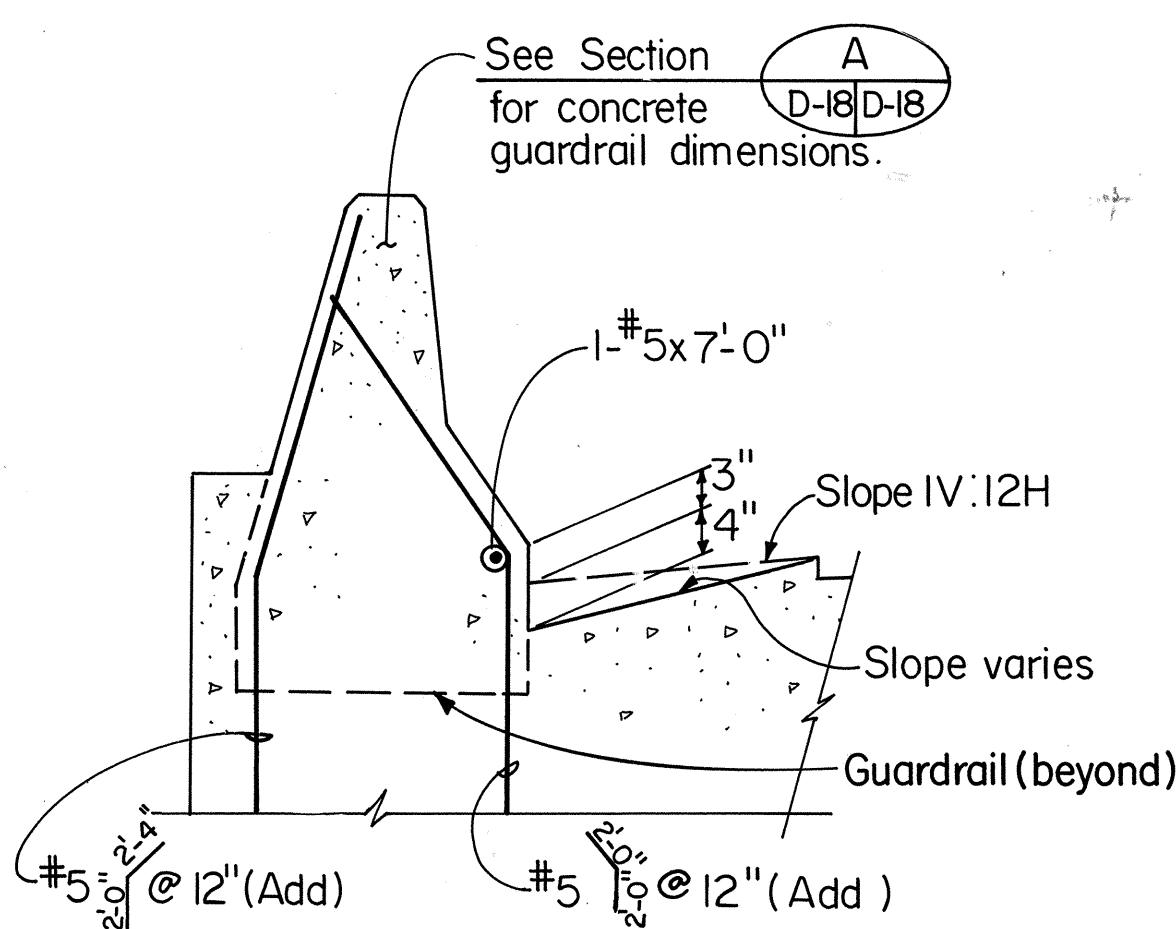


- NOTES:
- For Details not shown, see Type DI Catch Basin on Std. Plan H-02.
 - Concrete guardrail to be poured monolithically with Type 'F' Catch Basin. Payment for concrete guardrail shall be considered incidental to catch basin.

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

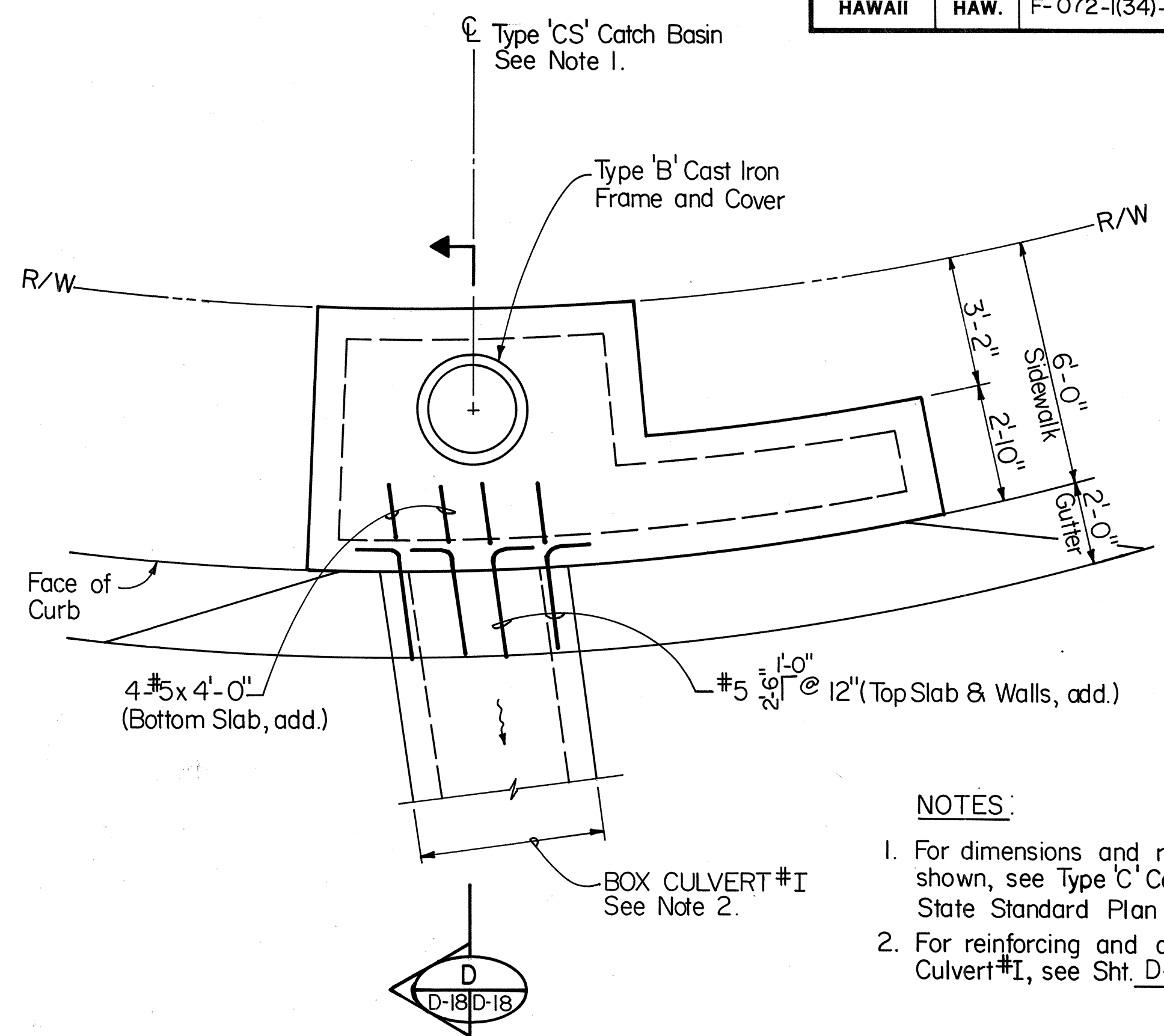


SECTION A
Scale: 3/4" = 1'-0"



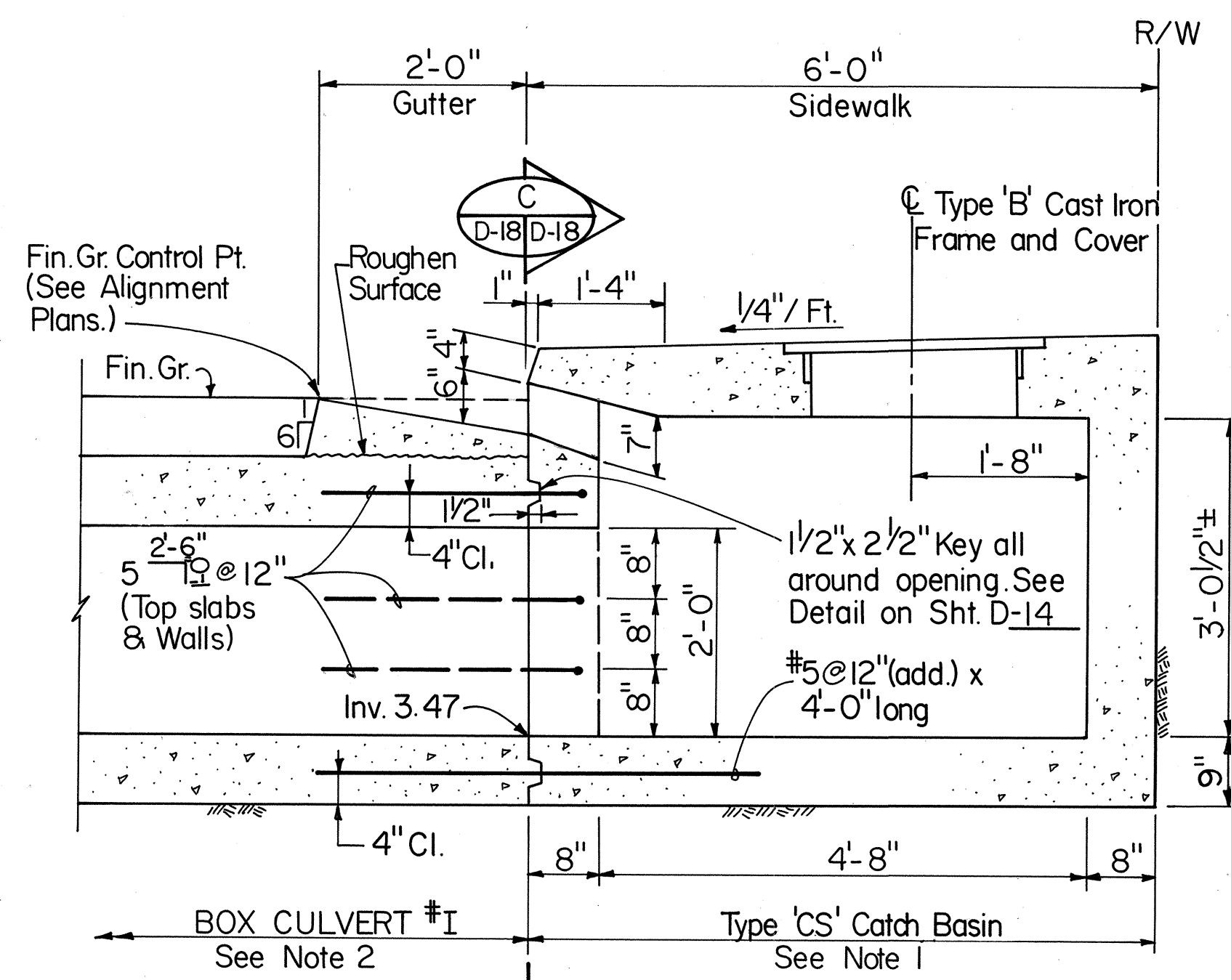
SECTION B
Scale: 3/4" = 1'-0"

CATCH BASIN TYPE 'F'
DRAINAGE STRUCTURE NO. 59
Sta. 120+75

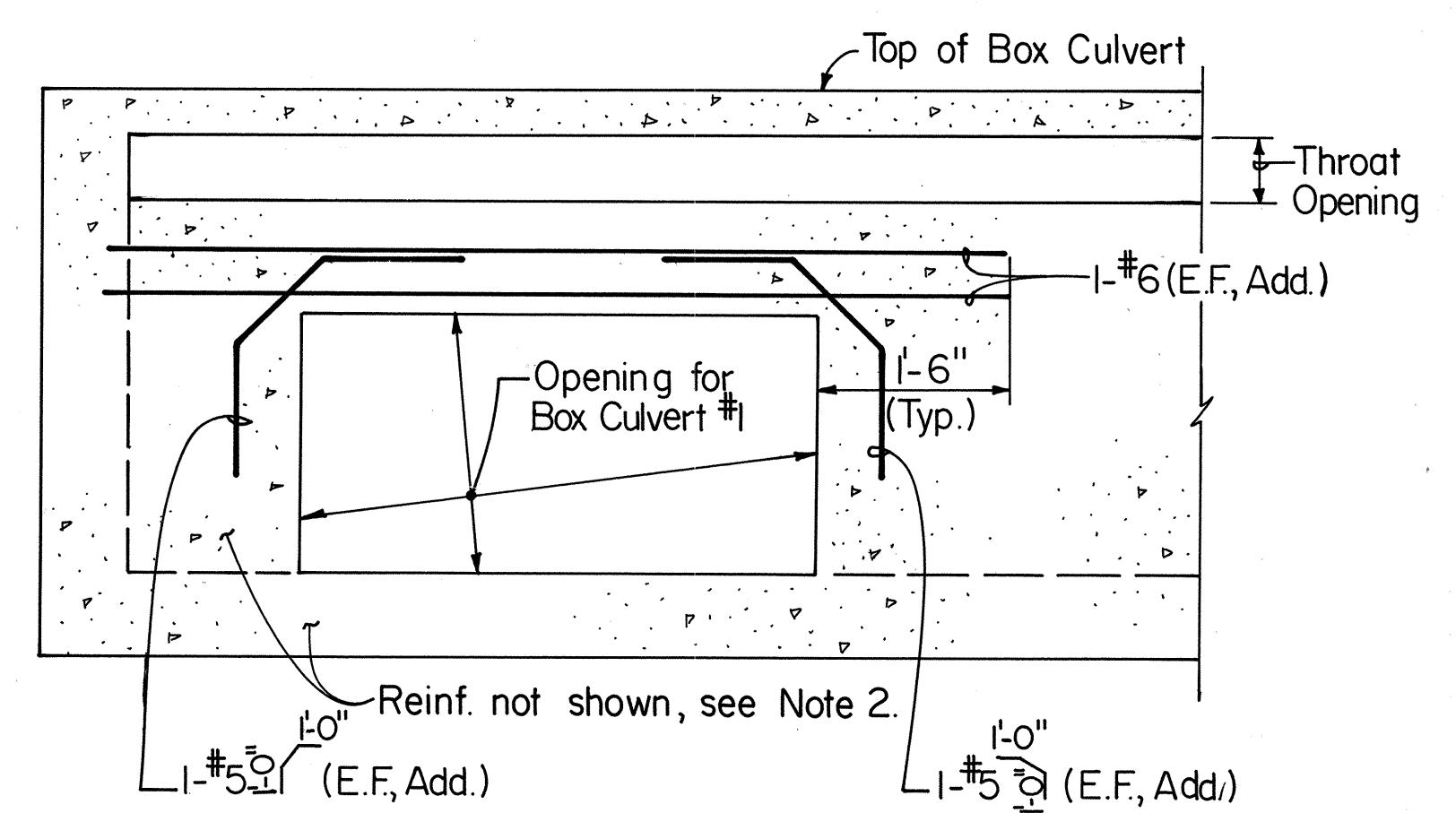


- NOTES:
- For dimensions and reinforcement not shown, see Type C Catch Basin on State Standard Plan H-01.
 - For reinforcing and dimensions of Box Culvert #I, see Sht. D-11.

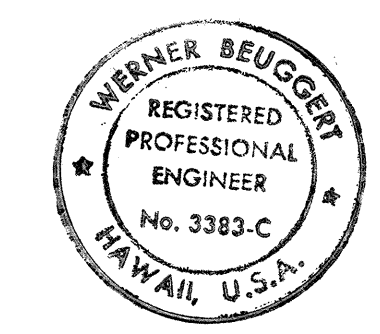
PLAN
Scale: 3/8" = 1'-0"



SECTION D
Scale: 3/4" = 1'-0"
CATCH BASIN TYPE 'CS'
DRAINAGE STRUCTURE NO. 9
Sta. 104+35



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



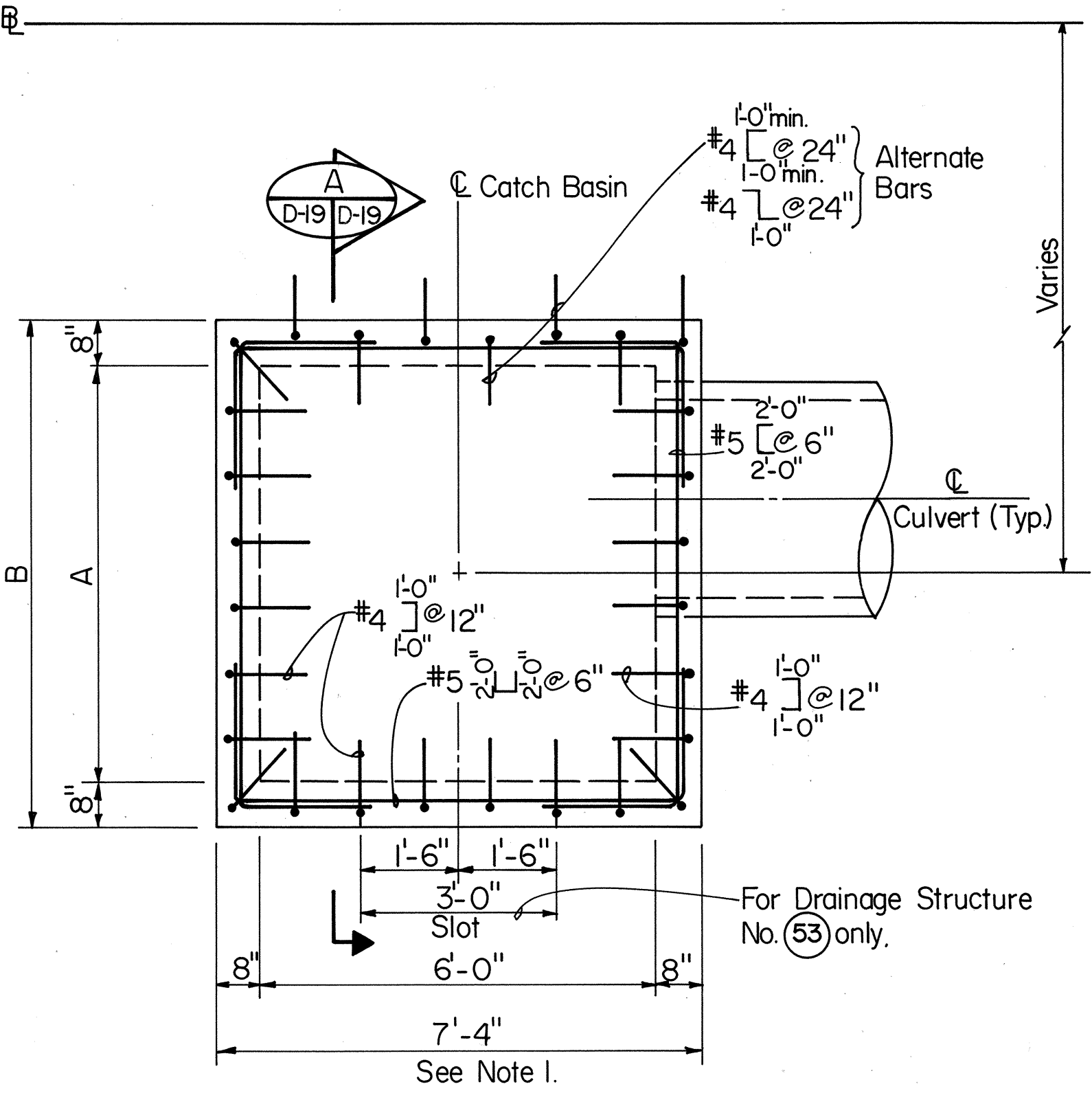
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

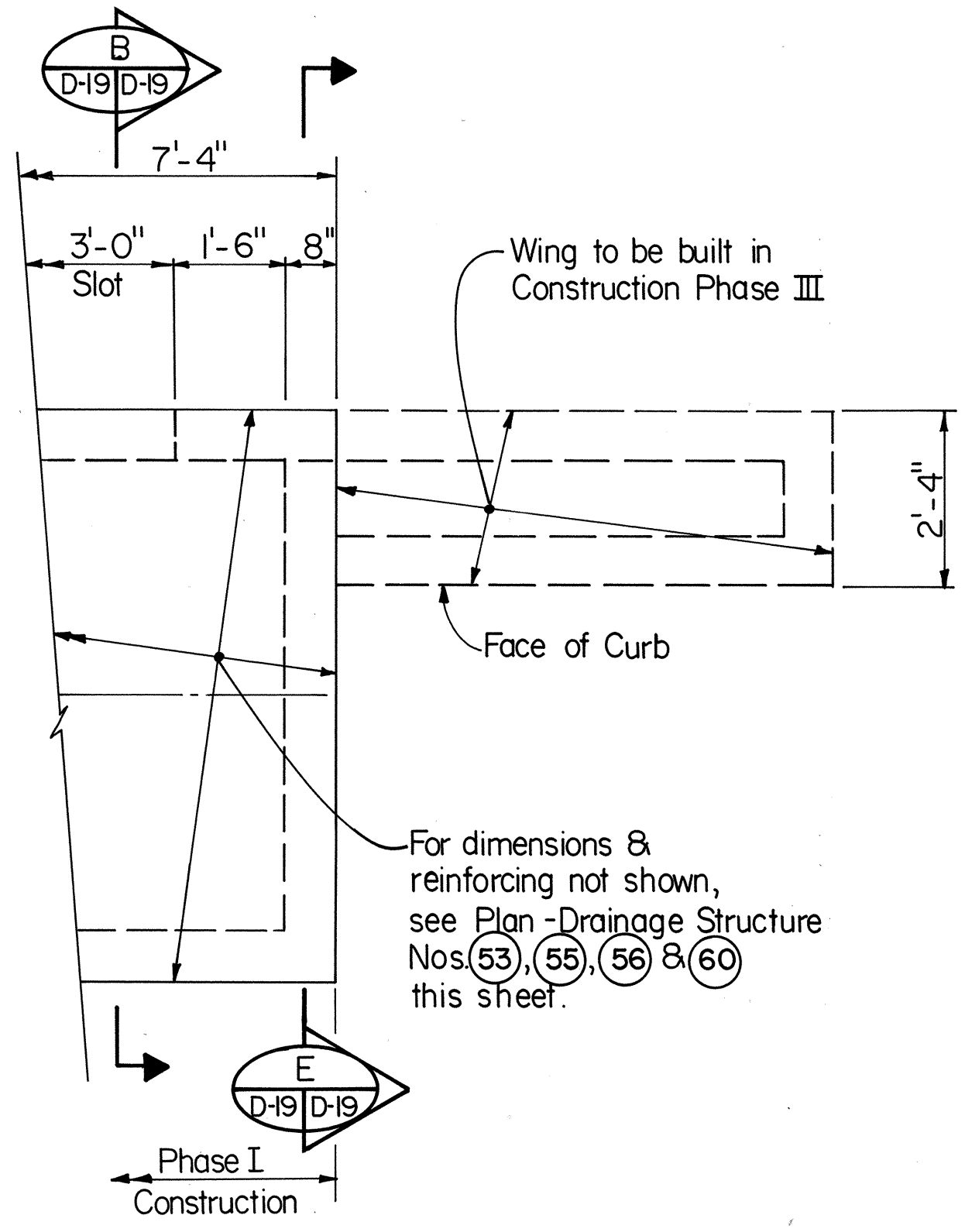
TYPE 'F' CATCH BASIN
TYPE 'CS' CATCH BASIN
KALANIANA'OLE HIGHWAY
Waiupe Circle to East Hind Drive
FA Project No. F-072-(134)-A
SCALE: As shown
DATE: JUNE 30, 1990
SHEET No. D-18 OF 37 SHEETS

ORIGINAL PLAN	DATE
DRAWN BY	
DESIGNED BY	
CHECKED BY	
NOTE BOOK	
No.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(34)-A	1990	48	186



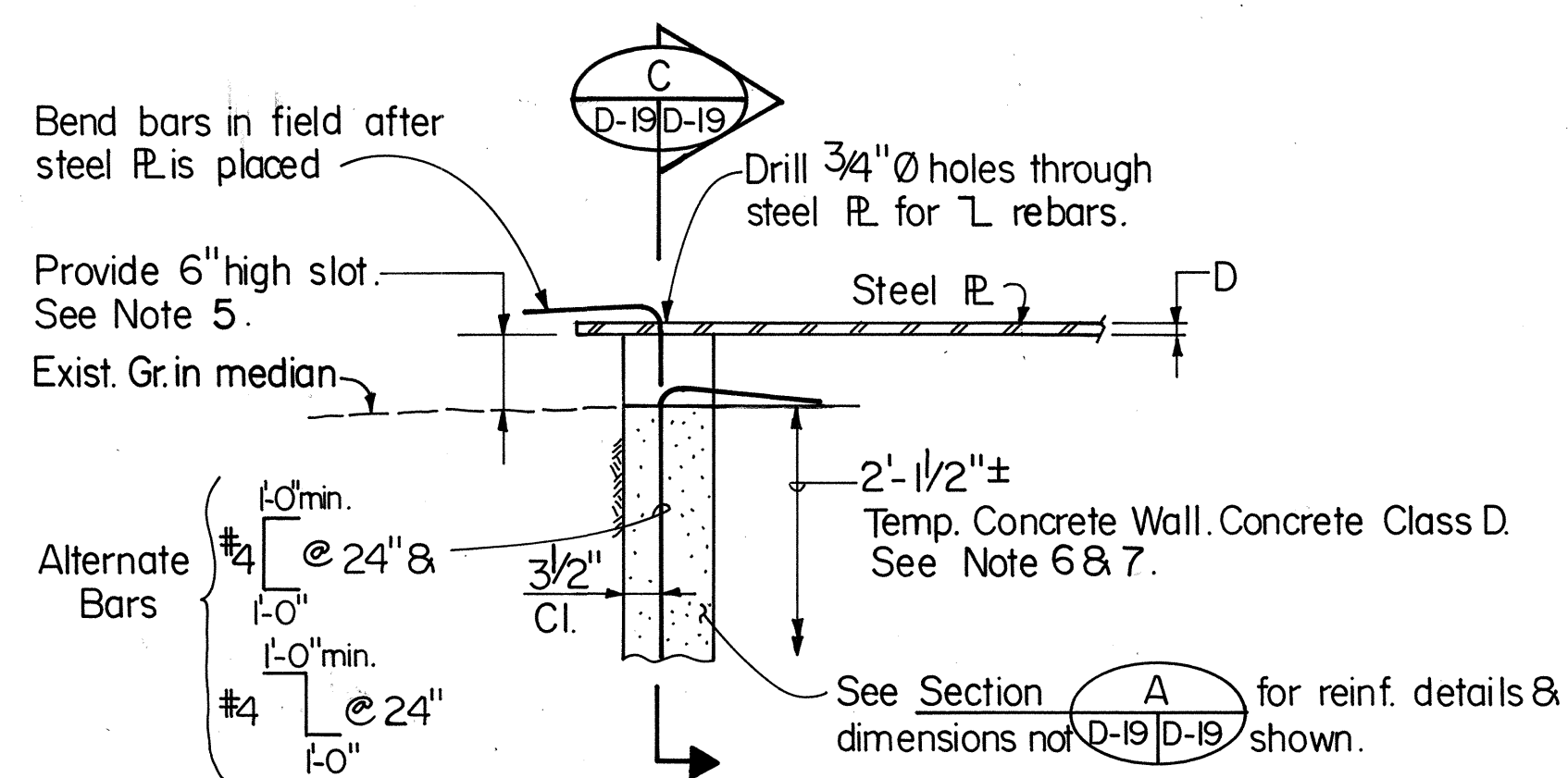
PLAN - DRAINAGE STRUCTURE NOS. 53, 55, 56 & 60
Scale: 1/2" = 1'-0"



PARTIAL PLAN - DRAINAGE STRUCTURE NO. 61
Scale: 1/2" = 1'-0"

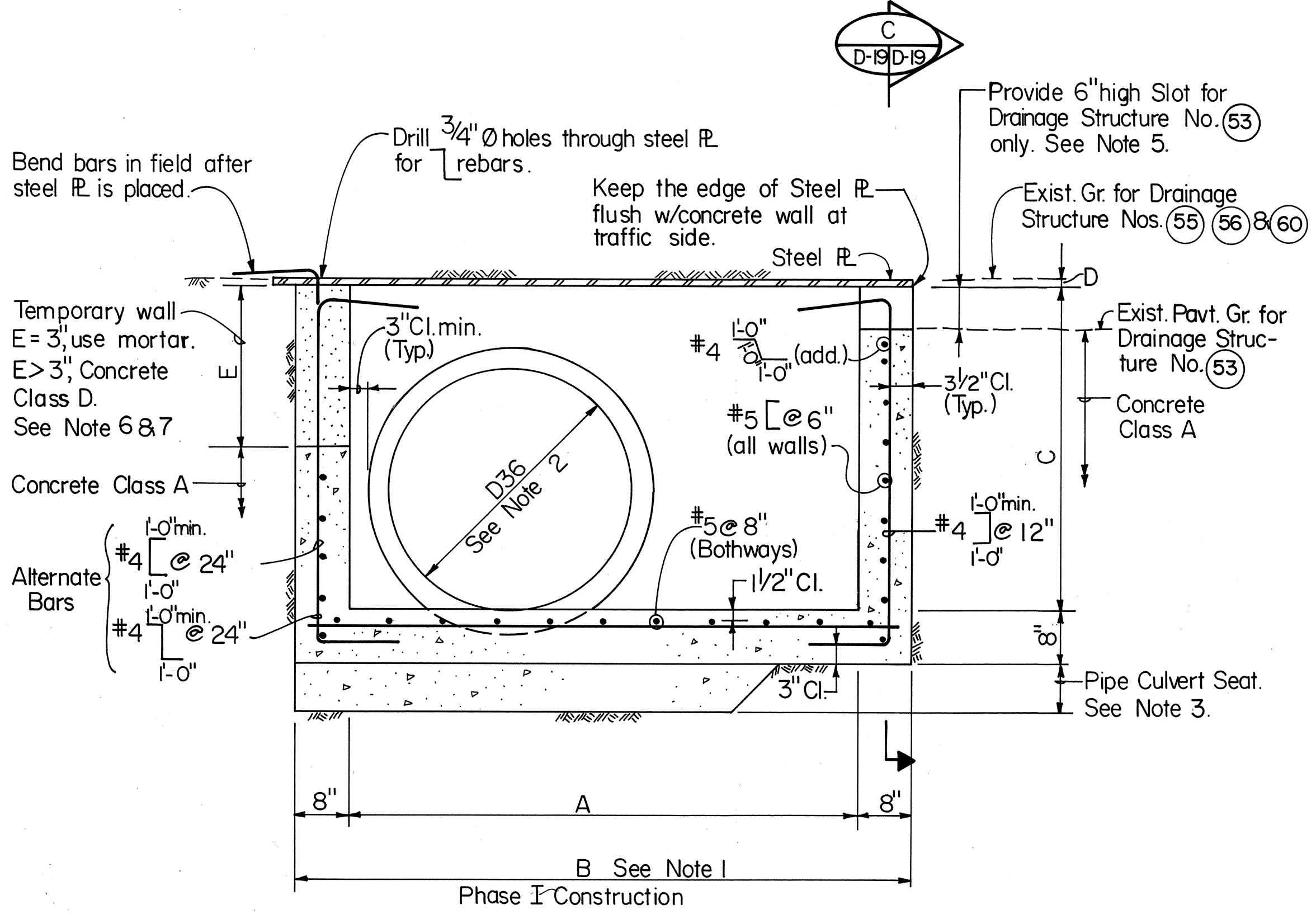
PARTIAL CATCH BASIN SCHEDULES						
C.B. DIMENSIONS	MARK	DRAINAGE STRUCTURE				
		NO. 53	NO. 55	NO. 56	NO. 60	NO. 61
		TYPE 'D' CB.	TYPE 'D' CB.	TYPE 'D' C.B.	TYPE 'DI' CB.	TYPE 'CI' C.B. *
	A	6'-4"	6'-4"	6'-4"	5'-5"	5'-5"
	B	7'-8"	7'-8"	7'-8"	6'-9"	6'-9"
	C	4'-10"±. See Note 5	5'-3"±. See Note 4	6'-8"±. See Note 4.	4'-2"±. See Note 4.	4'-9"±. See Note 5
D	1"	1"	1"	1"	1"	
E	3"	3"	3"	1'-1"±	2'-7½"±	

* Except as shown in Partial Plan - Drainage Structure No. 61

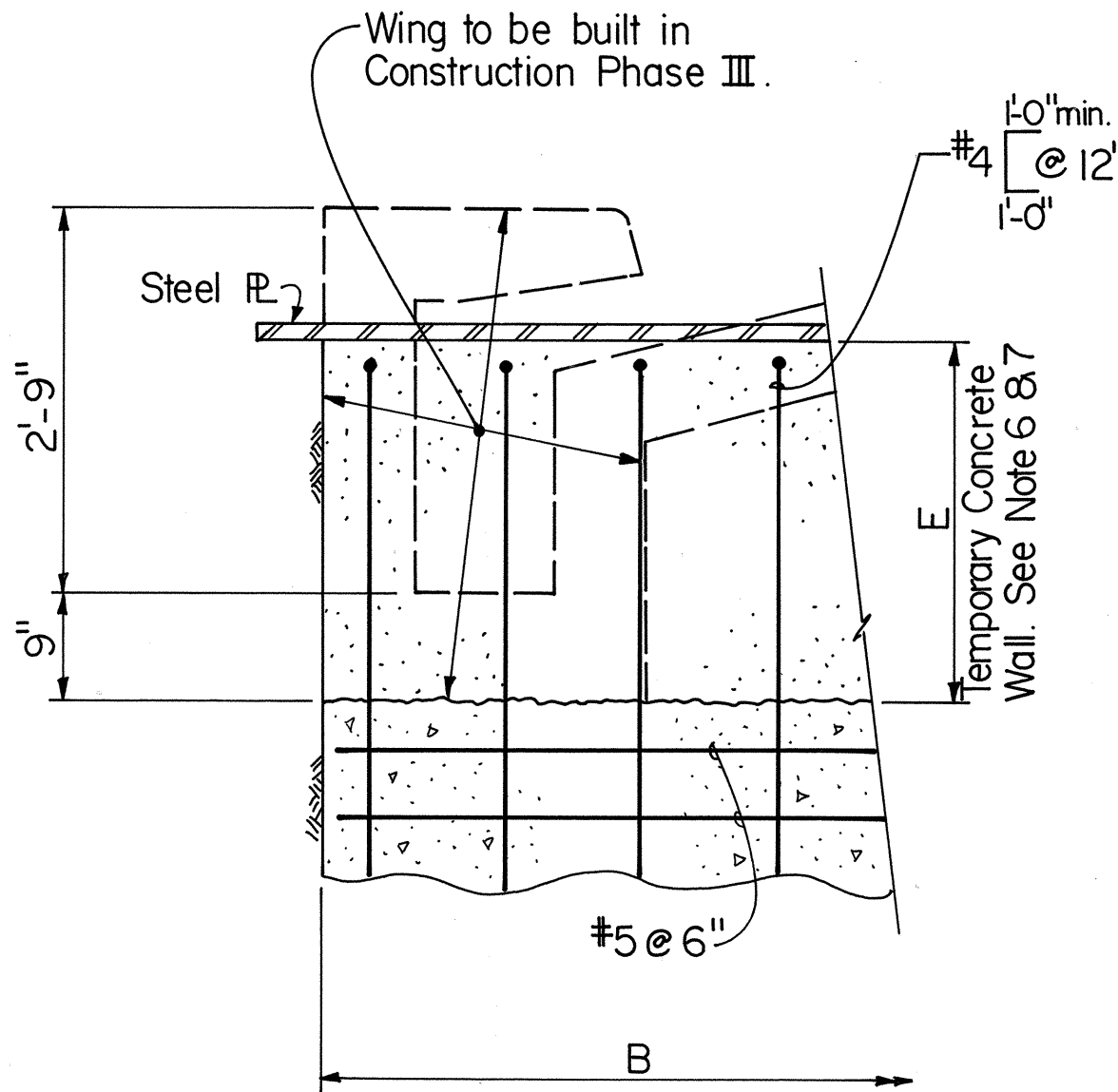


SECTION B
Scale: 3/4" = 1'-0"

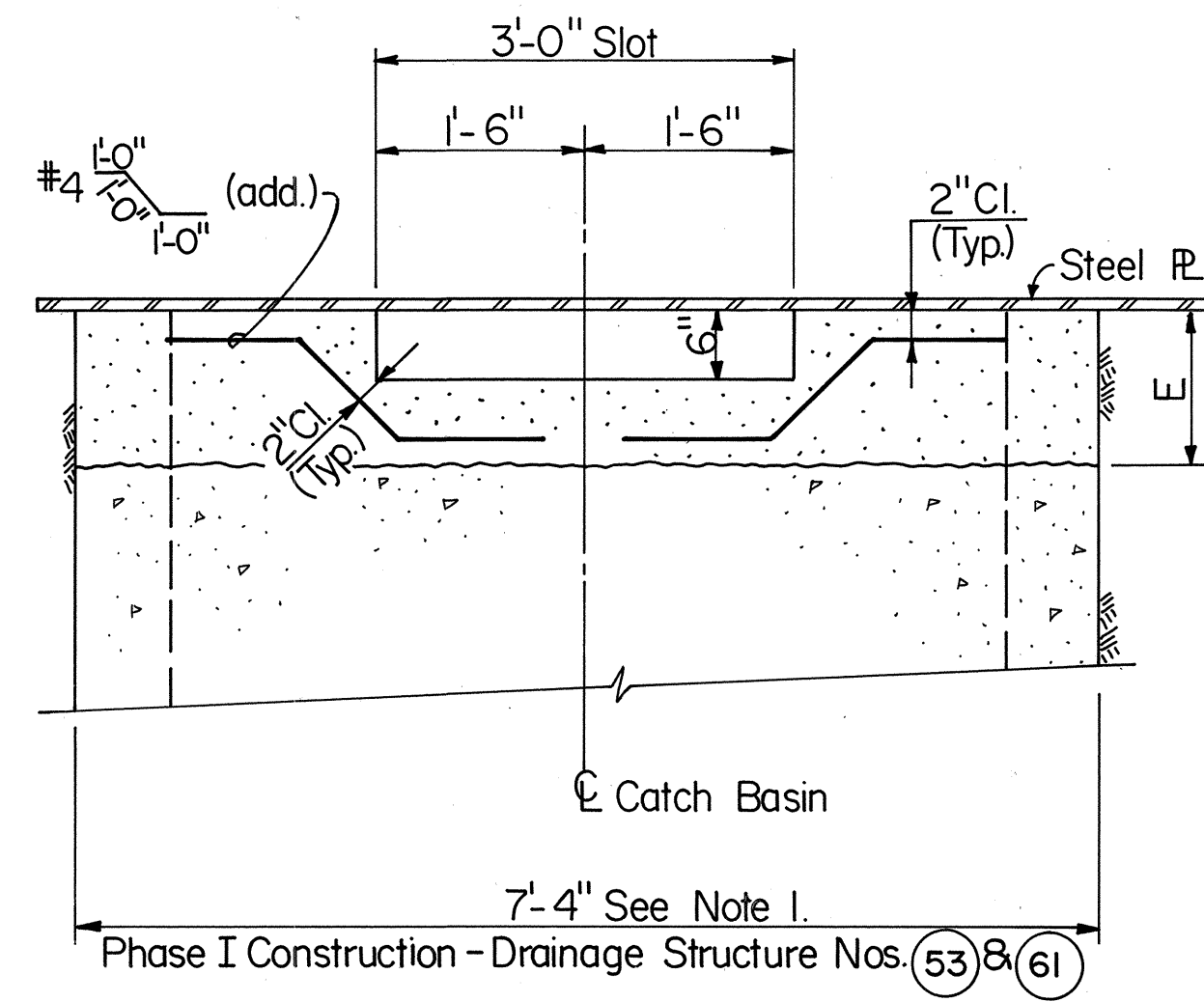
- NOTES:
- For Catch Basin Dimensions & Reinforcing Details not shown, see Type 'C', 'D' & 'D-1' Catch Basin on Std. Plans H-01, H-02, & H-04.
 - For Additional Reinforcing of Pipe Culvert Opening, see Detail on Sht. D-17.
 - For Pipe Culvert Seat Dimensions & Reinforcing Details, see Sht. D-17.
 - Top of Steel R to match exist. grade for Drainage Structure Nos. 55, 56 & 60.
 - Bottom of Steel R shall be 6" above exist. grade for Drainage Structure Nos. 53 & 61.
 - Temporary Concrete $f_c = 2000$ psi.
 - Wrap rebars with polyethylene sheet prior to pouring temporary concrete to facilitate removal of temporary walls in Construction Phase III.
 - Partial construction of catch basins in Phase I including all material & labor required shall be paid under the appropriate catch basin type.



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

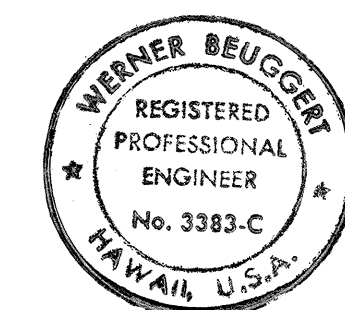


SECTION E
Scale: 3/4" = 1'-0"



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

DRAINAGE STRUCTURE NOS. 53, 55, 56, 60 & 61 CONSTRUCTION PHASE I

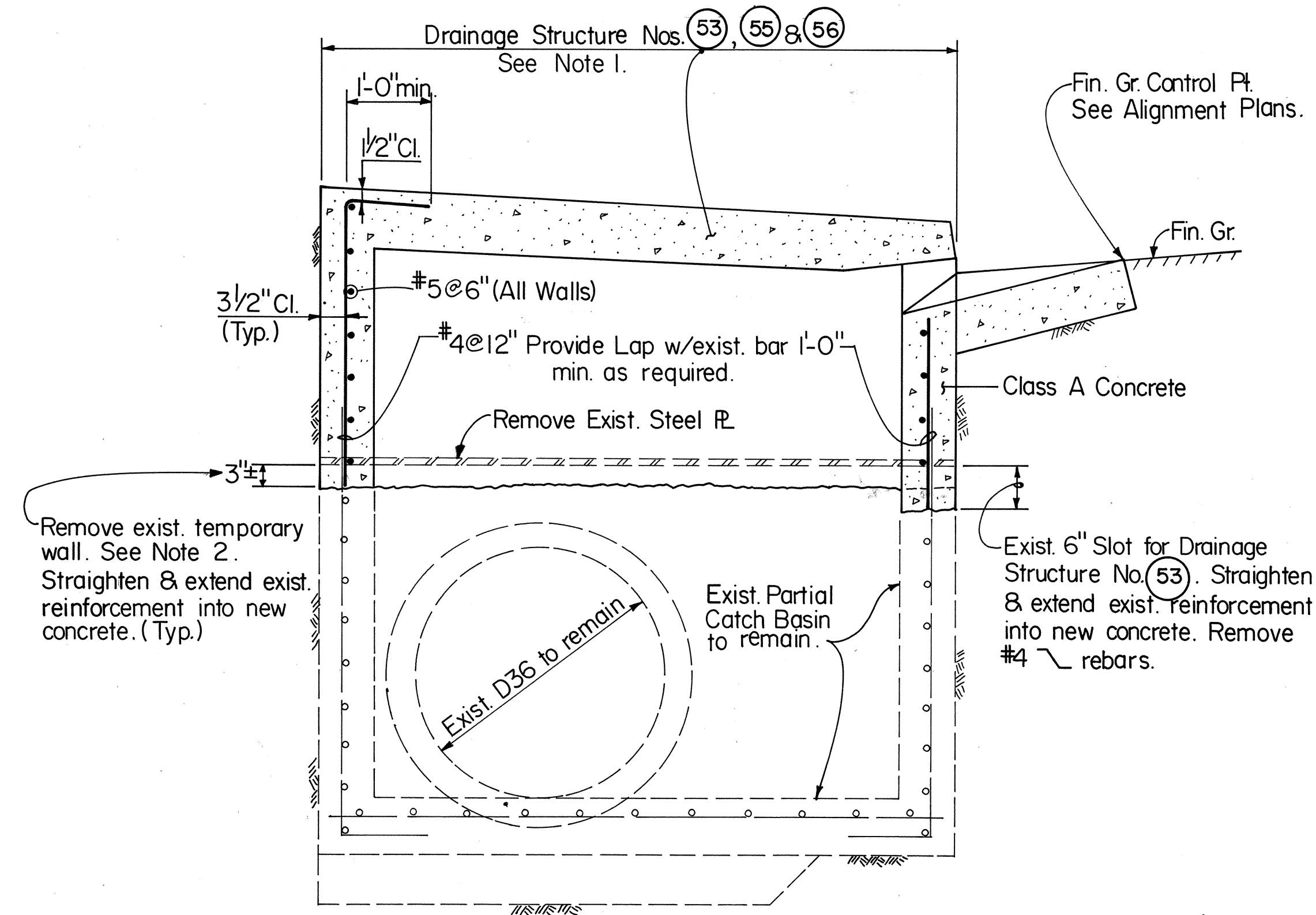


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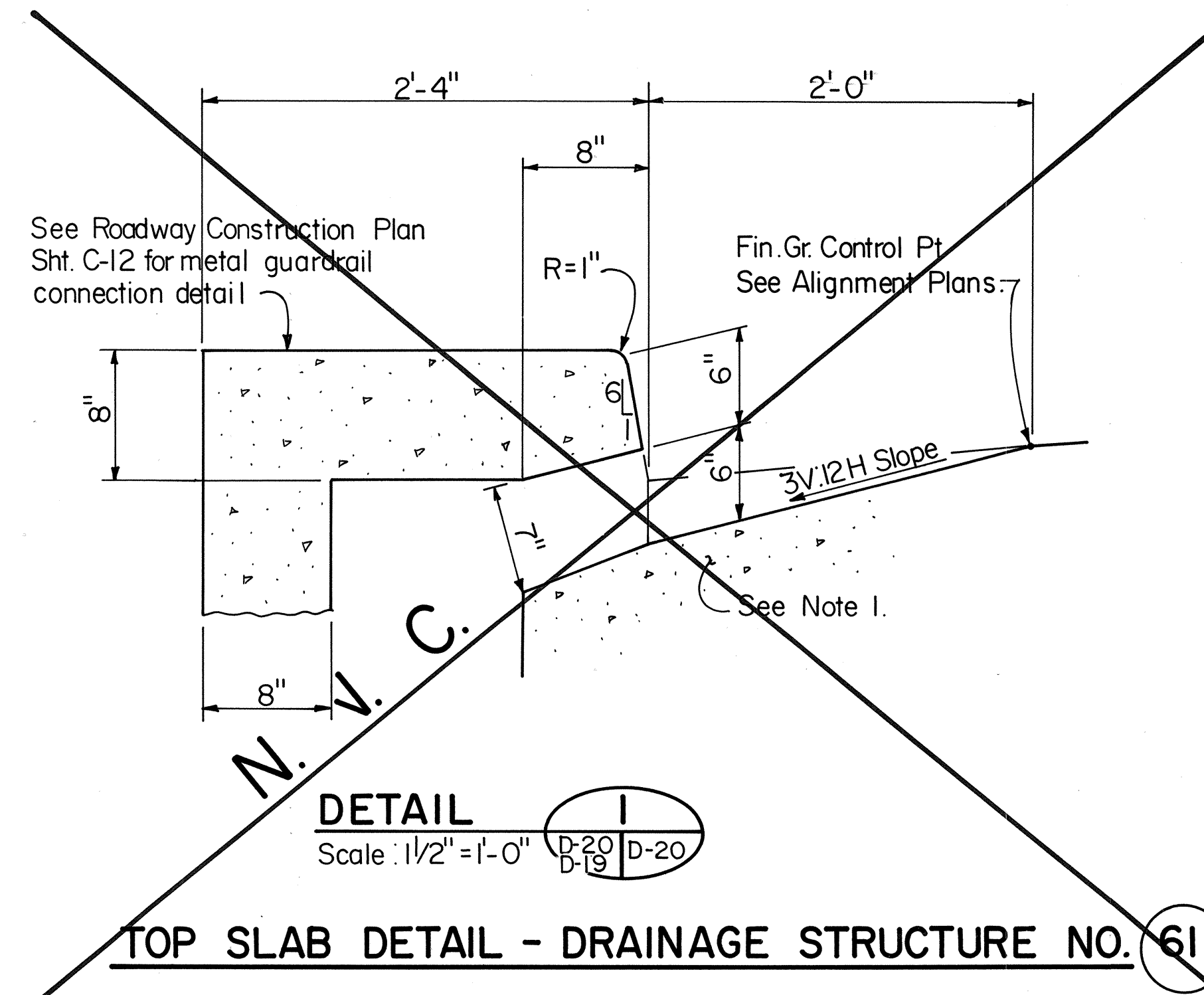
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
PARTIAL CONSTRUCTION OF
TYPES 'D', 'D-1' & 'C' CATCH BASIN
CONSTRUCTION PHASE I
KALANIANA'OLE HIGHWAY
Waiupe Circle to East Hind Drive
F.A. Project No. F-072-1(34)-A
SCALE: As shown
DATE: June 30, 1990
SHEET No. D-19 OF 37 SHEETS

48

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(34)-A	1990	49	186

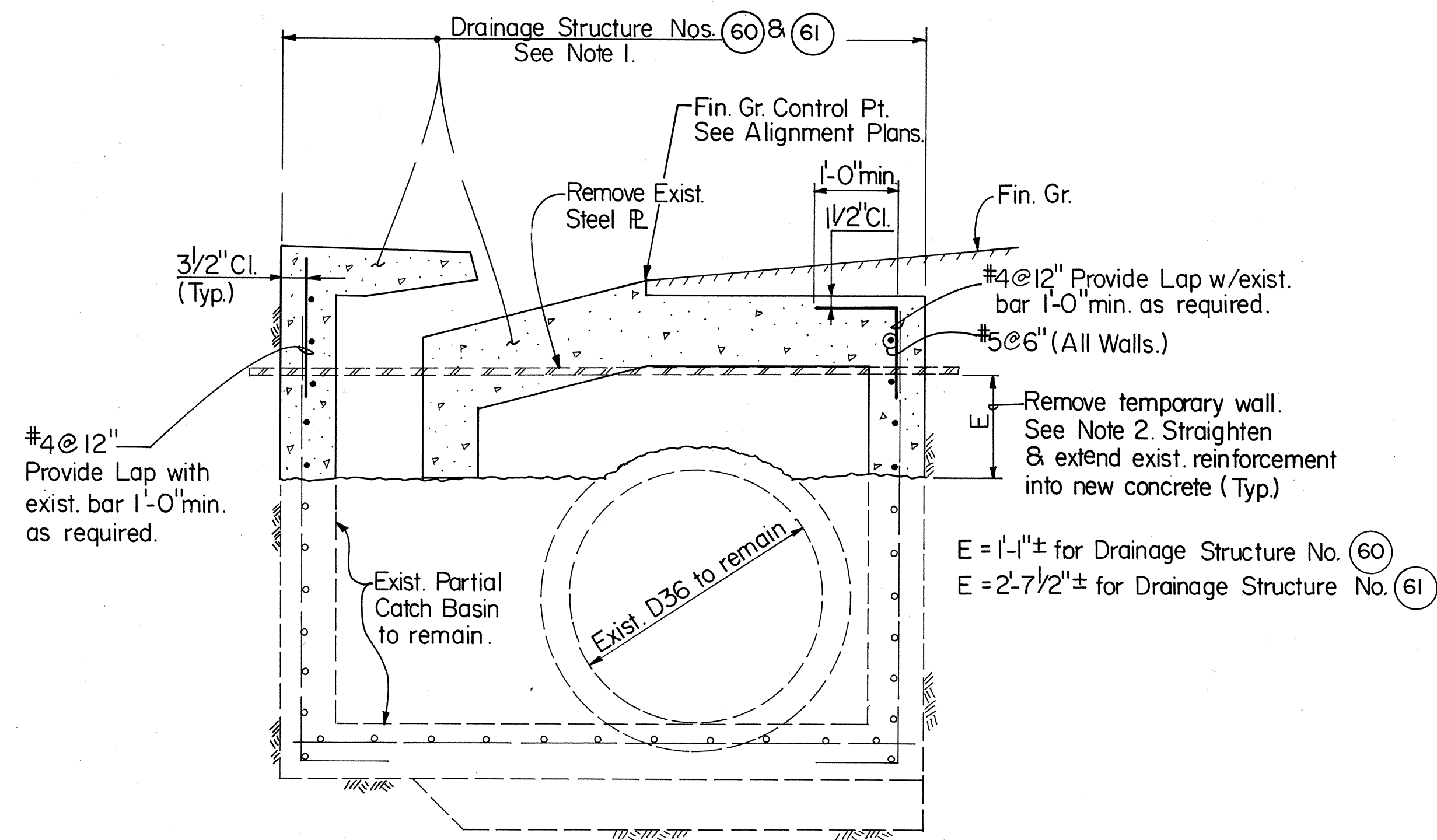


TYPICAL SECTION - DRAINAGE STRUCTURE NOS. 53, 55 & 56
Scale: 3/4" = 1'-0"



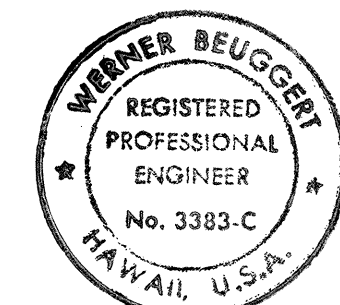
NOTES:

- For Catch Basin Dimensions & Reinforcing Details not shown, see Type 'CI', 'D' or 'DI' Catch Basin on State Standard Plans H-01, H-02 & H-04. See Standard Plan H-08 for Type " " Cast Iron Frame and Cover details.
- The interface between new and old concrete shall be clean, free of laitance and roughened to a full amplitude of 1/4". Epoxy bonding material shall be applied to the roughened surface immediately prior to pouring new concrete.



TYPICAL SECTION - DRAINAGE STRUCTURE NOS. 60 & 61
Scale: 3/4" = 1'-0"

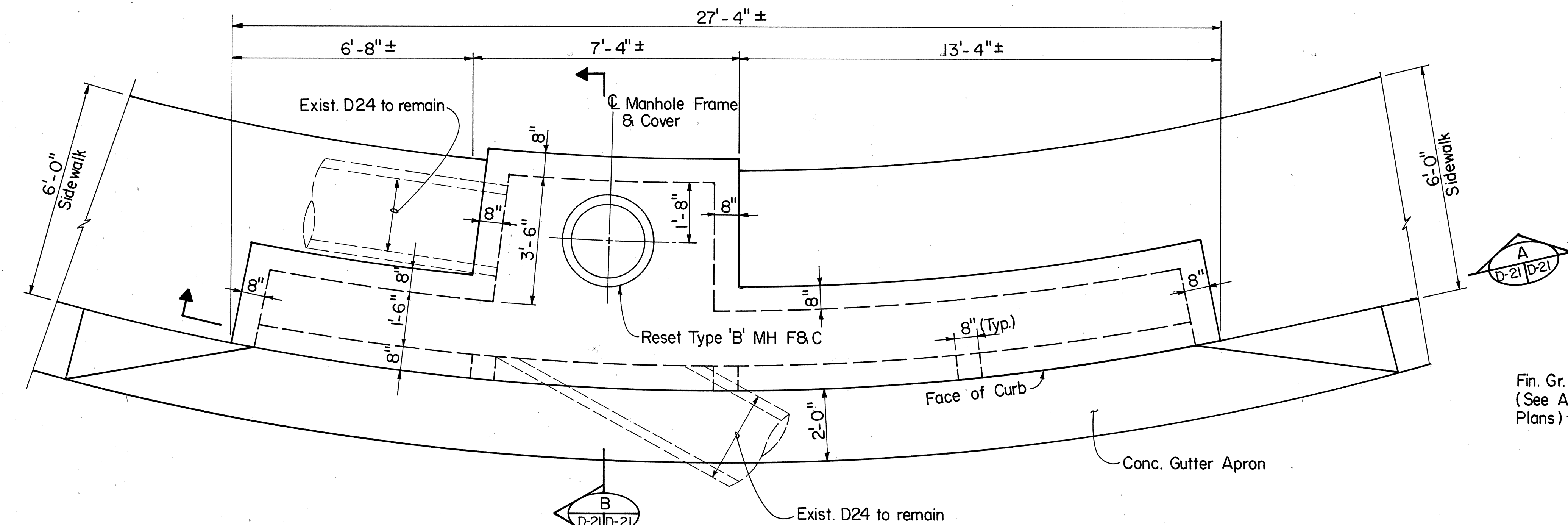
DRAINAGE STRUCTURE NOS. 53, 55, 56, 60 & 61
CONSTRUCTION PHASE III



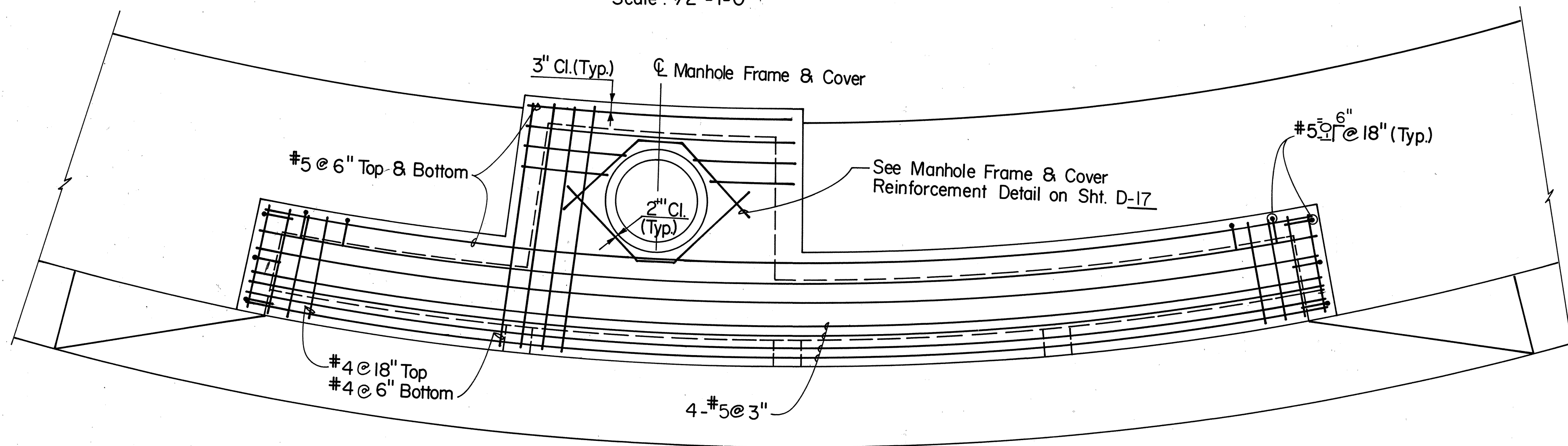
THIS WORK WAS PREPARED BY ME
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Werner Beuggert

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**PARTIAL CONSTRUCTION OF
TYPES 'D', 'DI' & 'CI' CATCH BASIN
CONSTRUCTION PHASE III**
KALANIANA'OLE HIGHWAY
Wailupe Circle to East Hind Drive
FA Project No. F-072-1(34)-A
SCALE: As shown DATE: JUNE 30, 1990
SHEET No. D-200F 37 SHEETS

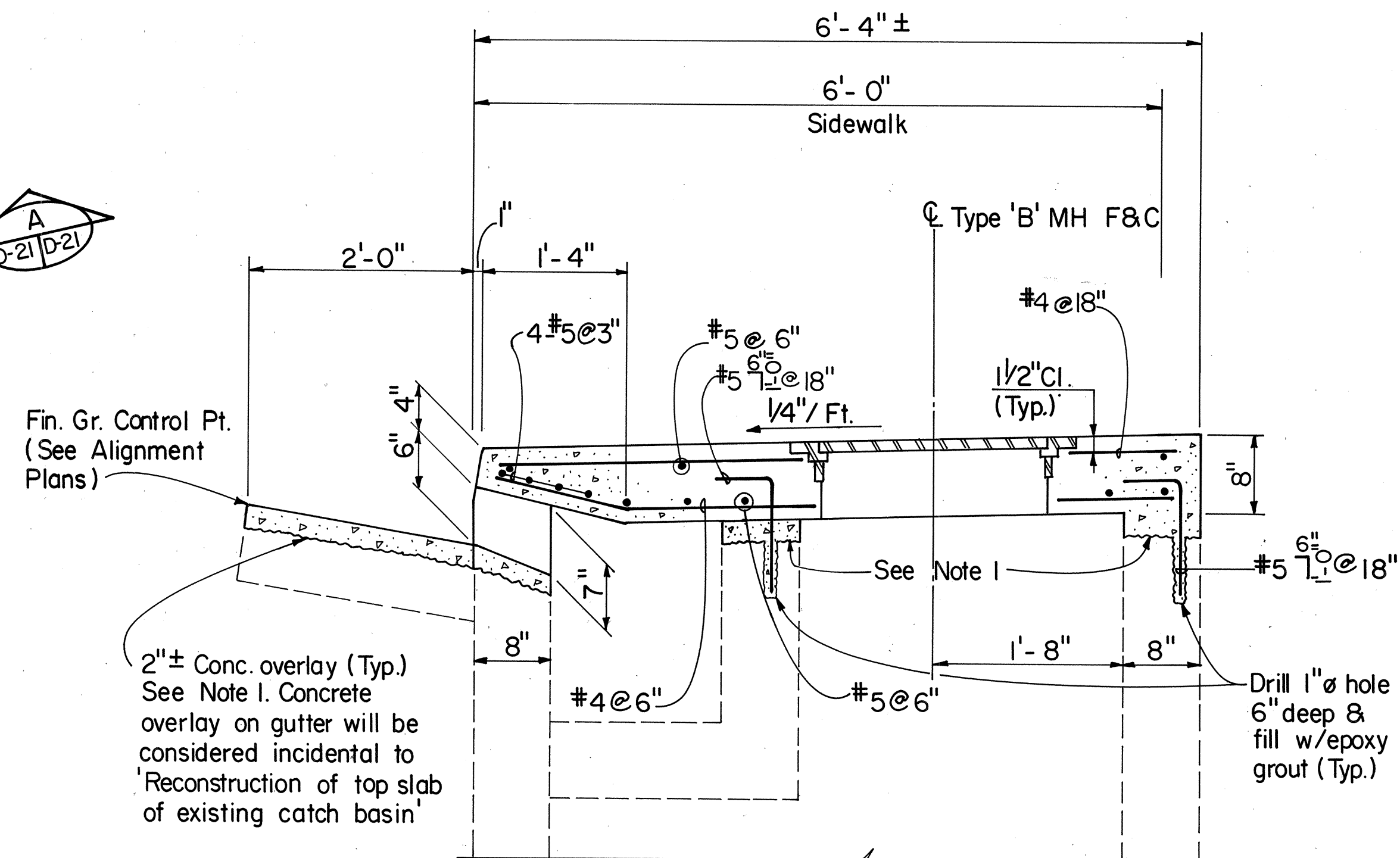
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(34)-A	1990	50	186



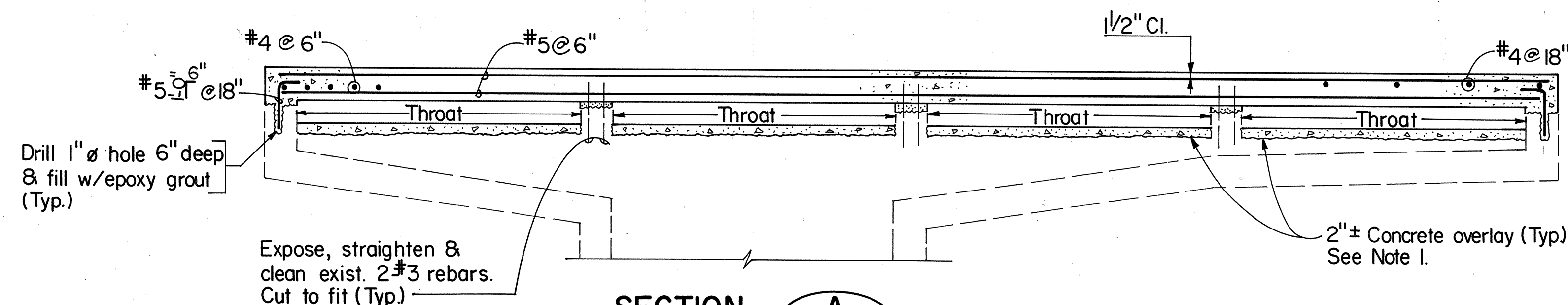
PLAN
Scale: 1/2" = 1'-0"



PLAN VIEW OF REINFORCING STEEL
Scale: 1/2" = 1'-0"



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



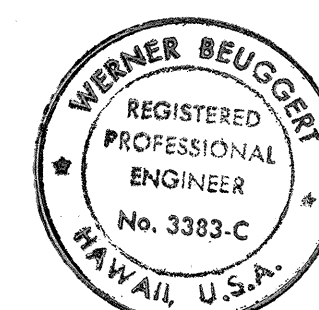
SECTION A
Scale: 1/2" = 1'-0"

NOTES:

1. Roughen exist. concrete surface. Concrete surface to be thoroughly cleaned of surface laitance, dirt and other material foreign to concrete by abrasive blast cleaning or other method approved by the Engineer. Apply epoxy bonding material immediately prior to placing concrete.

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

DRAINAGE STRUCTURE NO. 66
Sta. 123+87 ±, LT.



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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

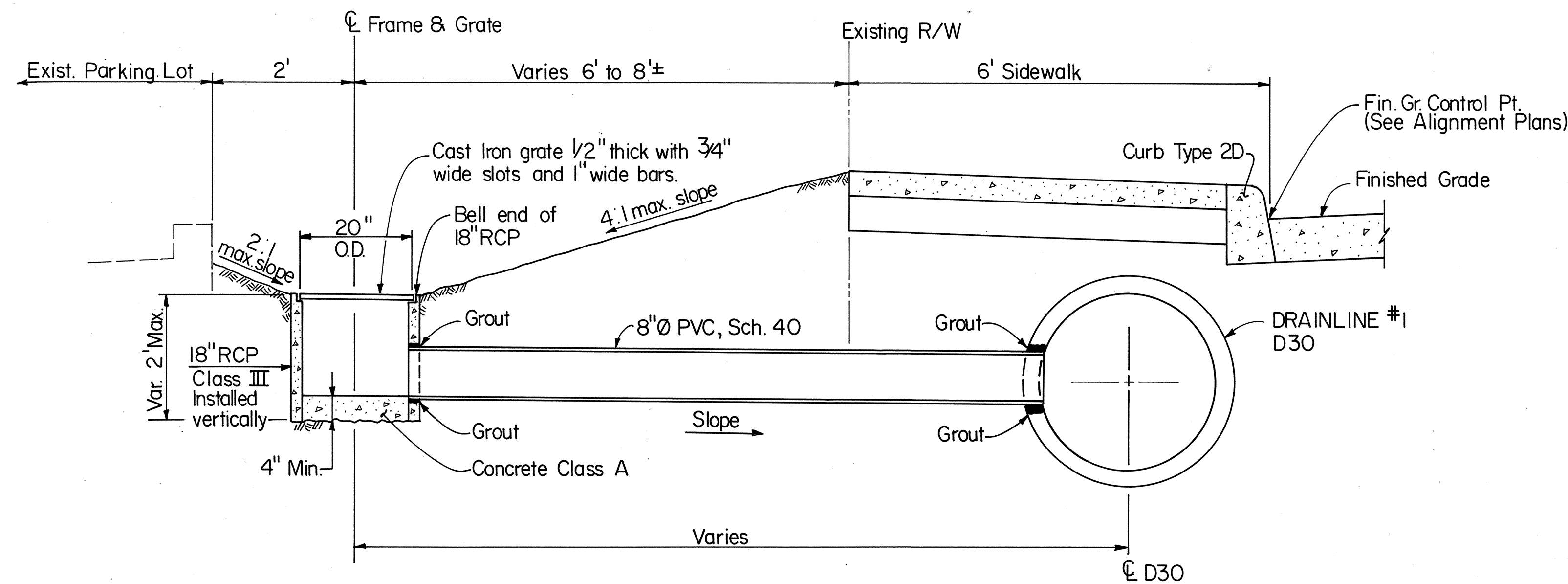
**TOP SLAB RECONSTRUCTION
OF EXISTING CATCH BASIN**

KALANIANA'OLE HIGHWAY
Waiupe Circle to East Hind Drive
FA Project No. F-072-1(34)-A

SCALE: As shown DATE: JUNE 30, 1990

SHEET No. D-21 OF 37 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(34)-A	1990	51	186

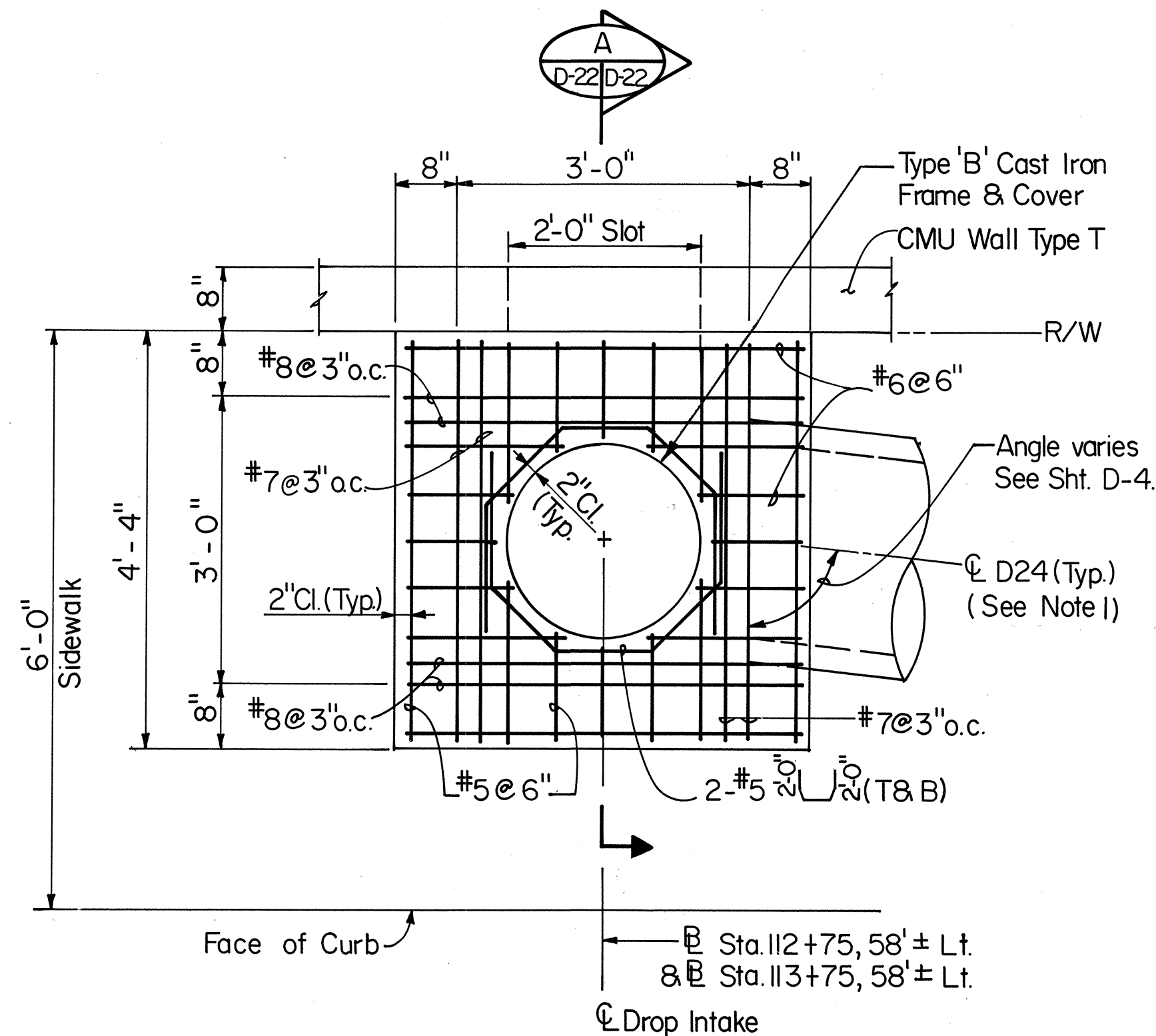


TYPICAL SECTION
Scale: 3/4" = 1'-0"

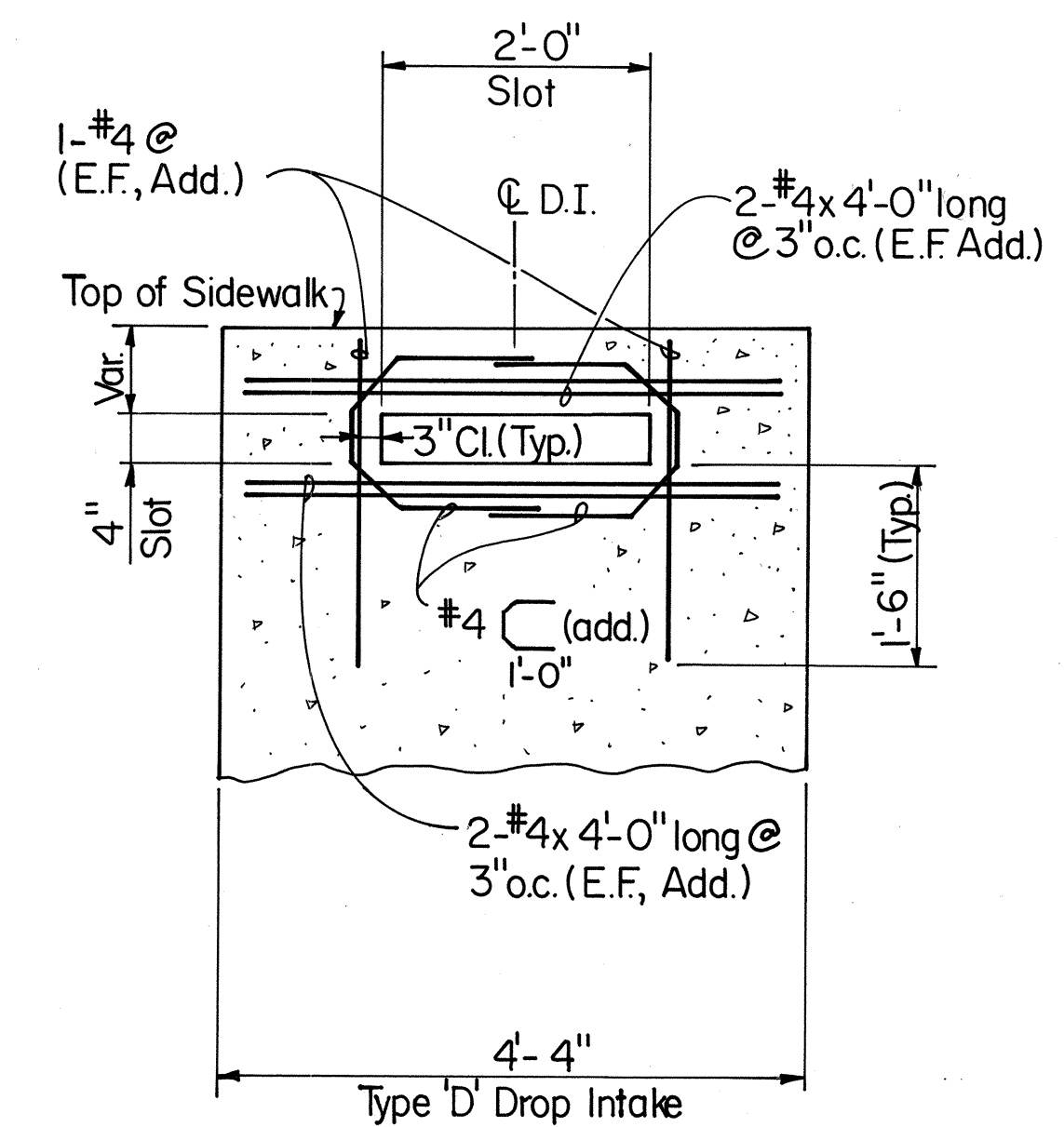
TYPE 'B' DROP INTAKE

DRAINAGE STRUCTURE NOS. 3, 5, 6 & 27
 STA. 101+98, LT., STA. 102+65, LT.,
 STA. 103+70, LT., STA. 108+94±, Rt.

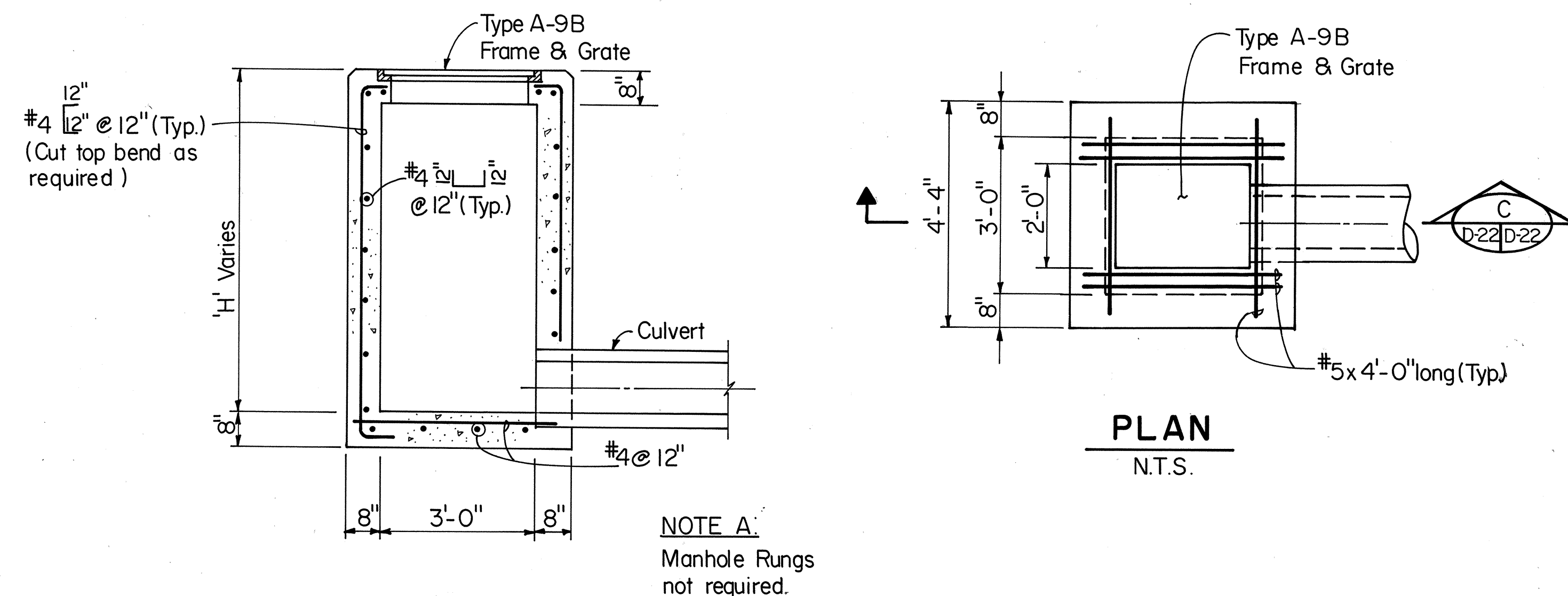
NOTE:
 8"Ø PVC, Sch. 40 shall be paid under Type 'B' Drop Intake



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



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

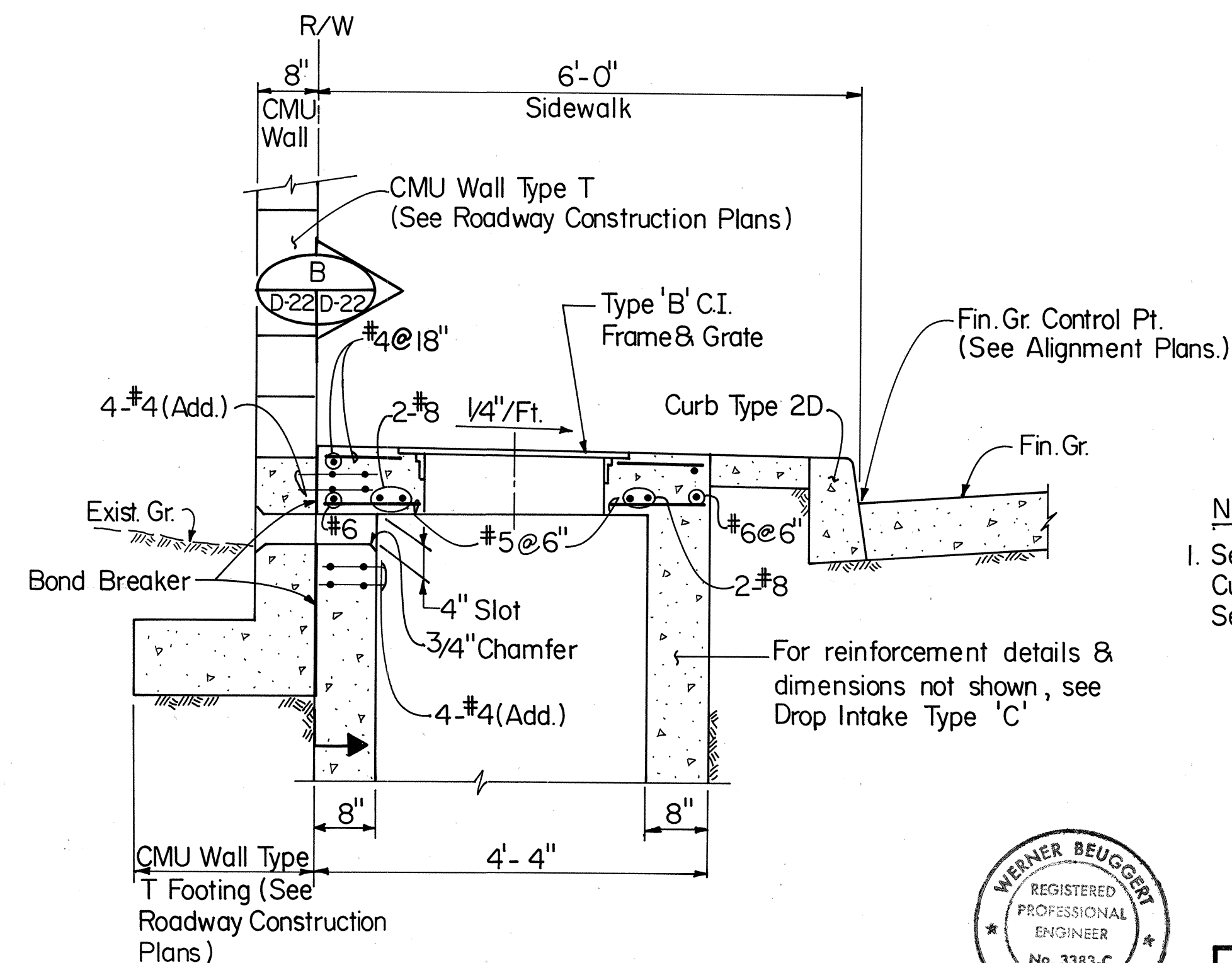


SECTION C
D-22 D-22

TYPE 'C' DROP INTAKE
Scale: 1/2" = 1'-0"

DRAINAGE STRUCTURE NO. 46
 STA. 114+66±, 8' RT±,
 PHASE 1 DETOUR CONSTRUCTION

NOTE A:
 Manhole Rungs not required.

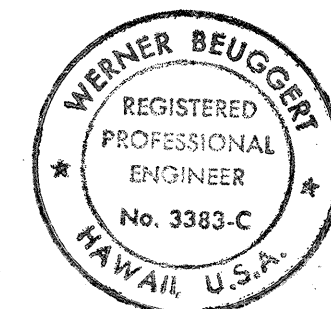


SECTION A
Scale: 3/4" = 1'-0"

TYPE 'D' DROP INTAKE

DRAINAGE STRUCTURE NOS. 41 & 42
 STA. 112+75, 57.83' LT., STA. 113+75, 57.83' LT.

NOTE
 1. See Added Reinforcement for Pipe Culvert Openings and Pipe Culvert Seat Details on Sht. D-17



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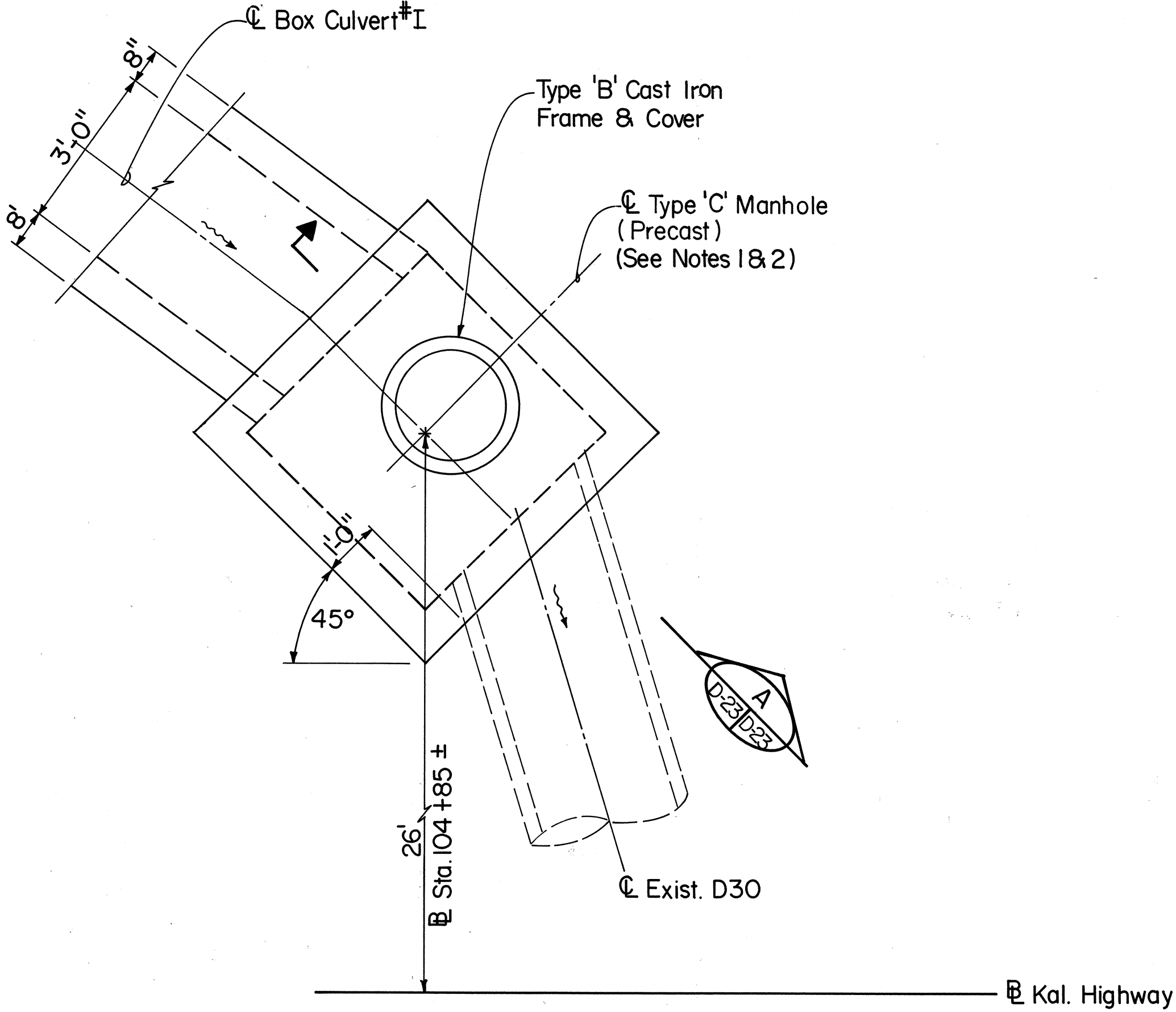
TYPES 'B', 'C' & 'D' DROP INTAKE

KALANIANA'OLE HIGHWAY
 Waiu Circle to East Hind Drive
 F.A. Project No. F-072-1(34)-A

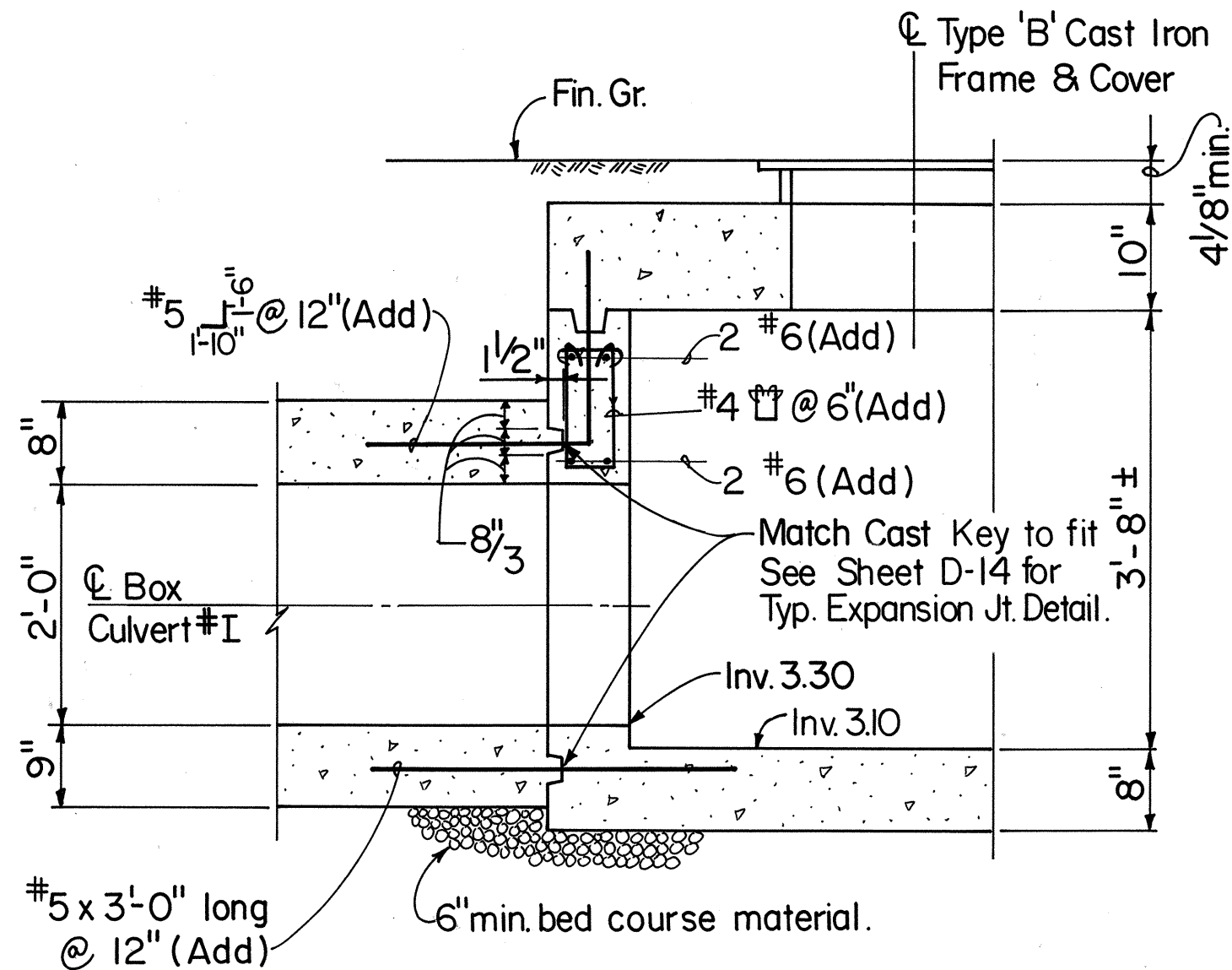
SCALE: As shown DATE: JUNE 30, 1990
 SHEET NO. D-22 OF 37 SHEETS

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(34)-A	1990	52	186



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



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

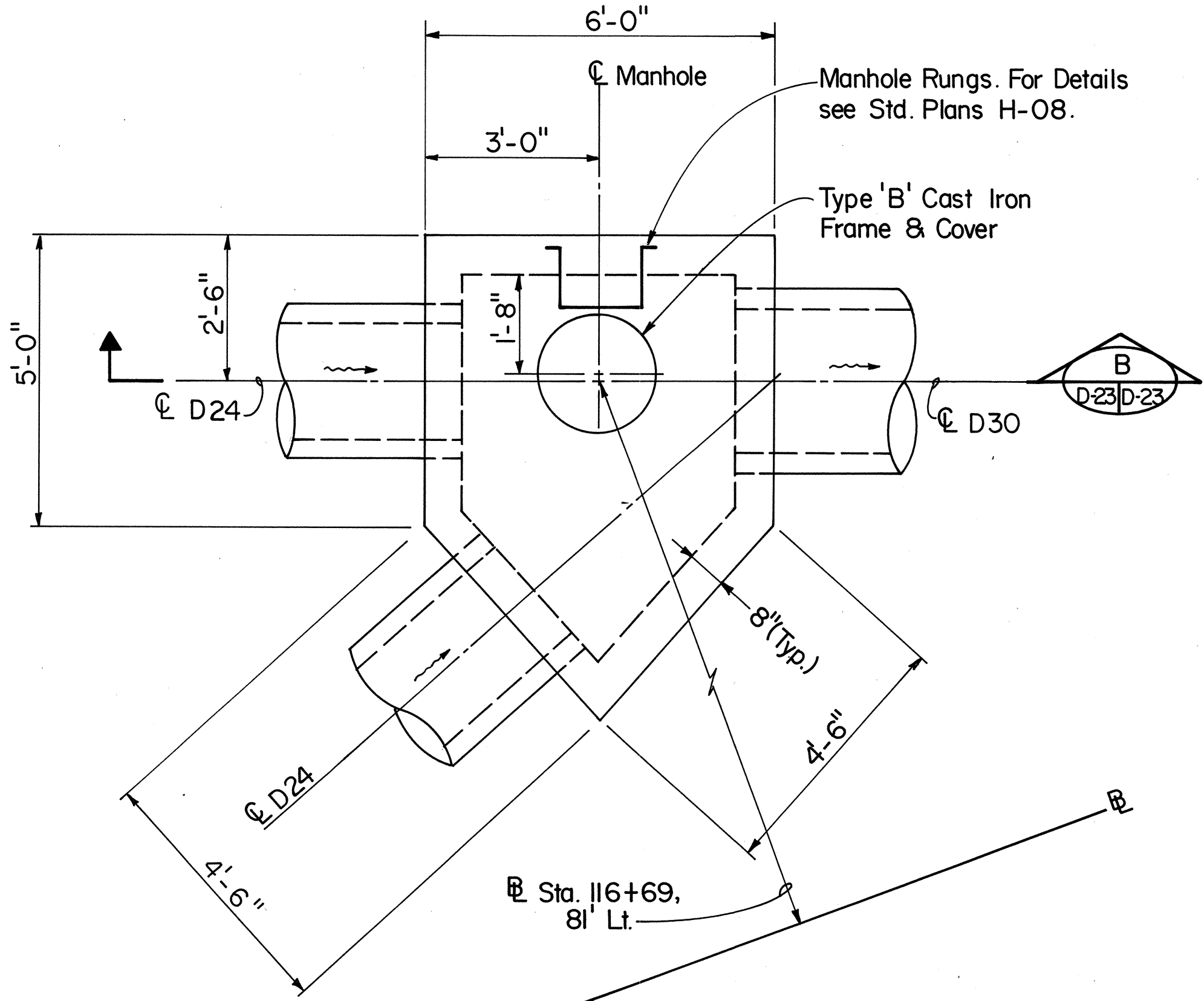
TYPE 'C' MANHOLE (PRECAST)

DRAINAGE STRUCTURE NO. (12)

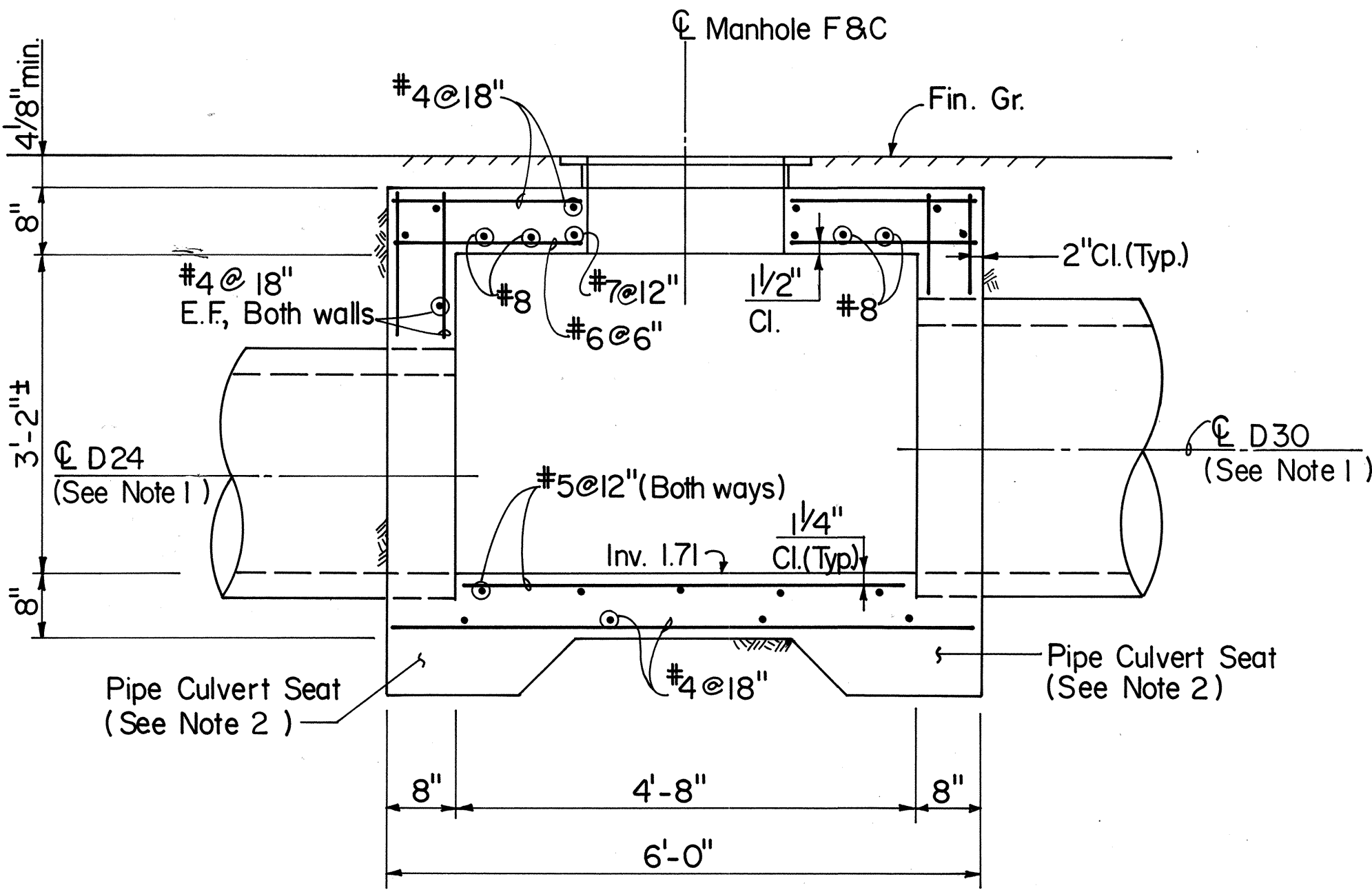
Sta. 104+85 ±, 26' LT. ±

NOTES:

- For Reinforcing & Dimensions of Type 'C' Manhole, see Std. Plans H-05.
- Contractor shall verify location & dimension of opening for new box culvert and exist. pipe prior to manufacturing precast manhole.
- Payment for bed course material will be considered incidental to Precast Type 'C' Manhole.
- Manhole shall be precast to facilitate traffic maintenance. Contractor shall submit shop drawings to the Engineer for approval.



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

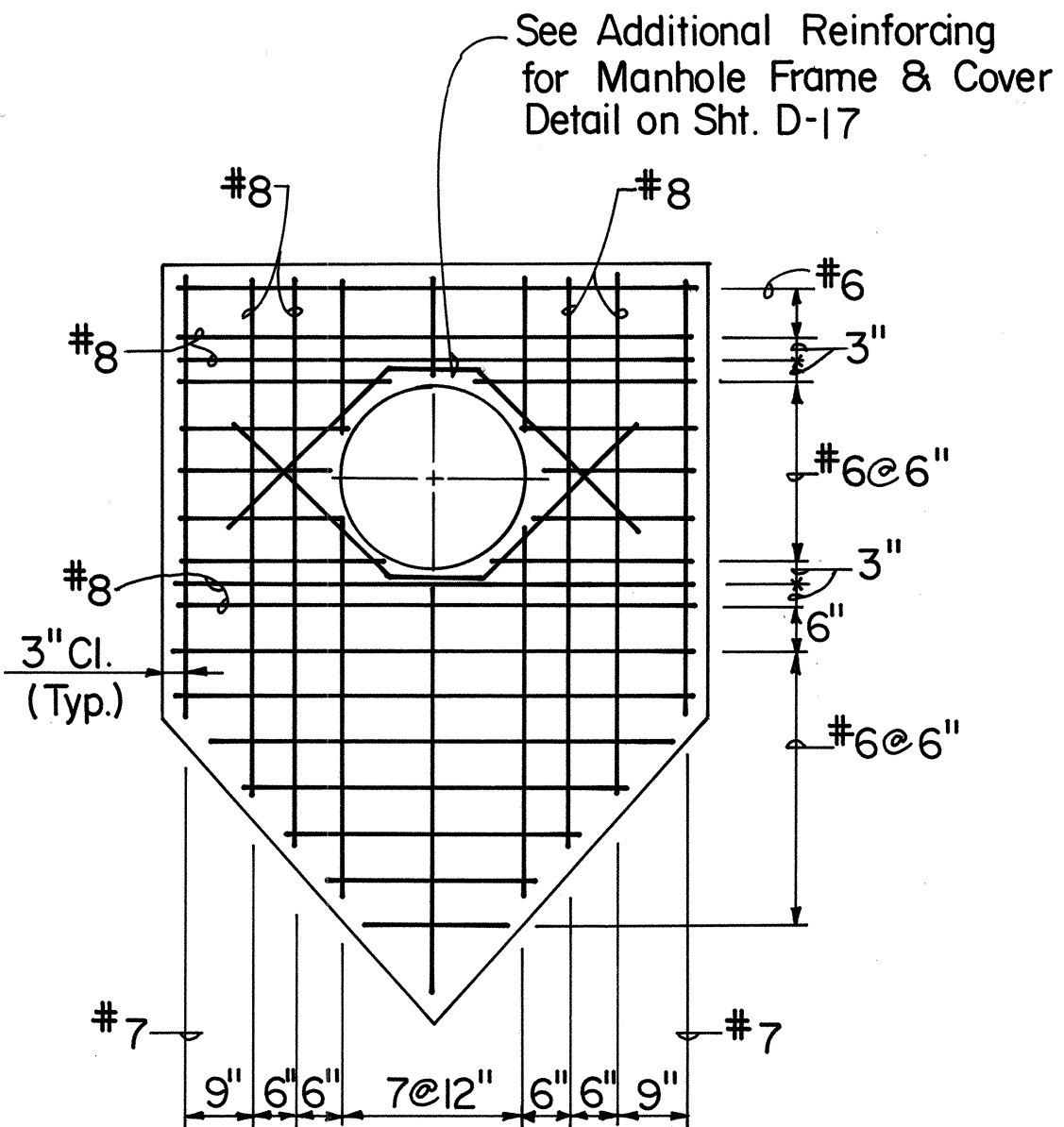


SECTION B
Scale: 3/4"=1'-0"

TYPE 'G' MANHOLE

DRAINAGE STRUCTURE NO. (51)

Sta. 116+69, 81' LT.

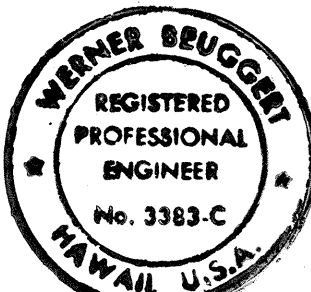


TOP SLAB REINFORCEMENT

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

NOTES:

- For Added Reinforcement for Pipe Opening, see Detail on Sht. D-17.
- For Detail of Culvert Seat, see Detail on Sht. D-17.



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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE 'C' MANHOLE (PRECAST)

TYPE 'G' MANHOLE

KALANIANA'OLE HIGHWAY

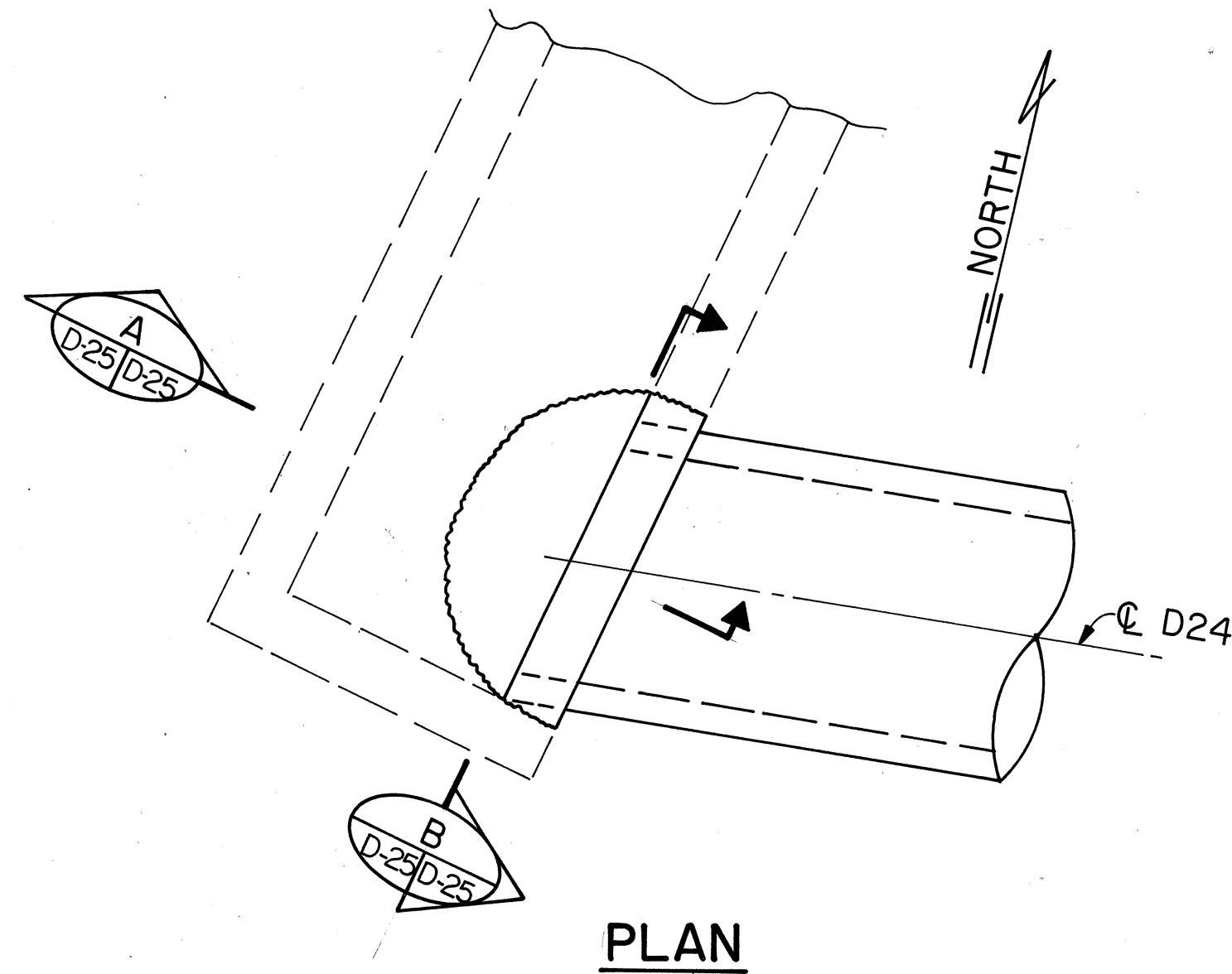
Wailupe Circle to East Hind Drive

F.A. Project No. F-072-1(34)-A

SCALE: As shown DATE: JUNE 30, 1990

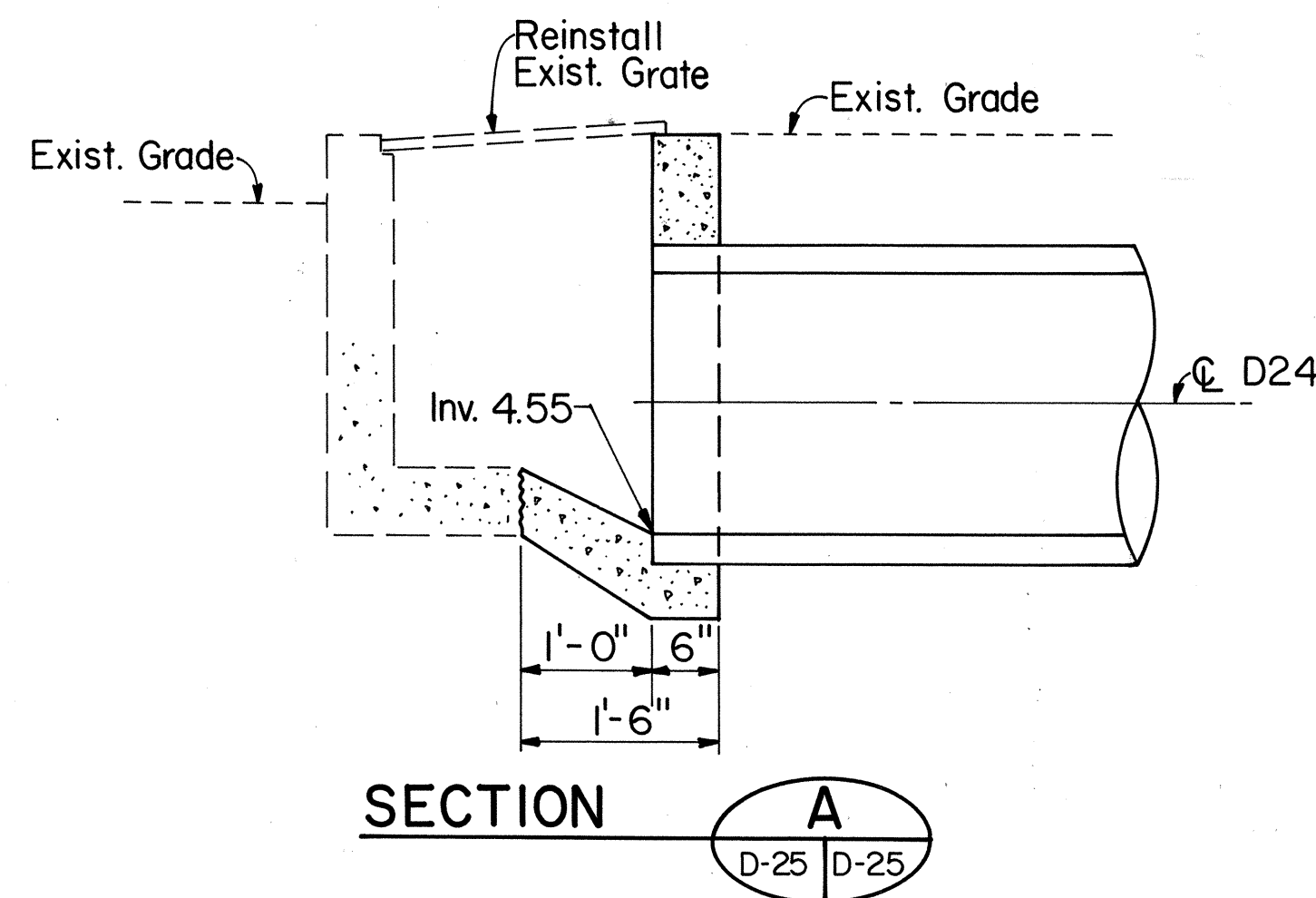
SHEET No. D-23 OF 37 SHEETS

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

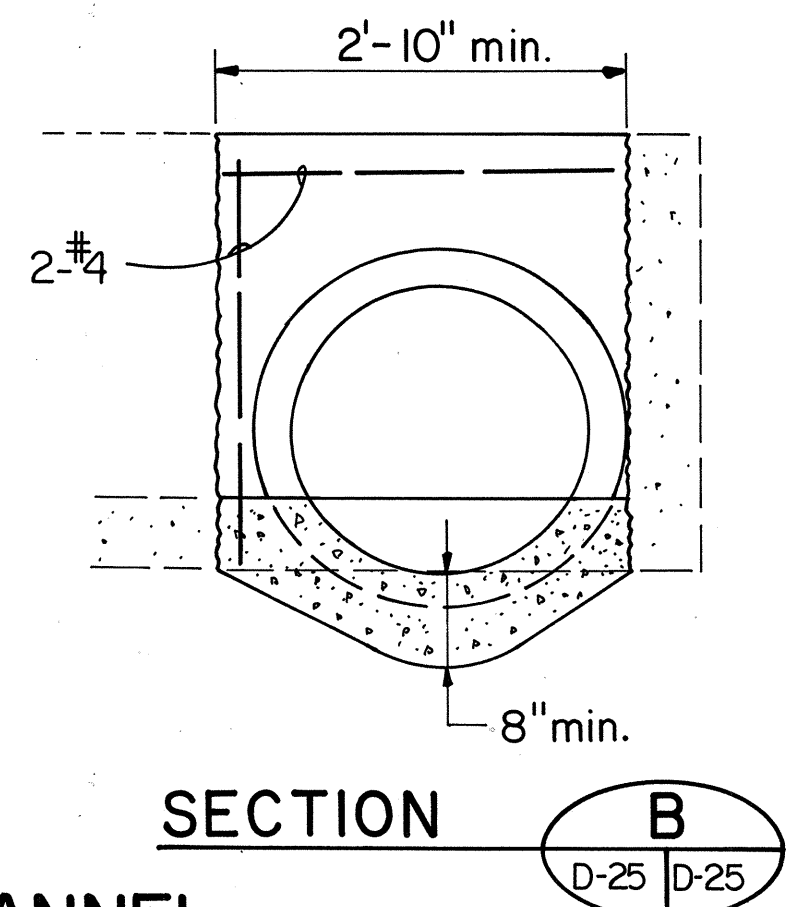


PLAN

NOTE: Payment for Reconstruction of Concrete Channel shall be considered incidental to various contract items.

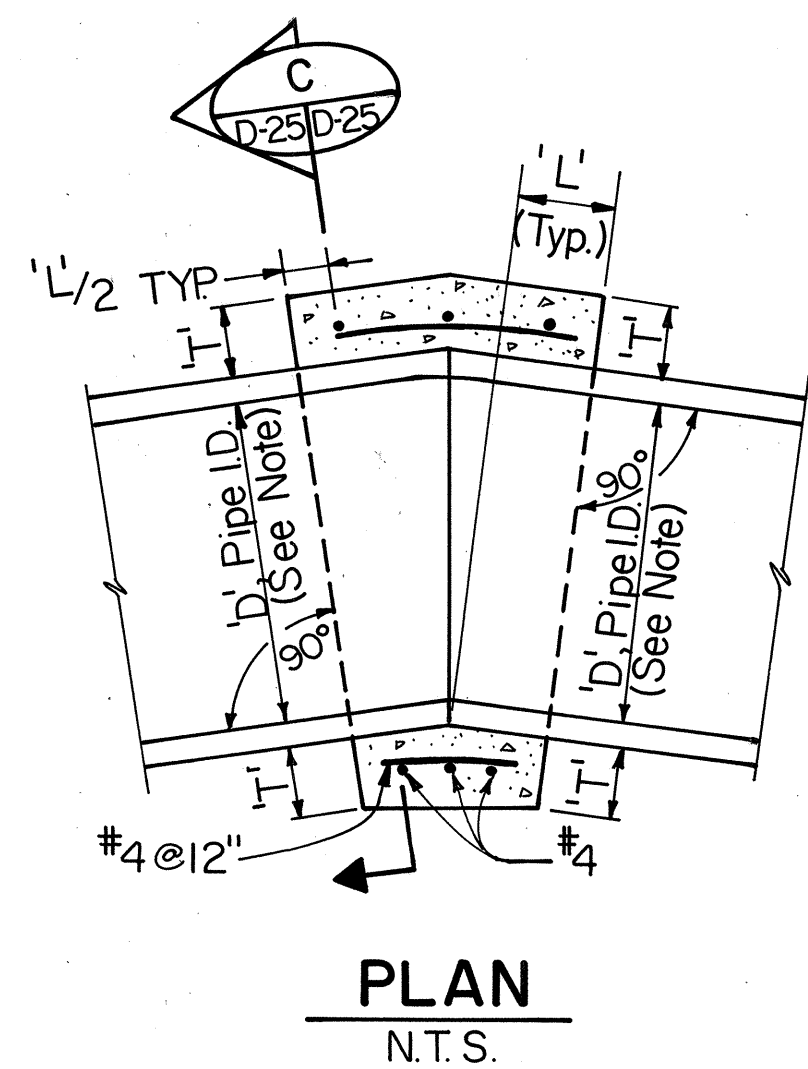


SECTION A
D-25 D-25



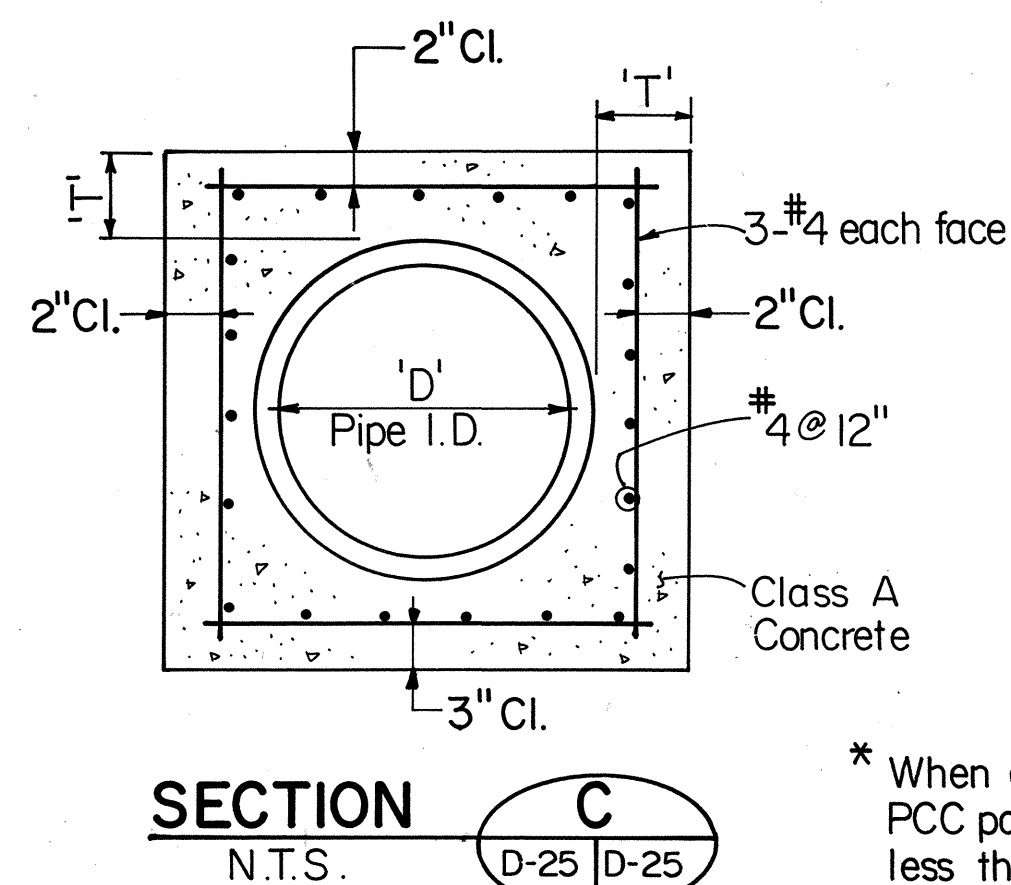
SECTION B
D-25 D-25

RECONSTRUCTION OF CONCRETE CHANNEL
DRAINAGE STRUCTURE NO. 1
Scale: 3/4" = 1'-0"



PLAN
N.T.S.

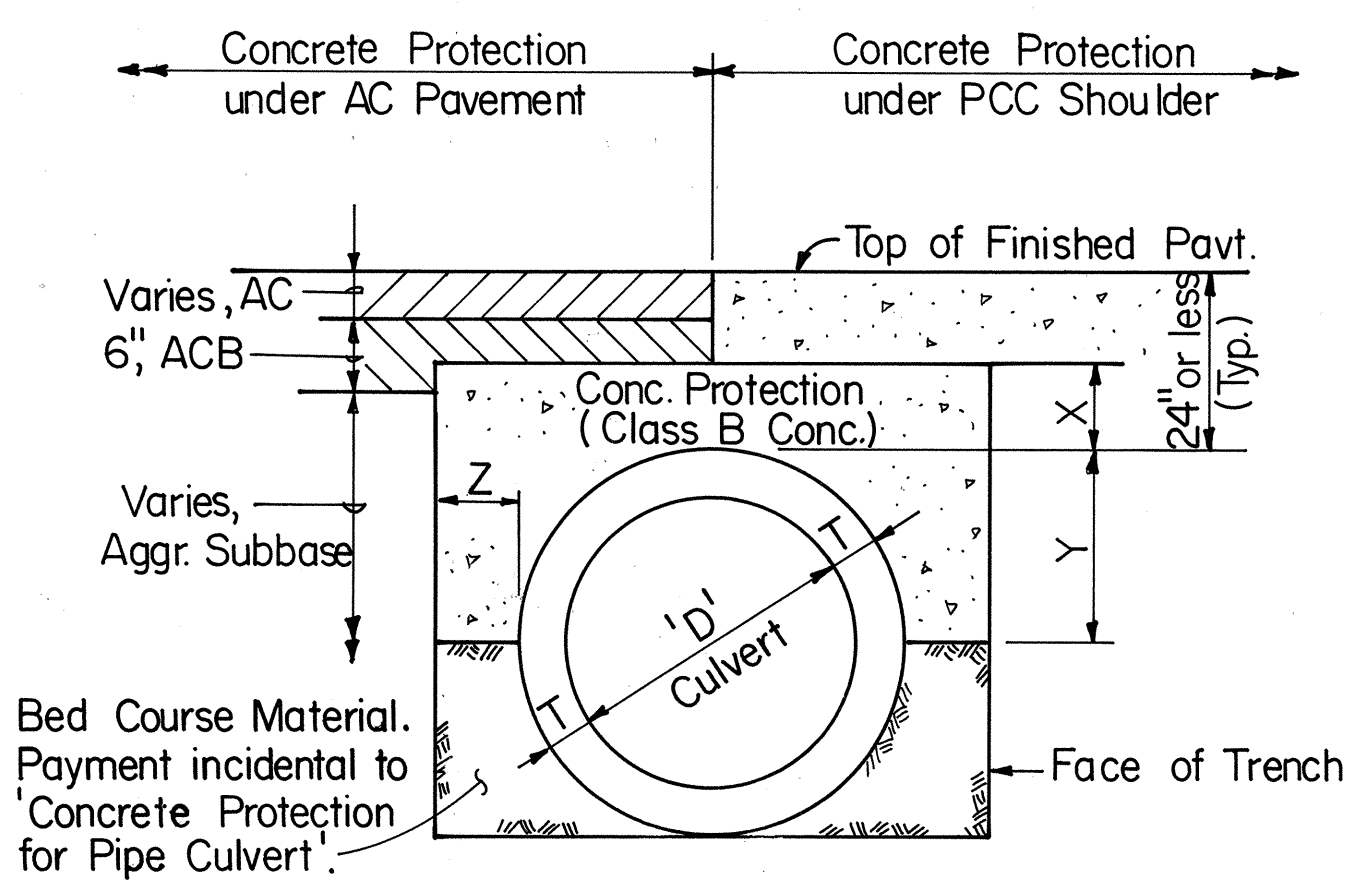
TABLE A		
'D'	'L'	'T'
24"	1.0'	6"
30"	1.5'	8"
36"	1.5'	8"



SECTION C
N.T.S. D-25 D-25

NOTE: For dimensions 'D', 'L' & 'T' See Table A.

CONCRETE COLLAR FOR PIPE CULVERTS

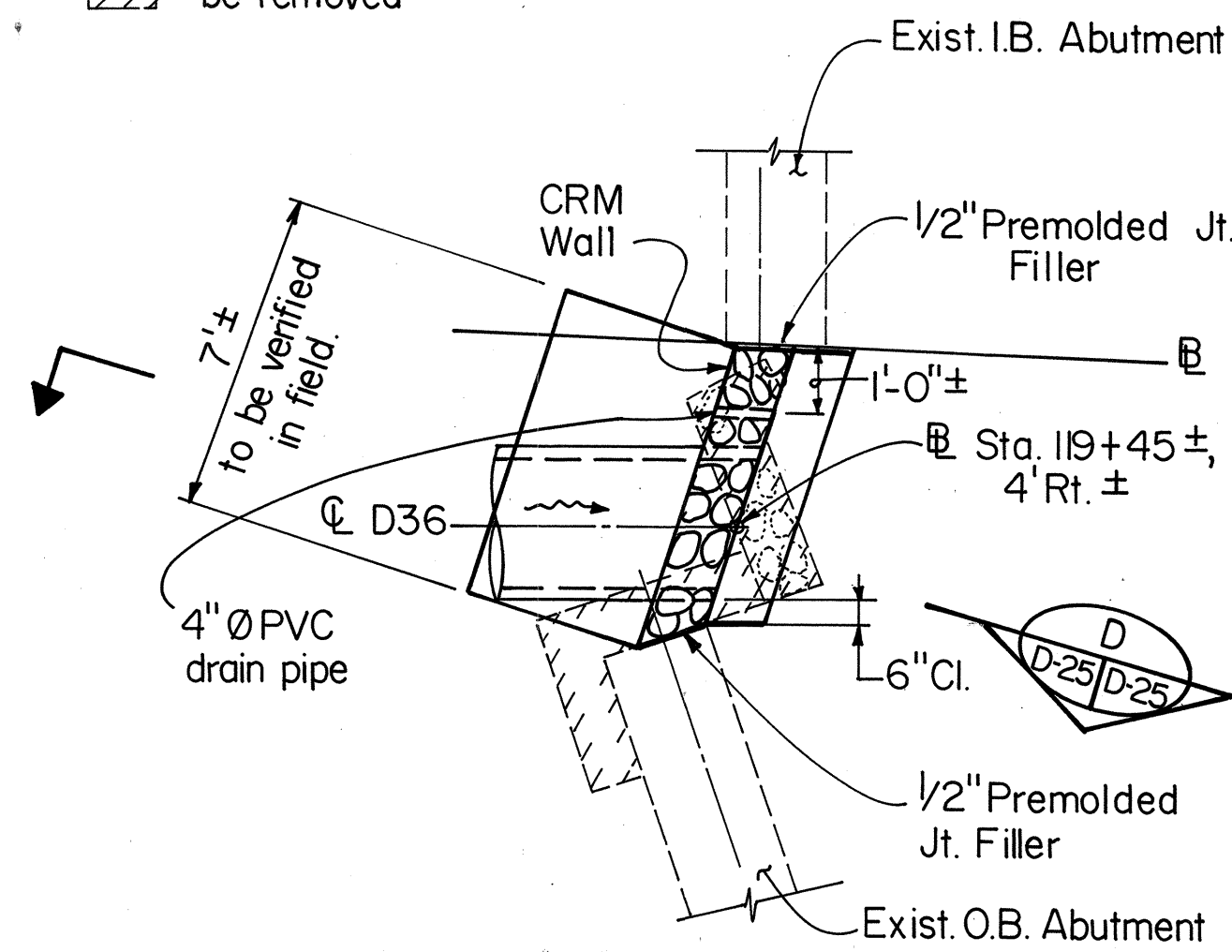


Note: 1. This detail to be used when cover is less than 24"

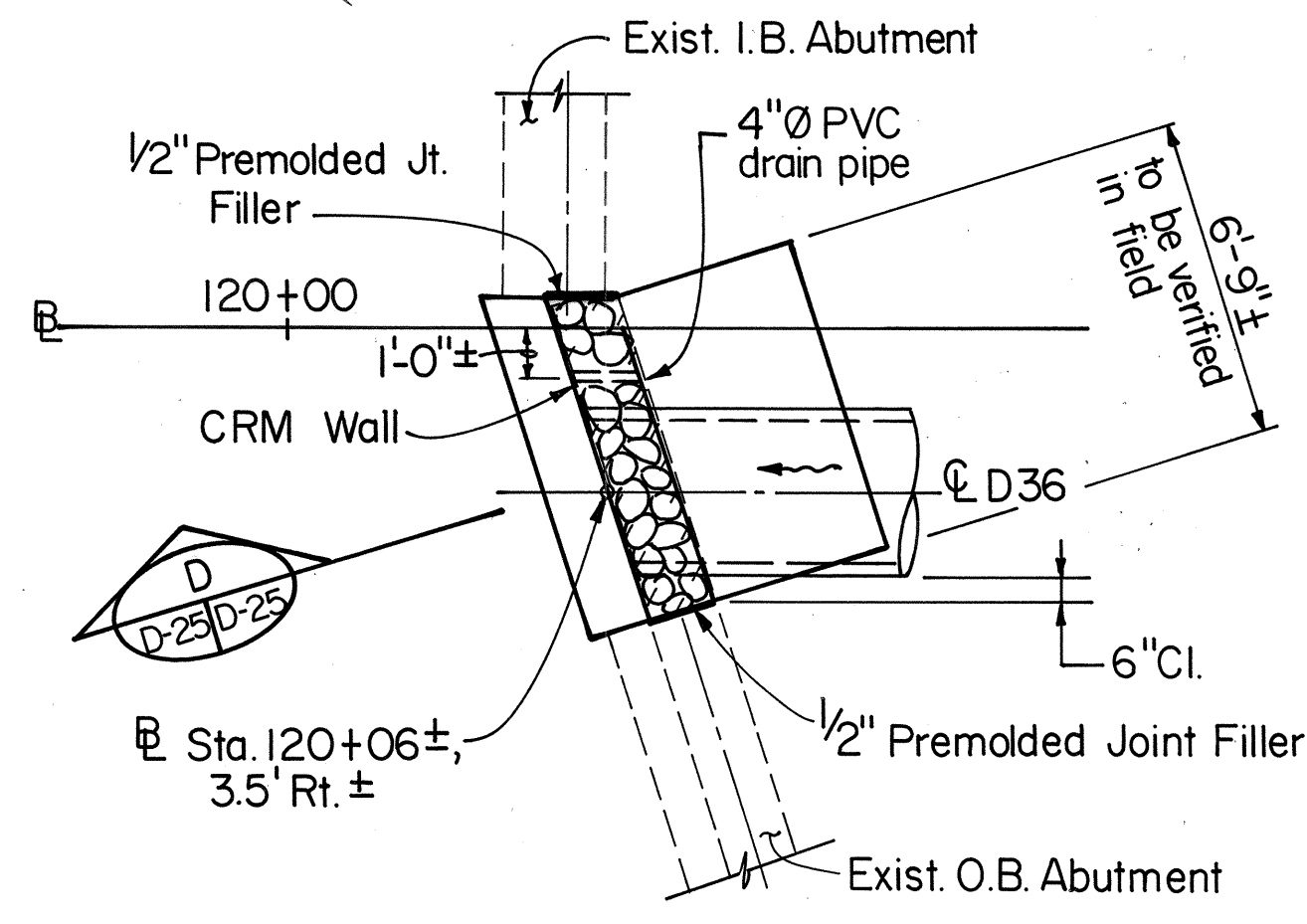
DATA FOR CONC. PROTECTION OVER CULVERTS		
X*	Y	Z
7" Min. for 24" D	$\frac{D}{2} + T$	Z measured from pipe to face of trench. Minimum = X Max. pay quantity will be Z=12"
8" Min. for 30" D		
9" Min. for 36" D		

CONC. PROTECTION FOR PIPE CULVERTS
N.T.S.

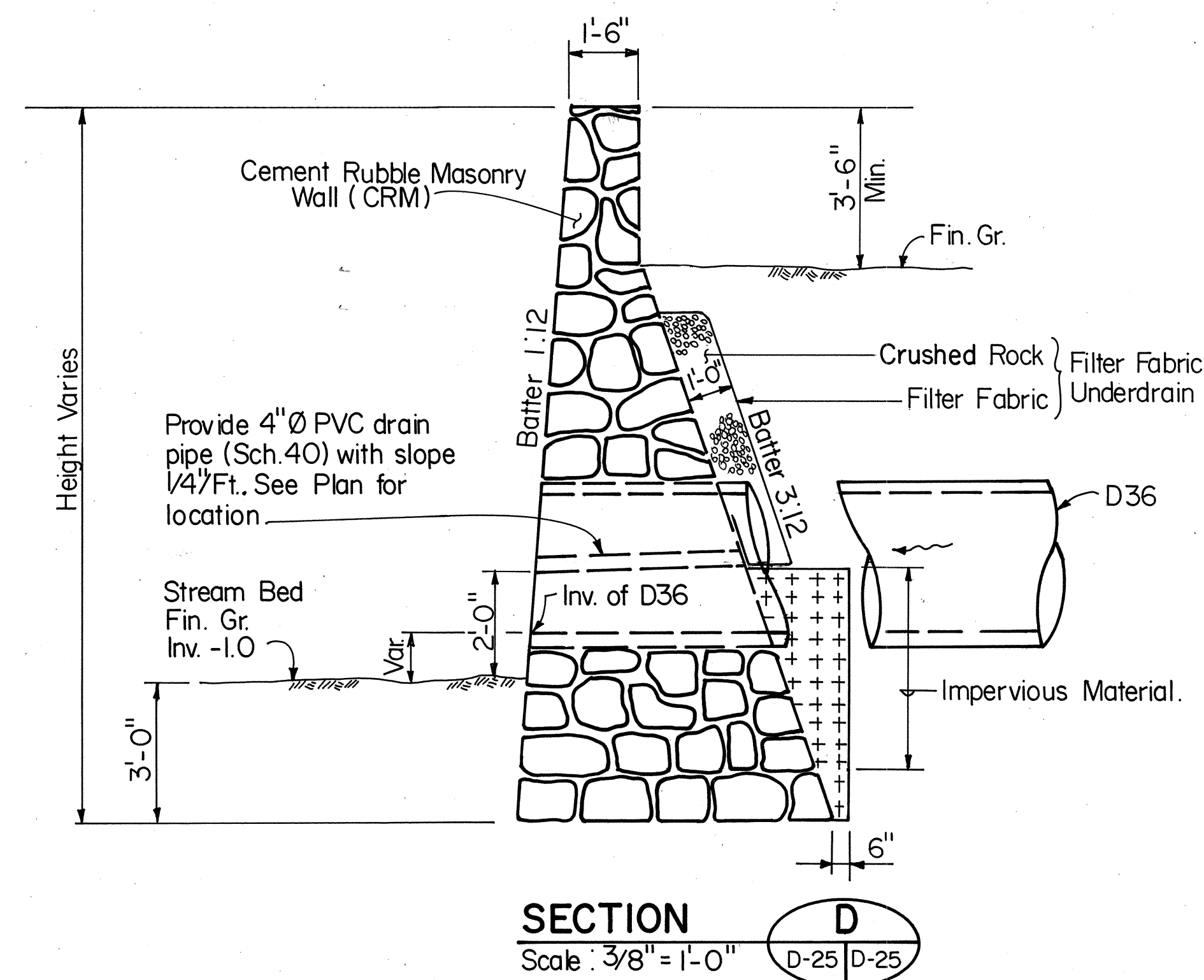
Legend:
Exist Wall to be removed



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

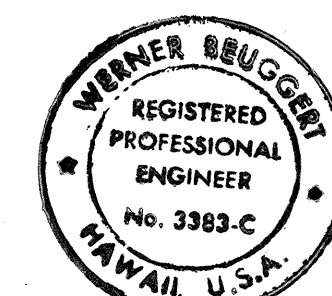


PLAN
Scale: 1/4" = 1'-0"



SECTION D
Scale: 3/8" = 1'-0" D-25 D-25

TYPE 'A' PIPE OUTFALL
DRAINAGE STRUCTURE NOS. 57 & 58



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE 'A' PIPE OUTFALL
MISCELLANEOUS DRAINAGE DETAILS

KALANIANA'OLE HIGHWAY
Waiupe Circle to East Hind Drive
F.A. Project No. F-072-1(34)-A
SCALE: As Shown DATE: JUNE 30, 1990

SHEET NO. D-25 OF 37 SHEETS

DRAINAGE SUMMARY

SHEET No.D-26 OF 37 SHEETS

DRAINAGE SUMMARY																																FED. ROAD DIST. NO.		STATE	FED. AID PROJ. NO.		FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII																																HAW.	F-072-1(34)-A		1990	56	186		

STRUCTURES			CULVERTS		ESTIMATED QUANTITIES																																					
DRAINAGE SHEET	STRUCTURE NUMBER	TYPE	FROM STRUCTURE NO.	TO STRUCTURE NO.	ITEM NO.	604	604	604	604	604	604		604	604	604	604	604	604		604	604	604	604	604	604	604		604	604	604	604											
						.6010	.6020	.6025	.6030	.6035	.6040		.7010	.7020	.7030	.7040	.7050	.7060	.7070		.8010	.8020	.8030	.8040	.8050	.8060	.8070		.9000	.9010	.9020	.9030										
					DRAINLINE NO.	TYPE B MANHOLE 3.00 FEET TO 3.99 FEET	TYPE C MANHOLE 4.00 FEET TO 4.99 FEET	TYPE C MANHOLE 6.00 FEET TO 6.99 FEET	TYPE D MANHOLE 4.00 FEET TO 4.99 FEET	TYPE D MANHOLE 5.00 FEET TO 5.99 FEET	TYPE G MANHOLE		TYPE A CURB SLOT INLET	TYPE A PIPE OUTFALL	TYPE A OUTLET STRUCTURE	CONCRETE PROTECTION FOR PIPE CULVERT	CONCRETE COLLAR FOR PIPE CULVERT	RECONSTRUCTION OF EXISTING MANHOLE	RECONSTRUCTION OF TOP SLAB OF EXIST. CB		BOX CULVERT # I	BOX CULVERT # II	BOX CULVERT # III	BOX CULVERT # IV	BOX CULVERT # V	BOX CULVERT # VI	BOX CULVERT # VII		TYPE A DROP INTAKE	TYPE B DROP INTAKE	TYPE C DROP INTAKE	TYPE D DROP INTAKE										
					UNIT	EA.	EA.	EA.	EA.	EA.	EA.		EA.	EA.	EA.	L.F.	EA.	L.S.	L.S.		L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.		EA.	EA.	EA.	EA.										
D-2	1	RECONSTRUCTION OF CONCRETE CHANNEL			1																																					
		24" PIPE	1	2																																						
	2	TYPE G CB																																								
D-2 D-3		30" PIPE	2	7																																						
D-2	3	TYPE B DI																																								
D-3	5	TYPE B DI																																								
	6	TYPE B DI																																								
	7	TYPE D CB																																								
		30" PIPE	7	9																																						
	9	TYPE CS CB																																								
		BOX CULVERT # I	9	12																																						
	12	TYPE C MH																																								
	14	TYPE C MH																																								
		30" PIPE	14	—																																						
D-2 D-3	4	TYPE C1 CB			2																																					
D-3		24" PIPE	4	8																																						
	8	TYPE C1 CB																																								
		24" PIPE	8	10																																						
	10	TYPE B1 CB																																								
		24" PIPE	10	14																																						
																																							</			

DRAINAGE SUMMARY

DRAINAGE SUMMARY

STRUCTURES			CULVERTS		ESTIMATED																		QUANTITIES																												
DRAINAGE SHEET	STRUCTURE NUMBER	TYPE	FROM STRUCTURE NO.	TO STRUCTURE NO.	ITEM NO.	604	604	604	604	604	604		604	604	604	604	604	604		604	604	604	604	604	604	604		604	604	604	604																				
					DRAINLINE NO.	TYPE B MANHOLE 3.00 FEET TO 3.99 FEET	TYPE C MANHOLE 4.00 FEET TO 4.99 FEET	TYPE C MANHOLE 6.00 FEET TO 6.99 FEET	TYPE D MANHOLE 4.00 FEET TO 4.99 FEET	TYPE D MANHOLE 5.00 FEET TO 5.99 FEET	TYPE G MANHOLE		TYPE A CURB SLOT INLET	TYPE A PIPE OUTFALL	TYPE A OUTLET STRUCTURE	CONCRETE PROTECTION FOR PIPE CULVERT	CONCRETE COLLAR FOR PIPE CULVERT	RECONSTRUCTION OF EXISTING MANHOLE	RECONSTRUCTION OF TOP SLAB OF EXIST. CB		BOX CULVERT # I	BOX CULVERT # II	BOX CULVERT # III	BOX CULVERT # IV	BOX CULVERT # V	BOX CULVERT # VI	BOX CULVERT # VII		TYPE A DROP INTAKE	TYPE B DROP INTAKE	TYPE C DROP INTAKE	TYPE D DROP INTAKE																			
						UNIT	EA.	EA.	EA.	EA.	EA.	EA.		EA.	EA.	EA.	L.F.	EA.	L.S.	L.S.		L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.		EA.	EA.	EA.	EA.																		
D-3	11	TYPE B MH			3	1																																													
		BOX CULVERT # II	13	18																	L.S.																														
	19	TYPE A CURB SLOT INLET											1																																						
		BOX CULV. # IV	20	22																			L.S.																												
D-3 D-4		BOX CULV. # V	22	30																			L.S.																												
D-4		BOX CULV. # VI	30	33																				L.S.																											
		BOX CULV. # VII	33	35																				L.S.																											
		TYPE A OUTLET STRUCTURE													1																																				
		36" PIPE	37	39																																															
	39	TYPE C MH						1																																											
		36" PIPE	39	40												25																																			
	40	RECONSTRUCTION OF EXISTING MANHOLE																L.S.																																	
D-3	15	TYPE A DI			4																							1																							
D-3		BOX CULV. # III	16	17	4																		L.S.																												
D-3	21	TYPE D CB			5																																														
		24" PIPE	21	23																																															
	23	TYPE D CB																																																	
D-3 D-4		24" PIPE	23	25																																															
D-4	25	TYPE D CB																																																	
		24" PIPE	25	28																																															
	28	TYPE D CB																																																	

DRAINAGE SUMMARY

DRAINAGE SUMMARY

SHEET No.D-31 OF 37 SHEETS

DRAINAGE SUMMARY

SHEET No.D-32 OF 37 SHEETS

DRAINAGE SUMMARY

STRUCTURES			CULVERTS		ESTIMATED																		QUANTITIES																			
DRAINAGE SHEET	STRUCTURE NUMBER	TYPE	FROM STRUCTURE NO.	TO STRUCTURE NO.	ITEM NO.	604	604	604	604	604	604		604	604	604	604	604	604		604	604	604	604	604	604	604		604	604	604	604											
					DRAINLINE NO.	TYPE B MANHOLE 3.00 FEET TO 3.99 FEET	TYPE C MANHOLE 4.00 FEET TO 4.99 FEET	TYPE C MANHOLE 6.00 FEET TO 6.99 FEET	TYPE D MANHOLE 4.00 FEET TO 4.99 FEET	TYPE D MANHOLE 5.00 FEET TO 5.99 FEET	TYPE G MANHOLE		TYPE A CURB SLOT INLET	TYPE A PIPE OUTFALL	TYPE A OUTLET STRUCTURE	CONCRETE PROTECTION FOR PIPE CULVERT	CONCRETE COLLAR FOR PIPE CULVERT	RECONSTRUCTION OF EXISTING MANHOLE	RECONSTRUCTION OF TOP SLAB OF EXIST. CB		BOX CULVERT # I	BOX CULVERT # II	BOX CULVERT # III	BOX CULVERT # IV	BOX CULVERT # V	BOX CULVERT # VI	BOX CULVERT # VII		TYPE A DROP INTAKE	TYPE B DROP INTAKE	TYPE C DROP INTAKE	TYPE D DROP INTAKE										
					UNIT	EA.	EA.	EA.	EA.	EA.	EA.		EA.	EA.	EA.	L.F.	EA.	L.S.	L.S.	L.S.		L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.		EA.	EA.	EA.	EA.									
D-5		24" PIPE	45	47	DRAINLINE #7 CONTINUED											15																										
	47	TYPE D1 CB			FROM PREVIOUS SHEET																																					
		24" PIPE	47	49												110																										
▼	49	TYPE D1 CB			▼																																					
D-4		24" PIPE	38	41	8																																					
	41	TYPE D DI			↓																																					
		24" PIPE	41	42																																						
▼	42	TYPE D DI			▼																																					
D-5	44	TYPE B CB			9																																					
		24" PIPE	44	48	↓											130																										
	48	TYPE D1 CB			↓																																					
▼		24" PIPE	48	51	▼											59																										
D-5		24" PIPE	50	51	10											10																										
	51	TYPE G MH			↓						1																															
		30" PIPE	51	52	↓											41																										
	52	TYPE A CB			↓																																					
		30" PIPE	52	53	↓											4																										
	53	TYPE D CB			↓																																					
		36" PIPE	53	55	▼																																					
▼	55	TYPE D CB			DRAINLINE #10 CONTINUED ON NEXT SHEET																																					
		SUBTOTAL THIS SHEET →									1					369																										
																				</																						

DRAINAGE SUMMARY

SHEET No.D-34 OF 37 SHEETS

DRAINAGE SUMMARY

64

DRAINAGE SUMMARY

65

DRAINAGE SUMMARY

SHEET No.D-37 OF 37 SHEETS