

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-HI-1(93)15	1977	158	350

GENERAL :

- ALL ELEVATIONS ARE BASED ON MEAN SEA LEVEL DATUM.
- UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND CONSTRUCTION OF WATER, SEWER AND GAS SYSTEM FACILITIES AND APPURTENANCES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION DATED 1976 AND ALL SUBSEQUENT AMENDMENTS AND ADDITIONS.
- THE CONTRACTOR SHALL NOTIFY THE AIR FORCE AND NAVY IN WRITING TWO (2) WEEKS PRIOR TO COMMENCEMENT ON UTILITIES WORK.
- DURING CONSTRUCTION, ALL UTILITY SERVICES SHALL BE MAINTAINED WITH THE LEAST AMOUNT OF DISTURBANCE TO EXISTING SERVICES.
- THE CONTRACTOR SHALL COORDINATE ALL UTILITIES RELOCATIONS WITH CONSTRUCTION AND PHASING OF DETOUR ROADS. THE CONTRACTOR SHALL ALSO COORDINATE ALL ADJACENT PROJECT CONTRACTORS AS TO WHEN THE UTILITIES SYSTEMS MAY BE PLACED IN OPERATION.
- WHERE PUMPING IS REQUIRED, THE CONTRACTOR SHALL POST A CUSTODIAN DURING THE ENTIRE PUMPING OPERATION. THE CUSTODIAN MUST HAVE A WORKING KNOWLEDGE OF THE PUMP USED.
- CARE SHALL BE EXERCISED IN THE INSTALLATION OF ALL UTILITIES TO PREVENT AS LITTLE DAMAGE OR INJURIES TO TREES AND SHRUBBERIES DESIGNATED ON THE PLANS TO REMAIN.
- THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES APPURTENANCES AND STRUCTURES SHOWN ARE BASED ON AVAILABLE RECORDS VERIFIED WHENEVER POSSIBLE BY FIELD SURVEYS. THE CONTRACTOR SHALL VERIFY LOCATIONS AND INVERTS OF EXISTING LINES AND SHALL BE REQUIRED TO MAKE ADJUSTMENTS TO ANY NEW OR EXISTING SYSTEMS AS NECESSARY WITH THE APPROVAL OF THE ENGINEER, OR WHENEVER DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL NOT ASSUME THAT WHERE NO EXISTING UTILITIES ARE SHOWN, THAT NONE EXIST.
- CONTRACTOR SHALL BE RESPONSIBLE AND PAY FOR ALL DAMAGES TO EXISTING UTILITIES.
- UNLESS OTHERWISE INDICATED, ALL EXISTING UTILITY LINES SHOWN ON THE DRAWINGS SHALL REMAIN.
- THE CONTRACTOR IS CAUTIONED THAT MILITARY ELEVATIONS AND BENCH MARKS ARE NOT BASED ON MEAN SEA LEVEL DATUM AND MUST BE ADJUSTED TO MATCH THE STATE HIGHWAY DIVISION BENCH MARKS SHOWN ON THE PLANS.
- WHERE REQUIRED, RESTORATION OF EXISTING PAVEMENTS AND IMPROVEMENTS DEMOLISHED BY UTILITY RELOCATION WORK SHALL BE INCIDENTAL TO THE VARIOUS CONTRACT ITEMS. RESTORATION SHALL BE TO ORIGINAL OR BETTER CONDITION.

WATER :

- THE CONTRACTOR SHALL PRESSURE TEST AND DISINFECT ALL NEW WATER SYSTEMS IN ACCORDANCE WITH THE SPECIFICATIONS AND SPECIAL PROVISIONS. AND IN THE PRESENCE OF THE ENGINEER, AND RESPECTIVE AIR FORCE AND NAVY INSPECTORS.
- THE CONTRACTOR SHALL PLUG THE ENDS OF ABANDONED WATER MAINS WITH CLASS "C" CONCRETE. PAYMENT FOR CLASS "C" CONCRETE USED AS PLUGS SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS CONTRACT ITEMS FOR THE WATER SYSTEM.
- CONCRETE IN REACTION AND TEST BLOCKS AND REINFORCED CONCRETE JACKET SHALL BE CLASS "B".
- WATER MAINS SHALL BE DUCTILE IRON, CAST IRON OR CONCRETE CYLINDER, CLASS 150 UNLESS OTHERWISE NOTED.
- ANY EXCAVATION WORK AROUND EXISTING WATER MAINS SHALL BE BY HAND ONLY.
- HECO AND HTOC UTILITY POLES, HANDHOLES, MANHOLES, DUCTLINES AND SEWER MAINS AND APPURTENANCES SHALL HAVE A MINIMUM OF THREE (3) FEET CLEARANCE FROM WATER MAINS AND OTHER WATER SYSTEM APPURTENANCES. DUCTLINES, SEWER LINES, AND GAS LINES CROSSING WATER MAINS SHALL HAVE A MINIMUM OF 6" VERTICAL CLEARANCE.
- IN FILL AREAS WHERE THE COVER (FROM THE EXISTING GROUND) OVER THE NEW MAIN IS LESS THAN THREE (3) FEET, THE CONTRACTOR SHALL FIRST FILL AND COMPACT THE AREA (TO PROVIDE A MINIMUM OF THREE (3) FEET COVER) PRIOR TO TRENCHING FOR THE NEW MAIN.
- A.C. COUPLINGS AS ITEMIZED ON THE PLANS SHALL BE CONSIDERED INCIDENTAL AND INCLUDED IN THE PAYMENT FOR A.C. PIPES.
- ALL GATE VALVES, FIRE HYDRANTS AND OTHER APPURTENANCES INDICATED AS "RE LOCATED" ON THE PLANS SHALL BE REMOVED, CLEANED, PAINTED AND REINSTALLED AT THE NEW LOCATION BY THE CONTRACTOR UNLESS OTHERWISE SPECIFIED.
- ALL EXISTING WATER LINES SHALL BE ABANDONED IN PLACE UNLESS OTHERWISE NOTED. THE CONTRACTOR HAS THE OPTION OF EITHER PLUGGING OR REMOVING ABANDONED WATER LINES.
- DO NOT IMPRINT "BOARD OF WATER SUPPLY" ON THE CAST IRON COVER FOR TYPE III METER BOX.
- THE WATER SUPPLY INTO HICKAM AND WITHIN AIR FORCE WATER SYSTEMS WILL BE CUT OFF ONLY UNDER THE FOLLOWING CONDITIONS:
 - HICKAM SHALL BE GIVEN 2 WEEKS NOTICE PRIOR TO EACH WATER OUTAGE. IF THE PROPOSED WATER OUTAGE INTERFERES WITH CRITICAL MILITARY OPERATIONS, THE OUTAGE SHALL BE RESCHEDULED.
 - EACH WATER OUTAGE SHALL BE LIMITED TO 8 HOURS MAXIMUM. OUTAGES SHALL BE BETWEEN THE HOURS OF 9:30 P.M. AND 5:30 A.M.
 - NO AREA SHALL HAVE A WATER OUTAGE 2 CONSECUTIVE DAYS.
- MINIMUM CLEARANCES BETWEEN FIRE HYDRANTS AND UTILITY POLES OR LIGHT STANDARDS SHALL BE 3 FEET.
- CONNECTIONS TO NAVY WATER SYSTEMS:
 - THE CONTRACTOR SHALL NOTIFY THE NAVY PUBLIC WORKS CENTER (PWC) 2 WEEKS PRIOR TO CONDUCTING ANY WORK ON EXISTING NAVY WATER SYSTEMS.
 - THE CONTRACTOR SHALL OBTAIN PERMISSION FROM THE NAVY PWC PRIOR TO OPERATING ANY VALVES.
 - ONCE SERVICE HAS BEEN INTERRUPTED, THE CONTRACTOR SHALL WORK CONTINUOUSLY UNTIL THE CONNECTIONS HAVE BEEN COMPLETED AND SERVICE RESTORED.
 - CONNECTIONS SHALL BE MADE IN THE PRESENCE OF NAVY PWC INSPECTORS.

SEWER :

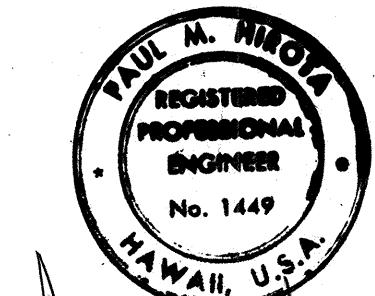
- THE UPPER THREE (3) FEET OF ABANDONED NAVY SEWER MANHOLES SHALL BE COMPLETELY REMOVED AND ALL MANHOLES SHALL BE FILLED WITH SAND.
- ALL EXISTING SEWER LINES TO BE ABANDONED UNLESS OTHERWISE NOTED. THE CONTRACTOR HAS THE OPTION OF EITHER PLUGGING OR REMOVING ABANDONED SEWER LINES.
- SEWER LINES SHALL BE CLASS III REINFORCED CONCRETE PIPES UNLESS OTHERWISE NOTED.
- 21-INCH SEWERS SHALL BE INSTALLED WITH CONTINUOUS CONCRETE CRADLE EXCEPT AT REINFORCED CONCRETE JACKET.

GAS :

- ALL TRENCH & STRUCTURAL EXCAVATION FOR THE RELOCATION OF THE GAS MAIN FACILITIES SHALL BE DONE BY THE CONTRACTOR. FURNISHING OF PIPE, FITTINGS, VALVES & APPURTENANCES AND THE INSTALLATION OF GAS MAIN FACILITIES SHALL BE THE RESPONSIBILITY OF GASCO, INC. THE CUTTING, PLUGGING, AND RECONNECTING OF LIVE GAS LINES SHALL BE DONE BY GASCO, INC. BOTH PARTIES SHALL MUTUALLY COORDINATE THE WORK TO MINIMIZE CONFLICTS AND DELAYS TO EITHER PARTY.
- ALL GAS LINES SHALL HAVE A MINIMUM OF 12" CLEARANCE FROM ANY STRUCTURE OR UTILITY. WHERE THE CLEARANCE IS LESS THAN 12", THE GAS LINE SHALL BE PROTECTED WITH A GASCO, INC. APPROVED INSULATED MATERIAL.
- THE GASCO, INC. GAS PIPE LINES IN THE PROJECT AREA ARE PLASTIC COATED AND CATHODICALLY PROTECTED. THE CONTRACTOR SHALL BE EXTREMELY CAREFUL WHEN WORKING NEAR THESE GAS PIPE LINES.
- THE CONTRACTOR SHALL CALL GASCO, INC. A MINIMUM OF 48 HOURS BEFORE STARTING EXCAVATION TO ARRANGE FOR FIELD LOCATION OF ALL EXISTING GAS PIPE LINES. THE TELEPHONE NUMBER IS 548-2126 DURING BUSINESS HOURS, AND 548-2123 AFTER HOURS.

THE CONTRACTOR SHALL EXCAVATE AND BACKFILL AROUND GAS PIPE LINES IN THE PRESENCE OF A GASCO, INC. REPRESENTATIVE. ALL BACKFILL WITHIN SIX INCHES OF GAS PIPE LINE SHALL BE SELECT CUSHION MATERIAL APPROVED BY GASCO, INC.
- FOR RELOCATION OF ANY GAS PIPE LINE, THE CONTRACTOR SHALL NOTIFY GASCO, INC. FIVE WORKING DAYS BEFORE STARTING WORK. THE CONTRACTOR SHALL PROVIDE THE NECESSARY EXCAVATION AND BACKFILL, ARRANGE FOR TRAFFIC PERMITS AND RESTORE SIDEWALK PAVEMENT OR OTHER FACILITIES.
- THE CONTRACTOR SHALL NOTIFY GASCO, INC. IMMEDIATELY AFTER ANY DAMAGE HAS BEEN CAUSED TO EXISTING GAS PIPELINES. THEIR COATINGS OR THEIR CATHODIC PROTECTION DEVICES. REPAIR WORK ON THIS DAMAGE SHALL BE DONE BY GASCO, INC. WITH PAYMENT FOR THIS WORK TO BE BORNE BY THE CONTRACTOR.
- MINIMUM VERTICAL OR HORIZONTAL CLEARANCE BETWEEN GAS PIPE LINES AND OTHER PIPELINES, CONDUITS, OR DUCTLINES SHALL BE 12 INCHES. ADEQUATE SUPPORT AND PROTECTION FOR GAS PIPE LINES EXPOSED IN THE TRENCH SHALL BE PROVIDED. SUCH SUPPORT AND PROTECTION SHALL BE APPROVED BY GASCO, INC.
- THE CONTRACTOR SHALL WORK IN AN EXPEDITIOUS MANNER IN ORDER TO KEEP UNCOVERED GAS PIPE LINES EXPOSED FOR AS SHORT A PERIOD OF TIME AS POSSIBLE.
- CATHODIC PROTECTION DEVICES WILL BE FURNISHED AND INSTALLED BY GASCO.

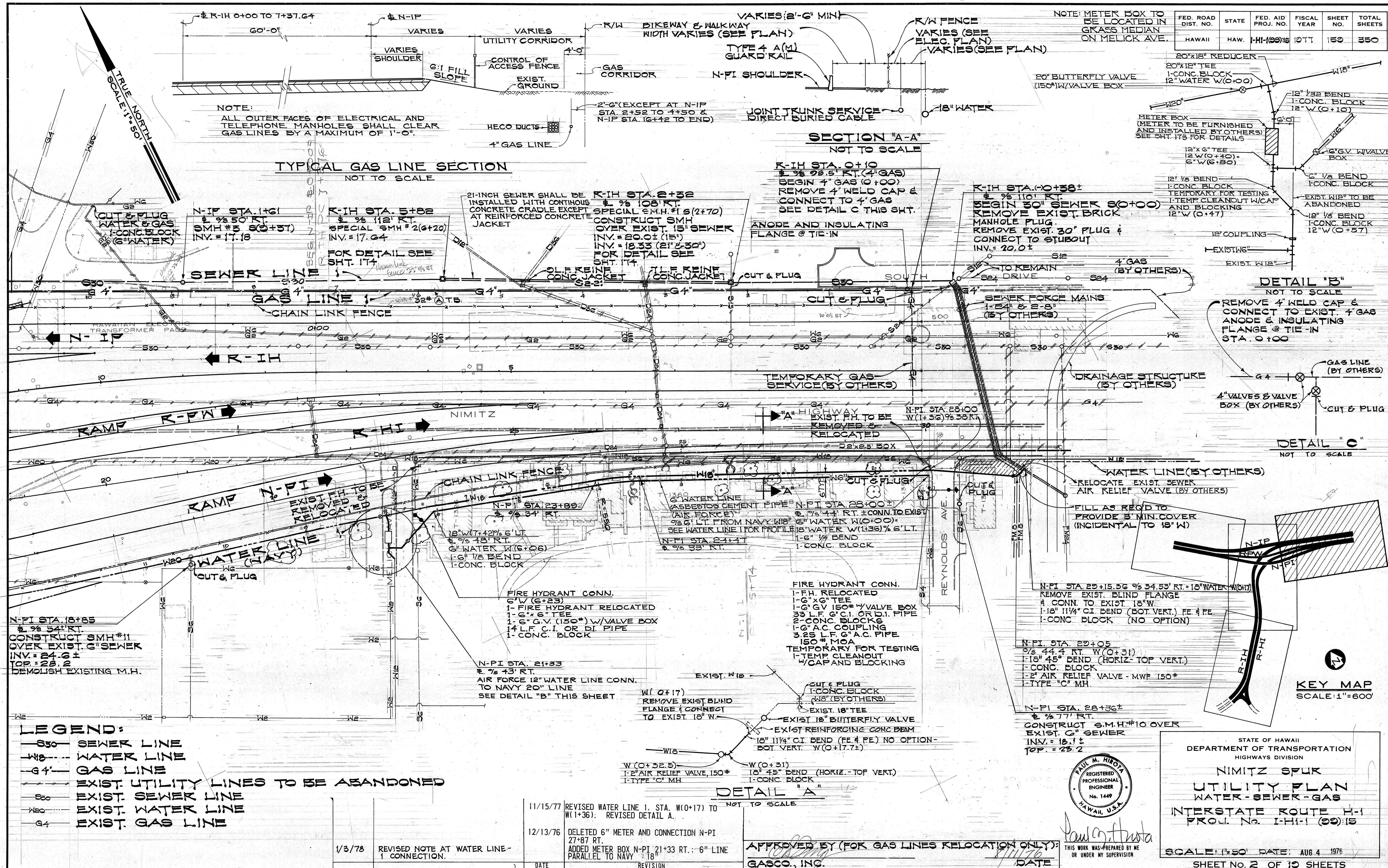
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DRAWN BY	
TRACED BY	
QUANTITIES BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
NO.	



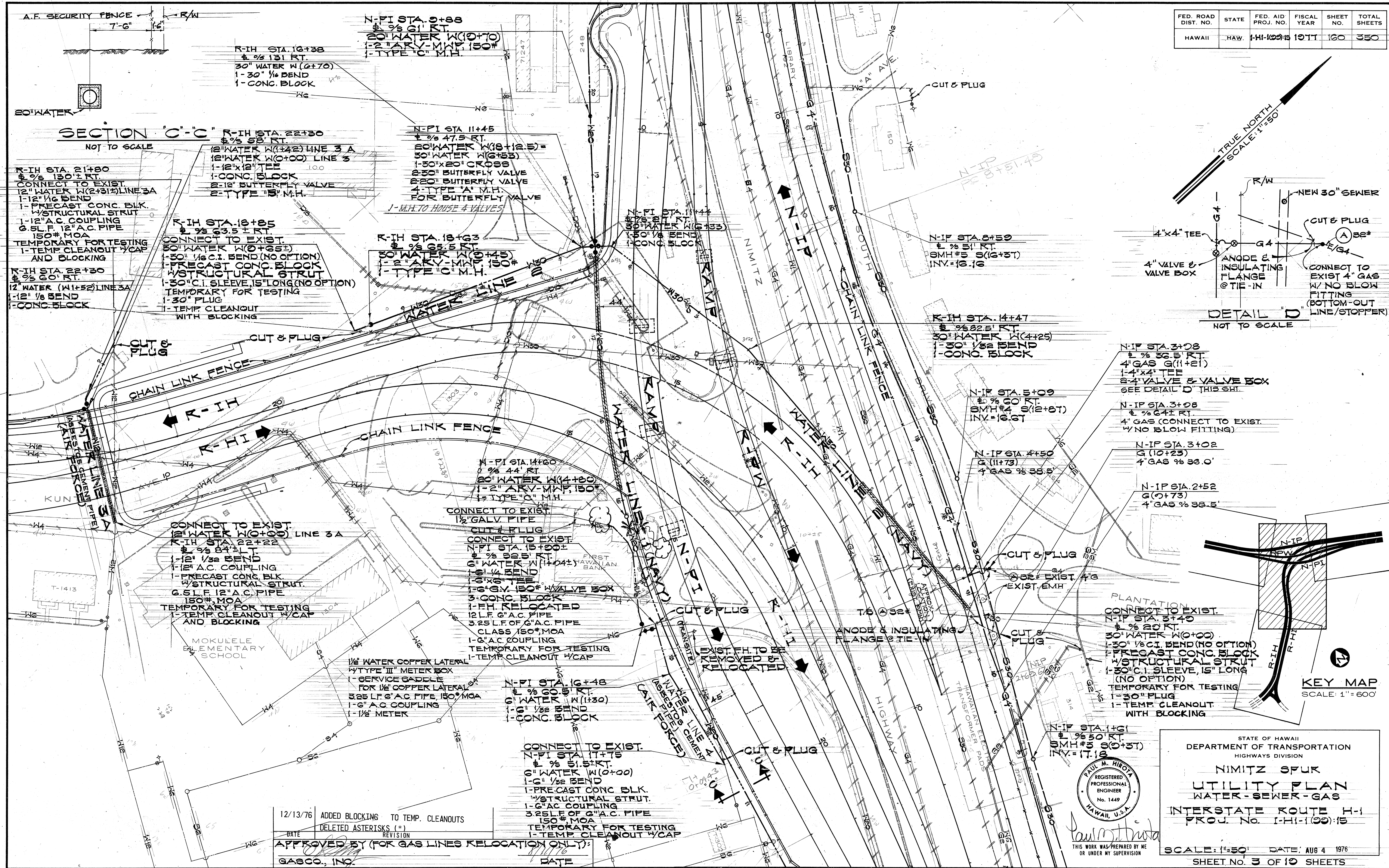
THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION

12/13/76	WATER NOTES: REVISED NOTE 1 AND 12 ADDED NOTE 14
DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION NIMITZ SPUR GENERAL UTILITY NOTES WATER, SEWER & GAS INTERSTATE ROUTE H-1 PROJ. NO. 1-HI-1(93)15	
NO SCALE:	DATE: AUG 4 1976
SHEET No. 1 OF 10 SHEETS	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-H-1(99)15	1977	150	350



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-109:15	1977	160	350



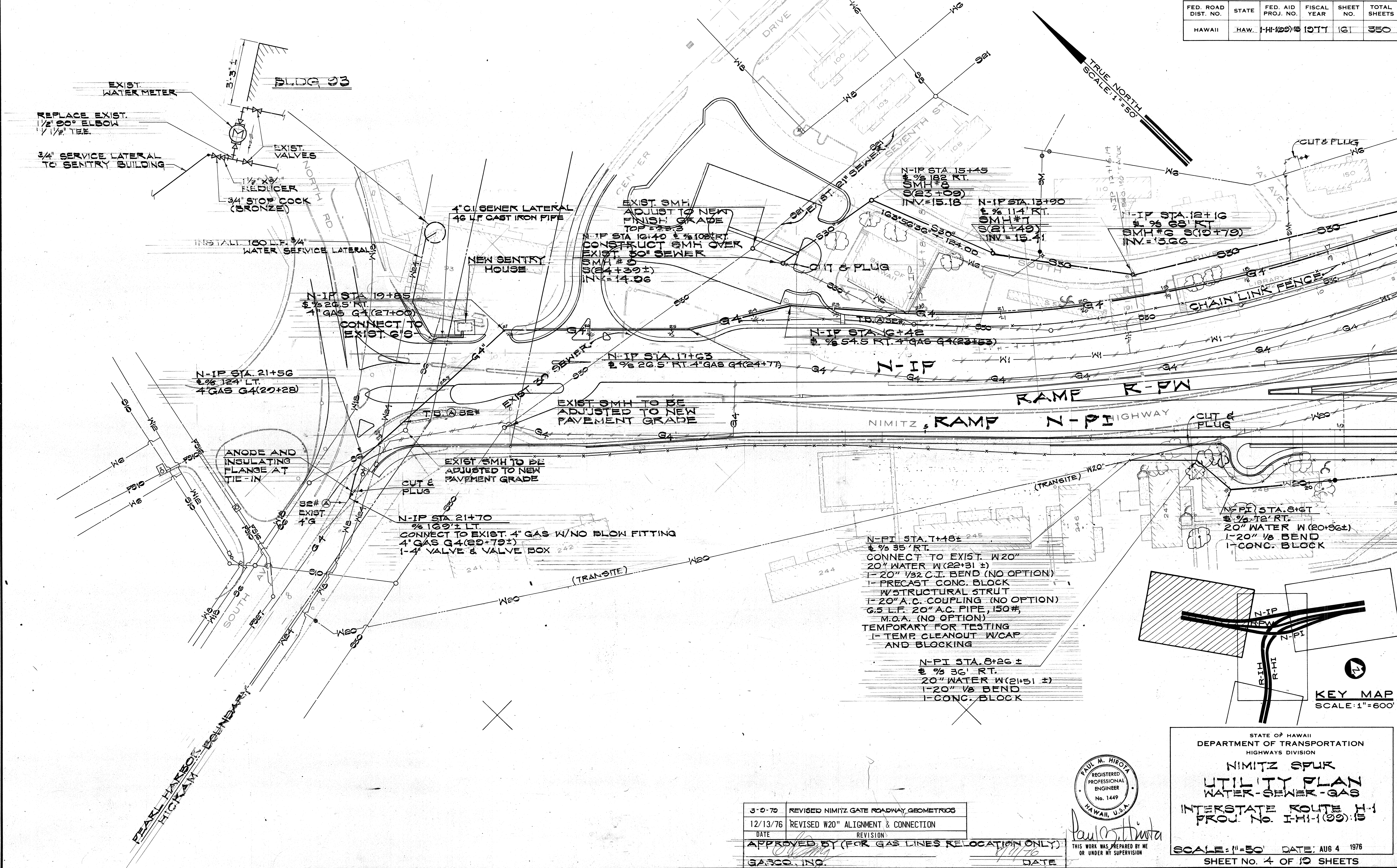
DATE
SURVEY PLOTTED BY
DESIGNED BY
CHECKED BY
ORIGINAL PLAN
NOTE BOOK
QUANTITIES BY

0-57

PRINTED ON NO. 10000 CLEARPRINT

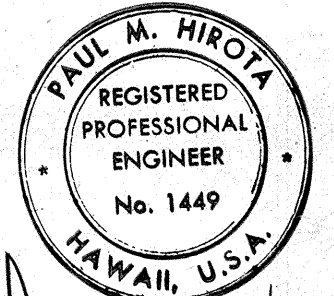
UTILITY & SEWER, WATER

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-109-15	1977	161	350



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

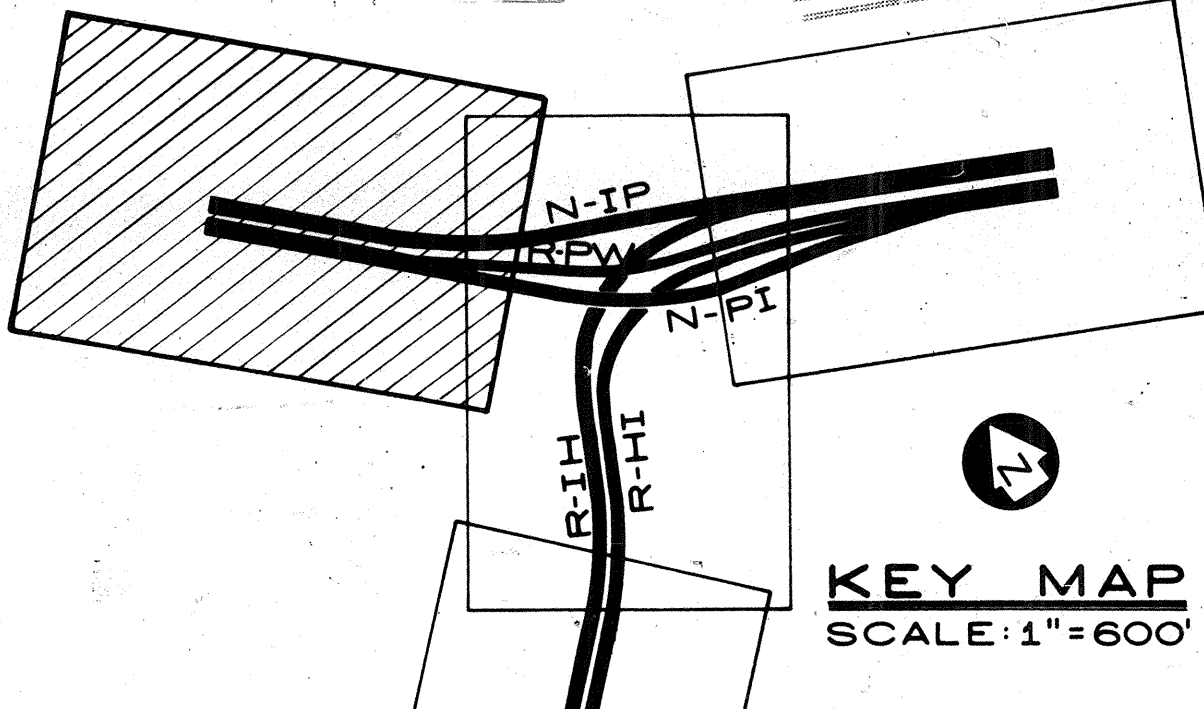
3-9-79	REVISED NIMITZ GATE ROADWAY GEOMETRICS
12/13/76	REVISED W20" ALIGNMENT & CONNECTION
DATE	REVISION
APPROVED BY (FOR GAS LINES RELOCATION ONLY)	
GARCO, INC.	DATE



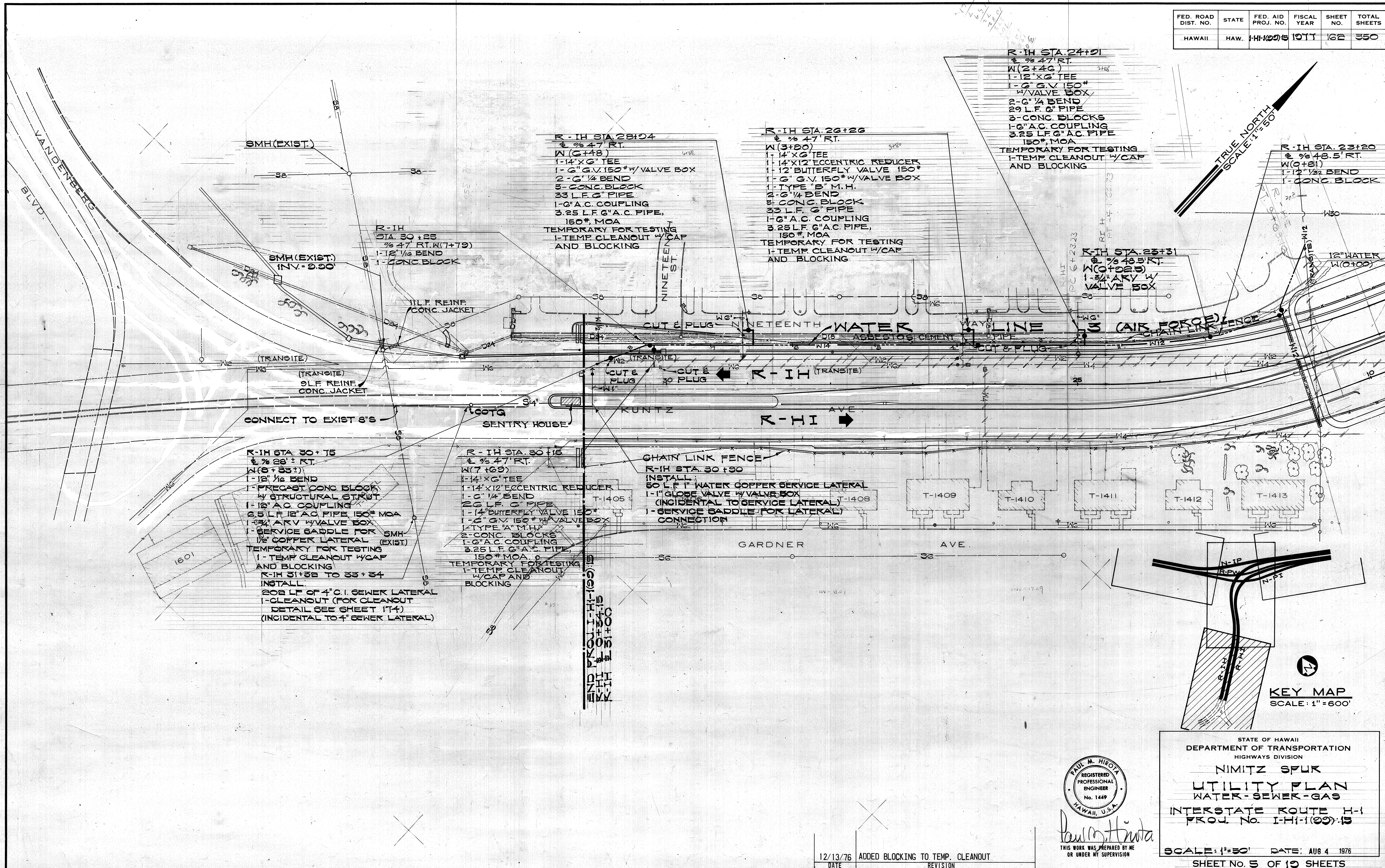
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**NIMITZ SPUR
UTILITY PLAN
WATER-SEWER-GAS**
INTERSTATE ROUTE I-1
PROJ. NO. I-HI-109-15

SCALE: 1"=50' DATE: AUG 4 1976
SHEET NO. 4 OF 10 SHEETS

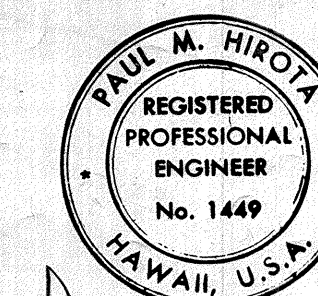


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HI-100-15	1977	162	350



DATE	12/13/76
SURVEY PLOTTED BY	PAUL M. HIROTA
DRAWN BY	PAUL M. HIROTA
TRACED BY	PAUL M. HIROTA
DESIGNED BY	PAUL M. HIROTA
CHECKED BY	PAUL M. HIROTA
NO.	1

12/13/76 DATE
ADDED BLOCKING TO TEMP. CLEANOUT REVISION



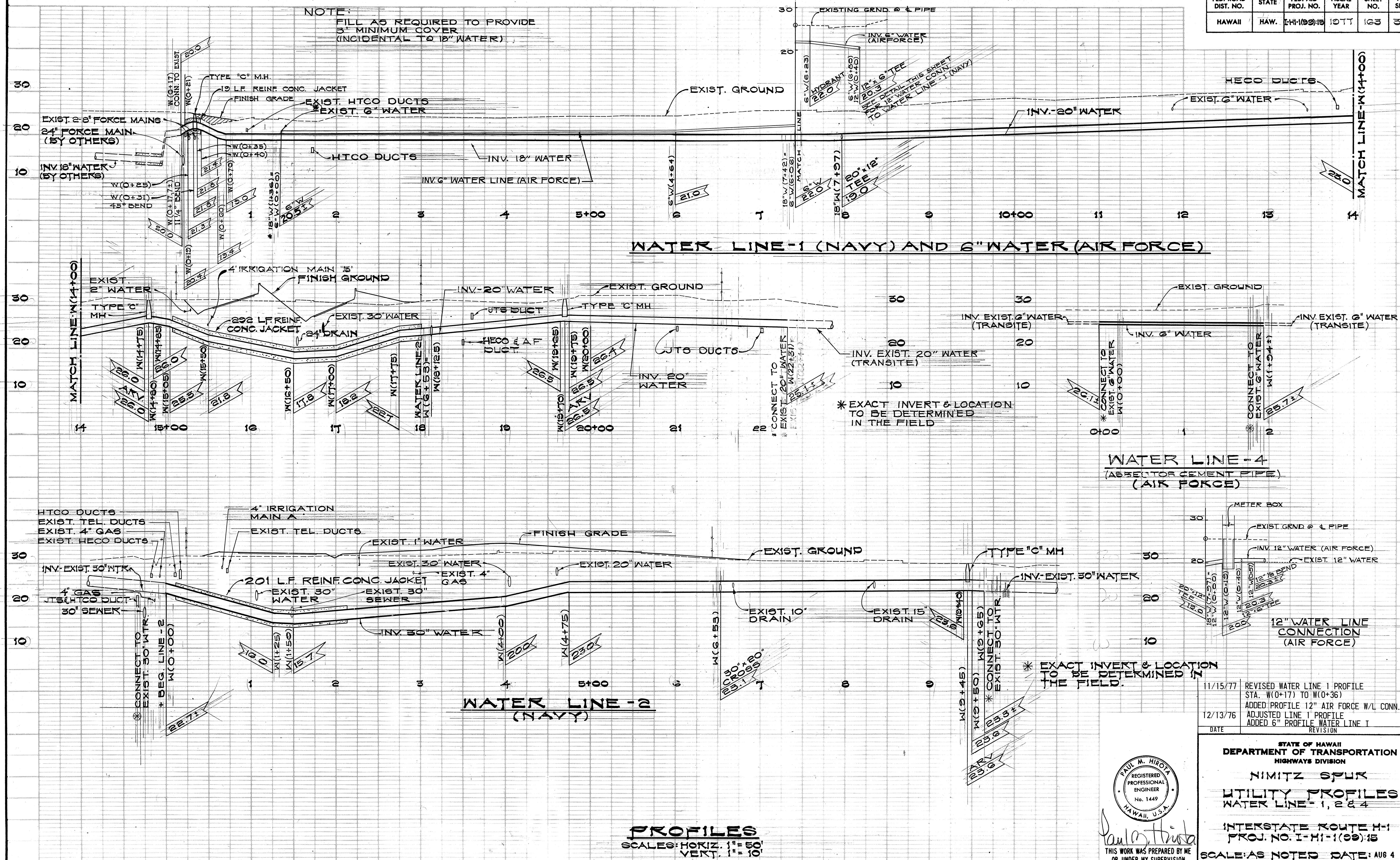
THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
NIMITZ SPUR
UTILITY PLAN
WATER-SEWER-GAS
INTERSTATE ROUTE H-1
PKOL No. I-H-1(99)-15
SCALE: 1" = 50' DATE: AUG 4 1976
SHEET No. 5 OF 10 SHEETS

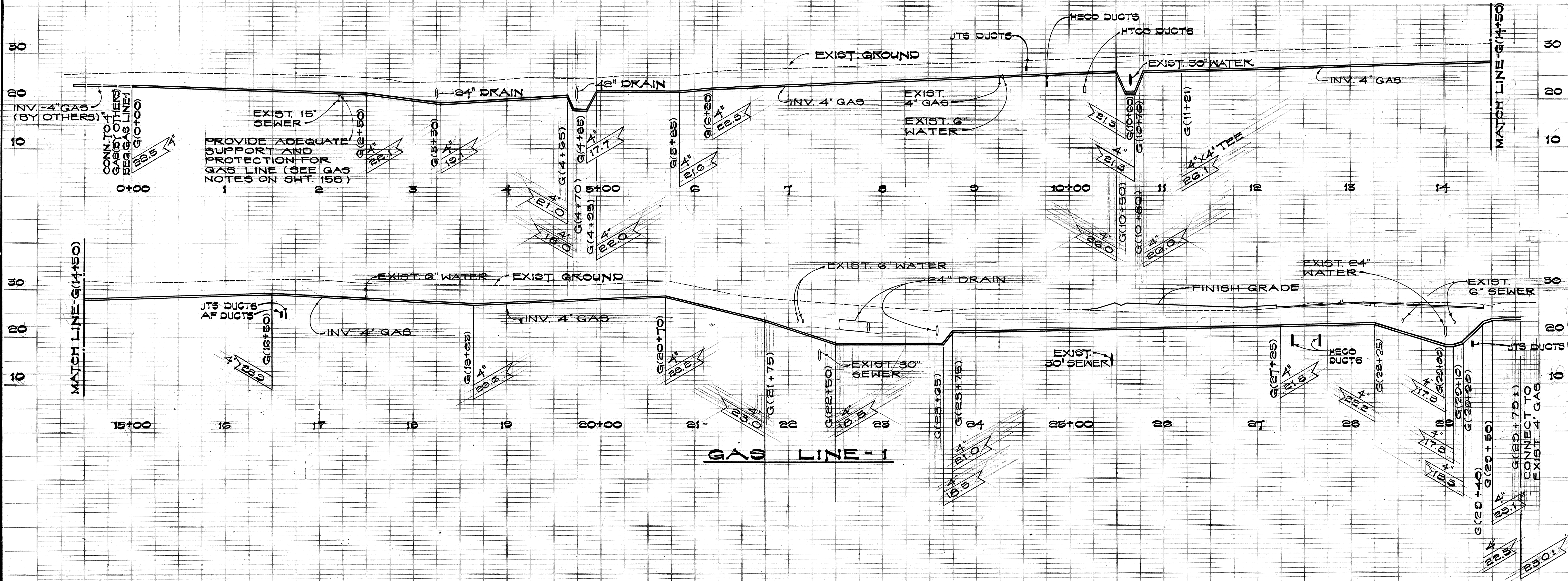
ADD. 162

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-H-1(99)15	1977	163	350

NOTE:
FILL AS REQUIRED TO PROVIDE
3" MINIMUM COVER
(INCIDENTAL TO 18" WATER)



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	141-1(99)15	1977	165	350



SURVEY PLOTTED BY	DATE
DRAWN BY	
TRACED BY	
NOTED BY	
CHECKED BY	
NO.	

PROFILES
 SCALES: HORIZ. 1" = 50'
 VERT. 1" = 10'

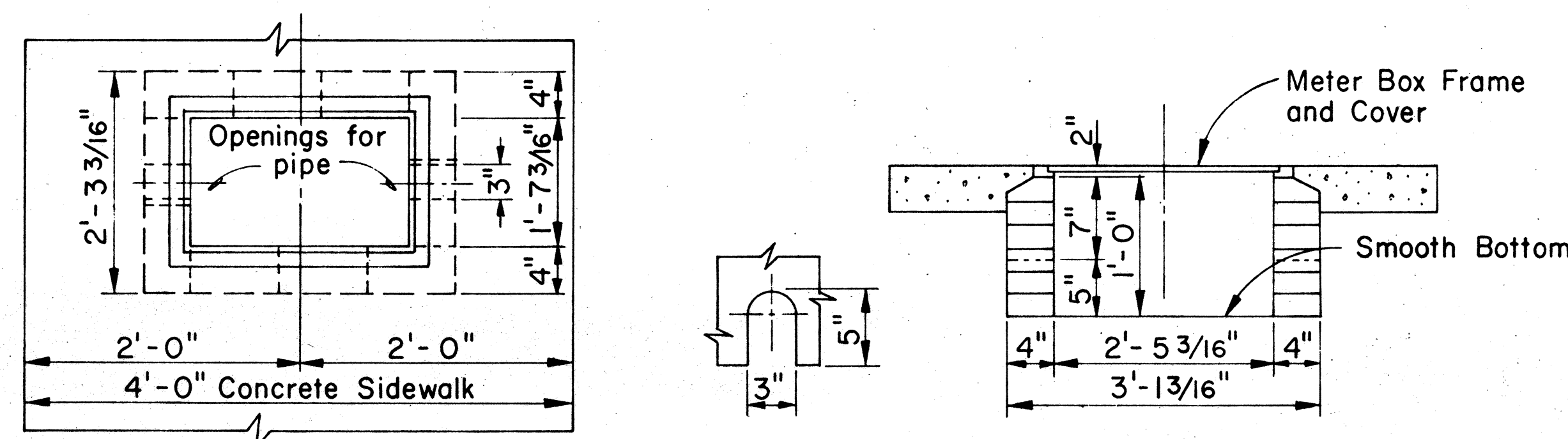
APPROVED BY (FOR GAS LINES RELOCATION ONLY)
 GASCO, INC. DATE



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 OR UNDER MY SUPERVISION

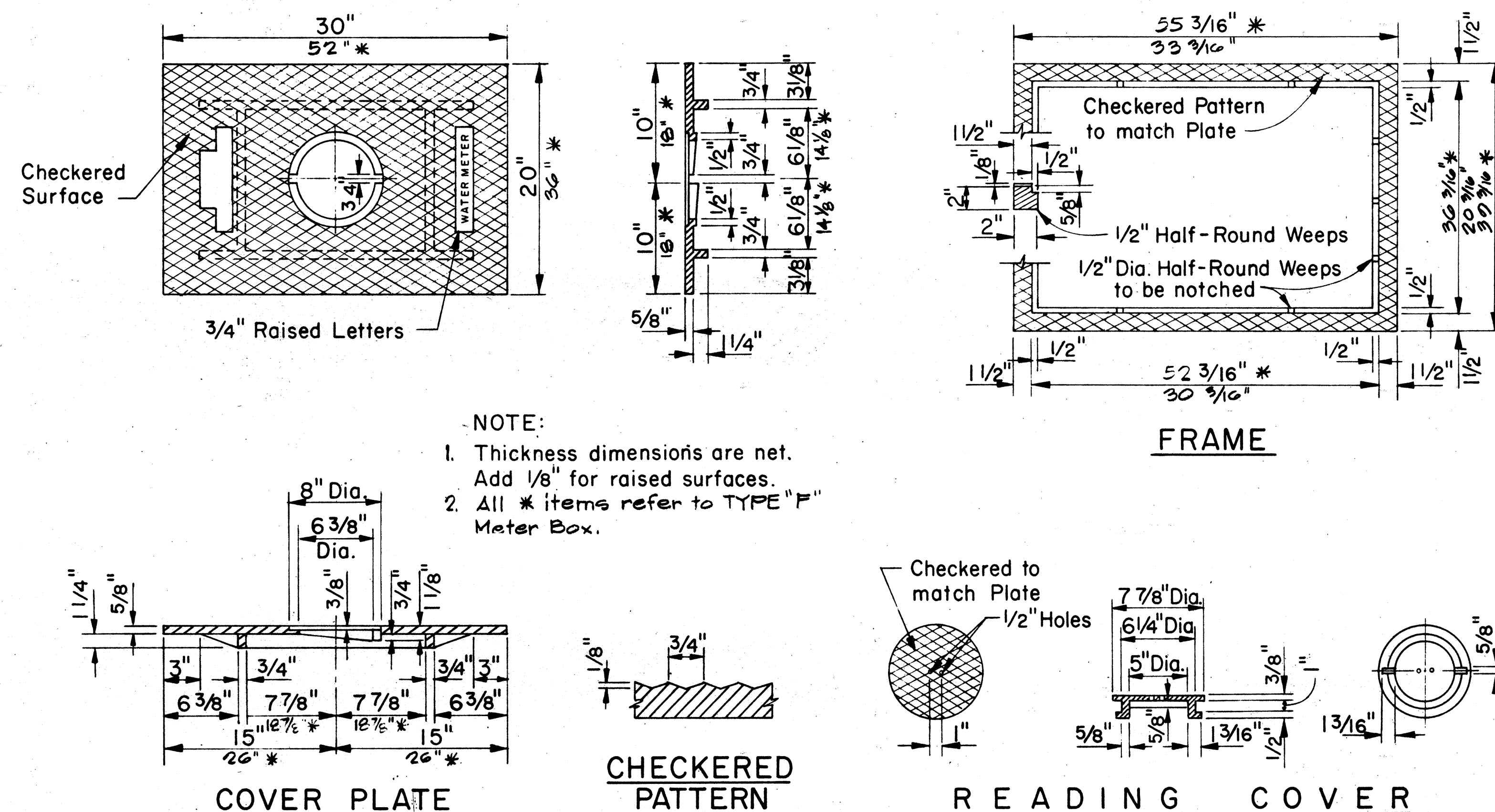
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
NIMITZ SPUR
UTILITY PROFILES
GAS LINE
 INTERSTATE ROUTE H-1
 PROJ. NO. I-HI-1(99)15
 SCALE: AS NOTED DATE: AUG 4 1976
 SHEET No. 8 OF 19 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(99)15	1977	166	350



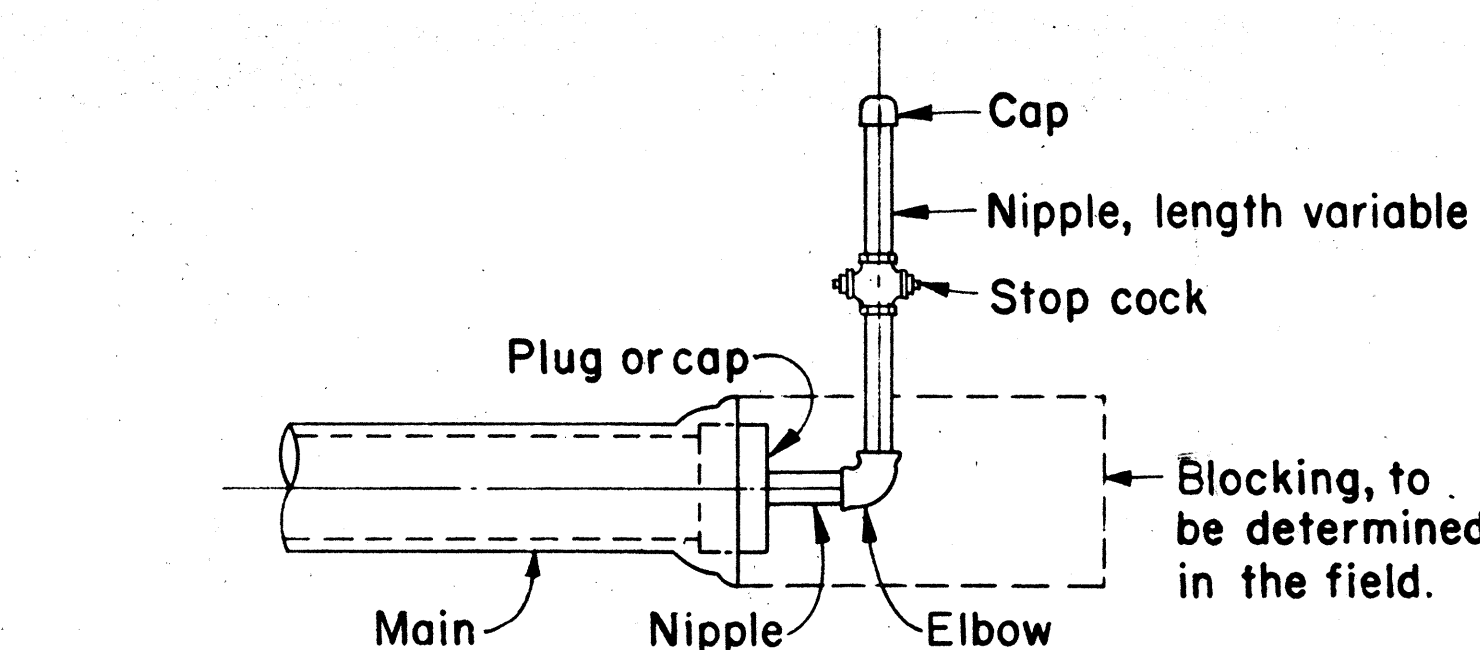
TYPE III METER BOX

FIGURE 29

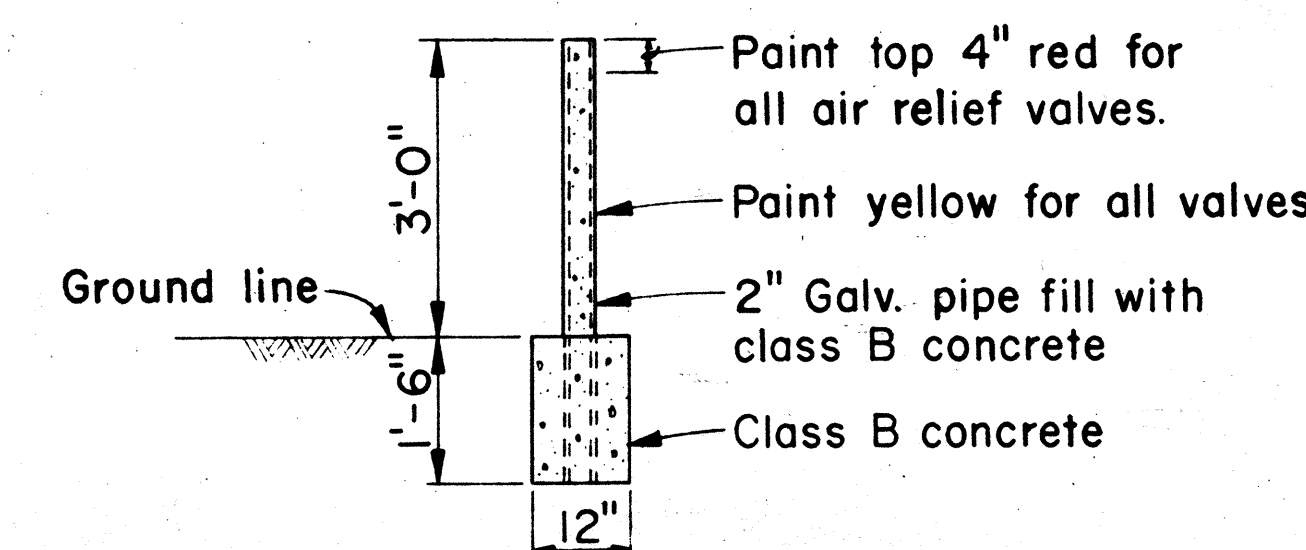


CAST IRON FRAME, PLATE AND COVER
TYPE II

FIGURE 28



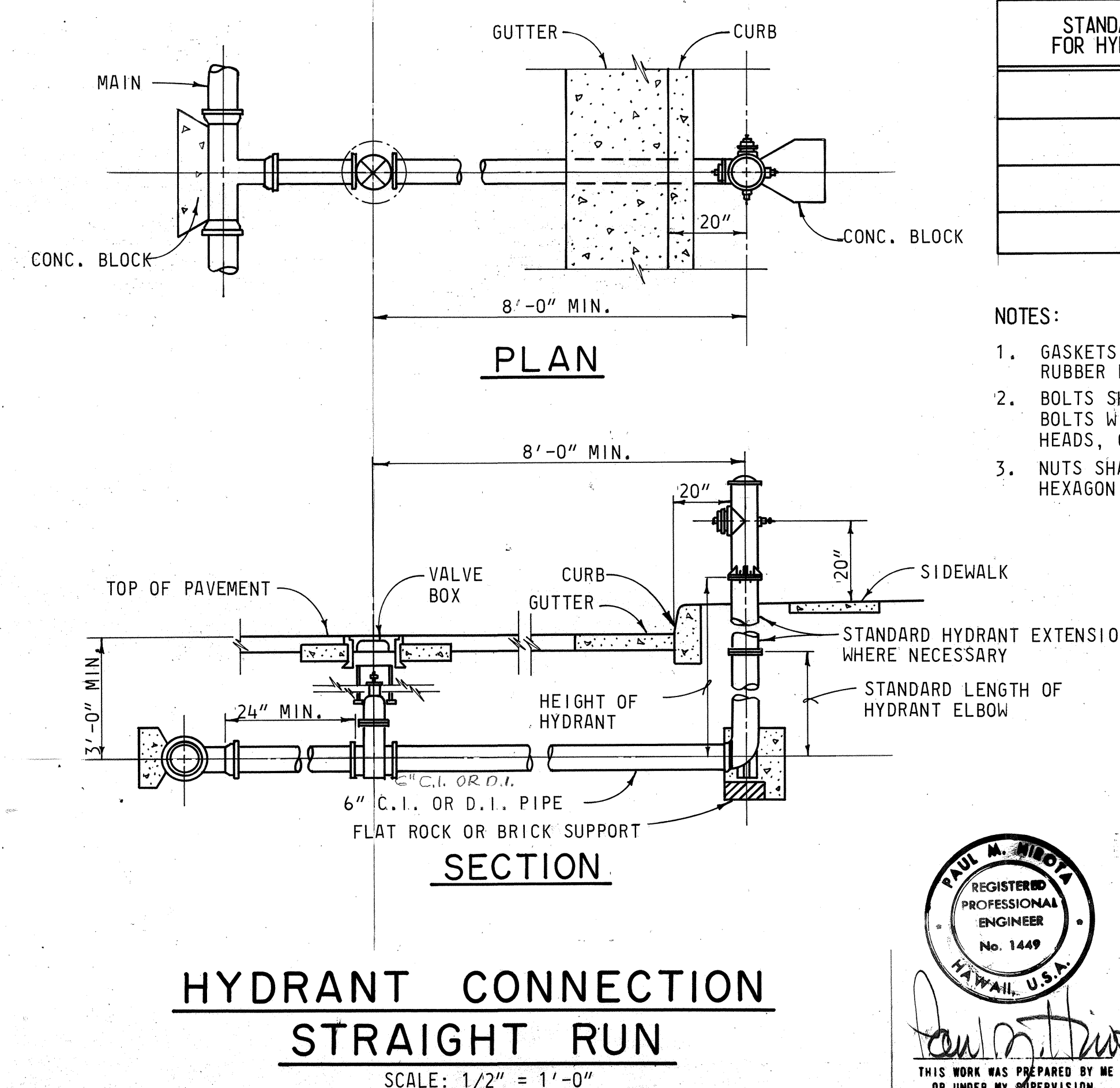
DETAIL OF TEMPORARY CLEANOUT



DETAIL OF VALVE MARKER

CLEANOUTS, RISERS AND VALVE MARKERS

FIGURE 16



HYDRANT CONNECTION
STRAIGHT RUN

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

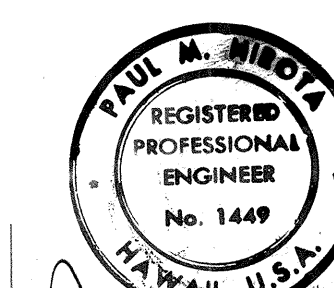
FIGURE 13

STANDARD LENGTHS FOR HYDRANT ELBOW
30"
36"
42"
48"

STANDARD HYDRANT EXTENSIONS ARE AVAILABLE IN THE FOLLOWING LENGTHS:
6 TO 30 INCHES LONG IN INCREMENTS OF 6 INCHES.

NOTES:

- GASKETS FOR FLANGED JOINTS SHALL BE 1/16" DUCK-INSERTED RUBBER PACKING GARLOCK NO. 19.
- BOLTS SHALL BE 5/8" DIAMETER X 2 3/4" LONG STEEL MACHINE BOLTS WITH CUT THREADS, AMERICAN STANDARD HEAVY HEXAGON HEADS, GALVANIZED.
- NUTS SHALL BE AMERICAN STANDARD HEAVY COLD PUNCHED HEXAGON NUTS, GALVANIZED.

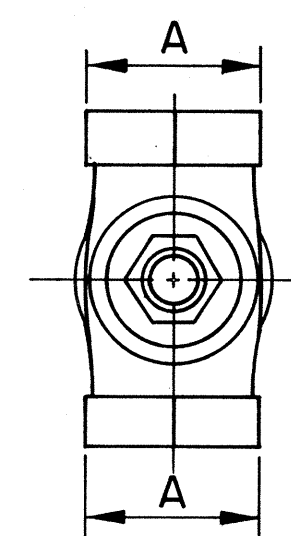


12/13/76	ADDED TO CLEANOUT NOTE 2.
DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION NIMITZ SPUR	
WATER DETAILS	
INTERSTATE ROUTE H-1 PROJ NO I-HI-1(99) 15	
SCALE AS NOTED	DATE AUG 4 1976
SHEET NO. 9 OF 13 SHEETS	

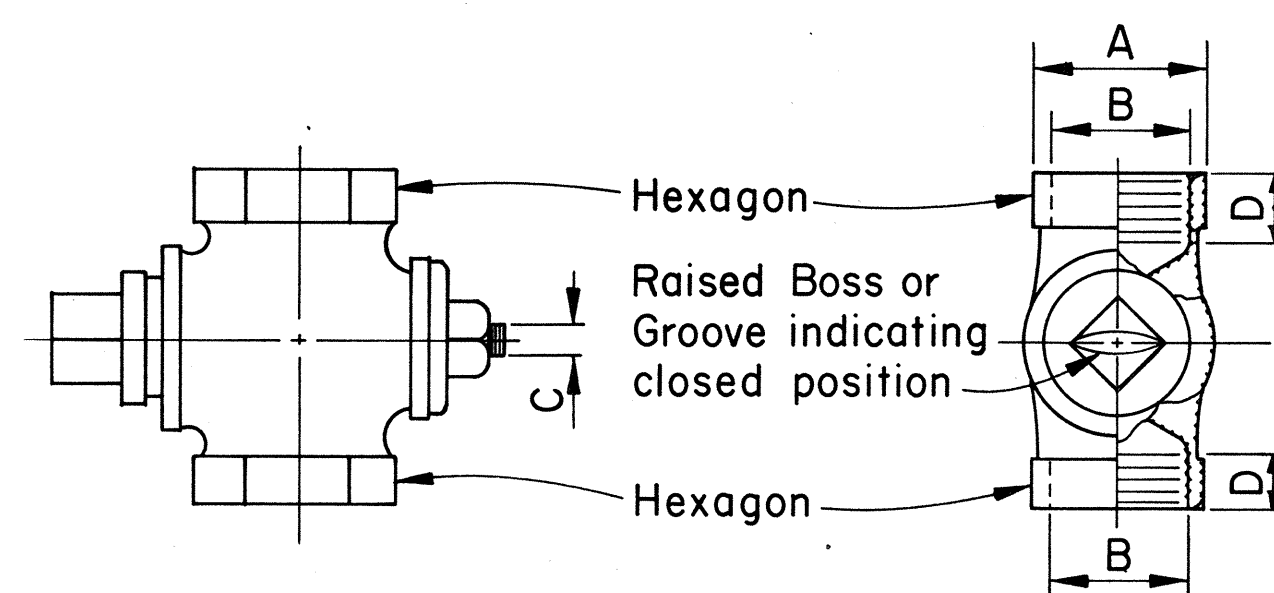
ADD. 166

All dimensions are in inches. Thread dimensions must be as shown. Dimensions A, C and D may vary but shall not be less than the minimums shown in the accompanying table. Minimum acceptable weight of complete fitting may be 5% less than average weight. Metal composition shall conform to A.S.T.M. Designation B 62. The stopcock shall have either a raised boss on the head or a groove cut into the head to indicate the open and closed position of the stopcock. The net area (in square inches) of the opening through the stopcock shall be not less than that shown in the accompanying table (E). The taper of the plug of the stopcock shall be approximately 15/8 inches to the foot. Suitable markings on all stopcocks must be made to indicate the manufacturer.

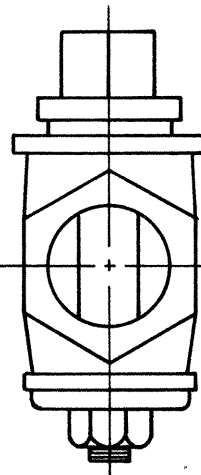
SIZE	Min- imum A	Pipe Thread B	Min- imum C	Min- imum D	Average Weight of Complete Fitting lbs. oz.	Min- imum E
1/2	1 1/8	1/2"	3/8	5/8	0 9	0.190
3/4	1 3/8	3/4"	9/16	5/8	1 2	0.428
1	1 5/8	1 "	5/8	5/8	1 10	0.746
1 1/4	2	1 1/4"	11/16	5/8	2 12	1.166
1 1/2	2 3/8	1 1/2"	3/4	3/4	4 0	1.679
2	2 7/8	2 "	7/8	7/8	6 11	2.922
2 1/2	3 5/8	2 1/2"	13/16	15/16	10 6	4.000



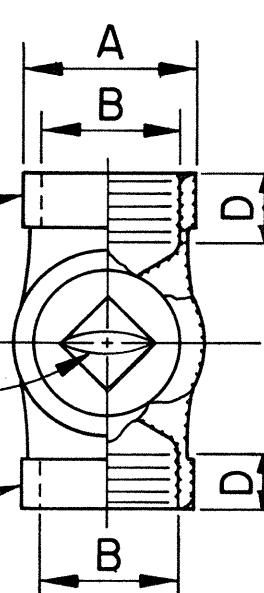
BOTTOM



SIDE



END



TOP

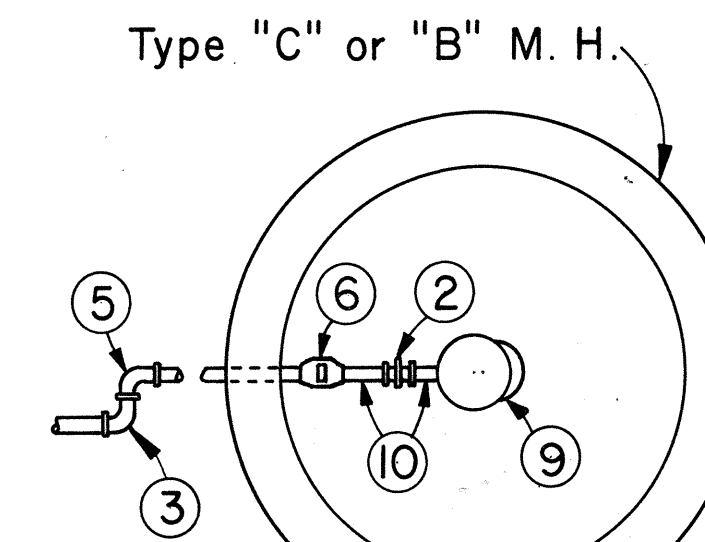
STOP COCK

NOT TO SCALE

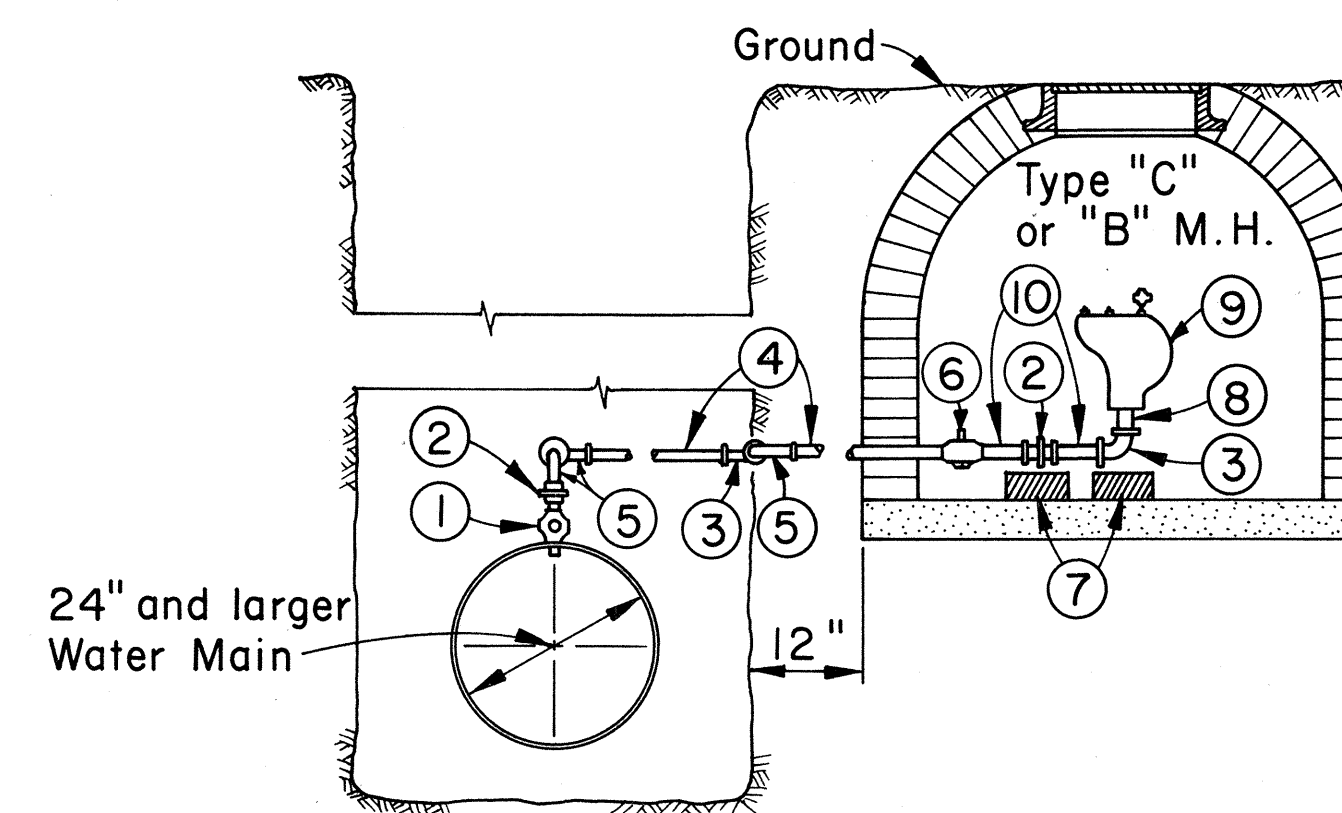
FIGURE 31

LIST OF MATERIALS

ITEM	NO. REQ.	DESCRIPTION
1	1	1 1/2" x 2" Corporation Stop
2	2	2" Union, bronze
3	3	2" 90° Elbow, bronze
4	2	2" Brass Pipe, cut to fit
5	3	2" Street Elbow
6	1	2" Stop Cock
7	2	Brick Support
8	1	2" Dia. x 4" Nipple, brass
9	1	2" Air Relief Valve
10	2	2" Dia. x 6" Nipple, brass



PLAN



ELEVATION

OFFSET MANHOLE FOR AIR RELIEF VALVE

NOT TO SCALE

FIGURE 33

DETAIL OF FIRE HYDRANT

CONCRETE PAD

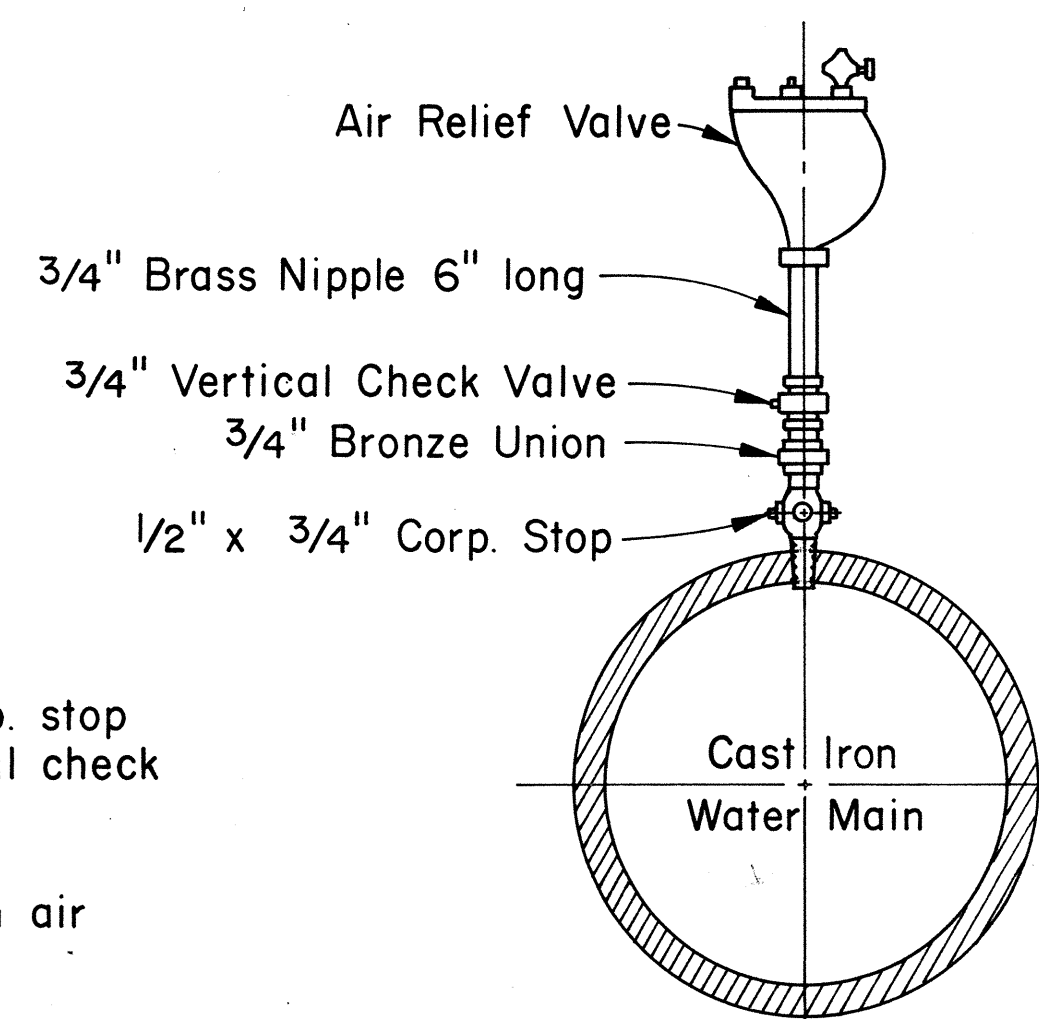
SCALE: 3/4" = 1'-0"

FIGURE 34

NOTE:

For 2" air relief valve, size of corp. stop shall be 1 1/2" x 2". Union, vertical check valve and nipple shall be 2".

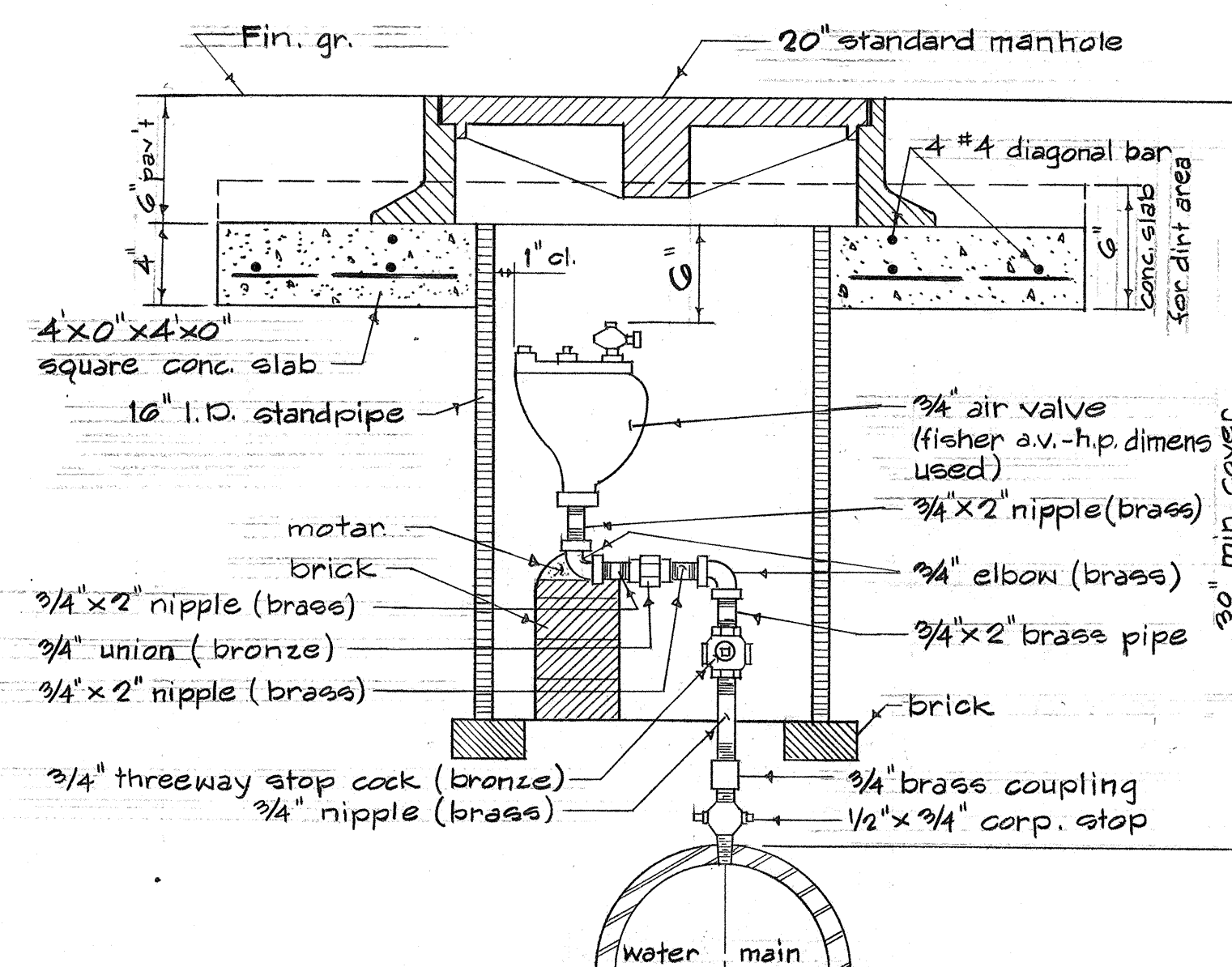
Vertical check valve required when air relief valve is immersed in water.



STANDARD CONNECTION FOR AIR RELIEF VALVE

NOT TO SCALE

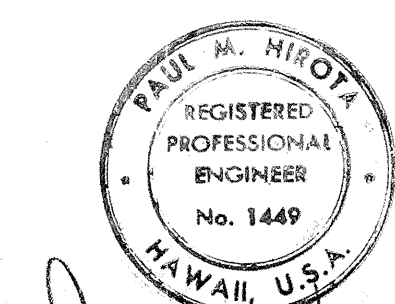
FIGURE 32



STANDARD CONNECTION FOR
3/4" AIR RELIEF VALVE AT VALVE BOX

NOT TO SCALE

FIGURE 35



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

NIMITZ SPUR

WATER DETAILS

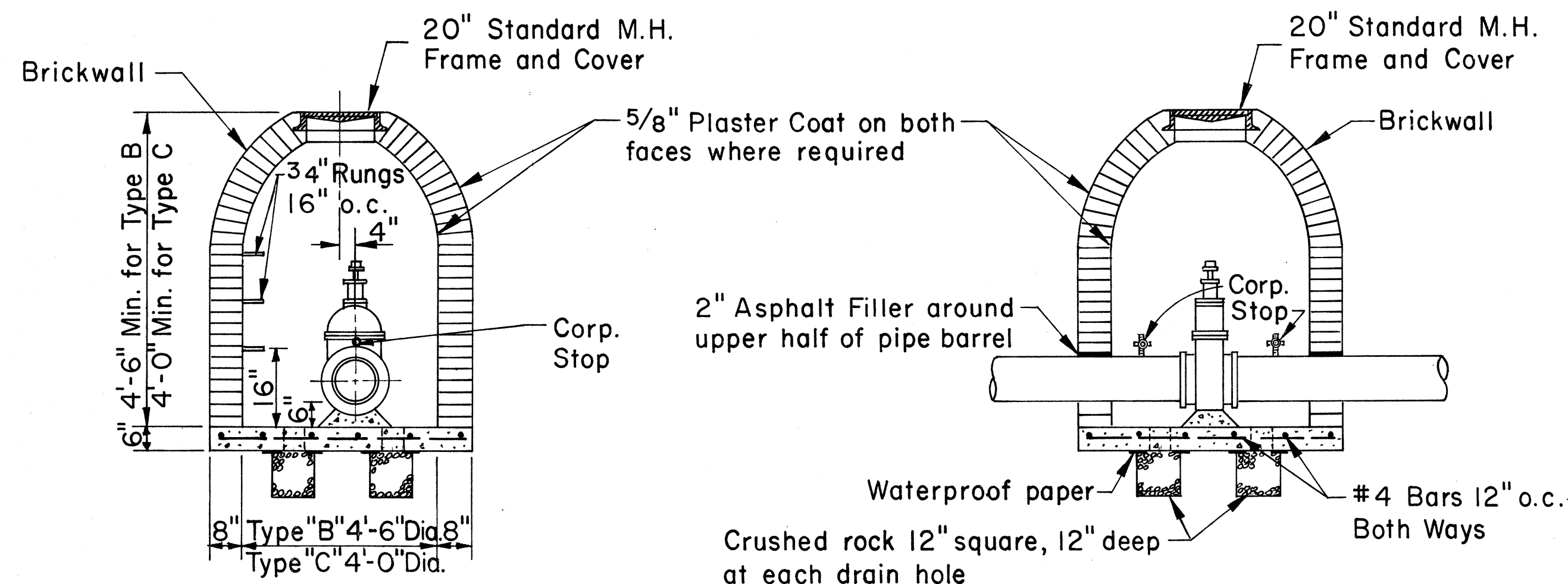
INTERSTATE ROUTE H-1
PROJ. NO. I-HI-1(99):15

SCALE: AS SHOWN

DATE: AUG 4 1976

SHEET No. 10 OF 10 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	11-100-15	1977	108	350

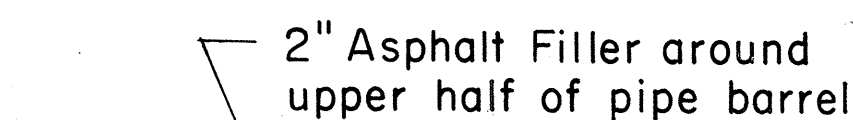


- NOTE:
1. Refer to Figure 8 for Details.
 2. Refer to Figure 9 for Corp. Stop Layout and required Corp. Stop sizes.
 3. Omit Drain Holes and Crushed Rock for Waterproofed Manholes.
 4. Concrete shall be Class B

TYPE B & C MANHOLES GENERAL ARRANGEMENT

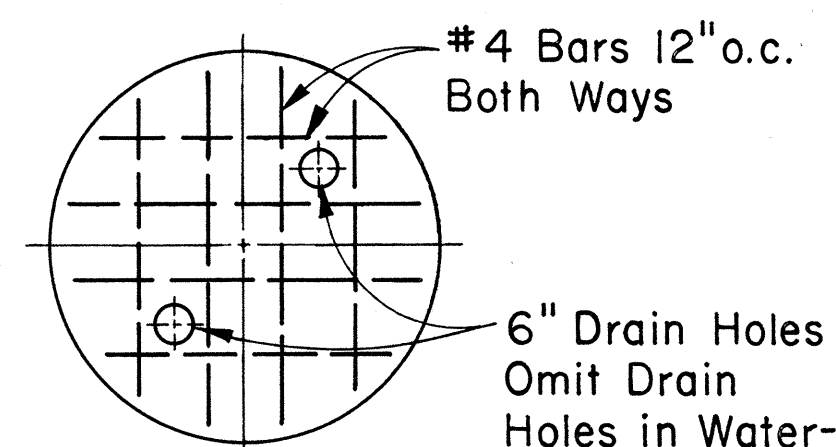
SCALE: 1/2" = 1'-0"

FIGURE 7



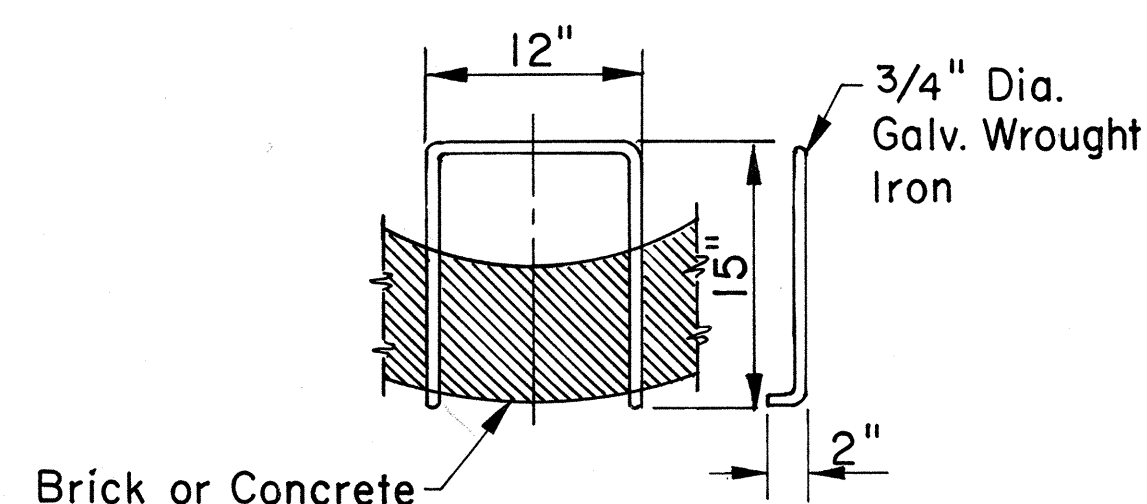
FILLER DETAIL

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



BOTTOM SLAB PLAN

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



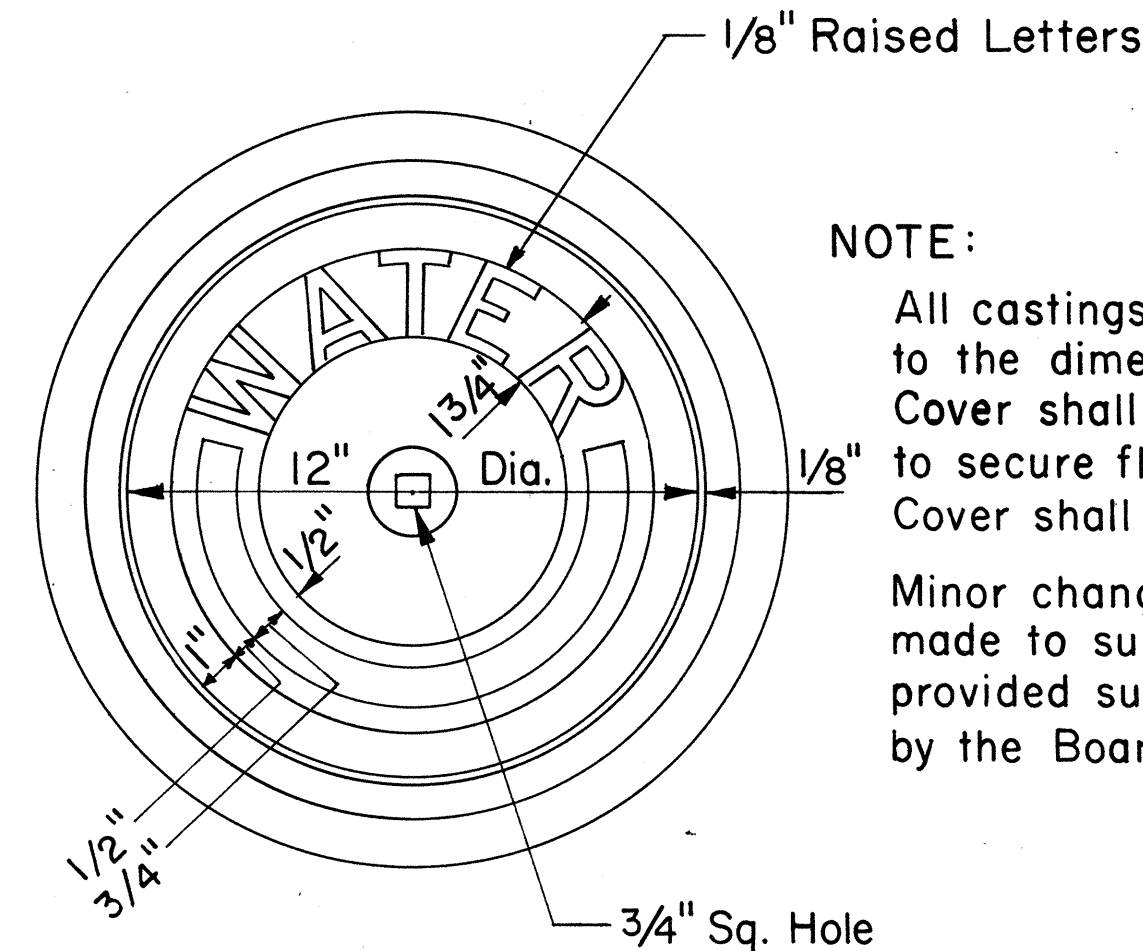
RUNG DETAIL

NOT TO SCALE

TYPE B & C MANHOLES DETAILS

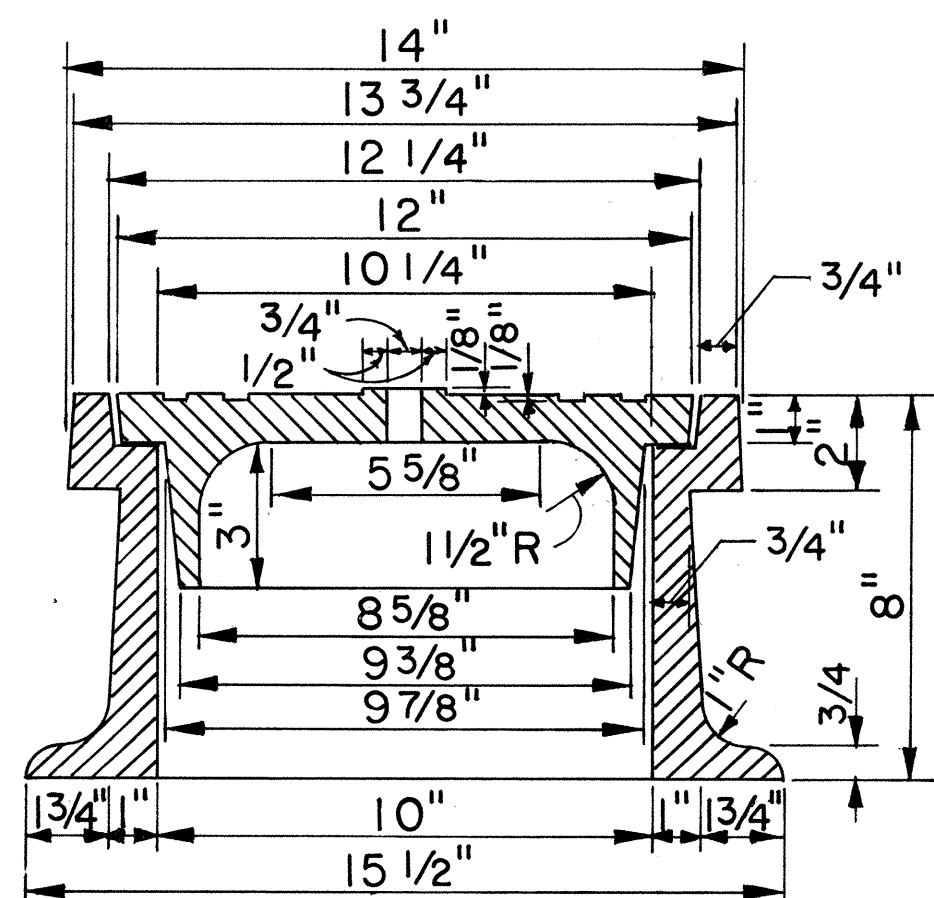
SCALE AS SHOWN

FIGURE 8



NOTE:

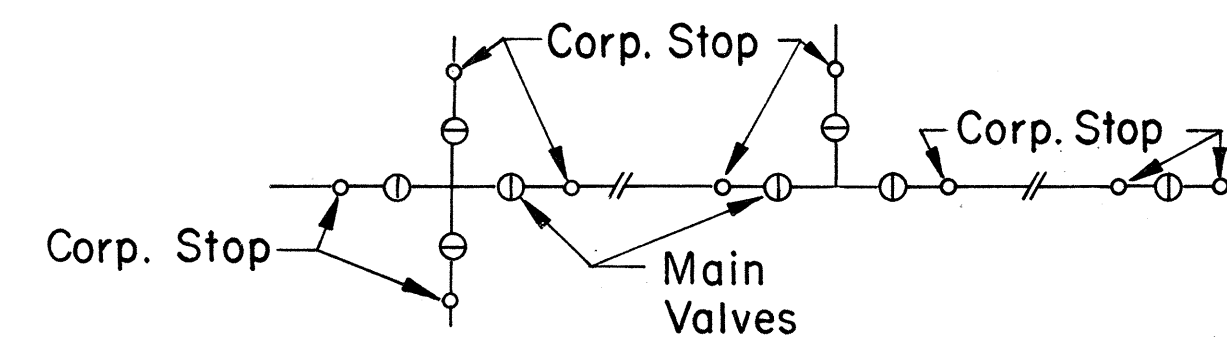
All castings shall be made accurately to the dimensions shown. Seat and Cover shall be machined, not ground to secure flat and true surfaces. The Cover shall not rattle in any position. Minor changes in dimensions may be made to suit foundry conditions provided such changes are approved by the Board of Water Supply.



VALVE BOX FRAME AND COVER

SCALE: 3" = 1'-0"

FIGURE 10



CORPORATION STOP LAYOUT

TABLE A
REQUIRED CORP. STOP SIZES AT MAIN VALES

DIA. OF MAINS (INCHES)	SIZE OF CORP. STOP
4	1" x 1/4"
6	1" x 1/4"
8	1" x 1/4"
12	1" x 1/4"
16	1" x 1/4"
20	1" x 1/4"
24	1 1/2" x 2"
30	1 1/2" x 2"
36	1 1/2" x 2"

NOTE:

For Valves on the "run" the size of one Corp. Stop shall be as shown in Table A. The other Corp. Stop shall be 1" x 1/4" for all sizes of pipes.

Whenever the Corp. Stop at the Valve must be used for flushing the main, the size of the Corp. Stop shall be the maximum size permitted for the main.

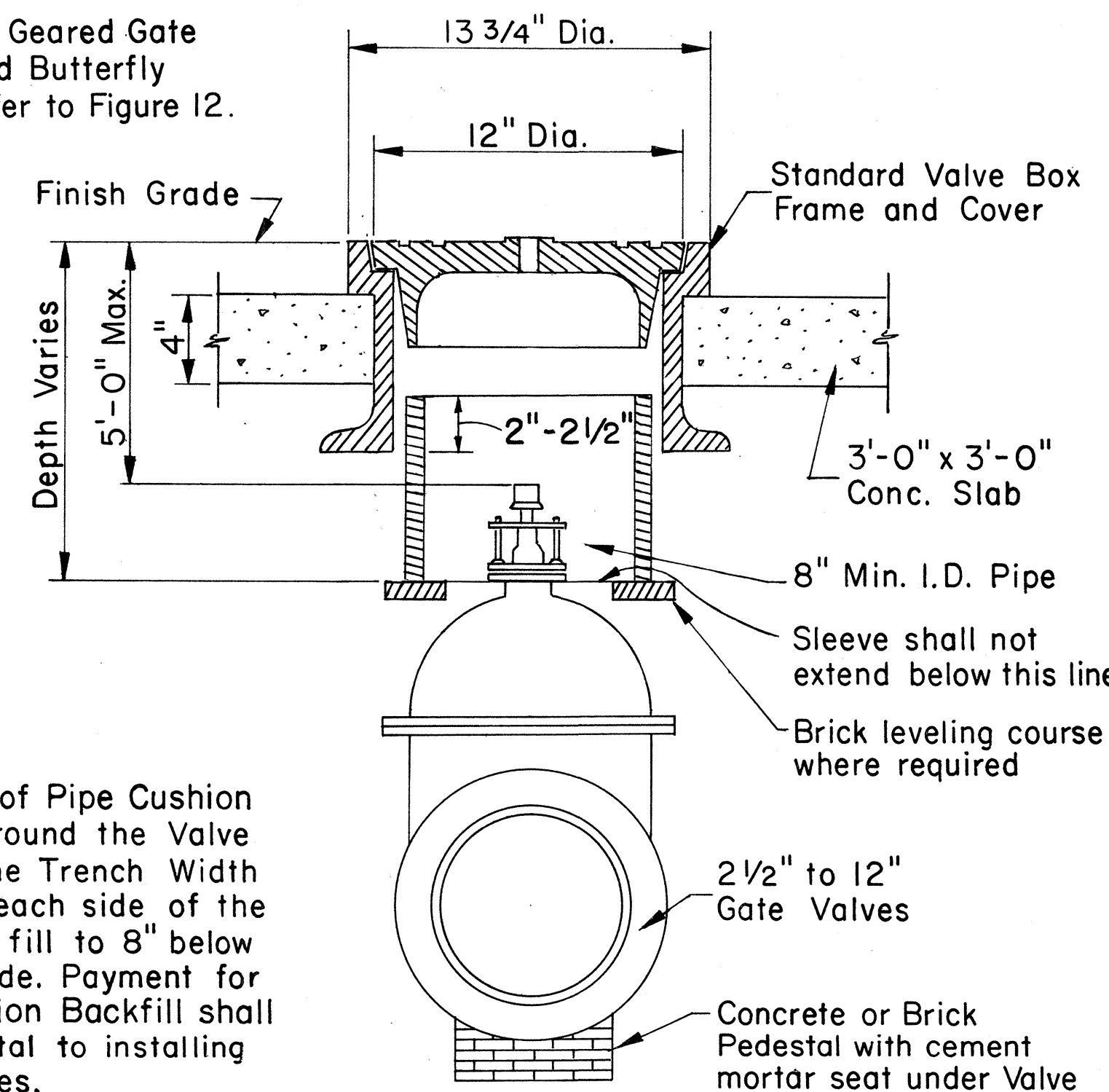
CORPORATION STOP LAYOUT AND SIZES

NOT TO SCALE

FIGURE 9

NOTE:

For Bevel Geared Gate Valves and Butterfly Valves refer to Figure 12.

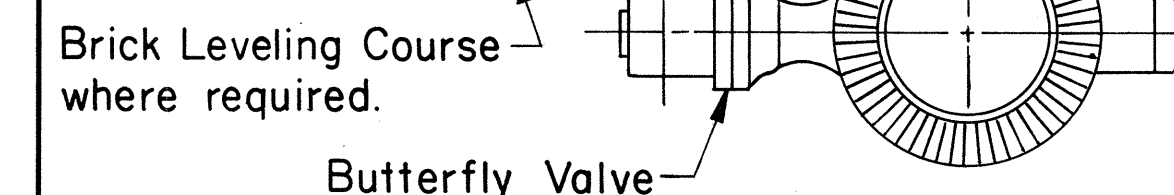
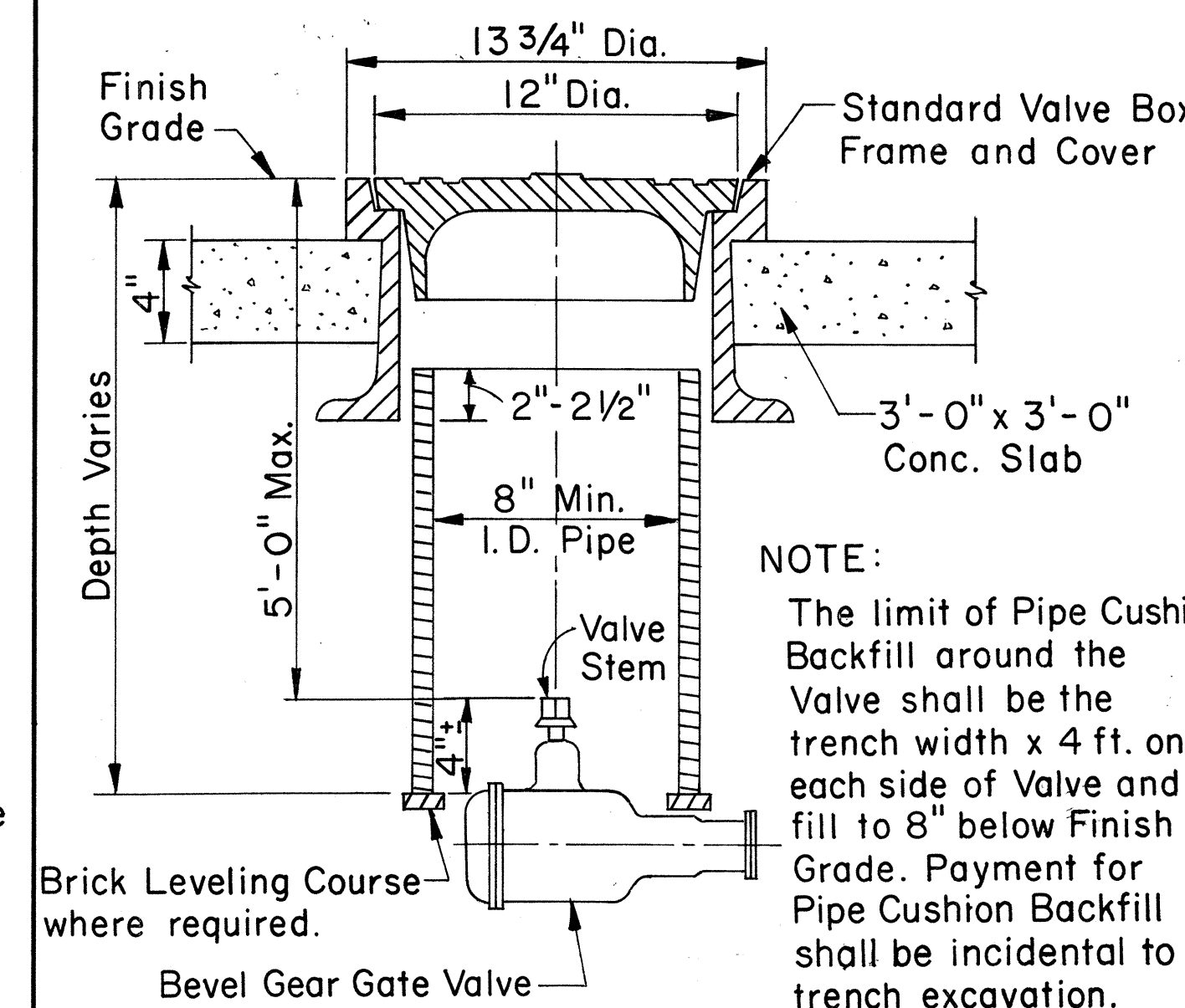


The limit of Pipe Cushion Backfill around the Valve shall be the Trench Width x 4 ft. on each side of the Valve and fill to 8" below Finish Grade. Payment for Pipe Cushion Backfill shall be incidental to installing valve boxes.

VALVE BOX INSTALLATION FOR GATE VALVES

NOT TO SCALE

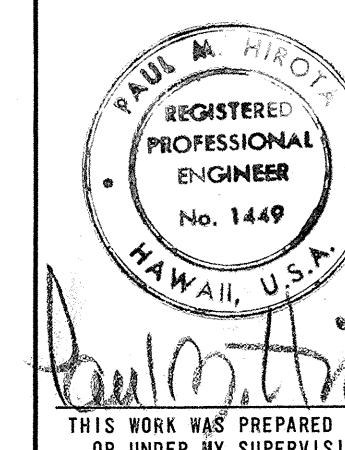
FIGURE 11



VALVE BOX INSTALLATION FOR BGGV AND BUTTERFLY VALVES

NOT TO SCALE

FIGURE 12



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

NIMITZ SPUR

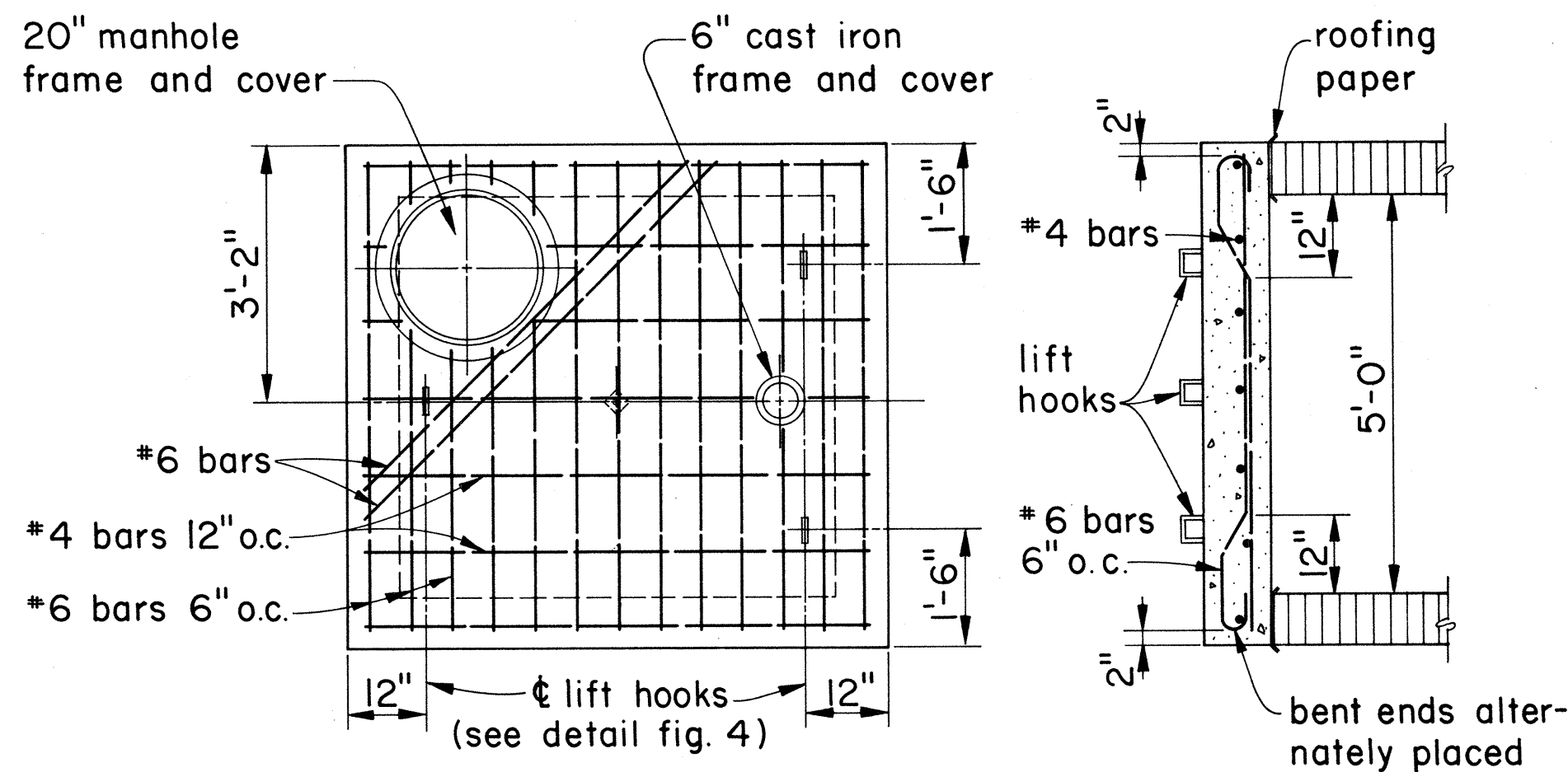
WATER DETAILS

INTERSTATE ROUTE H-1
PROJ. NO. I-HI-1(99):15

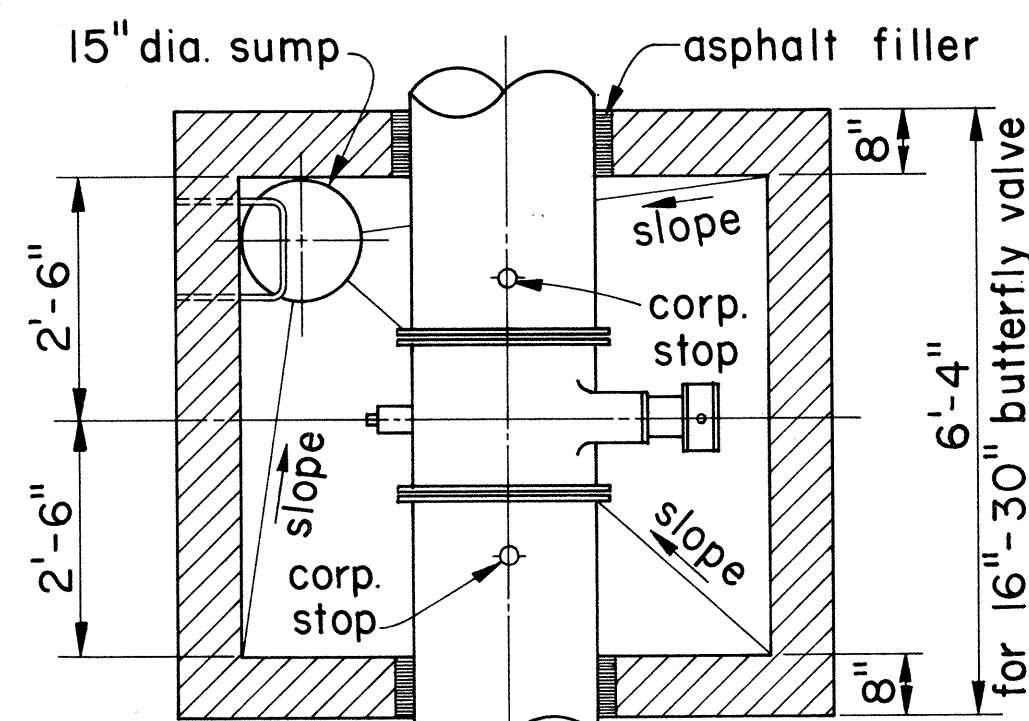
SCALE: AS SHOWN. DATE: AUG 4 1976

SHEET No. 11 OF 12 SHEETS

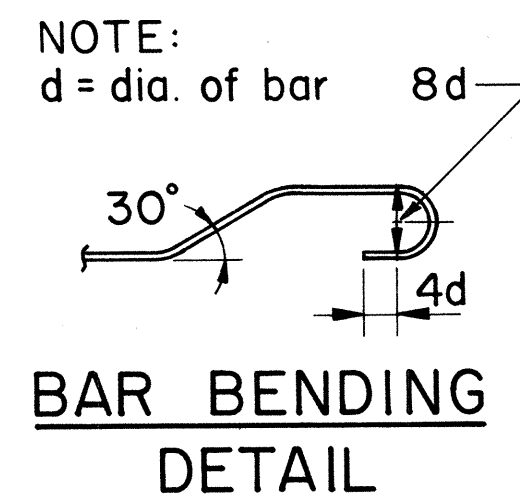
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(99)15	1999	100	350



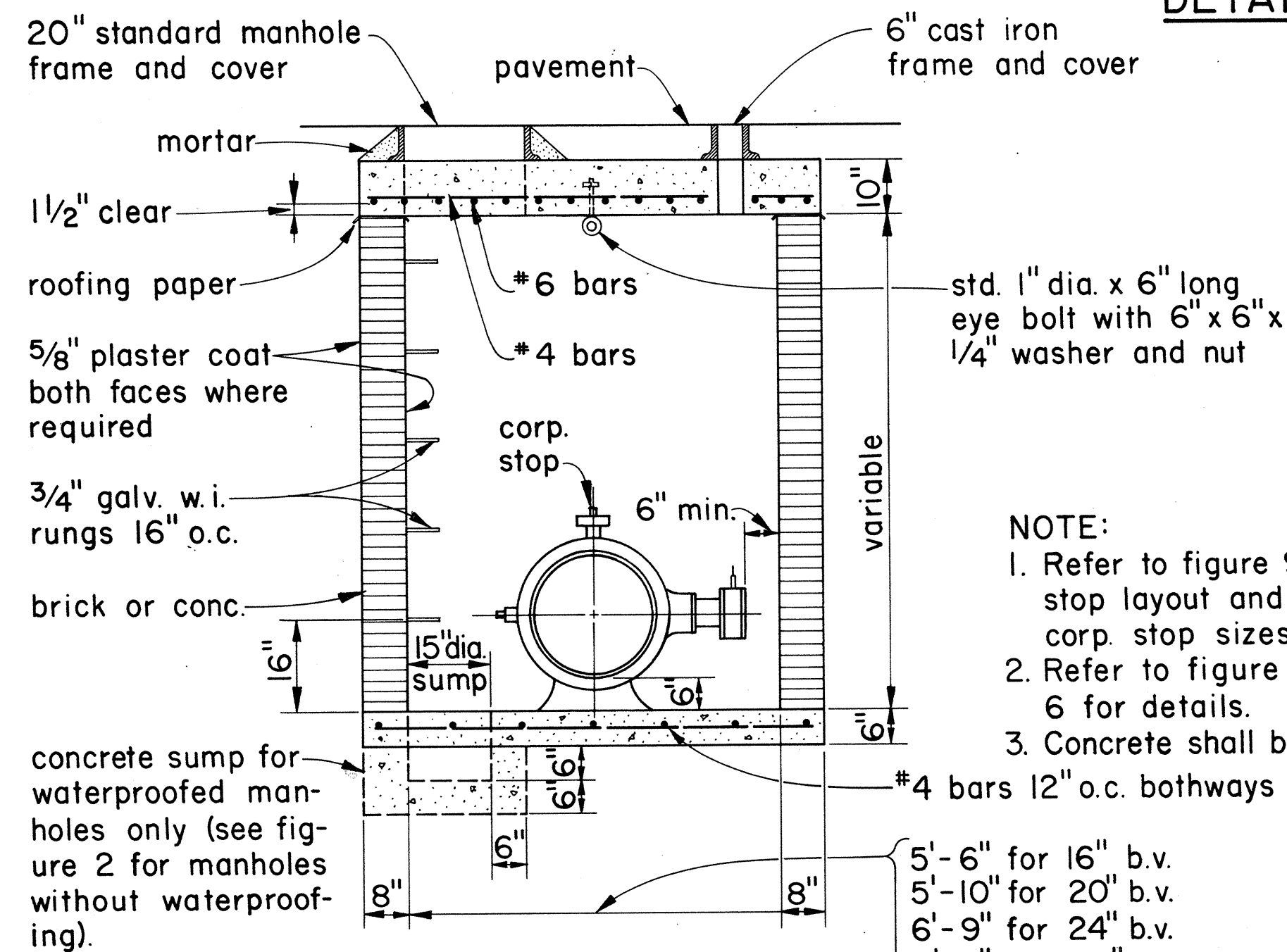
PLAN OF TOP SLAB



SECTION



BAR BENDING DETAIL

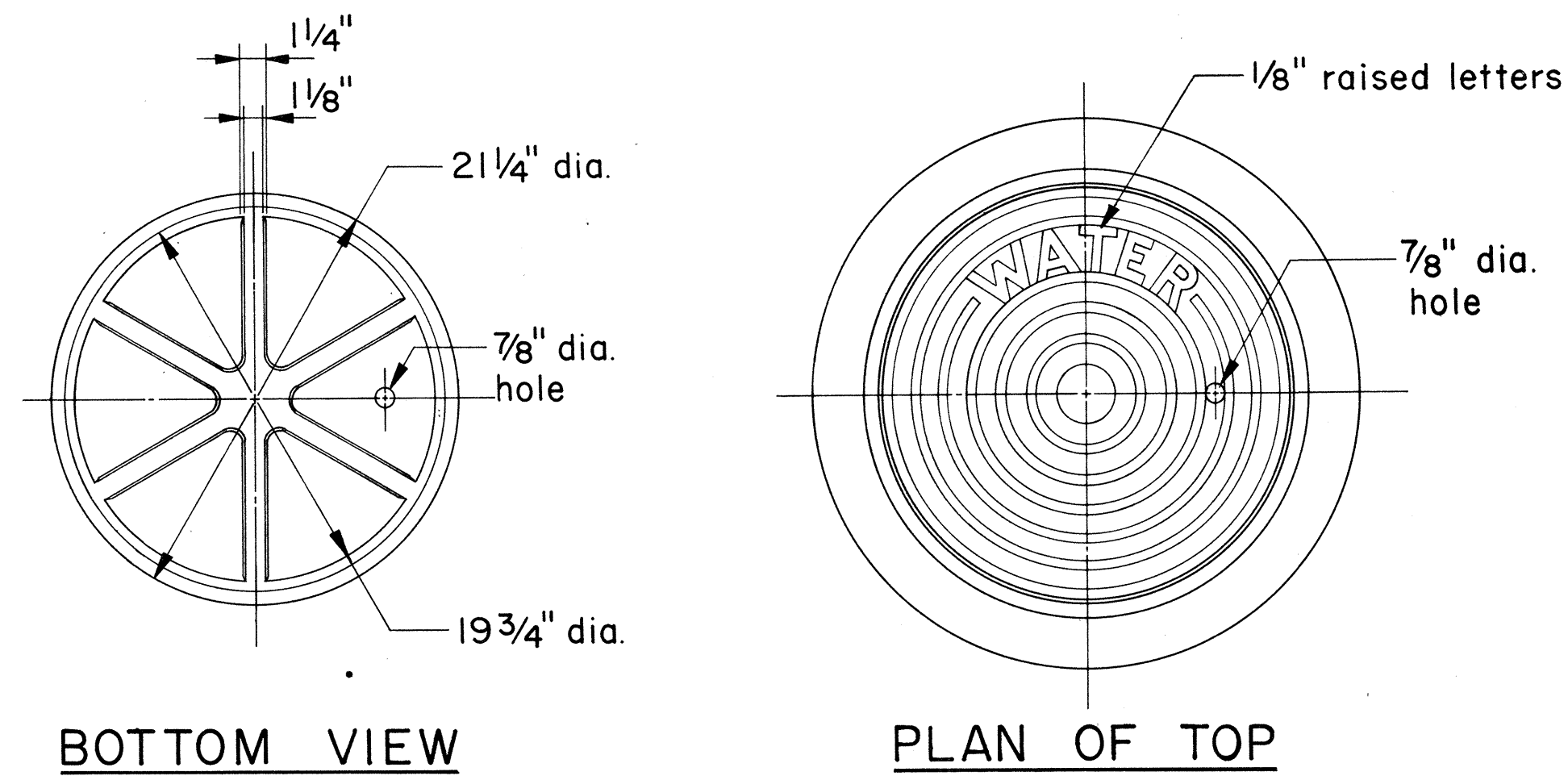


SECTION

TYPE A MANHOLE FOR BUTTERFLY VALVES

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

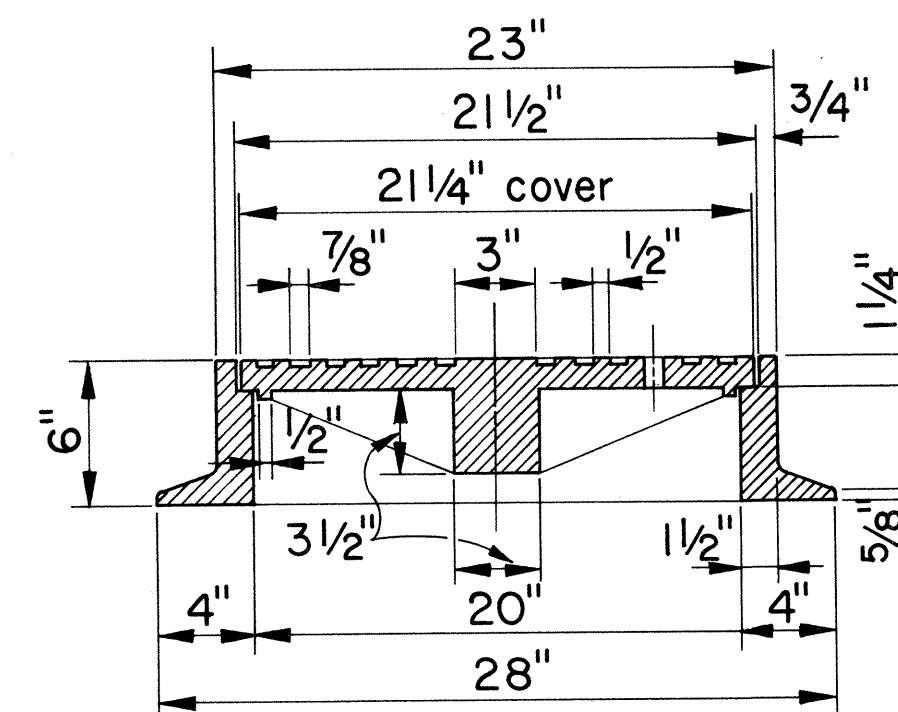
FIGURE 3



BOTTOM VIEW

PLAN OF TOP

NOTE:
All castings shall be made accurately to the dimensions shown. Seat and cover shall be machined, not ground to secure flat and true surfaces. The cover shall not rattle in any position.

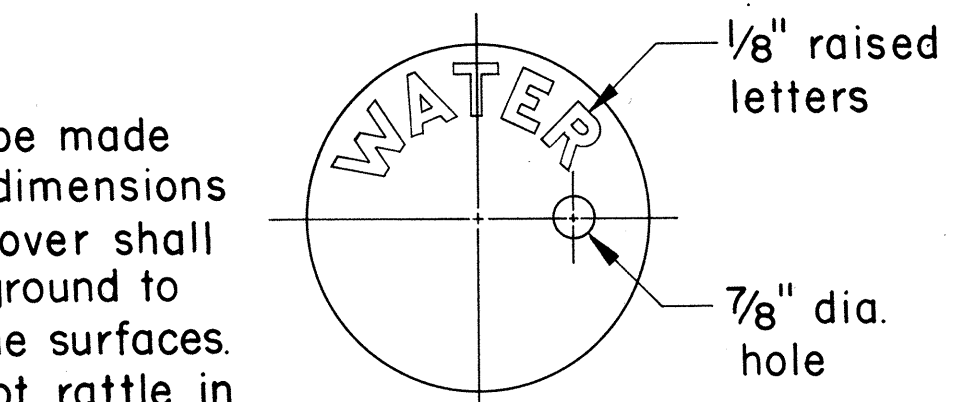


SECTION

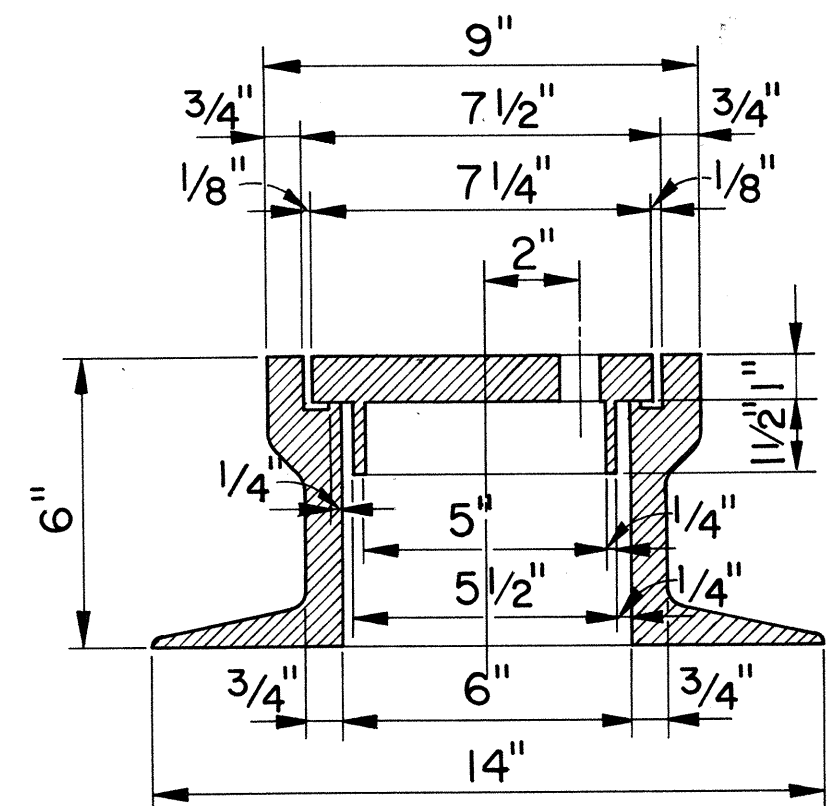
MANHOLE FRAME AND COVER CAST IRON, 20" SIZE

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

FIGURE 6



PLAN OF COVER

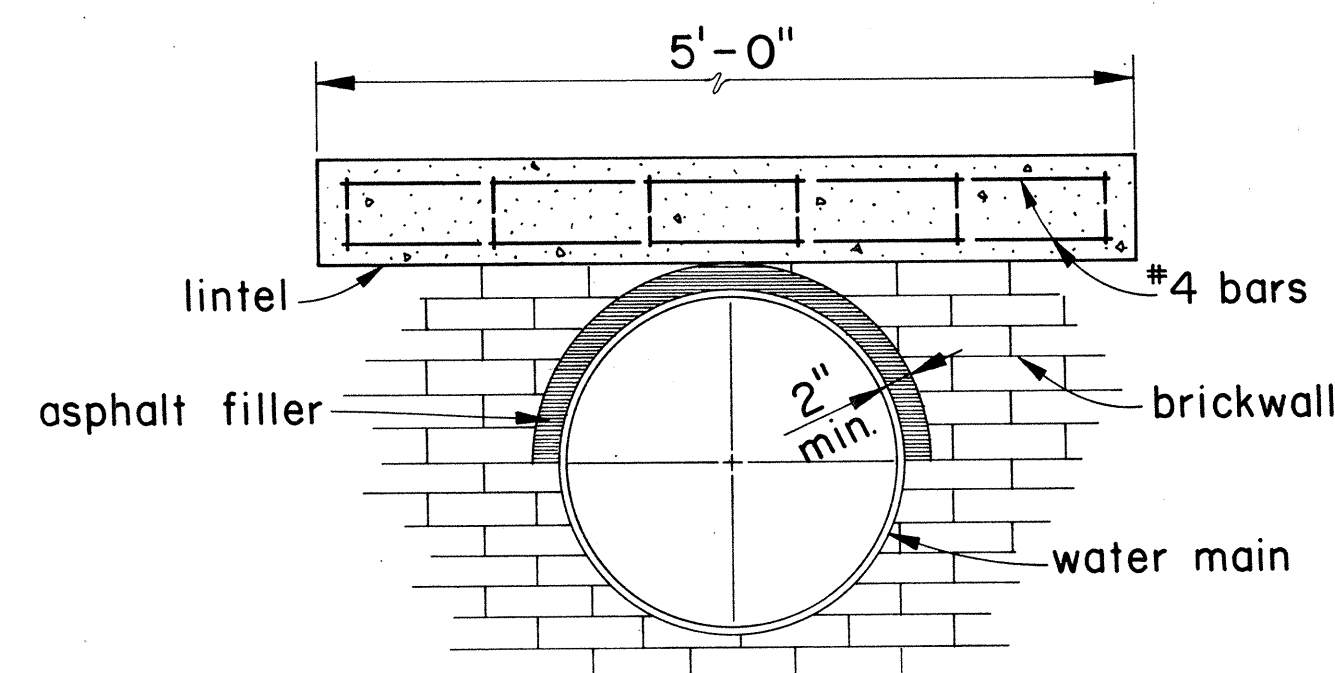


SECTION

MANHOLE FRAME AND COVER CAST IRON, 6" SIZE

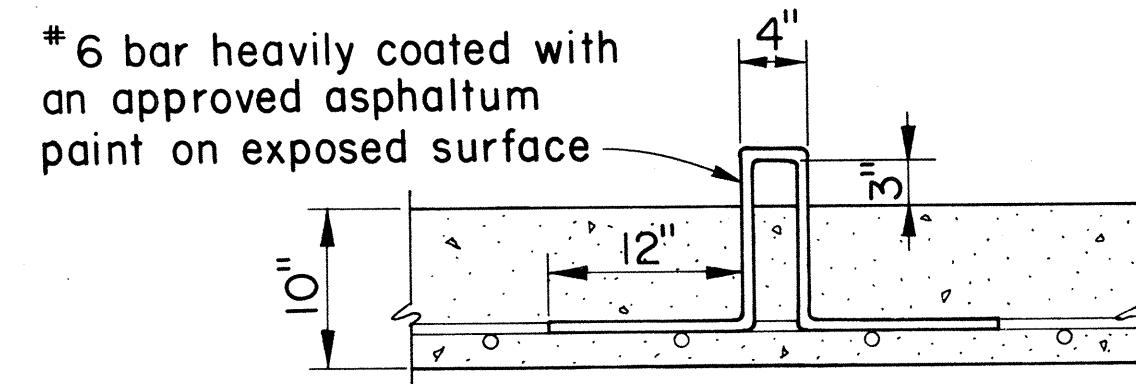
SCALE: 3" = 1'-0"

FIGURE 5

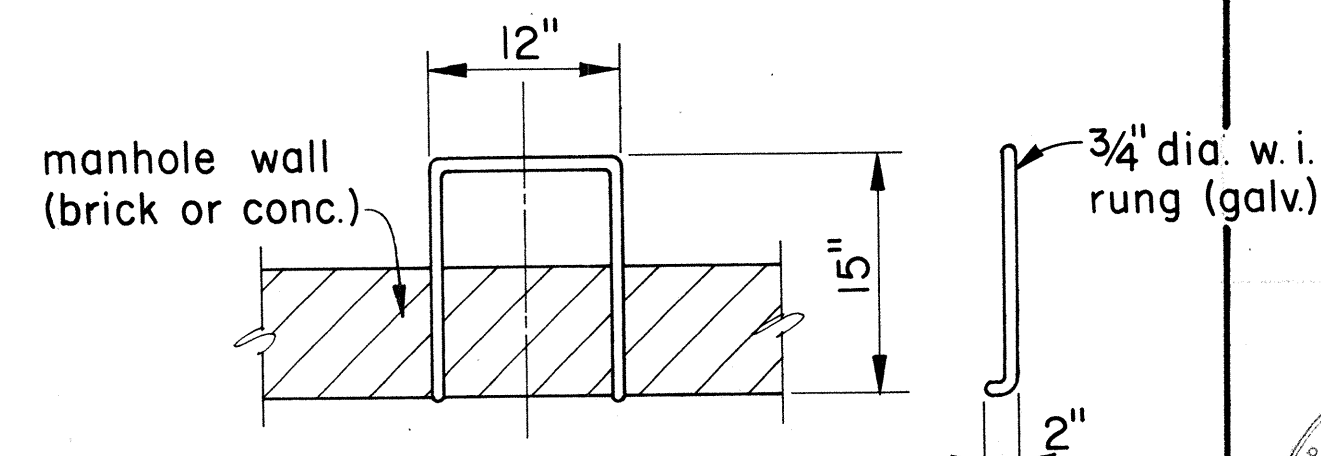


SECTION THRU LINTEL

NOTE:
Concrete shall be class B



LIFT HOOK DETAIL

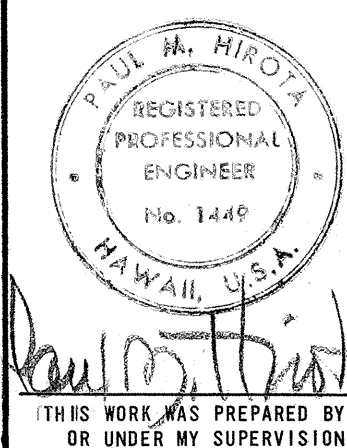


DETAIL OF RUNG

TYPE A MANHOLE DETAIL OF RUNG, LINTEL, FILLER, & LIFT HOOK

SCALE: 1" = 1'-0"

FIGURE 4



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

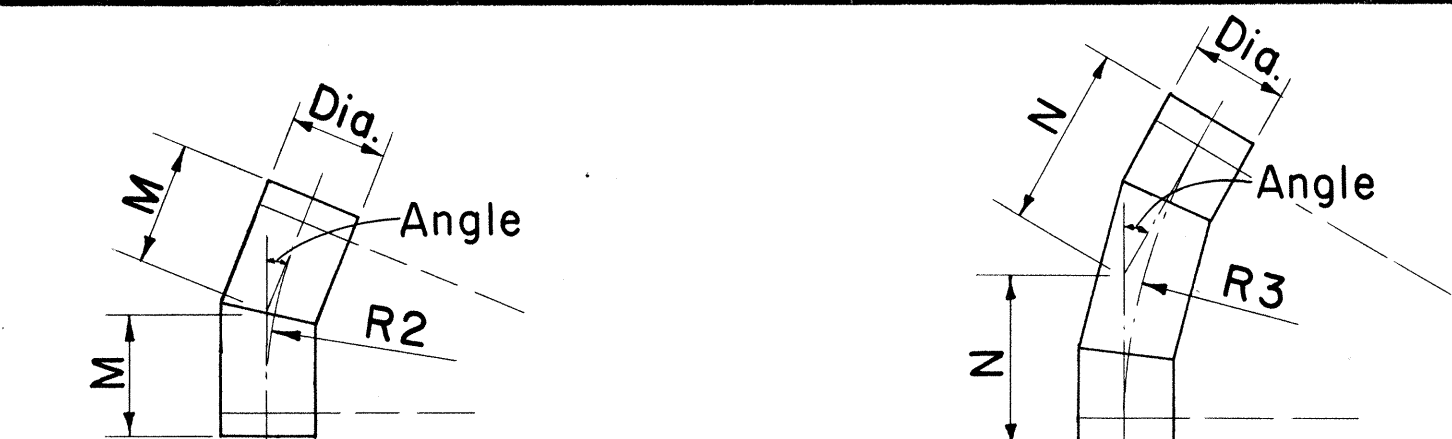
NIMITZ SPUR
WATER DETAILS

INTERSTATE ROUTE H-1
PROJ. NO. I.HI-1(99)15

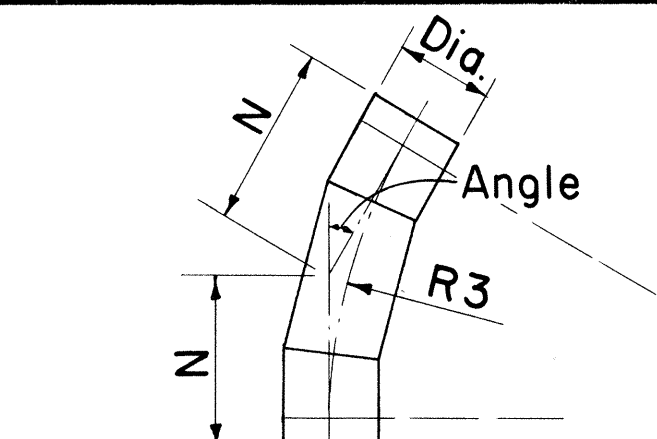
SCALE: AS NOTED DATE: AUG 4 1996

SHEET No. 12 OF 12 SHEETS

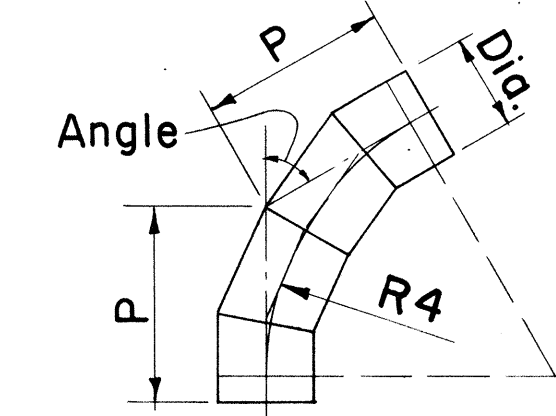
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-159-15	1977	170	350



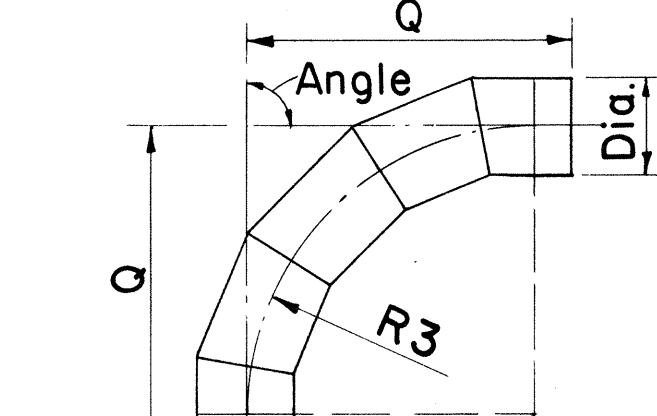
2 PIECE ELBOW
6° to 22 1/2° Inclusive



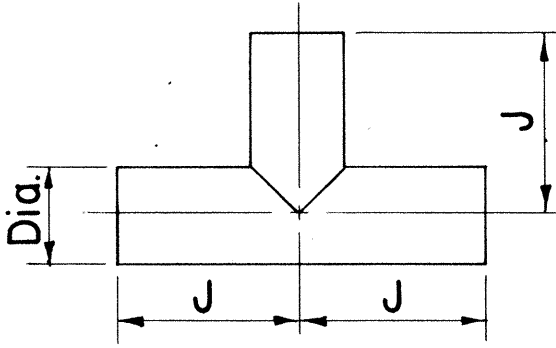
3 PIECE ELBOW
Over 22 1/2° to 45° Inclusive



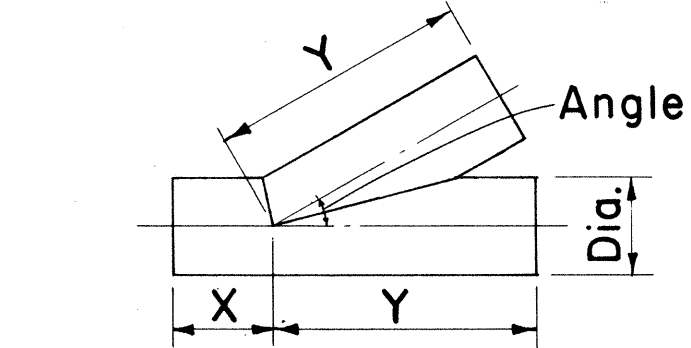
4 PIECE ELBOW
Over 45° to 67 1/2° Inclusive



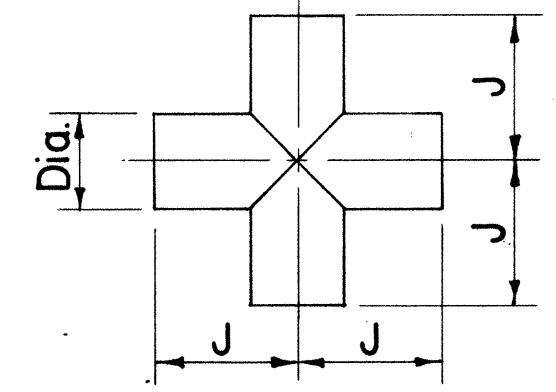
5 PIECE ELBOW
Over 67 1/2° to 90° Inclusive



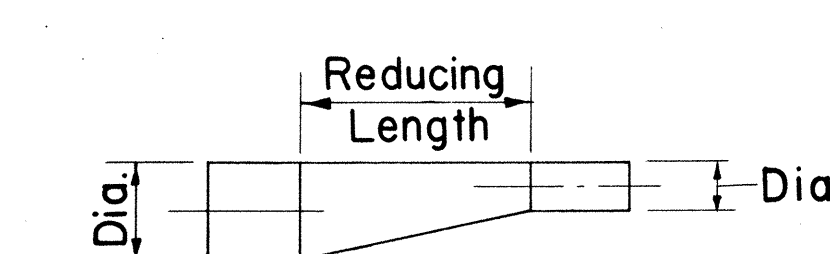
TEE



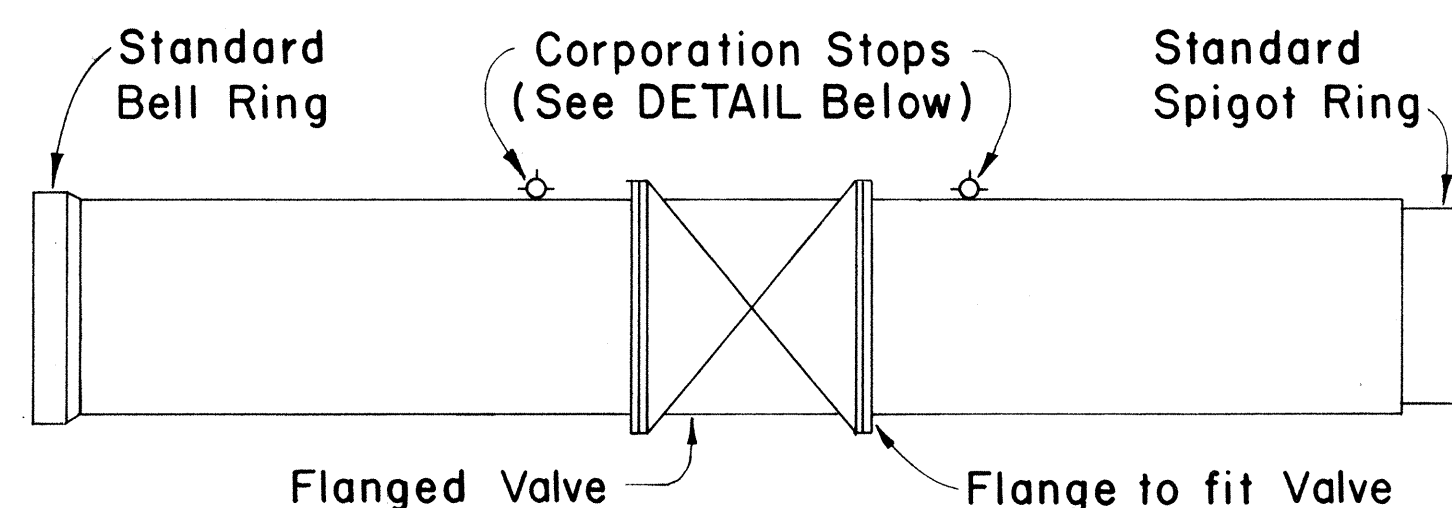
LATERAL
30° Minimum - 75° Maximum



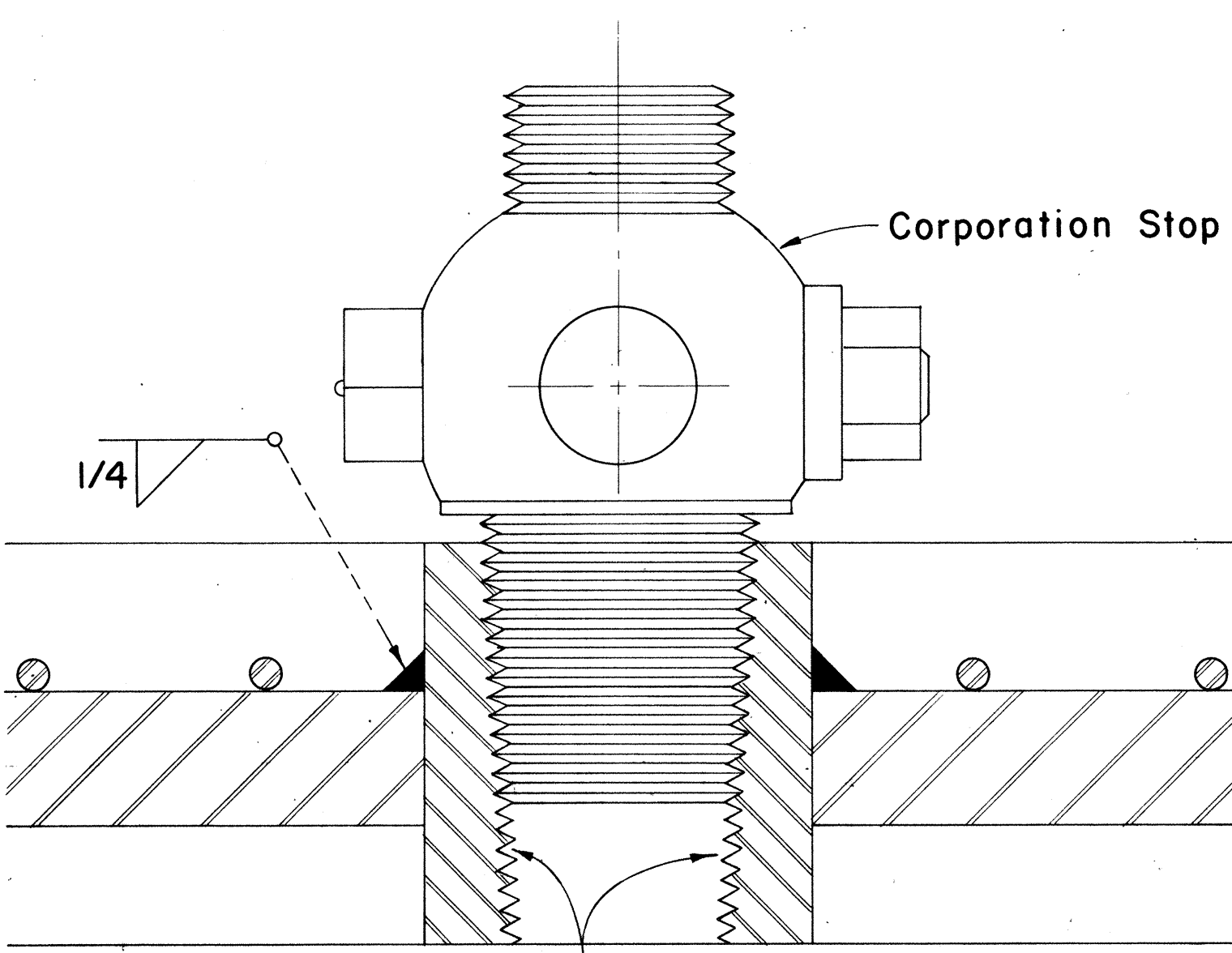
CROSS



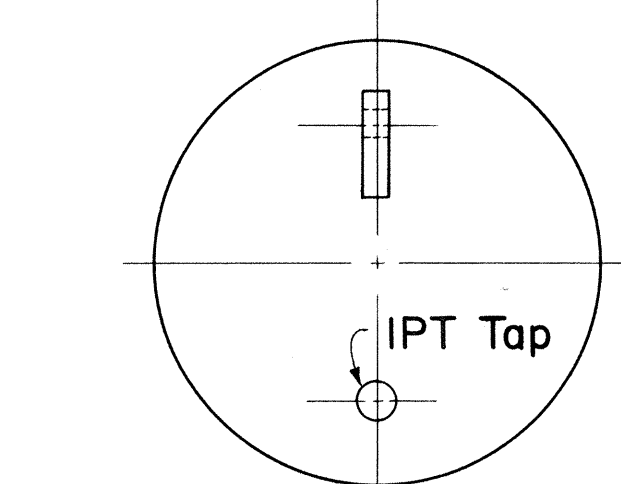
REDUCER



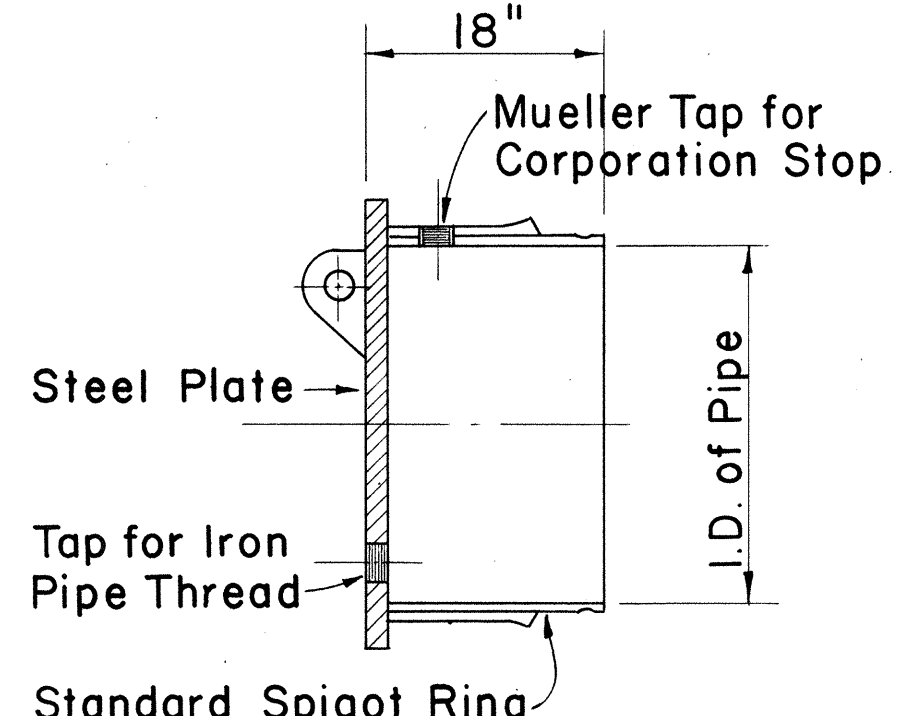
ELEVATION



TYPICAL SECTION THRU CONCRETE PIPE AT CORPORATION STOP

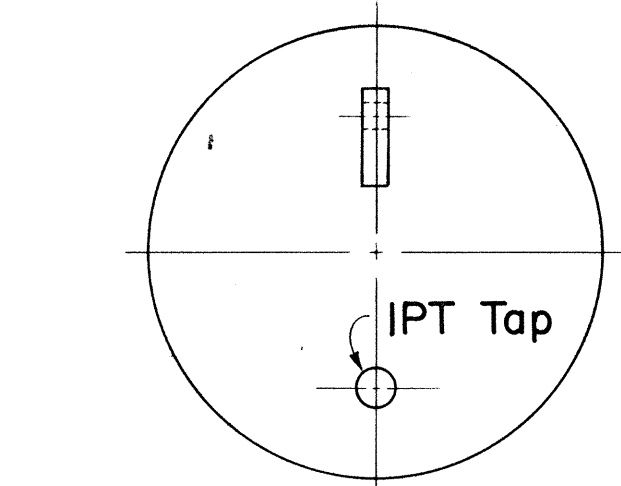


ELEV. OF STEEL PLATE

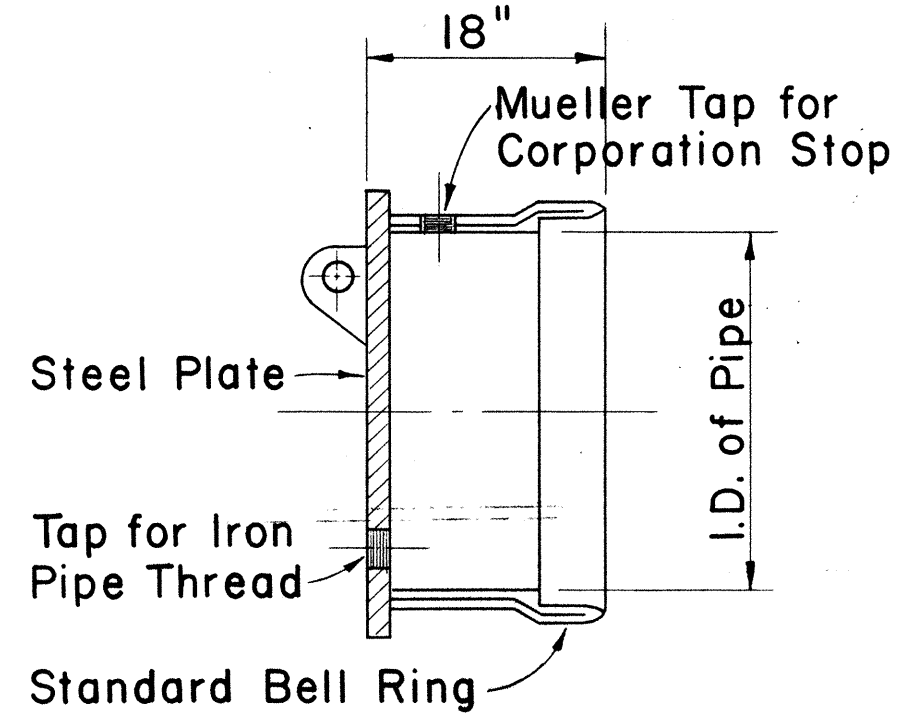


SECTION

DETAIL OF PLUG

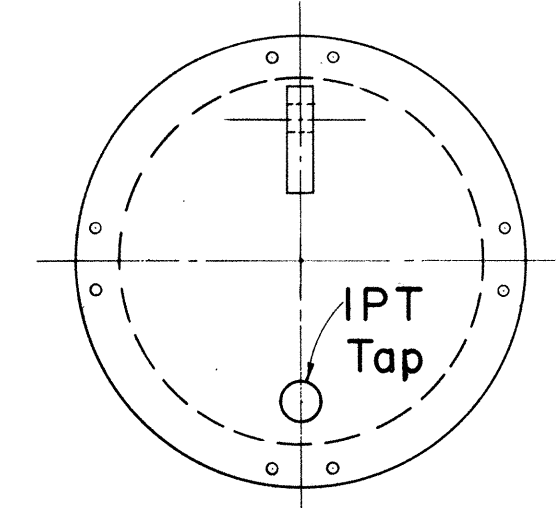


ELEV. OF STEEL PLATE

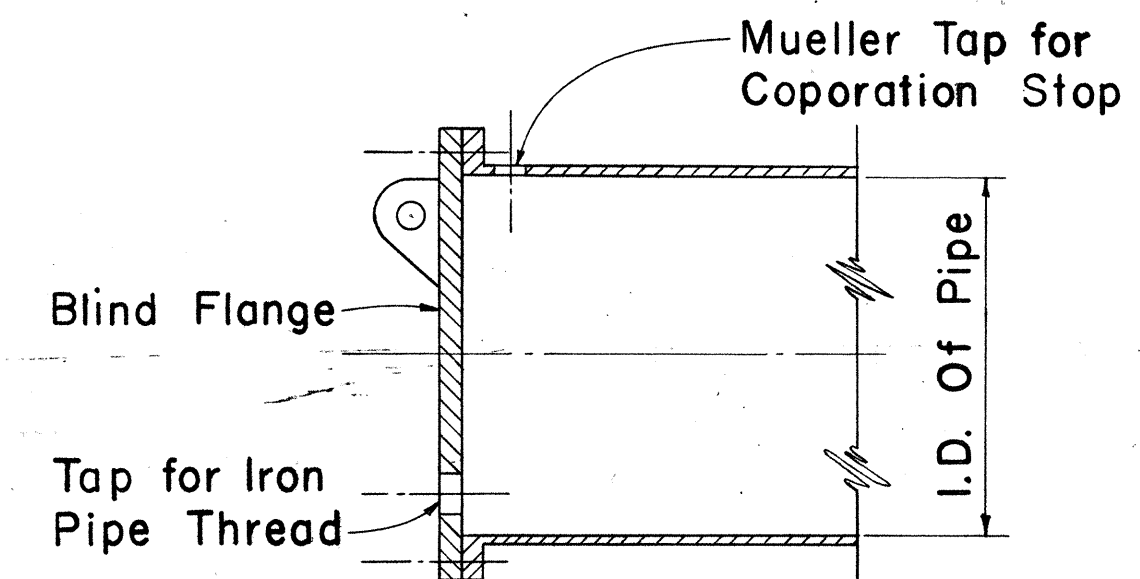


SECTION

DETAIL OF CAP



ELEV. OF BLIND FLANGE



SECTION

DETAIL OF BLIND FLANGE

STANDARD FITTING DIMENSIONS													
DIAMETER	TEE		CROSS (Both Ways) J+J	LATERAL (30° to 75°) Run X+Y Outlet Y		ELBOWS (Center to End)							
	Run J+J	Outlet J		Run X+Y	Outlet Y	2 Piece (up to 22 1/2°)		3 Piece (22 1/2° to 45°)		4 Piece (45° to 67 1/2°)		5 Piece (67 1/2° to 90°)	
	M	R2	N	R3	P	R4	Q	R5					
16"	34"	17"	34"	62"	52"	12"	60"	18"	44"	26"	39"	44"	40"
18"	36"	18"	36"	66"	56"	12"	60"	19"	47"	27"	41"	36"	32"
20"	38"	19"	38"	72"	60"	13"	65"	20"	49"	28"	42"	54"	50"
22"	40"	20"	40"	78"	66"	13"	65"	21"	51"	30"	45"	41"	37"
24"	42"	21"	42"	84"	72"	14"	70"	22"	54"	32"	48"	64"	60"
30"	60"	30"	60"	96"	84"	15"	75"	25"	61"	37"	51"	79"	75"
36"	66"	33"	66"	110"	96"	16"	80"	27"	66"	40"	60"	94"	90"
42"	72"	36"	72"	124"	108"	17"	85"	30"	71"	49"	69"	109"	105"

DIMENSIONS FOR ECCENTRIC REDUCER REDUCING SECTION

- 36" x 30" Eccentric Reducer - Length 66"
- 30" x 24" Eccentric Reducer - Length 66"
- 24" x 20" Eccentric Reducer - Length 26"
- 20" x 16" Eccentric Reducer - Length 26"
- 42" x 36" Eccentric Reducer - Length 66"
- 42" x 30" Eccentric Reducer - Length 66"

NOTE:

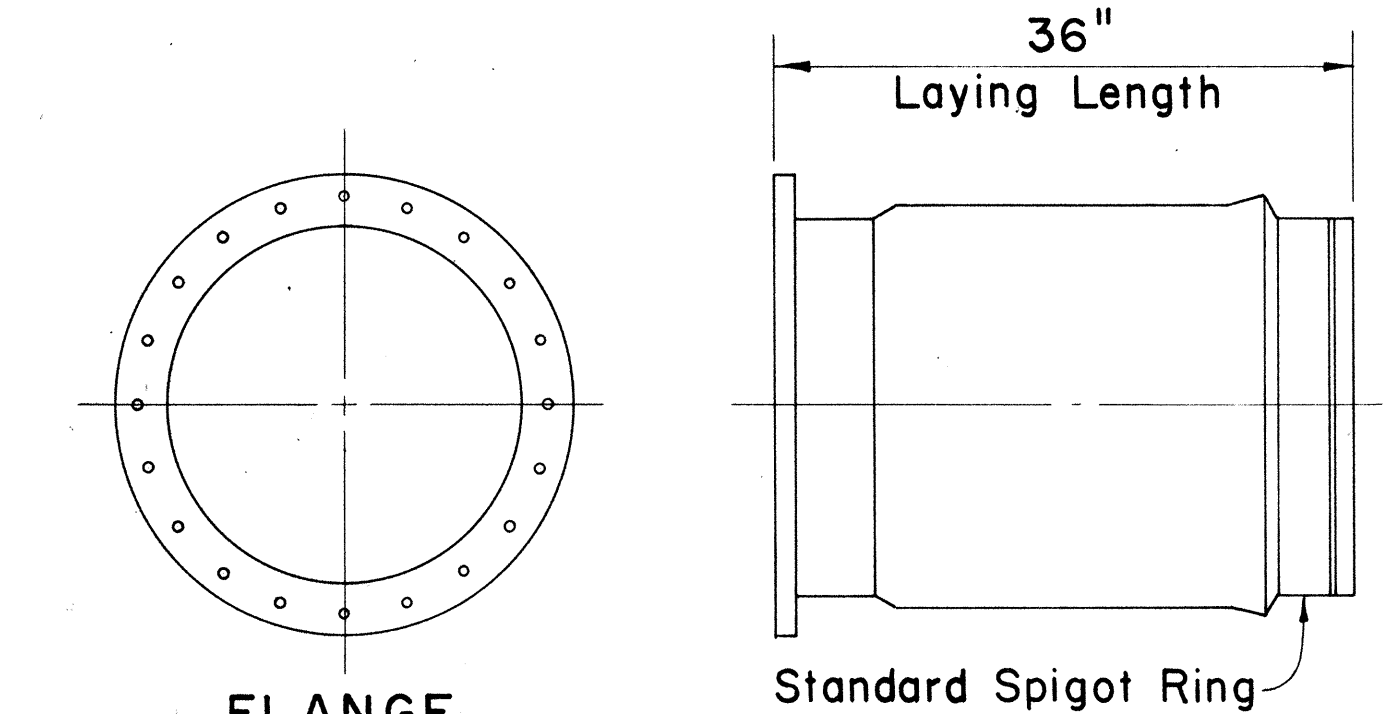
All dimensions shown are laying lengths.
All fittings and specials shall be fabricated independent from pipe sections and in accordance with the dimensions shown.
All fittings and specials shall be all bell unless otherwise noted.
All tees, wyes, crosses and reducers 16-inch in diameter and larger shall be reinforced with steel ribs or steel crotch plates welded continuously to the cylinder or by other methods to withstand the longitudinal crushing effect caused by the test pressure as called for in the plans.



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
NIMITZ SPUR

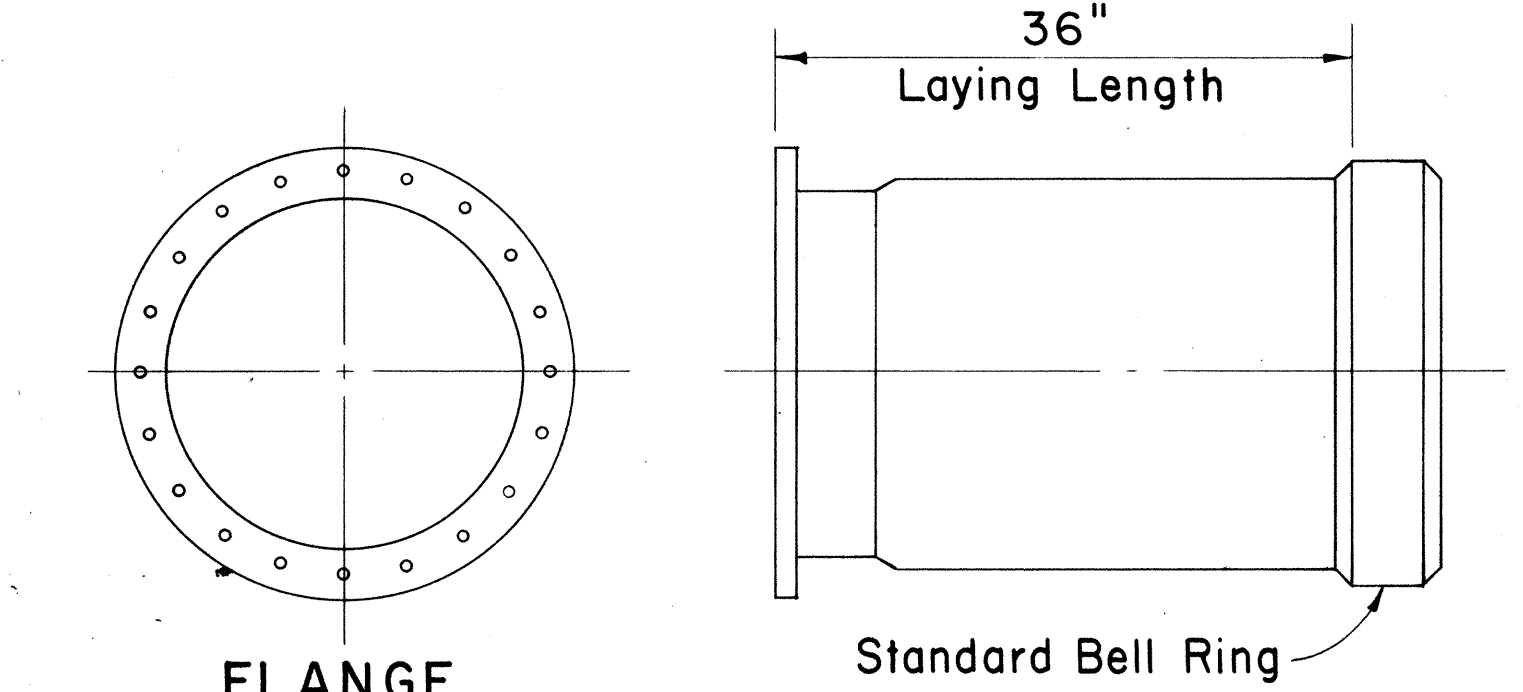
CONCRETE CYLINDER PIPE
MISCELLANEOUS DETAILS
INTERSTATE ROUTE H-1
PROJ. NO. I-HI-1(99):15
Scale: No Scale Date: AUG 4 1976
SHEET No. 13 OF 19 SHEETS

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



FLANGE

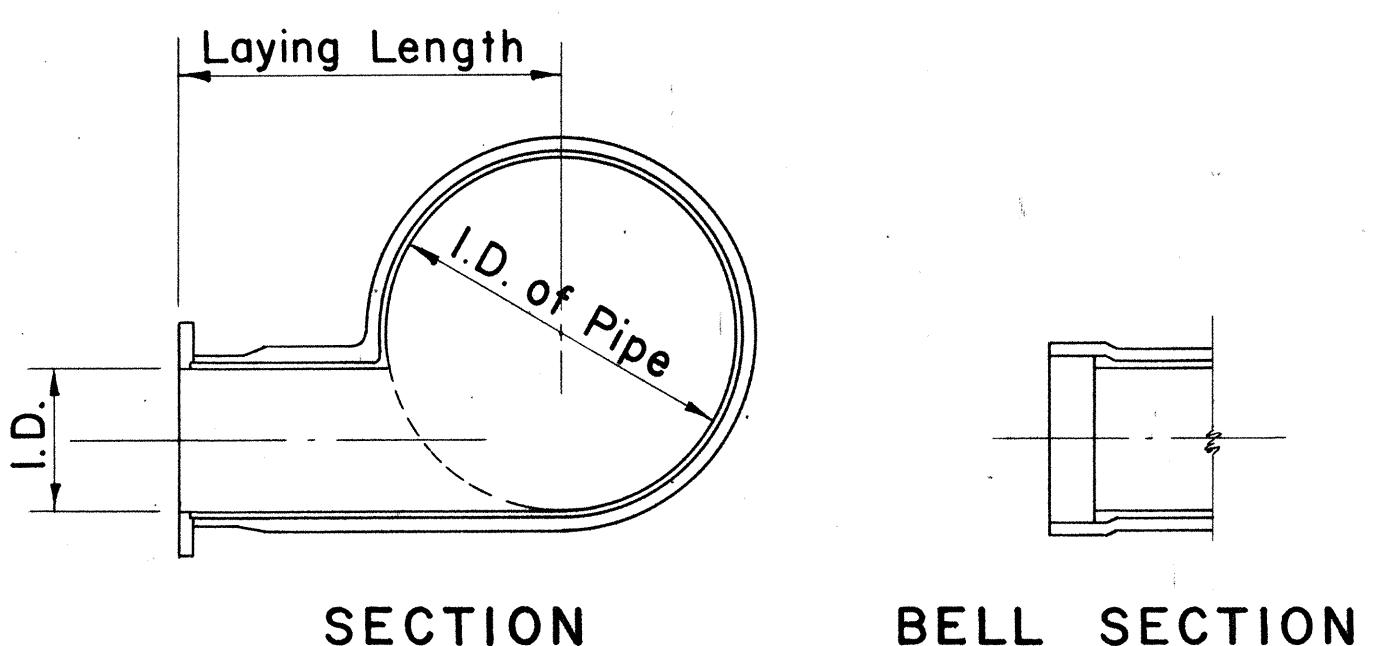
See Specs. for Flange Class



FLANGE

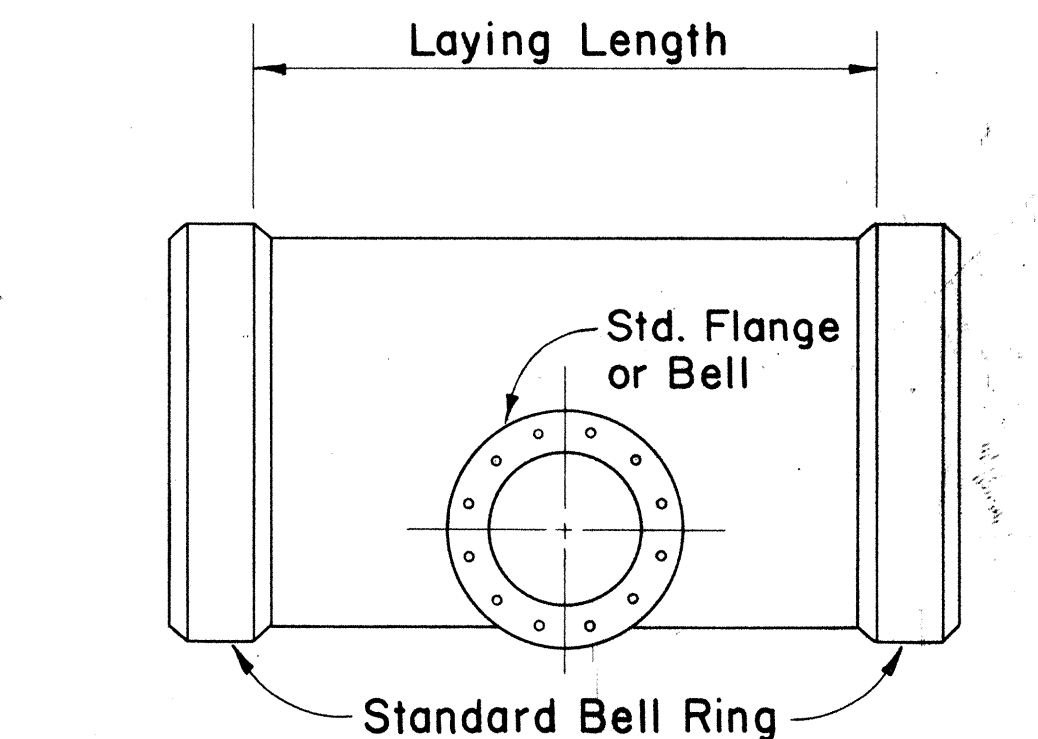
See Specs. for Flange Class

TYPICAL DETAIL OF ADAPTER



SECTION

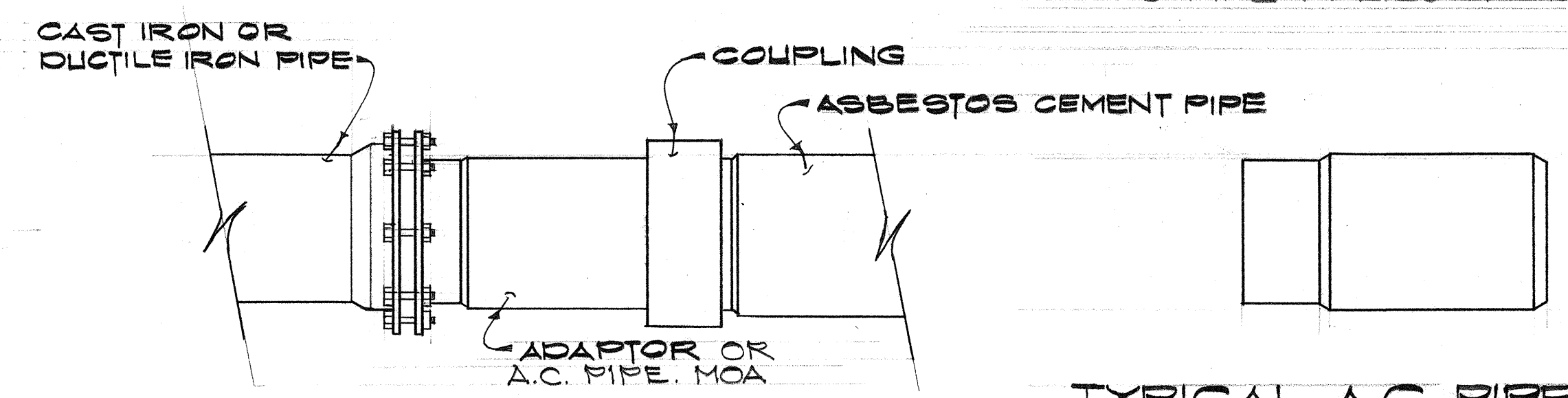
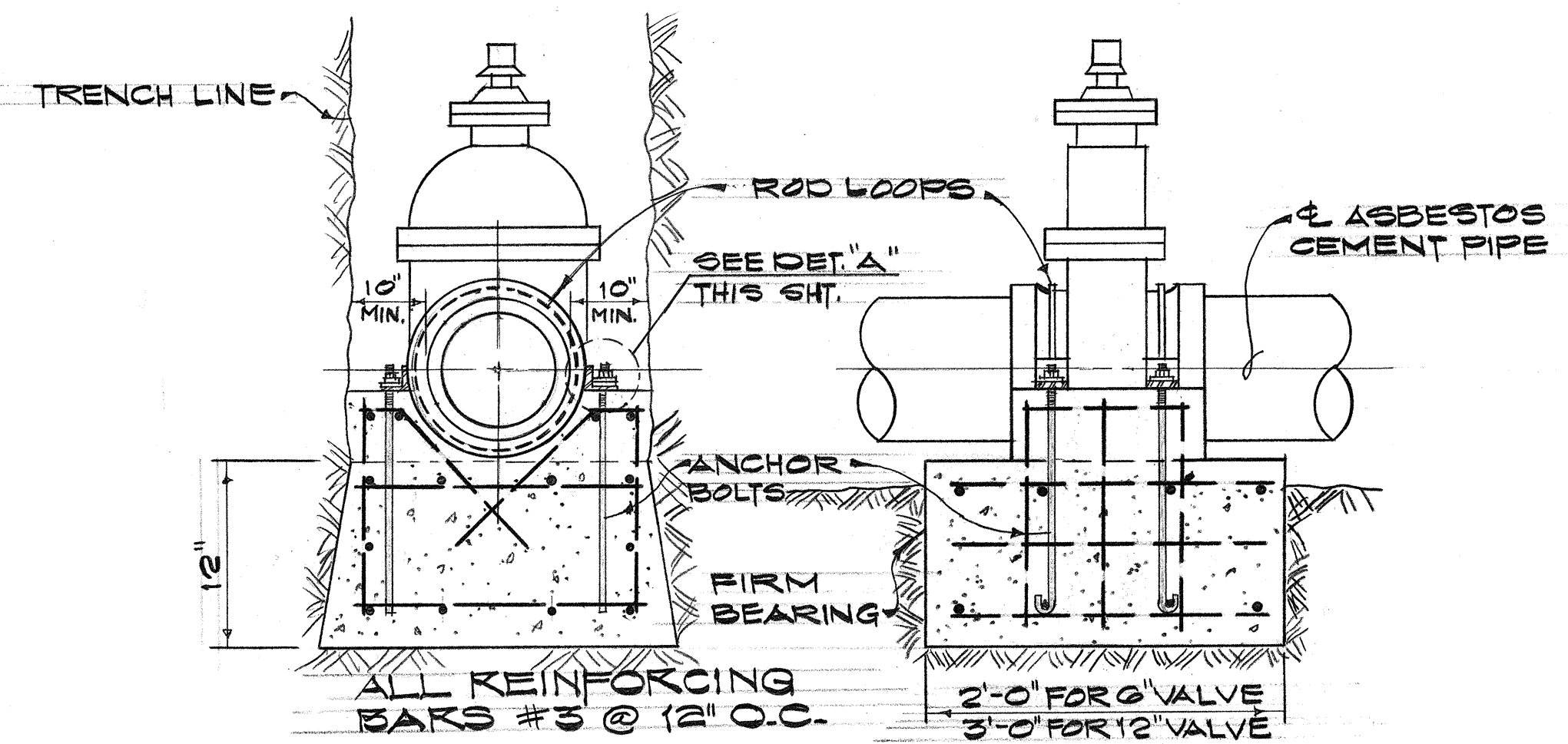
BELL SECTION



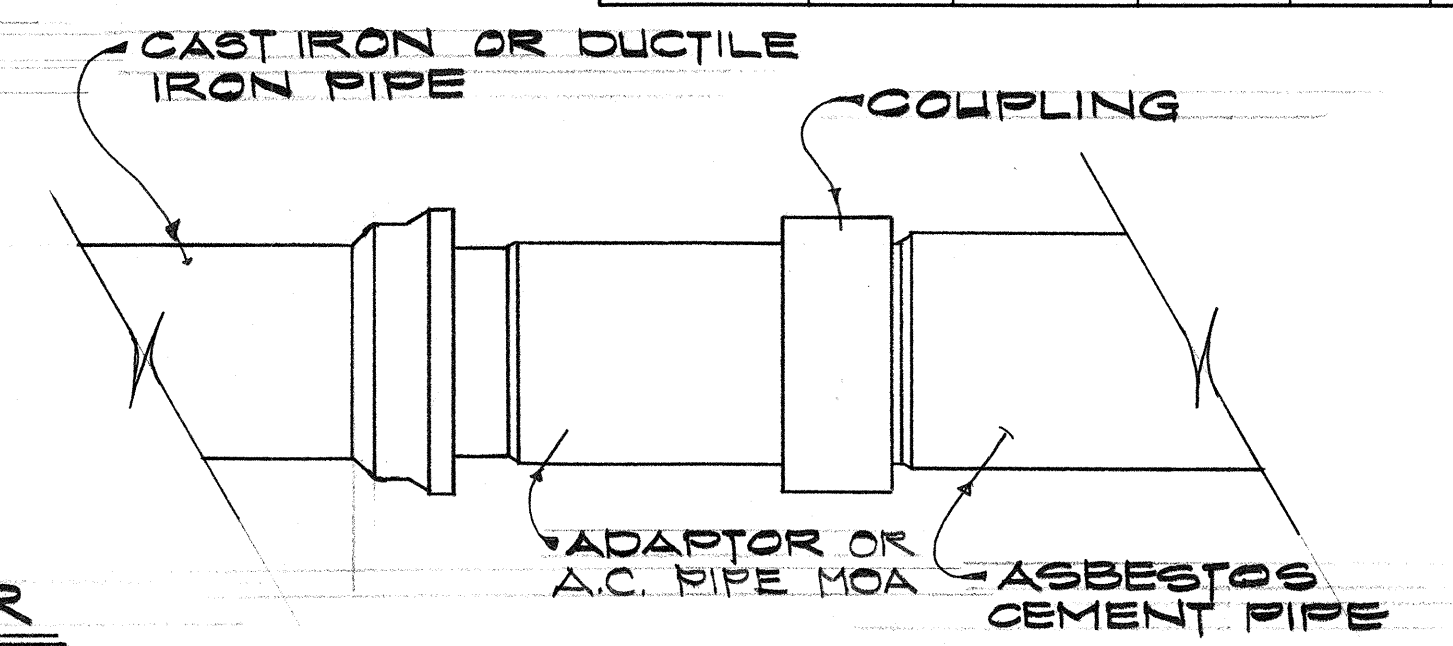
TYPICAL DETAIL OF BLOW-OFF TEE

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	111-105-115	1977	171	350

NOTE:
 1. ADAPTER & COUPLING SHALL BE CONSIDERED INCIDENTAL TO THE A.C. PIPE.
 2. CONTRACTOR MAY INSTALL MOA A.C. PIPE IN LIEU OF ADAPTORS.

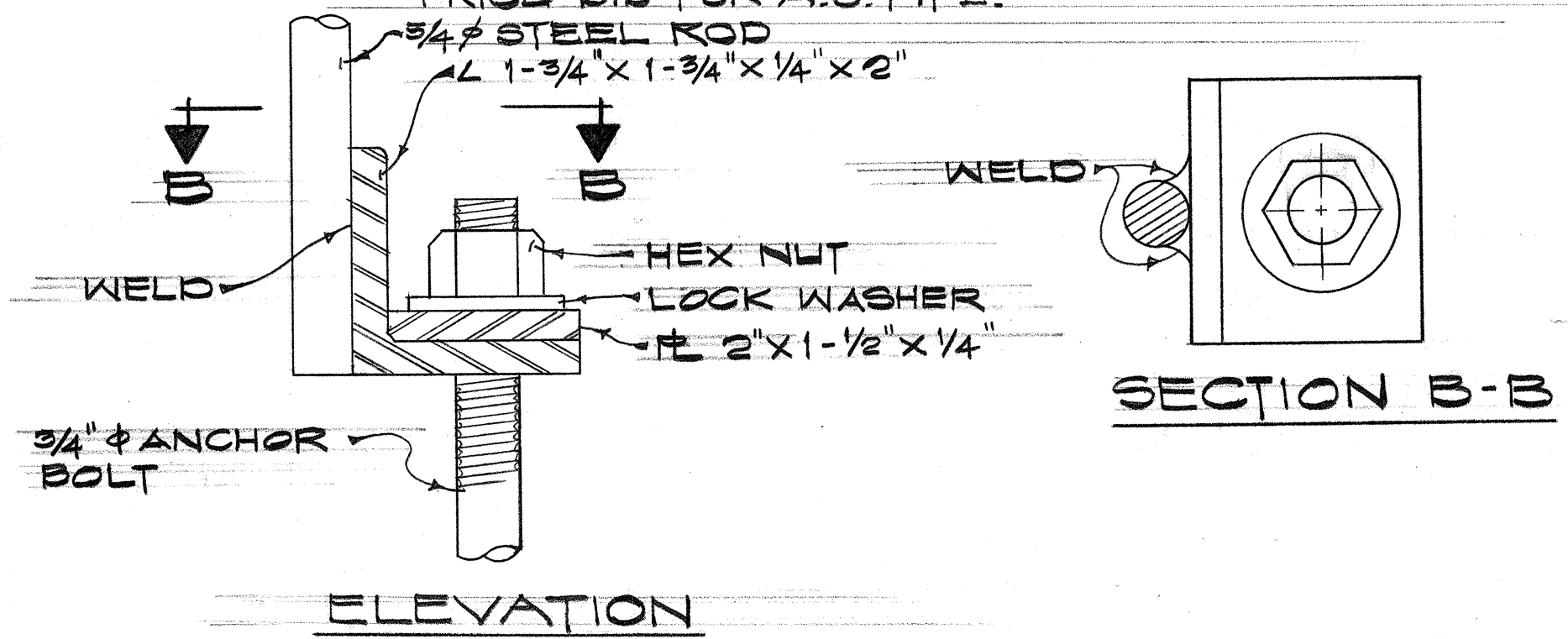


TYPICAL CONNECTION FOR MECHANICAL JOINT FITTING
 NOT TO SCALE

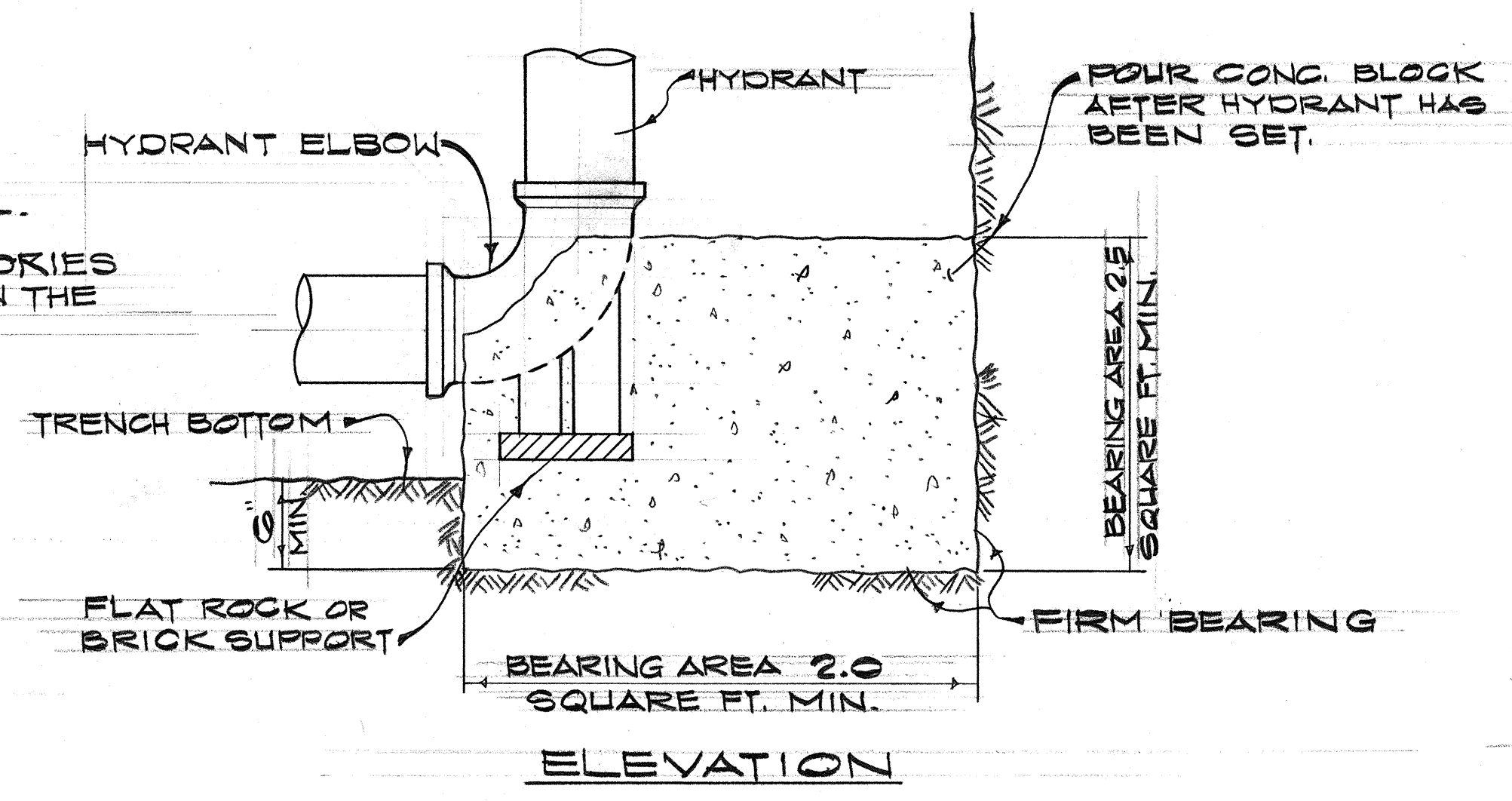


TYPICAL CONNECTION FOR POURED BELL OR SLIP JOINT FITTING
 NOT TO SCALE

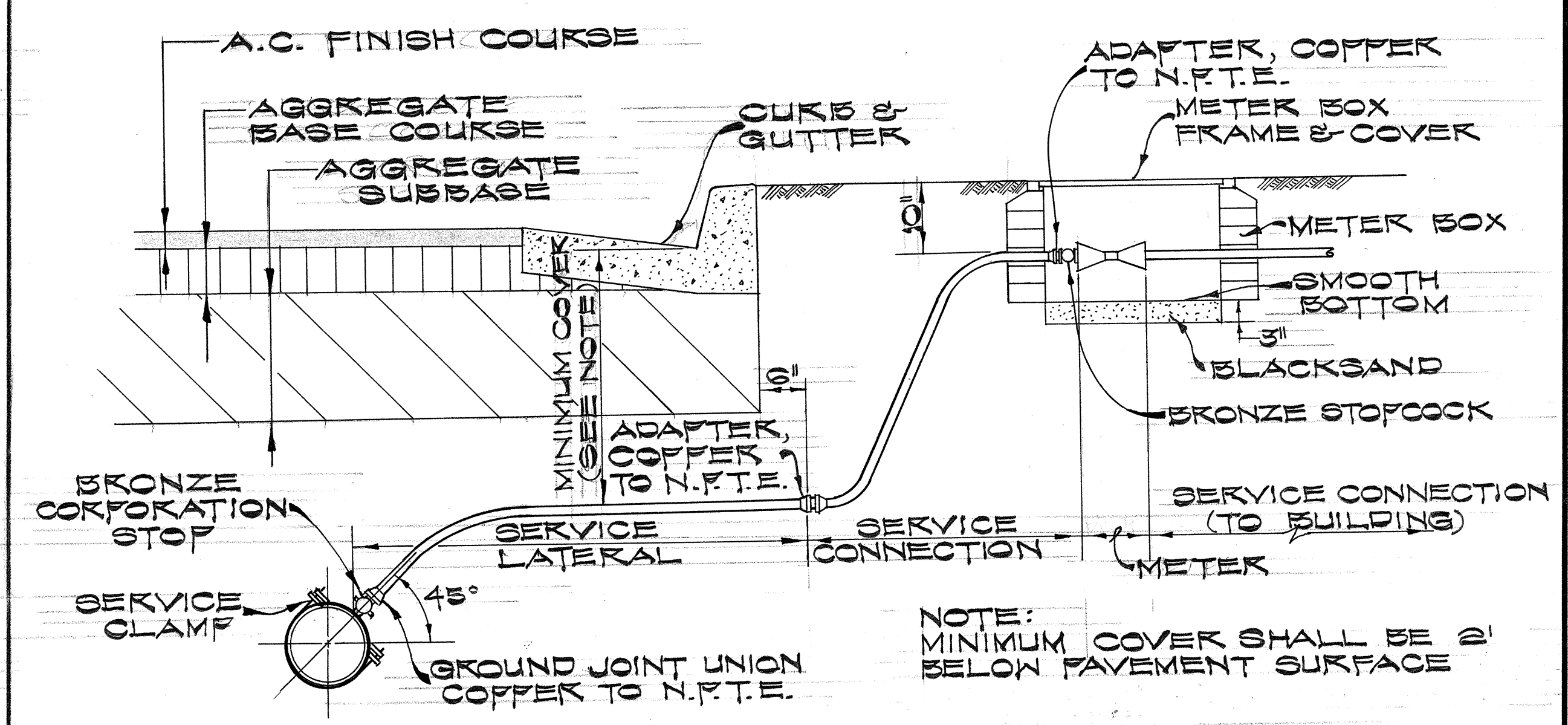
- NOTES:
1. APPLY BOND BREAKER BETWEEN GATE VALVE AND CONCRETE
 2. ALL ANCHOR MATERIALS SHALL BE OF NON-CORROSIVE METAL
 3. 3" CLEARANCE FOR ALL REINFORCING STEEL
 4. ANCHOR BLOCK FOR GATE VALVES INCLUDING REINFORCING STEEL, ANCHOR BOLTS & ALL ACCESSORIES SHALL BE CONSIDERED INCIDENTAL & INCLUDED IN THE PRICE BID FOR A.C. PIPE.



DETAIL "A" - FOR WATER VALVES
 NOT TO SCALE 12" & SMALLER (TYP.)



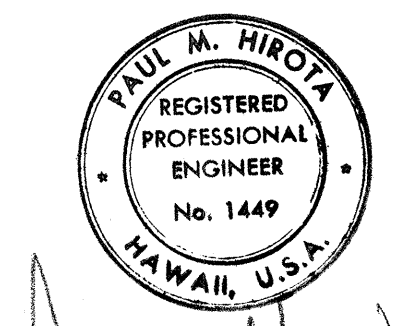
CONCRETE BLOCK FOR HYDRANT
 NOT TO SCALE



SERVICE LATERAL, SERVICE CONNECTION AND WATER METER
 NOT TO SCALE

ASBESTOS CEMENT PIPE CONNECTION DETAILS

SURVEY PLOTTED BY	DATE
DRAWN BY	
CHECKED BY	
NOTE BOOK	
NO.	



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

NIMITZ SPUR

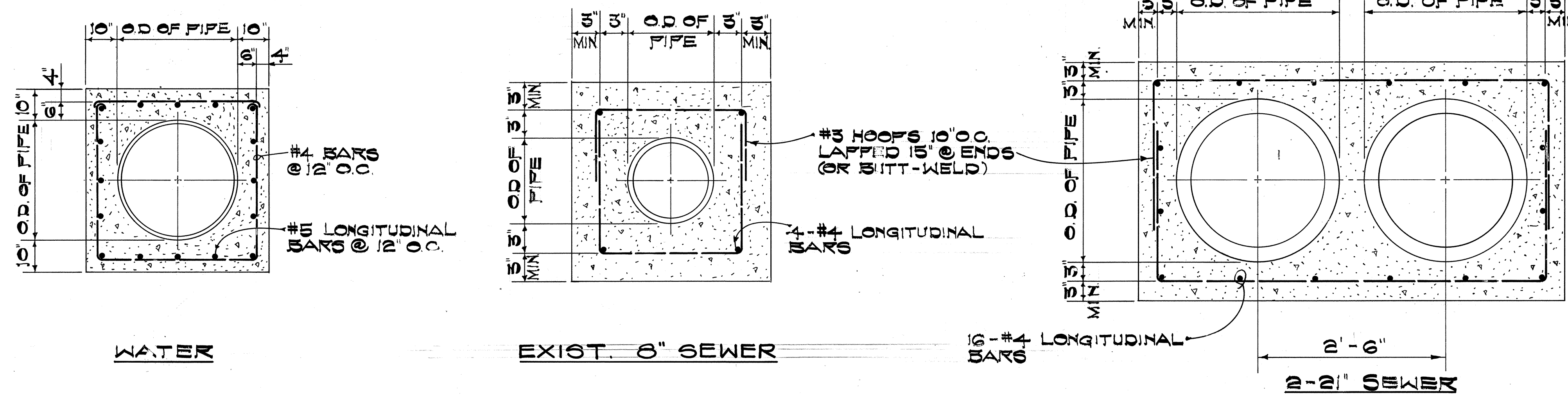
WATER DETAILS

INTERSTATE ROUTE HI
 PROJ. NO. I-HI-1(99):15

SCALE: AS NOTED DATE: AUG 4 1978

SHEET NO. 14 OF 19 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	111(199)15	1977	172	350

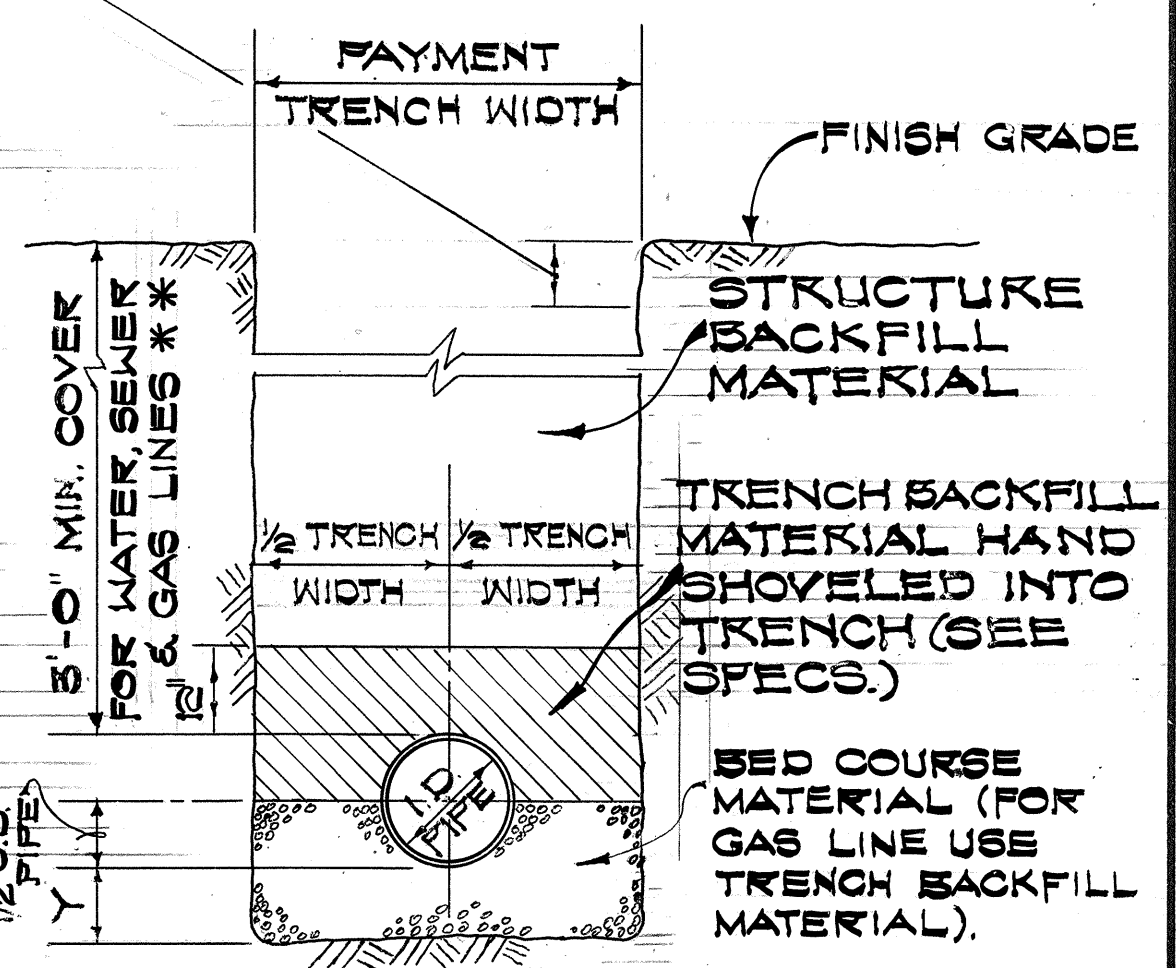


REINFORCED CONCRETE JACKET
NOT TO SCALE

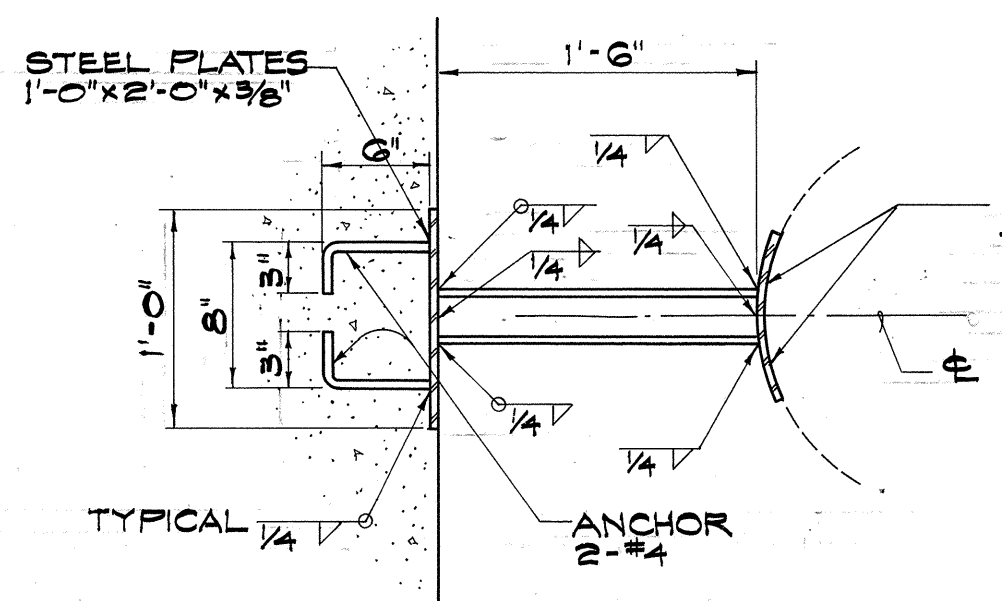
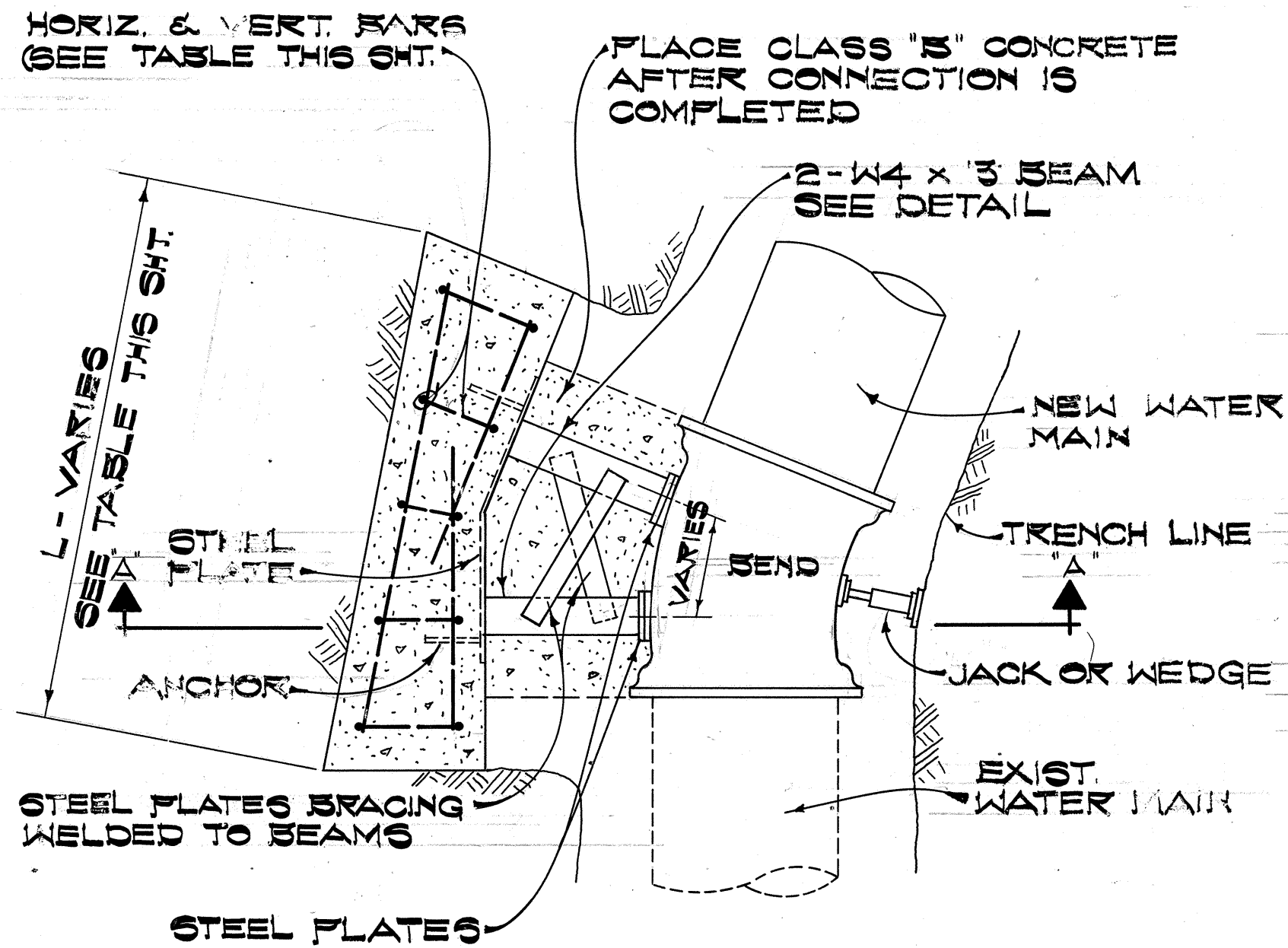
TRENCH DIMENSIONS

PIPE SIZE	PAYMENT TRENCH WIDTH	Y
4" GAS	36"	4"
6", 8" & 12" WATER	24"	6"
14" & 16" WATER	30"	6"
18" & 20" WATER	36"	6"
30" WATER	48"	6"
30" SEWER	50"	10"
2-21" SEWER	75"	*

* 2-21" SEWER SHALL BE INSTALLED WITH CONTINUOUS CONCRETE CRADLE EXCEPT AT REINFORCED CONCRETE JACKET.
** AIR FORCE 6" WATER SHALL HAVE A MINIMUM COVER OF 2'-0" WHERE NOTED ON THE PLANS. SEE WATER LINE #1 PROFILE ON SHEET 103.

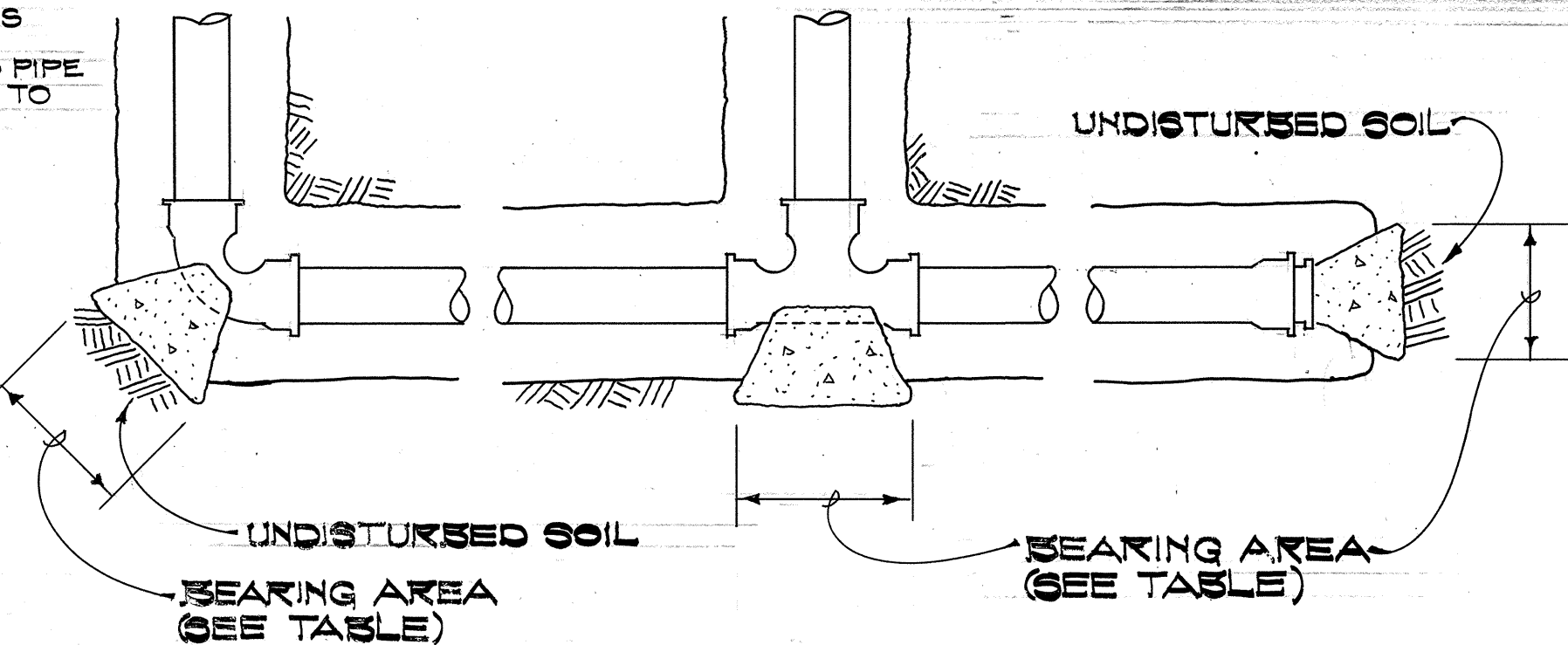


TRENCH DETAIL
NOT TO SCALE



BEAM DETAIL
NOT TO SCALE

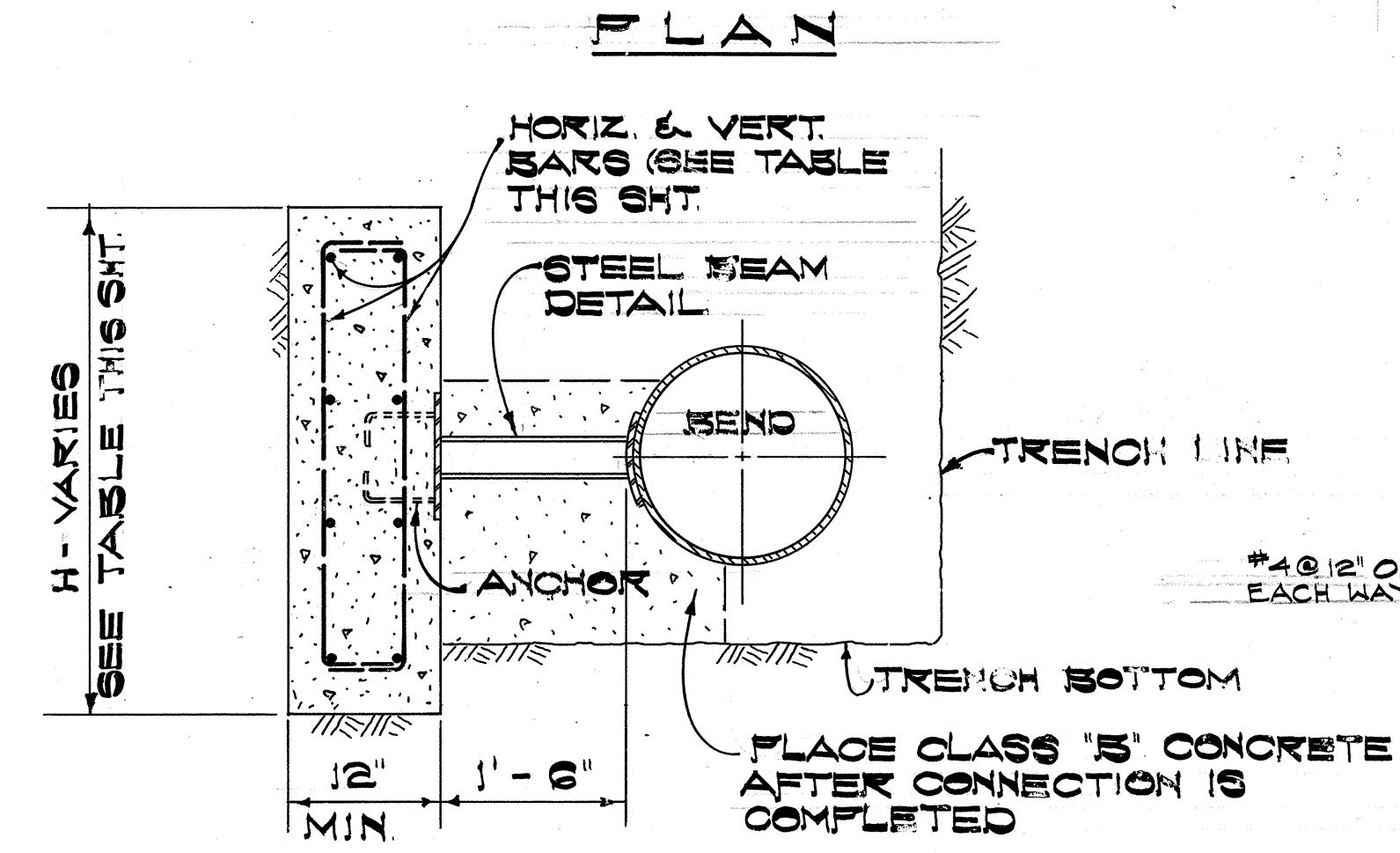
WATER LINE SIZE	H	L	HORIZONTAL REINFORCING	VERTICAL REINFORCING	WATER PRESSURE OR CLASS PIPE	DEGREE BEND
20"	4'-0"	8'-0"	*6@10'E.F.	*6@10'E.F.	150 P.S.I.	1/8"
30"	4'-0"	4'-0"	*6@8'E.F.	*6@8'E.F.	"	1/16"
30"	5'-0"	8'-0"	*8@12'E.F.	*8@12'E.F.	"	1/8"
6"	2'-0"	3'-4"	*4@12'E.F.	*5@12'E.F.	"	1/32"
12"	2'-0"	3'-0"	*4@12'E.F.	*5@12'E.F.	"	1/32"
12"	2'-0"	3'-0"	*4@12'E.F.	*5@12'E.F.	"	1/16"



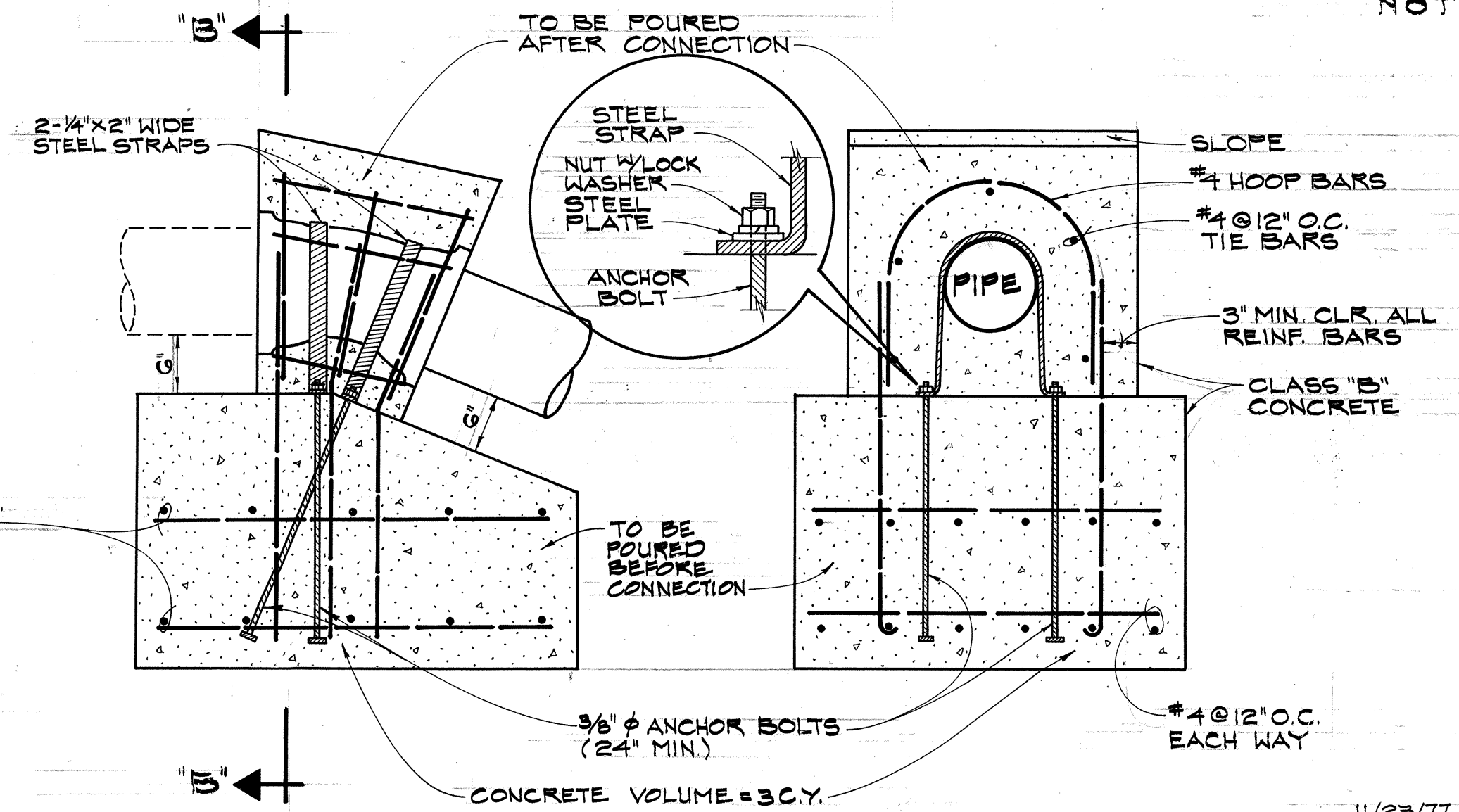
WATER SYSTEM CONCRETE BLOCK DETAIL
(FOR HORIZONTAL AND BOTTOM VERTICAL BENDS)
NOT TO SCALE

WATER SYSTEMS

FITTING	BEARING AREA SQ. FT.
6" 1/32 BEND	0.3
6" 1/8 BEND	1.6
6" 1/4 BEND	2.0
6" TEE	1.5
8" 1/4 BEND	2.5
12" 1/32 BEND	1.1
12" 1/16 BEND	3.3
12" 1/8 BEND	4.3
12"x6" TEE	1.5
12"x12" TEE	5.7
14" 1/16 BEND	3.0
14"x6" TEE	1.5
18" 1/8 BEND	0.7
18" PLUG	12.7
20" 1/32 BEND	3.1
20" 1/16 BEND	6.1
20" 1/8 BEND	12.0
20"x12" TEE	5.7
30" 1/32 BEND	6.9
30" 1/16 BEND	13.8
30" 1/8 BEND	27.1

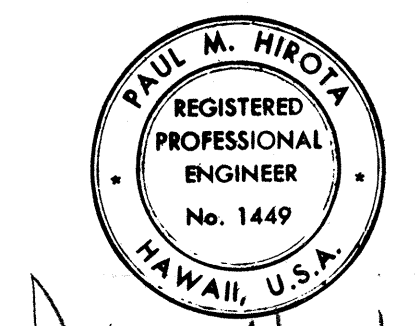


SECTION "A-A"
PRECAST CONCRETE BLOCK WITH STRUCTURAL STRUT
NOT TO SCALE



ELEVATION
TOP VERTICAL REACTION BLOCK
NOT TO SCALE

DATE	REVISION
11/23/77	ADDED TOP VERTICAL REACTION BLOCK DETAIL
12/13/76	CONC. BLOCK TABLE: ADDED 6" 1/8 BEND, 12" 1/16 BEND, & DELETED 18"x6" TEE. MINIMUM COVER EXCEPTION FOR AIR FORCE 6" WATER ADDED TO TRENCH DETAIL.

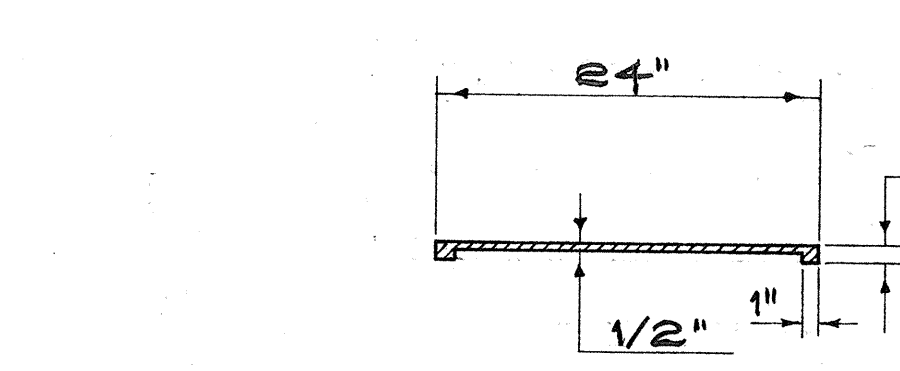
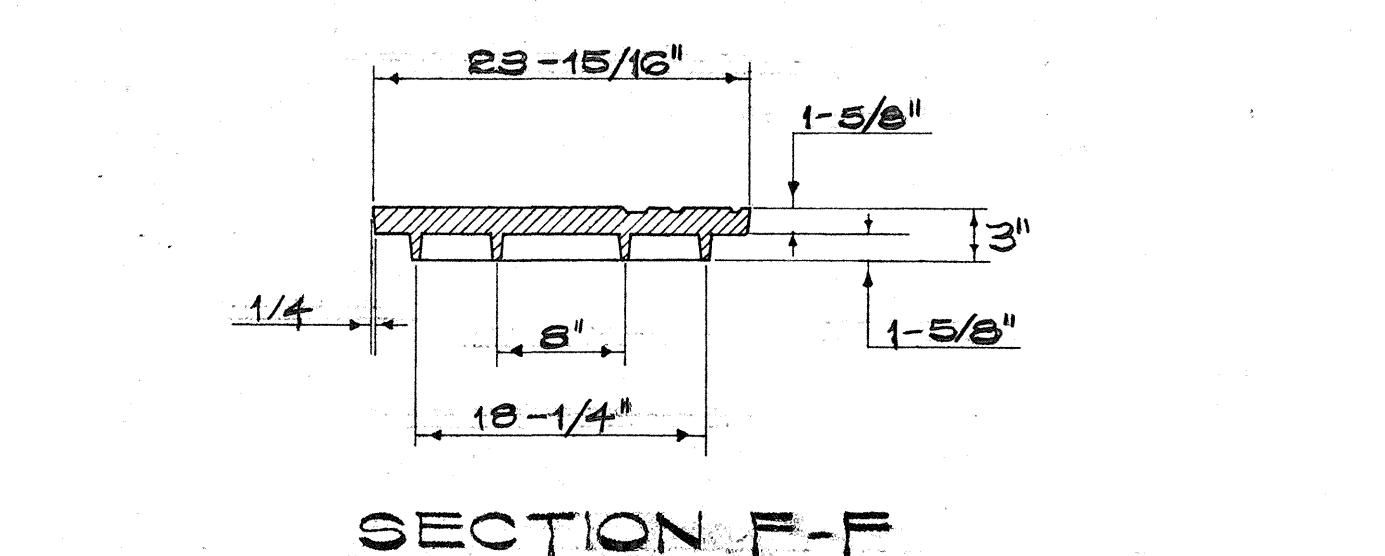
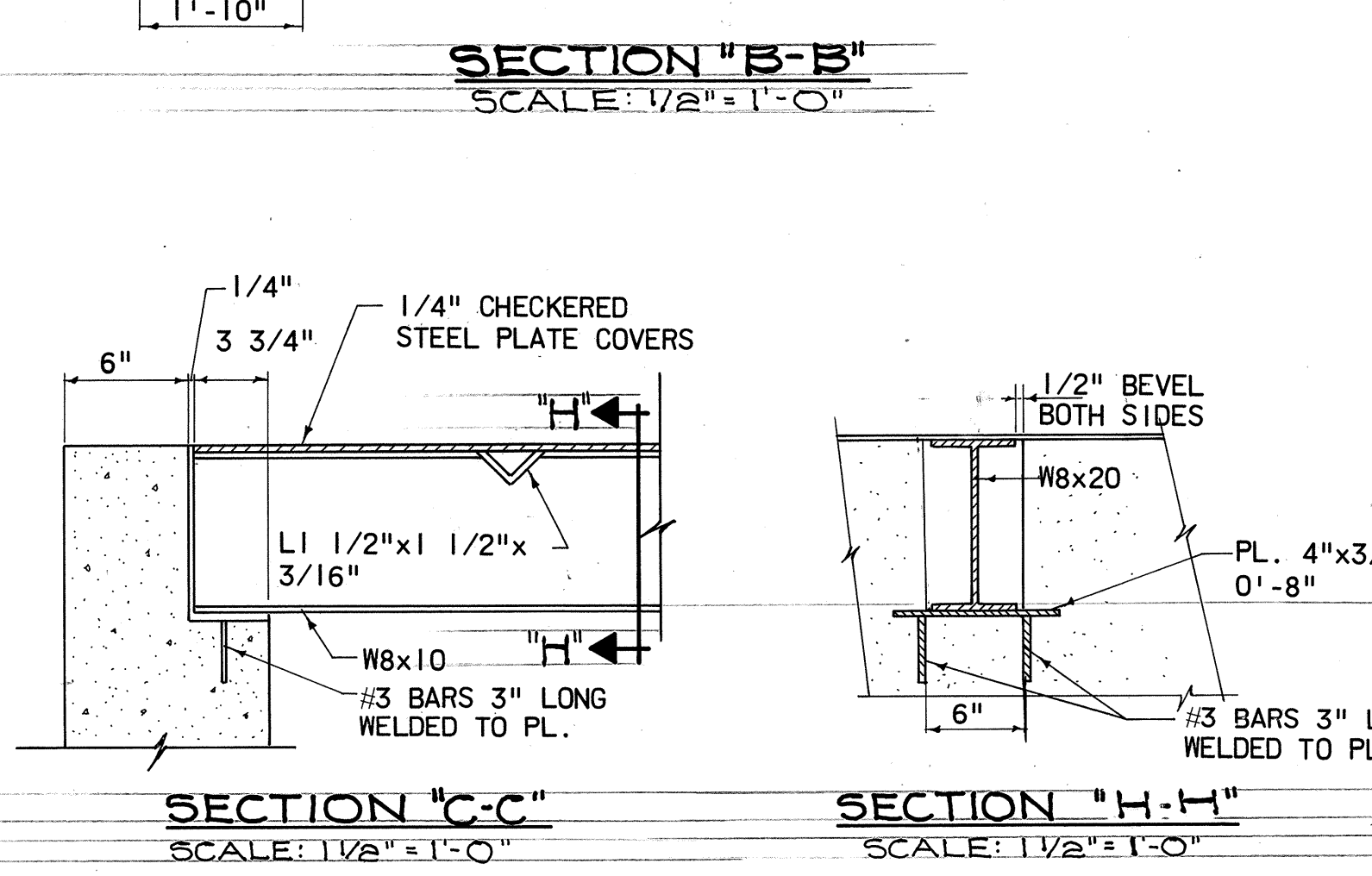
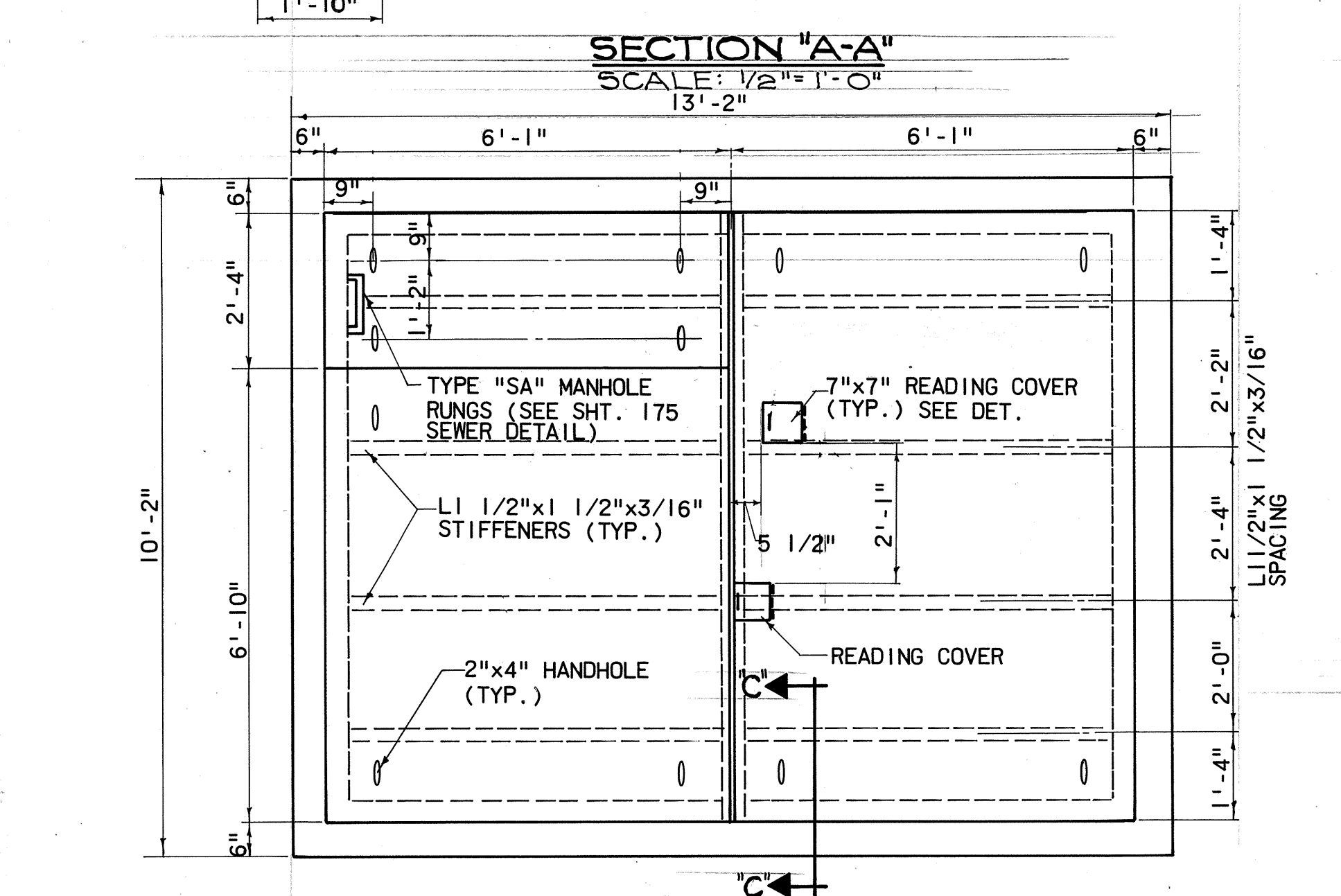
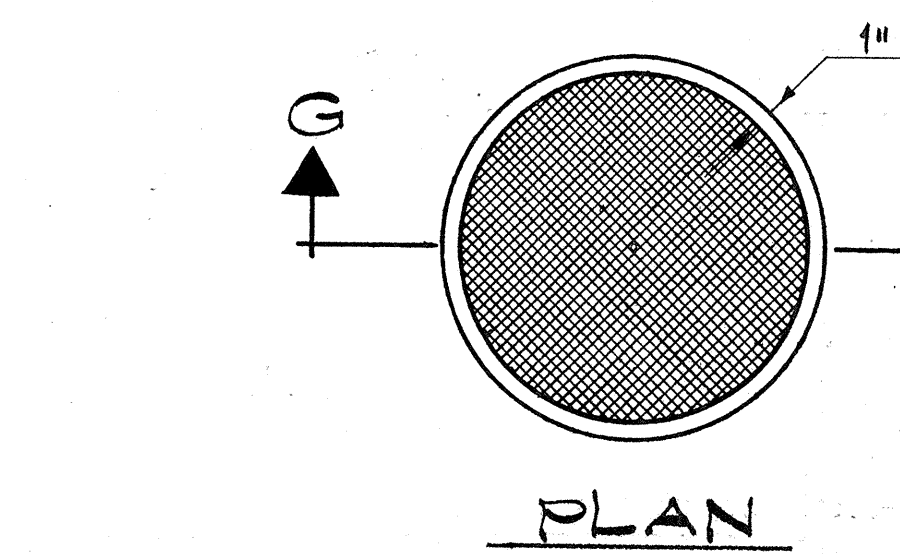
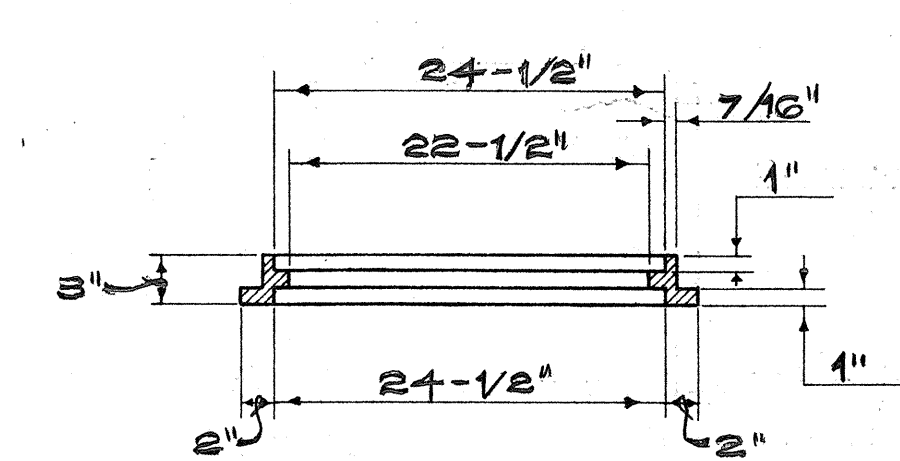
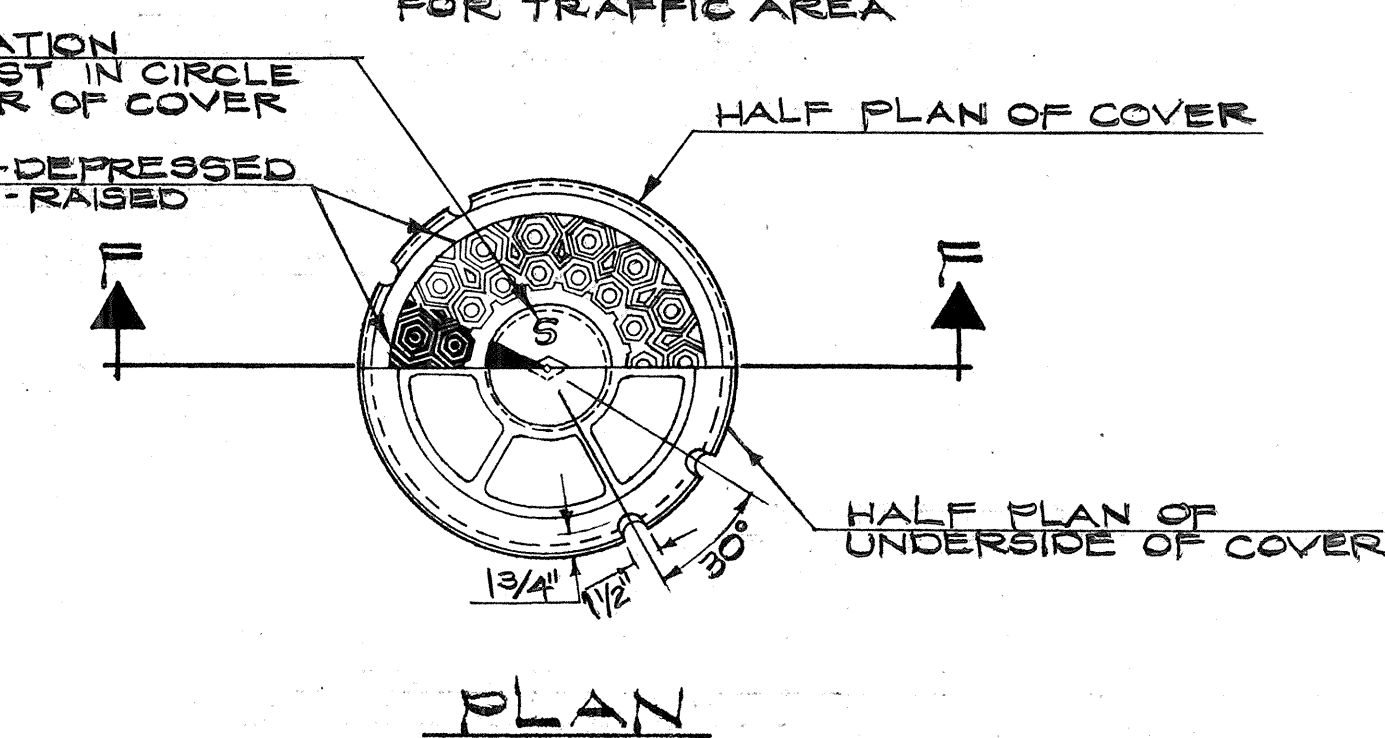
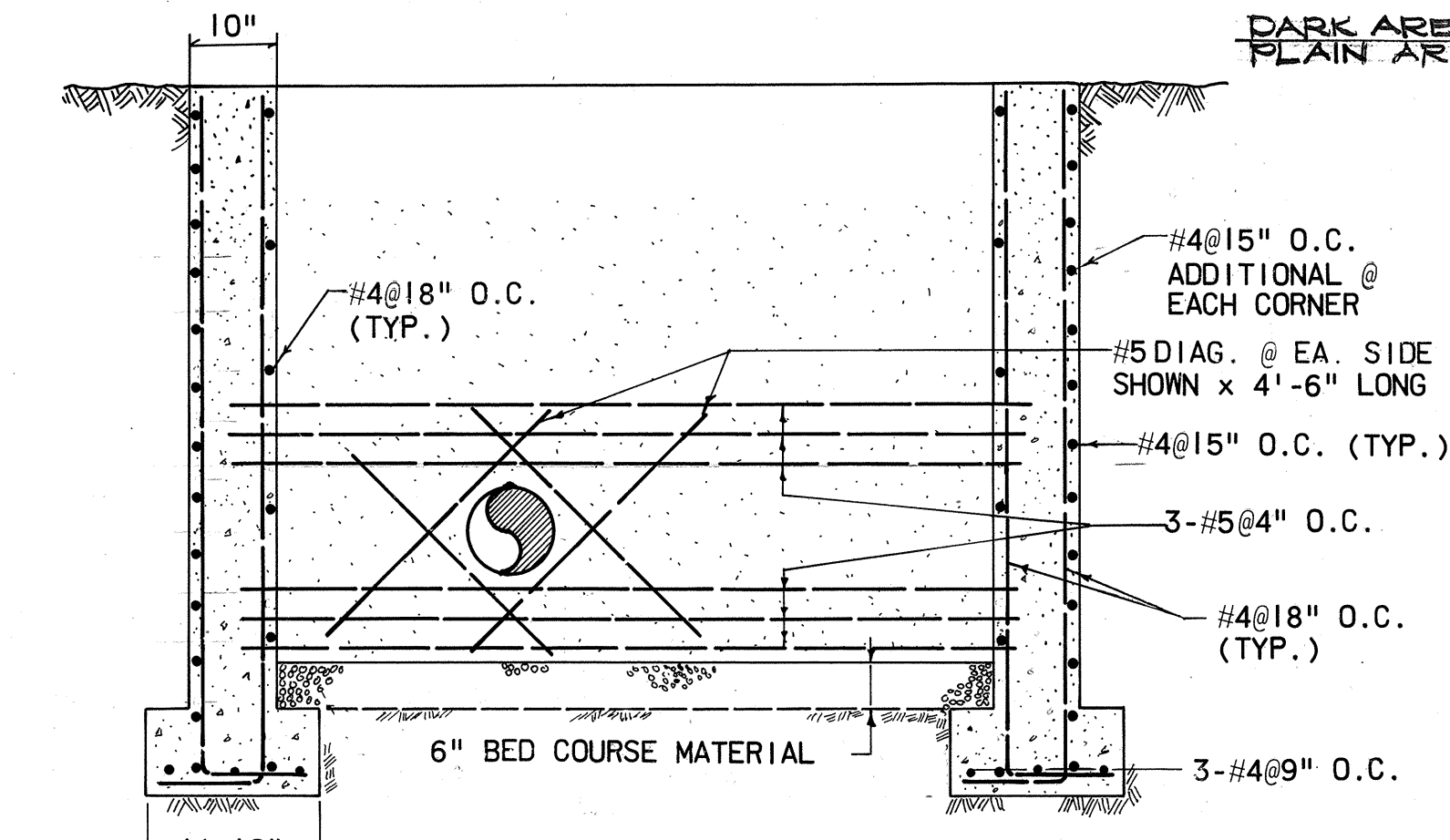
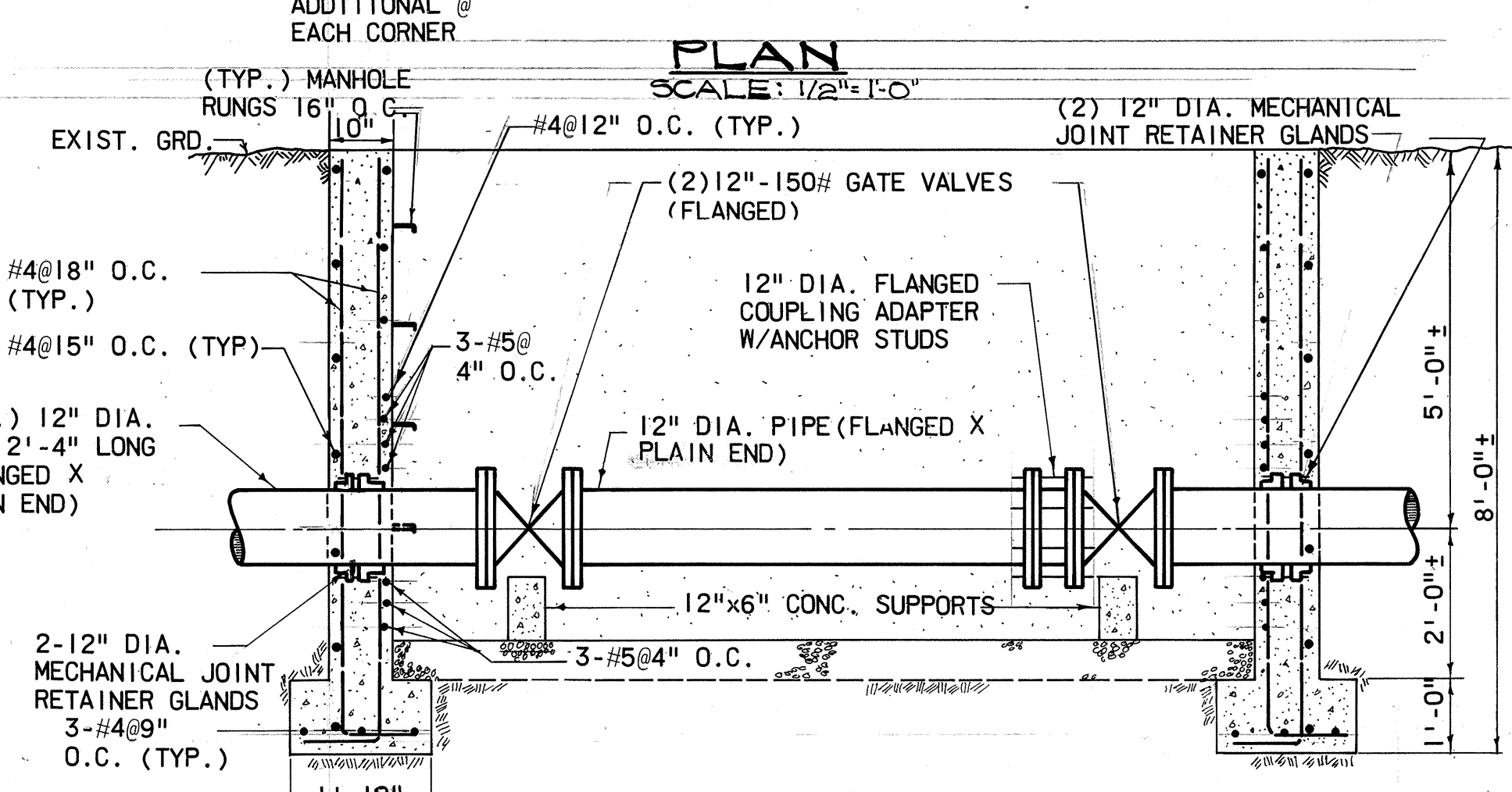
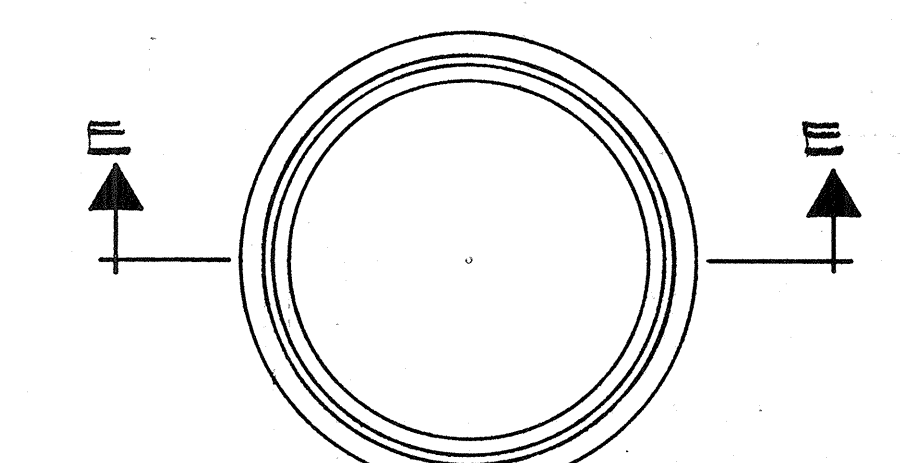
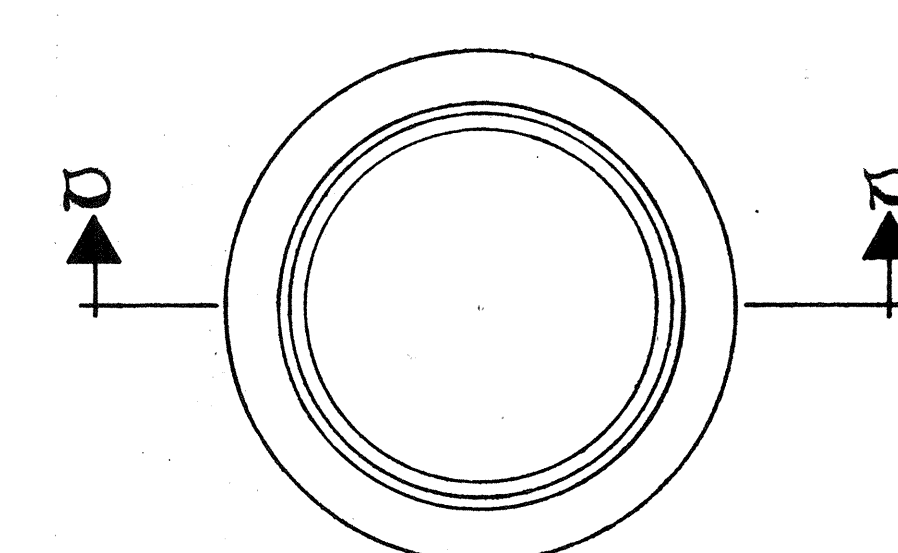
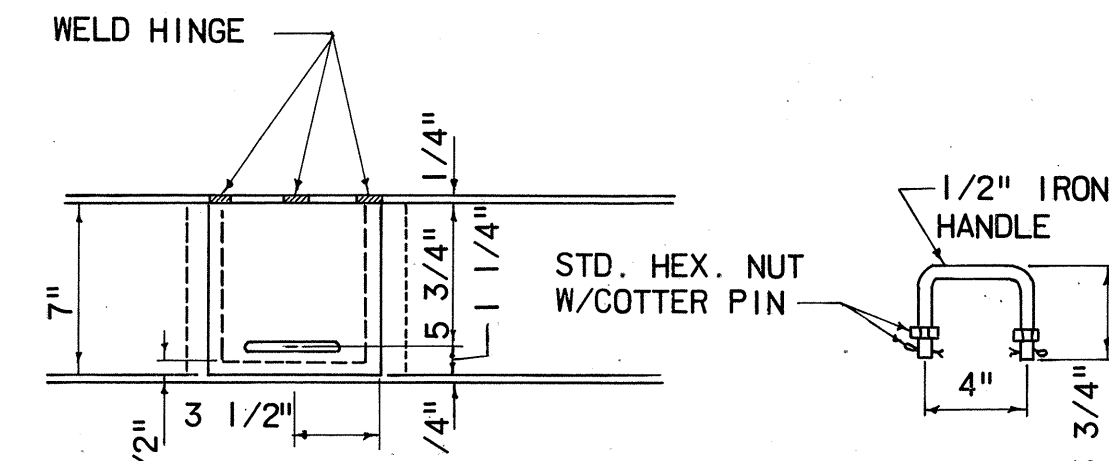
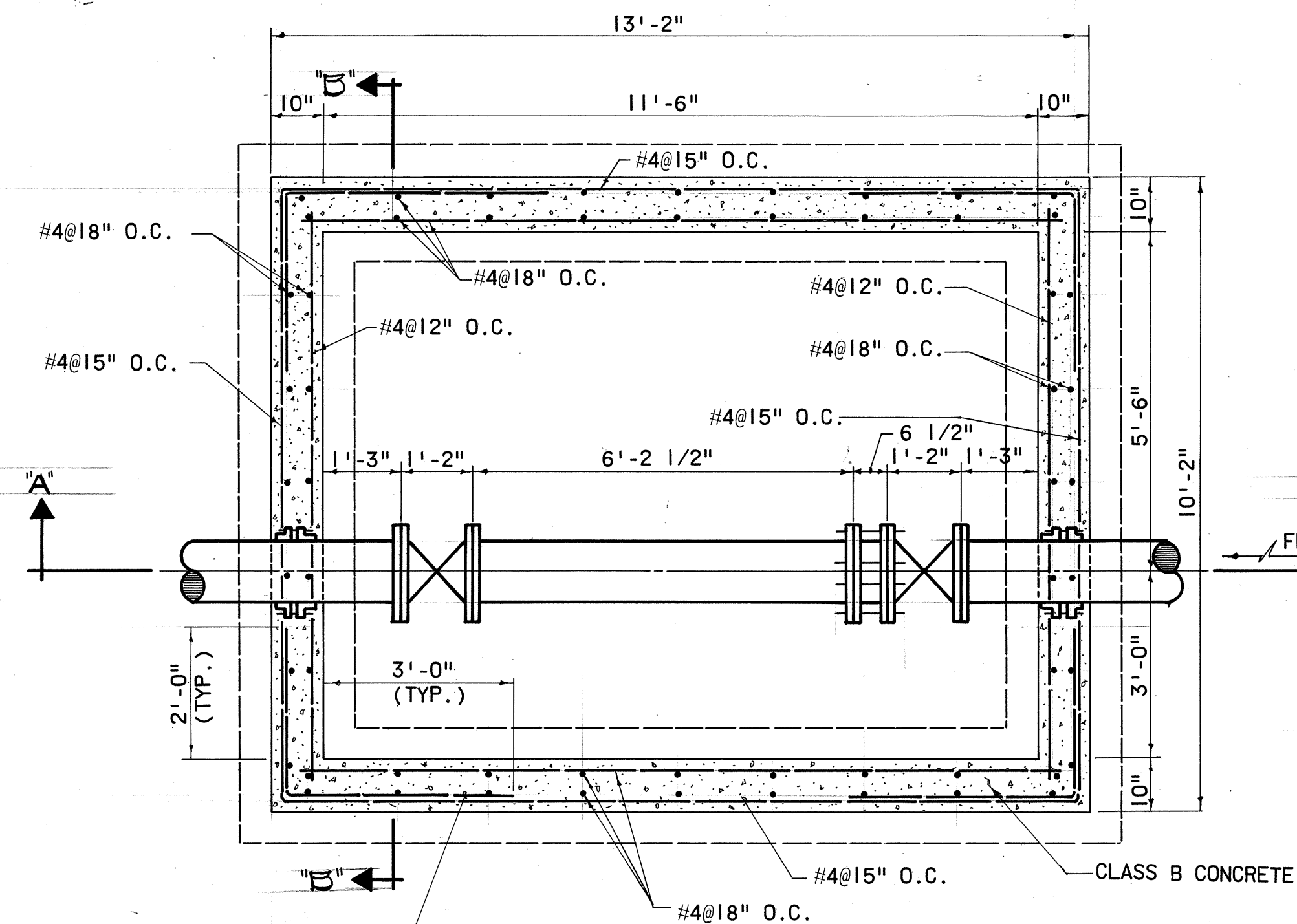


THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

APPROVED BY (FOR GAS LINES RELOCATION ONLY)
GASCO, INC. DATE

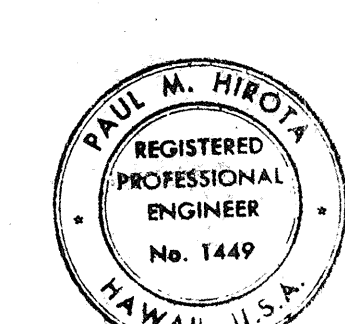
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
MINUTE SPUR
MISC. DETAILS
WATER, SEWER & GAS
INTERSTATE ROUTE H-1
PROJECT NO. I-HI-1(99)15
SCALE: AS NOTED DATE: AUG 4 1976
SHEET NO. 15 OF 19 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(99)15	1977	173	350



NAVY SEWER MANHOLE FRAMES & COVERS (OPTIONAL)

SCALE: 1"=1'-0"



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
NIMITZ SPUR
MISC. DETAILS
(WATER & SEWER)
INTERSTATE ROUTE H-1
PROJECT NO. I-HI-1(99)15
SCALE: AS NOTED DATE: AUG 4 1976
SHEET NO. 16 OF 19 SHEETS

DATE	REVISION
12/13/76	DELETED WATER METER BOX "F" DETAILS ADDED: NAVY WATER METER BOX DETAILS DELETED 30" SEWER MANHOLE DETAIL (TO SEWER DETAIL SHEET 175)

REINFORCED CONCRETE WATER METER BOX

COVER PLATE DETAIL

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

SECTION "H-H"

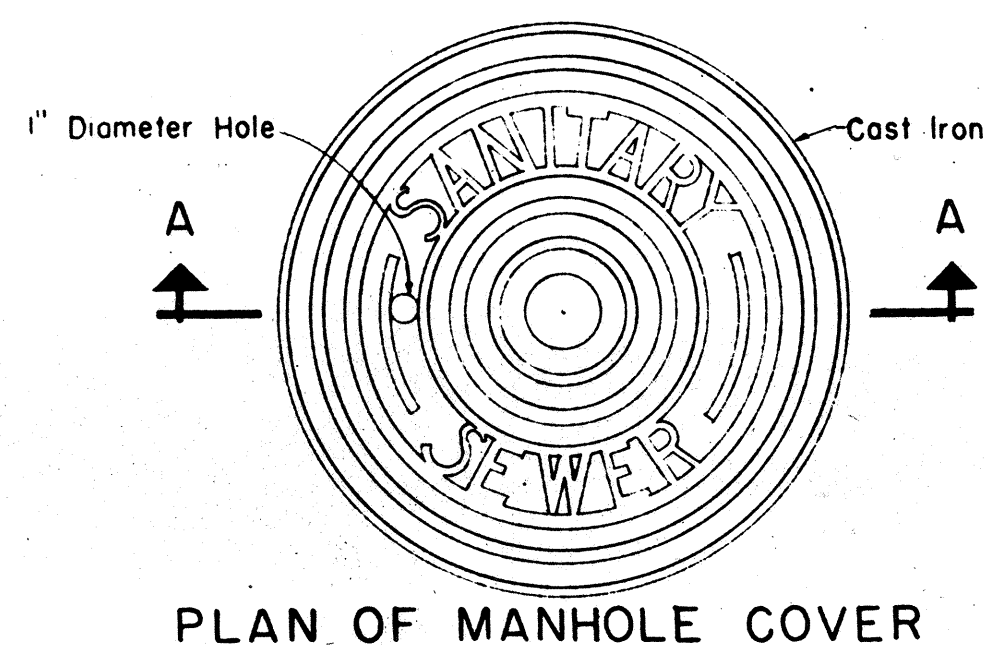
SCALE: 1/2"=1'-0"

SECTION "C-C"

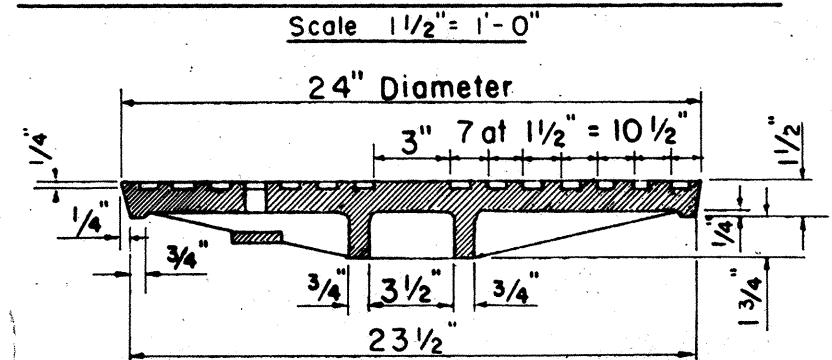
SCALE: 1/2"=1'-0"

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(99) 15	1977	175	350

Payment for excavation for manholes shall be made under unit price for trench excavation and shall be measured to one foot outside of walls from original ground elevation to authorized bottom elevation.
Payment for manhole walls (brick, or cast-in-place concrete) shall include brick, mortar, concrete, reinforcing steel, cast-iron steps, galvanized wrought iron rungs, and plastering.



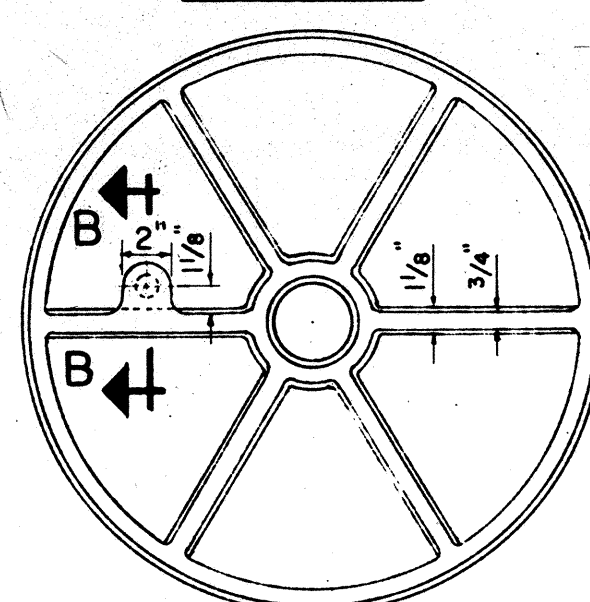
PLAN OF MANHOLE COVER



SECTION A-A

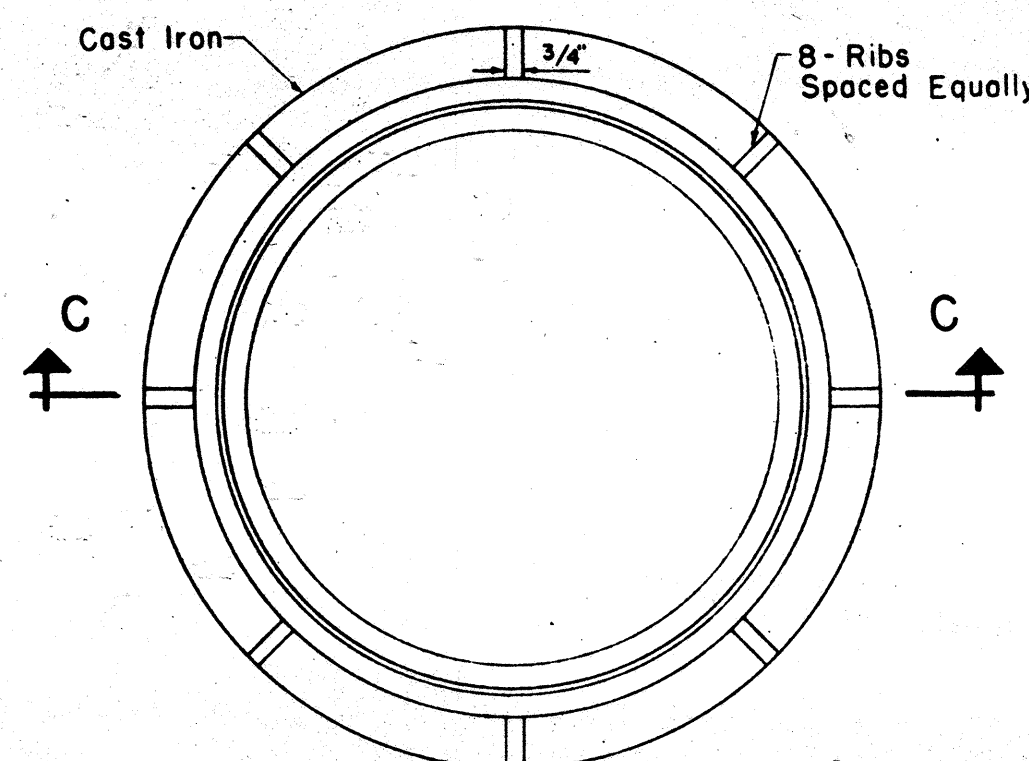
Scale: 1/2" = 1'-0"

NOTE: This cover is used with the "SA" frame.



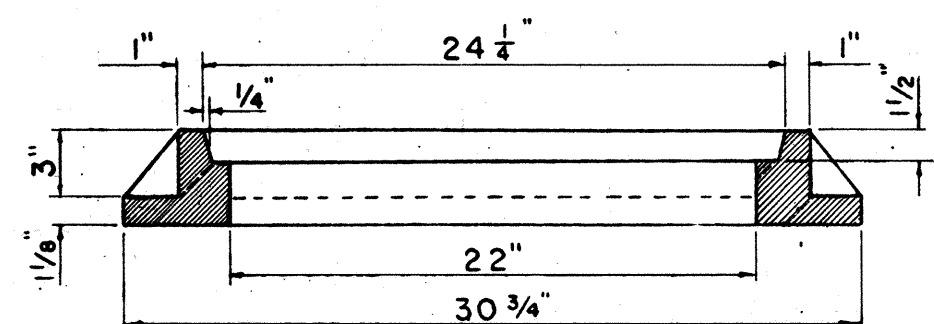
BOTTOM VIEW OF COVER

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



PLAN OF MANHOLE FRAME

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

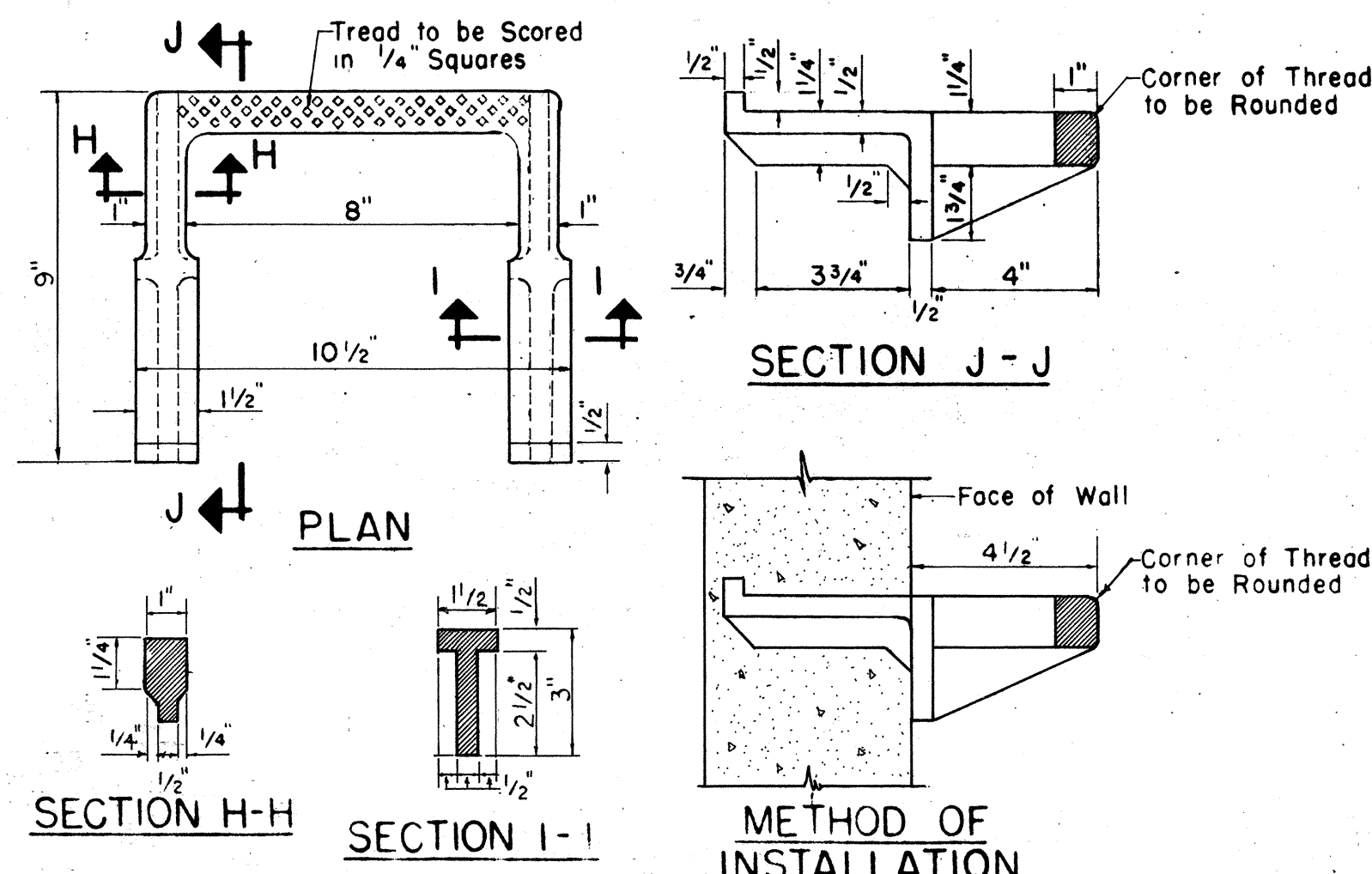


SECTION C-C

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

TYPE "SA" SEWER MANHOLE FRAME AND COVER

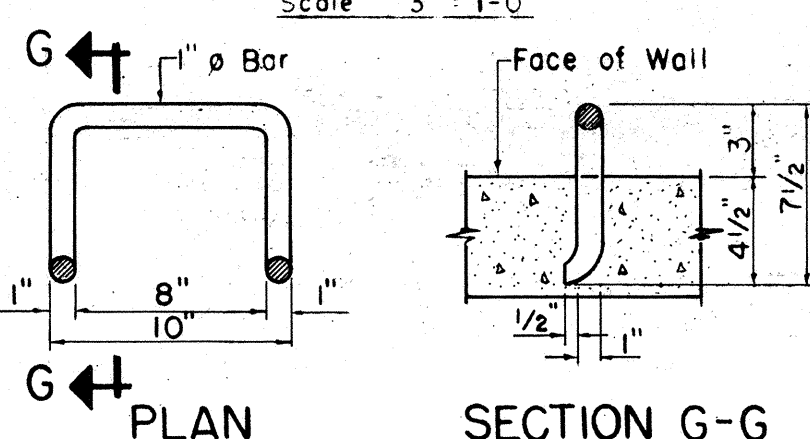
Scale: 1/2" = 1'-0"



SECTION J-J

TYPE "SB" MANHOLE RUNGS (CAST IRON)

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

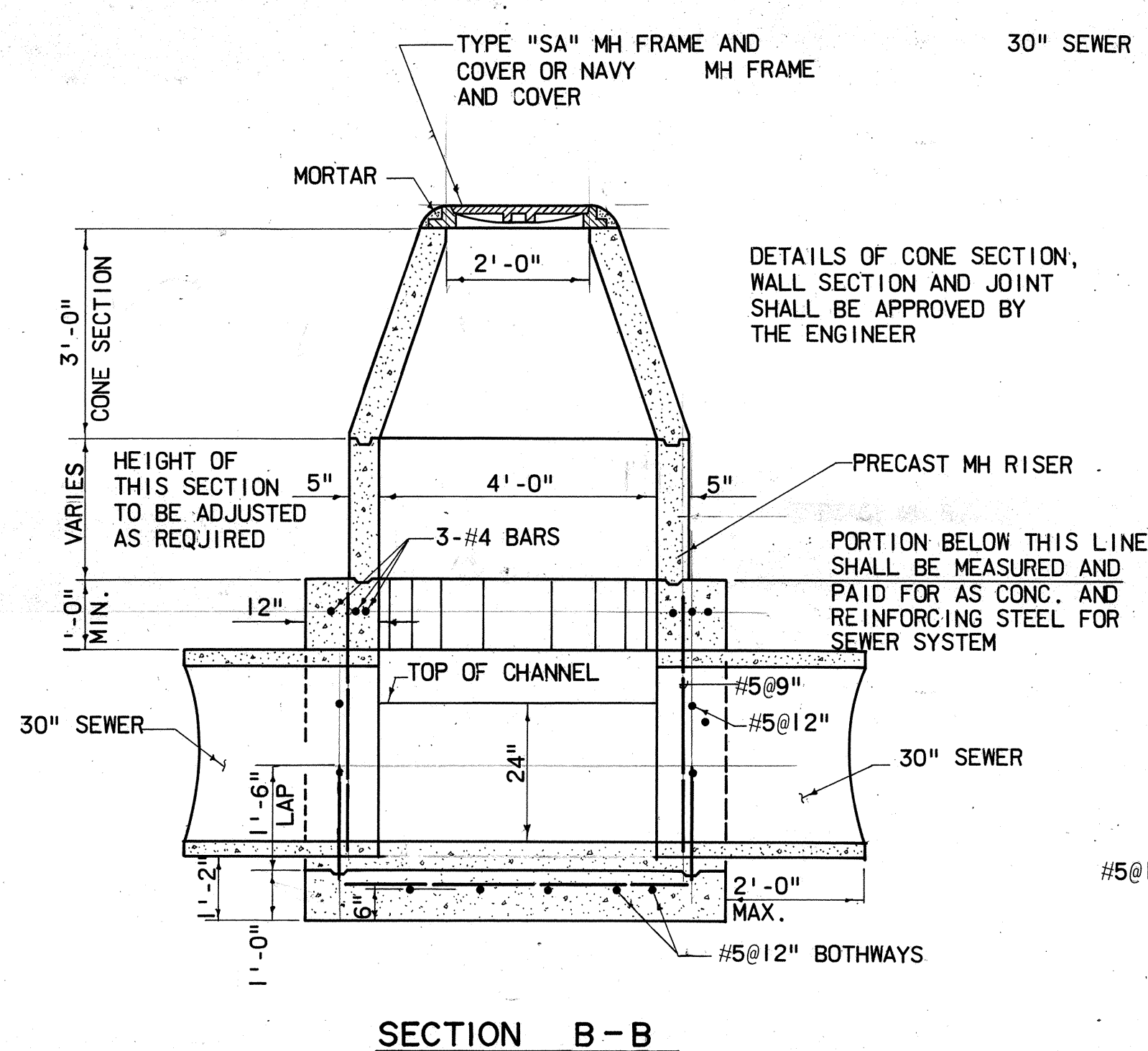


SECTION G-G

TYPE "SA" MANHOLE RUNGS (WROUGHT IRON)

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

NOTE: INSTALL TYPE "SB" MANHOLE RUNGS 16" O.C. (MAX.). RUNGS SHALL NOT BE INSTALLED OVER A PIPE CONNECTION AND THE LOWEST RUNG SHALL BE NOT MORE THAN 3'-0" ABOVE THE INVERT.



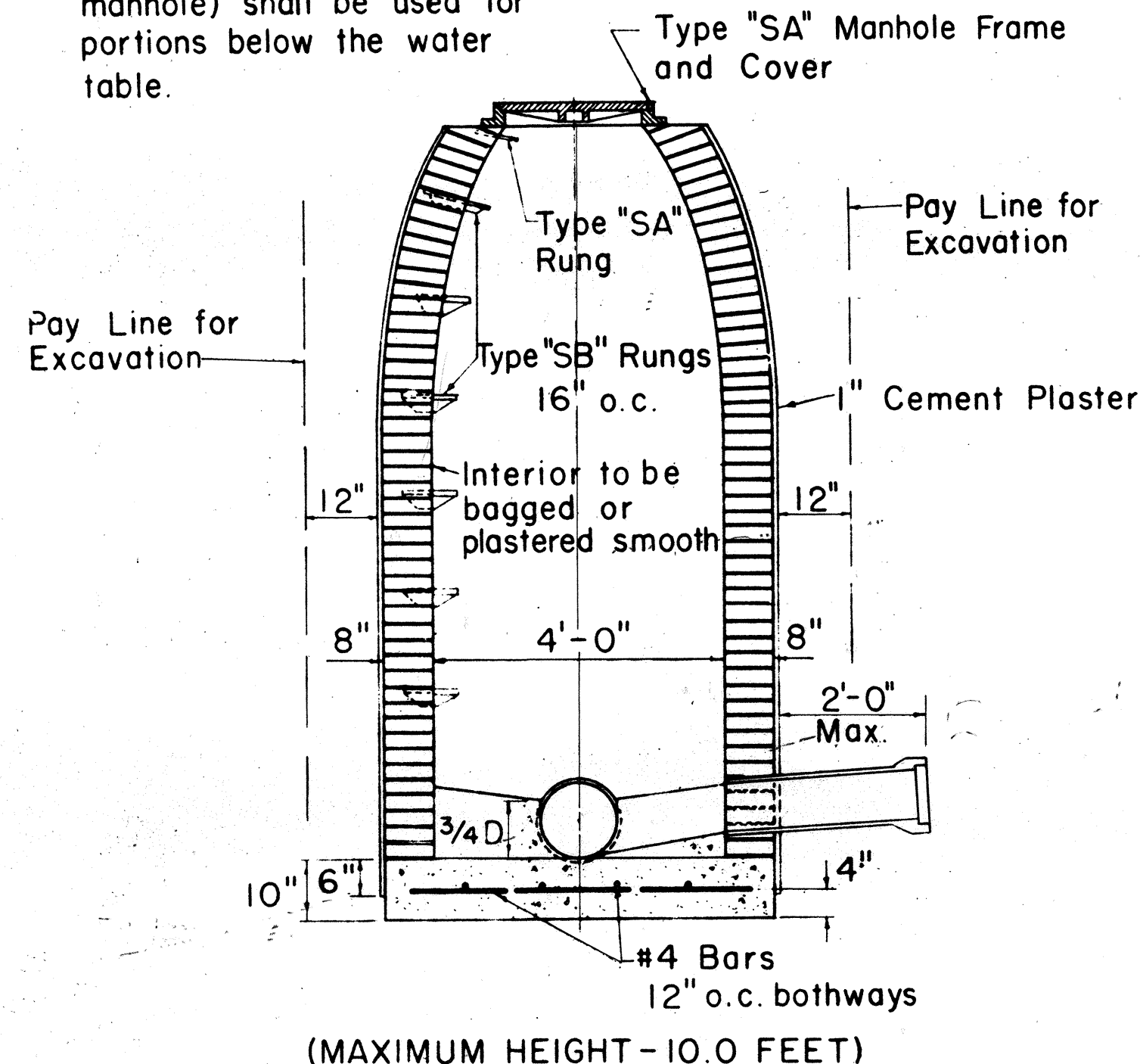
SECTION B-B

30" SEWER PRE-CAST CONCRETE SEWER MANHOLE

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

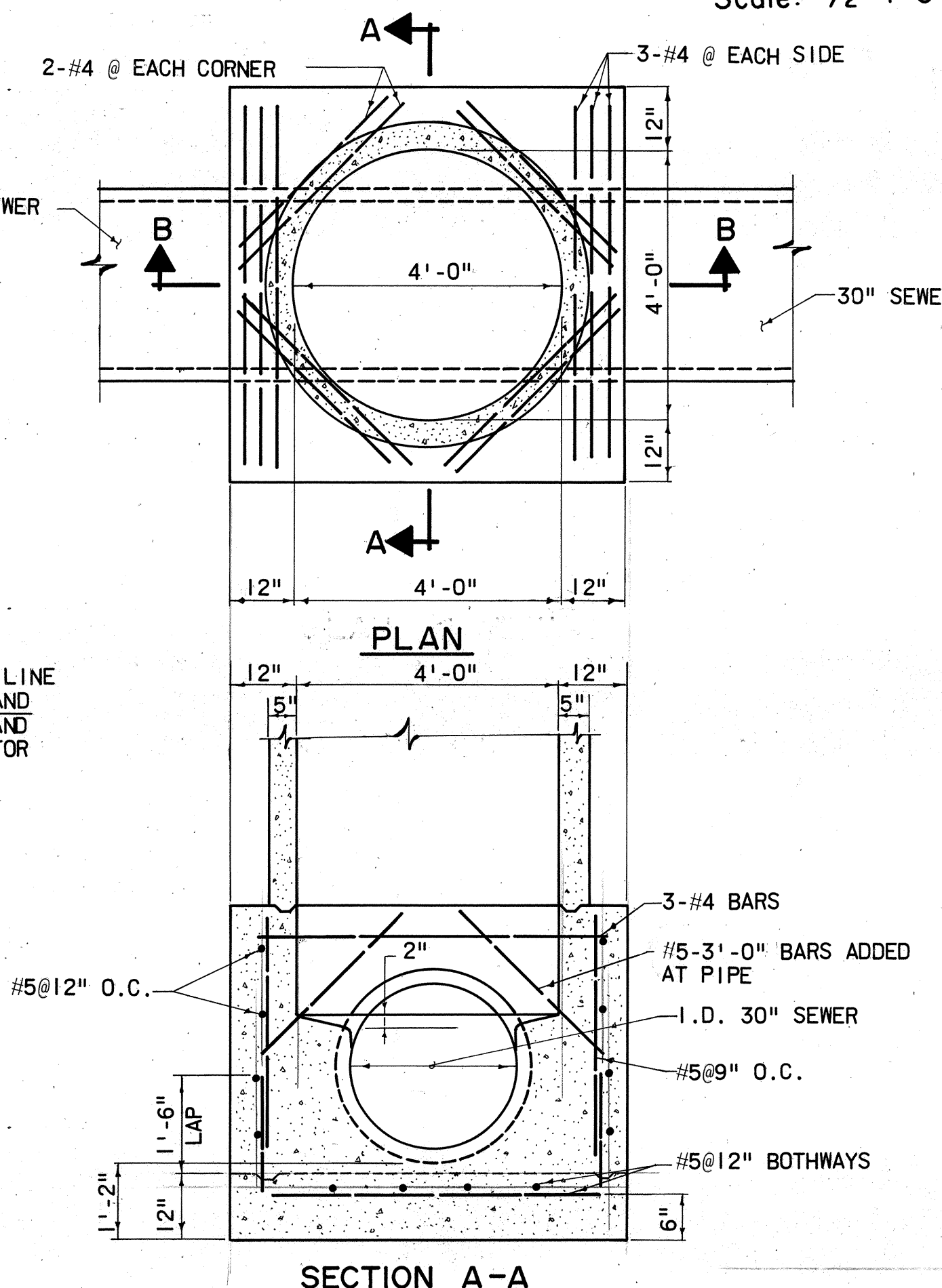
NOTE:

Reinforced concrete manhole walls (See detail of plain manhole) shall be used for portions below the water table.



BRICK MANHOLE

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



SECTION A-A

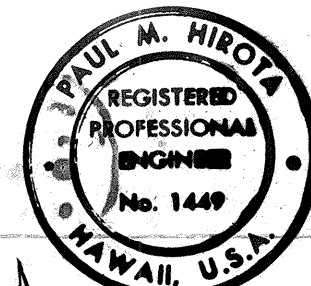
12/13/76 ADDED 30" PRECAST CONC. SEWER MH DETAILS.
DATE REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
NIMITZ SPUR

SEWER DETAILS

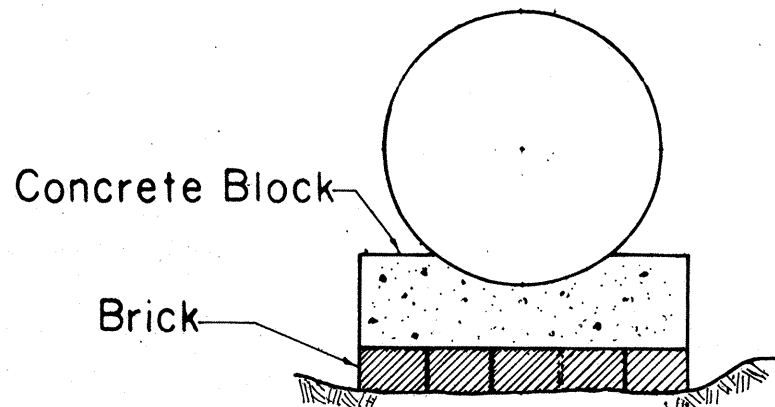
INTERSTATE ROUTE H-1
PROJ NO I-HI-1(99) 15
SCALE AS NOTED
DATE AUG 4 1976

SHEET NO. 18 OF 19 SHEETS



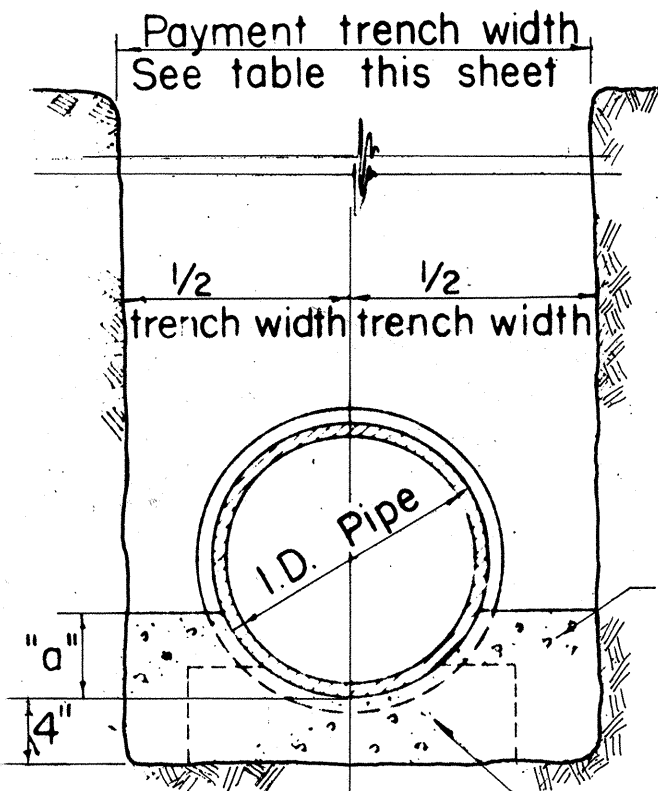
THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(99) 15	1977	176	350



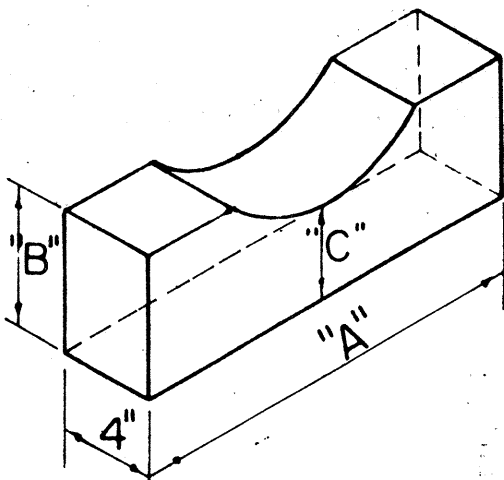
METHOD OF USING BRICKS UNDER CONCRETE BLOCKS

Not To Scale



NOTE: Payment width of cradle shall be payment trench width.

CONCRETE PIPE TABLE				
TRENCH WIDTHS		DIM. OF CONC CRADLE		
PIPE SIZE	PAY. WIDTH	PIPE SIZE	"a"	WIDTH
6"	24"	6"	3"	24"
8"	24"	8"	3"	24"
10"	24"	10"	3"	24"
12"	30"	12"	3"	30"
15"	38"	15"	4"	38"
18"	41"	18"	5"	41"
21"	45"	21"	5"	45"
24"	50"	24"	6"	50"
27"	53"	27"	7"	53"
30"	57"	30"	7"	57"



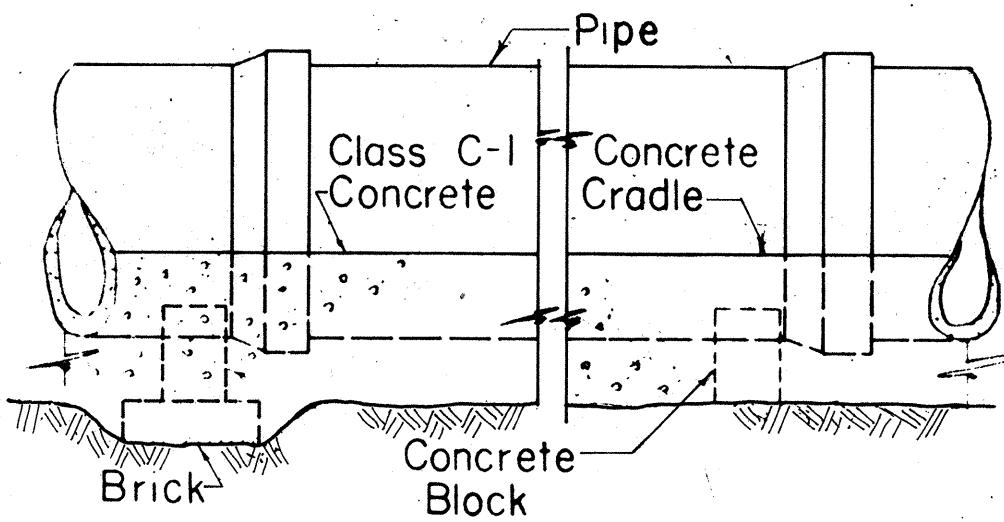
DETAIL OF PRECAST CONC. PIPE BLOCK

CONCRETE BLOCK DIMENSIONS			
PIPE SIZE	"A"	"B"	"C"
6"	1'-2"	6"	3"
8"	1'-5"	6"	3"
10"	1'-7"	6"	3"
12"	1'-8"	6"	4"
15"	1'-9"	6"	4"
18"	1'-10"	6"	4"
21"	1'-11"	6"	4"
24"	2'-0"	6"	4"
27"	2'-3"	6"	4"
30"	2'-3"	6"	4"

CONCRETE CRADLE FOR CONCRETE PIPE

Not To Scale

Contractor shall see Concrete Blocks on undisturbed ground Where ground is too low, the contractor shall not heap up dirt under the Concrete Block but use Concrete Bricks to take up the deficiency, scraping away beneath Concrete Block to give sufficient room for Brick



ELEVATION SHOWING METHOD OF LAYING PIPE

Not To Scale



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
NIMITZ SPUR

SEWER DETAILS

INTERSTATE ROUTE H-1
PROJ NO I-HI-1(99) 15
SCALE AS NOTED DATE AUG 4 1976
SHEET No. 190 OF 190 SHEETS