

BOARD OF WATER SUPPLY NOTES

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DE-0200(803)	2000	26	79

- SURVEY PLOTTED BY
DATE

DRAWN BY
DATE

TRACED BY
DATE

QUANTITIES BY
DATE

CHECKED BY
DATE

ORIGINAL
PLAN

NOTE BOOK

NO.

1. Unless otherwise specified, all materials and construction of water system facilities and appurtenances shall be in accordance with the City and County of Honolulu, Board of Water Supply's "WATER SYSTEM STANDARDS" VOLUME 1, DATED 1985, THE "APPROVED MATERIAL LIST AND STANDARD DETAILS FOR WATER SYSTEM CONSTRUCTION", VOLUME 2, DATED 1985, THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 1991, and all subsequent amendments and additions.

2. All plans approved by the Board of Water Supply are based solely on the adequacy of the water supply. All other features of the water system, such as lines, grades, fittings, drainage, etc., and other features of improvements shall not be the responsibility of the Board of Water Supply.

3. The existence and location of underground utilities and structures as shown on the plans are from the latest available data but is not guaranteed as to the accuracy or the encountering of other obstacles during the course of the work. The Contractor shall be responsible and shall pay for all damages to existing utilities. The Contractor shall not assume that where no utilities shown, that none exist.

4. The Contractor shall be responsible for the protection of all water lines during construction. The Contractor shall be especially careful when excavating behind water lines, tees, and bends wherever there is a possibility of water line movement due to removal of the supporting earth beyond the existing reaction blocks. The Contractor shall take whatever measure necessary to protect the water lines, such as constructing special reaction blocks (with BWS approval) and/or modifying his construction method.

5. Re-approval shall be required if this project is not under construction within a period of two (2) years.

6. The Contractor shall notify BWS Planning and Engineering Division, Construction Section in writing and submit four (4) sets of approved construction plans one week prior to commencing work on the water system. (Revised 6/98)

7. The Contractor shall verify all existing service lateral locations whether shown or not shown on plans prior to commencing with any of the work and shall not assume that where no service laterals are shown none exists.

8. Prior to any excavating, the Contractor shall verify in the field the location of existing water mains and appurtenances.

9. Any adjustments to the existing water system required during construction to meet requirements of BWS Standards, whether shown on the plans or not, shall be done by the Contractor at no cost to the Board of Water Supply.

10. The Contractor shall have existing water mains toned before construction of work in vicinity of water mains, call the investigation section at 527-5296 for toning services. Guardrail post locations are to be kept to a minimum clear distance of 18 inches to any 2-1/2 Inch water lines and meter boxes. No post driving will be allowed when post is to be installed closer than 3 feet from water main. Excavated areas shall be restored to their original condition.

11. Prior to installation, the Contractor shall submit for approval by Board of Water Supply, the manufacturer's certification that all cast iron (gray or ductile) fittings for the project conform in all respects to the Water System Standards, dated 1985.

12. All ductile iron pipe, fittings and valves shall be wrapped with two (2) layers of 8 mil. polyethylene wrap.

13. Test pressure shall be 150 psi.

14. Ball corp and ball stop shall be used in lieu of a corporation stop and stopcock respectively. (Added 7/21/97)

15. The Contractor shall cut and plug all existing unused laterals at the main whether or not shown on the plans. The damaged area shall be repaired to an equal or better condition than the immediate area. All work shall be done at the expense of the Contractor.

16. Polygon shape for mechanical joint glands as described in AWWA Standard C111 shall be "straight-sided" or an approved equal on a job to job basis.

17. Pipe cushion shall be of high resistivity material. The contractor shall submit a soil certification that high resistant cushion material has a resistivity greater than 5,000 OHM-CM. Remainder of the backfill material shall be as specified in Volume 1 of the Water System Standards. Pipe cushion and backfill material shall contain no hazardous substances above regulatory action levels including but not limited to lead, asbestos, mercury, chromium, cadmium, zinc, strontium, and polychlorinated biphenyls (PCB). (Revised/Added 8/28/96)

18. For waterlines crossing existing or new ductlines:

i.) At the electrical/signal ductline water crossings, adjust all electrical/signal ductline elevations to maintain 6" vertical clear separation from all waterlines (12" clear for all electrical/signal ductline structures larger than 16") at no cost to the Board of Water Supply.

ii.) Maintain 3'-0" min. horizontal clear separation between all waterline system and nearest electrical/signal ductlines paralleling the water system at no cost to the Board of Water Supply.

iii.) Maintain 3'-0" min. horizontal clear separation between street light/traffic signal, standards (including any modular units) and the nearest water system. The Contractor shall field verify for any conflicts at each street light/traffic signal standard location. Where conflicts occur, the contractor shall coordinate with the project engineer to revise the street light/traffic signal standard to provide the required clearances at no cost to the Board of Water Supply.

19. For cut-in connection to existing:
"All waterline construction requiring shutdown connection shall be scheduled for AFTER working hours at SIX (6) hours maximum downtime."

20. The Contractor/Developer shall obtain a NPDES permit prior to chlorination and/or dewatering. A copy of the permit shall be submitted to the Board of Water Supply, Planning and Engineering Division, Construction Section.

21. The contractor shall chlorinate the entire inside surface of each pipe and fitting with disinfection solution of 5 ounces of sodium hypochlorite mixed with 10 gallons of water. (For connection only)

22. The contractor shall follow the following revised chlorination and water sampling procedures:

A. The following chlorination and water sample collection procedure shall apply to all water pipeline projects:

Step 1: Chlorinate main by filling with water and introducing chlorine in sufficient quantity to obtain a minimum chlorine concentration of 50 parts per million. Leave chlorinated water in main overnight.

Step 2: Flush main with fresh water until all chlorine has been flushed out as evidenced by the ortho-tolidine test, then collect a water sample while continuing to flush the main.

Step 3: Repeat Steps 1 and 2. After collecting the second water sample, stop flushing and allow the water to stand in the main overnight.

Step 4: Thoroughly flush the main with fresh water until all water that had been standing in the main overnight has been flushed out. Stop flushing and let the water stand in the main for one (1) hour. Collect a water sample.

B. The main is deemed acceptable and certified when (1) two consecutive water samples, collected 24 hours apart under Steps 1 and 2, show no total and fecal coliform and less than 200 colony forming units (CFU) of total bacteria and (2) the sample of water held in the main for one hour, collected under Step 4, also shows no total and fecal coliform and less than 200 CFU total bacteria.

C. Chlorination, flushing, sampling and testing will be extended should unsatisfactory results be encountered. Any sample that shows positive coliform presence or total bacteria greater than 200 CFU is unsatisfactory.

D. Steps 1 and 2 may be repeated before collecting the one hour hold sample specified in Step 4. Repeating Steps 1 and 2 is recommended in the event samples show the presence of coliforms and/or increasing total bacterial results from one sample to the next.

E. Water samples that show the presence of atypical colonies, debris or results inconsistent with existing water are subject to reconfirmation. BWS reserves the right to request and test additional water samples in the interest of safeguarding public health and safety.
- APPROVED:

Michael Jaha

CHIEF, PLANNING AND ENGINEERING, B.W.S.

CITY AND COUNTY OF HONOLULU

Date: 4/27/00
- STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY NOTES

KAMEHAMEHA HIGHWAY

Intersection Improvements at
Leilehua Golf Course Road

Fed. Aid Project No. DE-0200(803)

Date: Mar. 4, 2000

SHEET No. 1 OF 15 SHEETS

GENERAL CONSTRUCTION NOTES

- A. Trenching to be by hand digging near and across existing utility lines.
- B. Unless otherwise requested by the Board of Water Supply, minimum clearance between water lines and conduits shall be:
Horizontal = 3 feet
Vertical = 6 inches
- C. Adjust new conduit alignment, if required to provide clearances. If conduit cannot be realigned, adjustments to existing water system shall be performed in accordance with standards of the Board of Water Supply.
- D. Minimum clearance between highway light standards and fire hydrants shall be 3 feet.
- E. Underground utilities shown hereon are for information only. No guarantee is made on the accuracy or completeness of said information.
- F. All new and existing concrete pullbox and handhole covers which are located in new finished sidewalks shall be provided with new exposed aggregate concrete covers to match new exposed aggregate concrete sidewalk finish.
- G. Where necessary, reconstruction of sidewalk, gutter and driveway areas shall conform to the standard details of the governmental agency having jurisdiction over the work.
- H. The Contractor shall be responsible for removal of all silt and debris resulting from his work and deposited in drainage facilities, roadways and other areas. The cost for any necessary remedial action by the Chief Engineer shall be payable by the Contractor.
- I. The Contractor, at his own expense, shall keep the project area free from dust nuisance. The work shall be in conformance with the air pollution control standards and regulations of the State Department of Health.

HAWAIIAN ELECTRIC COMPANY NOTES

1. The location of HECO's overhead and underground facilities shown on the plans are from existing records with varying degrees of accuracy and are not guaranteed as shown. The Contractor shall exercise extreme caution whenever construction crosses or is in close proximity of underground lines and shall maintain a minimum 13'-0" clearance when operating equipment within or under any overhead lines.
2. The Contractor shall comply with the State of Hawaii's Occupational Safety and Health law (DOSH).
3. The Contractor shall obtain an excavation permit from HECO's Customer Installation Department located at 820 Ward Avenue, 4th Floor, two weeks prior to starting construction.
4. The Contractor to stakeout all facilities for verification by the utility involved and/or affected before proceeding.
5. All manholes, pullboxes and ductlines to be installed in concrete, shall be inspected and approved by the utility company before placing concrete. Notify utility company 48 hours prior to placing concrete.
6. All completed ductlines shall be mandrel tested by the Contractor in the presence of the utility company's inspector using the utility company's standard practice.
7. The Contractor shall install a 1/8" polyolefin pull line in all completed HECO and CATV ductlines after mandrel testing is complete.
8. The Contractor shall be responsible for all proposed work within private property to enable the conversion from overhead to underground. The Contractor shall coordinate all work with the utility companies.
9. The Contractor shall give HECO forty (40) working days notice to proceed with it's portion of the work.
10. Barricading of HECO's facilities, if required, shall be done by Contractor. Breaking into existing HECO facilities shall be done by HECO.
11. HECO shall remove all existing HECO facilities except as noted on the plans.
12. HECO shall be the JP removal company.

HAWAIIAN ELECTRIC COMPANY NOTES (Continued)

13. The following terms will be used interchangeably throughout this project:
a. HECO or "T" for Hawaiian Telephone Company
b. HECO or "E" for Hawaiian Electric Company
c. Oceanic Cable or "V" for Oceanic Cablevision
14. The Contractor shall furnish his construction schedule forty-five (45) working days prior to starting any HECO work.
15. For verifying the location of underground ductlines and for assistance in providing proper support and protection of underground ductlines, the Contractor shall contact the HECO underground division at 543-7871 or 543-7345, a minimum of 72 hours in advance. Location and depth of all handholes and manholes shall be verified and approved in the field by HECO prior to excavation, construction, or installation.
16. When trench excavation is adjacent to or under existing structures or facilities, the Contractor is responsible for properly sheeting and bracing the excavation and stabilizing the existing ground to render it safe and secure from possible slides, cave-ins and settlement, and for properly supporting existing structures and facilities with beams, struts or underpinning to fully protect it from damage.
17. Any work required to relocate HECO facilities shall be done by HECO and the Contractor shall be responsible for all coordination, and for costs if applicable.
18. Should it become necessary to temporarily relocate any HECO facilities to enable the Contractor to perform his work in a safe and expeditious manner in fulfilling his contract obligations, these temporary relocations will be done by HECO, or by the Contractor under HECO's supervision, with all costs being borne by the Contractor.
19. Any damage to HECO's facilities shall be reported immediately to HECO's trouble dispatcher at 543-7874.
20. All HECO overhead and underground facilities shown on these plans or whose approximate locations within the project boundaries have been made known by reasonable means. All HECO facilities shall be protected at all times by the Contractor during construction. Costs for damages to HECO facilities shall be borne by the Contractor. This repair work shall be done by HECO, or by the Contractor under HECO's supervision.
21. **CAUTION!!! ELECTRICAL HAZARD!!!!**
Existing electrical facilities, overhead lines and underground encased buried duct lines are energized and will remain energized during construction. Cables in service boxes, transformer vaults and handholes are also energized. Only Hawaiian Electric Company personnel are to handle these energized cables and erect temporary guards to protect cables from damage. Contractor shall work cautiously to avoid accidents and damage to existing facilities. Contractor shall coordinate his work with HECO u.g. division (phone: 543-7871 or 543-7345) and inspection division (phone: 543-4356).
22. The Contractor shall furnish and install all materials to complete construction of the underground ductline system, including riser conduits. All electric ducts shall be encased in concrete jacket unless otherwise specified. All ducts and conduits shall be inspected and approved by HECO prior to placing concrete. The Contractor shall notify HECO's inspection division (phone 548-4356) at least 24 hours prior to placing concrete.
23. The Contractor is to stake out all temporary & permanent new pole locations so as not to conflict with any existing or proposed utility for HECO approval. The Contractor shall be responsible for cost incurred by conflicting utilities.
24. The Contractor shall install Schedule 40 PVC conduit for all HECO ductline, no split ducts will be allowed. No notching of HECO boxes will be allowed.
25. HECO to receive 75 working days notice for any relocation work.
26. When excavating near utility poles, the Contractor shall protect, support, secure and take all other precautions to prevent damage to or leaning of these poles. Contractor is responsible for all costs associated to repair or straighten pole.
27. For construction of underground facilities refer to HECO Specification CS7003 and CS7001.
28. All duct line installation shall be concrete encased, Schedule 40 PVC.

HAWAIIAN ELECTRIC COMPANY NOTES (Continued)

29. The underground pipes, cables or ductlines known to exist by the Engineer from his search of records are indicated on the plans. The Contractor shall verify the locations and depths of the facilities and exercise proper care in excavating the area. Wherever connections of new utilities to existing utilities are shown on the plans, the Contractor shall expose the existing lines at the proposed connections to verify their locations and depths prior to excavation for the new lines.
30. Locations of all existing handholes and service boxes are approximate and exact location shall be determined in the field.
31. The Contractor shall provide two sets of as-built reproducible tracings showing the offsets, stationing and vertical elevation of the duct line(s) constructed. One set is for the State Department of Transportation, Highways Division and the other is for the Hawaiian Electric Company.
32. The Contractor shall use proper care in excavating the area. He shall be responsible for any damage to surface or underground facilities whether shown or not shown on the plans.
33. All manholes shall be cast in place unless approved by HECO.

HECO REFERENCE SPECIFICATIONS

SPEC. NO.	DESCRIPTION
CS7001	Construction of Underground Facilities
CS7003	Construction of Electrical Facilities
CS7202	General Conditions for Construction of Projects
CS9301	Concrete Work

HECO REFERENCE DRAWINGS

DWG. NO.	DESCRIPTION
16688 SHT. 1&2	Details Handholes & Manholes, UG Standards
30-2005	Pullbox, 2' x 4'
18841	Handhole, 3' x 5'
18843	Handhole, 5' x 7'
18844	Handhole, 6' x 11'
71468	Handhole, 6' x 14'
16687	Manhole, 5' x 7'
18775	Manhole, 6' x 11'
71467	Manhole, 6' x 14'
15588	Manhole, 7'-2" x 16'-0"

APPROVED:

Date:

Hawaiian Electric Co.

DRAWING REVIEW

Reviewed for HECO's Facilities Only

Date 4/20/00 By JKN

Engineering Department
Hawaiian Electric Company, Inc.

HECO's review of these drawings shall in no way relieve the Customer, its Consultant, its Contractor or anyone acting on the Customer's behalf from the responsibility for engineering, design, materials and any other liability associated with this project.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY NOTES

KAMEHAMEHA HIGHWAY

Intersection Improvements at
Leilehua Golf Course Road

Fed. Aid Project No. DE-0200(803)

Date: Apr. 26, 2000

SHEET No. 2 OF 15 SHEETS

HAWAIIAN TELEPHONE COMPANY GENERAL CONSTRUCTION/DESIGN NOTES

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DE-0200(803)	2000	28	79

1. The Contractor shall procure and pay for all licenses and permits and shall give all notices necessary and incident to the due and lawful prosecution of the work.
2. The Contractor shall obtain an excavation permit and toning request from GTE Hawaiian Telephone Company's Excavation Permit Section, located at 3239 Ualena Street, third floor, two weeks prior to the start of construction. Hours of business are 7:00 a.m. to 10:45 a.m. and 11:30 a.m. to 2:45 p.m. Monday through Friday, except holidays.
3. Prior to the excavation of the ductline, the contractor shall request the GTE Hawaiian Telephone Company to locate existing ductline wherever required. For underground cable locating and marking, five (5) working days advance notice is required. Three (3) working days advance notice is required for any inspection by a designated representative.
4. The locations of existing utilities are approximate only. The Contractor shall exercise extreme caution and shall maintain proper clearances whenever construction crosses or is in close proximity of GTE Hawaiian Telephone Company facilities. The Contractor shall verify their locations and shall be liable for any damages to GTE Hawaiian Telephone Company facilities. Any damages shall be reported immediately to GTE Hawaiian Telephone Company's repair section at *611 (24 hours) or to the excavation permit section at 840-1444 (normal working hours, Monday through Friday, except holidays). As a result of his operations, adjustments to the new ductline alignment, if required, shall be made to provide the required clearances.
5. The Contractor shall take necessary precaution not to damage existing cables or ducts. A GTE Hawaiian Telephone inspector or designated representative is required to be at any job site whenever there will be a breakage into or entry into any structure that contain GTE Hawaiian Telephone facilities. Temporary cable and duct supports shall be provided wherever necessary.
6. The Contractor shall notify GTE Hawaiian Telephone Company's inspector or designated representative a minimum of 72 hours prior to excavation, bracing, or backfilling of GTE Hawaiian Telephone Company's structures or facilities.
7. All applicable construction work shall be done in accordance with the "GTE Hawaiian Telephone Company Standard Specifications for Placing Underground Telephone Systems" dated March 1999. All subsequent amendments and additions, and all other pertinent standards for telephone construction. Contractor shall familiarize his personnel by obtaining applicable specifications.
8. When excavation is adjacent to or beneath GTE Hawaiian Telephone Company's existing structures or facilities, the contractor shall:
 - a) Sheet and/or brace the excavation to prevent slides, cave-ins, or settlements to ensure no movement to GTE Hawaiian Telephone Company's structures or facilities.
 - b) Protect existing structures and/or facilities with beams, struts, or underpinning while excavating beneath them to ensure no movement to GTE Hawaiian Telephone Company's structures or facilities.
9. The Contractor shall brace all poles or light standards near the new ductline, manhole, or handhole during his operations.
10. The Contractor shall saw-cut A.C. pavement and concrete gutter wherever new manholes, handholes, or ductlines are to be placed and shall restore to existing condition or better.
11. The Contractor shall comply with the policy adopted by the Department of Public Works, City and County of Honolulu, concerning the replacement of concrete sidewalks after excavation work.
12. The underground pipes, cables, or ductlines known to exist by the engineer from his search of records are indicated on the plans. The Contractor shall verify the locations and depths of the facilities and exercise proper care in excavating in the area. Wherever connections of new utilities to existing utilities are shown on the plans, the Contractor shall expose the existing lines at the proposed connections to verify their locations and depths prior to excavation for the new lines.
13. Wherever connections to existing utilities are shown on the plans, the contractor shall expose the existing lines prior to excavation of the main trenches to verify their locations and depths.
14. The Contractor, at his own expense, shall keep the project and surrounding area free from dust nuisance. The cost for supplementary measures, which will be required by the City and County, shall be borne by the Contractor.
15. The Contractor shall pump all manholes dry during final inspection.
16. The Contractor shall notify the GTE Hawaiian Telephone Company inspector 24 hours prior to the pouring of concrete or backfilling.
17. When connecting to manhole walls, all existing reinforcing bars shall be left intact. Ducts shall be adjusted in the field in order to clear reinforcing.
18. The Contractor shall be responsible for laying out all required lines and grades and shall preserve all bench marks and working points necessary to lay out the work correctly. The new ductline shall be adjusted by the Contractor to suit the existing conditions and the details as described in the plans.
19. Minimum concrete strength shall be:

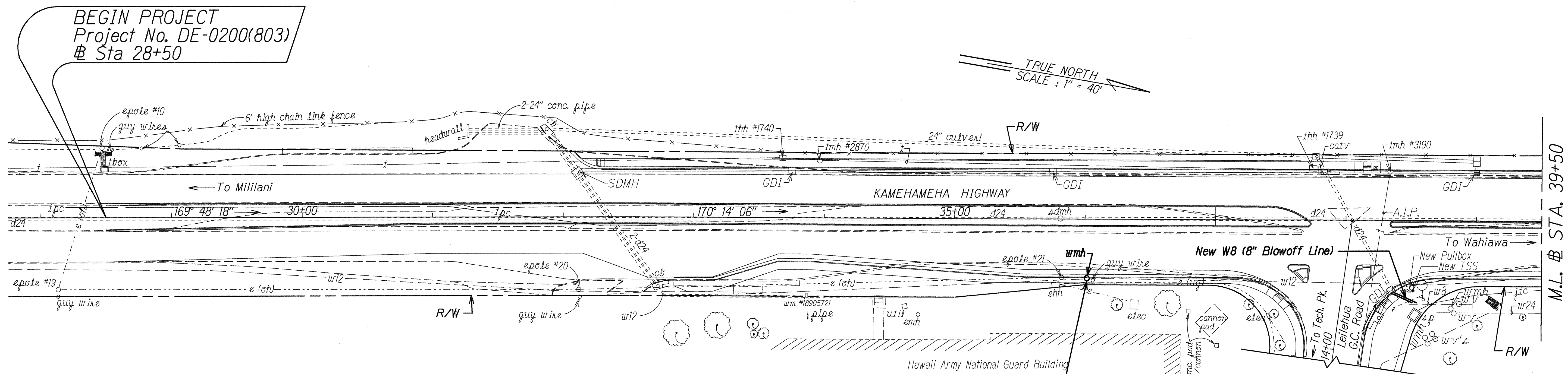
For ductline	2500 psi at 28 days
For manhole	3000 psi at 28 days or as specified in design notes
20. Bends in the duct alignment, due to changes in grade shall have a minimum radius of 25 feet. All 90 degree C-bends at a pole or at the building floor slab penetration, shall have a bend radius of ten times the diameter of the duct or greater.
21. After ductline has been completed, a mandrel with a square front not less than 12" long and having a diameter of 1/4" less than the inside diameter of the duct, shall be pulled through each duct after which a brush with stiff bristles shall be pulled through to make certain that no particles of earth, sand, or gravel have been left inside. Ducts shall be completely dry and clean.
22. All ducts and conduits shall have an 1800# polyester mule-tape (NEPTCO, WPI800P, GTE Hawaiian Telephone Material Code No. 571154) installed throughout its entire length. All ducts shall be capped to prevent entry of foreign material during construction and at the completion of installation.

ORIGINAL PLAN	DATE	SURVEY PLOTTED BY	_____
		DRAWN BY	_____
		TRACED BY	_____
		CHECKED BY	_____
NOTE BOOK	DATE	QUANTITIES BY	_____
		CHECKED BY	_____
		DATE	_____
		DATE	_____

APPROVED: _____ Date: 5/16/00
GTE Hawaiian Telephone Co.

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
UTILITY NOTES
KAMEHAMEHA HIGHWAY
Intersection Improvements at
Leilehua Golf Course Road
Fed. Aid Project No. DE-0200(803)
Date: May 10, 2000
SHEET No. 3 OF 15 SHEETS

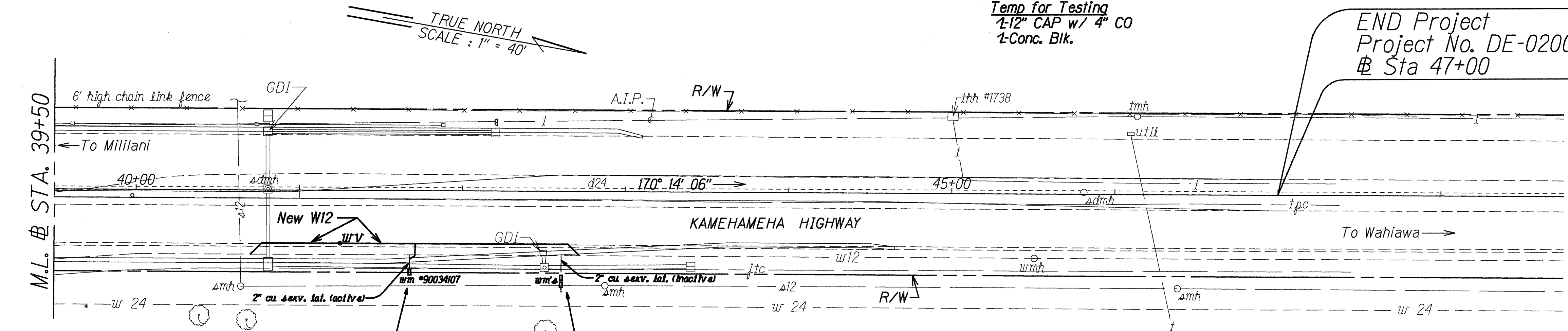
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DE-0200(803)	2000	29	79



Kam. Hwy. @ Sta. 36+00± Rt.
Remove Exist. 12" G.V.
8± Lin. Ft. 12" D.I. Pipe, CL 52.
1-12" Sleeve, 12" Long.
Remove Exist. Water Manhole,
then Backfill & Compact Hole.
Salvage C.I. Frame & Cover.

Temp for Testing
1-12" CAP w/ 4" CO
1-Conc. Blk.

Kam. Hwy. @ Sta. 38+37±; o/s 55'± Rt. to Kam. Hwy. @ Sta. 38+54.50±; o/s 63'± Rt.
Construct New 8" Blowoff Line. (Approx. 19 Lin. Ft. of D.I. Pipe)
Remove Exist. 8" Blowoff Line. (Approx. 17 Lin. Ft. of D.I. Pipe)
Removal of the 8" Blowoff Line will not be paid for separately, but shall be considered incidental to the various B.W.S. contract items and shall include the removal of the blowoff line, the bend, and the conc. blk(s), sleeve(s), and pipe(s) used for the bend connection. (See Plan & Profile on Utility Sht. No. 5)



P/ID #1142965
M/N 90034107

Kam. Hwy. @ Sta. 42+60± Rt.
P/ID #1142951 O/F 8/29/94
Contractor to Cut and Plug Lateral at Main.
Also, Remove and Dispose of Exist. Meter Box.

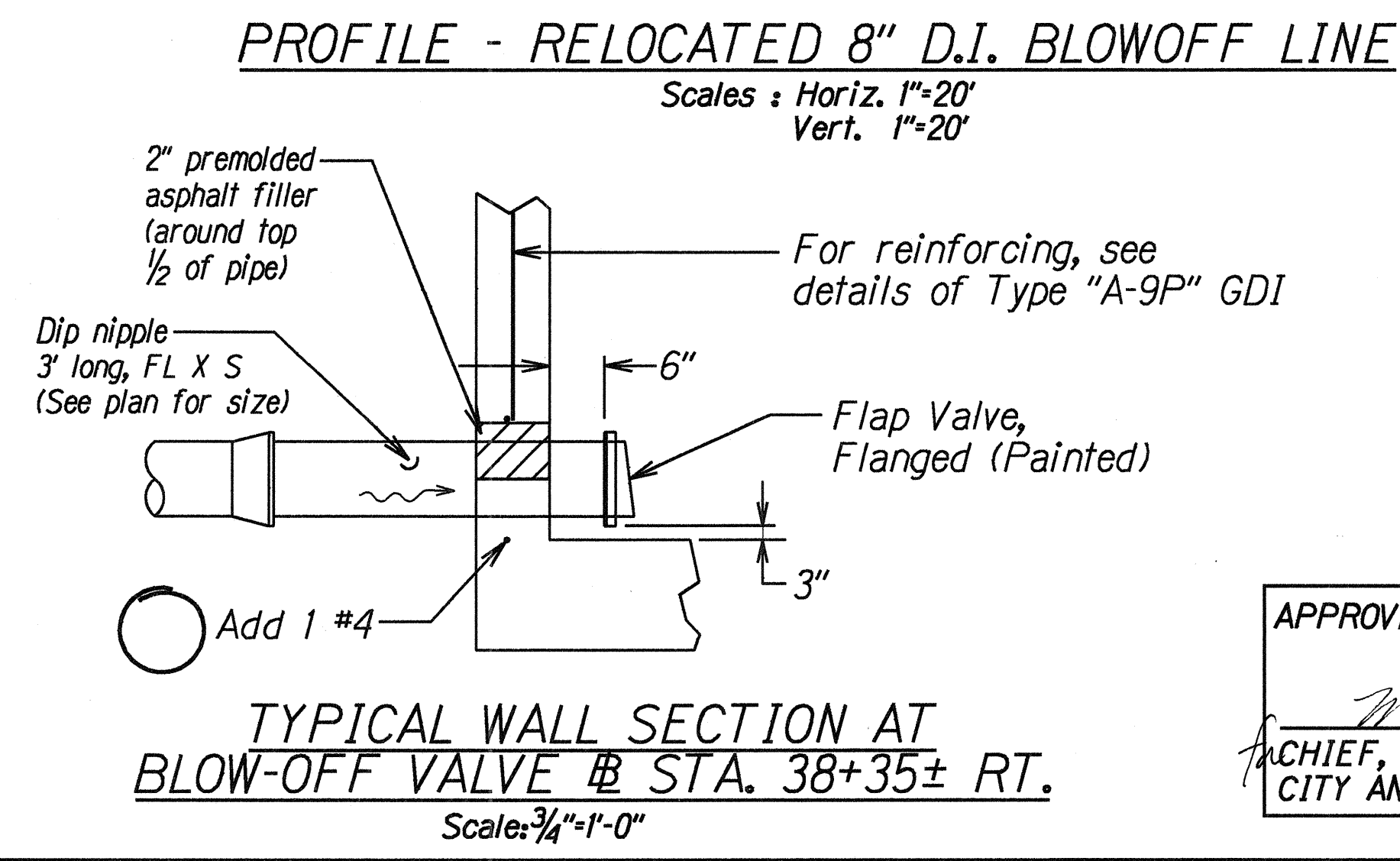
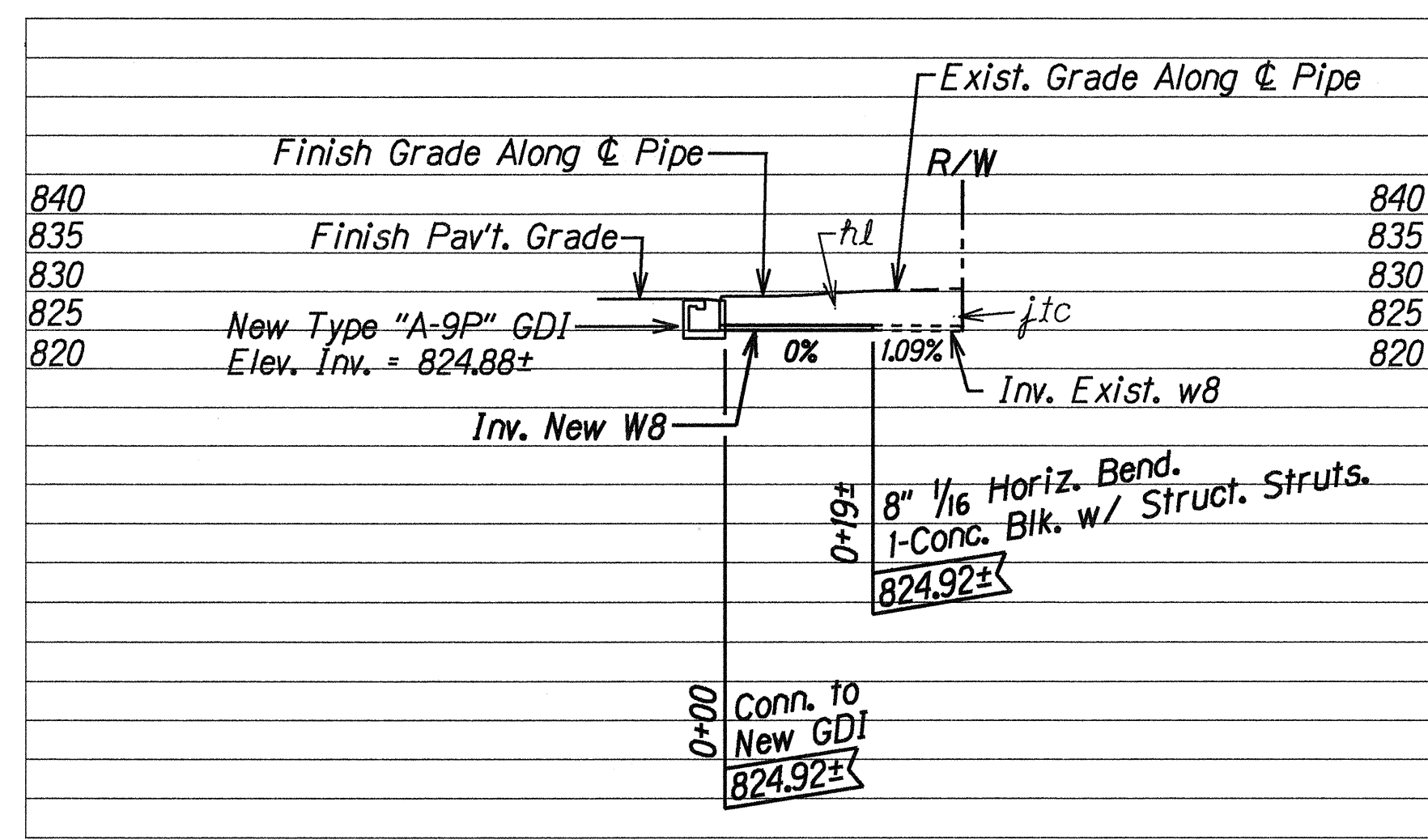
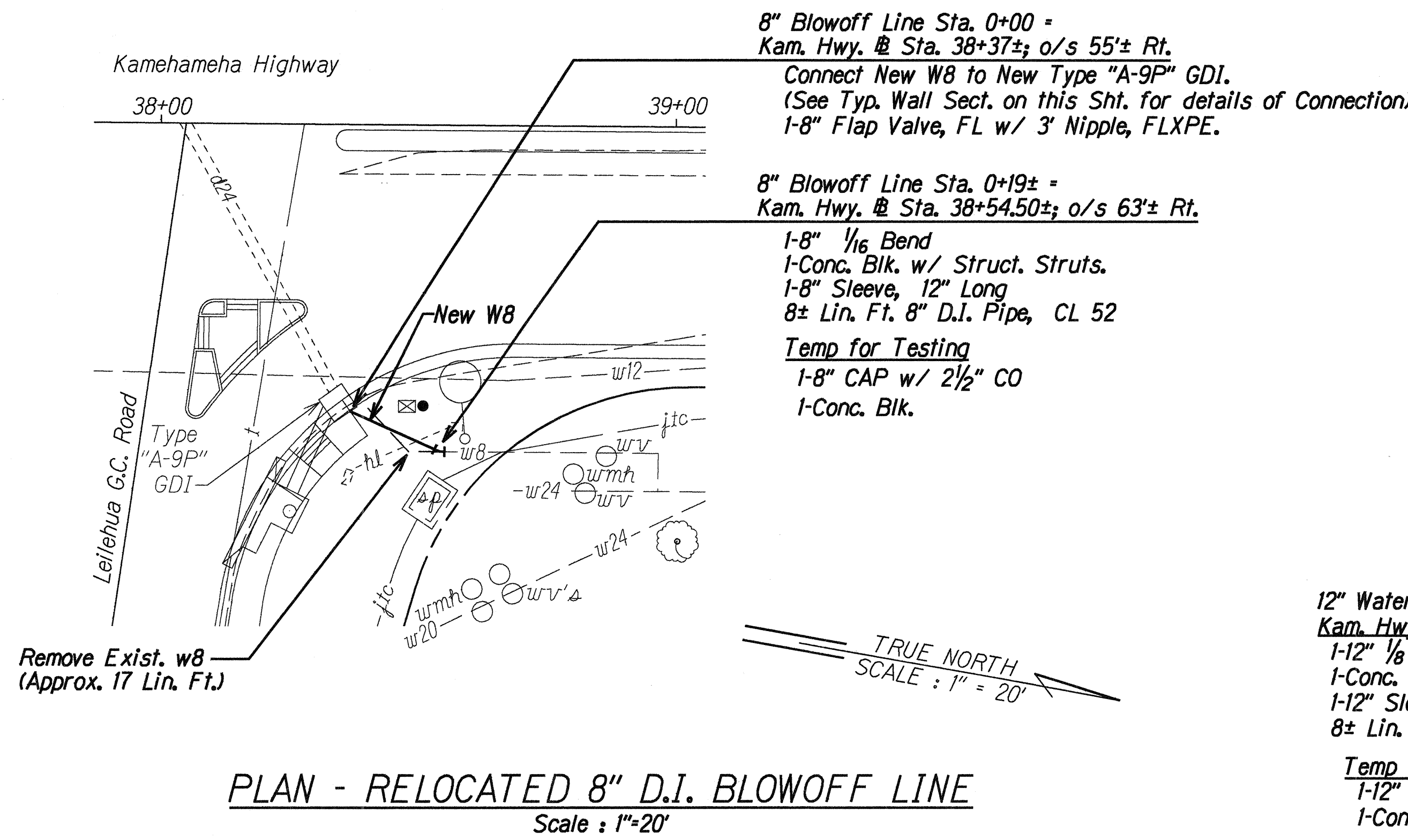
Kam. Hwy. @ Sta. 40+70 Rt. to Kam. Hwy. @ Sta. 42+75 Rt.
Construct New 12" Water Main. (Approx. 211 Lin. Ft. of D.I. Pipe)
Install New 12" G.V. and New Valve Box.
Contractor to Reconnect Exist. 2" CU Service Lateral to New 12" Water Main.
Remove Approx. 115 Lin. Ft. of Exist. 12" Water Main.
Remaining Pipes to be Abandoned-In-Place.
Removal of the 12" Water Main will not be paid for separately, but shall be considered incidental to the various contract items, and shall also include removing a portion of the inactive serv. lat. for New Drain Line. (See Plan & Profile on Utility Sht. No. 5)

APPROVED: Michael Jha Date: 4/27/00
CHIEF, PLANNING AND ENGINEERING, B.W.S.
CITY AND COUNTY OF HONOLULU

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
UTILITIES - BOARD OF WATER SUPPLY
KAMEHAMEHA HIGHWAY
Intersection Improvements at
Leilehua Golf Course Road
Fed. Aid Project No. DE-0200(803)
Scale: 1" = 40' Date: Mar. 4, 2000
SHEET No. 4 OF 15 SHEETS

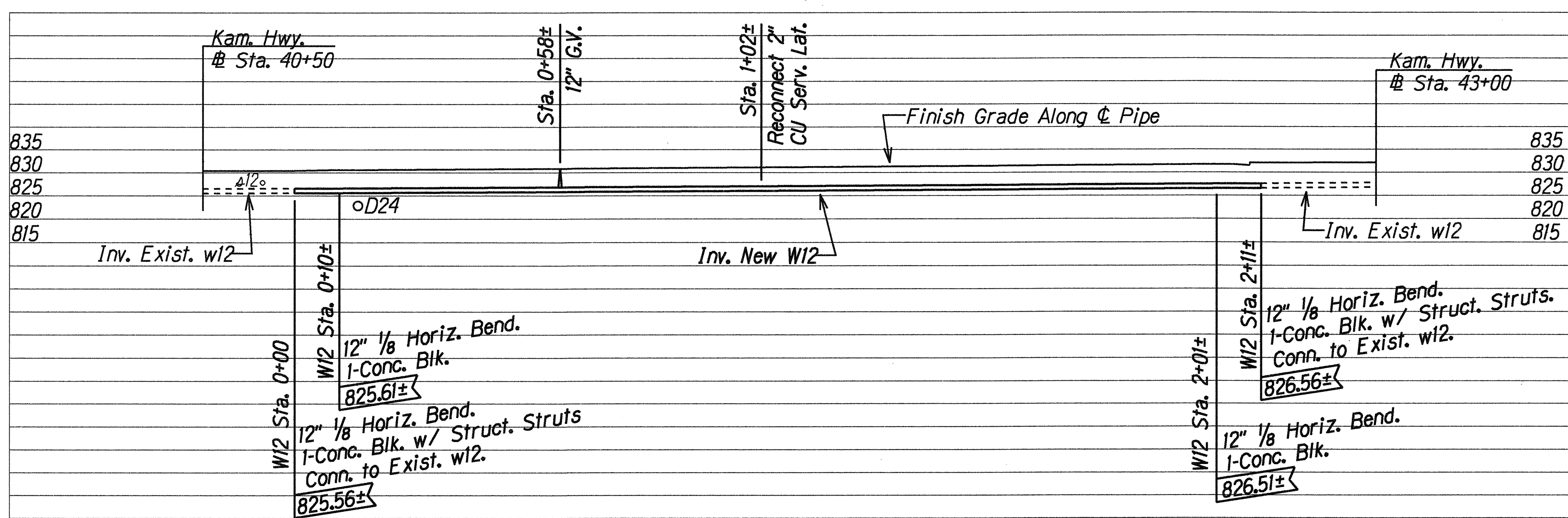
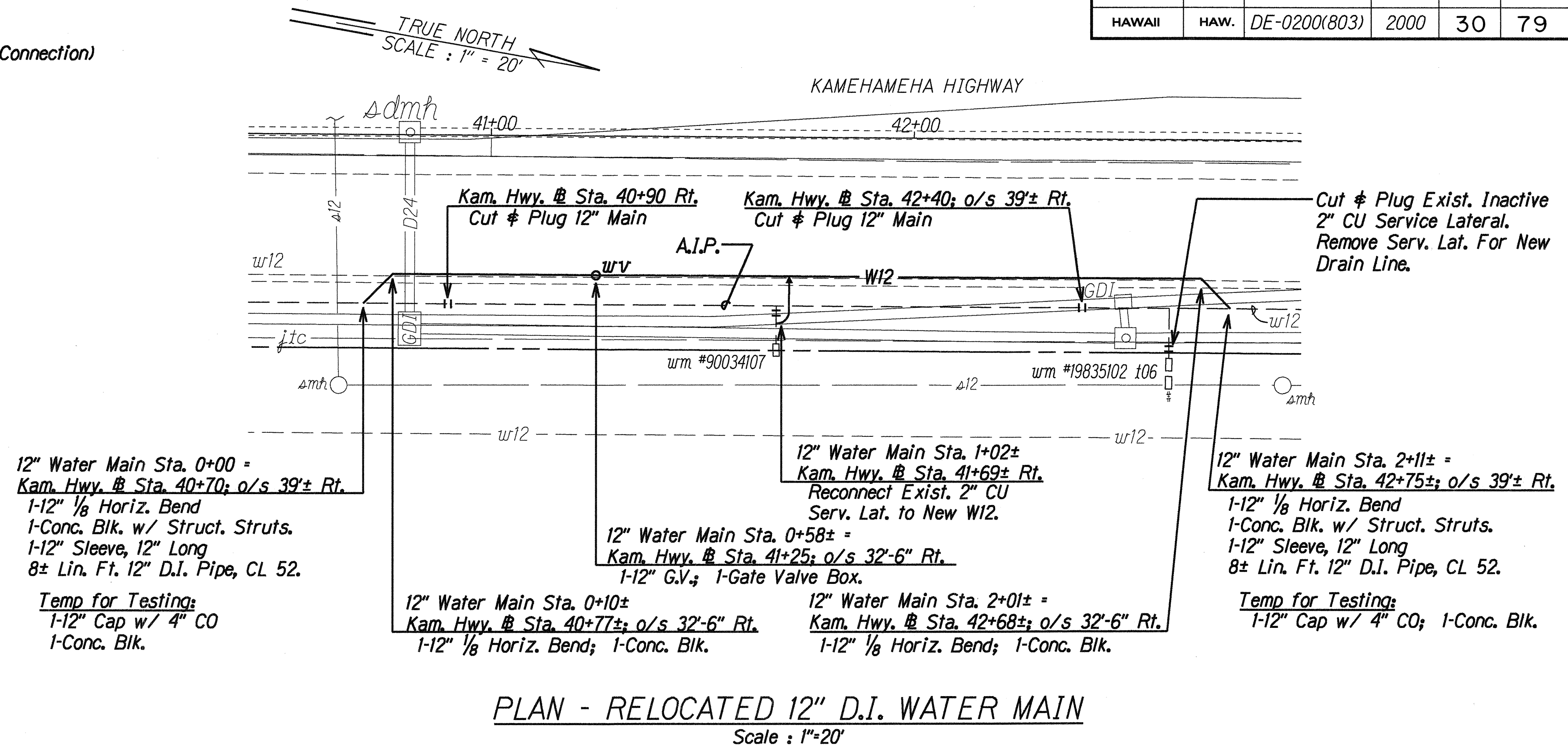
SURVEY PLOTTED BY	DATE
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ORIGINAL PLAN	
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DE-0200(803)	2000	30	79



APPROVED: _____ Date: 4/27/00

Michael Luke
CHIEF, PLANNING AND ENGINEERING, B.W.S.
CITY AND COUNTY OF HONOLULU



PROFILE - RELOCATED 12" D.I. WATER MAIN
Scales : Horiz. 1"=20'
Vert. 1"=20'

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES - BOARD OF WATER SUPPLY

KAMEHAMEHA HIGHWAY
Intersection Improvements at
Leilehua Golf Course Road
Fed. Aid Project No. DE-0200(803)

Scale: As Shown Date: Mar. 4, 2000
SHEET No. 5 OF 15 SHEETS

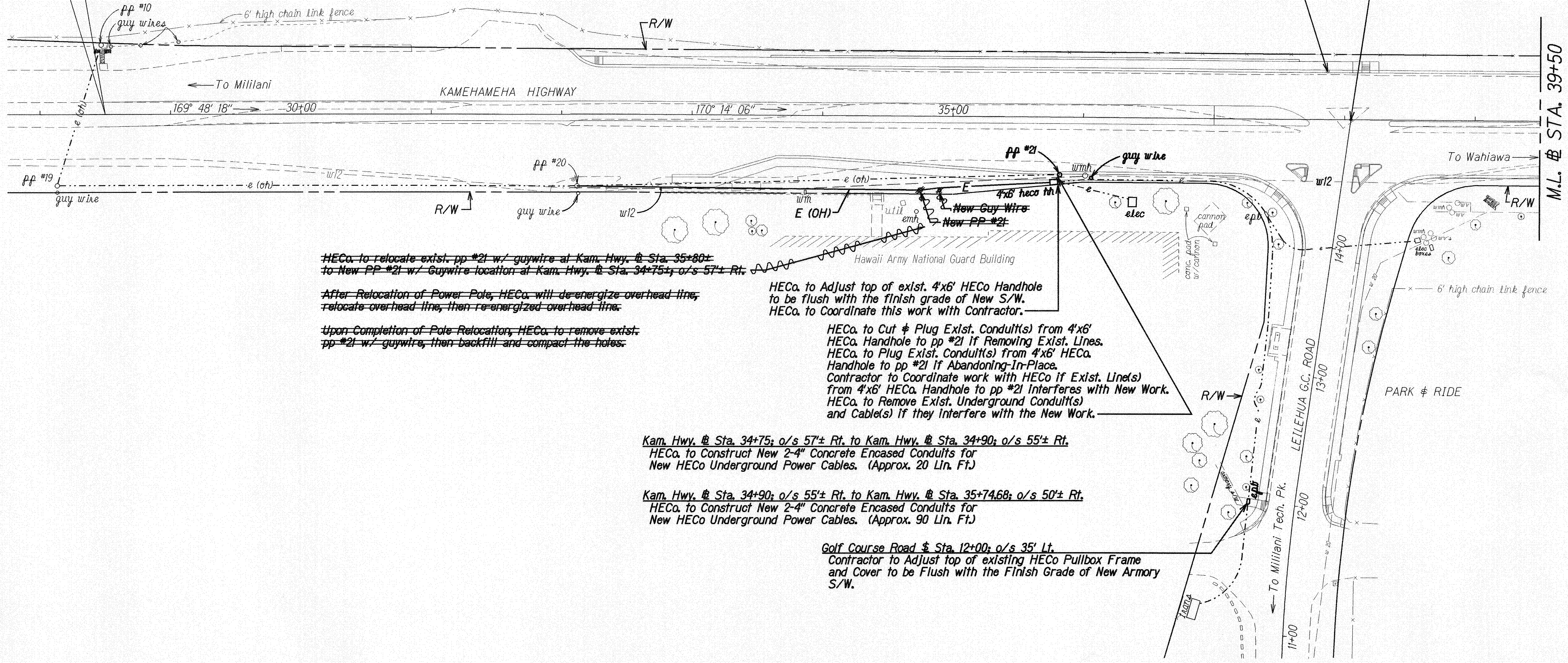
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DE-0200(803)	2000	31	79

TRUE NORTH
SCALE: 1" = 40'

BEGIN PROJECT
Project No. DE-0200(803)
Sta 28+50

Benchmark: Trav. Lellehua ("+" on conc.)
Kam. Hwy. Sta. 37+86.76; o/s 37.0746' Lt.
114,887.9101N, 489990.1260E: El.=829.44

Kam. Hwy. Sta. 38+04.86 =
Lellehua G.C. Rd. Sta 14+99.94
114,912.03 N, 490,023.59 E



HECo. to relocate exist. pp #21 w/ guywire at Kam. Hwy. Sta. 35+80+ to New PP #21 w/ Guywire location at Kam. Hwy. Sta. 34+75+; o/s 57'± Rt.
After Relocation of Power Pole, HECo. will de-energize overhead line, relocate overhead line, then re-energized overhead line.
Upon Completion of Pole Relocation, HECo. to remove exist. pp #21 w/ guywire, then backfill and compact the holes.

HECo. to Adjust top of exist. 4'x6' HECo Handhole to be flush with the finish grade of New S/W.
HECo. to Coordinate this work with Contractor.
HECo. to Cut & Plug Exist. Conduit(s) from 4'x6' HECo. Handhole to pp #21 If Removing Exist. Lines.
HECo. to Plug Exist. Conduit(s) from 4'x6' HECo. Handhole to pp #21 If Abandoning-In-Place.
Contractor to Coordinate work with HECo if Exist. Line(s) from 4'x6' HECo. Handhole to pp #21 Interferes with New Work.
HECo. to Remove Exist. Underground Conduit(s) and Cable(s) If they Interfere with the New Work.

Kam. Hwy. Sta. 34+75; o/s 57'± Rt. to Kam. Hwy. Sta. 34+90; o/s 55'± Rt.
HECo. to Construct New 2-4" Concrete Encased Conduits for New HECo Underground Power Cables. (Approx. 20 Lin. Ft.)
Kam. Hwy. Sta. 34+90; o/s 55'± Rt. to Kam. Hwy. Sta. 35+74.68; o/s 50'± Rt.
HECo. to Construct New 2-4" Concrete Encased Conduits for New HECo Underground Power Cables. (Approx. 90 Lin. Ft.)

Golf Course Road Sta. 12+00; o/s 35' Lt.
Contractor to Adjust top of existing HECo Pullbox Frame and Cover to be Flush with the Finish Grade of New Armory S/W.

SURVEY PLOTTED BY	DATE
DRAWN BY	
TRACED BY	
NOTED BY	
QUANTITIES BY	
CHECKED BY	

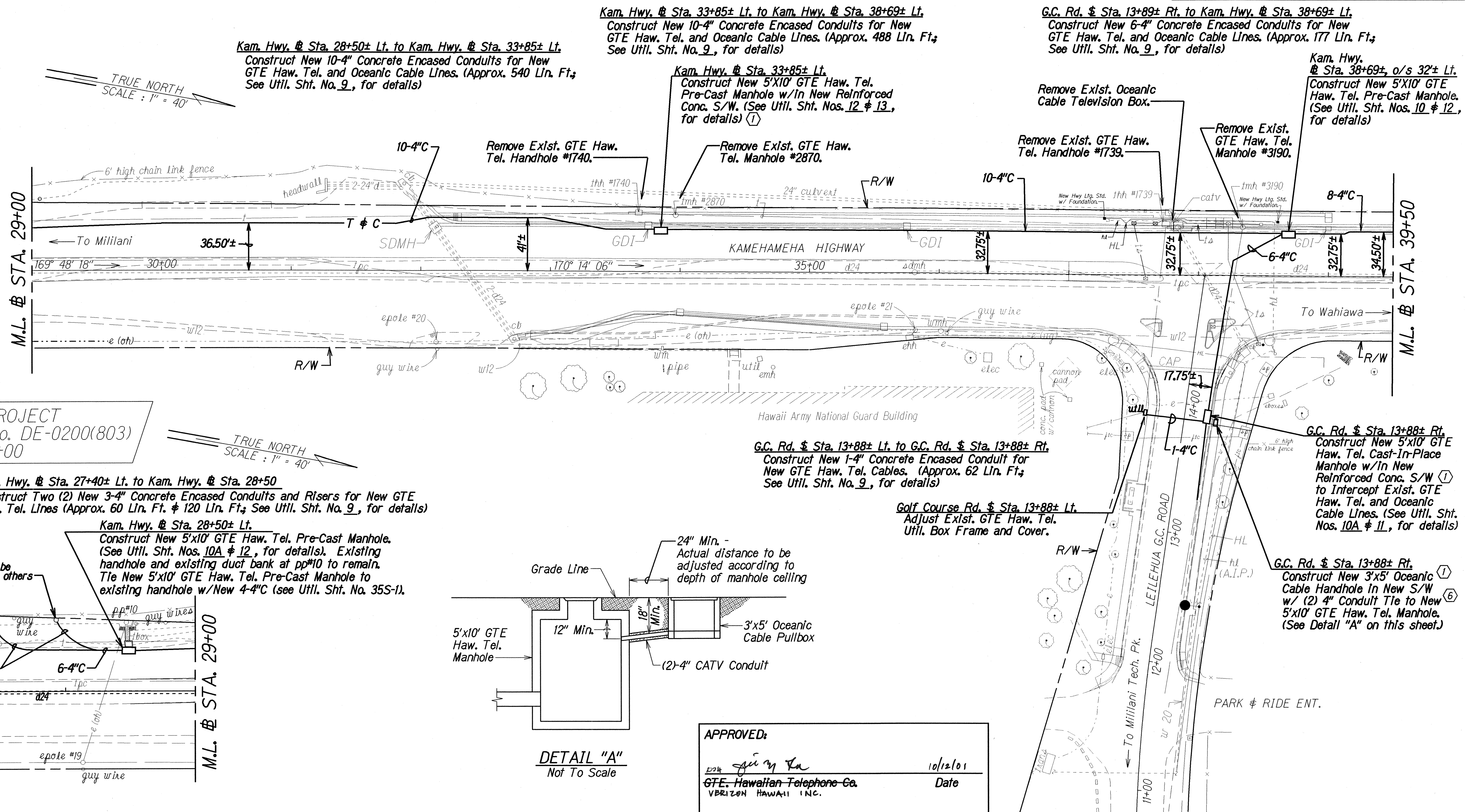
APPROVED: _____ Date: _____
Hawaiian Electric Co.

LEGEND FOR AS-BUILT POSTINGS	
	Squiggly line for as-built deletion
	Double line for as-built deletion
Roadway	Text for as-built posting

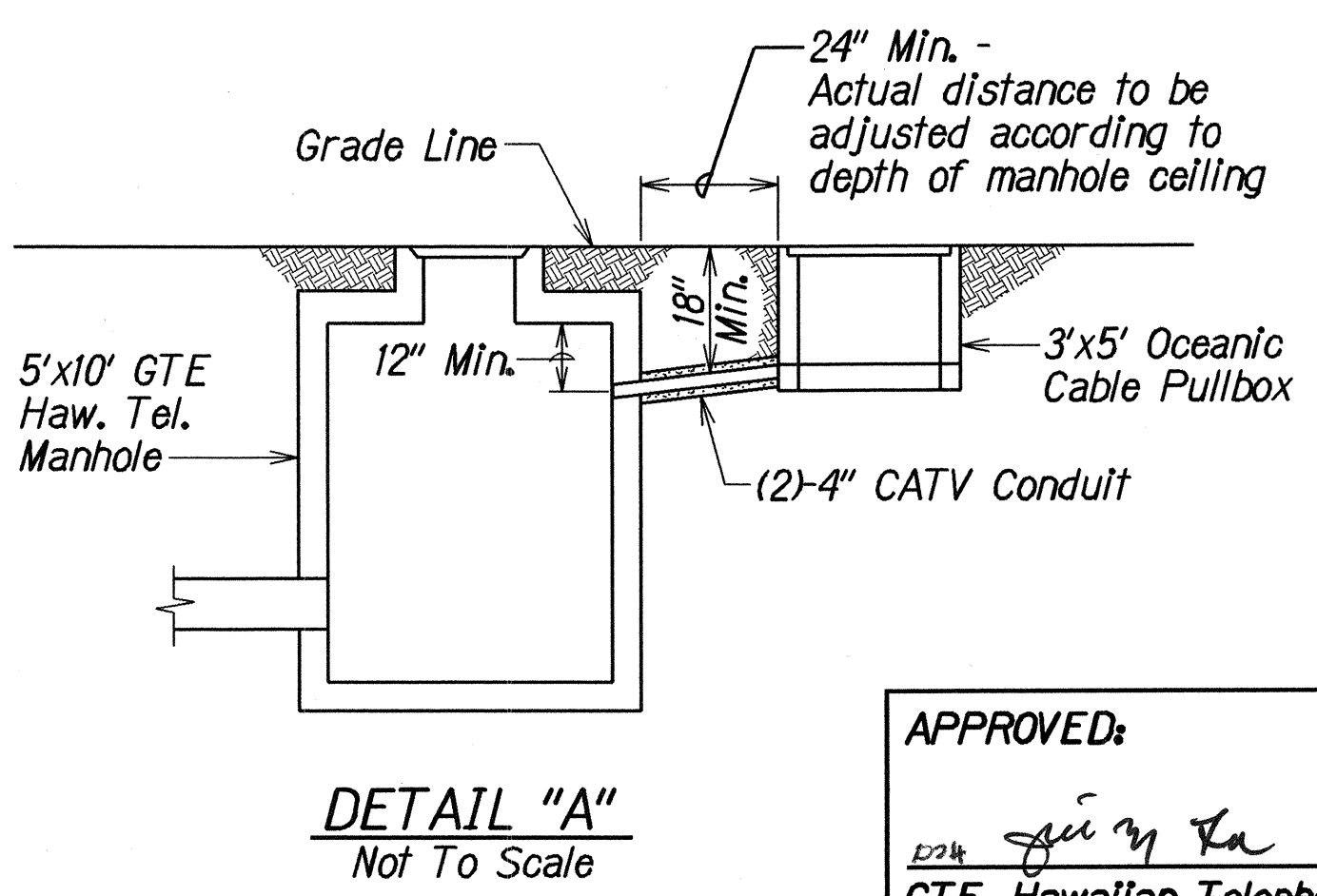
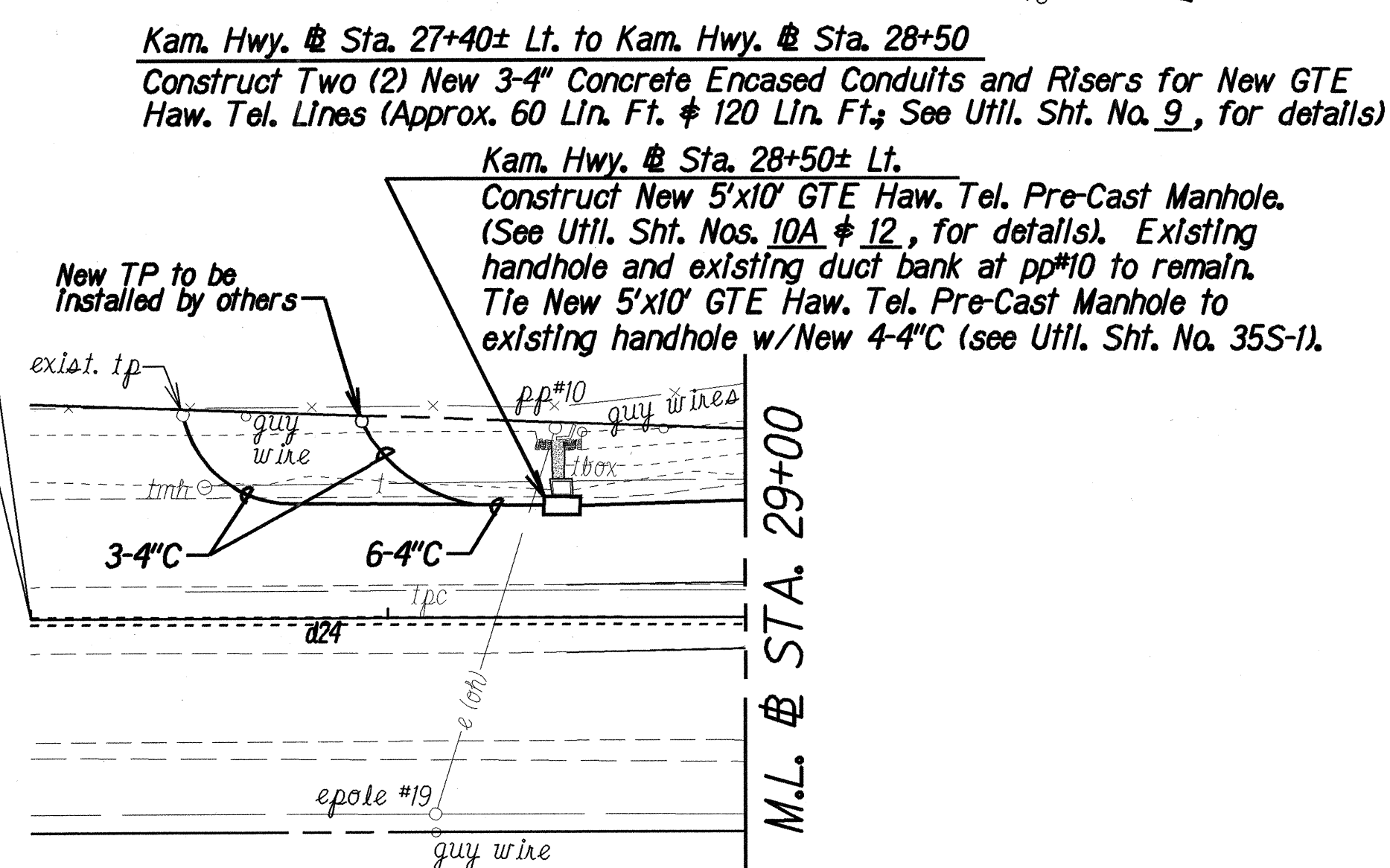
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
UTILITIES - HAWAIIAN ELECTRIC CO.
KAMEHAMEHA HIGHWAY
Intersection Improvements at
Lellehua Golf Course Road
Fed. Aid Project No. DE-0200(803)
Scale: 1" = 40' Date: Apr. 26, 2000
SHEET No. 6 OF 15 SHEETS

"AS-BUILT"

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DE-0200(803)	2000	C.O.32	79



BEGIN PROJECT
Project No. DE-0200(803)
Sta 27+00



APPROVED:	
<i>[Signature]</i>	10/12/01
GTE Hawaiian Telephone Co.	Date
VERIZON HAWAII INC.	
<i>[Signature]</i>	10/24/01
Oceanic Cable	Date

NOTES:

- All GTE Haw. Tel. & Oceanic Cable Manholes that are constructed within the new sidewalk areas shall have cover(s) that have non-skid surfaces.
- The Contractor shall remove only the sections of exlst. GTE Haw. Tel. conduit(s) that interfere with the new work. The Contractor shall cut & plugged the remaining conduit(s) that will be abandoned-in-place.
- The Contractor shall contact Oceanic Cable sixty (60) days prior to constructing the (2) 4" Conduit tie from Oceanic Cable's 3'x5' Handhole to GTE Haw. Tel's 5'x10' Manhole.
- Construction of the (2) 4" Conduit tie, complete in place, from Oceanic Cable's 3'x5' Handhole to GTE Haw. Tel's 5'x10' Manhole shall be considered incidental to the installation of Oceanic Cable's 3'x5' Handhole.
- All Newly Constructed GTE Manholes (Pre-Cast or Cast-In-Place) shall be paid under Contract Item No. 630.0450 - GTE Manhole (5'-0" x 10'-0").
- Conduit Tie between 3'x5' Oceanic Cable Pullbox and New 5'x10' GTE Haw. Tel. Manhole shall be as shown in Detail "A".

DATE	REVISION
9/17/01	Revise Conduit connection and Detail Note for 5'x10' GTE Manhole located at Kamehameha Hwy. Sta. 28+50± Lt.
4/28/01	Revise "Begin Project" to Sta. 27+00. Revise 5'x10' GTE ductline and Manhole location at Leilehua G.C. Rd. Sta. 13+88 Rt., Kamehameha Hwy. Sta. 29+50± Lt., Sta. 33+85± Lt. and Sta. 38+69± Lt. Add Detail "A" and Note no. 6.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

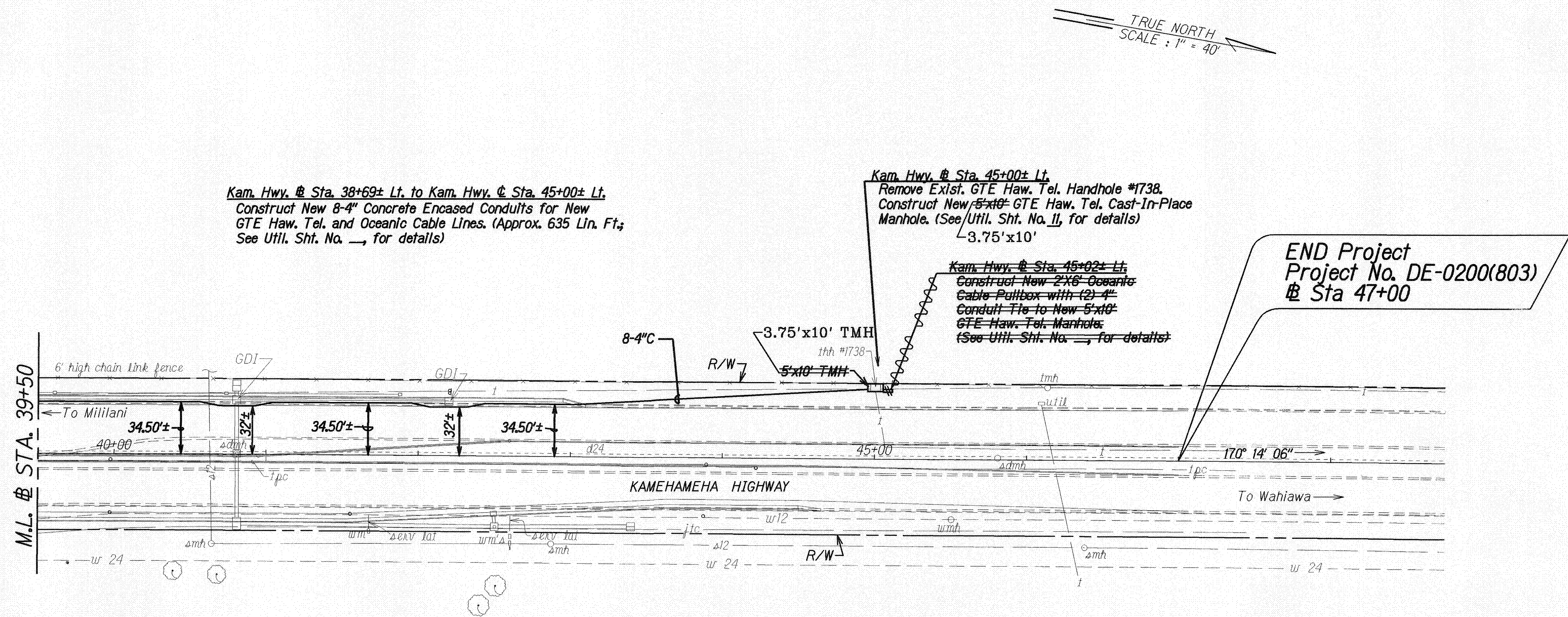
UTILITIES - GTE HAW. TEL. & OCEANIC CABLE

KAMEHAMEHA HIGHWAY
Intersection Improvements at
Leilehua Golf Course Road
Fed. Aid Project No. DE-0200(803)

Scale: 1" = 40' Date: May 10, 2000

SHEET No. 7 OF 15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DE-0200(803)	2000	33	79



Kam. Hwy. @ Sta. 38+69± Lt. to Kam. Hwy. @ Sta. 45+00± Lt.
Construct New 8-4" Concrete Encased Conduits for New
GTE Haw. Tel. and Oceanic Cable Lines. (Approx. 635 Lin. Ft.;
See Util. Sht. No. —, for details)

Kam. Hwy. @ Sta. 45+00± Lt.
Remove Exist. GTE Haw. Tel. Handhole #1738.
Construct New 5'x10' GTE Haw. Tel. Cast-In-Place
Manhole. (See Util. Sht. No. —, for details)

Kam. Hwy. @ Sta. 45+02± Lt.
Construct New 2'x6' Oceanic
Cable Pullbox with (2) 4"
Conduit Tie to New 5'x10'
GTE Haw. Tel. Manhole.
(See Util. Sht. No. —, for details)

END Project
Project No. DE-0200(803)
@ Sta 47+00

LEGEND FOR AS-BUILT POSTINGS	
	Squiggly line for as-built deletion
	Double line for as-built deletion
Roadway	Text for as-built posting

- NOTES:**
- The Contractor shall remove only the sections of exist. GTE Haw. Tel. conduit(s) that interfere with the new work. The Contractor shall cut & plugged the remaining conduit(s) that will be abandoned-in-place.
 - The Contractor shall contact Oceanic Cable sixty (60) days prior to constructing the (2) 4" Conduit tie from Oceanic Cable's 2'x6' Pullbox to GTE Haw. Tel's. 5'x10' Manhole.
 - Construction of the (2) 4" Conduit tie, complete in place, from Oceanic Cable's 2'x6' Pullbox to GTE Haw. Tel's. 5'x10' Manhole shall be considered incidental to the installation of Oceanic Cable's 2'x6' Pullbox.
 - All Newly Constructed GTE Manholes (Pre-Cast or Cast-In-Place) shall be paid for under Contract Item No. 630.0450 - GTE Manhole (5'-0" x 10'-0").

APPROVED:	
GTE. Hawaiian Telephone Co.	Date
Oceanic Cable	Date

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES - GTE HAW. TEL & OCEANIC CABLE

KAMEHAMEHA HIGHWAY
Intersection Improvements at
Leilehua Golf Course Road
Fed. Aid Project No. DE-0200(803)

Scale: 1" = 40' Date: May 10, 2000
SHEET No. 8 OF 15 SHEETS

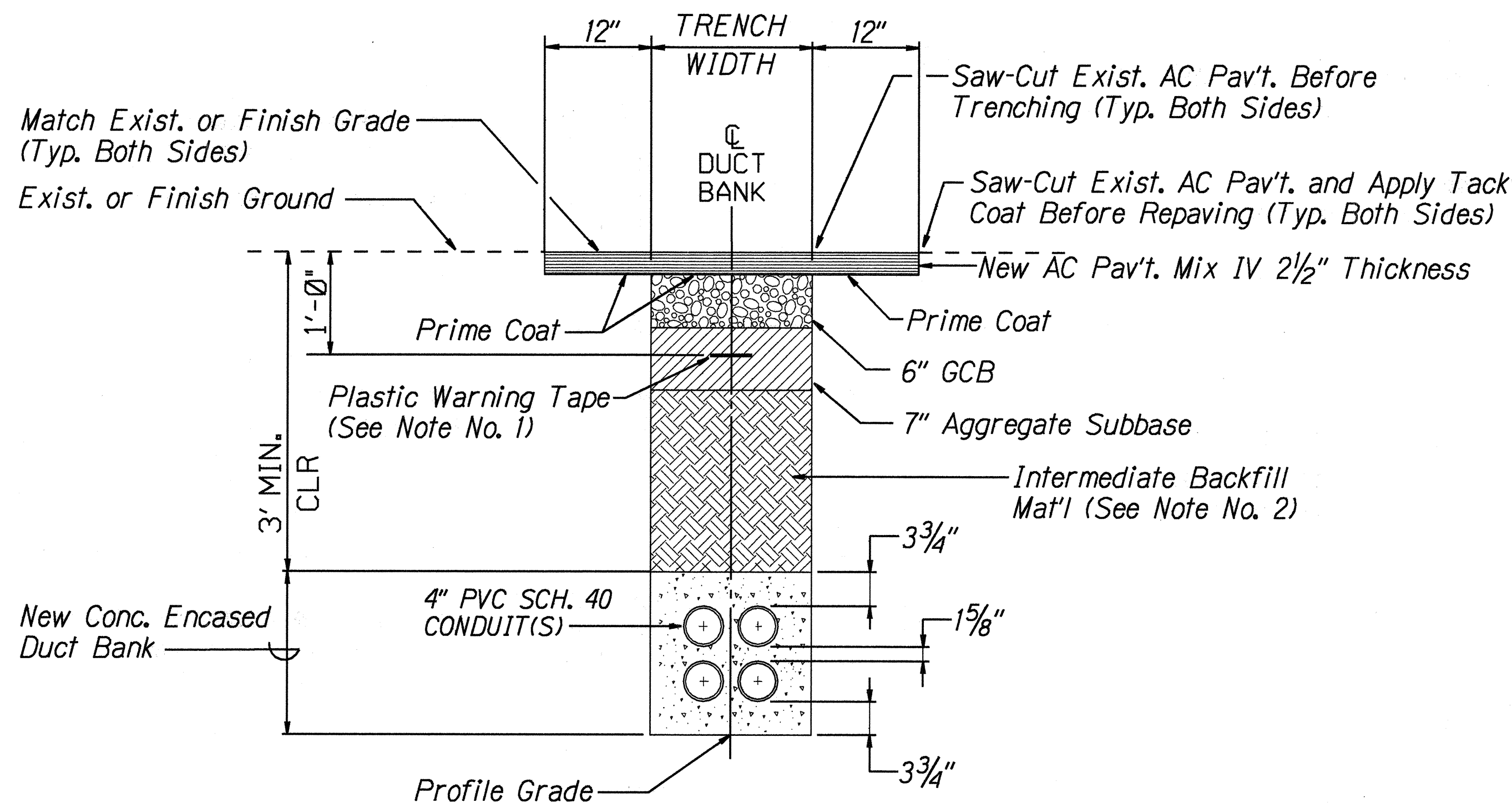
"AS-BUILT"

GENERAL NOTES:

1. Plastic Warning Tape Shall be 8-Mil Colored Orange Not Less Than 4" Wide Along Entire Length of Trench. Tape Shall Read: "WARNING-STOP DIGGING-CALL GTE COMMUNICATION CABLE BURIED BELOW, FAILURE TO COMPLY COULD RESULT IN LEGAL ACTION".
2. Type "A" Backfill Material shall be Beach Sand, Earth, or Earth and Gravel. If Earth and Gravel used, the maximum shall contain not more than 50% by Volume of Rock Particles. Maximum 8" Loose Fill per Lift. Obtain 95% Compaction for each Lift.
3. If Trench is located in Sidewalk Areas, The Contractor shall replace the 2½" AC Pav't., the 6" Base Course, and the 7" Subbase with 4" Reinforced Conc. Sidewalk, 4" Bed Course Material, and Type "A" Backfill Material.

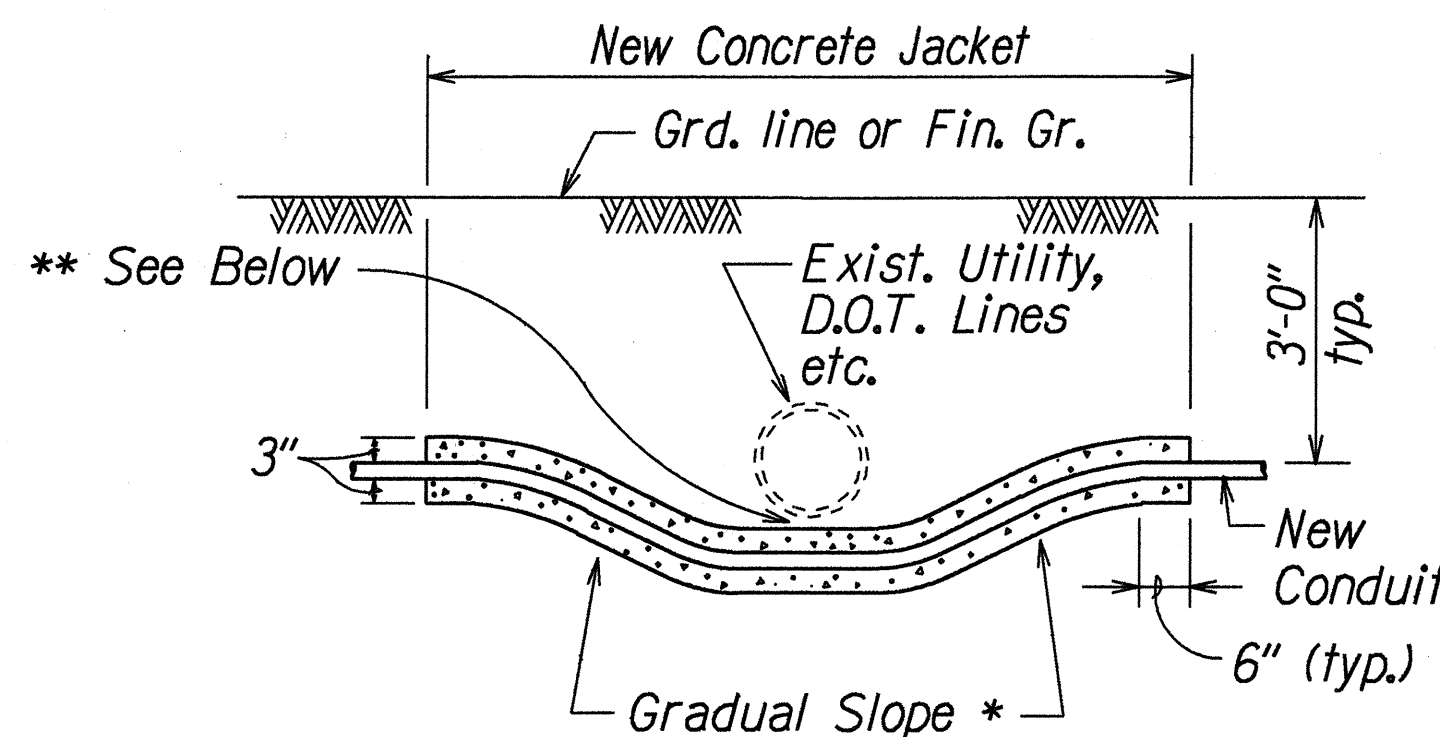
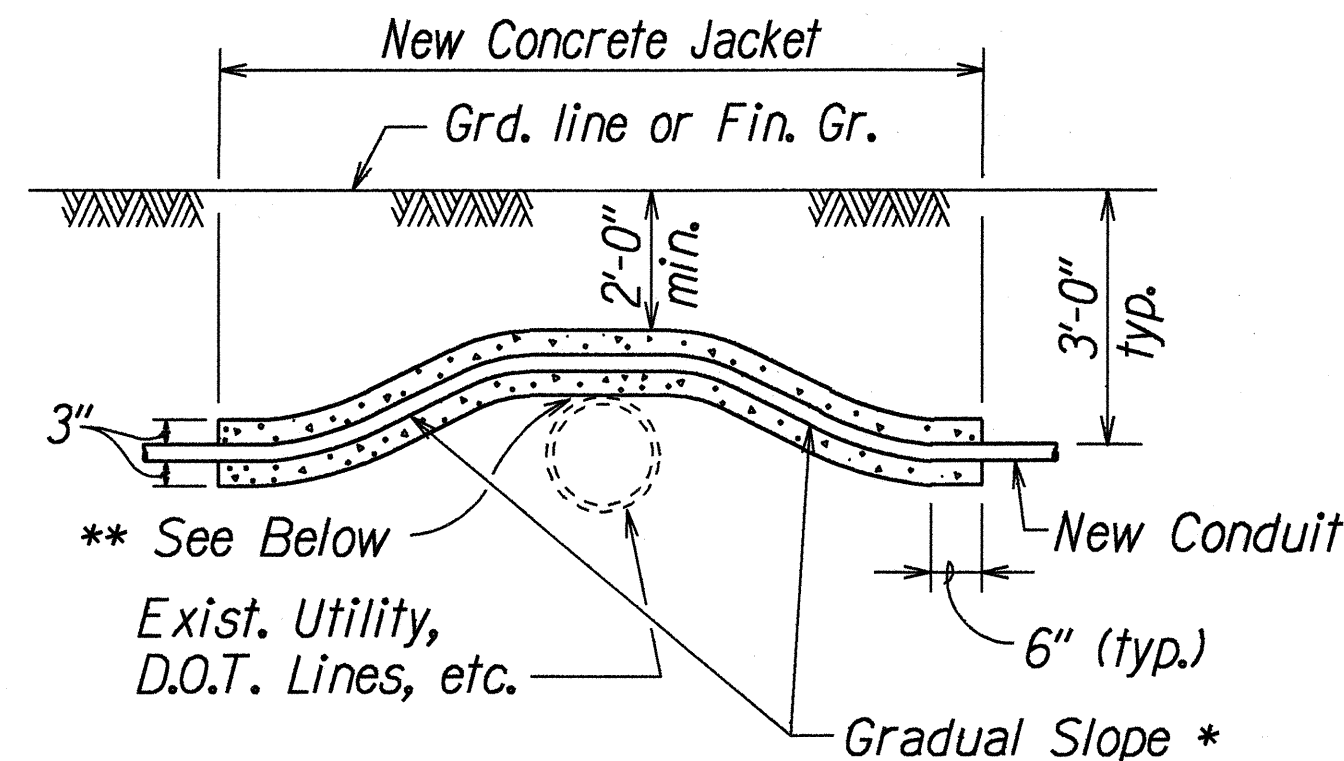
4. If Trench is located in an Unpaved Area outside Sidewalk Areas, the Contractor shall replace the 2½" AC Pav't., the 6" Base Course, and the 7" Subbase with Type "A" Backfill Material.
5. Concrete for Encasement of the Ducts shall be 3000 psi Compressive Strength @ 3 Days.
6. Base Course and Subbase per 1994 State Standard Specifications for Highway Construction.
7. The Contractor shall coordinate this work with HTCo. The Contractor may begin backfilling the Conduit Trench when the Concrete reaches 3000 psi Compressive Strength after 3 Days.

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DE-0200(803)	2000	34	79



TYPICAL TRENCH AND BACKFILL SECTION WITH CONCRETE ENCASED DUCTS

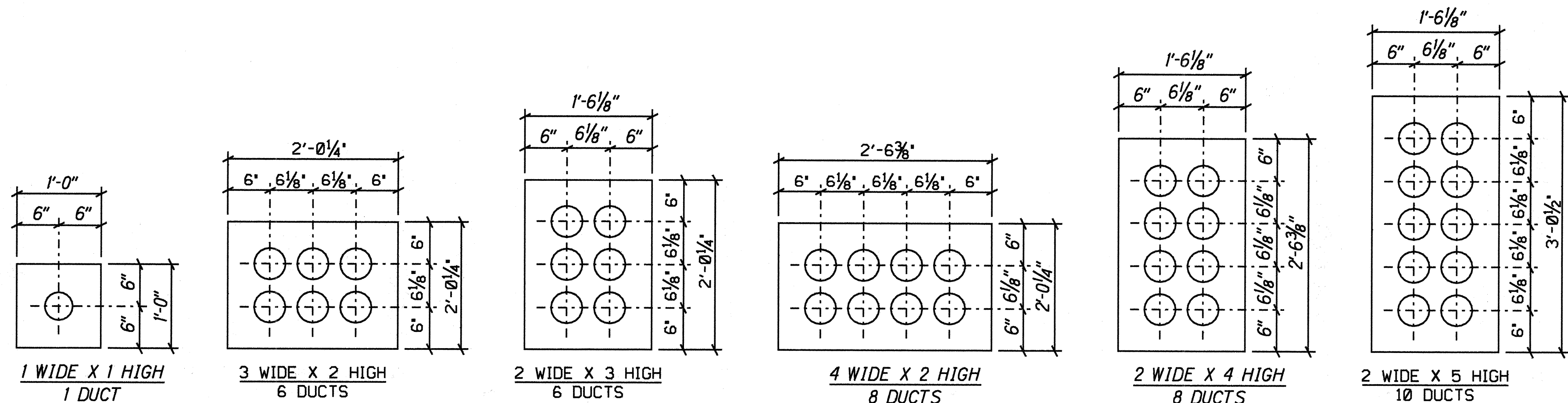
Scale: 1" = 1'-0"



- * To be determined by HTCo. Inspector/Engineer
 ** The Contractor shall provide a 1'-0" Min. Clearance from drainage lines
 The Contractor shall contact Utility Co. for their proper clearances.
 The Contractor shall contact Wheeler Army Airfield for the proper clearance from their 12" Sewer Line.

CONDUIT BY-PASS DETAIL AT VARIOUS UTILITIES

Not To Scale



STANDARD CONCRETE ENCASED DUCT FORMATIONS

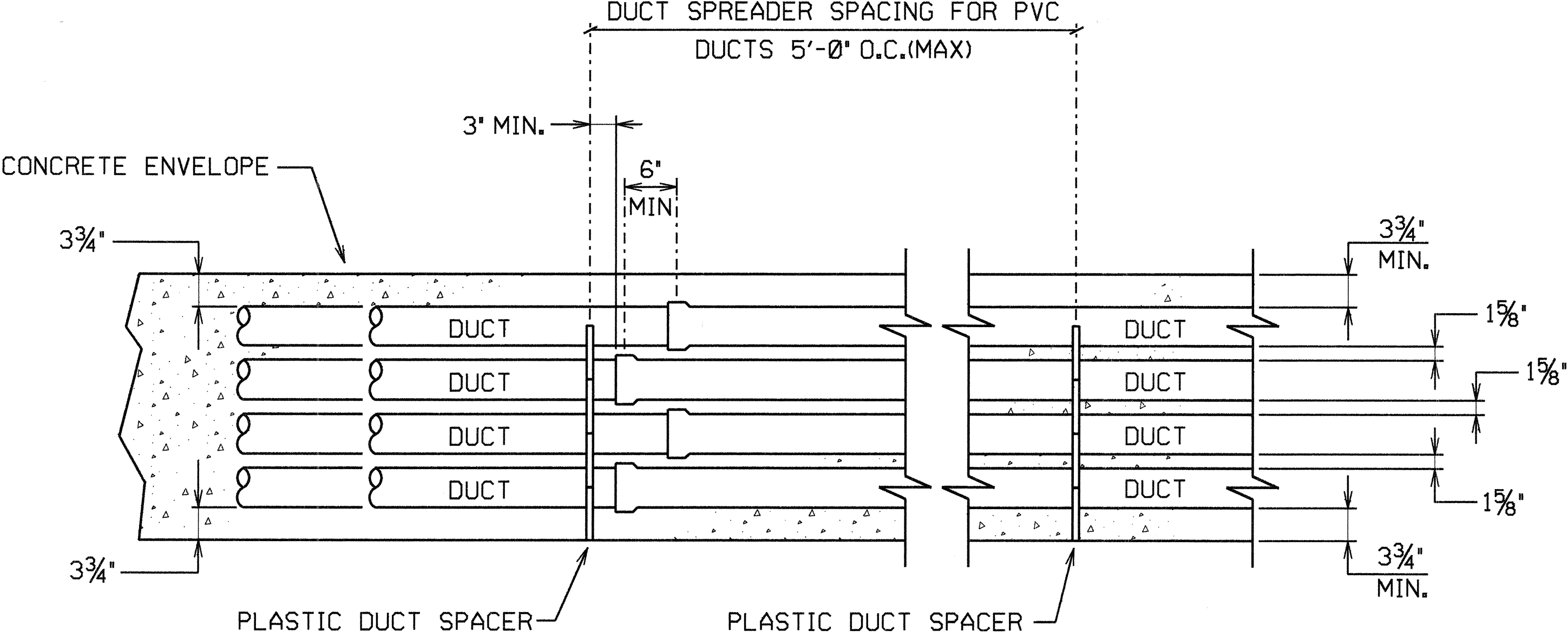
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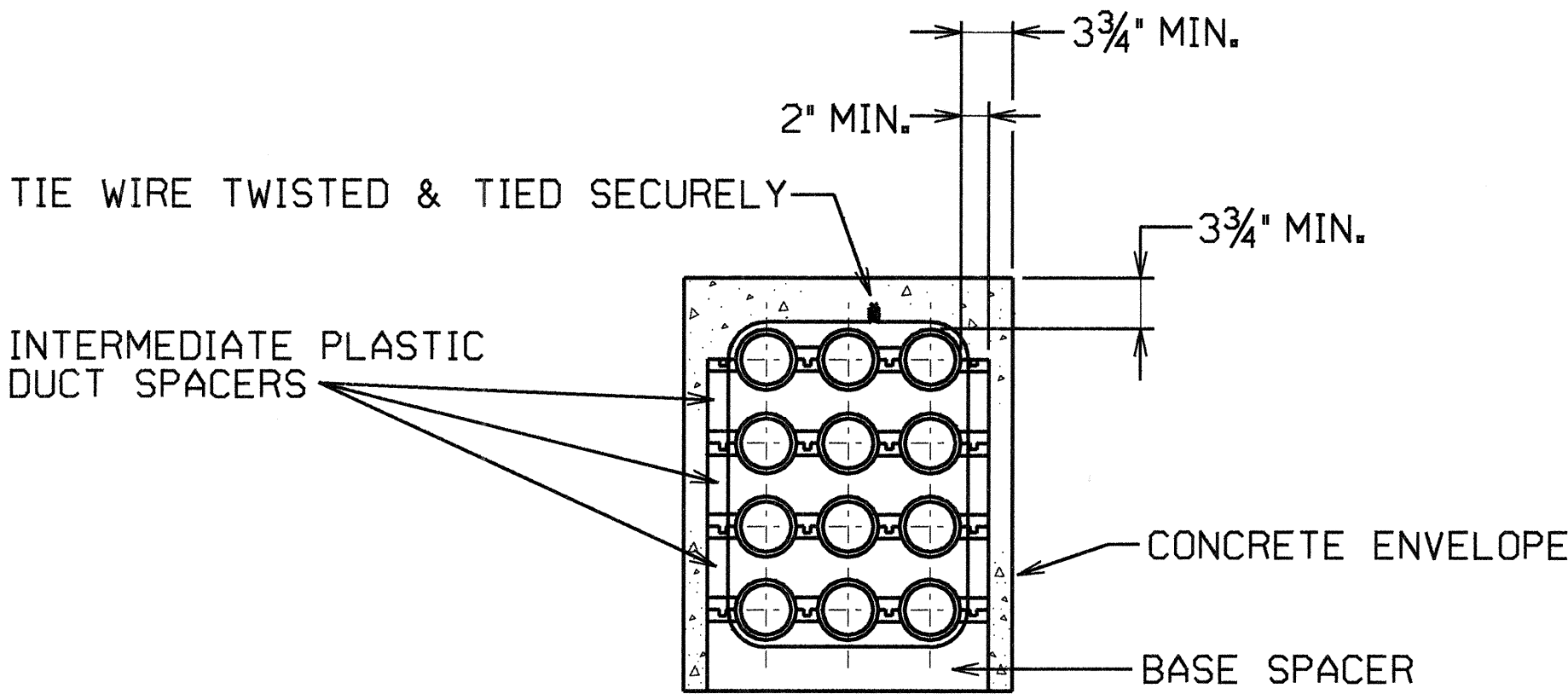
For: *Calvin Choy* Date: *5/16/00*
 GTE. Hawaiian Telephone Co. Date

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
HTCo. & OCEANIC CABLE CONDUIT DETAILS
KAMEHAMEHA HIGHWAY
Intersection Improvements at
Leilehua Golf Course Road
Fed. Aid Project No. DE-0200(803)
 Scale : As Shown Date: May 10, 2000
 SHEET No. 9 OF 15 SHEETS

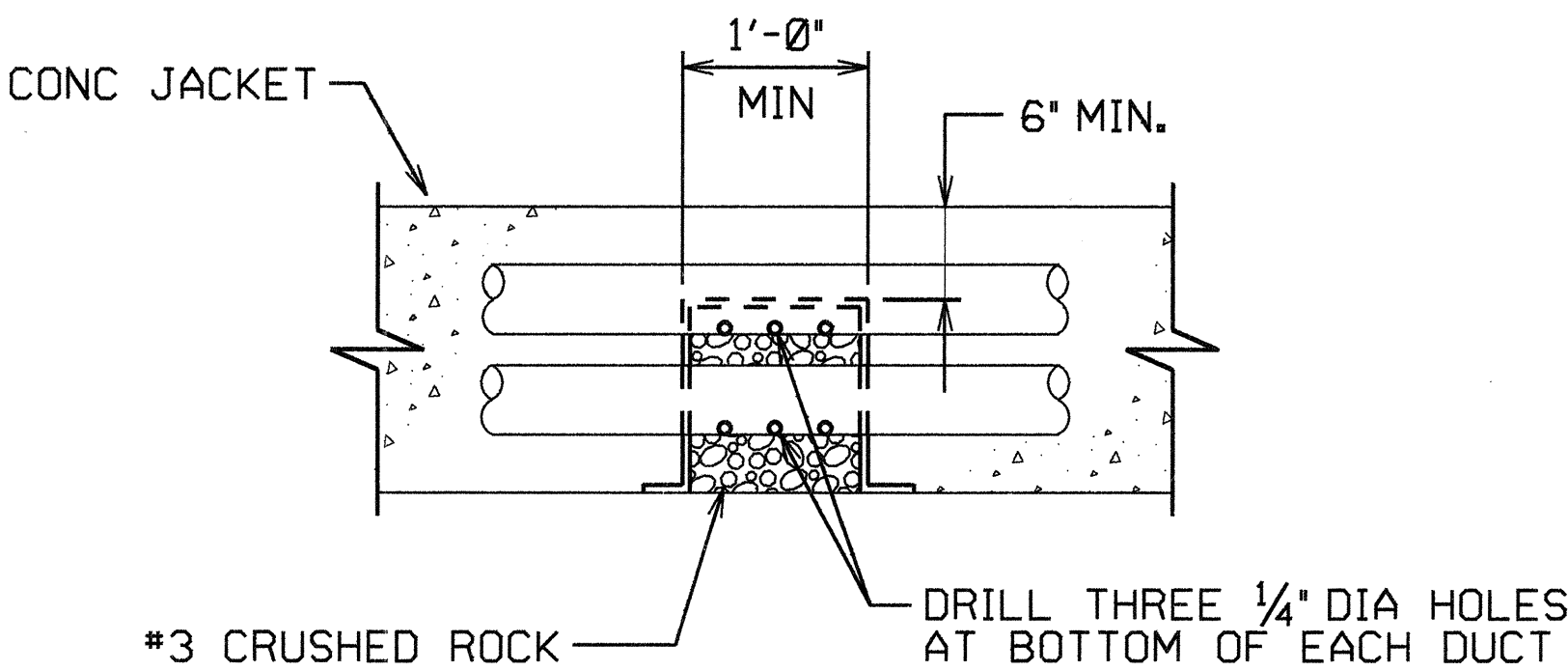
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DE-0200(803)	2000	35	79



TYPICAL DUCT ENVELOPE ELEVATION
ARRANGEMENT OF PLASTIC SPACERS
SCALE: 1" = 1'-0"



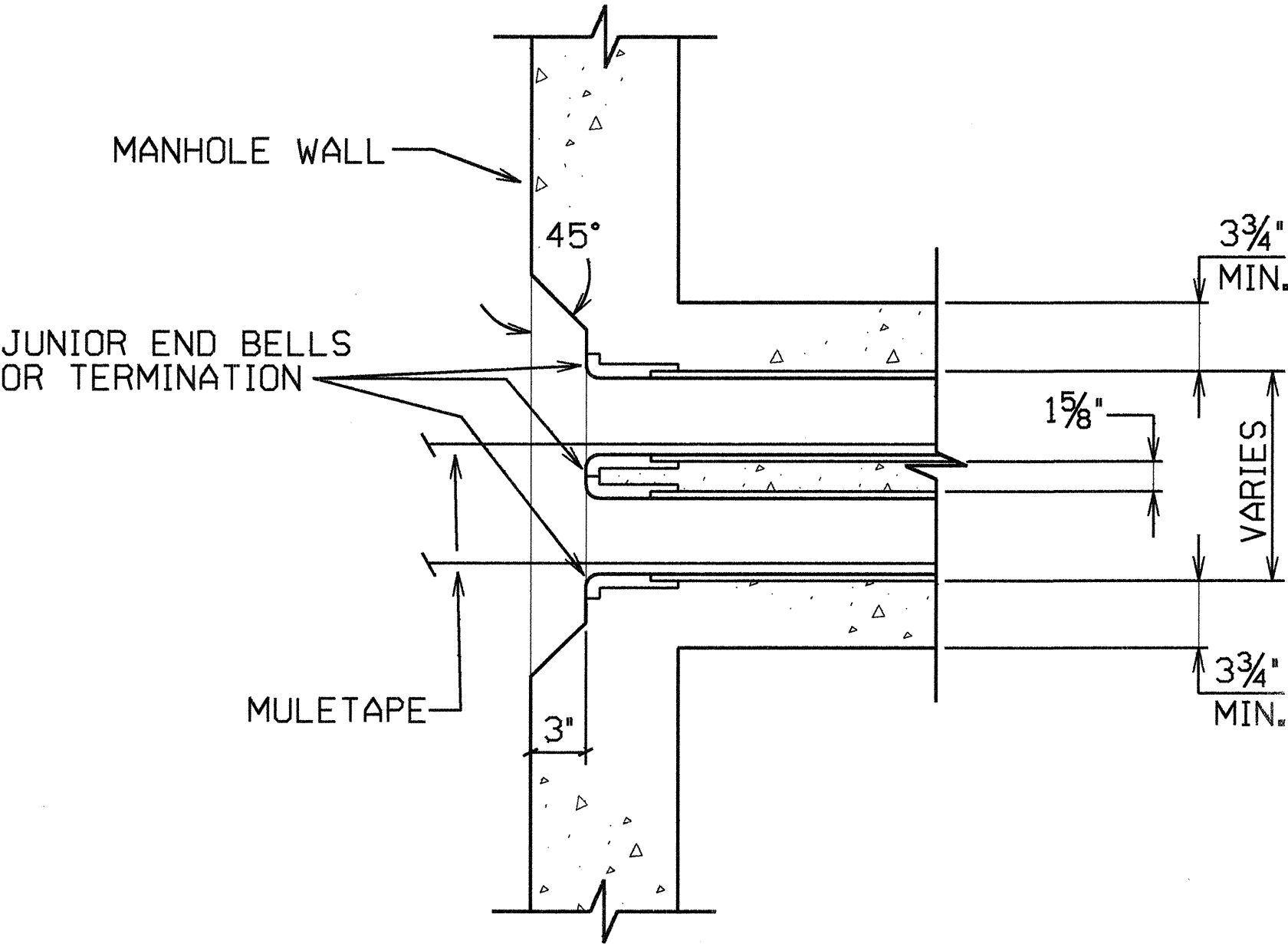
SECTION VIEW - DUCT INTER-LOCKING SPACERS
SCALE 1" = 1'-0"



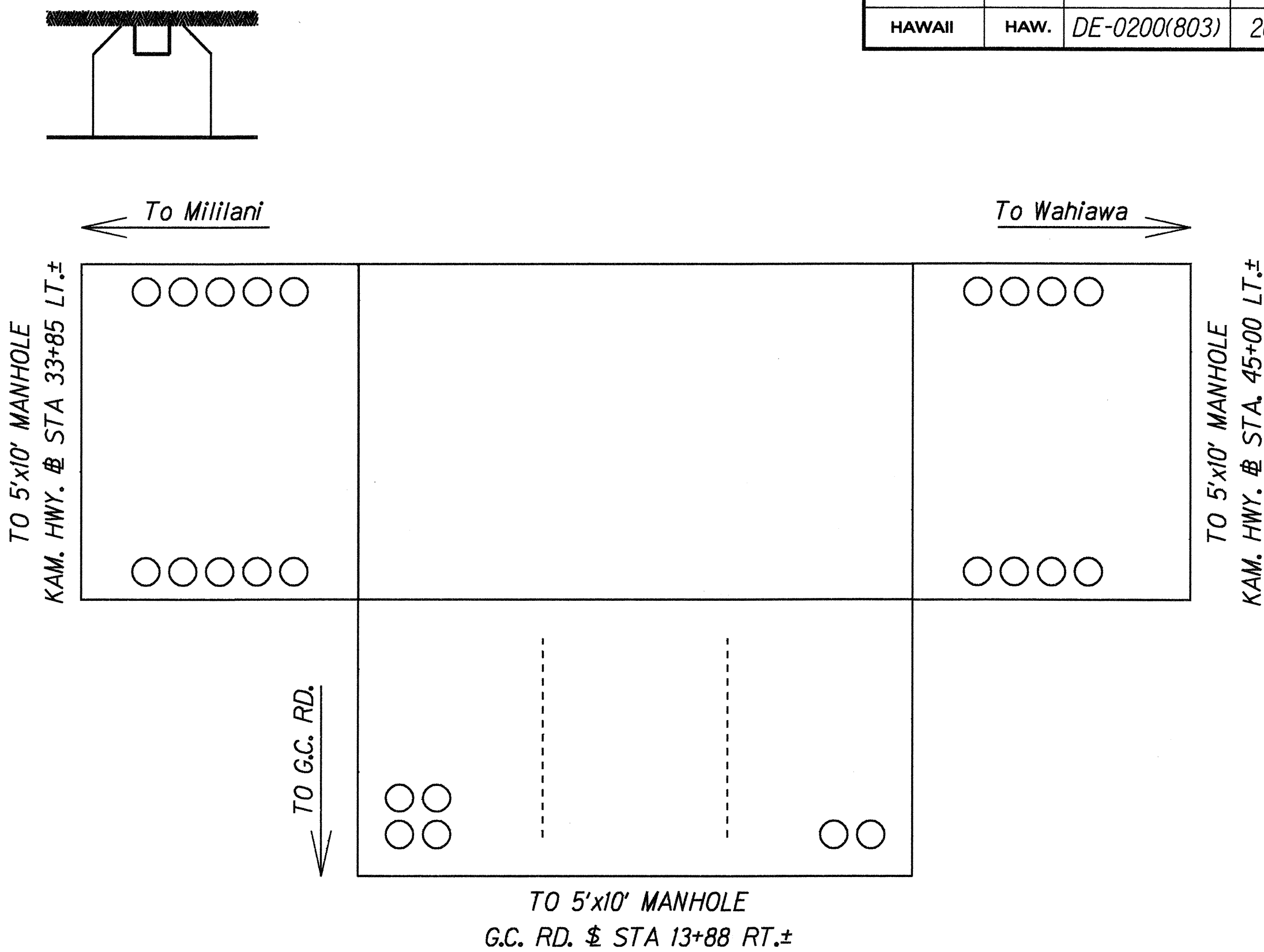
NOTE:
BEFORE PLACEMENT OF CONC, CONTRACTOR SHALL SEAL OFF THE CRUSHED ROCK AREA WITH A PLASTIC SHEET. TO PREVENT CONC FROM OOOZING INTO 1/4" HOLES FOR DRAINAGE.

ELEVATION VIEW OF DUCT DRAIN DETAIL
SCALE 1" = 1'-0"

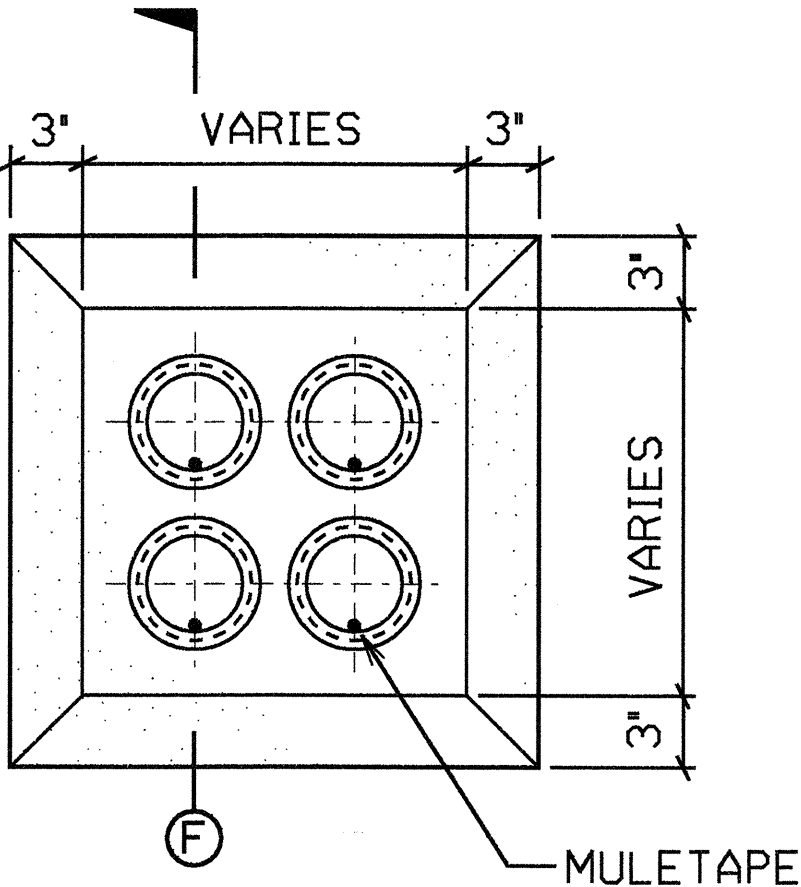
APPROVED:
Calvin Chong
GTE. Hawaiian Telephone Co. 5/17/00
Date



SECTION F - TYPICAL MANHOLE DUCT WINDOW
SCALE: 1 1/2" = 1'-0"



DUCT ENTRANCE TO 5'X10' MANHOLE
KAM. HWY. @ STA. 38+69 LT.±
Not To Scale



TYPICAL MANHOLE DUCT WINDOW
SCALE: 1 1/2" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

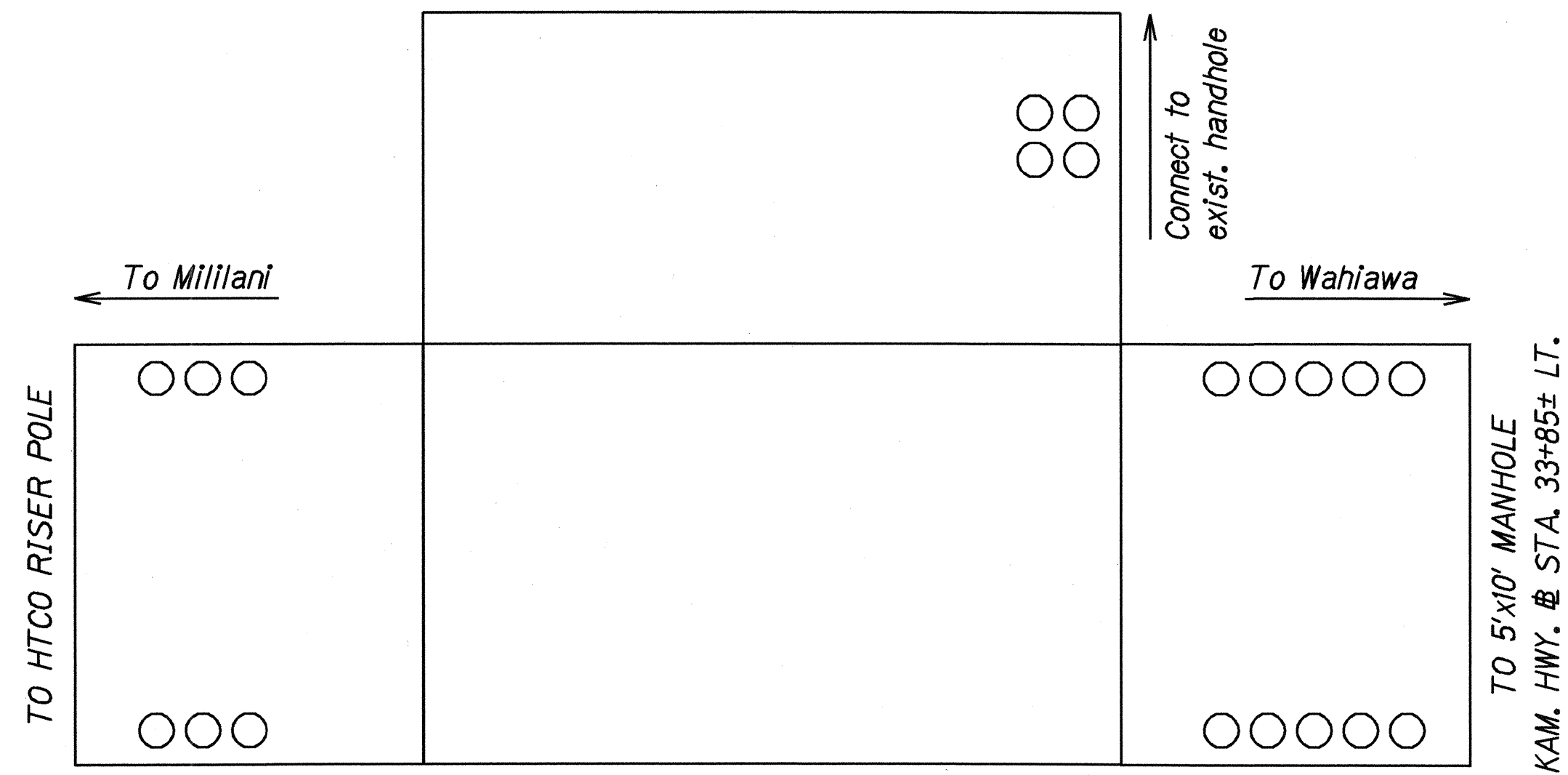
HTC TYPICAL DUCT & MANHOLE DETAILS

KAMEHAMEHA HIGHWAY
Intersection Improvements at
Leilehua Golf Course Road
Fed. Aid Project No. DE-0200(803)
Scale : As Shown Date: May 10, 2000

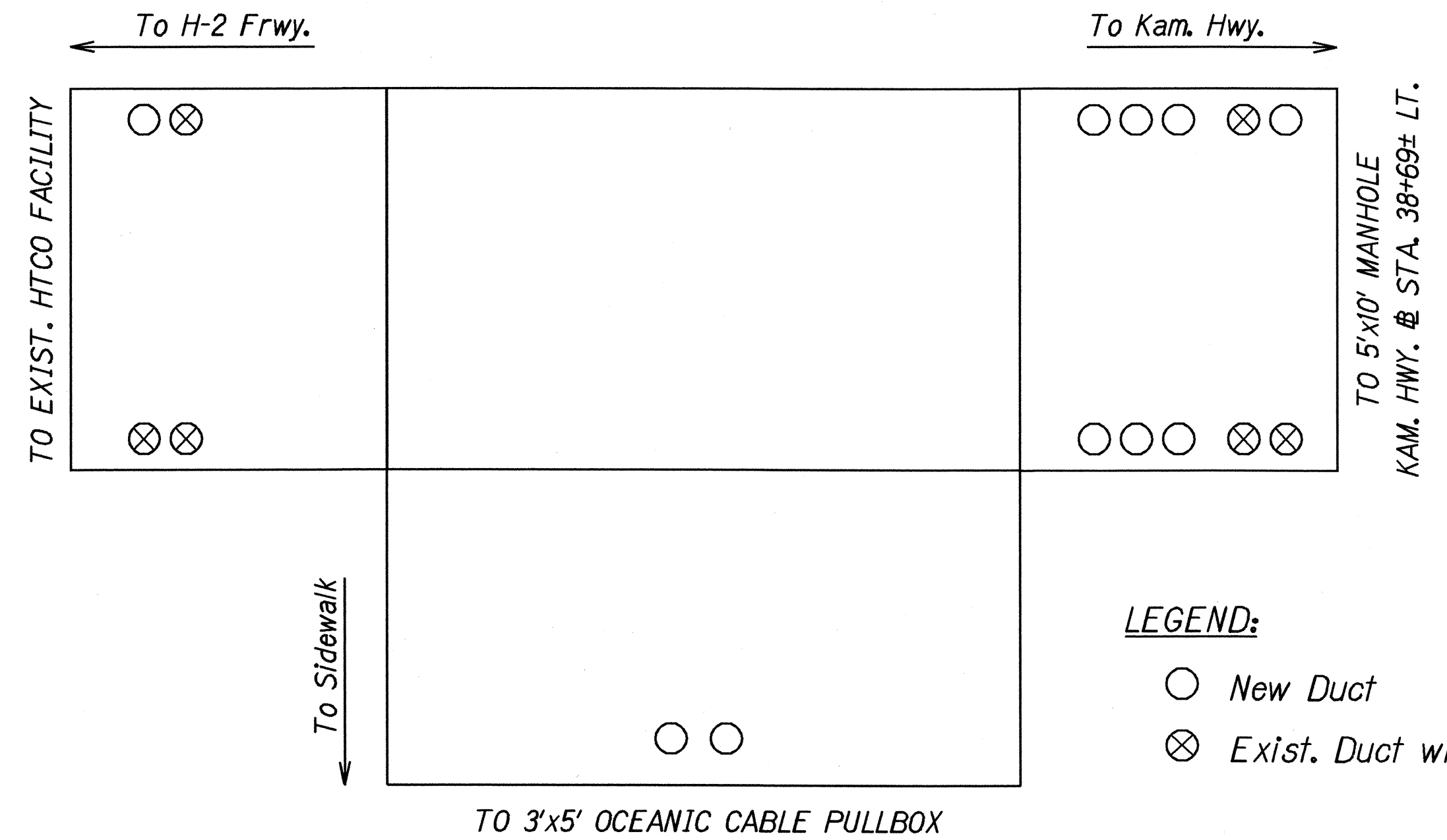
SHEET No. 10 OF 15 SHEETS

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DE-0200(803)	2000	C.O.35S-1	79



DUCT ENTRANCE TO 5'X10' MANHOLE
KAM. HWY. @ STA. 28+50± LT.
Not To Scale



DUCT ENTRANCE TO 5'X10' MANHOLE
G.C. RD. @ STA. 13+88± LT.
Not To Scale

LEGEND:
○ New Duct
⊗ Exist. Duct with Active Cables

ORIGINAL PLAN	DATE
SURVEY PLOTTED BY	10/12/01
DRAWN BY	
DESIGNED BY	
CHECKED BY	
NOTED BY	
DATE	

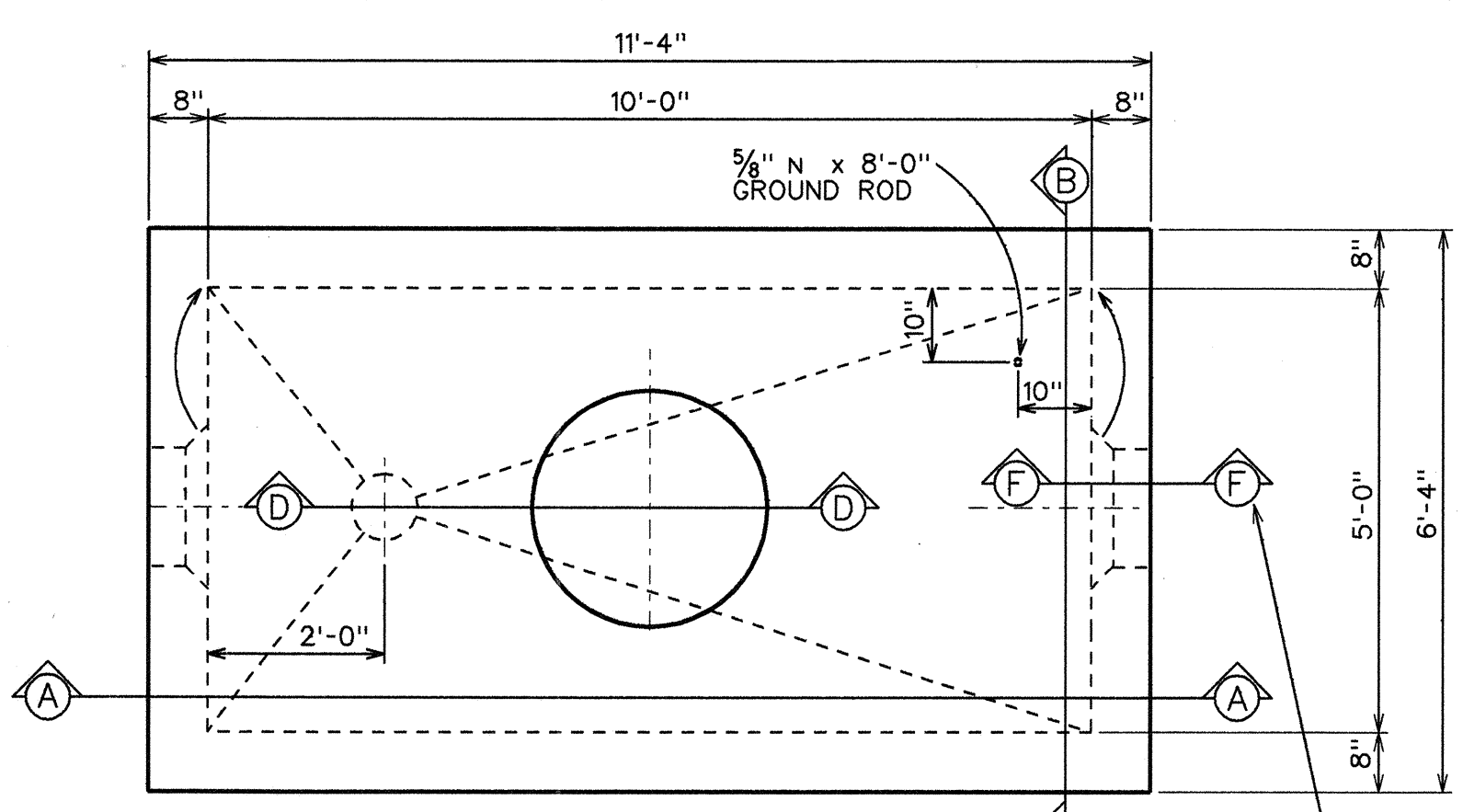
APPROVED:	
<i>[Signature]</i>	10/12/01
GTE Hawaiian Telephone Co.	Date
VERIZON HAWAII INC.	

9/17/01	Revise 5'x10' Manhole Envelope, Kam. Hwy. @ Sta. 28+50± Lt.
5/4/01	Add 5'x10' Manhole Envelope Details.
DATE	REVISION

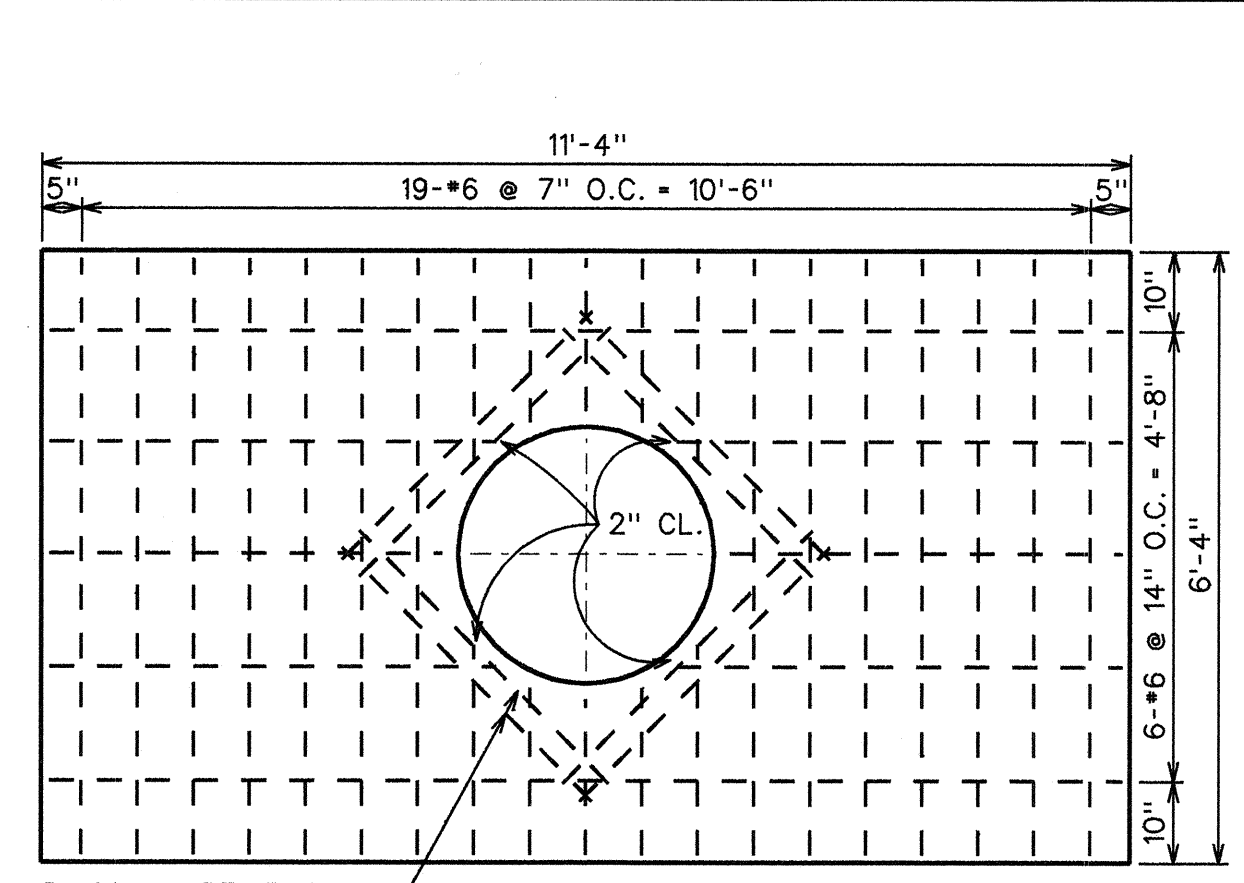
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
HTCO TYPICAL DUCT & MANHOLE DETAILS
KAMEHAMEHA HIGHWAY Intersection Improvements at Leilehua Golf Course Road Fed. Aid Project No. DE-0200(803) Scale : As Shown Date: May 10, 2000
SHEET No. 10A OF 15 SHEETS

C.O. 35S-1

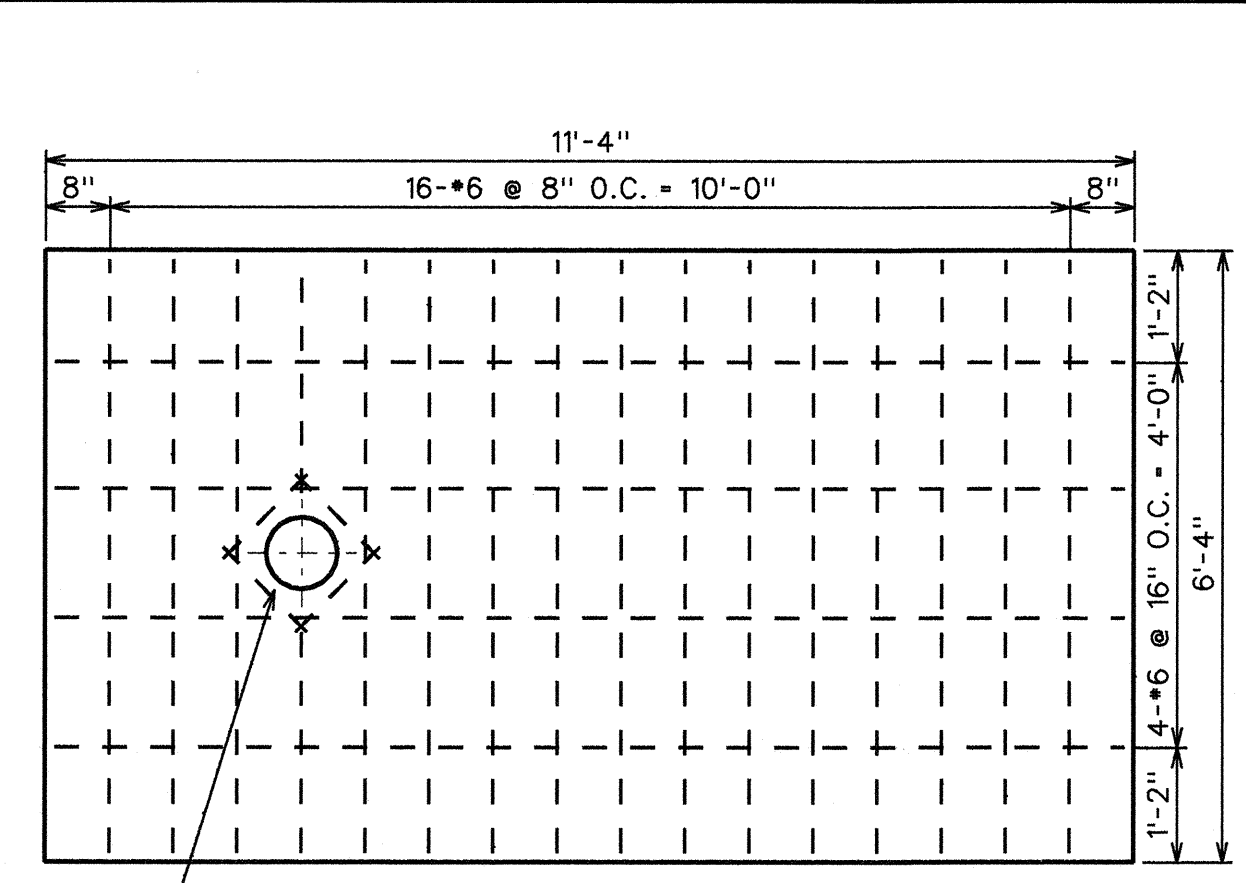
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DE-0200(803)	2000	36	79



PLAN-M.H. TYPE "A-3"
FOR ROADWAY & SIDEWALK AREAS
SCALE: 1/2" = 1'-0"

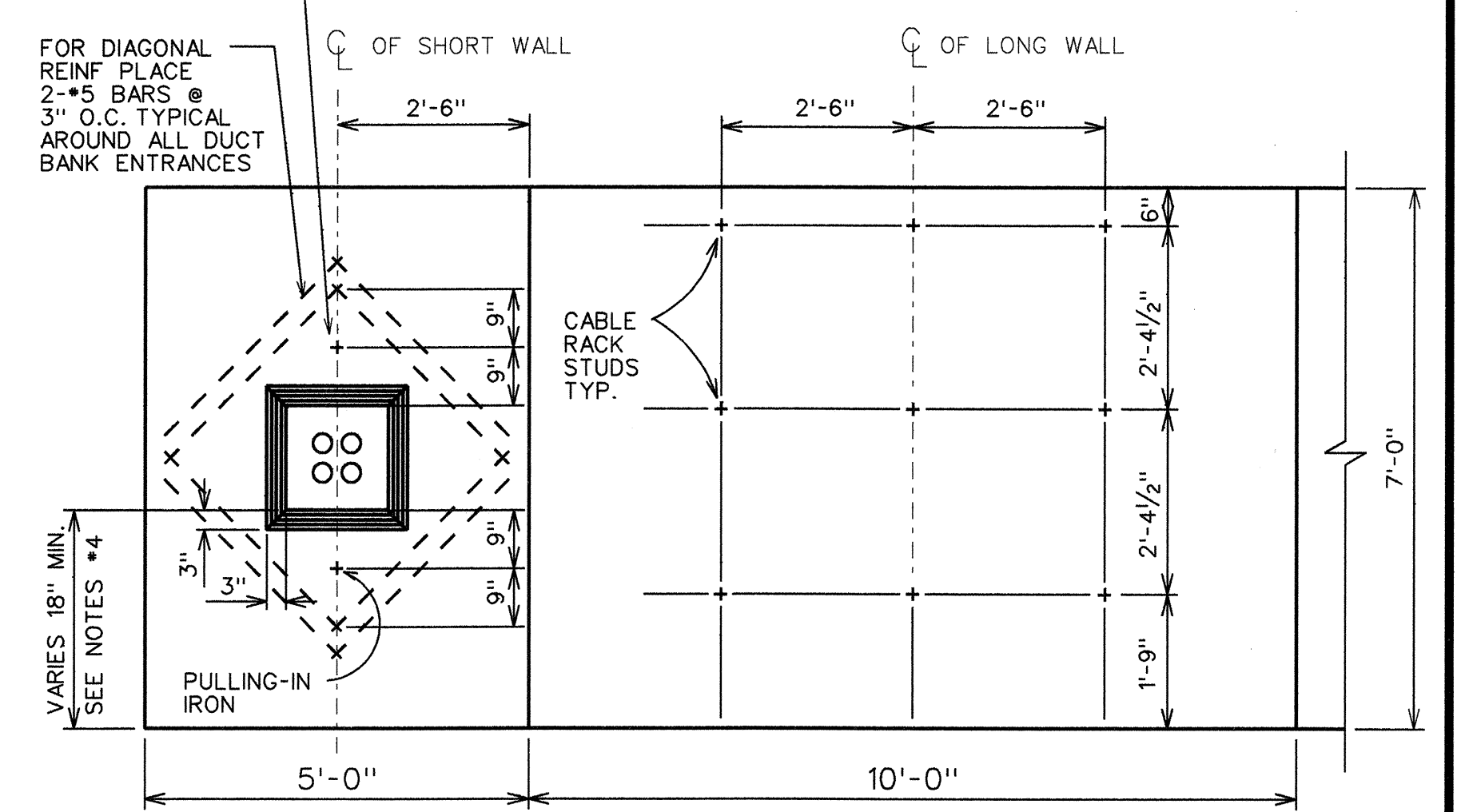


ROOF SLAB REINF. PLAN
SCALE: 1/2" = 1'-0"

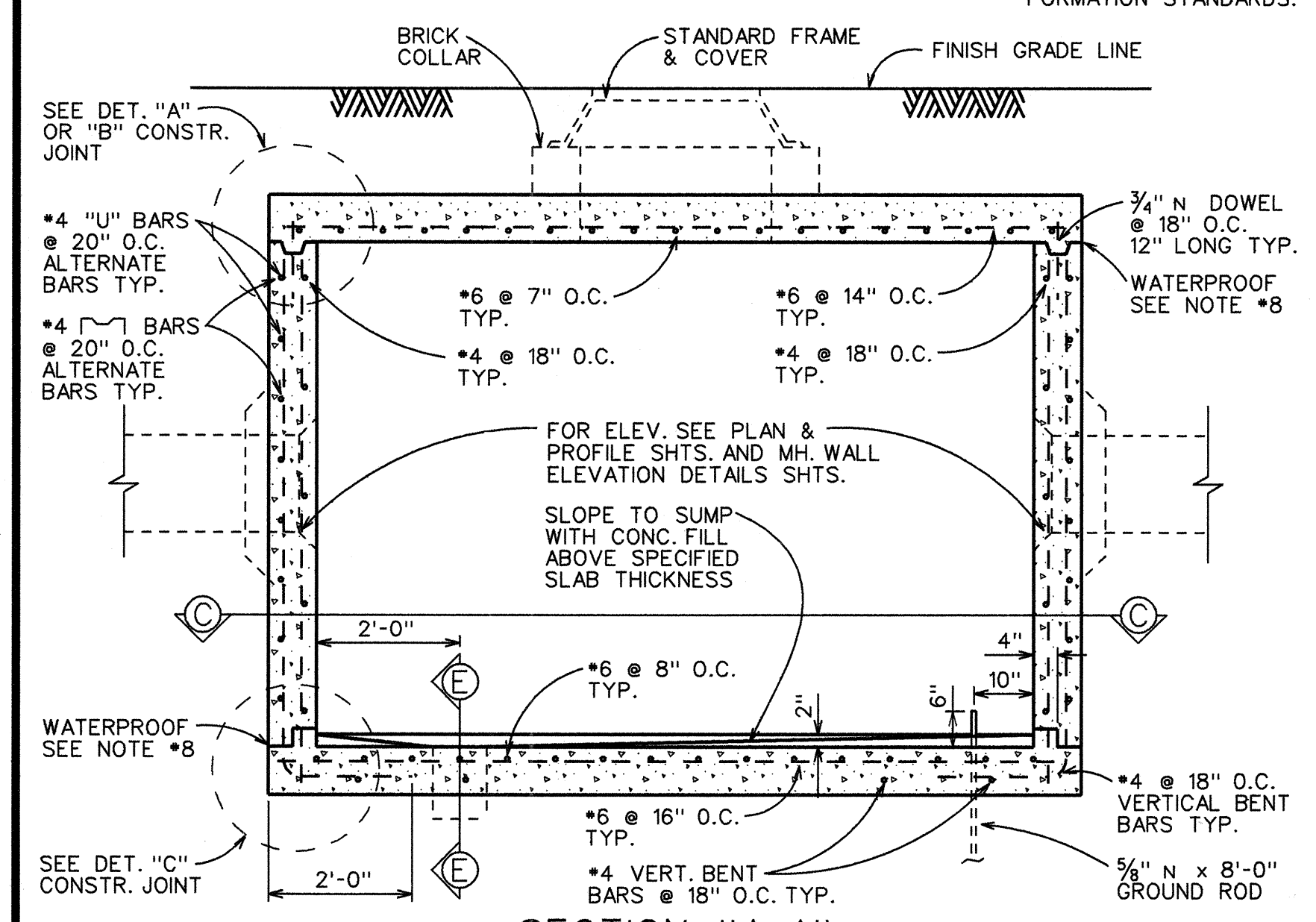


FLOOR SLAB REINF. PLAN
SCALE: 1/2" = 1'-0"

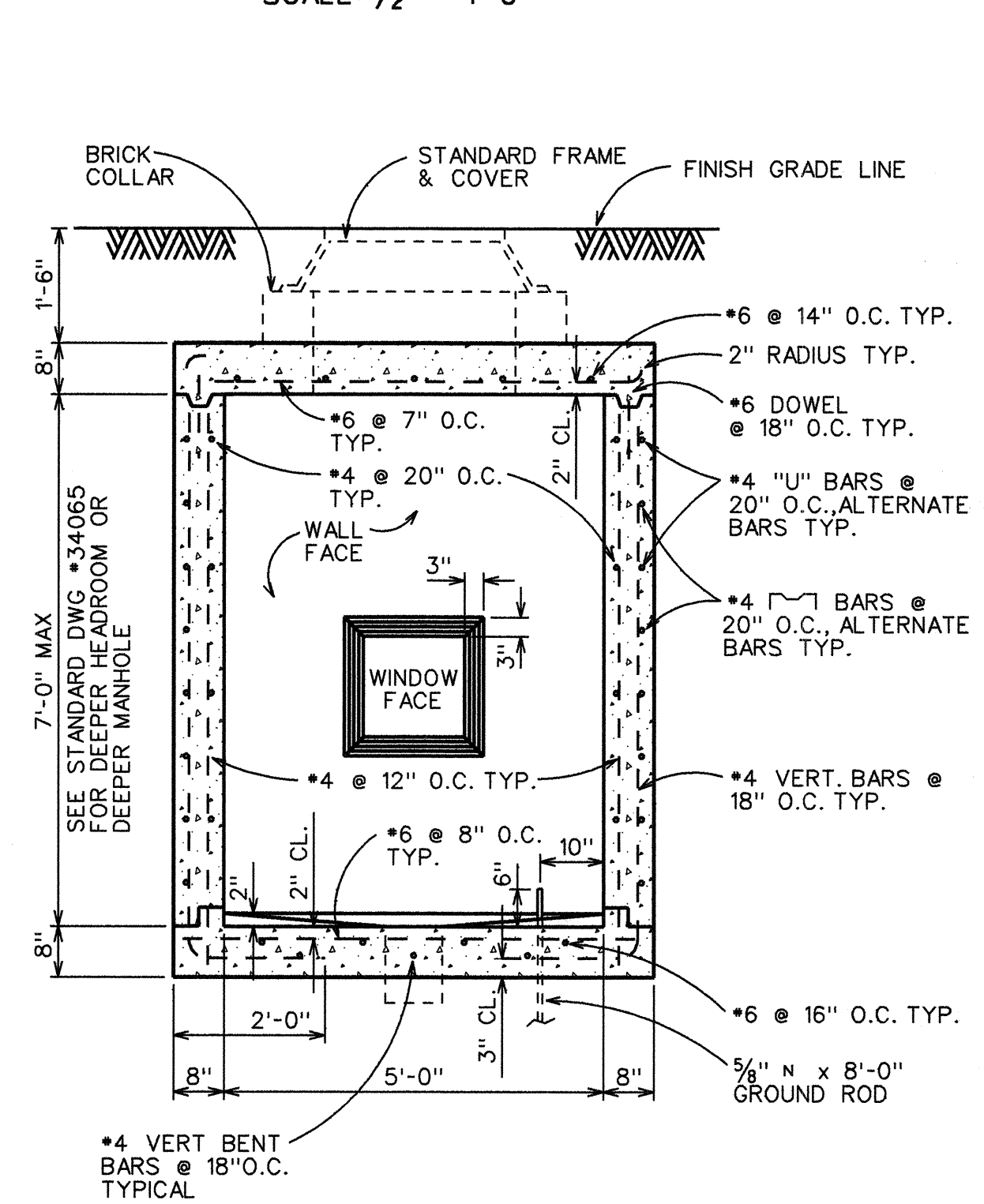
FOR LOCATION OF PULLING-IN IRONS SEE ELEVATION OF M.H. WALLS FOR DETAILS SEE STD. DUCT FORMATIONS & M.H. DETAIL SHEET.



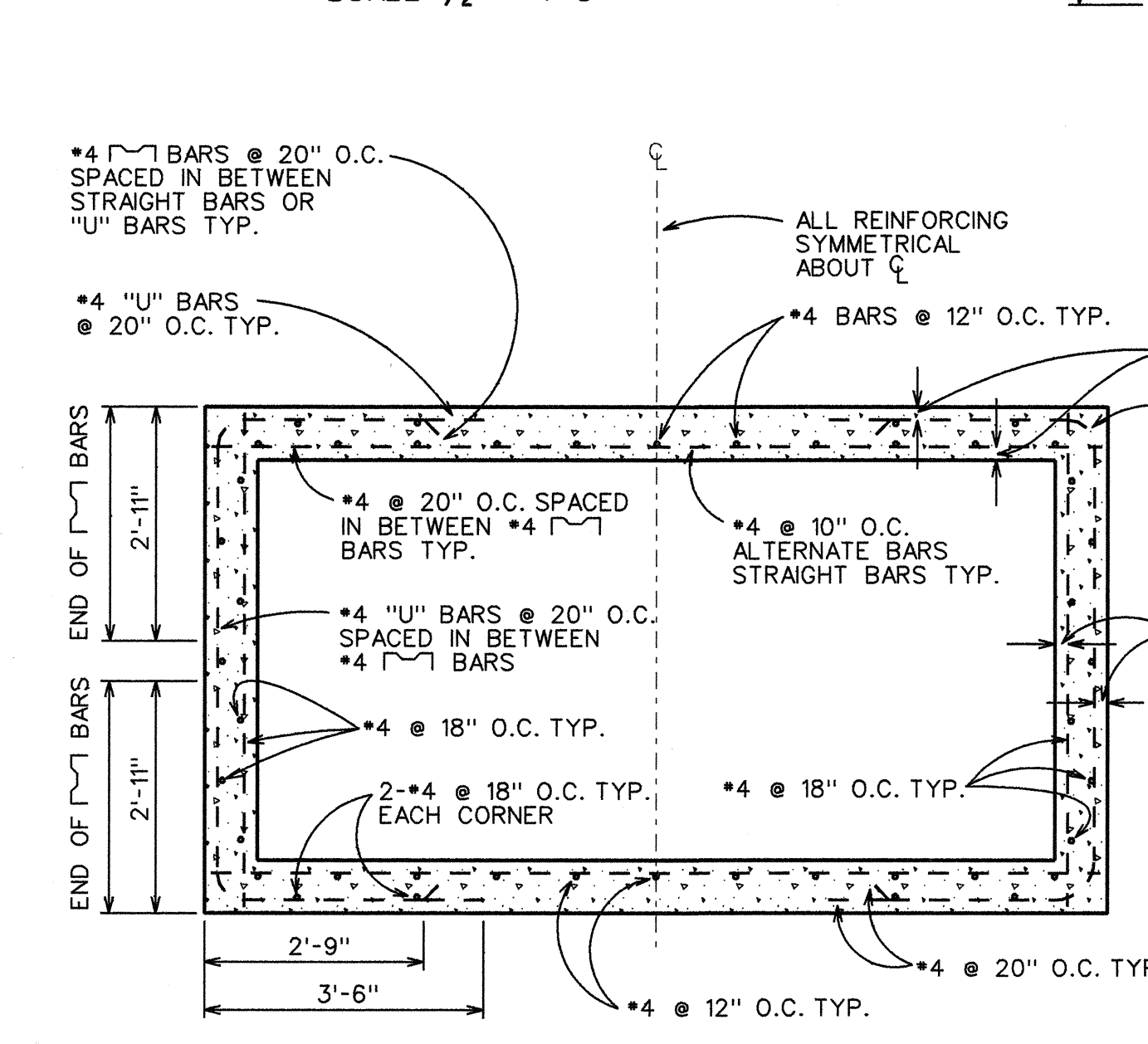
ELEVATION OF M.H. WALLS
TYPE "A-3" SERIES
(OPPOSITE FACES SIMILAR)
SCALE: 3/8" = 1'-0"



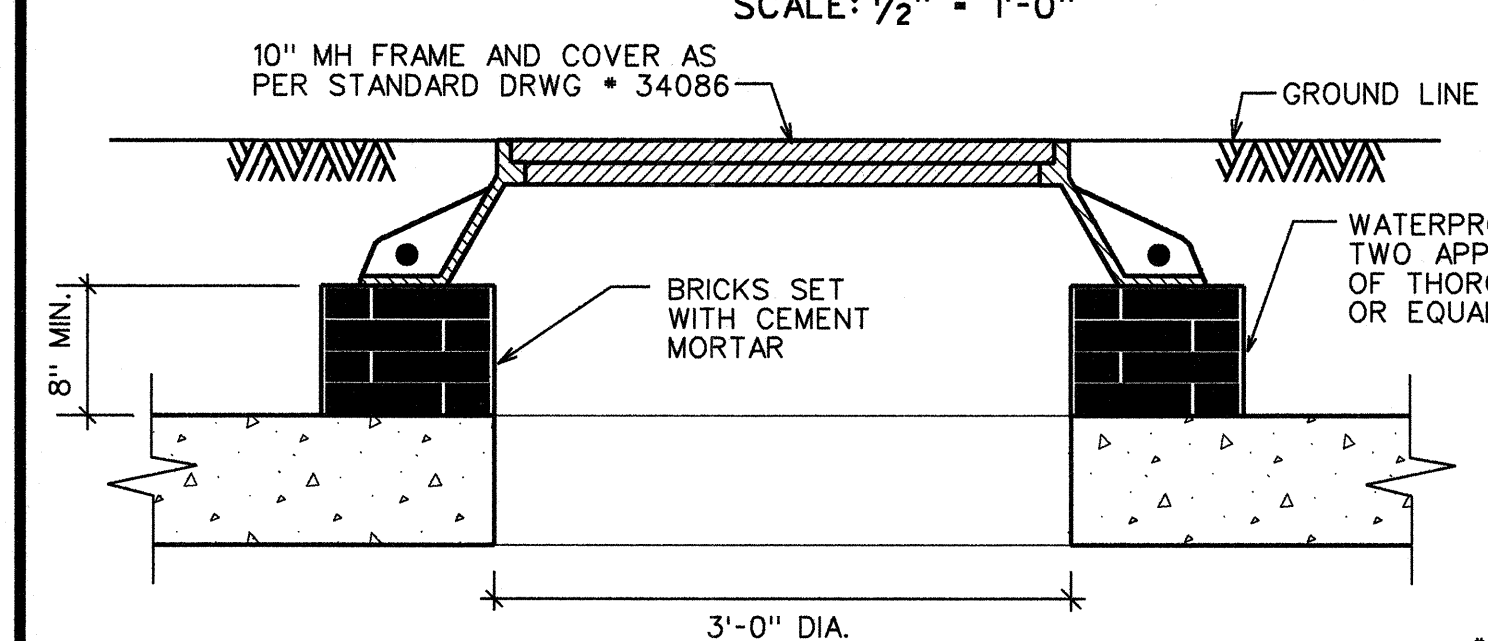
SECTION "A-A"
SCALE: 1/2" = 1'-0"



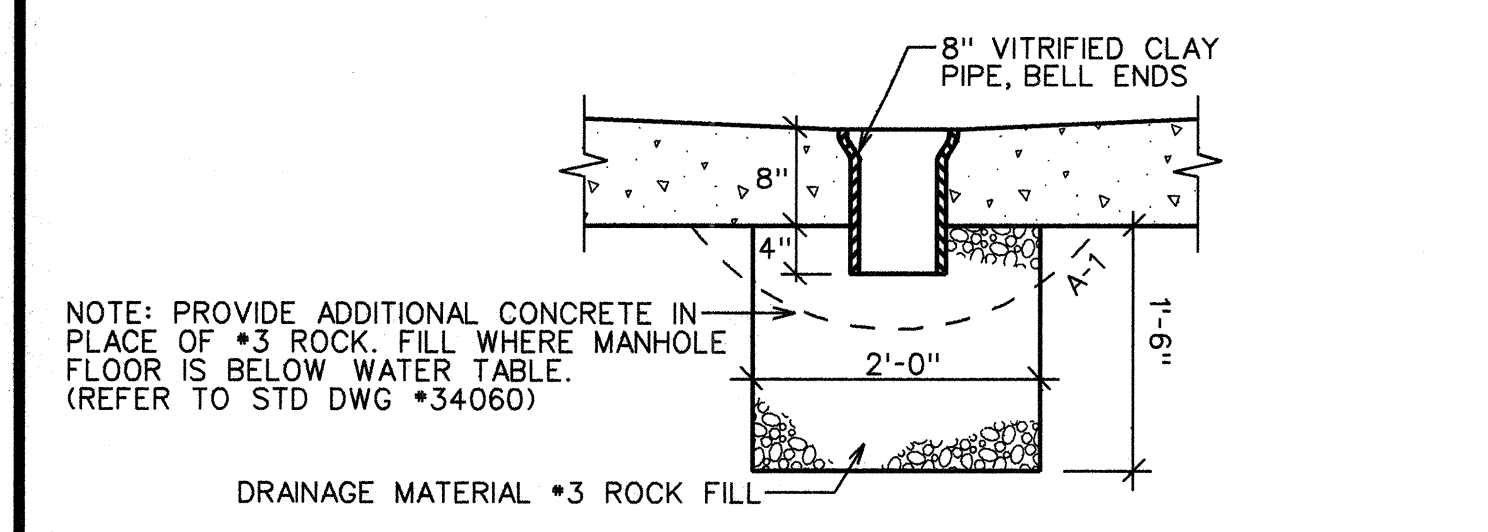
SECTION "B-B"
SCALE: 1/2" = 1'-0"



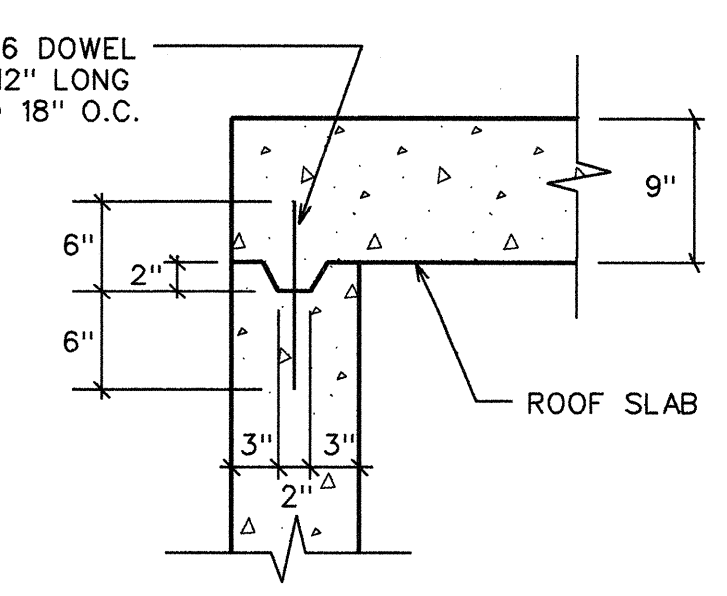
SECTION "C-C"
SCALE: 1/2" = 1'-0"



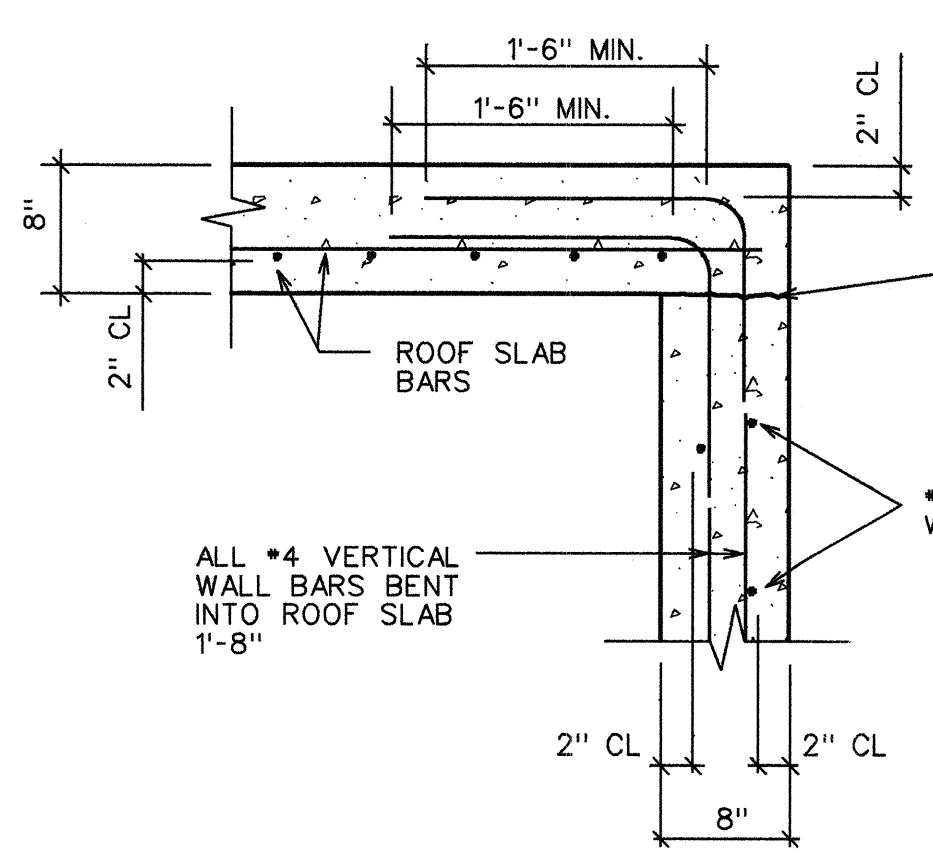
SECTION "D-D"
SCALE: 1" = 1'-0"



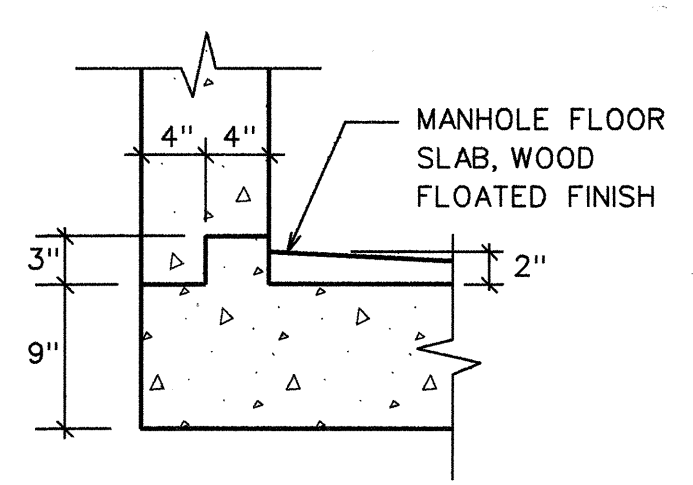
SECTION "E-E"
M.H. SUMP DETAIL
SCALE: 3/4" = 1'-0"



DETAIL "A"
(TOP CONSTR. JOINT DETAIL)
SCALE: 1" = 1'-0"



DETAIL "B"
(CONSTRUCTION JOINT DETAIL)
SCALE: 1" = 1'-0"



DETAIL "C"
(BOTTOM CONSTR. JOINT DETAIL)
SCALE: 1" = 1'-0"

M.H. CLASSIFICATION TYPE - A - 3 - 6.0' MANHOLE HEADROOM
WIDTH & LENGTH DESIGNATION " 3 " = 5.0' X 10.0'

APPROVED: *Colum Chon* 5/16/00
GTE HAWAIIAN TELEPHONE CO. DATE

GENERAL NOTES

- DESIGN DATA
f_s = 20,000 PSI
f_c = 3,000 PSI
f_c = 1,200 PSI
n = 10
w = EQUIV. FLUID PRESSURE 30 PSI
- CONCRETE SHALL BE CLASS A-1 & SHALL HAVE COMPRESSIVE STRENGTH OF 3,000 PSI IN 28 DAYS. SLUMP SHALL BE 3 1/2" ± 1".
- REINFORCING - INTERMEDIATE GRADE DEFORMED BARS.
- UNLESS OTHERWISE INDICATED, FOR VERTICAL LOCATION OF DUCT WINDOWS SEE PROFILE SHEET.
- MANHOLE WALLS SHALL BE DOUBLE FORMED.
- ALL CONCRETE SHALL BE CURED BY AN IMPERVIOUS LIQUID MEMBRANE COMPOUND.
- CONCRETE SHALL NOT BE LOADED, EXCEPT BY ITS OWN WEIGHT, UNTIL 28 DAYS AFTER PLACEMENT.
- ALL CONSTRUCTION JOINTS SHALL BE WATERPROOFED WITH TWO APPLICATIONS OF THORO-SEAL OR EQUAL.
- PLUG ALL DUCTS AND STUBOUTS.
- APPLY DAMPROOFING TO THE SURFACES OF REINFORCE CONCRETE THAT ARE IN CONTACT WITH THE EARTH EXCLUDING THE UNDERSIDE OF THE FLOOR SLAB. MATERIAL AND APPLICATION SHALL BE ACCORDING TO THE CURRENT EDITION OF THE "STATE" HIGHWAY DEPARTMENT'S STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
- BACKFILL MATERIAL AROUND MANHOLE SHALL BE GROUND MATERIAL AND COMPACTED TO BE 90% MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D1557. BACKFILL, WITHIN 2 FEET OF FINISH GRADE, SHALL CONSIST OF SELECT BORROW AND COMPACTED TO 95% MAXIMUM DRY CONSISTENCY. BACKFILL SHALL NOT BE PLACED OVER THE MANHOLE UNTIL THE TOP SLAB HAS ATTAINED FULL DESIGN STRENGTH.
- THE MANHOLE SHALL BE CONSTRUCTED WATERTIGHT, AND ALL CRACKS AND LEAKS SEALED BY EPOXY INJECTION OR OTHER APPROVED METHODS.
- FOR CABLE RACK STUD BOLTS PULLING IN IRON LOCATION, DUCT ENTRY AND ADDED REINFORCEMENTS FOR DUCT HOLES, SEE WALL AND ELEVATOR SHEETS.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

5'x10' GTE CAST-IN-PLACE
MANHOLE DETAILS

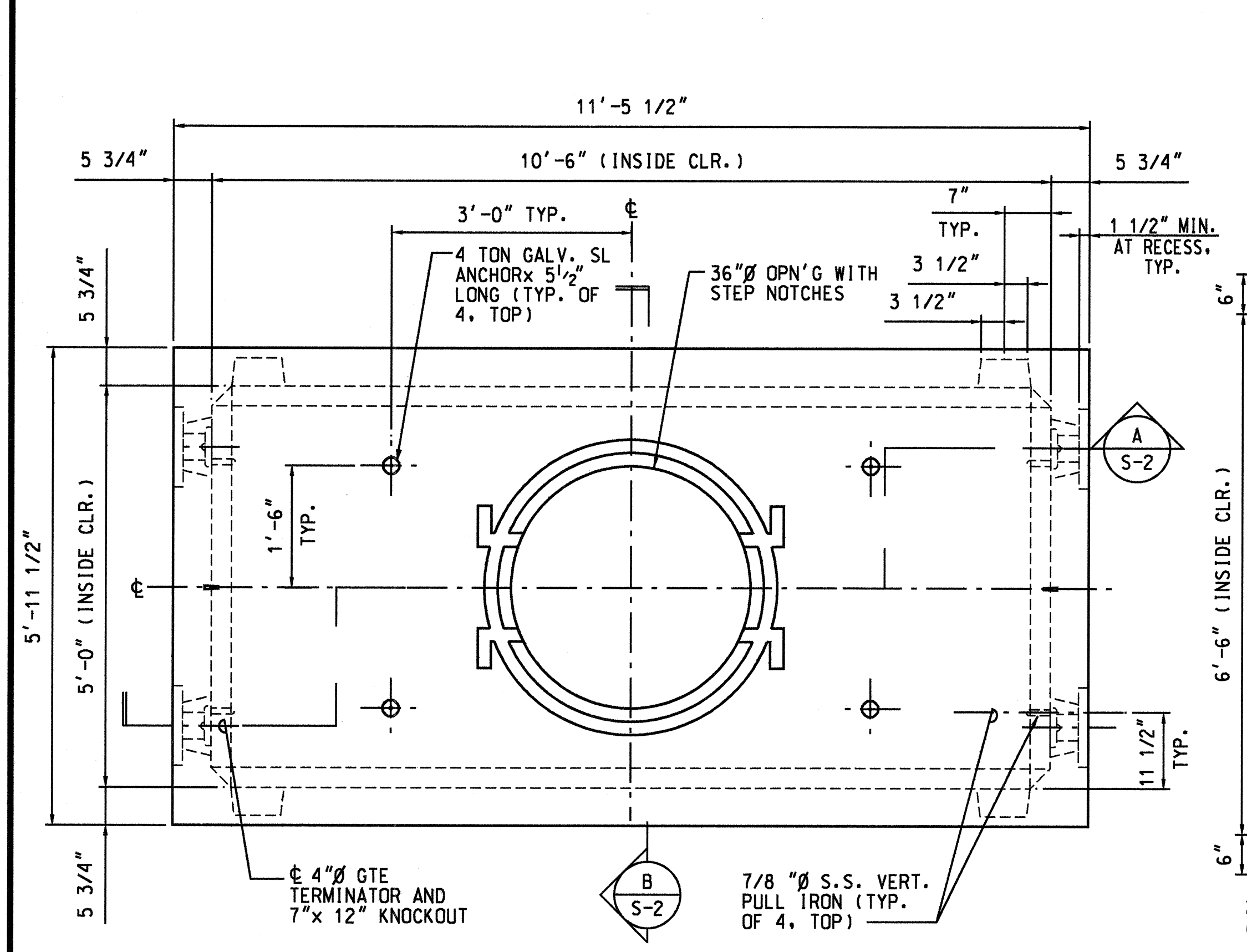
KAMEHAMEHA HIGHWAY
Intersection Improvements at
Leilehua Golf Course Road
Fed. Aid Project No. DE-0200(803)

Scale: As Shown Date: May 10, 2000

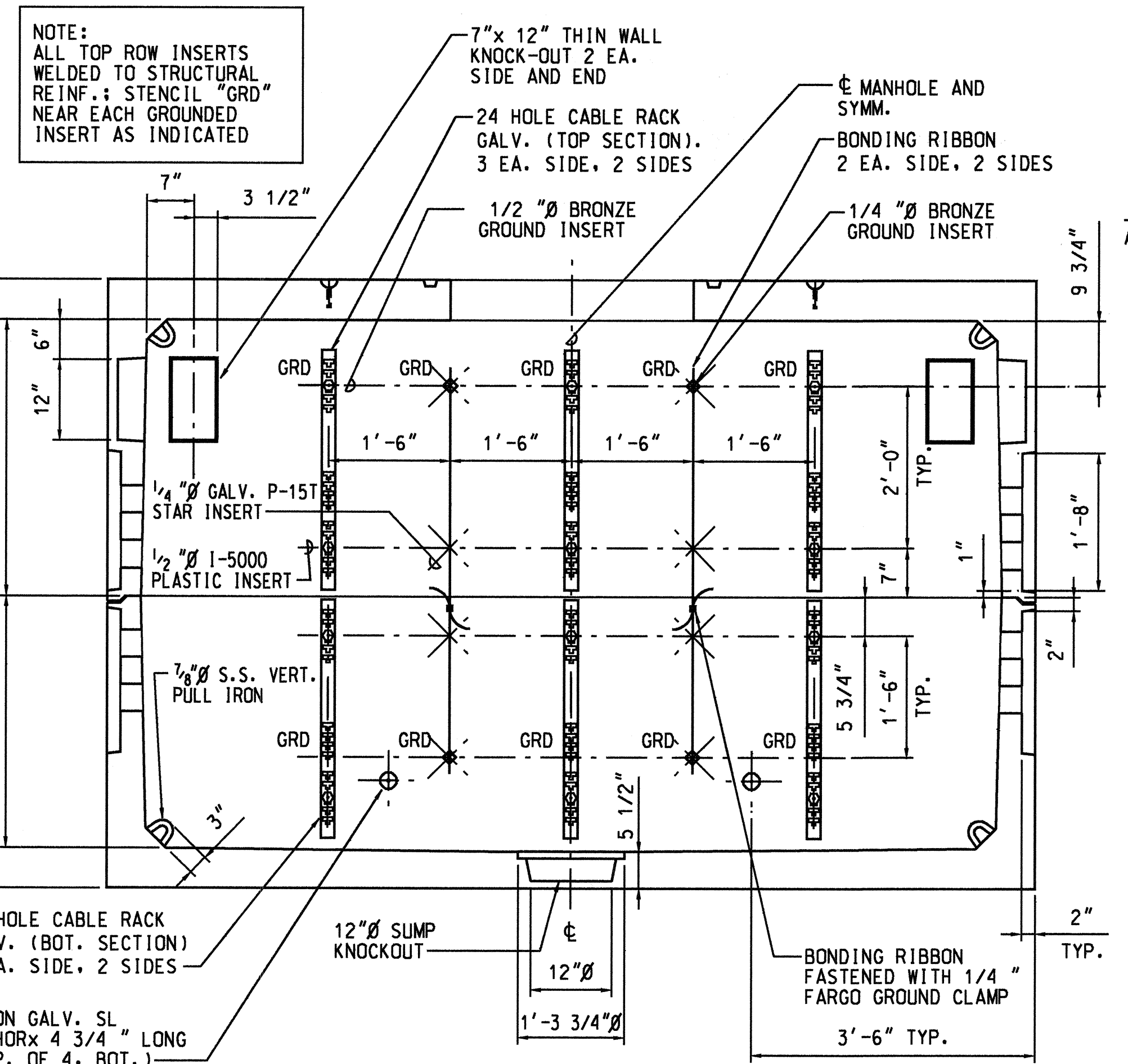
SHEET No. 11 OF 15 SHEETS

DATE	_____
SURVEY PLOTTED BY	_____
DRAWN BY	_____
CHECKED BY	_____
ORIGINAL PLAN	_____
NOTE BOOK	_____
QUANTITIES BY	_____

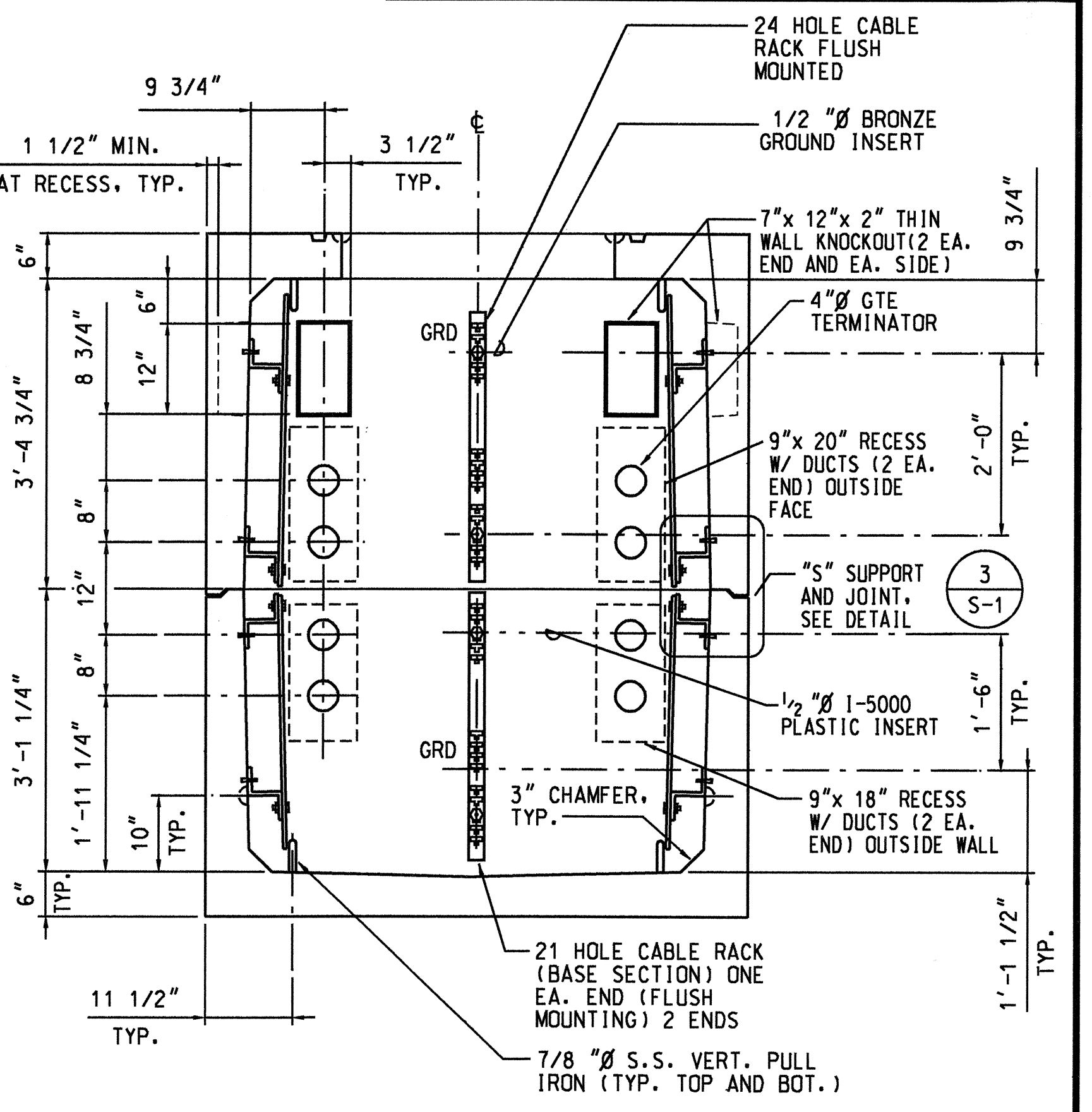
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DE-0200(803)	2000	37	79



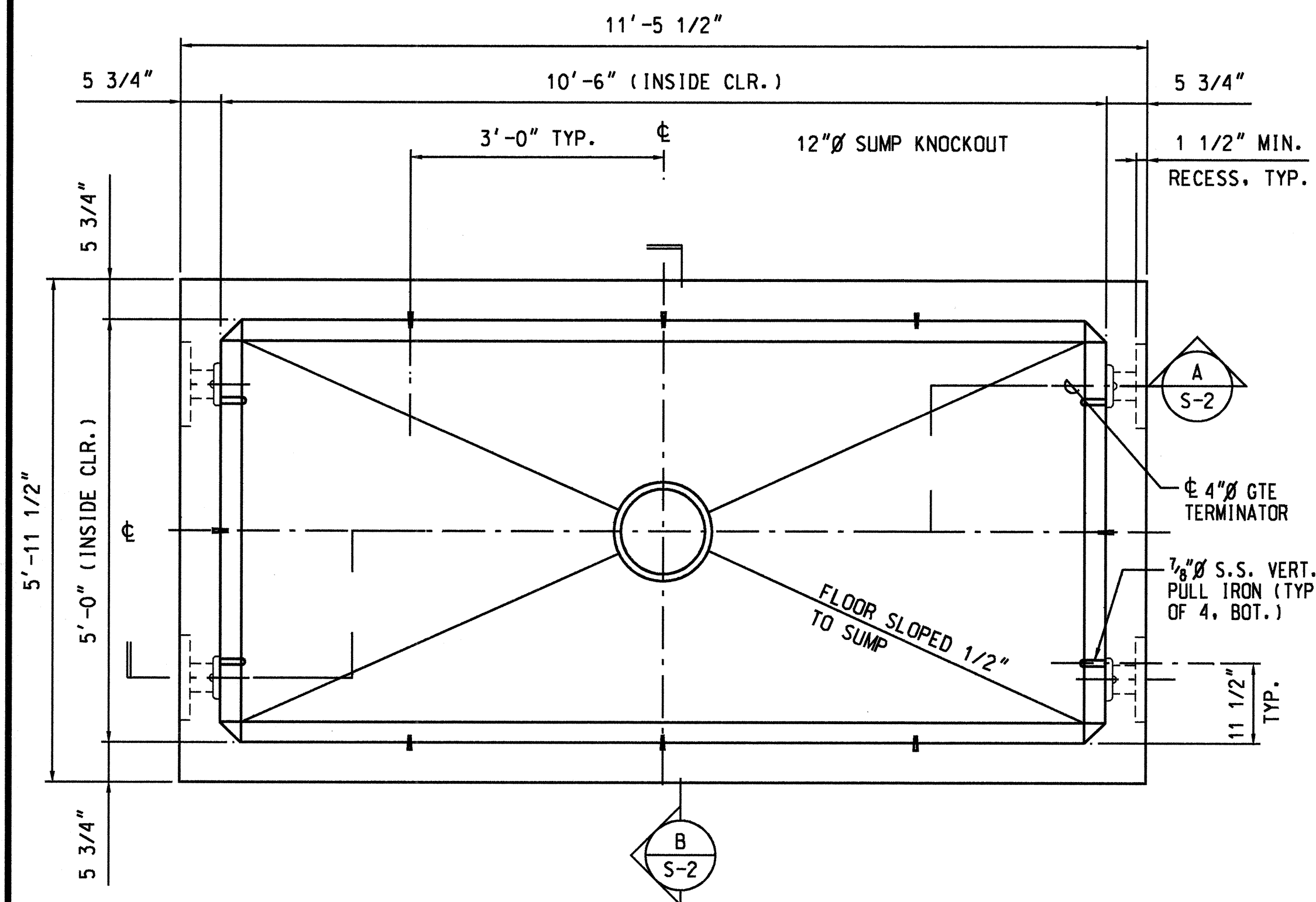
1 TOP SECTION - PLAN VIEW
S-1 SCALE: 3/4" = 1'-0"



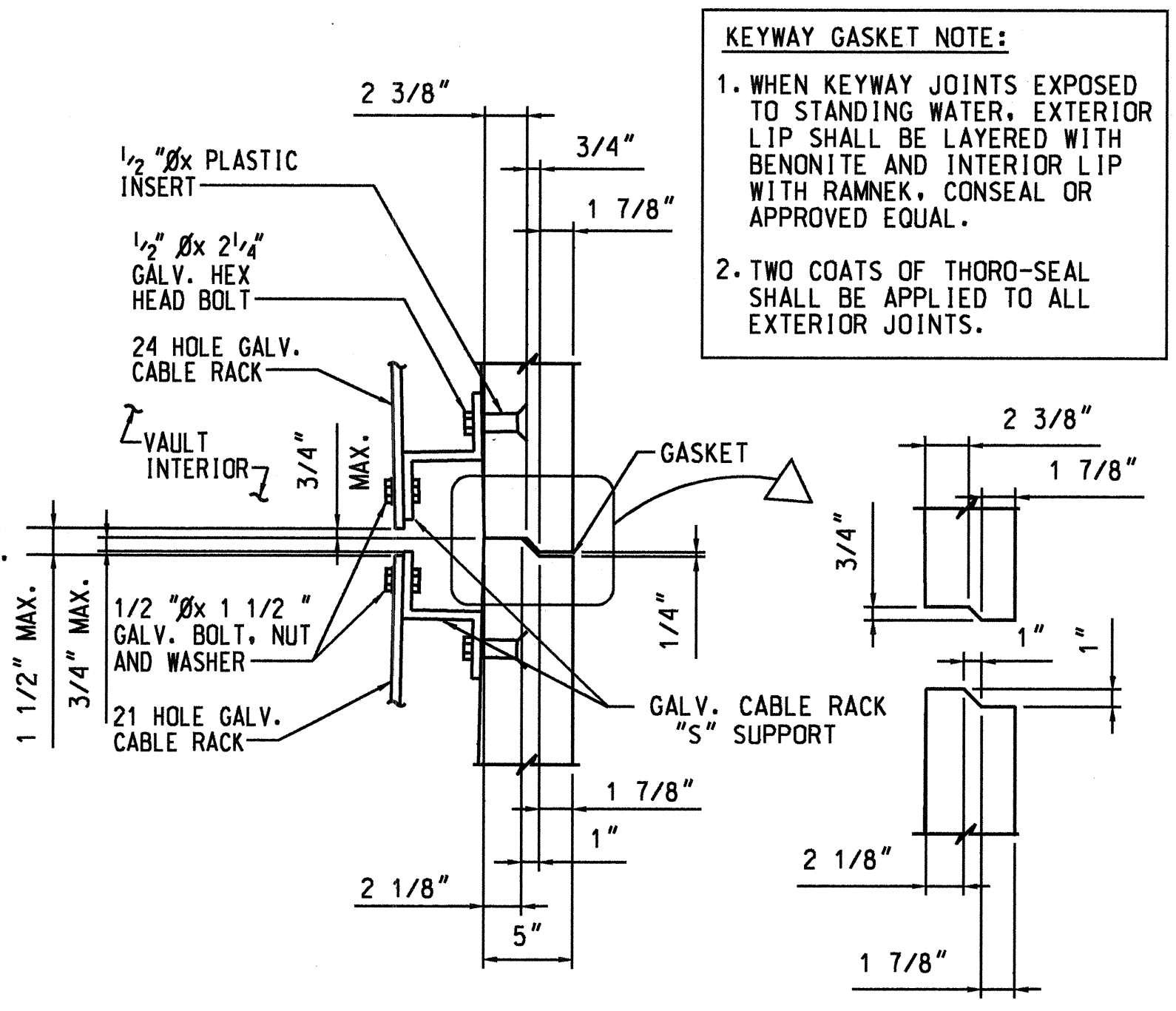
A SECTION AND SIDE WALL ELEVATION
S-1 SCALE: 3/4" = 1'-0"



B SECTION AND END WALL - ELEVATION
S-1 SCALE: 3/4" = 1'-0"



2 BASE SECTION - PLAN VIEW
S-1 SCALE: 3/4" = 1'-0"



3 DETAIL
S-1 1-1/2" = 1'-0"

GENERAL NOTES:

- CONTRACTOR TO VERIFY ALL BLOCKOUT SIZES AND LOCATIONS, SUPPLY AND INSTALL ALL PIPING, ELECTRICAL, DIVIDER WALLS, INSTALL ALL LADDERS AND COMPLETE ALL PAINTING REQUIRED.
- AFTER SETTING MANHOLE, BONDING RIBBONS AT JOINT MUST BE CONNECTED TOGETHER W/ BRONZE FARGO CLAMPS.
- ALL EXTERIOR CONSTRUCTION JOINTS SHALL BE WATERPROOFED W/ TWO APPLICATIONS OF THOROSEAL OR EQUAL.
- A SIX INCH LAYER OF COMPACTED SAND OR GTE HAWAIIAN TEL. TYPE "B" BACKFILL SHALL BE PLACED AS A BASE.
- INTERIOR WALLS AND CEILING SHALL BE SMOOTH, FREE OF IRREGULARITIES AND EQUIVALENT TO A NEAT CEMENT PASTE FINISH. ALL SURFACES SHALL BE SOUND AND FREE OF ROCK POCKETS AND HONEYCOMB AREAS. SECTIONS SHALL BE FREE OF CRACKS THAT IMPAIR THE STRUCTURE OR AFFECT WATER MIGRATION.
- INTERIOR WALLS SHALL BE PAINTED WITH A NON TOXIC WHITE LATEX PAINT.
- NECK PORTION, INCLUDING MANHOLE FRAME AND COVER, SHALL NOT BE LESS THAN 18" DEEP NOR MORE THAN 36" DEEP WITHOUT THE APPROVAL OF THE ENGINEER.
- PRECAST MANHOLES SHALL BE SUPPLIED BY ONLY GTE APPROVED VENDORS.
- THE CONTRACTOR IS DIRECTED TO THE FOLLOWING SHEET FOR PRE-CAST MANHOLE REINFORCEMENT DETAILS.

STRUCTURAL NOTES:

- CONCRETE: 28 DAY COMPRESSIVE STRENGTH $f'_c = 5500\text{PSI}$
- REBAR: ASTM A-706 GRADE 60
- MESH: ASTM A-185 GRADE 65 (OPTIONAL)
- DESIGN: ACI-318-89 BUILDING CODE, AMENDED 92
ASTM C-857 "MINIMUM STRUCTURAL DESIGN LOADING FOR UNDERGROUND PRECAST CONCRETE UTILITY STRUCTURES."
- LOADS: AASHTO H-20-A16 WHEEL LOAD WITH 30% IMPACT,
AASHTO LIVE LOAD SURCHARGE (2' SOIL) TO 8' DEPTH
EFFECTIVE SOIL PRESSURE BELOW WATER TABLE=80 p.c.f.
EFFECTIVE SOIL PRESSURE ABOVE WATER TABLE=45 p.c.f.
- SOIL COVER: 3'-0" MAX. WITH WATER TABLE 3'-0" BELOW FINISHED GRADE

ABBREVIATIONS:

GRD	GROUND
SL	SWIFT-LIFT
S.S.	STAINLESS STEEL
Ø	DIAMETER

APPROVED:

Calvin Choy 5/16/00
GTE HAWAIIAN TELEPHONE CO. DATE

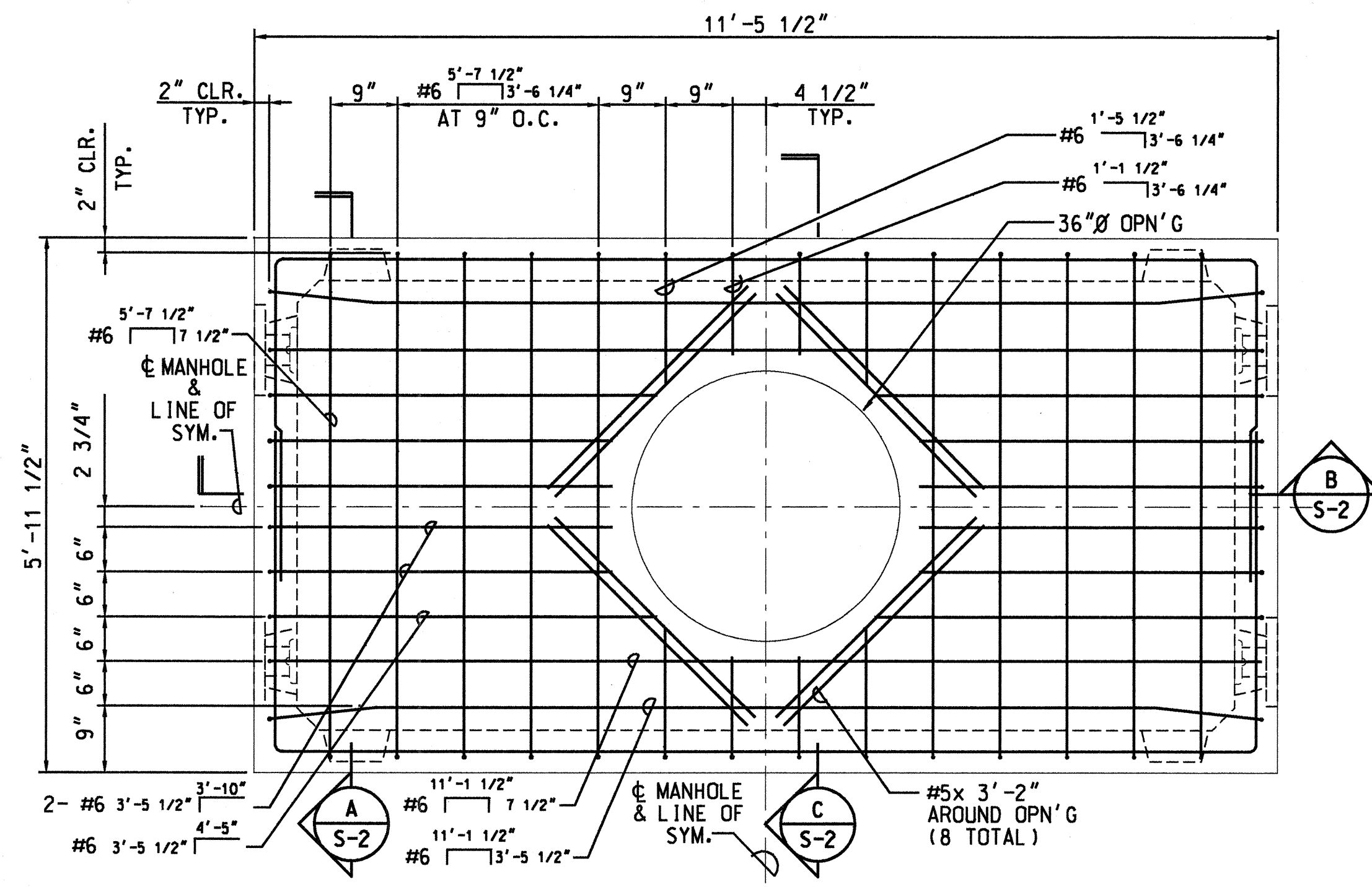
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

5'x10' GTE PRE-CAST MANHOLE DETAILS

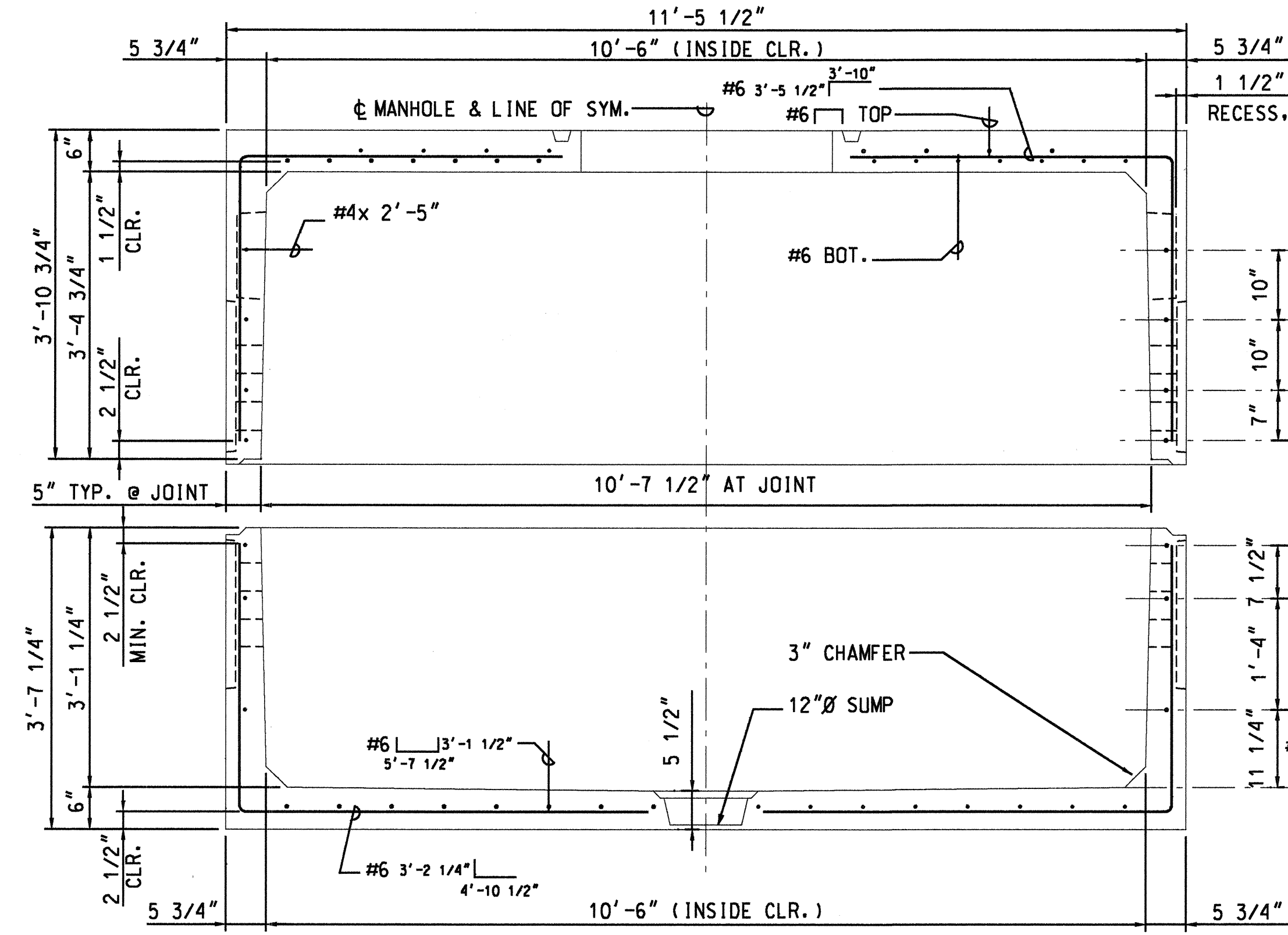
KAMEHAMEHA HIGHWAY
Intersection Improvements at
Leilehua Golf Course Road
Fed. Aid Project No. DE-0200(803)
Scale: As Shown Date: May 10, 2000

ORIGINAL PLAN	DATE
DRAWN BY HWT/S	
CHECKED BY HWT/S	
DESIGNED BY HWT/S	
QUANTITIES BY HWT/S	
CHECKED BY	

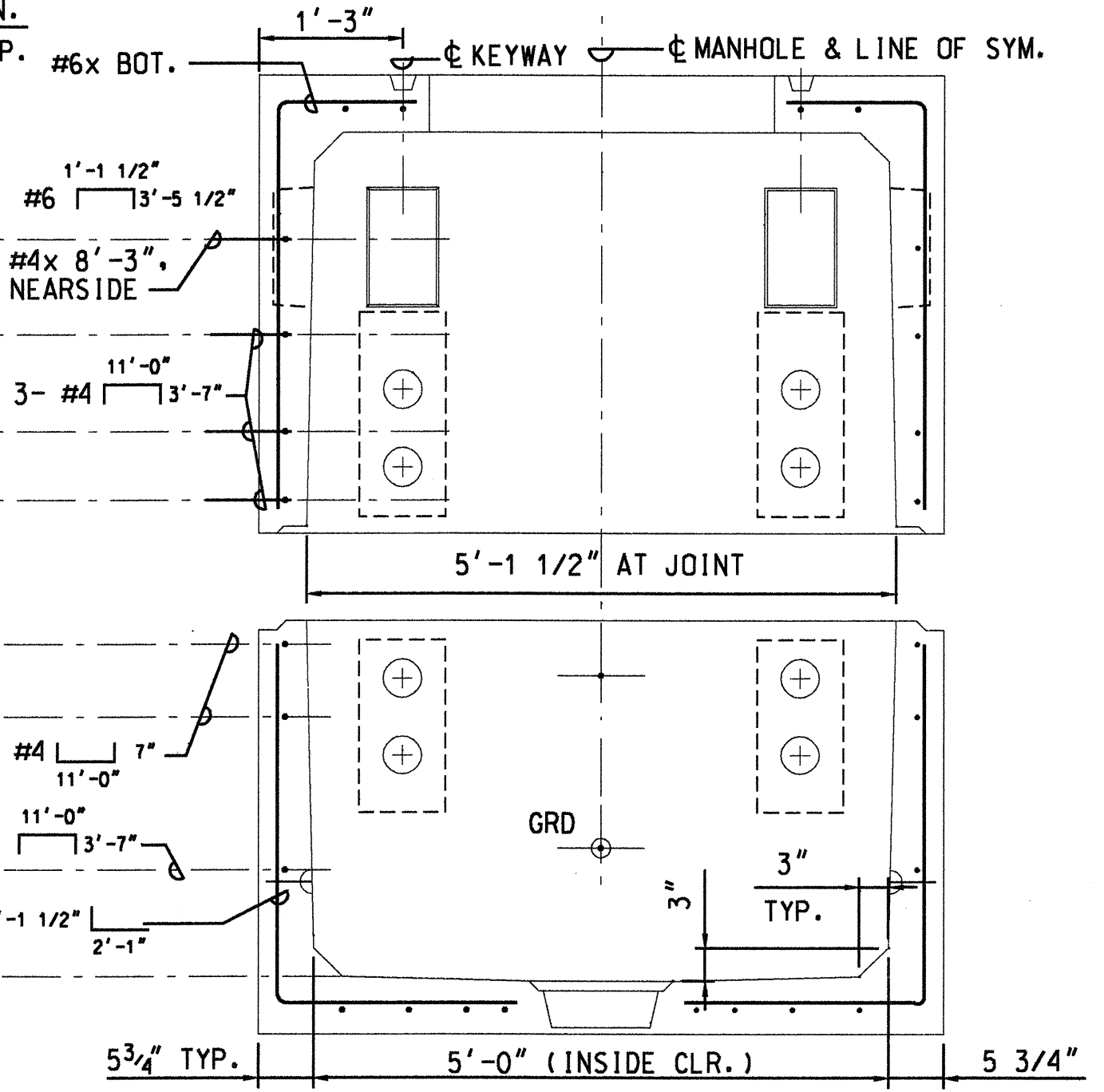
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DE-0200(803)	2000	38	79



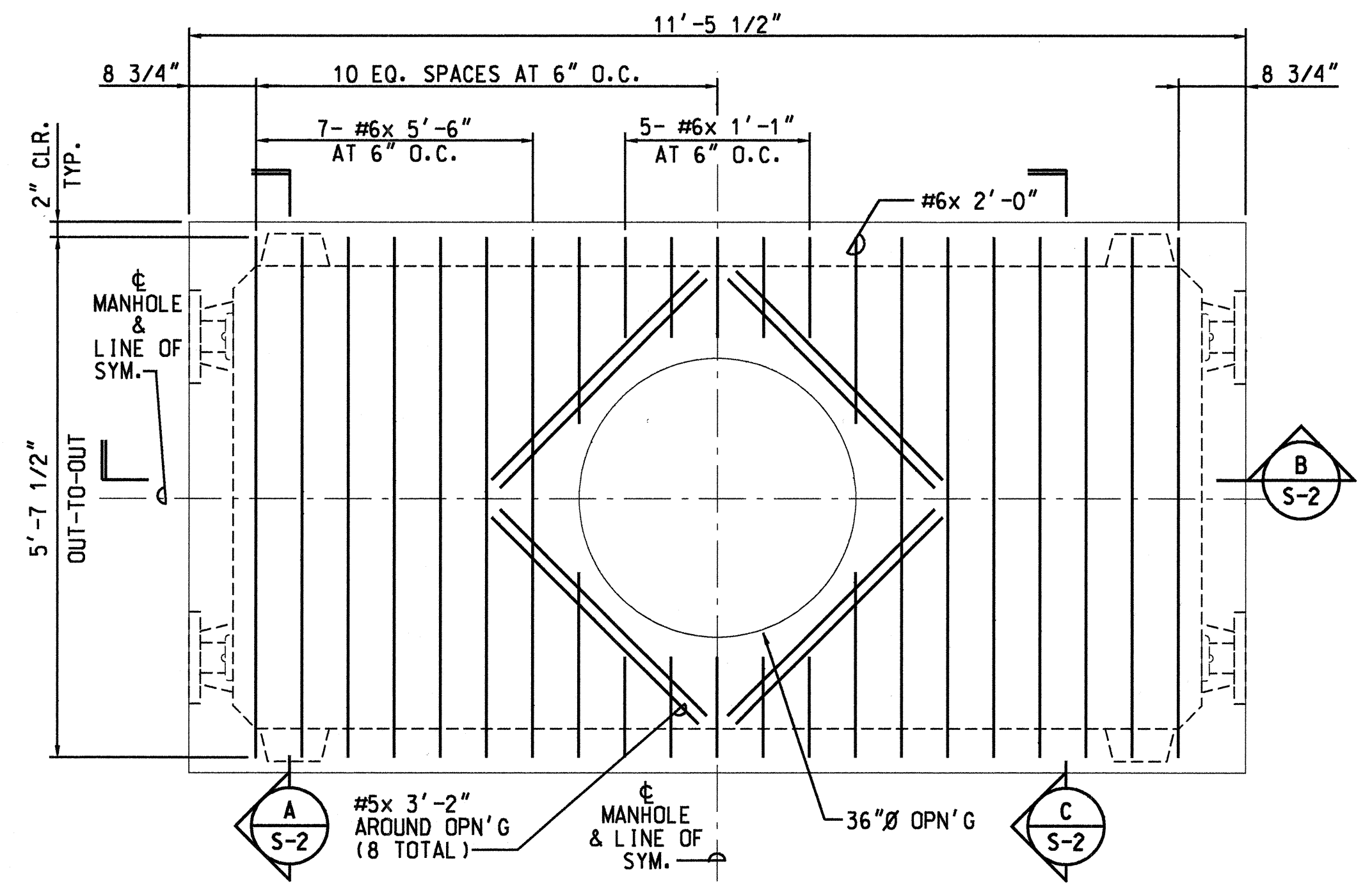
1 TOP SECTION - ROOF SLAB TOP REINFORCING PLAN
SCALE: 3/4" = 1'-0"



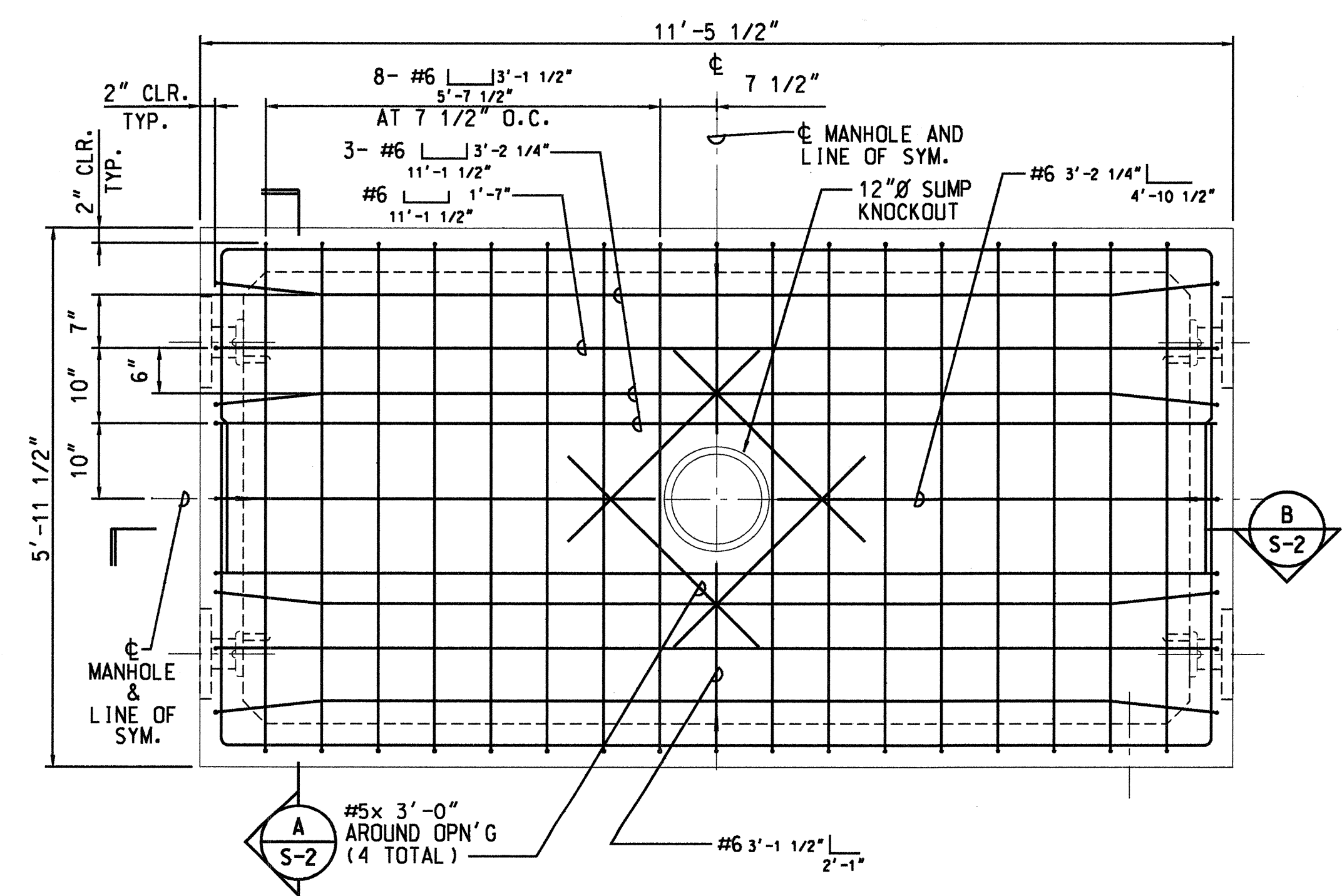
B LONGITUDINAL SECTION
SCALE: 3/4" = 1'-0"



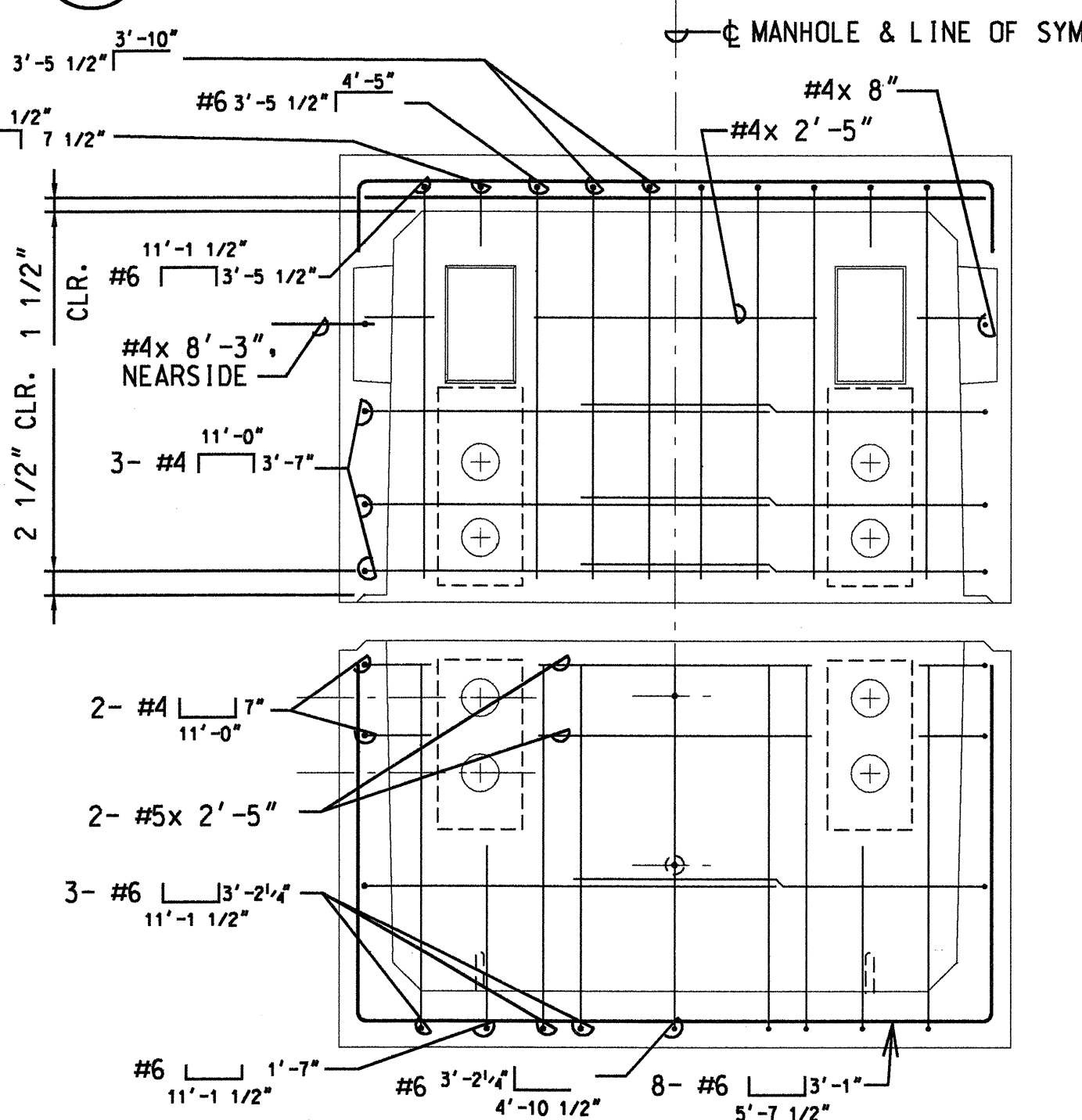
C TYPICAL TRANSVERSE SECTION
SCALE: 3/4" = 1'-0"



2 TOP SECTION - ROOF SLAB BOTTOM REINFORCING PLAN
SCALE: 3/4" = 1'-0"



3 BASE SECTION - REFLECTED FLOOR SLAB REINFORCING PLAN
SCALE: 3/4" = 1'-0"



C END WALL REINFORCING ELEVATION
SCALE: 3/4" = 1'-0"

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

APPROVED:
Calvin Choy
GTE HAWAIIAN TELEPHONE CO. DATE 5/16/00

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
5'x10' GTE PRE-CAST MANHOLE DETAILS
KAMEHAMEHA HIGHWAY
Intersection Improvements at
Leilehua Golf Course Road
Fed. Aid Project No. DE-0200(803)
Scale: As Shown Date: May 10, 2000
SHEET No. 13 OF 15 SHEETS

