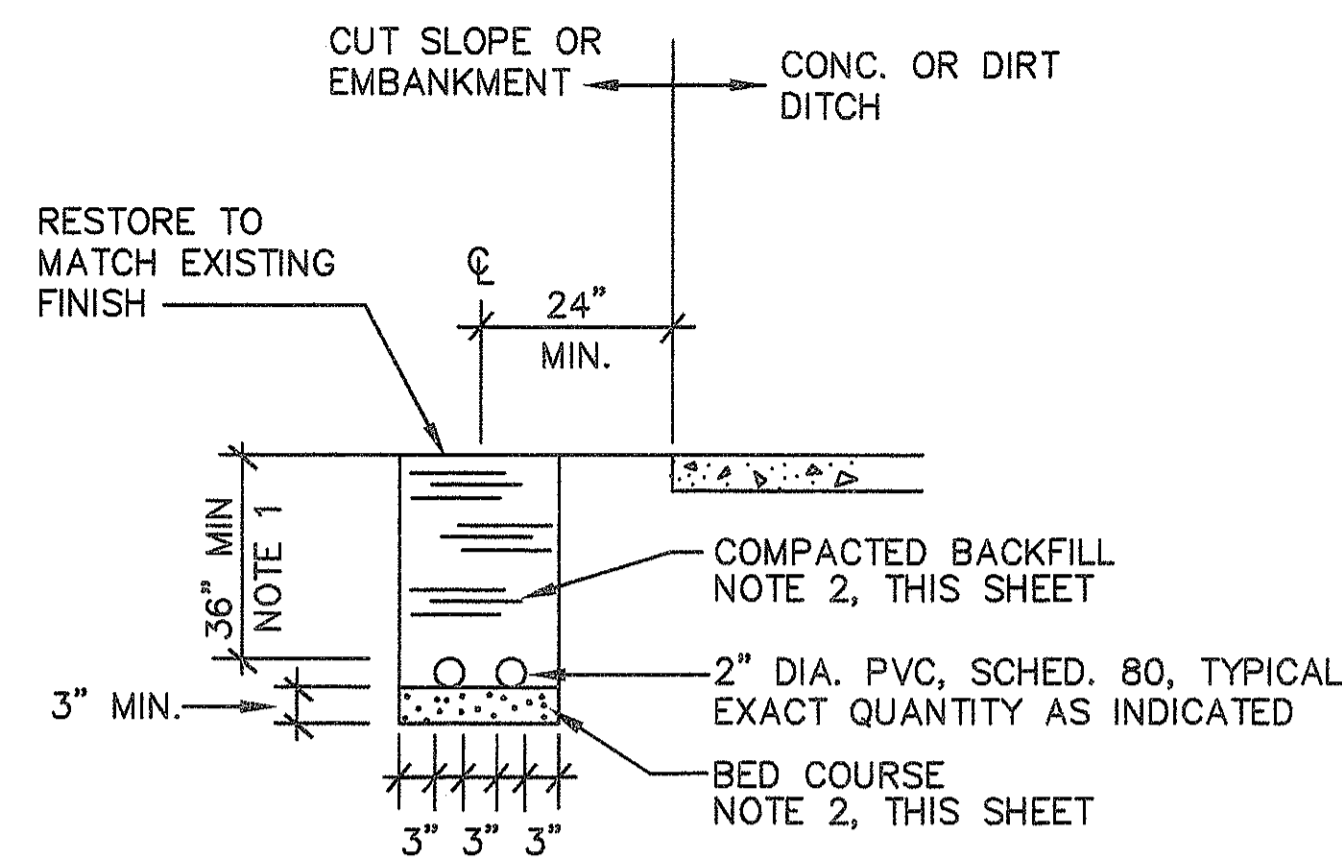
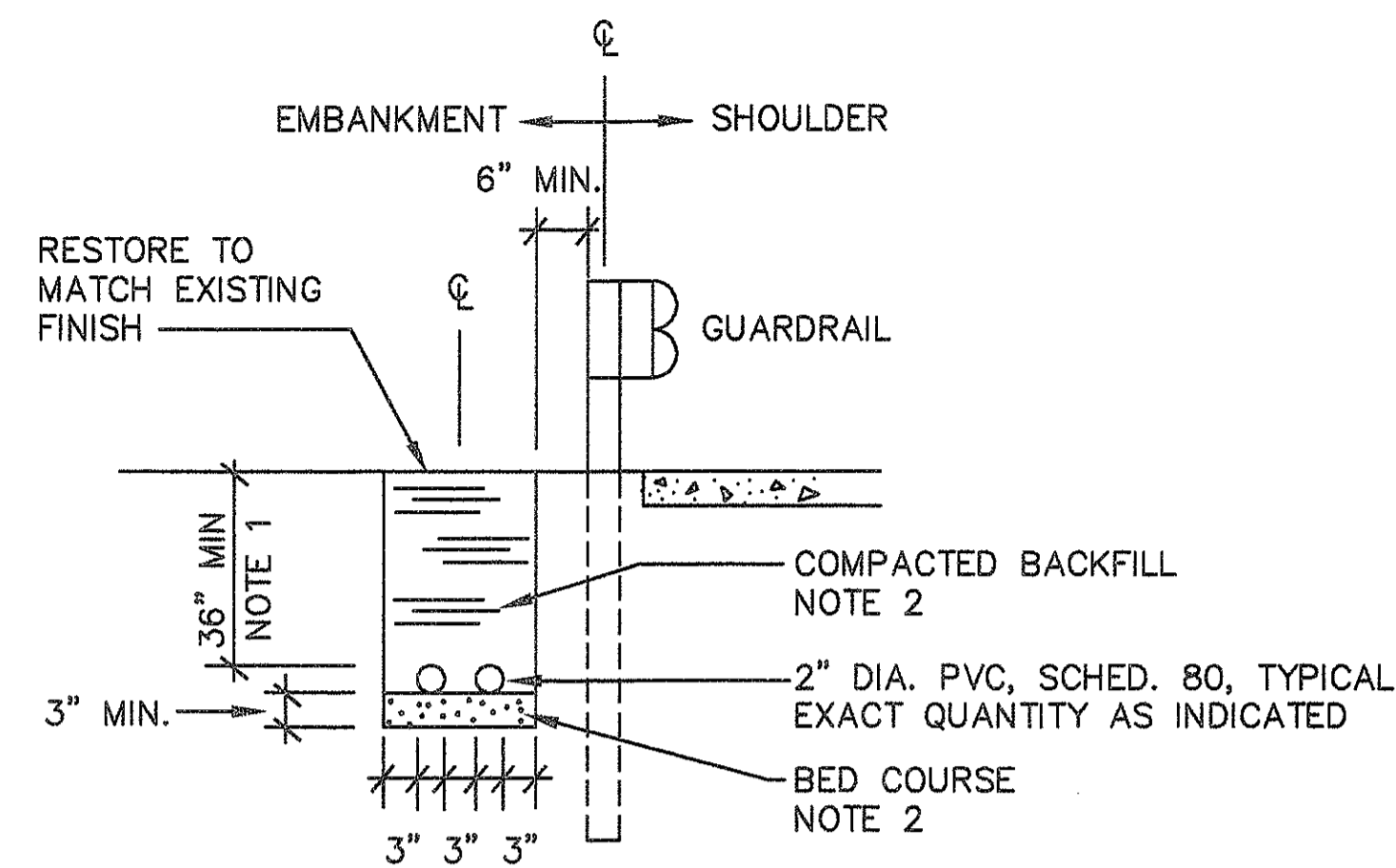


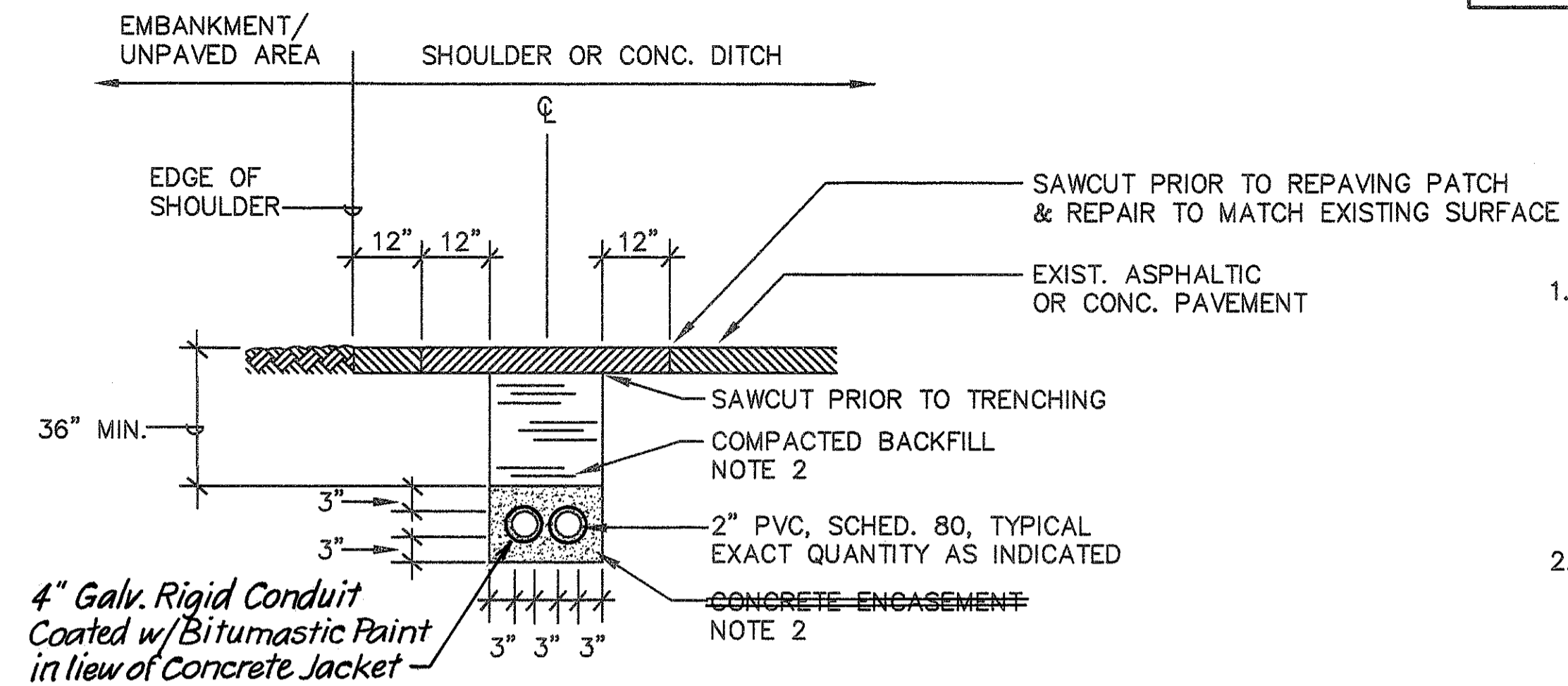
FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	IR-H1-1 (213)	1994	32	38



AA TYPICAL DUCT SECTION  
E-30 NOT TO SCALE



BB TYPICAL DUCT SECTION  
E-30 NOT TO SCALE



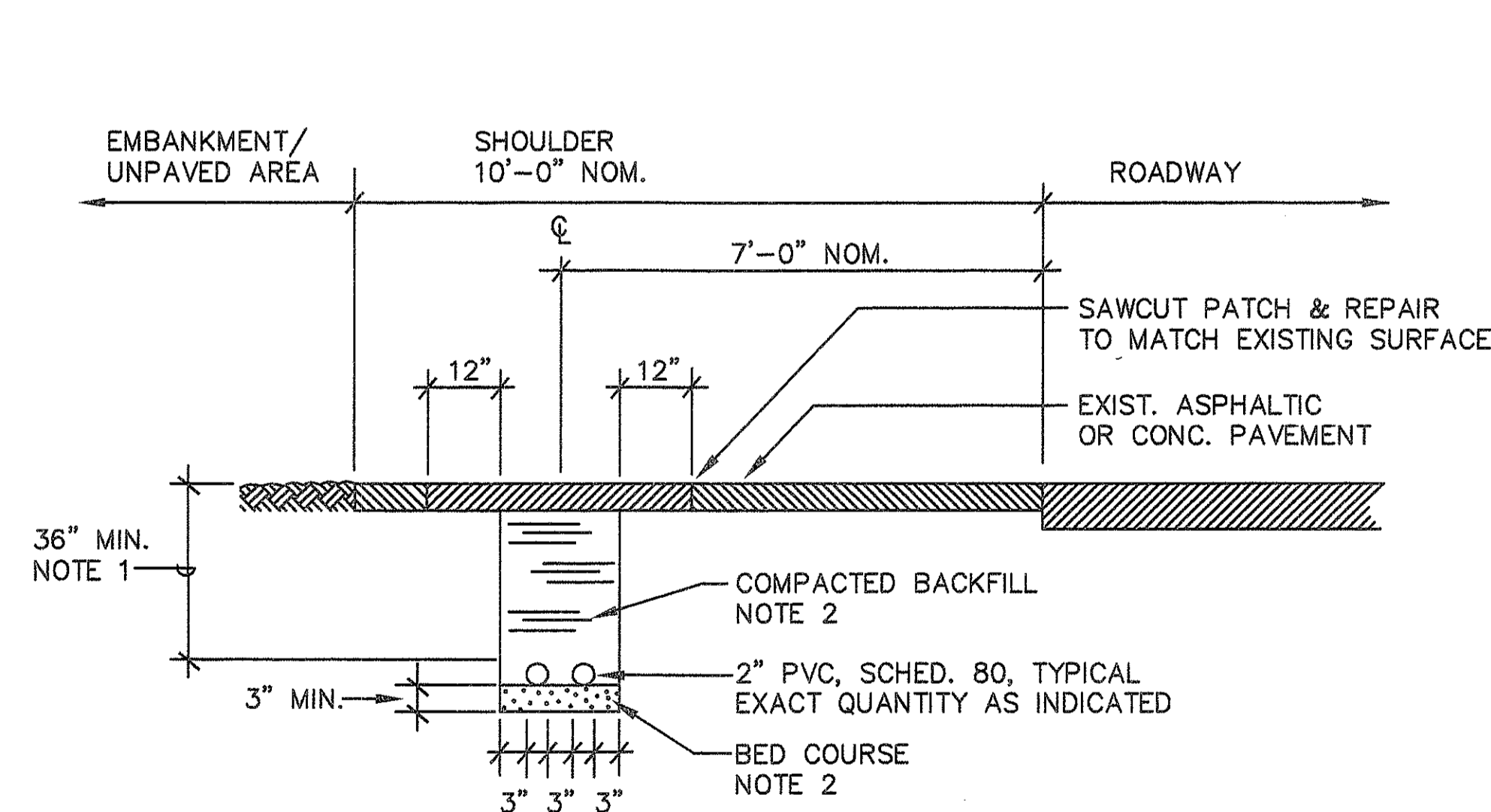
CC TYPICAL DUCT SECTION  
E-30 NOT TO SCALE

# NOTES:

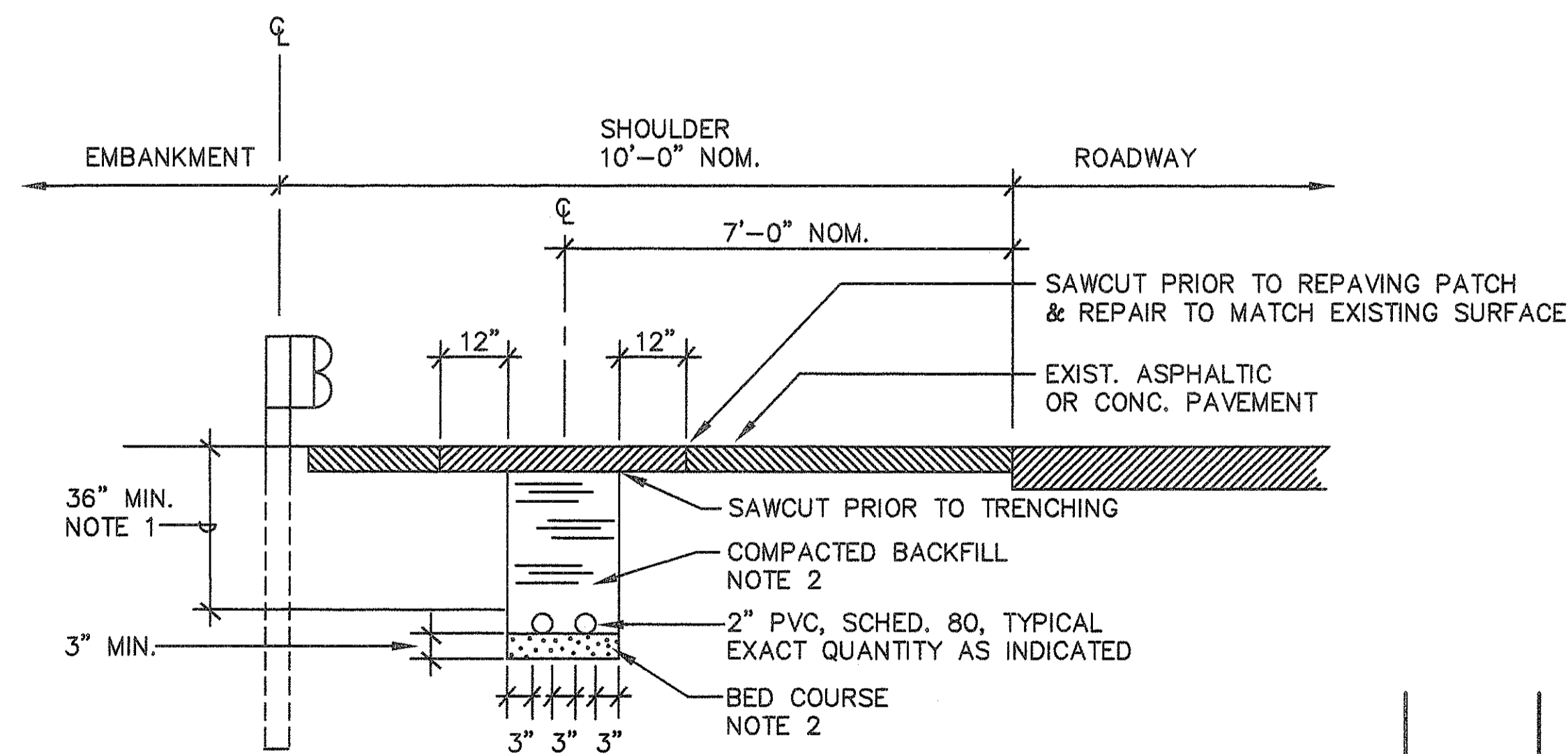
- IF EXISTING CONDITIONS DO NOT ALLOW A BURIAL DEPTH OF 36" (TO TOP OF CONDUIT) FOR "DIRECT BURIED" CONDUITS, PROVIDE CONCRETE ENCASEMENT SIMILAR TO DETAIL
- COMPACTED BACKFILL AND BED COURSE MATERIAL SHALL BE AS INDICATED ON DET.

B  
E-31

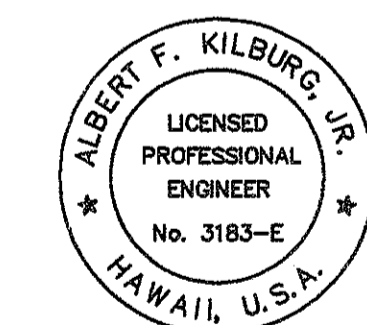
A  
E-31



DD TYPICAL DUCT SECTION  
E-30 NOT TO SCALE



EE TYPICAL DUCT SECTION  
E-30 NOT TO SCALE



Albert F. Kilburg, Jr.  
THIS WORK WAS PREPARED BY  
ME OR UNDER MY SUPERVISION

E-30

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

## DUCT DETAILS

INTERSTATE ROUTE H-1  
PALAILAI I.C. TO KUNIA I.C.  
PROJECT No. IR-H1-1(213)

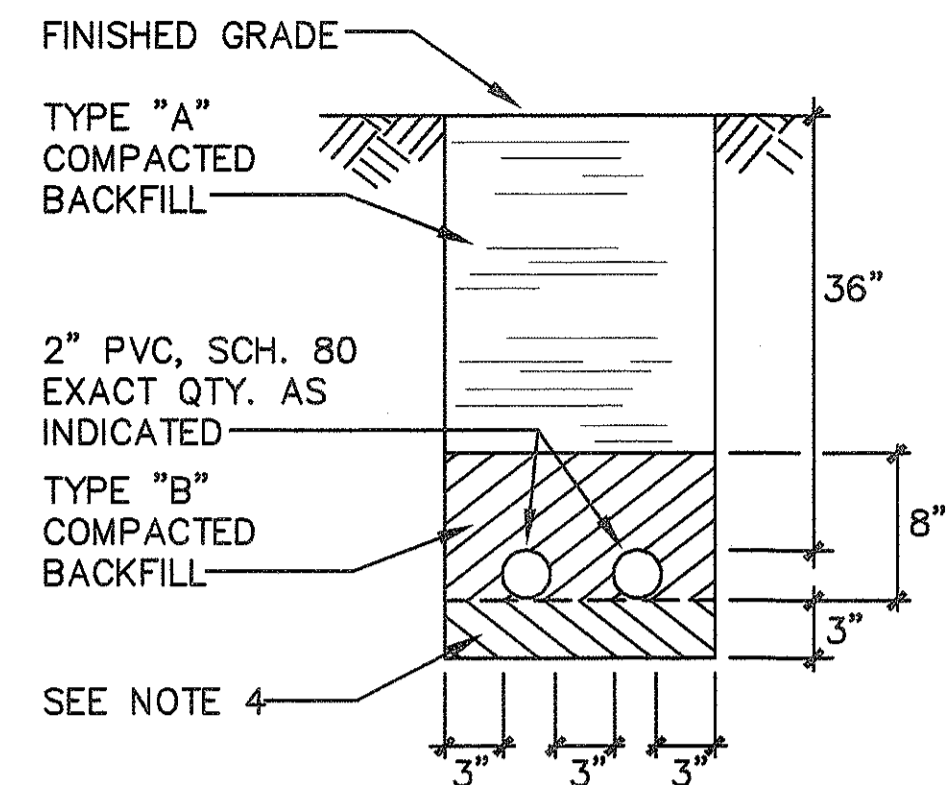
SCALE: AS NOTED

SHEET No. 17 OF 18 SHEETS

DVM JOB No.: 89104.01  
CAD FILE No.: E-30/3

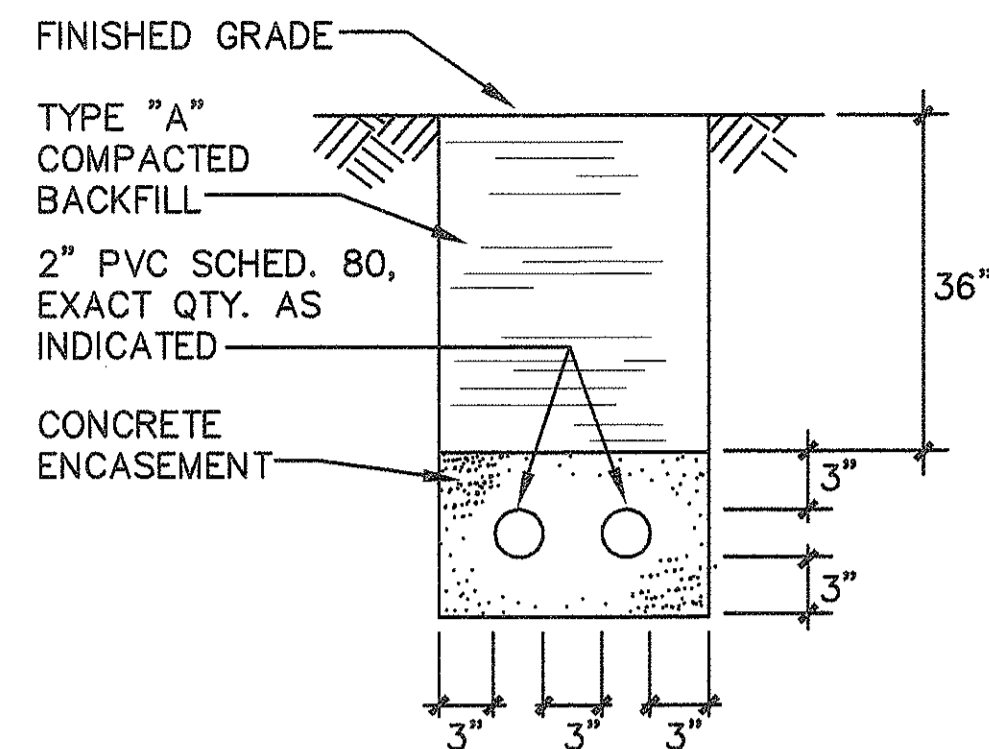
DATE REVISION

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	IR-H1-1 (213)	1994	33	38



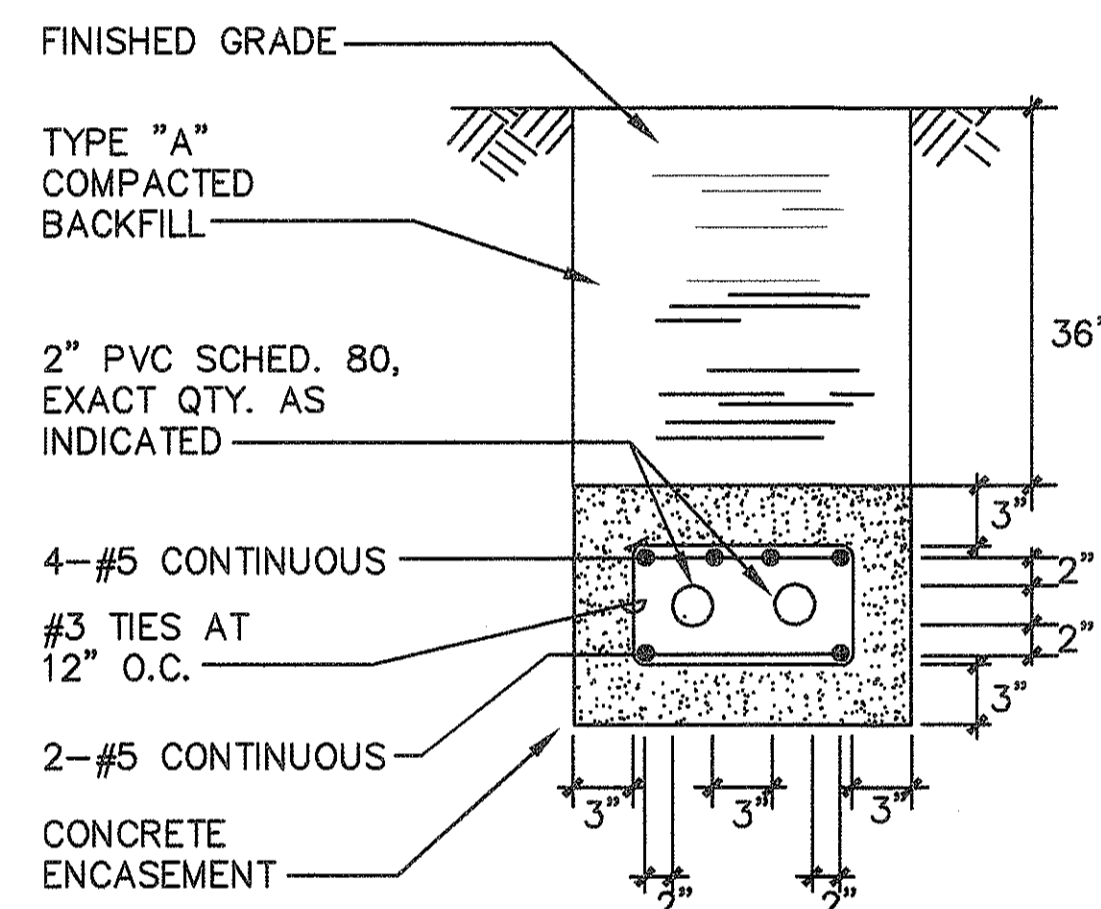
**TYPICAL STREET LIGHT DUCT SECTION (DIRECT BURIED)**

A  
E-31  
NOT TO SCALE



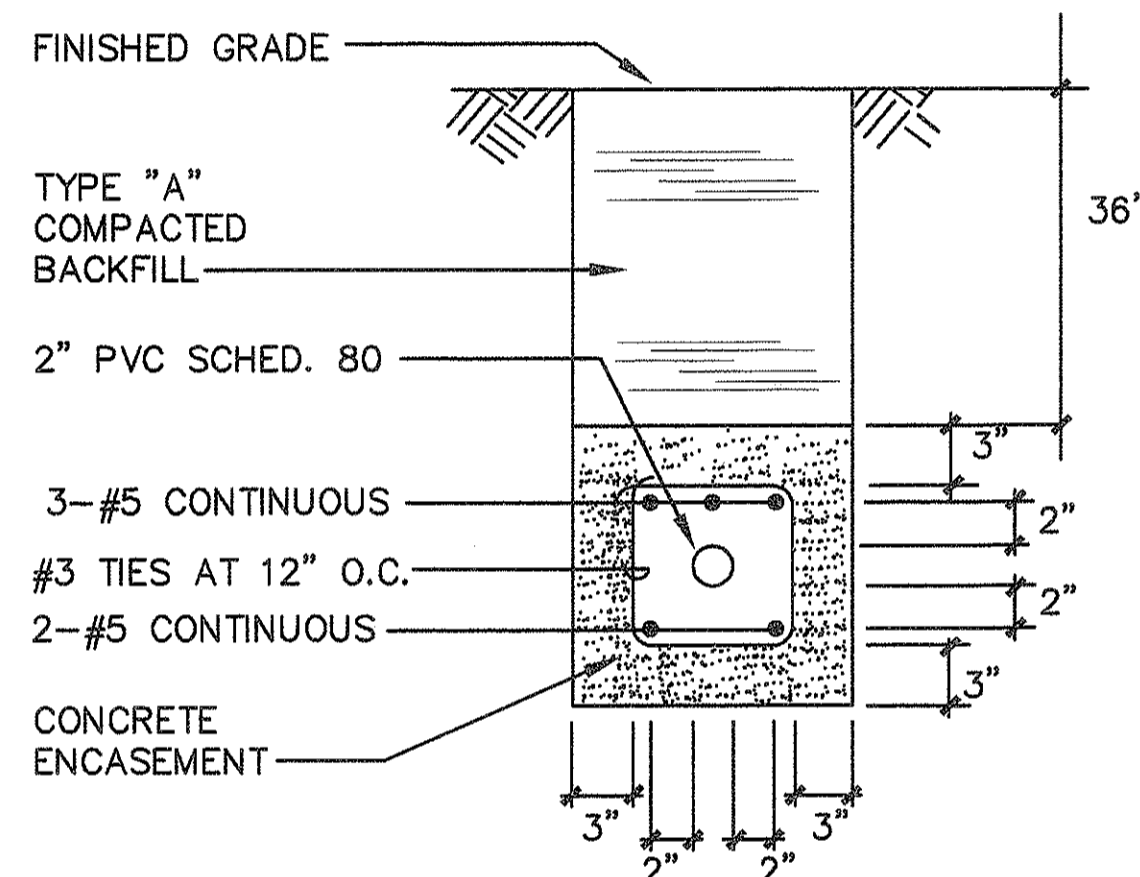
**TYPICAL STREET LIGHT DUCT SECTION (CONCRETE ENCASED)**

B  
E-31  
NOT TO SCALE



**TYPICAL STREET LIGHT DUCT SECTION (REINFORCED CONC. ENCASED)**

C  
E-31  
NOT TO SCALE



**TYPICAL STREET LIGHT DUCT SECTION (REINFORCED CONC. ENCASED)**

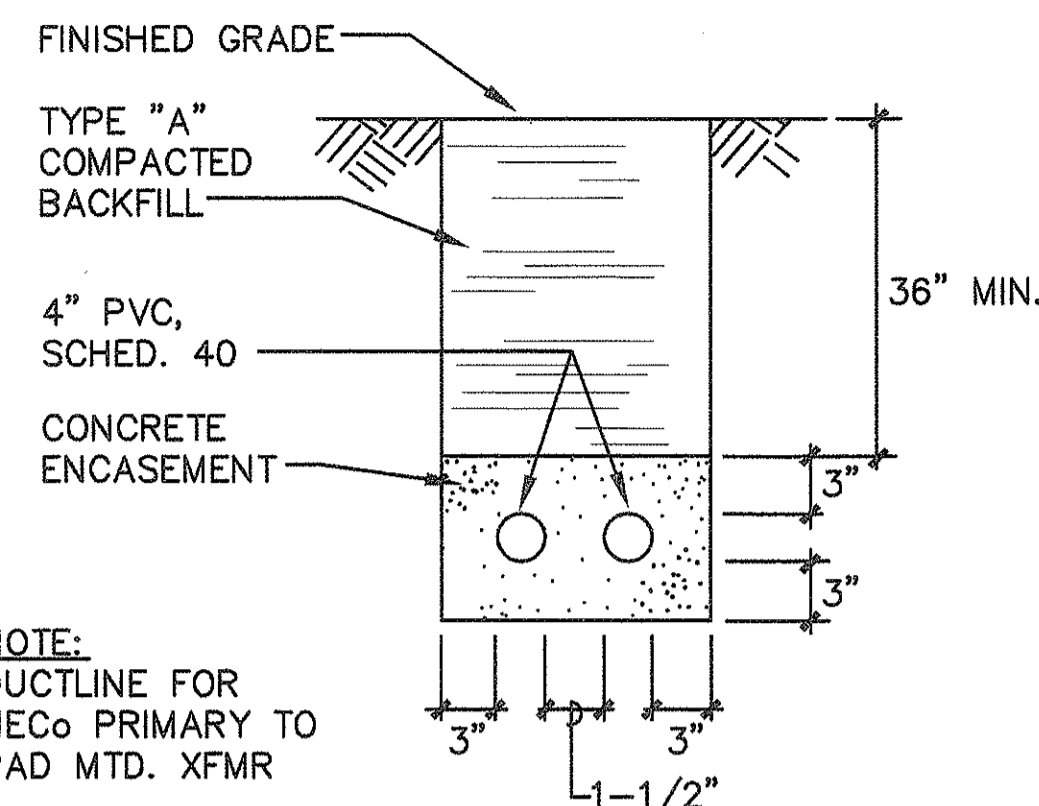
M  
E-31  
NOT TO SCALE

### NOTES:

- ALL CONDUIT SHALL BE "PVC" SCHED. 80 FOR DIRECT BURIED OR CONCRETE ENCASEMENT, U.O.N.
- BACKFILL OVER CONCRETE DUCT SECTIONS SHALL BE TYPE "A"
- BACKFILL OVER DIRECT BURIED CONDUITS SHALL BE TYPE "B"
- IF THE NORMAL MATERIAL IN THE BOTTOM OF A TRENCH CONTAINING A DIRECT BURIAL CONDUIT IS NOT TYPE "B" AN ADDITIONAL 3" SHALL BE EXCAVATED AND TYPE "B" BACKFILL PROVIDED.
- MINIMUM COVER OVER CONCRETE DUCT SECTION SHALL BE 21"
- THE CONTRACTOR IS HEREBY ADVISED TO EXPECT THAT ALL EXCAVATION FOR ELECTRICAL DUCTS, HANDHOLES AND MANHOLES IS LIKELY TO ENCOUNTER SOLID ROCK REQUIRING DRILLING AND BLASTING.
- CONCRETE FOR DUCTS TO BE 2500 P.S.I. IN 28 DAYS.

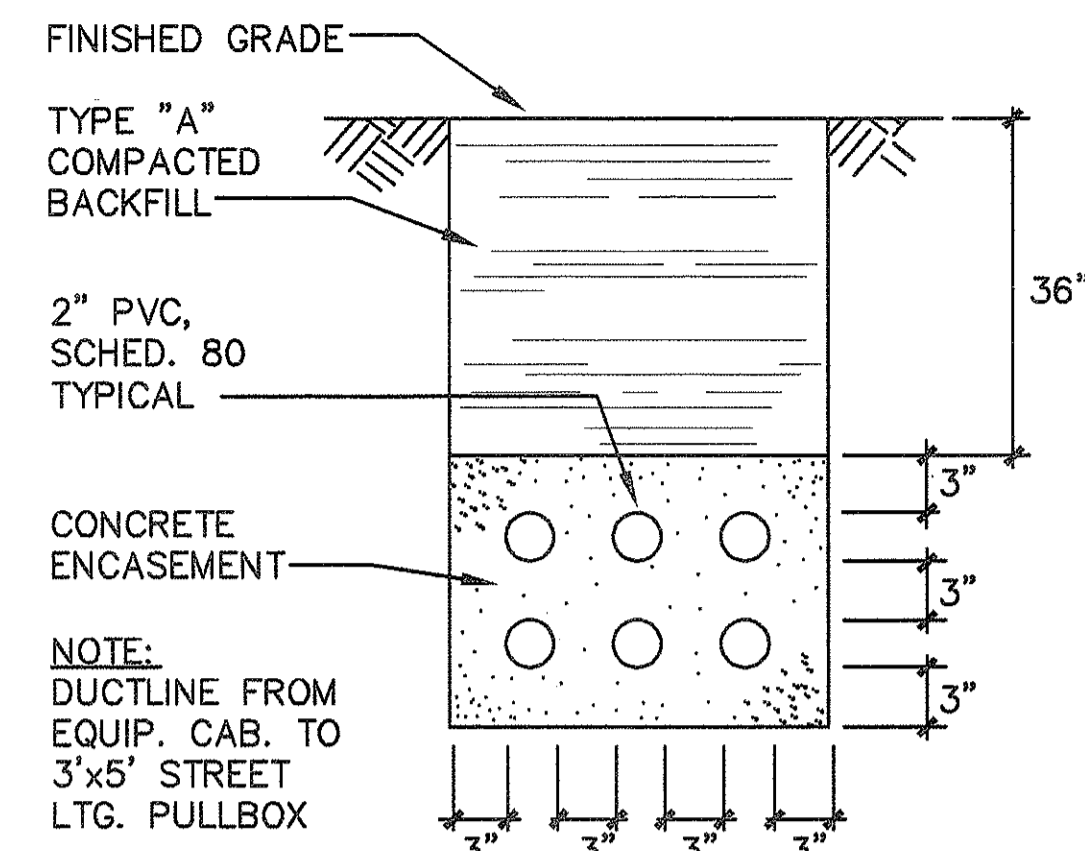
### BACKFILL TYPES ARE:

- TYPE "A". BEACH SAND, EARTH, OR EARTH AND GRAVEL. IF EARTH AND GRAVEL USED, THE MAXIMUM ROCK SIZE SHALL BE 1" AND THE MIXTURE SHALL CONTAIN NOT MORE THAN 50% BY VOLUME OF ROCK PARTICLES.
- TYPE "B". BEACH SAND, EARTH, OR EARTH AND GRAVEL. IF EARTH AND GRAVEL USED, MIXTURE MUST PASS A 1/2" MESH SCREEN AND CONTAIN NOT MORE THAN 20% BY VOLUME OF ROCK PARTICLES.



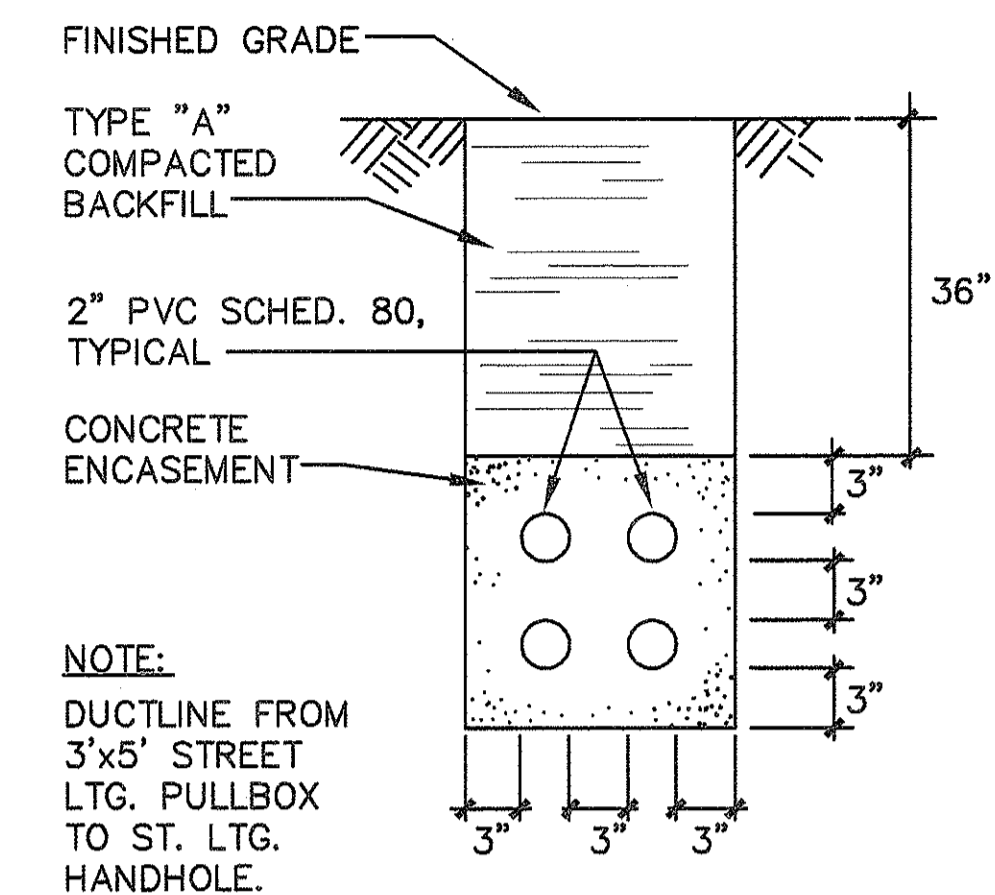
**DUCT SECTION**

D  
E-16  
NOT TO SCALE  
E-31



**DUCT SECTION**

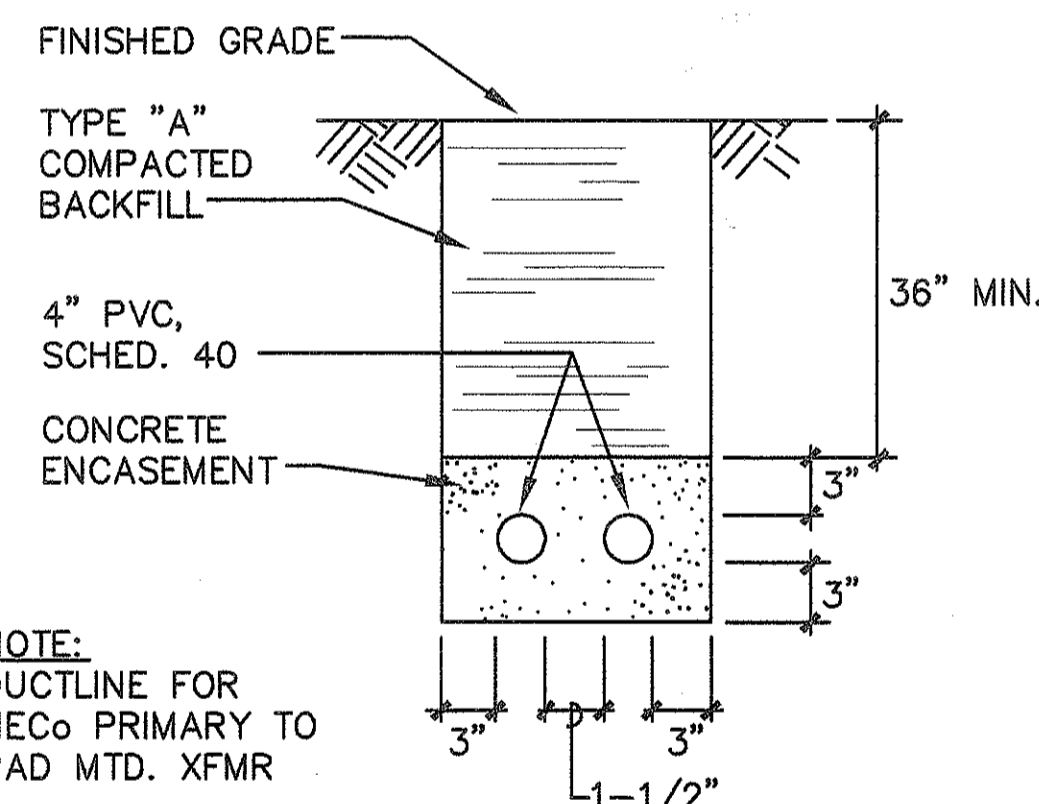
E  
E-16  
NOT TO SCALE  
E-31



**DUCT SECTION**

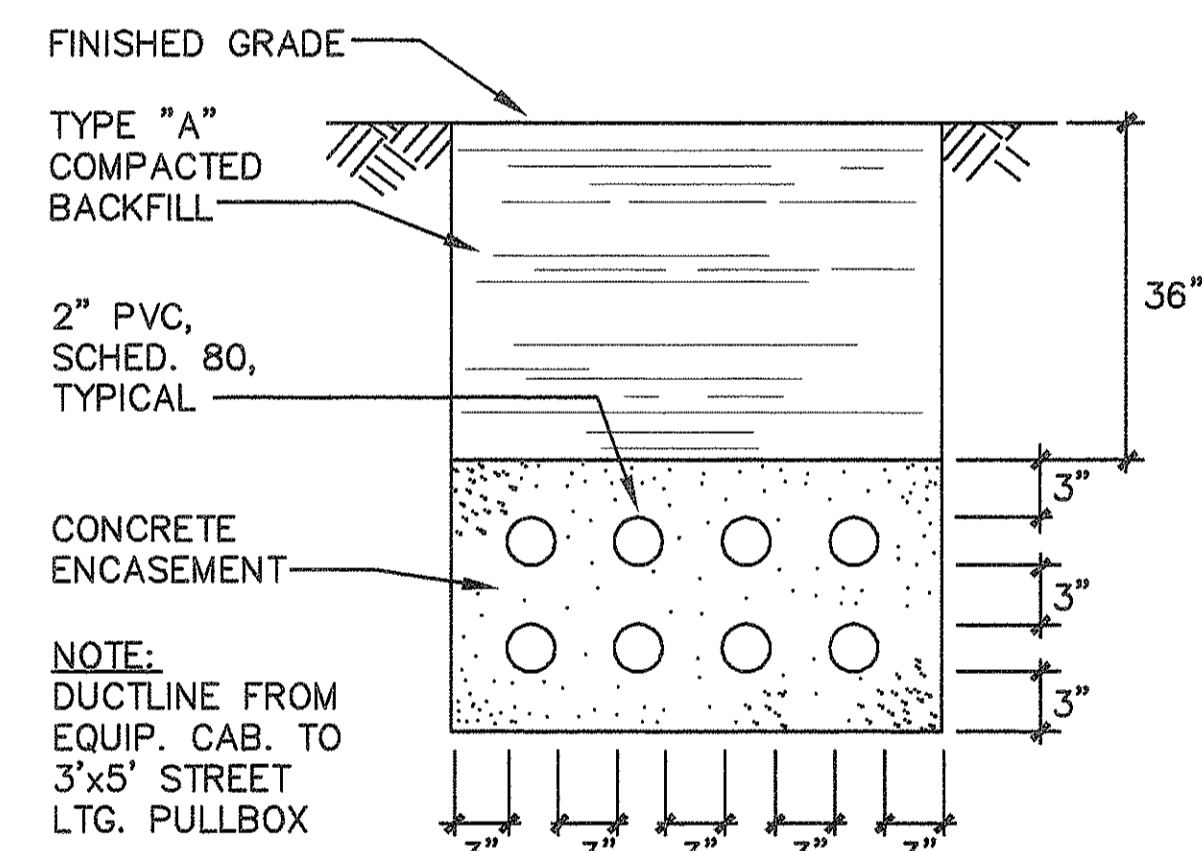
F  
E-16  
NOT TO SCALE  
E-31

G  
E-31  
DIST. CENTER "B"  
NOT TO SCALE



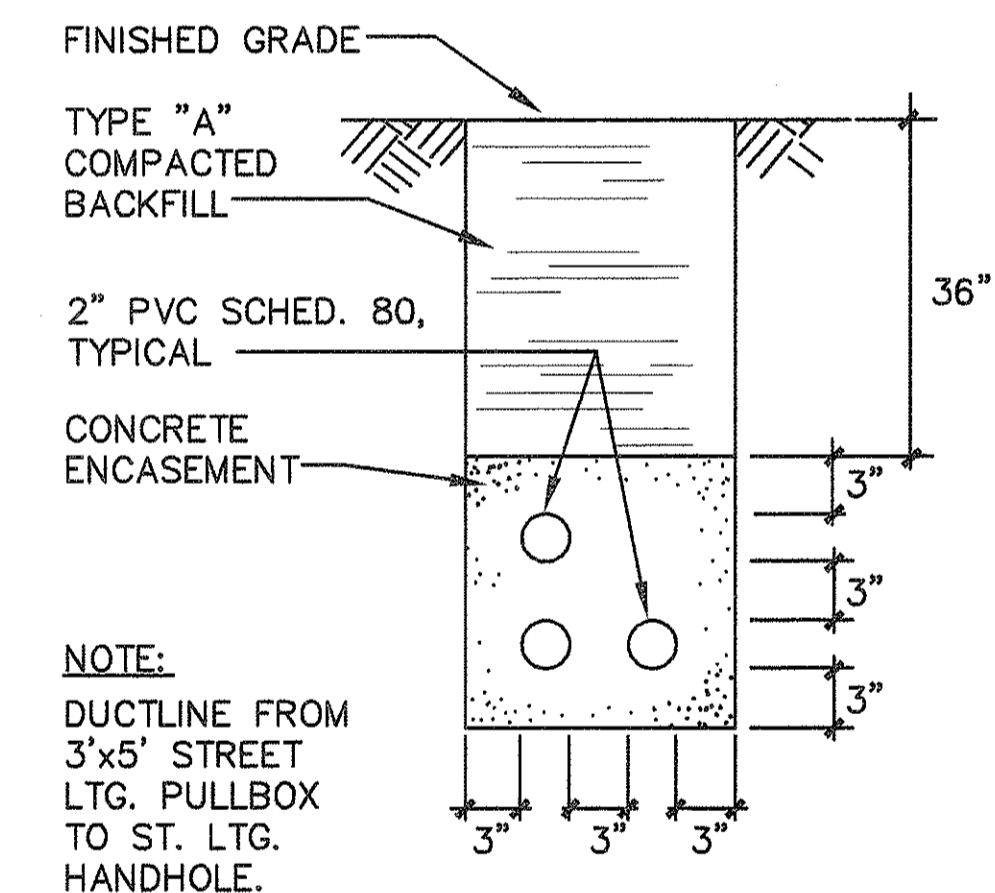
**DUCT SECTION**

H  
E-18  
NOT TO SCALE  
E-31



**DUCT SECTION**

J  
E-18  
NOT TO SCALE  
E-31

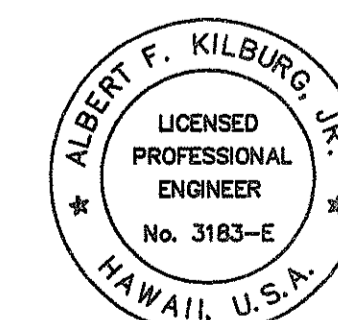


**DUCT SECTION**

K  
E-18  
NOT TO SCALE  
E-31

L  
E-31  
DIST. CENTER "C"  
NOT TO SCALE

**DRAWING REVIEW:**  
Reviewed for HECO's Facilities Only  
Date: 2/11/94 By: [Signature]  
Distribution 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 Customer's behalf from the responsibility for engineering, design, materials and any liability associated with this project.



Albert F. Kilburg, Jr.  
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

DVM JOB No.: 89104.01  
CAD FILE No.: E-31/3

DATE REVISION

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

### DUCT DETAILS

INTERSTATE ROUTE H-1  
PALALAI I.C. TO KUNIA I.C.  
PROJECT No. IR-H1-1(213)

SCALE: AS NOTED

SHEET No. 18 OF 18 SHEETS

E-31