



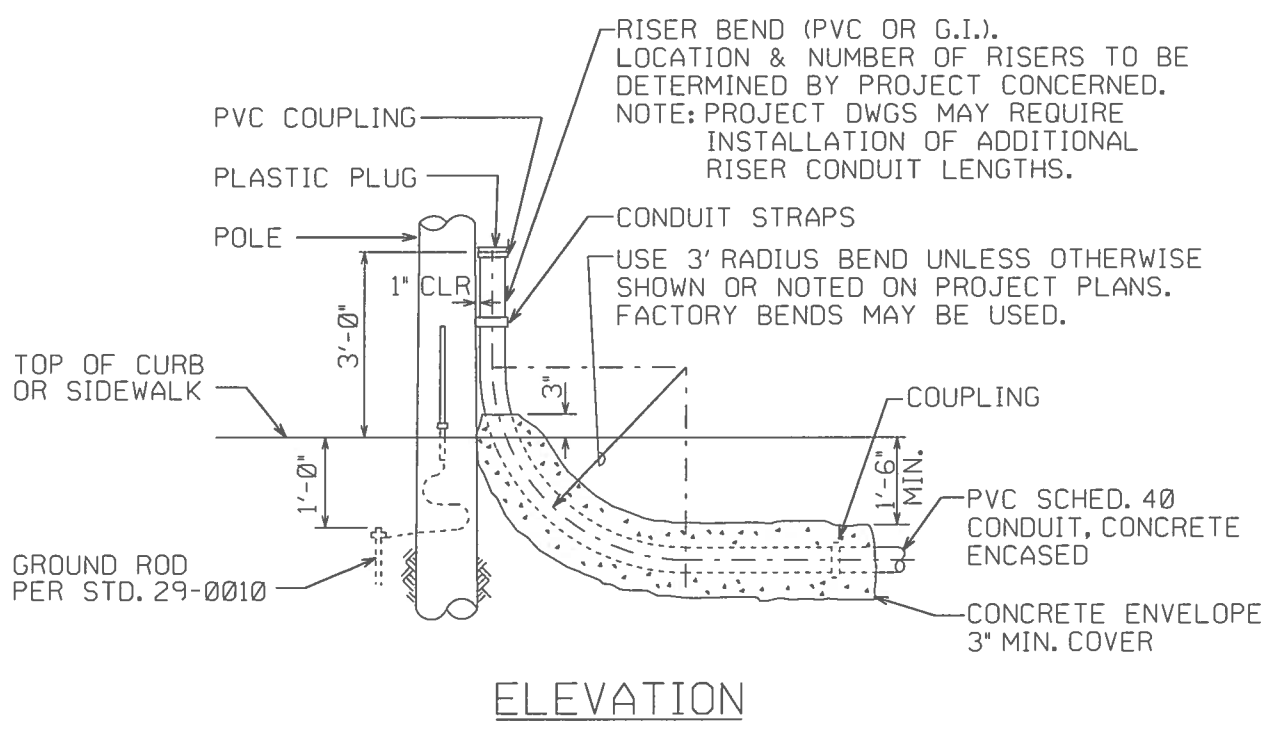
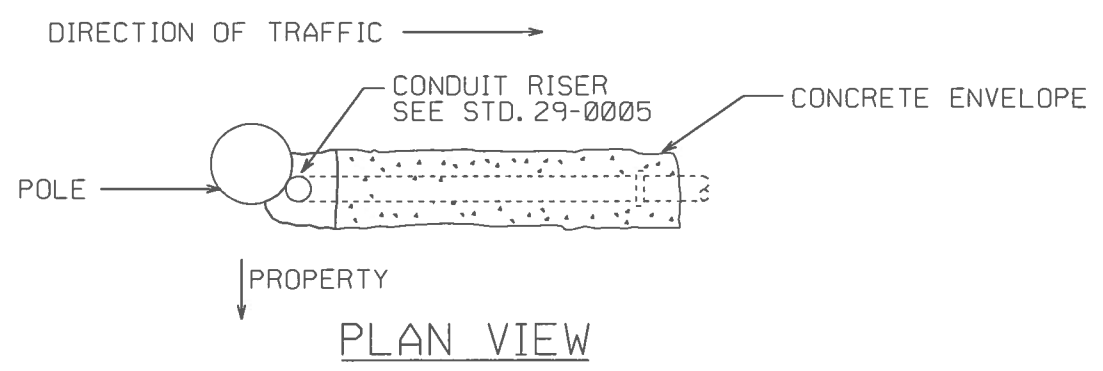
**Hawaiian
Electric**

The information found in this document are general guidelines that may be used to aid in the preparation of your service request proposal. Please be advised that depending on the specific needs and actual conditions of your project, Hawaiian Electric may require your design to comply with different specifications including specifications that include more stringent requirements than those included in these design specification guidelines. For further guidance and clarification on the actual specifications that will apply to your particular project, please refer to instructions issued by Hawaiian Electric's Planner or Engineer who is assigned to your particular (Project/Review Request/...). Additionally, please be advised that Hawaiian Electric reserves the right to require additional modifications to any approved design if it is determined during actual construction that additional modifications must be made to address certain field conditions that were not detected or Hawaiian Electric was unaware of during the design review process.



SCOPE:

THIS STANDARD PROVIDES DETAILS FOR CONSTRUCTION OF UNDERGROUND DUCTLINES UNDER SPECIAL CONDITIONS/CIRCUMSTANCES. REFER TO STD. 30-1035 FOR DETAILS FOR CONSTRUCTION OF UNDERGROUND DUCTLINES UNDER ROUTINE/TYPICAL CONDITIONS. REFER TO HECO ENGINEERING FOR CONDITIONS NOT COVERED ON THIS OR STD. 30-1035.

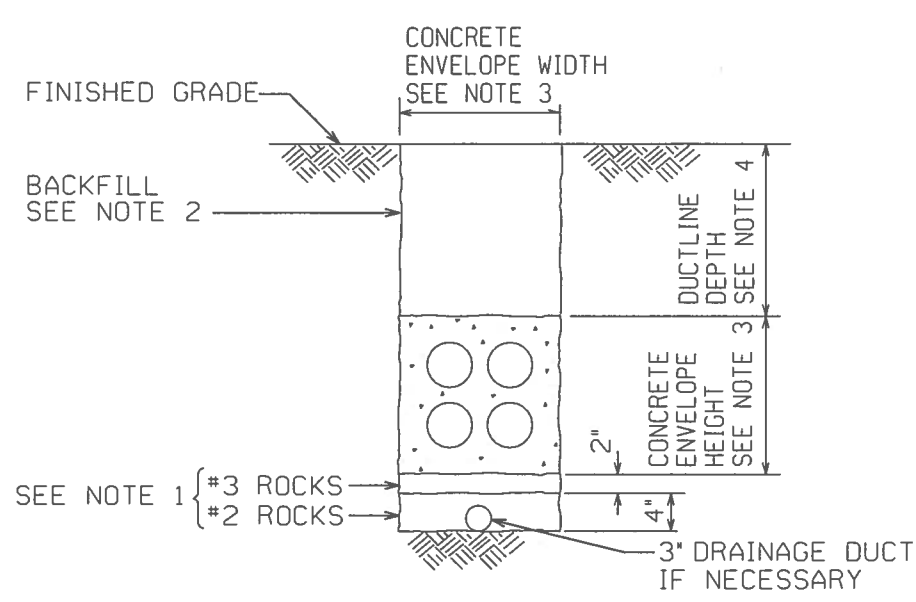


REFER TO STDS. 29-0005 AND 29-0010 FOR ADDITIONAL DETAILS
TYPICAL RISER DETAIL (POLE RISER SHOWN)
 NOT TO SCALE

REVISION	DATE	INITIAL	6-5-74	RM	TN
	10-24-86	RM	9/94	RM	FK
	10/31/99	CT	DH	FK	CT
	06-01	CT			

DRAWN	CT	DESIGNED	APPD	ST	JAR	TN	VEC	REDRAWN	10/31/99
SUPERSEDES		18585 & 20191		PLASTIC DUCTS				ORIGINAL	6/13/72
ENGINEERING STANDARD		SPECIAL INSTALLATION DETAILS				30-1030		REV	5
HAWAIIAN ELECTRIC CO. INC.						UNDERGROUND DETAILS		SHEET 1 OF 5	

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**CONCRETE ENCASED DUCTS
EXCAVATION & BACKFILL DETAILS
AREAS REQUIRING DRAINAGE**
NOT TO SCALE

NOTES:

1. IF DRAINAGE IS NECESSARY, INSTALL 6" ROCKFILL AS SHOWN. IN EXTREMELY WATERY AREAS, INSTALL 3" DRAINAGE DUCT.
2. REFER TO HECO SPECIFICATION CS7001, LATEST REVISION (OR EQUIVALENT) FOR BACKFILL MATERIAL REQUIREMENTS.
3. SIZE OF CONCRETE ENVELOPE (HEIGHT AND WIDTH) TO BE DETERMINED BY SPECIFIC PROJECT REQUIREMENTS. SEE PROJECT DRAWINGS AND SPECIFICATIONS.
4. DEPTH FROM FINISHED GRADE TO TOP OF CONCRETE ENVELOPE TO BE 1'-6" MINIMUM UNLESS OTHERWISE NOTED ON PROJECT DRAWINGS.
5. REFER TO STDS. 30-1005 AND 30-1035 FOR ADDITIONAL INFORMATION.

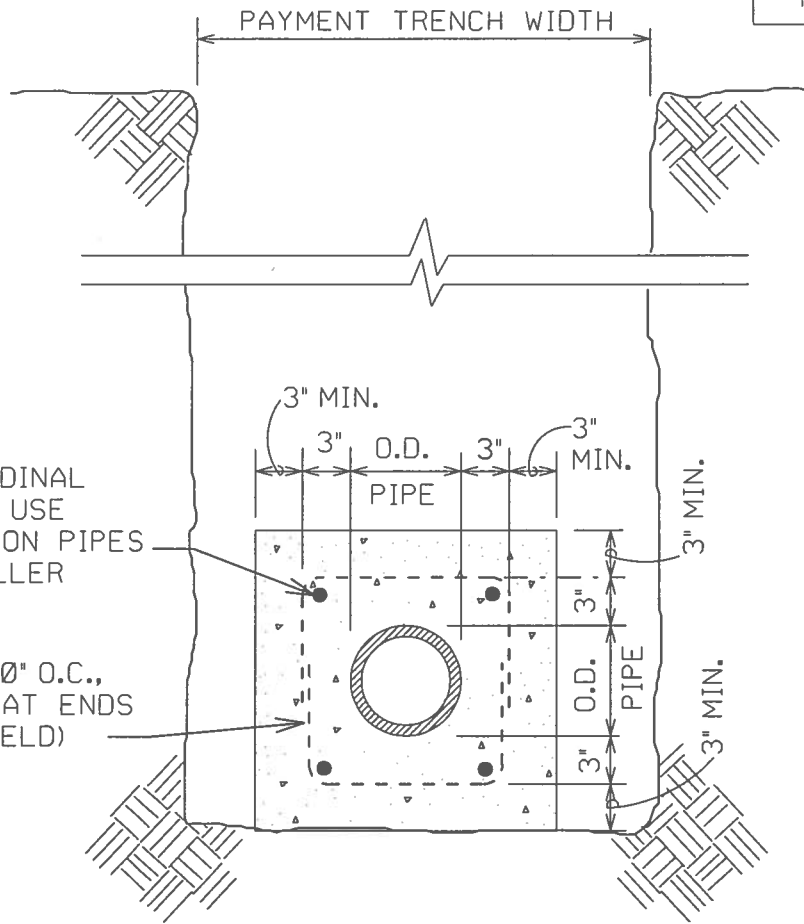
REVISION	DATE INITIAL	9/94 RM FK	8/96 WJA PAC FK CT	10/31/99 DH FK	06-01 SK
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DRAWN TH II	DESIGNED	APPD	TN	VEC	REDRAWN	MARCH 1998	
SUPERSEDES 18585 & 20191					ORIGINAL	6/13/72	
ENGINEERING STANDARD HAWAIIAN ELECTRIC CO. INC.					PLASTIC DUCTS SPECIAL INSTALLATION DETAILS UNDERGROUND DETAILS	30-1030	REV 3
					SHEET	2 OF 5	

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#4 LONGITUDINAL
AT 12" O.C.. USE
ONLY 4-#4 ON PIPES
8" AND SMALLER

#3 HOOPS, 10" O.C.,
LAPPED 15" AT ENDS
(OR BUTT-WELD)



**DETAIL OF CONCRETE JACKET
FOR PIPES 12" & SMALLER**

NOT TO SCALE

NOTES:

1. SEWER LINES WHICH CROSS OVER OR UNDER OTHER CONDUITS AND UTILITIES MAY REQUIRE PROTECTION FROM EXTRA LOADING.
2. WHEN THE SEWER CROSSES A CONDUIT AND THE CLEARANCE IS LESS THAN 12 INCHES, THE SEWER LINE SHOULD BE JACKETED WITH REINFORCED CONCRETE FOR A DISTANCE OF 5 FEET (INSIDE DIAMETER PLUS 5 FEET IF THE CONDUIT IS OVER 24 INCHES INSIDE DIAMETER).
3. WHERE THE CLEARANCE IS GREATER THAN 12 INCHES BUT LESS THAN 24 INCHES, A PLAIN CONCRETE JACKET MAY BE USED.
4. REFERENCE THE ABOVE DETAIL FOR PIPES LESS THAN OR EQUAL TO 12 INCHES INSIDE DIAMETER. SEE HECO STRUCTURAL DIVISION FOR PIPE DIAMETERS LARGER THAN 12 INCHES.
5. FINAL DETERMINATION OF THE STRUCTURAL REQUIREMENTS WILL BE MADE BY THE CITY

DATE
INITIAL

REVISION

DRAWN TH II DESIGNED FK

APPD *JV arimoto*

REDRAWN

SUPERSEDES

ORIGINAL 06-01

ENGINEERING STANDARD
HAWAIIAN ELECTRIC CO. INC.

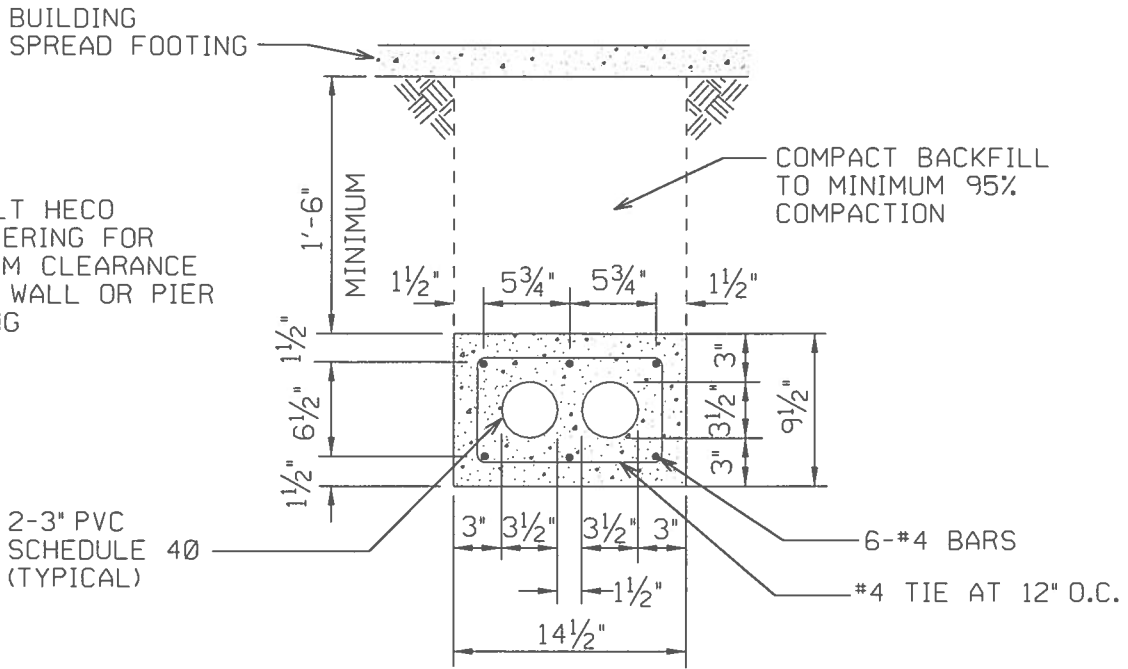
PLASTIC DUCTS
SPECIAL INSTALLATION DETAILS
UNDERGROUND DETAILS

30-1030

REV
0

SHEET 3 OF 5

NOTE:
CONSULT HECO
ENGINEERING FOR
MINIMUM CLEARANCE
UNDER WALL OR PIER
FOOTING



**CONCRETE ENCASED DUCTS
UNDER BUILDINGS**
NOT TO SCALE

2 1/2" GALV. RD.
WASHERS

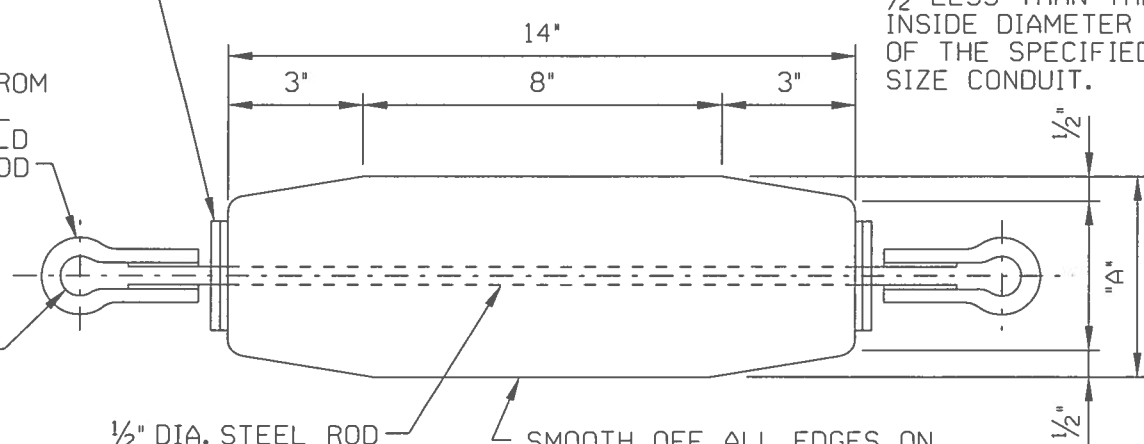
MAKE EYE FROM
3/8" DIA. STEEL
ROD AND WELD
TO 1/2" DIA. ROD

APPROX.
1" DIA.

1/2" DIA. STEEL ROD

SMOOTH OFF ALL EDGES ON
HARDWOOD MANDREL AND COAT WITH
VARNISH UNTIL SURFACE IS SMOOTH

DIMENSION "A" TO BE
1/2" LESS THAN THE
INSIDE DIAMETER
OF THE SPECIFIED
SIZE CONDUIT.



NOTE: OTHER MODELS OF MANDRELS MAY BE USED IF APPROVED BY
ENGINEERING.

MANDREL DETAIL
NOT TO SCALE

DATE
INITIAL

REVISION

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SUPERSEDES		PLASTIC DUCTS SPECIAL INSTALLATION DETAILS UNDERGROUND DETAILS	ORIGINAL 06-01
ENGINEERING STANDARD HAWAIIAN ELECTRIC CO. INC.			REV 0
			SHEET 4 OF 5

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References:

Standard:

- 29-0005 Riser Conduit Location at Base of Pole
- 29-0010 Grounding Requirements Wood Pole Construction
- 30-1005 Conduit Application Guide
- 30-1006 Duct Line Applications
- 30-1010 Typical Backfill Details
- 30-1015 Typical Duct Encasement Details
- 30-1020 Duct Roll Sections
- 30-1035 Plastic Ducts, Installation Details

Specifications:

- M7001 Plastic Conduits & Fittings Constructed With PVC Plastic
- CS 7202 General Conditions
- CS 7001 Construction of UG Facilities
- CS 7003 Construction of Electrical Facilities

DATE
INITIAL

REVISION

DRAWN TH I I	DESIGNED FK	APPD <i>JW Arimoto</i>	REDRAWN
SUPERSEDES		PLASTIC DUCTS SPECIAL INSTALLATION DETAILS UNDERGROUND DETAILS	ORIGINAL 06-01
ENGINEERING STANDARD HAWAIIAN ELECTRIC CO. INC.			REV 0
			SHEET 5 of 5