

C:\CIVIL 3D PROJECTS\2012_153.000_KEAAU-PAHOA RD IMPR RTE\130\FOUNDABOUT DESIGN\01 CIVIL DRAWINGS\02 ORCH AND MAKUU\077 EVC TCS NOTES.DWG 8/25/2020 11:16 AM SRODELAS

ENHANCED VEHICLE CLASSIFICATION (EVC) SYSTEM NOTES

1. The location of new loop sensors and piezo sensors shall be staked out in the field by the Contractor and approved by the Engineer prior to installation.
2. The Contractor shall inform the Engineer at least three days prior to saw-cutting pavement and installing loop sensors and piezo sensors.
3. Pull sensor cables and piezo sensor lead cables into conduit, where indicated. Cables shall be tested for acceptance before and after installation into conduit.
4. Piezo lead cables shall be continuous with no splices.
5. The Contractor shall restore all affected areas to their original condition. This item of work shall not be paid for separately, but shall be considered incidental to work of other paid items.
6. The Contractor shall verify the location of the existing utilities and underground structures whether or not it is shown on the plans.
7. The Contractor shall assume that existing underground utilities not shown on the plans may exist. The Contractor shall be responsible for contacting the different utility companies for information and toning.
8. The Contractor shall be held liable for any damages incurred to the existing utilities and underground structures as a result of his operations. All damaged portions shall be replaced in accordance with the standards and specifications of the affected utility company at no cost to the State.
9. Changes to the contract plans and specifications will not be permitted, unless approved by the Engineer in writing.
10. All cables are to be terminated within the EVC cabinet and shall have a minimum 12" additional slack.
11. Highway crossing conduit shall be provided with 36" cover.
12. Sawcuts shall be made by wet cutting only.
13. Clean away collected dust, dirt, and refuse after saw-cutting is done. The sawcuts shall be cleared by water applied by pressure washer. Residual water within the sawcuts shall be vacuumed by use of a wet/dry vacuum. The sawcuts shall then be dried by air compressor.
14. After sawcuts are dried, any remaining debris stuck within the cut shall be removed. The sawcuts must be completely clean and dry before inserting the sensors and filling the voids with Loop Sealant (for loop sensors) or PU200 Piezo Installation Resin or equivalent (for piezo sensors).
15. The collected slurry shall be disposed of appropriately (i.e., either placed in a filter fabric lined filtration box or in a filter fabric lined dug up retention/percolation basin, and after filtration/percolation, the filter fabric and the retained sediments, disposed of appropriately).

LOOP SENSOR LAYOUT NOTES

1. Loop sensors shall consist of four turns of 1C #14 cable (meeting IMSA Spec 51-3 or equivalent) embedded in a 3/8" wide by 4" deep sawcut, except as noted. Loop sensors shall be provided a minimum 2" cover.
2. After laying the loop sensor cable in four (4) turns within the 4" deep cut, press 1"-long pieces of backer rod in each foot of the loop and the loop lead sawcut, to anchor the wire in the slot before applying the Loop Sealant. Backer rod shall be embedded at least 2" below the top of pavement. The backer rod shall be placed into the sawcut with a blunt object, such as a wooden paint stir stick. No sharp objects (such as a screw driver) shall be used to place the backer rod into the sawcuts.
3. Loop sensor and lead cable shall be one continuous wire. Lead wires from the same loop shall be twisted in pairs, five twists per foot, from the edge of paved shoulder to the pullbox. Do not twist one loop pair with another loop pair.
4. Continuity of loop sensors and lead-in wires shall be tested and warrantied for one year from the date of acceptance by the Engineer.
5. Loop sensor lead cables shall be spliced only at the closest pullbox to the loop. Splice point of cables shall be suspended near the top of the pullbox with a j-hook.
6. Splices shall be made by use of a splice kit.
7. Stagger loop sensors on roadways with lanes that are less than 12 feet in width, as shown on contract plans or by direction of the Engineer.
8. The Contractor shall label the topo and piezo sensor leads clearly to identify traffic direction, lane number, and sequence of loop and piezo sensors in each lane per direction.
9. The left-most lane in the direction of traffic flow is designated as Lane 1, and the next lane to its right as Lane 2, and so on as indicated on plans.

FED. ROAD DIST. NO.	STATE	FED-AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0130(27)	2021	77	116

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**EVC TRAFFIC COUNTING
SYSTEM NOTES**
KEAAU-PAHOA ROAD
INTERSECTION IMPROVEMENTS
at Orchidland Drive & Makuu Drive
Federal-Aid Project No. STP-0130(27)

Scale: N/A Date: Sept, 2020

SHEET No. 1 OF 5 SHEETS

1', Typ.

6', Typ.

3', Typ.

9', Typ.

3', Typ.

6', Typ.

1', Typ.

New 11' Class 1 BL Piezo Sensor, Typ.

New 6'x 6' Octagonal Loop Sensors Centered in Lanes, Typ.

ETW

ETW

EP

N1T

P3

P4

N1A

To Pahoa

S1A

P1

P2

S1T

To Keaau

ETW

EP

See Conduit Table "B"

New Type "A" Pullbox

Excavation Warning Sign on Post

New In-Road Temperature Sensor

New M-Type Cabinet on Conc. Foundation w/ Work Pad

EP = Edge of Pavement
ETW = Edge of Travelway

N = North
S = South
A = Approaching
T = Trailing

N 2 T
 └─ Indicates approaching or trailing loop
 └─ Indicates lane number
 └─ Indicates directions

1. *All dimensions and callouts are typical unless otherwise noted on plan.*
2. *Contractor shall coordinate service agreements and connections to electrical and communication service. Contractor shall also contact the appropriate State Department of Transportation Representative for service agreement. (Highway Planning, Contact, Goro Sulijoadikusumo, P.E., at 587-1839).*

Conduit* # - Size	Class 1 BL Sensor Lead Cables	2C #18 Loop Detector Cable	In-Road Temperature Sensor Cable
2 - 2"	4	4	1

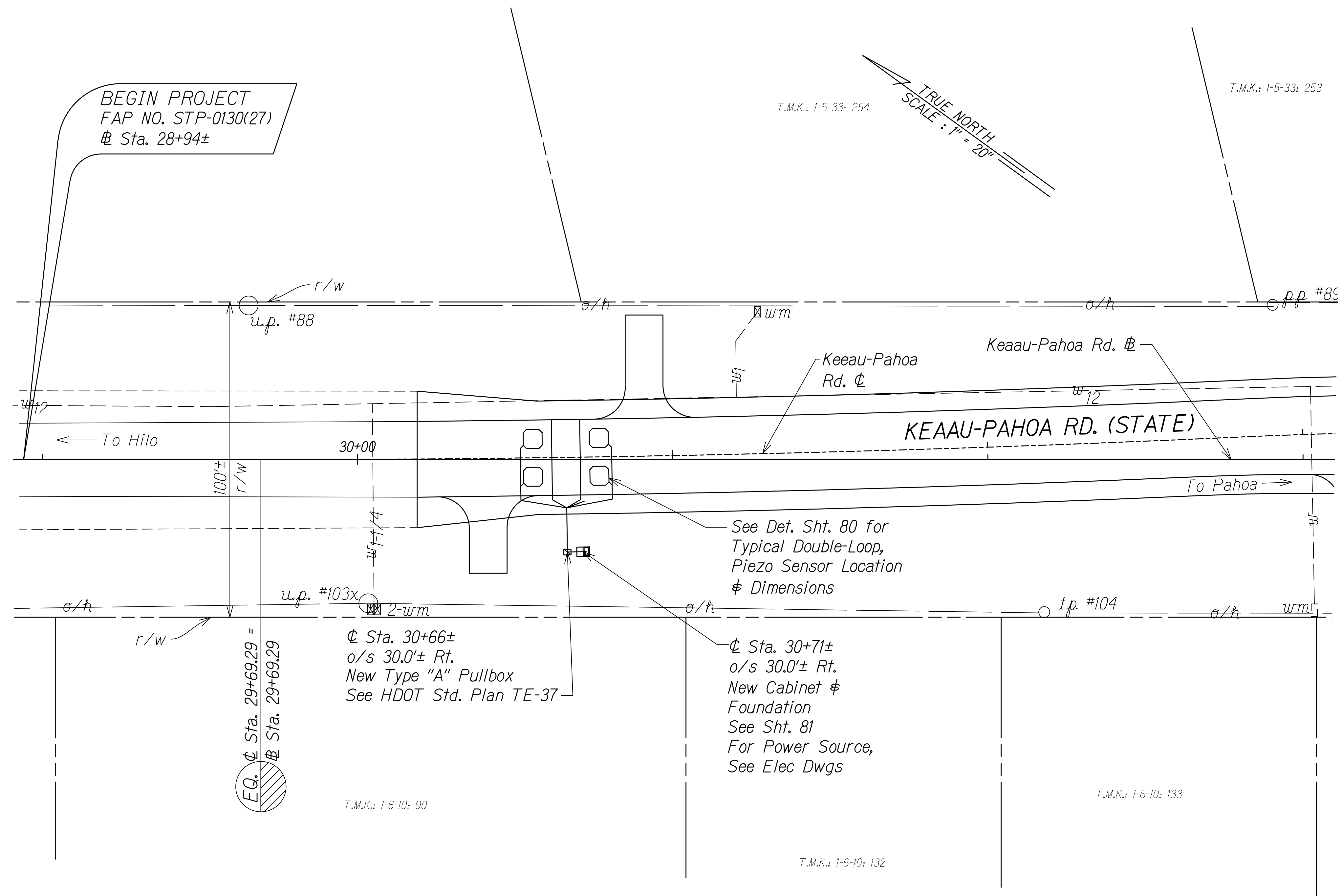
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

EVC TRAFFIC COUNTING
SYSTEM LAYOUT
KEAAU-PAHOA ROAD
INTERSECTION IMPROVEMENTS
at Orchidland Drive & Makuu Drive
Federal-Aid Project No. STP-0130(27)

Scale: Not to Scale Date: Sept, 2020

SHEET No. 2 OF 5 SHEETS

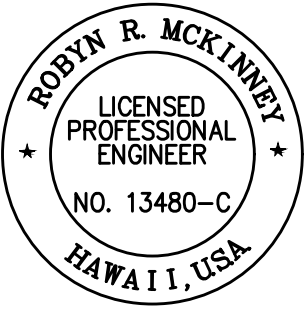
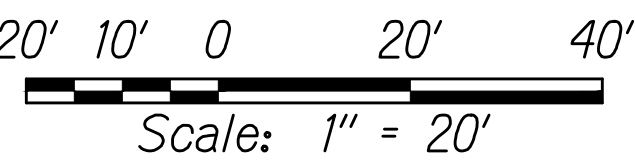
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HAWAII	HAW.	STP-0130(27)	2021	79	116



NOTE:

1. Location for traffic counting station equipment shown on plan are approximate. Final location of equipment to be determined in the field. The Contractor shall submit the final equipment location plan including the loops, piezo and road temperature sensors.

GRAPHIC SCALE:



THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION AND
CONSTRUCTION OF THIS PROJECT
WILL BE UNDER MY OBSERVATION.

Rodyn McKinney 04/30/22
SIGNATURE EXPIRATION DATE
OF THE LICENSE

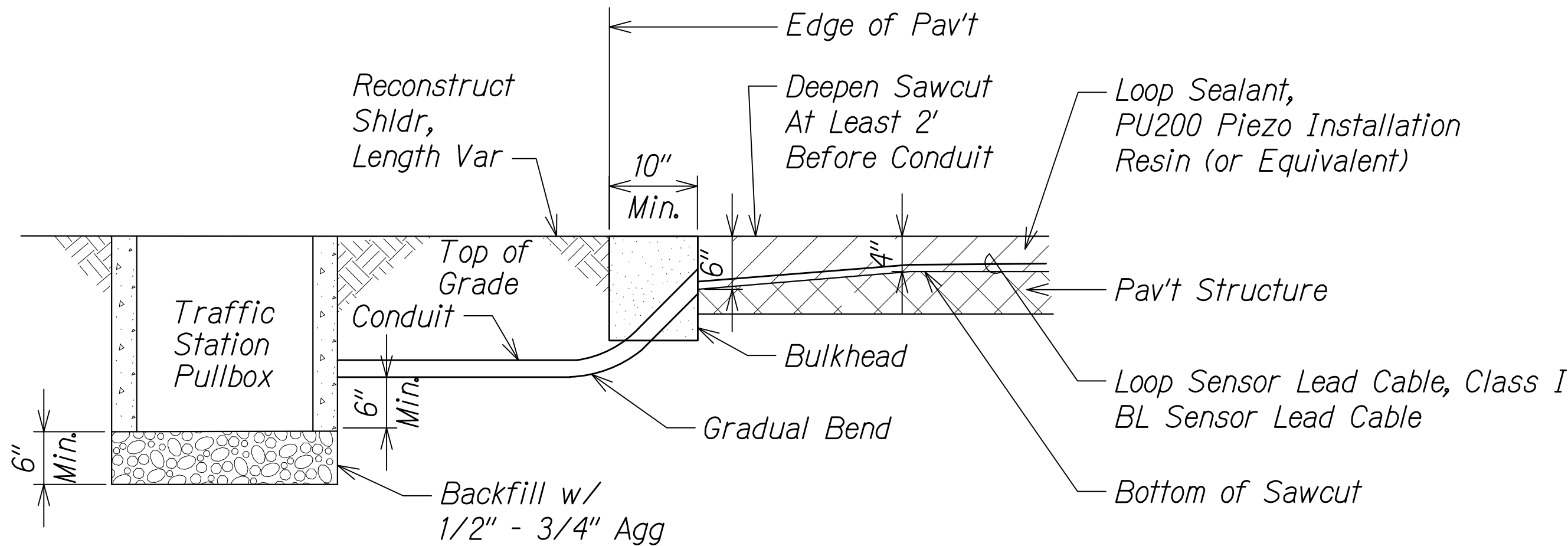
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**EVC TRAFFIC COUNTING
SYSTEM PLAN**
KEAAU-PAHOA ROAD
INTERSECTION IMPROVEMENTS
at Orchidland Drive & Makuu Drive
Federal-Aid Project No. STP-0130(27)

Scale: 1" = 20' Date: Sept, 2020

SHEET No. 3 OF 5 SHEETS

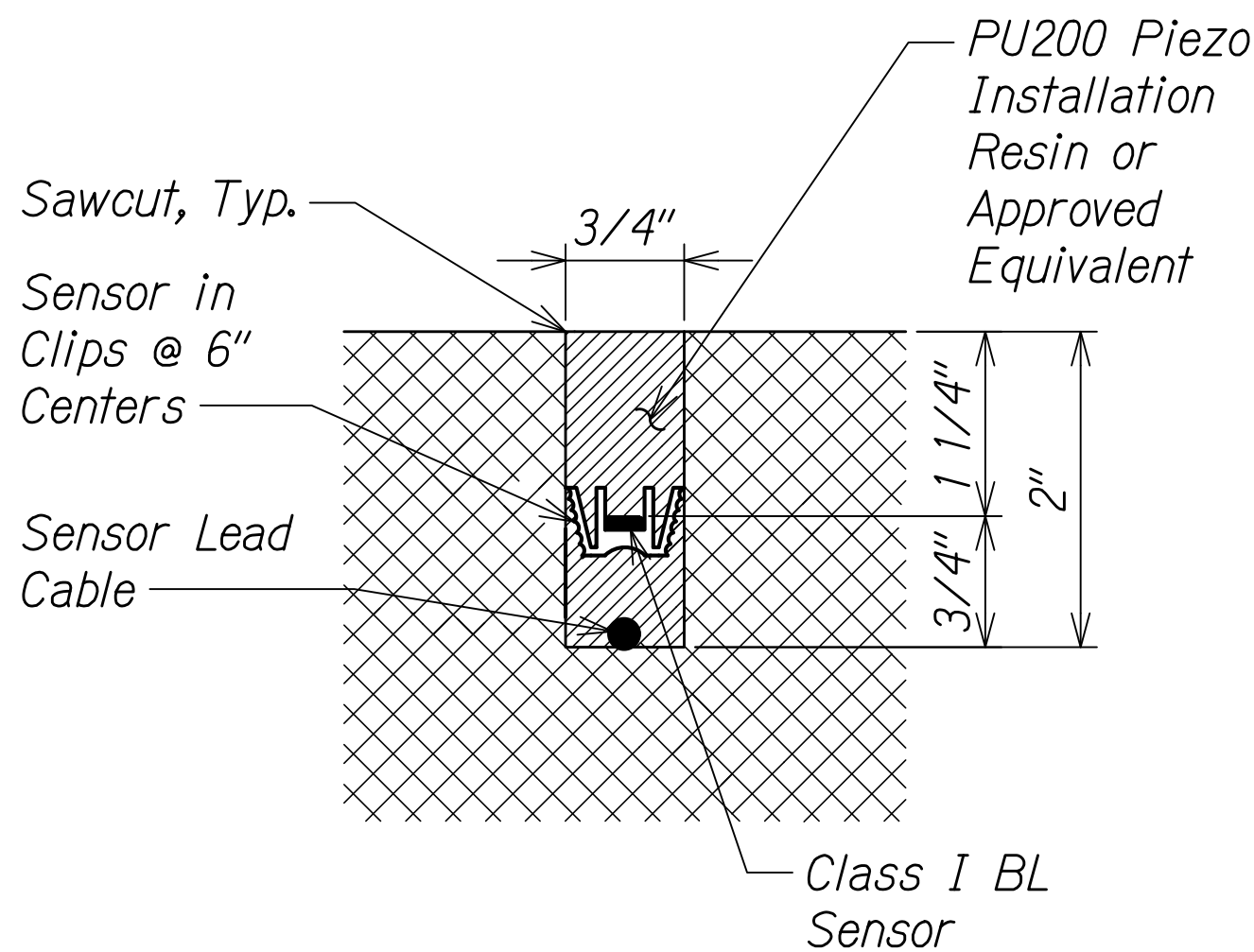
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HAWAII	HAW.	STP-0130(27)	2021	80	116



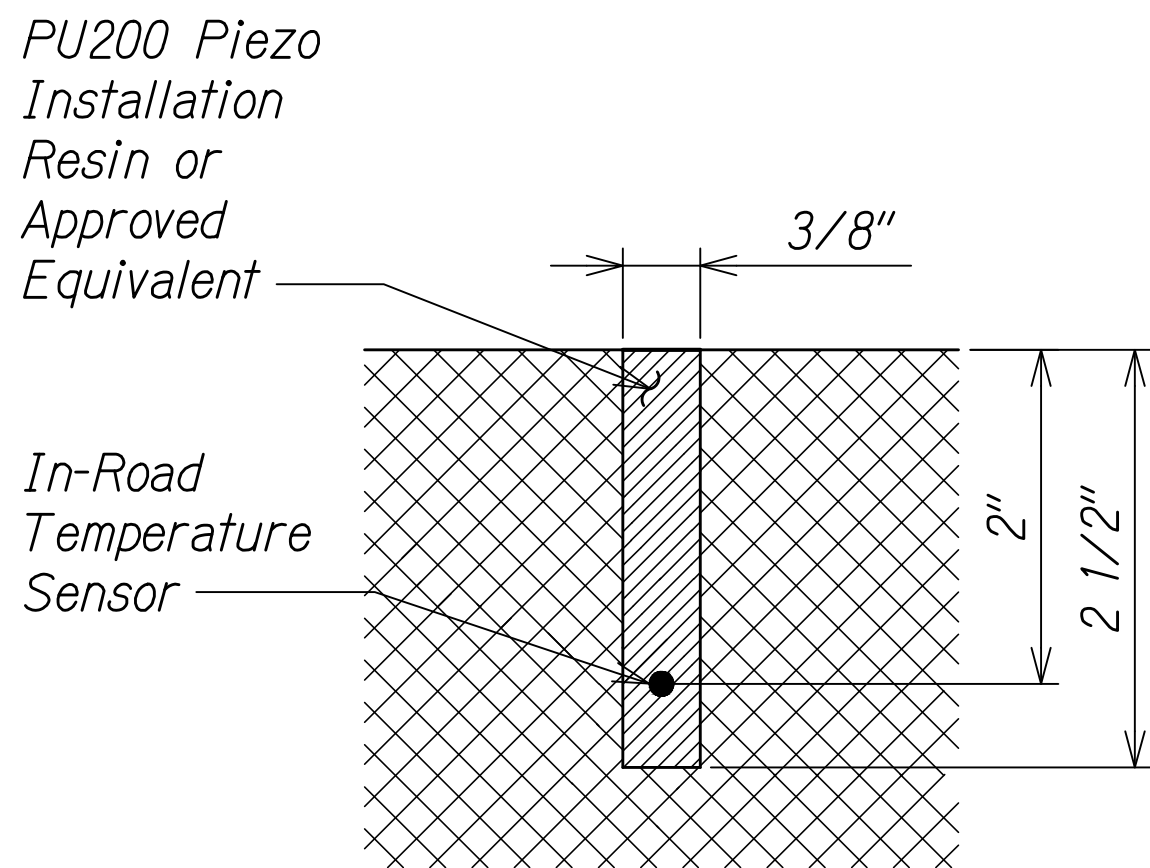
EDGE OF ROADWAY DETAILS
Scale: NTS

NOTES ON CONSTRUCTION AT END OF SAWCUT:

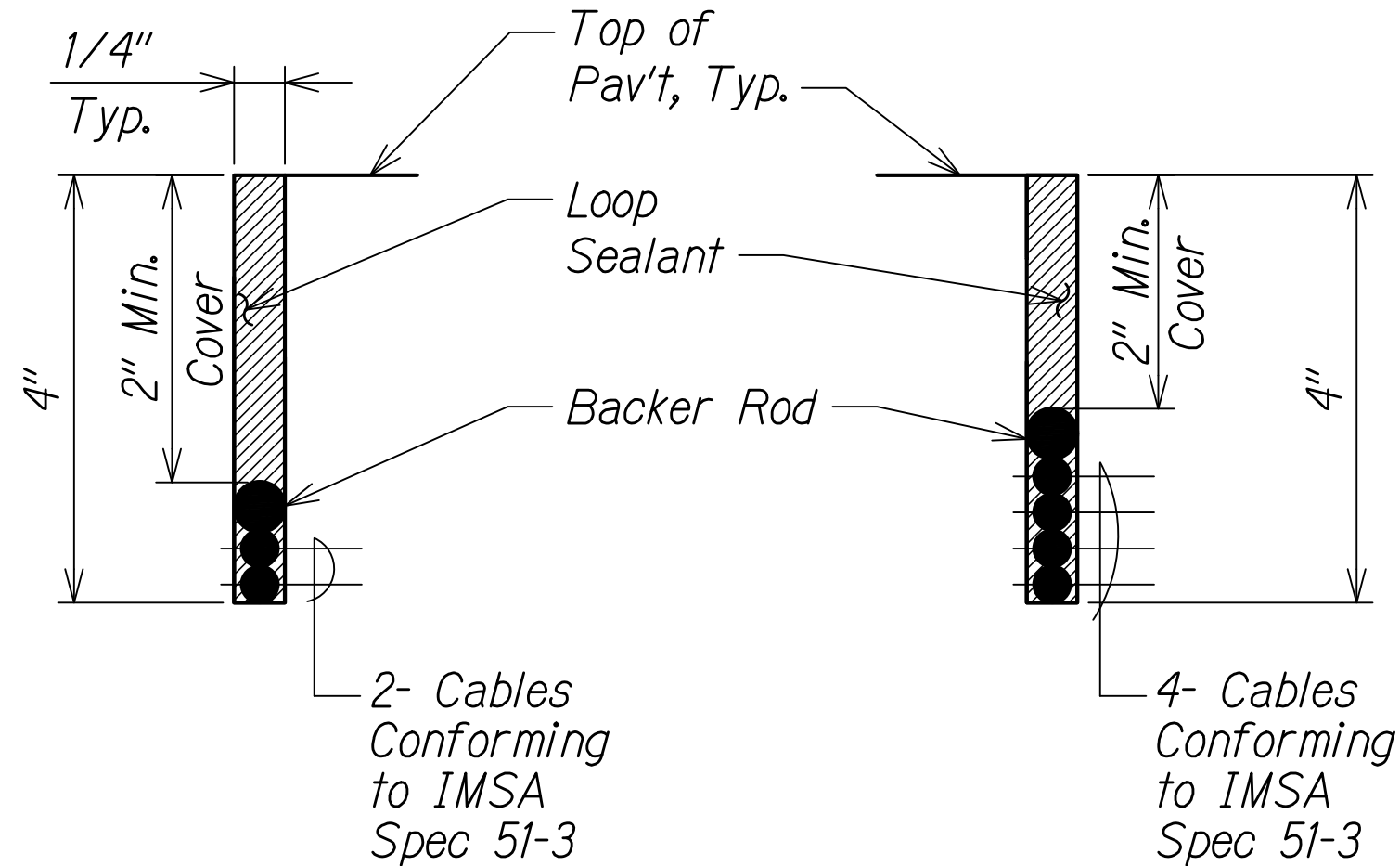
1. Seal roadway end of conduit with duct seal compound after installation of conductor.
2. Install bulkhead across sawcut to keep sealant in sawcut as it is placed.
3. Place Loop Sealant, PU200 Piezo Installation Resin (or Equivalent) in sawcut.
4. Place sand to cover exposed lead cables to protect and separate them from backfill.
5. Backfill over conduit with new AC cold mix.
6. Reconstruct shoulder, curb and gutter as required.
7. Conduit should be installed at least 10 inches from the edge of pavement. If the depth of pavement is 4 inches or less at the edge, conduit should be installed at least 12 inches from the edge of pavement.



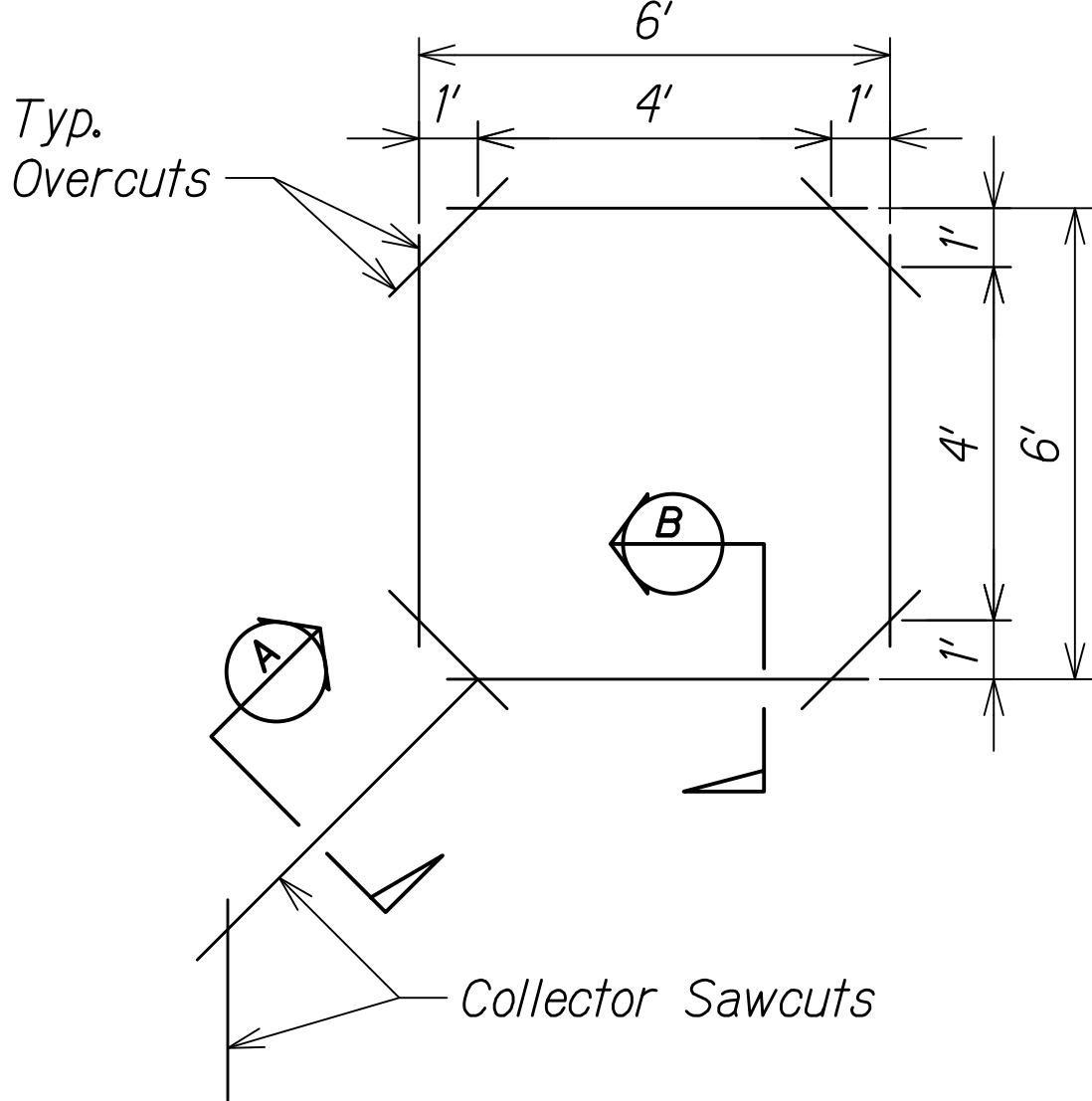
PIEZO SENSOR SAWCUT SECTION DETAIL
Scale: NTS



TEMPERATURE SENSOR SAWCUT SECTION DETAIL
Scale: NTS

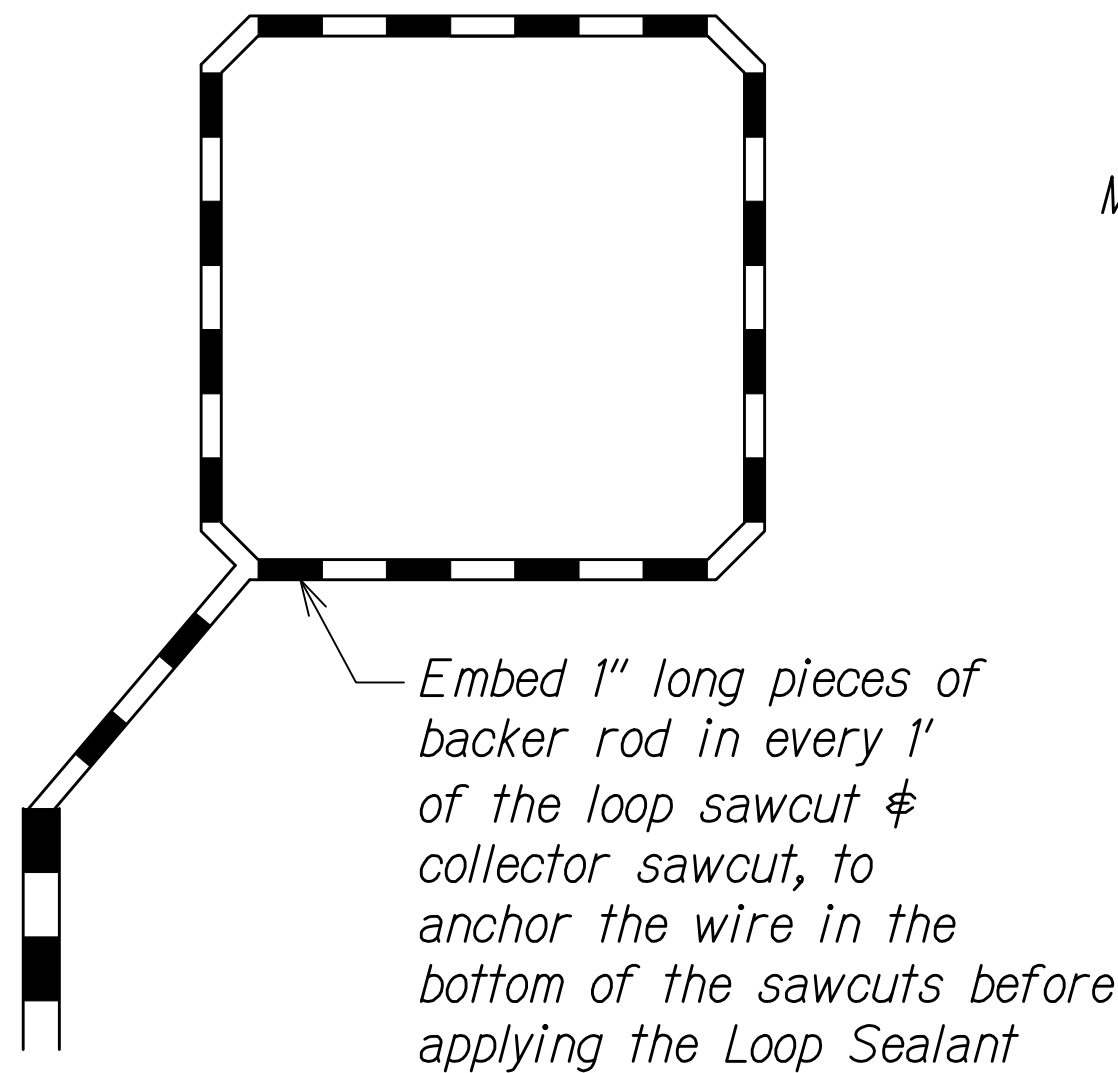


TYPICAL SECTIONS LOOP SENSORS
Scale: NTS

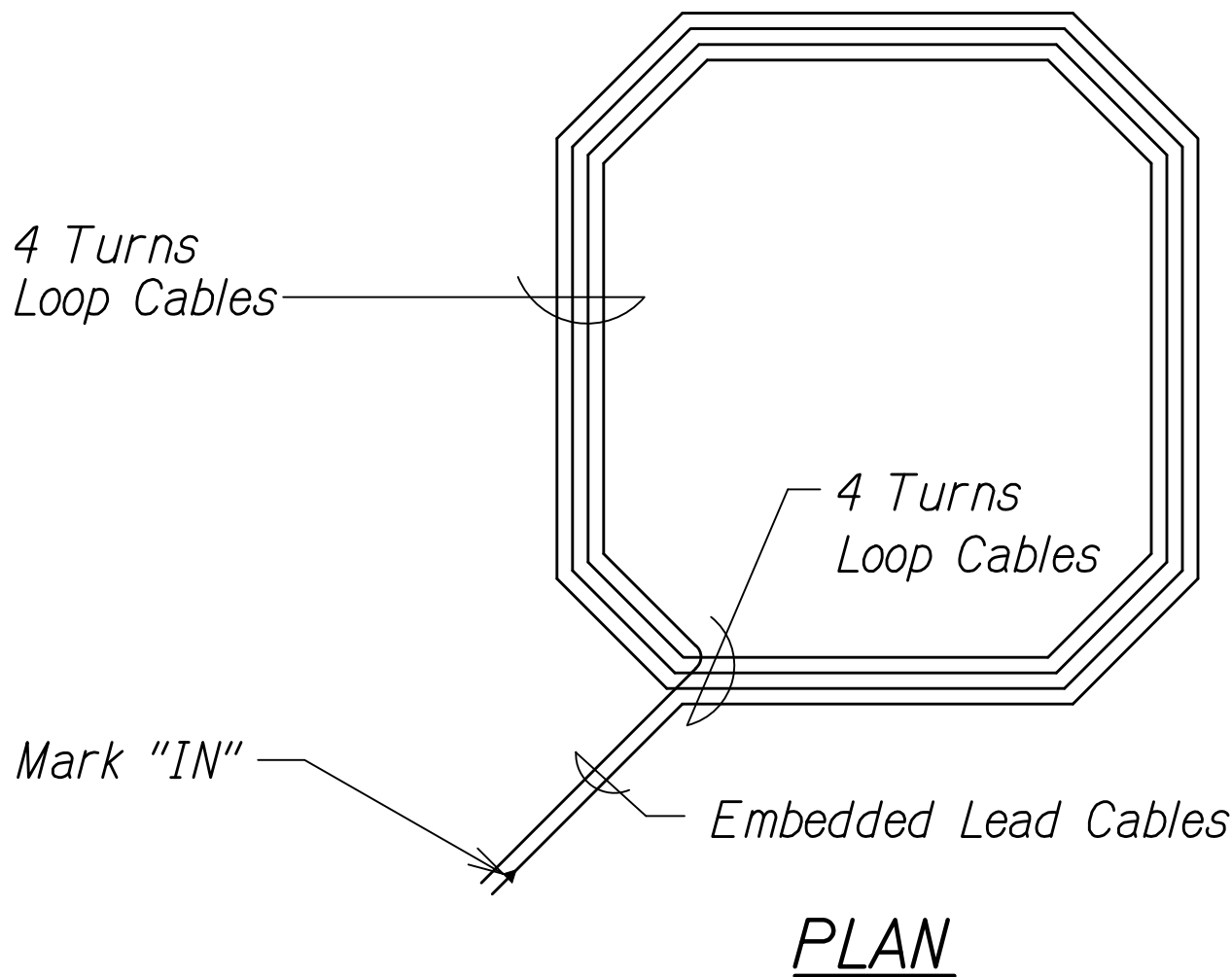


TYPICAL LOOP SENSOR SAWCUT DETAIL
Scale: NTS

SENSOR LOOP SAWCUT NOTES:
Length of overcuts shall be kept to a minimum. All overcuts shall be backfilled with Loop Sealant.



TYPICAL LOOP SENSOR BACKER ROD PLACEMENT DIAGRAM
Scale: NTS

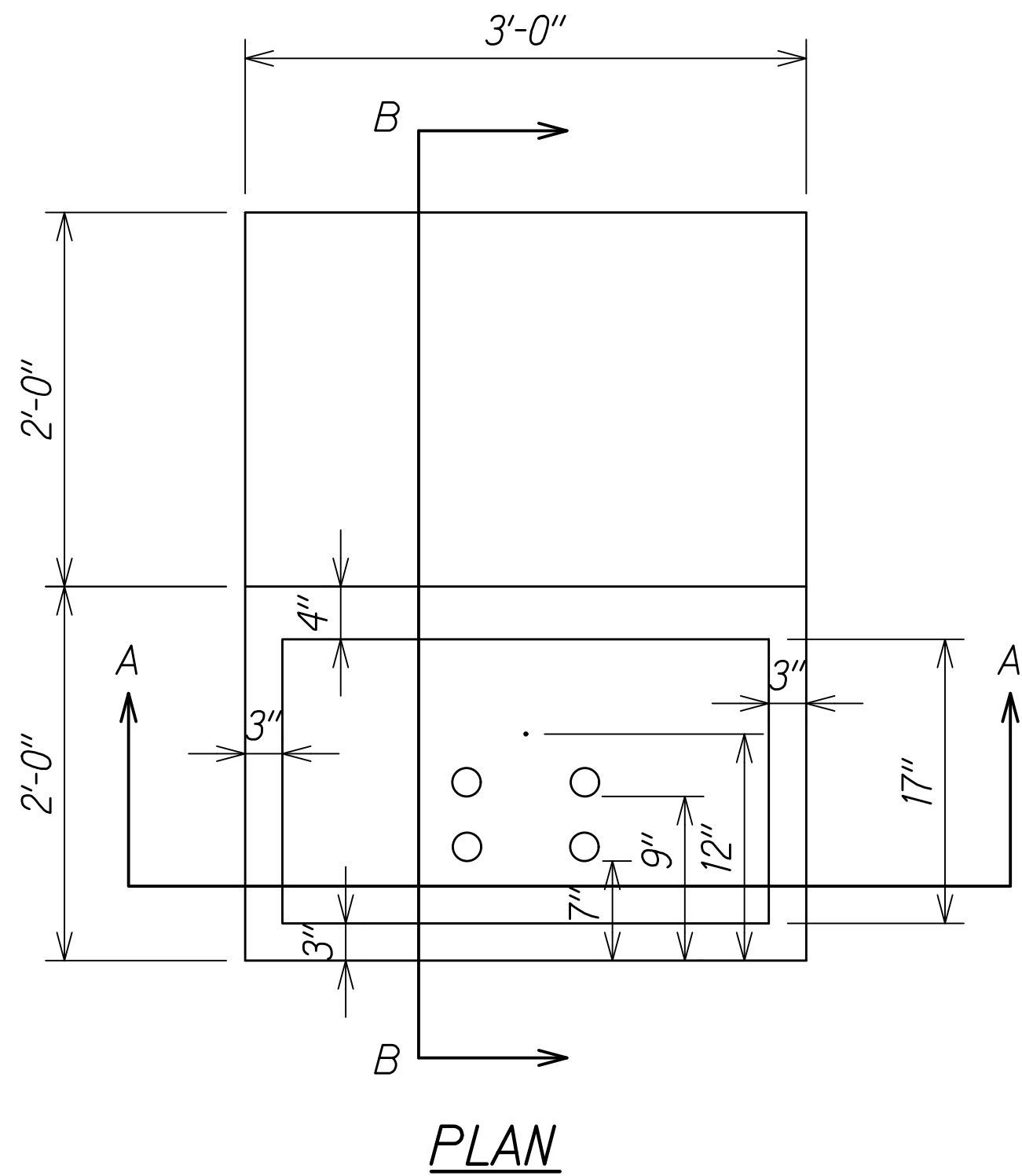


TYPICAL LOOP SENSOR WIRING DIAGRAM
Scale: NTS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**EVC TRAFFIC COUNTING
SYSTEM SENSOR DETAILS**
KEAAU-PAHOA ROAD
INTERSECTION IMPROVEMENTS
at Orchidland Drive & Makuu Drive
Federal-Aid Project No. STP-0130(27)
Scale: Not to Scale Date: Sept, 2020

FED. ROAD DIST. NO.	STATE	FED-AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0130(27)	2021	81	116



NOTES:

1. Mount M type controller cabinet on slab and secure with bolts and nuts.
2. Concrete slab shall be poured in place.
3. Connect 110 VAC power to dual outlet boxes mounted on inside wall of the cabinet.
4. The Contractor shall furnish the State key(s) to the cabinet.
5. Provide #8 AWG copper wire ground terminal to the cabinet.
6. All exposed conduits shall be steel conduits.

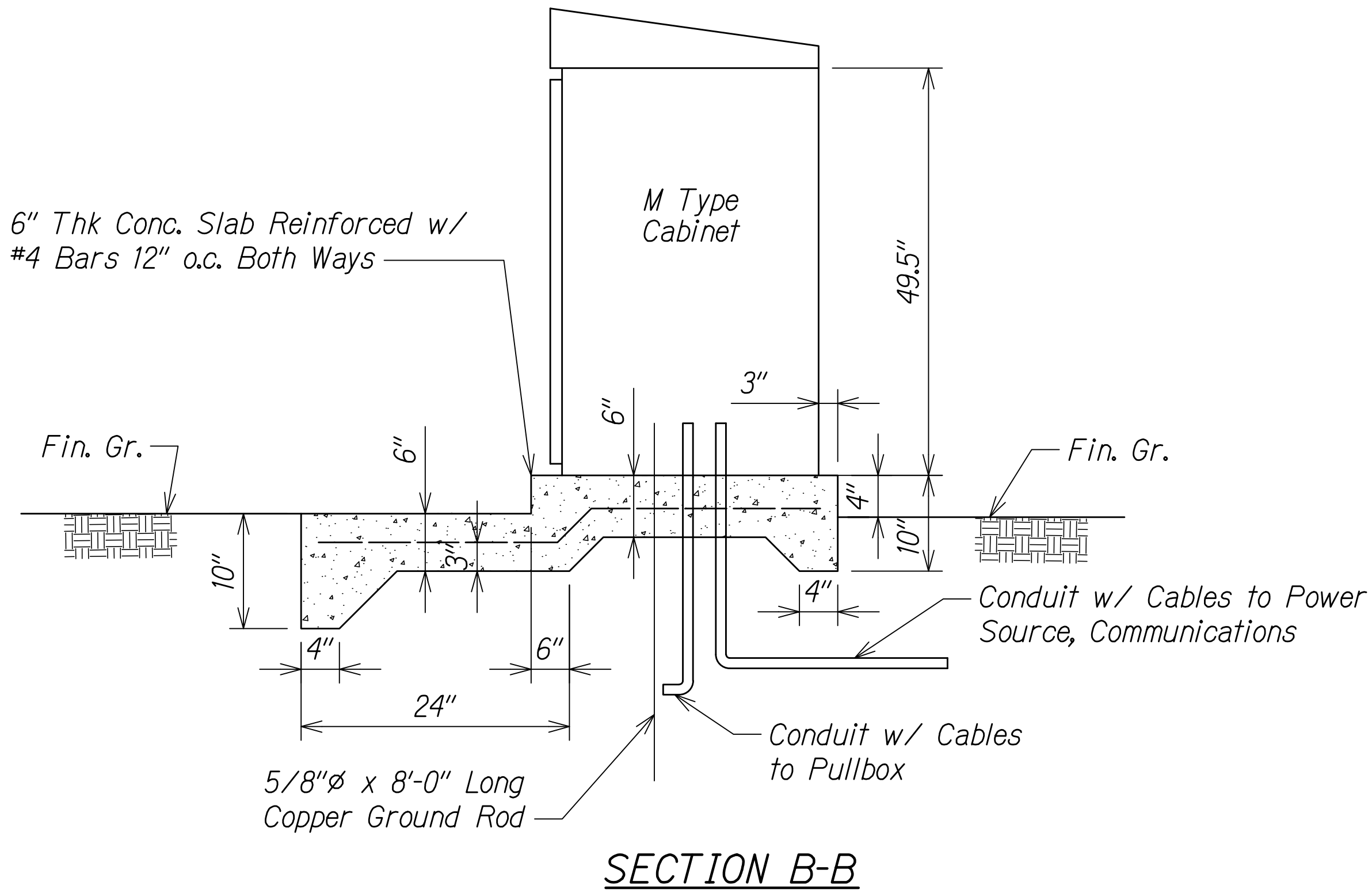
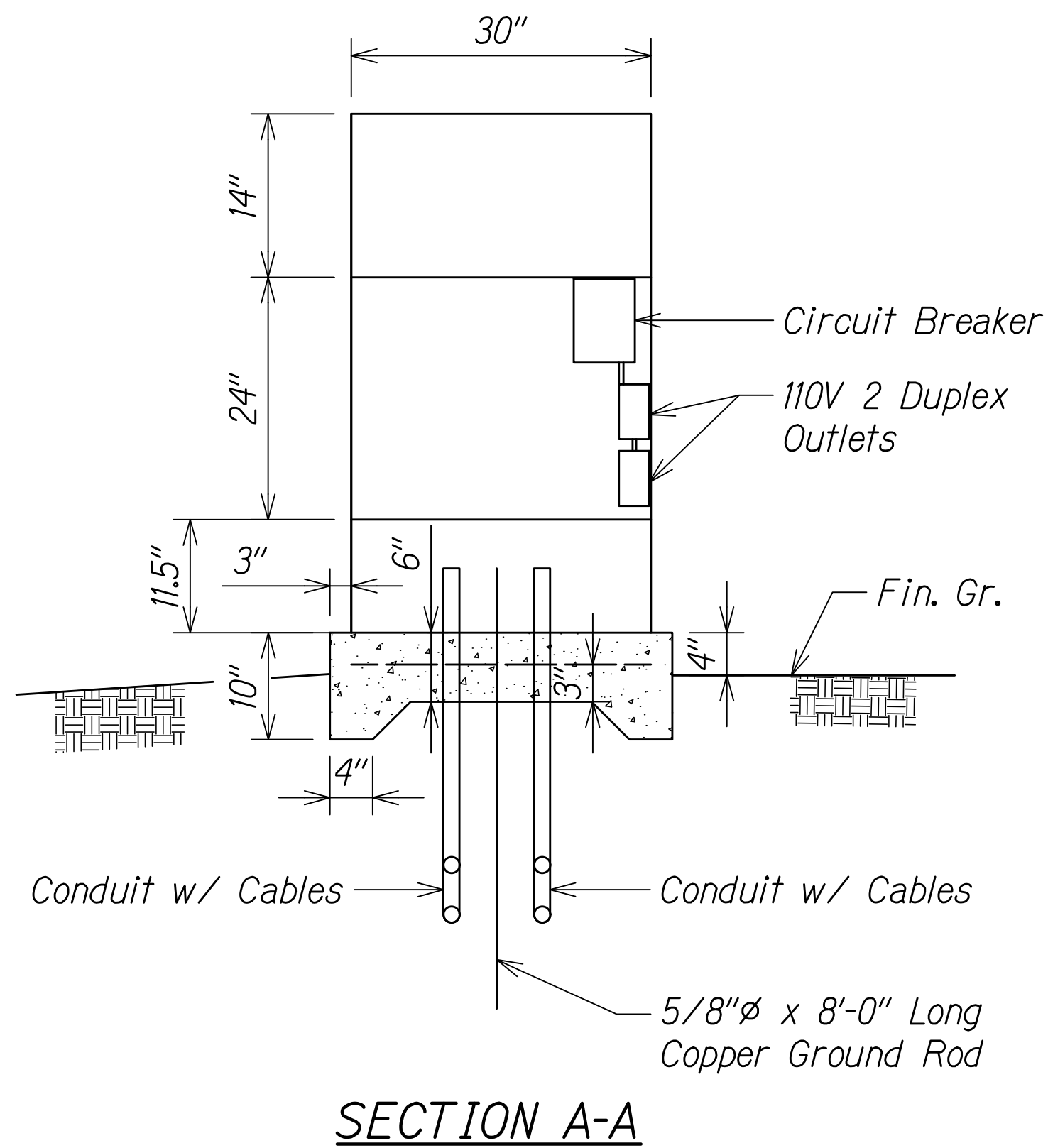


NOTES:

1. For sign post detail, see HDOT Standard Plans TE-03B and Sht. 75.
2. Two (2) warning signs shall be placed on each sign post "Back-to-Back".
3. Text on sign shall be centered both ways and shall be black text on yellow background.
4. Bottom edge of sign shall be 8' above grade.

WARNING SIGN DETAIL

Scale: NTS



M TYPE CABINET DETAIL

Scale: NTS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

EVC TRAFFIC COUNTING SYSTEM CABINET
FOUNDATION AND OTHER DETAILS

KEAAU-PAHOA ROAD
INTERSECTION IMPROVEMENTS
at Orchidland Drive & Makuu Drive
Federal-Aid Project No. STP-0130(27)

Scale: Not to Scale Date: Sept, 2020

SHEET No. 5 OF 5 SHEETS