

TRAFFIC SIGNAL SYSTEM NOTES

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-076-1(5)	2000	59	83

1. All Traffic Signal Work Shall Conform To The Requirements Of The "Manual On Uniform Traffic Control Devices For Streets And Highways," Federal Highway Administration (1988) And Amendments.
2. All Work Shall be Done in Accordance with the "Hawaii Standard Specifications for Road, Bridge, and Public Works Construction", 1994, of the Department of Transportation, State of Hawaii, Except as Modified Herein or in the Special Provisions.
3. The Location Of The Traffic Signal Standards, Traffic Signal Standards With Mast-Arm, Pedestrian Pushbuttons, Traffic Controller, Pullboxes, Conduits, Barriers And Loop Detectors Shall Be Staked Out In The Field By The Contractor And Approval Of The Locations Shall Be Obtained From The Engineer Prior To Construction And Installation. Locations and Standards Shown On The Plans Shall Be Adjusted As Necessary To Prevent Conflicts with Existing Or New Facilities.
4. All New Conduits Under Roadway Shall Be PVC Schedule 80.
5. A Solid #8 Bare Copper Wire Shall Be Pulled With The Traffic Signal Cable For Equipment Ground. Cost Shall Be Incidental To The Installation Of The Signal Cable.
6. Lead-In Wires In Pullbox Near Loops Shall Be Tagged With Loop Number(s).
7. Department Of Transportation Services, City & County Of Honolulu Will Assist The Engineer In Construction Inspection For The Traffic Signal System. Work By The Department Of Transportation Services, C&C Of Honolulu:
- Make All Electrical Equipment Connections In The Field For Signal System After The System Has Been Installed In Place By The Contractor.
  - Final Adjustment Of Traffic Signal Control Equipment.
8. Locations Of Existing Underground Structures And Utilities Such As Pipelines, Conduits, Cables, Etc. Shown On Plans Are Approximate Only. Its Is Not The Intent Of These Plans To Show The Exact Location Of All Underground Utilities and Structures. It is the Responsibility of the Contractor to Verify the Locations of all Existing Utilities with the Respective Owners. Existing Utilities Damaged by the Contractor shall be Repaired by the Contractor at his Own Cost.
9. Locations Of Traffic Markings And Markers (Lane Lines, Stop Lines, Cross-Walks, Etc.) Shown On The Plans Shall Be Verified With The Engineer Prior To The Installation Of The Traffic Signal System.
10. All Traffic Signal Controller Equipment Shall Be Completely Wired In The Cabinet And Shall Control The Traffic Signals As Called For In The Plans.
11. The Locations Of All New Traffic Signal Standards And Controllers On The Drawings Or Approximate. Exact Location Will Be Determined In The Field By The Contractor and Approved By The Engineer. Conflicts Between Standards And Crosswalk Locations Shall Be Avoided Wherever Possible. The Locations Of Signal Standards, Controllers, Pullboxes, and Conduits Shall be Staked Out By The Contractor And Approved By The Engineer Prior To Any Excavation.
12. All Cables Except Type 4 Sensor Loop Cables Shall Be Installed In Conduits In Groups Or One Or More Cables Between Pullboxes As Specified On The Project Plans. Type 4 Cables Shall Be Installed In Sawcuts And Conduits In The Groups Shown On The Details For Sensor Loops.
13. The Contractor Shall Notify the Traffic Control Branch, Dept. of Transportation Services, Three (3) Working Days Prior To Commencing Work on the Traffic Signal System (Phone 523-4589).

14. The Traffic Signal System Shall be Kept Operational During Construction. Any Relocation Required Shall be Approved by the Traffic Control Branch, Department of Transportation Services, and Paid for by the Contractor.
15. The Contractor Shall be Responsible for Any Damages to the Existing Traffic Signal Facilities, Including the Traffic Signal Interconnect System. Any and All Damages to these Facilities Shall be Repaired by the Contractor at his Cost in Accordance with the Requirements of the City and County of Honolulu.
16. The Contractor Shall be Responsible for Any Damages to Existing Traffic Signal Fiber Optic Cable System. Any and All Damages to these Facilities Shall be Repaired by the Contractor at his Cost in Accordance with the Requirements of the City and County of Honolulu.
17. The Contractor Shall Notify All Affected Utility Companies and Government Agencies of Their Intent to Begin Construction on Any Intersection or Street At Least Two (2) Weeks Prior to the Start of Such Construction.
18. The Contractor Shall Notify the Joint Pole Committee Two (2) Weeks in Advance of Any Relocation of Utility Pole(s), Guy(s) and Anchor(s) That May be Necessary.
19. All Splicing Shall be Done in the Pullboxes.
20. Furnishing and Installing the Conduit Stubouts (Pullboxes to Edge of Pavement) Will Not be Paid for Separately But Shall be Considered Incidental to the Various Contract Items.
21. Should Any Defect be Encountered During the Warranty Period, the Manufacturer Will be Notified and He Shall Promptly Correct Such Defect. Service Call (by Factory Qualified Representative) During the Warranty Period For Repairs or Other Maintenance Shall be Done As Soon As Possible.
22. All Signal-Drop Cables (Type 5 Cables) From the Various Types of Traffic Signal Heads on the Traffic Signal Standards and Mast Arms to the Pullboxes Shall Not be Paid for Separately But Considered Incidental to the Traffic Signal Standard Installation or Relocation.
23. After Installing All the Traffic Signal Cables, the Contractor Shall Duct Seal All Conduits in the Pullboxes, Traffic Signal Standards and Traffic Signal Controller Cabinet Concrete Base. The Duct Seal Material Shall be Approved by the Traffic Signal Inspector/Engineer and Shall Not be Paid for Separately But Considered Incidental to the Direct Buried and/or Concrete Encased Conduits.
24. After Installing the Traffic Signal System, the Contractor Shall Apply Grease to All Parts of the Traffic Signal System (i.e. Fittings, Brackets, Nipples, Elbows, Screws, Signal Head Assemblies, Bolts, Hinges, Etc.) As Directed by the Traffic Signal Inspector, to Prevent Rust and Corrosion. The Grease Material Shall be Approved by the Signal Inspector.
25. Connecting into Existing Traffic Signal System and Making All Necessary Adjustments Shall Not be Paid for Separately, But Considered Incidental to the Various Traffic Signal Contract Items.
26. All Existing Pullboxes, Traffic Signal Poles and Controller Bases Not Incorporated into the New Traffic Signal System Shall be Removed to 6-Inches Below Grade.

TRAFFIC SIGNAL LEGEND

New	Relocated	Existing	
●	●	○	Traffic Signal Standard or Pedestrian Pushbutton Pedestal
⬤	⬤	⬤	Temporary Microwave Detector, See Sheet ___ for Detail
---	---	---	Temporary Microwave Detector Cable
---	---	---	Traffic Signal Conduit
□	□	□	Loop Detectors
⬅	⬅	⬅	12" RYG Traffic Signal Head
⬅	⬅	⬅	12" RY↑ Traffic Signal Head
⬅	⬅	⬅	12" RY← Traffic Signal Head
⬅	⬅	⬅	12" RY← Traffic Signal Head (Programmed Visibility)
⬅	⬅	⬅	Opticom Detector
⬅	⬅	⬅	Type I Traffic Signal Standard and Attached Signals
⬅	⬅	⬅	Type II Traffic Signal Standard with Mast Arm and Attached Signals
⬅	⬅	⬅	Pedestrian Signal Head
□	□	□	Type A Pullbox
⊠	⊠	⊠	Type B Pullbox
⊠	⊠	⊠	Type C Pullbox
---	---	---	Existing Telephone Ductline
---	---	---	Existing Electric Ductline
---	---	---	Existing Water Line
---	---	---	Existing Sewer Line
---	---	---	Existing Drain Line
---	---	---	Existing Gas Line

Approved: \_\_\_\_\_ Date \_\_\_\_\_  
Chief, Traffic Review Branch, DPP  
(For Construction within City R/W Only)



THIS WORK WAS PREPARED BY ME  
OR UNDER MY SUPERVISION.

C. Kim

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
TRAFFIC SIGNAL NOTES	
FORT WEAVER ROAD RESURFACING N. of Lualaunui St. to the Vicinity of Hanakahi St. F. A. Project No. STP-076-1(5)	
Scale: None	Date: July, 1999
SHEET No. 1 OF 11 SHEETS	



CONDUIT	CABLE
2" New	3-4/C #14 1-2/C #14

Relocated Type I Traffic Sig. Std. & Signal Heads.

Install New Ped. Push Button w/ R10-4b(R) Sign

Relocate Exist. Type I Signal Std. & Signal Heads. Remove Exist. Ped. Push Button.



FORT WEAVER ROAD  
(NORTHBOUND)

Install Temporary Microwave Detector & 4/C #16 Cable (Install in Exist. Conduits & Controller) (245 L.F.).

Install Temporary Microwave Detector & 4/C #16 Cable (Install in Exist. Conduits & Controller) (95 L.F.). Relocate Detector to New Pole Location As Req'd.

Install 3 Ea. Loop Detectors, 4-6'x6', Centered in Lanes

New Type I-8 Traffic Sig. Std. Install New Ped. Sig. Heads w/ Type TP-2W Mounting Install Per Curb Ramp Type "E" Detail

CONDUIT	CABLE
2" New	2-4/C #14 2-2/C #14

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-076-1(5)	2000	C.O. 60	83

CONDUIT	CABLE
2" New	2-4/C #14

CONDUIT	CABLE
2" New	3-#6, 600V, RHW-USE

Install New Ped. Push Button w/ R10-4b(L) Sign on New Traffic Sig. Std.

Relocated Street Light Std. & Traffic Signal Heads

Relocate Exist. Street Light Std. Remove Exist. Ped. Heads & Ped. Push Button.

Install 4 Ea. Loop Detectors, 1-6'x6', Centered in Lanes

Install 1 Ea. Loop Detectors, 6-6'x6', Centered in Lanes

Install Temporary Microwave Detector & 4/C #16 Cable (Install in Exist. Conduits & Controller) (310 L.F.). Relocate Detector to New Pole Location As Req'd.

Remove Exist. Ped. Push Buttons & Install New Ped. Push Button w/ R10-4b(L) Sign on Exist. Traffic Sig. Std.

Install 2 Ea. Loop Detectors, 1-6'x6' Centered in Lanes

Install 1 Ea. Loop Detectors, 6-6'x6', Centered in Lanes

Install 2 Ea. Loop Detectors, 1-6'x6', Centered in Lanes

Install 4 Ea. Loop Detectors, 1-6'x6', Centered in Lanes

Relocate Type I Traffic Sig. Std. & Signal Heads.

Install New Push Button w/ R10-4b(R&L) Sign

Install New Type II Traffic Sig. Std. per Curb Ramp Type "B" Mod. Def. Install New Traffic Sig. Heads w/ MA-1W(I) Mounting and Ped. Sig. Head w/ B-1W Mounting

Install New Ped. Push Button w/ R10-4b(L) Sign

St. Francis Medical Center West

LEGEND FOR TRAFFIC SIGNAL CONDUIT ENCASED IN PLAIN CONCRETE JACKET

- 2 - 2" Sched. 80 PVC
- 3 - 2" Sched. 80 PVC
- 4 - 2" Sched. 80 PVC

NOTES:

- For New Curb Ramp Work, See Intersection Plans, Sheets 22 to 27.
- See Also Typ. Curb Ramp Details, Sheets 28 to 32 for Planned Locations of Traffic Signal Standards w/ Ped. Push Buttons.
- Seal All Exposed Holes in Standards with Stainless Steel Capping Echelon.
- See Sheets 65 thru 68 for Traffic Signal & Street Lighting Details.
- Trenching Work Shall be Done Prior to Pavement Resurfacing.

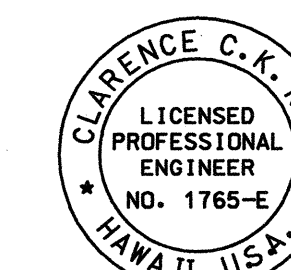
CONDUIT	CABLE
2-2" New	3-4/C #14 1-2/C #14

Install 4 Ea. Loop Detectors, 1-6'x6'

Remove Exist. Type II Signal Std. & Sig. Heads

CONDUIT	CABLE
2" New	3-4/C #14 1-2/C #14

Install Temporary Microwave Detector & 4/C #16 Cable (Install in Exist. Conduits & Controller) (420 L.F.). Relocate Detector to New Pole Location As Req'd.



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Approved:

Chief, Traffic Review Branch, DPP Date  
(For Construction Within City R/W Only)

Chief, Traffic Control, DTS Date  
(For Construction Within City R/W Only)

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

TRAFFIC SIGNAL PLANS

FORT WEAVER ROAD RESURFACING  
N. of Laulaunui St. to the Vicinity of Hanakahi St.  
F. A. Project No. STP-076-1(5)  
Scale: As Shown Date: July, 1999

SHEET No. 2 OF 11 SHEETS

C.O. 60

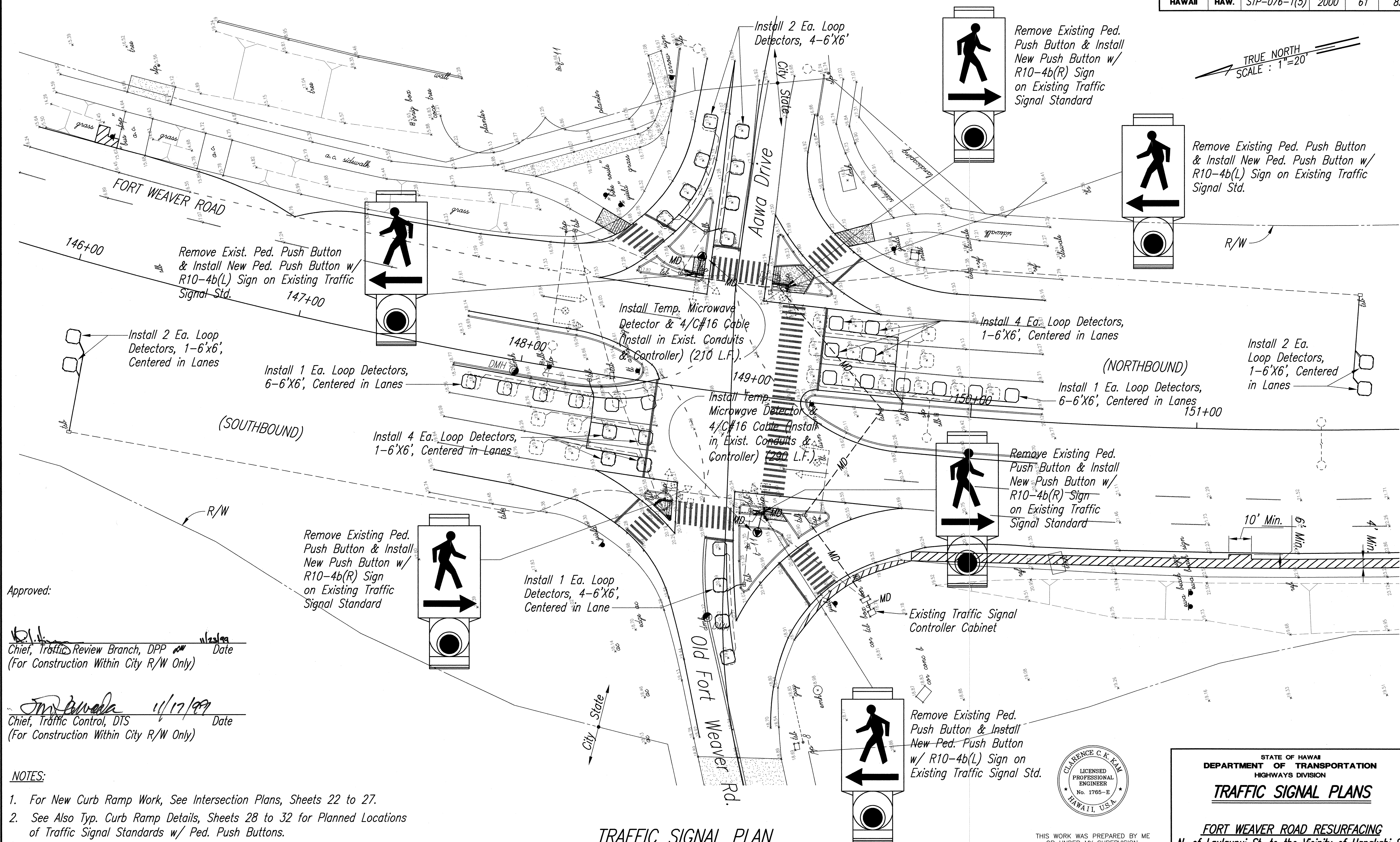
TRAFFIC SIGNAL PLAN  
FORT WEAVER ROAD AND LAULAUNUI STREET  
SCALE: 1"=20'-0"

7/13/01	Added traffic signal conduits and legend.
①	
Date	Revision

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



FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-076-1(5)	2000	61	83



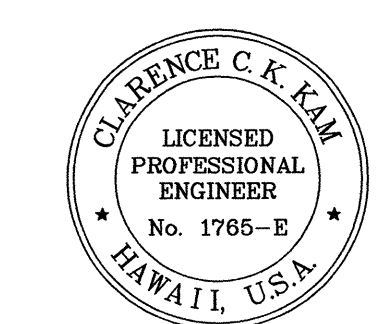
Approved:

*[Signature]* 11/23/99 Date  
Chief, Traffic Review Branch, DPP  
(For Construction Within City R/W Only)

*[Signature]* 11/17/99 Date  
Chief, Traffic Control, DTS  
(For Construction Within City R/W Only)

- NOTES:**
1. For New Curb Ramp Work, See Intersection Plans, Sheets 22 to 27.
  2. See Also Typ. Curb Ramp Details, Sheets 28 to 32 for Planned Locations of Traffic Signal Standards w/ Ped. Push Buttons.
  3. Seal All Exposed Holes in Standards with Stainless Steel Capping Echelon.
  4. See Sheets 65 thru 68 for Traffic Signal & Street Lighting Details.
  5. Trenching Work Shall be Done Prior to Pavement Resurfacing.

**TRAFFIC SIGNAL PLAN**  
**FORT WEAVER ROAD AND AAWA DRIVE / OLD FORT WEAVER ROAD**  
 SCALE: 1"=20'-0"



THIS WORK WAS PREPARED BY ME  
OR UNDER MY SUPERVISION.

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**TRAFFIC SIGNAL PLANS**

**FORT WEAVER ROAD RESURFACING**  
**N. of Laulauui St. to the Vicinity of Hanakahi St.**  
**F. A. Project No. STP-076-1(5)**

Scale: As Shown Date: July, 1999

SHEET No. 3 OF 11 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
TRACED BY		
QUANTITIES BY		
CHECKED BY		
No.		



FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-076-1(5)	2000	C.O. 62	83

LEGEND FOR TRAFFIC SIGNAL CONDUIT ENCASED IN PLAIN CONCRETE JACKET

- 2 - 2" Sched. 80 PVC
- 3 - 2" Sched. 80 PVC
- 4 - 3 - 2" Sched. 80 PVC & 1 - 4" Sched. 80 PVC
- 5 - 1 - 4" Sched. 80 PVC & 1 - 2" Sched. 80 PVC

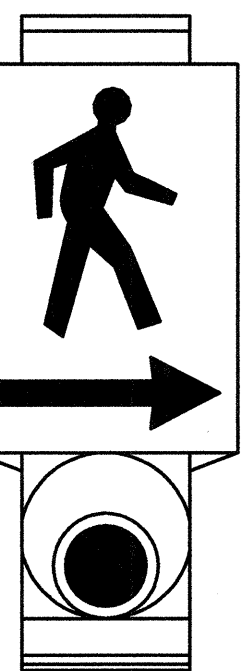
Approved:

Chief, Planning & Engineering, B.W.S. Date

Chief, Traffic Review Branch, DPP Date  
(For Construction Within City R/W Only)

Chief, Traffic Control, DTS Date  
(For Construction Within City R/W Only)

Remove Exist. Ped. Push Button & Install New Push Button w/ R10-4b(R) Sign on Exist. Traffic Signal Std.



7/13/01  
① Added traffic signal pullboxes w/ conduits.  
Added legend for conduits.

Date Revision

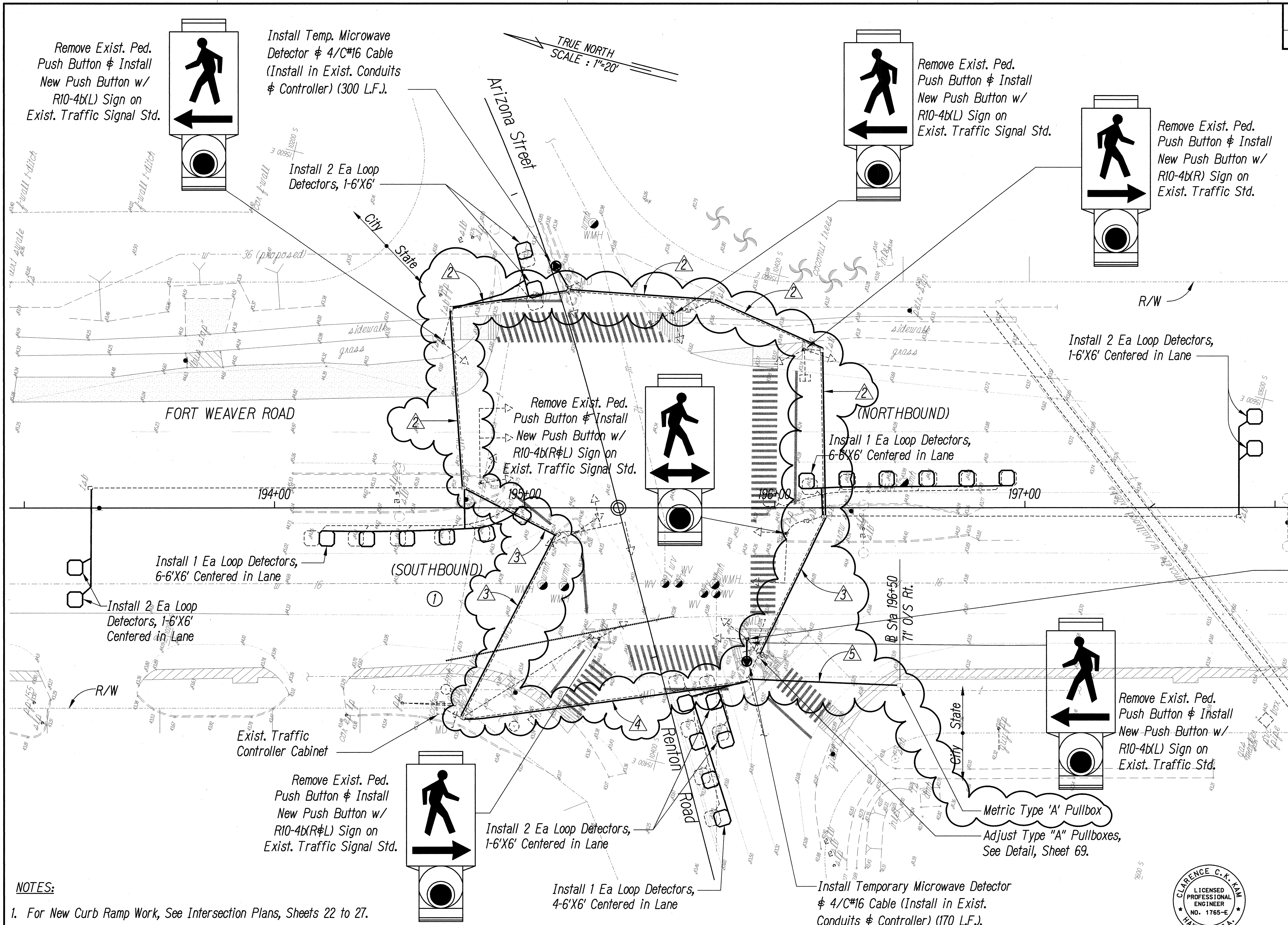
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

TRAFFIC SIGNAL PLANS

FORT WEAVER ROAD RESURFACING  
N. of Laulaunui St. to the Vicinity of Hanakahi St.  
F. A. Project No. STP-076-1(5)  
Scale: As Shown Date: July, 1999

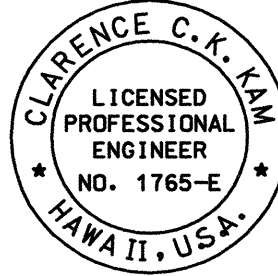
SHEET No. 4 OF 11 SHEETS

C.O. 62



- NOTES:
- For New Curb Ramp Work, See Intersection Plans, Sheets 22 to 27.
  - See Also Typ. Curb Ramp Details, Sheets 28 to 32 for Planned Locations of Traffic Signal Standards w/ Ped. Push Buttons.
  - Seal All Exposed Holes in Standards with Stainless Steel Capping Echelon.
  - See Sheets 64 thru 68 for Traffic Signal & Street Lighting Details.
  - Trenching Work Shall be Done Prior to Pavement Resurfacing.

TRAFFIC SIGNAL PLAN  
FORT WEAVER ROAD AND ARIZONA STREET / RENTON ROAD  
SCALE: 1"=20'-0"



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

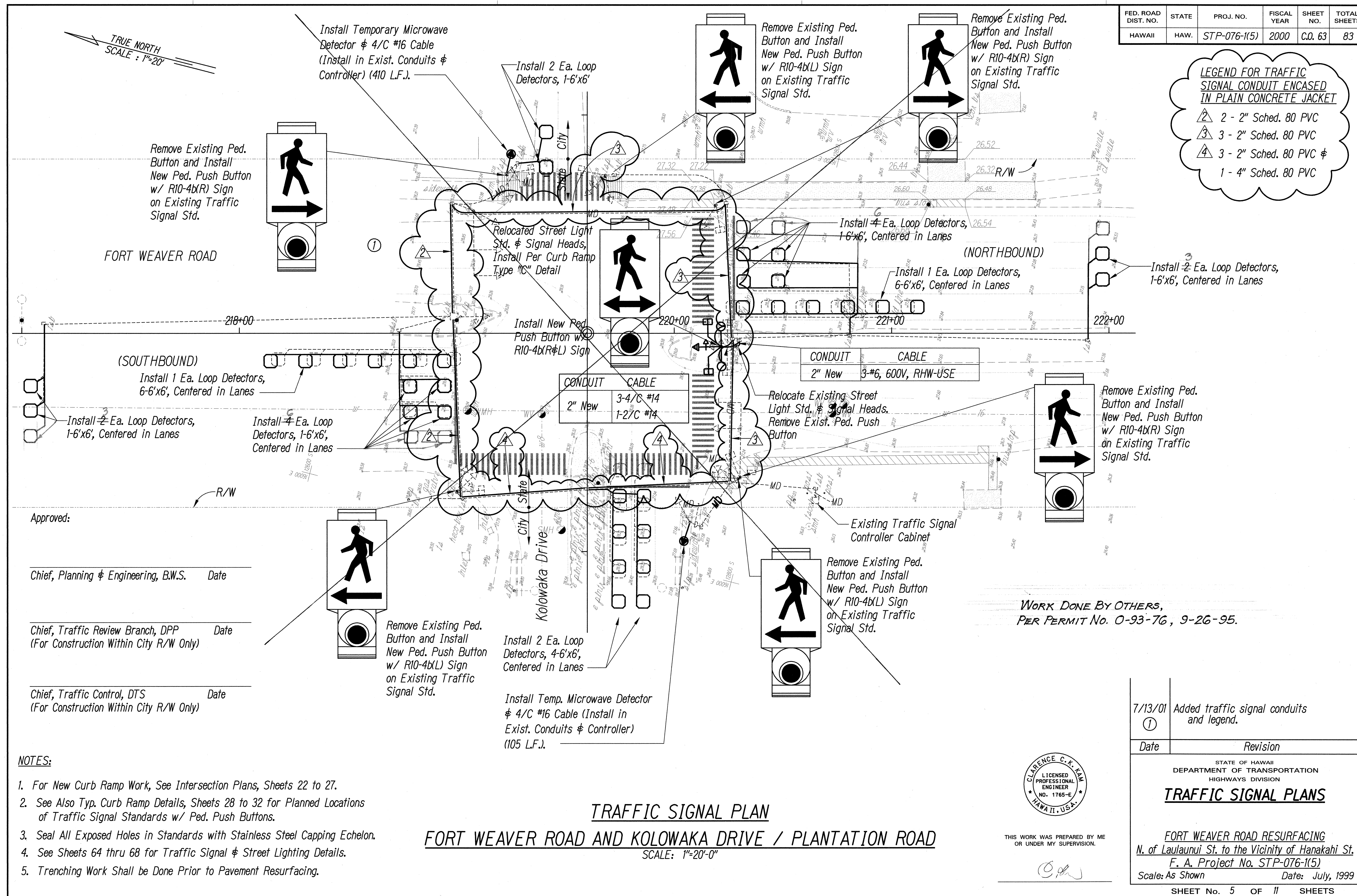
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SURVEY PLOTTED BY	_____
DRAWN BY	_____
DESIGNED BY	_____
CHECKED BY	_____
ORIGINAL PLAN	_____
NOTE BOOK	_____



FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-076-1(5)	2000	C.O. 63	83

**LEGEND FOR TRAFFIC SIGNAL CONDUIT ENCASED IN PLAIN CONCRETE JACKET**

- ② 2 - 2" Sched. 80 PVC
- ③ 3 - 2" Sched. 80 PVC
- ④ 3 - 2" Sched. 80 PVC & 1 - 4" Sched. 80 PVC



Approved:

Chief, Planning & Engineering, B.W.S. Date

Chief, Traffic Review Branch, DPP Date  
(For Construction Within City R/W Only)

Chief, Traffic Control, DTS Date  
(For Construction Within City R/W Only)

**NOTES:**

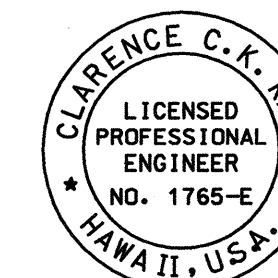
1. For New Curb Ramp Work, See Intersection Plans, Sheets 22 to 27.
2. See Also Typ. Curb Ramp Details, Sheets 28 to 32 for Planned Locations of Traffic Signal Standards w/ Ped. Push Buttons.
3. Seal All Exposed Holes in Standards with Stainless Steel Capping Echelon.
4. See Sheets 64 thru 68 for Traffic Signal & Street Lighting Details.
5. Trenching Work Shall be Done Prior to Pavement Resurfacing.

**TRAFFIC SIGNAL PLAN**

**FORT WEAVER ROAD AND KOLOWAKA DRIVE / PLANTATION ROAD**

SCALE: 1"=20'-0"

THIS WORK WAS PREPARED BY ME  
OR UNDER MY SUPERVISION.



7/13/01  
① Added traffic signal conduits and legend.

Date Revision

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**TRAFFIC SIGNAL PLANS**

**FORT WEAVER ROAD RESURFACING**  
N. of Laulaunui St. to the Vicinity of Hanakahi St.  
F. A. Project No. STP-076-1(5)  
Scale: As Shown Date: July, 1999

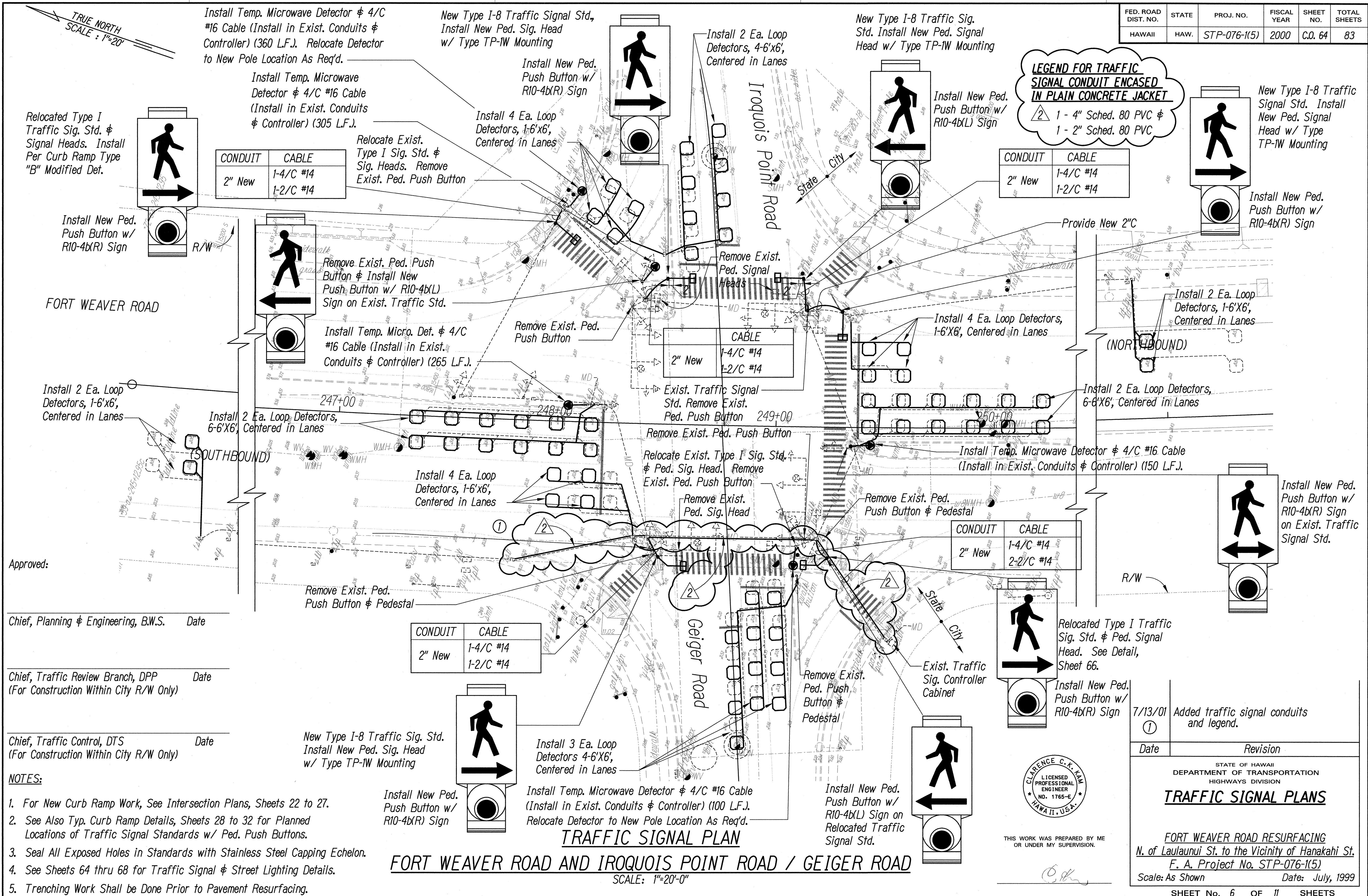
SHEET No. 5 OF 11 SHEETS

"AS-BUILT"

**C.O. 63**

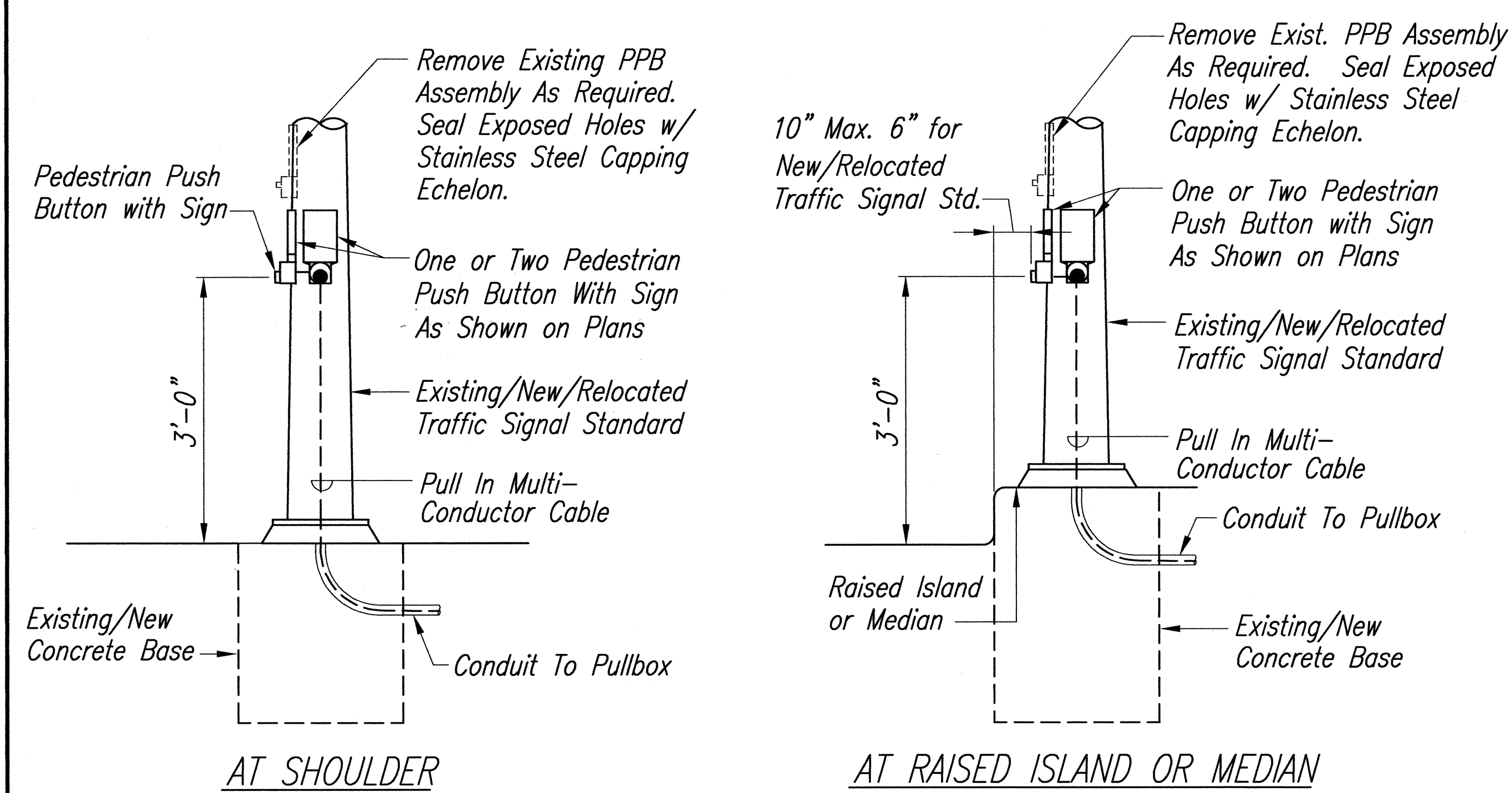


FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-076-1(5)	2000	C.O. 64	83



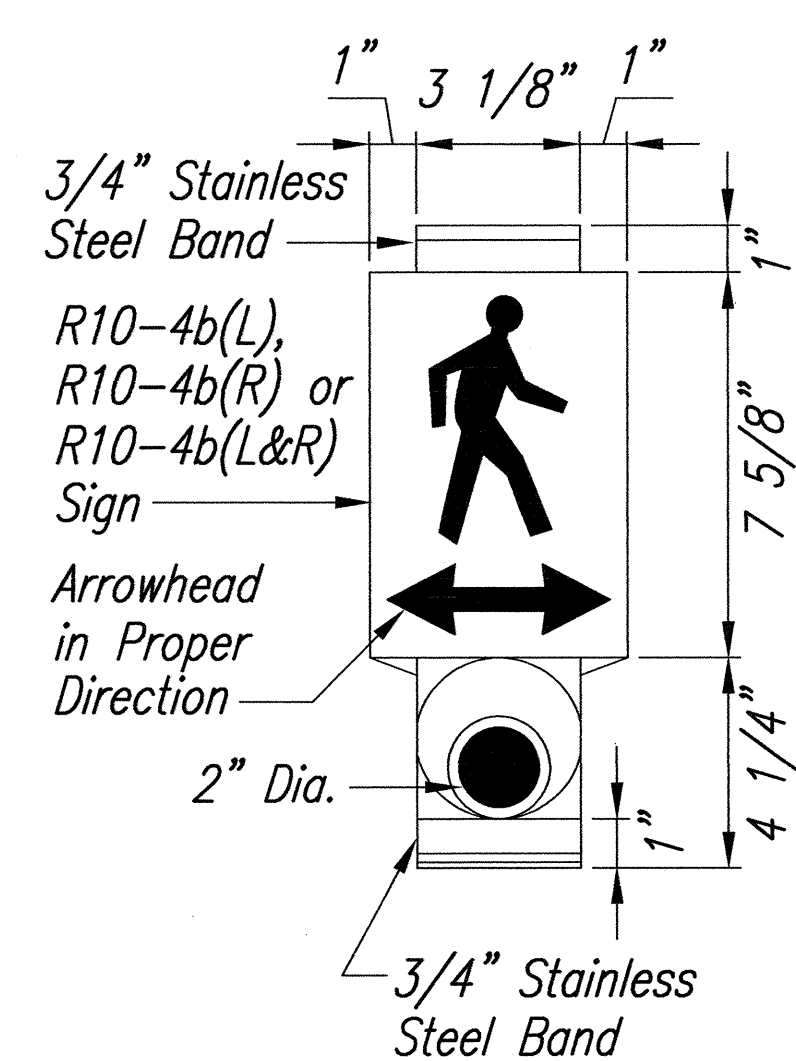


FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-076-1(5)	2000	65	83

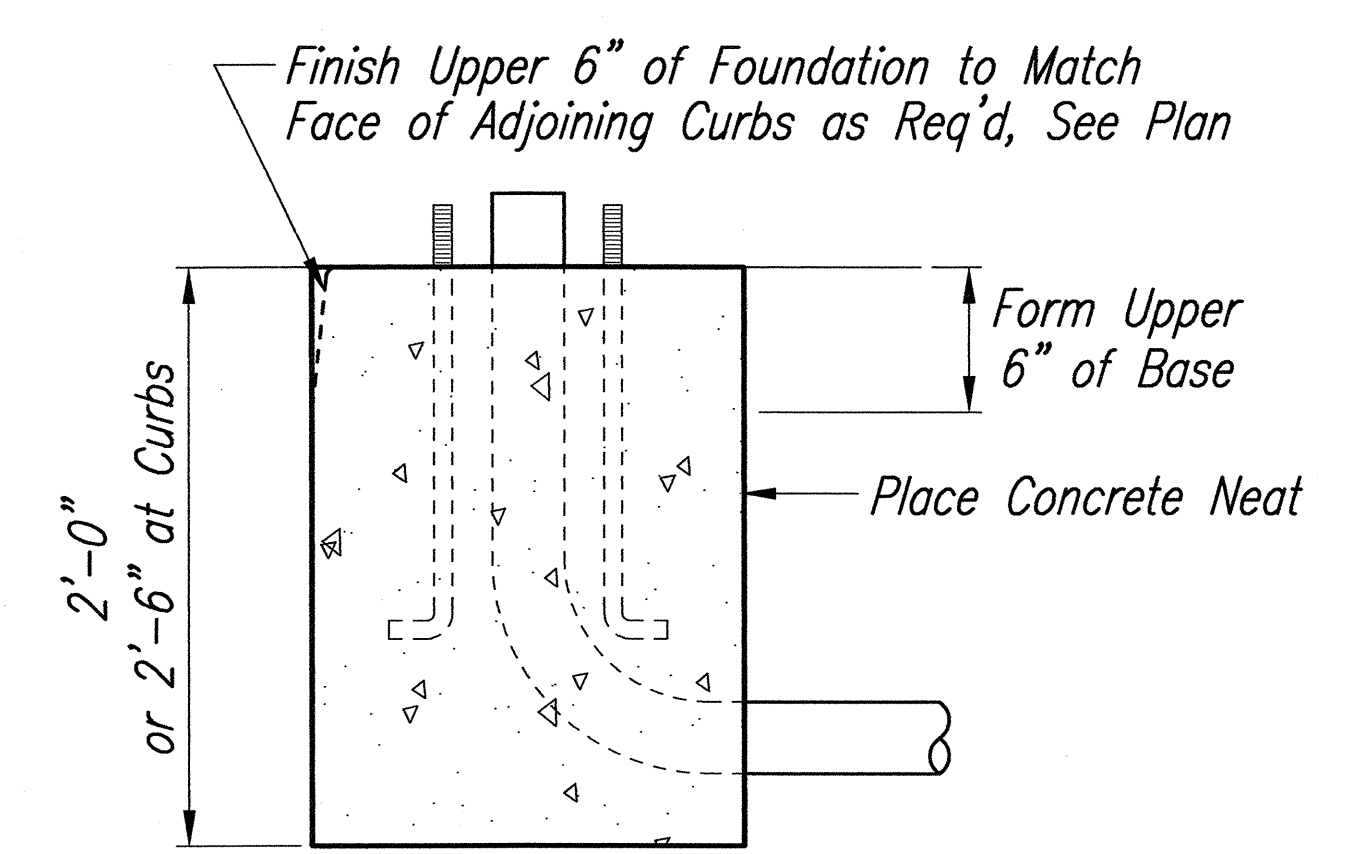
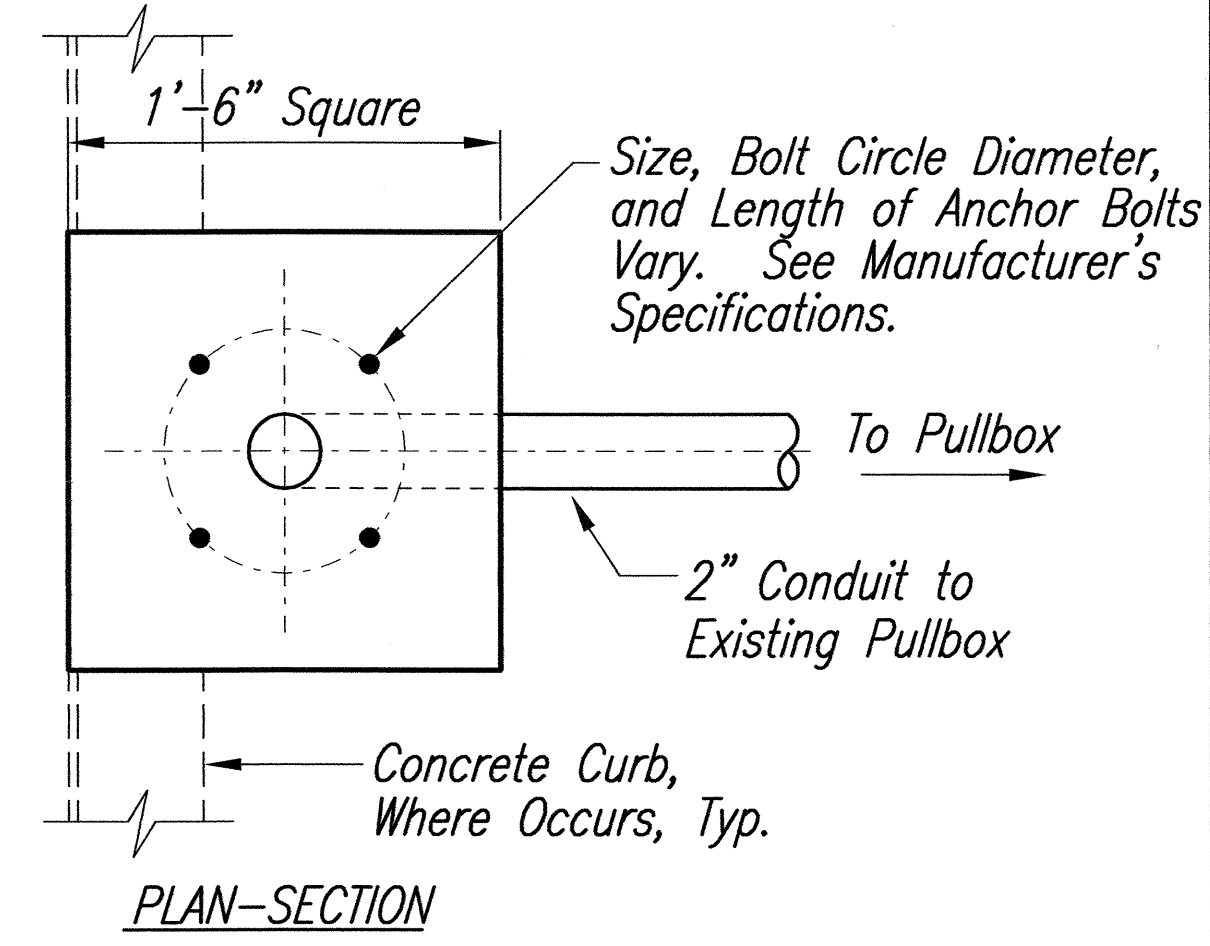


**PEDESTRIAN PUSHBUTTON INSTALLATION DETAILS**  
Not to Scale

- NOTES:**
1. The Pedestrian Push Button Unit Shall Consist of a One Piece Assembly with a Raise Walking Man, Arrow Indication and Push Button.
  2. The Push Button Activator Shall be of the Mushroom Plunger Type, ADA Acceptable, 2-inches in Diameter that Requires Less Than 5 lbs. of Pressure to Activate.
  3. The Raised Man and Arrows Shall be Directional and Match the Directional Indication as Shown on the Plans.
  4. The Push Button Shall be Tamper Proof, Weatherproof and Constructed so that Electrical Shocks are Impossible.
  5. The Color Scheme Shall Be:  
White - Man, Arrow and Push Button  
Black - Background



**PEDESTRIAN PUSHBUTTON DETAILS**  
Not to Scale



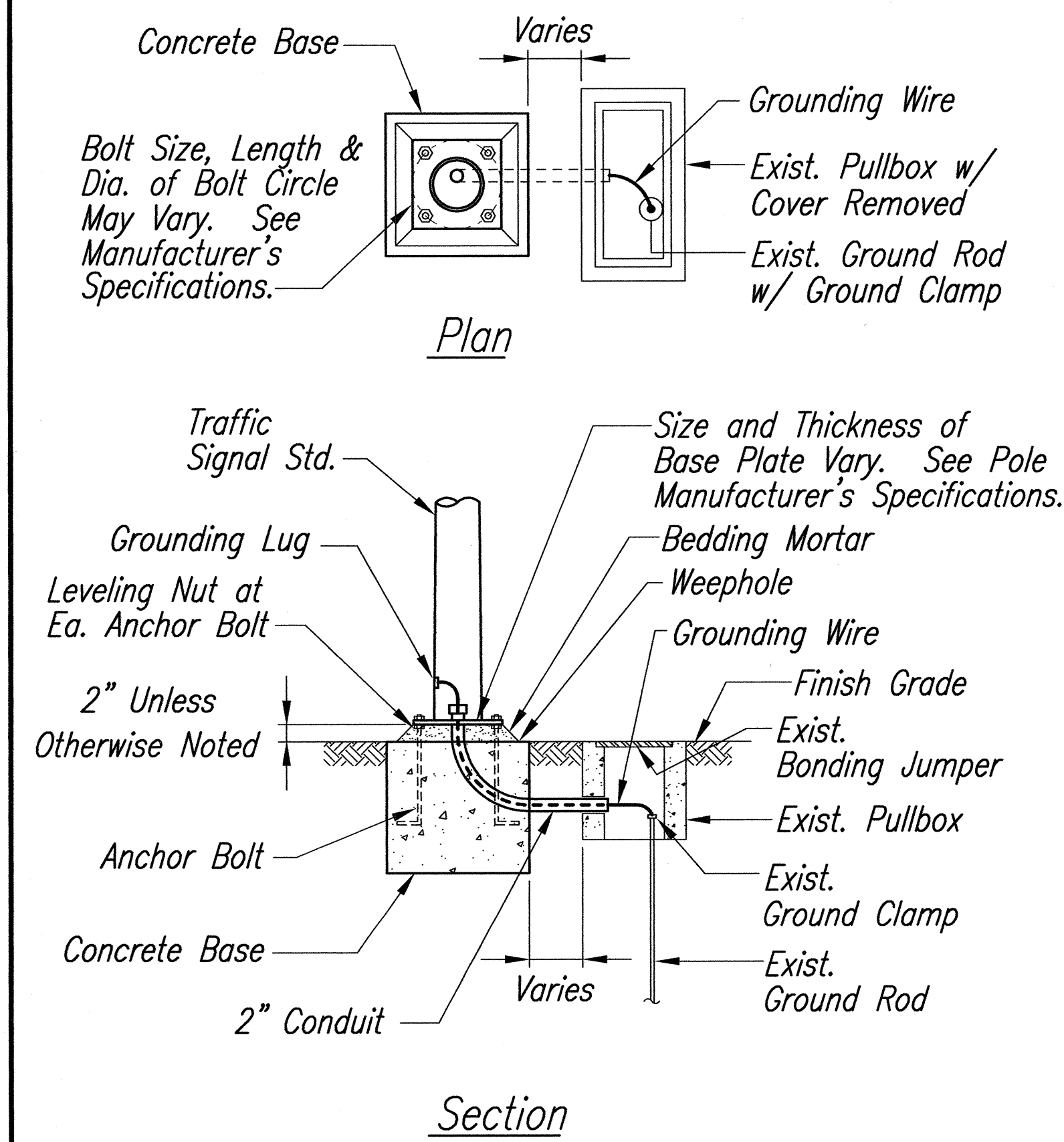
- NOTES:**
1. Concrete Shall be Class "B"
  2. Type "A" Concrete Base Shall be Used for Types 1-10 & 1-8 Traffic Signal Standards.
  3. Conduit Bend is Incidental to Concrete Base.

**TYPE "A" CONCRETE BASE**  
Not to Scale

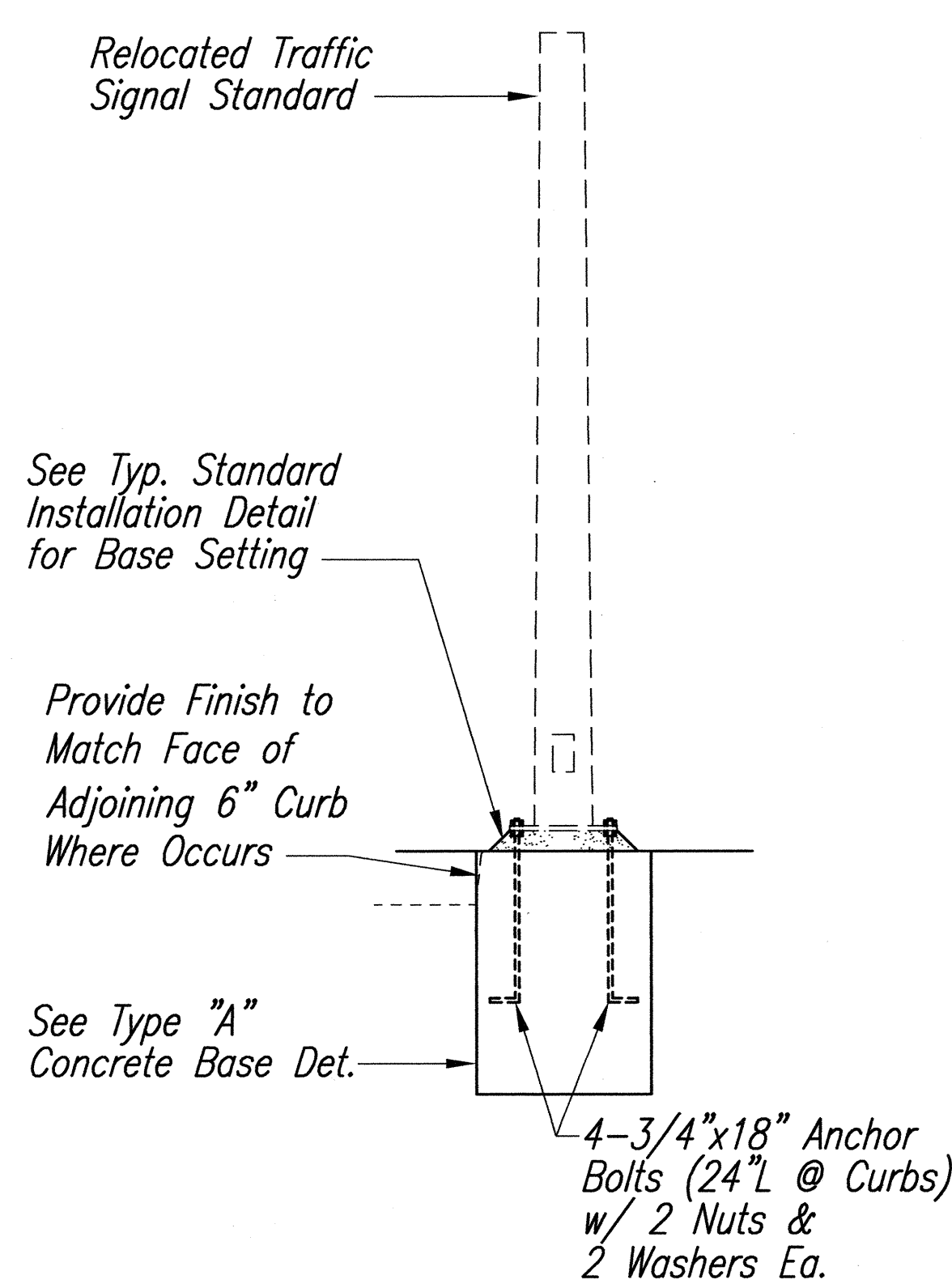
Approved:

*[Signature]* 11/23/99  
Chief, Traffic Review Branch, DPP  
(For Construction Within City R/W Only)

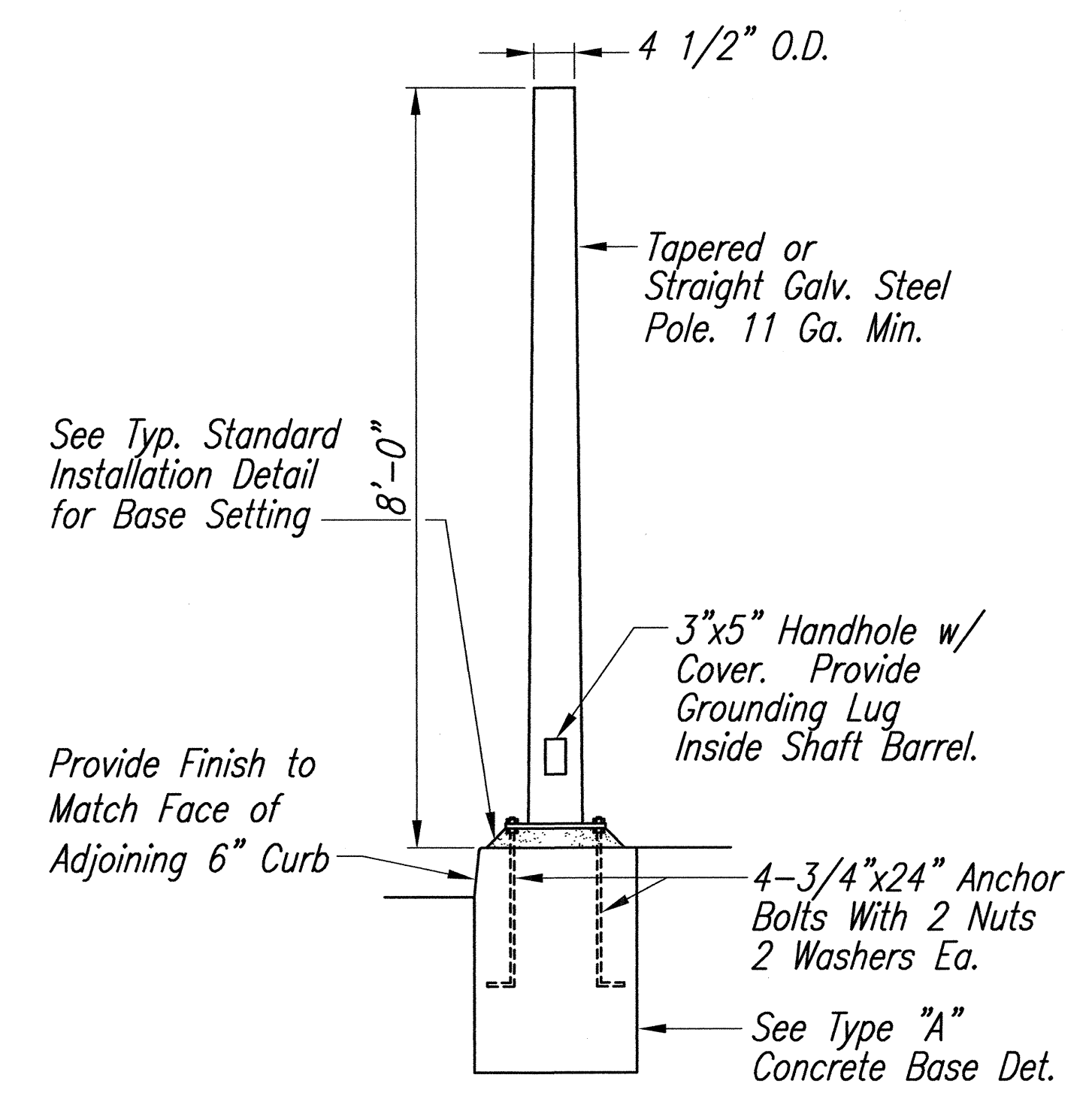
*[Signature]* 11/17/99  
Chief, Traffic Control, DTS  
(For Construction Within City R/W Only)



**TYPICAL STANDARD INSTALLATION**  
Not to Scale



**RELOCATED TYPE 1 TRAFFIC SIGNAL STANDARD**  
Not to Scale



**TYPE 1-8 TRAFFIC SIGNAL STANDARD**  
Not to Scale



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*[Signature]*

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**TRAFFIC SIGNAL DETAILS**

**FORT WEAVER ROAD RESURFACING**  
N. of Laulauui St. to the Vicinity of Hanakahi St.  
F. A. Project No. STP-076-1(5)

Scale: As Shown Date: July, 1999

SHEET No. 7 OF 10 SHEETS

DATE: \_\_\_\_\_

SURVEY PLOTTED BY: \_\_\_\_\_

DESIGNED BY: \_\_\_\_\_

NOTED BY: \_\_\_\_\_

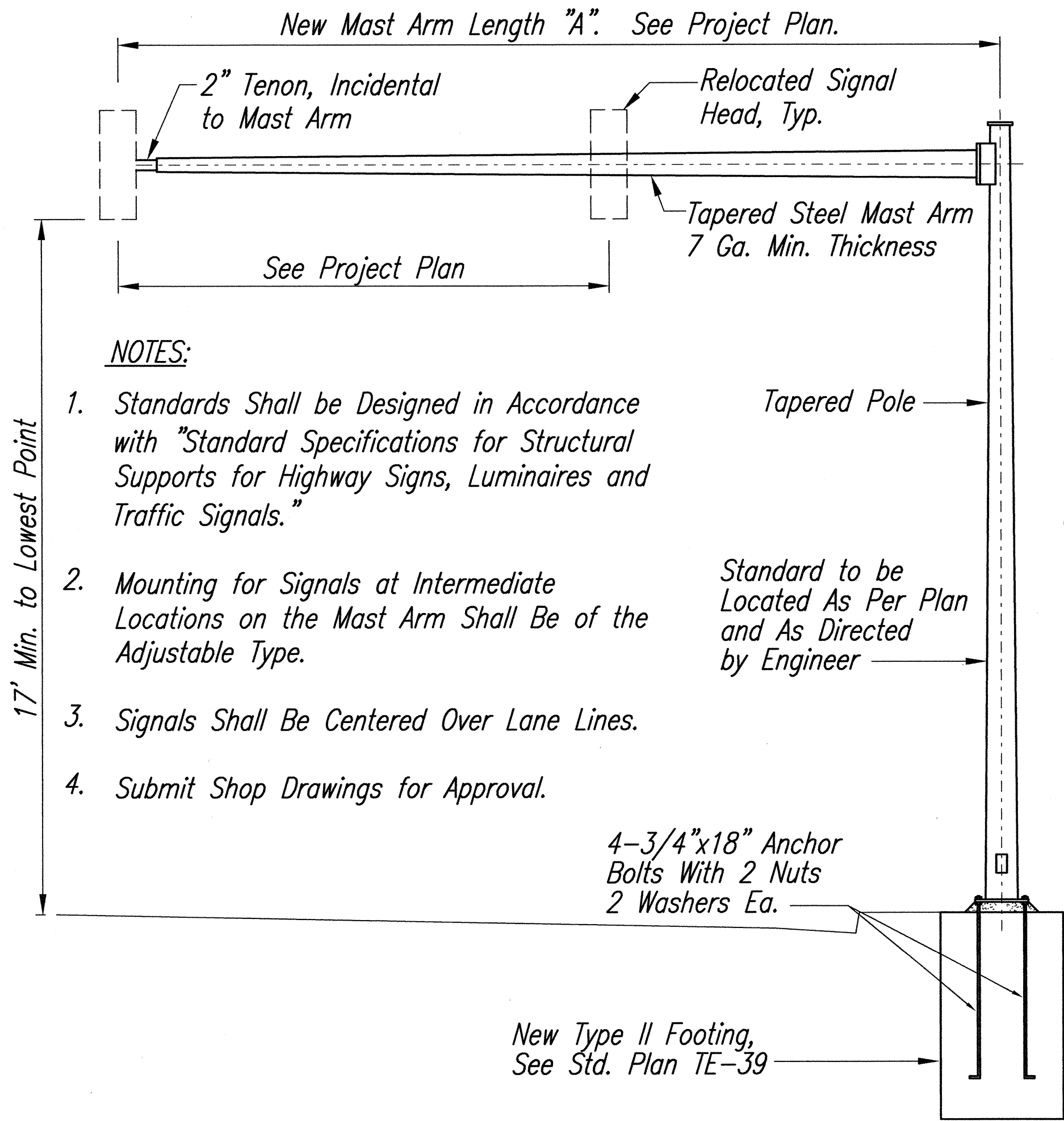
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ORIGINAL PLAN: \_\_\_\_\_

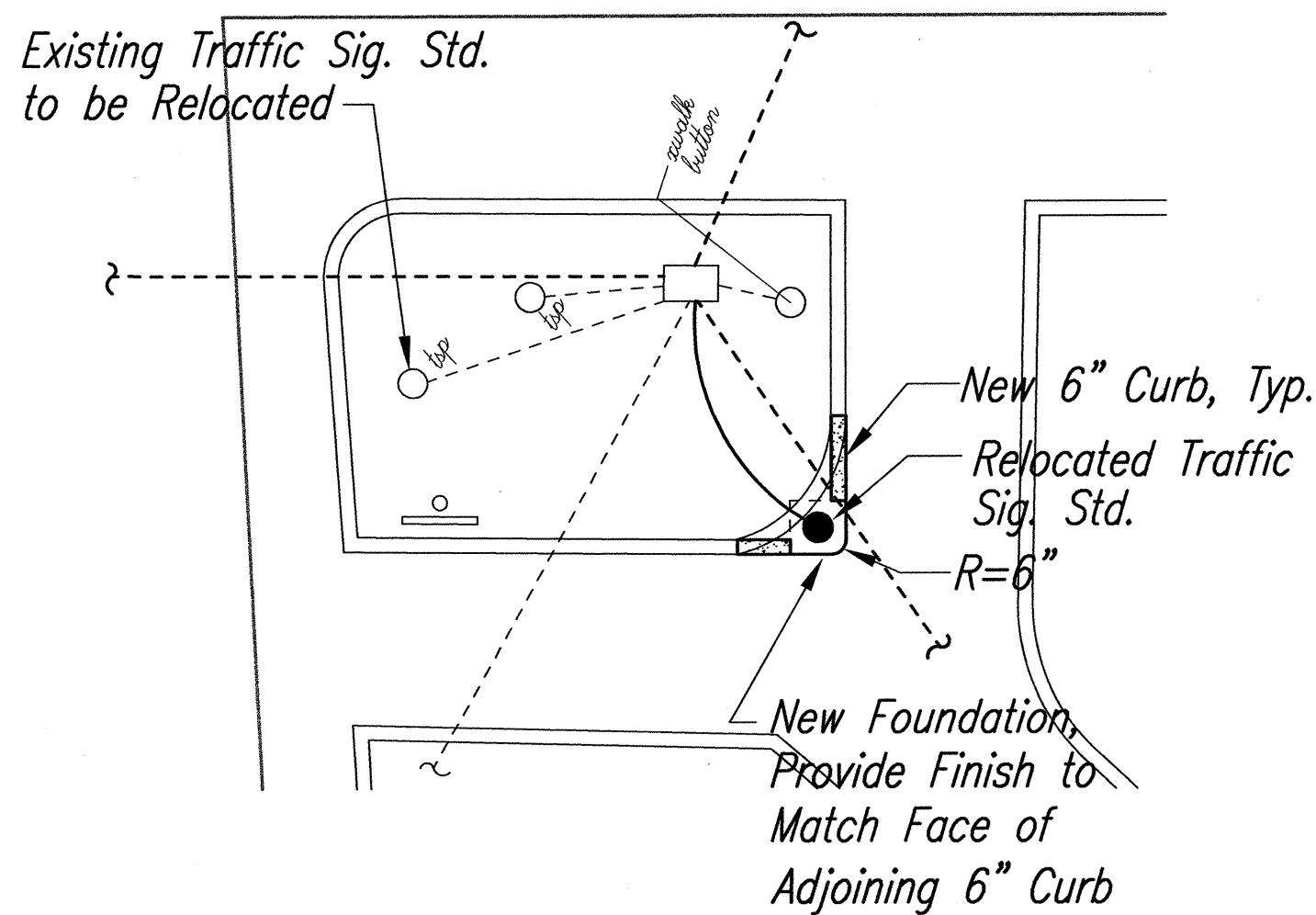
NOTE BOOK: \_\_\_\_\_

NO. \_\_\_\_\_

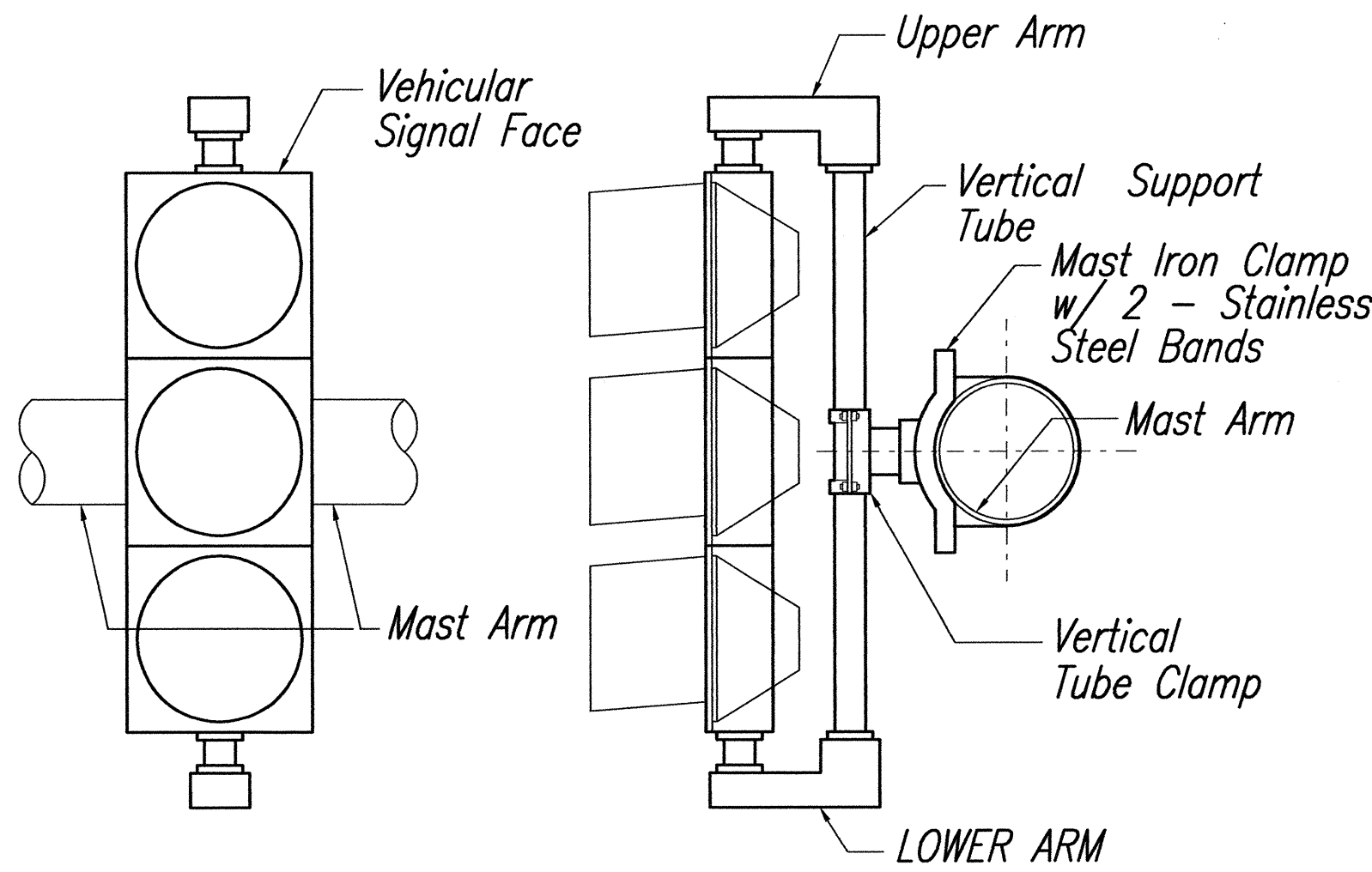
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-076-1(5)	2000	66	83



**TYPE II-"A" TRAFFIC SIGNAL STANDARD**  
Not to Scale



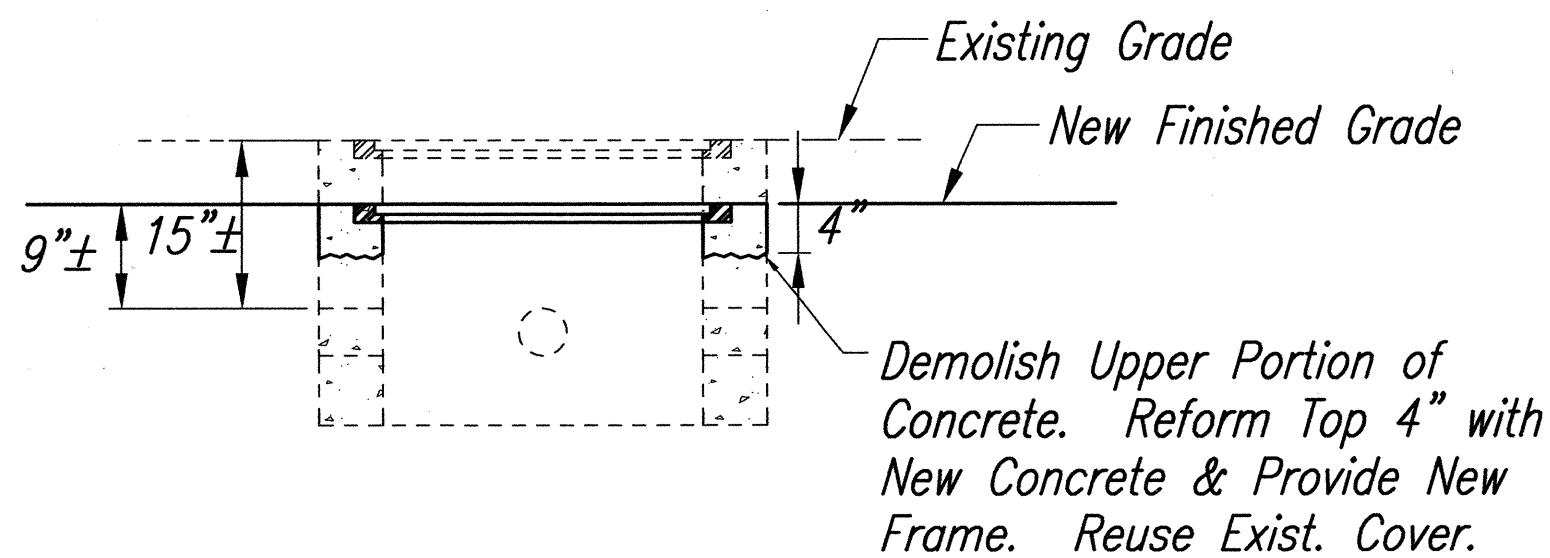
**POLE RELOCATION DETAIL**  
**@ FT WEAVER/GEIGER INTERSECTION**  
Not to Scale



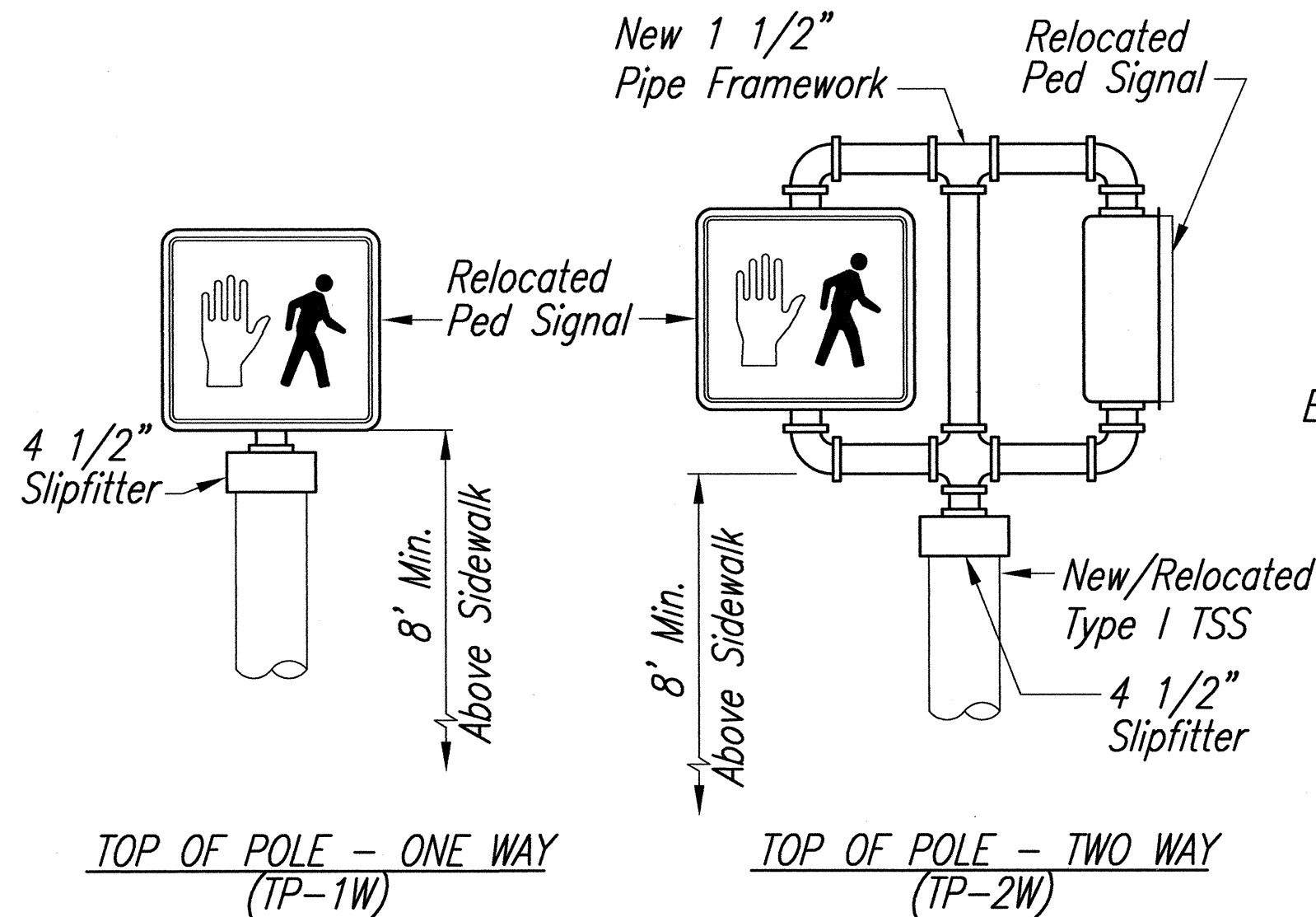
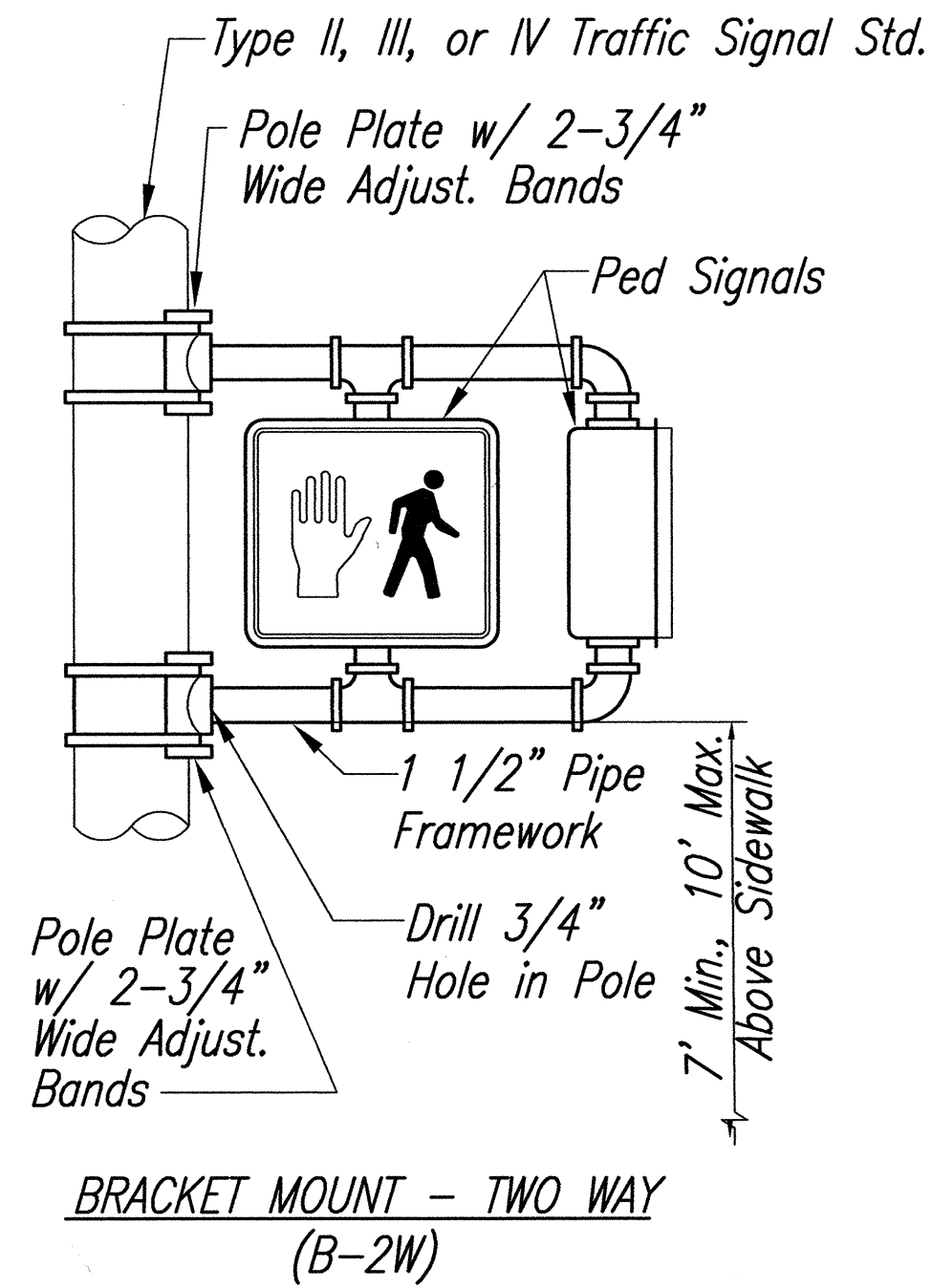
**ADJUSTABLE MAST ARM**  
**ONE WAY MOUNTING AT INTERMEDIATE POINT**  
MA-1W(1)

- NOTE:
- Stainless Steel Bands Shall be 1/2" Wide x 0.050" Thick, Min. Tensile Strength Shall be 100,000 psi Min.
  - Upper Arm, Lower Arm and Vertical Support Tube Shall be of 356 Cast Aluminum
  - All Wiring Shall be Concealed.
  - Vertical Tube Clamp Shall be Malleable Iron, Grade 32510.
  - All Aluminum Parts Shall Have an Alodine 1200 Finish.

**VEHICULAR SIGNAL MOUNTINGS**  
Not to Scale



**PULLBOX ADJUSTMENT DETAIL**  
Not to Scale



**PEDESTRIAN SIGNAL MOUNTINGS**  
Not to Scale

Approved:

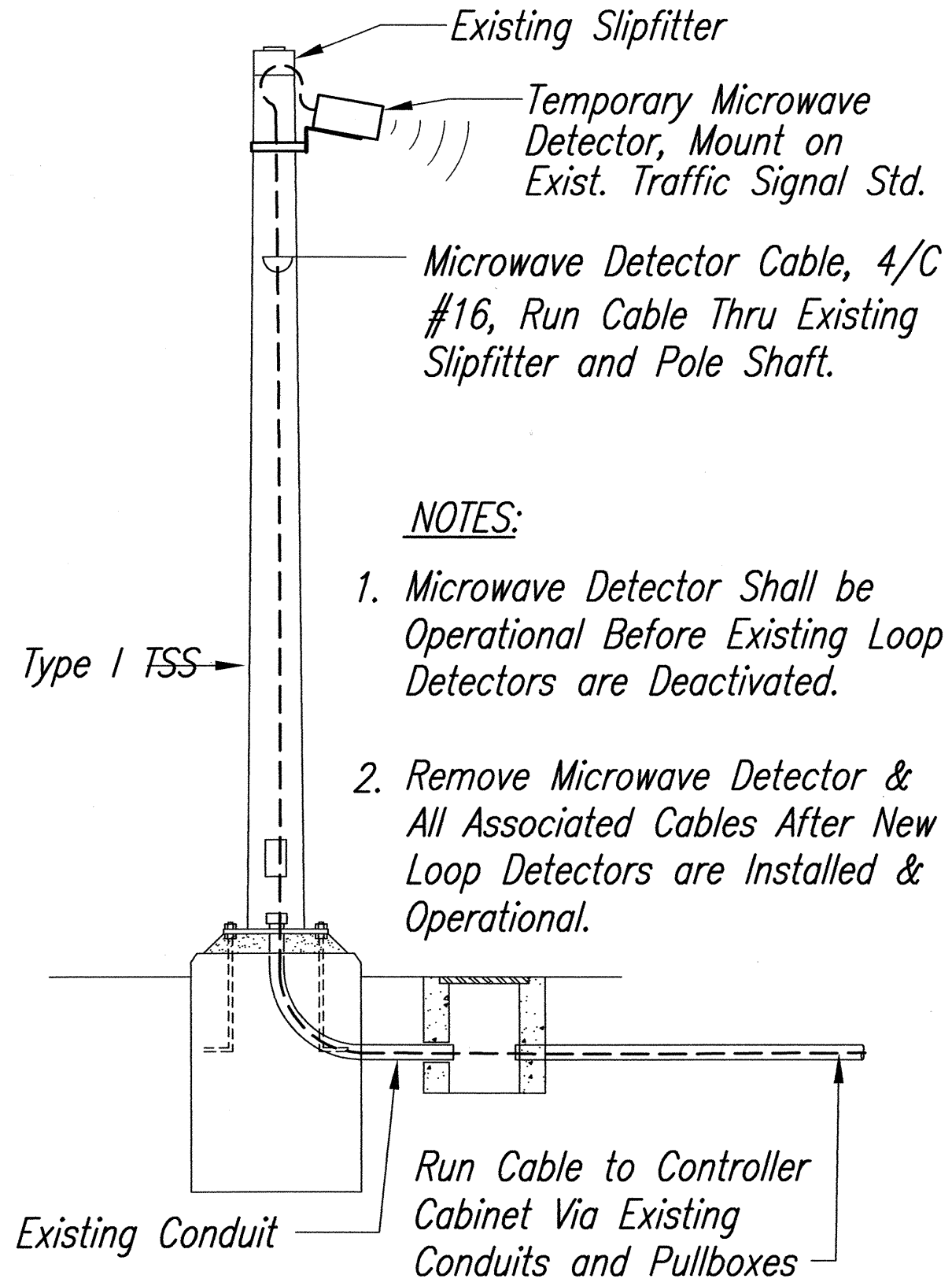
*[Signature]* Date  
Chief, Traffic Review Branch, DPP  
(For Construction Within City R/W Only)

*[Signature]* 11/17/99 Date  
Chief, Traffic Control, DTS  
(For Construction Within City R/W Only)

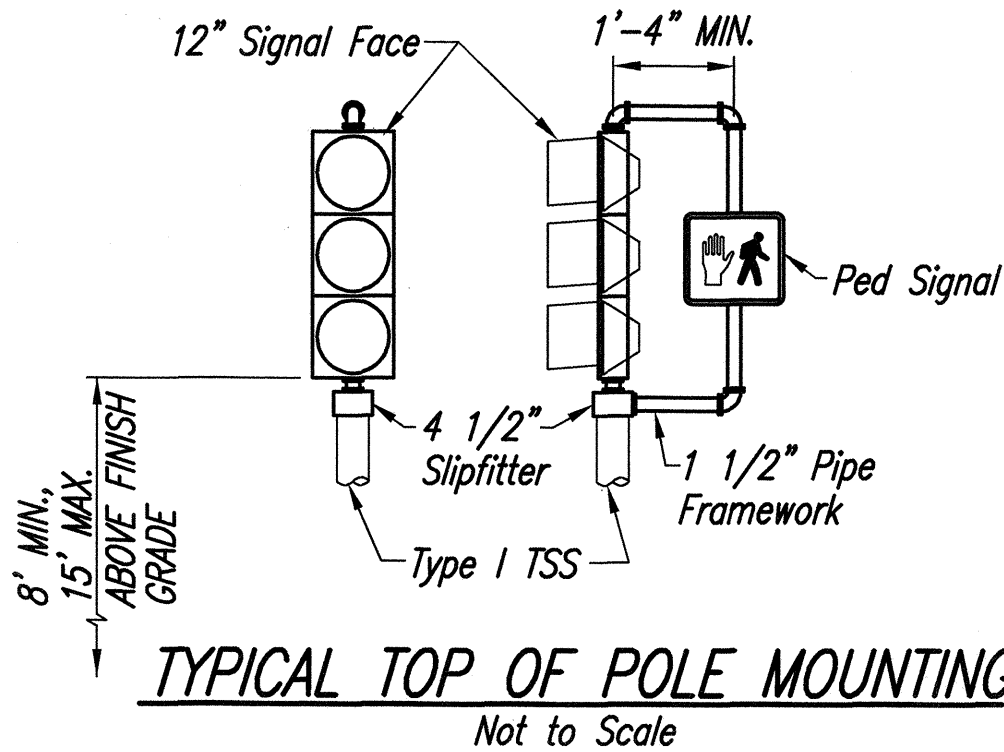


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*[Signature]*



**TEMPORARY MICROWAVE DETECTOR DETAIL**  
Not to Scale



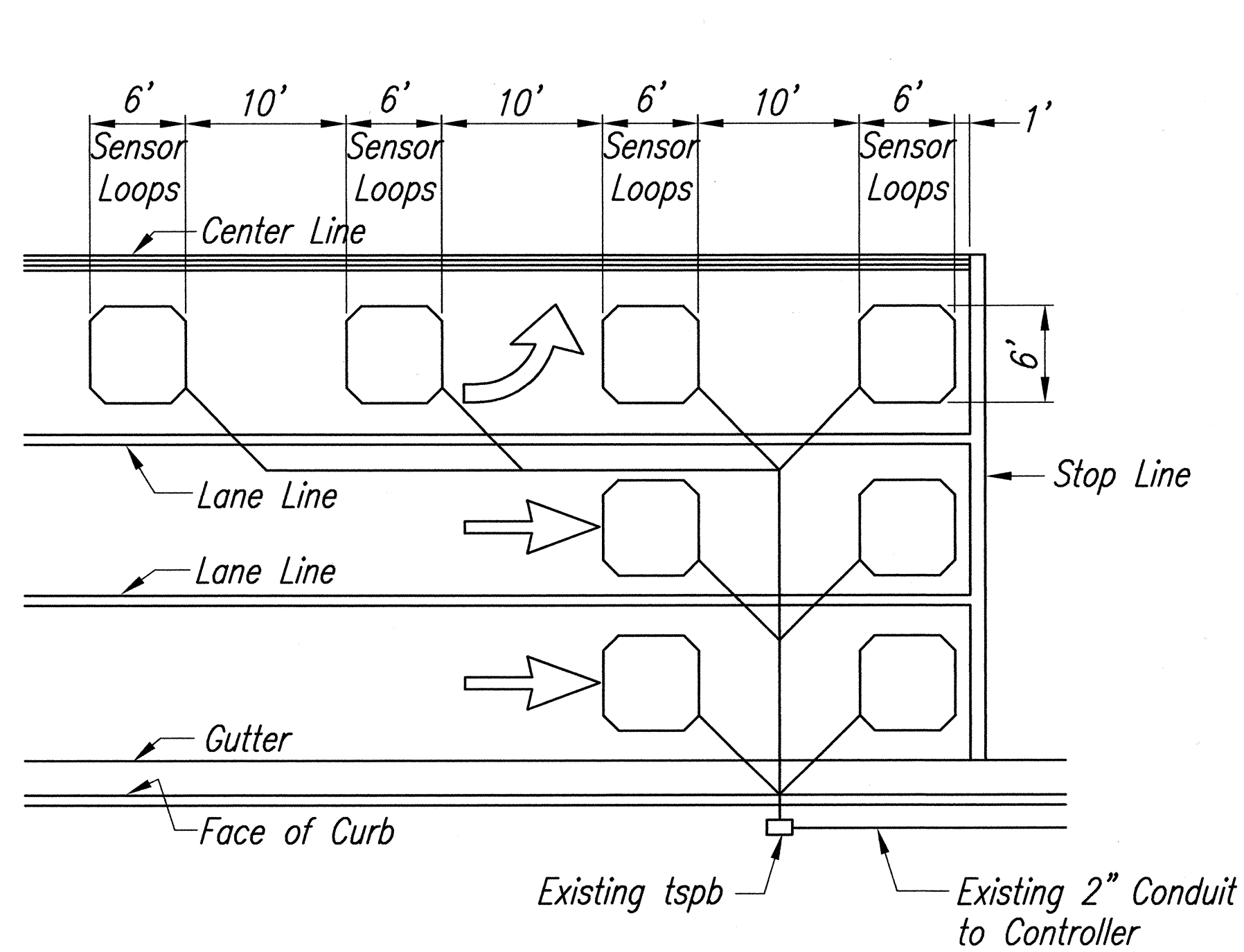
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**TRAFFIC SIGNAL DETAILS**

**FORT WEAVER ROAD RESURFACING**  
**N. of Laulauui St. to the Vicinity of Hanakahi St.**  
**F. A. Project No. STP-076-1(5)**  
Scale: Date: July, 1999

SHEET No. 8 OF 10 SHEETS

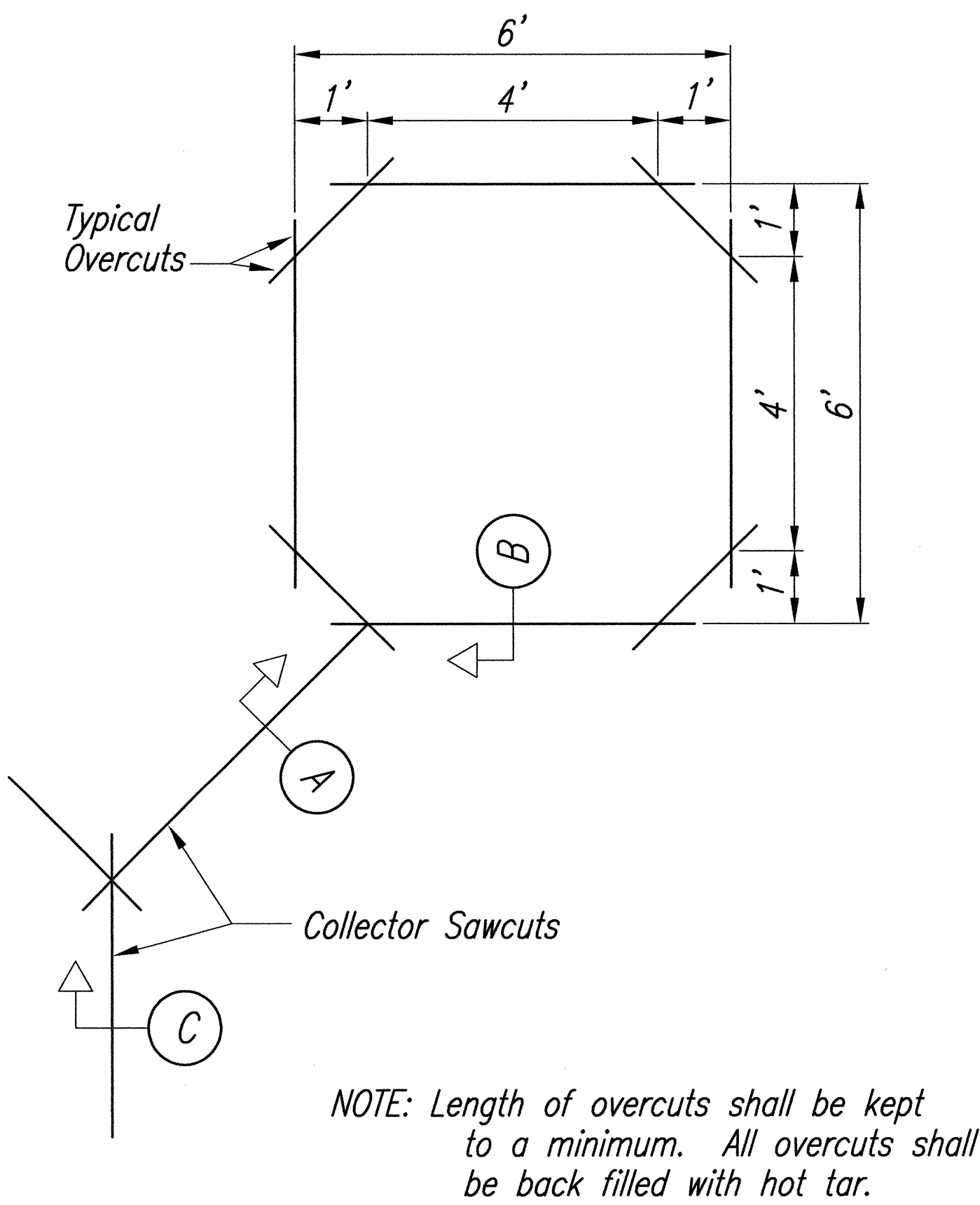


FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-076-1(5)	2000	67	83

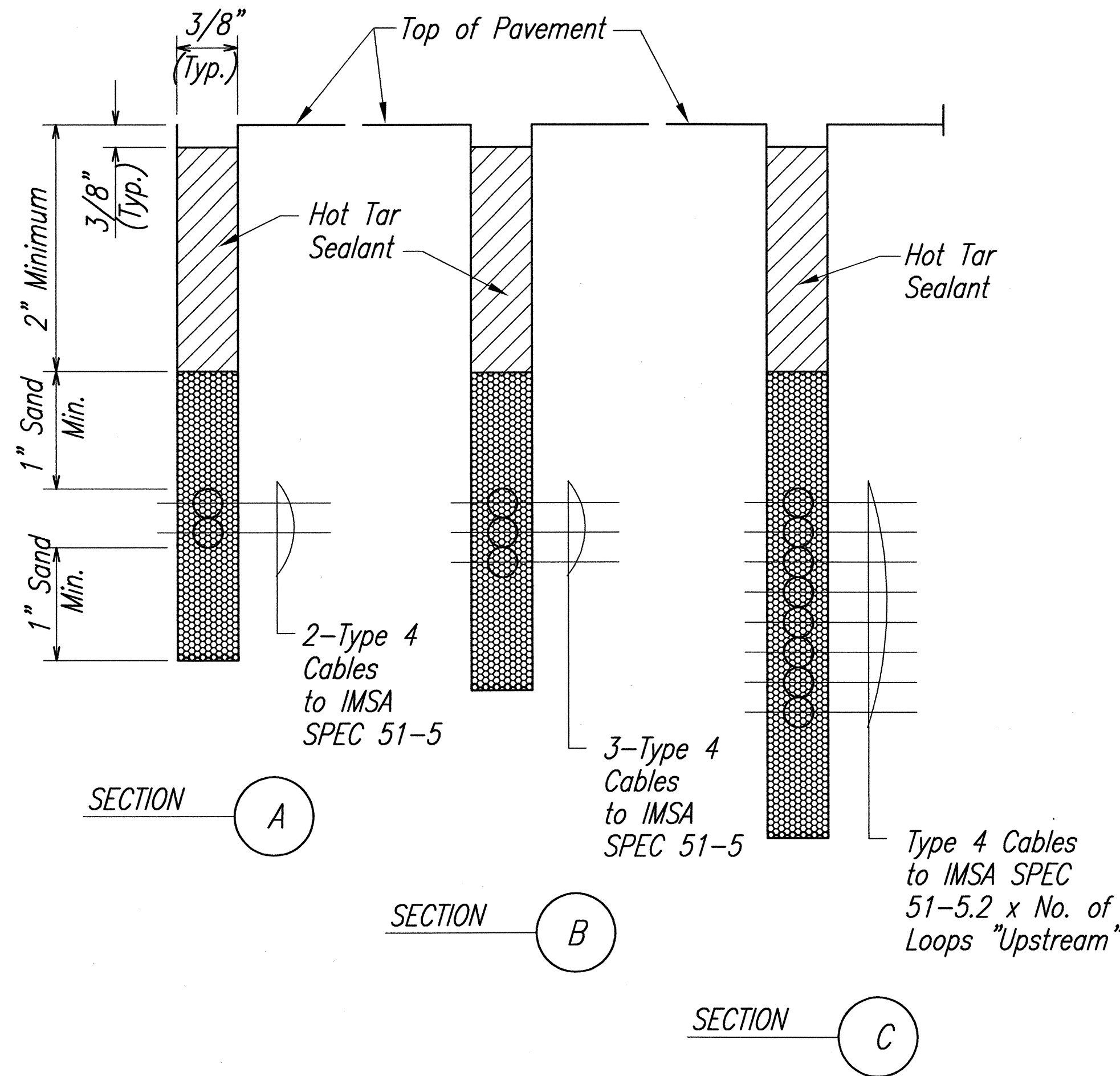


- NOTES:
- Center sensor loops in lanes.
  - Collector cables shall be twisted 2 turns per foot.
  - Number of loops and locations vary. See project plans.
  - Number and locations of collector sawcuts may be varied in the field to suit.

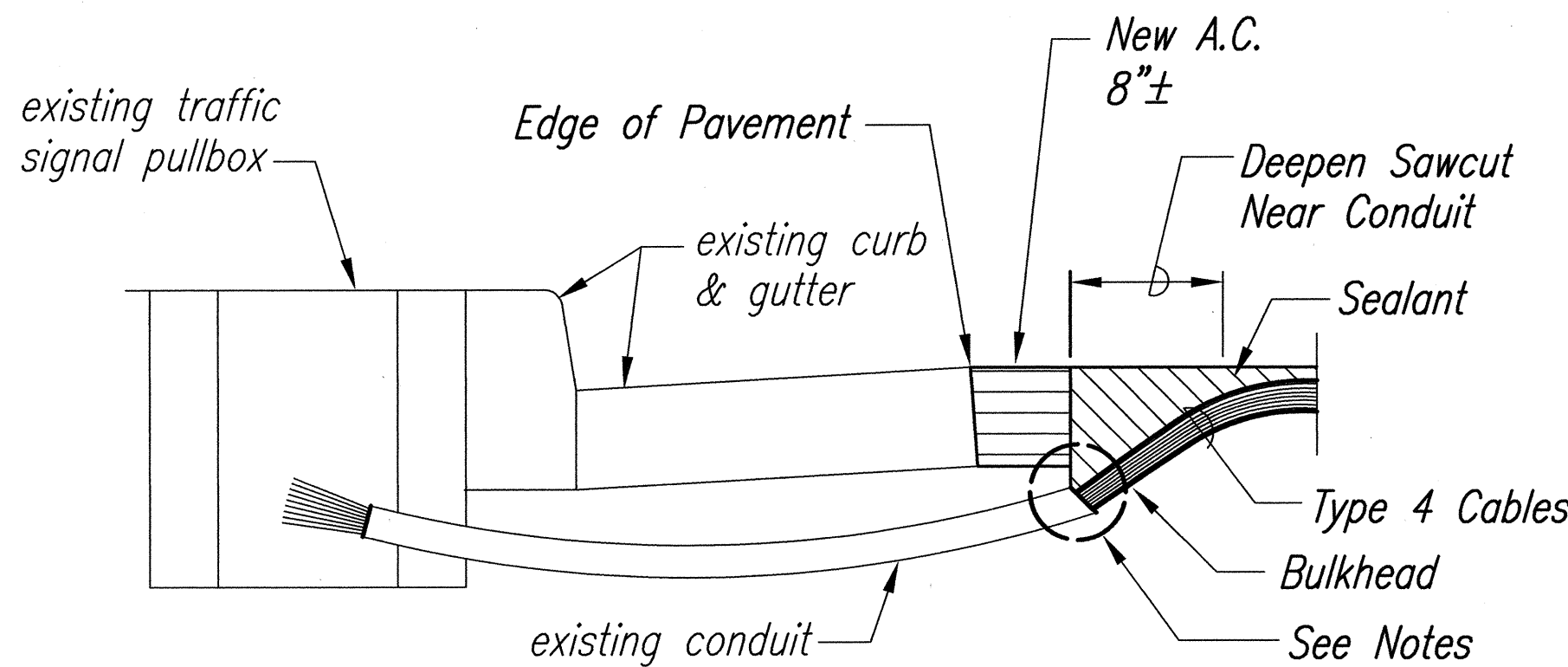
**TYPICAL SENSOR LOOP LAYOUT**  
Not to Scale



**TYPICAL SENSOR LOOP SAWCUT DETAIL**  
Not to Scale

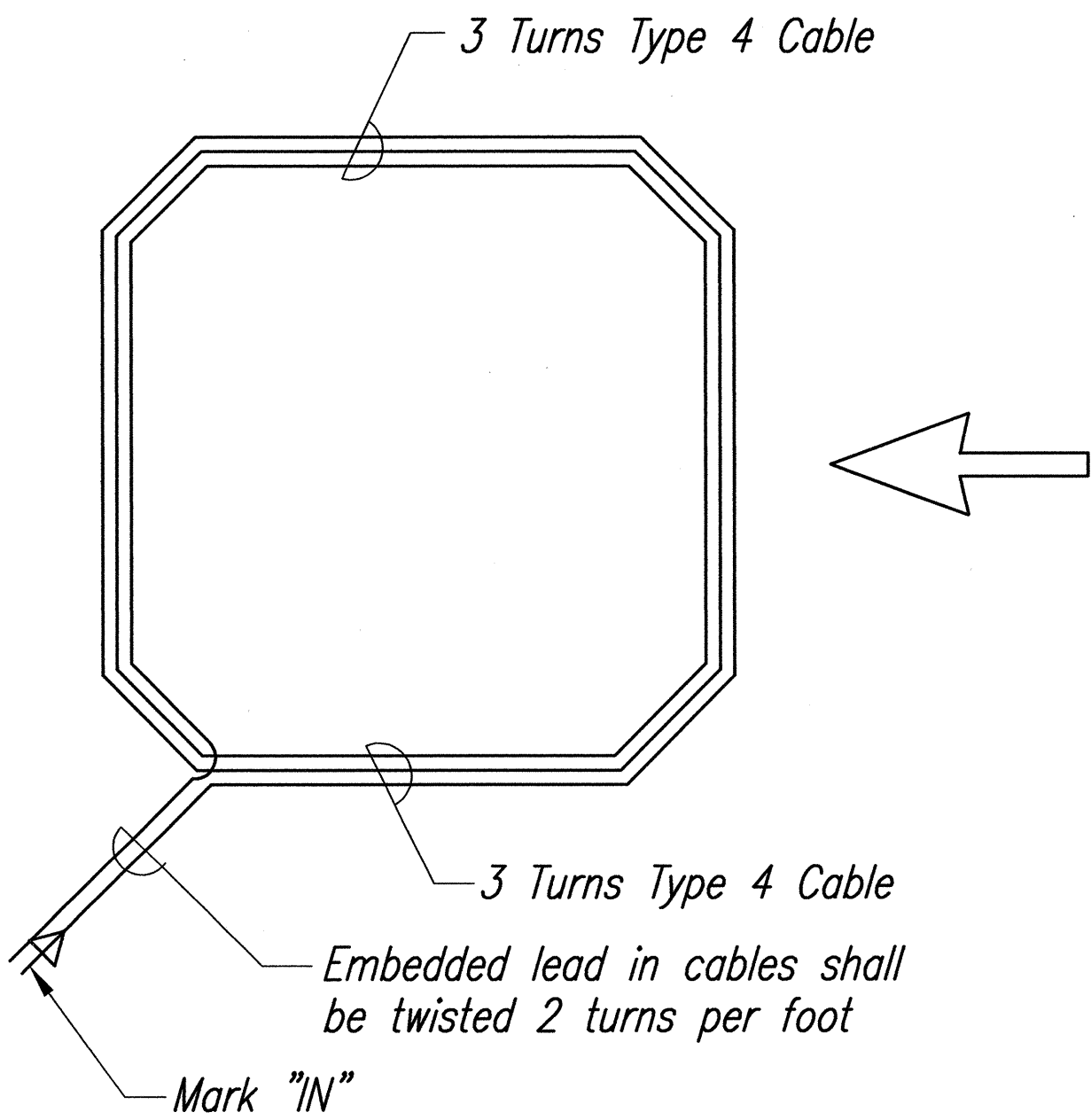


**TYPICAL SECTION THROUGH SENSOR LOOP**  
Not to Scale



- NOTES:
- Seal Roadway End Of Conduit After Installation Of Conductors.
  - Install Bulkhead Across Conduit Trench.
  - Place Approved Sealant In Sawcut.
  - Backfill Over Conduit With New A.C.
  - Reconstruct Curb & Gutter As Required.

**SENSOR LOOP INSTALLATION AT  
EDGE OF ROADWAY**  
Not to Scale



**TYPICAL SENSOR LOOP WIRING DIAGRAM**  
Not to Scale

Approved:

*[Signature]* *[Signature]* *[Signature]*  
 Chief, Traffic Review Branch, DPP Date  
 (For Construction Within City R/W Only)

*[Signature]* *[Signature]* *[Signature]*  
 Chief, Traffic Control, DTS Date  
 (For Construction Within City R/W Only)



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OR UNDER MY SUPERVISION.

*[Signature]*

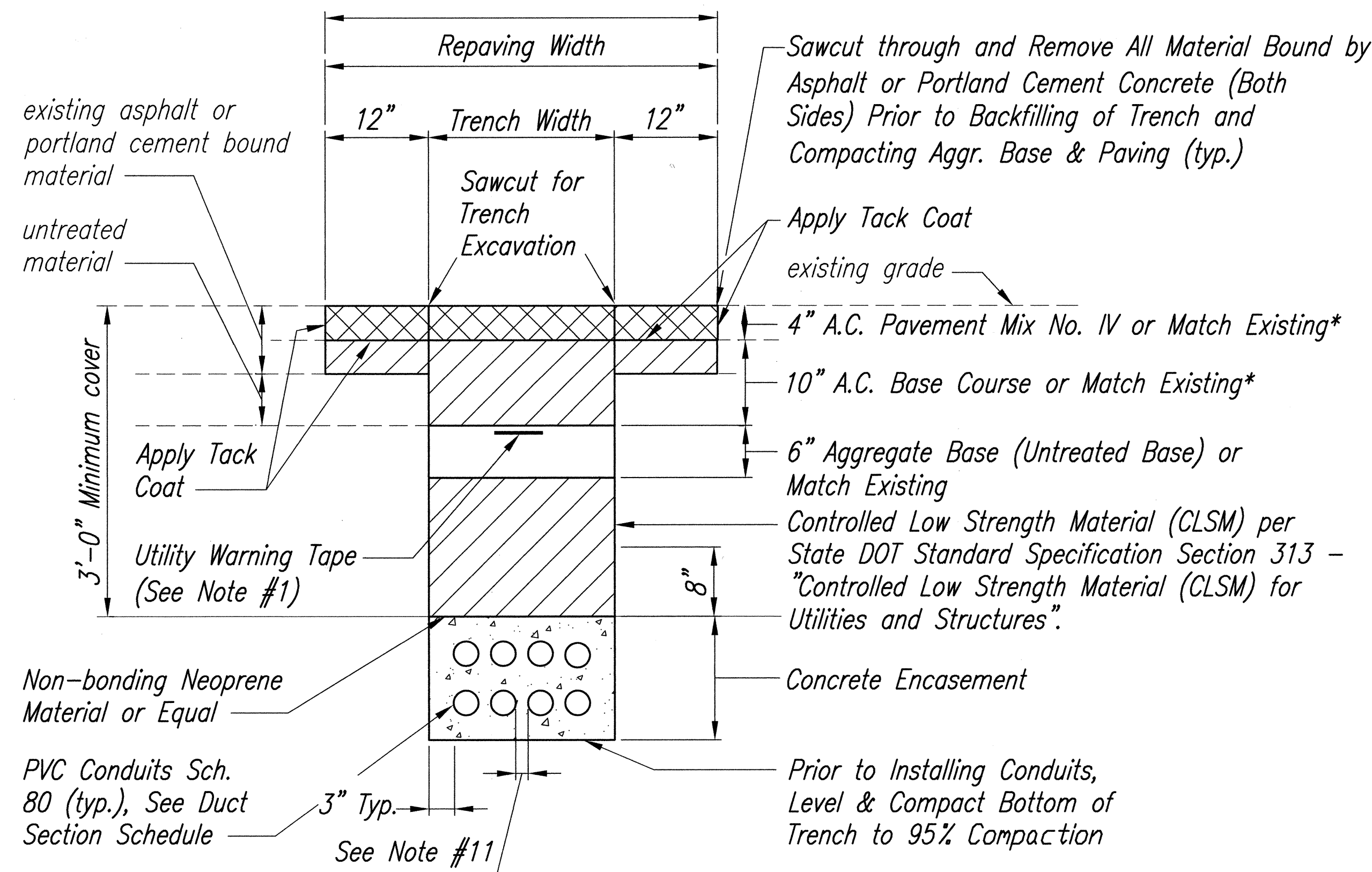
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**TRAFFIC SIGNAL DETAILS**

**FORT WEAVER ROAD RESURFACING**  
**N. of Lualunui St. to the Vicinity of Hanakahi St.**  
**F. A. Project No. STP-076-1(5)**  
Scale: As Shown Date: July, 1999  
SHEET No. 9 OF 10 SHEETS

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

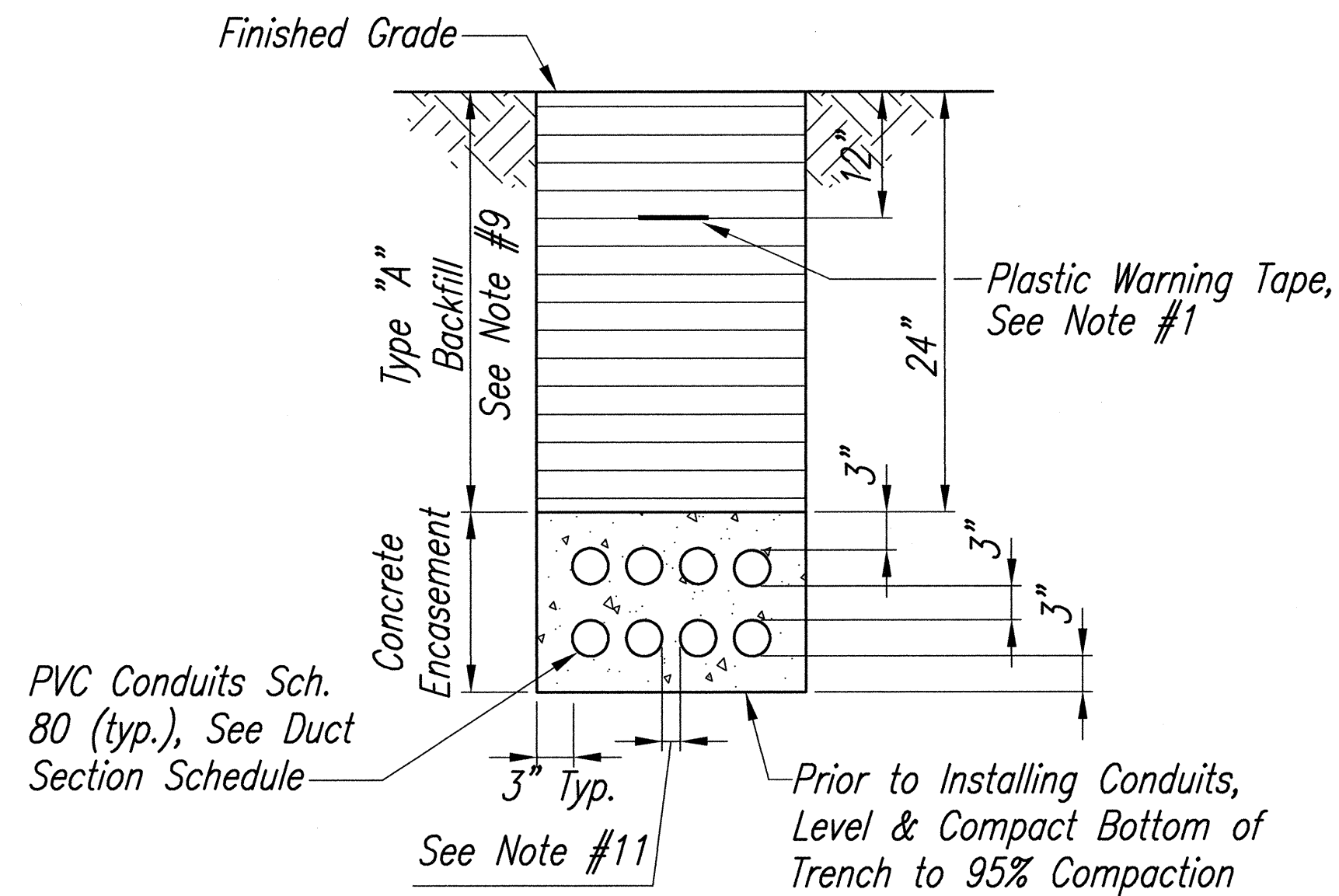


FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-076-1(5)	2000	68	83



\* Minimum Thickness or Replace to Existing Thickness if Greater.

#### A.C. PAVEMENT AREAS



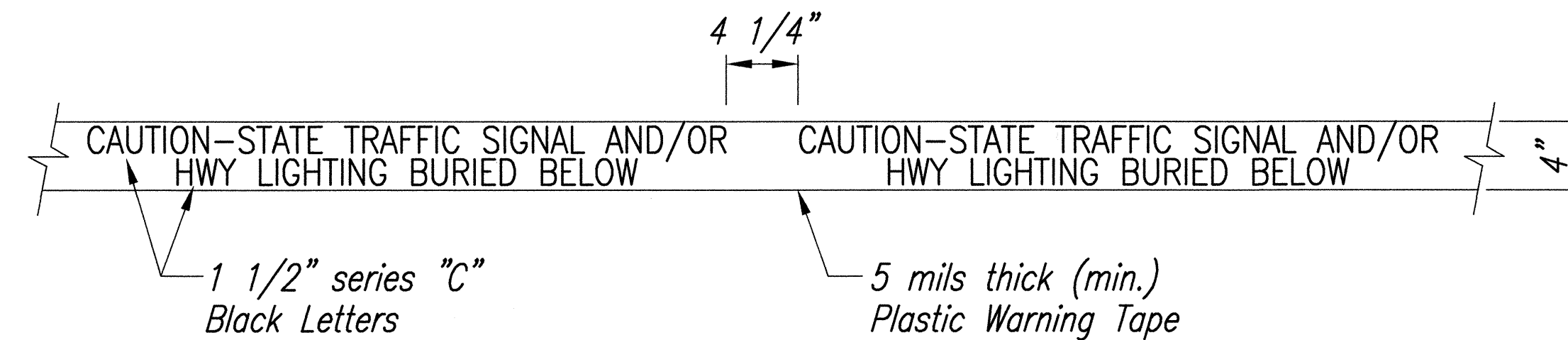
#### NON-PAVEMENT AREAS



#### TRENCH NOTES:

- 5 mil Thick Yellow Colored Plastic Warning Tape 4" Wide, Entire Length of Duct. Tape to have Continuous Metallic Backing and Corrosion Resistant Foil Core. Warning and Identification to be Imprinted on Tape and Shall Read, "CAUTION BURIED ELECTRIC CABLE, TELEPHONE CABLE, TRAFFIC SIGNAL AND/OR HWY LIGHTING BELOW". Message Shall be Repeated Approximately Every Ten Feet. Tape Shall be Considered Incidental to Ductline Work. See Detail, This Sheet.
- The Contractor May Begin Backfilling the Conduit Trench When the Concrete Reaches 2500 psi Compressive Strength.
- Maximum Four (4) Conduits Per Row for Multiple Conduit Duct Section.
- Saw Cut Existing Pavement, Curbs, Sidewalks and Repair to the Satisfaction of the Engineer.
- Excavation, Ductline Including Concrete Jacket, Backfill, Compaction, Shall be Completed and Ready for Acceptance. Incomplete Work Shall be Provided with Approved Safety Protection Measures.
- Traffic Bearing Pavement Shall be Completed and Ready for Traffic Each Day. During the Course of the Work, Maintain a Minimum of (11-foot wide) Traffic Lane at All Times.

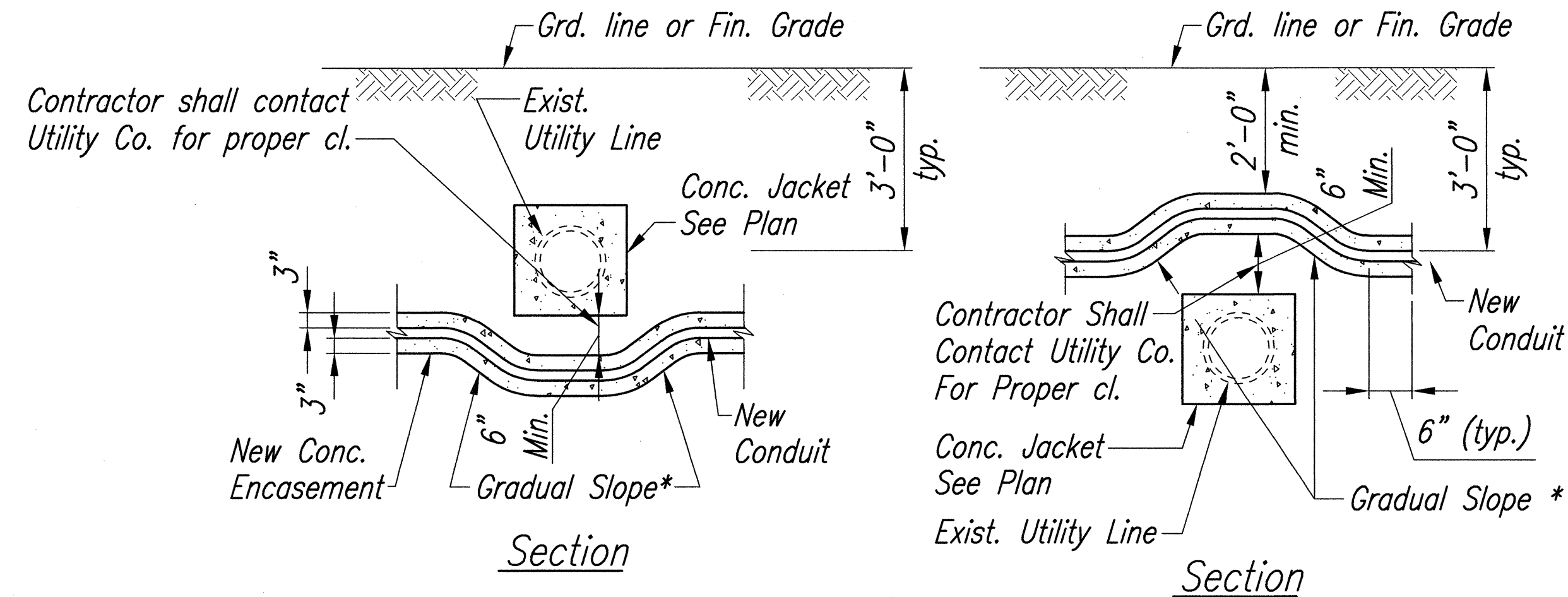
- Backfill Shall Include Appropriate Road Base and Subbase Courses to Match Existing Condition and Compaction to Standard Specifications Requirements.
- Trees and Shrub Encounters Shall be Avoided By Shifting Ductline. Adjust Ductline Route to Avoid Obstruction Both Above and Below Grade.
- For Grassed Area, Re-sod and Maintain Per Specifications.
- At Sidewalks, Replace the Entire Modular Section of Sidewalks From Construction Joint to Construction Joint). Trench Width Patches in Sidewalks Shall Not be Accepted. Replace Curbs and Gutters in Similar Manner.
- Provide 1 1/2" Separation Between Ducts of Same System.
- Where Ductlines and Other Utilities Exist, the New Ductline May be Constructed Adjacent to Existing. When Necessary, Dive Under Existing Ductline or Utilities for Crossover. Existing Ductline Shall Remain Active Until New Street Light System is Completed.
- Type "A" Backfill: Beach Sand, Earth, or 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.
- If Material Below Duct Is Not Equivalent to Backfill Material "A", Excavate Material and Provide 3" Backfill Material "A".



For additional information see note no. 1.

#### METAL DETECTABLE YELLOW PLASTIC WARNING TAPE

Not to Scale

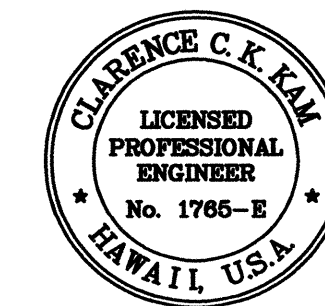
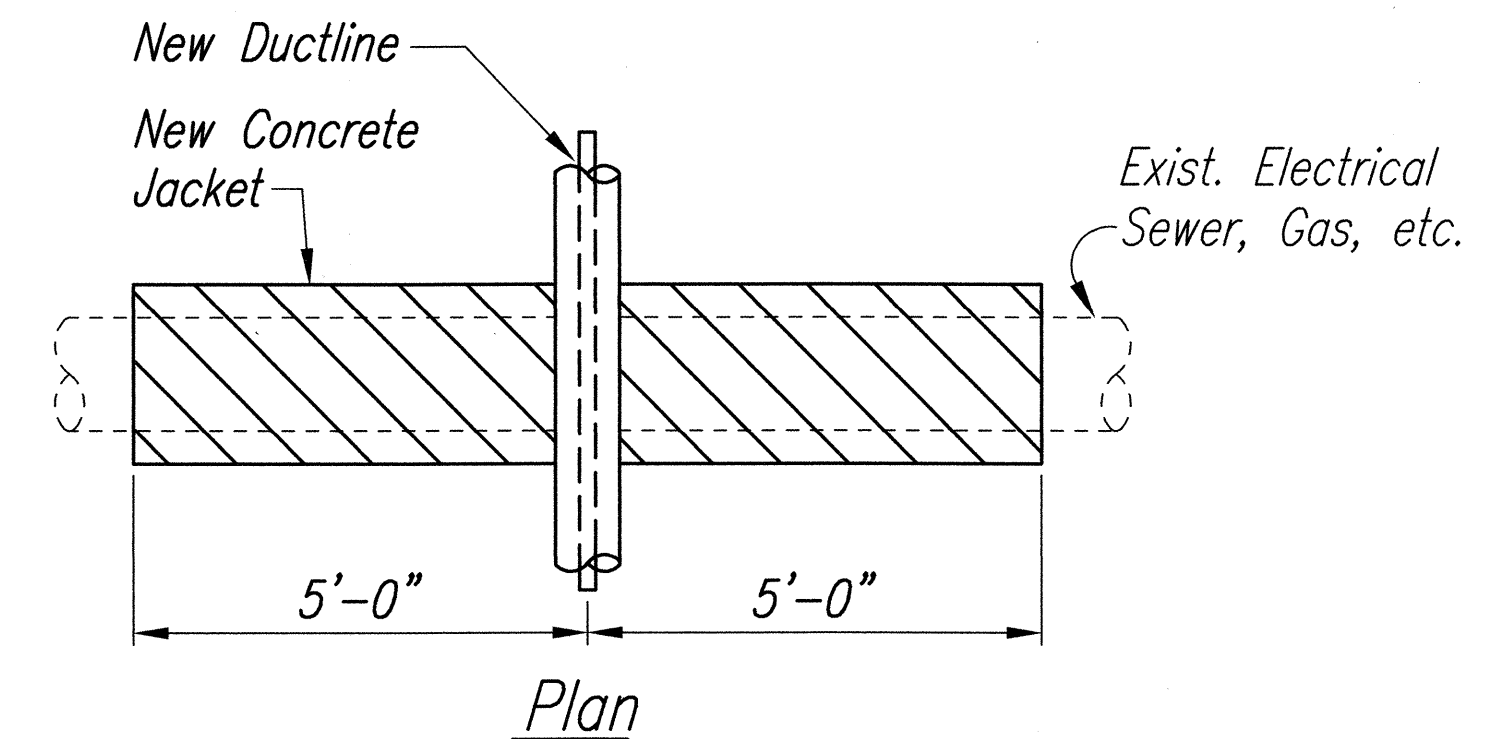


NOTE: Do not Jacket Water Lines. See General Notes for Proper Vertical Clearance.

\* To be determined by County Electrical Inspector/Engineer

#### CONDUIT BY-PASS DETAIL AT VARIOUS UTILITIES

Not to Scale



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C. Tam

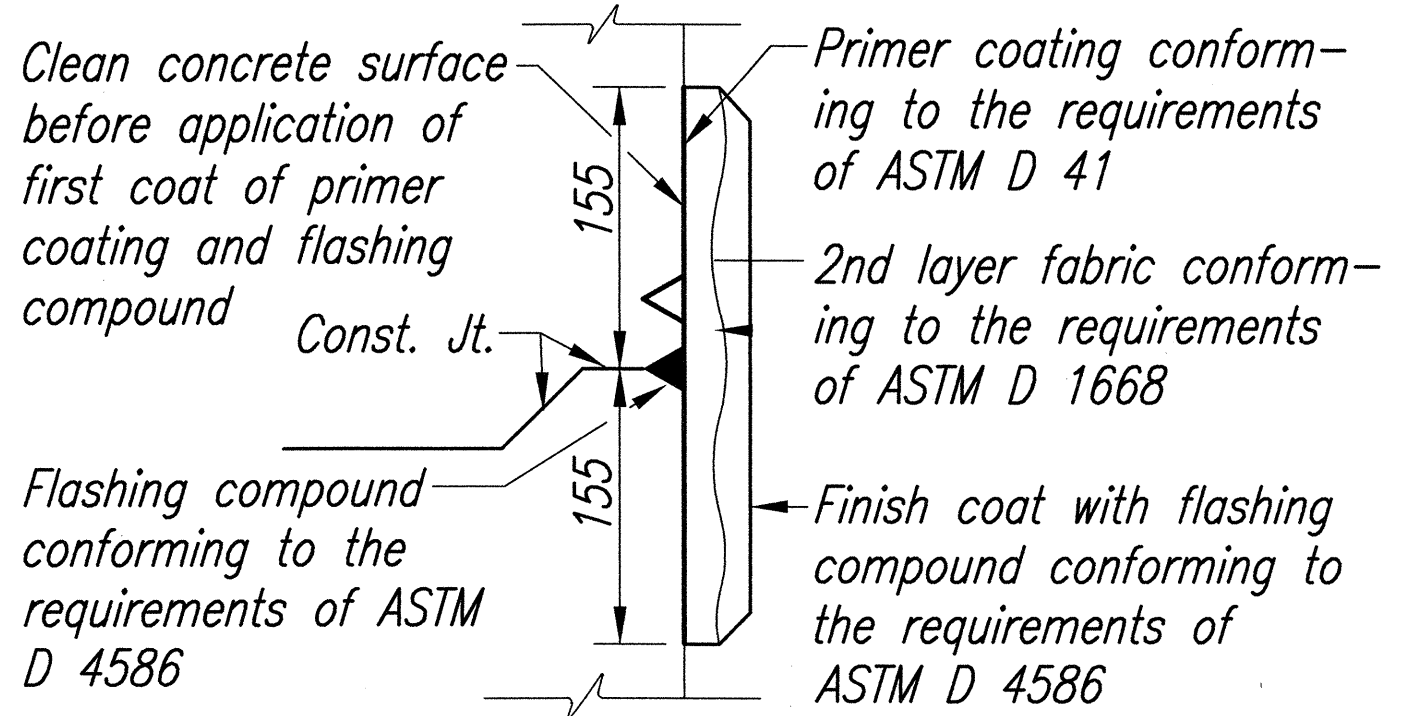
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
<b>TRAFFIC SIGNAL DETAILS</b>	
FORT WEAVER ROAD RESURFACING N. of Laulauui St. to the Vicinity of Hanakahi St. F. A. Project No. STP-076-1(5)	
Scale: As Shown	Date: July, 1999
SHEET No. 10 OF 11 SHEETS	



FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-076-1(5)	2000	69	83

GENERAL NOTES

1. Provide a minimum of one 16 dia. x 2.5m Copperweld Ground Rod in each pullbox. When directed by the Traffic Signal Inspector/Engineer, install additional Ground Rods. Cost of Ground Rods shall be incidental to the pullboxes.
2. All pre-cast concrete pullboxes shall be manufactured in two pieces.
3. The pullbox w/ cover shall be capable of supporting an MS 18 Loading.
4. The max. weight of the pullbox cover shall not exceed 27 kilograms.
5. The openings for the conduits on all pullboxes shall be pre-cast concrete knockouts.
6. After installing the conduits in the openings of the pullboxes, Contractor shall fill the excess opening in the pre-cast knockouts with conc. mortar.
7. Prior to installing the pullboxes, the Contractor shall level the bottom of the trench and achieve a minimum of 95% relative compaction of the bottom of the trench.
8. All concrete shall be Class A (25MPa, min.).
9. Rebars shall be Grade 300 and all lapped splices shall be 360mm min.
10. The #57 or #67 sized aggregate shall conform to latest version of AASHTO M43 (ASTM D 448).
11. Type "C" Pullbox shall be installed in a location protected from vehicular traffic (i.e. raised sidewalk, behind A.C. curbs, traffic signal standard or pipe guards).



TYPICAL FLASHING COMPOUND  
WATERPROOFING DETAILS

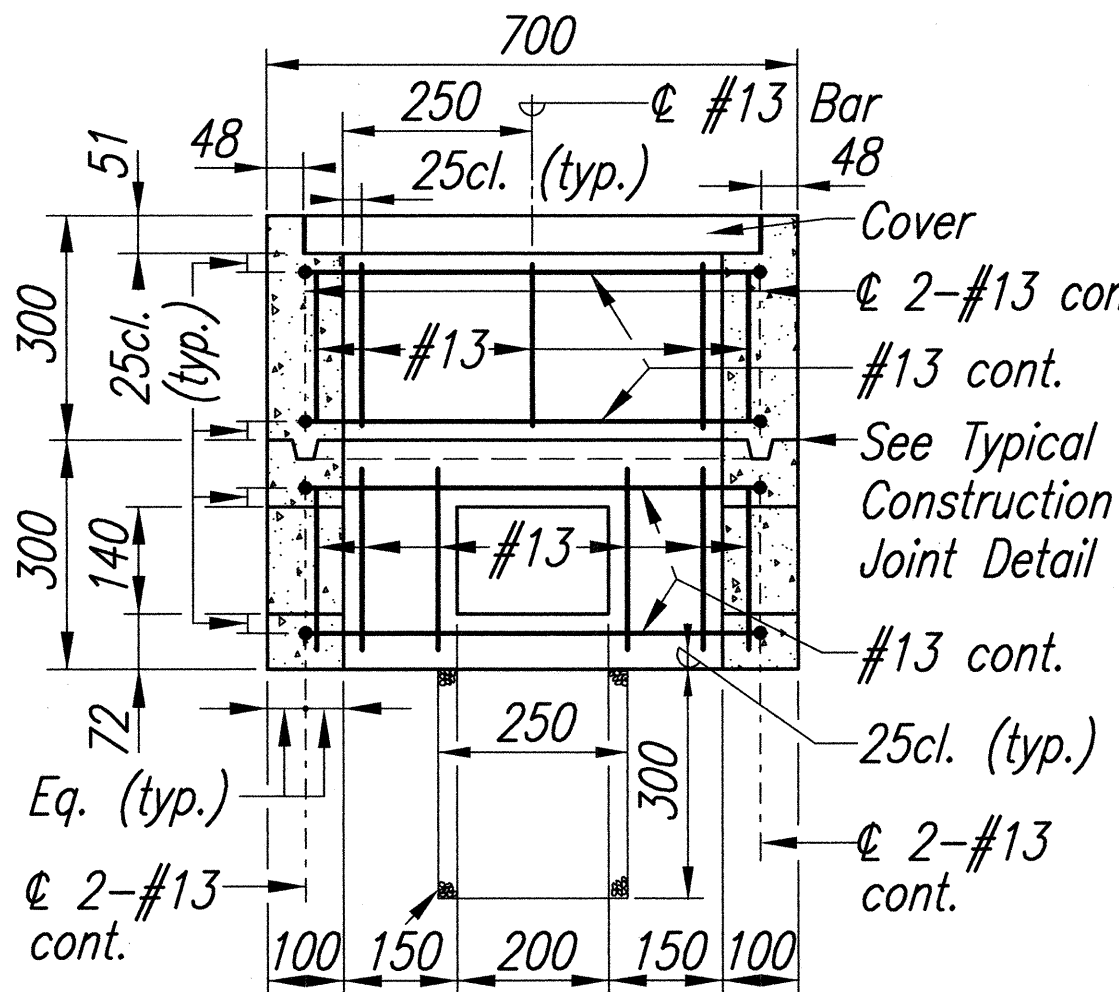
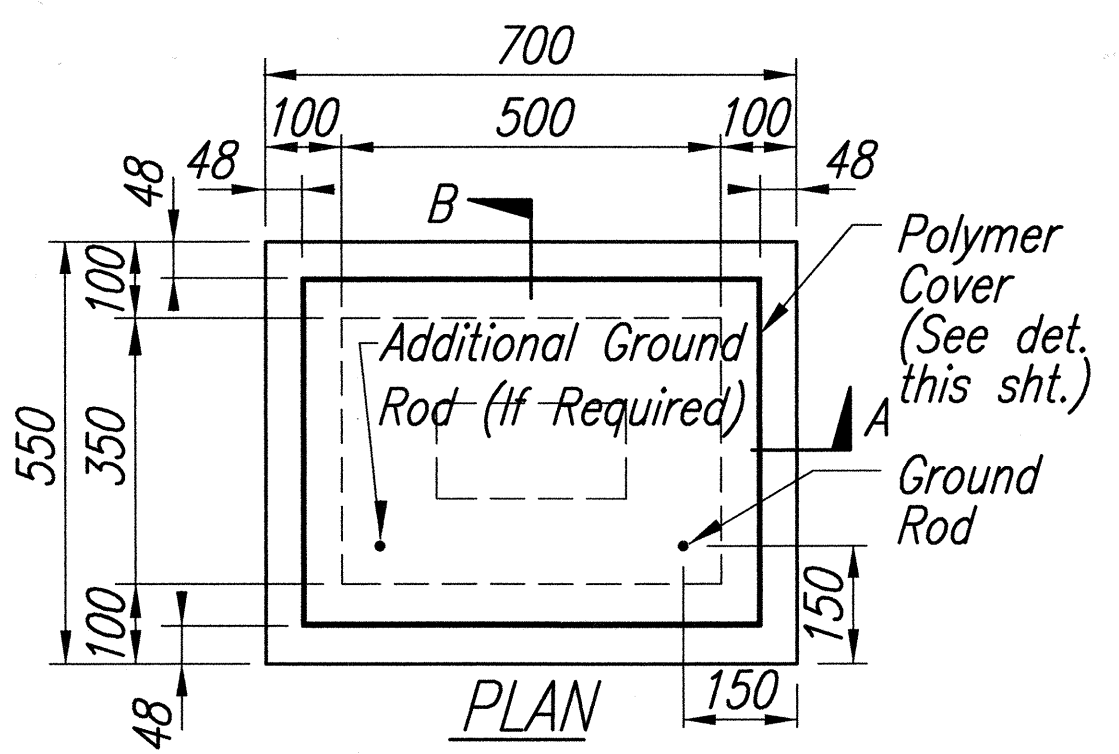
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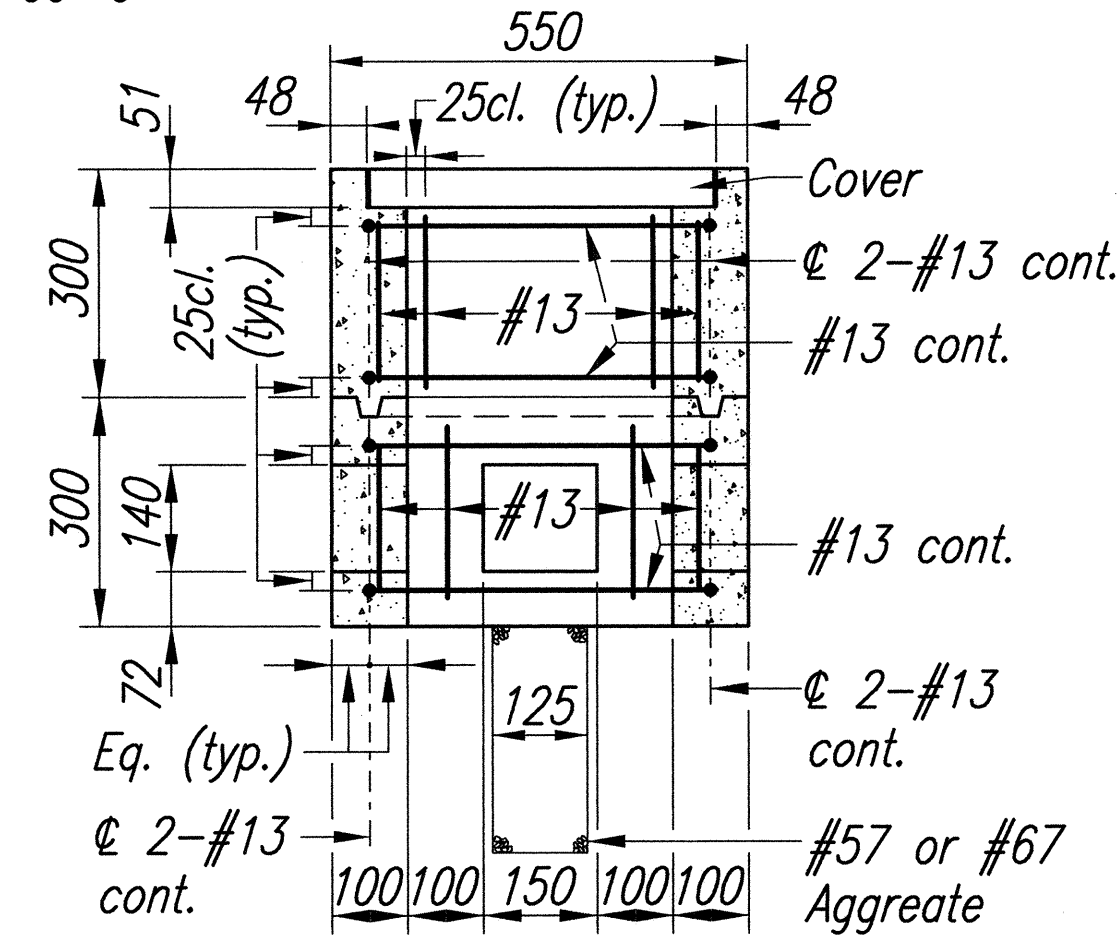
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OR UNDER MY SUPERVISION.

*C. Kail*

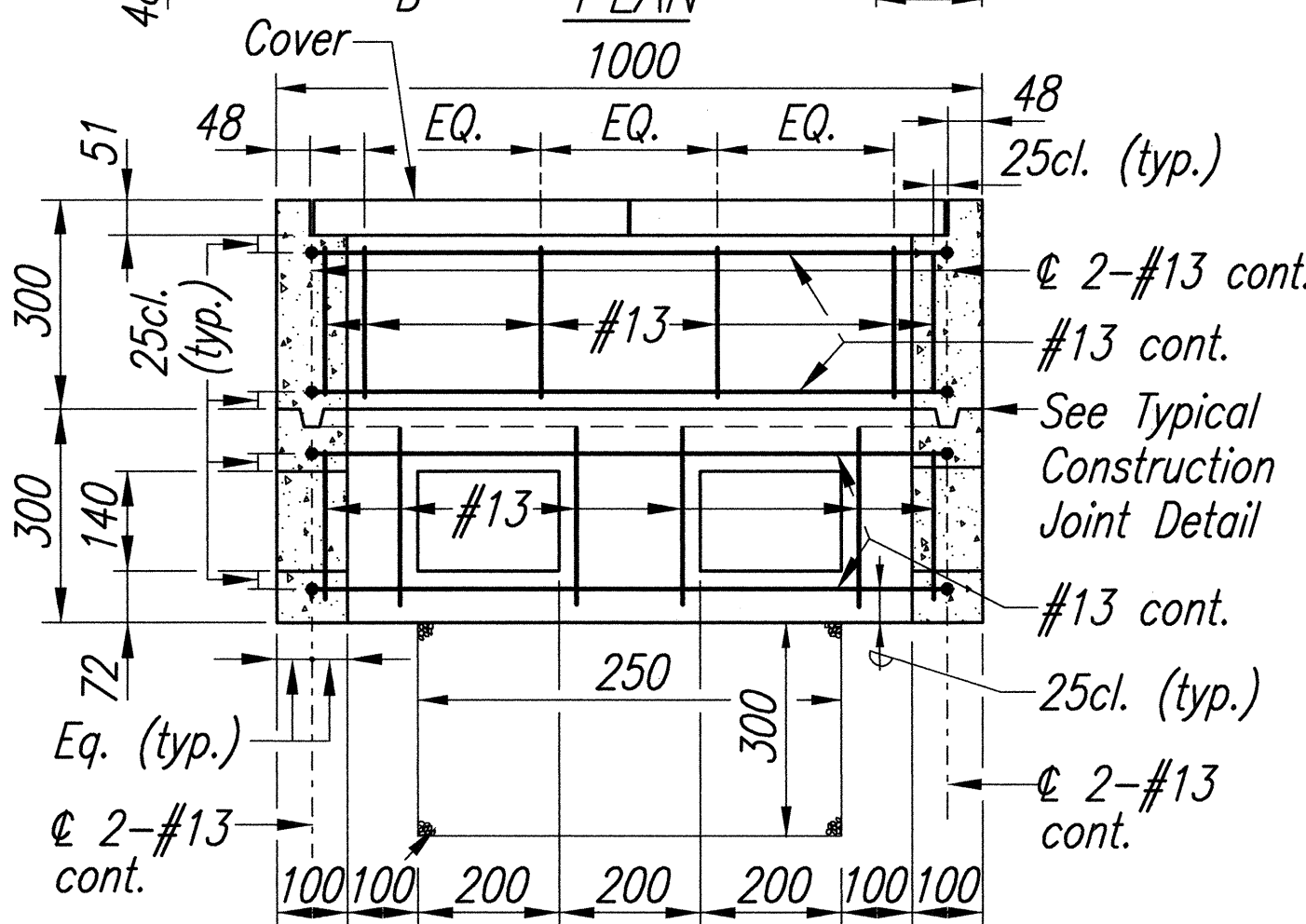
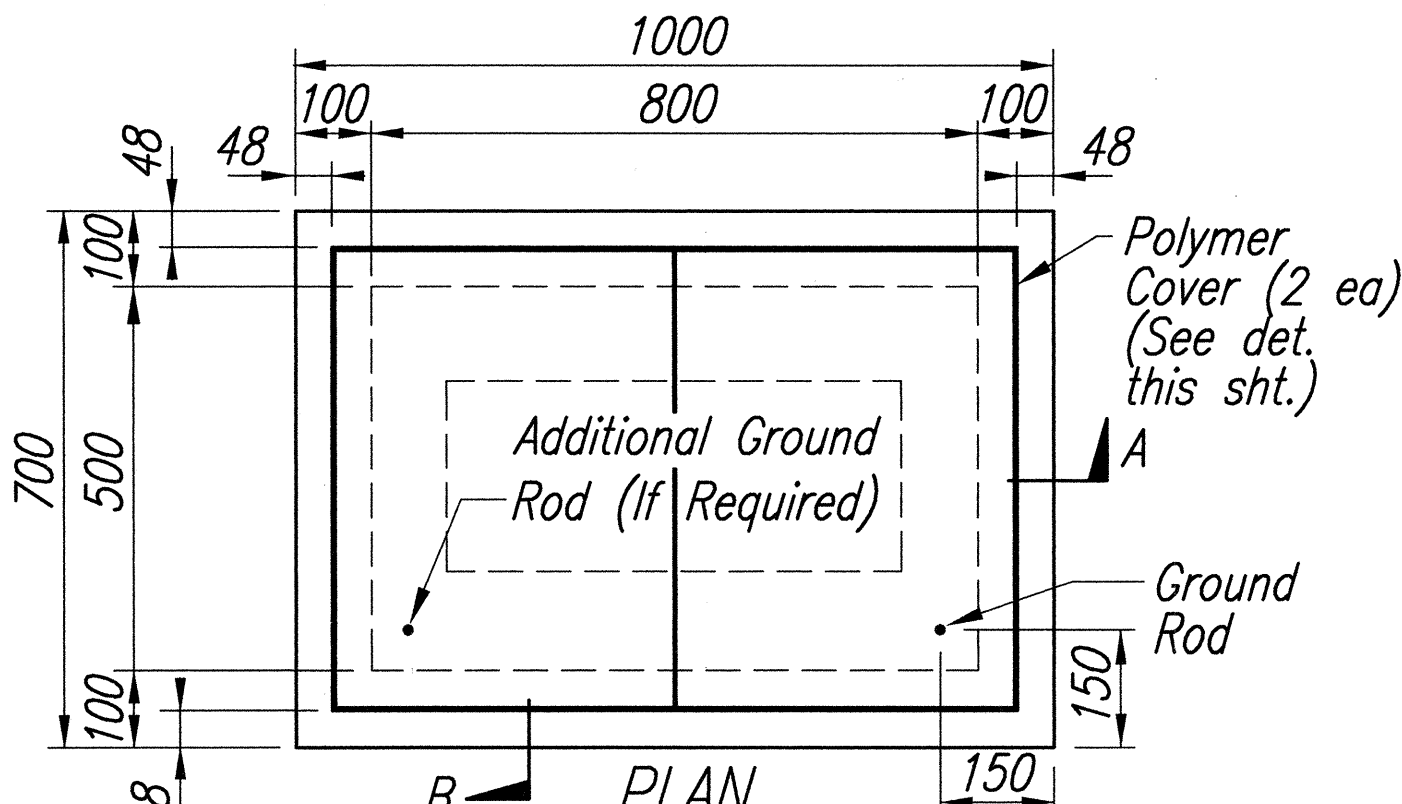
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**PULLBOX & COVER DETAILS**  
  
FORT WEAVER ROAD RESURFACING  
N. of Lualaunui St. to the Vicinity of Hanakahi St.  
F. A. Project No. STP-076-1(5)  
Scale: As Shown Date: July, 1999  
SHEET No. 11 OF 11 SHEETS



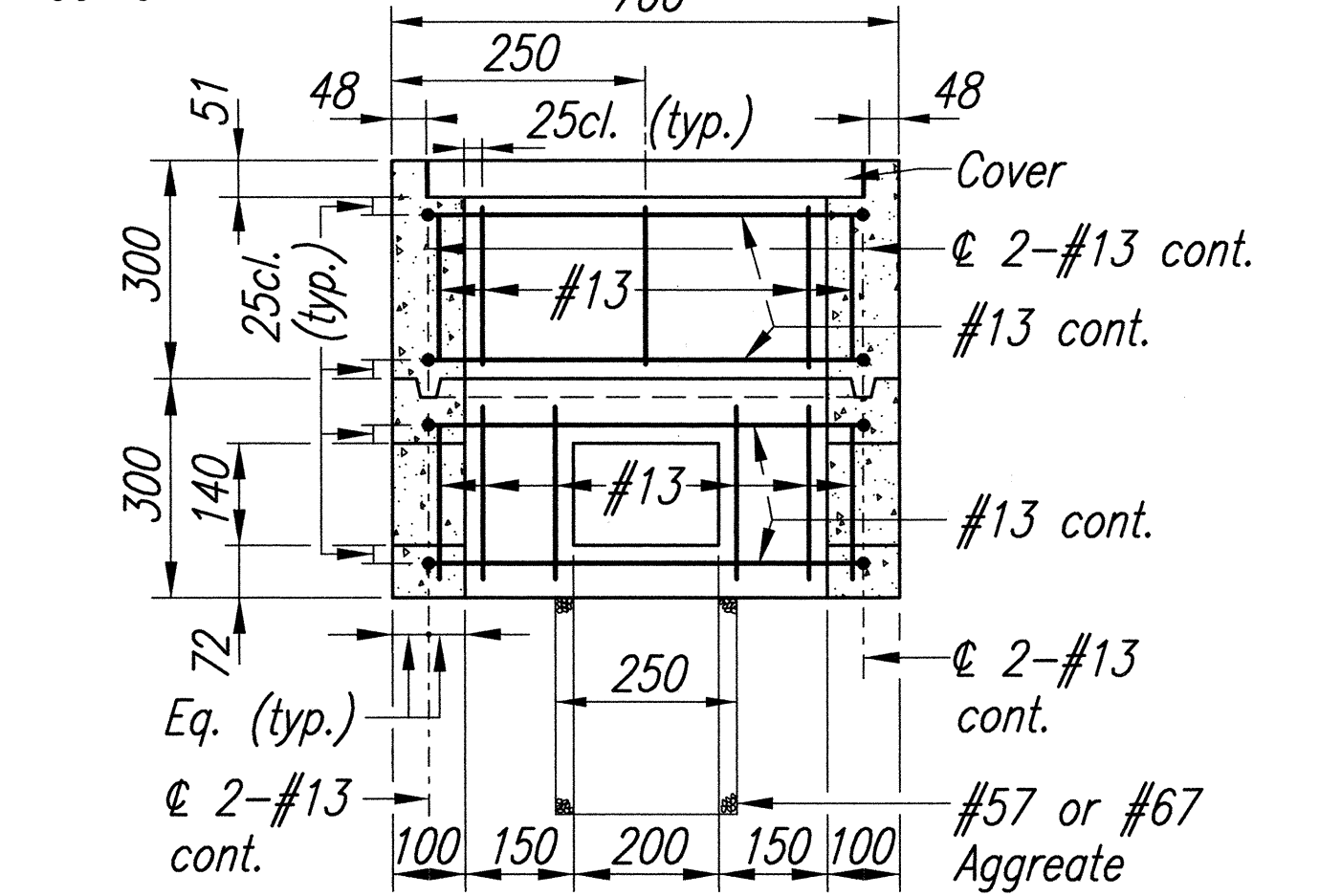
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TYPE "A" PULLBOX (Old Type "B")  
Scale: 1:10



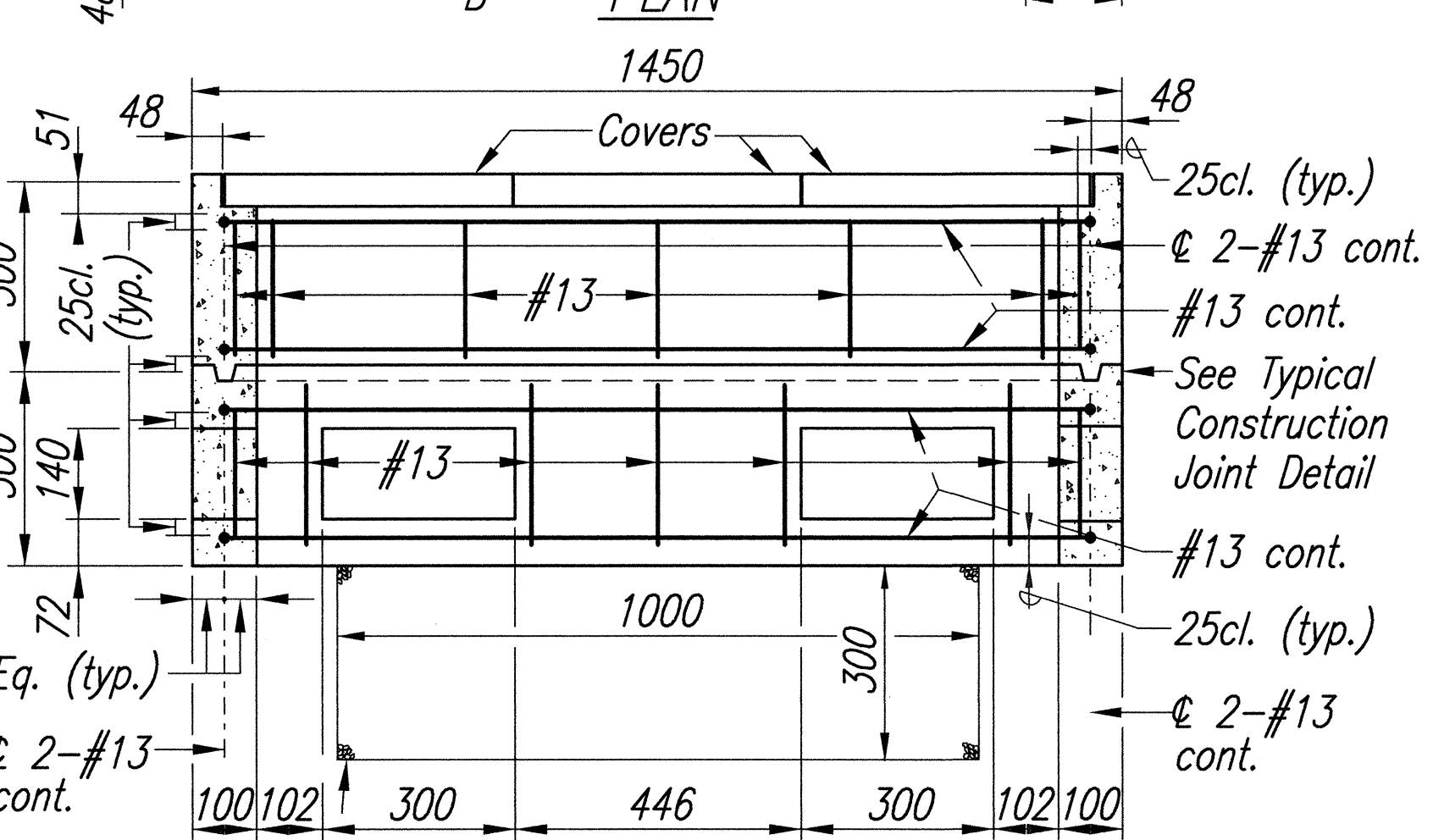
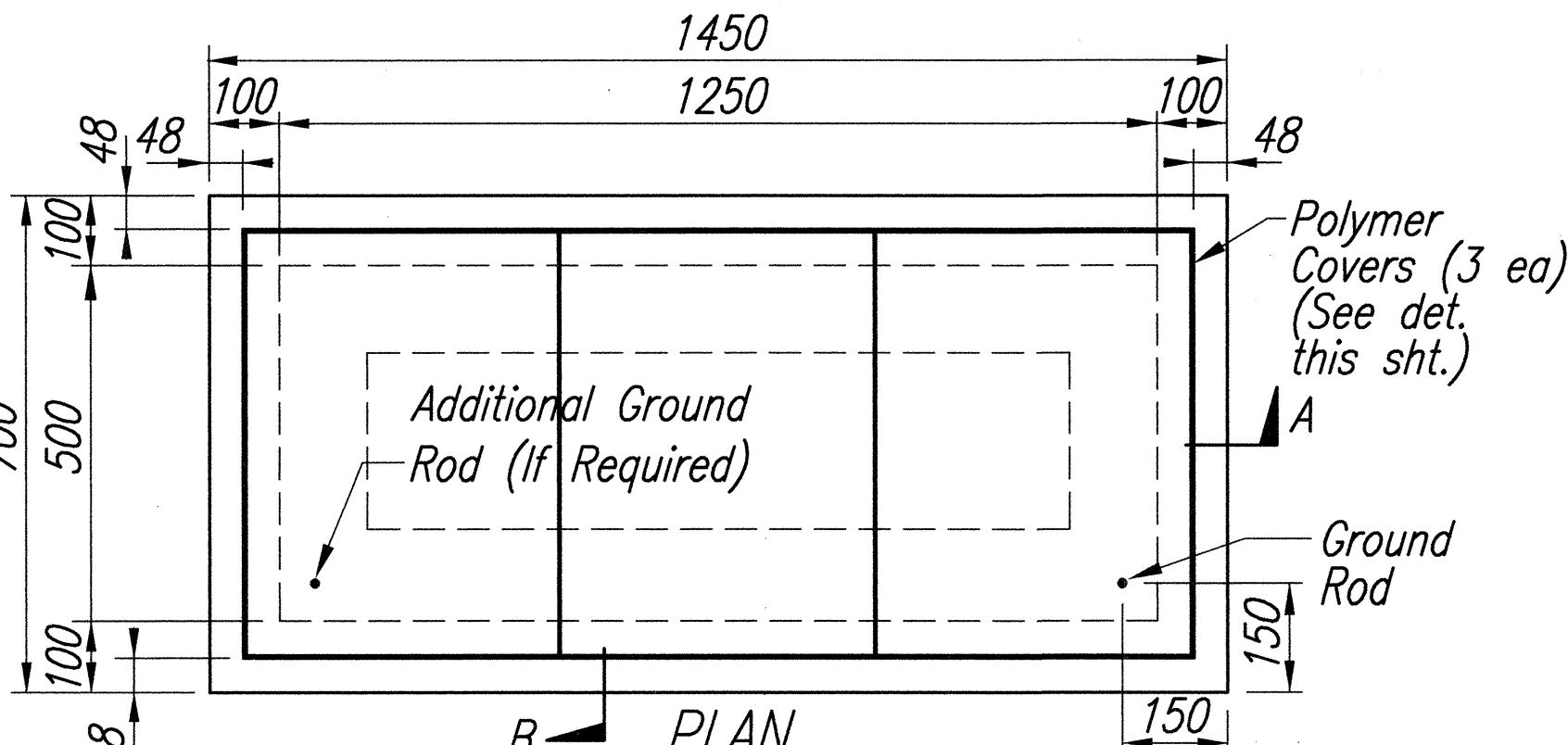
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TYPE "A" PULLBOX (Old Type "B")  
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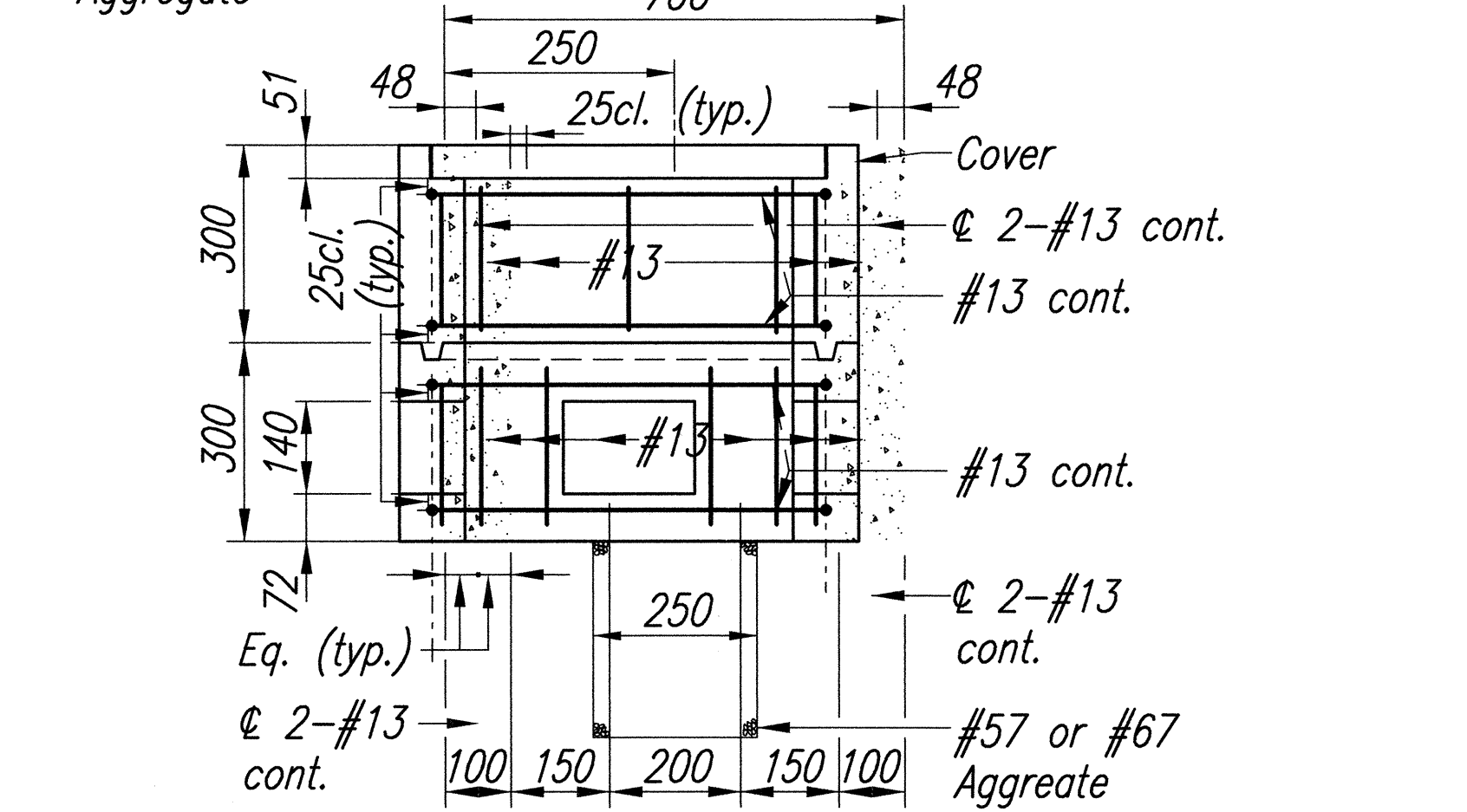
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TYPE "B" PULLBOX (Old Type "C")  
Scale: 1:10



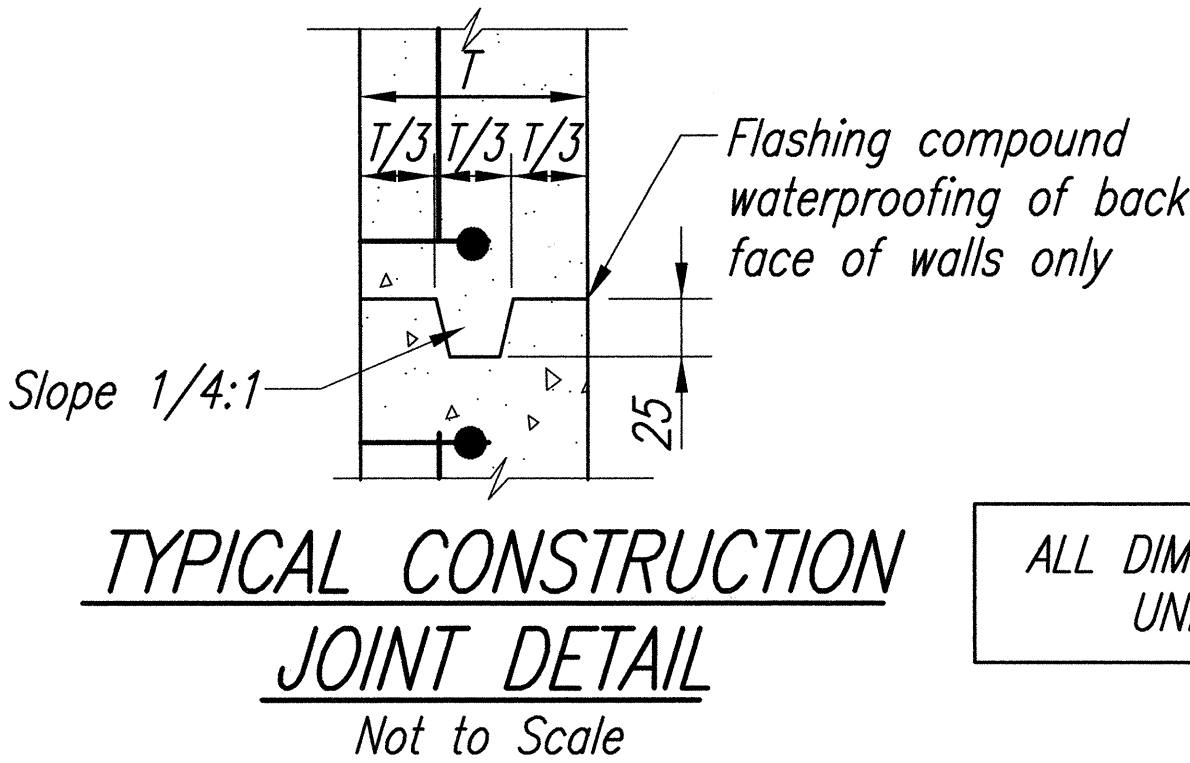
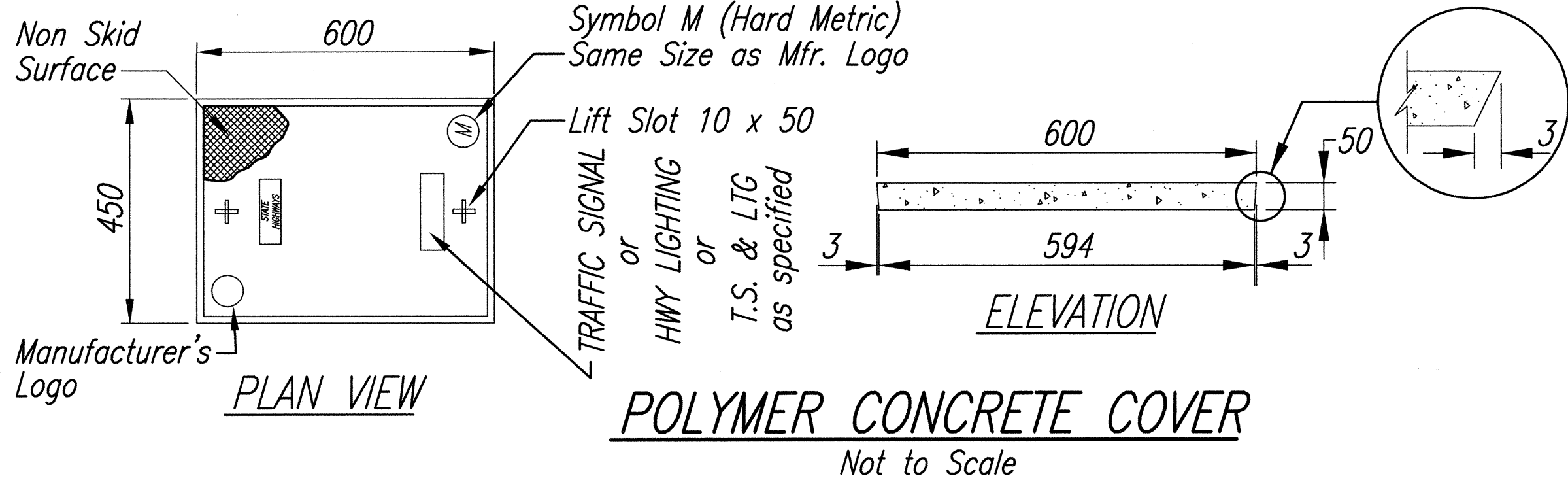
SECTION B-B  
TYPE "B" PULLBOX (Old Type "C")  
Scale: 1:10



SECTION A-A  
TYPE "C" PULLBOX (Old Type "D")  
Scale: 1:10



SECTION B-B  
TYPE "C" PULLBOX (Old Type "D")  
Scale: 1:10



TYPICAL CONSTRUCTION  
JOINT DETAIL  
Not to Scale

ALL DIMENSIONS ARE IN MILLIMETERS  
UNLESS OTHERWISE SHOWN