

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-0300(98)	2004	16	143

CURB RAMP AND SIDEWALK NOTES:

1. These typical details are intended as curb ramp guidelines for design and construction.
2. A 2% maximum cross slope shall be maintained in the direction of pedestrian traffic.
3. Subject to field conditions, the Engineer shall determine the final location of curb ramps.
4. All pullboxes shall be installed away from the curb ramp and within the sidewalk/unpaved area to the maximum extent feasible.
5. Where necessary, existing pullboxes, handholes, manholes, etc. shall be adjusted to match curb ramp grade. Adjustments shall not be paid for separately but shall be considered incidental to the various curb ramp items unless indicated otherwise.
6. Transitions from ramps to gutters and roadways shall be flush.
7. Curb ramps and sidewalks shall be constructed to eliminate ponding to the maximum extent feasible.
8. The pedestrian push button shall meet operational and reach requirements of the American with Disabilities Act Accessibility Guidelines (ADAAG):
 - a) Forward Reach. The maximum height for forward reach shall be 48".
 - b) Side Reach. The maximum height for side reach shall be 54".
 - c) Operation. Controls and operating mechanisms shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate controls shall be no greater than 5 lbf.
9. The maximum slopes of adjoining gutters or road surface immediately fronting the curb ramp shall not exceed 5% for Type A, D, and Combination ramps and 8.33% for Type B, C, and E ramps.
10. There shall be a 30"x48" level ground surface (2% max. cross slope, both directions) for a forward or side approach, as appropriate, to a pedestrian push button.
11. Construction joints are required to join curb ramps with sidewalks.
12. Unless otherwise noted, new gutters are required as shown.
13. All curb ramps shall be reinforced with 6x6 W1.4/W1.4 welded wire fabric.
14. Surface of sidewalks and curb ramps shall be firm, stable, and slip-resistant. This includes the surfaces of pullboxes, valve covers, manhole covers, etc.
15. Bed course material is required for curb ramps, sidewalks, and gutters.
16. All sidewalks shall provide a minimum clear width of 3'-0" (excluding curb) for pedestrian circulation. If this cannot be met, a minimum 32-inch clear width is allowed for a distance of 24-inches.
17. Passing spaces along new sidewalks with 5' clear width or less shall be provided at maximum 200' intervals as required by ADA guidelines. The passing area shall be a minimum 5' wide by 5' long as feasible.
18. If possible, install utility poles, fire hydrants, light poles, sign posts, pullboxes, etc. off of sidewalk but within the right-of-way.
19. Objects protruding from utility poles and walls adjacent to the sidewalks (i.e. wall mounted fire hydrants, telephones, meters on poles, etc.) shall be mounted to meet the current American with Disabilities Act Accessibility Guidelines (ADAAG) and will be subject to Engineer's approval.
20. If a curb ramp is not constructed according to the plans, the Contractor shall reconstruct the curb ramp at no cost to the State. Construction tolerance for Portland Cement Concrete shall be based on 1/4 inch per 10 ft. ($\pm 0.2\%$). Remedial measures will not be accepted.
21. Additional information is available from:
 - a) American with Disabilities Act Accessibility Guidelines (ADAAG), Jan. 1998, The Access Board.
 - b) Accessible Rights-of-Way: A Design Guide, Nov. 1999, The Access Board.
 - c) Designing Sidewalks and Trails for Access, Part 1, July 1999, FHWA.
 - d) Designing Sidewalks and Trails for Access, Part 2, Sept. 2001, FHWA.
22. Pay limits for the various types of curb ramps are as shown on these typical details.
23. For curb ramps at curb returns, install Construction Joints per See Miscellaneous Detail Sht. D10, full width sidewalk at curb return.
24. When directed by the Engineer, Sidewalk Transition Area shall be extended beyond shown plan limits to match the nearest scoreline.

ORIGINAL PLAN	DATE
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DESIGNED BY	DATE
QUANTITIES BY	DATE
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CAD by R. Mendoza, 05-02

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Dexter S. Eji

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

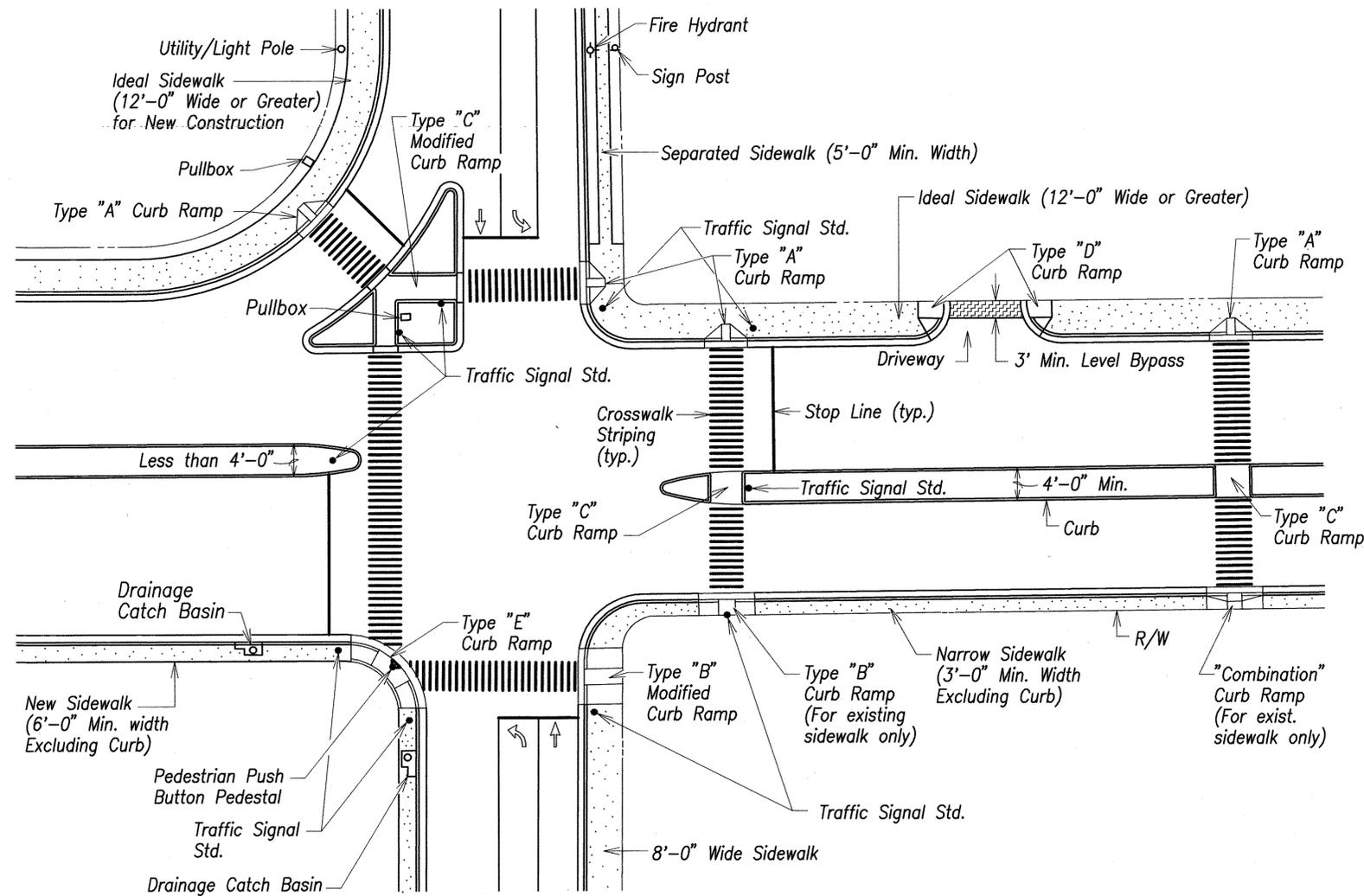
CURB RAMP & SIDEWALK NOTES

*Pedestrian Facilities & ADA Compliance at
Various Locations on Oahu, Unit 7
Federal Aid Project No. CMAQ-0300(98)*

Scale: No Scale Date: August 2004

SHEET No. D-1 OF 22 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-0300(98)	2004	17	143



TYPICAL CURB RAMPS

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CD by R. Mendoza, 05-02

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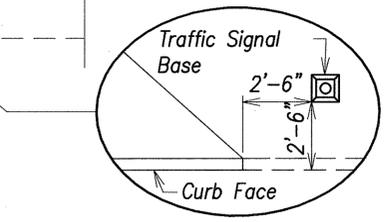
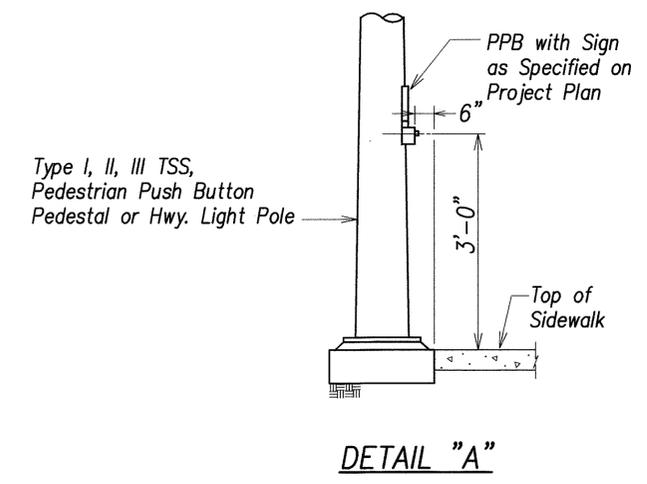
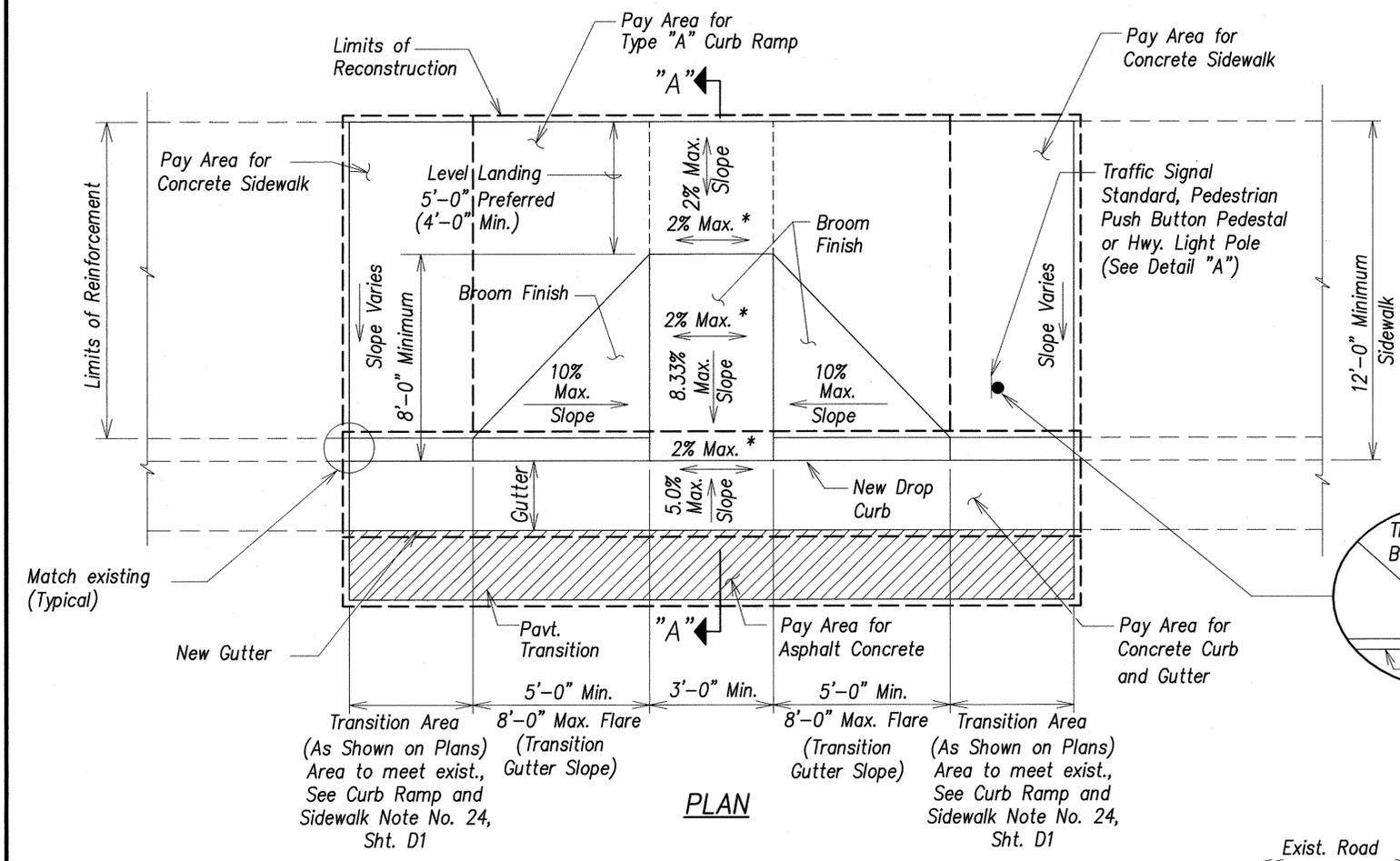
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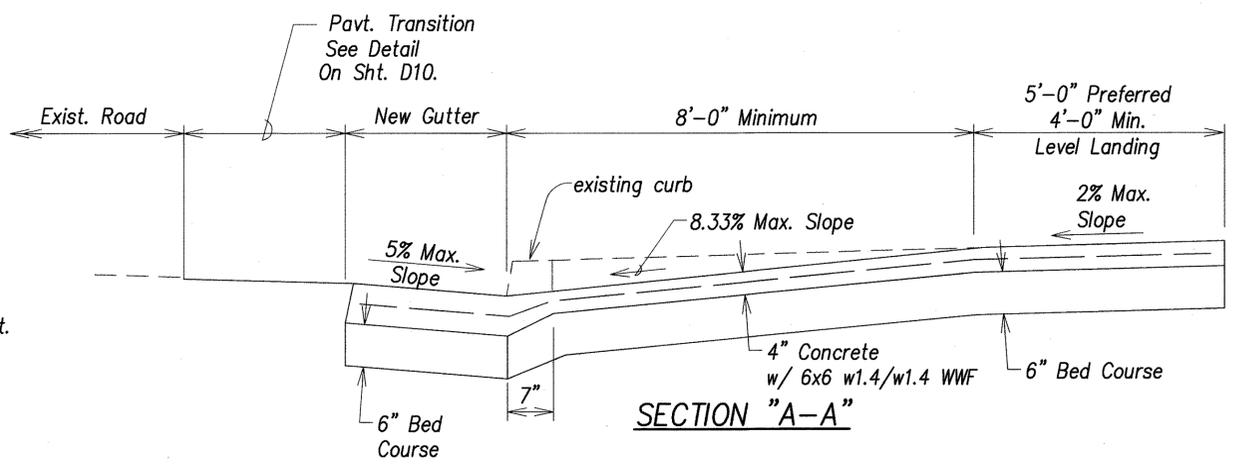
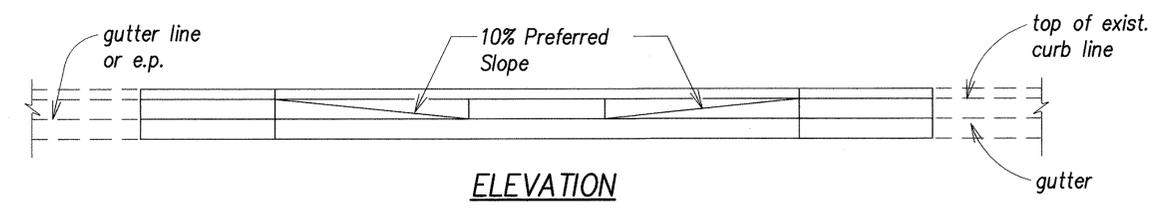
TYPICAL CURB RAMP LAYOUT

Pedestrian Facilities & ADA Compliance at Various Locations on Oahu, Unit 7
Federal Aid Project No. CMAQ-0300(98)
Scale: No Scale Date: August 2004
SHEET No. D-2 OF 22 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-0300(98)	2004	18	143



* If roadway slope >2% conform to roadway slope and file Technical Infeasibility (TI) Statement.



CURB RAMP - TYPE "A"
SIDEWALK WIDTH 12'-0" OR GREATER



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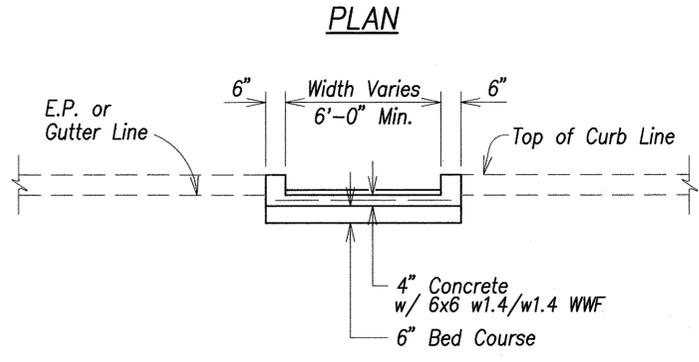
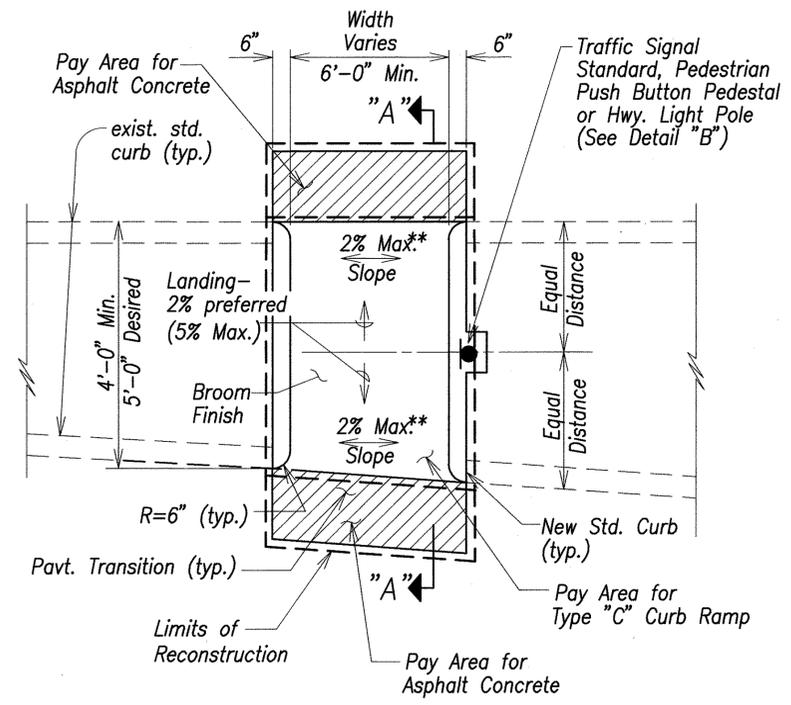
CURB RAMP DETAILS-1

Pedestrian Facilities & ADA Compliance at Various Locations on Oahu, Unit 7
Federal Aid Project No. CMAQ-0300(98)
Scale: No Scale Date: August 2004
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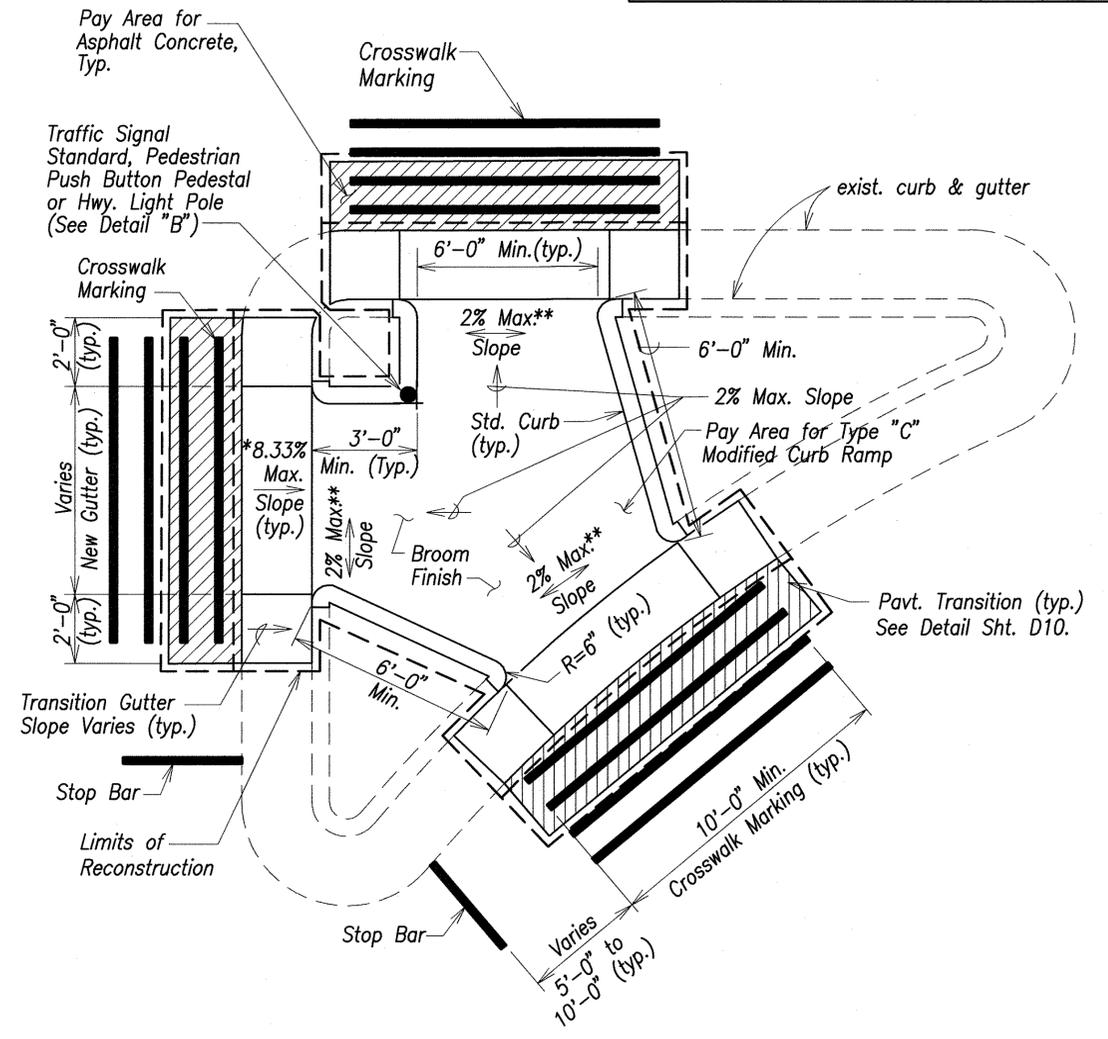
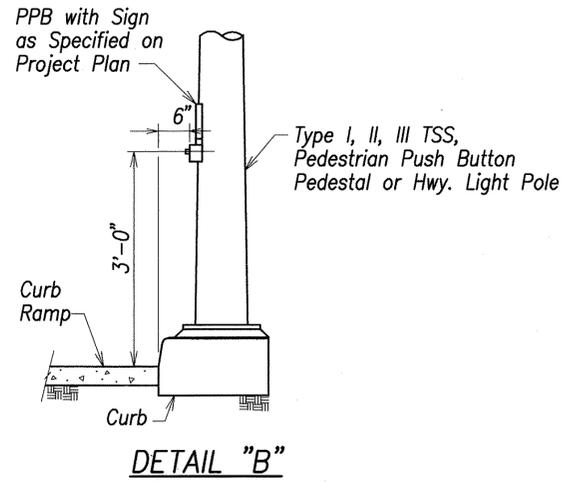
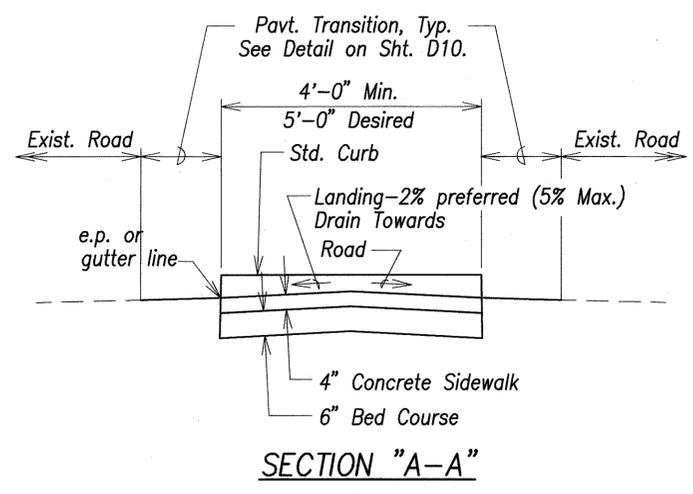
CAD by R. Mendosa, 05-52

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-0300(98)	2004	20	143



ELEVATION
CURB RAMP - TYPE "C"
 Not to scale
 USE AT MEDIAN CROSSINGS, ISLANDS

* See Curb Ramp and Sidewalk Note No. 9, Sht. D1
 ** If roadway slope >2% conform to roadway slope and file Technical Infeasibility (TI) Statement.



CURB RAMP - TYPE "C" MODIFIED
 Not to scale

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CD by R. Manafra, 15-52

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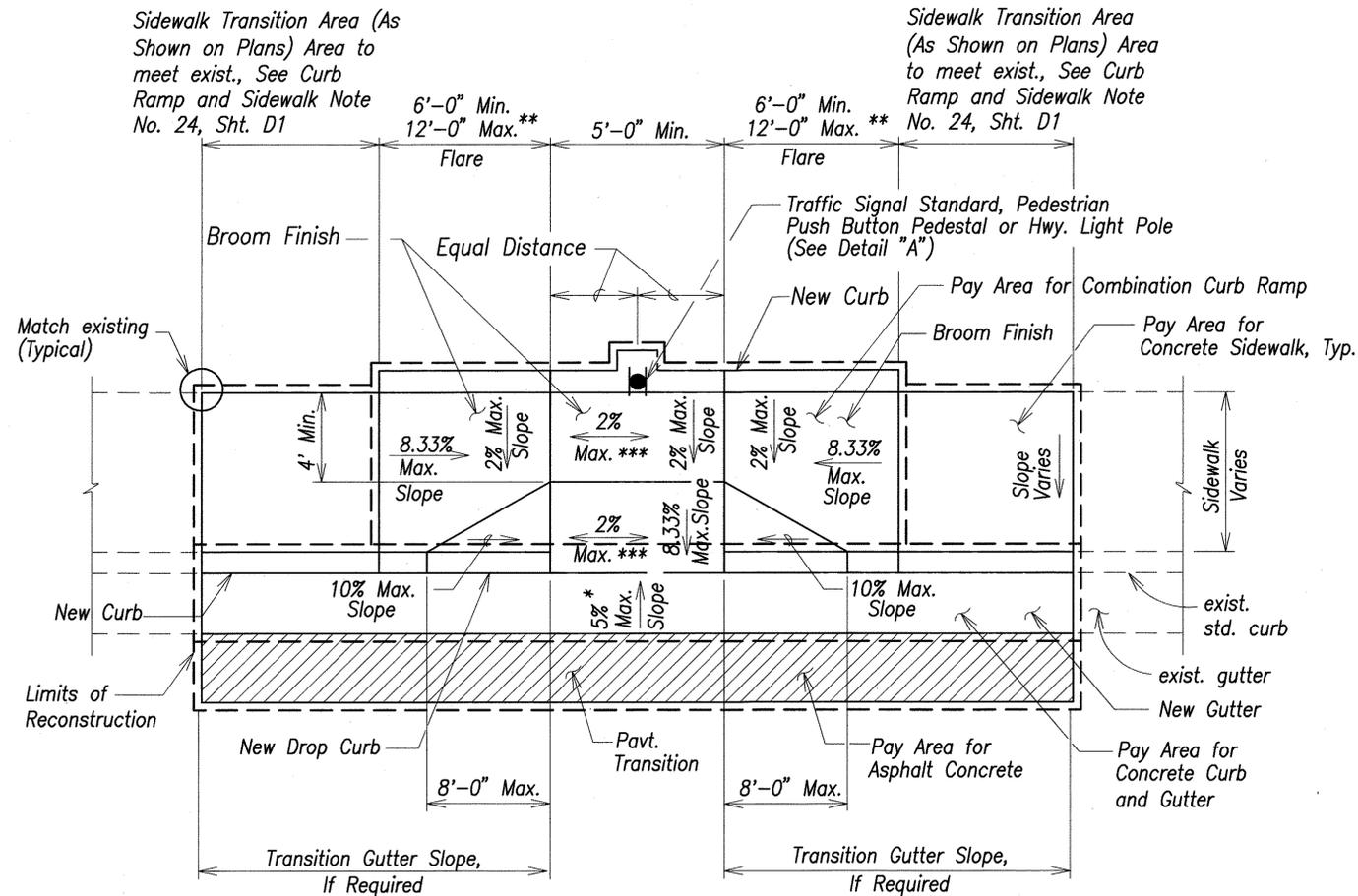
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STATE OF HAWAII
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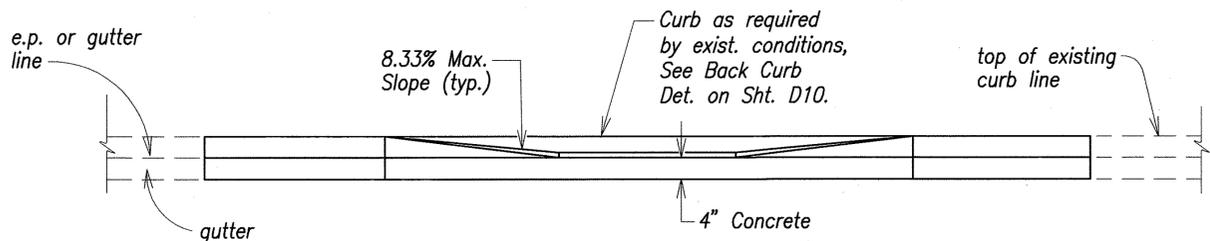
CURB RAMP DETAILS-3

Pedestrian Facilities & ADA Compliance at Various Locations on Oahu, Unit 7
 Federal Aid Project No. CMAQ-0300(98)
 Scale: No Scale Date: August 2004
 SHEET No. D-5 OF 22 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-0300(98)	2004	22	143



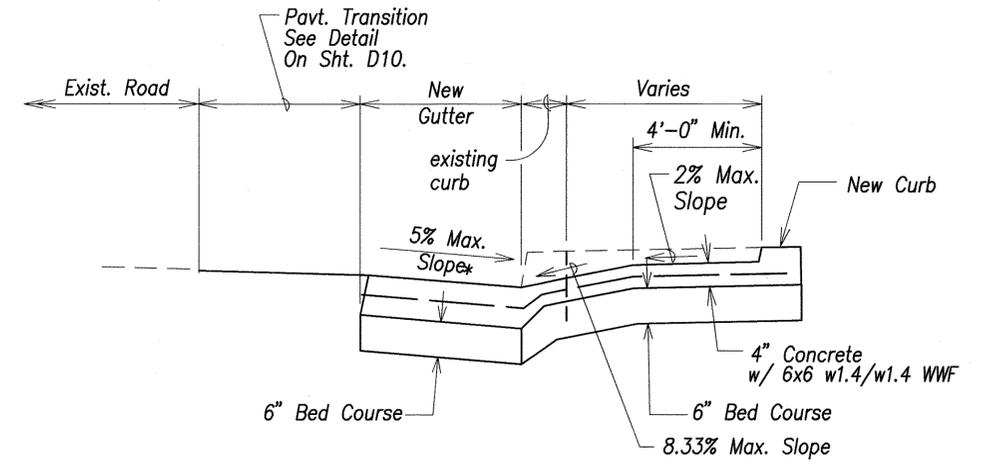
PLAN



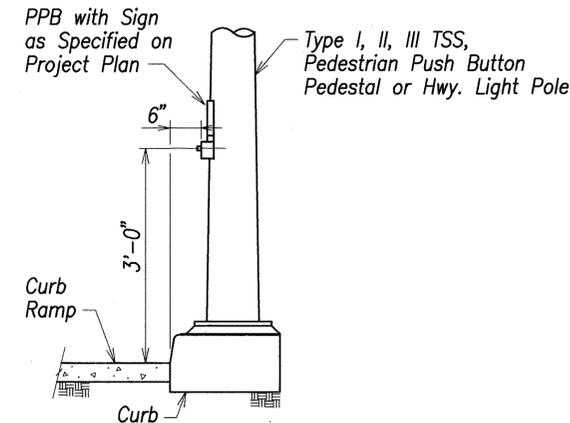
ELEVATION

- * See Curb Ramp and Sidewalk Note No. 9, Sht. D1
- ** The slope of the ramp shall take precedence over the length of the ramp. If the maximum slope of a ramp cannot be met within a length of 12 feet, then the slope of the ramp shall be set when the length of the ramp is set at the maximum of 12 feet.
- *** If roadway slope >2% conform to roadway slope and file Technical Infeasibility (Ti) Statement.

CURB RAMP - COMBINATION



TYPICAL SECTION



DETAIL "A"

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GD by R. Mendez, 05-02

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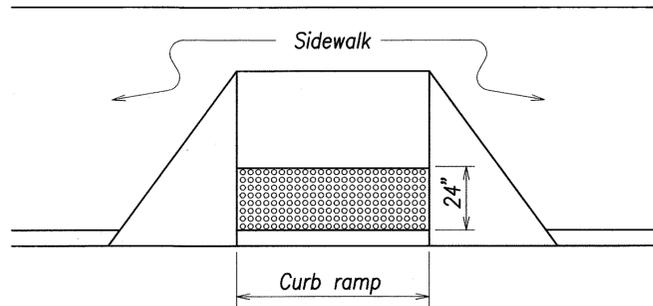
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STATE OF HAWAII
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HIGHWAYS DIVISION

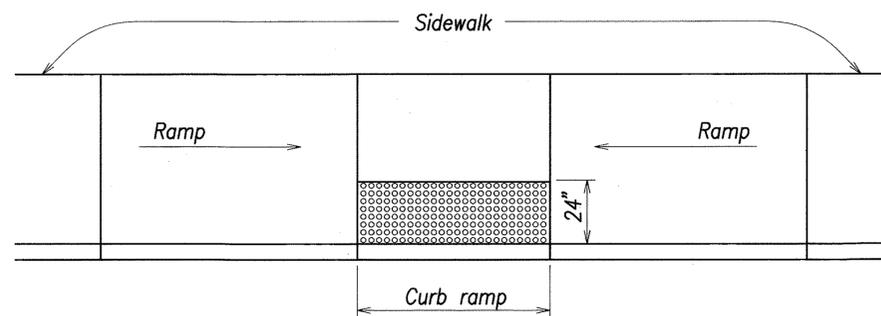
CURB RAMP DETAILS-5

Pedestrian Facilities & ADA Compliance at Various Locations on Oahu, Unit 7
Federal Aid Project No. CMAQ-0300(98)
Scale: No Scale Date: August 2004
SHEET No. D-7 OF 22 SHEETS

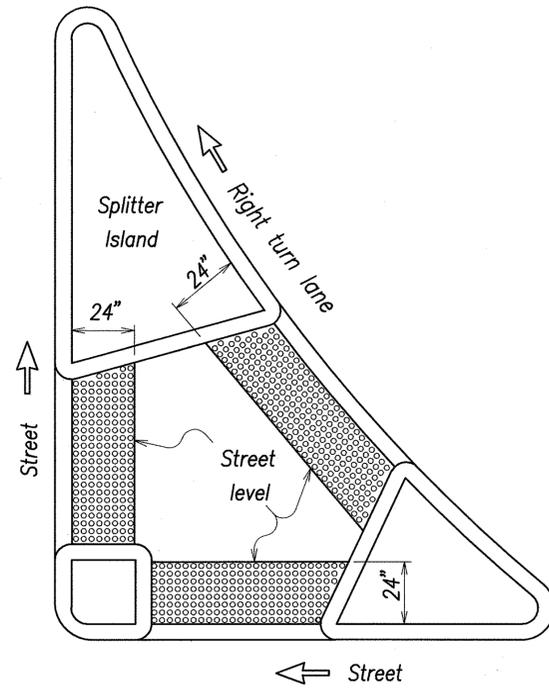
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HAWAII	HAW.	CMAQ-0300(98)	2004	23	143



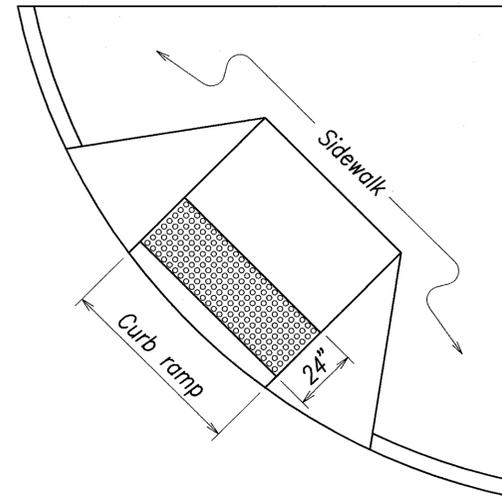
DETECTABLE WARNING AT CURB RAMP



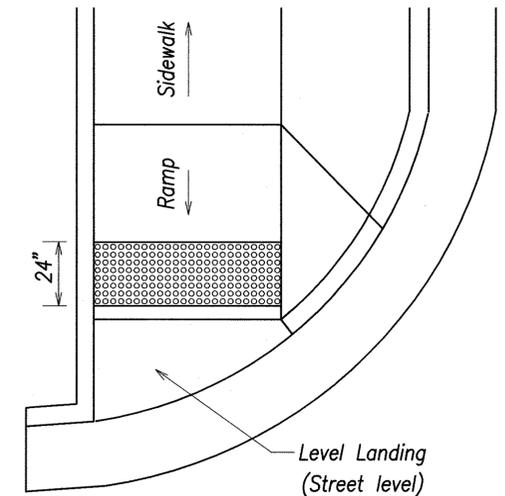
TRANSITION RAMP WITH DETECTABLE WARNING



REFUGE ISLAND WITH DETECTABLE WARNING



SHARED CURB RAMP WITH DETECTABLE WARNING



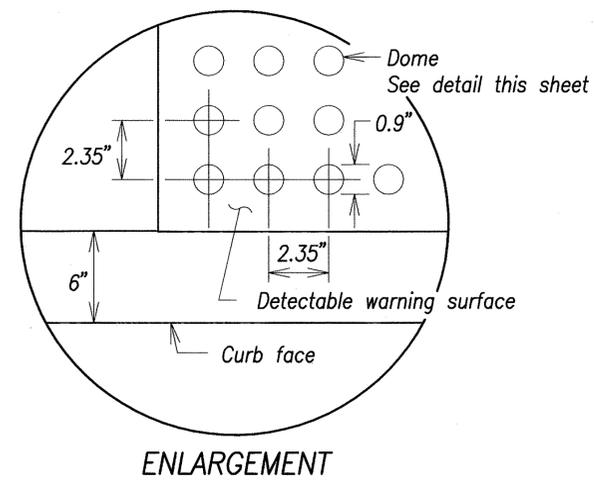
END OF SIDEWALK CURB RAMP WITH DETECTABLE WARNING

TYPICAL INSTALLATION OF DETECTABLE WARNINGS

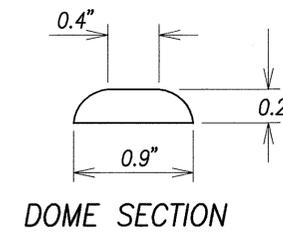
Not to Scale

NOTES:

1. Detectable warnings shall be 24 inches in the direction of travel and extend the full width of the curb ramp or flush surface (does not include flares).
2. Truncated domes shall have a diameter of 0.9 inch at the bottom, a diameter of 0.4 inch at the top, a height of 0.2 inch and a center-to-center spacing of 2.35 inches measured along one side of a square arrangement.
3. Domes shall be aligned on a square grid in the predominant direction of travel to permit wheels to roll between the domes.
4. The detectable warning shall be "safety yellow".
5. The material used to provide visual contrast shall be an integral part of the detectable warning surface.
6. The detectable warning shall be located so that the edge nearest the curb line or other potential hazard is 6 to 8 inches from the curb line.



ENLARGEMENT



DOMES SECTION



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Dexter S. E.J.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETECTABLE WARNING DETAILS

Pedestrian Facilities & ADA Compliance at Various Locations on Oahu, Unit 7
Federal Aid Project No. CMAQ-0300(98)

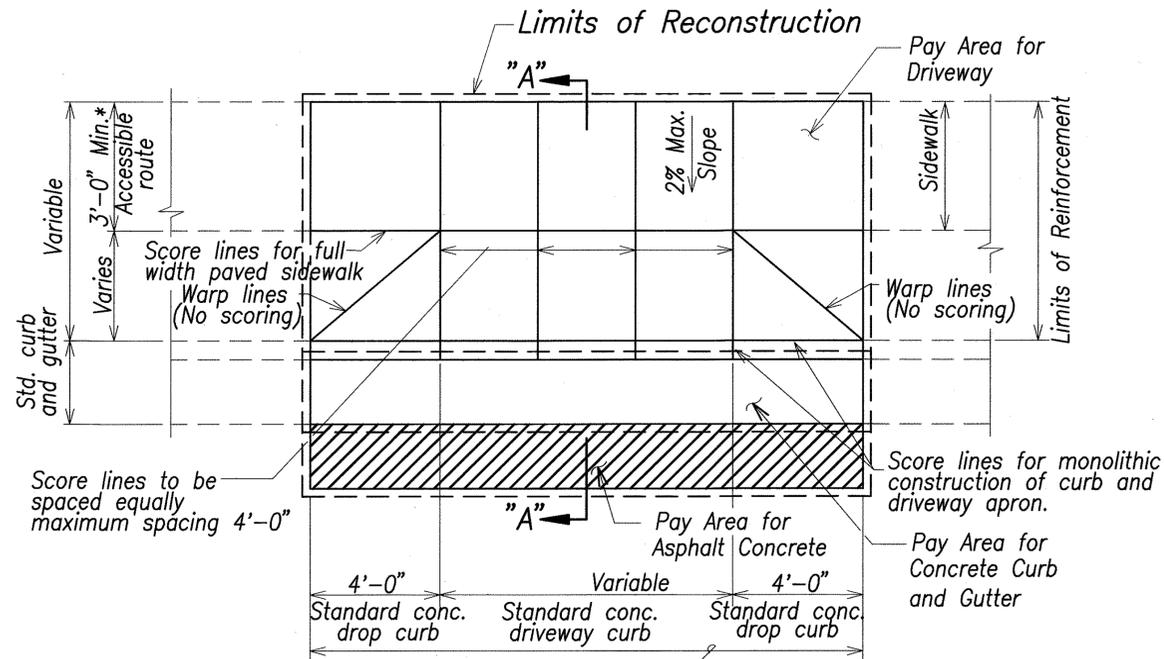
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SHEET No. D-8 OF 22 SHEETS

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CDL by R. Hernandez, 55-52

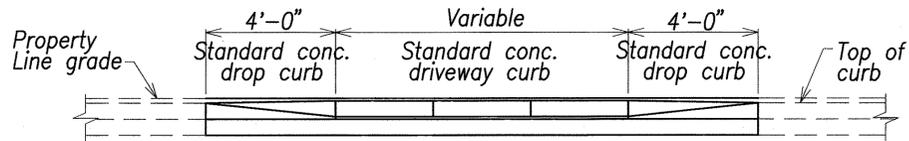
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-0300(98)	2004	24	143



Limits of reinforcement. 4" thick concrete reinforced with 6"x6"-W2.9XW2.9 galv. welded wire fabric for residential districts. 6" thick for all other districts. Surface shall be broom finished.

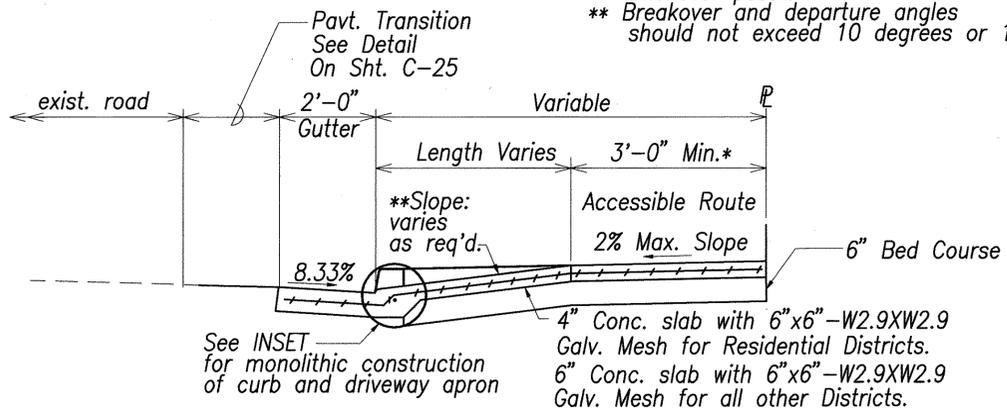
Curb return type driveway may be permitted for parking areas exceeding 100 spaces, fire stations and hospitals.

PLAN
NOT TO SCALE



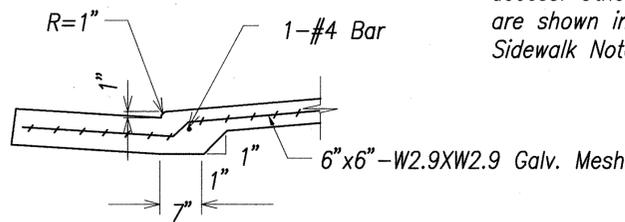
ELEVATION
NOT TO SCALE

- * Match width of existing sidewalk whenever possible.
- ** Breakover and departure angles should not exceed 10 degrees or 17%.

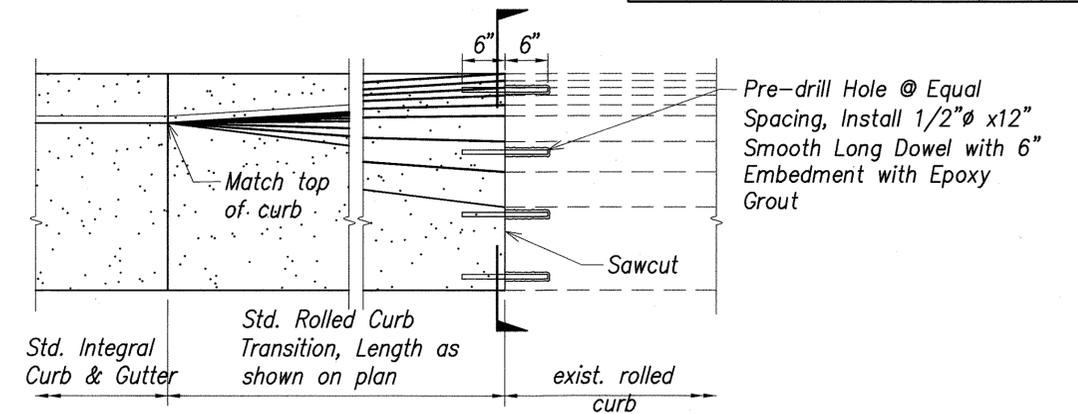


SECTION A-A
NOT TO SCALE

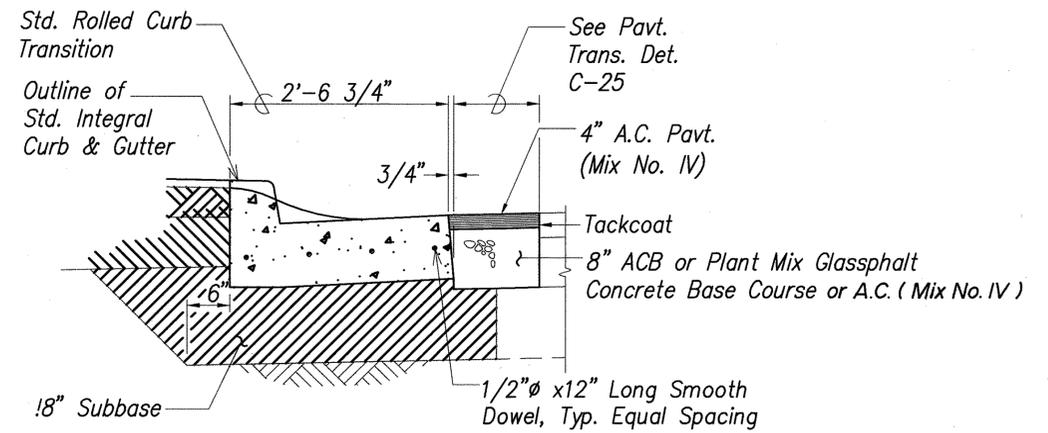
DRIVEWAY APRON



INSET
NOT TO SCALE



PLAN VIEW



SECTION

ROLLED CURB TRANSITION CONNECTION DETAIL
NOT TO SCALE

- NOTES:**
- For extension to existing driveway, scoring and finish shall match existing scoring and finish. For driveway constructed in built up areas, scoring conforming to scoring at adjacent driveways may be authorized.
 - This detail is only one method for providing ADA access. Other methods can be used. These methods are shown in references listed in Curb Ramp and Sidewalk Note No. 21, Sht. D1.



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRIVEWAY APRON

Pedestrian Facilities & ADA Compliance at Various Locations on Oahu, Unit 7
Federal Aid Project No. CMAQ-0300(98)

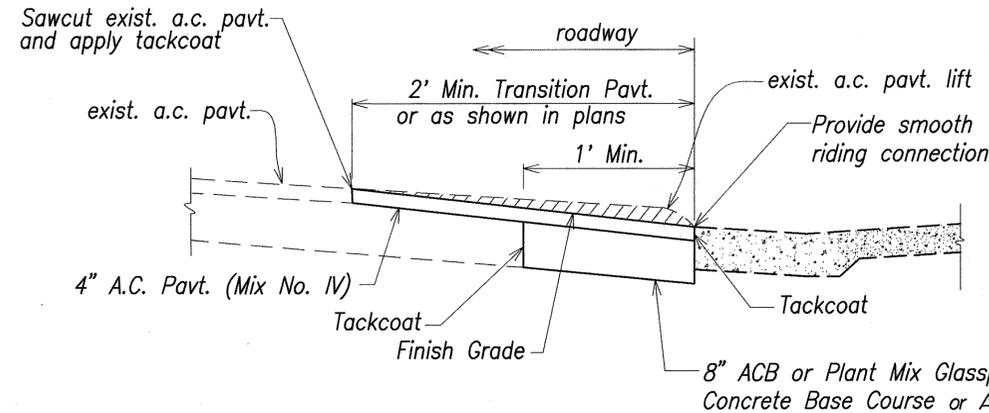
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SHEET No. D-9 OF 22 SHEETS

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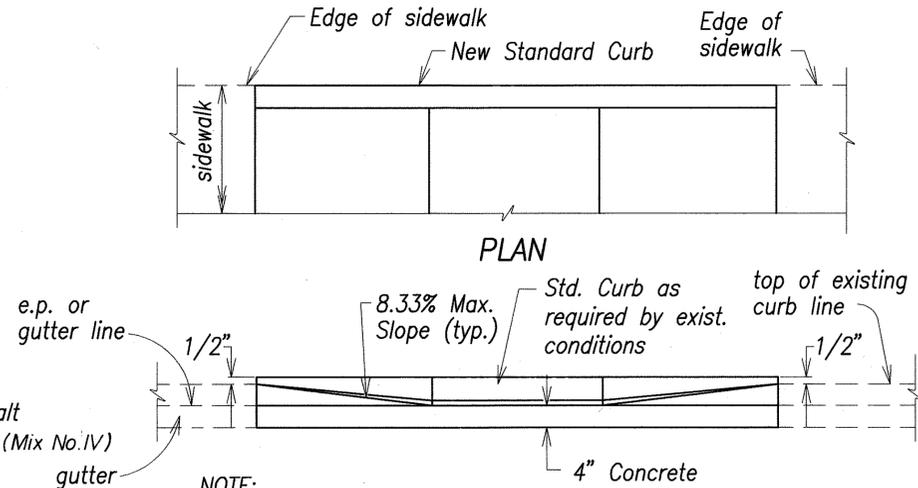
CAD by R. Mendez, 05-02

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-0300(98)	2004	25	143



PAVEMENT TRANSITION DETAIL

Not to scale

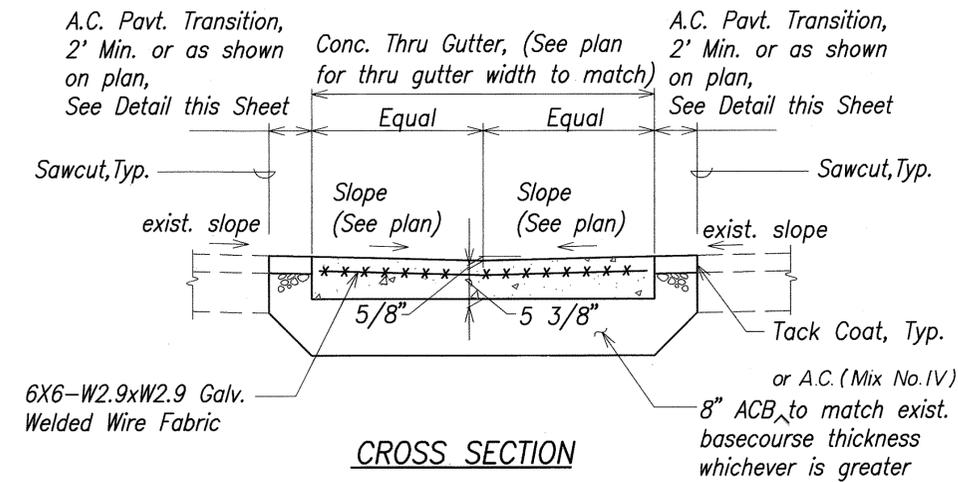


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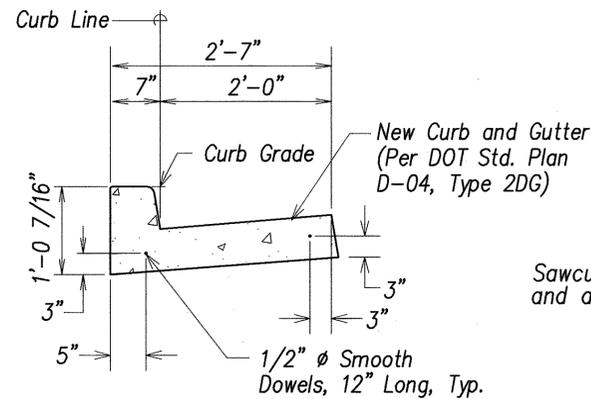
This detail can be used in situations where the edge of sidewalk cannot be flush with the face of (back) curb due to right of way restrictions.

ELEVATION DETAIL - BACK CURB
Not to scale

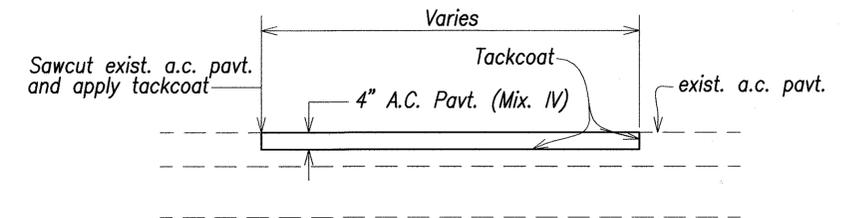
NOTE:
All curb ramps shall be reinforced.



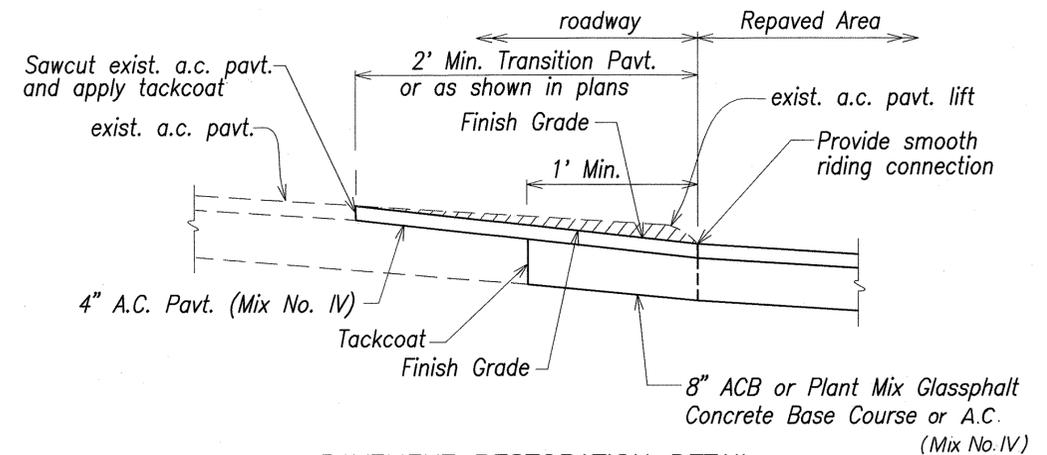
CROSS SECTION



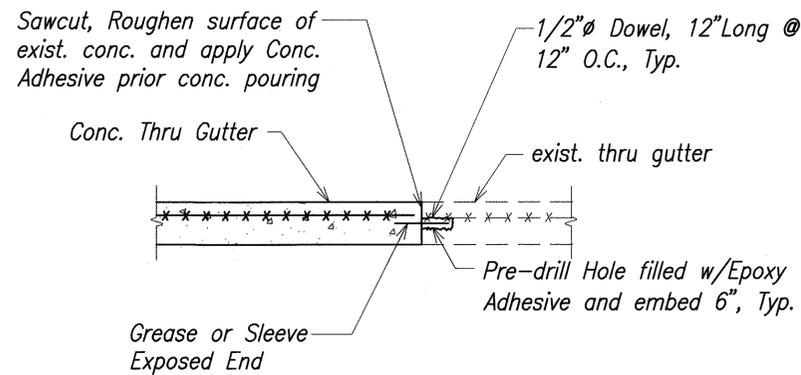
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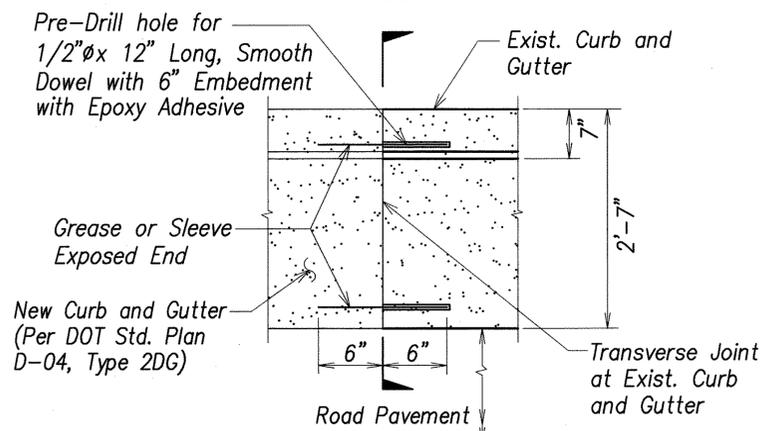
RESURFACE CROSSWALK
Not to scale



PAVEMENT RESTORATION DETAIL
Not to scale



LONGITUDINAL SECTION



PLAN CURB AND GUTTER CONNECTION
Not to scale

CONCRETE THRU GUTTER CONNECTION DETAIL
Not to scale

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CDJ by R. Marafioti, 05-02

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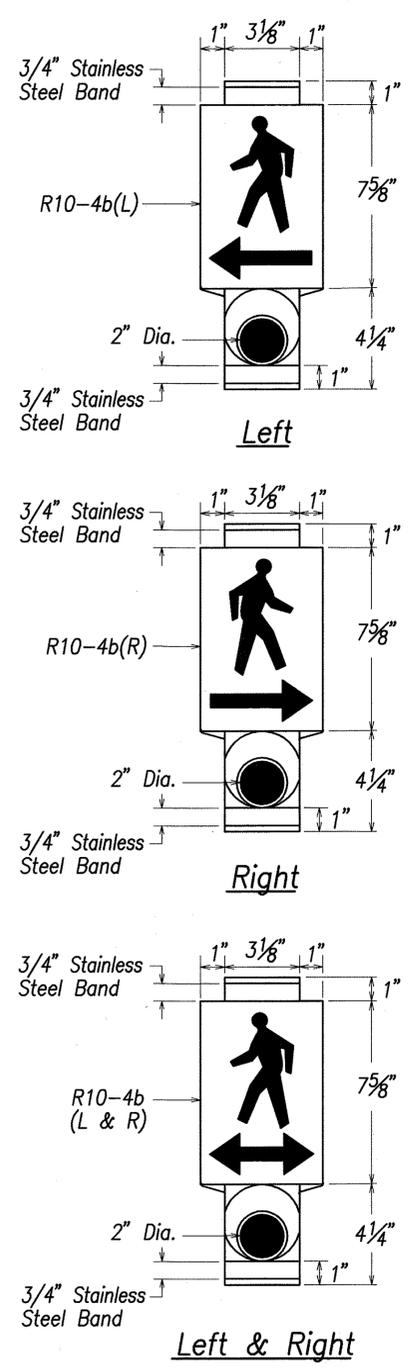
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

MISCELLANEOUS DETAILS
AC TRANSITION

Pedestrian Facilities & ADA Compliance at Various Locations on Oahu, Unit 7
Federal Aid Project No. CMAQ-0300(98)

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SHEET No. D-10 OF 22 SHEETS

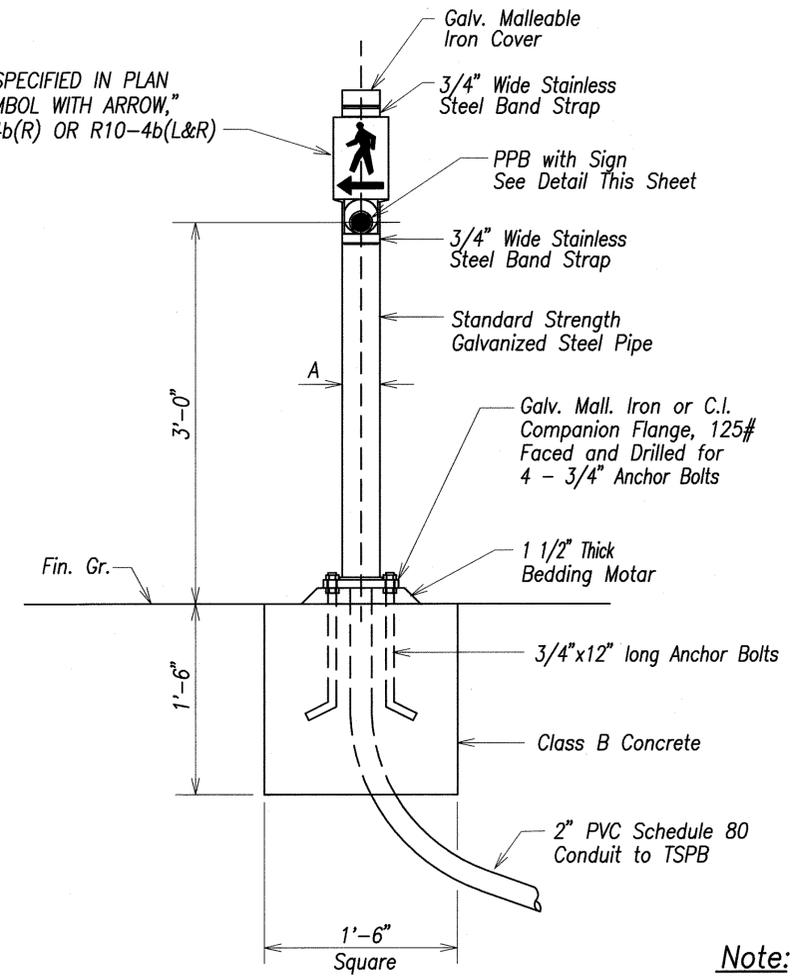
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-0300(98)	2004	26	143



PEDESTRIAN PUSH BUTTON WITH SIGN
 Man, Arrow & Push Button - White
 Background - Black

Note:
 There shall be a 30" x 48" level ground surface (2% max. cross slope, both directions) for a forward or side approach, as appropriate, to a pedestrian push button. Location of pedestrian push button shall be shown on Civil Plans.

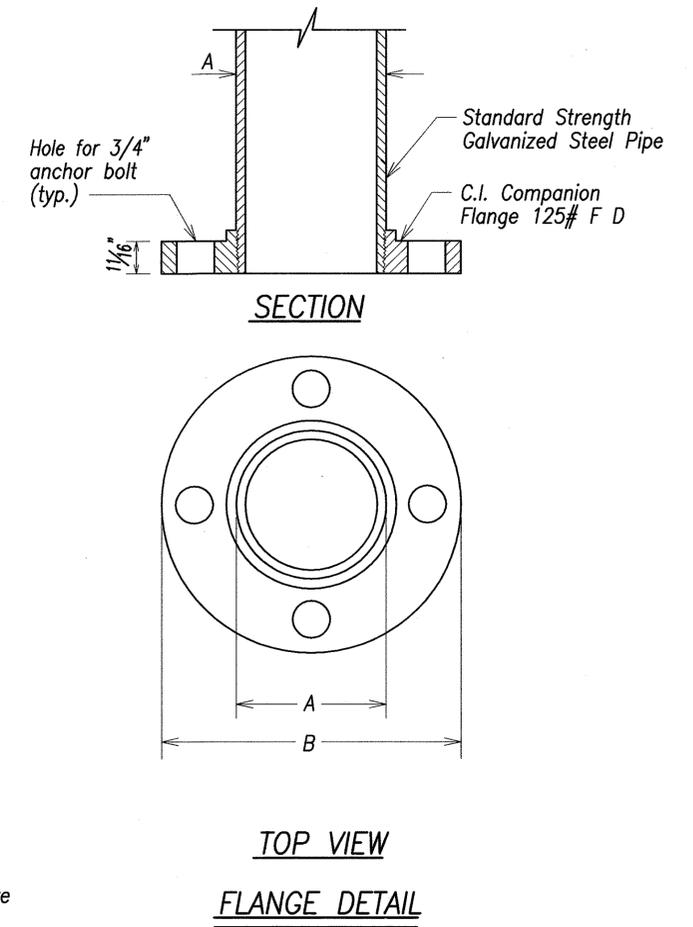
TRAFFIC SIGN AS SPECIFIED IN PLAN
 "WALKING MAN SYMBOL WITH ARROW,"
 R10-4b(L), R10-4b(R) OR R10-4b(L&R)



PPB POST AND FOOTING DETAIL

DATA TABLE FOR PPB POST		
AMOUNT OF PPB	DIMENSIONS	
	A	B
1	3 1/2"	8"
2 → 3	4 1/2"	9"

Note:
 1. Conduits shall protrude 2" max. above finished surface of foundation.
 2. Conduits shall slope away from post foundation.



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CD by R. Mendonca, 05-02

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DEXTER S. EU
 LICENSED PROFESSIONAL ENGINEER
 No. 4739-C
 HAWAII, U.S.A.

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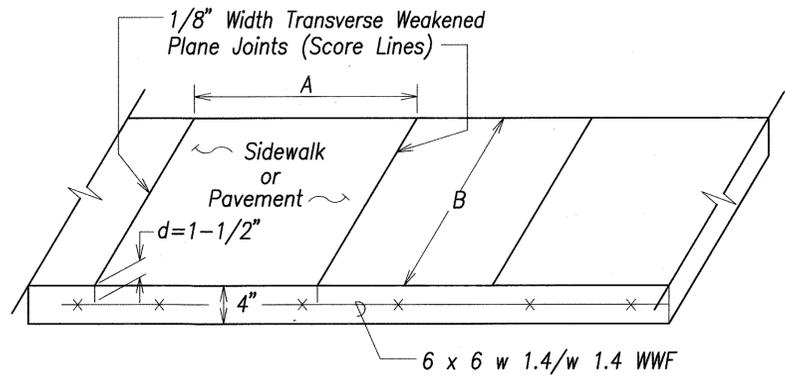
Dexter S. Eu

STATE OF HAWAII
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 HIGHWAYS DIVISION

PEDESTRIAN PUSH BUTTON DETAILS

Pedestrian Facilities & ADA Compliance at Various Locations on Oahu, Unit 7
 Federal Aid Project No. CMAQ-0300(98)
 Scale: No Scale Date: August 2004
 SHEET No. D-11 OF 22 SHEETS

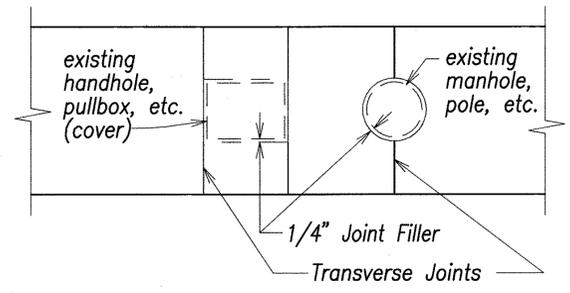
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-0300(98)	2004	27	143



Note: A = 6' if B ≤ 8'.
If B > 8', Add Longitudinal Joint

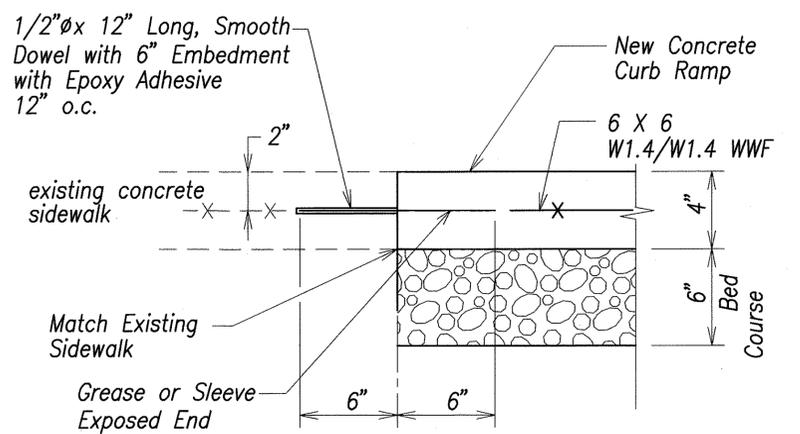
SIDEWALK SCORE LINE DETAIL

Not to scale



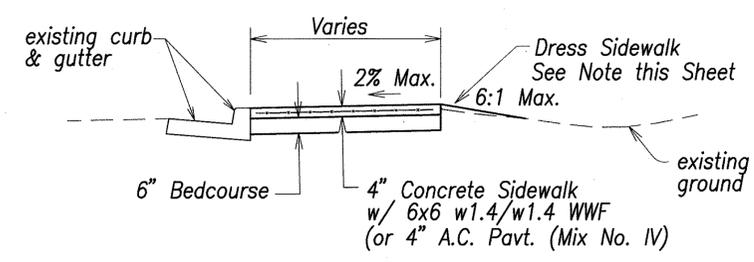
SIDEWALK ISOLATION JOINT DETAIL

Not to scale



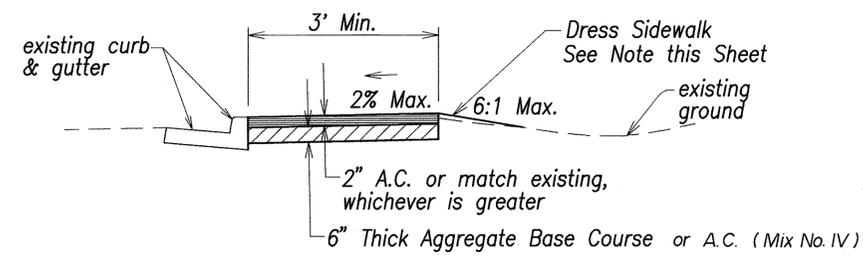
TYPICAL CONSTRUCTION JOINT AT EXISTING SIDEWALK

Not to scale



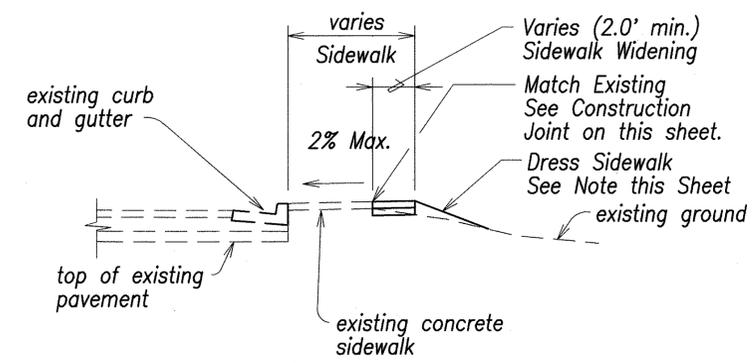
SIDEWALK DETAIL

Not to scale



A.C. SIDEWALK DETAIL

Not to scale

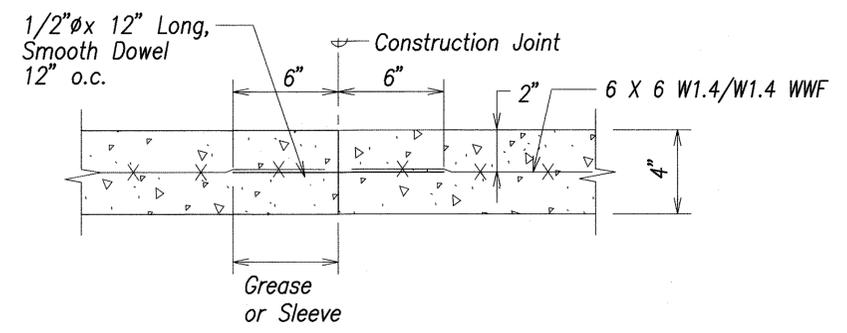


SIDEWALK WIDENING SECTION

Not to scale

NOTES:

1. Dressing of sidewalk shall consist of clearing, grubbing, grading, reshaping and compacting the area adjacent to the improvement with suitable material as shown on the plans and/or as directed by the Engineer. If existing ground is asphalt or concrete surface, dress sidewalk with A.C. pavement, Mix No. IV. This work shall be considered incidental to the new sidewalk.
2. Transverse and longitudinal weakened Plane Joints for sidewalk shall be considered incidental to the New Sidewalk.
3. Installation of dowels and tie bars including drilling, and epoxy grout shall be incidental to Sidewalk.



TRANSVERSE CONSTRUCTION JOINT DETAIL

Not to scale

DESIGNED BY	DATE
TRACED BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
NO.	

CAD by R. Mendosa, 05-02

Last Saved: J:\COE-Curb Ramps\Oahu Package2\Details\0-12 Sidewalk-Detail.dwg 09/01/04 at 08:59



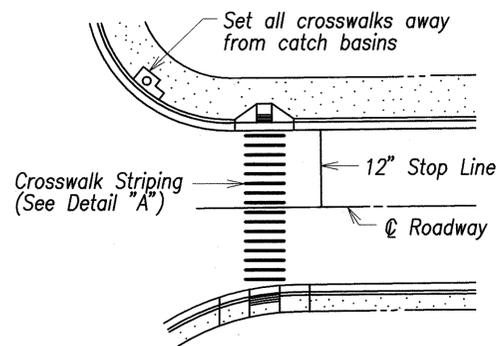
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
[Signature]

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

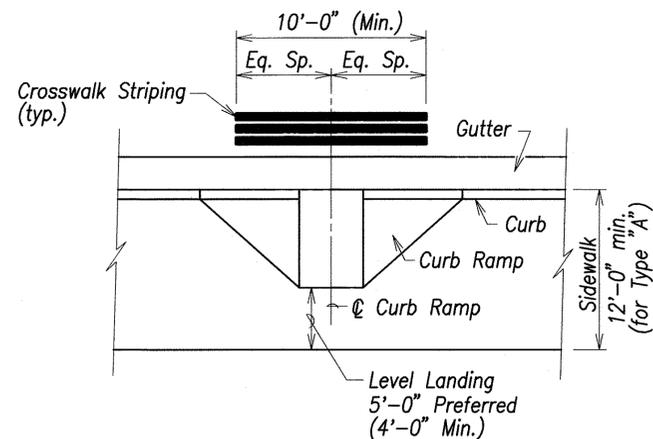
SIDEWALK DETAILS

Pedestrian Facilities & ADA Compliance at Various Locations on Oahu, Unit 7
Federal Aid Project No. CMAQ-0300(98)
Scale: No Scale Date: August 2004
SHEET No. D-12 OF 22 SHEETS

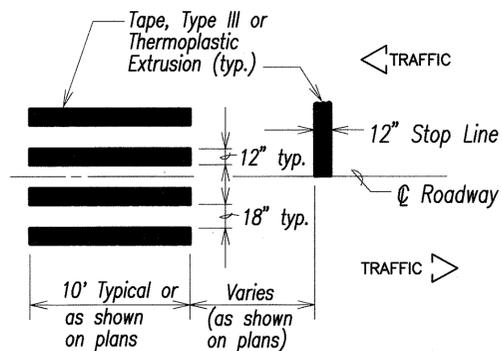
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-0300(98)	2004	28	143



PLAN



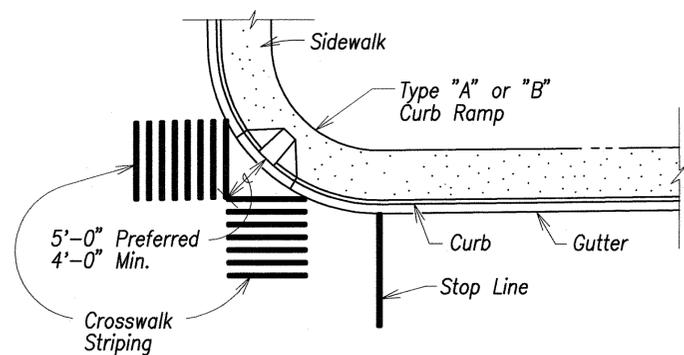
TYPICAL CROSSWALK STRIPING AT CURB RAMP



DETAIL "A"

CROSSWALK STRIPING DETAIL

NOTE:
Longitudinal lines shall be parallel to traffic flow.



TYPICAL CROSSWALK STRIPING AT DIAGONAL CURB RAMP

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

CDL by R. Mendoza, 155-52

Last Saved: J:\COE-Curb Ramps\Oahu Package2\Details\0-13 Striping-Detail.dwg 09/01/04 at 09:00



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Dexter S. Eji

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STRIPING DETAILS

Pedestrian Facilities & ADA Compliance at Various Locations on Oahu, Unit 7
Federal Aid Project No. CMAQ-0300(98)
Scale: No Scale Date: August 2004

SHEET No. D-13 OF 22 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-0300(98)	2004	29	143

TRAFFIC SIGNAL NOTES

- All Traffic Signal work shall conform to the requirements of the Manual on Uniform Traffic Control Devices for Streets and Highways, U.S. Department of Transportation, Federal Highway Administration, Latest Edition, and Amendments.
- The locations of the traffic signal standards, traffic signal standards with mast arm, pedestrian push buttons, traffic controller, transformer, pullboxes, conduits, & loop detectors shall be staked out in the field by the Contractor and locations accepted by the Engineer prior to construction and installation. Locations shown on plans shall be adjusted as necessary to prevent conflict with existing or new facilities.
- All conduits shall be PVC Schedule 80.
- Loop detectors shall be installed according to Loop Detector Details shown on the Plans.
- Lead-in wires in pullbox near loops shall be tagged with Loop Number(s).
- Existing pavement shall be restored according to Restoration of Existing Pavement due to Trench Excavation detail shown on the Plans.
- Department of Transportation Services, City & County of Honolulu will assist the Engineer in construction inspection for the Traffic Signal System.
- Steel plates for covering trenches shall have skid resistant surface.
- All structures, pavements, utilities, landscaping, and other topographical features shown on the Plans are existing and shall remain unless noted or indicated otherwise. All grassed areas damaged by construction activities shall be topsoiled and grassed.
- 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.
- Existing signal standards, signal heads, appurtenances and existing pullboxes, controller footings and the top 1'-6" of signal standard footings shall be removed and become the property of the Contractor.
- A solid #8 bare copper wire shall be pulled in all conduits with the traffic control cable for equipment ground. Cost shall be considered incidental to the installation of the signal control cable.
- All splicing shall be done in the pullboxes.
- All traffic signal controller equipment shall be completely wired in the cabinet and shall control the traffic signal as called for in the Plans.
- The loop amplifier units furnished for this project shall be capable of operating the loop detector configurations shown on the Plans.
- The Contractor shall notify the Traffic Control Branch, Department of Transportation Services, City & County of Honolulu, (Phone No. 523-4589) three (3) working days prior to commencing any work on the traffic signal system.
- The Contractor shall be responsible for any damages to the 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.

- A 3'x4' level area shall be provided along side pedestrian push button assemblies at a distance not to exceed 10'-0". An unobstructed 3'-0" min. wide route shall be provided along all sidewalks.
- The Contractor shall verify with the respective utility companies and government agencies, the locations of all electric, telephone, traffic signal, street light, cable television, fire alarm, gas, water, sewer, drain and other lines crossing the excavation path or in excavation areas.
- All work and materials for the traffic signal system shall conform to Section 623 - Traffic Signal System, of the current Standard Specifications for Road, Bridge, and Public Works Construction - 1994 of the Hawaii State Department of Transportation, except as otherwise provided on the Plans or in the Special Provisions.
- Provide ground rod in all pullboxes, pullboxes adjacent to signal standards, pedestals, controller cabinets, and other locations specified by the Engineer. Ground rod connectors shall be copper welded and shall meet ground to earth resistance as specified by the National Electric Code or local inspecting agency.
- Underground pipes, cables, or ductlines known to exist 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.
- Where pedestrian walkways exist, they shall be maintained in passable condition or other facilities for pedestrians shall be provided. Passage between walkways at intersections shall likewise be provided.
- Driveways shall be kept open unless the owners of the property using these rights-of-way are otherwise provided for satisfactorily.
- No material and/or equipment shall be stockpiled or otherwise stored within street rights-of-way except at locations designated in writing and accepted by the Engineer.
- Traffic Signal Supports and Foundations shall meet the requirements of "AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 4th Edition 2001."
- 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 various contract items.
- 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.
- Existing traffic signal pullboxes in sidewalks shall be removed by demolishing the top 6" of box, filling with #3 rock, and patching with 4" concrete to match existing. Payment shall be considered incidental to the various contract items.
- Contractor shall probe and verify locations of traffic signal foundations prior to manufacturing mast arms.

TRAFFIC SIGNAL LEGEND

New	Existing	
		Traffic Signal Head
		Pedestrian Signal Head
		Pedestrian Push Button Assembly
		Emergency Vehicle Preempt Receiver (Opticom Receiver)
		Pullbox, Type as Noted on Plans
		Traffic Signal Pole

ORIGINAL PLAN	DATE
DRAWN BY	
DESIGNED BY	
NOTE BOOK	
QUANTITIES BY	
CHECKED BY	
No.	

CAD by P. Nakamichi 05-02



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[Signature]

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

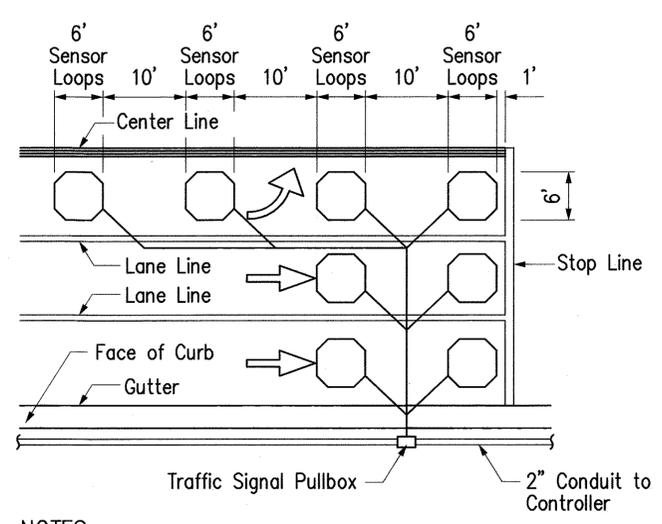
TRAFFIC SIGNAL NOTES & LEGEND

Pedestrian Facilities & ADA Compliance at Various Locations on Oahu, Unit 7
Federal Aid Project No. CMAQ-0300(98)

Scale: None Date: August 2004

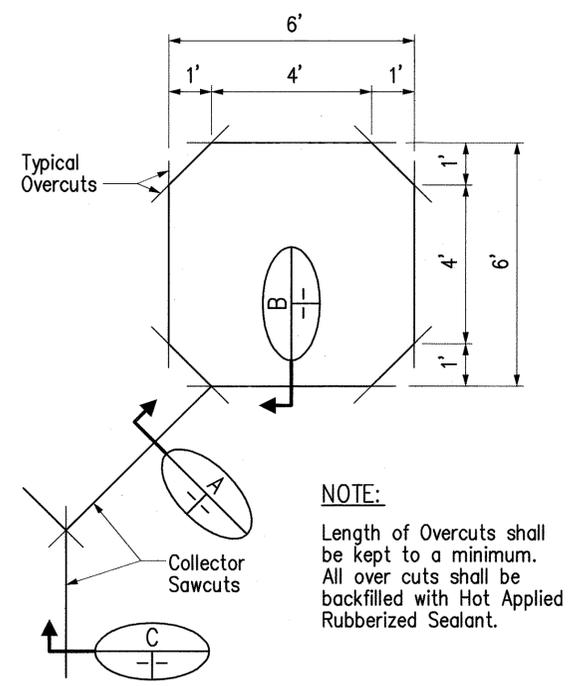
SHEET No. D-14 OF 22 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-0300(98)	2004	30	143



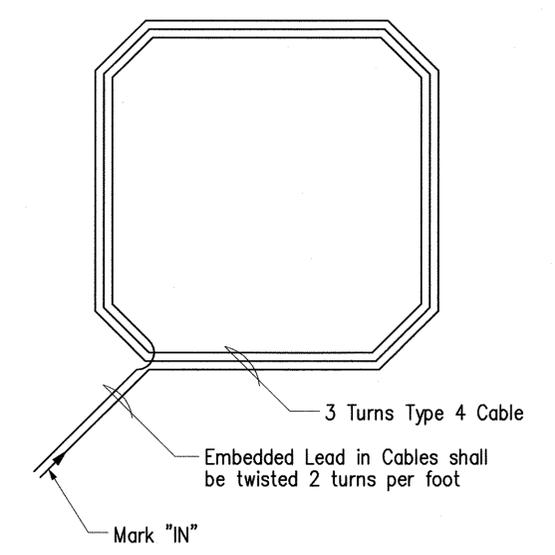
- NOTES:**
1. Center Sensor Loops in Lanes.
 2. Collector Cables shall be twisted 2 turns per foot.
 3. Number of Loops and locations vary. See Project Plans.
 4. Number and locations of Collector Sawcuts may be varied in the field.

TYPICAL SENSOR LOOP LAYOUT

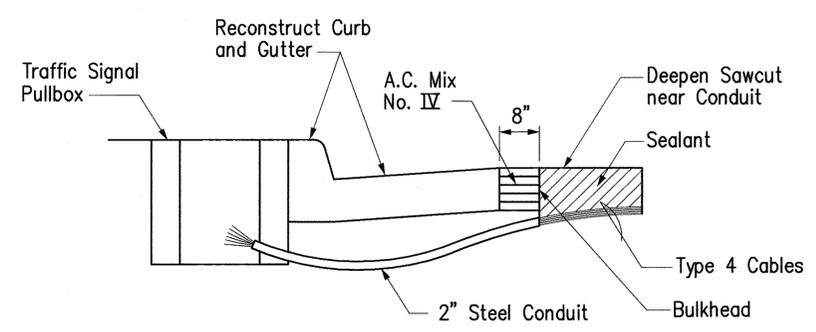


NOTE:
Length of Overcuts shall be kept to a minimum. All over cuts shall be backfilled with Hot Applied Rubberized Sealant.

TYPICAL SENSOR LOOP SAWCUT DETAIL

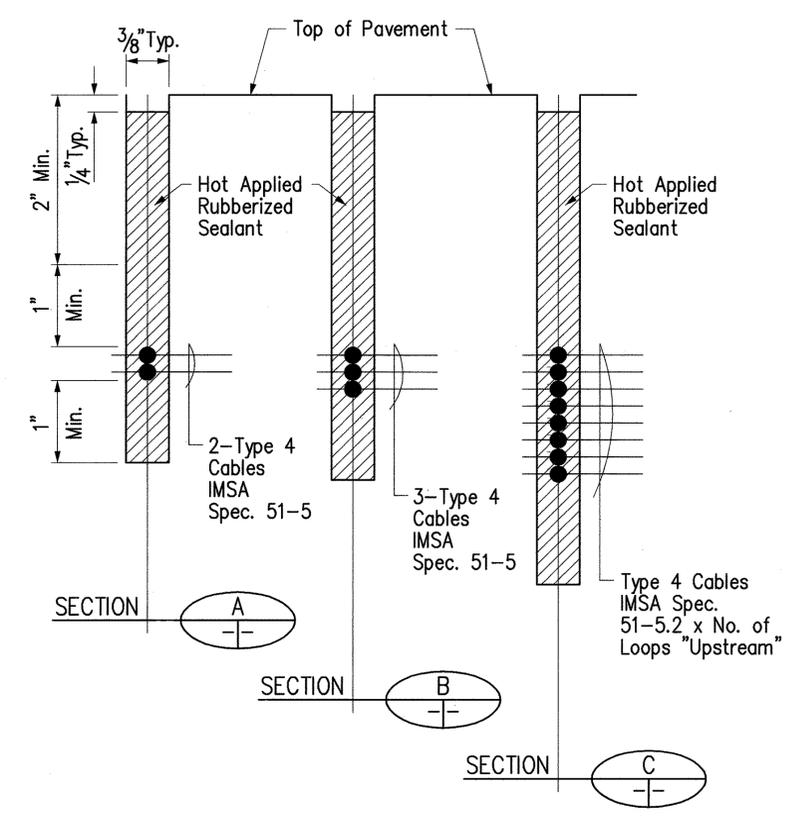


TYPICAL SENSOR LOOP WIRING DIAGRAM



- NOTES ON CONSTRUCTION AT END OF SAWCUT:**
1. Seal Roadway End of Conduit after installation of Conductors.
 2. Install Bulkhead across Conduit Trench.
 3. Place Hot Tar in Sawcut.
 4. Backfill over Conduit with New A.C.
 5. Reconstruct Curb and Gutter as required

DETAIL OF SENSOR LOOP INSTALLATION AT EDGE OF PAVEMENT



TYPES OF CABLES

- Type 1 Signal Loop Cable: Stranded No. 14, 26 conductors
- Type 2 Detector lead in cable and pedestrian push button circuit cable: Stranded, No. 14, two conductors
- Type 3 Interconnect Cable: Solid No. 19, 12 pairs
- Type 4 Loop Sensor Cable: Solid No. 12, single conductor to IMSA spec. 51-5
- Type 5 Cable from signal loop to signal head: Stranded, No. 14, four conductors
- Type 6 Service Cable: Solid, No. 6, three conductors
- Type 7 Optical Detector Cable: Berktek Type B, Stranded, No. 20, three conductors
- Type 8 Drop Cable: Solid, No. 14, four conductors

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
IN CHARGE BY	
NO. OF SHEETS	
TOTAL SHEETS	

CAD by P. Nakonehi, 05-52

DEXTER S. ELLIOTT
LICENSED PROFESSIONAL ENGINEER
No. 4739-C
HAWAII, U.S.A.
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Dexter S. Elliott

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LOOP DETECTOR DETAILS

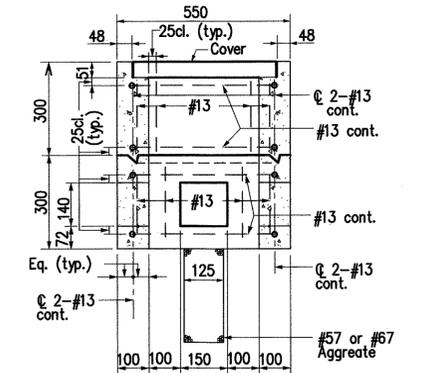
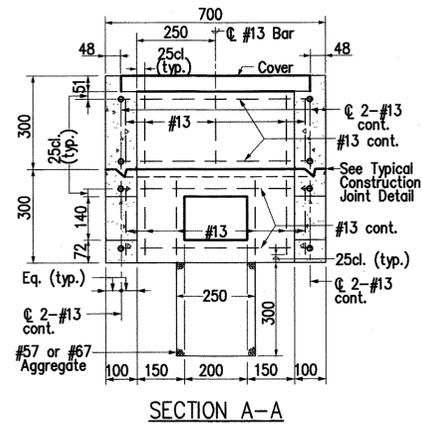
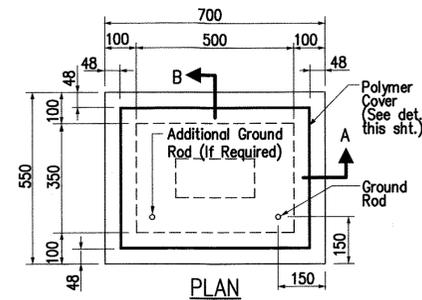
Pedestrian Facilities & ADA Compliance at Various Locations on Oahu, Unit 7
Federal Aid Project No. CMAQ-0300(98)
Scale: None Date: August 2004

SHEET No. D-15 OF 22 SHEETS

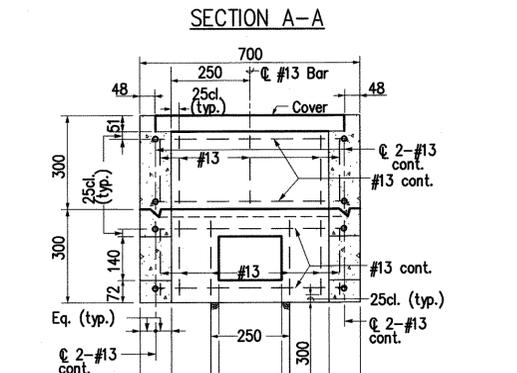
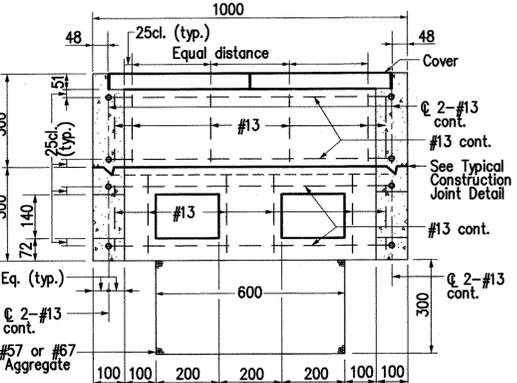
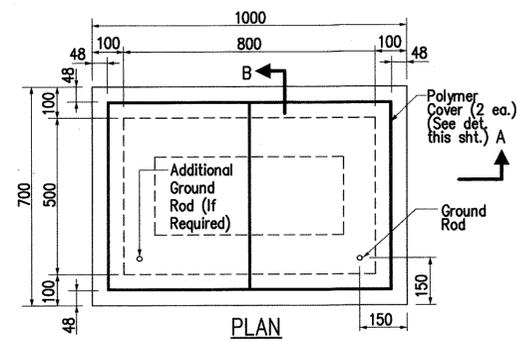
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-0300(98)	2004	31	143

GENERAL NOTES:

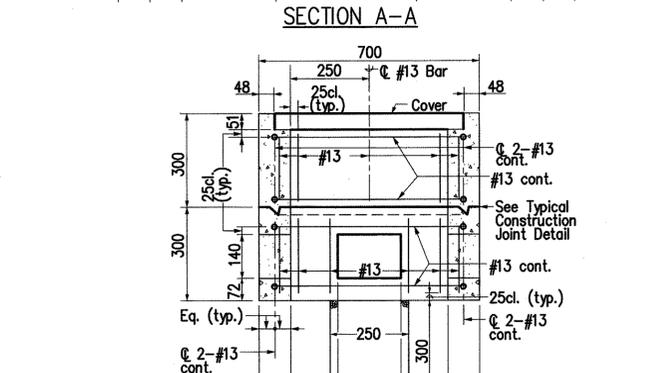
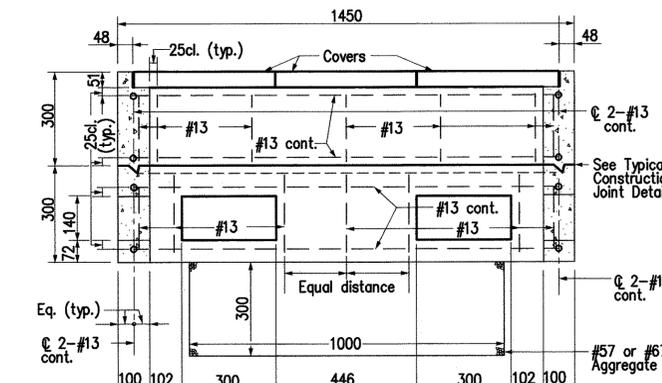
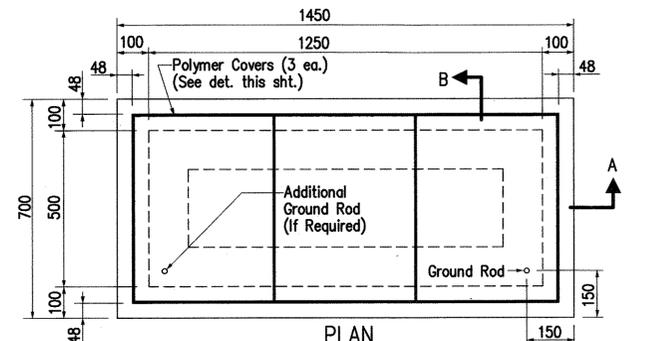
1. Provide a minimum of one 16Ø x 2.5m Copperweld Ground Rod in each pullbox. When directed by the Traffic Signal Inspector/Engineer, install additional Ground Rods. Cost of Ground Rods shall be incidental to the pullboxes.
2. All pre-cast concrete pullboxes shall be manufactured in two pieces.
3. The pullbox with cover shall be capable of supporting an MS 18 Loading.
4. The maximum 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, the Contractor shall fill the excess opening in the pre-cast knockouts with concrete 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 minimum.
10. The #57 or #67 size 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).



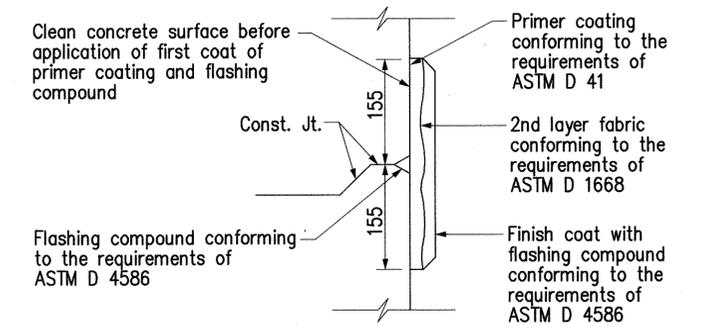
TYPE "A" PULLBOX (Old Type "B")
Scale: 1 : 100



TYPE "B" PULLBOX (Old Type "C")
Scale: 1 : 100

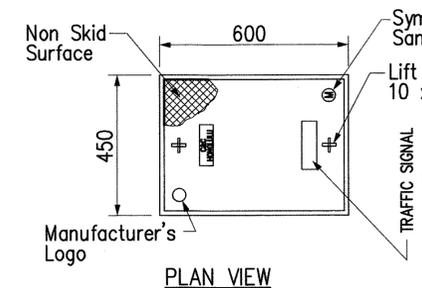


TYPE "C" PULLBOX (Old Type "D")
Scale: 1 : 100

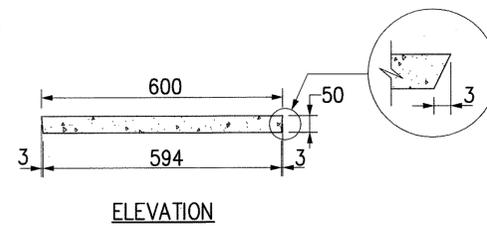


TYPICAL FLASHING COMPOUND WATERPROOFING DETAILS
Not to Scale

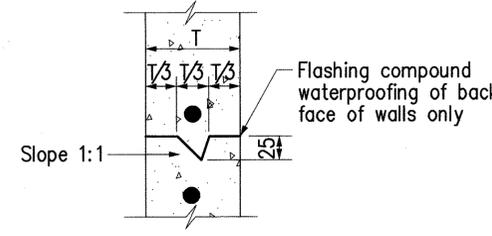
ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN



POLYMER CONCRETE COVER
Not to Scale



ELEVATION



TYPICAL CONSTRUCTION JOINT DETAIL
Not to Scale



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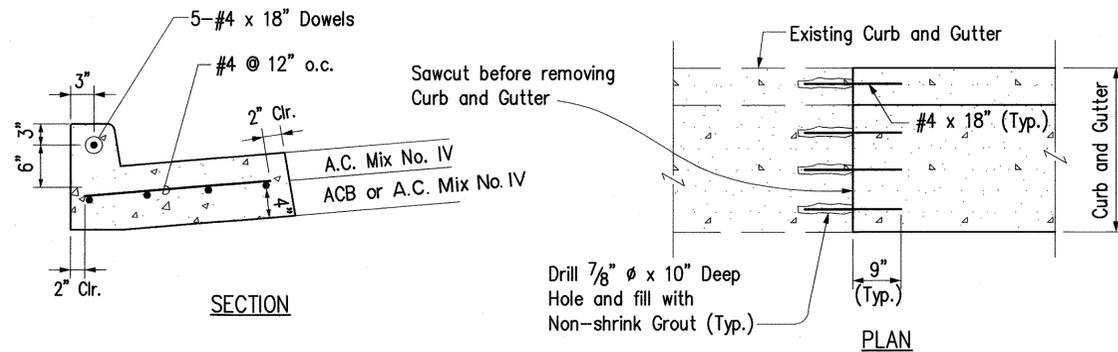
PULLBOX & COVER DETAILS

Pedestrian Facilities & ADA Compliance at Various Locations on Oahu, Unit 7
Federal Aid Project No. CMAQ-0300(98)
Scale: None Date: August 2004
SHEET No. D-16 OF 22 SHEETS

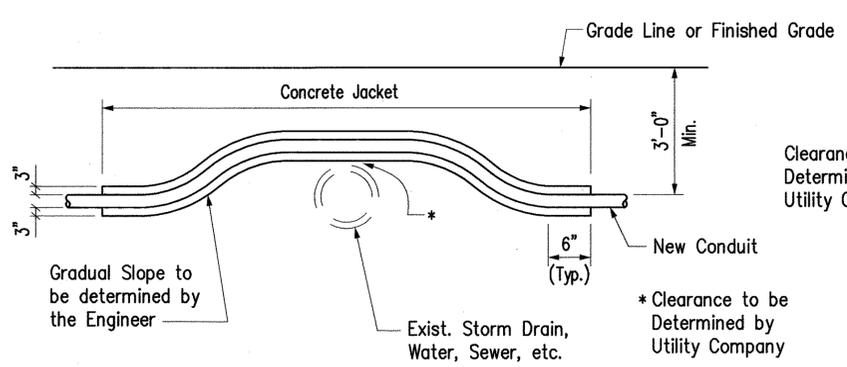
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QUANTITIES BY	_____
CHECKED BY	_____
ORIGINAL PLAN	_____
NOTE BOOK	_____
No.	_____

GD0 by P. Nakaneishi, 05-02

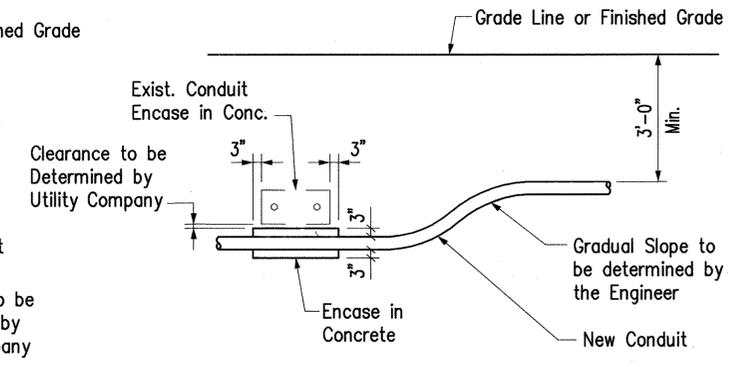
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-0300(98)	2004	32	143



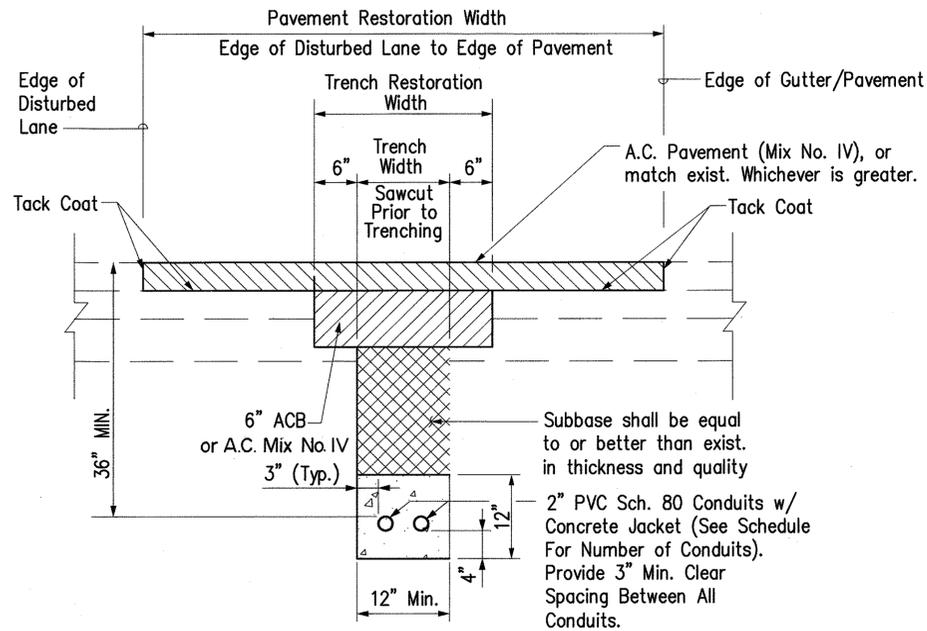
RESTORATION OF CURB AND GUTTER DUE TO TRENCH EXCAVATION



CONDUIT BY-PASS DETAIL AT VARIOUS UTILITIES



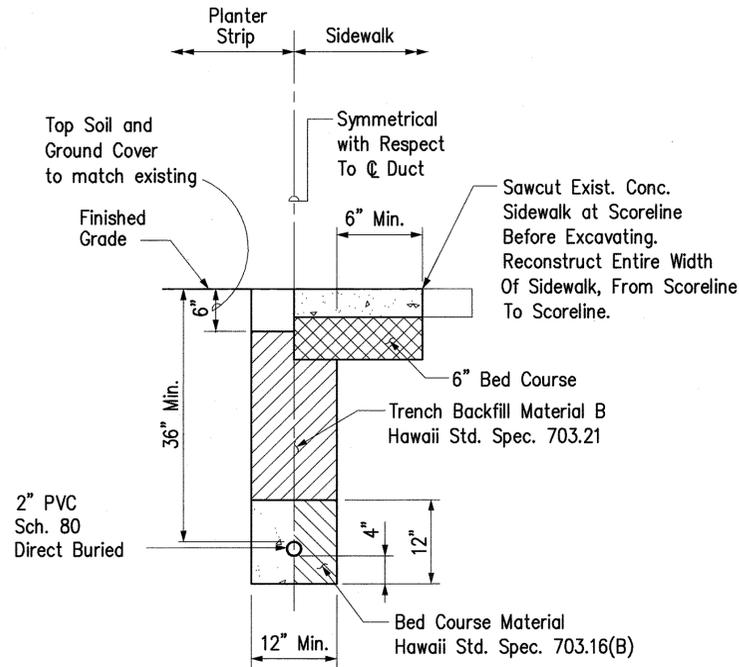
CONDUIT BY-PASS DETAIL



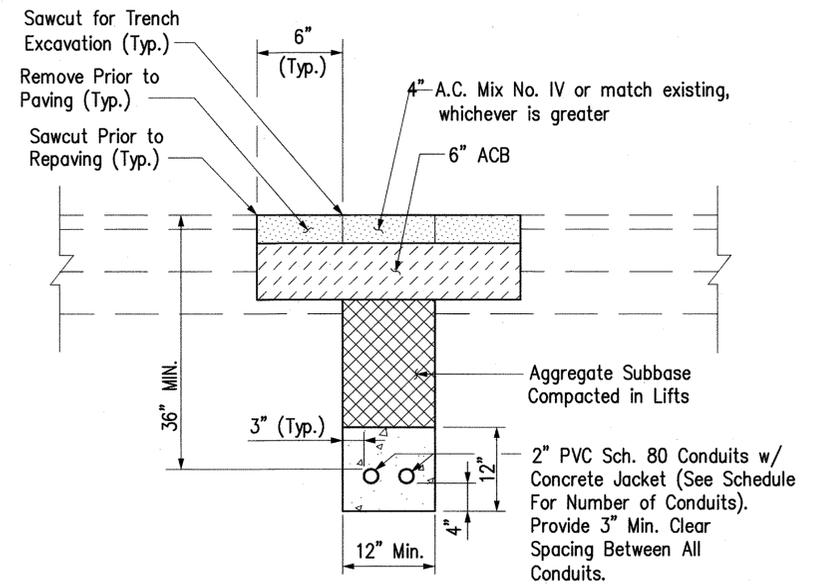
NOTES

1. Pavement structure shall be equal to or better than existing in thickness and quality.
2. For pavement restoration outside of trench restoration width, cold plane 1-1/2 inch of A.C. then repave entire lane width with 1-1/2 inch of A.C. Mix No. IV.
3. All disturbed pavement markings shall be replaced and all required utility adjustments such as manhole covers etc. shall be done by the Permittee.
4. All required ADA improvements shall be undertaken by the Permittee.
5. Permittee shall coordinate work with all other utility entities and Dept. of Facility Maintenance.
6. This detail applies for longitudinal trenches only.

PAVEMENT RESURFACING DUE TO LONGITUDINAL TRENCH EXCAVATION



RESTORATION OF EXISTING GROUND DUE TO TRENCH EXCAVATION



RESTORATION OF EXISTING PAVEMENT DUE TO TRENCH EXCAVATION

SURVEY PLOTTED BY	DATE
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DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
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GD by P. Inouehashi 55-52

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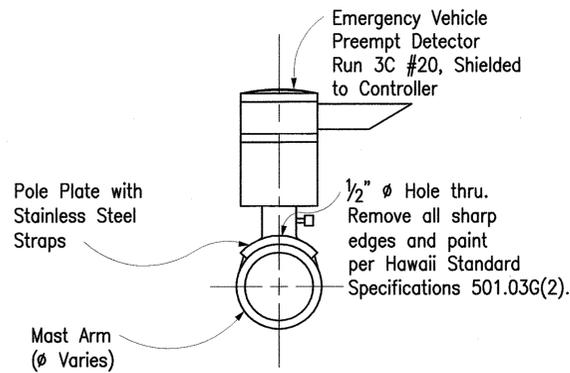
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

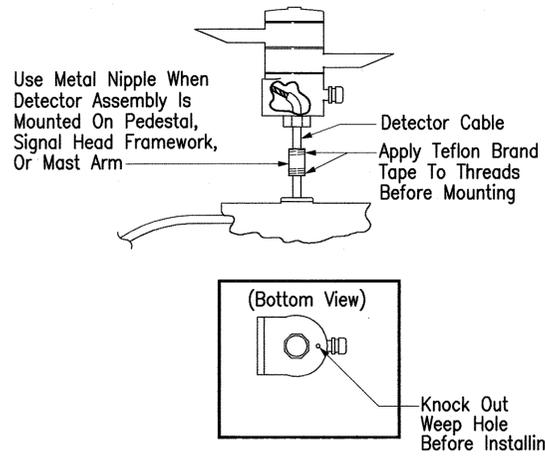
TRENCHING DETAILS

Pedestrian Facilities & ADA Compliance at Various Locations on Oahu, Unit 7
Federal Aid Project No. CMAQ-0300(98)
Scale: None Date: August 2004
SHEET No. D-17 OF 22 SHEETS

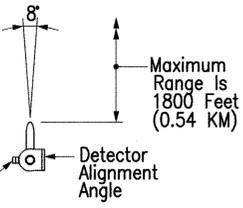
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-0300(98)	2004	33	143



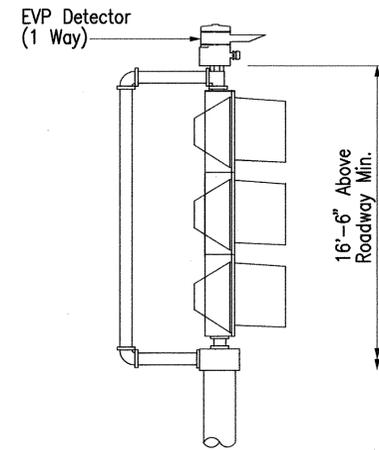
TYPICAL HORIZONTAL MOUNT OF EMERGENCY VEHICLE PREEMPT DETECTOR



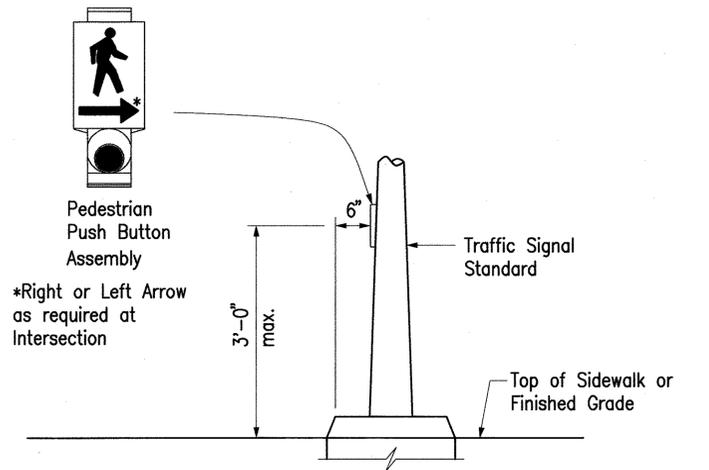
Detector Reception Angle Varies With Distance. It Is Approximately 8° at 1800 Feet (0.54km). Due To Reflection Reception, Angle Is Increased At Close Range. The Detector must be Aligned Within 8° of The Farthest Point Where Priority Vehicle Is To Be Sensed.



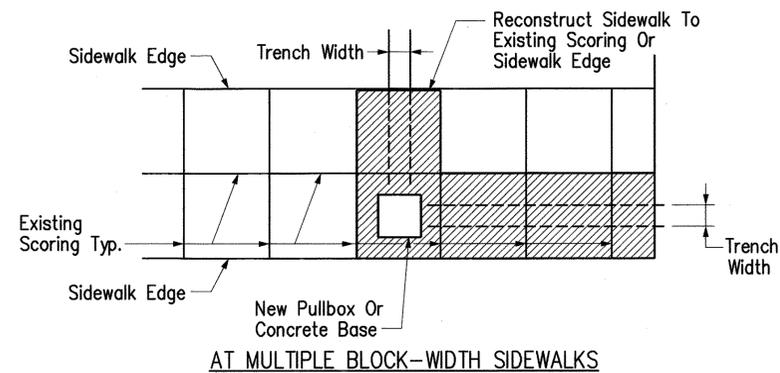
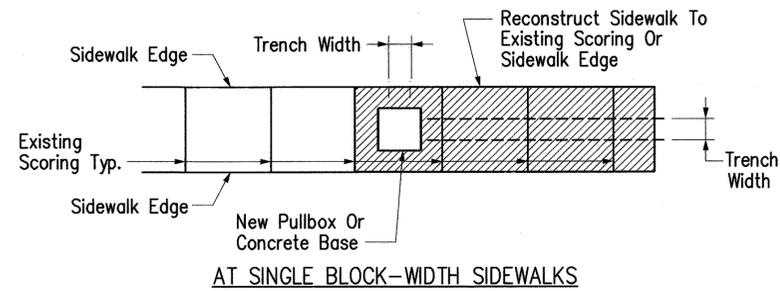
TYPICAL MAST ARM MOUNT OF EMERGENCY VEHICLE PRE-EMPT DETECTOR



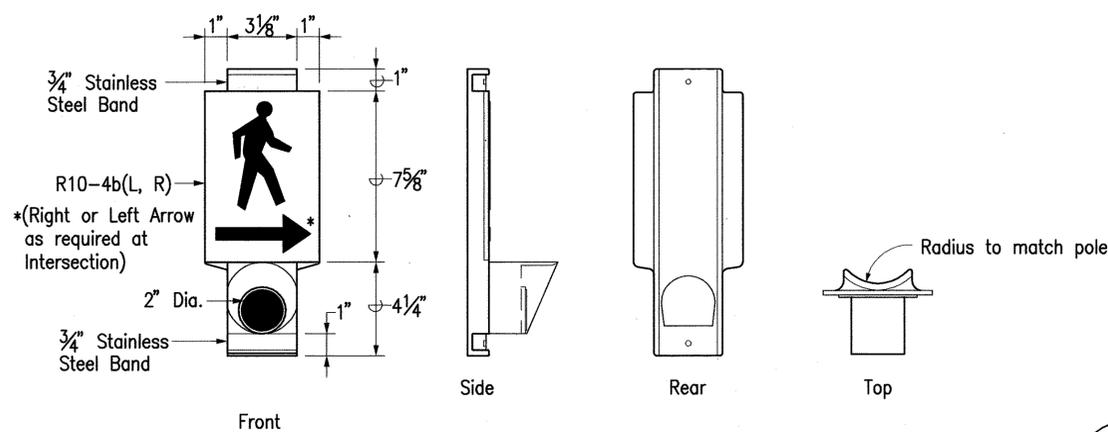
TYPICAL TP MOUNT OF EMERGENCY VEHICLE PRE-EMPT DETECTOR



PEDESTRIAN PUSH BUTTON PLACEMENT



SIDEWALK RECONSTRUCTION DETAILS



PEDESTRIAN PUSH BUTTON ASSEMBLY

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

CAD by P. Nakamaki, 5/5/02

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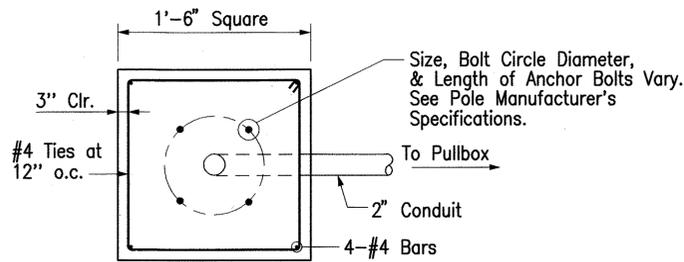
Dexter S. Eji

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

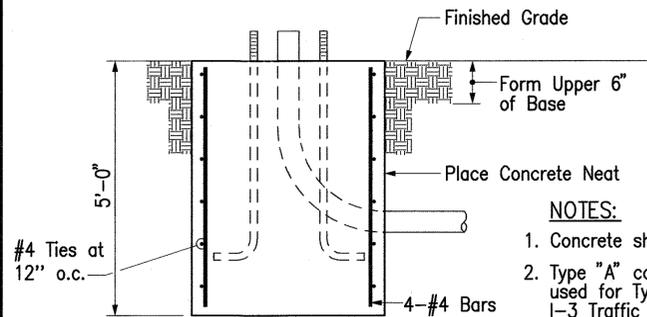
MISCELLANEOUS DETAILS

Pedestrian Facilities & ADA Compliance at Various Locations on Oahu, Unit 7
Federal Aid Project No. CMAQ-0300(98)
Scale: None Date: August 2004
SHEET No. D-18 OF 22 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-0300(98)	2004	34	143



PLAN-SECTION



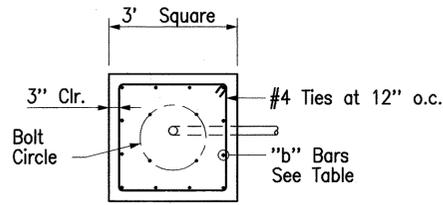
VERTICAL SECTION

TYPE "A" CONCRETE BASE

Not to Scale

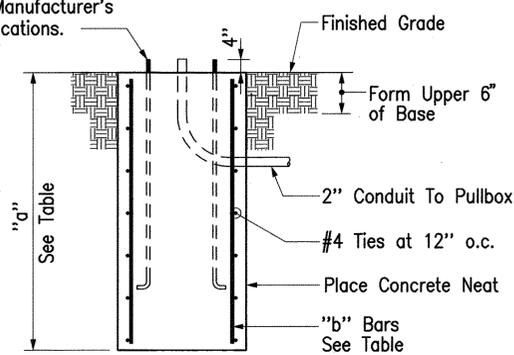
NOTES:

1. Concrete shall be Class "B".
2. Type "A" concrete base shall be used for Type I-10, I-7, and I-3 Traffic Signal Standards.
3. Conduit bend is incidental to concrete base.



PLAN - SECTION

Size, Length & Diameter of Anchor Bolts Vary. See Pole Manufacturer's Specifications.



VERTICAL SECTION

TYPE "C" CONCRETE BASE

Scale: 1/2" = 1'-0"

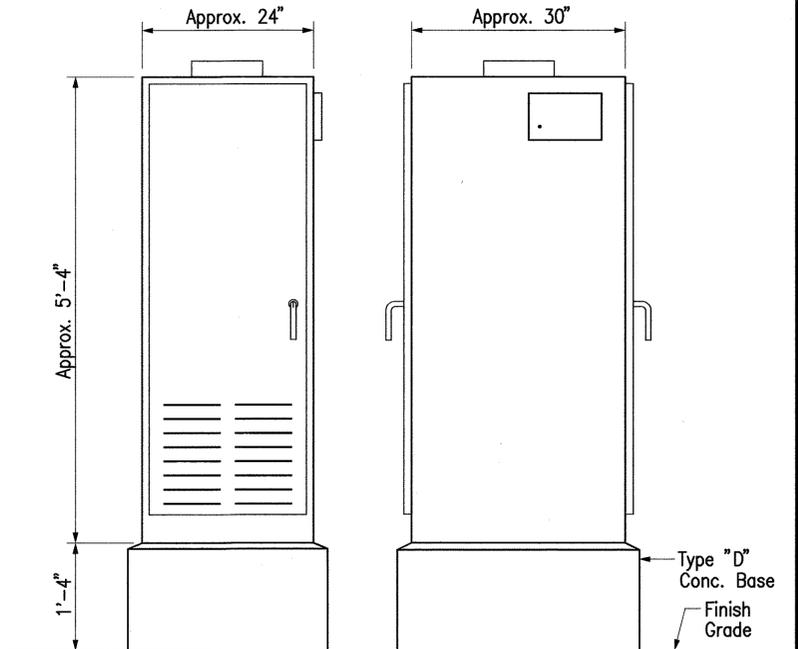
TYPE "C" CONCRETE BASE		
TYPE OF STANDARD	"a" Bars	"b" Bars
II - 27	7'-9"	12-#4
II - 30	7'-10"	12-#4
II - 31	7'-11"	12-#4
II - 32	7'-11"	12-#4
II - 48	8'-7"	12-#4

Typical Standard Designation: II - 30

Type Mast Arm Length

NOTES:

1. Concrete shall be Class "B".
2. Type "C" concrete base shall be used for Types II and III Traffic Signal Standards.
3. Design Lateral Pressure: 1,500 PSF.
4. Conduit bend is incidental to concrete base.
5. Reinforcing steel shall conform to ASTM A615, Grade 60.

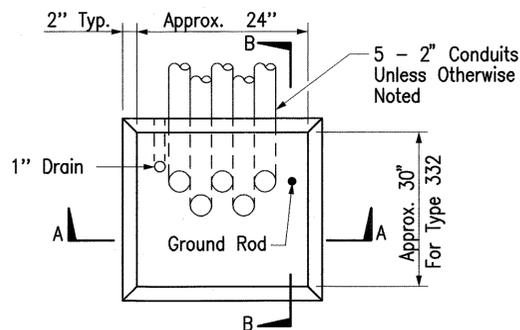


FRONT VIEW

SIDE VIEW

TYPE 332A CABINET

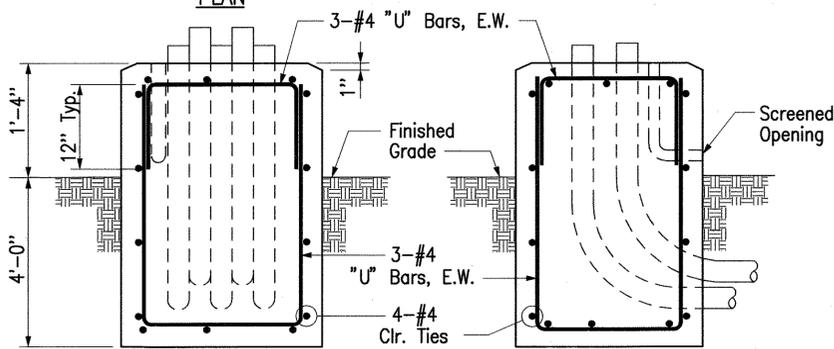
Scale: 1" = 1'-0"



PLAN

NOTES:

1. Concrete shall be Class "B".
2. Dimensions shall be altered to suit controller cabinet actually furnished.
3. Conduit bends and drain are incidental to concrete base.
4. Refer to cabinet manufacturer's specifications for details of anchor bolts and base setting.
5. All exposed surfaces of concrete base shall be given a Class 2, Rubbed Finish.

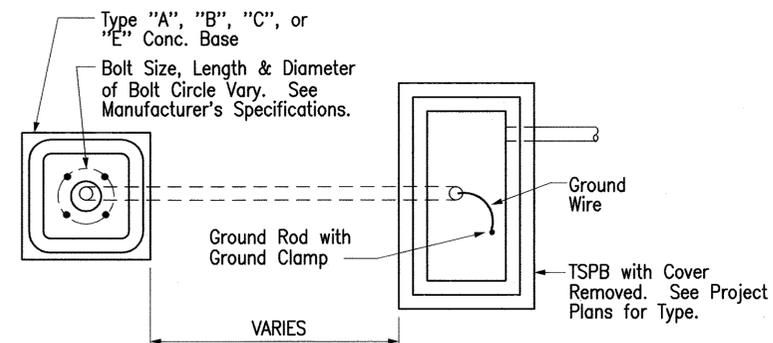


SECTION "A"

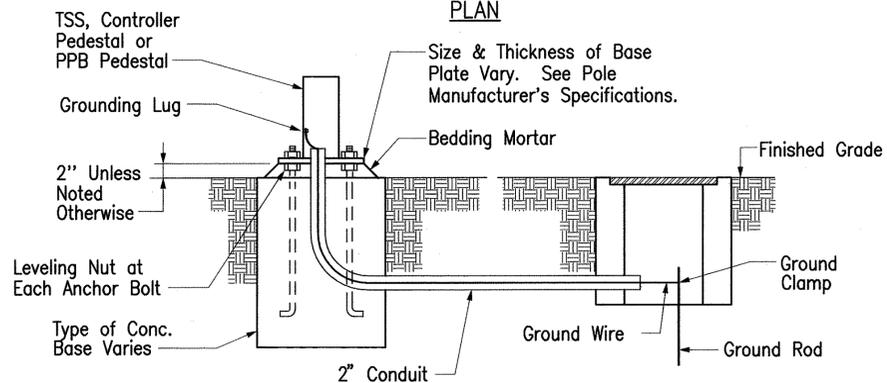
SECTION "B"

TYPE "D" CONC. BASE FOR CONTROLLER CABINETS

Scale: 1" = 1'-0"



PLAN



SECTION

TYPICAL STANDARD AND PEDESTAL INSTALLATION

Scale: 1/2" = 1'-0"

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GD5 by P. Inouehashi, 55-52

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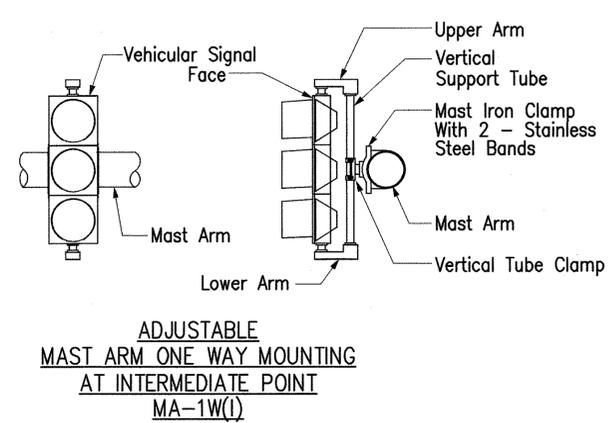
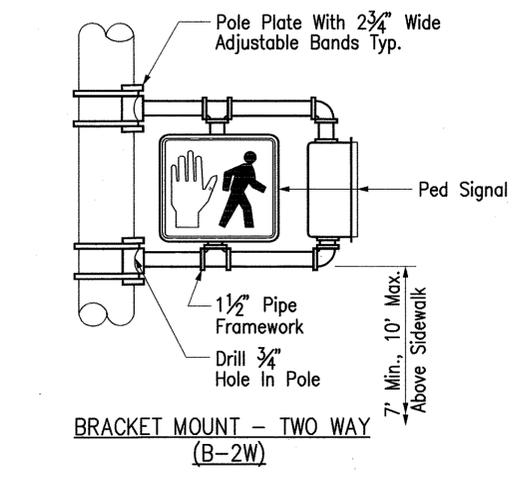
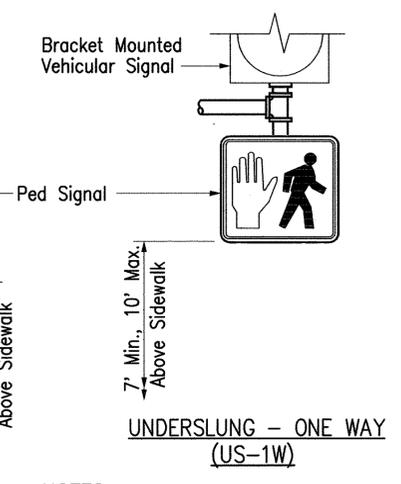
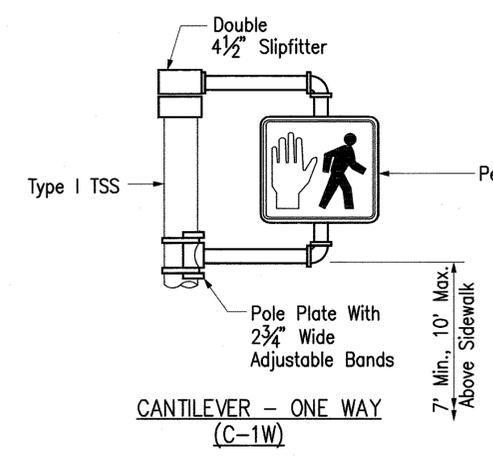
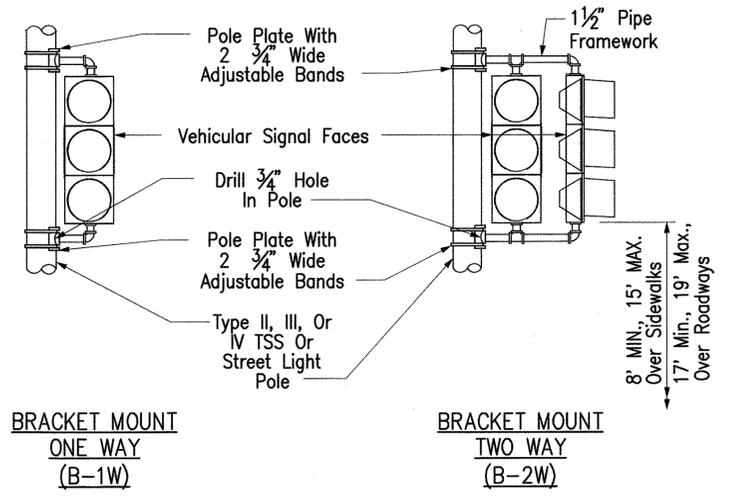
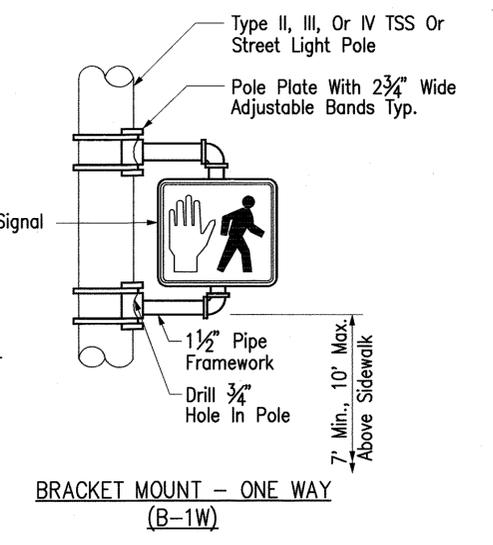
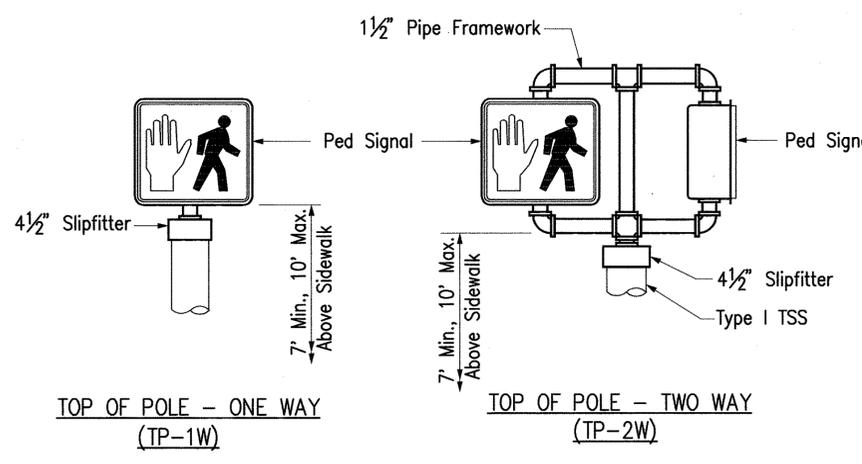
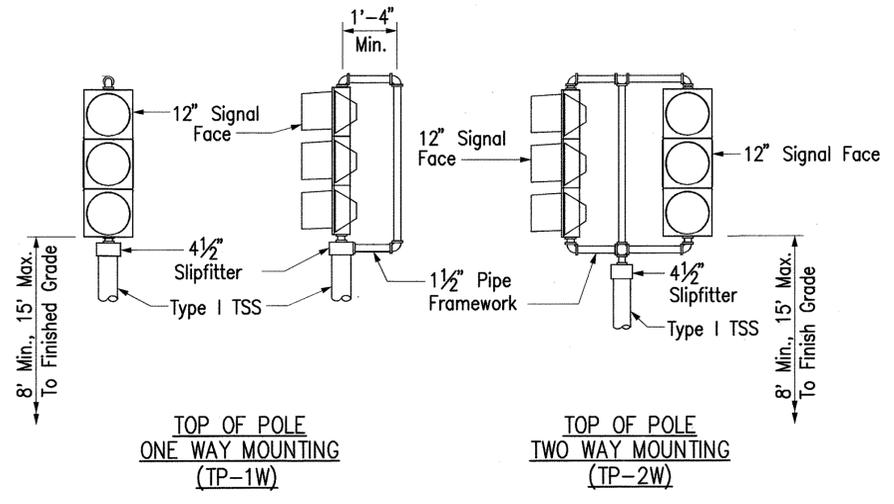
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONCRETE BASE DETAILS

Pedestrian Facilities & ADA Compliance at Various Locations on Oahu, Unit 7
Federal Aid Project No. CMAQ-0300(98)
Scale: None Date: August 2004

SHEET No. D-19 OF 22 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-0300(98)	2004	35	143



VEHICULAR SIGNAL MOUNTINGS

NOTES:

1. Stainless Steel Bands Shall Be 1/2" Wide X .050" Thick, Minimum. Tensile Strength shall be 100,000 PSI minimum.
2. Upper Arm, Lower Arm And Vertical Support Tube shall be of 356 Cast Aluminum.
3. All wiring shall be concealed.
4. Vertical Tube Clamp shall be of Malleable Iron, Grade 32510.
5. All Aluminum Parts shall have an Alodine 1200 Finish.

PEDESTRIAN SIGNAL MOUNTINGS



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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

MOUNTING BRACKET DETAILS

Pedestrian Facilities & ADA Compliance at Various Locations on Oahu, Unit 7
Federal Aid Project No. CMAQ-0300(98)

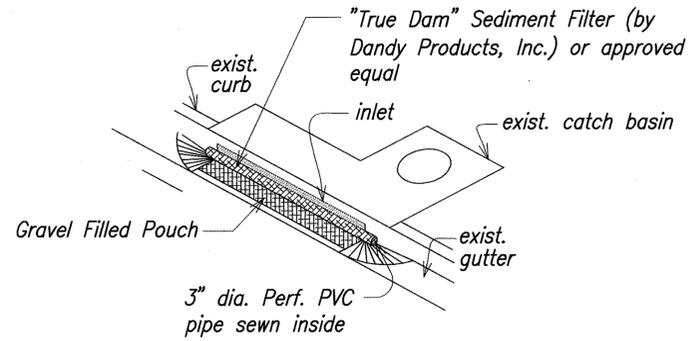
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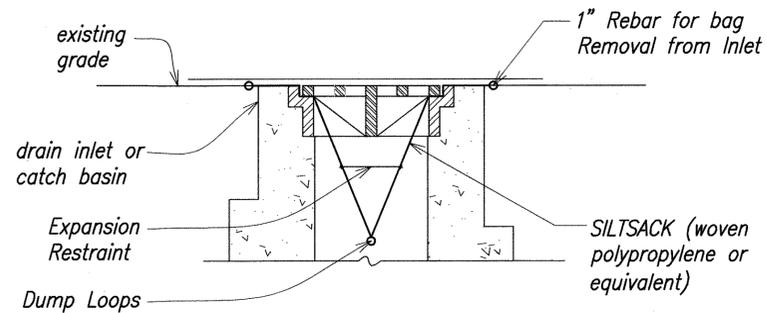
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CAD by P. Nohamahi, 55-52

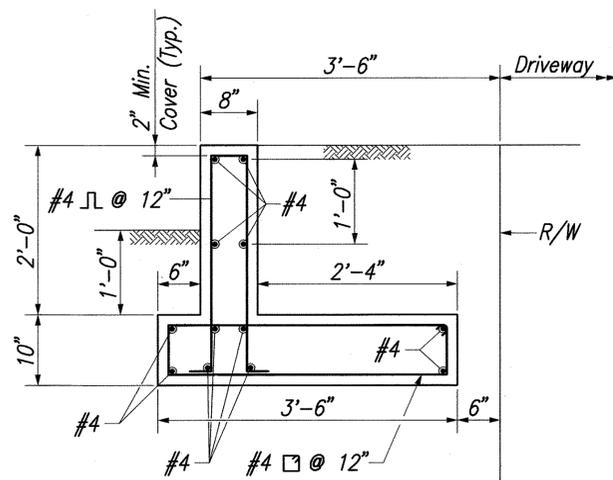
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HAWAII	HAW.	CMAQ-0300(98)	2004	36	143



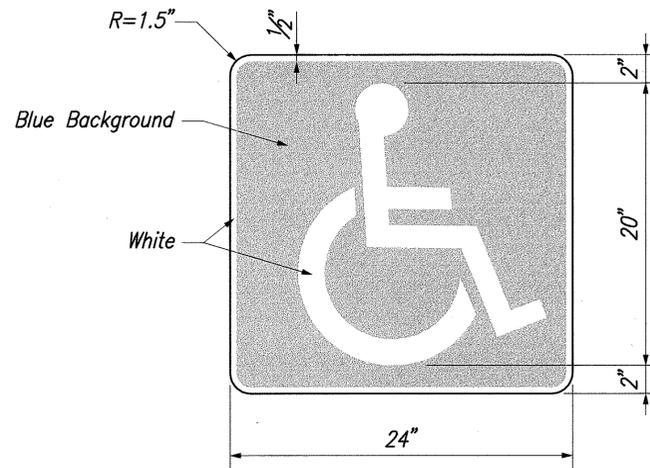
INLET PROTECTION (SEDIMENT CONTROL FILTER)
AT CATCH BASIN
 Not to scale



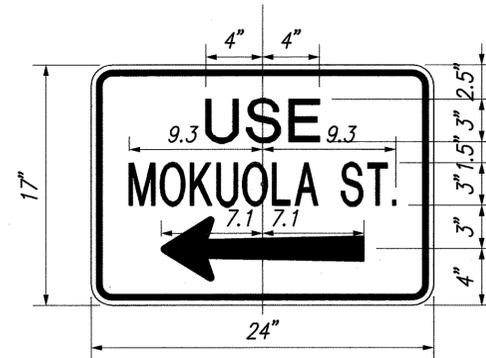
GRADED INLET PROTECTION
 Not to scale



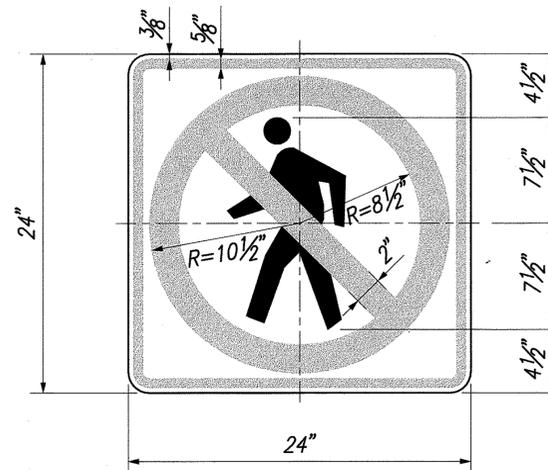
TYPICAL RETAINING WALL DETAIL
 Not to Scale



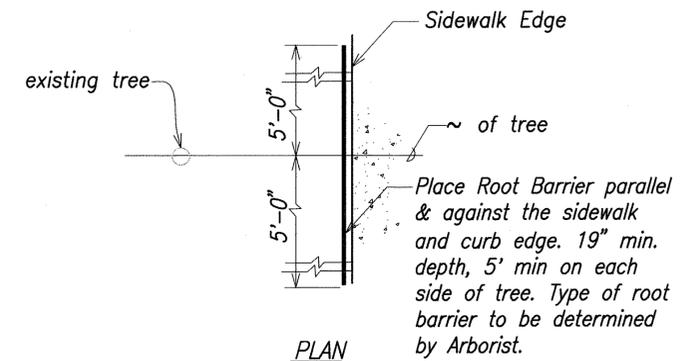
D9 - 6
 Not to Scale



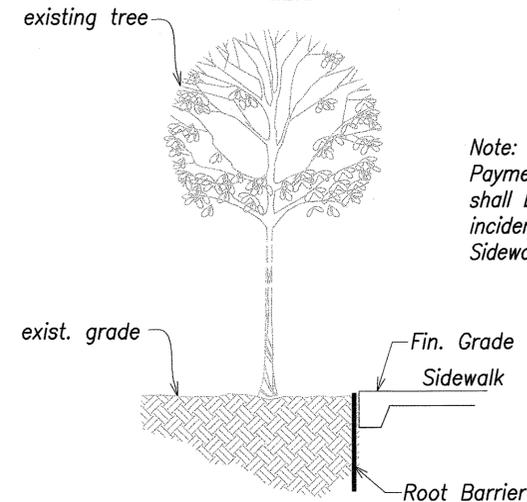
D9-6a
 Not to Scale



R9 - 3a
 Not to Scale



PLAN



ELEVATION

ROOT BARRIER DETAIL
 Not to scale

Note:
 Payment for Root Barrier shall be considered incidental to Concrete Sidewalk work.

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CSB by L. Fong, 05-02

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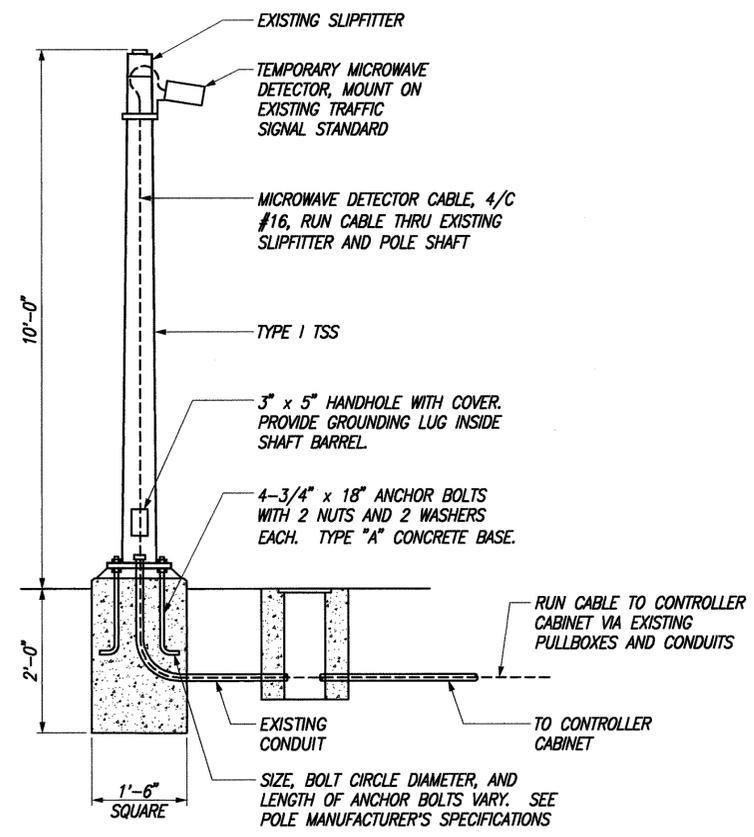
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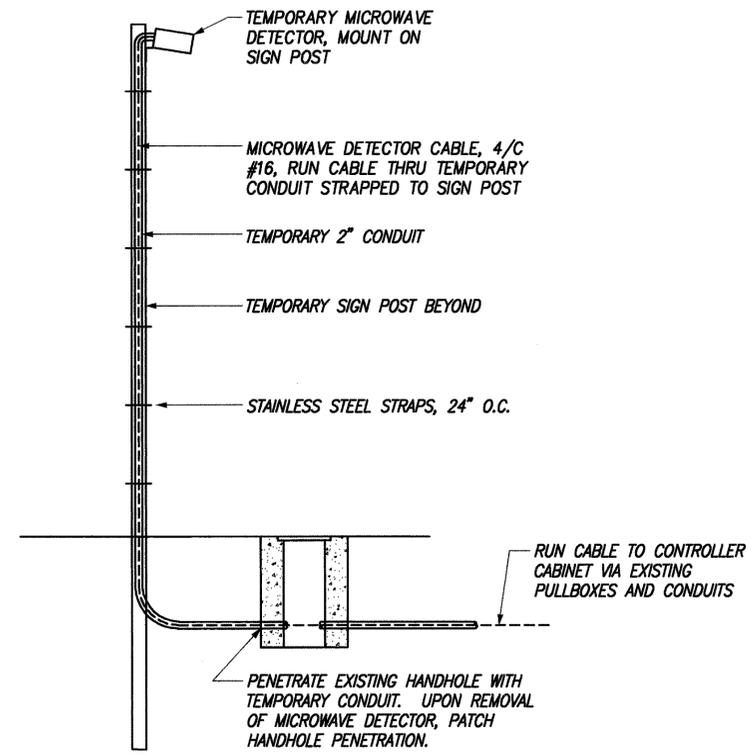
MISCELLANEOUS DETAILS

Pedestrian Facilities & ADA Compliance at Various Locations on Oahu, Unit 7
 Federal Aid Project No. CMAQ-0300(98)
 Scale: As Shown Date: August 2004
 SHEET No. D21 OF 22 SHEETS

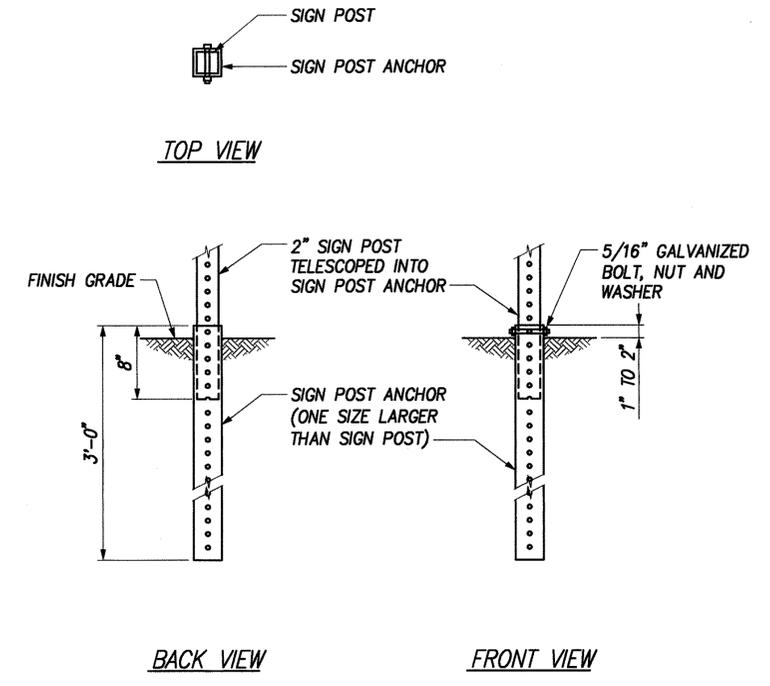
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-0300(98)	2004	37	143



AT EXISTING TRAFFIC SIGNAL STANDARD



AT TEMP SIGN POST



TEMPORARY SIGN POST DETAIL
NOT TO SCALE

NOTES:

- STANDARDS SHALL BE DESIGNED IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS.
- CONCRETE SHALL BE CLASS "B".
- TYPE "A" CONCRETE BASE SHALL BE USED FOR TYPE I-10, TRAFFIC SIGNAL STANDARDS.
- CONDUIT BEND IS INCIDENTAL TO CONCRETE BASE.

TEMPORARY MICROWAVE DETECTOR DETAIL
NOT TO SCALE

NOTES:

- MICROWAVE DETECTOR SHALL BE OPERATIONAL BEFORE EXISTING LOOP DETECTORS ARE DEACTIVATED.
- REMOVE MICROWAVE DETECTOR AND ALL ASSOCIATED CABLES AFTER NEW LOOP DETECTORS ARE INSTALLED AND OPERATIONAL.

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TEMPORARY MICROWAVE DETECTOR DETAIL

Pedestrian Facilities & ADA Compliance at Various Locations on Oahu, Unit 7
Federal Aid Project No. CMAQ-0300(98)

Scale: As Shown Date: August 2004

SHEET No. D-22 OF 22 SHEETS