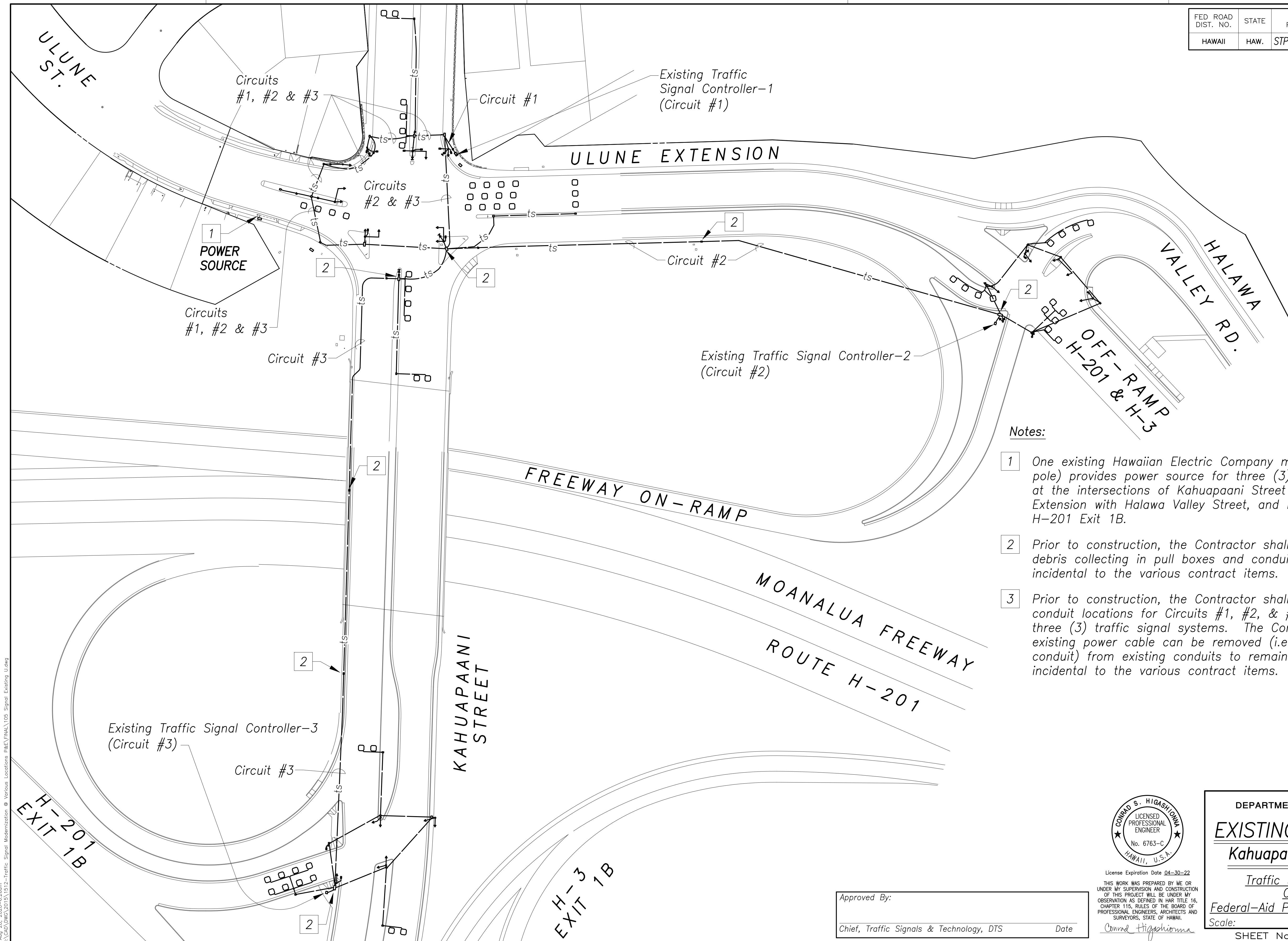


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	105	284

True North  
Scale: 1"=10'  
TMK: 9-9-055,  
057, 072 & 074



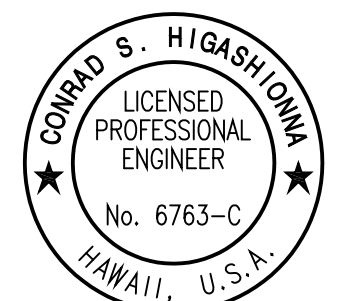
Notes:

- 1 One existing Hawaiian Electric Company meter (mounted to wood pole) provides power source for three (3) traffic signal systems at the intersections of Kahuapaani Street with Ulune Street, Ulune Extension with Halawa Valley Street, and Kahuapaani Street with H-201 Exit 1B.
- 2 Prior to construction, the Contractor shall remove sediment and debris collecting in pull boxes and conduits. This work shall be incidental to the various contract items.
- 3 Prior to construction, the Contractor shall verify pull box and conduit locations for Circuits #1, #2, & #3 providing power to the three (3) traffic signal systems. The Contractor shall verify existing power cable can be removed (i.e., is not stuck in conduit) from existing conduits to remain. This work shall be incidental to the various contract items.

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DESIGNED BY		
QUANTITIES BY		
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Approved By:  
Chief, Traffic Signals & Technology, DTS  
Date



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Conrad Higashimura

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

EXISTING SIGNAL PLAN

Kahuapaani St & Ulune St

Traffic Signal Modernization,  
Oahu, Phase 1

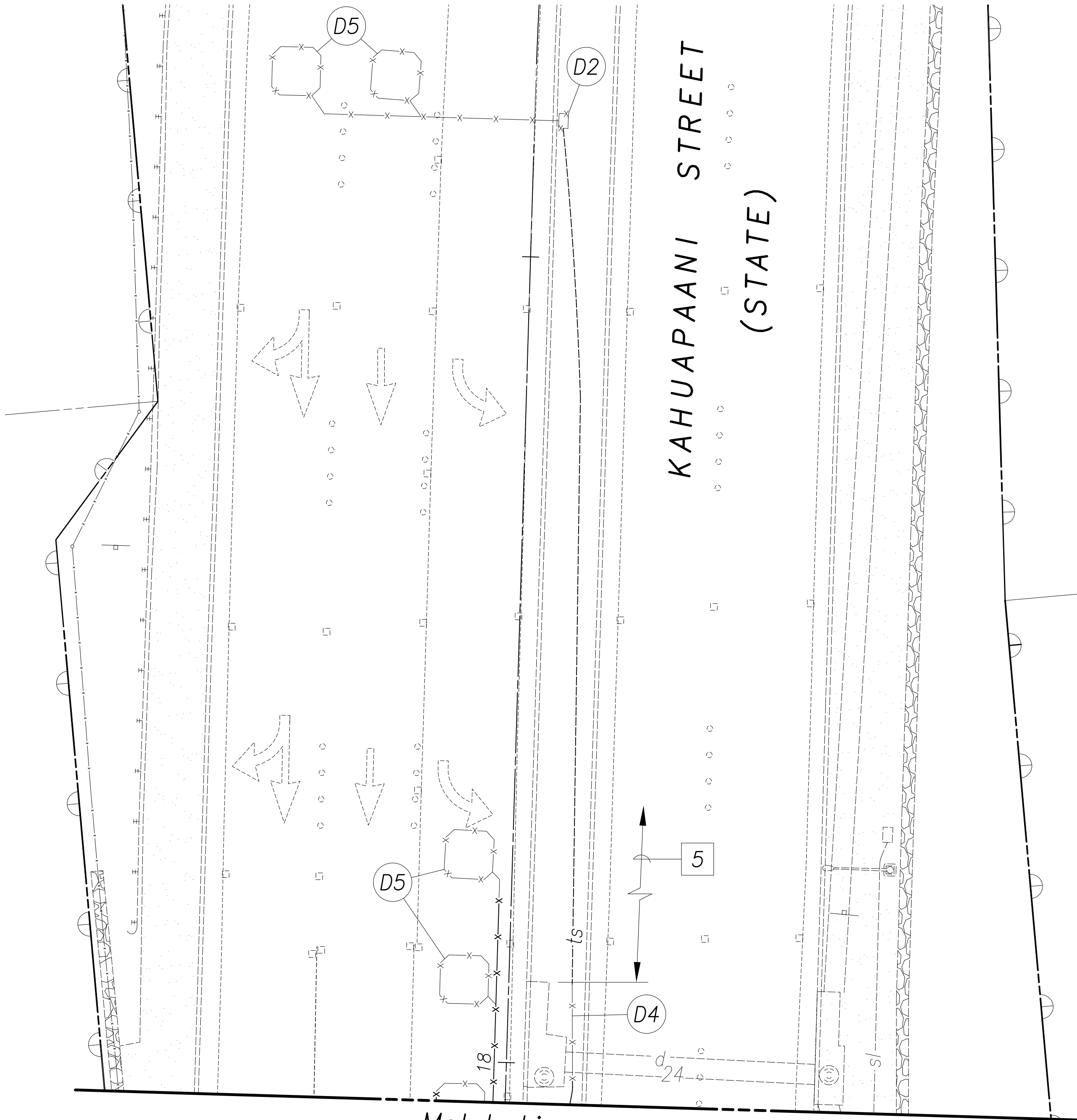
Federal-Aid Project No. STP-0300(163)

Scale: Date: July 2020

SHEET No. TS-10 OF 113 SHEETS

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Match Line  
Sta. 17+05  
See Sht. 107

True North

Scale: 1"=10'  
TMK: 9-9-055,  
057, 072 & 074

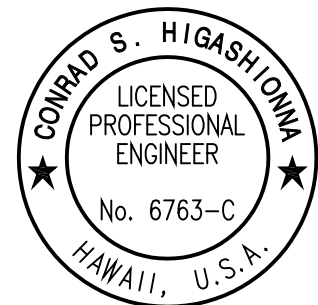
Notes:

- 1 The traffic signal system shall remain operational at all times during construction. Existing poles, traffic signal lights, and pedestrian signal heads may be removed only after new equipment is operational.
- 2 Deliver salvaged equipment to C&C of Honolulu, Dept. of Transportation Services, Traffic Signal & Technology baseyard at 999 Makolu Street (ph: 768-5323).
- 3 Existing pullbox to remain.
- 4 Existing traffic signal standard to remain.
- 5 Existing traffic signal duct line to remain.

Demolition Callouts:

- D1 Remove and salvage traffic signal controller and cabinet. Demolish and dispose of concrete base one foot below finish grade.
- D2 Demolish and dispose of traffic signal pullbox.
- D3 Remove traffic signal cables. Abandon ducts in place. Fill ducts with lean concrete.
- D4 Remove traffic signal cables. Remove entire duct line and concrete encasement within State right-of-way.
- D5 Abandon vehicle loop detectors in place.
- D6 Remove and salvage existing traffic signal standard. Demolish and dispose of concrete foundation two feet below finish grade. Remove and salvage traffic signal heads and pedestrian signal heads.
- D7 Remove and salvage pedestrian push button. Demolish and dispose of concrete foundation.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	106	284



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Conrad Higashimura

Approved By:

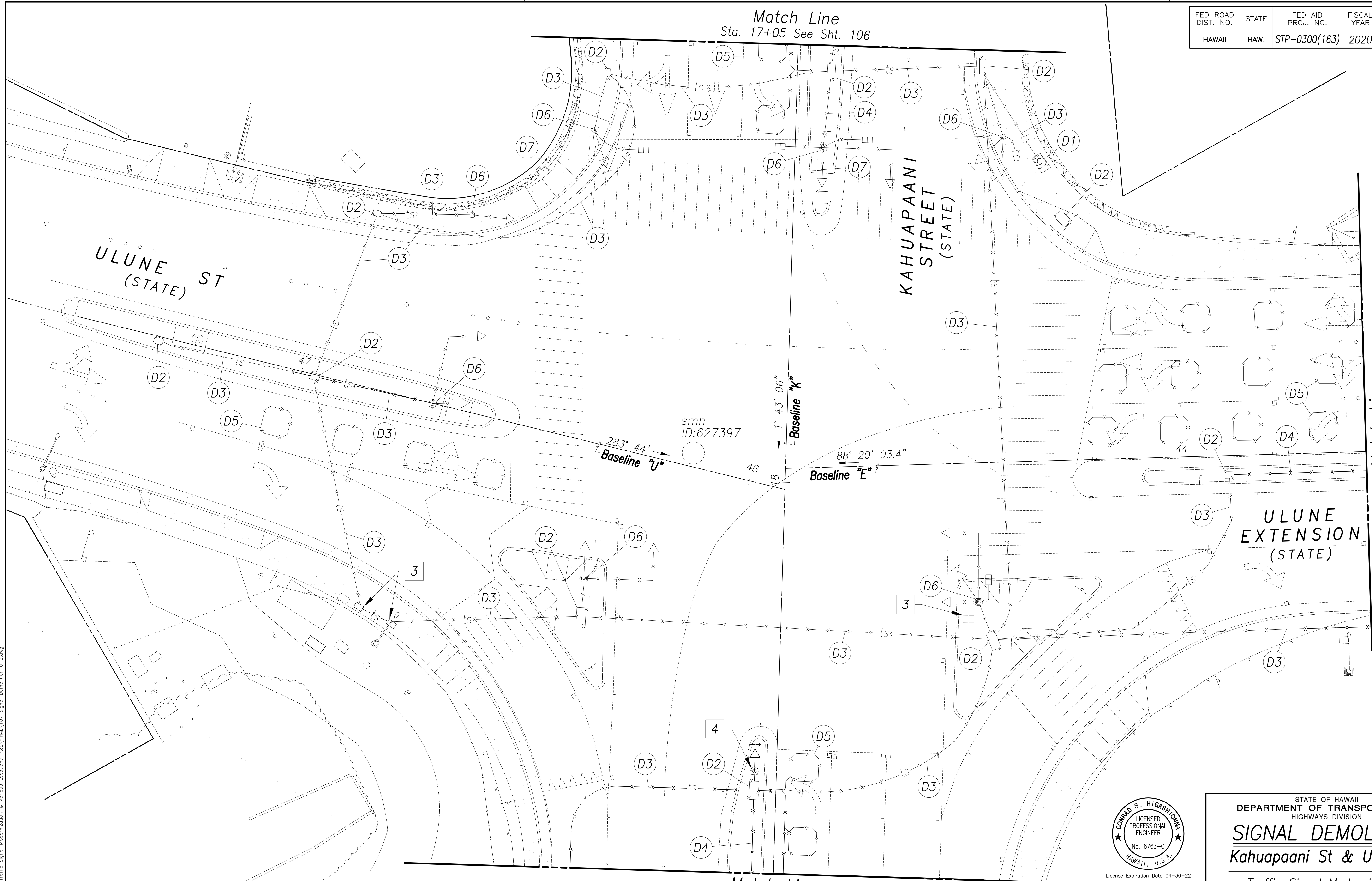
Chief, Traffic Signals & Technology, DTS

Date

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**SIGNAL DEMOLITION**  
**Kahupaani St & Ulune St**  
*Traffic Signal Modernization,*  
*Oahu, Phase 1*  
**Federal-Aid Project No. STP-0300(163)**  
Scale: Date: July 2020  
SHEET No. TS-11 OF 113 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	107	284

True North  
Scale: 1"=10'  
TMK: 9-9-055,  
057, 072 & 074

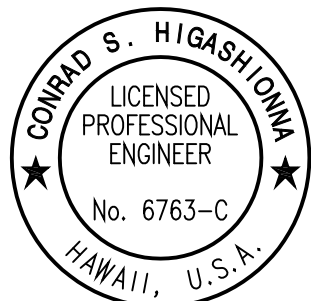


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Match Line  
Sta. 18+85  
See Sht. 108

Approved By: \_\_\_\_\_  
Chief, Traffic Signals & Technology, DTS  
Date \_\_\_\_\_



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Conrad Higashimura

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**SIGNAL DEMOLITION**  
**Kahupaani St & Ulune St**

Traffic Signal Modernization,  
Oahu, Phase 1

Federal-Aid Project No. STP-0300(163)

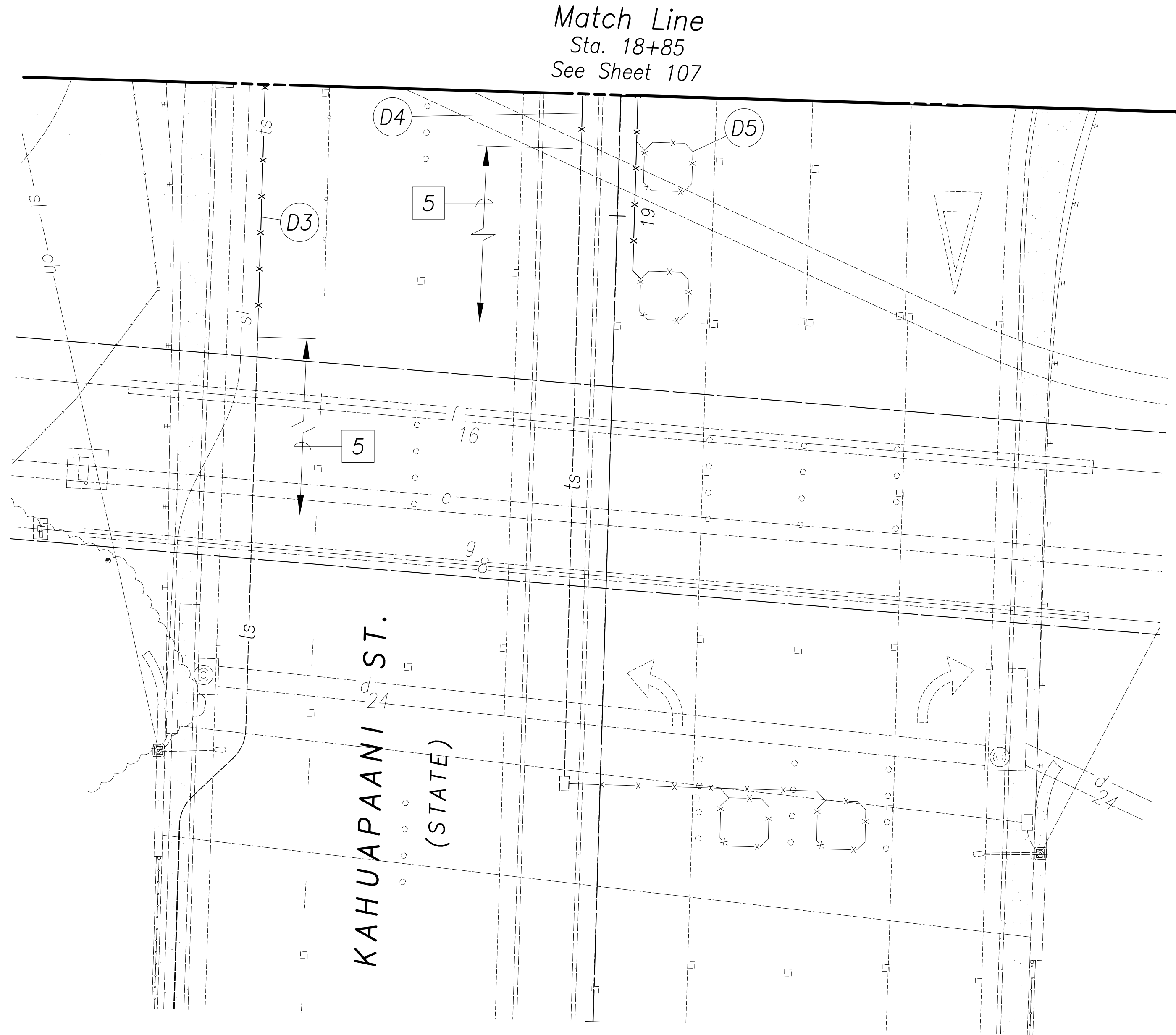
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SHEET No. TS-12 OF 113 SHEETS

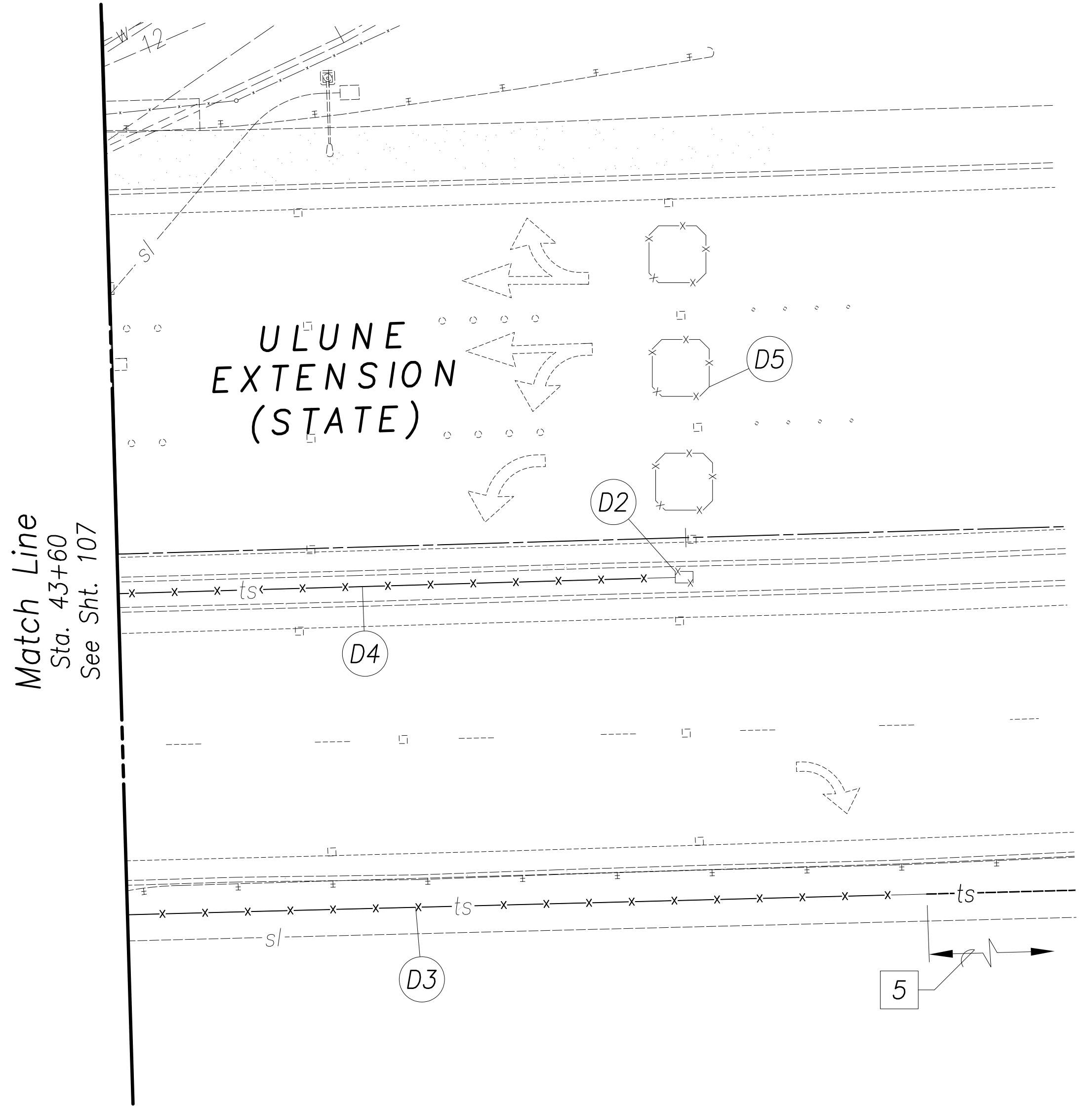


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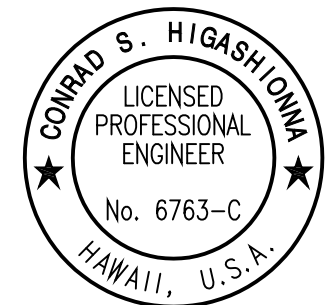


True North  
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TMK: 9-9-055,  
057, 072 & 074



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	108	284

Approved By:  
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Conrad Higashimura

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**SIGNAL DEMOLITION**  
**Kahuapaani St & Ulune St**  
Traffic Signal Modernization,  
Oahu, Phase 1  
Federal-Aid Project No. STP-0300(163)  
Scale: Date: July 2020  
SHEET No. TS-13 OF 113 SHEETS

ORIGINAL PLAN

NOTE BOOK

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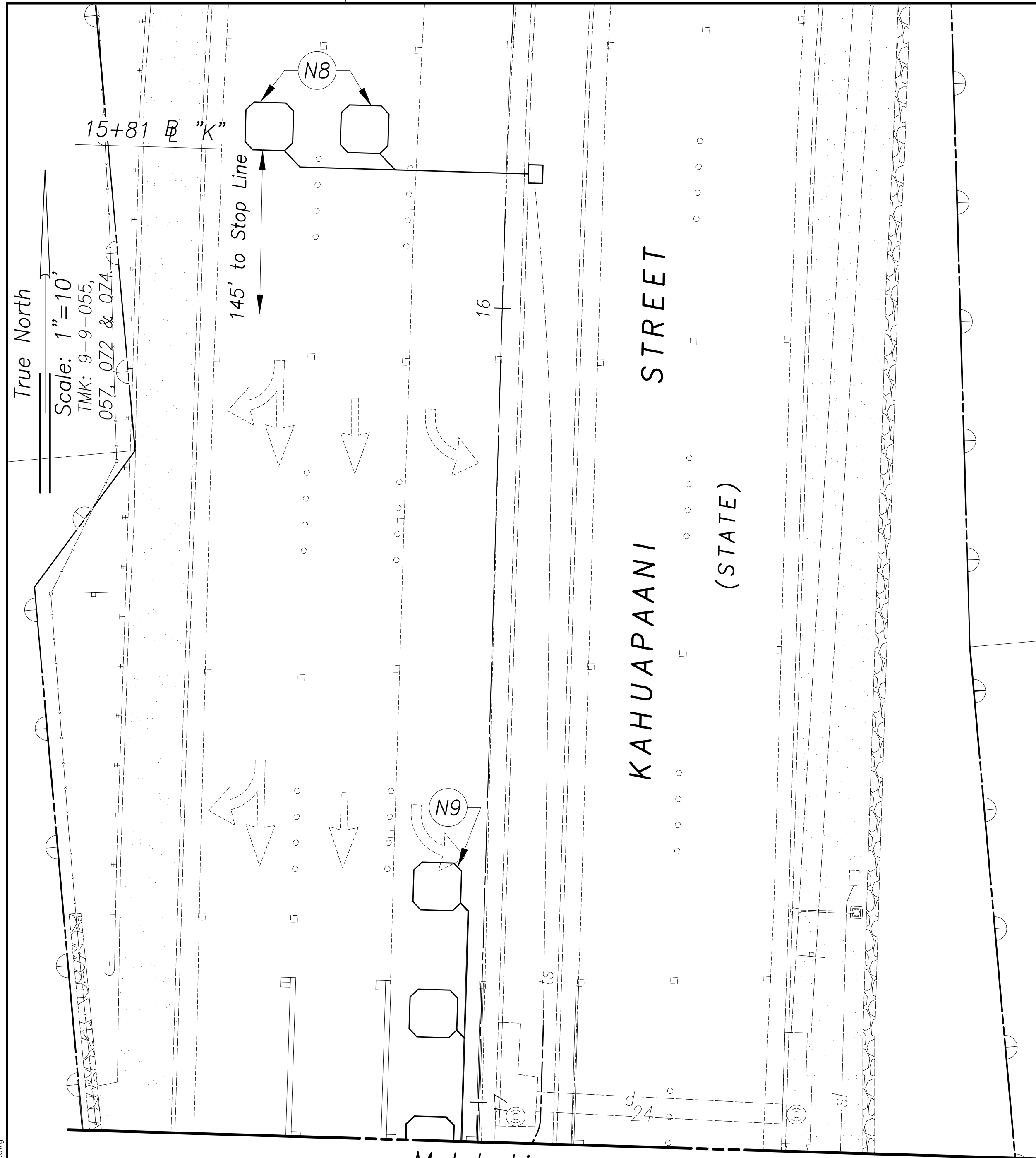
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DATE

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Match Line  
Sta. 17+05  
See Sht. 110

Notes:

- 1 Tie-down of traffic signal standards is to center of vertical pole. Tie-down of pullboxes is to center of box.
- 2 For location of traffic signal pullboxes, see New Duct Line Work.
- 3 Type I Traffic Signal Standard to remain.
- 4 See sheet 116 for new signal work schedules.

New Signal Work Callouts:

- N1 Install Controller Assembly with Software  
17+27.51 @ "K" (45.07' Lt.)
- N2 Install Type II Traffic Signal Standard with 30-foot mast arm and drilled shaft foundation. 17+39.33 @ "K" (46.34' Lt.)
- N3 Install Type II Traffic Signal Standard with 17-foot mast arm and drilled shaft foundation. 18+21.52 @ "K" (54.67' Lt.)
- N4 Install Type II Traffic Signal Standard with 25-foot mast arm and drilled shaft foundation. 18+26 @ "K" (40.75' Rt.)
- N5 Install Type II Traffic Signal Standard with 50-foot mast arm and drilled shaft foundation. 17+47.44 @ "K" (63.33' Rt.)
- N6 Install Type I Traffic Signal Standard, 10-feet height, with foundation. 17+37.43 @ "K" (49.71' Rt.)
- N7 Install Type I Traffic Signal Standard, 10-feet height, with foundation. 17+15 @ "K" (5.3' Lt.)
- N8 Install Loop Detector Sensing Unit (6 Ft. x 6 Ft.) 1 Loops centered in lane
- N9 Install Loop Detector Sensing Unit (6 Ft. x 6 Ft.) 4 Loops centered in lane
- N10 Install pedestrian push button PPB-1, ADA compliant, on a pedestal with foundation.
- N11 Install pedestrian push button PPB-2, ADA compliant, on a pedestal with foundation.
- N12 Install pedestrian push button PPB-3, ADA compliant, on a pedestal with foundation.
- N13 Install pedestrian push button PPB-4, ADA compliant, on a pedestal with foundation.
- N14 Install pedestrian push button PPB-5, ADA compliant, on a pedestal with foundation.
- N15 Install pedestrian push button PPB-6, ADA compliant, on Type I traffic signal standard.
- N16 Install pedestrian push button PPB-7, ADA compliant, on Type I traffic signal standard.
- N17 Install temporary Approach-Only Microwave Vehicle Detector on new sign post or new traffic signal standard.

Approved By:

Chief, Traffic Signals & Technology, DTS

Date

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	109	284

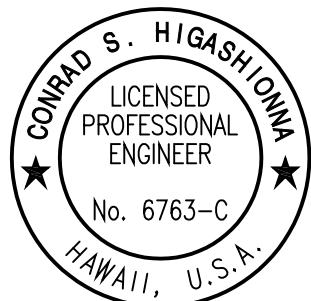
DRILLED SHAFT FOUNDATIONS  
for Type II Traffic Signal Standards

I.D. LABEL	SOIL TYPE	GRADE	MAST ARM LENGTH (feet)	DRILLED SHAFT DIAMETER (inches)	DRILLED SHAFT LENGTH (feet)
(A)*	Stiff Clays	Level	30	30	7
(B)*	Stiff Clays	Level	17	30	6
(D)*	Stiff Clays	Level	25	30	6
(E)**	Stiff Clays	Level	50	36	18

\* For drilled shaft foundation details, see 2008 Standard Plans TE-33A.1 & TE-33A.2.

\*\* For drilled shaft foundation details, see structural drawings S-1 thru S-3 for drilled shaft foundation.

Log of Boring 1	Approximate Ground Surface Elevation (feet MSL): 116 Water Level: Not encountered	
	DESCRIPTION	
5	6-inch CONCRETE	
	Reddish brown GRAVELLY SAND (BASALTIC) with a little clay and silt, medium dense, moist (fill)	
	Brown w/ multi-colored mottling SILTY CLAY with some sand, stiff moist (fill)	
10	Brownish red with multi-colored mottling SILTY CLAY with traces of gravel, stiff, moist (residual soil)	
	grades to purplish brown, hard	
15	Reddish brown SILTY SAND with some gravel, very dense, moist (saprolite)	
20	Gray vesicular BASALT, severely to moderately fractured, moderately to highly weathered, medium hard to hard (basalt formation)	
25	Boring terminated at 28 feet	



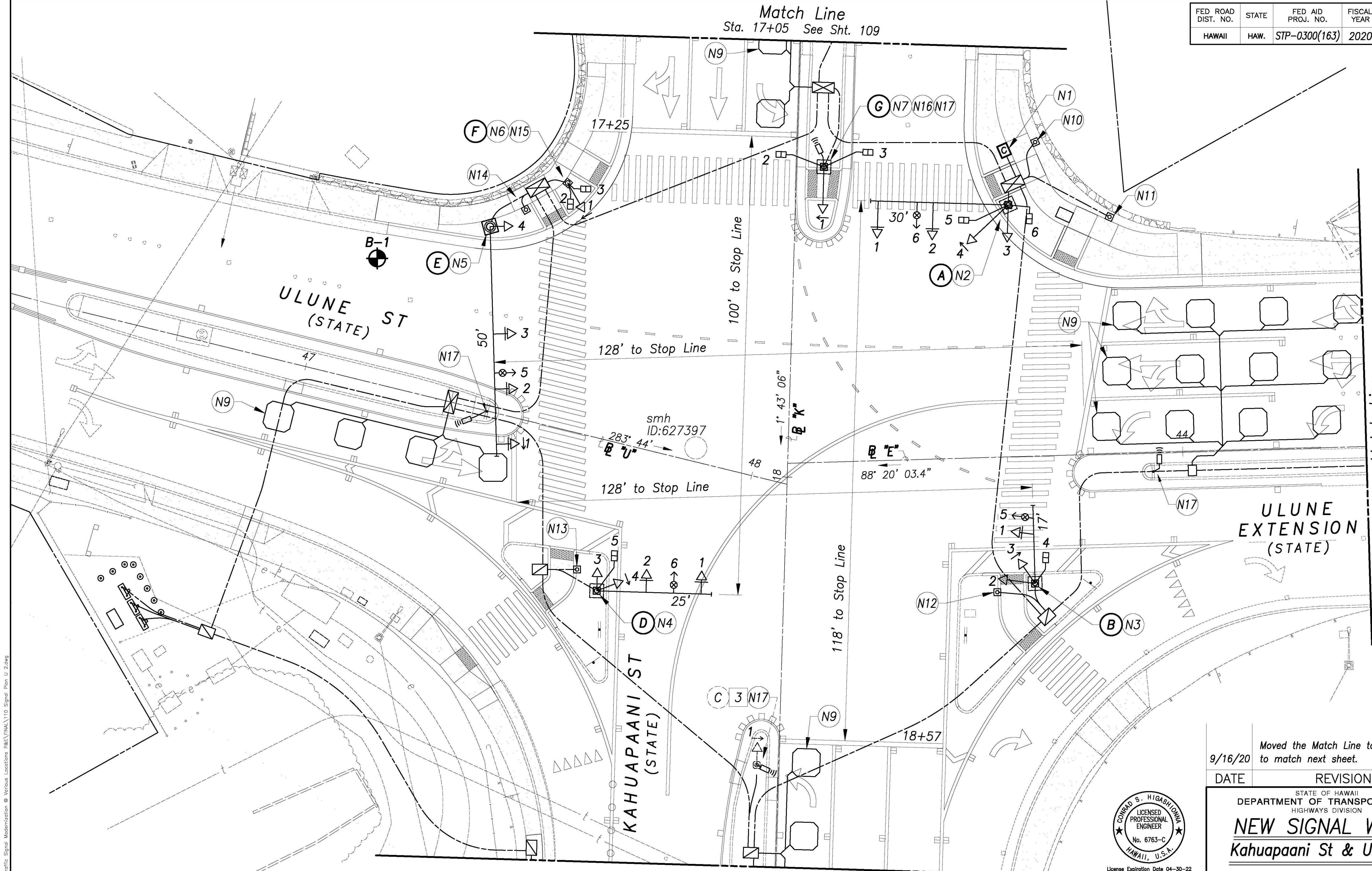
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Conrad Higashimura

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**NEW SIGNAL WORK**  
**Kahuapaani St & Ulune St**  
Traffic Signal Modernization,  
Oahu, Phase 1  
Federal-Aid Project No. STP-0300(163)  
Scale: 1"=10' Date: July 2020  
SHEET No. TS-14 OF 113 SHEETS



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HAWAII	HAW.	STP-0300(163)	2020	110	284



True North  
Scale: 1"=10'  
TMK: 9-9-055,  
057, 072 & 074

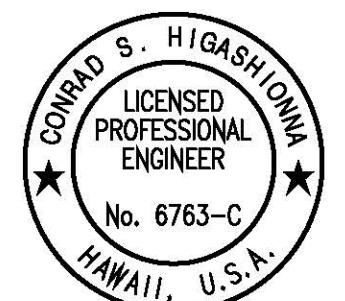
Match Line  
Sta. 43+60  
See Sht. 111

Match Line  
Sta. 17+05 See Sht. 109

Match Line  
Sta. 18+85  
See Sht. 111

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*Conrad Higashimura*

Approved By: \_\_\_\_\_  
Chief, Traffic Signals & Technology, DTS  
Date \_\_\_\_\_

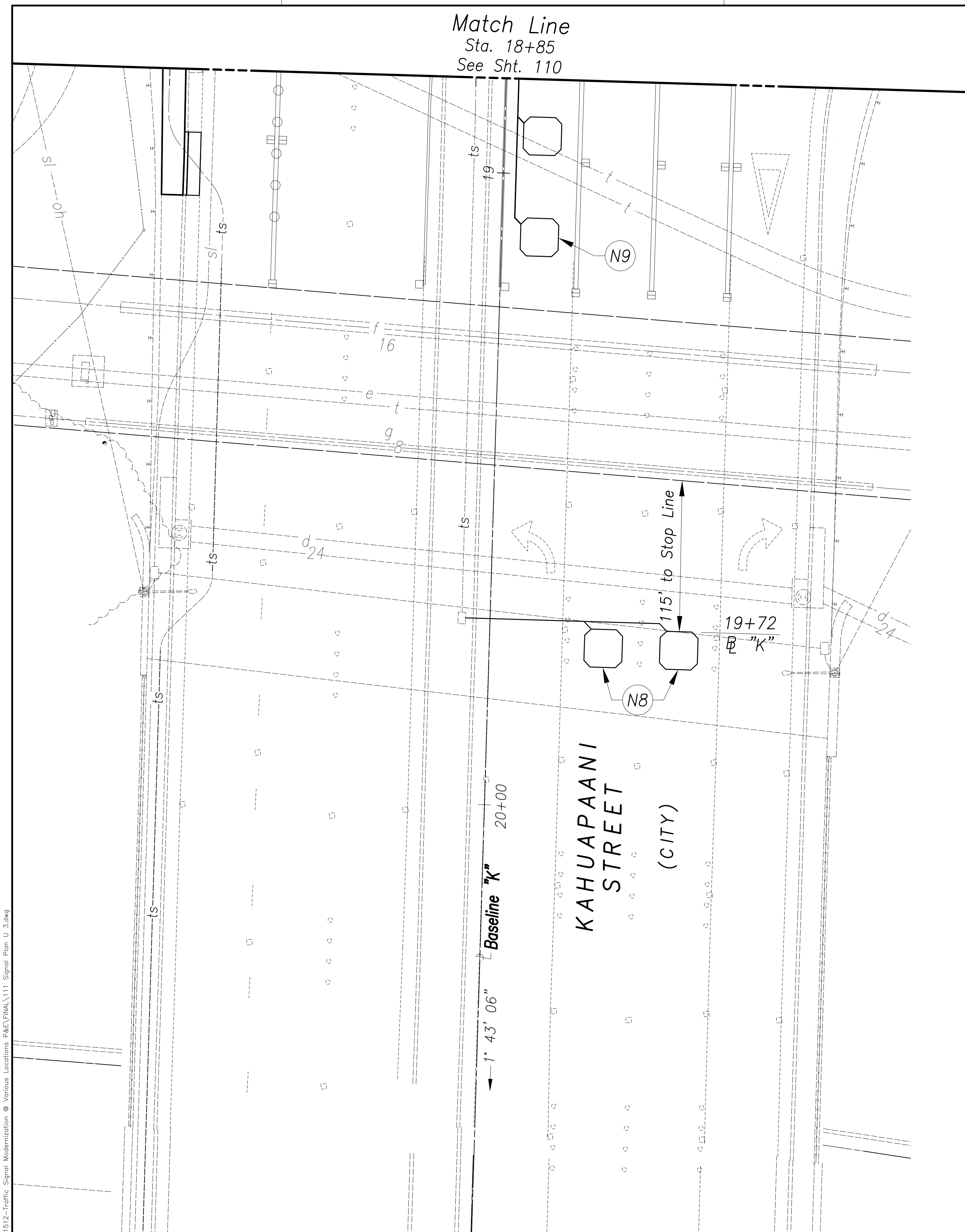
9/16/20  
DATE

Moved the Match Line to Sta. 18+85 to match next sheet.  
REVISION

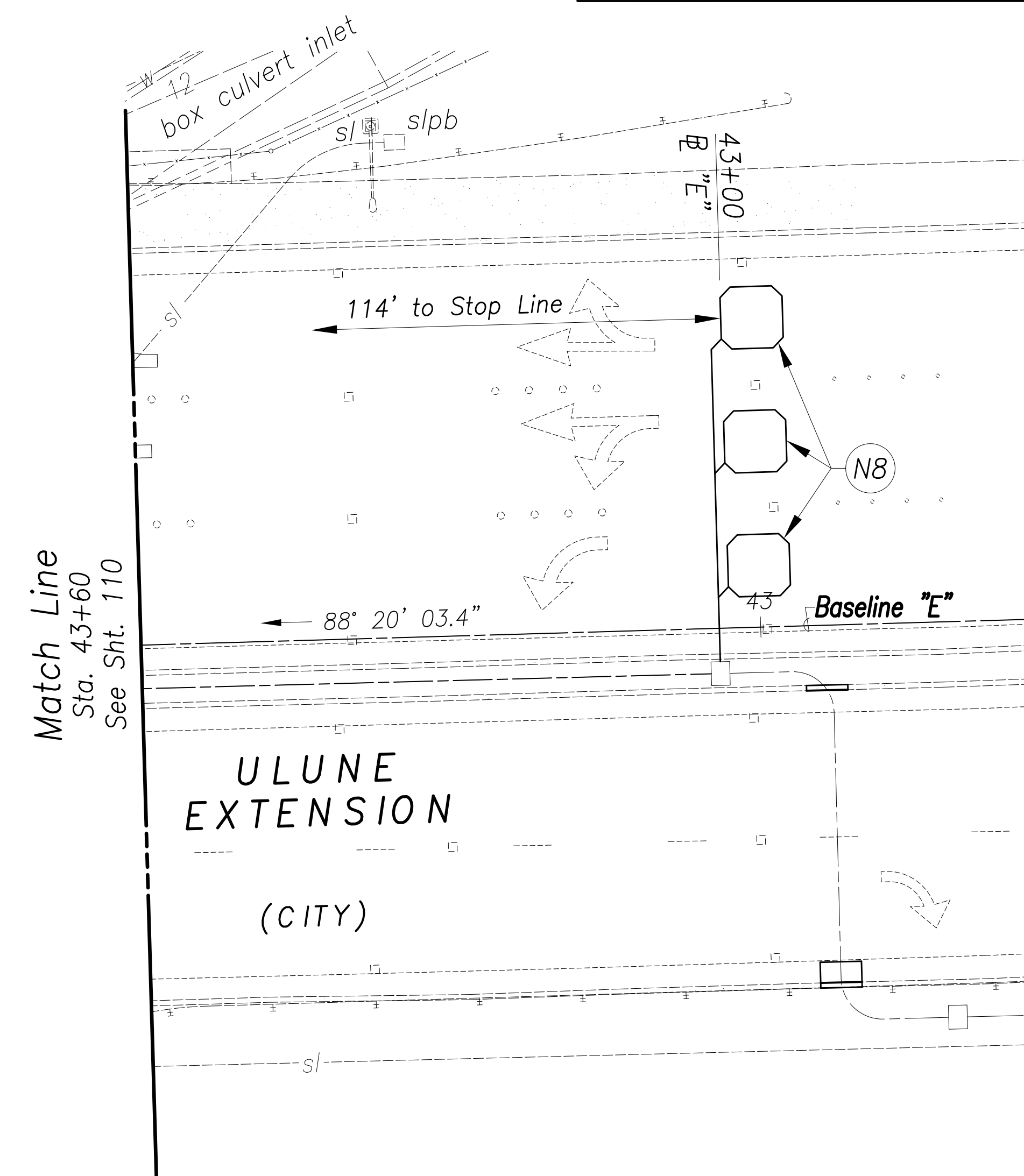
STATE OF HAWAII  
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HIGHWAYS DIVISION  
**NEW SIGNAL WORK**  
**Kahupaani St & Ulune St**  
*Traffic Signal Modernization,  
Oahu, Phase 1*  
**Federal-Aid Project No. STP-0300(163)**  
Scale: 1"=10' Date: July 2020  
SHEET No. TS-15 OF 113 SHEETS



FED ROAD DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	111	284



True North  
Scale: 1"=10'  
TMK: 9-9-055,  
057, 072 & 074



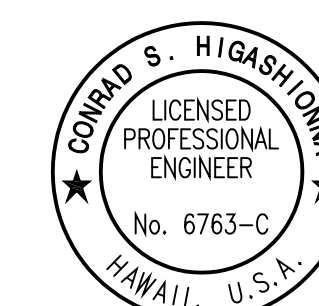
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CONRAD HIGASHIYAMA

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

NEW SIGNAL WORK  
Kahuapaani St & Ulune St

Traffic Signal Modernization,  
Oahu, Phase 1

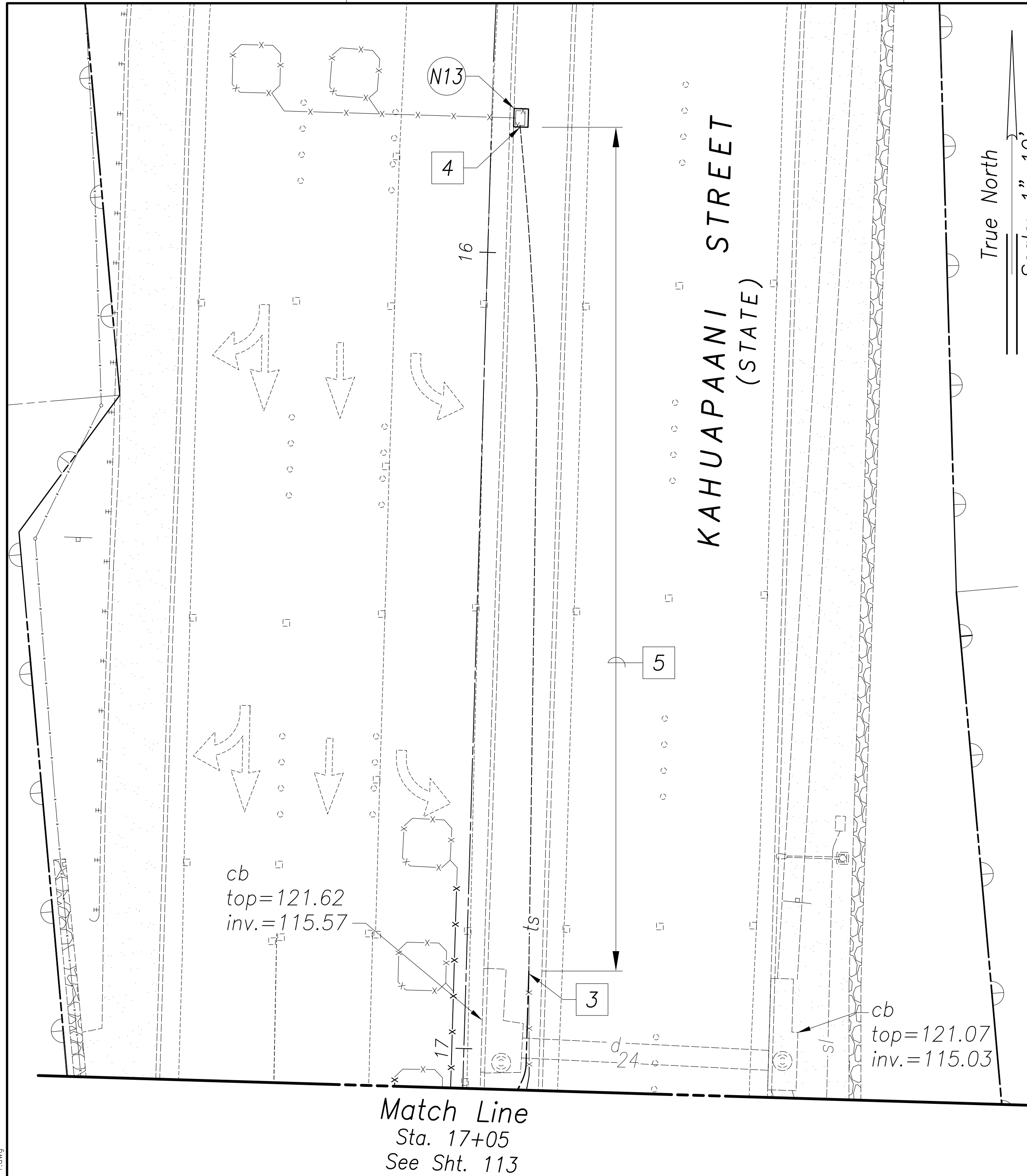
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Scale: 1"=10' Date: July 2020

SHEET No. *TS-16* OF *113* SHEETS

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Notes:

- Existing power source. See drawings E-11 thru E-15.
- New power source for three traffic signals. See drawings E-11 thru E-15.
- Intercept existing 2-inch traffic signal duct and connect to new ducts.
- Intercept existing 2-inch traffic signal duct and connect to new pullbox.
- Existing traffic signal duct line to remain.
- Existing traffic signal pull box to remain.
- Existing street light pull box to remain.
- See sheet 116 for new duct line work schedules.
- See Duct Layout Plans for horizontal alignment tie-down and Duct Profiles for vertical alignment.
- Precast pull boxes shall be set on six (6) inches of level, 95% compacted crushed rock fill, 3/4 inch to one (1) inch size, extending twelve (12) inches beyond the pull box on each side. Granular fill shall be compacted by a minimum of four passes with a plate type vibrator.

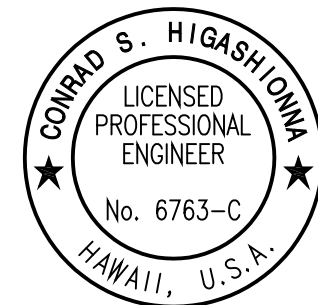
New Duct Line Work Callouts:

- Install Type C Pullbox PB-1. 17+34.73 @ "K" (47.21' Lt.)
- Install Type B Pullbox PB-2. 18+28.70 @ "K" (57.44' Lt.)
- Install Type B Pullbox PB-3. 18+82 @ "K" (5.5' Lt.)
- Install Type B Pullbox PB-4. 18+21.72 @ "K" (53.26' Rt.)
- Install Type C Pullbox PB-5. 17+85.87 @ "K" (73.72' Rt.)
- Install Type C Pullbox PB-6. 17+38.67 @ "K" (56.21' Rt.)
- Install Type C Pullbox PB-7. 17+15 @ "K" (5.30' Rt.)
- Install Type A Pullbox PB-8. 43+98 @ "E" (4.10' Lt.)
- Install Type A Pullbox PB-9. 43+04 @ "E" (4.4'± Lt.)
- Install Type A Pullbox PB-10. 42+82 @ "E" (38'± Lt.)
- Install Type B Pullbox PB-11. 46+78.20 @ "U" (57.45' Rt.)
- Install Type B Pullbox PB-12. 18+82.25 @ "K" (53.09' Rt.)
- Install Type A Pullbox PB-13. 15+83± @ "K" (3.7'± Lt.)
- New traffic signal controller. 17+27.51 @ "K" (45.07' Lt.)
- Remove existing street light pull box and install new Type B pullbox flush with finish grade. Maintain existing circuits and conduits.

Approved By:

Chief, Traffic Signals & Technology, DTS

Date



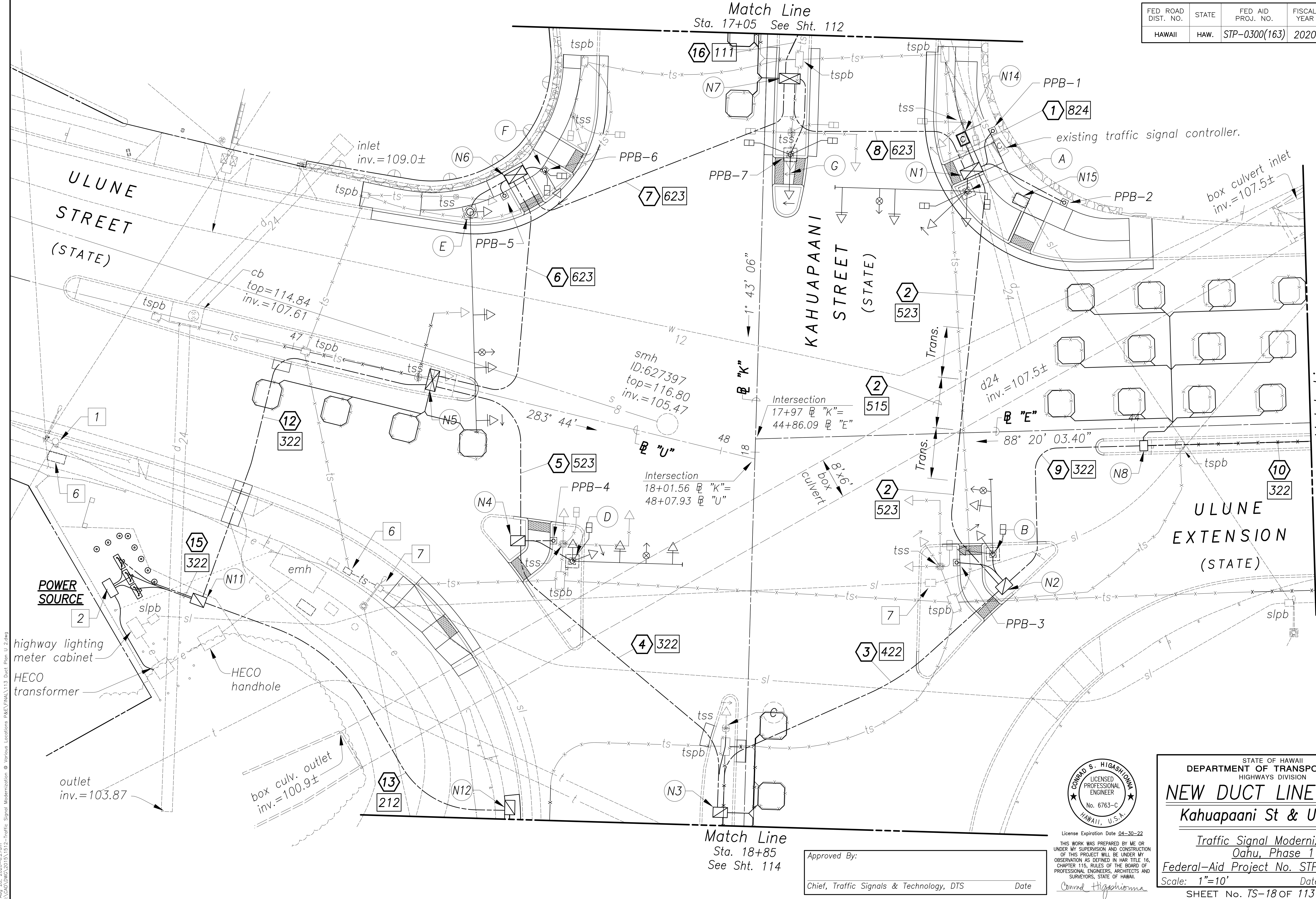
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Conrad Higashimura

STATE OF HAWAII  
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HIGHWAYS DIVISION  
**NEW DUCT LINE WORK**  
**Kahupaani St & Ulune St**  
Traffic Signal Modernization,  
Oahu, Phase 1  
Federal-Aid Project No. STP-0300(163)  
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HAWAII	HAW.	STP-0300(163)	2020	113	284

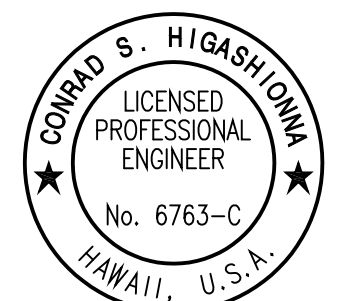


True North  
Scale: 1"=10'  
TMK: 9-9-055, 057, 072 & 074

Match Line  
Sta. 43+60  
See Sht. 114

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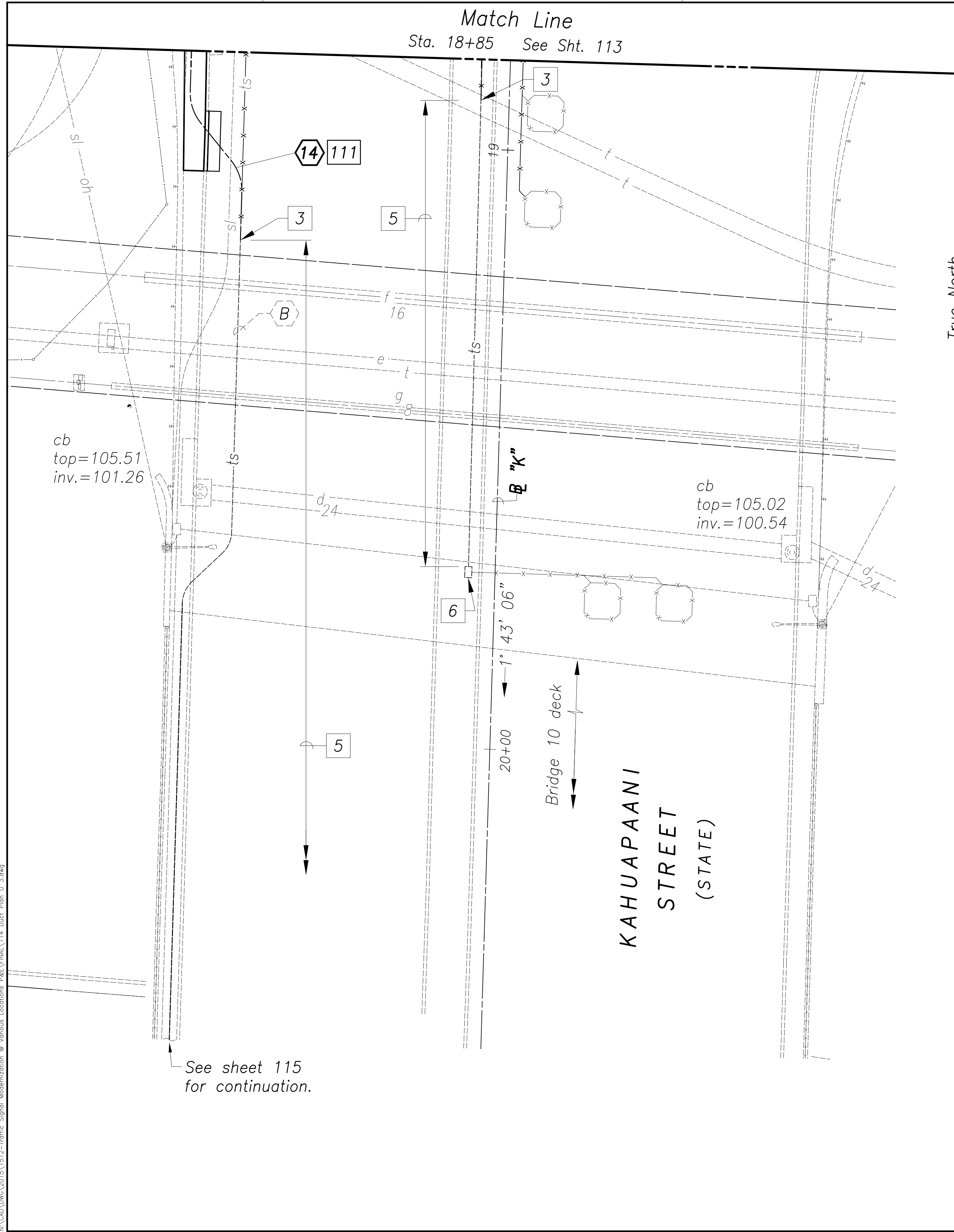
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Chief, Traffic Signals & Technology, DTS  
Date: \_\_\_\_\_

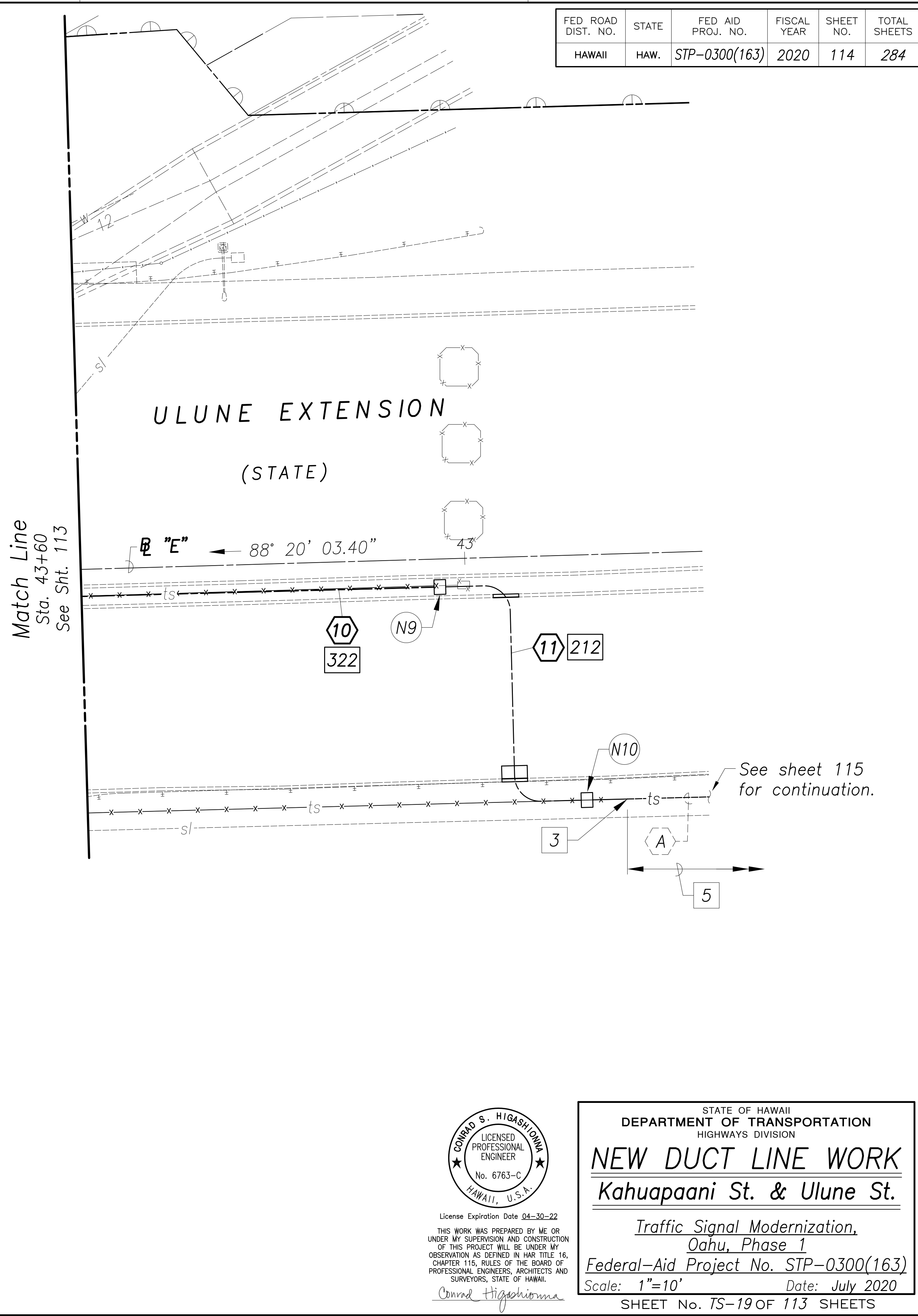
STATE OF HAWAII  
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HIGHWAYS DIVISION  
**NEW DUCT LINE WORK**  
**Kahupaani St & Ulune St**  
Traffic Signal Modernization,  
Oahu, Phase 1  
Federal-Aid Project No. STP-0300(163)  
Scale: 1"=10' Date: July 2020  
SHEET No. TS-18 OF 113 SHEETS

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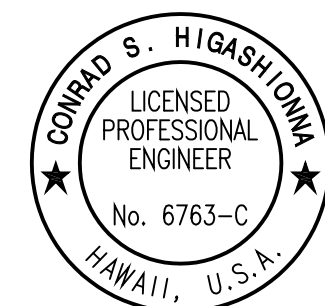
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True North  
Scale: 1"=10'  
TMK: 9-9-055,  
057, 072 & 074



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	114	284



License Expiration Date 04-30-22  
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Conrad Higashimura

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

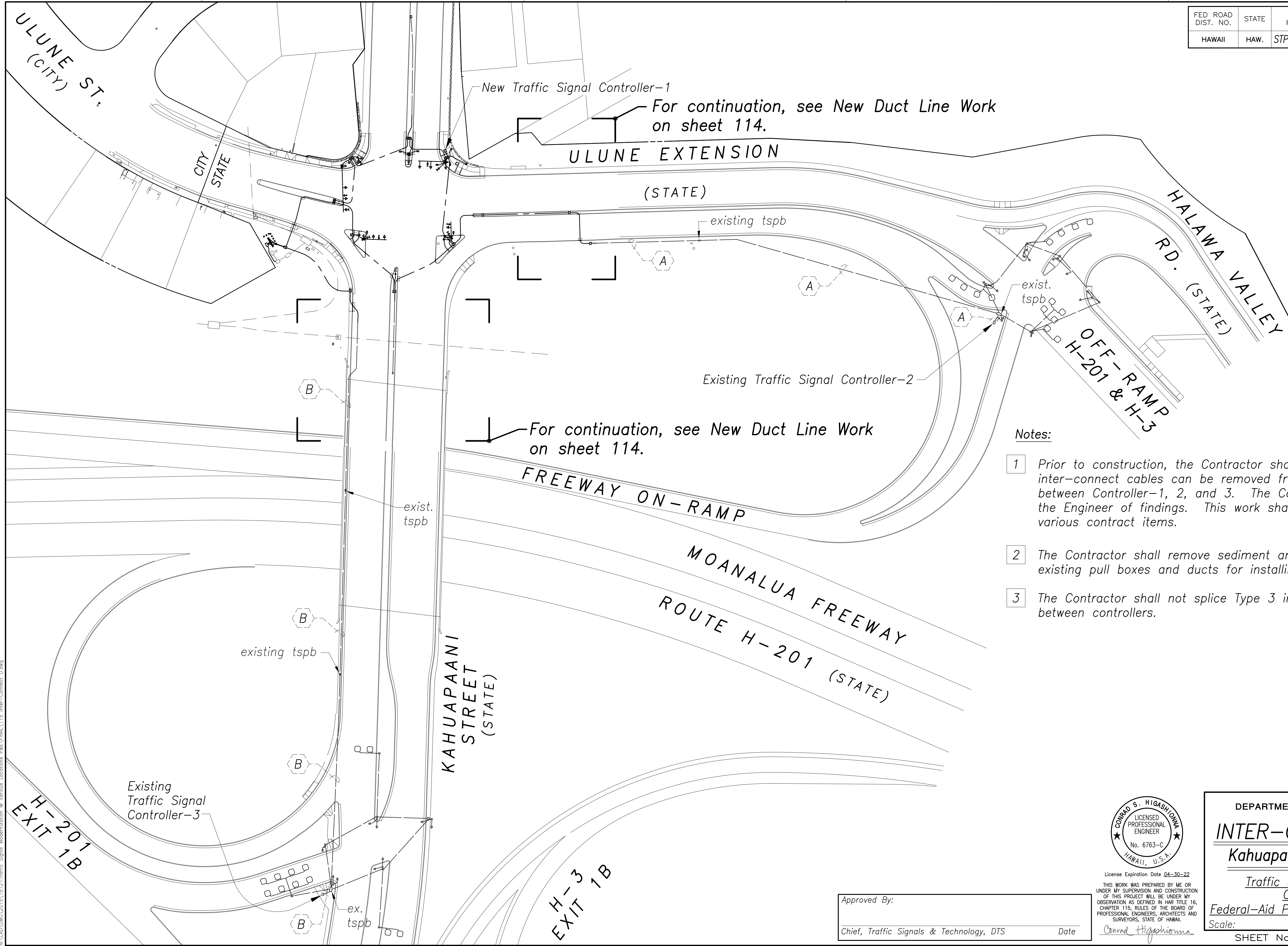
**NEW DUCT LINE WORK**  
**Kahuapaani St. & Ulune St.**

*Traffic Signal Modernization,  
Oahu, Phase 1*  
Federal-Aid Project No. STP-0300(163)  
Scale: 1"=10' Date: July 2020  
SHEET No. TS-19 OF 113 SHEETS



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	115	284

True North  
Scale: 1"=10'  
TMK: 9-9-055,  
057, 072 & 074



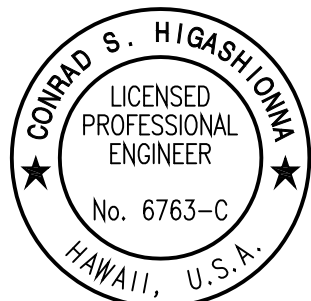
Notes:

- 1 Prior to construction, the Contractor shall verify the existing inter-connect cables can be removed from existing ducts between Controller-1, 2, and 3. The Contractor shall notify the Engineer of findings. This work shall be incidental to the various contract items.
- 2 The Contractor shall remove sediment and debris collecting in existing pull boxes and ducts for installing inter-connect cable.
- 3 The Contractor shall not splice Type 3 inter-connect cables between controllers.

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

Aug 28, 2020-14:37pm  
N:\CAO\DWG\2015\1512-Traffic Signal Modernization @ Various Locations P&E\FINAL\115 Inter-Connect Udwg

Approved By: \_\_\_\_\_  
Chief, Traffic Signals & Technology, DTS  
Date \_\_\_\_\_



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HIGHWAYS DIVISION

INTER-CONNECT PLAN

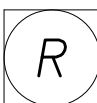




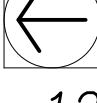

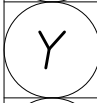

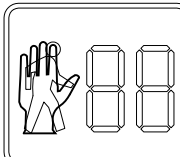
Kahuapaani St & Ulune St

Traffic Signal Modernization,  
Oahu, Phase 1

Federal-Aid Project No. STP-0300(163)


Scale: \_\_\_\_\_ Date: July 2020

SHEET No. TS-20 OF 113 SHEETS

SIGNAL HEAD SCHEDULE	
Head Type and Description	Pole Letter – Signal Head Number
 Red Ball  Yellow Ball  Green Arrow (Thru) 12" RY↑ Traffic Signal Head	A-1** A-2** A-3 D-1** D-2**
 Red Ball  Yellow Arrow (Left)  Green Arrow (Left) 12" R←← Traffic Signal Head	A-4    E-1** B-3    F-1 C-1*    G-1 D-4
 Red Ball  Yellow Ball  Green Ball 12" RYG Traffic Signal Head	B-1**    E-2** B-2    E-3** D-3    E-4
 Countdown Pedestrian Signal Head	A-5    F-2 A-6    F-3 B-4    G-2 D-5    G-3
* Existing signal head to remain  ** Install Backplate with Retroreflective Borders	

OPTICOM SCHEDULE	
Mounting Type	Pole Letter – Opticom Number
Mast Arm, One-Way	A-6    D-6 B-5    E-5

Approved By: _____	
Chief, Traffic Signals & Technology, DTS	Date _____



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OBSERVATION AS DEFINED IN HAR TITLE 16,  
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SURVEYORS, STATE OF HAWAII.

Conrad Higashionna

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

## NEW WORK SCHEDULES

Kahuapaani St & Ulune St

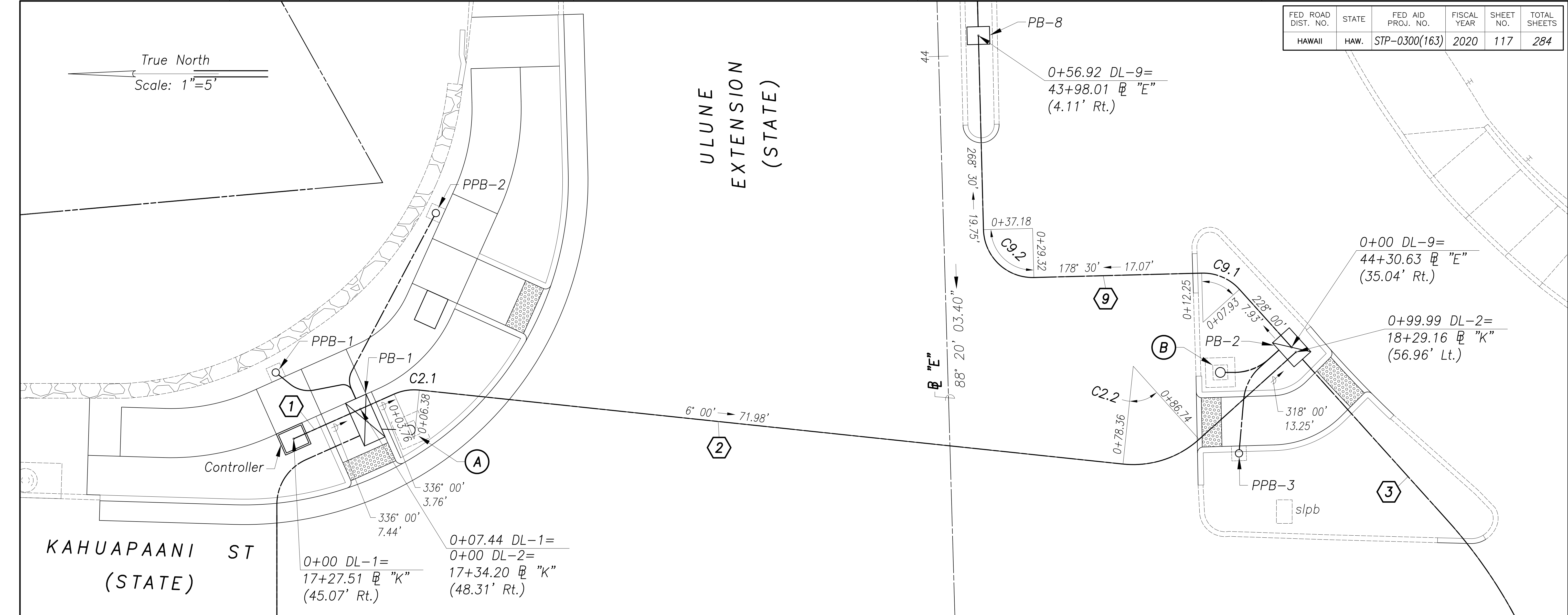
Traffic Signal Modernization,  
Oahu, Phase 1

Federal-Aid Project No. STP-0300(163)

Scale: \_\_\_\_\_ Date: July 2020

SHEET No. *TS-21* OF *113* SHEETS





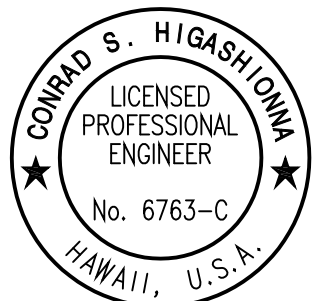
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	117	284

Aug 28, 2020-10:30am  
N:\CAO\DWG\2015\1512-Traffic Signal Modernization @ Various Locations P&E\FINAL\17 Duct Layout U 1.dwg

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CHECKED BY	
NOTE BOOK	
QUANTITIES BY	
CHECKED BY	
No.	

Duct Line Curve Data				
	C2.1	C2.2	C9.1	C9.2
$\Delta$	30° 00' 00"	48° 00' 00"	90° 00' 00"	21° 00' 00"
$\Delta/2$	15° 00' 00"	24° 00' 00"	45° 00' 00"	10° 30' 00"
R	5.00'	10.00'	3.50'	43.00'
T	1.34'	4.45'	3.50'	7.97'
Ch	2.59'	8.13'	4.95'	15.67'
Lc	2.62'	8.38'	5.50'	15.76'

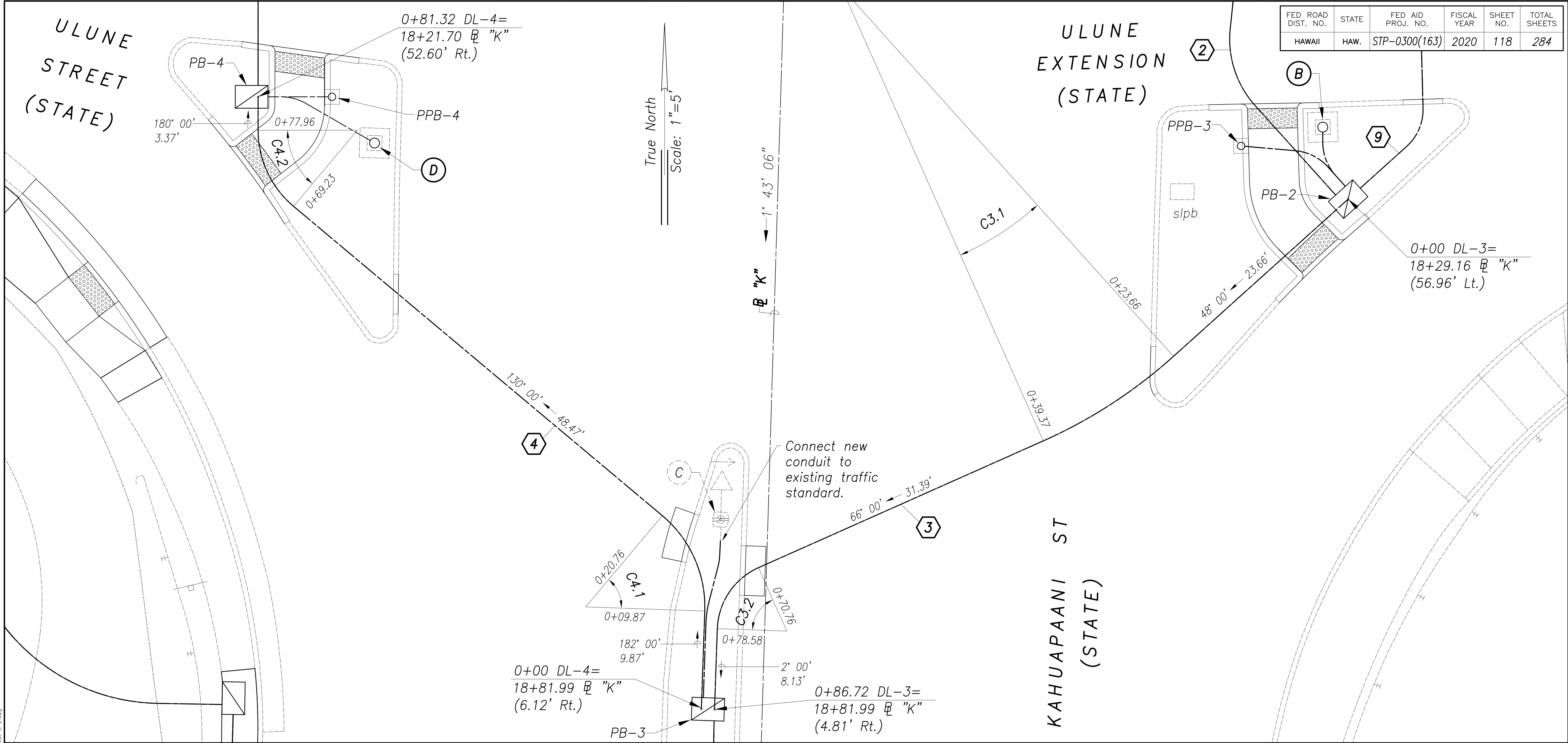
Approved By: \_\_\_\_\_  
Chief, Traffic Signals & Technology, DTS Date \_\_\_\_\_



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Conrad Higashimura

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**DUCT LAYOUT PLAN**  
**Kahuapaani St & Ulune St**  
Traffic Signal Modernization,  
Oahu, Phase 1  
Federal-Aid Project No. STP-0300(163)  
Scale: 1"=5' Date: July 2020  
SHEET No. TS-22 OF 113 SHEETS



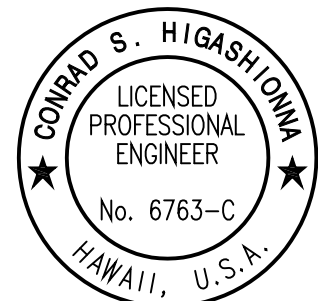
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	118	284

SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
CHECKED BY	
NOTE BOOK	
QUANTITIES BY	
CHECKED BY	
No.	

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Duct Line Curve Data				
	C3.1	C3.2	C4.1	C4.2
$\Delta$	30° 00' 00"	48° 00' 00"	52° 00' 00"	50° 00' 00"
$\Delta/2$	15° 00' 00"	24° 00' 00"	26° 00' 00"	25° 00' 00"
R	5.00'	10.00'	12.00'	10.00'
T	1.34'	4.45'	5.85'	4.66'
Ch	2.59'	8.13'	10.52'	8.45'
Lc	2.62'	8.38'	10.89'	8.73'

Approved By: \_\_\_\_\_  
Chief, Traffic Signals & Technology, DTS  
Date \_\_\_\_\_



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*Conrad Higashimura*

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**DUCT LAYOUT PLAN**  
**Kahupaani St & Ulune St**  
*Traffic Signal Modernization,  
Oahu, Phase 1*  
**Federal-Aid Project No. STP-0300(163)**  
Scale: 1"=5' Date: July 2020  
SHEET No. TS-23 OF 113 SHEETS



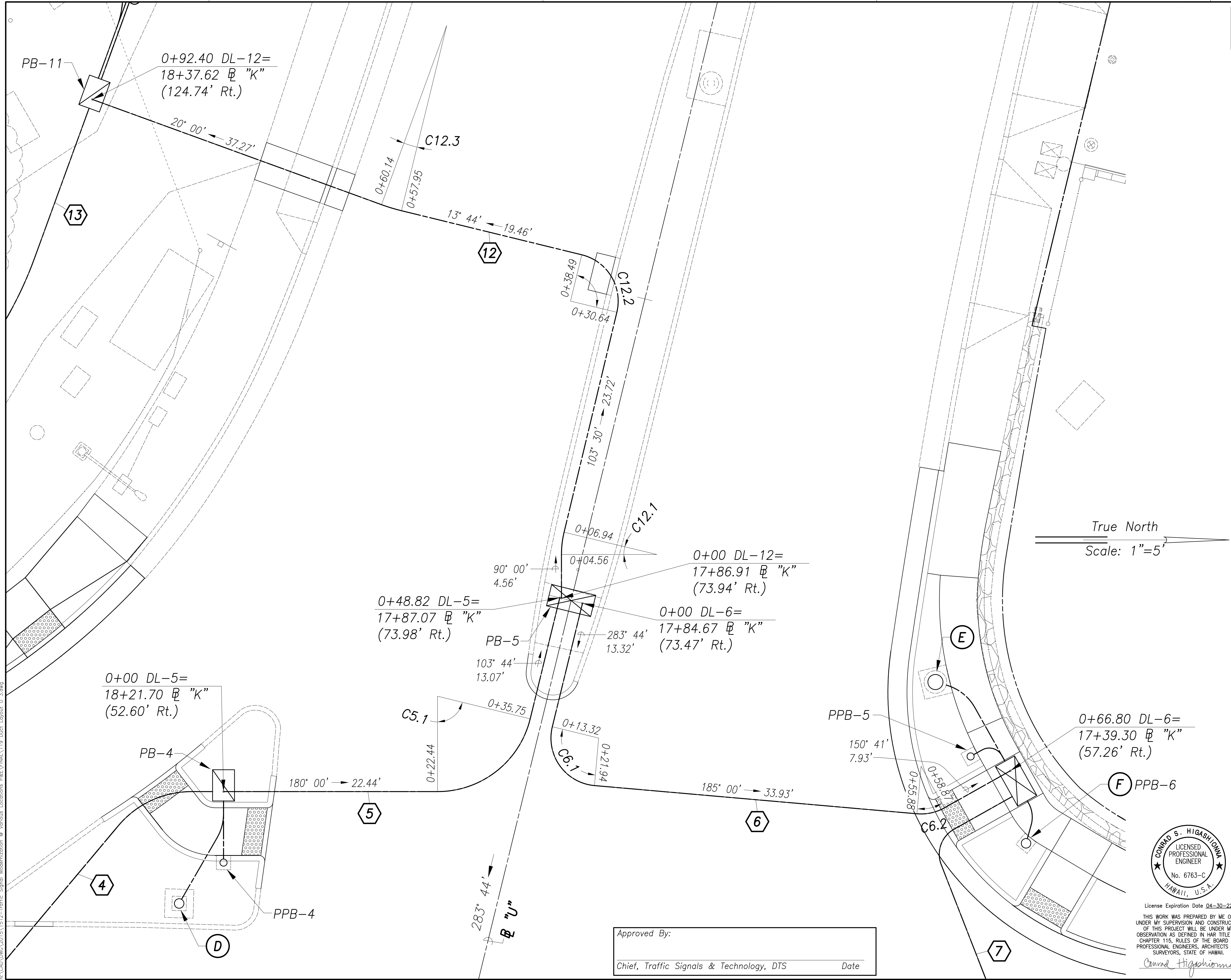
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	119	284

☉ Duct Line Curve Data

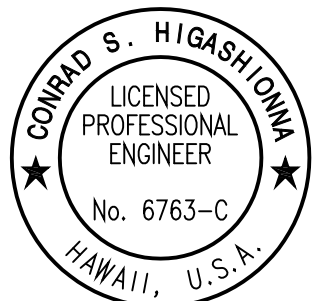
	C5.1	C6.1
Δ	76° 16' 00"	98° 44' 00"
Δ/2	38° 08' 00"	49° 22' 00"
R	10.00'	5.00'
T	7.85'	5.83'
Ch	12.35'	7.59'
Lc	13.31'	8.62'
	C6.2	C12.1
Δ	34° 19' 00"	13° 30' 00"
Δ/2	17° 09' 30"	6° 45' 00"
R	5.00'	10.00'
T	1.54'	1.18'
Ch	2.95'	2.35'
Lc	2.99'	2.36'
	C12.2	C12.3
Δ	89° 46' 00"	6° 16' 00"
Δ/2	44° 53' 00"	3° 08' 00"
R	5.00'	20.00'
T	4.98'	1.09'
Ch	7.07'	2.19'
Lc	7.85'	2.19'

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NOTE BOOK	
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Chief, Traffic Signals & Technology, DTS  
Date \_\_\_\_\_

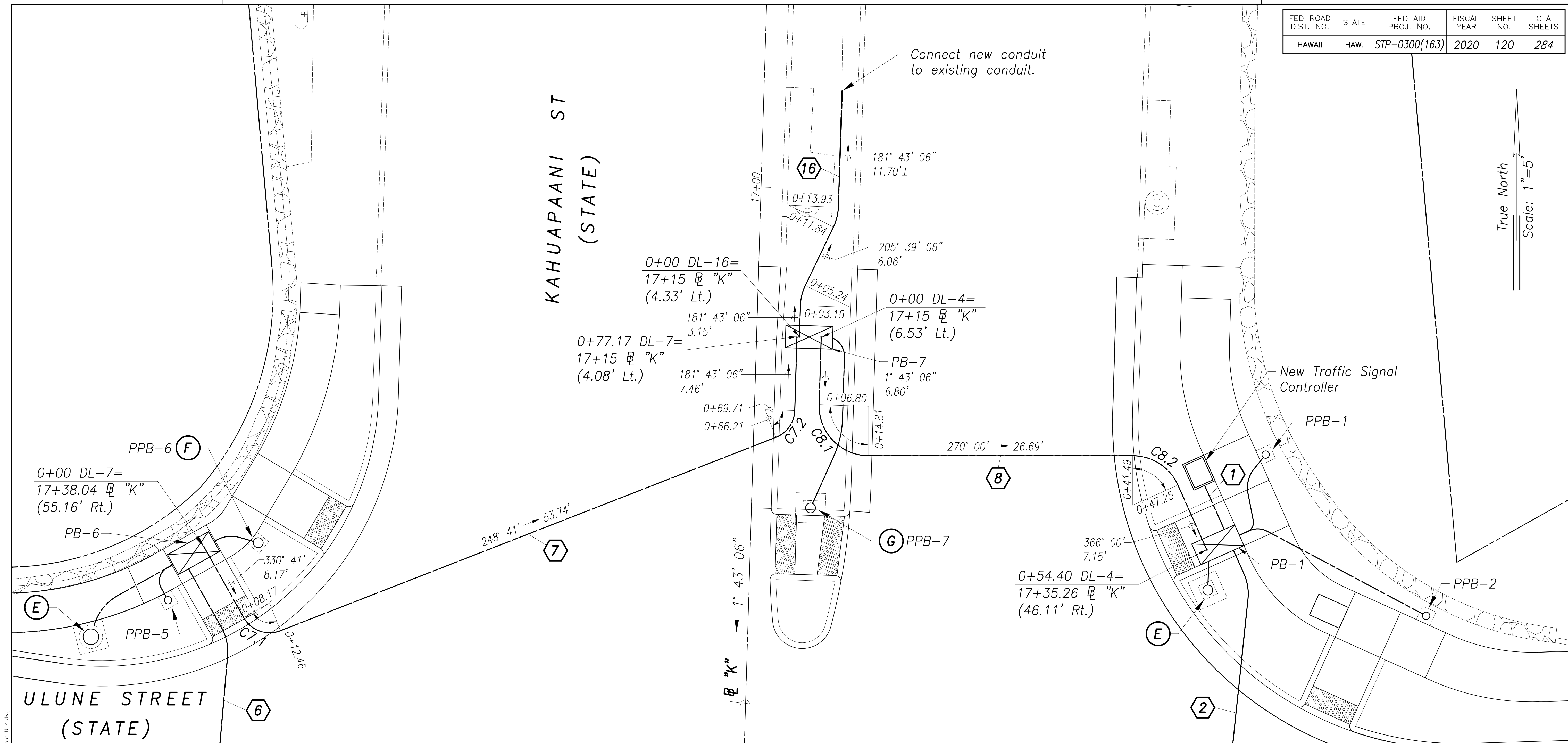


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*Conrad Higashimura*

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**DUCT LAYOUT PLAN**  
**Kahuapaani St & Ulune St**  
*Traffic Signal Modernization,  
Oahu, Phase 1*  
**Federal-Aid Project No. STP-0300(163)**  
Scale: 1"=5'      Date: July 2020  
SHEET No. TS-24 OF 113 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	120	284

True North  
Scale: 1"=5'



Aug 28, 2020-10:30am  
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No.	

Duct Line Curve Data						
	C7.1	C7.2	C8.1	C8.2	C16.1	C16.2
$\Delta$	82° 00' 00"	66° 57' 54"	91° 43' 06"	66° 00' 00"	23° 56' 00"	23° 56' 00"
$\Delta/2$	41° 00' 00"	33° 28' 57"	45° 51' 33"	33° 00' 00"	11° 58' 00"	11° 58' 00"
R	3.00'	3.00'	5.00'	5.00'	5.00'	5.00'
T	2.61'	1.98'	5.15'	3.25'	1.06'	1.06'
Ch	3.94'	3.31'	7.18'	5.44'	2.07'	2.07'
Lc	4.29'	3.51'	8.00'	5.76'	2.09'	2.09'

Approved By: \_\_\_\_\_  
Chief, Traffic Signals & Technology, DTS  
Date \_\_\_\_\_

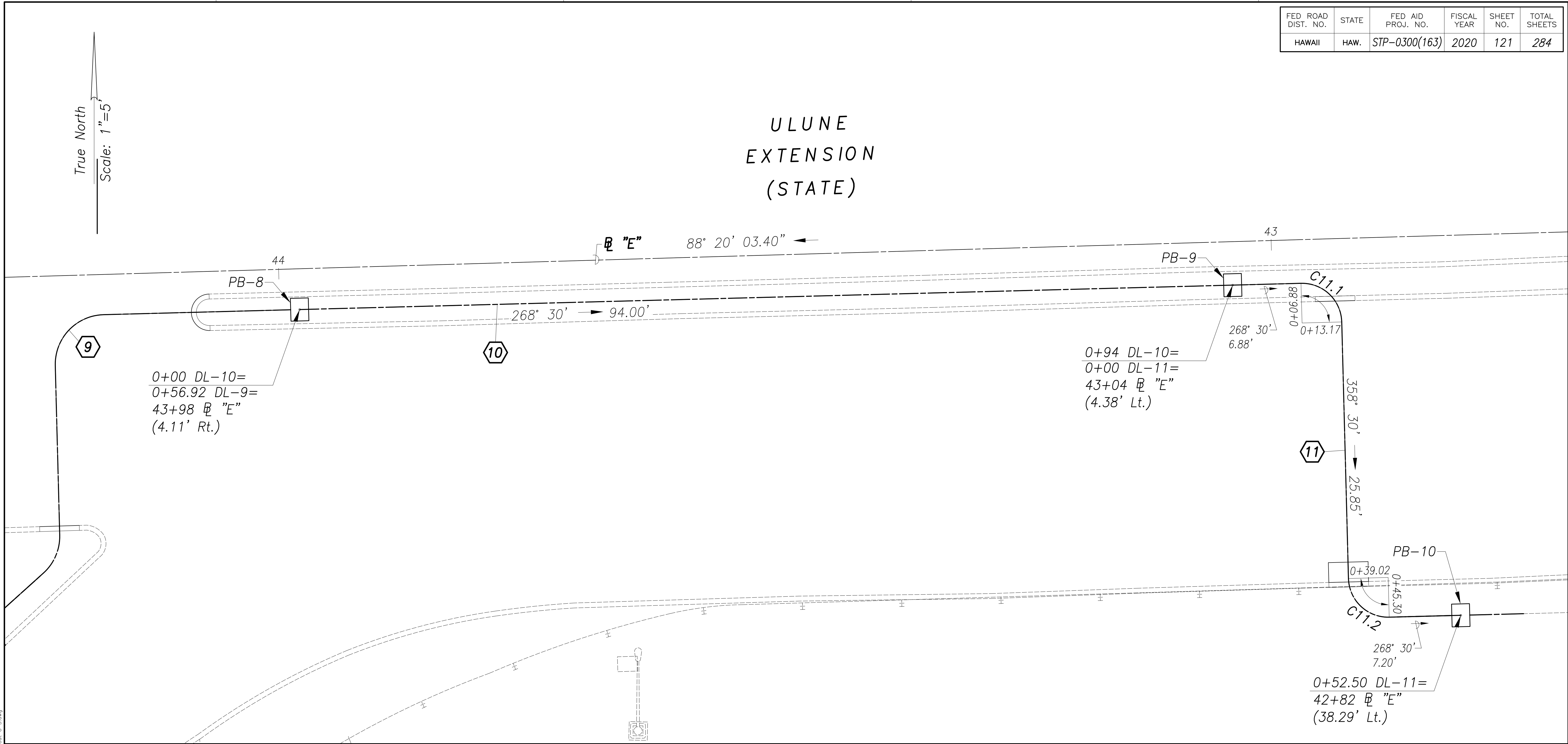


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Conrad Higashimura

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**DUCT LAYOUT PLAN**  
**Kahuapaani St & Ulune St**  
*Traffic Signal Modernization,  
Oahu, Phase 1*  
**Federal-Aid Project No. STP-0300(163)**  
Scale: 1"=5' Date: July 2020  
SHEET No. TS-25 OF 113 SHEETS



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	121	284

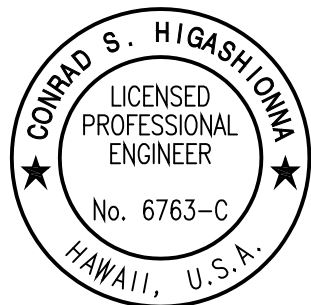


Duct Line Curve Data		
	C11.1	C11.2
$\Delta$	90° 00' 00"	90° 00' 00"
$\Delta/2$	45° 00' 00"	45° 00' 00"
R	4.00'	4.00'
T	4.00'	4.00'
Ch	5.66'	5.66'
Lc	6.28'	6.28'

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
	DESIGNED BY	
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Chief, Traffic Signals & Technology, DTS  
Date



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DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

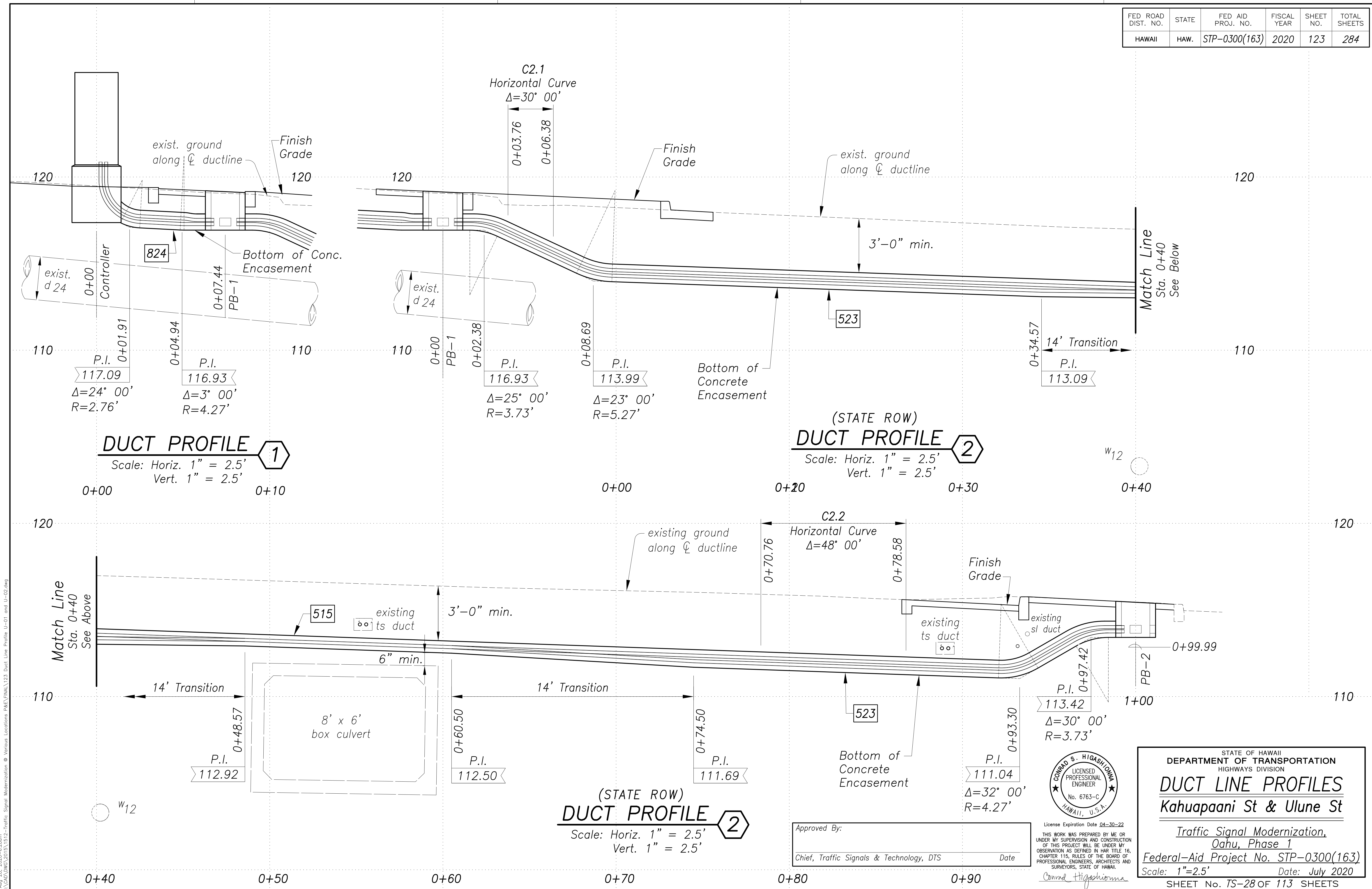
**DUCT LAYOUT PLAN**  
**Kahuapaani St & Ulune St**

Traffic Signal Modernization,  
Oahu, Phase 1  
Federal-Aid Project No. STP-0300(163)

Scale: 1"=5' Date: July 2020  
SHEET No. TS-26 OF 113 SHEETS



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	123	284



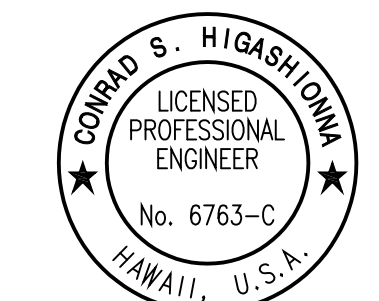
**DUCT PROFILE 1**  
Scale: Horiz. 1" = 2.5'  
Vert. 1" = 2.5'

**(STATE ROW) DUCT PROFILE 2**  
Scale: Horiz. 1" = 2.5'  
Vert. 1" = 2.5'

**(STATE ROW) DUCT PROFILE 2**  
Scale: Horiz. 1" = 2.5'  
Vert. 1" = 2.5'

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Chief, Traffic Signals & Technology, DTS  
Date: \_\_\_\_\_

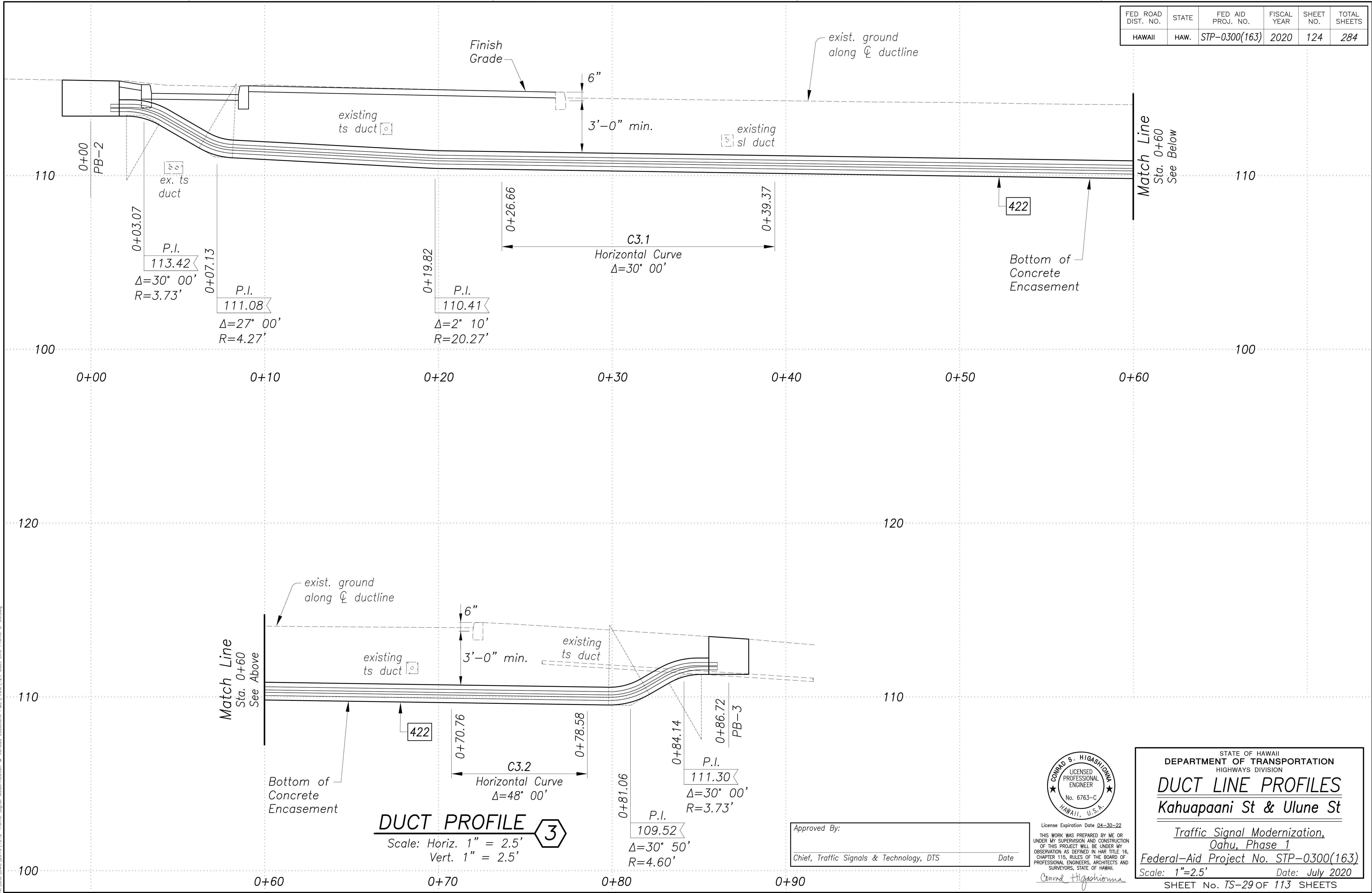
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**DUCT LINE PROFILES**  
**Kahuapaani St & Ulune St**

Traffic Signal Modernization,  
Oahu, Phase 1  
Federal-Aid Project No. STP-0300(163)  
Scale: 1"=2.5' Date: July 2020  
SHEET No. TS-28 OF 113 SHEETS

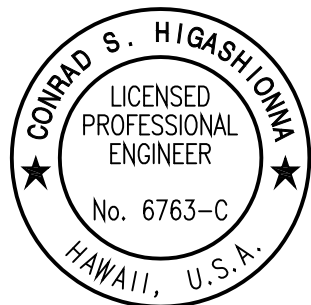


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	124	284



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CHECKED BY	
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NOTE BOOK	
No.	

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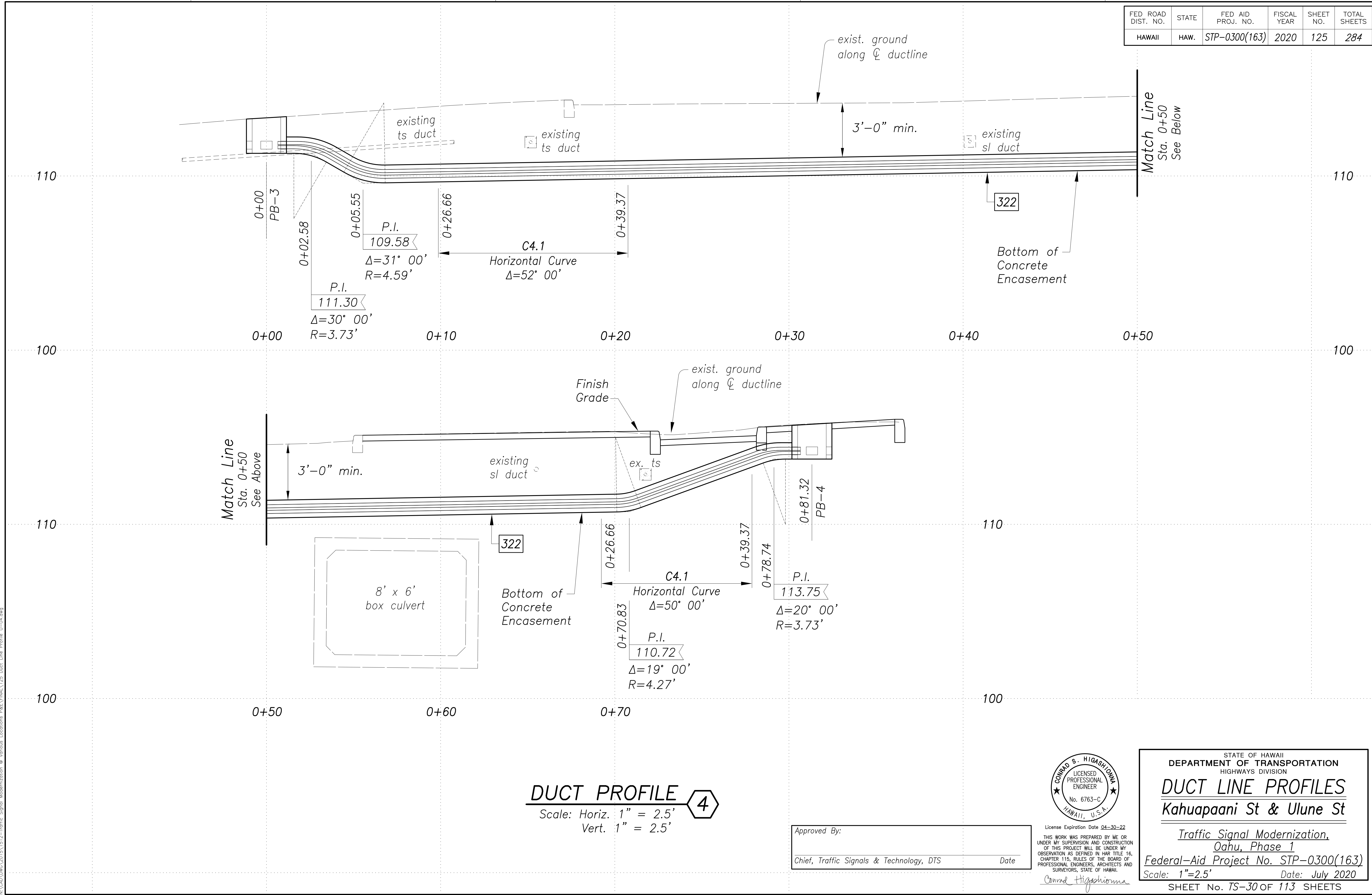
Conrad Higashi

Approved By: \_\_\_\_\_ Date \_\_\_\_\_  
Chief, Traffic Signals & Technology, DTS

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**DUCT LINE PROFILES**  
**Kahuapaani St & Ulune St**  
Traffic Signal Modernization,  
Oahu, Phase 1  
Federal-Aid Project No. STP-0300(163)  
Scale: 1"=2.5' Date: July 2020  
SHEET No. TS-29 OF 113 SHEETS

124

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	125	284

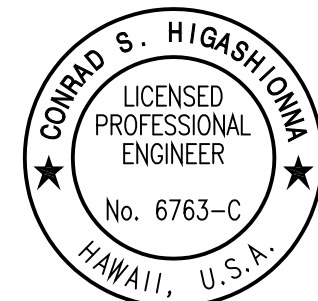


SURVEY PLOTTED BY	DATE
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CHECKED BY	
No.	

Aug 28, 2020-1:30pm  
N:\CAO\DWG\2015\1512-Traffic Signal Modernization @ Various Locations P&E\FINAL\125 Duct Line Profile U-04.dwg

**DUCT PROFILE**  
Scale: Horiz. 1" = 2.5'  
Vert. 1" = 2.5'

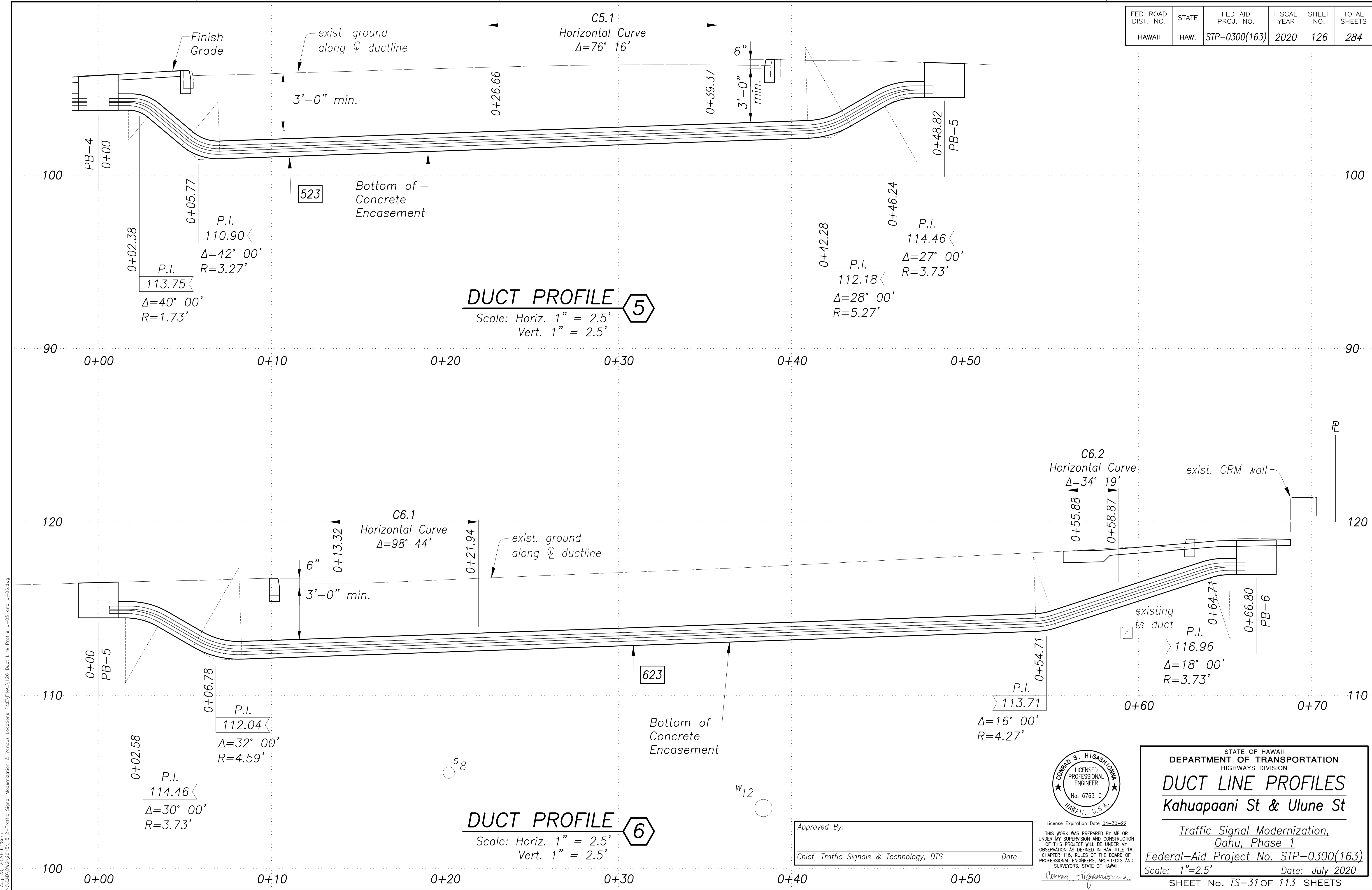
Approved By: \_\_\_\_\_  
Chief, Traffic Signals & Technology, DTS Date \_\_\_\_\_



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*Conrad Higashimura*

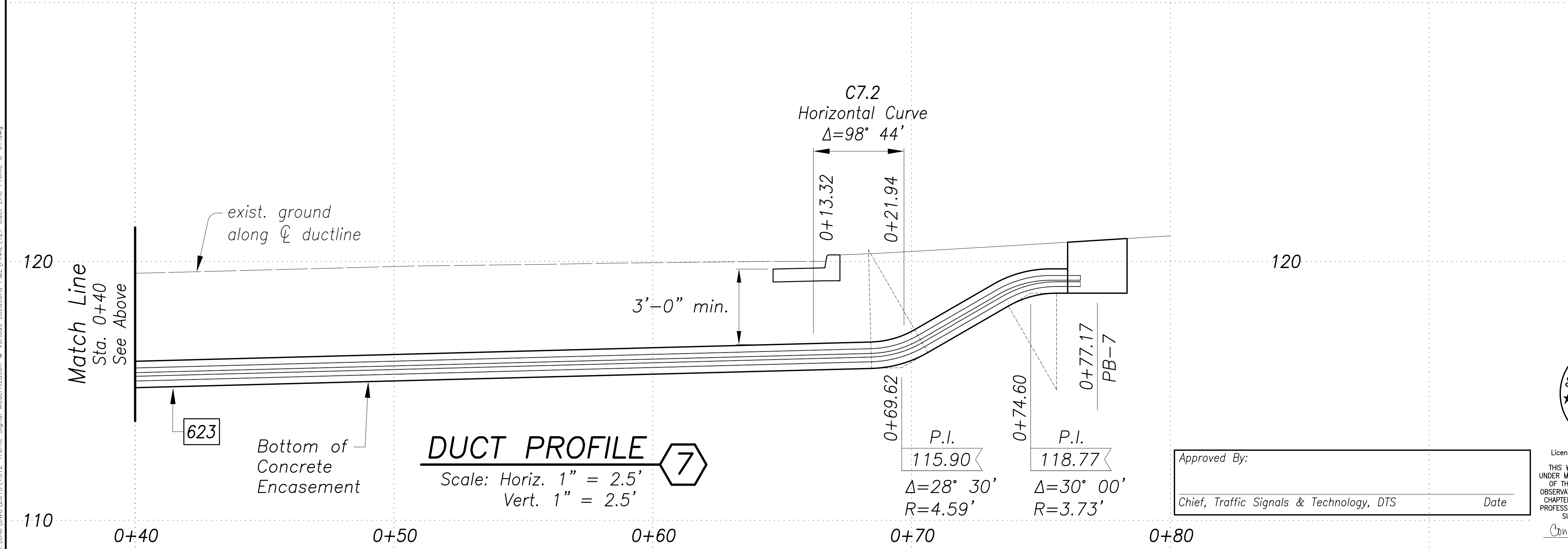
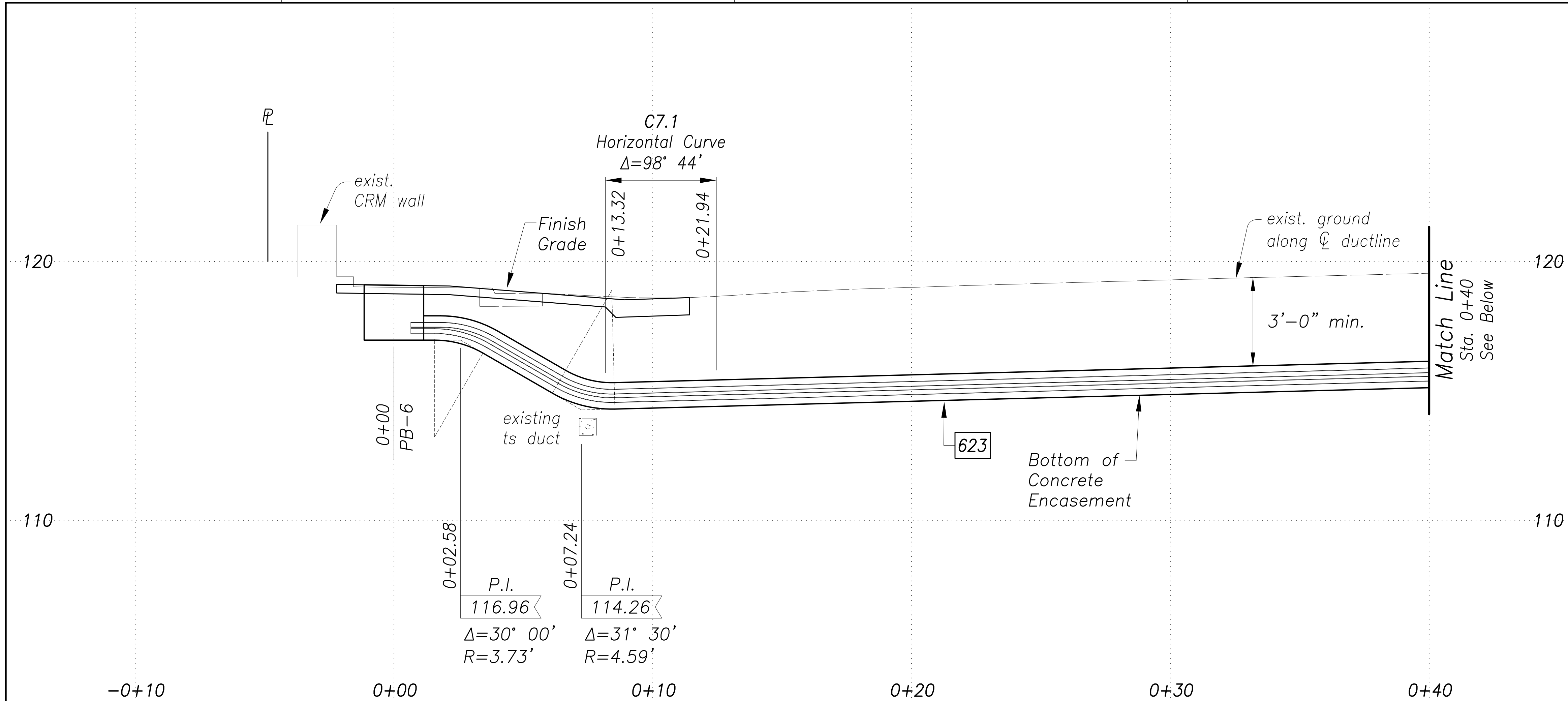
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**DUCT LINE PROFILES**  
**Kahuapaani St & Ulune St**  
Traffic Signal Modernization,  
Oahu, Phase 1  
Federal-Aid Project No. STP-0300(163)  
Scale: 1"=2.5' Date: July 2020  
SHEET No. TS-30 OF 113 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	126	284



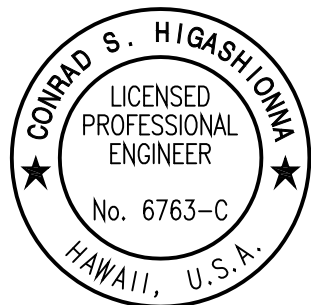


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	127	284



**DUCT PROFILE** 7  
 Scale: Horiz. 1" = 2.5'  
 Vert. 1" = 2.5'

Approved By: \_\_\_\_\_  
 Chief, Traffic Signals & Technology, DTS Date \_\_\_\_\_

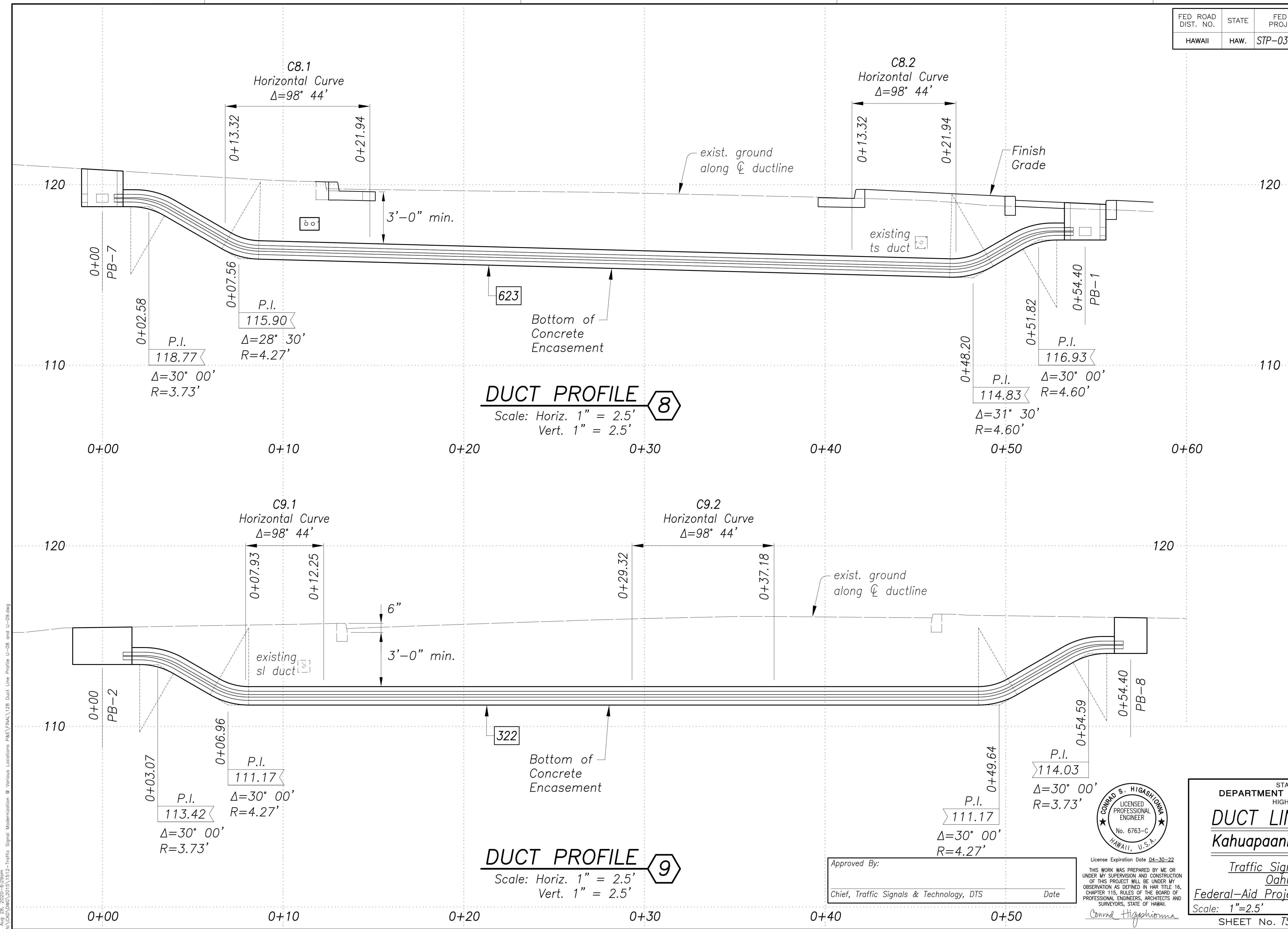


License Expiration Date: 04-30-22  
 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION AS DEFINED IN HAWAII TITLE 16, CHAPTER 115, RULES OF THE BOARD OF PROFESSIONAL ENGINEERS, ARCHITECTS AND SURVEYORS, STATE OF HAWAII.  
 Conrad Higashimura

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**DUCT LINE PROFILES**  
**Kahuapaani St & Ulune St**  
Traffic Signal Modernization,  
Oahu, Phase 1  
Federal-Aid Project No. STP-0300(163)  
Scale: 1"=2.5' Date: July 2020  
SHEET No. TS-32 OF 113 SHEETS

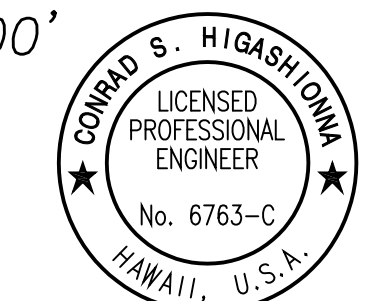
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	128	284



ORIGINAL PLAN	DATE
DRAWN BY	
DESIGNED BY	
NOTED BY	
CHECKED BY	
No.	

Aug 28, 2020-1:30pm  
N:\CAO\DWG\2015\1512-Traffic Signal Modernization @ Various Locations P&E\FINAL\128 Duct Line Profile U-08 and U-09.dwg



Approved By: \_\_\_\_\_  
Chief, Traffic Signals & Technology, DTS Date: \_\_\_\_\_

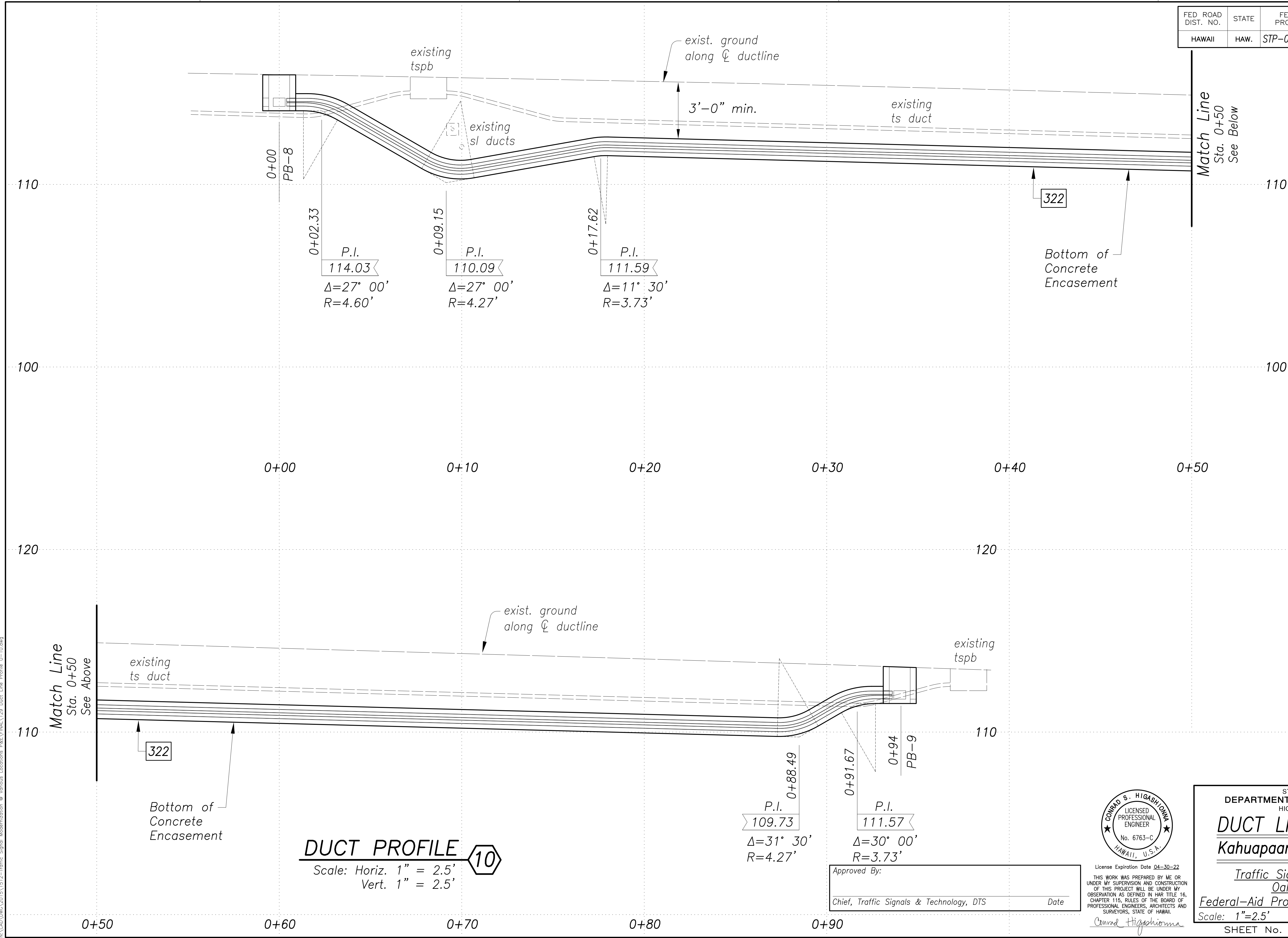
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**DUCT LINE PROFILES**  
**Kahuapaani St & Ulune St**

Traffic Signal Modernization,  
Oahu, Phase 1  
Federal-Aid Project No. STP-0300(163)

Scale: 1"=2.5' Date: July 2020  
SHEET No. TS-33 OF 113 SHEETS

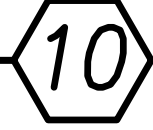
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	129	284



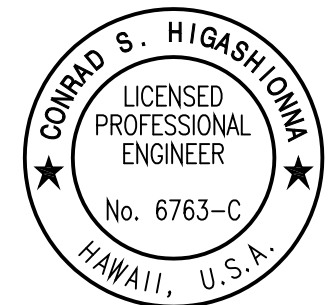
SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
No.	

Aug 28, 2020-10:30am  
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**DUCT PROFILE**  
Scale: Horiz. 1" = 2.5'  
Vert. 1" = 2.5'



Approved By: \_\_\_\_\_  
Chief, Traffic Signals & Technology, DTS Date



License Expiration Date 04-30-22  
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION AS DEFINED IN HAWAII TITLE 16, CHAPTER 115, RULES OF THE BOARD OF PROFESSIONAL ENGINEERS, ARCHITECTS AND SURVEYORS, STATE OF HAWAII.  
*Conrad Higashimura*

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**DUCT LINE PROFILES**  
**Kahuapaani St & Ulune St**

Traffic Signal Modernization,  
Oahu, Phase 1

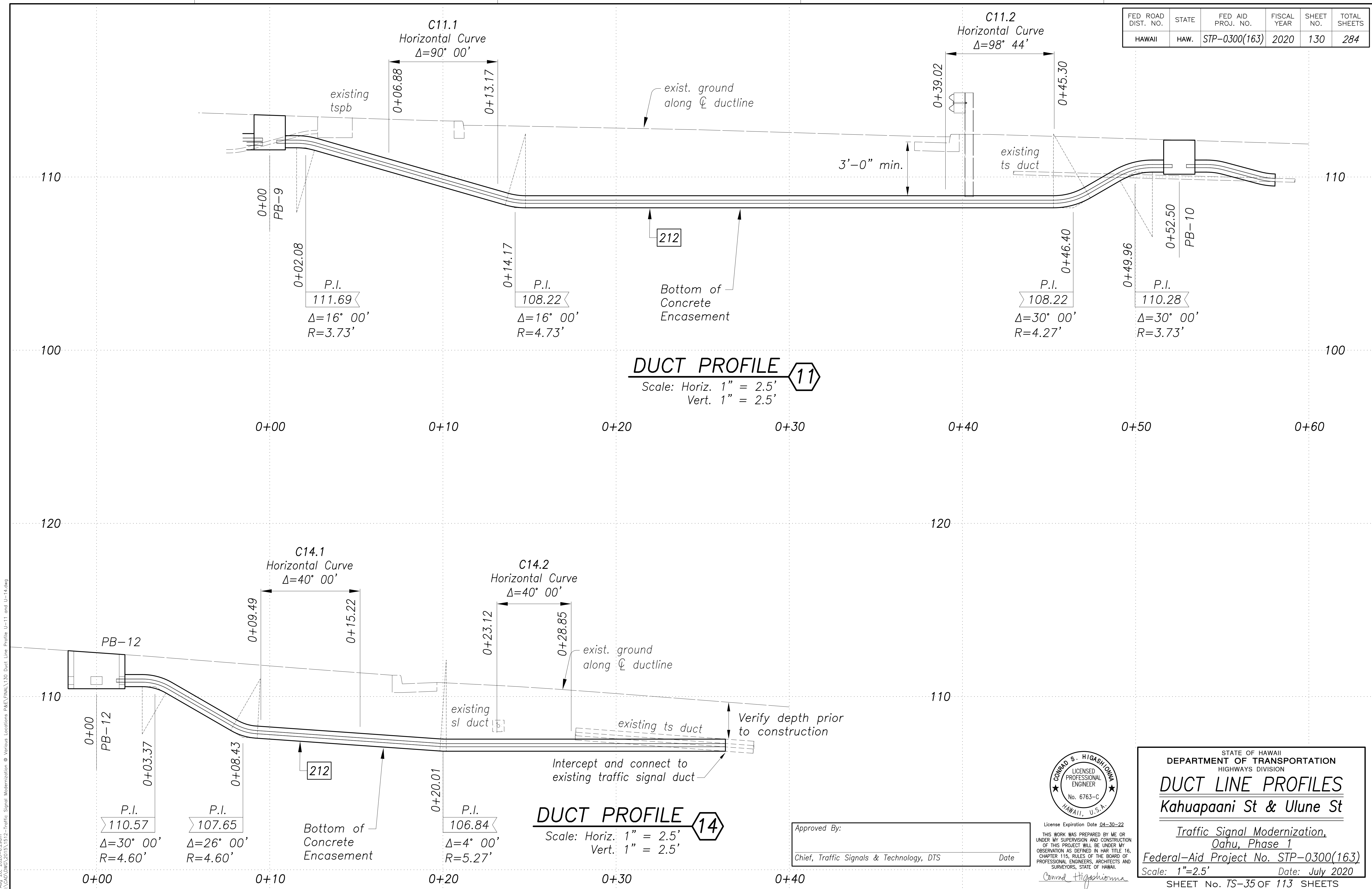
Federal-Aid Project No. STP-0300(163)

Scale: 1"=2.5' Date: July 2020

SHEET No. TS-34 OF 113 SHEETS

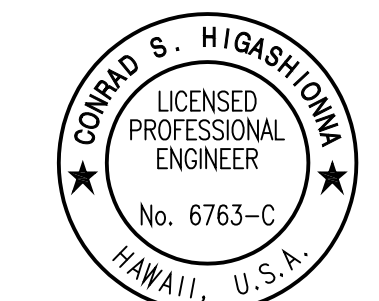


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	130	284



SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
No.	

Aug 28, 2020-10:30am  
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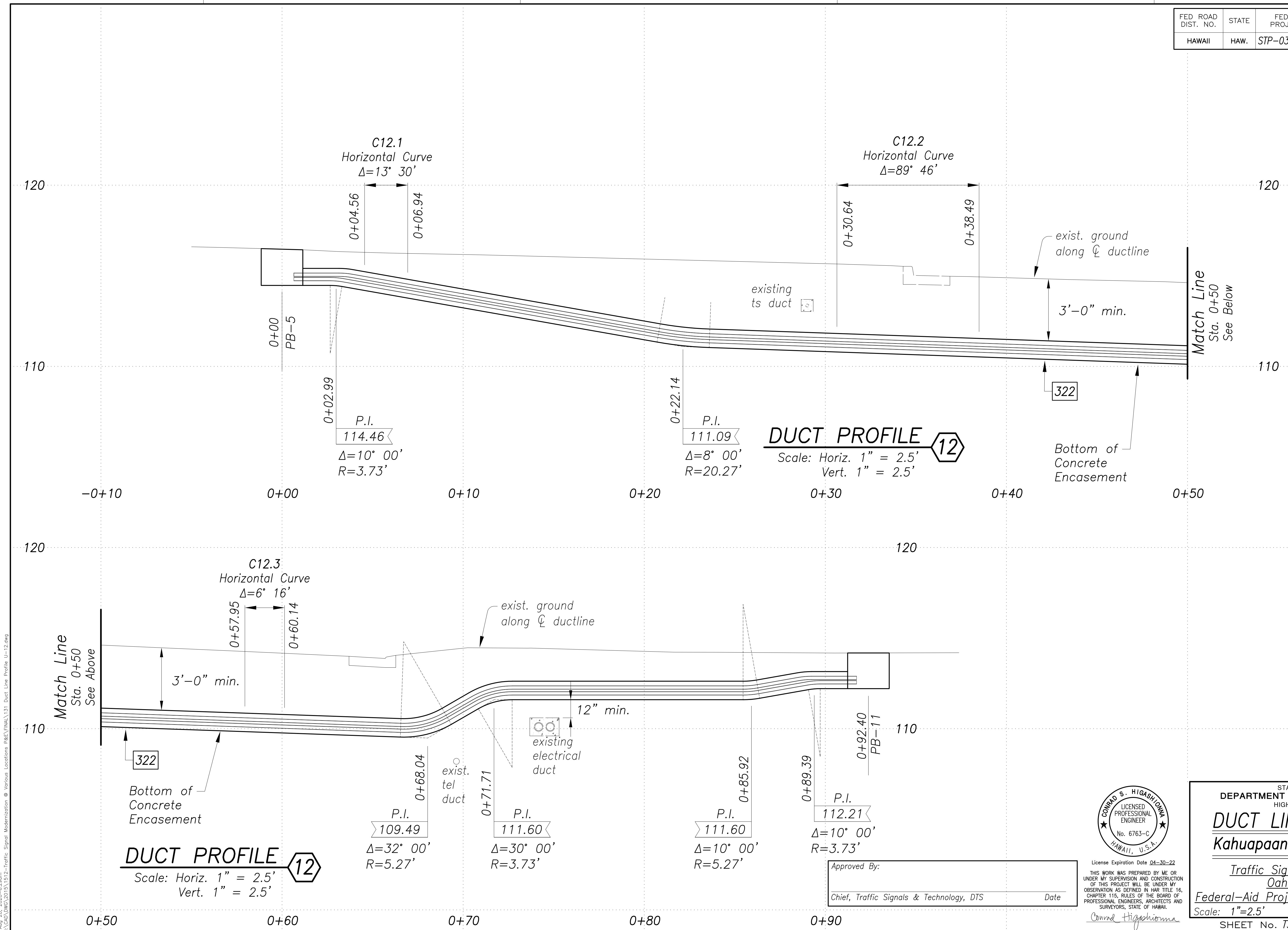
Approved By: \_\_\_\_\_  
Chief, Traffic Signals & Technology, DTS Date: \_\_\_\_\_

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**DUCT LINE PROFILES**  
**Kahuapaani St & Ulune St**

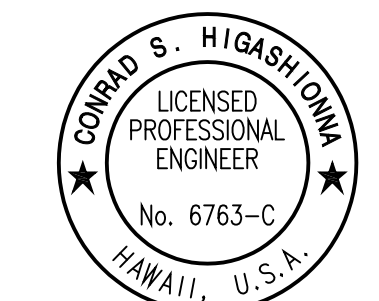
Traffic Signal Modernization,  
Oahu, Phase 1  
Federal-Aid Project No. STP-0300(163)  
Scale: 1"=2.5' Date: July 2020  
SHEET No. TS-35 OF 113 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	131	284



SURVEY PLOTTED BY	DATE
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QUANTITIES BY	
CHECKED BY	
No.	

Aug 28, 2020-12:30pm  
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Approved By: \_\_\_\_\_  
Chief, Traffic Signals & Technology, DTS Date

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**DUCT LINE PROFILES**  
**Kahuapaani St & Ulune St**

Traffic Signal Modernization,  
Oahu, Phase 1  
Federal-Aid Project No. STP-0300(163)  
Scale: 1"=2.5' Date: July 2020  
SHEET No. TS-36 OF 113 SHEETS

