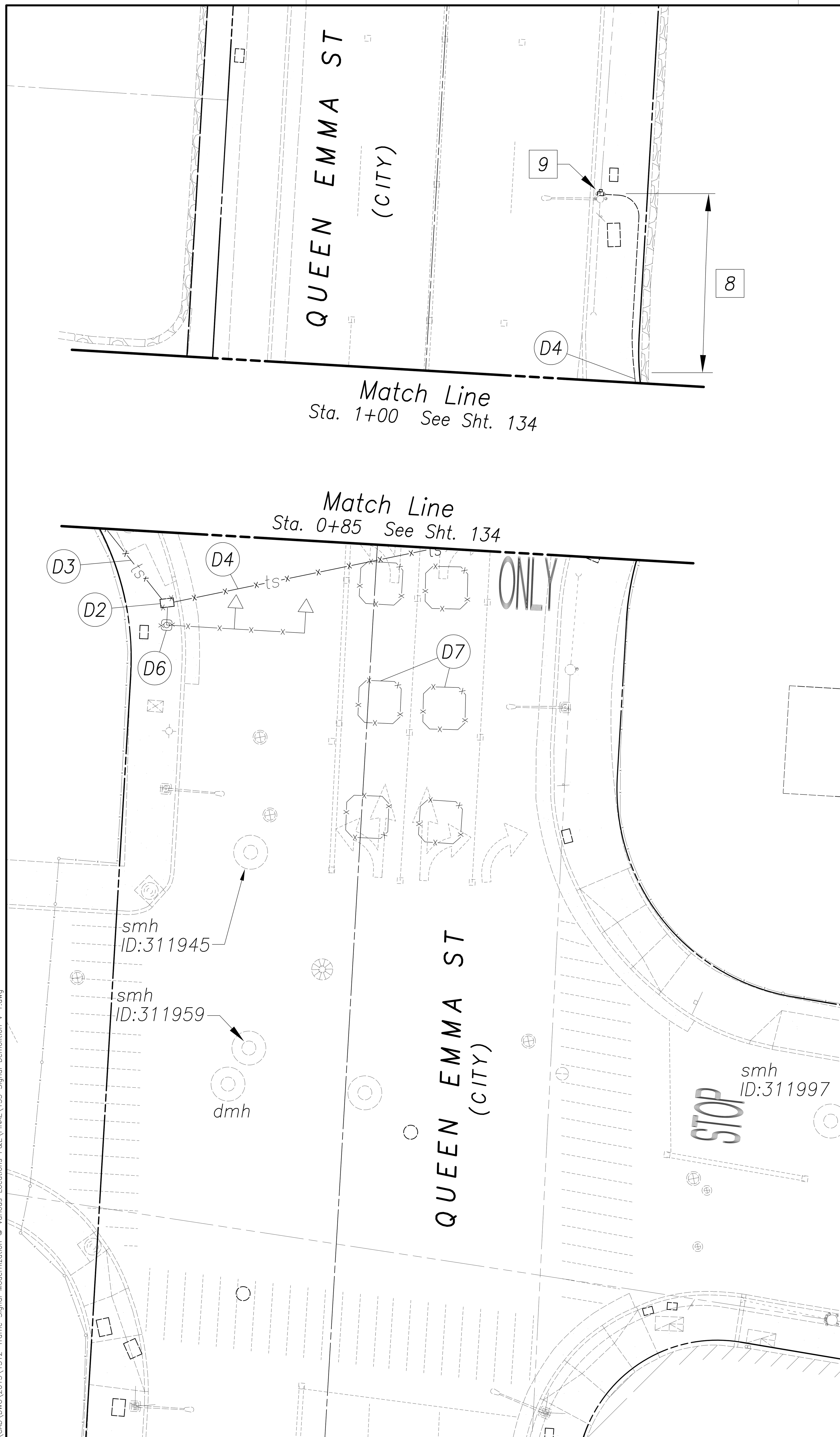
FED ROAD DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	133	284



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 Dept. of Transportation Services, Traffic Signal & Technology baseyard at 999 Makolu Street (ph: 768–5323).

3 Existing pullbox to remain. Remove unnecessary existing traffic signal cables. The Contractor shall not damage existing fiber optic cables to remain.

4 Existing traffic signal standard and/or pedestrian push button pedestal to remain.

5 Existing pullbox to remain.

6 Abandon vehicle loop detectors in place.

7 Existing inter–connect duct to remain.

8 Existing duct to remain.

9 Existing HECO meter, signal power source 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. **The Contractor shall not damage asbestos–cement ducts to be abandoned.**

D3 Remove traffic signal cables. The Contractor shall verify conduit material. **Abandon asbetos–cement ducts in place, fill with lean concrete.** Steel ducts may be demolished and removed to facilitate construction.

D4 Remove traffic signal cables. Abandon ducts in place. Fill ducts with lean concrete.

D5 Remove pedestrian push button and pedestal. Salvage pedestrian push button and pedestal.

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, pedestrian signal heads, pedestrian push buttons.

D7 Abandon vehicle detectors in place.

D8 Remove and salvage pedestrian signal heads.

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

Aug 28, 2020–6:29am
N:\CAD\DWG\2015\1512–Traffic Signal Modernization @ Various Locations P&E\FINAL\133 Signal Demolition V 1.dwg

Approved By:

Chief, Traffic Signals & Technology, DTS — Date

Chief, Civil Engineering Branch, DPP (For Construction in City ROW only) — Date

CONRAD S. HIGASHIONNA LICENSED PROFESSIONAL ENGINEER No. 6763–C HAWAII, U.S.A.

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 HAR TITLE 16, CHAPTER 115, RULES OF THE BOARD OF PROFESSIONAL ENGINEERS, ARCHITECTS AND SURVEYORS, STATE OF HAWAII.

Conrad Higashionna

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SIGNAL DEMOLITION

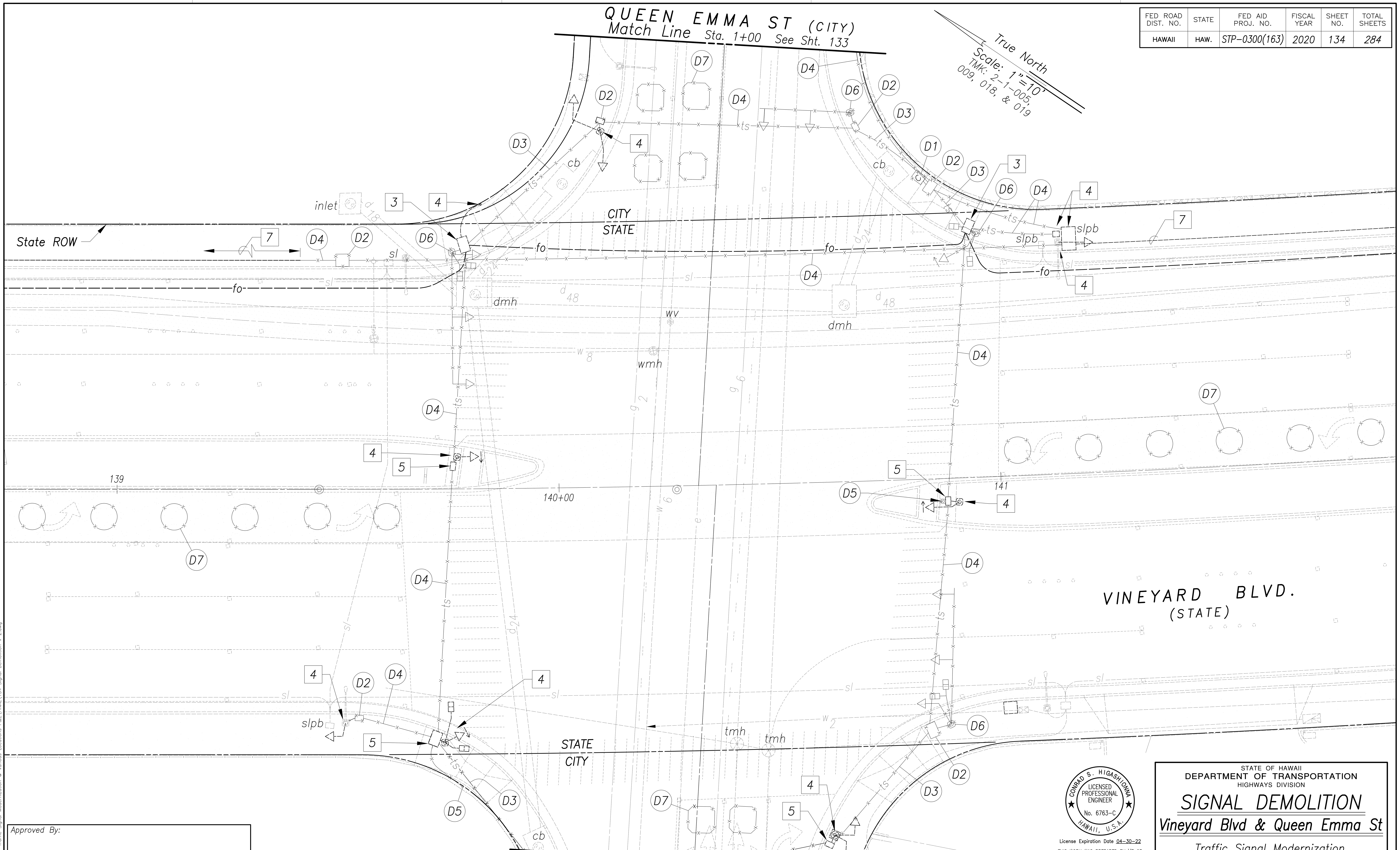
Vineyard Blvd & Queen Emma St

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

Scale: 1"=10' Date: July 2020

SHEET No. TS–38 OF 113 SHEETS

FED ROAD DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	134	284



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

Aug 28, 2020-6:29am
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Approved By:

Chief, Traffic Signals & Technology, DTS — Date

Chief, Civil Engineering Branch, DPP (For Construction in City ROW only) — Date

CONRAD S. HIGASHIONNA
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No. 6763-C
HAWAII, U.S.A.

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Conrad Higashionna

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

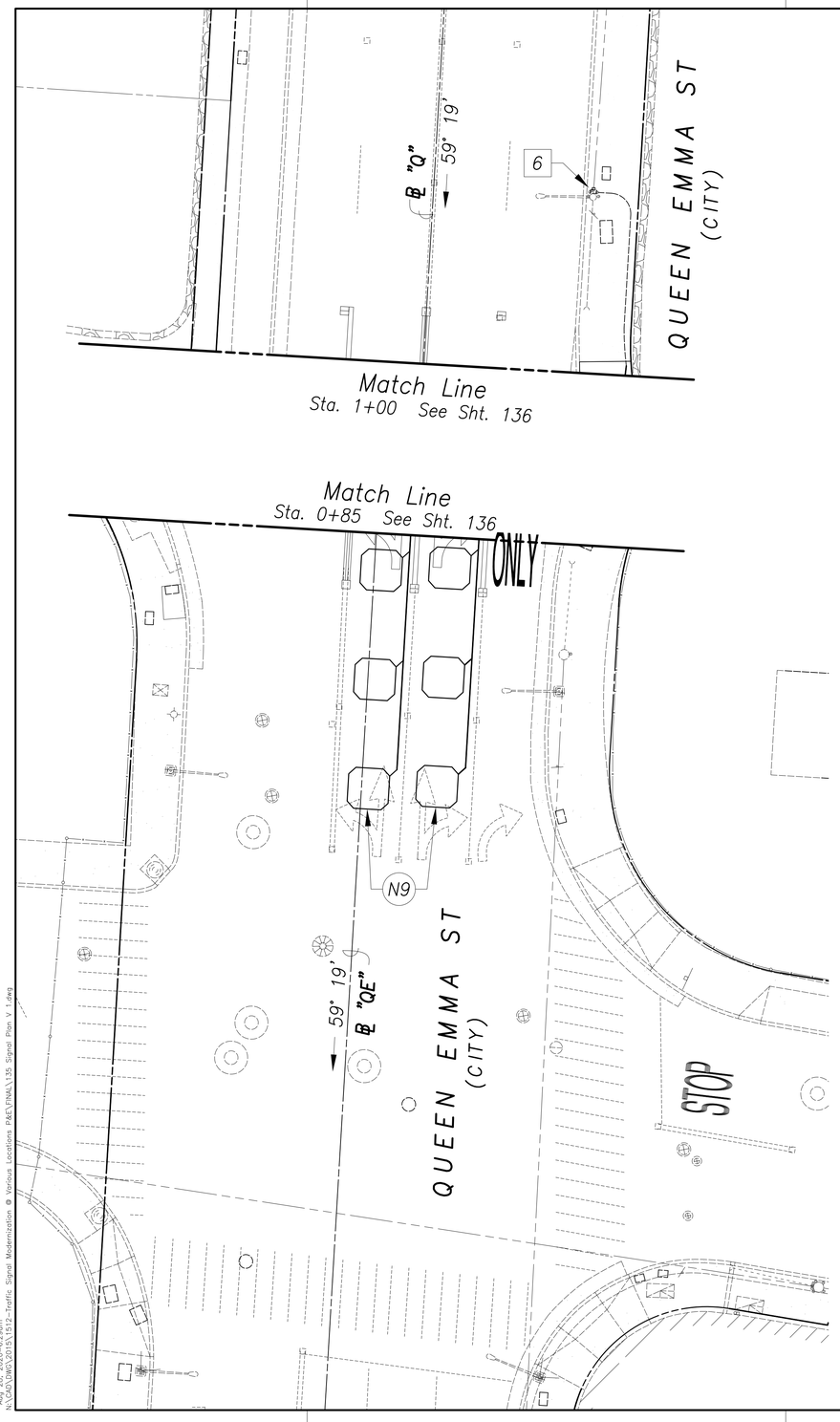
SIGNAL DEMOLITION

Vineyard Blvd & Queen Emma St

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

Scale: 1"=10' Date: July 2020

SHEET No. TS-39 OF 113 SHEETS



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

Aug 28, 2020-6:29pm
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Notes:

1. *Tie-down of traffic signal standards is to center of vertical pole.*
2. *For location of traffic signal pullboxes, see New Duct Line Work.*
3. *Existing street light standard with signal head to remain.*
4. *Type I traffic signal standard to remain.*
5. *Existing pedestrian push button (ppb-1 & 2) to remain.*
6. *Existing power source. Existing HECO meter on joint pole.*
7. *Relocate 2-inch water lateral, see sheet 54.*
8. *See sheet 140 for new signal work schedules.*

New Signal Work Callouts:

- (N1) *Install Controller Assembly with Software 139+46.03 ℄ "V" (76.5' Rt.)*
- (N2) *Install Type II Traffic Signal Standard with 36-foot mast arm and drilled shaft foundation. 139+71 ℄ "V" (54' Lt.)*
- (N3) *Install Type I Traffic Signal Standard, 10-feet height, with foundation. 139+88 ℄ "V" (61.7' Lt.)*
- (N4) *Install Type II Traffic Signal Standard with 25-foot mast arm and drilled shaft foundation. 140+67 ℄ "V" (88' Lt.)*
- (N5) *Install Type I Traffic Signal Standard, 10-feet height, with foundation. 141+02.98 ℄ "V" (53.74' Lt.)*
- (N6) *Install Type II Traffic Signal Standard with 38-foot mast arm and drilled shaft foundation. 140+92.25 ℄ "V" (53.5' Rt.)*
- (N7) *Install Type II Traffic Signal Standard with 35-foot mast arm and drilled shaft foundation. 139+88.50 ℄ "V" (68.5' Rt.)*
- (N8) *Install Loop Detector Sensing Unit (6 Ft. x 6 Ft.) 2 Loops centered in lane*
- (N9) *Install Loop Detector Sensing Unit (6 Ft. x 6 Ft.) 4 Loops centered in lane*
- (N10) *Install Loop Detector Sensing Unit (6 Ft. x 6 Ft.) 6 Loops centered in lane*
- (N11) *Install pedestrian push button PPB-3, ADA compliant, on traffic signal standard.*
- (N12) *Install pedestrian push button PPB-4, ADA compliant, mounted on a pedestal with foundation.*
- (N13) *Install pedestrian push buttons PPB-5 and PPB-6, ADA compliant, mounted on traffic signal standard.*
- (N14) *Install temporary Approach-Only Microwave Vehicle Detector on existing traffic signal standard.*

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	135	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)
(D)*	Sand & Gravel	Level	36	30	10
(G)*	Sand & Gravel	Level	25	30	7
(K)*	Sand & Gravel	Level	38	30	10
(M)*	Sand & Gravel	Level	35	30	9

* *For drilled shaft foundation details, see 2008 Standard Plans TE-33A.1 & TE-33A.2 – above ground water table.*

No boring for soils data conducted for this site.

A HECO standby inspector must be on-site anytime the excavation is within 10 feet of the outside face of the FTB enclosure surrounding 138kV cable pipes.

CAUTION! HECO 138kV duct bank consists of conduits and steel pipe that is not concrete encased.

Approved By:

Chief, Traffic Signals & Technology, DTS Date

Chief, Civil Engineering Branch, DPP Date
(For Construction in City ROW only)

CONRAD S. HIGASHIONNA
LICENSED PROFESSIONAL ENGINEER
No. 6763-C
HAWAII, U.S.A.

License Expiration Date 04-30-22

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Conrad Higashionna

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

NEW SIGNAL WORK

Vineyard Blvd & Queen Emma St

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

Scale: 1"=10' Date: July 2020

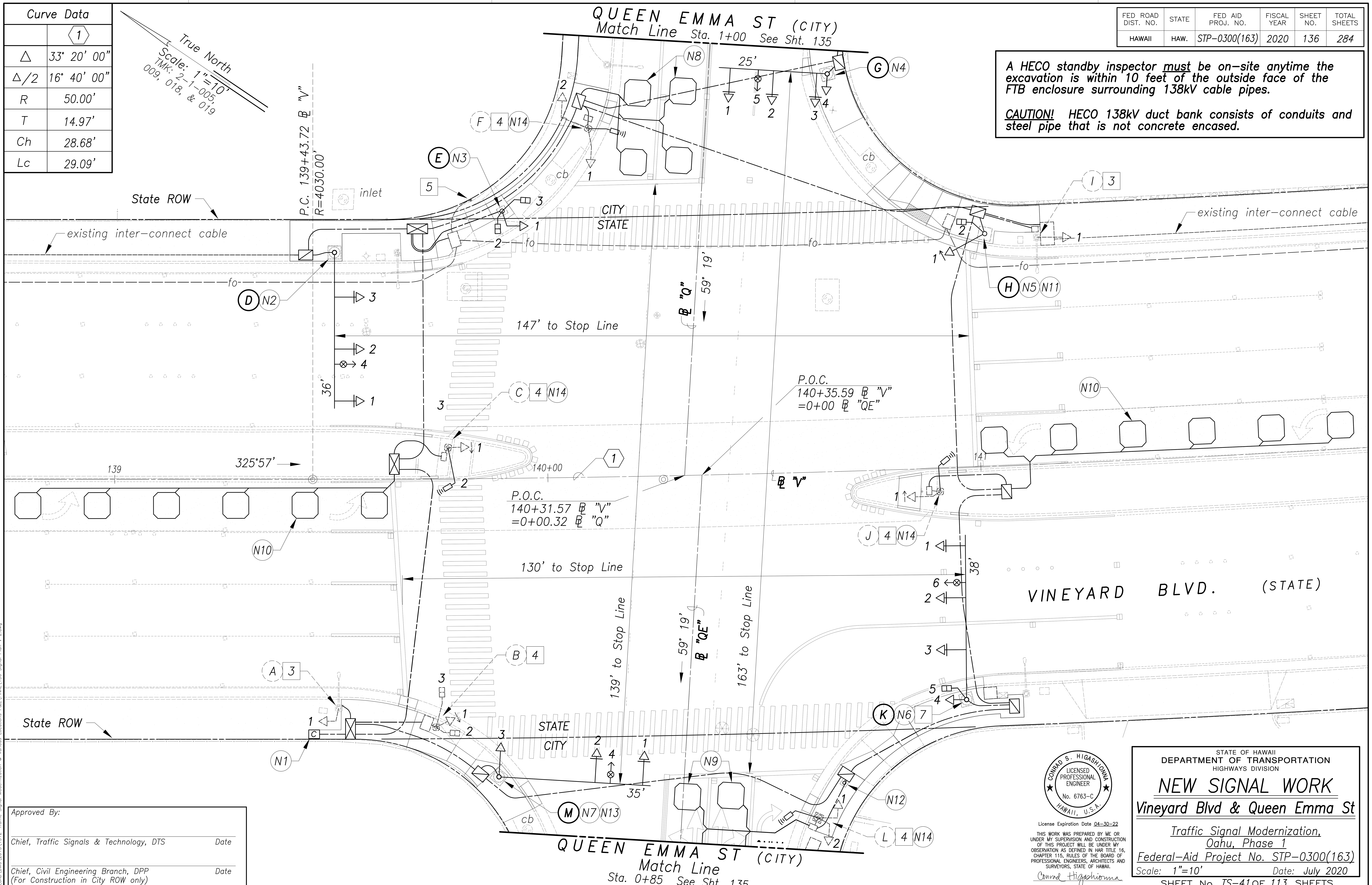
SHEET No. TS-40 OF 113 SHEETS

FED ROAD DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	136	284

A HECO standby inspector must be on-site anytime the excavation is within 10 feet of the outside face of the FTB enclosure surrounding 138kV cable pipes.

CAUTION! HECO 138kV duct bank consists of conduits and steel pipe that is not concrete encased.

Curve Data	
	1
Δ	33° 20' 00"
Δ/2	16° 40' 00"
R	50.00'
T	14.97'
Ch	28.68'
Lc	29.09'



Approved By:

Chief, Traffic Signals & Technology, DTS — Date

Chief, Civil Engineering Branch, DPP (For Construction in City ROW only) — Date

CONRAD S. HIGASHIONNA LICENSED PROFESSIONAL ENGINEER No. 6763-C HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

NEW SIGNAL WORK

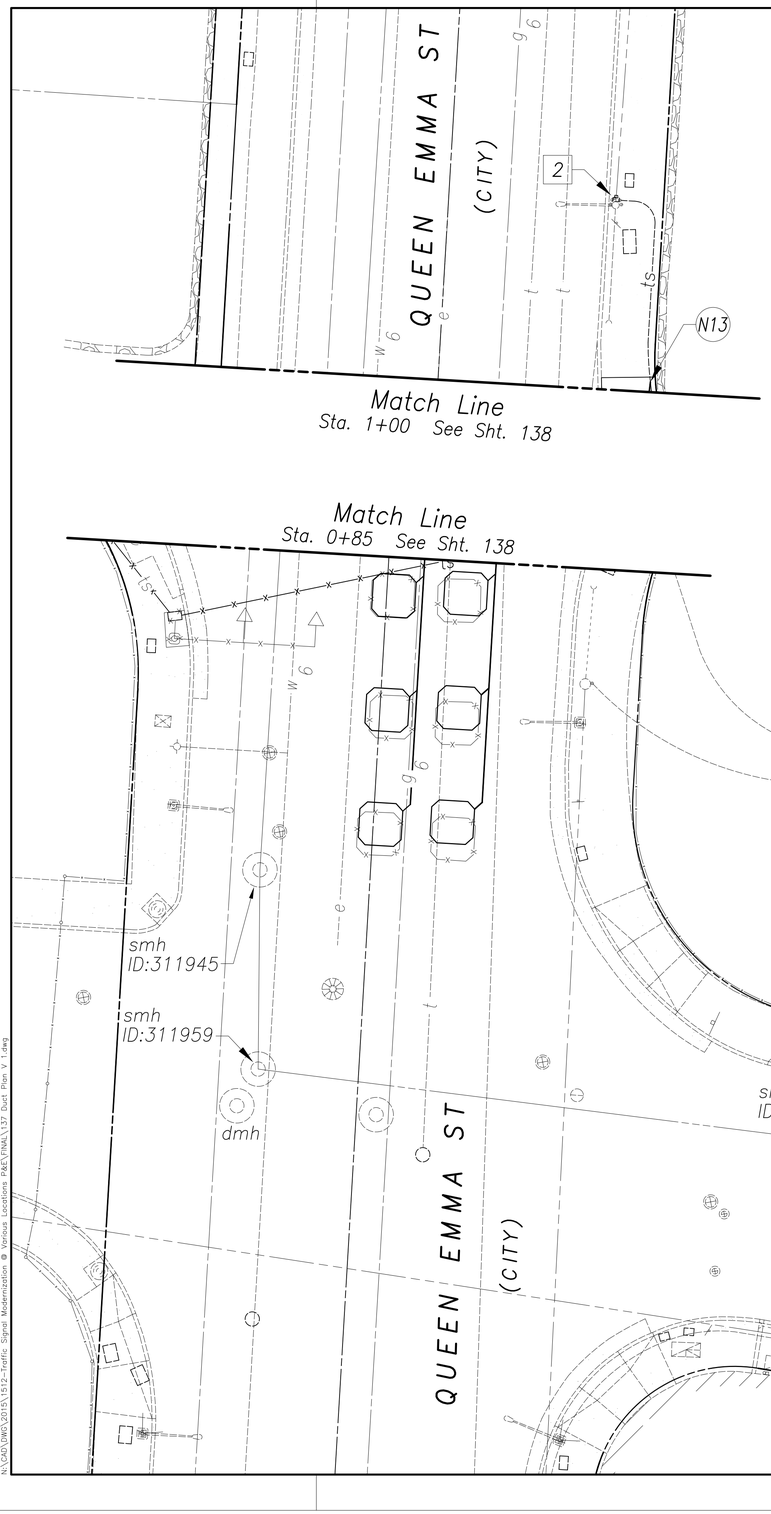
Vineyard Blvd & Queen Emma St

Traffic Signal Modernization, Oahu, Phase 1

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

Scale: 1"=10' Date: July 2020

SHEET No. TS-41 OF 113 SHEETS



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	137	284

A HECO standby inspector must be on-site anytime the excavation is within 10 feet of the outside face of the FTB enclosure surrounding 138kV cable pipes.

CAUTION! HECO 138kV duct bank consists of conduits and steel pipe that is not concrete encased.

Notes:

1. Tie-down of traffic signal controller & pullboxes is to center of box.
2. Existing power source. Existing HECO meter mounted on joint pole.
3. 20 L.F. Reinforced Concrete Jacket on 8" sewer.
4. 11 L.F. Reinforced Concrete Jacket on 8" sewer.
5. Existing pullbox PB-10 to remain.
6. Existing pullbox PB-11 to remain.
7. Existing pullbox PB-13 to remain.
8. Existing pullbox PB-15 to remain.
9. Existing pullbox PB-16 to remain.
10. Existing pullbox PB-17 to remain.
11. Existing pullbox PB-18 to remain.
12. Existing pullbox PB-19 to remain.
13. 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.

Notes continued:

14. Relocate 2-inch water lateral, see sheet 54.
15. See sheet 140 for new duct line work schedules.
16. **The Contractor shall notify the Engineer of any changes to horizontal or vertical alignment within City & County of Honolulu right-of-way. All changes in horizontal or vertical alignment within City right-of-way require revision approval from the Department of Planning and Permitting prior to construction.**

New Duct Line Work Callouts:

- (N1) Install Type C Pullbox PB-1. 139+87 ℄ "V" (72' Rt.)
- (N2) Install Type C Pullbox PB-2. 139+87 ℄ "V" (5' Lt.)
- (N3) Install Type C Pullbox PB-3. 139+69 ℄ "V" (58.52' Lt.)
- (N4) Install Type B Pullbox PB-4. 140+07.50 ℄ "V" (87.20' Lt.)
- (N5) Install Type B Pullbox PB-5. 141+00 ℄ "V" (58' Lt.)
- (N6) Install Type B Pullbox PB-6. 140+94 ℄ "V" (5' Rt.)
- (N7) Install Type B Pullbox PB-7. 140+97 ℄ "V" (56' Rt.)
- (N8) Install Type B Pullbox PB-8. 140+61 ℄ "V" (86' Rt.)
- (N9) Install Type B Pullbox PB-9. 139+87 ℄ "V" (72' Rt.)
- (N10) Install Type B Pullbox PB-12. 139+42 ℄ "V" (51.8' Lt.)
- (N11) Install Type B Pullbox PB-14. 140+69.50 ℄ "V" (92.09' Lt.)
- (N12) New traffic signal controller. 139+46.03 ℄ "V" (76.5' Rt.)

New Duct Line Work Callouts continued:

- (N13) Connect new concrete encased conduit to existing conduit.
- (N14) Connect new conduits to existing pullboxes. The Contractor shall drill thru existing pull box wall and patch hole with non-shrink grout. Cut abandoned ducts at inside face of pullbox. Remove unneeded traffic signal cables.
- (N15) Connect new conduit to existing riser at street light standard with traffic signal head.

ORIGINAL SURVEY PLOTTED BY	DATE
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NOTE BOOK	
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Approved By:

Chief, Civil Engineering Branch, DPP (For Construction in City ROW only) Date

Chief, Wastewater Branch, DPP Date

Chief, Traffic Signals & Technology, DTS Date

CONRAD S. HIGASHIONNA
LICENSED PROFESSIONAL ENGINEER
No. 6763-C
HAWAII, U.S.A.

License Expiration Date 04-30-22

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Conrad Higashionna

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

NEW DUCT LINE WORK

Vineyard Blvd & Queen Emma St

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

Scale: 1"=10' Date: July 2020

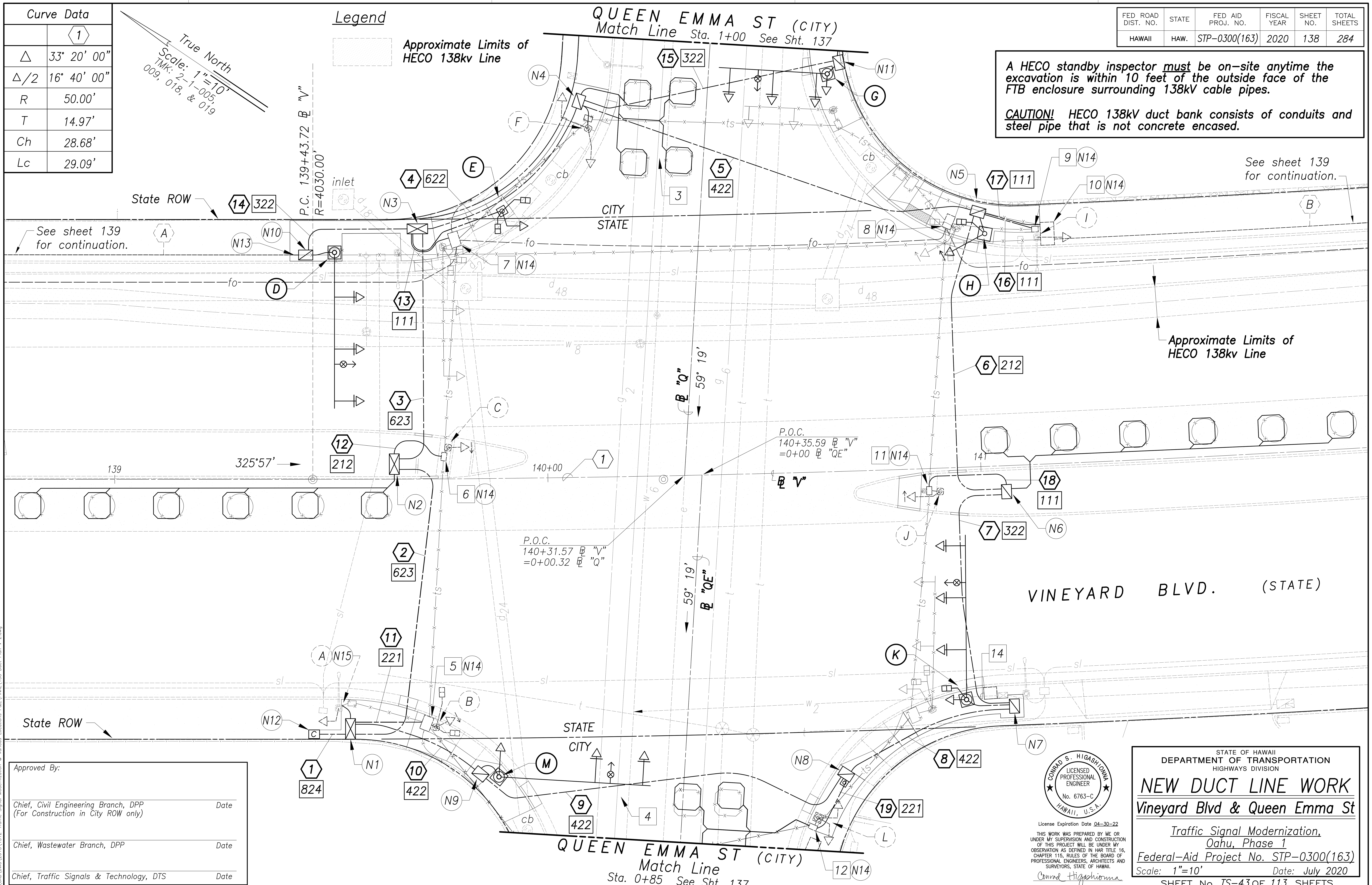
SHEET No. TS-42 OF 113 SHEETS

FED ROAD DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	138	284

A HECO standby inspector must be on-site anytime the excavation is within 10 feet of the outside face of the FTB enclosure surrounding 138kV cable pipes.

CAUTION! HECO 138kV duct bank consists of conduits and steel pipe that is not concrete encased.

Curve Data	1
Δ	33° 20' 00"
Δ/2	16° 40' 00"
R	50.00'
T	14.97'
Ch	28.68'
Lc	29.09'



Approved By:

Chief, Civil Engineering Branch, DPP (For Construction in City ROW only) — Date

Chief, Wastewater Branch, DPP — Date

Chief, Traffic Signals & Technology, DTS — Date

CONRAD S. HIGASHIONNA, LICENSED PROFESSIONAL ENGINEER, No. 6763-C, HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

NEW DUCT LINE WORK

Vineyard Blvd & Queen Emma St

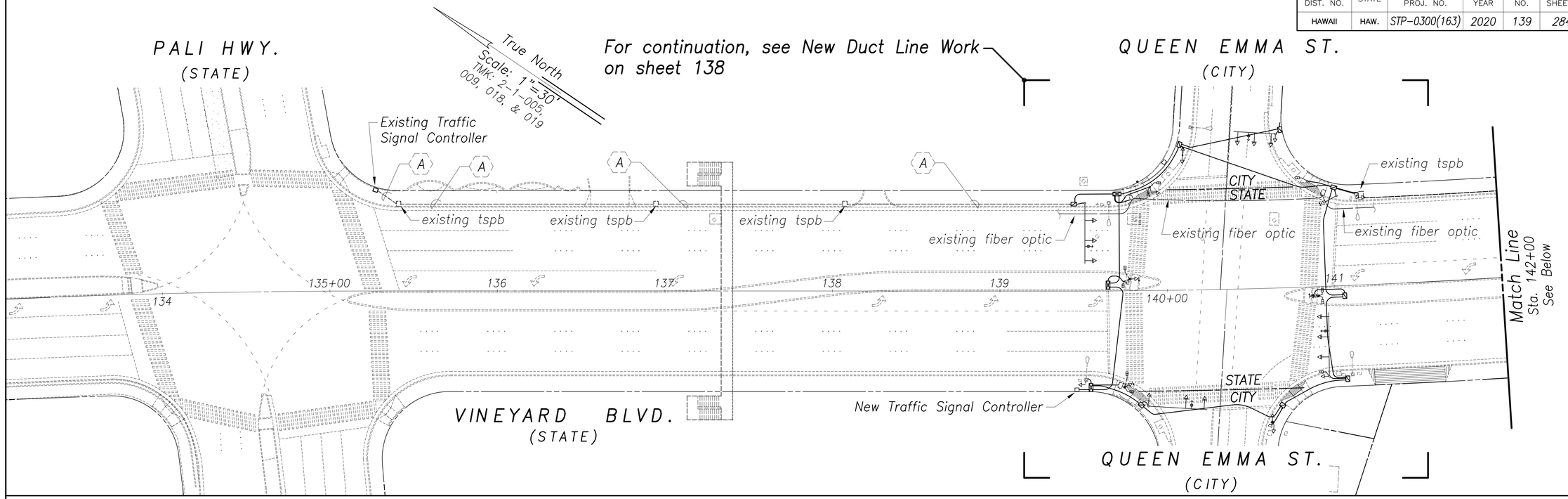
Traffic Signal Modernization, Oahu, Phase 1

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

Scale: 1"=10' Date: July 2020

SHEET No. TS-43 OF 113 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	139	284



Notes:

1. Prior to construction, the Contractor shall verify the existing inter-connect cables can be removed from existing conduits between at the intersections of Vineyard Boulevard with Pali Highway, Queen Emma Street, and Punchbowl Street. 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
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Approved By:

Chief, Traffic Signals & Technology, DTS Date

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Conrad Higashionna

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

INTER-CONNECT PLAN

Vineyard Blvd & Queen Emma St

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

Scale: 1"=30' Date: July 2020

SHEET No. TS-44 OF 113 SHEETS

CONDUIT–CABLE SCHEDULE

⬡	FROM	TO	CONDUIT	CABLE
1	CONTR.	PB–1	New 8–2" Sch. 40 Concrete Encased	1–Type 1, Ground Wire 1–Type 1, Ground Wire 4–Type 2 3–Type 2 2–Type 3 1–Type 6 4–Type 7 Spare
2	PB–1	PB–2	New 6–2" Sch. 40 Concrete Encased	1–Type 1, Ground Wire 4–Type 2 2–Type 3 1–Type 6 2–Type 7 Spare
3	PB–2	PB–3	New 6–2" Sch. 40 Concrete Encased	1–Type 1, Ground Wire 5–Type 2 2–Type 3 1–Type 6 2–Type 7 Spare
4	PB–3	PB–4	New 6–2" Sch. 40 Concrete Encased	1–Type 1, Ground Wire 4–Type 2 1–Type 3 1–Type 6 1–Type 7 Spare
5	PB–4	PB–5	New 4–2" Sch. 40 Concrete Encased	1–Type 1, Ground Wire 1–Type 2 1–Type 3 Spare
6	PB–5	PB–6	New 2–2" Sch. 40 Concrete Encased	1–Type 1, Ground Wire Spare
7	PB–6	PB–7	New 3–2" Sch. 40 Concrete Encased	1–Type 1, Ground Wire 1–Type 2 Spare
8	PB–7	PB–8	New 4–2" Sch. 40 Concrete Encased	1–Type 1, Ground Wire 1–Type 2 1–Type 7 Spare
9	PB–8	PB–9	New 4–2" Sch. 40 Concrete Encased	1–Type 1, Ground Wire 3–Type 2 1–Type 7 Spare
10	PB–9	PB–10	New 4–2" Sch. 40 Concrete Encased	1–Type 1, Ground Wire 2–Type 2 2–Type 7 Spare
11	PB–1	Exist. PB–10	New 2–2" Sch. 40 Concrete Encased	2–Type 2 1–Type 5
12	PB–2	Exist. PB–11	New 2–2" Sch. 40 Concrete Encased	1–Type 2 1–Type 5
13	PB–5	Exist. PB–12	New 1–2" Sch. 40 Concrete Encased	2–Type 2
14	PB–3	PB–13	New 3–3" Sch. 40 Concrete Encased	1–Type 3 1–Type 5 1–Type 7
15	PB–4	PB–14	New 3–2" Sch. 40 Concrete Encased	1–Type 5 1–Type 6 1–Type 7
16	PB–14	Exist. HECO Meter	New 1–2" Sch. 40 Concrete Encased	1–Type 6
17	PB–5	Exist. PB–16	New 1–2" Sch. 40 Concrete Encased	1–Type 5
18	PB–5	Exist. PB–17	New 1–2" Sch. 40 Concrete Encased	1–Type 3
19	PB–6	Exist. PB–18	New 1–2" Sch. 40 Concrete Encased	1–Type 5
20	PB–7	Exist. PB–19	New 2–2" Sch. 40 Concrete Encased	1–Type 2 1–Type 5
A	PB–12	Exist. Contr.	Exist. 1–2"	1–Type 3
B	PB–17	Exist. Contr.	Exist. 1–2"	1–Type 3

SIGNAL HEAD SCHEDULE

Head Type and Description	Pole Letter – Signal Head Number
(R) Red Ball (Y) Yellow Ball (G) Green Ball 12" RYG Traffic Signal Head	A–1* I–1* D–1** K–1** D–2** K–2** D–3** K–3** E–1 K–4 F–1* L–1* F–2* L–2* G–1** M–1** G–2** M–2** G–3** M–3 G–4
(R) Red Ball Yellow Arrow (Left) Green Arrow (Left) 12" R←← Traffic Signal Head	B–1* H–1
(R) Red Ball Yellow Arrow (Left) Green Arrow (Left) 12" R←← Programmed Visibility Traffic Signal Head	C–1* J–1*
Countdown Pedestrian Signal Head	B–2* E–2 B–3* E–3 H–2 K–5

* Existing signal head to remain

** Install Backplate with Retroreflective Borders

OPTICOM SCHEDULE

Mounting Type	Pole Letter – Opticom Number
Mast Arm, One–Way	D–4 K–6 G–5 M–4

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	140	284

PEDESTRIAN PUSH BUTTON SCHEDULE

Description	New Signal Work Callout	Pole or Pedestal PPB–#
	N11	(H) PPB–3
	N13	(M) PPB–5
	N12	Pedestal PPB–4
	N13	(M) PPB–6

DATE	REVISION
9/16/20	Revised conduit 10 cable schedule.

CONRAD S. HIGASHIONNA
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HAWAII, U.S.A.

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Conrad Higashionna

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

NEW WORK SCHEDULES

Vineyard Blvd & Queen Emma St

Traffic Signal Modernization, Oahu, Phase 1

Federal–Aid Project No. STP–0300(163)

Scale: As noted Date: July 2020

SHEET No. TS–45 OF 113 SHEETS

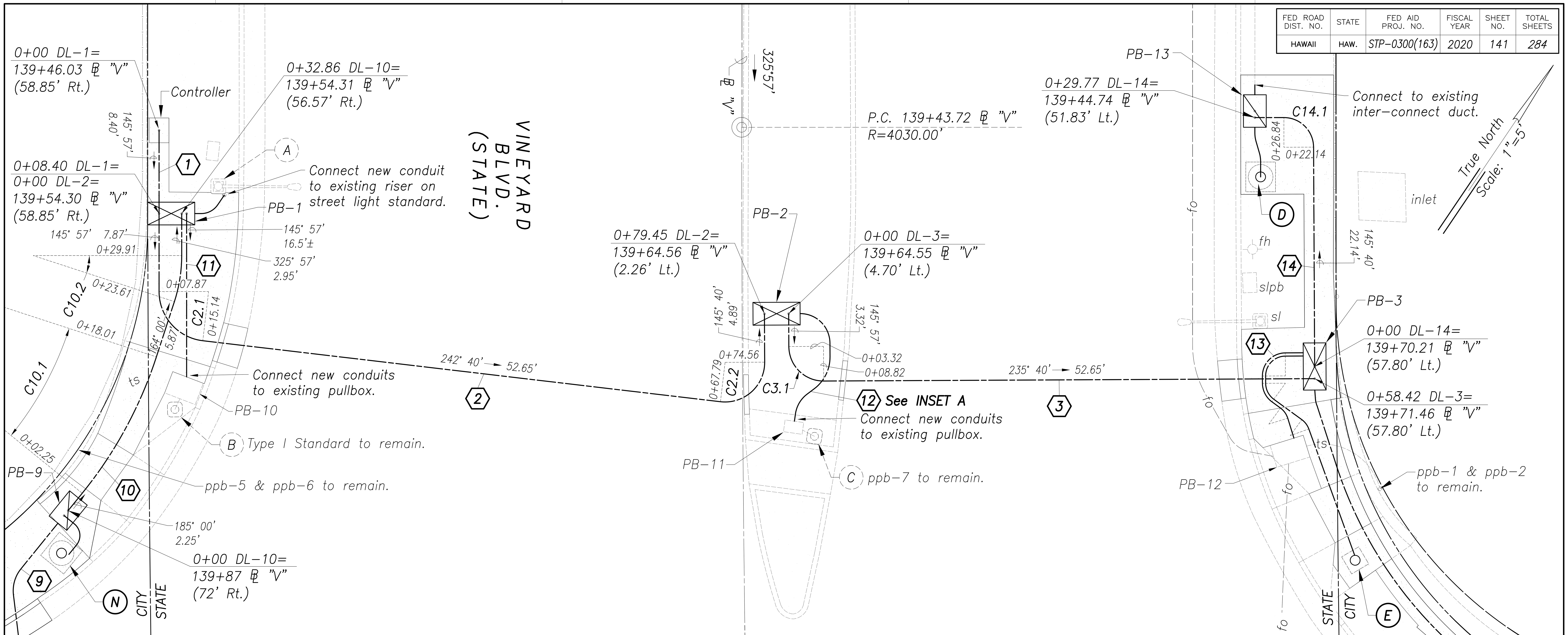
140R

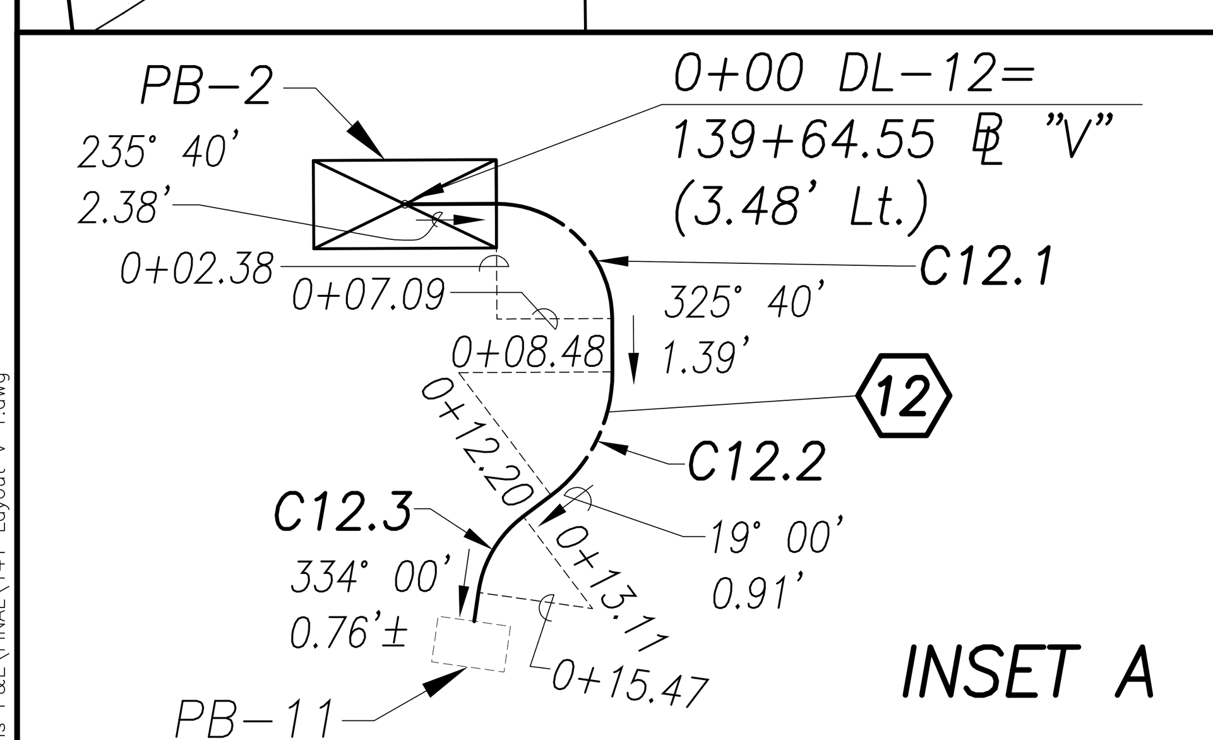
ORIGINAL PLAN | NOTE BOOK | No.

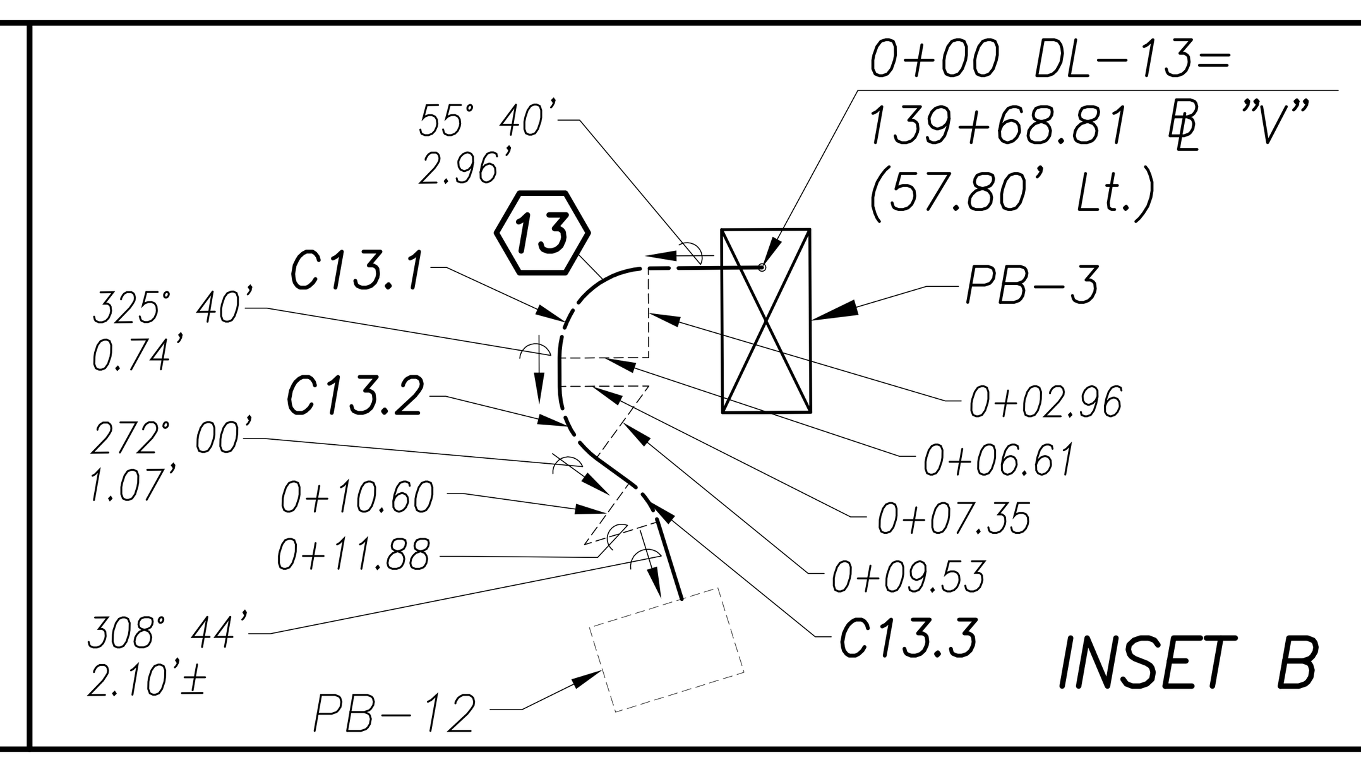
SURVEY PLOTTED BY / DRAWN BY / TRACED BY / DESIGNED BY / QUANTITIES BY / CHECKED BY | DATE

Sep 17, 2020–10:03am
N:\CAD\DWG\2015\1512–Traffic Signal Modernization @ Various Locations P&E\FINAL\140 Table V Addendum.dwg

FED ROAD DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	141	284







Approved By:

Chief, Civil Engineering Branch, DPP (For Construction in City ROW only) Date

Chief, Traffic Signals & Technology, DTS Date

℄ Duct Line Curve Data

	C2.1	C2.2	C3.1	C10.1	C10.2	C12.1	C12.2	C12.3	C13.1	C13.2	C13.3	C14.1
Δ	83° 17' 00"	97° 00' 00"	90° 00' 00"	21° 00' 00"	18° 03' 00"	90° 00' 00"	53° 19' 00"	45° 00' 00"	90° 00' 00"	53° 40' 00"	36° 44' 00"	89° 43' 00"
Δ/2	41° 38' 30"	48° 30' 00"	45° 00' 00"	10° 30' 00"	9° 01' 30"	45° 00' 00"	26° 39' 30"	22° 30' 00"	45° 00' 00"	26° 50' 00"	18° 22' 00"	44° 51' 30"
R	5.00'	4.00'	3.50'	43.00'	20.00'	3.00'	4.00'	3.00'	2.32'	2.32'	2.00'	3.00'
T	4.45'	4.52'	3.50'	7.97'	3.18'	3.00'	2.01'	1.24'	2.32'	1.18'	0.66'	2.99'
Ch	6.64'	5.99'	4.95'	15.67'	6.27'	4.24'	3.59'	2.30'	3.29'	2.10'	1.26'	4.23'
Lc	7.27'	6.77'	5.50'	15.76'	6.30'	4.71'	3.72'	2.36'	3.65'	2.18'	1.28'	4.70'

CONRAD S. HIGASHIONNA
LICENSED PROFESSIONAL ENGINEER
No. 6763-C
HAWAII, U.S.A.

License Expiration Date 04-30-22

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DUCT LAYOUT PLAN

Vineyard Blvd & Queen Emma St

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

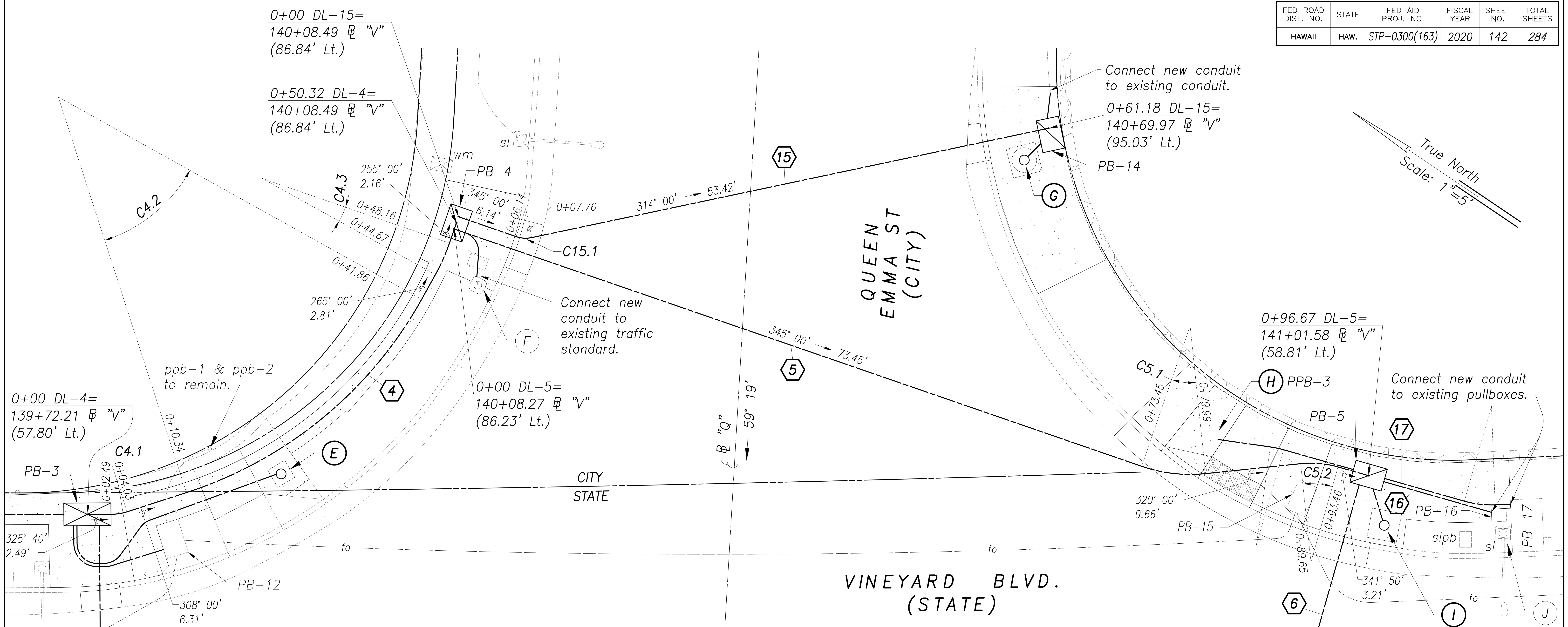
Scale: 1"=5' Date: July 2020

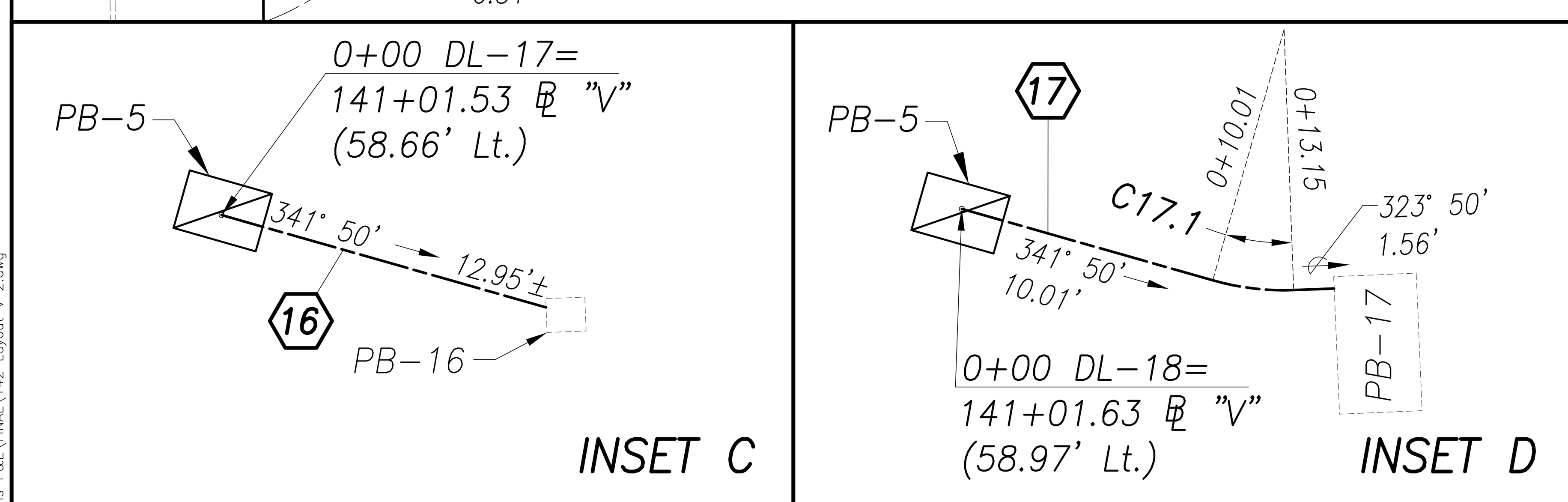
SHEET No. TS-46 OF 113 SHEETS

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

Aug 28, 2020–6:30am
N:\CAD\DWG\2015\1512–Traffic Signal Modernization @ Various Locations P&E\FINAL\141 Layout V 1.dwg

FED ROAD DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	142	284





℄ Duct Line Curve Data

	C4.1	C4.2	C4.3	C5.1	C5.2	C15.1	C17.1
Δ	17° 40' 00"	43° 00' 00"	10° 00' 00"	25° 00' 00"	21° 50' 00"	31° 00' 00"	18° 00' 00"
Δ/2	8° 50' 00"	21° 30' 00"	5° 00' 00"	12° 30' 00"	10° 55' 00"	15° 30' 00"	9° 00' 00"
R	5.00'	42.00'	20.00'	15.00'	10.00'	3.00'	10.00'
T	0.78'	16.52'	1.75'	3.33'	1.93'	0.83'	1.58'
Ch	1.54'	30.75'	3.49'	6.49'	3.79'	1.60'	3.13'
Lc	1.54'	31.48'	3.49'	6.54'	3.81'	1.62'	3.14'

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

Aug 28, 2020-6:30am
N:\CAD\DWG\2015\1512-Traffic Signal Modernization @ Various Locations P&E\FINAL\142 Layout V 2.dwg

Approved By:

Chief, Civil Engineering Branch, DPP (For Construction in City ROW only) Date

Chief, Traffic Signals & Technology, DTS Date

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License Expiration Date 04-30-22

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Conrad Higashionna

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DUCT LAYOUT PLAN

Vineyard Blvd & Queen Emma St

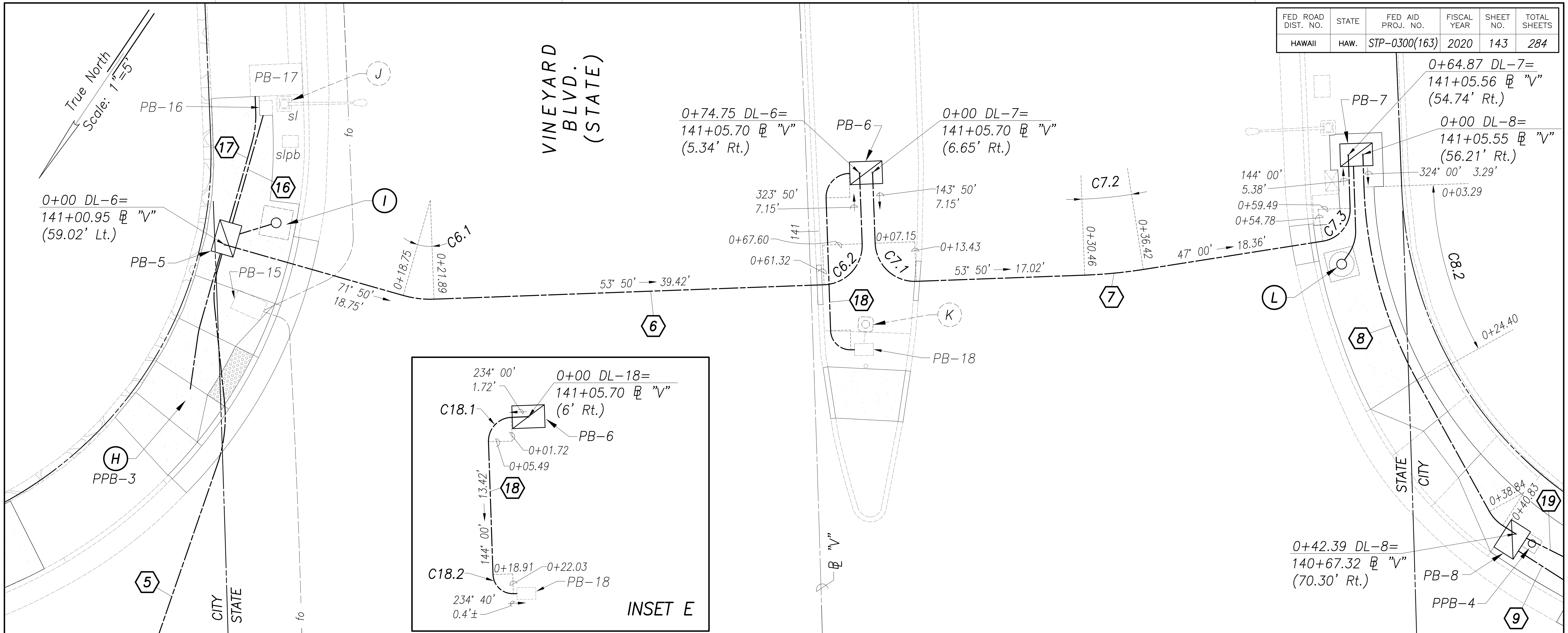
Traffic Signal Modernization, Oahu, Phase 1

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

Scale: 1"=5' Date: July 2020

SHEET No. TS-47 OF 113 SHEETS

FED ROAD DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	143	284



Approved By:

Chief, Civil Engineering Branch, DPP (For Construction in City ROW only) — Date

Chief, Traffic Signals & Technology, DTS — Date

℄ Duct Line Curve Data

	C6.1	C6.2	C7.1	C7.2	C7.3	C8.1	C8.2	C18.1	C18.2
Δ	18° 00' 00"	90° 00' 00"	90° 00' 00"	6° 50' 00"	83° 00' 00"	27° 00' 00"	29° 00' 00"	90° 00' 00"	89° 20' 00"
Δ/2	9° 00' 00"	45° 00' 00"	45° 00' 00"	3° 25' 00"	41° 30' 00"	13° 30' 00"	14° 30' 30"	45° 00' 00"	44° 40' 00"
R	10.00'	4.00'	4.00'	50.00'	3.25'	43.81'	3.00'	2.40'	2.00'
T	1.58'	4.00'	4.00'	2.99'	2.88'	10.52'	0.78'	2.40'	1.98'
Ch	3.13'	5.66'	5.66'	5.96'	4.31'	20.45'	1.50'	3.39'	2.81'
Lc	3.14'	6.28'	6.28'	5.96'	4.71'	20.64'	1.52'	3.77'	3.12'

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DUCT LAYOUT PLAN

Vineyard Blvd & Queen Emma St

Traffic Signal Modernization, Oahu, Phase 1

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

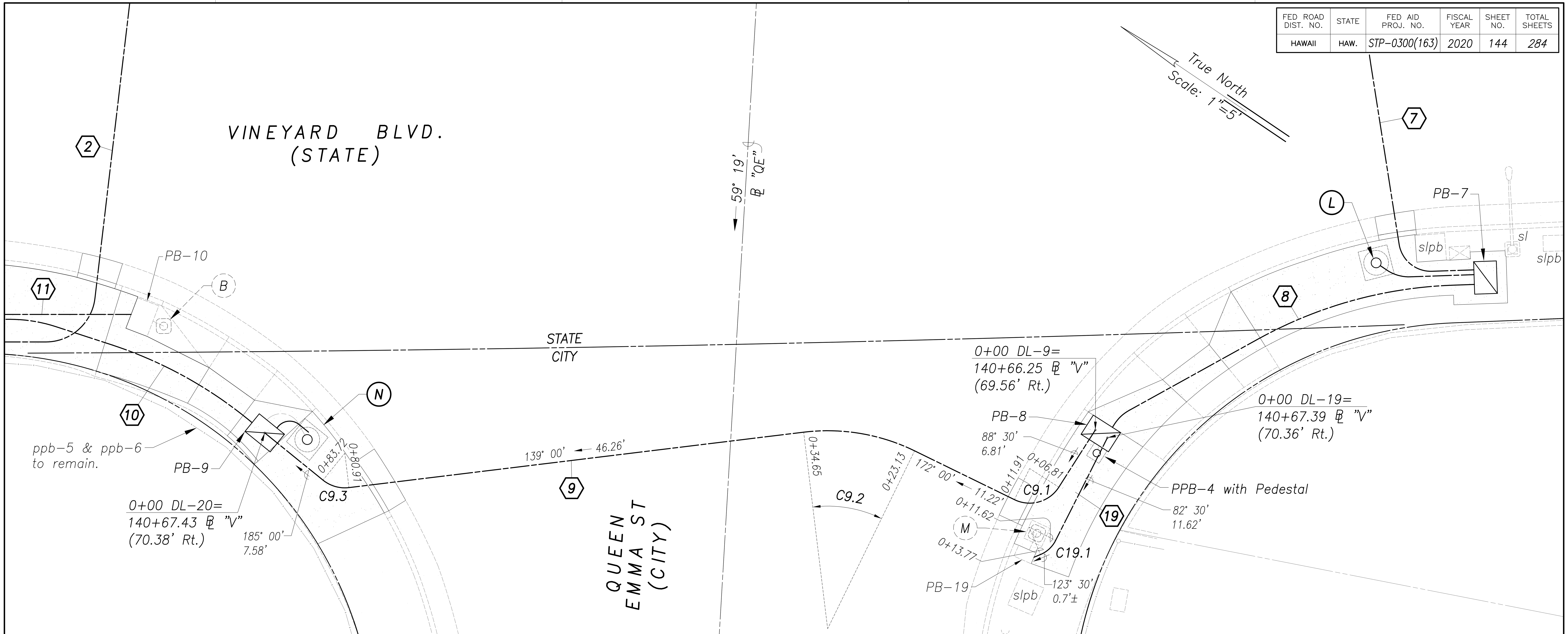
Scale: 1"=5' Date: July 2020

SHEET No. TS-48 OF 113 SHEETS

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

Aug 28, 2020-6:30am N:\CAD\DWG\2015\1512-Traffic Signal Modernization @ Various Locations P&E\FINAL\143 Layout V 3.dwg

FED ROAD DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	144	284



℄ Duct Line Curve Data				
	C9.1	C9.2	C9.3	C19.1
△	83° 30' 00"	33° 00' 00"	46° 00' 00"	41° 00' 00"
△/2	41° 45' 00"	16° 30' 00"	23° 00' 00"	20° 30' 00"
R	3.50'	20.00'	3.50'	3.00'
T	3.12'	5.92'	1.49'	1.12'
Ch	4.66'	11.36'	2.74'	2.10'
Lc	5.10'	11.52'	2.81'	2.15'

Approved By:

Chief, Civil Engineering Branch, DPP (For Construction in City ROW only) — Date

Chief, Traffic Signals & Technology, DTS — Date

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License Expiration Date 04-30-22

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DUCT LAYOUT PLAN

Vineyard Blvd & Queen Emma St

Traffic Signal Modernization, Oahu, Phase 1

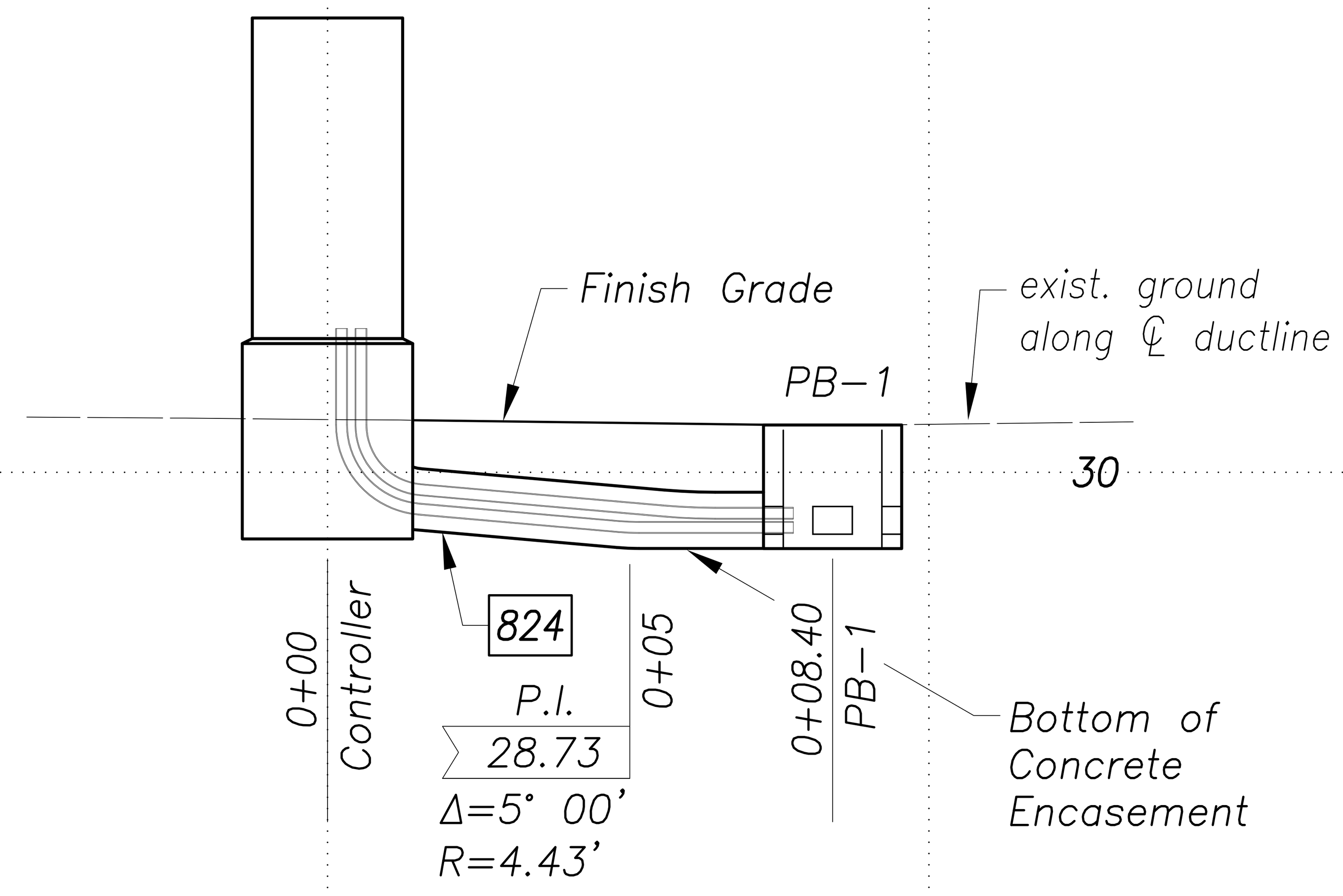
Federal-Aid Project No. STP-0300(163)

Scale: 1"=5' Date: July 2020

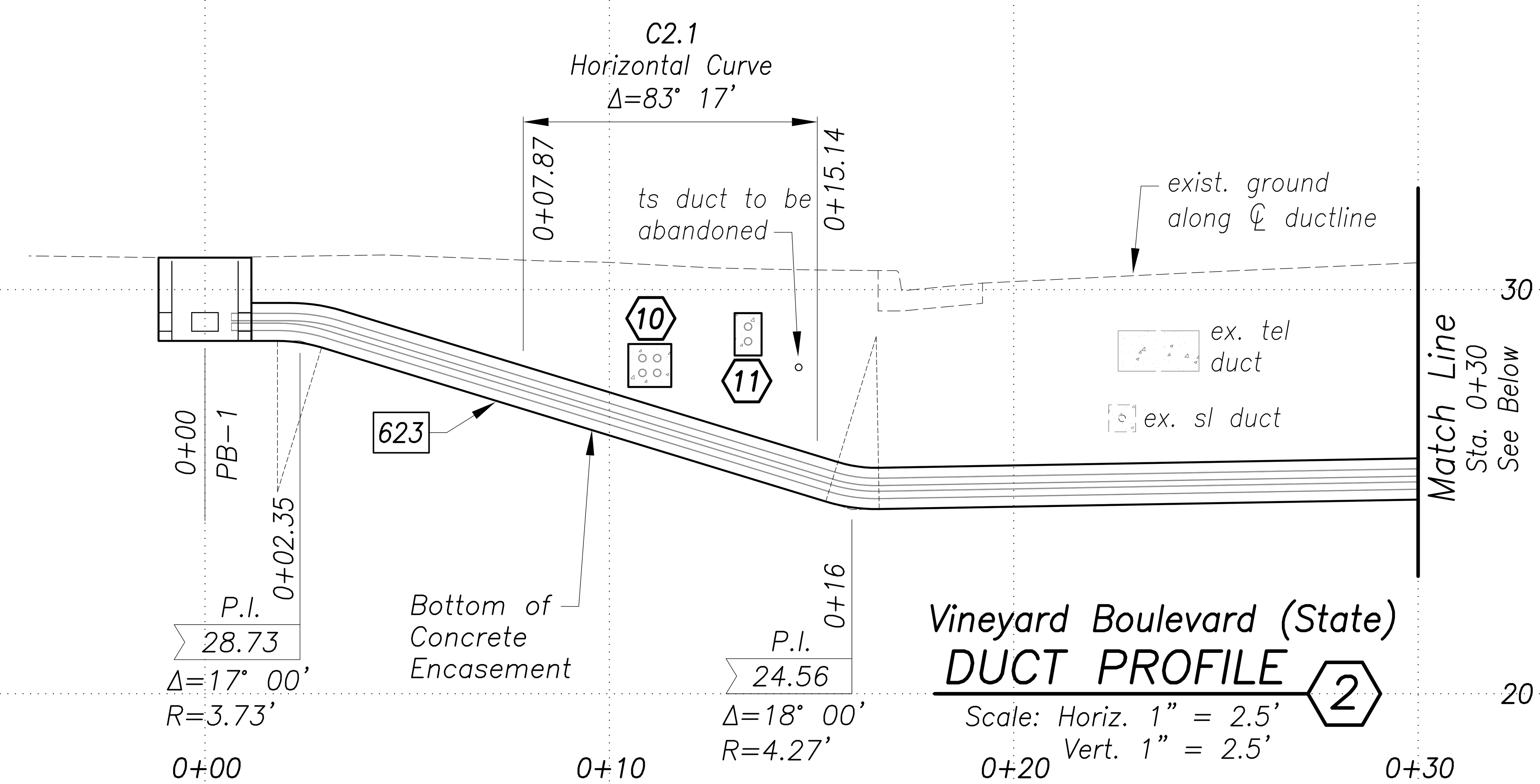
SHEET No. TS-49 OF 113 SHEETS

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

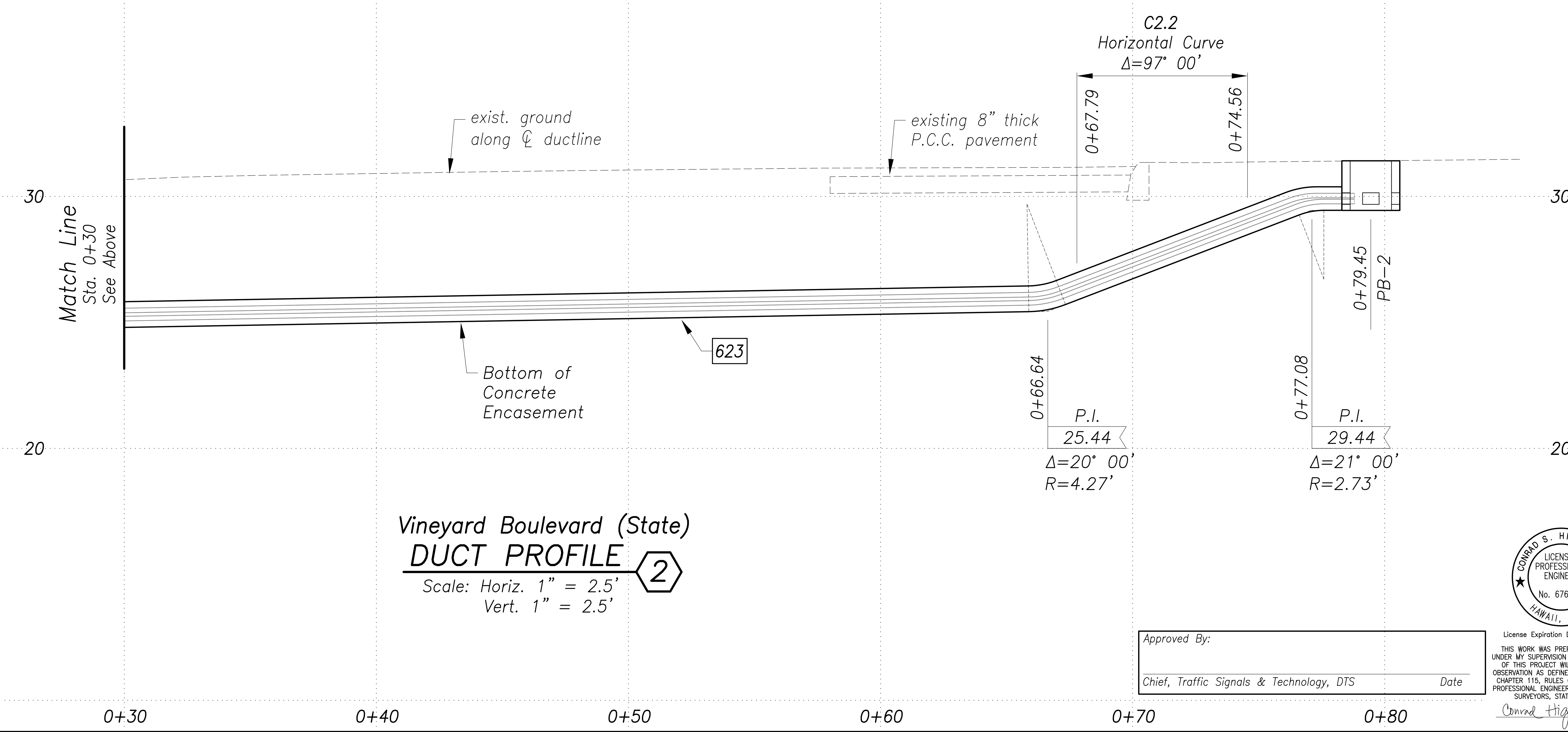
FED ROAD DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	145	284



Vineyard Boulevard (State)
DUCT PROFILE (1)
Scale: Horiz. 1" = 2.5'
Vert. 1" = 2.5'



Vineyard Boulevard (State)
DUCT PROFILE (2)
Scale: Horiz. 1" = 2.5'
Vert. 1" = 2.5'



Vineyard Boulevard (State)
DUCT PROFILE (2)
Scale: Horiz. 1" = 2.5'
Vert. 1" = 2.5'

Approved By:

Chief, Traffic Signals & Technology, DTS — Date

CONRAD S. HIGASHIONNA, LICENSED PROFESSIONAL ENGINEER, No. 6763-C, HAWAII, U.S.A.

License Expiration Date 04-30-22

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DUCT LINE PROFILES

Vineyard Blvd & Queen Emma St

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

Scale: 1"=2.5' Date: July 2020

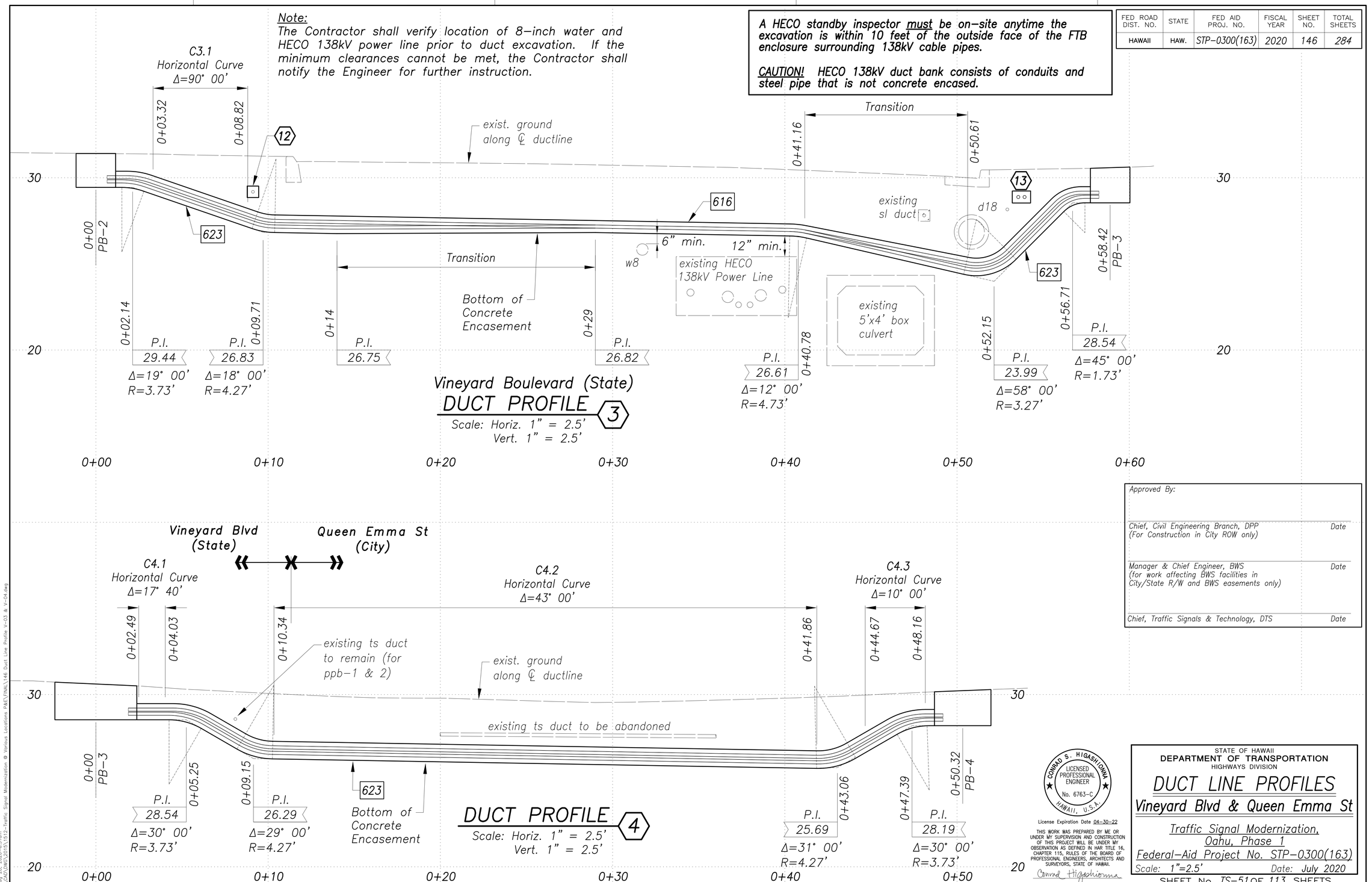
SHEET No. TS-50 OF 113 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	146	284

Note:
The Contractor shall verify location of 8-inch water and HECO 138kV power line prior to duct excavation. If the minimum clearances cannot be met, the Contractor shall notify the Engineer for further instruction.

A HECO standby inspector must be on-site anytime the excavation is within 10 feet of the outside face of the FTB enclosure surrounding 138kV cable pipes.

CAUTION! HECO 138kV duct bank consists of conduits and steel pipe that is not concrete encased.



Vineyard Boulevard (State) DUCT PROFILE 3

Scale: Horiz. 1" = 2.5'
Vert. 1" = 2.5'

DUCT PROFILE 4

Scale: Horiz. 1" = 2.5'
Vert. 1" = 2.5'

Approved By:

Chief, Civil Engineering Branch, DPP (For Construction in City ROW only) — Date

Manager & Chief Engineer, BWS (for work affecting BWS facilities in City/State R/W and BWS easements only) — Date

Chief, Traffic Signals & Technology, DTS — Date

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

Aug 28, 2020-8:51am
N:\CAD\WO\2015\1512-Traffic Signal Modernization @ Various Locations P&E\DWA\146 Duct Line Profile V-03 & V-04.dwg

CONRAD S. HIGASHIONNA
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No. 6763-C
HAWAII, U.S.A.

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Conrad Higashionna

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DUCT LINE PROFILES

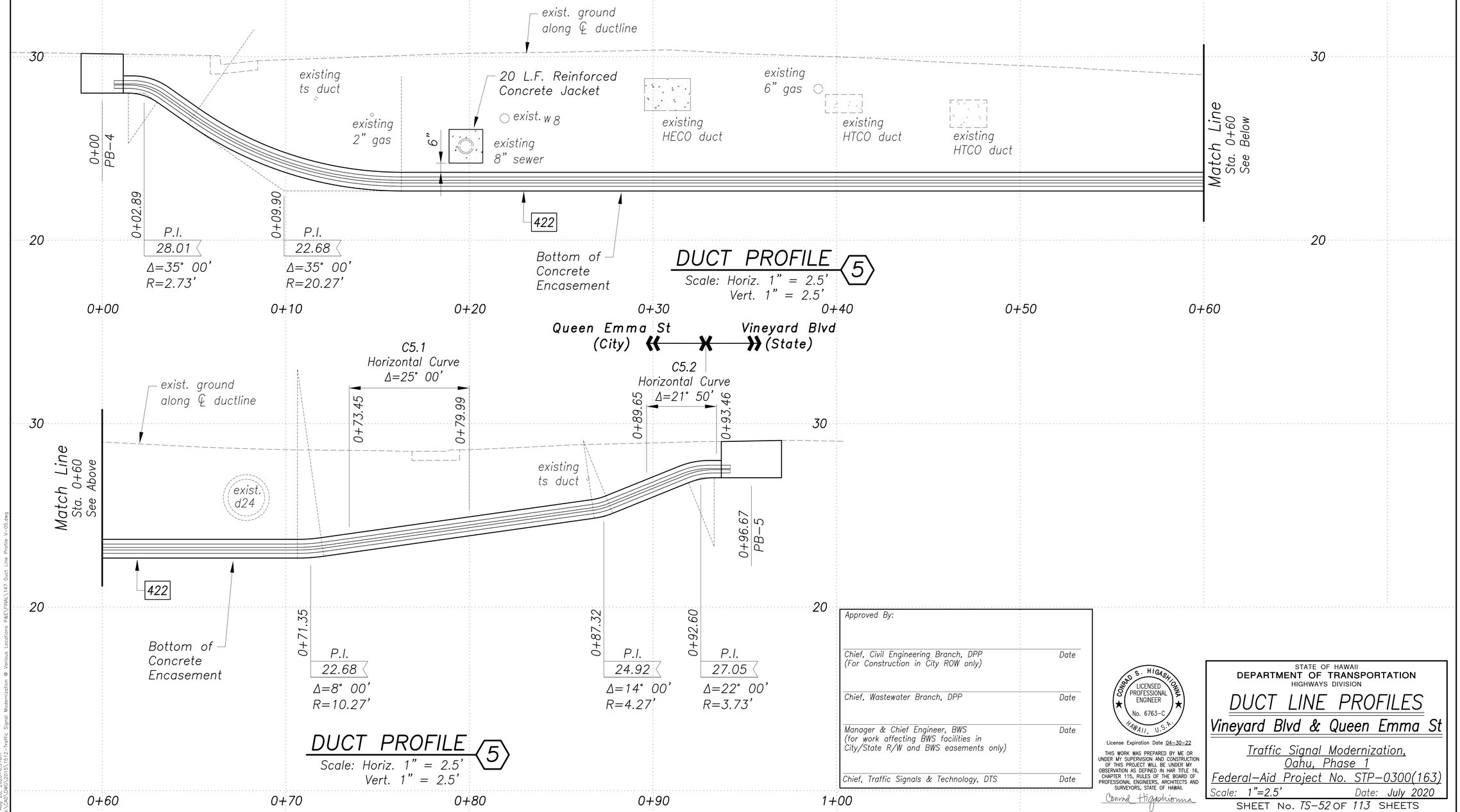
Vineyard Blvd & Queen Emma St

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

Scale: 1"=2.5' Date: July 2020

SHEET No. TS-51 OF 113 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	147	284



DUCT PROFILE 5

Scale: Horiz. 1" = 2.5'
Vert. 1" = 2.5'

Queen Emma St (City) ⟷ Vineyard Blvd (State)

DUCT PROFILE 5

Scale: Horiz. 1" = 2.5'
Vert. 1" = 2.5'

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

Aug 28, 2020-6:31pm
N:\DOE\DWG\2015\TS12-Traffic Signal Modernization @ Various Locations P&E\FINAL\147 Duct Line Profile_V-05.dwg

Approved By:

Chief, Civil Engineering Branch, DPP (For Construction in City ROW only)	Date
Chief, Wastewater Branch, DPP	Date
Manager & Chief Engineer, BWS (for work affecting BWS facilities in City/State R/W and BWS easements only)	Date
Chief, Traffic Signals & Technology, DTS	Date

CONRAD S. HIGASHIONNA
LICENSED PROFESSIONAL ENGINEER
No. 6763-C
HAWAII, U.S.A.

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Conrad Higashionna

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DUCT LINE PROFILES

Vineyard Blvd & Queen Emma St

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

Scale: 1"=2.5' Date: July 2020

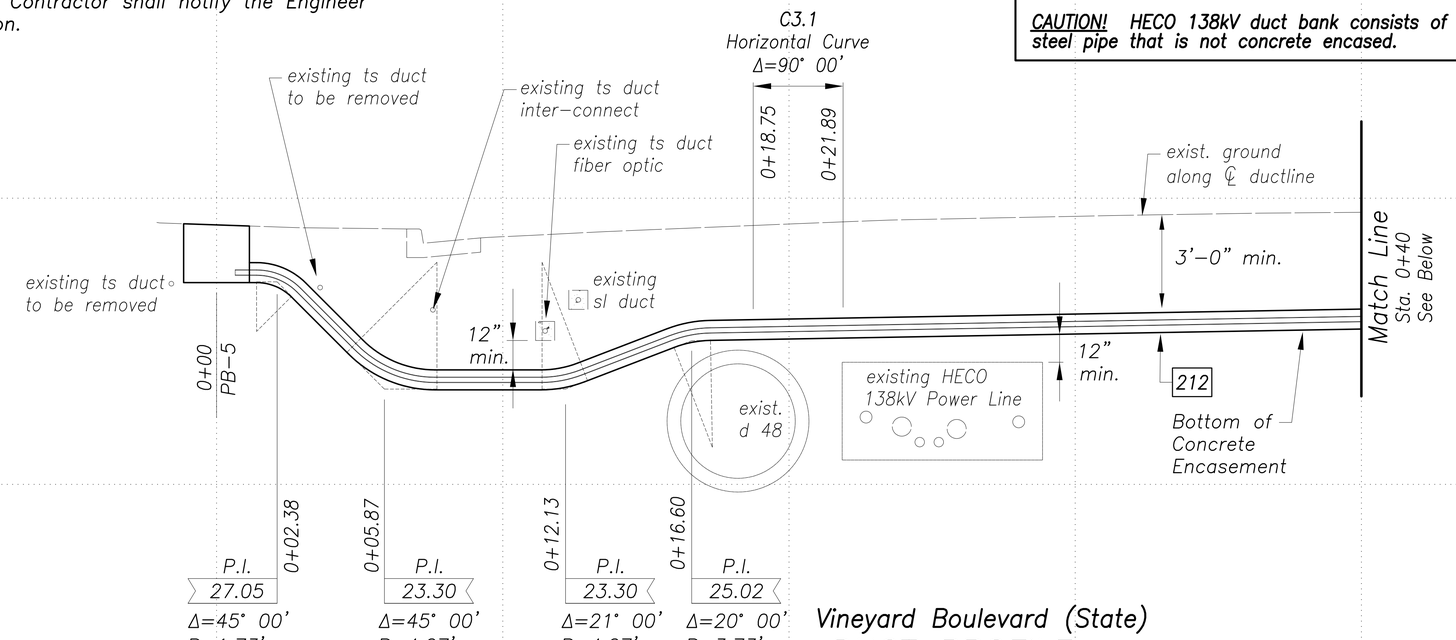
SHEET No. TS-52 OF 113 SHEETS

Note:
The Contractor shall verify location of HECO 138kV power line prior to duct excavation. If the minimum clearances cannot be met, the Contractor shall notify the Engineer for further instruction.

A HECO standby inspector must be on-site anytime the excavation is within 10 feet of the outside face of the FTB enclosure surrounding 138kV cable pipes.

CAUTION! HECO 138kV duct bank consists of conduits and steel pipe that is not concrete encased.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	148	284

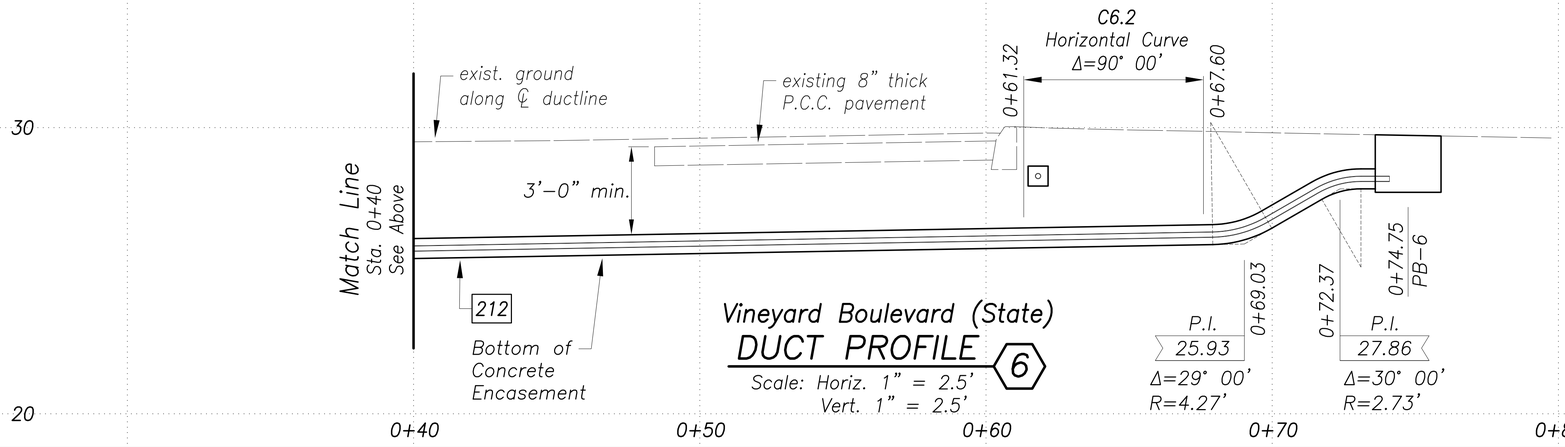


Vineyard Boulevard (State)
DUCT PROFILE ⑥

Scale: Horiz. 1" = 2.5'
Vert. 1" = 2.5'

Approved By:

Chief, Traffic Signals & Technology, DTS — Date



Vineyard Boulevard (State)
DUCT PROFILE ⑥

Scale: Horiz. 1" = 2.5'
Vert. 1" = 2.5'

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

Aug 28, 2020-4:31pm
N:\CAD\DWG\2015\1512-Traffic Signal Modernization @ Various Locations P&E\ENA\148 Duct Line Profile V-06.dwg

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HAWAII, U.S.A.

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Conrad Higashionna

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

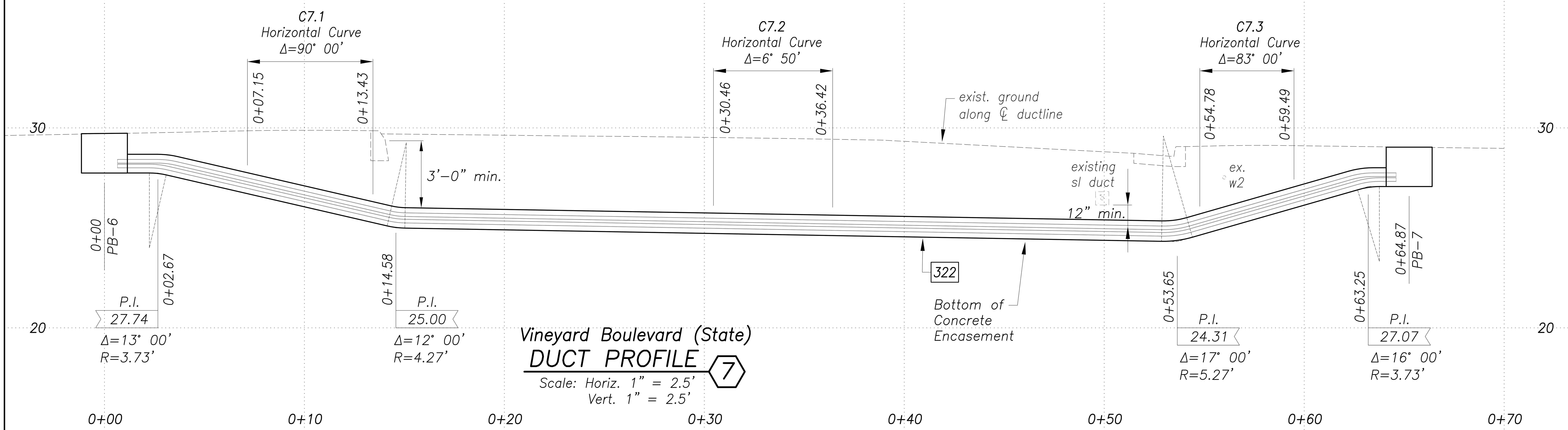
DUCT LINE PROFILES
Vineyard Blvd & Queen Emma St

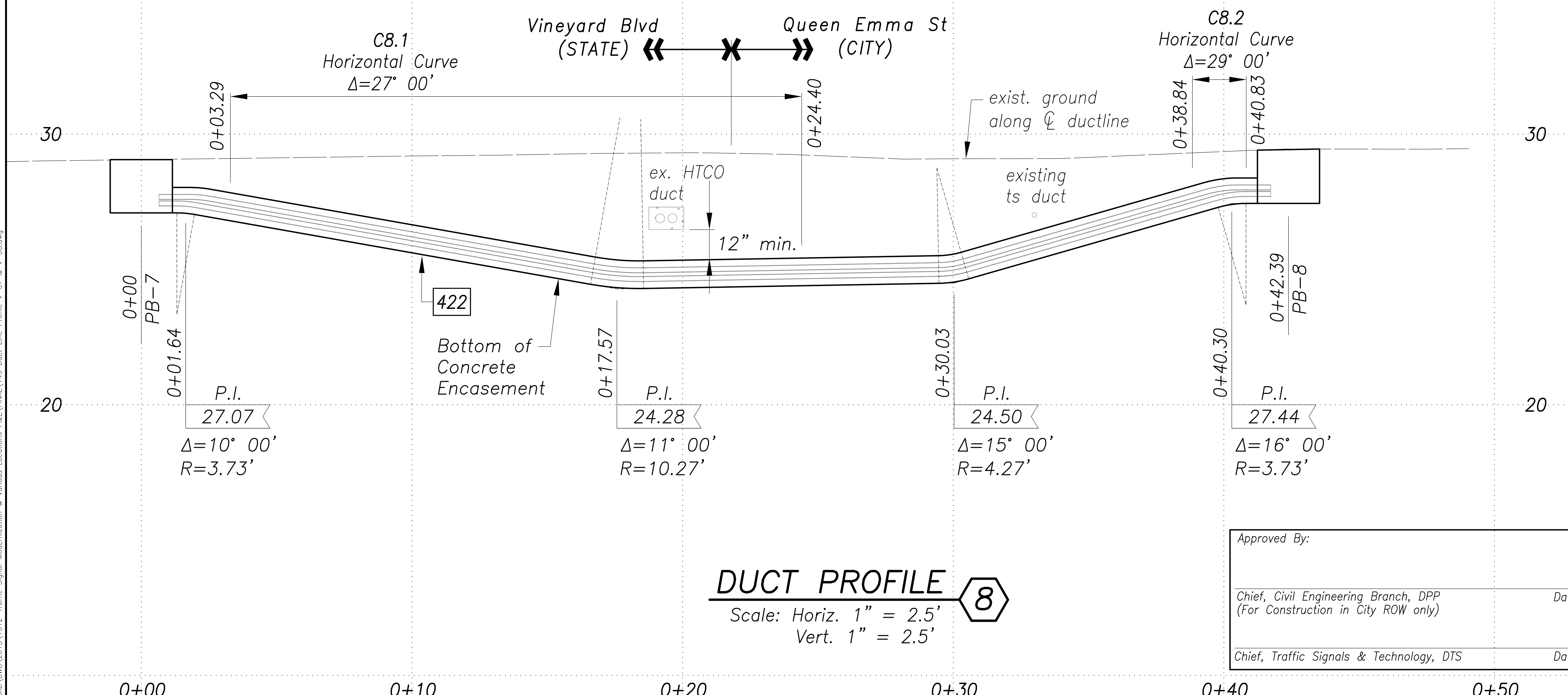
Traffic Signal Modernization, Oahu, Phase 1
Federal-Aid Project No. STP-0300(163)

Scale: 1"=2.5' Date: July 2020

SHEET No. TS-53 OF 113 SHEETS

FED ROAD DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	149	284





Approved By:

Chief, Civil Engineering Branch, DPP (For Construction in City ROW only) — Date

Chief, Traffic Signals & Technology, DTS — Date

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DUCT LINE PROFILES

Vineyard Blvd & Queen Emma St

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

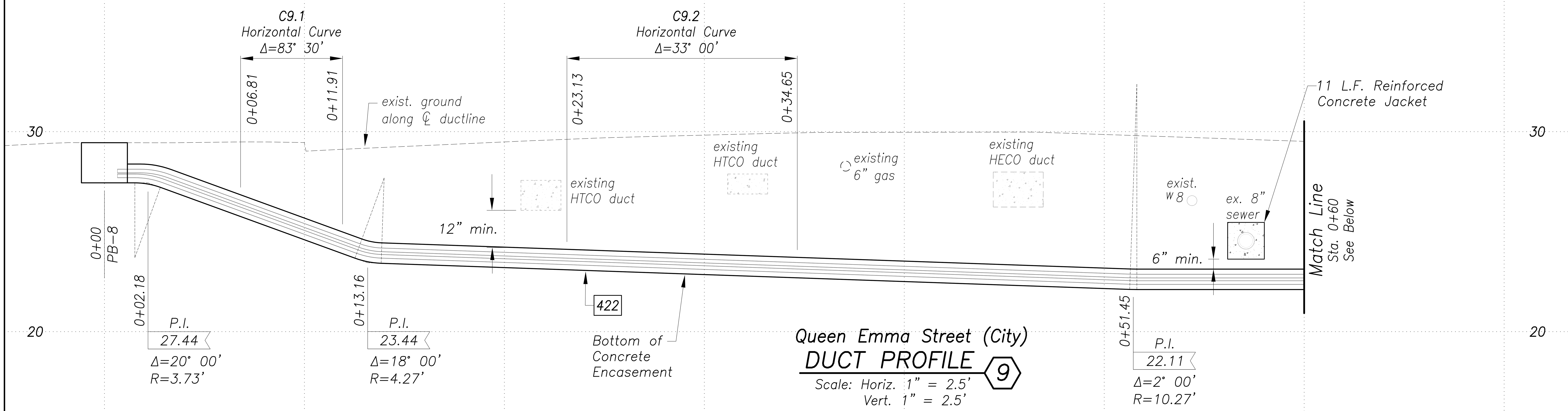
Scale: 1"=2.5' Date: July 2020

SHEET No. TS-54 OF 113 SHEETS

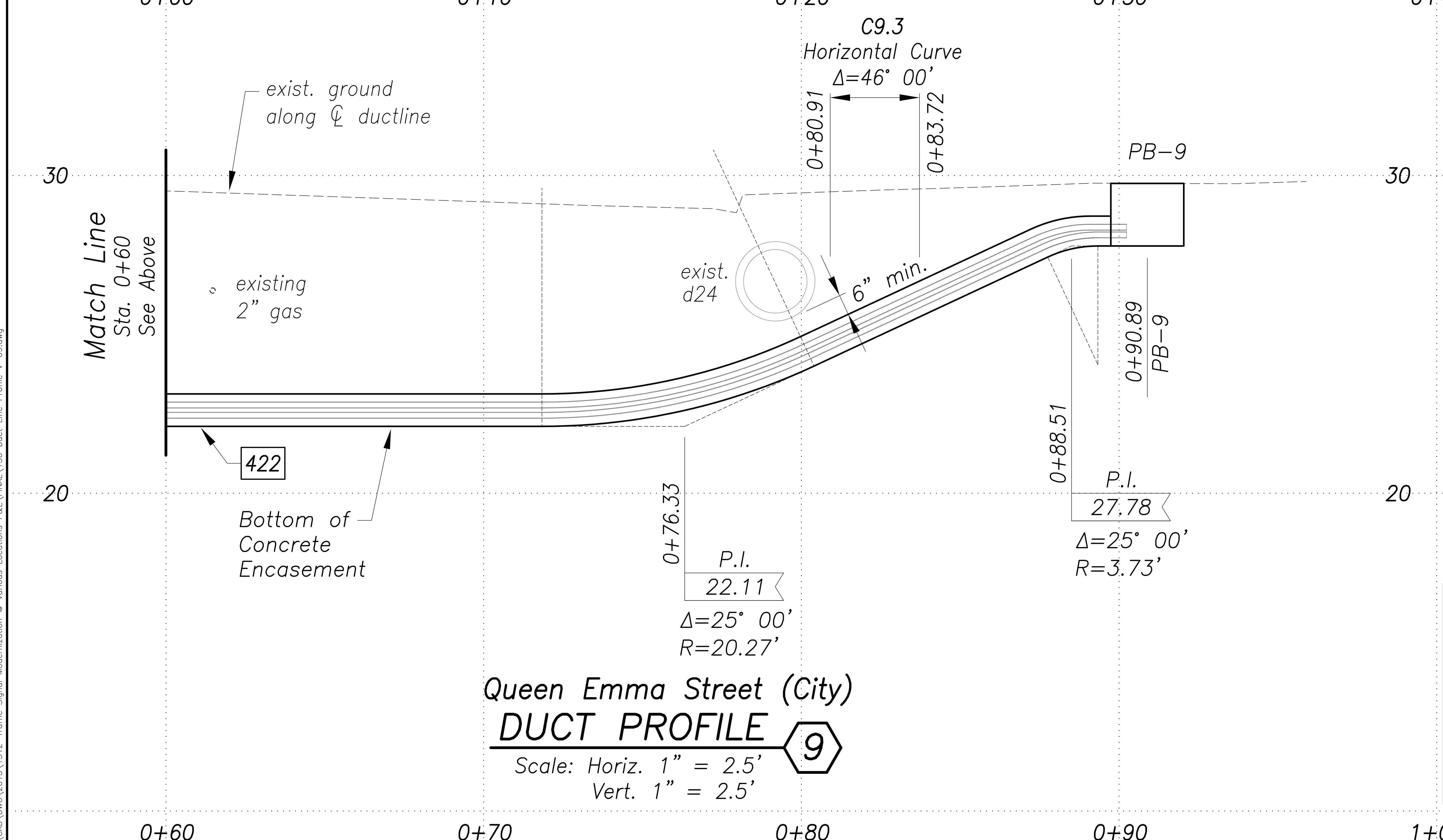
ORIGINAL PLAN	SURVEY PLOTTED BY / DRAWN BY / TRACED BY / DESIGNED BY / QUANTITIES BY / CHECKED BY	DATE
NOTE BOOK		
No.		

Aug 28, 2020-6:31am N:\CAD\DWG\2015\1512-Traffic Signal Modernization @ Various Locations P&E\FINAL\149 Duct Line Profile V-07 & V-08.dwg

FED ROAD DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	150	284



Queen Emma Street (City)
DUCT PROFILE 9
Scale: Horiz. 1" = 2.5'
Vert. 1" = 2.5'



Queen Emma Street (City)
DUCT PROFILE 9
Scale: Horiz. 1" = 2.5'
Vert. 1" = 2.5'

Approved By:

Chief, Wastewater Branch, DPP — Date

Manager & Chief Engineer, BWS (for work affecting BWS facilities in City/State R/W and BWS easements only) — Date

Chief, Traffic Signals & Technology, DTS — Date

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DUCT LINE PROFILES

Vineyard Blvd & Queen Emma St

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

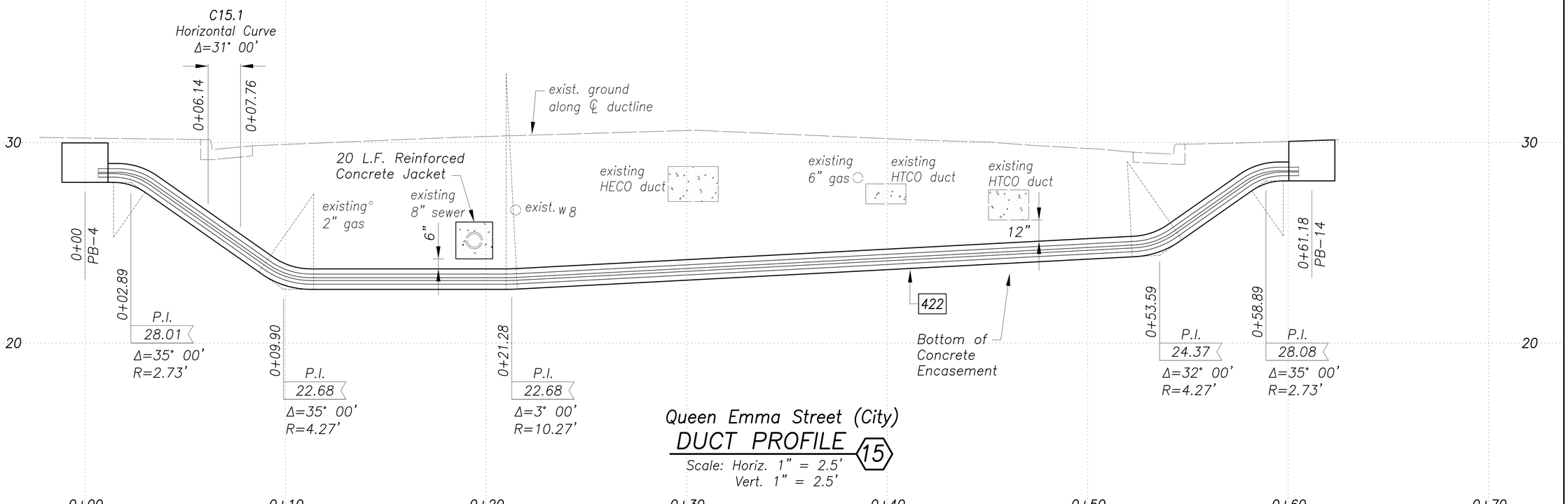
Scale: 1"=2.5' Date: July 2020

SHEET No. TS-55 OF 113 SHEETS

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

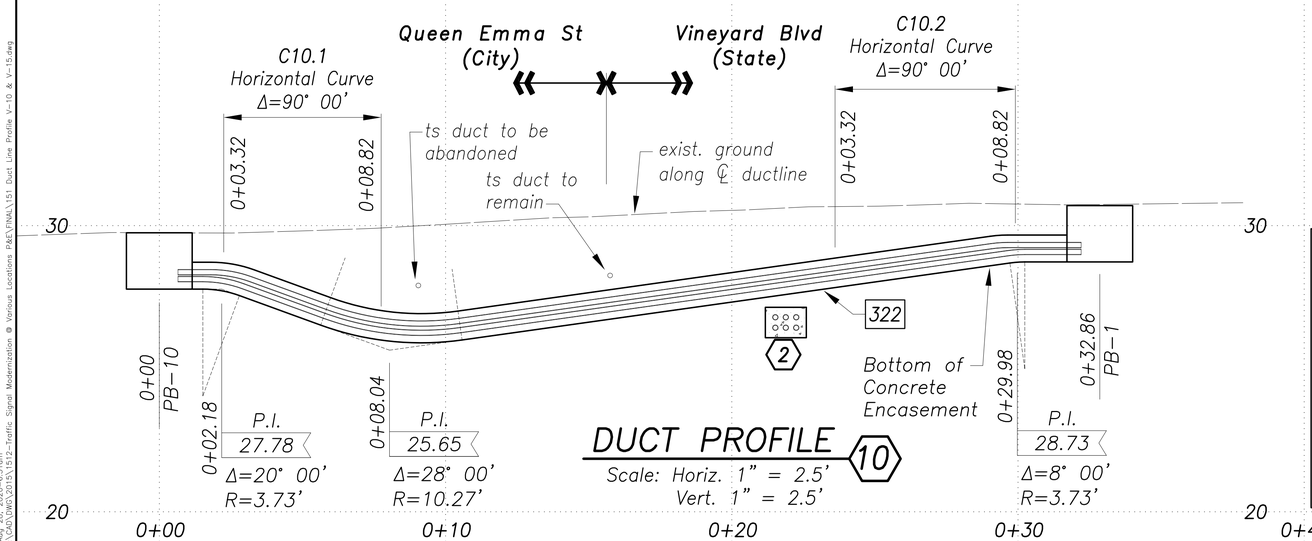
Aug 28, 2020-6:31am N:\CAD\DWG\2015\1512-Traffic Signal Modernization @ Various Locations P&E\FINAL\150 Duct Line Profile V-09.dwg

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	151	284



Queen Emma Street (City)
DUCT PROFILE 15

Scale: Horiz. 1" = 2.5'
Vert. 1" = 2.5'



DUCT PROFILE 10

Scale: Horiz. 1" = 2.5'
Vert. 1" = 2.5'

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

Aug 28, 2020-6:31pm
N:\DOT\DWG\2015\1512-Traffic Signal Modernization @ Various Locations P&E\FINAL\151 Duct Line Profile_V-10 & V-15.dwg

Approved By:

Chief, Civil Engineering Branch, DPP (For Construction in City ROW only) — Date

Chief, Wastewater Branch, DPP — Date

Manager & Chief Engineer, BWS (for work affecting BWS facilities in City/State R/W and BWS easements only) — Date

Chief, Traffic Signals & Technology, DTS — Date

CONRAD S. HIGASHIONNA
LICENSED PROFESSIONAL ENGINEER
No. 6763-C
HAWAII, U.S.A.

License Expiration Date 04-30-22

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Conrad Higashionna

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

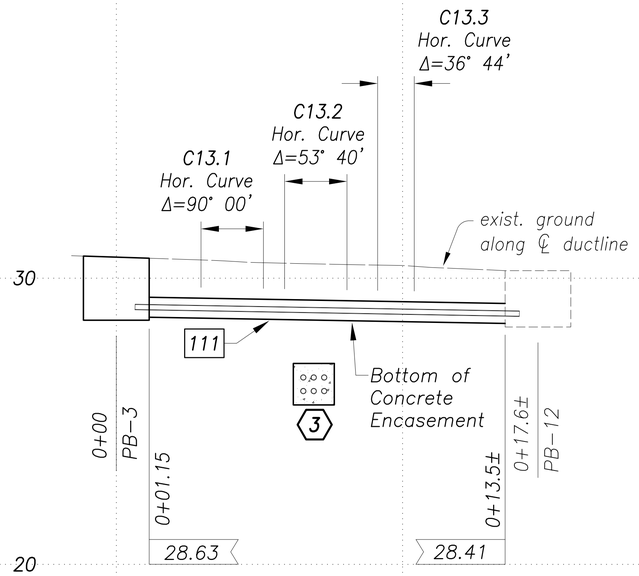
DUCT LINE PROFILES
Vineyard Blvd & Queen Emma St

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

Scale: 1"=2.5' Date: July 2020

SHEET No. TS-56 OF 113 SHEETS

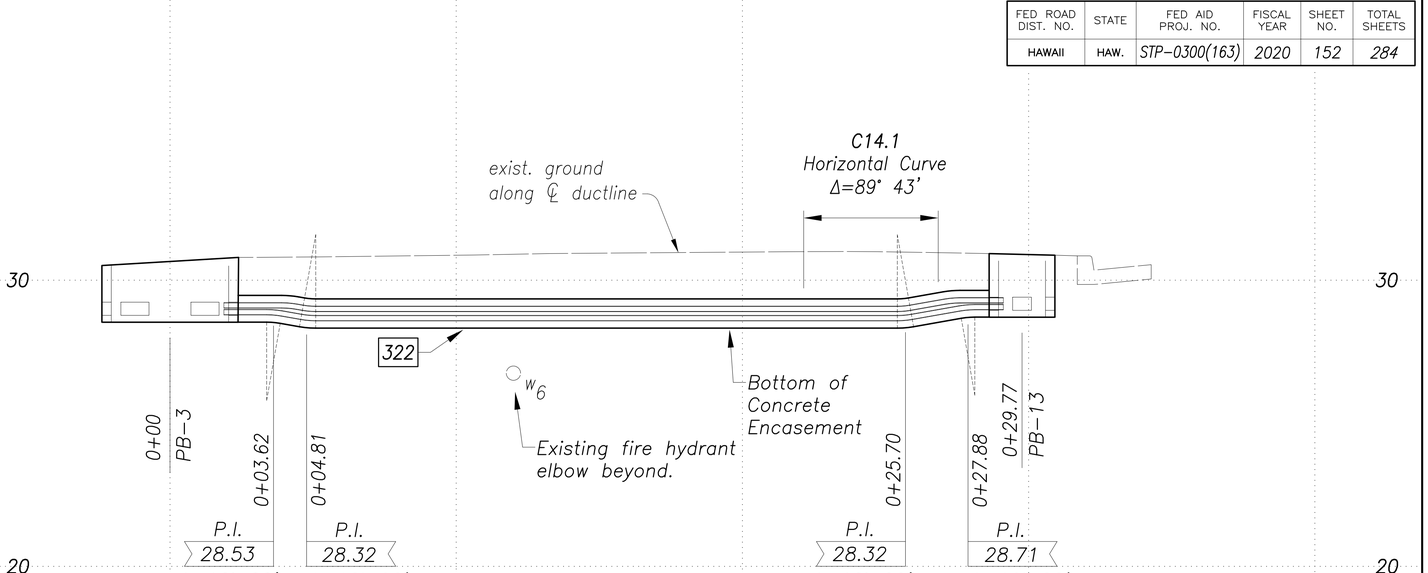
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	152	284



Vineyard Boulevard (State)

DUCT PROFILE 13

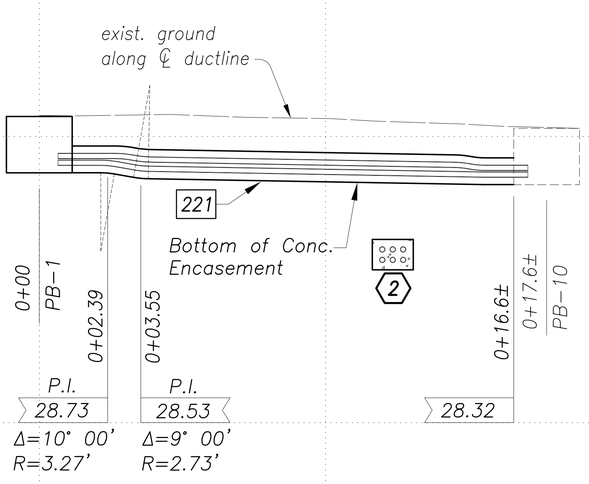
Scale: Horiz. 1" = 2.5'
Vert. 1" = 2.5'



Vineyard Boulevard (State)

DUCT PROFILE 14

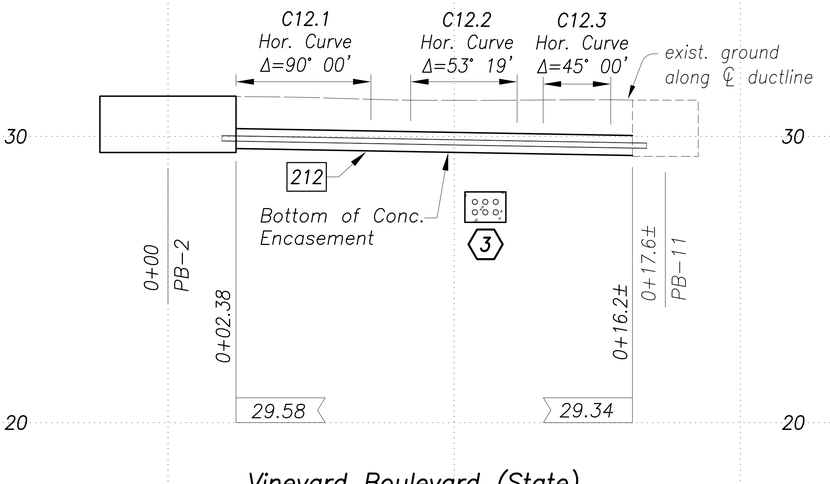
Scale: Horiz. 1" = 2.5'
Vert. 1" = 2.5'



Vineyard Boulevard (State)

DUCT PROFILE 11

Scale: Horiz. 1" = 2.5'
Vert. 1" = 2.5'



Vineyard Boulevard (State)

DUCT PROFILE 12

Scale: Horiz. 1" = 2.5'
Vert. 1" = 2.5'

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

Aug 28, 2020-8:31am
N:\CIVIL\WO-2015\1512-Traffic Signal Modernization @ Various Locations P&E\ENA\152 Duct Line Profile V-11 & 12 & 13 & 14.dwg

Approved By:

Chief, Traffic Signals & Technology, DTS Date

CONRAD S. HIGASHIONNA
LICENSED PROFESSIONAL ENGINEER
No. 6763-C
HAWAII, U.S.A.

License Expiration Date 04-30-22

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Conrad Higashionna

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DUCT LINE PROFILES

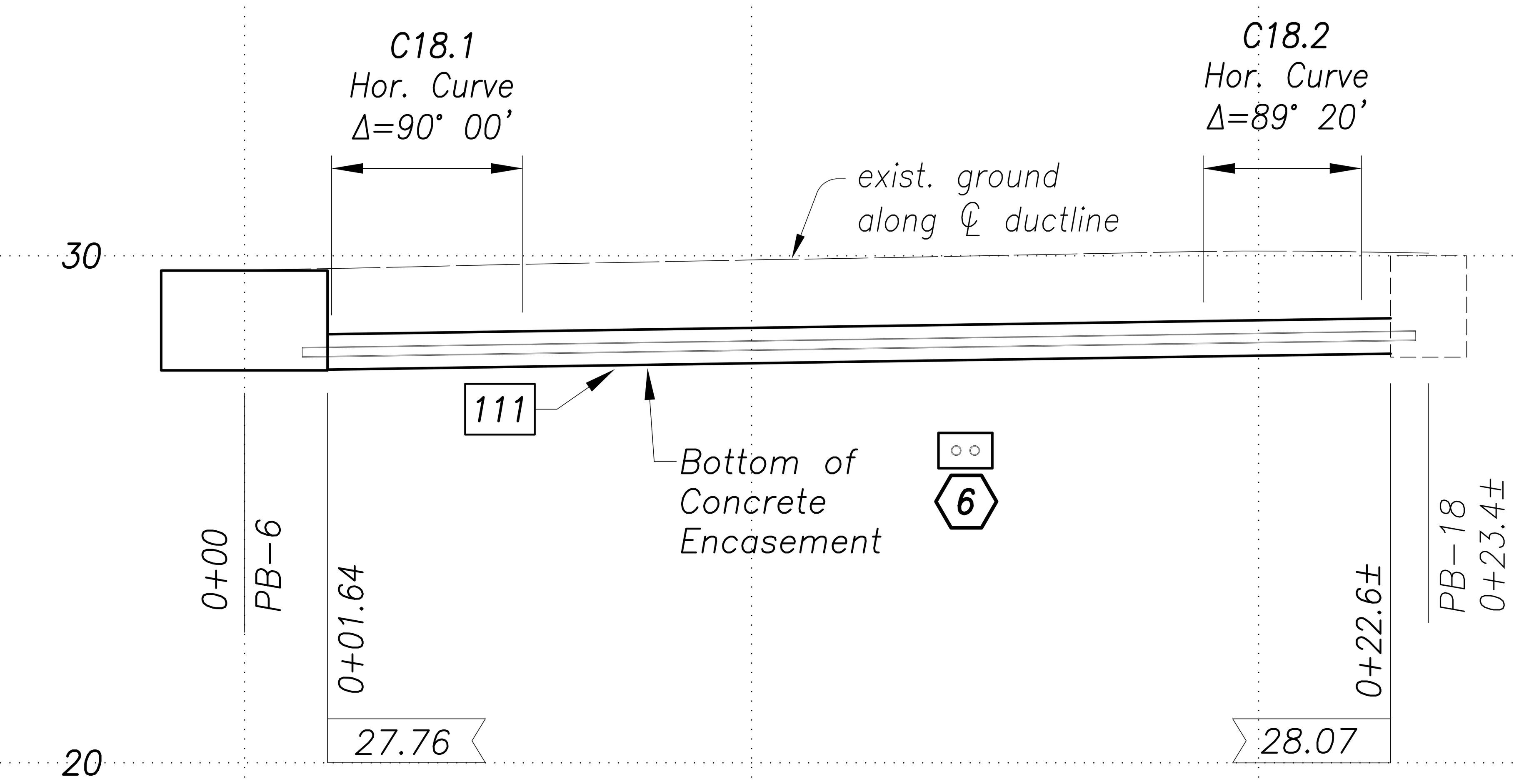
Vineyard Blvd & Queen Emma St

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

Scale: 1"=2.5' Date: July 2020

SHEET No. TS-57 OF 113 SHEETS

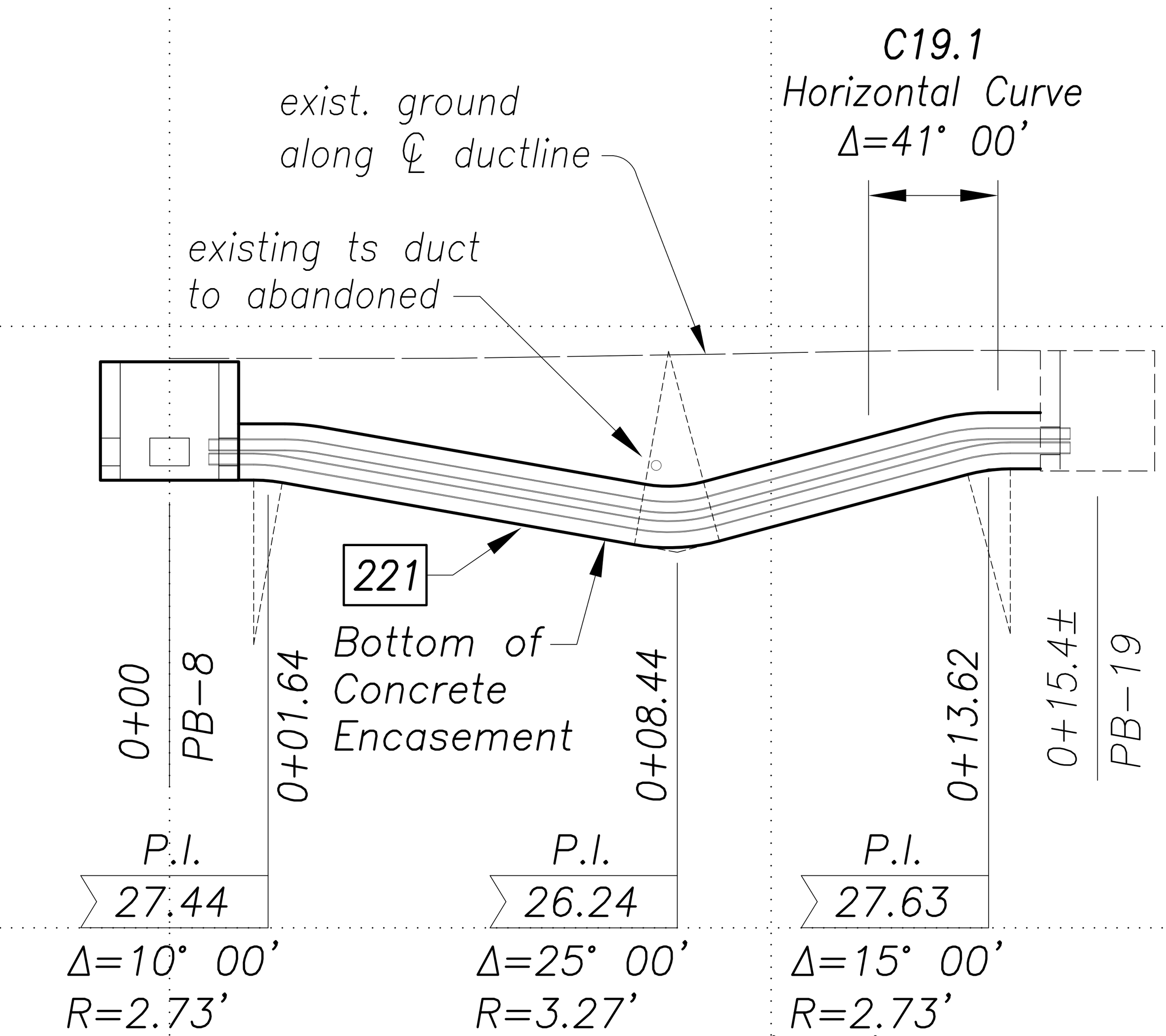
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)	2020	153	284



Vineyard Boulevard (State)

DUCT PROFILE 18

Scale: Horiz. 1" = 2.5'
Vert. 1" = 2.5'

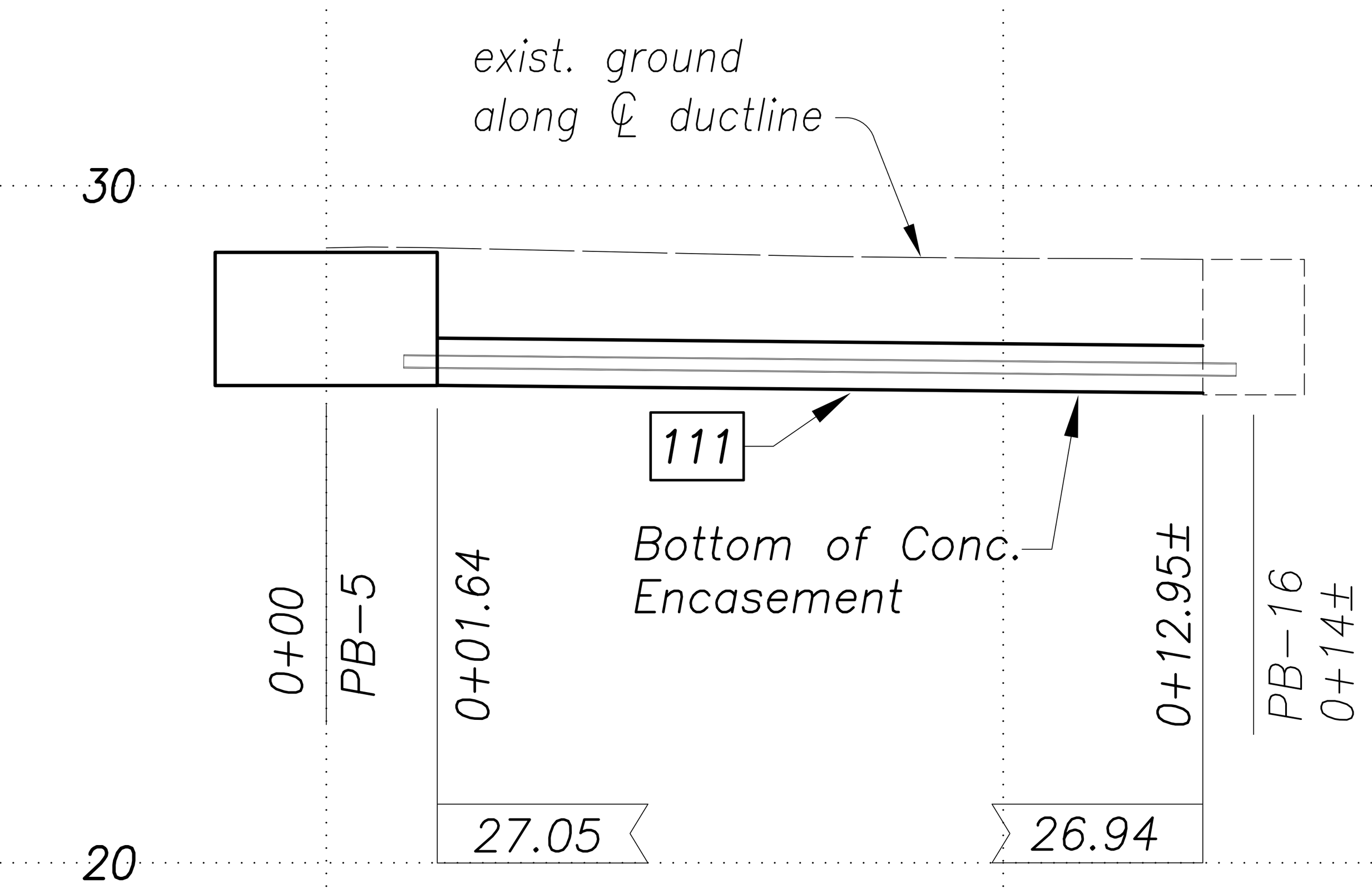


Queen Emma Street (City)

DUCT PROFILE 19

Scale: Horiz. 1" = 2.5'
Vert. 1" = 2.5'

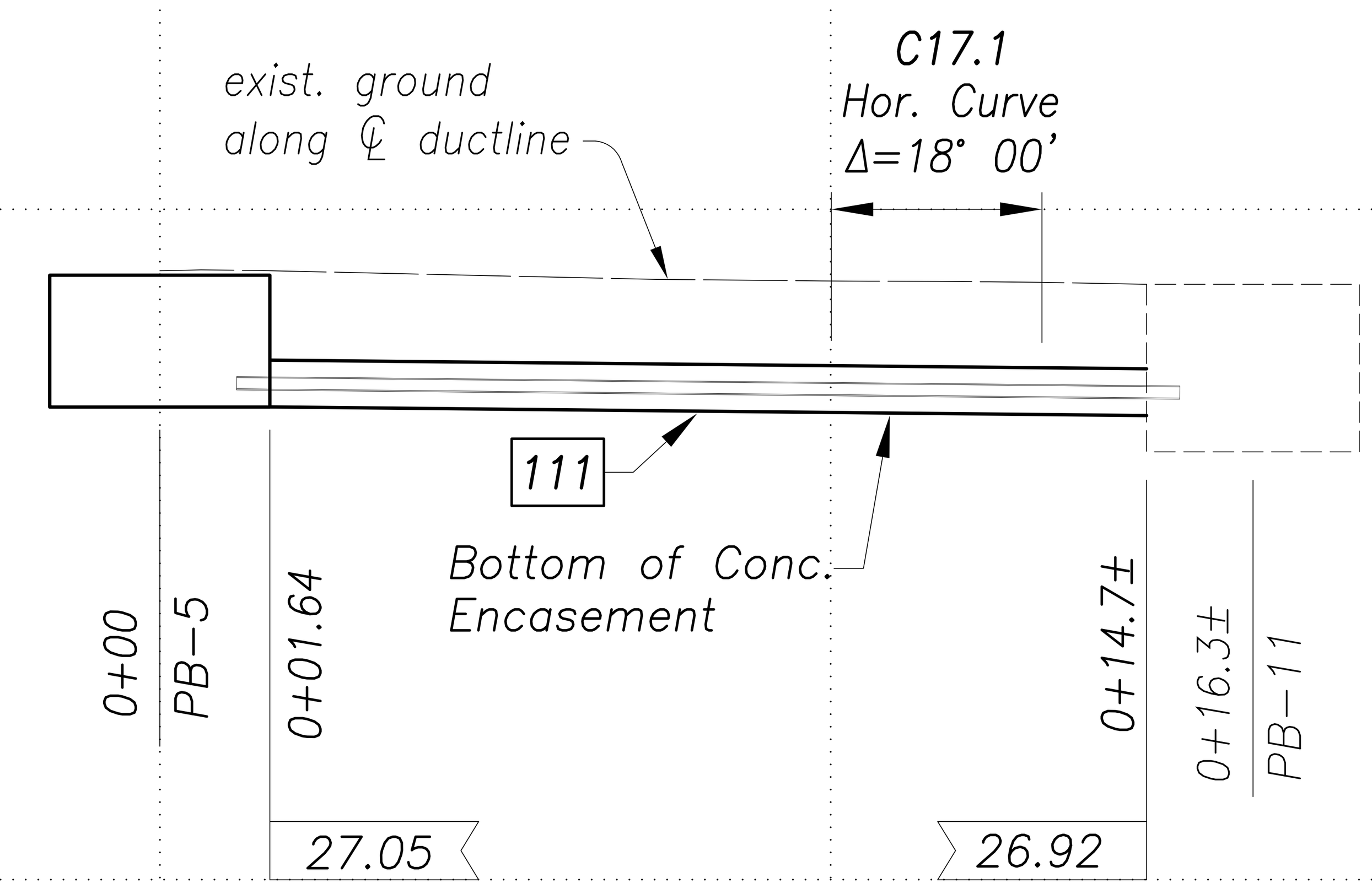
0+00 0+10 0+20



Vineyard Boulevard (State)

DUCT PROFILE 16

Scale: Horiz. 1" = 2.5'
Vert. 1" = 2.5'



Vineyard Boulevard (State)

DUCT PROFILE 17

Scale: Horiz. 1" = 2.5'
Vert. 1" = 2.5'

0+00 0+10 0+20 0+00 0+10 0+20

Approved By:

Chief, Civil Engineering Branch, DPP (For Construction in City ROW only) Date

Chief, Traffic Signals & Technology, DTS Date

CONRAD S. HIGASHIONNA LICENSED PROFESSIONAL ENGINEER No. 6763-C HAWAII, U.S.A.

License Expiration Date 04-30-22

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Conrad Higashionna

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DUCT LINE PROFILES

Vineyard Blvd & Queen Emma St

Traffic Signal Modernization, Oahu, Phase 1

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

Scale: 1"=2.5' Date: July 2020

SHEET No. TS-58 OF 113 SHEETS

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

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