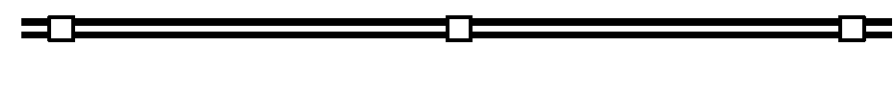




LEGEND



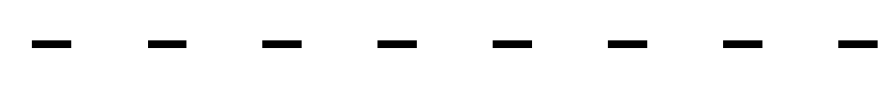
8" White Stripe with Type "C" Raised Pavement Markers @ 20'-0" o.c. (Thermoplastic Extrusion)



4" Double Solid Yellow with Type "D" Raised Pavement Markers @ 20'-0" o.c. (Thermoplastic Extrusion)



4" Yellow Edge Stripe with Type "H" Raised Pavement Markers @ 40'-0" o.c. (Thermoplastic Extrusion)



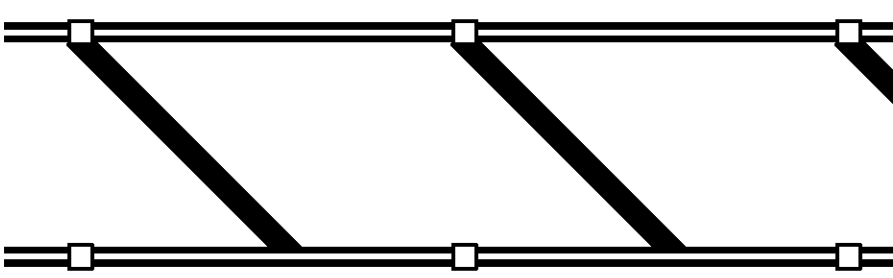
4" White Guide Lines, See Std. Plan TE-31



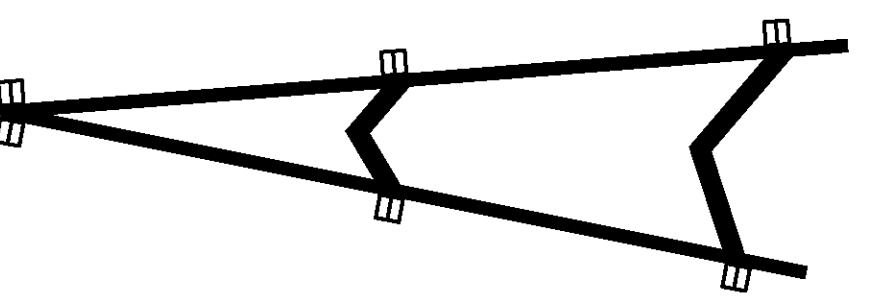
4" or 8" White Edge Stripe with Type "C" Raised Pavement Markers @ 40'-0" o.c. (Thermoplastic Extrusion)



8" White Guide Lines (Thermoplastic Extrusion)



Transverse Median Marking (Thermoplastic Extrusion)

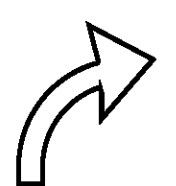


Channelizing Island or Deceleration Lane Gore (Thermoplastic Extrusion)

ONLY



Pavement Word (Preformed Thermoplastic)

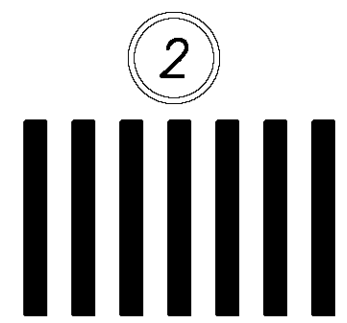


Pavement Arrow (Preformed Thermoplastic)

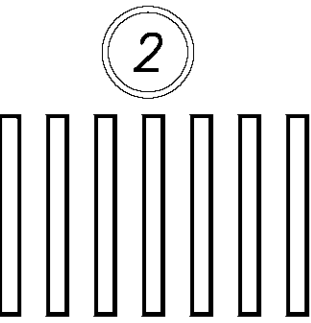
Pavement Arrow with 1-1/2" Black Border (Preformed Thermoplastic)



RM-2 Reflector Marker w/ Flexible Delineator Post

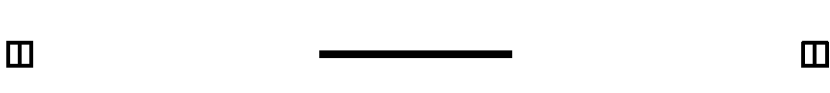


Crosswalk and Stop Line. All stop lines shall be 10'-0" from crosswalk unless otherwise noted. The number indicates the number of lanes for payment. (Preformed Thermoplastic)

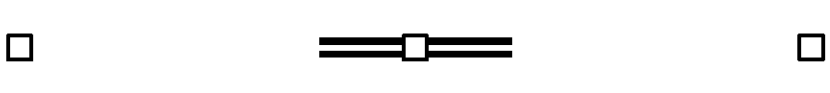


Crosswalk and Stop Line with 1-1/2" black border.

LEGEND (continued)



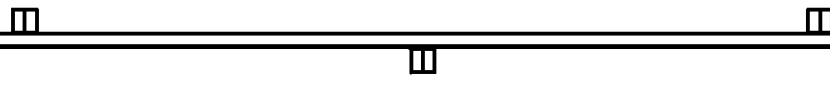
4" or 6" White Stripe 10'-0" Long at 40' o.c. (Thermoplastic Extrusion) with Type "C" Raised Pavement Markers @ 40'-0" o.c.



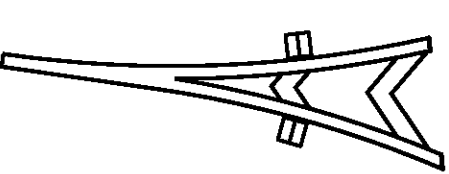
4" Double Yellow Stripe 10'-0" Long at 40' o.c. (Thermoplastic Extrusion) with Type "D" Raised Pavement Markers @ 20'-0" o.c.



4" White Edge Stripe on P.C.C. Pavement (Preformed Thermoplastic) with Type "C" Raised Pavement Markers @ 40'-0" o.c.



8" White Stripe on P.C.C. Pavement (Preformed Thermoplastic) with Type "C" Raised Pavement Markers @ 20'-0" o.c.

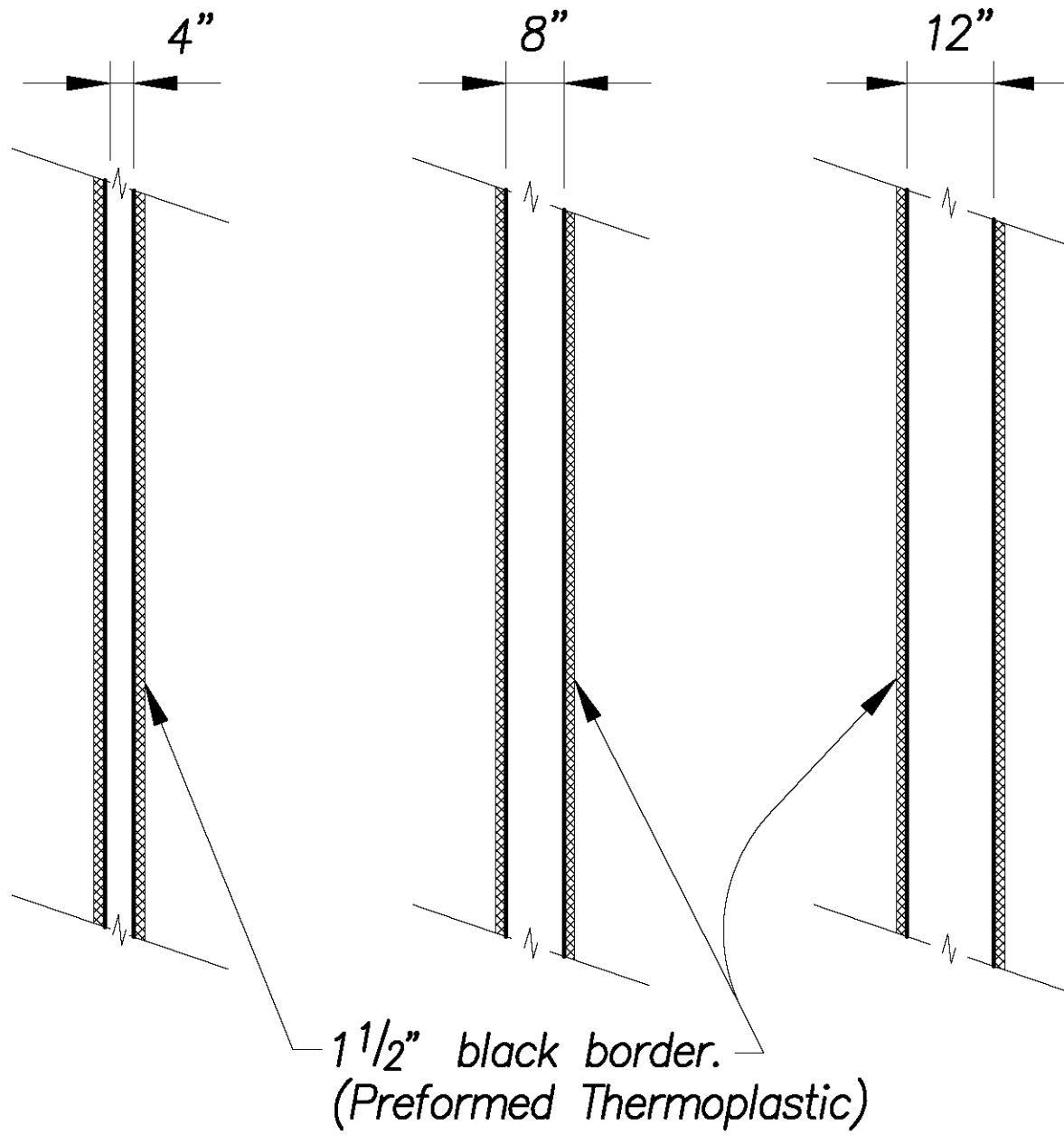


Channelizing Island (Preformed Thermoplastic) on P.C.C. Pavement

Notes:

- Layout of pavement markings and striping shall be done by the Contractor and approved by the Engineer prior to any installation work.
- Existing pavement markings not incorporated in the final traffic pattern shall be removed as directed by the Engineer. Costs shall be incidental to the various pavement marking items.
- Raised pavement markers shall not be installed within crosswalks.
- Final locations of all signs shall be approved by the Engineer prior to any installation work.
- Existing signs not shown on these plans shall remain as posted unless otherwise directed by the Engineer. Removal and disposal of existing signs and/or posts as designated on these plans shall be incidental to the various signing items.
- Final locations of all Stop Lines shall be approved by the Engineer prior to installation.
- All pavement striping shall be as noted on the legend or plans.
- All preformed pavement marking tapes over existing pavement shall be applied with an approved primer as recommended by the tape manufacturer and as approved by the Engineer. The primer shall be allowed to dry to the tacky stage prior to tape applications.
- All pedestrian warning signs with supplemental sign shall be on a fluorescent yellow-green retroreflective background with a black legend and border.
- The Contractor shall install preformed thermoplastic pavement markings with a black border on Portland Cement Concrete (PCC) pavement as shown on sheet 90.
- The Contractor shall install preformed thermoplastic pavement markings per the manufacturer's recommendations.

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | STP-0300(163)      | 2020        | 85        | 284          |

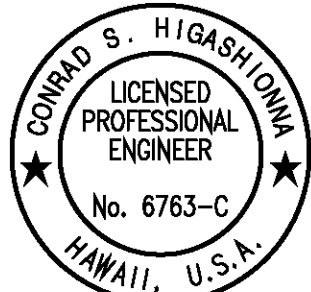


4", 8" & 12" WHITE STRIPE ON P.C.C. PAVEMENT

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

|                   |      |
|-------------------|------|
| SURVEY PLANNED BY | DATE |
| DRAWN BY          |      |
| DESIGNED BY       |      |
| QUANTITIES BY     |      |
| CHECKED BY        |      |
| NOTE BOOK         |      |
| No.               |      |

See 17, 2020-12-18am  
N:\CAO\DWG\2015\1512-Traffic Signal Modernization @ Various Locations P&E\TMA\085 Signing Marking Notes Addendum.dwg



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

|  |  |
|--|--|
| 9/16/20  | Added the following to legend: 4" and 8" white stripe on P.C.C. pavement and Channelizing Island on P.C.C. pavement. |
| DATE   | REVISION   |
| STATE OF HAWAII<br>DEPARTMENT OF TRANSPORTATION<br>HIGHWAYS DIVISION |  |
| STRIPING LEGEND  |  |
| Traffic Signal Modernization,<br>Oahu, Phase 1                       |  |
| Federal-Aid Project No. STP-0300(163)                                |  |
| Scale: As shown  | Date: July 2020  |
| SHEET No. R-55 OF 65 SHEETS  |  |



See 17, 2020-04-08  
N:\CAO\DWG\2015\1512-Traffic Signal Modernization @ Various Locations P&E\TMA\080 Signing Marking Plan H 10 Scale Addendum.dwg

|                   |       |
|-------------------|-------|
| DATE              | ***** |
| SURVEY PLANNED BY |       |
| DRAWN BY          |       |
| DESIGNED BY       |       |
| QUANTITIES BY     |       |
| CHECKED BY        |       |
| ORIGINAL PLAN     |       |
| NOTE BOOK         |       |
| No.               |       |

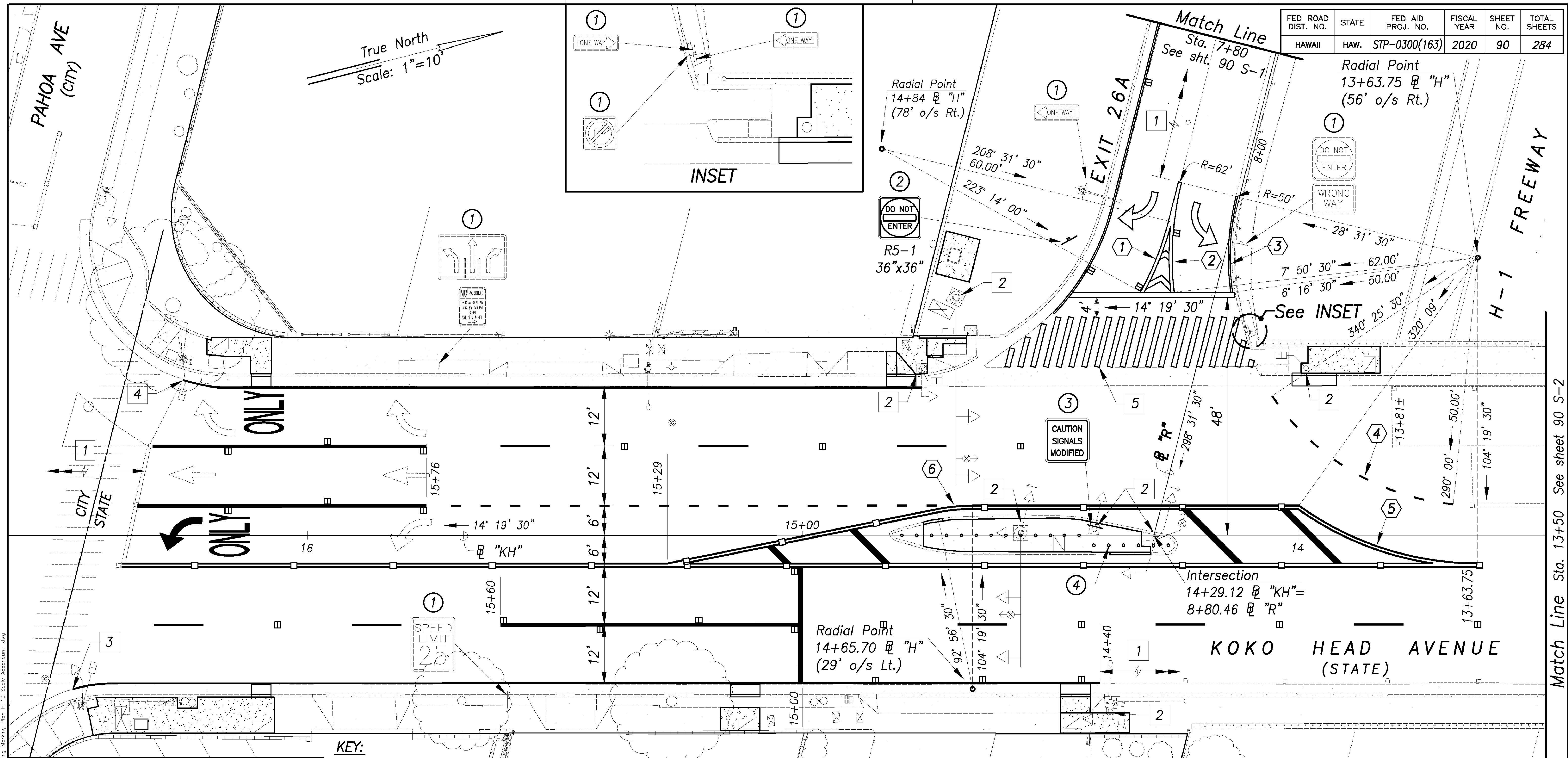
| Curve Data |             |             |             |
|------------|-------------|-------------|-------------|
| Curve      | (1)         | (2)         | (3)         |
| $\Delta$   | 14° 42' 30" | 20° 41' 00" | 22° 15' 00" |
| $\Delta/2$ | 7° 21' 15"  | 10° 20' 30" | 11° 07' 30" |
| R          | 60.00'      | 62.00'      | 50.00'      |
| T          | 7.74'       | 11.31'      | 9.83'       |
| Ch         | 15.36'      | 22.26'      | 19.29'      |
| Lc         | 15.40'      | 22.38'      | 19.41'      |
| Curve      | (4)         | (5)         | (6)         |
| $\Delta$   | 55° 25' 30" | 35° 49' 30" | 11° 23' 00" |
| $\Delta/2$ | 27° 42' 45" | 17° 54' 45" | 5° 41' 30"  |
| R          | 50.00'      | 62.00'      | 37.00'      |
| T          | 9.83'       | 20.04'      | 3.69'       |
| Ch         | 19.29'      | 38.14'      | 7.34'       |
| Lc         | 19.41'      | 38.77'      | 7.35'       |

#### KEY:

- Existing sign(s) to remain.
- Install new sign(s) on new post(s).
- Install temporary new W3-3A sign 24"x24" on new traffic signal pole. Remove W3-3A sign one week after effective data.
- 19 Each, RM-3 Marker at 3' o.c. mounted on Flexstake HD or approved equal. Epoxy to raised concrete median.

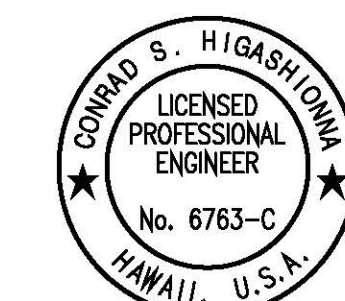
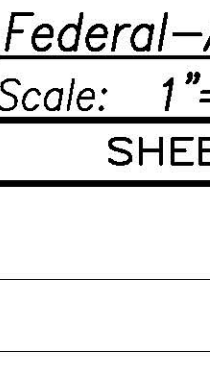
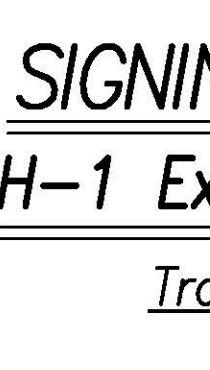
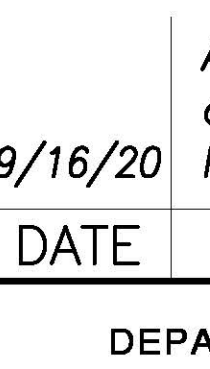
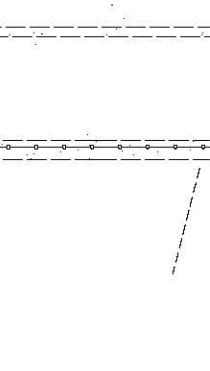
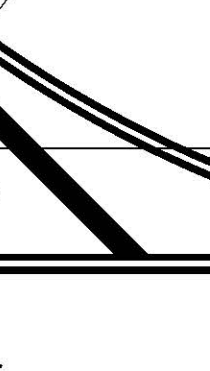
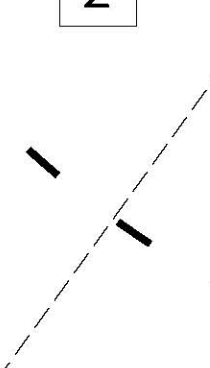
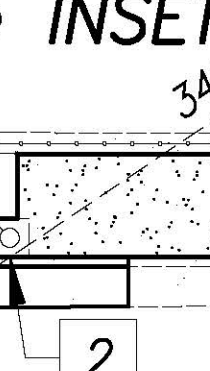
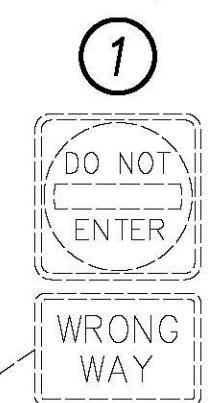
#### Notes:

- Tie into existing pavement markings.
- Install Type II Object Marker on pole.
- End 4-inch white stripe at crosswalk.
- End 4-inch white stripe at stop line.
- Crosswalk markings on concrete pavement shall be paid under 12" White Stripe on P.C.C. Pavement (Preformed Thermoplastic).



| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | STP-0300(163)      | 2020        | 90        | 284          |

Radial Point  
13+63.75 @ "H"  
(56' o/s Rt.)



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

Added 4" white stripe and markers along Exit 26A. Added Key note 4 for RM-3 Markers. Added Note 5.

9/16/20

DATE

REVISION

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**SIGNING & STRIPING PLAN**

**H-1 Exit 26A & Koko Head Ave**

Traffic Signal Modernization,  
Oahu, Phase 1

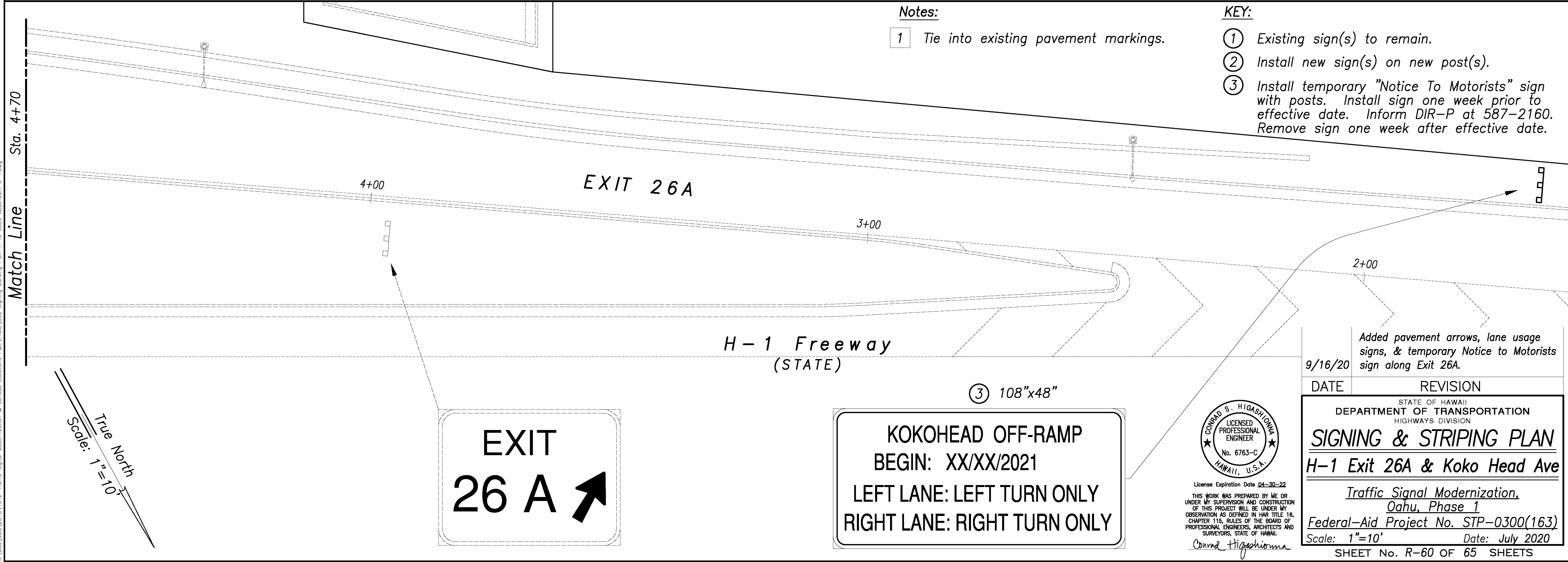
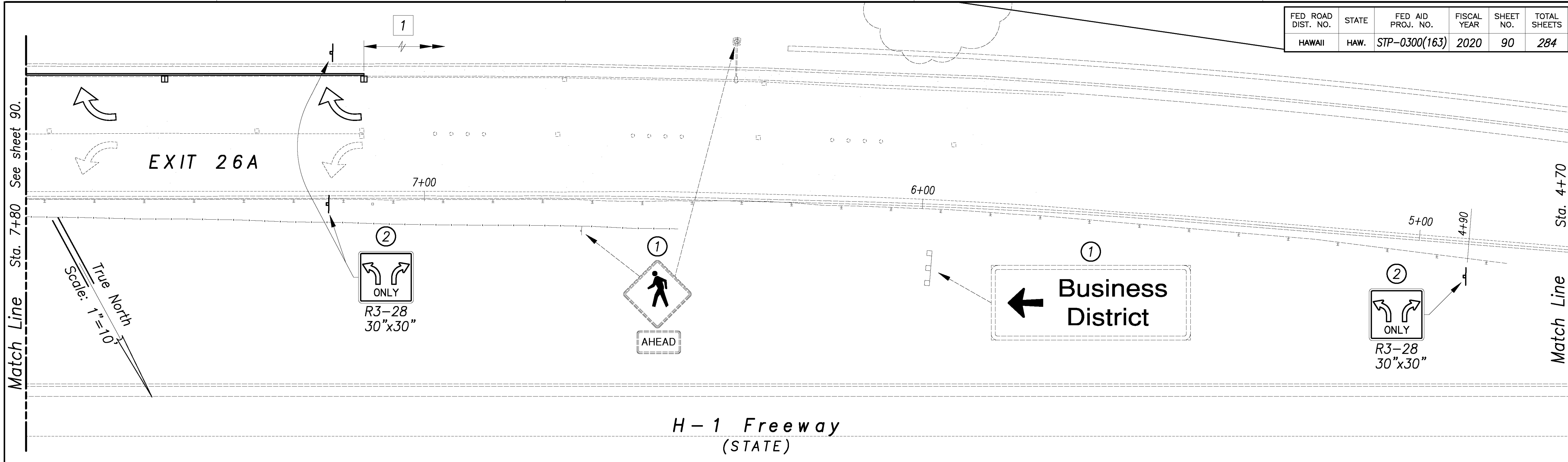
Federal-Aid Project No. STP-0300(163)

Scale: 1"=10' Date: July 2020

SHEET No. R-60 OF 65 SHEETS

ADD. 90

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | STP-0300(163)      | 2020        | 90        | 284          |



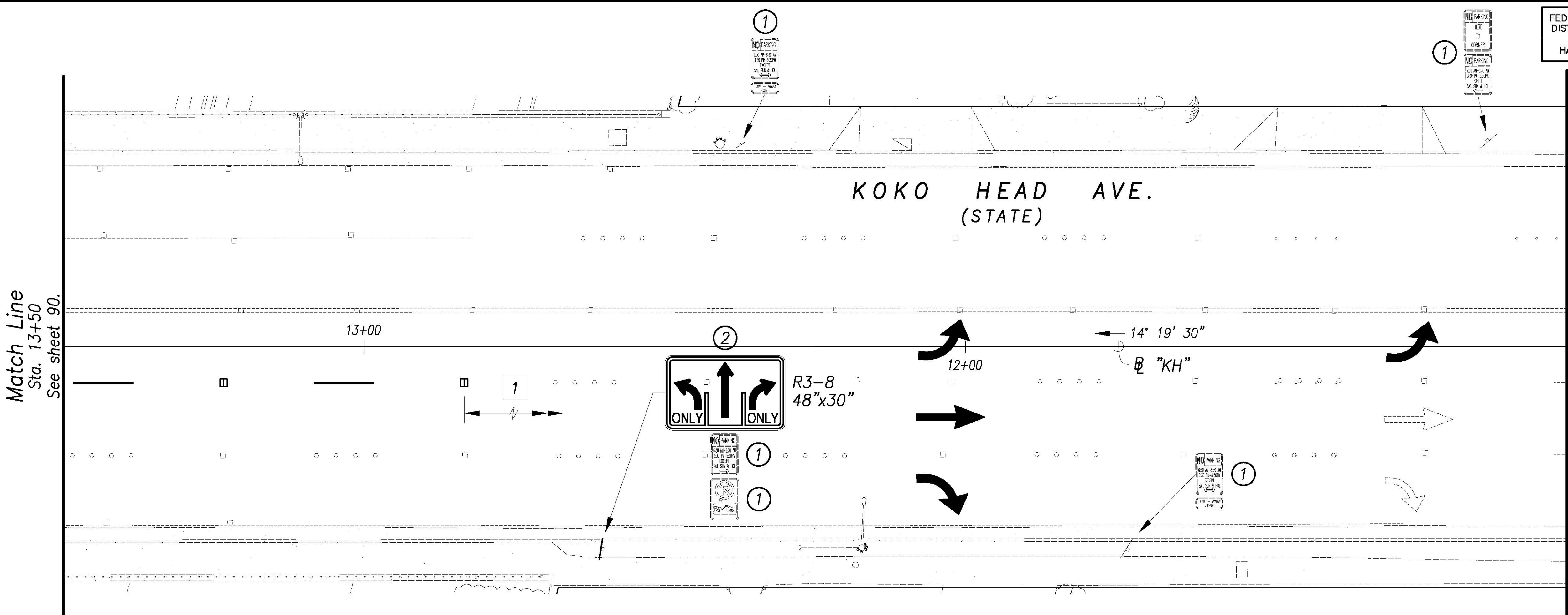
| ORIGINAL PLAN     | DATE |
|-------------------|------|
| SURVEY PLATTED BY |      |
| DRAWN BY          |      |
| DESIGNED BY       |      |
| QUANTITIES BY     |      |
| CHECKED BY        |      |
| No.               |      |

Sep 16, 2020-10:21am  
N:\CAO\DWG\2015\1512-Traffic Signal Modernization @ Various Locations P&E\FINAL\090 Signing Marking Plan H 10 Scale Addendum S-1.dwg



| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | STP-0300(163)      | 2020        | 90        | 284          |

True North  
Scale: 1"=10'



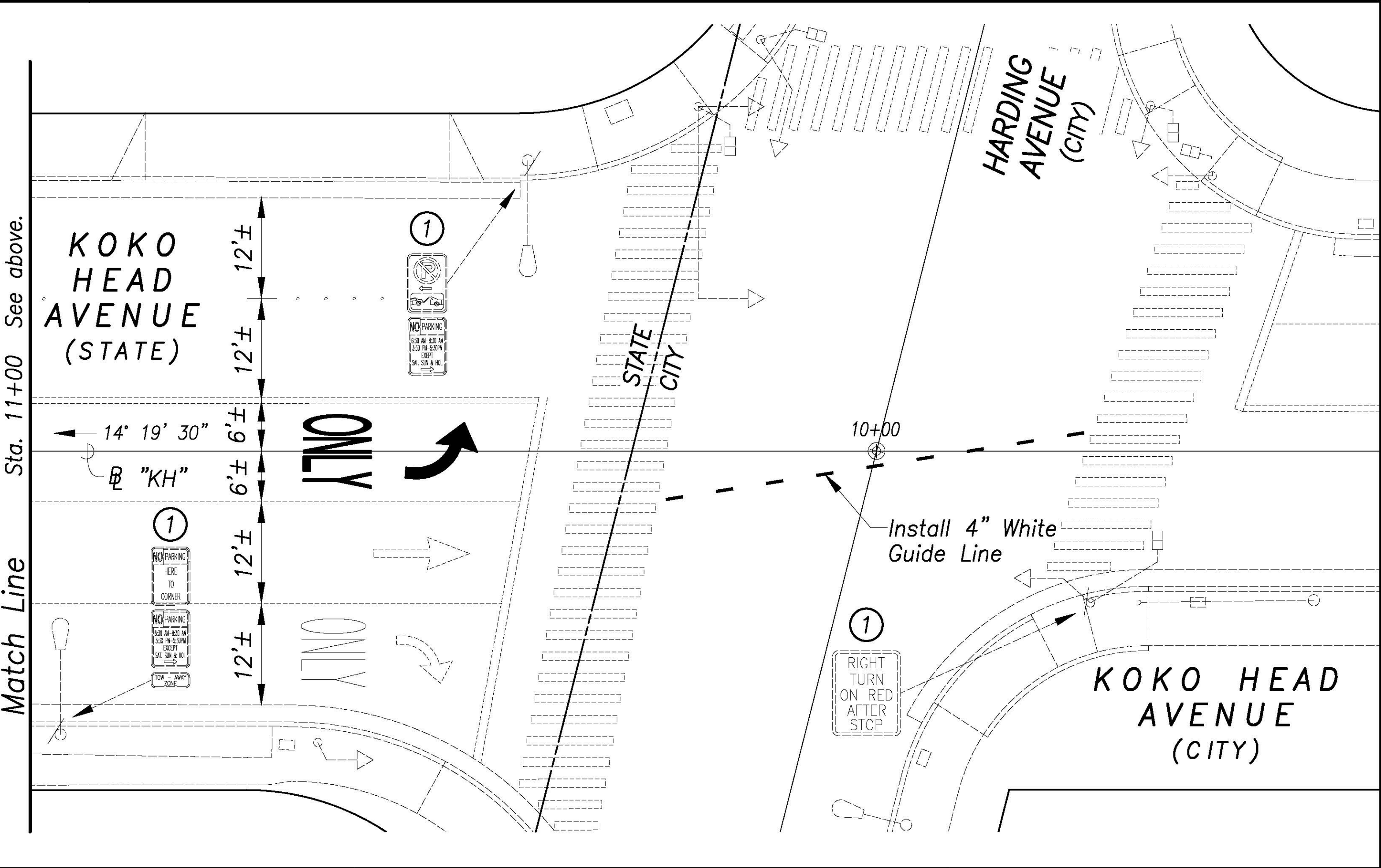
Match Line  
Sta. 11+00  
See below.

KEY:

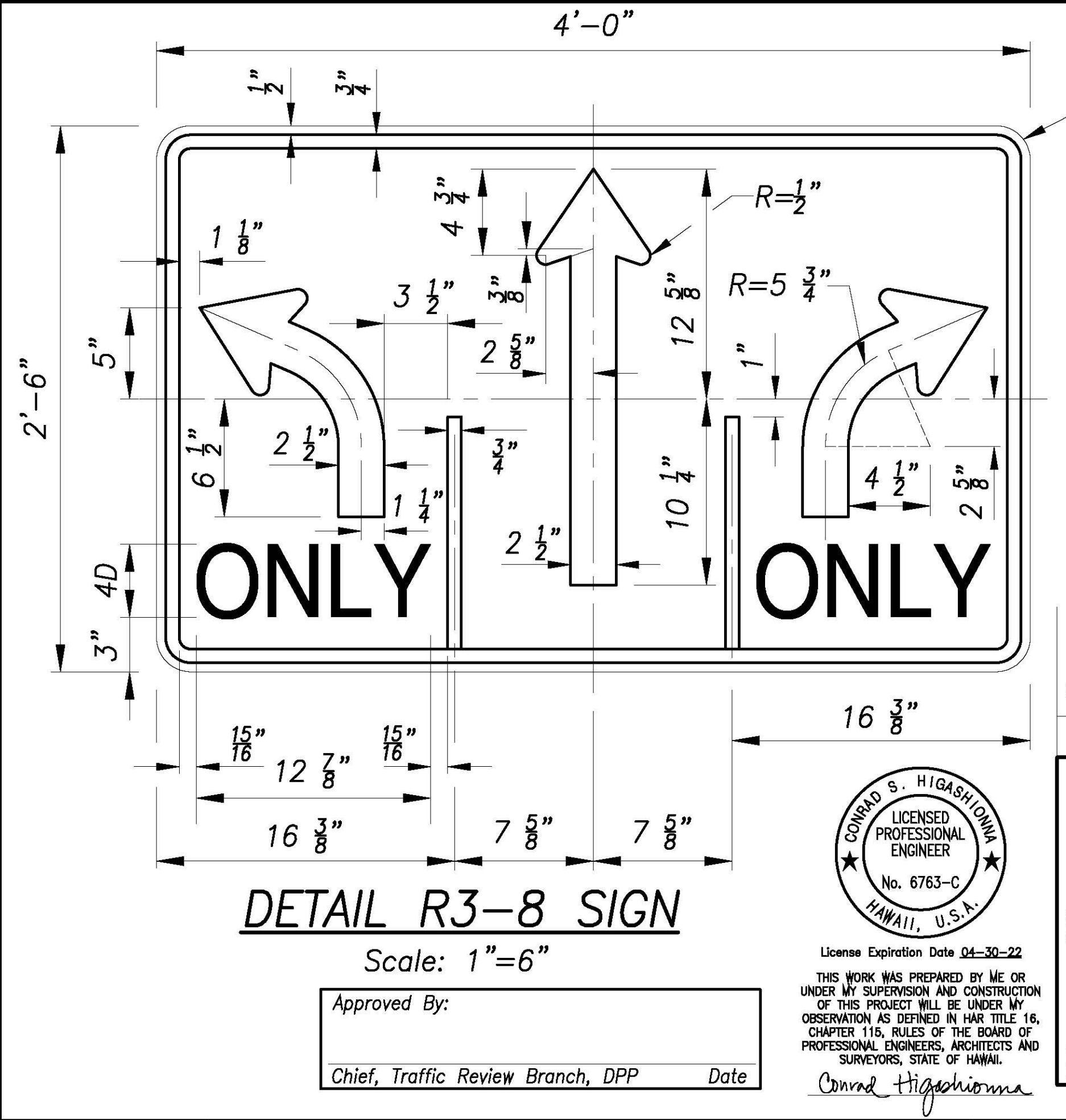
- ① Existing sign(s) to remain.  
② Install new R3-8 sign on existing post. See detail on this sheet.

Notes:

- 1 Tie into existing pavement markings.



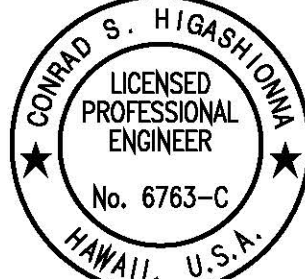
Match Line  
Sta. 11+00  
See above.



Added pavement markings and arrows along Koko Head Avenue. Install new lane usage sign on existing post.

DATE REVISION

|  |
|--|
| STATE OF HAWAII<br>DEPARTMENT OF TRANSPORTATION<br>HIGHWAYS DIVISION |
| <b>SIGNING &amp; STRIPING PLAN</b>                                   |
| <b>H-1 Exit 26A &amp; Koko Head Ave</b>                              |
| <i>Traffic Signal Modernization,<br/>Oahu, Phase 1</i>               |
| <b>Federal-Aid Project No. STP-0300(163)</b>                         |
| Scale: 1"=10' Date: July 2020  |
| SHEET No. R-60 OF 65 SHEETS  |



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

Conrad Higashimura

Approved By:  
Chief, Traffic Review Branch, DPP Date

|                   |       |
|-------------------|-------|
| DATE              | _____ |
| SURVEY PLOTTED BY | _____ |
| DRAWN BY          | _____ |
| DESIGNED BY       | _____ |
| QUANTITIES BY     | _____ |
| CHECKED BY        | _____ |
| NO.               | _____ |

See 17, 2020-10-08  
N:\CAO\DWG\2015\1512-Traffic Signal Modernization @ Various Locations P&E\FINAL\080 Signing Marking Plan H 10 Scale Addendum S-2.dwg

TRAFFIC SIGNAL NOTES

|                     |       |                    |             |           |              |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII              | HAW.  | STP-0300(163)      | 2020        | 97        | 284          |

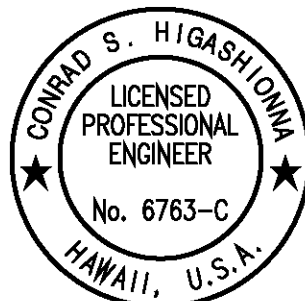
- The locations of the traffic signal standards, pedestrian push buttons, traffic controller, pull boxes, conduits and loop detectors shall be staked out in the field by the Contractor and approval of the locations shall be obtained from the Engineer prior to construction and installation.
- Any required splicing shall be done in the pull boxes.
- Furnishing and installing controller barriers, risers on poles and conduit stub outs (pull boxes to the edge of pavement) will not be paid for separately but shall be considered incidental to the various contract items.
- A solid #8 bare copper wire shall be pulled with the traffic signal control cable for equipment ground. Cost shall be incidental to the installation of the control cable.
- All traffic signal controller equipment shall be completely wired in the cabinet and shall control traffic signals as called for on the plans.
- The Contractor shall install the meter socket breaker as shown in the electrical drawings.
- The loop amplifier units furnished for this project shall be capable of operating the loop detector configurations shown on the plans. Cost for the loop amplifier shall be incidental to the installation of the loop detector.
- Should any defect be encountered during the controller warranty period, the manufacturer will be notified and he shall promptly correct such defect. Service call (by factory qualified representative) during the warranty period for repairs or other maintenance shall be answered within 24 hours and shall be done at no expense whatsoever to the State. All repairs shall be done as soon as possible.
- Existing traffic signal standards to be replaced shall be removed together with its respective footing. The Contractor may elect to remove only the top portion of the footing and shall ensure that the remaining footing is 2 feet below the existing or finish ground. Costs shall be considered incidental to the various contract items.
- The existing traffic signal and CCTV systems shall remain in operation until the new traffic signal system is put into service. The Contractor shall arrange his work accordingly and shall provide temporary relocations and wiring, as necessary. Payment shall be considered incidental to the various contract items.
- The Contractor shall clean and/or repair the existing traffic signal pull boxes to be used prior to installing conduits and cables. This work will not be paid for separately but shall considered incidental to the various contract items.
- The Contractor shall clean all existing conduits prior to pulling cables. This work will not be paid for separately but shall be considered incidental to the various contract items.

- The existing controller foundations and pull boxes not to be incorporated in the final signal system shall be removed in accordance with Section 202, "Removal of Structures and Obstruction" of the Standard Specifications. Pavement shall be constructed to match surrounding pavement.
- The Contractor shall maintain a 36" clearance between the control duct line and loop detectors.
- Restoration of existing pavements and improvements unavoidably damaged shall be incidental to the various contract items. Restoration shall be to the original or better condition.
- Removing and disposing of existing power source equipment (i.e. meter, conduits, cables, etc.) shall not be paid for separately but considered incidental to the various contract items.
- The Contractor shall verify and remove existing traffic signal heads, standards, foundations, pedestrian pushbuttons, pull box frame and covers, cables, and appurtenances, etc. which are called for removal in the plans, abandoned, or not incorporated into the new traffic signal system. The Engineer shall determine the salvageable equipment. All salvageable equipment shall become the property of the City Department of Transportation Services and the un-salvegeable equipment shall become the property of the Contractor for proper disposal. Removing and salvaging existing traffic signal equipment shall not be paid for separately but considered incidental to the various contract items.
- The Contractor shall notify the Traffic Signal and Technology Division, Department of Transportation Services, three (3) days prior to commencing work of the Traffic Signal and CCTV system (Phone: 768-8388).
- Concrete encased conduits and Type 2 cables between the pedestrian push button and pull box shall be furnished and installed in sufficient numbers and lengths, as required. Cost shall be incidental to the installation of pedestrian push buttons.
- Concrete encased conduits and signal drop cables between traffic signal standards and pull boxes shall be furnished and installed in sufficient numbers and lengths, as required. Cost shall be incidental to traffic signal foundation.
- The Contractor shall verify all work in the field prior to submitting of bid, ordering of materials, fabrication of brackets, etc.
- The Contractor shall not construct conduits, pull boxes, traffic signal standard foundations, etc. outside of State or County right-of-way unless shown otherwise on the plans.
- Existing conduits not incorporated into the new traffic signal system shall be plugged with concrete and abandoned in place. This work shall be incidental to the various contract items.
- The Contractor shall use a 5-foot length to transition from normal duct section to fit conduits within pullbox knockout unless otherwise noted. All conduits shall enter pullbox through knockouts.

- The Contractor shall remove all temporary microwave detectors not incorporated in the final signal system after the new signal system is operational and prior to final acceptance unless otherwise notified by the State. Temporary microwave detectors shall be salvaged and delivered to the City and County Department of Transportation Services.
- The Contractor shall provide 3'-0" minimum cover over top of concrete jacket for traffic signal ducts installed within the traveled way and shoulders, unless otherwise called for on the plans.
- For new Type I Traffic Signal Standards, the Contractor shall provide new Type I Signal Standard and new footing per 2008 Standard Plan TE-32, unless otherwise called for on the plans. The Contractor shall provide new traffic signal heads, pedestrian signal heads, ADA compliant pedestrian push button, and necessary new mounting equipment and accessories as required and as shown on the plans. The Contractor shall provide one 2-inch Schedule 40 conduit concrete encased with cables required for traffic and pedestrian signal heads and pedestrian push buttons.
- For new Type II Traffic Signal Standards, the Contractor shall provide new Type II Signal Standard and new drilled shaft foundation per 2008 Standard Plan TE-33A.1 and TE-33A.2, unless otherwise called for on the plans. The Contractor shall provide new traffic signal heads, pedestrian signal heads, ADA compliant pedestrian push button, and necessary new mounting equipment and accessories as required and as shown on the plans. The Contractor shall provide 2-inch Schedule 40 conduits concrete encased with cables for traffic signal heads, pedestrian signal heads, pedestrian push buttons, and Opticom detector.
- The Contractor shall ensure that traffic signal standards are designed and manufactured to be compatible with the drilled shaft design to avoid bolt circle-cage conflicts.
- Existing traffic signal pullboxes, street light pullboxes, and traffic signal standards to remain shall be adjusted to finish grade. The cost shall be incidental to the various contract items.
- Existing traffic signal systems shall remain operational at all times during construction; the Contractor shall provide temporary equipment or power as needed to facilitate construction. The cost shall be incidental to the various contract items.

|               |                   |      |
|---------------|-------------------|------|
| ORIGINAL PLAN | SURVEY PLATTED BY | DATE |
| NOTE BOOK     | DRAWN BY          |      |
|               | DESIGNED BY       |      |
|               | QUANTITIES BY     |      |
|               | CHECKED BY        |      |
| No.           |                   |      |

See 17, 2020-11 Item  
M:\CAO\DWG\2015\1512-Traffic Signal Modernization @ Various Locations P&E\TMA\097 Signal Notes 2.dwg



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.

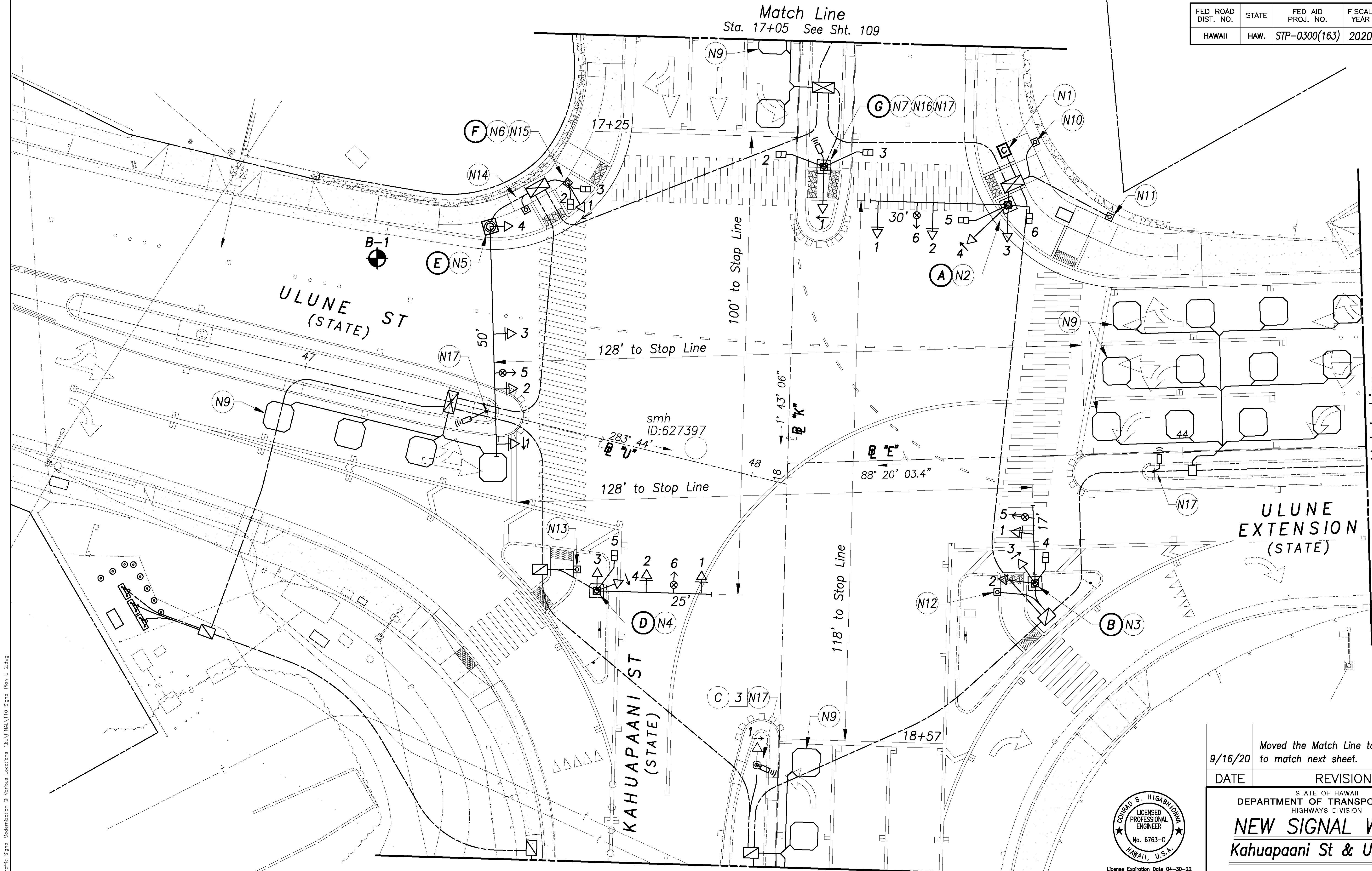
Conrad Higashimura

|  |
|--|
| Approved By:                             |
| Chief, Traffic Signals & Technology, DTS |
| Date                                     |

|  |                 |
|--|-----------------|
| 9/16/20  | Added Note 31.  |
| DATE   | REVISION        |
| STATE OF HAWAII<br>DEPARTMENT OF TRANSPORTATION<br>HIGHWAYS DIVISION |                 |
| TRAFFIC SIGNAL NOTES   |                 |
| Traffic Signal Modernization,<br>Oahu, Phase 1                       |                 |
| Federal-Aid Project No. STP-0300(163)                                |                 |
| Scale:   | Date: July 2020 |
| SHEET No. TS-2 OF 113 SHEETS   |                 |



| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | STP-0300(163)      | 2020        | 110       | 284          |

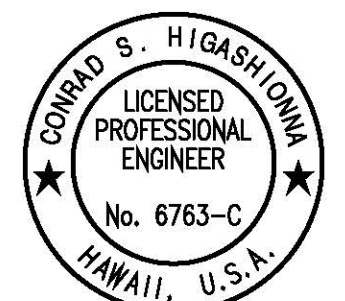


|               |                   |      |
|---------------|-------------------|------|
| ORIGINAL PLAN | SURVEY PLATTED BY | DATE |
| NOTE BOOK     | DRAWN BY          |      |
| QUANTITIES BY | DESIGNED BY       |      |
| CHECKED BY    |                   |      |

See 17, 2020-10-30am  
N:\CAO\DWG\2015\1512-Traffic Signal Modernization @ Various Locations P&E\FINAL\110 Signal Plan U 2.dwg

Match Line  
Sta. 18+85  
See Sht. 111

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*

9/16/20  
DATE

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

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
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



SURVEY PLOTTED BY

DATE

\*\*\*\*\*

ORIGINAL PLAN

NO.

DRAWN BY

DESIGNED BY

QUANTITIES BY

CHECKED BY

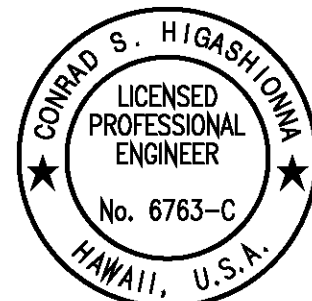
NOTE BOOK

NO.

Sep 17, 2020-10:35am  
N:\CAO\DWG\2015\1512-Traffic Signal Modernization @ Various Locations PKG\FINAL\140 Table V Addendum.dwg

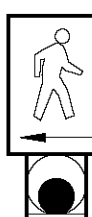
| CONDUIT-CABLE SCHEDULE |        |      |                                      |   |  |       |                         |                                      |  |
|------------------------|--------|------|--------------------------------------|---|--|-------|-------------------------|--------------------------------------|--|
|                        | FROM   | TO   | CONDUIT                              | CABLE   |  | FROM  | TO                      | CONDUIT                              | CABLE  |
|                        | CONTR. | PB-1 | New 8-2" Sch. 40<br>Concrete Encased | 1-Type 1, Ground Wire<br>1-Type 1, Ground Wire<br>4-Type 2<br>3-Type 2<br>2-Type 3<br>1-Type 6<br>4-Type 7<br>Spare |  | PB-8  | PB-9                    | New 4-2" Sch. 40<br>Concrete Encased | 1-Type 1, Ground Wire<br>3-Type 2<br>1-Type 7<br>Spare |
|                        | PB-1   | PB-2 | New 6-2" Sch. 40<br>Concrete Encased | 1-Type 1, Ground Wire<br>4-Type 2<br>2-Type 3<br>1-Type 6<br>2-Type 7<br>Spare                                      |  | PB-9  | PB-10                   | New 4-2" Sch. 40<br>Concrete Encased | 1-Type 1, Ground Wire<br>2-Type 2<br>2-Type 7<br>Spare |
|                        |        |      |                                      |   |  | PB-1  | Exist.<br>PB-10         | New 2-2" Sch. 40<br>Concrete Encased | 2-Type 2<br>1-Type 5                                   |
|                        |        |      |                                      |   |  | PB-2  | Exist.<br>PB-11         | New 2-2" Sch. 40<br>Concrete Encased | 1-Type 2<br>1-Type 5                                   |
|                        | PB-2   | PB-3 | New 6-2" Sch. 40<br>Concrete Encased | 1-Type 1, Ground Wire<br>5-Type 2<br>2-Type 3<br>1-Type 6<br>2-Type 7<br>Spare                                      |  | PB-5  | Exist.<br>PB-12         | New 1-2" Sch. 40<br>Concrete Encased | 2-Type 2   |
|                        |        |      |                                      |   |  | PB-3  | PB-13                   | New 3-3" Sch. 40<br>Concrete Encased | 1-Type 3<br>1-Type 5<br>1-Type 7                       |
|                        |        |      |                                      |   |  | PB-4  | PB-14                   | New 3-2" Sch. 40<br>Concrete Encased | 1-Type 5<br>1-Type 6<br>1-Type 7                       |
|                        | PB-3   | PB-4 | New 6-2" Sch. 40<br>Concrete Encased | 1-Type 1, Ground Wire<br>4-Type 2<br>1-Type 3<br>1-Type 6<br>1-Type 7<br>Spare                                      |  | PB-14 | Exist.<br>HECO<br>Meter | New 1-2" Sch. 40<br>Concrete Encased | 1-Type 6   |
|                        |        |      |                                      |   |  | PB-5  | Exist.<br>PB-16         | New 1-2" Sch. 40<br>Concrete Encased | 1-Type 5   |
|                        |        |      |                                      |   |  | PB-5  | Exist.<br>PB-17         | New 1-2" Sch. 40<br>Concrete Encased | 1-Type 3   |
|                        | PB-4   | PB-5 | New 4-2" Sch. 40<br>Concrete Encased | 1-Type 1, Ground Wire<br>1-Type 2<br>1-Type 3<br>Spare  |  | PB-6  | Exist.<br>PB-18         | New 1-2" Sch. 40<br>Concrete Encased | 1-Type 5   |
|                        | PB-5   | PB-6 | New 2-2" Sch. 40<br>Concrete Encased | 1-Type 1, Ground Wire<br>Spare  |  | PB-7  | Exist.<br>PB-19         | New 2-2" Sch. 40<br>Concrete Encased | 1-Type 2<br>1-Type 5                                   |
|                        | PB-6   | PB-7 | New 3-2" Sch. 40<br>Concrete Encased | 1-Type 1, Ground Wire<br>1-Type 2<br>Spare  |  | PB-12 | Exist.<br>Contr.        | Exist. 1-2"                          | 1-Type 3   |
|                        | PB-7   | PB-8 | New 4-2" Sch. 40<br>Concrete Encased | 1-Type 1, Ground Wire<br>1-Type 2<br>1-Type 7<br>Spare  |  | PB-17 | Exist.<br>Contr.        | Exist. 1-2"                          | 1-Type 3   |

| SIGNAL HEAD SCHEDULE   |   |
|--|---|
| Head Type and Description  | Pole Letter - Signal Head Number  |
| <div><div> Red Ball</div><div> Yellow Ball</div><div> Green Ball</div></div> <div>12" RYG Traffic Signal Head</div>  | A-1* I-1*<br>D-1** K-1**<br>D-2** K-2**<br>D-3** K-3**<br>E-1 K-4<br>F-1* L-1*<br>F-2* L-2*<br>G-1** M-1**<br>G-2** M-2**<br>G-3** M-3<br>G-4 |
| <div><div> Red Ball</div><div> Yellow Arrow (Left)</div><div> Green Arrow (Left)</div></div> <div>12" R&lt;-&lt; Traffic Signal Head</div>                       | B-1*<br>H-1   |
| <div><div> Red Ball</div><div> Yellow Arrow (Left)</div><div> Green Arrow (Left)</div></div> <div>12" R&lt;-&lt; Programmed Visibility Traffic Signal Head</div> | C-1*<br>J-1*  |
| <div></div> <div>Countdown Pedestrian Signal Head</div>  | B-2* E-2<br>B-3* E-3<br>H-2<br>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<br>G-5 M-4  |
| Approved By: _____<br>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

|   |                    |                       |                              |              |                 |
|---|--------------------|-----------------------|------------------------------|--------------|-----------------|
| FED. ROAD<br>DIST. NO.  | STATE              | FED. AID<br>PROJ. NO. | FISCAL<br>YEAR               | SHEET<br>NO. | TOTAL<br>SHEETS |
| HAWAII  | HAW.               | STP-0300(163)         | 2020                         | 140          | 284             |
| PEDESTRIAN PUSH BUTTON<br>SCHEDULE  |                    |                       |                              |              |                 |
| Description   | New Signal<br>Work | Signal<br>Callout     | Pole or<br>Pedestal<br>PPB-# |              |                 |
|  |                    | N11                   | H PPB-3                      |              |                 |
|   |                    | N13                   | M PPB-5                      |              |                 |
|  |                    | N12                   | Pedestal<br>PPB-4            |              |                 |
|   |                    | N13                   | M PPB-6                      |              |                 |

9/16/20

Revised conduit 10 cable schedule.

|      |          |
|------|----------|
| DATE | REVISION |
|------|----------|

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

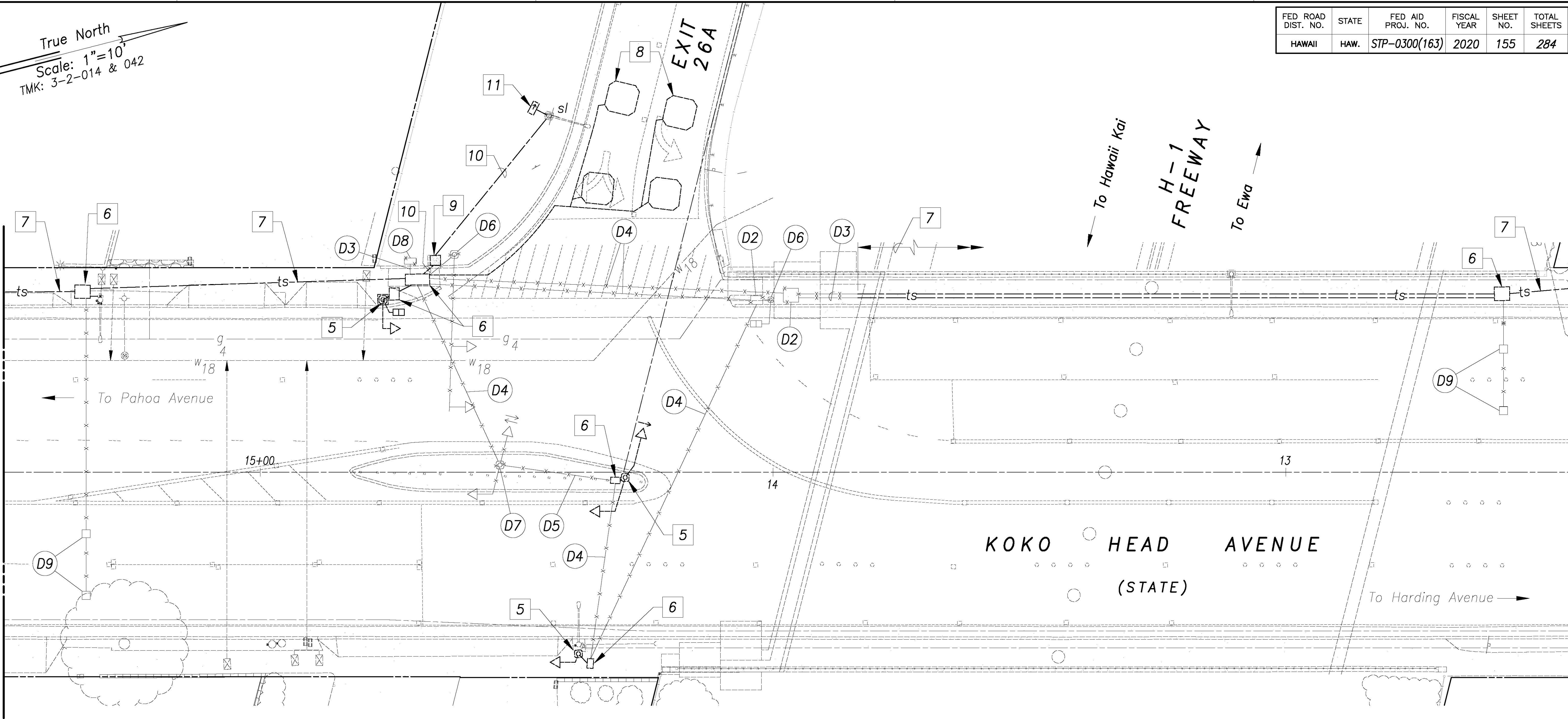
SHEET No. TS-45 OF 113 SHEETS



| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | STP-0300(163)      | 2020        | 155       | 284          |

True North  
Scale: 1"=10'  
TMK: 3-2-014 & 042

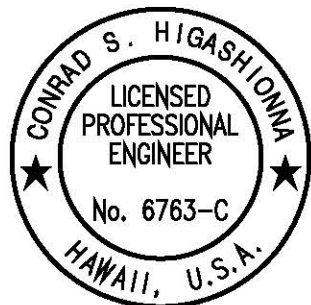
Match Line  
Sta. 15+65 See Sheet 154



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

Sep 17, 2020-13:27pm  
N:\CAO\DWG\2015\1512-Traffic Signal Modernization @ Various Locations P&E\FINAL\155 Signal Demolition H 2 Addendum.dwg

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

| 9/16/20  | The existing pavement markings were shown incorrectly. Pavement markings revised to show correct existing condition. |
|--|--|
| DATE   | REVISION   |
| STATE OF HAWAII<br>DEPARTMENT OF TRANSPORTATION<br>HIGHWAYS DIVISION |  |
| <b>SIGNAL DEMOLITION</b>   |  |
| <b>H-1 Exit 26A &amp; Koko Head Ave</b>                              |  |
| Traffic Signal Modernization,<br>Oahu, Phase 1                       |  |
| Federal-Aid Project No. STP-0300(163)                                |  |
| Scale: 1"=10'  | Date: July 2020  |
| SHEET No. TS-60 OF 113 SHEETS  |  |



Notes and New Signal Work Callouts for Intersection of Pahoa Ave & Koko Head Ave ONLY:

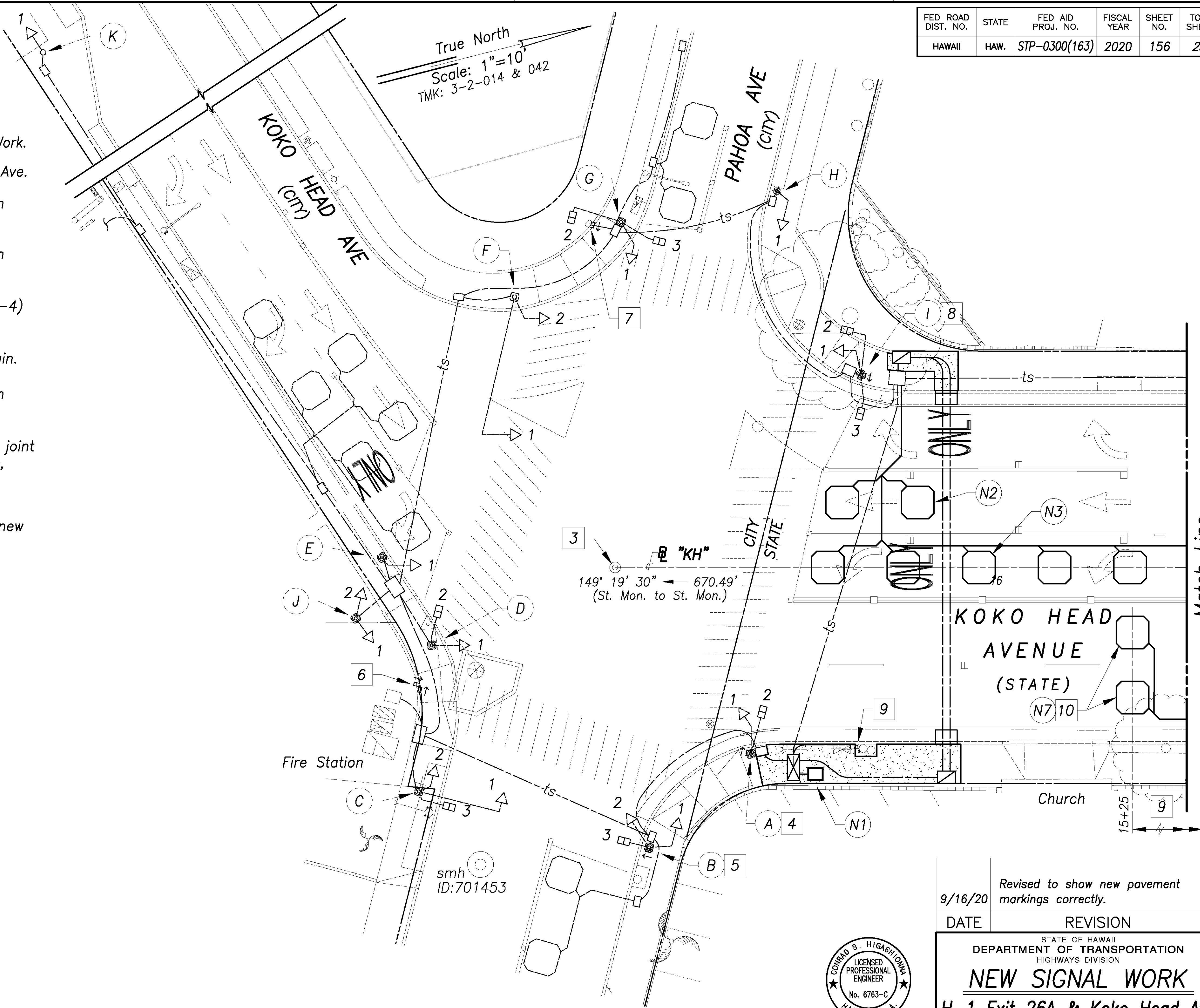
Notes:

- 1
- Tie-down of traffic signal controller and standards is to center of cabinet and vertical pole, respectively.
- 2
- For location of traffic signal pullboxes, see New Duct Line Work.
- 3
- Street Monument 16+70.49 @ "KH" = 42+50.91 Pahoa Ave.
- 4
- Existing traffic signal standard and pedestrian push button (ppb-1) to remain.
- 5
- Existing traffic signal standard and pedestrian push button (ppb-2) to remain.
- 6
- Existing pedestrian push button pedestal (ppb-3 and ppb-4) to remain.
- 7
- Existing pedestrian push button pedestal (ppb-5) to remain.
- 8
- Existing traffic signal standard and pedestrian push button (ppb-8) to remain.
- 9
- Existing power source. Existing HECO meter mounted on joint pole. The Contractor shall brace poles near new ductline, pullbox or controller during construction operations.
- 10
- New loop detectors for intersection of Exit 26A and Koko Head Ave. Loops located 75' from new stop line. See new signal work callout on sheet 157.
- 11
- See sheet 162 for new signal work schedules.

New Signal Work Callouts:

- N1
- Install Controller Assembly with Software 16+34 @ "KH" (38.13' Rt.)
- N2
- Install Loop Detector Sensing Unit (6 Ft. x 6 Ft.) 2 Loops centered in lane
- N3
- Install Loop Detector Sensing Unit (6 Ft. x 6 Ft.) 6 Loops centered in lane

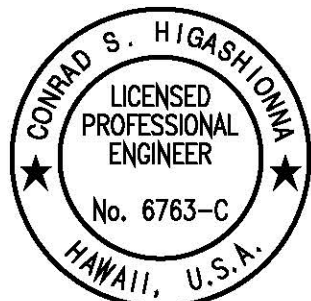
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | STP-0300(163)      | 2020        | 156       | 284          |



|               |                   |      |
|---------------|-------------------|------|
| ORIGINAL PLAN | SURVEY PLANNED BY | DATE |
| NOTE BOOK     | DRAWN BY          |      |
| No.           | DESIGNED BY       |      |
|               | QUANTITIES BY     |      |
|               | CHECKED BY        |      |

Sep 17, 2020-13:56pm  
N:\CAO\DWG\2015\1512-Traffic Signal Modernization @ Various Locations P&E\FINAL\156 Signal Plan H-1 Addendum.dwg

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



Licensed Professional Engineer  
No. 6763-C  
HAWAII, U.S.A.

Revised to show new pavement markings correctly.  
9/16/20

DATE REVISION

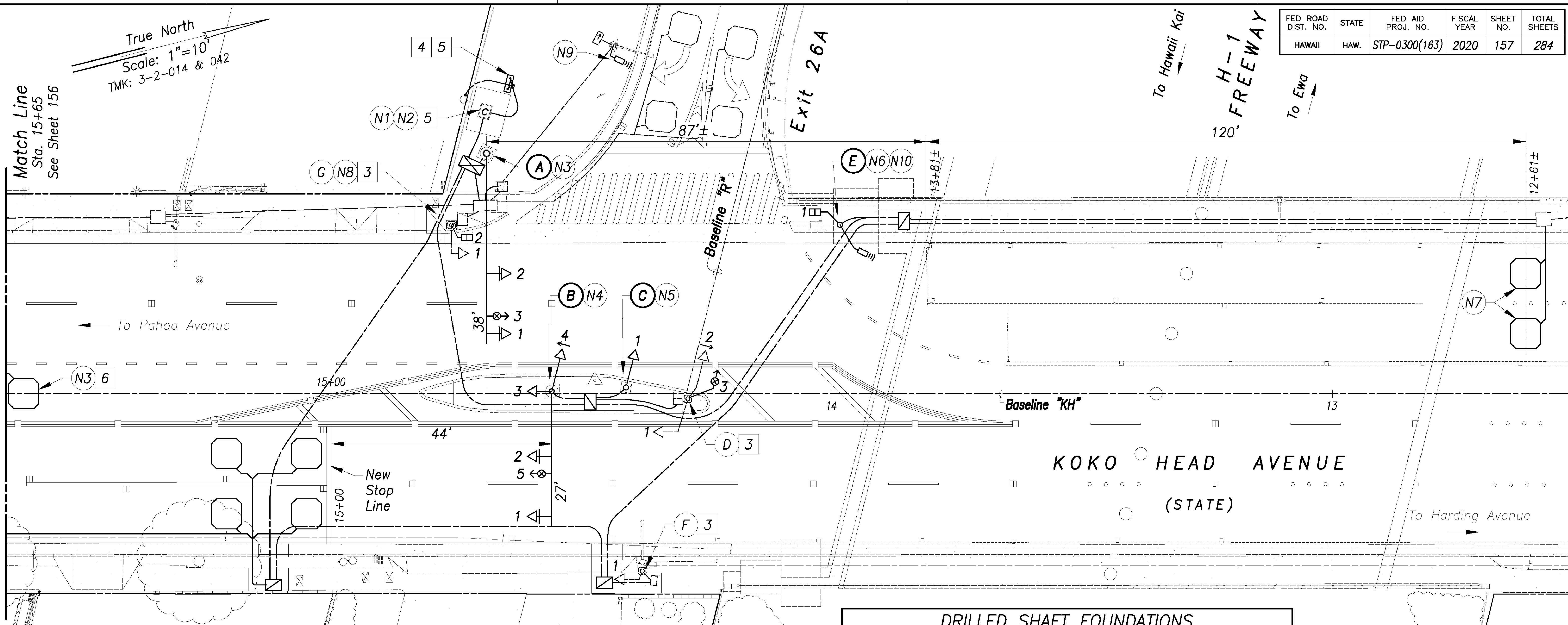
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**NEW SIGNAL WORK**  
**H-1 Exit 26A & Koko Head Ave**  
*Traffic Signal Modernization,  
Oahu, Phase 1*  
**Federal-Aid Project No. STP-0300(163)**  
Scale: 1"=10' Date: July 2020  
SHEET No. TS-61 OF 113 SHEETS

Match Line  
Sta. 15+65 See Sheet 157



Sep 17, 2020 - 14:00m  
N:\CAO\DWG\2015\1512-Traffic Signal Modernization @ Various Locations P&E\FINAL\157 Signal Plan H 2 Addendum.dwg

|                   |       |
|-------------------|-------|
| SURVEY PLANNED BY | DATE  |
| DRAWN BY          | ***** |
| DESIGNED BY       |       |
| QUANTITIES BY     |       |
| CHECKED BY        |       |
| NOTE BOOK         |       |
| No.               |       |



**Notes and New Duct Line Work Callouts for Intersection of Pahoa Ave & Koko Head Ave ONLY:**

- New Signal Work Callouts:**
- N1 Install Controller Assembly with Software 14+69.35 @ "KH" (56.40' Rt.)
  - N2 Install concrete pad for controller. See sheet 156 for details.
  - N3 Install Type II Traffic Signal Standard with 38-foot mast arm and drilled shaft foundation. 14+69.05 @ "KH" (48' Rt.)
  - N4 Install Type II Traffic Signal Standard with 27-foot mast arm and drilled shaft foundation. 14+56 @ "KH" (0.50' Rt.)
  - N5 Install Type I Traffic Signal Standard, 10-foot height, with foundation. 14+41.18 @ "KH" (1.25' Rt.)
  - N6 Install Type I Traffic Signal Standard, 8-foot height, with foundation and pedestrian push button (PPB-2). 13+98.43 @ "KH" (33.73' Rt.)
  - N7 Install Loop Detector Sensing Unit (6 Ft. x 6 Ft.) 1 Loops centered in lane

- N8 Install pedestrian push button PPB-1, ADA compliant, mounted on existing traffic signal standard.
- N9 Install temporary Approach-Only Microwave Vehicle Detector on existing traffic signal standard.
- N10 Install permanent Approach-Only Microwave Vehicle Detector on existing traffic signal standard.

- Notes:**
- 1 Tie-down of traffic signal controller and standards is to center of cabinet and vertical pole, respectively.
  - 2 For location of traffic signal pullboxes, see New Duct Line Work.
  - 3 Existing traffic signal standard to remain.
  - 4 New power source. HECO meter, see drawings E-16 thru E-19.
  - 5 The Contractor shall restore existing landscaping and irrigation system affected by construction work to equal or better condition. The restoration work shall be incidental to the various contract items.

| DRILLED SHAFT FOUNDATIONS<br>for Type II Traffic Signal Standards  |             |       |                        |                                 |                             |
|--|-------------|-------|------------------------|---------------------------------|-----------------------------|
|  | SOIL TYPE   | GRADE | MAST ARM LENGTH (feet) | DRILLED SHAFT DIAMETER (inches) | DRILLED SHAFT LENGTH (feet) |
| ○  | Stiff Clays | Level | 38                     | 30                              | 11                          |
| Ⓐ  | Stiff Clays | Level | 27                     | 30                              | 7                           |
| Ⓑ  | Stiff Clays | Level | 27                     | 30                              | 7                           |
| Drilled shaft foundations shall be constructed per 2008 Standard Plans TE-33A.1 & TE-33A.2 – above ground water table. |             |       |                        |                                 |                             |
| No boring for soils data conducted for this site.  |             |       |                        |                                 |                             |

- 6 New loop detectors for intersection of Pahoa Ave and Koko Head Ave. See new signal work callout on sheet 156.
- 7 See sheet 163 for new signal work schedules.

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

CONRAD S. HIGASHIOWA  
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 HAWAII TITLE 16, CHAPTER 115, RULES OF THE BOARD OF PROFESSIONAL ENGINEERS, ARCHITECTS AND SURVEYORS, STATE OF HAWAII.  
Conrad Higashiomwa

9/16/20

Revised to show new pavement markings correctly.

| DATE | REVISION |
|------|----------|
|      |          |

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**NEW SIGNAL WORK**  
**H-1 Exit 26A & Koko Head Ave**  
*Traffic Signal Modernization,  
Oahu, Phase 1*  
**Federal-Aid Project No. STP-0300(163)**  
Scale: 1"=10' Date: July 2020  
SHEET No. TS-62 OF 113 SHEETS



Notes and New Duct Line Work Callouts for Intersection of Pahoa Ave & Koko Head Ave ONLY:

Notes:

- 1

Tie-down of pullboxes is to center of box.
- 2

Existing pullbox PB-2 to remain.
- 3

Existing pullbox PB-3 to remain.
- 4

Existing pullbox PB-4 to remain.
- 5

Existing pullbox PB-5 to remain.
- 6

Existing pullbox PB-6 to remain.
- 7

Existing pullbox PB-7 to remain.
- 8

Existing pullbox PB-8 to remain.
- 9

Existing pullbox PB-9 to remain.
- 10

Existing pullbox PB-10 to remain.
- 11

Existing pullbox PB-13 to remain.
- 12

Existing pullbox PB-14 to remain.
- 13

Existing pullbox PB-15 to remain.
- 14

Existing pullbox PB-16 to remain.
- 15

Existing pullbox for Fire Department warning flasher to remain.
- 16

Existing duct and cables for Fire Department warning flashers to remain.
- 17

Existing stub-out to fire station.
- 18

The existing Fire Department warning flasher system shall remain in operation at all times. The Contractor shall not damage warning system conduits and cables resident in traffic signal pullboxes.
- 19

Existing power source, HECO meter mounted on joint pole. The Contractor shall brace poles near new ductline, pullbox or controller, as required. See HECO Note 6 – Pole Bracing on drawing E-2.
- 20

See sheet 162 for new duct line work schedules.
- 21

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.
- 22

Prior to construction, the Contractor shall verify existing cables can be removed from conduits to remain and inform the Engineer. This work shall be incidental to the various contract items. Existing Type 2 detector cables and Type 5 signal-drop cables within traffic signal standards and pedestrian push button pedestals shall remain up to the pull boxes. Splice existing cables to new within pullboxes.

New Duct Line Work Callouts:

- N1

Install Type C Pullbox PB-1. 16+37.59 @ "KH" (36.90' Lt.)
- N2

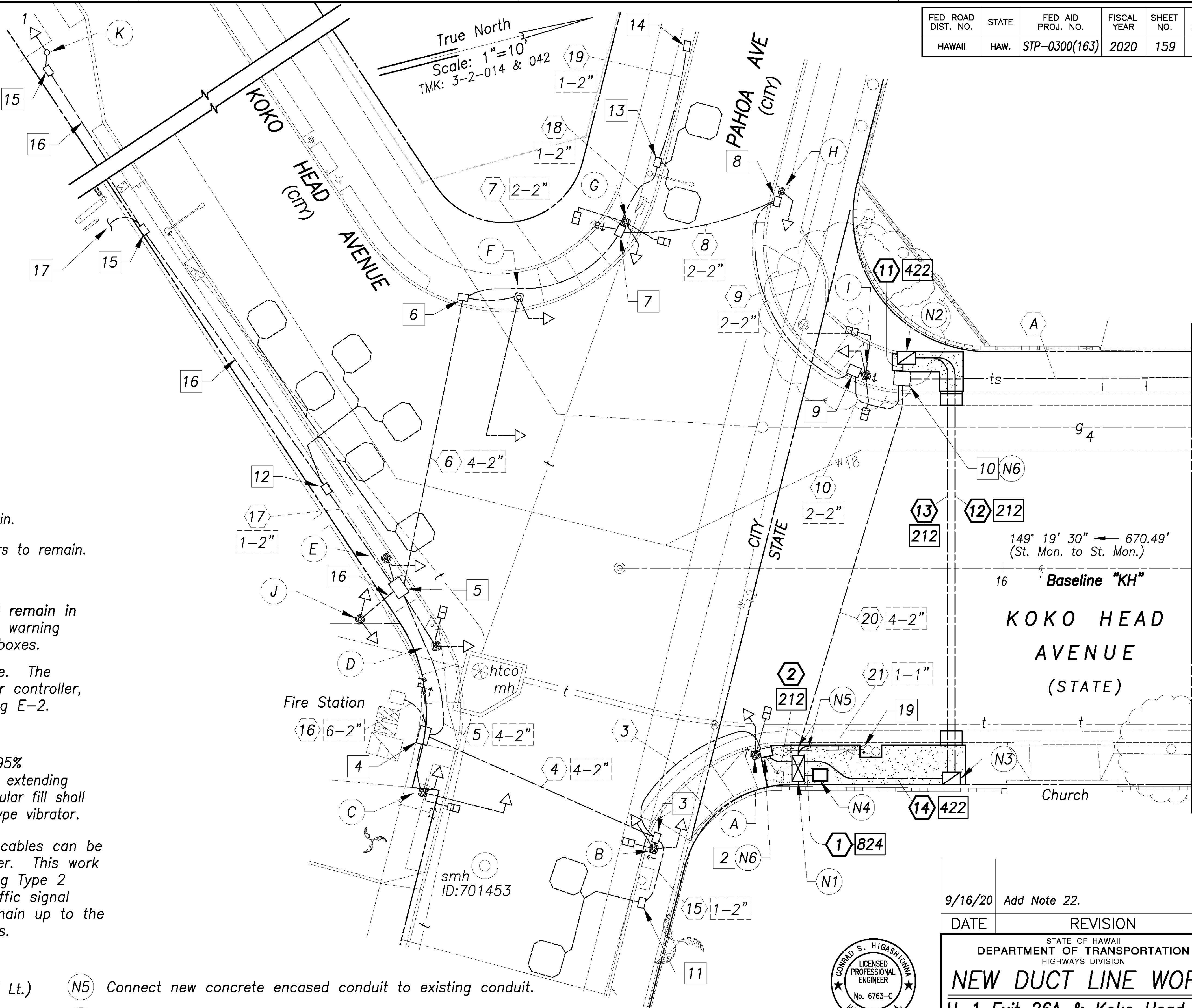
Install Type B Pullbox PB-11. 16+17.62 @ "KH" (38.77' Rt.)
- N3

Install Type B Pullbox PB-12. 16+09.36 @ "KH" (38.74' Lt.)
- N4

New traffic signal controller. 16+34.03 @ "KH" (38.13' Lt.)
- N5

Connect new concrete encased conduit to existing conduit.
- N6

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.

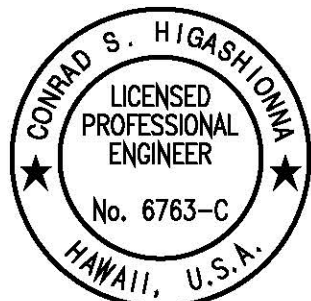


| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | STP-0300(163)      | 2020        | 159       | 284          |

|                   |      |
|-------------------|------|
| SURVEY PLANNED BY | DATE |
| DRAWN BY          | DATE |
| DESIGNED BY       | DATE |
| QUANTITIES BY     | DATE |
| CHECKED BY        | DATE |

See 17, 2020-12-28  
N:\CAO\DWG\2015\1512-Traffic Signal Modernization @ Various Locations\PAEH\PAEA\159 Duct Plan H 1.dwg

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

9/16/20 Add Note 22.

DATE REVISION

|  |
|--|
| STATE OF HAWAII<br>DEPARTMENT OF TRANSPORTATION<br>HIGHWAYS DIVISION |
| <b>NEW DUCT LINE WORK</b>  |
| <b>H-1 Exit 26A &amp; Koko Head Ave</b>                              |
| <i>Traffic Signal Modernization,<br/>Oahu, Phase 1</i>               |
| <i>Federal-Aid Project No. STP-0300(163)</i>                         |
| Scale: 1"=10' Date: July 2020  |
| SHEET No. TS-64 OF 113 SHEETS  |

ADD. 159

Match Line  
Sta. 15+65 See Sheet 160