STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ADDENDUM NO. 5
for
FARRINGTON HIGHWAY WIDENING
KAPOLEI GOLF COURSE ROAD TO FORT WEAVER ROAD
PROJECT NO. 7101A-01-20

The following amendments shall be made to the Bid Documents:

A. SPECIAL PROVISIONS

1. Replace Table of Contents dated 06/08/22 with attached Table of Contents dated r07/21/22.

2. Replace Special Provision Section 201 – Clearing and Grubbing dated 11/25/20 with attached Special Provision Section 201 – Clearing and Grubbing dated r07/21/22.

3. Replace Special Provision Section 203 – Excavation and Embankment dated 06/08/22 with attached Special Provision Section 203 – Excavation and Embankment dated r07/21/22.

4. Replace Special Provision Section 204 – Excavation and Backfill for Miscellaneous Facilities dated r06/08/22 with attached Section 204 – Excavation and Backfill for Miscellaneous Facilities dated r07/26/22.

5. Add Special Provision Section 316 – Polypropylene Biaxial Geogrid dated 07/21/22.

6. Replace Special Provision Section 401 – Hot Mix Asphalt (HMA) Pavement dated 06/08/22 with attached Special Provision Section 401 – Hot Mix Asphalt (HMA) dated r07/21/22.

7. Replace Special Provision Section 503 – Concrete Structures dated 06/08/22 with attached Special Provision Section 503 – Concrete Structures dated r07/21/22.

8. Replace Special Provision Section 624 – Water System dated 05/15/21 with attached Special Provision Section 624 – Water System dated r07/21/22.

9. Replace Special Provision Section 651 – Horizontal Directional Drilling dated 04/14/22 with attached Special Provision Section 651 – Horizontal Directional Drilling dated r07/21/22.

10. Add Special Provision Section 652 – Pilot Tube Microtunneling dated 07/21/22.

11. Replace Special Provision Section 660 – Gas System dated 09/24/21 with attached Special Provision Section 660 – Gas System dated r07/26/22.

12. Replace Special Provision Section 675 – Mass Concrete dated 04/14/22 with attached Special Provision Section 675 – Mass Concrete dated r07/21/22.

13. Replace Special Provision Section 680 – Electric and Communication Systems dated 04/19/22 with the attached Special Provision Section 680 – Electric and Communication Systems dated r07/22/22.

B. PROPOSAL

1. Replace Proposal page P-4 dated 3/3/2021 with Proposal page P-4 dated r7/26/2022

2. Replace Proposal pages P-11 to P-47 dated r06/08/2022 with Proposal Pages P-11 to P-46 dated r07/22/2022.

C. PLANS

1. Replace Civil Plan Sheets C-5, C-6, C-12, C-13, C-15, C-20, C-27, C-31 to C-41, C-53, C-60, C-63, C-65, C-68, C-77, C-81, C-85, C-87, C-95, C-98, C-101, C-103, C-116, C-117, C-120 to C-C-124, C-127, C-129 to C-136, C-140, C-142, C-146, C-149, C-151, C-152, C-154 to C-160, C-162, C-165, C-168 to C-178, C-181, C-182, C-195, C-207, C-208 to C-211, C-222 to C-233, C-236, C-244, C249, C-250, CP-1, CP-2, CP-3, CP-4 dated 06/08/2022 with the attached Civil Plan Sheets C-5, C-6, C-12, C-13, C-15, C-20, C-27, C-31 to C-41, C-53, C-60, C-63, C-65, C-68, C-77, C-81, C-85, C-87, C-95, C-98, C-101, C-103, C-116, C-117, C-120 to C-C-124, C-127, C-129 to C-136, C-140, C-142, C-146, C-149, C-151, C-152, C-154 to C-160, C-162, C-165, C-168 to C-178, C-181, C-182, C-195, C-207, C-208 to C-211, C-222 to C-233, C-236, C-244, C249, C-250, CP-1, CP-2, CP-3, CP-4 dated 07/15/2022.

2. Replace Structural Plan Sheets S0.4, SA1.1, SA1.2, SA2.4, SA2.6, SA7.1 to SA7.13, SA7.16, SA7.18, SA8.1 to SA8.4, SA11.2, SA13.1, SA13.2, SB2.4, SB5.2, SB12.2 to SB12.4, SC2.5 to SC2.8, SC2.18, SC2.20, SC3.01, SC3.18, SC2.20, SC3.1, SC3.18, SC3.19, SD2.1, SD3.2, SD3.4, SD4.2, SD5.3 dated 06/08/2022 with the attached Structural Plan Sheets S0.4, SA1.1, SA1.2, SA2.4, SA2.6, SA7.1 to SA7.13, SA7.16, SA7.18, SA8.1 to SA8.4, SA11.2, SA13.1, SA13.2, SB2.4, SB5.2, SB12.2 to SB12.4, SC2.5 to SC2.8, SC2.18, SC2.20, SC3.01, SC3.18, SC2.20, SC3.1, SC3.18, SC3.19, SD2.1, SD3.2, SD3.4, SD4.2, SD5.3 dated 07/15/2022.

3. Replace Electrical Plan Sheets EA-1, EA-2, EA-6, EB-04, EB-14, EB-15, EB-19, EB-25, ED-01, ED-02, ED-06, ED-24, ED-32, ED-33, ED-34, EE-14, EE-17, EF-19, EG-01, EK-02, EK-05, EL-05, EL-06, EM-04, EM-05 dated 06/08/2022 with the attached Electrical Plan Sheets EA-1, EA-2, EA-6, EB-04, EB-14, EB-15, EB-19, EB-25, ED-01, ED-02, ED-06, ED-24, ED-32, ED-33, ED-34, EE-14, EE-17, EF-19, EG-01, EK-02, EK-05, EL-05, EL-06, EM-04, EM-05 dated 07/15/2022.

4. Add the attached Civil Plan Sheet C-179 dated 07/15/22.

5. Add the attached Structural Plan Sheets SD3.5 and SD3.6 dated 07/15/22.

D. ANSWERS TO QUESTIONS FROM PROSPECTIVE BIDDERS

1. Attached are RFIs and responses for your information.

Please acknowledge receipt of this Addendum No. 5 by recording the date of its receipt in the space provided on page P-4 of the Proposal.

Jade T. Butay
Director of Transportation

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SECTION 201 – CLEARING AND GRUBBING

Make the following amendments to said Section:

(I) Add the following paragraphs to Subsection **201.03(E) Grubbing**, after line 140, to read as follows:

"Grubbing shall consist of stripping the top 12 inches of the organically ladened soils and mixed with other vegetative matter. Soft and yielding areas encountered during clearing and grubbing below areas designated to receive fill shall be over-excavated to expose firm natural material, and the resulting excavation shall be backfilled with well-compacted fill. The stripped soils from grubbing and excavated soft soils shall be properly disposed of off-site.

Over-excavated subgrades and areas designated to receive fills exposing generally stiff materials shall be scarified to a minimum depth of 8 inches, moisture-conditioned to at least 4 percent above the optimum moisture content, and compacted to a minimum of 90 percent relative compaction. Relative compaction refers to the in-place dry density of soil expressed as a percentage of the maximum dry density of the same soil determined in accordance with AASHTO T-180 (or ASTM D1557). Optimum moisture is the water content (percentage by dry weight) corresponding to the maximum dry density.

Where shrinkage cracks (wider than 1/8-inch in width) are noted after compaction of the subgrade, the soil shall be prepared again as required above.

Saturation and subsequent yielding of the exposed subgrade due to inclement weather and poor drainage shall be over-excavated of the softened areas and replacement with well-compacted fill at no additional cost to the State, as directed by the Engineer."

(II) Amend **201.04 – Measurement** by revising lines 167 to 168 to read as follows:

"**201.04 Measurement.**

(A) The Engineer will measure clearing and grubbing per acre in accordance with the contract documents.

(B) The Engineer will only measure additional grubbing when requested by the Engineer on a force account basis in accordance with Subsection 109.06 – Force Account Provisions and Compensation."

(III) Amend **201.05 – Payment** by revising lines 170 to 179 to read as follows:

"**201.05 Payment.** The Engineer will pay for accepted pay items listed below at contract price per pay unit, as shown in the proposal schedule. Payment will be full compensation for the work prescribed in this section and the contract documents.

The Engineer will pay for the following pay items when included in the proposal schedule:

Pay Item	**Pay Unit**
Clearing and Grubbing	Acre
Additional Grubbing	Force Account

An estimated amount for force account is allocated in proposal schedule under 'Additional Grubbing', but actual amount to be paid will be the sum shown on accepted force account records, whether this sum be more or less than estimated amount allocated in proposal schedule. The Engineer will pay for additional grubbing requested by the Engineer that are beyond the scope of the original contract work on a force account basis. No progress payment will be authorized until the Engineer accepts additional grubbing in writing."

END OF SECTION 201

SECTION 203 – EXCAVATION AND EMBANKMENT

Make the following amendments to said Section:

(I) Amend **203.03(C)(2)(a) – Maximum Dry Unit Weight** from line 245 to line 255 to read as follows:

> "**(a) Maximum Dry Unit Weight.** Test for maximum dry unit weight according to AASHTO T 180, and apply the correction for fraction larger than 3/4 inch. Use Hawaii Test Method HDOT TM 5 for sample preparation of sensitive soils when so designated by the Engineer."

(II) Amend **203.03(C)(3) – Compaction of Cut Areas and Embankments With Moisture and Density Tests** from line 261 to line 284 to read as follows:

> **(3) Compaction of Cut Areas and Embankments With Moisture and Density Tests.** Prior to shaping and compacting, condition the on-site clayey soil to a moisture content of at least 4 percent above optimum moisture content determined in accordance with AASHTO T 180. Moisture condition embankment material and place in layers not to exceed 8 inches in loose thickness, and compact each layer of material as specified, before placement of next lift. Determine maximum density and relative compaction in accordance with Subsection 203.03(C)(2) – Relative Compaction Test.
>
> In-situ soil or embankment material contained in prism within 2 feet below subgrade and within width of traveled way, auxiliary lane, and shoulder on each side shall have relative compaction of 95 percent or more. When in-situ material within 2 feet below subgrade does not conform to specified moisture condition or the relative compaction, excavate and recompact material until specified moisture condition and relative compaction is achieved.
>
> Top 6 inches of in-situ material and embankment material below top 2 feet of subgrade, and beyond traveled way, auxiliary lane, and shoulder prism, shall have relative compaction of at least 90 percent. When in-situ material cannot be compacted to 90 percent, provide working platform to allow 90 percent compaction of first lift."

(III) Amend **203.04 – Measurement** by revising lines 345 to 366 to read as follows:

"**203.04 Measurement.**

(A) The Engineer will measure roadway excavation per cubic yard. The Engineer will compute quantities of roadway excavation by average end area method and centerline distances. Curvature correction will not be applied to quantities within roadway prism, as indicated in the contract documents. In computing excavation quantities from outside the roadway prism, where roadway centerline is used as a base, curvature correction will be applied when centerline radius is 1,000 feet or less.

When roadway excavation quantities by average end area method cannot be computed due to the nature of a particular operation or changed conditions, the Engineer will determine and use computation method that will produce an accurate quantity estimate.

(B) The Engineer will measure imported borrow per cubic yard in accordance with the contract documents. The Engineer will compute quantities of imported borrow incorporated into the work on a volume basis, using average end area method in place at work site.

(B) The Engineer will only measure over excavation, moisture conditioning and recompaction when requested by the Engineer on a force account basis in accordance with Subsection 109.06 – Force Account Provisions and Compensation."

(III) Amend **203.05 – Payment** by revising lines 368 to 457 to read as follows:

"**203.05 Payment.** The Engineer will pay for the accepted pay items listed below at the contract price per pay unit, as shown in the proposal schedule. Payment will be full compensation for the work prescribed in this section and the contract documents.

The Engineer will pay for each of the following pay items when included in the proposal schedule:

Pay Item	**Pay Unit**
Roadway Excavation	Cubic Yard

The Engineer will pay for:

(1) 15 percent of the contract bid price upon completion of obliterating old roadways and hauling.

(2) 30 percent of the contract bid price upon completion of preparing subgrade.

(3) 40 percent of the contract bid price upon completion of placing selected material in final position, rounding of slopes, and using water for compaction.

(4) 15 percent of the contract bid price upon completion of disposing of surplus excavation material.

Imported Borrow Cubic Yard

The Engineer will pay for accepted quantities of subexcavation, as roadway excavation at the contract unit price per cubic yard, when ordered by the Engineer, for work prescribed in Subsection 203.03(A)(4) – Subexcavation. Payment will be full compensation for the work prescribed therein and in the contract documents.

The Engineer will pay for accepted quantities of unlined gutter excavation as roadway excavation at the contract unit price per cubic yard, when gutter is located as follows: within median area of a divided highway; and between roadbed shoulder and adjacent cut slope. Payment will be full compensation for removing and disposing of excavated material; backfilling and compacting; and for the work prescribed in the contract documents.

The Engineer will not pay for stockpiling selected material, placing selected material in final position, or placing selected material in windrows along tops of roadway slopes for erosion control work, separately and will consider the cost as included in the unit prices for the various excavation contract pay items. The cost is for work prescribed in this section and the contract documents.

The Engineer will not pay for overhaul separately and will consider the cost as included in the unit prices for the various excavation contract pay items. The cost is for work prescribed in this section and the contract documents.

The Engineer will not pay for embankment separately and will consider the cost as included in the unit price for roadway excavation. The cost is for work prescribed in this section and the contract documents.

The Engineer will not pay for Non-Woven Geotextile Fabric (Mirafi 180N or approved equal) separately and will consider the cost as included in the unit price for roadway excavation. The cost is for work prescribed in this section and the contract documents.

Over Excavation, Moisture Condition and Recompaction Force Account

An estimated amount for force account is allocated in proposal schedule under ‘Additional Grubbing’, but actual amount to be paid will be the sum shown on accepted force account records, whether this sum be more or less than estimated amount allocated in proposal schedule. The Engineer will pay for additional grubbing requested by the Engineer that are beyond the scope of the original contract work on a force account basis. No progress payment will be authorized until the Engineer accepts additional grubbing in writing.”

END OF SECTION 203

SECTION 204 – EXCAVATION AND BACKFILL FOR MISCELLANEOUS FACILITIES

Make the following amendments to said Section:

(I) Amend **204.04 – Measurement** by revising lines 180 to 186 to read as follows:

"**204.04 Measurement.**

(A) The Engineer will measure trench excavation for Water Lines, Sewer Lines, and Gas Pipelines per cubic yard in accordance with the contract documents.

(B) The Engineer will measure trench backfill for Water Lines, Sewer Lines, and Gas Pipelines per cubic yard in accordance with the contract documents.

(II) Amend **204.05 – Payment** by revising lines 196 to 200 to read as follows:

" **Pay Item**	**Pay Unit**
Trench Excavation for Water Lines	Cubic Yard
Trench Backfill for Water Lines	Cubic Yard
Trench Excavation for Sewer Lines	Cubic Yard
Trench Backfill for Sewer Lines	Cubic Yard"

END OF SECTION 204

Add Section 316 – Polypropylene Biaxial Geogrid to read as follows:

"**SECTION 316 – POLYPROPYLENE BIAXIAL GEOGRID**

316.01 Description. This work includes furnishing and placing polypropylene biaxial geogrid over a non-woven geotextile fabric.

316.02 Material. The grid material shall meet the following:

The biaxial geogrid shall be a punched and drawn polypropylene geogrid with the following characteristics based on the minimum average roll values (MARV):

- Aperature Dimensions = 1 to 1.3 inches
- Minimum Rib Thickness = 0.05 inch
- Tensile Strength at 2% Strain (ASTM D6637-01) = 380 lb/ft in machine direction, 510 lb/ft in cross-machine direction
- Tensile Strength at 5% Strain (ASTM D6637-01) = 720 lb/ft in machine direction, 1,000 lb/ft in cross-machine direction
- Ultimate Tensile Strength (ASTM D6637-01) = 1,400 lb/ft in machine direction, 1,610 lb/ft in cross-machine direction
- Junction Efficiency (GRI-GG2-05) = 93%
- Flexural Stiffness (ASTM D5732-01) = 750,000 mg-cm
- Aperture Stability (U.S. Army Corps of Engineers Methodology for measurement of Torsional Rigidity) = 0.48 m-N/deg
- Resistance to Installation Damage in Gravel = 75%
- Resistance to Long Term Degradation (EPA 9090 immersion test) = 100%
- Resistance to UV Degradation (500 hours of UV in accordance with ASTM D4355-05) = 100%

316.03 Construction Requirements.

Place geogrid onto the geotextile fabric.

The geogrid material shall have a minimum overlap of 12 inches for transverse joints. The means and methods to attain this minimum overlap is the responsibility of the Contractor. However, one method could involve flapping the geogrids upwards and placing temporary fill that is easier to remove when excavating the adjacent area.

Due to constructability issues, overlaps are not required for the longitudinal joints between lanes.

316.04 Method of Measurement. The Engineer will measure geogrid per square yard of geogrid finished surface, not including overlaps.

316.05 Basis of Payment. The Engineer will pay for the accepted geogrid at the contract unit price per square yard. Payment will be full compensation for the work prescribed in this section and the contract documents

The Engineer will pay for the following pay item when included in the proposal schedule::

Pay Item	**Pay Unit**
Polypropylene Biaxial Geogrid	Square Yard”

END OF SECTION 316

Amend Section 401- HOT MIX ASPHALT (HMA) PAVEMENT to read as follows:

"SECTION 401 – HOT MIX ASPHALT (HMA) PAVEMENT

401.01 Description. This section describes furnishing and placing dense graded HMA pavement (herein referred to as HMA) on a prepared surface.

401.02 Materials.

Asphalt Cement (PG 64-16)	702.01(A)

Use for non-surface mixes, unless otherwise specified in the project documents.

Asphalt Cement (PG 64E-22)	702.01(B)

Use for all surface mixes, except for on Lanai and Molokai, and unless otherwise specified in the project documents. Polymer modified asphalt (PMA) pavement refers to asphalt mix using PG 64E-22, unless otherwise indicated.

Emulsified Asphalt	702.04
Warm Mix Asphalt Additive	702.06
Aggregate for Hot Mix Asphalt Pavement	703.09
Filler	703.15
Hydrated Lime or a liquid anti-strip approved by the engineer	712.03

(A) General. HMA pavement shall be plant mixed and shall include mixture of aggregate and asphalt binder and may include reclaimed asphalt pavement (RAP) or filler, or both.

The manufacture of HMA may include warm mix asphalt (WMA) processes in accordance with these specifications. WMA processes include combinations of organic additives, chemical additives, and foaming.

HMA pavement shall include surface course and may include one or more binder courses, depending on HMA pavement thickness indicated in the contract documents.

RAP is defined as removed or reprocessed pavement materials containing asphalt and aggregates. Process RAP by crushing until 100 percent of RAP passes 3/4-inch sieve. Size, grade uniformly, and combine materials such that blend of RAP and aggregate material conforms to grading requirements of Subsection 703.09 - Aggregate for Hot Mix Asphalt

Pavement.

In surface and binder courses, aggregate for HMA may include RAP quantities up to 20 percent of total mix weight.

Quantity of filler material to correct deficiencies in aggregate gradation passing the No. 200 sieve shall not exceed 3 percent by weight of fine aggregates.

(B) Job-Mix Formula and Tests. Design job-mix formula in accordance with procedures contained in current edition of Asphalt Institute's *Mix Design Methods for Asphalt Concrete and Other Hot Mix Types,* Manual Series No. 2 (MS-2) for either Marshall Method or Hveem Method of Mix Design.

Limit compacted lift thickness and asphalt content of job-mix formula as specified in Table 401.02-1 - Limits of Compacted Lift Thickness and Asphalt Content.

TABLE 401.02-1 - LIMITS OF COMPACTED LIFT THICKNESS AND ASPHALT CONTENT

MIX NO.	II	III	IV	V
Minimum to Maximum Compacted Thickness for Individual Lifts (Inches)	2-1/4 to 3	2 to 3	1-1/2 to 3	1-1/4 to 3
Asphalt Content Limits (Percent of Total Weight of Mix)	3.8 to 6.1	4.3 to 6.1	4.3 to 6.5	4.8 to 7.0

Asphalt content limits for porous aggregate may be exceeded only if it is requested ahead of placement and is reviewed then accepted in writing by the Engineer.

Meet job-mix formula design criteria specified in Table 401.02-2 - Job-Mix Formula Design Criteria.

TABLE 401.02-2 - JOB-MIX FORMULA DESIGN CRITERIA	
Hveem Method Mix Criteria (AASHTO T 246 and AASHTO T 247)	
Stability, minimum	37
Air Voids (percent)[1]	3 - 5
Marshall Method Mix Criteria (AASHTO T 245)	
Compaction (number of blows each end of specimen)	75
Stability, minimum (pounds)	1,800
Flow (x 0.01 inch)	8 - 16
Air Voids (percent)[1]	3 - 5
Notes: 1. Air Voids: AASHTO T 166 or AASHTO T 275; AASHTO T 209, AASHTO T 269.	

Minimum percent voids in mineral aggregates (VMA) of job-mix formula shall be as specified in Table 401.02-3 - Minimum Percent Voids in Mineral Aggregates (VMA).

TABLE 401.02-3 - MINIMUM PERCENT VOIDS IN MINERAL AGGREGATES (VMA)					
Nominal Maximum Particle Size, (Inches)	1-1/2	1	3/4	1/2	3/8
VMA, (percent)[1]	11.0	12.0	13.0	14.0	15.0
Notes: 1. VMA: See Asphalt Institute Manual MS-2					

(C) Submittals. Establish and submit job-mix formula for each type of HMA pavement mix indicated in the contract documents a minimum of 30 days before paving production. Job mix shall include the following applicable information:

(1) Design percent of aggregate passing each required sieve size.

(2) Design percent of asphalt binder material (type determined by type of mix) added to the aggregate (expressed as % by weight of total mix),

(3) Design proportion of processed RAP.

(4) Design temperature of mixture at point of discharge at paver.

(5) Source of aggregate.

(6) Grade of asphalt binder.

(7) Test data used to develop job-mix formula.

Except for item (4) in this subsection, if design requirements are modified after the Engineer accepts job-mix formula, submit new job-mix formula before using HMA produced from modified mix design. Submit any changes to the design temperature of mixture at point of discharge for acceptance by the Engineer.

Submit a certificate of compliance for the asphalt binder, accompanied by substantiating test data from a certified testing laboratory.

(D) Range of Tolerances for HMA. Provide HMA within allowable tolerances of accepted job mix formula as specified in Table 401.02-4 - Range of Tolerances HMA. These tolerances are not to be used for the design of the job mix, they are solely to be used during the testing of the production field sample of the HMA mix.

TABLE 401.02-4 - RANGE OF TOLERANCES HMA	
Passing No. 4 and larger sieves (percent)	± 7.0
Passing No. 8 to No. 100 sieves (inclusive) (percent)	± 4.0
Passing No. 200 sieve (percent)	± 3.0
Asphalt Content (percent)	± 0.4
Mixture Temperature (degrees F)	± 20

The tolerances shown are the allowable variance between the physical characteristics of laboratory job mix submitted mix design and the production or operational mix, i.e., field samples.

401.03 Construction.

(A) Weather Limitations. Placement of HMA shall not be allowed under the following conditions:

(1) On wet surfaces, e.g., surface with ponding or running water, surface that has aggregate or surface that appears beyond surface saturated dry, as determined by the Engineer.

(2) When air temperature is below 50 degrees F and falling. HMA may be applied when air temperature is above 40 degrees F and rising. Air temperature will be measured in shade and away from artificial heat.

(3) When weather conditions prevent proper method of construction.

(B) Equipment.

(1) Mixing Plant. Use mixing plants that conform to AASHTO M 156, supplemented as follows:

(a) All Plants.

1. Automated Controls. Control proportioning, mixing, and mix discharging automatically. When RAP is incorporated into mixture, provide positive controls for proportioning processed RAP.

2. Dust Collector. AASHTO M 156, Requirements for All Plants, Emission Controls is amended as follows:

Equip plant with dust collector. Dispose of collected material. In the case of baghouse dust collectors, dispose of collected material or return collected material uniformly.

3. Modifications for Processing RAP. When RAP is incorporated into mixture, modify mixing plant in accordance with plant manufacturer's recommendations to process RAP.

(b) Drum Dryer-Mixer Plants.

1. Bins. Provide separate bin in cold aggregate feeder for each individual aggregate stockpile in mix. Use bins of sufficient size to keep plant in continuous operation and of proper design to prevent overflow of material from one bin to another.

2. Stockpiling Procedures. Separate aggregate for Mix II, Mix III and Mix IV into at least three stockpiles with different gradations as follows: coarse, intermediate, and fine. Separate aggregates for Mix V into at least two stockpiles. Stockpile RAP separately from virgin aggregates.

3. Checking Aggregate Stockpile. Check condition of the aggregate stockpile often enough to ensure that the aggregate is in optimal condition.

(c) Batch and Continuous Mix Plants.

1. Hot Aggregate Bin. Provide bin with three or more separate compartments for storage of screened aggregate fractions to be combined for mix. Make partitions between compartments tight and of sufficient height to prevent spillage of aggregate from one compartment into another.

2. Load Cells. Calibrated load cells may be used in batch plants instead of scales.

(2) Hauling Equipment. Use trucks that have tight, clean, smooth metal beds for hauling HMA.

Thinly coat truck beds with a minimum quantity of non-stripping release agent to prevent mixture from adhering to beds. Diesel or petroleum-based liquid release agents, except for paraffin oil, shall not be used. Drain excess release agent from truck bed before loading with HMA.

Provide a designated clean up area for the haul trucks.

Equip each truck with a tarpaulin conforming to the following:

(a) In good condition, without tears and holes.

(b) Large enough to be stretched tightly over truck bed, completely covering mix. The tarpaulin shall be secured in such a manner that it remains stretched tightly over truck bed and HMA mix until the bed is about to be raised up in preparation for discharge.

(3) Asphalt Pavers. Use asphalt pavers that are:

(a) Self-contained, power-propelled units.

(b) Equipped with activated screed or strike-off assembly, heated if necessary.

(c) Capable of spreading and finishing courses of HMA mixtures in lane widths applicable to typical section and thicknesses indicated in the contract documents.

(d) Equipped with receiving hopper having sufficient capacity for uniform spreading operation.

(e) Equipped with automatic feed controls to maintain uniform depth of material ahead of screed.

(f) Equipped with automatic screed controls with sensors capable of sensing grade from outside reference line, sensing transverse slope of screed, and providing automatic signals to control screed grade and transverse slope.

(g) Capable of operating at constant forward speeds consistent with satisfactory laying of mixture.

(h) Equipped with a means of preventing the segregation of the coarse aggregate particles from the remainder of the bituminous plant mix when that mix is carried from the paver hopper back to the paver augers. The means and methods used shall be approved by the paver manufacturer and may consist of chain curtains, deflector plates, or other such devices and any combination of these.

The following specific requirements shall apply to the identified bituminous pavers:

1. **Blaw-Knox Bituminous Pavers.** Blaw-Knox bituminous pavers shall be equipped with the Blaw-Knox Materials Management Kit (MMK).

2. **Cedarapids Bituminous Pavers.** Cedarapids bituminous pavers shall be those that were manufactured in 1989 or later.

3. Barber-Green/Caterpillar Bituminous Pavers. Barber-Green/Caterpillar bituminous pavers shall be equipped with deflector plates as identified in the December 2000 Service Magazine entitled “New Asphalt Deflector Kit {6630, 6631, 6640}”.

Bituminous pavers not listed above shall have similar attachments or designs that shall make them equivalent to the bituminous pavers listed above. The Engineer will solely decide if it is equal to or better that the setups described for the equipment listed above.

Submit for review and acceptance, prior to the start of using the paver for the placing of plant mix, a full description in writing of the means and methods that will be used to prevent the bituminous paver from having both aggregate and temperature segregation. Use of any paver that has not been accepted is prohibited until acceptance of the paver is received from the Engineer. Any pavement placed with an unaccepted paver will be regarded as not compliant work and may not be paid for and may require removal.

Supply a Certificate of Compliance that verifies that the manufacturer’s approved means and methods used to prevent bituminous paver from having both aggregate and temperature segregation have been implemented on all pavers used on the project and are working in accordance with the manufacturer’s requirements and Contract Documents.

(4) Rollers. Rollers shall be self-propelled, steel-tired tandem, pneumatic-tired, or vibratory-type rollers capable of reversing without shoving or tearing the just placed HMA mixture. Provide sufficient number, sequencing, type, and rollers of sufficient weight to compact the mixture to required density while mixture is still in workable condition unless otherwise indicated. Equipment shall not excessively crush aggregate. Operate rollers in accordance with manufacturer's recommendations and Contract Documents. The use of intelligent compaction is encouraged and may be required elsewhere in the Contract Documents.

(a) Steel-Tired Tandem Rollers. Steel-tired tandem rollers used for initial breakdown or intermediate roller passes shall have minimum gross weight of 12 tons and shall provide minimum 250-pound weight per linear inch of width on drive wheel.

Steel-tired tandem rollers used for finish roller passes shall have minimum total gross weight of 3 tons.

Do not use roller with grooved or pitted rolling drum or worn scrapers or wetting pads. Replace excessively worn scrapers and wetting pads before use.

(b) Pneumatic-Tired Rollers. Pneumatic-tired rollers shall be oscillating-type, equipped with smooth-tread pneumatic tires of equal size and diameter. Maintain tire pressure within 5 pounds per square inch of designated operational pressure when hot. Space tires so that gaps between adjacent tires are covered by following set of tires.

Pneumatic-tired rollers used for breakdown or intermediate roller passes shall have a ballast capable of establishing an operating weight per tire of not less than 3,000 pounds. Equip rollers with tires having minimum 20-inch wheel diameter with tires inflated to 70 to 75 pounds per square inch pressure when cold and 90 pounds per square inch when hot. Equip rollers with skirt-type devices to maintain temperature of tires during rolling operations.

Pneumatic-tired rollers used for kneading finished asphalt surfaces shall have a ballast capable of establishing an operating weight per tire of not less than 1,500 pounds. Equip rollers with tires having minimum 15-inch wheel diameter with tires inflated to 50 to 60 pounds per square inch pressure. If required, equip rollers with skirt-type devices to maintain temperature of tires during rolling operations.

(c) Vibratory Rollers. Vibratory rollers shall be steel-tired tandem rollers having minimum total weight of 3 tons. Equip vibratory rollers with amplitude and frequency controls and speedometer. Operate vibratory roller in accordance with manufacturer's recommendations. For very thin lifts, 1 inch or less in thickness, vibratory rollers shall not be used in the vibratory mode. Instead, operate the unit in the static mode.

(5) Hand Tools. Keep hand tools used in production, hauling, and placement of HMA clean and free of contaminants. Diesel or mineral spirits or other cleaning material that is potentially deleterious to HMA may be used to clean hand tools providing:

(a) It does not contaminate HMA with cleaning material.

(b) Clean hand tools over catch pan with capacity to hold all the cleaning material.

(c) Remove all diesel or mineral spirits or other cleaning material that is potentially deleterious to HMA from hand tools before using with HMA.

(d) Hand tools used shall be in a condition such that it meets the requirements that it was manufactured for, e.g., a straightedge shall meet the straightness requirement of the manufacturer.

(6) Material Transfer Vehicle (MTV).

(a) Usage. MTV usage applies to surface courses of paving projects on all Islands except Lanai, unless otherwise indicated. When placing HMA surface course use MTV to independently deliver mixtures from hauling equipment to paving equipment. MTV usage will not be required for the following:

1. Projects with less than 1,000 tons of HMA.

2. Temporary pavements.

3. Bridge deck approaches.

4. Shoulders.

5. Tapers.

6. Turning lanes.

7. Driveways.

8. Areas with low overhead clearances.

(b) Equipment. When using MTV, install minimum 10-ton-capacity hopper insert in conventional paver hopper. Provide the following equipment:

1. High-capacity truck unloading system in MTV capable of receiving HMA from hauling equipment.

2. MTV storage bin with minimum 15-ton capacity.

3. An auger mixing system in one of the following:

the MTV storage bin, or paver hopper insert, or paver hopper to continuously mix HMA prior to discharging to the paver's conveyor system.

Avoid stop-and-go operations by coordinating plant production rate, number of haul units, and MTV and paver speeds to provide a continuous, uniform, segregation-free material flow and smooth HMA pavement. Maintain uniform paver speed to produce smooth pavements.

(c) Performance Evaluation. Evaluate the performance of MTV and mixing equipment by measuring mat temperature profile immediately behind paver screed on first day of paving and when it feels the need to do so due to perceived changes in performance or as directed by the Engineer.

Use a hand-held temperature device that has been calibrated within the past 12 months. It shall be an infrared temperature gun is capable of measuring in one degree or finer increments between the temperatures of 80 degrees to 400 degrees F with a laser to indicate where the temperature reading is being taken. Six temperature profile measurements shall be taken of mat surface using infrared temperature gun at 50-foot intervals behind paver. Each temperature profile shall consist of three surface temperature measurements taken transversely across the mat in approximately a straight line from screed while paver is operating. For each profile, temperatures shall be measured approximately 1 foot from each edge and in middle of mat. The difference between maximum and minimum temperature measurements for each temperature profile shall not exceed 10 degrees F. If any two or more temperature profiles exceeds the allowable 10-degree F temperature differential, halt paving operation and adjust MTV or mixing equipment to ensure that material placed by paver meets specified temperature requirements. Redo the measuring of mat temperature profile until adjustment of the MTV or mixing equipment is adequate. Submit all temperature profiles to the Engineer by next business day. Information on the report shall show location and temperature readings and time test was performed. Enough information shall be given, so the Engineer will be able to easily locate the test site of the individual measurement.

When requested temperature profile measurements shall be done in the presence of the Engineer.

Once adjustments are made, repeat measurement procedure for the next two placements to verify that material placed by paver meets specified temperature requirements. Terminate paving if temperature profile requirements are not met during repeated measurement procedure. If equipment fails to meet requirements after measurement procedure is repeated once, replace equipment before conducting any further temperature profile measurements

The Engineer may perform surface temperature profile measurements at any time during project. The Engineer may in lieu of a hand-held infrared temperature device use an infrared camera or device that is capable of measuring temperatures to locate cold spots. If such cold spots exist, the Engineer may require adjustments to the MTV.

If bleeding or fat spots occur in the pavement adjust means and methods to eliminate such pavement defects and perform remedial repair to pavement acceptable to the Engineer. Bleeding is defined as excess binder occurring on the surface of the pavement. It may create a shiny, glass-like, reflective appearance and may be tacky to the touch. Fat spots are localized bleeding.

(d) Transport.

1. Trailered MTV. Transport MTV by means of truck-tractor/trailer combination in accordance with Chapter 104 of Title 19, Department of Transportation, entitled “The Movement by Permit of Oversize and Overweight Vehicles on State Highways”.

2. Crossing Bridges for Self-Powered MTV. When self-powered MTV exceeds legal axle or total weight limits for vehicles under the HRS, Chapter 291, conform to the following when crossing bridges within project limits unless otherwise indicated:

a. Completely remove mix from MTV.

b. Move MTV at relatively constant speed not exceeding 5 miles per hour. MTV will not be allowed to stop on bridge.

c. No other vehicle or equipment will be allowed on bridge.

d. The MTV shall not attempt to cross a bridge where the posted load limit is less than or equal to the weight of the MTV empty. Permission to cross the bridge shall be obtained from the Engineer and HWY-DB in writing.

(C) Preparation of Surface. Clean existing pavement in accordance with Section 310 - Brooming Off. Apply tack coat in accordance with Section 407 - Tack Coat. Tack coat shall not be applied to surfaces to receive an application of joint adhesive.

Where indicated, bring irregular surfaces to uniform grade and cross section by furnishing and placing one or more leveling courses of HMA Mix V. Spread leveling course in variable thicknesses to eliminate irregularities in existing surface. Place leveling course such that maximum depth of each course, when thoroughly compacted to the Contract Documents' requirements, does not exceed 3 inches.

In multiple-lift leveling course construction, spread subsequent lifts beyond edges of previously spread lifts in accordance with procedures contained in current edition of the Asphalt Institute's *Construction of Hot Mix Asphalt Pavements,* Manual Series No. 22 (MS-22) for leveling wedges.

Notify the Engineer of existing surfaces that may not be in a condition that will have enough strength to be a good bonding surface or foundation and should be removed or have remedial repairs done before new pavement placement.

(D) Plant Operation.

(1) Preparation of Asphalt Binder. Uniformly heat asphalt binder and provide continuous supply of heated asphalt cement from storage to mixer. Do not heat asphalt binder above the recommendation of the supplier for modified binders or above 350 degrees F for neat binders.

(2) Preparation of Aggregate. Dry and heat aggregate material at temperature sufficient to produce design temperature of job-mix formula. Do not exceed 350 degrees F. Adjust heat source used for drying and heating to avoid damage to and contamination of aggregate. When dry, aggregate shall not contain more than 1 percent moisture by weight.

For batch plants, screen aggregates immediately after heating and drying into three or more fractions. Convey aggregates into separate compartments ready for batching and mixing with asphalt binder.

(3) Mixing. Measure aggregate and asphalt; or aggregate, RAP, and asphalt into mixer in accordance with an accepted job-mix formula. Mix until components are completely mixed and adequately coated with asphalt binder in accordance with AASHTO M 156. Percent of coated particles shall be 95 percent when tested in accordance with AASHTO T 195.

(4) Plant Inspection. For control and acceptance testing during periods of production, provide a testing laboratory that meets the requirements of AASHTO M 156. Provide space, utilities, and equipment required for performing specified tests.

(E) Spreading and Finishing. Prior to each day's paving operation, check screed or strike-off assembly surface with straight edge to ensure straight alignment and there is no damage or wear to the machine that will affect performance. Provide screed or strike-off assembly that produces finished surface without tearing, shoving, and gouging HMA. Discontinue using spreading equipment that leaves ridges, indentations, or other marks, or combination thereof in surface that cannot be eliminated by rolling or affects the final smoothness of the pavement or be prevented by adjustment in operation.

Maintain HMA at minimum 250 degrees F temperature at discharge to paver. The Engineer shall observe the contractor measuring the temperature of mix in hauling vehicle just before depositing into spreader or paver or MTV.

Deposit HMA in a manner that minimizes segregation. Raise truck beds with tailgates closed before discharging HMA.

Lay, spread, and strike off HMA upon prepared surface. Where practical, use asphalt pavers to distribute mixture.

Where practical, control horizontal alignment using automatic grade and slope controls from reference line, slope control device. Existing pavements or features shall not be used for grade control alone.

Obtain sensor grade reference, horizontal alignment by using established grade and slope controls. For subsequent passes, substitution of one ski with joint-matching shoe riding on finished adjacent pavement is acceptable. Use of a comparable non-contact mobile reference system and joint matching shoe is acceptable.

Avoid stop-and-go operation. Maintain a constant forward speed of paver during paving operation and minimize other methods that impact smoothness.

Offset longitudinal joint in successive lifts by approximately 6 inches. Incorporate into paving method an overlap of material of 1-inch +/- 0.5 inches at the longitudinal joint. The HMA overlap material shall be left alone when initially placed and shall not be bumped back or pushed back with a lute or any other hand-held device. If the overlap exceeds the maximum amount, remove the excess with a flat shovel, allowing recommended amount of overlap HMA material to remain in place to be compacted. Do not throw the removed excess HMA material on to the paving mat. The longitudinal joint in a surface course when total roadway width is comprised of two lanes shall be near the centerline of pavement or near lane lines when roadway is more than two lanes in width. The longitudinal joint shall not be constructed in the wheel path or under the longitudinal lane lines. Make a paving plan drawing showing how the longitudinal joint will not be located in these areas.

Control the horizontal alignment of the longitudinal edge of the HMA mat being installed so that the edge is parallel to the centerline or has a uniform alignment, e.g., the edge of the mat is straight line or uniform curve, no wavy edge, etc. to have a consistent amount of HMA material at the joint.

Check the compaction of the longitudinal joint during paving often enough to ensure that it will meet the compaction requirements.

If nuclear gauges and ground penetrating radar are used as the contractor’s quality control method, they shall be properly calibrated and periodically checked by comparison to cores taken from the pavement. The use of sand as an aid in properly seating the gauge may also be considered for improving the accuracy of the gauge.

In areas where irregularities or unavoidable obstacles make use of mechanical spreading and finishing equipment impracticable, spread, rake, and lute mixture by hand tools. For such areas, deposit, spread evenly, and screed mixture to required compacted thickness.

Demonstrate competence of personnel operating grade and crown control device before placing surface courses. If automatic control system becomes inoperative during the day's work, the Engineer will permit the Contractor to finish day's work using manual controls. The Engineer may also allow additional HMA to be ordered and placed using manual controls if it will provide a safer work site for the public to travel through. Do not resume work until automatic control system is made operative. The Engineer may waive requirement for electronic screed control device when paving gores,

shoulders, transitions, and miscellaneous reconstruction areas where the use of the devices is not practical.

When production of HMA can be maintained and when practicable, use pavers in echelon shall be used to place surface course in adjacent lanes.

At the end of each workday, HMA pavement that is open to traffic shall not extend beyond the panel of the adjacent new lane pavement by more than the distance normally placed in one workday. At end of each day's production, construct tapered transitions along all longitudinal and transverse pavement drop-offs; this shall apply to areas where existing pavement is to meet newly placed pavement. Use slopes of 6:1 for longitudinal taper transitions and 48:1 for transverse tapered transitions. Maximum drop-off height along the joints shall be 2 inches. Also, using a 48:1 slope provides a taper around any protruding object, e.g., manholes, drain boxes, survey monuments, inlets, etc., that may be above pavement surface when opened to the public. If the object is below the surface of the pavement then fill the depression until it is level with the surrounding pavement or raise depressed objects to the finish grade of the placed pavement. Remove and dispose of all transition tapers before placing adjoining panel or next layer of HMA. Notify traveling public of pavement drop-offs or raised objects with signs placed in every direction of traffic that may use and encounter pavement drop-offs or protruding objects or holes.

Use the same taper rates for areas where there is a difference in elevation due to construction work.

At end of each workweek, complete full width of the roadway’s pavement, including shoulders, to same elevation with no drop-offs.

(F) Compaction. Immediately after spreading and striking off HMA and adjusting surface irregularities, uniformly compact mixture by rolling.

Initiate compaction at highest mix temperature allowing compaction without excessive horizontal movement. Temperature shall not be less than 220 degrees F.

Finish rolling using tandem roller while HMA temperature is at or above 175 degrees F.

On superelevated curves, begin rolling at lower edge and progress to higher edge by overlapping of longitudinal trips parallel to centerline.

If necessary, repair damage immediately using rakes and fresh mix. Do not displace line and grade of HMA edges during rolling.

Keep roller wheels properly moistened with water or water mixed with small quantities of detergent. Use of excess liquid, diesel, and petroleum-based liquids will not be allowed on rollers.

Along forms, curbs, headers, walls and other places not accessible to rollers, compact mixture with hot hand tampers, smoothing irons, or mechanical tampers. On depressed areas, trench roller or cleated compression strips under roller may be used to transmit compression.

Before the start of compaction or during compaction or both remove pavement that is loose, broken, or contaminated, or combination thereof; pavement that shows an excess or deficiency in asphalt binder content; and pavement that is defective in any way. Replace with fresh HMA pavement of same type, and compact. Remove and replace defective pavement and compact at no increase in contract price or contract time.

Operate rollers at slow and uniform speed with no sudden stops. The drive wheels shall be nearest to the paver. Continue rolling to attain specified density and until roller marks are eliminated.

Rollers shall not be parked on the pavement placed that day or shift.

(1) HMA Pavement Courses One and a Half Inches Thick or Greater. Where HMA pavement compacted thickness indicated in the Contract Documents is 1-1/2 inches or greater, compact to not less than 93.0 percent nor greater than 97.0 percent of the maximum specific gravity determined in accordance with AASHTO T 209, modified by deletion of Supplemental Procedure for Mixtures Containing Porous Aggregate.

Place HMA pavement in individual lifts that are within minimum and maximum allowable compacted thickness for various types of mixture as specified in Table 401.02-1 - Limits of Compacted Lift Thickness and Asphalt Content.

(2) HMA Pavement Courses Less Than One and a Half Inches Thick. Where HMA pavement compacted thickness indicated in the contract documents is less than 1-1/2 inches, compaction to a specified density will not be required.

Use only non-vibratory, steel-tired, tandem roller. Roll entire surface with minimum of two roller passes. A roller pass is defined as one trip of the roller in one direction over any one spot.

For intermediate rolling, roll entire surface with minimum of four

passes of roller.

Finish rolling using steel-tired, tandem roller. Continue rolling until entire surface has been compacted with minimum of three passes of roller, and roller marks have been eliminated.

Do not use rollers that will excessively crush aggregate.

(3) HMA Pavement Courses One and a Half Inches Thick or Greater In Special Areas Not Designated For Vehicular Traffic. For areas such as bikeways that are not part of roadway and other areas not subjected to vehicular traffic, compact to not less than 90.0 percent of maximum specific gravity determined in accordance with AASHTO T 209, modified by deletion of Supplemental Procedure for Mixtures Containing Porous Aggregate. Increase asphalt content by at least 0.5 percent above that used for HMA pavements designed for vehicular traffic. Paved shoulders shall be compacted in the same manner as pavements designed for vehicular traffic.

(G) Joints, Trimming Edges and Utility Marking. At HMA pavement connections to existing pavements, make joints vertical to depth of new pavement. Saw cut existing pavement and cold plane in accordance with Section 415 - Cold Planing of Existing Pavement to depth equal to thickness of surface course or as indicated in the Contract Documents.

At HMA connections to previously placed lifts, form transverse joints by cutting back on previous run to expose full depth of course. Dispose of material trimmed from edges. Protect end of freshly laid mixture from rollers.

Before and after paving, identify and mark location of existing utility manholes, valves, and handholes on finished surface. Adjust existing frames and covers and valve boxes to final pavement finish grade in accordance with Section 604 - Manholes, Inlets and Catch Basins and Section 626 - Manholes and Valve Boxes for Water and Sewer Systems.

(1) Longitudinal joints. Submit for review the means and methods that will be used to install longitudinal joints at the required compaction and density. Compact longitudinal joints to be not less than 91.0 percent of the maximum specific gravity determined in accordance with AASHTO T 209, modified by deletion of Supplemental Procedure for Mixtures Containing Porous Aggregate. Verify the compaction of the longitudinal joints meets requirements by using non-destructive testing methods during paving and submit the results on the daily quality control test reports.

Test for compaction and density regardless of layer thickness.

Compaction and density of the longitudinal joint shall be determined by using six-inch diameter cores. For longitudinal joints made using butt joints cores shall be taken over the joint with half of the core being on each side of the joint. For longitudinal joints using butt wedge joints, center core over the center of the wedge so that 50 percent of the material is from the most recently paved material and the remaining 50 percent of the core is from the material used to pave the previous layer. One core shall be taken at a maximum of every 250 tons of longitudinal joint and any fraction of that length for each day of paving with a minimum of one core taken for each longitudinal joint per day. Cores taken for the testing of the longitudinal joint may be used to determine pavement thickness.

When the longitudinal joints are found to have less than 91.0 percent of the maximum specific gravity, overband all longitudinal joints within the entire lot represented by the non-compliant core, PG binder seal coat, or other type of joint enrichment accepted by the Engineer. The overband shall not decrease the skid resistance of the pavement under any ambient weather condition. Submit overband material's catalog cuts, test results and application procedure for review and acceptance by the Engineer before use. Center the overband over the longitudinal joint. The overband shall be placed in a uniform width and horizontal alignment. The overband shall have no holidays or streaking in its placement. The width of the overband shall be based on how the longitudinal joint was constructed or as directed by the Engineer. If a butt joint is used, the overband width shall be a minimum of 12-inches. For butt wedge or wedge joints the overband width shall be the width of the wedge plus an additional six-inches minimum. Replace any pavement markings damaged or soiled by the overband remedial repair process.

For longitudinal joints that have a compaction of less than 89 percent of the maximum specific gravity; removal may be required by the Engineer instead of overbanding the non-compliant joint.

Persistent low compaction results may be cause to suspend work and remove non-conforming work. During the suspension of paving, revise means and methods used in constructing longitudinal joints and submit to the Engineer for review and acceptance. Suspension may occur when:

(1) Two or more longitudinal joints tests fail to meet the minimum compaction

(2) One sample reveals that the joint compaction is 89 percent or less.

Compaction results for longitudinal joints until January 1, 2023 will not be included in any Sliding Scale Pay Factor for Compaction payment calculation. After, January 1, 2023 it will be included.

(H) HMA Pavement Samples. Obtain test samples from compacted HMA pavement within 72 hours of lay down. Provide minimum 4-inch diameter cores consisting of undisturbed, full-depth portion of compacted mixture taken at locations designated by the Engineer in accordance with the "Sampling and Testing Guide for Acceptance and Verification" in Hawaii DOT Highways Division, *Quality Assurance Manual for Materials*, Appendix 3. Cores shall be taken in the presence of the Engineer. Turn cores over to Engineer immediately after cores have been taken.

For pavement samples for longitudinal joints provide 6-inch diameter cores minimum. For pavement samples for other than longitudinal joints 4-inch diameter cores minimum shall be taken. All cores shall consist of undisturbed, full-depth of the lift of the compacted mixture taken at locations designated by the Engineer in accordance with the "Sampling and Testing Guide for Acceptance and Verification" in Hawaii DOT Highways Division, *Quality Assurance Manual for Materials*, appendix 3. Coring of longitudinal joints shall use a modified HDOT Sampling and Testing Guide as required by the Contract Documents.

Cores that separate shall indicate to the Engineer that there is insufficient bonding of layers. Modify the previously used paving means and methods to prevent future debonding of layers. Debonding of a core sample after adjustment of the Contractor's methods will be an indication of continued non-conforming work and the Engineer may direct removal of the layer at no additional cost or contract time.

Restore HMA pavement immediately after obtaining samples. Clean core hole and walls of all deleterious material that will prevent the complete filling of the core hole and the bonding of the new HMA to the existing. Apply tack coat to vertical faces of sample holes. Fill sampled area with new HMA pavement of same type as that removed. If hand compaction is used; fill in layers not exceeding the minimum thickness stated in Table 401.02-1 - Limits of Compacted Lift Thickness And Asphalt Content. Compact each layer to compaction requirements. If Mechanical Compaction methods are used, then layers may be the maximum layer thickness stated in Table 401.02-1 - Limits of Compacted Lift Thickness And Asphalt Content. Using tires or hand tamping to compact the HMA material to restore the pavement shall not be considered as mechanical compaction.

Only sample and test leveling course if 1-1/2 inches or greater. No compaction requirements for less than 1-1/2 inches.

(I) HMA Pavement Thickness Tolerances.

The Engineer will measure thickness of pavement by cores obtained

by the Contractor in accordance with HDOT TM 09-19 Field Sampling Bituminous Material after Compaction (Obtaining Cores). The Engineer will measure cores in accordance with HDOT TM 09-19, except that measurement will be taken to nearest one thousandth of an inch; and average of such measurements will be taken to nearest one hundredth of an inch.

Thickness of finished HMA pavement shall be within 0.25 inch of thickness indicated in the Contract Documents. Pavement not meeting the thickness requirements of the Contract Documents may be required by the Engineer to be removed and replaced.

Corrective methods taken on pavement exceeding specified tolerances, e.g., insufficient thickness by methods accepted by the Engineer, including removal and replacement, shall be at no increase in contract price or contract time.

The checking of pavement thickness shall be done after all remedial repairs, e.g., smoothness compliance repairs, compaction, have been completed, reviewed, and accepted by the Engineer.

(J) Quality Control Using New Technology. The Engineer and MTRB reserves the right to utilize new technology and methods to improve the detection of noncompliant work on the project. The technology or method may be used to locate defects in the work, e.g., ground penetrating radar to locate delaminations, moisture damage, thin sections, voids, non-compliant compaction, other non-destructive testing to locate flaws. The defect will be verified by the methods stated in the Contract Documents or by other established conventional means. If the technology or method has already been accepted elsewhere or has standardized testing procedures the results may be judged acceptable by the Engineer and no further testing will be required. These new technologies and methods may be used for the selection of sampling locations.

(K) Protection of HMA Pavement. Except for construction equipment directly connected with paving operations, keep traffic off HMA pavement.

Protect HMA pavement from damage until it has cooled and set.

Do not refuel equipment or clean equipment or hand tools over paved surfaces unless catch pan or device that will contain spilled fuel and other products is provided. After completion of refueling or cleaning, remove catch pan or device without spilling any of the collected content.

Do not park roller or other paving equipment on HMA pavement paved within 24 hours of laydown.

(L) Pavement Joint Adhesive

(1) Pavement Joint Adhesive on Joints. Use on all asphalt pavement construction where joints are formed at such locations but not limited to the following:

(a) Adjacent asphalt pavements, e.g., trafficked lanes, shoulders, etc.

(b) Asphalt pavement and adjacent concrete pavement or curb and gutter or any other surface where the bonding of the asphalt pavement and concrete surface is desired,

(c) Transverse joints between asphalt pavements not placed at the same time or if the pavement's temperature on one side of the joint is below the minimum temperature the mix can be at, during asphalt pavement compaction or installation.

(d) Cut face of an existing pavement where it will have new HMA pavement placed against it, e.g., utility trenches, partial or full depth repairs, etc.

Pavement joint adhesive is not required on a longitudinal construction joint between adjacent hot mix asphalt pavements formed by echelon paving. Echelon paving is defined as paving multiple lanes side-by-side with adjacent pavers slightly offset at the same time.

A longitudinal construction joint between one shift's work and another shall have pavement joint adhesive applied at the joint. Any longitudinal construction joint formed, with the temperature on one side of the joint that is below the minimum temperature the mix can be when compacted to contract requirements during asphalt pavement installation, shall have pavement joint adhesive applied at the joint.

(2) Material requirements. Asphalt joint adhesive shall meet requirements as specified in Table 401.03-1 - Asphalt Joint Adhesive Specifications.

TABLE 401.03-1 – ASPHALT JOINT ADHESIVE SPECIFICATIONS		
TEST		**SPECIFICATION**
Brookfield Viscosity, 204 °C [400 °F]	ASTM D 3236	4,000-10,000 cp
Cone Penetration, 25 °C [77 °F]	ASTM D 5329	60-100 dmm
Resilience, 25 °C [77 °F]	ASTM D 5329	30% minimum
Ductility, 25 °C [77 °F]	ASTM D 113	30 cm minimum
Ductility, 4 °C [39.2 °F]	ASTM D 113	30 cm minimum
Tensile Adhesion, 25 °C [77 °F]	ASTM D 5329	500% minimum
Softening Point	ASTM D 36	77 °C [170 °F] min.
Asphalt Compatibility	ASTM D 5329	Pass

(3) Construction Requirements for Asphalt Joint Adhesive

(a) Equipment Requirements. Use a jacketed double boiler type melting unit, with both agitation and recirculation systems. Provide a pressure feed wand application system.

(b) Material Handling. Submit a copy of the manufacturer's recommendations for heating, re-heating, and applying the joint adhesive material. Follow manufacturer's recommendations. Do not remove the joint adhesive from the package until immediately before it is placed in the melter. Joint adhesive boxes must be clearly marked with the name of the manufacturer, the trade name of the adhesive, the manufacturer's batch and lot number, the application/pour temperature, and the safe heating temperature. Feed additional material into the melter at a rate equal to the rate of material used.

Verify the pouring temperature of the joint adhesive at least once per hour at the point of discharge. Stop production if the adhesive falls below the recommended application/pour temperature. When the temperature of the adhesive exceeds the maximum safe heating temperature, stop production, empty the melter, and dispose of that adhesive in an environmentally safe method. No payment will be made for this material or its disposal.

Do not blend or mix different manufacturer’s brands or different types of adhesives.

(c) Joint Adhesive Application: The face of the joint that the new asphalt pavement will bind to shall be clean and dry

before the joint adhesive is applied. Apply the pavement joint adhesive material to the entire face of the surface where HMA pavement shall be installed. The thickness of the asphalt adhesive application shall be approximately 1/8 inch. Use an application shoe attached to the end of application wand. Do not overlap the joint by greater than 1/2-inch at the top of the joint or two-inches at the bottom of the joint. Apply the joint adhesive immediately in front of the paving operation. If the adhesive is tracked by construction vehicles, repair the damaged area, and restrict traffic from driving on the adhesive.

(d) Field Sampling. Take a sample from the application wand during the first 20 minutes of placing sealant. One sample should be taken per manufacturer's batch or minimum of every 6 months on the Project in the presence of the Engineer.

Each sample shall consist of one quart in an aluminum or steel sample container. The sampling container shall be labeled with Contractor's name; project name and number; date and time sample taken; location of where material was used at, e.g., from where to where it was used at in stations; manufacturer and lot number of the sealant. Turn over samples to Engineer without Engineer losing sight of the sample. The Engineer reserves the right to conduct supplementary sampling and testing of the sealant material.

(M) Pavement Smoothness Rideability Test. Perform surface profile tests frequently to ensure that the means and methods being used produces pavement that is compliant with the surface profile smoothness requirement. Test the pavement surface for smoothness with High-Speed Inertial Profiler to determine the International Roughness Index (IRI) of the pavement. For the locations determined by the Engineer, a 10-foot straightedge shall be used to measure smoothness.

All smoothness testing must be performed with the presence of the Engineer. The High-Speed Inertial Profiler operator shall be a certified operator by MTRB or the manufacturer.

The High-Speed Inertial Profiler operator's certification shall be no older than five years old at the date of the Notice to Proceed and at the day of the pavement profile measurement.

The finished pavement shall comply to all the following requirements:

(a) Smoothness Test using 10-Foot Straightedge (Manual or rolling) The 10-foot straightedge is used to identify the locations that vary more than 3/16 inch from the lower edge when the 10-foot straightedge is laid on finished pavement on the direction parallel with the centerline or perpendicular to centerline. Remove the high points that cause the surface to exceed that 3/16 inch tolerance by grinding.

The Contractor shall use a 10-foot straightedge for the following locations:

1. Longitudinal profiling parallel to centerline, when within 15 feet of a bridge approach or existing pavement which is being joined.

2. Transverse profiling of cross slopes, approaches, and as otherwise directed. Lay the straightedge in a direction perpendicular to the centerline.

3. When pavement abuts bridge approaches or pavement not under this Contract, ensure that the longitudinal slope deviations of the finished pavement comply with Contract Document's requirements.

4. Short pavement sections up to 600 feet long, including both mainline and non-mainline sections on tangent sections and on horizontal curves with a centerline radius of curve less than 1,000 feet.

5. Within a superelevation transition on horizontal curves having centerline curve radius less than 1,000 feet, e.g., curves, turn lanes, ramps, tapers, and other non-mainline pavements.

6. Within 15 feet of transverse joint that separates pavement from existing pavement not constructed under the contract, or from bridge deck or approach slab for longitudinal profiling.

7. At miscellaneous areas of improvement where width is less than 11 feet, such as medians, gore areas, and shoulders.

8. As otherwise directed by the Engineer. The Engineer may confine the checking of through traffic lanes with the straightedge to joints and obvious irregularities or choose to use it at locations not specifically stated in this Section.

(b) High-Speed Inertial Profiler

There shall be a minimum 3 profile runs per lane, for each wheel path (left and right) which is approximately three feet from edge lane line. The segment length shall be 0.1 mi. The final segments in a lane that are less than 0.1 mi shall be evaluated as an independent segment and pay adjustments will be prorated for length. The profiles shall be taken in the direction of traffic only.

The latest version of FHWA ProVAL software shall be used to conduct profile analysis to determine IRI and areas of localized roughness. The IRI values shall be reported in units of in/mi.

Areas of localized roughness will be identified by using ProVAL's "Smoothness Assurance" analysis, calculating IRI with a continuous short interval of 25 feet and the 250-mm filter applied.

Additional runs may be required by the Engineer if the data indicate a lack of repeatability of results. A 92% agreement is required for repeatability and IRI values shall have at minimum a 95% confidence level.

(N) Required Pavement Smoothness

The IRI for the left and right wheel paths in an individual lane will be computed and then averaged to determine the Mean Roughness Index (MRI) values. The MRI will be used to determine acceptance and pay adjustment. Each lane shall be tested and evaluated separately.

There are three (3) categories of target MRI values:

TABLE 401.03-2 – PAVEMENT SMOOTHNESS CATEGORIES

Category	Description	MRI
Type A	Three or more opportunities for improving ride	Shall not exceed 60 in/mi
Type B	Two opportunities for improving ride	Shall not exceed 70 in/mi
Type C	One opportunity for improving ride	Shall not exceed 75 in/mi

An opportunity for improving ride is considered as one (1) lift of asphalt pavement, including but not limited to HMAB, HMA, PMA, and SMA.

For the location where a 10-foot manual straightedge is required, the surface shall not vary more than 3/16 inch from the lower edge of a straightedge.

No pre-final inspection, final inspection, and substantial completion granted will be made until the pavement meets smoothness requirement and all required profile reports are submitted to the Engineer and MTRB and are accepted.

(O) Request for Profile Testing by the Department.

For Type C, prior to pavement activities, the Engineer will measure the smoothness of the existing pavement.

The Contractor shall submit a written request to the Engineer to perform all required profile tests.

The request shall be made at least 30 days before desired testing date and shall include an approximate acceptance profile testing date, a plan view drawing of the area to be tested with the limits of the test area highlighted.

The Contractor shall reimburse HDOT for any incurred cost related to any Contractor-caused cancellation or a deduction to the monthly payment will be made.

(P) Department Requirements for Profile Testing. When a request for testing is made, the requested area to be tested shall be 100% of the total area indicated to be paved in the Contract Documents unless the requirement is waived by the Engineer and MTRB.

Department acceptance surface tests will not be performed earlier than 14 days after HMA placement.

Clean debris and clear obstructions from area to be tested, as well as a minimum of 100 feet before and beyond the area to be tested before testing starts for use as staging areas. Provide traffic control for all profile testing.

The Engineer or MTRB or both may cancel the profile testing if the test area is not sufficiently clean, traffic control is unsatisfactory, or the area is not a safe work environment or test area does not meet Contract Document requirements. This canceled profile test will count as one profile test.

(Q) Cost of Acceptance Profile Testing by The Department. The Engineer, MTRB, or State's Third-Party Consultant will perform one initial profile test, at no cost to the Contractor for each area to be tested.

The Department's High-Speed Inertial Profiler pavement profile will be used to determine if the pavement's profile, i.e., smoothness is acceptable.

If the profile of the pavement does not meet the requirements of the Contract Documents, the Contractor shall perform remedial work, i.e. corrective work then retest the area to ensure that the area has the required MRI, i.e., smoothness, before requesting another profile test by the Engineer.

(1) Additional testing. Additional testing, by the Department beyond the initial test will be performed at cost to the Contractor as follows:

(a) $2,500 per test will be required when Department personnel or State's Third-Party Consultant is used.

(R) Remedial Work for Pavements.

(1) Corrective work shall be required for any 25 ft interval with a localized roughness in excess of 160 in/ mi. The Engineer may waive localized roughness requirements for deficiencies resulting from manholes or other similar appurtenances. Adjust manholes or other similar appurtenances so that using a 10-ft. straightedge the area around that manhole or other similar appurtenance shall not have more than 3/16-in. variation between any 2 contacts on the straightedge.

If corrective action is not successful, the Engineer may require continued corrective action, or apply a payment adjustment of $250 per occurrence.

(2) Corrective work shall also be required for any 0.1 mile interval with an average MRI above 95.0 in/mi for Types A and B. For Type A, correct the deficient section to an MRI of 60 in/mi or less. For Type B, correct the deficient section to an MRI of 70 in/mi or less. For Type C, corrective work may be required by the Engineer for 0.1 mile intervals that have an average MRI above the threshold shown in Table 401.03-4 - Smoothness Pay Disincentives with MRI and Table 401.03-5 - Smoothness Pay Disincentives For Percent Improvement, as applicable.

If corrective action does not produce the required improvement, the Engineer may require continued corrective action, or apply payment adjustment as shown in Table 401.03-4 - Smoothness Pay Disincentives with MRI and Table 401.03-5 - Smoothness Pay Disincentives For Percent Improvement

(3) The Contractor shall notify the Engineer at least 24 hours prior to commencement of the corrective work. The Contractor shall not

commence corrective work until the methods and procedure have been approved in writing by the Engineer.

(4) All smoothness corrective work for areas of localized roughness shall be for the entire lane width. Pavement cross slope shall be maintained through corrective areas.

(5) The remedial repair areas shall be neat, rectangular areas having a uniform surface appearance.

(6) If grinding is used on HMA pavement, the surface shall have nearly invisible grinding marks to passing motorist.

(7) Other methods may include milling and overlaying HMA pavement. The length, depth of the milling and the replacement material will be solely decided by the Engineer.

(8) The finished repaired pavement surface shall leave no ridges or valleys or fins of pavement other than those allowed below.

(9) Remedial repairs shall not leave any drainage structures' inlets higher than the surrounding pavement or alter the Contract Document's drainage pattern.

(10) For items in the pavement other than drainage structures, e.g., manhole frame and covers, survey monuments, expansion joints etc., the finish pavement, ground or not, shall not be more than 1/4 inch in elevation difference. Submit to the Engineer remedial repair method to correct these conditions for acceptance.

(11) Pick up immediately grinding operation residue by using a vacuum attached to grinding machine or other method acceptable to the Engineer.

(a) Any remaining residue shall be picked up before the end of shift or before the area is open to traffic, whichever is earlier.

(b) Prevent residue from flowing across pavement or from being left on pavement surface or both.

(c) Residue shall not be allowed to enter the drainage system.

(d) The residue shall not be allowed to dry or remain on the pavement.

(e) Dispose of all material that is the result of the remedial repair operation, e.g., HMA residue, wastewater, and dust at a legal facility.

(12) Complete corrective work before determining pavement thickness for HMA pavements in accordance with Subsection 401.03(l) – HMA Pavement Thickness Tolerances.

(13) All HMA wearing surface areas that have been ground shall receive a coating, e.g., a coating material that will restore any lost impermeability of the HMA due to the grinding of the surface. The coating used shall not be picked up or tracked by passing vehicles or be degraded after a short period of time has passed, i.e., it shall have a service life equal to or greater than the HMA pavement. The coating shall not decrease the pavement's friction value. The coating's limits shall be the full width of the lane regardless how small. If the remedial repair area extends into the next lane, then the repair area will be full lane width also. Extend the length of coating areas in order for the coating area to look like the rest of the road and does not have patches on it, i.e., make the road look uniform in color. The coating shall be of a color that matches the surrounding pavement. The areas receiving the coating shall not be open to traffic until it has cured enough so that it cannot be picked up or tracked by passing vehicles or degrade. Submit means and methods of the coating and type of coating to the Engineer or MTRB for review and acceptance. Do not proceed with the coating without acceptance from the Engineer.

(14) Recompacting cold HMA, i.e., HMA that has reached ambient temperature is not an acceptable remedial repair method.

(15) Replace all pavement markings damaged or discolored by remedial repairs.

(16) Reprofile the corrected area and provide the Engineer the results that show the corrective action, i.e., remedial repairs were successful.

(S) Pavement Smoothness and Acceptance.

(1) Price and payment in various paving sections, e.g., 401 (Hot Mix Asphalt Pavement), shall be full compensation for all work and materials specified in the various paving sections and this section, including but not limited to furnishing all labor, materials, tools, equipment, testing, incidentals and for doing all work involved in micro milling, milling (cold planing), grinding existing or new pavement, removing residue, cleaning the pavement, necessary disposal of

residue, furnishing of any water or air used in cleaning the pavement and any other related ancillary work or material or services. Also, it includes any remedial work, e.g., re-paving, surface grinding, application of a coating, curing compound, and replacement of damaged pavement markings.

(2) The contract price in those sections may be adjusted for pavement smoothness by the Engineer. The pavement smoothness contract unit price adjustments and work acceptance will be made in accordance with the following schedules.

TABLE 401.03-3 –SMOOTHNESS PAY INCENTIVES

Category	MRI (in/mi)	Pay Adjustment $ per 0.1 mi
Type A	<30.0	$580
	30.0- less than 35.0	$480
	35.0- less than 40.0	$380
	40.0- less than 45.0	$280
	45.0- less than 50.0	$180
	50.0- less than 55.0	$80
	55.0- less than 60.0	$0
Type B	<35.0	$420
	35.0- less than 40.0	$360
	40.0- less than 45.0	$300
	45.0- less than 50.0	$240
	50.0- less than 55.0	$180
	55.0- less than 60.0	$120
	60.0- less than 65.0	$60
	65.0- less than 70.0	$0
Type C	<40.0	$280
	40.0- less than 45.0	$240
	45.0- less than 50.0	$200
	50.0- less than 55.0	$160
	55.0- less than 60.0	$120
	60.0- less than 65.0	$80
	65.0- less than 70.0	$40
	70.0- less than 75.0	$0

(3) Pay Pavement Smoothness Adjustment will be based on the

initial measured MRI for both left and right wheel path, prior to any corrective work for the 0.10-mile section, except for sections that the Contractor has chosen to remove and replace. For sections that are replaced, assessments will be based on the MRI determined after replacement.

(a) The Pavement Smoothness Adjustment will be computed using the plan surface area of pavement shown in the Contract Documents. This Pavement Smoothness Adjustment will apply to the total area of the 0.10-mile section for the lane width represented by MRI for the same lane. It does not include any other price adjustments specified in the Contract Documents. Those price adjustments will be, for each adjustment, calculated separately using the original contract price to determine the amount of adjustment to be made to the contract price. Sections shorter than 0.1 mile and longer than 50 feet shall be prorated.

(b) For 0.1 mile intervals with an average MRI above the threshold shown in Table 401.03-3 - Smoothness Pay Incentives, the Engineer shall apply a disincentive payment adjustment up to the limit shown.

i. For Types A and B, payment adjustments shall be applied up to an MRI of 95.0 per Table 401.03-4 - Smoothness Pay Disincentives with MRI.

ii. For Type C, the payment adjustment shall be dependent on the average MRI of the pavement prior to paving activities
    1. If the MRI of the pavement prior to paving activities is 125.0 in/mi or less, the payment adjustment shall be per Table 401.03-4 - Smoothness Pay Disincentives with MRI.
    2. If the MRI of the pavement prior to paving activities is more than 125.0 in/mi, the disincentive payment adjustment shall be per Table 401.03-5 - Smoothness Pay Disincentives for Percent Improvement, and based on the percent improvement using the following formula:

% Improvement = (Initial segment MRI – Final segment MRI) x 100 / (Initial Segment MRI)

TABLE 401.03-4 –SMOOTHNESS PAY DISINCENTIVES WITH MRI		
Category	**MRI (in/mi)**	**Pay Adjustment $ per 0.1 mi**
Type A	60.0- less than 65.0	-$100
	65.0- less than 70.0	-$250
	70.0- less than 75.0	-$350
	75.0- less than 80.0	-$450
	80.0- less than 85.0	-$550
	85.0- less than 95.0	-$650
	> 95.0	Corrective Work
Type B	70.0- less than 75.0	-$100
	75.0- less than 80.0	-$200
	80.0- less than 85.0	-$300
	85.0- less than 95.0	-$400
	> 95.0	Corrective Work
Type C (pre-paving MRI < 125)	75.0- less than 80.0	-$50
	80.0- less than 85.0	-$100
	85.0- less than 90.0	-$150
	90.0- less than 100.0	-$200
	>100.0	-$250

TABLE 401.03-5 –SMOOTHNESS PAY DISINCENTIVES FOR PERCENT IMPROVEMENT		
Category	**Percent Improvement %**	**Pay Adjustment $ per 0.1 mi**
Type C (pre-paving MRI > 125)	≥ 40	$0
	20.0- less than 40.0	-$100
	< 20	-$200

(c) Incentives will not apply to areas where payment deductions or remedial repairs has been made for non-compliant work, e.g., low compaction, thin pavement, thermal segregation, low compressive or flexural strength, non-compliant alignment. Incentives will also not apply to areas where corrective work was required to meet contract

smoothness requirements, unless the pavement section was replaced. All areas where corrective work was performed shall be tested again to ensure the smoothness requirements are met.

(d) There will be no incentive price adjustments to the contract prices regardless of the pavement meeting the Contract Documents' requirements for incentive contract price adjustment, when 25% of the total area paved of that particular type of pavement on the project has failed to meet any of the Contract document requirements, e.g., smoothness, thickness, unit weight, asphalt content, pavement defects, compaction, flexural or compressive strength. Areas exempt from the smoothness requirements may not be included in the total area calculation unless it is non-compliant.

(e) For contracts using lump sum the method described in Subsection 104.06 Methods of Price Adjustment paragraph (3), will be used to calculated proportionate unit price, i.e., the Engineer's calculated theoretical unit price. This calculated proportionate unit price will be used to calculate the unit price adjustment.

401.04 Measurement.

(A) The Engineer will measure HMA and PMA pavement per ton in accordance with the Contract Documents.

(B) Engineer will measure additional State pavement profiling work when applicable on a cost-plus basis as specified in this section and as ordered by Engineer. The Engineer will issue a billing for the pavement profile work done for the time period with the invoices and receipts that the billing was based on attached to the Contractor for each contract item. The Contractor's pavement profile work required in this section will not be measured and will be considered incidental to the various paving items unless stated otherwise.

401.05 Payment. The Engineer will pay for the accepted HMA or PMA pavement at the contract price per pay unit, as shown in the proposal schedule. Payment will be full compensation for the work prescribed in this section and the contract documents.

(A) Price and payment in Section 401 – HMA Pavement will be full compensation for all work and materials specified in this Section including furnishing all labor, materials, tools, equipment, testing, pavement profiles and incidentals and for doing all work involved in grinding existing or new pavement, removing residue, and cleaning the pavement, including

necessary disposal of residue and furnishing any water or air used in cleaning the pavement and remedial work needed to conform to the requirements of the Contract Documents.

(B) No payment for the Contractor's pavement profile work required in this section will be made. The Contractor's pavement profile work shall be considered incidental to the various paving items unless stated otherwise.

(C) Engineer will pay or deduct for the following pay items when included in proposal schedule:

Pay Item	**Pay Unit**
Pavement Smoothness Incentive	Allowance
_____ HMA Pavement Speed Table, Mix No. _____	Ton
_____ PMA Pavement, Mix No. _____	Ton

(1) 70% of the contract unit price or the theoretical calculated unit price upon completion of submitting a job-mix formula acceptable to the Engineer; preparing the surface, spreading, and finishing the mixture; and compacting the mixture.

(2) 20% of the contract unit price or the theoretical calculated unit price upon completion of cutting samples from the compacted pavement for testing; placing and compacting the sampled area with new material conforming to the surrounding area; protecting the pavement; and compaction acceptance. Maintain temporary pavement markings and other temporary work zone items, maintain a clean work site.

(3) 10% of the contract unit price or calculate the unit price when the final configuration of the pavement markings is in place.

The Engineer will pay for adjusting existing frames and covers and valve boxes in accordance with and under Section 604 – Manholes, Inlets and Catch Basins. Adjustments for existing street survey monument frames and covers will be paid for as if each were a valve box frame and cover.

The Engineer may, at his sole discretion, in lieu of requiring removal and replacement, use the sliding scale factor to accept HMA pavements compacted below 93.0 percent and above 97.0 percent. The Engineer will make payment for the material in that production day, if the Engineer decides to use a sliding scale factor, at a reduced price arrived at by multiplying the contract unit price by the pay factor. The Engineer is not obligated to allow non-compliant work to remain in place

and may at any time chose not to use a sliding scale factor method of payment and instead require removal of the noncompliant pavement that is greater than 97.0 or less than 93.0.

In compliance with Subsection 105.12 Removal of Non-Conforming and Unauthorized Work remove and replace HMA compacted below 90.0 percent.

The Engineer will solely decide if the noncompliant work would be acceptable if a reduced payment for the noncompliant work is made. The Engineer is not obligated to allow noncompliant work to remain in place and may at any time choose not to use a sliding scale factor method of payment as a method of resolution. Instead, utilize the remedy allowed in Subsection 105.12 Removal of Non-Conforming and Unauthorized Work, requiring removal of the noncompliant pavement, shall be used.

Such a reduced payment, if made and accepted by the Contractor, shall be a mutually agreeable resolution to the noncompliant work being addressed. If it is not mutually acceptable, the noncompliant work shall be removed. If the reduced payment is acceptable; the Engineer will make the reduced payments for the noncompliant work in accordance with Table 401.05-2 - Sliding Scale Pay Factor for Compaction. The amount of tonnage to be reduced will be determined by the Engineer by using the initial cores taken on the mat. No additional cores shall be taken to determine the limits of the non-compliant area unless requested by the Engineer.

The Engineer, for determining the reduced tonnage for noncompliant work, will assume the level of compaction is linear and will proportion the compaction level from the last core that indicated an acceptable compaction level to the nearest core indicating a noncompliant compaction level to determine the calculated limit of acceptable compaction. The length will be the linear distance between the cores measured along the baseline. If there is no core that was taken for the shift's or day's work that were compliant then the limit will be the end or start of the day's or shift's work. The width will be the nominal paving width. Use the day's specific gravity of the mix to determine tonnage. The thickness will be the nominal paving thickness.

The total reduced noncompliant tonnage to be paid will be determined by multiplying the applicable percent of reduction by the computed tonnage of the noncompliant work. Percent of Quantity Paid shall be the percentage shown in Table 401.05-2 - Sliding Scale Pay Factor for Compaction. The reduced tonnage shall be used as the payment quantity for the noncompliant work. The reduced quantity paid that is used for the monthly payment will be arrived at by multiplying the contract unit price by the reduced tonnage.

Table 401.05-2 – Sliding Scale Pay Factor for Compaction	
Percent Compaction	**Percent of Quantity Paid**
> 98.0	Removal
>97.0 - 98.0	95
93.0- 97.0	100
90.0 - <93.0	80
<90.0	Removal

END OF SECTION 401”

SECTION 503 - CONCRETE STRUCTURES

Make the following amendments to said Section:

(I) Amend **503.01 Description** by revising the word culverts in line 4 to read "box culverts".

(II) Amend **503.02 Materials** by deleting Abrasive Coating 712.11 at line 31 and by adding the following after line 32:

"Grout 712.04"

(III) Amend **503.03(B) Falsework, Formwork, or Centering** as follows:

Delete the word formwork from line 59.

Replace the words "AASHTO LRFD Bridge Specifications" with "AASHTO Guide Design Specifications for Bridge Temporary Works" at line 78.

Add the following two sentences at the end of the first paragraph at line 63: "Formwork is a temporary structure or mold used to retain the plastic on fluid concrete in its designated shape until it hardens. Formwork must have enough strength to resist the fluid pressure exerted by plastic concrete and any additional fluid pressure effects generated by vibrations."

(IV) Amend **503.03(B) Falsework, Formwork, or Centering** by adding the following sentence to the seventh paragraph at line 106:

"Temporary bracing shall be provided, as necessary to withstand all imposed loads during erection, construction and removal of falsework."

(V) Amend **503.03(B) Falsework, Formwork, or Centering** by revising the ninth paragraph from lines 112 to 122 as follows:

"Show stresses and deflection of load supporting members in design calculations. Show anticipated total settlements of falsework and forms on falsework drawings, including falsework footing pressure and settlement, and joint take-up. Construct deck slab form between girders with no allowance for settlement relative to girders. Do not exceed 1 inch for anticipated settlements of falsework. Provide tell-tales attached to soffit forms, readable from the ground, at sufficient locations to determine total settlements and deflections resulting form concrete placement. Check for any movement or deformation of forms and falsework that may exceed the calculated or anticipated deflection or settlement. If the movement or deformation is exceeded, take appropriate action. This action may include halting concrete placement to install additional bracing or changing the rate or sequence of concrete placement to achieve the required lines and

grade. Discontinue concrete placement when settlements deviate more than ± 3/8 inch from those indicated on falsework drawings. In such affected areas, provide corrective measures prior to initial set of concrete. Remove unacceptable concrete."

(VI) Amend **503.03(C)(1) Construction** by revising the first paragraph between lines 169 and 172 as follows:

(1) Construction. "Use wood or metal forms that are impervious to moisture, non-staining to concrete, mortar tight and sufficiently rigid to prevent distortion due to pressure of concrete and other loads, including vibration, incidental to construction. Construct and maintain forms to prevent joints from opening. Formwork joints shall be filled with approved material that is impervious to moisture, will not stain concrete, and produces tight joints."

(VII) Amend **503.03(C)(1) Construction** by revising the second paragraph between lines 174 and 176 to read as follows:

"Unless otherwise indicated in the contract documents, place minimum ¾ inch by ¾ inch chamfer at sharp edges of exposed concrete surfaces. Give girder and coping forms bevels or drafts to ensure easy removal."

(VIII) Amend **503.03(C)(1) Construction** by adding the following sentence to the ninth paragraph at line 209:

"The Engineer will stop the use of the forms or forming systems which produce a concrete surface with excessive undulations until the Contractor makes modification acceptable to the Engineer."

(IX) Amend **503.03(C)(2) Form Lumber** by adding the following sentence to the first paragraph after line 223:

"When requested by the Engineer, submit certificates verifying grade and species of any piece of lumber which does not have a grade or species stamp."

(X) Amend **503.03(D) Removal of Falsework and Forms** by revising Table 503.03-1 – Removal of Falsework and Forms at line 297 to read as follows:

"TABLE 503.03-1 – REMOVAL OF FALSEWORK AND FORMS						
Railing and Barriers – 12 Hours Removal Time						
Beams, Arches, and Other Members – 14 days Removal Time						
Slabs With Maximum Thickness of (Inches)	9		12		More Than 12	
Removal Time (Days)	7		10		14	
Walls, Columns, and Vertical Sides of Beams With Maximum Height of (Feet)	2	5	10	20	30	**40 or More**
Removal Time (Days)	0.5	1	2	3	5	7
Note: Where forms also support vertical or horizontal loads imposed on slab or beam soffits, use 14 days for removal time."						

(XI) Amend **503.03(D) Removal of Falsework and Forms** by deleting the last paragraph between lines 329 and 334.

(XII) Amend **503.03(E) Loading** by deleting the words, "except abutment walls and wing walls" in line 337.

(XIII) Amend **503.03(F)(1) General** by adding the following paragraphs after line 419:

"At the time of placement, the concrete temperature shall not exceed 90 degrees Fahrenheit.

The rate of evaporation shall be measured by using the nomograph: ACI 308R Figure 4.1 Nomograph for Estimating the Maximum Potential Rate of Evaporation of the Environment Assuming a Water-Covered Surface in Which the Water Temperature Is Equal to the Concrete Temperature or by using an evaporation rate calculator e.g., Kestrel 5200 hat has been reviewed and accepted by the Engineer. Use procedures as stated in ACI 308R Chapter 4 – Monitoring Curing and Curing Effectiveness. Approximately 30 minutes prior to the scheduled start of concrete placement measure the ambient air temperature, relative humidity and wind velocity with industrial grade weather monitoring instruments or with an evaporation rate calculator to determine the on-site evaporation rate. When the rate of evaporation is equal to or exceeds 0.05 lb/sq

ft/h fogging shall begin. During the placement of the concrete recalculate evaporation rate every 15 minutes using new real-time data including actual temperature of concrete being placed. The concrete shall be fogged before, during and after finishing. Fogging shall start at the point the bleed water starts to evaporate. Fogging may stop when the curing compound application is complete. Fogging shall be accomplished by self-powered atomized mister, e.g. BossTek DustBoss, that creates a mist of water droplets above the concrete surface that will float in the air. The droplets should float in the air, not fall on the concrete. The goal is to humidify the air, not wet the concrete. Let the water evaporate before finishing. If the concrete is fogger before floating, brooming or trowelling, do not finish the accumulated surface water into the concrete surface or it will weaken it. Do not allow water to run off the concrete surface. Adjust foggers or pause its operation. Foggers shall not drip water on the poured concrete surface. Point foggers into the air above the concrete pour not at it and not in the direction of the incoming wind. It shall not be acceptable to use a water hose to spray water into the air as a substitute. This will be considered adding additional water to the deck surface. If plastic shrinkage cracks appear during the finishing, the cracks shall be closed by striking each side of the crack with a float and refinishing the concrete."

(XIV) Amend **503.03(F)(2) Box Culverts** by revising the paragraphs from lines 421 to 429 as follows:

> **(2) Box Culverts.** "Place and allow base slab or footings of box culverts to set at least 12 hours before constructing remainder of culvert.
>
> When constructing box culverts, place and allow concrete in walls to set at least 12 hours before placing top slab. Provide appropriate keys in sidewalls for anchoring top slab."

(XV) Amend **503.03(F)(3) Box Girder Spans** by revising the title Box Girder Spans at line 431 to read Sequence.

(XVI) Amend **503.03(F)(7) Hot Weather Concreting** by adding the word "ambient" in front of the word "temperature" at line 560.

(XVII) Amend **503.03(F) Placing Concrete** by adding the following Subsection after line 565:

> **"(8) Certified Concrete Flatwork Finisher Requirement.** Perform the placement, and finishing operations of concrete flatwork with a minimum ratio of one certified ACI Concrete Flatwork Finisher and Technician with 4,500 hours of acceptable work experience (certified craftsman) per three concrete finishers (concrete finishers without ACI Concrete Flatwork Finisher and Technician certification and 4,500 hours of acceptable work experience) at each location having flatwork done. The

concrete flatwork shall be under the direct supervision of a certified craftsman. Designate the certified craftsman who will be supervising and responsible for determining the quality of the finish of the concrete flatwork being performed. No flatwork shall be performed without the required amount of certified craftsman present.

(a) Flatwork concrete is defined as any concrete work that requires tools or machines to be used during the placement and finishing operations of concrete. Concrete flatwork includes concrete work that requires a specified finishing, smoothness or rigid surface tolerances such as sidewalks, walkways, Portland cement concrete pavement, concrete white-topping, girder seats, pier caps, bridge decks, on-grade concrete slabs, approach slabs, concrete overlays, and concrete repairs which exceed one square foot per day.

(b) Areas that are not considered flatwork concrete are the top of foundations or structures that will have backfill material placed directly on the concrete surface.

(c) Submit copies of the craftsman's current ACI certification 30 days before concrete flatwork begins for the Engineer's review and acceptance. The Engineer has the right to require the removal, replacement, retraining and re-certification of a certified craftsman if that person does not, in the opinion of the Engineer, demonstrate the ability to place and finish concrete in accordance with the practices recommended in the ACI Concrete Flatwork Finisher Certification Program and to meet the finishing standards required by the contract documents.

(d) Any cost or impact to the contractor in providing, training, certification, retraining, replacement or re-certification is incidental to the contract items that require concrete flatwork."

(XVIII) Amend **503.03(G) Joints** by adding the following sentence after line 566:

"Prior to backfilling with earth or other materials against the joints, all construction, expansion, contraction, and control joints shall be waterproofed with flashing compound waterproofing as detailed in the Standard Plans."

(XIX) Amend **503.03(G)(1) Construction Joints** by revising the second paragraph between lines 572 and 579 to read as follows:

"Before placing concrete on substrate concrete at construction joint, the following work shall be performed:

(a) Remove laitance, loose particles, dust, dirt, impervious membrane curing compound, and any other material foreign to the construction joint and projecting reinforcement.

(b) Roughen horizontal construction joint by abrasive blast cleaning or other approved methods to full amplitude of approximately ¼ inch."

(XX) Amend **503.03(G)(3) Contraction Joints** by revising the first paragraph from lines 661 to 665 to read as follows:

"(3) Contraction Joints. Contraction joints in walls and in other structures shall be spaced at not more than 20 feet on centers and shall be spaced, at abrupt changes in height or thickness and at obtuse corners unless otherwise directed by the Engineer."

(XXI) Amend **503.03(I)(3) Flashing Compound for Joints** between lines 755 and 757 by deleting this subsection.

(XXII) Amend **503.03(L) Curing Methods** by adding the following paragraph after line 794:

"The Contractor shall have the option to use curing compound SINAK WCE or SINAK LITHIUM for bridge structures when approved by the Engineer. Six copies of the manufacturer's brochure and certificates of test results shall be submitted. All work shall conform with the manufacturer's recommendations."

(XXIII) Amend **503.03(L)(2) Impervious Membrane Curing** by revising the third sentence of the first paragraph from lines 818 to 819, to read as follows:

"Use ratio of at least one gallon for each 100 square feet of concrete surface."

(XXIV) Amend **503.03(L)(2) Impervious Membrane Curing** by adding the following sentences to the first paragraph after line 819:

"The curing compound shall be applied to the concrete following the surface finishing operation, immediately before the moisture sheen disappears from the surface, but before any drying shrinkage or craze cracks begin to appear. In the event of any drying or cracking of the surface, application of water with an atomizing nozzle (fog spray) as specified in Section 503.03(L)(1), "Water Curing", shall be started immediately and shall be continued until application of the compound is resumed or started; however, the compound shall not be applied over any resulting freestanding water. Should the film of compound be damaged from any cause before the expiration of 7 days after the concrete is placed in the

case of structures and 72 hours in the case of pavement, the damaged portion shall be repaired immediately with additional compound."

(XXV) Amend **503.03(L)(2) Impervious Membrane Curing** by revising the last sentence of the second paragraph between lines 822 and 825 as follows:

"Do not apply membrane curing compound on surfaces to which concrete is to be bonded or to which waterproofing or epoxy is to be applied."

(XXVI) Amend **503.03(M) Finishing Concrete Surfaces** by adding the following sentences at line 841:

"No additional water shall be added to the concrete surfaces in an effort to aid the finishing operation as the application of water to aid the finishing operation will result in the rejection of the concrete pour. Finishing aids or evaporation retarders may be used only with written authorization by the Engineer. Only finishing aids shall be used to finish the concrete surface and only evaporation retarders used to minimize the evaporation rate of the plastic concrete. These solutions shall not be used interchangeably."

(XXVII) Amend **503.03(M)(3)(a)1. Machine Finishing** by adding the following sentences at the end of the second paragraph at line 1021:

"The screed rails shall be adjustable for elevations. The screed shall be set to elevations, with allowances for anticipated settlement, camber and deflection, as required to form the surface of the bridge deck to the line and grade shown in the contract. The Contractor shall install screed rail type such that the rails shall not deflect appreciably under the applied loads. The supports for the screed rails shall not be placed within the full width of the bridge.

The Contractor shall not apply any additional water to the deck surface in an effort to aid his finishing operation. The unauthorized application of water will result in the rejection of that day's concrete placement."

(XXVIII) Amend **503.03(M)(3)(a)1. Machine Finishing** by deleting the last three paragraphs between lines 1098 to 1111 and adding the following five paragraphs:

"Concrete bridge decks, concrete sleeper slabs, and concrete approach slabs shall be textured longitudinally by mechanical grooving. Grooves shall be cut into the hardened concrete using a mechanical water-cooled diamond edge blade saw device which shall produce straight uniformly spaced grooves spaced at 3/4 inch. The groove width shall be 1/8 inch plus or minus 0.02 inch and the groove depth shall be 1/8 inch plus 1/16 inch or minus zero inches.

If grooves cannot be cut into a continuous longitudinal operation, the continuation of grooves shall be aligned such that joints are not visible.

Before grooves are cut into the accepted hardened concrete, the upper 1/8 inch of the concrete surface for the bridge deck, approach slabs, and sleeper slabs shall be removed by grinding. Grooving shall be done after the concrete has attained sufficient strength to prevent spalling and raveling, and before the structure is opened to traffic.

A working drawing to control, collect and dispose of run-off water at an accepted off-site facility shall be submitted to the Engineer.

The requirements of Section 411.03(N) Surface Test shall apply to concrete bridge decks and concrete approach slabs. If additional grinding is required to achieve the specified profile index, the grinding shall be performed prior to the mechanical grooving and shall be done only in the longitudinal direction."

(XXIX) Amend **503.03(M)(3)(b) Sidewalk and Median Strip** by revising the first and second paragraphs from lines 1182 to 1191 to read as follows:

(b) Sidewalks and Median Strips. "Provide final finish for concrete sidewalks and median strips using wooden float and broom finish. Do not plaster surface. Use edging tool with ¼-inch radius to finish outside edges of sidewalk. Finish sidewalk as plane surface with 2-percent (allowable construction tolerance of plus or minus 0.4 percent maximum) cross slope towards roadway. Test surface of concrete sidewalk with 10-foot straightedge. Correct any deviation in excess of ¼ inch."

(XXX) Amend **503.03 Construction** by adding subsection 503.03(0) beginning at line 1200 as follows:

"**(0) Tolerance for Concrete Construction and Materials.** Conform to the stricter of tolerances specified in the specifications, ACI 117 Standard Specifications for Tolerance for Concrete Construction and Materials, PCI Tolerance for Precast and Prestressed Concrete, and PCI MNL-116 Manual for Quality Control of Plants and Production of Structural Precast Concrete Products."

(XXXI) Amend **503.04 Measurement** by revising lines 1201 to 1205 to read as follows:

"503.04 Measurement. The Engineer will not measure concrete when contracted on a lump sum basis.

The Engineer will not make deductions for the volume occupied by reinforcing steel, piles, floor drains, weepholes, timber bumpers, pipes less than eight (8) inches, conduits, or expansion joint materials."

(XXXII) Amend **503.05 Payment** by revising lines 1206 to 1223 to read as follows:

"**503.05 Payment.** The Engineer will pay for the accepted quantities of concrete complete in place and the accepted mechanical grooving and grinding at the contract lump sum price for the pay items listed below and contained in the proposal.

The contract lump sum amount paid shall be full compensation for mechanical grooving; for grinding upper concrete deck surface; for the concrete; for placing, curing and finishing; for furnishing materials including admixtures and cement (including extra cement added to concrete deposited under water); for furnishing and installing drains, scuppers, premolded joint fillers, joint seals, waterproofing at construction joints, waterstops, pipes and conduits; for furnishing and installing metal rockers, anchor bolts, structural shapes for expansion joints and other similar items; for timber bumpers, forms, form lining and falsework or centering, bearing pads, structural steel bearing plates; and for equipment, tools, labor, materials and incidentals necessary to complete the work.

The Engineer will pay for the following pay item when included in the proposal schedule:

Pay Item	Pay Unit
Concrete for _____ (Class _____ if applicable)	Lump Sum
Blanket Grinding and Mechanical Grooving for _____	Lump Sum
Concrete Head Wall, 3.00 feet to 3.99 feet	Lump Sum
Concrete Head Wall, 4.00 feet to 4.99 feet	Lump Sum
Concrete Head Wall, 5.00 feet to 5.99 feet	Lump Sum
Concrete Head Wall, 10.00 feet to 10.99 feet	Lump Sum

The Engineer will pay for excavation and backfill for foundations in accordance with and under Section 205 – Excavation and Backfill for Bridge and Retaining Structures and Section 206 – Excavation and Backfill for Drainage Facilities."

END OF SECTION 503

SECTION 624 – WATER SYSTEM

Make the following amendments to said Section:

(I) Amend **624.04 – Measurement** by revising lines 587 to 588 to read as follows:

"**624.04 Measurement.**

(A) The Engineer will measure ductile iron pipe per linear foot, inclusive of all fittings, special castings, and all appurtenances in accordance with Contract Documents.

(B) The Engineer will measure bevel geared gate valves, gate valves, air relief valves (ARV) and fire hydrants, inclusive of all fittings, special castings, and all appurtenances per each in accordance with Contract Documents.

(C) Relocation of Water Service Lateral at Station 144+92.6, inclusive of all fittings, and all appurtenances in accordance with Contract Documents will be paid on a lump sum basis. Measurement for payment will not apply.

(D) Cathodic protection will be paid on a lump sum basis. Measurement for payment will not apply.

(E) The Engineer will not measure connection to existing waterlines, inclusive of all fittings, special castings, and all appurtenances per each in accordance with the Contract Documents. The cost of connection to existing waterlines shall be considered incidental to the various items of work in Section 624.

(F) Temporary Waterline By-pass will be paid on a lump sum basis. Measurement for payment will not apply.

(G) The engineer will only measure Relocate Irrigation System when requested by the Engineer on a force account basis in accordance with Subsection 109.06 – Force Account Provisions and Compensation."

(II) Amend **624.05 – Payment** by revising lines 589 to 596 to read as follows:

"**624.05 Payment.** The Engineer will pay for the accepted pay items listed below at the contract price per pay unit, as shown in the proposal schedule. Payment will be full compensation for the work prescribed in this section and contract documents.

The Engineer will pay for each of the following pay items when included in the proposal schedule:

Pay Item	**Pay Unit**
_____ - Inch Ductile Iron Pipe, Class 53	Linear Foot
_____ - Inch Bevel Geared Gate Valve	Each
_____ - Inch Gate Valve	Each
_____ - Inch ARV	Each
_____ - Inch Offset ARV	Each
Relocate Water Service Lateral at Station 144+92.6	Lump Sum
Fire Hydrant	Each
Cathodic Protection	Lump Sum
Temporary Waterline By-Pass _____	Lump Sum
Relocate Irrigation System	Force Account”

An estimated amount for force account is allocated in proposal schedule under ‘Relocate Irrigation System’, but actual amount to be paid will be the sum shown on accepted force account records, whether this sum be more or less than estimated amount allocated in proposal schedule. The Engineer will pay for additional grubbing requested by the Engineer that are beyond the scope of the original contract work on a force account basis. No progress payment will be authorized until the Engineer accepts additional grubbing in writing.”

END OF SECTION 624

Make this section a part of the Standard Specifications:

"SECTION 651 - HORIZONTAL DIRECTIONAL DRILLING

651.01 Description. This work shall consist of furnishing and installing underground pipelines using the horizontal directional drilling (HDD) method of installation, also commonly referred to as directional boring or guided horizontal boring.

651.02 Materials. Materials shall be approved by the Engineer prior to use.

(A) HDD Pipe. HDD pipe shall be high density polyethylene (HDPE) pipe meeting the requirements of Subsection 706.10 – High Density Polyethylene Pipe.

651.03 Construction The requirements set forth herein specify a wide range of procedural precautions necessary to ensure that the very basic, essential aspects of a proper directional bore installation are adequately controlled. Strict adherence is required under specifically covered conditions outlined in this specification. Adherence to the specifications contained herein, or the Engineer's approval of any aspect of any directional bore operation covered by this specification, shall in no way relieve the Contractor of their ultimate responsibility for the satisfactory completion of the work authorized under the Contract.

(A) Qualifications. HDD installer shall have demonstrated by previous experience ability to do the work. The required previous experience of the Contractor shall consist of having performed a minimum of five horizontal directional drill installations of 500 feet or more using 6" or greater diameter pipe. The Supervisor must have at least two years directional drilling experience. A competent and experienced supervisor representing the Drilling Contractor shall be present at all times during the drilling operations. The HDD operator shall have at least two years of experience and shall have worked on at least two projects using the same equipment proposed for this project in similar ground conditions.

(B) Submittals

Work Plan. Prior to beginning work, the Contractor shall submit to the Engineer a general work plan outlining the procedure and schedule to be used to execute the work. The work plan shall include a list of subcontractors, details of the proposed method of construction and the sequence of operations to be performed during construction, a safety plan, a traffic control plan, an environmental protection plan and contingency plans for possible problems. In addition, the Contractor shall submit drawings showing the layout of the HDD equipment, and location of the entry and exit pits.

(1) Equipment. The Contractor shall submit specifications on all directional drilling equipment to be used to ensure that the equipment will be adequate to complete the work.

(2) Materials. Specifications on material to be used, including pipe and method(s) for joining pipe, shall be submitted to the Engineer.

(3) Qualifications. The Contractor shall submit information to verify that the HDD installer meets the required qualifications specified in this Section. As part of the bid submission, include contact information of the responsible party for each installation listed.

(4) Detailed Bore Plan. Following completion of the required field exploratory work and prior to HDD installation, the Contractor shall submit for approval a detailed bore plan. At a minimum, the bore plan shall include pipe bell and barrel diameters, bore path inside diameter, entry and exit points, entry and exit angles, any horizontal bend radii, and a profile showing points of tangent and curvature, vertical radii, and the depth of the bore along the alignment.

(5) Calculations. The Contractor shall submit calculations demonstrating that the HDPE pipe selected can support the maximum anticipated earth loads and superimposed live loads, which may be imposed on the pipe. Submit calculations to determine the additional stresses (such as pull back forces) imposed on the pipe during pull back operations and upgrade the quality and strength of the pipe to the extent necessary to withstand the additional stresses imposed by the HDD operation. The maximum calculated pulling force shall not exceed the manufacturer's or supplier's recommended yield tensile strength and factor of safety for the proposed pipe material and fused joints.

(6) As-Built Drawings. The Contractor shall submit, no later than one week after completion of the HDD work, the as-built alignment of the utility line installed by HDD.

(7) All submittals shall be in accordance with Section 105 – Control of Work.

(C) Equipment Requirements.

(1) Work Included. The directional drilling equipment shall consist of a directional drilling rig of sufficient capacity to perform the

bore and pull-back the pipe, a drilling fluid mixing and delivery system of sufficient capacity to successfully complete the work, a guidance system to accurately guide boring operations, and trained and competent personnel to operate the system. Equipment shall include a vacuum trailer to withdraw excess drilling fluid and a drilling fluid cleaning system truck for mixing and recycling drilling fluid. All equipment shall be in good, safe, operating condition with sufficient supplies, materials, and spare parts on hand to maintain the system in good working order for the duration of the work.

(2) Drilling System.

(a) Drilling Rig. The directional drilling machine shall consist of a hydraulically powered system to rotate, push, and pull hollow drill pipe into the ground at a variable angle while delivering a pressurized fluid mixture to a guidable drill (bore) head. The machine shall be anchored to the ground to withstand the pulling, pushing, and rotating pressure required to complete the crossing. The hydraulic power system shall be self-contained with sufficient pressure and volume to power drilling operations. The hydraulic system shall be free of leaks. The rig shall have a system to monitor and record maximum pull-backpressure during pull-back operations, and shall be grounded during drilling and pull-back operations. There shall be a system to detect electrical current from the drill string and an audible alarm, which automatically sounds when an electrical current is detected.

(b) Drill Head. The drill head shall be steerable by changing its rotation and shall provide the necessary cutting surfaces and drilling fluid jets.

(c) Mud Motors. Mud motors (where required) shall be of adequate power to turn the required drilling tools.

(d) Drill Pipe. Select the appropriate drill rod to be used for the installation of the product pipe along the planned alignment and in the anticipated subsurface conditions. Submit certified statement that the drill pipe has been inspected and is in satisfactory condition for its intended use.

(3) Guidance System. The guidance system shall be of a proven type (walkover guidance systems are not acceptable for this project) and shall be set up and operated by personnel trained and experienced with the system. If using a magnetic system, the operator shall be aware of any magnetic anomalies and shall consider such influences in the operation of the guidance system.

The guidance system shall be capable of knowing, at all times during the drilling operations, the exact location (vertical, horizontal, and degree of inclination) of the drill head. The guidance system shall be accurate to 2% of the vertical depth of the borehole at sensing position at depths up to one hundred feet and accurate within 1.5 meters horizontally.

(4) Drilling Fluid (Mud) System.

(a) Mixing System. A self-contained, closed, drilling fluid mixing system shall be of sufficient size to mix and deliver drilling fluid composed of bentonite clay, potable water, and appropriate additives. The mixing system shall be able to molecularly shear individual bentonite particles from the dry powder to avoid clumping and ensure thorough mixing. The drilling fluid reservoir tank shall be of sufficient size for the work. The mixing system shall continually agitate the drilling fluid during drilling operations.

(b) Drilling Fluid. Drilling fluid shall be composed of clean water and an appropriate additive. Water shall be from a clean source with proper pH to ensure no contamination is introduced into the soil during the drilling, reaming, and pipe installation process. The Contractor is responsible for any required pH adjustments. . The water and additives shall be mixed thoroughly and be absent of any clumps or clods. No hazardous additives may be used. Drilling fluid shall be maintained to ensure borehole stability, cutting suspension and transport, bit and electronics cooling, and hole lubrication to reduce drag on the drill pipe and the product pipe. All materials, including any additives used to make up the drilling fluid, shall be approved by the Engineer prior to use.

(c) Delivery System. The mud pumping system shall have sufficient capacity and be capable of delivering the drilling fluid at a constant pressure to meet the needs of the work. The delivery system shall have filters in-line to prevent solids from being pumped into the drill pipe. Connections between the pump and drill pipe shall be relatively leak-free. Used drilling fluid and drilling fluid spilled during drilling operations shall be contained and properly disposed of. A containment system shall be maintained around drill rigs, drilling fluid mixing system, entry and exit pits, drilling fluid recycling system, and environment. Pumps and/or vacuum truck(s) of sufficient size shall be in place to convey excess drilling fluid from containment areas to storage facilities.

(5) Other Equipment.

(a) Pipe Rollers. Pipe rollers shall be of sufficient size to fully support the weight of the pipe during pull-back operations. Sufficient number of rollers shall be used to prevent excess sagging of pipe.

(b) Pipe Rammers. Hydraulic or pneumatic pipe rammers may only be used if necessary and with the authorization of Engineer.

(c) Restrictions. Other devices or utility placement systems for providing horizontal thrust other than those previously defined shall not be used unless approved by the Engineer prior to commencement of the work. Consideration for approval will be made on an individual basis for each specified location. The proposed device or system will be evaluated prior to approval or rejection on its potential ability to complete the utility placement satisfactorily without undue stoppage and to maintain line and grade within the tolerances prescribed by the particular conditions of the project.

(D) Construction Requirements.

(1) General. The Engineer must be notified 48 hours in advance of starting work. The directional bore shall not begin until the Engineer is present at the job site and agrees that proper preparations for the operation have been made. The Engineer approval for beginning the installation shall in no way relieve the Contractor of the ultimate responsibility for the satisfactory completion of the work as authorized under the Contract. The Contractor is responsible for damages to utilities and repairs for such damages, at no cost to the State.

(2) Personnel. All personnel shall be fully trained in their respective duties as part of the directional drilling crew and in safety.

(3) Drilling Procedure.

(a) Site Preparation. Prior to any alterations to the work site, the Contractor shall photograph or video the entire work area, including entry and exit points, one copy of which shall be provided to the Engineer and one copy to remain with the Contractor for a period of 1 year following the completion of the project.

Work site, as indicated on the Plans, within right-of-way, shall be graded or filled to provide a level working area. The Contractor is responsible for design and construction of the drill entrance and exit pits. No alterations beyond what is required for operations are to be made. The Contractor shall confine all activities to designated work areas.

Prior to anchoring the drilling rig to the ground, the Contractor shall confirm locations of all underground utilities in the area of the drilling rig, the entry and exit pits, and along the HDD alignment.

(b) Drill Path Survey. The entire drill path shall be accurately surveyed, with entry and exit stakes placed in the appropriate locations within the areas indicated on the Plans. If the Contractor is using a magnetic guidance system, the drill path will be surveyed for any surface geo-magnetic variations or anomalies.

(c) Environmental Protection. The Contractor shall place silt fence between all drilling operations and any drainage, wetland, waterway, or other area designated for such protection by the Contract Documents or state, federal, and local regulations. Additional environmental protection necessary to contain any hydraulic or drilling fluid spills shall be put in place, including berms, liners, turbidity curtains, and other measures. Disposal of fluids is the responsibility of the Contractor. The Contractor shall adhere to all applicable environmental regulations. Fuel or oil may not be stored in bulk containers within 200 feet of any water body or wetland.

(d) Safety. The Contractor shall adhere to all applicable state, federal, and local safety regulations and all operations shall be conducted in a safe manner. Safety meetings shall be conducted at least weekly written record of attendance and topic submitted to the Engineer.

(e) Pilot Hole. The pilot hole shall be drilled on the bore path with no deviations greater than 5% of depth over a length of 100 feet. In the event the pilot hole does deviate from the bore path more than 5% of depth in 100', the Contractor will notify the Engineer and the Engineer may require the Contractor to pull-back and re-drill from the location along the bore path before the deviation.

In the event that a drilling fluid fracture, inadvertent returns, or returns loss occurs during pilot hole drilling operations, the

Contractor shall cease drilling until fluid loss volumes can be brought under control to minimize further inadvertent returns in the project area. If mud fracture or returns loss continues, the Contractor will cease operations and notify the Engineer. The Engineer and the Contractor will discuss additional options and work will then proceed accordingly. The Contractor shall clean up locations were drilling fluid inadvertently returns and restore the surface area to its original condition.

(f) Reaming. Upon successful completion of the pilot hole, the Contractor will ream the bore hole up to a maximum diameter of 1.5 times the outside diameter of the pipe using the appropriate tools. The Contractor will not attempt to ream at one time more than the drilling equipment and mud system are designed to safely handle.

(g) Pull-Back. After successfully reaming the bore, the Contractor will pull the pipe through the bore hole. Pipe lengths shall be connected together in one length. Pipe shall be placed on rollers with rollers spaced close enough to prevent excessive sagging of pipe. In front of the pipe will be a swivel. Once pull-back operations have commenced, operations must continue without interruption until the pipe is completely pulled into the bore hole. During pull-back operations, the Contractor will not apply more than the pipe manufacturer's maximum safe pipe pull pressure at any time. In the event that the pipe becomes stuck, the Contractor will cease pulling operations to allow any potential hydro-lock to subside and will commence pulling operations. If the pipe remains stuck, the Contractor will notify the Engineer. The Engineer and the Contractor will discuss options and then work will proceed accordingly.

(h) Inlet Grouting. Upon completion of installation, the excess pipe shall be removed and the bore hole shall be filled with flowable fill or cement grout as directed by the Engineer.

(E) Site Restoration. Following drilling operations, the Contractor will de-mobilize equipment and restore the work-site to original condition. All excavations will be backfilled and compacted to 95% of the maximum dry unit weight determined in accordance with AASHTO T 180. Landscaping will be restored to original to the satisfaction of the Engineer.

(F) Record Keeping, As-Builts. The Contractor shall maintain a daily project log of drill operations and a guidance system log with a copy given

to the Engineer at completion of the work. As-built drawings shall be certified as to accuracy by the Contractor.

651.04 Method of Measurement. The installation and construction of communication ductlines will be paid on a lump sum basis. Measurement for payment will not apply.

651.05 Basis of Payment. The Engineer will pay for the accepted pay item below at the contract lump sum basis. Payment will be full compensation for the work prescribed in this section and the work prescribed in this section and the contract documents. Payment shall be full compensation for furnishing all labor, tools, equipment, and materials; for excavation, sheeting and bracing, de-watering, and backfilling; for furnishing and installing the HDD pipe and carrier pipe utilizing horizontal directional boring method of installation; for furnishing and installing pipe spacers and end seals; for restoration of physical features; and for all work required for a complete installation of the highway crossing including clearing, grubbing, erosion control, excavation, excavation support, dewatering, drilling, removal of tailings, backfilling, compaction, and flushing; for preparing and furnishing required submittals, reports, and as-built drawings; and for furnishing all labor, materials, tools, equipment, and incidentals necessary to complete the work.

The Engineer will pay for the following pay item when included in the proposal schedule:

Pay Item	Pay Unit
AT&T One 6-Inch Conduit Encased in Concrete Jacket with Four 1.5-Inch Inner Ducts – Honouliuli Bridge, Horizontal Directional Drilling	Lump Sum

END OF SECTION 651

Make this section a part of the Standard Specifications:

"SECTION 652 – PILOT TUBE MICROTUNNELING

652.01 Description. This Section includes requirements for installation of waterline using pilot tube microtunneling methods at the location shown on the Plans.

(A) Definition. Pipe jacking methods using pilot tube microtunneling equipment shall be employed to install the jacking casing pipes, or directly install the waterline, at the locations indicated on the Plans and in accordance with the Contract requirements. The Contractor is responsible to select, design, and provide a pilot tube microtunneling system to install the waterline along the alignment and profile as shown on the Plans.

Take all precautions necessary to protect existing utilities, trees, historic structures, and other adjoining structures from damage by construction activities. Repair and/or restore any existing utilities, trees, and all nearby structures damaged by pilot tube microtunneling and related work immediately, at no additional cost to the State.

Pilot Tube Microtunneling is defined as an underground method of constructing a pipeline that involves jacking a laser-guided, steerable pilot tube using hydraulic jacks to the receiving pit. Excavation is then carried out with trailing segments of casing encased continuous flight augers. When the casings and augers segments are jacked to the receiving pit, the product pipe segments are jacked behind the casing, following the previously excavated path, to the receiving pit.

Pilot Tube Microtunneling equipment shall be capable of excavating into the hard rock formations with unconfined compressive strength ranging from 5,000 to 15,000 psi. Unforeseen Obstructions are defined as underground obstruction(s) exceeding the anticipated range of subsurface conditions described in the Geotechnical Report, such as high strength material (substantially exceeding 15,000 psi unconfined compressive strength), metal debris, existing utilities not shown correctly on Plans, and old foundations, or other unknown obstructions, which stop the pilot tube microtunneling system from advancing and must be removed to continue pilot tube microtunneling.

(B) Design Criteria.

(1) Pilot Tube Microtunneling And Associated Equipment. Pilot tube microtunneling and associated equipment shall selected by the Contractor shall be compatible with the geologic conditions

described in the Geotechnical Report for the waterline section of this project, and other requirements specified herein.

(2) Settlement. Control ground surface settlement or heave above the centerline of the waterline to 1 inch or less. The Contractor shall repair any damage resulting from surface settlement or heave caused by pilot tube microtunneling, or jacking and receiving pit excavation and construction, at no additional cost to the State.

(3) Thrust Block. The thrust block shall be constructed perpendicular to the proposed pipe alignment and shall be designed to withstand the maximum jacking pressure to be used, with a factor of safety of at least 2.5, without excessive deflection or displacement.

(4) Dewatering. Dewatering methods for groundwater control will not be permitted for all shaft or trenching excavation for construction of the waterline.

(5) Tolerances. The jacking pipes for the waterline shall be installed to meet the following tolerances along the entire length of the jacked pipes:

(a) Line Tolerance. Line Tolerance: ±2 inches from design horizontal alignment.

(b) Grade Tolerance. Grade Tolerance: ±1 inch from design grade.

(C) Submittals Submit the following 90 days prior to mobilization of pilot tube microtunneling equipment. Provide sufficient detail to allow the Engineer to judge whether the proposed equipment, materials, and procedures, and the qualifications of the actual Contractor work force, will meet the Contract requirements.

(1) Manufacturer Specifications and Shop Drawings. Provide manufacturer's literature and shop drawings describing in detail the pilot tube microtunneling system(s) to be used. Provide manufacturer's written verification that the pilot tube microtunneling equipment is compatible with the range of anticipated ground conditions outlined in the Geotechnical Report and for the required alignment shown on the Plans. Provide descriptions of at least three (3) projects on which this entire system has been successfully used, including names, addresses, and telephone numbers of Owner's representatives for these projects, as well as length, diameter, pipe material used, project cost, and geologic conditions encountered.

(2) **Alignment.** Provide a description of the alignment control procedures, and steering related systems. Provide manufacturer's literature, drawings showing setup and support provisions, and other details for the laser or laser-theodolite navigation systems. Submit a description of surveying methods and procedures to set laser or laser-theodolite positions. Submit description to check laser and reset or re-align laser or laser-theodolite during construction. Submit equipment and systems manufacturers' confirmation that these systems can achieve the required pipeline line-and-grade within the specified tolerances.

(3) **Capacity, Number, and Arrangement of Main Jacks.** Provide details of thrust ring, jacking controls, and pressure gages. Provide an estimate of the maximum jacking force expected to be required to complete each drive, including jacking loads calculations for each drive and name and qualifications of person performing the calculations.

(4) **Thrust Block And Jacking Frame Design and Details**. Submit calculations demonstrating that the thrust block can transfer the maximum planned forces developed by the main jacks to the ground without excessive movements.

(5) **Entry and Exit Seals Design and Details**. Submit shop drawing for documentation that the entry and exit seals are designed and fabricated to withstand the anticipated hydrostatic head and operation stresses.

(6) **Spoils.** Spoil handling, transport, and disposal equipment and procedures indicating spoil disposal sites. Provide written documentation from the approved disposal site(s) indicating that they will accept the spoil and are in compliance with all City, State, and Federal regulations.

(7) **Settlement.** Layout of all surface settlement points and monitoring provisions.

(8) **Nearby Obstacles.** Provisions for protecting adjacent utilities, trees, and structures within 50 feet of the waterline centerline. Provide sufficient details to demonstrate proposed means and methods to install casing waterline under very tight pipe clearance under existing utilities.

(9) **Safety Plan.** A safety plan for the pilot tube microtunneling operations. Provide the name of a Contractor's site safety representative responsible for implementing the safety program.

(10) Obstacle Removal. Provide a general plan, procedures, and details for constructing recovery shafts, drilling operation, and other methods to remove obstructions that may be encountered before or during pilot tube microtunneling.

(11) Schedule. Schedule for pilot tube microtunneling work identifying all major construction activities as independent items. The schedule shall include as a minimum the following activities: mobilization; verification of utilities; protection of existing utilities; pre-drilling; shaft excavation and excavation support; jacking equipment setup; installation of casing and distribution pipes; annulus grouting, site restoration; cleanup; and demobilization. The schedule shall also include the working hours for each activity, and a written description of the construction methods and equipment to be employed in completing each of the work activities shown on the schedule. Any action with an anticipated duration longer than one (1) week should be listed separately in the task list of the schedule. The schedule shall be reviewed with the Engineer and be updated and resubmitted by the Contractor on a weekly basis.

(12) Licenses. Submit the name(s) and resume(s) of a surveyor licensed in the State of Hawaii who will be responsible for setting survey control and laser or laser-theodolite for pipe installation and all related construction, including the survey and documentation of the location and elevation of the pilot tube microtunneling machine on the jacking frame prior to the launch of each drive.

(13) Reports and Records

(a) All relevant control data, which include but not limited to the following, must be accessible for observation and documentation by the Engineer:

i. Length of the tunnel or Station of Pilot Tube Microtunneling.

ii. Rate of advance

iii. Line-and-grade deviation

iv. Roll

v. Inclination

vi. Thrust force

vii. Torque

The Contractor shall at all times provide and maintain instrumentation that will accurately provide to the Engineer all required reports and records.

(b) Submit to the Engineer copies of field notes used to establish all lines-and-grades and allow the Engineer to review laser or laser-theodolite set-up prior to beginning pilot tube microtunneling.

(c) Submit survey measurements of surface settlement points and markers to the Officer-in-Charge by the end of the same day that measurements are taken.

(D) Quality Assurance

(1) Qualifications. All pilot tube microtunneling work shall be performed by an experienced contractor, whose staff shall include a pilot tube microtunneling project manager, a pilot tube microtunneling superintendent, and a pilot tube microtunneling machine operator(s). The Contractor's pilot tube microtunneling project manager or pilot tube microtunneling superintendent shall attend weekly progress meetings at the site. All pilot tube microtunneling work must be supervised full time by the pilot tube microtunneling superintendent. The pilot tube microtunneling machine operator must have prior successful experience in working with at least one of the pilot tube microtunneling guidance systems that can be used for this project.

The pilot tube microtunneling system shall be manufactured by a company that specializes in the design and fabrication of this type of equipment and has at least five years of experience in manufacturing such pilot tube microtunneling systems.

(2) Surveying. All surveying, including stake out of all construction locations, shall be performed by a surveyor licensed in the State of Hawaii. The surveyor responsible for setting survey control for pilot tube microtunneling work shall have prior experience in providing surveying and setting survey controls for pilot tube microtunneling or tunneling work.

(3) Safety. Perform all work in accordance with the current applicable regulations of Federal, State, and local agencies, including, but not limited to, 29 CFR Part 1926, Subpart S, Underground Construction by OSHA.

652.03 Materials and Products

(A) Pilot Tube Microtunneling System

(1) Compatibility. The pilot tube microtunneling system shall be compatible with the range of geologic conditions along the waterline alignment as described in the Geotechnical Report.

(2) Stabilization Capability. The pilot tube microtunneling system shall be capable of fully supporting the surrounding ground, during both excavation and shutdown periods, prevent water inflow, and shall have the capability of exerting a controllable, measurable, continuous, stabilizing pressure at the face as required to prevent loss of ground. The auger drill transport system, if used, must be capable of synchronizing the rate of excavation spoil removed at the tunnel face with the rate of advance of the pilot tube microtunnel systems so there is no over-excavation or loss of ground, or jamming of the flight augers.

(3) Operation. The pilot tube microtunneling system shall be remotely operated, laser- or theodolite-guided, and monitored continuously by the operator. A display showing the position of the pilot tube in relation to design line-and-grade shall be provided at the operation location or display unit to allow the operator to monitor jacking pressure, roll, inclination, laser position, steering attitude, rate of advance, installed length, thrust force, and other necessary instrumentation to achieve the desired results.

(4) Optics. The pilot tube microtunneling system shall have a laser or laser-theodolite guidance system with a light sensitive or electronic target appropriate for the drive lengths required and capable of achieving the line-and-grade control requirements for the project.

(5) Steering. The pilot tube microtunneling systems and procedures shall have the capability to steer in both vertical and horizontal directions to maintain line-and-grade within the specified tolerances.

(6) Lubrication. If necessary, a pipe lubrication injection system shall be provided to inject pipe lubricants as required to minimize jacking forces.

(7) Gaskets and Seals. The pilot tube microtunneling system and the entry and exit area of the jacking and reception pits shall have gaskets and seals to prevent material from running or flowing into the system and pits.

(8) Over-cut. The maximum allowable over-cut shall not be greater than ½-inch larger in diameter than the outside of the jacked pipe.

(9) Jacking and Control System. The jacking and control system shall be capable of continuously monitoring the jacking pressure, the rate of advancement, and the distance jacked. The jacking system shall develop a uniform distribution of jacking forces on the end of the pipe.

(B) Jacking Pipe. Steel jacking casing that meets all specified project requirements of Standard Specification, Section 712.04 to grout all annular voids with non-shrink grout.

(C) Distribution Pipes.

(1) 36" Ductile Iron Pipe Class 53 Waterline

(2) 60" Permalok steel casing or approved equal

652.03 Construction Requirements

(A) General Construction Requirements

(1) Pilot tube microtunneling shall not begin until the following has been completed:

(a) Required submittals have been made and the Engineer has reviewed and accepted all submittals.

(b) Required pre-construction surveys have been completed in accordance with the specified requirements.

(c) All additional potholing and obstruction removal work, if any, has been satisfactorily completed.

(d) Jacking and receiving pit excavation and support have been completed.

(e) Groundwater control measures, if applicable, including related ground improvement work are properly completed for launching pilot tube microtunneling out of jacking pits and breaking into receiving pits.

(2) The waterlines shall be installed using pilot tube microtunneling methods between the limits indicated on the Plans and to the specified lines-and-grades with due regard for safety of workers, adjacent structures and improvements, utilities, and the public. Jacking and receiving pits shall be located as identified on the Plans, unless approved otherwise by the Engineer.

(3) All work shall conform to the requirements of OSHA. Perform all work in accordance with current applicable regulations of Federal, State, and local agencies. In the event of conflict, comply with the most stringent applicable requirement.

(4) Furnish all necessary equipment, power, water, and utilities for pilot tube microtunneling, pipe lubricant mixing and pumping, removal and disposal of spoil, and other associated work required for the Contractor's methods of construction.

(5) A thrust block is required to transfer jacking loads to the soil behind the jacking pit. The thrust block shall be designed to meet or exceed the specified requirements, properly constructed, and shall be perpendicular to the proposed pipe alignment.

(6) Provide suitable and effective launching seals to prevent inflow of groundwater, loss of ground and loss of lubricants at jacking and receiving pits.

(7) No gasoline-powered equipment shall be permitted in jacking and receiving pits. Diesel, electrical, hydraulic, and air-powered equipment are acceptable, subject to applicable City, State, and Federal regulations.

(8) Conduct all operations such that trucks and other construction vehicles do not create a dust nuisance in the streets and adjacent properties. Promptly clean up, remove, and properly dispose of any spoil spillage. Traffic control shall be provided as indicated on the Plans.

(9) All work shall be done so as not to disturb roadways, adjacent structures, trees, landscaped areas, or utilities. Any damage shall be immediately repaired to the satisfaction of the property owner, residents, agency, or utility having jurisdiction, and the Engineer, at no additional cost to the State.

(10) The Contractor shall provide a drill rig and crew and all necessary equipment, in accordance with accepted submittals, for obstruction removal. When requested and authorized by the Engineer, the Contractor shall apply for applicable drilling permits for anticipated probing and drilling locations requested. If unforeseen obstructions exceeding the anticipated subsurface conditions described in the Geotechnical Report and herein which stops the pilot tube microtunneling machine from advancing are encountered, probing and drilling shall be performed as authorized by the Engineer. A minimum 8-inch diameter drill hole(s) shall be drilled to fragment and/or remove the obstruction and minimize delays in the work. The drilled hole(s) shall be backfilled with compacted granular backfill to 3 feet below ground surface. The top 3 feet of the drill hole(s) shall be backfilled with cement grout. The 28-day unconfined compressive strength of the cement grout shall be a minimum of 100 psi.

(11) The Contractor shall construct emergency recovery or access shafts along the waterline alignment for removal of unforeseen obstructions during pilot tube microtunneling, if obstructions such as high strength material (substantially exceeding 15,000 psi unconfined compressive strength) and large boulders, metal debris, existing utilities not shown correctly on Plans, and old foundations, or other unknown obstructions, are encountered which stop the pilot tube microtunneling machine from advancing. Obstruction removal shall include use of drilling rigs with casings to support the drilled holes where necessary. The shafts shall be properly supported with suitable shoring provisions to minimize loss of ground and ground movements that could damage adjacent utilities, streets, or structures. Provide traffic control as indicated in the plans. Obtain necessary approvals from affected agencies and proceed with the construction of recovery shafts as required to remove obstructions and minimize delays in the work.

(B) Pipe Installation

(1) Pipe installation shall be completed in accordance with approved shop drawings, and accepted submittals.

(2) Provide a suitable jacking frame and thrust block to carry out the work.

(3) Special care shall be taken when setting the pipe guide rails prior to starting the work in the jacking pit to ensure correctness of the alignment, grade, and stability. A licensed surveyor retained by the Contractor shall survey the location and orientation of the pipe guide rails to ensure they are on the proper line-and-grade and verify that they are properly supported.

(4) Jacking pipe sections shall be handled and transported from the storage area to the jacking pit properly in accordance with the manufacturer's recommendations to avoid damage. Set the jacking pipe sections properly, braced and supported by guide rails. Join the two pipe sections together following the below joint connection procedures or as indicated in approved submittals.

(a) Clean both ends of each pipe section and the joint components.

(b) Apply joint lubricant to the bell interior surface and gaskets. Use only lubricants approved by the pipe manufacturer.

(c) Use suitable equipment and end protection to push the pipes together. Install all required joint protection measures.

(d) Do not exceed forces recommended by the manufacturer for jointing or pushing pipe.

(5) The axial forces from the thrust jacks shall be distributed to the pipe uniformly through a properly designed thrust ring and cushion materials, as recommended by the pipe manufacturer, to prevent damage to the ends of the pipe. Jacking forces shall be applied uniformly to the pipe wall. The jacking system shall be capable of continuously monitoring the jacking pressure and advance rate.

(6) Pipes shall be jacked into position following the design line-and-grade of the waterline without damaging the pipes. In the event a section of the pipe is damaged during the jacking operation, the pipe shall be jacked through to the receiving pit and removed. Other methods of repairing the damaged pipe may be used, subject to the approval by the Engineer.

(7) Pilot tube microtunneling shall be operated so as to minimize both surface heave and loss of ground during pilot tube

microtunneling. Restrict the excavation of the materials to only those materials that are physically displaced by the pilot tube and augers themselves in order to prevent loss of ground, settlement, or possible damage to overlying structures. Control the advance rate, monitor the volume of material excavated, and adjust the advance rate, as required to avoid loss of ground, overexcavation, and surface heave.

(8) The pilot tube shall be steered to maintain line-and-grade within the tolerance specified. This shall be achieved by continuously monitoring and recording rate of advance, line-and-grade deviation, roll, inclination, and steering adjustments during the operation for each pipe section installed.

(C) Control of Line-and-Grade

(1) The benchmarks and other primary survey control have been established and are shown on the Plans. The Contractor and a licensed surveyor retained by the contractor shall verify the accuracy of these benchmarks at the beginning of construction and report any errors or discrepancies to the Engineer immediately.

(2) When satisfied that all benchmarks are correct, use these benchmarks to furnish and maintain all reference lines-and-grades for pilot tube microtunneling. For pilot tube microtunneling, use these lines-and-grades to establish the location of the pipe using a laser, or laser-theodolite guidance system. The Contractor shall be fully responsible for the accuracy of the work and the correction of defective work, as required.

(3) Laser or laser-theodolite shall be mounted independently from the thrust block and jacking frame to maintain the alignment of the laser or laser-theodolite. Stop pilot tube microtunneling operations and reset laser or laser-theodolite, if laser or laser-theodolite alignment shifts or is moved off of pre-set design alignment and grade for any reason. Laser or laser-theodolite should only be reset by qualified surveying personnel in accordance with approved procedures. When requested by the Engineer, reset laser or laser-theodolite using a licensed surveyor retained by the Contractor at no additional cost to the State.

(4) Monitor line-and-grade continuously during pilot tube microtunneling operations. Record deviation with respect to

design line-and-grade and submit records to the Engineer as requested. Control line-and-grade of the pipe to within the specified tolerances. Notify the Engineer immediately if pilot tube microtunneling exceeded the specified line or grade tolerances.

(5) When the pilot tube microtunneling excavation is off line or grade, make the necessary corrections and return to the design line-and-grade at a rate of not more than 1 inch per 25 feet.

(6) If the pipe installation exceeds the specified tolerances for deviations, correct the installation, including, if necessary, redesign and reconstruction of the waterline. All corrective work shall be performed as approved by the Engineer, at no additional cost to the State.

(D) Spoil Transport and Disposal

(1) Auger drill spoil transport methods may be used for pilot tube pilot tube microtunneling.

(2) Properly transport and dispose of all excavated materials away from the construction sites in accordance with all applicable City, State, and Federal regulations.

(E) Temporary Ventilation. Furnish and operate when personnel are underground, a temporary ventilation system and air monitoring system conforming to the requirements of OSHA. Provide a sufficient supply of fresh air and maintain an atmosphere free of flammable gasses in all underground work areas.

(F) Surface Settlement Monitoring

(1) Install and monitor surface settlement points as appropriated. A three-point array of settlement points and markers shall be established every 25 feet along the alignment of the waterline to be installed by pilot tube microtunneling.

(2) Measurements of installed settlement points and markers shall be taken daily while pilot tube microtunneling operations are taking place and within 100 feet of the settlement point, and at least once per week thereafter until all subsidence stops.

(G) Leakage Testing. Perform testing of the completed waterline in accordance with Section 624.

(H) Cleanup and Restoration. Restoration shall follow construction activities as the work progresses and shall be completed as soon as possible, in accordance with Section 203, "Excavation and Embankment." Restore and repair any damage resulting from surface settlement caused by shaft construction or pilot tube microtunneling. Any property damaged or destroyed shall be restored to a condition equal to or better than existing prior to construction Final restoration that cannot be performed within the thirty (30) day period due to adverse weather conditions may, upon written request that includes a proposed procedure and time schedule, be performed as approved by the Engineer.

652.04 Method of Measurement. The pilot tube microtunneling will be paid on a lump sum basis. Measurement for payment will not apply.

652.05 Basis of Payment. The Engineer will pay for the waterline installed by pilot tube microtunneling, in place completed within specified line-and-grade tolerances and satisfying the leakage test requirements at the contract lump sum price. Payment will be full compensation for the work prescribed in this section and the contract documents. Payment shall be full compensation for furnishing all labor, tools, equipment, and materials; for jacking and receiving pits excavation, sheeting and bracing, de-watering, and backfilling; for furnishing and installing the waterline and carrier pipe utilizing pilot tube microtunneling method of installation; for furnishing and installing pipe spacers and end seals; for restoration of physical features; and for all work required for a complete installation of the highway crossing including clearing, grubbing, erosion control, excavation, excavation support, dewatering, drilling, removal of tailings, backfilling, compaction, and flushing; for preparing and furnishing required submittals, reports, and as-built drawings; and for furnishing all labor, materials, tools, equipment, and incidentals necessary to complete the work.

The Engineer will pay for the following pay item when included in the proposal schedule:

Pay Item	**Pay Unit**
36-Inch Ductile Iron Pipe Class 53 Waterline Pilot Tube Microtunneling	Lump Sum

END OF SECTION 653

Add **Section 660 – Gas System** in its entirety to the specifications:

"SECTION 660 - GAS SYSTEM

660.01 Description. This section describes constructing gas systems.

660.02 Materials.

Trench Backfill Material 703.21

660.03 Construction.

(A) General. Notify Hawaii Gas in writing at least one month (30 calendar days) before commencement of work of gas system.

Invert grades of gas pipelines shall provide a minimum of three feet cover from top of pipe to finish grades.

Minimum vertical and horizontal clearance between the gas pipelines and other pipelines, conduits, ductlines, or other facilities shall comply with the maximum clearance needed based on the standards of the utility companies.

(B) Trench Excavation.

(1) General. Pile excavated material next to trench, or haul and store to site acceptable to the State Engineer.

In fill areas, compact fill to subbase or to elevation 4 feet above top of pipe, whichever is less, before excavating trench.

Excavate trenches in accordance with Section 204 – Excavation and Backfill for Miscellaneous Facilities, and as modified below.

Do not construct trench with jumps or spaces unless acceptable to the State Engineer. Maintain excavation during installation of gas systems and placing of backfill.

Construct trench widths for various size pipes in accordance with the Construction Plans.

Correct trenches over-excavated below specified grade with trench backfill material, compacted, at no increase in contract price or contract time.

(2) Removal of Mud and Other Unsuitable Material from Trench Bottom. If soft, spongy, or other unsuitable material is encountered at specified depths, remove material under pipe to maximum depth of 30 inches below invert grade of pipe. Backfill space to 6 inches below invert grade of pipe with untreated base. Use untreated base with maximum aggregate size of 1-1/2 inches. Compact untreated base until relative compaction is not less than 95 percent.

(3) Sheathing. Properly sheath and brace excavation to provide secure excavation. Remove sheathing and bracing before completing backfill. When sheathing is necessary, widen trench beyond those widths specified in Subsection 624.03(B)(1) - General. Follow OSHA requirements.

(4) Dewatering. Keep trenches free from water while installing and testing pipe and backfilling trench. Comply with NPDES requirements and other applicable regulations. Obtain NPDES construction dewatering permit for discharge of uncontaminated ground water.

(5) Use of Explosives. The use of explosives is not permitted, in accordance with Subsection 104.10 – Use of Explosives.

(C) Trench Backfill.

(1) General. Do not use adobe, clay or material of similar nature for backfill. When removal of unsuitable excavated materials creates shortage of backfill material, furnish suitable material. Material from roadway or other excavation may be used.

(2) Preparation of Trench Bottom. After excavating trench to proper depth below invert grade of pipe, backfill trench bottom to required invert grade of trench with trench backfill material.

(3) Backfilling. Upon completion of installation and testing of pipelines by Hawaii Gas, conform to following:

(a) Backfill trench widths in accordance with the Construction Plans.

(b) Backfill remainder of trench with trench backfill material, conforming to Subsection 703.21 – Trench Backfill Material.

(c) Place trench backfill materials in layers not exceeding six inches in loose thickness. Compact each layer to not less

than 95 percent relative compaction conforming to Subsection 203.03(C)(2) Relative Compaction Test.

(D) Laying Pipe. Gas pipelines shall be provided and installed by Hawaii Gas.

660.04 Measurement. Gas system will be paid on a force account basis in accordance with Subsection 109.06 – Force Account Provisions and Compensation. Measurement for payment will not apply.

660.05 Payment. The Engineer will pay for the fee for the Installation of Gas Pipeline on a force account basis in accordance with Subsection 109.06 – Force Account Provisions and Compensation. Payment will be full compensation as prescribed in this section and contract documents. The actual amount to be paid will be the sum shown on the accepted force account records whether this sum be more or less than the estimated amount allocated in the proposal schedule.

Pay Item	**Pay Unit**
Allowance for Trench Excavation and Backfill, and Installation of Gas Pipeline	Force Account

END OF SECTION 660”

Make this Section a part of the Standard Specifications:

SECTION 675 – MASS CONCRETE

675.01 Description. This Section describes mass concrete, which is the placement of any large volume of cast-in-place concrete with dimensions large enough to require taking measures to cope with the generation of heat from hydration of cement and attendant volume change. Elements that are considered mass concrete include but are not limited to the drilled shaft cap beams and end beams for both Honouliuli Stream Bridge and Kaloi Stream Bridge.

675.02 Materials.

Portland Cement	701.01
Fine Aggregate for Concrete	703.01
Coarse Aggregate for Portland Cement Concrete	703.02
Admixtures	711.03
Water	712.01

675.03 Construction.

(A) Submittals.

(1) At least 14 days prior to the mass concrete pour, submit a Thermal Control Plan prepared by a specialty Engineer with at least 5 years of experience in the design and temperature control of mass concrete. The plan shall follow ACI 207.1R "Guide to Mass Concrete" and also address the following issues:

(a) An analysis of anticipated thermal developments within the mass pour placements using proposed materials and casting methods. List locations of anticipated mass concrete pours, type of structure, and anticipated volume of concrete

(b) A plan which includes mix design, insulation and cooling outlining specific measures to be taken to control the temperature differential and the maximum temperature

(c) The proposed monitoring system

(d) Duration and method of curing

(e) An outline of corrective actions to maintain the temperature differential and the maximum temperature to avoid cracking

(f) Proposed methods of repairs or corrective actions if the mass concrete member is not accepted as well as preventative measures to ensure issues do not reoccur

(2) Drilled shaft concrete heat of hydration development shall be addressed independently from the Thermal Control Plan considering ambient ground conditions and range of expected placement temperatures to ensure conformance with the maximum temperature limit and gradients set forth herein.

(B) Quality Control. Mass Concrete production requires Contractor responsibility for quality control of materials during handling, blending, mixing, curing, and placement operations.

Sample, test, and inspect concrete to ensure quality control of component materials and concrete. Sampling and testing for quality control in accordance with standard methods shall be performed by certified ACI Concrete Field Technician Grade I. Perform quality control tests for slump, air content, temperature, and unit weight during production of mass concrete other than concrete for incidental construction. Submit quality control test results.

Cease all mass placement operations and revise the Thermal Control Plan as necessary if either the maximum core temperature or maximum differential temperature is exceeded.

If any mass concrete placed under these Specifications proves unsatisfactory, the Contractor will be required to make the necessary repairs or to remove and replace the material at the Contractor's expense.

The Engineer will be the sole judge in determining the acceptance of a mass concrete member. Corrective actions, as approved in the Thermal Curing Plan Report, shall be made in those areas directed by the Engineer before the mass concrete member will be considered for acceptance.

(C) Pre-Operational Conference. Schedule a meeting with the Contractor, and suppliers representatives involved in construction operation of the mass concrete and the Engineer, at a mutually agreed time, to discuss and verify the methods of accomplishing all phases of the mass concrete operations, contingency planning, and standards of workmanship for the completed items of work. Include the Contractor's superintendents, foremen, subcontractors, and supplier's technical representatives, and all key personnel involved with the mass concrete work as attendees of the pre-operation conference. Do not begin

placement of mass concrete before the Engineer accepts the pre-operational conference as completed.

(D) Just-In-Time Training. JITT shall conform to Section 695 – JUST IN TIME TRAINING.

(E) Mix Design. The specialty Engineer shall select the concrete mix proportions that will generate the lowest maximum temperature possible to ensure that no Delayed Ettringite Formation (DEF) will occur and also the lowest temperature differential to ensure there will be no thermal cracking. Mass concrete shall conform to the provisions in Section 601 – Structural Concrete with the following exceptions:

(1) Select concrete ingredients, e.g., aggregates, gradation, admixtures, and cement types that minimize the heat of hydration.

(2) Cementitious Material: Mass concrete shall contain a minimum of 505 pounds of cementitious material per cubic yard of concrete. To better control the heat of hydration of the mass concrete, the concrete mix design shall contain a pozzolanic material such as fly ash, silica fume, or ground granulated blast furnace slag (GGBFS). GGBFS shall be compliance with ASTM C989. The minimum amount of fly ash or natural pozzolan shall be the weight of the total amount of cementitious material.

(a) When supplementary cementitious (SCM) material is GGBFS, the amount of SCM shall be 50 to 75 percent by weight of the total cementitious material used in the mix. When the SCM is not GGBFS, the SCM content shall be from 25 to 35 percent by weight of the total cementitious material used in the mix.

(3) Temperature Sensing Equipment: Use thermistor-type temperature-sensing devices or an approved equal capable of indicating temperatures over a range of 50 to 200 degrees Fahrenheit, with an accuracy and precision of ±1 degree Fahrenheit. Connect the sensors to a device that continuously records and displays temperatures and produces a record that can be detached and filed.

(F) Monitoring and Controlling Temperature.

(1) Thermally cure the concrete in order to maintain a temperature differential between the internal (hottest: located as close as possible to the center of the pour but not less than 12 inches from the surface) and external (coolest temperature of the concrete) of 35 degrees Fahrenheit maximum. In addition, the internal temperature of the concrete (measured at the hottest point located at the center of the pour) shall at

no time exceed 160 degrees Fahrenheit. The Contractor may submit a mix design that is outside of these temperature parameters if the analysis shows no signs of thermal cracking or Delayed Ettringite Formation (DEF). The Engineer will be the sole judge in determining the acceptance of the newly proposed temperature requirements.

(2) Use a combination of the following elements to thermally cure the concrete to maintain internal and differential temperature:

(a) Use of shaved, flaked, or chipped ice or other concrete cooling ingredients

(b) Use of liquid nitrogen dosing systems

(c) Controlling the rate or time of concrete placement

(d) Using insulation or supplemental external heat to control heat loss

(e) Using supplementary cementing materials or additives that will reduce heat of hydration without affecting strength or durability

(f) Using a mechanical cooling system

(g) Using a cooling system to control the core temperature

(h) Other methods accepted by the Engineer

(3) Provide temperature monitoring devices to record temperature development between the interior and exterior of the element at points approved by the Engineer, and shall monitor the mass pours to measure temperature differentials. Temperature monitoring shall continue until the interior temperature is within 35 degrees Fahrenheit of the lowest ambient temperature, and when the interior temperature has plateaued and is decreasing.

(a) Furnish and install a temperature monitoring and recording system. This system shall consist of temperature sensors and a data acquisition system. Use these devices to simultaneously measure and record the temperature of the concrete at the core, the surface, and the ambient temperature within 12 inches of the concrete pour. The Engineer may adjust the locations for all temperature sensors from those stated in the Contractor's Thermal Control Plan.

(b) Record each set of readings as they are taken and make a temperature chart for each mass pour element showing temperature readings vs. time. The temperature chart showing temperature differential shall have both the interior temperature and ambient temperatures on the same chart. Submit to the Engineer the readings and chart. If the temperatures indicate temperatures are trending toward non-compliant temperatures immediately inform the Engineer and take action as presented in the Thermal Control Plan. Record the temperature readings hourly or more frequently. The Engineer may change the recording frequency of the reading at any time.

(c) Methods of concrete consolidation and placement shall prevent damage to the temperature monitoring and recording system. Wiring from temperature sensors cast into the concrete shall be protected to prevent movement. Wire runs shall be kept short as possible. The ends of the temperature sensors shall not come into contact with concrete form or with bar reinforcing steel or casing.

(4) If monitoring indicates that the proposed measures are not controlling the concrete temperature differential within the 35 degrees Fahrenheit specified, implement corrective actions as presented in the Thermal Curing Plan to maintain the temperature differential.

675.04 Measurement. The Engineer will measure mass concrete as concrete used in other sections in accordance with that other applicable sections.

675.05 Payment. The Engineer will pay for the accepted mass concrete as concrete used in other sections as concrete under that other applicable sections."

END OF SECTION 675

This Section shall be made a part of the Standard Specifications:

SECTION 680 - ELECTRIC AND COMMUNICATION SYSTEMS

680.01 Description. This work shall consist of furnishing all labor, materials and equipment to install in place and in operating condition underground structures required for the facilities of Hawaiian Electric, herein referred to as HE, the facilities of Hawaiian Telcom herein referred to as HT, AT&T Corporation hereinafter referred to a AT&T, and the facilities of Spectrum Oceanic herein referred to as CATV. Such works shall be performed and tested at the indicated locations in accordance with the requirements herein specified and the indicated details, or as ordered by the Engineer, and includes but is not limited to the following.

(A) Complete underground duct system extension including excavation, backfilling, concrete work, conduits, handholes, and manholes, to be used in the future by HE for their cables and equipment. Work shall also include securing the approval of the HE inspector.

(B) Complete underground duct system extension including excavation, backfilling, concrete work, conduits, handholes, and manholes to be used in the future by HT for their cables and equipment. Work shall also include securing the approval of the HT inspector.

(C) Complete underground duct system extension including excavation, backfilling, concrete work, conduits, handholes and manholes, to be used in the future by CATV for their cables and equipment. Work shall also include securing the approval of the CATV inspector.

(D) Complete underground duct system extension including excavation, backfilling, concrete work, conduits and pullboxes, to be used in the future by AT&T for their cables and equipment. Work shall also include securing the approval of the AT&T inspector.

(E) Coordinate work and arrange for periodic inspections by HE, HT, AT&T, CATV and Engineer.

(F) Provide warning tape above utility ductlines in accordance with the respective standard specifications of the respective utility companies and as indicated on the contract drawings.

(G) Pass test mandrel through all ducts and conduits, and make corrections as directed by the utility inspectors or Engineer.

(H) Provide pulling wire, polypropelene cord, in all empty ducts and conduits, unless indicated otherwise. Provide duct measuring/cable pulling tape in all HT ducts and conduits.

(I) Immediately report and pay for damages to existing equipment and existing utility installations.

(J) Obtain and pay for electrical permits, arrange for periodic inspection by local authorities and deliver certificate of final inspection to Engineer.

(K) Contractor shall check and test the installation for completeness and functional operation as described by the drawings and specified herein. Final test shall be in the presence of Engineer and representatives of utility companies. Contractor shall arrange and pay for all testing costs.

(1) Incidental parts which are not shown on the plans or specified herein and which are necessary to complete the underground electric, telephone, and cable television duct systems shall be furnished and installed by the Contractor as though such parts were shown on the plans, or specified herein or in the special provisions.

(2) All electrical equipment shall conform to the NEMA Standards, and all electrical work shall conform to ordinances of City and County of Honolulu; latest edition of National Electrical Code; Title 6, Chapter 37, Hawaii Administrative Rules, State of Hawaii; and Regulations and Standard Practices of HE, HT, AT&T, and CATV.

(L) Applicable rules, standards and specifications of following associations shall apply to materials and workmanship:

(1) American National Standards Institute (ANSI)

(2) Edison Electric Institute (EEI)

(3) Illumination Engineer Society (IES)

(4) National Board of Fire Underwriters (NBFU)

(5) National Electrical Manufacturer's Association (NEMA)

(6) National Fire Protection Association (NFPA)

(7) Underwriters' Laboratories, Inc. (UL)

680.02 Materials.

(A) Materials shall meet the requirements specified in the following subsections of Division 700 - Materials.

Concrete Pull Box	712.06(B)

(B) Ducts and Conduits shall conform to the requirements of Section 712.27 - Conduits. Ducts and conduits required shall be new and provided by the Contractor in accordance with the construction drawings and specifications.

(1) Polyvinyl Chloride (PVC) Schedule 40 type ducts shall be provided for the HE, HT, and CATV duct systems. The fittings shall be of the same material as the conduit and duct.

(2) High-Density Polyethylene (HDPE) SDR 11 Type duct casing, designed for directional boring use, shall be provided for the AT&T duct systems when installed via trenchless directional boring.

(a) Duct lengths shall be 20'-0".

(b) Joints shall be secure, water-proof without the use of solvent cement.

(c) Product shall be CAN-LOC Directional Boring Conduit as manufactured by CANTEX INC. or approved equivalent.

(3) High-Density Polyethylene (HDPE) SDR 11 Type innerduct.

(C) Fluidized Thermal Backfill. Submit concrete mix designs using State Highways Division form DOT 4-151. Fluidized thermal backfill shall meet the following requirements:

The proportions for the following mix designs shall be in accordance with the guidelines of ACI 211 and ASTM C94 "Standard Specification for Ready Mix Concrete, Option B". The mixes may be modified to maintain yield, slump, setting time and strength. Prior to unloading, a maximum of two gallons of water per cubic yard, may be added, provided that the specification limits for slump and time are not exceeded. Reinforced masonry group proportions are selected from compression test results per ASTM C 1019, "Standard Method of Sampling and Testing Grout".

Material	Fine Agg	Fine Agg	Course Agg
Type	Orca Stratum	Conc. Sand	#3 Fine
Source	B C-Basalt	Kapaa-Basalt	Kapaa-Basalt
Spec	ASTM C-33	ASTM C-33	ASTM C-33

Material	Course Agg	Cement	Water
Type	3/8" Pea Gravel	I / II	Water
Source	Kapaa-Basalt	Hawaiian	City-Water
Spec	ASTM C-33	ASTM C-150	ASTM C-1602

Weight in LBS Per Cubic Yard (SSD)
Mix: Fluidized Thermal Backfill 150 psi

Material Type	Sp. G	Volume (ft3)	XX67HE04
Slump			8” ± 1”
Cement	3.15	0.59	115 lb
Orca Stratum	2.75	5.54	950 lb
Conc. Sand	2.65	3.27	540 lb
#3 Fine	2.70	7.89	1330 lb
3/8” Pea Gravel	2.70	3.01	507 lb
Water	1.00	6.28	47.0 gal
Air		0.40	1.5%

(1) Fluidized Thermal Backfill design mix shall be coordinated with Geotherm, Inc. (21239 FM529 Rd, Bldg F Cypress, Texas 77433, telephone (281) 985-9344, fax (925) 999-8837) to ensure that the design thermal rho will be acceptable.

(2) In addition to the normal testing, two standard compression test cylinders shall be made from each design mix of the Fluidized Thermal Backfill. The test cylinders shall be made using the normal methods except each shall contain a special heater and thermocouple device property located for the purpose of testing the thermal rho of the Fluidized Thermal Backfill. The special devices, laboratory testing, and consultation costs shall be paid by the Contractor and shall be purchased from Geotherm, Inc. Shipping costs shall be paid by the Contractor.

(D) Submit concrete mix design using State Highways Division form DOT 4-151. Concrete shall conform to the requirements of Section 601 - Structural Concrete, except that for concrete jackets and concrete caps, the maximum size of coarse aggregate shall be 3/4 inch in lieu of the one-inch to No. 4 specified and the slump shall be 6-inch minimum and 7-inch maximum. Concrete for manholes, handholes, and pullboxes shall be Class A. Concrete for jacketing conduits and ducts shall be Class B except that the cement content shall be 5.6 sacks per cubic yard.

(E) Thermal Concrete (Class II Mix). Submit concrete mix design using State Highways Division form DOT 4-151. Thermal concrete shall meet the following requirements:

(1) Class II design mix shall be coordinated with Geotherm, Inc. (21239 FM529 Rd, Bldg F Cypress, Texas 77433, telephone (281) 985-9344, fax (925) 999-8837) to ensure that the design thermal rho will be acceptable.

(2) In addition to the normal testing, two standard compression test cylinders shall be made from each design mix of the Class II concrete for the purpose of determining the thermal rho characteristics of the concrete. The test cylinders shall be made using the normal methods except each shall contain a special heater and thermocouple device properly located for the purpose of testing the thermal rho of the concrete. The special devices,

laboratory testing, and consultation costs shall be paid by the Contractor and shall be purchased from Geotherm, Inc. Shipping costs shall also be paid by the Contractor.

(3) The proportions for the following mix designs shall be in accordance with the guidelines of ACI 211 and ASTM C94 "Standard Specification for Ready Mix Concrete, Option B". The mixes may be modified to maintain yield, slump, setting time and strength. Prior to unloading, a maximum of two gallons of water per cubic yard, may be added, provided that the specification limits for slump and time are not exceeded. Reinforced masonry group proportions are selected from compression test results per ASTM C 1019, "Standard Method of Sampling and Testing Grout".

Material	Fine Agg	Fine Agg	Course Agg	Course Agg
Type	Orca Stratum	Conc. Sand	#3 Fine	3/8" Pea Gra
Source	B C-Basalt	Kapaa-Basalt	Kapaa-Basalt	Kapaa-Basalt
Spec	ASTM C-33	ASTM C-33	ASTM C-33	ASTM C-33

Material	Cement	Water	Admix	Admix
Type	I / II	Water	MASTERPOZ ZOLITH 322	MASTERSET DELVO
Source	Hawaiian	City-Water	BASF-A	BASF-B
Spec	ASTM C-150	ASTM C-1602	ASTM C-494	ASTM C-494

Weight in LBS Per Cubic Yard (SSD)
Mix: 3,000 PSI-3/4" Pump

Material Type	Sp. G	Volume (ft3)	3067HE04
Slump			6" ± 1"
Cement	3.15	3.28	645 lb
Orca Stratum Sand	2.75	4.87	835 lb
Conc. Sand	2.65	2.39	395 lb
#3 Fine	2.70	8.16	1375 lb
3/8" Pea Gravel	2.70	2.82	475 lb
Water	1.00	5.08	38.0 gal
MASTERPOZZOLITH 322			19-45 lq oz
MASTERSET DELVO			0-45 lq oz
Air		0.41	1.5%

(F) Concrete Bricks shall conform to Subsection 704.02 - Concrete Brick. The use of broken bricks will not be permitted.

(G) Cement Mortar for Setting Bricks shall conform to the requirements of Section 601 - Structural Concrete. Submit concrete mix designs using State Highways Division form DOT 4-151. Cement mortar shall be a one-to-three

volumetric mix of portland cement and a combined fine aggregate. Combined fine aggregate shall conform to Section 703 - Aggregates.

(H) Concrete Covers, Steel Frames and Miscellaneous Metals and Appurtenances for Handholes and Manholes. Steel shapes shall conform to the applicable provisions of Section 713 - Structural Steel and Related Materials. Fabrication of steel frames shall conform to the applicable provisions of Section 501 - Steel Structures. Steel frames shall be hot-dipped galvanized after fabrication. Concrete for covers shall be Class A and shall conform to Section 601 - Structural Concrete. Cast iron frame and cover shall conform to Subsection 712.07 (A) - Frame and Covers.

(I) Reinforcing Steel. Reinforcing Steel for manholes, handholes and pullboxes, and concrete jackets shall conform to the requirements of Section 602 - Reinforcing Steel.

(J) Materials will be subject to inspection at any time. Failure of the Engineer to note faulty material or workmanship during construction will not relieve the Contractor of his responsibility for removing or replacing such materials and dredging the work at his expense.

680.03 Construction.

(A) General.

(1) The Contractor shall in performing required excavation and backfill, exercise due care to avoid disturbing existing facilities. He shall remove and dispose of all demolished or excess material from the job site.

(2) Upon completion of the work, the Contractor shall submit an 'As Built' or corrected plan showing in detail thereon all construction changes.

(3) Before bidding, the Contractor shall visit project site, carefully review each section of the Specification and all Drawings of this Contract, and obtain and review the standards, specifications and drawings of the local utility companies.

(a) The Contractor shall report any error, conflicts or omissions to the Engineer at least one week before submission of bids for interpretation or clarification. If errors or omissions are not reported, the Contractor shall provide necessary work at no cost to the State of Hawaii to properly complete intent of Specification and Plans.

(4) The Contractor shall make detailed arrangements for work by utility companies pertaining to this contract. Payment to utility companies for their work shall be by the State.

(5) Electric and telecommunication utility cables and equipment shall be by respective utility companies.

(B) Existing Utilities. Existing utilities are shown on the drawings in approximate locations for the convenience of the Contractor. It is not the intention of plans to imply that all existing utilities are drawn and located, and the fact that any utility is not shown on the drawings shall not relieve the Contractor of his responsibility under this Section. It shall be the Contractor's responsibility to ascertain the location of all existing utilities which may be subject to damages by construction under this Contract. The Contractor shall:

(1) Support and protect all HE, HT, AT&T, and CATV utilities during construction,

(2) Notify HE, HT, AT&T, and CATV immediately of any damage to its system caused by construction under this Contract, and

(3) Reconstruct, at his expense, damaged portions of the utility system in accordance with the requirements and specifications of HE, HT, AT&T, and CATV.

(4) Contractor shall provide 24-hour access to all utility poles in the vicinity of the construction area.

(5) Where the Contractor determines that bracing of utility poles is required for execution of the work, the Contractor shall develop detailed pole bracing plans and back-up structural calculations for submission to and review by the utility companies. The plans and calculations are to be stamped by a Structural Engineer licensed in the State of Hawaii. Concurrence by the utility companies of the pole bracing plans does not relieve the Contractor of the responsibility for the integrity of the poles. Any damage occurring as a result of pole damage or failure shall be the paid for by the Contractor. Work to develop the pole bracing designs and supporting calculations is considered incidental to the Contract.

(6) The Contractor shall be responsible for and shall pay for all damages to existing utilities of all types.

(7) Existing Transite Ductlines may contain asbestos. Any removal or demoltion of existing transite ductlines shall meet Federal, State, and County Requirements For Hazardous Material Demolition and Removal Work.

(C) HE Facilities. The Contractor shall provide HE with 24-hour access to all existing HE facilities that are to remain, or, for facilities that are to be removed, until they are removed and to all new HE facilities after they are installed. The Contractor shall be responsible for any delays in utility company work due to his

failure to provide access to utility company facilities. All existing HE facilities shall remain in place until proposed permanent facilities are completed and energized. Any cost for temporary relocations arising during construction shall be borne by the Contractor.

(1) Electrical equipment or conductors, whether electrically energized or not, shall remain in place at all time during construction. Handling and moving of electrical equipment or conductors, when required by the Engineer, shall be done by HE. Work by the Contractor in areas with energized electrical equipment or conductors shall be performed with extreme caution to prevent accidents and to avoid disturbing or damaging this equipment or conductors or any temporary supports or protective guards that are constructed. Unless otherwise permitted by HE, all work by the Contractor in areas with energized equipment of conductors shall be performed in the presence of a HE inspector and/or standby man. The Contractor shall have the sole responsibility for maintaining safe and efficient working conditions and procedures in these areas.

(2) Any existing or new HE facilities including equipment or conductors damaged by the Contractor during construction shall be replaced by HE at the Contractor's expense.

(3) The Contractor shall give HE two weeks advance notice for any work to be done by HE on its facilities. Unless otherwise indicated on the drawings or otherwise directed by the Engineer, HE will:

(a) Remove the concrete envelope from existing underground HE ducts containing electrical cables.

(b) Construct temporary supports and protective barriers for bare duct and electrical cables immediately after removal of the concrete envelope is completed. Material for such supports and barriers shall be furnished by the Contractor as an incidental cost.

(c) Remove temporary supports and protective barriers constructed under item (2) above.

(D) HT, AT&T and CATV Facilities. The Contractor shall provide HT, AT&T, and CATV with 24-hour access to all existing HT, AT&T, and CATV facilities that are to remain, or, for facilities that are to be removed, until they are removed and to all new HT, AT&T and CATV facilities after they are installed. The Contractor shall be responsible for any delays in utility company work due to his failure to provide access to utility company facilities. All existing HT, AT&T, and CATV facilities shall remain in place until proposed permanent facilities are completed and energized. Any cost for temporary relocations arising during construction shall be borne by the Contractor.

(1) Telecommunications equipment or cables, shall remain in place at all time during construction. Handling and moving of telecommunications equipment or cables, when required by the Engineer, shall be done by their respective Owners. Unless otherwise permitted by HT, AT&T and CATV, all work by the Contractor in areas with energized equipment of conductors shall be performed in the presence of their respective inspector and/or standby man. The Contractor shall have the sole responsibility for maintaining safe and efficient working conditions and procedures in these areas.

(2) Any existing or new HT, AT&T and CATV facilities including equipment or cables damaged by the Contractor during construction shall be replaced by their respective Owners (HT, AT&T and CATV) at the Contractor's expense.

(3) The Contractor shall give HT, AT&T and CATV two weeks advance notice for any work to be done by on their respective facilities.

(E) Excavation and Backfill. All excavation and backfill for electric, telephone, AT&T, and cable television underground structures and trenches shall conform to the requirements of Section 206 - Excavation and Backfill for Drainage Facilities, modified as follows:

(1) Excavation.

(a) The width of trenches for concrete encased ducts shall be not less than the width of the encasement nor more than that required to properly and safely execute the work.

(b) Ducts encased in concrete jackets which are bedded in disturbed (fill) ground shall be installed in the following manner: Embankments shall be built up and thoroughly compacted to the elevation which is three feet above the top-of-jacket elevation, or to the required elevation shown on the plans, whichever is less than five times the width of the jacket. This work shall conform to the requirements of Section 203 - Excavation and Embankment. The trench to accommodate the jacket shall then be excavated through the constructed embankment.

(c) The Contractor shall not excavate for manholes, handholes and duct lines until he has the locations for these structures staked out and verified to be correct, and approved by the respective utility company inspectors.

(d) Trenches shall be excavated at least 50 feet ahead of duct placement so that any obstruction to the duct line can be avoided

through gradual alignment. The profile grade may be adjusted by the Engineer to increase or decrease the excavation depth (up to 3 feet) as a result of unforeseen obstruction at no additional cost.

(e) Excavation for each handhole and manhole, plus 50 feet of trenching for all ducts connected to those structures shall be completed, and the locations and depths of the handholes and manholes shall be verified and approved by the respective utility company inspectors prior to construction or installation of the structures. All cuts in excess of depths required shall be filled with concrete, beach sand, or Type A backfill. The lateral limit for handholes and manholes shall be the vertical surfaces two feet outside the neat lines of the structures.

(f) The bottom of the trench excavation shall be flat and smooth. All trenches shall be approved by the Engineer and the utility company inspectors before any ducts or conduits are placed or any structures and foundations are constructed.

(g) The trenches shall be widened at handholes and manholes to permit proper entry of the ducts and conduits.

(h) The Contractor shall provide all sheathing and bracing to support the sides of the excavated trench. Provision and removal of these items are incidental to the trenching work.

(2) Backfill.

(a) No backfilling shall be done until the duct and conduit installations and the handhole and manhole placements have been verified to be correct and approved by the respective utility company inspectors.

(b) Material for use as trench backfill for direct buried cable above select backfill shall be non-expansive and shall conform to Subsection 680.03 (D) (2) (c) below. Backfilling and compaction shall be as specified in Section 206 – Excavation and Backfill for Drainage Facilities. Backfill material shall be beach sand, earth or earth and gravel mixture. If earth and gravel, mixture must pass 1/2 inch mesh screen and contain not more than 20 percent of rock particles by volume.

(c) Material for use as select backfill for direct buried cables shall be non-expansive and shall conform to the requirements of Subsection 703.15 Filler.

(d) Backfilling shall be to finished grades indicated on

accompanying drawings, and/or matching existing conditions. Backfill material shall be placed in maximum of 8" layers in loose thickness before compacting. Backfill shall be thoroughly compacted with hand or mechanical tampers to 95% of the ASTM D1557 maximum dry density. In no case shall tamping be accomplished by using the wheels or tracks of a vehicle.

(3) Fluidized Thermal Backfill. Backfill for ductbank noted on the contract drawings shall meet the following requirements.

(a) Install Fluidize Thermal Backfill where shown on the drawings to encase pipes and ducts, and at other locations.

(b) Notify Engineer and respective utility inspector three working days before placing Fluidize Thermal Backfill. Fluidize Thermal Backfill shall be placed only in the presence of the Engineer or respective utility inspector.

(c) Trench shall be free of all debris and free of standing water before Fluidize Thermal Backfill is poured.

(d) Anchor pipe type casings to the trench bottom to prevent flotation during Fluidize Thermal Backfill installation. Alternatively, a first thin layer of Fluidize Thermal Backfill shall be poured around the pipe so that when it has hardened it will adequately hold the pipe down without floating, then a second layer of Fluidize Thermal Backfill shall be poured to the prescribed thickness.

(e) Fluidize Thermal Backfill shall be supplied and transported in such a way as to minimize segregation and facilitate installation. Fluidize Thermal Backfill shall be poured or pumped into the trench and shall completely fill all voids without causing segregation. Flow requirements may have to be adjusted for installations using pumps.

(f) If trenches are shored or bulkheads are used on sloping ground, the shoring shall be lifted no later than one hour after the Fluidize Thermal Backfill is poured while the Fluidize Thermal Backfill is still in a semi-fluid state. The Fluidize Thermal Backfill should not be allowed to develop cracks. If cracks or voids are found to exist, they shall be filled by pouring additional Fluidize Thermal Backfill.

(g) In poorly draining native soils, provisions shall be made to allow excess bleed water to drain away or be pumped away.

(h) Where Fluidize Thermal Backfill is used for direct buried conduit applications, place an electrical warning tape 12 inches

above the top of the direct buried conduits.

(i) Field Testing: Conduct testing and submit reports for the following. Costs of all testing shall be borne by the Contractor.

1. Consistency (Flow Test): Shall conform to ASTM C 143-03; one test when a set of strength test cylinders is prepared.

2. Thermal Resistivity (Thermal Probe Test): Conduct thermal resistivity test using Geotherm TPA-7000 equipment in accordance with IEEE Standard 442-1981 and ICC guidelines for the transient thermal probe test. Two cylinders for thermal testing shall be prepared each time strength cylinders are taken. Tests shall be conducted on a sample cured for 4 days and on a sample totally dried in an oven at 105 degrees C.

3. Air Content: Conduct air content test per ASTM C 231-03 when compressive strength test cylinders are prepared.

4. Density Tests: Conduct density tests when thermal resistivity tests are performed.

5. Unconfined compressive strength: A set of 3 cylinders shall be prepared per ASTM C 31-03 for each day's pour plus additional sets for each 100 cubic yards or fraction thereof. Conduct compressive strength tests on each set: 1 at 7 days and 2 at 28 days per ASTM C 39-03.

(F) Installation of Conduits and Duct Banks. All joints shall be water tight and all ducts shall be installed to drain towards pull points unless otherwise shown on the plans.

(1) Plastic Duct Joints.

(a) Field cutting of plastic ducts shall be performed by the Contractor and only with the use of a miter box. Burrs shall be removed by filing before the joint is made. All foreign matter shall be wiped off the sockets of the fittings and the edges of the duct with a clean cloth.

(b) Cement for plastic duct joints shall be obtained from the duct manufacturer. Thinning of the cement will not be permitted. A liberal and uniform coat of cement shall be applied with a natural bristle brush to the inside of the coupling and to the outside of the duct end. Immediately thereafter, the duct shall be slipped into the

socket of the fitting with a half-twist, and the excess cement shall be wiped off.

(c) Allow the joined members to cure for at least five minutes before disturbing or applying stress to the joint. After this initial cure, care must be exercised in handling to prevent twisting or pulling the joint. In damp weather, this interval shall be increased to allow for slower evaporation of the solvent.

(d) Another fitting or section of conduit may be added to the opposite end within 2 or 3 minutes if care is exercised in handling so that strain is not placed on the previous assembly.

(e) Any joint included in a section of conduit to be bent in the trench shall be assembled above ground and allowed to lie undisturbed for at least two hours before installation. In cases where a plastic connection is made with the union under stress due to misalignment or other factors, the union shall be staked out to relieve stress on the joint until the conduit is backfilled or encased.

(2) Plastic Duct Installation.

(a) The Contractor shall provide spacers to maintain proper separation between ducts. The bottom duct spacers shall be placed on the prepared trench bottom, the first tier of ducts placed in the grooves of the spacers, and couplings attached to the duct ends. Spacers shall be 15 inches or more away from any coupling or joint. Successive lengths of ducts shall then be placed and connected to the preceding lengths as specified above. The second tier of duct spacers shall then be placed over the ducts previously placed and followed by installation of couplings. The operation shall be repeated for each successive tier until the top tier is set in place after which the top spacers are placed.

(b) When conduit is assembled above the ground, the spacer shall be supported in a vertical position by use of a No. 4 rebar and smooth black steel wire, No. 14 gage.

(c) Duct alignment shall be as straight as feasible. Such directional changes as are required shall be made by using field made bends or with segments using angle couplings or deflection couplings, except where otherwise indicated. The deflection angle between two adjacent lengths of duct shall not exceed five degrees, unless otherwise indicated.

(d) Horizontal and vertical bends for HE conduits/ducts shall be constructed with 30-foot minimum radius curves unless otherwise

approved by the utility inspector. Horizontal bends for HT, and CATV conduits/ducts shall be constructed with 25-foot minimum radius curves unless indicated otherwise or approved by the respective utility company inspector. Vertical bends for HT, and CATV conduits/ducts shall be constructed with 25-foot minimum radius curves unless indicated otherwise or approved by the respective utility company inspector.

(e) Spacers shall not be located at the centers of a long radius bend. On pre-fabricated bends, the spacer shall be located in the tangent, free of the coupling. On trench formed bend, the spacer shall be located midway between the tangent and center of the bend.

(f) Precaution shall be taken to prevent damage in plastic duct lines from thermal expansion and contraction. All ducts shall be cool when placed in trenches and when the concrete jacket is being poured.

(g) Ducts ending in manholes shall be terminated with junior end bells. End bells, terminators or ducts shall be flush to inside wall surfaces; duct extension into boxes is not acceptable.

(h) The terminated ends of the conduit in an underground structure shall be free of support for a distance of at least 10 feet from the structure. The conduit shall be aligned and supported inside the structure with proper spacing and shall be cut to length after the concrete envelope has cured.

(i) The ends of the conduit shall be sealed with a plastic cap, plug, or approved substitute at the end of each day's work, when work on duct installation has to be interrupted, where ducts may be submerged in water, and in stub outs.

(j) For installation of ducts and innerducts for AT&T, see AT&T Corp. Construction Notes in the contract drawings.

(3) A 4" wide warning tape, orange in color with a black imprinted message "WARNING -- STOP DIGGING -- CALL HAWAIIAN TELCOM, COMMUNICATIONS CABLE BURIED BELOW, FAILURE TO COMPLY COULD RESULT IN LEGAL ACTION", shall be placed 12" below the surface over the duct or concrete jacket for the entire length of duct installations. See HT Standard Drawing No. 34028. Recommended tape is manufactured by Thor Enterprises, Inc., Sun Prairie, WI 53590, part numbers DTOGTE-41 (1,000 feet), and DTOGTE-46 (6,000 feet). Equivalent tapes are acceptable.

(4) The Contractor shall apply a thin coat of sealing compound on ducts and conduits at couplings and bells.

(5) Conduits stubbed for future connections shall be plugged and marked.

(6) The Contractor shall securely anchor duct banks prior to pouring concrete encasement to prevent ducts from floating.

(G) Installation of Split Ducts Encased in Concrete Jacket. Split ducts with concrete jacket shall be installed around existing cables to remain in service, where shown on the plans.

(1) Field cutting of plastic ducts longitudinally into two equal halves shall be performed by the Contractor with the use of accepted tools and equipment.

(2) The two equal halves of plastic ducts shall be placed carefully around existing cables and sturdily bound together with wire or tape in order not to dislodge during pouring of concrete. The Contractor shall take necessary precautions not to damage the cables and shall work in an expeditious manner in order to keep uncovered cable exposed for as short a period of time as possible.

(3) Subsequent to binding of the plastic ducts, concrete shall be poured to fully encase the ducts. The dimensions of the concrete encasement shall be similar to standard duct formation encasement dimensions.

(H) The Contractor shall test the completed ducts by passing a test mandrel through the length of each duct of each duct run. For HE, and CATV conduits, the mandrel shall be a bullet shaped, blunt tipped type, unless indicated otherwise, about 14 inches long with a diameter 1/2 inch less than the inside diameter of the ducts through the length of each duct run. Mandrel for HT ducts shall be bullet shaped, blunt tipped type about 12 inches long with a diameter 1/4 inch less than the inside diameter of the ducts through the length of each duct run. Scars in the mandrel deeper than 1/32 inch, other than that caused by normal abrasion between the duct line and bottom of mandrel shall be considered an indication of the presence of burrs and/or obstructions in the duct run. The Contractor shall remove such burrs and/or obstructions, after which the test mandrel will be passed through again. All tests shall be conducted in the presence of the Engineer and respective utility company inspectors, and shall be repeated until the results obtained are satisfactory to the Engineer and to the utility company inspectors.

(I) Unless indicated otherwise, the Contractor shall furnish and install a 1/8 inch Polyolefin pull line between pull points in all ducts after testing.

(1) For HT ducts, provide duct measuring/cable pulling tape (NEPTCO

WP1800P Muletape or approved equal) in each new duct. Using the duct measuring/cable pulling tape, Contractor shall measure the actual lengths for duct runs and for at least one duct of each common duct run. The distances shall be marked on the record prints and submitted to the Owner at the final inspection. A copy of the record prints shall also be submitted to the HT inspector for record keeping.

(2) For HE ducts, provide duct measuring/cable pulling tape (NEPTCO WP1800P Muletape or approved equal) in each new duct.

(J) Concrete. The Contractor shall notify the utility companies inspector a minimum of 72 hours prior to placement of any concrete.

(1) Securely anchor duct banks prior to pouring concrete encasement to prevent ducts from floating.

(2) When pouring concrete, prevent heavy masses of concrete from falling directly on ducts. If unavoidable, protect ducts with plank.

(3) Direct flow of concrete down sides of duct bank to bottom, allowing concrete to rise between ducts, filling all open spaces uniformly.

(4) To insure against voids in concrete, work a long, flat splicing bar or spatula liberally and carefully up and down the vertical rows of ducts. Mechanical vibrators shall be used for stacked duct banks of three ducts or higher.

(5) Cure concrete for a minimum of 72 hours before permitting traffic and/or backfilling.

(6) Convey concrete from mixer to forms rapidly to prevent segregation. Free drop shall be limited to five feet, unless authorized by inspector.

(7) Placing.

(a) Clean and remove all debris from inside forms and trenches before placing concrete.

(b) Place concrete only on clean damp surfaces, free from water.

(c) Place concrete in forms, in horizontal layers not exceeding 18" thickness.

(d) Place concrete to avoid segregation of materials and displacement of ducts, inserts and reinforcing.

(e) Vibrate structural concrete thoroughly during and

immediately after placing to insure dense watertight concrete.

(8) Forming.

(a) Forms shall be of good sound lumber with sufficient strength and conforming to shapes and dimensions indicated on drawings.

(b) Forms shall be treated with non-staining form oil immediately before each use.

(9) Patching: Patch all voids, pour joints and holes before concrete is thoroughly dry. Use mortar of same proportions as original concrete.

(10) Curing: Curing of concrete shall be accomplished by impervious membrane method with liquid membrane compound. Apply two or more coats to obtain a total of one gallon for each 150 square feet of concrete surface.

(K) Reinforcing Steel.

(1) Clean reinforcing of mill or rust scale and form to dimensions indicated.

(2) Install reinforcing in proper locations and secure in place to prevent movement during concrete placing or vibrating.

(L) Concrete Brick.

(1) Concrete brick shall be laid in full bed of mortar, both horizontally and vertically.

(2) Mortar shall be one-part cement and three parts sand, thoroughly mixed and used when fresh. Re-tampering will not be allowed.

(3) Setting bed shall be of depth required to bring top of blocks flush with finish line.

(M) Restoration of Existing Streets and Other Improvements. Street, sidewalks, curbs, gutters, traffic detection loops, and other improvements of the State, private owners, or those of the City and County which are maintained by the State, which are damaged by rearrangements to the electric, cable television, AT&T, or telephone system, shall be restored by the Contractor to their original condition. Materials and workmanship shall conform to the applicable sections in these specifications. Payment for all materials and labor required shall be considered as incidental to the various contract items.

(1) Repairing of City streets and other improvements not maintained by

the State and where such work is called for on the plans shall conform to the requirements of the City and County of Honolulu.

(2) All disturbed unpaved surfaces shall be backfilled and graded to match the surrounding areas, and sodded areas shall be replanted with the same type of grass. Fences and other improvements shall be restored to their original condition. This work shall be incidental to and included in the appropriate contract item under which the rearranged facility is provided.

680.04 Measurement.

(A) The electric and communication ductlines, intercept handhole, intercept manhole and demolition of utility ductlines and structures will be paid on a lump sum basis. Measurement for payment will not apply.

(B) The Engineer will measure the handhole penetration, manhole penetration, transformer pad, pullbox, handhole and manhole per each in accordance with the contract documents.

680.05 Payment. The Engineer will pay for the accepted pay items listed below on a contract lump sum basis, as shown in proposal schedule. Payment will be full compensation for work prescribed in this section and in contract documents.

The Engineer will pay for each of the following pay items when included in proposal schedule:

Pay Item	**Pay Unit**
HECo Ductline, _____	Lump Sum
HTCo Ductline, _____	Lump Sum
CATV Ductline, _____	Lump Sum
Demolish _____	Lump Sum
_____ Handhole/Manhole Penetration	Each
_____ Handhole/Manhole Adjustment	Each
_____ Handhole	Each
_____ Manhole	Each
_____ Intercept Handhole	Lump Sum
_____ Intercept Manhole	Lump Sum

HECO Transformer Pad Penetration ___ Each

AT&T One 6-Inch Conduit Encased in Concrete Jacket with Four 1.5-Inch Inner Ducts Lump Sum

HECO _-Phase Transformer Pad ___ Each

Demolish and Remove Existing Concrete Encased Asbestos-Containing Transite Ductline After Cables are Removed by ____; Lump Sum

The Engineer will pay for the accepted hauling and stockpiling of salvaged materials and equipment off the right-of-way, in accordance with Subsection 104.02 – Changes."

The Engineer will not pay for trench and structure excavation and backfill; saw cutting and repairing of existing pavement, sidewalk, curb or gutter; conduit stub-outs; conduit stub-out markers; conduit risers; steel reinforcement for ductlines; conduit interception; manhole/handhole interception of existing ductlines; ductline tie-in, and duct sealing of conduits separately. The Engineer will consider the cost as included in the contract prices of the various contract items. The cost is for the work described in this section and in the contract documents.

END OF SECTION 680

The undersigned bidder acknowledges receipt of any addendum issued by the Department by recording in the space below the date of receipt.

Addendum No. 1 _____ Addendum No. 3 _____

Addendum No. 2 _____ Addendum No. 4 _____

Addendum No. 5 _____ Addendum No. 6 _____

In accordance with Section 103D-302, Hawaii Revised Statutes, the undersigned as bidder has listed the name of each person or firm, who will be engaged by the bidder on the project as Joint Contractor or Subcontractor and the nature of work to be done by each. It is understood that failure to comply with the aforementioned requirements may be cause for rejection of the bid submitted.

	Name of Subcontractor	Nature and Scope of Work
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

	Name of Joint contractor	Nature and Scope of Work
1.		
2.		
3.		

("None" or if left blank indicates no Subcontractor or Joint Contractor; if more space is needed, attach additional sheets.)

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
201.1000	Clearing and Grubbing	37	Acre	$_____	$_____
201.1100	Additional Grubbing	F.A.	F.A.	F.A.	$56,000.00
202.1000	Removal of Existing Bridges	L.S.	L.S.	L.S.	$_____
202.2000	Removal of Guardrails	1,965	L.F.	$_____	$_____
202.2100	Removal of Miscellaneous Walls and Fences	814	L.F.	$_____	$_____
202.3000	Removal of AC Pavement	50,594	S.Y.	$_____	$_____
202.3300	Removal of Concrete Curb and Gutter	3,292	L.F.	$_____	$_____
202.3500	Removal of Concrete Sidewalk	54	S.Y.	$_____	$_____
202.3600	Removal of Pavement Striping and Markers	L.S.	L.S.	L.S.	$_____
202.4000	Removal of 5-Inch, 24-Inch, 30-Inch, and 36-Inch Water Lines	2,920	L.F.	$_____	$_____
202.4200	Removal of gate valves, valve boxes, manholes, reaction blocks, thrust beams, fire hydrants, concrete jackets, and any other waterline appurtenances and incidentals	L.S.	L.S.	L.S.	$_____
202.4300	Removal of Drainage Culverts and Headwalls.	L.S.	L.S.	L.S.	$_____
202.4400	Removal of Excess Excavated Material, including Selected Material and Borrow Excavated Material.	63,914	C.Y.	$_____	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
203.0100	Roadway Excavation	83,127	C.Y.	$_____	$_____
203.0200	Imported Borrow	19,213	C.Y.	$_____	$_____
203.1000	Over Excavation, Moisture Conditioning and Recompaction	F.A.	F.A.	F.A.	$100,000.00
204.1000	Trench Excavation for Water Lines	7,887	C.Y.	$_____	$_____
204.1100	Trench Backfill for Water Lines	2,482	C.Y.	$_____	$_____
204.2000	Trench Excavation for Sewer Lines	536	C.Y.	$_____	$_____
204.2100	Trench Backfill for Sewer Lines	529	C.Y.	$_____	$_____
205.1000	Structure Excavation for Kaloi Abutments and Wingwalls	880	C.Y.	$_____	$_____
205.1100	Structure Excavation for Honouliuli Abutments and Wingwalls	1,500	C.Y.	$_____	$_____
205.1200	Structure Excavation for Honouliuli Retaining Walls	371	C.Y.	$_____	$_____
205.2000	Structure Excavation for Palehua Box Culvert, Inlet and Outlet Structure	1,160	C.Y.	$_____	$_____
205.2100	Structure Excavation for Hunehune Box Culvert, Inlet and Outlet Structure	1,470	C.Y.	$_____	$_____
205.2200	Structure Excavation for 42-Inch Inlet/Outlet Structure	150	C.Y.	$_____	$_____
205.3000	Structure Excavation for Retaining Wall at Kahi Mohala	620	C.Y.	$_____	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
205.4000	Structure Backfill for Kaloi Abutments and Wingwalls	500	C.Y.	$_____	$_____
205.4100	CLSM Backfill for Honouliuli Abutments and Wingwalls	1,176	C.Y.	$_____	$_____
205.4200	Structure Backfill for Honouliuli Abutments and Wingwalls	62	C.Y.	$_____	$_____
205.4300	Structure Backfill for Honouliuli Retaining Walls	486	C.Y.	$_____	$_____
205.5000	Structure Backfill for Palehua Box Culvert	520	C.Y.	$_____	$_____
205.5100	Structure Backfill for Hunehune Box Culvert	1,300	C.Y.	$_____	$_____
205.5200	Structure Backfill for 42-Inch Inlet/Outlet Structure	48	C.Y.	$_____	$_____
205.6000	Structure Backfill for Retaining Wall at Kahi Mohala	700	C.Y.	$_____	$_____
205.7000	Filter Material	290	C.Y.	$_____	$_____
206.1000	Excavation for Drain Lines and Drain Culvert	19,368	C.Y.	$_____	$_____
207.1000	Channel Excavation (Kaloi and Honouliuli)	9,443	C.Y.	$_____	$_____
207.2000	Basin Excavation	31,957	C.Y.	$_____	$_____
209.0100	Installation, Maintenance, Monitoring, and Removal of BMP	L.S.	L.S.	L.S.	$_____
209.0200	Additional Water Pollution, Dust, and Erosion Control	F.A.	F.A.	F.A.	$250,000.00

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
301.1000	Hot Mix Asphalt Base Course	44,385	TON	$_____	$_____
304.1000	Aggregate Base	202	C.Y.	$_____	$_____
305.1000	Aggregate Subbase	46,058	C.Y.	$_____	$_____
316.1000	Polypropylene Biaxial Geogrid	128,773	S.Y.	$_____	$_____
401.1000	2-Inch PMA Pavement, Mix No. IV	10,905	TON	$_____	$_____
401.1000	3-Inch HMA Pavement Speed Table, Mix No. IV	139	TON	$_____	$_____
401.1100	3-Inch PMA Pavement, Mix No. IV	71	TON	$_____	$_____
401.1200	2.5-Inch PMA Pavement, Mix No. IV	84	TON	$_____	$_____
411.1000	11-Inch Concrete Pavement	90	C.Y.	$_____	$_____
503.1000	Concrete for Kaloi Drilled Shaft Cap Beams	L.S.	L.S.	L.S.	$_____
503.1010	Concrete for Kaloi Wing Wall	L.S.	L.S.	L.S.	$_____
503.1020	Concrete for Kaloi Bridge Deck, End Beams, Diaphragms, and Corbels	L.S.	L.S.	L.S.	$_____
503.1030	Concrete for Kaloi Approach Slab with Sleeper Slab	L.S.	L.S.	L.S.	$_____
503.1040	Concrete for Kaloi Sidewalks	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
503.1100	Concrete for Honouliuli Drilled Shaft Cap Beams	L.S.	L.S.	L.S.	$_____
503.1120	Concrete for Honouliuli Wing Walls and Keywalls	L.S.	L.S.	L.S.	$_____
503.1130	Concrete for Honouliuli Bridge Deck, End Beams, Diaphragms, and Corbels	L.S.	L.S.	L.S.	$_____
503.1140	Concrete for Honouliuli Approach Slabs and Sleeper Slabs	L.S.	L.S.	L.S.	$_____
503.1150	Concrete for Honouliuli Sidewalks	L.S.	L.S.	L.S.	$_____
503.1160	Concrete for Honouliuli Retaining Walls	L.S.	L.S.	L.S.	$_____
503.2000	Concrete for Palehua Box Culvert	L.S.	L.S.	L.S.	$_____
503.2010	Concrete for Palehua Box Culvert Inlet and Outlet Structures	L.S.	L.S.	L.S.	$_____
503.2100	Concrete for Hunehune Box Culvert	L.S.	L.S.	L.S.	$_____
503.2110	Concrete for Hunehune Box Culvert Inlet and Outlet Structures	L.S.	L.S.	L.S.	$_____
503.2200	Concrete for 42-Inch Inlet/Outlet Structures	L.S.	L.S.	L.S.	$_____
503.3000	Concrete for Retaining Walls at Kahi Mohala	L.S.	L.S.	L.S.	$_____
503.4000	Blanket Grinding and Mechanical Grooving for Kaloi	L.S.	L.S.	L.S.	$_____
503.5000	Blanket Grinding and Mechanical Grooving for Honouliuli	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
503.7000	Concrete for Reinforced Concrete Jackets	L.S.	L.S.	L.S.	$_____
503.7100	Concrete for Reinforced Concrete Reaction Blocks	L.S.	L.S.	L.S.	$_____
503.8000	Concrete Head Wall, 3.00 feet to 3.99 feet	L.S.	L.S.	L.S.	$_____
503.8010	Concrete Head Wall, 4.00 feet to 4.99 feet	L.S.	L.S.	L.S.	$_____
503.8020	Concrete Head Wall, 5.00 feet to 5.99 feet	L.S.	L.S.	L.S.	$_____
503.8030	Concrete Head Wall, 10.00 feet to 10.99 feet	L.S.	L.S.	L.S.	$_____
504.1000	Prestressed Concrete Girders for Kaloi	10	EACH	$_____	$_____
504.1100	Prestressed Concrete Girders for Honouliuli	10	EACH	$_____	$_____
507.1000	Bridge Concrete Railing for Kaloi	250	L.F.	$_____	$_____
507.1010	Concrete End Post Railing for Kaloi	4	EACH	$_____	$_____
507.1100	Bridge Concrete Railing for Honouliuli	355	L.F.	$_____	$_____
507.1110	Concrete End Post Railing for Honouliuli	4	EACH	$_____	$_____
511.0100	Furnishing Drilled Shaft Drilling Equipment	L.S.	L.S.	L.S.	$_____
511.0200	Obstructions	40	HOURS	$_____	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
511.0300	Load Test at Kaloi (48-inch Diameter)	1	EACH	$_____	$_____
511.0310	Load Test at Honouliuli (48-inch Diameter)	1	EACH	$_____	$_____
511.0400	Drilled Shaft at Kaloi (48-Inch Diameter)	624	L.F.	$_____	$_____
511.0410	Drilled Shaft at Honouliuli (48-Inch Diameter)	507	L.F.	$_____	$_____
511.0500	Unclassified Shaft Excavation at Kaloi (48-Inch Diameter)	624	L.F.	$_____	$_____
511.0510	Unclassified Shaft Excavation at Honouliuli (48-Inch Diameter)	507	L.F.	$_____	$_____
511.0600	Trial Shaft at Kaloi (48-inch Diameter)	90	L.F.	$_____	$_____
511.0610	Trial Shaft at Honouliuli (48-inch Diameter)	90	L.F.	$_____	$_____
511.0700	Coring for Integrity Testing for Acceptable Drilled Shafts	275	L.F.	$_____	$_____
540.1000	VESLMC for Kaloi Closure Pour	L.S.	L.S.	L.S.	$_____
602.1000	Reinforcing Steel for Kaloi Drilled Shaft Cap Beams	L.S.	L.S.	L.S.	$_____
602.1010	Reinforcing Steel for Kaloi Wing Wall	L.S.	L.S.	L.S.	$_____
602.1020	Reinforcing Steel for Kaloi Bridge Deck, End Beams, Diaphragms, and Corbels	L.S.	L.S.	L.S.	$_____
602.1030	Reinforcing Steel for Kaloi Approach Slabs with Sleeper Slabs	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
602.1040	Reinforcing Steel for Kaloi Sidewalks	L.S.	L.S.	L.S.	$_____
602.1100	Reinforcing Steel for Honouliuli Drilled Shaft Cap Beam	L.S.	L.S.	L.S.	$_____
602.1120	Reinforcing Steel for Honouliuli Wing Walls and Keywalls	L.S.	L.S.	L.S.	$_____
602.1130	Reinforcing Steel for Honouliuli Bridge Deck, End Beams, Diaphragms, and Corbels	L.S.	L.S.	L.S.	$_____
602.1140	Reinforcing Steel for Honouliuli Approach Slabs and Sleeper Slab	L.S.	L.S.	L.S.	$_____
602.1150	Reinforcing Steel for Honouliuli Sidewalk	L.S.	L.S.	L.S.	$_____
602.1160	Reinforcing Steel for Honouliuli Retaining Walls	L.S.	L.S.	L.S.	$_____
602.2000	Reinforcing Steel for Palehua Box Culvert	L.S.	L.S.	L.S.	$_____
602.2010	Reinforcing for Palehua Box Culvert Inlet and Outlet Structures	L.S.	L.S.	L.S.	$_____
602.2100	Reinforcing Steel for Hunehune Box Culvert	L.S.	L.S.	L.S.	$_____
602.2110	Reinforcing Steel for Hunehune Box Culvert Inlet and Outlet Structures	L.S.	L.S.	L.S.	$_____
602.2200	Reinforcing Steel for 42-Inch Inlet/Outlet Structures	L.S.	L.S.	L.S.	$_____
602.3000	Reinforcing Steel for Retaining Wall at Kahi Mohala	L.S.	L.S.	L.S.	$_____
602.3200	Reinforcing Steel for Reinforced Concrete Jackets and Reaction Blocks	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
603.1000	Bed Course Material for Culvert	3,554	C.Y.	$_____	$_____
603.2000	24-Inch Reinforced Concrete Pipe, Class III	11,846	L.F.	$_____	$_____
603.2001	30-Inch Reinforced Concrete Pipe, Class III	1,935	L.F.	$_____	$_____
603.2002	36-Inch Reinforced Concrete Pipe, Class III	34	L.F.	$_____	$_____
603.2003	42-Inch Reinforced Concrete Pipe, Class III	73	L.F.	$_____	$_____
603.2004	48-Inch Reinforced Concrete Pipe, Class III	269	L.F.	$_____	$_____
603.3000	Clean Existing Culvert	F.A.	F.A.	F.A.	$10,000.00
604.1000	Type C Manholes, 14.99 Feet to 14 Feet	1	EACH	$_____	$_____
604.1001	Type C Manholes, 13.99 Feet to 13 Feet	1	EACH	$_____	$_____
604.1002	Type C Manholes, 11.99 Feet to 11 Feet	4	EACH	$_____	$_____
604.1003	Type C Manholes, 10.99 Feet to 10 Feet	1	EACH	$_____	$_____
604.1004	Type C Manholes, 8.99 Feet to 8 Feet	2	EACH	$_____	$_____
604.1005	Type C Manholes, 7.99 Feet to 7 Feet	1	EACH	$_____	$_____
604.1006	Type C Manholes, 6.99 Feet to 6 Feet	2	EACH	$_____	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
604.2000	Type Special Manholes, 9.99 Feet to 9 Feet	1	EACH	$_____	$_____
604.3000	Type 2A-9P Inlet, 14.99 Feet to 14 Feet	1	EACH	$_____	$_____
604.3001	Type 2A-9P Inlet, 13.99 Feet to 13 Feet	1	EACH	$_____	$_____
604.3002	Type 2A-9P Inlet, 12.99 Feet to 12 Feet	2	EACH	$_____	$_____
604.3003	Type 2A-9P Inlet, 11.99 Feet to 11 Feet	2	EACH	$_____	$_____
604.3004	Type 2A-9P Inlet, 10.99 Feet to 10 Feet	5	EACH	$_____	$_____
604.3005	Type 2A-9P Inlet, 9.99 Feet to 9 Feet	2	EACH	$_____	$_____
604.3006	Type 2A-9P Inlet, 8.99 Feet to 8 Feet	11	EACH	$_____	$_____
604.3007	Type 2A-9P Inlet, 7.99 Feet to 7 Feet	14	EACH	$_____	$_____
604.3008	Type 2A-9P Inlet, 6.99 Feet to 6 Feet	25	EACH	$_____	$_____
604.3009	Type 2A-9P Inlet, 5.99 Feet to 5 Feet	3	EACH	$_____	$_____
604.4000	Type Special 2A-9P Inlet, 17.99 Feet to 17 Feet	1	EACH	$_____	$_____
604.4001	Type Special 2A-9P Inlet, 15.99 Feet to 15 Feet	2	EACH	$_____	$_____
604.4002	Type Special 2A-9P Inlet, 13.99 Feet to 13 Feet	1	EACH	$_____	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
604.4003	Type Special 2A-9P Inlet, 12.99 Feet to 12 Feet	1	EACH	$_____	$_____
604.4004	Type Special 2A-9P Inlet, 11.99 Feet to 11 Feet	2	EACH	$_____	$_____
604.4005	Type Special 2A-9P Inlet, 10.99 Feet to 10 Feet	1	EACH	$_____	$_____
604.4006	Type Special 2A-9P Inlet, 9.99 Feet to 9 Feet	5	EACH	$_____	$_____
604.4007	Type Special 2A-9P Inlet, 7.99 Feet to 7 Feet	3	EACH	$_____	$_____
604.4008	Type Special 2A-9P Inlet, 6.99 Feet to 6 Feet	7	EACH	$_____	$_____
607.1000	6-Feet Chain Link Fence	5,737	L.F.	$_____	$_____
607.2000	Chain Link Gate, 6 Feet High and 12 Feet Wide	10	EACH	$_____	$_____
610.1000	4-Inch Reinforced Concrete Driveway	L.S.	L.S.	L.S.	$_____
612.1000	Grouted Rubble Paving	L.S.	L.S.	L.S.	$_____
614.1000	New Street Survey Monuments	12	EACH	$_____	$_____
616.1000	Temporary Irrigation System	L.S.	L.S.	L.S.	$_____
619.1000	Planting	L.S.	L.S.	L.S.	$_____
621.1000	Counting Stations	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
622.1000	State Street Light Standard, 98W LED Luminaire, 8' Bracket Arm, Standard Pole, Base and Appurtenances	111	EACH	$_____	$_____
622.1010	State Street Light Standard, 98W LED Luminaire, 8' Bracket Arm, 18' Pole, Base and Appurtenances	2	EACH	$_____	$_____
622.1020	State Street Light Standard, 98W LED Luminaire, 8' Bracket Arm, 17' Pole, Base and Appurtenances	1	EACH	$_____	$_____
622.1030	State Street Light Standard, 120W LED Luminaire, 8' Bracket Arm, Standard Pole, Base and Appurtenances	15	EACH	$_____	$_____
622.1040	State Street Light Standard, 120W LED Luminaire, 8' Bracket Arm, 18' Pole, Base and Appurtenances	1	EACH	$_____	$_____
622.1050	State Street Light Standard, 120W LED Luminaire, 8' Bracket Arm, 25' Pole, Base and Appurtenances	105	EACH	$_____	$_____
622.1060	State Street Light, 98W LED Luminaire, 8' Bracket Arm, Mounted on HECO Wood Pole	8	EACH	$_____	$_____
622.1070	Street Light Metering Cabinet, pad, panelboard, meter socket and appurtenances	2	EACH	$_____	$_____
622.1080	GE Light Grid Node	243	EACH	$_____	$_____
622.1090	Type "B" Streetlight Pullboxes	225	EACH	$_____	$_____
622.1100	Streetlight Conductors, #2 RHW	95,260	L.F.	$_____	$_____
622.1110	Streetlight 2"C Pvc Sch 40	35,390	L.F.	$_____	$_____
622.1120	Street Light Trench Excavation	35,390	L.F.	$_____	$_____
622.1130	Street Light Concrete	136	C.Y.	$_____	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
622.2000	Remove Type "B" Streetlight Pull box	12	EACH	$_____	$_____
622.2010	Remove Pole Mounted Streetlight, Bracket Arm, Luminaire, and Appurtenances	15	EACH	$_____	$_____
622.2020	Remove Standalone Streetlight Base, 30' Pole, Bracket Arm, Luminaire, and Appurtenances	22	EACH	$_____	$_____
622.2030	Remove Streetlight Ductbank	2,640	L.F.	$_____	$_____
622.2040	Remove Streetlight Cables	2,640	L.F.	$_____	$_____
622.3000	HECo. Service Charge for Street Light Service	L.S.	L.S.	L.S.	$_____
623.0001	Traffic Signal Cabinet and Foundation	5	EACH	$_____	$_____
623.0002	Type I Traffic Signal Standard (10' Arm) with conduit & Cabling	38	EACH	$_____	$_____
623.0005	Type II Traffic Signal Standard (20' Arm) with conduit & Cabling	2	EACH	$_____	$_____
623.0006	Type II Traffic Signal Standard (25' Arm) with conduit & Cabling	10	EACH	$_____	$_____
623.0007	Type II Traffic Signal Standard (25'/15' Arm) with conduit & Cabling	2	EACH	$_____	$_____
623.0008	Type II Traffic Signal Standard (30' Arm) with conduit & Cabling	20	EACH	$_____	$_____
623.0009	Type II Traffic Signal Standard (35' Arm) with conduit & Cabling	6	EACH	$_____	$_____
623.0010	Type II Traffic Signal Standard (40' Arm) with conduit & Cabling	1	EACH	$_____	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
623.0011	Type II Traffic Signal Standard (45' Arm) with conduit & Cabling	2	EACH	$_____	$_____
623.0012	Type II Traffic Signal Standard (50' Arm) with conduit & Cabling	2	EACH	$_____	$_____
623.0013	Street Light Traffic Signal Standard	11	EACH	$_____	$_____
623.0014	Traffic Signal Assembly, All Ball, with Cabling	35	EACH	$_____	$_____
623.0015	Traffic Signal Assembly, Straight Arrow, with Cabling	16	EACH	$_____	$_____
623.0016	Traffic Signal Assembly, Left Arrow, with Cabling	14	EACH	$_____	$_____
623.0017	Traffic Signal Assembly, Left Arrow, Programmed Visibility	16	EACH	$_____	$_____
623.0018	Traffic Signal Assembly, Yellow Flasher, with Cabling	2	EACH	$_____	$_____
623.0019	Pedestrian Signal Assembly with Cabling	32	EACH	$_____	$_____
623.0020	Pedestrian Pushbutton with Instruction Sign with Cabling	32	EACH	$_____	$_____
623.0021	Type "A" Pullbox	14	EACH	$_____	$_____
623.0022	Type "B" Pullbox	45	EACH	$_____	$_____
623.0023	Type "C" Pullbox	241	EACH	$_____	$_____
623.0024	Pullbox Tie-in	103	EACH	$_____	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
623.0025	Loop Detector Sensing Unit (6 Ft. x 6 Ft.) with Cabling	161	EACH	$_____	$_____
623.0026	EVP Optical Receiver	20	EACH	$_____	$_____
623.0027	EVP Optical Receiver Cabling	3,000	L.F.	$_____	$_____
623.0028	Traffic Signal Ductline 1-2"C Pvc Sch 40, Conc. Encased	6,200	L.F.	$_____	$_____
623.0029	Traffic Signal Ductline 2-2"C Pvc Sch 40, Conc. Encased	20	L.F.	$_____	$_____
623.0030	Traffic Signal Ductline 6-2"C Pvc Sch 40, Conc. Encased	7,000	L.F.	$_____	$_____
623.0031	Traffic Signal Ductline 7-2"C Pvc Sch 40, Conc. Encased	300	L.F.	$_____	$_____
623.0032	Traffic Signal Ductline 8-2"C Pvc Sch 40, Conc. Encased	200	L.F.	$_____	$_____
623.0033	Type 1 Cable - 26C#14	6,000	L.F.	$_____	$_____
623.0034	Type 2 Cable - 2C#14	20,000	L.F.	$_____	$_____
623.0035	Type 6 Cable - Electrical Service Cable	500	L.F.	$_____	$_____
623.0036	Demolish Traffic Signal Conduits, Cables, and Equipment	L.S.	L.S.	L.S.	$_____
623.0037	Service and Metering Equipment Assembly	6	EACH	$_____	$_____
623.0039	HECo. Service Charge for Traffic Signal Service	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
624.0000	6-Inch Ductile Iron Pipe, Class 53	115	L.F.	$_____	$_____
624.0001	8-Inch Ductile Iron Pipe, Class 53	72	L.F.	$_____	$_____
624.0002	12-Inch Ductile Iron Pipe, Class 53	433	L.F.	$_____	$_____
624.0003	16-Inch Ductile Iron Pipe, Class 53	212	L.F.	$_____	$_____
624.0004	20-Inch Ductile Iron Pipe, Class 53	823	L.F.	$_____	$_____
624.0005	24-Inch Ductile Iron Pipe, Class 53	106	L.F.	$_____	$_____
624.0006	30-Inch Ductile Iron Pipe, Class 53	92	L.F.	$_____	$_____
624.0007	36-Inch Ductile Iron Pipe, Class 53	1,532	L.F.	$_____	$_____
624.0008	42-Inch Ductile Iron Pipe, Class 53	56	L.F.	$_____	$_____
624.1000	20-Inch Bevel Geared Gate Valve	1	EACH	$_____	$_____
624.1001	30-Inch Bevel Geared Gate Valve	1	EACH	$_____	$_____
624.1002	36-Inch Bevel Geared Gate Valve	2	EACH	$_____	$_____
624.1200	12-Inch Gate Valve	5	EACH	$_____	$_____
624.1210	6-Inch Gate Valve	3	EACH	$_____	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
624.1300	3/4-Inch ARV	2	EACH	$_____	$_____
624.1301	2-Inch Offset ARV	7	EACH	$_____	$_____
624.2000	Relocate Water Service Lateral at Station 144+92.6	L.S.	L.S.	L.S.	$_____
624.2100	Fire Hydrant	4	EACH	$_____	$_____
624.3000	Cathodic Protection	L.S.	L.S.	L.S.	$_____
624.8000	Temporary Waterline By-Pass 1	L.S.	L.S.	L.S.	$_____
624.8001	Temporary Waterline By-Pass 2	L.S.	L.S.	L.S.	$_____
624.8002	Temporary Waterline By-Pass 3	L.S.	L.S.	L.S.	$_____
624.8003	Temporary Waterline By-Pass 4	L.S.	L.S.	L.S.	$_____
624.8004	Temporary Waterline By-Pass 5	L.S.	L.S.	L.S.	$_____
624.8005	Temporary Waterline By-Pass 6	L.S.	L.S.	L.S.	$_____
624.8006	Temporary Waterline By-Pass 7	L.S.	L.S.	L.S.	$_____
624.8007	Temporary Waterline By-Pass 8	L.S.	L.S.	L.S.	$_____
624.8008	Temporary Waterline By-Pass 9	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
624.8009	Temporary Waterline By-Pass 10	L.S.	L.S.	L.S.	$_____
624.8010	Temporary Waterline By-Pass 11	L.S.	L.S.	L.S.	$_____
624.8011	Temporary Waterline By-Pass 12	L.S.	L.S.	L.S.	$_____
624.8012	Temporary Waterline By-Pass 13	L.S.	L.S.	L.S.	$_____
624.8013	Temporary Waterline By-Pass 14	L.S.	L.S.	L.S.	$_____
624.8014	Temporary Waterline By-Pass 15	L.S.	L.S.	L.S.	$_____
624.8015	Temporary Waterline By-Pass 16	L.S.	L.S.	L.S.	$_____
624.8016	Temporary Waterline By-Pass 17	L.S.	L.S.	L.S.	$_____
624.8017	Temporary Waterline By-Pass 18	L.S.	L.S.	L.S.	$_____
624.8018	Temporary Waterline By-Pass 19	L.S.	L.S.	L.S.	$_____
624.8019	Temporary Waterline By-Pass 20	L.S.	L.S.	L.S.	$_____
624.8020	Temporary Waterline By-Pass 21	L.S.	L.S.	L.S.	$_____
624.8021	Temporary Waterline By-Pass 22	L.S.	L.S.	L.S.	$_____
624.8022	Temporary Waterline By-Pass 23	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
624.9000	Relocate Irrigation System	F.A.	F.A.	F.A.	$10,000.00
625.1000	10-Inch PVC for Sewer System	385	L.F.	$_____	$_____
626.1000	Sewer Manhole, 14 Feet to 14.99 Feet	1	EACH	$_____	$_____
626.2300	Type "A" Manhole 11.99 Feet to 11 Feet	4	EACH	$_____	$_____
626.3501	Type "D" Manhole 7.99 Feet to 7 Feet	6	EACH	$_____	$_____
626.4000	Type "C" Manhole 9.99 Feet to 9 Feet	1	EACH	$_____	$_____
626.5000	12-Inch Gate Valve Standard Valve Box	5	EACH	$_____	$_____
626.5100	6-Inch Gate Valve Standard Valve Box	3	EACH	$_____	$_____
626.6000	3/4-Inch Air Relief Valve Standard Valve Box	2	EACH	$_____	$_____
626.7000	Adjusting Water Manhole Frame and Cover	L.S.	L.S.	L.S.	$_____
626.8000	Adjusting Water Valve Box	L.S.	L.S.	L.S.	$_____
653.1000	36-Inch Ductile Iron Pipe Class 53 Waterline Pilot Tube Microtunneling	L.S.	L.S.	L.S.	$_____
627.0001	CCTV, Controller, CCTV	6	EACH	$_____	$_____
627.0002	CCTV Type "C" Pullbox	78	EACH	$_____	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
627.0003	CCTV Ductline 2-2"C Pvc Sch 40, Conc. Encased	4,600	L.F.	$_____	$_____
627.0004	CCTV Ductline 4-2"C Pvc Sch 40, Conc. Encased	6,400	L.F.	$_____	$_____
627.0005	CCTV Ductline 5-2"C Pvc Sch 40, Conc. Encased	100	L.F.	$_____	$_____
627.0006	CCTV Ductline 6-2"C Pvc Sch 40, Conc. Encased	400	L.F.	$_____	$_____
627.0007	Dual Camera Site Equipment	4	EACH	$_____	$_____
627.0008	Quad Camera Site Equipment	1	EACH	$_____	$_____
627.0009	CCTV Camera Cable	1,000	L.F.	$_____	$_____
627.0010	Demolish CCTV Conduits, Cables, and Equipment	L.S.	L.S.	L.S.	$_____
627.0011	Broadband Type "B" Pullbox	78	EACH	$_____	$_____
627.0012	Broadband Ductline 2-2"C Pvc Sch 40, Conc. Encased	6,000	L.F.	$_____	$_____
629.1000	Profiled Thermoplastic Striping	2,051	L.F.	$_____	$_____
629.1100	4-Inch Pavement Striping (Thermoplastic)	37,884	L.F.	$_____	$_____
629.1200	6-Inch Pavement Striping (Thermoplastic)	56,643	L.F.	$_____	$_____
629.1300	8-Inch Pavement Striping (Thermoplastic)	10,165	L.F.	$_____	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
629.1400	12-Inch Pavement Striping (Thermoplastic)	8,943	L.F.	$_____	$_____
629.1500	24-Inch Pavement Striping (Thermoplastic)	292	L.F.	$_____	$_____
629.2000	Crosswalk Marking (Thermoplastic)	161	LANE	$_____	$_____
629.3000	Pavement Arrow (Thermoplastic)	40	EACH	$_____	$_____
629.3100	Pavement Symbol (Thermoplastic)	192	EACH	$_____	$_____
629.4000	Pavement Word (Thermoplastic)	46	EACH	$_____	$_____
629.5100	Type "C" Pavement Marker	332	EACH	$_____	$_____
629.5200	Type "D" Pavement Marker	5	EACH	$_____	$_____
629.5300	Type "H" Pavement Marker	999	EACH	$_____	$_____
629.5400	Type "F" Pavement Marker	4	EACH	$_____	$_____
629.6000	Temporary Construction Zone Markings	F.A.	F.A.	F.A.	$50,000.00
631.1000	Regulatory Sign (10 Square Feet or Less)	130	EACH	$_____	$_____
634.1000	Portland Cement Concrete Sidewalk	31,695	S.Y.	$_____	$_____
635.1000	E-Construction License	F.A.	F.A.	F.A.	$10,000.00

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
638.1000	Curb, Type 2D	16,915	L.F.	$_____	$_____
638.2000	Curb and Gutter, Type 2DG	17,360	L.F.	$_____	$_____
641.1000	Hydro-Mulch Seeding	L.S.	L.S.	$_____	$_____
642.1000	Plant Maintenance	9	MONTH	$_____	$_____
642.2000	Irrigation Maintenance	9	MONTH	$_____	$_____
645.1000	Traffic Control	L.S.	L.S.	L.S.	$_____
645.2000	Additional Police Officers, Additional Traffic Control Devices, and Advertisements	F.A.	F.A.	F.A.	$750,000.00
647.0001	Type "B" Pullbox	78	EACH	$_____	$_____
647.0002	ITS, 72 Strand, Fiber Optic Cable	24,000	L.F.	$_____	$_____
647.0003	ITS 3-cell Innerduct	65,600	L.F.	$_____	$_____
647.0004	ITS Ductline 3-2"C Pvc Sch 40, Conc. Encased	4,000	L.F.	$_____	$_____
647.0005	ITS Ductline 1-4"C Pvc Sch 40, Conc. Encased	3,200	L.F.	$_____	$_____
647.0006	ITS Ductline 3-2" & 1-4"C Pvc Sch 40, Conc. Encased	16,000	L.F.	$_____	$_____
647.0007	ITS Demolish Conduits, Cables, and Equipment	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
648.1000	Field-Posted Drawings	L.S.	L.S.	L.S.	$_____
650.1100	Curb Ramp, Type A	55	EACH	$_____	$_____
650.1200	Curb Ramp, Type B	12	EACH	$_____	$_____
650.1400	Curb Ramp, Type D	4	EACH	$_____	$_____
651.0000	AT&T One 6-Inch Conduit Encased in Concrete Jacket with Four 1.5-Inch Inner Ducts - Honouliuli Bridge, Horizontal Directional Drilling	L.S.	L.S.	L.S.	$_____
652.1000	36-Inch Ductile Iron Pipe Class 53 Waterline Pilot Tube Microtunneling	L.S.	L.S.	L.S.	$_____
655.1000	Dumped Riprap	986	C.Y.	$_____	$_____
660.1000	Allowance for Trench Excavation and Backfill, and Installation of Gas Pipelines	F.A.	F.A.	F.A.	$65,000.00
680.2000	CATV Ductline, Two 4-Inch Conduit Encased in Concrete Jacket	L.S.	L.S.	L.S.	$_____
680.2100	CATV Ductline, One 4-Inch Conduit Encased in Concrete Jacket	L.S.	L.S.	L.S.	$_____
680.2200	CATV 3' x 5' Intercept Handhole	1	EACH	$_____	$_____
680.2300	CATV Handhole/Manhole Penetration	4	EACH	$_____	$_____
680.2400	CATV Handhole/Manhole Adjustment	3	EACH	$_____	$_____
680.2500	Demolish CATV Ductline	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
680.2600	Demolish CATV Handhole/Manhole	L.S.	L.S.	L.S.	$_____
680.3000	CATV Ductline, Two 4-Inch Conduit Encased in Concrete Jacket (For Future Development)	L.S.	L.S.	L.S.	$_____
680.3011	CATV Ductline, Four 4-Inch Conduit Encased in Concrete Jacket (For Future Development)	L.S.	L.S.	L.S.	$_____
680.3100	CATV Ductline, One 4-Inch Conduit Encased in Concrete Jacket (For Future Development)	L.S.	L.S.	L.S.	$_____
680.3200	CATV 2' x 6' Handhole	1	EACH	$_____	$_____
680.4010	HTCO Ductline, Three 4-Inch Conduit Encased in Concrete Jacket	L.S.	L.S.	L.S.	$_____
680.4100	HTCO Ductline, Two 4-Inch Conduit Encased in Concrete Jacket	L.S.	L.S.	L.S.	$_____
680.4200	HTCO Ductline, One 4-Inch Conduit Encased in Concrete Jacket	L.S.	L.S.	L.S.	$_____
680.4310	HTCO 5' x 10' Manhole	2	EACH	$_____	$_____
680.4400	HTCO Handhole/Manhole Penetration	6	EACH	$_____	$_____
680.4500	HTCO Handhole/Manhole Adjustment	4	EACH	$_____	$_____
680.4600	Demolish HTCO Ductline	L.S.	L.S.	L.S.	$_____
680.4700	Demolish HTCO Handhole/Manhole	L.S.	L.S.	L.S.	$_____
680.4800	Demolish HTCO Equipment pad	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
680.4900	Demolish and Remove Existing Concrete Encased Asbestos-Containing Transite Ductline After Cables are Removed by HTCO	L.S.	L.S.	L.S.	$_____
680.5100	HTCO Ductline, Two 4-Inch Conduit Encased in Concrete Jacket (For Future Development)	L.S.	L.S.	L.S.	$_____
680.6010	HECO 6' x 14' Manhole	3	EACH	$_____	$_____
680.6011	HECO Betterment 6' x 14' Manhole	9	EACH	$_____	$_____
680.6012	HECO Betterment Upsize to 6' x 14' Manhole (Betterment)	1	EACH	$_____	$_____
680.6013	HECO Betterment 6' x 11' Manhole	1	EACH	$_____	$_____
680.6020	HECO 6' x 11' Manhole	3	EACH	$_____	$_____
680.6030	HECO 5' x 8' Manhole	3	EACH	$_____	$_____
680.6100	HECO 3' x 5' Handhole	2	EACH	$_____	$_____
680.6200	HECO 3' x 5' Handhole (For Traffic Signal Electric Service)	1	EACH	$_____	$_____
680.6300	HECO 1-Phase Transformer Pad (For Traffic Sign Electric Service)	1	EACH	$_____	$_____
680.6400	HECO Handhole/Manhole Penetration	2	EACH	$_____	$_____
680.6410	HECO Transformer Pad Penetration	1	EACH	$_____	$_____
680.6420	HECO Transformer Pad Penetration (For Street Light Service)	1	EACH	$_____	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
680.6500	HECO Handhole/Manhole Adjustment	1	EACH	$_____	$_____
680.6600	Demolish HECO Ductline	L.S.	L.S.	L.S.	$_____
680.6700	Demolish HECO Handhole/Manhole	L.S.	L.S.	L.S.	$_____
680.6800	Demolish HECO Equipment pad	L.S.	L.S.	L.S.	$_____
680.6900	Demolish HECO 138kV Foundation	L.S.	L.S.	L.S.	$_____
680.7000	Demolish and Remove Existing Concrete Encased Asbestos-Containing Transite Ductline After Cables are Removed by HECO	L.S.	L.S.	L.S.	$_____
680.7200	HECO Ductline, Two 6-Inch Conduit Encased in Concrete Jacket	L.S.	L.S.	L.S.	$_____
680.7300	HECO Ductline, Four 5-Inch Conduit Encased in Thermal Concrete Jacket & FTB	L.S.	L.S.	L.S.	$_____
680.7310	HECO Ductline, Eight 5-Inch Conduit Encased in Concrete Jacket & FTB	L.S.	L.S.	L.S.	$_____
680.7400	HECO Ductline, Four 5-Inch Conduit Encased in Concrete Jacket	L.S.	L.S.	L.S.	$_____
680.7410	HECO Ductline, Two 5-Inch Conduit Encased in Concrete Jacket	L.S.	L.S.	L.S.	$_____
680.7500	HECO Ductline, Two 4-Inch Conduit Encased in Concrete Jacket	L.S.	L.S.	L.S.	$_____
680.7600	HECO Ductline, Two 3-Inch Conduit Encased in Concrete Jacket	L.S.	L.S.	L.S.	$_____
680.7700	HECO Ductline, Two 2-Inch Conduit Encased in Concrete Jacket	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
680.8000	HECO Ductline, Two 4-Inch Conduit Encased in Concrete Jacket (For Future Development)	L.S.	L.S.	L.S.	$_____
680.8100	HECO Ductline, Four 5-Inch Conduit Encased in Concrete Jacket	L.S.	L.S.	L.S.	$_____
680.8200	HECO Handhole/Manhole Penetration	1	EACH	$_____	$_____
680.8300	HECO Ductline, Four 5-Inch Conduit Encased in Concrete Jacket.	L.S.	L.S.	L.S.	$_____
680.8400	HECO Ductline, Four 5-Inch Conduit Encased in Thermal Concrete Jacket & FTB.	L.S.	L.S.	L.S.	$_____
680.9000	AT&T One 6-Inch Conduit Encased in Concrete Jacket with Four 1.5-Inch Inner Ducts	L.S.	L.S.	L.S.	$_____
680.9100	AT&T 4' x 4' Intercept Manhole	LS	L.S.	L.S.	$_____
680.9200	AT&T 4' x 4' Manhole	LS	L.S.	L.S.	$_____
680.9300	AT&T Handhole/Manhole Adjustment	3	EACH	$_____	$_____
680.9400	Demolish AT&T Ductline	L.S.	L.S.	L.S.	$_____
680.9500	Demolish AT&T Manhole	L.S.	L.S.	L.S.	$_____
695.1000	Just-In-Time-Training	L.S.	L.S.	L.S.	$_____
696.1000	Field Office Trailer (Not to Exceed $50,000)	L.S.	L.S.	L.S.	$_____
696.3000	Maintenance of Trailers	F.A.	F.A.	F.A.	$25,000.00

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
699.1000	Mobilization (Not to Exceed 6% of the Sum of All Items Excluding the Bid Price of This Item).	L.S.	L.S.	L.S.	$_____
	A. Sum of All Items				$_____
NOTE:	Bidders must complete all unit prices and amounts. Failure to do so may be grounds for rejection of bid.				

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PROPOSAL SCHEDULE-QUEEN'S WEST INTERSECTION WORK

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
201.1000Q	Clearing and Grubbing	1	Acre	$_____	$_____
201.1100Q	Additional Grubbing	F.A.	F.A.	F.A.	$1,000.00
202.3000Q	Removal of AC Pavement	3,448	S.Y.	$_____	$_____
202.3300Q	Removal of Concrete Curb and Gutter	1,009	L.F.	$_____	$_____
203.0100Q	Roadway Excavation	3,836	C.Y.	$_____	$_____
203.1000Q	Over Excavation, Moisture Conditioning and Recompaction	F.A.	F.A.	F.A.	$20,000.00
209.0100Q	Installation, Maintenance, Monitoring, and Removal of BMP	L.S.	L.S.	L.S.	$_____
209.0200Q	Additional Water Pollution, Dust, and Erosion Control	F.A.	F.A.	F.A.	$35,000.00
301.1000Q	Hot Mix Asphalt Base Course	1,198	TON	$_____	$_____
305.1000Q	Aggregate Subbase	1,230	C.Y.	$_____	$_____
316.1000Q	Polypropylene Biaxial Geogrid	2,960	S.Y.	$_____	$_____
401.1000Q	2-Inch PMA Pavement, Mix No. IV	299	TON	$_____	$_____
604.3004Q	Type 2A-9P Inlet, 10.99 Feet to 10 Feet	1	EACH	$_____	$_____

PROPOSAL SCHEDULE-QUEEN'S WEST INTERSECTION WORK

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
604.4007Q	Type Special 2A-9P Inlet, 6.99 Feet to 6 Feet	1	EACH	$_____	$_____
614.1000Q	New Street Survey Monuments	1	EACH	$_____	$_____
616.1000Q	Temporary Irrigation System	L.S.	L.S.	L.S.	$_____
623.0001Q	Traffic Signal Cabinet and Foundation	1	EACH	$_____	$_____
623.0002Q	Type I (10') Traffic Signal Standard with conduit & Cabling	2	EACH	$_____	$_____
623.0003Q	Type II Traffic Signal Standard (10' Arm) with conduit & Cabling	1	EACH	$_____	$_____
623.0004Q	Type II Traffic Signal Standard (15' Arm) with conduit & Cabling	1	EACH	$_____	$_____
623.0008Q	Type II Traffic Signal Standard (30' Arm) with conduit & Cabling	1	EACH	$_____	$_____
623.0009Q	Type II Traffic Signal Standard (35' Arm) with conduit & Cabling	3	EACH	$_____	$_____
623.0013Q	Street Light Traffic Signal Standard	3	EACH	$_____	$_____
623.0014Q	Traffic Signal Assembly, All Ball, with Cabling	4	EACH	$_____	$_____
623.0015Q	Traffic Signal Assembly, Straight Arrow, with Cabling	6	EACH	$_____	$_____
623.0016Q	Traffic Signal Assembly, Left Arrow, with Cabling	5	EACH	$_____	$_____

PROPOSAL SCHEDULE-QUEEN'S WEST INTERSECTION WORK

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
623.0017Q	Traffic Signal Assembly, Left Arrow, Programmed Visibility	6	EACH	$_____	$_____
623.0018Q	Traffic Signal Assembly, Yellow Flasher, with Cabling	2	EACH	$_____	$_____
623.0019Q	Pedestrian Signal Assembly with Cabling	8	EACH	$_____	$_____
623.0020Q	Pedestrian Pushbutton with Instruction Sign with Cabling	8	EACH	$_____	$_____
623.0020Q	Type "A" Pullbox	2	EACH	$_____	$_____
623.0022Q	Type "B" Pullbox	9	EACH	$_____	$_____
623.0023Q	Type "C" Pullbox	23	EACH	$_____	$_____
623.0024Q	Pullbox Tie-in	9	EACH	$_____	$_____
623.0025Q	Loop Detector Sensing Unit (6 Ft. x 6 Ft.) with Cabling	52	EACH	$_____	$_____
623.0026Q	EVP Optical Receiver	4	EACH	$_____	$_____
623.0027Q	EVP Optical Receiver Cabling	800	L.F.	$_____	$_____
623.0028Q	Traffic Signal Ductline 1-2"C Pvc Sch 40, Conc. Encased	750	L.F.	$_____	$_____
623.0030Q	Traffic Signal Ductline 6-2"C Pvc Sch 40, Conc. Encased	800	L.F.	$_____	$_____

PROPOSAL SCHEDULE-QUEEN'S WEST INTERSECTION WORK

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
623.0031Q	Traffic Signal Ductline 7-2"C Pvc Sch 40, Conc. Encased	200	L.F.	$_____	$_____
623.0032Q	Traffic Signal Ductline 8-2"C Pvc Sch 40, Conc. Encased	100	L.F.	$_____	$_____
623.0033Q	Type 1 Cable - 26C#14	1,500	L.F.	$_____	$_____
623.0034Q	Type 2 Cable - 2C#14	6,000	L.F.	$_____	$_____
623.0035Q	Type 6 Cable - Electrical Service Cable	800	L.F.	$_____	$_____
623.0037Q	Service and Metering Equipment Assembly	1	EACH	$_____	$_____
623.0039Q	HECo. Service Charge for Traffic Signal Service	L.S.	L.S.	L.S.	$_____
629.1000Q	Profiled Thermoplastic Striping	865	L.F.	$_____	$_____
629.1100Q	4-Inch Pavement Striping (Thermoplastic)	2,720	L.F.	$_____	$_____
629.1200Q	6-Inch Pavement Striping (Thermoplastic)	26	L.F.	$_____	$_____
629.1300Q	8-Inch Pavement Striping (Thermoplastic)	40	L.F.	$_____	$_____
629.1400Q	12-Inch Pavement Striping (Thermoplastic)	120	L.F.	$_____	$_____
629.2000Q	Crosswalk Marking (Thermoplastic)	7	LANE	$_____	$_____

PROPOSAL SCHEDULE-QUEEN'S WEST INTERSECTION WORK

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
629.3000Q	Pavement Arrow (Thermoplastic)	22	EACH	$_____	$_____
629.3100Q	Pavement Symbol (Thermoplastic)	8	EACH	$_____	$_____
629.4000Q	Pavement Word (Thermoplastic)	3	EACH	$_____	$_____
629.5100Q	Type "C" Pavement Marker	20	EACH	$_____	$_____
629.5200Q	Type "D" Pavement Marker	10	EACH	$_____	$_____
629.5300Q	Type "H" Pavement Marker	8	EACH	$_____	$_____
629.6000Q	Temporary Construction Zone Markings	F.A.	F.A.	F.A.	$15,000.00
631.1000Q	Regulatory Sign (10 Square Feet or Less)	5	EACH	$_____	$_____
634.1000Q	Portland Cement Concrete Sidewalk	408	S.Y.	$_____	$_____
638.1000Q	Curb, Type 2D	643	L.F.	$_____	$_____
638.2000Q	Curb and Gutter, Type 2DG	282	L.F.	$_____	$_____
645.1000Q	Traffic Control	L.S.	L.S.	L.S.	$_____
645.2000Q	Additional Police Officers, Additional Traffic Control Devices, and Advertisements	F.A.	F.A.	F.A.	$75,000.00

PROPOSAL SCHEDULE-QUEEN'S WEST INTERSECTION WORK

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
650.1100Q	Curb Ramp, Type A	3	EACH	$_____	$_____
650.1200Q	Curb Ramp, Type B	1	EACH	$_____	$_____
650.1300Q	Curb Ramp, Type C	3	EACH	$_____	$_____
696.1000Q	Field Office Trailer (Not to Exceed $50,000)	L.S.	L.S.	L.S.	$_____
696.2000Q	Project Site Laboratory Trailer (Not to Exceed $50,000)	L.S.	L.S.	L.S.	$_____
696.3000Q	Maintenance of Trailers	F.A.	F.A.	F.A.	$10,000.00
699.1000Q	Mobilization (Not to Exceed 6% of the Sum of All Items Excluding the Bid Price of This Item).	L.S.	L.S.	L.S.	$_____

B. Sum of All Items (Queen's West Intersection Work) $_____

C. Sum of Item A on P-38 $_____

Sum of Item B on P-45 $_____

Total of Item A and Item B $_____

NOTE: Bidders must complete all unit prices and amounts. Failure to do so may be grounds for rejection of bid.

PROPOSAL SCHEDULE

The bidder is directed to Subsection 105.16 – Subcontracts.

The bidder's attention is directed to Sections 696 - Field Office and Project Site Laboratory and 699 - Mobilization for the limitation of the amount bidders are allowed to bid.

If the bid price for any proposal item having a maximum allowable bid indicated therefore in any of the contract documents is in excess of such a maximum amount, the bid price for such proposal item shall be adjusted to reflect the limitation thereon. The comparison of bids to determine the successful bidder and the amount of contract to be awarded shall be determined after such adjustments are made, and such adjustments shall be binding upon the bidder.

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
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Project Bench Mark

The project bench mark is referenced to the City traverse station "Street Monument A" located in the vicinity of Farrington Highway, near the intersection of Kapolei Golf Course Road. The elevation of "Street Monument A" is 112.95–feet mean sea level (msl). Benchmark provided by ControlPoint Surveying Inc.

Notes for Construction (City and County of Honolulu)

1. All applicable construction work shall be done in accordance with the Standard Specifications for Public Works Construction, September 1986 and Standard Details for Public Works Construction, September 1984, as amended, of the Department of Public Works, City and County of Honolulu and the counties of Kauai, Maui, and Hawaii.

2. The underground pipes, cables or ductlines known to exist by the Engineer from his search of records are indicated on the plans. The contractor shall verify the locations and depths of the facilities and exercise proper care in excavating in the area. Wherever connections of new utilities to existing utilities are shown on the plans, the contractor shall expose the existing lines at the proposed connections to verify their locations and depths prior to excavation for the new lines.

3. No contractor shall perform any construction operation so as to cause falling rocks, soil or debris in any form to fall, slide or flow into existing City drainage systems, or adjoining properties, streets or natural watercourses. should such violations occur, the contractor may be cited and the contractor shall immediately make all remedial actions necessary.

4. The general contractor/developer/owner of the project shall be responsible for conformance with applicable provisions of the Hawaii Administrative Rules, Title 11, Chapter 54, "Water Quality Standards," and Title 11, Chapter 55, "Water Pollution Control," as well as Chapter 14 of the Revised Ordinances of Honolulu, as amended. Best management practices shall be employed at all times during construction.

   The general contractor/developer/owner of the project shall obtain National Pollutant Discharge Elimination System (NPDES) permit coverage(s) for the following:

   1. Storm water discharges associated with construction activities that disturb one (1) acre or more, and
   2. Discharges of hydrotesting effluent, dewatering effluent, and well drilling effluent to State waters.

   In accordance with State law, all discharges related to project construction or operations are required to comply with State Water Quality Standards (Hawaii Administrative Rules, Chapter 11–54). Best management practices shall be used to minimize or prevent the discharge of sediment, debris, and other pollutants to state waters. Permit coverage is available from the Department of Health, Clean Water Branch at http://health.hawaii.gov/cwb. The owner/developer/contractor is responsible for obtaining other federal, state, or local authorizations as required by law.

5. For non–City projects, the contractor shall notify the Civil Engineering Branch, D.P.P. at 768–8084 to arrange for inspectional services and submit two (2) sets of approved construction plans seven (7) days prior to commencement of construction work. For city projects, the contractor shall coordinate inspectional services with the responsible city agency.

Notes for Construction (City and County of Honolulu) Cont.

6. The contractor may submit a substitution request to precast any City owned and/or maintained drainage structure (ex., catch basins, drain manholes, drain inlets, culverts, etc.) However, prior to construction and installation of any precast structure, the contractor shall a) submit six (6) sets of shop drawings to the Civil Engineering Branch, Department of Planning and Permitting and obtain written approval and b) notify the Civil Engineering Branch, Department of Planning and Permitting at 768–8084 to arrange for inspectional services. non–compliance with any of these requirements shall mean immediate suspension of all precast construction work and rejection of all precast structures already constructed.

⚠2 7. Confined space

   For entry by City personnel, including inspectors, into a permit required confined space as defined in 29 CFR part 1910.146(b), the contractor shall be responsible for providing:

   i. All safety equipment required by the confined space regulations applicable to all parties other than the construction industry, to include, but not limited to, the following:

      a. full body harnesses for up to two personnel.
      b. lifeline and associated clips.
      c. ingress/egress and fall protection equipment.
      d. two–way radios (walkie–talkies) if out of line–of–sight.
      e. emergency (escape) respirator (10 minute duration).
      f. cellular telephone to call for emergency assistance.
      g. continuous gas detector (calibrated) to measure oxygen, hydrogen, sulfide, carbon monoxide and flammables (capable of monitoring at a distance of at least 20–feet away).
      h. personal multi–gas detector to be carried by inspector.

   ii. Continuous forced air ventilation adequate to provide safe entry conditions.

   iii. One attendant/rescue personnel topside (two, if conditions warrant it).

8. Pursuant to Chapter 6E, HRS, in the event any artifacts or human remains are uncovered during construction operations, the contractor shall immediately suspend work and notify the Honolulu Police Department, the State Department of Land and Natural Resources–Historic Preservation Division (692–8015). In addition, for non–City projects, the contractor shall inform the Civil Engineering Branch, Department of Planning and Permitting (768–8084); and for City projects, notify the responsible City agency.

9. For projects abutting State Highways' rights–of–way, the owner or his authorized representative shall notify the State Department of Transportation, Highways Division, Oahu District, Drainage Discharge Unit at 831–6793 for an assessment of State Highways permit requirements.

⚠2 10. For bench mark, see sheet C–23.

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

⚠5

DATE	REVISION
07/15/22	⚠5 Rev. notes.
06/08/22	⚠2 Deleted note, revised note

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Construction Notes – 4

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

Scale: As Shown Date: April 2022

SHEET No. C-5 OF 767 SHEETS

ADD. 6

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	7	767

Environmental Control Notes For Grading

1. In accordance with Chapter 11–60.1, AIR POLLUTION CONTROL, Title 11, Hawaii Administrative Rules, the Property Owner/Developer shall be responsible for ensuring that effective control measures are provided to minimize or prevent any visible dust emission caused by the construction work from impacting the surrounding areas; including the off–site roadways used to enter/exit the project. These measures include but are not limited to the use of water wagons, sprinkler systems, dust fences, etc.

2. In accordance with Chapter 11–55, WATER POLLUTION CONTROL and Chapter 11–54, WATER QUALITY STANDARDS, Title 11, Hawaii Administrative Rules, the Property Owner/Developer shall be responsible for ensuring that the Best Management Practice (BMP) to minimize or prevent the discharge of sediments, debris and other water pollutant into State waters are provided at all times.

3. In accordance with Chapter 11–56, SOLID WASTE MANAGEMENT CONTROL, Title 11, Hawaii Administrative Rules, the Property Owner/Developer shall be responsible for ensuring that grub material, demolition waste and construction waste generated by the project are disposed of in a manner or at a site approved by the State Department of Health. Disposal of any of these wastes by burning or burying is prohibited.

4. The Contractor shall be responsible for compliance with all applicable permits from the Department of Health including but not limited to (NPDES), Notice of Intent and General Permit for storm water, hydrostatic test and dewatering discharges.

5. The Contractor shall remove daily all silt and debris resulting from this work and deposited in drainage facilities, roadways and other areas. The cost incurred for any necessary remedial action by the Engineer shall be payable by the Contractor.

6. Best Management Practices (BMP's) shall be employed at all times to the maximum extent practicable to prevent damage by sedimentation, erosion or dust to streams, watercourses, natural areas and the property of others.

7. In accordance with Chapter 11–46, COMMUNITY NOISE, Hawaii Administrative Rules, the Contractor and the Property Owner/Developer shall be responsible for providing effective control measures to minimize or prevent construction related noise from impacting the residents in the immediate area. If required, noise reduction measures shall be implemented by the Contractor during the construction work.

8. The property may harbor rodents which will be dispersed to the surrounding areas when the site is cleared. In accordance with Chapter 11–26, VECTOR CONTROL, Title 11, HAR, the applicant shall ascertain the presence or absence of rodents on the property. Should the presence of rodents be determined, the applicant shall eradicate the rodents prior to clearing the site.

9. A copy of the plans, construction schedule and/or written measures that is required to be submitted by the Contractor (Dust Control Measures/Plans) should also be sent to the Department of Health for monitoring purposes.

Notes for Grading (City and County of Honolulu)

1. All grading work shall be done in accordance with Chapter 14, Articles 13, 14, 15 and 16, as related to grading, soil erosion and sediment control of the Revised Ordinances of Honolulu, 1990, as amended, and soil reports by Geolabs Inc., entitled "Geotechnical Engineering Exploration–Farrington Highway Improvements–Kapolei Golf Course to Fort Weaver Road–Ewa, Oahu, Hawaii" dated August 4, 2021.

2. No Contractor shall perform any grading operation so as to cause falling rocks, soil or debris in any form to fall, slide or flow onto adjoining properties, streets or natural watercourses. should such violations occur, the contractor may be cited and the contractor shall immediately make all remedial actions necessary.

3. The contractor, at his own expense, shall keep the project area and surrounding area free from dust nuisance. The work shall be in conformance with the Air Pollution Control Standards contained in the Hawaii Administrative Rules, Title 11, Chapter 60.1, "Air Pollution Control."

4. The underground pipes, cables or ductlines known to exist by the Engineer from his search of records are indicated on the plans. The contractor shall verify the locations and depths of the facilities and exercise proper care in excavating in the area. wherever connections of new utilities to existing utilities are shown on the plans, the contractor shall expose the existing lines at the proposed connections to verify their locations and depths prior to excavation for the new lines.

5. Adequate provisions shall be made to prevent surface waters from damaging the cut face of an excavation or the sloped surfaces of a fill. furthermore, adequate provisions shall be made to prevent sediment–laden run off from leaving the site.

6. All slopes and exposed areas shall be sodded, planted, or sprayed with soil sement chemical stabilizer as soon as final grades have been established. planting shall not be delayed until all grading work has been completed. grading to final grade shall be continuous, and any area, within which work has been interrupted or delayed, shall be planted.

7. Fills on slopes steeper than 5H:1V shall be keyed.

8. The City shall be informed of the location of the borrow/disposal site for the project when the application for a grading permit is made. The borrow/disposal site must also fulfill the requirements of the Grading Ordinance.

9. No grading work shall be done on Saturdays, Sundays and Holidays at any time without prior notice to the Director, D.P.P., provided such grading work is also in conformance with the Community Noise Control Standards contained in the Hawaii Administrative Rules, Title 11, Chapter 46, "Community Noise Control".

10. The limits of the area to be graded shall be flagged before the commencement of the grading work.

11. The general contractor/developer/owner of the project shall be responsible for conformance with applicable provisions of the Hawaii Administrative Rules, Title 11, Chapter 54, "Water Quality Standards," and Title 11, Chapter 55, "Water Pollution Control," as well as Chapter 14 of the Revised Ordinances of Honolulu, as amended. best management practices shall be employed at all times during construction. The general contractor/developer/owner of the project shall obtain National Pollutant Discharge Elimination System (NPDES) permit coverage(s) for the following:

    A. Storm water discharges associated with construction activities that disturb one (1) acre or more, and
    B. Discharges of hydrotesting effluent, dewatering effluent, and well drilling effluent to State waters.

In accordance with State law, all discharges related to project construction or operations are required to comply with State Water Quality Standards (Hawaii Administrative Rules, Chapter 11–54). best management practices shall be used to minimize or prevent the discharge of sediment, debris, and other pollutants to state waters. permit coverage is available from the department of health, clean water branch at http://health.hawaii.gov/cwb. The owner/developer/contractor is responsible for obtaining other federal, state, or local authorizations as required by law.

Notes for Grading (Continued)

12. Where applicable and feasible the measures to control erosion and other pollutants shall be in place before any earth moving phase of the grading is initiated.

13. Temporary erosion controls shall not be removed before permanent erosion controls are in–place and established.

14. Temporary erosion control procedures shall be submitted for approval prior to application for grading permit.

15. If the grading work involves contaminated soil, then all grading work shall be done in conformance with applicable State and Federal requirements.

16. For non–City projects, the contractor shall notify the Civil Engineering Branch, D.P.P. at 768–8084 to arrange for inspectional services and submit two (2) sets of approved construction plans seven (7) days prior to commencement of construction work. For City projects, the contractor shall coordinate inspectional services with the responsible City agency.

17. Pursuant to Chapter 6e, HRS, in the event any artifacts or human remains are uncovered during construction operations, the contractor shall immediately suspend work and notify the Honolulu Police Department, the State Department of Land and Natural Resources–Historic Preservation Division (692–8015). In addition, for non–City projects, the contractor shall inform the Civil Engineering Branch, Department of Planning and Permitting (768–8084); and for City projects, notify the responsible City agency.

18. For all projects, which will disturb one (1) acre or more of land, the contractor shall not start construction until a Notice of General Permit Coverage (NGPC) is received from the Department of Health, State of Hawaii, and has satisfied any other applicable requirements of the NPDES permit program. Also, for non–City and other non–governmental agency projects, the contractor shall provide a written copy of the NGPC to the permitting and inspection section, Civil Engineering Branch, D.P.P., at least seven (7) calendar days before the start of construction. for city or other governmental projects, the contractor should provide a written copy of the ngpc to the appropriate city department or governmental agency per their requirements.

19. All grading and construction work shall implement measures to ensure that the discharge of pollutants from the construction site will be reduced to the maximum extent practicable and will not cause or contribute to an exceedance of water quality standards.

20. Non–compliance to any of the above requirements shall mean immediate suspension of all work, and remedial work should commence immediately. all costs incurred shall be billed to the violator. furthermore, violators shall be subjected to administrative, civil and/or criminal penalties.

21. For bench mark, see sheet C–23.

ORIGINAL PLAN	STORY PLOTTED BY	DATE
	DATA TAKEN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
No.	CHECKED BY	

5 07/15/22 Rev. notes.

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Construction Notes – 5

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

Scale: As Shown Date: April 2022

SHEET No. C-6 OF 767 SHEETS

ADD. 7

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	13	767

Water Notes (Board of Water Supply)

1. Unless otherwise specified, all materials and construction of water system facilities and appurtenances shall be in accordance with the STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, dated 2005, as amended, of the Hawaii Highways Division, Department of Transportation, and the City and County of Honolulu Board of Water Supply's "WATER SYSTEM STANDARDS", DATED 2002, THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 2021, and all subsequent amendment and additions.

2. No deviation to the Board of Water Supply 2002 Water System Standards shall be allowed without the manager and Chief Engineer's approval.

3. All ductile iron pipe and fittings, including sections requiring reinforced concrete jacketing shall be ductile iron pipe class 53, with a bonded dielectric coating per the Board of Water Supply 2002 System Standards as amended.

4. Test pressure shall be 200 psi. During the 30-minute pressure test, the pressure shall not drop more than 10 psi.

5. The Contractor shall notify Board of Water Supply Capital Projects Division, Construction Section in writing or call (808) 748-5730, and submit six (6) sets of 24" x 36" approved construction drawings, one week prior to commencing construction activities.

6. The contractor shall chlorinate the entire inside surface of each pipe and fitting with disinfection solution of 5 ounces of sodium hypochlorite (5% chlorine bleach) mixed with 10 gallons of water. (For connection only). 5

7. The contractor shall be responsible for the protection of all water lines during construction. The contractor shall be especially careful when excavating behind water lines, tees, and bends wherever there is a possibility of water line movement due to the removal of the supporting earth beyond the existing reaction blocks. The contractor shall take whatever measures necessary to protect the water lines, such as constructing special reaction blocks (with BWS approval) and/or modifying his construction method.

8. The existence and location of underground utilities and structures as shown on the plans are from the latest available data but is not guaranteed as to the accuracy or the encountering of other obstacles during the course of the work. The contractor shall be responsible and shall pay for all damages to existing utilities. The contractor shall not assume that where no utilities are shown, that none exist.

9. Prior to installation, the contractor shall submit for approval by Board of Water Supply, the manufacturer's certification that all cast iron (gray or ductile) fittings for the project conform in all respects to the Water System Standards, dated 2002.

10. Polygon shape for mechanical joint glands as described in AWWA Standard C111 shall be "straight-sided" or an approved equal on a job to job basis.

11. Re-approval shall be required if this project is not under construction within a period of two (2) years.

12. Contractor shall cut and plug all existing unused laterals at the main whether or not shown on the plans. The damaged area shall be repaired to an equal or better condition than the immediate area. All work shall be done at the expense of the contractor.

Water Notes (Board of Water Supply) (Continued)

13. The contractor/developer shall obtain a NPDES permit prior to chlorination and/or dewatering. A copy of the permit shall be submitted to the Board of Water Supply, Capital Projects Division, Construction Section.

14. Soil resistivity for the site has a corrosion rating of Moderately to Severely Corrosive as reported by Geolabs, Inc. in their report entitled "Geotechnical Engineering Exploration, Farrington Highway Improvements, Kapolei Golf Course Road to Fort Weaver Road, Ewa, Oahu, Hawaii, Dated August 4, 2021. All required electrical isolation procedures and corrosion control requirements shall apply.

15. Pipe cushion shall be of high resistivity material. The contractor shall submit a soil certification that high resistant cushion material has a resistivity greater than 5,000 ohm-cm. Remainder of the backfill material shall be as specified in volume 1 of the Water System Standards. Pipe cushion and backfill material shall contain no hazardous substances above regulatory action levels including but not limited to lead, asbestos, mercury, chromium, cadmium, zinc, strontium, and polychlorinated biphenyls (PCB).

16. Upon completion of the project, the developer shall provide the BWS with a certificate from a registered soils engineer certifying that the road prism has been constructed in accordance to City and County road standards.

17. Two-way blue reflective hydrant markers type DB shall be installed at all new fire hydrant installations. Contractor shall verify the exact locations of hydrant markers with the nearest Honolulu Fire Department battalion chief.

18. Cleaning shall be by the use of "pigs" introduced into the pipeline and run completely through all installed pipelines and all branch lines for fire hydrants. "Pigging" of service laterals is not required. Bare foam "pigs" shall be used to swab piping clean as each length of the pipeline is installed. The type, density, size, diameter and length of the pig shall be submitted for review and approval by the Manager prior to pigging work. "Pig" shall be used per manufacturer's specifications. Prior to use, the "pig" shall be submerged in a chlorine solution of 1 oz. of 5% chlorine bleach in 5 gallons of water. "Pigging" of the pipeline shall be considered incidental to the installation of the new pipeline. Manual sweeping, hand cleaning or swabbing may be allowed in lieu of "pigging" as approved by the Board of Water Supply Manager.

19. The contractor shall install electronic markers to all mains and test the electronic markers prior to installations to verify proper operation. BWS personnel shall verify the number and locations of placed electronic markers before final paving of the project.

20. The Board of Water Supply will not send a completion notice to the Department of Planning and Permitting until easement documents are submitted to the Board of Water Supply and recorded.

21. Prior to any excavating, the Contractor shall verify in the field, the location of existing waterlines and appurtenances.

22. Any adjustments to the existing water system required during construction, to meet the requirements of the BWS Standards, whether shown on the plans or not, shall be done by the Contractor at no cost to the Board of Water Supply.

23. After installation of tapping sleeve and tapping valve and prior to tapping the existing water main, the assembly shall be pressure tested at 200 psi on both sides of the valve and in accordance with the Water System Standards, dated 2002.

Water Notes (Board of Water Supply) (Continued)

24. Maintain 3'-0" minimum cover for all existing waterlines from new finish grade. The contractor shall probe the waterline and service laterals and submit the probing data to BWS Capital Projects Division, Construction Section.

25. The contractor shall furnish and install an insulating corporation stop and petrolatum wax tape at all taps (for DI pipe and copper lateral combination only).

26. All ductile iron pipe fittings and valves shall be coated with a bonded dielectric coating and wrapped with petrolatum wax tape.

5 27. At the electrical/cable/signal ductline and water crossings, adjust all electrical/cable/signal ductline elevations to maintain the required vertical clear separation from all water mains. Conformance to the Board of Water Supply 2002 Water System Standards as amended shall be at no cost and adhered to.

28. Maintain the required minimum horizontal clear separation between electrical/cable/signal appurtenances, (including any modular units) and the nearest water mains or water appurtenance. Contractor shall field verify for any conflicts at each electrical/cable/signal appurtenance location. Where conflicts occur, the contractor shall coordinate with the project engineer to revise the electrical/cable/signal appurtenance to provide the required clearances. Conformance to the Board of Water Supply, Water System Standards, dated 2002, as amended, shall be at no cost and adhered to.

5 29. All plans approved by the Board of Water Supply are based solely on the adequacy of the water supply.

30. Maintain the required minimum horizontal clear separation between all water mains, and the nearest electrical/cable/signal ductlines paralleling the water system. Conformance to the Board of Water Supply 2002 Water System as amended shall be at no cost and adhered to. 5

APPROVED:

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

DATE	REVISION
07/15/22	5 Revised notes
06/08/22	2 Note Added

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Construction Notes - 11

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. C-12 OF 767 SHEETS

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

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

ADD. 13

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-12 Construction Notes - 11.dwg saved July 6, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	14	767

Water Notes (Board of Water Supply) (Continued)

30. Install 4 mil thick, non-metallic, blue colored, 6 inches wide warning tape over centerline of the pipe and below the base course along the entire length of trench. Tape should be marked with "caution water line buried below".

31. Board of Water Supply approval of these plans does not constitute a water commitment. Availability of water will be determined when building permit is presented to the department. Water commitment will depend upon the status of the water system at that time. Should water service be made available, the water commitment will be effective when the project receives an approved building permit from the building department. All water commitments will be canceled in the event the building permit is canceled.

32. When a utility (gas, sewer, electrical duct line, fiber optic, drainage, etc.) crosses below a Board of Water Supply water main, the designer of record and their construction engineer shall be responsible for determining the adequate water main structural support and submit the construction method and shop drawing, stamped by a licensed engineer and reviewed and accepted by the designer of record, to the Board of Water Supply for review and approval. All work shall be at no cost to the Board of Water Supply.

33. At utility crossings where proper compaction under a water main is difficult to achieve, CLSM shall be installed in place of backfill material and pipe cushion material. CLSM mixture to be furnished shall be in accordance with Division 200 – Materials, Section 209.06 Controlled Low Strength Material (CLSM) of the Water System Standards, as amended. (2)

Chlorination and Hydrotesting Effluent Note

1. The contractor shall only use dechlorinated hydrotesting effluent for dust control, irrigation and/or other purposes that do not involve discharges to waters of the State of Hawaii.

Trenchless Installation Work

1. For trenchless utility work (micro-tunneling, directional drilling, pipe ramming/jacking of new utilities such as electrical duct lines, sewer lines or drain lines) crossing or paralleling existing waterlines, provide the required minimum horizontal and vertical clearance to existing waterlines. No deviation shall be allowed without the Manager and Chief Engineer's approval. The utility owner or contractor shall make adjustments to meet the minimum clearances should the utility line be installed closer to the existing waterlines, at no cost to the Board of Water Supply. The contractor shall submit as-built plans of the new utility lines after inspection of the project.

Waterline Chlorination and Testing Procedures

1. The contractor shall follow the following revised chlorination and water sampling procedures:

   The following chlorination and water sample collection procedure shall apply to all water pipeline projects (all work to be coordinated through BWS inspector):

   Chlorination of Water Systems

   A. The contractor shall provide a 4-week advance notice, in writing, to the Officer-In-Charge for proposed flushing, filling and bacterial testing of the new pipeline. (5)

Waterline Chlorination and Testing Procedures (Continued)

B. The Contractor shall hire a State of Hawaii – Department of Health certified laboratory to provide water sampling services and to deliver water samples to the Micro Lab for analysis. Water samples for bacterial testing shall be delivered no later than 2:30 p.m. on the day the samples are taken to the Board of Water Supply Microlab located at 630 S. Beretania St., Honolulu, HI 96843. The Micro Lab shall perform analysis and provide their results to the Officer-In-Charge by 4:30 p.m. on the following day (in some cases, final results notification may take up to 48 hours).

C. Water mains shall be disinfected in accordance with the Board of Water Supply Water System Standards (2002), as amended, Section 302.29. (5)

Step 1 – Preliminary Flushing (Prior to Chlorination):
The mains shall be flushed with maximum available pressure and velocity. Adequacy of turnovers shall be determined by the absence of particles. Turbidity shall be less than 1.0 NTU before chlorination. During all flushing operations, the Manager or the Manager's authorized representative shall determine the rate of water use.

Step 2 – Chlorination:
The Contractor shall submit to the Manager, for approval, a sketch showing locations of sampling points and a plan or schedule delineating the method or steps the Contractor proposes to use to accomplish the work. The following methods for chlorination shall be used:

1. The following chlorination and water sample collection procedure shall apply to all water pipeline projects:

   a. Step 1: Chlorinate main by filling with water and introducing chlorine in sufficient quantity to obtain a minimum chlorine concentration of 50 parts per million. Leave chlorinated water in main overnight.

   b. Step 2: Flush main with fresh water until all chlorine has been flushed out as evidenced by the N, N-diethyl-p-phenylenediamine (DPD) test, then collect a water sample while continuing to flush the main.

   c. Step 3: Repeat Steps 1 and 2. After collecting the second water sample, stop flushing and allow the water to stand in the main overnight.

   d. Step 4: Thoroughly flush the main with fresh water until all water that had been standing in the main overnight has been flushed out. Stop flushing and let the water stand in the main for one hour. Collect a water sample.

2. The main is deemed acceptable and certified when (I) the three consecutive water samples, collected 24 hours apart under Steps 1 and 2, show no TC (Total Coliform bacteria), no E. Coli, less than 200 CFU/ml (Colony Forming Units per ml) of HPC (Heterotrophic Plate Count bacteria) or less than 202 HPC using the MPN (Most Probable Number) method and Turbidity <1.0 NTU and (II) the sample of water held in the main for one hour, collected under Step 4, also shows no TC, no E. coli, less than 200 CFU/ml of HPC or less than 202 HPC using the MPN method and Turbidity <1.0 NTU.

Waterline Chlorination and Testing Procedures (Continued)

3. Chlorination, flushing, sampling and testing will be extended should unsatisfactory results be encountered. Any sample that shows positive TC, E. coli, HPC>200 CFU/ml, HPC>202 MPN or Turbidity > 1.0 NTU is unsatisfactory.

4. Steps 1 and 2 may be repeated before collecting the one hour hold sample specified in Step 4. Repeating Steps 1 and 2 is recommended in the event samples show the presence of TC and/or E. coli and/or increasing total bacterial results from one sample to the next.

5. Water samples that show the presence of atypical results, debris, high turbidity or results inconsistent with existing water are subject to reconfirmation. The Manager reserves the right to request and test additional water samples in the interest of safeguarding public health and safety at no additional cost to the Department.

6. Liquid chlorine, chlorine based liquid disinfectants or calcium hypochlorite that has been tested and certified as meeting the specifications of the ANSI/NSF Standard 60, Drinking Water Treatment Chemicals – Health Effects, shall be used for the chlorination of the water mains.

APPROVED:

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

DATE	REVISION
07/15/22	(5) Notes Revised
06/08/22	(2) Numbering Revised

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Construction Notes – 12

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

SHEET No. C-13 OF 767 SHEETS

ADD. 14

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

FILE: K:\Civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-13 Construction Notes – 12.dwg saved June 30, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	16	767

Water Meter Installations (For Meters 3–In. and Larger) (Continued)

13. The Contractor shall chlorinate the entire inside surface of each pipe and fitting with disinfection solution of 5 ounces of sodium hypochlorite (5% chlorine bleach) mixed with 10 gallons of water. (For connection only). 5

14. All ductile iron pipe, fittings, and valves shall be coated with a bonded dielectric coating and wrapped with petrolatum wax tape.

15. All ductile iron pipe and fittings, including sections requiring reinforced concrete jacketing, shall be ductile iron Class 53, and bonded dielectric coated as per the Board of Water Supply 2002 Water System Standards, as amended.

16. The project shall pay the applicable water system facilities and/or one–time service charge and for the meter which will be furnished by Board of Water Supply and installed by the Contractor when the lateral is installed.

17. Contractor shall cut and plug and remove all existing unused laterals at the main whether or not shown on the plans. Meter and valve boxes to be or already abandoned shall be demolished or removed and properly disposed of. The damaged area shall be repaired to an equal or better condition than the immediate area. All work shall be done at the expense of the Contractor.

18. After installation of tapping sleeve and tapping valve and prior to tapping the existing water main, the assembly shall be pressure tested at 200 psi on both sides of the valve and in accordance with the WATER SYSTEM STANDARDS, dated 2002. 5

19. For meters 3 inches and larger (Compound, F.M., and Detector Check), Contractor shall notify Customer Care Division – Service Engineering Section in writing after the plan is approved, no later than 120 days, prior to withdrawing meter from Board of Water Supply storeyard. Such notice shall indicate number, size, and type of meter (Compound, F.M., or Detector Check) and approximate month and year meter is anticipated to be drawn out. If the approved plan is allowed to lapse, the 120–day notice will be voided.

20. Board of Water Supply approval of these plans does not constitute a water commitment. Availability of water will be determined when building permit is presented to the Department. Water commitment will depend upon the status of the water system at that time. Should water service be made available, the water commitment will be effective when the project receives an approved building permit from the Building Department. All water commitments will be canceled in the event the building permit is canceled. 5

21. The project shall be subject to the Board of Water Supply's Cross–Connection Control requirements prior to issuance of the Building Permit.

22. Easement documents must be submitted to Board of Water Supply and recorded before meter is issued.

23. The installation, chlorination, and testing of the water main and facilities after the property line shall not be the responsibility of the Board of Water Supply.

24. Prior to installation, the Contractor shall submit for approval by the Board of Water Supply, the manufacturer's certification that all cast iron (gray or ductile) fittings for the project conform in all respects to the Board of Water Supply Water System Standards, dated 2002 and addendums.

25. Polygon shape for mechanical joint glands as described in AWWA Standard C111 shall be "straight–sided" or an approved equal on a job–to–job basis.

26. The backflow preventer device must be installed before meter is issued.

27. Pipe cushion shall be of high resistivity material. The Contractor shall submit a soil certification that high resistant cushion material has a resistivity greater than 5,000 OHM–CM. Remainder of the backfill material shall be as specified in the Water System Standards. Pipe cushion and backfill material shall contain no hazardous substances above regulatory action levels including but not limited to lead, asbestos, mercury, chromium, cadmium, zinc, strontium, and polychlorinated biphenlys (PCB).

Water Meter Installations (For Meters 3–In. and Larger) (Continued)

28. The Contractor shall install electronic markers to all mains and test the electronic markers prior to installations to verify proper operation. Board of Water Supply personnel shall verify the number and locations of placed electronic markers before final paving of the project.

29. The Contractor shall furnish and install an insulting corporation stop and petrolatum wax tape at all taps (for D.I. pipe and copper lateral combination only).

30. Install 4 mil thick, non–metallic, blue colored, 6 inches wide warning tape over centerline of the pipe and below the base course along the entire length of trench. Tape should be marked with "CAUTION WATER LINE BURIED BELOW".

Honolulu Board of Water Supply Right–of–Entry

1. The Contractor shall be fully responsible for all costs related to the processing and obtaining of the Consent of Entry (COE) and Release and Waiver (R&W) with the Honolulu Board of Water Supply (BWS). Any delays caused by obtaining the COE and R&W will be at the cost of the Contractor. The Contractor shall coordinate all COE and R&W work with Mr. Michael Matsuo, BWS Land Division, Land Administrator, phone number: (808) 748–5951.

Honolulu Board of Water Supply Reinforced Concrete Jackets on Existing Waterlines Notes:

1. Reinforced concrete jackets on existing waterlines are based upon the as–built location of the pipe joints. The Contractor shall verify the pipe joint locations in the field and shall extend the reinforced concrete jackets as necessary to comply with BWS Std. Det. B1. Shortening of the reinforced concrete jacket is not allowed.

2. The Contractor shall obtain BWS approval of the means and methods to construct the reinforced concrete jackets on the existing waterlines. The Contractor shall provide a schematic shop drawing to BWS that details the materials and procedures necessary to safely encase the existing waterlines without a water shutdown.

3. In order to provide additional stability beneath the existing waterlines, the Contractor shall provide a CLSM cushion beneath the bell ends of the existing waterlines that are to be encased in a reinforced concrete jacket. The CLSM cushion shall be a minimum of 6" thick and shall extend 1' in each direction from the end of the reinforced concrete jacket.

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

APPROVED:

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

2

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 Notes Revised
06/08/22	2 Notes Added

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Construction Notes – 14

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

Scale: As Shown Date: April 2022

SHEET No. C-15 OF 767 SHEETS

ADD. 16

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	21	767

Legend:

	Existing:	Proposed:
Baseline		℄
Property Line		℄
Delta		△
State Right-of-way	r/w	R/W
Property Line or City Right-of-way		
Easement Line		
Power Pole	○	●
Guy Wire		
Overhead Utility Line	o/h	O/H
Traffic Light Pole	☼	
Traffic Signal, Street Light or Electric Box	▭	▭ ▭
Street Light		
Chain Link Fence		
Metal Guardrail		
Hedge/Brush		
Trees		
Benchmark	△	
Top of Bank	Fill Condition Cut Condition	Fill Condition Cut Condition
Bottom of Bank		
Riprap		
Drain Manhole	○	▣
Grated Drain Inlet Box	▥	▥ ▭
Bridge Scupper		▪
Catch Basin		
Drainline	D24	D24
Drainage Flow Direction		
Sign on Post	⊦	⊦
Raised Pavement Markings	◫ □	◫ ■
Waterline	EW16	W24
Sewerline	S8	S8

Abbreviations:

AASHTO	American Association of State Highway and Transportation Officials
Ac.	Acre
AC	Asphalt Concrete
ASTM	Association Society for Testing and Materials
BC	Bottom of Curb
Blk.	Block
Bot.	Bottom
BV	Bottom Vertical
BVC	Begin Vertical Curve
BW	Bottom of Wall
BWS	Board of Water Supply
C	Chord
CB	Catch Basin
Cl.	Class
Clr.	Clear
CO	Cleanout
Comm.	Communications
Conc.	Concrete
Conn.	Connect
Cont.	Continuous
Decel.	Deceleration
Det.	Detail
D.I.	Ductile Iron
D.I.P.	Ductile Iron Pipe
DI	Drain Inlet
Dia.	Diameter
D.L.	Drainline
DMH	Drain Manhole
D.P.P.	Department of Planning and Permitting
D.S.	Downspout
E.P.	Edge of Pavement
E.S.	Edge of Shoulder
EVC	End Vertical Curve
Exist.	Existing
FE	Flanged End
GDI	Grated Drop Inlet
GV	Gate Valve
HDOT	Hawaii Department of Transportation
HGL	Hydraulic Grade Line
Hwy.	Highway
I.B.	Inbound
Inv.	Invert
Lc	Length of Chord
Lt.	Left
LP	Light Pole
O.B.	Out Bound
O.C.	On Center
o/s	Offset
Max.	Maximum
Min.	Minimum
Mod.	Modified
MJ	Mechanical Joint
No.	Number
Pav't.	Pavement
PC	Point of Curvature
PCC	Portland Cement Concrete
Ph.	Phase
PI	Point of Intersection
PIVC	Point of Inflection Vertical Curve
PMA	Polymer Modified Asphalt
POC	Point on Curve
PP	Power Pole
Psi	Pounds Per Square Inch
PT	Point of Tangency
Pt.	Point
R	Radius
RC	Reinforced Concrete
Rd.	Road
Rt.	Right
R/W	Right-of-Way
Shldr.	Shoulder
Sht.	Sheet
SLB	Street Light Box
Spec.	Specification
Sp.	Special
STA.	Station
Std.	Standard
Struct.	Structure
St.	Street
Sq.	Square
SWQ	Storm Water Quality
T	Tangent
TC	Top of Curb
TD	Top of Deck
TLP	Traffic Light Pole
TMK	Tax Map Key
TSB	Traffic Signal Box
TV	Top Vertical
TW	Top of Wall
Typ.	Typical
VB	Valve Box
V.E.	Vertical Curve
W.L.	Waterline
WV	Water Valve
WWF	Welded Wire Fabric
Yd.	Yard

APPROVED:

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

5

DATE	REVISION
07/15/22	5 Signature Block Revised

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

General Legend and Abbreviations

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. C-20 OF 767 SHEETS

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

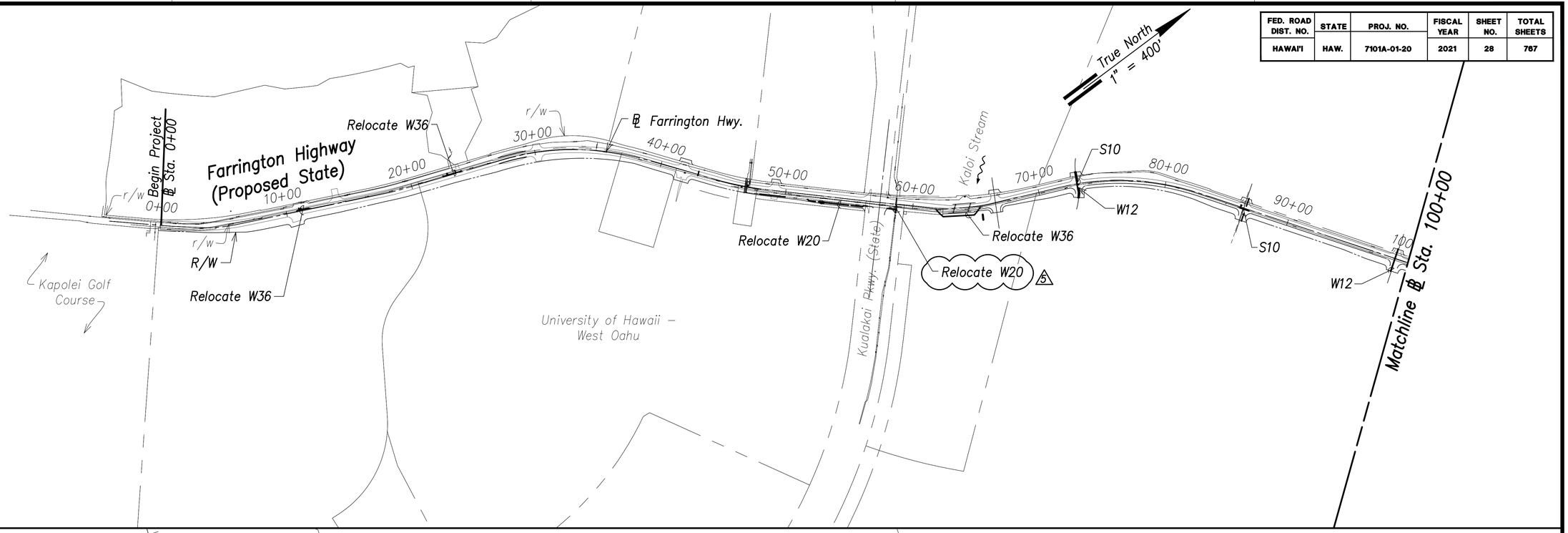
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

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

ADD. 21

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	28	767



Legend:

Proposed Water or Sewer System

Proposed Sewer System

2

General Water and Sewer Plan

Scale: 1" = 400'

Graphic Scale: 1" = 400' (400' 0 400' 800') Scale in Feet

APPROVED:

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

DATE	REVISION
07/15/22	5 Callouts Revised
06/08/22	2 Revised Sewer Linetype

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

General Water and Sewer Plan

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6635-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

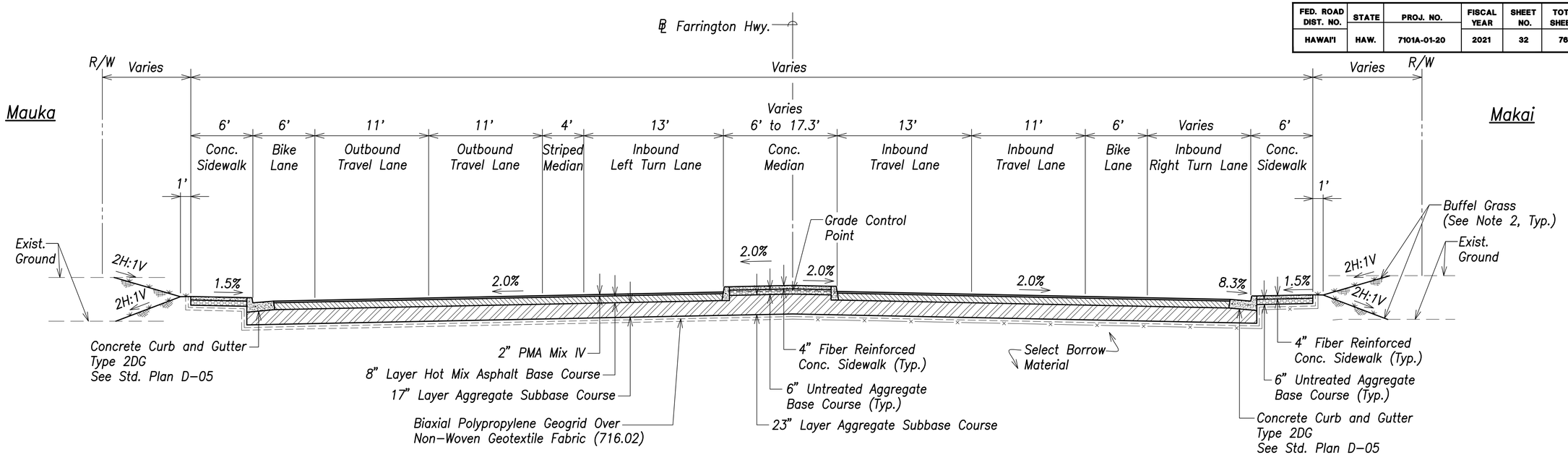
SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

SHEET No. C-27 OF 767 SHEETS

ADD. 28

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	32	767

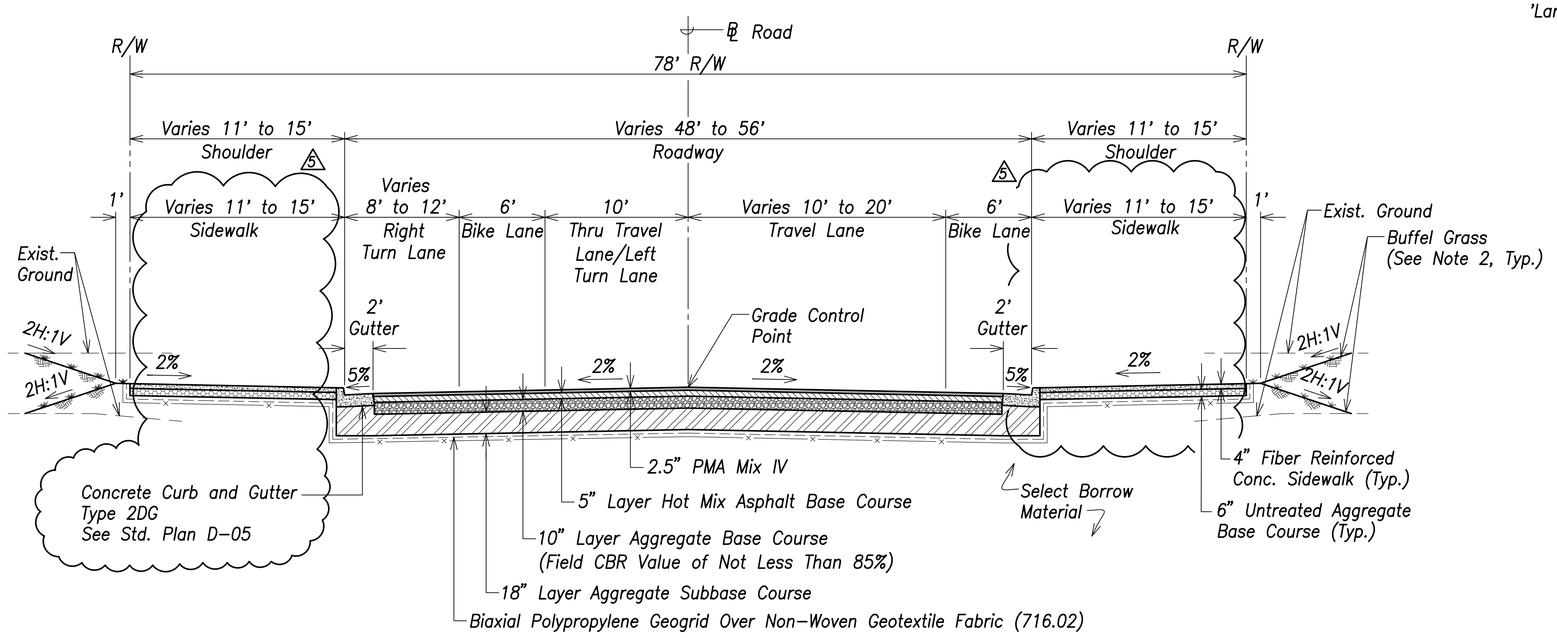


Typical Section – Farrington Highway (℄ Sta. 158+51.86 to ℄ Sta. 159+94.12)

Scale: 1" = 5'

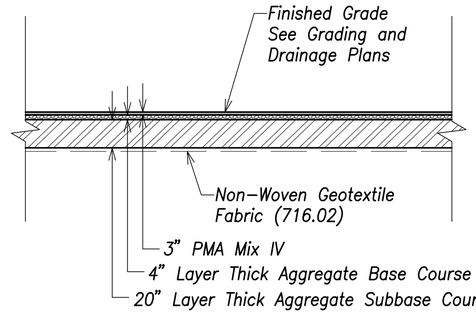
Notes:

1. Farrington Highway is a low speed facility with a design speed of 30 MPH and Posted speed of 25 MPH.
2. All exposed surfaces shall be seeded with Buffel Grass (Cenchrus Cilaiaris 'Laredo'). Seed at 2 lbs./1,000 SF w/Hydromulch at 30 lbs./1,000 SF.



Typical Section – Road 'K' and Road 'L'

Scale: 1" = 5'



Typical Section – PMA Pavement (Private Driveway)

Scale: 1" = 5'

ORIGINAL PLAN	STUFF PLOTTED BY	DATE
	PLANS BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

DATE	REVISION
07/15/22	5 Revised callouts; added note

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Typical Sections – 4

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

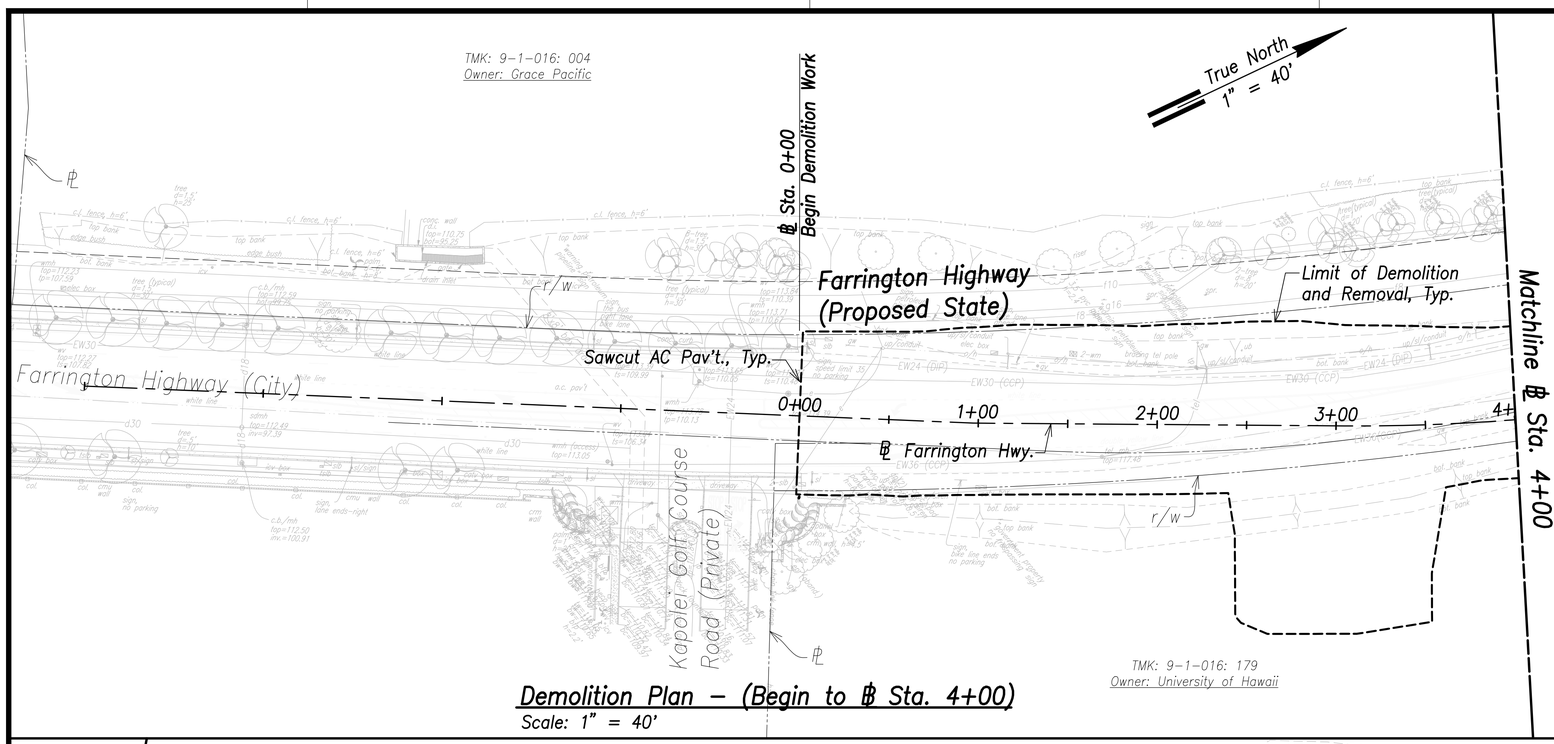
SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

SHEET No. C-31 OF 767 SHEETS

ADD. 32

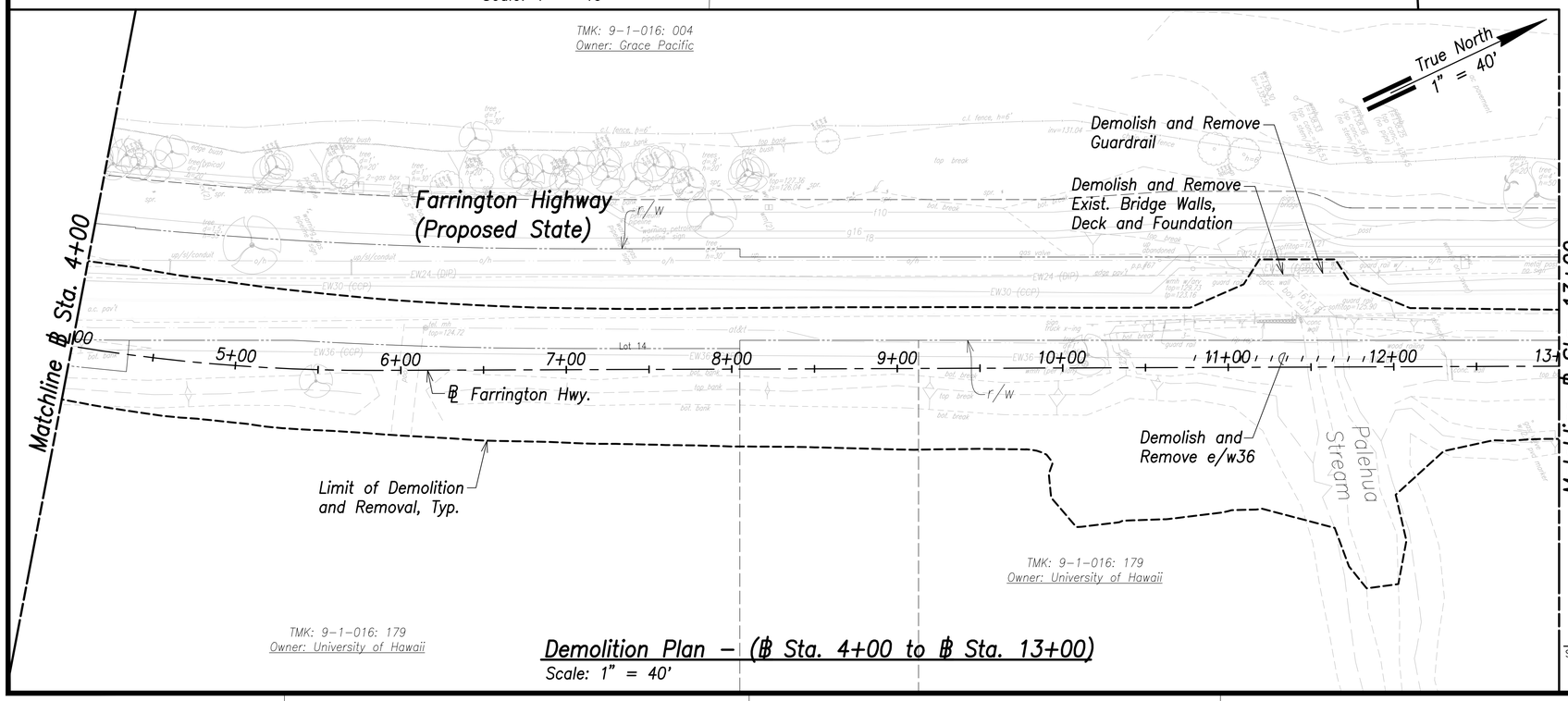
FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-31 Typical Sections – 4.dwg saved July 8, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	33	767



Demolition Plan – (Begin to ℄ Sta. 4+00)

Scale: 1" = 40'



Demolition Plan – (℄ Sta. 4+00 to ℄ Sta. 13+00)

Scale: 1" = 40'

Notes:

1. All drainage structures, curbs, gutters, sidewalks, pavement, guardrails, striping, vegetation, posts, and signing shall be removed within the limit of demolition and removal.
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APPROVED:

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

5

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

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

07/15/22	5 Signature Block Revised
DATE	REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

Demolition Plan
℄ Sta. 0+00 to ℄ Sta. 13+00

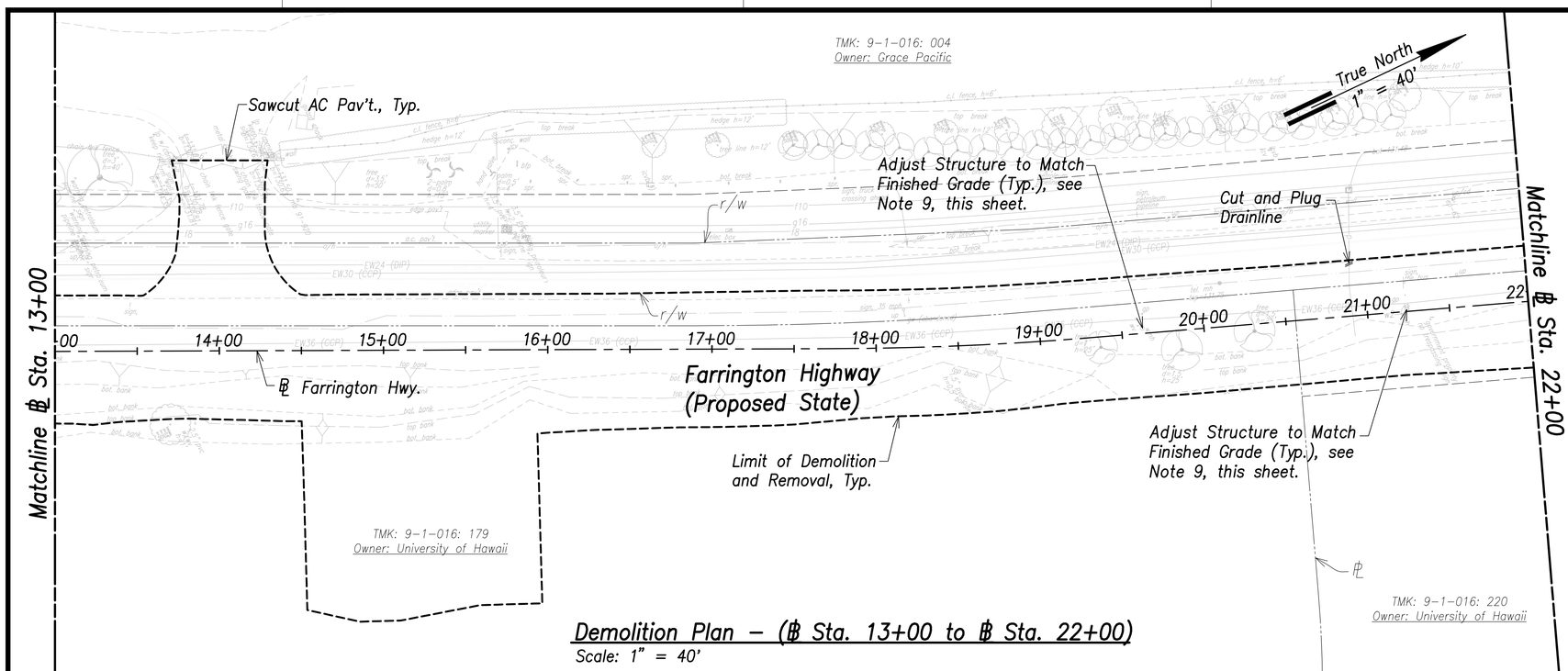
FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown — Date: April 2022

SHEET No. C-32 OF 767 SHEETS

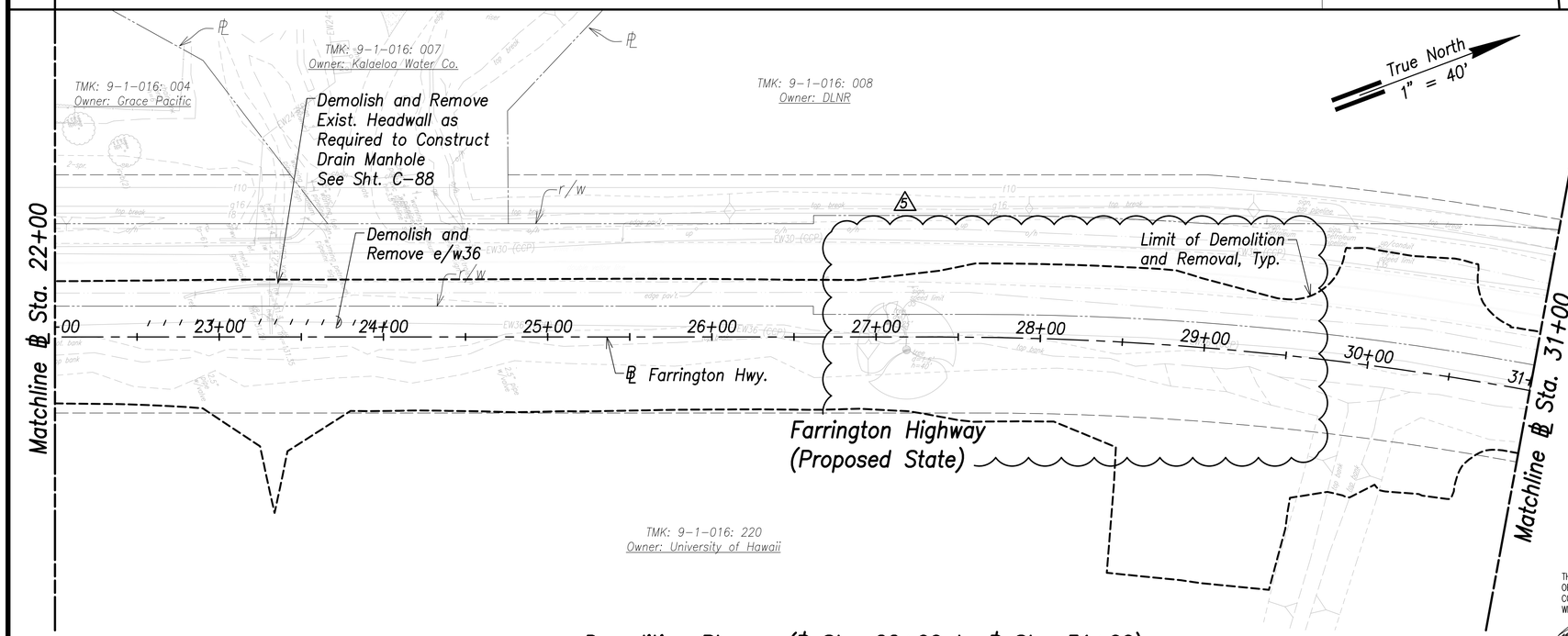
ADD. 33

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	34	767



Demolition Plan – (℄ Sta. 13+00 to ℄ Sta. 22+00)

Scale: 1" = 40'



Demolition Plan – (℄ Sta. 22+00 to ℄ Sta. 31+00)

Scale: 1" = 40'

Notes:

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APPROVED:

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

5

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

DATE	REVISION
07/15/22	5 Signature Block and Limit Revised

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Demolition Plan
℄ Sta. 13+00 to ℄ Sta. 31+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

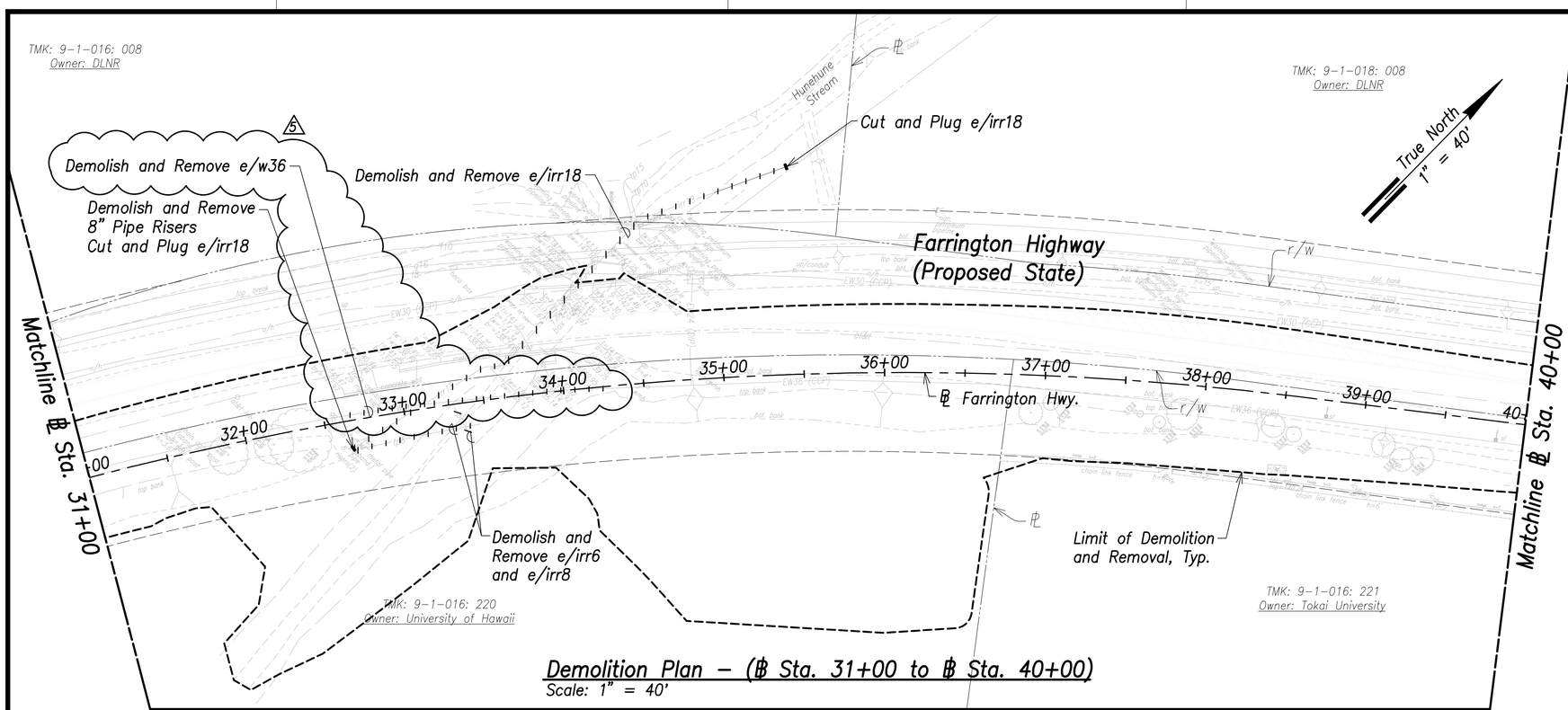
SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

SHEET No. C-33 OF 767 SHEETS

ADD. 34

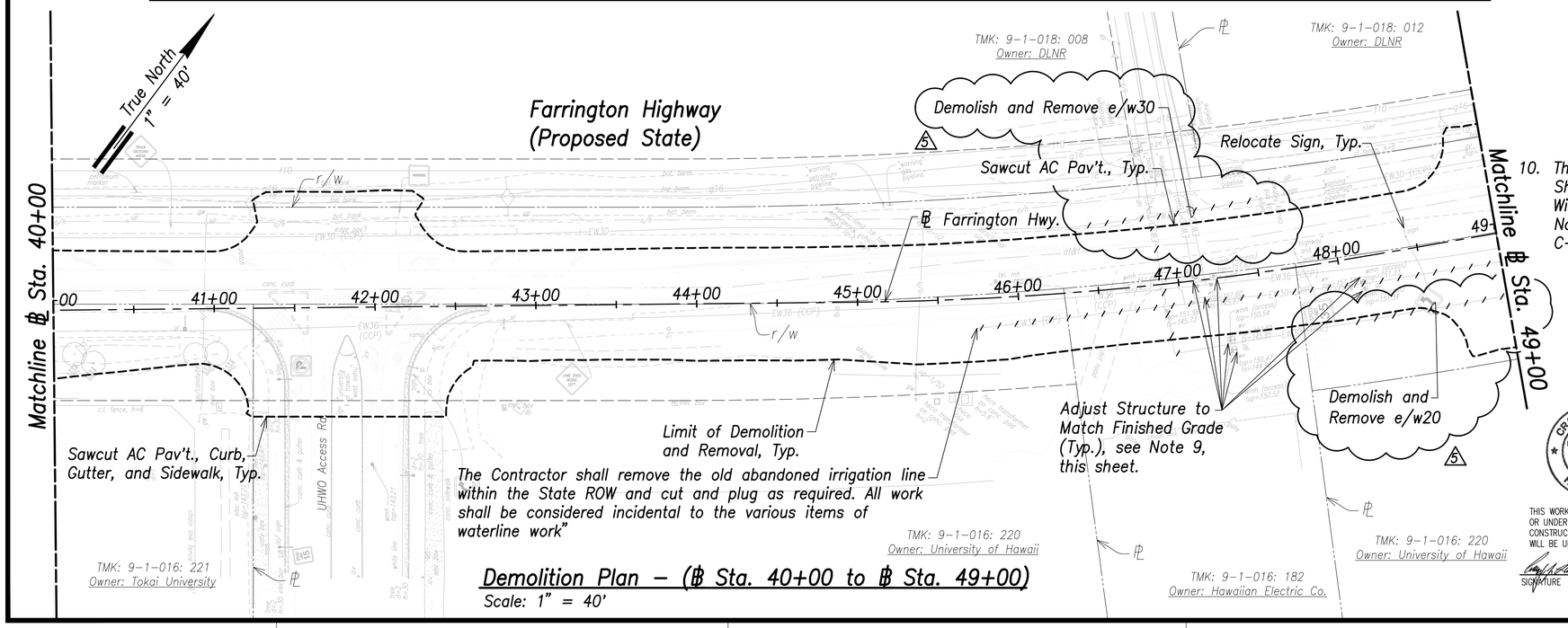
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
NOTE BOOK | No.

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-33 Demo Plan – Sta. 13+00 to 31+00.dwg saved July 8, 2022



Demolition Plan – (℄ Sta. 31+00 to ℄ Sta. 40+00)

Scale: 1" = 40'



Demolition Plan – (℄ Sta. 40+00 to ℄ Sta. 49+00)

Scale: 1" = 40'

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	35	767

Notes:

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APPROVED:

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

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

DATE	REVISION
07/15/22	5 Revised demolition and signature block

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Demolition Plan
℄ Sta. 31+00 to ℄ Sta. 49+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

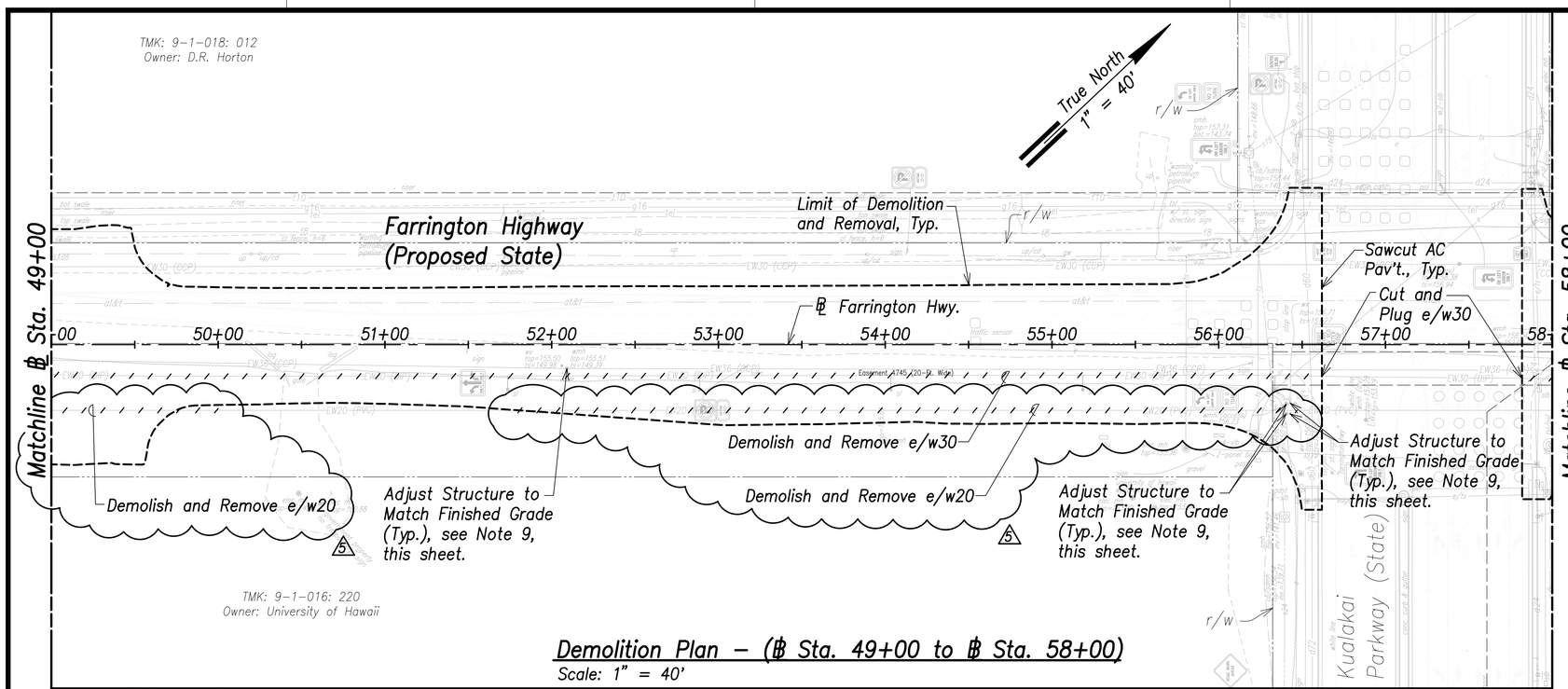
SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

SHEET No. C-34 OF 767 SHEETS

ADD. 35

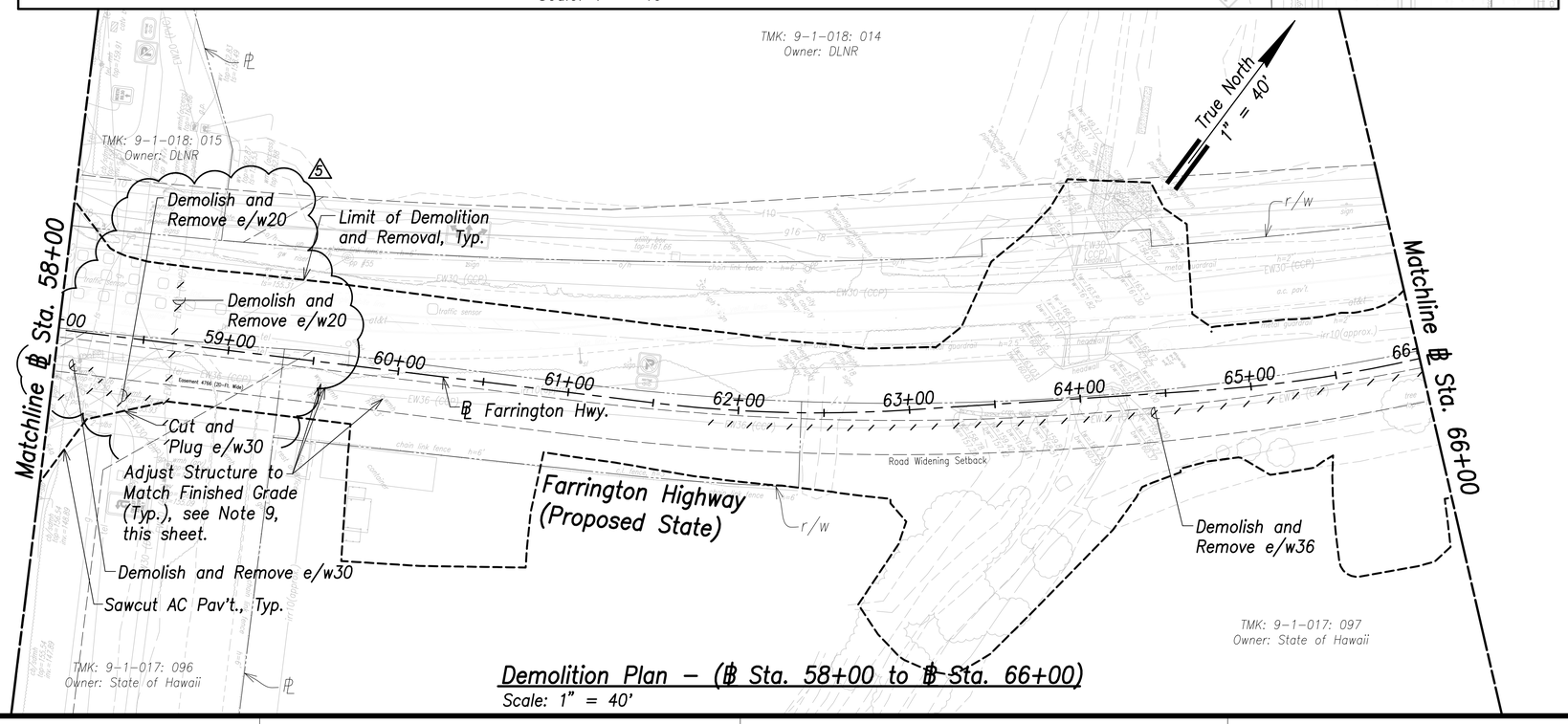
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | NOTE BOOK | DESIGNED BY | QUANTITIES BY | CHECKED BY | No. | DATE

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-34 Demo Plan – Sta. 31+00 to 49+00.dwg saved July 14, 2022



Demolition Plan – (℄ Sta. 49+00 to ℄ Sta. 58+00)

Scale: 1" = 40'



Demolition Plan – (℄ Sta. 58+00 to ℄ Sta. 66+00)

Scale: 1" = 40'

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	36	767

Notes:

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APPROVED:

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

Graphic Scale:

1" = 40' (40' 20' 0 40' 80')

Scale in Feet

DATE	REVISION
07/15/22	5 Revised demolition and signature block

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Demolition Plan
℄ Sta. 49+00 to ℄ Sta. 66+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown — Date: April 2022

SHEET No. C-35 OF 767 SHEETS

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6635-C
HAWAII, U.S.A.

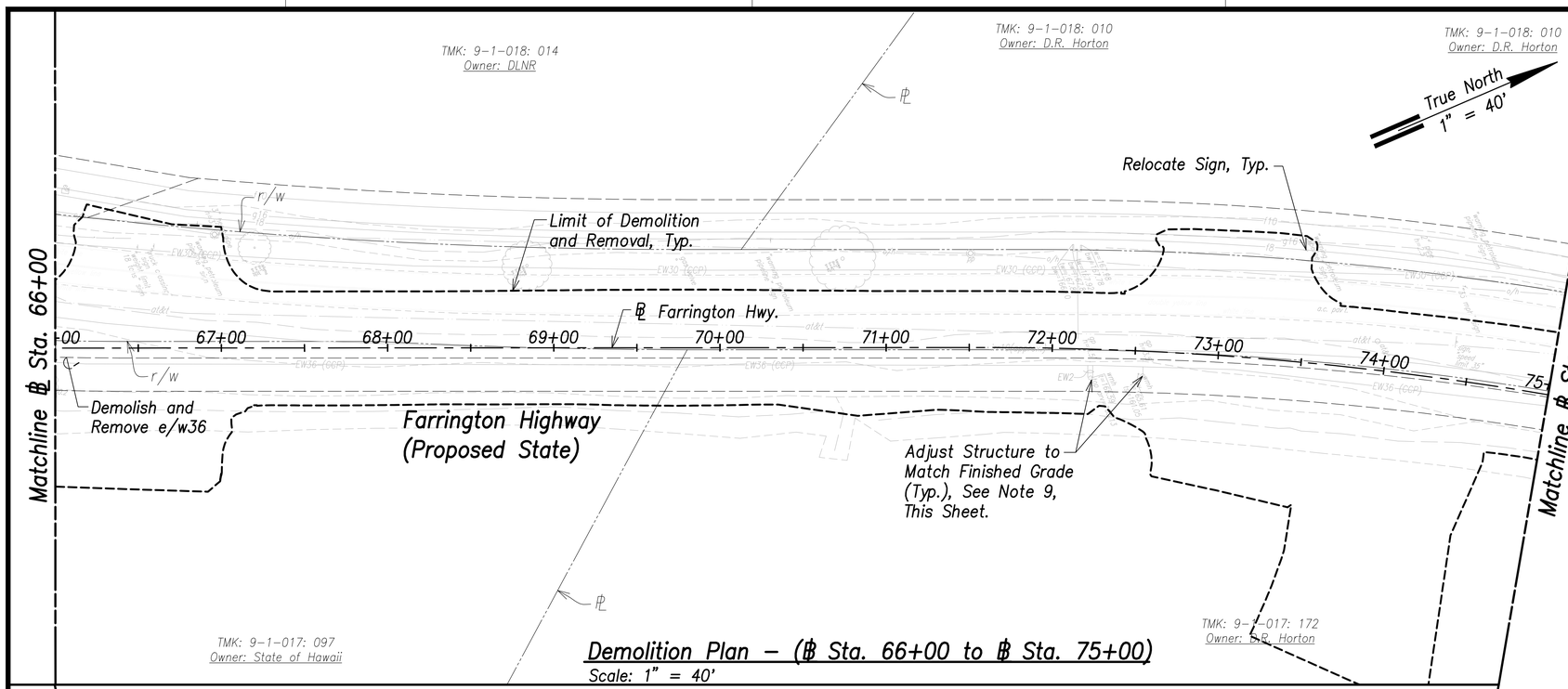
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

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

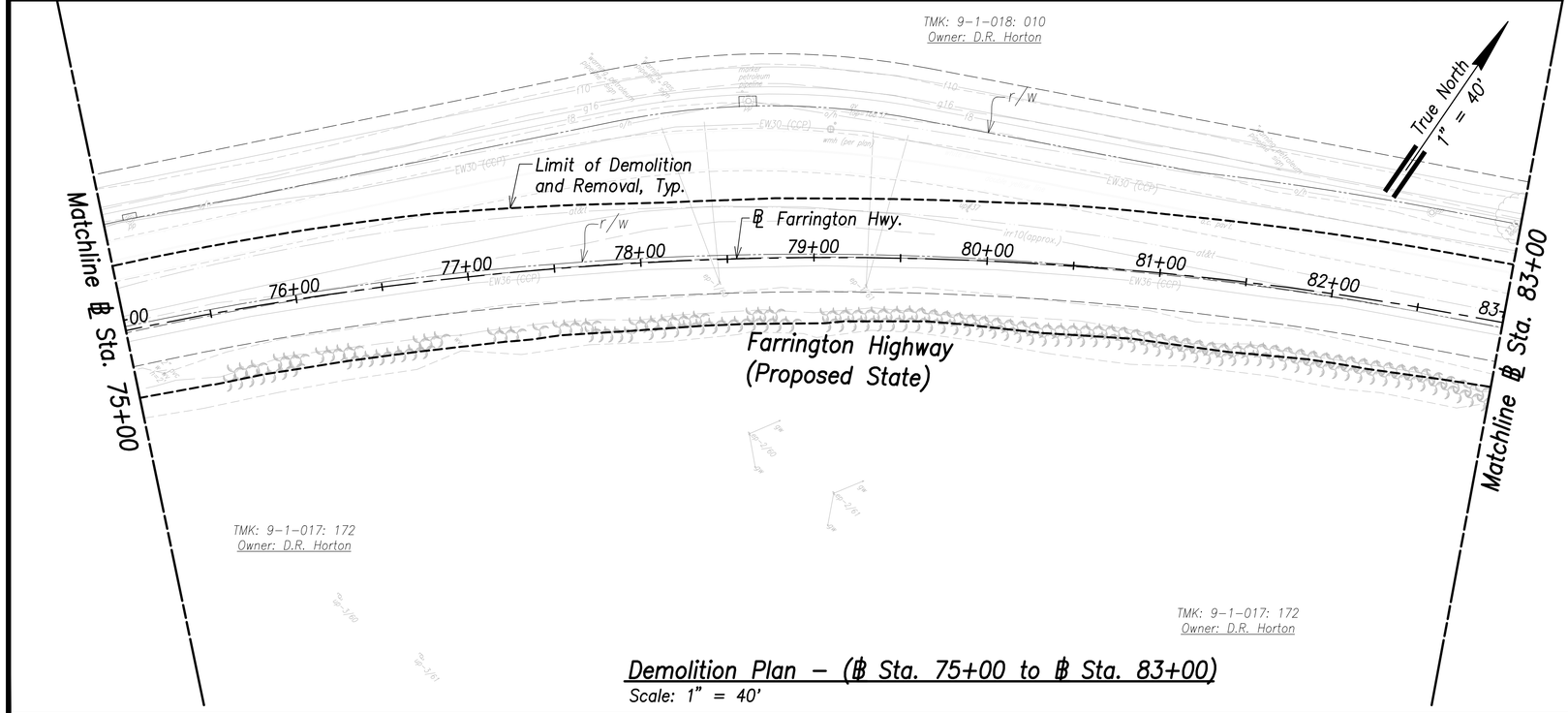
ADD. 36

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	37	767



Demolition Plan – (℄ Sta. 66+00 to ℄ Sta. 75+00)

Scale: 1" = 40'



Demolition Plan – (℄ Sta. 75+00 to ℄ Sta. 83+00)

Scale: 1" = 40'

Notes:

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APPROVED:

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

5

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

DATE	REVISION
07/15/22	5 Signature Block Revised

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Demolition Plan
℄ Sta. 66+00 to ℄ Sta. 83+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. C-36 OF 767 SHEETS

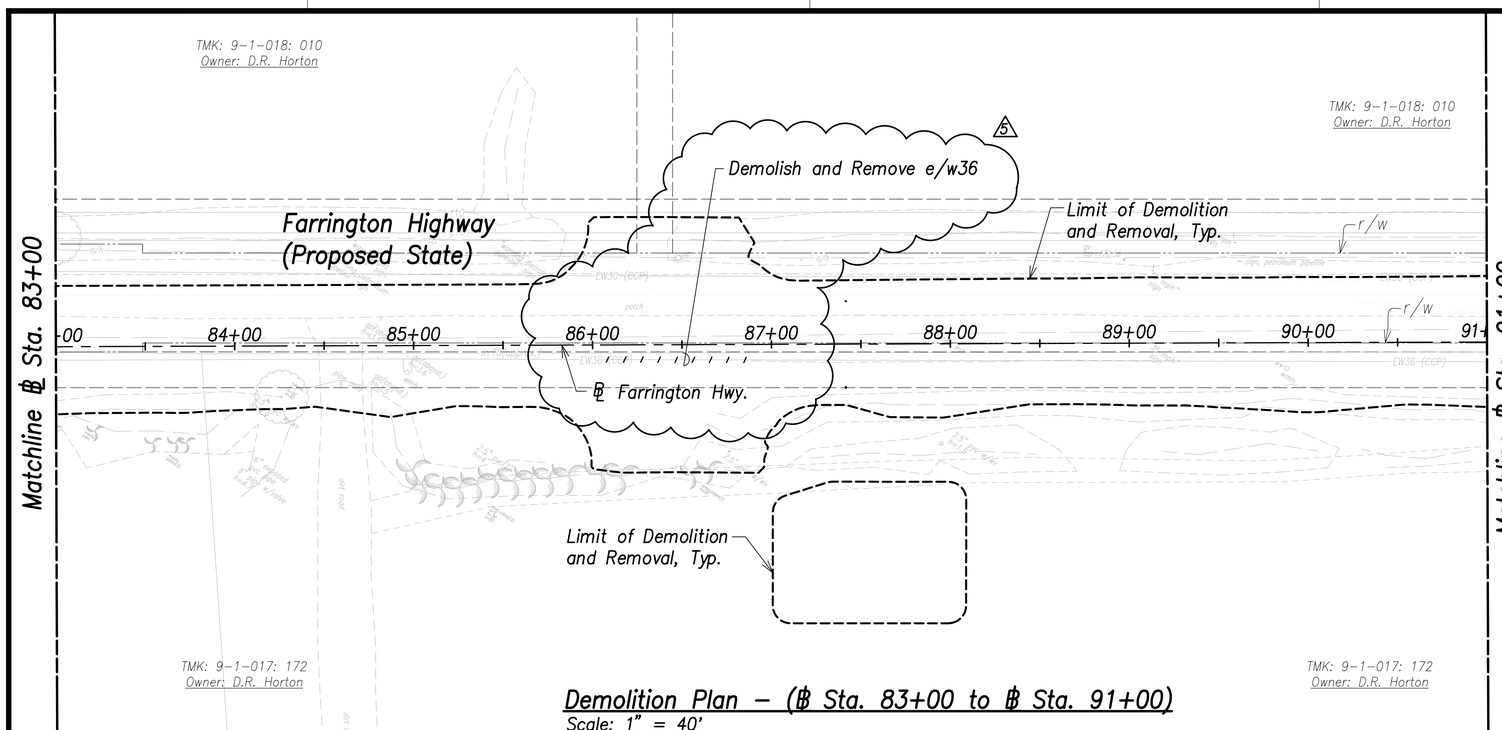
CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

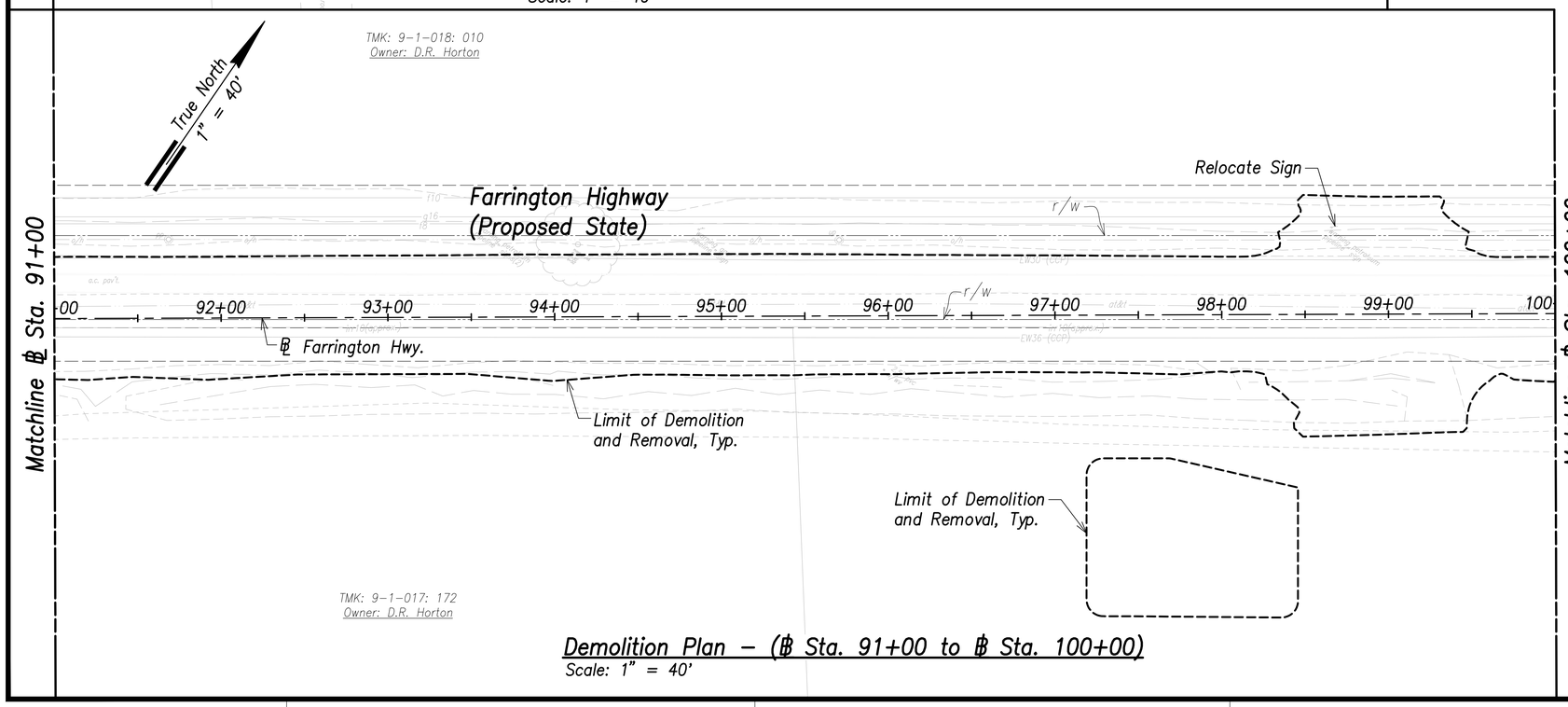
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

ADD. 37



Demolition Plan – (℄ Sta. 83+00 to ℄ Sta. 91+00)

Scale: 1" = 40'



Demolition Plan – (℄ Sta. 91+00 to ℄ Sta. 100+00)

Scale: 1" = 40'

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	38	767

Notes:

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APPROVED:

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

5

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

DATE	REVISION
07/15/22	5 Revised demolition and signature block

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Demolition Plan
℄ Sta. 83+00 to ℄ Sta. 100+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

SHEET No. C-37 OF 767 SHEETS

ADD. 38

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	39	767

TMK: 9-1-018: 010
Owner: D.R. Horton

TMK: 9-1-018: 006
Owner: Hawaiian Electric Co.

Matchline ℄ Sta. 100+00

Farrington Highway
(Proposed State)

Limit of Demolition
and Removal, Typ.

r/w

100+00 101+00 102+00 103+00 104+00 105+00 106+00 107+00 108+00 109

℄ Farrington Hwy.

Adjust Structure to
Match Finished Grade
(Typ.), see Note 9,
this sheet.

Matchline ℄ Sta. 109+00

TMK: 9-1-017: 172
Owner: D.R. Horton

Demolition Plan – (℄ Sta. 100+00 to ℄ Sta. 109+00)

Scale: 1" = 40'

True North
1" = 40'

TMK: 9-1-018: 006
Owner: Hawaiian Electric Co.

TMK: 9-1-018: 016
Owner: HBP Partners LLC

TMK: 9-1-018: 016
Owner: HBP Partners LLC

Relocate Sign, Typ.

Adjust Structure to
Match Finished Grade
(Typ.), see Note 9,
this sheet.

e/w42 To Be
Demolished By Others

Demolish and
Remove e/W30

Farrington Highway
(Proposed State)

Matchline ℄ Sta. 109+00

109+00 110+00 111+00 112+00 113+00 114+00 115+00 116+00 117+00 118

℄ Farrington Hwy.

Demolish and
Remove e/W36

Demolish and
Remove e/W24

Demolish and
Remove e/W42

Limit of Demolition
and Removal, Typ.

Matchline ℄ Sta. 118+00

TMK: 9-1-017: 172
Owner: D.R. Horton

TMK: 9-1-017: 070
Owner: Board of Water Sypply

TMK: 9-1-017: 172
Owner: D.R. Horton

Demolition Plan – (℄ Sta. 109+00 to ℄ Sta. 118+00)

Scale: 1" = 40'

True North
1" = 40'

Notes:

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APPROVED:

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

5

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

DATE	REVISION
07/15/22	5 Signature Block, Limit, and Callouts Revised
06/08/22	2 Added Waterline Demolition

ORIGINAL PLAN — SURVEY PLOTTED BY — DRAWN BY — TRACED BY — DESIGNED BY — QUANTITIES BY — CHECKED BY — DATE

NOTE BOOK — No.

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

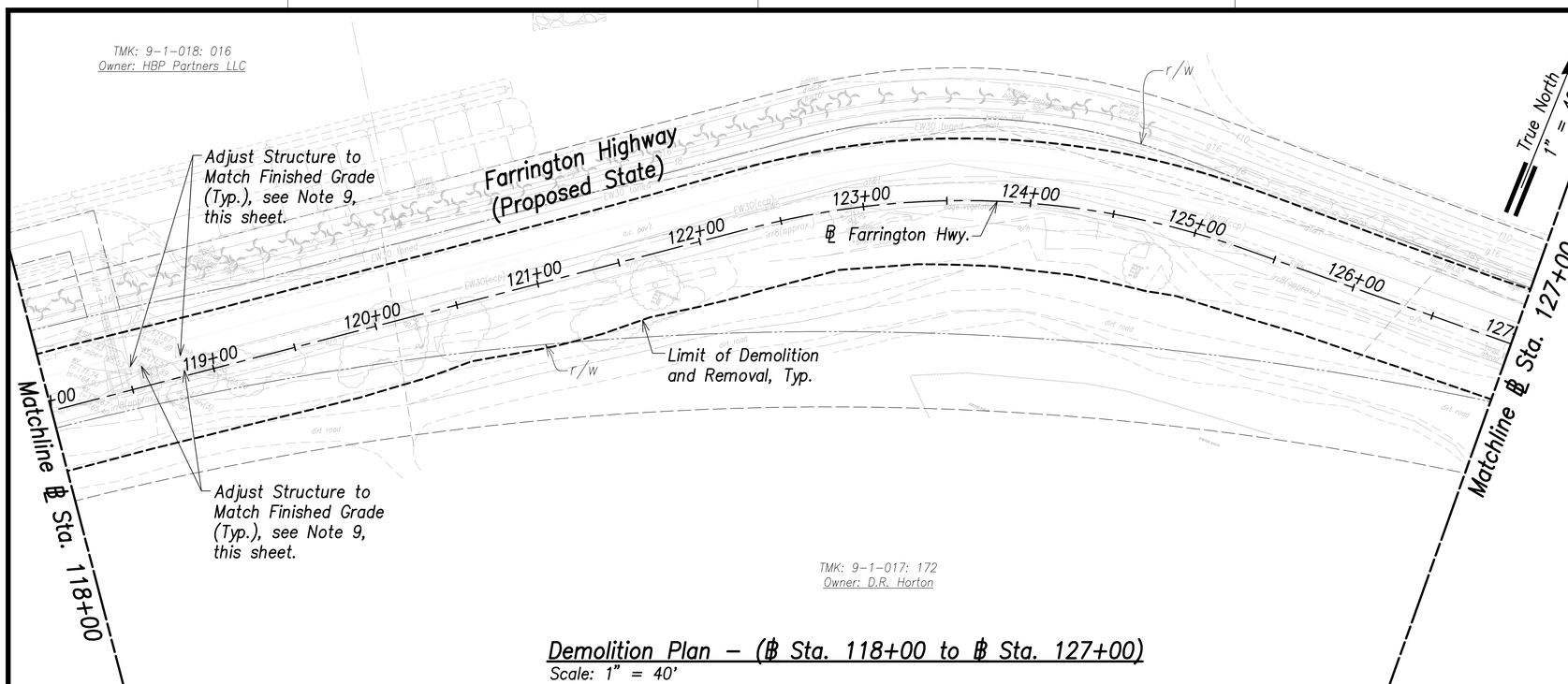
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Demolition Plan
℄ Sta. 100+00 to ℄ Sta. 118+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

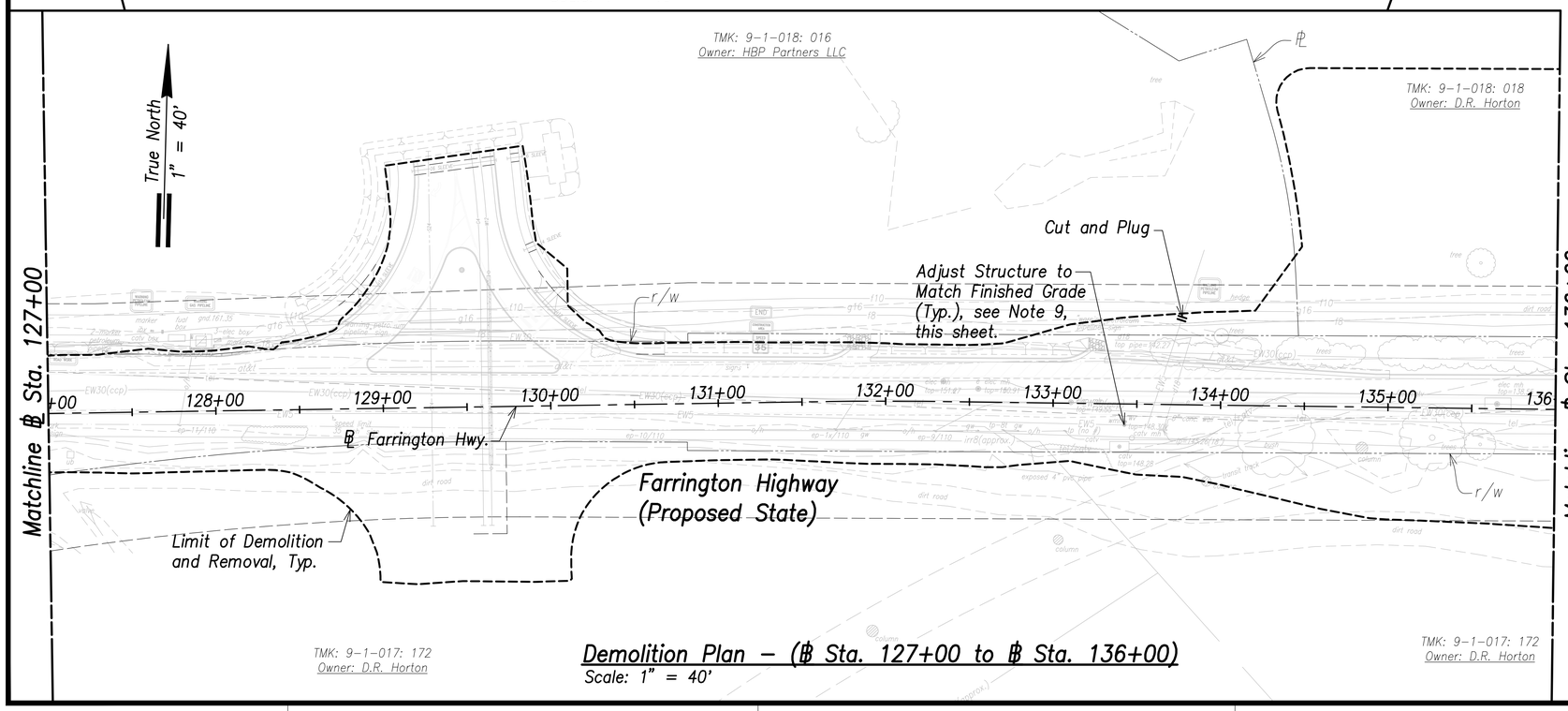
Scale: As Shown — Date: April 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	40	767



Demolition Plan – (℄ Sta. 118+00 to ℄ Sta. 127+00)

Scale: 1" = 40'



Demolition Plan – (℄ Sta. 127+00 to ℄ Sta. 136+00)

Scale: 1" = 40'

Notes:

1. All drainage structures, curbs, gutters, sidewalks, pavement, guardrails, striping, vegetation, posts, and signing shall be removed within the limit of demolition and removal.
2. See Structural Drawings for Demolition and Removal of Bridge Deck and Structural Members.
3. Remove by grinding pavement striping, to avoid conflicts with existing striping. See Signing and Marking Plans.
4. For Demolition of Electrical and Telecommunication Utilities and Structures, Refer to Electrical Site Demolition Plans. The Contractor is Responsible for Coordinating all Electrical Work with Respective Utility Companies.
5. The Contractor Shall Ensure Demolition and Removal Work of Contaminated Materials is Done in Compliance with the State Department of Health and Federal Environmental Protection Agency Guidelines.
6. The Contractor shall coordinate all work with impacted utility owners and ensure continuous access.
7. Service shall be maintained at all times to impacted utilities. No interruption in service will be allowed. The contractor shall phase work to allow for continuous utility service.
8. All Water, Sewer, Fuel, and Gas Systems Shall Remain Undisturbed Unless Indicated For Demolition.
9. The Contractor shall reconstruct tops of all existing utility manholes, valve boxes, meter boxes and structures that are remaining in service and contained within the project area flush with the finished grade.
10. The Contractor Shall Comply With Traffic Notes on Sht. C-19.

APPROVED:

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

5

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

DATE	REVISION
07/15/22	5 Signature Block Revised

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Demolition Plan
℄ Sta. 118+00 to ℄ Sta. 136+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

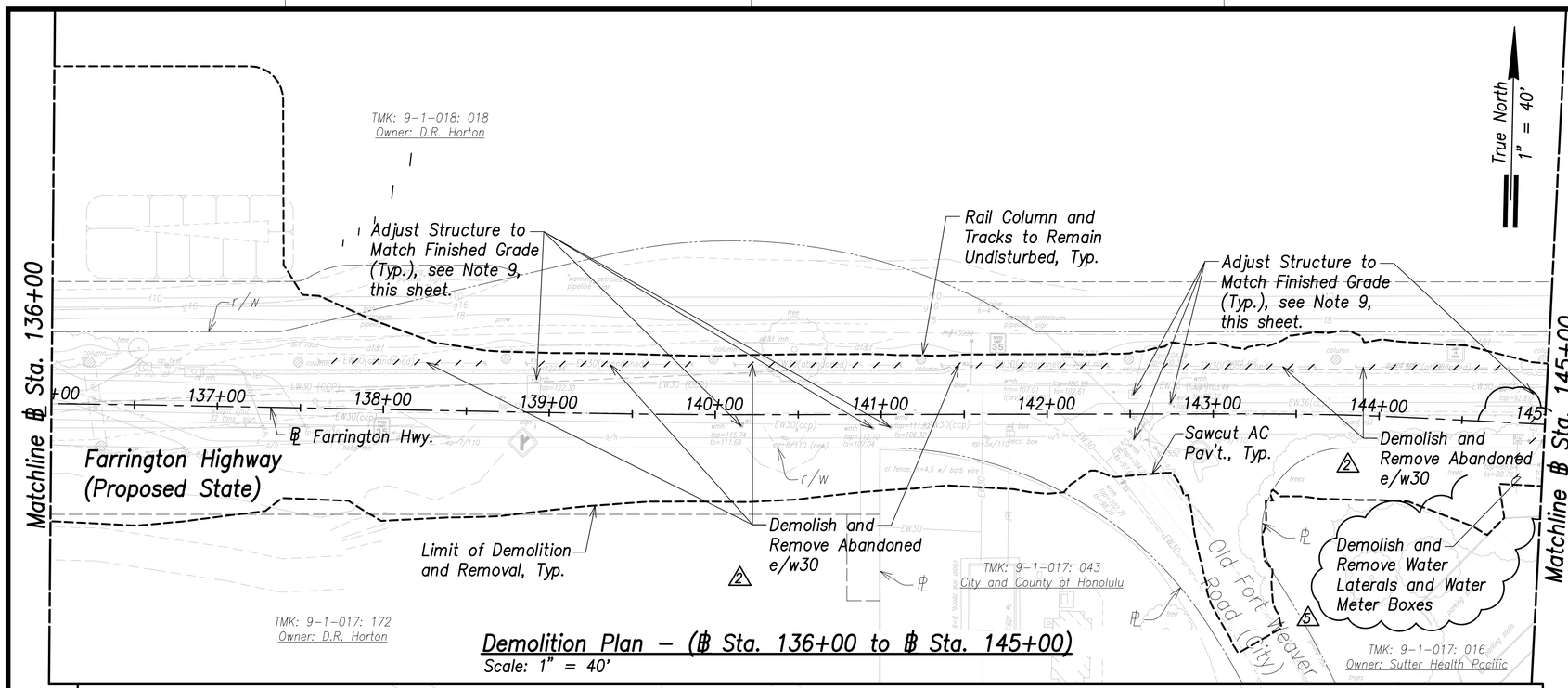
SHEET No. C-39 OF 767 SHEETS

ADD. 40

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

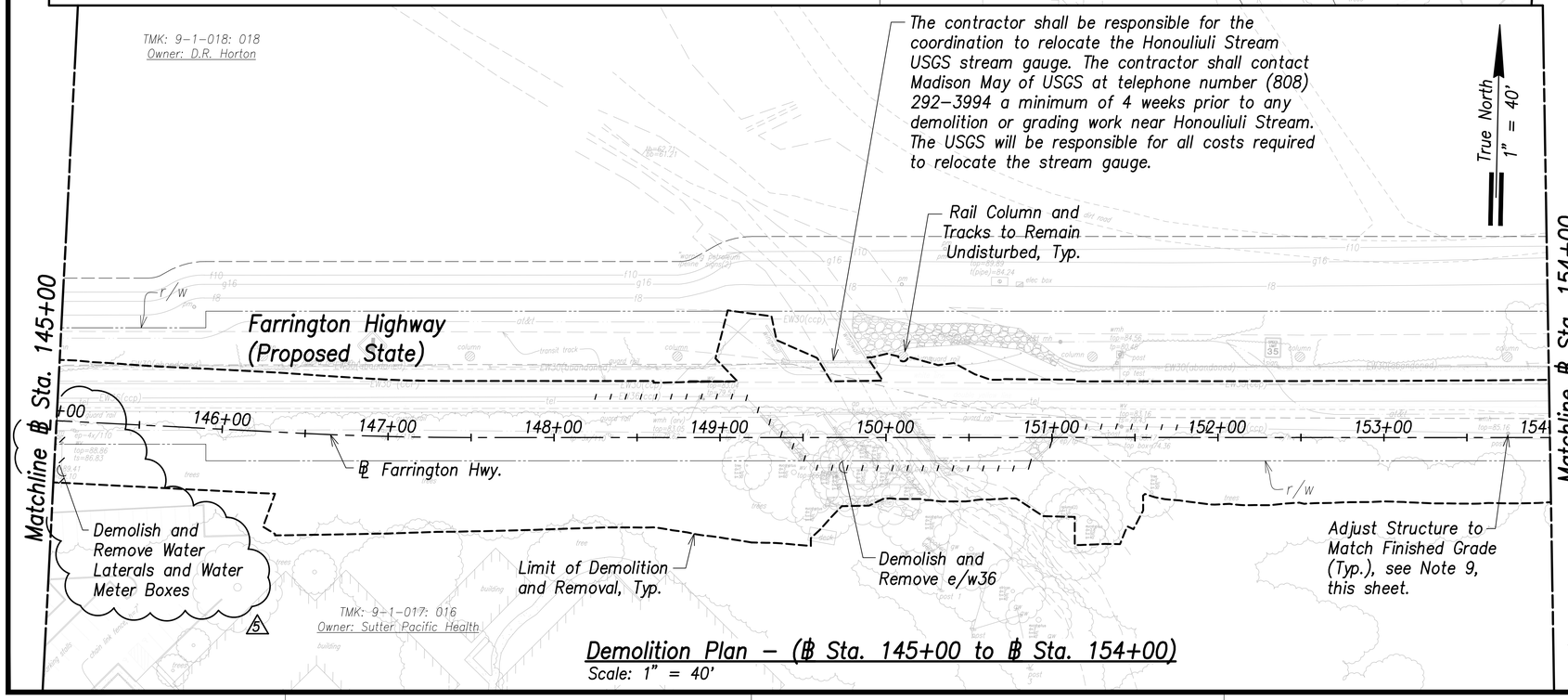
FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-39 Demo Plan – Sta. 118+00 to 136+00.dwg saved July 8, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	41	767



Demolition Plan – (℄ Sta. 136+00 to ℄ Sta. 145+00)

Scale: 1" = 40'



Demolition Plan – (℄ Sta. 145+00 to ℄ Sta. 154+00)

Scale: 1" = 40'

Notes:

1. All drainage structures, curbs, gutters, sidewalks, pavement, guardrails, striping, vegetation, posts, and signing shall be removed within the limit of demolition and removal.
2. See Structural Drawings for Demolition and Removal of Bridge Deck and Structural Members.
3. Remove by grinding pavement striping, to avoid conflicts with existing striping. See Signing and Marking Plans.
4. For Demolition of Electrical and Telecommunication Utilities and Structures, Refer to Electrical Site Demolition Plans. The Contractor is Responsible for Coordinating all Electrical Work with Respective Utility Companies.
5. The Contractor Shall Ensure Demolition and Removal Work of Contaminated Materials is Done in Compliance with the State Department of Health and Federal Environmental Protection Agency Guidelines.
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7. Service shall be maintained at all times to impacted utilities. No interruption in service will be allowed. The contractor shall phase work to allow for continuous utility service.
8. All Water, Sewer, Fuel, and Gas Systems Shall Remain Undisturbed Unless Indicated For Demolition.
9. The Contractor shall reconstruct tops of all existing utility manholes, valve boxes, meter boxes and structures that are remaining in service and contained within the project area flush with the finished grade.
10. The Contractor Shall Comply With Traffic Notes on Sht. C-19.

APPROVED:

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

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

DATE	REVISION
07/15/22	5 Revised demolition and signature block
06/08/22	2 Added Waterline Demolition

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE

NOTE BOOK | No.

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Demolition Plan
℄ Sta. 136+00 to ℄ Sta. 154+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

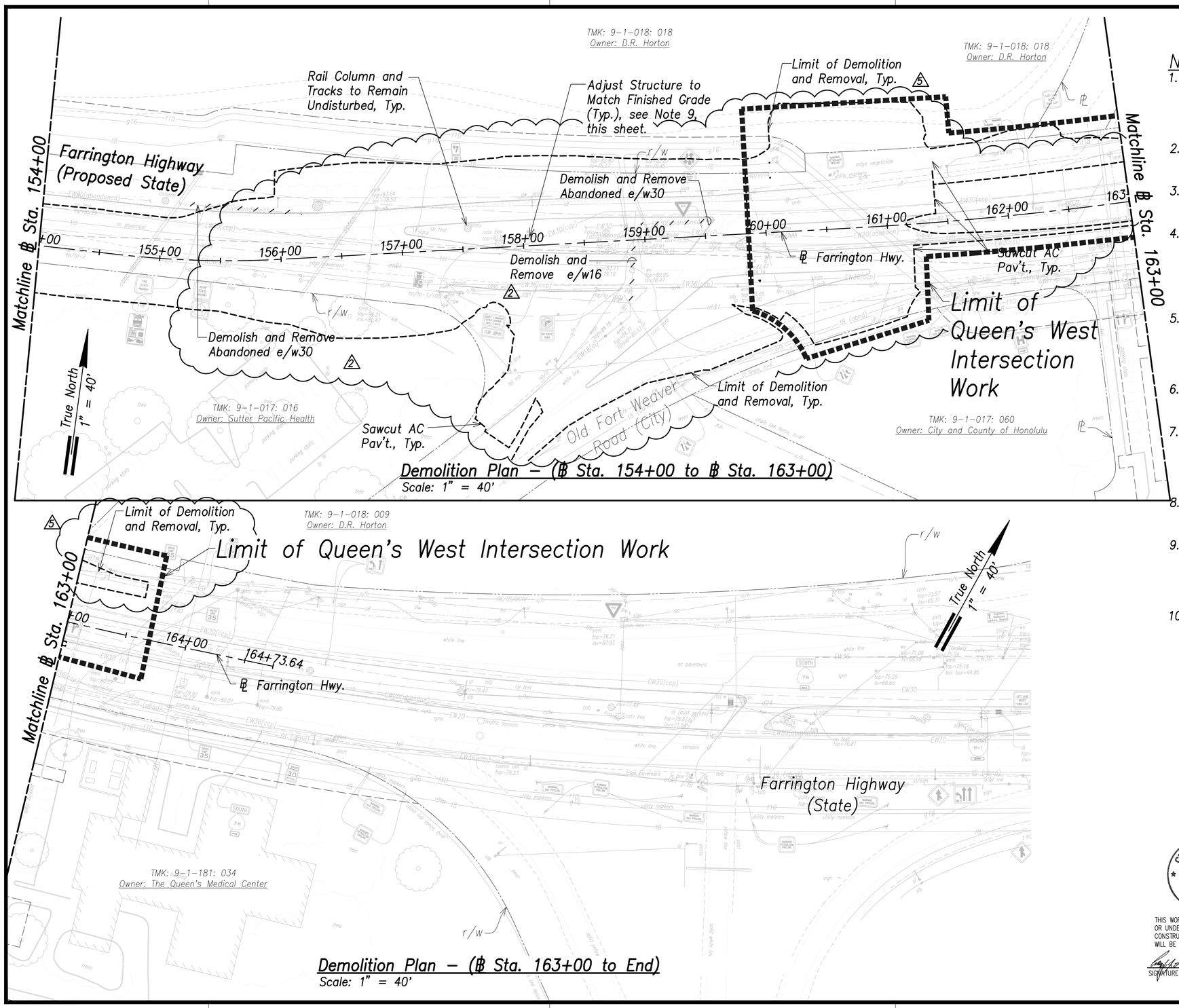
SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

SHEET No. C-40 OF 767 SHEETS

ADD. 41

FILE: K:\Civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-40 Demo Plan – Sta. 136+00 to 154+00.dwg saved July 11, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	42	767



Notes:

1. All drainage structures, curbs, gutters, sidewalks, pavement, guardrails, striping, vegetation, posts, and signing shall be removed within the limit of demolition and removal.
2. See Structural Drawings for Demolition and Removal of Bridge Deck and Structural Members.
3. Remove by grinding pavement striping, to avoid conflicts with existing striping. See Signing and Marking Plans.
4. For Demolition of Electrical and Telecommunication Utilities and Structures, Refer to Electrical Site Demolition Plans. The Contractor is Responsible for Coordinating all Electrical Work with Respective Utility Companies.
5. The Contractor Shall Ensure Demolition and Removal Work of Contaminated Materials is Done in Compliance with the State Department of Health and Federal Environmental Protection Agency Guidelines.
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8. All Water, Sewer, Fuel, and Gas Systems Shall Remain Undisturbed Unless Indicated For Demolition.
9. The Contractor shall reconstruct tops of all existing utility manholes, valve boxes, meter boxes and structures that are remaining in service and contained within the project area flush with the finished grade.
10. The Contractor Shall Comply With Traffic Notes on Sht. C-19.

APPROVED:

5

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

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

DATE	REVISION
07/15/22	5 Revised demolition and signature block
06/08/22	2 Added Waterline Demolition

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

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

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SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Demolition Plan
℄ Sta. 154+00 to End

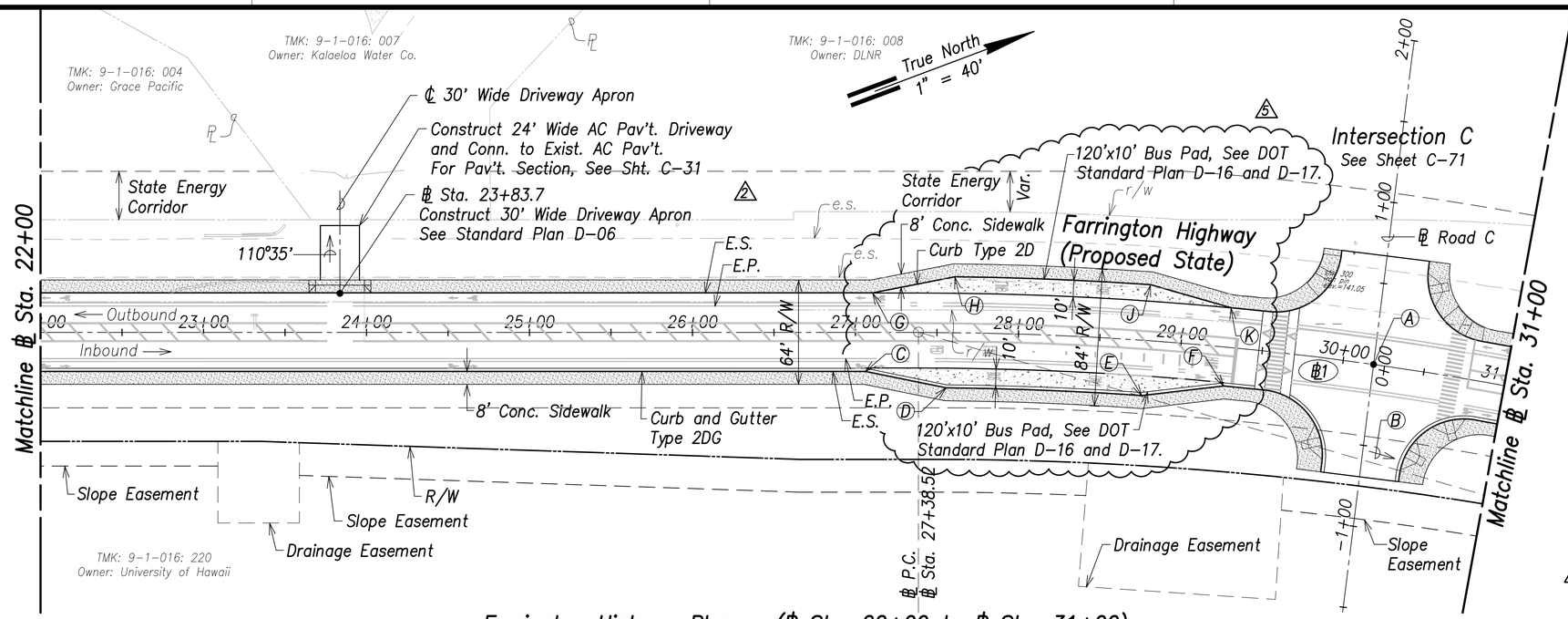
FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown — Date: April 2022

SHEET No. C-41 OF 767 SHEETS

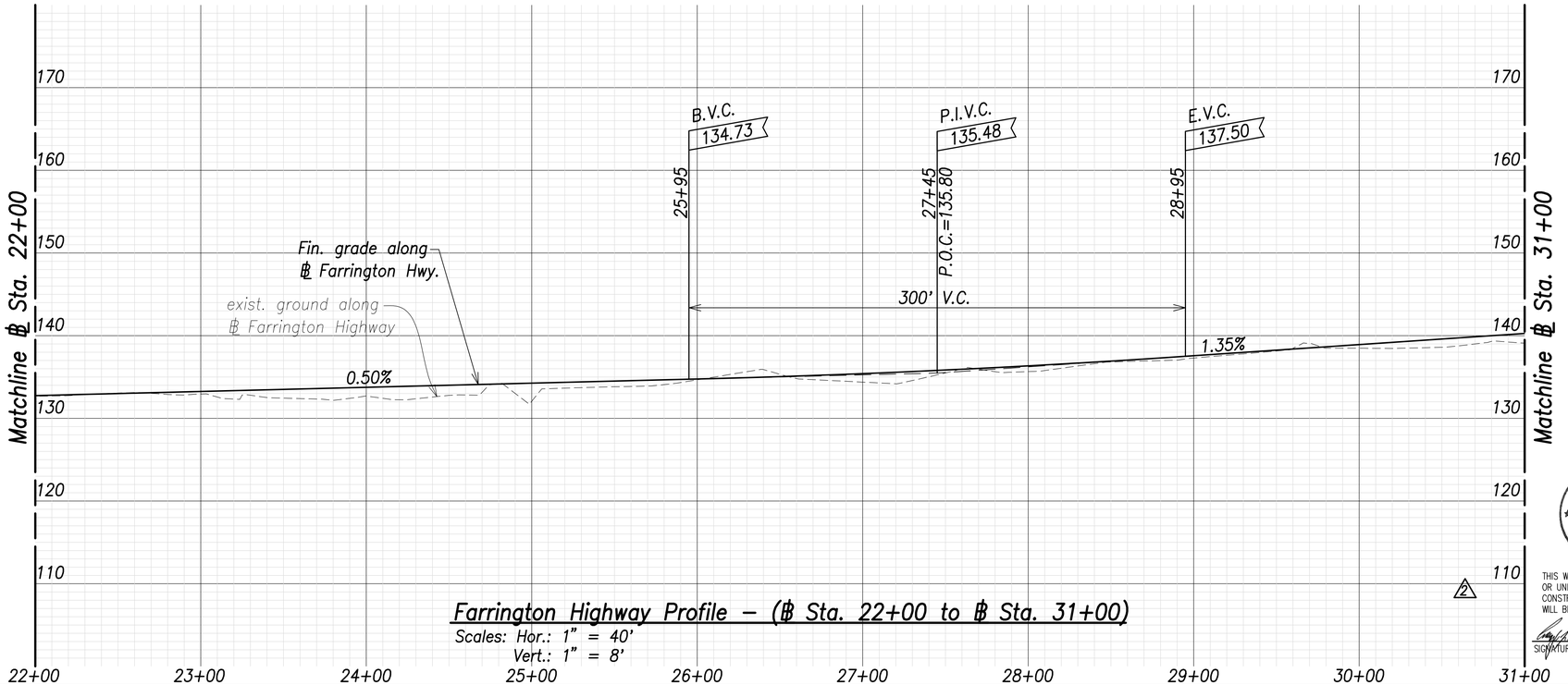
ADD. 42

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	54	767



Farrington Highway Plan – (℄ Sta. 22+00 to ℄ Sta. 31+00)

Scale: 1" = 40'



Farrington Highway Profile – (℄ Sta. 22+00 to ℄ Sta. 31+00)

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Ⓐ
Intersection C
℄ Sta. 30+18.81 Farrington Highway
= ℄ Sta. 0+00 Road C
Install Street Survey Monument
See Std. Plan D-08

Ⓑ
216°37'51", 1105.73'
(℄ P.C. to ℄ P.T.)

℄ Curve Data:

℄1
Δ=32°05'42"
Δ/2=16°02'51"
R=2000.00'
T=575.28'
C=1105.73'
Lc=1120.32'

△5
- Ⓒ ℄ Sta. 27+08.50 o/s 24' Rt.
- Ⓖ ℄ Sta. 27+08.50 o/s 24' Lt.
- Ⓓ ℄ Sta. 27+58.50 o/s 34' Rt.
- Ⓗ ℄ Sta. 27+58.50 o/s 34' Lt.
- Ⓔ ℄ Sta. 28+78.50 o/s 34' Rt.
- Ⓙ ℄ Sta. 28+78.50 o/s 34' Lt.
- Ⓕ ℄ Sta. 29+28.50 o/s 24' Rt.
- Ⓚ ℄ Sta. 29+28.50 o/s 24' Lt.

Note:
The Contractor Shall Phase Construction to Ensure 1 Lane in Each Direction Remains Operational

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

DATE	REVISION
07/15/22	△5 Add Bus Bay
06/08/22	△2 Callout Revised; Revised exist. ground

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Roadway Plan and Profile
℄ Sta. 22+00 to ℄ Sta. 31+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

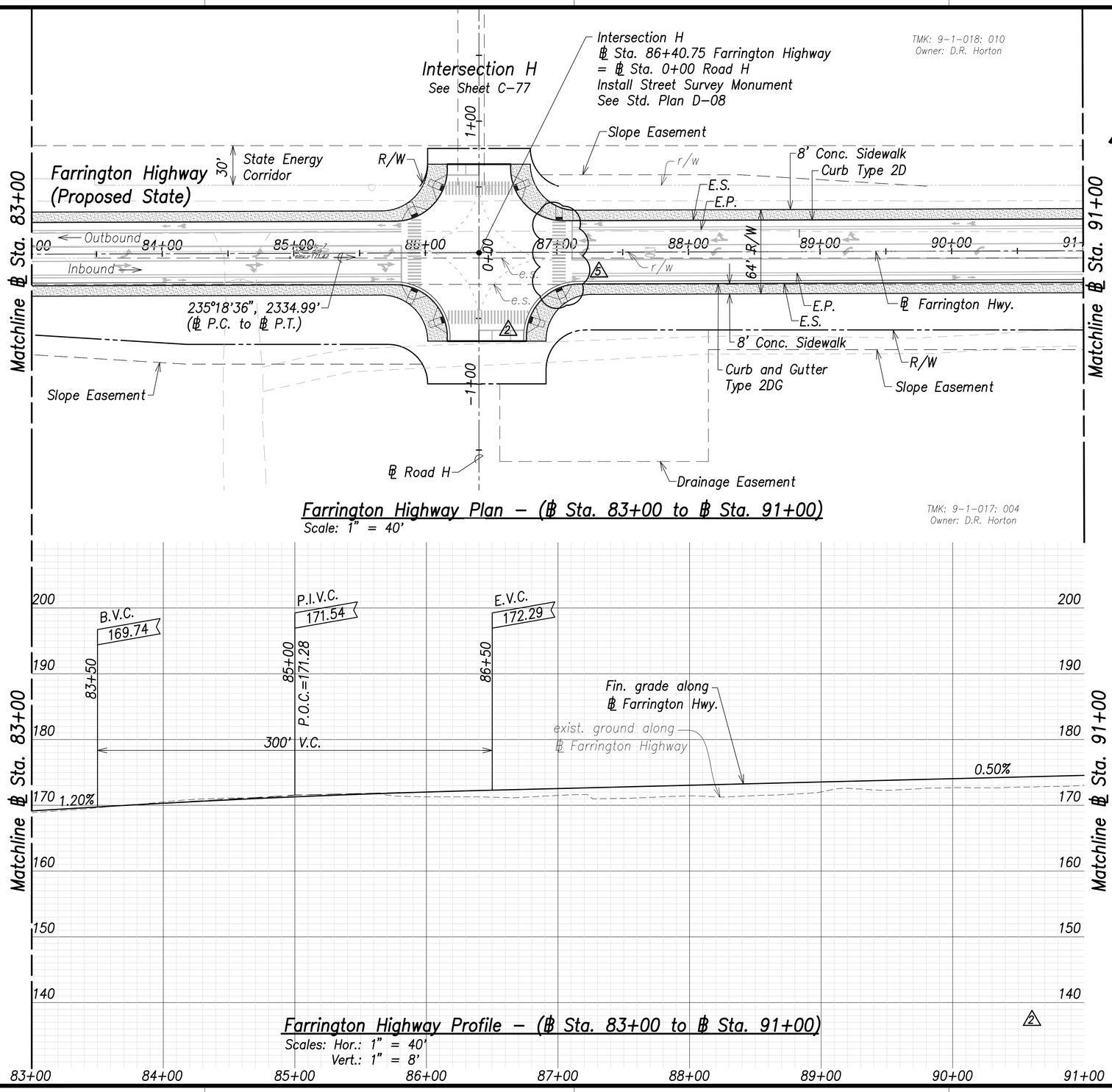
SHEET No. C-53 OF 767 SHEETS

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

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-53 Roadway Plan – Sta. 22+00 to 31+00 – PLAN.dwg saved July 11, 2022

ADD. 54

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	61	767



Note:
The Contractor Shall Phase Construction to Ensure 1 Lane in Each Direction Remains Operational

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

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

DATE	REVISION
07/15/22	5 Speed Table removed
06/08/22	2 Revised exist. ground; Added exist. edge of shoulder callouts

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Roadway Plan and Profile
℄ Sta. 83+00 to ℄ Sta. 91+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

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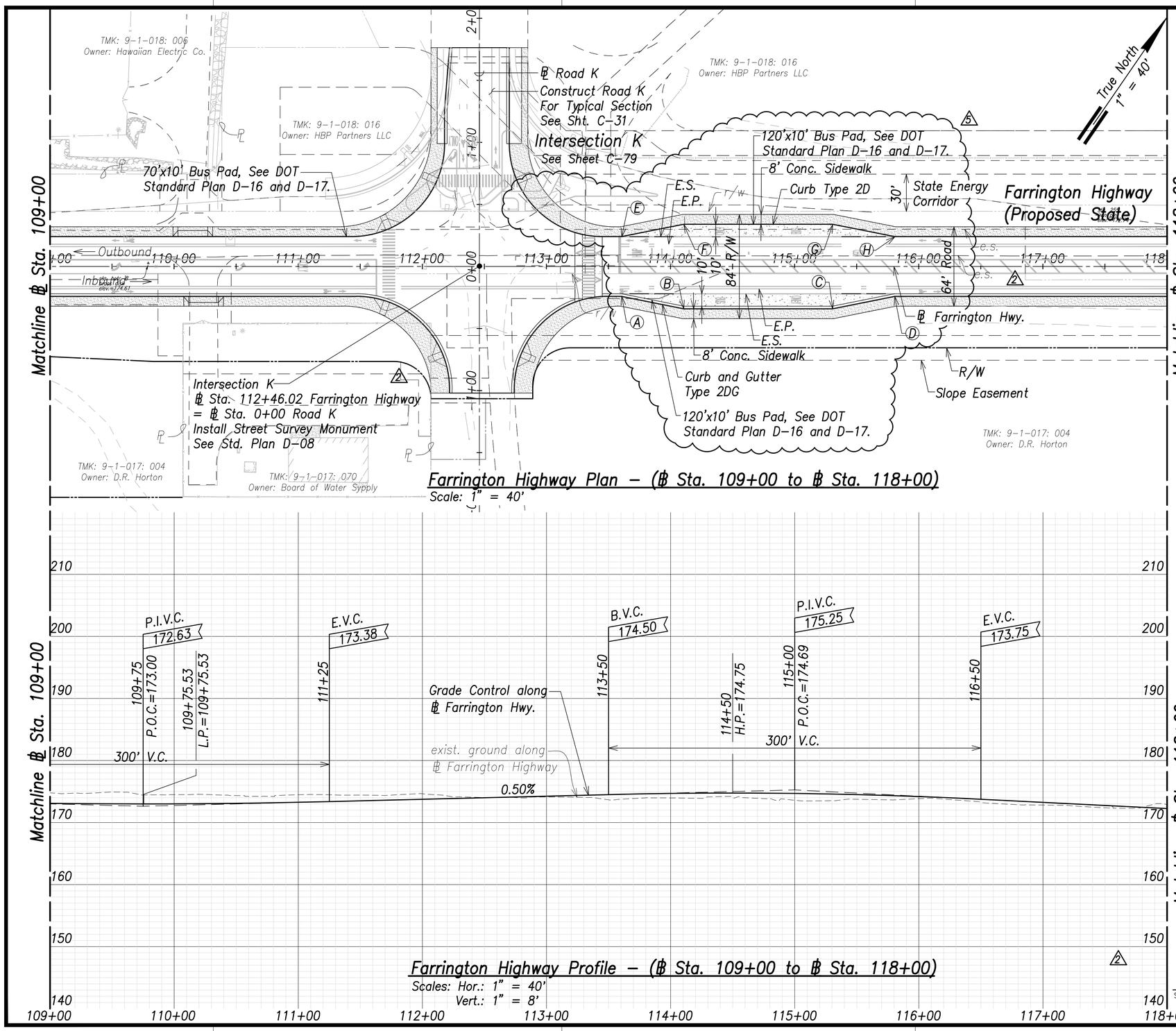
SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

SHEET No. C-60 OF 767 SHEETS

ADD. 61

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-60 Roadway Plan – Sta. 83+00 to 91+00 – PLAN.dwg saved July 12, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	64	767



Farrington Highway Plan – (℄ Sta. 109+00 to ℄ Sta. 118+00)

Scale: 1" = 40'

5
- Ⓐ ℄ Sta. 113+60.60 o/s 24' Rt.
- Ⓑ ℄ Sta. 114+10.60 o/s 34' Rt.
- Ⓒ ℄ Sta. 115+30.60 o/s 34' Rt.
- Ⓓ ℄ Sta. 115+80.60 o/s 24' Rt.
- Ⓔ ℄ Sta. 113+60.60 o/s 24' Lt.
- Ⓕ ℄ Sta. 114+10.60 o/s 34' Lt.
- Ⓖ ℄ Sta. 115+30.60 o/s 34' Lt.
- Ⓗ ℄ Sta. 115+80.60 o/s 24' Lt.

Farrington Highway Profile – (℄ Sta. 109+00 to ℄ Sta. 118+00)

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

DATE	REVISION
07/15/22	5 Add Bus Bay, Del. callout
06/08/22	2 Street Survey Monument Added; Revised exist. ground

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Roadway Plan and Profile ℄ Sta. 109+00 to ℄ Sta. 118+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. C-63 OF 767 SHEETS

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

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

ADD. 64

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	66	767

℄ Road L

Intersection L
See Sheet C-80

Construct Road L
For Typical Section
See Sht. C-31

Intersection L
℄ Sta. 129+47.94 Farrington Highway
= ℄ Sta. 0+00 Road L
Install Street Survey Monument
See Std. Plan D-08

TMK: 9-1-018: 016
Owner: HBP Partners LLC

Drainage Easement

True North
1" = 40'

8' Conc. Sidewalk
Curb Type 2D

Farrington Highway
(Proposed State)

30' State Energy Corridor

r/w
E.S.
E.P.

64' Road

Outbound
Inbound

Matchline ℄ Sta. 127+00

Matchline ℄ Sta. 136+00

Rail Guideway and
Columns To Remain
Undisturbed, Typ.

Curb and Gutter
Type 2DG

℄ P.C.
℄ Sta. 131+66.76

℄ P.T.
℄ Sta. 132+23.02

R/W

Slope Easement

TMK: 9-1-017: 004
Owner: D.R. Horton

Farrington Highway Plan – (℄ Sta. 127+00 to ℄ Sta. 136+00)

Scale: 1" = 40'

℄ Curve Data:

℄1

Δ=1°36'42"
Δ/2=0°48'21"
R=2000.00'
T=28.13'
C=56.26'
Lc=56.26'

Ⓑ
268°25'39", 56.26'
(℄ P.C. to ℄ P.T.)

Ⓒ
269°14'00", 381.64'
(℄ P.T. to ℄ P.C.)

B.V.C. 157.51
P.I.V.C. 154.16
E.V.C. 141.91
P.O.C.=151.93
500' V.C.
Grade Control along ℄ Farrington Hwy.
exist. ground along ℄ Farrington Highway
(–)1.34%

Farrington Highway Profile – (℄ Sta. 127+00 to ℄ Sta. 136+00)

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Graphic Scales:
1" = 40' 40' 20' 0 40' 80'
1" = 8' 8' 4' 0 8' 16'
Scale in Feet

DATE	REVISION
07/15/22	5 Delete callout
06/08/22	2 Added Street Survey Monument; Revised callout; Revised exist. ground; Added exist. edge of shoulder callouts

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Roadway Plan and Profile
℄ Sta. 127+00 to ℄ Sta. 136+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

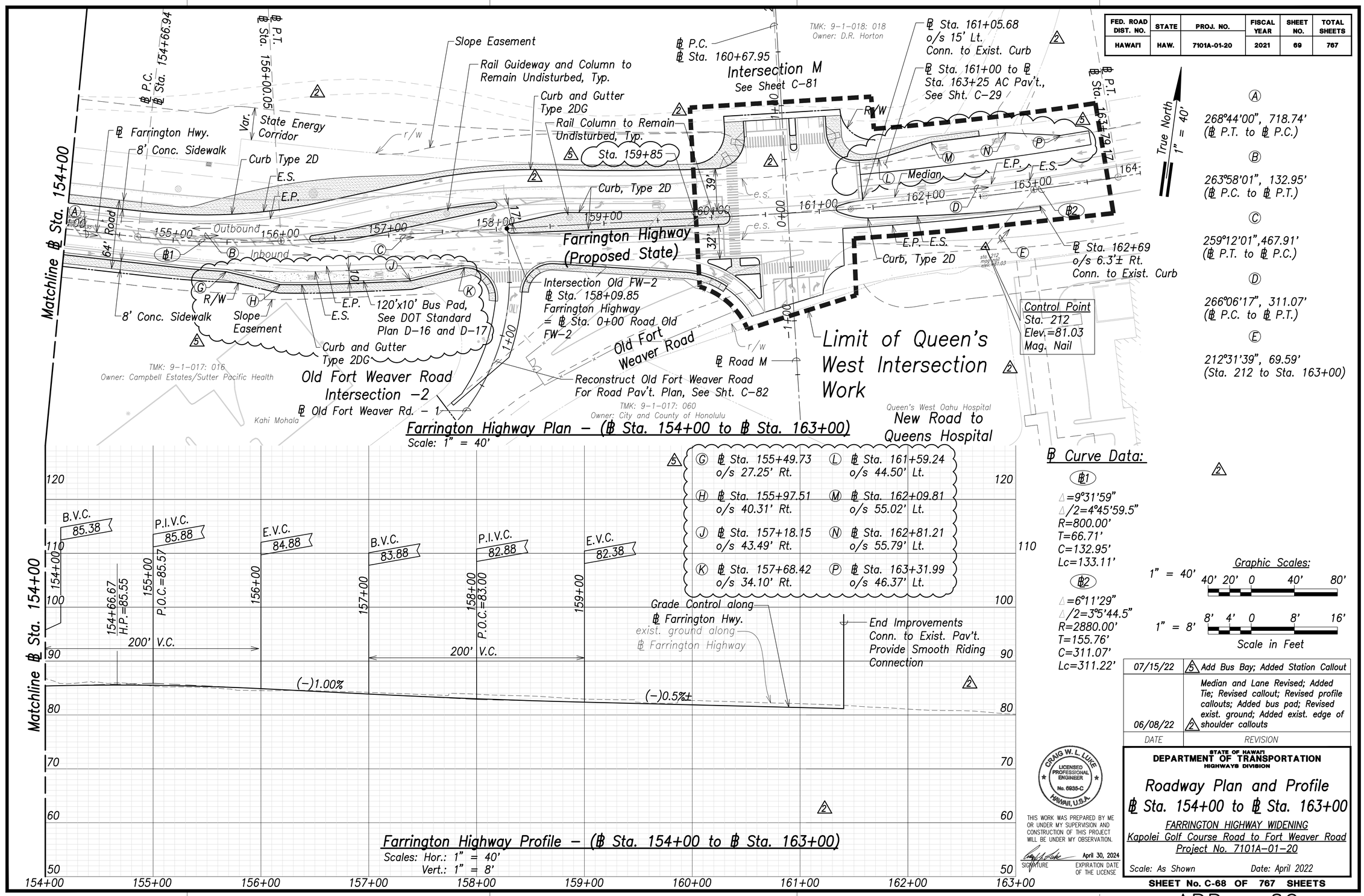
SHEET No. C-65 OF 767 SHEETS

ADD. 66

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

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-65 Roadway Plan – Sta. 127+00 to 136+00 – PLAN.dwg saved July 6, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	69	767



℄ Curve Data:

℄1
- Δ=9°31'59"
- Δ/2=4°45'59.5"
- R=800.00'
- T=66.71'
- C=132.95'
- Lc=133.11'

℄2
- Δ=6°11'29"
- Δ/2=3°5'44.5"
- R=2880.00'
- T=155.76'
- C=311.07'
- Lc=311.22'

Ⓐ 268°44'00", 718.74' (℄ P.T. to ℄ P.C.)

Ⓑ 263°58'01", 132.95' (℄ P.C. to ℄ P.T.)

Ⓒ 259°12'01",467.91' (℄ P.T. to ℄ P.C.)

Ⓓ 266°06'17", 311.07' (℄ P.C. to ℄ P.T.)

Ⓔ 212°31'39", 69.59' (Sta. 212 to Sta. 163+00)

Graphic Scales:
1" = 40' 40' 20' 0 40' 80'
1" = 8' 8' 4' 0 8' 16'
Scale in Feet

DATE	REVISION
07/15/22	5 Add Bus Bay; Added Station Callout
06/08/22	Median and Lane Revised; Added Tie; Revised callout; Revised profile callouts; Added bus pad; Revised exist. ground; Added exist. edge of shoulder callouts

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

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — EXPIRATION DATE OF THE LICENSE: April 30, 2024

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Roadway Plan and Profile ℄ Sta. 154+00 to ℄ Sta. 163+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

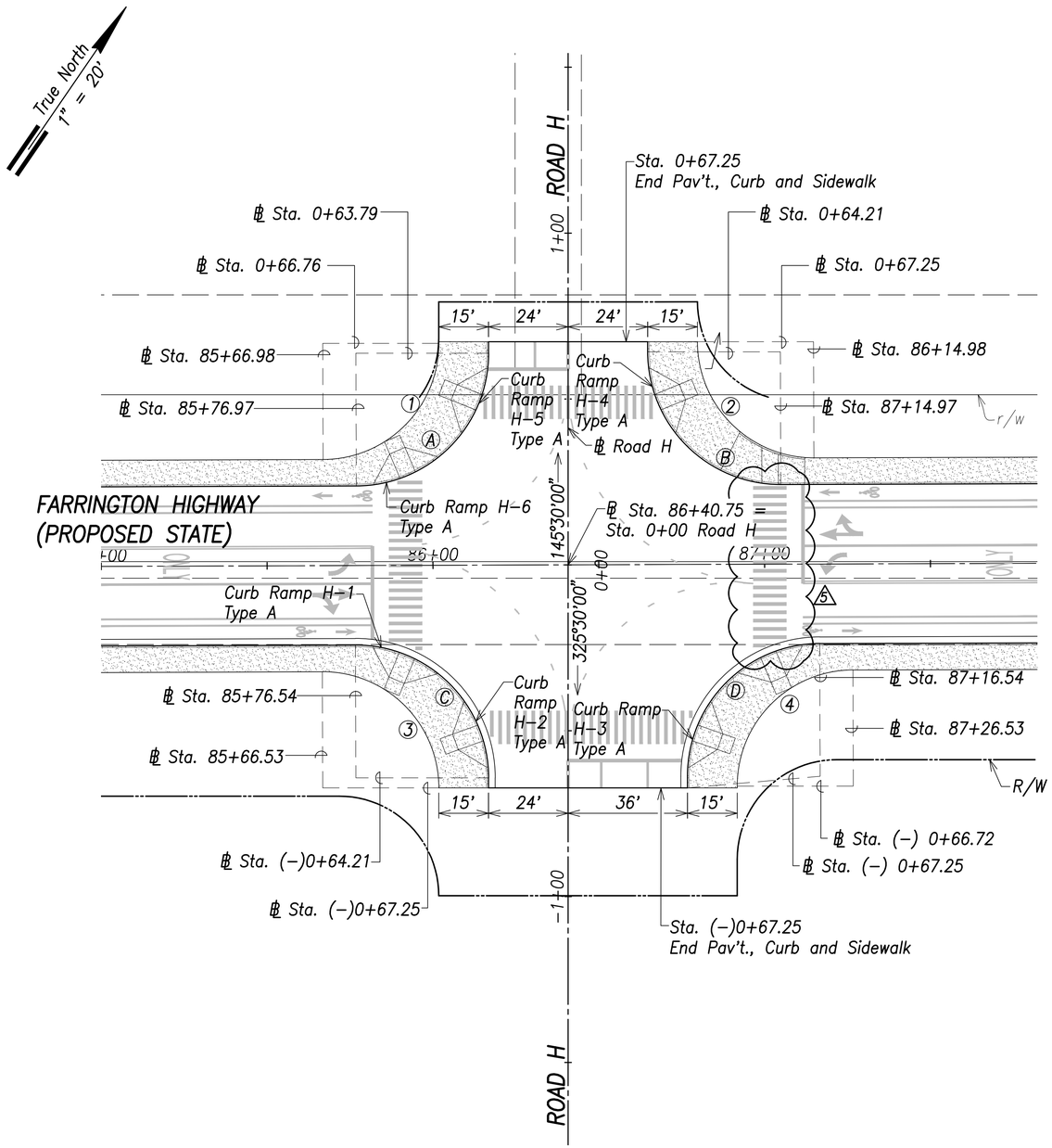
Scale: As Shown — Date: April 2022

SHEET No. C-68 OF 767 SHEETS

ADD. 69

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-68 Roadway Plan - Sta. 154+00 to 163+00 - PLAN.dwg saved July 18, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	78	767



Intersection Plan – Intersection H

Scale: 1" = 20'

Curb Curve Data:

Ⓐ
△=89°48'36"
△/2=44°54'84"
R=40.00'
T=39.87'
C=56.47'
Lc=62.70'

Ⓑ
△=90°11'24"
△/2=45°05'42"
R=40.00'
T=40.13'
C=56.66'
Lc=62.96'

Ⓒ
△=90°11'24"
△/2=45°05'42"
R=40.00'
T=40.13'
C=56.66'
Lc=62.96'

Ⓓ
△=89°48'36"
△/2=44°54'18"
R=40.00'
T=39.87'
C=56.47'
Lc=62.70'

℄/Back of Curb Curve Data:

①
△=89°48'36"
△/2=44°54'18"
R=35.00'
T=34.88'
C=49.42'
Lc=54.86'

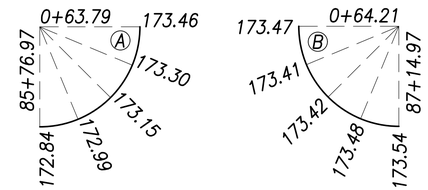
②
△=90°11'24"
△/2=45°05'42"
R=35.00'
T=35.12'
C=49.58'
Lc=55.09'

③
△=90°11'24"
△/2=45°05'42"
R=35.00'
T=35.12'
C=49.58'
Lc=55.09'

④
△=89°48'36"
△/2=44°54'18"
R=35.00'
T=34.88'
C=49.42'
Lc=54.86'

Curb Return Grades:

(Elevations refer to top of curb)



Notes:

1. For roadway plans and profiles, see sheets C–50 to C–68.
2. For roadway grading, drainage, and stormwater quality, see sheets C–86 to C–103.
3. For curb ramp layout and grading, see sheets C–184 to C–202.
4. Future HECO Electrical System, Construction Will Occur at the Same as this Project (Farrington Highway Improvements). The Contractor Shall Fully Coordinate Work with HECO and their Contractor. The Cost to Coordinate Work Will be Considered Incidental to the Various Items of Work.

Graphic Scale:
1" = 20' 20' 10' 0 20' 40'
Scale in Feet

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

07/15/22	5 Speed Table removed

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

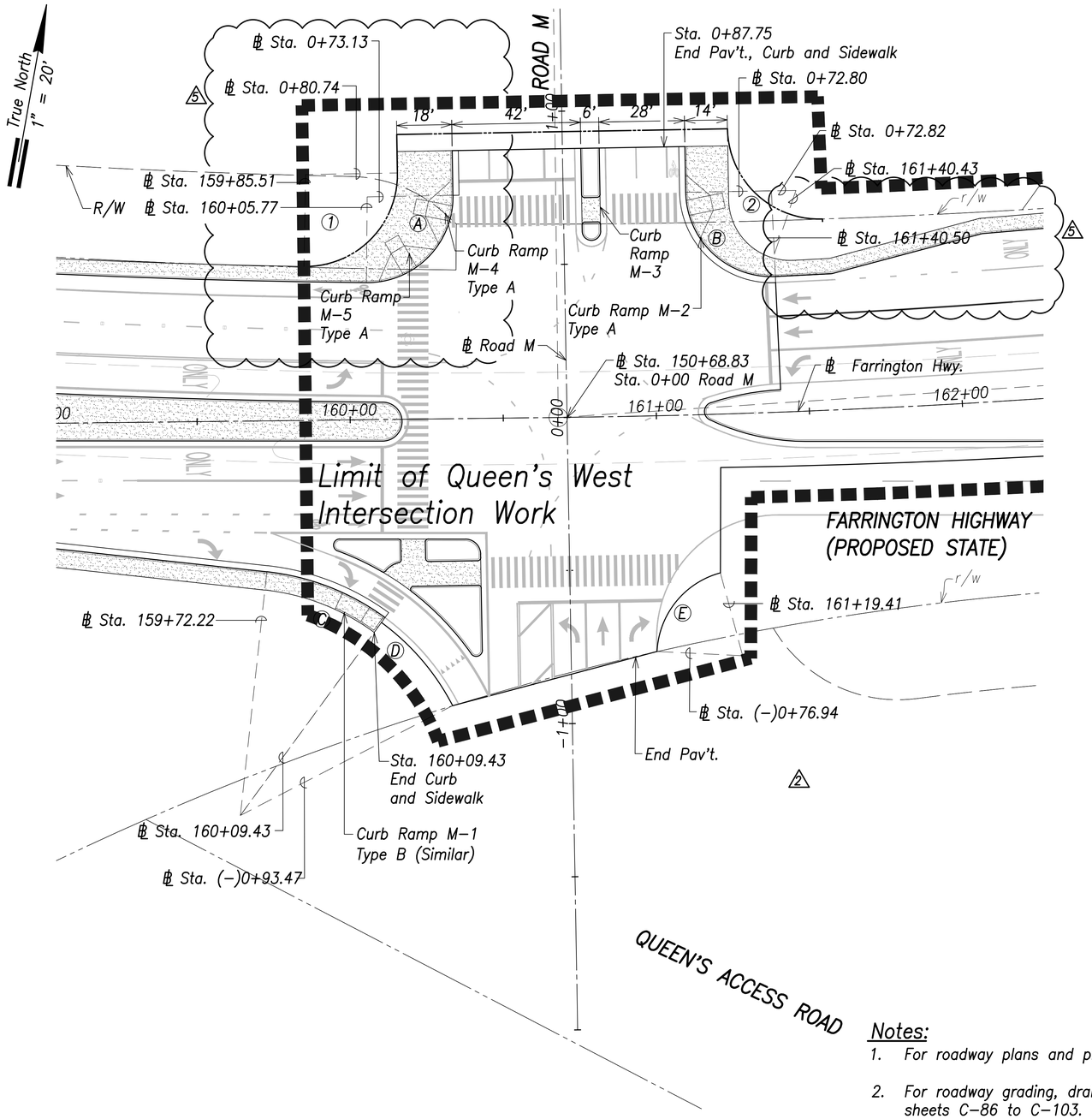
Intersection Plan
Intersection H

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

Scale: As Shown Date: April 2022

SHEET No. C-77 OF 767 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	82	767



Intersection Plan – Intersection M

Scale: 1" = 20'

Curb Curve Data:

Ⓐ
Δ=91°32'42"
Δ/2=45°46'21"
R=28.00'
T=28.77'
C=40.13'
Lc=44.74'

Ⓑ
Δ=91°40'23"
Δ/2=45°50'12"
R=28.00'
T=28.83'
C=40.17'
Lc=44.80'

Ⓒ
Δ=29°58'43"
Δ/2=14°59'21"
R=80.00'
T=21.42'
C=41.38'
Lc=41.86'

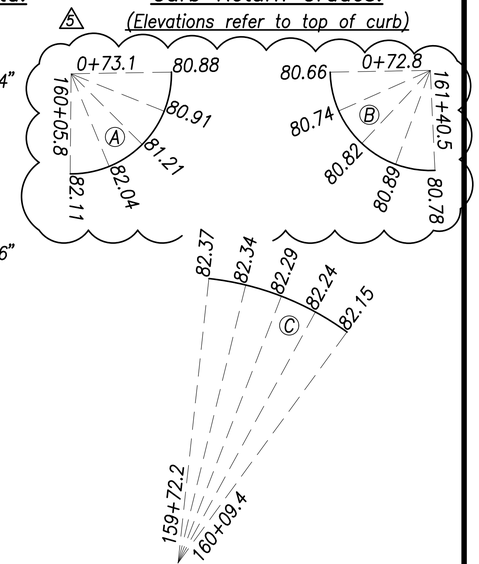
Back of Sidewalk Data:

①
Δ=91°57'48"
Δ/2=45°58'54"
R=30.00'
T=31.05'
C=43.15'
Lc=48.15'

②
Δ=70°21'32"
Δ/2=35°10'46"
R=22.00'
T=15.51'
C=25.35'
Lc=27.02'

Curb Return Grades:

(Elevations refer to top of curb)

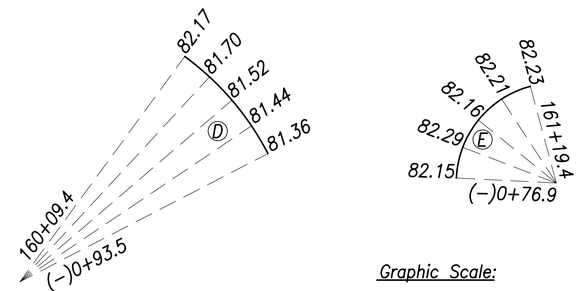


EOP Curve Data:

Ⓓ
Δ=26°29'15"
Δ/2=13°14'37"
R=78.00'
T=18.36'
C=35.74'
Lc=36.06'

Ⓔ
Δ=72°07'23"
Δ/2=36°03'41"
R=28.00'
T=20.39'
C=32.96'
Lc=35.25'

EOP Return Grades:



Graphic Scale:
1" = 20' 20' 10' 0 20' 40'
Scale in Feet

Notes:

1. For roadway plans and profiles, see sheets C–50 to C–68.
2. For roadway grading, drainage, and stormwater quality, see sheets C–86 to C–103.
3. For curb ramp layout and grading, see sheets C–184 to C–202.

DATE	REVISION
07/15/22	5 Curb Return Revised
06/08/22	2 Revised callout

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Intersection Plan
Intersection M

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

SHEET No. C-81 OF 767 SHEETS

ADD. 82

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

FILE: K:\chal\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-81 Intersection Plan – Farrington Highway and Road M.dwg saved July 14, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	86	767

True North
1" = 10'

Curve Data:

Ⓐ
△=18°46'01"
△/2=9°23'0.5"
R=500.00'
T=82.63'
C=163.04'
Lc=163.77'

Ⓑ
△=8°50'12"
△/2=4°25'6"
R=1027.00'
T=79.35'
C=158.24'
Lc=158.39'

Ⓒ
△=4°45'50"
△/2=2°22'55"
R=520.00'
T=21.63'
C=43.22'
Lc=43.24'

Ⓓ (5)
△=7°17'20"
△/2=3°38'40"
R=498.00'
T=31.72'
C=63.31'
Lc=63.35'

Ⓔ
△=13°40'49"
△/2=6°50'25"
R=519.00'
T=62.26'
C=123.62'
Lc=123.92'

Ⓕ (2)
△=12°46'05"
△/2=6°23'2.4"
R=50.50'
T=5.65'
C=11.23'
Lc=11.25'

Ⓖ
△=2°48'16"
△/2=1°24'8"
R=2852.30'
T=69.82'
C=139.59'
Lc=139.61'

Ⓗ
△=34°34'37"
△/2=17°17'18.5"
R=92.60'
T=28.82'
C=55.04'
Lc=55.88'

Ⓙ (5)
△=3°14'20"
△/2=1°37'10"
R=2813.3'
T=79.54'
C=159.02'
Lc=159.04'

℄ Sta. 154+71.1
o/s 24.0' Lt.

℄ Sta. 155+02.2
o/s 24.8' Rt.

℄ Sta. 156+38.5
o/s 33.6' Lt.

℄ Sta. 156+29.5
o/s 3.6' Lt.

℄ Sta. 156+57.0
o/s 32.7' Rt.

℄ Sta. 156+72.4
o/s 8.7' Lt.

℄ Sta. 157+23.5
o/s 47.4' Lt.

℄ Sta. 157+35.6
o/s 19.0' Lt.

℄ Sta. 157+98.6
o/s 25.2' Lt.

℄ Sta. 158+47
o/s 52.6' Lt.

℄ Sta. 158+56.7
o/s 11.3' Lt.

℄ Sta. 158+71.1
o/s 11.7' Lt.

℄ Sta. 159+95.41
o/s 42.7' Rt.

℄ Sta. 160+10.6
o/s 5.7' Lt.

℄ Sta. 160+10.6
o/s 7.0' Lt.

℄ Sta. 160+38.62
o/s 76.8' Rt.

℄ Farrington Hwy.

FARRINGTON HIGHWAY
(PROPOSED STATE)

155+00 150+00 157+00 158+00 159+00 160+00 1+00

ONLY

Limit of Queen's West Intersection Work

ROAD M

FARRINGTON HIGHWAY (PROPOSED STATE)

79°53'48", 41.01'
R=2'
R=1'
R=8'
R=1'
8'
7.33'
8'
18'
12'
R=5'
R=1'
258°51'56"
348°51'56", 20.21'
R=2'

℄ Sta. 159+60.7
o/s 36.9' Rt.

℄ Sta. 159+73.1
o/s 43.6' Rt.

℄ Sta. 159+84.9
o/s 50.2' Rt.

℄ Sta. 160+02.4
o/s 33.0' Rt.

℄ Sta. 160+07.9
o/s 69.2' Rt.

Graphic Scale:
1" = 10' 10' 5' 0 10' 20'
Scale in Feet

Enlarged Roadway Layout Plan – 2
Scale: 1" = 20'

DATE	REVISION
07/15/22	(5) Revised layout
06/08/22	(2) Detectable Warning Mat Added

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Enlarged Layout Plan – 2

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

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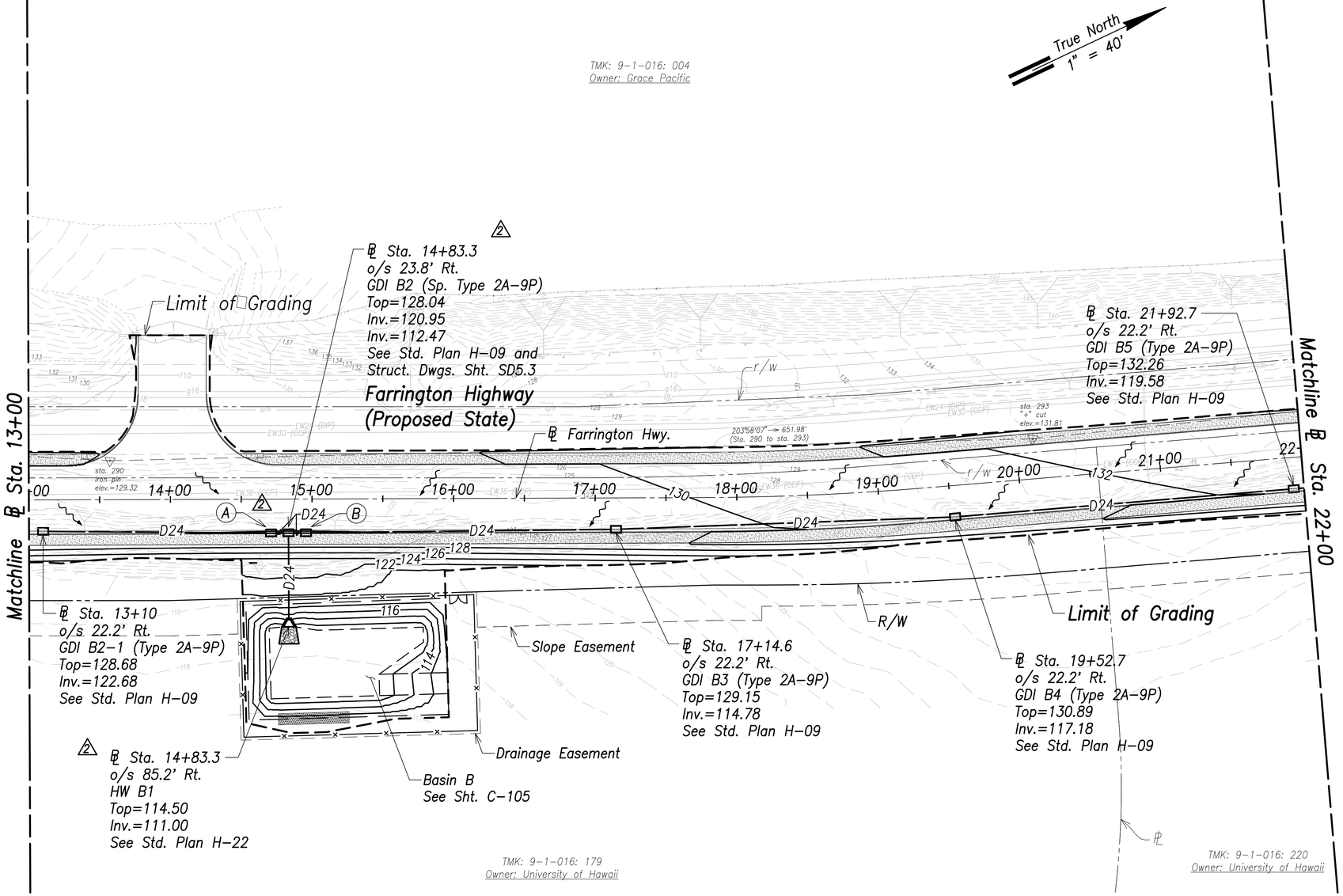
SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

SHEET No. C-85 OF 767 SHEETS

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

FILE: K:\chin\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-85 Enlarged Median Plan – 2 (Near Queens).dwg saved July 13, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	88	767



Legend:

- Existing Grade Contour (70)
- Finished Grade Contour (100)
- Limit of Grading
- Drainage Flow Direction

Notes:

1. The Contractor Shall Construct/Phase Drainage Improvements to Avoid Flooding Adjacent Properties and Washout of Roadway.
2. See Access to Farm Lots notes on sheet C-3

Graphic Scale:

1" = 40' (40' 20' 0 40' 80')

Scale in Feet

(A)

℄ Sta. 14+71
o/s 23.8' Rt.
GDI B2-A (Sp. Type 2A-9P)
Top=128.05
Inv.=121.07
See Std. Plan H-09 and
Struct. Dwgs. Sht. SD5.3

(B)

℄ Sta. 14+95.7
o/s 23.8' Rt.
GDI B2-B (Sp. Type 2A-9P)
Top=128.05
Inv.=112.59
See Std. Plan H-09 and
Struct. Dwgs. Sht. SD5.3

Grading and Drainage Plan – (℄ Sta. 13+00 to ℄ Sta. 22+00)

Scale: 1" = 40'

DATE	REVISION
07/15/22	5 Revised GDI Type
06/08/22	2 Revised HW B1; Revised GDI B2, B2-A, and B2-B

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

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

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SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Grading and Drainage Plan ℄ Sta. 13+00 to ℄ Sta. 22+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

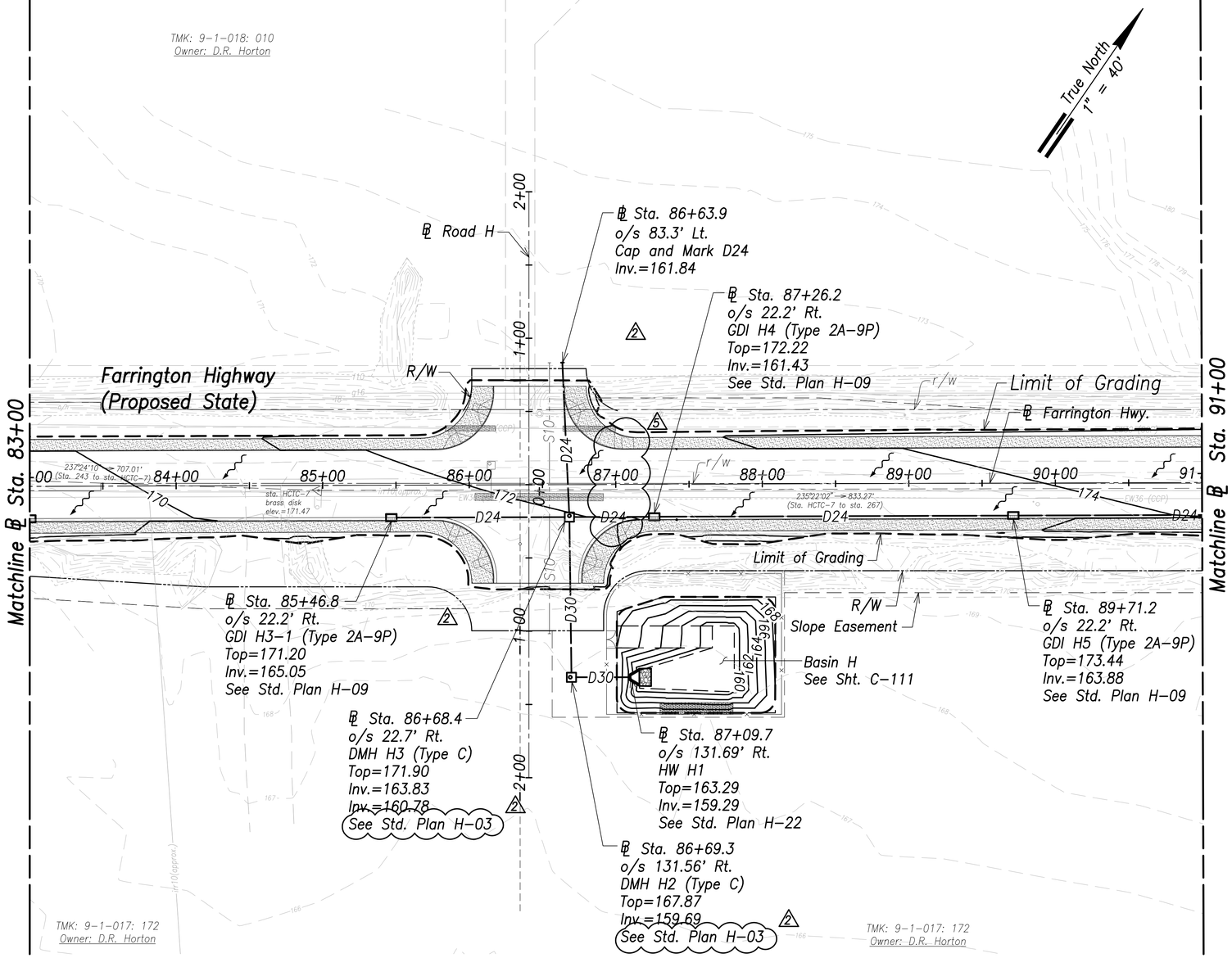
Scale: As Shown Date: April 2022

SHEET No. C-87 OF 767 SHEETS

ADD. 88

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-87 Grading and Drainage Plan - Sta. 13+00 to 22+00.dwg saved July 8, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	96	767



Grading and Drainage Plan – (℄ Sta. 83+00 to ℄ Sta. 91+00)

Scale: 1" = 40'

Legend:

- 70 — Existing Grade Contour
- 100 — Finished Grade Contour
- Limit of Grading
- Drainage Flow Direction

Notes:

1. The Contractor Shall Construct/Phase Drainage Improvements to Avoid Flooding Adjacent Properties and Washout of Roadway.
2. See Access to Farm Lots notes on sheet C-3.
3. Future HECO Electrical System, Construction Will Occur at the Same as this Project (Farrington Highway Improvements). The Contractor Shall Fully Coordinate Work with HECO and their Contractor. The Cost to Coordinate Work Will be Considered Incidental to the Various Items of Work.

Graphic Scale:
1" = 40' 40' 20' 0 40' 80'
Scale in Feet

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

DATE	REVISION
07/15/22	5 Speed Table removed
06/08/22	2 Revised road stub grading; Revised detail reference;

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

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SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Grading and Drainage Plan ℄ Sta. 83+00 to ℄ Sta. 91+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

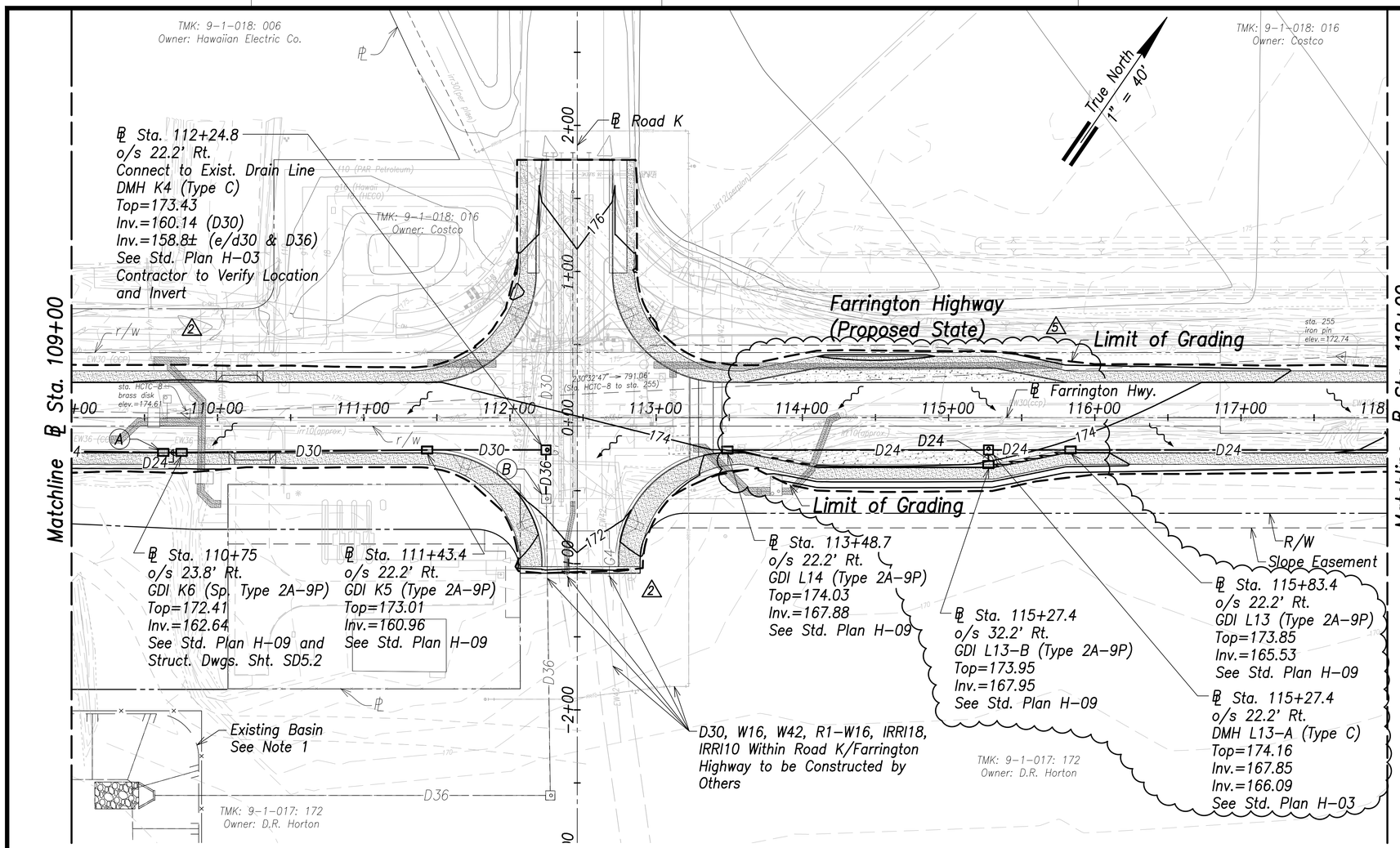
Scale: As Shown Date: April 2022

SHEET No. C-95 OF 767 SHEETS

ADD. 96

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-95 Grading and Drainage Plan - Sta. 83+00 to 91+00.dwg saved July 11, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	99	767



Ⓐ

℄ Sta. 109+63
o/s 23.8' Rt.
GDI K6-A (Sp. Type 2A-9P)
Top=172.41
Inv.=162.76
See Std. Plan H-09 and
Struct. Dwgs. Sht. SD5.2

Ⓑ

℄ Sta. 112+24.8
o/s 55.5' Rt.
Conn. To Exist. DMH K3
Inv.=158.2± (e/D36 & D36)

Grading and Drainage Plan – (℄ Sta. 109+00 to ℄ Sta. 118+00)

Scale: 1" = 40'

Notes:

1. Future drain line, manhole and basin improvements to be constructed by others under the project plans prepared by the R.M. Towill Corp., titled "Ho'opili Development – Industrial Mixed Use Intersection Improvements", Construction Plan File No. 2017/CP-307 (Subd. File No. 2018/SUB-187, 2018/SUB-201) and "Ho'opili Industrial Mixed Use (IMX) Subdivision Mass Grading and Infrastructure Improvements", Construction Plan File No. 2020/CP-66 (Subd. File No. 2019/SUB-162)
2. The Contractor Shall Construct/Phase Drainage Improvements to Avoid Flooding Adjacent Properties and Washout of Roadway.
3. See Access to Farm Lots notes on sheet C-3.

Legend:

- 70 — Existing Grade Contour
- 100 — Finished Grade Contour
- Limit of Grading
- Drainage Flow Direction

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

DATE	REVISION
07/15/22	5 Add Bus Bay and DMH. Rev. GDI's.
06/08/22	2 Revised drain line; Revised road stub grading

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

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

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SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Grading and Drainage Plan ℄ Sta. 109+00 to ℄ Sta. 118+00

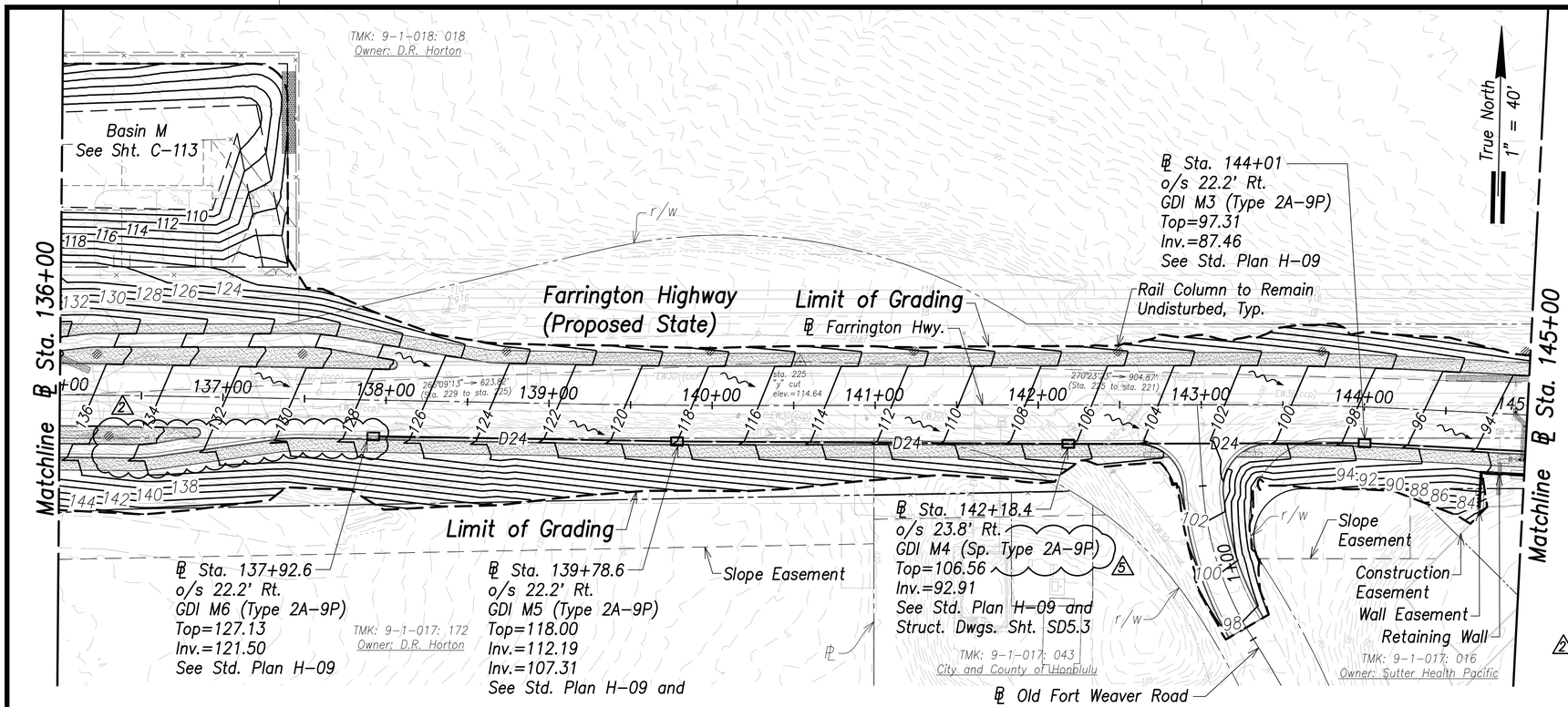
FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. C-98 OF 767 SHEETS

ADD. 99

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	102	767



Note:

1. The Contractor Shall Construct/Phase Drainage Improvements to Avoid Flooding Adjacent Properties and Washout of Roadway.
2. Contractor Shall Locate Guardrail Posts to Provide 2' Min. Clear From Drain Utilities.
3. Grading along the makai shoulder between Old Fort Weaver Road (West) and Honouliuli Stream Bridge, and construction of Retaining Wall must be completed within four months of receiving Notice to Proceed. The Contractor shall coordinate work with HECo.

Grading and Drainage Plan – (℄ Sta. 136+00 to ℄ Sta. 145+00)

Scale: 1" = 40'

Legend:

- Existing Grade Contour (70)
- Finished Grade Contour (100)
- Limit of Grading
- Drainage Flow Direction

Graphic Scale:

1" = 40' — 40' 20' 0 40' 80' — Scale in Feet

DATE	REVISION
07/15/22	5 Revised GDI Type
06/08/22	2 Removed drain line and blocks, added notes

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Grading and Drainage Plan ℄ Sta. 136+00 to ℄ Sta. 145+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6635-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

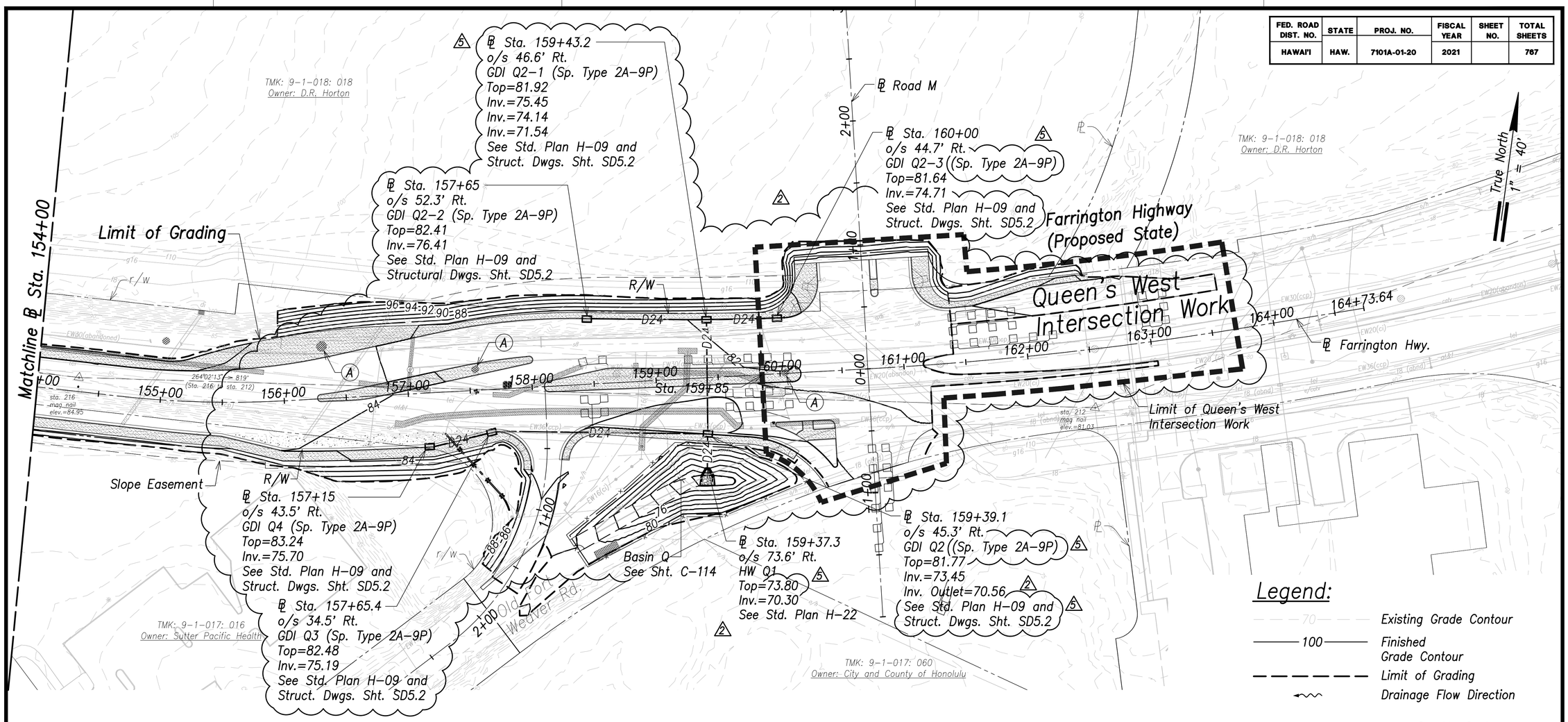
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

SHEET No. C-101 OF 767 SHEETS

ADD. 102

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-101 Grading and Drainage Plan – Sta. 136+00 to 145+00.dwg saved July 18, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021		767



Legend:

- 70 — Existing Grade Contour
- 100 — Finished Grade Contour
- Limit of Grading
- Drainage Flow Direction

Graphic Scale:
1" = 40' (40' 20' 0 40' 80')
Scale in Feet

(A) Construct Splash Block
See Det., Sht. C-205

Grading and Drainage Plan – (℄ Sta. 154+00 to ℄ Sta. 165+00)

Scale: 1" = 40'

Notes:

1. The Contractor Shall Construct/Phase Drainage Improvements to Avoid Flooding Adjacent Properties and Washout of Roadway.
2. Contractor Shall Locate Guardrail Posts to Provide 2' Min. Clear From Drain Utilities and Cleanout.
3. See Access to Farm Lots notes on sheet C-3.

DATE	REVISION
07/15/22	(5) Added bus pullouts; Revised drain structures and headwall height
06/08/22	(2) Revised HW Q1 and GDI Q2

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Grading and Drainage Plan ℄ Sta. 154+00 to ℄ Sta. 165+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

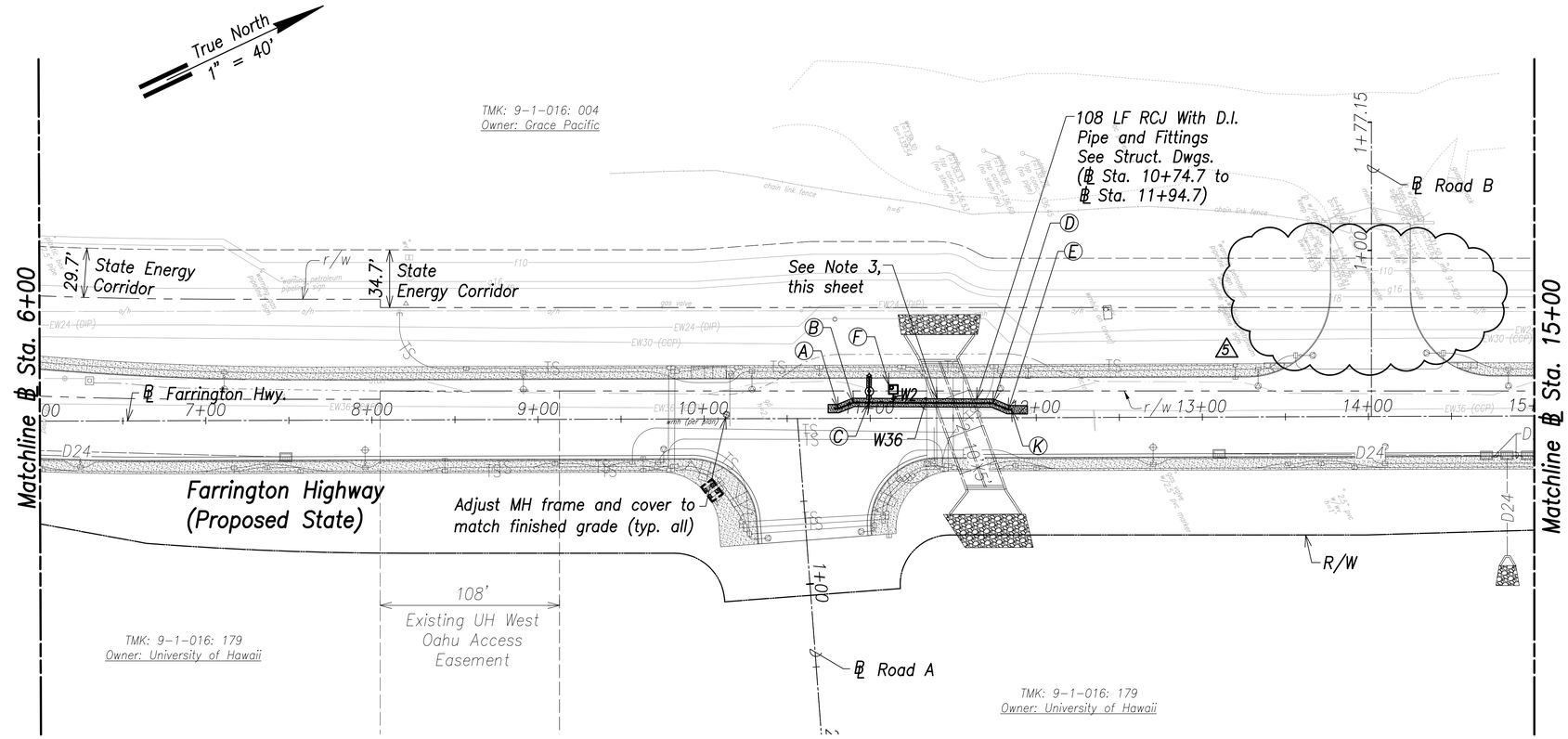
SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

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

SHEET No. C-103 OF 767 SHEETS

ADD. 104

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	117	767



Utility Plan – (℄ Sta. 6+00 to ℄ Sta. 15+00)

Scale: 1" = 40'

Ⓐ

℄ Sta. 10+80.7, o/s 5.7' Lt.
Conn. to e/w36
Contractor to verify location and invert
Materials for Connection:
1–36" 1/16 Bend (H)
1–36" CCPxD.I. Adapter
1–36" Sleeve, 15" Long
8± LF 36" D.I.P, Cl. 53
Temp for Testing:
1–36" Cap Tapped for 6" I.P.T.
1–6" C.O.
1–Conc. Block
See Sht. C–168 For Temporary By–Pass Plan and Profile – 1

Ⓑ

℄ Sta. 10+90, o/s 9.4' Lt.
1–36" 1/16 Bend (H)

Ⓒ 5

FH 1
℄ Sta. 10+99.4, o/s 9.4' Lt.
1–36"x6" Tee, D.I.
1–6" G.V., 200#
1–Type "C" Manhole and Cover, See BWS Std. Det. MH19
1–FH (Ht.=9.5')
1–FH Elbow
1–Conc. Block
16 LF 6" D.I.P., Cl. 53
1–Blue Type F FH Marker
See Profile, Sht. C–162
See BWS Std. Det. FH4

Ⓓ

℄ Sta. 11+73.9 o/s 8.7' Lt.
1–36" 1/16 Bend (H)

Ⓔ

℄ Sta. 11+83.0, o/s 4.8' Lt.
1–36" 1/16 Bend (H)

Ⓕ 5

℄ Sta. 11+14, o/s 17.2' Lt.
Center MH
2–2" Offset ARV, 200#
1–Type "D" MH
See BWS Std. Det. V5, MH20–MH21, and Water Details on Sht. C–207

Ⓚ 5

℄ Sta. 11+87.1, o/s 4.8' Lt.
Conn. to e/w36
Contractor to verify location and invert
Materials for Connection:
1–36" 1/16 Bend (H)
1–36" CCPxD.I. Adapter
1–36" Sleeve, 15" Long
8± LF 36" D.I.P, Cl. 53
Temp for Testing:
1–36" Cap Tapped for 6" I.P.T.
1–6" C.O.
1–Conc. Block
See Sht. C–168 For Temporary By–Pass Plan and Profile – 1

Notes:

1. Location of existing utilities are from "as–built" drawings. The Contractor shall verify tie–in connection points prior to the ordering of materials and the start of construction.
2. The Contractor shall coordinate construction with utility companies.
3. All waterlines shall be ductile iron pipe, class 53 with ductile iron fittings and shall be in accordance with the STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, dated 2005, as amended, of the Hawaii Highways Division, Department of Transportation, and the City and County of Honolulu Board of Water Supply's "WATER SYSTEM STANDARDS", DATED 2002, THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 2021, and all subsequent amendment and additions.
4. For electrical relocations, see electrical drawings.
5. For the portions of the water main to be concrete jacketed, a bell is to be installed in case there is a break on the line. This allows the removal of the compromised portion of the line without affecting the reinforced concrete jacketed segment of the existing water line. The installation of the bell shall be incidental to the various pay items under Section 624.

Graphic Scale:
1" = 40' 40' 20' 0 40' 80'
Scale in Feet

DATE	REVISION
07/15/22	5 Revised callouts and RCJ
06/08/22	2 Deleted note; Revised callout

APPROVED:

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

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Utility Plan
℄ Sta. 6+00 to ℄ Sta. 15+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

Scale: As Shown — Date: April 2022

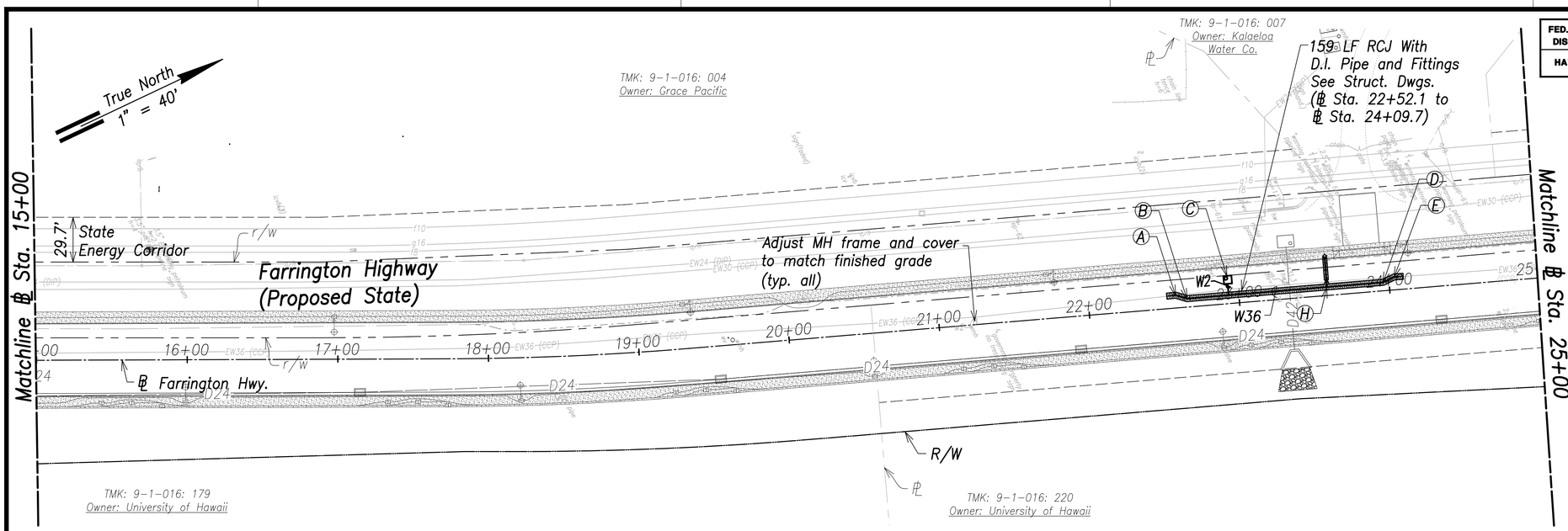
SHEET No. C-116 OF 767 SHEETS

ADD. 117

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

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-116 Utility Plan – Sta. 6+00 to 15+00.dwg saved July 8, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	118	767



Utility Plan – (℄ Sta. 15+00 to ℄ Sta. 25+00)

Scale: 1" = 40'

Ⓐ

℄ Sta. 22+58.1, o/s 7.9' Lt.
Conn. to e/w36
Contractor to verify location and invert
Materials for Connection:
1–36" 1/16 Bend (H)
1–36" CCPxD.I. Adapter
1–36" Sleeve, 15" Long
8± LF 36" D.I.P., Cl. 53
Temp. for Testing:
1–36" Cap Tapped for 6" I.P.T.
1–6" C.O.
1–Conc. Block
See Sht. C–168 For Temporary By–Pass Plan and Profile – 2

Ⓑ

℄ Sta. 22+65.4, o/s 5.5' Lt.
1–36" 1/16 Bend (H)

Ⓒ

℄ Sta. 22+93.4, o/s 15.8' Lt.
Center MH
2–2" Offset ARV, 200#
1–Type "D" MH
See BWS Std. Det. V5 and MH20–MH21

Ⓓ

℄ Sta. 23+97.5, o/s 30.5' Lt.
1–36" 1/16 Bend (H)

Ⓔ

℄ Sta. 24+05, o/s 33.6' Lt.
Conn. to e/w36
Contractor to verify location and invert
Materials for Connection:
1–36" 1/16 Bend (H)
1–36" CCPxD.I. Adapter
1–36" Sleeve, 15" Long
8± LF 36" D.I.P., Cl. 53
Temp. for Testing:
1–36" Cap Tapped for 6" I.P.T.
1–6" C.O.
1–Conc. Block
See Sht. C–168 For Temporary By–Pass Plan and Profile – 2

Ⓗ

FH 2
℄ Sta. 23+58.6, o/s 29.7' Lt.
1–36"x6" Tee, D.I.
1–6" G.V., 200#
1–Valve Box
1–FH (Ht.=7.5')
1–FH Elbow
1–Conc. Block
21 LF 6" D.I.P., Cl. 53
1–Blue Type F FH Marker
See Profile, Sht. C–162
See BWS Std. Det. FH4
5

Notes:

1. Location of existing utilities are from "as–built" drawings. The Contractor shall verify tie–in connection points prior to the ordering of materials and the start of construction.
2. The Contractor shall coordinate construction with utility companies.
3. All waterlines shall be ductile iron pipe, class 53 with ductile iron fittings and shall be in accordance with the STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, dated 2005, as amended, of the Hawaii Highways Division, Department of Transportation, and the City and County of Honolulu Board of Water Supply's "WATER SYSTEM STANDARDS", DATED 2002, THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 2021, and all subsequent amendment and additions.
4. For electrical relocations, see electrical drawings.
5. For the portions of the water main to be concrete jacketed, a bell is to be installed in case there is a break on the line. This allows the removal of the compromised portion of the line without affecting the reinforced concrete jacketed segment of the existing water line. The installation of the bell shall be incidental to the various pay items under Section 624.

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

Graphic Scale:
1" = 40' 40' 20' 0 40' 80'
Scale in Feet

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

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 Revised callout
06/08/22	2 Deleted note

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

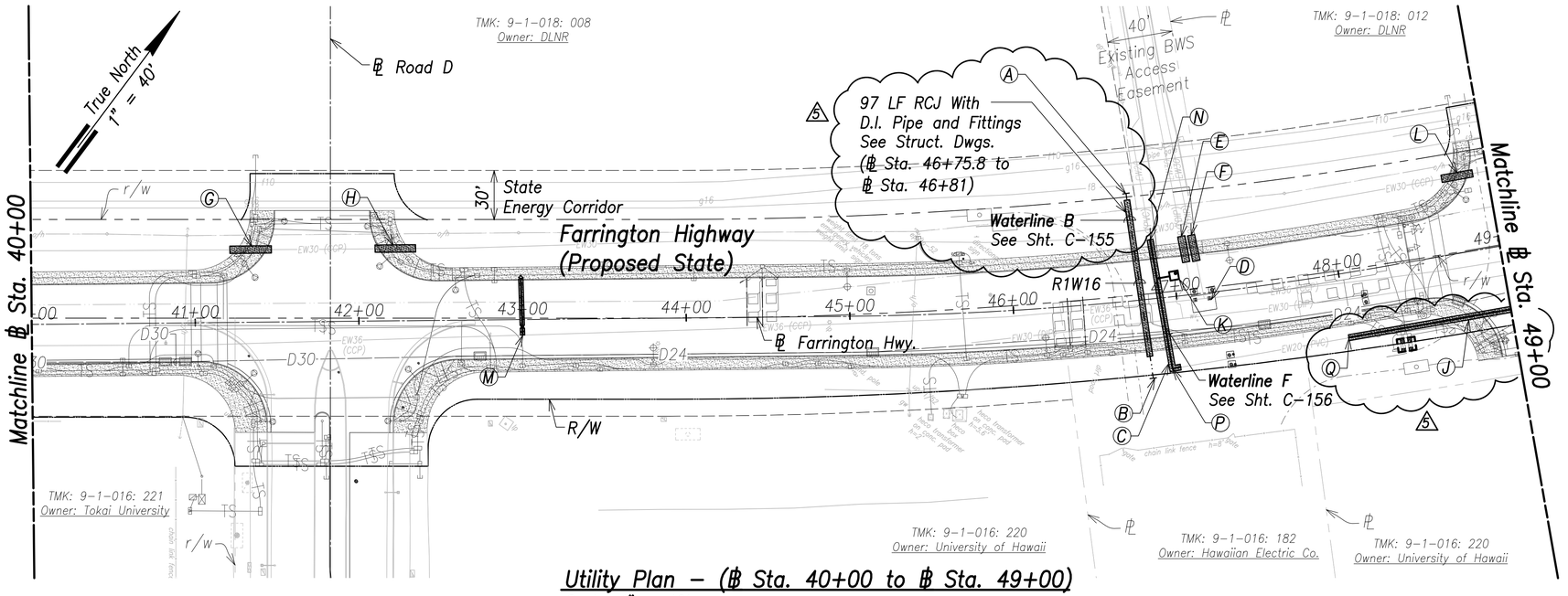
Utility Plan
℄ Sta. 15+00 to ℄ Sta. 25+00
FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

Scale: As Shown Date: April 2022

SHEET No. C-117 OF 767 SHEETS

ADD. 118

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-117 Utility Plan – Sta. 15+00 to 25+00.dwg saved June 30, 2022



Utility Plan – (℄ Sta. 40+00 to ℄ Sta. 49+00)

Scale: 1" = 40'

Ⓐ

℄ Sta. 46+75.4, o/s 65.5' Lt.
=℄ Sta. 1+12.7 WL B
1–16" Cap w/4" Clean out
1– 4'x4' Square Concrete Slab
1–Valve Marker (Marked R1W16)

Ⓑ

℄ Sta. 46+81.7, o/s 48.5' Rt.
=℄ Sta. 0+00 WL B
1–16" Cap w/4" Clean out
1– 4'x4' Square Concrete Slab
1–Valve Marker (Marked R1W16)

Ⓒ

77 LF RCJ With D.I. Pipe and Fittings
See Struct. Dwgs.
(℄ Sta. 46+87.6 to ℄ Sta. 46+92.5)

Ⓓ

Adjust MH frame and cover to match finished grade (typ. all)

Ⓔ

16 LF RCJ on Exist. Waterline
See BWS Std. Det. B1
(℄ Sta. 47+07.1 to ℄ Sta. 47+08.3)
See BWS RCJ Notes, Sht. C–15

Ⓕ

16 LF RCJ on Exist. Waterline
See BWS Std. Det. B1
(℄ Sta. 47+13.3 to ℄ Sta. 47+14.7)
See BWS RCJ Notes, Sht. C–15

Ⓖ

26 LF RCJ on Exist. Waterline
See BWS Std. Det. B1
(℄ Sta. 41+21.6 to ℄ Sta. 41+47)
See BWS RCJ Notes, Sht. C–15

Ⓗ

25 LF RCJ on Exist. Waterline
See BWS Std. Det. B1
(℄ Sta. 42+10.3 to ℄ Sta. 42+35.1)
See BWS RCJ Notes, Sht. C–15

Ⓙ

200 LF RCJ With D.I. Pipe and Fittings
See Struct. Dwgs.
(℄ Sta. 48+00 to ℄ Sta. 50+00)
5

Ⓚ

℄ Sta. 47+00, o/s 12.6' Lt.
Center MH
1–2" Offset ARV, 200#
1–Type "D" MH
See Bws Std. Det. V5 and MH20–MH21

Ⓛ

19 LF RCJ on Exist. Waterline
See BWS Std. Det. B1
(℄ Sta. 48+72.1 to ℄ Sta. 48+91.3)
See Note 6, This Sht.

Ⓜ

FH 3
℄ Sta. 43+00, o/s 9.4' Lt.
1–36"x6" Tapping Tee
1–6" Tapping Valve, 200#
1–Valve Box & Cover
1–6" Sleeve, 12" Long
1–Conc. Block w/ Struct. Struts
8± LF 6" D.I.P., Cl. 53
1–FH (Ht.=8.5')
1–FH Elbow
1–Conc. Block
16 LF 6" D.I.P., Cl. 53
1–Blue Type F FH Marker
See Profile, Sht. C–162
See BWS Std. Det. FH4
Temp. for Testing:
1–6" Cap Tapped for 2–1/2" I.P.T.
1–2–1/2" C.O.
1–Conc. Block

Ⓝ

℄ Sta. 46+87.6, o/s 36' Lt.
Conn. to e/w20
Contractor to verify location and invert
Materials for Connection:
1–20" Sleeve, 15" Long
8± LF 20" D.I.P., Cl. 53
Temp. for Testing:
1–20" Cap Tapped for 4" I.P.T.
1–4" C.O.
1–Conc. Block
See Sht. C–178 For Temporary
By–Pass Plan and Profile – 20
5

Ⓟ

℄ Sta. 46+92.8, o/s 43.8' Rt.
Conn. to e/w20
Contractor to verify location and invert
Materials for Connection:
1–20" Sleeve, 15" Long
8± LF 20" D.I.P., Cl. 53
Temp. for Testing:
1–20" Cap Tapped for 4" I.P.T.
1–4" C.O.
1–Conc. Block
See Sht. C–178 For Temporary
By–Pass Plan and Profile – 20
5

Ⓠ

℄ Sta. 48+00, o/s 39.6' Rt.
Conn. to e/w20
Contractor to verify location and invert
Materials for Connection:
1–20" Sleeve, 15" Long
8± LF 20" D.I.P., Cl. 53
Temp. for Testing:
1–20" Cap Tapped for 4" I.P.T.
1–4" C.O.
1–Conc. Block
See Sht. C–179 For Temporary
By–Pass Plan and Profile – 23
5

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	121	767

Notes:

1. Location of existing utilities are from "as–built" drawings. The Contractor shall verify tie–in connection points prior to the ordering of materials and the start of construction.
2. The Contractor shall coordinate construction with utility companies.
3. All waterlines shall be ductile iron pipe, class 53 with ductile iron fittings and shall be in accordance with the STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, dated 2005, as amended, of the Hawaii Highways Division, Department of Transportation, and the City and County of Honolulu Board of Water Supply's "WATER SYSTEM STANDARDS", DATED 2002, THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 2021, and all subsequent amendment and additions.
4. For electrical relocations, see electrical drawings.
5. For the portions of the water main to be concrete jacketed, a bell is to be installed in case there is a break on the line. This allows the removal of the compromised portion of the line without affecting the reinforced concrete jacketed segment of the existing water line. The installation of the bell shall be incidental to the various pay items under Section 624.

APPROVED:

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

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

DATE	REVISION
07/15/22	5 Revised callouts
06/08/22	2 Added new W20; Revised callouts

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

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6635-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Utility Plan
℄ Sta. 40+00 to ℄ Sta. 49+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

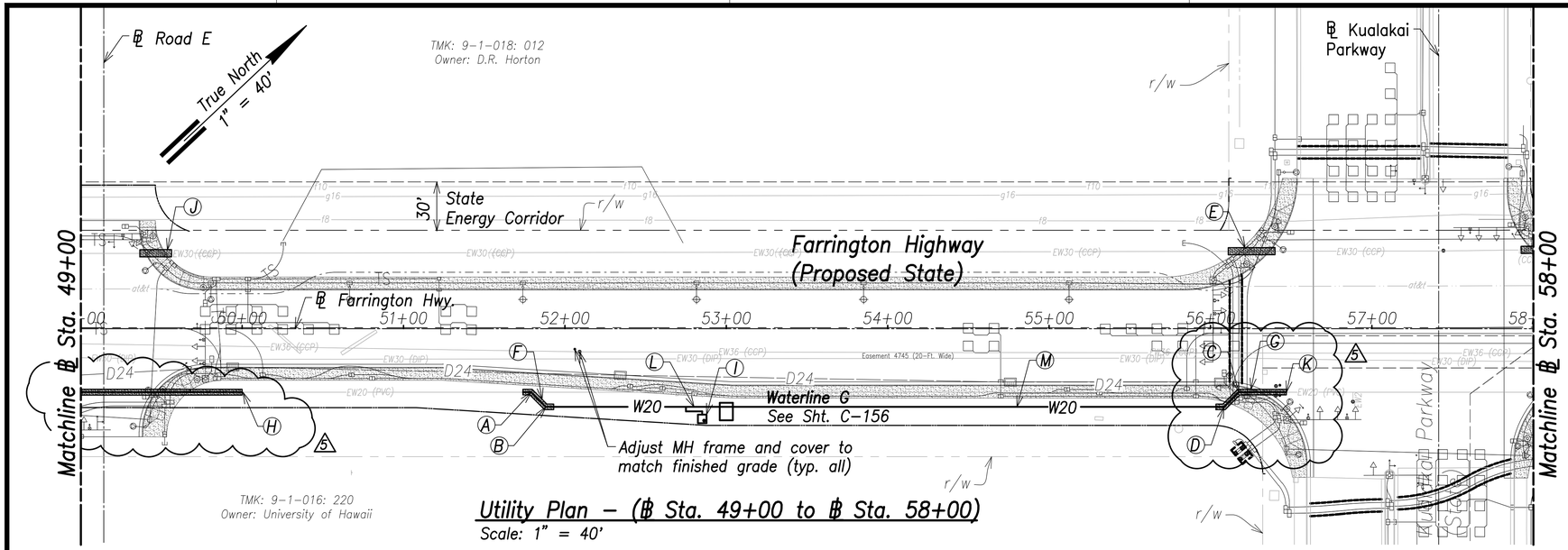
Scale: As Shown — Date: April 2022

SHEET No. C-120 OF 767 SHEETS

ADD. 121

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-120 Utility Plan – Sta. 40+00 to 49+00.dwg saved July 18, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	122	767



Utility Plan – (℄ Sta. 49+00 to ℄ Sta. 58+00)

Scale: 1" = 40'

Ⓐ

℄ Sta. 51+79, o/s 39.4' Rt.
Conn. to e/w20
Contractor to verify location and invert
Materials for Connection:
1–20" 1/8 Bend (H)
1–20" Sleeve, 15" Long
1–20" B.G.G.V., 200#
1–Type "A" MH
1–Conc. Block w/ Struct. Struts
8± LF 20" D.I.P., Cl. 53
Provide Insulating Joint Test Station
See Shts. CP–1 to CP–4
Temp. for Testing:
1–20" Cap Tapped for 4" I.P.T.
1–4" C.O.
1–Conc. Block
See Sht. C–176 For Temporary By–Pass Plan and Profile – 16

Ⓑ

℄ Sta. 51+88.1, o/s 48.5' Rt.
1–20" 1/8 Bend (H)

Ⓒ

℄ Sta. 56+17.5, o/s 39.4' Rt.
1–20" 1/8 Bend (H)

Ⓓ

℄ Sta. 56+08.4, o/s 48.5' Rt.
1–20" 1/8 Bend (H)
Provide Insulating Joint Test Station
See Shts. CP–1 to CP–4

Ⓔ

32 LF RCJ on Exist. Waterline
See BWS Std. Det. B1
(℄ Sta. 56+11 to ℄ Sta. 56+40)
See BWS RCJ Notes, Sht. C–15

Ⓕ

23 LF RCJ With
D.I. Pipe and Fittings
See Struct. Dwgs.
(℄ Sta. 51+74 to
℄ Sta. 51+93.1)

Ⓖ

48 LF RCJ With
D.I. Pipe and Fittings
See Struct. Dwgs.
(℄ Sta. 56+03.4 to
℄ Sta. 56+47)

Ⓗ

℄ Sta. 50+00, o/s 39.4' Rt.
Conn. to e/w20
Contractor to verify location and invert
Materials for Connection:
1–20" Sleeve, 15" Long
8± LF 20" D.I.P., Cl. 53
Temp. for Testing:
1–20" Cap Tapped for 4" I.P.T.
1–4" C.O.
1–Conc. Block
See Sht. C–179 For Temporary By–Pass Plan and Profile – 23

Ⓘ

℄ Sta. 52+85, o/s 56' Rt.
Center MH
1–2" Offset ARV, 200#
1–Type "D" MH
See BWS Std. Det. V5 and MH20–MH21

Ⓙ

20 LF RCJ on Exist. Waterline
See BWS Std. Det. B1
(℄ Sta. 49+36.6 to ℄ Sta. 49+56.3)
See BWS RCJ Notes, Sht. C–15

Ⓚ

℄ Sta. 56+47, o/s 39.4' Rt.
Conn. to e/w20
Contractor to verify location and invert
Demolish and remove exist. WMH, frame, cover, and valve
Materials for Connection:
1–20" Sleeve, 15" Long
1–Conc. Block w/ Struct. Struts
8± LF 20" D.I.P., Cl. 53
Temp. for Testing:
1–20" Cap Tapped for 4" I.P.T.
1–4" C.O.
1–Conc. Block
See Sht. C–176 For Temporary By–Pass Plan and Profile – 17

Ⓛ

℄ Sta. 52+80, o/s 48.5' Rt.
Provide Anode Test Station
See Shts. CP–1 to CP–4

Ⓜ

℄ Sta. 54+80, o/s 48.5' Rt.
Provide Anode Test Station
See Shts. CP–1 to CP–4

Notes:

1. Location of existing utilities are from "as–built" drawings. The Contractor shall verify tie–in connection points prior to the ordering of materials and the start of construction.
2. The Contractor shall coordinate construction with utility companies.
3. All waterlines shall be ductile iron pipe, class 53 with ductile iron fittings and shall be in accordance with the STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, dated 2005, as amended, of the Hawaii Highways Division, Department of Transportation, and the City and County of Honolulu Board of Water Supply's "WATER SYSTEM STANDARDS", DATED 2002, THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 2021, and all subsequent amendment and additions.
4. For electrical relocations, see electrical drawings.
5. For the portions of the water main to be concrete jacketed, a bell is to be installed in case there is a break on the line. This allows the removal of the compromised portion of the line without affecting the reinforced concrete jacketed segment of the existing water line. The installation of the bell shall be incidental to the various pay items under Section 624.

Graphic Scale:
1" = 40' 40' 20' 0 40' 80'
Scale in Feet

DATE	REVISION
07/15/22	5 Revised Waterline G and connection point
06/08/22	2 Revised Callouts; Profile Sheet References Revised; Deleted note

APPROVED:

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

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Utility Plan
℄ Sta. 49+00 to ℄ Sta. 58+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown — Date: April 2022

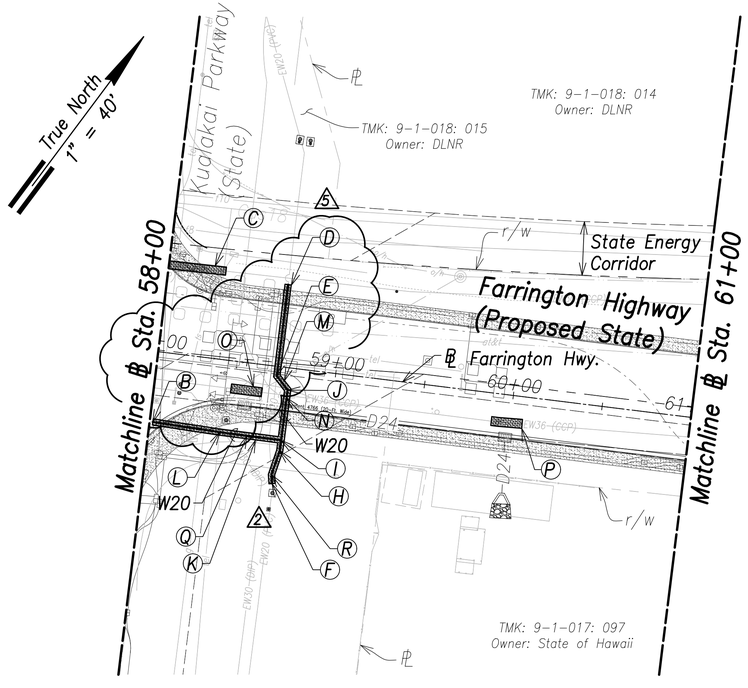
SHEET No. C-121 OF 767 SHEETS

ADD. 122

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

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-121 Utility Plan – Sta. 49+00 to 58+00.dwg saved July 18, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	123	767



Utility Plan – (℄ Sta. 58+00 to ℄ Sta. 61+00)

Scale: 1" = 40'

Ⓑ
℄ Sta. 58+01.8, o/s 39.4' Rt.
=℄ Sta. 0+00 Waterline N
Conn. to e/w20
Contractor to verify location and invert
Materials for Connection:
1–20" Sleeve, 15" Long
8± LF 20" D.I.P., Cl. 53
Temp. for Testing:
1–20" Cap Tapped for 4" I.P.T.
1–4" C.O.
1–Conc. Block
See Sht. C–177 For Temporary By–Pass Plan and Profile – 18

Ⓒ
40 LF RCJ on Exist. Waterline
See BWS Std. Det. B1
(℄ Sta. 57+92.4 to
℄ Sta. 58+32.1)
See BWS RCJ Notes, Sht. C–15

Ⓓ
℄ Sta. 58+67.5, o/s 46.1' Lt.
=℄ Sta. 0+00 Waterline P
Conn. to e/w20
Contractor to verify location and invert
Materials for Connection:
1–20" Sleeve, 15" Long
8± LF 20" D.I.P., Cl. 53
Temp. for Testing:
1–20" Cap Tapped for 4" I.P.T.
1–4" C.O.
1–Conc. Block
See Sht. C–177 For Temporary By–Pass Plan and Profile – 19

Ⓔ
℄ Sta. 58+67.5, o/s 5.4' Lt.
1–20" 1/8 Bend (H)

Ⓕ
℄ Sta. 58+72.2, o/s 65.5' Rt.
=℄ Sta. 1+14.8 Waterline P
Conn. to e/w20
Contractor to verify location and invert
Contractor to verify pipe size prior to the start of construction
Materials for Connection:
1–Conc. Block w/ Struct. Struts
5± LF 20" D.I.P., Cl. 53
Temp. for Testing:
1–12" Cap Tapped for 4" I.P.T.
1–4" C.O.
1–Conc. Block
See Sht. C–177 For Temporary By–Pass Plan and Profile – 19

Ⓗ
℄ Sta. 58+74.2, o/s 46.7' Rt.
1–20" 1/32 Bend (H)

Ⓘ
℄ Sta. 58+74.2, o/s 40.7' Rt.
=℄ Sta. 0+44.8 Waterline N
=℄ Sta. 0+38.2 Waterline P
1–20"x20" Tee

Ⓙ
℄ Sta. 58+74.4, o/s 12.4' Rt.
1–20" 1/8 Bend (H)

Ⓚ
73 LF RCJ With
D.I. Pipe and Fittings
See Struct. Dwgs.
(℄ Sta. 58+01.8 to
℄ Sta. 58+74.2)

Ⓛ
℄ Sta. 58+39.5, o/s 40.5' Rt.
Deflect 1°

Ⓜ
115 LF RCJ With
D.I. Pipe and Fittings
See Struct. Dwgs.
(℄ Sta. 58+67.5 to
℄ Sta. 58+72.2)

Ⓝ
Waterline P
See Profile
Sht. C–159

Ⓞ
17 LF RCJ on Exist. Waterline
See BWS Std. Det. B1
(℄ Sta. 58+42.9 to
℄ Sta. 58+60.2)
See BWS RCJ Notes, Sht. C–15

Ⓟ
17 LF RCJ on Exist. Waterline
See BWS Std. Det. B1
(℄ Sta. 59+89.5 to
℄ Sta. 60+06.8)
See BWS RCJ Notes, Sht. C–15

Ⓠ
Waterline N
See Profile
Sht. C–159

Ⓡ
℄ Sta. 58+71.3, o/s 52.7' Rt.
1–20" 1/16 Bend (H)

Notes:

1. Location of existing utilities are from "as–built" drawings. The Contractor shall verify tie–in connection points prior to the ordering of materials and the start of construction.
2. The Contractor shall coordinate construction with utility companies.
3. All waterlines shall be ductile iron pipe, class 53 with ductile iron fittings and shall be in accordance with the STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, dated 2005, as amended, of the Hawaii Highways Division, Department of Transportation, and the City and County of Honolulu Board of Water Supply's "WATER SYSTEM STANDARDS", DATED 2002, THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 2021, and all subsequent amendment and additions.
4. For electrical relocations, see electrical drawings.
5. For the portions of the water main to be concrete jacketed, a bell is to be installed in case there is a break on the line. This allows the removal of the compromised portion of the line without affecting the reinforced concrete jacketed segment of the existing water line. The installation of the bell shall be incidental to the various pay items under Section 624.

Graphic Scale:
1" = 40' 40' 20' 0 40' 80'
Scale in Feet

APPROVED:

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

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 Revised waterlines and callouts
06/08/22	2 Revised Callouts; Profile Sheet References Revised; Deleted Note

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Utility Plan
℄ Sta. 58+00 to ℄ Sta. 61+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

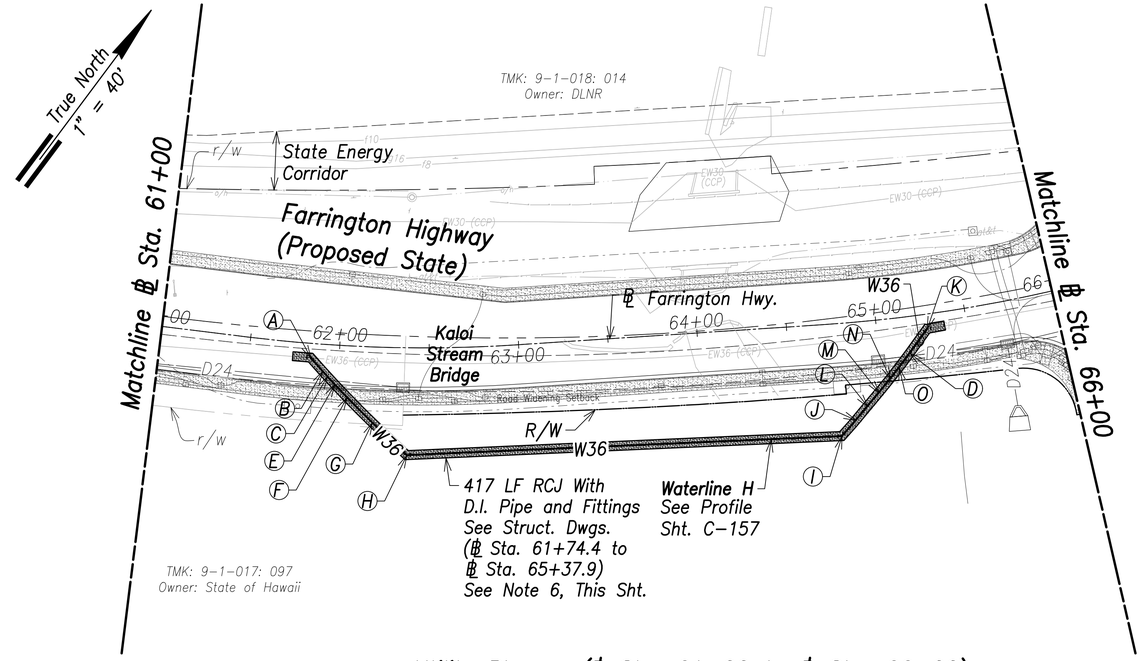
Scale: As Shown Date: April 2022

SHEET No. C-122 OF 767 SHEETS

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

ADD. 123

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	124	767



Utility Plan – (℄ Sta. 61+00 to ℄ Sta. 66+00)

Scale: 1" = 40'

Ⓐ

℄ Sta. 61+84.3, o/s 8' Rt.
= ℄ Sta. 0+00 WL H
Conn. to e/w36
Contractor to verify location and invert
Materials for Connection:
1–36" 1/8 Bend (H)
1–36" CCPxD.I. Adapter
1–36" Sleeve, 15" Long
8± LF 36" D.I.P, Cl. 53
Temp for Testing:
1–36" Cap Tapped for 6" I.P.T.
1–6" C.O.
1–Conc. Block
See Sht. C–169 For Temporary By–Pass Plan and Profile – 3

Ⓑ

℄ Sta. 61+91.4, o/s 15' Rt.
Deflect 1° (H)

Ⓒ

℄ Sta. 61+94.3, o/s 18' Rt.
Deflect 1° (H)

Ⓓ

℄ Sta. 65+16.8, o/s 20.4' Rt.
Deflect 1° (H)

Ⓔ △2

℄ Sta. 61+98.5, o/s 21.9' Rt.
Deflect 1° (H)

Ⓕ

℄ Sta. 62+05.5, o/s 28.7' Rt.
Deflect 1° (H)

Ⓖ

℄ Sta. 62+19.6 o/s 42.3' Rt.
Deflect 1° (H)

Ⓗ

℄ Sta. 62+38.1, o/s 60.1' Rt.
1–36" 1/8 Bend (H)

Ⓘ

℄ Sta. 64+76.6, o/s 62.9' Rt.
1–36" 1/8 Bend (H)

Ⓙ

℄ Sta. 64+84.6, o/s 54.7' Rt.
Deflect 1° (H)

Ⓚ

℄ Sta. 65+28.2, o/s 8.3' Rt.
= ℄ Sta. 3+96.7 WL H
Conn. to e/w36
Contractor to verify location and invert
Materials for Connection:
1–36" 1/8 Bend (H)
1–36" CCPxD.I. Adapter
1–36" Sleeve, 15" Long
8± LF 36" D.I.P, Cl. 53
Temp for Testing:
1–36" Cap Tapped for 6" I.P.T.
1–6" C.O.
1–Conc. Block
See Sht. C–169 For Temporary By–Pass Plan and Profile – 4

Ⓛ

℄ Sta. 64+91.4, o/s 47.7' Rt.
Deflect 1° (H)

Ⓜ

℄ Sta. 64+98.1, o/s 40.7' Rt.
Deflect 1° (H)

Ⓝ

℄ Sta. 65+04.8, o/s 33.6' Rt.
Deflect 1° (H)

Ⓞ △5

℄ Sta. (65+10.1, o/s 27.6') Rt.
Deflect 1° (H)

△5

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

APPROVED:

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

Notes:

1. Location of existing utilities are from "as–built" drawings. The Contractor shall verify tie–in connection points prior to the ordering of materials and the start of construction.
2. The Contractor shall coordinate construction with utility companies.
3. All waterlines shall be ductile iron pipe, class 53 with ductile iron fittings and shall be in accordance with the STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, dated 2005, as amended, of the Hawaii Highways Division, Department of Transportation, and the City and County of Honolulu Board of Water Supply's "WATER SYSTEM STANDARDS", DATED 2002, THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 2021, and all subsequent amendment and additions.
4. For electrical relocations, see electrical drawings.
5. For the portions of the water main to be concrete jacketed, a bell is to be installed in case there is a break on the line. This allows the removal of the compromised portion of the line without affecting the reinforced concrete jacketed segment of the existing water line. The installation of the bell shall be incidental to the various pay items under Section 624.

△2

DATE	REVISION
07/15/22	△5 Callout "O" Revised; Callout "P" Removed
06/08/22	△2 Callout Revised; Deleted Note

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

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Utility Plan
℄ Sta. 61+00 to ℄ Sta. 66+00

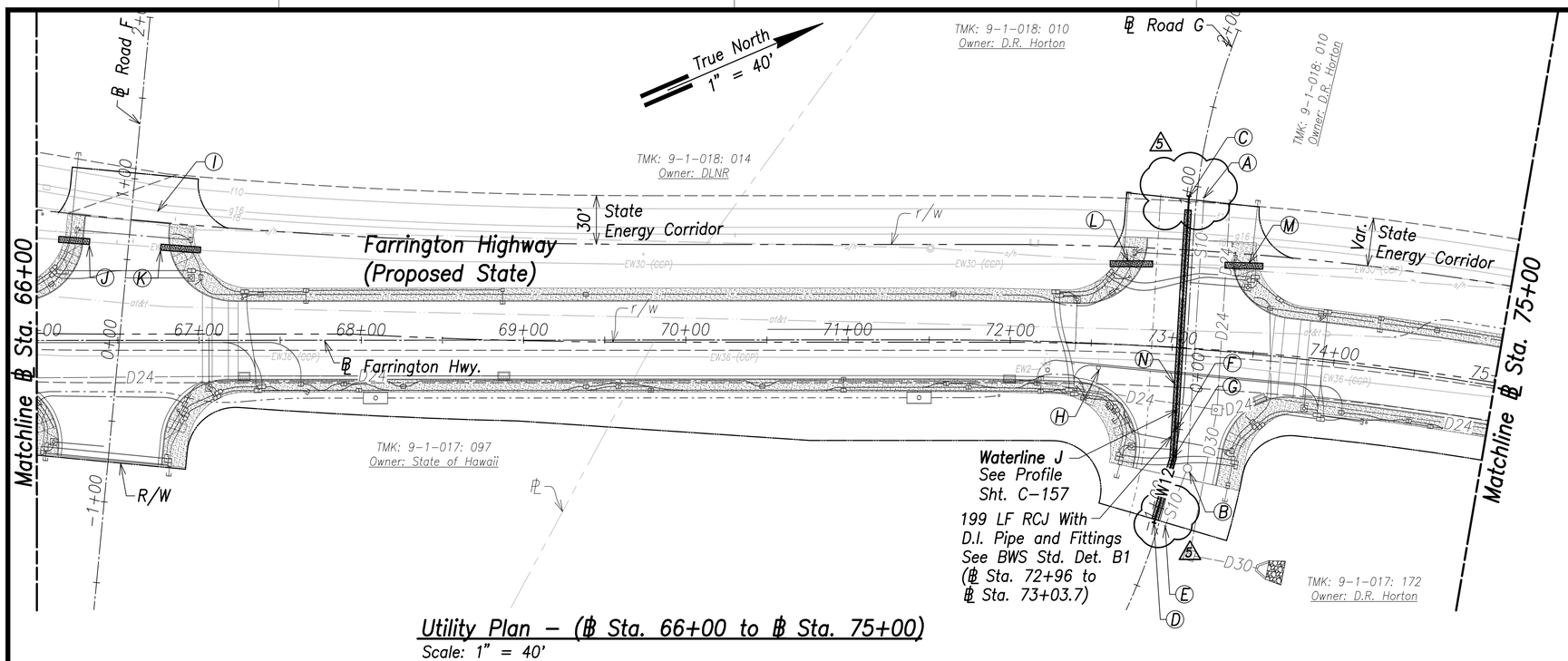
FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

Scale: As Shown Date: April 2022

SHEET No. C-123 OF 767 SHEETS

ADD. 124

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-123 Utility Plan – Sta. 61+00 to 66+00.dwg saved June 30, 2022



Utility Plan – (℄ Sta. 66+00 to ℄ Sta. 75+00)

Scale: 1" = 40'

Ⓐ

℄ Sta. 73+12.5, o/s 93.8' Lt.
Cap and Mark S10
Inv.=153.62

Ⓑ

SMH 1
℄ Sta. 73+14.9
o/s 73.7' Rt.
Top=166.93
Inv.=152.28
See City and County of Honolulu Std. Det. S-11

Ⓒ

℄ Sta. 73+03.7, o/s 93.8' Lt.
= ℄ Sta. 0+00 WL J
End W12
1-12" G.V., 200#
1-12" Cap Tapped for 4" I.P.T.
1-4" C.O.
1-G.V. Box & Cover
1-Conc. Block
See BWS Std. Det. B16, V2, V14, and V22
5

Ⓓ

℄ Sta. 72+96, o/s 108.6' Rt.
= ℄ Sta. 2+03.2 WL J
End W12
1-12" G.V., 200#
1-12" Cap Tapped for 4" I.P.T.
1-4" C.O.
1-G.V. Box & Cover
1-Conc. Block
See BWS Std. Det. B16, V2, V14, and V22
5

Ⓔ

℄ Sta. 73+03.4
o/s 110' Rt.
Cap and Mark S10
Inv.=151.78
See Profile, Sht. C-167

Ⓕ

℄ Sta. 73+05.2, o/s 51.2' Rt.
1-3/4 ARV, 200#
(WP=121.0 PSI)
1-ARV Box & Cover

Ⓖ

℄ Sta. 73+05.3, o/s 67.9' Rt.
1-12" 1/32 Bend (H)

Ⓗ

Adjust MH frame and cover to match finished grade (typ.)

Ⓘ

Assist HECO with the relocation of Test Station TS-10W. The Contractor shall coordinate all work with HECO and grade down to expose the 8" fuel pipeline and zinc ribbon. HECO will install new Test Station and conductors to pipeline and zinc ribbon. The contractor shall backfill to finished grade. All work shall be considered incidental to the various items of work.

Ⓙ

19 LF RCJ on Exist. Waterline
See BWS Std. Det. B1
(℄ Sta. 66+13.6 to ℄ Sta. 66+32.6)
See BWS RCJ Notes, Sht. C-15

Ⓚ

25 LF RCJ on Exist. Waterline
See BWS Std. Det. B1
(℄ Sta. 66+76.5 to ℄ Sta. 67+01)
See BWS RCJ Notes, Sht. C-15

Ⓛ

26 LF RCJ on Exist. Waterline
See BWS Std. Det. B1
(℄ Sta. 72+59.3 to ℄ Sta. 72+84.8)
See BWS RCJ Notes, Sht. C-15

Ⓜ

23 LF RCJ on Exist. Waterline
See BWS Std. Det. B1
(℄ Sta. 73+28.2 to ℄ Sta. 73+50.9)
See BWS RCJ Notes, Sht. C-15

Ⓝ

See Note 3, this sheet

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	125	767

Notes:

1. Location of existing utilities are from "as-built" drawings. The Contractor shall verify tie-in connection points prior to the ordering of materials and the start of construction.
2. The Contractor shall coordinate construction with utility companies.
3. All waterlines shall be ductile iron pipe, class 53 with ductile iron fittings and shall be in accordance with the STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, dated 2005, as amended, of the Hawaii Highways Division, Department of Transportation, and the City and County of Honolulu Board of Water Supply's "WATER SYSTEM STANDARDS", DATED 2002, THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 2021, and all subsequent amendment and additions.
4. For electrical relocations, see electrical drawings.
5. For the portions of the water main to be concrete jacketed, a bell is to be installed in case there is a break on the line. This allows the removal of the compromised portion of the line without affecting the reinforced concrete jacketed segment of the existing water line. The installation of the bell shall be incidental to the various pay items under Section 624.

Graphic Scale:
1" = 40' 40' 20' 0 40' 80'
Scale in Feet

DATE	REVISION
07/15/22	5 Revised callouts; Revised RCJ
06/08/22	2 Revised W.L. naming; added callout; Deleted note; Revised callout

APPROVED:

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

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Utility Plan
℄ Sta. 66+00 to ℄ Sta. 75+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown — Date: April 2022

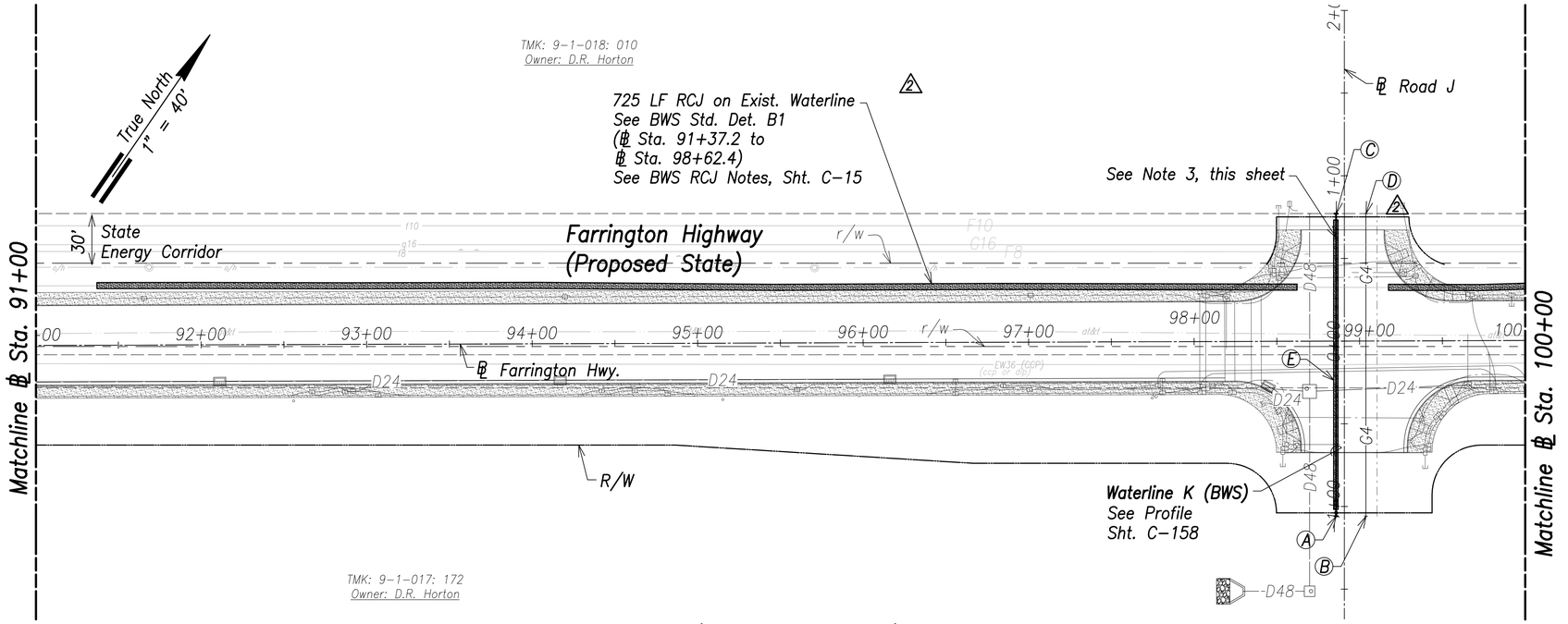
SHEET No. C-124 OF 767 SHEETS

ADD. 125

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

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-124 Utility Plan – Sta. 66+00 to 75+00.dwg saved July 5, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	128	767



Utility Plan – (℄ Sta. 91+00 to ℄ Sta. 100+00)

Scale: 1" = 40'

Notes:

1. Location of existing utilities are from "as-built" drawings. The Contractor shall verify tie-in connection points prior to the ordering of materials and the start of construction.
2. The Contractor shall coordinate construction with utility companies.
3. All waterlines shall be ductile iron pipe, class 53 with ductile iron fittings and shall be in accordance with the STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, dated 2005, as amended, of the Hawaii Highways Division, Department of Transportation, and the City and County of Honolulu Board of Water Supply's "WATER SYSTEM STANDARDS", DATED 2002, THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 2021, and all subsequent amendment and additions.
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Ⓐ

℄ Sta. 98+85.4, o/s 105.9' Rt.
= ℄ Sta. 1+83 WL K
End W12
1-12" G.V., 200#
1-3/4" ARV, 200#
1-12" Cap Tapped for 4" I.P.T.
1-4" C.O.
1-G.V. Box & Cover
1-ARV Box & Cover
1-Conc. Block
1-Conc. Thrust Beam w/ Reverse Bell Pipe
See BWS Std. Det. B16, V2, V14, and V22

Ⓑ

℄ Sta. 99+03.4, o/s 105.9 Rt.
Cap and Mark G2
Provide 3' Min. Cover
See Profile, Sht. C-166

Ⓒ

℄ Sta. 98+86, o/s 77.1' Lt.
= ℄ 0+00 WL K
End W12
1-12" Cap Tapped for 4" I.P.T.
1-4" C.O.
1-Valve Box
1-Conc. Block
See BWS Std. Det. V2 and V22

Ⓓ

℄ Sta. 99+04, o/s 77.1' Lt.
Cap and Mark G2
Provide 3' Min. Cover

Ⓔ

175 LF RCJ With D.I. Pipe and Fittings
See BWS Std. Det. B1
(℄ Sta. 98+85.4 to ℄ Sta. 98+86)

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

APPROVED:

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

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 Revised callout
06/08/22	2 Revised callouts; removed gate valve; Deleted note

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Utility Plan
℄ Sta. 91+00 to ℄ Sta. 100+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

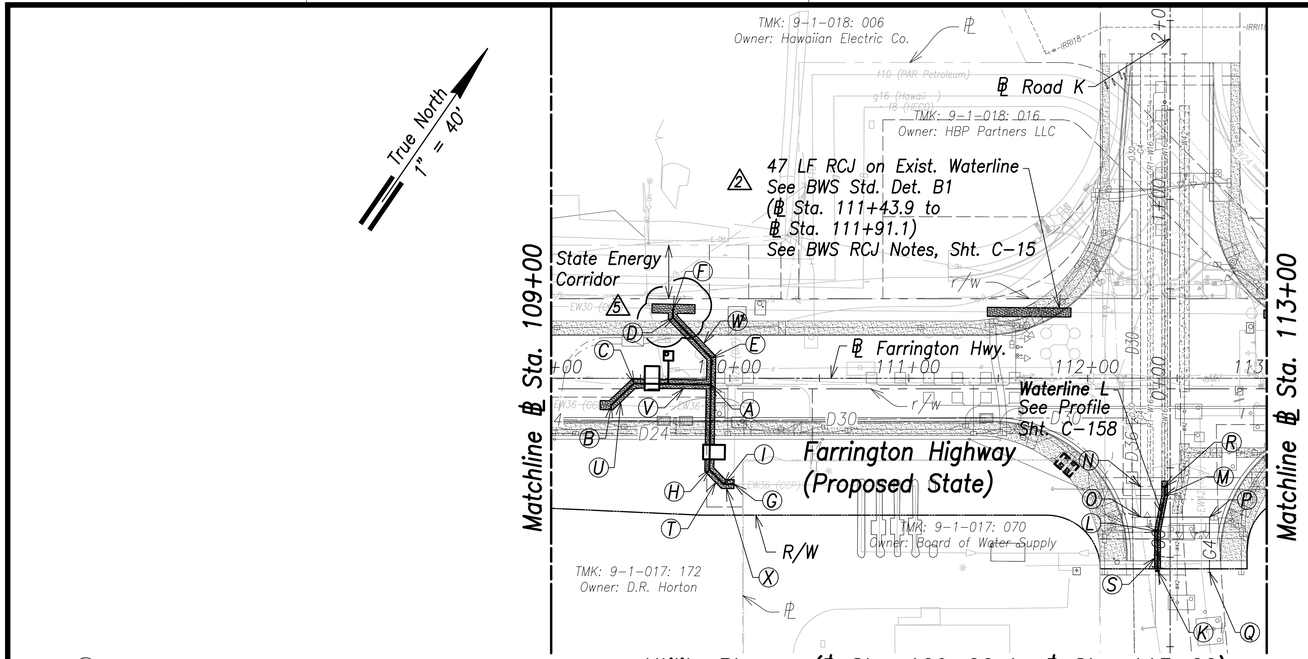
Scale: As Shown Date: April 2022

SHEET No. C-127 OF 767 SHEETS

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

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-127 Utility Plan - Sta. 91+00 to 100+00.dwg saved July 11, 2022

ADD. 128



Utility Plan – (℄ Sta. 109+00 to ℄ Sta. 113+00)

Scale: 1" = 40'

Ⓐ

℄ Sta. 109+89.1, o/s 3.4' Rt.
1–36"x36" Tee
1–36"x24" Reducer
2–36" B.G.V., 200#
2–Type "A" MH
See BWS Std. Det. MH1–MH5

Ⓑ

℄ Sta. 109+33.6, o/s 15.1' Rt.
Conn. to e/w36
Contractor to verify location and invert
Contractor to verify pipe size prior to the start of construction
Materials for Connection:
1–36" CCPxD.I. Adapter
1–36" Sleeve 5
1–36" 1/8 Bend (H)
8± LF 36" D.I.P, Cl. 53
Temp. for Testing:
1–36" Cap Tapped for 6" I.P.T.
1–6" C.O.
1–Conc. Block
See Sht. C–170 For Temporary By–Pass Plan and Profile – 6

Ⓒ

℄ Sta. 109+46.4, o/s 2.9' Rt.
1–36" 1/8 Bend (H)

Ⓓ

℄ Sta. 109+68.2, o/s 33.9' Lt.
1–24" 1/8 Bend (H)

Ⓔ

℄ Sta. 109+89.6, o/s 11.4' Lt.
1–24" 1/8 Bend (H)

Ⓕ

℄ Sta. 109+68.3, o/s 38.9' Lt.
=℄ Sta. 0+00 WL Q
Conn. to e/w30
Contractor to verify location and invert
Materials for Connection:
1–30"x24" Tee
2–30" CCPxD.I. Adapter
1–24" Sleeve, 15" Long
8± LF 24" D.I.P, Cl. 53
8± LF 30" D.I.P, Cl. 53
Temp. for Testing:
1–24" Cap Tapped for 6" I.P.T.
1–6" C.O.
1–Conc. Block
See Sht. C–171 For Temporary By–Pass Plan and Profile – 7

Ⓖ

℄ Sta. 110+02.3, o/s 59.2' Rt.
=℄ Sta. 1+15.7 WL Q
Conn. to e/w36
Remove exist. 1/4 bend
Contractor to verify location and invert
Materials for Connection:
1–36" CCPxD.I. Adapter
1–36" Sleeve, 15" Long
8± LF 36" D.I.P, Cl. 53
Temp. for Testing:
1–36" Cap Tapped for 6" I.P.T.
1–6" C.O.
1–Conc. Block
See Sht. C–171 For Temporary By–Pass Plan and Profile – 8

Ⓗ

℄ Sta. 109+88.5, o/s 51' Rt.
1–36" 1/8 Bend (H)

Ⓘ

℄ Sta. 109+96+.4, o/s 59.1' Rt.
1–36" 1/8 Bend (H)

Ⓙ

℄ Sta. 109+65.7, o/s 12.6' Lt.
Center MH
2–2" Offset ARV, 200#
1–Type "D" MH
See BWS Std. Det. V5 and MH20–MH21

Ⓚ

℄ Sta. 112+39, o/s 107.7' Rt.
=℄ Sta. 0+48.4 WL L
End W16
1–16" Cap Tapped for 4" I.P.T.
1–4" C.O.
1–Valve Box for C.O.
1–Conc. Block
See BWS Std. Det. V2 and V22

Ⓛ

℄ Sta. 112+39, o/s 85.6' Rt.
1–16" 1/32 Bend (W16), H

Ⓜ

℄ Sta. 112+43, o/s 65.6' Rt.
1–16" 1/32 Bend (W16), H

Ⓝ

℄ Sta. 112+29.5, o/s 60.5' Rt.
Conn. to e/g4
Match exist. slope and invert
Remove exist. cap and marker
Provide 3' Min. Cover
See Profile, Sht. C–166

Ⓞ

℄ Sta. 112+29.6, o/s 77.6' Rt.
1–4" Gas 1/4 Bend

Ⓟ

℄ Sta. 112+68, o/s 77.6' Rt.
1–4" Gas 1/4 Bend

Ⓠ

℄ Sta. 112+68, o/s 108.5' Rt.
Cap and Mark G4
Provide 3' Min. Cover

Ⓡ

℄ Sta. 112+43, o/s 60.5' Rt.
=℄ Sta. 0+00 WL L
Conn. to e/w16
Remove exist. cap, cleanout, and conc. block
Match exist. slope and invert
Materials for Connection:
1–16" Sleeve, 15" Long
8± LF 16" D.I.P., Cl. 53
Temp. for Testing:
1–16" Cap Tapped for 4" I.P.T.
1–4" C.O.
1–Conc. Block
Contractor to verify location and invert

Ⓢ

50 LF RCJ With D.I. Pipe and Fittings
See Struct. Dwgs.
(℄ Sta. 112+39 to ℄ Sta. 112+43)

Ⓣ

Waterline Q
See Sht. C–160

Ⓤ

30 LF RCJ With D.I. Pipe and Fittings
See Struct. Dwgs.
(℄ Sta. 109+27.6 to ℄ Sta. 109+52.4)

Ⓥ

28 LF RCJ With D.I. Pipe and Fittings
See Struct. Dwgs.
(℄ Sta. 109+60.6 to ℄ Sta. 109+89.1)

Ⓦ

83 LF RCJ With D.I. Pipe and Fittings
See Struct. Dwgs.
(℄ Sta. 109+73.3 to ℄ Sta. 109+88.8)

Ⓧ

23 LF RCJ With D.I. Pipe and Fittings
See Struct. Dwgs.
(℄ Sta. 109+88.6 to ℄ Sta. 110+02.3)

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	130	767

Notes:

1. Location of existing utilities are from "as–built" drawings. The Contractor shall verify tie–in connection points prior to the ordering of materials and the start of construction.
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4. For electrical relocations, see electrical drawings.
5. For the portions of the water main to be concrete jacketed, a bell is to be installed in case there is a break on the line. This allows the removal of the compromised portion of the line without affecting the reinforced concrete jacketed segment of the existing water line. The installation of the bell shall be incidental to the various pay items under Section 624.

Graphic Scale:
1" = 40' 40' 20' 0 40' 80'
Scale in Feet

DATE	REVISION
07/15/22	5 Revised callouts; RCJ added; Revised Waterline Q
06/08/22	2 Removed thrust beam; Added callouts; Revised callouts; Deleted note

APPROVED:

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

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Utility Plan
℄ Sta. 109+00 to ℄ Sta. 113+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

Scale: As Shown Date: April 2022

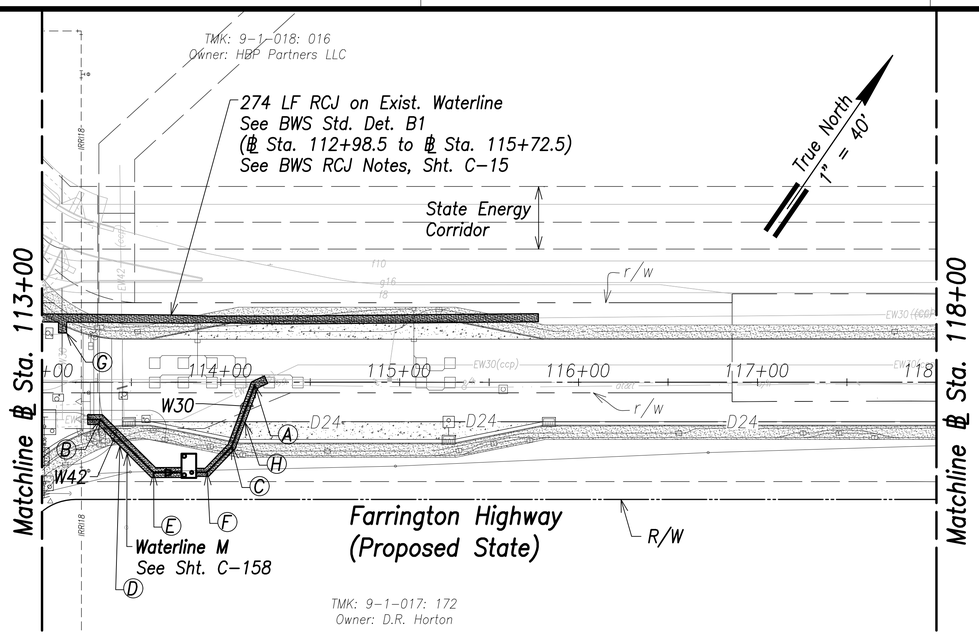
SHEET No. C-129 OF 767 SHEETS

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

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-129 Utility Plan – Sta. 109+00 to 113+00.dwg saved July 19, 2022

ADD. 130

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	131	767



Utility Plan – (℄ Sta. 113+00 to ℄ Sta. 118+00)

Scale: 1" = 40'

Ⓐ

℄ Sta. 114+19, o/s 1.6' Rt.
=℄ Sta. 1+08.5 WL M
Conn. to e/w30
Contractor to verify location and invert
Materials for Connection:
1-30" CCPxD.I. Adapter
1-30" 1/8 Bend (H)
1-Concrete Block with Struct. Struts
Rotate bend to match exist. pipe slope
8± LF 30" D.I.P, Cl. 53
Temp for Testing:
1-30" Cap Tapped for 6" I.P.T.
1-6" C.O.
1-Conc. Block
See Sht. C-172 For Temporary By-Pass Plan and Profile – 10

Ⓑ

℄ Sta. 113+32.7, o/s 20.9' Rt.
=℄ Sta. 0+00 WL M
Conn. to e/w42
Contractor to verify location and invert
Materials for Connection:
1-42" CCPxD.I. Adapter
1-42" Sleeve, 24" Long
1-42" 1/8 Bend (H) 5
1-42"x30" Reducer
1-30" B.G.G.V., 200#
1-Type "A" MH
8± LF 42" D.I.P, Cl. 53
See BWS Std. Det. MH1-MH5
Temp for Testing:
1-42" Cap Tapped for 6" I.P.T.
1-6" C.O.
1-Conc. Block
See Sht. C-172 For Temporary By-Pass Plan and Profile – 9

Ⓒ

℄ Sta. 114+06.1, o/s 36' Rt.
=℄ Sta. 0+91.8 WL M
1-30" 1/16 Bend (H) 5

Ⓓ

65 LF RCJ With D.I. Pipe and Fittings
See Struct. Dwgs.
(℄ Sta. 113+25.7 to ℄ Sta. 113+72.1)

Ⓔ

℄ Sta. 113+62.4, o/s 50.5' Rt.
1-42" 1/8 Bend (H)

Ⓕ

℄ Sta. 113+92.3, o/s 50.4' Rt.
1-30" 1/8 Bend (H)

Ⓖ

9 LF RCJ on Exist. Waterline
See BWS Std. Det. B1
(℄ Sta. 113+11.6 to ℄ Sta. 113+11.7)
See BWS RCJ Notes, Sht. C-15

Ⓗ

63 LF RCJ With D.I. Pipe and Fittings
See BWS Std. Det. B1
(℄ Sta. 113+80.3 to ℄ Sta. 114+15.3)

Graphic Scale:
1" = 40' 40' 20' 0 40' 80'
Scale in Feet

APPROVED:

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

Notes:

1. Location of existing utilities are from "as-built" drawings. The Contractor shall verify tie-in connection points prior to the ordering of materials and the start of construction.
2. The Contractor shall coordinate construction with utility companies.
3. All waterlines shall be ductile iron pipe, class 53 with ductile iron fittings and shall be in accordance with the STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, dated 2005, as amended, of the Hawaii Highways Division, Department of Transportation, and the City and County of Honolulu Board of Water Supply's "WATER SYSTEM STANDARDS", DATED 2002, THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 2021, and all subsequent amendment and additions.
4. For electrical relocations, see electrical drawings.
5. For the portions of the water main to be concrete jacketed, a bell is to be installed in case there is a break on the line. This allows the removal of the compromised portion of the line without affecting the reinforced concrete jacketed segment of the existing water line. The installation of the bell shall be incidental to the various pay items under Section 624.

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

DATE	REVISION
07/15/22	5 Revised callouts
06/08/22	2 Deleted note; Revised callouts; Revised waterline

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Utility Plan

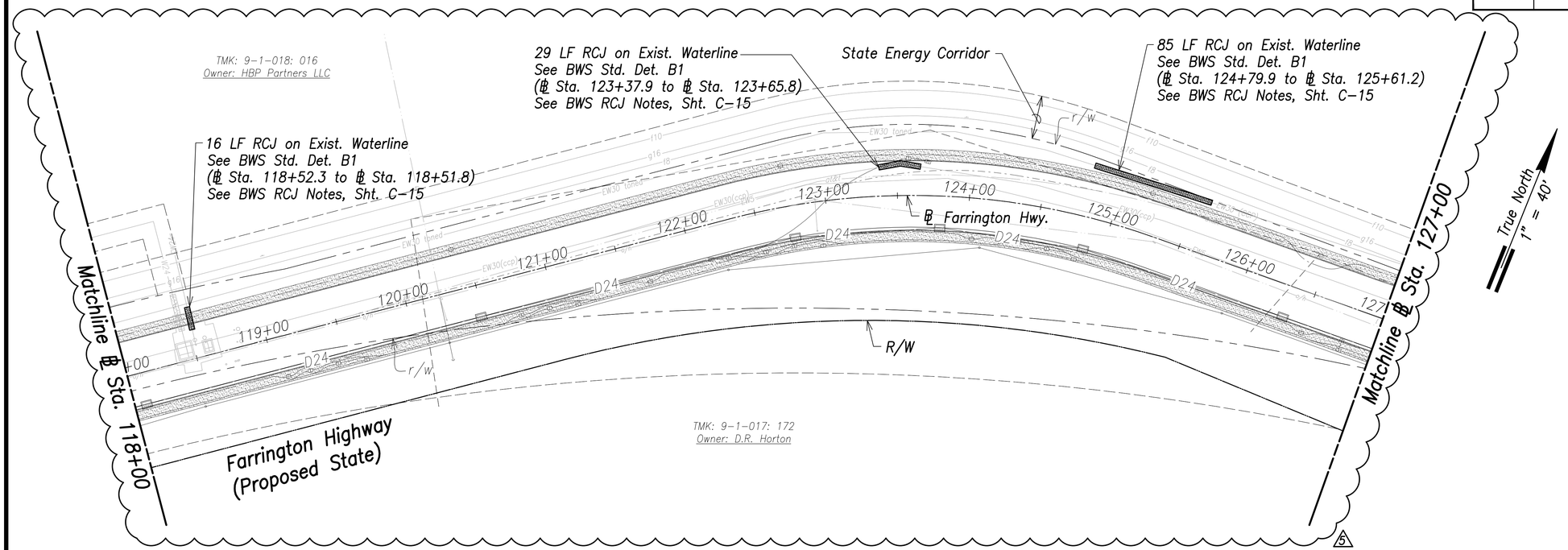
℄ Sta. 113+00 to ℄ Sta. 118+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

ADD. 131

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	132	767



Utility Plan – (℄ Sta. 118+00 to ℄ Sta. 127+00)

Scale: 1" = 40'

Notes:

1. Location of existing utilities are from "as-built" drawings. The Contractor shall verify tie-in connection points prior to the ordering of materials and the start of construction.
2. The Contractor shall coordinate construction with utility companies.
3. All waterlines shall be ductile iron pipe, class 53 with ductile iron fittings and shall be in accordance with the STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, dated 2005, as amended, of the Hawaii Highways Division, Department of Transportation, and the City and County of Honolulu Board of Water Supply's "WATER SYSTEM STANDARDS", DATED 2002, THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 2021, and all subsequent amendment and additions.
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Graphic Scale:
1" = 40' 40' 20' 0 40' 80'
Scale in Feet

DATE	REVISION
07/15/22	5 Added electrical
06/08/22	2 Deleted note; Revised callout

APPROVED:

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

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Utility Plan
℄ Sta. 118+00 to ℄ Sta. 127+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

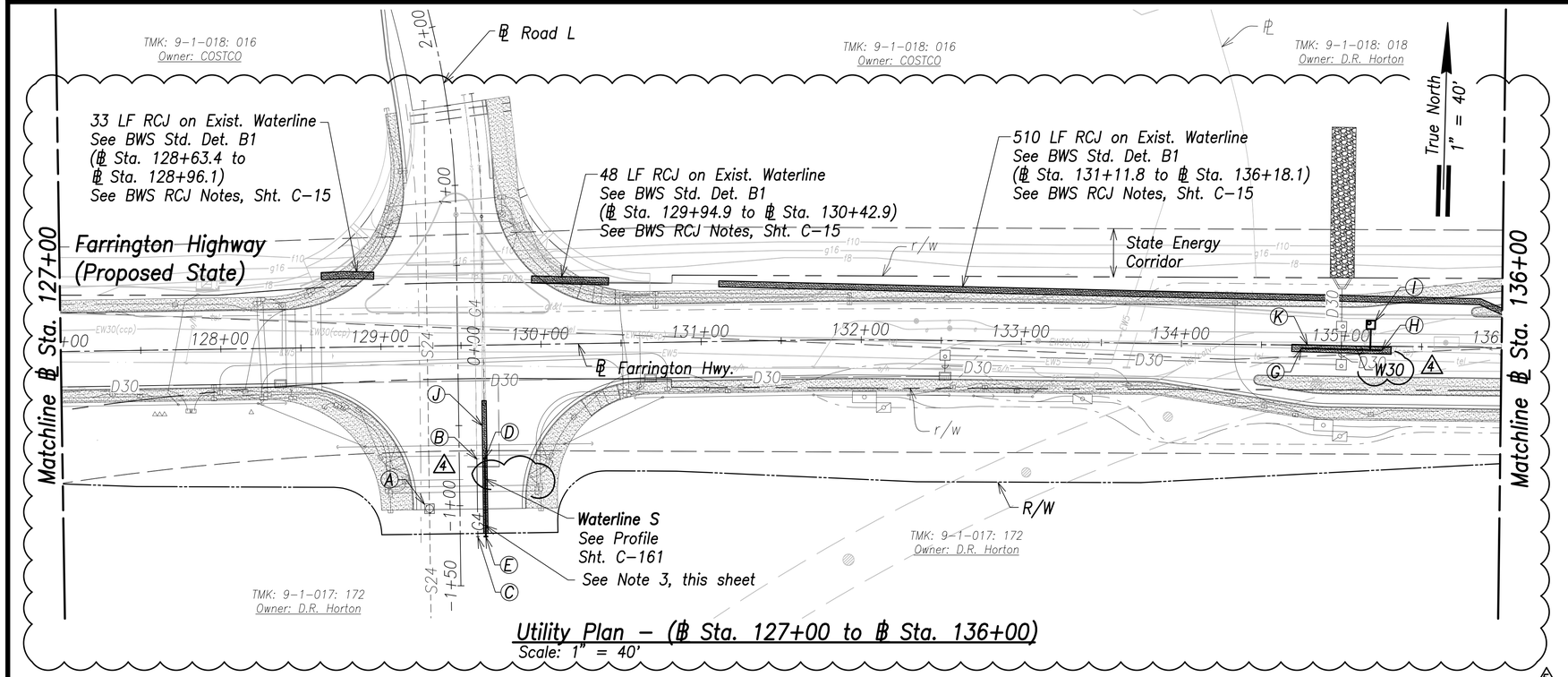
SHEET No. C-131 OF 767 SHEETS

ADD. 132

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

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-131 Utility Plan – Sta. 118+00 to 127+00.dwg saved June 30, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	133	767



Utility Plan – (℄ Sta. 127+00 to ℄ Sta. 136+00)

Scale: 1" = 40'

Ⓐ

℄ Sta. 129+28.8, o/s 101.6' Rt.
Remove exist. conc. collar
Adjust top to match roadway
finished grade

Ⓑ

℄ Sta. 129+58.8, o/s 70.8' Rt.
Conn. to e/g4
Match exist. slope and invert
Remove exist. cap and marker
Provide 3' Min. Cover

Ⓒ

℄ Sta. 129+58.7, o/s 119.5' Rt.
Cap and Mark G4
Provide 3' Min. Cover
See Profile, Sht. C-166

Ⓓ

℄ Sta. 129+63.8, o/s 70.8' Rt.
= ℄ Sta. 0+00 WL S
Conn. to e/w12
Remove exist. cap, cleanout, and conc. block
Match exist. slope and invert
Materials for Connection:
1-12" Sleeve, 12" Long
8± LF 12" D.I.P., Cl. 53
Temp. for Testing:
1-12" Cap Tapped for 4" I.P.T.
1-4" C.O.
1-Conc. Block
Contractor to verify location and invert

Ⓔ

℄ Sta. 129+63.7, o/s 119.5' Rt.
= ℄ Sta. 0+48.7 WL G
End W12
1-12" Cap Tapped for 4" I.P.T.
1-4" C.O.
1-Valve Box for C.O.
See BWS Std. Det. V2, and V22

Ⓖ 5

℄ Sta. 134+75, o/s 1.9' Rt.
Conn. to e/w30
Contractor to verify location and invert
Materials for Connection:
1-CCPxD.I. Adapter
1-30" Sleeve, 15" Long
8± LF 30" D.I.P., Cl. 53
Temp. for Testing:
1-30" Cap Tapped for 6" I.P.T.
1-6" C.O.
1-Conc. Block
See Sht. C-175 For Temporary
By-Pass Plan and Profile – 15

Ⓗ 5

℄ Sta. 135+24.9, o/s 2.5' Rt.
Conn. to e/w30
Contractor to verify location and invert
Materials for Connection:
1-CCPxD.I. Adapter
1-30" Sleeve, 15" Long
8± LF 30" D.I.P., Cl. 53
Temp. for Testing:
1-30" Cap Tapped for 6" I.P.T.
1-6" C.O.
1-Conc. Block
See Sht. C-175 For Temporary
By-Pass Plan and Profile – 15

Ⓘ

℄ Sta. 135+18.2, o/s 13.3' Lt.
Center MH
2-2" Offset ARV, 200#
1-Type "D" MH
See BWS Std. Det. V5 and MH20-MH21

Ⓙ

83 LF RCJ With D.I. Pipe and Fittings
See BWS Std. Det. B1
(℄ Sta. 129+63.7 to ℄ Sta. 129+63.9)

Ⓚ

62 LF RCJ With D.I. Pipe and Fittings
See Struct. Dwgs.
(℄ Sta. 134+69 to ℄ Sta. 135+30.9)

Notes:

1. Location of existing utilities are from "as-built" drawings. The Contractor shall verify tie-in connection points prior to the ordering of materials and the start of construction.
2. The Contractor shall coordinate construction with utility companies.
3. All waterlines shall be ductile iron pipe, class 53 with ductile iron fittings and shall be in accordance with the STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, dated 2005, as amended, of the Hawaii Highways Division, Department of Transportation, and the City and County of Honolulu Board of Water Supply's "WATER SYSTEM STANDARDS", DATED 2002, THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 2021, and all subsequent amendment and additions.
4. For electrical relocations, see electrical drawings.
5. For the portions of the water main to be concrete jacketed, a bell is to be installed in case there is a break on the line. This allows the removal of the compromised portion of the line without affecting the reinforced concrete jacketed segment of the existing water line. The installation of the bell shall be incidental to the various pay items under Section 624.

Graphic Scale:
1" = 40' 40' 20' 0 40' 80'
Scale in Feet

DATE	REVISION
07/15/22	5 Removed GV from Waterline S; Revised waterline size; Added electrical
06/08/22	2 Revised waterline; Revised callouts; Deleted note

APPROVED:

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

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Utility Plan
℄ Sta. 127+00 to ℄ Sta. 136+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

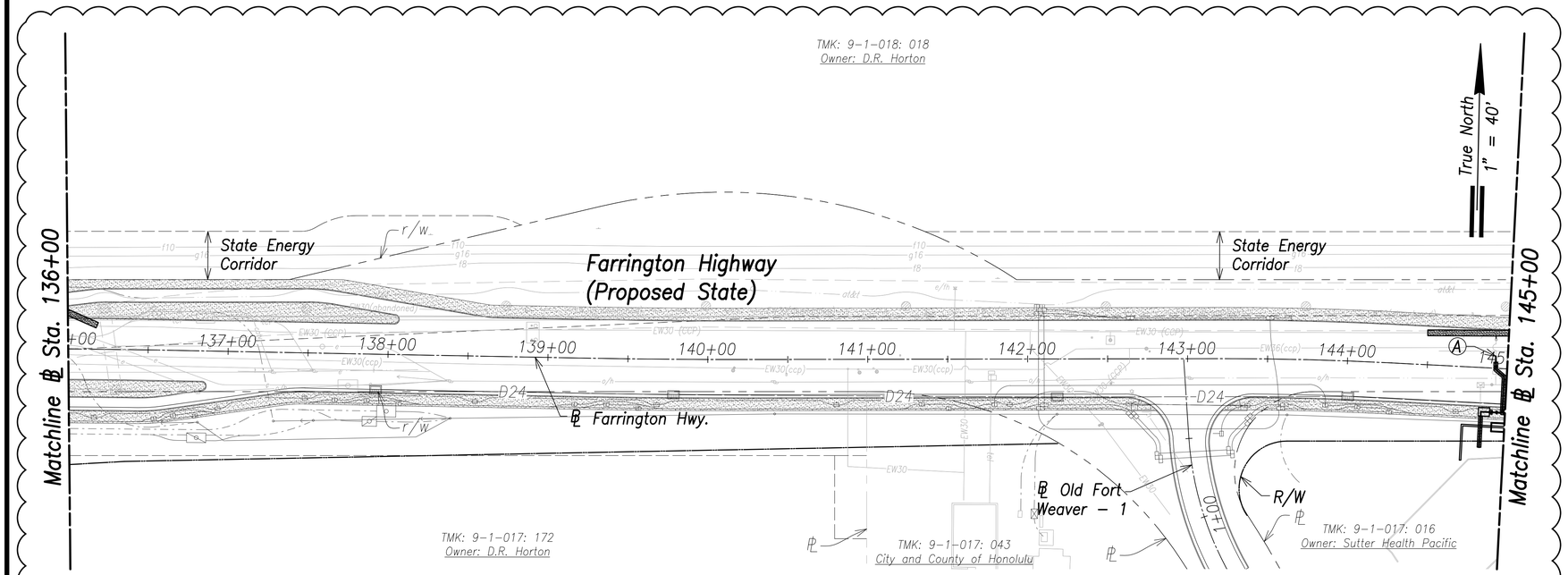
Scale: As Shown — Date: April 2022

SHEET No. C-132 OF 767 SHEETS

ADD. 133

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	134	767



Utility Plan – (℄ Sta. 136+00 to ℄ Sta. 145+00)

Scale: 1" = 40'

5

Ⓐ

℄ Sta. 144+92.6, o/s 7.5' Lt.
=℄ Sta. 0+00 DC Meter
Construct 12" Water Lateral Connection
Relocate exist. water meters and provide replacement water meter boxes.
Contractor shall connect to the existing water lateral and provide continuous water service to affected users.
See BWS Det. L16 and L22
Premise I/D: 7675805060
Meter No.: 11099411 (3" Compound)
Meter No.: 81189630 (8" Detector Check)
See Plan & Profile Sht. C-136

Materials for Connection:
1-12" Sleeve, 15" Long
1-12"x8" Reducer
1-Conc. Block w/ Struct. Struts

Temp. for Testing:
1-12" Cap Tapped for 4" I.P.T.
1-4" C.O.
1-Conc. Block

5

Graphic Scale:
1" = 40' 40' 20' 0 40' 80'
Scale in Feet

APPROVED:

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

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

Notes:

1. Location of existing utilities are from "as-built" drawings. The Contractor shall verify tie-in connection points prior to the ordering of materials and the start of construction.
2. The Contractor shall coordinate construction with utility companies.
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DATE	REVISION
07/15/22	5 Added electrical; Revised connection
06/08/22	2 Deleted note

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Utility Plan
℄ Sta. 136+00 to ℄ Sta. 145+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

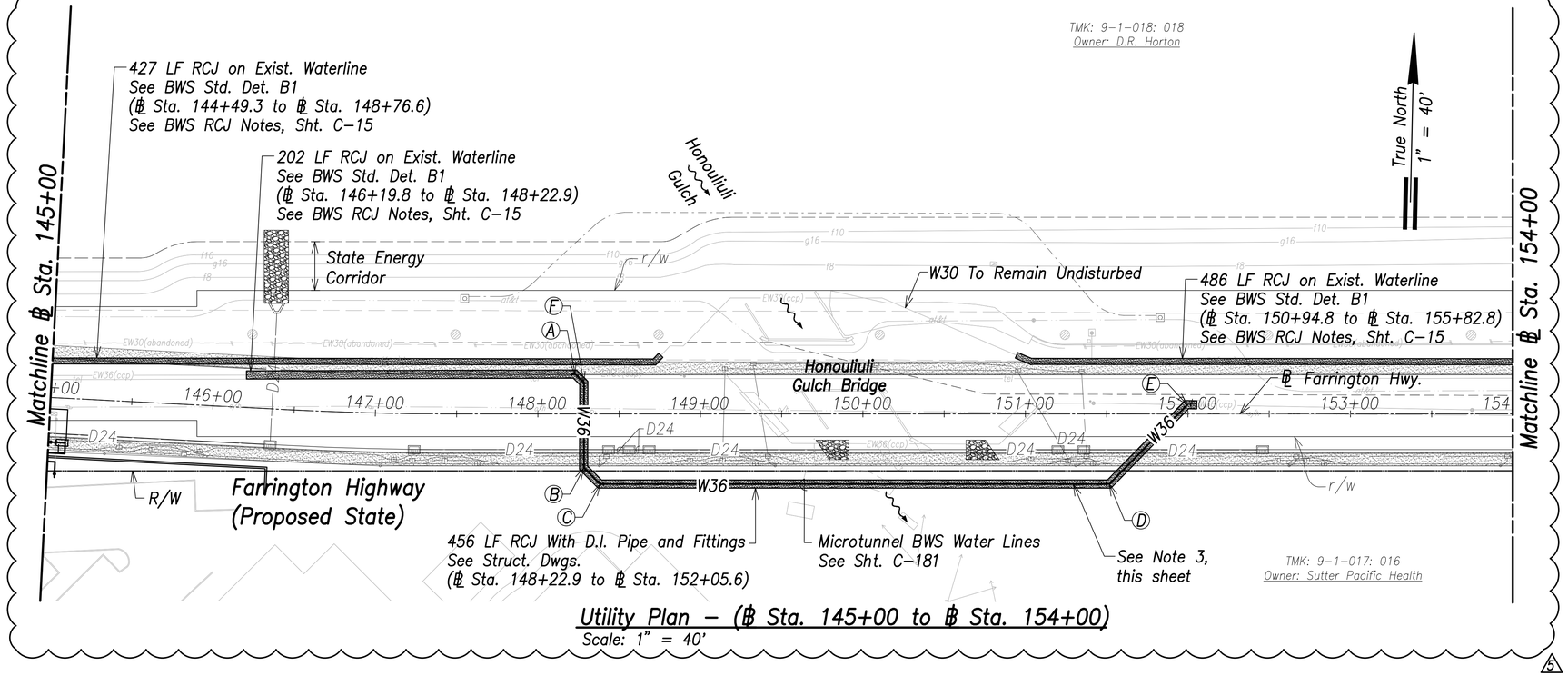
SHEET No. C-133 OF 767 SHEETS

ADD. 134

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

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-133 Utility Plan – Sta. 136+00 to 145+00.dwg saved July 19, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	135	767



Utility Plan – (℄ Sta. 145+00 to ℄ Sta. 154+00)

Scale: 1" = 40'

Ⓐ

℄ Sta. 148+22.9, o/s 24.5' Lt.
= ℄ Sta. 0+00 36" Microtunnel WL
Open Trench
Conn. to e/w36
Contractor to verify location and invert
Materials for Connection:
1–36" 1/8 Bend (H)
1–36" CCPxDI Adapter
1–36" Sleeve, 15" Long
8± LF 36" D.I.P., Cl. 53
Temp. for Testing:
1–36" Cap Tapped for 6" I.P.T.
1–6" C.O.
1–Conc. Block
See Sht. C-173 For Temporary By-Pass Plan and Profile – 11

Ⓑ

℄ Sta. 148+28.3, o/s 33.2' Rt.
Open Trench
1–36" 1/8 Bend (H)

Ⓒ

℄ Sta. 148+38.3, o/s 43.2' Rt.
Open Trench
1–36" 1/8 Bend (H)

Ⓓ

℄ Sta. 151+51.7, o/s 43.2' Rt.
Open Trench
1–36" 1/8 Bend (H)

Ⓔ 5

℄ Sta. 152+05.6, o/s 5.7' Lt.
=℄ Sta. 4+55.9 36" Microtunnel WL
Open Trench
Conn. to e/w36
Contractor to verify location and invert
Materials for Connection:
1–36" 1/8 Bend (H)
1–36" CCPxDI Adapter
1–36" Sleeve, 15" Long
8± LF 36" D.I.P., Cl. 53
Temp. for Testing:
1–36" Cap Tapped for 6" I.P.T.
1–6" C.O.
1–Conc. Block
See Sht. C-173 For Temporary By-Pass Plan and Profile – 12

Ⓕ

℄ Sta. 148+28.4, o/s 19' Lt.
Open Trench
1–36" 1/8 Bend (H)

Graphic Scale:
1" = 40' 40' 20' 0 40' 80'
Scale in Feet

APPROVED:

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

Notes:

1. Location of existing utilities are from "as-built" drawings. The Contractor shall verify tie-in connection points prior to the ordering of materials and the start of construction.
2. The Contractor shall coordinate construction with utility companies.
3. All waterlines shall be ductile iron pipe, class 53 with ductile iron fittings and shall be in accordance with the STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, dated 2005, as amended, of the Hawaii Highways Division, Department of Transportation, and the City and County of Honolulu Board of Water Supply's "WATER SYSTEM STANDARDS", DATED 2002, THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 2021, and all subsequent amendment and additions.
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DATE	REVISION
07/15/22	5 Added electrical; Revised Station
06/08/22	2 Deleted note; Revised callouts

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Utility Plan

℄ Sta. 145+00 to ℄ Sta. 154+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

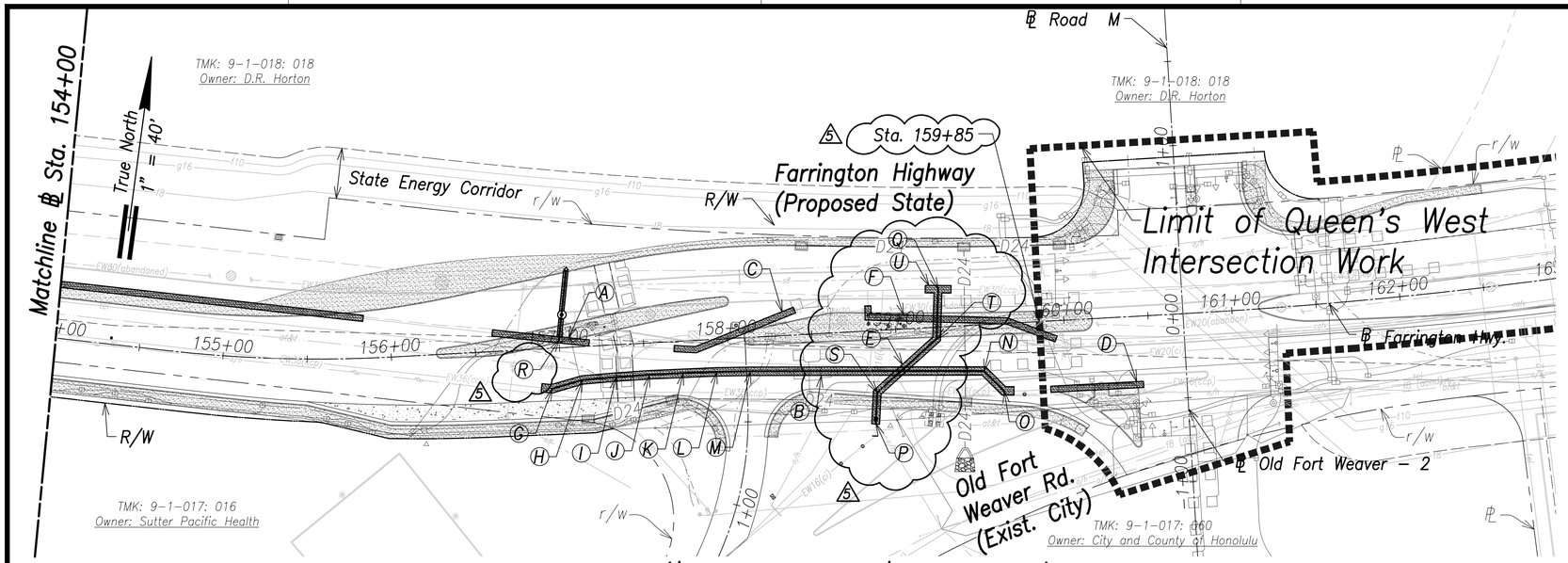
SHEET No. C-134 OF 767 SHEETS

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

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-134 Utility Plan – Sta. 145+00 to 154+00.dwg saved July 19, 2022

ADD. 135

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	136	767



Utility Plan – (℄ Sta. 154+00 to ℄ Sta. 165+00)

Scale: 1" = 40'

Ⓐ

58 LF RCJ on Exist. Waterline
See BWS Std. Det. B1
(℄ Sta. 156+60 to ℄ Sta. 157+17.3)
See BWS RCJ Notes, Sht. C–15

Ⓑ

286 LF RCJ With D.I. Pipe and Fittings
See Struct. Dwgs.
(℄ Sta. 156+87.9 to ℄ Sta. 159+67.8)

Ⓒ

76 LF RCJ on Exist. Waterline
See BWS Std. Det. B1
(℄ Sta. 157+67.5 to ℄ Sta. 158+40.1)
See BWS RCJ Notes, Sht. C–15

Ⓓ

55 LF RCJ on Exist. Waterline
See BWS Std. Det. B1
(℄ Sta. 159+90.1 to ℄ Sta. 160+45.3)
See BWS RCJ Notes, Sht. C–15

Ⓔ

96 LF RCJ With D.I. Pipe and Fittings
See Struct. Dwgs.
(℄ Sta. 158+85.3 to ℄ Sta. 159+26.6)

Ⓕ

120 LF RCJ on Exist. Waterline
See BWS Std. Det. B1
(℄ Sta. 158+83.9 to ℄ Sta. 159+94.4)
See BWS RCJ Notes, Sht. C–15

Ⓖ

℄ Sta. 156+94.2, o/s 24.1' Rt.
Conn. to e/w36
Contractor to verify location and invert
Materials for Connection:
1–36" 1/8 Bend (H)
1–36" CCPxDI Adapter
1–36" Sleeve, 15" Long
8± LF 36" D.I.P., Cl. 53
Temp. for Testing:
1–36" Cap Tapped for 6" I.P.T.
1–6" C.O.
1–Conc. Block
See Sht. C–174 For Temporary By–Pass Plan and Profile – 13

Ⓗ

℄ Sta. 157+12, o/s 19.8' Rt.
1–36" 1/32 Bend (H)

Ⓘ

℄ Sta. 157+32, o/s 19.2' Rt.
Deflect 1°

Ⓙ

℄ Sta. 157+52, o/s 18.9' Rt.
Deflect 1°

Ⓚ

℄ Sta. 157+72, o/s 19' Rt.
Deflect 1°

Ⓛ

℄ Sta. 157+92, o/s 19.4' Rt.
Deflect 1°

Ⓜ

℄ Sta. 158+12, o/s 20.1' Rt.
Deflect 1°

Ⓝ

℄ Sta. 159+50.6, o/s 27.5' Rt.
1–36" 1/8 Bend (H)

Ⓞ

℄ Sta. 159+62.3, o/s 40.0' Rt.
Conn. to e/w36
Contractor to verify location and invert
Materials for Connection:
1–36" 1/16 Bend (H)
1–36" CCPxDI Adapter
1–36" Sleeve, 15" Long
8± LF 36" D.I.P., Cl. 53
Temp. for Testing:
1–36" Cap Tapped for 6" I.P.T.
1–6" C.O.
1–Conc. Block
See Sht. C–174 For Temporary By–Pass Plan and Profile – 14

Ⓟ

℄ Sta. 158+85.3, o/s 54.3' Rt.
=℄ Sta. 0+00 Waterline R
Conn. to e/w16
Contractor to verify location and invert
Materials for Connection:
1–16" Sleeve, 12" Long
1–3/4" ARV, 200#
1–ARV Box & Cover
1–30"x16" Reducer
8± LF 16" D.I.P., Cl. 53
Temp. for Testing:
1–16" Cap Tapped for 4" I.P.T.
1–4" C.O.
1–Conc. Block
See Sht. C–178 For Temporary By–Pass Plan and Profile – 21

Ⓠ

℄ Sta. 159+26.6, o/s 5.8' Rt.
=℄ Sta. 0+95.8 Waterline R
Conn. to e/w16
Contractor to verify location and invert
Materials for Connection:
1–16" Sleeve, 12" Long
8± LF 16" D.I.P., Cl. 53
Temp. for Testing:
1–16" Cap Tapped for 4" I.P.T.
1–4" C.O.
1–Conc. Block
See Sht. C–175 For Temporary By–Pass Plan and Profile – 22

Ⓡ

FH 4
℄ Sta. 157+00, o/s 4.7' Lt.
1–30"x6" Tapping Tee
1–6" Tapping Valve, 200#
1–Type "C" Manhole and Cover, See BWS Std. Det. MH19
1–6" Sleeve, 12" Long
1–Conc. Block w/ Struct. Struts
1–FH (Ht.=9')
1–FH Elbow
1–Conc. Block
42 LF 6" D.I.P., Cl. 53
42 LF RCJ
1–Blue Type F FH Marker
See Profile, Sht. C–162
See BWS Std. Det. FH4.
Temp. for Testing:
1–6" Cap Tapped for 2–1/2" I.P.T.
1–2–1/2" C.O.
1– Conc. Block

Ⓢ

℄ Sta. 158+87.2, o/s 36.8' Rt.
1–16" 1/8 Bend (H)

Ⓣ

℄ Sta. 159+29.4, o/s 6.9' Rt.
1–30" 1/8 Bend (H)

Ⓤ

16 LF RCJ on Exist. Waterline
See BWS Std. Det. B1
(℄ Sta. 159+19 to ℄ Sta. 159+34.3)
See BWS RCJ Notes, Sht. C–15

Ⓥ

Waterline R
See Profile
Sht. C–160

Notes:

1. Location of existing utilities are from "as–built" drawings. The Contractor shall verify tie–in connection points prior to the ordering of materials and the start of construction.
2. The Contractor shall coordinate construction with utility companies.
3. All waterlines shall be ductile iron pipe, class 53 with ductile iron fittings and shall be in accordance with the STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, dated 2005, as amended, of the Hawaii Highways Division, Department of Transportation, and the City and County of Honolulu Board of Water Supply's "WATER SYSTEM STANDARDS", DATED 2002, THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 2021, and all subsequent amendment and additions.
4. For electrical relocations, see electrical drawings.
5. For the portions of the water main to be concrete jacketed, a bell is to be installed in case there is a break on the line. This allows the removal of the compromised portion of the line without affecting the reinforced concrete jacketed segment of the existing water line. The installation of the bell shall be incidental to the various pay items under Section 624.

Graphic Scale:
1" = 40' 40' 20' 0 40' 80'
Scale in Feet

APPROVED:

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

DATE	REVISION
07/15/22	5 Revised callouts; Revised Water Line
06/08/22	2 Added Type "C" Manhole; Revised Callouts; Deleted Note

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

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Utility Plan

℄ Sta. 154+00 to ℄ Sta. 165+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

Scale: As Shown Date: April 2022

SHEET No. C-135 OF 767 SHEETS

ADD. 136

Ⓐ

℄ Sta. 144+92.6, o/s 7.5' Lt.
=℄ Sta. 0+00 DC Meter
Conn. to Exist. Water Lateral
For Callouts, See Sht. C-133

Ⓑ

℄ Sta. 144+98.4, o/s 27.5' Rt.
=℄ Sta. 0+37.7 DC Meter
=℄ Sta. 0+00 Compound Meter
1-12"x12" Tee, Fl.
1-12"x8" Reducer, Fl.
1-12"x4" Reducer, Fl.

Ⓒ

8" Detector Check Meter
Provide Meter Box and Install
Piping and Appurtenances Per
BWS Std. Det. M9, M19, M26,
M30, and M31.

Ⓓ

℄ Sta. 144+84.9, o/s 49.8' Rt.
=℄ Sta. 0+73.3 DC Meter
Conn. to Exist. W8
Contractor to Verify
Location and Invert

Ⓔ

11.8 LF RCJ With D.I. Pipe and Fittings
See Struct. Dwgs.
(℄ Sta. 144+84.9 to ℄ Sta. 144+84.9)

Ⓕ

3" Compound Meter
Provide Meter Box and Install
Piping and Appurtenances Per
BWS Std. Det. M9, M25-M31

Ⓖ

℄ Sta. 145+10.6, o/s 34.1' Rt.
=℄ Sta. 0+18.8 Compound Meter
1-4" 1/4 Bend (H)

Ⓗ

℄ Sta. 145+05, o/s 47.0' Rt.
=℄ Sta. 0+63.4 Compound Meter
1-4" G.V., 200#
1-Valve Box & Cover
1-Conc. Block

Ⓙ

℄ Sta. 144+91.9, o/s 34.1' Rt.
=℄ Sta. 0+37.5 Compound Meter
1-4" 1/4 Bend (H)

Ⓚ

℄ Sta. 144+91.9, o/s 39.5' Rt.
=℄ Sta. 0+42.9 Compound Meter
1-4" 1/4 Bend (H)

Ⓛ

℄ Sta. 145+04.9, o/s 39.5' Rt.
=℄ Sta. 0+55.8 Compound Meter
1-4" 1/4 Bend (H)

Ⓜ

℄ Sta. 145+05, o/s 49.0' Rt.
=℄ Sta. 0+65.4 Compound Meter
Conn. to Exist. W4
Contractor to Verify Location and Invert

Ⓝ

℄ Sta. 144+94.8, o/s 27.5' Rt.
=℄ Sta. 0+41.3 DC Meter
1-8" G.V., Fl., 200#
1-Valve Box & Cover

Ⓟ

℄ Sta. 145+01.7, o/s 27.5' Rt.
=℄ Sta. 0+03.4 Compound Meter
1-4" G.V., Fl., 200#
1-Valve Box & Cover

Ⓠ

34 LF RCJ With D.I. Pipe and Fittings
See Struct. Dwgs.
(℄ Sta. 144+92.7 to ℄ Sta. 144+98.4)

Ⓡ

14.7 LF RCJ With D.I. Pipe and Fittings
See Struct. Dwgs.
(℄ Sta. 144+90.4 to ℄ Sta. 145+05.1)

Ⓢ

2" Copper Bypass Line

Ⓣ

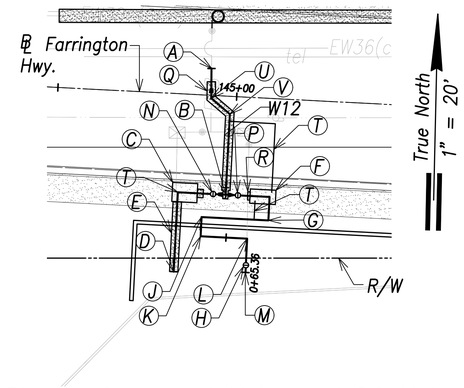
℄ Sta. 144+84.9, o/s 27.5' Rt.
=℄ Sta. 0+51.1 DC Meter
1-8" 1/4 Bend, Fl. (H)

Ⓤ

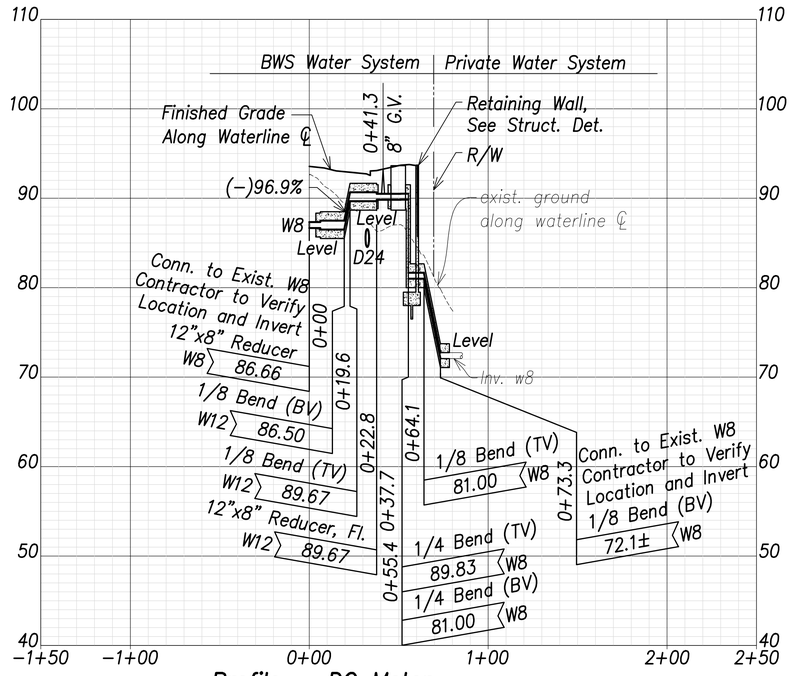
℄ Sta. 144+92.9, o/s 0.8' Rt.
=℄ Sta. 0+08.3 DC Meter
1-12" 1/8 Bend (H)

Ⓥ

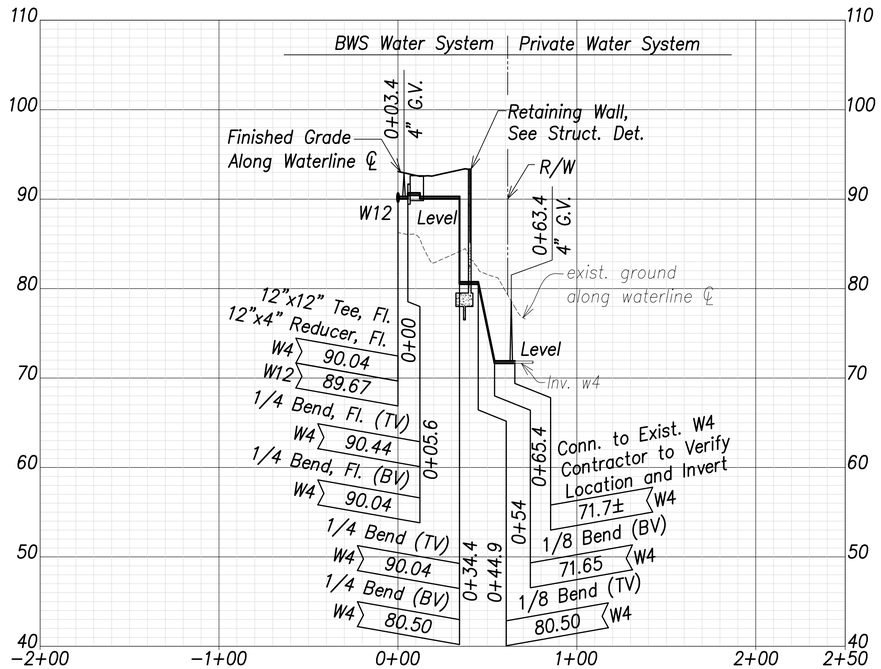
℄ Sta. 145+98.4, o/s 45.0' Rt.
=℄ Sta. 0+15.2 DC Meter
1-12" 1/8 Bend (H)



Plan – Compound Meter and DC Meter
Scale: 1" = 20'



Profile – DC Meter
Scales: Hor.: 1" = 40'
Vert.: 1" = 8'



Profile – Compound Meter
Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	137S-1	767

Notes:

1. Location of existing utilities are from "as-built" drawings. The Contractor shall verify tie-in connection points prior to the ordering of materials and the start of construction.
2. The Contractor shall coordinate construction with utility companies.
3. All waterlines shall be ductile iron pipe, class 53 with ductile iron fittings and shall be in accordance with the STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, dated 2005, as amended, of the Hawaii Highways Division, Department of Transportation, and the City and County of Honolulu Board of Water Supply's "WATER SYSTEM STANDARDS", DATED 2002, THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 2021, and all subsequent amendment and additions.
4. For electrical relocations, see electrical drawings.
5. For the portions of the water main to be concrete jacketed, a bell is to be installed in case there is a break on the line. This allows the removal of the compromised portion of the line without affecting the reinforced concrete jacketed segment of the existing water line. The installation of the bell shall be incidental to the various pay items under Section 624.
6. Reinforced concrete jackets on existing waterlines are based upon the as-built location of the pipe joints. The Contractor shall verify the pipe joint locations in the field and shall extend the reinforced concrete jackets as necessary to comply with BWS Std. Det. B1. Shortening of the reinforced concrete jacket is not allowed.
7. The Contractor shall connect to the existing water lateral and provide continuous water service to affected users.

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

APPROVED:

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

Graphic Scales:

1" = 8' 8' 4' 0 8' 16'
1" = 20' 20' 10' 0 20' 40'
1" = 40' 40' 20' 0 40' 80'
Scales in Feet

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

07/15/22	5 Replace Sheet
DATE	REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Plan & Profile
Compound Meter and DC Meter

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

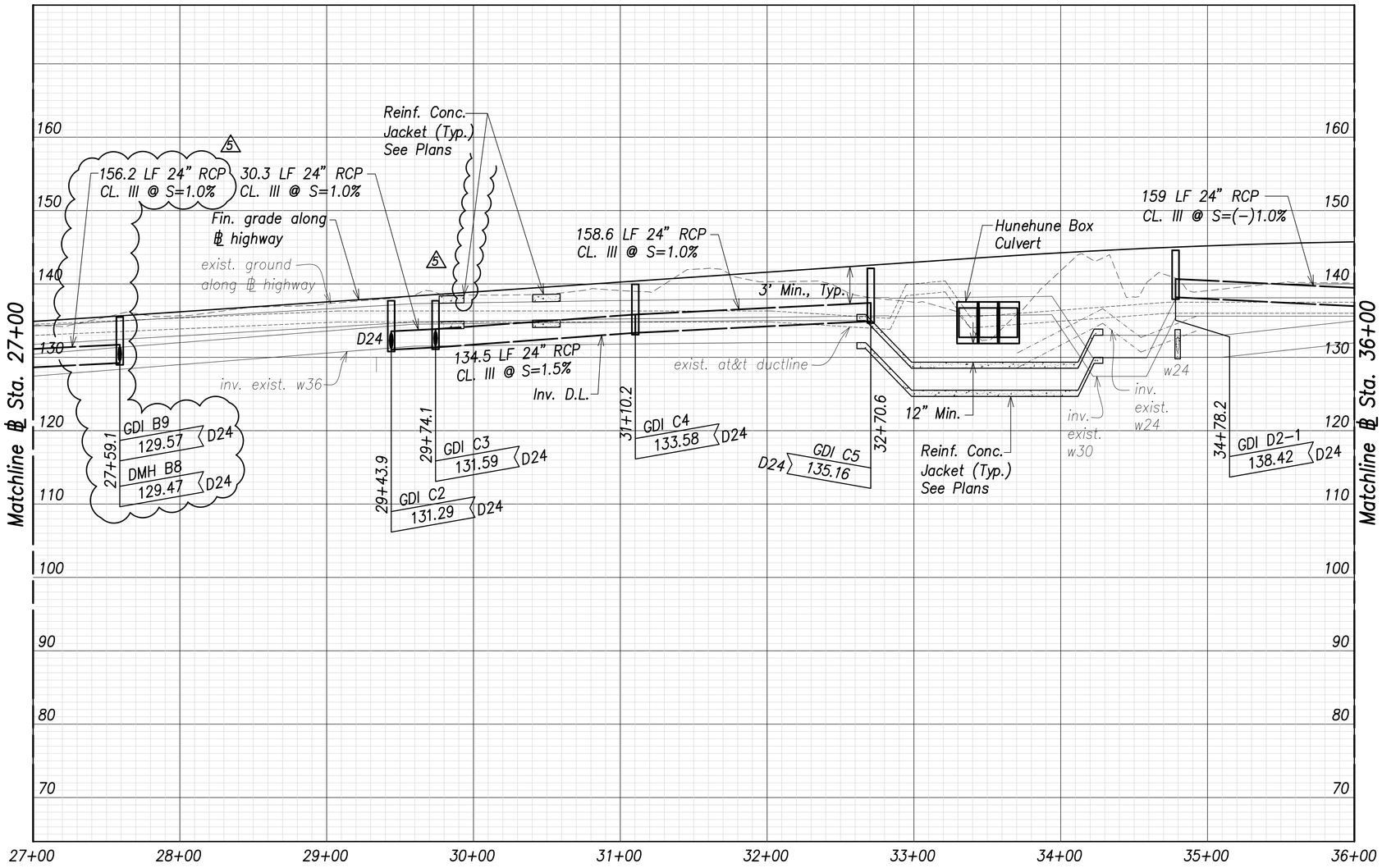
Scale: As Shown — Date: April 2022

SHEET No. C-136 OF 767 SHEETS

ADD. 137

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-136 Meter Plans and Profiles.dwg saved July 20, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	141	767



Utility and Drain Profiles – (℄ Sta. 27+00 to ℄ Sta. 36+00)

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Note:

Drain pipe lengths and slopes shown on profiles are calculated from the center of structures.

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

DATE	REVISION
07/15/22	5 Added callout arrow; Revised GDI's and Drain Line
06/08/22	2 Added note

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

APPROVED:

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

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

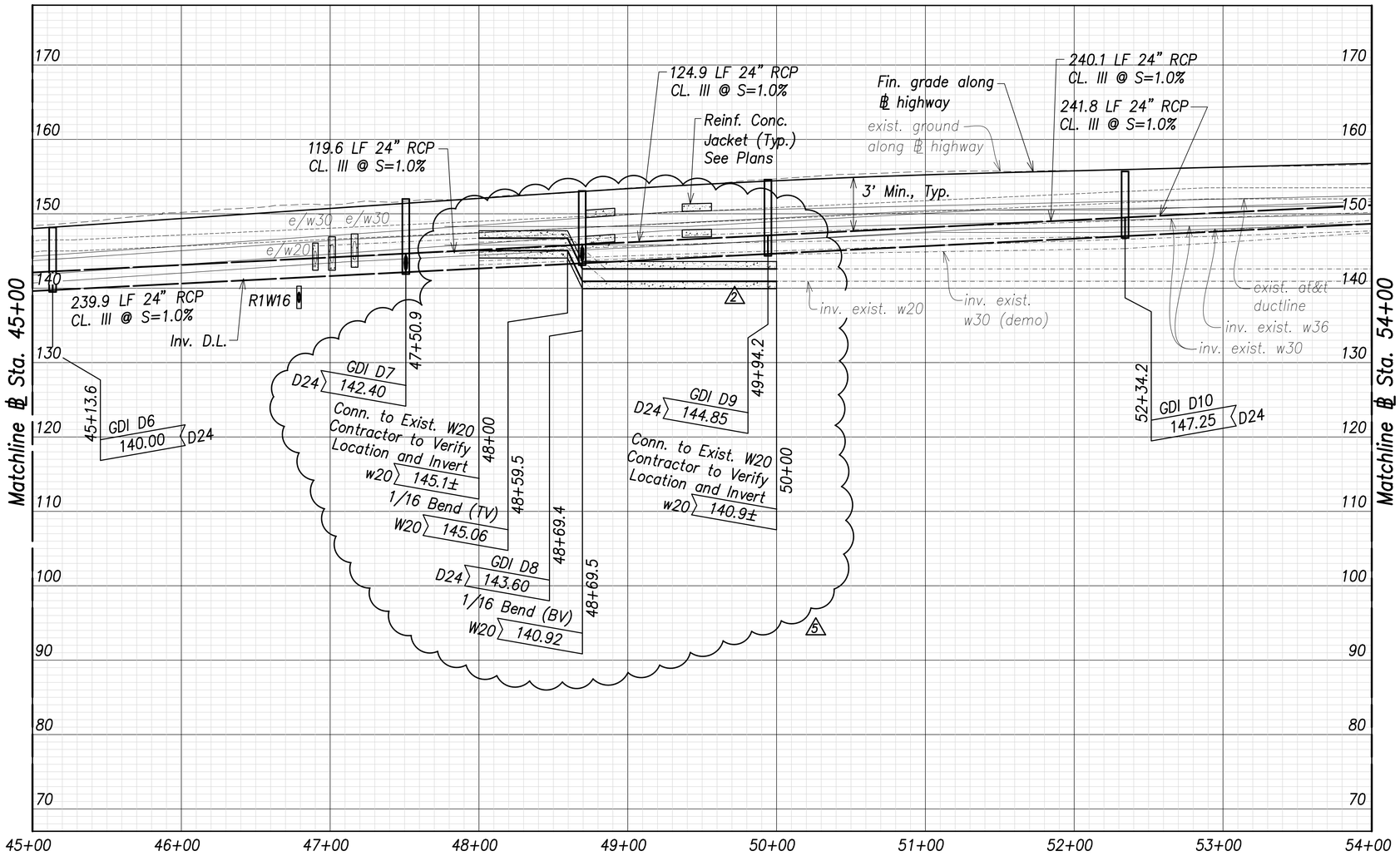
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Utility and Drain Profiles ℄ Sta. 27+00 to ℄ Sta. 36+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	143	767



Utility and Drain Profiles – (℄ Sta. 45+00 to ℄ Sta. 54+00)

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Note:

Drain pipe lengths and slopes shown on profiles are calculated from the center of structures.

2

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

DATE	REVISION
07/15/22	5 Added waterline
06/08/22	2 Sta. 49+65 Waterline and Jacket Removed, Added Note

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

APPROVED:

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

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6635-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Utility and Drain Profiles
℄ Sta. 45+00 to
℄ Sta. 54+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

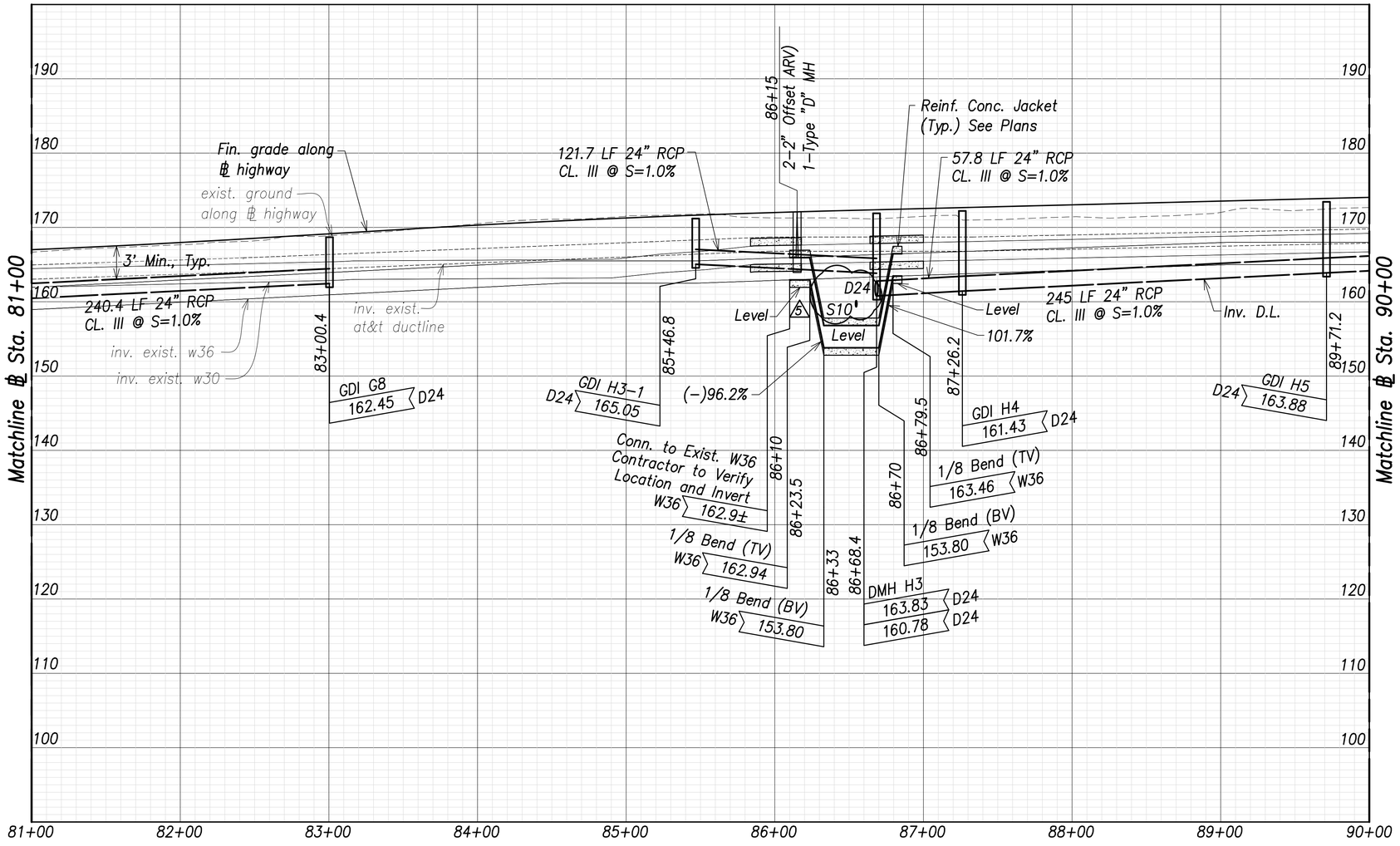
Scale: As Shown Date: April 2022

SHEET No. C-142 OF 767 SHEETS

ADD. 143

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-142 Utility and Drain Profiles - Sta. 45+00 to 54+00 - PLAN.dwg saved July 8, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	147	767



Utility and Drain Profiles – (℄ Sta. 81+00 to ℄ Sta. 90+00)

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Note:

Drain pipe lengths and slopes shown on profiles are calculated from the center of structures.

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

DATE	REVISION
07/15/22	5 Removed G4 crossing from profile
06/08/22	2 Added note

APPROVED:

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

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Utility and Drain Profiles ℄ Sta. 81+00 to ℄ Sta. 90+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

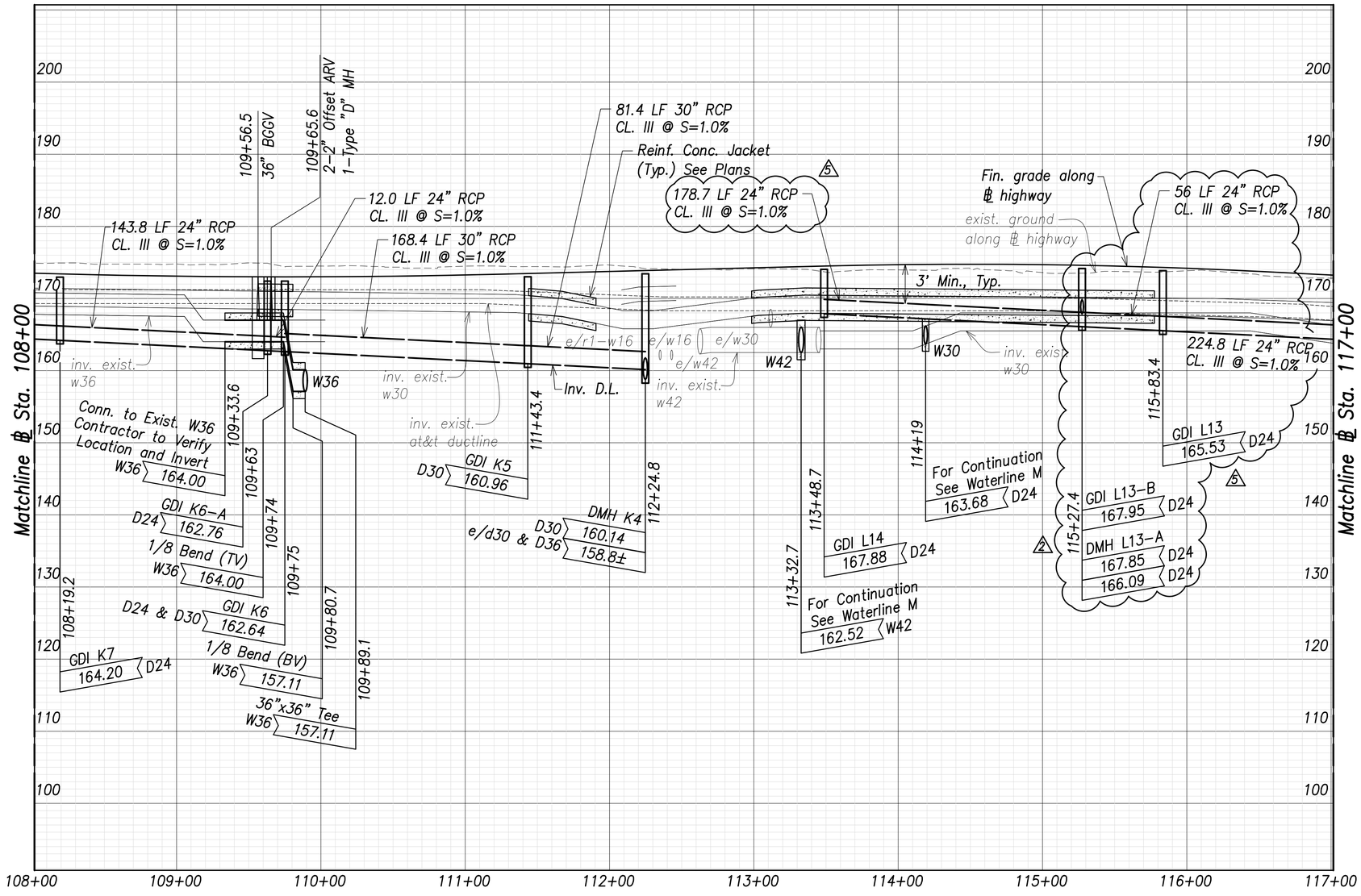
Scale: As Shown — Date: April 2022

SHEET No. C-146 OF 767 SHEETS

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

ADD. 147

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	150	767



Utility and Drain Profiles (℄ Sta. 108+00 to ℄ Sta. 117+00)

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Note:

Drain pipe lengths and slopes shown on profiles are calculated from the center of structures.

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

DATE	REVISION
07/15/22	5 Revised GDI's and Drain Lines
06/08/22	2 Added note; Revised connection

APPROVED:

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

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Utility and Drain Profiles ℄ Sta. 108+00 to ℄ Sta. 117+00

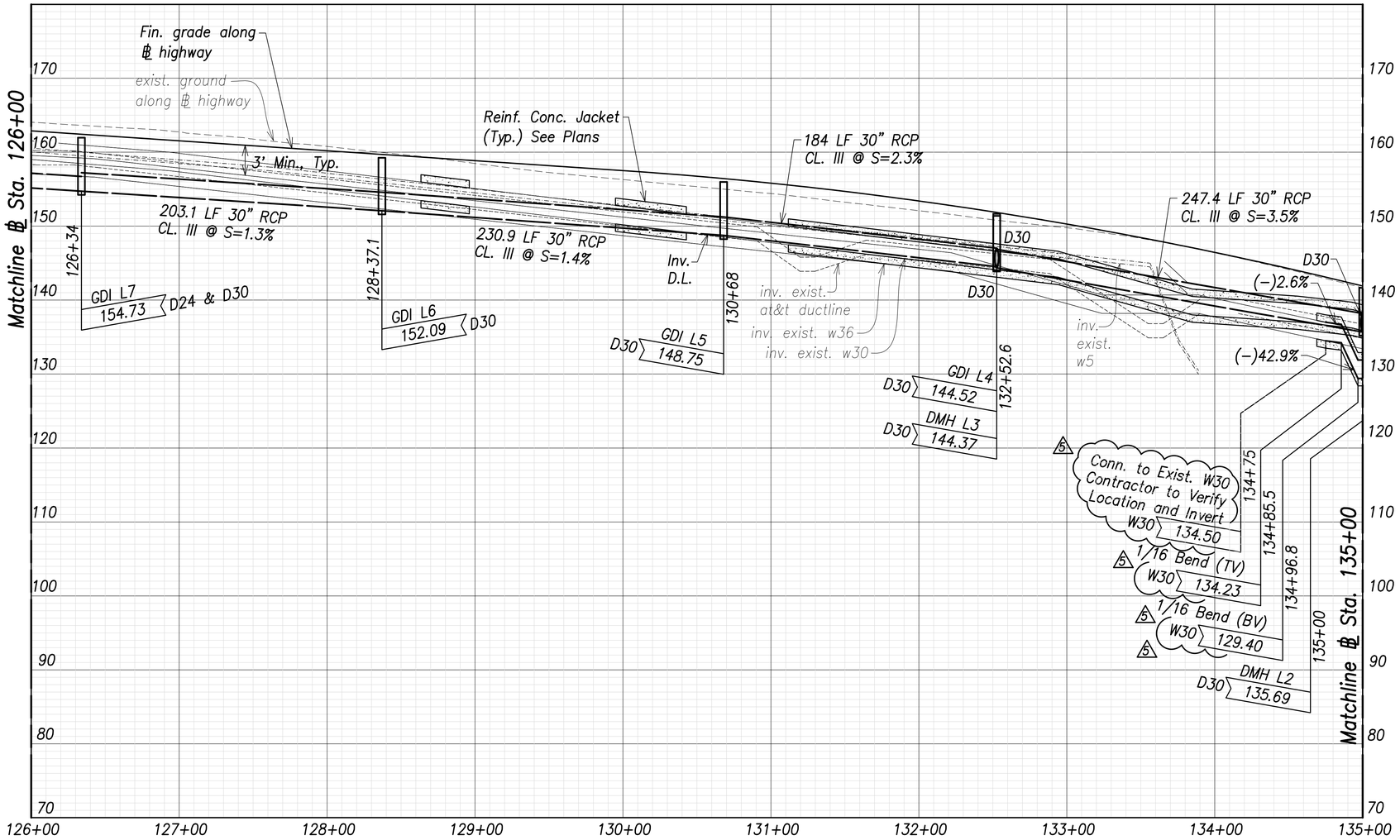
FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown — Date: April 2022

SHEET No. C-149 OF 767 SHEETS

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	152	767



Utility and Drain Profiles – (℄ Sta. 126+00 to ℄ Sta. 135+00)

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

Note:

Drain pipe lengths and slopes shown on profiles are calculated from the center of structures.

2

APPROVED:

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

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 Revised waterline size
06/08/22	2 Revised bend callouts, added note

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Utility and Drain Profiles
℄ Sta. 126+00 to ℄ Sta. 135+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

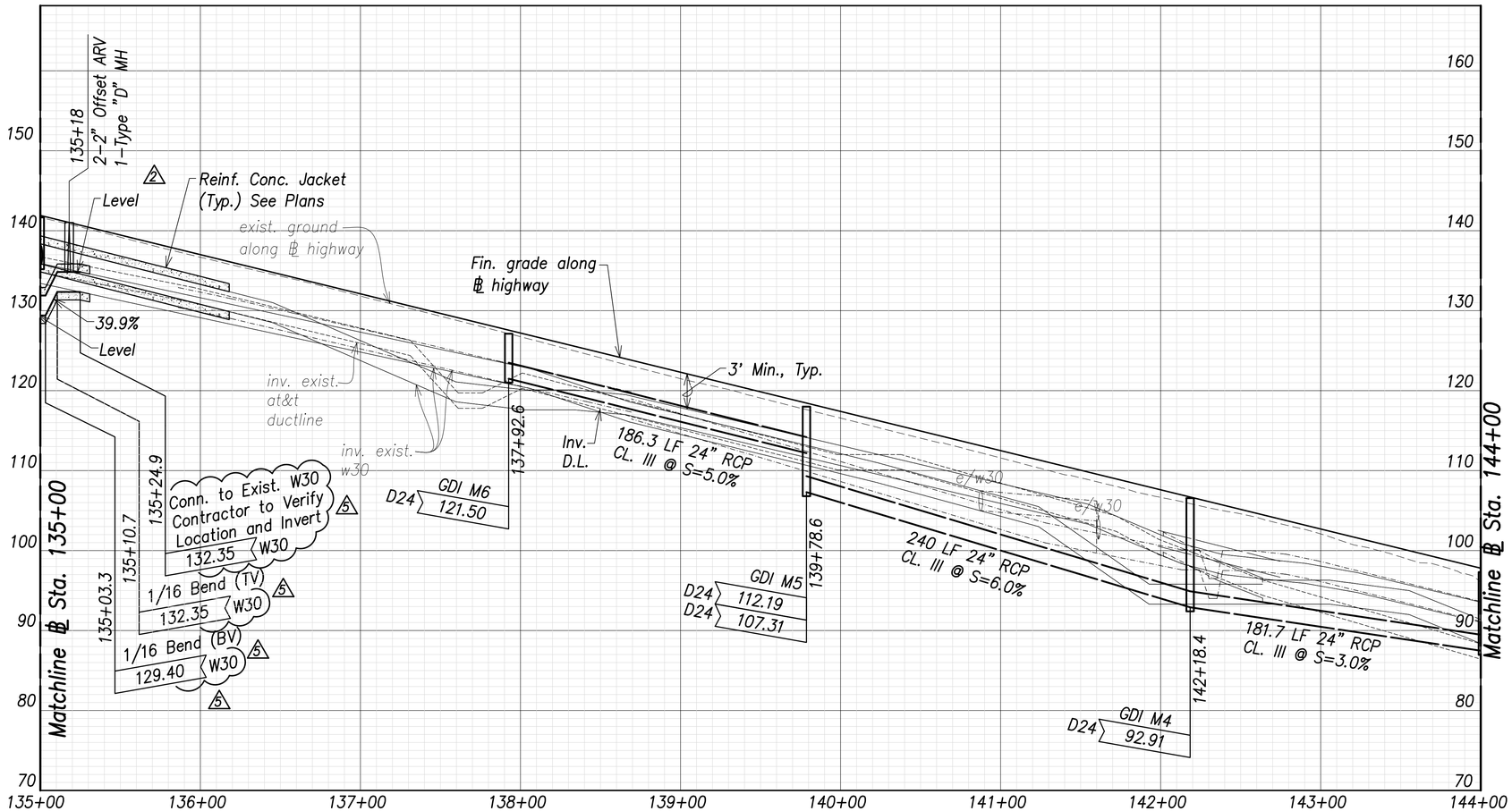
SHEET No. C-151 OF 767 SHEETS

ADD. 152

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

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-151 Utility and Drain Profiles – Sta. 126+00 to 135+00 – PLAN.dwg saved July 8, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	153	767



Utility and Drain Profiles – (℄ Sta. 135+00 to ℄ Sta. 144+00)

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Note:

Drain pipe lengths and slopes shown on profiles are calculated from the center of structures.

△2

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

DATE	REVISION
07/15/22	△5 Revised waterline size
06/08/22	△2 Revised bend callouts, grid, and pipe layout, added note

APPROVED:

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

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Utility and Drain Profiles
℄ Sta. 135+00 to ℄ Sta. 144+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

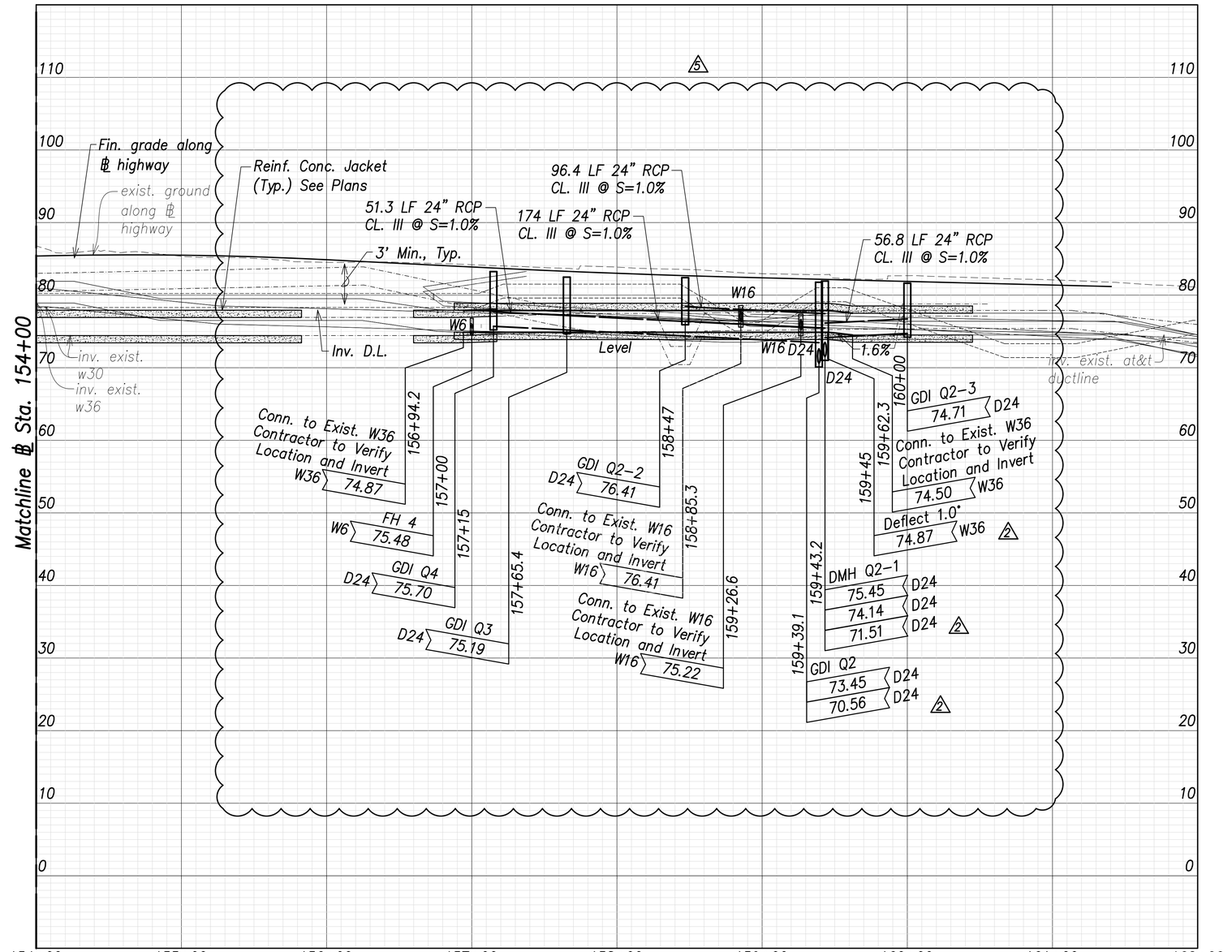
SHEET No. C-152 OF 767 SHEETS

ADD. 153

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

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-152 Utility and Drain Profiles - Sta. 135+00 to 144+00 - PLAN.dwg saved July 8, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	155	767



Utility and Drain Profiles – (℄ Sta. 154+00 to ℄ Sta. 162+00)

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

APPROVED:

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

ORIGINAL PLAN | STUFF PLOTTED BY ____ DATE | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | NOTE BOOK | No.

Note:

Drain pipe lengths and slopes shown on profiles are calculated from the center of structures.

2

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

DATE	REVISION
07/15/22	5 Revised Profiles
06/08/22	2 Revised inverts and water line, added note

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Utility and Drain Profiles ℄ Sta. 154+00 to ℄ Sta. 162+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

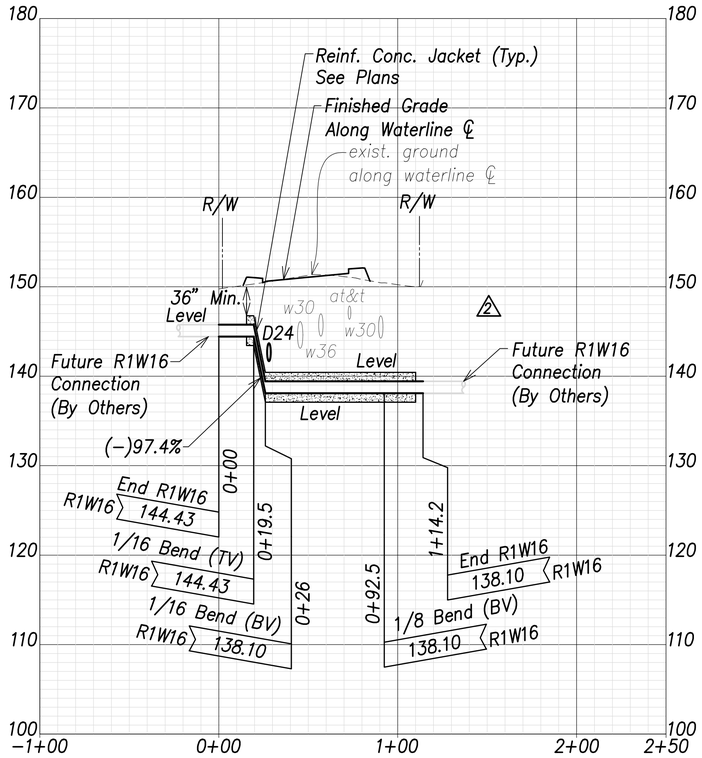
Scale: As Shown — Date: April 2022

SHEET No. C-154 OF 767 SHEETS

ADD. 155

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-154 Utility and Drain Profiles - Sta. 154+00 to 162+00 - PLAN.dwg saved July 12, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	156	767



Waterline B Profile
(Sta. 46+71 Farrington Highway)

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

△5 **Note:**
The Contractor shall provide Controlled Low Strength Material (CLSM) in areas where required compaction cannot be met. CLSM shall be extend a minimum of 2' beyond the waterline at the crossing and shall extend to the top of the crossing pipe

APPROVED:

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

DATE	REVISION
07/15/22	△5 CLSM Note Added
06/08/22	△2 Min. Cover Callout Added

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

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SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Waterlines Profile – 1

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

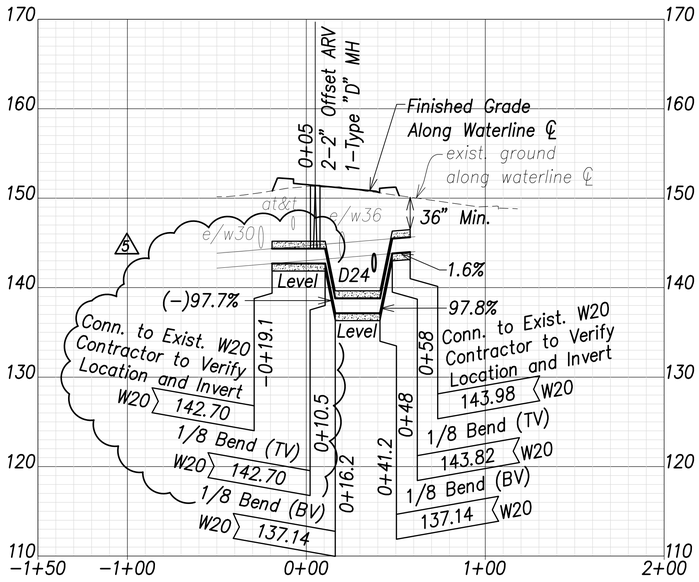
SHEET No. C-155 OF 767 SHEETS

ADD. 156

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

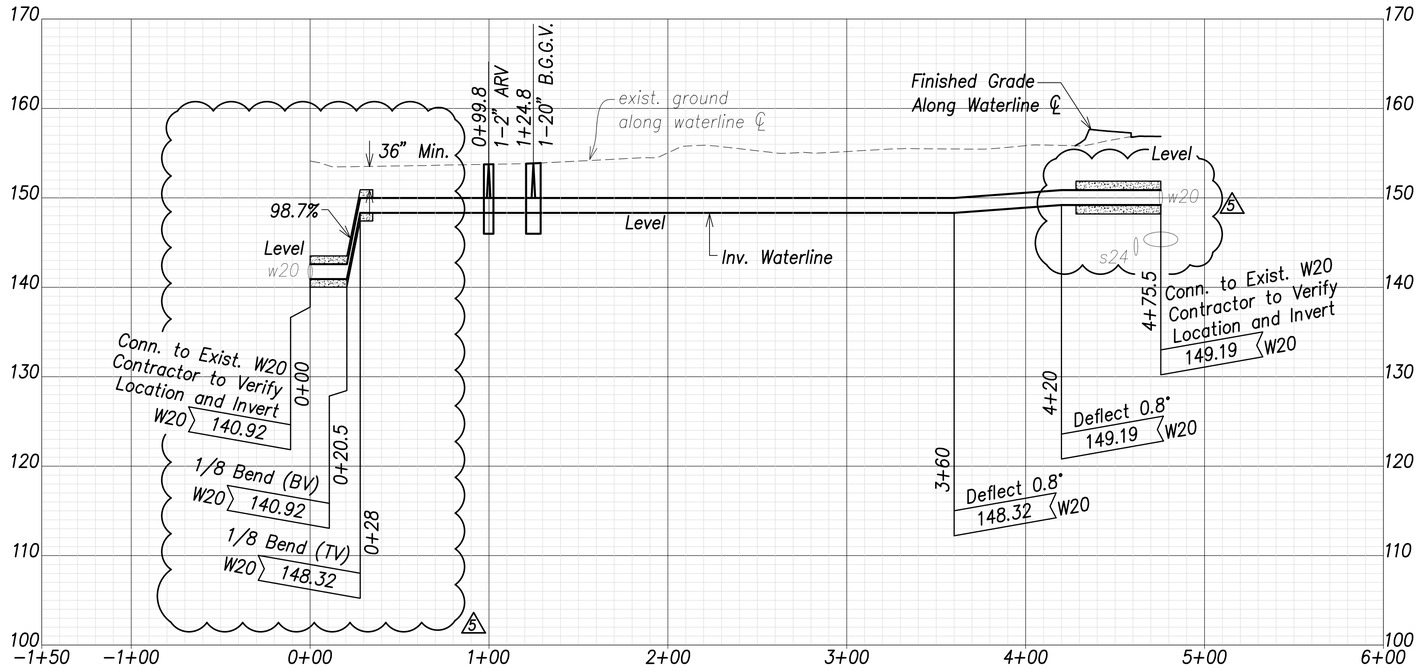
FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-155 Water Profiles – 1.dwg saved July 1, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	157	767



Waterline F Profile
(Sta. 46+87.6 Farrington Highway)

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'



Waterline G Profile
(Sta. 51+89 Farrington Highway)

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

DATE	REVISION
07/15/22	5 Revised profiles
06/08/22	2 Revised profiles

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Waterlines Profile – 2

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

Scale: As Shown Date: April 2022

SHEET No. C-156 OF 767 SHEETS

ADD. 157

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

Note:
The Contractor shall provide Controlled Low Strength Material (CLSM) in areas where required compaction cannot be met. CLSM shall be extend a minimum of 2' beyond the waterline at the crossing and shall extend to the top of the crossing pipe

APPROVED:

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

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

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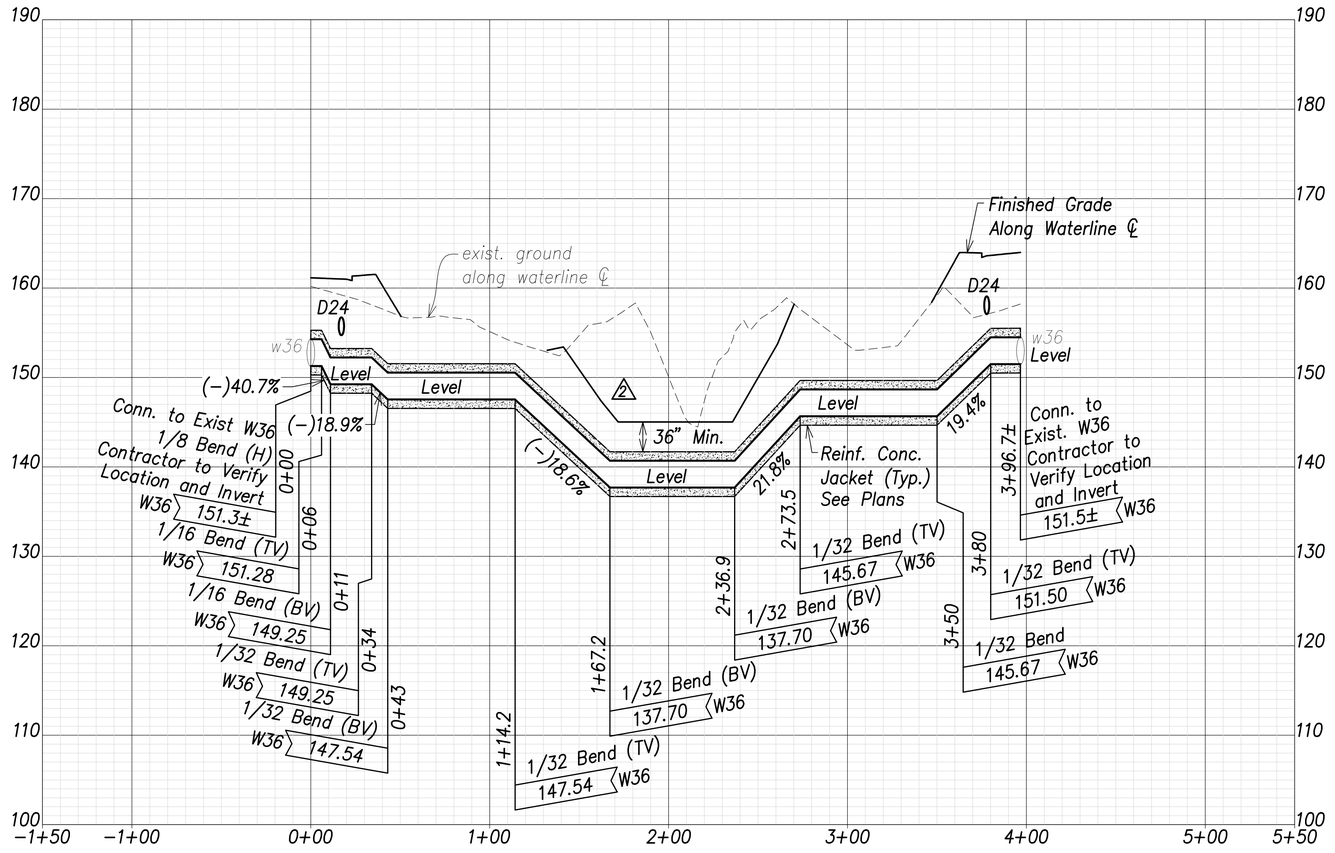
SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

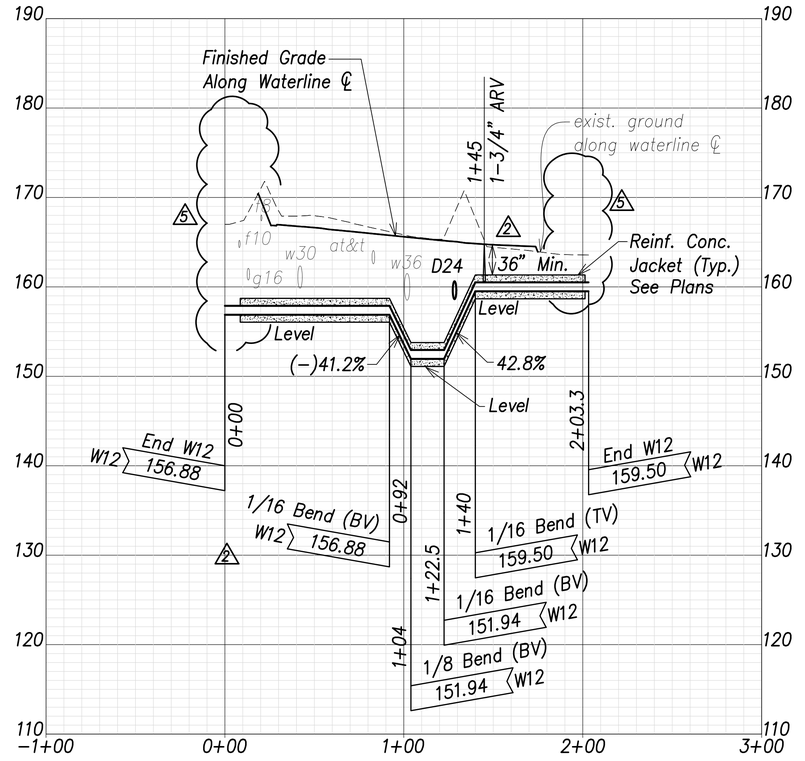
FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-156 Water Profiles – 2.dwg saved July 18, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	158	767



Waterline H Profile
(Sta. 61+78.5 Farrington Highway)

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'



Waterline J Profile
(Sta. 72+91 Farrington Highway)

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

DATE	REVISION
07/15/22	5 CLSM Note Added, G.V. Removed, Jacket revised
06/08/22	2 Min. Cover Callout Added, revised profile

5

Note:
The Contractor shall provide Controlled Low Strength Material (CLSM) in areas where required compaction cannot be met. CLSM shall be extend a minimum of 2' beyond the waterline at the crossing and shall extend to the top of the crossing pipe

APPROVED:

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

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Waterlines Profile – 3

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

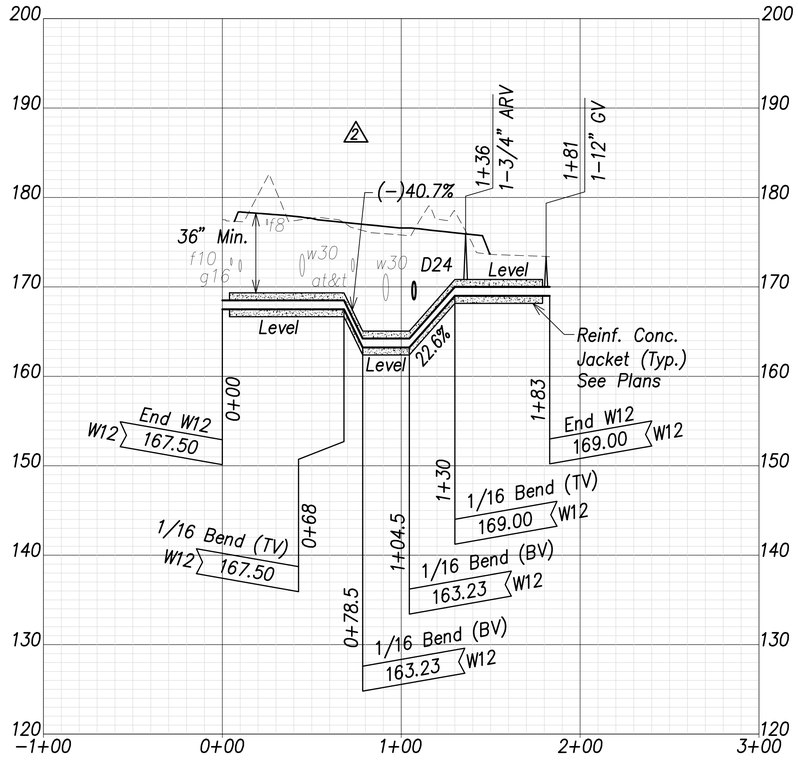
SHEET No. C-157 OF 767 SHEETS

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

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-157 Water Profiles - 3.dwg saved July 18, 2022

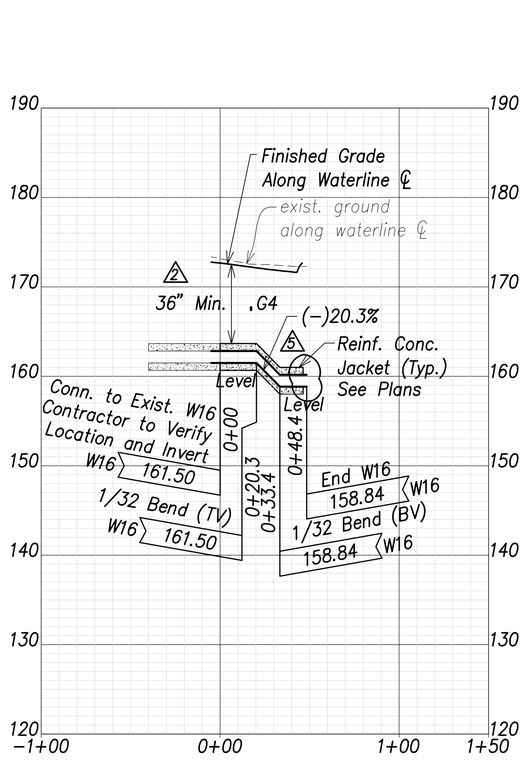
ADD. 158

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	159	767



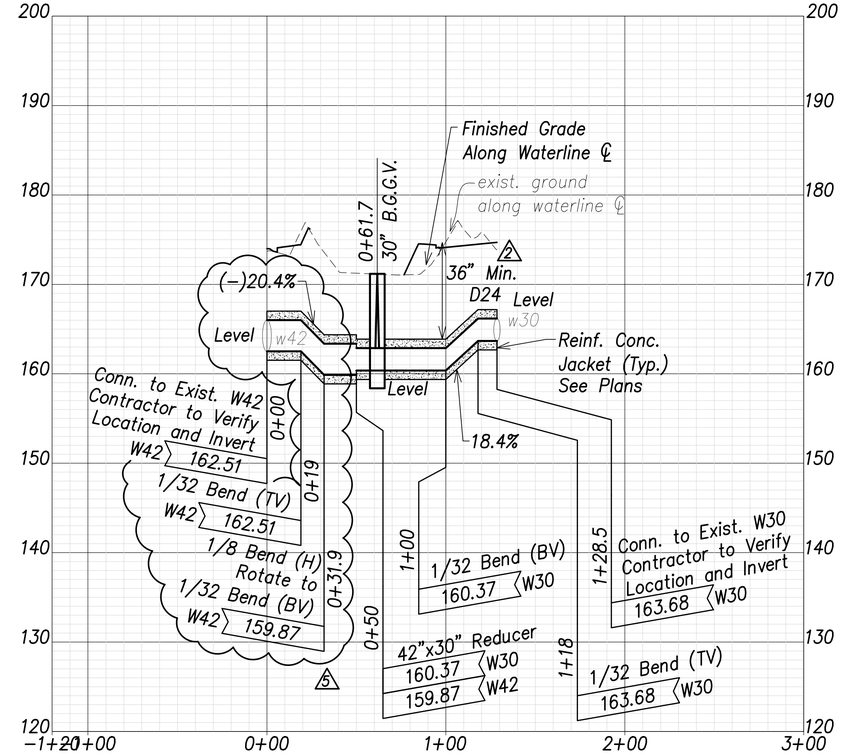
Waterline K Profile (Sta. 98+71 Farrington Highway)

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'



Waterline L Profile (Sta. 112+29 Farrington Highway)

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'



Waterline M Profile (Sta. 113+32.7 Farrington Highway)

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

DATE	REVISION
07/15/22	5 Reinf. Conc. Jacket pulled back 2'; Revised Waterline M Profile
06/08/22	2 Revised profile

APPROVED:

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

Note:
The Contractor shall provide Controlled Low Strength Material (CLSM) in areas where required compaction cannot be met. CLSM shall be extend a minimum of 2' beyond the waterline at the crossing and shall extend to the top of the crossing pipe

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6635-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Waterlines Profile – 4

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

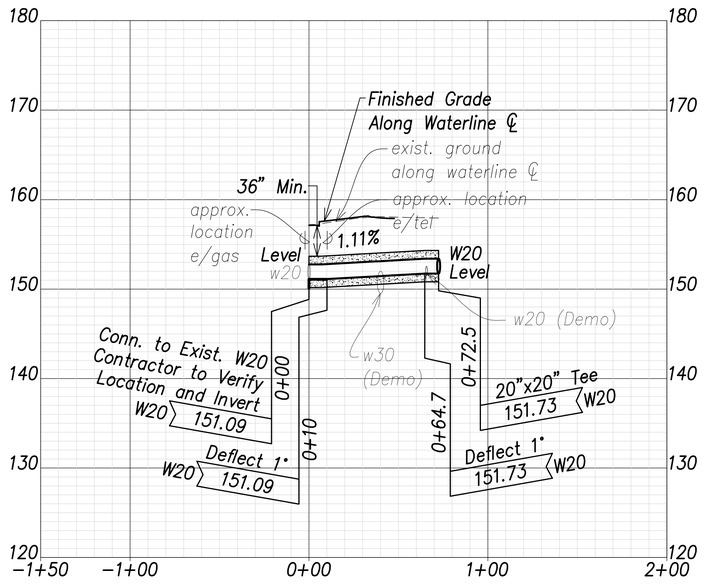
SHEET No. C-158 OF 767 SHEETS

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

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-158 Water Profiles – 4.dwg saved July 19, 2022

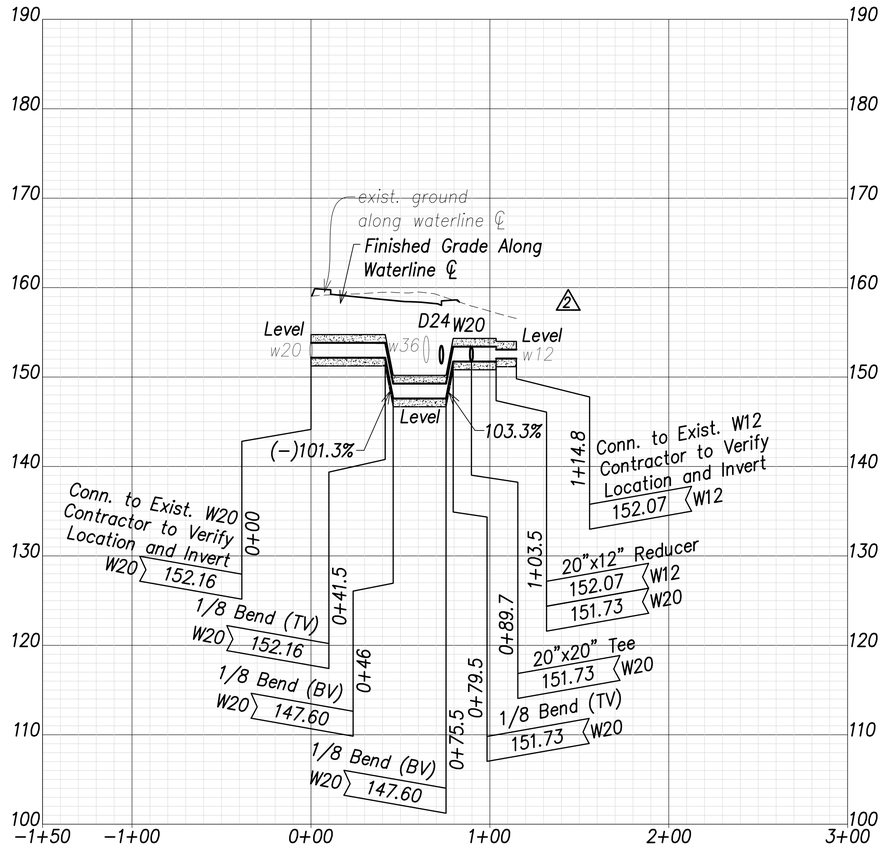
ADD. 159

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	160	767



⚠2 Waterline N Profile (Sta. 58+32.4 Farrington Highway)

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'



Waterline P Profile (Sta. 58+67.5 Farrington Highway)

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

5

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

DATE	REVISION
07/15/22	⚠5 Revised profiles
06/08/22	⚠2 Min. Cover Callout Added, Waterline N Profile Added

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

Note:
The Contractor shall provide Controlled Low Strength Material (CLSM) in areas where required compaction cannot be met. CLSM shall be extend a minimum of 2' beyond the waterline at the crossing and shall extend to the top of the crossing pipe

APPROVED:

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

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE ____ April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Waterlines Profile – 5

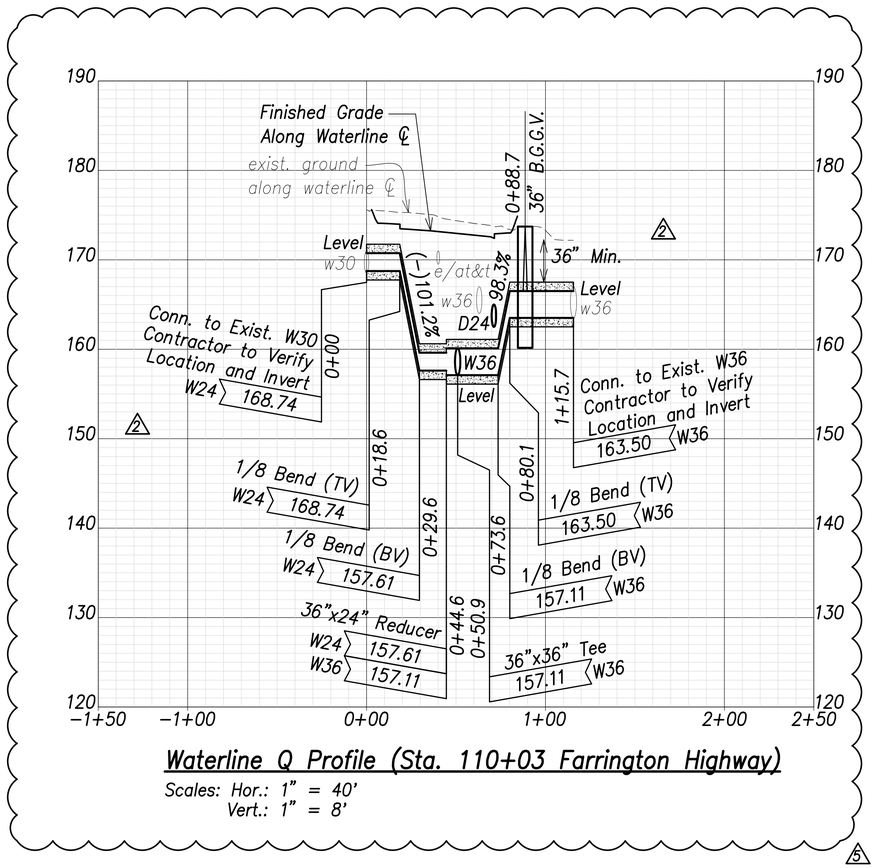
FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. C-159 OF 767 SHEETS

ADD. 160

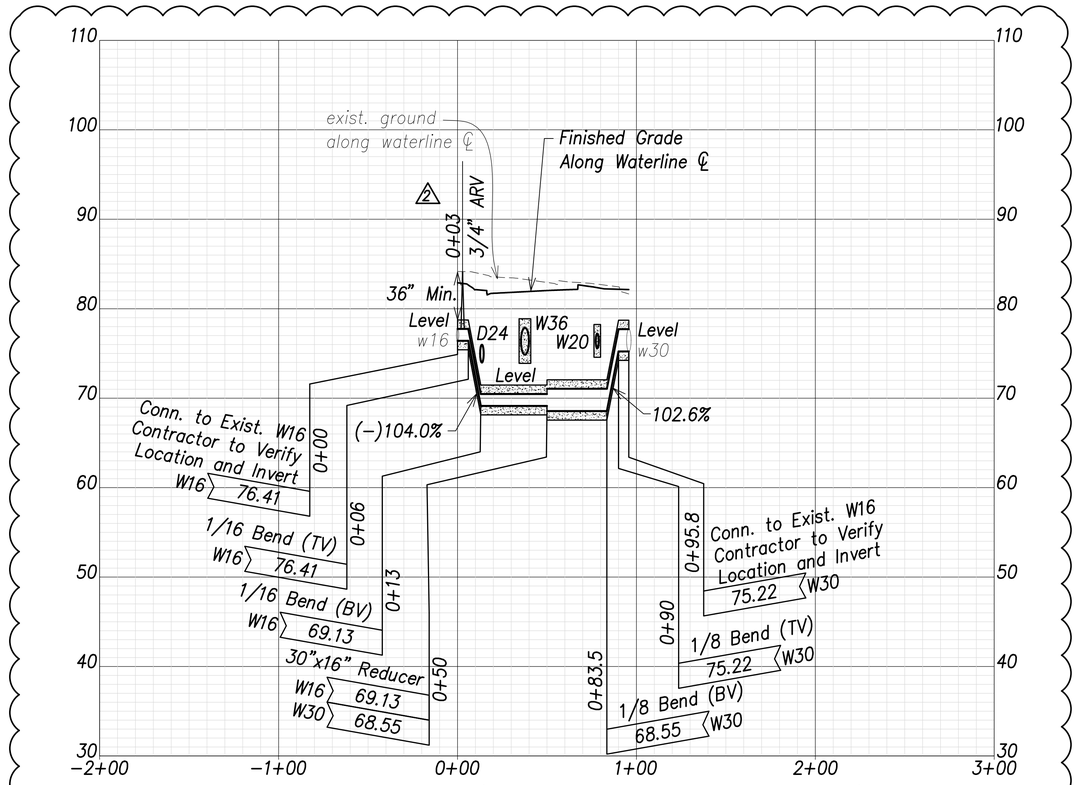
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	161	767



Waterline Q Profile (Sta. 110+03 Farrington Highway)

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

5



Waterline R Profile (Sta. 158+85 Farrington Highway)

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

5

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

DATE	REVISION
07/15/22	5 Revised Profiles
06/08/22	2 Revised Profiles

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Waterlines Profile – 6

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. C-160 OF 767 SHEETS

Note:
The Contractor shall provide Controlled Low Strength Material (CLSM) in areas where required compaction cannot be met. CLSM shall be extend a minimum of 2' beyond the waterline at the crossing and shall extend to the top of the crossing pipe

APPROVED:

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

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

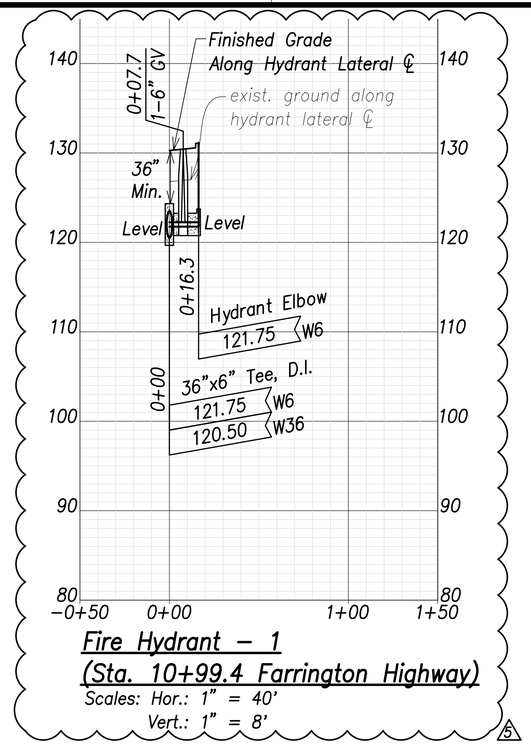
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

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

ADD. 161

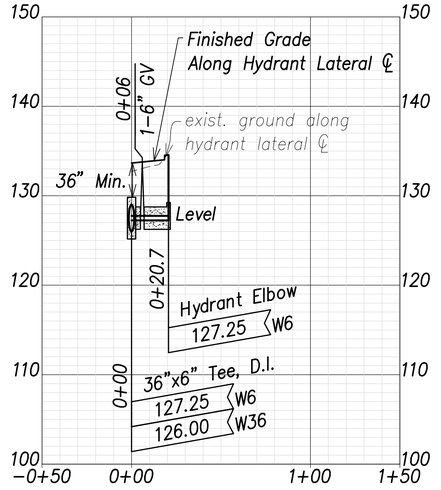
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	163	767



Fire Hydrant – 1
(Sta. 10+99.4 Farrington Highway)

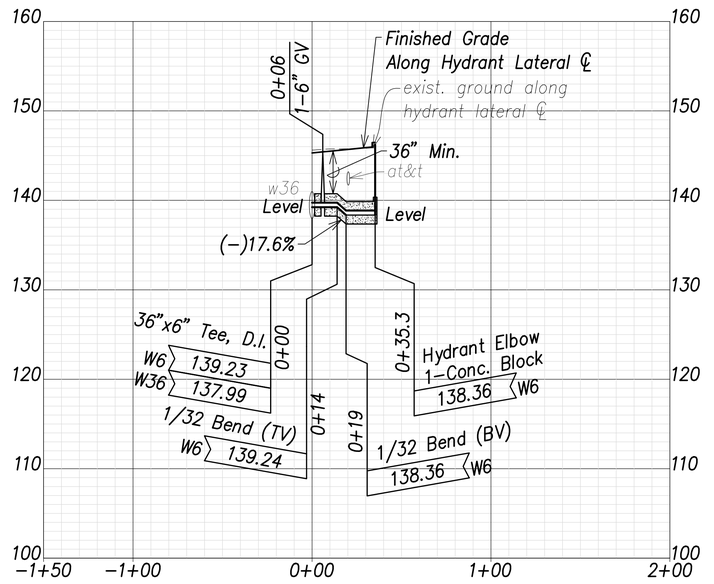
Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

5



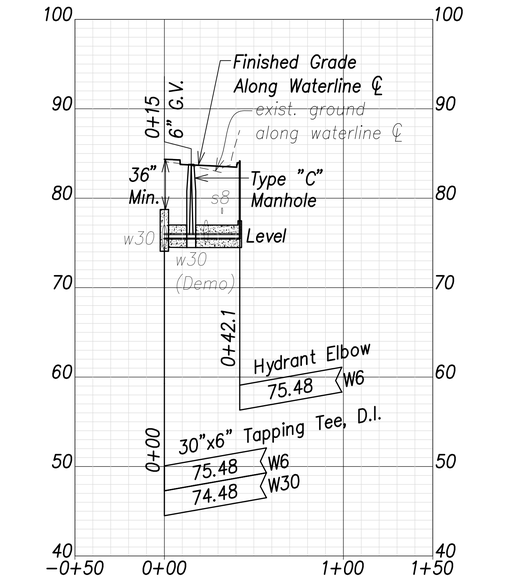
Fire Hydrant – 2
(Sta. 23+58.6 Farrington Highway)

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'



Fire Hydrant – 3
(Sta. 43+00 Farrington Highway)

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'



Fire Hydrant – 4
(Sta. 157+00 Farrington Highway)

5

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

DATE	REVISION
07/15/22	5 Revised profile
06/08/22	2 Min. Cover Callout Added, Revised FH1 Profile, Added MH to FH4

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

APPROVED:

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

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Fire Hydrant Profiles

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

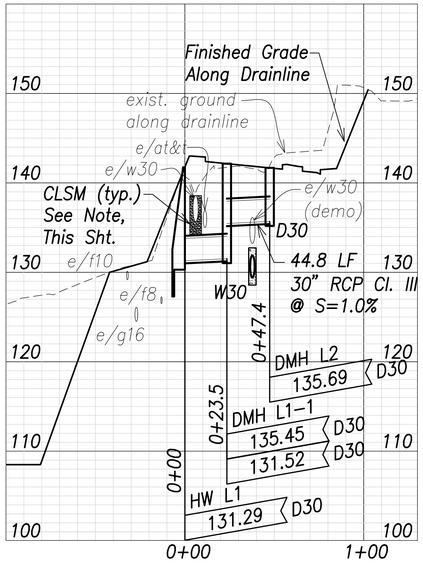
Scale: As Shown Date: April 2022

SHEET No. C-162 OF 767 SHEETS

ADD. 163

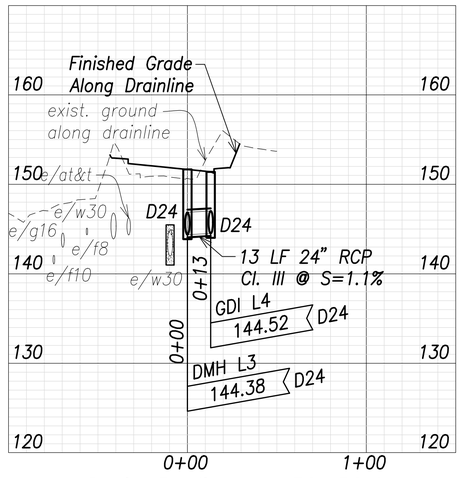
FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-162 Fire Hydrant Profiles.dwg saved July 18, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	166	767



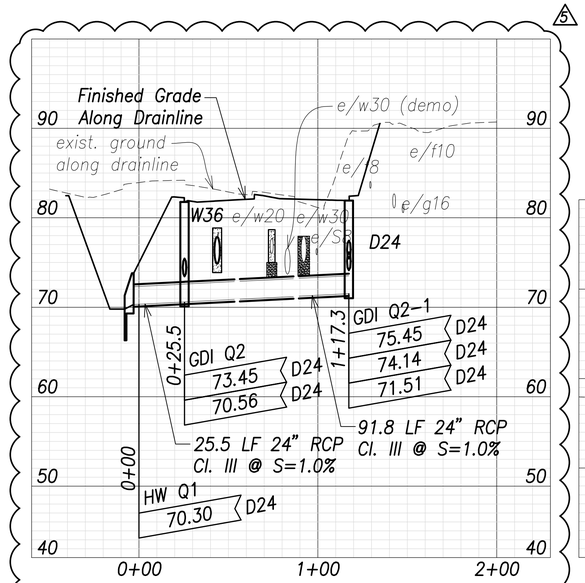
Drain Profile at 135+00

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'



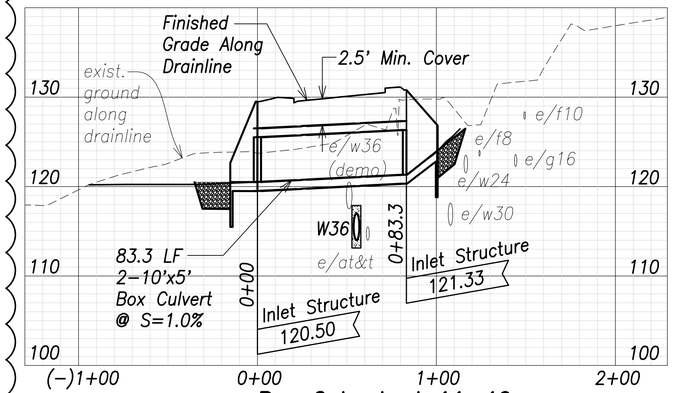
Drain Profile at 132+52.6

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'



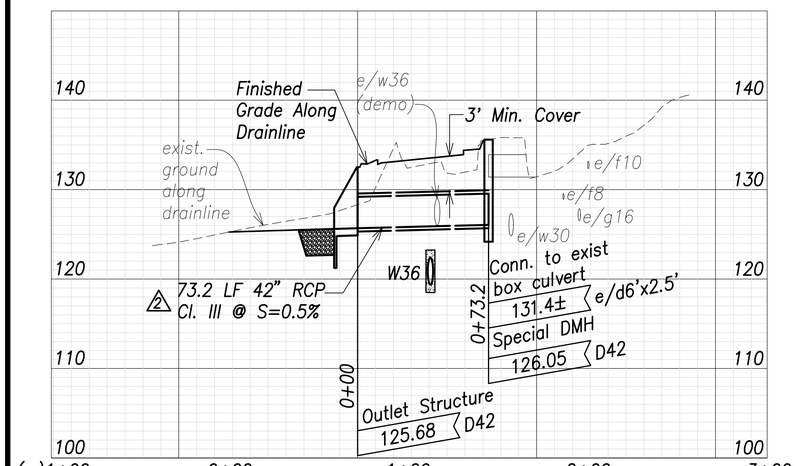
Drain Profile at HW Q1 to GDI Q2-1

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'



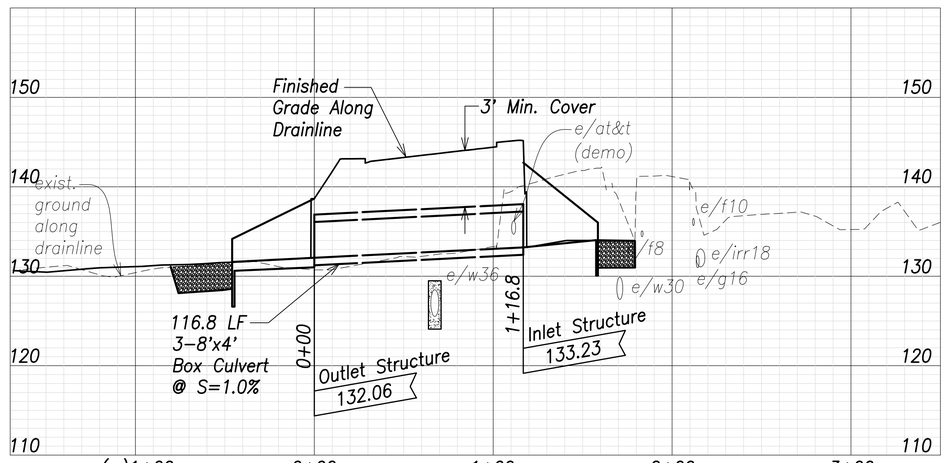
Box Culvert at 11+46

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'



Drain Profile at 23+36

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'



Box Culvert at 33+90

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Notes:

1. The Contractor shall provide Controlled Low Strength Material (CLSM) in areas where required compaction cannot be met. CLSM shall be extend a minimum of 2' beyond the waterline at the crossing and shall extend to the top of the crossing pipe. 2
2. Drain pipe lengths and slopes shown on profiles are calculated from the center of structures.

APPROVED:

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

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

DATE	REVISION
07/15/22	5 Revised Drain Profile
06/08/22	2 Revised profiles, added note

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Drain Profiles – 3

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown — Date: April 2022

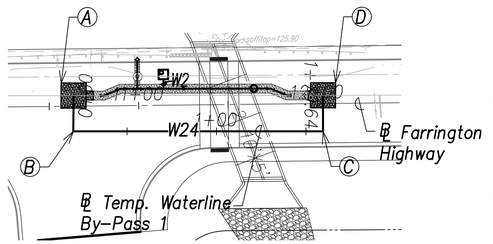
SHEET No. C-165 OF 767 SHEETS

ADD. 166

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	169	767

True North
1" =40'



Temporary Waterline By–Pass 1 Plan (℄ Sta. 10+80.7 Farrington Highway) (℄ Sta. 11+87.1 Farrington Highway)

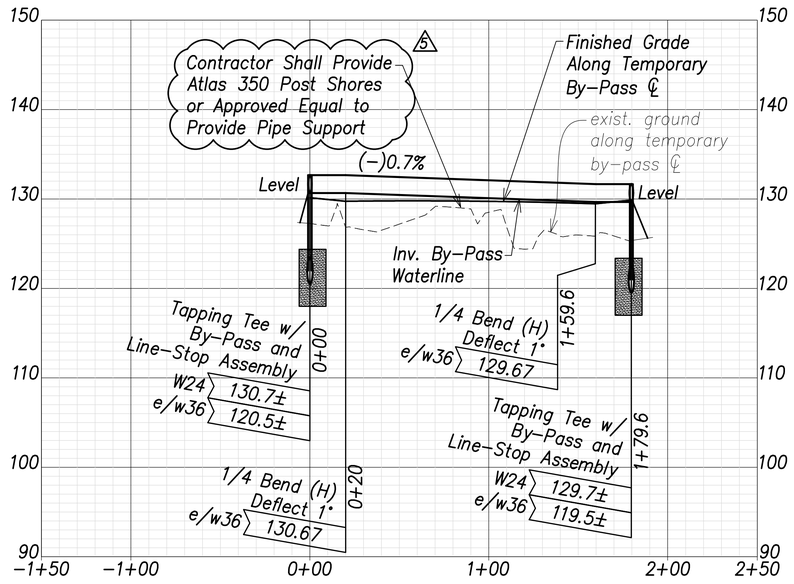
Scale: 1" = 40'

Ⓐ
℄ Sta. 10+63.7, o/s 5.9' Lt. Farrington Highway
=℄ Sta. 0+00 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

Ⓑ
℄ Sta. 10+63.3, o/s 14' Rt. Farrington Highway
=℄ Sta. 0+20 By–Pass
1–24" 1/4 Bend
5

Ⓒ
℄ Sta. 12+02.9, o/s 15.5' Rt. Farrington Highway
=℄ Sta. 1+59.5 By–Pass
1–24" 1/4 Bend
5

Ⓓ
℄ Sta. 12+03, o/s 4.6' Lt. Farrington Highway
=℄ Sta. 1+79.6 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)



Temporary Waterline By–Pass 1 Profile

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Notes:

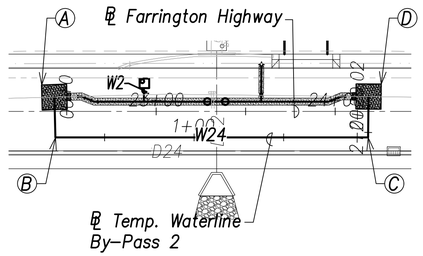
1. Contractor shall provide mechanical joint pipes and fittings with retainer glands and/or flanged pipes and fittings to construct the temporary by–passes 5
2. The Contractor shall submit the construction schedule and construction phasing for the temporary by–passes to BWS for review and approval. The Contractor shall not commence work on the temporary by–passes until approval is obtained by BWS.

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

APPROVED:

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

True North
1" =40'



Temporary Waterline By–Pass 2 Plan (℄ Sta. 22+58.1 Farrington Highway) (℄ Sta. 24+05 Farrington Highway)

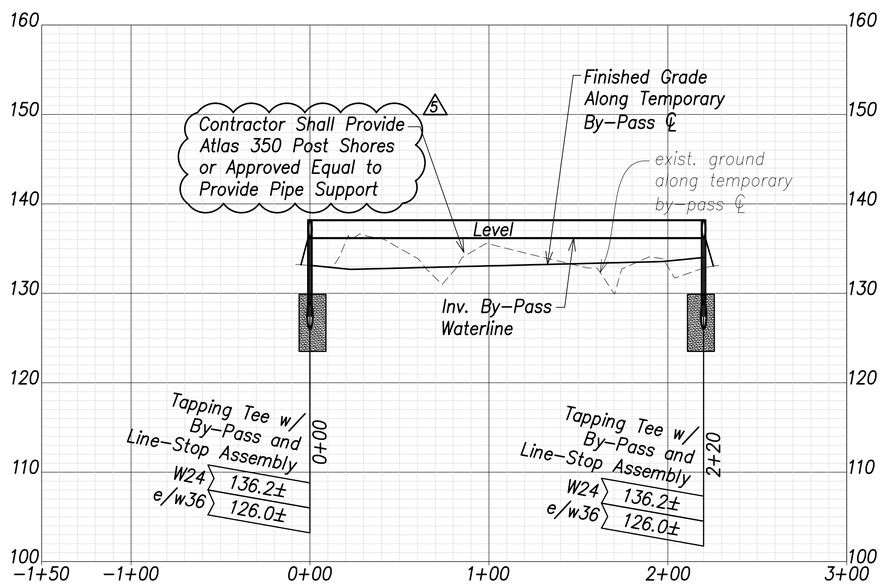
Scale: 1" = 40'

Ⓐ
℄ Sta. 22+43.1, o/s 8' Lt. Farrington Highway
=℄ Sta. 0+00 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

Ⓑ
℄ Sta. 22+43.7, o/s 14.5' Rt. Farrington Highway
=℄ Sta. 0+22.5 By–Pass
1–24" 1/4 Bend
5

Ⓒ
℄ Sta. 24+18.4, o/s 14.5' Rt. Farrington Highway
=℄ Sta. 1+97.2 By–Pass
1–24" 1/4 Bend
5

Ⓓ
℄ Sta. 24+18.7, o/s 8.3' Lt. Farrington Highway
=℄ Sta. 2+20 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)



Temporary Waterline By–Pass 2 Profile

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

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SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 Revised callouts; Added note

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Waterline Connection and Temporary By–Pass – 1

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

Scale: As Shown — Date: April 2022

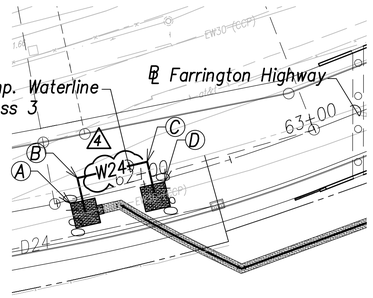
SHEET No. C-168 OF 767 SHEETS

ADD. 169

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C–168 Waterline Connection and Temporary By–Pass – 1.dwg saved July 14, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	170	767

True North
1"=40'



Ⓐ
℄ Sta. 61+64.6, o/s 8.2' Rt. Farrington Highway
=℄ Sta. 0+00 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.) 5

Ⓑ
℄ Sta. 61+6.0, o/s 11.8' Lt. Farrington Highway
=℄ Sta. 0+20 By–Pass
1–24" 1/4 Bend 5

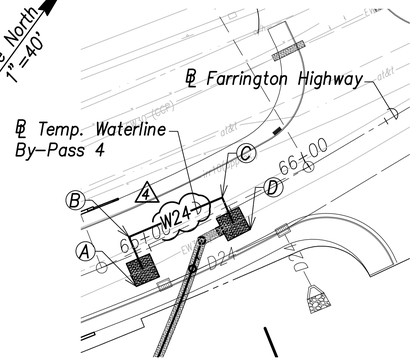
Ⓒ
℄ Sta. 62+04.7, o/s 11.8' Lt. Farrington Highway
=℄ Sta. 0+60 By–Pass
1–24" 1/4 Bend 5

Ⓓ
℄ Sta. 62+04.1, o/s 8.2' Rt. Farrington Highway
=℄ Sta. 0+80 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.) 5

Temporary Waterline By–Pass 3 Plan (℄ Sta. 61+84.3 Farrington Highway)

Scale: 1" = 40'

True North
1"=40'



Ⓐ
℄ Sta. 64+91.7, o/s 9.9' Rt. Farrington Highway
=℄ Sta. 0+00 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

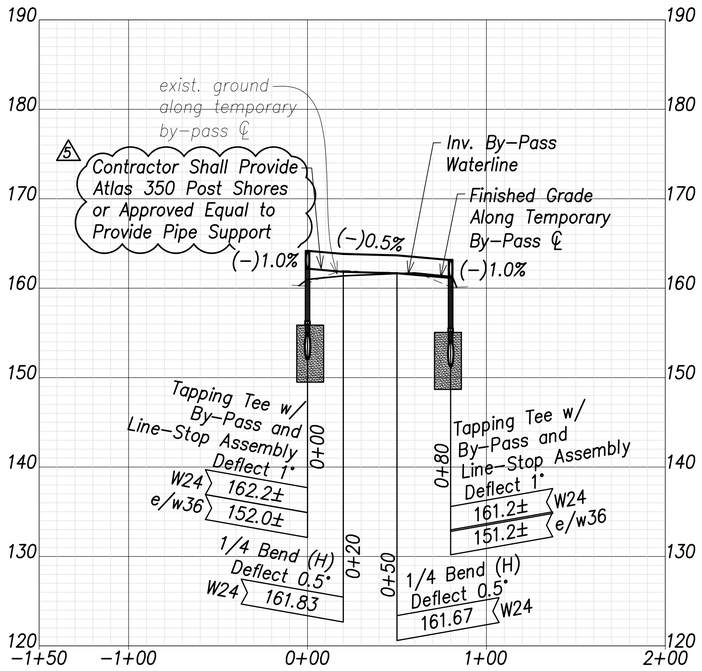
Ⓑ
℄ Sta. 64+91.6, o/s 10.1' Lt. Farrington Highway
=℄ Sta. 0+20 By–Pass
1–24" 1/4 Bend 5

Ⓒ
℄ Sta. 65+48.9, o/s 8.2' Lt. Farrington Highway
=℄ Sta. 0+76.6 By–Pass
1–24" 1/4 Bend 5

Ⓓ
℄ Sta. 65+47.8, o/s 7.7' Rt. Farrington Highway
=℄ Sta. 0+92.6 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

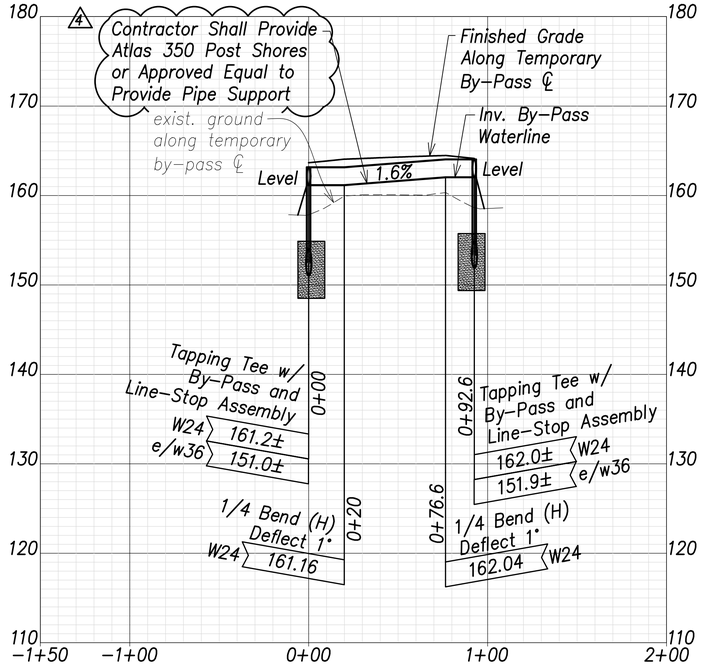
Temporary Waterline By–Pass 4 Plan (℄ Sta. 65+28.2 Farrington Highway)

Scale: 1" = 40'



Temporary Waterline By–Pass 3 Profile

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'



Temporary Waterline By–Pass 4 Profile

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

5

Notes:

1. Contractor shall provide mechanical joint pipes and fittings with retainer glands and/or flanged pipes and fittings to construct the temporary by–passes
2. The Contractor shall submit the construction schedule and construction phasing for the temporary by–passes to BWS for review and approval. The Contractor shall not commence work on the temporary by–passes until approval is obtained by BWS.

07/15/22	5 Revised callouts; Added note; Added waterline labels
06/08/22	2 Callout Revised
DATE	REVISION

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

APPROVED:

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

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Waterline Connection and Temporary By–Pass – 2

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

Scale: As Shown — Date: April 2022

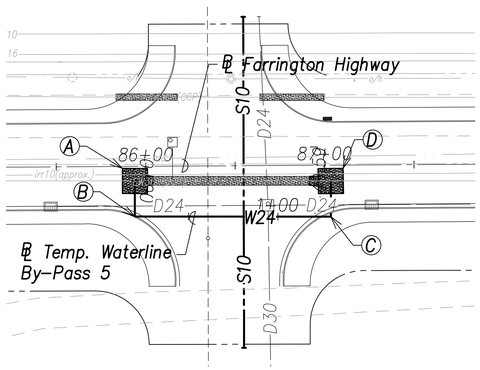
SHEET No. C-169 OF 767 SHEETS

ADD. 170

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C–169 Waterline Connection and Temporary By–Pass – 2.dwg saved July 1, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	171	767

True North
1"=40'



Temporary Waterline By–Pass 5 Plan
(℄ Sta. 86+10 Farrington Highway)
(℄ Sta. 86+85.5 Farrington Highway)

Scale: 1" = 40'

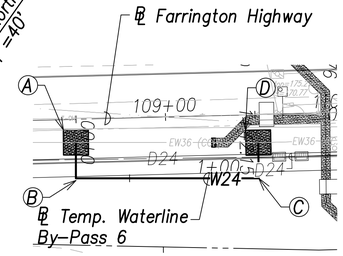
(A) ℄ Sta. 85+93.9, o/s 8.1' Rt. Farrington Highway
=℄ Sta. 0+00 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.) 5

(B) ℄ Sta. 85+93.8, o/s 28.0' Rt. Farrington Highway
=℄ Sta. 0+20 By–Pass
1–24" 1/4 Bend 5

(C) ℄ Sta. 87+03.4, o/s 28.8' Rt. Farrington Highway
=℄ Sta. 1+29.6 By–Pass
1–24" 1/4 Bend 5

(D) ℄ Sta. 87+15, o/s 8.8' Rt. Farrington Highway
=℄ Sta. 1+49.6 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.) 5

True North
1"=40'



Temporary Waterline By–Pass 6 Plan
(℄ Sta. 109+33.6 Farrington Highway)

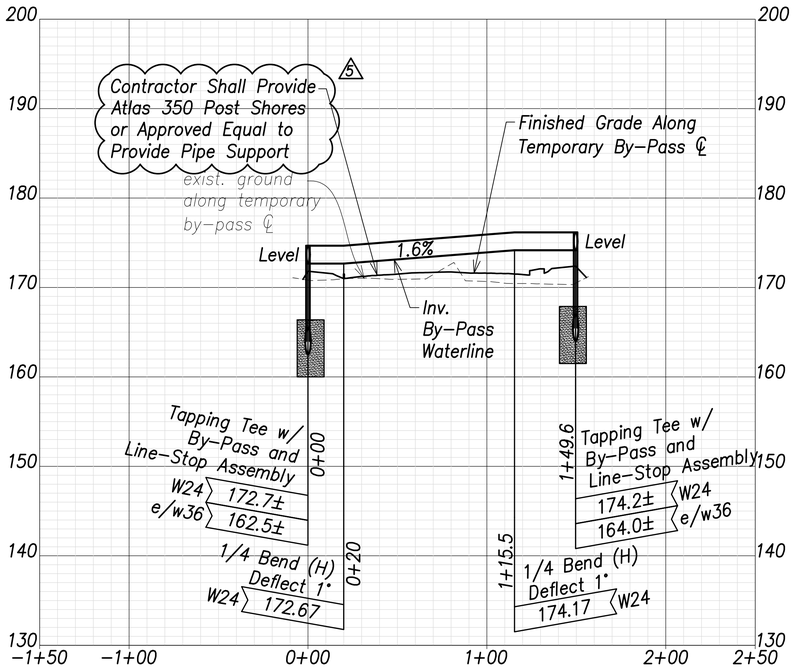
Scale: 1" = 40'

(A) ℄ Sta. 108+49.6, o/s 13' Rt. Farrington Highway
=℄ Sta. 0+00 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

(B) ℄ Sta. 108+49.1, o/s 34.1' Rt. Farrington Highway
=℄ Sta. 0+20 By–Pass
1–24" 1/4 Bend 5

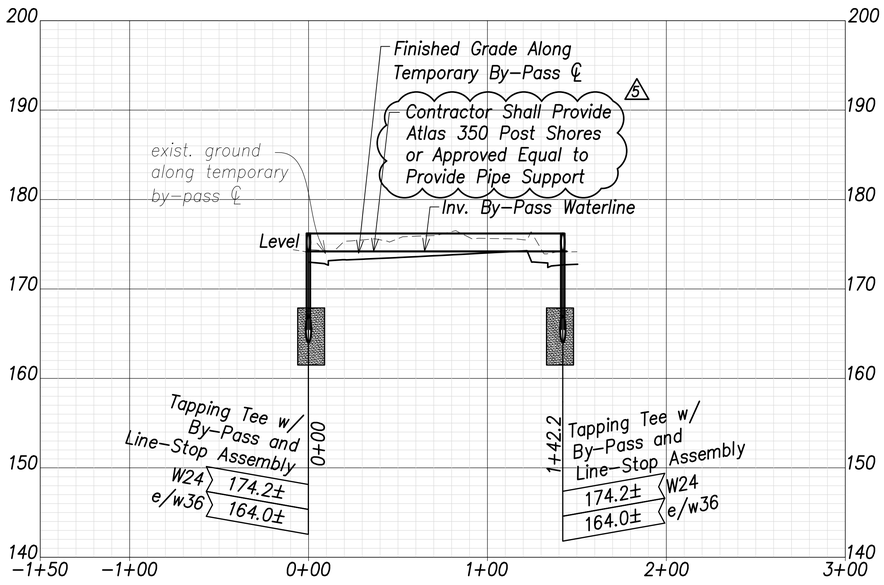
(C) ℄ Sta. 109+51.2, o/s 35.6' Rt. Farrington Highway
=℄ Sta. 1+22.15 By–Pass
1–24" 1/4 Bend 5

(D) ℄ Sta. 109+51.5, o/s 15.6' Rt. Farrington Highway
=℄ Sta. 1+42.15 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)



Temporary Waterline By–Pass 5 Profile

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'



Temporary Waterline By–Pass 6 Profile

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Notes:

1. Contractor shall provide mechanical joint pipes and fittings with retainer glands and/or flanged pipes and fittings to construct the temporary by–passes
2. The Contractor shall submit the construction schedule and construction phasing for the temporary by–passes to BWS for review and approval. The Contractor shall not commence work on the temporary by–passes until approval is obtained by BWS.
3. Contractor to probe and layout manhole and bypass block prior to block construction. 5

APPROVED:

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

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

CRAIG W. I. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 Revised callouts; added note
06/08/22	2 Revised By–Pass Alignment & Profile

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Waterline Connection and Temporary By–Pass – 3

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

Scale: As Shown — Date: April 2022

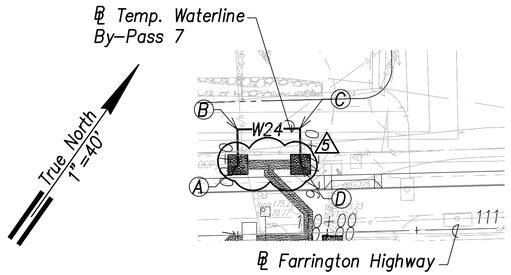
SHEET No. C-170 OF 767 SHEETS

ADD. 171

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

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-170 Waterline Connection and Temporary By-Pass – 3.dwg saved July 14, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	172	767



Temporary Waterline By–Pass 7 Plan
(℄ Sta. 109+68.3 Farrington Highway)

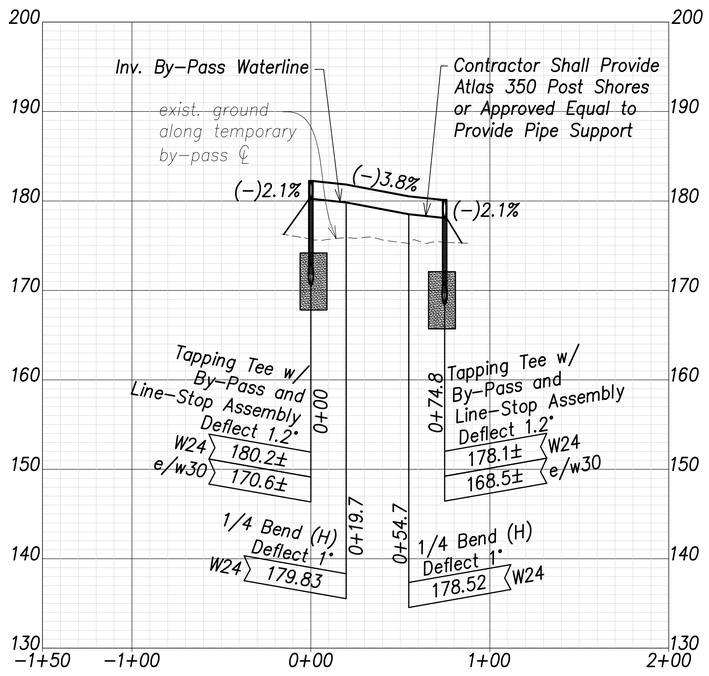
Scale: 1" = 40' 5

Ⓐ
℄ Sta. 109+51.1, o/s 39.3' Lt. Farrington Highway
=℄ Sta. 0+00 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

Ⓑ
℄ Sta. 109+51.3, o/s 59' Lt. Farrington Highway
=℄ Sta. 0+19.7 By–Pass
1–24" 1/4 Bend, Fl. 5

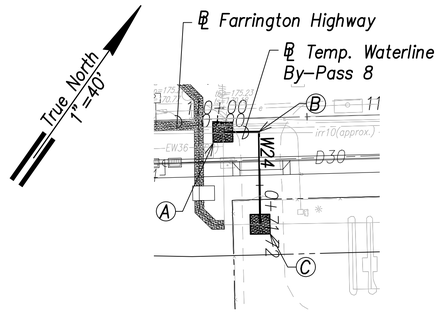
Ⓒ
℄ Sta. 109+86.3, o/s 58.6' Lt. Farrington Highway
=℄ Sta. 0+35 By–Pass
1–24" 1/4 Bend, Fl. 5

Ⓓ
℄ Sta. 109+86.1, o/s 38.5' Lt. Farrington Highway
=℄ Sta. 0+74.8 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)



Temporary Waterline By–Pass 7 Profile

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'



Temporary Waterline By–Pass 8 Plan
(℄ Sta. 110+02.3 Farrington Highway)

Scale: 1" = 40'

Ⓐ
℄ Sta. 110+02.9, o/s 7.4' Rt. Farrington Highway
=℄ Sta. 0+00 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

Ⓑ
℄ Sta. 110+22.9, o/s 7.7' Rt. Farrington Highway
=℄ Sta. 0+20 By–Pass
1–24" 1/4 Bend, Fl. 5

Ⓒ
℄ Sta. 110+22.3, o/s 59.4' Rt. Farrington Highway
=℄ Sta. 0+71.7 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

Temporary Waterline By–Pass 8 Profile

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Notes:

1. Contractor shall provide mechanical joint pipes and fittings with retainer glands and/or flanged pipes and fittings to construct the temporary by–passes
2. The Contractor shall submit the construction schedule and construction phasing for the temporary by–passes to BWS for review and approval. The Contractor shall not commence work on the temporary by–passes until approval is obtained by BWS.

5

Schedule Note:
The construction working period for Temporary By–Passes 7 and 8 shall be limited to November to February, as approved by BWS.

5

07/15/22	5 Revised callouts; added notes
06/08/22	2 Revised By–Pass Alignment & Profile
DATE	REVISION

APPROVED:

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

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Waterline Connection and Temporary By–Pass – 4

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

Scale: As Shown Date: April 2022

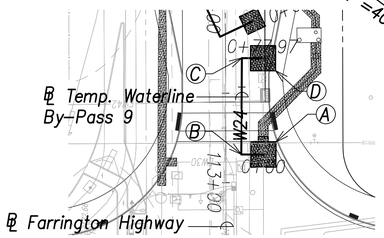
SHEET No. C-171 OF 767 SHEETS

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

FILE: \\PWIC-FS\1project\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-171 Waterline Connection and Temporary By-Pass – 4.dwg saved July 20, 2022

ADD. 172

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	173	767



Temporary Waterline By–Pass 9 Plan (℄ Sta. 113+32.7 Farrington Highway)

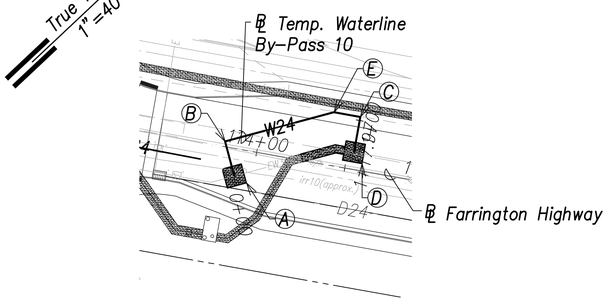
Scale: 1" = 40'

Ⓐ
℄ Sta. 113+15.6, o/s 21' Rt. Farrington Highway
=℄ Sta. 0+00 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

Ⓑ
℄ Sta. 113+15.8, o/s 8.7' Rt. Farrington Highway
=℄ Sta. 0+12.3 By–Pass
1–24" 1/4 Bend

Ⓒ
℄ Sta. 113+69.6, o/s 9.2' Rt. Farrington Highway
=℄ Sta. 0+66.2 By–Pass
1–24" 1/4 Bend

Ⓓ
℄ Sta. 113+69.5, o/s 20.9' Rt. Farrington Highway
=℄ Sta. 0+78 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)



Temporary Waterline By–Pass 10 Plan (℄ Sta. 114+09 Farrington Highway)

Scale: 1" = 40'

Ⓐ
℄ Sta. 113+90.1, o/s 15.2' Lt. Farrington Highway
=℄ Sta. 0+00 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

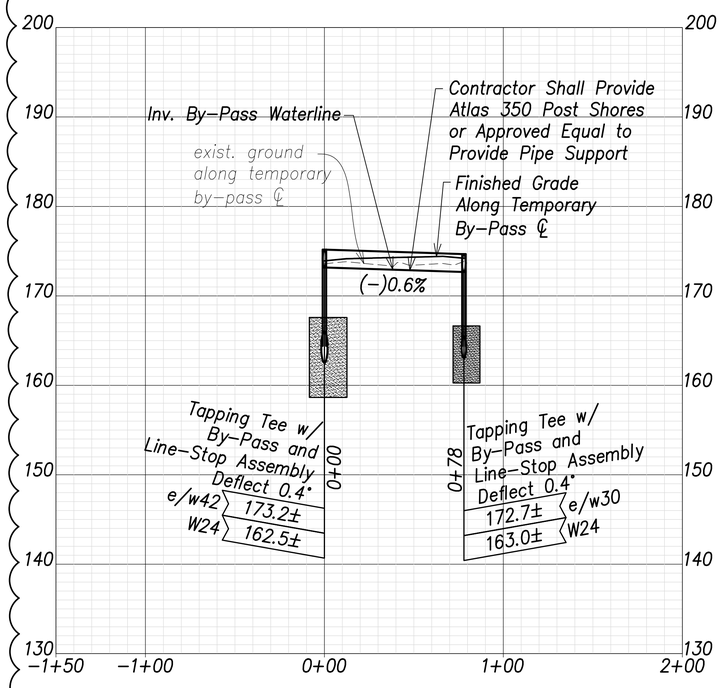
Ⓑ
℄ Sta. 113+81.6, o/s 3' Lt. Farrington Highway
=℄ Sta. 0+20 By–Pass
1–24" 1/4 Bend

Ⓒ
℄ Sta. 114+53.6, o/s 29.7' Lt. Farrington Highway
=℄ Sta. 0+98 By–Pass
1–24" 1/4 Bend

Ⓓ
℄ Sta. 114+53.6, o/s 9.7' Lt. Farrington Highway
=℄ Sta. 1+18 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

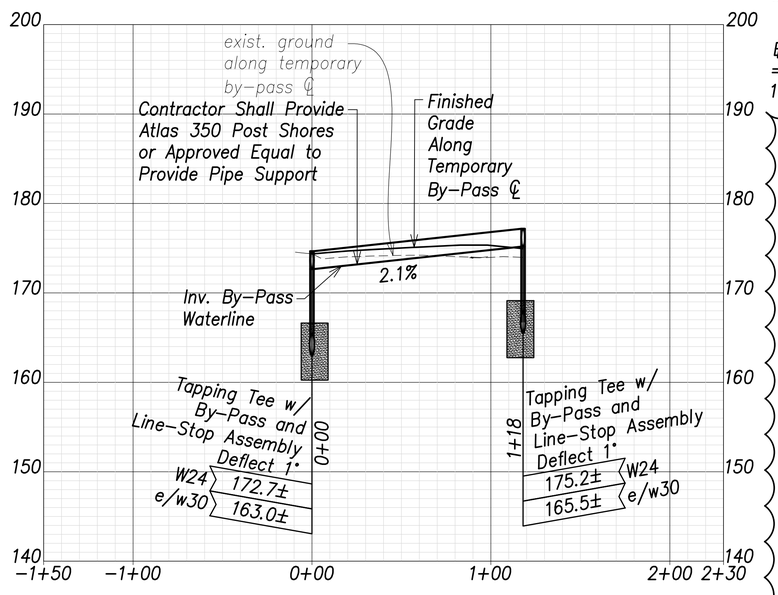
Ⓔ
℄ Sta. 114+38.6, o/s 29.7' Lt. Farrington Highway
=℄ Sta. 0+83 By–Pass
1–24" 1/8 Bend

5



Temporary Waterline By–Pass 9 Profile

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'



Temporary Waterline By–Pass 10 Profile

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Notes:

1. Contractor shall provide mechanical joint pipes and fittings with retainer glands and/or flanged pipes and fittings to construct the temporary by–passes
2. The Contractor shall submit the construction schedule and construction phasing for the temporary by–passes to BWS for review and approval. The Contractor shall not commence work on the temporary by–passes until approval is obtained by BWS.

5

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

APPROVED:

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

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 Revised By–Passes; Added note

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Waterline Connection and Temporary By–Pass – 5

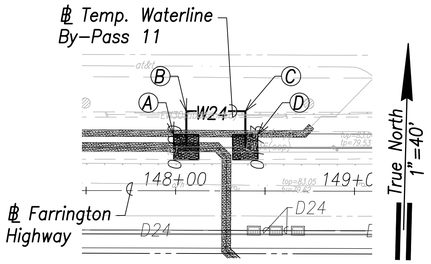
FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

Scale: As Shown — Date: April 2022

SHEET No. C-172 OF 767 SHEETS

ADD. 173

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	174	767



Temporary Waterline By–Pass 11 Plan (℄ Sta. 148+22.9 Farrington Highway)

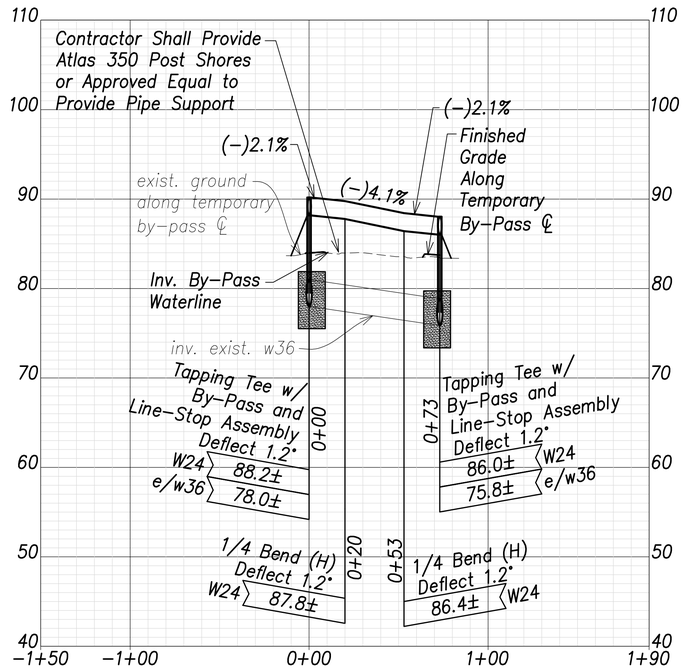
Scale: 1" = 40'

Ⓐ
℄ Sta. 148+05.9, o/s 24.4' Lt. Farrington Highway
=℄ Sta. 0+00 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

Ⓑ
℄ Sta. 148+05.9, o/s 44.4' Lt. Farrington Highway
=℄ Sta. 0+20 By–Pass
1–24" 1/4 Bend
5

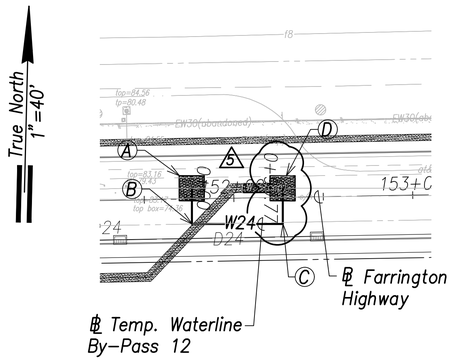
Ⓒ
℄ Sta. 148+38.9, o/s 44.5' Lt. Farrington Highway
=℄ Sta. 0+53 By–Pass
1–24" 1/4 Bend
5

Ⓓ
℄ Sta. 148+38.9, o/s 24.5' Lt. Farrington Highway
=℄ Sta. 0+73 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)



Temporary Waterline By–Pass 11 Profile

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'



Temporary Waterline By–Pass 12 Plan (℄ Sta. 152+05.6 Farrington Highway)

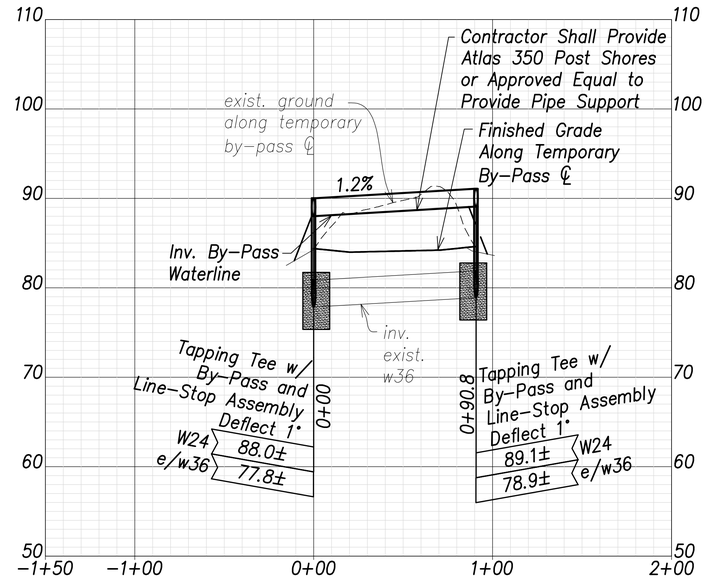
Scale: 1" = 40'

Ⓐ
℄ Sta. 151+76.7, o/s 6.1' Lt. Farrington Highway
=℄ Sta. 0+00 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

Ⓑ
℄ Sta. 157+76.3, o/s 14' Rt. Farrington Highway
=℄ Sta. 0+20 By–Pass
1–24" 1/4 Bend

Ⓒ
℄ Sta. 152+27.1, o/s 14.8' Rt. Farrington Highway
=℄ Sta. 0+65.8 By–Pass
1–24" 1/4 Bend

Ⓓ
℄ Sta. 152+27.5, o/s 5.2' Lt. Farrington Highway
=℄ Sta. 0+90.8 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)
5



Temporary Waterline By–Pass 12 Profile

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Notes:

1. Contractor shall provide mechanical joint pipes and fittings with retainer glands and/or flanged pipes and fittings to construct the temporary by–passes
2. The Contractor shall submit the construction schedule and construction phasing for the temporary by–passes to BWS for review and approval. The Contractor shall not commence work on the temporary by–passes until approval is obtained by BWS.

5

DATE	REVISION
07/15/22	5 Revised callouts; added note; Revised Temp. Bypass 12 layout
06/08/22	2 Revised By–Pass Alignment & Profile

APPROVED:

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

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Waterline Connection and Temporary By–Pass – 6

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

Scale: As Shown Date: April 2022

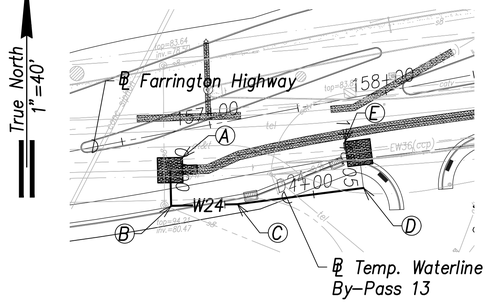
SHEET No. C-173 OF 767 SHEETS

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

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-173 Waterline Connection and Temporary By-Pass - 6.dwg saved July 19, 2022

ADD. 174

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	175	767



Temporary Waterline By-Pass 13 Plan (Ⓑ Sta. 156+94.2 Farrington Highway)

Scale: 1" = 40'

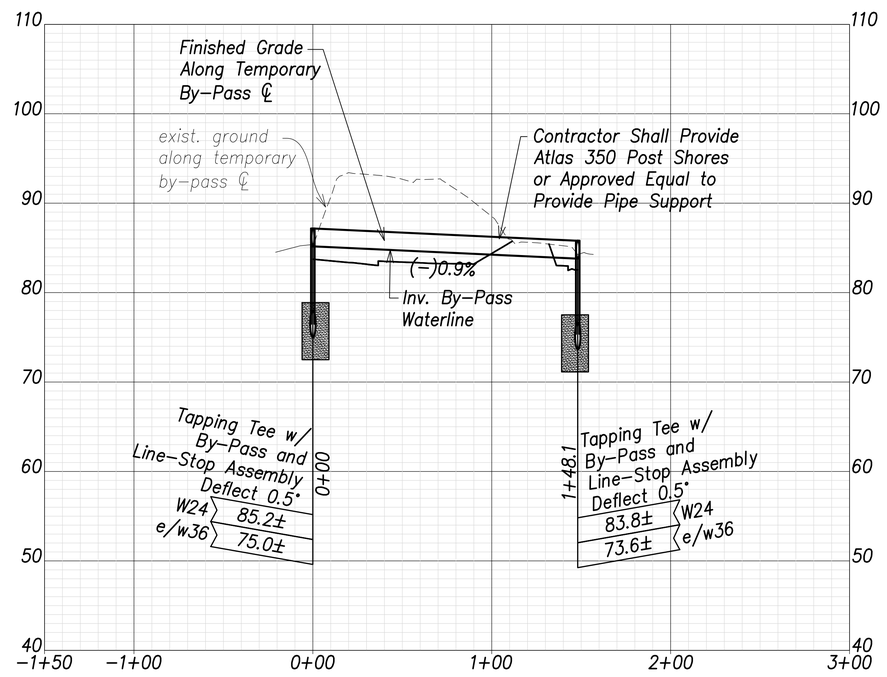
Ⓐ
Ⓑ Sta. 156+73.5, o/s 20.7' Rt. Farrington Highway
=Ⓑ Sta. 0+00 By-Pass
Temporary By-Pass Connection
See Detail Shts. C-208 to C-211 (Typ.)

Ⓑ
Ⓑ Sta. 156+70.2, o/s 40.4' Rt. Farrington Highway
=Ⓑ Sta. 0+20 By-Pass
1-24" 1/4 Bend
5

Ⓒ
Ⓑ Sta. 157+06.7, o/s 46.5' Rt. Farrington Highway
=Ⓑ Sta. 0+57 By-Pass
1-24" 1/16 Bend
5

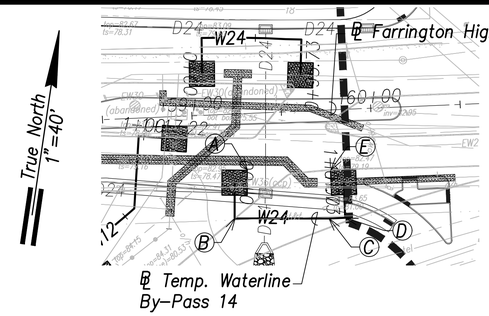
Ⓓ
Ⓑ Sta. 157+77.6, o/s 50.8' Rt. Farrington Highway
=Ⓑ Sta. 1+28.1 By-Pass
1-24" 1/4 Bend
5

Ⓔ
Ⓑ Sta. 157+78.8, o/s 30.8' Rt. Farrington Highway
=Ⓑ Sta. 1+48.1 By-Pass
Temporary By-Pass Connection
See Detail Shts. C-208 to C-211 (Typ.)



Temporary Waterline By-Pass 13 Profile

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'



Temporary Waterline By-Pass 14 Plan (Ⓑ Sta. 159+62.3 Farrington Highway)

Scale: 1" = 40'

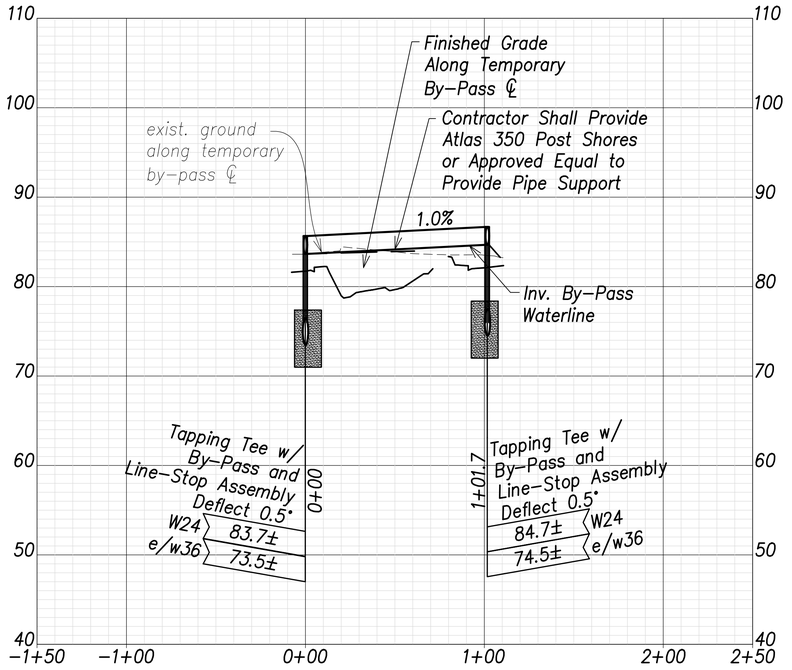
Ⓐ
Ⓑ Sta. 159+22.3, o/s 38.3' Rt. Farrington Highway
=Ⓑ Sta. 0+00 By-Pass
Temporary By-Pass Connection
See Detail Shts. C-208 to C-211 (Typ.)

Ⓑ
Ⓑ Sta. 159+21.5, o/s 58.3' Rt. Farrington Highway
=Ⓑ Sta. 0+20 By-Pass
1-24" 1/4 Bend
5

Ⓒ
Ⓑ Sta. 159+73.9, o/s 60.5' Rt. Farrington Highway
=Ⓑ Sta. 0+72.5 By-Pass
1-24" Deflection
5

Ⓓ
Ⓑ Sta. 159+83.2, o/s 60.5' Rt. Farrington Highway
=Ⓑ Sta. 0+81.7 By-Pass
1-24" 1/4 Bend
5

Ⓔ
Ⓑ Sta. 159+83.2, o/s 40.5' Rt. Farrington Highway
=Ⓑ Sta. 1+01.7 By-Pass
Temporary By-Pass Connection
See Detail Shts. C-208 to C-211 (Typ.)



Temporary Waterline By-Pass 14 Profile

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Notes:

1. Contractor shall provide mechanical joint pipes and fittings with retainer glands and/or flanged pipes and fittings to construct the temporary by-passes
2. The Contractor shall submit the construction schedule and construction phasing for the temporary by-passes to BWS for review and approval. The Contractor shall not commence work on the temporary by-passes until approval is obtained by BWS. 5

07/15/22	5 Revised callouts; added note
06/08/22	2 Revised By-Pass Alignment & Profile
DATE	REVISION

APPROVED:

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

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Waterline Connection and Temporary By-Pass - 7

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. C-174 OF 767 SHEETS

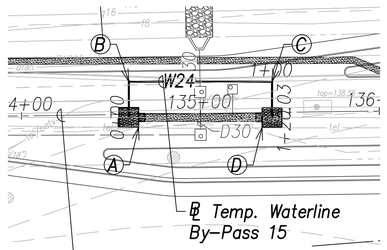
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
NOTE BOOK | No.

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-174 Waterline Connection and Temporary By-Pass - 7.dwg saved July 14, 2022

ADD. 175

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	176	767

True North
1"=40'



Temporary Waterline By–Pass 15 Plan (℄ Sta. 134+75 Farrington Highway) (℄ Sta. 135+24.9 Farrington Highway)

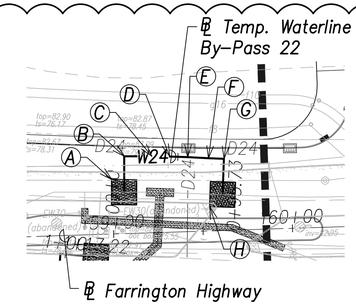
Scale: 1" = 40'

Ⓐ
℄ Sta. 134+60, o/s 1.7' Rt. Farrington Highway
=℄ Sta. 0+00 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

Ⓑ
℄ Sta. 134+60.3, o/s 18.3' Lt. Farrington Highway
=℄ Sta. 0+20 By–Pass
1–24" 1/4 Bend
△5

Ⓒ
℄ Sta. 135+40.3, o/s 17.2' Lt. Farrington Highway
=℄ Sta. 1+00 By–Pass
1–24" 1/4 Bend
△5

Ⓓ
℄ Sta. 135+40, o/s 2.8' Rt. Farrington Highway
=℄ Sta. 1+20 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)



Temporary Waterline By–Pass 22 Plan (℄ Sta. 150+07.3 Farrington Highway) (℄ Sta. 159+61.6 Farrington Highway)

Scale: 1" = 40'

Ⓐ
℄ Sta. 159+06.7, o/s 2.3' Lt. Farrington Highway
=℄ Sta. 0+00 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

Ⓑ
℄ Sta. 159+07.3, o/s 43.3' Lt. Farrington Highway
=℄ Sta. 0+20 By–Pass
1–12" 1/4 Bend

Ⓒ
℄ Sta. 159+22.7, o/s 42.7' Lt. Farrington Highway
=℄ Sta. 0+35.3 By–Pass
1–12" Deflection

Ⓓ
℄ Sta. 159+32.6, o/s 42.3' Lt. Farrington Highway
=℄ Sta. 0+45.3 By–Pass
1–12" Deflection

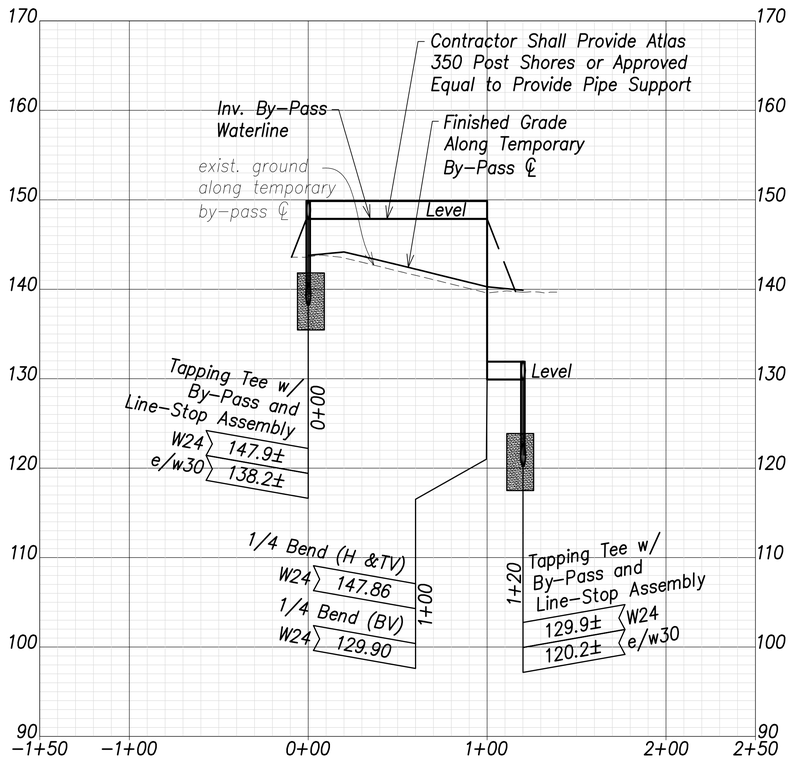
Ⓔ
℄ Sta. 159+42.6, o/s 41.6' Lt. Farrington Highway
=℄ Sta. 0+55.3 By–Pass
1–12" Deflection

Ⓕ
℄ Sta. 159+54.2, o/s 40.6' Lt. Farrington Highway
=℄ Sta. 0+67.0 By–Pass
1–12" Deflection

Ⓖ
℄ Sta. 159+62.9, o/s 40.0' Lt. Farrington Highway
=℄ Sta. 0+75.7 By–Pass
1–12" 1/4 Bend

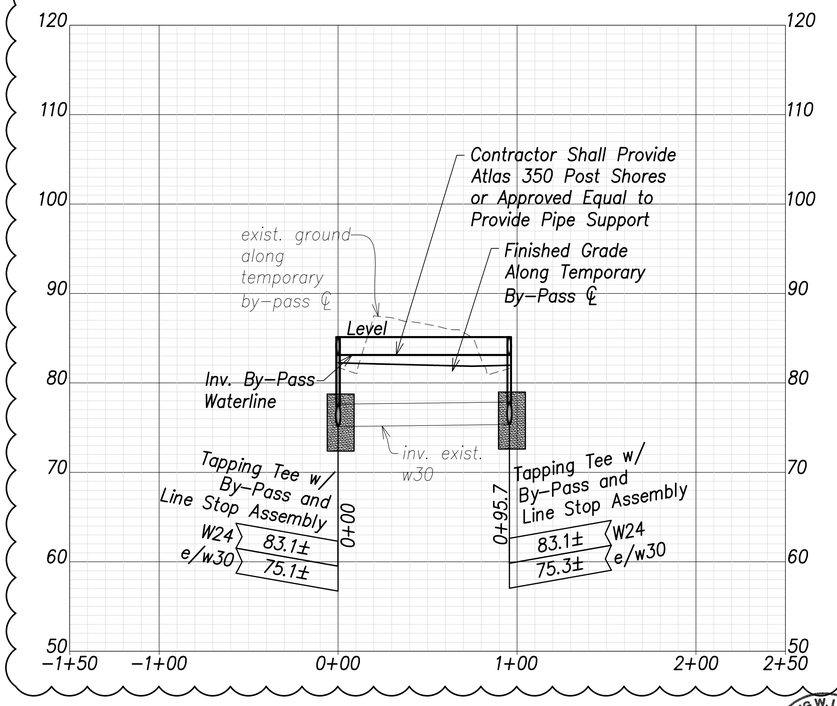
Ⓗ
℄ Sta. 159+73.6, o/s 19.3' Lt. Farrington Highway
=℄ Sta. 0+95.7 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

△5



Temporary Waterline By–Pass 15 Profile

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'



Notes:

1. Contractor shall provide mechanical joint pipes and fittings with retainer glands and/or flanged pipes and fittings to construct the temporary by–passes
2. The Contractor shall submit the construction schedule and construction phasing for the temporary by–passes to BWS for review and approval. The Contractor shall not commence work on the temporary by–passes until approval is obtained by BWS.

△5

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

APPROVED:

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

DATE	REVISION
07/15/22	△5 Revised callouts; added note
06/08/22	△2 Revised By–Pass Alignment & Profile

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Waterline Connection and Temporary By–Pass – 8

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

Scale: As Shown Date: April 2022

SHEET No. C-175 OF 767 SHEETS

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

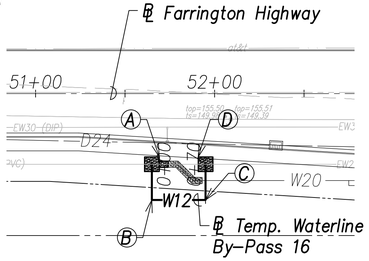
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | NOTE BOOK | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE | No.

ADD. 176

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-175 Waterline Connection and Temporary By-Pass - 8.dwg saved July 18, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	177	767

True North
1" =40'



Temporary Waterline By–Pass 16 Plan (℄ Sta. 51+79 Farrington Highway)

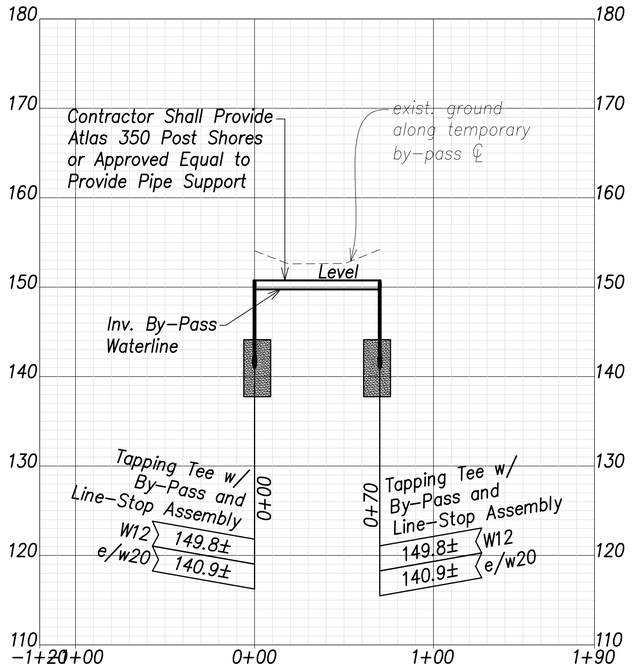
Scale: 1" = 40'

Ⓐ
℄ Sta. 51+65, o/s 39.4' Rt. Farrington Highway
=℄ Sta. 0+00 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

Ⓑ
℄ Sta. 51+65, o/s 59.4' Rt. Farrington Highway
=℄ Sta. 0+20 By–Pass
1–12" 1/4 Bend
5

Ⓒ
℄ Sta. 51+95, o/s 59.4' Rt. Farrington Highway
=℄ Sta. 0+50 By–Pass
1–12" 1/4 Bend
5

Ⓓ
℄ Sta. 51+95, o/s 39.4' Rt. Farrington Highway
=℄ Sta. 0+70 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

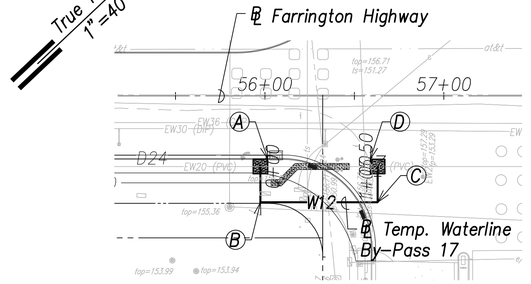


Temporary Waterline By–Pass 16 Profile

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Schedule Note:
The construction working period for Temporary By–Passes 16 and 17 shall be limited to November to February, as approved by BWS.
5

True North
1" =40'



Temporary Waterline By–Pass 17 Plan (℄ Sta. 56+37 Farrington Highway)

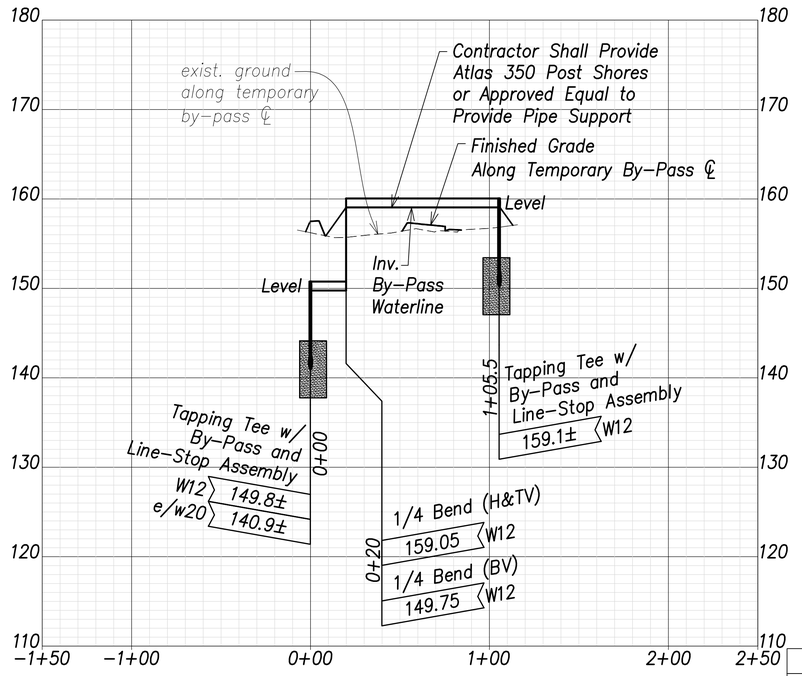
Scale: 1" = 40'

Ⓐ
℄ Sta. 55+97.5, o/s 39.4' Rt. Farrington Highway
=℄ Sta. 0+00 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

Ⓑ
℄ Sta. 55+97.5, o/s 59.4' Rt. Farrington Highway
=℄ Sta. 0+20 By–Pass
1–12" 1/4 Bend
5

Ⓒ
℄ Sta. 56+63, o/s 59.4' Rt. Farrington Highway
=℄ Sta. 0+85.5 By–Pass
1–12" 1/4 Bend
5

Ⓓ
℄ Sta. 56+63, o/s 39.4' Rt. Farrington Highway
=℄ Sta. 1+05.5 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)



Temporary Waterline By–Pass 17 Profile

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Notes:
1. Contractor shall provide mechanical joint pipes and fittings with retainer glands and/or flanged pipes and fittings to construct the temporary by–passes
2. The Contractor shall submit the construction schedule and construction phasing for the temporary by–passes to BWS for review and approval. The Contractor shall not commence work on the temporary by–passes until approval is obtained by BWS.

5

APPROVED:

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

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 Revised callouts; added notes

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Waterline Connection and Temporary By–Pass – 9

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

Scale: As Shown — Date: April 2022

SHEET No. C-176 OF 767 SHEETS

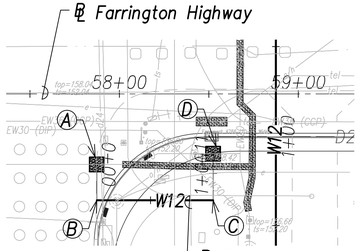
ADD. 177

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

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-176 Waterline Connection and Temporary By-Pass – 9.dwg saved July 20, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	178	767

True North
1"=40'



Temporary Waterline By–Pass 18 Plan (℄ Sta. 58+67.5 Farrington Highway) (℄ Sta. 58+70.7 Farrington Highway)

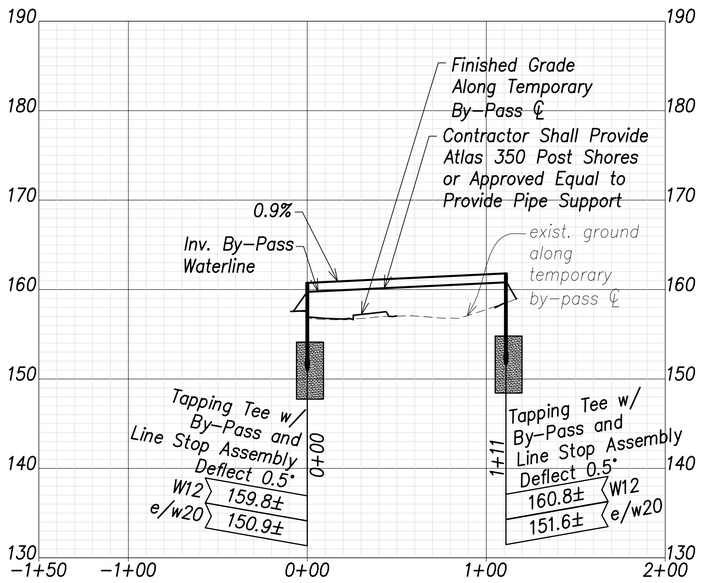
Scale: 1" = 40'

Ⓐ
℄ Sta. 57+87.4, o/s 39.4' Rt. Farrington Highway
=℄ Sta. 0+00 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

Ⓑ
℄ Sta. 58+20.2, o/s 55.7' Rt. Farrington Highway
=℄ Sta. 0+20 By–Pass
1–12" 1/4 Bend
5

Ⓒ
℄ Sta. 58+52.4, o/s 59.4' Rt. Farrington Highway
=℄ Sta. 0+65 By–Pass
1–12" 1/4 Bend
5

Ⓓ
℄ Sta. 58+52.4, o/s 33.4' Rt. Farrington Highway
=℄ Sta. 1+11 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

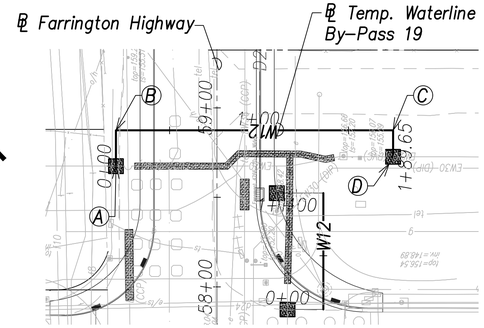


Temporary Waterline By–Pass 18 Profile

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Schedule Note:
The construction working period for Temporary By–Passes 18 and 19 shall be limited to November to February, as approved by BWS.
5

True North
1"=40'



Temporary Waterline By–Pass 19 Plan (℄ Sta. 58+32.4 Farrington Highway)

Scale: 1" = 40'

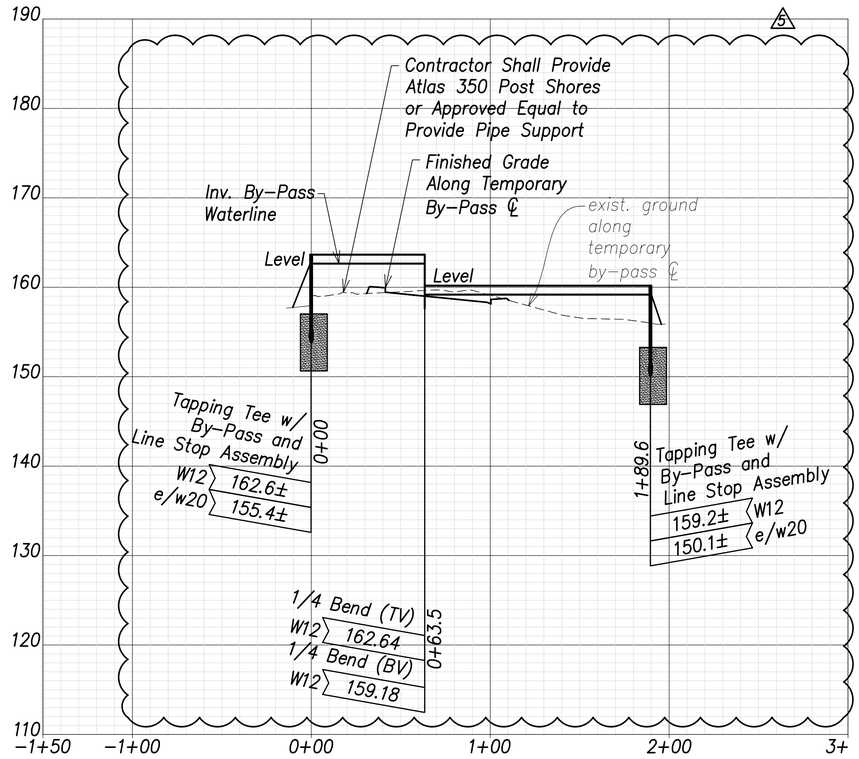
Ⓐ
℄ Sta. 58+67.5, o/s 56.5' Lt.
Farrington Highway
=℄ Sta. 0+00 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

Ⓑ
℄ Sta. 58+87.5, o/s 56.5' Lt.
Farrington Highway
=℄ Sta. 0+20 By–Pass
1–12" 1/4 Bend

Ⓒ
℄ Sta. 58+87.5, o/s 98.4' Rt.
Farrington Highway
=℄ Sta. 1+74.9 By–Pass
1–12" 1/4 Bend

Ⓓ
℄ Sta. 58+72.7, o/s 98.4' Rt.
Farrington Highway
=℄ Sta. 1+89.7 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

5



Temporary Waterline By–Pass 19 Profile

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Notes:
1. Contractor shall provide mechanical joint pipes and fittings with retainer glands and/or flanged pipes and fittings to construct the temporary by–passes
2. The Contractor shall submit the construction schedule and construction phasing for the temporary by–passes to BWS for review and approval. The Contractor shall not commence work on the temporary by–passes until approval is obtained by BWS.

5

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

APPROVED:

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

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 Revised callouts; Added notes; Revised by–pass

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Waterline Connection and Temporary By–Pass – 10

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

Scale: As Shown — Date: April 2022

SHEET No. C-177 OF 767 SHEETS

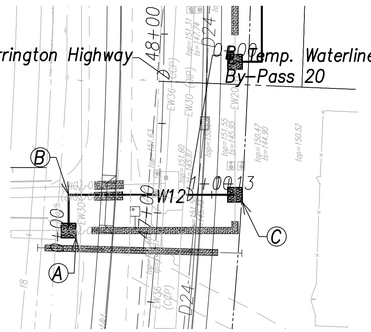
ADD. 178

FILE: K:\Civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C–177 Waterline Connection and Temporary By–Pass – 10.dwg saved July 20, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	179	767

True North
1"=40'

℄ Farrington Highway
℄ Temp. Waterline By–Pass 20



Temporary Waterline By–Pass 20 Plan
(℄ Sta. 46+87.6 Farrington Highway)
(℄ Sta. 46+92.8 Farrington Highway)

Scale: 1" = 40'

Ⓐ
℄ Sta. 46+63.0, o/s 41.5' Lt. Farrington Highway
=℄ Sta. 0+00 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

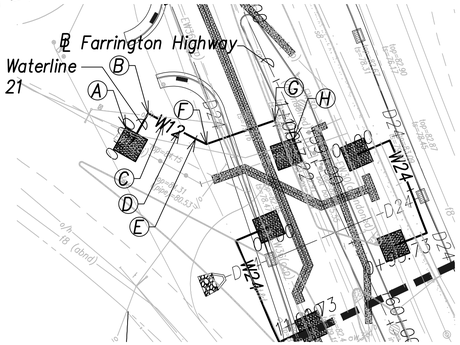
Ⓑ
℄ Sta. 47+07.2, o/s 50.3' Lt. Farrington Highway
=℄ Sta. 0+20 By–Pass
1–24" 1/4 Bend

Ⓒ
℄ Sta. 47+12.5, o/s 42.6' Rt. Farrington Highway
=℄ Sta. 1+13 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

Notes:
1. Contractor shall provide mechanical joint pipes and fittings with retainer glands and/or flanged pipes and fittings to construct the temporary by–passes

True North
1"=40'

℄ Farrington Highway
℄ Temp. Waterline By–Pass 21



Temporary Waterline By–Pass 21 Plan
(℄ Sta. 158+47.9 Farrington Highway)
(℄ Sta. 158+89.8 Farrington Highway)

Scale: 1" = 40'

Ⓐ
℄ Sta. 158+47.9, o/s 88.7' Rt.
Farrington Highway
=℄ Sta. 0+00 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

Ⓑ
℄ Sta. 158+36.2, o/s 72.5' Rt.
Farrington Highway
=℄ Sta. 0+20 By–Pass
1–12" 1/4 Bend

Ⓒ
℄ Sta. 158+44.4, o/s 66.6' Rt.
Farrington Highway
=℄ Sta. 0+30 By–Pass
1–12" Deflection

Ⓓ
℄ Sta. 158+60.4, o/s 54.6' Rt.
Farrington Highway
=℄ Sta. 0+40 By–Pass
1–12" Deflection

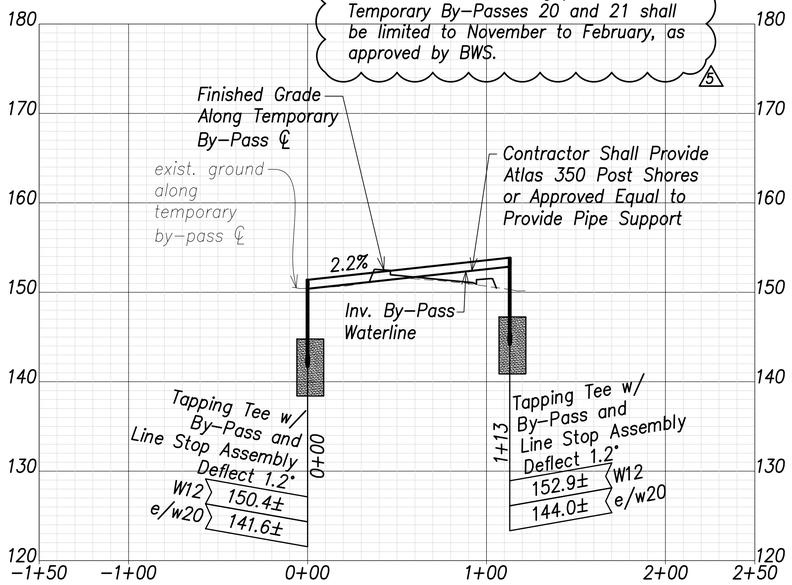
Ⓔ
℄ Sta. 158+52.4, o/s 60.7' Rt.
Farrington Highway
=℄ Sta. 0+50 By–Pass
1–12" 1/8 Bend

Ⓕ
℄ Sta. 158+65.7, o/s 50.4' Rt.
Farrington Highway
=℄ Sta. 0+50 By–Pass
1–12" Deflection

Ⓖ
℄ Sta. 158+69.9, o/s 10.2' Rt.
Farrington Highway
=℄ Sta. 0+97.2 By–Pass
1–12" 1/4 Bend

Ⓗ
℄ Sta. 158+89.8, o/s 12.3' Rt.
Farrington Highway
=℄ Sta. 1+17.2 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

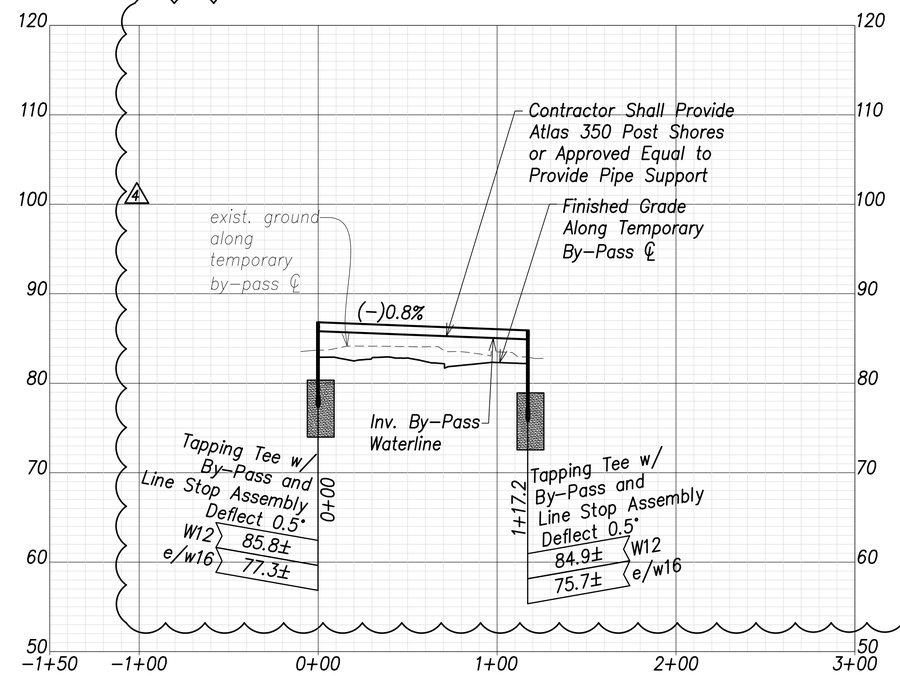
Schedule Note:
The construction working period for Temporary By–Passes 20 and 21 shall be limited to November to February, as approved by BWS.



Temporary Waterline By–Pass 20 Profile

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Notes:
2. The Contractor shall submit the construction schedule and construction phasing for the temporary by–passes to BWS for review and approval. The Contractor shall not commence work on the temporary by–passes until approval is obtained by BWS.



Temporary Waterline By–Pass 21 Profile

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

APPROVED:

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

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 Revised callouts; added note

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Waterline Connection and Temporary By–Pass – 11

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

Scale: As Shown — Date: April 2022

SHEET No. C-178 OF 767 SHEETS

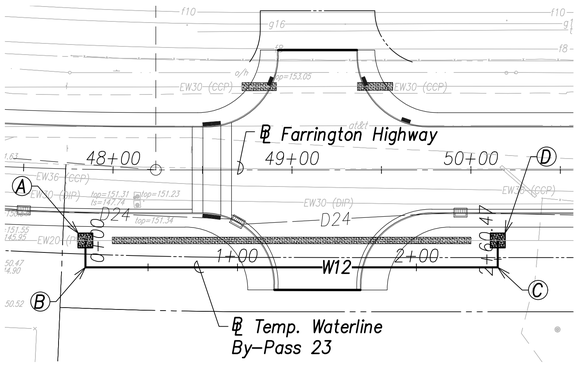
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
NOTE BOOK | No.

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-178 Waterline Connection and Temporary By-Pass – 11.dwg saved July 20, 2022

ADD. 179

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	180S-1	767

True North
1" =40'



Temporary Waterline By–Pass 23 Plan (℄ Sta. 47+85.3 Farrington Highway) (℄ Sta. 50+15 Farrington Highway)

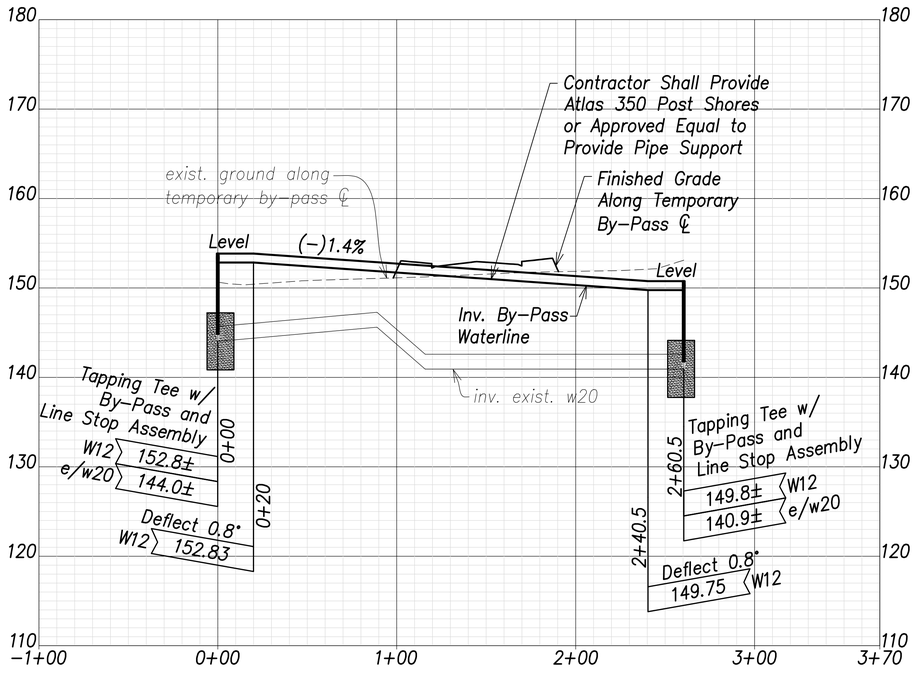
Scale: 1" = 40'

Ⓐ
℄ Sta. 47+85.3, o/s 39.8' Rt. Farrington Highway
=℄ Sta. 0+00 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)

Ⓑ
℄ Sta. 47+85.6, o/s 54.8' Rt. Farrington Highway
=℄ Sta. 0+15 By–Pass
1–12" 1/4 Bend, Fl.

Ⓒ
℄ Sta. 51+15, o/s 54.4' Rt. Farrington Highway
=℄ Sta. 2+45.5 By–Pass
1–12" 1/4 Bend, Fl.

Ⓓ
℄ Sta. 50+15, o/s 39.4' Rt. Farrington Highway
=℄ Sta. 2+60.5 By–Pass
Temporary By–Pass Connection
See Detail Shts. C–208 to C–211 (Typ.)



Temporary Waterline By–Pass 23 Profile

Scale: 1" = 40'

Schedule Note:
The construction working period for Temporary By–Pass 23 shall be limited to November to February, as approved by BWS.

APPROVED:	
Manager and Chief Engineer, BWS (for work affecting BWS facilities State R/W & BWS easements only)	DATE

Graphic Scales:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

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

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

07/15/22	5 New Sheet
DATE	REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Waterline Connection and Temporary By–Pass – 12

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

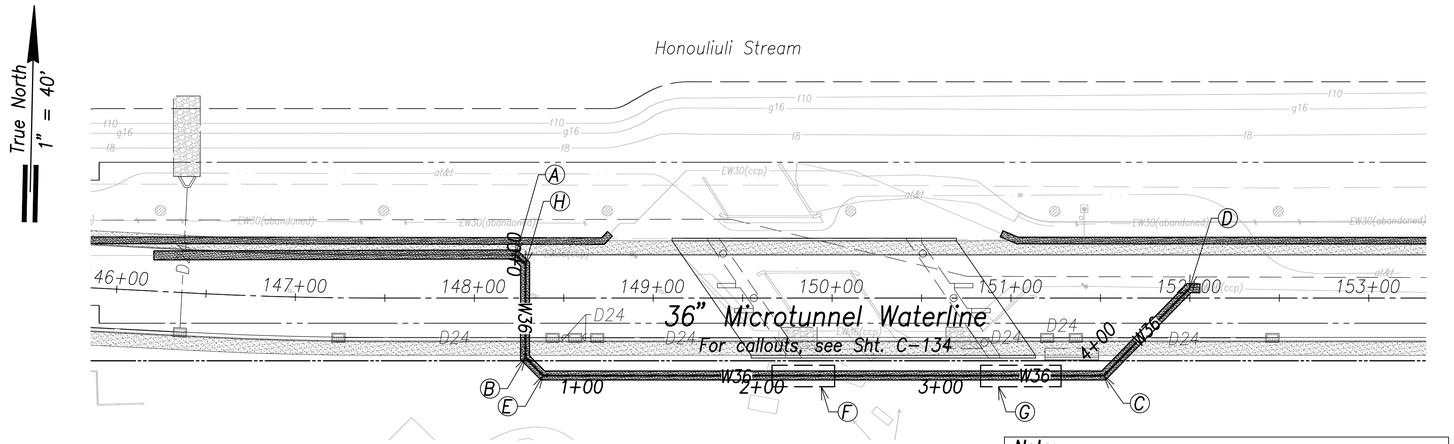
Scale: As Shown Date: April 2022

SHEET No. C-179 OF 767 SHEETS

ADD. 180S–1

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C–179 Waterline Connection and Temporary By–Pass – 12.dwg saved July 20, 2022

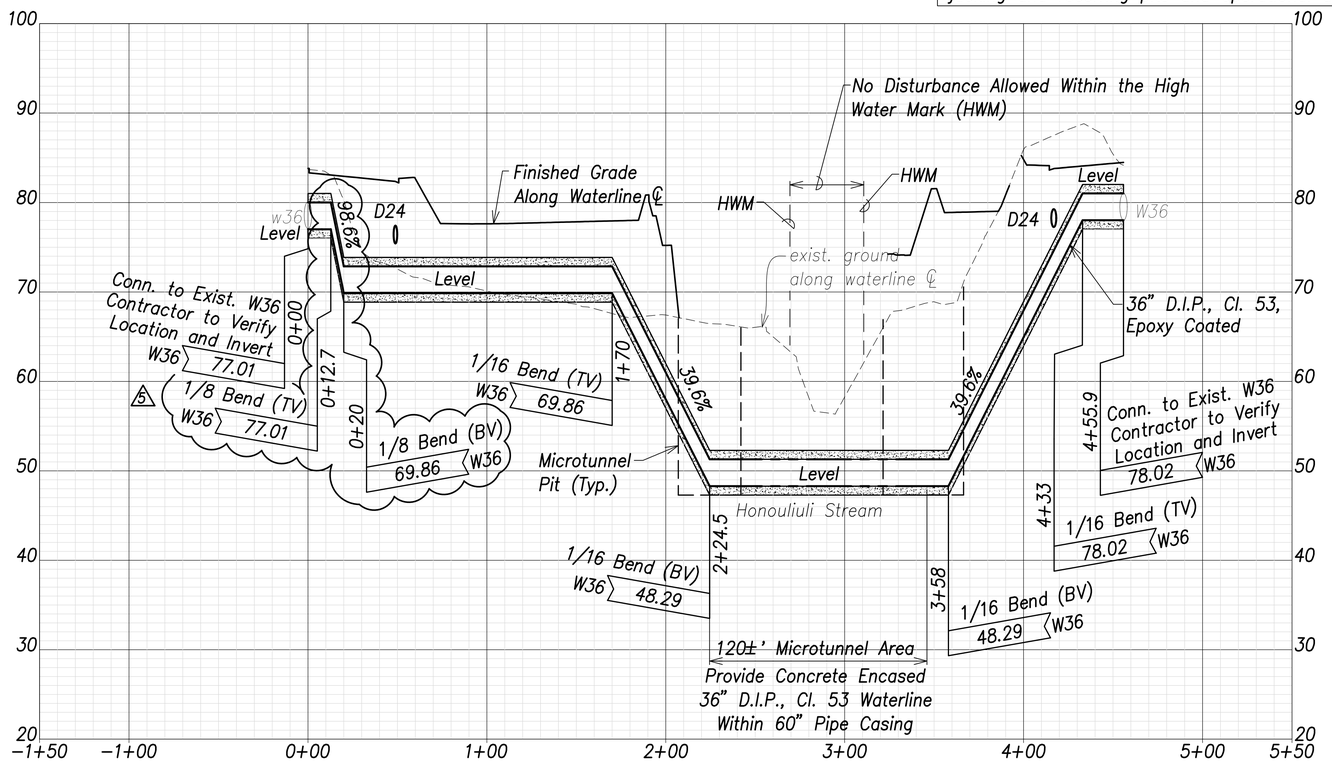
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	182	767



36" Waterline Microtunneling Plan

Scale: 1" = 40'

Note:
Contractor shall be responsible for the design, construction, maintenance, and restoration of the jacking and receiving pits and operational areas



36" Waterline Microtunneling Profile

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

Ⓐ
℄ Sta. 0+00 36" Microtunnel Waterline
= ℄ Sta. 148+22.9, o/s 24.5' Lt. Farrington Highway
Open Trench

Ⓑ
℄ Sta. 0+60 36" Microtunnel Waterline
= ℄ Sta. 148+28.3, o/s 33.2' Rt. Farrington Highway
Open Trench

Ⓒ
℄ Sta. 3+87.5 36" Microtunnel Waterline
= ℄ Sta. 151+51.7, o/s 43.2' Rt. Farrington Highway
Open Trench

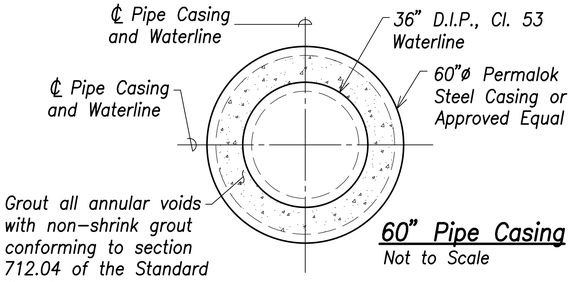
Ⓓ
℄ Sta. 4+55.9 36" Microtunnel Waterline
= ℄ Sta. 152+05.6, o/s 5.7' Lt. Farrington Highway
Open Trench

Ⓔ
℄ Sta. 0+74.1 36" Microtunnel Waterline
= ℄ Sta. 148+38.3, o/s 43.2' Rt. Farrington Highway
Open Trench

Ⓕ
12' Wide x 35' Long Microtunnel Pit

Ⓖ
12' Wide x 45' Long Microtunnel Pit

Ⓗ
℄ Sta. 0+07.7 36" Microtunnel Waterline
= ℄ Sta. 148+28.4, o/s 19' Lt. Farrington Highway
Open Trench



60" Pipe Casing

Not to Scale

APPROVED:

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

DATE	REVISION
07/15/22	5 Revised Waterline Profile

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

36" Waterline Microtunneling Plan & Profile at Honouliuli Stream

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown — Date: April 2022

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

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SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

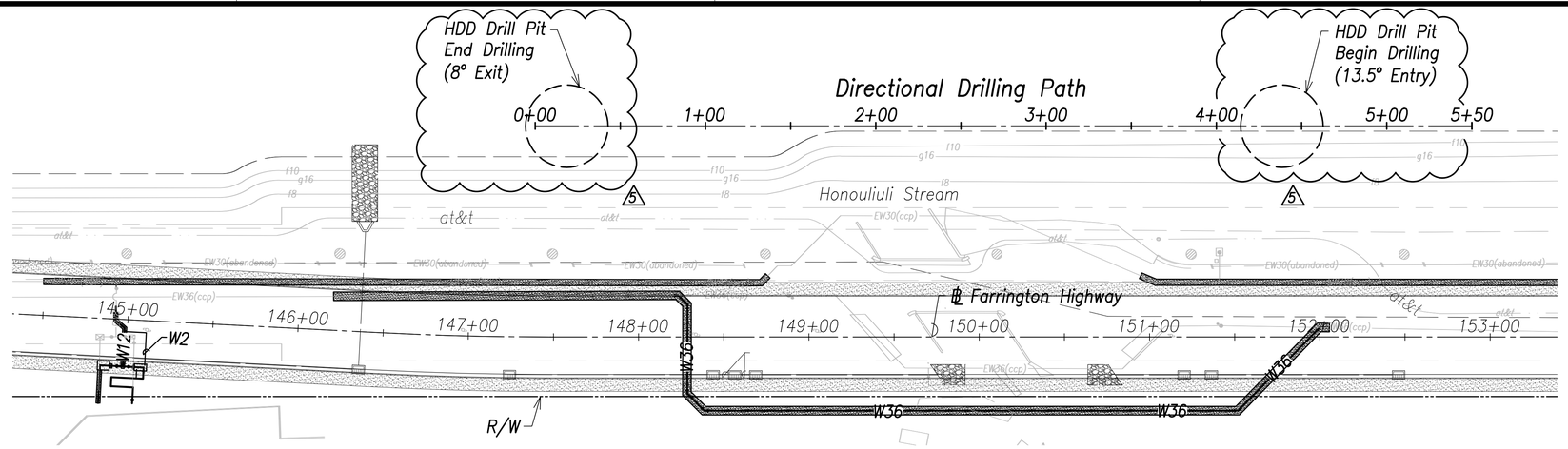
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
NOTE BOOK | No.

SHEET No. C-181 OF 767 SHEETS

182

FILE: \\RMTC-FS\[project\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-181 Directional Drilling - Water - 36 inch Water.dwg saved July 19, 2022

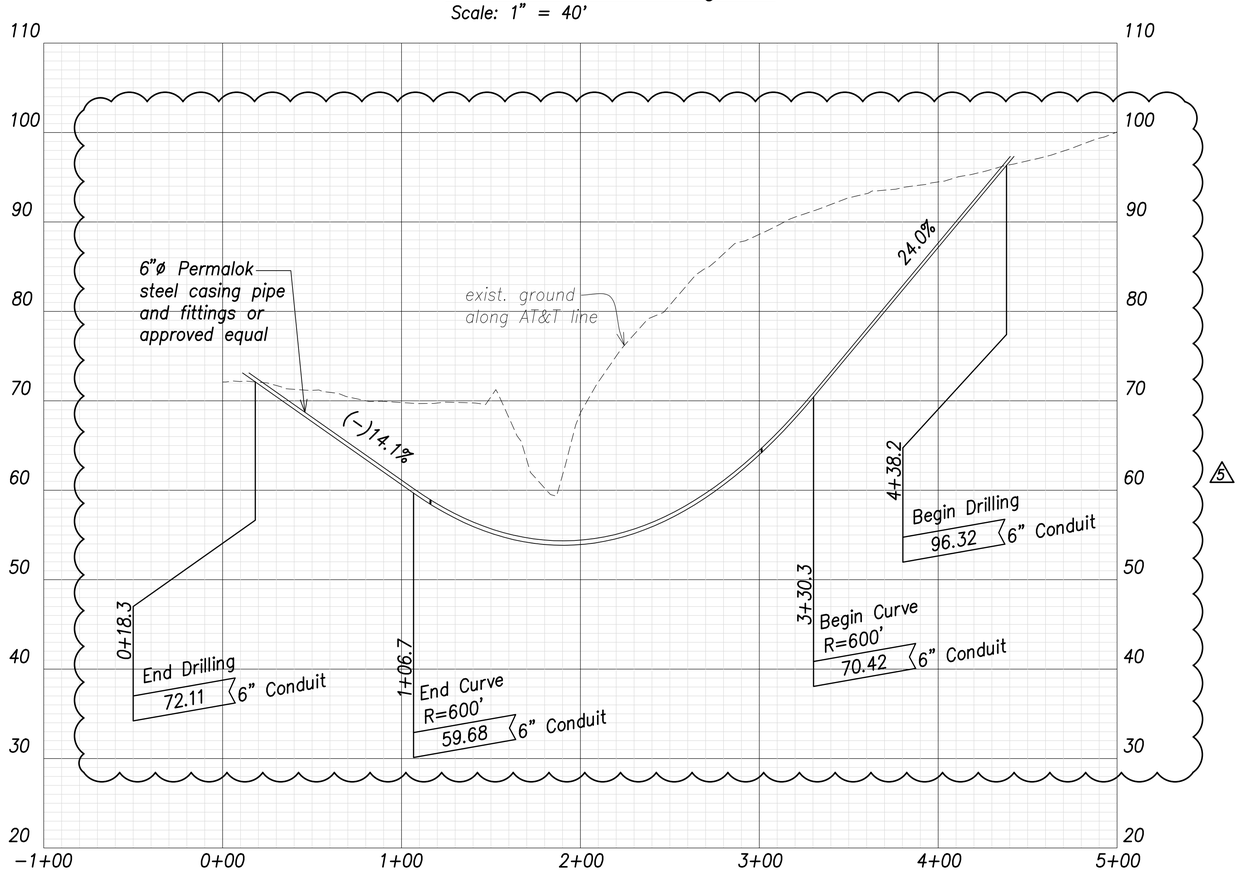
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	183	767



Note:
Contractor shall be responsible for the design, construction, maintenance, and restoration of the HDD drill pits and operational areas

AT&T Directional Drilling Plan

Scale: 1" = 40'



AT&T Directional Drilling Profile

Scales: Hor.: 1" = 40'
Vert.: 1" = 8'

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

07/15/22	5 Revised directional drilling
DATE	REVISION

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

AT&T Directional Drilling Plan & Profile

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

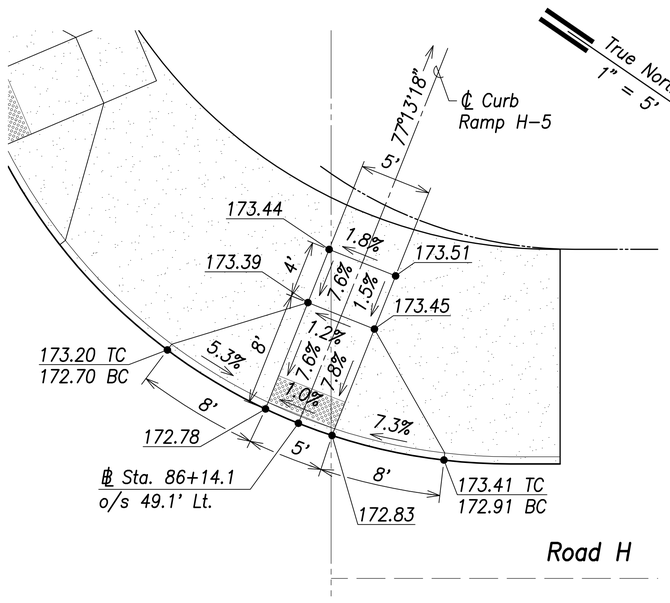
CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

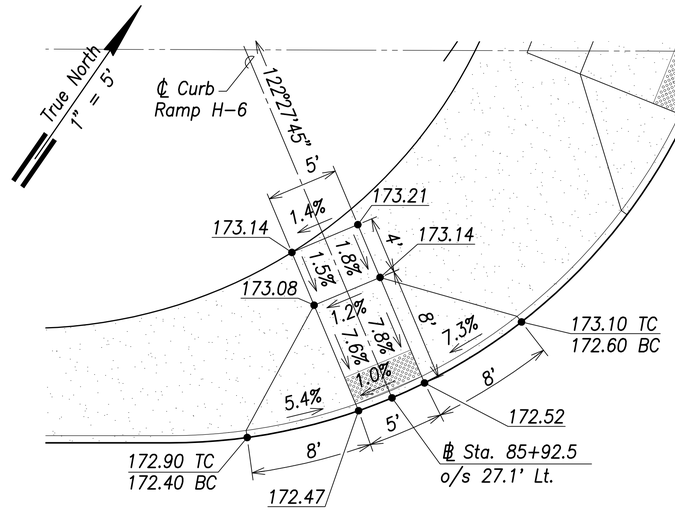
SHEET No. C-182 OF 767 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021		767



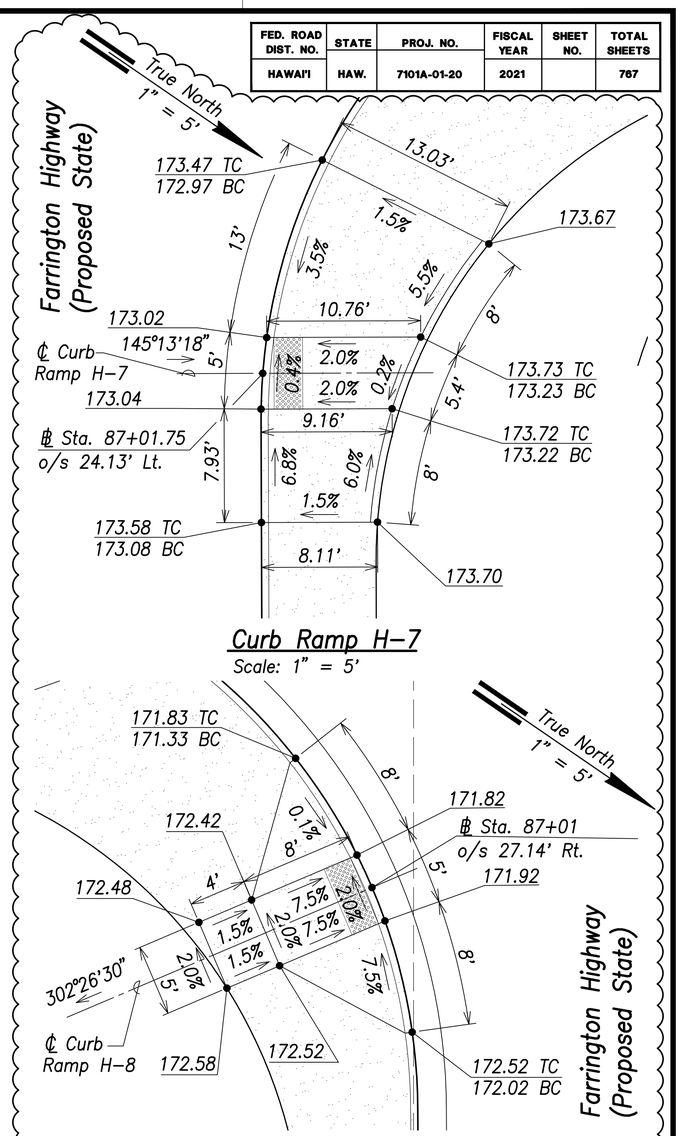
Curb Ramp H-5

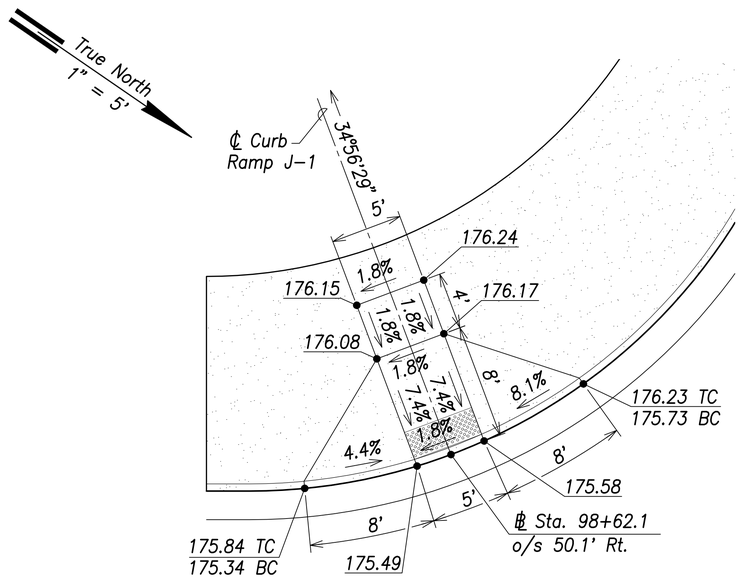
Scale: 1" = 5'



Curb Ramp H-6

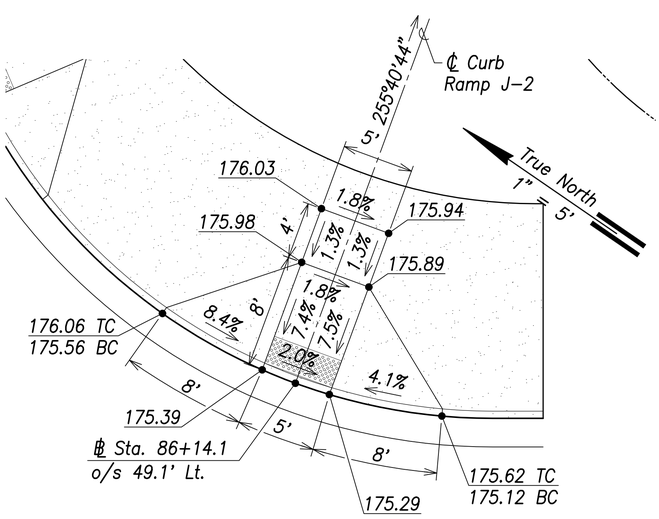
Scale: 1" = 5'





Curb Ramp J-1

Scale: 1" = 5'



Curb Ramp J-2

Scale: 1" = 5'

Graphic Scale:

1" = 5' 5' 2.5' 0 5 10'

Scale in Feet

07/15/22 | 5 | Added curb ramps

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Curb Ramp Layout & Grading Plan – 13

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

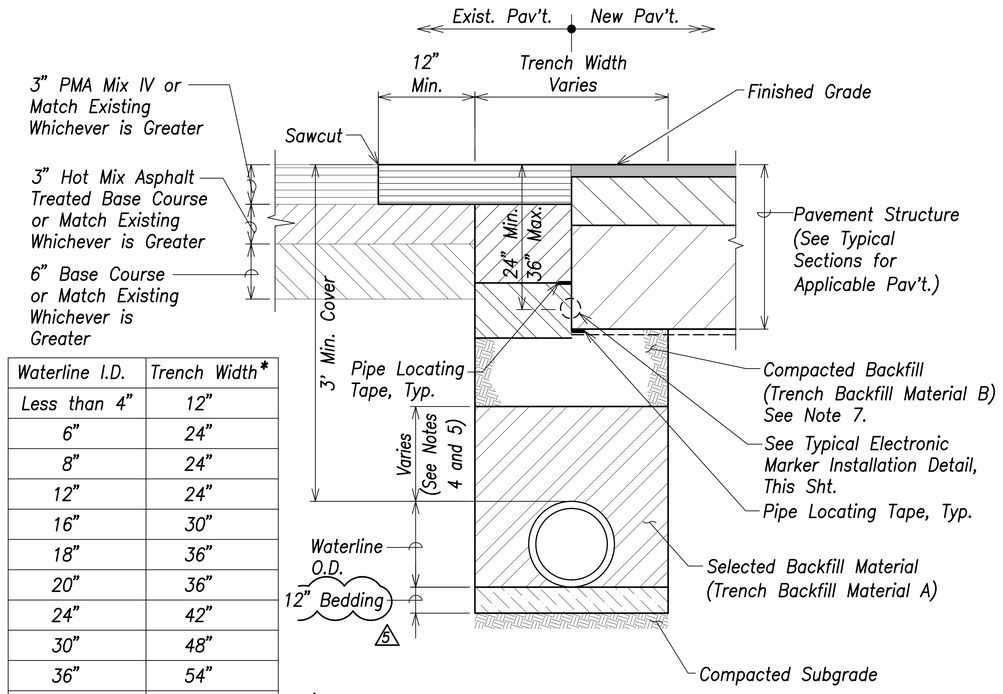
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE | NOTE BOOK | No.

SHEET No. C-195 OF 767 SHEETS

ADD. 196

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-195 Curb Ramp Layout & Grading Plan – 13.dwg saved July 11, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	208	767



Waterline I.D.	Trench Width*
Less than 4"	12"
6"	24"
8"	24"
12"	24"
16"	30"
18"	36"
20"	36"
24"	42"
30"	48"
36"	54"
42"	66"

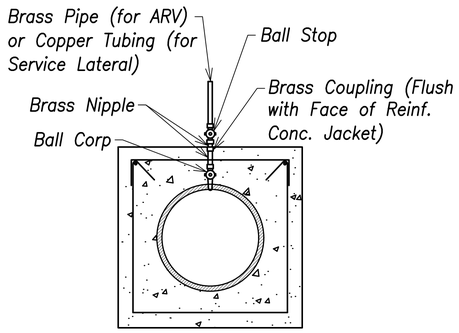
2

*Trench widths for concrete encased portions of the water system shall conform to Section 624.03(B) of the Standard Specifications

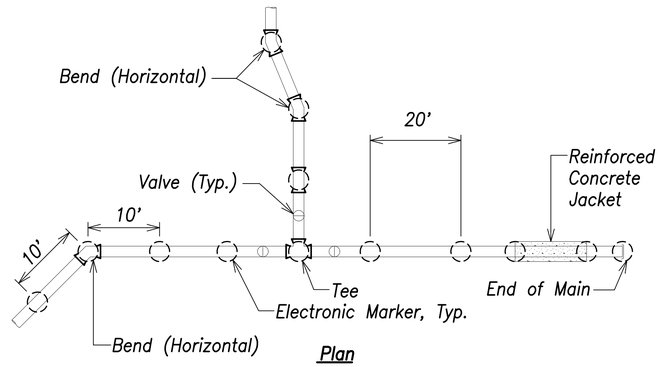
Waterline Trench Detail
Not to Scale

Notes:

1. A min. of 3–feet of cover shall be maintained at all times within the State R/W.
2. All other conditions for pipeline installations remain as specified.
3. Contractor shall provide minimum pavement structure as shown or match the existing pavement structure for trench restoration of existing pavement in the State R/W.
4. 12" of Cushion Material above the top of the pipe for Pipes 16" or Larger. 6" Cushion Material above the top of the pipe for Pipes 12" or Smaller at Locations Where Invert is Above 4–Foot Elevation.
5. 12" of Cushion Material above the top of the pipe for All Pipe Sizes at Locations Where the Invert is at or Below the 4–Foot Elevation.
6. In Areas Where Soft and/or Loose Soils are Encountered Near the Proposed Drain Line, the Contractor Shall Remove the Unsuitable Materials as Required by the Project Soils Engineer and Provide a Subgrade Stabilization Layer with a Thickness to be Determined by the Project Soils Engineer.
7. Where existing utilities under the new waterline cannot achieve the required compaction, Controlled Low Strength Material (CLSM) with a 28–day unconfined compressive strength between 50 and 150 pounds per square inch (psi) shall be used in place of compacted backfill.



Service Lateral or ARV Connection Through Reinforced Concrete Detail
Not to Scale

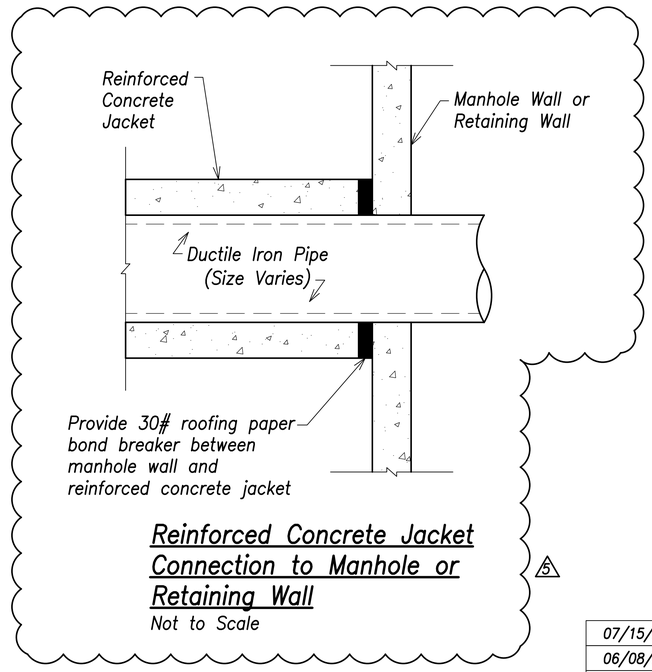


Plan

Notes:

1. Install electronic marker over center line of pipe at a minimum depth of 2 feet and a maximum depth of 3 feet from finished grade.
2. Install trench backfill and pipe cushion material in accordance to the plans and specifications.
3. Install electronic makers at a minimum clearance of 6–inches, where possible. Install markers above the pipe or concrete jackets.

Typical Electronic Marker Installation
Not to Scale



Reinforced Concrete Jacket Connection to Manhole or Retaining Wall
Not to Scale

5

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

APPROVED:

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

DATE	REVISION
07/15/22	5 Revised details
06/08/22	2 Revised trench width table

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Water Details

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

Scale: As Shown — Date: April 2022

CRAIG W. L. LUKE — LICENSED PROFESSIONAL ENGINEER — No. 6935-C — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

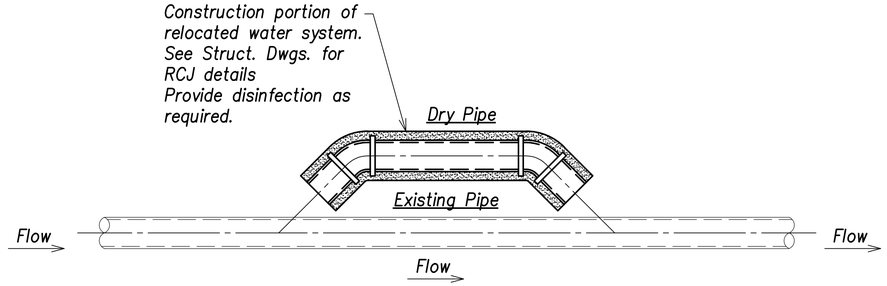
SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

SHEET No. C-207 OF 767 SHEETS

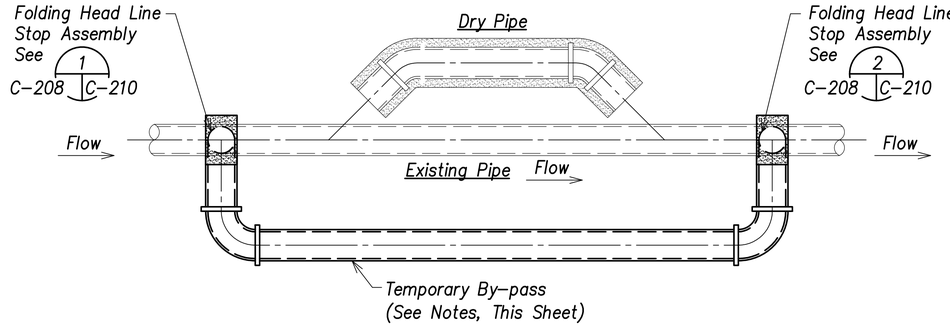
ADD. 208

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-207 Water Details.dwg saved July 14, 2022

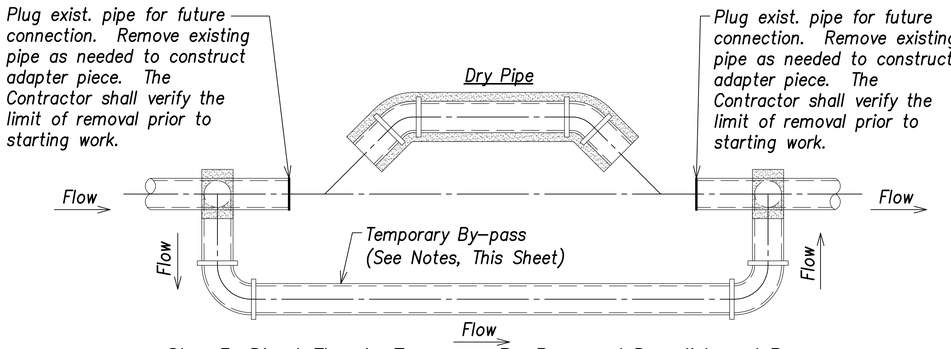
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	209	767



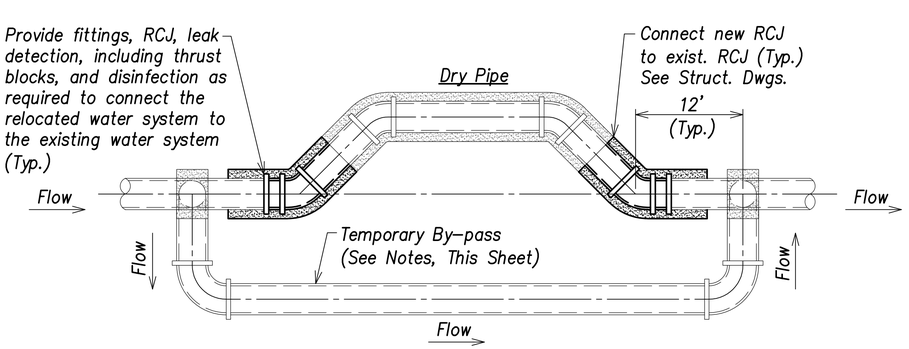
Step 1: Construct Portion of Relocated Water System and Chlorinate



Step 2: Construct Folding Head Line Stop Assembly and Temporary By-pass



Step 3: Divert Flow to Temporary By-Pass and Demolish and Remove Portions of the Existing Water System as Required to Construct the Waterline Connection



Step 4: Connect Relocated Water System to Existing Water System

Typical Temporary By-Pass Procedure (Step 1 to Step 4)

Not to Scale

Temporary By-pass Notes:

1. All pipes and fittings shall be Ductile Iron Pipe, Cl. 53, Fl.
2. When shutting down or opening water flow in pipe, the Contractor shall slowly close valve at a rate of 6" of diameter per minute to avoid any abrupt water flow stoppage or opening and resulting water hammer effect. The closure of the valve shall be monitored by the Board of Water Supply. The Contractor shall be responsible for any damages to the water system and impacts to the regional water system if the water system is not shut down slowly and any damages arise due to the Contractor's carelessness. 5
3. Contractor shall provide Atlas 350 Post Shores or approved equal to support the temporary by-pass throughout construction.
4. The water pipe velocities are critical to the construction of the temporary water system. The Contractor shall construct and remove the temporary water system folding head line stop assembly during the period of low water system use between the hours of midnight to 4:00 A.M. 5 2
5. Construction of the additional reinforced concrete jacket to connect the existing reinforced concrete jacket and concrete support block shall be incidental to the temporary bypass work
6. The Contractor shall provide shop drawings for the by-pass procedures, including the proposed means and methods for connections and chlorination.

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

APPROVED:

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

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 Revised Notes
06/08/22	2 Note Added

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Typical Temporary By-Pass Procedures (Step 1 to Step 4)

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

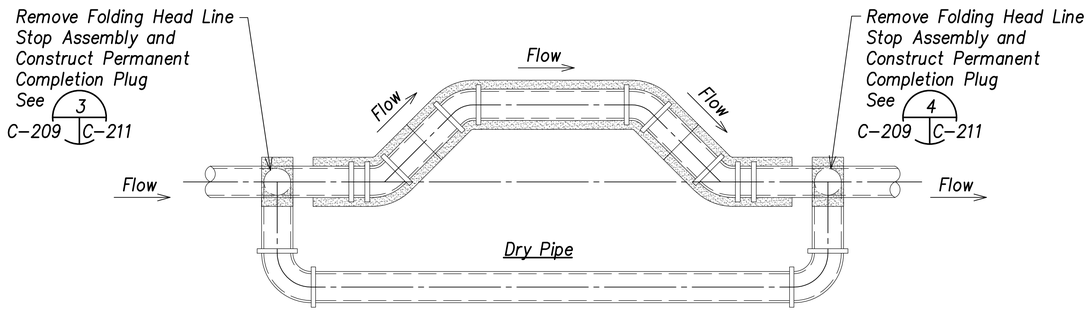
Scale: As Shown — Date: April 2022

SHEET No. C-208 OF 767 SHEETS

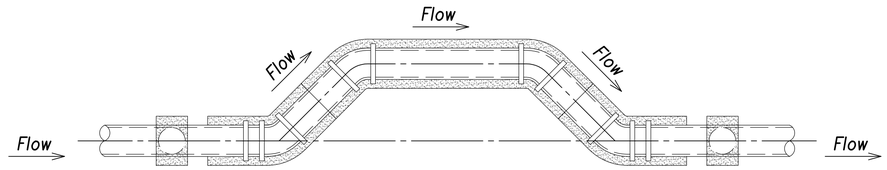
ADD. 209

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-208 Water Connection Details.dwg saved July 19, 2022

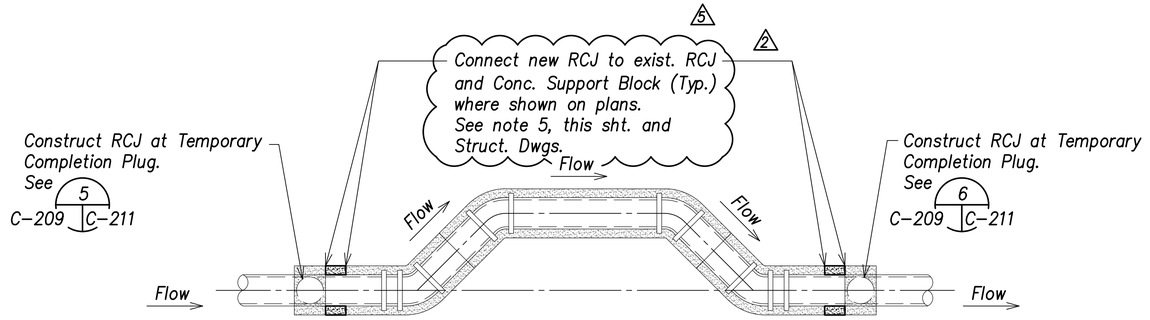
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	210	767



Step 5: Divert Flow to Relocated Waterline, Remove Folding Head Line Stop Assembly, and Construct Permanent Completion Plug



Step 6: Remove Temporary By-Pass



Step 7: Construct RCJ at Permanent Completion Plug

Typical Temporary By-Pass Procedure (Step 5 to Step 7)

Not to Scale

Temporary By-pass Notes:

1. All pipes and fittings shall be Ductile Iron Pipe, Cl. 53, Fl.
2. When shutting down or opening water flow in pipe, the Contractor shall slowly close valve at a rate of 6" of diameter per minute to avoid any abrupt water flow stoppage or opening and resulting water hammer effect. The closure of the valve shall be monitored by the Board of Water Supply. The Contractor shall be responsible for any damages to the water system and impacts to the regional water system if the water system is not shut down slowly and any damages arise due to the Contractor's carelessness.
3. Contractor shall provide Atlas 350 Post Shores or approved equal to support the temporary by-pass throughout construction. 5
4. The water pipe velocities are critical to the construction of the temporary water system. The Contractor shall construct and remove the temporary water system folding head line stop assembly during the period of low water system use between the hours of midnight to 4:00 A.M.
5. Construction of the additional reinforced concrete jacket to connect the existing reinforced concrete jacket and concrete support block shall be incidental to the temporary bypass work. 5 2
6. The Contractor shall provide shop drawings for the by-pass procedures, including the proposed means and methods for connections and chlorination.

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

APPROVED:

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

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

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SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 Revised callout; Revised Notes
06/08/22	2 Notes Added; Revised callout

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

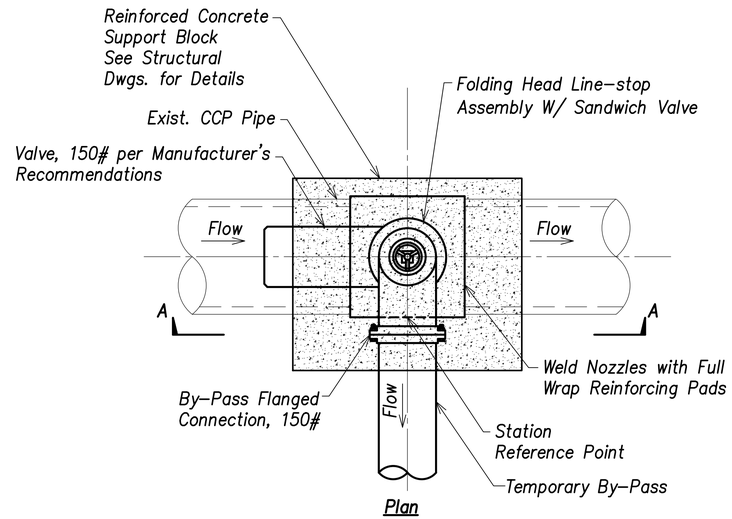
Typical Temporary By-Pass Procedures (Step 5 to Step 7)

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

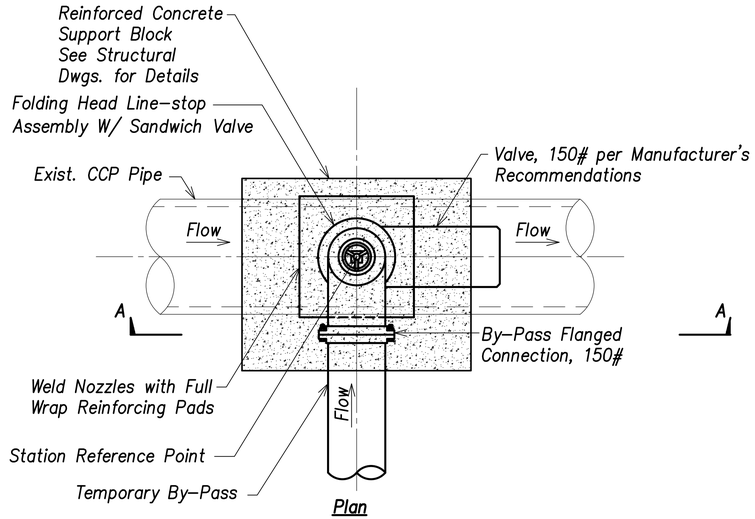
Scale: As Shown — Date: April 2022

SHEET No. C-209 OF 767 SHEETS

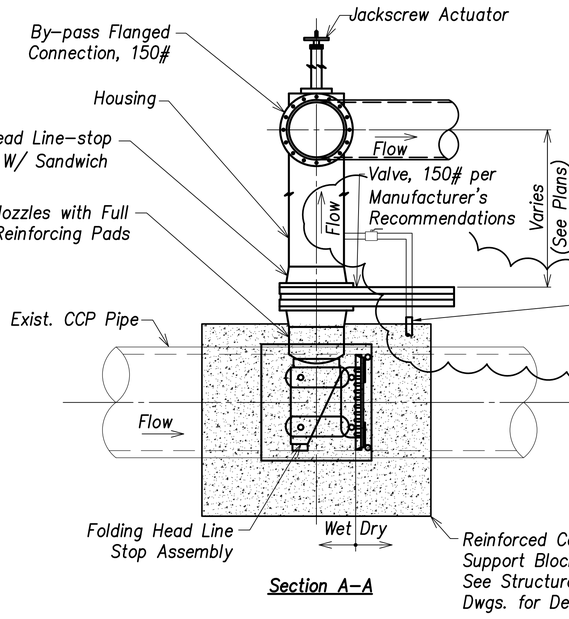
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	211	767



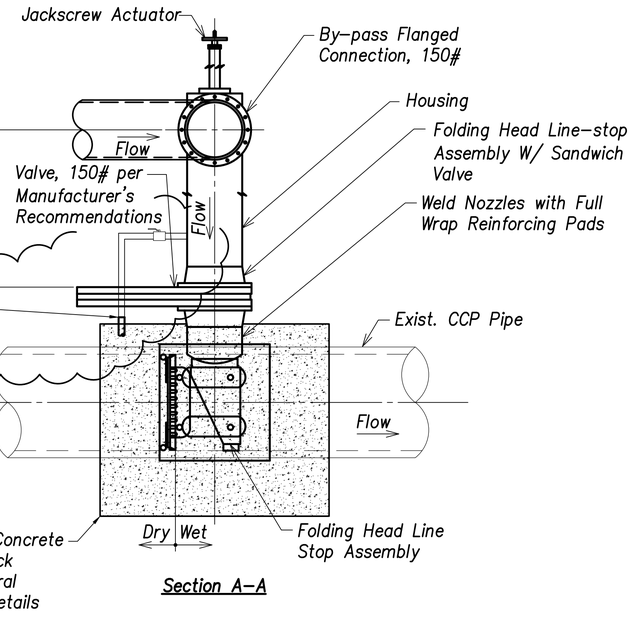
Plan



Plan



Section A–A



Section A–A

Notes:

1. Prior to start of Construction, Contractor shall submit shop drawings for approval of the tapping tee w/ anchor full wrap steel plate, the temporary by–pass unit with folding head line–stop assembly w/ sandwich valve, the 3" line–stop nipple, the permanent completion plug, and the CCPxDIP adapter.
2. See sheets C–208 to C–209 for Temporary Bypass Procedures.
3. See Struct. Dwgs. for Reinforced Concrete Support Block details.
4. Upon completion of the permanent connection, testing, and approval of the connection by BWS, portions of the existing water system that are no longer in use shall be demolished and removed.

1 C–208 C–210 **Typical Temporary By–Pass and Line–Stop Details (Upstream of Connection)**
Not to Scale

2 C–208 C–210 **Typical Temporary By–Pass and Line–Stop Details (Downstream of Connection)**
Not to Scale

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

APPROVED:

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

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

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SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 Revised connection

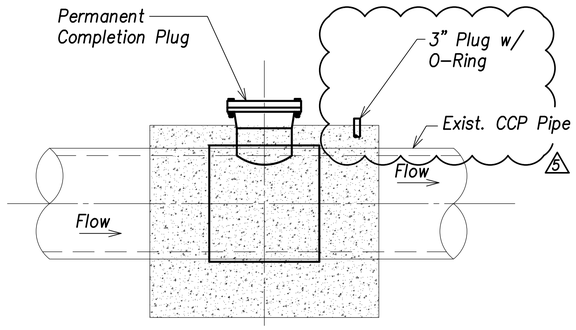
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Waterline Connection and Temporary By–Pass Typical Details – 1

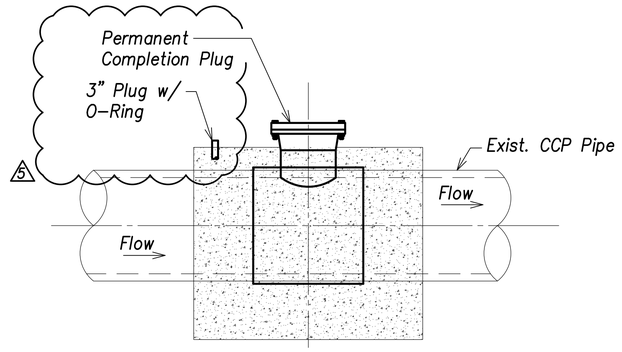
FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

Scale: As Shown — Date: April 2022

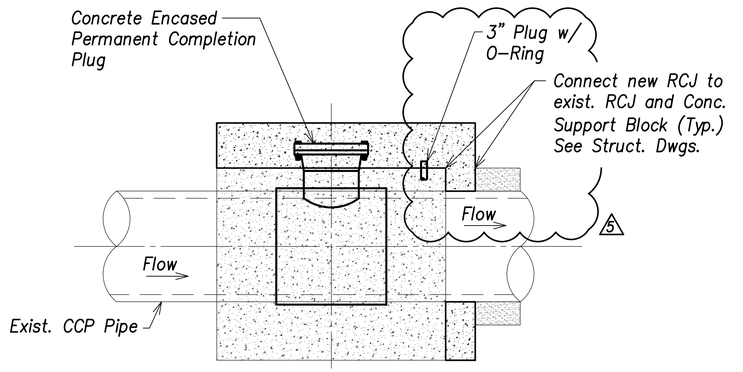
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	212	767



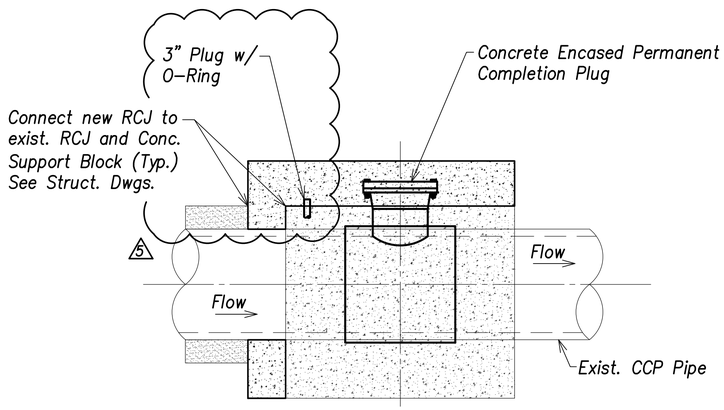
3 C-209 C-211 **Typical Permanent Completion Plug (Upstream of Connection)**
Not to Scale



4 C-209 C-211 **Typical Permanent Completion Plug (Downtream of Connection)**
Not to Scale



5 C-209 C-211 **Typical RCJ at Permanent Completion Plug (Upstream of Connection)**
Not to Scale



6 C-209 C-211 **Typical RCJ at Permanent Completion Plug (Downstream of Connection)**
Not to Scale

Notes:

1. Prior to start of Construction, Contractor shall submit shop drawings for approval of the tapping tee w/ anchor full wrap steel plate, the temporary by-pass unit with folding head line-stop assembly w/ sandwich valve, the 3" line-stop nipple, the permanent completion plug, and the CCPxDIP adapter.
2. See sheets C-208 to C-209 for Temporary Bypass Procedures.
3. See Struct. Dwgs. for Reinforced Concrete Support Block details.
4. Upon completion of the permanent connection, testing, and approval of the connection by BWS, portions of the existing water system that are no longer in use shall be demolished and removed.

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

APPROVED:

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

DATE	REVISION
07/15/22	5 Revised connections

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Waterline Connection and Temporary By-Pass Typical Details – 2

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

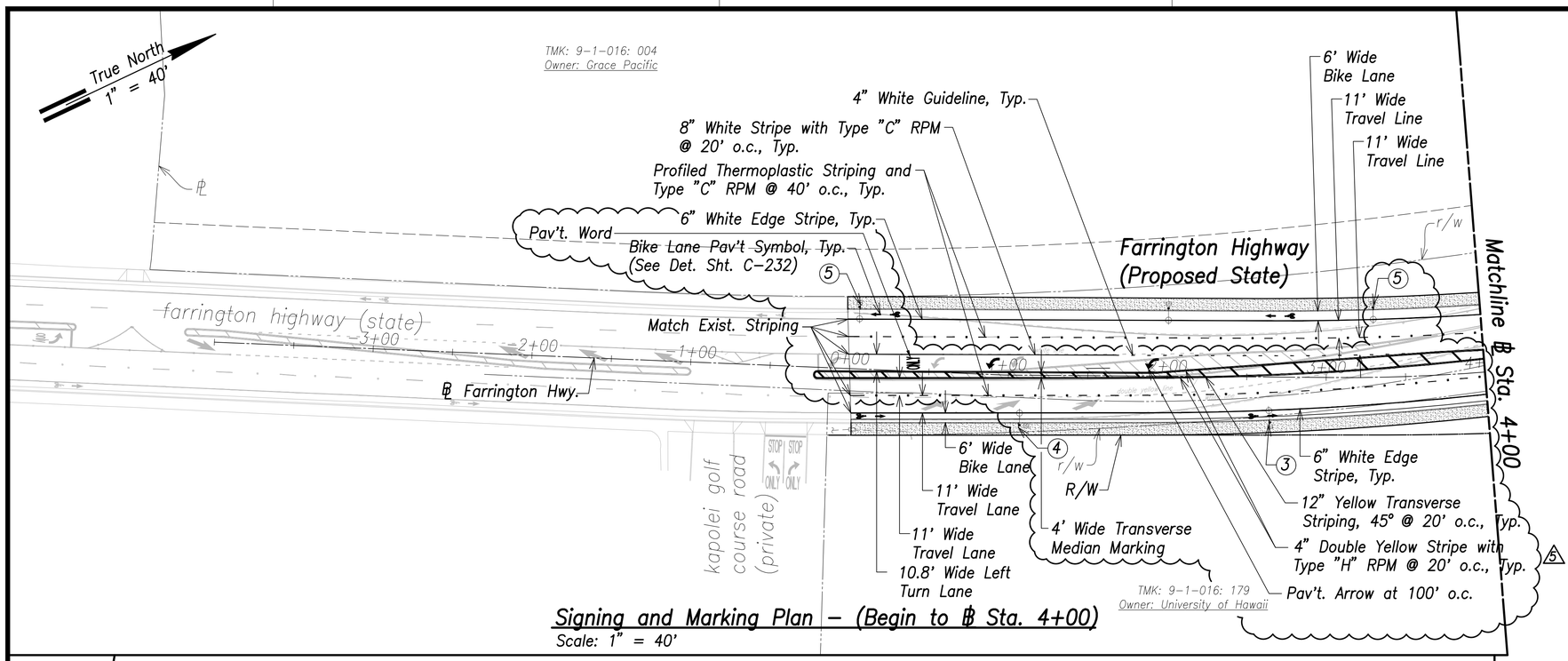
Scale: As Shown Date: April 2022

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

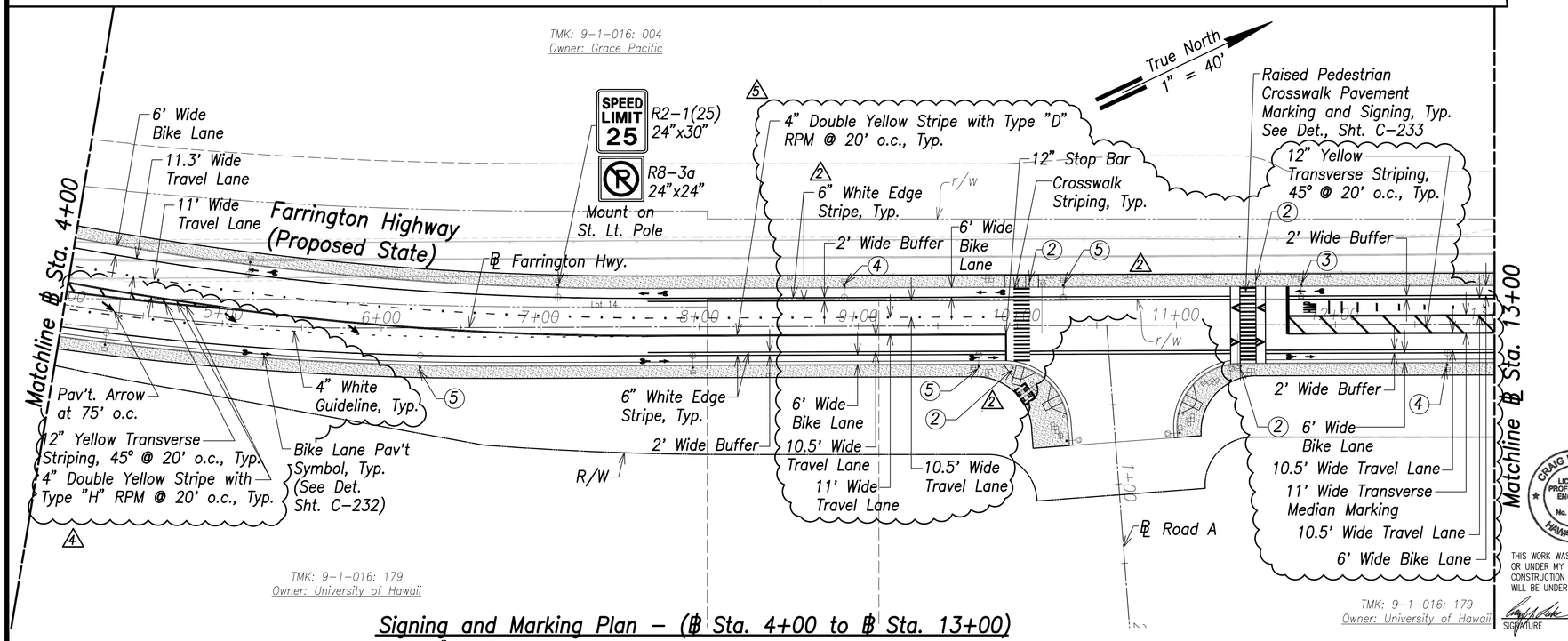
SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	223	767



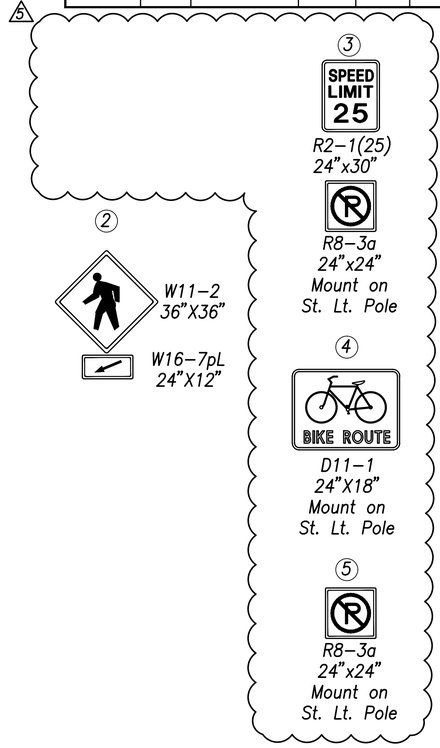
Signing and Marking Plan – (Begin to ℄ Sta. 4+00)

Scale: 1" = 40'



Signing and Marking Plan – (℄ Sta. 4+00 to ℄ Sta. 13+00)

Scale: 1" = 40'



Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

DATE	REVISION
07/15/22	5 Rev. Signing, Striping, Add callouts
06/08/22	2 Pav't. Arrow Revised, Crosswalk Signage Added, Label Added, Stripe Added

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Signing and Marking Plan ℄ Sta. 0+00 to ℄ Sta. 13+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. C-222 OF 767 SHEETS

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

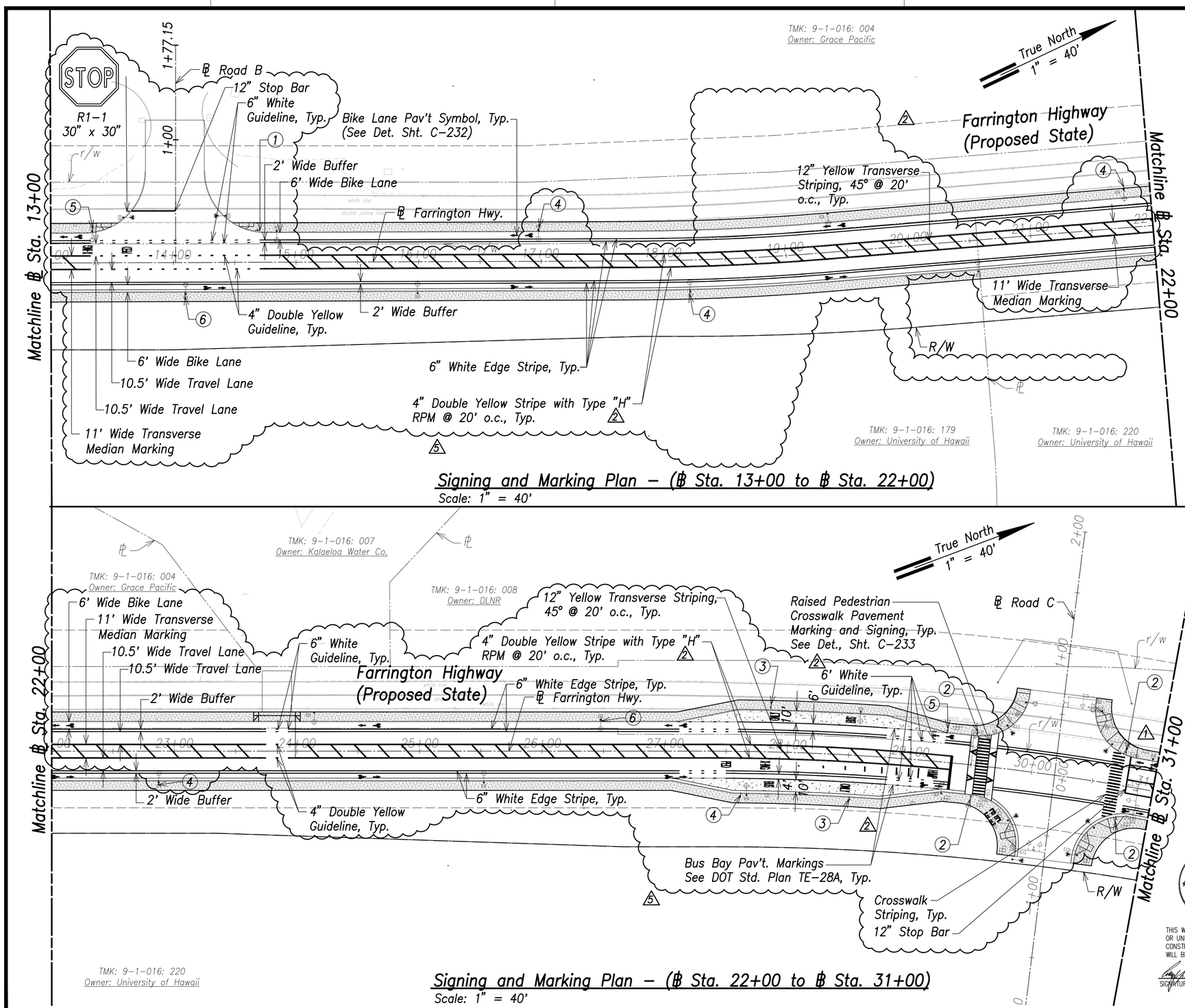
CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

ADD. 223

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	224	767

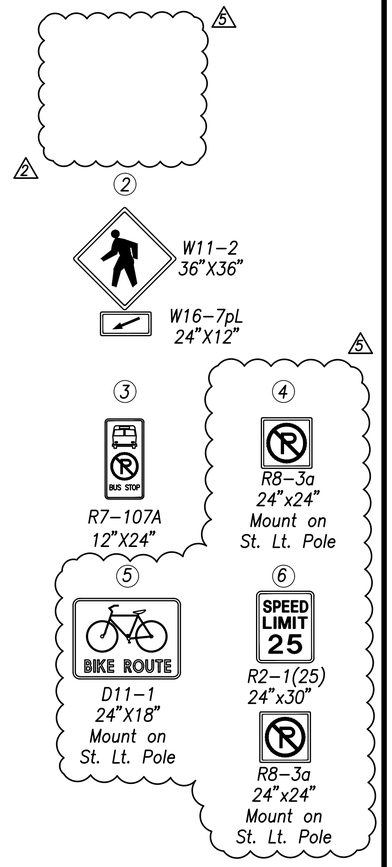


Signing and Marking Plan – (℄ Sta. 13+00 to ℄ Sta. 22+00)

Scale: 1" = 40'

Signing and Marking Plan – (℄ Sta. 22+00 to ℄ Sta. 31+00)

Scale: 1" = 40'



Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

DATE	REVISION
07/15/22	5 Rev. Signing, Striping, Add callouts
06/08/22	2 Pav't. Arrow Revised, Crosswalk Signage Added, Turning Vehicles Yield to Pedestrians Sign Removed, Stripe Labels Added

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Signing and Marking Plan
℄ Sta. 13+00 to ℄ Sta. 31+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

SHEET No. C-223 OF 767 SHEETS

ADD. 224

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

FILE: K:\Civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-223 Striping Plan – Sta. 13+00 to 31+00.dwg saved July 7, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	225	767

TMK: 9-1-016: 008
Owner: DLNR

TMK: 9-1-018: 008
Owner: DLNR

6" White Edge Stripe, Typ.

Bike Lane Pav't Symbol, Typ.
(See Det. Sht. C-232)

4" Double Yellow Stripe with Type "H" RPM @ 20' o.c., Typ.

R2-1(25) 24"x30"

R8-3a 24"x24"

6' Wide Bike Lane

2' Wide Buffer

10.5' Wide Travel Lane

10.5' Wide Travel Lane

Farrington Highway (Proposed State)

Matchline ℄ Sta. 31+00

Matchline ℄ Sta. 40+00

11' Wide Transverse Median Marking

2' Wide Buffer

6' Wide Bike Lane

12" Yellow Transverse Striping, 45° @ 20' o.c., Typ.

℄ Farrington Hwy.

R/W

TMK: 9-1-016: 220
Owner: University of Hawaii

TMK: 9-1-016: 221
Owner: Tokai University

Signing and Marking Plan – (℄ Sta. 31+00 to ℄ Sta. 40+00)

Scale: 1" = 40'

℄ Road D

Raised Pedestrian Crosswalk Pavement Marking and Signing, Typ. See Det., Sht. C-233

Crosswalk Striping, Typ.

12" Stop Bar

6' Wide Bike Lane

2' Wide Buffer

10.5' Wide Travel Lane

11' Wide Left Turn Lane

10.5' Wide Travel Lane

2' Wide Buffer

6' Wide Bike Lane

8" White Stripe with Type "C" RPM @ 20' o.c., Typ.

4" White Guideline, Typ.

℄ Farrington Hwy.

Pav't. Arrow @ 100' o.c., Typ.

6" White Edge Stripe, Typ.

4" Double Yellow Stripe with Type "H" RPM @ 20' o.c., Typ.

4" Double Yellow Guideline, Typ.

6" White Guideline, Typ.

Raised Pedestrian Crosswalk Pavement Marking and Signing, Typ. See Det., Sht. C-233

For Markings at Intersection D, See Sht. C-72

TMK: 9-1-018: 008
Owner: DLNR

TMK: 9-1-018: 012
Owner: DLNR

TMK: 9-1-016: 220
Owner: University of Hawaii

TMK: 9-1-016: 182
Owner: Hawaiian Electric Co.

TMK: 9-1-016: 220
Owner: University of Hawaii

Signing and Marking Plan – (℄ Sta. 40+00 to ℄ Sta. 49+00)

Scale: 1" = 40'

True North
1" = 40'

① R8-3a 24"x24" Mount on St. Lt. Pole

② FARRINGTON HWY. D3-1 Variesx12"

③

④

⑤ BIKE ROUTE D11-1 24"X18" Mount on St. Lt. Pole

⑥ STOP R1-1 30" x 30" Mount on St. Lt. Pole

⑦ W11-2 36"X36"

W16-7pL 24"X12"

Graphic Scale:
1" = 40' 40' 20' 0 40' 80'
Scale in Feet

DATE	REVISION
07/15/22	5 Rev. Signing, Striping, Add callouts
06/08/22	2 Turning Vehicles Yield to Pedestrians Sign Removed, Pav't Arrow Revised, Stree Sign Removed, Stripe Label Added

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Signing and Marking Plan
℄ Sta. 31+00 to ℄ Sta. 49+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. C-224 OF 767 SHEETS

ADD. 225

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

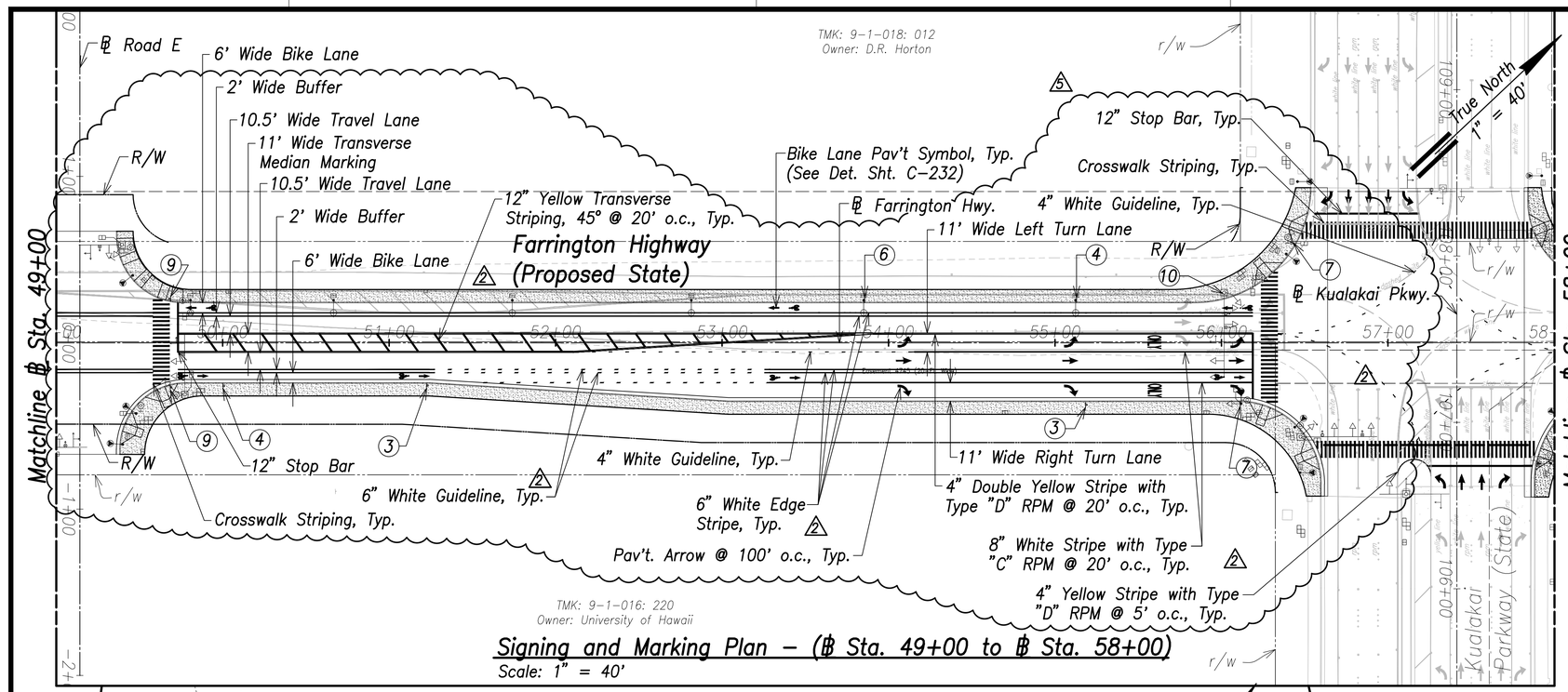
SIGNATURE

April 30, 2024
EXPIRATION DATE OF THE LICENSE

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

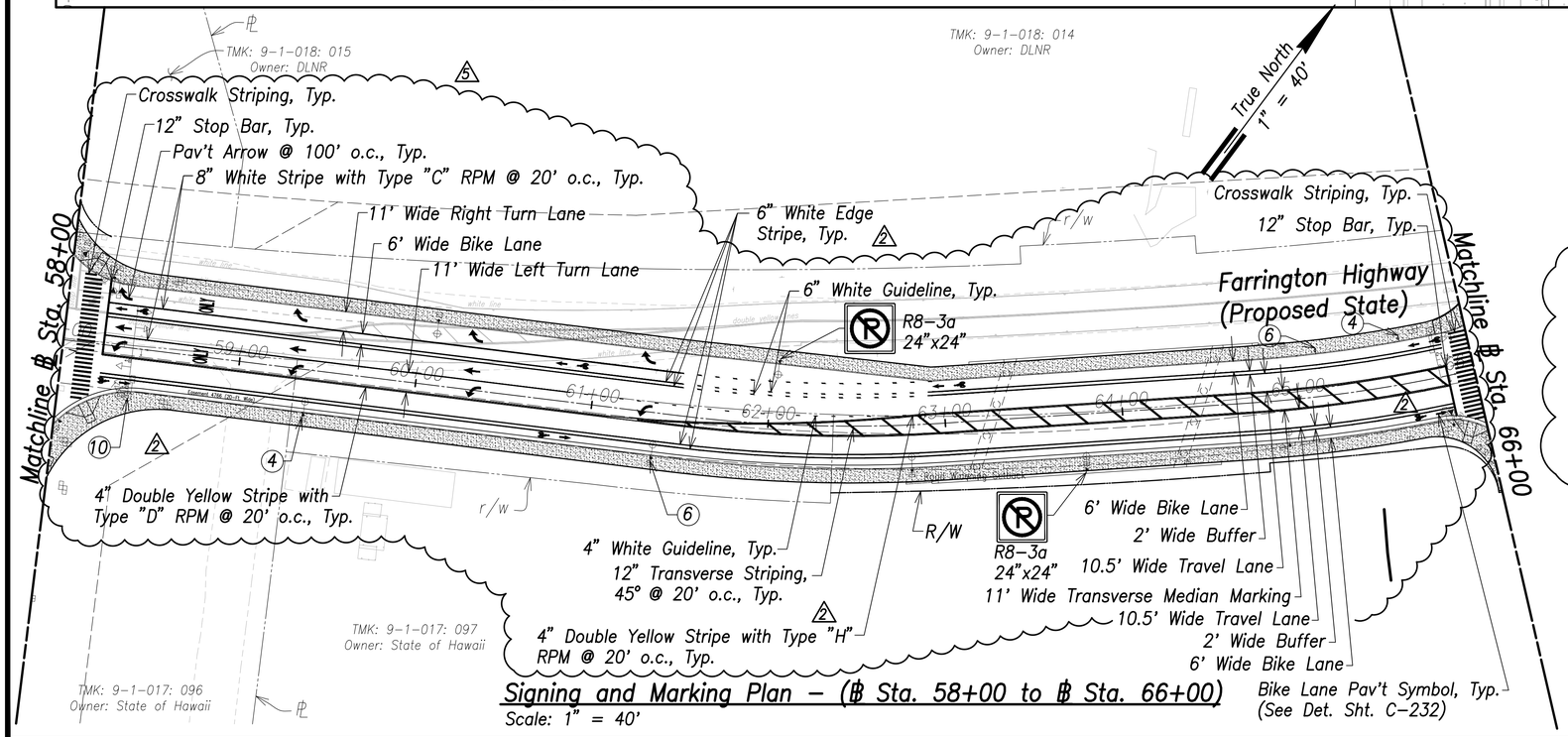
FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-224 Striping Plan – Sta. 31+00 to 49+00.dwg saved July 15, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	226	767



Signing and Marking Plan – (℔ Sta. 49+00 to ℔ Sta. 58+00)

Scale: 1" = 40'



Signing and Marking Plan – (℔ Sta. 58+00 to ℔ Sta. 66+00)

Scale: 1" = 40'

(5) (6) SPEED LIMIT 25 — R2-1(25) 24"x30"; R8-3a 24"x24"

(5) (3) R3-8a(MOD.) 45"X30" (ONLY / ONLY); R8-3a 24"x24" Mount on St. Lt. Pole

(5) (7) (2) RIGHT ON RED ARROW AFTER STOP — R10-17a 24"x30" Mount on Traffic Signal Pole

(5) (4) BIKE ROUTE — D11-1 24"X18" Mount on St. Lt. Pole

(5) (9) W11-2 36"X36"; W16-7pL 24"X12"

(5) (10) ON LEFT GREEN ARROW ONLY — R3-5(MOD.) 30"x42" Mount next to signal

NO U TURN — R3-4(MOD.) 18"x30" Mount next to signal

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

DATE	REVISION
07/15/22	(5) Rev. Signing, Striping, Add callouts
06/08/22	(2) Turning Vehicles Yield to Pedestrians Sign Removed, Pav't Arrow Revised, Sign Added

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Signing and Marking Plan
℔ Sta. 49+00 to ℔ Sta. 66+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

CRAIG W. L. LUKE — LICENSED PROFESSIONAL ENGINEER — No. 6935-C — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

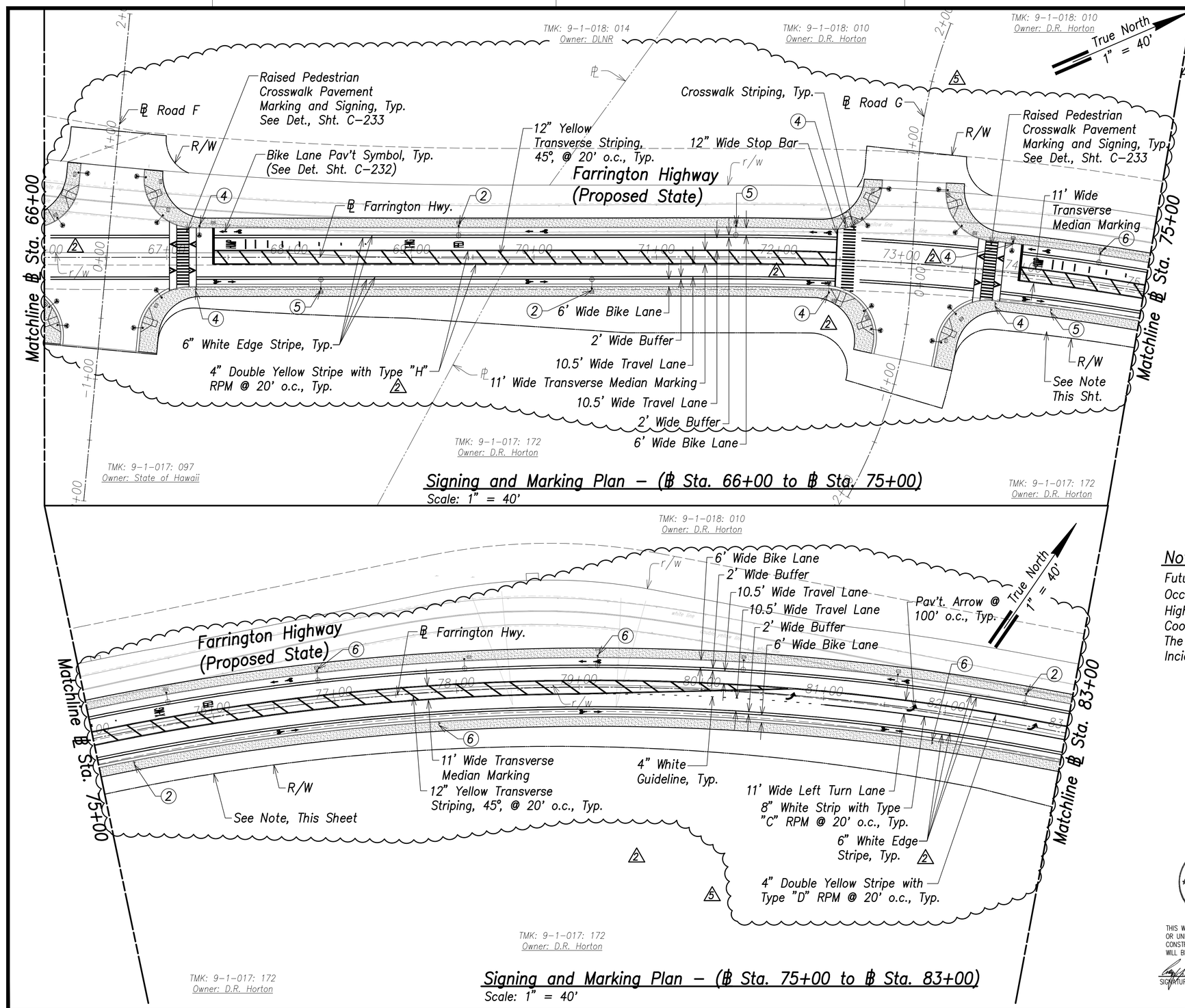
SHEET No. C-225 OF 767 SHEETS

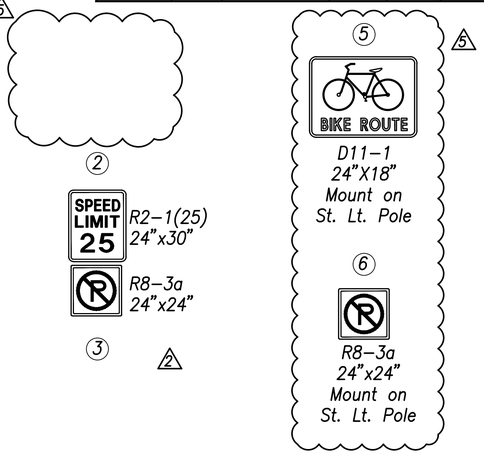
ADD. 226

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

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-225 Striping Plan - Sta. 49+00 to 66+00.dwg saved July 13, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	227	767





Note:

Future HECO Electrical System, Construction Will Occur at the Same as this Project (Farrington Highway Improvements). The Contractor Shall Fully Coordinate Work with HECO and their Contractor. The Cost to Coordinate Work Will be Considered Incidental to the Various Items of Work.

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

DATE	REVISION
07/15/22	5 Rev. Signing, Striping, Add callouts
06/08/22	2 Turning Vehicles Yield to Pedestrians Sign Removed, Pav't Arrow Revised, Stripe Label Added

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Signing and Marking Plan ℄ Sta. 66+00 to ℄ Sta. 83+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — EXPIRATION DATE OF THE LICENSE: April 30, 2024

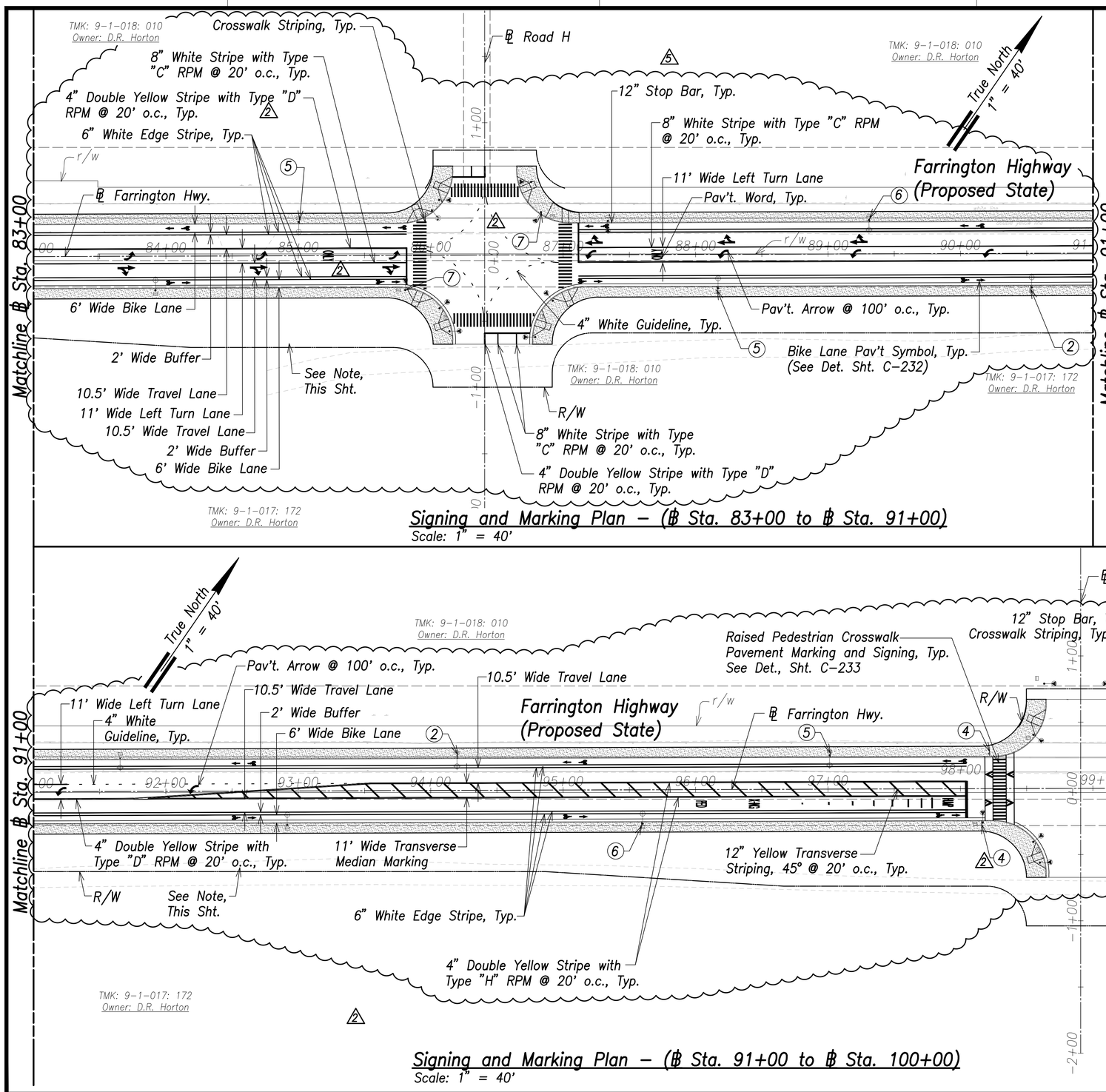
SHEET No. C-226 OF 767 SHEETS

ADD. 227

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

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-226 Striping Plan - Sta. 66+00 to 83+00.dwg saved July 7, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	228	767

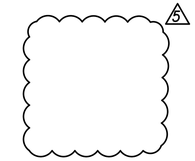


Signing and Marking Plan – (℄ Sta. 83+00 to ℄ Sta. 91+00)

Scale: 1" = 40'

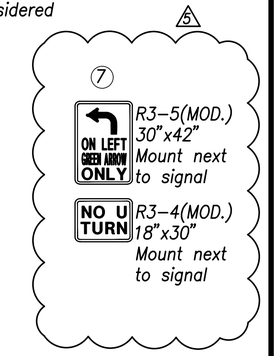
Signing and Marking Plan – (℄ Sta. 91+00 to ℄ Sta. 100+00)

Scale: 1" = 40'



Note:

Future HECO Electrical System, Construction Will Occur at the Same as this Project (Farrington Highway Improvements). The Contractor Shall Fully Coordinate Work with HECO and their Contractor. The Cost to Coordinate Work Will be Considered Incidental to the Various Items of Work.



Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

DATE	REVISION
07/15/22	5 Rev. Signing, Striping, Add callouts
06/08/22	2 Turning Vehicles Yield to Pedestrians Sign Removed, Stripes Added, Stripe Label Added

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

ORIGINAL PLAN
NOTE BOOK
No.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Signing and Marking Plan ℄ Sta. 83+00 to ℄ Sta. 100+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

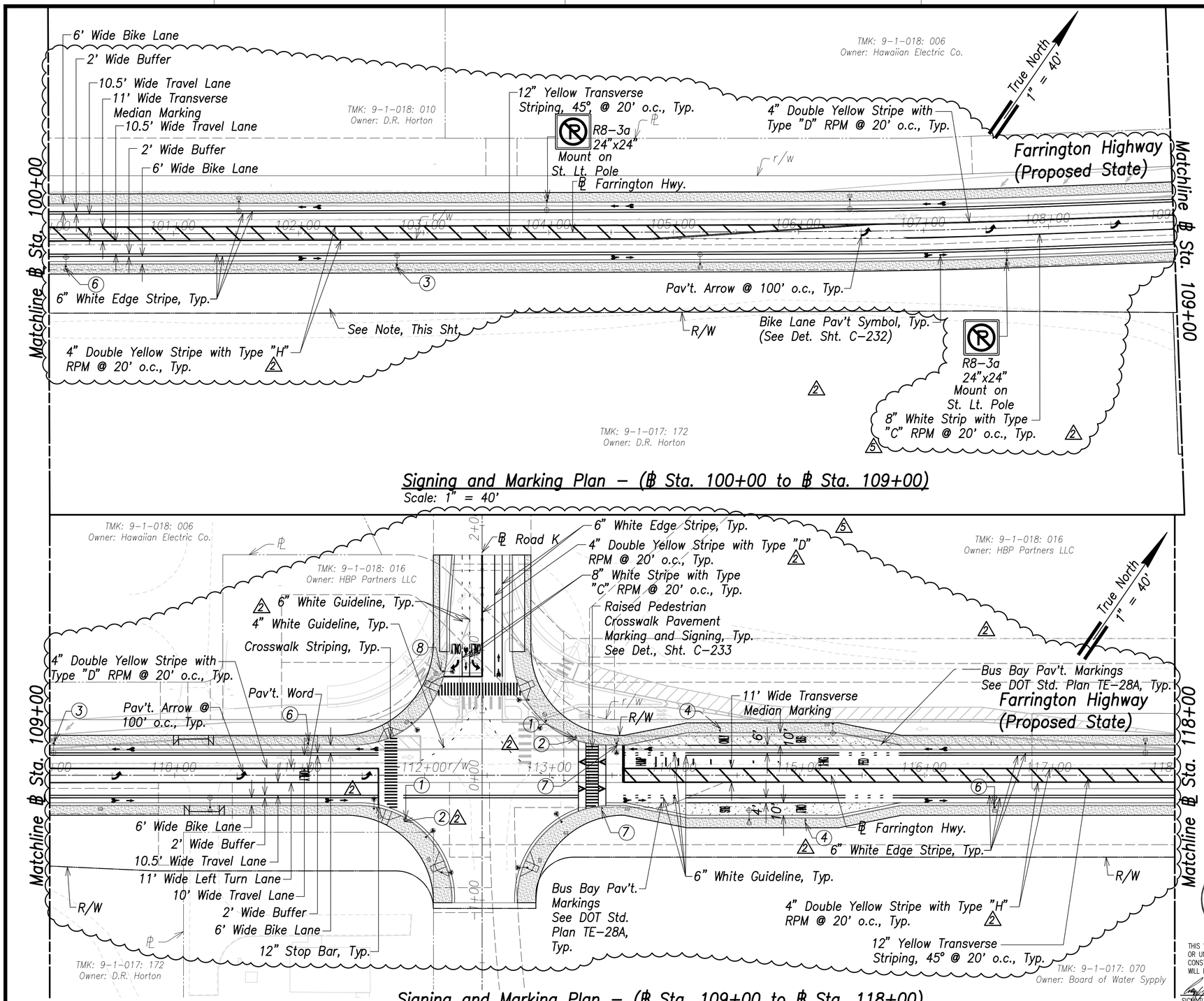
April 30, 2024
EXPIRATION DATE OF THE LICENSE

SHEET No. C-227 OF 767 SHEETS

ADD. 228

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-227 Striping Plan - Sta. 83+00 to 100+00.dwg saved July 7, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	229	767



Signing and Marking Plan – (℄ Sta. 100+00 to ℄ Sta. 109+00)

Scale: 1" = 40'

Signing and Marking Plan – (℄ Sta. 109+00 to ℄ Sta. 118+00)

Scale: 1" = 40'

① FARRINGTON HWY. D3-1 Variesx12"

② ROAD K D3-1 Variesx12"

③ SPEED LIMIT 25 R2-1(25) 24"x30"; R8-3a 24"x24"

④ BUS STOP R7-107A 12"x24"

⑤ 2

⑥ BIKE ROUTE D11-1 24"X18"; Mount on St. Lt. Pole

⑦ W11-2 36"X36"; W16-7pR 24"X12"

⑧ STOP R1-1 30" x 30" Mount on St. Lt. Pole

Note:

Future HECO Electrical System, Construction Will Occur at the Same as this Project (Farrington Highway Improvements). The Contractor Shall Fully Coordinate Work with HECO and their Contractor. The Cost to Coordinate Work Will be Considered Incidental to the Various Items of Work.

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

DATE	REVISION
07/15/22	5 Add Bus Bay, Rev. Sign and Striping
06/08/22	2 Turning Vehicles Yield to Pedestrians Sign Removed, Pav't. Arrow Revised, Stripes Added, Stripe Labels Added

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

CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6635-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Signing and Marking Plan ℄ Sta. 100+00 to ℄ Sta. 118+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. C-228 OF 767 SHEETS

ADD. 229

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-228 Striping Plan – Sta. 100+00 to 118+00.dwg saved July 13, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	230	767

TMK: 9-1-018: 016
Owner: HBP Partners LLC

12" Yellow Transverse Striping, 45°, @ 20' o.c., Typ.
2' Wide Buffer
6' Wide Bike Lane
4" White Guideline, Typ.
R8-3a 24"x24" Mount on St. Lt. Pole
4" Double Yellow Stripe with Type "H" RPM @ 20' o.c., Typ.
℄ Farrington Hwy.
8" White Stripe with Type "C" RPM @ 20' o.c., Typ.
6" White Edge Stripe, Typ.
Pav't. Arrow @ 100' o.c., Typ.
Bike Lane Pav't Symbol, Typ. (See Det. Sht. C-232)
4" Double Yellow Stripe with Type "D" RPM @ 20' o.c., Typ. 2
R/W
2' Wide Buffer
6' Wide Bike Lane
10.5' Wide Travel Lane
10.5' Wide Travel Lane
11' Wide Transverse Median Marking 5
Farrington Highway (Proposed State)
Matchline ℄ Sta. 118+00
Matchline ℄ Sta. 127+00
True North 1" = 40'

TMK: 9-1-017: 172
Owner: D.R. Horton

Signing and Marking Plan – (℄ Sta. 118+00 to ℄ Sta. 127+00)
Scale: 1" = 40'

4" Double Yellow Stripe with Type "D" RPM @ 20' o.c., Typ. 2
6" White Guideline, Typ.
℄ Road L
TMK: 9-1-018: 016
Owner: HBP Partners LLC
Pav't. Arrow @ 100' o.c., Typ.
12" Yellow Transverse Striping, 45°, @ 20' o.c., Typ.
2 8" White Stripe with Type "C" RPM @ 20' o.c., Typ.
4" White Guideline, Typ.
6" White Edge Stripe, Typ.
12" Stop Bar
4" Double Yellow Stripe with Type "H" RPM @ 20' o.c., Typ. 5
Bike Lane Pav't Symbol, Typ. (See Det. Sht. C-232)
Pav't. Word
2' Wide Buffer
6' Wide Bike Lane
Pav't. Arrow @ 100' o.c., Typ.
Farrington Highway (Proposed State)
12" Stop Bar
℄ Farrington Hwy.
8" White Stripe with Type "C" RPM @ 20' o.c., Typ.
Raised Pedestrian Crosswalk Pavement Marking and Signing, Typ. See Det., Sht. C-233
6' Wide Bike Lane
2' Wide Buffer
10.5' Wide Travel Lane
10.5' Wide Travel Lane
11' Wide Transverse Median Marking
Crosswalk Striping, Typ.
12" Yellow Transverse Striping, 45°, @ 20' o.c., Typ.
R/W
TMK: 9-1-018: 018
Owner: D.R. Horton
TMK: 9-1-017: 172
Owner: D.R. Horton
Matchline ℄ Sta. 127+00
Matchline ℄ Sta. 136+00
True North 1" = 40'

Signing and Marking Plan – (℄ Sta. 127+00 to ℄ Sta. 136+00)
Scale: 1" = 40'

1 FARRINGTON HWY. D3-1 Variesx12"
2 ROAD L D3-1 Variesx12"
3 SPEED LIMIT 25 R2-1(25) 24"x30"; R8-3a 24"x24"
4 2
5 BIKE ROUTE D11-1 24"X18"
6 W11-2 36"X36"; W16-7pL 24"X12"
7 STOP R1-1 30" x 30" Mount on St. Lt. Pole 5

Graphic Scale:
1" = 40' 40' 20' 0 40' 80'
Scale in Feet

DATE	REVISION
07/15/22	5 Rev. Signing, Striping, Add callouts
06/08/22	2 Pav't. Arrow Revised, Turn Lane and Median Striping Revised, Turning Vehicles Yield to Pedestrians Sign Removed, Street Sign Removed, Stripe Label Revised and Added

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Signing and Marking Plan ℄ Sta. 118+00 to ℄ Sta. 136+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

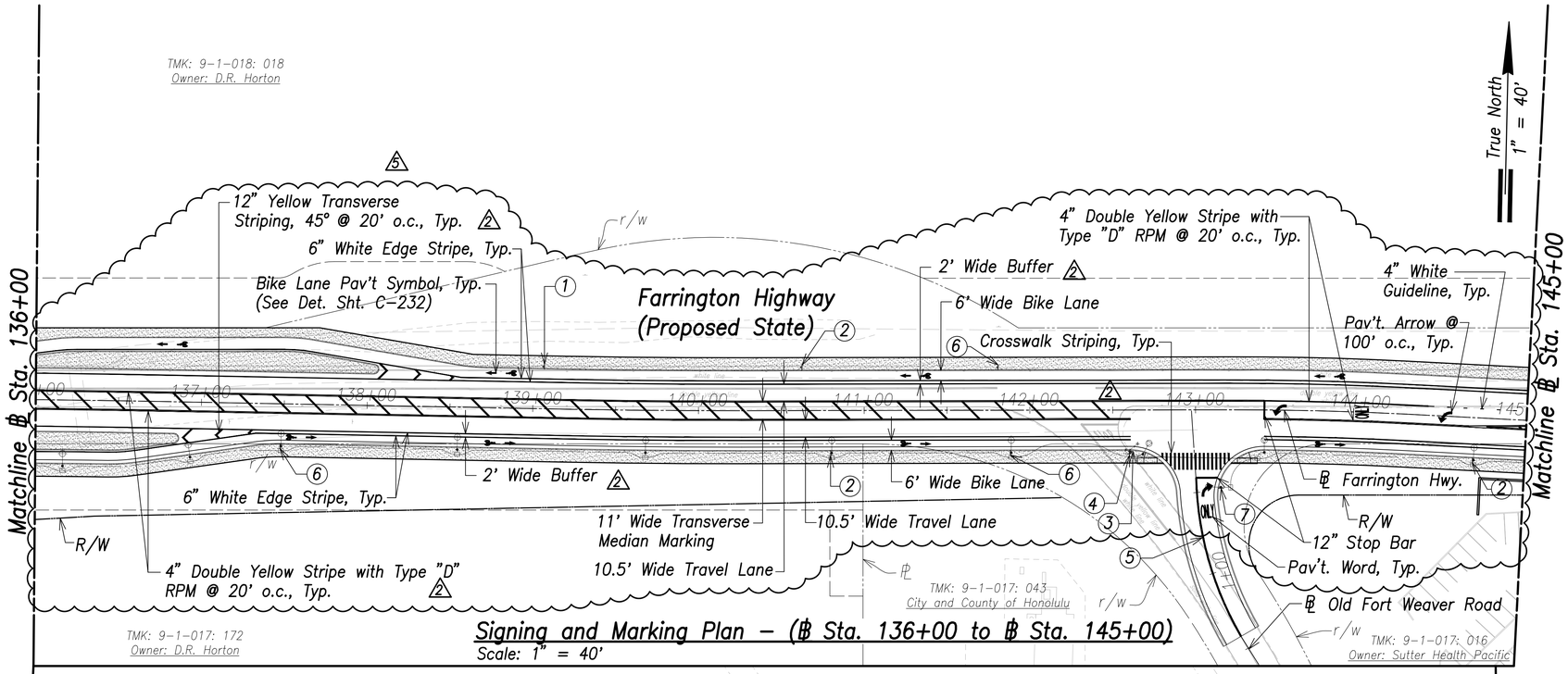
SHEET No. C-229 OF 767 SHEETS

ADD. 230

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

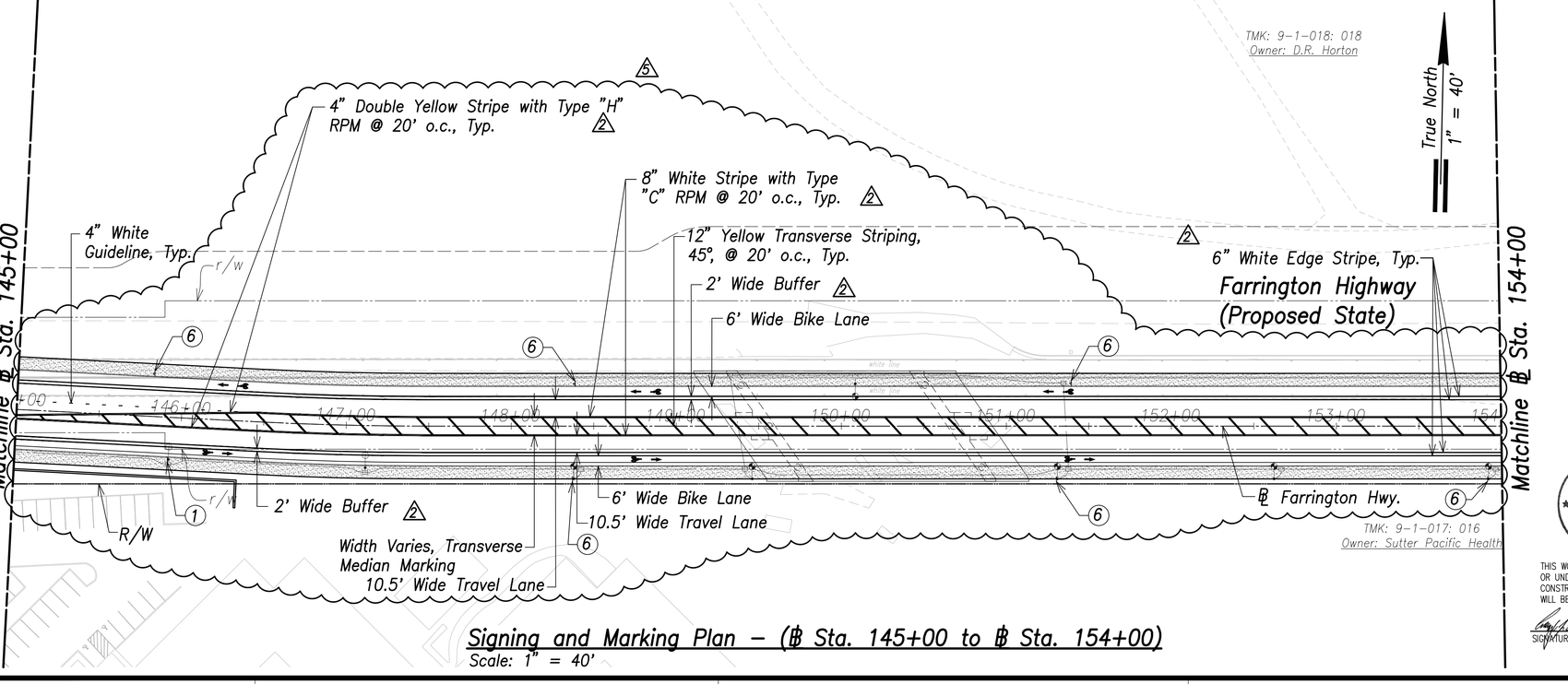
FILE: K:\Civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-229 Striping Plan – Sta. 118+00 to 136+00.dwg saved July 13, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	231	767



Signing and Marking Plan – (℄ Sta. 136+00 to ℄ Sta. 145+00)

Scale: 1" = 40'



Signing and Marking Plan – (℄ Sta. 145+00 to ℄ Sta. 154+00)

Scale: 1" = 40'

1. SPEED LIMIT 25 — R2-1(25) 24"x30"; R8-3a 24"x24" — Mount on St. Lt. Pole
2. BIKE ROUTE — D11-1 24"X18"
3. FARRINGTON HWY. — D3-1 Variesx12"
4. OLD FORT WEAVER RD. — D3-1 Variesx12"
5. 4" Double Yellow Stripe with Type "D" RPM @ 20' o.c., Typ. △2
6. R8-3a 24"x24"
7. STOP — R1-1 30" x 30"

Graphic Scale:
1" = 40' — 40' 20' 0 40' 80' — Scale in Feet

DATE	REVISION
07/15/22	△5 Rev. Signing, Striping, Add callouts
06/08/22	△2 Median Striping Revised; Added callouts; Revised callouts

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Signing and Marking Plan ℄ Sta. 136+00 to ℄ Sta. 154+00

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown — Date: April 2022

CRAIG W. L. LUKE — LICENSED PROFESSIONAL ENGINEER — No. 6935-C — HAWAII, U.S.A.

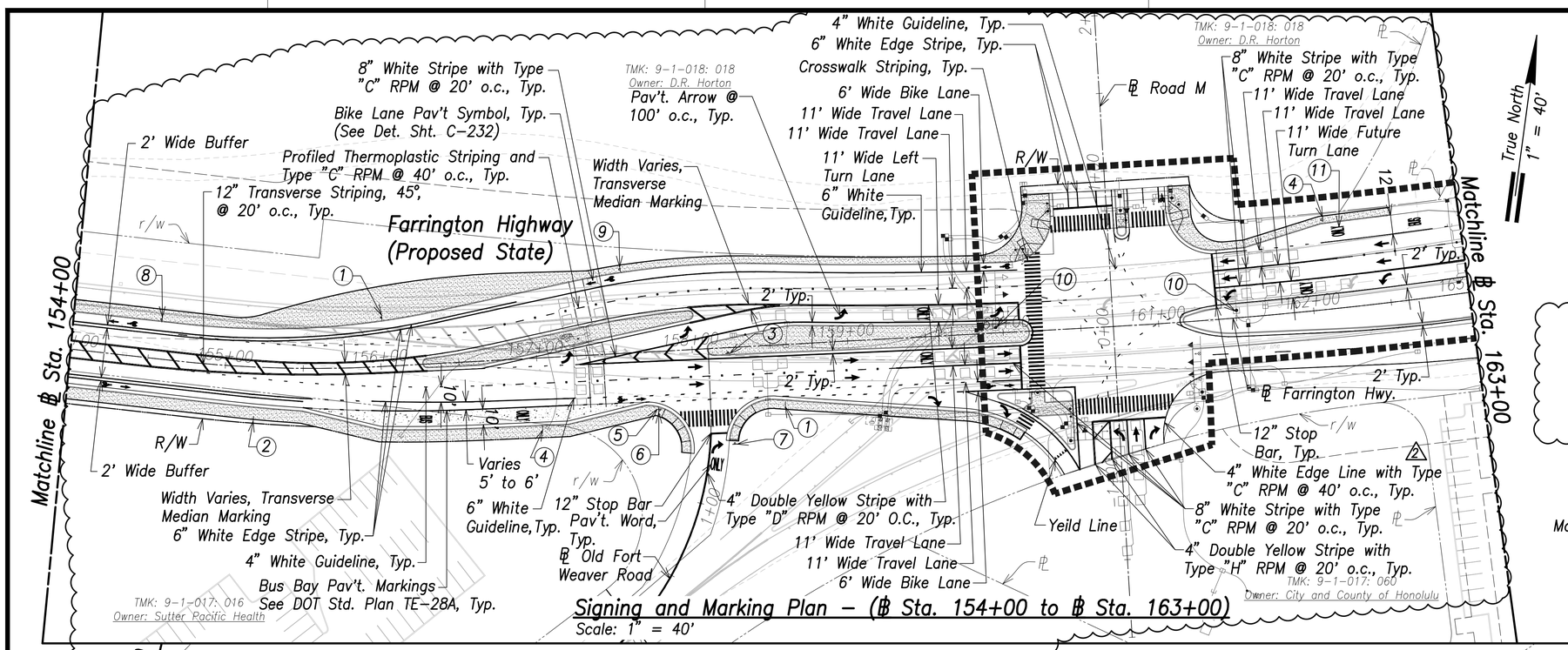
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

SHEET No. C-230 OF 767 SHEETS

ADD. 231

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	232	767



1 — SPEED LIMIT 25 — R2-1(25) 24"x30"
R8-3a 24"x24"
Mount on St. Lt. Pole

2 — R3-8a(MOD.) 45"x30"
R8-3a 24"x24"
Mount on St. Lt. Pole

3 — NO LEFT TURN — R3-2 24" x 24" 24" x 18"
ONE WAY — R6-1(R) 36" x 12"

4 — R7-107A 12"x24"

5 — FARRINGTON HWY. D3-1 VARIESx12"

6 — OLD FORT WEAVER RD. D3-1 Variesx12"

7 — STOP R1-1 30" x 30"

8 — R8-3a 24"x24"

9 — BIKE ROUTE D11-1 24"X18" Mount on St. Lt. Pole

11 — Bus Bay Pav't. Markings See DOT Std. Plan TE-28A, Typ.

10 — ON LEFT GREEN ARROW ONLY — R3-5(MOD.) 30"x42" Mount next to signal
NO U TURN — R3-4(MOD.) 18"x30" Mount next to signal

Graphic Scale:
1" = 40' — 40' 20' 0 40' 80' — Scale in Feet

DATE	REVISION
07/15/22	5 Add Bus Bay, Rev. Sign and Striping
06/08/22	2 Revised turn lane striping, removed Intersection M striping

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Signing and Marking Plan ℄ Sta. 154+00 to End

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown — Date: April 2022

CRAIG W. L. LUKE — LICENSED PROFESSIONAL ENGINEER — No. 6635-C — HAWAII, U.S.A.

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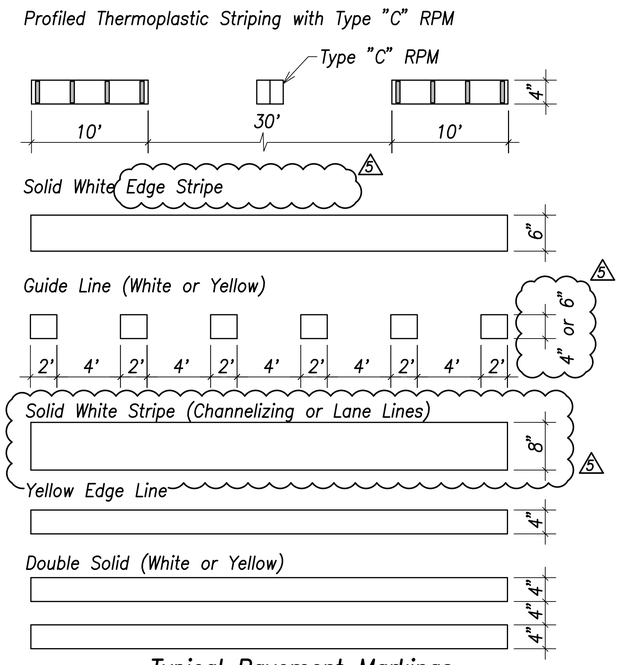
SIGNATURE — April 30, 2024 — EXPIRATION DATE OF THE LICENSE

SHEET No. C-231 OF 767 SHEETS

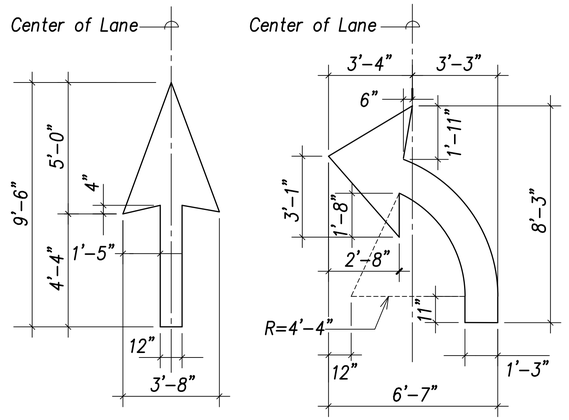
ADD. 232

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	233	767



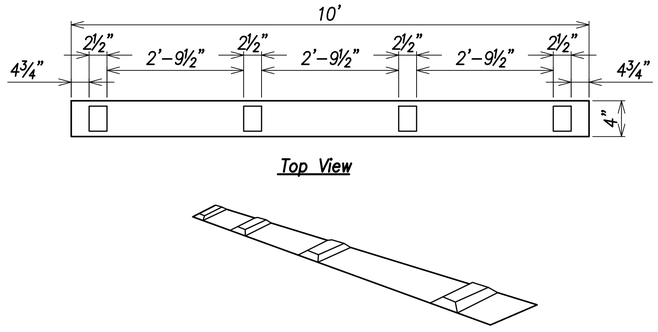
Typical Pavement Markings
Not To Scale



Through Arrow Turn Arrow

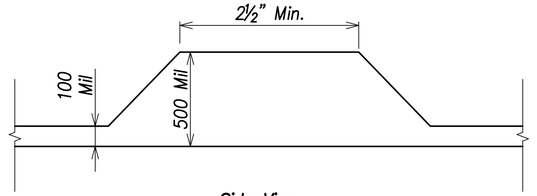
Note:
See Std. Plan TE-29
for Additional Details.

Typical Pavement Arrows
Not To Scale



Top View

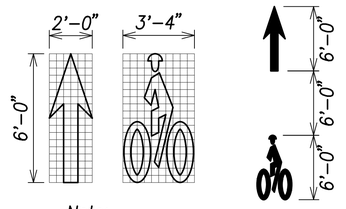
Perspective View



Side View

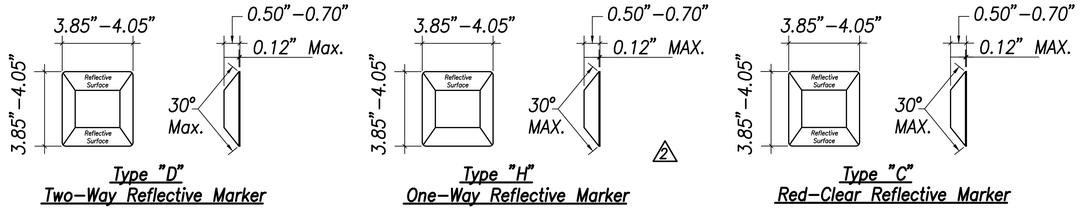
Note:
Profiles shall be placed on 36" o.c., shall be 500 mil height, including 100 mil baseline, and shall have a width equal to approximately the baseline width.

Profiled Thermoplastic Striping
Not to Scale



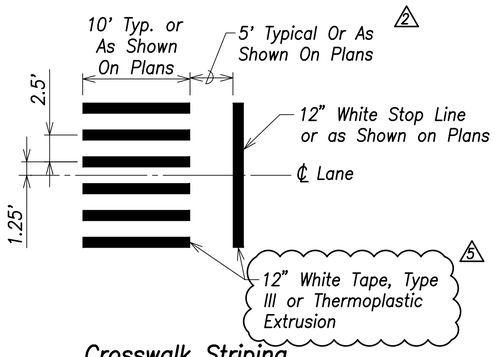
Note:
□ = 4" x 4"

Bike Route Pavement Markings
Not To Scale

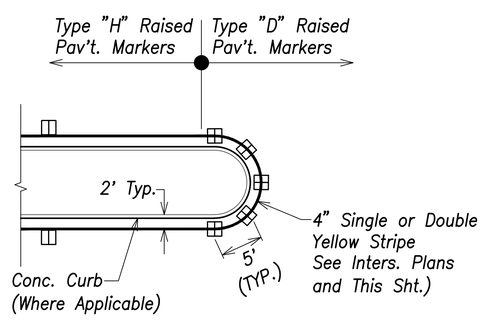


Type "D" Two-Way Reflective Marker Type "H" One-Way Reflective Marker Type "C" Red-Clear Reflective Marker

Standard Raised Pavement Markers
Not To Scale



Crosswalk Striping
Not To Scale



Typical Median Nose Delineation
Not To Scale

DATE	REVISION
07/15/22	5 Revise Detail and Callout
06/08/22	2 Revised Description; Revised Callout

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Pavement Marking Details – 1

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

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SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

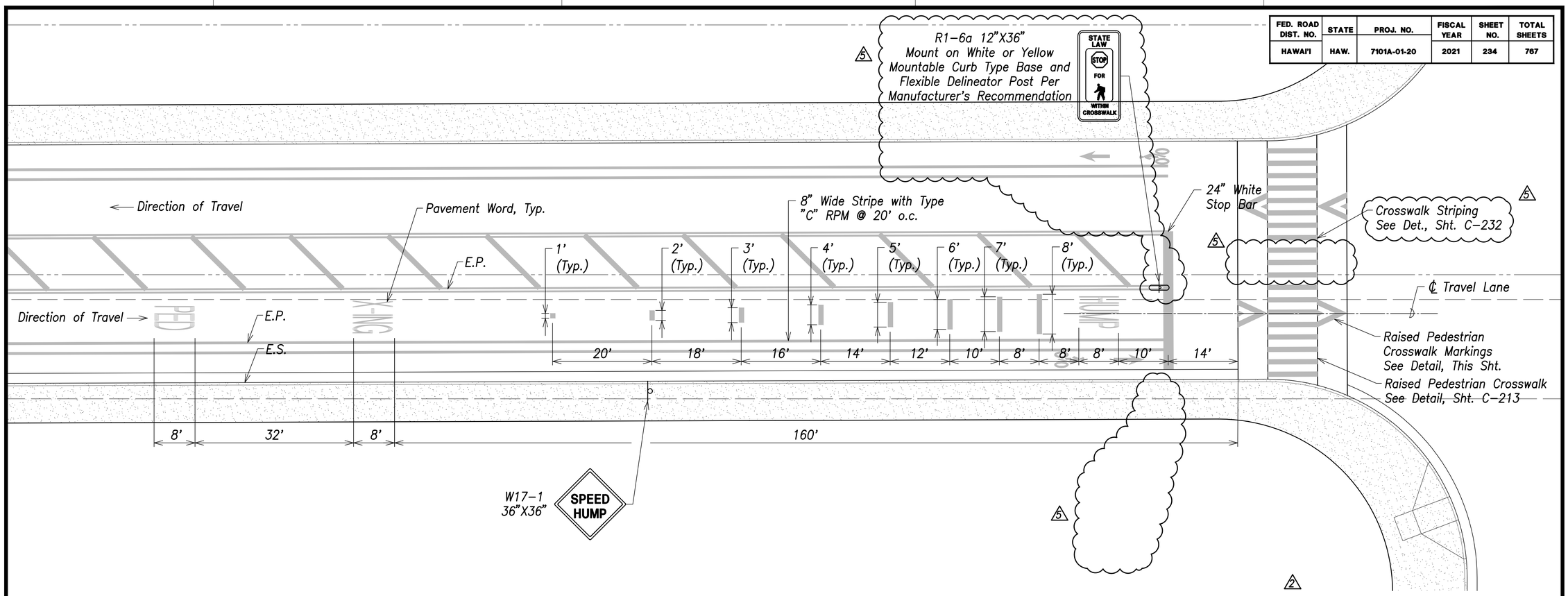
SHEET No. C-232 OF 767 SHEETS

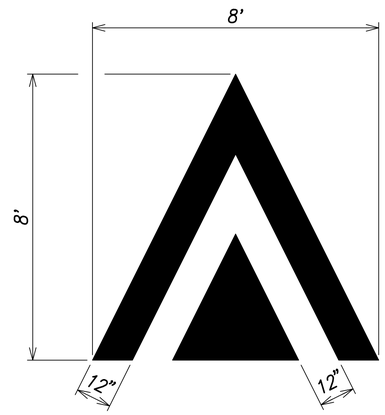
ADD. 233

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

FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-232 Signing and Pavement Marking Details – 1.dwg saved July 1, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	234	767





Raised Pedestrian Crosswalk Markings
Not To Scale

Raised Pedestrian Crosswalk Pavement Marking and Signage Layout Plan
Scale: 1"=10'

Notes:
1. For remainder of signing and marking callouts, see Signing and Marking Plans.
2. Raised pedestrian crosswalk markings and words shall be centered on the centerline of the travel lane.

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

DATE	REVISION
07/15/22	5 Rev. Sheet Ref., Callout and Sign. Del. Sign and Symbol
06/08/22	2 Revised Sheet

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

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SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Pavement Marking Details – 2

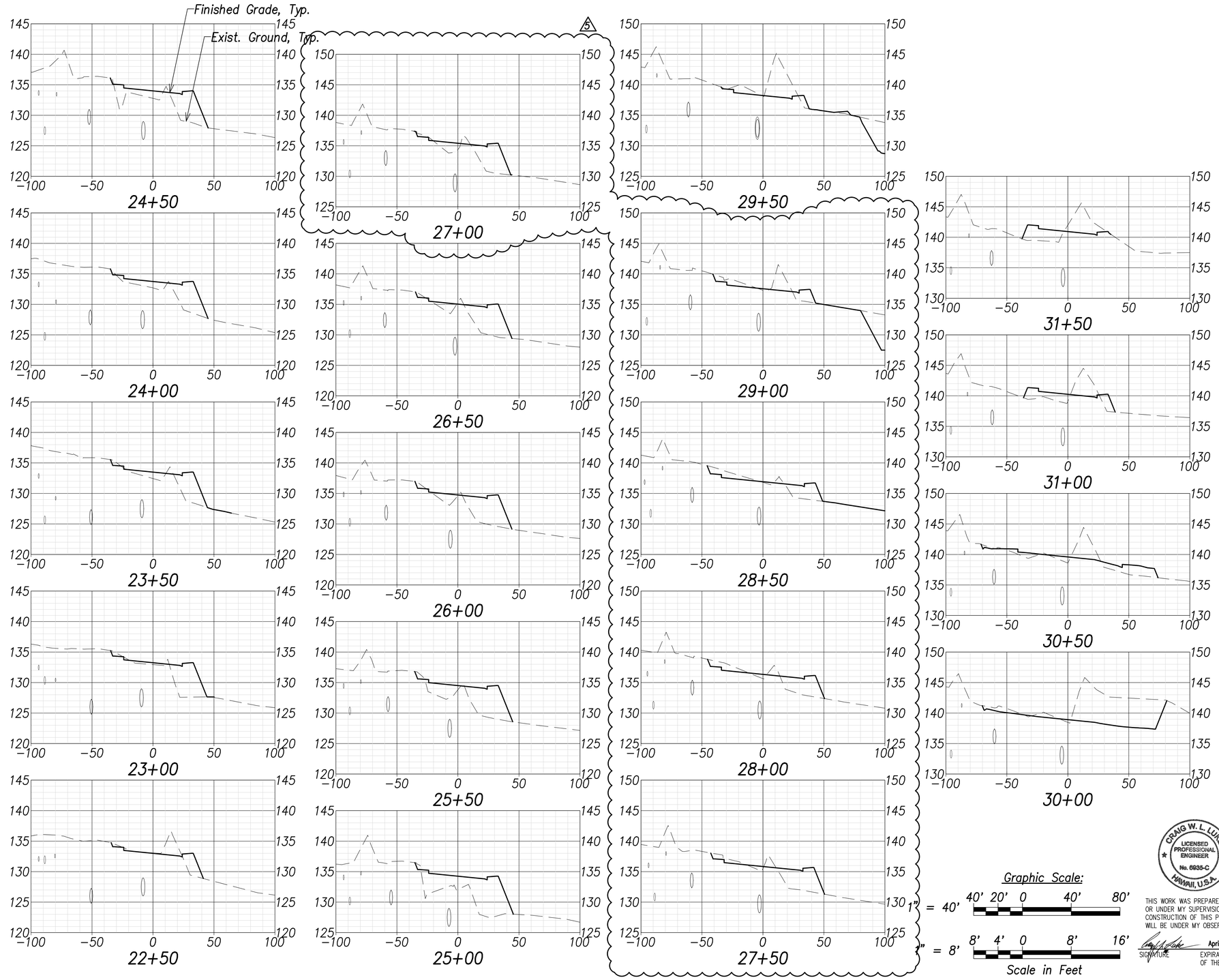
FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

Scale: As Shown Date: April 2022

SHEET No. C-233 OF 767 SHEETS

ADD. 234

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	237	767



07/15/22	5 Revise cross sections
06/08/22	2 Replace sheet
DATE	REVISION

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Cross Sections – 3

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

Graphic Scale:
1" = 40' 40' 20' 0 40' 80'
1" = 8' 8' 4' 0 8' 16'
Scale in Feet

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

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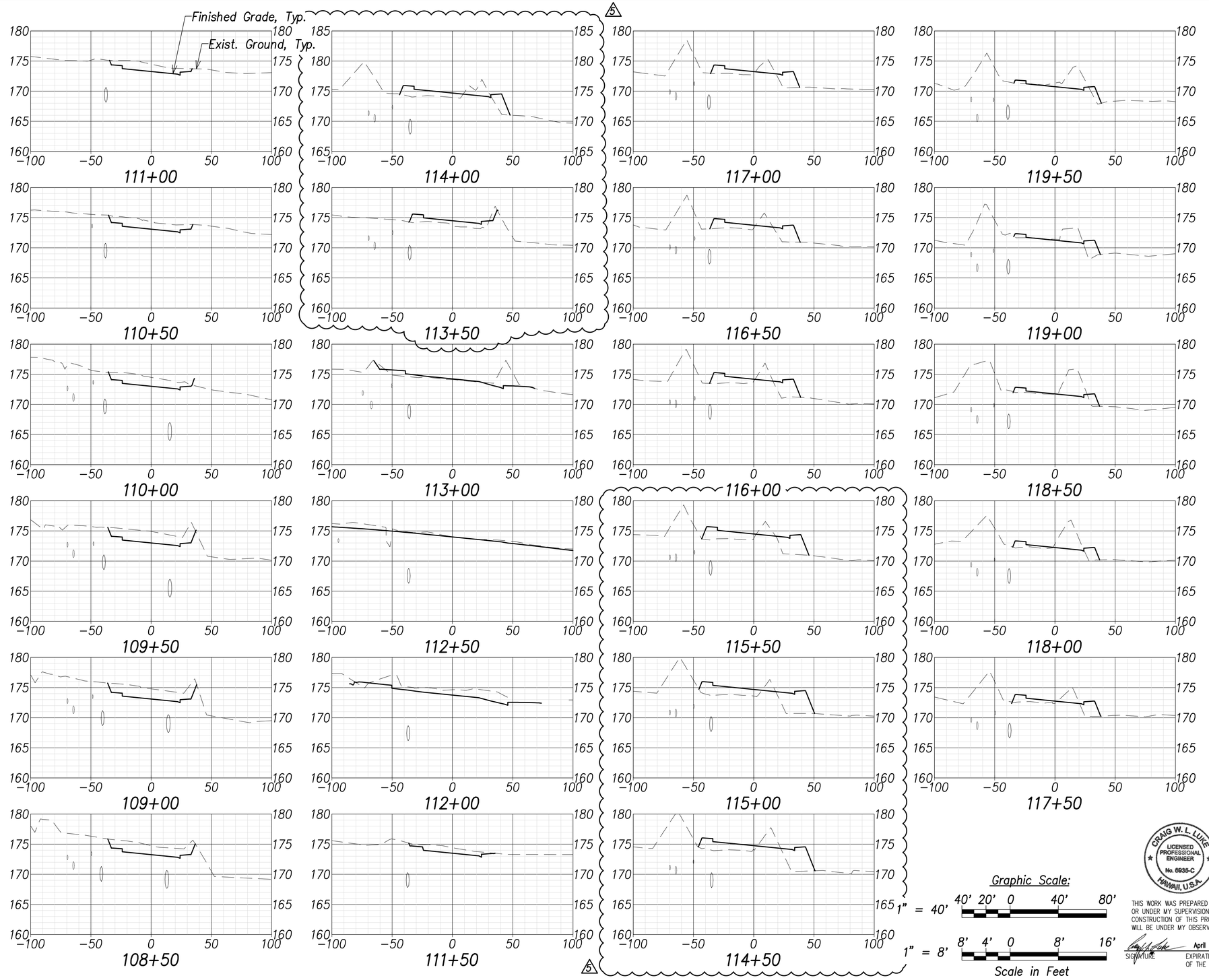
SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

SHEET No. C-236 OF 767 SHEETS

ADD. 237

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	245	767



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

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

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CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 Revise cross sections
06/08/22	2 Replace sheet

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Cross Sections – 11

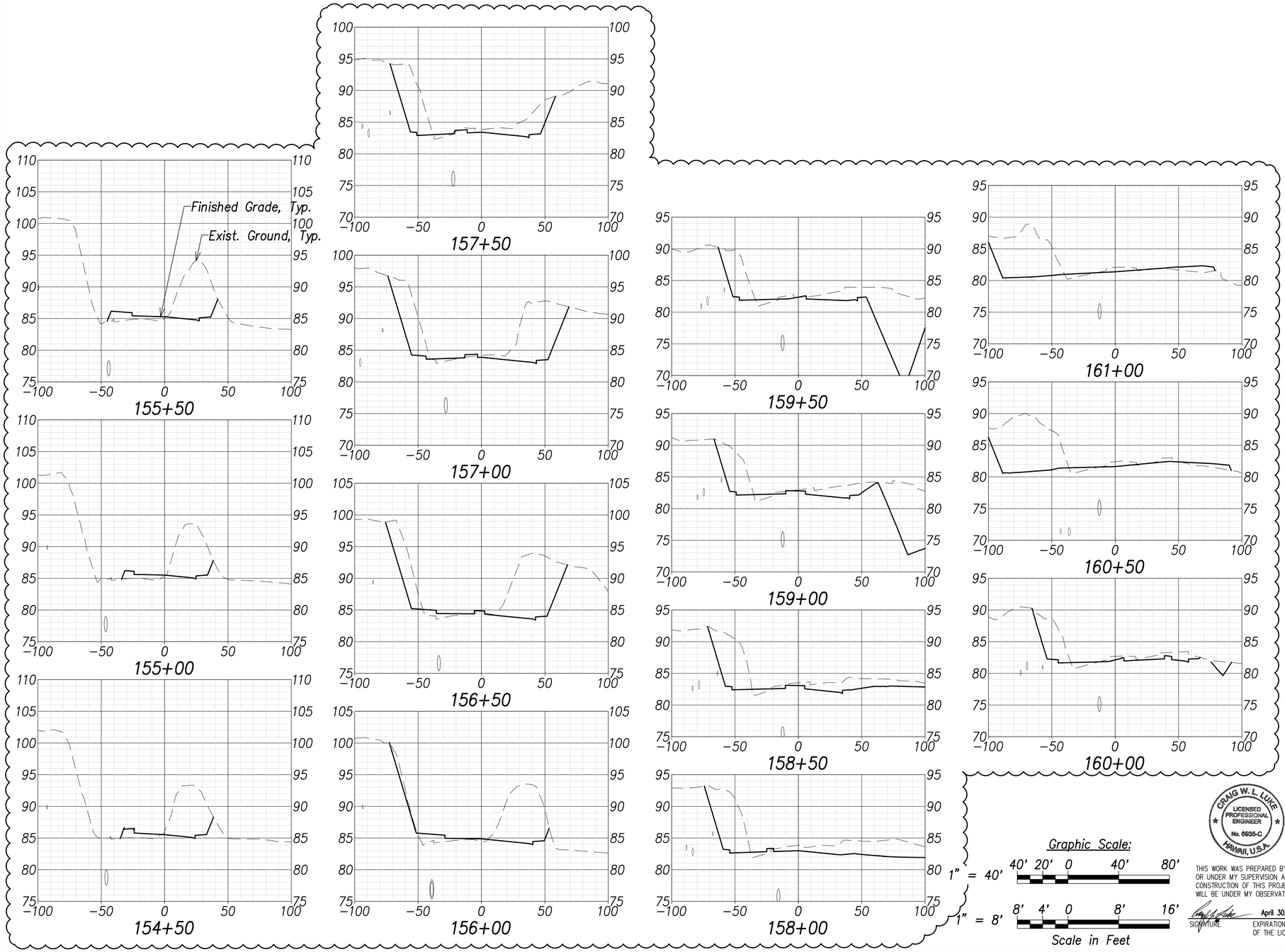
FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. C-244 OF 767 SHEETS

ADD. 245

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	250	767



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

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

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CRAIG W. L. LUKE LICENSED PROFESSIONAL ENGINEER No. 6935-C HAWAII, U.S.A.

SIGNATURE

April 30, 2024
EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 Revised cross sections
06/08/22	2 Replace sheet

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Cross Sections – 16

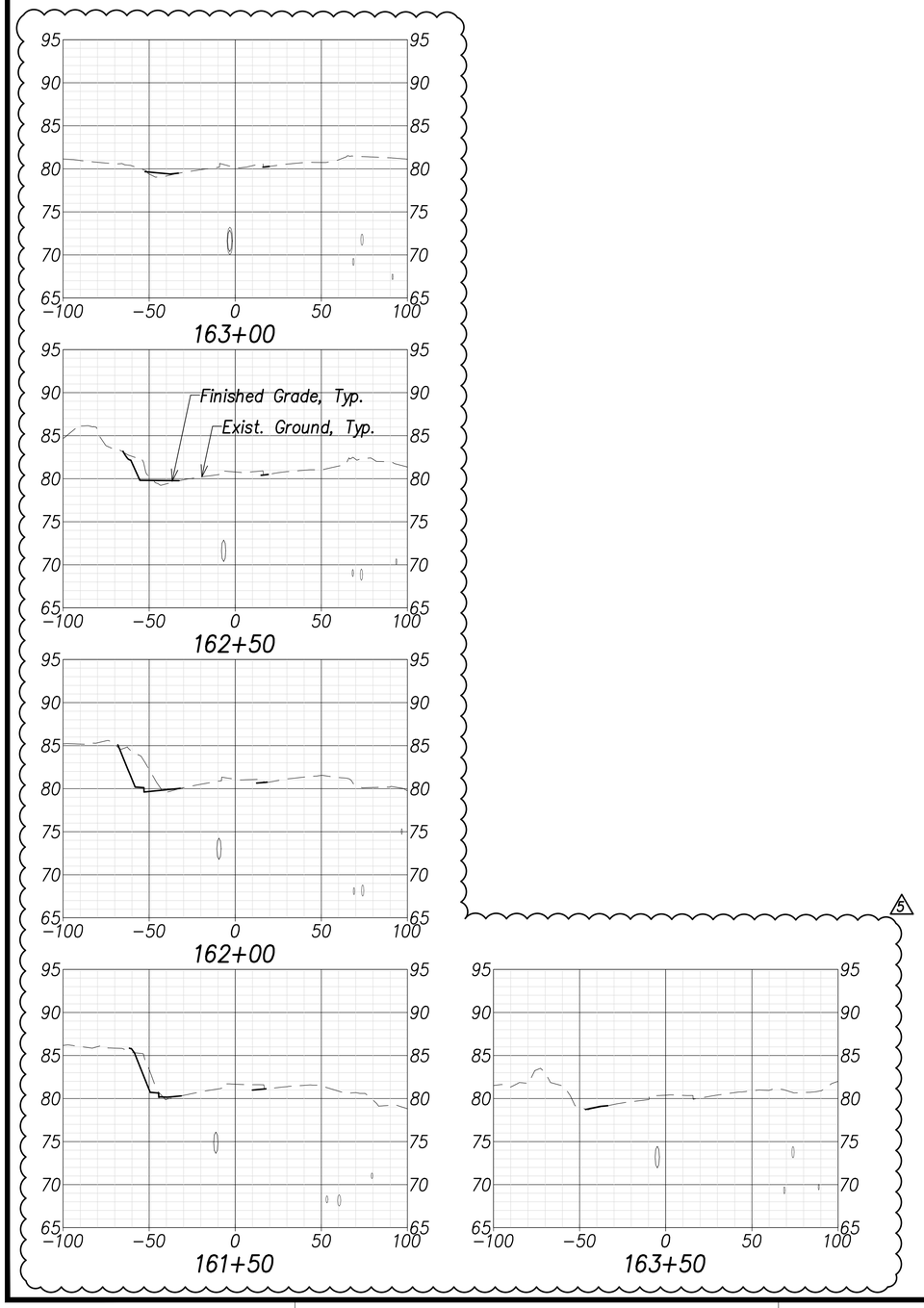
FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. C-249 OF 767 SHEETS

ADD. 250

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	251	767



5

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

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

1" = 8' 8' 4' 0 8' 16'

Scale in Feet

CRAIG W. L. LUKE
LICENSED PROFESSIONAL ENGINEER
No. 6935-C
HAWAII, U.S.A.

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SIGNATURE

April 30, 2024
EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 Revised cross sections
06/08/22	2 Replace sheet

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Cross Sections – 17

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. C-250 OF 767 SHEETS

ADD. 251

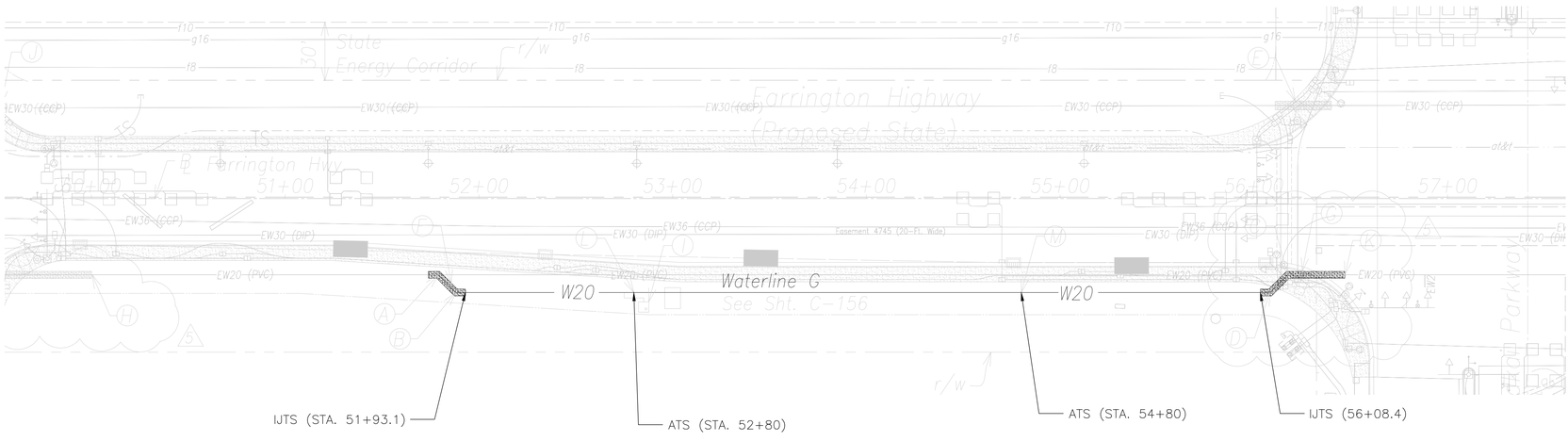
FILE: K:\civil\23146 Farrington Hwy Widening\Dwg\Construction Dwgs\C-250 Cross Sections – 17.dwg saved July 11, 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A–01–20	2021		XXX

TEST STATION SCHEDULE							
NO.	PIPELINE/STREET NAME	STATION	TEST STATION TYPE	NUMBER OF ANODES	TYPE OF ANODES	NOTES	REFERENCE DETAILS
1	W20	51+93.1	IJTS	N/A	N/A	INSULATING JOINT BEFORE RCJ	2/CP-2, B/CP/2, 2/CP-3
2	W20	52+80.0	ATS	4	HIGH-POTENTIAL MAGNESIUM (60 LB)		1/CP-2, A/CP-2, 1/CP-3
3	W20	54+80.0	ATS	4	HIGH-POTENTIAL MAGNESIUM (60 LB)		1/CP-2, A/CP-2, 1/CP-3
4	W20	56+08.4	IJTS	N/A	N/A	INSULATING JOINT BEFORE RCJ	2/CP-2, B/CP/2, 2/CP-3

NOTES:

1. TEST STATIONS TO BE LOCATED ON THE FAR EDGE OF THE ROW AND IN AREAS NOT SUBJECT TO VEHICULAR TRAFFIC, SUCH AS SIDEWALKS.
2. WHEN AVAILABLE, TEST STATIONS TO BE LOCATED BEHIND NEAREST CURB AND WITHIN 5 FT OF FIRE HYDRANT.
3. IJTS STATIONING TAKEN FROM INSULATING JOINT. INSULATING JOINT SHALL BE INSTALLED BETWEEN CONCRETE ENCASED PIPE AND NON–ENCASED PIPE.
4. ELECTRICALLY ISOLATE ALL METALLIC LATERAL PIPING (INCLUDING ARVs) FROM PROJECT PIPELINES. IF METALLIC LATERAL PIPING IS NOT PROPERLY ISOLATED FROM THE PROJECT PIPELINES, THEN THE CATHODIC PROTECTION SYSTEM COULD BE PREMATURELY DEPLETED.
5. THE CATHODIC PROTECTION SYSTEM DESIGN IS DEPENDENT ON THE DIP HAVING A BONDED DIELECTRIC COATING PER THE BWS WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS. IF THE DIP DOES NOT HAVE A BONDED DIELECTRIC COATING, THEN THE CATHODIC PROTECTION SYSTEM COULD BE PREMATURELY DEPLETED.



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

V&A
1000 Broadway, Suite 320
Oakland, CA 94607
Tel. (510) 903-6600, Fax (510) 903-6601
Project No. 21-0197

GLENN H WILLSON
LICENSED PROFESSIONAL ENGINEER
No. 11304-C
HAWAII, USA

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SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

07/15/22 | 5 Replace Sheet

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CATHODIC PROTECTION TEST STATION SCHEDULE

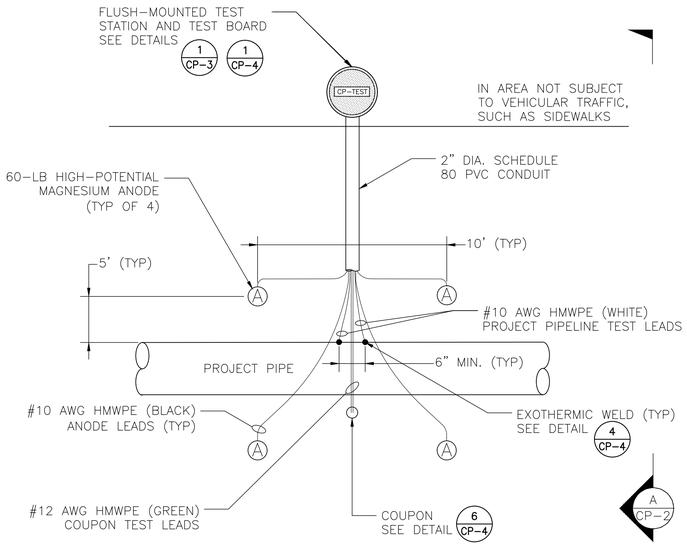
FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

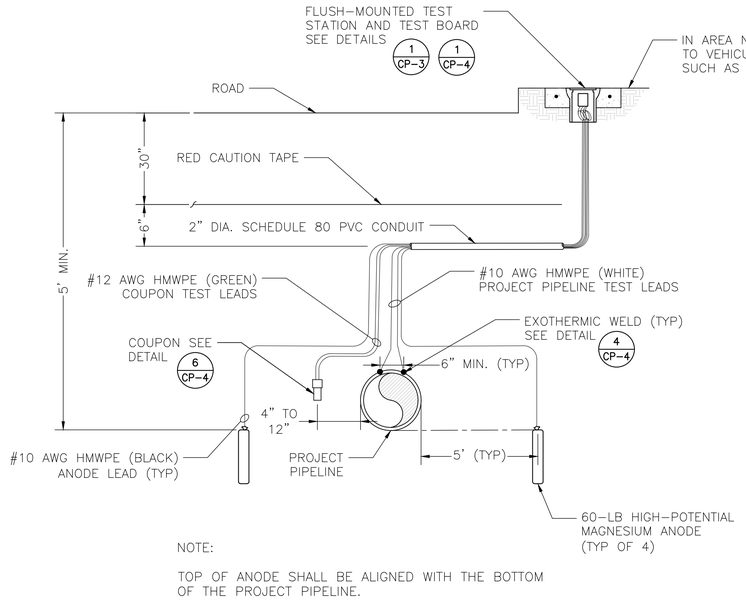
Scale: As Shown Date: April 2022

SHEET No. CP-1 OF 767 SHEETS

ADD. 251S–1

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021		XXX





NOTE:

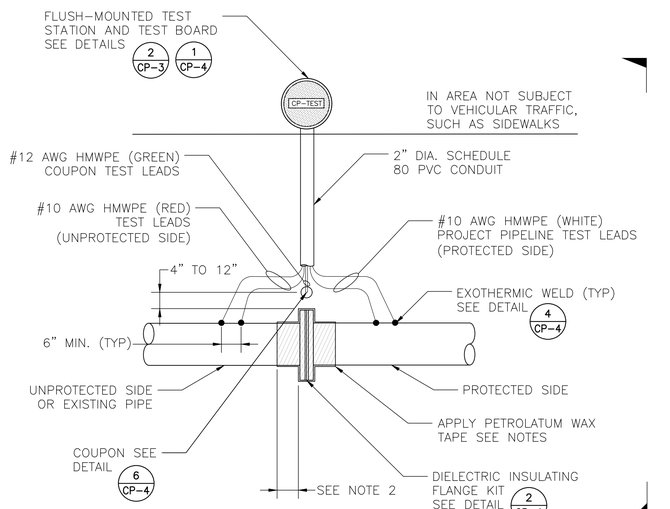
TOP OF ANODE SHALL BE ALIGNED WITH THE BOTTOM OF THE PROJECT PIPELINE.

ANODE TEST STATION (ATS) PLAN VIEW

SCALE: NTS — 1 / CP-2

ANODE TEST STATION (ATS) SECTION VIEW

SCALE: NTS — A / CP-2

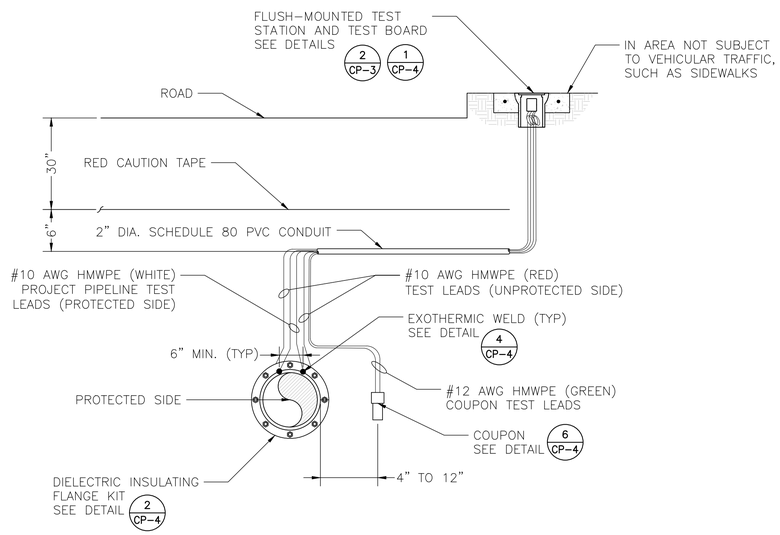


NOTES:

1. REINFORCED CONCRETE JACKETING NOT SHOWN FOR CLARITY.
2. COAT THE EXTERIOR OF THE INSULATING FLANGE WITH PETROLATUM WAX TAPE FOR A MINIMUM OF 3 FEET BEYOND THE GASKET WITH A MINIMUM OF 6 INCHES OF OVERLAP WITH THE FACTORY-APPLIED COATING ON THE PIPELINE.

INSULATING JOINT TEST STATION (IJTS) PLAN VIEW

SCALE: NTS — 2 / CP-2



INSULATING JOINT TEST STATION (IJTS) SECTION VIEW

SCALE: NTS — B / CP-2

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

V&A
1000 Broadway, Suite 320
Oakland, CA 94607
Tel. (510) 903-6600, Fax (510) 903-6601
Project No. 21-0197

GLENN H WILLSON LICENSED PROFESSIONAL ENGINEER No. 11304-C HAWAII, U.S.A.

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SIGNATURE — April 30, 2024 — EXPIRATION DATE OF THE LICENSE

07/15/22 | 5 Replace Sheet

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CATHODIC PROTECTION DETAILS

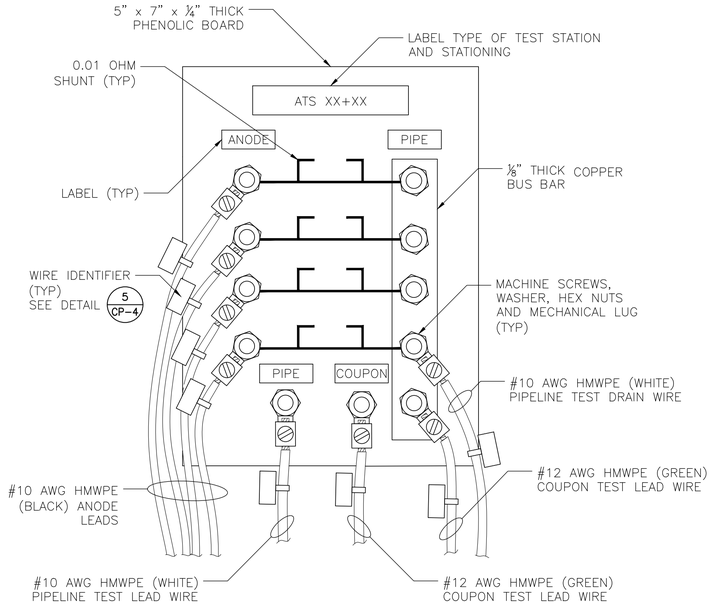
FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown — Date: April 2022

SHEET No. CP-2 OF 767 SHEETS

ADD. 251S-2

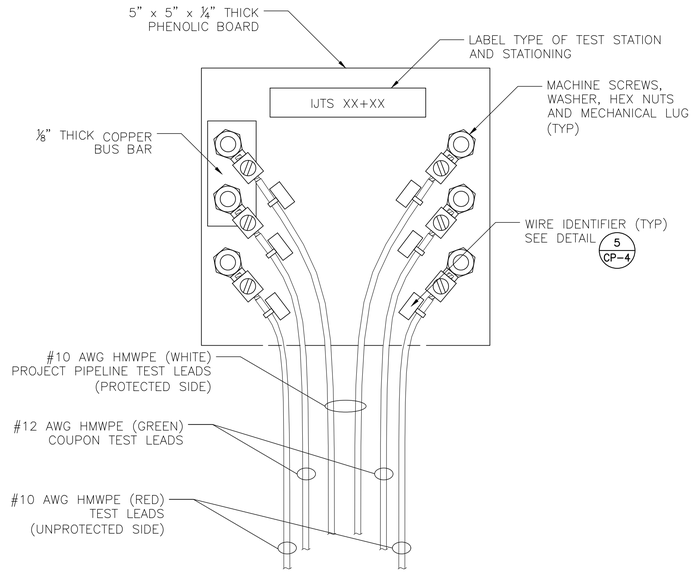
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021		XXX



ANODE TEST STATION (ATS) TERMINAL BOARD DETAIL

SCALE: NTS

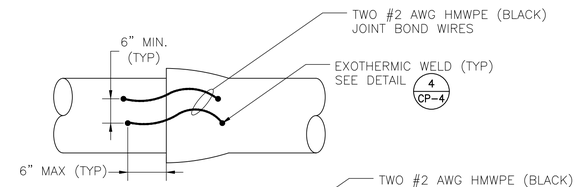
1 CP-3

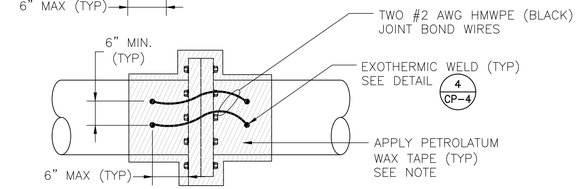


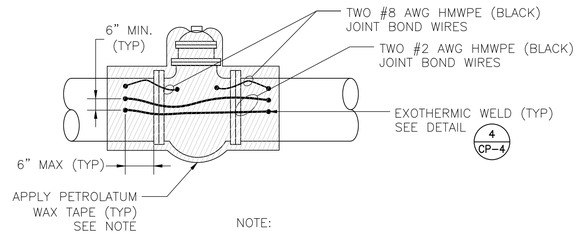
INSULATING JOINT TEST STATION (IJTS) TERMINAL BOARD DETAIL

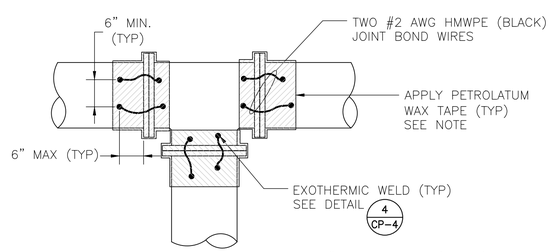
SCALE: NTS

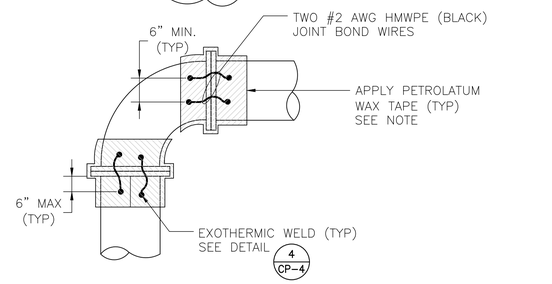
2 CP-3











NOTE:

COAT THE EXTERIOR OF THE JOINT WITH PETROLATUM WAX TAPE FOR A MINIMUM OF 3 FEET BEYOND THE JOINT WITH A MINIMUM OF 6 INCHES OF OVERLAP WITH THE FACTORY-APPLIED COATING ON THE PIPELINE.

PIPE JOINT BONDING DETAILS FOR NON-INSULATED JOINTS

SCALE: NTS

4 CP-3

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

V&A
1000 Broadway, Suite 320
Oakland, CA 94607
Tel. (510) 903-6600, Fax (510) 903-6601
Project No. 21-0197

GLENN H WILLSON LICENSED PROFESSIONAL ENGINEER No. 11304-C HAWAII, U.S.A.

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SIGNATURE — April 30, 2024 — EXPIRATION DATE OF THE LICENSE

07/15/22	5 Replace Sheet

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CATHODIC PROTECTION DETAILS

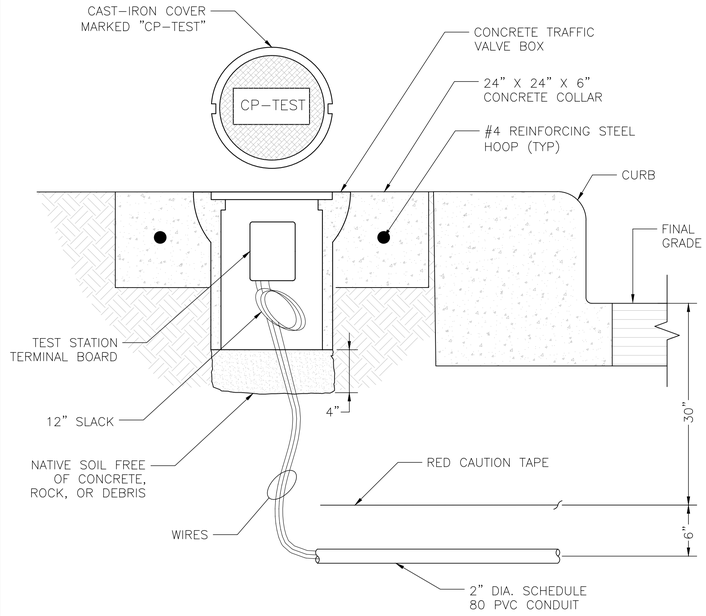
FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown — Date: April 2022

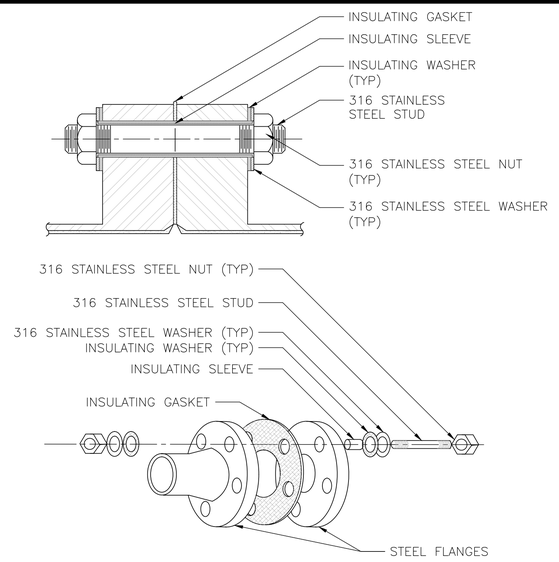
SHEET No. CP-3 OF 767 SHEETS

ADD. 251S-3

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021		XXX



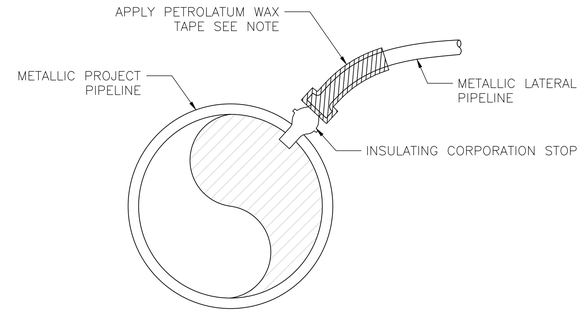
FLUSH-MOUNTED TEST STATION DETAIL (1 / CP-4)
SCALE: NTS



NOTE:

PETROLATUM WAX TAPE NOT SHOWN

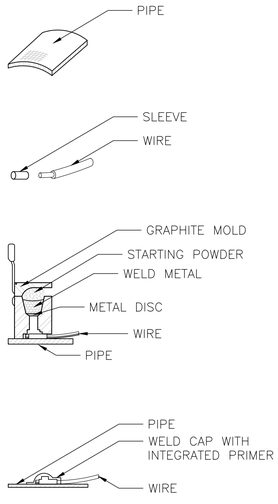
DIELECTRIC INSULATING FLANGE KIT DETAIL WITH SECTION VIEW (2 / CP-4)
SCALE: NTS



NOTE:

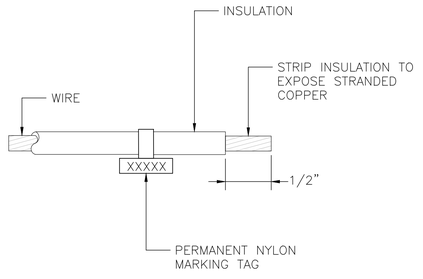
WRAP FIRST THREE FEET OF METALLIC LATERAL IN PETROLATUM WAX TAPE.

LATERAL CONNECTION DETAIL (3 / CP-4)
SCALE: NTS



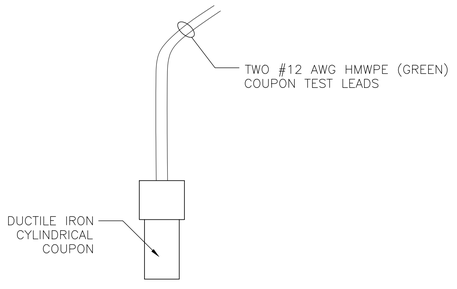
1. ALL WELDS SHALL BE 6" APART AT MINIMUM.
2. GRIND PIPE TO BARE METAL AND CLEAN SURFACE. GROUND AREA SHALL BE LARGE ENOUGH FOR EXOTHERMIC WELD AND SMALL ENOUGH TO BE COMPLETELY COVERED BY WELD CAP.
3. STRIP INSULATION FROM WIRE AND ATTACH SLEEVE.
4. HOLD MOLD FIRMLY WITH OPENING AWAY FROM OPERATOR. IGNITE WITH FLINT GUN. REMOVE SLAG FROM CONNECTION WITH CHIPPING HAMMER. TEST WELD WITH 22 OZ HAMMER.
5. COVER CONNECTION WITH WELD CAP WITH INTEGRATED PRIMER. REPAIR ALL DAMAGE TO COATING AND LINING IN ACCORDANCE WITH COATING AND LINING MANUFACTURER'S RECOMMENDATIONS.

EXOTHERMIC WELD DETAIL FOR DUCTILE IRON PIPE (4 / CP-4)
SCALE: NTS



WIRE IDENTIFIER SCHEDULE	
STRUCTURE	LABEL
XX" DIP WATER	XX" DI
GALVANIC ANODE	ANODE
COUPON	COUP

WIRE IDENTIFIER DETAIL (5 / CP-4)
SCALE: NTS



COUPON DETAIL (6 / CP-4)
SCALE: NTS

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NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

V&A
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Oakland, CA 94607
Tel. (510) 903-6600, Fax (510) 903-6601
Project No. 21-0197

GLENN H WILLSON
LICENSED PROFESSIONAL ENGINEER
No. 11304-C
HAWAII, U.S.A.

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07/15/22 — 5 Replace Sheet

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CATHODIC PROTECTION DETAILS

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. CP-4 OF 767 SHEETS

ADD. 251S-4

INDEX TO STRUCTURAL DRAWINGS

SHEET NO.	DESCRIPTION	SHEET NO.	DESCRIPTION
			DRILLED SHAFT FOUNDATION
SC3.1	PALEHUA STREAM BOX CULVERT LAYOUT PLAN	SD1.1	TRAFFIC SIGNAL FOUNDATION NOTES AND SECTIONS
SC3.2	PALEHUA STREAM BOX CULVERT LONGITUDINAL SECTION	SD1.2	TRAFFIC SIGNAL FOUNDATION SCHEDULE
SC3.3	PALEHUA STREAM BOX CULVERT TYPICAL BOX CULVERT SECTION		
SC3.4	PALEHUA STREAM BOX CULVERT BOX CULVERT SECTION AT SKEW		
SC3.5	PALEHUA STREAM BOX CULVERT INLET BOTTOM SLAB PLAN AND DETAILS		RETAINING WALL
SC3.6	PALEHUA STREAM BOX CULVERT INLET TOP SLAB PLAN AND DETAILS	SD2.1	RETAINING WALL PAY LIMIT
SC3.7	PALEHUA STREAM BOX CULVERT OUTLET BOTTOM SLAB PLAN AND DETAILS	SD2.2	TYPICAL RETAINING WALL JOINT DETAILS
SC3.8	PALEHUA STREAM BOX CULVERT OUTLET TOP SLAB PLAN AND DETAILS	SD2.3	TYPICAL RETAINING WALL DETAILS
SC3.9	PALEHUA STREAM BOX CULVERT HEADWALL PLANS	SD2.4	TYPICAL RETAINING WALL SECTION AND SCHEDULE AT KAHI MOHALA
SC3.10	PALEHUA STREAM BOX CULVERT HEADWALL DETAILS	SD2.5	KAHI MOHALA WALL PROFILE STA 0+00 TO STA 1+83
SC3.11	PALEHUA STREAM BOX CULVERT INLET PLAN AND DETAILS	SD2.6	KAHI MOHALA WALL PROFILE STA 1+83 TO STA 3+75
SC3.12	PALEHUA STREAM BOX CULVERT OUTLET PLAN AND DETAILS		
SC3.13	PALEHUA STREAM BOX CULVERT TYPICAL INLET/OUTLET SECTION		
SC3.14	PALEHUA STREAM BOX CULVERT INLET/OUTLET WALL ELEVATION		CONCRETE JACKETS
SC3.15	PALEHUA STREAM BOX CULVERT INLET/OUTLET LONGITUDINAL SECTION	SD3.1	VERTICAL BEND PIPE JACKETS
SC3.16	PALEHUA STREAM BOX CULVERT DEMOLITION PLAN	SD3.2	HORIZONTAL BEND PIPE JACKETS
SC3.17	PALEHUA STREAM BOX CULVERT DEMOLITION SECTIONS	SD3.3	TEMPORARY LINE STOP CONCRETE SUPPORT BLOCK PLAN AND SECTIONS
SC3.18	PALEHUA STREAM BOX CULVERT CONSTRUCTION SEQUENCE	SD3.4	CONCRETE SUPPORT BLOCK TOPPING PLAN AND SECTIONS
SC3.19	PALEHUA STREAM BOX CULVERT CONSTRUCTION SEQUENCE	SD3.5	CONCRETE SUPPORT BLOCK PLANS AT PVC PIPE 5
SC3.20	PALEHUA STREAM BOX CULVERT CONSTRUCTION SEQUENCE	SD3.6	CONCRETE SUPPORT BLOCK SECTIONS AT PVC PIPE
SC3.21	PALEHUA STREAM BOX CULVERT CONSTRUCTION SEQUENCE		
SC4.1	42-INCH CULVERT INLET PLAN		MANHOLE ADJUSTMENTS
SC4.2	42-INCH CULVERT OUTLET PLAN	SD4.1	TYPE "A" MANHOLE ADJUSTMENT SECTION AND DETAIL
SC4.3	42-INCH CULVERT SPECIAL DMH - DETAILS	SD4.2	TYPE "B" MANHOLE ADJUSTMENT SECTION
SC4.4	42-INCH CULVERT SPECIAL DMH - DETAILS		
SC4.5	42-INCH CULVERT SPECIAL DMH - PLAN AND SECTIONS		
SC4.6	42-INCH CULVERT OUTLET SECTION		GRATED DROP INLET
SC4.7	42-INCH CULVERT OUTLET SECTIONS	SD5.1	TYPICAL GRATED DROP INLET DETAILS
SC4.8	42-INCH CULVERT DEMOLITION PLAN	SD5.2	MODIFIED GRATED DROP INLET
		SD5.3	SPECIAL GRATED DROP INLET B2 AND D2

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 343	

DATE	REVISION
07/15/22	5 Revised Index

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Index to Structural Drawings

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: None — Date: Apr. 2022

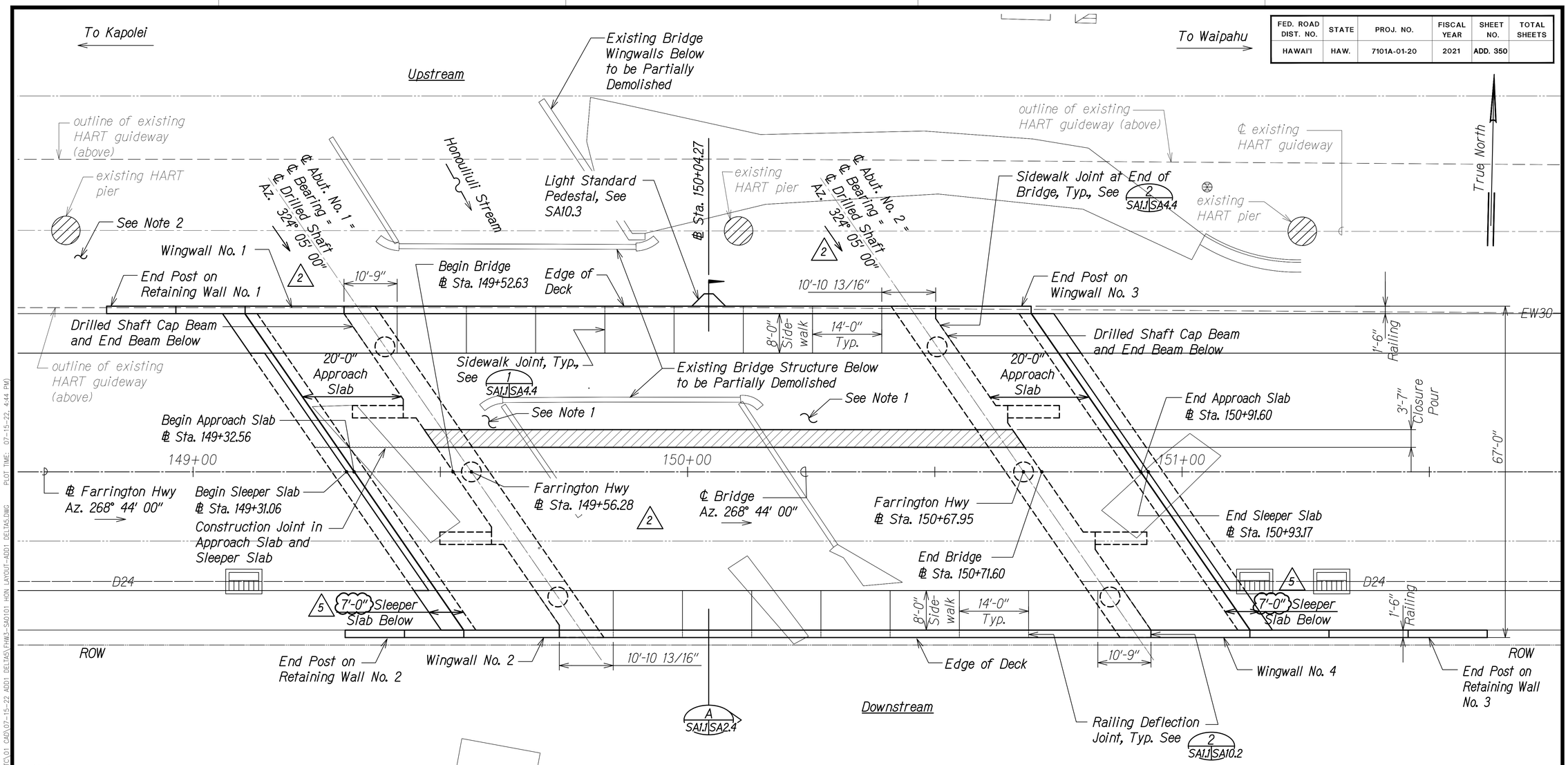
SHEET No. S0.4 OF 10 SHEETS

ADD. 343

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

DRAWING NAME: Z:\00 ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTAS\FHWA-S0001 INDEX.DWG PLOT TIME: 07-15-22, 6:32 PM)

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 350	



LAYOUT PLAN

Scale: 1" = 10'-0"

A SA1.1 SA1.1

Notes:

1. Contractor is responsible for determining the limits and providing all necessary earthwork shoring to facilitate the staged construction requirements of the bridge. Shoring design shall take in to account grade differences between the staged backfilling operations as well as the location of and load imposed by the nearby existing metal guardrails.
2. Earthwork shoring near existing HART piers may be required during structure excavation work
3. The Contractor shall submit working drawings and calculations for the shoring design. The drawings and calculations shall be stamped by a licensed Structural Engineer and a licensed Civil Engineer specializing in Geotechnical Engineering in the State of Hawaii. The drawings and calculations shall be reviewed by the Engineer before any construction work is to proceed.
4. Dimensions for approach slab and sleeper slab are measured parallel with ℄ bridge.

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

DRAWING NAME: Z:\OD ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\HWS-SA01101 HON LAYOUT-ADD1 DELTA5.DWG PLOT TIME: 07-15-22, 4:44 PM)

DATE	REVISION
07/15/22	5 Revised Sleeper Slab Width
06/08/22	2 Revised Station and Azimuth

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge Layout Plan

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

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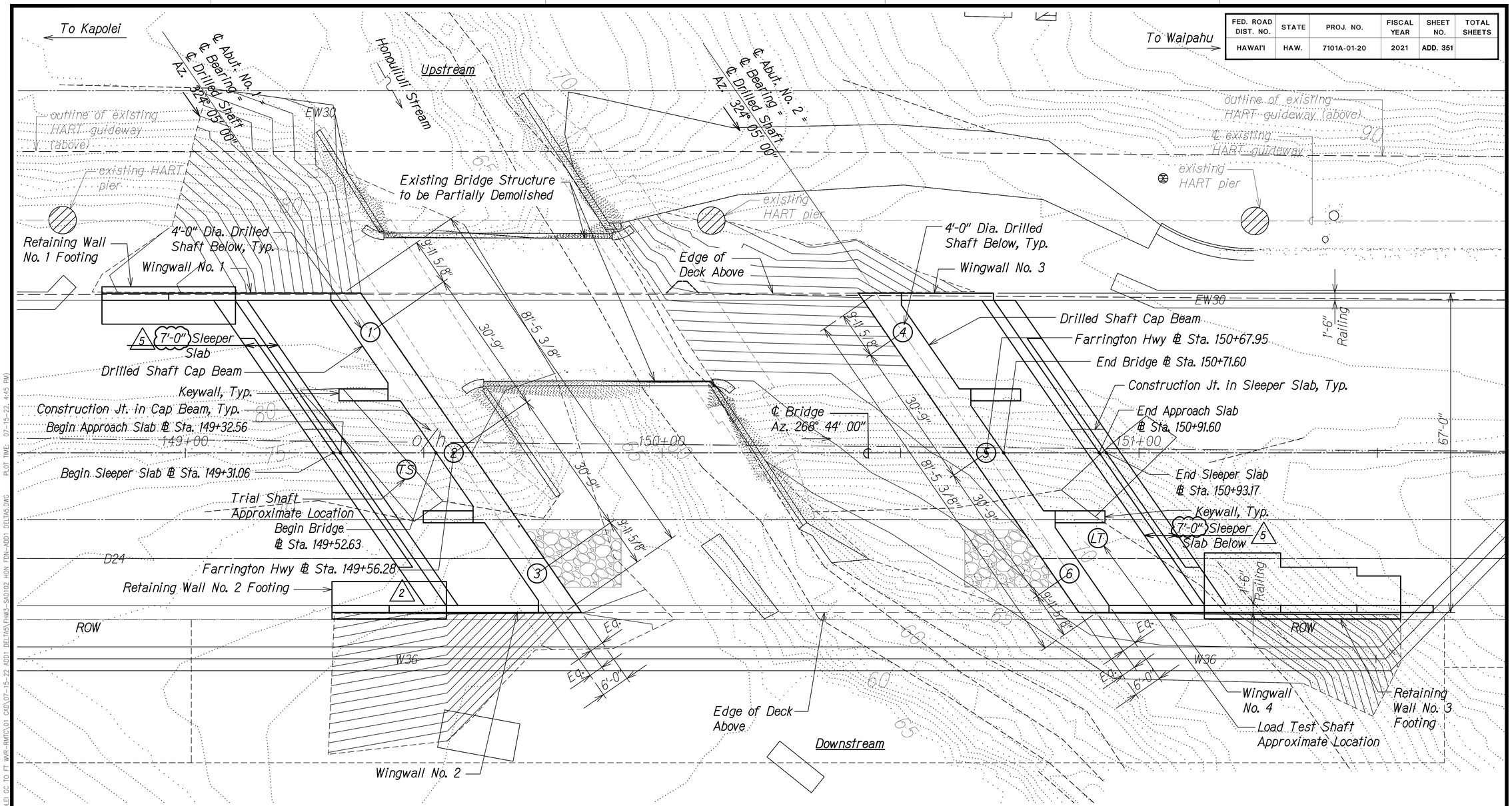
SHEET No. SA1.1 OF 4 SHEETS

ADD. 350

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 351	



FOUNDATION PLAN

Scale: 1" = 10'-0"

A SA1.2 | SA1.2

Notes:

1. Existing structures are shown for reference only and are to be partially demolished. See sheets SA3.1 to SA3.3.
2. Locations for trial shaft and load test shaft are approximate. For additional requirements, see Special Provisions 511.
3. For drilled shaft details, see sheets SA9.1 to SA9.3.

Legend:

- (#) Drilled Shaft Number
- (TS) Trial Shaft
- (LT) Load Test Shaft

DATE	REVISION
07/15/22	5 Revised Sleeper Slab Width
06/08/22	2 Revised Elevation

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

DRAWING NAME: Z:\00 ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHWA-SA0102 HON FDN-ADD1 DELTA5.DWG PLOT TIME: 07-15-22, 4:45 PM

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge Foundation Plan

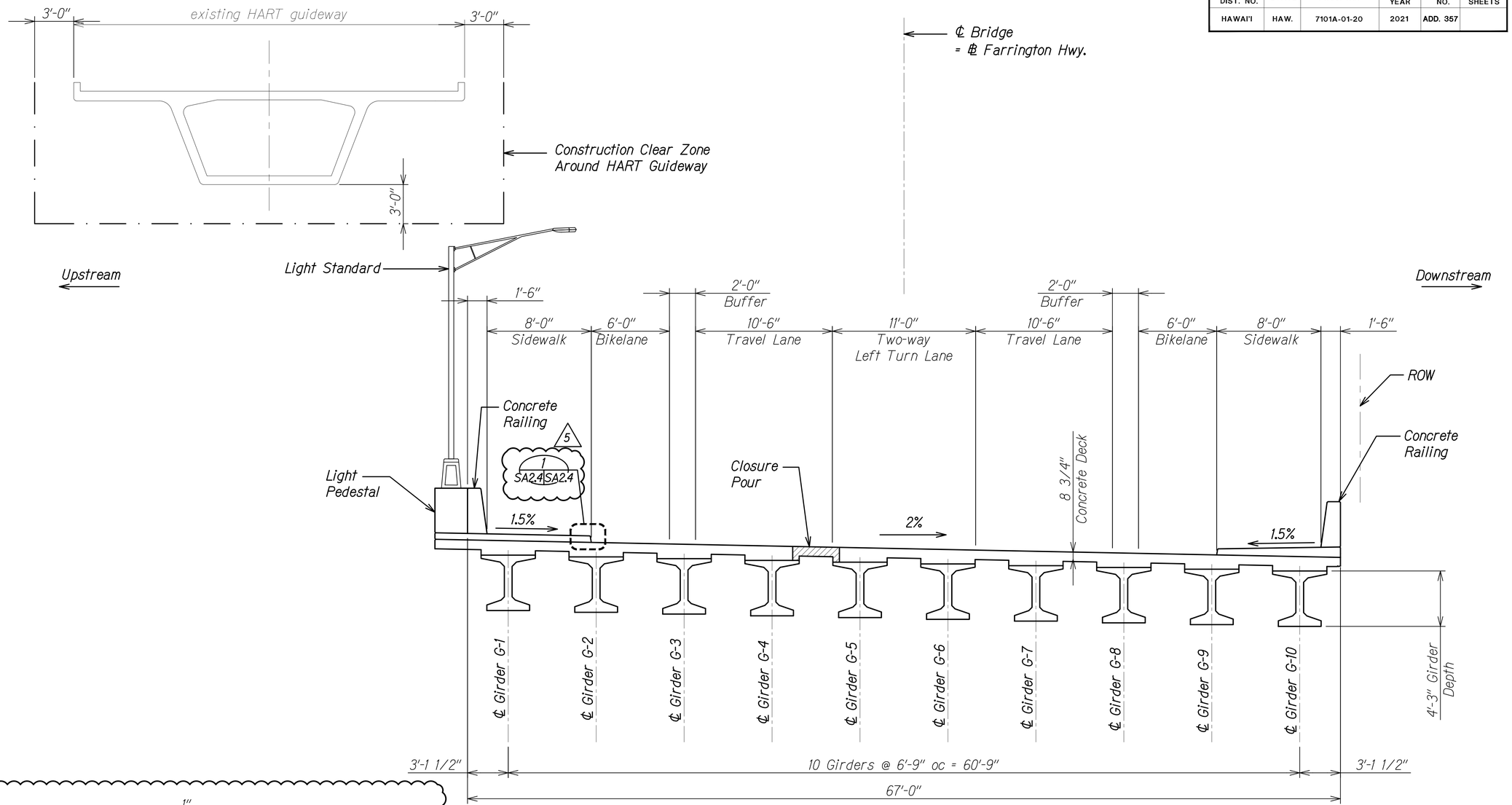
FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

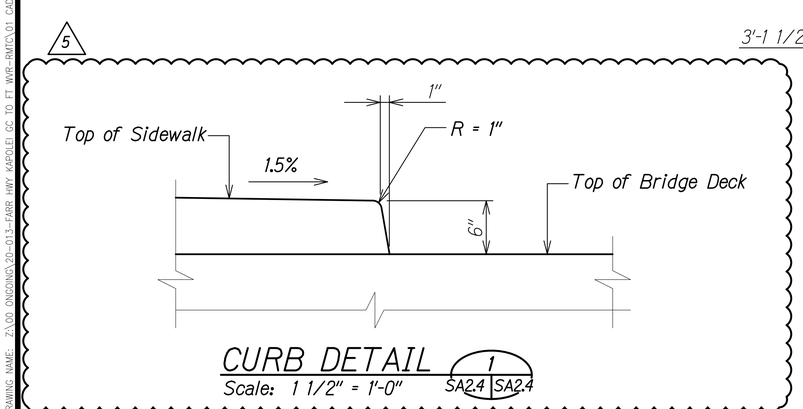
Scale: As Shown — Date: Apr. 2022

SHEET No. SA1.2 OF 4 SHEETS

ADD. 351

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 357	





CURB DETAIL 1 SA2.4 | SA2.4
Scale: 1 1/2" = 1'-0"

TYPICAL TRANSVERSE SECTION A SA1.1 | SA2.4
5 Scale: 1/4" = 1'-0"
2

DATE	REVISION
07/15/22	5 Added Curb Detail
06/08/22	2 Revised Sheet Reference

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge
Typical Transverse Section

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown — Date: Apr. 2022

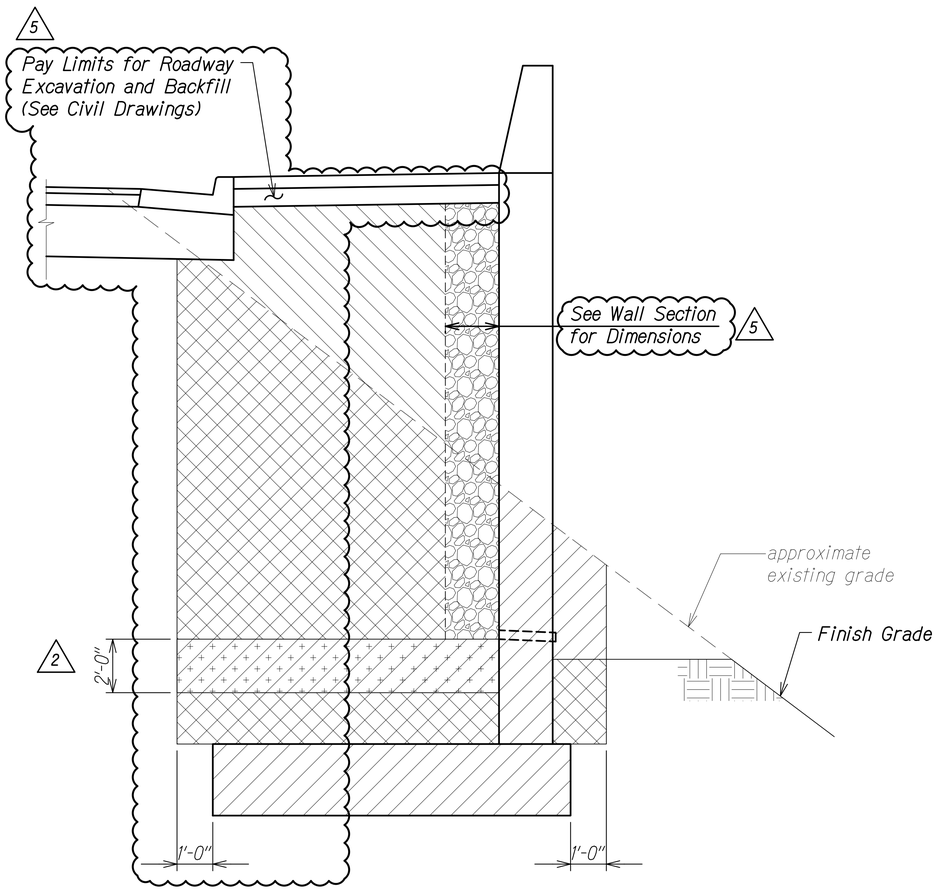
SHEET No. SA2.4 OF 6 SHEETS

ADD. 357

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

DRAWING NAME: Z:\00 ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTAS\FHWA-SA0204 HON TRANS SECT-ADD1 DELTAS.DWG PLOT TIME: 07-15-22, 7:05 PM)

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 359	



AT RETAINING WALL NOS. 1, 2, AND 3

STRUCTURE EXCAVATION AND BACKFILL PAY LIMITS SECTION

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

A SA2.6 | SA2.6

Notes:

1. All horizontal dimensions are measured perpendicular to the vertical face.
2. Impervious material shall be incidental to the measurement and payment for Structure Backfill for Honouliuli Retaining Walls.

Legend:

- Structure Excavation
- Structure Backfill
- Filter Material w/ Filter Fabric
- Impervious Material

5

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

DRAWING NAME: Z:\00 ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHWA-SA0205 EXCAVBACKFILL-ADD1 DELTA5.DWG PLOT TIME: 07-15-22, 4:46 PM)

DATE		REVISION
07/15/22	5	Revised Section and Legend
06/08/22	2	Added Dimension

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge Excavation and Backfill Pay Limits

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

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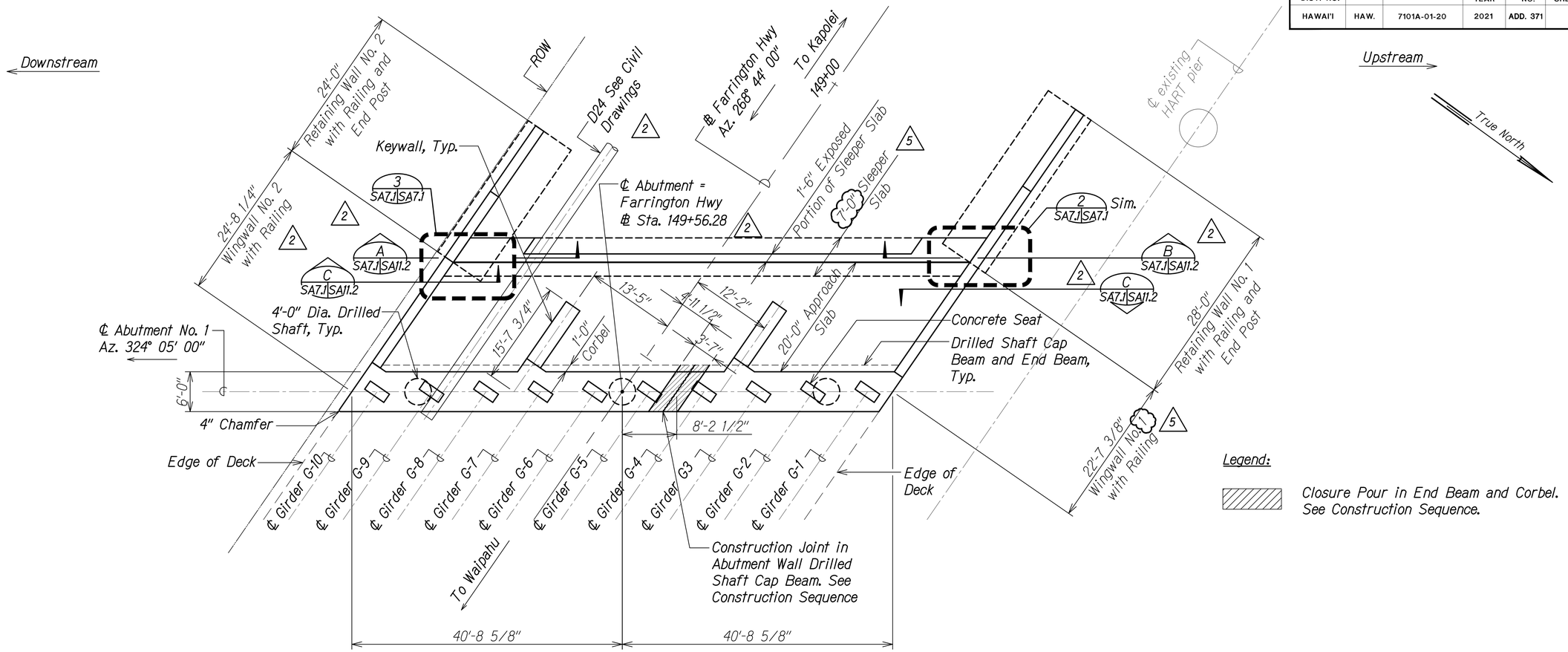
SHEET No. SA2.6 OF 6 SHEETS

ADD. 359

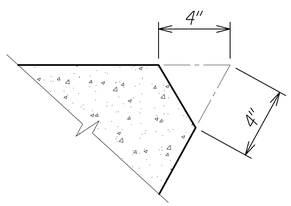
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 371	



ABUTMENT NO. 1 PLAN

Scale: 1/8" = 1'-0"

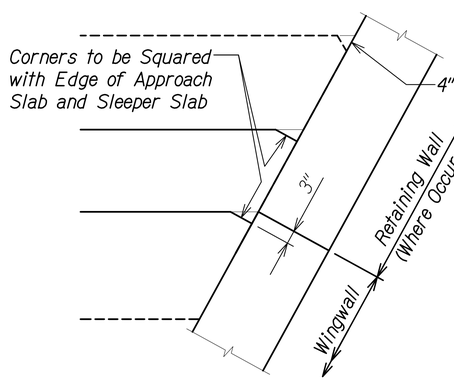
A SA7.1|SA7.1



4" CHAMFER DETAIL AT ACUTE CORNER

Scale: 3" = 1'-0"

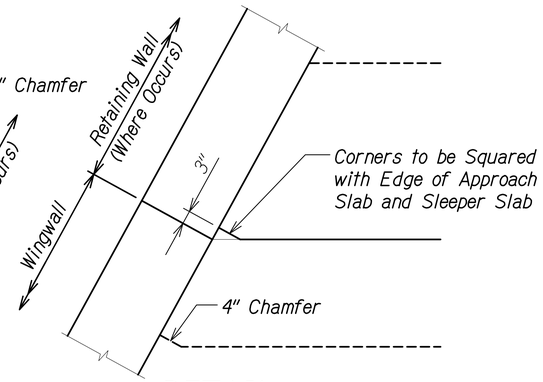
1 SA7.1|SA7.1



DETAIL

Scale: 3/4" = 1'-0"

2 SA7.1|SA7.1 SA7.3



DETAIL

Scale: 3/4" = 1'-0"

3 SA7.1|SA7.1 SA7.3

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

DRAWING NAME: Z:\DO ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHWA-SA0701 ABUT1 PLAN-ADD1 DELTA5.DWG PLOT TIME: 07-15-22, 4:46 PM)

DATE		REVISION
07/15/22	5	Revised Wingwall and Sleeper Slab
06/08/22	2	Revised Station and Drainline

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge Abutment No. 1 Plan

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

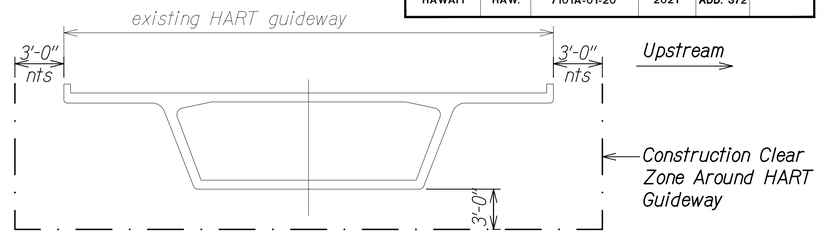
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

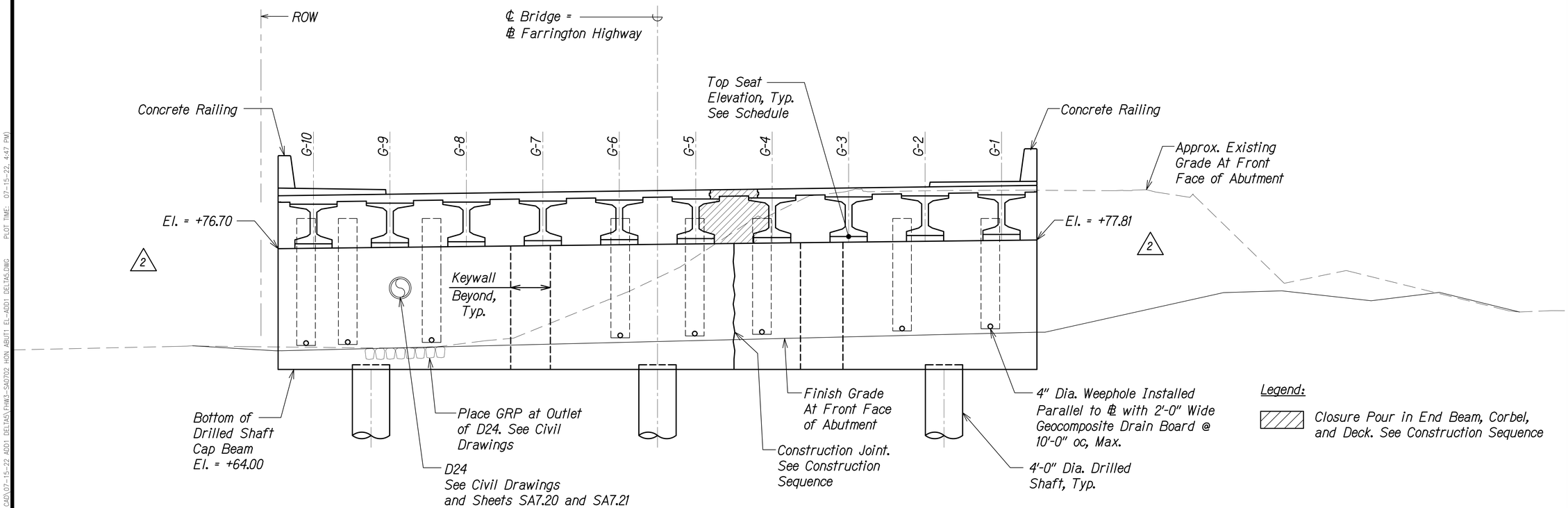
SIGNATURE — April 30, 2024 — EXPIRATION DATE OF THE LICENSE

SHEET No. SA7.1 OF 20 SHEETS

ADD. 371

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 372	





Legend:

Closure Pour in End Beam, Corbel, and Deck. See Construction Sequence

Abutment No. 1										
Girder #	1	2	3	4	5	6	7	8	9	10
Top of Seat Elevation	+78.26	+78.15	+78.03	+77.92	+77.81	+77.70	+77.59	+77.47	+77.36	+77.25

See sheet SA7.19 for concrete seat details.
Seat Elevations are shown as + MSL

Notes:

1. Contractor shall not encroach within construction clear zone around HART Guideway at any time during construction.
2. Top of Drilled Shaft Cap Elevations are measured at ℄ of abutment.
3. Geocomposite Drain Boards and Drain Pipes shall be incidental to the measurement and payment for CLSM Backfill for Honouliuli Abutments and Wingwalls.

ABUTMENT NO. 1 ELEVATION LOOKING TOWARDS KAPOLEI

Scale: 3/16" = 1'-0"

5 A SA7.2 SA7.2

07/15/22	5	Revised Sheet Reference
06/08/22	2	Revised Elevations
DATE		REVISION

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge
Abutment No. 1 Elevation

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

SHEET No. SA7.2 OF 20 SHEETS

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

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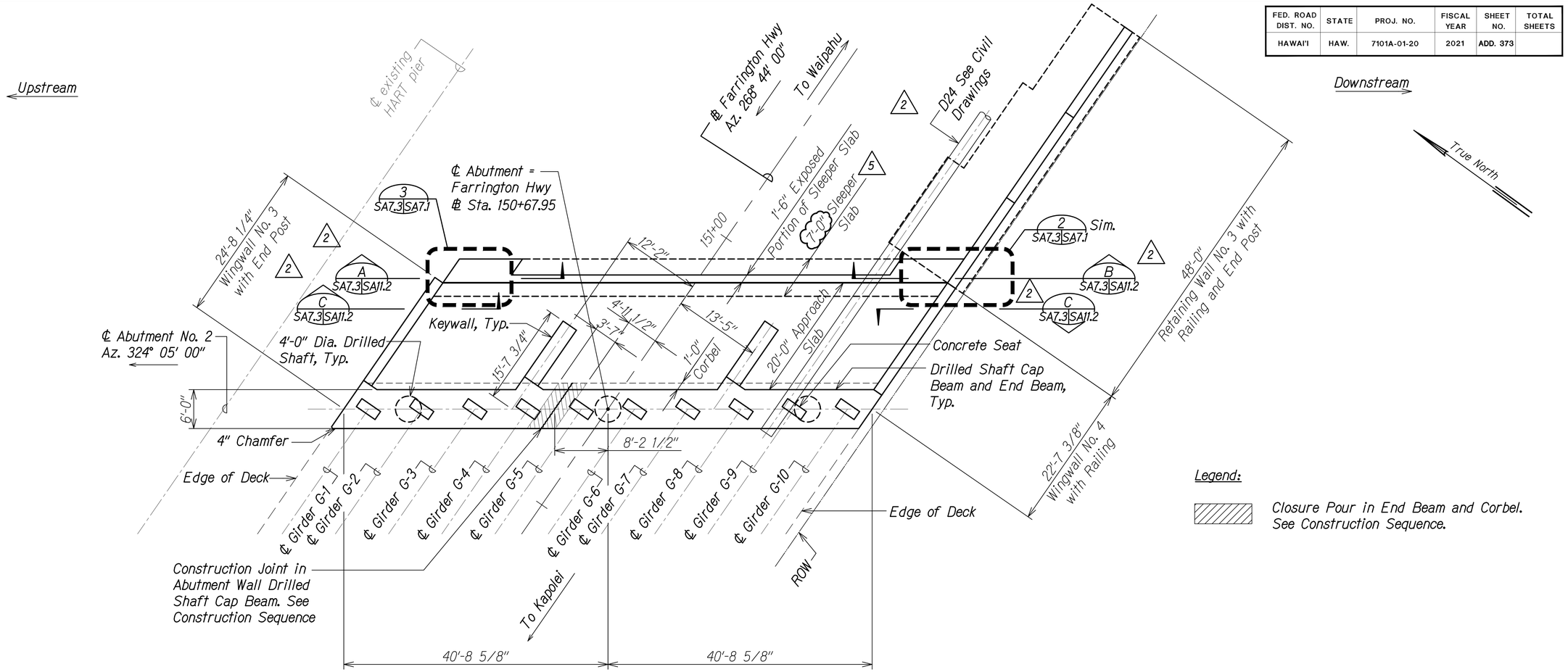
SIGNATURE — EXPIRATION DATE OF THE LICENSE: April 30, 2024

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

DRAWING NAME: Z:\OD ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHWA-SA0702 HON ABUT1 EL-ADD1 DELTA5.DWG PLOT TIME: 07-15-22, 4:47 PM)

ADD. 372

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 373	



ABUTMENT NO. 2 PLAN

Scale: 1/8" = 1'-0"

A SA7.3 | SA7.3

Legend:

Closure Pour in End Beam and Corbel. See Construction Sequence.

DATE	REVISION
07/15/22	5 Revised Sleeper Slab Width
06/08/22	2 Revised Drainline

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge
Abutment No. 2 Plan

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

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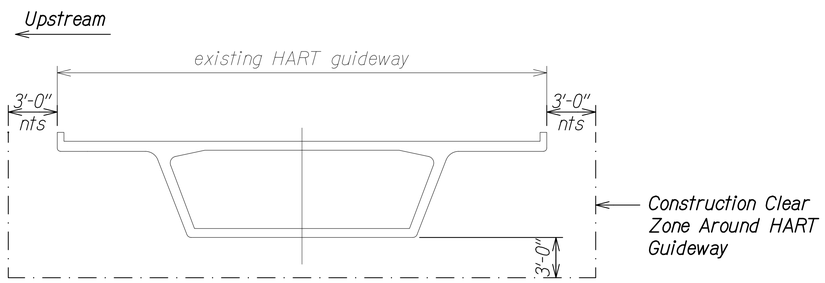
SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

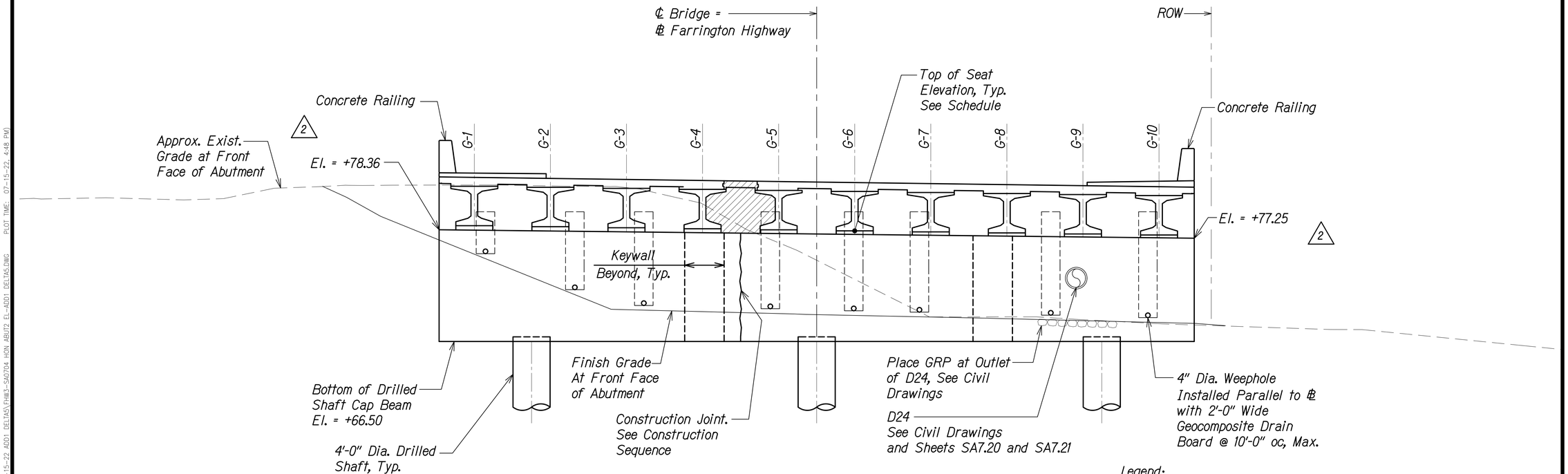
ORIGINAL PLANS	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

DRAWING NAME: Z:\00 ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHWA-SA0703 ABUT2 PLAN-ADD1 DELTA5.DWG PLOT TIME: 07-15-22, 4:47 PM)

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 374	



Downstream



Abutment No. 2										
Girder #	1	2	3	4	5	6	7	8	9	10
Top of Seat Elevation	+78.81	+78.69	+78.58	+78.47	+78.36	+78.25	+78.14	+78.02	+77.91	+77.80

See sheet SA7.19 for concrete seat details.
Seat Elevations are shown as + MSL

Legend:

Closure Pour in End Beam and Deck. See Construction Sequence.

Notes:

1. Contractor shall not encroach within construction clear zone around HART Guideway at any time during construction.
2. Top of Drilled Shaft Cap Elevations are measured at ℄ of abutment.
3. Geocomposite Drain Boards and Drain Pipes shall be incidental to the measurement and payment for CLSM Backfill for Honouliuli Abutments and Wingwalls.

ABUTMENT NO. 2 ELEVATION LOOKING TOWARDS WAIPAHU

Scale: 3/16" = 1'-0"

5 SA7.4 A SA7.4

DATE		REVISION
07/15/22	5	Revised Sheet Reference
06/08/22	2	Revised Elevations

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge Abutment No. 2 Elevation

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

RUSS S. MIYAHARA LICENSED PROFESSIONAL ENGINEER NO. 9444-S HAWAII, U.S.A.

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SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

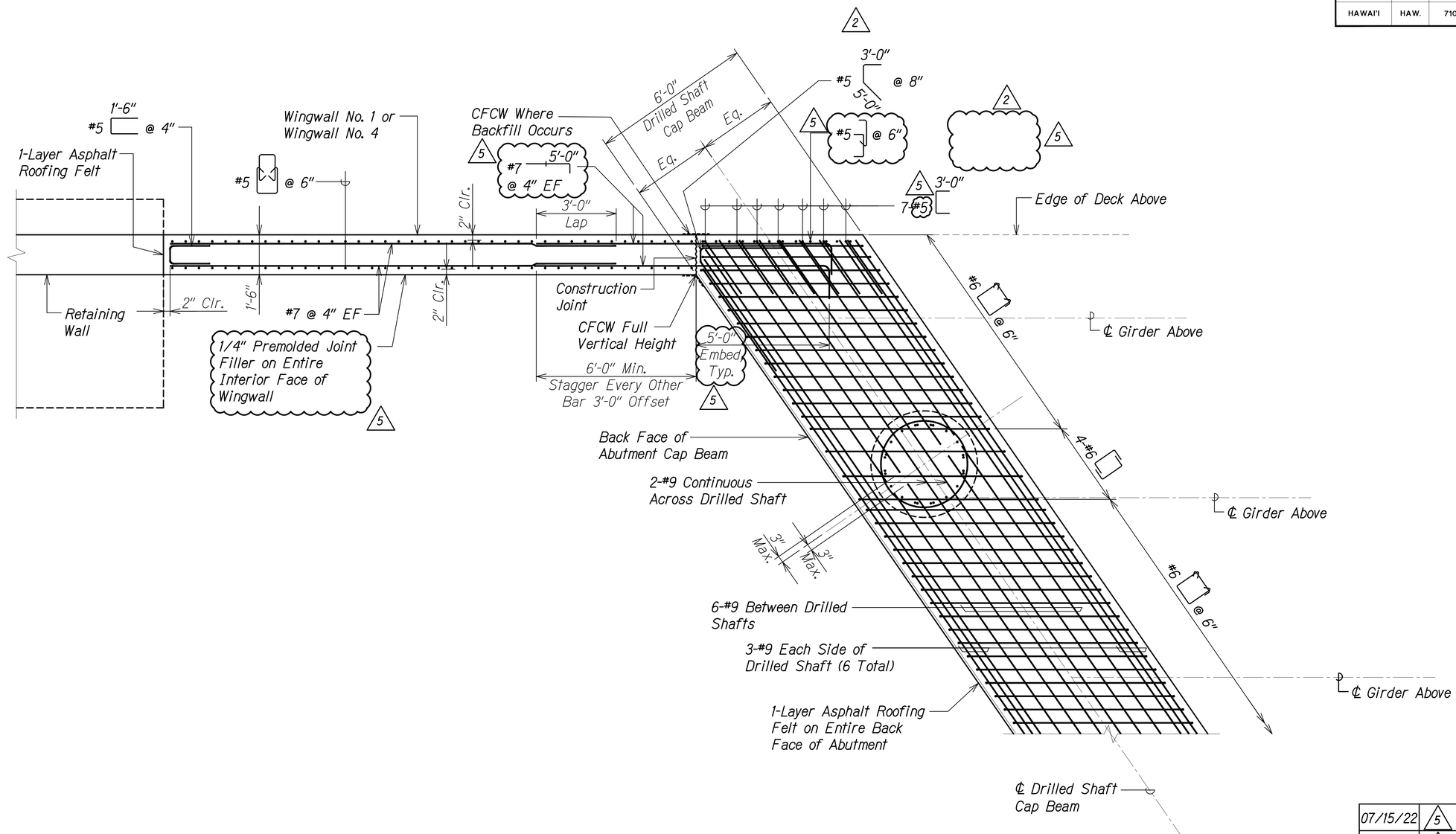
SHEET No. SA7.4 OF 20 SHEETS

ADD. 374

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

DRAWING NAME: Z:\OD ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHWA-SA0704 HON ABUT2 EL-ADD1 DELTA5.DWG PLOT TIME: 07-15-22, 4:48 PM)

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 375	



TYPICAL DRILLED SHAFT CAP BEAM BOTTOM REINFORCING PLAN

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

A SA7.5 | SA7.5

07/15/22	5	Revised Reinforcing
06/08/22	2	Added Reinforcing
DATE		REVISION

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge Abutment Reinforcing Plan

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

SHEET No. SA7.5 OF 20 SHEETS

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

April 30, 2024
EXPIRATION DATE OF THE LICENSE

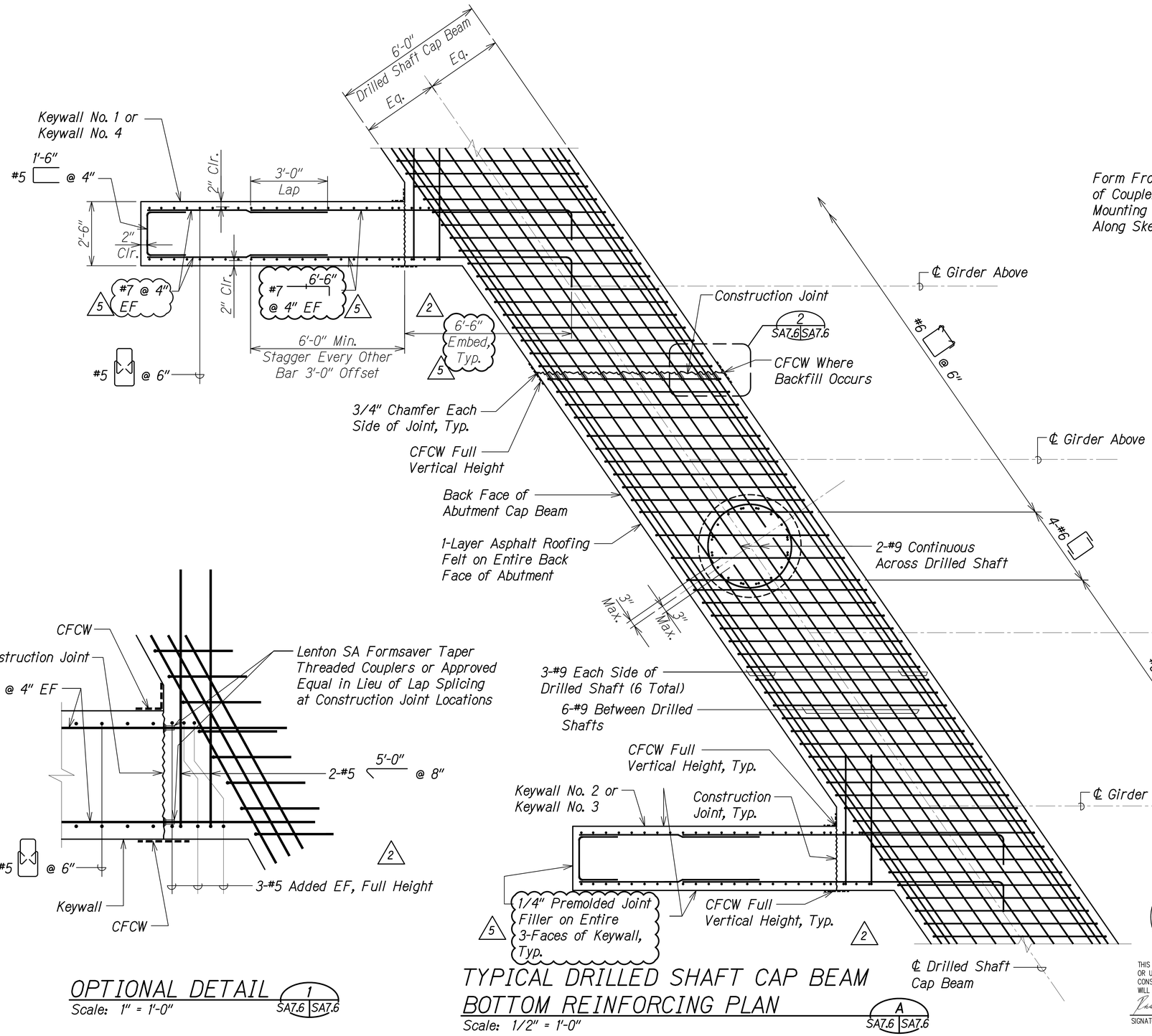
ORIGINAL PLAN
NOTE BOOK No.

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

DRAWING NAME: Z:\OD ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHWA3-SA0705 ABUT1 PLAN-ADD1 DELTA5.DWG PLOT TIME: 07-15-22, 4:48 PM)

ADD. 375

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 376	



TYPICAL DRILLED SHAFT CAP BEAM BOTTOM REINFORCING PLAN

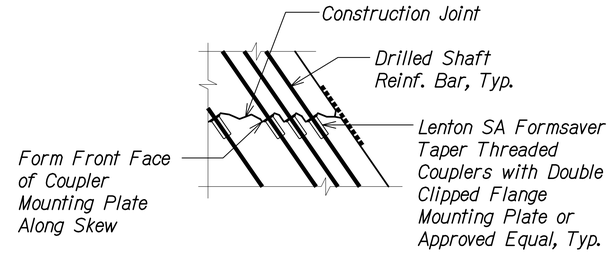
Scale: 1/2" = 1'-0"

A SA7.6 SA7.6

OPTIONAL DETAIL

Scale: 1" = 1'-0"

1 SA7.6 SA7.6



COUPLER DETAIL

Scale: 1" = 1'-0"

2 SA7.6 SA7.6

DATE	REVISION
07/15/22	5 Revised Reinforcing
06/08/22	2 Revised Details

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge Abutment Reinforcing Plan

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

SHEET No. SA7.6 OF 20 SHEETS

RUSS S. MIYAHARA ★ LICENSED PROFESSIONAL ENGINEER ★ NO. 9444-S ★ HAWAII, U.S.A.

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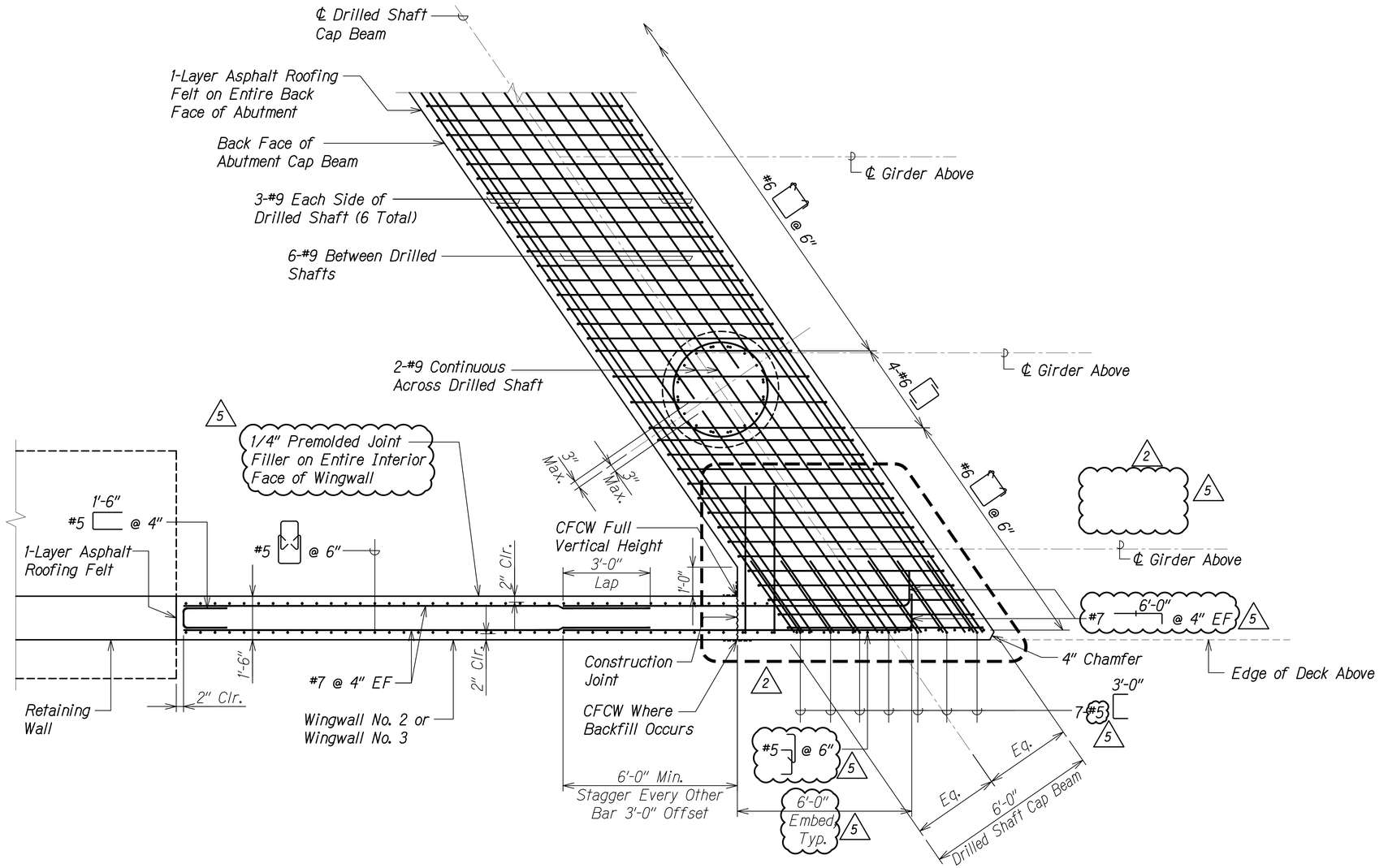
SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

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

DRAWING NAME: Z:\00 ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTAS\FHWA-SA0705 ABUT1 PLAN-ADD1 DELTAS.DWG PLOT TIME: 07-15-22, 4:49 PM)

ADD. 376

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 377	



TYPICAL DRILLED SHAFT CAP BEAM BOTTOM REINFORCING PLAN

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

A
SA7.7 | SA7.7

DATE	REVISION
07/15/22	5 Revised Reinforcing
06/08/22	2 Added Reinforcing

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge Abutment Reinforcing Plan

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

SHEET No. SA7.7 OF 20 SHEETS

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

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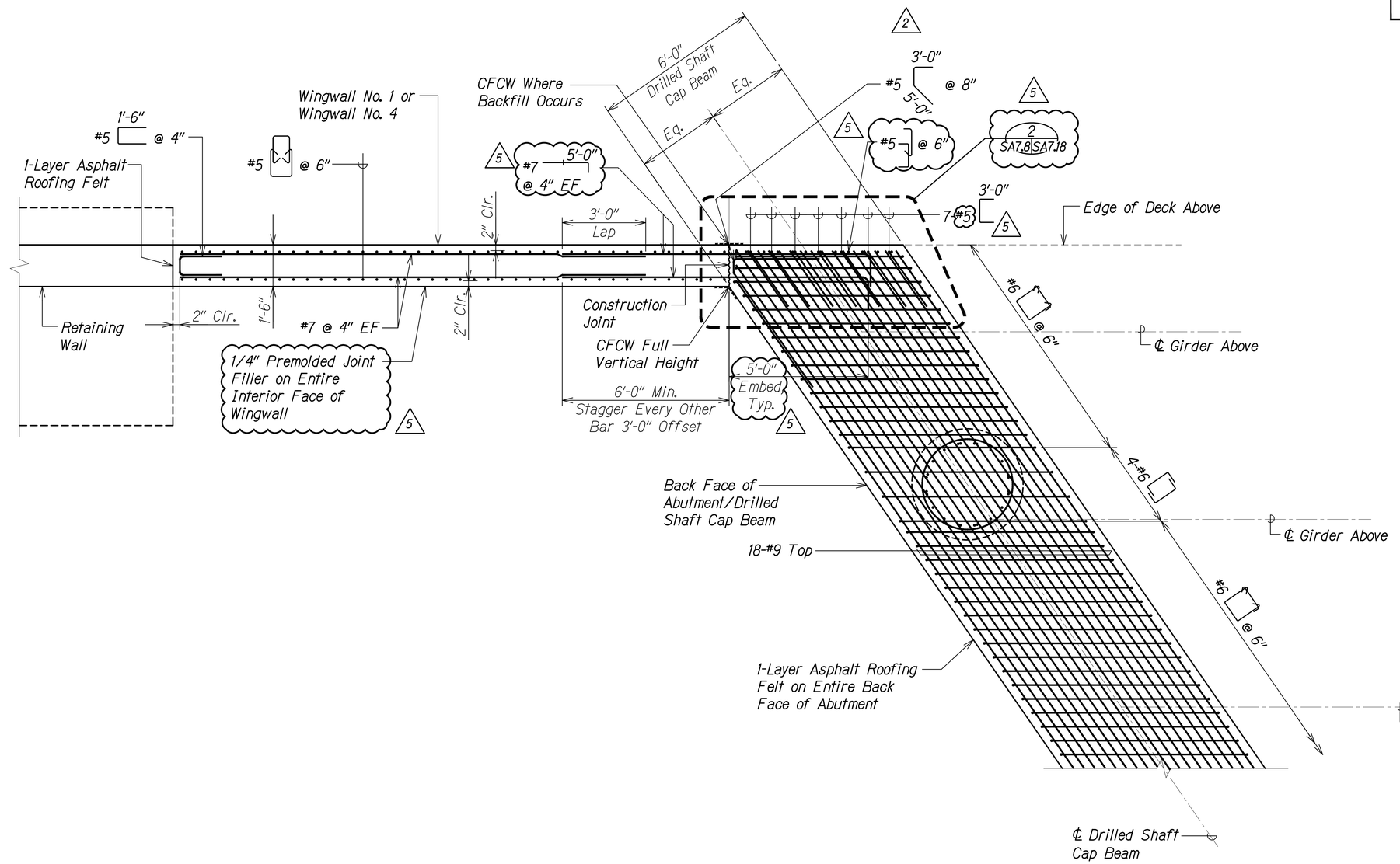
SIGNATURE — EXPIRATION DATE OF THE LICENSE: April 30, 2024

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

DRAWING NAME: Z:\OD ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHWS-SA0705 ABUT1 PLAN-ADD1 DELTA5.DWG PLOT TIME: 07-15-22, 4:49 PM)

ADD. 377

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 378	



TYPICAL DRILLED SHAFT CAP BEAM TOP REINFORCING PLAN

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

A SA7.8 | SA7.8

DATE	REVISION
07/15/22	5 Revised Reinforcing
06/08/22	2 Added Reinforcing

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge Abutment Reinforcing Plan

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

RUSS S. MIYAHARA LICENSED PROFESSIONAL ENGINEER NO. 9444-S HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

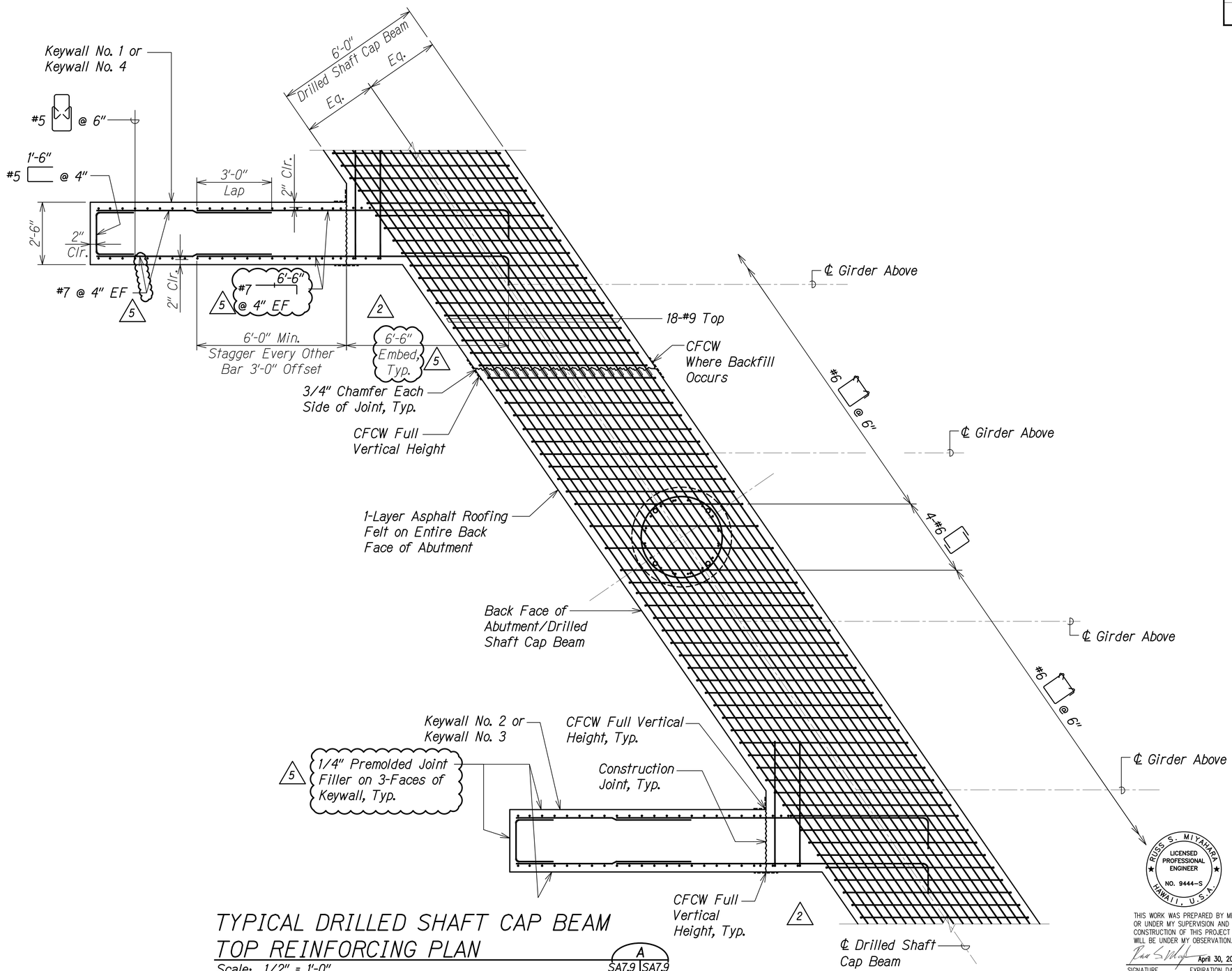
SHEET No. SA7.8 OF 20 SHEETS

ADD. 378

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

DRAWING NAME: Z:\00 ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHWJ-SA0708 ABUT1 PLAN-ADD1 DELTA5.DWG PLOT TIME: 07-15-22, 4:50 PM)

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 379	



TYPICAL DRILLED SHAFT CAP BEAM TOP REINFORCING PLAN

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

A
SA7.9 | SA7.9

DATE		REVISION
07/15/22	5	Revised Reinforcing
06/08/22	2	Added Reinforcing

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge Abutment Reinforcing Plan

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

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SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

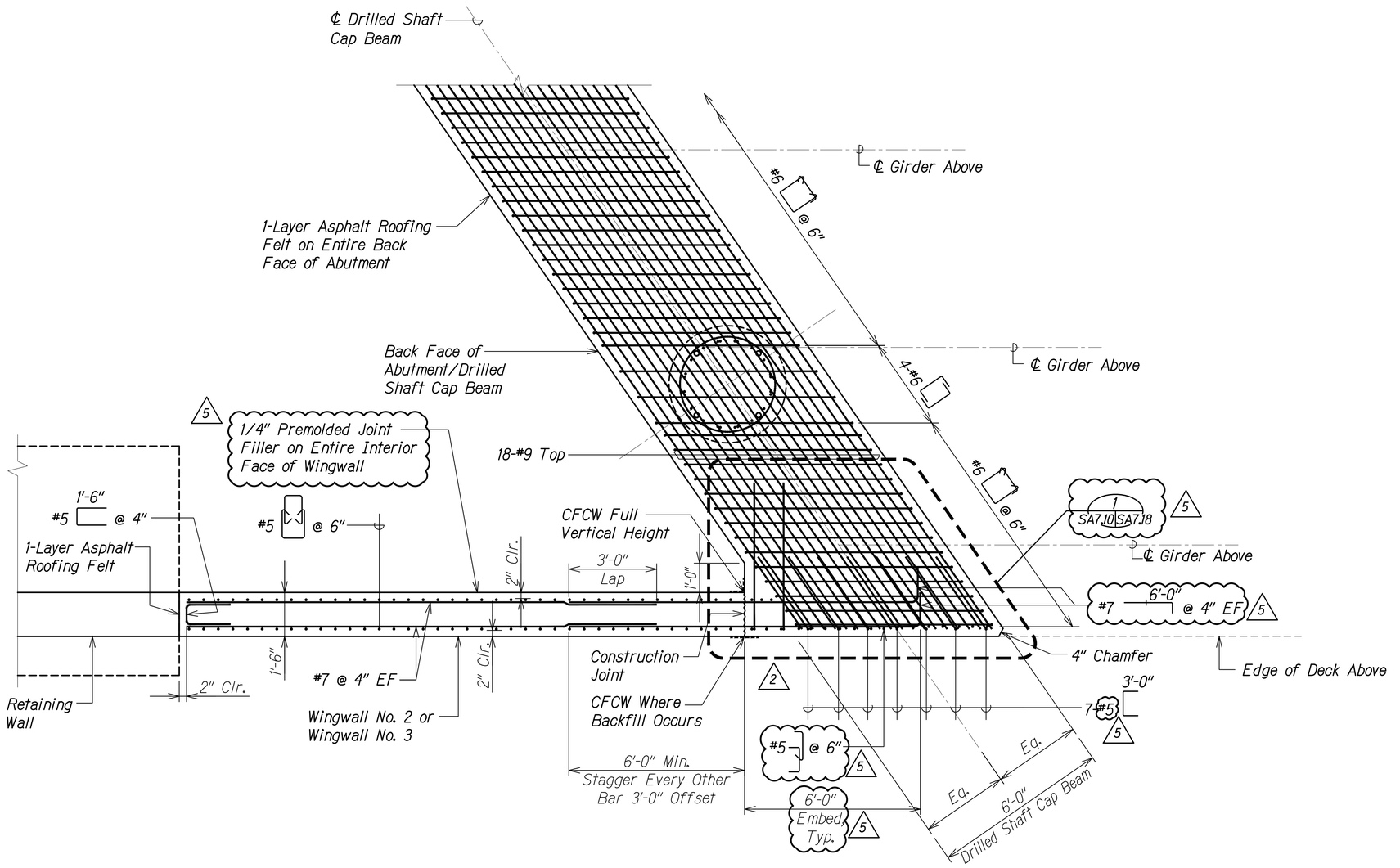
SHEET No. SA7.9 OF 20 SHEETS

ADD. 379

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

DRAWING NAME: Z:\OO ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHWA3-SA0708 ABUT1 PLAN-ADD1 DELTA5.DWG PLOT TIME: 07-15-22, 4:50 PM)

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 380	



TYPICAL DRILLED SHAFT CAP BEAM TOP REINFORCING PLAN

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

A
SA7.10 SA7.10

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

DRAWING NAME: Z:\00 ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTAS\FHWY-SA0708 ABUT1 PLAN-ADD1 DELTAS.DWG PLOT TIME: 07-15-22, 4:50 PM)

DATE	REVISION
07/15/22	5 Revised Reinforcing
06/08/22	2 Added Reinforcing

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge
Abutment Reinforcing Plan

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

RUSS S. MIYAHARA
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HAWAII, U.S.A.

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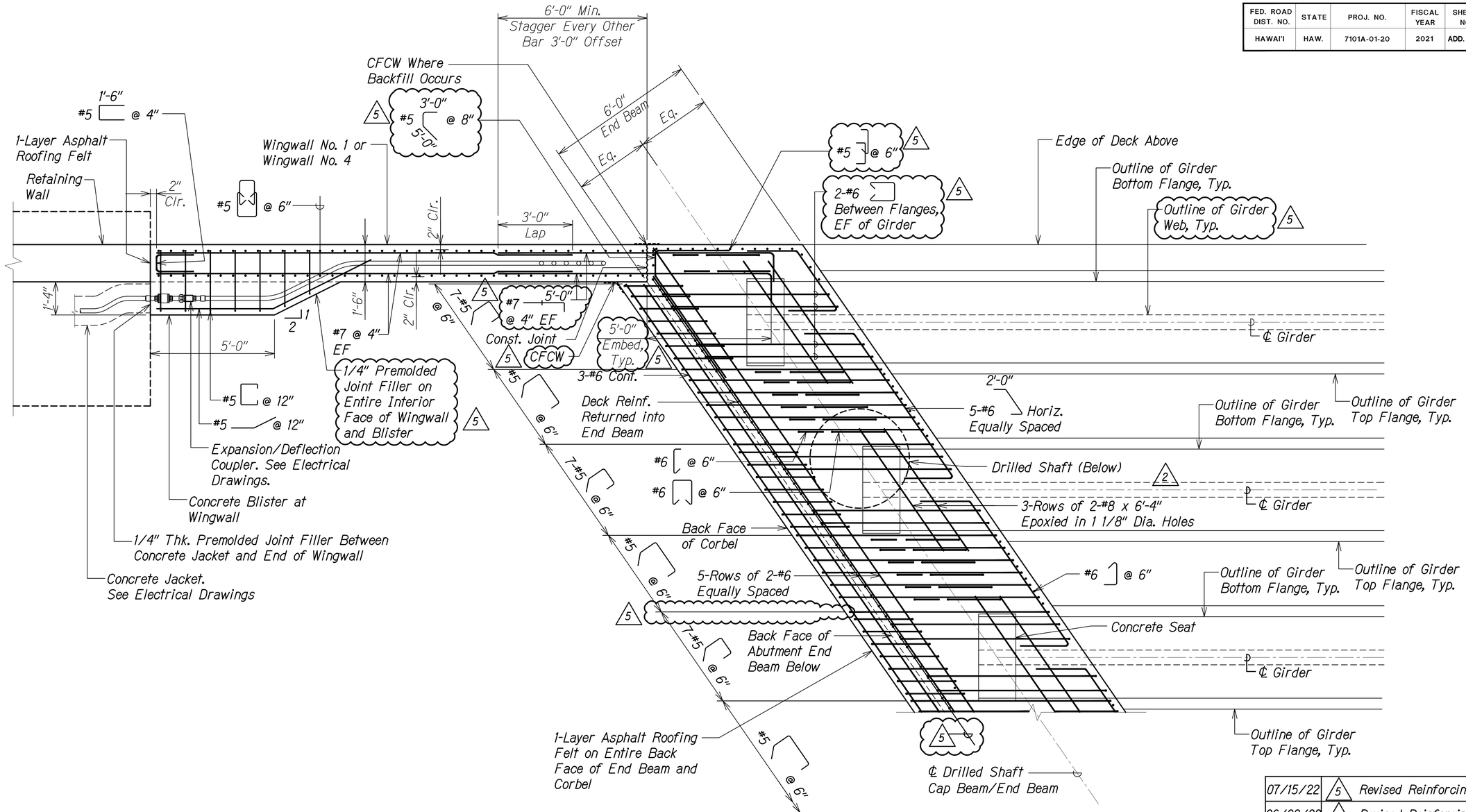
SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

SHEET No. SA7.10 OF 20 SHEETS

ADD. 380

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 381	



TYPICAL END BEAM REINFORCING PLAN

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

A
SA7.11 | SA7.11

DATE	REVISION
07/15/22	5 Revised Reinforcing
06/08/22	2 Revised Reinforcing Length

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge
Abutment Reinforcing Plan

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

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SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

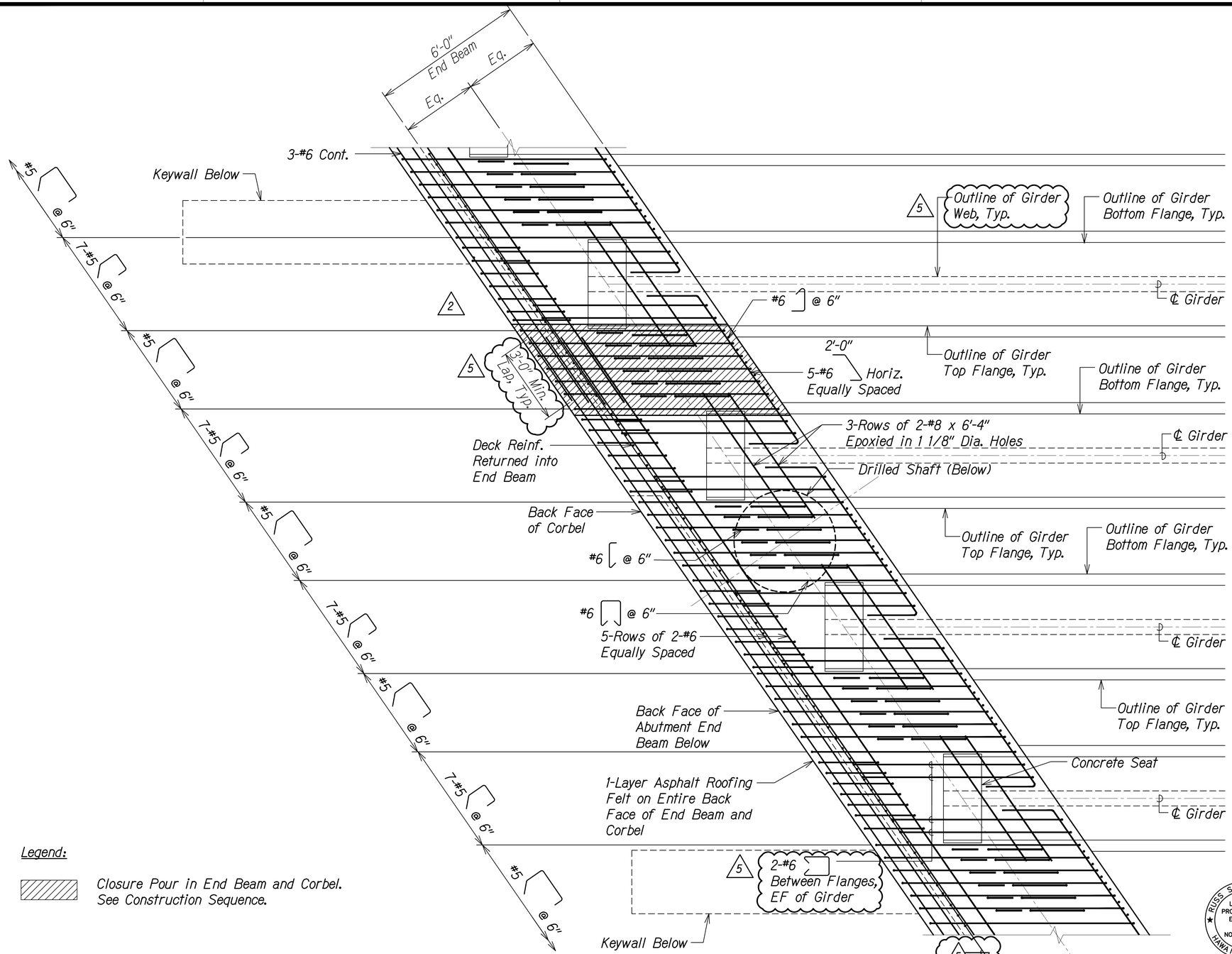
SHEET No. SA7.11 OF 20 SHEETS

ADD. 381

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

DRAWING NAME: Z:\OO ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTAS\FHWA-SA0711 ABUT1 PLAN-ADD1 DELTA5.DWG PLOT TIME: 07-15-22, 4:51 PM)

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 382	



Legend:

Closure Pour in End Beam and Corbel. See Construction Sequence.

TYPICAL END BEAM REINFORCING PLAN

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

A
SA7.12 | SA7.12

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

07/15/22	5	Revised Reinforcing
06/08/22	2	Clarified Lap Location
DATE		REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge Abutment Reinforcing Plan

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

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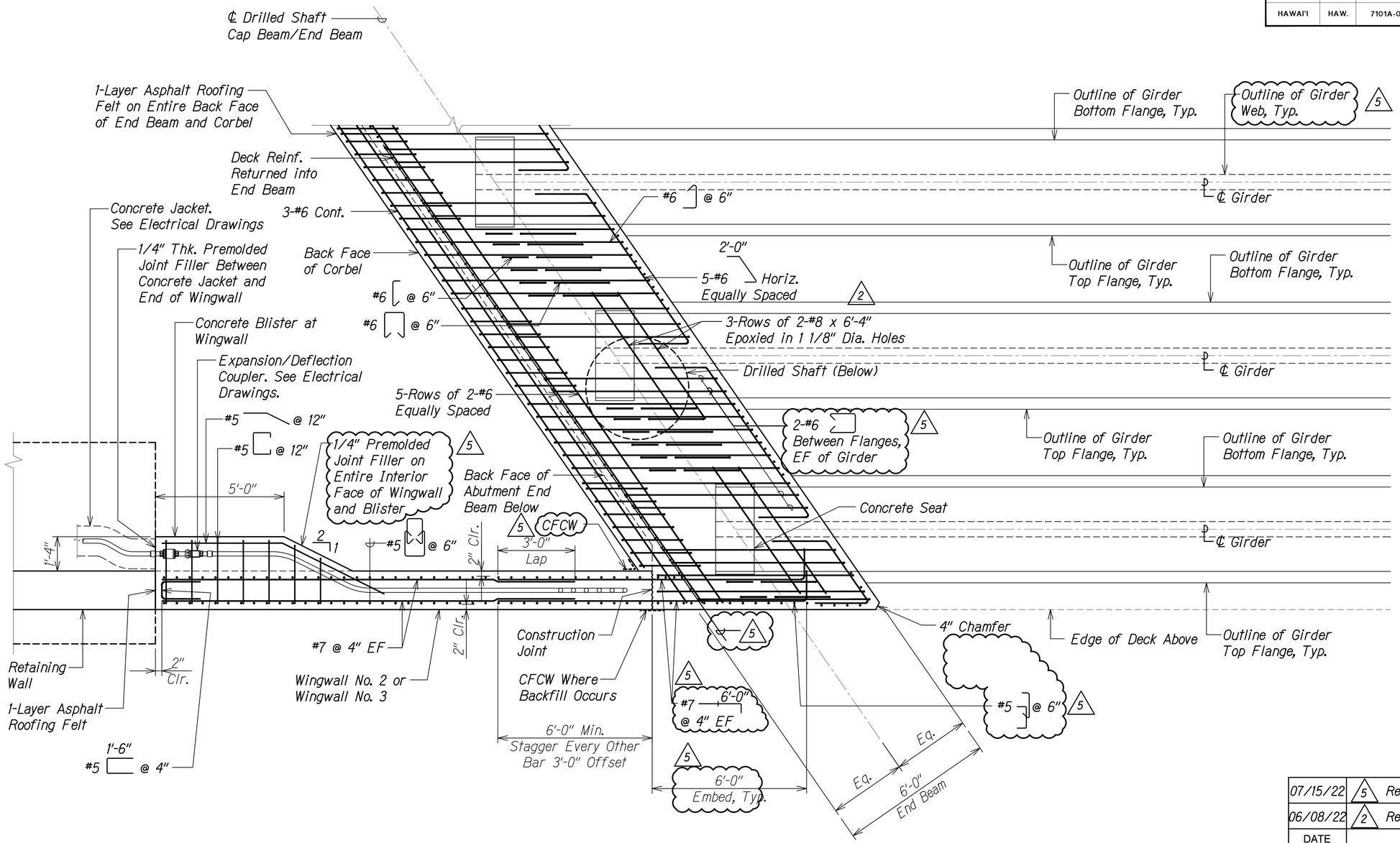
SIGNATURE

April 30, 2024
EXPIRATION DATE OF THE LICENSE

SHEET No. SA7.12 OF 20 SHEETS

ADD. 382

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 383	



TYPICAL END BEAM REINFORCING PLAN

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

A
SA7.13 | SA7.13

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

DRAWING NAME: Z:\OD ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTAS\FHWA-SA0711 ABUT1 PLAN-ADD1 DELTAS.DWG PLOT TIME: 07-15-22, 4:52 PM)

DATE	REVISION
07/15/22	5 Revised Reinforcing
06/08/22	2 Revised Reinforcing Length

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge
Abutment Reinforcing Plan

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

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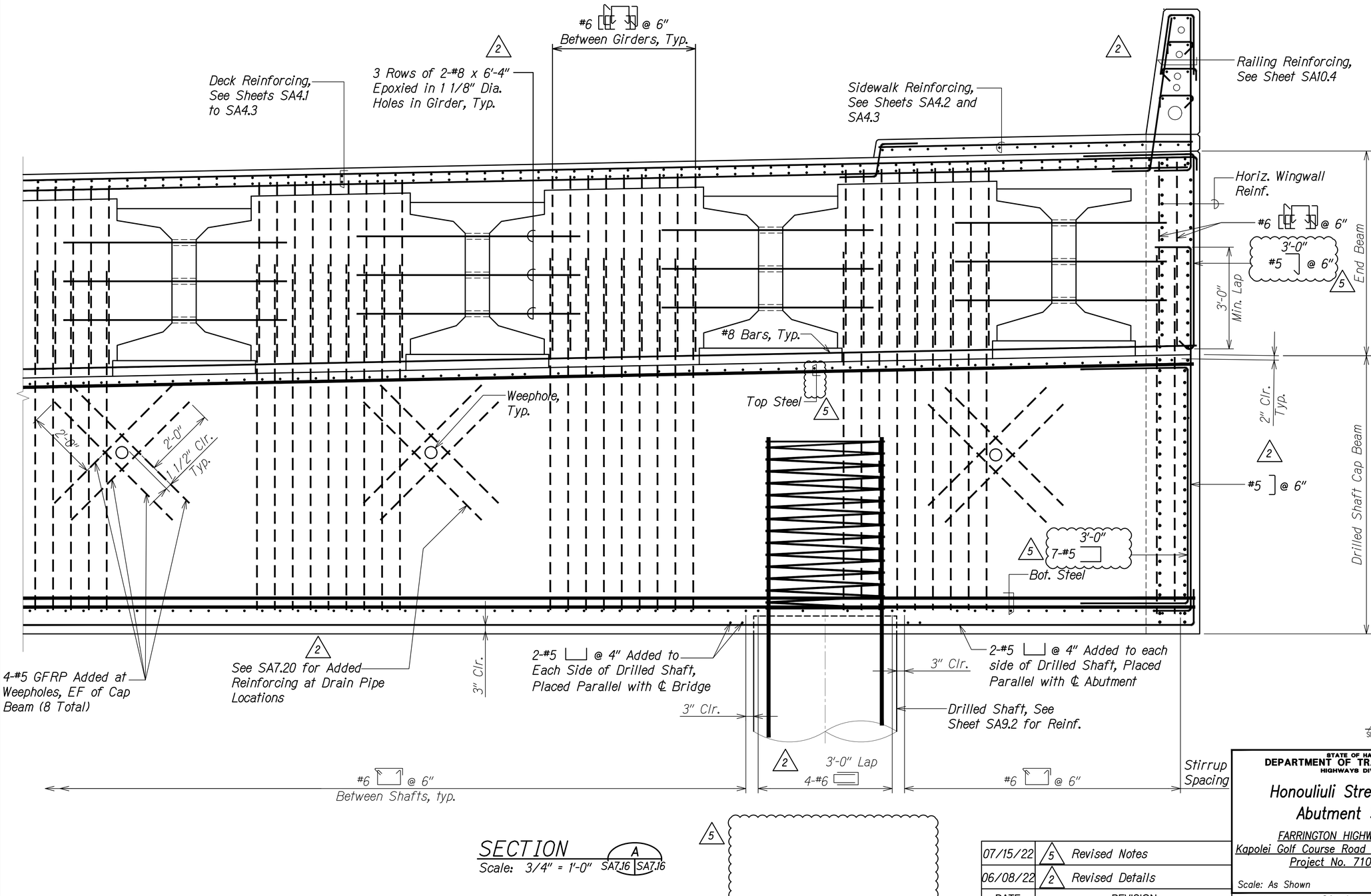
SIGNATURE

April 30, 2024
EXPIRATION DATE OF THE LICENSE

SHEET No. SA7.13 OF 20 SHEETS

ADD. 383

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 386	



SECTION A
Scale: 3/4" = 1'-0" SA7.16 | SA7.16

DATE		REVISION
07/15/22	5	Revised Notes
06/08/22	2	Revised Details

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
No. 9444-S
HAWAII, U.S.A.

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SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge
Abutment Section

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

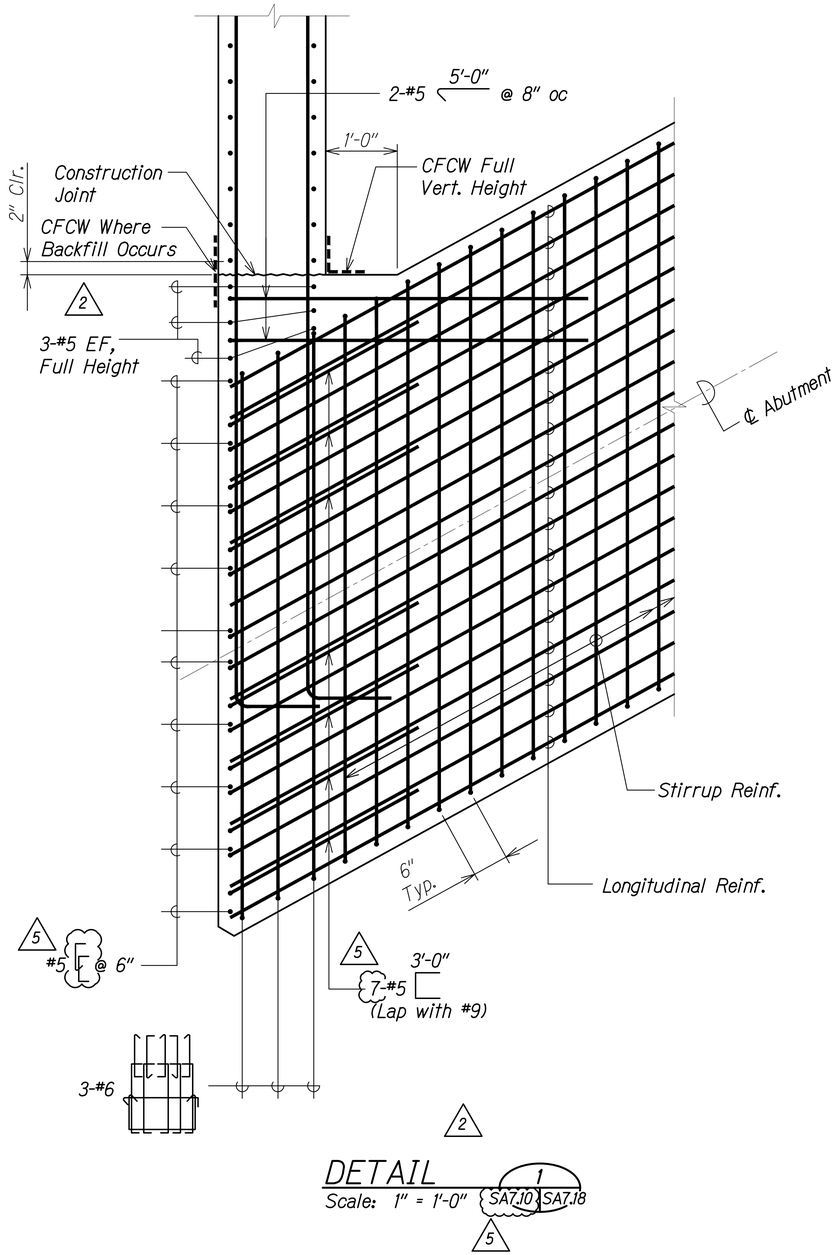
SHEET No. SA7.16 OF 20 SHEETS

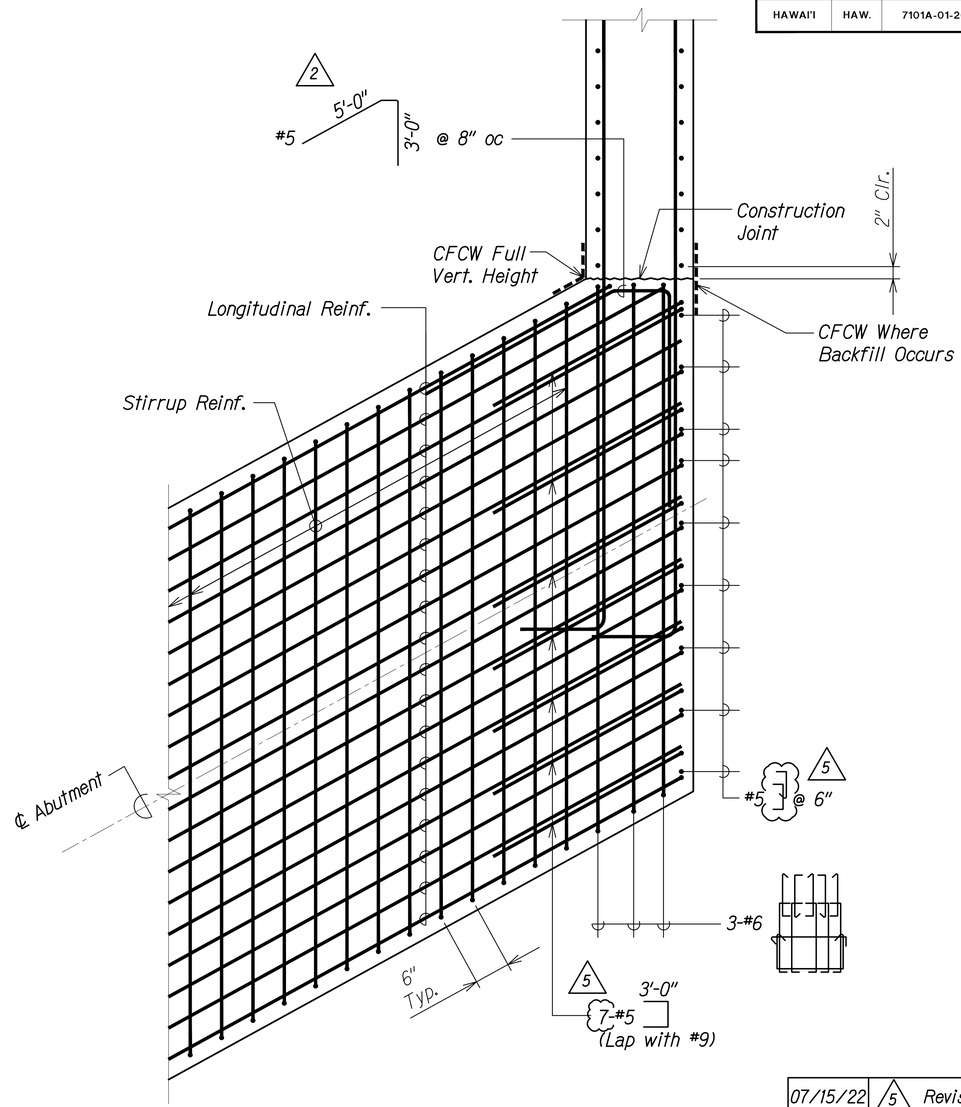
ORIGINAL PLANS | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
NOTE BOOK | No.

DRAWING NAME: Z:\GO ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHWA-SA0716 HON ABUT SECT-ADD1 DELTA5.DWG PLOT TIME: 07-15-22, 6:58 PM)

ADD. 386

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 388	





DATE	REVISION
07/15/22	5 Revised Details
06/08/22	2 Revised Reinforcing

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge Abutment Details

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

RUSS S. MIYAHARA
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NO. 9444-S
HAWAII, U.S.A.

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SIGNATURE — EXPIRATION DATE OF THE LICENSE: April 30, 2024

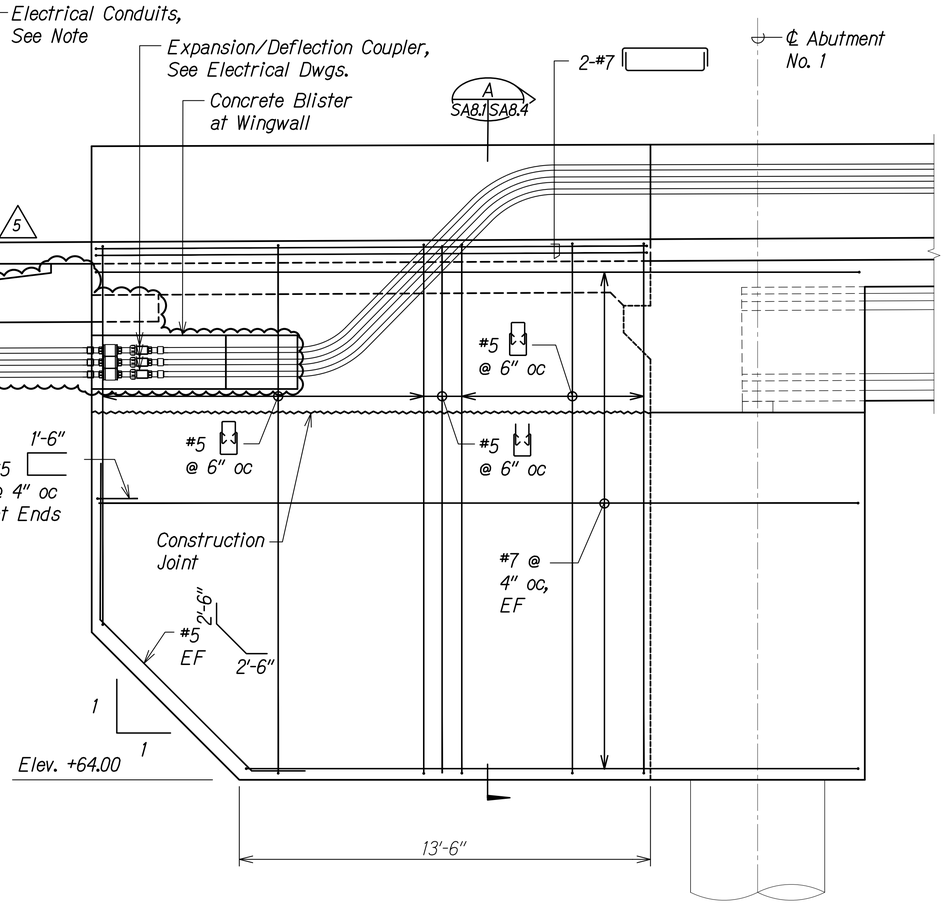
SHEET No. SA7.18 OF 20 SHEETS

ADD. 388

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

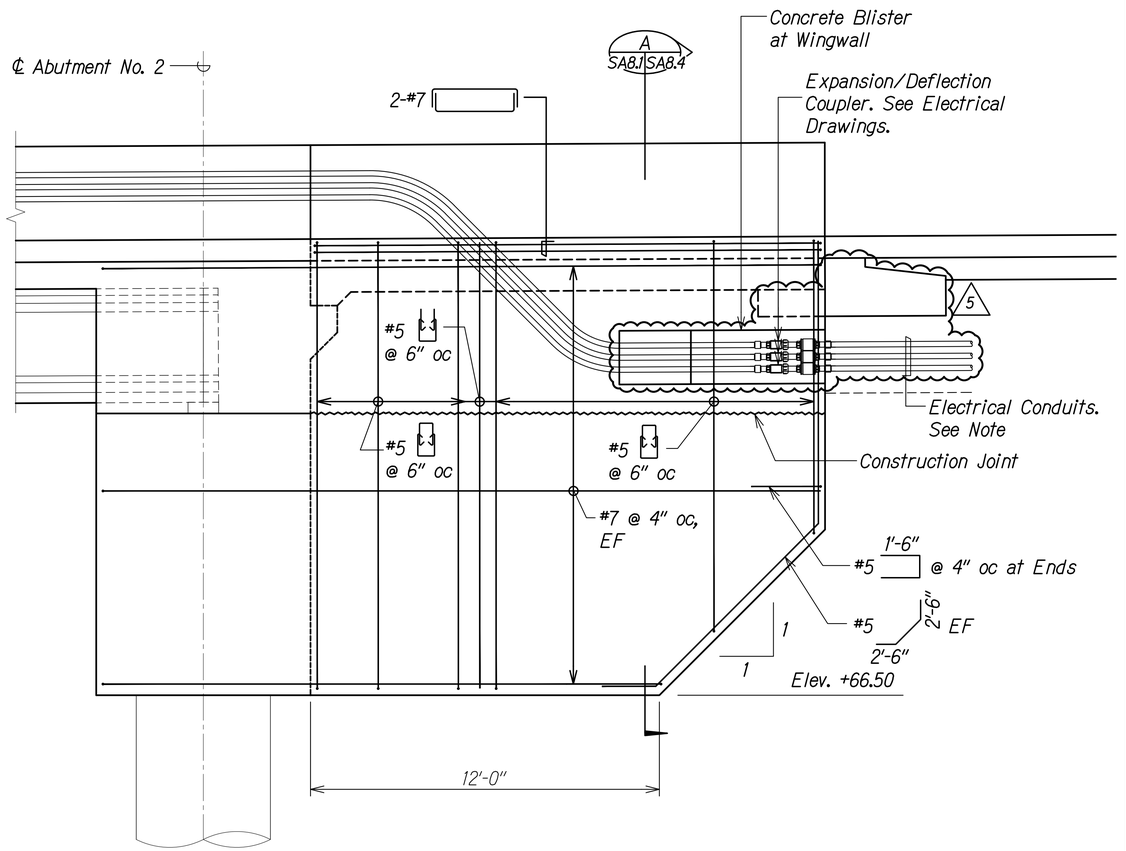
DRAWING NAME: Z:\GO ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHWA-SA0718 HON ABUT REINF-ADD1 DELTA5.DWG PLOT TIME: 07-15-22, 5:05 PM)

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 391	



WINGWALL NO. 1
REINFORCING ELEVATION (A SA8.1 | SA8.1)

Scale: 3/8" = 1'-0"



WINGWALL NO. 3
REINFORCING ELEVATION (B SA8.1 | SA8.1)

Scale: 3/8" = 1'-0"

Note: (2)

1. (3) 2" Dia. conduits in Wingwall Nos. 1 and 3.

DATE	REVISION
07/15/22	(5) Revised Sleeper Slab and Blister
06/08/22	(2) Revised Note

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge
Wingwall Reinforcing Elevations

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

RUSS S. MIYAHARA LICENSED PROFESSIONAL ENGINEER NO. 9444-S HAWAII, U.S.A.

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SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

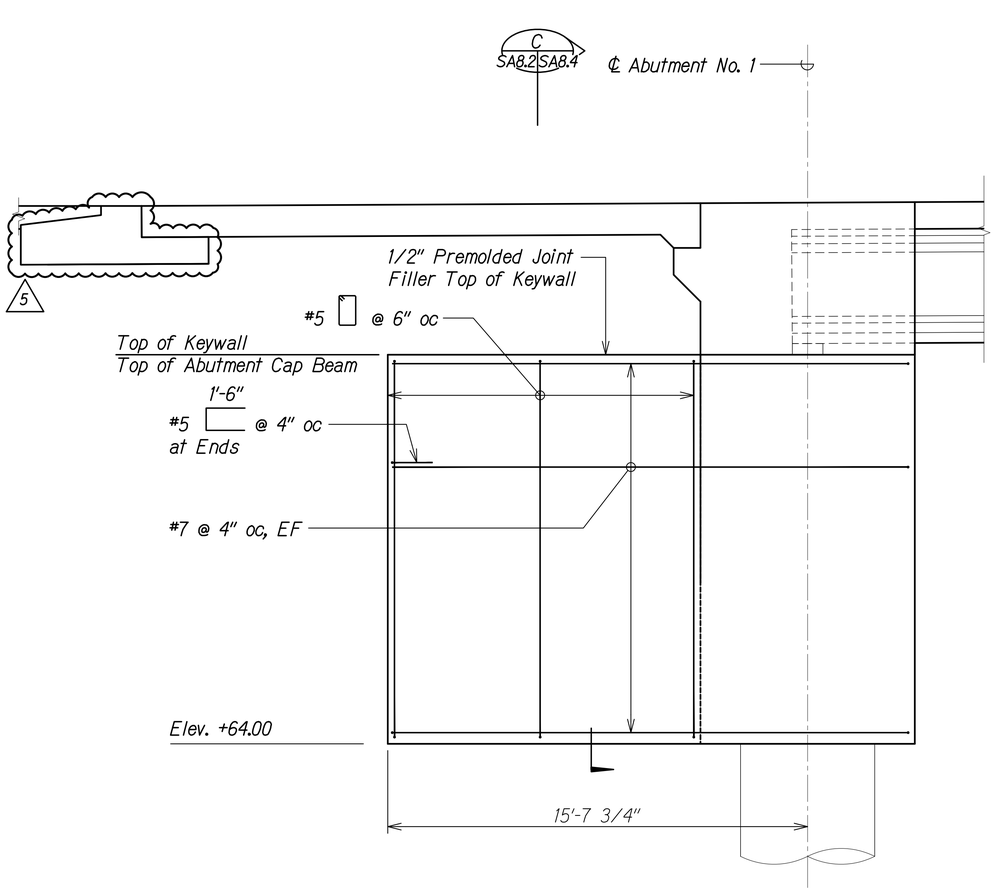
SHEET No. SA8.1 OF 5 SHEETS

ADD. 391

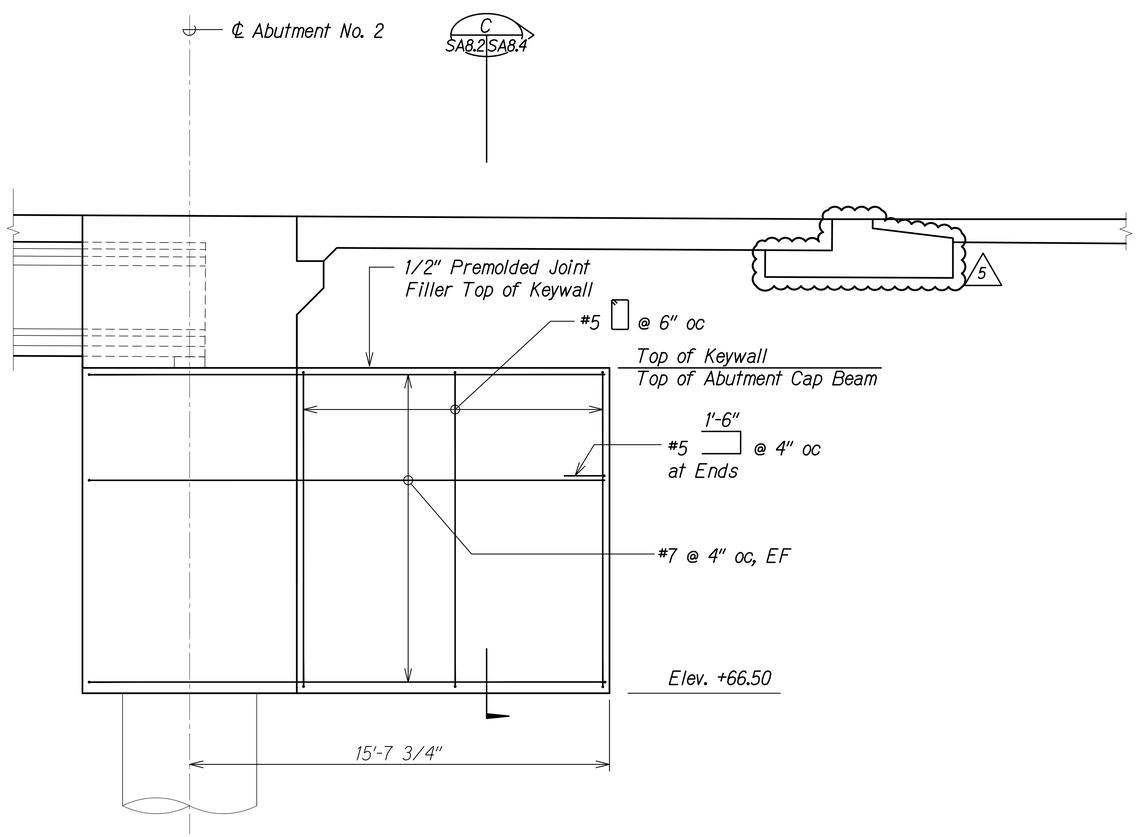
ORIGINAL PLANS | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
NOTE BOOK | No.

DRAWING NAME: Z:\00 ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHWJ-SA0801 HON WWALL-ADD1 DELTA5.DWG PLOT TIME: 07-15-22, 5:06 PM)

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 392	



KEYWALL
REINFORCING ELEVATION (A SA8.2 | SA8.2)
Scale: 3/8" = 1'-0"



KEYWALL
REINFORCING ELEVATION (B SA8.2 | SA8.2)
Scale: 3/8" = 1'-0"

DATE	REVISION
07/15/22	5 Revised Sleeper Slab

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge
Keywall Reinforcing Elevations

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

SHEET No. SA8.2 OF 5 SHEETS

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

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SIGNATURE — EXPIRATION DATE OF THE LICENSE: April 30, 2024

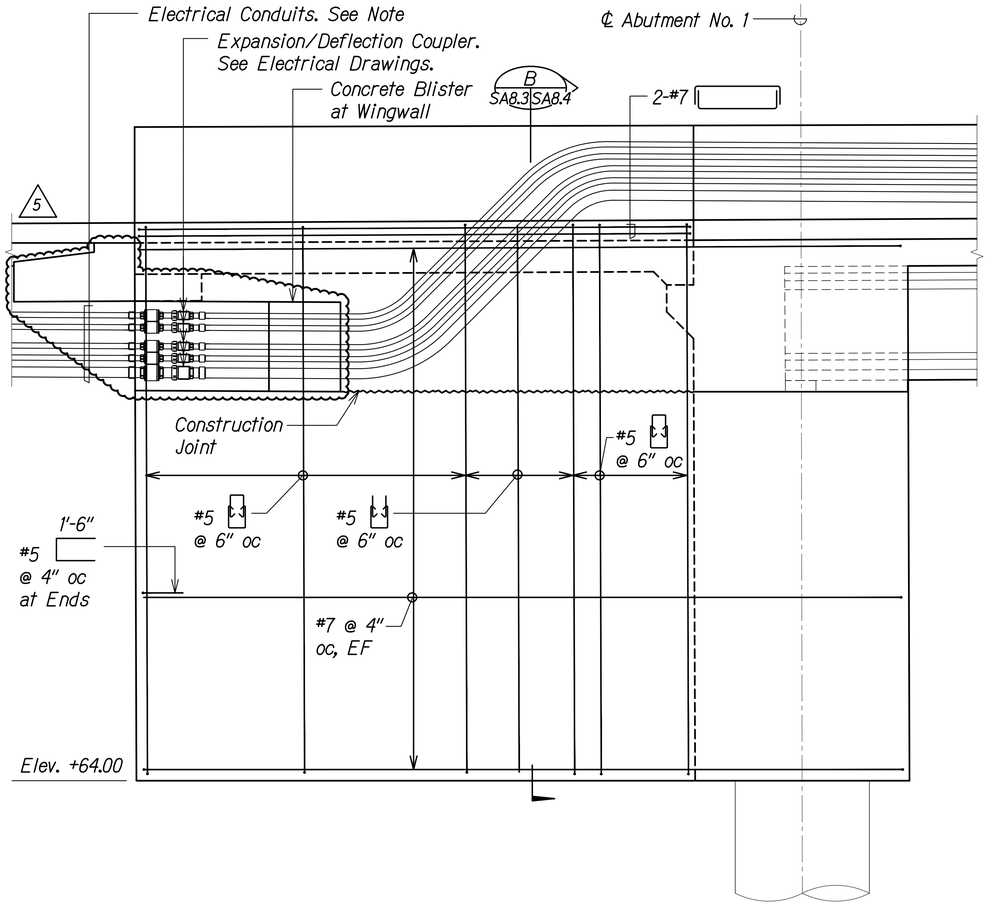
ORIGINAL PLAN
NOTE BOOK
No.

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

DRAWING NAME: Z:\OD ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHWA-SA0802 HON WWALL DELTA5.DWG PLOT TIME: 07-15-22, 5:07 PM)

ADD. 392

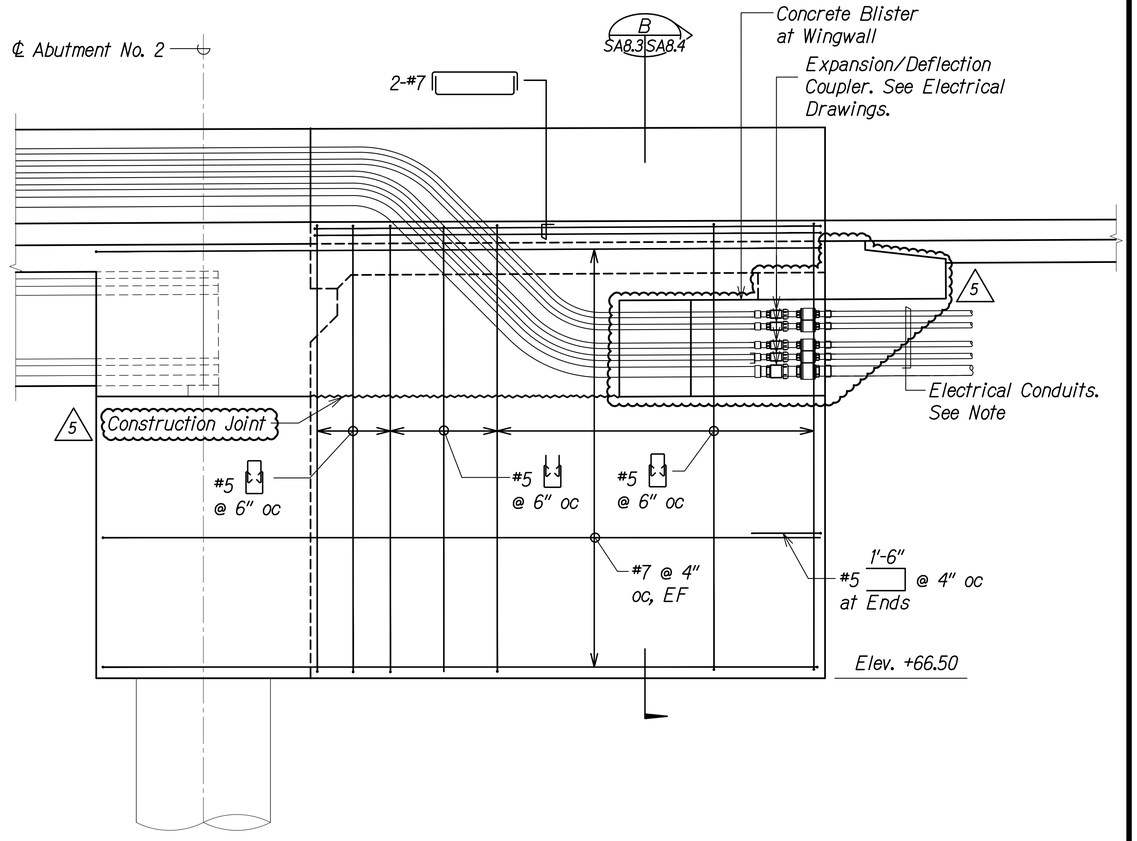
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 393	



WINGWALL NO. 2
REINFORCING ELEVATION

Scale: 3/8" = 1'-0"

A
SA8.3 | SA8.3



WINGWALL NO. 4
REINFORCING ELEVATION

Scale: 3/8" = 1'-0"

B
SA8.3 | SA8.3

Note:

1. (1) 4" Dia. conduit and (4) 2" dia. conduits in Wingwall Nos. 2 and 4.

07/15/22	5	Revised Sleeper Slab
DATE		REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge
Wingwall Reinforcing Elevations

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

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SIGNATURE — EXPIRATION DATE OF THE LICENSE: April 30, 2024

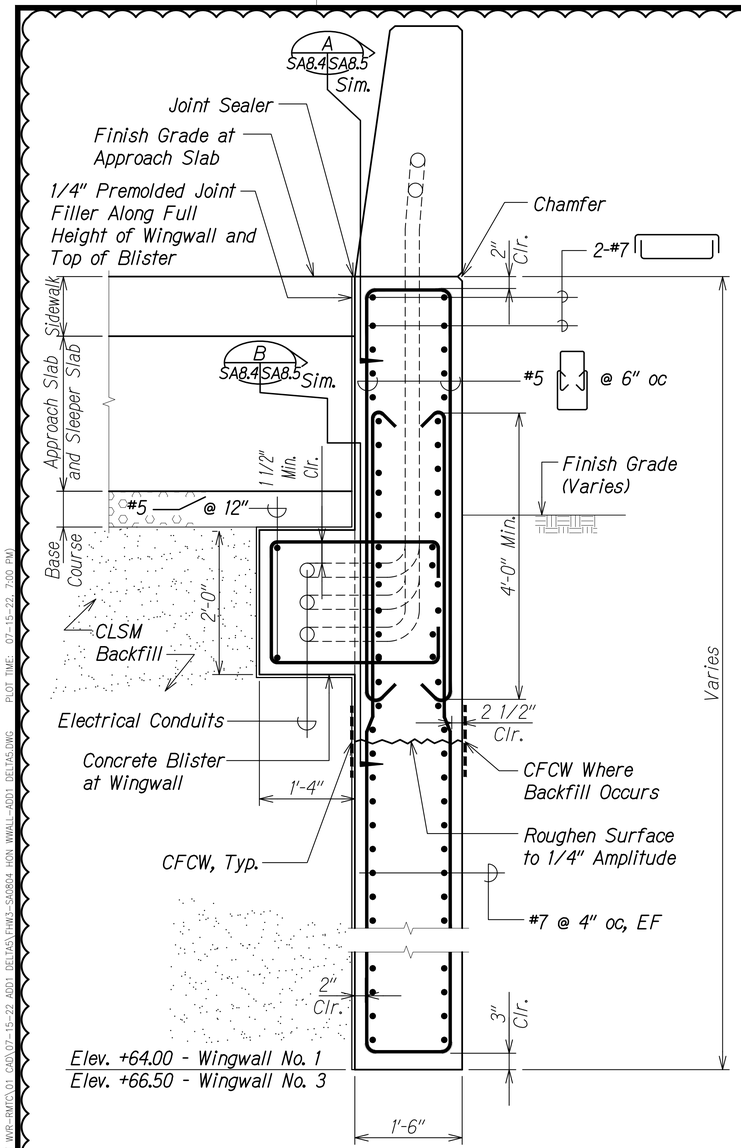
SHEET No. SA8.3 OF 5 SHEETS

ADD. 393

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

DRAWING NAME: Z:\OD ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTAS\FHWS-SA0803 HON WWALL DELTAS.DWG PLOT TIME: 07-15-22, 5:07 PM)

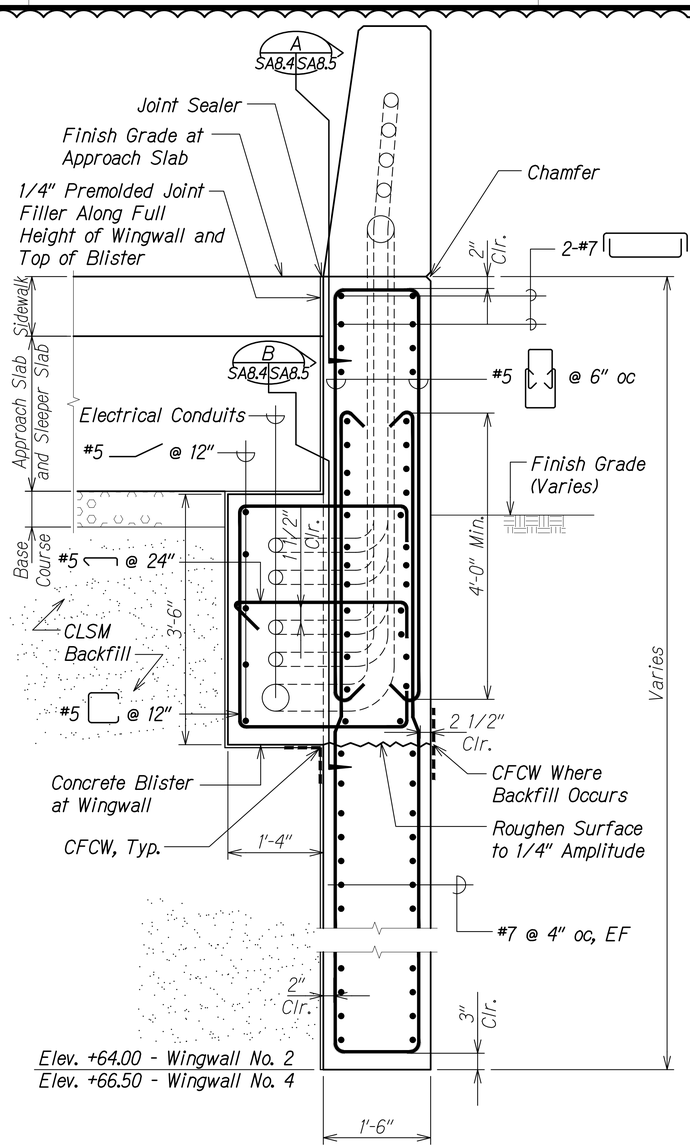
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 394	



WINGWALLS NO. 1 AND 3 SECTION

Scale: 1" = 1'-0"

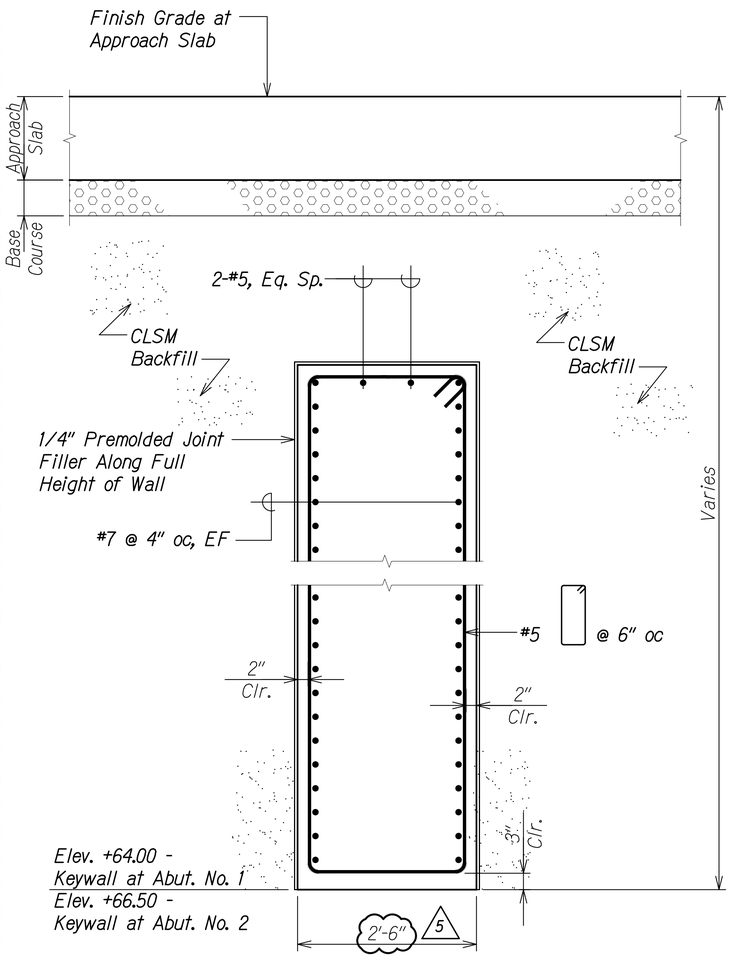
A SA8.1 SA8.4



WINGWALLS NO. 2 AND 4 SECTION

Scale: 1" = 1'-0"

B SA8.3 SA8.4



TYPICAL KEYWALLS SECTION

Scale: 1" = 1'-0"

C SA8.2 SA8.4

5

Note:

1. Elevations at bottom of wingwall are taken at the lowest point. Bottom of wingwall elevation changes along the length.

2

DATE	REVISION
07/15/22	5 Revised Sections
06/08/22	2 Delete Note

RUSS S. MIYAHARA LICENSED PROFESSIONAL ENGINEER NO. 9444-S HAWAII, U.S.A.

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SIGNATURE — EXPIRATION DATE OF THE LICENSE: Apr 30, 2024

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge
Wingwall and Keywall Sections

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown — Date: Apr. 2022

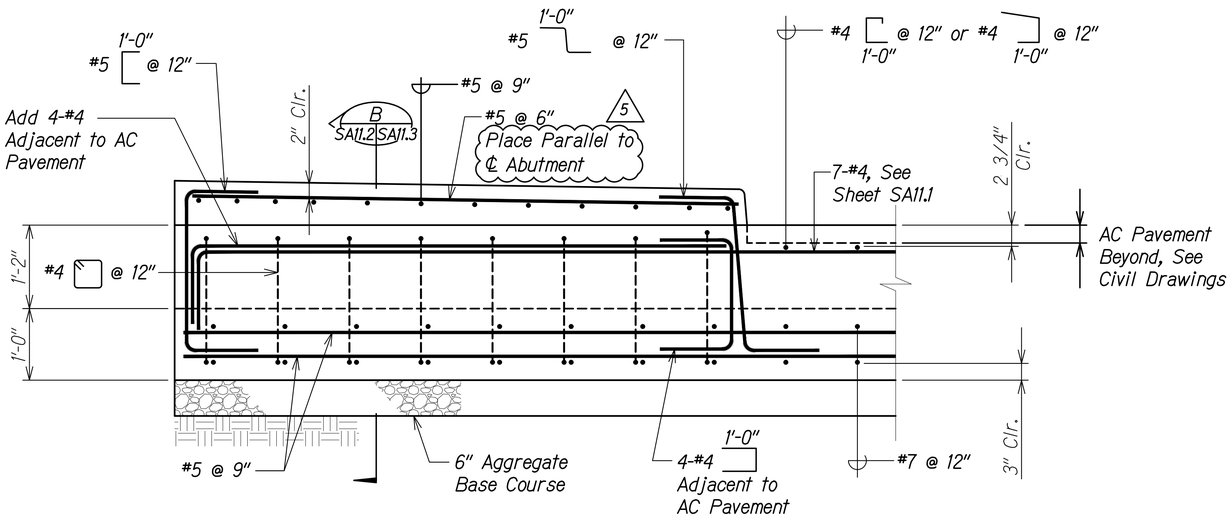
SHEET No. SA8.4 OF 5 SHEETS

ADD. 394

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

DRAWING NAME: Z:\GO ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHWA-SA0804 HON WWALL-ADD1 DELTA5.DWG PLOT TIME: 07-15-22, 7:00 PM)

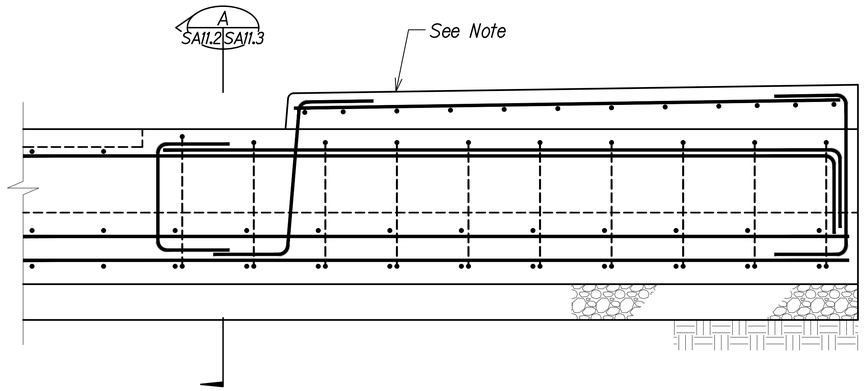
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 404	



SLEEPER SECTION AT SIDEWALK

Scale: 1" = 1'-0"

A
SA7.1 | SA11.2
SA7.3
2



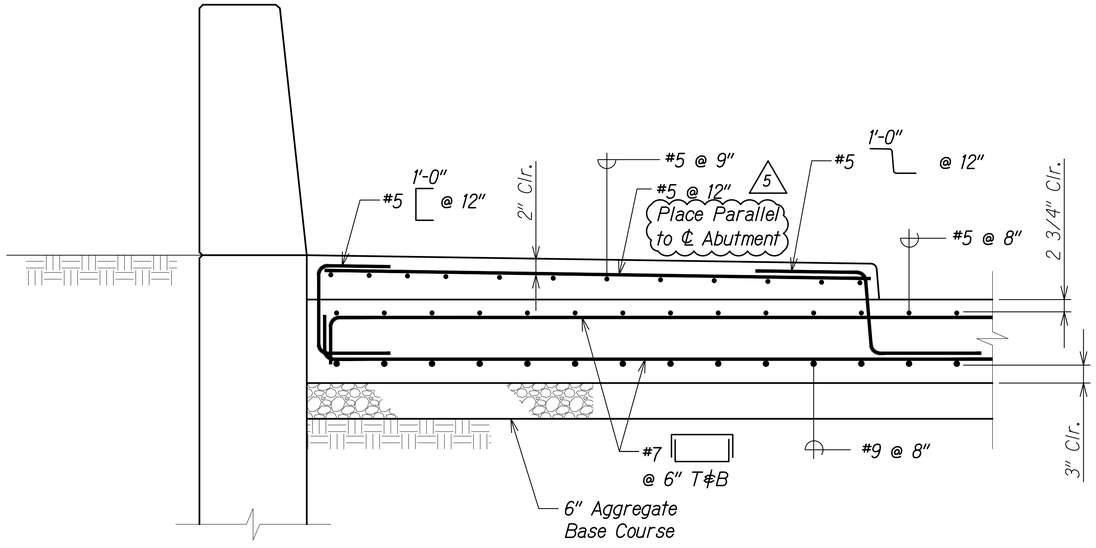
SLEEPER SECTION AT SIDEWALK

Scale: 1" = 1'-0"

B
SA7.1 | SA11.2
SA7.3
2

Note:

Reinforcing in section B is similar to section A. Section B is provided to show the condition of the sleeper slab at the gutter.



APPROACH SECTION AT SIDEWALK

Scale: 1" = 1'-0"

C
SA7.1 | SA11.2
SA7.3
2

DATE	REVISION
07/15/22	5 Revised Reinf. and Callouts
06/08/22	2 Revised Callouts

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge
Approach Slab and Sleeper Slab Sections

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

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SIGNATURE — EXPIRATION DATE OF THE LICENSE: April 30, 2024

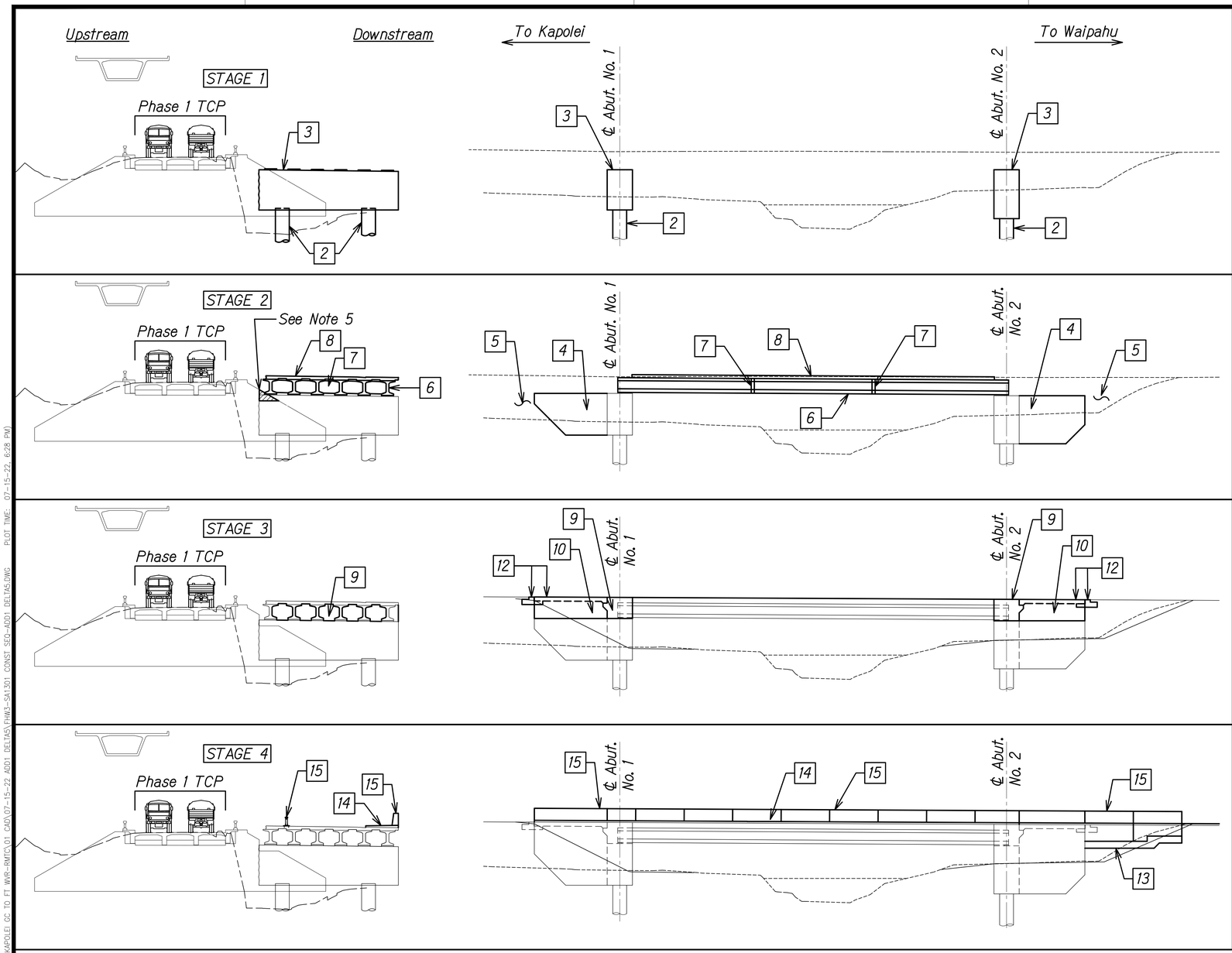
SHEET No. SA11.2 OF 4 SHEETS

ADD. 404

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

DRAWING NAME: Z:\OD ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHWA-SA11102 APPROACH SECT-ADD1 DELTA5.DWG PLOT TIME: 07-15-22, 5:10 PM)

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 412	



CONSTRUCTION STAGE 1 - MAKAI BRIDGE

1. Install trial and load test shaft.
2. Excavate to bottom of drilled shaft cap beam and install production drilled shafts (2), (3), (5), and (6).
3. Construct drilled shaft cap beams including seats, See Note 3.

CONSTRUCTION STAGE 2 - MAKAI BRIDGE

4. Construct wingwalls 2 and 4 and keywalls to top of drilled shaft cap beam, see Note 4.
5. Backfill behind abutment to 1'-0" below top of drilled shaft cap beam. Do not exceed 2-ft lifts for CLSM placement.
6. Erect girders G-5 through G-10, see Note 5.
7. Construct intermediate diaphragms.
8. Pour concrete deck, see Note 6.

CONSTRUCTION STAGE 3 - MAKAI BRIDGE

9. Pour end beams and corbel a minimum of 30 days after step 8. Concrete pour shall occur between 1:00 am and 4:00 am.
10. Construct remainder of wingwalls, see Note 7.
11. Backfill behind abutment to bottom of approach slab and sleeper slab.
12. Construct sleeper slab and approach slab, see Note 8.

CONSTRUCTION STAGE 4 - MAKAI BRIDGE

13. Construct retaining walls, see Note 9.
14. Pour sidewalk on downstream side of bridge, see Note 10.
15. Construct bridge railings, end posts, and temporary construction barriers.
16. Blanket grind and mechanically groove bridge deck, approach slabs, and sleeper slabs, see Note 11.

SEE PHASE 1 TCP - SHEET TC-15

DATE	REVISION
07/15/22	5 Revised Sheet Reference
06/08/22	2 Revised Sheet Reference

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

RUSS S. MIYAHARA LICENSED PROFESSIONAL ENGINEER NO. 9444-S HAWAII, U.S.A.

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SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge Construction Sequence

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

SHEET No. SA13.1 OF 3 SHEETS

ADD. 412

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 413	

Upstream

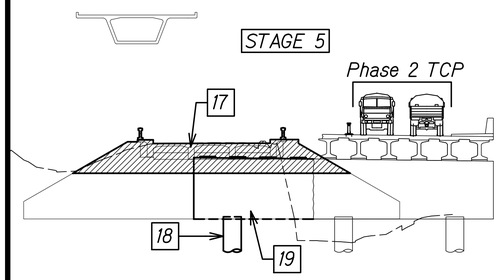
Downstream

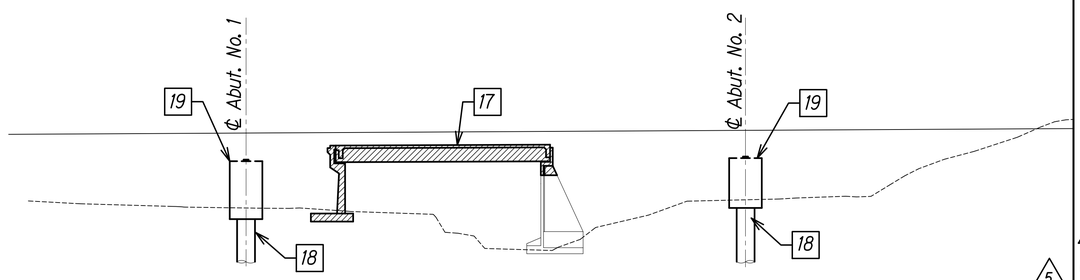
To Kapolei

To Waipahu

STAGE 5

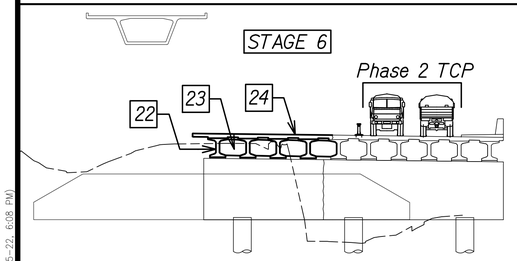
Phase 2 TCP

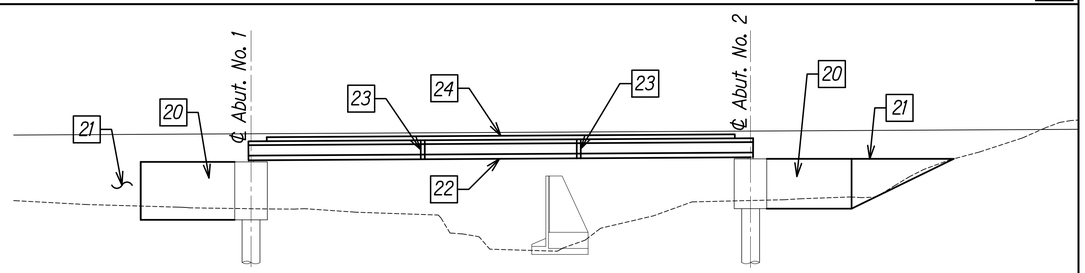




STAGE 6

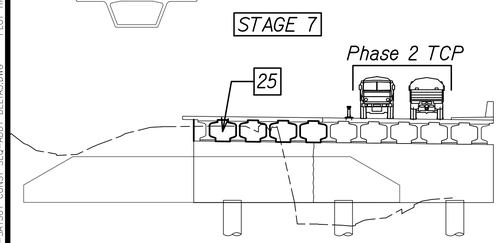
Phase 2 TCP

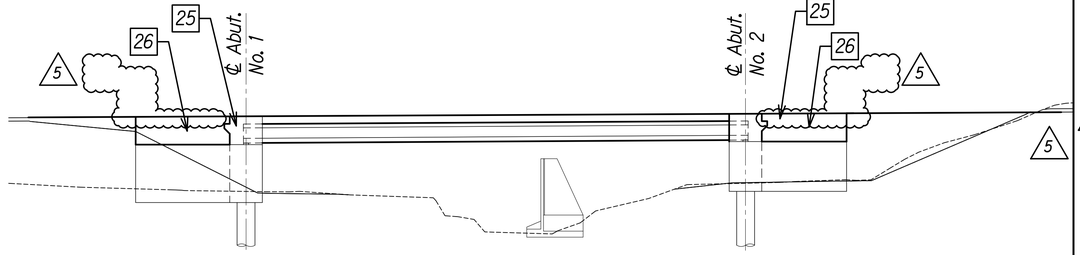




STAGE 7

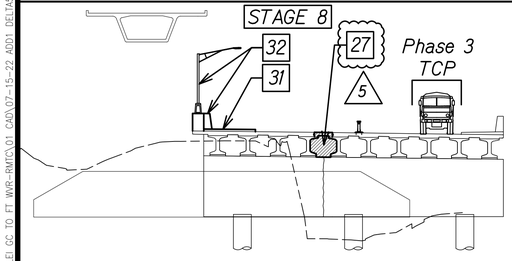
Phase 2 TCP

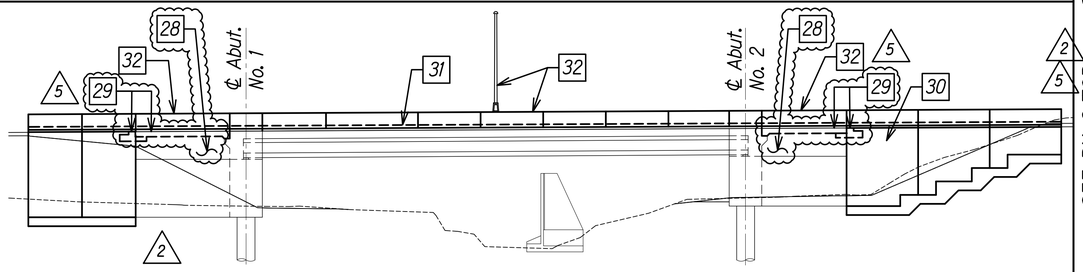




STAGE 8

Phase 3 TCP





SEE PHASE 2 TCP - SHEET (TC-21)

SEE PH. 3 TCP SHEET (TC-22)

SEE PH. 2 TCP SHEET (TC-21)

CONSTRUCTION STAGE 5 - MAUKA BRIDGE

17 Demolish existing bridge superstructure and substructure.

18 Excavate to bottom of drilled shaft cap beam and install production drilled shafts (1) and (4).

19 Construct drilled shaft cap beams including seats, see Note 12.

CONSTRUCTION STAGE 6 - MAUKA BRIDGE

20 Construct wingwalls 1 and 3 and keywalls to top of drilled shaft cap beam, see Note 13.

21 Backfill behind abutment to 1'-0" below top of drilled shaft cap. Do not exceed 2-ft lifts for CLSM placement.

22 Erect girders G-1 through G-4, see Note 14.

23 Construct intermediate diaphragms.

24 Pour concrete deck, see Note 15.

CONSTRUCTION STAGE 7 - MAUKA BRIDGE

25 Pour end beams and corbel a minimum of 30 days after step 24. Concrete pour shall occur between 1:00 am and 4:00 am.

26 Construct remainder of wingwalls, see Note 16.

CONSTRUCTION STAGE 8 - MAUKA BRIDGE

27 Place closure pour at end beams, corbel, deck, and diaphragm locations between Mauka and Makai bridge using VESLMC. Concrete pour shall occur between 1:00 am and 4:00 am. 5

28 Backfill behind abutment to bottom of approach slab and sleeper slab.

29 Construct sleeper slab and approach slab, see Note 17. 5

30 Construct retaining walls, see Note 18.

31 Pour sidewalk on upstream side of bridge, see Note 19.

32 Construct bridge railings, end posts, and light standards.

33 Blanket grind and mechanically groove bridge deck, approach slabs, and sleeper slabs, see Note 20.

DATE	REVISION
07/15/22	5 Revised Sheet Reference and Callout
06/08/22	2 Revised Details

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

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

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SIGNATURE

April 30, 2024
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Honouliuli Stream Bridge Construction Sequence

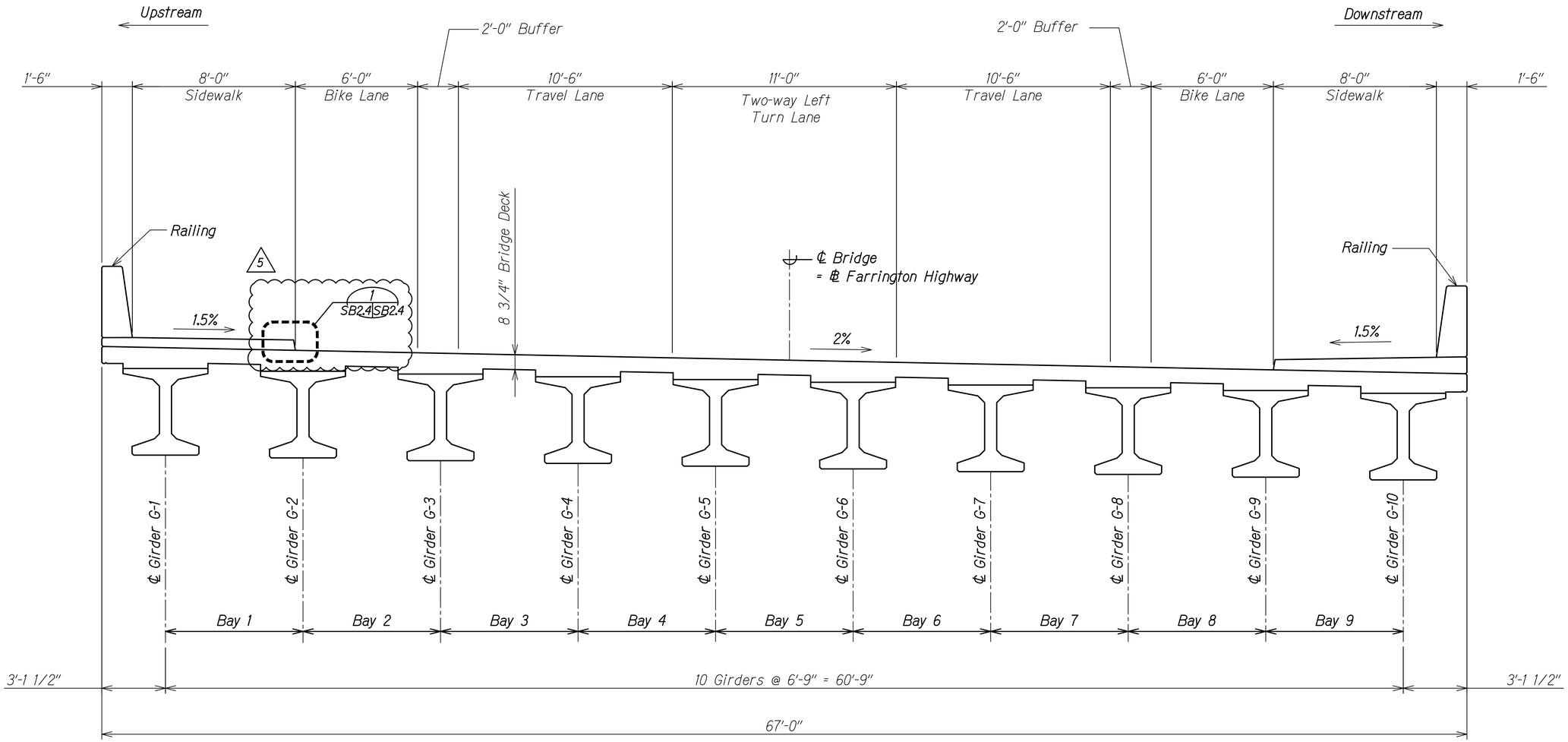
FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

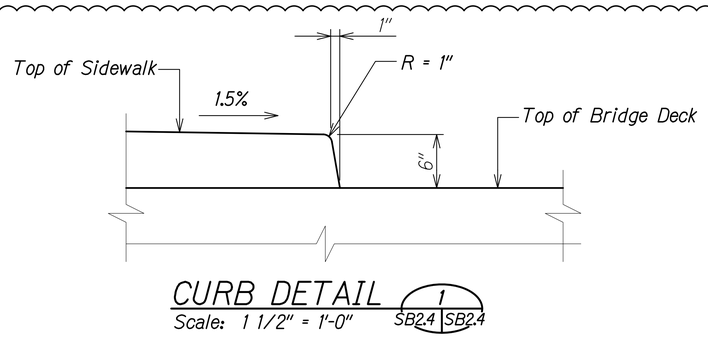
Scale: As Shown Date: Apr. 2022

SHEET No. SA13.2 OF 3 SHEETS

ADD. 413

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 423	





CURB DETAIL (1)
Scale: 1 1/2" = 1'-0"
SB2.4 | SB2.4

TYPICAL TRANSVERSE SECTION (A)
Scale: 3/8" = 1'-0"
SB2.4 | SB2.4

5

DATE	REVISION
07/15/22	5 Added Curb Detail

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Kaloi Gulch Bridge
Typical Transverse Section

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

SHEET No. SB2.4 OF 5 SHEETS

RUSS S. MIYAHARA
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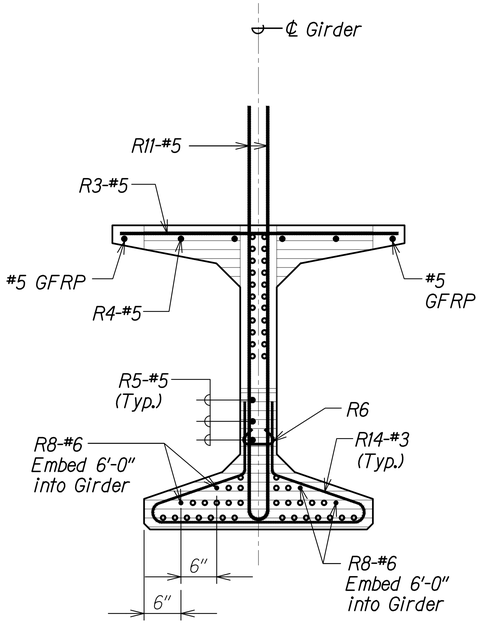
SIGNATURE — EXPIRATION DATE OF THE LICENSE: April 30, 2024

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

DRAWING NAME: Z:\OD ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTAS\FHWA-SB0204 KAL TYP TRANS SECT ADD5.DWG PLOT TIME: 07-15-22, 5:34 PM)

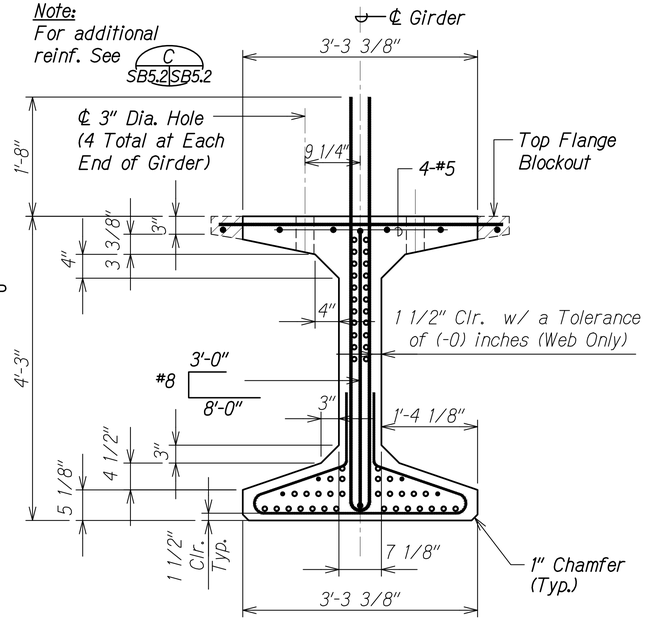
ADD. 423



END ELEVATION (A)

Scale: 1" = 1'-0"

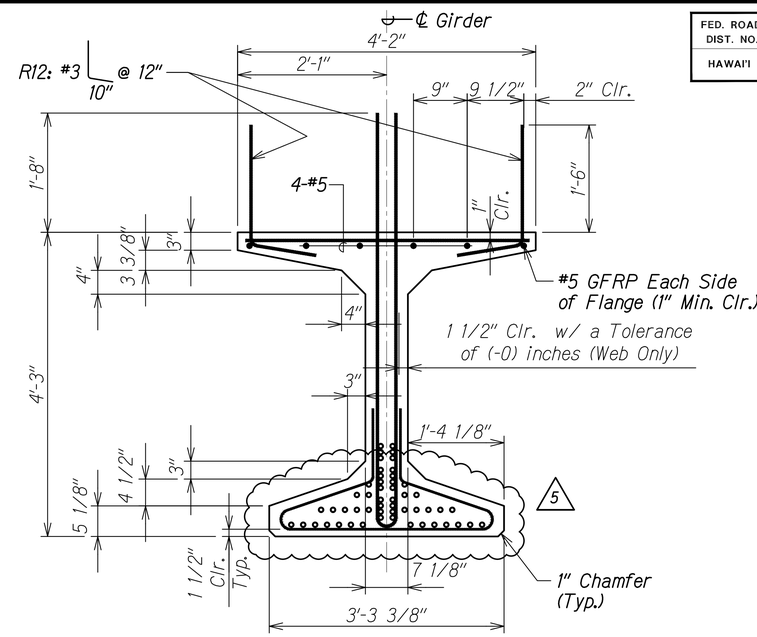
SB5.1 | SB5.2



SECTION WITHIN END BEAM (B)

Scale: 1" = 1'-0"

SB5.1 | SB5.2



TYPICAL SECTION (C)

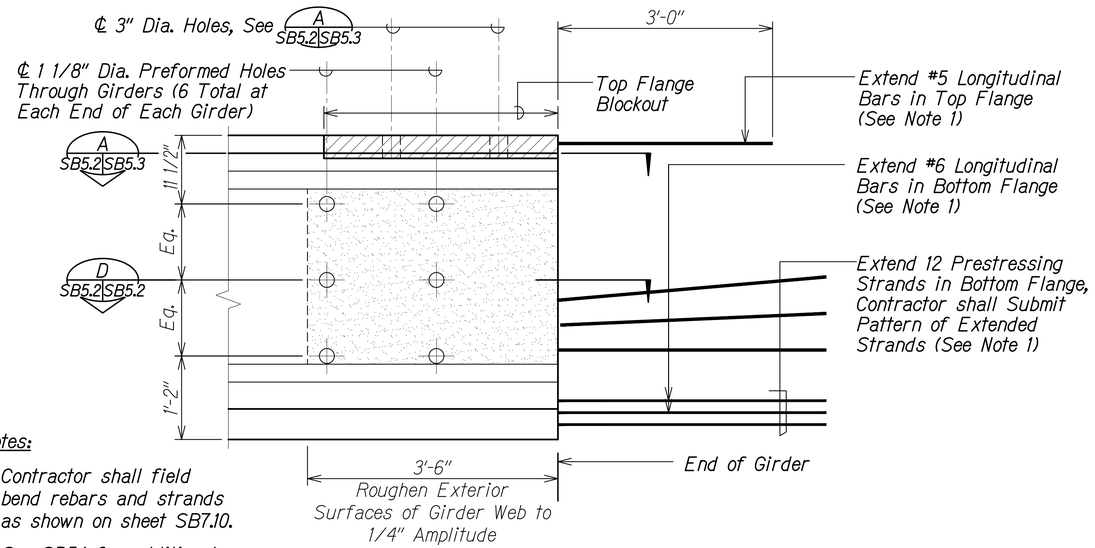
Scale: 1" = 1'-0"

SB5.1 | SB5.2

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 435	

Notes:

1. Sawteeth shown by hatched area
2. Strands are shown for illustrative purposes only.
3. Type II girders (G-1 Through G-10)
4. For R Type reinforcing see sht. SB5.3
5. See sheet SB5.1 for stirrup spacing.



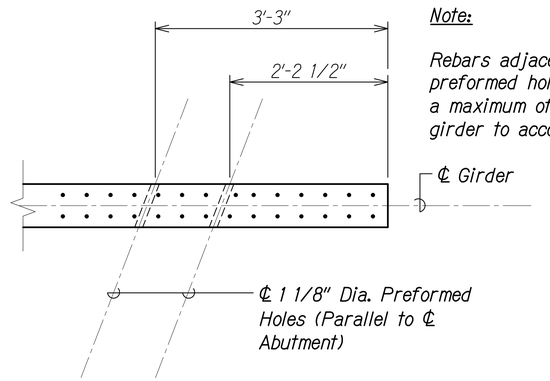
Notes:

1. Contractor shall field bend rebars and strands as shown on sheet SB7.10.
2. See SB5.1 for additional reinforcing details.

TYPE II GIRDER END DETAIL (1)

Scale: 1" = 1'-0"

SB5.2 | SB5.2



Note:

Rebars adjacent to 1 1/8" Dia. preformed holes may be adjusted a maximum of 1/4" along ℄ girder to accomodate the hole

SECTION (D)

Scale: 1" = 1'-0"

SB5.2 | SB5.2

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

DRAWING NAME: Z:\00 ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTAS\FHWJ-SB0501 GIRDER DET ADD5.DWG PLOT TIME: 07-15-22, 5:18 PM)

07/15/22	5	Revised Detail
DATE	REVISION	

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Kaloi Gulch Bridge
Type II Prestressed Girder Sections

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

RUSS S. MIYAHARA
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NO. 9444-S
HAWAII, U.S.A.

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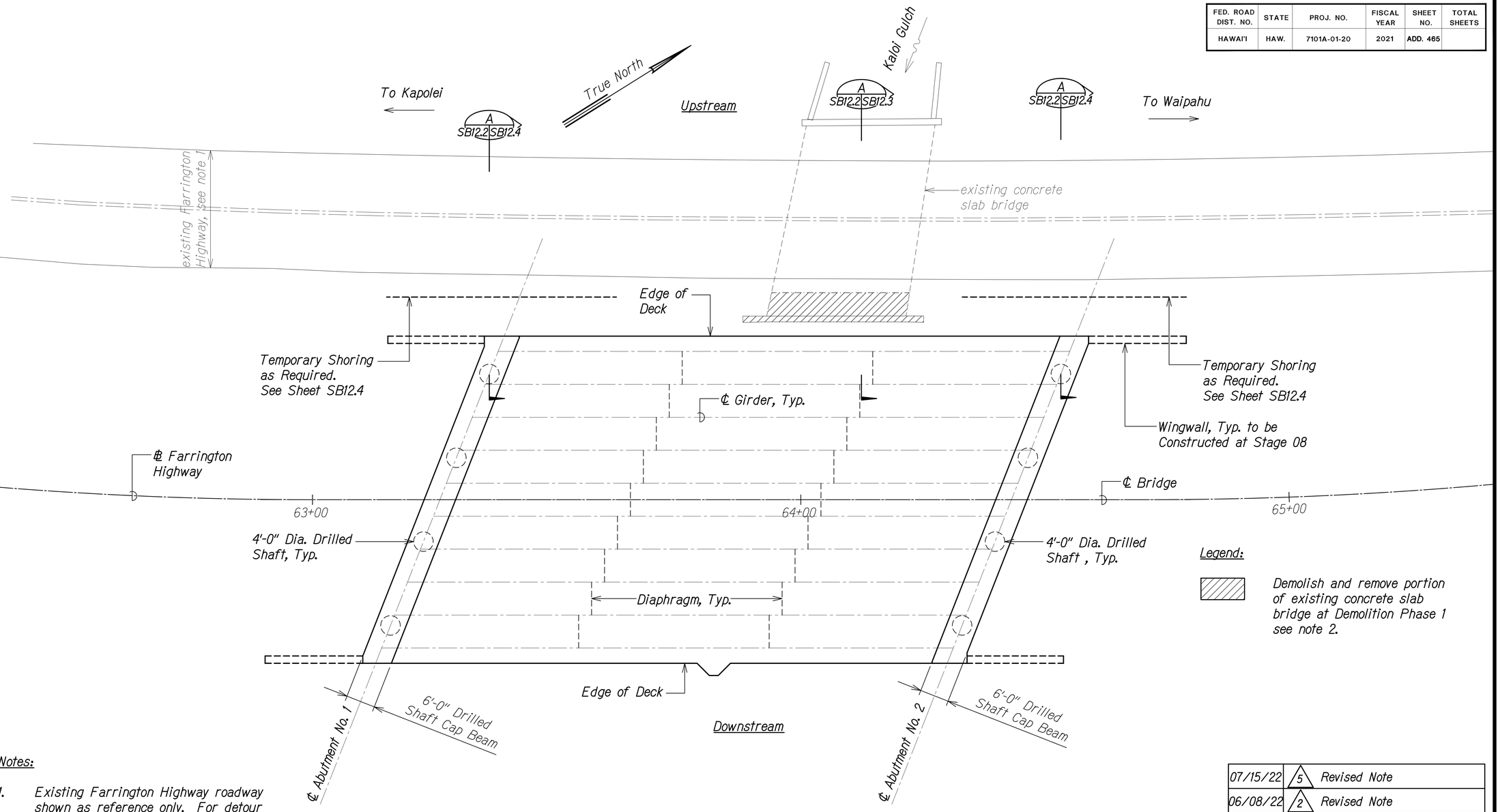
April 30, 2024
EXPIRATION DATE OF THE LICENSE

SHEET No. SB5.2 OF 3 SHEETS

ADD. 435

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 465	



Legend:

Demolish and remove portion of existing concrete slab bridge at Demolition Phase 1 see note 2.

Notes:

1. Existing Farrington Highway roadway shown as reference only. For detour road and temporary barrier requirements, see Civil sheet TC-10. 2 5
2. For demolition of all existing structures, see sheets SB3.1 to SB3.5.
3. For temporary shoring requirements and contractor submittals, see structural general note 8.H. Temporary slopes for excavation shall be 1H:1V or flatter.

LAYOUT PLAN - STAGE 06

A
SB12.2 SB12.2

Scale: 1" = 10'-0"

DATE		REVISION
07/15/22	5	Revised Note
06/08/22	2	Revised Note

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Kaloi Gulch Bridge
Layout Plan During Construction

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

SHEET No. SB12.2 OF 4 SHEETS

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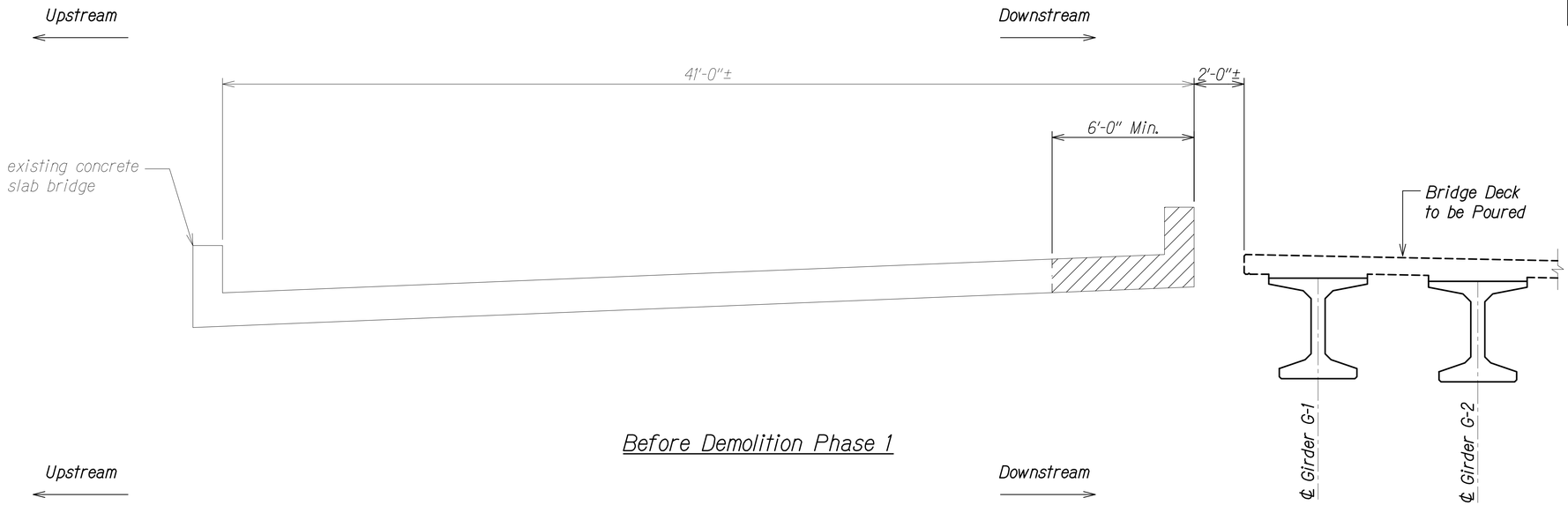
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
No.	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

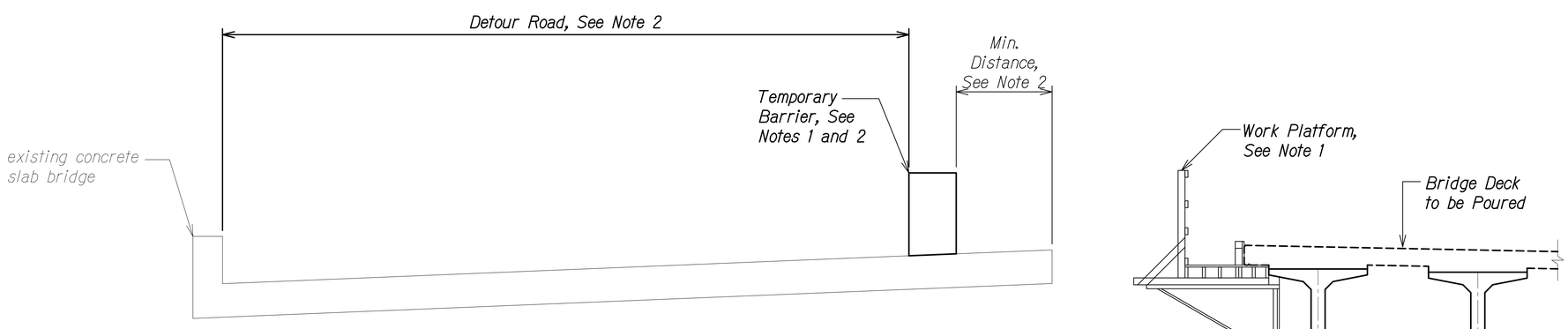
DRAWING NAME: Z:\OD ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTAS\FHWA-SB1202 KAL STAGE 06 PLAN ADD1 ADD5.DWG PLOT TIME: 07-15-22, 5:19 PM)

ADD. 465

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 466	



Before Demolition Phase 1



After Demolition Phase 1

Legend:

Demolish and remove portion of existing concrete slab bridge at Demolition Phase 1.

Notes:

1. Work platform and temporary barrier are shown for schematic purposes.
2. For detour road and temporary barrier requirements, see Civil sheet TC-10, 2 △ 5
3. Horizontal distances shown are measured perpendicular to ℄ Farrington Highway.

SECTION AT STREAM A

Scale: 3/8" = 1'-0"

SBI2.2 | SBI2.3

DATE	REVISION
07/15/22	5 △ Revised Note
06/08/22	2 △ Revised Note

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Kaloi Gulch Bridge
Section During Construction

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

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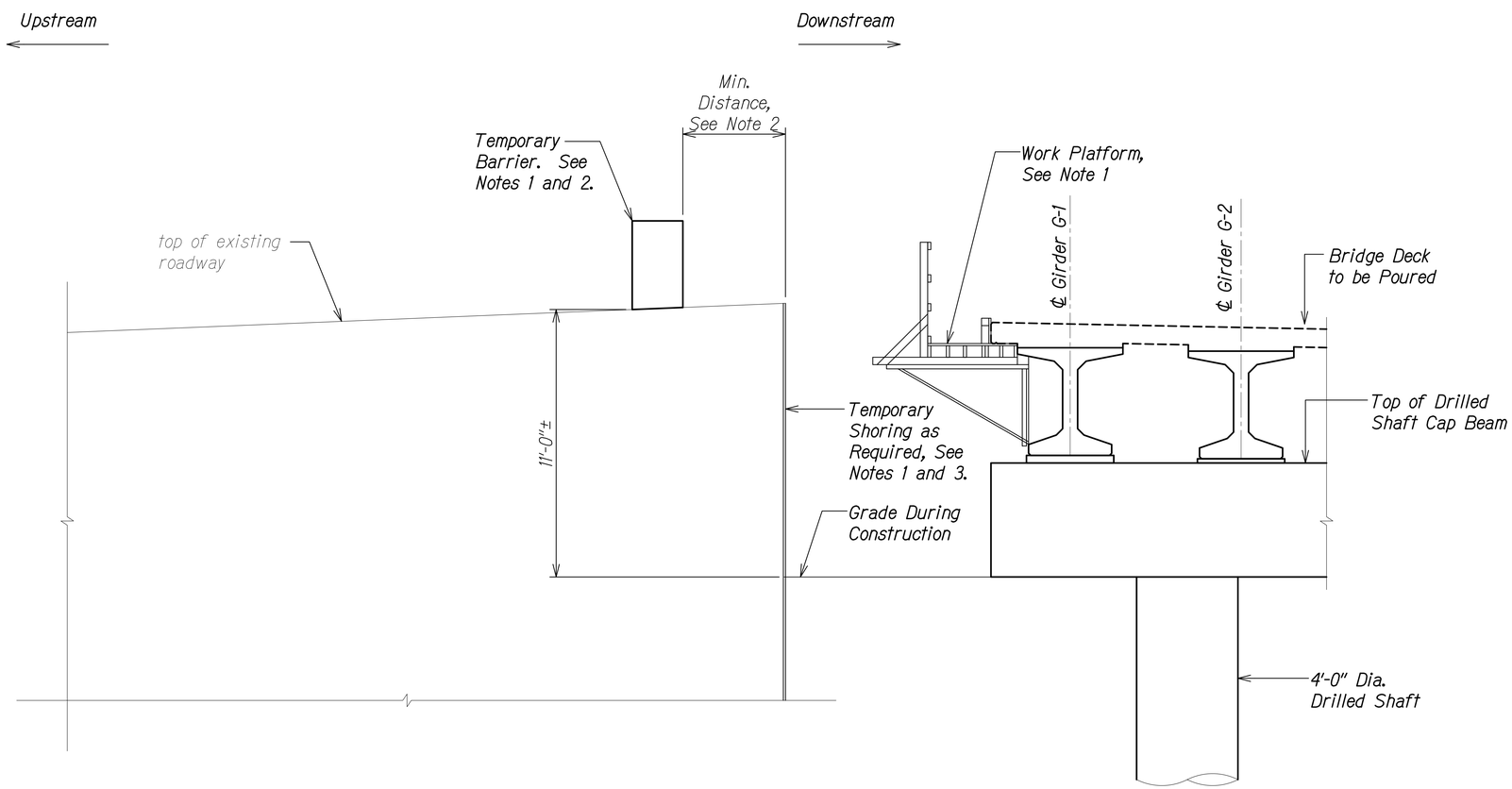
SHEET No. S12.3 OF 4 SHEETS

ADD. 466

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

DRAWING NAME: Z:\OD ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHWA-SB1203 KAL STAGE SECT ADD1 ADD5.DWG PLOT TIME: 07-15-22, 5:20 PM)

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 467	



Notes:

1. Work platform, temporary barrier, and temporary shoring are shown for schematic purposes.
2. For detour road and temporary barrier requirements, see Civil sheet TC-10. (2) (5)
3. For temporary shoring requirements and contractor submittals, see structural general note 8.H. Temporary slopes for excavation shall be 1H:1V or flatter.

SECTION AT NEW ABUTMENT (A)

Scale: 3/8" = 1'-0"

SB12.2 SB12.4

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

DATE	REVISION
07/15/22	(5) Revised Note
06/08/22	(2) Revised Note

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Kaloi Gulch Bridge
Section During Construction

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

RUSS S. MIYAHARA
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NO. 9444-S
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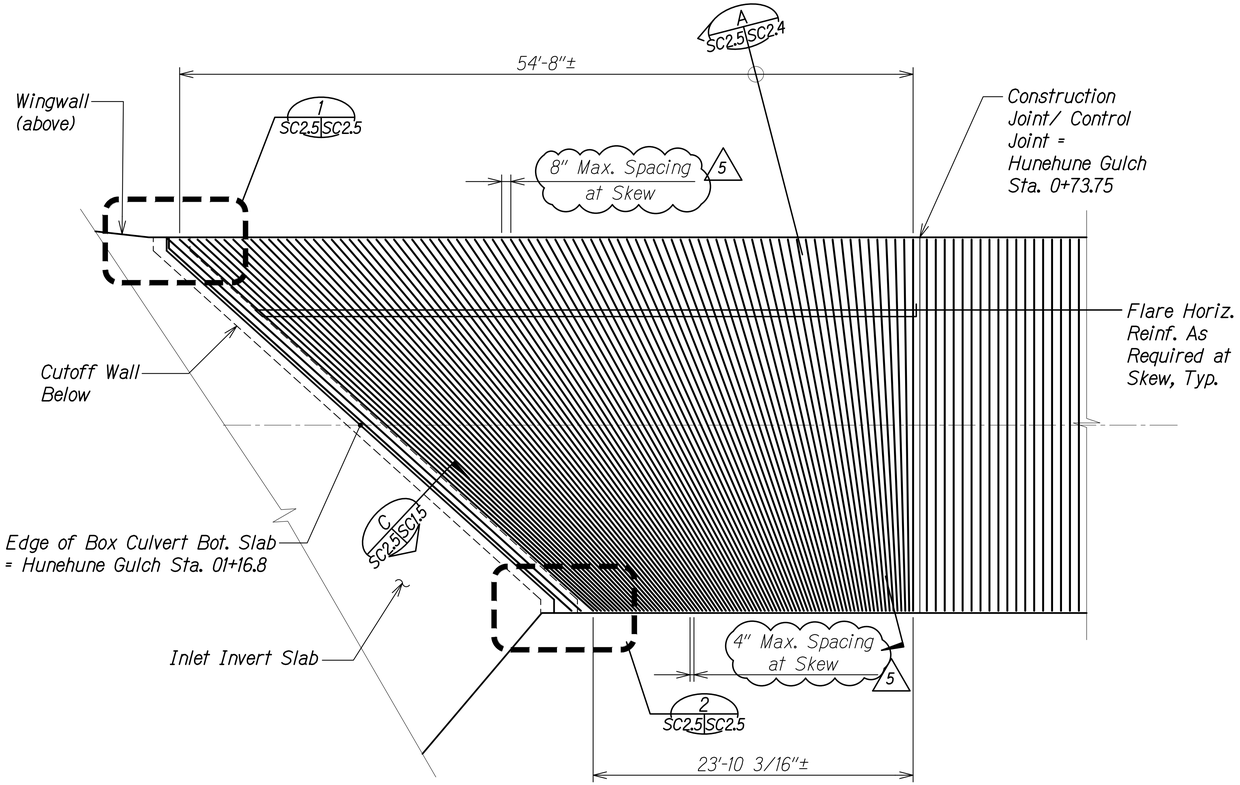
April 30, 2024
EXPIRATION DATE OF THE LICENSE

SHEET No. SB12.4 OF 4 SHEETS

ADD. 467

DRAWING NAME: Z:\DO ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHWA-SB1203 KAL STAGE SECT ADD1 ADD5.DWG PLOT TIME: 07-15-22, 5:20 PM)

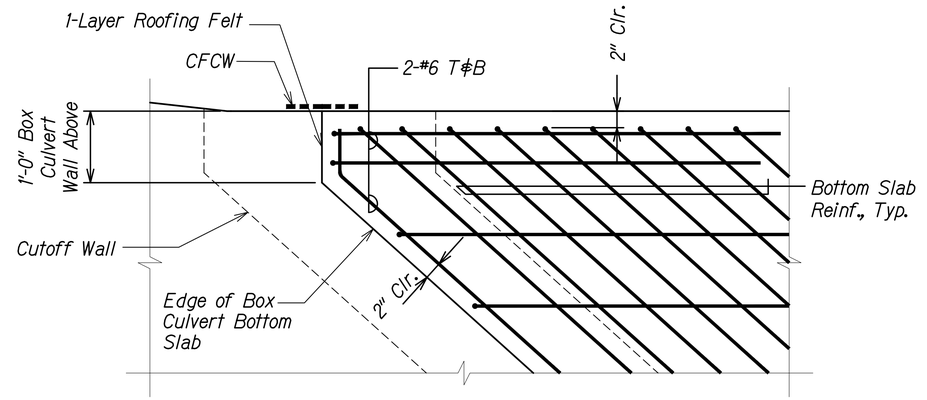
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 480	



BOTTOM SLAB REINFORCING PLAN AT INLET

Scale: 3/16" = 1'-0"

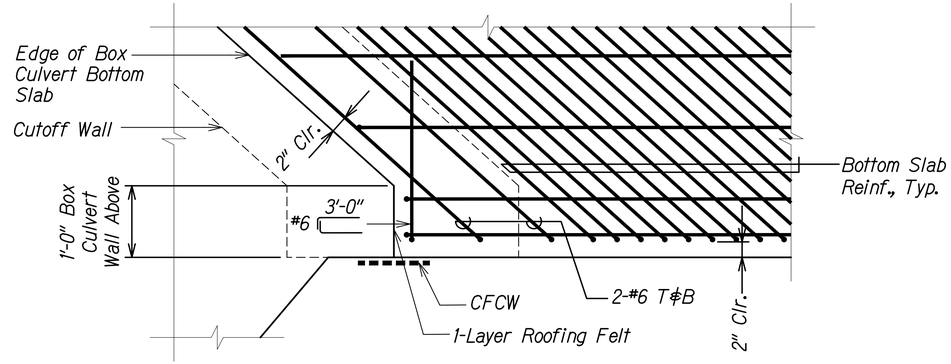
A SC2.5 SC2.5



INLET - BOX CULVERT BOT. SLAB DETAIL

Scale: 1" = 1'-0"

1 SC2.5 SC2.5



INLET - BOX CULVERT BOT. SLAB DETAIL

Scale: 1" = 1'-0"

2 SC2.5 SC2.5

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

DRAWING NAME: Z:\OD ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTAS\FHWA-SC0205-HUNE BOX BOT SLAB INLET ADD5.DWG PLOT TIME: 07-15-22, 5:40 PM)

DATE	REVISION
07/15/22	5 Revised Dimension

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Hunehune Gulch Box Culvert Inlet Bottom Slab Plan and Details

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

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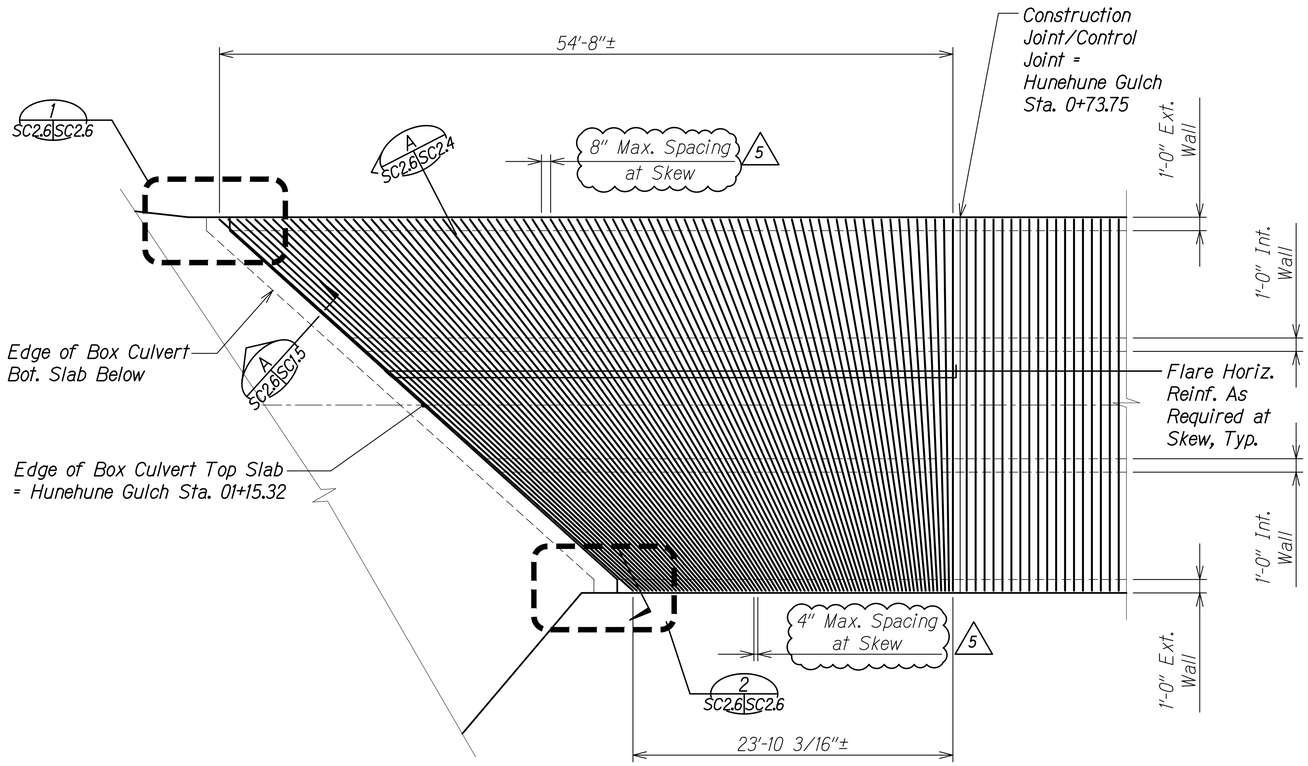
SHEET No. SC2.5 OF 23 SHEETS

ADD. 480

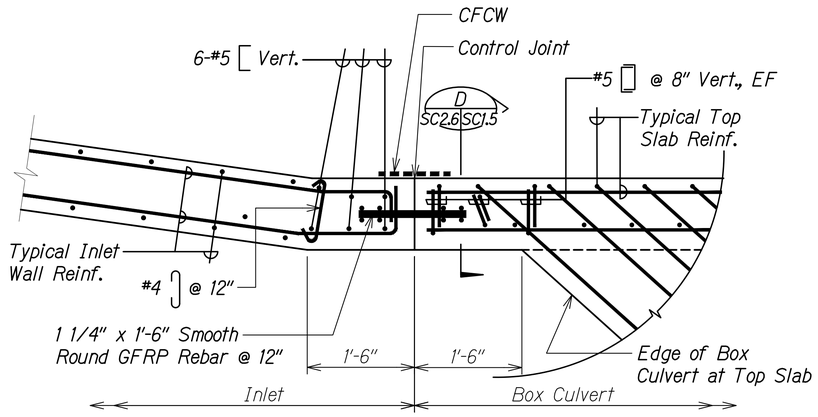
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 481	



TOP SLAB REINFORCING PLAN AT INLET

Scale: 3/16" = 1'-0"

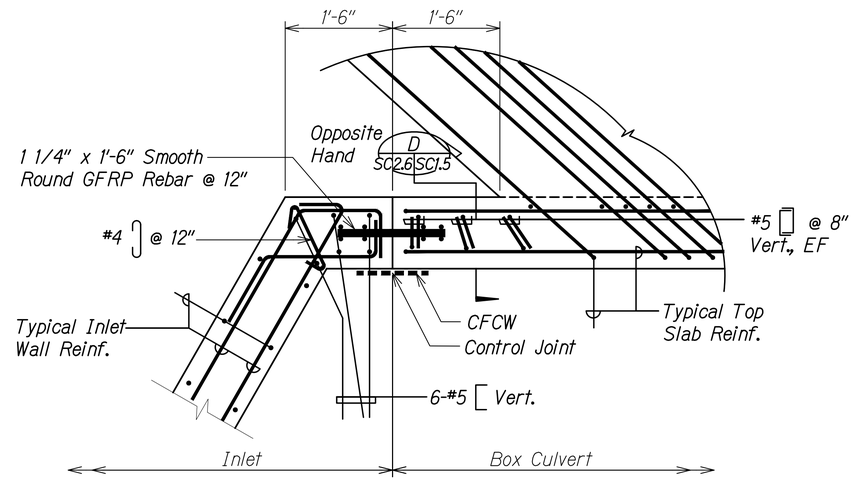
A
SC2.6 SC2.6



INLET - BOX CULVERT TOP SLAB DETAIL

Scale: 1" = 1'-0"

1
SC2.6 SC2.6



INLET - BOX CULVERT TOP SLAB DETAIL

Scale: 1" = 1'-0"

2
SC2.6 SC2.6

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

DATE	REVISION
07/15/22	5 Revised Title/Scale

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Hunehune Gulch Box Culvert Inlet Top Slab Plan and Details

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

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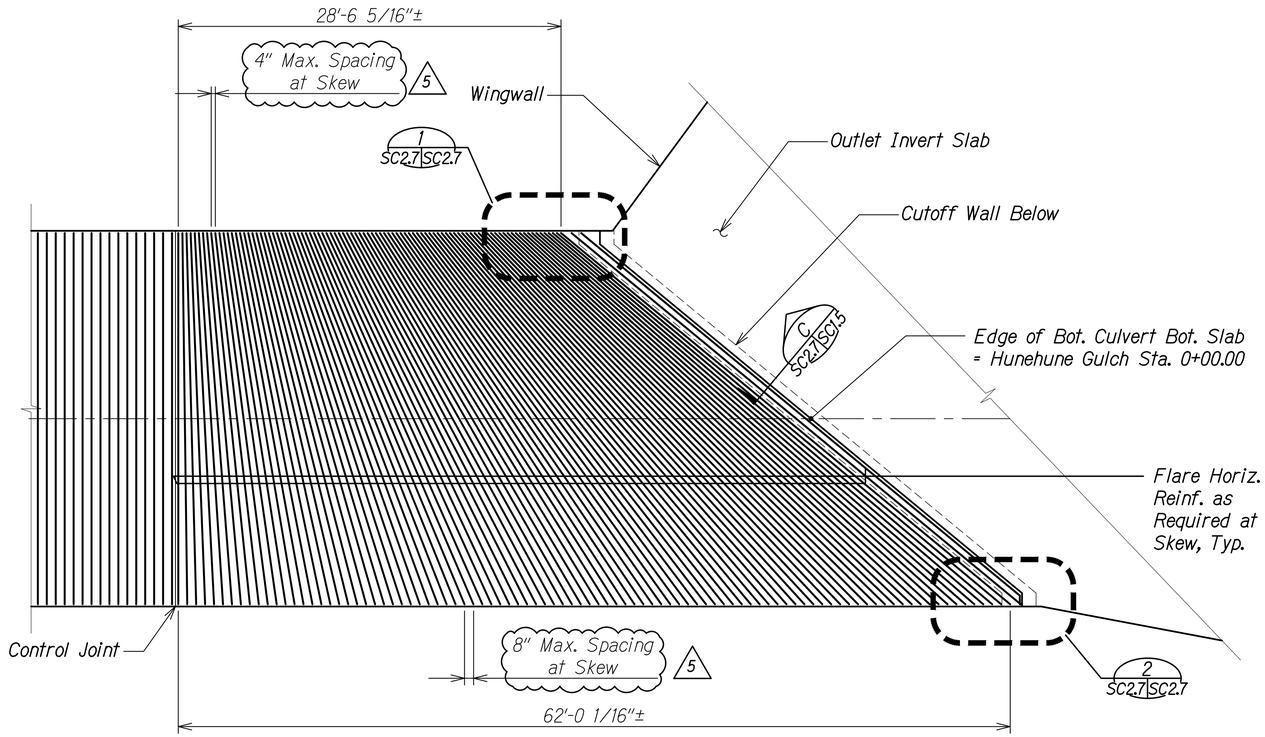
SIGNATURE

April 30, 2024
EXPIRATION DATE OF THE LICENSE

SHEET No. SC2.6 OF 23 SHEETS

ADD. 481

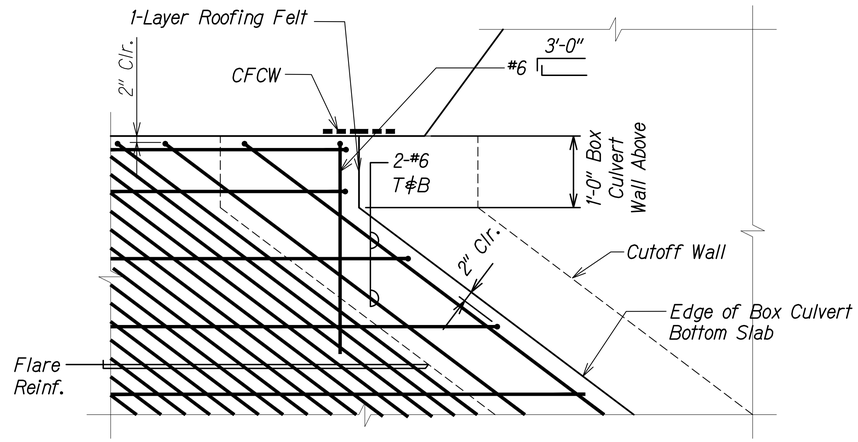
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 482	



BOTTOM SLAB REINFORCING PLAN AT OUTLET

Scale: 3/16" = 1'-0"

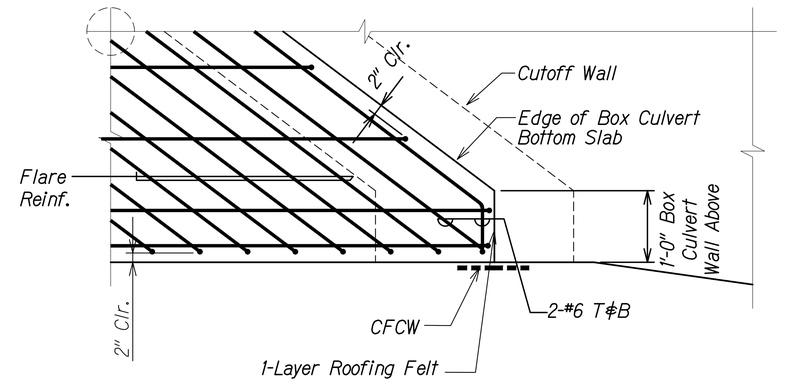
A
SC2.14 SC2.7



OUTLET - BOX CULVERT BOT. SLAB DETAIL

Scale: 1" = 1'-0"

1
SC2.7 SC2.7



OUTLET - BOX CULVERT BOT. SLAB DETAIL

Scale: 1" = 1'-0"

2
SC2.7 SC2.7

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

ORIGINAL PLAN | NOTE BOOK | No.

DRAWING NAME: Z:\OD ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WWR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHW3-SC0207-HUNE BOX BOT SLAB OUTLET ADD5.DWG PLOT TIME: 07-15-22, 5:40 PM)

07/15/22	5	Revised Dimension
DATE	REVISION	

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Hunehune Gulch Box Culvert Outlet Bottom Slab Plan and Details

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

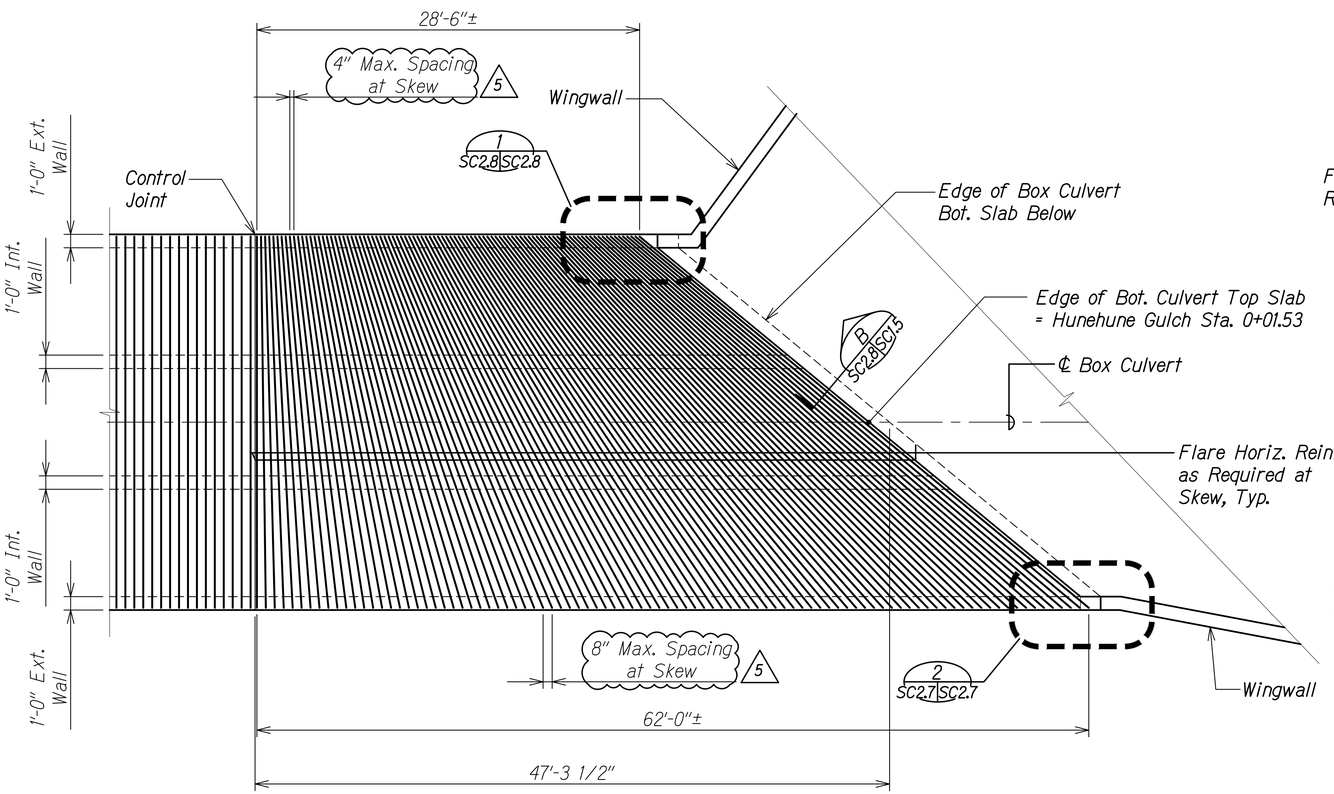
SIGNATURE

April 30, 2024
EXPIRATION DATE OF THE LICENSE

SHEET No. SC2.7 OF 23 SHEETS

ADD. 482

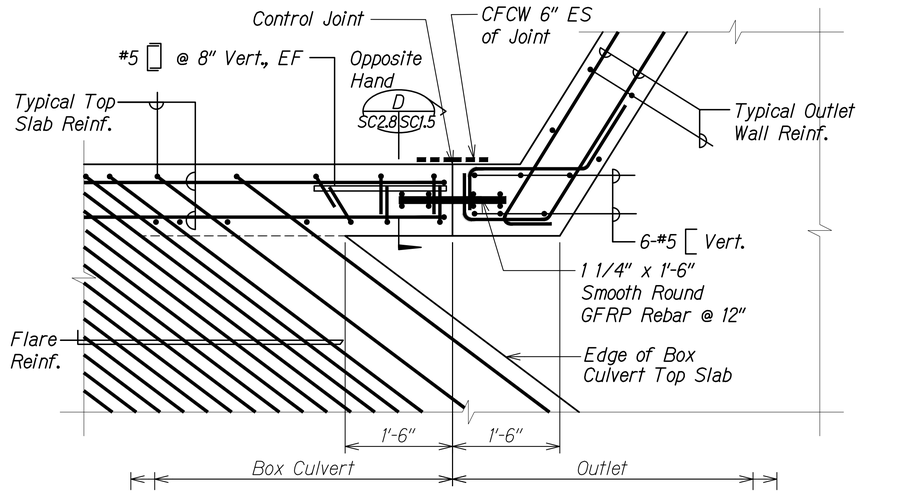
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 483	



TOP SLAB REINFORCING PLAN AT OUTLET

Scale: 3/16" = 1'-0"

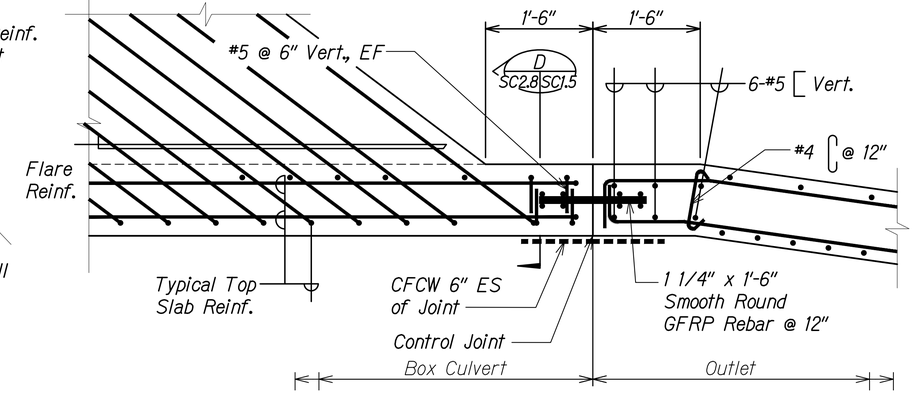
A
SC2.14|SC2.8



OUTLET - BOX CULVERT TOP SLAB DETAIL

Scale: 1" = 1'-0"

1
SC2.8|SC2.8



OUTLET - BOX CULVERT TOP SLAB DETAIL

Scale: 1" = 1'-0"

2
SC2.8|SC2.8

DATE	REVISION
07/15/22	5 Revised Dimension

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Hunehune Gulch Box Culvert Outlet Top Slab Plan and Details

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

SHEET No. SC2.8 OF 23 SHEETS

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

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SIGNATURE

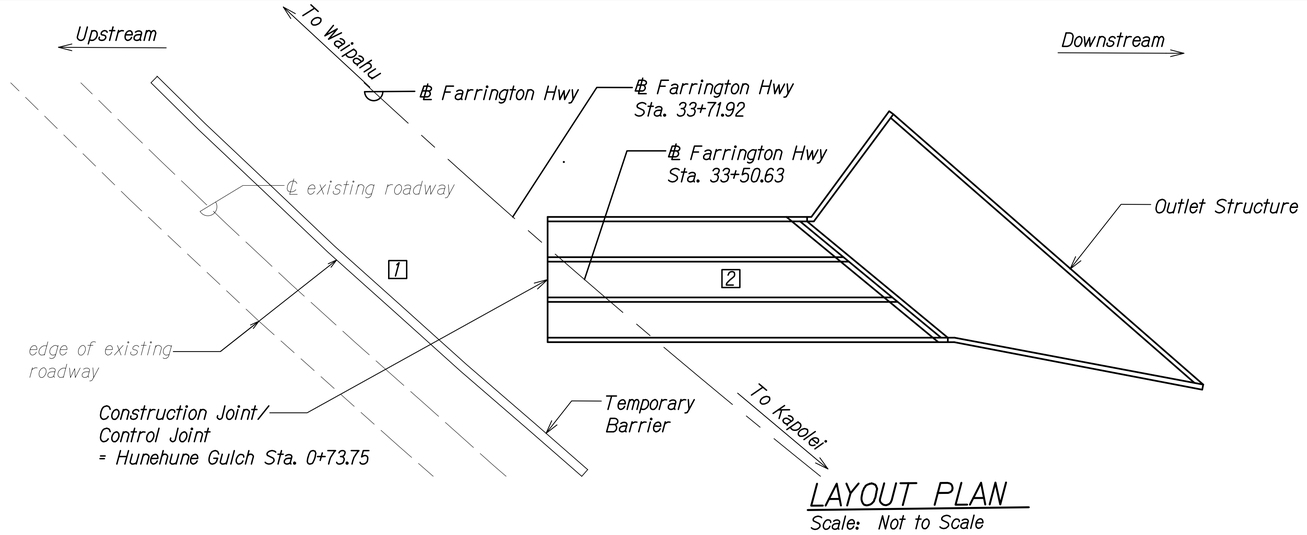
April 30, 2024
EXPIRATION DATE OF THE LICENSE

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

DRAWING NAME: Z:\OD ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHWA-SC0208-HUNE BOX TOP SLAB OUTLET ADD5.DWG PLOT TIME: 07-15-22, 5:41 PM)

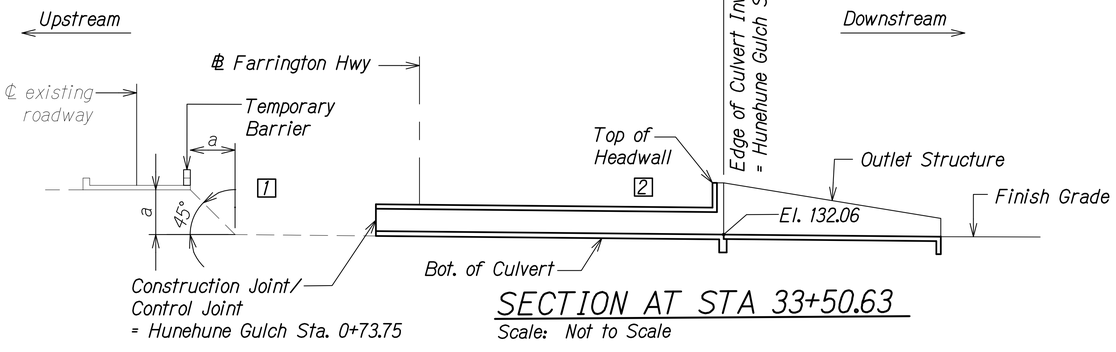
ADD. 483

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 493	



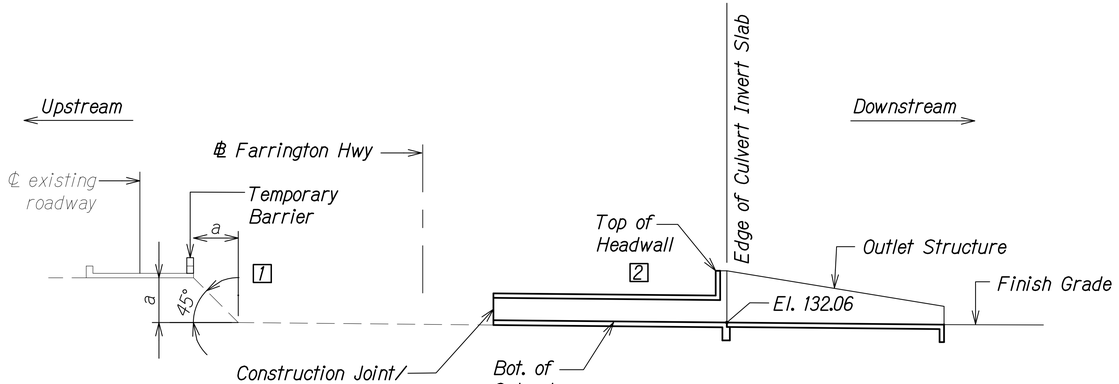
LAYOUT PLAN

Scale: Not to Scale



SECTION AT STA 33+50.63

Scale: Not to Scale



SECTION AT STA 33+71.92

Scale: Not to Scale

CONSTRUCTION STAGE 1

1 Excavate and cut grade for construction of downstream end of culvert.

Install Temporary Barrier along existing roadway. For layout and extent of temporary barrier along existing roadway, see Traffic Control Plan - Phase 1, Sheet TC-26 (2) (5)

(2) 2

Notes:

The Contractor shall submit working drawings for the limits of excavation and demolition to the Engineer for approval. The working drawings shall show all proposed bracing and shoring as needed to protect the existing roadway and detour road. Demolition and excavation shall be coordinated with any temporary shoring, detour road, and construction of the new culvert.

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

DRAWING NAME: Z:\OD ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHWA-SC0218-HUNE CONSTR SEQ ADD1 ADD5.DWG PLOT TIME: 07-15-22, 5:42 PM)

DATE		REVISION
07/15/22	(5)	Revised Note
06/08/22	(2)	Revised Note

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Hunehune Gulch Box Culvert Construction Sequence

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

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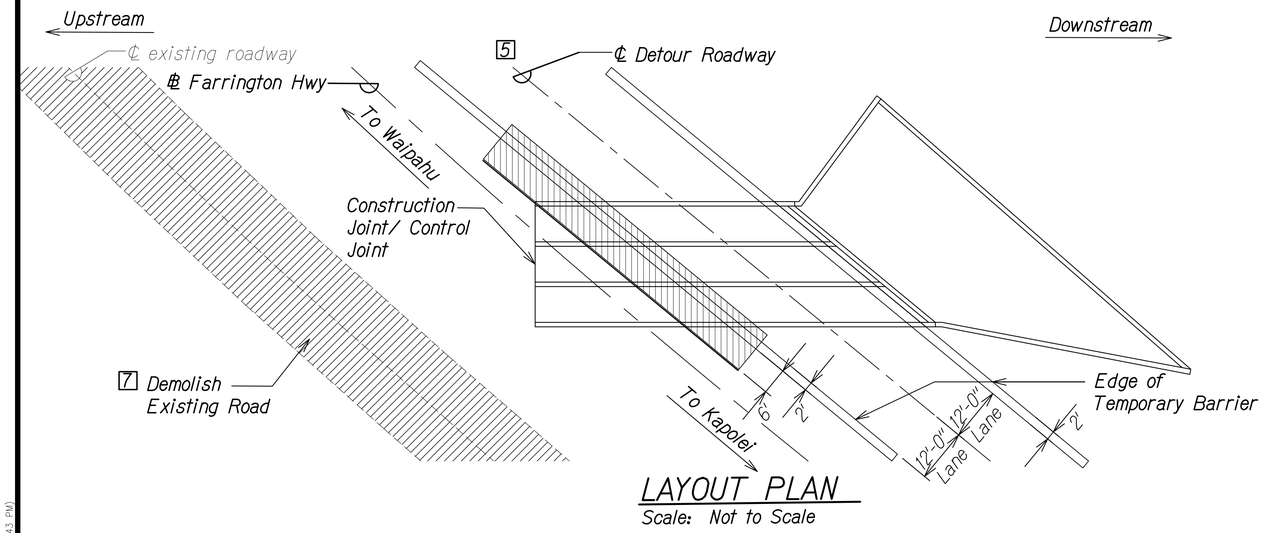
SIGNATURE

April 30, 2024
EXPIRATION DATE OF THE LICENSE

SHEET No. SC2.18 OF 23 SHEETS

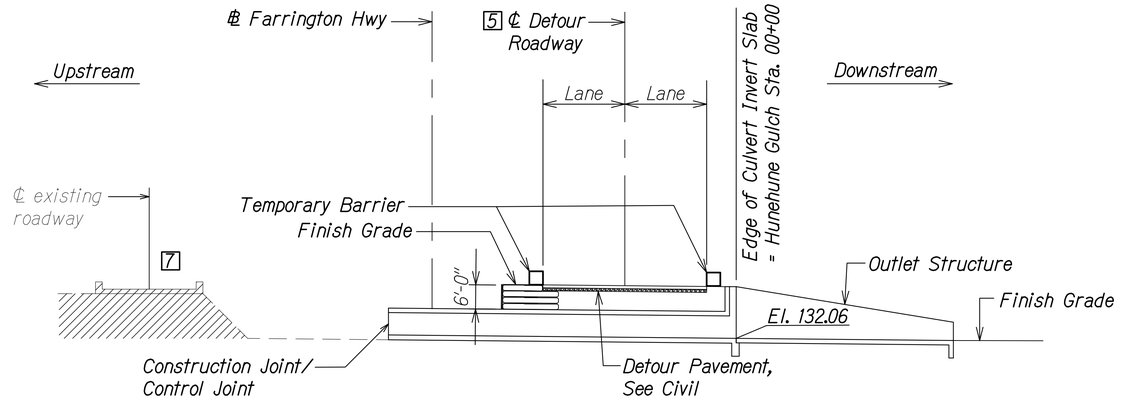
ADD. 493

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 495	



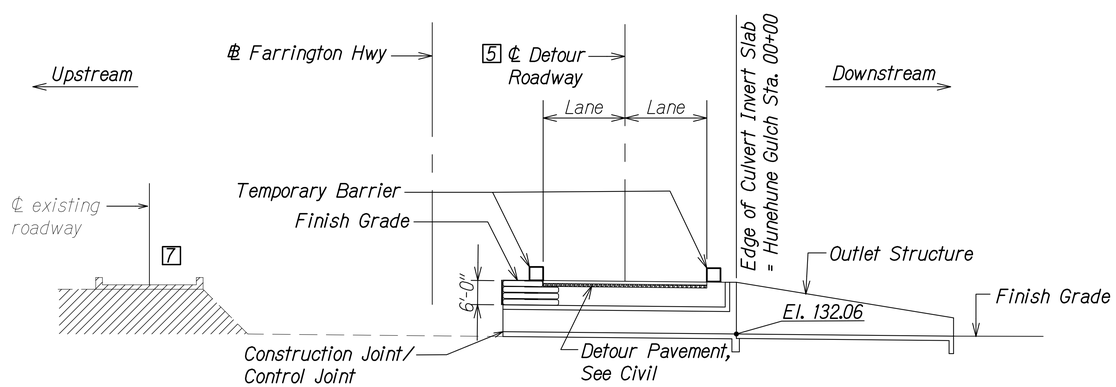
LAYOUT PLAN

Scale: Not to Scale



SECTION AT STA 33+50.63

Scale: Not to Scale



SECTION AT STA 33+71.92

Scale: Not to Scale

CONSTRUCTION STAGE 3

5 Construct detour roadway. See Traffic Control Plan - Phase 2, Sheet TC-30, 2, 5

Install Temporary Barrier along detour roadway. For extent and location of temporary barriers along detour roadway, see Traffic Control Plan - Phase 2, Sheet TC-30, 2, 5

6 Open traffic to detour roadway.

7 Demolish existing roadway structure.

Notes:

The Contractor shall submit working drawings for the limits of excavation and demolition to the Engineer for approval. The working drawings shall show all proposed bracing and shoring as needed to protect the existing roadway and detour road. Demolition and excavation shall be coordinated with any temporary shoring, detour road, and construction of the new culvert.

DATE	REVISION
07/15/22	5 Revised Note
06/08/22	2 Revised Note

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Hunehune Gulch Box Culvert Construction Sequence

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

RUSS S. MIYAHARA
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NO. 9444-S
HAWAII, U.S.A.

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SIGNATURE

April 30, 2024
EXPIRATION DATE OF THE LICENSE

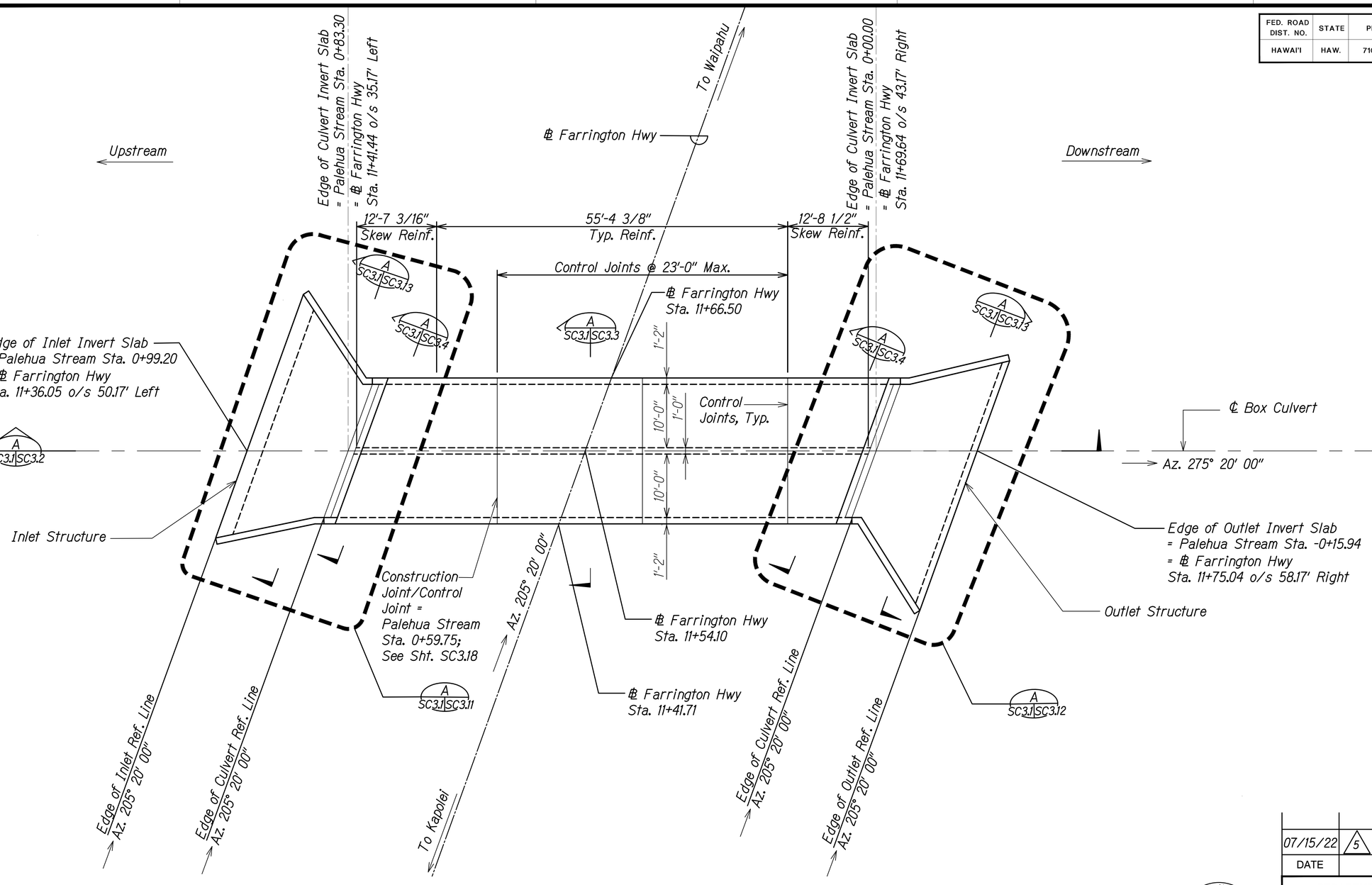
SHEET No. SC2.20 OF 23 SHEETS

ADD. 495

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

DRAWING NAME: Z:\GO ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHWA-SC0218-HUNE CONSTR SEQ ADD1 ADD5.DWG PLOT TIME: 07-15-22, 5:43 PM)

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 499	



LAYOUT PLAN (A SC3.1|SC3.1) 5
Scale: 1/8" = 1'-0"

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

DRAWING NAME: Z:\00 ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTAS\FHWA-SC0301-PALE BOX CULV LAYOUT ADD5.DWG PLOT TIME: 07-15-22, 5:50 PM)

07/15/22	5	Revised Title/Scale
DATE	REVISION	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Palehua Stream Box Culvert Layout Plan

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

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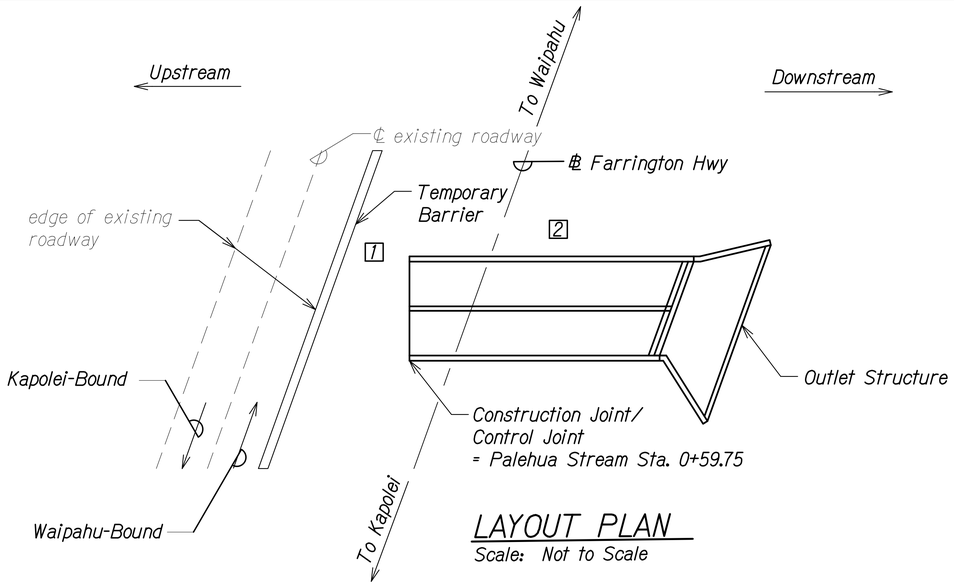
SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

SHEET No. SC3.1 OF 21 SHEETS

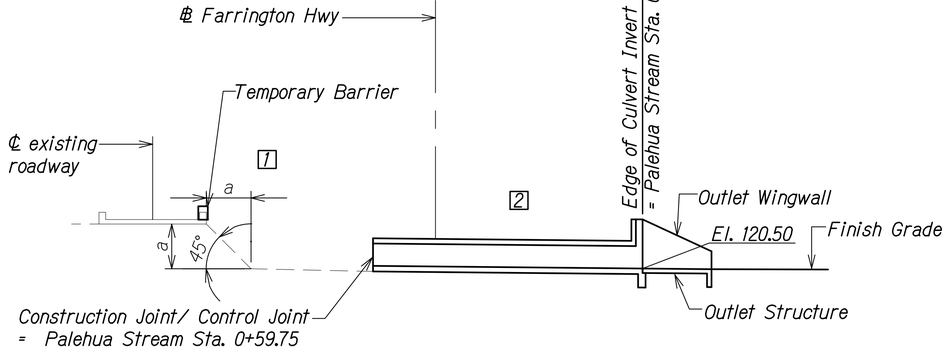
ADD. 499

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 516	



LAYOUT PLAN

Scale: Not to Scale



SECTION AT ℄ BOX CULVERT

Scale: Not to Scale

CONSTRUCTION STAGE 1

1 Excavate and cut grade for construction of downstream end of culvert. Temporarily shore existing roadway, as required.

For extent and location of temporary barrier along existing roadway, see Traffic Control Plan - Phase 1, Sheet TC-25.2 5

2 Construct downstream end of culvert and outlet structure.

Notes:

The Contractor shall submit working drawings for the limits of excavation and demolition to the Engineer for approval. The working drawings shall show all proposed bracing and shoring as needed to protect the existing roadway and detour road. Demolition and excavation shall be coordinated with any temporary shoring, detour road, and construction of the new culvert.

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

DRAWING NAME: Z:\OD ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHWA-SC0318-PALE CONSTR SEQ ADD1 ADD5.DWG PLOT TIME: 07-15-22, 5:51 PM)

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

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SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 Revised Note
06/08/22	2 Revised Note

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Palehua Stream Box Culvert Construction Sequence

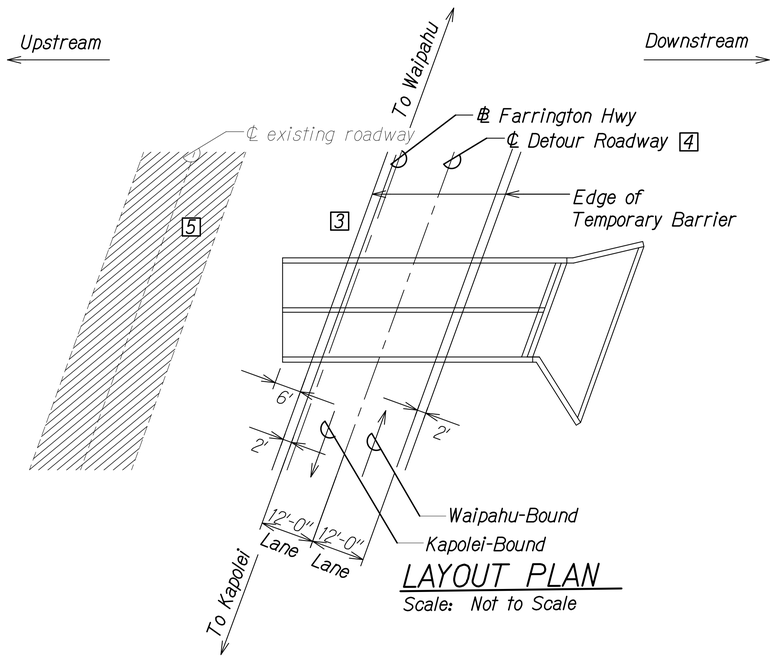
FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

SHEET No. SC3.18 OF 21 SHEETS

ADD. 516

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 517	



LAYOUT PLAN

Scale: Not to Scale

CONSTRUCTION STAGE 2

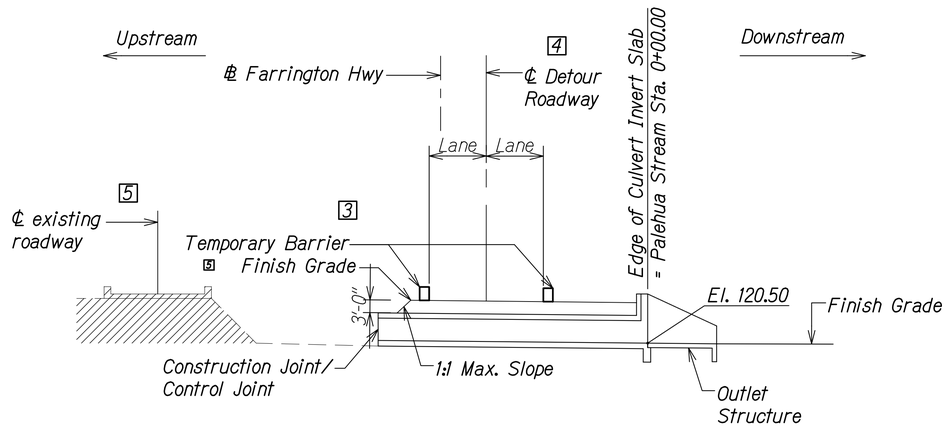
3 Backfill constructed portion of culvert to finish grade up to construction joint.

4 Construct roadway detour. See Traffic Control Plan - Phase 2, Sheet TC-29. For extent and location of temporary barriers along detour roadway, see Traffic Control Plan - Phase 2, Sheet TC-29. Open roadway to detour.

5 Demolish existing roadway structure.

Notes:

The Contractor shall submit working drawings for the limits of excavation and demolition to the Engineer for approval. The working drawings shall show all proposed bracing and shoring as needed to protect the existing roadway and detour road. Demolition and excavation shall be coordinated with any temporary shoring, detour road, and construction of the new culvert.



SECTION AT ℄ BOX CULVERT

Scale: Not to Scale

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

DRAWING NAME: Z:\OO ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTAS\FHWA-SC0318-PALE CONSTR SEQ ADD1 ADD5.DWG PLOT TIME: 07-15-22, 5:51 PM)

07/15/22	5	Revised Note
06/08/22	2	Revised Note
DATE		REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Palehua Stream Box Culvert Construction Sequence

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

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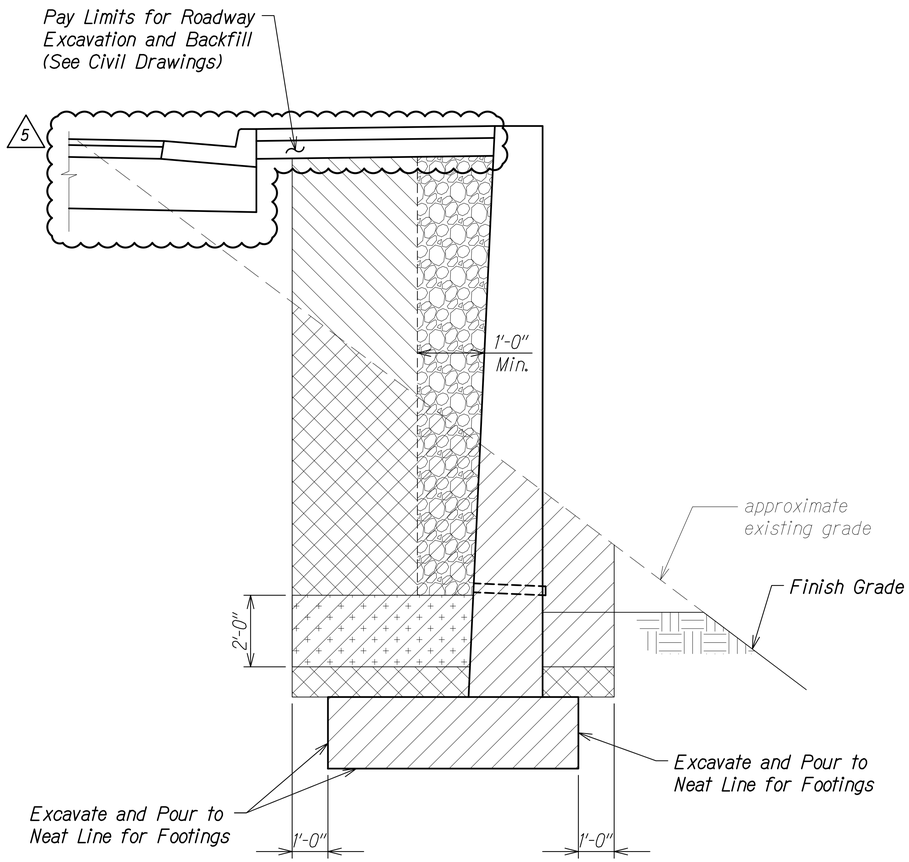
SIGNATURE — April 30, 2024 — EXPIRATION DATE OF THE LICENSE

SHEET No. SC3.19 OF 21 SHEETS

ADD. 517

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 530	



RETAINING WALL AT KAHI MOHALA

STRUCTURE EXCAVATION AND BACKFILL PAY LIMITS SECTION

A
SD2.1 | SD2.1

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

Legend:

- Structure Excavation
- Structure Backfill
- Filter Material Wrapped in Filter Fabric
- Impervious Material

5

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

DRAWING NAME: Z:\OD ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTAS\FHWA-SD0201 EXC&BACKFILL.DWG PLOT TIME: 07-15-22, 5:52 PM)

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RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

DATE		REVISION
07/15/22	5	Revised Section and Legend

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Retaining Wall Pay Limit

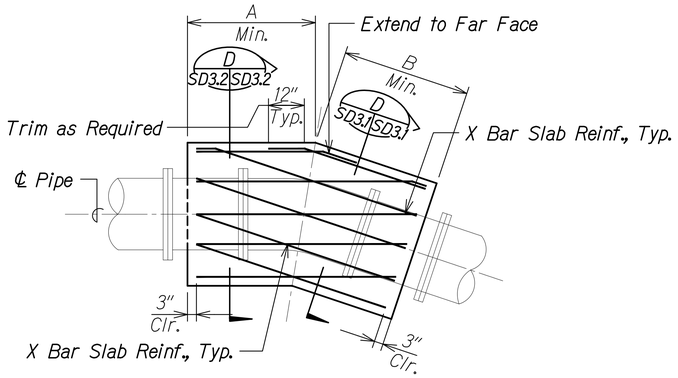
FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

SHEET No. SD2.1 OF 6 SHEETS

ADD. 530

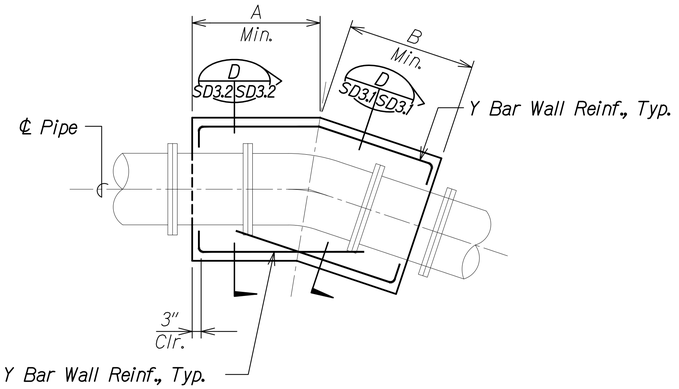
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 537	



TOP AND BOTTOM SLAB REINF.

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

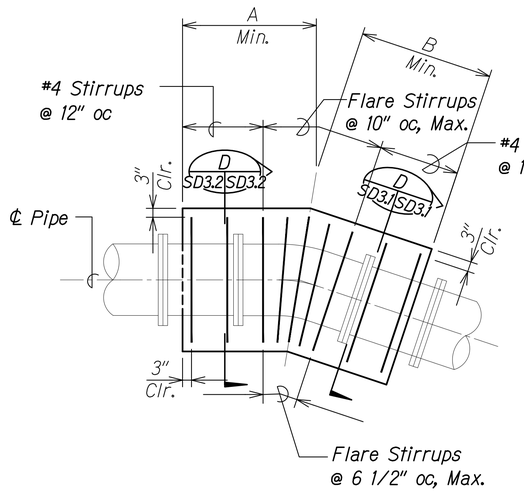
A SD3.2 SD3.2



WALL REINFORCING

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

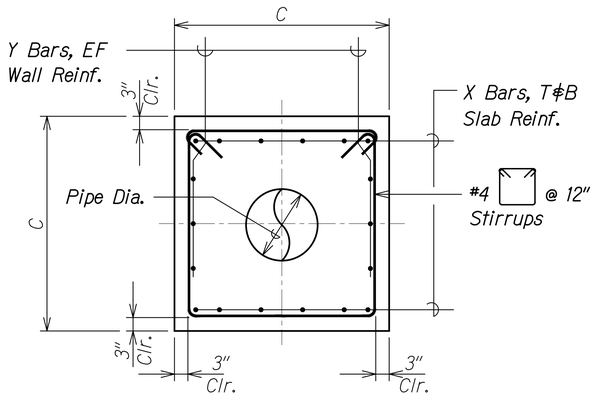
B SD3.2 SD3.2



STIRRUP REINFORCING

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

C SD3.2 SD3.2



TYPICAL HORIZONTAL PIPE JACKET SECTION

Scale: 3/4" = 1'-0"

D SD3.2 SD3.2

SCHEDULE

PIPE DIAMETER	DIMENSIONS			REINFORCING		REMARKS
	A	B	C	X BAR	Y BAR	
16"	3'-0"	3'-0"	3'-2"	#6 @ 12"	#6 @ 12"	
20"	4'-3"	4'-3"	3'-6"	#6 @ 12"	#6 @ 10"	
30"	7'-5"	7'-5"	4'-6"	#6 @ 12"	#6 @ 6"	
36"	9'-8"	9'-8"	5'-0"	#7 @ 12"	#7 @ 6"	
42"	11'-11"	11'-11"	5'-6"	#7 @ 12"	#7 @ 4"	

Notes:

1. Concrete shall develop a minimum 28-Day compressive strength of 4,000 psi, unless shown otherwise. (2)
2. See Sheet S0.7 for reinforcement notes.
3. Pipe test presssure = 200 psi
4. Any soft soil encountered during excavation shall be removed to firm soil and replaced with compacted fill.
5. Concrete jackets shall attain full design strength prior to any pressure testing on pipes.
6. 1/4 maximum horizontal bends.
7. Allowable lateral bearing pressure = 3.0 ksf. (2)
8. Location of face of jacket shall be flush with the bell for slip joints and set back from the joint for mechanical joints in accordance with the City and County of Honolulu Board of Water Supply's "Water System Standards, 2002". (5)

(2)

APPROVED:

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

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

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SIGNATURE — EXPIRATION DATE OF THE LICENSE: April 30, 2024

DATE	REVISION
07/15/22	(5) Revised notes
06/08/22	(2) Revised notes and signature block

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Horizontal Bend Pipe Jackets

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown — Date: Apr. 2022

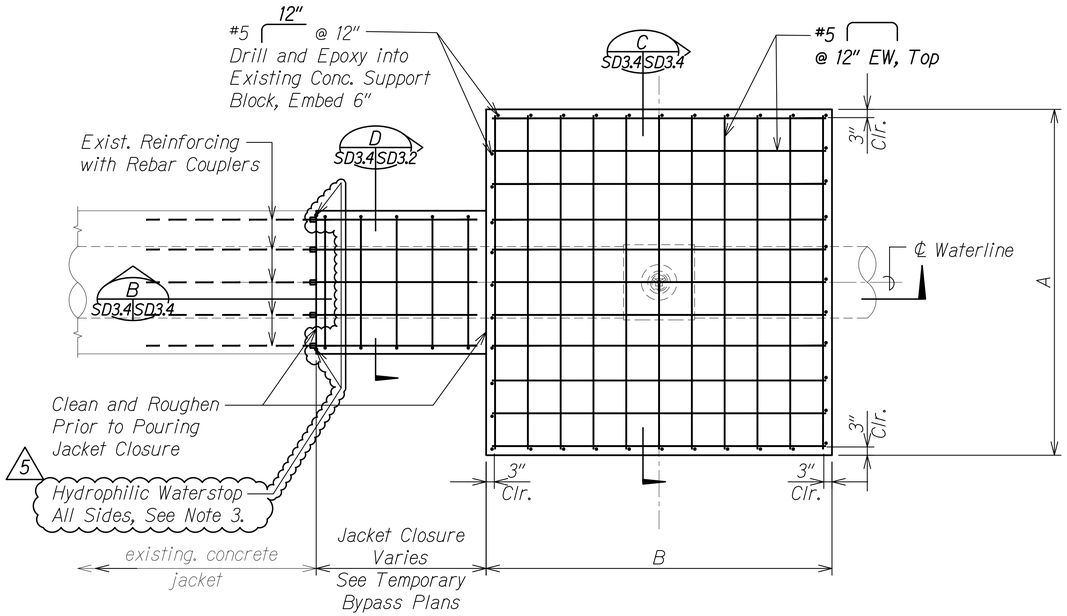
SHEET No. SD3.2 OF 4 SHEETS

ADD. 537

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

DRAWING NAME: Z:\00 ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTAS\FHWA-SD0302 HORIZ JACKETS DET - ADD 1 DELTA 5.DWG PLOT TIME: 07-15-22, 6:00 PM)

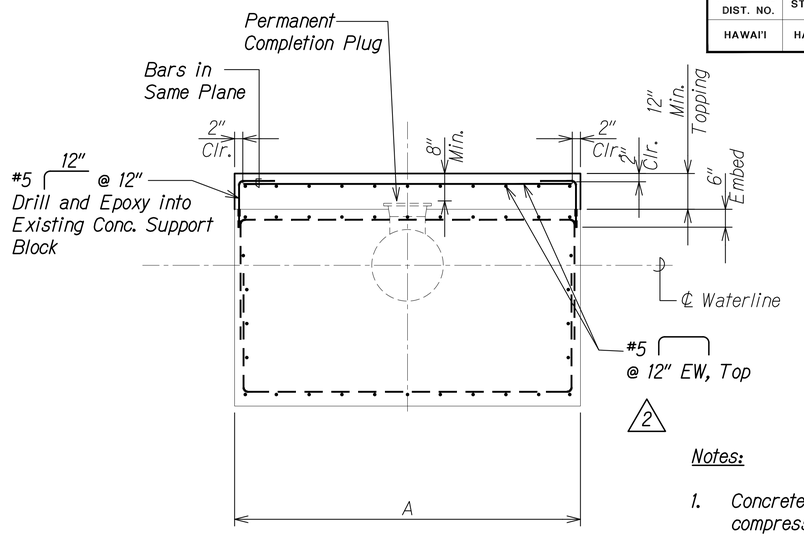
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 539	



CONCRETE SUPPORT BLOCK TOPPING - PLAN

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

A SD3.4 SD3.4



CONCRETE SUPPORT BLOCK TOPPING - SECTION

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

C SD3.4 SD3.4

Notes:

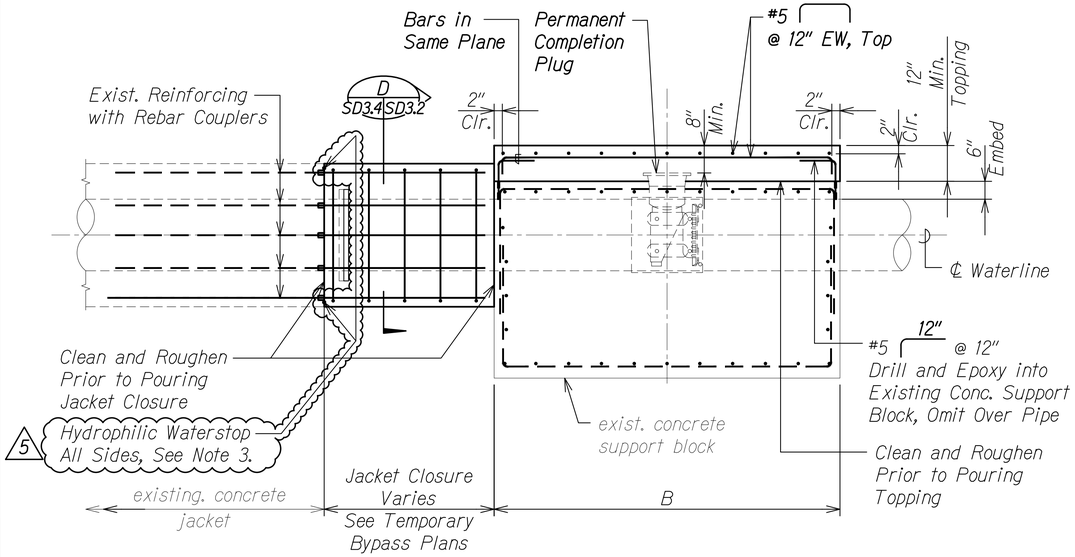
1. Concrete shall develop a minimum 28-Day compressive strength of 4,000 psi, unless shown otherwise.
2. See Sheet S0.7 for reinforcement notes.
3. Watestop shall be placed as directed by manufacturer to ensure concrete is not Damaged when waterstop contacts water. Cost of waterstop shall be incidental to jacket concrete.

5

2

APPROVED:

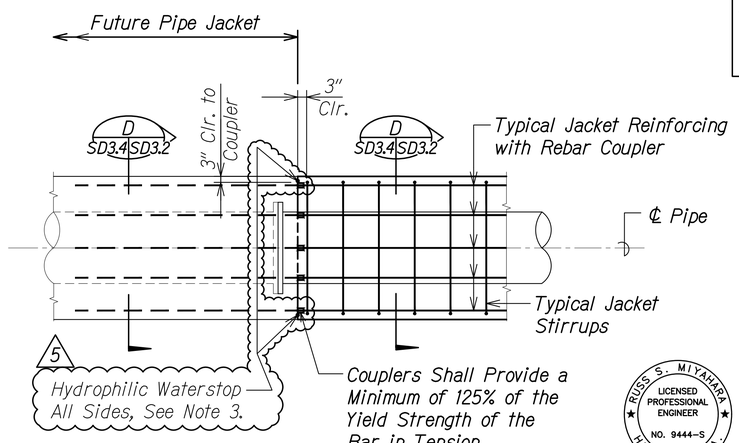
Manager and Chief Engineer, BWS (for work affecting BWS facilities in City/State R/W & BWS easements only) DATE



CONCRETE SUPPORT BLOCK TOPPING - SECTION

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

B SD3.3 SD3.4



JACKET SPLICE DETAIL

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

1 SD3.4 SD3.4

DATE		REVISION
07/15/22	5	Added waterstop
06/08/22	2	Added notes and revised signature block

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Concrete Support Block Topping Plan and Sections

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

SHEET No. SD3.4 OF 4 SHEETS

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

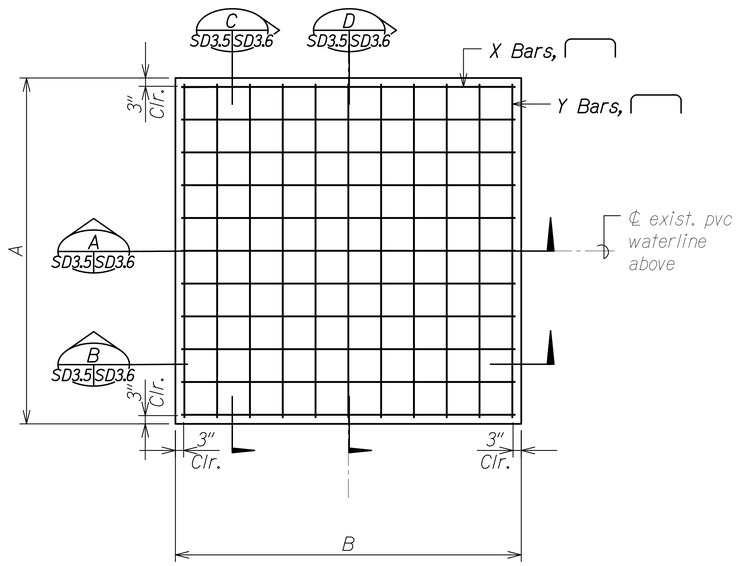
April 30, 2024
EXPIRATION DATE OF THE LICENSE

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

DRAWING NAME: Z:\00 ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTAS\FHWA-SD0303 JACKETS DET - ADD1 DELTAS.DWG PLOT TIME: 07-15-22, 6:20 PM)

ADD. 539

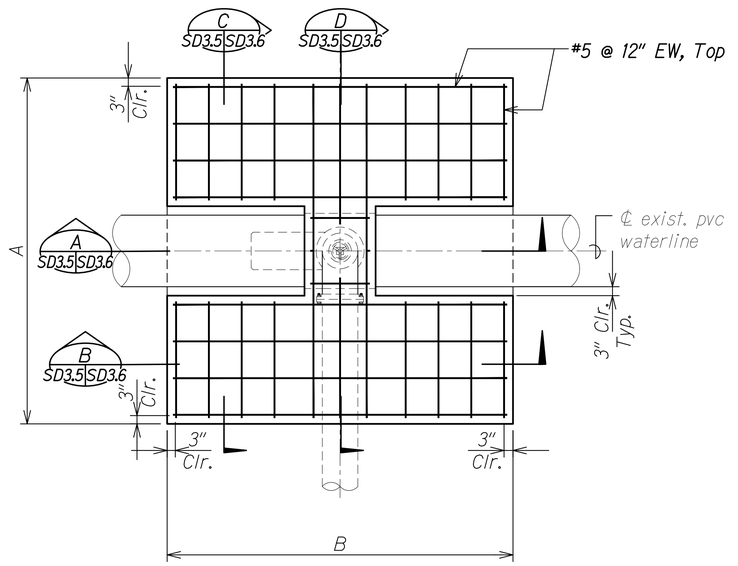
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 539 S-1	



LINE STOP CONCRETE SUPPORT BLOCK- PLAN

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

A SD3.6 SD3.5



LINE STOP CONCRETE SUPPORT BLOCK- PLAN

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

B SD3.6 SD3.5

Notes:

1. *Concrete shall develop a minimum 28-Day compressive strength of 4,000 psi, unless shown otherwise.*
2. *See Sheet S0.7 for reinforcement notes.*
3. *See Sheet SD3.3 for dimensions A, B, and C, and reinforcing X Bar and Y Bar.*

APPROVED:

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

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

DRAWING NAME: Z:\DO ONGOING\20-154-FARR HWY KAPOLEI GC TO FT WVR-RMTC\07-ADD\07-1-22 ADD\DELTA5\FHWA-SD0303 TICKETS DELTA5.DWG PLOT TIME: 07-15-22, 6:21 PM

07/15/22	5	Added sheet
		REVISION

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Concrete Support Block Plans at PVC Pipe

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

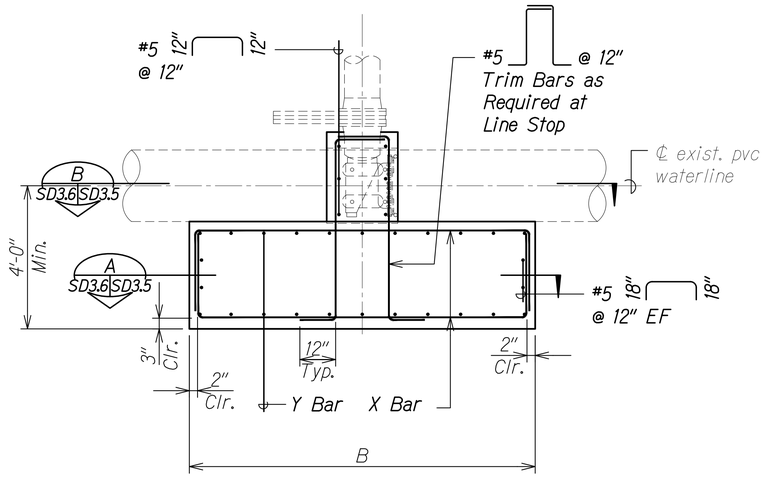
Scale: As Shown — Date: Apr. 2022

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

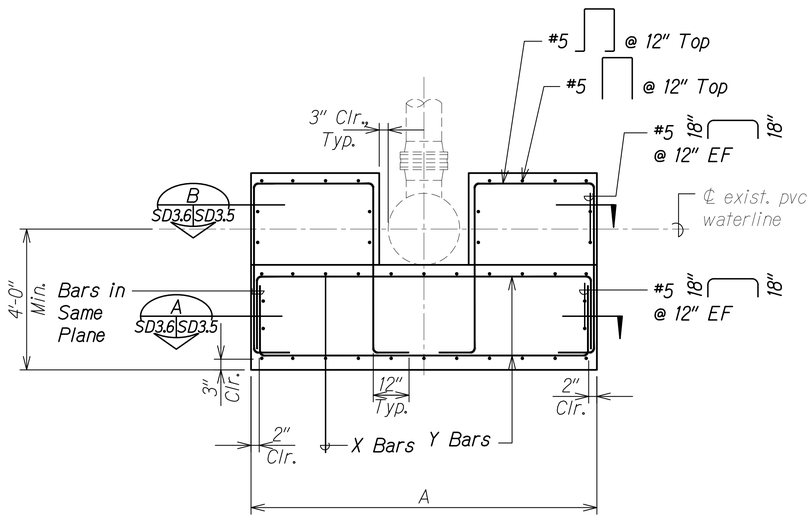
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 539 S-2	



LINE STOP CONCRETE SUPPORT BLOCK- SECTION A

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

SD3.5 | SD3.6



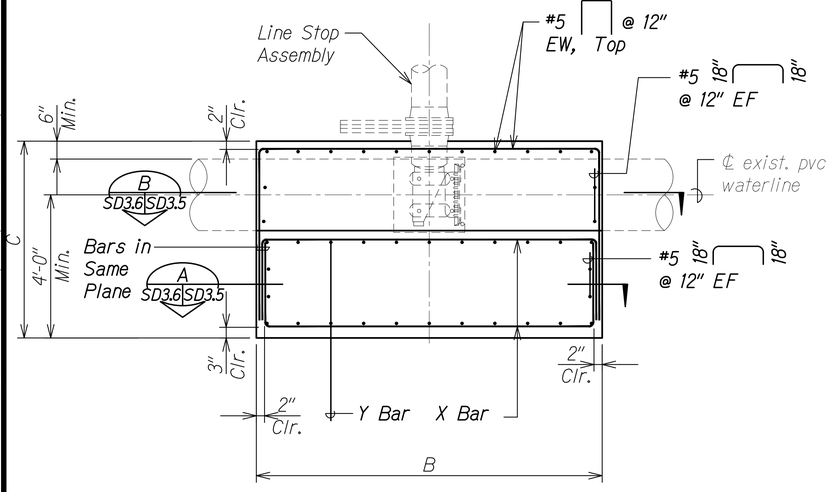
LINE STOP CONCRETE SUPPORT BLOCK- SECTION C

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

SD3.5 | SD3.6

Notes:

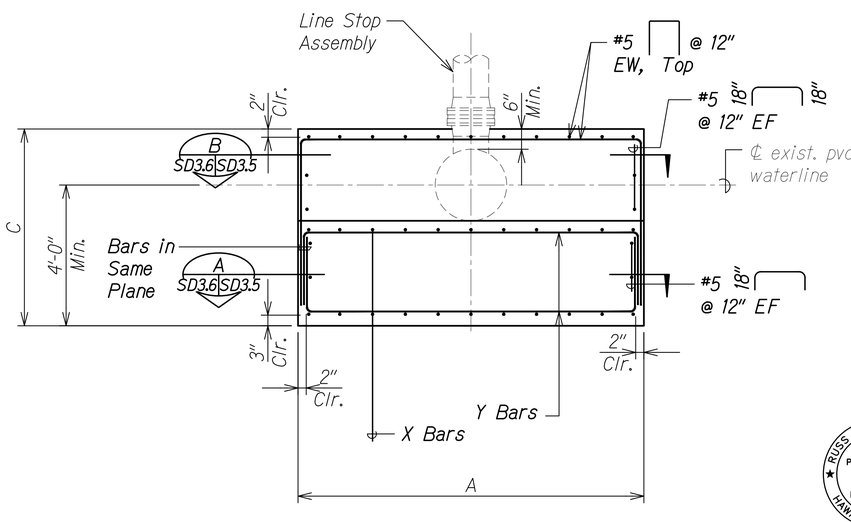
1. *Concrete shall develop a minimum 28-Day compressive strength of 4,000 psi, unless shown otherwise.*
2. *See Sheet S0.7 for reinforcement notes.*
3. *See Sheet SD3.3 for dimensions A, B, and C, and reinforcing X Bar and Y Bar.*



LINE STOP CONCRETE SUPPORT BLOCK- SECTION B

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

SD3.5 | SD3.6



LINE STOP CONCRETE SUPPORT BLOCK- SECTION D

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

SD3.5 | SD3.6

APPROVED:

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

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

DRAWING NAME: C:\DOT\ONGOING\20-047 FARR HWY KAPOLEI TO FT WVR-RMTO\CAD\07-22 ADD\DELTAS\FINAL-SD0303 BACKETS DGN - ADD1 TMA5.DWG
PLOT TIME: 07-15-22, 6:21 PM

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

07/15/22	5	Added sheet
DATE		REVISION

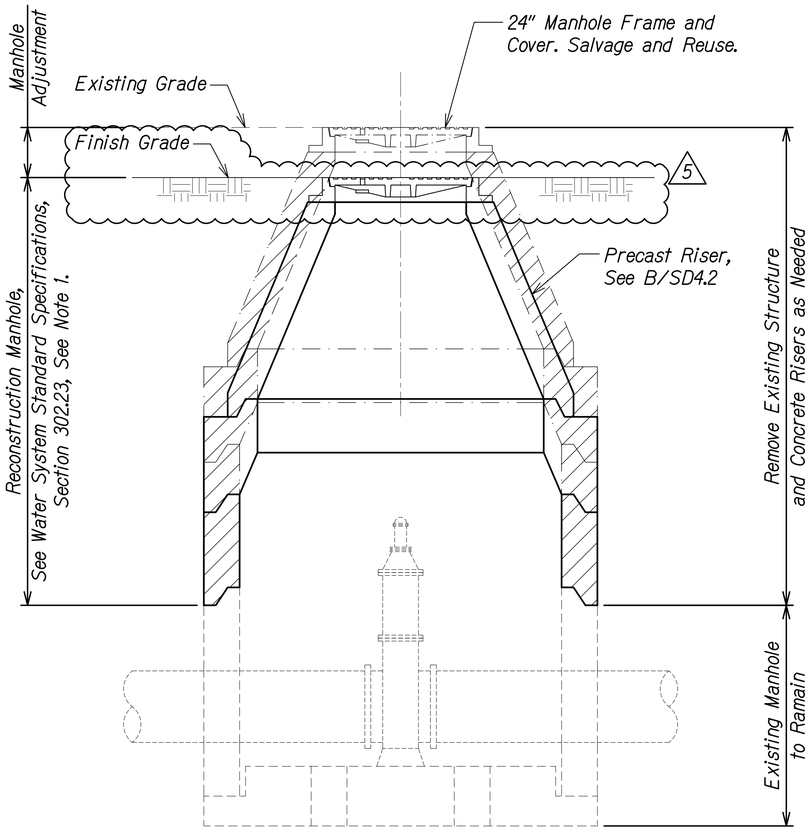
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Concrete Support Block Sections at PVC Pipe

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

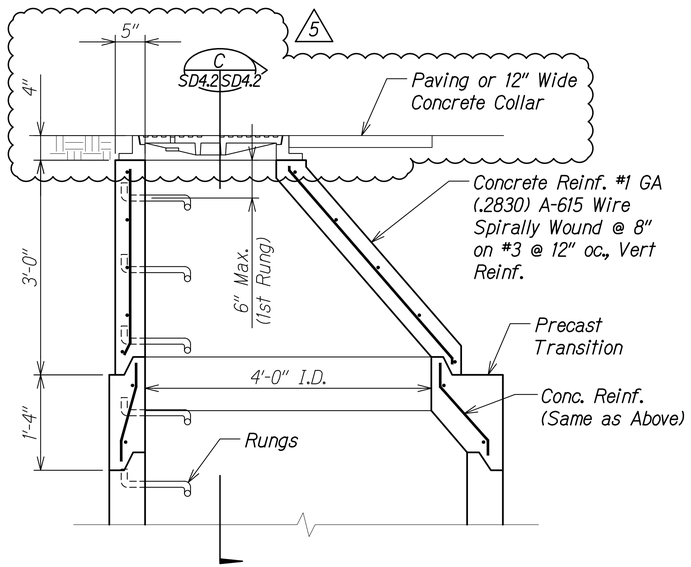
Scale: As Shown — Date: Apr. 2022

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 541	



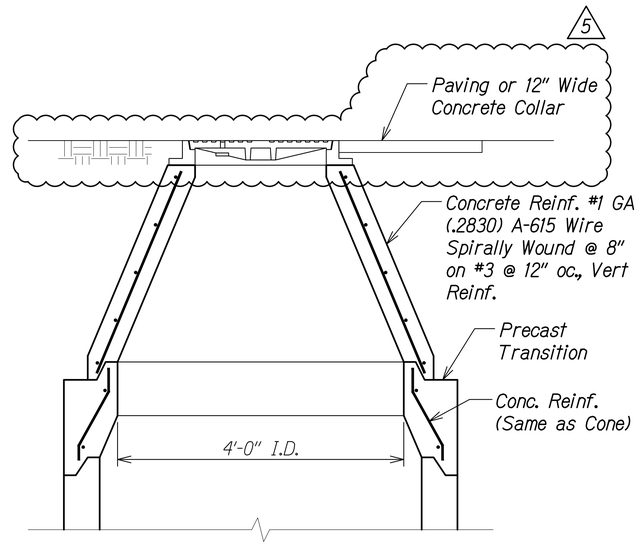
EXISTING TYPE "B" PRECAST MANHOLE LOWERING (A SD4.2 | SD4.2)

Scale: 1" = 1'-0"



TYPE "B" MANHOLE (B SD4.2 | SD4.2)

Scale: 1" = 1'-0"



SECTION (C SD4.2 | SD4.2)

Scale: 1" = 1'-0"

Notes:

1. Contractor shall submit shop drawings for Type "B" manhole to BWS for approval.
2. Existing waterlines, valves and appurtenances shall be protected at all times during construction.

DATE	REVISION
07/15/22	5 Revised finish grade
06/08/22	2 Revised signature block

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Type "B" Manhole Adjustment Section

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

SHEET No. SD4.2 OF 2 SHEETS

2

APPROVED:

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

RUSS S. MIYAHARA
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

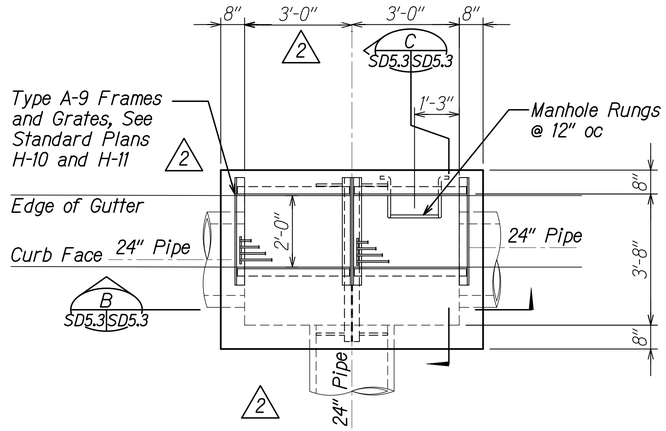
SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

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

DRAWING NAME: Z:\00 ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHWA-SD0402-TYPE B MH ADJ-ADD1 DELTA5.DWG PLOT TIME: 07-15-22, 6:22 PM)

ADD. 541

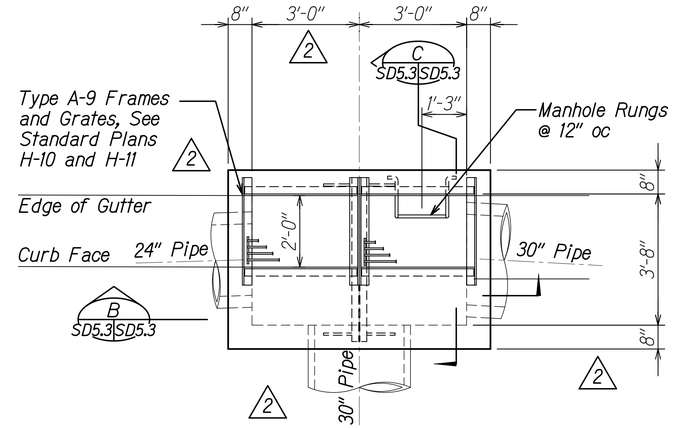
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	7101A-01-20	2021	ADD. 544	



PLAN - SPECIAL GRATED DROP INLET (GDI B2)

A SD5.3 SD5.3

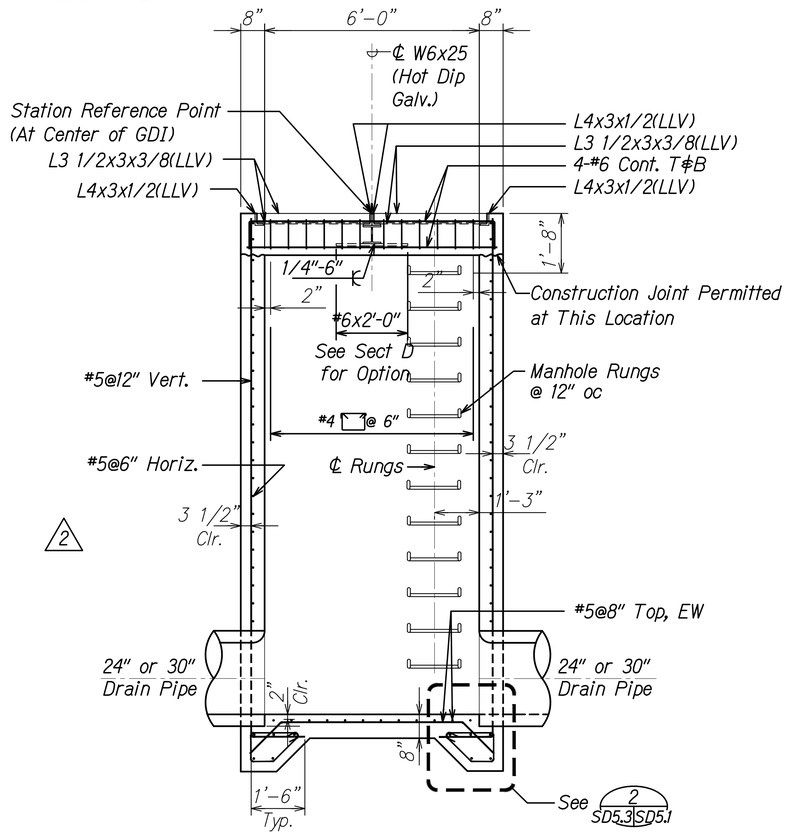
Scale: 1/2" = 1'-0"



PLAN - SPECIAL GRATED DROP INLET (GDI D2)

B SD5.3 SD5.3

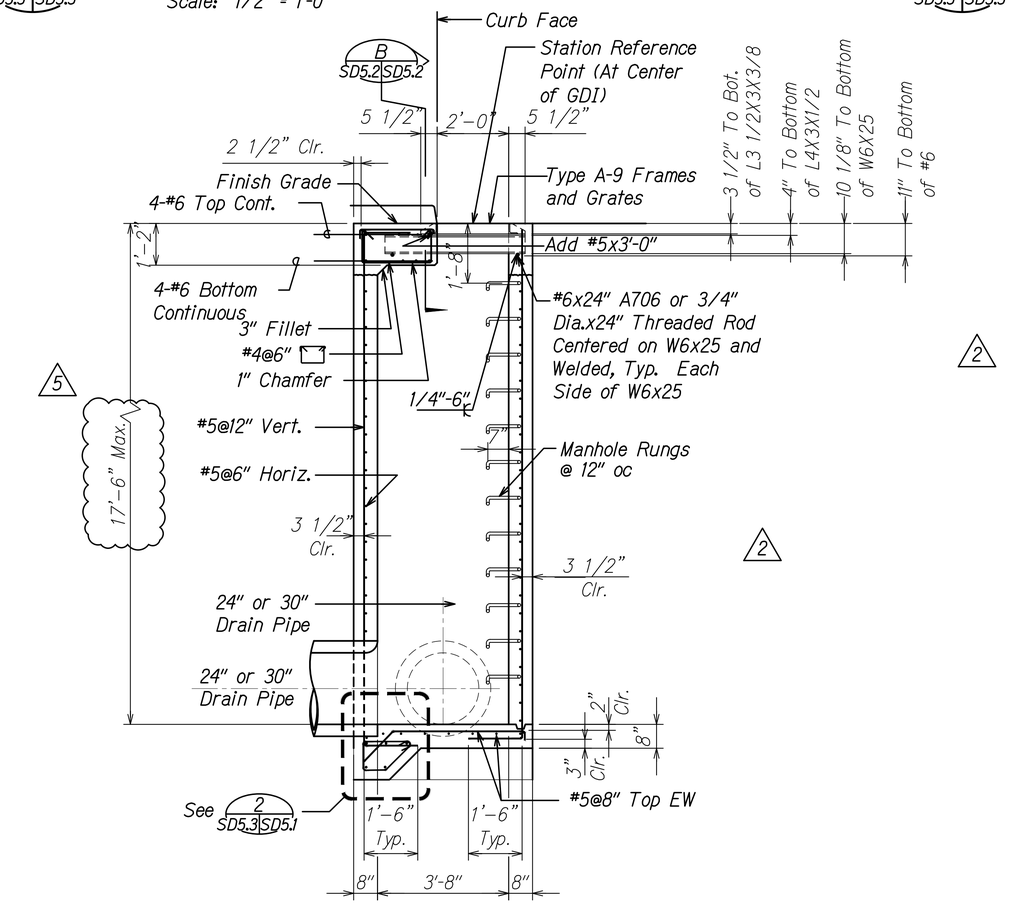
Scale: 1/2" = 1'-0"



SECTION - SPECIAL GRATED DROP INLET

C SD5.3 SD5.3

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



SECTION - SPECIAL GRATED DROP INLET

D SD5.3 SD5.3

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

DATE	REVISION
07/15/22	5 Revised GDI Maximum height
06/08/22	2 Revised pipe and curb face location

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Special Grated Drop Inlet B2 and D2

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: Apr. 2022

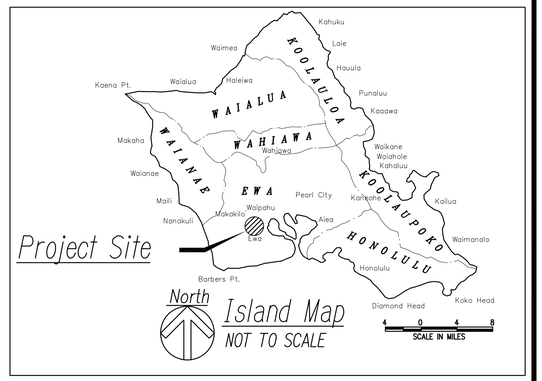
SHEET No. SD5.3 OF 3 SHEETS

ADD. 544

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

DRAWING NAME: Z:\OD ONGOING\20-013-FARR HWY KAPOLEI GC TO FT WVR-RMTC\01 CAD\07-15-22 ADD1 DELTA5\FHW3-SD0503-GDI - ADD 1 DELTA 5.DWG PLOT TIME: 07-15-22, 5:57 PM)

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	EA-1	790



General Notes:

1. *Provide 5' Minimum Clear Between Street Light Poles & Sewer Laterals.*
2. *Provide 3' Minimum Clear Between Pullboxes & Sewer Laterals.*
3. *Provide 6' Minimum Clear Between Transformer Pads & Sewer Laterals (Do Not Straddle).*
4. *Provide 3' Minimum Clear Between Ductlines & Sewer Lines.*
5. *Contractor Shall Verify Sewer Lateral Locations with Civil Sheets.*
6. *Provide 3' Minimum Horizontal Clear & 6" Vertical Clear Between Water Lines & All Electrical Systems. Provide Minimum 12" Vertical Clear Between BWS Water Lines & All Electrical Systems.*
7. *The Electrical Contractor and any other subcontractor shall be responsible to arrange with the General Contractor to identify the locations of civil site utilities, driveways, etc. prior to electrical contractors layout of electric, telephone, street light, traffic signal, and CATV systems.*
8. *The Contractor Shall Maintain a Minimum Vertical Clearance of 16'-6" From the Ground to Existing Electrical Lines.*

Notes for Construction:

A. *The Location of Overhead and Underground Facilities Shown on the Plans are From Existing Records With Varying Degrees of Accuracy and are Not Guaranteed As Shown. the Contractor Shall Exercise Extreme Caution Whenever Construction Crosses Or is In Proximity of Underground Lines and Shall Maintain Adequate Clearance When Operating Equipment Under Any Overhead Lines.*

B. *The Contractor is to Comply With the Directions of the State of Hawaii Occupational Safety and Health Law (HIOSH).*

C. *When Trench Excavation is Adjacent to Existing Structures Or Facilities, the Contractor is Responsible For Properly Sheeting and Bracing the Excavation and Stabilizing the Existing Ground to Render it Safe and Secure From Possible Slides, Cave-ins and Settlement, and For Properly Supporting Existing Structures and Facilities With Beams, Struts Or Underpinning to Fully Protect it From Damage.*

D. *As Required by Section 645, the Contractor Shall Provide Two Off-duty Police Officers to Control the Flow of Traffic at Each Location.*

E. *Where Pedestrian Walkways Exist, Such Walkways Shall Be Maintained In Passable Condition Or Other Facilities For Pedestrians Shall Be Provided. Passage Between Walkways At Intersections Shall Likewise Be Provided, All Shall Be ADA Compliant.*

F. *Driveways Shall Be Kept Open Unless the Owners of the Property Using These Right-of-ways are Otherwise Provided For Satisfactorily.*

G. *The Underground Pipes, Cables Or Ductlines Known by the Engineer to Exist From His Search of Records are Indicated on the Plans. the Contractor Shall Verify the Location and Depth of the Facilities and Exercise Proper Care In Excavating the Area. Wherever Connections of New Utilities to Existing Utilities are Shown on the Plans, the Contractor Shall Expose the Existing Lines At the Proposed Connections to Verify Their Locations and Depths Prior to Excavation For the New Lines.*

City & County of Honolulu - Department of Transportation Services Traffic Signals And Technology Notes:

1. *The Contractor Shall Notify The Traffic Signals And Technology Division, Department Of Transportation Services, Three (3) Working Days Prior To Commencing Work On The Traffic Signal System (Phone: 768-8388).*
2. *The Traffic Signal System Shall Be Kept Operational During Construction. Any Relocation Required Shall Be Approved By The Traffic Signals And Technology Division, Department Of Transportation Services, And Paid For By The Contractor.*
3. *The Contractor Shall Be Responsible For Any Damages To The Existing Traffic Signal Facilities, Including But Not Limited To The Traffic Signal Fiber Optic Cable System, And Interconnect System. Any And All Damages To The Facilities Shall Be Repaired By The Contractor At Their Cost In Accordance With The Requirements Of The Traffic Signal And Technology Division, Department Of Transportation Services.*
4. *Coordinate All Speciality Work to be Performed by Traffic Signal System (TS) Contractor and Closed Circuit Television (ITS) Contractor. Work Included are New and Relocation of HECO Services, Including HECO Metering and Underground Feeders to Equipment.*

City & County of Honolulu - Department of Design & Construction Mechanical/Electrical Division Notes:

1. *The Contractor Shall Notify the Mechanical/Electrical Division, Department of Design and Construction Two (2) Weeks in Advance of Any Relocation of Utility Pole(s) that May Be Necessary. (1-808-768-8431).*
2. *The Contractor Shall Notify the Mechanical/Electrical Division, Department of Design and Construction, Three (3) Working Days Prior to Commencing Work on the Street Light System. (1-808-768-8431).*
3. *The Street Lighting System Shall Be Kept Operational During Construction. Any Relocation Required Shall Be Approved by the Mechanical/Electrical Division and Paid for by the Contractor.*
4. *The Locations of the Existing Underground Street Light Facilities Shown On the Plans are from Existing Plans and are Approximate Only. The Contractor Shall Exercise Caution when Construction Crosses or Is In Close Proximity to the Existing Street Light Facilities. The Contractor Shall Be Responsible for Any Damages to the Existing Street Light Facilities. Any and All Damages to these Facilities Shall Be Repaired by the Contractor at His Cost in Accordance with the Requirements of the City and County of Honolulu.*
5. *The Contractor Shall Be Responsible for Any Damages to the City's Existing Communications Fiber Optic Cable System. Any and All Damages to these Facilities Shall be Repaired by the Contractor at His Cost in Accordance with the Requirements of the City and County of Honolulu.*
6. *Salvage and Deliver Existing Standards for steel poles, Luminaries & Control Nodes, Mass Arms from Wood Poles (HECO Joint Wood Poles) to Department of Facility Maintenance Pearl City Corp Yard at Pearl City (952 Third Street) as Directed by the Street Light Inspector. Contractor is to Contact 1-808-768-5300 a Minimum of Two Days Prior to Delivery of Salvage Items. Contractor is to Meet with Department of Facility Maintenance Personnel at Pearl City Corp Baseyard on the Day of Delivery to show where to Unload the Items (i.e. Steel Poles).* 5

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

FILE: Z:\ACAD\PROJECTS\220067HA\EA01_220067HI_GENERAL_NOTES.DWG saved July 13, 2022

APPROVED BY

PROGRAM ADMINISTRATOR, MECHANICAL/ELECTRICAL DIVISION DATE
DEPT. OF DESIGN AND CONSTRUCTION
CITY & COUNTY OF HONOLULU

CHIEF, TRANSPORTATION TECHNOLOGY DIVISION DATE
DEPT. OF TRANSPORTATION SERVICES
CITY & COUNTY OF HONOLULU

DUSTIN Y. NAKAMOTO
LICENSED PROFESSIONAL ENGINEER
No. 14287-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 UPDATED NOTE
06/08/22	2 UPDATED NOTE, ADDED NOTE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GENERAL NOTES

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. EA-1 OF 12 SHEETS

ADD. 575

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	EA-2	790

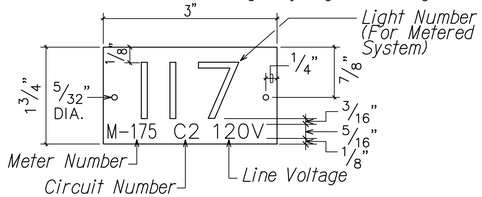
Electrical Symbols

Symbol	Description
	Exst. Street Light
1	Note Symbol, See Plan For Notes
	Breakline To Begin & End Duct Section Type
2-2E A	Electric/Signal Ductline With Designators; Indicates Type "A" Duct Section With "2-2E" Ducts. See Sheet EF-01 For Duct Sections And This Sheet For The Conduit Schedule
	Saw Cut Exst A.C. Pavement, Conc. Sidewalk, Curb & Gutter Prior To Trench Excavation. Restore Subbase, Basecourse, Pavement, Conc. Sidewalk, Curb & Gutter Per Hdot Requirements, Thickness Shall Match Exst Road Design See Civil Sheets For Restoration Details.
TS	Traffic Signal Ducts & Wiring
sl	Exst. Street Light Ducts & Wiring
ts	Exst. Traffic Signal Ducts & Wiring
	HECO 2' X 4' Handhole
	HECO 3' X 5' Handhole
	Exst. HECO 4' X 6' Manhole
	Exst. HECO 5' X 8' Manhole
	Exst. HECO 6' X 11' Manhole
	Exst. HECO 6' X 14' Manhole
	Exst. HECO 7' X 16' Manhole
	HECO 6' X 18' Manhole
	HTCO 2' X 4' Handhole
	Exst. HTCO 3' X 5' Handhole
	Exst. HTCO 5' X 10' Manhole
	Exst. CATV 2' X 6' Handhole
	Exst. CATV 3' X 5' Handhole
	CATV 4' X 6' Manhole
	Exst. SIC 4' X 6' Manhole
	Exst. AT&T 6' X 6' Manhole
	AT&T 4' X 4' Manhole

Symbol	Description
	Exst. HECO 3-PHASE PADMOUNT TRANSFORMER (1000-1500 KVA)
	See Detail B/EF-12
	Exst. HECO 3-PHASE PADMOUNT TRANSFORMER (500-750 KVA)
	See Detail A/EF-12
	Exst. HECO 3-PHASE PADMOUNT TRANSFORMER (75-300 KVA)
	HECO 1-PHASE PADMOUNT TRANSFORMER
	See Detail C/EF-12
	Exst. HECO SWITCHGEAR PAD
	HECO 1-PHASE OVERHEAD TRANSFORMER
	HECO 3-PHASE OVERHEAD TRANSFORMER BANK
e-oh	Exst. OVERHEAD HECO LINE
t-oh	Exst. OVERHEAD HTCO LINE
v-oh	Exst. OVERHEAD CATV LINE
g-oh	Exst. OVERHEAD SPAN GUY
sl-oh	Exst. OVERHEAD STREET LIGHT LINE
E-OH	OVERHEAD HECO LINE
T-OH	OVERHEAD HTCO LINE
V-OH	OVERHEAD CATV LINE
G-OH	OVERHEAD SPAN GUY
SL-OH	OVERHEAD STREET LIGHT LINE
e	Exst. UNDERGROUND HECO LINE
t	Exst. UNDERGROUND HTCO LINE
v	Exst. UNDERGROUND CATV LINE
at&t	Exst. UNDERGROUND AT&T LINE
	UTILITY POLE BY UTILITY COMPANY UNLESS OTHERWISE STATED
	ANCHOR & GUY WIRE BY UTILITY COMPANY UNLESS OTHERWISE STATED
M	Metering Equipment, See Sheet EG-15
	Metering Equipment, See Sheet EH-1
	Exst. Metering Equipment
S	Concrete Stub Out Marker, See Sheet EF-01
E	Elec Connection, WP

Symbol	Description
T	Traffic Signal Controller, See Detail A/EH07
C	CCTV Controller, See Detail A/EH07
B, 25'	Type ØIØI Traffic Signal Standard With Traffic Signal Heads Mounted On Mast Arm Standard; Pole "B" with 25' Mast Arm Indicated, Standard; Pole "B" With 25' Mast Arm Indicated, See Detail A/EH03
	Pedestrian Push Button, See Detail B/EH04
	Vehicle Loop Detector, See Sht EH06
A	Signal Standard, 10' Height, Unless Indicated Otherwise With Designator; Pole "A" Indicated, See Detail C/EH04
	12" RYG Traffic Signal Head, See Mounting Details A/EH04
	12" RYGA Traffic Signal Head (Straight Arrow), See Mounting Details A/EH04
	12" RYGA Traffic Signal Head (Left Turn Arrow Indicated), See Mounting Details A/EH04
	12" RYGA Programmed Visibility Traffic Signal Head (Left Turn Arrow Indicated), See Mounting Details A/EH04
	Pedestrian Signal Head, See Mounting Detail C/EH05
	Optical Pre-emption Detector, See Mounting Details A & B/EH05
C	CCTV Camera, See Mounting Detail B/EH08
	HECO Meter Pedestal, See Detail A/EH01
	Type "A" Metric State Highway Traffic Signal Pullbox
	Type "B" Metric State Highway Traffic Signal Pullbox
	Type "C" Metric State Highway Traffic Signal Pullbox
	Type "B" Metric State Highway Street Light Pullbox
	98W State Standard LED Street Light, Bracket Arm Length As Noted On Plan
	98W Reduced Height LED Street Light, Bracket Arm Length And Mounting Height As Noted On Plan
	120W State Standard LED Street Light, Bracket Arm Length As Noted On Plan
	120W Reduced Height LED Street Light, Bracket Arm Length And Mounting Height As Noted On Plan
	Exst. City Street Light (To Be Removed) 5

See Detail 3/EG-18 For State Highway Light I.D. Tag Indicator Legend.



STREET LIGHT I.D. TAG DETAIL
NOT TO SCALE (METERED SYSTEM)

Notes:

1. "X" Thru System Denotes Item to be Removed, Unless Otherwise Noted.
2. Dashed Symbol Indicates Existing Item, Unless Otherwise Noted.
3. Dashed and Screened Symbol Indicates Future Item, Unless Otherwise Noted.
4. "Top Of Wall" Indicates Pole Base Mounted On Top Of Retaining Wall.
   "In Cut Slope" Indicates Pole Base Located In Cut Slope Area.
   "In Fill Slope" Indicates Pole Base Located In Fill Slope Area.
   "Behind Guardrail" Indicates Pole Base Located Behind Guardrail.
   "Breakaway" Indicates Breakaway Transformer Base.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
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	QUANTITIES BY	
	CHECKED BY	

DATE	REVISION
07/15/22	5 UPDATED LEGEND
06/08/22	2 UPDATED LEGEND

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL SYMBOLS

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

ADD. 576

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	EA-6	790

HECo Underground Fuel Oil Pipeline Notes:
Rev. 3/26/18

1. Excavation Near HECo Fuel Oil Pipelines
The Contractor Shall Exercise Extreme Caution Whenever Construction Crosses or is in Close Proximity to HECo's Underground Fuel Oil Pipelines. If Any Excavation Work Will Be Performed Within 10-Feet of the Fuel Pipelines, the Contractor Shall Notify HECo's Fuels Department at least Two Weeks Prior to the Start of the Excavation Work. If the Excavation is Adjacent to or Beneath the Fuel Pipeline, HECo May Require a Stand-By Person to Monitor the Work of the Contractor. The Cost of the Stand-By Person Shall Be Borne by the Contractor.

Whenever the Integrity of the Pipeline, its Coating, Test Stations, or Cathodic Protection System is Affected by the Excavation Work, the Pipeline and/or its Appurtenances Shall Be Repaired by HECo Personnel Or A Contractor With HECo Operator Qualification Certification, According to US DOT Regulations. The Cost of Any Repairs Shall Be Borne by the Contractor.

The Contractor Shall Notify the Hawaii One Call Center (HOCC) At Least Five Working Days Prior to the Start of Excavation Work, as Required By Hawaii Revised Statute 269E-7.

The US DOT Requires that the Pipeline be Inspected Any Time that it is Exposed. The Contractor Shall Make the Area with the Exposed Pipeline Available to HECo, and Provide Safe Access to the Excavated Area, for this Inspection.

2. Clearance Requirements
Any New Installation Near HECo's Fuel Oil Pipelines Shall Adhere to The Following Clearance Requirements:

- Parallel to HECo Fuel Pipeline: 24-Inches
- Crossing Below HECo Fuel Pipeline: 24-Inches Below
- Crossing Above HECo Fuel Pipeline: Crossing Above Not Permitted

3. Notification
Prior to Beginning Any Excavation Work, the Contractor Shall Notify the HECo Fuels Department at 543-4108.

In the Event of an Emergency, or Damage to Any Pipeline Facilities, Notify HECo Security Command Center at 543-7685, so HECo Personnel Can Secure the Damaged Section and Report Any Oil Spills to the Proper Authorities. All Costs Associated with the Damage, Repair, and Oil Spill Cleanup Shall Be Borne by the Contractor. This Phone is Manned 24-Hours a Day.

Equipment Schedule

The Hawaiian Electric Co (HECo), Hawaiian Telcom (HTCo), Spectrum Oceanic Cable (CATV), & AT&T pullboxes, handholes and transformer pad lots shall be constructed by the contract as shown in these drawings & in accordance with the the following standard drawings:

Type	Description
3' X 5' HECo Handhole	3' X 5' precast concrete handhole with precast concrete cover, provided in accordance with HECo standard drawing No. 103783.
6' X 11' HECo Manhole	6' X 11' reinforced concrete manhole with traffic rated cover, provided in accordance with HECo standard drawing No. 103776.
6' X 14' HECo Manhole	6' X 14' reinforced concrete manhole with traffic rated cover, provided in accordance with HECo standard drawing No. 103777.
6' X 18' HECo Manhole	6' X 18' reinforced concrete manhole with traffic rated cover, provided in accordance with HECo standard drawing No. 105260.
8'-4" X 7'-8" HECo Transformer Pad Lot	8'-4" X 7'-8" transformer pad lot with reinforced concrete transformer pad & ground rod per HECo standard drawing Nos. 30-5001 & 011249.
4' X 4' AT&T Manhole	4' X 4' reinforced concrete manhole with traffic rated frame & cover, provided in accordance with drawing EF-16.

Type	Description
2' X 4' HTCo Pullbox	2' X 4' type 435TB precast concrete pullbox with 2-piece steel "slip-not" grip or polymer "non-skd" covers and ground rod, per HTCo standard drawing no. 34056. A minimum of 2 precast concrete pullbox sections shall be required at each pullbox.
5' X 10'-6" HTCo Manhole	5' X 10'-6" X 6'-6" D precast reinforced concrete manhole with traffic rated frame and cover, and ground rod, provided in accordance with HTCo standard drawing No. 180016.
2' X 6' CATV Handhole	2' X 6' reinforced concrete handhole with "slip-not" grip covers, similar to HTCo type 435TB6 (standard drawing no. 34078), except with "CATV" inscribed on cover. 3 pre-cast concrete pullbox sections shall be required at each pullbox.
4' X 6' CATV Manhole	4' X 6' reinforced concrete manhole with traffic rated frame & cover, similar to HTCo standard drawing no. 180014, except with "CATV" inscribed on cover.

Notes:
If ducts enter handhole/manhole outside of the approved handhole/manhole window, submit the handhole/manhole shop drawing & structural calculations to the respective utility company for approval.

HECo handholes & manholes sized 3'x5' and larger shall be reviewed by HECo prior to ordering and fabrication.

5

DRAWING REVIEW

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Req# _____ By _____ Date _____

Transmission & Distribution Engineering
Hawaiian Electric

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DATE	REVISION
07/15/22	5 UPDATED EQUIP SCHD NOTES

DUSTIN Y. NAKAMOTO
LICENSED PROFESSIONAL ENGINEER
No. 14287-E
HAWAII, U.S.A.

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SIGNATURE

April 30, 2024
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HAWAIIAN ELECTRIC (HECo) NOTES & EQUIPMENT SCHEDULE

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. EA-6 OF 12 SHEETS

ORIGINAL PLAN
NOTE BOOK
No.

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DATE

FILE: Z:\ACAD\PROJECTS\22006TH\EA06_22006TH_HECO-NOTES-03.dwg saved July 13, 2022

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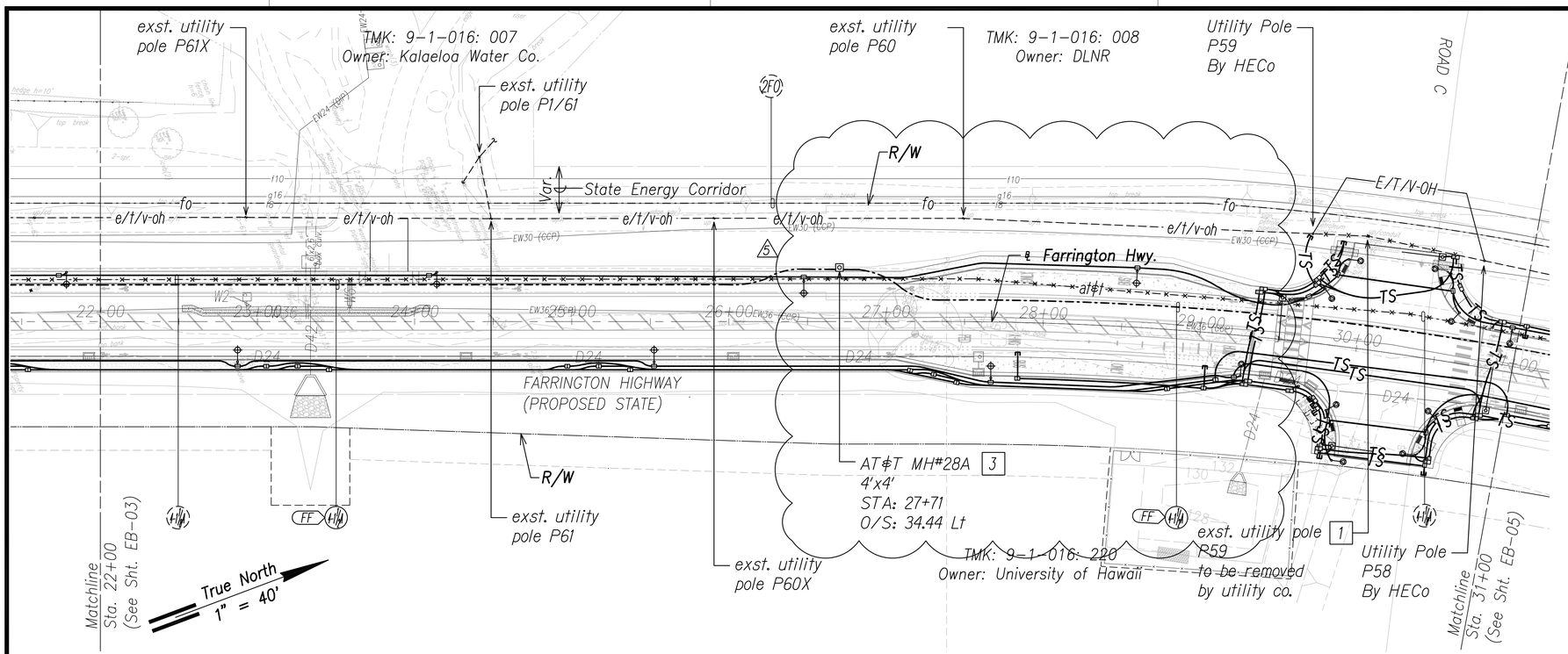

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	EB-04	790

General Electrical Notes:

1. Caution!!! Electrical Hazard!!! Existing HECo overhead and underground lines, are energized and will remain energized during construction unless prior special arrangements have been made with HECo. Only HECo personnel are to handle these energized lines and erect temporary guards to protect these lines from damage. The contractor shall work cautiously at all times to avoid accidents and damage to existing HECo facilities which can result in electrocution.
2. Construct new utility structures ℄ coordinate relocation of respective utility facilities, prior to removal of existing, respectively.
3. See street lighting ℄ traffic signal plans for street lighting ℄ traffic signal work.
4. HECo, HTCo ℄ CATV to remove their respective overhead facilities.

Notes:

1. Provide proper bracing/support for exst. utility pole during construction; submit details to respective utility company(s) for approval.
2. Excavate ℄ expose exst. duct(s) to intercept with new duct(s). Coordinate and schedule work with AT℄T prior to excavation. Repair to match existing.
3. Excavate ℄ expose exst. duct(s) to intercept with new manhole. Coordinate and schedule work with AT℄T prior to excavation. Provide duct entry for AT℄T, per utility co. requirements. Repair to match existing.

Electrical Plan 4 - (Sta. 22+00 to Sta. 31+00)

Scale: 1" = 40'

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

DRAWING REVIEW

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Req# _____ By _____ Date _____

Transmission & Distribution Engineering
Hawaiian Electric

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DATE	REVISION
07/15/22	5 ADDED BUS BAYS & BWS CMTS

DUSTIN Y. NAKAMOTO
LICENSED PROFESSIONAL ENGINEER
No. 14287-E
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL PLAN 4

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

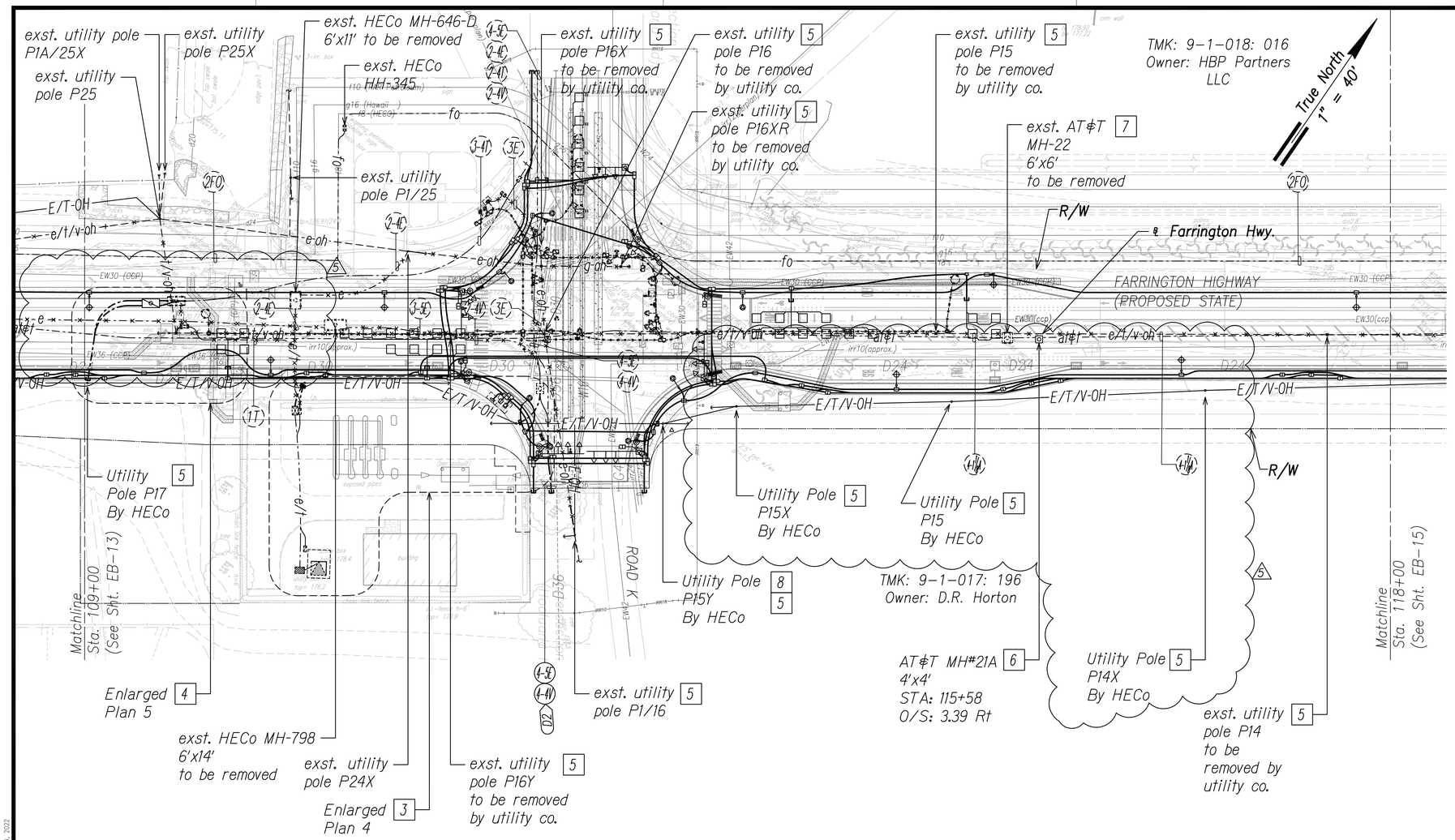
Scale: As Shown Date: April 2022

SHEET No. EB-04 OF 25 SHEETS

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

FILE: Z:\ACAD\PROJECTS\220067HI\EB04_220067HI_ELEC_Roadway Plan 4 - Sta. 22+00 to 31+00.dwg saved July 13, 2022

ADD. 590



FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	EB-14	790

General Electrical Notes:

1. Caution!!! Electrical Hazard!!! Existing HECo overhead and underground lines, are energized and will remain energized during construction unless prior special arrangements have been made with HECo. Only HECo personnel are to handle these energized lines and erect temporary guards to protect these lines from damage. The contractor shall work cautiously at all times to avoid accidents and damage to existing HECo facilities which can result in electrocution.
2. Construct new utility structures & coordinate relocation of respective utility facilities, prior to removal of existing, respectively.
3. See street lighting & traffic signal plans for street lighting & traffic signal work.
4. HECo, HTCo & CATV to remove their respective overhead facilities.
5. Coordinate manhole/handhole adjustments with respective utility(s).
6. Remove old non-utility pole(s) as required.

Notes:

1. Provide conduit riser(s) up pole per utility company requirements.
2. Expose existing duct(s), provide coupling(s) & extend. Coordinate and schedule work with respective utility company prior to excavation.
3. See Sht. EB-24 for Enlarged Plan 4.
4. See Sht. EB-25 for Enlarged Plan 5.
5. Excavate & expose existing manhole wall(s). Coordinate and schedule work with respective utility company prior to excavation. Provide duct entry per utility co. requirements. Provide couplings & extend duct(s). Repair to match existing.
5. Provide proper bracing/support for exst. utility pole during construction; submit details to respective utility company(s) for approval.
6. Excavate & expose exst. duct(s) to intercept with new manhole. Coordinate and schedule work with AT&T prior to excavation. Provide duct entry for AT&T, per utility co. requirements. Repair to match existing.
7. Excavate & expose exst. manhole wall(s). Coordinate and schedule work with with AT&T prior to excavation. Demolish exst. manhole, provide couplings as required & extend duct(s) to exst. Repair to match existing.
8. Weatherhead for traffic signal service to be installed on pole.

Electrical Plan 14 - (Sta. 109+00 to Sta. 118+00)

Scale: 1" = 40'

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

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Transmission & Distribution Engineering
Hawaiian Electric

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DUSTIN Y. NAKAMOTO LICENSED PROFESSIONAL ENGINEER No. 14287-E HAWAII, U.S.A.

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DATE	REVISION
07/15/22	5 ADDED BUS BAYS & BWS CMTS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL PLAN 14

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. EB-14 OF 25 SHEETS

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

FILE: Z:\AGAD\PROJECTS\2200676\TL\EB14_2200676TL_ELEC_Roadway Plan 14 - Sta. 109+00 to 118+00.dwg saved July 14, 2022

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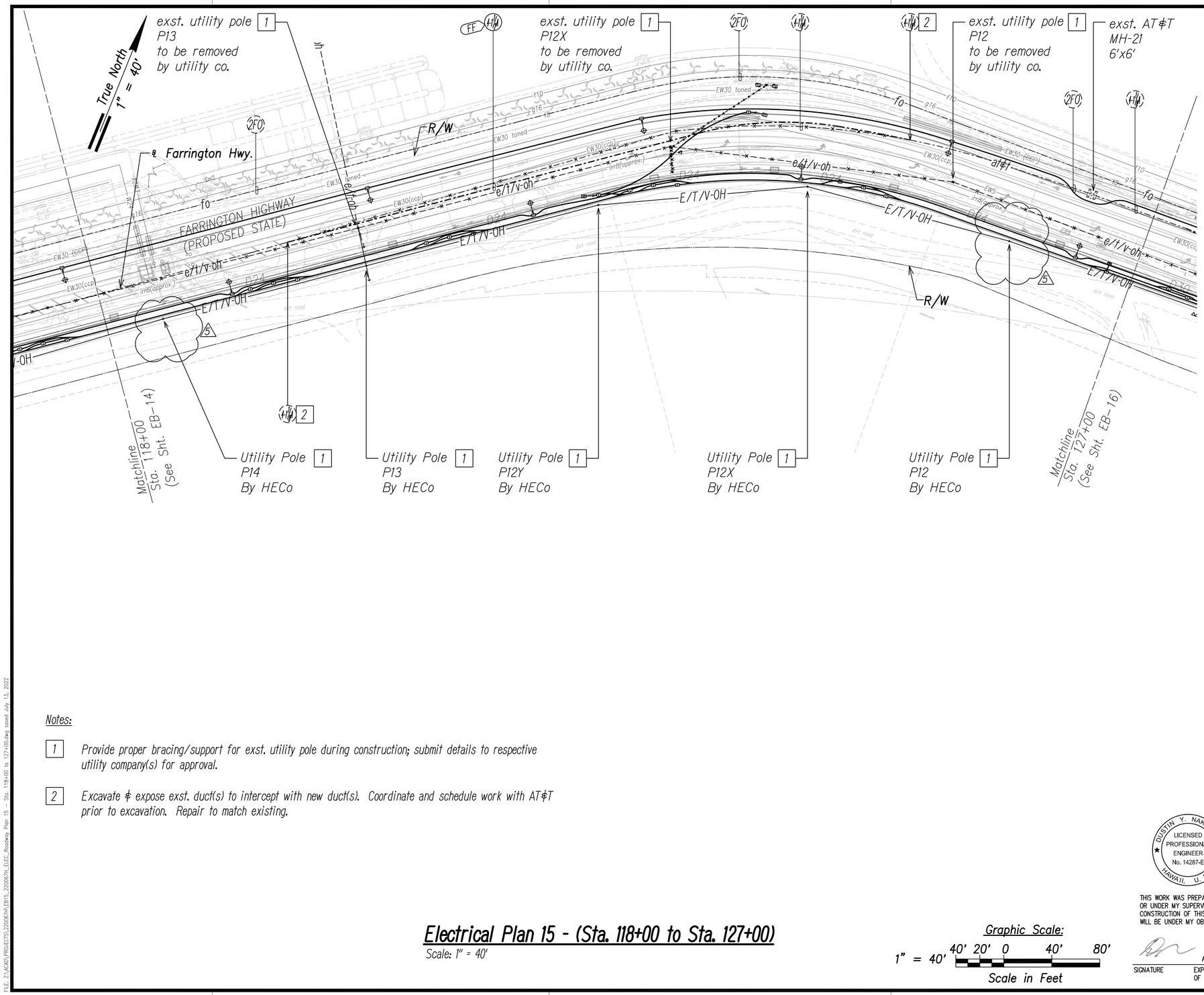

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	EB-15	790

General Electrical Notes:

1. Caution!!! Electrical Hazard!!! Existing HECo overhead and underground lines, are energized and will remain energized during construction unless prior special arrangements have been made with HECo. Only HECo personnel are to handle these energized lines and erect temporary guards to protect these lines from damage. The contractor shall work cautiously at all times to avoid accidents and damage to existing HECo facilities which can result in electrocution.
2. Construct new utility structures & coordinate relocation of respective utility facilities, prior to removal of existing, respectively.
3. See street lighting & traffic signal plans for street lighting & traffic signal work.
4. HECo, HTCo & CATV to remove their respective overhead facilities.
5. Coordinate manhole/handhole adjustments with respective utility(s).

Notes:

1 Provide proper bracing/support for exst. utility pole during construction; submit details to respective utility company(s) for approval.

2 Excavate & expose exst. duct(s) to intercept with new duct(s). Coordinate and schedule work with AT&T prior to excavation. Repair to match existing.

Electrical Plan 15 - (Sta. 118+00 to Sta. 127+00)

Scale: 1" = 40'

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

DRAWING REVIEW

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Req# _____ By _____ Date _____

Transmission & Distribution Engineering
Hawaiian Electric

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DUSTIN Y. NAKAMOTO
LICENSED PROFESSIONAL ENGINEER
No. 14287-E
HAWAII, U.S.A.

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07/15/22	5 ADJUSTED POLE LOCATIONS
DATE	REVISION

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL PLAN 15

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

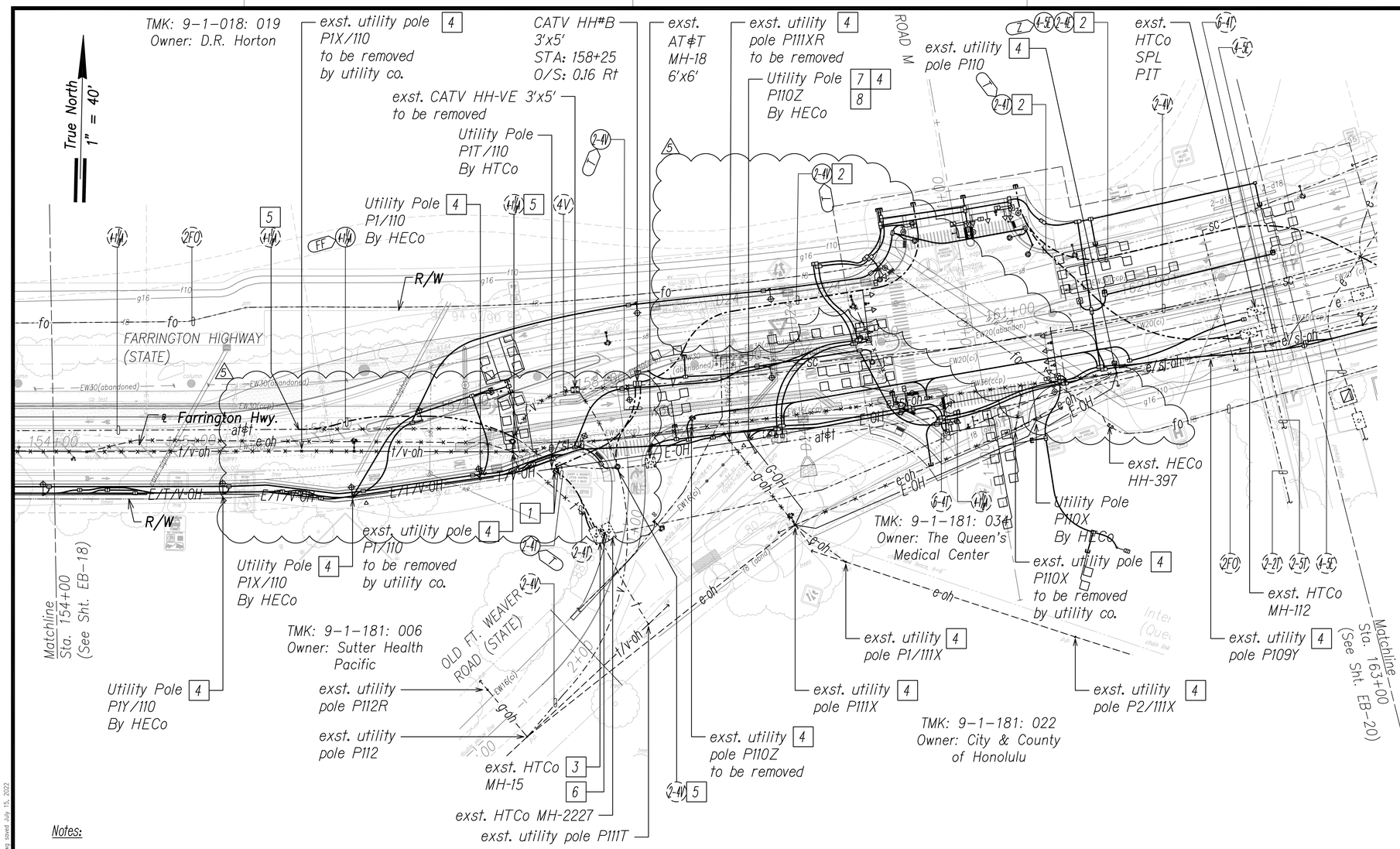
SHEET No. EB-15 OF 25 SHEETS

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

FILE: Z:\ACAD\PROJECTS\220067H\EB15_220067H_ELEC_Roadway Plan 15 - Sta. 118+00 to 127+00.dwg saved July 13, 2022

ADD. 601

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	EB-19	790



General Electrical Notes:

1. *Caution!!! Electrical Hazard!!! Existing HECo overhead and underground lines, are energized and will remain energized during construction unless prior special arrangements have been made with HECo. Only HECo personnel are to handle these energized lines and erect temporary guards to protect these lines from damage. The contractor shall work cautiously at all times to avoid accidents and damage to existing HECo facilities which can result in electrocution.*
2. *Construct new utility structures & coordinate relocation of respective utility facilities, prior to removal of existing, respectively.*
3. *See street lighting & traffic signal plans for street lighting & traffic signal work.*
4. *HECo, HTCo & CATV to remove their respective overhead facilities.*
5. *Coordinate manhole/handhole adjustments with respective utility(s).*

Notes:

1. *Provide conduit riser(s) up pole per utility company requirements.*
2. *For future development.*
3. *Excavate & expose exst. manhole/handhole wall(s). Coordinate and schedule work with respective utility company prior to excavation. Provide duct entry per utility co. requirements. Provide couplings as required & extend duct(s). Repair to match existing.*
4. *Provide proper bracing/support for exst. utility pole during construction; submit details to respective utility company(s) for approval.*
5. *Excavate & expose exst. duct(s), to intercept, provide coupling(s) as required & extend duct(s). Coordinate and schedule work with respective utility company prior to excavation.*
6. *Remove old equipment pad. Coordinate and schedule work with HTCo prior to excavation. Cap duct(s) as required. Repair to match existing.*
7. *HECo to install overhead transformer for new traffic signal service.*
8. *Weatherhead for traffic signal service to be installed on pole.*

Electrical Plan 19 - (Sta. 154+00 to Sta. 163+00)

Scale: 1" = 40'

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

DRAWING REVIEW

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Req# _____ By _____ Date _____

Transmission & Distribution Engineering
Hawaiian Electric

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DUSTIN Y. NAKAMOTO
LICENSED PROFESSIONAL ENGINEER
No. 14287-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

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07/15/22	5 ADDED BUS BAY & REV TOPO
DATE	REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL PLAN 19

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown *Date: April 2022*

SHEET No. EB-19 OF 25 SHEETS

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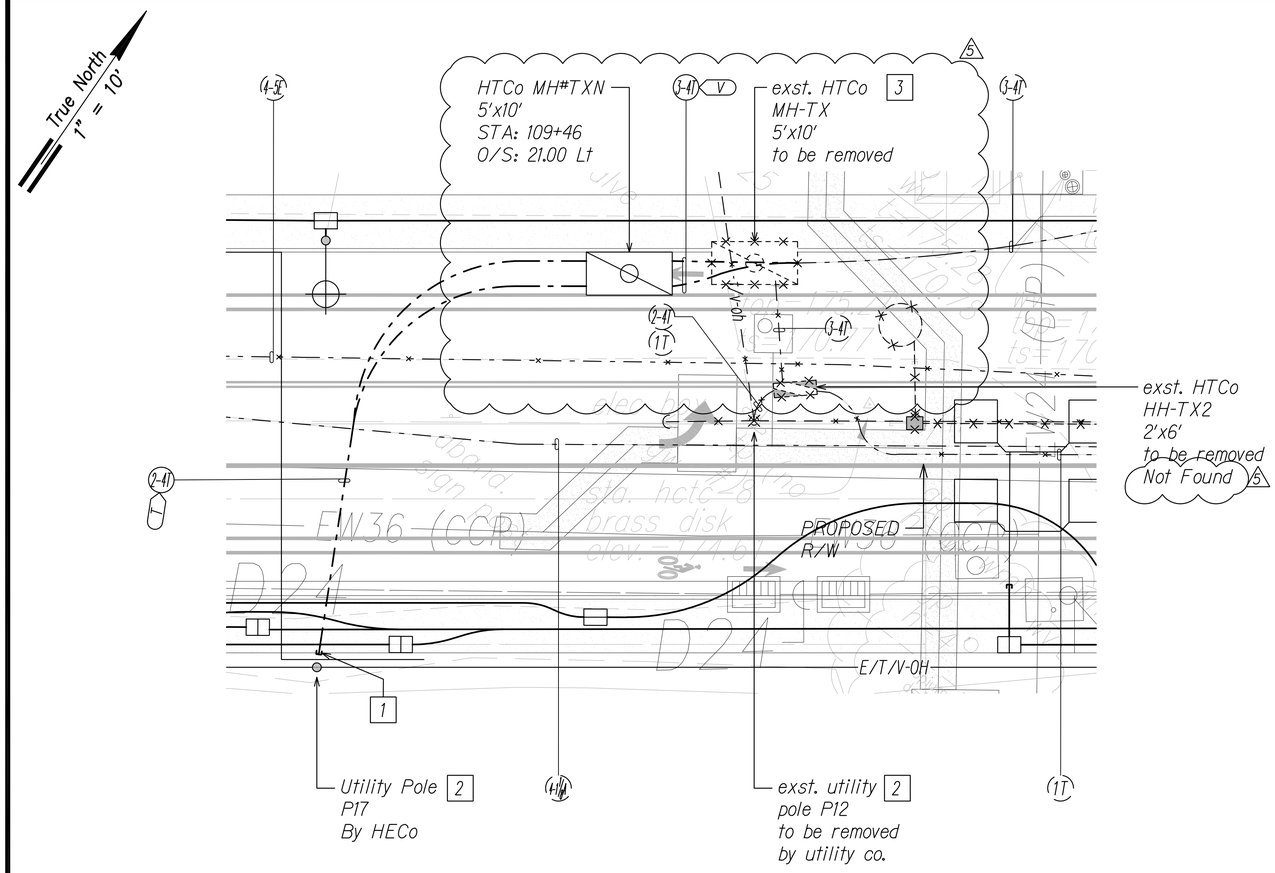
NOTE BOOK	TRACED BY	
No.	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

FILE: Z:\ACAD\PROJECTS\220067H\EB19_220067H_ELEC_Roadway Plan 19 - Sta. 154+00 to 163+00.dwg saved July 15, 2022

ADD. 605

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	EB-25	790



General Electrical Notes:

1. Caution!!! Electrical Hazard!!! Existing HECo overhead and underground lines, are energized and will remain energized during construction unless prior special arrangements have been made with HECo. Only HECo personnel are to handle these energized lines and erect temporary guards to protect these lines from damage. The contractor shall work cautiously at all times to avoid accidents and damage to existing HECo facilities which can result in electrocution.

2. Construct new utility structures & coordinate relocation of respective utility facilities, prior to removal of existing, respectively.

3. See street lighting & traffic signal plans for street lighting & traffic signal work.

4. HECo, HTCo & CATV to remove their respective overhead facilities.

Notes:

1 Provide conduit riser(s) up pole per utility company requirements.

2 Provide proper bracing/support for exst. utility pole during construction; submit details to respective utility company(s) for approval.

3 Excavate & expose exst. manhole wall(s). Coordinate and schedule work with with HTCo prior to excavation. Demolish exst. manhole, provide couplings as required & extend duct(s) to exst. Repair to match existing.

Enlarged Electrical Plan 5

Scale: 1" = 10'

Graphic Scale:

1" = 10' 10' 5' 0 10' 20'

Scale in Feet

DRAWING REVIEW

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Req# _____ By _____ Date _____

Transmission & Distribution Engineering
Hawaiian Electric

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DUSTIN Y. NAKAMOTO
LICENSED PROFESSIONAL ENGINEER
No. 14287-E
HAWAII, U.S.A.

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SIGNATURE

April 30, 2024
EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 UPDATED DWG

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ENLARGED ELECTRICAL PLAN 5

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. EB-25 OF 25 SHEETS

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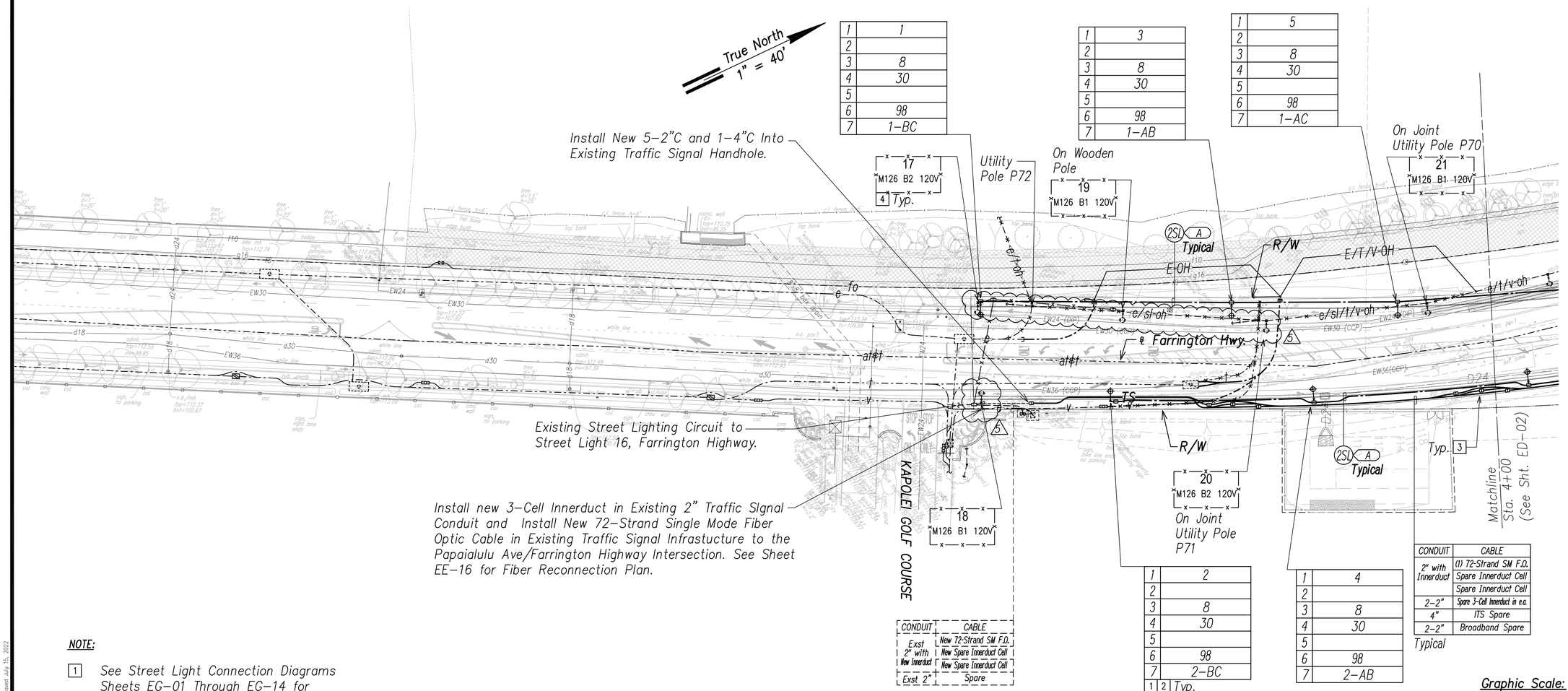
FILE: Z:\ACAD\PROJECTS\22006PH\EB25_22006PH_ELEC_ENLARGED PLAN 05.dwg saved July 13, 2022

ADD. 611

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	ED-01	790



1	1
2	
3	8
4	30
5	
6	98
7	1-BC

1	3
2	
3	8
4	30
5	
6	98
7	1-AB

1	5
2	
3	8
4	30
5	
6	98
7	1-AC

CONDUIT	CABLE
Exst 2" with New Innerduct	New 72-Strand SM F.O.
	New Spare Innerduct Cell
	New Spare Innerduct Cell
Exst 2"	Spare

1	2
2	
3	8
4	30
5	
6	98
7	2-BC

1	4
2	
3	8
4	30
5	
6	98
7	2-AB

CONDUIT	CABLE
2" with Innerduct	(1) 72-Strand SM F.O.
	Spare Innerduct Cell
	Spare Innerduct Cell
2-2"	Spare 3-Cell Innerduct in e.a.
4"	ITS Spare
2-2"	Broadband Spare

Typical

NOTE:

1. See Street Light Connection Diagrams Sheets EG-01 Through EG-14 for Street Light Wiring.
2. See Sheet EG-18 for State Highway Light ID Tag Indicator Legend
3. Typical Handhole Grouping. See Sheet EG-15 for Details.
4. Salvage and Return All Removed Equipment to C&C DFM as Directed by Street Light Inspector.
5. All Traffic Signal Conduits to be in Minimum 3" Concrete Encasement. 5

Street Light & Traffic Signal Plan 1 - (Sta. -5+00 to Sta. 4+00)

Scale: 1" = 40'

APPROVED BY

PROGRAM ADMINISTRATOR, MECHANICAL/ELECTRICAL DIVISION DATE
DEPT. OF DESIGN AND CONSTRUCTION
CITY & COUNTY OF HONOLULU

SCOTT N. SHIRAISHI LICENSED PROFESSIONAL ENGINEER No. 14753-E HAWAII U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

Scott Shiraishi April 30, 2024
SIGNATURE EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 REVISED NOTE AND SYMBOLS

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STREET LIGHT & TRAFFIC SIGNAL PLAN 1

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

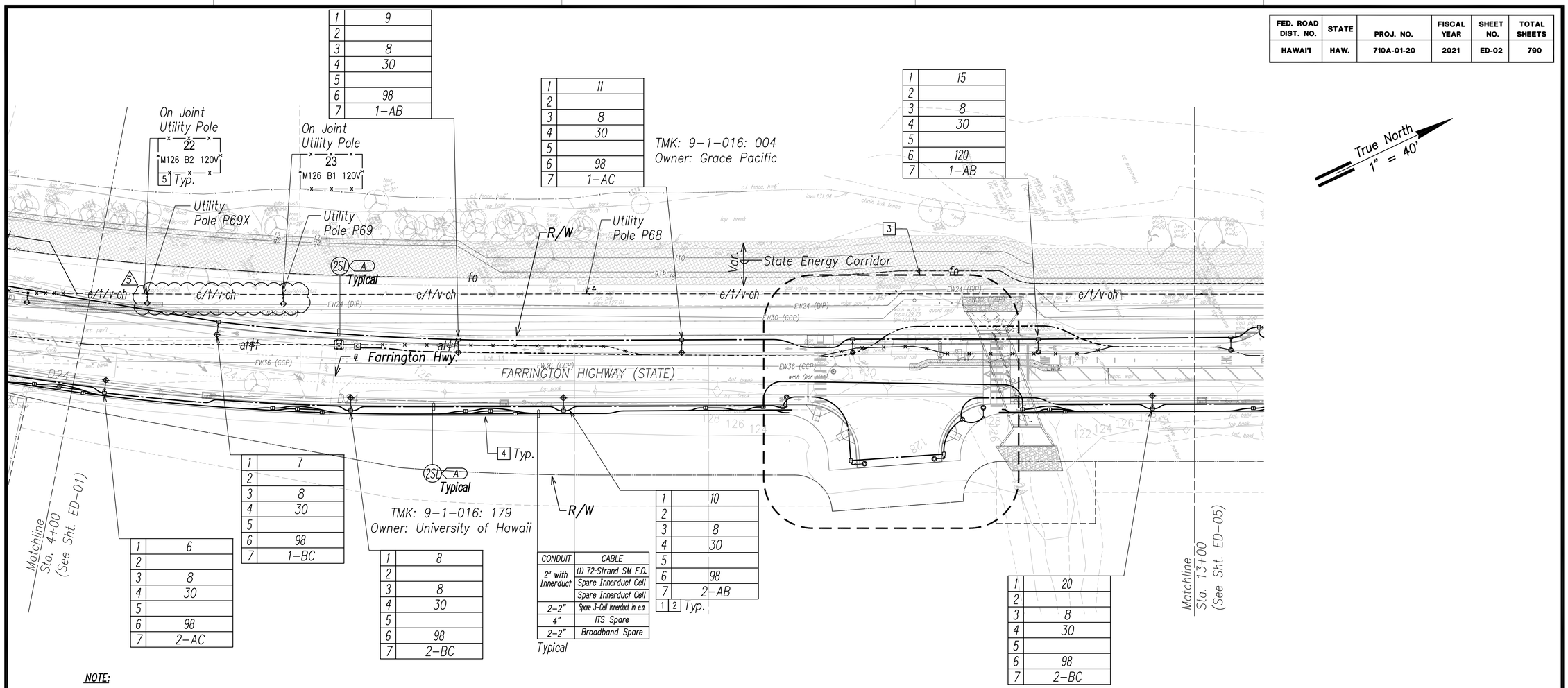
SHEET No. ED-01 OF 35 SHEETS

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

FILE: Z:\ACAD\PROJECTS\220067PA\ED01_220067H_SLTS_Roadway Plan 1 - Sta. -5+00 to 4+00.dwg saved July 15, 2022

ADD. 612

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	ED-02	790



1	9
2	
3	8
4	30
5	
6	98
7	1-AB

1	11
2	
3	8
4	30
5	
6	98
7	1-AC

1	15
2	
3	8
4	30
5	
6	120
7	1-AB

1	7
2	
3	8
4	30
5	
6	98
7	1-BC

1	6
2	
3	8
4	30
5	
6	98
7	2-AC

1	8
2	
3	8
4	30
5	
6	98
7	2-BC

1	10
2	
3	8
4	30
5	
6	98
7	2-AB

1 2 Typ.

CONDUIT	CABLE
2" with Innerduct	(1) 72-Strand SM F.O.
	Spare Innerduct Cell
	Spare Innerduct Cell
2-2"	Spare 3-Cell Innerduct in e.a.
4"	ITS Spare
2-2"	Broadband Spare

Typical

1	20
2	
3	8
4	30
5	
6	98
7	2-BC

NOTE:

1. See Street Light Connection Diagrams Sheets EG-01 Through EG-14 for Street Light Wiring.
2. See Sheet EG-18 for State Highway Light ID Tag Indicator Legend.
3. See Enlarged Plan Sheet ED-03.
4. Typical Handhole Grouping. See Sheet EG-15 for Details.
5. Salvage and Return All Removed Equipment to C&C DFM as Directed by Street Light Inspector.
6. All Traffic Signal Conduits to be in Minimum 3" Concrete Encasement.

Street Light & Traffic Signal Plan 2 - (Sta. 4+00 to Sta. 13+00)

Scale: 1" = 40'

Graphic Scale:
1" = 40' 40' 20' 0 40' 80'
Scale in Feet

APPROVED BY

PROGRAM ADMINISTRATOR, MECHANICAL/ELECTRICAL DIVISION DATE
DEPT. OF DESIGN AND CONSTRUCTION
CITY & COUNTY OF HONOLULU

SCOTT N. SHIRAISHI
LICENSED PROFESSIONAL ENGINEER
No. 14753-E
HAWAII U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

Scott Shirai April 30, 2024
SIGNATURE EXPIRATION DATE OF THE LICENSE

07/15/22	5 REVISED NOTE AND SYMBOLS
DATE	REVISION

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STREET LIGHT & TRAFFIC SIGNAL PLAN 2

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

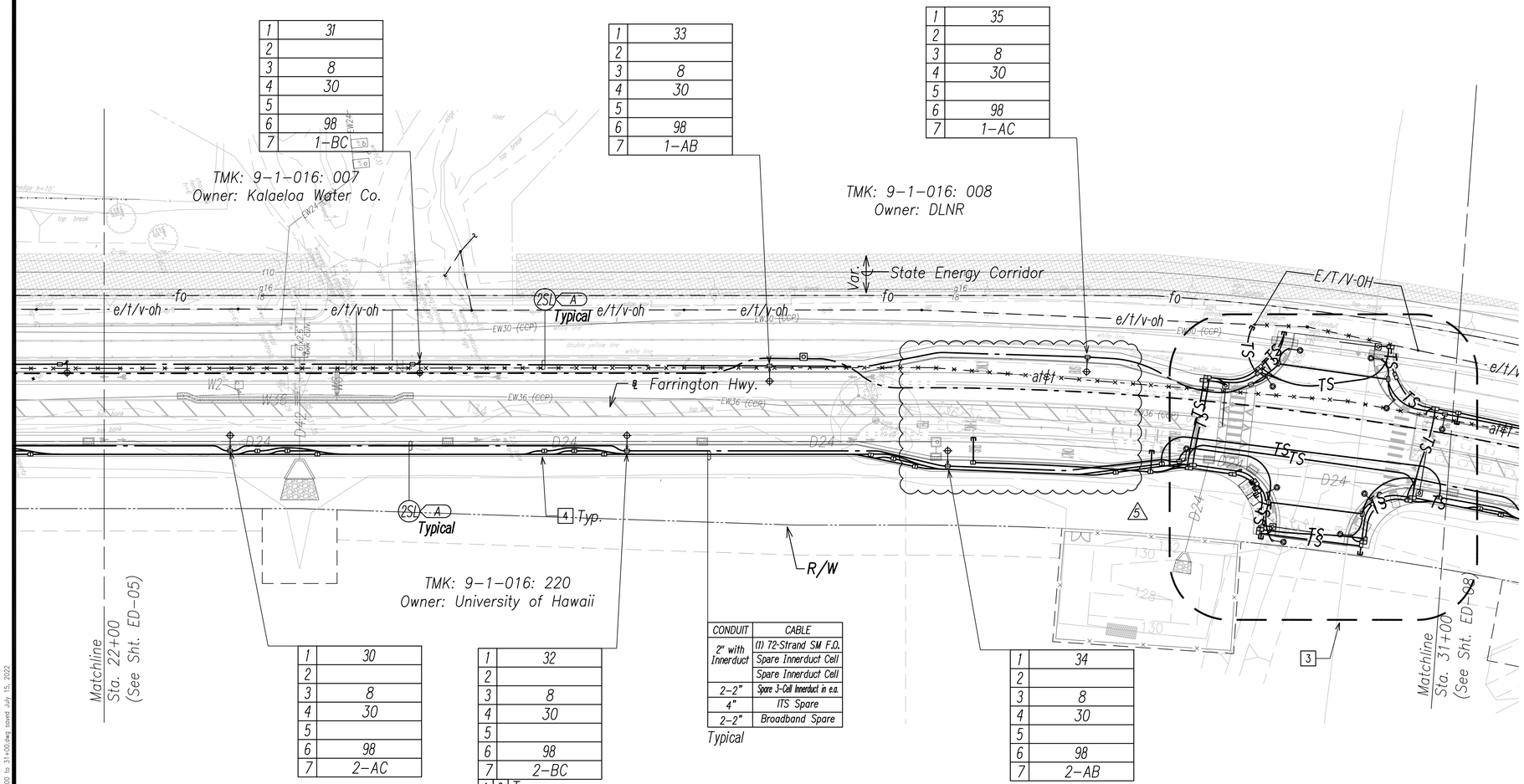
SHEET No. ED-02 OF 35 SHEETS

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

FILE: Z:\Acad\projects\220067HA\ED02_220067HL_SLTS_Roadway Plan 2 - Sta. 4+00 to 13+00.dwg saved July 15, 2022

ADD. 613

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	ED-06	790



1	31
2	
3	8
4	30
5	
6	98
7	1–BC

1	33
2	
3	8
4	30
5	
6	98
7	1–AB

1	35
2	
3	8
4	30
5	
6	98
7	1–AC

1	30
2	
3	8
4	30
5	
6	98
7	2–AC

1	32
2	
3	8
4	30
5	
6	98
7	2–BC

1 2 Typ.

CONDUIT	CABLE
2" with Innerduct	(1) 72-Strand SM F.O.
	Spare Innerduct Cell
	Spare Innerduct Cell
2–2"	Spare 3-Cell Innerduct in e.a.
4"	ITS Spare
2–2"	Broadband Spare

Typical

1	34
2	
3	8
4	30
5	
6	98
7	2–AB

True North
1" = 40'

NOTE:

1. See Street Light Connection Diagrams Sheets EG-01 Through EG-14 for Street Light Wiring.
2. See Sheet EG-18 for State Highway Light ID Tag Indicator Legend
3. See Enlarged Plan Sheet ED-07
4. Typical Handhole Grouping. See Sheet EG-15 for Details.
5. All Traffic Signal Conduits to be in Minimum 3" Concrete Encasement.

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

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

FILE: Z:\Acad\projects\220067H\ED06_220067H_SLTS_Roadway Plan 6 - Sta. 22+00 to 31+00.dwg saved July 15, 2022

Street Light & Traffic Signal Plan 6 - (Sta. 22+00 to Sta. 31+00)

Scale: 1" = 40'

SCOTT N. SHIRAISHI LICENSED PROFESSIONAL ENGINEER No. 14753-E HAWAII U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

Scott Shiraishi — April 30, 2024
SIGNATURE — EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 REVISED LOCATIONS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STREET LIGHT & TRAFFIC SIGNAL PLAN 6

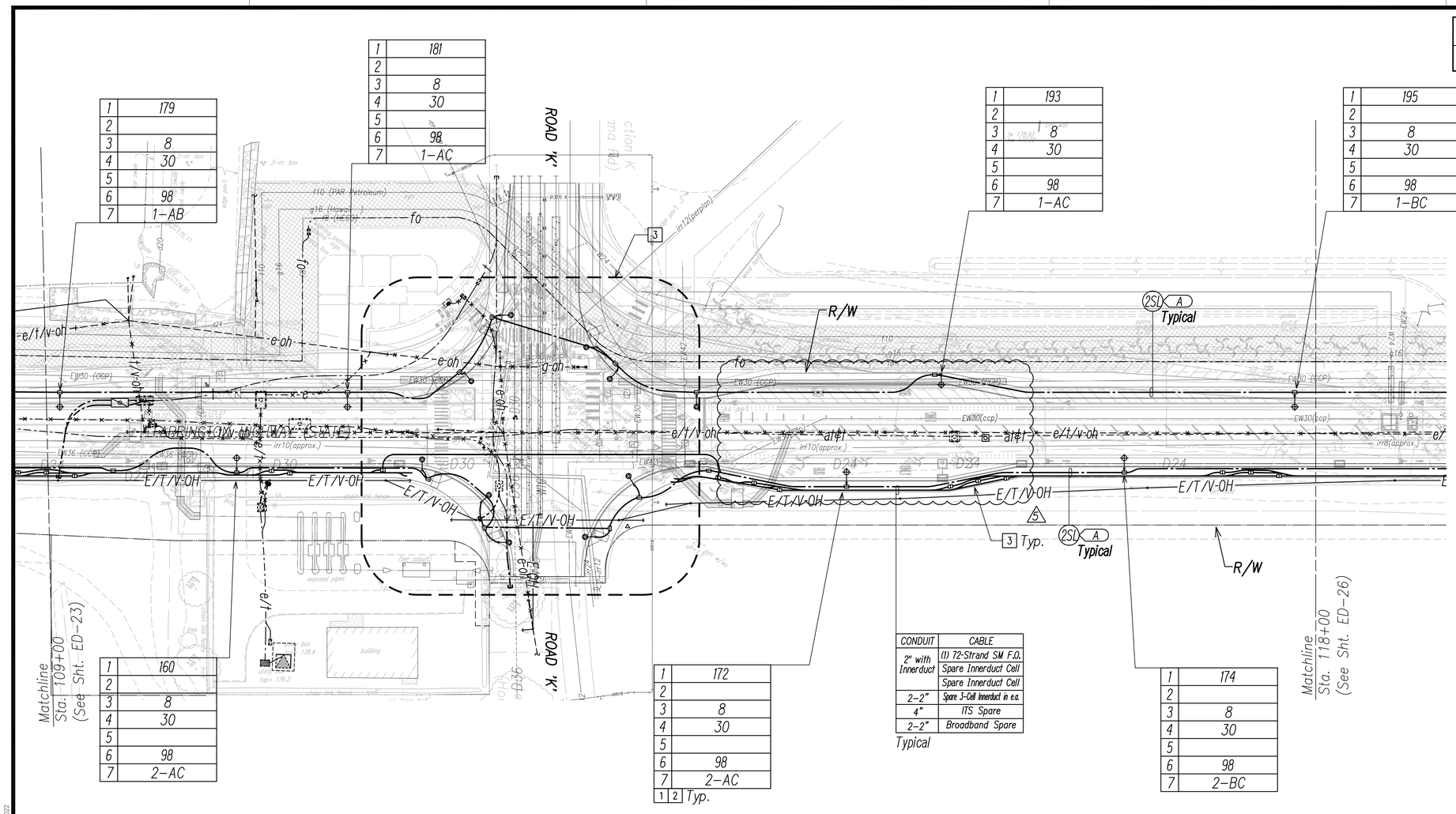
FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. ED-06 OF 35 SHEETS

ADD. 617

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	ED-24	790



NOTE:

1. See Street Light Connection Diagrams Sheets EG-01 Through EG-14 for Street Light Wiring.
2. See Sheet EG-18 for State Highway Light ID Tag Indicator Legend
3. See Enlarged Plan Sheet ED-25
4. Typical Handhole Grouping. See Sheet EG-15 for Details.
5. All Traffic Signal Conduits to be in Minimum 3" Concrete Encasement.

True North
1" = 40'

Graphic Scale:
1" = 40' 40' 20' 0 40' 80'
Scale in Feet

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

FILE: Z:\Acad\projects\220067HI\ED24_220067HI_SLTS_Roadway Plan 24 - Sta. 109+00 to 118+00.dwg saved July 15, 2022

Street Light & Traffic Signal Plan 24 - (Sta. 109+00 to Sta. 118+00)

Scale: 1" = 40'

DATE	REVISION
07/15/22	5 REVISED NOTE AND SYMBOLS

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STREET LIGHT & TRAFFIC SIGNAL PLAN 24

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. ED-24 OF 35 SHEETS

SCOTT N. SHIRAISHI
LICENSED PROFESSIONAL ENGINEER
No. 14753-E
HAWAII U.S.A.

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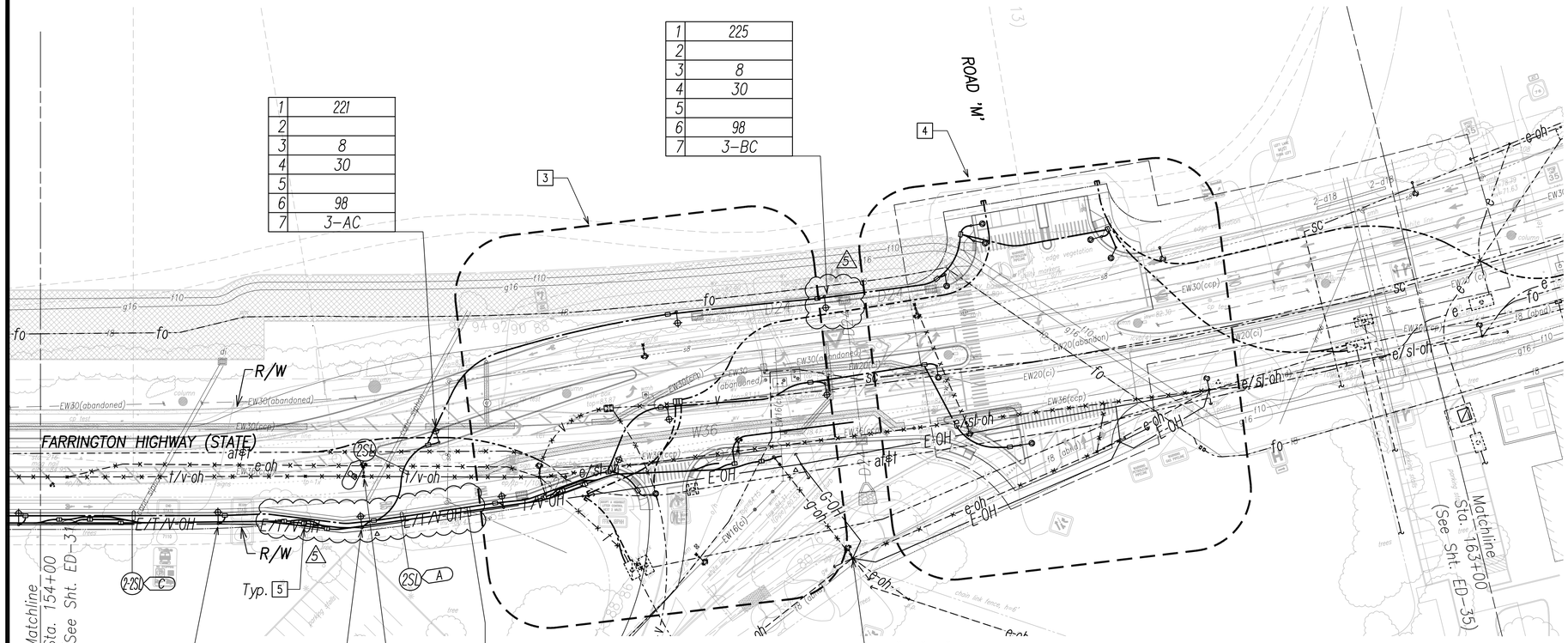
Scott Shiraishi April 30, 2024
SIGNATURE EXPIRATION DATE OF THE LICENSE

ADD. 635

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	ED-32	790



1	221
2	
3	8
4	30
5	
6	98
7	3-AC

1	225
2	
3	8
4	30
5	
6	98
7	3-BC

1	234
2	
3	8
4	30
5	
6	98
7	4-BC

5

1	236
2	
3	8
4	30
5	
6	98
7	4-AC

1 2 5 Typ.

CONDUIT	CABLE
2" with Innerduct	(1) 72-Strand SM F.O.
	Spare Innerduct Cell
	Spare Innerduct Cell
2-2"	Spare 3-Cell Innerduct in e.a.
4"	ITS Spare
2-2"	Broadband Spare

True North
1" = 40'

NOTE:

1. See Street Light Connection Diagrams Sheets EG-01 Through EG-12 for Street Light Wiring.
2. See Sheet EG-16 for State Highway Light ID Tag Indicator Legend
3. See Enlarged Plan Sheet ED-33
4. See Enlarged Plan Sheet ED-34
5. Street Light Mounted on HECO Pole
6. Typical Handhole Grouping. See Sheet EG-15 for Details.
7. All Traffic Signal Conduits to be in Minimum 3" Concrete Encasement.

Graphic Scale:

1" = 40' 40' 20' 0 40' 80'

Scale in Feet

DATE	REVISION
07/15/22	5 REVISED NOTE AND SYMBOLS

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STREET LIGHT & TRAFFIC SIGNAL PLAN 32

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SCOTT N. SHIRAISHI
LICENSED PROFESSIONAL ENGINEER
No. 14753-E
HAWAII U.S.A.

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SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

SHEET No. ED-32 OF 35 SHEETS

ORIGINAL PLAN
NOTE BOOK No.

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

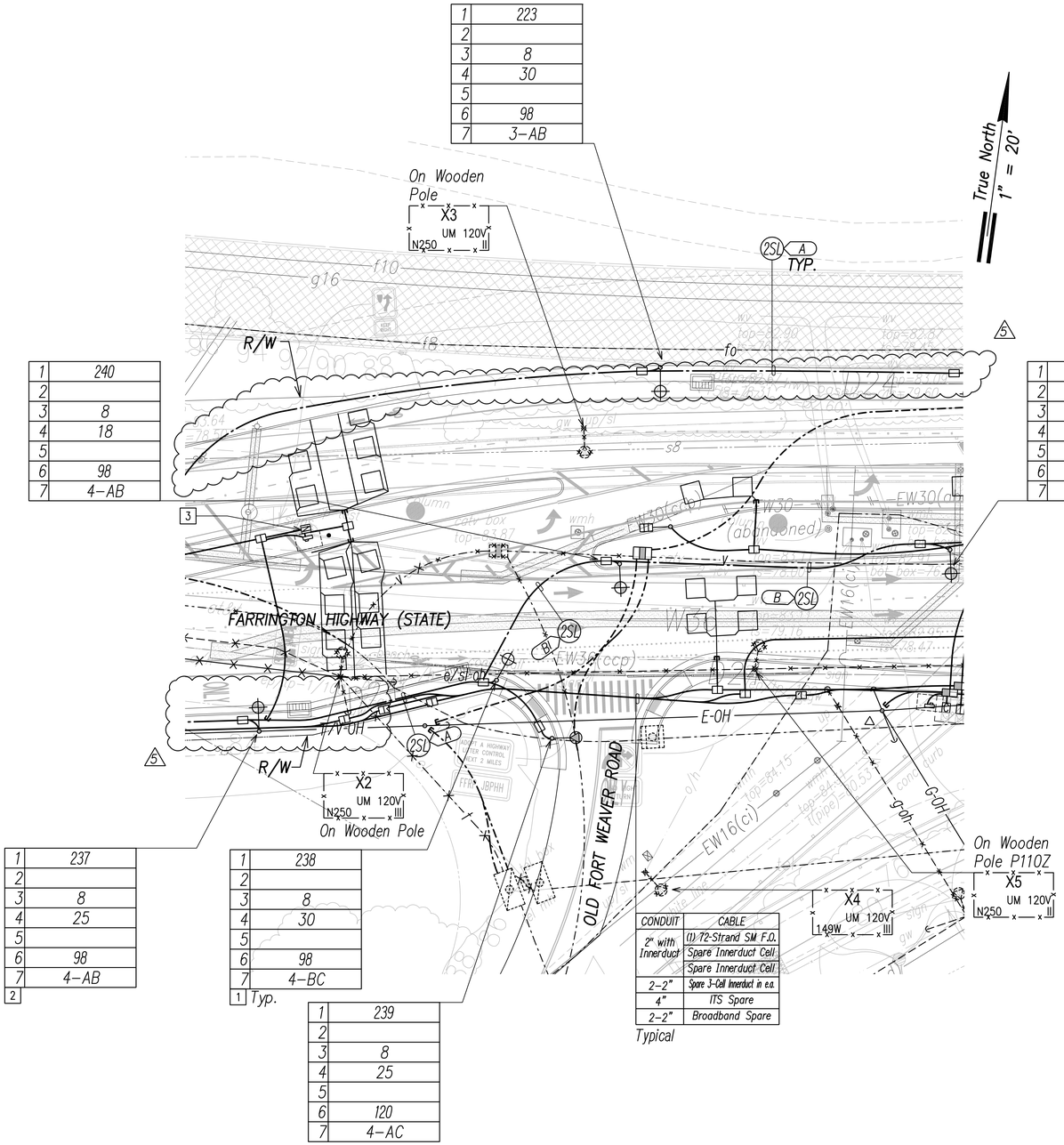
Street Light & Traffic Signal Plan 32 - (Sta. 154+00 to Sta. 163+00)

Scale: 1" = 40'

FILE: Z:\kcad\projects\2200671N\ED32_2200671N_ST15_Roadway Plan 32 - Sta. 154+00 to 163+00.dwg saved July 15, 2022

ADD. 643

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	ED-33	790



1	223
2	
3	8
4	30
5	
6	98
7	3-AB

1	240
2	
3	8
4	18
5	
6	98
7	4-AB

1	241
2	
3	8
4	18
5	
6	98
7	4-BC

1	237
2	
3	8
4	25
5	
6	98
7	4-AB

2

1	238
2	
3	8
4	30
5	
6	98
7	4-BC

1	239
2	
3	8
4	25
5	
6	120
7	4-AC

NOTE:

1. See Sheet EG-18 for State Highway Light ID Tag Indicator Legend
2. Street Light Mounted on HECO Pole
3. Traffic Counting Cabinet. See Sheet EI-03 for Details
4. See Sheet EE-17 for Traffic Signal Work.

Graphic Scale:

1" = 20' 20' 10' 0 20' 40'

Scale in Feet

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

FILE: Z:\Acad\projects\220067HA\EA33_220067H_SLTS_Roadway Plan 33 - Old Fort Weaver Intersection 2.dwg saved July 15, 2022

Street Light & Traffic Signal Plan 33 - Old Fort Weaver Intersection 2

Scale: 1" = 20'

SCOTT N. SHIRAISHI
LICENSED PROFESSIONAL ENGINEER
No. 14753-E
HAWAII U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

Scott Shiraishi April 30, 2024
SIGNATURE EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 REVISED NOTE AND SYMBOLS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STREET LIGHT & TRAFFIC SIGNAL PLAN 33

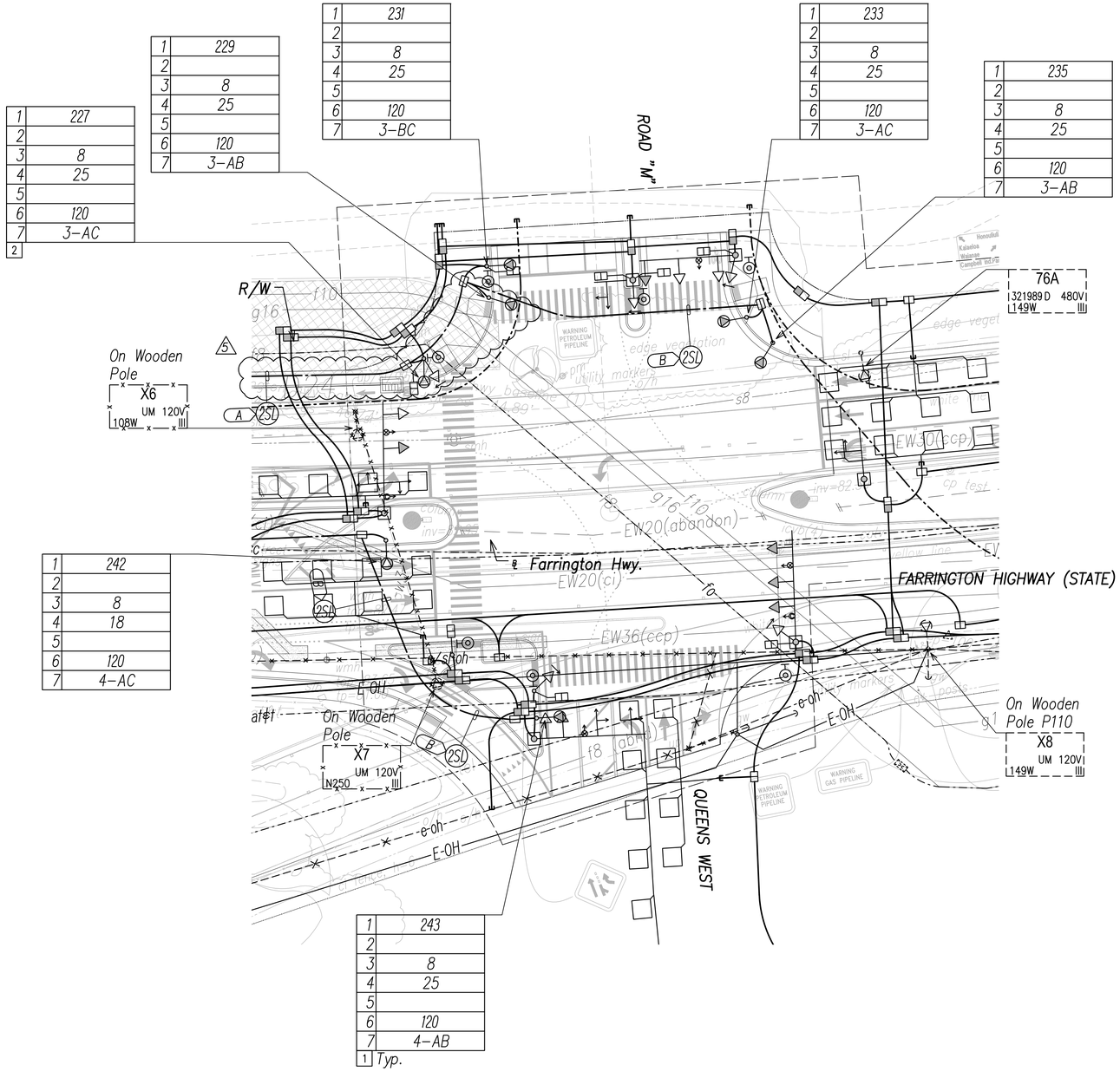
FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. ED-33 OF 35 SHEETS

ADD. 644

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	ED-34	790



1	227
2	
3	8
4	25
5	
6	120
7	3-AC
2	

1	229
2	
3	8
4	25
5	
6	120
7	3-AB

1	231
2	
3	8
4	25
5	
6	120
7	3-BC

1	233
2	
3	8
4	25
5	
6	120
7	3-AC

1	235
2	
3	8
4	25
5	
6	120
7	3-AB

1	242
2	
3	8
4	18
5	
6	120
7	4-AC

1	243
2	
3	8
4	25
5	
6	120
7	4-AB

1 Typ.

True North
1" = 20'

NOTE:

1. See Sheet EG-18 for State Highway Light ID Tag Indicator Legend
2. See Sheet EE-17 for Traffic Signal Work.

Graphic Scale:
1" = 20' 20' 10' 0 20' 40'
Scale in Feet

Street Light & Traffic Signal Plan 34 - Intersection M

Scale: 1" = 20'

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

FILE: Z:\Acad\projects\220067HA\ED34_220067HL_SLTS_Roadway Plan 34 - Intersection M.dwg saved July 15, 2022

SCOTT N. SHIRAISHI LICENSED PROFESSIONAL ENGINEER No. 14753-E HAWAII U.S.A.

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Scott Shiraishi April 30, 2024
SIGNATURE EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 REVISED NOTE AND SYMBOLS

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STREET LIGHT & TRAFFIC SIGNAL PLAN 34

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

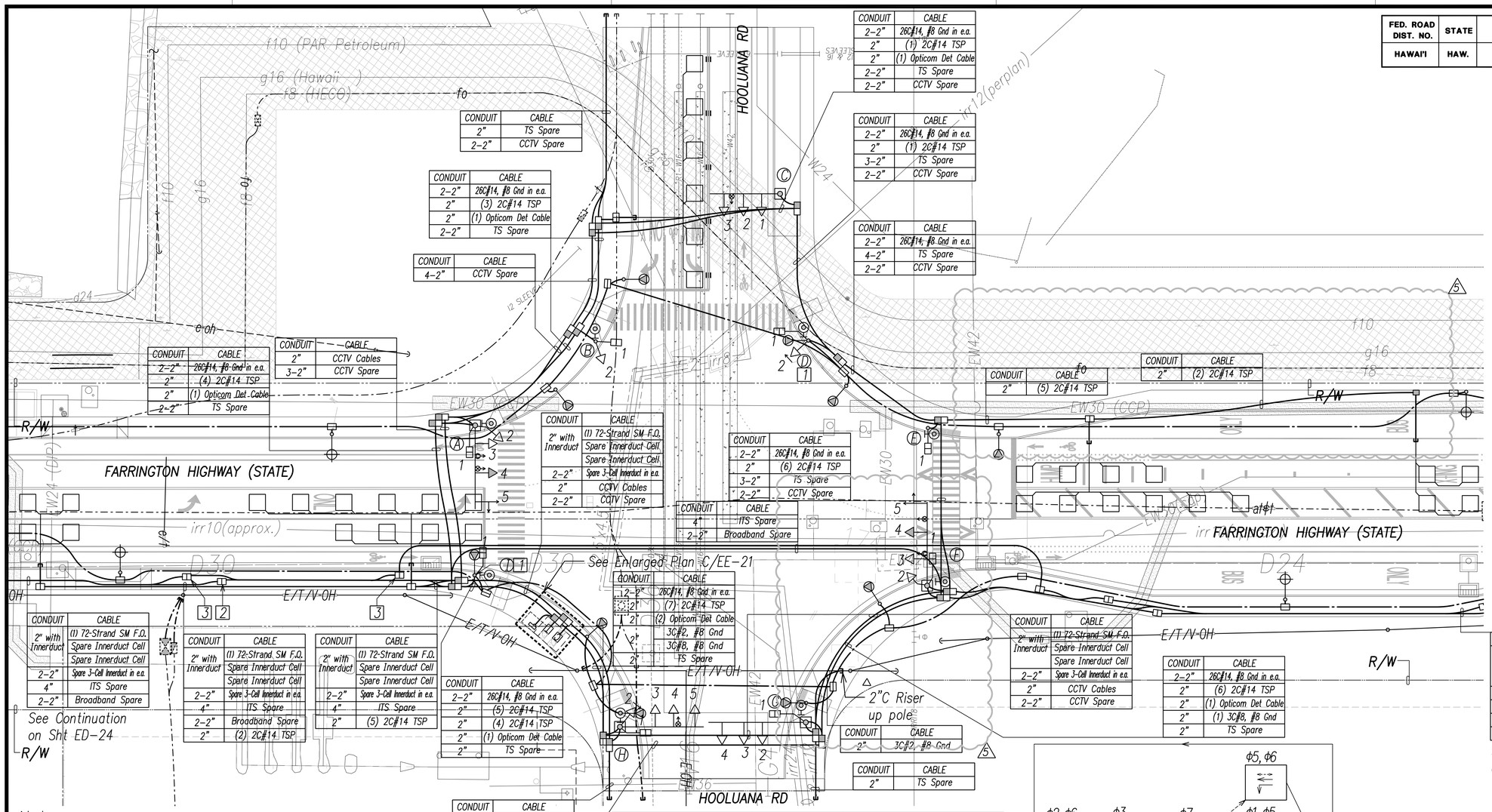
Scale: As Shown Date: April 2022

SHEET No. ED-34 OF 35 SHEETS

ADD. 645

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	EE-14	790

APRIL 2022



CONDUIT	CABLE
2"	TS Spare
2–2"	CCTV Spare

CONDUIT	CABLE
2–2"	26C#14, #8 Gnd in e.a.
2"	(3) 2C#14 TSP
2"	(1) Opticom Det Cable
2–2"	TS Spare

CONDUIT	CABLE
4–2"	CCTV Spare

CONDUIT	CABLE
2–2"	26C#14, #8 Gnd in e.a.
2"	(1) 2C#14 TSP
2"	(1) Opticom Det Cable
2–2"	TS Spare
2–2"	CCTV Spare

CONDUIT	CABLE
2–2"	26C#14, #8 Gnd in e.a.
2"	(1) 2C#14 TSP
3–2"	TS Spare
2–2"	CCTV Spare

CONDUIT	CABLE
2–2"	26C#14, #8 Gnd in e.a.
4–2"	TS Spare
2–2"	CCTV Spare

CONDUIT	CABLE
2–2"	26C#14, #8 Gnd in e.a.
2"	(4) 2C#14 TSP
2"	(1) Opticom Det Cable
2–2"	TS Spare

CONDUIT	CABLE
2"	CCTV Cables
3–2"	CCTV Spare

CONDUIT	CABLE
2" with Innerduct	(1) 72-Strand SM F.O.
	Spare Innerduct Cell
	Spare Innerduct Cell
2–2"	Spare 3-Cell Innerduct in e.a.
2"	CCTV Cables
2–2"	CCTV Spare

CONDUIT	CABLE
2–2"	26C#14, #8 Gnd in e.a.
2"	(6) 2C#14 TSP
3–2"	TS Spare
2–2"	CCTV Spare

CONDUIT	CABLE
4"	ITS Spare
2–2"	Broadband Spare

CONDUIT	CABLE
2"	(5) 2C#14 TSP

CONDUIT	CABLE
2"	(2) 2C#14 TSP

CONDUIT	CABLE
2" with Innerduct	(1) 72-Strand SM F.O.
	Spare Innerduct Cell
	Spare Innerduct Cell
2–2"	Spare 3-Cell Innerduct in e.a.
4"	ITS Spare
2–2"	Broadband Spare

CONDUIT	CABLE
2" with Innerduct	(1) 72-Strand SM F.O.
	Spare Innerduct Cell
	Spare Innerduct Cell
2–2"	Spare 3-Cell Innerduct in e.a.
4"	ITS Spare
2"	(5) 2C#14 TSP

CONDUIT	CABLE
2–2"	26C#14, #8 Gnd in e.a.
2"	(5) 2C#14 TSP
2"	(4) 2C#14 TSP
2"	(1) Opticom Det Cable
2"	TS Spare

CONDUIT	CABLE
2–2"	26C#14, #8 Gnd in e.a.
2"	(7) 2C#14 TSP
2"	(2) Opticom Det Cable
2"	3C#2, #8 Gnd
2"	3C#8, #8 Gnd
2"	TS Spare

CONDUIT	CABLE
2"	3C#2, #8 Gnd

CONDUIT	CABLE
2"	TS Spare

CONDUIT	CABLE
2–2"	CCTV Spare

CONDUIT	CABLE
2–2"	26C#14, #8 Gnd in e.a.
2"	(7) 2C#14 TSP
2"	(1) Opticom Det Cable
2"	3C#2, #8 Gnd
2"	3C#8, #8 Gnd
2"	TS Spare

CONDUIT	CABLE
2" with Innerduct	(1) 72-Strand SM F.O.
	Spare Innerduct Cell
	Spare Innerduct Cell
2–2"	Spare 3-Cell Innerduct in e.a.
2"	(1) 3C#8, #8 Gnd
4"	ITS Spare
2–2"	Broadband Spare

POLE	TYPE
A	Type II–30'
B	Type I–10'
C	Type II–25'
D	Street Light
E	Type I–10'
F	Type II–30'
G	Type II–35'
H	Type II–30'
I	Street Light

Notes:

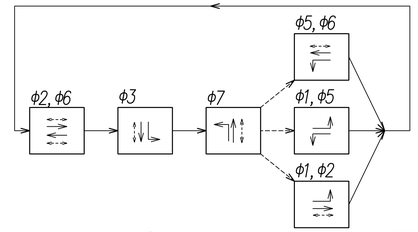
1. Traffic Signal Equipment to be Mounted on Street Light. Provide 2"C to TS Handhole.
2. Type "B" TSPB to be labeled "ITS"
3. Type "B" TSPB to be labeled "STATE BROADBAND"
4. All Traffic Signal Conduits to be in Minimum 3" Concrete Encasement.
5. All TSPB to be Labeled "STATE SIGNAL" Unless Noted Otherwise.

Signal Indication	(LED)	(LED)	(LED)	(LED)
Description	12" RYG Ball	12" RYG (Left Arrow)	12" RYG (Str. Arrow)	Pedestrian Signal Head
Pole Letter–Signal Head Number	A–2 G–2	A–5*	A–4	A–1 I–1
	A–3 G–3	D–2	F–4	B–1
	B–2 G–4	F–5*		D–1
	C–1 H–3	H–2		E–1
	C–2 H–4			F–1
	C–3 H–5			G–1
	F–2			H–1
	F–3			

* Indicates Programmed Visibility Signal Head

Traffic Signal Plan – Intersection K

Scale: 1" = 20'



Phase Sequence Diagram

- Protected Movement
- Permitted Movement
- Pedestrian Movement

Graphic Scale:

1" = 20' 20' 10' 0 20' 40'

Scale in Feet

DATE	REVISION
07/15/22	5 EQUIPMENT LOCATION REVISIONS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL PLAN INTERSECTION K

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A–01–20

Scale: As Shown Date: April 2022

GEORGE D. TAKASE
LICENSED PROFESSIONAL ENGINEER
No. 13741–E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

SHEET No. EE-14 OF 790 SHEETS

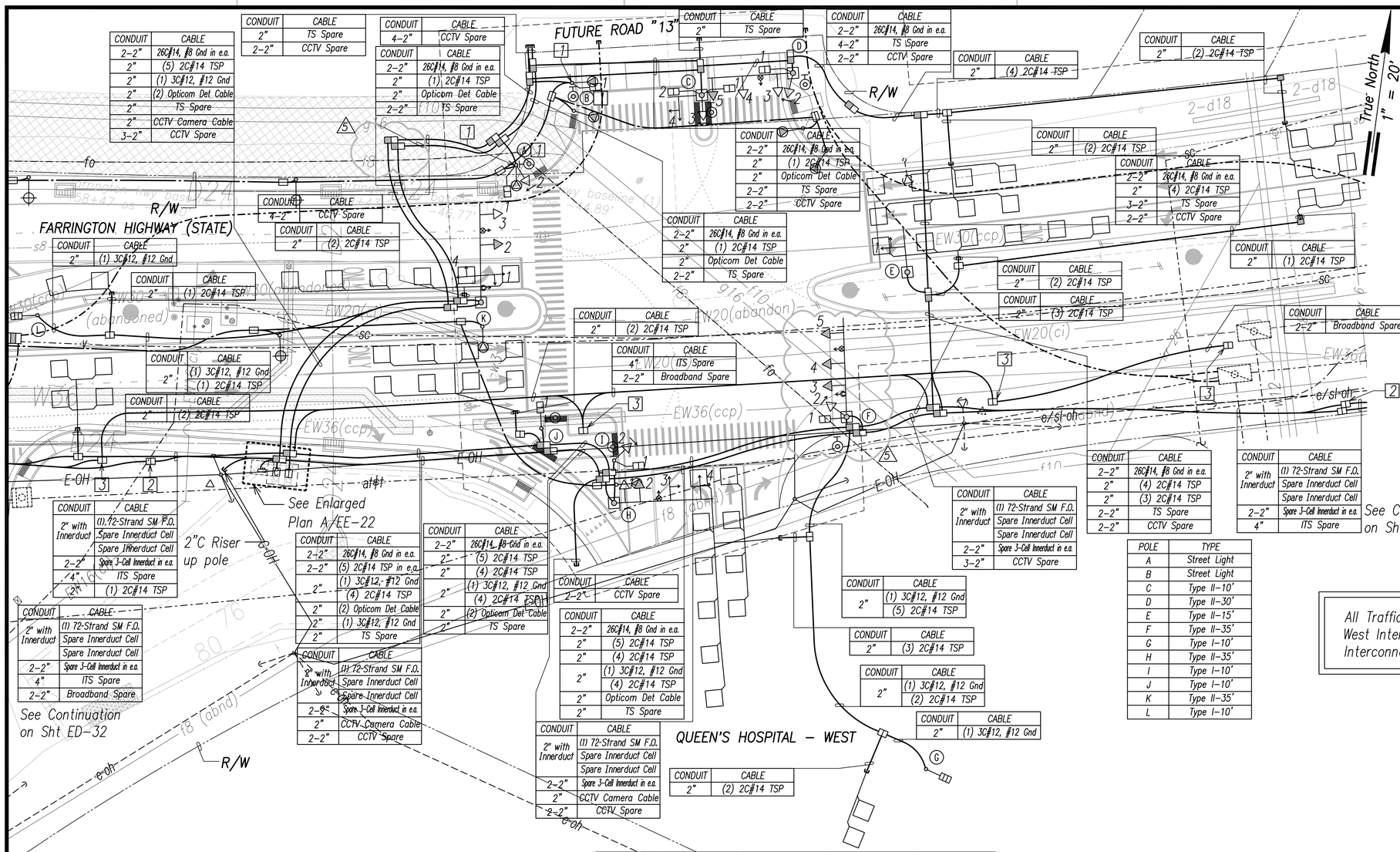
ORIGINAL PLANS	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

FILE: Z:\Acad\projects\220067\VEE14_220067IL_INTERSECTION K.dwg saved July 15, 2022

ADD. 660

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	EE-17	790

APRIL 2022



CONDUIT	CABLE
2-2"	26C#14, #8 Gnd in e.a.
2"	(5) 2C#14 TSP
2"	(1) 3C#12, #12 Gnd
2"	(2) Opticom Det. Cable
2"	TS Spare
2"	CCTV Camera Cable
3-2"	CCTV Spare

CONDUIT	CABLE
2"	TS Spare
2-2"	CCTV Spare

CONDUIT	CABLE
4-2"	CCTV Spare

CONDUIT	CABLE
2-2"	26C#14, #8 Gnd in e.a.
2"	(1) 2C#14 TSP
2"	Opticom Det Cable
2-2"	TS Spare

CONDUIT	CABLE
2"	TS Spare

CONDUIT	CABLE
2-2"	26C#14, #8 Gnd in e.a.
4-2"	TS Spare
2-2"	CCTV Spare

CONDUIT	CABLE
2"	(4) 2C#14 TSP

CONDUIT	CABLE
2"	(2) 2C#14 TSP

CONDUIT	CABLE
2-2"	26C#14, #8 Gnd in e.a.
2"	(1) 2C#14 TSP
2"	Opticom Det Cable
2-2"	TS Spare
2-2"	CCTV Spare

CONDUIT	CABLE
2-2"	26C#14, #8 Gnd in e.a.
2"	(4) 2C#14 TSP
3-2"	TS Spare
2-2"	CCTV Spare

CONDUIT	CABLE
2"	(1) 2C#14 TSP

CONDUIT	CABLE
2-2"	26C#14, #8 Gnd in e.a.
2"	(1) 2C#14 TSP
2"	Opticom Det Cable
2-2"	TS Spare

CONDUIT	CABLE
2"	(1) 3C#12, #12 Gnd

CONDUIT	CABLE
2"	(1) 3C#12, #12 Gnd
	(1) 2C#14 TSP

CONDUIT	CABLE
2"	(2) 2C#14 TSP

CONDUIT	CABLE
2"	(2) 2C#14 TSP

CONDUIT	CABLE
4"	ITS Spare
2-2"	Broadband Spare

CONDUIT	CABLE
2-2"	Broadband Spare

CONDUIT	CABLE
2" with Innerduct	(1) 72-Strand SM F.O.
	Spare Innerduct Cell
	Spare Innerduct Cell
2-2"	Spare 3-Cell Innerduct in e.a.
4"	ITS Spare
2"	(1) 2C#14 TSP

CONDUIT	CABLE
2" with Innerduct	(1) 72-Strand SM F.O.
	Spare Innerduct Cell
	Spare Innerduct Cell
2-2"	Spare 3-Cell Innerduct in e.a.
4"	ITS Spare
2-2"	Broadband Spare

CONDUIT	CABLE
2-2"	26C#14, #8 Gnd in e.a.
2-2"	(5) 2C#14 TSP in e.a.
2"	(1) 3C#12, #12 Gnd
	(4) 2C#14 TSP
2"	(2) Opticom Det Cable
2"	(1) 3C#12, #12 Gnd
2"	TS Spare

CONDUIT	CABLE
2" with Innerduct	(1) 72-Strand SM F.O.
	Spare Innerduct Cell
	Spare Innerduct Cell
2-2"	Spare 3-Cell Innerduct in e.a.
2"	CCTV Camera Cable
2-2"	CCTV Spare

CONDUIT	CABLE
2-2"	26C#14, #8 Gnd in e.a.
2"	(5) 2C#14 TSP
2"	(4) 2C#14 TSP
2"	(1) 3C#12, #12 Gnd
	(4) 2C#14 TSP
2"	(1) 3C#12, #12 Gnd
	(4) 2C#14 TSP
2"	(2) Opticom Det Cable
2"	TS Spare

CONDUIT	CABLE
2-2"	CCTV Spare

CONDUIT	CABLE
2-2"	26C#14, #8 Gnd in e.a.
2"	(5) 2C#14 TSP
2"	(4) 2C#14 TSP
2"	(1) 3C#12, #12 Gnd
	(4) 2C#14 TSP
2"	Opticom Det Cable
2"	TS Spare

CONDUIT	CABLE
2" with Innerduct	(1) 72-Strand SM F.O.
	Spare Innerduct Cell
	Spare Innerduct Cell
2-2"	Spare 3-Cell Innerduct in e.a.
2"	CCTV Camera Cable
2-2"	CCTV Spare

CONDUIT	CABLE
2" with Innerduct	(1) 72-Strand SM F.O.
	Spare Innerduct Cell
	Spare Innerduct Cell
2-2"	Spare 3-Cell Innerduct in e.a.
2-2"	CCTV Spare
3-2"	CCTV Spare

CONDUIT	CABLE
2"	(1) 3C#12, #12 Gnd
	(5) 2C#14 TSP

CONDUIT	CABLE
2"	(3) 2C#14 TSP

CONDUIT	CABLE
2"	(1) 3C#12, #12 Gnd
	(2) 2C#14 TSP

CONDUIT	CABLE
2"	(1) 3C#12, #12 Gnd

CONDUIT	CABLE
2"	(2) 2C#14 TSP

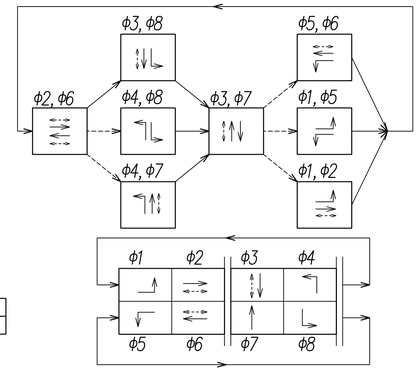
CONDUIT	CABLE
2-2"	26C#14, #8 Gnd in e.a.
2"	(4) 2C#14 TSP
3-2"	TS Spare
2-2"	CCTV Spare

CONDUIT	CABLE
2"	(1) 2C#14 TSP

CONDUIT	CABLE
2-2"	Broadband Spare

CONDUIT	CABLE
2" with Innerduct	(1) 72-Strand SM F.O.
	Spare Innerduct Cell
	Spare Innerduct Cell
2-2"	Spare 3-Cell Innerduct in e.a.
4"	ITS Spare

POLE	TYPE
A	Street Light
B	Street Light
C	Type II-10'
D	Type II-30'
E	Type II-15'
F	Type II-35'
G	Type I-10'
H	Type II-35'
I	Type I-10'
J	Type I-10'
K	Type II-35'
L	Type I-10'



Phase Sequence Diagram

- Protected Movement
- Permitted Movement
- Pedestrian Movement

All Traffic Signal Work to be Part of the Queen's West Intersection Work. CCTV, Broadband, and Interconnect to be Part of Base Bid Work.

Graphic Scale:
1" = 20' 20' 10' 0 20' 40'
Scale in Feet

Notes:

1. Future Traffic Signal Equipment to be Mounted on Street Light. Provide 2"C to TS Handhole.
2. Type "B" TSPB to be labeled "ITS"
3. Type "B" TSPB to be labeled "STATE BROADBAND"
4. All Traffic Signal Conduits to be in Minimum 3" Concrete Encasement.
5. All TSPB to be Labeled "STATE SIGNAL" Unless Noted Otherwise.

Signal Indication	(LED)	(LED)	(LED)	(LED)
Description	12" RYG Ball	12" RYG (Left Arrow)	12" RYG (Str. Arrow)	Pedestrian Signal Head
Pole Letter–Signal Head Number	D-3 D-4 H-1 K-3	A-2 H-3* C-3 H-4* C-4* I-2 D-2 K-1* E-1* K-4* F-2	D-5 F-3 F-4 F-5 H-2 K-2	D-1 B-1 F-1 C-1 I-1 C-2 J-1 A-1

* Indicates Programmed Visibility Signal Head (Non-LED)

Note: Poles ⑥ and Ⓛ are Type I-10' With Flashing Signal Heads with Sign: "STOP AHEAD WHEN FLASHING"

Traffic Signal Plan – Intersection M

Scale: 1" = 20'

Graphic Scale:
1" = 20' 20' 10' 0 20' 40'
Scale in Feet

GEORGE D. TAKASE
LICENSED PROFESSIONAL ENGINEER
No. 13741-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 EQUIPMENT LOCATION REVISIONS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL PLAN INTERSECTION M

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

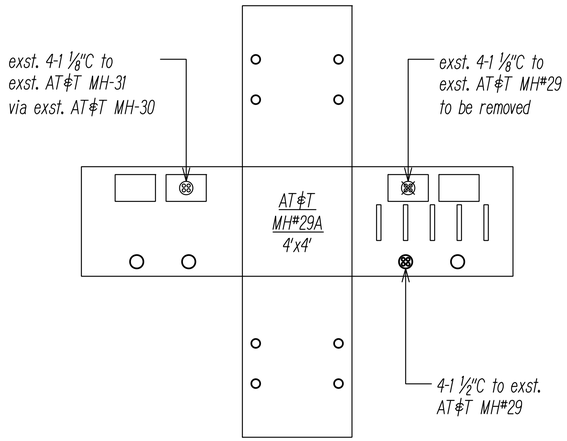
SHEET No. EE-17 OF 23 SHEETS

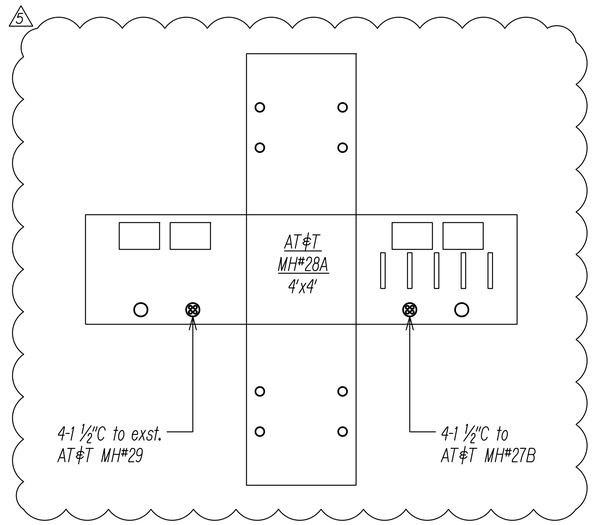
ORIGINAL PLAN
SURVEY PLOTTED BY
DRAWN BY
NOTE BOOK
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
No.
DATE

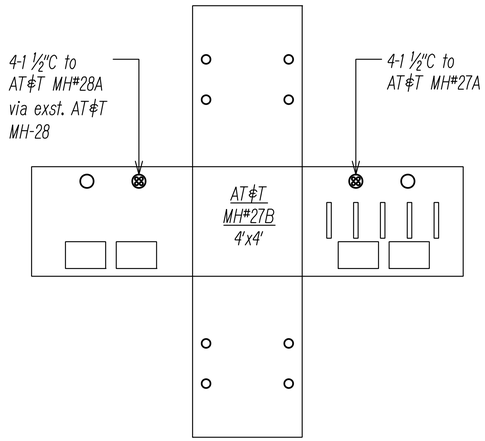
FILE: Z:\Acad\projects\220067HI\EE17_220067HI_INTERSECTION M.dwg saved July 15, 2022

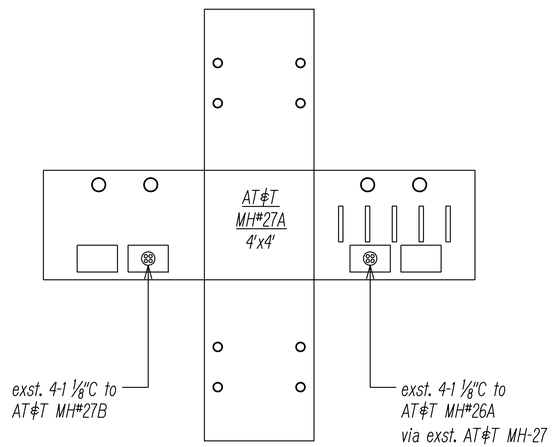
ADD. 663

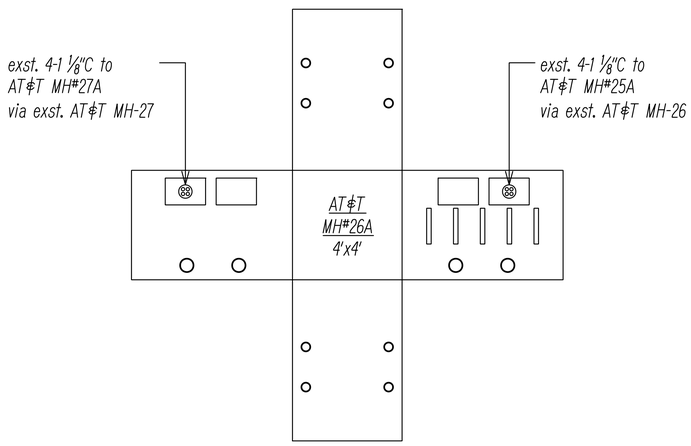
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	EF-19	790

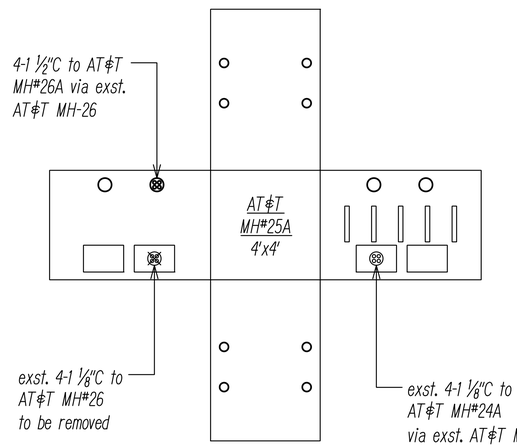












AT&T MANHOLE DETAILS 4

NOT TO SCALE

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

FILE: Z:\ACAD\PROJECTS\220067HL\EF19_220067HL_ATT-MH-DETAIL-04.dwg saved June 28, 2022

DATE	REVISION
07/15/22	5 ADDED BUS BAYS & BWS CMTS

DUSTIN Y. NAKAMOTO
LICENSED PROFESSIONAL ENGINEER
No. 14287-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

April 30, 2024
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

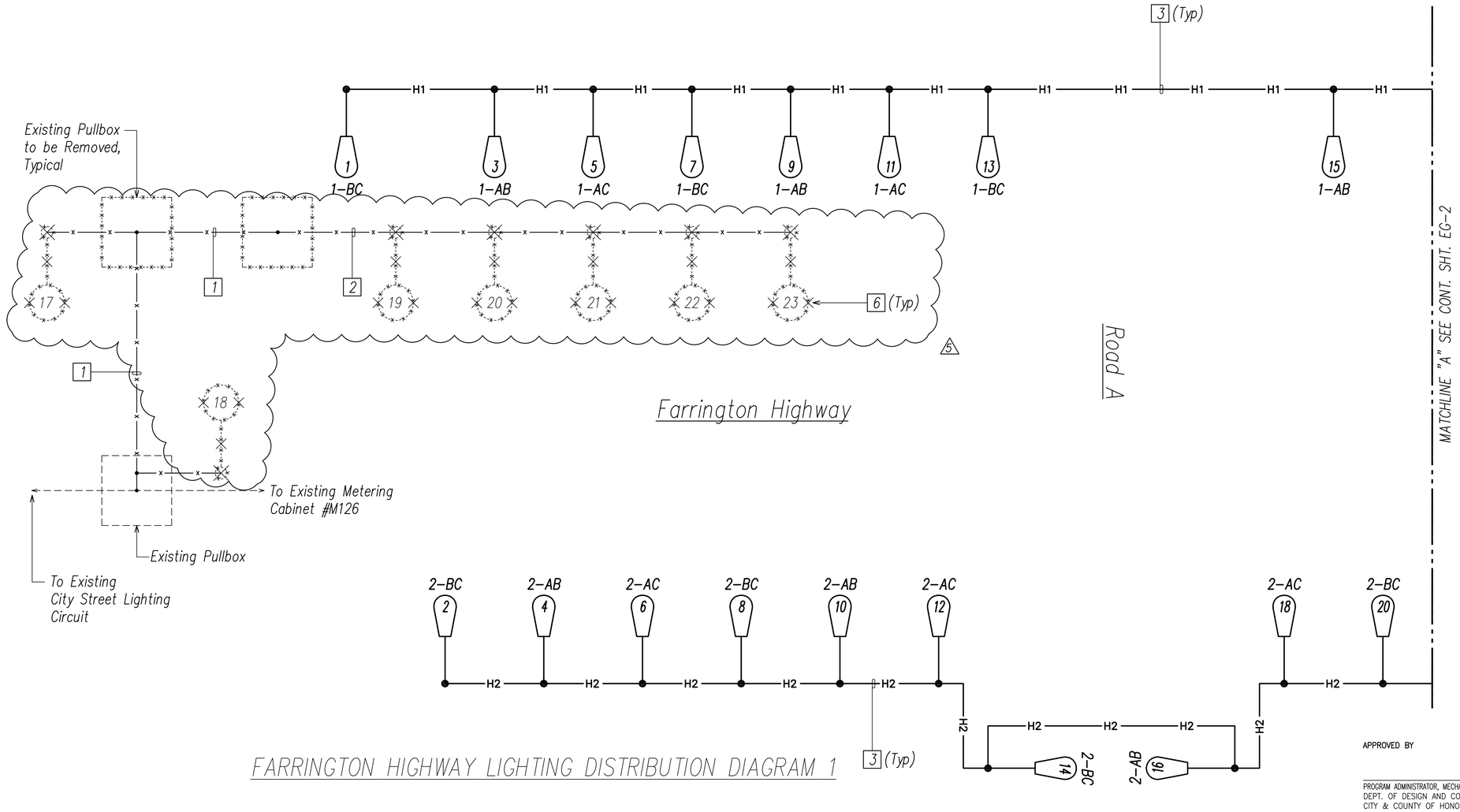
AT&T MANHOLE DETAILS 4

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

ADD. 688

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	EG-01	790



FARRINGTON HIGHWAY LIGHTING DISTRIBUTION DIAGRAM 1

APPROVED BY

PROGRAM ADMINISTRATOR, MECHANICAL/ELECTRICAL DIVISION DATE
DEPT. OF DESIGN AND CONSTRUCTION
CITY & COUNTY OF HONOLULU

DIAGRAM NOTES: (Items in ( ) Identified on Diagrams as Boxed Items)

(1) Existing Underground Conductors, to be Removed
(2) Existing Overhead Conductors, to be Removed
(3) New 2"C, 3#2, 1#2 Gnd
4. General Notes:
   a. Not all Highway Light Pullboxes are shown; See Highway Lighting Plans for Conduit and Pullbox Requirements.
   b. For Typical Highway Lighting Standard Wiring Connection Diagram, See Sheet EG-14.
5. ~~New Pullboxes and Junction Boxes Are Not~~ Shown on Diagram for Clarity.
(6) Existing City Street Light, to be Removed 5

DIAGRAM WIRING SYMBOLS:

Symbol	Description
H1	Denotes New Conduit with New Lighting Circuit H1
H2	Denotes New Conduit with New Lighting Circuit H2
K3	Denotes New Conduit with New Lighting Circuit H3.
K4	Denotes New Conduit with New Lighting Circuit H4.
- - - - - - - - - -	Denotes Existing Equipment and Wiring.
—x—x—x—	Denotes Existing Equipment, Conduit, and Wiring to be Removed.

SCOTT N. SHIRASHI LICENSED PROFESSIONAL ENGINEER No. 14753-E HAWAII U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

Scott Shirashi April 30, 2024
SIGNATURE EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 REVISED SYMBOLS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING CONNECTION DIAGRAM 1

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

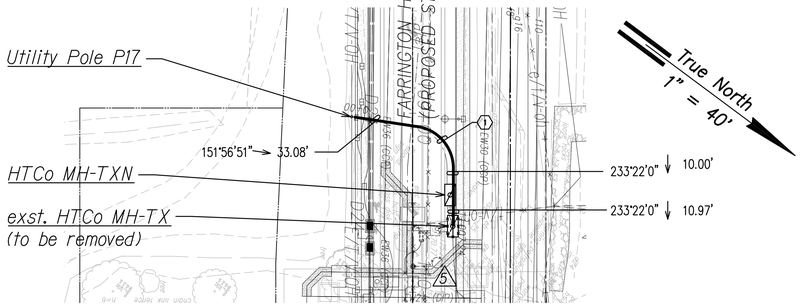
SHEET No. EG-01 OF 17 SHEETS

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

FILE: Z:\ADA\PROJECTS\220607HI\E01_220607HI hwy lt connection diagram 1.dwg saved July 15, 2022

ADD. 691

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	EK-02	790

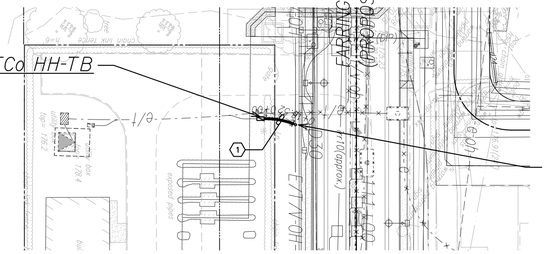


HTCO DUCTLINE "D1"

CURVE DATA						
ID	Δ	Δ / 2	RADIUS	T	C	Lc
1	84°0'46"	42°0'22.9"	23.62'	21.27'	31.62'	34.64'

HTCo Ductline "D1" - Plan

Scale: 1" = 40'

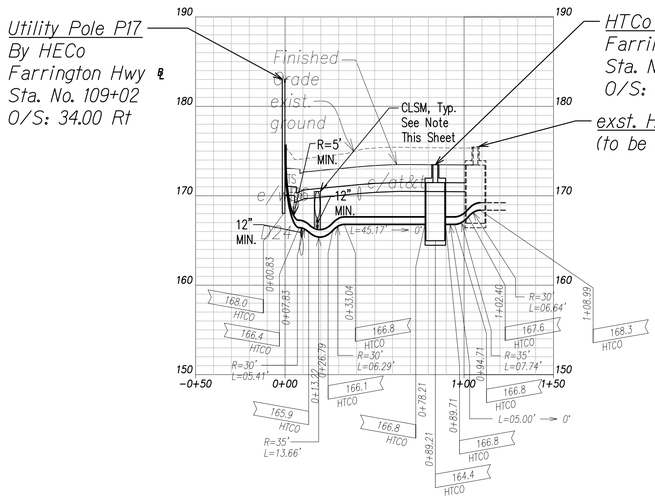


HTCo Ductline "D2" - Plan

Scale: 1" = 40'

HTCO DUCTLINE "D2"

CURVE DATA						
ID	Δ	Δ / 2	RADIUS	T	C	Lc
1	22°21'26"	11°10'43.2"	42.29'	8.36'	16.40'	16.50'



HTCo Ductline "D1" - Profile

Scale: Horiz. 1"= 40'
Vert. 1" - 4'

HTCo Ductline "D2" - Profile

Scale: Horiz. 1"= 40'
Vert. 1" - 4'

Note:
The Contractor Shall Provide Controlled Low Strength Material (CLSM) in Areas Where Required Compaction Cannot be Met. CLSM Shall be Extended a Minimum of 2' Beyond the Waterline at the Crossing and Shall Extend to the Top of the Crossing Pipe.

Graphic Scales:

Horiz. 1" = 40' — 40' 20' 0 40' 80'

Vert. 1" = 4' — 4' 2' 0 4' 8'

Scale in Feet

APPROVED BY

HAWAIIAN TELCOM DATE

DUSTIN Y. NAKAMOTO LICENSED PROFESSIONAL ENGINEER No. 14287-E HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

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

DATE	REVISION
07/15/22	5 UPDATED HTCO DUCTLINE "D1"
06/08/22	2 ADDED DRAWING

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCo DUCTLINE PLAN & PROFILE "D1 & "D2"

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

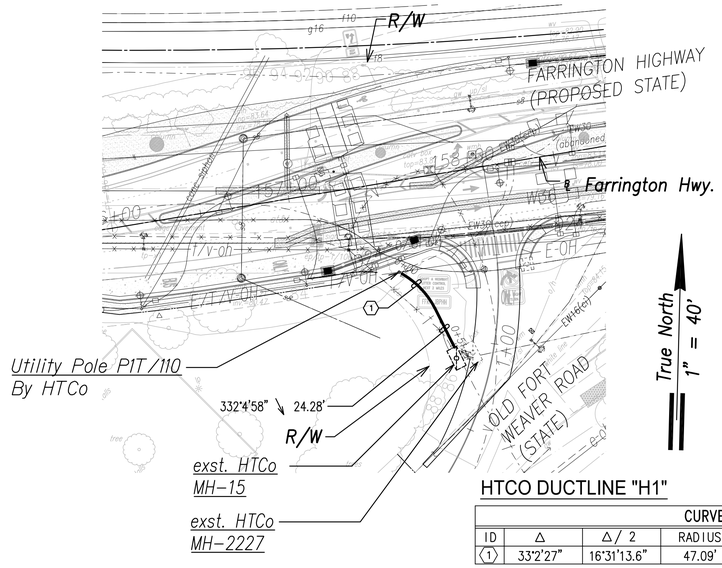
Scale: As Shown Date: April 2022

SHEET No. EK-02 OF 5 SHEETS

FILE: Z:\ACAD\PROJECTS\230067H\Dwg\230067H_HTCo-Ductline-Plan-Profile-01-02.dwg saved July 14, 2022

ADD. 742

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	EK-05	790

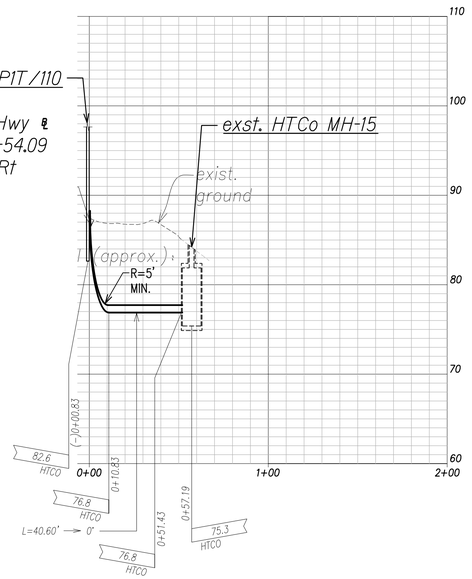


HTCo Ductline "H1" - Plan

Scale: 1" = 40'

HTCO DUCTLINE "H1"

CURVE DATA						
ID	Δ	Δ / 2	RADIUS	T	C	Lc
1	33°2'27"	16°31'13.6"	47.09'	13.97'	26.78'	27.16'

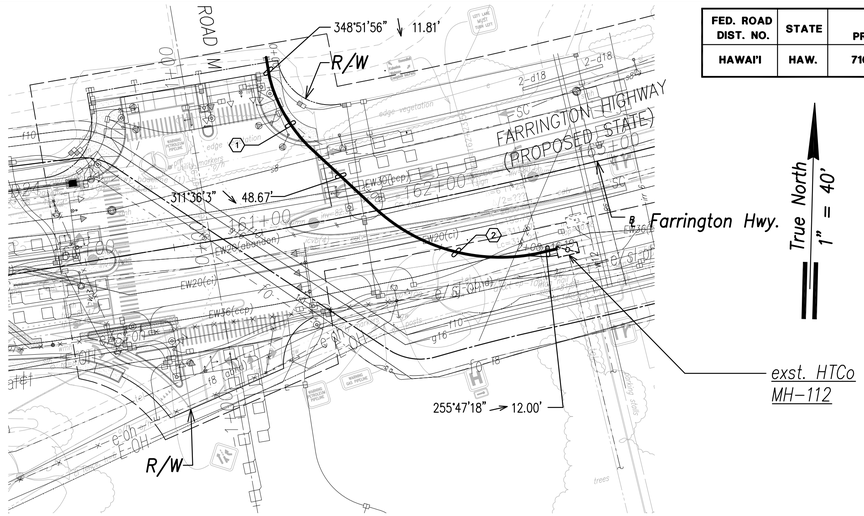


HTCo Ductline "H1" - Profile

Scale: Horiz. 1"= 40'
Vert. 1" = 4'

5

Note:
The Contractor Shall Provide Controlled Low Strength Material (CLSM) in Areas Where Required Compaction Cannot be Met. CLSM Shall be Extended a Minimum of 2' Beyond the Waterline at the Crossing and Shall Extend to the Top of the Crossing Pipe.

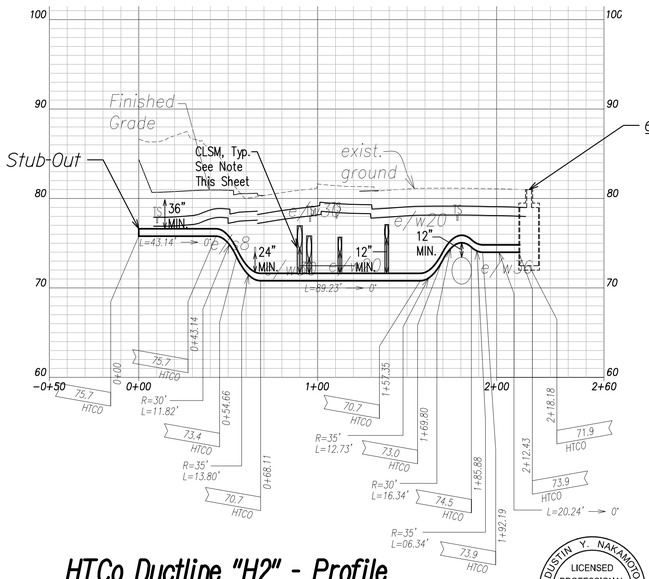


HTCo Ductline "H2" - Plan

Scale: 1" = 40'

HTCO DUCTLINE "H2"

CURVE DATA						
ID	Δ	Δ / 2	RADIUS	T	C	Lc
1	29°21'3"	14°40'31.4"	85.32'	22.35'	43.23'	43.71'
2	55°32'19"	27°46'9.7"	102.67'	54.06'	95.67'	99.52'



HTCo Ductline "H2" - Profile

Scale: Horiz. 1"= 40'
Vert. 1" = 4'

Graphic Scales:

Horiz. 1" = 40' 40' 20' 0 40' 80'

Vert. 1" = 4' 4' 2' 0 4' 8'

Scale in Feet

APPROVED BY

HAWAIIAN TELCOM DATE

STATE OF HAWAI'I
LICENSED PROFESSIONAL ENGINEER
No. 14287-E
DUSTIN Y. NAKAMOTO
HAWAII, U.S.A.

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DATE	REVISION
07/15/22	5 UPDATED HTCO DUCTLINE "H1"
06/08/22	2 ADDED DRAWING

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCo DUCTLINE PLAN & PROFILE "H1" & "H2"

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

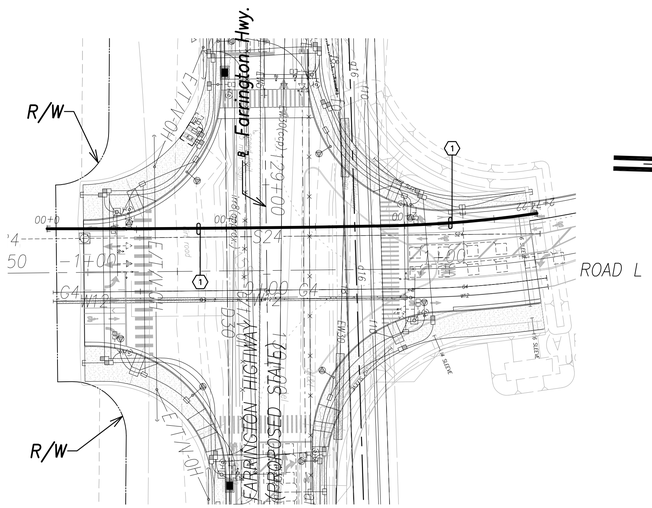
SHEET No. EK-05 OF 5 SHEETS

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

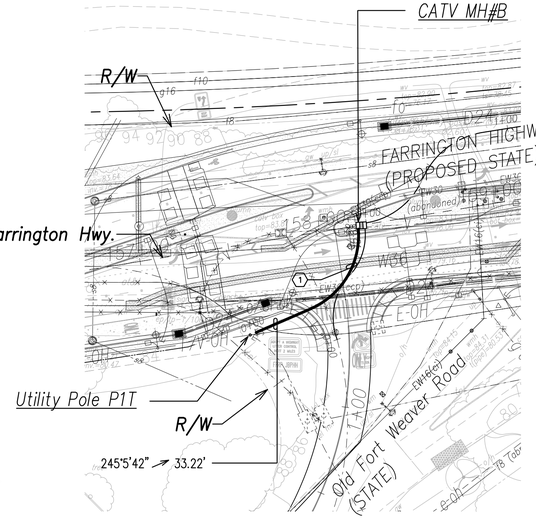
FILE: Z:\ACAD\PROJECTS\220067HA\EK05_220067H_HTCo-Ductline-Plan-Profile-H1-H2.dwg saved July 14, 2022

ADD. 745

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	EL-05	790



True North
1" = 40'



True North
1" = 40'

CATV Ductline "G3" - Plan

Scale: 1" = 40'

CATV DUCTLINE "G3"

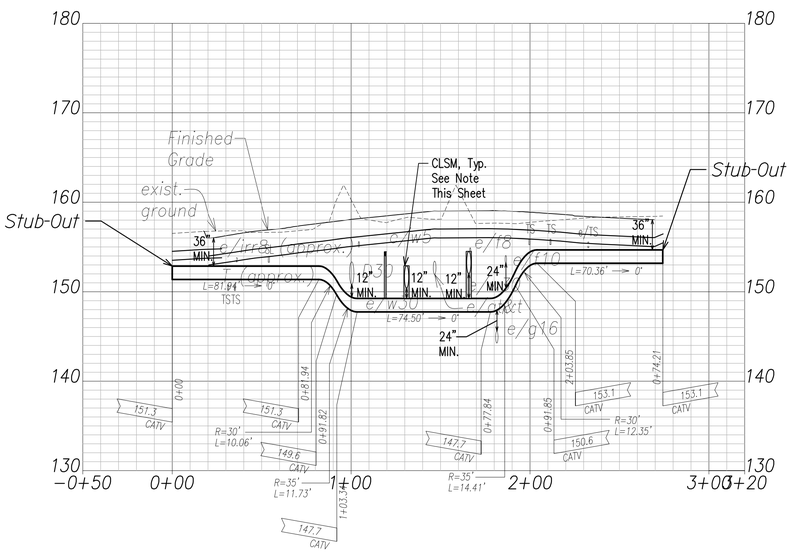
CURVE DATA						
ID	Δ	Δ / 2	RADIUS	T	C	Lc
1	1°17'38"	0°38'48.9"	8665.42'	97.84'	195.68'	195.68'
2	6°47'38"	3°23'48.9"	662.32'	39.31'	78.49'	78.53'

CATV Ductline "H1" - Plan

Scale: 1" = 40'

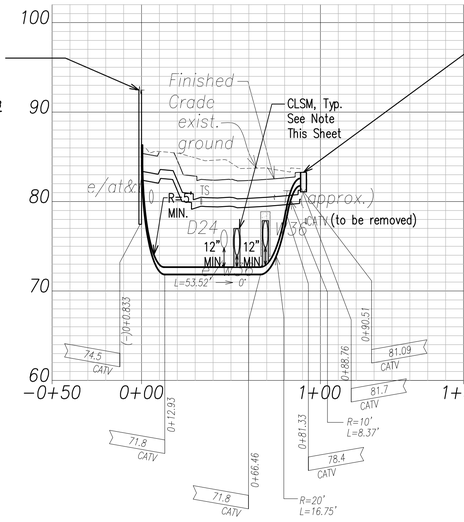
CATV DUCTLINE "H1"

CURVE DATA						
ID	Δ	Δ / 2	RADIUS	T	C	Lc
1	71°28'35"	35°44'17.3"	44.52'	32.04'	52.01'	55.54'



CATV Ductline "G3" - Profile

Scale: Horiz. 1"= 40'
Vert. 1" - 4'



CATV Ductline "H1" - Profile

Scale: Horiz. 1"= 40'
Vert. 1" - 4'

Graphic Scales:

20' 0 40' 80'

Vert. 1" = 4' 4' 2' 0 4' 8'

Scale in Feet

APPROVED BY

SPECTRUM OCEANIC DATE

DUSTIN Y. NAKAMOTO
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SIGNATURE April 30, 2024 EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 REVISED CATV DUCTLINE "H1"
06/08/22	2 ADDED DRAWING

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CATV DUCTLINE PLAN & PROFILE "G3" & "H1"

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

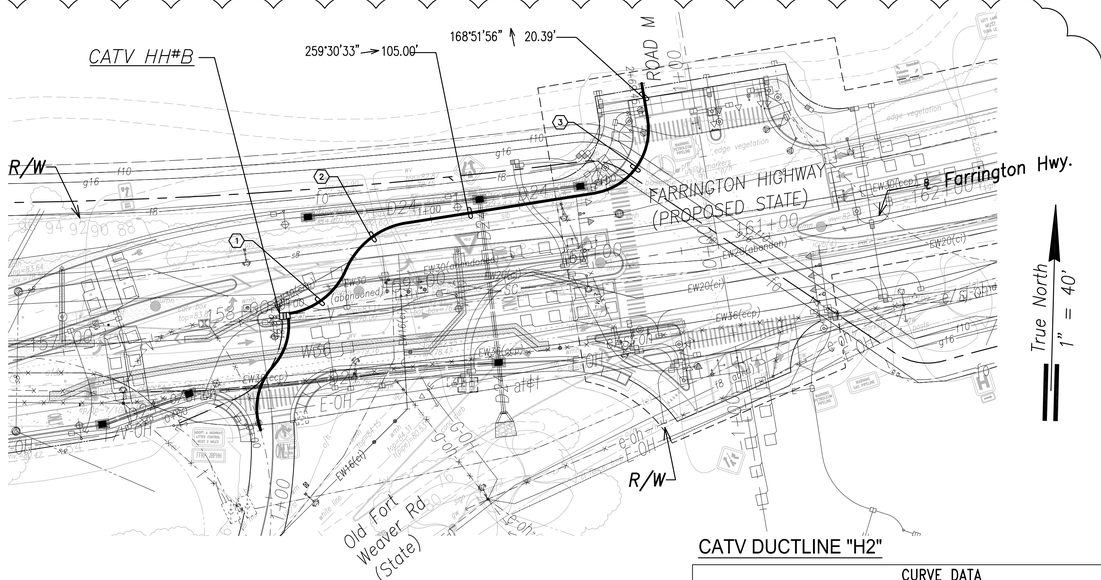
SHEET No. EL-05 OF 6 SHEETS

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

FILE: Z:\ACAD\PROJECTS\23006\FHLEL05_23006FHL CATV-Ductline-Plan-Profile-G3-H1.dwg saved July 15, 2022

ADD. 749S-1

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	EL-06	790

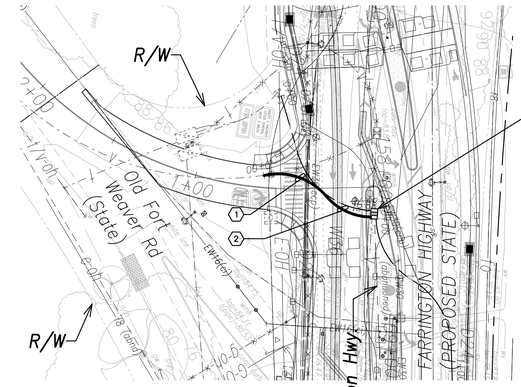


CATV Ductline "H2" - Plan

Scale: 1" = 40'

CATV DUCTLINE "H2"

CURVE DATA						
ID	Δ	Δ / 2	RADIUS	T	C	Lc
1	58°9'24"	29°4'42.2"	41.37'	23.01'	40.21'	41.99'
2	59°37'35"	29°48'47.3"	44.36'	25.42'	44.11'	46.17'
3	89°25'18"	44°42'39.2"	35.85'	35.49'	50.44'	55.95'

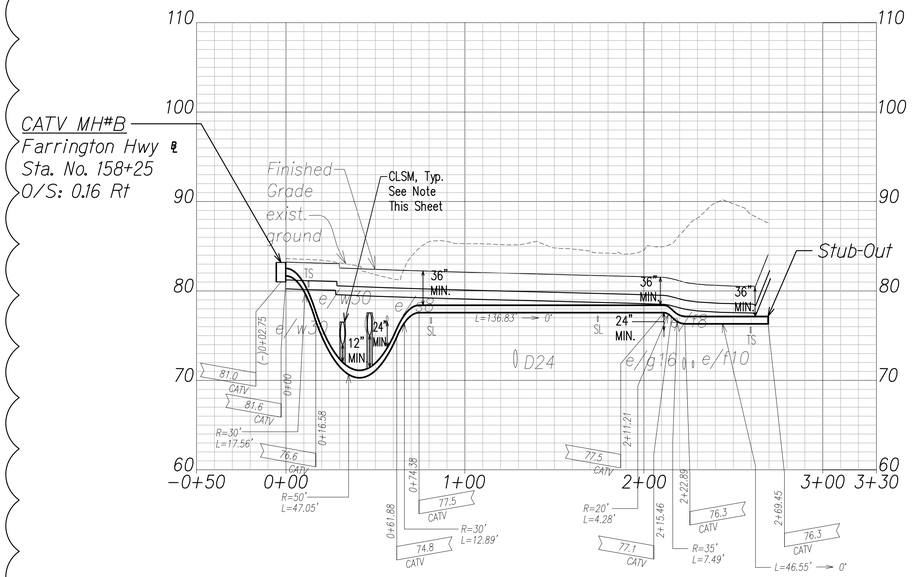


CATV Ductline "H3" - Plan

Scale: 1" = 40'

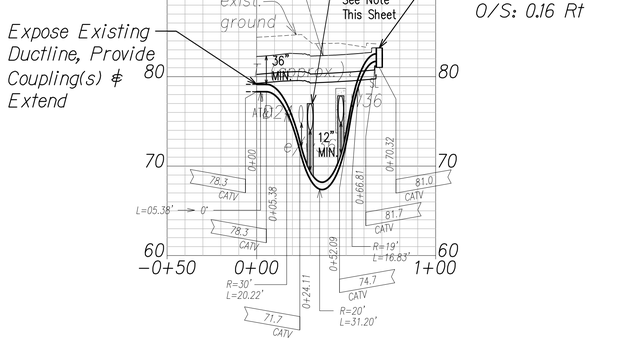
CATV DUCTLINE "H3"

CURVE DATA						
ID	Δ	Δ / 2	RADIUS	T	C	Lc
1	64°14'32"	32°7'16.2"	35.06'	22.01'	37.29'	39.31'
2	45°20'15"	22°40'7.4"	33.57'	14.02'	25.87'	26.56'



CATV Ductline "H2" - Profile

Scale: Horiz. 1"= 40'
Vert. 1" - 4'



CATV Ductline "H3" - Profile

Scale: Horiz. 1"= 40'
Vert. 1" - 4'

DATE	REVISION
07/15/22	5 UPDATED CATV DUCTLINE "H2"
06/08/22	2 ADDED DRAWING

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CATV DUCTLINE PLAN & PROFILE "H2" & "H3"

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. EL-06 OF 6 SHEETS

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

FILE: Z:\ACAD\PROJECTS\22006\HI\EL06_22006HI_CATV-Ductline-Plan-Profile-H2-H3.dwg saved July 15, 2022

APPROVED BY
SPECTRUM OCEANIC DATE

Graphic Scales:
20' 0 40' 80'
Vert. 1" = 4'
4' 2' 0 4' 8'
Scale in Feet

DUSTIN Y. NAKAMOTO
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HAWAII, U.S.A.

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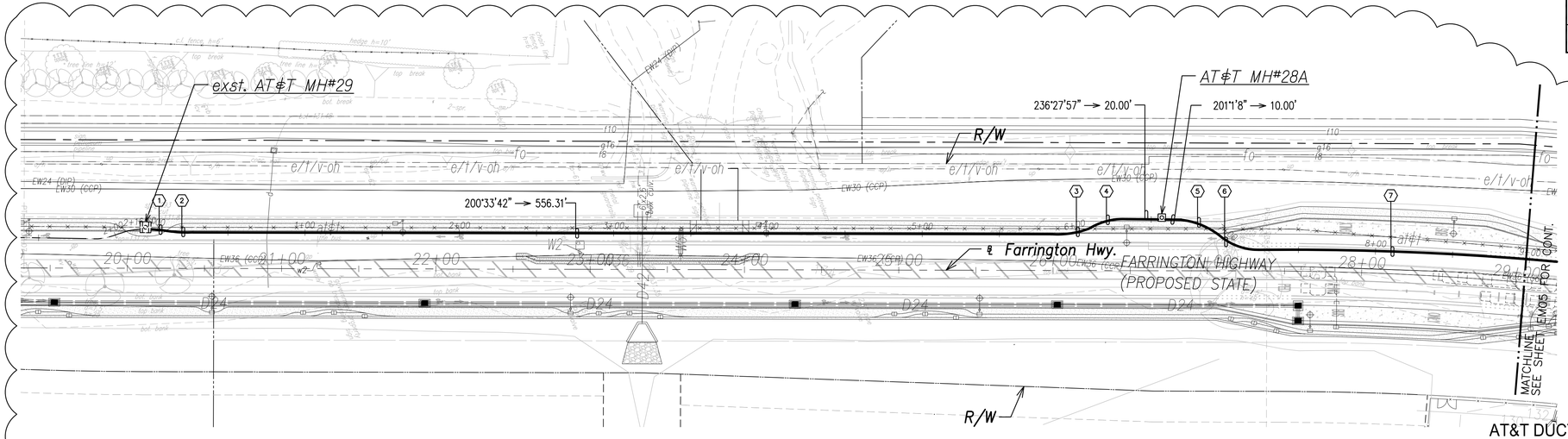
SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

ADD. 749S-2

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	EM-04	790

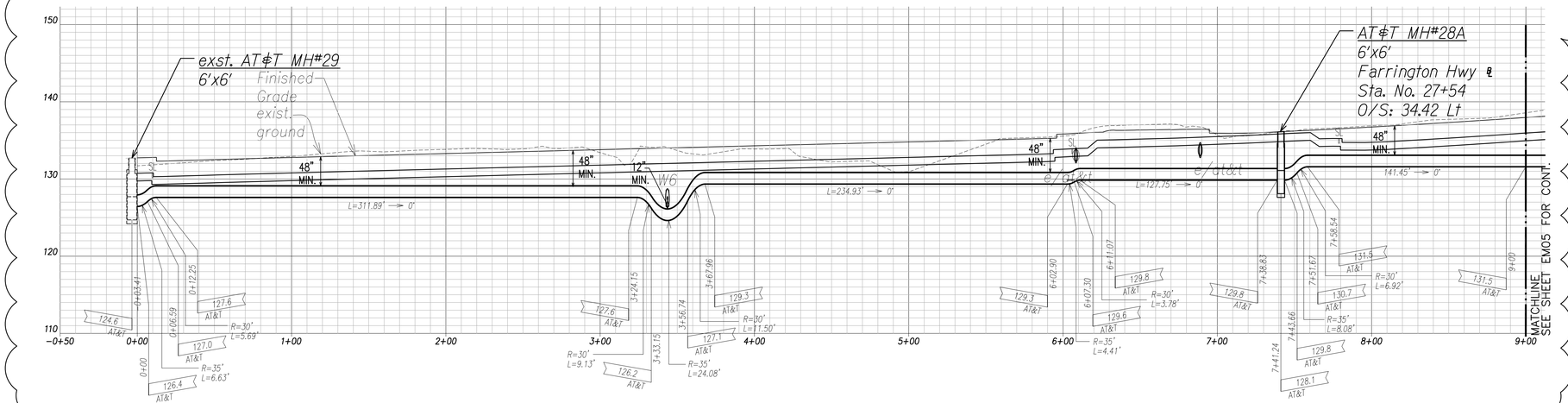


AT&T Ductline "B1" - Plan

Scale: 1" = 40'

AT&T DUCTLINE "B1"

CURVE DATA						
ID	Δ	Δ / 2	RADIUS	T	C	Lc
1	4°30'45"	2°15'22.7"	173.63'	6.84'	13.67'	13.68'
2	11°14'51"	5°37'25.6"	69.21'	6.82'	13.57'	13.59'
3	24°6'4"	12°3'2.0"	59.09'	12.61'	24.67'	24.85'
4	35°28'40"	17°44'19.9"	42.07'	13.46'	25.64'	26.05'
5	34°19'34"	17°9'46.9"	50.50'	15.60'	29.80'	30.25'
6	36°10'27"	18°5'13.6"	39.24'	12.81'	24.36'	24.77'
7	5°5'42"	2°32'51.1"	1950.54'	86.78'	173.40'	173.45'



AT&T Ductline "B1" - Profile

Scale: Horiz. 1"= 40'
Vert. 1" = 4'

Graphic Scales:

Horiz. 1" = 40' 40' 20' 0 40' 80'

Vert. 1" = 4' 4' 2' 0 4' 8'

Scale in Feet

DATE	REVISION
07/15/22	5 UPDATED AT&T DUCTLINE "B1"
06/08/22	2 ADDED DRAWING

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

AT&T DUCTLINE PLAN & PROFILE "B1"

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. EM-04 OF 10 SHEETS

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HAWAII, U.S.A.

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	DESIGNED BY	
	QUANTITIES BY	
No.	CHECKED BY	

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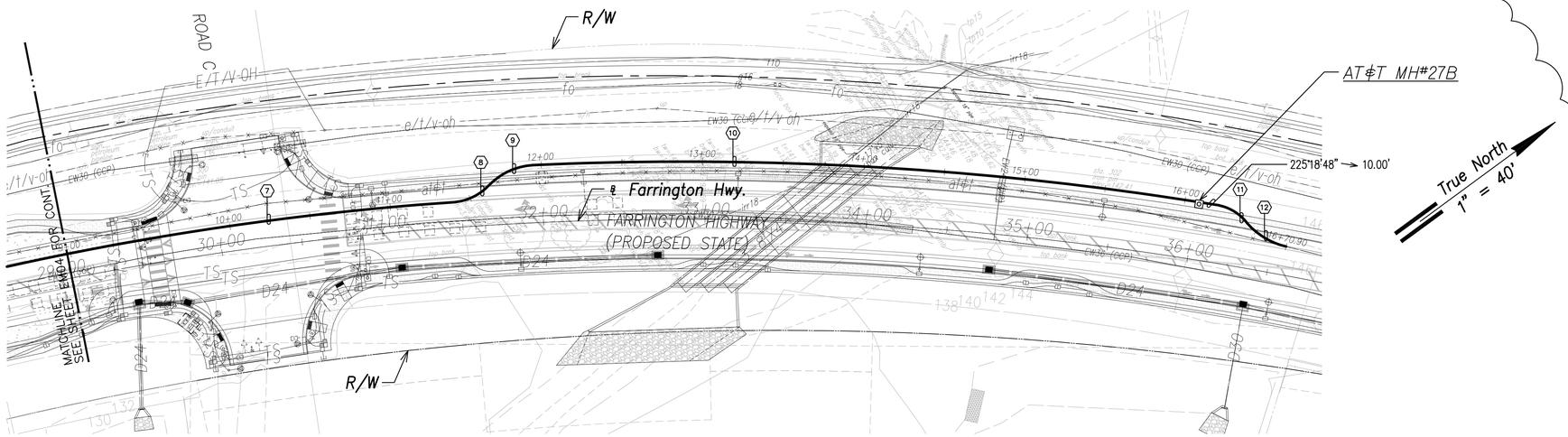
ADD. 749S-6

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAI'I	HAW.	710A-01-20	2021	EM-05	790

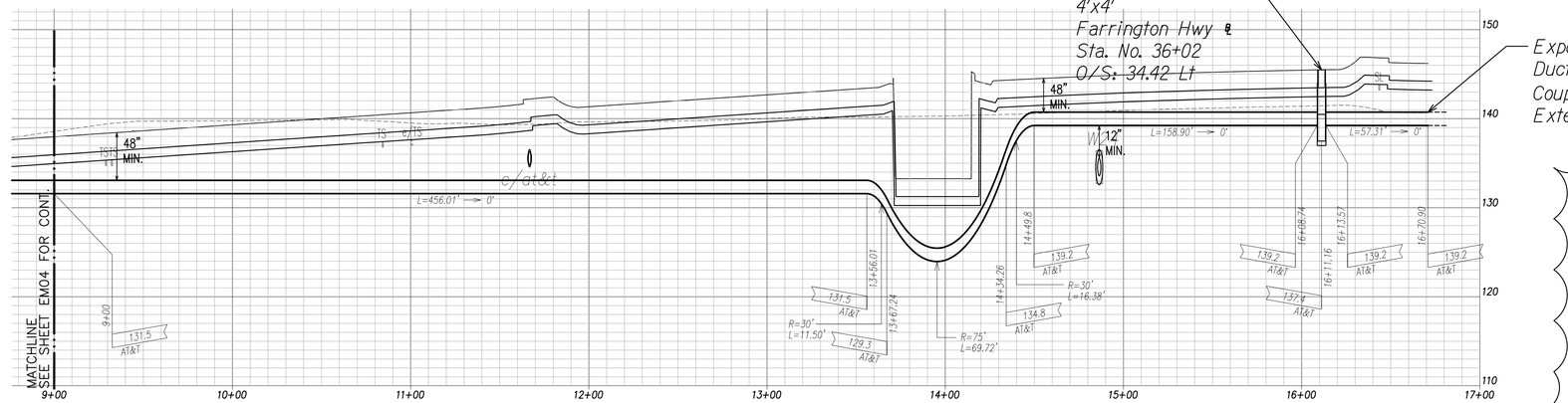


AT&T Ductline "B1" - Plan

Scale: 1" = 40'

AT&T DUCTLINE "B1"

CURVE DATA						
ID	Δ	Δ/ 2	RADIUS	T	C	Lc
⑦	7°24'26"	3°42'13.0"	1880.17'	121.70'	242.90'	243.07'
⑧	39°41'57"	19°50'58.6"	33.68'	12.16'	22.87'	23.34'
⑨	42°5'8"	21°2'33.9"	41.01'	15.78'	29.45'	30.12'
⑩	11°34'56"	5°47'28.1"	2039.16'	206.81'	411.51'	412.21'
⑪	40°30'53"	20°15'26.4"	30.18'	11.14'	20.90'	21.34'
⑫	35°2'35"	17°31'17.3"	46.17'	14.58'	27.80'	28.24'



AT&T Ductline "B1" - Profile

Scale: Horiz. 1"= 40'
Vert. 1" - 4'

Graphic Scales:

Horiz. 1" = 40' — 40' 20' 0 40' 80'

Vert. 1" = 4' — 4' 2' 0 4' 8'

Scale in Feet

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

FILE: Z:\ACAD\PROJECTS\230067HA\DIOS_230067HA_ATT-Ductline-Plan-Profile-B1-2.dwg saved July 14, 2022

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DUSTIN Y. NAKAMOTO LICENSED PROFESSIONAL ENGINEER No. 14287-E HAWAII, U.S.A.

SIGNATURE — April 30, 2024 EXPIRATION DATE OF THE LICENSE

DATE	REVISION
07/15/22	5 UPDATED AT&T DUCTLINE "B1"
06/08/22	2 ADDED DRAWING

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

AT&T DUCTLINE PLAN & PROFILE "B1"

FARRINGTON HIGHWAY WIDENING
Kapolei Golf Course Road to Fort Weaver Road
Project No. 7101A-01-20

Scale: As Shown Date: April 2022

SHEET No. EM-05 OF 10 SHEETS

ADD. 749S-7

Questions for solicitation: B22001933 7101A-01-20 Farrington Hwy Widening, Kap. G. Course to Ft W. Rd

118. **Please confirm that the State's contractor maintaining the light nodes (I believe it is Johnson Controls) will be activating/bringing on-line the light nodes for the new lights and any activation costs will be covered by HDOT.**

Confirmed

119. **What is the new end date for RFI's?**

Please review information provided on HIePRO.

120. **There is no bid item for fiber optic equipment, termination and splicing. Please add a lump sum bid item for this work.**

Equipment should be incidental to the installation of the CCTV equipment. Splicing and termination is incidental to the fiber optic cables. See specs from addendum 2.

121. **Addendum 2 Traffic Control Plan TC-16 (Sheet 765) calls for temporary traffic signals for the Mauka Side but does not show what is required. Please provide temporary traffic control plan and lump sum bid item for this work.**

The plans specified that contractor shall design and provide a temporary traffic signal system. Cost shall be considered incidental to proposal item 645.1000.

122. **Fiber Optic Cable Spec Section 642.02, Paragraph F says the City will furnish the single-mode fiber optic cable for this project. Please advise where this single-mode fiber optic cable is being installed as I only see multi-mode fiber optic cable being installed for this project.**

There is no section 642. Section 647.02.F for the FOC does not mention single-mode FOC. There is no paragraph F in section 627.02 for the CCTV cameras.

123. **Please correct the index to drawings on the plan Title Sheet. Additional electrical sheets were added which go to Sheet 761 which overlaps the traffic control plan sheets that go from Sheet 750 to 780**

Electrical sheet numbers revised. Please see Addendum 5.

124. **The limits of demolition do not seem to capture the extents of all of the existing asphalt. Please clarify if it is the intention of the project to demolish and remove all of the existing asphalt along or we should only anticipate demolishing the asphalt within the limits of demolition as stated in note 1 on the demolition sheets.**

Please follow demolition plans. The existing pavement outside of the limits will not be removed.

125. **Sheet 101 of Addendum 2 added DMH L1-1. Please provide an additional bid item for this as the manhole is 10.00-10.99 and does not fall under any of the current bid items. Please see Addendum 5 for revised manhole bid items.**

126. **Addendum 2 eliminated bid item 604.2000 for the special drain manhole 9.00-9.99. We believe that this item was intended for the special drain manhole over the existing 6'x2.5' box culvert. Please advise as to which bid item this work would be incidental to. Please see Addendum 5 for revised manhole bid items.**

127. **Please refer to bid item 204.1000 Trench Excavation for Water Lines. Does the 7,887 CY include the excavation for the jackets on the existing water lines? Based on our takeoffs the quantity seems low if it were to consider both the excavation for new water lines as well as the excavation for the jackets on existing lines.**

The quantity for 204.1000 does include excavation to install concrete jackets on existing waterlines.

128. **Can you please clarify what bid items the drain headwalls should be incidental to?**

Please see proposal items 503.8000, 503.8010, 503.8020 and 503.8030 in Addendum 5.

129. **Please refer to note 3 on Sheet Add 4. This note states that the contractor shall install a temporary concrete barrier where the earth berm is removed. The existing earth berm runs down nearly the entire alignment of the project. The RFI responses from Addendum 2 indicate that the contractor shall install a 10' Dust Fence along the entire limits of grading. Will the concrete barrier be in addition to the dust fence installation or will the dust fence be considered a suitable barrier?**

Dust fence is not suitable barrier. The contractor shall provide dust fence and concrete barrier as indicated on plans.

130. **The existing berm along the farm properties are know to be made mostly of rubbish, green waste and other unsuitable materials . It is not possible to accurately determine the volume of material from this berm that would be suitable for reuse on this project. It is also not possible to determine the amount of rubbish that will be encountered in the berm. Please consider making an allowance item for the handling and disposal of the unsuitable material from the existing berms.**
The contractor shall bid in accordingly. Cost for handling and disposal of trash in various items of work is incidental.

131. **The AT&T Directional Drilling Plan & Profile calls 6" Ø Permalok steel casing pipe with a 200' vertical radius. Industry Standards dictate that the profile should utilize a 600' radius. Furthermore, Section 652.03(C)(3) Construction – Guidance System does not allow walkover guidance systems. Wireline guidance system require 3.5" Ø drill pipe, which further prohibits a tight radius. Please confirm HDD Bore Profile Attachment. Please see revised directional drilled profile with the attached Addendum No.5.**

132. **Can the microtunnel installation on Sheet No. C-181 be substituted with a conventional auger bore / Jack & Bore? The Contractor substitute micro-tunnel installation provided they obtain approval from the BWS for their revised design, takes 100% responsibility for their design, and meets Army Corps of Engineers Section 404 requirements for their work.**

133. **Special Provision Section 108, lines 23 -25, of Addendum 2 indicates "During the period between the Notice to Proceed and the Start Work Date the Contractor should adjust work forces, equipment, schedules, and procure materials and required permits, prior to beginning physical work." Please confirm that HDOT and its consultants will review and approve submittals during this period (up to 450 days after NTP). Please also confirm that the timelines for submittal approval stated in the contract documents shall apply during this period.**
Confirmed.

134. **Can the microtunnel installation on the Sheet No. C-181 be substituted with a conventional auger bore / Jack & Bore?**

See response for question number 132.

135. **The AT&T Directional Drilling Plan & Profile calls 6" Ø Permalok steel casing pipe with a 200' vertical radius. Industry Standards dictate that the profile should utilize a 600' radius. Furthermore, Section 652.03(C)(3) Construction – Guidance System does not allow walkover guidance systems. Wireline guidance system require 3.5" Ø drill pipe, which further prohibits a tight radius. Please confirm HDD Bore Profile Attachment (attachment will be emailed). Please see revised directional drilled profile with the attached Addendum No.5.**

136. **Please refer to special provision 675 - Mass Concrete. The description of this work describes mass concrete, which is the placement of any large volume of cast in place concrete with dimensions large enough to require taking measures to cope with the generation of heat from hydration of cement and attendant volume change. It is unclear what elements of the proposed project would be subject to the requirements of this specification section. Please consider providing a list of construction elements that would be governed by this specification.**

Elements that are considered mass concrete include but are not limited to the drilled shaft cap beams and end beams for both Honouliuli Stream Bridge and Kaloi Stream Bridge. Please see Addendum No.5 for revised special provisions Section 675 – Mass Concrete for requirements.

137. **The water line relocation work calls for Ductile Iron x CCP adapters. These adapters are custom made based on the true outside diameter at each tie in location. Prior to ordering these adapter the contractor needs to expose the existing line, break the concrete around the steel cylinder and measure the true outside diameter of the using a large caliper (typically borrowed from BWS). The concrete around the cylinder can then be patched and the excavation backfilled while the contractor waits on the fittings to arrive. Two of these fittings per tie in for the CCP sections are required and they are long lead items. Can this work be after the NTP date and prior to the official work start date? If not, has the duration of these operations and the procurement of these fittings been anticipated in the allowed time to complete the project?**

HDOT has accounted for long lead item procurement by the contractor, between NTP and start work date. Construction sequencing will be at the approval of the Engineer.

138. **Will HDOT pay for Materials on Hand for long lead items that are ordered after the NTP date and delivered prior to the work start date?**

Contractor is responsible for procurement and potential storage of materials.

139. **1. DOH Noise Variance: Addendum 2 Response to Question 1 confirms Contractor is responsible to obtain the Noise Variance. The Contractor has no control over the DOH as to whether such a variance will be given or what restrictions might be imposed. Given the considerable LD's on the project and a tight overall schedule, the Contractor cannot price the work when DOH terms and conditions for a Noise Variance if one is granted at all, are unknown. The State should be responsible for any changes that are imposed by future DOH edicts, that differ from normal work shifts. Please confirm?**

HDOT is currently applying for a Noise Variance with DOH. Contractor may furnish HDOT's approved Noise Variance as supporting documentation for Contractor's own Noise Variance. Contractor will be held liable for days over contract time, as determined by the Engineer.

140. **2. Referencing Addendum No.2, Question 2: Please clarify when the OWNER long-lead items will be obtained. This information is vital for the contractor to determine when to begin construction, as this could delay the start and completion of this project substantially.**

HDOT long lead items will be obtained between NTP and start work date. Contractor's start work date will not be affected.

141. **3. Referencing spec. 641 Hydro-Mulch Seeding – Is erosion control matting required over all landscaped areas?**

Erosion control matting is required on all sloped areas 2 horizontal to 1 vertical or steeper.

142. **4. Sheet C-181: In what bid item will Microtunneling be paid?**

Specification and proposal item will be added and issued within Addendum 5.

143. **Please clarify where the proposal schedule for Queens West starts and ends. Is this from the match line (Sta. 154+00) on Electrical Plan 19 to the match line (Sta. 164+73.18) on Electrical Plan 20?**

The start of the Queens West work starts at station 159+85. Pls see Addendum 5.

144. **Plan sheet 480 – SC2.5 – Hunehune Gulch Box Culvert Inlet Bottom Slab – Detail A. Reinforcing spacing indicates 86 bars on the 54'-8" side and 72 bars on the 23'10 3/16" side. Which is correct?**
Please follow 86 bars requirement, please see revision in Addendum No.5.

145. **Plansheet 481 – SC2.6 – Hunehune Gulch Box Culvert Top Slab – Detail A. Reinforcing spacing indicates 86 bars on the 54'-8" side and 72 bars on the 23'10 3/16" side. Which is correct?**
Please follow 86 bars requirement, please see revision in Addendum No.5.

146. **Plansheet 482 – SC2.7 – Hunehune Gulch Box Culvert Outlet Bottom Slab – Detail A. Reinforcing spacing indicates 93 bars on the 62'0 1/16" side and 86 bars on the 23'10 3/16" side. Which is correct?**
Please follow 93 bars requirement, please see revision in Addendum No.5.

147. **Plansheet 483 – SC2.8 – Hunehune Gulch Box Culvert Outlet Top Slab – Detail A. Reinforcing spacing indicates 93 bars on the 62'0" side and 86 bars on the 28'6" side. Which is correct?**
Please follow 93 bars requirement, please see revision in Addendum No.5.

148. **"Addendum 02, RFI Question #13 - Drawing C-5 (Sheet 6), Construction Notes – 4, Note 5, required the Contractor to retain the services of a licensed Professional Engineer(s) for quality control. This Contractor requested a specification. The response did not address the question. Is the Farrington Highway Widening project a Contractor Quality Control project, such that the Contractor provides inspection, sampling, testing, laboratory testing, daily reports, and licensed Professional Engineer oversite and certification? If so a specification should be provided for the Contractor to price the work."**
Note deleted. Please see Addendum No. 5.

149. **"Addendum 02, RFI Question #16 - Drawings C-28 through C-31, Typical Sections, …….. The question was not answered and the subject drawings have not been revised to answer the question. Contractor requests specifications for the Biaxial Polypropylene Geogrid and Non-Woven Geotextile Fabric."**

Added Geogrid Special Provision 316. Please see Addendum 5.

150. **Addendum 02, RFI Question #17 and #18 - Bid Items 623.0039. RFI response states "Revised 622.3000 & 623.0039 to ALLOWANCE. Both 622.3000 and 623.0039 are L.S. in the Addendum No. 2 Proposal Schedule. Please confirm the correct unit of measure.**

Revised to "LS". See Addendum No. 5.

151. **Addendum 02, RFI Question #51 and #71 - Q51 states contractor to provide staging areas. Q71 states – "See Construction Parcels in Add. No. 2. If additional staging area is required, Contractor will be responsible for obtaining required land. Addendum No. 2 plans do not provide parcels for staging. Please issue plans with staging areas shown.**

The contractor shall use areas within the project limit for staging. If addition area is desired the Contractor shall be responsible for obtaining their own additional staging areas at their own cost

152. **"Addendum 02, RFI Question 69 - SP 203-1A, Lines 29-36 – Testing In-situ material 2' below subgrade. RFI answer states an allowance will be created. Addendum # 2 proposal does not include an allowance. Specify payment via new allowance item."**

Added pay item 203.1000. Please see Addendum No.5.

153. **Addendum 02, RFI Question 74 - Sheet C-2, Note 25. The original note specifies the Contractor is responsible for temporary relocation of existing utilities. The response to Q74 modifies the original not making all utility relocation the Contractors responsibility. The response should be changed to address temporary relocation only.**

The Contractor is responsible for temporary utilities. The cost for temporary utilities shall be incidental to the various items of work.

154. **Addendum 02, RFI Question 93 - Response states the CCTV Controller should be part of the Queens West Bid Items Schedule, however, Addendum 02 proposal does not have a bid item for the CCTV Controller. Please provide bid item.**

CCTV controller for the Queens West intersection is part of the main CCTV bid item, not part of Queens West.

155. **"There are several items in the electrical drawings that are not accounted for in the pay item proposal. Please provide respective bid item or advise where items need to be priced for: CCTV - (3) 2""C PVC W/ PULLSTRING. CONCRETE ENCASED CCTV - (8) 2""C PVC, W/ PULLSTRING. CONCRETE ENCASED CCTV - 2""C PVC, W/ PULLSTRING. CONCRETE ENCASED CCTV - 2""C PVC. CONCRETE ENCASED TS - (2) 3""C PVC, W/ PULLSTRING. CONCRETE ENCASED TS - (3) 2""C PVC W/ PULLSTRING. CONCRETE ENCASED 2-3""C PVC SCH 40, CONC.ENCASED (FOR TSP) @TRAFFIC CONTROLLER 4-2""C PVC SCH 40, CONC.ENCASED W/PULLSTRING (FOR TS SPARE (4)) 5-2""C PVC SCH 40, CONC.ENCASED (FOR TSP) @TRAFFIC CONTROLLER 1-3""C PVC SCH 40 (FOR EXTENSION) HECO DUCTLINE, FOUR 5-INCH CONDUIT ENCASED IN CONCRETE JACKET (FUTURE) HECO DUCTLINE, SIX 5-INCH CONDUIT ENCASED IN CONCRETE JACKET HECO DUCTLINE, TWO 4-INCH FIBRE OPTIC CONDUIT ENCASED IN CONCRETE JACKET TS - 2-3""C PVC W/ PULL STRING OUTDOOR CAT6 CCTV - CCTV CAMERA SECURITY - OPTICAL PRE-EMPTION DETECTOR WEATHERHEAD FOR TRAFFIC SIGNAL SERVICE TO BE INSTALLED ON POLE"**

All conduits to controller are considered incidental to the controller installation as the boxes are typically within 3' of the controller, per the specs. All installation and mounting equipment for Optical Pre-Emption Detector is incidental to the equipment being installed.

156. **Addendum 02, Sheet No. C-3 - Work Near Kahi Mohala - Note 2 requires completing the makai shoulder including retaining wall within four+E75 (4) months of receiving Notice to Proceed. This conflicts with Special Provision 108..01 Notice to Proceed (NTP), that allows the Contractor up to 450 calendar days after NTP to begin physical work. Additionally, a joint Pole Line runs the length of the makai shoulder in this area. Does the State mean four (4) months after beginning physical work?**

Note revised. See Addendum No. 5.

157. **In a previous RFI question, "Item Number 603.2002 states there is 481 LF of 36" RCP, Class III. This piping is not found on either the utility and drain profiles or the grading and drainage plan. Please confirm where this size piping is or if this piping does not exist." The answer to this question was, "Please see Addendum No. 2 for revised sheet (Grading and Drainage Plan BL Sta. 109+00 to BL Sta 118+00). 36" RCP quantity has also been revised in the proposal schedule." In Addendum No. 2, on this sheet the linear footage of 36" RCP is found to be 34 LF. Contractor has also not found any other**

quantity of this size RCP. The proposal quantity for Addendum No. 2 has not been changed. Please change the proposal quantity to the correct linear footage.

Revised quantity for pay item 603.2002. See Addendum No. 5.

158. **Sheet 32, Sheet No. C-31, Typical Sections - 4, on detail "Typical Section - Road 'K' and Road 'L' is a 2' Gutter called out as "Conc. Curb and Gutter See C&C Std. Det. R-4A Rev." This appears to be another type of curb and gutter other than the Curb, Type 2D and Curb, Type 2DG. Please add a separate bid items for this gutter.**

Curb changed to State Type 2DG. See Addendum No. 5.

159. **Addendum 02, Sheet No. 5.3 - Special Grated Drop Inlet B2 or D2. The maximum height that is shown is 16'. GDI D2 called out this drawing and is found to be greater than 17 feet. Please either provide drawing for this height GDI or change current drawing to include this height.**

See revised drawings for GDI height

160. **Addendum 02 removed Bid Item 617.1000 "Imported Planting Soil" from the Proposal, however in the original plans on Sheet No. C-31, Typical Sections - 4, on detail "Typical Section - Road 'K' and Road 'L'" there is found to be a planter strip with 4" of topsoil. This is not a plan sheet that is included in Addendum 02. Please either add this Bid Item back into the proposal, or provide an updated drawing of this detail without the planter strip.**

Planter strip removed. See Addendum No. 5.

161. **Addendum 02, Sheet No. C-87, Grading and Drainage Plan Sta. 13+00 to Stat. 22+00, GDI B2-A is labeled as a standard Type 2A-9P, however the callout for the drawing is for Special Type 2A-9P. Please confirm whether callout is incorrect or if GDI B2-A is mislabeled.**

Callouts of structure type are correct.

162. **Addendum 02 removed 604.2000 "Type Special Manhole, 9.99 to 9 Feet" from the proposal. Is contractor to assume the Special Drain Manhole, found on Addendum 02 Sheet No. C-88 "Grading and Drainage Plan Sta. 22+00 to Sta 31+00", is included in Bid Items 205.2200 "Structure Excavation for 42" Inlet/Outlet Structure", 205.5200 Structure Backfill for 42" Inlet/Outlet Structure", 503.2200 "Concrete for 42" Inlet/Outlet Structures" and 602.2200 "Reinforcing Steel for 42" Inlet/Outlet**

Structures". If this is not the case, please add a Bid Item for the Special Drain Manhole Found on Sheet No. C-88.

Yes, the Sp. DMH at Sta. 23+33.8, o/s 38' Lt. and 42" Drainage Culvert Headwall are to be covered under bid items 205.2200, 205.5200, 503.2200 and 602.2200.

163. **Addendum 02 Sheet No. C-92, Grading and Drainage Plan Sta 57+75 to Sta. 66+00, GDI F2 appears to be shown as a Special Drain Manhole, but it is labeled as a typical Drain Manhole. Please clarify.**

GDI F2 is shown and called out as a grated drop inlet (GDI), not a special drain manhole on sheet C-92.

164. **Addendum 02, ADD. 351, SHEET No. SA1.2, Specifies Revision 2 is an elevation change. Contractor can only find a partial bubble around Abutment 1 center of drilled shaft cap beam station at the baseline. Please clarify.**

"Elevation Change" was the incorrect terminology to use for Delta 2 Revision Block. It should have stated "Revised Stationing."

165. **Addendum 02, 8, Sheet No. C-7, Water Pollution And Erosion Control Notes, 8. Sediment and Erosion Control BMP measures shown in the Contract Documents are minimum BMP requirements and do not constitute a complete Sediment and Erosion Control Plan. The Contractor shall incorporate additional BMP's..... Costs shall be included in lump sum Pay Item No. 209.0100, Installation, Maintenance, Monitoring, and Removal of BMP and shall not be paid for separately. The note as written does not allow Contractor's to quantify the BMP scope of work to assign to the Lump Sum Item. The note as written does not reflect the current Proposal Schedule which has 209.0100 Lump Sum to cover the plan sheet BMP's and 209.0200 Additional Water Pollution, Dust and Erosion Control - Force Account to cover additional unforseen BMP's. Suggest revising the subject note to reflect the proposal and make 209.0100 - Lump Sum priceable.**

Contractor shall bid on project documents as shown.

166. **Addendum 02 changed the proposal Bid Item 503.7000 "Concrete For Reinforced Concrete Jackets" into a Lump Sum item. With Contractor having to follow BWS standard of of being flush with**

the face of slip joints contractor requests as-builts of all pipes to be concrete jacketed. Without being given these, it does not allow Contractor to quantify the Concrete Jacket linear footage of each pipe. Contractor requests to be given as-builts of pipe to be concrete jacketed or for the Bid Item to be changed to CY as to give the contractor a quantity to price from.

Please see available waterline as-builts in Addendum No. 5. The contractor shall price Concrete for Reinforced Concrete Jackets as lump sum per contract documents with available information.

167. **Please confirm if the HECO 4-5E X Ductiline from approximately station 49+50 - 57+00 and 58+00 - 61+00 can be done in Phase 2.**

Contractor shall sequence work in accordance with TCP. Any deviations/changes resulting from alternative means and methods will require approval of the Engineer during the time of construction.

168. **Please provide profile for Temporary Waterline By-Pass 16, 17, 18, 19, 20 and 21.**

Added additional temporary bypass waterlines. See Addendum No. 5.

169. **Contractor is unable to find Temporary Waterline By-Pass 21, please confirm existence of this waterline and provide detail.**

Added additional temporary bypass waterlines. See Addendum No. 5, sheet C-178.

170. **"Addendum 02, RFI Question #12 - Drawing C-3 (Sheet 4) Construction Notes – 2, Access to Farm Lots, Note 5, requires the Contractor to relocate all irrigation lines impacted by construction… The RFI response tells Contractor to relocate shown lines and an ALLOWANCE item will be added for other not recorded lines that are still in service. Addendum No. 2, Proposal Schedule does not contain an allowance item for relocating unknown in service irrigation lines. Please issue a revised Proposal Schedule."**

Added pay item 624.9000. See Addendum No. 5.

171. **Addendum 02 Sheet No. C-103, Grading and Drainage Plan Sta. 154+00 to Sta. 165+00, GDI Q2, GDI Q2-1, GDI Q2-2, GDI Q2-4, and GDI Q3 all appear to be shown as Special Drain Manholes, but none of these are labeled as such. Please clarify if this is an incorrect drawing or if the callout is incorrect.**

Callouts of structure type are correct.