FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-019-1(38)R	2016	4	~~528~~ 522

GENERAL NOTES:

1. The scope of work for this project includes design and construction of improvements to Queen Kaahumanu Highway between Kealakehe Parkway and Keahole Airport Road including, but not limited to, construction of additional lanes; paving; resurfacing; drainage system improvements; water system improvements; wastewater system improvements; retaining walls; medians; traffic signal and lighting; installing traffic signs and pavement markings; replacing baseline and reference monuments; and adjusting and relocating electric and cable facilities.

2. The Contractor's attention is directed to the following Sections of the Special Provisions: Section 645 - Work Zone Traffic Control. Section 107 - Legal Relations and Responsibility to Public.

3. At the end of each day's work, the Contractor shall remove all equipment and other obstructions to permit free and safe passage of public traffic.

4. The existence and location of underground utilities, manholes, monuments and structures as shown on the plans are from the latest available data but the accuracy is not guaranteed. The encountering of other obstacles during the course of work is possible. The Contractor shall be held liable for any damages incurred to the existing facilities and/or improvements as a result of his operations.

5. Existing drainage system will be functional at all times during construction. The Contractor is to furnish materials, equipment, labor, tools and incidentals necessary to maintain flow. This work shall be considered incidental to various contract items.

6. The Contractor shall provide for safe and accessible pedestrian passage and for free and safe vehicular access to and from all existing side streets and driveways at all times.

7. All saw cutting work shall be considered incidental to the various contract items.

8. 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 close proximity of underground lines and shall maintain adequate clearance when operating equipment within or under any overhead lines.

9. The Contractor shall exercise extreme caution when the excavation and construction crosses or is in close proximity of underground telephone and signal cable facilities and shall maintain adequate clearance for his equipment while working close to and/or under overhead facilities. Any damages to the existing underground facilities shall be repaired and paid for by the Contractor.

10. For field location of Verizon Facilities, contact Verizon Outside Plant Engineering Section, a minimum of 72 hours in advance, prior to start of excavation.

11. 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 facilities with beams, struts, or underpinning to fully protect it from damage. This work shall be considered incidental to various contract items.

12. The Contractor shall survey and stake and install all appurtenances associated with the project within the State right-of-way or construction parcels as shown in the plans.

13. The Contractor shall provide centerline and reference survey monuments in accordance with Section 613 - Centerline and Reference Survey Monuments of the Standard Specifications. Centerline monuments shall be installed at all control points (PC, PT, POC, POT, Equation Stations) of the construction baseline, both at the baseline and in the outside shoulder. The Contractor shall verify offset with the Engineer prior to placement.

14. The Contractor is advised that in addition to other contractors working in the same areas, various utility companies (or their contractors) may be performing work within the project area. The Contractor is to coordinate all work with other contractors in the area and to coordinate the design. In case of unreasonable conflict among contractors regarding access or work sites, the Engineer will make the final determination of priorities.

15. The term "Engineer for the Utility Companies" shall also mean his delegated Representative and/or the Utilities' inspectors of Record.

16. When excavating near utility poles, the Contractor shall protect, support, secure and take all other precautions to prevent damage to or leaning of these poles. The Contractor is responsible for all costs associated to repair and/or straighten pole.

17. Where pedestrian walkways exist, they shall be maintained in a safe and passable condition, or other facilities for pedestrians shall be provided. Passages between walkways at intersections shall likewise be provided at all times.

18. 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 and Regulations of the State Department of Health.

19. The Contractor shall be solely responsible for the protection of adjacent properties, utilities and existing structures from damages due to construction. Repairing any damage shall be at the contractor's own expense, and to the satisfaction of the Engineer.

20. Removal and disposal of any debris shall be considered incidental to their respective bid items. The Contractor shall clean and remove any accumulation of aggregates along the roadside within 10 feet of the edge of pavement. This work shall be considered incidental to the various contract items and will not be paid for separately.

21. Smooth riding connections shall be constructed at all limits of surfacing.

22. Trimming and dressing of shoulder shall consist of clearing, grubbing, grading, reshaping and compacting the unpaved shoulders with suitable material as shown on the plans and/or as directed by the Engineer. Suitable materials shall include materials from roadway excavation, including topsoil, and if necessary, additional materials from borrow outside the limits of the right of way. This work shall be considered incidental to various contract items.

23. Contractor shall adjust all existing manholes, valve boxes, street monuments, frames and covers, etc., as necessary. Adjustments shall not be measured for payment but shall be considered incidental to various items of work in the proposal.

24. After completion of paving, the Contractor and the Engineer will test for , and determine ponding areas (i.e. low spots within the paved area). It shall be the responsibility of the Contractor to correct and resurface and/or repair all such ponding areas.

25. Construction and restorations of all existing highway facilities within State right-of-way shall be done in accordance with all applicable section of the 2005 Standard Specifications for Road, Bridge and Public Works Construction, and the Specifications for Installation of Miscellaneous Improvements within State Highways of the State Highway Division.

26. Lane closures will be permitted only from 8:30 a.m. to 3:30 p.m. with the approval of the Engineer.

27. The Contractor shall provide, install, and maintain all necessary signs, lights, flares, barricades, markers, cones, and other protective facilities, and shall take necessary precautions for the protection, convenience, and safety of public traffic. All such protective facilities and precautions to be taken shall conform with the "Administrative Rules of Hawaii Governing the Use of Traffic Control Devices at Work Sites on or Adjacent to Public Street and Highways", adopted by the Director of Transportation, and the 2003 U.S. Federal Highway Administration "Manual on Uniform Traffic Control Devices for Streets and Highways, Part VI - Standards and Guides for Traffic Control for Street and Highway Construction, Maintenance, Utility and Incident Management Operations: and NCHRP 350.

28. The Contractor shall be required to provide adequate, safe, non-skid bridging material over any trench, including shoring, when trenching in pavement areas to handle all types of vehicular traffic. The use of steel plates shall not be used in the freeway travelway.

29. All regulatory, guide and construction signs and barricades shall be high intensity reflective sheeting.

30. Stop work and contact the State Historic Preservation Office, at 933-7653 immediately should any unidentified archaeological site or remains (such as artifacts, shells, bones, charcoal deposits, road or coral alignments, pavings or walls) be encountered during construction.

31. All signs, pavement markings, striping, etc. removed or damaged by the Contractor shall be replaced by the Contractor at no additional cost to the State.

32. The Hawaii Ironman Triathlon is typically held each year on the third weekend of October. This is a major event for the Kona community. The bicycle and running routes are both located along Queen Kaahumanu Highway, starting at Palani Road and travel north. The Contractor shall ensure that the pavement is in good condition with no construction zones, metal plates, uneven surfaces, or bumps. The travel lanes and paved shoulders shall remain clean of debris. The Contractor shall ensure that these conditions are met during the event, as well as three weeks before and one week after the event.

33. Traffic signals shall be kept operational during construction, and if deemed necessary by the District Engineer or Representative, a temporary vehicle detection device shall be installed. All work shall be done in accordance to the requirements of the State Highways Division, and paid for by the Contractor.

AUSTEN W. DRAKE
LICENSED PROFESSIONAL ENGINEER
NO. 13059-C
HAWAII, USA

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

Austen W. Drake — SIGNATURE

APRIL 30, 2018 — EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GENERAL NOTES

QUEEN KAAHUMANU HIGHWAY WIDENING
Kealakehe Pkwy. To Keahole Airport Rd.(Ph. 2)
Federal Aid Project No. NH-019-1(38)R

Scale: AS NOTED Date: MAY 2012

SHEET No. 1 OF 5 SHEETS

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

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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-019-1(38)R	2016	C.O. 5	528

GENERAL NOTES FOR TRAFFIC CONTROL PLAN:

1. The Permittee shall make minor adjustments at intersections, driveways, bridges, structures, etc., to fit field conditions.
2. Cones or delineators shall be extended to a point where they are visible to approaching traffic.
3. Traffic control devices shall be installed such that the sign or device farthest from the work area shall be placed first. The others shall then be placed progressively toward the work area.
4. Regulatory and warning signs within the construction zone that are in conflict with the traffic control plans shall be removed or covered. All signs shall be restored upon completion of work.
5. Flaggers and/or police officers shall be in sight of each other or in direct communication at all times.
6. When required by the issuing office, the Contractor shall install a flashing arrow signal as shown in the traffic control plans.
7. Sign spacings (D), taper lengths (T) and spacings of cones or delineators shall be as shown in table 1, unless otherwise noted on the traffic control plans.
8. All traffic lanes shall be a minimum of 10 feet wide.
9. All construction warning signs shall be promptly removed or covered whenever the message is not applicable or not in use.
10. The backs of all signs used for traffic control shall be appropriately covered to preclude the display of inapplicable sign messages (i.e., when signs have messages on both faces).
11. At the end of each day's work, or as soon as the work is completed, the Permittee shall remove all traffic control devices no longer needed to permit free and safe passage of public traffic. Removal shall be in the reverse order of installation.
12. (1) Replace existing faded or obliterated pavement markings that are necessary for safe traffic flow in the construction area with temporary or permanent markings before opening the roadway to public traffic each day.
13. (1) All work zone traffic control devices shall comply with the "Statewide Guideline for Work Zone Traffic Control Devices" dated September 13, 2000.
14. (1) Stationary construction lasting three (3) days or longer throughout the project corridor shall require long-term construction warning signs and regulatory speed limit signs, see the HDOT Work Zone Signing Plan, Notes & Details.

STANDARD TRAFFIC NOTES: (3)

1. All traffic signs and pavement markings shall conform to the latest amended edition of the "Manual on Uniform Traffic Control Devices", applicable sections of Part 5 of the "Standard Details for Public Works Construction", dated September, 1984, and the "2005 Hawai'i Standard Specifications for Road and Bridge Construction", unless otherwise indicated on the plans, specifications, or the Standard Traffic Notes.
2. The Contractor shall install permanent or temporary pavement markers, striping and markings as required by Section(s) 629 and 755.05 of the "2005 Hawai'i Standard Specifications for Road and Bridge Construction", and as amended. To ensure proper lane widths and the safe flow of traffic, temporary striping shall be installed as closely as possible to the final striping plan, but not in a manner that would obstruct permanent striping layout operations.

   The Contractor shall provide and install all traffic signs and markings for all project-related temporary traffic control plans. The Contractor shall coordinate and hire special duty officer(s) as needed to provide traffic control while working within County right of way.
3. The Contractor shall inform the Traffic Division at least six (6) working days prior to any work on pavement markings operations and/or sign installations to schedule a review and approval of the striping and/or signing plans.
4. The approved striping plan shall be layed out using thinned-out paint or other approved methods. Field adjustments shall be made as directed by the Engineer before the final markings are applied.
5. All pavement markings that become inapplicable shall be removed by the Contractor at his own expense. Removal shall be by eradication or by other methods approved by the Engineer before the new pavement markings are applied. Excessive gouging of the pavement shall be repaired at the Contractor's expense.
6. All pavement striping shall be with alkyd based reflective Thermoplastic Compound Pavement Marking as specified in Section(s) 629 and 755.05 of the Hawai'i Standard Specifications for Road and Bridge Construction, 2005 edition, and as amended, on all roadways. The Contractor shall submit Certificate of Compliance certifying that the thermoplastic materials to be used meet the current AASHTO M-247 and AASHTO M-249 specifications.

   For crosswalks and stop lines, the Contractor shall apply high skid-resistant white corundum at a rate equal to the rate of application of the glass beads.
7. On concrete pavements, pre-stripe application area with binder material, primer, or prime seal coat recommended by pavement marker manufacturer.
8. Heat applied pre-formed thermoplastic pavement marking tape with visible temperature indicators, or an equal pavement marking tape that is approved by the Traffic Division shall be used for all bike lane symbols and legends, and may be used for crosswalks, stop lines, pavement arrows, alphabets, & symbols in lieu of Thermoplastic Compound.

   Heat applied pre-formed thermoplastic pavement marking tape for crosswalks and stop lines shall be made of a durable, high skid-resistant material.
9. Reflectorized raised pavement markers shall be the regular sized markers with approximate dimensions of 4" by 4" by 0.7". The Contractor shall submit a Certificate of Compliance certifying that the raised pavement markers to be used meets and/or exceeds the current State of Hawai'i, Department of Transportation specifications.
10. All traffic signs & posts shall meet the requirements of the County of Hawai'i Standard Details T-1 except that flanged channel posts and octagonal posts will not be acceptable. Signs shall be on aluminum sheeting of 0.080-inch minimum thickness. Sign post shall be 2" square telespar tubing No. 20 F 12 or equivalent with 2 1/4 inch square telespar anchor post.

    For all County dedicated streets, the Contractor shall place a Traffic Division maintenance sticker on the back of each single-sided sign. Stickers are to be acquired at the Traffic Division.
11. All traffic signs shall be completely reflectorized with Type XI High Intensity Retroreflective Sheeting.
12. The 2 1/4" square anchor post for signs shall be driven into the ground, ac pavement or concrete sidewalk in accordance with the plans. All damages to the surrounding area shall be repaired to its original condition or better. Before driving into concrete, a neat hole of approximately 3 inch diameter shall be drilled through the concrete prior to the installation of the anchor post. If driving into concrete or ac pavement is not possible without damage to the surrounding concrete or ac pavement, a 12" by 12" square shall be saw-cut and removed prior to the installation of the anchor post and then patched with hot mix to match the existing ac pavement, or concrete to match the existing concrete sidewalk.
13. Upon completion of the construction work, including; but not limited to the final paving of the entire project area and off-site construction, the Contractor shall re-stripe all pavement markings within the construction area as approved by the Traffic Division and in accordance with item 6 of the current Standard Traffic Notes. The Contractor shall maintain all temporary pavement markings, permanent pavement markings and all traffic signs and posts until the project is accepted by the County of Hawai'i.

    All traffic signs & posts within and in the vicinity of the construction area that have been damaged, removed, or adversely affected by the construction work shall be replaced by the Contractor according to item(s) 10, 11 and 12 of the current Standard Traffic Notes at no cost to the county.

TABLE 1 - FOR TRAFFIC CONTROL PLAN

POSTED SPEED LIMIT (MPH)	SIGN SPACING (D) (FEET)	TAPER LENGTH (T) (FEET)		LONGITUDINAL BUFFER SPACE (B) (FEET)	SPACING OF CONES OR DELINEATORS (FEET)		
		W=12' OR LESS*	W=GREATER THAN 12'*		TAPER	TANGENT	WORK AREA
20	250	200	W X 17	35	20	20	10
25	250	200	W X 17	55	25	30	10
30	250	250	W X 20	85	30	30	10
35	250	250	W X 20	120	35	35	10
40	500	350	W X 30	170	40	40	10
45	500	550	W X 45	220	45	45	10
50	1000	600	W X 50	280	50	50	10
55	1000	700	W X 55	335	55	55	10

* W = Width of lane or shoulder

DATE	REVISION
1/20/17	(3) Added Notes
1/22/16	(1) Revised Notes #12 to #14

AUSTEN W. DRAKE
LICENSED PROFESSIONAL ENGINEER
NO. 13059-C
HAWAII, USA

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

Austen W. Drake — SIGNATURE

APRIL 30, 2018 — EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GENERAL NOTES

QUEEN KAAHUMANU HIGHWAY WIDENING
Kealakehe Pkwy. To Keahole Airport Rd.(Ph. 2)
Federal Aid Project No. NH-019-1(38)R

Scale: AS NOTED Date: DECEMBER 2016

SHEET No. 2 OF 5 SHEETS

C.O. 5

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

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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-019-1(38)R	2016	C.O. 5S-1	528

STANDARD TRAFFIC NOTES (CONTINUED): 3

14. All dedicated streets must have street names which have been approved by resolution before acceptance of the street by the County of Hawai'i.

    Unless otherwise approved by the Traffic Division, all street name signs shall have an uppercase first letter/lower case format and the proper Hawaiian spelling for the street names as approved by the County of Hawai'i Planning Department.

15. Install Private Road sign(s) on all private road(s). Sign shall be on 18" wide by 12" high aluminum plate with 4" black lettering on white reflectorized sheeting with border.

16. All signs & markings for private roadways shall be maintained by the private owners.

NOTES FOR WORK WITHIN THE COUNTY-RIGHT-OF-WAY 3

1. All work shall be done in accordance with the County of Hawaii, Department of Public Works (DPW), "Standard Specifications for Public Works Construction," dated September 1986 and "Standard Details for Public Works Construction," dated September 1984.

2. The Contractor shall verify the location of all existing utilities, whether shown on the plan or not, shall be responsible for the repair or replacement of same in the event of damages due to its construction practices. The Contractor shall coordinate his work with the respective utility companies.

3. The Contractor shall provide and install all traffic control devises in conformance with the current edition of the "Manual on Uniform Traffic Control Devices for Streets and Highways," and as directed by the DPW.

4. The Contractor shall notify the DPW 48 hours before the commencement of any utility line work to schedule a field review and secure approval of the proposed utility line location within the County right-of-way.

5. The proposed utility line location shall be laid out in the field prior o the conducting of the field review by the DPW.

6. Field adjustments shall be made as directed by the DPW prior to the commencement of any utility line work.

7. The required permit under Chapter 22, Article 4, Division 1 of the Hawai'i County Code, shall be obtained from the DPW by the Contractor for work within the County right-of-way.

8. The Contractor shall provide at least one (1) lane for traffic movement at all times. Two (2) lanes for traffic movement shall be provided between the hours of 3:30 p.m. to 7:00 a.m.

9. The existing pavement shall be saw-cut before commencement of trenching work.

10. Any pavement outside the contract zone limits damaged as a result of construction operations shall be restored to its original condition, or better, as directed by the DPW.

11. A temporary cold mix patch shall be applied immediately upon completion of the backfilling operation or upon plating of trench and shall be maintained by the Contractor until a permanent patch is authorized by the DPW.

12. No material, except the trench excavated material, shall be stockpiled closer than six (6) feet from the existing edge of pavement.

13. No construction equipment shall be parked within the road right-of-way in such manner that the equipment will obstruct the normal movement and sight distance of the driving motorist, except during actual working hours.

14. Except during actual working hours, all signs that do not pertain to the construction activity such as "men working" and "flagman ahead" shall be covered or laid down. However, all signs necessary for the safety of the public shall be maintained.

15. Any pavement markings, structures, and appurtenances (within or outside of the contract zone limits) damaged and/or worn away under the permit shall be repainted or reconstructed as directed by the DPW.

16. No trenching shall be left open for more than five (5) working days.

17. Should trenching occur through an existing sidewalk, or should damages occur to the sidewalk as a result of any construction work, the following procedure shall be utilized to repair the sidewalk:

    A. All Portland cement concrete to be removed shall first be cut with a concrete saw that has a diamond or carborundum abrasive wheel. Those cuts shall be made to a depth equal to at least one-fourth of the depth of the slab, or enough as is deemed necessary by the DPW, to permit breaking out the balance of the concrete without spalling off the exposed edges of the slab left in place.
    B. If any concrete block is touched the whole block shall be removed and later replaced, unless a minor variation is authorized by the DPW or its representative.
    C. Any damages to adjacent areas due to settlement or to any other effects whatsoever caused by the construction work shall be properly repaired and corrected.
    D. All other incidental work shall be satisfactorily performed to effect the proper restoration of the sidewalk area.
    E. Should damage to a sidewalk, curb and/or gutter at a location where a curb ramp should exist, or to a driveway that does not meet with the requirements of the Americans with Disabilities Act (ADA), repair work shall include the construction of a curb ramp, or reconstruction to the driveway such that the repair work complies with the ADA and meets with the approval of DPW.

18. When work interferes with a sidewalk, the applicant shall provide for the safe passage of pedestrians including the disabled around or through the work area.

19. The Permittee shall maintain, to the satisfaction of DPW, the area worked within the government right-of-way including any repairs to pavement and shoulder damaged as a result of the installation work, for a period of one (1) year from the date of final inspection. The Permittee shall undertake repairs expeditiously, whenever directed by the DPW during the maintenance period.

GRADING NOTES: 3

1. All work shall conform to Chapter 10 of Hawai'i County Code. Should a grading permit be required, no work shall commence until the DPW approves a grading permit.

2. The Contractor shall remove all silt and debris deposited in the drainage facilities, roadways and other areas resulting from his work. The costs incurred for any necessary remedial action by the DPW shall be payable by the Contractor.

3. The Contractor, at his own expense, shall keep the project and surrounding areas shall be kept from dust nuisances. The work shall be in conformance with the Air Pollution Control rules of the State Department of Health, HAR 11-60.1, Fugitive Dust.

4. All grading operations shall be performed in conformance with the applicable provisions of the Hawai'i Administrative Rules, Title 11, Chapter 55, Water Pollution Control and Chapter 54, Water Quality Standards, and to the Erosion and Sedimentation Control Standards and Guidelines of the DPW, County of Hawai'i.

5. The Contractor shall sod or plant all slopes and exposed areas immediately after the grading work has been completed.

6. Fill slopes steeper than 5:1 shall be keyed.

7. The Contractor shall inform the DPW of the location of the disposal and/or borrow site(s) required for this project when an application for a grading permit is made. The disposal and/or borrow site(s) must also fulfill the requirements of the grading ordinance.

8. No grading work shall be done on Saturdays, Sundays and holidays anytime without prior approval from the DPW. Grading work on normal working days shall be between the hours of 7:00 a.m. to 3:30 p.m.

9. Fills shall be compacted to 90 percent (90%) of maximum density per ASTM D-1557 test.

10. The Contractor shall remove all vegetation including large roots, and other deleterious material before placing fills on natural ground surfaces.

AUSTEN W. DRAKE
LICENSED PROFESSIONAL ENGINEER
NO. 13059-C
HAWAII, USA

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

Austen W. Drake — APRIL 30, 2018
SIGNATURE — EXPIRATION DATE OF THE LICENSE

DATE	REVISION
1/20/17	3 Added sheet for notes

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GENERAL NOTES

QUEEN KAAHUMANU HIGHWAY WIDENING
Kealakehe Pkwy. To Keahole Airport Rd.(Ph. 2)
Federal Aid Project No. NH-019-1(38)R

Scale: AS NOTED Date: DECEMBER 2016

SHEET No. 2A OF 5 SHEETS

C.O. 5S-1

ORIGINAL PLAN
SURVEY PLOTTED BY
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-019-1(38)R	2016	C.O. 6	~~528~~ ~~522~~

WASTEWATER COLLECTION SYSTEM NOTES:

GENERAL REQUIREMENTS: 1

1. The General Requirements and Covenants of the Department of Public Works, County of Hawaii (July 1972): the Standard Specifications for Public Work Construction (September 1986), the Standard Details for Public Works Construction, Department of Public Works County of Hawaii, September 1984 and the County of Hawaii, Department of Environmental Management, Wastewater Division (WWD) Standard Details (WW-1 thru WW-9) shall be applicable and incorporated herein unless otherwise noted.

2. The Contractor shall procure all permits and licenses, pay all charges and fees and give all notices necessary and incidental to the duly and lawful prosecution of the work.

3. The Contractor shall furnish all labor, materials, and equipment required for the complete installation of the subject work unless specifically written otherwise.

4. It shall be the contractor's responsibility to perform all construction per the approved plans and specifications. Any additions, deletions, or changes to the wastewater system shall meet the approval of the County of Hawai'i, Department of Environmental Management, Wastewater Division.

5. Inspections shall be required for all work which involves the WWD's sewer mains, laterals, cleanouts, and all dedicable new construction. Call the Wastewater Division at 961-8338 at least two (2) working days in advance to schedule an inspection.

   a. When and as often as the WWD determines through their inspection procedures, material, equipment or workmanship do not meet the requirements, the WWD will give written notice of the noncompliance to the Contractor and immediate correction of the deficiencies shall be addressed with the WWD Engineer and/or their representative.

   b. Inspection shall be performed prior to backfilling or covering of the pipe and after all plumbing work, in accordance with the plumbing permit, is complete within the parcel.

6. Sewer work shall be scheduled such that work shall not be performed on Saturdays, Sundays or County of Hawaii holidays. If such work dictates performance on these non-working days and after normal hours (3:30 PM to 7:00 AM) of operation then, the Contractor shall be responsible for payment of overtime charges to the WWD.

7. All existing wastewater line(s), whether or not shown on the plans, if damaged during construction, shall be repaired by the contractor and the contractor shall pay all expenses.

8. Bypassing or spilling of sewage to the ground, drainage system or State waters is prohibited. The Contractor shall pay penalties, including legal fees and other costs related to the bypass and/or spill.

9. The Contractor shall be or have in person on the job site or be represented by a responsible agent with authority to act for the Contractor in connection with this project at all times

10. At all times during the work, keep the premises clean and orderly, and upon completion of the work, repair all damage caused by equipment and leave the project free of rubbish and excess materials of any kind.

SEWER SYSTEM REQUIREMENTS: 1

1. Sewer Main Pipe and Fittings:

   a. All sewer pipe and fittings shall be PVC SDR-26 bell and spigot or an approved equal.

   b. Laying of pipe shall commence at the lowest point, the bell end facing upstream. Pipe shall be fitted together and matched so that when laid it will form a uniform and smooth invert.

   c. The interior of the sewer pipe shall be cleared of all debris and foreign materials as the work progresses. Exposed ends of sewer pipe shall be closed with temporary covers to prevent earth and debris from entering the pipe before leaving the workplace for the night.

   d. Because of the nature of plastic pipe and fittings, the Contractor is cautioned to exercise care in handling, loading, unloading, and storing to avoid damage.

2. Trench, Pipe Bedding, and Backfill:

   a. Trenches shall be properly backfilled and compacted as shown on the approved plan.

   b. Pipe bedding shall be Class B ¾" aggregate base course placed within trench not less than 6 inches but not more than 8 inches in compacted thickness, should provide uniform and adequate longitudinal support under the pipe, and shall be compacted to 95 percent maximum dry density unless otherwise noted on plans.

   c. Pipe cushion shall be Class B ¾" aggregate base course properly placed a minimum of 12" compacted thickness over the top of the pipe to provide adequate side support while avoiding vertical and lateral displacement.

   d. Controlled Low-Strength Material (CLSM) shall be used as the final backfill unless otherwise noted on the plan or approved by the WWD Engineer.

   e. Compaction testing for base course material shall be performed by an independent testing and quality control laboratory. Compaction testing shall be a minimum of one (1) test per 150 lineal feet or a fraction thereof. The Engineer reserves the right to increase the frequency of compaction to match field conditions. Test results shall be submitted to the WWD Engineer for as part of the final acceptance.

3. Sewer Manholes and Appurtenances:

   a. Precast sewer manhole base, sections, cone, flat top, benches, and channels shall include a concrete waterproofing admixture. Admixture shall be Xypex Admin C-1000 or approved equal product. Dosage shall be per manufacturer's instruction and shall not be less than 3% of the weight of the Portland cement fraction of the mix design.

   b. All drop sewer manholes, transitional sewer manhole from a force main, and sewer manhole(s) with sewer mains larger than or equal to 12 inches shall be constructed using Sewer Manhole and Appurtenances note #3a and shall be lined with a PVC liner, Dura-Plate or an equal product.

   c. All sewer manhole benches and channels shall be coated using Xypex Megamix I or an approved equal product. Sewer manhole channels shall provide a smooth transition between inlet and outlet sewers and the angle between the inlet and outlet shall be a minimum of 90 degrees.

   d. All manholes for sewer lines less than or equal to 24-inch in diameter and greater than 5'0" deep shall be provided with an "Eccentric" cone section and a Type SA frame and cover. All manholes 5'0" deep or less shall be provided with a Flat Top cover with Type SB frame and cover.

   e. All manholes with sewer lines greater than 24-inch shall be provided with 48-inch frame and cover. The 48-inch cover shall have a smaller 24-inch cover installed for routine maintenance and inspection. Covers shall be provided with recessed stainless steel bolts to allow securing of the covers. Permanent alignment marks (match mark) for the bolts shall be provided to facilitate reinstallation of the cover. The frame and cover shall be an eccentric configuration, D&L Foundry & Supply; Model #A1428 or approved equal.

   f. Sewer pipe connections to new manholes shall be with an approved cast-in-place manhole pipe adapter (A-lok, Econoseal, or approved equal product). Sewer pipe connections to existing manholes shall be an approved manhole pipe adapter (A-Lok Field Sleeve or approved equal product).

   g. Sewer manhole rungs shall be Type "SP" Copolymer Polypropylene Plastic, Bowco Industries Inc, in accordance with Wastewater Standard Detail WW-7. Hand grab rung shall be Type "SA" per DPW Standard Detail S-42.

   h. Sewer manholes located in unpaved areas shall be provided a reinforced 3000 PSI Class "A" concrete collar. The reinforced concrete collar shall be a minimum of 12" thick, and extend a minimum of 12" beyond the frame and cover.

4. Sewer Lateral Pipe and Fittings:

   a. New sewer laterals and cleanout shall be 6" diameter, PVC SDR26 pipe and fittings.

   b. Sewer cleanouts shall be located in the County Right-of-Way within one foot of the property line. The cleanout shall be easily accessible (i.e. not be buried or located under or close to rock walls, fences or other obstructions.

   c. The cleanout shall be provided a brass countersunk cap and an 18"x18"x18" Class B concrete collar reinforced with 1-#3 reinforcement steel loop. Refer WWD Standard Detail WW-2. In the event that the cleanout is installed within a sidewalk or similar area having concrete surfaces, the concrete collar is not required.

LEGEND FOR AS-BUILT POSTINGS	
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Roadway	Text for as-built posting

DATE	REVISION
1/22/16	1 Updated all general & sewer system requirement notes to 6/9/14 version

AUSTEN W. DRAKE
LICENSED PROFESSIONAL ENGINEER
NO. 13059-C
HAWAII, USA

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

Austen W. Drake — SIGNATURE

APRIL 30, 2018 — EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GENERAL NOTES

QUEEN KAAHUMANU HIGHWAY WIDENING
Kealakehe Pkwy. To Keahole Airport Rd.(Ph. 2)
Federal Aid Project No. NH-019-1(38)R

Scale: AS NOTED Date: AUGUST 2016

SHEET No. 3 OF 5 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
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	QUANTITIES BY	
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-019-1(38)R	2016	C.O. 7	~~528~~ ~~522~~

1 d. If a cleanout is subject to vehicular or abnormal loading it shall be provided a traffic rated frame/cover (Model SBF 1246 W, manufactured by South Bay Foundry or approved equal) and shall be installed as per manufacturer's recommendations. Refer WWD Standard Detail WW-4.

e. Sewer lateral connections to an existing sewer main may be made with a wye configured flexible saddle rotated 45 degrees above the sewer spring line. Sewer lateral saddle connections and cored sewer main entry shall provide a smooth and unobstructed flow area. The sewer saddle shall completely overlay the core entry area on the main sewer pipe. The saddle shall be secured to the main sewer pipe with stainless steel straps and jacketed with Class B reinforced concrete. The reinforced jacket shall completely encase the existing main sewer pipe, be a minimum of 6" thick, and extend a minimum of 6" beyond the sewer saddle.

5. Sewer Line Acceptance Tests:

a. All newly installed sewer mains and laterals are subject to Leakage and CCTV inspection prior to final acceptance as directed by the WWD.

b. Leakage testing shall be accomplished with Section 21.3 D of the Standard Specifications for Public Works construction, September 1986. All costs for testing shall be borne by the Contractor.

c. An Initial CCTV inspection will be performed by the County at no cost to the Contractor subject to the conditions below.

i. The Contractor shall be responsible to obtain, from the WWD, a copy of the Sewer Line Acceptance Test Criteria prior to requesting or scheduling a CCTV inspection.

ii. The Contractor shall assist the County in the performance of the CCTV inspection, shall be responsible for all Traffic Control requirements, and shall be responsible for cleaning of the lines to remove all debris prior to CCTV inspection. In the event that pipes are found to have been inadequately cleaned, the County will terminate the inspection and any subsequent inspections will be subject to charges to the Contractor.

iii. The contractor shall have a Supervisory representative present during performance of the CCTV Inspection.

iv. If the CCTV inspection reveals conditions such as sags, dents, out-of-round, etc. then, mandrel testing in accordance with Section 21.3 E of the Standard Specifications for Public works construction, September 1986 will be required at which the cost will be borne by the Contractor.

v. CCTV inspections will be recorded in VHS or CDROM format. In the event that the Contractor requests a copy of the CCTV inspection, the Contractor will be charged for the copy at a rate of $25.00.

6. Final Project Submittals:

a. Upon final project acceptance submit to WWD one (1) set of "As-built" plans on vellum and two (2) copied sets and one (1) set of electronic drawings in AutoCAD 2009 version and(1) set of electronic drawings in Abode PDF format.

b. It is mandatory that the "As-Built" plans show correctly identified property TMK numbers, location of sewer manholes, laterals, cleanouts and all other major components of the wastewater collection system including invert levations at all sewer manholes, lateral connections at the main, lateral elevations at the cleanout. Submitted documentation shall be certified by a licensed professional land surveyor attesting to the location and elevations of all major components of the wastewater collection system as shown on the As-Built plans. 1

FORCE MAIN SYSTEM REQUIREMENTS:

1. Force main piping shall be AWWA C900 or C905 PVC Pipe, High Density Polyethylene HDPE Pipe, or Fusible PVC Pipe.

2. High Density Polyethylene (HDPE) pipe if used shall utilize butt-fused joints. Approved mechanical joints may be utilized for connection of HDPE piping to existing dissimilar piping (Ductile Iron, Cast Iron, Reinforced Concrete Pressure Pipe). Electro-fusion joints may be utilized when authorized by the Wastewater Division. Plastic welding of joints shall not be allowed.

3. HDPE Force Mains if used shall be purple in color.

4. Thrust blocks shall be provided for all fittings such as tees, plugs, caps, bends, offsets, reducers, and valves as well as all other pipeline appurtenances that are subject to unbalanced thrusts. Design of thrust blocks shall be in accordance with the current edition of the Water System Standards, Department of Water Supply, County of Hawai'i, State of Hawai'i.

5. Force Mains shall be designed with a continuous upward slope to eliminate high points on the piping and the need for installation of air relief valves. Designs incorporating high points in the Force Main shall not be allowed unless specifically authorized by the Wastewater Division.

6. In the event that high points on the force main has been authorized by the Wastewater Division, sewage air relief valves shall be installed on the high points. Sewage air relief's shall be installed in reinforced concrete vaults and shall vented to an adjacent sewer system with drainage of the vault to the sewer system to the maximum extent possible.

7. All sewage air relief valves shall be Vent-O-Mat Series RGX air relief valves or approved equal and shall be of Type 316 Stainless Steel and shall be provided with isolation valves to allow maintenance and repair of the air relief valve during periods when the Force Main is active.

8. Metallic tracer tape shall be installed above all buried piping. Tracer tape shall be acid and alkali resistant, green or yellow, 6-inches (minimum) width, 9-mil (minimum) thickness and be reinforced for increased breaking strength. Metallic tracer tape to be similar or equal to THORTEC Detectable warning tape and shall have working similar to "CAUTION – Sewer Line Buried Below." Tracer tape to be installed at a depth of approximately 12-inches from grade with a minimum depth coverage of 6-inches. Tape shall be placed on compacted backfill and shall be laid in continuous lengths with wording facing upwards.

9. Scotchmark 3M Full Range Markers, 15-inches in diameter, Product Number 1253, color coded to APWA standards designed for maximum depth applications (up to eight feet depth) shall be installed above buried piping at a maximum depth of 6-feet. Markers shall be placed at all piping directional changes (horizontal and/or vertical) and at maximum intervals of 50-feet. Electronic Markers shall be installed with 12-inches (top, bottom, sides) of No. 4 crushed screening around the Marker to protect it from damage during backfilling operations. Electronic Markers shall be installed in the horizontal position to maximize locator efficiency.

10. Prior to excavation in the vicinity (within 6 feet) of active Force Mains, the Contractor shall purchase and have on-site the following repair items in the event of damage to the existing lines during the excavation work:

a. Two (2) each Stainless Steel pipe repair clamps of appropriate size and pressure rating for each type of the existing force main where the excavation is taking place.

b. Two (2) each "Dresser" type couplings of the appropriate size and pressure rating for each type of the existing force main where the excavation is taking place.

c. One (1) each length of the appropriate size and pressure rating for each type of the existing force main where the excavation is taking place. As an alternative, the Contractor may provide piping of different material (PVC, HDPE, Cast Iron, Ductile Iron) provided that appropriate adapters are utilized.

11. Hydrostatic pressure tests shall be conducted in accordance with the project Special Provisions.

a. Only new piping installed per this section shall be hydrostatically tested for leakage. The new piping shall be disconnected from all existing piping prior to the test. Install appropriate blinds to allow testing of the new piping.

b. In the event that the test is not completed due to leakage, equipment failure, etc., deepressurize the piping then allow it to "relax" for a minimum of eight (8) hours prior to re-performing the test.

c. The Contractor shall conduct the test in the presence of the Wastewater Division.

RECLAIMED WATER SYSTEM REQUIREMENTS:

1. The Reclaimed Water Irrigation System shall conform to all requirements of the "Guidelines for the Treatment and Use of Reclaimed Water" by the Department of Health, State of Hawaii, dated May, 2002.

2. Horizontal and vertical clearances between potable water and other utilities, namely recycled water lines shall conform with the Board of Water Supply 2002 Water System Standards. Furthermore, the minimum easement or right-of-way widths, and minimum cover and requirements for non-potable shall also conform to this reference.

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AUSTEN W. DRAKE LICENSED PROFESSIONAL ENGINEER NO. 13059-C HAWAII, USA

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

Austen W. Drake APRIL 30, 2018
SIGNATURE EXPIRATION DATE OF THE LICENSE

DATE	REVISION
1/22/16	1 Updated all general & sewer system requirement notes to 6/9/14 version

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GENERAL NOTES

QUEEN KAAHUMANU HIGHWAY WIDENING
Kealakehe Pkwy. To Keahole Airport Rd.(Ph. 2)
Federal Aid Project No. NH-019-1(38)R

Scale: AS NOTED Date: AUGUST 2016

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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-019-1(38)R	2016	C.O. 8	~~528~~ ~~522~~

3. All new buried transmission piping in the recycled water system, including service lines, valves, and other appurtenances shall both be colored purple, suggested color Pantone 522 or equal, and embossed or be integrally stamped/marked "CAUTION: RECYCLED WATER-DO NOT DRINK," or be installed with a purple identification tape, or a purple polyethylene wrap, suggested color index 77742 violet #16, Pantone 512 or equal. 1

4. Identification tape shall be prepared with white or black printing on a purple field, suggested color index 77742 violet #16, Pantone 512 or equal, having the words "CAUTION: RECYCLED WATER - DO NOT DRINK." The overall width of the tape shall be at least three (3) inches. Identification tapes shall be installed on top of new transmission pipe longitudinally and shall be centered. The identification shall be continuous in their coverage on the pipe and shall be fastened to each pipe length no more than ten feet apart. Tape attached to sections of pipe before they are placed in the trench shall have flaps sufficient for continuous coverage. Other satisfactory means of securing the tape during backfill of the trench may be used if suitable for the work, as determined by the reclamation agency.

5. Valve boxes shall conform to the Department of Health "Guidelines for the Treatment and Use of Recycled Water", revised 2002, or as approved by the Department of Health. All valve covers on offsite reclamation transmission water lines shall be of non-interchangeable shape with potable water covers and with a recognizable inscription cast on the top surface "Recycled Water".

6. All above ground existing and new facilities shall be consistently color-coded purple, suggested color index 77742 violet #16, Pantone 512 or equal and marked to differentiate recycled water appurtenances from potable water or wastewater.

7. Either an in-line type or end-of-line type drain (blow-off) assembly shall be installed for removing water or sediment from the pipe. The line tap for the assembly shall be no closer than 18-inches to a valve, coupling, joint, or fitting unless it is at the end of the line. Since there are restrictions on runoff and ponding and there may be restrictions on infiltration, the method for disposal of the drain water shall be presented to DOH for approval.

8. Notification signs indicating that reclaimed water is being utilized for landscape irrigation shall be posted at conspicuous locations throughout the project. The signs shall indicate both in writing and pictorially that reclaimed water is not suitable for drinking. The location of the signs shall be noted on the irrigation system design plans.

9. Before construction of the irrigation system commences, the State Department of Health Wastewater Branch and the County of Hawaii's Department of Environmental Management must approve the reclaimed water irrigation system design.

10. The County of Hawaii's Department of Environmental Management has the right to stop construction should any work by found contrary to the approved plans and specifications, or detrimental to public interest.

11. Prior to start-up of the irrigation system, representatives of the State Department of Health Wastewater Branch and the County of Hawaii's Department of Environmental Management shall inspect the reclaimed water irrigation system along with the irrigation system contractor and project owner. Once the irrigation system passes inpection, permits for reclaimed water use shall be issued to the owner by each entity. 1

WATERLINE NOTES:

1. All work shall be done according to the Water System Standards, State of Hawaii, dated 2002 as amended; and the Department of Water Supply (DWS), County of Hawaii.

2. The Contractor shall inform the DWS Engineer 72 hours prior to the beginning of any waterline work and one week prior to any connection, chlorination, shut-off or relocation work.

3. All work and material furnished by the DWS shall be paid for by the Contractor.

4. All existing waterlines, waterline appurtenances and other utility locations shown on the plans are obtained from latest reliable sources. The Contractor shall be responsible to verify the exact location of all utilities in the field and shall bear all costs for damages done unto them during the contract period.

5. All hook-ups to existing waterlines shall be done by the Department of Water Supply. The Contractor shall provide all excavation, backfill, road repair, traffic control, etc.

6. Where water shut off of more than 3 hours becomes necessary, the Contractor, at his own cost, shall provide a temporary by-pass line. The by-pass size shall be determined by the DWS Engineer. If necessary, the DWS Engineer may require a by-pass line, regardless of the expected water shut off period.

7. Minimum horizontal clearance between waterlines and other utilities shall be 8-feet for road right-of-ways of 50 feet or less, minimum vertical clearance between waterline and other utilities shall be 12-inches provided the other utility is concrete jacketed and 18-inches if no concrete jackets are used. In all applicable instances, the waterlines shall be at a grade higher than other utilities. Minimum horizontal clearance between waterline and other utilities shall be 10-feet for road right-of-ways of more than 50-feet.

8. All fittings (Class 52) and all gate valves (class 200) shall be ductile iron, with mechanical joints unless otherwise specified. Butterfly valves shall be class 250 with epoxy coated interior unless otherwise specified.

9. The waterline shall be tested at a minimum of 225 p.s.i. or one and a half times the static pressure at the low point under DWS supervision just prior to paving the roadways.

10. The Contractor shall be responsible for the chlorination of the water system and shall bear all cost. The persons engaged to do the chlorination work must have the appropriate license to perform the work in the State of Hawaii.

11. All service laterals shall be soft copper, Type "K", with brass fittings.

12. Pipe cushion for copper pipes shall be No. 4 fine, manufactured sand.

13. The DWS will not assume ownership of nor grant any water service on the new waterline until the water system is dedicated to the DWS along with all necessary easements and documents.

14. Solder and flux shall contain not more than 0.2 percent lead.

15. 4' x 4' x 4" reinforced concrete slab for fire hydrant shall be reinforced with 6 x 6 - 10/10 welded wire fabric.

16. Service lateral(s) shall be flushed by the contractor under DWS supervision.

17. Install a Department of Water Supply approved reduced pressure principle type backflow prevention assembly (above ground) after the meter, on private property, in accordance with DWS standard detail V9. No taps or connections are allowed between the meter and the approved backflow prevention assembly. The owner is required to test the backflow prevention once per year.

18. Relocation of existing meters shall be done by or under DWS supervision. Relocations of customer service lines to relocated meters shall be done by the Contractor. Meters shall be the same as existing. All work and materials required shall be provided by the Contractor and considered incidental to various bid items. Existing meter boxes damaged by the Contractor shall be replaced at the Contractor's cost. A dielectric union shall be used to connect the copper pipe to the customer's G.I. Pipe (if applicable).

19. All pipelines 4" and larger in diameter, shall be ductile iron push on joints, Class 52, and all pipelines smaller than 4" in diameter shall be soft copper, Type "k", unless otherwise specified.

20. Existing valves, fire hydrants, valve boxes frame and covers that are "removed and salvaged" shall be cleaned of all dirt, scabe, and concrete and delivered to the respective DWS baseyard. This work shall be considered incidental to the project costs.

21. Existing waterlines, valves, fittings and appurtenances found during construction shall be abandoned in place subject to the approval of DWS, or as otherwise noted on the construction plans. All exposed valve boxes, valves, pipes, and appurtenances shall be removed and disposed of properly at no cost to the DWS.

22. It is the intent of the DWS to utilize the existing meter boxes. The Contractor shall furnish only those meter boxes identified on the plans and boxes damaged during construction.

23. All newly installed waterlines shall have a blue warning tape labeled "Waterline" placed directly over the compacted cushion material.

24. Construction projects requiring temporary water service shall be metered and paid for by the Contractor.

25. The Contractor shall be responsible for record drawings (As-Built drawings) and the licensed Engineer shall certify the drawings as to accuracy and submit the drawings and As-Built tracings to the DWS.

DATE	REVISION
1/22/16	1 Adjusted RW notes due to updating of all general & sewer system requirement notes to 6/9/14 version

AUSTEN W. DRAKE
LICENSED PROFESSIONAL ENGINEER
NO. 13059-C
HAWAII, USA

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

Austen W. Drake — APRIL 30, 2018
SIGNATURE — EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GENERAL NOTES

QUEEN KAAHUMANU HIGHWAY WIDENING
Kealakehe Pkwy. To Keahole Airport Rd.(Ph. 2)
Federal Aid Project No. NH-019-1(38)R

Scale: AS NOTED Date: AUGUST 2016

SHEET No. 5 OF 5 SHEETS

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