

SUPPLEMENTAL DIRECT TESTIMONY OF
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HAWAIIAN ELECTRIC COMPANY, INC.

Subject: Routing

1 installed in a single new underground ductline. The planned route of the main
2 ductline began at Makaloha Substation, and then proceeded as follows: (1) the
3 ductline exited Makaloha Substation onto Makaloha Street and headed in the
4 Diamond Head direction, past the Daiei store on the corner of Makaloha and
5 Kaheka Streets, until Kalakaua Avenue; (2) at Kalakaua Avenue, the ductline
6 headed in the makai direction along Kalakaua Avenue for a short distance until
7 the intersection with Fern Street; (3) the ductline then proceeded in the Diamond
8 Head direction along Fern Street until the intersection of Fern Street and Hauoli
9 Street; (4) the ductline then headed in the makai direction along Hauoli Street, and
10 turned in the Diamond Head direction onto Lime Street; (5) the main ductline then
11 continued a short distance along Lime Street and ended at a new manhole fronting
12 McCully Substation. The total length of the proposed main ductline would have
13 been approximately 3,450 feet.

14 As I pointed out in HECO T-7, pages 3-5, however, there are three existing
15 46kV circuits between Makaloha and McCully Substations. All three of these
16 circuits are located underground in three ducts that share a single common
17 ductline. There are three additional ducts in the same ductline for existing 12kV
18 lines. This existing ductline follows the same route proposed for the two new
19 46kV circuits. As explained by Ms. Ishikawa in HECO T-4, the two new 46kV
20 circuits are higher capacity cables and are essentially an upgrade to the existing
21 three 46kV circuits described above. Once installed, the two new 46kV circuits
22 will replace the existing three 46kV circuits, which will be cut and removed from
23 the existing ductline. In addition, modifications to the 12kV system in the area
24 would allow the existing 12kV circuits in the ductline to be removed. Thus, there
25 was a possibility (after further evaluation of certain practical issues) that the two

1 new 46kV replacement circuits could be installed in the six existing ducts. Each
2 of the two 46kV circuits would occupy three ducts (one duct for each single-phase
3 cable; three cables per each 46kV circuit).

4 Q. Has HECO further evaluated the use of the existing ductline?

5 A. Yes. Since the PUC application filing, field inspections and further engineering
6 review have confirmed that instead of constructing a new ductline, approximately
7 70% (~2450 feet) of an existing ductline between the Makaloa Substation and the
8 McCully Substation could be used to install the two new 46kV circuits. The
9 existing ductline follows the same route as the originally proposed new ductline.
10 From Poni Street to McCully Substation, the existing ductline could be used to
11 install the two new 46kV circuits. From Makaloa Substation to Poni Street, the
12 existing ductline could only accommodate the installation of one of the 46kV
13 circuits because existing 12kV circuits in the ductline must remain. Therefore, a
14 new ductline from Poni Street to McCully Substation would need to be
15 constructed to accommodate the second 46kV circuit. Although the scope of
16 work has changed, there is no change to the route of the two new 46kV circuits
17 that are required between the Makaloa and McCully Substations.

18 Q. Does this proposed change continue to support an all-underground alignment for
19 the two 46kV circuits between the Makaloa and McCully Substations?

20 A. Yes. The use of existing underground facilities between the Makaloa and
21 McCully Substations strongly supports an all-underground alignment. The use of
22 existing ducts would substantially reduce the extent of construction impacts
23 related to trenching in roadways along the proposed alignment. Impacts on traffic
24 congestion, noise and dust would be reduced or eliminated on Makaloa Street,
25 Kalakaua Avenue, Fern Street, Hauoli Street and Lime Street, therefore reducing

1 potential customer complaints and project delays. A more detailed discussion of
2 the advantages and disadvantages of implementing this change is discussed in
3 HECO-ST-201.

4 Q. HECO stated that it would further examine the use of Kapiolani Boulevard as a
5 possible route instead of Fern Street (HECO T-7, page 7, line 17 to page 8, line
6 22). Has HECO done that?

7 A. Yes, HECO has re-examined the use of Kapiolani Boulevard as a possible route
8 instead of Fern Street. Since the project filing with the PUC, our findings further
9 support the use of Fern Street instead of Kapiolani Boulevard for the two new
10 46kV circuits between the Makaloa and McCully Substations (see HECO-ST-701
11 for a detailed discussion). There are two major reasons for this:

- 12 • With the use of an existing ductline between the Makaloa and McCully
13 Substations, no trenching would be required for approximately 70% of the
14 route. Therefore, construction impacts and costs would be substantially
15 minimized for this portion of the project. In comparison, because there are no
16 existing ductlines on Kapiolani Boulevard that could accommodate the two
17 new 46kV circuits, a new ductline would need to be constructed if Kapiolani
18 Boulevard were utilized. Because Kapiolani Boulevard is a heavily traveled
19 roadway and contains numerous existing underground utilities, the traffic
20 disruption and construction costs would be substantially higher in comparison
21 to utilizing the existing ductline on Fern Street.
- 22 • There may be potential conflicts with installing a new ductline on Kapiolani
23 Boulevard with the City's proposed Bus Rapid Transit project. With minimum
24 space available in Kapiolani Boulevard for new underground utilities,
25 construction costs could increase substantially because of the possible need to

1 relocate existing utilities and/or dig deeper trenches in order to resolve the
2 potential conflicts.

3 Other 46kV Connections - Pumehana Street Ductline (McCully Area)

4 Q. Are there other proposed changes related to 46kV connections in Phase 1?

5 A. Yes, there is one more proposed change for Phase 1. As described in Mr. Wong's
6 testimony, HECO T-2, a single new ductline for a 46kV underground circuit was
7 proposed in the McCully area (near Lunalilo Elementary School) to connect the
8 existing Archer #41 overhead 46kV circuit on Pumehana Street with the existing
9 Pukele #2 overhead 46kV circuit near the intersection of Date Street and
10 Pumehana Street also near Lunalilo Elementary School. This underground
11 connection would have been approximately 130 feet in length. HECO-ST-202,
12 page 1, provides a diagram of the originally proposed work.

13 Since the PUC project filing, further engineering review has identified an
14 alternative connection, which maintains the current operational flexibility of the
15 existing 46kV circuit configurations, and reduces the potential for public
16 opposition to this portion of the project. The proposed change would directly
17 connect the Archer #46 46kV underground circuit near McCully Substation to the
18 Pukele #2 46kV circuit near the intersection of Date Street and Pumehana Street,
19 thereby eliminating the need to utilize the Archer #41 46kV overhead circuit as a
20 pathway. The proposed change involves the construction of a new 720 feet
21 ductline along Pumehana Street from the McCully Substation to Pole 5 near the
22 intersection of Date and Pumehana Streets. HECO-ST-202, page 2, provides a
23 diagram of this proposed change.

24 Q. What are the advantages associated with this proposed change?

25 A. As stated in HECO-ST-201, the advantages for implementing this change are as

1 follows:

- 2 ▪ The proposed change maintains the same level of operational flexibility near
3 the McCully Substation as is available today, which is an overall benefit to the
4 public. Currently, the existing Archer #41 46kV overhead circuit on
5 Pumehana Street has essentially no current flow under normal operating
6 conditions, which makes this circuit readily available for use in contingency
7 situations on the 46kV system. For example, maintenance or unplanned
8 outages of certain 46kV lines being served from Pukele or Archer Substations
9 could be manually backed up by this circuit. With the initially proposed
10 connection, this portion of the Archer #41 46kV overhead circuit would be
11 used on a daily basis, carrying approximately 400 amperes of current under
12 normal operating conditions. Therefore, the use of this portion of the circuit
13 on a daily basis limits its available capacity to address contingency situations
14 on the 46kV system.
- 15 ▪ The proposed change reduces a potential area of controversy by maintaining
16 the status quo of essentially no current flow under normal operating conditions
17 on the Archer #41 46kV overhead circuit on Pumehana Street, adjacent to
18 Lunalilo Elementary School. Given the concern expressed by some area
19 residents and their legislators regarding the proposed new power lines,
20 particularly in the immediate area of this school, minimizing changes in the
21 operation of the system in this particular area reduces potential project delays
22 which could be brought about by heightened public concern over the project.

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1 approximately 70% of the route. Although, there will be no change in the route
2 for these two new circuits, the use of existing ducts minimizes construction
3 activity and reduces costs.

4 Second, the Archer #46 46kV underground circuit near McCully
5 Substation and the Pukele #2 46kV overhead circuit near the intersection of Date
6 and Pumehana Streets are proposed to be connected directly with a new
7 underground 46kV circuit on Pumehana Street. The original proposal involved
8 the use of the existing Archer #41 46kV overhead circuit on Pumehana Street and
9 a relatively short new underground connection in the intersection of Date and
10 Pumehana Streets to connect the Archer #46 and Pukele #2 circuits. Although the
11 proposed change calls for a longer underground connection than originally
12 proposed, the existing operating condition of the Archer #41 46kV overhead
13 circuit is maintained. This would allow HECO to maintain existing operational
14 flexibility in its 46kV system and should help lessen potential public opposition to
15 this area of the project and thereby minimize potential project delays.

16 The use of Kapiolani Boulevard (vs. Fern Street) for Phase 1 and Young
17 Street (vs. King Street) for Phase 2 was further examined. Fern Street is preferred
18 over Kapiolani Boulevard primarily because the potential traffic disruption and
19 cost increases of constructing a new ductline on Kapiolani Boulevard are
20 substantial when compared to utilizing the existing ductline between the Makaloa
21 and McCully Substations.

22 Young Street is not a preferable routing alternative for the new 46kV
23 underground lines for Phase 2. The loss of on-street parking during construction,
24 the difficulty in coordinating HECO's construction with the City's proposed
25 Young Street Park Boulevard project, less flexibility to install ductlines in a

1 smaller width roadway because of existing underground utility facilities, and lack
2 of opportunity to consider night construction, further supports the use of King
3 Street for Phase 2 of the project.

4 Q. Does this conclude your testimony?

5 A. Yes, it does.

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