

1 Make the following Section a part of the Standard Specifications:

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3 **"SECTION 652 - TELECOMMUNICATIONS UTILITY SYSTEM**

4
5 **652.01 Description.** This work includes constructing telephone and cable
6 television underground structures, facilities and ductline work required for the
7 installation and relocation of the Hawaiian Telcom (HT) and Spectrum facilities
8 according to the contract or as specified by the Engineer.

9
10 HT and/or Spectrum will furnish, install, connect, and test all proposed
11 overhead and underground wires and cables as may be required.

12
13 **652.02 Materials.** Furnish materials unless otherwise indicated. Materials
14 shall conform to the following requirements:

15

16 Structural Concrete	601
17 Reinforcing Steel	602
18 Structure Backfill Material	703.20
19 Trench Backfill Material	703.21
20 Conduits	712.27

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23
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26 Concrete shall conform Section 601 – Structural Concrete, except use
27 coarse aggregate No. 67, 3/4-inch to No. 4 for concrete duct banks. Plain
28 concrete duct banks shall be Class A concrete.

29
30 Underground ducts and conduits shall be of rigid polyvinylchloride (PVC),
31 Type GT-42 or Schedule 40. Rigid PVC ducts and conduits shall be extruded
32 standard wall, according to NEMA standard TC-6 and HT GT80 specifications.
33 Conduits exposed to the sunlight shall be PVC-Type D meeting specifications
34 GTS 8343.

35
36 Pulling irons, fittings, ground rods, and miscellaneous hardware shall be
37 according to HT and Spectrum standard details.

38
39 **652.03 Construction Requirements.**

40
41 **(A) General.** Avoid disturbing existing facilities. Remove and dispose
42 of all demolished or excess material from the job site.

43
44 Notify HT and Spectrum at least 3 working days in advance of
45 intent to commence concreting operations for that utility's duct lines.

47 Construction of HT underground facilities shall be in accordance
48 with HT's "Standard Specifications for Placing Underground Systems,"
49 dated January 2007, and all subsequent amendments and additions.
50

51 **(B) Existing Utilities.** Existing utilities and utility facilities to be
52 constructed are shown on the plans in approximate locations for the
53 convenience of the Contractor. Any utility not shown on the plans shall
54 not relieve the Contractor of his/her responsibility under this Section.
55 Ascertain the location of all existing utilities which may be subject to
56 damage. Differing site conditions will be remedied in the manner
57 specified in subsection 104.11(C).
58

59 Expose and remove the concrete envelope from the existing
60 ductlines containing HT or Spectrum cables.
61

62 Provide HT and Spectrum with 24-hour access to all existing HT
63 and Spectrum facilities that are to remain or until they are removed and to
64 all new HT and Spectrum facilities after they are installed. The Contractor
65 shall be responsible for any delays in HT and Spectrum work due to his
66 failure to provide access to HT and Spectrum facilities. All existing HT
67 and Spectrum facilities shall remain in place until after the proposed
68 permanent and/or temporary facilities are completed and operational. Any
69 cost of temporary relocations arising during construction for the
70 Contractor's benefit shall be at no cost to the State.
71

72 **(C) Excavation and Backfill.** All excavation and backfill for telephone
73 and cablevision underground ductlines shall conform to Section 204 -
74 Excavation and Backfill for Miscellaneous Facilities, and modified as
75 follows:
76

77 **(1) Excavation.**
78

79 **(a)** The width of trenches for duct banks shall be not less
80 than the width of the duct bank nor more than that required
81 to properly and safely execute the work.
82

83 **(b)** Excavate the trenches at least 30 feet ahead of duct
84 placement so that any obstruction to the ductline can be
85 avoided through gradual alignment. The Engineer may
86 adjust the profile grade to increase or decrease the
87 excavation depth (up to 3 feet) as a result of unforeseen
88 obstruction at no additional cost.
89

90 **(c)** Excavation for each handhole plus 50 feet of
91 trenching for all ducts connected to these structures shall be
92 complete before starting construction on these structures.

Backfill all cuts in excess of depths required with compacted bed course material at no cost to the State.

(d) All excavation shall be inspected by the Engineer before any ducts are placed or any structures are constructed.

(e) Do not excavate for handholes, manholes, and ductlines until HT and Spectrum stake out and verify the locations for these structures through the Engineer.

(2) Backfill. Do not backfill until after the utility company inspects the duct installations through the Engineer.

Trench backfill material placed below a horizontal plane 12 inches above the top of the duct bank shall conform to the requirements of Subsection 703.21 (A) – Trench Backfill Material A.

Backfill the remainder of the trench with structure backfill material according to Subsection 703.20 with structure backfill material B or with trench backfill material according to Subsection 703.21(B) – Trench Backfill Material B.

(D) Construction of Manholes and Handholes. HT and Spectrum inspectors will verify and approve the locations and depths of manholes and handholes before construction or installation. Do not place concrete for handholes until the utility company inspects the work and the concrete specifications are accepted by the Engineer. Ensure that all completed facilities are clean and kept free of loose concrete, lumber, debris and other extraneous matter.

(E) Adjusting Manhole Frames and Covers. Adjust existing manhole frames and covers to required grade. Remove, clean and paint existing frames and covers with one coat of asphaltum paint before reinstallation.

(F) Installation of Underground Ducts Encased in Concrete Jackets. All joints shall be water tight.

(1) Plastic Duct Joints. Perform field cutting of plastic ducts only with the use of a miter box.

Remove burrs by filing before the joint is made. All connections shall be of the solvent weld type.

Make solvent weld joints according to the conduit manufacturer's recommendations and as approved. The Engineer

will not permit thinning of the cement. Apply the cement with a natural bristle brush to the inside of the coupling and to the outside of the duct end. Immediately thereafter, place the coupling over the duct and half-twist the coupling to ensure a good bond. Wipe off the excess cement.

All ducts shall be cool prior to placing in trenches and when the concrete jacket is being poured.

Due to expansion and contraction of the plastic conduit of 1-1/2 inches per 100 feet for every 20°F change in the temperature, allow extra conduit footage at each tie-in for contraction when the conduit temperature is higher than that of the earth; or extra room for expansion if the converse condition exists.

(2) Plastic Duct Installation. Construct duct banks as follows:

(a) Duct alignment shall be as straight as feasible. Make directional changes, as necessary to clear obstructions, with curved segments using plastic duct couplings or deflection couplings, except where otherwise indicated. The deflection angle between two adjacent lengths of duct shall not exceed four degrees, unless otherwise indicated.

(b) Provide at least one set of duct spacers for each length of duct run with a maximum spacing between spacers of six feet for a straight run. Tie the ducts securely at each set of duct spacers.

(c) Do not place concrete for duct encasement until after the utility company inspects the work through the Engineer. Use only hand spades in compacting the concrete. Cure the concrete for at least 72 hours before permitting vehicular traffic to run over it.

(d) Seal the end of ducts plastic plugs at the end of each day of work, whenever the work of duct installation must be interrupted, or whenever ducts may be subjected to submergence in water.

(e) After completing ductline, pull a wooden mandrel not less than 12 inches long and having a diameter 1/4-inch less than inside diameter of duct, through each duct after which pull a brush with stiff bristles through to make certain that no particles of earth, sand, or gravel have been left in the duct.

(f) Furnish and install muletape, in each new duct, in accordance with HT and Spectrum standards.

(G) Restoration of Existing Streets and Other Improvements.

Restore streets, sidewalks, driveways, walkways, curbs, gutters, traffic detection loops, walls, fences, buildings and all other improvements inside and outside of the right-of-way, publicly or privately owned, which are damaged by the Contractor's operations to their original condition, or better, at not cost to the State. Trenches through roadways shall be repaved over the entire section. Materials and workmanship shall conform to the applicable sections in these specifications.

(H) Place a 4-inch 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", 12-inches over the contract jacket for telephone ducts for the entire length of ductline installation. See HT Standard Drawing 34028.

(I) Place a 4-inch wide warning tape, orange in color, with black imprinted message "CAUTION BURIED CABLE LINE BELOW", 12-inches over the concrete jacket for Spectrum ducts for the entire length of ductline installation.

652.04 Measurement. The Engineer will measure the ductline, manhole and pole riser for payment.

652.05 Payment. The Engineer will pay for the accepted ductline at the contract unit price per linear foot complete in place. The price includes full compensation for furnishing and installing the ductline, removal of existing ductline, excavation, warning tape, muletape and pullstring, pouring concrete, backfilling, furnishing and installing conduit, making required handhole penetrations, placing aggregate subbase, asphalt concrete base, asphalt concrete pavement, restoring sidewalks, salvaging existing materials, making required tests and furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work.

The Engineer will pay for the accepted manhole on a contract unit price per each complete in place. The price includes full compensation for submitting the equipment list and drawing, furnishing and installing the manhole, removing existing handholes and equipment; excavating and backfilling, restoring appurtenances damaged or destroyed during construction and furnishing labor, materials, equipment, tools and incidentals necessary to complete the work.

The Engineer will pay for the accepted pole riser at the contract unit price per each complete in place. The price includes full compensation for furnishing and installing the 90-degree conduit bend up to 3 feet above grade, restoring appurtenances damaged or destroyed during construction, salvaging existing materials, furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work.

The Engineer will consider additional materials and labor, needed to complete the installation of the system and not shown in the contract as included in the bid price of the various contract items.

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

Pay Item	Pay Unit
HT Ductline _____	L.F.
Spectrum Ductline _____	L.F.
HT Manhole _____	Each
Spectrum Manhole _____	Each
HT Pole Riser _____	Each
Spectrum Pole Riser _____	Each"

END OF SECTION 652