

**SECTION 206 – EXCAVATION AND BACKFILL  
FOR DRAINAGE FACILITIES**

Make the following amendments to said Section:

(I) Amend **206.03 – Construction** by revising line 141 to read as follows:

**“(C) Pre- and Post-LiDAR Surveys**

**(1) General.** The Contractor shall conduct two LiDAR Surveys, the 1<sup>st</sup> one prior to moving sand for the berms and the 2<sup>nd</sup> after the completion of the sand berms are created and installed. The LiDAR Surveys shall include the full extent of the beach sand at Wailua Beach, from the north end of the beach to Wailua River.

**(2) LiDAR Survey Requirements.**

- a. The LiDAR sensor shall have a minimum range of 1,500 meters.
- b. The LiDAR sensor shall have a minimum horizontal resolution of 10 centimeters.
- c. The LiDAR sensor shall have a minimum vertical resolution of 10 centimeters.
- d. The LiDAR data shall be collected in a minimum of 60% overlap between adjacent flightlines.
- e. The LiDAR data shall be processed using a minimum of two returns per point.
- f. LiDAR shall be taken at low tide to obtain the maximum limits of the sand.

**(3) Deliverables.** The Contractor shall prepare (for both Pre- and Post-Surveys) a report outlining the LiDAR Survey process, means and methods for obtaining the data, and a visual representation of the data.

Additionally, the Contractor shall provide the Engineer the raw LiDAR data in LAS format and the processed final terrain data in CADD format (AutoCAD Civil3D). The final terrain surface shall maintain a minimum surface grid spacing of 10 ft throughout the surveyed area and be smooth and continuous.

The Pre-Survey will be used by the Engineer to determine the final sand dune grading plan. The Post-Survey will be used to obtain the final quantities for payment and the baseline for future surveys.

**(4) Schedule.** The Pre-Survey shall be conducted within three weeks of completing the Sandsaver installation work. The Post-

Survey shall be conducted within three weeks of completing the final grading of the sand berms.

**(D) Sand Fill.**

**(1) General.** Move sand as needed to create the sand dunes and grading as shown on the plans or provided by the Engineer following the Pre-LiDAR Survey.”

**(II)** Amend **206.04 – Measurement** by revising lines 142 to 143 to read as follows:

**“206.04 Measurement.**

**(A)** The Engineer will measure excavation per cubic yard in accordance with contract documents.

**(B)** The Contractor will provide the Pre- and Post- LiDAR Survey as mentioned above which will be used to measure the amount of sand moved per cubic yard in accordance with contract documents.

**(C)** The collection and delivery of the LiDAR data will be paid on a lump sum basis. Measurement for payment will not apply.”

**(III)** Amend **206.05 – Payment** by revising lines 145 to 154 to read as follows:

**“206.05 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 contract documents.

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

<b>Pay Item</b>	<b>Pay Unit</b>
Excavation for Class VIII Riprap	Cubic Yard
Sand Fill for Berms and Revetment	Cubic Yard
LiDAR Data Collection	Lump Sum”

**END OF SECTION 206**