



May 3, 2017

Mr. Thomas Christensen  
 Riparian Projects Coordinator  
 Monterey Peninsula Water Management District  
 Post Office Box 85  
 Monterey, CA 93942-0085

**Re: Aerial Photography for the Carmel River, Monterey County, CA**

Dear Mr. Christensen:

In response to your request, Towill submits the following proposal to provide aerial photography for the Carmel River from the Pacific Ocean to San Clemente Reservoir, approximately 19 miles in Monterey County, California. As an option, the photography will continue an additional 7 miles further east to the Los Padres Reservoir, for a total of approximately 26 miles.

We are proposing three options for this project. **Option 1** will consist of aerial photography roughly centered on the river channel with approximate georeferencing of the images. **Option 2** will consist of aerial photography of the river channel and include the production of orthophotography for a corridor 1000' either side of the approximate centerline of the river. **Option 3** would emulate Option 2 with the addition of airborne LiDAR data collected simultaneously with the aerial photography. All of these options will have associated costs for the two coverage limits – Pacific Ocean to San Clemente Reservoir or Pacific Ocean to Los Padres Reservoir. The following tables contain our understanding of the project specifications and major details related to our approach for each of the options:

**Option 1 – Pacific Ocean to San Clemente Reservoir**

<b>Imagery Bands:</b>	Natural Color (RGB)
<b>Nominal GSD of Photography:</b>	7.5 cm (0.25')
<b>Number of Flight Lines:</b>	7
<b>Number of Exposures:</b>	114
<b>Photo Centers:</b>	Approximate photo center locations determined by Airborne GPS collected at time of flight, reported in California State Plane Coordinates, Zone 4, US Survey Feet.
<b>Photo Orientation:</b>	Approximate TFW and JGW provided for each exposure.
<b>Image Format:</b>	Uncompressed TIFF and JPEG
<b>AutoCAD Delivery:</b>	Project flight plan with final photo center locations.
<b>Fee</b>	\$10,000

**Option 1 – Pacific Ocean to Los Padres Reservoir**

<b>Imagery Bands:</b>	Natural Color (RGB)
<b>Nominal GSD of Photography:</b>	7.5 cm (0.25')
<b>Number of Flight Lines:</b>	9
<b>Number of Exposures:</b>	156
<b>Photo Centers:</b>	Approximate photo center locations determined by Airborne GPS collected at time of flight, reported in California State Plane Coordinates, Zone 4, US Survey Feet.
<b>Photo Orientation:</b>	Approximate TFW and JGW provided for each exposure.
<b>Image Format:</b>	Uncompressed TIFF and JPEG
<b>AutoCAD Delivery:</b>	Project flight plan with final photo center locations.
<b>Fee</b>	\$12,000.00



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**Option 2 – Pacific Ocean to San Clemente Reservoir**

<b>Imagery Bands:</b>	Natural Color (RGB)
<b>Nominal GSD of Photography:</b>	7.5 cm (0.25')
<b>Number of Flight Lines:</b>	9
<b>Number of Exposures:</b>	265
<b>Orthophotography:</b>	0.5' GSD (ground sample distance)
<b>Georeferencing of Imagery:</b>	Airborne GPS and IMU acquired at time of photography processed through Aerotriangulation
<b>Image Format:</b>	Uncompressed TIFF and JPEG
<b>AutoCAD Delivery:</b>	Project flight plan with final photo center locations.
<b>Fee</b>	\$25,000.00

**Option 2 – Pacific Ocean to Los Padres Reservoir**

<b>Imagery Bands:</b>	Natural Color (RGB)
<b>Nominal GSD of Photography:</b>	7.5 cm (0.25')
<b>Number of Flight Lines:</b>	13
<b>Number of Exposures:</b>	374
<b>Orthophotography:</b>	0.5' GSD (ground sample distance)
<b>Georeferencing of Imagery:</b>	Airborne GPS and IMU acquired at time of photography processed through Aerotriangulation
<b>Image Format:</b>	Uncompressed TIFF and JPEG
<b>AutoCAD Delivery:</b>	Project flight plan with final photo center locations.
<b>Fee</b>	\$30,000.00

**Option 3 – Pacific Ocean to San Clemente Reservoir**

<b>Imagery Bands:</b>	Natural Color (RGB)
<b>Nominal GSD of Photography:</b>	7.5 cm (0.25')
<b>Mean LiDAR Point Spacing:</b>	4 points per square meter
<b>Orthophotography:</b>	0.5' GSD (ground sample distance)
<b>Georeferencing of Imagery:</b>	Airborne GPS and IMU acquired at time of photography processed through Aerotriangulation
<b>Image Format:</b>	Uncompressed TIFF and JPEG
<b>AutoCAD Delivery:</b>	Project flight plan with final photo center locations.
<b>LiDAR Delivery:</b>	LAS format tiles of the LiDAR Data
<b>Fee</b>	\$30,000.00

**Option 3 – Pacific Ocean to Los Padres Reservoir**

<b>Imagery Bands:</b>	Natural Color (RGB)
<b>Nominal GSD of Photography:</b>	7.5 cm (0.25')
<b>Mean LiDAR Point Spacing:</b>	4 points per square meter
<b>Orthophotography:</b>	0.5' GSD (ground sample distance)
<b>Georeferencing of Imagery:</b>	Airborne GPS and IMU acquired at time of photography processed through Aerotriangulation
<b>Image Format:</b>	Uncompressed TIFF and JPEG
<b>AutoCAD Delivery:</b>	Project flight plan with final photo center locations.
<b>LiDAR Delivery:</b>	LAS format tiles of the LiDAR Data
<b>Fee</b>	\$35,000.00



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### **Optional Ground Control**

For an additional fee, approximately 10 ground control stations will be surveyed along the project corridor. These control stations (either established targets or photo-identifiable features) will be surveyed to improve the horizontal and/or vertical accuracy for the orthophotography and/or LiDAR data associated with **Options 2 and 3**. The fee for the establishment of this ground control is \$15,000.00.

### **MAP ACCURACY**

It is Towill's understanding that the deliverables for this project will not be used for engineering design purposes. Therefore, the horizontal and/or vertical accuracies stated below are for reference only.

#### **Option 1**

There is no horizontal accuracy estimate associated with the georeferencing of the imagery performed under this task.

#### **Option 2**

The horizontal accuracy of well-defined planimetric features that appear in the digital orthophotography (i.e. those on paved or unpaved areas that are not obscured by vegetation or other overhead features or structures and have suitable contrast in the imagery) is anticipated to be +/- 5.0 feet Root-Mean-Square-Error (RMSE) if no ground control is utilized for the project. If the Optional Ground Control is used, we anticipate a horizontal accuracy of +/- 1.0 foot RMSE.

#### **Option 3**

The horizontal accuracy of well-defined planimetric features that appear in the digital orthophotography (i.e. those on paved or unpaved areas that are not obscured by vegetation or other overhead features or structures and have suitable contrast in the imagery) or that can be identified in the LiDAR data is anticipated to be +/- 5.0 feet RMSE if no ground control is utilized for the project. The vertical accuracy of the LiDAR data collected for the project in open, unobstructed areas is anticipated to be +/- 2.0 feet RMSE if no ground control is utilized for the project. If the Optional Ground Control is used, we anticipate a horizontal accuracy of +/- 1.0 foot RMSE and a vertical accuracy of +/- 0.5 foot RMSE.

### **EXCEPTIONS**

Services other than those specifically described herein are not currently proposed.

### **TIME SCHEDULE**

We anticipate acquiring the imagery on a mutually agreed upon week day between May 15 and June 21 as weather conditions allow. We anticipate the remaining deliverables will be completed and submitted within three weeks of the image acquisition for **Option 1**. We anticipate the remaining deliverables will be completed and submitted within six weeks of the image acquisition for **Options 2 or 3**.

EXHIBIT 10-A



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Thank you for requesting this proposal from Towill, Inc. **If for any reason this proposal does not meet your budget or time constraints, please contact me to discuss options to revise the proposal to meet your needs.**

Sincerely,

TOWILL, INC.

A handwritten signature in black ink that reads "Lorraine B. Amenda". The signature is fluid and cursive, with the first name being the most prominent.

Lorraine B. Amenda, PLS  
Project Manager