

EXHIBIT A.3

**STATEMENT OF WORK – BUILDING REPRESENTATIONS
FOR
DIGITAL AERIAL DATA**

SECTION 1 – STATEMENT OF WORK

1.1 GENERAL

1.1.1 INTRODUCTION

Contractor shall deliver under this Statement of Work Building Representations collected from stereo imagery. The planimetric features (building representations) shall be topologically correct and meet the American Society for Photogrammetry and Remote Sensing (ASPRS) accuracy standards for large scale class 1 maps for 1" = 100' (and 1" = 200' for some areas) mapping in order to be incorporated into existing participants' GIS systems.

1.1.2 DEFINITIONS

In addition to the terms defined in the Base Agreement, the following definitions shall apply throughout this Exhibit A.3 (Statement of Work – Building Representations):

1. Planimetric Features

The term "Planimetric Feature(s)" shall mean representations of structures and other geographic features extracted from aerial photography. Examples of Planimetric Features include building representations, paved surfaces, curb lines, fences, manholes, signals, runways, dams, culverts, etc.

2. Building Representation

The term "Building Representation" shall mean Planimetric Feature representing the representation of an erect building (not under construction or ruin) that serves a primary business, government, or residential function.

1.2 TASKS AND DELIVERABLES

TASK 1 – DEVELOP PROJECT WORK PLAN

Contractor shall review and analyze the Data Requirements for the Building Representations to be provided under this Agreement and develop a Project Work Plan, which shall be used to accomplish the following:

1. Guide project planning;
2. Document project planning assumptions and constraints;
3. Document project-planning decisions regarding alternatives chosen;
4. Facilitate communication between project stakeholders;
5. Define key management reviews as to content, extent and timing;
6. Provide a baseline for progress measurement and project control; and
7. Provide a cost per representation for that will be used to develop project cost based upon building size and number of buildings, which will be entered into Section 2 (Schedule of Deliverables and Payments) of the Scope of Work.

DELIVERABLE 1 – PROJECT WORK PLAN

Contractor shall provide for County approval a Project Work Plan document in Word and Portable Document Format (PDF) developed in accordance with Task 1 (Develop Project Work Plan).

TASK 2 – UPDATE BUILDING REPRESENTATIONS

Contractor should utilize stereo imagery to update the existing building representations. This method will allow for data extraction without radial displacement and delineation of features obstructed by building lean. Existing LAR-IAC building representations will be provided for building edits/updates. Contractor shall provide deliverables that enable LARIAC to identify buildings that have been demolished, modified, replaced, or added since last capture/creation.

1. Horizontal accuracy shall be consistent with Second Order, Class I, i.e. ninety-five percent (95%) confidence interval of 2 cm base error and 20 parts per million linear errors.
2. Data creation shall be constrained to American Society for Photogrammetry and Remote Sensing (ASPRS) accuracy standards for large scale class 1 maps for 1" = 100'.
3. Vertical datum shall be NAVD88. All vertical stations set will be tied directly to NGS monuments whose orthometric height was determined by differential leveling and adjusted by the NGS on, or after June 1995.
4. Units shall be U.S. Survey Feet.
5. All features will conform to the California Coordinate System of 1983, Zone 5. Longitude and latitude will be based on the North American Datum of 1983.
6. Each enclosed building representation polygon shall contain two "z" (elevation) attributes representing the highest point on the building (building height above ground and mean sea level), excluding flagpoles, chimneys, and other features smaller than 4 square feet.
7. Original building IDs shall be maintained with new building IDs generated for updated/new buildings. A separate data set for demolished/removed building representations will also be created.

DELIVERABLE 2 – FINAL ACCEPTANCE

Contractor shall provide the following Deliverables in accordance with Task 2 (Update Building Representations):

- 2.1 ArcGIS shapefile with building representations as of imagery capture date represented as closed polygons (with height and elevation or "z" values as attributes for each feature), including attributes identifying source of change (modification, new construction, replacement) and links to prior building IDs. When factors such as shadows or occlusions exist building shapes can be "interpreted" but should be attributed as such.
- 2.2 ArcGIS shapefile of all buildings that have been updated, to support change analysis and detection, including attributes identifying source of change (demolition, modification, new construction, replacement) and links to current building IDs.
- 2.3 FGDC Compliant metadata.

TASK 3 – PROVIDE OPTIONAL WORK

Optional work, including any Optional Products and Optional Services, shall be provided by Contractor in accordance with Paragraph 5.2 (Optional Work) and Paragraph 4 (Change Notices and Amendments) of the Base Agreement.

Optional work shall be limited to additional work related to building representations and/or Planimetric Features.

Examples of Optional Work:

1. **Level of Detail:** Participants may request enhanced levels of detail as provided by Contractor, including enhanced three-dimensional modeling, addition of textures and applied imagery, etc as supported by Contractor.
2. **Building Size:** Participants may request the capture of building representations for buildings smaller than the original scope of work (400 sq. ft.).
3. **Attribute Information:** Participants may request the capture and addition of address information to their building representations. This may include the addition of the primary, secondary, and fractional addresses, construction types, or use types.
4. **Non-Permanent Features:** Participants may seek to capture non-permanent features such as mobile homes, boats, Recreational Vehicles, or other features not specified in the original scope of work.
5. **Other Items:** Participants may seek to capture other items not specified in the original scope of work and not currently envisioned.

DELIVERABLE 6 – OPTIONAL WORK

Contractor shall successfully provide Optional Work deliverables in accordance with Task 3 (Provide Optional Work).

1.3 SPECIFICATIONS

1.3.1 DATA REQUIREMENTS

Remote-sensed digital orthogonal aerial imagery will be collected to provide source data for creation of building representations. Existing LAR-IAC building representations will be provided for building updates (demolition, modification, new construction, replacement).

1.3.2 EQUIPMENT REQUIREMENTS

Due Prior to commencing processing, Contractor shall clearly identify the equipment (stereo software, hardware, etc.) to be used to process building representations.

1.3.3 DIRECT DIGITAL AERIAL IMAGERY ACQUISITION

Contractor shall describe the overall methodology for building representations collection and processing and procedures for ensuring accuracy standards of data are met.

1.3.4 PROTOTYPE (TEST) AREAS

Contractor will provide County with sample building representations displaying the same processing standards as will be done for the project. This sample data will be

provided to the QA/QC vendor as well as to County. County will have an opportunity to review the samples, and will give written acceptance of the enhancements prior to the Contractor processing the remainder of the project.

1.3.5 METADATA

FGDC-compliant metadata will be provided for the deliverables (building representations). These metadata will be completed using standard industry metadata tools and output in standard file formats for viewing in all widely available viewing utilities.

1.3.6 ACCURACY STANDARDS

All building representations should conform to the industry accuracy and quality standards established by the American Society for Photogrammetry and Remote Sensing (ASPRS) for Large Scale Mapping Class 1 Maps for 1” = 100’ mapping.

1.4 ACCEPTANCE CRITERIA

Contractor (and subcontractor) acknowledges that all finished products and final deliverables will be subject to systematic QA/QC, which will be done by an independent firm, whose services will be solicited by County in conjunction with this contract.

For this purpose, the County and participating cities will do additional random QA/QC to assure that all received building representations are in compliance with specified technical specifications and standards.

The Acceptance Criteria Table with “Tested Characteristics” and “Measure of Acceptability” will be finalized by Contractor and County’s QA/QC vendor during the first weeks of the project. Contractor will provide in its subcontractor’s Project Work Plan (which is Contractor’s first project deliverable) and County’s QA/QC vendor will provide in its Quality Plan document.

1.4.1 ACCEPTANCE CRITERIA: COMPLETENESS AND AESTHETICS – BUILDING REPRESENTATIONS

** Contractor is responsible for delivering building representations to County’s QA/QC vendor meeting the format and specifications below. QA/QC vendor will assure final delivery to County is in the correct format.

	RESPONSIBLE COMPANY	TESTED CHARACTERISTIC	MEASURE OF ACCEPTABILITY
A		Building Representations	
A.1.	Contractor to QA/QC vendor; QA/QC vendor to LAR-IAC	Media: USB External hard drives	Media is readable, all files accessible, no files corrupted
A.2.	QA/QC vendor	Media label	As specified by County
A.3.	Contractor	File name	Buildings
A.4.	Contractor	File format	ESRI shapefile

	RESPONSIBLE COMPANY	TESTED CHARACTERISTIC	MEASURE OF ACCEPTABILITY
A		Building Representations	
A.5.	Contractor	Files must open in correct location	Files must open with ESRI software
A.6.	Contractor	Vertical Datum	NAVD88
A.7.	Contractor	Projection	NAD 1983 State Plane – California Zone V
A.8.	Contractor	Horizontal Datum	NAD 83 reference datum
A.9.	Contractor	Units	U.S. Survey Feet
A.10.	Contractor	Spatial accuracy standards	ASPRS Accuracy Standards for Large Scale Maps Class 1 Maps 1" = 100' and 1" = 200' (national forest areas)
A.11.	Contractor	Feature	Features captured will represent building representations for permanent structures that meet the minimum size requirements. This excludes RV parks.
A.12.	Contractor	Feature Types	<p>Primary building - Polygon enclosing all erect buildings (not under construction or ruin) that serve primary business and residential functions (i.e., houses, apartments, commercial facilities). Includes attached covered porches, permanent overhangs, carport roofs, covered sidewalks, etc. as part of the building. Do not show common rooflines (e.g., between town homes, or interior sections/firewalls in commercial buildings).</p> <p>Courtyard or Atrium - Polygon created inside a primary building that is fully encompassing of an open area.</p> <p>Secondary building – Polygon enclosing all erect buildings (not under construction or ruin) that serve as secondary or minor buildings (garage/outbuilding). Includes the following:</p> <p>Smokestack - A closed circle enclosing the base of a large cylindrical smokestack.</p> <p>Silo/Bin - Polygon enclosing a large cylindrical receptacle for farm product storage.</p> <p>Tank - Polygon enclosing commercial storage tank features (Oil, chemical and propane). Do not capture small private / residential propane tanks.</p> <p>Water tower - Polygon enclosing water tower.</p> <p>Do not capture temporary structures such as construction trailers or tool storage sheds.</p>

	RESPONSIBLE COMPANY	TESTED CHARACTERISTIC	MEASURE OF ACCEPTABILITY
A		Building Representations	
A.13.	Contractor	Vector data	Features should be closed polygons that are snapped and joined to create continuous segments without overruns and gaps.
A.14.	Contractor	Buildings/townhouses and parcels	Features will be cut by parcel lines (downtown core buildings only) unless extending 1' or less into the next parcel. In this case, it should be snapped to the parcel. Townhouses and contiguous buildings crossing parcel lines will not be cut.
A.15.	Contractor	Buildings connected by corridors, covers, and walkways	Each building portion shall be created or digitized as a separate polygon (when possible).
A.16.	Contractor	Building generalization	Building shapes can be "interpreted" (and attributed as such) when factors such as shadows or occlusions exist.
A.17.	Contractor	Vertical or "Z" values and building IDs	Z-values for height above ground and mean sea level will be gathered from the highest point of the roof (rounded to the nearest 1/10 th of a foot). This excludes non-structural features such as chimneys, air conditioning units, antennas, and flag poles. Original building IDs will be maintained with new IDs generated for updated/new buildings. Demolished/removed building representations will be consolidated into a separate data set.
A.18.	Contractor	Minimum building size	Building shapes (polygons) should be created for all structures 20' X 20' (or 400 sq. ft.) or larger in size.
A.19.	Contractor	Minimum segment length	1.5' excluding awnings
A.20.	Contractor	Minimum size for change	Buildings that have roofline changes greater than 100 square feet.
A.21.	Contractor	Metadata	Complies with standard (to be determined by LA County; to match LAR-IAC metadata deliverable). Meets minimum FGDC Content Standard.

1.5 **SOFTWARE REQUIREMENTS**

Building Representations from the LAR-IAC Project can be viewed using any software that can read and display the shapefile format.

1.6 COUNTY OBLIGATIONS

1.6.1 SYSTEM REQUIREMENTS

County's system for use of the building representations in shapefile format will have sufficient capabilities and capacity to view and manage the digital GIS datasets.

1.6.2 COUNTY RESPONSIBILITIES

1. County will make available the following countywide information to Contractor at the following URL: <http://egis3.lacounty.gov/dataportal/lariac/lar-iac4/rfp-data/>
 - a) LAR-IAC Project Area Boundaries (shapefile format)*
 - b) Detailed County/City Boundaries (for orientation only - shapefile format)*
 - c) Grid for project tiles (shapefile format)*
 - d) Oblique Aerial Digital Imagery 1 sq. mile sector grid (for orientation only – shapefile format)*
 - e) Boundary of Urban Canyons “Downtown Areas” high-rise areas (shapefile format)*
 - f) Parcel vector database (for orientation only – shapefile format)
 - g) Existing control cadastral monuments (shapefile format)
 - h) Existing LAR-IAC deliverables in various formats as mutually agreed upon (ie. DTM and/or DSM, first generation 4” ortho imagery)
 - i) Other relevant GIS layers mutually determined by the Contractor and County.

*These shapefiles will be provided to all Proposers as a necessary input to the preparation of their response to this RFP.

2. All data sets provided by County for Contractor will be in ESRI shapefile format in California State Plane Coordinate System, Zone 5, NAD83, U.S. Survey Feet.

1.7 REFERENCE MAPS

1.7.1 BUILDING REPRESENTATION AREA (BRA)

Contractor (and subcontractor) shall start the building representation process by beginning with Area 1 (as described below), followed by Area 2. Maps of these areas are shown below.

BRA	RESPONSIBLE COMPANY	AREA	AREA DESCRIPTION
BRA1	Contractor	Project Area 1	All primary and secondary structures meeting the standards set forth in the acceptance criteria however, building shapes (polygons) should be created for all structures 20' X 20' (or 400 sq. ft.) or larger in size. This area covers all areas inside the County of los Angeles except for those areas falling within the Angeles and Los Padres National Forests
BRA2	Contractor	Project Area 2	All primary and secondary structures meeting the standards set forth in the acceptance criteria falling within the Angeles and Los Padres National Forests

1.7.2 PROJECT AREA MAPS

