



White Oak Central Utility Plant Scope of Work (SOW) for Laser Scanning and BIM-Based Facilities Management Services

**U.S. General Services Administration
Public Buildings Service
Office of the Chief Architect
National 3D-4D-BIM Program**

July 2, 2008

Program Background and Project Description	4
Scope of Services	5
1.0 BASE SERVICES.....	5
1.1. Deliverables Summary Tables.....	5
1.2. Table Parameters.....	7
1.2.1. Level of Detail.....	7
1.2.1.1. Level 1.....	7
1.2.1.2. Level 2.....	7
1.2.2. Type.....	7
1.2.3. Tolerance.....	8
1.2.4. Minimum Artifact Size (Resolution).....	8
1.3. 2D, 3D, and BIM Model of Existing Conditions.....	8
1.3.1. 2D Drawings of Existing Conditions.....	8
1.3.1.1. Plans.....	9
1.3.1.2. Elevations.....	9
1.3.1.3. Sections.....	9
1.3.2. 3D Geometrical Models.....	9
1.3.2.1. Architectural.....	9
1.3.2.2. Structural.....	9
1.3.3. Building Information Model.....	9
1.3.3.1. BIM Deliverables Specification Table (DST).....	10
1.3.3.2. Architectural BIM.....	10
1.3.3.3. Structural BIM.....	10
1.3.3.4. Space Object Modeling.....	10
1.3.3.5. Zone Object Modeling.....	10
2.0 OPTION A.....	10
3.0 OPTION B.....	11
4.0 OPTION C.....	11
4.1. 3D Geometric Mechanical, Electrical, Plumbing and Civil Model.....	11
5.0 OPTION D.....	11
5.1. Mechanical, Electrical, Plumbing, and Civil BIM.....	11
6.0 OPTION E.....	12
6.1. Modeling of Required Building Equipment Attributes (As-Built).....	12
6.2. National CAD Standard.....	12
6.3. <i>OmniClass</i>	12
7.0 OPTION F.....	12
7.1. Modeling of Required Building Equipment Attributes (As-Built).....	12
7.2. Construction Operations Building Information Exchange (COBIE).....	13
8.0 SPECIFICATIONS OF DELIVERABLES.....	13
8.1. Imaging/Scan and Post Processing Plan.....	13
8.2. Registered Raw Data.....	14
8.3. Quality Control Report.....	14
8.4. BIM Modeling Plan.....	15
9.0 SCHEDULE OF DELIVERABLES.....	15
9.1. Submission Schedule.....	15
9.2. Modifications to Scanning or Post-Processing Plans.....	15
9.3. Status Reports.....	16
9.4. Post Scan Support Services.....	16
10.0 EVALUATION FACTORS.....	16
10.1. Cost.....	16
10.2. Personnel and Past Performance.....	16

10.3.	Technical	17
11.0	GOVERNMENT FURNISHED INFORMATION	17
11.1.	Current drawings and Specifications	17
11.2.	Site Visit.....	17
11.3.	Pre-Bid Conference	17
11.4.	Site Access.....	17
11.5.	Ownership and Rights in Data.....	18
12.0	ADMINISTRATION.....	18
12.1.	GSA Representatives	18
12.2.	Payments.....	19

A complete copy of this announcement is available at <http://www.gsa.gov/bim>. Click the BIM Solicitations link on the left.

Program Background and Project Description

Program Background:

In July 2003, the Office of the Chief Architect (OCA) established the National 3D-4D-BIM Program. To date, OCA has initiated over 70+ capital projects across the nation using an array of 3D, 4D, and Building Information Modeling (BIM) technologies in support of GSA business needs. The power of visualization, coordination, simulation, and optimization from three-dimensional (3D), four-dimensional (4D), and BIM computer technologies allow GSA to more effectively meet customer, design, construction, and program requirements. GSA is committed to a strategic and incremental adoption of 3D, 4D, BIM technologies (www.gsa.gov/bim).

Project Description:

Project Name: White Oak CUP

Building Type: Central Utility Plant

Location: White Oak, MD

Approximate Area: 50,000 GSF

Year Built: Became operational in 2003

Project Summary: The White Oak CUP currently provides electric and hot water for the CDER laboratory and CDER Office. This is a mechanical equipment building.

The Spatial Data Management (SDM) project is a national initiative of the GSA/ Public Buildings Service (PBS) to measure federally occupied space in its facilities, capture the information in a graphical database, establish business processes, and maintain the accuracy of this data over time. The SDM project seeks to physically verify (measure and classify) the PBS space inventory and capture and maintain the resultant CAD libraries that shall be used as PBS's single trusted spatial data repository. In addition, the SDM project records and maintains accurate agency assignment data.

GSA would like to perform a comparative study between traditional SDM techniques and deliverables, versus a BIM-based method utilizing laser scanning. In addition, current GSA procedures do not adequately capture required equipment information necessary for the effective management and operation of its facilities via GSA Computer Maintenance and Management System (CMMS). GSA has a desire to enhance its building information database with this information to create a more robust and effective building management environment, enabling coordinated commissioning activities and facility management (e.g., maintenance schedules, maintenance coordination, mechanical operation, etc.) across building life-cycle phases.

Objectives for this BIM Solicitation:

- To create an accurate current-condition record of the existing building conditions. The deliverables from the interior scanning will be used primarily for verification and comparison of spatial data and area measurements. The 3D imaging at this location will provide 2D CAD plans, elevations and 3D geometric models and/or BIM required to document as-built conditions, including details of the interior spaces.
- To generate a point cloud of the building interior and exterior for applications such as spatial data management, visualization, and facility management.
- To create a BIM(s) that contains a selected population of critical architectural, structural, mechanical, electrical, plumbing, and civil objects for building services such as Fire, HVAC, Data/Communications, Security, and Lighting that may be utilized for building operation. The model(s) will support services such as spatial validation and building operations and maintenance activities.
- To populate the critical mechanical, electrical, plumbing, and civil objects with the appropriate performance requirements and as-built information. The object attribute information that is captured will be used throughout the building lifecycle and integrated into the GSA CMMS.
- To assist the GSA in developing Best Practices for the services/applications listed in sections 1.0-7.0 that will be incorporated into GSA's BIM Guide Series. It is the intention of the government to develop the Best Practices in a collaborative way so that future use of BIM for similar applications yields high quality deliverables in the most efficient manner.

Scope of Services

The following sections describe the services requested through this solicitation. The contractor shall coordinate and seek approval from the GSA COTR regarding the equipment *object types*, elements, element attributes, and zones to be modeled (these are defined later in this section). Information on the specified equipment object types, elements, element attributes, and zones to be modeled will be provided to the contractor directly by GSA COTR as that information becomes available. All services listed below include the support of development of best practices guidelines for the GSA BIM Guide Series.

This BIM Scope of Work will be a Firm Fixed Price Contract.

1.0 BASE SERVICES

1.1. Deliverables Summary Tables

The deliverables are summarized in Table 1 below. Information, deliverables, and services are explained in subsequent sections. Contractor shall refer to Appendix B, Table 1 – BIM Deliverables Specification Table for more information regarding BIM deliverables. Supporting images can be found in Appendix B.

Table 1: Deliverables Summary Table (DST)			
Area of Interest (AOI)	Deliverable		Type
	SOW Section	Description	
General Requirements			
Applicable to all Areas of Interest	8.1	Imaging/Scan + Post-Processing Plan	Base
	8.2	Registered Raw Data (subject to tolerance and resolution requirements of corresponding Areas of Interest)	Base
	8.3	Quality Control Report	Base
Level 1			
Coordinate Frame: State Plan Coordinate System (SPC)			
<i>Unless otherwise noted, registered raw data, drawing, and modeling specifications shall be:</i>			
Tolerance: +/- 2", Minimum Artifact Size: Resolution 2" x 2"			
1-A Site	1.3.1.1	Site Plan	Option A
	1.3.3	3D/BIM	Option A
Level 2			
Coordinate Frame: Project			
<i>Unless otherwise noted, registered raw data, drawing, and modeling specifications shall be:</i>			
Tolerance: +/- 1", Minimum Artifact Size: Resolution 1" x 1"			
2-A Exterior (Facades)	1.3.1.2	Elevations	Option A
	1.3.3	3D/BIM	
2-B Interior (all spaces below ceiling level)	1.3.1.1	Plans	Option A
	1.3.1.3	Sections	
	1.3.3	3D/ BIM	
2-C The above drop ceiling areas on the 1 st floor	1.3.1.1	Plans	Option B
	1.3.1.3	Sections	
	1.3.3	3D/BIM	
2-D The above drop ceiling areas on the 2 nd floor	1.3.1.1	Plans	Option B
	1.3.1.3	Sections	
	1.3.3	3D/BIM	

1.2. Table Parameters

The parameters in Table 1 are:

1.2.1. Level of Detail

A hierarchical system of scale with identified Areas of Interest (AOI) in which each 3D imaging/scan is registered per the scanning specifications outlined in Section 1.0 - Table 1.

1.2.1.1. Level 1

All deliverables at this level of detail shall be registered to State Plane Coordinates (SPC) or equivalent if approved by GSA COTR. Unless otherwise noted, registered raw data, drawing, and modeling tolerance for Level 1 areas of interest shall be +/- 2". Registered raw data, drawing, and modeling deliverables shall cover all building features and elements with an artifact size that is larger than 2" x 2".

1-A: The subject building and the surrounding landscape and streetscape (Appendix B: Figure 1). The building is located on the FDA campus in White Oak, MD.

1.2.1.2. Level 2

All deliverables at this level of detail shall be registered to Project Coordinate Frame or equivalent if approved by GSA COTR. Unless otherwise noted, registered raw data, drawing, and modeling tolerance for Level 2 areas of interest shall be +/- 1". Registered raw data, drawing, and modeling deliverables shall cover all building features and elements with an artifact size that is larger than 1" x 1".

2-A: All exterior facades, including the roof.

2-B: The interior spaces on all building levels below ceiling level. Access to the interior spaces for scanning will be coordinated between GSA and the building tenants. As this is a Central Utility Plant, the contractor shall capture all mechanical, electrical, and plumbing equipment in the scan. The building consists of a 2-story office component (approx. 1000sf on 2nd floor). Back portion is 1 story with a large roof. The total square footage is approximately 50,000 gsf.

2-C: The areas of interest are the above ceiling areas on the 1st floor and is accessible through the ceiling panels. The contractor shall capture any ductwork and equipment above the ceilings.

2-D: The areas of interest are the above ceiling areas on the 2nd floor and is accessible through the ceiling panels. The contractor shall capture any ductwork and equipment above the ceilings.

1.2.2. Type

Refers to the requirement of either Base deliverables or Optional deliverables, as determined in Section 1.0 - Table 1.

1.2.3. Tolerance

The allowable dimensional deviation, in the selected coordinate frame of the deliverables, relative to truth measured in Imperial Units (English Units). Truth being measurements obtained by other means and/or a third party as determined by the GSA COTR.

1.2.4. Minimum Artifact Size (Resolution)

The dimensions of the smallest recognizable feature to be included in the deliverables, measured in Imperial Units (English Units).

1.3. 2D, 3D, and BIM Model of Existing Conditions

The contractor shall submit 2D representations of existing conditions (e.g., represent deformations and out-of-plumb conditions of artifacts that are subject to the artifact size definitions) of the areas scanned using the registered raw data from Deliverable 8.2. The government shall provide current drawings and specifications for each facility structure, if available, after GSA issues the Notice to Proceed. The 3D imaging information is expected to be used for verification and modification of existing 2D CAD drawings which will be provided by the GSA to the contractor.

The contractor shall model the existing condition of the facilities (e.g., represent deformations and out-of-plumb conditions of artifacts that are subject to the artifact size definitions) for the architectural, structural, mechanical, electrical, and plumbing components listed below using either a 3D model (Section 1.3.2) and/or a BIM model (1.3.3).

3D/BIM model(s) shall conform to the scanning specifications outlined in Section 1.2.1. The tolerance for Area of Interest Level 1 shall be +/- 2". The models shall cover all building features and elements with an artifact size that is larger than 2" x 2". The tolerance for AOI Level 2 shall be +/- 1". The models shall cover all building features and elements with an artifact size that is larger than 1" x 1". The tolerance for AOI Level 3 shall be +/- 1/4" and the models shall cover artifact size larger than 1/2" x 1/2".

1.3.1. 2D Drawings of Existing Conditions

2D drawings shall conform to the scanning specifications outlined in Section 1.2.1. The tolerance for Area of Interest Level 1 shall be +/- 2". The drawings shall cover all building features and elements with an artifact size that is larger than 2" x 2". The tolerance for AOI Level 2 shall be +/- 1". The drawings shall cover all building features and elements with an artifact size that is larger than 1" x 1". The tolerance for AOI Level 3 shall be +/- 1/4" and the drawing shall cover artifact size larger than 1/2" x 1/2".

The GSA PBS CAD standards apply for all cases of this deliverable. The PBS CAD standards can be found at the public GSA website: <http://www.gsa.gov> (Home > Buildings > Public Buildings > Design and Construction > CAD Standards > CAD Standards Library). The contractor shall extrapolate the drafted drawing beyond the limits of the laser scanner range to the maximum extent possible showing as much detail as possible. Other traditional forms of surveying are acceptable as supplements to the 3D scanning process in order to capture data that exceeds the maximum limits of the scanner.

Contractor shall submit 2 sets of paper drawings 36" x 24" to the GSA COTR and the regional representative of the project; submit two additional electronic copies of the same drawings in ".dwg" format, one to GSA COTR and another to the regional project manager.

The system of measure for modeling renovation and alternation projects can be soft metric (e.g., designations such as "1 inch (25.4mm)" in which metric equivalents are attached to English units).

1.3.1.1. Plans

The contractor shall provide plans of the AOIs. Plans shall represent the as-built conditions of the facility and its surroundings. Contractor shall provide a roof plan drawing that clearly shows the roof configuration, but is not limited to, the following items: antenna locations and assignments, skylights, penthouses, cooling towers, venting systems for air and mechanical, etc. Refer to PBS CAD Standards (March 2004), page 13.

1.3.1.2. Elevations

The contractor shall provide elevations for the AOIs. Elevations shall represent the as-built conditions of the exterior condition of the facility.

1.3.1.3. Sections

The contractor shall provide five sections for the corresponding AOIs specified in Table 1. Sections shall represent the as-built conditions of the interior condition of the facility. Contractor shall coordinate with GSA to determine which sections shall be provided.

1.3.2. 3D Geometrical Models

Using a 3D computer application(s), the contractor shall deliver a 3D geometric model of the components listed below. The contractor shall use 3D geometries (e.g., shapes, solids, surfaces, etc.) to represent building components. The contractor shall coordinate and seek approval from the GSA COTR regarding the components to be modeled (examples are listed below). The geometric model should include, but is not limited to, the following components listed in Sections 1.3.2.1 – 1.3.2.2.

1.3.2.1. Architectural

The 3D model(s) shall include slabs/floors, walls (exterior and interior), roofs, ceilings (plasters or suspended), doors, windows, etc.

1.3.2.2. Structural

The 3D model(s) shall include trusses, beams, columns, joists, pre-cast systems, etc.

1.3.3. Building Information Model

The contractor shall provide an architectural and a structural BIM. The contractor shall properly use available "object information" that embody information about the building component requirements and properties (e.g., construction materials, functional information, dimensions, etc). The contractor shall refer to GSA BIM Guide Series 02-

Spatial Program Validation for a minimum list of required building elements to be modeled.

The BIM model shall be in accordance with GSA BIM Guides (www.gsa.gov/bim). The object model shall be submitted in a BIM software application that can export to the Industry Foundation Classes (IFC) format. Autodesk Revit, Autodesk Architectural Desktop, Bentley Architecture, Onuma, Vectorworks, and Graphisoft ArchiCAD are the software applications that have been validated as compatible with the GSA BIM Guide. Other BIM applications may be acceptable; contractors shall seek approval of any alternate formats from the GSA COTR.

1.3.3.1. BIM Deliverables Specification Table (DST)

Contractor shall refer to the Appendix B – Table 1 for the BIM Deliverables Specification Table.

1.3.3.2. Architectural BIM

The contractor shall provide an architectural BIM that contains all significant architectural elements. Building elements to be modeled include all exterior and interior walls, roofs, ceilings, doors, windows, and stairs.

1.3.3.3. Structural BIM

The contractor shall provide a structural BIM that contains all major structural elements, including slabs, columns, and beams. These elements shall be integrated into the architectural BIM in section 1.3.2, as is required by Section 3-Building Elements of the BIM Guide Series 02- Spatial Program Validation.

1.3.3.4. Space Object Modeling

The model shall build upon the architectural BIM (Section 1.3.2) with the following spatial attributes: Space Number (ID), Space Name, GSA BIM Area, GSA Design Gross Area, Occupant Organization Name, and GSA STAR Space Type. The contractor shall finalize deliverables in accordance with the BIM Guide Series 02- Spatial Program Validation developed by the GSA Office of the Chief Architect (www.gsa.gov/bim) and shall support GSA to conduct spatial program BIM analysis.

1.3.3.5. Zone Object Modeling

The contractor shall associate space objects in the BIM model (section 1.3.2) with zonal information to assist GSA in visualization and analyses of spatial information. Up to 5 sets of zonal information shall be modeled. Possible zones to be modeled are zones for HVAC, electrical, plumbing, data and communications, and security.

2.0 OPTION A

Contractor shall reference Table 1 in Section 1.0 for description of deliverables required in Option A.

3.0 OPTION B

Contractor shall reference Table 1 in Section 1.0 for description of deliverables required in Option B.

4.0 OPTION C

4.1. 3D Geometric Mechanical, Electrical, Plumbing and Civil Model

Using a 3D computer application(s), the contractor shall deliver a 3D geometric model of the components listed below. The contractor shall use 3D geometries (e.g., shapes, solids, surfaces, etc.) to represent building components. The contractor shall coordinate and seek approval from the GSA COTR regarding the components to be modeled (examples are listed below). The geometric model should include, but is not limited to, the following components listed in Sections 4.1.

The tasks detailed in Section 4.1 shall require one inclusive estimate (see Appendix A).

Mechanical: The 3D model(s) shall include air handling units, HVAC piping and ductwork, HVAC equipment, elevators, etc.

Electrical: The 3D model(s) shall include conduits over 1/2", panel boards, electrical equipment, etc.

Plumbing: The 3D model(s) shall include plumbing fixtures and equipment, piping over 1/2", etc.

Civil: The 3D model(s) shall include transformers, gas lines, water supply piping, etc.

5.0 OPTION D

The tasks detailed in Section 5.1 shall require one inclusive estimate (see Appendix A).

5.1. Mechanical, Electrical, Plumbing, and Civil BIM

The contractor shall provide mechanical, electrical, plumbing, and civil BIMs that model the major *object types* for these disciplines. The mechanical, electrical, plumbing, and civil objects that are modeled may pertain to a variety of building systems, such as HVAC, Fire Protection and Safety, Data and Communications, and Security. Approximately 30 different *object types* will be modeled for the existing design. Example *object types* are:

Mechanical: pumps, chillers, air handling units (AHU), exhaust fans, boilers, etc.

Electrical: electric panels, fluorescent lighting, fiber optics cables, cable trays, conduit, feeders, fire alarms, etc.

Plumbing: sprinkler systems, storage tanks, pumps, supply piping, etc.

Civil: transformers, gas lines, water supply piping, etc.

Instances of similar equipment types with varying manufacturers or sizes but *the same functional use* do not constitute separate *object types*. Quantities of each *object type* will vary based on design. Several object type quantities in the existing building are provided for reference:

Mechanical: chillers (0), AHUs (4), boilers (0)

Electrical: electric panels (23), fluorescent fixtures (2,756)

Plumbing: storage tanks (0), pumps (4)
Civil: transformers (9)

In addition to the basic properties of equipment name/description, dimensions, and location, a total of 3 equipment attributes (e.g. hp, tonnage, wattage) shall be required for each object. Options D and E address more extensive equipment attribute modeling.

6.0 OPTION E

The tasks detailed in Sections 6.1-6.3, though all under Option E, shall require two separate estimates, one for task 6.1 and one for tasks 6.2 and 6.3.

6.1. Modeling of Required Building Equipment Attributes (As-Built)

The contractor shall populate the building elements modeled in Option D with more extensive equipment information that captures the as-built conditions of the building. In addition to the basic properties of name/description, dimensions, location, National CAD Standard acronym (Section 6.2) and *OmniClass* classification (Section 6.3), a total of 15 equipment attributes (e.g. hp, gpm, rpm, power factor, etc.) shall be required for each object. Option E addresses more extensive equipment attribute modeling. Information on the specified equipment to be modeled will be provided to the contractor by the GSA COTR as that information becomes available.

6.2. National CAD Standard

To ensure stability and conformity throughout the life cycle of all assets and repairs, the GSA desires to create a standard system of acronyms based upon the National CAD Standard that will be used throughout the National Capital Region (Region 11/NCR) to identify equipment. The contractor shall coordinate with the GSA COTR to obtain the appropriate acronyms for the building equipment modeled in Option D. This information will be included in the list of attributes that is assigned to the required building elements.

6.3. *OmniClass*

The *OmniClass* Construction Classification System (known as *OmniClass* or OCCS) is a new classification system for the construction industry developed by the Construction Specification Institute (CSI). It builds upon MasterFormat for work results, UniFormat for elements, and EPIC (Electronic Product Information Cooperation) for structuring products. *OmniClass* is a reference library that will serve as the foundation upon which information is transferred between the BIM, COBIE, and GSA's CMMS (see Section 7.0). The contractor shall include the appropriate *OmniClass* classification in the list of attributes that is assigned to the required building elements. The contractor(s) shall coordinate with the GSA COTR to ensure the correct application to *OmniClass* to the modeled elements.

7.0 OPTION F

The tasks detailed in Sections 7.1-7.2, though all under Option F, shall require two separate estimates, one for tasks 7.1 and one for task 7.2.

7.1. Modeling of Required Building Equipment Attributes (As-Built)

The contractor shall populate the building elements modeled in Option D with more extensive equipment information that captures the as-built conditions of the building. In

addition to the basic properties of name/description, dimensions, and location, a total of 20 equipment attributes, including final specifications or attributes referenced in Sections 5 and 6, shall be required for each object. The contractor will be provided with the required as-built data directly by the GSA COTR and its construction phase general contractor as the information becomes available during the Construction Phase.

7.2. Construction Operations Building Information Exchange (COBIE)

The Construction Operations Building Information Exchange (COBIE) is a buildingSMART initiative of the National Institute of Building Science's (NIBS) Facility Maintenance and Operations Committee, the Facility Information Council, the International Alliance for Interoperability, and the National Building Information Model Standard. It is a federal government sponsored effort to support the development of BIM via information exchange between the construction and operations phases. COBIE has several functions. First, it serves as a repository for important equipment information, as does the BIM model. Second, it allows for the collection and management of electronic construction submittals in various file formats, and enables the owner to ensure that the performance requirements for the project have been met.

The contractor shall coordinate the appropriate equipment information from the BIM with the COBIE system. As construction as-built data is submitted to COBIE by the general contractor, the BIM services contractor shall update the appropriate equipment attributes in the BIM model. The contractor shall coordinate with the GSA COTR to ensure the correct coordination between the BIM and COBIE.

Equipment information from COBIE and the BIM will be transferred directly into the GSA CMMS by the GSA facility management team. The contractor will coordinate with the facility management team to ensure the information to be transferred is complete and in the correct format.

8.0 SPECIFICATIONS OF DELIVERABLES

8.1. Imaging/Scan and Post Processing Plan

The contractor shall develop a scan plan that explains how they will meet the requirements of Section 1.0 - Table 1. The plan will describe the methods and means of their operation, including but not limited to: equipment used, instrument calibration standards, current instrument calibration certification, scan procedures, control network methodology, personnel qualifications, proposed schedule for gathering field data (including alternatives in case of inclement weather), quality control plan, safety protocol and steps to be taken if there is missing data or errors. The contractor shall also explain how the registered scan data will be reduced in size (to filter noise and redundant data) after registration to the maximum extent possible without compromising quality.

The contractor shall develop and submit a post-processing plan. The plan shall address how the requirements of Section 1.0 - Table 1 will be achieved. This will include scan data processing software, modeling software, personnel qualifications, a description of the work flow from data acquisition through delivery, and quality control plan. This includes the processing of data obtained from auxiliary means, such as photographs and traditional surveys. For Options A-F, the contractor shall specify whether the models to be submitted will be 3D geometric models or BIM. Post-processing shall not commence until a post-processing plan is approved by the GSA COTR.

The scan plan and post-processing plan will be subject to the government's approval and scanning is not to commence until the scan plan and post-processing plan have been approved by the GSA COTR. The review and acceptance of the scan plan and post-processing plan by the GSA COTR does not obviate the provider from the responsibility of providing the specified tolerances for the deliverables in any way.

If at any time modifications are made to an already approved scan or post-processing methodology, it is the contractor's responsibility to update the scan or post-processing plan and send the revisions to the GSA COTR.

8.2. Registered Raw Data

The contractor shall submit registered raw data. Such raw data may include point cloud data, calibrated photographs, satellite images, etc. If 3D imaging technology is employed, the preferred format for this data is in ASCII: x, y, z, I, R, G, B (if intensity and color information are available). Other formats may be acceptable and are subject to approval by the GSA COTR. The registered point cloud data shall be reduced in size, to filter noise and redundant data to the maximum extent possible without compromising the accuracy and resolution of the model.

Unless otherwise noted or pre-approved by GSA, registered raw data shall conform to the scanning specifications outlined in Section 1.2.1. The tolerance for Level 1 shall be +/- 2" and the minimum artifact size shall be 2" x 2" resolution. The tolerance for Level 2 shall be +/- 1" and the minimum artifact size shall be 1" x 1" resolution. The tolerance for Level 3 shall be +/- 1/4" and the minimum artifact size shall be 1/2" x 1/2" resolution.

8.3. Quality Control Report

The contractor shall provide a Quality Control Report that verifies point cloud (if applicable), and post-processing accuracy in accordance with the DST. It should identify the specific steps that will be taken, such as but not limited to statistical analyses or independent measurement of standard artifacts. The contractor shall provide a report on the errors of the control network and the registration error, if applicable, between 1) the local or instrument coordinate frame and the control network or the project coordinate frame, 2) the project coordinate frame and the control network or the State Place System and 3) within a given coordinate frame.

The contractor shall provide Quality Control Reports based upon the chosen Options that verify the model(s) accuracy in accordance with the DST. They should identify the BIM modeling technological restrictions encountered during the modeling process, and the specific steps that will be taken to work around these restrictions.

The contractor shall provide biweekly narrative status reports to the GSA COTR via email. These reports should summarize completed tasks, upcoming tasks, risks, and mitigation plans. Reports shall detail names of staff who worked that week, the floors that were visited, rooms not accessed, and other issues that may delay or hinder timely project completion (For the duration of the contract period).

The contractor shall be responsible for the quality, technical accuracy, and the coordination of all deliverables. The contractor shall, without additional compensation, correct or revise any errors or deficiencies.

Neither the Government’s review, approval or acceptance of, nor payment for, the services required under this contract shall be construed to operate as a waiver of any rights under this contract or of any cause of action arising out of the performance of this contract.

8.4. BIM Modeling Plan

The contractor shall submit BIM modeling plans for the base deliverable and each Option exercised by GSA. The plans shall be due within 60 days after the NTP. The plans shall address how the contractor will meet the requirements of the BIM Deliverables Specification Table (DST) shown in Appendix B – Table 1. The plans will describe the methods and means of how the contractor plans to meet the modeling requirements, including, but not limited to, the BIM-authoring tools that will be used, proposed methodologies for integrating the required equipment attributes into the BIM model (when applicable), and the proposed modeling schedule.

A preliminary BIM Modeling Plan that address all the Options listed shall be submitted as part of the contractor bid package. It should include, in addition to the parameters listed above, the table listed below, with the proposed Days After Receiving Order (DARO) completion time filled in.

Deliverables:	Completion Time (DARO)
Base	
Option A	
Option B	
Option C	
Option D	
Option E	
Option F	

9.0 SCHEDULE OF DELIVERABLES

9.1. Submission Schedule

Submission	Deliverables	Schedule
Imaging + Post-Processing Plan	8.1	Within 30 calendar days after Notice to Proceed
Raw Data Acquisition and Registration on Site		
Registered Raw Data	8.2	Within 15 calendar days after completion of on-site imaging/scanning
Preliminary Submission	1.3.2, 1.3.3, 8.3, 8.4. Options as exercised	Within 60 calendar days after completion of on-site imaging/scanning
Final Submission	1.3.2, 1.3.3, 8.3, 8.4. Options as exercised	Within 60 calendar days after COTR's comments on Preliminary Submissions

9.2. Modifications to Scanning or Post-Processing Plans

If at any time modifications are made to an already approved scan or post-processing methodology, it is the contractor's responsibility to update the scan or post-processing plan and send the revisions to the GSA COTR.

9.3. Status Reports

The contractor shall provide biweekly narrative status reports to the GSA COTR via email. These reports should summarize completed tasks, upcoming tasks, risks, and mitigation plans.

9.4. Post Scan Support Services

The contractor shall provide post scan support services. This includes, but not limited to, phone conferences, data conflict resolution, and model troubleshooting. Post scan support services shall be made available for at least 6 months from completion of the last deliverable.

The contractor shall be responsible for the quality, technical accuracy, and the coordination of all deliverables. The contractor shall, without additional compensation, correct or revise any errors or deficiencies.

Neither the Government's review, approval or acceptance of, nor payment for, the services required under this contract shall be construed to operate as a waiver of any rights under this contract or of any cause of action arising out of the performance of this contract.

Contractors are to provide firm-fixed costs for each deliverable using the form in Appendix A. All bidders are to enter all costs (including travel cost) for the base and all optional requirements on this sheet and submit it with their proposal.

10.0 EVALUATION FACTORS

The evaluation factors below will be considered when selecting the offeror for award. For each proposal pertaining to a particular project location, the bid package shall not exceed a total of ten pages. Cover and separation sheets are counted and any page after the tenth page will not be considered. In addition to the ten pages, offerors shall fill out Appendix A and include it as an attachment to their proposal.

10.1. Cost

Offeror shall fill out Appendix A (all base and optional boxes with a firm fixed price) and include it to their proposal.

10.2. Personnel and Past Performance

This factor measures the relevancy of the offeror's past experience to the requirements of this project. The offeror shall identify key personnel, key subcontractors, and a proposed schedule for the project, as well as a detailed plan describing how the offeror intends to execute the work. The offeror shall identify key positions in their organization they intend to utilize for the project and shall provide a rationale for selecting these positions as being "key". The offeror shall provide resumes for its key personnel. Resumes must document recent and relevant experience (within the past five years).

Offerors shall provide a description of all relevant 3D Imaging and BIM Modeling projects that had like or similar requirements over the past three years, in particular any experience

relating to facility operations and maintenance. Provide descriptions including the project size, objectives, and deliverables. Images and diagrams may be used if available. In addition, this criterion measures the quality of the offeror's past performance for similar projects as defined herein. Quality is judged with respect to workmanship, administration, cost control, cooperation, and adherence to schedule and will be evaluated through reference checks made by the Government on relevant projects, completed or in progress, that include activity-specific experience.

10.3. Technical

This factor measures the contractor's demonstrated understanding of the project through a proposed Preliminary Scan, Post-processing, QC, and BIM Modeling Plans. These plans should address operation and risk mitigation strategies with respect to the services and deliverables outlined in Sections 1.0-4.0. Outside references are encouraged.

11.0 GOVERNMENT FURNISHED INFORMATION

The government shall cooperate to the fullest extent possible in providing information that is known to exist. Information listed below will be made available to the contractor upon request via the GSA COTR.

11.1. Current drawings and Specifications

Current drawings and specifications for the facility structure will be provided, if available, after GSA issues the Notice to Proceed.

11.2. Site Visit

The government will coordinate one site visit prior to the actual on-site scanning. The site visit schedule will be promulgated at a later time.

11.3. Pre-Bid Conference

The CO, GSA COTR, and regional teams will hold a pre-bid teleconference on **Monday, August 18th, at 10am ET**. Contractors bidding on any portion of this solicitation will have the opportunity to gain clarifications on that day. The teleconference number is **888-889-1956** and passcode is **BIM**.

The contractor may receive access to other data and information necessary to perform this work only if determined and facilitated by GSA and upon GSA's discretionary rights, resolve and approval.

11.4. Site Access

The government will assist the contractor with obtaining security access to the site. The contractor shall be responsible for all administrative matters regarding applications for access.

11.5. Notice To Proceed

Award of this contract will be predicated upon security clearance approvals which are conducted by security personnel at the project location. Therefore, although an award is made by GSA for performance under this contract, work may not commence until a Notice To Proceed is formally issued by the Contracting Officer. GSA assumes no financial obligation for the period between the award of the contract and the Notice To Proceed. If

a Notice To Proceed is not issued due to security concerns, GSA reserves the right to terminate the contract without recourse.

11.6. Ownership and Rights in Data

GSA PBS shall have ownership of and rights to all data contained in BIMs and other deliverables developed and provided by the A/E in accordance with the applicable provisions of the A/E contract, including relevant clauses detailed under FAR 52.227 and GSA Order 3490.1. The contractor must comply with, but is not limited to, the following 3490.1 clauses:

All 3D, 4D, and Building Information Modeling-related information is considered to be Sensitive But Unclassified (SBU). SBU documents provided under contract are intended for use by authorized users only. In support of the contracted requirements, GSA will require contractors to exercise reasonable care when handling documents relating to SBU building information. Dissemination of any information provided for, generated by, and resulting from GSA projects is only allowed to authorized users. It is the responsibility of the person or firm disseminating the information to assure that the recipient is an authorized user and to keep records of recipients. Valid identification for non-Government users is required to receive SBU building information. For qualifying forms of identification, refer to GSA Order 3490.1.

The efforts required above shall continue throughout the entire term of the contract and for whatever specific time thereafter as may be necessary. Authorized users should store electronic information in a password protected (non-public) environment. Necessary record copies for legal purposes (such as those retained by the architect, engineer, or contractor) must be safeguarded against unauthorized use for the term of retention. Documents no longer needed shall be destroyed (such as after contract award, after completion of any appeals process or completion of the work). Destruction shall be done by burning or shredding hardcopy, and/or physically destroying CD's, deleting and removing files from the electronic recycling bins, and removing material from computer hard drives using a permanent erase utility or similar software. A Written Agreement of Disposal must be provided to the GSA upon contract completion.

For further detail, refer to GSA Order 3490.1, FAR 52.227, and other relevant data ownership and rights regulations. A copy of these documents may be obtained by contacting the GSA CO.

12.0 ADMINISTRATION

12.1. GSA Representatives

On behalf of the GSA Contracting Officer (CO), the GSA COTR is responsible for the general administration of this Work Order and review/acceptance of all task deliverables. The following individuals will serve as the Government points of contact concerning the contract negotiations, information exchange, submission review, and payment. Nothing said by the GSA COTR and/or the regional project team shall be construed to change contract requirements unless supported in writing by the CO.

Contracting Officer	COTR	Region 11
---------------------	------	-----------

Collette Scott, Contracting Officer	TBD	TBD
Physical Capital Asset Mgmt Division (PGE) 1800 F STREET NW Room: 4302	PBS Office of the Chief Architect & Capital Construction Programs 1800 F Street NW	Financial Management Division 7 th & D Streets, SW
Washington, DC 20405	Washington, DC 20405	Washington, DC 20407
collette.scott@gsa.gov		
202-501-9154		

12.2. Payments

Payment terms shall be Net-30 following receipt of Deliverables.

Invoices must be transmitted electronically to GSA Ft. Worth, TX. All invoicing questions should be directed to Ft. Worth at (817)-978-2397.

Appendix A – Bid Proposal Summary Sheet

Contractors shall use this form as an attachment to their bid proposals. Contractors are to insert bid costs for base deliverables and **all** options. Costs for options shall be **in addition to** the base bid. The GSA reserves the right to exercise Options and Sub-Options at its discretion.

Bid Proposal Summary Sheet – New Bern				
Area of Interest	Deliverable		Type	Cost
	SOW Section	Description		
Base Deliverables				
Applicable to all levels of details	8.1	Imaging/Scan + Post-Processing Plan	Base	\$
	8.2	Registered Raw Data		
	8.3	Quality Control Report		
Total Base Bid:				\$
Options Deliverables				
1-A Site	1.3.1.1	Site Plan	Option A	\$
	1.3.3	3D/BIM		
2-A Exterior (Facades)	1.3.1.2	Elevations		
	1.3.3	3D/BIM		
2-B Interior (all spaces below ceiling level)	1.3.1.1	Plans		
	1.3.1.3	Sections		
	1.3.3	3D/BIM		
2-C The above drop ceiling areas on the 1 st floor	1.3.1.1	Plans	Option B	\$
	1.3.1.3	Sections		
	1.3.3	3D/BIM		
2-D The above ceiling areas on the 2 nd floor	1.3.1.1	Plans		
	1.3.1.3	Sections		
	1.3.3	3D/BIM		
BIM Deliverables	4.0	3D Geometric MEP and Civil Model	Option C	\$
	5.0	MEP and Civil BIM with (3) Equipment Attributes	Option D	\$
	6.1	MEP and Civil BIM with (15) Equipment Attributes	Option E1	\$
	6.2 & 6.3	National CAD Standard & OmniClass Attributes	Option E2	\$
	7.1	MEP and Civil BIM with (20) Equipment Attributes	Option F1	\$
	7.2	COBIE Attributes	Option F2	\$
Total Options Bid:				\$
Contractor Name:				

Appendix B

Table 1. BIM Deliverables Specification Table

Option	Description	Examples
Option A	Modeling Plan and QC Reports	.doc, .pdf
	Spaces and zones modeled (with IFC)	.rvt, .pln, .dgn, .dwg, .ifc
	Editable Architectural and Structural BIM model on a native platform	.rvt, .pln, .dgn, .dwg
Option B	Modeling Plan and QC Reports	.doc, .pdf
	Spaces and zones modeled (with IFC)	.rvt, .pln, .dgn, .dwg, .ifc
	Editable Architectural and Structural BIM model on a native platform	.rvt, .pln, .dgn, .dwg
Option C	Modeling and QC Reports	.doc, .pdf
	Editable MEP and Civil 3D models	.rvt, .pln, .dgn, .dwg
Option D	Modeling and QC Reports	.doc, .pdf
	Editable MEP and Civil BIM models (30 object types)	.rvt, .pln, .dgn, .dwg
Option E	Modeling Plan and QC Reports	.doc, .pdf
	Required equipment attributes (Performance Requirements)	.rvt, .pln, .dgn, .dwg
	National CAD Standard and OmniClass attributes	.rvt, .pln, .dgn, .dwg
Option F	Modeling Plan and QC Reports	.doc, .pdf
	Required equipment attributes (As-Builts)	.rvt, .pln, .dgn, .dwg
	COBIE Interface populated with required attribute information	.xls

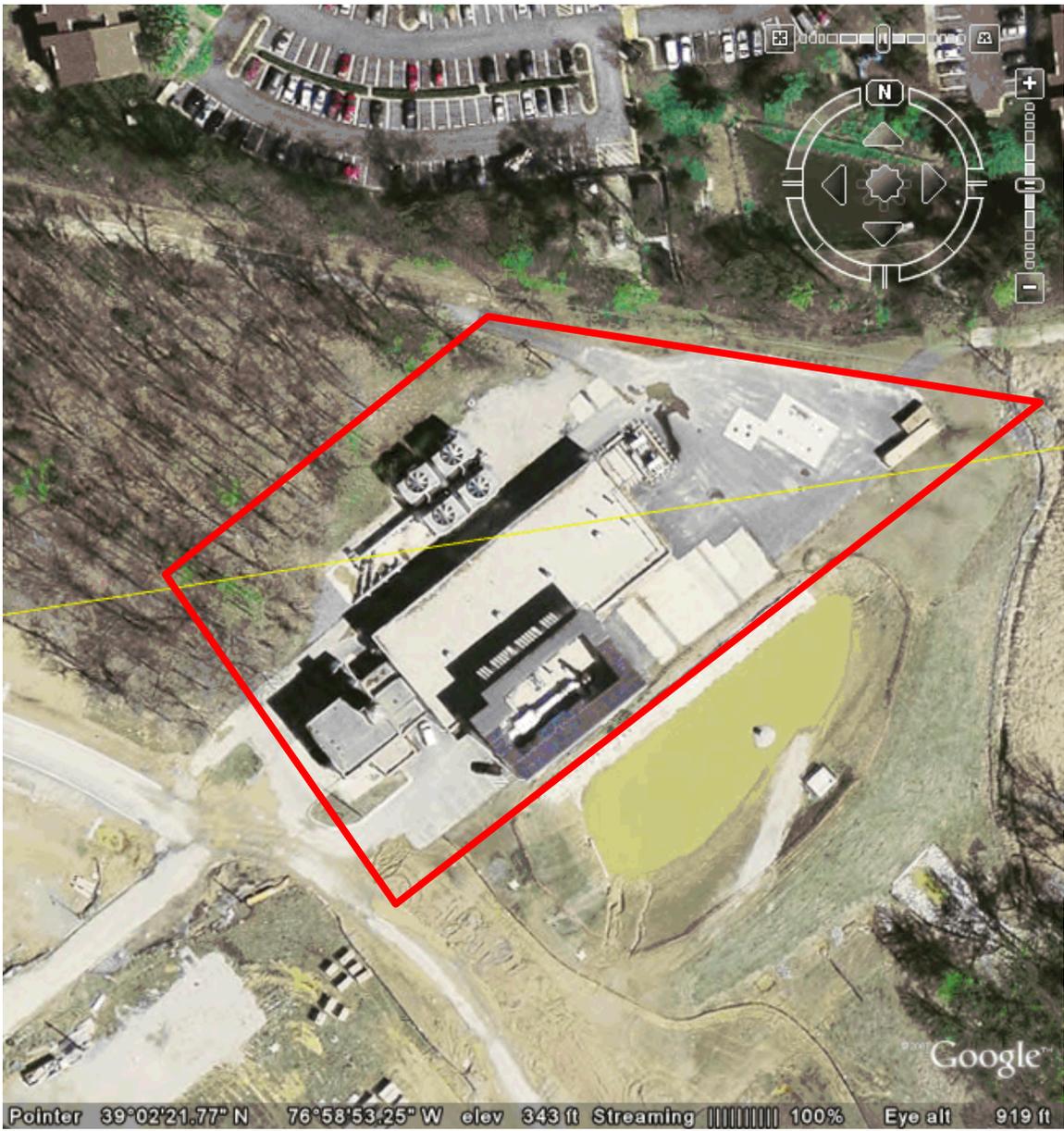


Figure 1. Site Plan of White Oak CUP Building