



**DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE TEST CENTER
EDWARDS AIR FORCE BASE CALIFORNIA**

NOTICE TO: Velocity Alliance Consortium Members and Industry Partners via SAM.gov

Request for Whitepapers (RWP) for AEDC Facility Digital Twins and Predictive Analytics

Authority: 10 U.S.C. § 4022

North American Industry Classification Standard (NAICS) Code: 541330 - Engineering Services

Federal Supply Code (FSC): T013 - Photo/Map/Imagery- 3D Model/Map

NAICS code will be used to establish business size. Offerors may recommend an alternative NAICS Code or FSC for consideration.

1.0 Introduction and Purpose

The Department of the Air Force, AFMC/AFTC/PZIA (Arnold), is issuing this Request for Whitepaper (RWP) to identify innovative, commercial, or non-traditional solutions for a comprehensive test facility scanning and high-definition 3D modeling prototype project.

This effort is being executed under the Other Transaction (OT) authority for prototype projects pursuant to 10 U.S.C. § 4022. The Government intends to award a multi-year, phased prototype project to modernize facility documentation and digital asset management, directly enhancing the mission effectiveness and operational safety of unique national test assets.

AEDC operates the most advanced and largest complex flight simulation test facilities in the world, characterized by highly complex, dense infrastructure. Currently, there is a critical need to capture accurate, as-built, up-to-date models and drawings of these facilities to support future projects, reduce timelines/costs, enhance safety, and improve configuration management.

2.0 Project Scope and Key Objectives

The objective of this prototype project is to develop a comprehensive suite of engineering-grade, high-fidelity 3D models. The initial prototype base phase will focus on the Von Kármán Gas Dynamics Facility (VKF) Yard and Plant (approx. 260,000 sq. ft. footprint / 1,040,000 sq. ft. scan area). Subsequent phases will scale this digital twin methodology to over 2.5 million square feet of facility footprint across the complex.

Core Objectives:

Whitepapers should detail an innovative approach to achieving the following technical parameters:

- **Model Accuracy:** Final dimensional accuracy of at least +/- 1/4 inch, globally referenced to project survey control. (Methodologies achieving +/- 1/8 inch are highly desired).
- **Level of Detail (LOD):** Delivery of 3D models to a minimum of LOD 350, including structural, mechanical, and major electrical systems. (Plans to achieve LOD 400 for primary connection points are highly desired).
- **Comprehensive Coverage:** Complete interior modeling of VKF (excluding only minor architectural finishes, branch conduit/HVAC, and inaccessible areas) and complete exterior VKF Yard modeling.
- **Intelligent Process Model:** In addition to architectural/structural models (Autodesk Revit), the solution must include a data-centric intelligent process model (Autodesk Plant 3D) containing all process piping, pressure systems, and testing infrastructure linked to existing PandIDs.

- **Data Formats and Usability:** Delivery of native authoring files, 2D drawings, registered point clouds, and open-standard formats (e.g., IFC, E57). The solution must enable immersive virtual walkthroughs and system-level asset management integration.

DISCLAIMER: This Section provides a high-level conceptual overview of the project objectives and does not override or supersede the detailed requirements set forth in the Statement of Objectives (SOO) - AEDC Facility Digital Twins and Predictive Analytics.

3.0 Instructions for Performer's Response

The Performer's whitepaper response must include the following distinct sections:

3.1 Technical Competency

The Performer must describe their capability and proposed methodology to execute the core objectives, focusing on:

- **Scanning and Registration Workflow:** The hardware (scanners, drones) and software suite used to capture dense, complex environments. Describe the methodology for establishing tight survey control and registering scans to a global coordinate system within $\pm 1/4$ inch.
- **Model Authoring and Level of Detail (LOD):** The procedure for constructing Revit and Plant 3D models. Detail the workflow to achieve LOD 350 generally, and LOD 400 for primary connection points (pipe flanges, equipment anchor plates, structural steel connections) to support pre-fabrication verification.
- **Plant 3D Metadata Integration:** The mechanism for embedding metadata (e.g., line number, material, pressure rating, asset ID) directly into the Plant 3D components and align them with existing AEDC PandID hierarchies.
- **Deviation Analysis and Quality Control:** The specific automated toolsets and statistical procedures used to validate the model's accuracy, including how the Performer shall generate and deliver deviation heat maps.

3.2 Intellectual Property and Data Rights

The Performer shall specify their proposed Intellectual Property (IP) and data rights assertions. The Government requires Unlimited Data Rights to all technical data, 3D models, point clouds, and other deliverables created under this agreement. All technical documents and models delivered must be marked with Distribution Statement C (Distribution authorized to U.S. Government agencies and their contractors).

3.3 Appropriate Use of Authority (10 U.S.C. § 4022(d))

The Performer must meet the statutory requirements of 10 U.S.C. § 4022(d). To be eligible for award, the Performer must certify compliance with at least one of the following conditions:

- (A) There is at least one nontraditional defense contractor or nonprofit research institution participating to a significant extent in the prototype project.
- (B) All significant participants in the transaction other than the Federal Government are small businesses or nontraditional defense contractors.
- (C) At least one-third of the total cost of the prototype project is to be paid out of funds provided by sources other than the Federal Government.

A "nontraditional defense contractor" is defined as an entity that is not currently performing and has not performed, for at least the one-year period preceding the solicitation, any contract or subcontract for the DoD that is subject to full coverage under the cost accounting standards (CAS).

3.4 Pricing and Schedule

The pricing proposal must be structured as firm, fully priced milestones for the base phase. The proposal must separate costs into a Base Phase and distinct Priced or Rough Order of Magnitude (ROM) Option Phases corresponding to the facilities detailed in Section 4.0. The proposed schedule must align directly with the program milestones detailed in Section 7.0 and demonstrates a logical critical path for the prototype.

Pricing Constraints – Proposal Validity:

Based on market standard practices, all Firm-Fixed Price (FFP) submissions for the base phase model prototype must remain valid and binding for a minimum of **180 days** from the date of the initial Other Transaction Prototype (OTP) award. Option phases that are priced must remain valid and binding for a minimum of **180 days** from the date of the initial Other Transaction Prototype (OTP) award. ROM estimates for subsequent phases are exempt from this strict 180-day hold but must reflect accurate market conditions at the time of submission.

3.5 Cybersecurity, CUI, and Operational Compliance

The Performer must demonstrate a mature cybersecurity posture and the capacity to protect Controlled Unclassified Information (CUI) in strict compliance with NIST SP 800-171 and CMMC requirements.

- CONUS Limitation: All work, including scanning, data processing, 3D modeling, and analysis—must be conducted entirely within the continental United States (CONUS). No project data may be accessed by or transmitted to non-U.S. persons or overseas locations.
- Personnel Security: All on-site and off-site personnel must be U.S. Citizens and capable of obtaining a Common Access Card (CAC) or DBIDS credential for unescorted base access.
- Non-Interference Strategy: Describe the operational strategy to execute high-density scanning without disrupting active AEDC facility testing schedules (including plans for third shifts, weekends, and scheduled facility outages).

4.0 Whitepaper Submission Instructions

Offerors are requested to submit a Whitepaper detailing their proposed solution.

- Question Deadline: 1 PM Central on 12 August 2026
- Submission Deadline: 1 PM Central on 8 September 2026
- Submission Format: Electronic submission via email/portal (portal mandatory for VAC members) in PDF format, no smaller than 11 point font and not to exceed 20 pages (excluding cost proposal and statutory compliance certifications)
- Government Point of Contact (POC): Erica A. Anglin, erica.anglin@u.af.mil

5.0 Evaluation Criteria

The Government will evaluate the Performer's whitepaper based on the following criteria:

1. Technical Merit and Innovation: The feasibility, precision, effectiveness, and innovativeness of the proposed modeling methodology to meet the requirement.
2. Program Management and Risk: The viability of the schedule, quality assurance procedures, and the strategy to navigate operational and security constraints.
3. Government Value and Scalability: The potential of the prototype to successfully scale across the remaining 18.5 million square feet of scan areas.
4. Cost and Price Realism: Evaluation of the proposed milestone pricing to ensure alignment with the technical scope, realistic cost estimates, and lack of unapproved cost overruns.
5. Cybersecurity and Compliance: The adequacy of the Performer's plan to meet CMMC Level 2 - self standards and secure data.

6.0 Successful Prototype Definition (10 U.S.C. § 4022(e)(5))

A successful prototype is defined as the physical, virtual, or business process demonstration that successfully achieves key operational and technical milestones. For this project, success is defined as the delivery of a fully validated, high-fidelity, data-centric digital twin of each model, demonstrating a scalable modeling methodology that meets the following acceptable quality levels:

Objective Area	Successful Prototype Evaluation Standard
Model Dimensional Accuracy	Maximum allowable deviation between any point on the authoring models (Revit/Plant 3D) and the corresponding point on the registered point cloud.
Model Level of Detail (LOD)	Graphical and data-centric representation of structural, mechanical, process, and major electrical systems.
Modeling Scope and Coverage	Comprehensive mapping of all interior VKF building elements and exterior VKF Yard supporting infrastructure.
Intelligent Process Model	Data-centric model developed in Autodesk Plant 3D containing process and pressure piping.
Model Usability and Walkthrough	Integrated, cross-disciplinary navigation and measurement environment.
Quality Assurance Validation	Verification of model accuracy through mathematical and visual metrics.
Technology, Security, and Operations	Maintenance of security protocols and operational test schedules.

7.0 Milestones

The project milestones are structured to clearly separate the core prototype demonstration (Base Phase) from the scalable expansions (Option Phases). This phased approach allows the Government to evaluate, test, and accept the finalized prototype methodology prior to exercising subsequent optional efforts.

Phase	Milestone (MS) Number	MS Title	MS Description
Base	MS 1	Project Kickoff and IMS Approval	Completion of the post-award kickoff meeting on-site inclusive of a requirements review and a visit to VKF; formal approval of the Program Management Plan (PMP) and the detailed Integrated Master Schedule (IMS) for the Base Phase.
	MS 2	Security, Quality Control, and Equipment Approvals	Approval of the NIST SP 800-171 Secure Data Lifecycle Plan, the Quality Control Plan (QCP), and formal written AEDC approval for the detailed on-site technology inventory.
	MS 3	Data Acquisition and Point Cloud Registration	Completion of all on-site scanning of the VKF Yard and Plant without operational disruption. Delivery and government acceptance of the unified, registered point cloud in native Autodesk ReCap (RCP) and ASTM E57 formats.
	MS 4	Draft VKF Architectural and Structural Model (LOD 350)	Delivery of the draft Autodesk Revit models containing all structural components, major equipment, platforms, and foundations, alongside the draft Exclusion Justification Report.
	MS 5	Draft Intelligent Process Model (Plant 3D)	Delivery of the draft Autodesk Plant 3D models containing all process piping, pressure systems, and test infrastructure mapped to existing PandIDs and piping specifications.
	MS 6	Quality Assurance Validation, Heat Maps, and Model Federation	Delivery of the integrated Navisworks (NWD) federated model, the formal Model Quality Control Report (including automated deviation analysis heat maps), and the finalized Exclusion Justification Report.
	MS 7	Model Delivery, Training, and Live Prototype Demonstration	Delivery of the finalized, corrected Revit and Plant 3D native files, AutoCAD 2D exports, and submission of the comprehensive End-User Training Curriculum. Execution of a live demonstration showcasing walkthrough capabilities, metadata interrogation, and database querying to AEDC stakeholders. Delivery of the formal transition report detailing the validated workflow template.
Option Phase 1	MS 1 – PWT	On-Site Data Acquisition and Point Cloud Delivery	Completion of all on-site scanning without operational disruption. Delivery and government acceptance of the unified, registered point cloud in native Autodesk ReCap (RCP) and ASTM E57 formats.
	MS 2 – PWT	Draft Architectural and Structural Model (LOD 350)	Delivery of the draft Autodesk Revit models containing all structural components, major equipment, platforms, and foundations, alongside the draft Exclusion Justification Report.
	MS 3 – PWT	Model Delivery, Training, and Live	Delivery of the finalized, corrected Revit and Plant 3D native files, AutoCAD 2D exports, and submission of the comprehensive End-User Training Curriculum. Execution

		Prototype Demonstration	of a live demonstration showcasing walkthrough capabilities, metadata interrogation, and database querying to AEDC stakeholders. Delivery of the formal transition report detailing the validated workflow template.
Option Phase 2	MS 1 – ETF	On-Site Data Acquisition and Point Cloud Delivery	Completion of all on-site scanning without operational disruption. Delivery and government acceptance of the unified, registered point cloud in native Autodesk ReCap (RCP) and ASTM E57 formats.
	MS 2 – ETF	Draft Architectural and Structural Model (LOD 350)	Delivery of the draft Autodesk Revit models containing all structural components, major equipment, platforms, and foundations, alongside the draft Exclusion Justification Report.
	MS 3 – EFT	Model Delivery, Training, and Live Prototype Demonstration	Delivery of the finalized, corrected Revit and Plant 3D native files, AutoCAD 2D exports, and submission of the comprehensive End-User Training Curriculum. Execution of a live demonstration showcasing walkthrough capabilities, metadata interrogation, and database querying to AEDC stakeholders. Delivery of the formal transition report detailing the validated workflow template.
Option Phase 3	MS 1 – Aerodynamic and Propulsion Test Unit and Associated Facilities	On-Site Data Acquisition and Point Cloud Delivery	Completion of all on-site scanning without operational disruption. Delivery and government acceptance of the unified, registered point cloud in native Autodesk ReCap (RCP) and ASTM E57 formats.
	MS 2 – Aerodynamic and Propulsion Test Unit and Associated Facilities	Draft Architectural and Structural Model (LOD 350)	Delivery of the draft Autodesk Revit models containing all structural components, major equipment, platforms, and foundations, alongside the draft Exclusion Justification Report.
	MS 3 – Aerodynamic and Propulsion Test Unit and Associated Facilities	Model Delivery, Training, and Live Prototype Demonstration	Delivery of the finalized, corrected Revit and Plant 3D native files, AutoCAD 2D exports, and submission of the comprehensive End-User Training Curriculum. Execution of a live demonstration showcasing walkthrough capabilities, metadata interrogation, and database querying to AEDC stakeholders. Delivery of the formal transition report detailing the validated workflow template.
Option Phase 4	MS 1 – Remaining Complex Facilities	On-Site Data Acquisition and Point Cloud Delivery	Completion of all on-site scanning without operational disruption. Delivery and government acceptance of the unified, registered point cloud in native Autodesk ReCap (RCP) and ASTM E57 formats.
	MS 2 – Remaining Complex Facilities	Draft Architectural and Structural Model (LOD 350)	Delivery of the draft Autodesk Revit models containing all structural components, major equipment, platforms, and foundations, alongside the draft Exclusion Justification Report.

	MS 3 – Remaining Complex Facilities	Model Delivery, Training, and Live Prototype Demonstration	Delivery of the finalized, corrected Revit and Plant 3D native files, AutoCAD 2D exports, and submission of the comprehensive End-User Training Curriculum. Execution of a live demonstration showcasing walkthrough capabilities, metadata interrogation, and database querying to AEDC stakeholders. Delivery of the formal transition report detailing the validated workflow template.
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8.0 Attachment

Attachment 1 - Statement of Objectives - AEDC Facility Digital Twins and Predictive Analytics

ERICA A. ANGLIN
Agreements Officer