

ARMY RANGE MANAGEMENT TOOLKIT
Testing Project Plan
For GIS
Statement of Work

CONTRACT: TDB

- 1.0 **BACKGROUND.** Geographic Information Systems (GIS) helps to provide a context to more efficiently manage the Army's training lands. This project will provide the Army the required documents necessary to field the ArcGIS extension: Range Managers Toolkit (RMTK) to installation personnel in order to support and manage safety hazards associated with live fire training activities. This project plan documents planned test support for the Surface Danger Zone (SDZ) add-in tool designed to operate as an add-in to ArcView/ArcMap.
- 2.0 **PURPOSE.** Testing will formally validate the system is ready for operational use. Validation will occur technical testing at an independent tester's facility, and at a TRADOC-designated user facility. Lab testing will verify that the requirements associated with this tool are satisfied by the contractor-delivered product. User testing will validate that the tool can be operated by the planned user community, and that it is operationally suitable for use. Testing will conform to AR 73-1 regulations, but testing will be constrained in recognition of the limited scope of the add-in tool.
- 3.0 **Applicable Regulations and Documents.**
 - 3.1 Army Regulation (AR) 73-1 (Test and Evaluation Policy)
 - 3.2 Army Regulation (AR) 385-63 (Range Safety)
 - 3.3 Department of Army Pamphlet (DAPAM) 385-63 (Range Safety)
 - 3.4 AR 210-21 (Army Range and Training Land Program)
 - 3.5 AR 350-4 (Army Integrated Training Area Management Program)
 - 3.6 AR 200-1 (Environmental Protection and Enhancement)
- 4.0 **OBJECTIVES.** This project will provide a testing plan and testing methodology for the baseline ArcGIS extension RMTK. Testing consists of two components: a functionality test and an accuracy test.
 - 4.1 **FUNCTIONAL TESTING.** The functionality testing shall (1) certify that the tool meets all required functionality and is ready for operation use, or (2) identify specific deficiencies, which render the product inaccurate, incomplete, or operationally unsuitable.
 - 4.2 **ACCURACY TESTING.** The Accuracy testing shall provide sufficient test results to the Army Safety Office (ASO) in order for the ASO to certify that the tool accurately and completely implements algorithms associated with drawing an SDZ in accordance with the parameters defined in DAPAM 385-63.
- 5.0 **SCOPE.** The scope of this project shall be limited to the testing on the Baseline implementation of RMTK.
 - 5.1 SQT is based on generating approximately 40 distinct SDZs during lab testing. Variance of more than 10 per cent will be grounds for schedule and price adjustments.
 - 5.2 An abbreviated Test Report, omitting supporting documentation of successful test execution, will be acceptable. The SAT Test Report (STR) will describe successful tests and contain sufficient documentation of failure conditions to support developer problem resolution and regression testing.

- 5.3 The Army will provide the necessary GIS data layers and graphics to support the development and testing of SDZs within a controlled environment. Traditional performance concerns (e.g., response time, application load time) are not a concern and can be excluded from testing.
- 5.4 The loading and execution of the SDZ tool is properly documented, and the testers will not require additional documentation or training to:
- o Load the tool;
 - o Load the database and graphics data layers;
 - o Operate the tool
- 5.5 A Point of Contact (POC) shall be available with functional and technical expertise in GIS and SDZ development.
- 6.0 **TASKS.** The Contractor shall conduct sufficient testing of the SDZ tool to support necessary tool certifications. The Contractor shall either (1) certify that the tool meets all required functionality and is ready for operation use, or (2) identify specific deficiencies, which render the product inaccurate, incomplete, or operationally unsuitable. Further, the Contractor shall provide sufficient test results to TRADOC stakeholders that TRADOC can certify that the tool accurately and completely implements algorithms associated with SDZ as stated in AR 385-63.

The Contractor shall conduct testing in a manner consistent with applicable guidance from AR 73-1. The Contractor shall document test results sufficient to support defect correction and regression testing, and to support audit-ability of test results in support of TRADOC certification. Testing shall be structured to obtain TRADOC certification of RMTK's accuracy and utility. The independent tester shall meet with TRADOC reps to ensure that the test suite, once completed, is sufficient for TRADOC certification.

The following are specific tasks to be performed to accomplish the SDZ tool testing goals. Target performance dates are associated with each task in Section 7 (Deliverables).

6.1 **Project Management**

6.1.1 **Project Kickoff**

Goal – Establish Mutual understanding of goals, schedules, costs, and expected results.

Tasks - Meet with Customer. Validate proposal, assumptions, and schedule. Establish Meeting with TRADOC. Acquire tool, tool documentation. Establish requirements baseline for test. Initiate process to obtain test database.

Staff – Contractor and Government POC

6.2 **Develop draft Test Plan**

Goal – Provide Preliminary documentation of planned testing to support TRADOC meeting.

Tasks – Review Provided Documentation. Develop Preliminary Test Plan. Develop first cut at SAT Storylines.

Staff – Contractor

6.3 **Meet with TRADOC Range Safety**

Goal – Establish Certification Requirements for Testing

Tasks - Meet with Army TRADOC Safety Office. Review draft Project Plan. Establish specific testing output required for TRADOC tool certification. Develop MOA from meeting documenting scope/conduct of planned/required testing.

Staff – Contractor, Government POC, and TRADOC ASO POC

6.4 **Finalize Test Plan**

Goal – Document Test Objectives, schedules and dependencies to support customer review/modification/approval, and to guide test conduct.

Tasks – Finalize draft Test Plan IAW Army comments. Complete SAT Storylines.

Staff – Contractor

6.5 Review Developer Test Results

Goal – Ensure the product is ready for independent testing, and to develop SQT scenarios.

Tasks – Observe the developer’s test process, and/or test results. Review other test results, as available.

Staff – Contractor

6.6 SQT Specific Activities

6.6.1 Develop SQT Scenarios

Goal – Ensure all functions, features, and formulae have adequate test coverage

Tasks – Develop SQT scenarios. Documentation will be minimal, with the target audience being the testers themselves. SQT scenarios are attached to the test plan, and must be complete enough to support independent review by concerned parties that the SQT scope is sufficient.

Staff – Contractor

6.6.2 Establish SQT Environment

Goal – Establish an environment, in accordance with provided documentation, to support independent testing.

Tasks – Following load and operating instructions provided by the government (GFI), and using a government-provided test bed (GFE), the testers will build and establish a working SDZ tool configuration. The government will also provide a representative database from a site targeted to receive the SDZ tool.

Staff – Contractor

6.6.3 Conduct SQT TRR

Goal – Establish that all parties agree that a productive and definitive SQT is ready to begin.

Tasks – Prior to the SQT, verify that each readiness criteria from the Test Plan is met. Document and distribute a summary of readiness criteria and status as a read ahead to all TRR participants. Conduct the TRR. Prepare the Developmental Test Readiness Statement (DTRS).

Staff – Contractor and Government POC

6.6.4 Conduct SQT

Goal – Validate that all functions, features, and formulae associated with the SDZ tool have been fully satisfied.

Tasks – Execute all SQT scenarios. Document and prioritize all Problem Reports. Track defects through resolution; regression test as necessary.

Staff – Contractor

6.7 SAT Specific Activities

6.7.1 Finalize SAT Plan

Goal – Update the draft test plan based on SQT results to convey any planned changes to SAT to all affected parties.

Tasks – Based on SQT execution and any ongoing project changes, update SAT participants, schedules, test environments, databases, and activities.

Staff – Contractor

6.7.2 Conduct Operational Test Readiness Review (any one day between end of SQT and start of SAT)

Goal – Obtain consensus that the SDZ tool is ready for SAT, and that the testers and operational test environment is likewise ready.

Tasks – Prior to the SAT, verify that each readiness criteria from the Test Plan is met. Document and distribute a summary of readiness criteria and status as a read ahead to all TRR participants. Conduct the TRR. Prepare the Operational Test Readiness Statement (OTRS).

Staff – Contractor and Government POC

6.7.3 Conduct SAT

Goal – Validate the operational readiness of the system.

Tasks – Manage the SAT process. Monitor user execution of SAT storylines. Conduct daily test reviews with interested parties. Track defects through resolution; regression test as necessary.

Staff – Contractor and Government testers (TBD)

6.8 Prepare SDZ Tool Test Report

Goal – Document Test Results in sufficient detail that either necessary remediation activities can be identified and completed, or that the operational readiness of the system is clearly conveyed and supported.

Tasks – Document test results as appropriate.

Staff – Contractor

7.0 Deliverables.

All tasks will be completed in accordance within the schedule outlined below.

Task	Paragraph	Schedule (Days after award)
Project Kickoff	6.1	No Later Than (NLT) 6 Days
Develop draft Test Plan	6.2	NLT 9 Days
Meet with TRADOC	6.3	NLT 10 Days
Finalize Test Plan	6.4	NLT 14 Days
Review Developer Test Results	6.5	NLT 18 Days
Develop SQT Scenarios	6.6.1	NLT 24 Days
Establish SQT Environment	6.6.2	NLT 25 Days
Conduct SQT TRR	6.6.3	NLT 27 Days
Conduct SQT	6.6.4	NLT 36 Days
Finalize SAT Plan	6.7.1	NLT 38 Days
Conduct Operational Test Readiness Review	6.7.2	NLT 38 Days
Conduct SAT	6.7.3	NLT 40 Days
Prepare SDZ Tool Test Report	6.8	NLT 50 Days

8.0 Government Furnished Equipment and Information. All data required, used, or otherwise handled remains the property of the installation or agency that provided it. The Contractor may not use datasets or other materials relating to this contract for publication without the expressed written consent of USAEC and the owning installation or agency. The Contractor shall contact the owning installation or agency to discuss data manipulations and authorship prior to conducting data analysis with the intent of publication. The Contractor shall make available to USAEC and to the owning installation or agency draft copies of any publications, based on work conducted or data collected under this contract, for their review and comment. In order to accomplish the tasks defined in this scope of work, the Government will provide the following information and equipment:

- Baseline Version of SDZ tool, an ArcGIS Extension for ArcGIS software.
- All internal documentation from SDZ Tool developer to support the independent testing of the SDZ Tool.
- GIS data sets required to perform SQT and SAT testing.

9.0 Points of Contact. The Points of Contact for work under this delivery order are as follows:

COTR
Paul Dubois, AEC-RDS
Ph 703-693-0542

Contract Management Assistant
Jim Furlo
Battelle
Contractual support to AEC-RDS
Ph 410-436-1505

ATSC POC
Billy Karnes, ATSC
Ph 757-878-3090

AEC Information Management
Barbara Schmidt, AEC-IERD
Ph 410-436-6340

10.0 **Security.** This project has no security issues.

11.0 **Place of Performance.** Work shall be performed at the Contractor's workplace.

12.0 **Period of Performance.** The Period of Performance shall be 50 days from the date of award.