

<b>DATA ITEM DESCRIPTION</b>	<i>FORM APPROVAL OMB NO 0704-0188</i>
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1. TITLE <b>Location Surveys and Mapping Plan</b>	2. IDENTIFICATION NUMBER <b>OT-FMC-005-07</b>
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3. DESCRIPTION / PURPOSE **To describe methods, equipment and accuracy required for location surveys and mapping of Ordnance and Explosives (OE) sites and to provide requirements for the Location Surveys and Mapping Plan at a specific project site.**

4. APPROVAL DATE (YYMMDD) <b>990205</b>	5. OFFICE OF PRIMARY RESPONSIBILITY <b>CEHNC-ED-CS-D</b>	6a. DTIC APPLICABLE	6b. GIDEP APPLICABLE
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7. APPLICATION / INTERRELATIONSHIP **This Data Item Description contains instructions for preparing Work Plan chapters addressing location surveys and mapping for OE projects.**

8. APPROVAL LIMITATION	9a. APPLICABLE FORMS	9b. AMSC NUMBER
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10. PREPARATION INSTRUCTIONS

10.1 General. The site-specific Location Surveys and Mapping Plan for each project will document the site specific survey, mapping, and aerial photography requirements tailored to the needs of that project. The Corps of Engineers Huntsville Center (CEHNC) will determine the appropriate mix required for implementing each OE project and the methodology to accomplish the tasks. Some projects may not require any of these capabilities but others may require comprehensive capabilities. Surveying and Mapping products will be required in either metric or English units depending upon the needs of the individual projects. All required services will be accurately specified in the individual project scope of work tasks.

10.1.1 Unexploded Ordnance (UXO) Safety Provision. During all fieldwork and all intrusive activities, the A/E or contractor shall provide a UXO Technician II to accompany the survey crew. The UXO Technician II shall conduct visual surveys for surface ordnance prior to the survey crew entering a suspected area, and a magnetometer survey of each intrusive activity site to ensure the site is anomaly free prior to the surveying crew setting monuments or driving stakes. The UXO Technician II shall not be assigned additional survey tasks which would interfere with the OE safety aspects of area clearance for driving stakes, iron pins, monumentation or other survey control, which will penetrate the surface in an OE contaminated area.

10.1.2 Control Points. Plastic or wooden hubs shall be used for all basic control points. A minimum number (to be specified in the delivery order for each project) of concrete monuments with 3-1/4 to 3-1/2 inch domed brass, bronze or aluminum alloy survey markers (caps) with witness posts shall be established at each site. The concrete monuments shall be located within the project limits, set 10 meters (m) from the edge of any existing road in the interior of the project limits, and a minimum of 300 meters apart. The top shall be set flush with the ground and the bottom a minimum of 0.6 meters below frost depth. NOTE: Revised specifications may be included in each delivery order.

10.1.2.1 Accuracy. Horizontal and vertical control of "Class I, Third Order" or better shall be established for the network of monuments. Horizontal control shall be based on either the English or metric system and referenced to the North American Datum of 1983 (NAD83) and the State Plane Coordinate Grid System. Vertical control, if required, shall also be based on either the English or metric system and referenced to the North American Datum of 1988 (NAVD88). If aerial photographs or orthophotography are used to provide this survey, the aerial targets used for control points shall meet the same horizontal and vertical accuracy and requirements detailed above.

10.1.2.2 Monument Caps. The caps for the new monuments shall be stamped in a consecutively numbered sequence and the identification shall be provided with each delivery order as follows:

11. DISTRIBUTION STATEMENT
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SWAMPY-1-1996  
USAESCH

SWAMPY-2-1996  
USAESCH

SWAMPY-3-1996  
USAESCH

Note: The name to be stamped on the caps shall be provided with each delivery order.

The dies for stamping the numbers and letters into these caps shall be 1/8-inch to 3/16-inch in size. All coordinates and elevations shall be shown to the closest one-thousandth of a meter (0.001 m) and one-hundredth of a foot (0.01 ft).

10.1.2.3 Plotting. All of the control points (monuments, aerial targets, and property corners) recovered and/or established at this site shall be plotted at the appropriate coordinate point on a reproducible (mylar) planimetric or topographic map at scales specified in the delivery order.

10.1.2.4 Description Cards. A tabulated list and a "Description Card" of all control points (monuments and aerial targets) established or used for this project shall be submitted. The Description Card shall show a north arrow; a sketch of each monument and its location relative to reference marks, buildings, roads, railroads, towers, trees, etc.; a typed description telling how to locate the monument from a well known and easily identifiable point; the monument's name or number; and the final adjusted coordinates and elevations in meters and feet (to the closest 0.001m and 0.01 ft.) The Description Cards shall be 5 by 8 inches describing one monument per card, or an 8-1/2 by 11 inch sheet of bond paper may be used for describing two monuments.

10.1.3 Mapping. The location, identification, coordinates, and elevations of all the control points recovered and/or established at the site shall be plotted on reproducible (mylar) planimetric or topographic maps at the scale specified in the delivery order. Each control point shall be identified on the map by its name and number and the final adjusted coordinates and elevations (to the closest 0.001m and 0.01 ft.). Each map shall include a grid north, a true north and a magnetic north arrow with the differences between them in minutes and seconds shown. Grid lines or tic marks at systematic intervals with their grid values shall be shown on the edges of the map. Also, a legend showing the standard symbols used for the mapping and a map index showing the site in relationship to all other sites within the boundary lines of the project area shall be shown. In addition, the state plane coordinates shall be established for the corners of each grid area investigated (100' by 100'; 100' by 200'; etc.; size and accuracy requirements to be determined when the Scope of Work (SOW) for the delivery order is prepared). The coordinates for the grid corners shall be shown to the closest on foot (1.0 ft.). The locations of individual recovered OE items shall be tape measured or the X and Y distance estimated, to obtain a horizontal accuracy of plus or minus one foot within the grid, and plotted and identified on the map. The use of a total station, geographic positioning system (GPS) or other precision survey method used to locate UXO, UXO scrap or geophysical anomalies is not required.

## 10.2 DIGITAL DATA

10.2.1 General Design File Requirements. An overall planimetric design file shall be created and shall be digitized into a Microstation ".dgn" file at an elevation of zero. If contours and spot elevations are required, all data shall be digitized into a second Microstation 3D design file with each element (contours and spot elevations) at their correct elevation, and topologically triangulated network (ttn) files shall be created to model the topographic surface. The ttn file shall be created using the elements of the topographic file, and all spot elevations, contours, and breaklines necessary to create the ttn file shall be used. The ttn file shall be created so that it can be used in an Intergraph software product INROADS to recreate the contours at their exact locations. Cut sheet plots and views into the project data shall be created by referencing the planimetric and contour files from additional Microstation work files.

10.2.1.1 Each sheet shall be standard metric A-1 size drawing which is 841 mm by 594 mm (33.1 inches by 23.4 inches). Each sheet shall also have a standard border; revision block; title block; complete index sheet layout; bar scale; legend; grid lines or grid tic layout in feet or meters; a True North, a Magnetic North and a Grid North arrow, with their differences shown in minutes and seconds; and shall be plotted at the horizontal scales required.

10.2.1.2 The cell library used shall be attached and provided with the digital data set along with all other supporting files or data. All production and work files shall be fully documented into a concise data manual. This manual shall include all specific information required for an outsider to be able to recreate all products and determine the location, names, structures, and association of the data such as layer description, weights, colors, symbology, referencing of files etc. This manual shall be included as an ASCII file titled READ.ME that is included with all

distributed digital data.

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10.2.1.3 No digital data will be acceptable until proven compatible with the CEHNC Graphics System. All revisions required to obtain compatibility with the CEHNC Graphics System shall be done at the contractor's own expense.

### 10.3 DIGITAL FORMAT FOR INTERGRAPH SURVEY / MAPPING DATA

10.3.1 All data shall conform to the Tri-Service Spatial Data Standards (TSSDS) for projects that require Geographic Information Systems and as outlined in the specific delivery order.

10.3.2 Sources and Standard: The TSSDS have been developed and produced by the Tri-Service CADD/GIS Technology Center. They are designed for computer assisted mapping methods that must interface with other surveying firms, Government contractors, and customers so that the final product will be usable with consistent CADD documents.

10.4 ITEMS AND DATA. The following items and data shall be submitted to CEHNC (submittal dates will be specified for each delivery order) :

10.4.1 Field survey. The original copies of all field books, layout sheets, computation sheets, abstracts, and computer printouts. All of these items shall be suitably bound, and clearly marked and identified.

10.4.2 A tabulated list of all control points (monuments, aerial targets and corners) showing the adjusted coordinates and elevations (in meters and feet) established and/or used for this survey.

10.4.3 The negatives and three sets of prints of the aerial photographs taken for the project, if aerial photography is required in the SOW.

10.4.4 A tabulated list of all UXO items with location information, or specific anomalies, as identified in the individual project SOW that were located in the field.

10.4.5 A "Report on Establishment of Survey Mark" (Description Card) on each permanent control monument established and/or used for the survey. In addition to the name or ID number of the monument, the cards shall show the adjusted coordinates, the adjusted elevations, a typed description for locating the monument, and a sketch showing how to locate the monument.

10.4.6 All unique items created and/or used to create the end products and the narrative and description required by the SOW.

10.4.7 Drawings and Digital Data. All maps shall be drawn on 841mm by 594mm (standard metric A-1 size drawing) reproducible (mylar) drawings generated by the CADD system. One original mylar and five blue-line prints of each final map, and two copies of the digital data shall be delivered to CEHNC.