Final Submittal
DD Form 1391
Shadow UAS Range Training Facility
Background Information
September 23, 2010

The following paragraphs are intended to provide some background information for site adaptation of the attached standardized Shadow UAS Range Training Facility DD Form 1391.

Reference Documents:

1. Engineering Technical Letter (ETL) XXX Airfield Planning and Design Criteria for Army Unmanned Aircraft Systems (UAS) (Draft)

2. Shadow Launch/Recovery Site Selection and Survey Guide

   Reference documents are available from HQ USACE Transportation Systems Center

Landing Surface Design:

The landing surface geometrics were established to match the current requirements for the Shadow UAS contained in reference 1. Reference 2 provides information on where the various pieces of equipment will be staged on the landing surface during aircraft operations. The runway required to support the Shadow is 800 feet long and 50 feet wide. Paved overruns 50 feet wide and 100 feet long are provided at both ends of the runway for aircraft run out once it engages the net barrier. The tow way connecting the aircraft shelter and the runway way will be 15 feet wide and 75 feet long minus the hangar access apron width (assume 15 feet for the access apron leaving 60 feet for the tow way length).

The runway ends will be marked with reflective white bars 10 feet wide and across the full 50-foot width of the runway. A white reflective letter U will be placed at each end of the runway to designate the runway is for UAS aircraft only.

The pavement design for the landing surface and tow way is governed by the load that will be applied to the pavements from the vehicles that support the Shadow and not the aircraft system itself. In addition in cold regions where snow is a factor, snow removal equipment will be a factor. For pavement thickness design it was assumed that the M923 5-ton cargo truck, in the UAS platoon's list of vehicles, will be the most demanding vehicle. It is assumed this vehicle will be similar to snow plow vehicles that will be used for snow removal. The UAS and Humvee have little impact on the required pavement thickness. The traffic used for the thickness design was 10,000 passes of the 5 ton truck and 30,000 passes of the Humvee. These assumptions resulted in a pavement section as follows: Three inches of hot mix asphalt surface course on 6 inches of dense graded aggregate base course on 4 inches of sub base course on compacted subgrade.

Building Features:

The aircraft shelter is an insulated pre-engineered metal building capable of temporary storage of 3 Shadow aircraft with concrete slab designed for Humvee access through a 32-foot wide by 12-foot clear

height overhead coiling door. The aircraft shelter will include personnel doors, skylights, pipe bollards at the overhead door, and wire mesh cage storage rooms for temporary use by using organizations. The aircraft shelter will include interior lighting, interior electrical distribution including 110V/220V outlets, interior emergency lighting, ventilation, single grounding points at each airframe location, and lightning protection. Lighting, ventilation and power will be provided by electrical generator provided by the using unit connected to the building by manual transfer switch. Exterior building mounted lighting will be solar powered. Water, sewer, fire detection and alarm systems, and communications will not be provided. Heating and air conditioning will not normally be provided. Heating or air conditioning may be provided at locations where extreme heat or cold could be life threatening. If heating or cooling is necessary at a given location, the costs for the systems must be added to the building costs. Handicapped accessibility, antiterrorism-force protection, and sustainable design measures will not be provided due to use of the facility as a range training facility not permanently occupied.

Vehicle Parking Lot:

The design of the unsurfaced parking lot follows the same design assumptions as used for the paved areas except that the surfacing will be gravel. These assumptions resulted in a pavement section as follows: Eight inches of unbound aggregate surface course on compacted subgrade. The PCASE run attached with the design name UNSURFACED contains the detail design assumptions and thickness calculation results. The parking lot was sized for 10 Humvees, 7 trailers, and one LMTU (5 ton truck). Rough dimensions for the lot are 116 feet by 94 feet.

Cost Data Information:

Costs in the 1391 document were calculated using the RS Means cost estimating guide with the costs presented in 2011 prices using an area cost factor of one.

UAS Facility Site Plan:

A site plan for the UAS facility is provided. The sketch shows the planed layout of the training facility, and markings for the runway. Although the sketch shows a short unimproved road coming into the gravel parking lot from the post, there are no costs in the 1391 for that road.