ELECTRONIC SECURITY SYSTEMS BUDGET ESTIMATOR

USER'S MANUAL

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Electronic Security System (ESS) Budget Estimator User's Manual

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References

The publications listed below form a part of this manual to the extent referenced. The publications are referred to in the text by designation only.

UFC 4-021-02……. (2019) Electronic Security Systems

IC Tech Spec-for ICD/ICS 705……. (2020) Technical Specifications for Construction and Management of Sensitive Compartmented Information Facilities

Electronic Security System (ESS) Budget Estimator User's Manual

1.0 INTRODUCTION

1.1 Purpose

The Electronic Security System (ESS) Budget Estimator was developed to assist budget estimators, planners, and programmers in developing budget estimates for the real property costs associated with the ESS portion of Military Construction (MILCON) projects once the requirements for ESS are defined.

Defining the requirements of an Electronic Security System (ESS) involves an interdisciplinary planning team. The team considers all interests relating to a project to determine how security fits into the total project design. The specific membership of the planning team is based on local considerations, but in general, the following functions should be represented; facility user, antiterrorism officer, operations, security, logistics, engineering, life safety, and others as required. That team will use the process in UFC 4-020-01 DoD Security Engineering Facilities Planning Manual to identify the design criteria, which includes the assets to be protected, the threats to those assets (the Design Basis Threat), and the levels of protection to be provided for the assets against the identified threats. In addition to those criteria elements, the team must also identify user constraints such as appearance, operational considerations, manpower requirements or limitations, energy conservation and sustainment costs.

Once the ESS is defined, this tool can be utilized to output the expected expenditures for both supporting infrastructure (funded by real property (MILCON) monies) and personal property ESS Equipment (funded by Other Procurement (OP) monies) based on the input provided by the team. These numbers can then be input into the DD 1391 as required.

This Estimator is in accordance with UFC 4-021-02 Electronic Security Systems.

1.2 Authorization

This manual has been developed for the Naval Facilities Engineering Command, Atlantic under Contract No. N62470-05-D-6004.

1.3 Basic Requirements

To utilize this tool effectively, the user should have a basic knowledge of the project requirements including:

- The size of the building and number of floors
- The size of the perimeter
- The number and approximate size of any required interior Secure Areas, Special Access Program Facilities (SAPF's), and Sensitive Compartmented Information Facilities (SCIF's)
- The overall security risk of the facility (low, medium, or high)
- The requirement for interior, exterior, and perimeter access control, intrusion detection, and video systems.

In addition, the user can modify several global parameters in the Estimator to account for individual project conditions including:

- Area Cost Factor (ACF)
- Contingency
- Supervision, Inspection, and Overhead (SIOH)
- Escalation
- Mobilization/Per Diem costs for work outside the U.S.

With the appropriate password authentication, the user may also modify the following project conditions:

- Subcontractor's Material Markup
- Subcontractor's Equipment Markup
- Subcontractor's Labor Overhead and Profit
- General Contractor's Overhead and Profit

2.0 ESTIMATOR OVERVIEW

The Estimator is a Microsoft Excel based application that requires input from the user. The user input is provided on three sheets within the workbook (the *Project Information* sheet, the *Project Budget Summary* sheet, and the *Zone Budget Detail* sheet). User input is only allowed on these sheets and only in specific cells, as the remaining sheets and cells are protected to prevent tampering and accidental modification.

To generate a budgetary estimate for the ESS portion of a project using the Estimator, the following steps should be completed:

1. Open Microsoft Excel.

2. Open the ESS Budget Estimator file.

   Note: The User will be prompted on whether to disable or enable the use of macros. Since the formulas in the Estimator are driven by macros, the User must select the "Enable Macros" button for the proper computation of the data. If a User's security level settings are set to "High", Excel may not allow the file to be opened. In this case, the User must go under Tools, Macro, and Security to select the option for the "Medium" security level.

3. Before you begin to fill in the form, save the file with a unique file name (such as project description and date) that is different from the original file name.

4. Select *Sheet 1 – Project Information*.

5. Fill-in the blanks for Sections 1 – 8 with all applicable project information.

6. Answer Questions A – T in Section 9 (refer to Section 3.0 of this manual for assistance answering the questions).

7. Select *Sheet 2 – Project Budget Summary*

8. Scroll down toward the bottom of the sheet to the user Input portion. Fill-in the blanks to Questions 1 – 4 based on the project requirements (refer to Section 3.0 of this manual for assistance filling in the blanks).

9. Select *Sheet 5 – Zone Budget Detail.*

10. If the user has the password authorization and if it is necessary for the project, make changes to the default values of Sections 1 – 4 (refer to Section 3.0 of this manual for assistance filling in the blanks).

11. Print a Summary Report (sheet 1 and 2 only) or a Complete Report (all sheets) using the buttons at the bottom of *Sheet 2 – Project Budget Summary*. Clicking on these buttons will automatically display the Printer Setup dialog box. The dialog box allows the user to select the appropriate printer or the Adobe PDF writer to create a PDF file for electronic filing.

12. Use the output of the Estimator as input in the DD 1391 for the project. The Total Real Property (MILCON) Request (cell B49) is the estimated expenditure on Supporting Infrastructure for the project, while the Total Personal Property (OP) Request (cell B50) is the estimated expenditure on ESS equipment.

3.0 ESTIMATOR GUIDANCE

This section of the manual is intended to provide guidance for the user of the Estimator on how to answer the questions posed on *Sheet 1 – Project Information, Sheet 2 – Project Budget Summary, and Sheet 3 – Zone Budget Detail.*

3.1 Sheet 1 – Project Information

The *Project Information* sheet is the most important sheet in the Estimator as the answers provided by the user dictate the major systems included in the final estimate. Each question asked on the *Project Information* sheet is outlined below, followed by a short discussion of the intent of the question and the ramifications of a particular answer. **Note:** Most installations typically only require security for interior enclaves (Secure Areas/SAPF/SCIF). Next would be installations that require interior enclaves and the facility itself, then for high asset values, add perimeter and in rare cases the actual site.

A. Enter the size of the facility in square feet.

   Guidance: Input the total square footage of the facility. **Note:** If the entire facility is to be considered a Secure Area, the estimator will calculate the appropriate equipment estimates based on the size of the facility. These estimates are separate from any interior Secure Areas and/or SAPF's and/or SCIF's.

B. Enter the number of floors.

   Guidance: Input the number of floors that the given square footage covers. For example, a three-story office building will most likely be three floors while a three - story hangar might only be one floor.

C. Does this project include exterior (building façade) access control (i.e., card readers at exterior doors into the facility)?

   Guidance: Answer Yes to this question if the project requires access control (keypad, magnetic swipe card reader, proximity card reader, etc) at exterior doors into the facility to limit access to authorized personnel. **Note:** If the entire facility is to be considered a Secure Area, answer Yes to this question and the estimator will calculate the appropriate equipment estimates based on the size of the facility and the overall Level of Protection required. These estimates are separate from any interior Secure Areas and/or SCIF's. Answer No if the general population will be allowed to enter the building through exterior doors without presenting a valid card reader credential. Enter No if access to the facility will be controlled using keys or other non-electronic means. Note: Answering Yes only provides card reader-controlled doors on the exterior of the building. Access control of interior spaces and at the site perimeter is separate.

D. Does this project include volumetric sensors (i.e., interior motion detectors) in areas other than the Secure Areas, SAPF's, or SCIF's?

Guidance: Answer Yes to this question if this project includes electronic interior intrusion detection devices (i.e. interior motion detectors, glass break detectors, etc) for protection of interior spaces. **Note:** If the entire facility is to be considered a Secure Area, answer Yes to this question and the estimator will calculate the appropriate equipment estimates based on the size of the facility and the overall Level of Protection required. Remember, interior SCIF's, interior SAPF's, and Secure Areas are handled separately so this question speaks to the requirement for interior intrusion devices in areas other than interior SCIF, interior SAPF, and Secure Areas. Answer No if this project includes no requirement for interior intrusion detection devices to protect interior assets in areas other than interior Secure Areas and SCIF's.

E. Does this project include an interior video system in areas other than the Secure Areas, SAPF's, or SCIF's?

Guidance: Answer Yes to this question if this project includes interior video cameras to view interior spaces. **Note:** If the entire facility is to be considered a Secure Areas, answer Yes to this question and the estimator will calculate the appropriate equipment estimates based on the size of the facility and the overall Level of Protection required. Remember, interior SCIF's, interior SAPF's, and Secure Areas are handled separately so this question speaks to the requirement for viewing of interior areas other than interior SCIF, interior SAPF, and Secure Areas. Answer No if this project includes no requirement for interior video cameras to view interior assets in areas other than interior Secure Areas and SCIF's.

F. Does this project include exterior (building façade) volumetric sensors (i.e. exterior mounted motion detectors protecting critical assets)?

Guidance: Answer Yes to this question if the project requires electronic intrusion detection devices (i.e. outdoor-rated motion detectors) mounted on the exterior of the building to protect critical exterior assets. Many times these devices are used to protect critical building systems including transformers, generators, and fuel tanks. Answer No if there will be no critical assets located around the building perimeter that need protection. Note: Answering Yes does not provide intrusion detection at the site perimeter, only at the building perimeter. Site perimeter intrusion detection is separate.

G. Does this project include an exterior (building façade) video system (i.e. building mounted cameras viewing exterior doors and around the building)?

Guidance: Answer Yes to this question if the project requires video cameras mounted on the exterior of the building to view critical exterior assets and entry points (including transformers, generators, fuel tanks, exterior doors, parking lots, etc.). Answer No if video cameras are not required to view any exterior assets

around the building. Note: Answering Yes does not provide video cameras on the interior of the building or at the site perimeter. Video cameras on the interior of the building and at the site perimeter are separate.

H. Does this project include exterior (site perimeter) access control (i.e. card readers at perimeter vehicle or pedestrian gates)?

Guidance: Answer *Yes* to this question if the project requires access control (keypad, magnetic swipe card reader, proximity card reader, etc) at the site perimeter vehicle or pedestrian gates to limit access to authorized personnel. Answer *No* if the general population will be allowed to enter the site without presenting a valid card reader credential. Enter *No* if access to the site will be controlled through the use of keys or other non-electronic means. **Note**: answering *Yes* only provides card reader controlled gates at the site perimeter. Access control of interior spaces and at the building façade is separate.

I. Does this project include exterior (site perimeter) intrusion detection (i.e. buried or fence mounted intrusion sensors)?

Guidance: Answer *Yes* to this question if the project requires intrusion detection capabilities at the site perimeter. This could include fence-mounted sensors to detect someone climbing over, under, or through the fence, as well as buried or free-standing sensors to detect unauthorized entry onto the site. Answer *No* if the project has no requirement for electronic intrusion detection at the site perimeter. **Note**: answering *Yes* only provides intrusion detection sensors at the site perimeter. Intrusion detection of the building façade and interior spaces within the building are separate.

J. Does this project include an exterior (site perimeter) video system (i.e. cameras viewing perimeter boundary of site)?

Guidance: Answer Yes to this question if the project requires video cameras to provide viewing capabilities around the site perimeter. Answer No if the project has no requirement for video cameras around the site perimeter. Note: answering Yes only provides video cameras around the site perimeter. Video cameras for the building façade and the interior of the building are separate.

K. Enter the length of perimeter feet to be protected in linear feet.

Guidance: This dimension will be used to calculate the required number of perimeter card readers, intrusion detection sensors, and video cameras around the fenced perimeter. If the project will be constructed at an existing installation that already has a defined perimeter, and the project will not require segregation from the installation, enter *0*. If the project will be constructed outside an installation or requires segregation from the installation it is being constructed on, enter the size of the perimeter.

L. Does this project include interior Sensitive Compartmented Information Facility's (SCIF's)? How many?

Guidance: If this project includes interior (located within the building) or exterior (located on the building grounds but not inside the building) SCIF's, enter how many in the blank provided. Providing a number (i.e. 2) for this question will provide an all-inclusive estimate for securing each applicable SCIF's with appropriate access control, intrusion detection, video system, and system monitoring. The estimate for securing SCIF's is handled separately from other facility security requirements; therefore, do not consider SCIF security requirements when answering the remainder of the questions. Entering *0* for this question means this project includes no interior or exterior SCIF's.

M. Enter the average size of the interior SCIF's in square feet.

Guidance: If this project includes interior or exterior SCIF's, enter the average size in square feet of each SCIF. For example, if the project includes three SCIF's with sizes of 1000 SF, 1500 SF, and 2000 SF, respectively, enter *1500*. If this project does not include any interior or exterior SCIF's, enter *0*.

N. Does this project include interior Secure Areas in addition to SCIF's? How many?

Guidance: If this project includes interior Secure Areas (i.e. interior areas within the building that will be segregated through the use of electronic access control) other than SCIF's, enter how many in the blank provided. Providing a number (i.e. 2) for this question will provide an all-inclusive estimate for securing each applicable Secure Area with appropriate access control, intrusion detection, video system, and system monitoring, depending on the facility risk chosen in Question T. The estimate for securing Secure Areas is handled separately from other facility security requirements; therefore, do not consider Secure Area security requirements when answering the remainder of the questions. Entering *0* for this question means this project includes no interior Secure Areas.

O. Enter the average size of the interior Secure Areas in square feet.

Guidance: If this project includes interior Secure Areas, enter the average size in square feet of each Secure Area. For example, if the project includes three Secure Areas with sizes of 1000 SF, 1500 SF, and 2000 SF, respectively, enter *1500*. **Note:** If the entire building is to be considered a Secure Area and the information for Questions C, D, E, and N have been answered appropriately, then enter a square footage that is 1 SF less than the building square feet. For example, if the entire building is a Secure Area and the size is 30,000 SF, then enter 29,999 SF for the average size of the Secure Areas. This will allow an escalation of components based on the building (Secure Area) size without deducting components if the square footage for the Secure Areas were to equal the building square footage. If this project does not include any interior Secure Areas, enter 0.

P. Does this project include local monitoring (at the facility) or remote monitoring (at a central monitoring station) of the electronic security system?

Guidance: Answer *Locally* if the project requires the electronic security systems installed in the building to be monitored by a console (video system monitor(s), access control workstation, video system workstation, badging workstation, etc.) located within the building. Answer *Remotely* if the project requires the electronic security systems installed in the building to be monitored by a console located in a different building. For example, if the project is being constructed on an existing installation that has a central monitoring station, and the project will require monitoring from that station, enter *Remotely*. If the project requires both local and remote monitoring, enter *Both*.

Q. Does this project warrant biometric devices for access control?

Guidance: Enter *Yes* if the facility risk is of an elevated nature and basic electronic access control devices (keypads, magnetic swipe readers, proximity readers) will not be sufficient. Entering *Yes* will provide adequate funds for the installation of fingerprint readers, retina scanners, and/or iris scanners at all applicable entry points where electronic access control is required. Enter No if the facility risk is not of an elevated nature and basic electronic access control devices will be sufficient.

R. Does this project warrant thermal imaging for the video cameras?

Guidance: Enter *Yes* if the facility risk is of an elevated nature and thermal imaging is required for nighttime viewing of the site perimeter. Thermal imaging is a high cost adder and should only be utilized where additional lighting and basic video system cameras are not feasible. Thermal imaging cameras will provide viewing capabilities in pitch-black conditions of human sized targets at distances up to 3,280 feet. Enter *No* if the facility risk is not of an elevated nature and basic video system cameras and additional lighting are sufficient for nighttime viewing of the site perimeter.

S. Does this project warrant video analytics/video content analysis for perimeter intrusion detection?

Guidance: Enter *Yes* if the facility risk is of an elevated nature and advanced video analytic capabilities are required on all exterior (building façade and site perimeter) cameras. Application of advanced video analytics is costly and is applied to all exterior cameras to allow for motion detection capabilities at the camera level. This technology provides motion detection in the field of view of the camera and is highly programmable through software. Enter *No* if the facility risk is not of an elevated nature and basic video system camera viewing is sufficient.

T. What is the overall Level of Protection requirement of the facility?

Guidance: The facility risk level designation dramatically affects the overall budget estimate of the project. In general, most projects should be classified as low or medium risk projects, with only the highest threat, highest vulnerability facilities receiving the designation of high risk. See *UFC 4-020-01 XX XX 2006* for guidance in choosing the appropriate Level of Protection. To give some insight into the difference between the risk designations as they pertain to the Budget Tool, consider the following:

- A medium risk Secure Area costs approximately 31% more than a low-risk Secure Area. A high-risk Secure Area costs approximately 125% more than a medium risk Secure Area.

- A high-risk facility will have approximately **four times** as many interior cameras, interior intrusion detection zones, and exterior (building façade) intrusion detection zones than a low-risk facility. A high-risk facility will have approximately **two times** as many exterior (building façade and site perimeter) video system zones, as well as **two times** as many thermal imaging zones than a low-risk facility.

Note: The risk designation of the facility does not alter the budget estimate of a SCIF. All SCIF's are secured the same, regardless of what the risk designation of the facility is.

3.2 Sheet 2 – Project Budget Summary

The *Project Budget Summary* sheet allows the user to input global parameters that affect the overall budget estimate of the project. These parameters include the Area Cost Factor (ACF); the Contingency percentage; the Supervision, Inspection, and Overhead percentage (SIOH), and the Escalation. **Note**: User input to these four areas is only applied to PSE equipment.

- **ACF Guidance**: It is commonly understood that labor, material, and equipment costs vary dramatically across the United States, and especially across the world. The ACF is a factor added to the overall estimate of the project based on the geographic location of the project. The ACF for a particular project should be gathered from the most recently published Unified Facilities Criteria, DoD Facilities Pricing Guide (UFC 3-701-XX). The factors can be found in Part 2, Table B. The overall adjustment factor for the state/country should be used where there is no specific factor for a location within the state/country. The factor for the closest location should be used only when market conditions (e.g. material prices, labor rates, labor availability, bidding climate) are similar.

- **Contingency Guidance**: The user should input an appropriate contingency percentage based on his/her confidence in the data provided to the Estimator. Be aware that projects with large contingency percentages (> 10%) are often highly scrutinized.

- **SIOH Guidance**: The user should input an appropriate SIOH percentage based on his/her knowledge of local project conditions. It should be noted that the SIOH for personal property (OP) funds is different from the SIOH on real property (MILCON) funds. **Note**: The SIOH on the funding the Navy uses for ESS is typically 8%.

- **Escalation Guidance**: Most times, the DD 1391 process is a multi-year process involving much iteration. For this reason, it is important that the estimate of the project in today's dollars be escalated to the **midpoint of construction** to account for the increased monies that will be required to fund the same project for the entire duration of construction. Otherwise stated, a $10,000,000 project today will most certainly cost more than $10,000,000 to construct three years from today. The Escalation factor for a particular project should be gathered from the most recently published Unified Facilities Criteria, DoD Facilities Pricing Guide (UFC 3-701-01). Escalation factors can be found in UFC 3-701-01, Table 4-2. FY2021 is the base year for the Estimator.

3.3 Sheet 5 – Zone Budget Detail

The *Zone Budget Detail* sheet allows users with the appropriate password authentication the ability to input parameters that affect the estimate of individual zones and, subsequently, the overall estimate of the project. These parameters include the Subcontractor's Material Markup, the Subcontractor's Equipment Markup, the Subcontractor's Labor Overhead and Profit, and the General Contractor's Markup.

- **Subcontractor's Material Markup Guidance**: This is the profit the subcontractor will earn on the purchase and resell of materials for the project. The percentage input here is added to the base cost of all materials required for the project. 2021 RSMeans recommends using 10%. It is not recommended to change this percentage unless it is **known** that the material markup charged by the subcontractor will be different than 10%.

- **Subcontractor's Equipment Markup Guidance**: This is the profit the subcontractor will earn on the rental and use of equipment for the project. The percentage input here is added to the base cost of all equipment required for the project. 2021 RSMeans recommends using 10%. It is not recommended to change this percentage unless it is known that the equipment charged by the subcontractor will be different than 10%.

- **Subcontractor's Labor Overhead and Profit Guidance**: This is the percentage added to the base labor rate to cover the subcontractor's overhead and profit on labor. The percentage input here is added to the base labor cost for each item required for the project. The Estimator assumes an **electrician** (base labor rate of $42/hr) will be utilized to install all ESS and associated supporting infrastructure. 2021 RSMeans subcontractor O & P for electrician is 49%. It is not

recommended to change this percentage unless it is **known** that the O & P charged by the subcontractor will be different than 49%.

- **General Contractor's Markup Guidance**: This is the percentage added to the total material, equipment, and labor cost for each item to account for the markup the general contractor will charge to manage the project. 2021 RSMeans recommends 10%. If a general contractor will not be used, Enter *1*.

4.0 DEFINITIONS

A. ACF: Area Cost Factor

B. ACS: Access Control System

C. Equipment: The implements used in an operation or activity.

D. ESS: Electronic Security System

E. IDS: Intrusion Detection System

F. Infrastructure: The permanent installations required for military purposes.

G. MILCON: Military Construction

H. OP: Other Procurement

I. PSE: Physical Security Equipment

J. SCIF: Sensitive Compartmented Information Facility

K. SIOH: Supervision, Inspection, and Overhead

L. VS: Video System