

ARMY RESERVE

Design Process and Submittal Requirements

PART A

PROJECT INCEPTION AND DEFINITION



1 April 2007

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ARMY RESERVE

Design Process and Submittal Requirements

PART A – PROJECT INCEPTION AND DEFINITION

Chapter 1.0 – INTRODUCTION

1.1 Purpose of the overall Manual

1.1.1 General

The Army Reserve (AR or Government) has opportunities to acquire real property and real property improvements through a variety of methods; the most common of these methods are design/bid/build (D/B/B), design/build (D/B) and real property exchange (RPX).

Three Parts of the Design Process and Submittal Requirements (DPSR) manual:

- DPSR manual **Part A -- Project Inception and Project Definition** (this part) describes the initial steps of launching Army Reserve construction projects. It begins with the Budget Process and ends with Project Definition (Phase I) wherein the project is sufficiently defined to allow detailed design. It is for use with either D/B/B or D/B acquisitions as described in Parts B and C below.
- DPSR manual **Part B -- Detailed Design (Phase II)** describes the standard Detailed Design (Phase II) process, requirements, and responsibilities for projects using the Design/Bid/Build (D/B/B) method. It spells out the requirements for major milestone design submittals -- Charrette, Interim, Final, etc -- that the project will go through before being put out for proposals by construction contractors.
- DPSR manual **Part C -- Design/Build -- Design Submittal Requirements after Award** focuses on the design-after-award requirements for Army Reserve projects that use the Design/Build (D/B) method. The requirements covered begin with the successful D/B Contractor's design submittal requirements after D/B Contract award, then the various milestones as Contractor's design progresses.

The parts A, B, and C of this Manual do not discuss the preparation of an RFP for Design-Build (D/B) construction. Refer to document [Army Reserve Design/Build RFP Instruction Manual](#) on the Reserve customer page of the Louisville District Web site. Current website hyperlink is <http://www.lrl.usace.army.mil/ed2/default.asp>.

Parts A, B, and C of this manual also do not discuss D/B proposal submittal format or content. These are covered in various Division 0 and 1 guide specifications and procurement documents that are available from the Louisville District, either on its web site or by contacting the District directly.

1.1.2 Standardization

The Manual will also serve to standardize the acquisition of real property improvements. It is intended to outline the Government's approved or preferred approach to these projects. Individual projects may be authorized to depart from the direction herein. The Manual is intended to repre-

sent the “80% solution” – it presents the preferred strategy that should apply 80% of the time; it does not resolve every issue for every project.

1.1.3 Intended Users

With the exception of Part C, the Manual is not intended to be shared with Contractors, but to record for Government benefit and continuing use the process for documents preparation, conducting the Bidding or Selection process, and administering execution of the construction contract. For new A-E teams preparing Army Reserve D/B/B or D/B bid or proposal request documents, it is intended to provide a “road map” to the preparation of the documents.

1.1.4 Precedence

The Manual does not supersede any contract for preparation of a bid or proposal document or any resultant contract for construction. If conflicts exist between this Manual and a contract, the contract governs.

1.2 Purpose of this part (Part A) of the Manual

1.2.1 Define the Budget Process

The Military Construction Army Reserve (MCAR) program exists to fund the design and construction of new and renovated facilities used to train and support Army Reserve soldiers. This program is funded by the U.S. Congress. The purpose of this document is to describe the MCAR budget process; define the design process; and establish project submittal requirements. It is important that U.S. Army Corps of Engineer Districts and Architectural/Engineering firms doing project designs understand these processes in order to satisfy the Army Reserve customer’s needs.

1.2.2 Define Acceptable Levels of Quality

This document defines acceptable levels of quality for the ARMY RESERVE facility delivery system and does not focus on minute project specific details such as the number of copies required for every submittal. The Louisville District Project Manager addresses this level of detail during the predesign meeting and incorporates agreements into the Project Description and Appendix A Scope of Work (SOW). The SOW serves as a design contract. It also requires the design agent to use UFC 4-171-05 Design: Army Reserve Facilities as well as this “Design Process and Submittal Requirements” document as criteria for designing the project. If there is a conflict between these two documents this “Design Process and Submittal Requirements” document shall take precedence. The SOW also contains requirements for the Designer’s Quality Control Plan (DQCP).

1.2.3 Understand Interdisciplinary Process

The Project Definition and Detailed Design stages are shaped by input from many different sources. Due to the unique nature of this early interdisciplinary process many of the required submittal documents are included under Chapter: *Design Process Overview*. This chapter also contains design procedures common to all disciplines. Therefore, all parties in this process must understand the Chapter's requirements. The discipline chapters contain additional discipline specific requirements.

1.3 A Word About BIM

The Army Reserve desires that BIM technology be made an integral part of its documents development for the design of Army Reserve Facilities, and that this be carried through later on by the

contractor in the as-built drawings.

Building Information Models hold solid modeled, three dimensional representations of designed elements, components and systems within a three dimensional environment. These elements have specific information about them stored and linked in other files within the dataset. The elements within the model are also linked directly to drawing output in the form of extractions and spreadsheets.

The US Army Reserve Center BIM Dataset and the USACE/USAR Workspace are provided by the Government. Instructions for deployment are provided with each release of the US Army Reserve Center BIM Dataset. All BIM files provided are from Bentley Building Solutions.

The BIM technology is continuously evolving, and the Army's methodology for obtaining and using information to be found within BIM is also evolving. During Project Inception and Project Definition as described in this Part A, the initial role of BIM tools may be limited, and supplemental cost and layout information may be provided through use of other tools available to the Corps and Army Reserve including Facility Composer, PACES cost information and other sources. As the BIM tools develop, a larger part may be played by BIM for the work of initial project launching.

1.4 Project Participants

The Army Reserve team will be made up of a number of groups and participants. These will include a Project Officer, members of the Army Reserve Regional Readiness Command (RRC) or Regional Readiness Sustainment Command (RRSC), and representatives from the Tenant unit(s). There will also be participation by the U.S. Army Corps of Engineers, serving as the Army Reserve's design and construction agent and technical consultant for design. The team may also include contract A-E's.

- For D/B/B projects there may be a contract A-E supporting the project design.
- For D/B projects there may be a contract A-E supporting the development of the D/B RFP.

The Army Reserve and all of these AR team members are sometimes referred to as the Government. This entire group is also referred to as the Project Delivery Team (PDT).

1.4.1 The Project Officer

The Project Officer is the Army Reserve's specialist for design and construction oversight. The Project Officer is the individual on the AR team who will obtain authority and define the AR requirements. All direction and approvals must come from the Project Officer. The Project Officer is the user community official representative and primary point of contact (POC) for D/B/B or D/B actions. The Project Officer is the staff specialist who provides direction to the Corps of Engineers (COE) for all contractual, real property, design and construction aspects of the action.

1.4.2 RRC or RRSC

The RRC or RRSC is the AR Command with the responsibility of supporting all of the AR facilities in its region. Once a facility is in operation, the RRC or RRSC will support the Tenants in operating and maintaining the facility. RRC or RRSC representatives will be responsible for reviewing all design and construction documents for maintenance and operability concerns.

1.4.3 The Tenants

The Tenants are the Army Reserve units and individual soldiers that will occupy or use a com-

pleted facility. The Tenant representatives will provide input on specific facility requirements to accommodate their missions and equipment.

1.4.4 The Corps of Engineers

The Corps of Engineers (COE) serves as the AR's technical agent for all real estate, environmental, design, and construction requirements. The COE is responsible to the AR for execution of real estate and environmental actions, and the design and construction of AR facilities.

- In a D/B/B action, the COE will prepare the construction bid or proposal documents, conduct the Contractor selection process, and has the authority to award and administer the D/B/B contract. The COE will also advise the AR on all aspects of real property, project program development, design and construction. The COE may contract with an A-E consultant for the preparation of the D/B/B bid documents, or for additional support connected with Government acquisition of the project.
- In a D/B action, the COE will prepare the RFP, conduct the Contractor selection process, and has the authority to award and administer the D/B contract. The COE will also advise the AR on all aspects of real property, project program development, design and construction. The COE may contract with an A-E consultant for the preparation of the D/B RFP, or for additional support connected with Government acquisition of the project.

1.4.5 A-E Team

An A-E team prepares the document package that forms the basis for the contractor's proposal. The package will be design plans and specifications for D/B/B projects, or RFP documents for RFP projects. The A-E team also typically conducts site investigations.

This team may be COE in-house staff, or a contract A-E.

1.4.6 The Contractor

The construction contractor is not a part of the process or team during Part A --Project Inception and Definition. The Contractor's role begins after Part A is completed.

The Contractor may be performing all work with its own forces, but is more likely to have a team which includes sub-contractors for at least some of the design and construction work effort. In this Manual, all of these participants, collectively and individually, will be referred to as the Contractor.

Chapter 2.0 – BUDGET PROCESS

2.1 Fiscal Year

The federal government's fiscal year (FY) begins on 1 October each year and ends on 30 September of the following year. Since the majority of the fiscal year occurs between January and October it is designated by that year. For example, FY 2007 begins on 1 October 2006 and ends on 30 September 2007. The fiscal year is divided into four quarters. The first quarter is from 1 October to 31 December. The second quarter is from 1 January to 31 March and so forth. The goal of the MCAR program is to achieve a first quarter construction contract award. Therefore, projects in the FY 2008 program must be awarded for construction within the time frame of 1 October to 31 December 2007.

2.2 Biennial Budget

The Department of Defense budgets MCAR projects in two - year cycles. One cycle is known as the biennial budget and consists of all projects in two consecutive fiscal years. FY 2006 and 2007 program projects together represent one biennial budget cycle. The next cycle is FY 2008 and 2009 and so forth. Funding of these projects depends on timely achievement of design milestones to produce cost estimates. Cost estimates provide the basis for establishing and reconciling project budgets. Design milestones differ for projects of different fiscal years within the same biennial budget. The successful execution of these design milestones is the basis for construction funding. If milestones are not achieved or the project is not within budget, it can become the basis for cancellation or deferring the project to a later fiscal year.

2.3 Project Delivery

2.3.1 Schedule

The typical Design/Bid/Build project begins design two or three years before the fiscal year of construction. If the fiscal year of construction begins in 2008, for example, then the design would begin in FY 2006 (October 2005). A 2009 project (in the second year of the biennial budget) also begins design in October 2005.

Chapter 3.0 – CONSTRUCTION STRATEGIES: FULL DESIGN AND DESIGN-BUILD CONTRACTS

Design/Bid/Build is the preferred contract delivery system for MCAR projects in the biennial budget cycle. However, Congress may insert a project into a fiscal years budget earlier than planned. This requires construction contract award in a very short time frame. It may be necessary to accomplish the award using a Design/Build contract.

3.1 Full Design (D/B/B) Projects

3.1.1 Guidance

The Army Reserve has specific programmatic, design and construction criteria for its facilities. UFC 4-171-05 Army Reserve Facilities is the design guide for U.S. Army Reserve Facilities (referred to below as the "Design Guide" or as UFC 4-171-05), and is the primary source for Army Reserve criteria. Army Reserve D/B/B project design and construction must comply with all applicable Government criteria documents.

The selected D/B/B Contractor is likely to be a private-sector development or construction contracting corporation.

See Part B, the Army Reserve Design/Bid/Build Process and Submittal Requirements Manual, for a listing of the major criteria and requirements for preparation of an Army Reserve D/B/B package.

3.2 Design-Build (D/B) Projects

3.2.1 Guidance

The Design Guide for U.S. Army Reserve Facilities (Design Guide or UFC 4-171-05), is the primary source for Army Reserve criteria for Design-Build projects. The intent for Reserve D/B projects is to apply more "commercial" criteria where feasible, compared to D/B/B projects.

For D/B contracts the selected D/B Contractor is likely to be a private-sector development or construction contracting corporation, or possibly a design firm.

See separate document Army Reserve Design/Build RFP Instruction Manual for preparation of an Army Reserve Design-Build RFP package. See <http://www.lrl.usace.army.mil/ed2/article.asp?id=180>

Note that Army Reserve D/B template specification section "Statement of Work" (numbered as of this writing as RST04DB 01 02 00.00 48) includes the following statement:

"The Contractor shall follow the guidance of the DG in developing the project design, unless this RFP directs otherwise. For the purposes of this RFP, when the word "should" is used in the DG, it indicates a mandatory requirement for this project. When the DG references Government criteria documents not referenced in this RFP, those criteria do not apply to this project."

Chapter 4.0 – DESIGN PROCESS OVERVIEW

4.1 General

4.1.1 Typical process

Typically, projects follow a two-step process. However, some projects are designed in a non-stop process due to compressed time available. These are described below.

4.1.2 Two Step Design Process.

The typical project utilizes a two step design process because the two step process is believed to be the most efficient way to satisfy the biennial budgeting cycle. Steps are:

Project Definition (Phase I)

Detailed Design (Phase II)

Project Definition (Phase I) lasts approximately 90 days and begins in first Quarter of the Fiscal Year two years prior to the fiscal year of projects in the first cycle of the biennial budget, and three years prior to the fiscal year for projects in the second year of the biennial budget. The process is initiated by the Assistant Chief of Staff for Installation Management - Army Reserve Division (ACSIM-AR), and the local Army Reserve user who is represented by the Regional Readiness Sustainment Command (RRSC). A series of meetings determine the type and number of buildings and the function and size of spaces. The ARMY RESERVE designates responsible parties to develop the "strawman" (pre-concept) layout for each building to convey important functional relationships. There is a design pause after submission of Phase I. The design pause lasts approximately four months for projects in the first year of the biennial budget and for sixteen months for projects in the second year of the biennial budget.

Detailed Design (Phase II) is the second step. It lasts approximately 6 to 9 months depending on project complexity. Detailed Design Phase II consists of a Charrette, Interim and Final design submittals.

4.1.3 Non-Stop Design Process.

Due to Congressional action or DOD management decisions, some projects are inserted into the budget late in the budget cycle. The designs for these projects must follow a non-stop design process so that the design can be completed in a year or less. The design process starts with the development of a "strawman" pre-concept layout. Preliminary site layouts are developed and the design progresses into the charrette phase of design. There is no formal Phase I submittal and no design pause. The design continues, without stopping, through the Charrette, Interim and Final stages of design.

Chapter 5.0 – PROJECT DEFINITION (PHASE I)

5.1 General.

The purpose of the project definition phase is to define project requirements in sufficient detail to make a reliable cost estimate for the MCAR budget submission. The intent is to do this with a minimum investment of design funds. This phase begins with a predesign meeting generally in October but may start earlier or later depending on the project complexity.

5.2 ACSIM-AR Actions.

Prior to the predesign meeting, Assistant Chief of Staff for Installation Management - Army Reserve Division (ACSIM-AR) or their representatives, in coordination with the ARMY RESERVE, completes the following tasks that may be finished either before or at the start of Phase I:

- Validate Project Documentation
- Prepare "strawman" space layouts and accompanying narrative.
- Prepare site sketch locating buildings, roads, and parking.
- Deliver these items to the Louisville District as starting point for further project design and development.

5.2.1 Validate documentation

Validate project documentation in accordance with Army Regulation AR 140-483, Army Reserve Land and Facilities Management. The Project Documentation includes:

- DD 1390
- DD 1391
- Worksheet Functional Space Details (DA 5034R)
- 171 Training Building
- 177 Mnvtr/Trng/Impact Area
- 214 Maintenance Tk & Auto
- UNH – Unheated Storage
- OTH– Other Building
- 9LD – Land
- SPRT – Support Facilities
- STAT – Statistics
 - Rated Capacity
 - Largest Drill Weekend
 - Largest Admin Weekend
 - Largest Maint Weekend
 - Weekend/month

- Memos
- Information Systems

5.2.2 Prepare a site sketch

Prepare a site sketch showing desired locations of buildings, POV parking, MEP, and access roads – in general all the items that are listed on the 1391 document, 5034R, and as requested by the Project Officer. The sketch may be a Microstation compatible CADD file (preferable) or drawn on paper.

5.2.3 Strawman Layout.

The goal for the Strawman Layout in the Project Definition (Phase I) phase is to arrive at workable set of floor plans in order to arrive at an accurate cost estimate for congressional budget purposes. The intentions are for the Phase I Designer of Record to advance the initial AR strawman layout, prepared by ACSIM-AR, accounting for: actual site constraints (size and shape including AT/FP considerations), proper life safety considerations, IT concerns, and building circulation needs.

Layouts must remain within the overall approved scope (area, size) of the project. The layout should clearly convey mandatory relationships and constraints to follow. Further, it is important that all project delivery team (PDT) members, especially the customers, are made aware that the Phase I Strawman floor plans are only a starting point to convey conceptual ideas and that the layouts will change as professional architects, engineers and interior designers develop the final design in a later phase of development.

In order for the Project Delivery Team (PDT) to properly review and approve the project layouts regarding authorization requirements and functionality, the floor plans (either single or double line drawings) shall show all rooms, circulation areas, and exterior access points. Rooms should contain the following information: room numbers, door locations, functional I.D. designation. (e.g. CLS for Classroom, FTP for Full Time Private Office, etc.), and unit designation (e.g. 416th Engrs). In addition, a tabular report must be provided either in the accompanying narrative or on the plans showing a room by room summary. The report should be set up and categorized matching the project's 5034-R documentation format and show the "approved" vs. "actual" square footage by the appropriate categories.

NOTE: The Project Definition (Phase I) strawman floor plan is usually not the project's final floor plan. Due to the "design pause", which may last from 4 -16 months as discussed below, there are inherent risks of unit and authorization fluctuations by the time Phase II portion of the project begins. In an effort to minimize Phase I lost effort, care should be taken not to expend too much effort in finalizing plans at this time. It will be the responsibility of the PM to coordinate this aspect with the ACSIM-AR Project Officer.

The above paragraph notwithstanding, the PDT should also be aware that RFP D/B contractors very often use the floor plan provided in the RFP package. Therefore the strawman as developed and refined in the RFP solicitation package must function properly.

5.2.4 Provide to Louisville District

ACSIM-AR is to provide to Louisville District the developed project documentation, space layouts, and site sketch. (Also provide a copy of the Real Estate Planning report [REPR] along with the Engineering Feasibility Study [EFS], prepared during real estate acquisition, if it is available.) Transfer CADD files by electronic means.

5.3 Louisville District Actions.

The Corps of Engineers Great Lakes and Ohio River Division Louisville District (CELRL) is the COE designated Center of Standardization as well as the design and construction agent for the Army Reserve. The Louisville District uses Architect/Engineer (A-E) firms under Indefinite Delivery Indefinite Quantity (IDIQ) Contracts, in-house resources, other (geographic) districts and, or a combination of these resources, to accomplish the Project Definition design (Phase I), and in the Detailed Design (Phase II).

5.3.1 Predesign Activities.

If it is determined to use an A-E firm to perform the Project Definition, the following steps should precede the initiation of Project Definition design work:

- Selection of an A-E
- Development of an Appendix A (SOW) for the work to be done in Project Definition.
- Arrange a predesign meeting. The purpose is resolving any details of the project and deliverables that affect cost to perform the A-E services. Depending on the nature of the project the predesign conference may be on-site or it may be sufficient to have only a teleconference.
- A two-part acquisition should be initiated by the PE/A as required.
- Proposal, negotiation, acceptance, and task order issued for the work with notice to proceed.

5.3.2 Predesign Meeting.

The Louisville District will schedule and coordinate requirements for the on-site "kickoff" meeting. Meeting participants will review the project documentation from ACSIM-AR and clarify project requirements. Thereafter, continuously dialogue with ACSIM-AR during this phase and obtain the project manager's concurrence, as the design progresses. This is the start of a continuous dialogue between designers and users and therefore represents a precursor to the charrette process that occurs in Phase II. See **Part B - Detailed Design**, in paragraph "PHASE II-CHARRETTE DESIGN".

5.3.3 Conduct Site Investigations.

Most large projects, or projects with significant requirements of a non-routine nature, will require a site visit/study to be made by the designers before the Project Definition design submittal in order to identify project parameters. The site visit may be combined with the Project Definition Kickoff meeting. The early identification and resolution of site issues is critical to the successful and timely execution of project designs.

Topographic Survey -- Refer to description in paragraph "Project Survey" below.

Geotechnical -- If preliminary geotechnical data from the proposed site is not available, it is expected that the designer will complete a limited geotechnical investigation report and include it with the Project Definition submittal. Refer to description in paragraph "Limited Geotechnical Investigation Report" below.

5.4 Submittal Requirements.

A complete Project Definition submittal consists of:

- Site plans
- Project Survey (complete topographic and utility survey of the site)
- Limited Geotechnical Investigation Report
- Conceptual floor plan layout
- Narrative report or "design analysis"
- Cost Estimate

The Louisville District provides copies for functional review to ACSIM-AR and designated subordinate elements. Army Reserve reviewers send comments through the chain of command to ACSIM-AR. If ACSIM-AR approves the comments they are forwarded to the Louisville District for implementation. The entire submittal is in electronic format, except for those parts that would be impractical. At the predesign meeting the Louisville District will verify which organizations need paper copies. The submittal includes a cover sheet and half size drawings when published on paper. This information is also reflected in the Appendix "A" SOW.

5.4.1 Site Plan.

Site plans for the Project Definition submittal should consist of the following drawings, as a minimum:

- Site Location Plan
- Site Topographic Plan
- Site Layout Plan
- Site Utility Plan
- Site Setbacks

Site plans should be scaled to fit on 11x17 paper. The smallest scale for site plans should be 1" = 100 ft. If the site will not fit on one 11x17 sheet, the site plan should be split onto two or more sheets, using match lines. Larger scales (i.e. 1"=50') should be used with decreasing site size. Include a bar scale and north arrow on each site plan. Include a drawing showing site and area location maps indicating the location of the site in relation to the state, city/county, and local areas. Include a Site Topographic Plan showing existing site topographic features such as contours, ditches, above-ground utilities, vegetation, property lines, existing roads and structures. Site layout plans should indicate the general location of new buildings, paved areas, structures, fences, ramps and curbs. Locate the building from a known point of reference. Show parking layout for privately owned vehicles (POV) and military equipment (MEP). Indicate different types of proposed pavement. Show the location of dumpster pads, building access drives, and access control gates/devices. Show the location of proposed stormwater treatment BMPs (retention basins, bio-retention areas, infiltration areas, grassed swales, etc.)

The site utility plan should indicate the location of known utilities, the location, size, and type of new utilities, and connection points for the site. Typical utilities shown would be water, sanitary sewer, natural gas, and electric. A separate site plan should be prepared showing the appropriate antiterrorism/force protection (AT/FP) setbacks. Consider including a drawing showing the site plan overlaid on an aerial photograph. Indicate capacity of service, size (pipe size, # of pairs, operating pressures etc), documentation of utility provider commitments...letters, emails, etc.

5.4.2 Project Survey.

A purpose of site investigation is to obtain available topographic data. Preliminary topographic information may be used initially, but in order to identify potential site complications, and facilitate site layout, it is expected that a complete project survey will be completed and submitted with the Project Definition submittal. The project survey may be completed by Louisville District Civil Engineering and Survey Section (either in-house or under an IDIQ contract), or completed by the A-E designer. If completed by the A-E designer, submittal requirements for the project survey should be detailed in the Appendix A SOW. In general the project survey will be accomplished by a professional, licensed surveyor and will be tied to the appropriate state plane coordinate system and a vertical datum (such as NAVD88) and show all planimetric site features including, but not limited to buildings, sidewalks, roadways, parking areas (including type such as gravel, paved, concrete, etc.), visible utilities, trees (size and type), road culverts (including type, size and inverts), rim, ground surface and invert elevations and pipe sizes at sanitary manholes, cleanouts, storm manholes, inlets and catch basins, location of fire hydrants and water valves, all utility lines, boxes and signs including electric, phone, cable, gas, water, etc. and the location, type and height of fences and walls. The site survey should include offsite surveying required for turning lanes, utility connections, grading and other required work attendant to the site.

5.4.3 Limited Geotechnical Investigation Report.

The "Proposed Geotechnical Exploration Data" form is to be completed by the A-E, and should be returned as an attachment to the original fee schedule before negotiation of the A-E contract. The PE/A should coordinate review of this form with Louisville District Geotechnical Section. This document provides the COE with an opportunity to review and comment on the appropriateness of the planned geotechnical investigation. The Louisville District document Geotechnical Requirements for Preparation of Full Plans and Specs Solicitation Packages provides a form for the A-E to outline his Proposed Geotechnical Exploration Data. The referenced documents and additional information may be found on the Louisville district web site:

<http://www.lrl.usace.army.mil/ed2/article.asp?id=162>

The limited geotechnical investigation report is a summary report used to provide a general characterization of the proposed site. This geotechnical investigation should also serve the purpose of identifying unique site conditions which might require the need for deep foundations, environmental remediation, and other conditions that may significantly impact the cost of the project. The basis for the report should be a review of applicable geologic maps, publications, and literature, a field reconnaissance, and site specific geotechnical exploration including test pits or soil test borings. The report should describe the site soil type(s), depth to bedrock, depth to groundwater, estimate the soil bearing capacity, and include boring logs, with a boring location plan. The report should describe any unusual features in the design or special geotechnical requirements/considerations. If site specific geotechnical information is not available, then limited borings or test pits should be completed. In general, a limited geotechnical exploration would consist of 1 soil test boring or test pit for each 25,000 sq. ft. of first floor building area and 1 boring soil test boring or test pit for each 75,000 sq. ft. of pavement, with a minimum of three borings or test pits.

5.4.4 Conceptual floor plan

The goal at this point is not to develop finished floor plans. It is to define workable footprints for an accurate cost estimate. The layout should be double line with proper room names. The layout should correlate to the table of functional areas included within the Design Analysis.

5.4.5 Design Narrative.

- 5.4.5.1 Write a narrative report in present tense verbiage.
- 5.4.5.2 Include site and architectural design objectives, preliminary calculations, and other considerations, such as setbacks and other considerations for AT/FP, life safety, LEED / sustainability requirements, and energy conservation.
- 5.4.5.3 Provide an architectural statement describing compatibility with installation design guide, or locale, as appropriate. Fully document any departures from the strawman layout.
- 5.4.5.4 Provide a table of functional areas, in DA Form 5034R format, that shows the programmed and provided area for each functional space.
- 5.4.5.5 Demolition Narrative. Describe existing buildings, pavement, fences, utilities, structures, trees and shrubs required to be removed.
- 5.4.5.6 Describe the site layout in terms of circulation, adjacencies, buffers and response to environmental and contextual issues. Describe proposed management of site stormwater run-off—both runoff volume and quality. Describe AT/FP setbacks and access control issues.
- 5.4.5.7 Provide a narrative of known utilities available at the site. Civil Utilities typically include sanitary and stormwater systems. Mechanical utilities typically include gas, water and sanitary systems. Electrical utilities typically include primary and secondary electrical power, telephone, telecommunications systems, and sometimes security, mass notification and central fire alarm systems
- 5.4.5.8 Summarize all environmental issues and identify required waivers, permits and fees.
- 5.4.5.9 Mechanical. Provide a narrative of special HVAC requirements, known site specific mechanical requirements, known utility, and other unique information on HVAC issues. Provide a discussion of any special mechanical equipment required for the project. Include a discussion of special plumbing and fire protection requirements
- 5.4.5.10 Electrical. Verify the size and location of the electrical, telephone and NOC rooms. See USAR CIO Information Technology Requirements for Army Reserve regarding NOC details.

5.4.6 Cost Estimate.

Prepare a current, complete and accurate project cost estimate, escalated to the midpoint of construction, reflecting the information contained in the other parts of the submittal. Develop costs for Primary Facilities (buildings), Supporting Facilities (site work), Antiterrorism/Force Protection, Furniture and Collateral Equipment. Add costs from the project documentation for Information Systems, and Real Estate (if applicable) to the developed estimate.

- 5.4.6.1 Required Estimating Tool. Use PACES version 6.0.7 (or higher) to prepare the project estimate.
- 5.4.6.2 Cost Estimate Basis. Create the estimate using the Import BLIS/IFC Project function if a project .xml file (exported from space layout tool) exists. Lacking a project .xml file, create the estimate using the Add Project function. Revise the PACES estimate as needed to reflect project requirements and site investigation, consistent with design detail.

- 5.4.6.3 Contingencies. Design contingencies of 5% may be used for projects where more than 50% of the project's design falls outside Army Reserve standards. Apply Design contingencies as part of Mobilization on the PACES Project Markups screen. Construction contingencies of 5% shall be used for new construction projects (including additions) and 10% shall be used for alteration/renovation projects. Contingencies differing from these standard values shall be fully justified and supported by a risk analysis.
- 5.4.6.4 Required Reports. Provide the Project ENG Form 3086 Report, Project Subsystem Detail Report, and Facility Building Parameters Reports for each building in the project. Submit these reports in .pdf format.
- 5.4.6.5 Cost Estimate Narrative. Prepare a narrative identifying the major cost engineering considerations used to prepare the Project Definition estimate. These considerations may be the assumptions made, or summary restatements of more detailed information contained within the overall Project Definition narrative. The cost estimate narrative shall reference the overall project definition narrative for more information where appropriate. Document revisions to the PACES default values (FSA Selection, FSA Density, Shell Quantity, Assembly usage and quantities) and the basis for those revisions in the cost estimate narrative. Include justification and risk analysis for contingency values that differ from the standards stated above.
- 5.4.6.6 PACES Native Format (*.mdb) File. Export the project to PACES (*.mdb) and provide the resulting *.mdb file.
- 5.4.6.7 Furniture estimate: At least a per sq ft cost should be submitted. A detailed take off is not required. At minimum the estimate should reflect the amount from the 1391 that was programmed.

5.5 REVIEW

The submittal is sent to meeting participants for information only. Usually, there is no formal review meeting, however, a teleconference may be necessary to clarify issues and enhance communication.

5.6 DESIGN PAUSE

5.6.1 General.

There is a design pause after completion of Project Definition (Phase I) and before the start of detailed design. The pause lasts about four months for projects in the first year of the biennial budget and sixteen months for projects in the second year of the biennial budget.

5.6.2 ACSIM-AR Actions.

Using information from the project engineering submittal, ACSIM-AR revises the project's DD Form 1391 for inclusion in the MCAR budget book. It undergoes a series of reviews within the Department of Defense, from June through December, which can change the project's scope or programmed amount. ACSIM-AR will coordinate documentation revisions with the Louisville District.

- 5.6.2.1 Revalidation. During the design pause (within sixty days prior to the charrette design meeting), ACSIM-AR revalidates project requirements. If there are changes, ACSIM-AR provides revised documentation and functional space worksheets to the Louisville District 45 days prior to the charrette design meeting.

5.6.3 Louisville District Actions.

If there is a significant change in the project during the preceding year, the Louisville District provides ACSIM-AR with a revised cost estimate twelve months into the design pause for projects in the second year of the biennial budget (in May 2007 for projects in the FY 2009 program).

APPENDIX

APPENDIX – GLOSSARY

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| 1354 | DD Form 1354 A form designed and issued for use in connection with the transfer of military real property between the military departments and to or from other government agencies. |
| 1390 | DD 1390 FY ____ Military Construction Program DoD forms may be found at http://www.js.pentagon.mil/whs/directives/infomgt/forms/formsprogram.htm |
| 1391 | DD1391 FY ____ Military Construction Project Data |
| 4288 | ENG 4288-R Submittal Register A form for recording the name and disposition of every item listed in the project specifications that is to be submitted by the contractor for review by the government. The form categorized the type of document and the action to be taken. The Prescribing Directive is ER 415-1-10 See http://www.usace.army.mil/publications/forms/ Other Army publications may be found at http://www.usace.army.mil/publications/ |
| 5034R | DA 5034-R Project Documentation Space Allowances Worksheet DA forms may be found at http://www.army.mil/usapa/eforms/index.html#eforms_range Information on its use can be found at http://www.army.mil/usapa/epubs/140_Series_Collection_1.html |
| A/E/C CADD Standard | The A/E/C CADD Standard has been developed by The CADD/GIS Technology Center to reduce redundant CADD standardization efforts within the Army, Navy, Air Force and Corps of Engineers. The standard is part of an initiative to consolidate existing CADD drafting standards into a format generic enough to operate under various CADD software packages (such as MicroStation® and AutoCAD®) and to incorporate existing industry/national standards. The A/E/C CADD Standard includes presentation graphics, level/layer assignments, electronic file naming, and standard symbology. Also, platform-specific software (called Workspaces) has been provided to aid the user in implementing the standards. Army repository of the Standard is https://tsc.wes.army.mil/products/standards/aec/aecstdweb.asp |
| A-E (also sometimes "A/E" or "Architect-Engineer") | Acronym for the design firm providing Architectural services, Engineering services, or both. Often the firm is called an "A-E" (or variant thereof) when providing services direct to Corps, and may be referred to as "Designer of Record" when teamed with a contractor in a Design-Build project. This usage is not strictly adhered to in everyday language. |

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| ACSIM-AR | Assistant Chief of Staff for Installation Management Army Reserve. Provides and maintains facilities and other associated real property and infrastructure supporting the Army Reserve. Plans, programs, and budgets Operations and Maintenance Army Reserve (OMAR) funds that support base operations and military construction. See http://www.hqda.army.mil/acsim/USARhomepage.shtml |
| Appendix "A" | "SOW", "Appendix A" or "Appendix A (SOW)" all usually refer to the Statement of Work forming the A-E's Scope of Work for design services. |
| ATFP or AT/FP | Antiterrorism and Force Protection, as defined by the Army. This term is often used in buildings and site design work as a shorthand way of referring to all the facility design requirements in UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings. That document when first issued in 1999 was entitled, "Interim Department of Defense Antiterrorism / Force Protection Construction Standards", and the abbreviation has stuck in common usage even though the title has changed. |
| AGCCS | Army Global Command And Control System |
| Bentley Design Solutions | Bentley Systems, Inc family of products that automate design and engineering information management in the areas of building, civil, geospatial, and plant construction. |
| Building Information Modeling (BIM) | A BIM is a digital representation of physical and functional characteristics of a facility. More at http://www.wbdg.org/design/bim.php Another description is, "A single, logical, and consistent source for information associated with a 3D building design". |
| CCL | Construction Cost Limit. Objective is to design projects within the construction cost limit as specified in the Statement of Work |
| Charrette | Charrette is a French word derived from "a collection of Ideas". The design process is compressed into a two to five day efficient planning and brainstorming session involving the entire team (i.e. client, design team, consultants, etc.). During this process, known as a "charrette," the team works side by side for an intense exchange of ideas to develop planning concepts and architecture that fits the project criteria. This approach ends with workable solutions supported by all major players. |
| Cost Comparison | Square foot analysis in 1391 format |
| Cost Estimate | A statement of probable construction costs |
| Design Build | Design-Build (D/B) is a project delivery method in which the agency or owner holds a single contract with a single entity for both the design and construction of a project. |
| Design Guide | UFC 4-171-05 Army Reserve Facilities |
| Design Narrative | Text describing the major elements that make up a planned design |

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| Design Team | Generalized term for those involved in an aspect of design. Its meaning derives from the usage context. For example, in D/B/B projects it may be the in-house or A-E provided design professionals and associates responsible for design of a project. For D/B provided designs it may mean the group of designers provided by the D/B contractor who will be the Designers of Record for the project. It is also used in the Louisville D/B specifications to mean the Corps team assigned to review and monitor the progress and product of the Designers of Record. |
| Designer of Record (DOR) | Refer to the definition (to be) used in the particular project's procurement document. Generally a DOR is the design professional entity who has assumed responsibility for the project -- those who have or will stamp the drawings. |
| DrChecks | DrChecks (pronounced "Doctor Checks") is a Web-based data system designed to facilitate the review and feedback of construction project related documents (plans and specifications), and to collect and share "lessons learned." DrChecks is a part of the ProjNet system, at https://www.projnet.org/ A/E's must obtain enrollment and access to the system; their PE/A can initiate the enrollment. |
| EMAAR | Engineer Management Automation, Army Reserve (obsolescent). Slated to be replaced by RCAS, see RCAS below. |
| FTP | File Transfer Protocol. This is the language used for file transfer from computer to computer across the WWW. An anonymous FTP is a file transfer between locations that does not require users to identify themselves with a password or log-in. An anonymous FTP is not secure, because it can be accessed by any other user of the WWW. |
| FY | Fiscal Year. The Federal Fiscal year begins October 1 of each calendar year, and ends September 30 of the calendar year following. "FY08" begins October 1 2007. The term 1 st quarter of FY08 refers to October, November and December 2007, and 4 th Quarter FY08 refers to July, August, and September 2008. |
| Green Power | Green Power is a term used to describe electricity produced by sources that are believed to be less harmful to the environment than fossil fuels. While there is no strict definition of Green Power, generally renewable sources such as solar, wind power, geothermal, biomass, and small hydroelectric are considered Green Power sources. |
| Groove | Groove® is Internet software owned by Microsoft that is used for making direct connections and sharing of common documents with a group of people engaged in a common task. Groove is one of the tools that the Corps of Engineers has adopted for use with shared tasks. |
| Image Files | Files containing pictures or graphics rather than words. Two major types of image files are 1) <u>raster files</u> --sometimes referred to as a bitmap because it contains information that is directly mapped to the display grid and a few basic types, and 2) <u>Vector graphics files</u> -- the creation of digital images through a sequence of commands or mathematical statements that place lines and shapes in a given two-dimensional or three-dimensional space. There are many formats of image files. Note: Image files are not searchable for specific words. Unless it is also sent through a special optical character recognition (OCR) program to turn it back into words, scanning a page of text will result in merely a |

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| | picture of the text -- an image file. |
| IDIQ | Indefinite Delivery Indefinite Quantity. Requires to contracting mechanism wherein a contract is formed for a stated period of time and a ceiling price, and against which individual task orders are written for the performance of work. |
| Industry Foundation Classes (IFCs) | An international (vendor independent) data format for achieving interoperability between software applications |
| Interoperability | The sharing of information between BIMs and associated design and engineering software applications |
| LEED | Leadership in Energy and Environmental Design The LEED Green Building Rating System™ is a nationally accepted benchmark for the design, construction, and operation of high performance green buildings. |
| Local Officials | For the purpose of this manual "Local Officials" are elected and appointed officials of state and local government, or their counterpart on military installations, who have jurisdiction/responsibility for protection of the public interest and life safety in land use, environment, building, transportation as it relates to military construction. |
| MCACES , MII or Mii | Micro-Computer Aided Cost Engineering System. MCACES is a detailed cost estimating program utilized primarily for development of cost estimates where detailed design information is available. MCACES is used by the Corps to estimate military, civil works, and HTRW project costs. The latest iteration has the acronym "MII". It replaces MCACES Gold/MCACES for Windows. |
| MCAR | <p>Military Construction, Army Reserve (MCAR)</p> <p>In the 2005 USACE Program, approximately 30 percent of the Military Programs budget was for reimbursable work for Army major commands and 70 percent was direct funded by HQ, Department of Army.</p> <p>Army military direct funding includes Operation & Maintenance, Army (OMA); Military Construction, Army (MCA); Military Construction, Army Reserve (MCAR); Army Family Housing (AFH); Housing Assistance Program (HAP); Base Realignment and Closure (BRAC), Research, Development, Test & Evaluation (RDT&E); Prime Power, and other programs.</p> <p>Reimbursable work for the Army includes the Installation Restoration Program, Installation Support, and other programs.</p> |
| MEP | Military equipment parking. Separated from the designated parking areas for Privately Owned Vehicles. See also POV |
| NOC – Network Operations Center | <p>Network Operations Center (NOC) as used in the telecommunications industry is a centralized place housing network switching equipment and management systems and may also housing storage devices. The term NOC is also used to describe a monitoring center equipped with hardware and software tools and managed by dedicated support engineers.</p> <p>The term "NOC" or "NOC room" as used within Reserve Centers is a lower level facility serving as the central point for the Center's data systems... See UFC 4-171-05 paragraph 2-10, and elsewhere throughout this UFC.</p> |

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| O&M | Operation and Maintenance |
| OMAR | Operation and Maintenance, Army Reserve (OMAR). The OMAR appropriation funds operational, logistical, administrative, engineering, and management support for the Army Reserve. Additionally, the OMAR appropriation supports America's Army in areas including installation management, maintenance of real property, record maintenance, and personnel support to retirees, veterans, and their families. |
| PACES | Parametric Cost Engineering System. PACES is a Windows based parametric cost estimating system. Minimal user input to create a detailed cost estimate. User can develop cost estimates for Building Facilities, Sitework, Runways & Taxiways, and others. Pre-defined engineering relationships link parameters to detailed quantities. Defaults and quantities can be changed by user. |
| Parametric Cost Estimate | Estimate derived from statistical correlation of historic system costs with performance and/or physical attributes of the system. As used here (e.g. in PACES, see above) it is based on a scalable model of a facility. The PACES software has models of most common military facility types. |
| PE/A | Project Engineer or Architect. The Corps professional who is the primary Point of Contact (POC) for the A/E, and who provides all directions to the A/E concerning the project. |
| Phase I | See Chapter "Project Definition (Phase I) of this manual Part A. As used herein, Phase I defines the project sufficient to allow subsequent commencement of Detailed Design (Phase II). |
| Phase II | As used herein Phase II is the name given for the Detailed Design of the project following completion of Phase I. See Part B of the manual, which describes development of project detailed designs – the working drawings, specifications and other documents that make up the completed project design documents |
| POV | Privately owned vehicles. See also definition for MEP |
| Project Definition | The purpose of the project definition phase is to define project requirements in sufficient detail to make a reliable cost estimate for the MCAR budget submission. The intent is to do this with a minimum investment of design funds. |
| Project Delivery Team (PDT) | A specialized mix of core team members and other stakeholders (a stakeholder is a party with a vested interest in a project) that have been assembled to deal with the unique set of program goals and technical requirements associated with each capital construction project. As used here, the project delivery team is assembled by the government. Delivery teams in federal projects will typically consist of government delivery team members (federal government employees) and contract delivery team members (private sector firms and their employees). The team typically will include a project manager, contracting officer, owner/client representative, A-E designer, specialty consultants, construction contractor, construction manager, and peer reviewer(s). |
| Project Manager | A project will often have several persons with the title "Project Manager", representing the management function for the Corps of Engineers, Using Agency, |

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| | <p>the A-E and other stakeholders.</p> <p>Corps Project Managers work closely with agency contracting officers in assembling the project delivery team. Project Managers need to have familiarity with acquisition and contracting regulations and procedures applicable to the managing agency, but only contracting officers (often referred to as the "CO") are permitted to contract for professional and construction services on behalf of the government.</p> |
| RCAS | Reserve Components Automation System |
| RPX | Real Property Exchange |
| RRC | Regional Readiness Command. (Obsolescent, see RRSC below.) |
| RRSC | Regional Readiness Sustainment Commands. These four organizations were put in place beginning September 2006 and include the 81st RRSC at Fort Jackson, S.C., the 88th RRSC at Fort McCoy, the 99th RRSC at Fort Dix, N.J., and the 63rd RRSC at Moffett Field, Calif. They take the place of the 10 Regional Readiness Command (RRC) headquarters. The current RRCs will disestablish in phases by FY 09 as the RRSCs become fully operational. |
| Scope of Work (SOW) | See entry for "Appendix A" above |
| Space Layout | A single line floor plan defining the general arrangement of the spaces and their relative spatial, size and functional relationships. |
| SPiRiT | <p>Sustainable Project Rating Tool. (Obsolescent, see LEED above.)</p> <p>This is the Army adaptation of LEED, a benchmark for the design, construction, and operation of high performance green buildings. SPiRiT is replaced with LEED in FY08 and beyond for Army projects.</p> |
| Strawman | <p>As used in this Manual: A strawman is created with the intent that it will be pulled apart and discarded. It is used to encourage discussion of the layout's strengths and weaknesses and to generate better designs. It provides something concrete to discuss. The design team can point to it, sketch on it, discuss why an element won't work or what they would prefer to see. It allows the team to discuss the layout without it being abstract.</p> <p>The other definition of a strawman -- NOT as used here -- concerns debate using a logical fallacy -- one example is to present a misrepresentation of the opponent's position, refute it, and pretend that the opponent's actual position has been refuted..</p> |
| Tasker | <p>Shorthand name often used by Corps to mean a work item assigned during a meeting to a specific person, to gather information or resolve an issue left open by the meeting. Thus used by the military, the "tasker" is the assigned task.</p> <p>(Note: This usage is opposite the typical dictionary definition: "One who imposes a task, or alternately one who performs a task, as a day-laborer.")</p> |
| TriForma | Bentley MicroStation's 3D, solids modeling software for object management, geometric modeling, drafting, information and standards management, visuali- |

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| | zation, drawing and report extraction, integration with analytical tools, and interference review. |
| Tri Services CADD Standard | An older name for the standard; see A/E/C CADD Standard. |