INFORMATION FLOW FOR MILITARY CONSTRUCTION

by

J. H. Johnson

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# Information Flow for Military Construction

## Abstract

This report presents information flow networks which correlate the operations and information flow supporting Army Military Construction (MCA) projects within the Corps of Engineers during the planning and programming phase. The diagrams are developed at three levels of functional inclusiveness to provide pertinent, ordered, and logical information flow to each reviewer of the MCA process. Identification of representative MCA procedures to the level necessary for a fundamental understanding necessitated the 30 information flow networks presented.

## Key Words

- Army Military Construction (MCA)
- Information flow networks
- MCA project development procedures
FOREWORD

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Mr. D. B. Baldwin is the OCE Technical Monitor.

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COL J. E. Hays is Commander and Director of CERL, and Dr. L. R. Shaffer is Deputy Director.
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INFORMATION FLOW FOR MILITARY CONSTRUCTION

1 INTRODUCTION

Background
Information flow within the Corps of Engineers (CE) is reviewed in this report as it relates to Army Military Construction (MCA) project development. The report answers the need for a generalized procedural summary of CE construction planning activities and was derived from an MCA procedures study at the U.S. Army Construction Engineering Research Laboratory (CERL). This report is a delineation of actual CE practices, it is not a source of regulatory requirements.

Purpose
The purpose of this report is to provide information flow characteristics of representative MCA project development procedures from proposal to award of the construction contract. The information flow networks of this report (compiled in Appendices A through E) were developed by correlating information flow with MCA functional operations, and are intended to provide reviewers of the MCA process with a source of CE procedural data sufficient for developing accurate concepts and reaching valid conclusions.

Scope
All intra-agency information flow directly resulting from planned or performed military construction within the CE is delineated in this report from development of the planning document to award of the construction contract. Representative procedures for fiscal year (FY) 76 are described by information flow networks for each major category of CE military construction. These networks present specific levels of functional detail for the convenience of differing reader review levels and identify principal functions, approval/action activities, and data transfer means or mechanisms appropriate to each level. The report also identifies internal data transmission events or systems when substantive to the greater information flow picture.

Approach
CE operating procedures were ascertained by surveys of the field operations and controlling regulations. The survey data were evaluated and organized for presentation, and a presentation method developed using simple information flow networks.

The information flow networks were developed at three correlated levels of functional inclusiveness. The first level is a "Top Flow" of interrelated managerial performance areas which provides an overall view of MCA project support operations. The second level is basic-function oriented, with each function related by position and number to an associated performance area in the top flow. The second or middle flow permits a nominal understanding of MCA working operations. The third level is concerned with detailed functions and events which again are related by position and number to both top and middle flows. The bottom flow provides the detailed relationships necessary to define and orient formal and informal data transmission, plans and status reporting, and other types of legal and informal communications.

Categories of Information
Identifying the types of information inherent in MCA information flow systems within the CE was fundamental to the network development process. MCA information flow systems facilitate and promote intended project development and effective management control by providing the necessary documentation, performance/status reports, and special or general-support study reports. These data may be further differentiated by the use-categories in Table 1.

Table 1
Categories of Documentation and Data Used in MCA Programming and Planning

1. Project definition; limits or criteria documents
2. Action-implementation forms
   a. Directives
   b. Approvals
   c. Verifications/certifications
3. Contracting/operations support data
   a. Materials
   b. Personnel
4. Project reporting documents
   a. Progress reports
   b. Status reports
5. Summary reports (periodic)
   a. Base status
   b. Projects initiation and progress
   c. Fiscal status
   d. Developmental and design status
   e. Contracting status
   f. Disclosure status
6. Management-effectiveness improvement and feedback documentation
   a. Engineering Improvement Recommendations System (EIRS) data
   b. Command management-improvement reports
Sources of Report Information

Information flow may be required by regulation, management directive, procedural necessity, or general practice. This report utilized the Armed Services Procurement Regulations (ASPR), Army Regulations (AR), Engineering Regulations (ER) or Pamphlets (EP), and CE policy as regulatory authority. Interviews with District and Division personnel established local procedures and practices. The Office of the Chief of Engineers (OCE) also provided informal input.

Presentation Methods

The format used to present the MCA information flow data was developed based on the material's descriptive requirements and intended use. The desired association between specific activities or functions and categories of generated data could not be clearly presented on a critical-path method chart or a standard computer program flow diagram.

A network approach was chosen to emphasize the significance and orientation of the identified MCA information flow. Three types of flow networks were considered:

1. Approval and/or generation level vs. a time or phase base (Figure 1).
2. Input/basic-function/output vs. project phase (Figure 2).
3. Functions at compatible levels connected by data flow arrows (Figure 3).

The first type (Figure 1) defines the principal areas of basic responsibility in the initiation, control, development, and contracting of a military construction project.

Figure 2 illustrates the second approach, using District specifications and bid-package production for an MCA project over the five development phases—budgetary, presign, design, contract development, and contracting. (The development phase is used since use of a time-base with this diagram involves either complicating mechanisms to represent variance or the use of oversimplifying assumptions.)

The selected approach (Figure 3) depicts the MCA project development at the “performance area” level and includes summary, formal project, and unofficial information flow. (As in Figure 2, a time base is not included.) This method allows easy identification of all general information flow features.

The function rectangles are provided according to their probable sequential occurrence at three levels of detail in three corresponding flows: performance area, basic function, and detailed function.

The information flow is represented by appropriately labeled arrows which connect each function to another function box, to a decision point (diamond), or to a hold point (bisected circle). The arrows may be solid (required), dashed (informal), or dotted (representation).

Readers knowledgeable in CE procedures and the presentation method used here may go directly to Chapter 4 and Appendix A for an abbreviated presentation of the MCA development process.

Figure 1. Approval and generation levels of MCA project information.
Figure 3. Example MCA information flow and functional block diagram.
2 IDENTIFYING INFORMATION FLOW WITHIN THE CE

General
The identification and evaluation of information flow in a complex development process can be facilitated by the use of representation networks. In this report, interpretation of CE procedures by functional flow diagrams permits delineation of information flow within the multiple interactions of MCA procedures.

Information flow includes communications (the transmission, receipt, and interpretation of intelligence), any movement of data records, and documentation activities. The definition of true communications does not include uninterpreted data transmission or data storage for contingencies. Information flow includes all movement of data or ideas; however, beneficial information flow is the transmission of information which is received and used. Military construction information flow, which is generated in support of determining facility needs and developing such needs into formal project proposals and installation programs, details the evaluation and confirmation of the program, the assessment of its validity for budgeting purposes, and the eventual processing and development of the program through design into the construction phase.

Applications to Key Procedures
The information flow network method of this report is a generalization; specific cases of MCA project development are not represented. The network presentation allows master plan and MCA project development procedures to be identified by block functions that are sequentially oriented. The block functions and the data flow lines connecting them permit definition of the data generated and identification of the knowledge transmitted between the functions. The value, and hence, the level of support provided information flow depends on the criticality, degree of activity, and occurrence of the functions which transmit or receive these data.

Application of these concepts to information flow diagrams for the overall MCA procedure is demonstrated by the following survey of program and project development activities.

Master Planning
The key role of the Master Plan (MP) in CE procedures (AR 210-20) should be reviewed in order for the reader to properly assess MCA project development. Annually, the construction selection process for the next Short-Range Construction Program (SRCP) is normally derived from the Intermediate-Range Construction Program (IRCP), which has evolved (with good planning) from the Long Range Construction Program (LRCP). This procedure is the yearly adjustment for MCA progress to the MP and derivative installation construction plans. It is also a convenient time for incorporating necessary or desired revisions.

The MP is initially developed in three phases (Figure 4) and consists of three corresponding parts.

Phase 1 identifies existing facilities or real estate by documentation in a Basic Information Map (BIM), an Analysis of Existing Facilities, and a Building Information Schedule (BIS). These documents locate and identify existing facilities; the BIS is essentially a printout listing buildings ranging from shelters to office buildings. If there is an emergency allocation, a Preliminary Land Use document may also be included in Phase 1.

Phase 2 includes a tab listing of Existing and Required Facilities, an Analytical Report of proposed or planned projects, and a Regional Plan. The first two documents define the need and the facility which meets this need. The Regional Plan includes a site plan and a reservation plan (a detail-type plan of the proposed project).

Phase 3 relates to factors such as environmental protection, use of utilities, utility loads, and development of roads in support of each planned project.

The MP is the responsibility of the Installation Commander (IC) who is supported by the Facilities Engineer (FE). The FE may provide funds to the District Engineer (DE) to reimburse the District in its installation-support efforts.

Programming and Design Process
Programming and design brings a major MCA project from the proposal or MP scheduling stage to construction contracting (Figure 5). Inclusion of a project in the proposed SRCP by the IC begins the programming

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¹Master Planning for Permanent Army Installations, AR 210-20 (Department of the Army, 1 January 1973). The revision to AR 210-20 issued 15 March 1976 was not considered in this study.
function. Forwarding a completed DD Form 1391 to the Department of the Army (OCE) and an approved Project Development Brochure-Part I (PDB-1) to the District implies Major Command endorsement of the project as worthy of submission to the Department of the Army staff for consideration for inclusion in the budget year program. (The "budget year" is the fiscal year preceding the fiscal year in which the associated budget will be submitted to Congress.)

Formal proposed facility requirements are developed by the Installation Planning Board (IPB) and documented on the Military Construction Project Data Sheet (DD Form 1391). The IC submits an initial 1391 to the Major Command (MACOM) for evaluation and approval for inclusion in the SRCP.* Upon acceptance and any resulting modifications, the IC binds applicable documents (the 1391, a budget attachment, and several site plans) or specially prepared data (per TM 5-800-3)3) and sufficient descriptive narrative to form the PDB-1. The PDB-1 is sent to the District Engineer, and the DD Forms 1390 (MC Program data) and 1391 plus budget attachment are forwarded to the MACOM.

*The SRCP is the new fiscal year (budget year +1) program being developed for submission to the Congress. Due to recent procedural changes, the development of the SRCP extends over a period of about 19 months measured from the closing date for submittal of detailed DD Forms 1391 to OCE until the final program is submitted to Congress. Hence the preparation periods for two successive SRCPs overlap for a period of about 7 months.

3Project Development Brochures—Part I, TM 5-800-3 (Department of the Army, 15 May 1974).

MACOM-approved SRCP data from each installation are reviewed and evaluated by OCE. OCE may direct the District to perform preliminary project studies or concept design while the project is still under review.

The OCE technical reviews are often conducted in parallel with that of the Construction Requirements Review Committee (CRRC), which investigates the applicability, impact, and feasibility of the project at the DA staff level. If CRRC gives the project a low rating, OCE drops the project and no directive is issued; if CRRC recommends the project, OCE issues either a preliminary directive (Code 1*); or a concept-design directive (Code 2) together with an annotated DD Form 1391 to the District.

After receipt of the implementing directive, the District organizes to support the program. District design support is planned by the DE, and the decision for an in-house or Architect-Engineer (AE)-prepared design is made. If AE support is desired, AE selection and design contract negotiation activities are performed subject to certain funding-level/AE-approval regulations. Considerable variation is allowed in the AE contract and the degree of AE project support.

During this period, if so directed by OCE, the District prepares a Preconcept Control Data Package (PCDP) for detailed OCE budget reviews and future Congressional review reference. The PCDP consists of budget sketches, 

*The code designations for OCE directives are presented in Appendix F.
Figure 5. MCA project information flow network, top flow.
an Engineering Form 3086 ("Current Working Estimate-Budget Planning"), and any clarifying supplementary data. OCE evaluates the cost aspects of the project based on the PCDP.

If the project is approved, OCE includes it in a "Green Book" consisting of the DD Forms 1390 and 1391 for DA-approved planning. The "Green Book" is forwarded for Office of the Secretary of Defense (OSD)/Office of Management and Budget (OMB) review, and the project is checked to insure that it is in the Five-Year Defense Plan (FYDP).* The "Green Book" is adjusted to reflect the approved OSD program. It is then sent to Congress where OSD, with OCE support, seeks approval of Congressional committees. The PCDP is used by the OCE representative at Congressional committee meetings to provide more detailed information on questioned programs or projects.

Implementation of design is initiated by an appropriate directive from OCE. This usually precedes construction approval by Congress; the design of small or predesigned projects often proceeds to completion during the approval deliberations by Congress, with project development being carried up to the construction-contract stage. However, no project can be awarded until after the funds become available through authorization and appropriation by Congress.

A design directive may specify partial development (Concept Design) or provide authority to continue through Final Design, according to the management needs of the project. Of course, DA may determine that a project is inappropriate and stop the operation at any time. This potential for project termination must be remembered to properly interpret the report flows.

Completion of the Concept Design (CD), which represents approximately 25 percent of the total design, is accomplished by the District's Design Branch or by a contracted AE. An extensive user/installation/District review of the CD is required, and Division-approved changes are incorporated. The Final Design (FD) is then generated with District review. The AE incorporates any corrections and/or revisions, and prepares the final drawings and specifications. The design phase is completed with review and sign-off by the next higher level

*The FYDP is an official publication of OSD which summarizes the approved (construction) plans and programs of DOD components. The FYDP contains data from prior fiscal years and for the current fiscal year, the budget year, and 4 subsequent fiscal years.

The District then proceeds to the construction-contracting phase, which, depends on completion of the Congressional appropriation. From the AI-supplied FD drawings and technical provisions, the District formulates contract content and produces a bid package for distribution to interested bidders (previously notified by the "Advance Notice" sent to listed bidders and/or by the formal advertisement in Commerce Business Daily).

Applications to Local District Functions

Correlations between the District MCA mission, District branch assignments, and the generalized procedures of the information flow networks are not always obvious. Typical branch functions are provided below with specific branch assignments for four Districts outlined in section A-3 of Appendix A. The functions now provided were suggested by OCE for selected branches of the Engineering Division in the District guidelines of ER 10-1-3.

1. Design. Responsible for structural design, architecture, electrical engineering, mechanical engineering, miscellaneous civil engineering, and other technical disciplines not specifically assigned to another branch. Responsible for preparation of plans and specifications for construction.

2. Foundations and Materials. Responsible for all matters pertaining to surface and subsurface explorations, foundations and embankment design, site investigations, seepage, slope protection, construction materials development, airfield and vehicular pavement structural design, division laboratory and other functions pertaining to geology and soil mechanics engineering. In those divisions having separate Geology and Foundations and Materials branches, the responsibilities listed above would be divided by disciplines as the names imply.

3. Military. Coordinates planning and technical requirements of using services; monitors and insures performance of all Engineering Division responsibilities for prosecution of the military construction program.

1Divisions and Districts, ER 10-1-3 (Department of the Army, 1 May 1968).
4. Survey. Responsible for matters pertaining to and the accomplishment of all topographical and construction surveying and mapping activities in the District.

5. Service. Provides administrative support and drafting support (optional) to the Engineering Division including typing and stenographic, central files, office supplies, travel orders, reproduction, personnel requests, time and attendance reports, and similar functions.

6. Planning and Reports. Responsible for planning studies, including but not limited to preauthorization studies, feasibility studies under special continuing authority programs, Phase I Advance Engineering and Design, and other studies involving the formulation, impact assessment, and evaluation of water resources plans. Responsible for preparation, coordination, and processing of planning reports to higher authorities, as well as coordination of reports with other Federal agencies and non-Federal interests. Responsible for providing input for the General Investigations budgetary submission, as well as portions of the Construction General budgetary submission related to the above planning activities.

7. Program Development. In those Districts not having a Program Development Office at staff level, is responsible for all functions pertaining to the budgetary cycle, preparation of PB forms, testifying officer data, and similar programming material.

3 ASSESSMENT OF CE PROCEDURES

Project-identifying characteristics, the development of CE functional interfaces, and the evolution of legal and operational requirements have influenced the development of current MCA planning procedures.

Understanding MCA project development at the generalized procedure level requires some knowledge of the characteristic influences and limitations applied to these procedures. The interrelationships between DA management control systems and the several categories of MCA project development are identified diagrammatically in this section. An understanding of the correlation between information flow and the management and control of MCA project planning will facilitate understanding of the development of the programming networks explained in Chapters 4 and 5.

Influences on MCA Projects

The controls placed on installation planning influence MCA development procedures. The mechanisms used in the regulation and control of installation development and planning interface with and often impact MCA projects and their implementation approach. Effective monitoring of the current status, strength projections, life cycles, and MP revisions of an installation is an important management objective. Certainly, any evaluation of the timeliness, feasibility, and approach to be used in introducing new facility proposals considers the mechanics of such information and control systems.

The Corps-wide Standard Finance and Accounting System now under development will interface with and provide information to District management control systems, the OCE Design Progress Reporting (PR) System (ER 415-345-43), the Resource-Allocation/Project-Management System (RA/PMS), and the Integrated Facilities System (IFS). The IFS describes user requirements and is an input to the functional criteria portion of the Master Plan.

Real Estate Status (ER 405-345-100)

A corollary of facility programming is site selection, acquisition, and preparation. The installation can perform this function initially or at some convenient time prior to final design. The installation may request the District/Division to assist in the process if analytical difficulties arise.

Land acquisition can be initiated by a Real Estate Directive (designating the land to be acquired and the amount of funds available for the acquisition). This directive is issued by the agency/department head when authorized by OCE per authority delegated by the Secretary of the Army.

Master Plan Revision Status (AR 210-20)

The MP is developed as defined in AR 210-20 and outlined in Chapter 2. Table 2 describes the content of the three development phases, and Figure 6 illustrates

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4 For information on implementing a District management control system see U.R. Poskus, Executive Summary for the Automated Military Construction Progress Reporting System (AMPRS), Technical Report P-50 (Construction Engineering Research Laboratory [CERL], 1975).

5 Military Construction Progress Reporting, ER 415-345-43 (Department of the Army, 31 March 1972).

6 Planning and Project Authorization-Military Projects, ER 405-345-100 (Department of the Army, 26 March 1973).
Figure 6. Installation master plan development, basic function information flow network.
Table 2

Master Plan Documentation
(AR 210-20)

Phase 1 Documents:
- Basic Information Maps (BIM)
- Analysis of Existing Facilities
  (Real Property Assets: DA Form 3640)
- Building Information Schedule (BIS)
- DA Form 3640 Printout
- Preliminary Land Use Plan
  (Optional when a general site plan is unavailable)

Phase 2 Documents:
- Tabulation of Existing and Required Facilities
  (DA Form 1269-11-R)
- Analytical Reports and Engineering Assessments
- Regional Plan

Phase 3 Documents:
- Utility and Site Plans

*Phase 2 documents are submitted by the IC as a unit, and provide the Assistant Chief of Staff for Force Development with information for use in staff planning actions.

the functional flow of installation support to this development. The resulting MP can have either two or three phases, since adequate planning can be accomplished with only Phases 1 and 2 complete.

The enabling documentation used to implement MP revision and/or project-proposal developments are the previously referenced planning and control reports, the IRCP revision forms (DD Form 1390), and the PDB-1. Hence, the MP interfaces with planning and control reports that specify or impact installation needs, project scope, and real property status activities. Ideally, the MP consists of the documentation for all three study phases. However, since early planning requires only the first two outputs, many installations are supplying these two parts as a working MP, with the complete plan to be developed at a future date.

Construction Planning

Installation planning for the IRCP and SRCP differs in the amount of detail provided, not in the reporting mechanism. The IRCP requires a "short" DD Form 1391 while the SRCP requires a full DD Form 1391 submittal. The IRCP revision is implemented by the DD Form 1390 and impacts the DD Form 1391 and thus the PDB-1 as shown in Table 3.

Table 3

Program and Project Information Forms

DD Form 1390
Lists proposed construction for IRCP in priority sequence (by command); information required for this form may be obtained from basic construction location and scheduling plans, from the "Inventory of Army Military Real Property" card, and from DD Form 1391 data.

DD Form 1391
Prepared for each project requiring OSD approval; submitted in the budget year plus one, regardless of previous submittals. The 1391 is also prepared for urgent construction and added to the SRCP after the fact. The form requires a detailing of the scope of the proposed construction. Selected example entries include:
- Space 18 - Floor area/no. of stories/designed capacity, people/cooling costs
- Space 19 - Features of Construction
- Space 20 - Components
- Space 21 - Supporting Facilities
- Space 22 - Total Project Cost
- Space 23 - Quantitative Data (Existing Structures, etc.)
- Space 24 - Related Projects
- Space 25 - MCA Funding of Equipment Justification of Project

Installation Real Property Status

OCE maintains an effective Real Property Inventory (RPI) for continental United States (CONUS) and foreign Army installations. Each installation reports changes in their RPI to OCE quarterly for automated checking and inclusion in the Central Inventory of Army Military Real Property. In turn, OCE provides the installation with an annual printout of their registered facilities for error correction (Figure 7). The RPI and associated data are considered primary documentation by each Installation Planning Board (IPB).

Inputs to the RPI updating system are made quarterly and include newly transferred facilities and any required detailing or corrections to previously identified structures. This requires the development and submittal of real-property/facility reports (DA Forms 3641 and 3640) by the IC to the Data Processing Unit of his Field Command Headquarters. These ADP data are then forwarded to the MACOM, which provides the data to OCE in the appropriate format.

OCE, in turn, provides each installation with an annual printout (DA Form 2541) of its official recorded real property status.

*See the Installation Expansion Capability Guide, TB ENG 354 (Department of the Army, 15 March 1976).
Figure 7. Army Real Property Inventory (RPI) system before implementation of IFS.
The forms used to implement and update the RPI System are:

DA Form 2014R: Army Leaseholdings in Foreign Countries Separate From Installation

DA Form 2541: Installation Inventory of Military Real Property (Printout)

DA Form 2877: Real Property Record Card

DA Form 3641: Real Property Assets; Contains Facility Data Records I and II - General Installation Information

DA Form 3640: Facility Data Update (OCE Revision Implementation); Record III - Real Property Information
  Record IV - Building Information Schedule (BIS for MP-1)

Status Determination after IFS Implementation

Modified procedures will be required at each installation after implementation of IFS to permit maintenance of the RPI and BIS documentation. After the IFS implementation, installations will not submit DA Form 3640 but will use the following procedure:

1. At the end of each fiscal quarter the Management Information System Office (MISO) will produce magnetic tape copies of the Installation Management and Planning (IMP) file, and Force and Mission Planning (FMP) file for all installations processed at the Data Processing Installation (DPI).

2. The tapes will be forwarded quarterly to HQDA, Office of the Chief of Engineers, ATTN: DAEN-FEM-S, Washington, DC 20314.

The assets data base is extracted from the OCE RPI/BIS files approximately 6 months before the installation cutover date. Copies of DA Forms 3640 submitted after that date are retained. This information is then loaded into the IFS at the start of data base build which is scheduled 3 months prior to implementation.

Procedural Categories in MCA Project Development

Although all MP entries for an installation are handled similarly, they may not be identically implemented during the programming phase. When the user is other than the IC (as for medical facilities), or when complex technical or safety considerations are involved, special review or control requirements may apply. Furthermore, when funding is by other than MCA appropriations, different budget review and control responsibilities are incorporated into the programming cycle.

Procedural variations required for the different categories of MCA project development can result in corresponding variations in information flow within the Corps. The most significant procedural influences are from funding-source differences and from differing user requirements.

Procedures Categorized by Funding Sources

MCA major construction projects are developed in accordance with the requirements and restrictions of their funding categories. Each category implies specific funding and sequencing criteria:

1. MCA Funding. MCA-funded major projects must be supported by a District budget study and subsequently must be specifically funded by Congressional appropriation, as illustrated in Figure 5.

2. Family Housing Funding. Family Housing is a separate appropriation, whose distribution is controlled by the Secretary of Defense according to strength assessments and the FYDP (Figure 8).

3. New Start Funding. New Start funds are allocated to the replacement, maintenance, or updating of commercial/industrial-type facilities necessary to a base.

4. Reimbursable Funding. Revenue-generating facilities may be built with nonappropriated funds on approval (Figure 9).

Special User or Review Board Requirements

Review requirements for development decisions and design products may be altered by the type of facility and the associated user. The following are examples of special user or technical requirements.

1. Installation Commander. Specialized review approval requirements for specific types of MCA projects include:
   a. Data Processing Center (DPC). All DPC equipment and facilities must be approved by the DA.
   b. Facilities for explosives, ammunition, and toxic/corrosive chemicals must be approved by the Explosive Safety Board (DDESB).
Figure 8. Family housing new construction, turnkey project.
Figure 9. Performance area network for MCA projects with reimbursable funding.
c. New Start Facilities. New Start costs which exceed specified limits must be approved by the Assistant Secretary of the Army or higher.

2. Medical Facilities. All base medical facility projects are under the Office of the Surgeon General (OTSG), which is considered the user agency. Concept-design of hospitals must also be provided to OSD for review and approval.

3. Detention Centers. Although the IC is considered the user for all base facilities except medical, in the case of detention centers, the Provost may perform a “user” support function for design approval and security requirements.

4. Commissaries and Mess Halls. By regulation and agreement, the Troop Support Agency (TSA) supplies the criteria and planning assessments for food-handling facilities to the IC as user agency.

Other Procedural Influences

Regulatory restraints and local District practices have significant procedural influence on MCA project development. The controlling mechanisms applied to MCA procedures are derived from legal or regulating restraints, DA directives and instructions, local District adaptations of these regulations and guidance.

Regulatory Restraints

The influence of procedural regulations on information flow during the programming phase is apparent. General procedural requirements for specific situations are provided in ARs, ERs, and other official regulatory publications. Cost criteria for contracting and procedural review are detailed in ASPR, Chapter 18 and summarized in ASPR, Appendix B to identify regulations and corresponding report forms which affect MCA programming and design procedures. The DD, DA, Engineering, and Special Forms customarily used to develop or manage the MCA project are listed in Appendix G.

District Adaptations

The Districts have developed various procedures in response to the same controlling criteria in order to optimize use of local manpower skills, and to meet the unique responsibilities evolved from geographical area and task-spectrum characteristics. The variations in section designations and group assignments for four Districts are developed in Section A-3 of Appendix A for basic major military construction projects. Appendix G identifies the forms used to support MCA projects for the Savannah and Sacramento Districts.

4 DEVELOPED INFORMATION FLOW NETWORKS

Detailed information flow patterns vary according to six major categories of users: Army, Army Reserve, Air Force, National Aeronautics and Space Administration (NASA), North Atlantic Treaty Organization (NATO), and Foreign. Even within a particular category, many procedural exceptions are possible for specific projects or circumstances. Appendix A contains detailed information flow networks for major construction projects (total project cost greater than $400,000), with supplementary charts for minor construction and family housing projects. The networks must be interpreted in accordance with their objectives and intended applications. Since the networks were developed from what are considered to be the most typical MCA project procedures, they may be taken as generally true within the context of the presentation. However, no feasible number of networks could account for all possible procedural exceptions derived for specific projects or circumstances.

Structural Pattern of the Networks

As previously described, the general pattern of the information flow model contains an overall “top” procedure, a functional “middle,” and a detailed “bottom” flow. Each block in the “top” flow represents a set of subblocks in the “middle” flow, which, in turn, represent corresponding sets in the “bottom” or detailed flow.

The functional blocks are sequentially ordered to represent their generally observed occurrence. The actual start and finish of an activity should not be inferred from the block geometry; no time-base is provided, and the space between blocks has no significance. Of course, in actual practice each activity blends into the next; thus the grouping of activities into a functional block is a semantic simplification.

Functional Content of Blocks

Each block in the top flow (Figure 5) identifies a performance area which incorporates primary functions at the middle and detailed functions at the bottom levels.

Block 1: Determination of Need

Block 1 provides a representation of the need realization and identification process. Army installation needs are the responsibility of the IC in consultation with the appropriate MACOM (designated Maj C on flow networks), under the policy direction of the Department of the Army (DA).

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General MCA program policy is derived from the FYDP maintained by the Secretary of Defense (SOD), and the Army Stationing and Installation Plan (ASIP) developed by the Assistant Secretary of the Army (Installations and Logistics) (ASA [IL]) from the FYDP and military planning documentation. Facility needs are developed from assessments of installation status and MACOM strength support requirements. Additional influences on base facility requirements stem from changing standards and criteria and the assumption of new support roles.

**Block 2: Planning and Programming**

The needs defined in Block 1 are developed into facility requirements in Block 2 by the Installation Planning Board (IPB), which, in communication with the MACOM activities of Block 4, develops sufficient facility characteristics to permit generation of a DD Form 1391 and the PDB-1 by the IC in Block 5. The IPB correlates base needs with what is considered feasible, and further develops MP and IRCP entries, or proposes new facilities with added judgments as to scheduling and priorities. The IPB (defined in AR 210-20) consists of the following members:

1. IC - Chairman
2. Facility Engineer
3. Technical staff personnel
4. Division Engineer (Div E)
5. Commanding Officer
6. Associate (nonvoting) members.

The District Engineer (DE) may be an associate member. Since the District Engineer often represents the Division Engineer at IPB meetings, the District can be oriented to installation real needs and necessary planning.

The IPB function may be reactivated at any time during project programming and design, when programming operations alter the criteria or scope of the originally proposed facility.

The formal facility requirements are always reviewed by the "user" (AR 415-10). The facility requirements are developed in accordance with DOD Construction Guidelines (DOD 4270.1M) and the TM 5-800 series. Procedural requirements are specified in appropriate MCA regulations (AR 415-15). Sources of MCA requirements may be identified according to status or type.

1. Status
   a. Urgent (not in MP): AR 415-15
   b. Planned (in MP): AR 210-20

2. Types
   a. Troop Support Requirements: AR 10-41 through 43
      (1) Bachelor Housing
      (2) Community Facilities
      (3) Food Service
      (4) Health
      (5) Training
   b. New-Start Commercial/Industrial Cost Limits: AR 235-5
   c. Explosive/Ammunition/Toxic-Chemical Facilities
   d. Data Processing Centers (DPC)
   e. Pollution Control Systems (> $50,000): AR 11-21, AR 200-1

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10. Management of Resources-Commercial and Industrial-Type Functions, AR 235-5 (Department of the Army, 6 November 1974).
11. Environmental Pollution Abatement, AR 11-21 (Department of the Army, 3 November 1967).
12. Environmental Protection and Enhancement, AR 200-1 (Department of the Army, 14 November 1975).
Projects which have been accepted by the Major Command and the installation are released for PDB-1 development, associated real estate acquisition studies, and any special or environmental impact reviews. At this time the District may also be informally alerted if the project is large, and the District has had no previous participation.

Special-agency reviews of certain installation facility planning and construction include:

1. Defense Department Explosive Safety Board (DDESB)
   a. Explosive/ammunition handling and storage
   b. Toxic chemicals storage
2. Office of the Surgeon General (OTSG)
   a. Base hospitals
   b. Medical clinics
   c. Dental clinics
3. Assistant Secretary of the Army - New Start (industrial/commercial-type facilities) cost overruns
4. Department of the Army (ASA [I&L]) - DPC's
5. Troop Support Agency (TSA)
   a. Post exchanges
   b. Food preparation facilities and systems.

Block 3: District/Division Preliminary Activities

Preliminary activities for a District and associated activities for the Division include project and MP evaluation, status monitoring, impact assessment, and gross scheduling.

At the request (with funding) of the IC, the District performs support to proposal development, definition, and MP impact evaluation. If technical feasibility studies are required for complex nonrepetitive projects, the District can be delegated project funds; it then contracts and manages the analytical study. When District support is requested without adequate funding, the District may generate a "Request for Predesign Funds" to remedy the oversight.

Block 3 contains the following District activities:

1. Identification and recording of the projects, and review of the current design criteria, as derived from IPB/Facility Engineer communications, OCE instruction/directives, and the CE Operations Plan (CLOP).
2. Authorization (directive) from OCE.
3. Assessment of project scope and funding from DD Form 1391 and CLOP sources.

Block 4: Major Command Review

The MACOM budget year (BY) construction program for all installations under the Command is developed according to annual DA policy/funding letters, DOD/DA documentation, and installation BY or SRCP project proposals (preliminary DD Form 1391). The goal of the MACOM review is a balanced construction program, meeting local installation requirements within DOD/DA requirements and funding limitations. Review procedures for both U.S. Army Forces Command (FORSCOM) and U.S. Army Training and Doctrine Command (TRADOC) are provided by the basic function networks for Block 4 in Appendix A.

Block 5: Preparation of Project Data

After sufficient study and coordination, the proposed facility is added to the annual MP revision or the developed construction program, according to the immediacy of the need. The minimum construction cycle for a major proposal is 3 years. These proposals are designated for the SRCP after approval, with projects beyond 6 years defined as intermediate (IRC). For each project in the SRCP construction year, a detailed justification and a completed DD Form 1391 signed by the IC must be provided OCE (Block 6). Additional site data are added to this material to constitute the PDB-1, which is now the basic project input to the District.

Block 6: Project Technical Review

OCE provides technical review and supports the evaluation by the CRCC and the Budget Review Committee (BRC) at the DA staff level for each proposed MCA project.

Basic project and SRCP data for each installation are provided by OCE to CRRC for the committee's detailed evaluation of appropriateness, compatibility with current policy, general impact, cost benefits, and general technical feasibility.
CRCC’s rating, expected funding levels, and project cost determine whether the project is accepted, deferred, or rejected by DA.

Project DD Forms 1391 with budget attachments are reviewed in the priority order that OCE estimates CRRC will assign to the projects. The forms are reviewed by specialists in each information area covered, with OCE-annotated copies provided to OSD/DA for funding on approved subjects and to the Division/District with a directive for study or design implementation. Each project’s short form (first page) of the DD Form 1391 and each installation’s DD Form 1390 for the total SRCP are included in the “Green Book” (GB), to be adjusted and finalized in Block 7 for presentation to OSD, OMB, and Congress.

Block 7: Project Evaluation and Representation

OCE further evaluates MCA projects preparatory to providing the formal presentation material to OSD/OMB for use in defining the Army Program in Congressional authorization and appropriation reviews. The adjusted 1390/1391 forms, tailored by OCE to meet estimated OSD acceptable levels, are submitted to DA and OSD/OMB in the preliminary GB. OCE uses the DA/OMB review comments to adjust the GB to meet OSD requirements.

The formal GB is then sent by OSD/OMB to the Congressional appropriations committees. If the appropriations bill and subsequent appropriations include a particular project, it is scheduled into the budget year for the SRCP appropriation.

Block 8: District/Division Budget and Project Coordination, MCA-Funded Projects

Upon receipt of one of several possible design directives or a predesign study (budget) directive from OCE, the District actively supports the MCA project. Generally, this support takes the form of a Preconcept Control Data Package (PCDP) provided to OCE (MCE-S), Block 7, for review and use by the OCE representative at Congressional hearings if the project is questioned.

The PCDP usually consists of a site plan, a gross building plan, outline specifications, and the Current Working Estimate (CWE) for Budget Purposes (ENG Form 3086). If the project requires a repetitive or standard design, OCE may specifically request only the ENG Form 3086.

Block 8 contains the following District activities:

1. Receipt and evaluation of the PDB-1 containing project instructions and criteria
2. Request for funds sent to OCE with affirmative reply
3. Establishment of funding schedule
4. Preparation of a budget estimate CWE on ENG Form 3086
5. Completion and submittal to OCE of the PCDP with site plans, a building plan, the CWE, and any supporting narrative
6. Correlation and/or resolution of District/Division interpretations with installation criteria.

Block 9: District Organization of Support

Organization of support for a MCA project officially begins when some implementing directive is received from OCE. Although the District may perform a rough scheduling and preliminary design-scope determination when first learning of a major project, significant District support actually begins only after the issuance of a directive by OCE. This support begins with designation of a Project Manager and determination of whether the future design will be in-house or contracted to an AE.

Although the AE selection and contract negotiation process is one of the District’s largest tasks, it is fundamentally an internal operation of the District and thus is included in the Block 9 organizational function. However, at specified levels of project costs or accumulated fees by the selected AE, appropriate increased levels of DA/DOD approval are required.

Procedures for effecting design-performance control and for performing the development, negotiation, and management of the AE contract are included in Block 9, which contains the following District activities:

1. Scheduling of internal District activities and manpower contingent on receipt of funds
2. Determination of in-house or AE design support
3. Receipt of support funds from OCE
4. Appointment of Project Manager and development of objective design schedule
5. AE contracting procedure. The AE contracting procedure can be broken into three major steps, each containing a number of specific activities:

a. Implementation of the AE selection process
   
   (1) Synopsis of project and AE contract plans
   (2) List of qualified AEs called-up from computer and provided with advance notice
   (3) Advertisement placed in CBD
   (4) Preselection Board lists five to 10 AE firms
   (5) Selection Board narrows list to three with priority ratings
   (6) Highest priority selection approved by each required level.

b. Negotiation of AE contract
   
   (1) AE notified of selection
   (2) Predesign conference held (optional)
   (3) AE evaluates task
   (4) AE audited
   (5) Prenegotiation conference held
   (6) AE determines fee; transmits to District negotiator
   (7) Negotiations conducted, agreement reached.

c. Implementation of AE contract
   
   (1) Design work implemented by Contract Letter Award (CLAW)
   (2) Contract prepared from negotiation minutes
   (3) Approval of AE and contract
   (4) AE and contracting officer sign contract.

Block 10: Concept Design (CD)

Concept design is performed by the District either in-house or by delegation (negotiated contract) to an AE firm, as determined in Block 9. When AE services are used, the CD may be initiated by transmittal of a contract letter award (CLAW), prior to a formal contract signing. Management of the concept design phase is handled by the District Engineer. Regardless of the design route chosen, the procedure for the concept design phase is the same.

The actual facility design (AE or in-house) is performed according to the estimating techniques inherent in a concept design and should not be carried further than 25 percent completion. The procedure is iterative in nature, balancing the requirements of structural and habitability planning. During the CD phase, the Project Manager may request informal or formal progress reports (PR) from the AE.

Prior to completion of the CD, preliminary submittals are made to the user and the DE by the designer. Several may be made before satisfying the CD review function of Block 12. The Division Engineer may screen user, installation, MACOM, and other comments on the completed CD for intent, feasibility, and legality in order to provide the District with a clear revision task. When all feasible/admissible comments are incorporated, the AE or design group provides the “approved” CD to the District for final review and coordination (if directed) with OCE.

Block 10 contains the following AE or District Design Branch (DB) activities:

1. Scheduling of entire project according to mandatory periods and sequential criteria provided by the District Engineer

2. Preparation of architectural concept design (CD)

3. Maintenance of a budget review and design cost analysis program

4. Development of
   
   a. Facility siting and general site planning
   b. Preliminary building layout
   c. Preliminary utility design
   d. Basic structural planning

5. Maintenance of CD for coordinated AE/District or DB/Project Manager (in-house) reviews as scheduled
6. Preparation of CD (25 percent completion) for release to user and Command Review.

**Block 11: OMB, OSD, and DA Review Policy Status**

OMB, OSD, DA staff, and the BRC review each major construction project to be submitted to Congress for compatibility with stated DOD and DA goals and limitations.

Project information provided the OSD is an annotated DD Form 1391 (short-form) and a detailed justification narrative. The SRCP information (DD Form 1390) for the installation program and the DD Form 1391 data for each project are reviewed and updated where needed and then used to revise the Green Book for Congressional review.

The OSD primarily checks to see if a proposed project is on their approved list and if sufficient detail is included to make the project and its impact understandable. When greater detail than provided by the Green Book is desired by Congressional committees, it is provided by OCE representatives.

After several successive Congressional committee reviews, an appropriation bill and amendments which eventually become law evolve. If the project of interest survives, a notification of its funding is supplied to the user, the installation, and the interested Division Engineer. Subsequently, an authorization is provided the District to proceed with construction activities.

**Block 12: Concept Design Review (CDR)**

The CDR insures that the Concept Design complies with the user's instructions and criteria, including cost, scope, consistency, and other specifications. The Division Engineer screens and integrates his own and other comments made by the user Installation Commander for transmittal to the DE. Corrections are made to the Concept Design by the District with AE assistance. If the design is performed in-house by the District, the Division Engineer must also approve the design. (Except for areas of special interest, no CDR responsibility rests with the Division Engineer for AE-designed facilities.)

The CDR controls the criteria developed for the Final Design and is the last stage for possible adjustments to outmoded aspects of the original planning. Hence, the CDR depends largely on user review with District/AE assistance. Significantly modified building plans require additional OSD approval.

The District collects and maintains all CDR records until facility turnover and acceptance.

**Block 13: District Prefinal Activities**

This function is the coordination preparatory to Final Design (FD), and contains the following District/AE activities:

1. Consolidation of concept-design comments and data for AE or Design Group implementation during FD

2. Site surveys and soil/foundation studies (if not performed prior to design phase), when required for detail design or construction cost estimating

3. Confirmation of construction contract period from the CD scope, the funding schedule, user requirements, projected construction rates, and any potentially limiting interfaces

**Block 14: Final Design Readiness**

A readiness evaluation before FD permits a full critique of the CD and CDR by OCE. It also allows marshaling of all "second thought" and modification proposals for complete evaluation before design commitment. Upon resolution of all problems, the Division Engineer requests FD authority from OCE. Issuance of the FD Directive initiates Block 15.

**Block 15: Final Design**

The FD is generated on the premise that no further design criteria changes will be made. When the FD phase is completed, 90 percent of the actual facility design has been completed. The remaining 10 percent is contingent on the final preparation of the facility design for OCE and Division signatures of approval.

Block 15 contains the following AE or Design Branch activities:

1. Development of final design in accordance with an approved CD and accepted CDR recommendations

2. Continuing cost analyses, supplying 60 percent cost estimate for District Engineer review

3. Finalizing building design

4. Finalizing utility plans

5. Finalizing architectural/structural specifications and drawings

6. Provision of CWE and support data to develop the Government Estimate.
Block 16: Final Design Review (FDR)

A preliminary FD is provided to the District by the AE or to the Division Engineer by the District Design Group to check for compatibility with the established objectives. Special design review boards may be required as specified in AR 385-60\(^1\) or AR 190-13\(^2\). The completed FD is not reviewed by the user (although in-process reviews may be made).

Block 16 contains the following District and/or Division activities:

1. Review of AE/Design Group computation and analysis and back-checking of the FD by the District

2. Review of FD for compliance with criteria, scope, and cost estimates

3. If necessary, return of FD to AE for corrections

4. Release of FD to Bid-Package Development; notification to user and Division Engineer of design completion

5. Preparation of the CWE for control purposes and the Government Estimate for bids review.

Block 17: OCE/Major Command/Division Notification

The Comptroller of the Army (COA) transmits Congressional allocation information immediately after notification by SOD. The supervisory Division formally notifies the District about each project, and the District begins construction-contracting procedures. The formal notifications are sent immediately after the appropriation and allocation of project funds, and may occur at any time after the OCE design directive. (Only about 5 percent of all projects must wait for construction funding after final design.)

Block 18: MCA Contracting

The contracting phase of project development begins with development of a Construction Contract Schedule at near-completion of the FD. Some Districts (Savannah) carefully weigh project needs and resource availability to determine optimal sequences. Due to work volume, other Districts must contract according to availability of District personnel. In any event, the functional procedures of advance notice, CBD advertisement, bid package preparation and distribution, bid opening, preaward survey, contract award, and Notice to Proceed (NTP) generation are the same.

Block 18 contains the following District activities:

1. Construction-contract development

   a. Identification of critical construction and phasing requirements (methods, materials, and scheduling)

   b. Determination of liquidated damages from user potential loss

   c. Obtaining wage labor rates

   d. Preparation of special provisions and other data to finish contract

2. Preparation of contract and Title 1 Documents, reproduction of plans and specs, and binding and distribution of Bid Package for review by District/Division

3. Obtaining fund certification for construction or a directive to proceed to bid opening pending funding availability

4. Performance of bid-contracting procedure

   a. Advance notification to bidders on qualified list

   b. Preparation of synopsis and placement of advertisement in CBD

   c. Distribution of bid-package to responders

   d. Processing of amendments necessitated by bidders’ comments

   e. Hold for funding certification if not received 10 days before scheduled bid opening

   f. Performance of bid opening and declaration of low bidder

   g. Performance of preaward survey

   h. Convening contract awards board and awarding contract to lowest responsive bidder.

\(^1\)Coordination With Armed Services Explosives Safety Board, AR 385-60 (Department of the Army, 20 December 1971).

\(^2\)The Army Physical Security Program, AR 190-13 (Department of the Army, 23 August 1974).
5 REVIEW OF DEVELOPED CE NETWORKS

The information flow networks presented in the appendices are developed for the CE procedural requirements of CONUS and foreign military construction. Three-level flows are provided for MCA CONUS in Appendix A, and one-level flows are provided for MCA Foreign, Army Reserve, Air Force, and NASA construction in Appendices B, C, D, and E, respectively. These developed networks are considered to be the most instructive networks for the purposes of the general reader.

MCA Projects, CONUS

CONUS Army installation construction projects can be differentiated by funding source as described below.

MCA-Funded Projects, Minor Construction

A simplified CE procedure (AR 415-35) is used for programming, design, and construction of Minor Construction (equal to or less than $400,000), as shown in Appendix A. Minor construction has two subcategories—urgent and standard.

Urgent Minor Construction (UMC) is so designated after generation of a Certificate of Urgency at the installation level (for projects greater than $50,000) and approval of the project at the OSD level (AR 415-20). If the CE does not begin construction within 180 days after UMC signing, the appropriation is cancelled by regulation. This effectively allows 30 days for initiation and programming, 10 days for AE negotiations and contracting, 90 days to design, 30 days to prepare drawings, and 20 days for a crash construction bidding procedure.

MCA-Funded Projects, Major Construction

MCA Major Construction constitutes the general (and largest) category of construction. By definition, such projects exceed $400,000 and are part of the annual review, authorization, and appropriation activities of DA, OSD, OMB, and Congress described in Chapters 2 and 3. The network models for MCA Major Construction provided in Appendix A show the procedural complexity, including DA staff, OSD, OMB, and Congressional review levels. Unique to these flows is the “Preconcept Control Data Package,” prepared by the District for OCE as a detailed predesign budget review and advocacy support at Congressional hearings.

MCA-Funded Projects, Bachelor Housing

Troop strength at an installation varies with military positioning requirements and the general Army strength level. Bachelor housing (BH) requirements directly reflect these variables and present the greatest forecasting problem in MCA planning. The IC supplies BH status to OCE periodically on DA Form 1709R and DD Form 1757, which are used to substantiate any DD Form 1391 BH construction proposals.

DA Form 1709R—Bachelor Housing Capabilities and Utilization. This form is a status statement used for defining existing bachelor housing capabilities and deficiencies in the stationing of troops. It is also of value to mobilization planning documents, as input to the data base of the stationing capability system, and as a basis for replying to high-level inquiries. Installations are required to submit the form semi-annually to Installation Planning Division, Assistant Chief of Engineers (ZC). (Some installations, listed in AR 210-18, are required to submit it quarterly.) Information from the form is also used in lines 8 through 10 of DD Form 1657.

DD Form 1657—Determination of Bachelor Housing Requirements. Every Army installation with bachelor housing projects programmed for construction or modernization must submit DD Form 1657 by 15 May each year to OCE (MCE-P), with one copy to Program Division, Assistant Chief of Engineers (ZCP). The form must also be submitted to validate projects in FYDP and to revalidate those approved by Congress prior to construction. Sources for completing the form are DOD 4270.1-M, ASIP, and AR 415-15. Preparation instructions and a definition of bachelor housing minimum adequacy requirements are given in AR 210-18. Several entries on DD Form 1391 are based on data from DD Form 1657 and are usually checked against it. It is assumed that the DD Forms 1657 are received at OCE prior to receiving DD Forms 1391.

Family Housing Management Agency (FHMA) Funded Projects, Minor Construction

Simplified MCA procedures are used for Family Housing Minor Construction, as described in “MCA Funded Projects, Minor Construction.”


16Project Development and Design Approval, AR 415-20 (Department of the Army, 28 March 1974).

17Bachelor Housing, AR 210-18 (Department of the Army, 14 January 1975).
Family Housing Projects, Major Construction

Family housing (FH) new construction procedures have been adapted to meet the realities of government and contractor capabilities. Because CE expertise does not include the techniques of FH construction, construction of large FH tracts requires appropriate contracting. Hence, MCA network descriptions are not applicable to family housing, since CE practices are here directed to the acquisition of large, specially qualified contractors.

Initial FH procedures reflect the special programming requirements for both detail review and fast response. Family housing is developed on a 6-year plan with the execution (current) program and the legislative (next FY) program of greatest interest. The annual data generated for these development phases are identified in Table 4 (AR 210-50\textsuperscript{18}). This procedure is shorter than MCA major construction, being based on an IC survey done in the calendar year (CY) preceding the implementing budget year for the project.

<table>
<thead>
<tr>
<th>Table 4</th>
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<tbody>
<tr>
<td><strong>FH New Construction Supporting Data</strong></td>
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<tr>
<td><strong>Documents Required</strong></td>
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<tr>
<td>New Housing Construction</td>
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<tr>
<td>Part I - Execution Program</td>
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<tr>
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</tr>
<tr>
<td>DD Form 1378</td>
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<tr>
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<td>DD Form 1391</td>
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<tr>
<td>Part III - Remaining Years</td>
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<tr>
<td>DD Form 1523</td>
</tr>
<tr>
<td>Certification</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| *Bachelor Housing, AR 210-18 (Department of the Army, 14 January 1975).  
| **DD Forms 1390 and 1391 are prepared at the DA level.**  

FH programming characteristically includes a DA proposal submitted to the SOD for incorporation into a total military FH planning budget. Early FH planning is supported by the District, the IC, the MACOM, and OCE. The IC provides the statement of need and family housing inventories and surveys required for DA/DOD response. The MACOM integrates installation family housing requests and assigns priorities. OCE formulates the Family Housing Construction Program (FHCP) and presents it as the legislative program for Army Staff and OSA review and approval. The Army FHCP is integrated into the overall DOD Family Housing Program presented to the authorization and appropriation committees of Congress in a Congressional Data Book. If the requests are questioned, they are defended by OCE representatives.

An important part of FH planning is the Land-use Study (LUS) which considers property to be used and any impact on surrounding areas. Since statute requires the LUS to be made within the CY of construction, the final version of the study is developed after authorization and appropriation of the military FH bill by Congress. (Since the actual siting of an FH project is not fixed during the proposal stage, only gross estimates are possible at that time, sometimes resulting in allocation adjustments within the total budget.)

A new aspect in FH construction is the replacement of government design by turnkey operations for major projects in CONUS (see section A-4 of Appendix A). Turnkey, in this case, means that design and construction are under one contract, but does not imply absence of progress monitoring or contract management. Response to a turnkey Request for Proposal (RFP) is expensive, since substantive proposals and definitive prices are required. Only large organizations participate, and project submittal dates are spaced so that entry into one does not prevent participation in the next. All proposals with competitive prices are screened and scored by a National Evaluation Team (NET) constituted as shown in Table 5. The proposal and price can then be renegotiated and a new evaluation made. The procedure eventually results in a local District selection made on the basis of the lowest (price/proposal-score) ratio and the best interests of the government.

<table>
<thead>
<tr>
<th>Table 5</th>
</tr>
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<tbody>
<tr>
<td><strong>National Evaluation Team Membership</strong></td>
</tr>
<tr>
<td>National Permanent Members (5): OCE representatives</td>
</tr>
<tr>
<td>Local Temporary Members (4): Representation from each of the following:</td>
</tr>
<tr>
<td>1. Using Installation</td>
</tr>
<tr>
<td>2. Major Command</td>
</tr>
<tr>
<td>3. Division</td>
</tr>
<tr>
<td>4. District</td>
</tr>
<tr>
<td>Local Temporary Associate (Nonvoting) Members (2):</td>
</tr>
<tr>
<td>1. Real Estate Authority</td>
</tr>
<tr>
<td>2. Project Manager (as District recorder)</td>
</tr>
</tbody>
</table>

\textsuperscript{18}Family Housing Management, AR 210-50 (Department of the Army, 21 November 1972).
Family Housing Projects, Modernization and Repair

Modernization and repair (MR) projects for existing family housing are approved and funded through OCE from designated appropriations. District procedures for MR projects include a feasibility (predesign) study and a final design with appropriate fiscal and development/design reviews.

MCA Projects, Foreign

MCA projects on foreign soil are proposed by the Theater Commander and processed at the CE Division level for installation master planning and project programming. Planning, design, and construction contracting are performed in accordance with the regulations of the host country.

Information flow networks for the European Division are provided in Appendix B.

European Division (EUD)

The EUD provides MCA support to U.S. operations in Europe. An important example of EUD procedures occurs in Germany. The German government reviews all MCA projects at the proposal, design, and construction stages. Any U.S. construction costing more than 80,000 DM ($28,000) must be approved as to its admissibility and evaluated as to where the design/construction responsibility will lie. The German government decides whether government engineering personnel will perform functions associated with the District in CONUS MCA procedures or if all activity other than environmental impact review will be left to the Division (Appendix B).

The EUD now provides the MCA support to Army, Air Force, and Navy installations in Italy, Greece, and Turkey which was formerly (FY75) provided by the Mediterranean Division (MD). Italy is an example of former MD procedures. The Italian government reviews U.S. Army military construction plans through a “Mixed Commission” (IMC). The IMC board reviews building plans for compatibility with local structural codes, to insure that Italian materials and machinery are used (as required by agreement), and to determine the long-term usefulness of the structure. A key criterion is whether the proposed facility designs will be useful to the Italians after the American departure (Appendix B).

Army Reserve Center (ARC) Construction Projects

Army Reserve Center (ARC) programming, design, and construction use the same documentation and communication forms as MCA-funded construction, but in different procedural flow patterns (Appendix C).

ARC projects are formulated between command channels, the Major Command (FORSCOM), and the Office of the Chief of Army Reserve (OCAR) from reserve unit requests and a Long-Range (10-year) ARC Planning Program. ARC construction funding for a budget year is an inclusive appropriation, permitting the Chief of AR to delegate or restrict funds to any particular project. This flexibility simplifies responding to planning changes or contingencies (within OSD limits).

Support to ARC projects providing for joint use by other military reserves depends on location and which military construction agency may most feasibly direct the project. When CE support is used, the project (usually minor construction) is handled by the District with relative independence.

For both joint- and single-use ARC, user design reviews are implemented at the concept and preliminary design levels, and courtesy contract award notifications are provided. No budget or technical supervision is applied unless conditions change or other problems arise. If 2 years pass between fund appropriation and construction-start, the Congressional A&A committees are notified when projects require funding changes. Construction contracting then proceeds after a “hold” of 30 days.

Air Force Construction Projects

Air Force (USAF) military construction is built to HQUAF/PRE and OCE specifications, under the supervision of the Division Engineer, and in consultation with the Air Force Resident Civil Engineer (AFRCE).

The information flow within the CE for USAF projects is similar to MCA-funded projects except for the AFRCE interface. The AFRCE has the option to consult with the Division Engineer, sit on the AE Selection Board, review preliminary designs, and inspect construction progress. He is responsible for coordination of user design reviews and the “Letter of Authorization” for construction contracting.*

No preliminary study directives are issued by OCE on USAF projects; only concept or early preliminary (CD or EPD), preliminary (PD), and final designs (FD) are performed, with an extensive PDR supported by all

*AFRCE functions, responsibilities, and authority are explained in Air Force Regional Civil Engineers, AFR 88-18 (Department of the Air Force, 6 March 1970), and summarized in Construction Management, AFR 89-1 (Department of the Air Force, 21 January 1970), Paragraph 4.4.
interested USAF Commands. As in MCA procedures, District/Division support to USAF construction may vary. When medical facilities are to be built on USAF bases, the AFRCE monitors the AF through completion of the concept design. After CD, exclusive direction returns to the District. All other aspects of USAF construction projects are similar to MCA-funded procedures.

NASA Construction

NASA construction projects cannot currently be represented by one procedural diagram. In the past, NASA programming procedures were often determined by the local director on a need basis. A changed funding situation has now resulted in close fiscal control by NASA Headquarters (NASA HQ).

The CE support procedure at the Los Angeles District is sufficiently standardized to permit development of the information flow network shown in Appendix E. The NASA Field Office (NASA FO), under close monitoring by NASA HQ, supports a three-phase design effort (first FY funding), followed by a contracting procedure (next FY funding) adapted to NASA policies. The latter includes commercial-style advertising and a contractual stipulation that the CE does all quality control inspections (no contractor quality control).

6 SUMMARY AND CONCLUSIONS

Summary

Actual MCA programming and planning procedures were obtained from District/Division interviews and correlated with known regulations to develop functional flows on which information flow could be identified. The data obtained have been sufficiently detailed to permit interpretation of three levels of CE procedural detail in information flow networks: 1) performance area (eight example networks), 2) basic function (17 example networks), and 3) detailed function (five example networks). This analytical approach covers seven types of construction supported by CE military construction services.

The major construction information flow networks of Appendix A reflect a characteristic District task. Shown are an overall performance area diagram and 15 basic function flows, representing each of the significant block functions in the top flow.* In addition, two functions (AE and construction contracting) are taken to the detailed function level. This presentation satisfies the analytical goals of this report, and allows for future expansion to any level of detail desired.

Conclusions

The method of presentation developed in this report provides a dynamic representation of Corps procedures at graded levels of detail, permitting convenient studying and utilization by researchers of varying interest levels.

LIST OF SYMBOLS

A: Army
A & A: Authorization and appropriation
ADP (E): Automated data processing (equipment)
AE or A/E: Architect-engineer
AIAE: Automated Engineering and Architectural Design System
AEC: Atomic Energy Commission (now Nuclear Regulatory Commission)
AFPB: Air Force Project Book
AFRCE: Air Force Resident Civil Engineer
AMC: Army Materiel Command (now Army Development and Readiness Command)
AR: Army Regulation
AR (C): Army Reserve (Centers)
ASA ((&L): Assistant Secretary of the Army (Installations and Logistics)
ASD: Assistant Secretary of Defense
ASIP: Army Stationing and Installation Plan
ASPR: Armed Services Procurement Regulations
Acq.: Acquisition
Awd: Award
B: Budget
BC: Budget Control
BD: Board
BH: Bachelor Housing
BIM: Basic Information Map
BIS: Building Information Schedule
BLS: Bureau of Labor Statistics
BP: MC Bid Package
Br: Branch
BRC: Budget Review Committee, DA staff level
BY: Budget year
C: Construction
C or Cmd: Command
CAEADS: Computer-Aided Engineering and Architectural Design System
CBD: Commerce Business Daily (government publication)
FHMA: FH Management Agency
FMP: Force and Mission Planning
FORSCOM: U.S. Army Forces Command
FPR: Federal Procurement Regulations
FY: Fiscal year
FYDP: Five Year Defense Plan
G or Gov: Government
GAO: General Accounting Office
GB: Green Book
GE: Government Estimate
GFE: Government-furnished equipment
GSA: General Services Administration
H: Housing
HQ (DA) (USAF): Headquarters (Department of the Army) (Air Force)
HND: Huntsville Division
I: Installation
IC: Installation Commander
ID: Identification
IFB: Information for Bidder
IFS: Integrated Facilities System (COEMIS)
IMC: Italian Mixed Commission
IMP: Installation Management and Planning
IPAR: Individual Procurement Action Report
IPB: Installation Planning Board
IRCP: Intermediate-Range Construction Program
Inv: Inventory
JMRC: Joint Military Research Centers
K: Contract or thousand ($)
L: Land, logistics, or letter
LOG: Logistics
LRCP: Long-Range Construction Program (Master Plan)
LU: Land use
LUS: Land-Use Study
M: Military
MACOM, Maj C or MC: Major Command(er)
MCA: Military Construction (Army)
MD: Mediterranean Division
MIDAS: Management Information and Decision Analysis System
MISO: Management Information System Office
MP: Master Plan(ing)
MRD: Missouri River Division
MRK: Kansas City District (MRD)
MRO: Omaha District (MRD)
MRP: Military real property
NAB: Baltimore District (NAD)
NAD: North Atlantic Division
NAN: New York District (NAD)
NAO: Norfolk District (NAD)
NASA: National Aeronautics and Space Administration
NATO: North Atlantic Treaty Organization
Neg: Negotiator or negotiation
NET: National Evaluation Team (FH)
No.: Number
NTP: Notice to Proceed
OASD: Office of the Assistant Secretary of Defense
OCAR: Office of the Chief of Army Reserve
OCE: Office of the Chief of Engineers
OCR: Optical code reader
OMB: Office of Management and Budget
OSD: Office of the Secretary of Defense
OTSG: Office of the Surgeon General
P: Project
PA: Public announcement
PCDP: Preconcept Control Data Package
PDB-1: Project Development Brochure - Part 1
PD (R): Preliminary Design (Review)
PM or PE: Project Manager or Project Engineer
PO: Printout
PR: Progress Report
R: Report
RA/PMS: Resource Allocation/Project Management
(Automated) System
RDTE: Research, development, test and evaluation
RE: Real estate
Rec: Record
Rev: Review
RF (I): Real Property (Inventory)
RF (P)(Q): Request for (Proposal) (Quote)
Rx: Receive
S: Study or system
SAD: South Atlantic Division
SAM: Mobile District (SAD)
SAS: Savannah District (SAD)
SBA: Small Business Authority/Administration
SOD: Secretary of Defense
SOW: Statement of work
Sp: Special
SPD: South Pacific Division
SPK: Sacramento District (SPD)
SPL: Los Angeles District (SPD)
SRCP: Short-Range Construction Program
SWD: Southwest Division
SWF: Fort Worth District (SWD)
TK: Turnkey contract
TRADOC: U.S. Army Training and Doctrine Command
TSA: Troop Support Agency
Tx: Transmitted
U: Utilities
UMC: Urgent Minor Construction
REFERENCES

Air Force Regional Civil Engineers, AFR 88-18 (Department of the Air Force, 6 March 1970).

The Army Physical Security Program, AR 190-13 (Department of the Army, 23 August 1974).

Bachelor Housing, AR 210-18 (Department of the Army, 14 January 1975).


Coordination With Armed Services Explosives Safety Board, AR 385-60 (Department of the Army, 20 December 1971).

Divisions and Districts, ER 10-1-3 (Department of the Army, 1 May 1968).

Environmental Pollution Abatement, AR 11-21 (Department of the Army, 3 November 1967).

Environmental Protection and Enhancement, AR 200-1 (Department of the Army, 14 November 1975).

Family Housing Management, AR 210-50 (Department of the Army, 21 November 1972).

General Provisions for Military Construction, AR 415-10 (Department of the Army, 15 March 1972).


Management of Resources - Commercial and Industrial-Type Functions, AR 235-5 (Department of the Army, 6 November 1974).

Master Planning for Permanent Army Installations, AR 210-20 (Department of the Army, 1 January 1973).

MCA Program Development, AR 415-15 (Department of the Army, 8 May 1969).

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Military Construction Progress Reporting, ER 415-345-43 (Department of the Army, 31 March 1972).


Planning and Project Authorization - Military Projects, ER 405-345-100 (Department of the Army, 26 March 1973).


Project Development Brochures - Part I, TM 5-800-3 (Department of the Army, 15 May 1974).

Project Development and Design Approval, AR 415-20 (Department of the Army, 28 March 1974).

U.S. Army Forces Command, AR 10-42 (Department of the Army, 15 April 1975).

U.S. Army Health Services Command, AR 10-43 (Department of the Army, 5 February 1975).

APPENDIX A: MCA CONUS PROJECT PROCEDURES

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<td>A-3 Performance Practices of Selected Districts</td>
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<td>A-4 Family Housing Construction and Improvement Practices</td>
<td>91</td>
</tr>
</tbody>
</table>
PERFORMANCE AREAS MCA, MINOR CONSTR

1. IC
   Minor Construction Needs Determined

2. Fac E/Distr
   MP Evaluated
   Diamond
   Yes
   Certificate of Urgency
   OSD/DA
   Review
   Minor Constr.
   Approval

3. IC
   Eval Minor
   C vs. MP
   1391
   Narrative
   Minor Cnd:
   Review/Approve
   Design Funds

4. Directive
   100 Dist Dp
   Concept Design
   CD Feedback
   CD Prep
   Submit

PRECEEDING PAGE BLANK-NOT FILMED
S MCA, MINOR CONSTRUCTION

VDA

Minor Constr Approval

Cmd
Direct

Funds

CD Feedback
CD Prelim Submittal
CD Review

12 O User/Dist

I0 O Dist DB Concept Design

Approved Concept Design

I3O Dist Prefinal Activities

Data

I5 O Dist DB Final Design

FD/Dwgs Specs

I8 O Dist MC Project Contracting

FD Feedback
Preliminary FD

Final Design

FD Review

MC Contract

19 O Maj C/IC/DIV Monitoring

20 O Dist Monitoring Construction Phase
A-2
1.0 DETERMINATION OF NEED

1.1 IC/USER COLLECTS FACILITY NEED DATA
1.2 IC EQUATES ASIP & PROJ. FACILITIES
1.3 IC: ID OF BASIC FACILITY NEEDS BY INSTALLATION
1.4 MAJOR CMD. INITIAL REVIEW & COMMENTS
1.5 FE DEVELOPS IPB PRESENTATIONS

DOD DOCUMENTATION SOD ANNUAL FYDP
DCS LOG DA POLICY DEVELOPED
POLICY LETTER

MP REVIEW
ASIP STRENGTH FORECAST

IPB MEETING DATA

INSTAL. FORECAST
ANTICIPATION & POLICY LETTERS
A-2
2.0 PLANNING AND PROGRAMMING

SPECIAL AGENCY REVIEW/APPROVAL

MAJOR CMD REVIEW/APP

APPROVAL AS REQUIRED BY FAC CATEGORY

DISAPPROVED, COMMENTS

FACILITY SUGGESTIONS

REVISIONS REQ (OPTIONAL)

DIV/DIST REVIEWS PROBLEM AREAS OR PROVIDES TECH STUDY

COMMENT, SP. STUDIES

REAL ESTATE ACQ PROCEDURE

IC: CALLS IPB MEETING

AGENDA

MAJOR CMD
IC, FE INPUTS

IPB NEEDS SURVEY

DATA

IPB EVALUATIONS & DECISIONS

IPB/IC DEVELOPS FACILITY PROPOSALS

IPB/IC PROPOSAL RE-EVALUATION & R ESTATEMENT

IC: FORMALIZES FACILITY REQUIREMENTS

COST EVALUATION

MINOR CONSTRUCTION DEVELOPMENT

MAJOR CONSTRUCTION DEVELOPMENT

MAJ CMD/IC MODIFICATION

DIVISION/DISTRICT COMMUNICATIONS
A-2
3.0 DISTRICT PRELIMINARY ACTIVITIES

1. DISTRICT EVALUATES PROPOSAL

2. IDENTIFICATION OF PROJECT CONCEPT BASICS

3. DETERM. OF IMPACT ON DISTR ACTIVITIES

4. OCE/CORD CH PRELIMINARY REVIEW

IC

YES

NO

MP Δ & B PROPOSALS DEVELOPED

MONITOR PROPOSAL DEVELOPMENT FOR IMPACT-CHANGES

DISTRICT BUDGET AND ORG - SUPPORT DEVELOPMENTS
A-2
4.0 MAJOR COMMAND REVIEW (FORSCOM)

All Installations Under
Major Constr Provide
Initial Submission on
Short (first page)
DD (391) For SRCP

Facility
(139)

MC
Data
Organization

Project
Summary
Inputs

Project
Comments

Const Br
Prepares
First Try List

Notice of
Dropped
Projects

IC's

Desired
Emphasis

MC Staff
Review

MC Staff
Supervision
Review/Control

MC Staff
Members
Report

Not Accepted

Commanding General
Review/Approval

Program Adjustments

Approved
Program

DA (DCSLOG)

Program Summary

Command Facilities
Review Board
Provides Overall Review

Installation
Distribution
DA/OSD REVIEW

CONSULTANT SUPPORT

OCE APPROVED
GREEN BOOK

COPY 2 PROJECT ACCEPTANCE

YES

STOP

NO

ACCEPTABLE

QUALIFIED

7.6

MCP: PROJECT ADJ TO MEET OSD REQUIREMENTS

MCP PREPARES FINAL SUBMITAL

DA/OSD/CONGRESSIONAL REVIEW

FORMAL GREEN BOOK

PROGRAM/ PROJECT DEFENSE, OCE REPS

PROJECT IN APPROPRIATION

YES

STOP DESIGN UNLESS CDR COMPLETED, IF SO CONTINUE THRU FINAL DESIGN

NO

7.8

MCP INCORPORATES 1391 PROJ/1390 PROGM INTO MCA BUDGET YEAR

APPROVED SRCP's

DIV/DIST MAJ CMD/IC
8.0 BUDGET PREPARATION AND REVIEW

- DIV/OCE A & SUPPORT
  - REQUEST FOR OPS. SUPPORT
  - PRELIMINARY FUNDS
  - SOURCE DOCS: PROJECT (391) DESCRIPTIONS PDB-1

- DIST: REVIEW OF AV. DATA
  - COST & FEAS FACTORS
  - SITE PLANS

- DIST: DEVELOP OF LINE SKETCHES
  - BUDGET DWGS
  - SITE/TOPogra DATA

- DIST-ED: SITE PLAN DETAILING
  - SPECIAL INVESTIGATIONS
  - SITE PLAN DWGS

- DIST: GROSS CONSTR EST.
  - ENG F-150

- DIST-RR: DEV OF CWE-BP
  - ENG F-3086

- DIST GENERATION OF PCD PACKAGE

- OCE SUPPORT TO OSO AND CONGRESSIONAL REVIEWS

- DIV PCDP REVIEW & DISTRIB

- PRECEDING PAGE BLANK, NOT FILLED

- PAGE BLANK, NOT FILLED
9.1.1 to 9.4.7 DISTRICT ORGANIZATION SUPPORT AND AE PRESELECTION

**Public Law 99-548, Section 8.2**

- **9.4.4** Congress notified by OSD

- **9.3.3** OSD/MA notified by OCE

- **9.2.2** OCE notified by Division

Authorization for CBO
Advertising per DPC 08.
Item 3B. Section of
ASPM 11-005.4 (8/12/11)

**9.4.1** Div notified by OCE, if AE fee assessed in $50000
(firm) otherwise phone

Ex/ AE fees
ASPM 11-002.2 (7/1)

- **9.4.4** Advertise for AE
  in Commerce
  Bus. Div.
  ASPM 11-09

- **9.4.5** Called on,
  QM/Div Board

- **9.4.6** List of
  Qualified AEs
  Preboard Survey
  ASPM 11-900

No AE Selection for 30 Days

Project BAE Cost Estimates
Pre Design Data

Integrate Project
Data, Determine
Survey Req
A-2
11.0 OSD/DA POLICY APPROVAL

11.1 DA STAFF: BRC Budget Review SRCP & MP
11.2 OSA: Review
11.3 OSD: Review for Cong. Sub.
11.4 Congress. Hearings
11.5 Program Enactment
11.6 OSD/OMB Apportionment Project Acceptance Notification
11.7 Comptroller (COA) Reviews; Relays Information

OCE
Construction Requests
Coordination
OSD
Approved Program
Comments
OCE Revisions
OCE Representation
A & A
OCE Implementation
A-2
18.0 DISTRICT MC PROJECT CONTRACTING

REQUEST FOR
ADVERT.
APPROVED

DIVISION REVIEW
BID SCHEDULE

18.1 COORD. BR.
BID PROCESSING
PREPARATION

NOTICES/ADVERT

QUALIF
BIDDER LIST

BP

BP AMEND
(>10 DAYS
TO BD)

BP CRITIQUE

18.7 BIDDER
BP REVIEW;
BID PREP

BIDS

Funds
RELEASED

OCE

CONSTRUCTION
PHASE

18.2 EST. SECTION
PRECONTRACT
ACTIVITIES

CRITERIA
PLANS/SCH.

18.6 SPEC. BR
BID-PACK
DEVELOPMENT

FEEDBACK

18.4 CONTRACT
DEVELOPMENT

SCHEDULES

18.5 DE/REVIEW

PROP. ORDER

18.8 CONSTR
CONTRACTING
PROCEDURE

18.3 PROJECT MANAGER
REQUIREMENTS MONITORING, UPDATING

RESOURCES
GFE
AVAILABILITY
PLANNING

FINAL DES.
GOV. EST.
SP. REQUIR.

DESIGN
SITE PLAN MOD.
RELOCATIONS

MOD
ECO
18.1 AND 18.2 MCA BID PROCESSING AND PRECONTRACT ACTIVITIES
A-2
186 TO 188 CONSTRUCTION CONTRACTING

[Flowchart diagram]

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AE CONTRACT COMPLETION

2011

- PM DETERMINES CONTRACT ACTIONS COMPLETED
- COST IDK
- STATEMENT

2012

- PM EVAL AE PERF & DIST REVIEWS

2013

- RECOM DDF-1413
- DE(CO) REVIEWS AE RECORD & PM RECOMM
- SIGNED DDF-1413

2014

- OCE
- INDIVIDUAL PROCUREMENT ACTION REPORT, DDF-350

DIV E PERFORMS PA NOTICES & CLOSEOUT

2015

- CONTRACT CLOSEOUT (30 DAYS AFTER COMPLETION)

FOR CLASSIFIED PROGRAMS
SEC REQUIREMENTS CHECKLIST
DD F-254 (PRIOR TO CLOSEOUT)

AE DETERMINES FD OUTPUT ACCEPTED

FDR

AE CONTRACT COMPLETED (PROVISIONS)

CONTRACT FILE
### District Group Assignments

<table>
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<th>MCA Projects*</th>
<th>MRO</th>
<th>SAS</th>
<th>SPK</th>
<th>SWF</th>
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<td><strong>Blocks 1, 2 &amp; 5</strong></td>
<td>Mil B</td>
<td>Mil B</td>
<td>Mil DB</td>
<td>PMB</td>
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<tr>
<td><strong>1.0 Determination of Need</strong></td>
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<td>1.3 Installation Need</td>
<td>MPS</td>
<td>MilPS</td>
<td>MPU</td>
<td>PIPs</td>
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<td>1.3.1 MP Impact Support</td>
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<td>MPU</td>
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<td><strong>2.0 Planning &amp; Programming</strong></td>
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<td>PIPs</td>
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<td>MilPS</td>
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#### MCA Projects

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#### 9.5 Command Approval/Div Notification

**9.7 Design NTP**

| 9.7.1 Div & Bd of Awds Transmittal                          | CMS | PM | to PM | PIP/S |
| 9.7.2 Distinct trans to AE                                  | CMS | CB (P&S) | PM | PIP/S |

**9.10 Project Plans/Post AE Selection**

| 9.10.1 Design Criteria                                      | PM | DB | PM/DB | ArS |
| 9.10.2 AE Package Update                                   | CMS | PM | NS | ArS |
| 9.10.3 VI Study Need Determination                          | PM | VE | PM | ArS |
| 9.10.4 Topo. Survey Request by                             | PM | PM | PM | ArS |

**9.10.5 Soil Investigation Request by:**

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**BLOCKS 15 & 16**

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| 15.8 Integrate Design Outputs                               | Est S | Est S | Est S | Est S |
| 16.1 Rev./Distr. Latest                                      | SPS | SPS | SPS | SPS |
| 16.2 Constructability Rev.                                  | SPS | SPS | SPS | SPS |
| 16.5/6 Final Review                                         | DB; CRS | DB; CRS | DB; CRS | DB; CRS |
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<td>18.1.6 Advance Notice Prep</td>
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<td>18.1.7 Bid Data/Notice Distr.</td>
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<td>18.1.9 Project Bidders - List Dev.</td>
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<td>18.1.10 Bid Schedule Development</td>
<td>PM/ABCh</td>
<td>PM</td>
<td>PM</td>
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<td><strong>18.2 Precontract Activities</strong></td>
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<td>PSD</td>
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<td>18.2.3 Bidders List Adjustments</td>
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<td>PM</td>
<td>SPS/PSD</td>
<td>ArS; PSD</td>
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<td>18.2.4 Est of K Time &amp; Money</td>
<td>CRB/Ext S</td>
<td>CD/PM</td>
<td>CD</td>
<td>CD; ArS</td>
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<td>18.2.5 Calc. of Liq. Damage Clause</td>
<td>SIB (CD)</td>
<td>PM</td>
<td>PM</td>
<td>CD; PSD; Council</td>
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<td>18.2.6 Dev. of Firm Bid Procedures</td>
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<td>CB</td>
<td>CD</td>
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<td>18.2.7 Req. Construction - Support Determination</td>
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<td>PM</td>
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<td>18.2.8 Generation of Nec. Permits</td>
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<td><strong>18.3 Requirements Monitoring</strong></td>
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<td><strong>18.4 Contract (K) Development</strong></td>
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<td>18.4.1 Prep. of Special Provisions &amp; Instructions</td>
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<td>SpS</td>
<td>SpS</td>
<td>DB, ArS; CD</td>
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<td>18.4.2 Prep. of Tech Provisions</td>
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<td>SpS</td>
<td>AE/DB</td>
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<td>18.4.3 (Integrated) Review of VE &amp; Lost Effort Aspects</td>
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<td>SpS</td>
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<td>18.4.4 Physical Preparation/Distr. (internal)</td>
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<td>CB (PSD)</td>
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<td><strong>18.5 Integrated Review of K &amp;/or BP Data</strong></td>
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<td>Channels</td>
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<td>18.6.1 Integration of K &amp; Instruct.</td>
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<td>SpS</td>
<td>PMB, DB; PSD; CD</td>
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<td>PM</td>
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<td>PESCH/DE</td>
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<td>18.6.3 BP Printing/Distrib.</td>
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<td>18.6.7 Amendment Process</td>
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<td>PM</td>
<td>Spec; ArS; PSD</td>
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<td><strong>18.8 Construction Contracting Procedure</strong></td>
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<td>18.8.1 Bid Opening</td>
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<td>18.8.2 Preaward Survey</td>
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<td>18.8.3 Award Process Review (Bids Out)</td>
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<td>18.8.6 Approval of K</td>
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<td>18.8.7 Contract Signed</td>
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<td>18.8.8 Official Records Filing</td>
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District Branch and Section Designations

Missouri River Division, Omaha District (MRD)

Engineering Division (ED)

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<tr>
<th>Section</th>
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<tbody>
<tr>
<td>Mil B</td>
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<td>A/E/W/S</td>
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Construction Division (CD)

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<td>PES</td>
<td>Project Engineering Section</td>
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Procurement and Supply Division (PSD)

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<tr>
<td>SIS</td>
<td>Survey Section</td>
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South Pacific Division, Sacramento District (SPK)

Engineering Division (ED)

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<td>Utilities Section</td>
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<td>F&amp;M B</td>
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Procurement and Supply Division (P&SD)

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South Atlantic Division, Savannah District (SAS)

Engineering Division (ED)

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Procurement and Supply Division (P&SD)

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Southwest Division, Fort Worth District (SWF)

Engineering Division (ED)

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<td>P&amp;IPS</td>
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Procurement and Supply Division (P&SD)

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<td>C C/B</td>
<td>Contracts Branch</td>
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* The Coordinating Section has recently been regrouped into the Army Projects Management and the Special Projects Management Sections.

* The listed CDB sections may also support MCA design.
<table>
<thead>
<tr>
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<td>SpS</td>
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**Construction Division (CD)**

**Procurement and Supply Division (PSD)**

**General**

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<td>Div</td>
<td>Division Engineer</td>
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<td>DL</td>
<td>District Engineer</td>
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<tr>
<td>PM</td>
<td>Project Manager</td>
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<td>SBA</td>
<td>Small Business Advisor</td>
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<tr>
<td>XCh</td>
<td>Chief of</td>
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</table>
A-3
94 AWARD OF AE CONTRACT (SACRAMENTO DISTRICT)

AE PACKAGE
- DESIGN GUIDE
- MANUALS
- STANDARDS
- SPECIAL REQUIREMENTS

AE PREPARES
FEE PROPOSAL

NEGOTIATION SECTION
ESTABLISH MANPOWER
AND CALCULATING
LABOR CHARGE +

NEGOTIATION
PREPARES
POSITION

GEIT
SPK-475

MAX PERMITTED

DD 633-1
AE DEVELOPMENT OF PROPOSED OVERHEAD
RATES + FINANCIAL RESPONSIBILITY
DETERMINATIONS

AUDIT

21BOA

AE FILE

21BO
NEGOTIATION FILE

21BOA
SAFETY ENGINEER APPROVAL

21BOA
DIV E APPROVAL FILE

21BO
SUPPLY (ORIGINAL)

AE SIGNS
CONTRACT
(3 COPIES)

CONTRACT

SB PROCUREMENT
PREPARES
CONTRACT

MINUTES
21BO
21BO A

NEGOTIATION

NEGRO
P MGR
AE

AGREEMENT

YES

NO

TO SELECTION #1
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AE STARTS
PROJECT DESIGN

AE SIGNS
CONTRACT LETTER

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ISSUED
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NTP
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DIV E
APPROVAL OF
[EC11BO-'1-'140]
A-3
DISTRICT COST CONTROL SYSTEM

AUTOMATED DATA BASE (ADB) - PROJECT STATUS AND DESIGN PROGRESS, INSTALLATION SUPPORT (PROJECTS) STATUS, DISTRICT MCA SUPPORT
A.4 Family Housing Construction and Improvement Procedures
BASIC FUNCTION BLOCKS 1.0 TO 8.3
FAMILY HOUSING NEW CONSTRUCTION PROGRAMMING

CONGRESSIONAL REVIEW, AUTHORIZATION, AND APPROPRIATION V. V.

DETERMINE NEED

CONDUCT PRELIMINARY SURVEY SUBMIT REPORT

REQUEST FOR STUDY - MODIFIED INITIAL PROGRAM

EXECUTE PREP FOR ABA REVIEW

EXECUTE PREP FOR PROPOSED PROGRAM BUDGET APPEAL

REQUEST FOR STUDY - UNMODIFIED INITIAL PROGRAM

EXECUTE PREP FOR GENERAL PROGRAM REVIEW

EXECUTE PREP FOR GENERAL PROGRAM REVIEW

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EXECUTE PREP FOR GENERAL PROGRAM REVIEW
A-4
BASIC FUNCTION BLOCKS 91 TO 97
FH TURNKEY CONSTRUCTION CONTRACTING
PERFORMANCE AREAS
FAMILY HOUSING IMPROVEMENT PROGRAM
MCA MODERNIZATION AND REPAIR

A-4
EU D PERFORMANCE AREAS (ITALY)
MC PROJECTS

MC PROJECTS SUPPORTED
- ARMY
- AIR FORCE
- NAVY

1.0 DIV.
PRELIMINARY
ACTIVITY: DESIGN SCOPES

3.0 DIV.
CONCEPT/EVALUATION

4.0 DIV.
PRELIM. SUBMISSION

5.0 DIV.
PRELIM. SUBMISSION

6.0 DIV.
CONCEPT/EVALUATION

CD/PO APPROVAL/REVIEW

MC SUPERVISORY ORGANIZATION

REMOTE USERS/PO
CD/PO REVIEW

CD/PO SUBMITTAL

PRELIMINARY ACTIVITIES

MC PROJECTS SUPPORTED

PRECEDING PAGE BLANK-NOT FILMED
APPENDIX E: NASA CONSTRUCTION PROJECT PROCEDURES
APPENDIX F: CODE DESIGNATIONS FOR OCE DIRECTIVES

<table>
<thead>
<tr>
<th>Code</th>
<th>OCE Directive</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Authorized for budget drawings and additional design, limited to extent described by individual directives issued by OCE. Submission of cost estimates is also required.</td>
</tr>
<tr>
<td>2</td>
<td>New items not previously authorized for design. Authorized for preparation and submission of budget drawings, outline specifications, and cost estimates. Also, preparation of concept design, which is the first element of design. It includes drawings and data developed prior to the initiation of final design. It is intended to firmly define functional and basic technical aspects of a facility so that changes will not be required during final design. Concept design includes (1) a site plan, (2) floor plans showing functional layout, (3) typical cross sections showing floor-to-floor height, (4) elevations indicating principal exterior materials to be used, (5) an outline of materials and methods of construction with a schedule of typical finishes, and (6) cost estimates of the structure, site work, and utilities. Electrical, mechanical, and structural aspects will not be developed beyond basic determinations except in those cases where they have particular importance related to the specific function for which the facility is intended. For medical projects, see TM 5-838-2. For nonrepetitive facilities, concept design will be limited to no more than 25 percent of total design. For repetitive facilities, concept effort will consist of conceptual design of site development only and project cost estimate.</td>
</tr>
<tr>
<td>3</td>
<td>Authorized for preparation and submission of budget sketches, outline specifications, and cost estimates. Items so coded have been previously authorized for design in some instances with a different scope. Submission of budget drawings, specifications, and estimates is required to reflect current design even though scope of item has not changed. Concept design is also authorized as outlined under Code 2 above.</td>
</tr>
<tr>
<td>4</td>
<td>Design withheld pending issuance of a supplementary design directive.</td>
</tr>
<tr>
<td>5</td>
<td>Deferred from program. Do not start design. If concept or final design has already been started by District Engineer personnel, it will be terminated. If concept or final design is being accomplished by architect-engineer contract, it will be terminated or completed as will best serve the interests of the government. When the AE contract is not terminated, inform OCE, ATTN: ENGMCC-CA, within 10 days with justification.</td>
</tr>
<tr>
<td>6</td>
<td>Authorized for final design.</td>
</tr>
<tr>
<td>7</td>
<td>Item cancelled, no longer a requirement.</td>
</tr>
<tr>
<td>8</td>
<td>Construction contract awarded since publication of last design annex.</td>
</tr>
</tbody>
</table>

1Medical Facilities Design-Army, TM 5-838-2 (Department of the Army, 6 April 1970).
APPENDIX G: FORMS AND REPORTS

MCA Project-Related Forms

Tables G1 through G5 list DOD, DA, Standard, Engineering, Savannah District, and Sacramento District forms related to MCA projects.

Periodic and Summary Reports

Tables G6 through G9 list annual, semiannual, quarterly, and monthly reports respectively.

Table G1

Department of Defense (DD) Forms

<table>
<thead>
<tr>
<th>DD Form</th>
<th>Title</th>
<th>Functions</th>
<th>Source</th>
<th>Recipient</th>
<th>Purpose</th>
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<tbody>
<tr>
<td>350</td>
<td>IPAR</td>
<td>Contract Awd.</td>
<td>Div</td>
<td>OCE</td>
<td>Ref: ASPR 21-100</td>
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<td>541</td>
<td>Settlement Proposal-Total Cost Basis</td>
<td>Fixed Price Contr.</td>
<td>Dist</td>
<td>AE</td>
<td>Ref: ASPR 8-802.2</td>
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<tr>
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<td>Settlement Proposal for Cost Reimbursement Contracts</td>
<td>AE Contract Terminations</td>
<td>Dist</td>
<td>AE</td>
<td>Ref: ASPR 8-803</td>
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<tr>
<td>548</td>
<td>Applic. for Partial Payments</td>
<td>Partial Perform. Payments</td>
<td>AE</td>
<td>DE</td>
<td>Reimbursement</td>
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<tr>
<td>813</td>
<td>Report of Cost and Analysis</td>
<td>CWE based on all Con Const. Contr. Awards</td>
<td>Dist</td>
<td>OCE</td>
<td>Ref: ER 335-345-1</td>
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<tr>
<td>879</td>
<td>Statement of Compliance</td>
<td>Contracting Certifications</td>
<td>Contractor</td>
<td>CO</td>
<td>Reimbursement</td>
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<tr>
<td>1195</td>
<td>Req. for Par. Pay.</td>
<td>See 547</td>
<td>Contractor</td>
<td>CO</td>
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<tr>
<td>1270</td>
<td>Short Contract (Negotiated)</td>
<td>Contract Form</td>
<td>Contractor</td>
<td>CO</td>
<td></td>
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<tr>
<td>1205 to 1220</td>
<td>Base Evaluation</td>
<td>Design Input; Site Characteristics</td>
<td>IC</td>
<td>PM</td>
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<tr>
<td>1354</td>
<td>Tx &amp; Acceptance of MRP</td>
<td>RP Inv.</td>
<td>IC</td>
<td>Records</td>
<td>Ref: ER 415-35-1</td>
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<tr>
<td>1376</td>
<td>FH Occupied by Mil Families</td>
<td>FH Survey</td>
<td>IC</td>
<td>Maj C</td>
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<tr>
<td>1377</td>
<td>Current FH Conditions Report</td>
<td>FH Survey</td>
<td>IC</td>
<td>Maj C</td>
<td></td>
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<tr>
<td>1378</td>
<td>Determination of Housing Req. and Project Composition</td>
<td>Projects LRFH Req/ Assets/Deficits/ No. and Types for Spec. Annual Proj.</td>
<td>IC</td>
<td>Maj C</td>
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<tr>
<td>1379</td>
<td>Narrative Summary for FH</td>
<td>Justifications and Major Missions of 1</td>
<td>IC</td>
<td>Maj C</td>
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<tr>
<td>1390</td>
<td>FY MCP</td>
<td>Installation SRCP Summary</td>
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<td>Maj C</td>
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116
<table>
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<th>Purpose</th>
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<td>1391</td>
<td>MCP-Data</td>
<td>SRCP Description and Criteria La Project</td>
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<td>OCE</td>
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<td>FH Proj. PR</td>
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<td>1413</td>
<td>Perform Eval. for Contr. Greater than $10,000</td>
<td>AE Evaluation</td>
<td>DL(CO)</td>
<td>DE</td>
<td>Ref: ASPR 18-403.4</td>
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<td>C. Data Req. List</td>
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<td>Div</td>
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<td>Notice Awd, Statement, etc.</td>
<td>As Req’d.</td>
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<td>Maj C/ Use/Div</td>
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<td>1501</td>
<td>Abstract of Bids</td>
<td>Bid Opening</td>
<td>CA Board</td>
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<td>Mil FH Justif.</td>
<td>FH Need Develop</td>
<td>Maj C</td>
<td>DCSLOG</td>
<td>FH Requirements</td>
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<td>Request for Pre-award Contr. Survey</td>
<td>Eval. of Cr Capabilities</td>
<td>CO</td>
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<td>OCE</td>
<td>Ref: ASPR 18-</td>
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<td>Contract Funds Status Report</td>
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<td>Determination of Bachelor Housing Requirements</td>
<td>Troop Housing Support</td>
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<td>Constr. Environment for:</td>
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<td>Nuclear Weapons Publications</td>
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<td>Manpower Summation</td>
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<td>Coord. IRCP Instal., LRCP</td>
<td>MP: Annotated for 6 year per.</td>
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<td>Manpower (Voucher)</td>
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<td>1709R</td>
<td>Bachelor Housing Capacities and Utilization</td>
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<td>C Labor Stds</td>
<td>Control of Constr. Phase</td>
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<td>2285R</td>
<td>Long-Range Analysis of C4 Functions</td>
<td>New Start Funds</td>
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<td>Sec. of Army</td>
<td>Ref: AR 235-5</td>
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<td>2368</td>
<td>BIS</td>
<td>MP, Phase 1</td>
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<td>Comd SRCP</td>
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<td>FH R Imps. Proj. Reports</td>
<td>FH Needs</td>
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<td>Maints. of FH Stds</td>
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<td>2788</td>
<td>EE Tech Data: Summary Utilities Heating Bldg. &amp; Grounds</td>
<td>Install. Monitoring</td>
<td>Fac E</td>
<td>IC</td>
<td>Ref: AR 420-16</td>
</tr>
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<td>2869-1</td>
<td>FH Util Anal-OP Data Utilization Pgm Narrative Review</td>
<td>Installation Monitoring</td>
<td>Fac E</td>
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Table G2
Department of the Army (DA) Forms
### Table G2 (Cont'd)

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<td>Cost. Anal. Work Sheet</td>
<td>Budget Analysis</td>
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<td>OCE /File</td>
<td>Fiscal Control (AR 235-5)</td>
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<td>3491R</td>
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<td>RC Planning</td>
<td>Dist</td>
<td>Chief, AR</td>
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<td>DE 3641 Update</td>
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<td>Dist</td>
<td>Chief, AR</td>
<td>Ref: AR 210-20</td>
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<td>3641</td>
<td>RP Assets</td>
<td>Fac. Data Card</td>
<td>Fac E</td>
<td>Records</td>
<td>Officers' Clubs</td>
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<td>3941</td>
<td>Certificate of Proficiency</td>
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<td>3965</td>
<td>Manpower Rev. Review</td>
<td>In-House Capability</td>
<td>DE</td>
<td>Div</td>
<td>District Design Capabilities</td>
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### Table G3

**Standard and Engineering Forms**

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<td>OCE 1391 Review</td>
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<td>D Status</td>
<td>PM/User</td>
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<td>CO/PM</td>
<td>OCE</td>
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<td>CEOP/MCA</td>
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<td>Proj. Cost Estimate</td>
<td>Budgeting, Programming</td>
<td>IC/Dist</td>
<td>OCE</td>
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<td>Contract Cost Est.</td>
<td>Funding</td>
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<td>Ref: TM-5-800-2</td>
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<td>R Prop Inv. Update</td>
<td>Data for DA 3641</td>
<td>Dist</td>
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<tr>
<td>251</td>
<td>AE Listings</td>
<td>AE Pre-selection Prep.</td>
<td>Dist ADP</td>
<td>AE Pre-selection Board</td>
<td>AE Selection</td>
</tr>
<tr>
<td>252</td>
<td>Fix Price Contract - AE</td>
<td>AE Contracting</td>
<td>Dist</td>
<td>AE/Dist</td>
<td>AE Design Implementation</td>
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<td>527</td>
<td>CE Lease Form</td>
<td>Gov. Lease Agreement</td>
<td>Div E or DE</td>
<td>OCE</td>
<td>Ref: ER 405-1-1020</td>
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<tr>
<td>856</td>
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<td>Gov. Lease Agreement</td>
<td>Div E or DE</td>
<td>OCE</td>
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<td>Site Acq</td>
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Table G3 (Cont’d)

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<td>1069</td>
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<td>Source Record for Data for Eng. F 3376</td>
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<td>Div E</td>
<td>Ref: ER 405-1-1017</td>
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<tr>
<td>1523-R</td>
<td>DA Lease for Industrial Fac</td>
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<td>DA</td>
<td>OCE</td>
<td>Ref: ER 405-1-103</td>
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<td>Plant and Equipment Schedule</td>
<td>Plant Desc.</td>
<td>AE</td>
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<td>Ref: ER 1180-1-1 App. A</td>
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<td>AE/Const. Contracts Preaward Survey</td>
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<td>Div</td>
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<td>3018a, b, c</td>
<td>Budget Summary R</td>
<td>I’Y Cost Report (Quarterly)</td>
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<td>OCE</td>
<td>Ref: ER 37-345-10; OCE Prog. Review/Admin</td>
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<td>Dist</td>
<td>Div/OCE</td>
<td>Ref: ER 37-345-10</td>
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<td>CWE</td>
<td>OCE Rpts. to Congr. Support</td>
<td>Dist</td>
<td>OCE</td>
<td>Budget Purposes</td>
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<td>3132-R</td>
<td>Adv Notice to Bidders</td>
<td>Info. on Projects</td>
<td>Dist</td>
<td>AE</td>
<td>Ref: EC 2-203-1</td>
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<td>Dist</td>
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**Std Form**

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Table G5
Sacramento District MCA Forms
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### Table G6

#### Annual Reports

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Semiannual Reports

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**Quarterly Reports**

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### Table G9

**Monthly Reports**

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