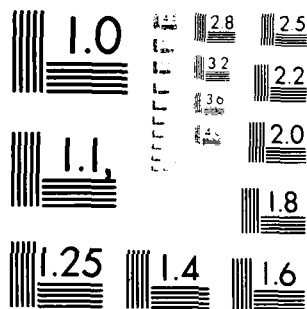


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construction
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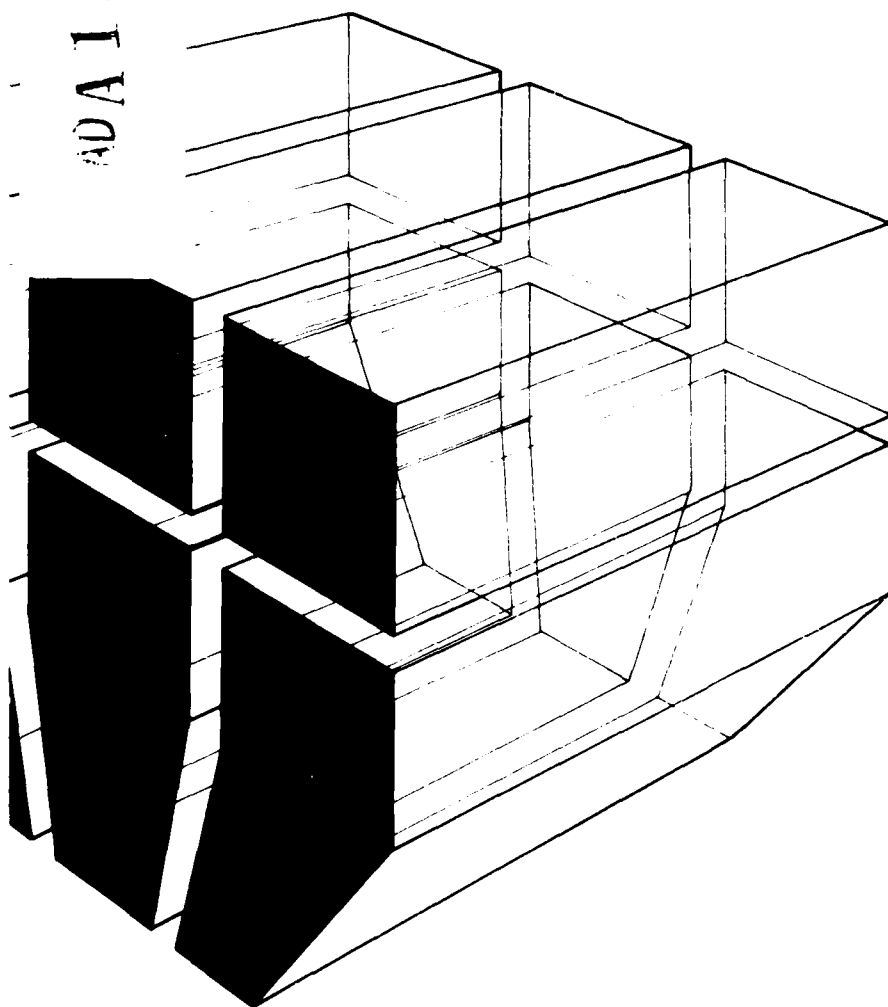


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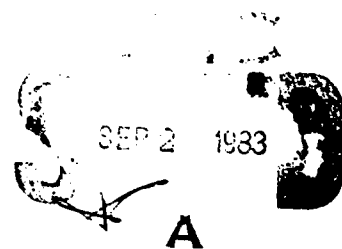
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Technical Report P-147
June 1983

DESIGN INFORMATION FOR EMERGENCY
OPERATIONS CENTERS

by
D. L. Dressel



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DD FORM 1473

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BLOCK 20. (CONT'D)

Interviews with OCE EOC personnel provided information on current and planned EOC activities. Designers used this information to develop a feasible layout for the OCE office. Researchers visited several Corps Districts and Divisions to determine basic needs in an EOC. This information was used to produce general design criteria which could be used as the basis for planning EOCs. Four EOC sites were visited and their needs analyzed. Solutions to these individual design problems were developed on a site-specific basis.

The design criteria produced from this research will be useful to Corps District and Division Facility Engineers for evaluating existing facilities and for designing new ones.

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FOREWORD

This guidance information was developed for the Directorate of Civil Works, Office of the Chief of Engineers (OCE), under reimbursable work order CWO-E 80-2. The Technical Monitor was Mr. M. Helpa.

The work was performed by the Facility Systems Division (FS), U.S. Army Construction Engineering Research Laboratory (CERL). Mr. David L. Dressel was the CERL Principal Investigator. The author wishes to express appreciation to William and Marla Miksch for their contributions to this report.

Mr. E. A. Lotz is Chief of CERL-FS. COL Louis J. Circeo is Commander and Director of CERL, and Dr. L. R. Shaffer is Technical Director.



1A

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DESIGN INFORMATION FOR EMERGENCY OPERATIONS CENTERS

1 INTRODUCTION

Background

Over the past few years, the involvement of the Corps of Engineers in natural disaster operations has grown considerably. Since becoming a Major Command (MACOM), the Corps now has a significant role in national preparedness planning and response to mobilization. An effective Emergency Operations Center (EOC) facility is an essential part of maintaining daily surveillance operations or disaster preparedness and emergency planning. This type of facility is maintained for immediate activation and staffing during natural disasters or national emergencies.

During FY80, the Emergency Operations Branch of the Office of the Chief of Engineers' (OCE) Civil Works Directorate's Construction Operations Division asked the U.S. Army Construction Engineering Research Laboratory (CERL) to design an EOC at OCE headquarters (HQ) in Washington, D.C. CERL was also asked to develop requirements and design information for the satellite EOCs at Corps Divisions and Districts which, together with HQ EOC, form the communications network during a disaster or emergency.

Objective

The objectives of this research were: (1) to develop a layout for an effective EOC at OCE HQ, and (2) to develop design information for EOCs at Corps Divisions and Districts.

Approach

Several Emergency Operations Branch staff members were interviewed to determine current and future activities. Based on this information, an optimum final design was developed. Several sites were visited to develop design requirements for Division and District EOCs, and six case study designs were developed and analyzed.

Scope

The design information in this report applies to the design of all Division and District EOCs. It is intended that a local design professional use this general information as a basis for planning an EOC; however, actual details will depend on the specific site.

2 DESIGNING A LAYOUT FOR THE OCE HEADQUARTERS, EMERGENCY OPERATIONS CENTER

Organization

The OCE EOC is staffed by the Emergency Operations Branch of the Construction Operations Division. The branch is divided into the Natural Disaster Section and the National Emergency Section. Minimal EOC staffing is required during normal daily operations. However, during natural disasters or national emergency exercises, the basic EOC staff is augmented by expert and/or essential personnel from other organizations.

Use of the Facility

EOC personnel at OCE were interviewed to determine their current activities and those planned for the future. This information was then used to develop design alternatives for an optimum EOC office area.

During some disaster or emergency situations, the EOC operates on 24-hour-a-day shifts. However, during national emergency exercises, access to the EOC is limited, since classified material is discussed and used for reference.

At times of intense use, especially during natural disasters, it is expected that the proposed Water Resources Data Center (WRDC) will feed the EOC with information by a planned computer link between the two facilities. It is also expected that situation briefings will be common.

Communication is an important capability, both routinely and during intense use. Teletype links with the National Weather Service, other Federal and state agencies, and Divisions and Districts are critical. For national emergency exercises, both secure voice equipment and radios are used. Additional computer links with other organizations may be developed in the future to enhance communications.

Design Constraints

A 1600 sq ft (144 m²) area immediately adjacent to the planned WRDC was identified as a possible location for the EOC (see Figure 1). One advantage of using this area was that its proximity to the WRDC would simplify communications links and would allow the WRDC to be used for "spill-over" EOC staff augmentation. Since this area is in the core of the building, it would also be easier to secure. Unfortunately, the area would be only marginally large enough for the EOC and would not be adjacent to any staff offices (these are along the exterior wall of the building and across the corridor). In this case, the entrance to the EOC and the entrance to the staff office area would be about 60 ft (18 m) apart. Ideally, however, the EOC and staff offices would be immediately adjacent.

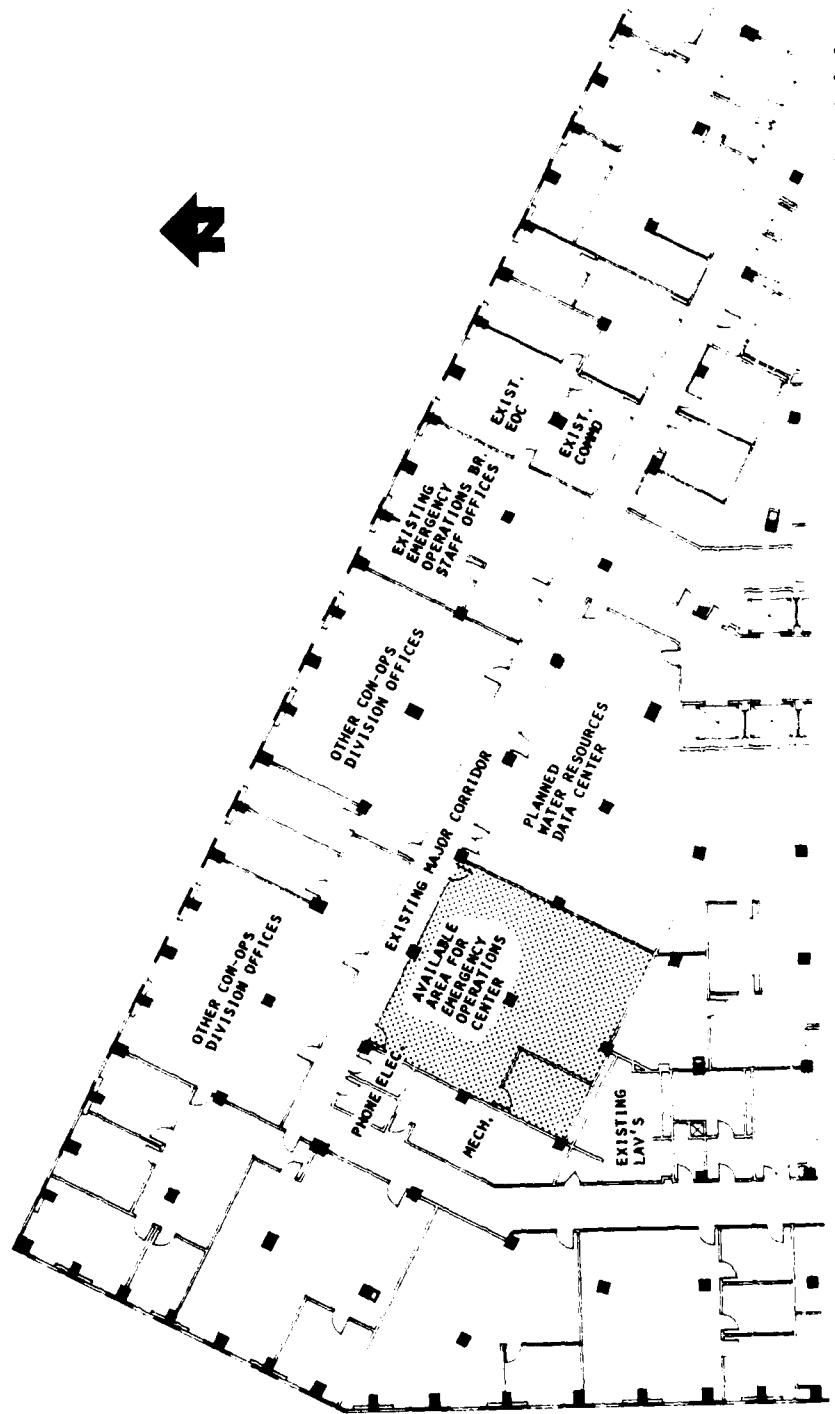


Figure 1. Area designated for EOC.

Design Solution

Figure 2 shows the design of the EOC and the layout of associated staff offices. Five functional areas comprise the actual EOC: Communications (or "Commo"), Operations (includes briefings), Life Support, Augmentation, and Audio-Visual Room (A-V). To minimize the distance between the staff office area and the EOC, the Construction Operations Division offices were redesigned to provide a location across the corridor for the staff offices. This merely meant rearranging the location of branches within the existing confines of the division.

To best use available floor space, use of vertical space was stressed, and many features were built in (see Figures 3 and 4). All communications equipment in the "Commo" area was to be on or in built-in equipment counters with an overhead cabinet for paper, supplies, and hand-held equipment storage. Power and communications connections were to be continuous in an under-counter chase. In the "Operations" area, a wall was designed for rear-screen projection and up to six TV monitors. All connections to TV and audio equipment are in the adjacent "A-V" room. All wall surfaces in the "Operations" room are tack surfaces for display of current situation charts and maps. An accordion-fold partition between the "Operations" room and the "Augmentation" area can be closed so that status briefings will cause the minimum disruption of activities.

To save space, augmentation carrels were designed to the minimum acceptable functional dimensions and built in. Wall surfaces above these carrels double as tack surfaces. In the "Life Support" area, the design specified bunk beds with built-in storage drawers and a "mini-kitchen," which includes a wet sink, microwave oven, two-burner range, and refrigerator.

Redesign

After the adjacent WRDC was completed, the original EOC design had to be altered for several reasons:

1. To fall within cable run limitations imposed by the location of the WRDC computers, the A-V room had to be located on a wall in common with the WRDC.
2. Higher authority disapproved of lavatory facilities in the Life Support area.
3. Status briefings would be held in the WRDC.
4. At the time of the original design, the impact of a MACOM role in mobilization was not fully determined. As this role gained definition, it was found that the planned EOC staff would not be enough. Since there was not enough space for all additional staff in the normal staff office area, some would have to be made available in the EOC.

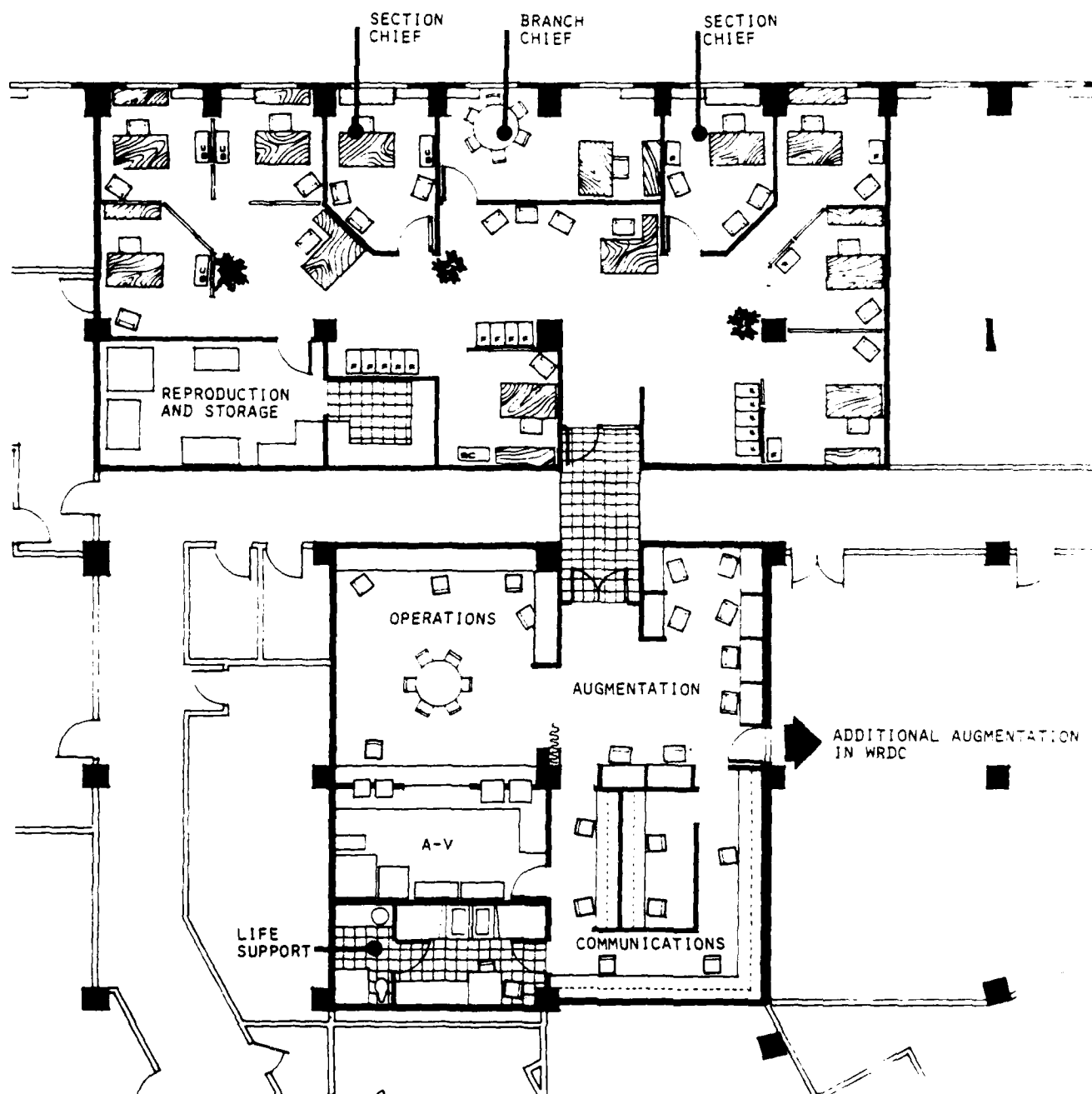


Figure 2. EOC and staff offices.

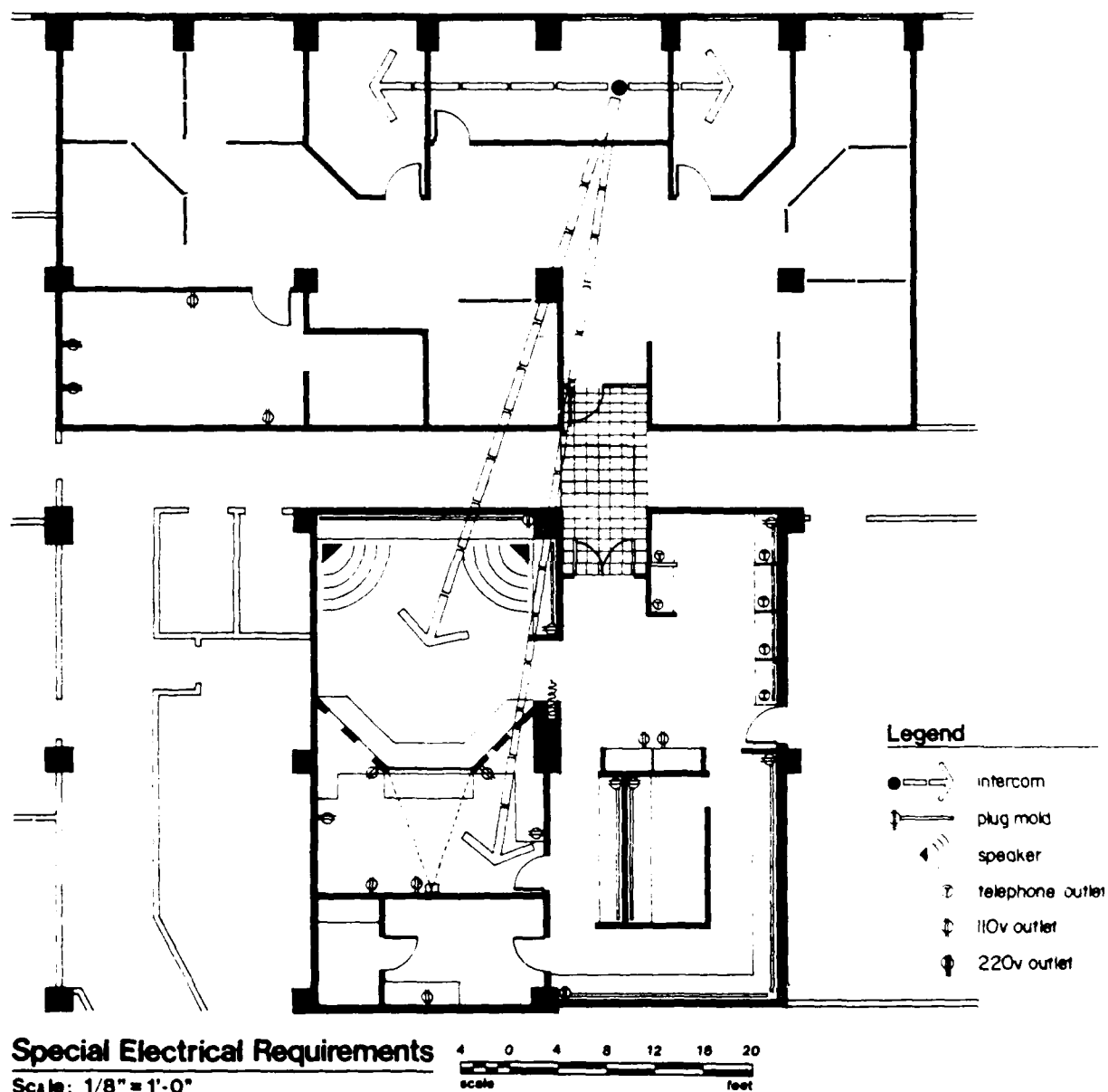


Figure 3. Special electrical requirements.

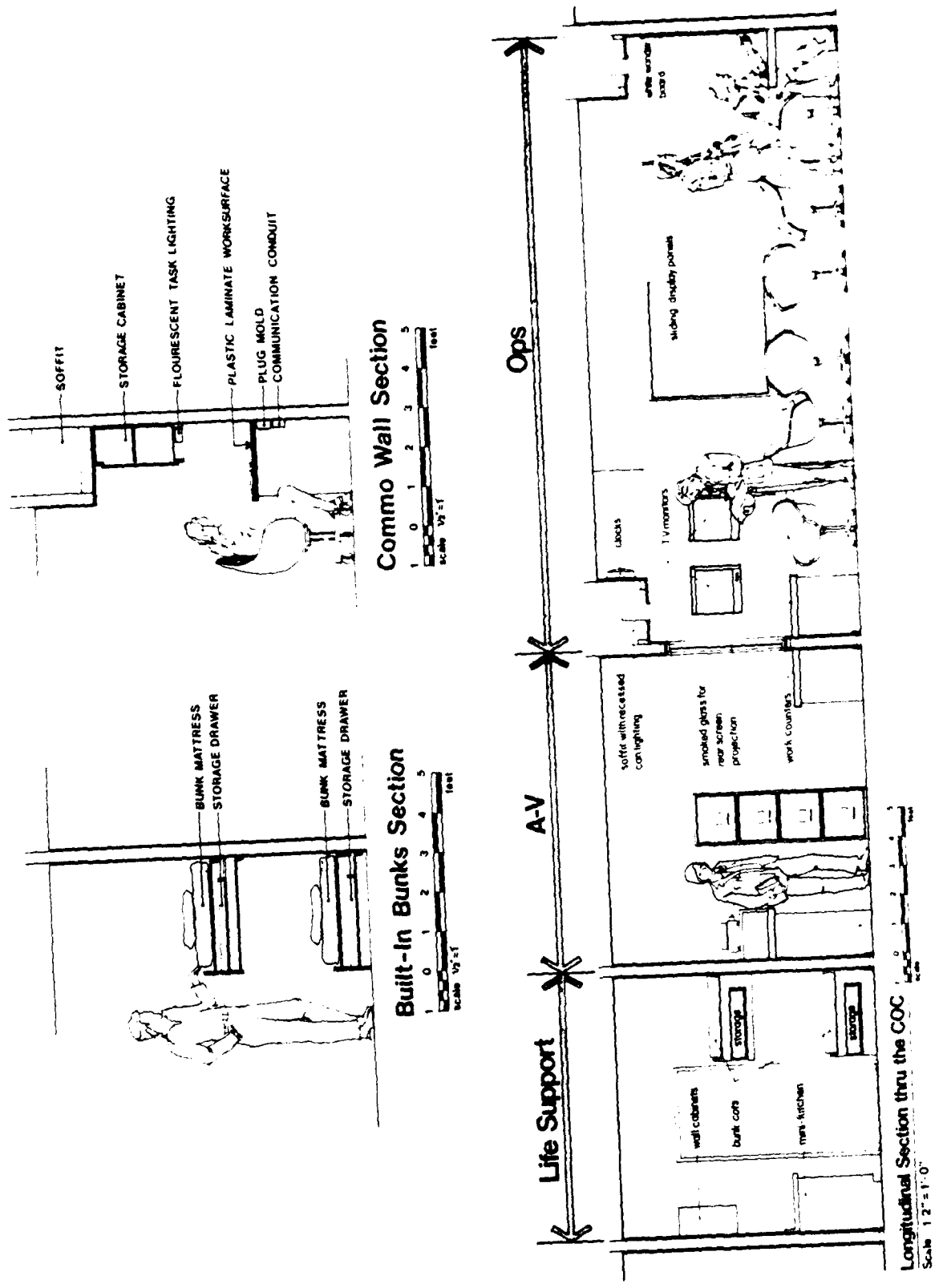


Figure 4. Built-in features.

5. Since the communications equipment was not going to be as extensive as originally planned, the Commo area could be reduced. However, a secure voice booth would be required, since the entire EOC itself could not be considered voice-secure.

6. Identification check would be required at the EOC entrance, so a check-in desk would be required.

The final design incorporated these changes (see Figure 5).

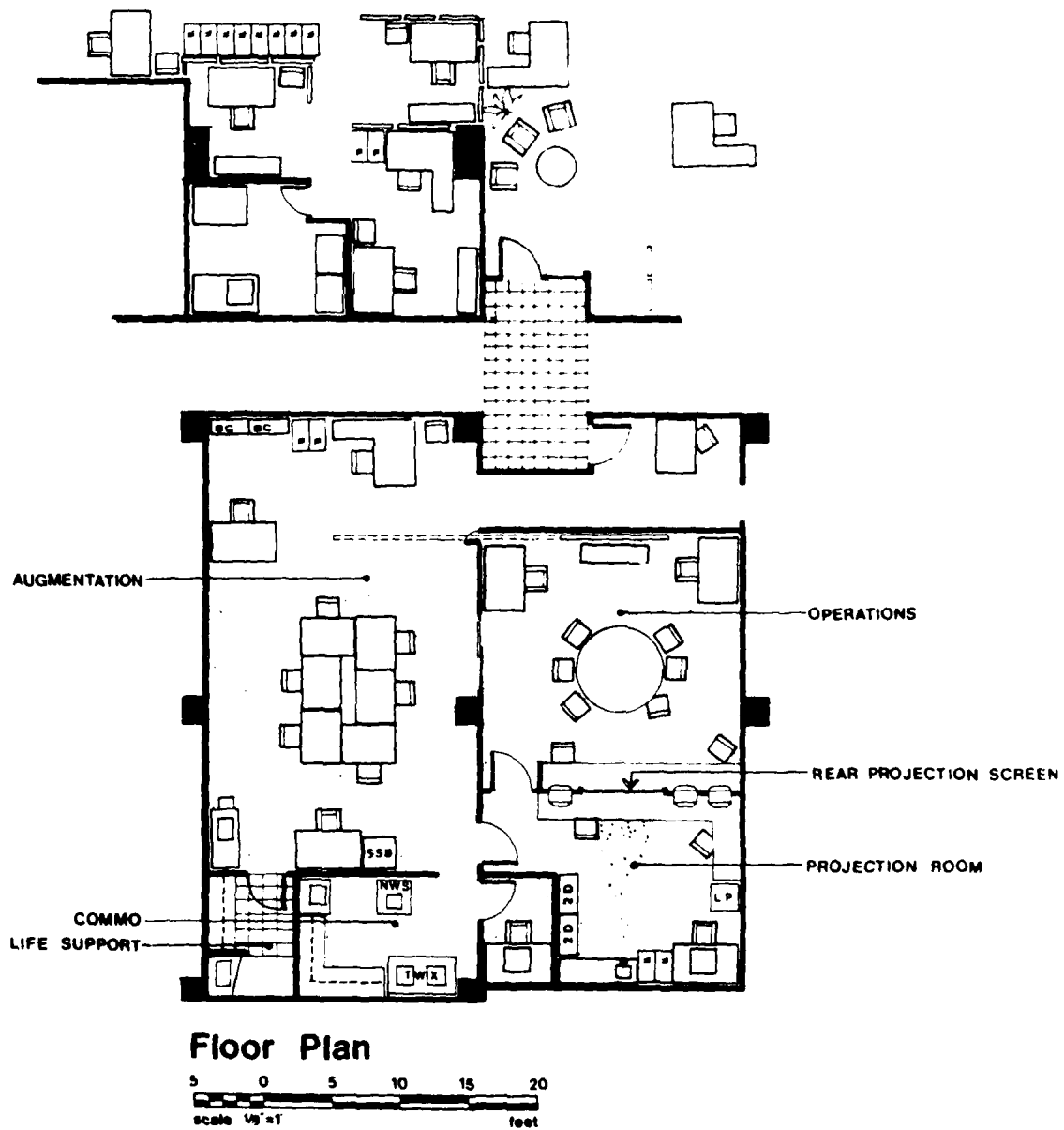


Figure 5. Redesigned EOC.

3 DEVELOPMENT OF DESIGN INFORMATION FOR DIVISION AND DISTRICT EOCs

Information Development

Design information was developed for Corps Divisions and Districts after interviewing emergency operations managers and staff at several Corps Divisions and Districts. The information gathered was synthesized to develop several case study designs. The design information developed is generic in nature; i.e., the recommendations can be applied at any Division or District EOC. However, in-house experts or a contract A-E firm should interpret the information in terms of local constraints.

Documentation

The information in the appendix describes the design information developed for the EOCs. The material was developed using a modified information gathering process,¹ categorization structure,² and formatting concept³ developed by CERL. This documentation can serve as a stand-alone document. The information provided is divided into four categories:

1. A discussion of topics relevant to the entire EOC, such as location, utilities, security, etc.
2. Requirements, criteria, and design guidance for EOC space.
3. Suggested furnishings, finish materials, colors, and signage.
4. Information for implementing built-in units.

In addition, information derived from case studies at three Districts and one Division has been analyzed in terms of site-specific physical constraints and design rationale.

¹ David L. Dressel, et al., A Prototype Procedure for the Local Generation of Facility Requirements, Interim Report D-80/ADAO43172 (U.S. Army Construction Engineering Research Laboratory [CERL], 1977).

² R. L. Brauer, et al., Concepts for the Generation, Communication, and Evaluation of Habitability Criteria, Special Report D-78/ADAO41187 (CERL, 1977).

³ Roger L. Brauer, et al., Preparing and Communicating Habitability Design Information, Technical Report P-121/ADAI13379 (CERL, 1982).

4 SUMMARY AND RECOMMENDATIONS

The design developed for the OCE EOC was based on the facility's functional requirements and on the most efficient use of space. The design incorporated use of vertical space and the use of built-in features. Modifications incorporated into the design allowed for constraints imposed by completion of a new Water Resources Data Center -- an essential component of the OCE EOC.

Design information developed for Corps District and Division EOCs was developed to be responsive to the requirements of EOCs during natural disasters or national emergencies. The information developed was designed to be generic in nature so that it could be applied at any Corps location. Local designers would then use the information as the basis for designing an individual facility, but would also take site-specific constraints into consideration.

It is recommended that EOC staff use this information when evaluating their current facilities, renovating existing facilities, or developing new ones.

APPENDIX:
DESIGN INFORMATION FOR
EMERGENCY OPERATIONS CENTERS

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INTRODUCTION

1

BACKGROUND

In the past few years, the Corps of Engineers' role in national preparedness planning and response to mobilization has grown considerably. An essential component of maintaining daily surveillance operations for disaster preparedness and emergency planning is an Emergency Operations Center (EOC) facility, maintained for immediate activation and staffing.

PURPOSE

This document presents information for the design of Emergency Operations Centers (EOC) at Corps of Engineers Division and District Offices. The recommendations contained herein, in the form of requirements, criteria and guidance, are responsive to the activities of the Emergency Operations organizations during times of natural disasters, national emergency, and daily operations.

SCOPE

The information presented in this document is applicable to the design of all Division and District EOC's, and addresses the selection of an area within a facility for an EOC, physical relationships of the EOC with other organizations at the installation, and the types of spaces necessary. Consideration is also given to utility, communications, security, and decor issues.

USE OF THIS DOCUMENT

When the establishment of an EOC is being considered, or the renovation or relocation of an existing EOC becomes necessary, the Special Concerns chapter should be examined first.

Chapter 2 (Special Concerns) discusses topics relevant to the entire EOC. Once these are reviewed, Chapter 3 (Space Design Information) presents requirements, criteria, and design guidance for each EOC space, as well as information on desirable space adjacencies.

Chapter 4 (Decor Information) suggests furnishings, finish materials, colors, and signage for the EOC.

Chapter 5 (Construction Information) presents information to aid in the actual implementation of special built-in units suggested in the guidance sections of the Space Design Information chapter.

Five example EOCs are presented in Chapter 6 (Case Studies). For each example, existing physical constraints and the reasoning behind the design are explained.

It is intended that a local design professional (whether in-house or outside contractor) use this information to plan an EOC. The EOC personnel can use this information to evaluate their existing facility, or alternative designs for a new or renovated facility.

**SPECIAL
CONCERNS 2**

SPECIAL CONCERNS 2.0

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

SELECTING A LOCATION

The location of an EOC is an important consideration. In some cases, capabilities or equipment are shared among other installation organizations. For example, on a daily basis, all telex messages may be routed through a unit located in the local Office of Administrative Services (OAS). In times of emergency or disaster, this would be acceptable if the OAS and EOC were near each other.

Since space at most installations is limited, it may be necessary for an EOC to share space with one or many other organizations. During emergency or disaster situations, it is often necessary for the EOC staff to brief the news media, other organizations at the installation, or local coordinating organizations. A dedicated briefing space for the EOC would seldom be justified. Briefings can be held in a conference room used by other organizations if it is near the EOC.

The possibility of power outages may also affect the location of the EOC. In a multi-story building, elevator service can be interrupted and cause significant circulation problems. If possible, the EOC should be located on or near the ground floor.

UTILITIES

All electrical service in the average EOC is 110 V. The only exception would be for a photocopy machine which sometimes requires 220 V service. There is a requirement, however, for continuous electrical supply if the building power is interrupted.

Water supply is unnecessary except for the "Life Support" space. Here, hot and cold water and a waste line should be provided.

An outdoor antenna is required for the single-side-band radio (see COMMUNICATIONS).

COMMUNICATIONS

There are several types of Commo equipment. If it is impossible to locate the office of the Emergency Operations Manager (EOM) next to the Operations Room, an intercom should be provided between the two spaces.

An external antenna is required for the single-side-band radio. No shielding or cable-run is required for the antenna lead.

SECURITY

The EOC in general and the Operations Room in particular should be protected from excessive non-essential pedestrian traffic. This can be done by providing as few entrances as possible, and buffering the Operations Room by other EOC spaces.

By locating the EOC clerical and professional staff spaces between the Operations Room and the EOC entrance, staff personnel can intercept unnecessary traffic.

During national emergency or exercises, the Operations Room must be secured. This can be done by installing coded button-operated locks on the Operations Room door(s).

2.0 SPECIAL CONCERNS

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

DECOR

The appropriate decor can make an office area more attractive and comfortable, and can contribute to employee satisfaction. Chapter 4 suggests appropriate styles and colors of furniture and discusses room materials and finishes.

CONSTRUCTION

It is suggested that several of the storage units, counters, etc., shown in the guidance sections of Chapter 3 be built in. Built-in features are generally more expensive and less flexible (in terms of relocation) than furniture or equipment purchased to fulfill the need. However, the cost of built-in storage can be more than offset by the increased efficiency it provides. Vertical space is nearly always put to better use, and less floor space is occupied. The floor space savings can be used to increase the size of adjoining areas or allocated to other organizations.

**SPACE
DESIGN
INFORMATION 3**

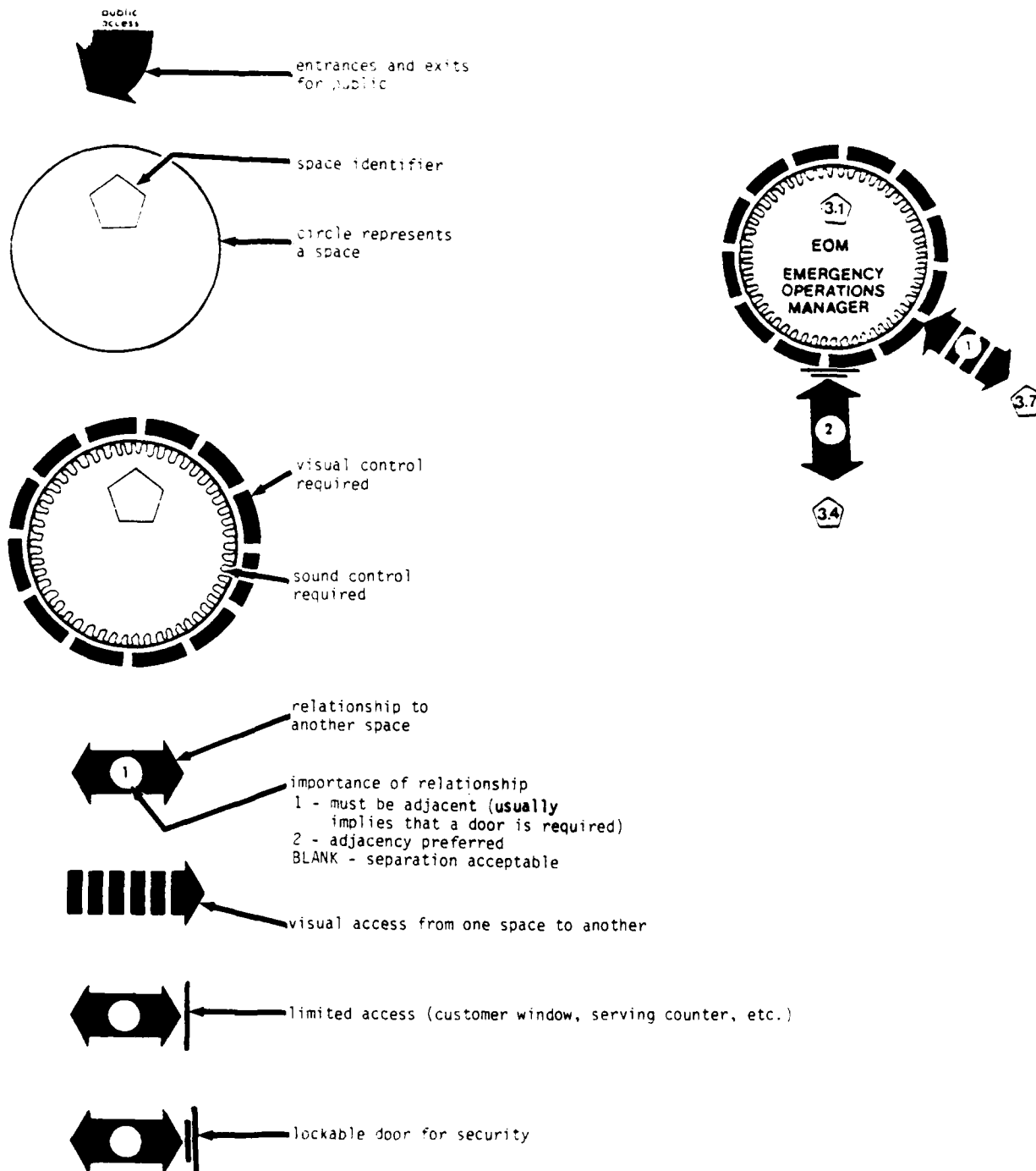
FORMAT DESCRIPTION 3.0

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

A format has been selected to provide a basis for arranging the functional areas and coordinating the many levels of information used in an EOC design. This format will help the reader understand the operation of the EOC and each of its elements; it will also provide guidance for developing relationships between each of the functional areas and implementing them into the selection of furnishings and the design of the EOC.

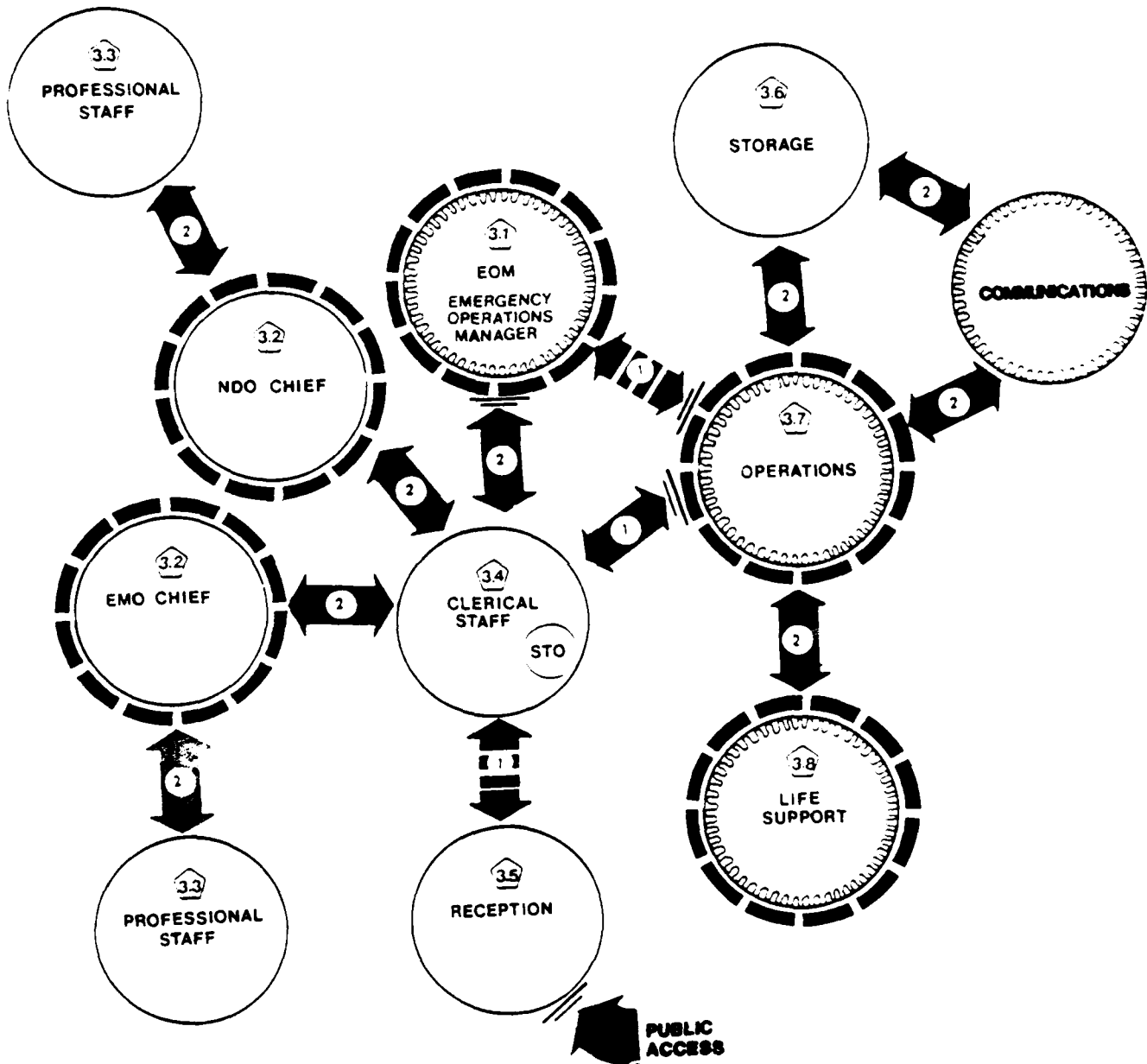
3.0 RELATIONSHIP DIAGRAM LEGEND

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS



RELATIONSHIP DIAGRAM 3.0

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS



3.0 **FORMAT DESCRIPTION**

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

FUNCTION

A statement which describes the primary reason for having a particular space. This statement illustrates the means by which a particular space contributes to the performance of this EOC mission.

CONTEXT

A visual key illustrating any important relationships which may exist between the particular space and other areas within the EOC.

ACTIVITIES USERS

A listing of the activities and users (personnel) required to perform the specified function for the space.

FURNISHINGS, EQUIPMENT

A listing of the furnishings and equipment which are necessary in performing the specified function for the space.

REQUIREMENTS

Qualitative statements of objectives for facilities. In performance language, they are defined as statements of discrete technical need or expected results for a facility, based upon the activities to be accomplished.

CRITERIA

Statements which are inferences from requirements and which form the basis for determining whether a purported solution satisfies those requirements; criteria are usually in a form which can be measured--quantified.

FORMAT DESCRIPTION 3.0

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

DESIGN INFORMATION - EMERGENCY OPERATIONS CENTERS

GUIDANCE

Advice regarding the application of criteria in facility planning, design, or operation; usually presented with diagrams or sketch graphics.

COMMENTARY

A statement which describes the rationale used in establishing a criterion. Such things as why a criterion has been selected, why a particular limiting value of a measure was chosen, and why satisfying the criterion will also explain why a particular requirement does not have a specific criterion measure; i.e., if the requirement is related to "qualities" of the environment.

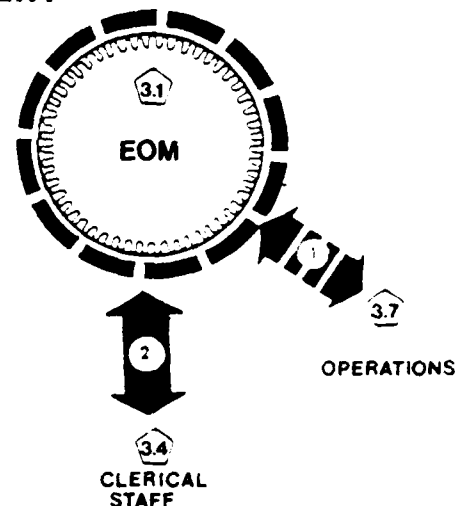
3.1 EOM

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

FUNCTION

Supervision and direction of all functions of Emergency Management Division/Branch.

CONTEXT



ACTIVITIES/USERS

Administration of EOC.
Division/Branch Chief.

FURNISHINGS/EQUIPMENT

Work surface with chair;
bookcase credenza
2 to 3 side chairs and table
Two 30 x 40 wall charts

REQUIREMENTS

1. Adequate area.
2. Adequate ceiling height.
3. Acoustical privacy.
4. Visual privacy.
5. Electrical survey.
6. Adequate lighting.
7. Adequate thermal comfort.
8. Middle management image.
9. Accessible phone lines.
10. Communication with OPS center and branch chiefs.
11. Wall space for charts.
12. Direct access to operations (physically and visually).

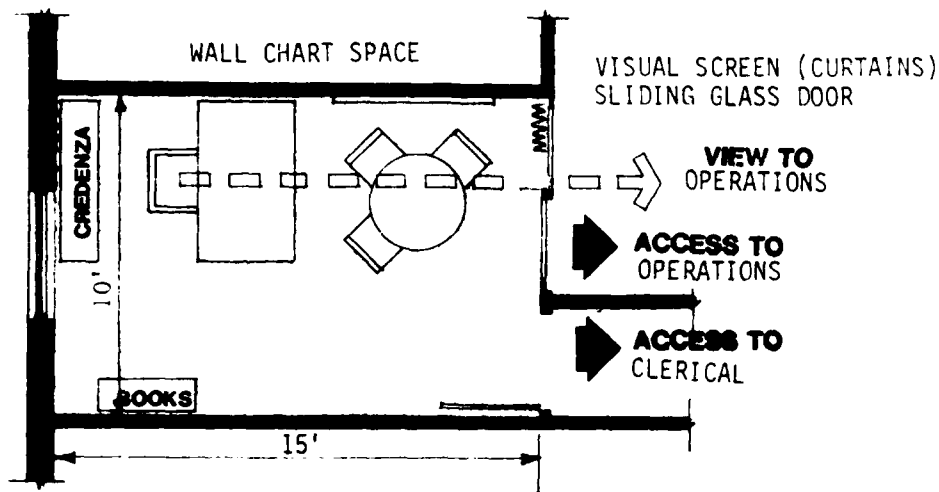
CRITERIA

1. 150 sq ft, enclosed office.
2. 8 ft minimum.
3. Enclosing walls: STC 40-45
Sound Reflectances:
Ceiling: NRC 50
Floor: NRC 25
4. Fully enclosed office.
Obscure vision at sliding glass doors with curtains.
(See 12 below.)
5. 110-V electrical outlets
6. General lighting: 20 to 30 foot-candles
Task lighting: 60 to 80 foot-candles
Surface Reflectances:
Ceiling: 80 to 90%
Wall: 40 to 60%
Floor: 20 to 40%
7. 68° (heating), 78° (cooling) dry-bulb temperature.
50 to 70% relative humidity.
15 CFM/person outside air minimum ventilation.
8. Furniture should be as comfortable as possible, carpet.
9. Multi-line phone.
10. Intercom to OPS center, branch chiefs.
11. Tack surface on wall for maps and charts (40 to 60 in. minimum).
12. Sliding glass doors between office and operations for additional visual access.

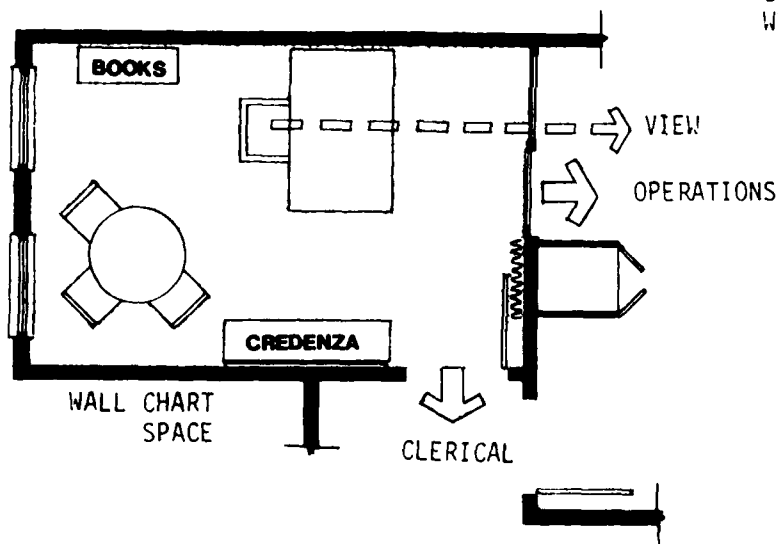
EOM 3.1

GUIDANCE

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS



EMERGENCY OPERATIONS MANAGER SHOULD HAVE VISUAL ACCESS AS WELL AS PHYSICAL ACCESS TO OPERATIONS AREA. SLIDING GLASS DOORS ARE RECOMMENDED WITH DRAPES TO OBSCURE VISION INTO OFFICE WHEN DESIRED.



COMMENTARY

1. Area based on study of both task and image related concerns.
2. Accepted practice.
3. AIA, Architectural Graphic Standards, New York, John Wiley and Sons, Inc., 1970, p. 504.
4. Privacy is a necessary component of task-performance-based CERL research.
5. Accepted practice.
6. AIA, p. 639.
7. Emergency energy guidelines may dictate 64° minimum for heating and 80° for cooling.
8. Accepted practice.
9. CERL
10. CERL
11. CERL
12. CERL

3.2 NEO/NDO CHIEF

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

FUNCTION

Receives and monitors meteorological, hydrological, and world situation data on a daily basis. Maintains emergency response posture.

ACTIVITIES/USERS

Planning and Administration
Branch Chief

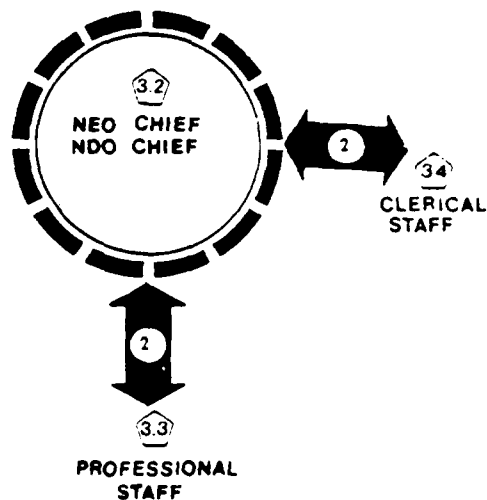
FURNISHINGS/EQUIPMENT

Work surface with chairs; bookcase
Credenza
1 side chair
Two 30 x 40 wall charts

REQUIREMENTS

1. Adequate area.
2. Adequate ceiling height.
3. Noise reduction.
4. Visual privacy.
5. Electrical services.
6. Adequate lighting.
7. Adequate thermal comfort.
8. Image appropriate for authority given.
9. Accessible phone lines.
10. Inter-office communication.
11. Adequate wall space for charts.

CONTEXT



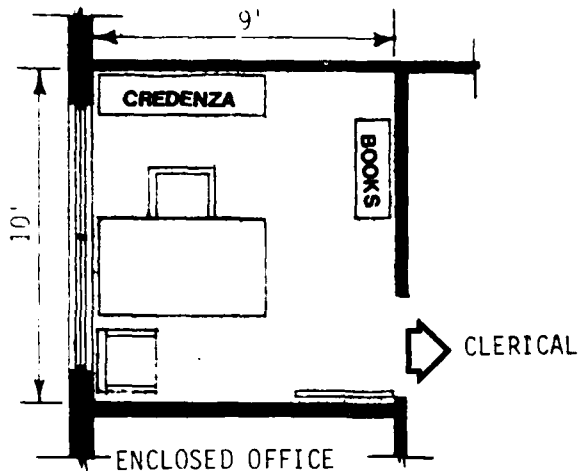
CRITERIA

1. 90 sq ft, open or enclosed office.
2. 9 ft minimum for open plan office schemes.
3. Enclosing wall sound rating STC: 40. Use materials such as carpeting on floor, suspended ceiling to reduce noise.
4. 60-in.-high minimum wall panels.
5. 110-V outlets as required.
6. General lighting: 20 to 30 foot-candles. Task lighting: 60 to 80 foot-candles. Surface Reflectances:
Ceiling: 80 to 90%
Wall: 40 to 60%
Floor: 20 to 40%
7. 68° (heating), 78° (cooling) dry-bulb temperature.
8. Furniture should be as comfortable as possible, carpeted floor surface.
9. Multi-line phone.
10. Inter-office intercom.
11. Two 30 x 40 wall charts.

NEO/NDO CHIEF 3.2

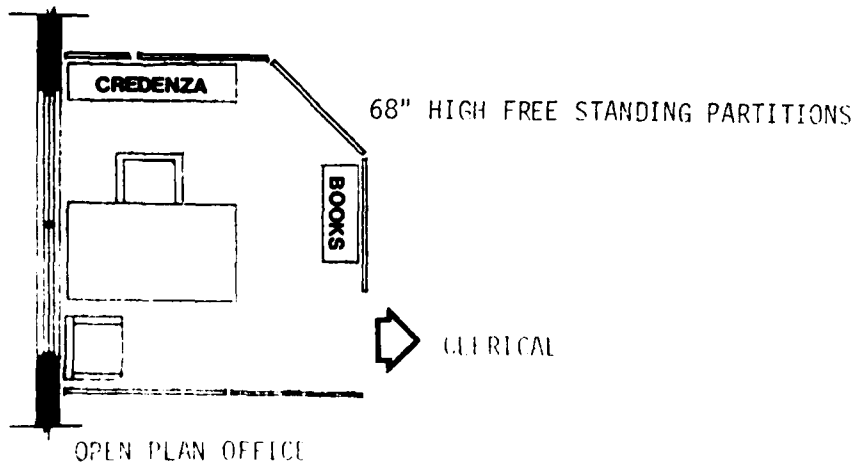
DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

GUIDANCE



NEO AND NDO CHIEFS MAY BE LOCATED IN FULLY ENCLOSED OR SEMI-PRIVATE OFFICES DEPENDING ON INDIVIDUAL CIRCUMSTANCES

"SEMI-PRIVATE" OFFICES SHOULD PROVIDE SOME DEGREE OF NOISE REDUCTION AND VISUAL PRIVACY



COMMENTARY

1. Area based on tank-related concerns.
2. Accepted practice.
3. AIA, Architectural Graphic Standards, New York, John Wiley and Sons, Inc., 1970, p. 504.
4. Privacy is a necessary component of task performance.
5. Accepted practice.
6. AIA, p. 639.
7. Emergency energy guidelines may dictate 65° minimum for heating and 80° for cooling.
8. CERL Research
9. CERL Research
10. CERL Research
11. CERL Research

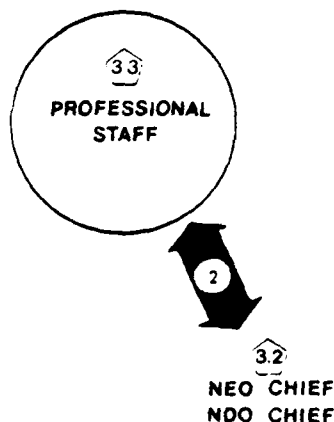
3.3 PROFESSIONAL STAFF

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

FUNCTION

Assist NDO/EMO Chief and EOC Manager as required.

CONTEXT



ACTIVITIES/USERS

Communications/daily weather monitoring
Civil Engineer Technician

FURNISHINGS/EQUIPMENT

Worksurface with chair
1 side chair
1 file cabinet

REQUIREMENTS

1. Adequate area.
2. Adequate ceiling height.
3. Noise reduction.
4. Visual privacy.
5. Electrical supply.
6. Adequate lighting.
7. Adequate thermal comfort.
8. Accessible phone lines.
9. Inter-office communication.

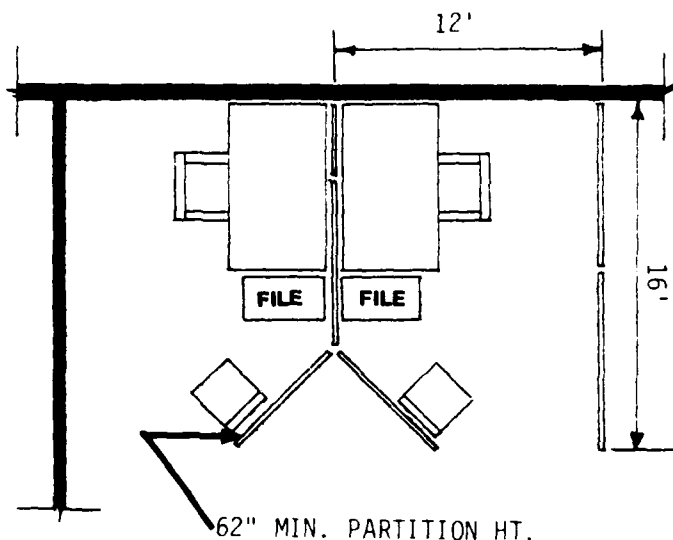
CRITERIA

1. Permanent: 75 to 90 sq ft, open office.
Temporary: work carrel in operations.
2. 9-ft minimum for open plan office schemes.
3. Enclosing walls: STC 40. Use materials such as carpeting, sound deadening wall treatment, insulation, etc., to reduce noise.
4. 62-in.-high (minimum) wall panels.
5. 110-V electrical outlets as required.
6. General lighting: 20 to 30 foot-candles. Task lighting: 60 to 80 foot-candles. Surface reflectances:
Ceiling: 80 to 90%
Wall: 40 to 60%
Floor: 20 to 40%
7. 68° (heating), 78° (cooling) dry-bulb temperature. 50 to 70% relative humidity. 15 CFM/person outside air minimum ventilation.
8. Multi-line phone.
9. Inter-office intercom.

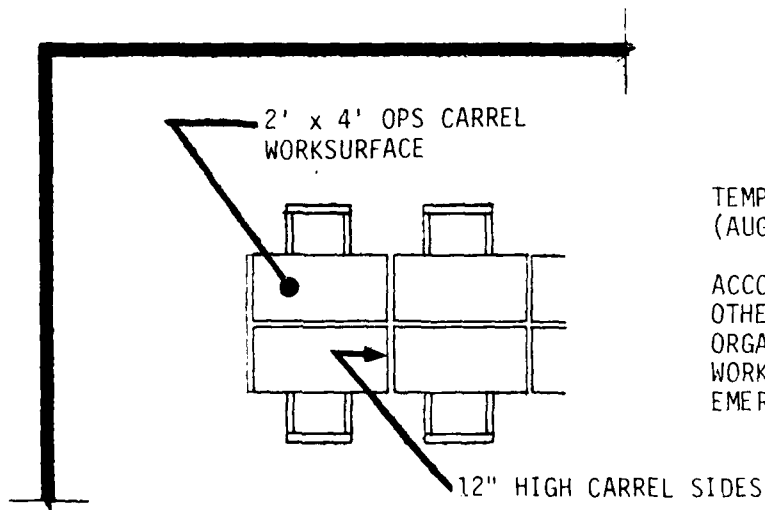
PROFESSIONAL STAFF 3.3

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

GUIDANCE



PERMANENT STAFF POSITION
ACCOMMODATES PERMANENT
EMERGENCY OPERATIONS
COORDINATOR IF ON STAFF



TEMPORARY POSITION
(AUGMENTATION)

ACCOMMODATES PERSONNEL FROM
OTHER DIVISION/DISTRICT
ORGANIZATIONS WHICH MUST
WORK OUT OF THE EOC DURING
EMERGENCY SITUATIONS

COMMENTARY

1. Area based on study of task-related concerns.
2. Accepted practice.
3. AIA, Architectural Graphic Standards, New York, John Wiley and Sons, Inc., 1970, p. 504.
4. CERL research.
5. Accepted practice.
6. AIA, p. 639.
7. Emergency energy guidelines may dictate 65° minimum for heating and 80° for cooling.
8. CERL research.
9. CERL research.

3.4 CLERICAL STAFF

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

FUNCTION

Perform clerical and typing functions as required to assist in performance of mission.

ACTIVITIES/USERS

Typing/Filing
Administrative Support
Staff Paperwork
Storage
Secretary

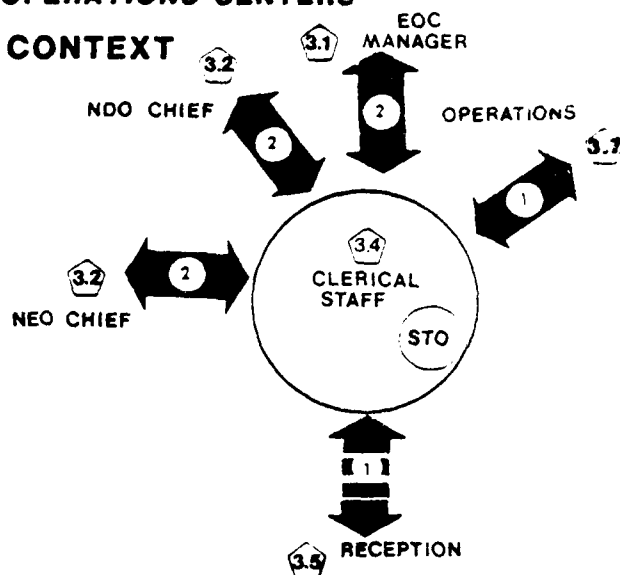
FURNISHINGS/EQUIPMENT

Typist desk with chair
4-drawer file unit (1 to 3 per station)
2 bookcase units

REQUIREMENTS

1. Adequate area.
2. Adequate ceiling height.
3. Noise reduction.
4. Visibility from entry.
5. Electrical supply.
6. Adequate lighting.
7. Adequate thermal comfort.
8. Phone.
9. Storage.
10. See guidance.

CONTEXT



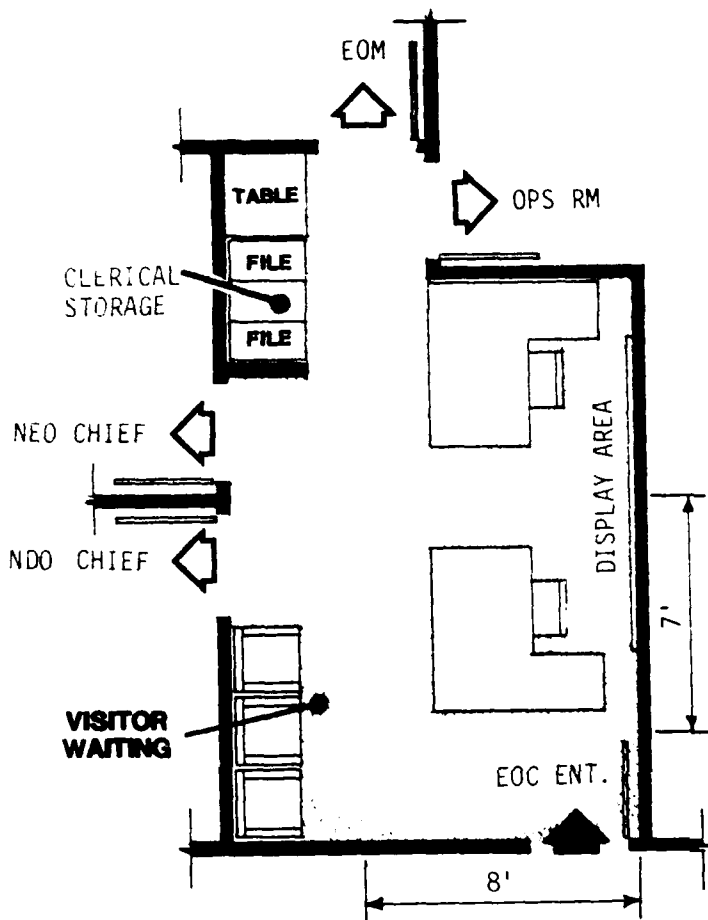
CRITERIA

1. 60 to 75 sq ft including storage, open.
2. 9 ft minimum for open plan office schemes.
3. Enclosing walls: STC 40. Provide sound-absorptive materials, such as carpeting, sound-deadening wall treatment, insulation, etc.
4. Maximum partition height = 42 in.
5. 110-V electrical outlets as required.
6. General lighting: 20 to 30 foot-candles. Task lighting: 60 to 80 footcandles. Surface reflectances:
Ceilings: 80 to 90%
Wall: 40 to 60%
Floor: 20 to 40%
7. 68° (heating), 78° (cooling) dry-bulb temperature. 50 to 70% relative humidity; 15 CFM/person outside air minimum ventilation.
8. Multi-line phone.
9. Provide counter for staff coffee and associated supplies. Provide some degree of enclosure for files and other storage.

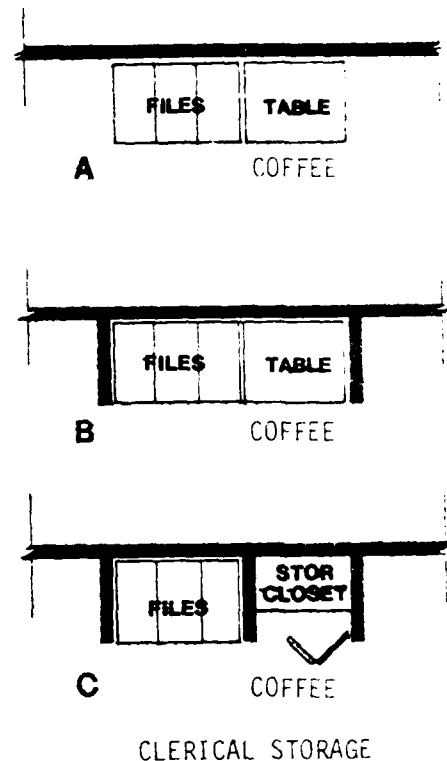
CLERICAL STAFF 3.4

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

GUIDANCE



THIS SCHEME ALLOWS FOR 1 EOC SECRETARY AND ONE CLERICAL ASSISTANT



OPTION "A" IS THE LEAST DESIRABLE CONDITION. NOTE SPACE PROVIDED FOR COFFEE POT AND ACCESSORIES

COMMENTARY

1. Area based on a study of task-related concerns.
2. Accepted practice.
3. AIA, Architectural Graphic Standards, New York, John Wiley and Sons, Inc., 1970, p. 504.
4. CERL research.
5. Accepted practice
6. AIA, p. 639
7. Emergency energy guidelines may dictate 65° minimum for heating and 80° for cooling.
8. CERL Research
9. CERL Research

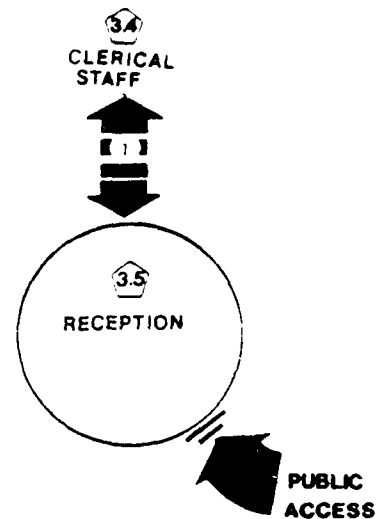
3.5 RECEPTION

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

FUNCTION

Receive and control flow of visiting personnel.

CONTEXT



ACTIVITIES/USERS

Waiting/Reception
Visitors (3 to 5)

FURNISHINGS/EQUIPMENT

3 to 5 side chairs
Side table
Optional: coat rack, plants

REQUIREMENTS

1. Adequate space.
2. Adequate ceiling height.
3. Noise reduction.
4. Direct access and visibility with secretary for control.
5. Electrical supply.
6. Adequate lighting.
7. Adequate thermal control.
8. Proper military image as a strong professional organization.
9. Graphics depicting function of EOC.

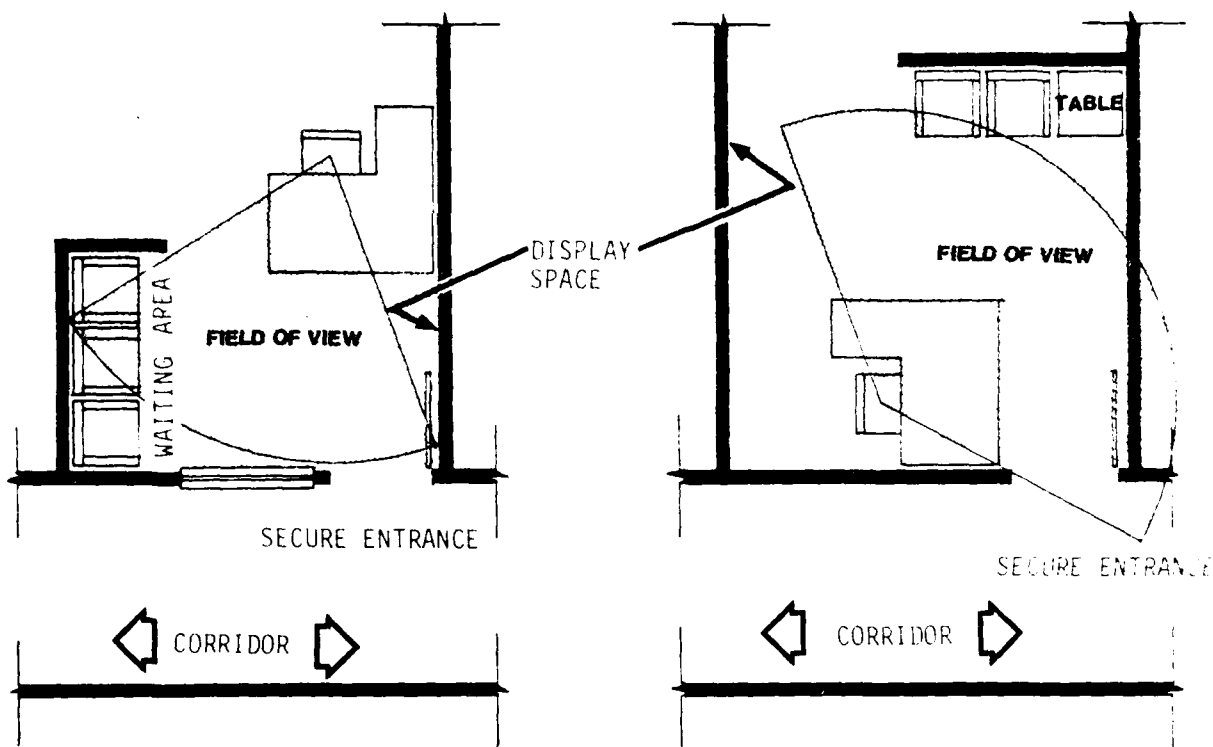
CRITERIA

1. 40 to 80 sq ft, open.
2. 9 ft minimum for open office plan.
3. Provide sound-absorptive materials such as carpeting, sound-deadening wall treatment, insulation, etc.
4. Identifiable entry with immediate view of reception.
5. 110-V electrical outlets as required.
6. General lighting: 20 to 30 foot-candles. Task lighting: 60 to 80 foot-candles. Surface reflectances:
Ceilings: 80 to 90%
Wall: 40 to 60%
Floor: 20 to 40%
7. 68° (heating), 78° (cooling) dry-bulb temperature. 50 to 70% relative humidity.
8. Comfortable seating, durable carpet.
9. See decor information.

RECEPTION 3.5

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

GUIDANCE



COMMENTARY

1. Area based on functional and image requirements.
2. Accepted practice.
3. AIA, Architectural Graphic Standards, New York, John Wiley and Sons, Inc., 1970, p. 504.
4. CERL research.
5. Accepted practice.
6. AIA, p. 639.
7. Emergency energy guidelines may dictate 65° minimum for heating and 80° for cooling.
8. CERL research.
9. CERL research.

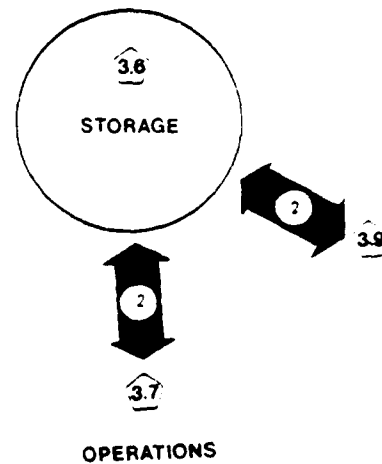
3.6 STORAGE

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

FUNCTION

Convenient, adequate storage of items used within the EOC.

CONTEXT



ACTIVITIES/USERS

Storage
Access by all personnel

FURNISHINGS/EQUIPMENT

One 5 x 3 x 7 ft closet
Two bookcases
Two cubicle shelves
Storage units (1 x 4 x 7 ft)

REQUIREMENTS

1. Adequate space.
2. Visually secure.
3. Adequate lighting in storage closet.

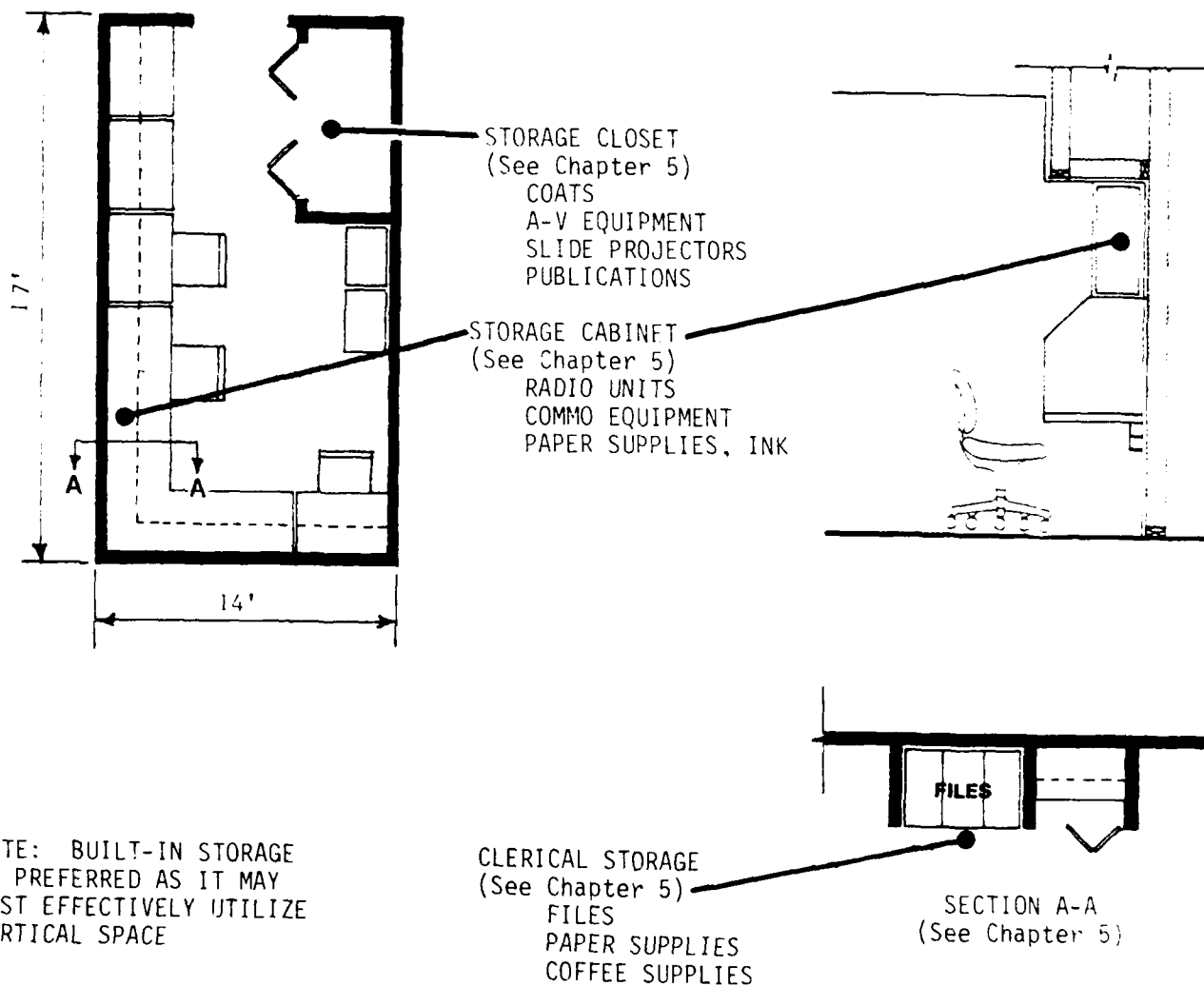
CRITERIA

1. Sufficient space to accommodate equipment requirements.
2. Cabinet doors with latches, locks not required.
3. General lighting: 10 to 20 foot-candles.

STORAGE 3.6

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

GUIDANCE



1. CERL research.
2. CERL research.
3. AIA, Architectural Graphic Standards,
New York: John Wiley and Sons, Inc.,
1970, p. 639.

COMMENTARY

3.7 OPERATIONS

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

FUNCTION

Serves as the operating center for staff personnel in monitoring emergencies and implementing Division/District Engineer decisions.

ACTIVITIES/USERS

Planning/briefing/conference display of charts, other visual aids Staff and visitors

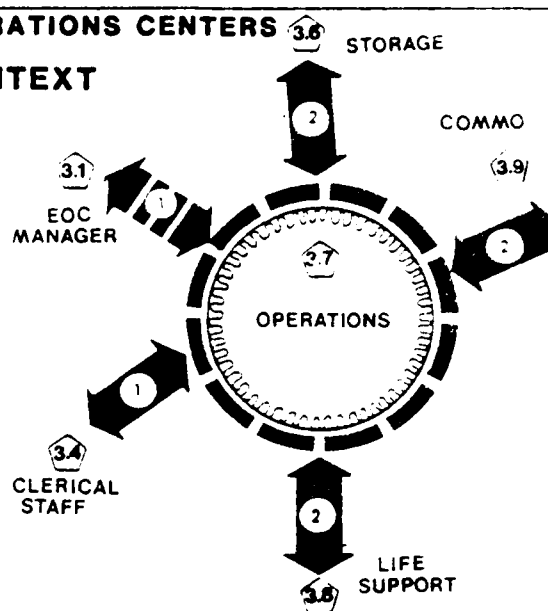
FURNISHINGS/EQUIPMENT

Six seating carrels
Two slide projectors for screens
One large 4 x 8 ft wall map
One tv/videotape recorder
Phones at each workstation

REQUIREMENTS

1. Adequate space.
2. Adequate ceiling height.
3. Acoustically private.
4. Visual privacy.
5. Electrical supply.
6. Phones.
7. Adequate lighting.
8. Adequate thermal comfort.
9. Professional military image.
10. Accessible phone lines.
11. Inter-office communication.
12. Storage of TV and audio-visual equipment for easy use.
13. Direct access with EOC manager.
14. Ability to mount charts at ceiling height.

CONTEXT



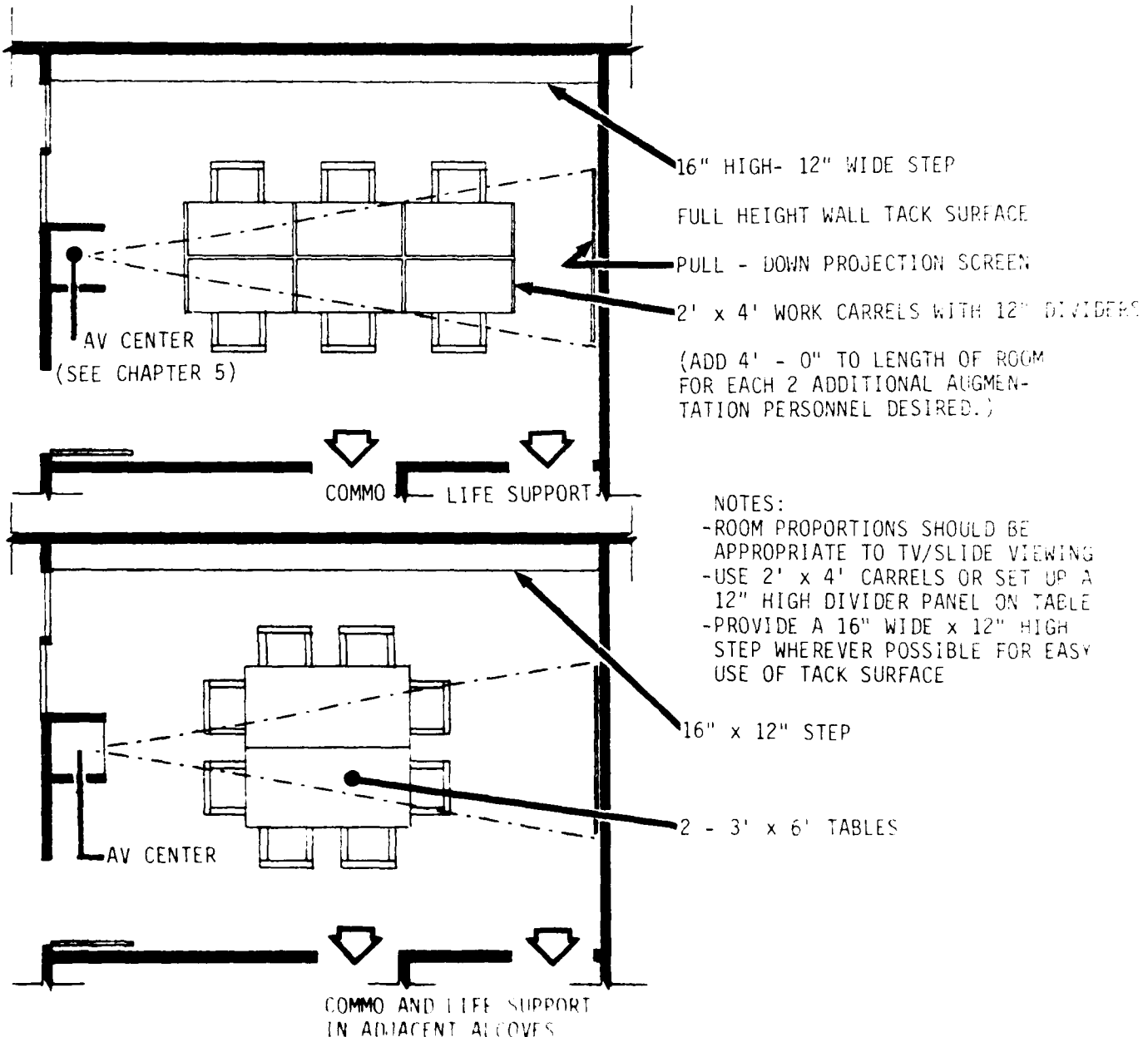
CRITERIA

1. 120 sq ft + (number of people) x (30 sq ft).
2. 9 ft minimum.
3. Enclosed walls STC: 45 to 50; use materials such as carpeting or carpet-like covering.
4. Completely enclosed room with full height walls.
5. 110-V electrical outlets as required, and outlets for A-V equipment and projectors.
6. Phones at each carrel for augmentation staff.
7. General lighting: 50 to 70 foot-candles. Task lighting: 60 to 80 foot-candles.
Surface reflectances:
Ceilings: 80 to 90%
Wall: 40 to 60%
Floor: 20 to 40%
8. 68° (heating), 78° (cooling) dry-bulb temperature.
50 to 70% relative humidity
15 CFM/person outside air minimum ventilation.
9. Comfortable seating, sturdy work carrels.
10. Multi-phone line.
11. Inter-office intercom.
12. Storage cabinet (see guidance).
13. Sliding glass door with vision screen.
14. 16-in. step for mounting charts/graphs.

OPERATIONS 3.7

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

GUIDANCE



1. Area based on a study of task-related concerns.
2. Standard practice.
3. AIA, Architectural Graphic Standards, New York, John Wiley and Sons, Inc., 1970, p. 504.
4. CERL research.
5. Standard practice.
6. CERL research.
7. AIA, p. 639.

COMMENTARY

8. Emergency energy guidelines may dictate 65° minimum for heating and 80° for cooling.
9. CERL research.
10. CERL research.
11. CERL research.
12. CERL research.
13. CERL research.
14. CERL research.

3.8 LIFE SUPPORT

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

FUNCTION

To provide 24-hour Life Support for staff during emergencies.

CONTEXT

OPERATIONS

ACTIVITIES/USERS

Sleeping and food preparation during emergencies
Staff personnel

FURNISHINGS/EQUIPMENT

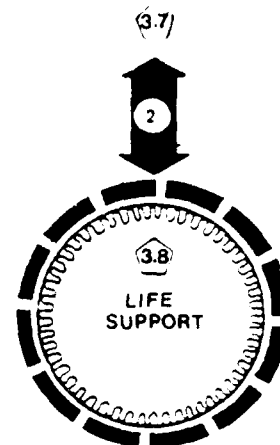
4 sleeping cots "bunk" style
1 microwave; food preparation counter
1 small refrigerator
1 small sink

REQUIREMENTS

1. Adequate area.
2. Adequate ceiling height.
3. Acoustical privacy.
4. Visual privacy.
- 5a. Electrical supply.
- 5b. Protected water supply.
6. Adequate lighting.
7. Adequate thermal comfort.
8. Easily maintained floor at food preparation counter.
9. Storage for food stuffs and cooking equipment.

CRITERIA

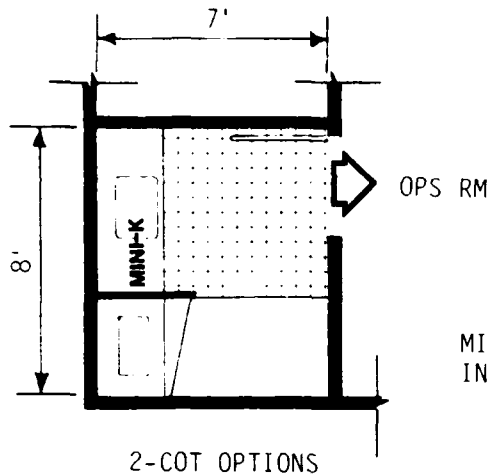
1. 75 to 100 sq ft, enclosed.
2. Minimum 8 ft ceiling height.
3. Enclosing walls: STC: 45 to 50; use materials such as carpeting, sound-deadening wall treatment, insulation, etc.
4. Fully enclosed private sleeping area.
- 5a. 110-V electrical outlets as required.
- 5b. Bottled water if possible.
6. General lighting: 20 to 30 foot-candles. Task lighting: 60 to 80 foot-candles. Surface reflectances:
Ceiling: 80 to 90%
Wall: 40 to 60%
Floor: 20 to 40%
7. 68° (heating), 78° (cooling) dry-bulb temperature.
50 to 70% relative humidity.
15 CFM/person outside air minimum ventilation
exhaust fan over cooking area.
8. Vinyl asbestos tile or equivalent.
9. Standard kitchen cupboards or cabinets.



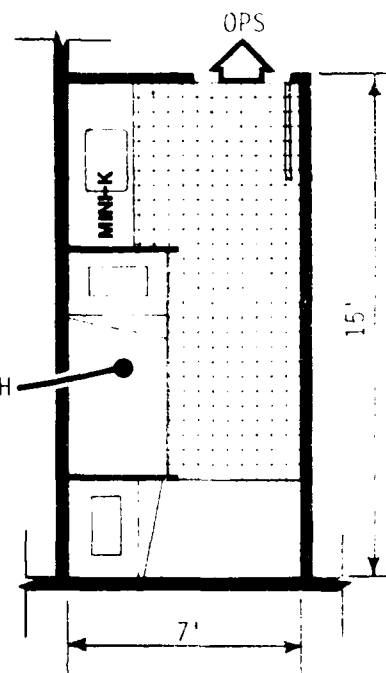
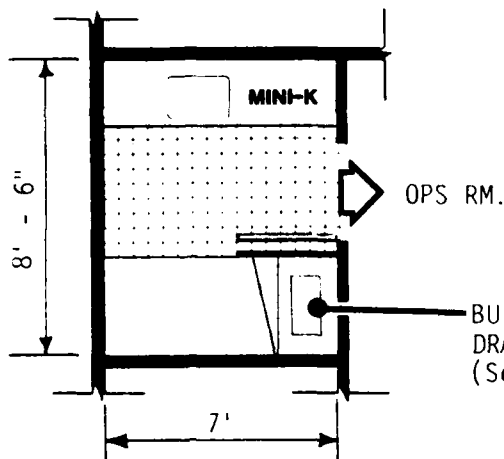
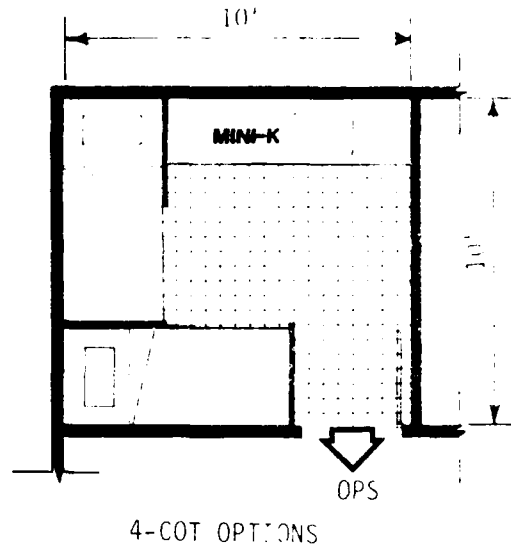
LIFE SUPPORT 3.8

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

GUIDANCE



MINI-KITCHEN TO INCLUDE:
SINK
STOVE SURFACE
MICROWAVE AREA
REFRIGERATOR
(See Chapter 4)



COMMENTARY

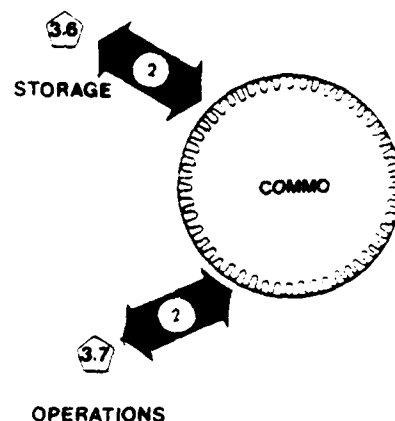
1. Area based on functional requirements.
2. Accepted practice.
3. AIA, Architectural Graphic Standards, New York: John Wiley and Sons, Inc., 1970, p. 504.
4. CERL research.
- 5a. Accepted practice.
- 5b. CERL research.
6. AIA, p. 639.
7. Emergency energy guidelines may dictate 65° minimum for heating and 80° for cooling.
8. CERL research.
9. Accepted practice.

3.9 COMMO

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

FUNCTION Reception and transmission of data primarily relevant to natural disasters, weather information, news releases; send and receive classified and unclassified communications as well as monitor intelligence-gathering equipment.

CONTEXT



ACTIVITIES/USERS

Communications

Communications Technician/Operator

FURNISHINGS/EQUIPMENT

2 Desk-type telecopiers 1 SSB radio
 1 Computer terminal Sewre telephone
 1 NAWAS alert system Sewre teletype
 20 Hand-held radio units and charges

REQUIREMENTS

1. Adequate area.
2. Adequate ceiling height.
3. Acoustical isolation.
4. Visual separation.
5. Electrical supply.
6. Adequate lighting.
7. Adequate thermal comfort.
8. Storage for hand-held radio units and charges.
9. Noise control for teletype.
10. Secure telephone.

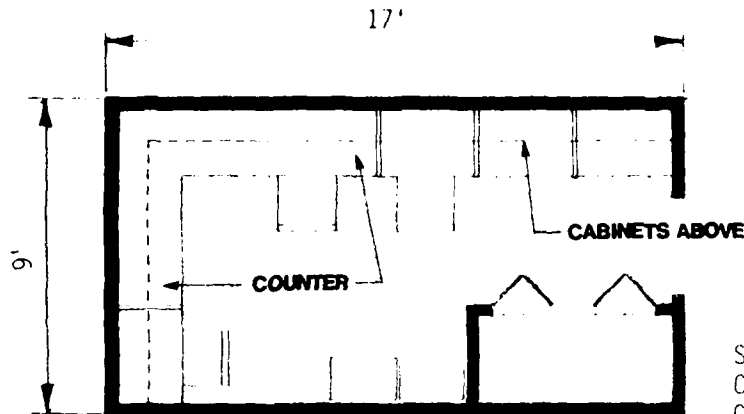
CRITERIA

1. 75 to 90 sq ft.
25 to 30 sq ft.
2. Minimum 8-ft ceiling height.
3. Enclosing walls: STS 45 to 50; use absorptive materials such as carpeting, acousticord, and insulation.
4. 68-in.-high partitions between workstations.
5. 110-V outlets as required.
6. General lighting: 20 to 50 foot-candles. Task lighting: 75 to 150 foot-candles. Surface reflectances:
 Ceiling: 80 to 90%
 Wall: 40 to 60%
 Floor: 20 to 40%
7. 68° (heating), 78° (cooling) dry-bulb temperatures.
8. See guidance.
9. See guidance (Section 3.12).
10. As required.

COMMO 3.9

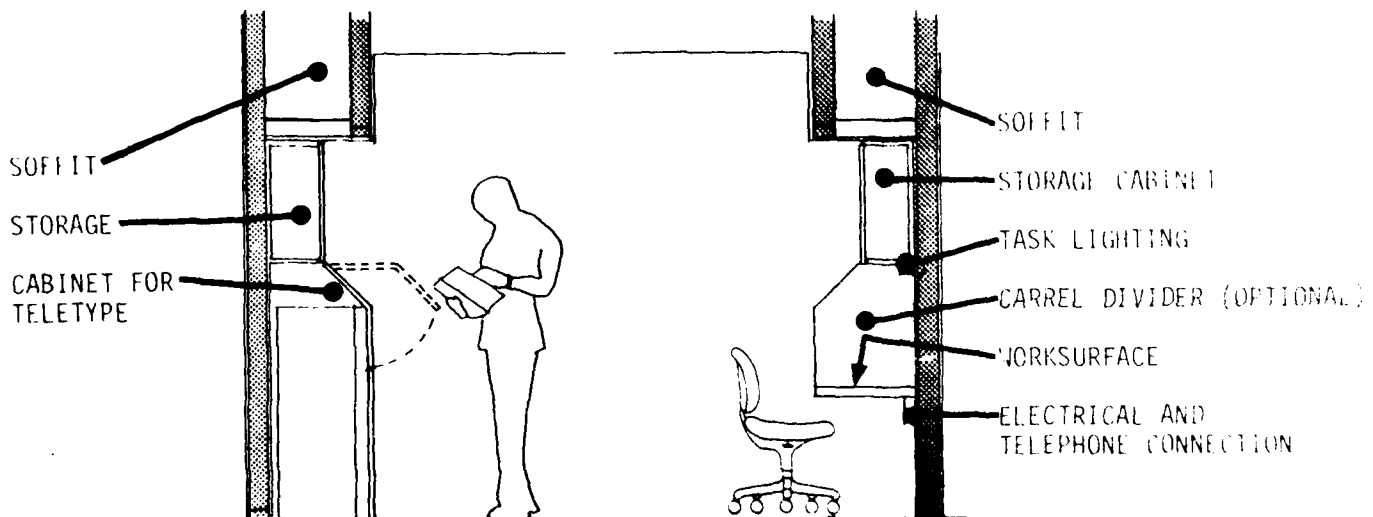
DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

GUIDANCE



SECURE COMMO IS A COMPONENT OF THE TOTAL COMMUNICATION AREA

ALLOWANCE SHOULD BE MADE FOR SECURE VOICE AND TELETYPE COMMUNICATION



COMMENTARY

1. Area based on functional requirements.
2. Accepted practice.
3. AIA, Architectural Graphic Standards, New York: John Wiley and Sons, Inc., 1970, p. 504.
4. CERL research.
5. Accepted practice.
6. AIA, p. 639.
7. Emergency energy guidelines may dictate 65° minimum for heating and 80° for cooling.
8. CERL research.
9. CERL research.
10. As required.

**DECOR
INFORMATION 4**

GENERAL DECOR, EOM 4

DECOR INFORMATION - EMERGENCY OPERATIONS CENTERS

GENERAL DECOR:

FLOOR COVERING

Carpet - 100% nylon level loop or cut pile commercial grade; neutral color; bold patterns discouraged.

In Life Support area, use vinyl asbestos tile in a color that complements the carpeting.

WALL PAINT

Off-white base paint.

If accent color is desired, use earth-tone colors.

CURTAINS

Off-white open-weave fabric.

WINDOW SHADES

White vinyl (opaque).

PARTITIONS

Fabric-covered; color to either blend in with new furnishings or to be used as accent.

CHAIRS

Select color for use as accent.

EOM:

CHAIRS

DESK

GSA Contemporary Steel Office Furniture

CREDENZA

SIDE CHAIRS

ROUND TABLE

30-in. diameter; wood grain plastic laminate top.

4 NEO/NDO, PROFESSIONAL, CLERICAL/RECEPTION

DECOR INFORMATION-EMERGENCY OPERATIONS CENTERS

NEO/NDO:

CHAIRS
DESK
CREDENZA

GSA Contemporary Steel Office Furniture

PROFESSIONAL STAFF:

PARTITIONS

62 in. high minimum

DESK

CHAIRS

GSA Contemporary Steel Office Furniture

FILE CABINET

For temporary staff member, see Chapter 3 (3.4) and Decor Information Sheet on Operations.

CLERICAL STAFF/RECEPTION:

DESK

CHAIR

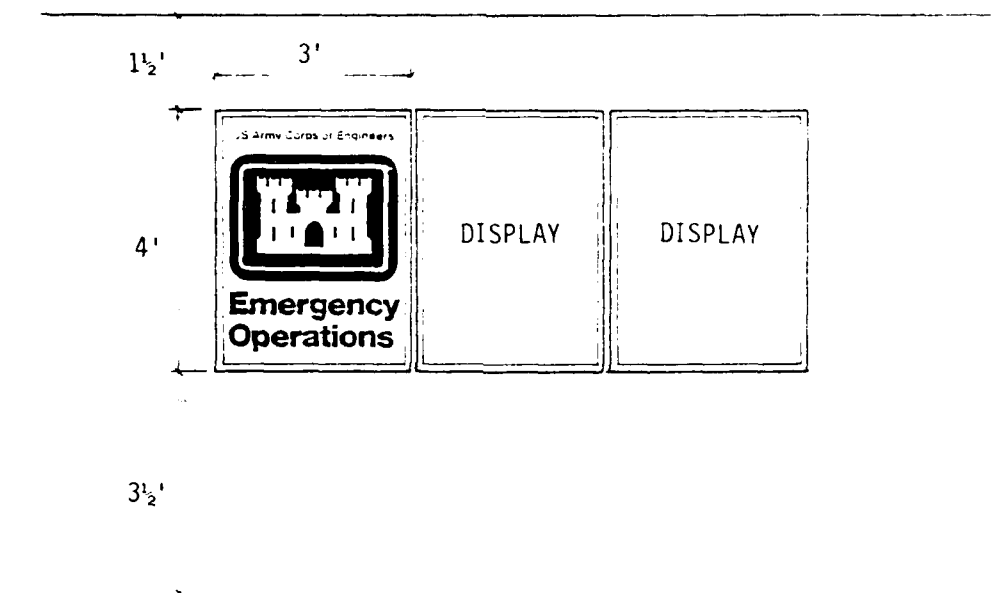
GSA Contemporary Steel Office Furniture

FILE CABINETS

On one wall, use emblem of EOC. Pictures of natural disasters and emergencies or other appropriate graphic displays depicting EOC functions or activities should be incorporated. Each should be about 3 ft long x 4 ft high, separately framed and displayed together. (See example.)

OPERATIONS 4

DECOR INFORMATION - EMERGENCY OPERATIONS CENTERS



OPERATIONS AREA:

CHAIRS

GSA Contemporary Steel Office Furniture

SCREEN

Combination horizontal or vertical sliding white board with District/Division map and a white board projection screen when the situation allows. Otherwise, use separate white board with map and projection screen. For larger-scale maps, mount the maps on 1/8 in. tempered masonite over which 1/8-in. Plexiglass should be mounted. All should be enclosed with a metal picture frame.

WALL COVERINGS

Sound-deadening wall treatment.

4 LIFE SUPPORT

DECOR INFORMATION-EMERGENCY OPERATIONS CENTERS

FLOOR COVERING

Neutral-colored carpet.

CARRELS

Each section has a 24- x 48-in. work surface with 12-in. high carrel sections to be mounted on top. If carrel sections are not desired, use either 30- x 60-in. or 36- x 72-in. GSA Contemporary Steel Office Furniture tables. All tables are to have walnut-grain plastic laminate tops.

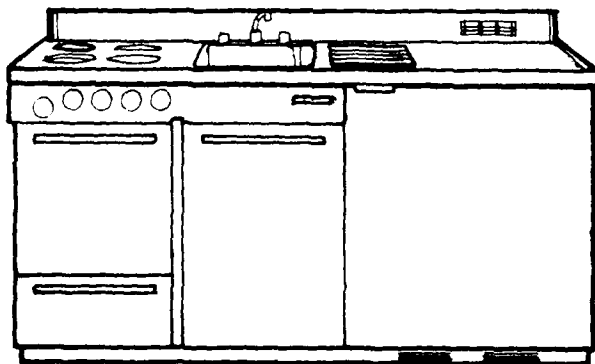
A-V CABINETS

For details, see Chapter 5 on Construction Information. Use sound-deadening wall treatment as finish.

LIFE SUPPORT:

MINI KITCHEN

Should include a sink, small stove, refrigerator, and counter space for microwave. (See example below.)



SLEEPING

Bunk beds or one single bed, whichever is needed.

COMMO, GSA OFFICE FURNITURE 4

DECOR INFORMATION -EMERGENCY OPERATIONS CENTERS

COMMO AREA:

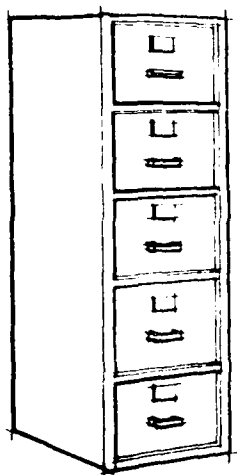
CHAIRS

GSA Contemporary Steel Office Furniture

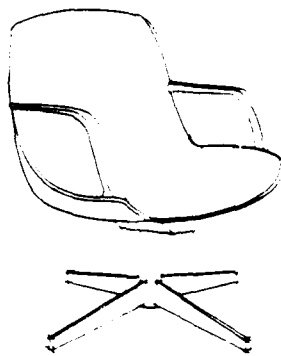
WORK SURFACE

Built-in counter (24-in.) with plastic laminate top and cabinets above (12 in. deep). For detailed drawing, see Chapter 5 on Construction Information.

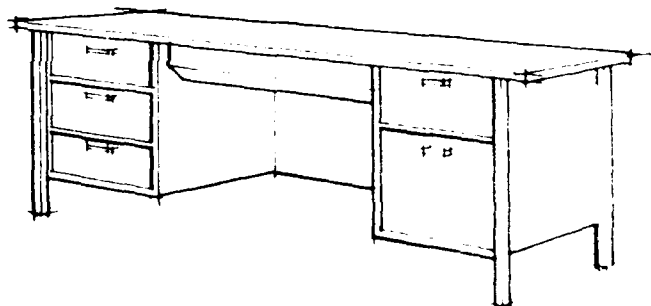
GSA CONTEMPORARY STEEL OFFICE FURNITURE:



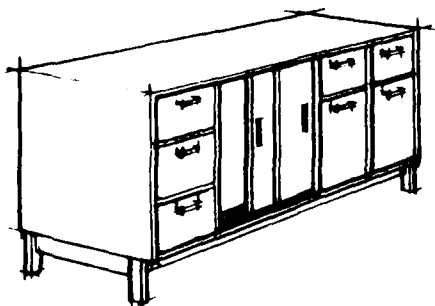
5-DWR. FILE CAB.



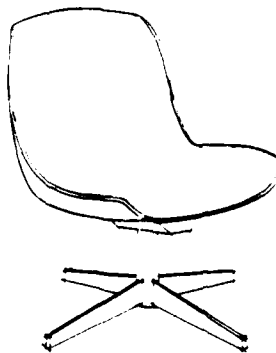
DESK CHAIR



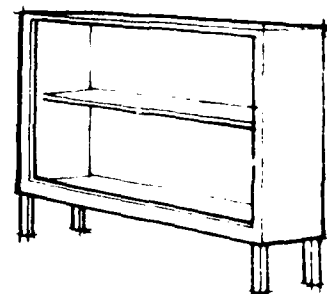
DESK



CREDENZA



SIDE/CLERICAL CHAIR



BOOKCASE

**CONSTRUCTION
INFORMATION**

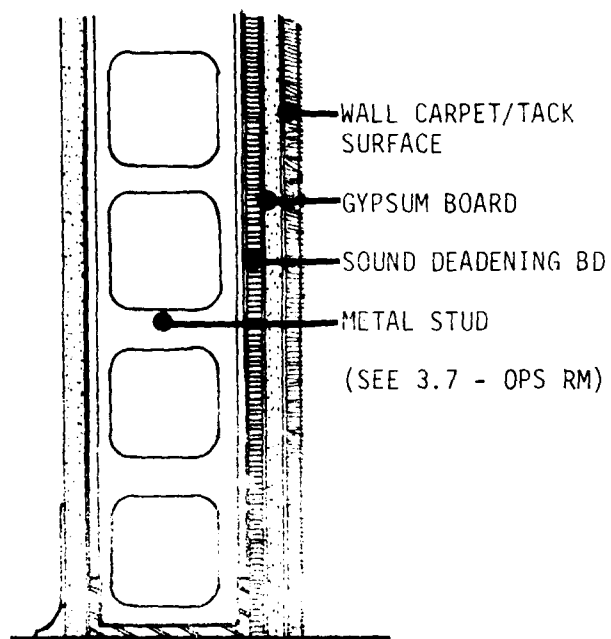
5

This section provides information about the design development of some of the built-in features indicated for the EOC. The information will show features of the built-in areas, rather than detailed construction documents.

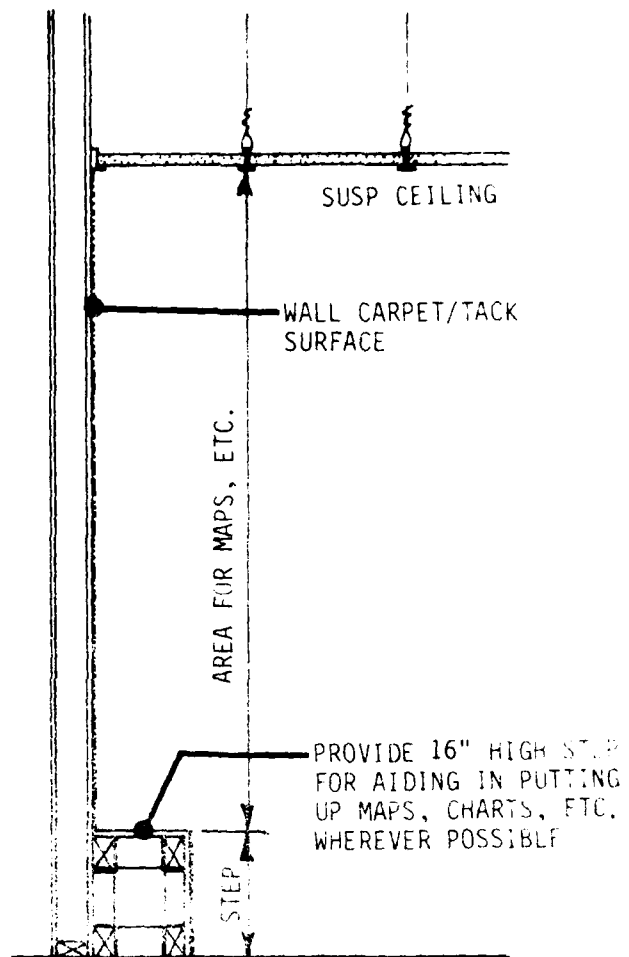
Built-in features within an EOC are desirable for several reasons. First, more efficient use is made of the areas given. Vertical space is used more effectively, allowing for a compact, efficient item. Second, since the EOC represents a permanent commitment of space, the relative inflexibility of built-in areas is not a negative consideration.

5.1 OPS WALL

CONSTRUCTION INFORMATION-EMERGENCY OPERATIONS CENTERS



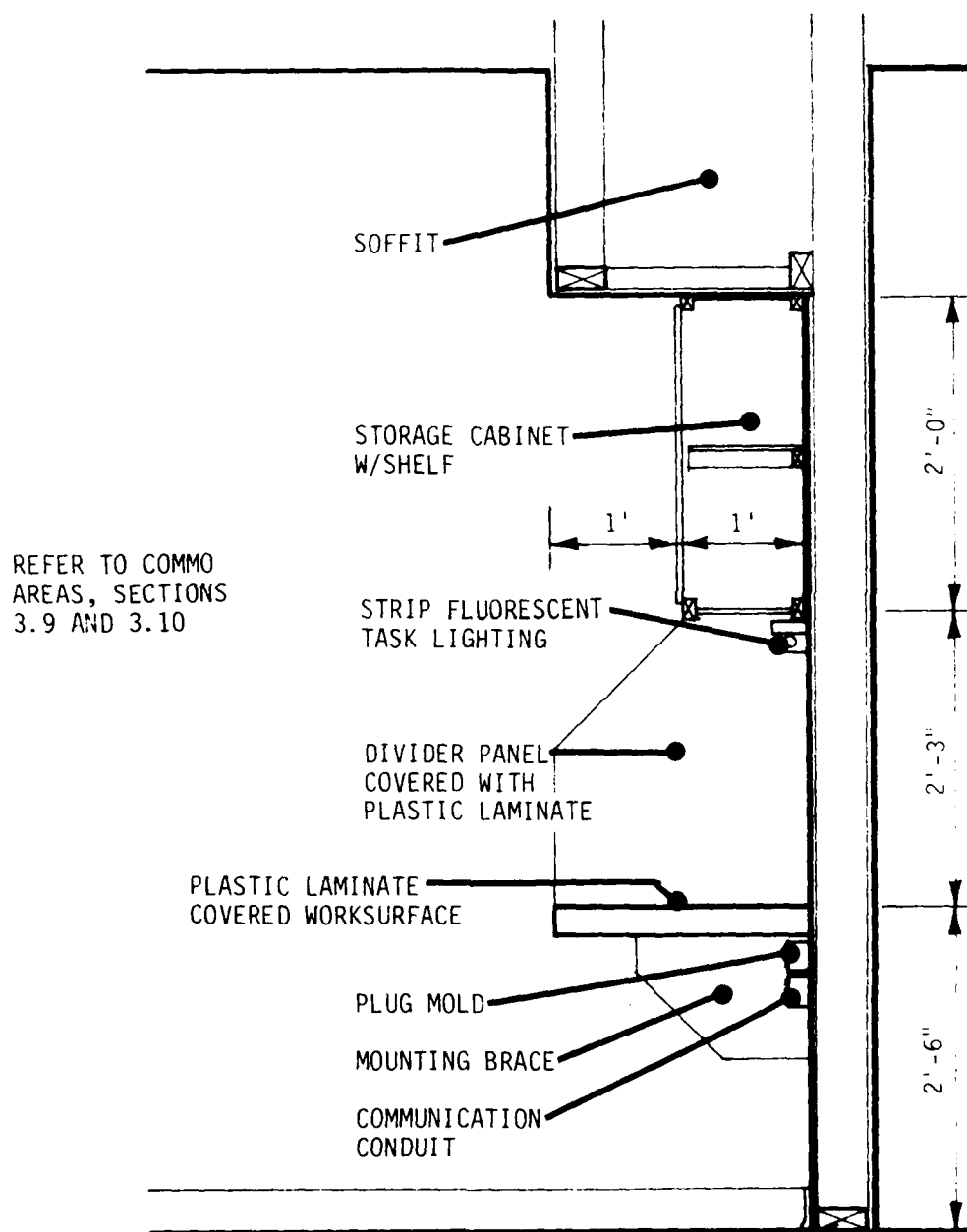
WALL CONSTRUCTION



TYPICAL OPS WALL

COMMO COUNTER 5.2

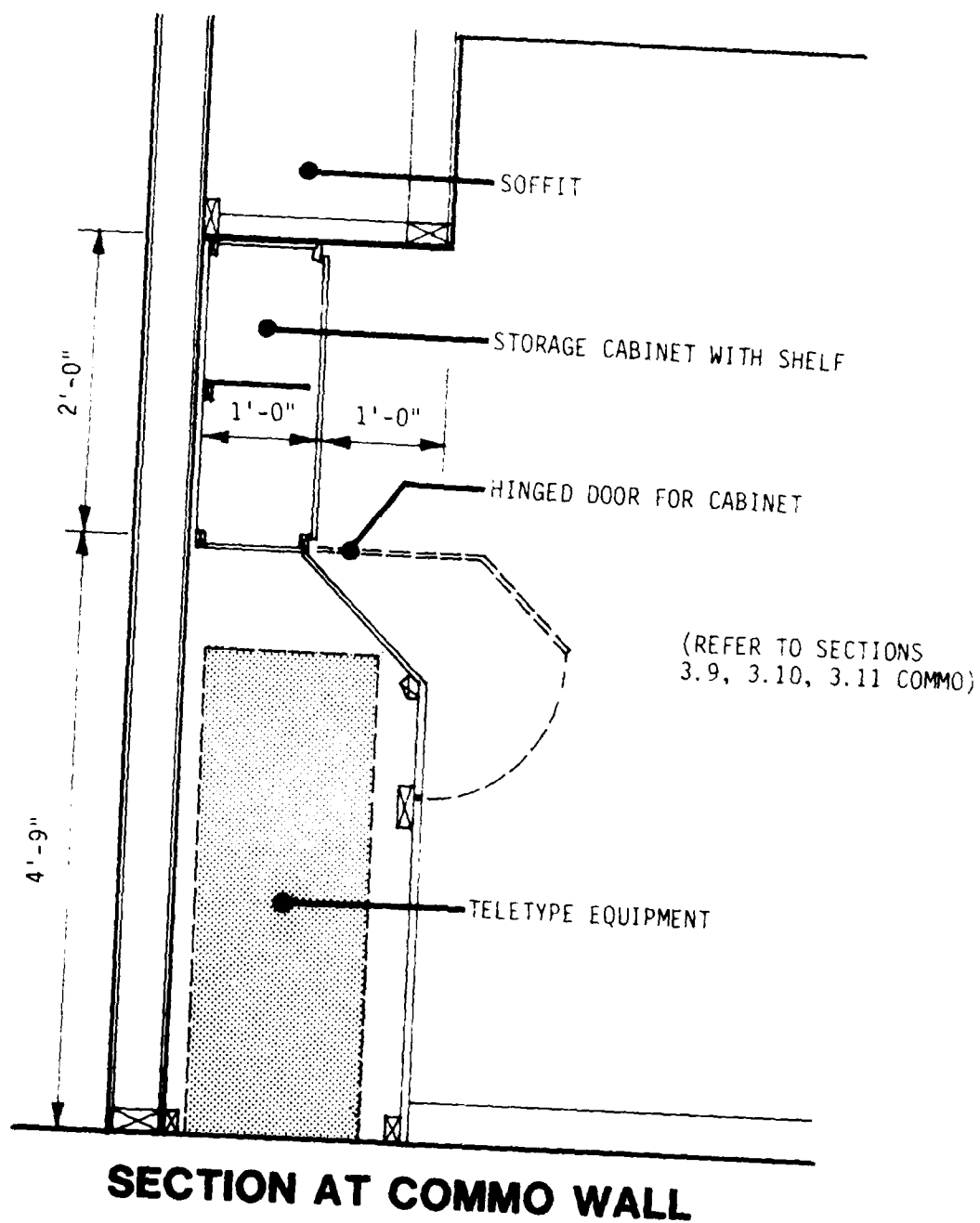
CONSTRUCTION INFORMATION-EMERGENCY OPERATIONS CENTERS



SECTION AT COMMO WALL

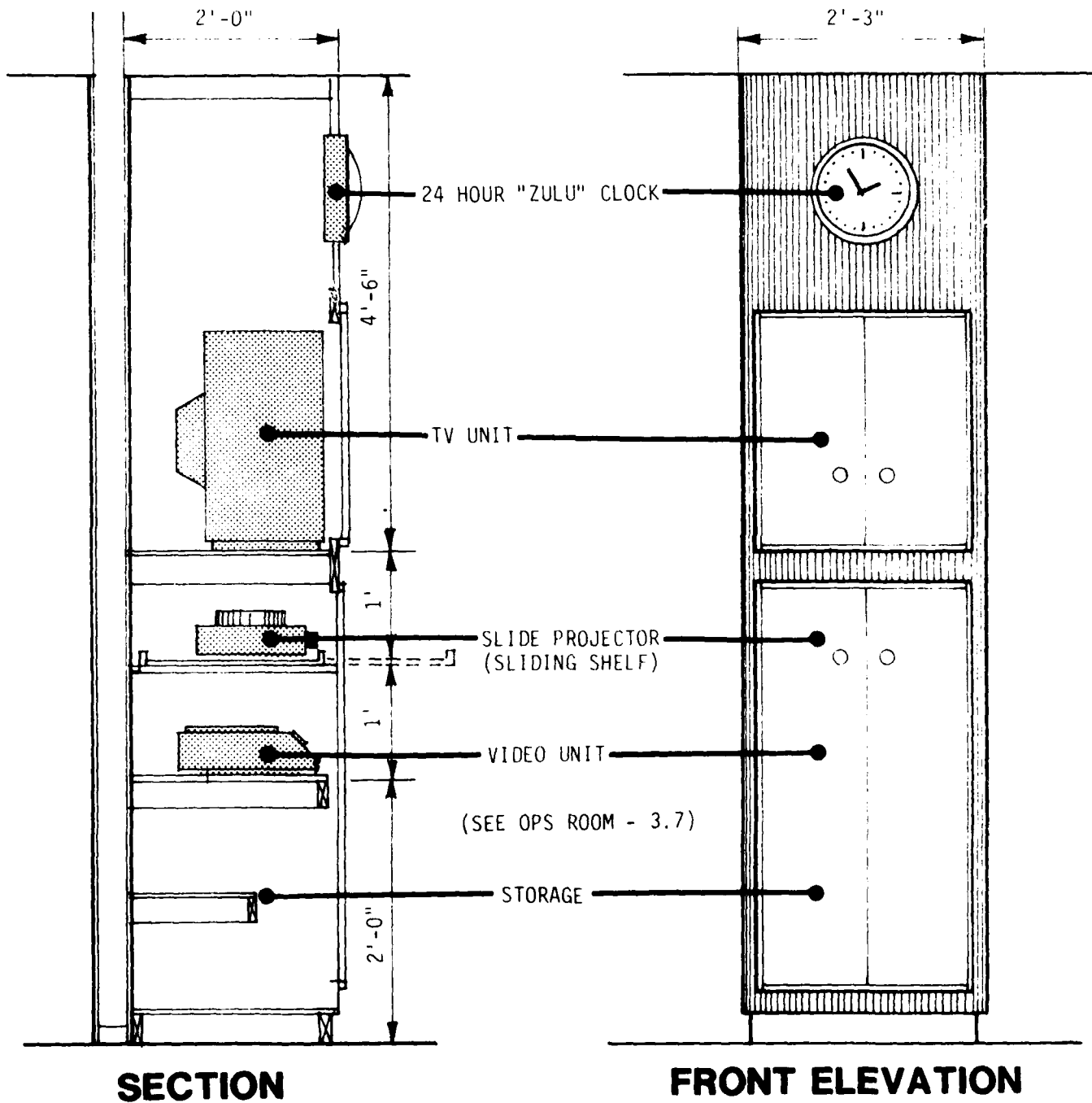
5.3 TELETYPE

CONSTRUCTION INFORMATION-EMERGENCY OPERATIONS CENTERS



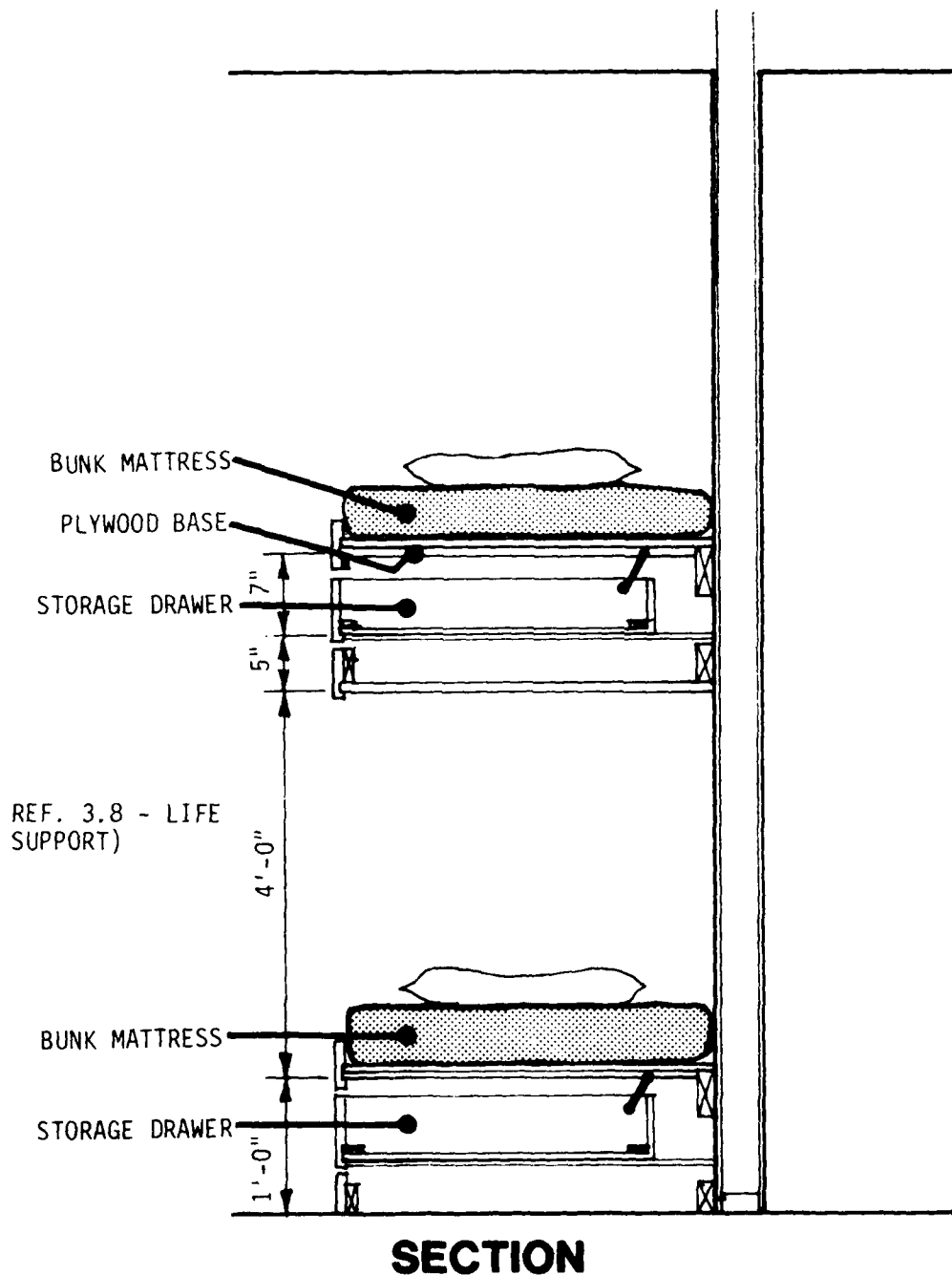
A-V CABINET 5.4

CONSTRUCTION INFORMATION-EMERGENCY OPERATIONS CENTERS



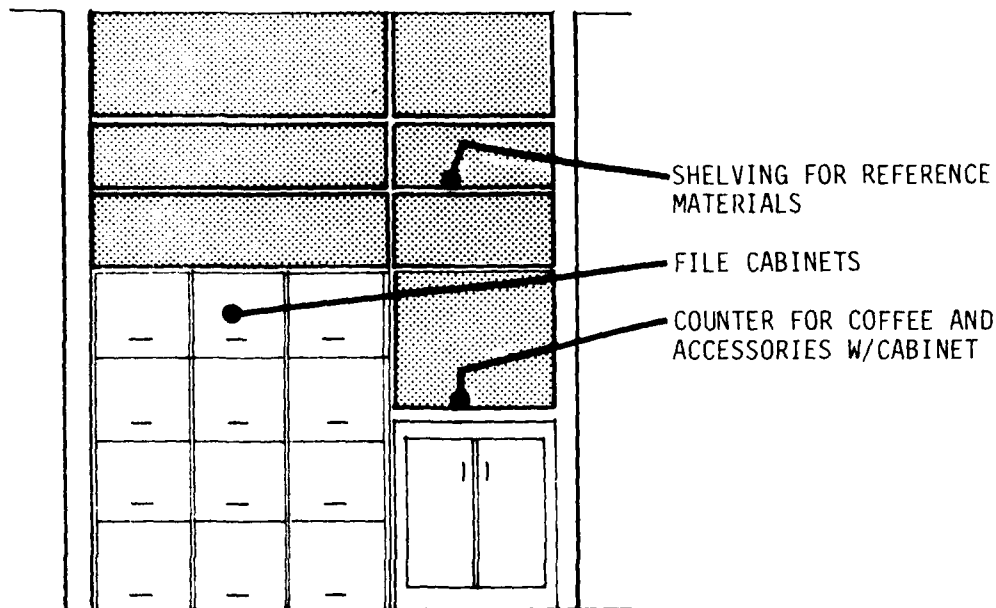
5.5 BUILT-IN BUNKS

CONSTRUCTION INFORMATION-EMERGENCY OPERATIONS CENTERS

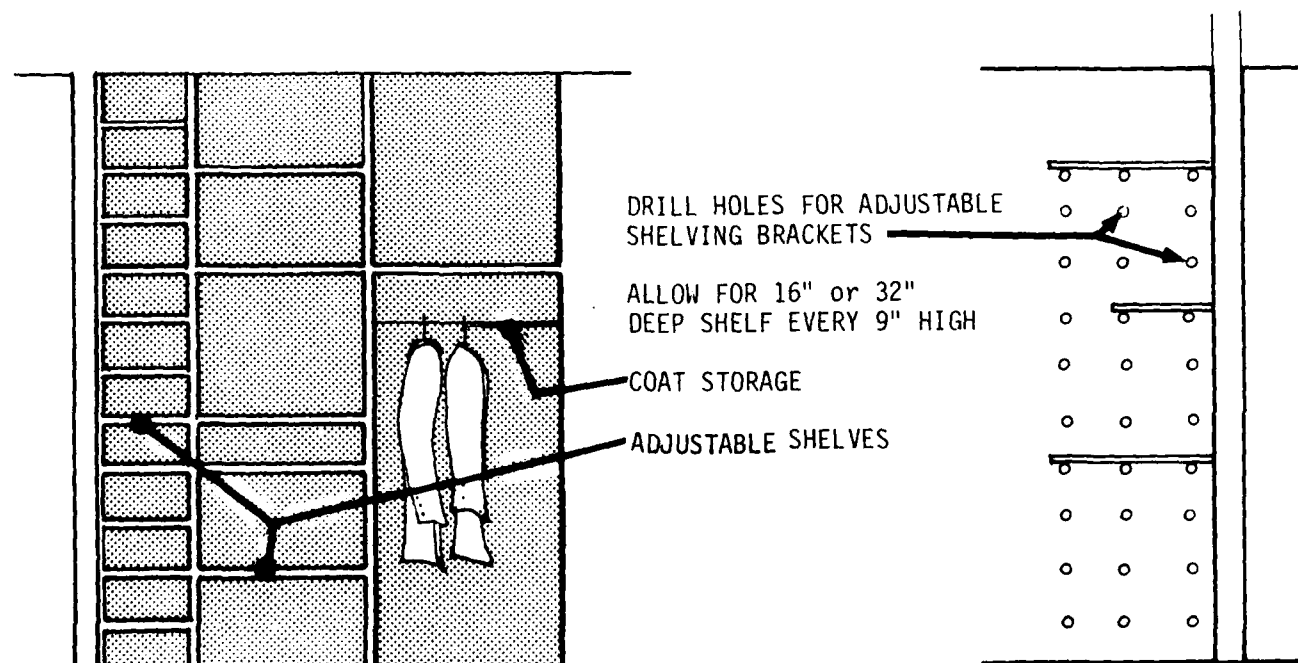


BUILT-IN STORAGE 5.6

CONSTRUCTION INFORMATION-EMERGENCY OPERATIONS CENTERS



CLERICAL STORAGE - FRONT VIEW



FRONT VIEW

SECTION

COMMO/OPS STORAGE

(REF 3.7, 3.9, 3.10, 3.11)

**CASE
STUDIES 6**

CASE STUDIES 6.0

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

Most of the information in this appendix was developed through interviews with Emergency Operations personnel at OCE, Divisions, and Districts. Much of the guidance information was determined by designing EOCs at Sacramento District, Mobile District, Rock Island District, South Pacific Division.

The following case studies are presented as examples of how an EOC can be established within local constraints. It is recognized that these examples will directly apply only to the situations for which they were designed.

6.1 CASE STUDY: SACRAMENTO DISTRICT

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

SITUATION

Sacramento District has three Emergency Operations personnel: an EOM, a National Emergency Coordinator, and a Natural Disaster Coordinator. Clerical personnel are shared with CONOPS division and are located in that organization's area. The only space provided for the EOC was one room for staff workstations. Additional space for an Operations Room had been requested.

SOLUTION

Space adjacent to the staff office area was selected for the Operations and Commo Rooms. Space is severely limited at the District offices, and another organizational element had to be relocated to get the additional space; thus, it was decided that an operations/conference space would minimize the impact on existing organizations. Space for the Commo Room was provided between the operations/conference room and the staff offices.

One unique feature of the Sacramento District EOC area is a built-in counter in the operations area for a CRT and a keyboard. During natural disasters, the EOC is in touch with the State of California Flood Control Center. The Center has a computer database that the EOC wanted to access so the keyboard and CRT were needed.

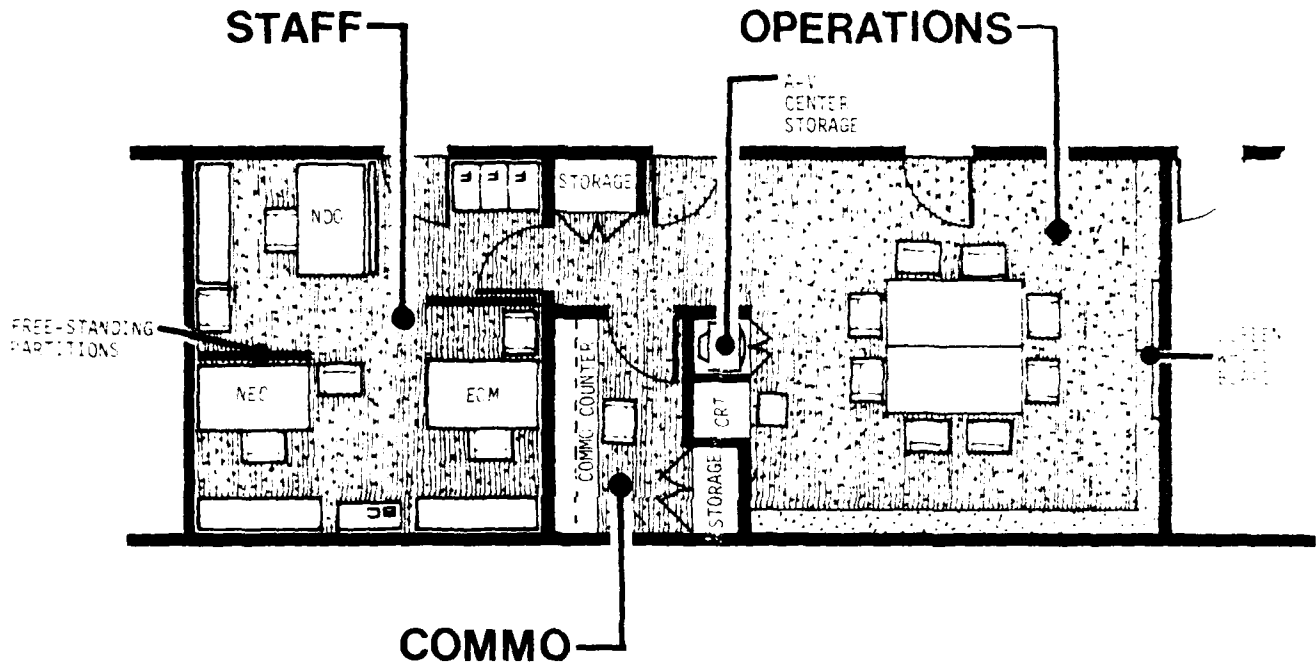
The staff workstation area is less than optimum due to space constraints. However, some effort has been made to define individual workstations by using free-standing partitions.

This EOC design solution requires 710 sq ft.

SACRAMENTO DISTRICT 6.1

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

PLAN



6.2 CASE STUDY: MOBILE DISTRICT

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

SITUATION

The new Mobile District EOC was designed at a time when the layout of all the District's office space was being studied. This study presented an opportunity to establish adequate space for the EOC without taking space from a neighboring organization.

At Mobile, the Emergency Operations Manager has the rank of division chief. The emergency operations organization is divided into two branches: the Natural Disaster Branch, and the National Emergency Branch. Each branch has a chief, and there are also two clerical personnel.

SOLUTION

A location on the second floor of the Federal Office Building was selected for the EOC. This location was selected for several reasons. The EOC should be on or as close as possible to the ground floor to minimize stair travel in case the elevators are inoperable because of a power outage. However, the ground floor of the Mobile District's office building could flood. If the EOC was located on the first floor and a flood occurred, it would be useless.

The new layout for the Mobile District offices provides enough space for all organization elements.

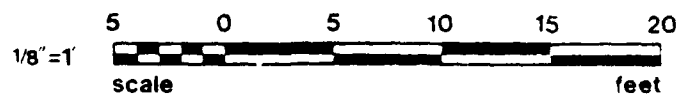
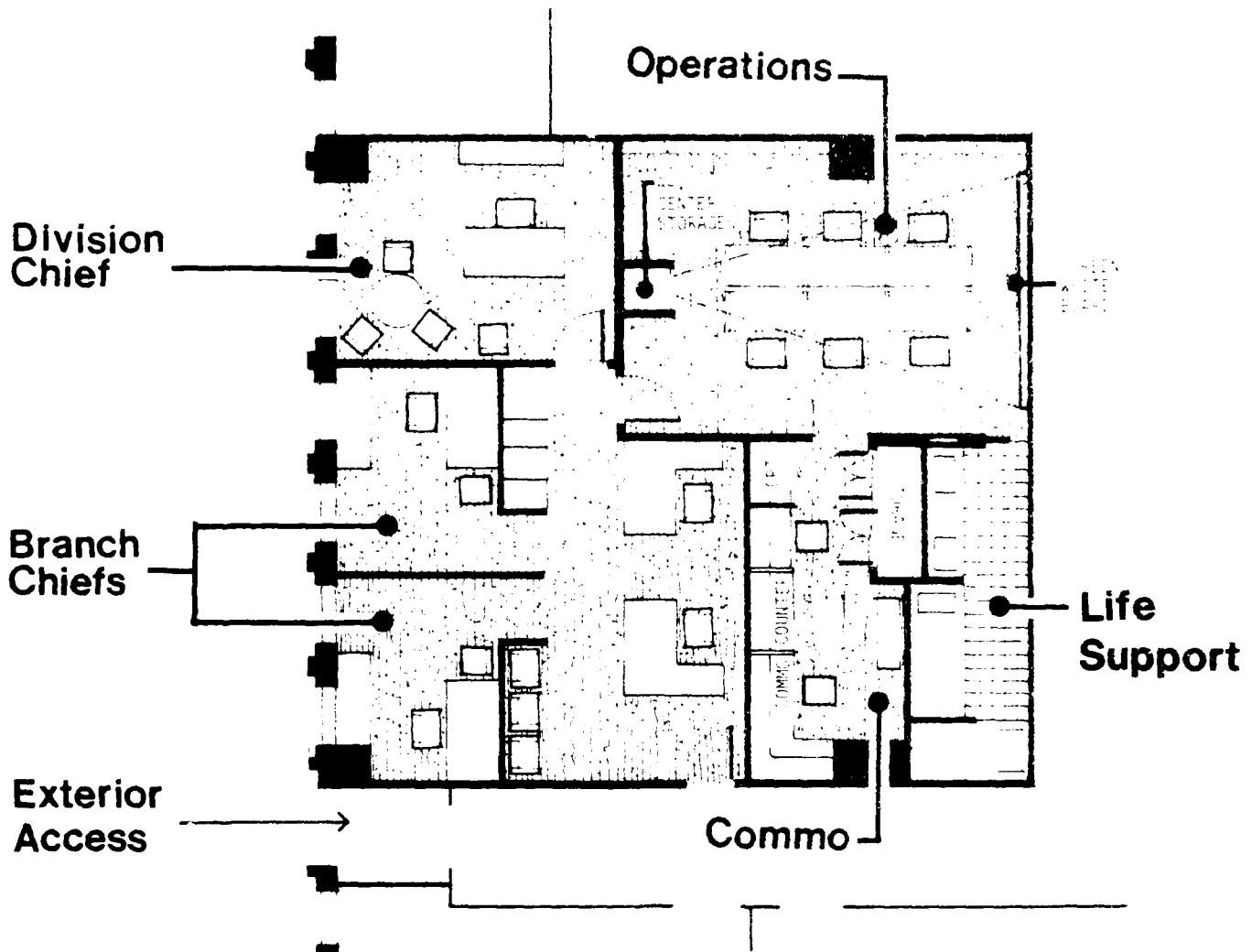
The design of the Mobile District EOC approaches the optimum. Each function -- Operations, Commo, Storage and Life Support -- has been provided a separate space, and there is adequate staff office space.

The design solution for this EOC required 1088 sq ft.

MOBILE DISTRICT 6.2

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

PLAN



6.3 CASE STUDY: ROCK ISLAND DISTRICT

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

SITUATION

The Rock Island District Emergency Management group has a four-person staff: an EOM, a Natural Disaster coordinator, a National Emergency Coordinator, and one clerical person. An annex to the existing District facility is being planned, and some other District organizations will occupy the annex. This move allowed a redistribution of space in the existing facility and provided an opportunity to plan adequate space for the EOC. An area on one corner of the third floor was set aside for the EOC.

SOLUTION

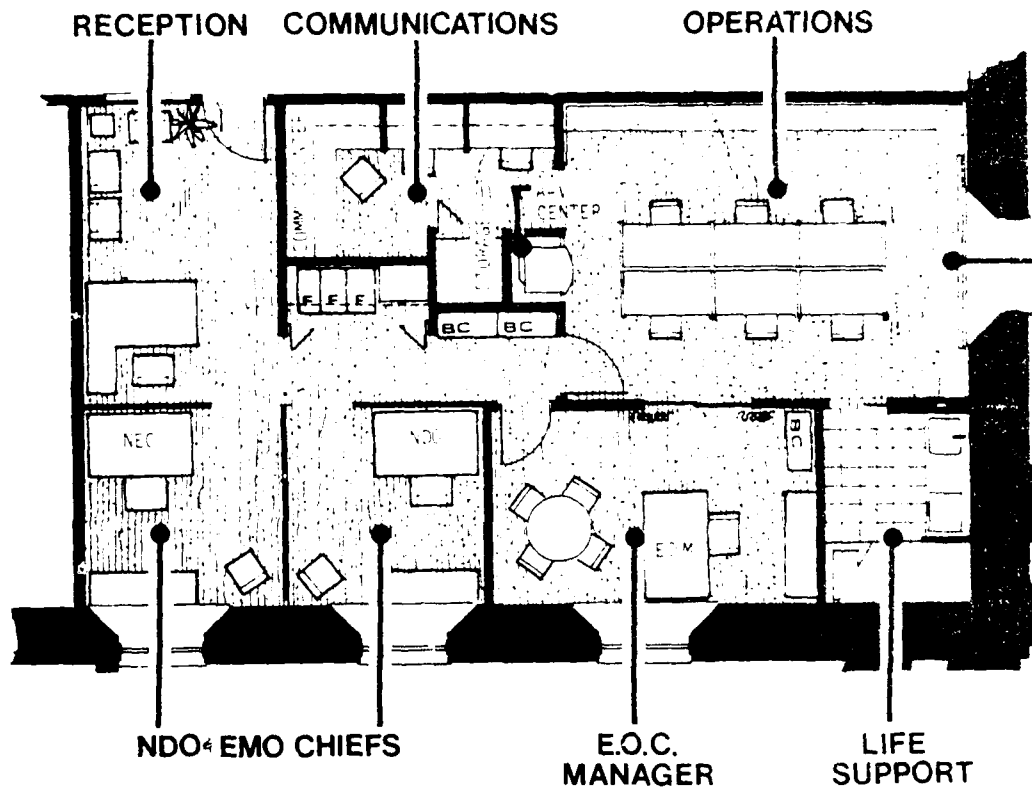
In this solution, each functional area is a defined space. Adequate staff workstation space is provided, as well as a private office for the EOM, a Communications Room, an Operations Room, and a two-bunk Life Support area. Adequate space was allocated for a dedicated Operations Room. Since this space does not have to double as a conference room for other District elements, the carrel arrangement could be used.

This design solution required 964 sq ft.

ROCK ISLAND DISTRICT 6.3

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

PLAN



6.4 CASE STUDY: SOUTH PACIFIC DIVISION

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

SITUATION

SPD has four professional staff assigned to the Emergency Operations Branch: an EOM, a Natural Disaster Manager, a National Emergency Manager, and an Emergency Operations Coordinator. The staff was separated from a large "landscaped" office area by free-standing partitions. There was no Operations Room, Commo area, or separation between individual staff member workstations.

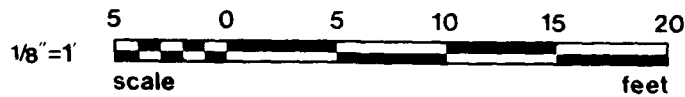
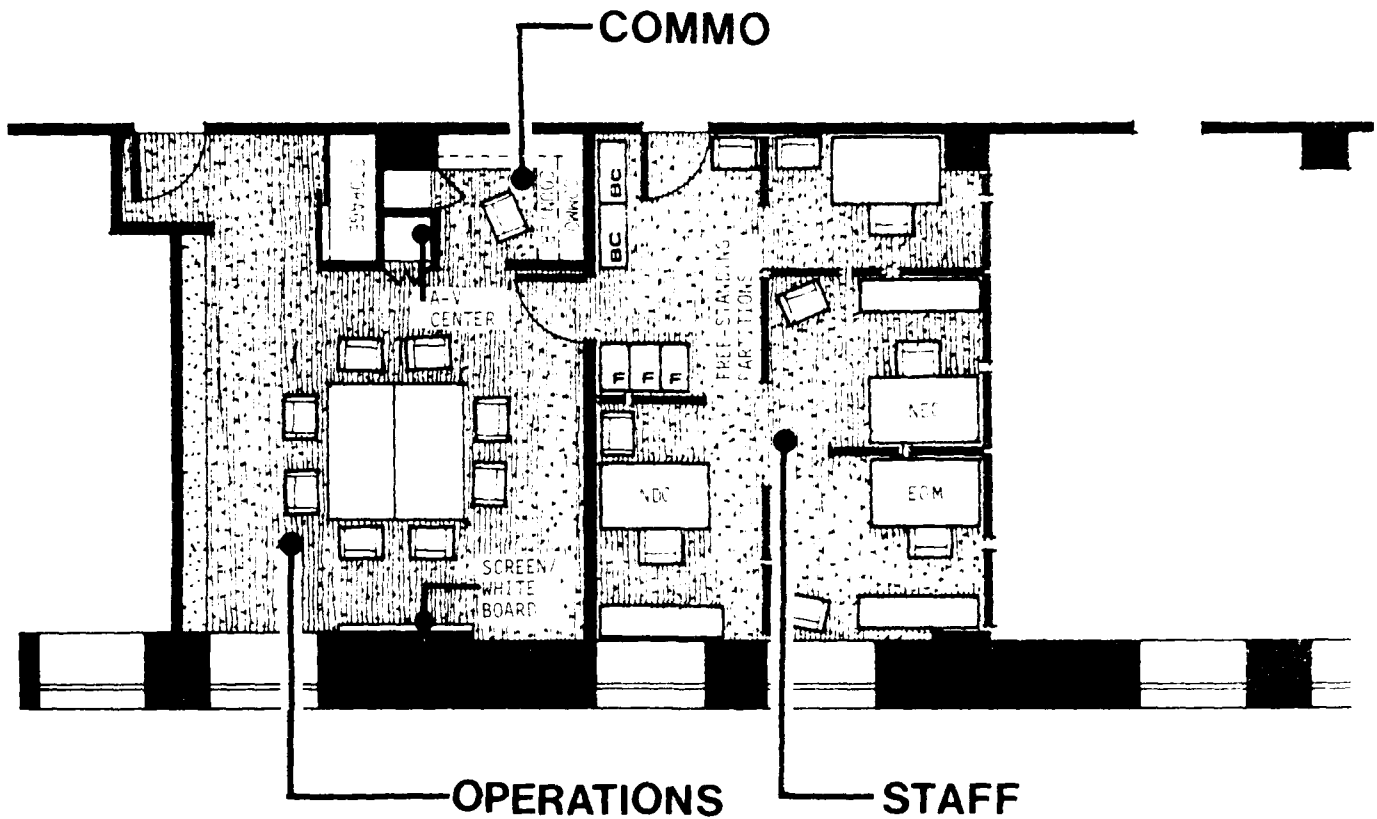
SOLUTION

A 414 sq ft space adjacent to the staff workstation area became available for EOC use. The EOM felt that since a nonoperating division does not require a dedicated Operations Room, an operations/conference room combination would be the best use of available space. The vacant space was divided into two functional areas: Commo and Operations. Since most communications are by telephone or portable 5-watt transceivers, the Commo counter only needed to be large enough to accommodate a radio base station and secure voice equipment. The A-V center and storage areas were designed into this area to preserve the shape of the larger operations area for use as an occasional conference room. Placement of the Commo Room, A-V center, and storage cabinets on the corridor wall allowed space for a doorway to be cut into the common wall between the Operations Room and the staff workstation area.

All staff workstations were accommodated in a very small space. It is desirable that the EOM have a private office and that staff workstations be somewhat larger, but no additional space was available.

The design solution for this EOC required 796 sq ft.

SOUTH PACIFIC DIVISION **6.4**
DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS
PLAN



6.5 CASE STUDY : LOWER MISSISSIPPI VALLEY DIVISION

DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS

SITUATION

LMVD has four professional staff assigned to the Emergency Operations Branch: An EOM, a Natural Disaster Manager, a National Emergency Manager, and an Emergency Operations Coordinator. In addition, there is a one-half time clerical position, but it is anticipated that this position will increase to full time.

The EOC staff was situated in approximately 775 square feet of space, with no accommodation for an operations room, commo area or life support space.

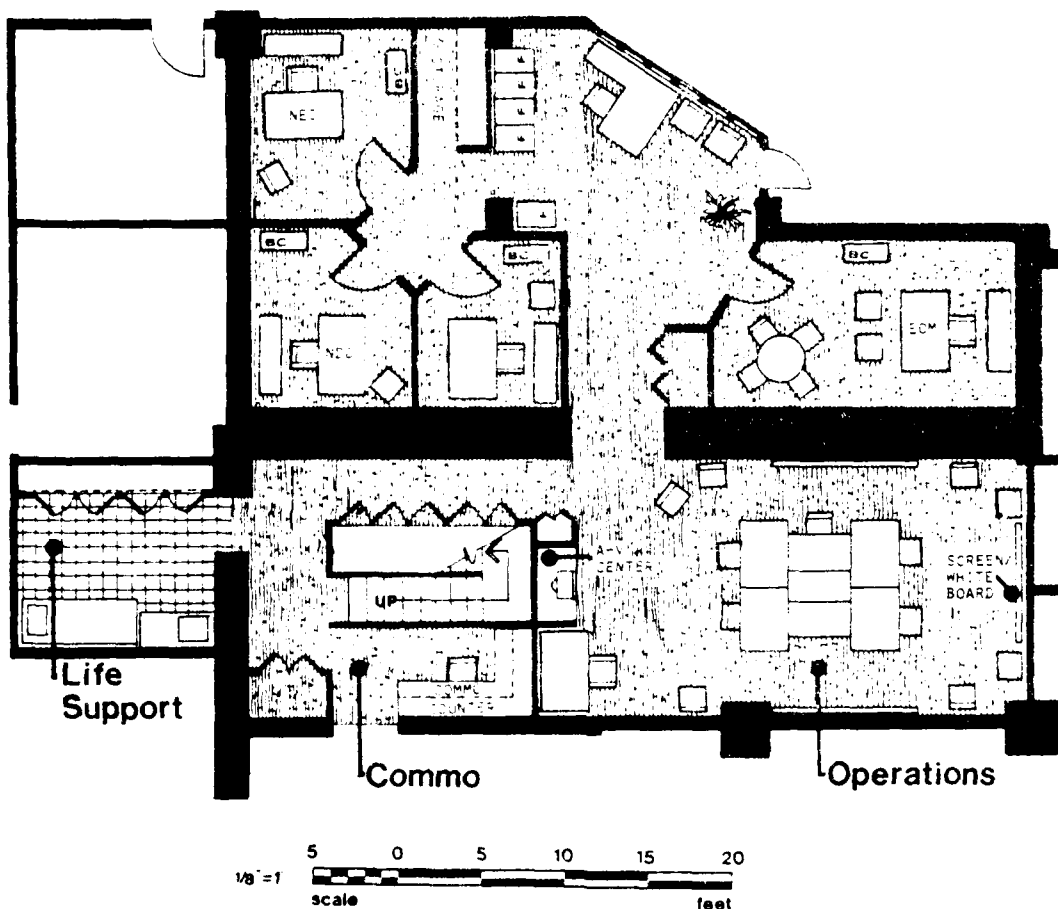
SOLUTION

Planning was in effect to relocate the LMVD library to an adjacent facility. The space vacated by the library had several important advantages:

1. Since it does not adjoin an exterior wall, security protection is easier,
2. It has direct access to the building exterior at grade, and
3. There is sufficient space for all EOC spaces.

Separate offices were provided for all professional staff, as well as generous clerical, reception, and storage space. The Commander's conference room is on the first floor of the building, over the EOC. A link was created between these two spaces by means of a stairway located near the Commo area. The Operations Room accommodates an auxiliary EOC Coordinator workstation as well as six staff augmentation workstations. The Operations Room is large enough for small, stand-up situation briefings. Larger, more formal briefings will be held in the Commander's conference room. Since routing supply and waste lines to the Life Support area would be prohibitively expensive, an exit was planned.

LOWER MISSISSIPPI VALLEY DIVISION DESIGN INFORMATION-EMERGENCY OPERATIONS CENTERS **6.5**



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Dressel, David L.
Design information for emergency operations centers. -- Champaign, Ill :
Construction Engineering Research Laboratory ; available from NTIS, 1983.
60 p. (Technical report / Construction Engineering Research Laboratory ;
P-147)

1. Emergency operations centers -- design. I. Title. II. Series:
Technical report (Construction Engineering Research Laboratory) ; P-147.

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