

SECTION 1: GENERAL GUIDANCE

1.1 General. This section provides general guidance on Department of Defense (DoD) policies and procedures for design and construction of Defense Medical Facilities, including medical and dental treatment facilities (MTF's), medical training facilities, medical research facilities, and veterinary treatment facilities in the Defense Medical Program. When feasible, this document is also to be utilized as criteria in the addition, alteration, or service upgrade to existing U.S. Military medical facilities funded by military departmental programs. Subject to the restrictions provided herein; applicability shall be limited only to those portions of such facilities, and/or the corresponding support services, specifically referenced by the project authorization document. It is the DoD objective to provide facilities that are responsive to the functional requirements of the using Military Department.

1.2 Applicability. This document sets forth DoD policy, procedures, and technical criteria for the design and construction of facilities in the Department of Defense Medical (DoDM) Military Construction (MILCON) program, and other medical design and construction projects over \$500,000. When feasible, the technical criteria in this document shall be the basis of design for Operations and Maintenance (O&M) or Repair and Maintenance (R&M) work, though the specific submittal and approval requirements may vary for those types of projects. In overseas locations where either Status of Forces Agreements (SOFA), local host country codes and standards, or other local circumstances may conflict with the criteria in this handbook, alternate design approaches shall be developed to achieve the intent of the criteria without compromising life safety or the safeguarding of persons and property. Conflicts shall be resolved at the Design Agent level, when the Design Agent's medical facilities design office or center of expertise determines that resolution does not represent a significant change to criteria affecting building occupant safety or health. All other proposed changes shall be coordinated through the Design Agent's medical office or center for submission to the Healthcare Facilities Steering Committee.

1.3 Policy. As stated in the DoD Directive 6015.17 (reference 1L), it is DoD policy to design efficient, economical, and safe facilities, which sustain an effective combat force, that support the DoD medical wartime mission, and that meet the provisions of Title 10, United States Code (reference 1a). This document prescribes the DOD technical criteria and policy guidance for the design and construction of safe, functional, and durable facilities, which will have reasonable and appropriate maintenance and operations, costs throughout their designed life. Detailed design criteria and procedures, which may be developed and issued by the DoD Components (Military Departments), shall be consistent with the policy statements and criteria contained herein and shall not deviate these criteria without TMA/DMFO approval, as provided at 1.4.3. Facility designs shall:

1.3.1 Meet the operating requirements of the using activity and provide reasonable flexibility to accommodate future changes.

1.3.2 Provide functional facilities at the most economical and practicable life-cycle-cost.

1.3.3 Be aesthetically compatible with the local environs and meet necessary environmental requirements including applicable federal, state, and local environmental standards and criteria. Necessary coordination shall be maintained with the state and local community in accordance with the requirements of E.O. 12372 (reference 1c) as implemented by DoD Directive 4165.61 (reference 1d).

1.4 Responsibilities. The Office of the Assistant Secretary of Defense (Health Affairs), OASD(HA), Tricare Management Activity (TMA), Defense Medical Facilities Office (DMFO) is responsible for medical facility policy and planning, and is the office having primary responsibility for preparing and maintaining healthcare facility criteria. The Medical Military Construction Operations (MMCO) is responsible for programming medical military construction projects and managing financial resources for planning, design and construction. TMA/DMFO is also responsible to review those portions of DoD Medical MILCON concept level designs described in Section 02 of this document, and to certify these designs in accordance with DoD Directives 5136.12 and 6015.17 (references 1e and 1f). The Design and Construction Agents may maintain supplementary technical criteria and will execute design and construction following established regulations and procedures unless otherwise directed by the TMA/DMFO. Design Agents will produce designs for a complete and useable facility within the approved programmed scope and programmed amount. The Military Departments as the users are responsible for all medical functional review and input during design. The Functional User's and the Service's Design Agent's responsibilities often overlap but do not supersede the respective medical and technical role of the other; the design of each facility must be a collaborative partnership. Specific responsibilities are addressed in various sections of this handbook.

1.4.1 Responsible Office. The Office of the Assistant Secretary of Defense (Health Affairs), OASD(HA), TMA/DMFO is responsible for the general administrative management of this entire document, and has responsibility for the contents and development of criteria in collaboration with the Healthcare Facilities Steering Committee (See below).

1.4.2 Healthcare Facilities Steering Committee (HFSC). The HFSC acts as the body responsible for the technical contents of this document. This Committee is composed of members of TMA, the using Military Departments, and the Service's design agents actively involved in the planning, programming, design, and construction of facilities. All proposed MIL-HDBK-1191 criteria updates and changes may be formally submitted to the Committee for evaluation. DD Form 1426 is provided for this purpose at the end of this MIL-HDBK-1191.

1.4.3 Waivers. TMA/DMFO has final authority to waive MIL-HDBK-1191 policy, procedures, or criteria including any deviations. Requests for project specific waivers to any portion of this document must be submitted in writing by the Design Agent, with full particulars and justification, and must be fully coordinated with the using Military Department.

1.4.4 Design/Construction Agents. As designated by the Secretary of Defense (SECDEF) for certain geographical locations, Design/Construction Agents are responsible for the execution of projects from receipt of a Design Authorization from TMA/DMFO through the completion of construction.

Design/Construction Agents are:

a) The U. S. Army Corps of Engineers (USACE). The Headquarters, USACE, Defense Agencies and Support For Others Branch (CEMP-MD) is the primary USACE point of contact with OASD(HA) and is responsible for all program management issues. The USACE Medical Facilities Center of Expertise, Huntsville Engineering and Support Center (CEHNC-MX) is USACE's technical expert for medical design, with responsibility for concept design oversight, medical technical review of final designs, and medical design guidance, criteria, and standards.

b) The Naval Facilities Engineering Command (NAVFAC). The NAVFAC Medical Facilities Design Office (MFDO) is the Navy's point of contact with OASD(HA) and technical expert for medical design and NAVFAC's final decision making authority regarding technical guidance, criteria, and standards on all medical projects from initiation of project to beneficial occupancy of the building.

c) The Air Force Civil Engineers (AF/ILECM). Air Force Civil Engineering Directorate of Engineering is the primary point of contact with OASD(HA) in the United Kingdom.

1.5 Referenced Documents. The DoD Directives, Instructions, and selected technical data, publications and standards (latest or most current editions) are referenced in the text by basic designation only and form a part of these criteria to the extent required by these references. Where references are made to MIL-HDBK-1190 (reference 1f), those referenced sections shall become an integral portion of this guidance.

1.6 Restrictions. This handbook is not to be used as a reference document for procurement of facilities construction. It is to be used in the acquisition of Military Medical Facilities engineering studies and designs (final plans, specifications, and cost estimates).

1.7 Predesign Considerations. Using Service, in coordination with TMA/DMFO and as funded by the using service, will prepare a Project Planning Package prior to the start of design. This package shall include the following documents and information, provided to TMA-DMFO by the Using Service in accordance with the DoD Medical Military Construction Timeline, Figure 2-1:

1.7.1 DD Form 1391. Describes the scope, cost, type of construction and the rationale for the project.

1.7.2 Project Narrative. Summarizes the sizing decision process, siting, construction scenario, significant planning information and results.

1.7.3 Economic Analysis (EA). The Using Service will provide an economic analysis as supporting justification of DOD medical projects with a cost over \$2 million, in accordance with guidance developed by the Healthcare Facilities Steering Committee. The Economic Analysis compares mission-based alternatives and identifies the most cost-effective capital investment. Specific requirements for the EA are contained in DoDI 6015.17 (Reference 11).

1.7.4 Program for Design (PFD). Include the estimated number of parking spaces as part of the Space Program.

1.7.5 Equipment Planning. The Using Service is responsible for preparing an equipment list for installed medical and dental equipment, and the associated budgeting, to support this requirement (MILCON) based on the Space and Equipment Planning System (SEPS). Equipment in Logistical category Codes E and F may be altered by the using Military Department if funding source requirements are not exceeded. Any increase in the funding for category Codes E and F equipment over the programmed amount of the project requires TMA/DMFO approval.

1.7.6 Project Book (PB). The PB summarizes existing site conditions and utilities, including the following minimum information.

a) Completed site survey (Example format is provided in Figure 1-1), area maps, location maps, site location, site description (to include grades, gates, etc), style of architecture, construction season limitations, seismic, wind and snow considerations, SOFA, host country agreements, soil and foundation conditions, utility conditions (water, sewer, power, steam, electrical capacities and location), and site restrictions (airfield, AICUZ potential helipad approach/departure zone obstructions, floodland, rights-of-way, etc.), site security restrictions, the National Capital Planning Commission (NCPC).

b) Utility availability, including water, sewage, storm drainage, electrical power, existing fuel sources, central heat or chilled water systems, including the tap-in locations. Also include the available capacities, power service characteristics and locations, electrical distribution, water and wastewater considerations.

c) Environmental impact requirements, archaeological and historical considerations, explosive ordinance locations, contaminated soil (fuel, asbestos, etc.), coastal zone considerations, wetlands and watershed considerations, threatened and endangered species considerations, water quality, air quality, asbestos contamination, protection of natural resources information, and any other Environmental Protection Agency (EPA) or Occupational Safety and Health Administration (OSHA) considerations necessary which might impact the MILCON project.

d) Force Protection/Security requirements including contingency considerations and statement by installation commander of designee identifying appropriate threat security level wherever minimal requirements are exceeded.

e) Contingency mode concept of operation where applicable.

f) Fire protection considerations, such as accessibility and water supply.

g) Communications Information or data systems, telephone and signal interface requirements for fire, police, etc., telephone switch capacities and line availability for MILCON project, Energy and Utility Monitoring and Control System (EMCS, UMCS) interface, master antenna, cable TV and closed circuit availability, computer interface, telecommunications and all other similar or useful information. (THE NEED TO ASSESS AND ADDRESS THE INFRASTRUCTURE FOR THE VARIOUS DIGITAL RADIOGRAPHY TECHNOLOGIES SHOULD BE ADDRESSED ALSO)

1.7.7 Addition-Alteration Facility Information. For these projects, information is provided on the type and characteristics of existing construction, size of facility, condition of utilities and services, existence of significant known code or safety issues, and descriptions of previous alterations or additions of significance.

1.8 Design Considerations.

1.8.1 Economic Feasibility. Project designs must be functional, aesthetically pleasing, and cost effective to acquire, maintain, and operate. The goal of every design is to provide the most functional, life-cycle cost-effective, maintainable, design possible within the available funds.

1.8.1.1 Cost estimates during design for building systems and casework shall be based on Figure 1-2. Logistical responsibility is explained in Section 16 and in the glossary.

1.8.2 Use of Local Materials and Skills. Project designs should consider economies that can be affected by the use of suitable local materials, construction methods, and skills which are consistent with the intent of these criteria.

1.8.3 Use of New Materials and Techniques. Project designs should consider new materials and techniques of construction, which have produced satisfactory results in actual use. Concurrence of the using Military Department, the Design Agent, and TMA/DMFO are required before proceeding with design using radically different materials or techniques.

1.8.4 Use of Stock Products. Use commercially available stock or standard materials, fixtures, and equipment whenever practicable.

1.8.5 Functional Use of Materials. Select both structural and finish materials that are consistent with simple functional design and appropriate for the climatic conditions of the geographical area where the project is located.

1.8.6 Integrated Building Systems (IBS). The basic IBS design concepts apply to all medical and medical research facilities regardless of size. The more sophisticated IBS Systems Module design concepts, including utility pods and interstitial walk-on decks dedicated to utility distribution, are to be considered only for larger or more complex

facilities. Use of the IBS Systems Module design concepts must be approved by TMA-DMFO.

1.8.7 Future Expansion. Incorporate considerations for future expansion into all designs. Consider both external and internal expansion of vital functions such as ancillary and utility services. Building siting, vehicular access, structural systems, departmental adjacencies, functional layouts within departments, and utility type and source all play major roles in developing an economically expandable design. Provision for future vertical expansion is authorized when approved by TMA/DMFO.

1.8.8 Construction Quality. Facilities shall be designed and constructed to provide a well-built and enduring product at the lowest practicable life cycle cost. Specific criteria for individual spaces are set forth in Appendix A. Materials used in design and construction of overseas projects shall be in character with materials, techniques, and methodologies used for similar structures in that country unless, in the opinion of TMA/DMFO, the Design Agent and the using Military Department, U.S. standards should prevail.

1.8.9 Environmental Quality. Congressional and administrative guidance for general policies regarding environmental quality is provided in MIL-HDBK-1190 (reference 1f). Additionally, comply with all Service specific requirements for environmental quality.

1.8.10 Fallout Protection. Provide Fallout protection according to the policy guidance given in DoD Directive 3020.35 (reference 1g) and MIL-HDBK-1190, (reference 1f), and as directed by the TMA/DMFO, using Military Department and Design Agents.

1.8.11 Arctic/Subarctic construction. Facility design must meet or exceed Army Technical Manual TM-5-852 (reference 1m). The requirements addressed in these technical manuals include but are not limited to adverse temperature, wind, snow, thermal stress due to frost heaving and permafrost conditions, labor and material costs associated with remote locations, and sub-zero temperature fuel additives and synthetic lubricants for construction equipment.

1.8.12 Antiterrorism and Force Protection (AT/FP). All projects must comply with the Department of Defense Antiterrorism and Force Protection (AT/FP) Construction Standards 16 December 1999 or latest revision as established and released by the Department.

1.8.12.1 Disposition of Excess Facilities. Provide descriptive plan for the removal of excess facilities.

1.9 Improvement/Alteration of Existing Facilities. The criteria contained herein are not to be used as the sole justification for any addition, alterations or improvements to an existing facility. Rather these criteria define requirements that shall be met when improvement or alterations of existing facilities, or sub-portions or systems thereof, are specifically authorized by reference in the project document.

1.9.1 Levels Of Facility Alteration. Categorize and estimate all costs associated with projects containing altered areas including the cost of temporary structures, if required, according to the following definitions

1.9.1.1 Level 1 - Light alteration includes minor partition layout changes, new finish treatment, minor casework and equipment changes, minor modifications to Heating, Ventilation and Air Conditioning (HVAC) distribution systems, and minor electrical branch circuit changes. The estimated cost of this alteration should not exceed 30 percent of replacement cost for the same type of facility.

1.9.1.2 Level 2 - Medium alteration includes Level 1 changes, minor-to-major partition layout changes with associated modifications to the HVAC distribution systems and electrical power and light requirements, minor structural modifications, new plumbing fixtures, allowances for roof repair, and changes in mechanical system insulation when asbestos is present. The estimated cost of this alteration should not exceed 50 percent of replacement cost for the same type of facility.

1.9.1.3 Level 3 - Heavy alteration includes Level 1 and 2 changes, gutting of the building to structural frame without demolishing floors, exterior walls and roof assembly, modifications to structural frame, main electrical distribution system, air handling units and auxiliary equipment, plumbing system, and energy plant. The estimated cost of this alteration should not exceed 75 percent of replacement cost for the same type of facility.

1.9.1.4 Proposed alteration projects with a cost exceeding the 75 percent of replacement cost must be considered for a total replacement of the facility unless other restrictions make it an infeasible option.

1.9.2 Interim Facilities. The cost of interim facilities (temporary construction), if required, shall be included in the estimated cost for each of the above levels of alteration.

1.9.3 Site Investigation. Designers shall conduct thorough investigations of existing facilities to be upgraded or modified, in accordance with the conditions of their design contracts, to become knowledgeable of facility conditions. This includes the need to inspect concealed spaces (above-ceiling areas, chases, and equipment rooms, for example), to permit evaluation and accurate depiction of as-built conditions. Design agents are responsible to assure that the scope of work for each design contract describes this designer responsibility. Generally, designers should be required to directly inspect all equipment rooms and all above-ceiling areas in enough locations as to reasonably establish the existing conditions in all major areas and departments, and on each floor, of a given project facility. In facilities with "hard" ceilings, this may require the creation of inspection openings, and the need to establish in the Scope of Work the responsibility for making and repairing these openings. The design team must recognize the economic advantages of a detailed designer site investigation: if the designers do not verify conditions, the construction contractor must do so, normally at a cost premium reflected in higher bidding costs (unknown conditions) and change orders (changed conditions).

1.9.4 Modifications to Existing Systems. Modifications to existing equipment and systems, including temporary connections, changes to system performance, or measures necessary to sustain service, shall be shown and described in detail in project design documents. Designers shall evaluate the impact on existing systems of "tap-ins" which increase overall system demand. The locations of new connections shall clearly be shown and/or described. The designer shall determine, and document for the design agent's information, any project work which will necessitate a reduction or interruption of any service to an existing, occupied area

1.9.5 Protection of Patients From Construction Contaminants. For additions or alterations to existing hospitals, design projects shall include instructions (including specifications, drawings, drawing notes, and details, as applicable) defining measures required of the construction-contractors to minimize contamination of the existing medical facility. Measures to reduce the potential of contamination and nosocomial infections include but are not limited to negative isolation of construction areas, construction of effective dust barriers, protection of air distribution systems serving occupied areas, maintenance of adequate handwashing stations, and disinfection of any reused ductwork. Designers should consult with the facility's infection control representative and facility management during the design process to assure thorough coordination of design features that may affect patient welfare.

1.9.6 Construction Phasing Plan. Designers shall develop a phasing plan, consisting of detailed written instructions as well as any graphic/drawing aids necessary to clearly communicate the content, location, and sequence of work activities. The plan shall identify the scope, duration, and timing sequence of each individually identifiable work item, with all required lead-in, preparatory, and commissioning activities.

1.9.7 Incremental Systems Testing/Placement in Service. Designers shall describe the procedures required to perform pre-acceptance equipment testing, functional system testing, and certification of satisfactory operation for systems constructed in an incremental or segmental fashion. An example of such a case might be a medical gas system upgrade to an existing facility, constructed and placed into operation incrementally on a department-by-department or floor-by-floor basis. Similar procedures shall be provided for existing systems, which are incrementally taken out of service.

1.9.8 Seismic Upgrades.

1.9.8.1 Policy. The Department of Defense policy is to provide a framework to make the most effective use of medical Military Construction (MILCON) funds and to accommodate the concerns and legal requirements associated with the seismic risks faced by military hospitals. The Earthquake Hazards Reduction Act (P.L. 95-124), (reference 1k) and the National Earthquake Hazards Reduction Program, while indicating the need to ensure that critical facilities such as hospitals are serviceable following an earthquake, also recognizes that the measures necessary to implement seismic requirements are extremely expensive.

1.9.8.2 Corrective Actions. When existing facilities having seismic deficiencies are being programmed, the seismic problem will be considered along with all other factors used in developing the requirement for a construction project. When programming existing facilities that are located in areas of seismic vulnerability, a seismic evaluation of the facility will be done early in the project development process so that rehabilitation funds, if needed, could be programmed prior to project authorization. The corrective measures planned must address all factors including earthquake safety, be consistent with system wide priorities, and be undertaken in a reasonable manner.

1.9.9 Types of Medical Facility Upgrade Surveys. Facility deficiency tabulation and upgrade surveys will be funded by the Military Department and based on the following guidance. The Using Service will provide the design agent a completed Checklist for Medical Facility Upgrade Survey Figure 1-3 to establish the scope of facility upgrade survey projects.

1.9.9.1 Basic Life Safety Survey. Facility is surveyed for compliance with: NFPA 101 (reference 1h), Chapter 13, "Existing Health Care Occupancies"; and part of NFPA 99 (reference 1i), Chapter 3, "Electrical Systems". This type survey only addresses the basic life safety and fire safety issues covered in NFPA 101, Chapter 13 and NFPA 99, Chapter 3 including: means of egress; protection; detection, alarm, and communication systems; building services; and essential electrical systems. The scope of this type survey is limited by using the exception allowed in NFPA 101, paragraph 7-1.2, so that the survey will not evaluate general compliance with other referenced NFPA Standards. However, the scope is extended to include the Life Safety Branch of the essential electrical system in accordance with NFPA 99, Chapter 3, because the condition of the life safety branch is vital to basic life safety in health care facilities. The end product of this survey is a limited "Deficiency Tabulation Report" that: identifies and prioritizes the deficiencies; proposes corrective solutions; and provides a cost estimate for corrections.

1.9.9.2 Life Safety and Utility Systems Survey. In addition to the requirements of the "Basic Life Safety Survey" this type survey also includes evaluation of the capacity and condition of building utility and support systems in relation to MIL-HDBK-1191 and using military department criteria. The end result of this survey is a "Deficiency Tabulation Report" that: identifies and prioritizes the deficiencies; proposes corrective solutions; and provides a cost estimate for corrections. This type survey could include: electrical systems including compliance with NFPA 70, "National Electrical Code" (reference 1j); communication and signal systems; heating, ventilating, and air conditioning systems; plumbing and medical gas systems; and transportation systems.

1.9.9.3 Facility Modernization Survey. In addition to the requirements for the "Life Safety and Utility Systems Survey" this survey provides a complete evaluation of the functional and facility deficiencies in relation to MIL-HDBK-1191 and using military department criteria. The end result of this survey is a proposed program and cost estimate to correct the functional, architectural, and engineering deficiencies to dramatically extend the useful life of a facility. This type survey

could include: functionality, medical equipment, building systems, architectural finishes, mechanical, plumbing, electrical, communication, fire and life safety, and transportation systems.

1.9.9.4 Special Studies. Any of the surveys described above could include special studies where required for a specific facility. The more common types of special studies include:

- a. Economic Analysis - New vs. add/alt construction vs. lease, etc. (Required for all projects with a projected cost of \$2 million or more.)
- b. Seismic/structural.
- c. Hazardous/Toxic Substances - Asbestos, PCB's, Lead in paint or in potable water, mercury contamination, etc.
- d. Maintenance and Repair Deficiencies.
- e. Uniform Federal Accessibility Standard and Americans With Disabilities Act Accessibility Guidelines.

1.10 Types of Construction. Construction levels and building types are outlined in MIL-HDBK-1190, Chapter 1 (reference 1f). For facilities, the following apply:

1.10.1 Permanent Construction. Facilities built in the United States, its territories, or possessions are to be of permanent construction with a life expectancy of 25 years or more.

1.10.2 Semi-Permanent Construction. Facilities built outside of the United States, its territories, or possessions are to be semi-permanent construction with a life expectancy of 5 to 25 years unless the normal building practices of the host country, Status of Forces Agreements (SOFA), or other agreements stipulate permanent-type construction.

1.10.3 Contingency Facilities. Typical freestanding medical contingency facilities are to be semi-permanent construction with a life expectancy of 15 years, durable, and consistent with locally available building technology.

1.10.4 Temporary Construction. This type of construction may be authorized as an emergency measure or as an interim solution as approved and coordinated through formal request from the using Military Departments to TMA/DMFO. Follow individual Military Department rules and regulations for construction of these facilities.

1.11 Total Building Commissioning. Commissioning is defined by the building industry as the process of verifying that all building systems perform interactively according to the design intent, and the systems meet the Owner's operational needs. Implementation of commissioning for a complex medical facility requires a higher level of comprehensive oversight of both the design and construction process. Typical of the building systems/system interfaces found in the larger MTFs which may require Total Building Commissioning, are the following:

- Complex HVAC systems, including electronic digital control systems.
- Medical and Dental gas, compressed air, and vacuum systems.

- High pressure steam, clean steam, and other major energy plant equipment.
- Emergency Power systems, and their interfaces to other critical building system operations.
- Fire detection and alarm systems, and their interfaces to other critical building system components.
- Electronic communications systems including voice and data transmission, nurse call, closed circuit TV, and others.
- Building systems which are incrementally constructed and commissioned, such as in phased construction projects.
- Critical envelope elements in severe climactic regions.

On a project by project basis, the Design/Construction Agent and Owner must determine in concert the extent and level of services required during project design and construction to achieve Total Building Commissioning. The Design/Construction Agent is responsible for the implementation of the Total Building Commissioning Process. Additional reference publications which describe the Commissioning Process are provided at references 1n, and 1o.

1.11.1 Commissioning During Design. For each project, design documents must be developed to adequately define functional testing procedures and operator training for building systems and their operational interfaces. Documentation must define the hardware needed to facilitate testing, requirements for testing instrumentation, the qualifications of testing personnel, and the required documentation of test results. The more complex the project and its supporting systems, the more complex the functional testing requirements become and the greater the expertise required to develop, and review for QA purposes, this documentation. Documentation for simpler projects and systems are more easily adapted from guide specifications and criteria guidance. Adequate design commissioning for almost all facilities associated with patient treatment mandates the involvement of the Agent's Medical Specialized Design Office or Center. For larger inpatient clinics, ambulatory surgery, and full service hospitals and medical centers, and in particular for projects involving additions and alterations, the commissioning effort may include designer and/or QA involvement by experts in systems commissioning and maintenance.

1.11.2. Commissioning During Construction. During the construction project, it is necessary for the Agent to assure that the contractor's proposed testing procedures, personnel, and instrumentation fully meet the design document requirements, and that the tests are properly conducted and results documented. For complex or high cost equipment and system shop drawing submissions, review by the original designer may be required to assure compliance with design intent, particularly when deviations from the original design are proposed by the construction contractor. For the more complex or medically unique systems, proposed testing procedures should be reviewed by technical personnel experienced in such systems commissioning, and who report directly to the Construction Agent. These personnel should also provide QA inspection or oversight of the contractor's functional testing, test documentation, operating and maintenance materials, and operator training.

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REFERENCES

- 1a. Title 10, United States Code (USC).
- 1b. DoD Directive 6000.12, Health Services Operations and Readiness, April 29, 1996
- 1c. Executive Order 12372, "Intergovernmental Review of Federal Programs", July 14, 1982
- 1d. DoD Directive 4165.61, "Intergovernmental Coordination of DoD Federal Development Programs and Activities", August 9, 1983.
- 1e. DoD Directive 5136.12, "Tricare Management Activity (TMA)," May 31, 2001.
- 1f. MIL-HDBK-1190, "Facility Planning and Design Guide".
- 1g. DoD Directive 3020.35, "Fallout Shelter Analysis".
- 1h. NFPA 101, "Life Safety Code."
- 1i. NFPA 99, "Health Care Facilities Handbook."
- 1j. NFPA 70, "National Electric Code."
- 1k. P.L. 95-124, "Earthquake Hazards Reduction Act"
- 1l. DoDI 6015.17, "Planning and Execution of Military HealthcarFacilities," May 4, 1995 DRAFT
- 1m. Army TM 5-852, "Arctic/Subarctic Construction Buildings," March 1988
- 1n. United States Army Corps of Engineers (USACE) ER 1110-345-723, SYSTEMS COMMISSIONING PROCEDURES, dated 31 July 1995
- 1o. DRAFT ASHRAE Guideline 0-200X, THE COMMISSIONING PROCESS, dated August, 2002

FIGURE 1-1
SITE CHECKLIST

PROJECT NAME: _____ DATE:

PROJECT LOCATION:

1. ARE ROADS TO SITE ADEQUATE? Y or N
2. IS SITE IN FLOODPLAIN? Y or N
3. WHAT IS PROJECT TYPE? NEW or ADDITION/ALTERATION
4. IS THERE ANY ASBESTOS? Y or N
5. ARE THERE ANY OTHER CONTAMINATION OR SAFETY HAZARDS? Y or N
TYPE: _____
6. ARE THERE ANY HISTORICAL STRUCTURES ON OR ADJACENT TO SITE? Y or N
7. SEISMIC ZONE OF SITE? 0 1 2 3 4
8. IS THERE ANY EXPANSIVE SOIL AT THIS SITE? Y or N
9. WHAT IS THE GENERAL BEARING STRATA DEPTH IN THIS AREA?
10. ARE SPECIAL FOUNDATIONS REQUIRED? NONE PIERS MAT PILES
OTHER: _____
11. WHAT IS WATER TABLE LEVEL AT THIS SITE?
12. IS NOISE A PROBLEM? Y or N IF Y, WHAT IS NC-LEVEL?
13. ARE THERE ANY EXISTING STRUCTURES TO BE DEMOLISHED? Y or N
14. DO ANY DISPLACED FUNCTIONS NEED TO BE REPLACED? N/A, Y or N
IF YES, WHAT ARE THEY? _____
15. DO ANY EASEMENTS CROSS THE PROPERTY? Y or N
IF YES, WHAT ARE THEY?
16. WHAT IS BASIC SIZE AND SHAPE OF SITE?
17. WHAT IS SLOPE OF SITE? LEVEL 3-8% 9-15% 16-25% >25%
18. IS THERE ANY SIGNIFICANT VEGETATION? Y or N
19. WHAT IS THE PREVAILING WIND DIRECTION?

FIGURE 1-1 (CONTINUED)

20. WHAT IS AVERAGE ANNUAL RAINFALL? _____ INCHES
21. WHAT IS AVERAGE ANNUAL SNOWFALL? _____ INCHES
22. WHAT ARE THE CLIMATIC CONDITIONS? WIN DB _____ SUM DB _____ WB
23. DOES WATER SUPPLY NEED TO BE TREATED? Y or N
24. WHAT IS THE AVAILABILITY OF UTILITIES TO THE SITE?

SYSTEM	DISTANCE TO CONNECTION POINT	CAPACITY AVAILABLE TO SITE	
WATER	_____ FEET	_____ GPM	_____ PSI
FIRE WATER	_____ FEET	_____ GPM	_____ PSI
CLEAN STEAM	_____ FEET	_____ #/HR	_____ PSI
UNTREATED STEAM	_____ FEET	_____ #/HR	_____ PSI
HI-TEMP HOT WATER	_____ FEET	_____ GPM	_____ TEMP
CHILLED WATER	_____ FEET	_____ GPM	_____ TEMP
SANITARY SEWER	_____ FEET	_____ GPM	
STORM SEWER	_____ FEET	_____ GPM	
GAS	_____ FEET	_____ GPM	_____ CFM
ELECTRICAL-Primary	_____ FEET	_____ KVA	_____ KILOVOLT
ELECTRICAL-Alternate	_____ FEET	_____ KVA	_____ KILOVOLT
CABLE TV	_____ FEET		
FIBER OPTIC LINE	_____ FEET		
COMMUNICATIONS	_____ FEET	_____ SWITCH	_____ CAPACITY
PATH. WASTE	_____ FEET	_____ #/DAY	

25. WHAT IS THE FREQUENCY OF LIGHTNING?
26. Is the site coordinated with the installation and tied into the installation Master Plan?
27. Has the history of the site been researched and investigated at least fifty years prior?
28. ADDITIONAL REMARKS: (Add additional pages if necessary):

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CERTIFICATION OFFICIAL:

NAME:

TITLE:

ORGANIZATION:

SIGNATURE:

FIGURE 1-2

LOGISTICAL RESPONSIBILITY FOR BUILDING SYSTEMS

Special Instructions. The items listed in this section shall be included in construction cost estimates as appropriate.

ITEM	Logistical Responsibility ⁽¹⁾
<u>BUILDING AND GROUNDS</u>	
Hospital buildings (including administration)	A
Medical Clinic buildings	A
Dental Clinic buildings	A
Clinical and Medical Research Laboratory buildings	A
Animal holding buildings	A
Maintenance shop buildings	A
Garages and automotive shelters	A
Power plant buildings (steam and/or electrical)	A
Sewage disposal plant structures	A
Medical helicopter/air evac landing pads	A
Chapel	A
Recreational building (including Red Cross, gymnasiums and swimming pools)	A
Recreational fields (including tennis courts, baseball diamonds, etc.)	A
Guard and sentry boxes, gate houses	A
Incinerator buildings	A
<u>ELECTRICAL SERVICE</u>	
Wiring (including material)	A
Conduits	A
Switches, panels boxes, service outlets	A
Transformers (step-down and distribution)	A
Lighting, fixtures (including initial lamping)	A
Generating equipment (including emergency)	A
Explosion-proof fixtures	A
Power conditioning/surge protectors	A
<u>HEATING, AIR CONDITIONING, AND VENTILATION</u>	
Air conditioning (including packaged units)	A
Boiler plants and water heaters	A
Heat and steam distribution systems	A
Central vacuum cleaning system	A

⁽¹⁾ See Para 16.2.1 for definition.

ITEM	Logistical Responsibility ⁽¹⁾
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<u>PLUMBING</u>	
Piping valves, fittings, and outlets	A
Toilet, bath, and lavatory fixtures (including shower stalls, mirrors, towel racks, toilet paper dispensers, paper towel dispensers, soap dispensers, and bed pan washers)	A
Sewer systems and plants	A
Gas, air pressure and suction, and medical gas systems	A
Automatic sprinkler systems	A
Fire protection system (water)	A
<u>REFRIGERATION</u>	
Refrigeration (walk-in)	A
Deep freeze (walk-in)	A
Built-in morgue refrigerators	A
<u>COMMUNICATIONS:</u>	
LAN - Local Area Network:	
Conduit, Boxes, Wiring, Patch panels, outlets	A
LAN Equipment	C
Telephone System, Complete:	
Interior Conduits, Boxes, Outlets, Wiring	A
Instruments, Outside cable and support work	A
Interior Telephone Switching Equipment	A
Supporting Expansion Work at Main Exchange	A
Intercom systems, Complete:	
Conduits, Boxes, Wiring, and Equipment	A
Public Address System, Complete:	
Conduits, Boxes, Wiring, and Equipment	A
Television System:	
Entertainment:	
Conduits, Boxes, Wiring, Antennas	A
Head Ends and Distribution Equipment	A
Mounting Brackets and Low Voltage Supplies	A
Television Receivers	C
Training:	
Conduits, Boxes, Wiring, Distribution Eq.	A
Cameras, Monitors, Control Equipment	C
Security:	
Conduits, Boxes, Blank Outlets	A
Cameras, Monitors, Wiring	C
Control Equipment	C

ITEM -----	Logistical Responsibility ⁽¹⁾
<u>COMMUNICATIONS - (Continued)</u>	
Patient Physiological Monitoring:	
Conduits, Boxes, Blank Outlets	A
Equipment	C
Staff Radio Paging Systems, Complete:	
Conduits, Boxes, Wiring, Equipment	A
Other Radio Systems, i.e., EMS, etc.:	
Conduits, Boxes, Site Support Work	A
Antennas, Equipment, and Wiring	C
Card Access System, Complete:	
Conduits, Boxes, Wiring, Equipment	A
Nurses' Call Systems, Complete:	
Conduits, Boxes, Wiring, Equipment	A
Central Dictating System:	
Conduits, Boxes, Wiring, Outlets	A
Dictation Equipment	C
Intrusion detection System:	
Conduits, Boxes, Blank Outlets	A
Wiring, Sensors and Control Equipment	A
Fire Detection and Alarm System, Complete	A
Clock Systems:-	
Central Clock System, Complete	A
Battery Clocks	C
<u>TRANSPORTATION SYSTEM</u>	A
<u>SIGNAGE (INTERNAL/EXTERNAL)</u>	A

FIGURE 1-3

CHECKLIST FOR MEDICAL FACILITY UPGRADE SURVEYS

(Select one "Type of Survey" and any "Special Studies" required)

A. TYPES OF SURVEY.

YES NO 1. BASIC LIFE SAFETY SURVEY. Survey will address compliance with the following standards:

a. NFPA 101, Chapter 13, "Existing Health Care Occupancies". Use exception allowed in NFPA 101, para. 7-1.2, so that the survey will not evaluate general compliance with referenced NFPA standards.

b. NFPA 99, Chapter 3, "Electrical Systems" as it relates to Essential Electrical System - Life Safety Branch only.

YES NO 2. LIFE SAFETY AND UTILITY SYSTEMS SURVEY. Survey will address compliance with the following standards:

a. NFPA 101, Chapter 13, "Existing Health Care Occupancies" including general compliance with referenced standards per NFPA 101, paragraph 7-1.2.

b. The building utility systems will be surveyed in relation to: MIL-HDBK-1191, "DoD Medical and Dental Treatment Facilities Design and Construction Criteria"; and Military Department Criteria. The following systems will be addressed:

- YES NO Electrical systems.
- YES NO Communication and signal systems.
- YES NO HVAC.
- YES NO Plumbing.
- YES NO Medical gas systems.
- YES NO Transportation and material handling systems.
- YES NO Other. Provide list.

YES NO 3. FACILITY MODERNIZATION SURVEY. Survey will address compliance with the following standards:

a. NFPA 101, Chapter 13, "Existing Health Care Occupancies" including general compliance with referenced standards per NFPA 101, paragraph 7-1.2.

CHECKLIST FOR MEDICAL FACILITY UPGRADE SURVEYS

(Select one "Type of Survey" and any "Special Studies" required)

b. The building will be surveyed in relation to: MIL-HDBK-1191, and Military Department Criteria. The following systems will be addressed:

- YES NO Site and Parking issues.
- YES NO Utility services.
- YES NO Structure.
- YES NO Exterior Finishes, roofing, glazing, etc.
- YES NO Medical/Functional Requirements.
- YES NO Architectural finishes.
- YES NO Equipment and Furnishings
- YES NO Waste Management System.
- YES NO Transportation and material handling systems.
- YES NO Electrical systems.
- YES NO Communication and signal systems.
- YES NO Energy Usage/System Efficiency Survey.
- YES NO HVAC.
- YES NO Plumbing.
- YES NO Medical gas systems.
- YES NO Other. Provide list.

B. SPECIAL STUDIES.

- YES NO Economic Analysis. (Attach scope of analysis).
- YES NO Seismic/structural evaluation.
- YES NO Hazardous/Toxic substance survey.
 - _____ Asbestos survey
 - _____ PCB survey
 - _____ Lead survey (in paint or in potable water)
 - _____ Mercury contamination
 - _____ Underground Fuel Tank Survey.
 - _____ Other. Provide list, _____.
- YES NO Maintenance and Repair Deficiency survey.
- YES NO Uniform Federal Accessibility Standard and Americans with Disabilities Act Guidelines Compliance.
- YES NO Other. Provide list. _____.