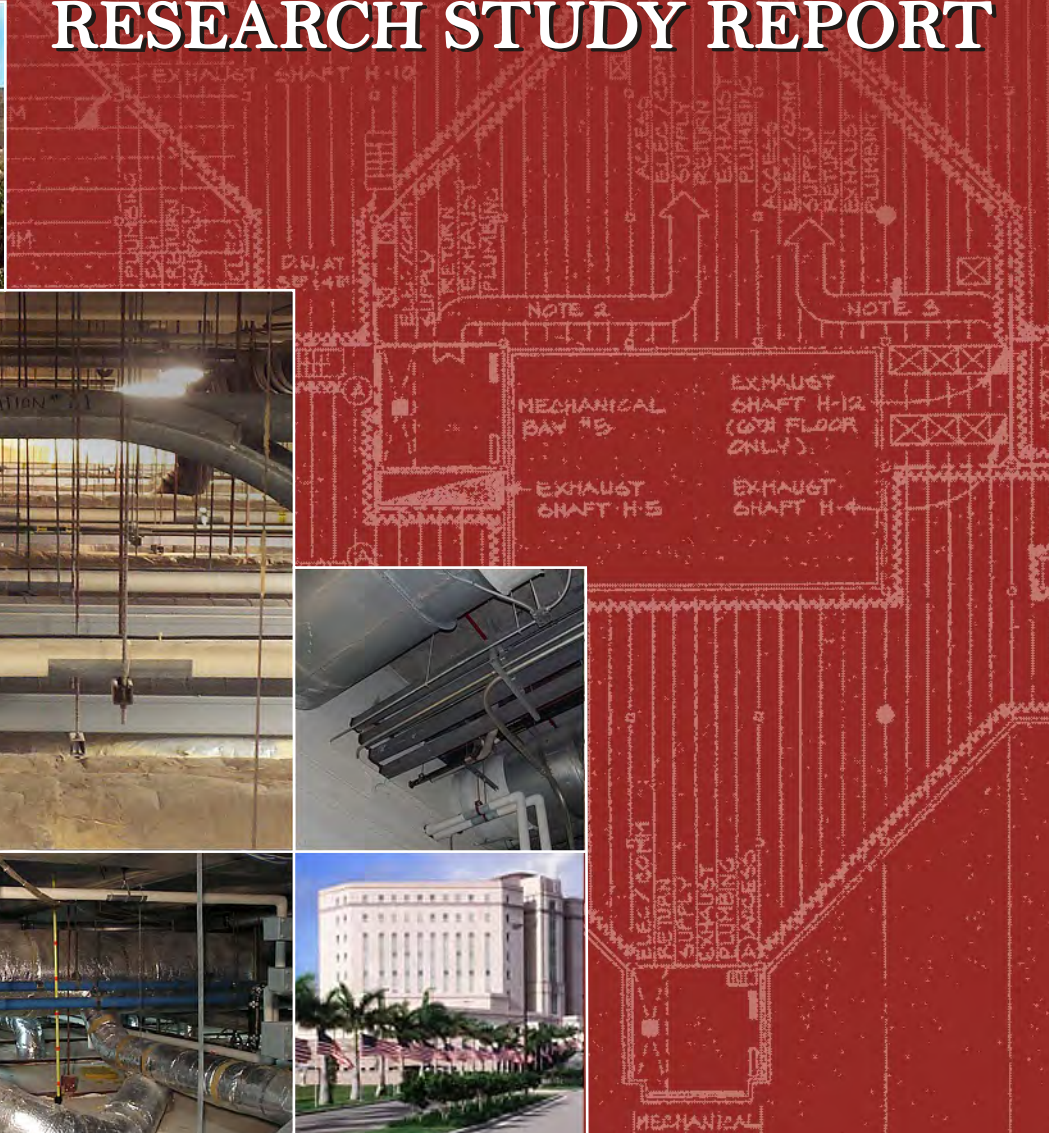
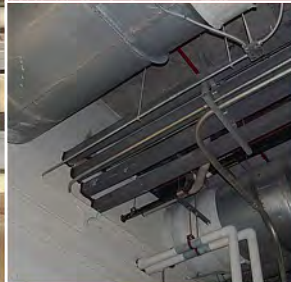




# SUPPLEMENT TO VA HOSPITAL BUILDING SYSTEM RESEARCH STUDY REPORT



## SUPPLEMENT

<b>Section 1</b>	<b>Foreword and Acknowledgements</b>
<b>Section 2</b>	<b>VAHBS Overview</b>
<b>Section 3</b>	<b>Issues</b>
<b>Section 4</b>	<b>Application to New Projects</b>
<b>Appendix A</b>	<b>Example VAHBS Hospitals</b>
<b>Appendix B</b>	<b>Record Drawings</b>
<b>Appendix C</b>	<b>VAHBS CAD Drawings</b>

This page intentionally left blank.

**Section 1**

**Foreword & Acknowledgements**

	Page
Foreword .....	1-1
Acknowledgements .....	1-3
Glossary .....	1-5

This page intentionally left blank.

## Foreword

VA policy is to design new hospital buildings to provide for continuing adaptability throughout their structural life. The VAHBS concept as defined in the VA Hospital Building System Research Study Report (Project 99-R047; U.S. Government Printing Office Stock No. 051-000-00 112-5) was created to provide such adaptability. The purpose of this supplement is to address the effects on the VAHBS concept and Research Study Report (Red Book) brought about by 30 years of changes in technology, construction practices, and health care models.

It has been VA's experience that VAHBS projects have not cost more than traditional construction in construction bidding, and have cost less on a life-cycle basis. A key factor in the bidding process is thorough pre-bid conferencing which includes sub-contractors (such as mechanical, plumbing, electrical, etc.) and material suppliers as well as general contractors to inform them of the potential savings in time and labor through the separation of trades on all levels. The use of drawings, models, and virtual reality should be considered for part of these pre-bid conferences.

The project team for a new VA hospital, including VA staff and design and engineering consultants, shall use this Supplement in conjunction with the VAHBS Research Study Report (Red Book) in the design and construction of new VAHBS buildings.

Lloyd H. Siegel, FAIA  
Associate Chief Facilities Management Officer  
for Strategic Management

This page intentionally left blank.

## **Acknowledgements**

Credit is due to the following individuals whose guidance, advice, and effort made this publication possible:

### **Facilities Management Office**

Robert L. Neary, Jr.	Acting Chief Facilities Management Officer
Lloyd H. Siegel, FAIA	Associate CFMO, Strategic Management Office
Kurt D. Knight, P.E.	Director, Facilities Quality Service
Satish C. Sehgal, P.E.	Program Manager
Robert Smoot	Director, A/E Evaluation & Program Support
Robert Clifton	Project Manager

### **VA Medical Centers And Other VA Offices**

John Bocek	Chief Facilities Officer
Joshua Elvove, P.E.	Safety Officer, VISN 19
Howard Gibson	Chief Facilities Officer
Wallace Thompson	Chief Facilities Officer

### **Private Sector Consultants**

#### GLHN Architects & Engineers, Inc.

William I. Nelson, P.E.	Ellen G. Alexander
Nicholas C. Krauja, AIA	Lisa Vickery
Theodore C Moeller, P.E	James Reynolds

#### Degenkolb, Structural Engineers

James Malley, P.E.	Jack Hsueh, P.E.
--------------------	------------------

#### Associated Construction Economists

William Green, MRICS



This page intentionally left blank.

## Glossary

**Adaptability:** The ability to respond to, or be readily adjusted to, changing conditions.

**Assembly:**

- A group of attached components considered collectively (e.g., a pre-hung door).
- A design configuration composed of a specific arrangement of service modules.

**Bedroom Zone:** A plan zone at the building perimeter sized to accommodate patient bedrooms.

**BGSF:** Building gross square foot, a unit of total floor area including building service spaces and shafts, common horizontal and vertical circulation systems, structure, and exterior enclosure systems; but excluding interstitial service zones.

**Building Subsystem:** One of the coordinated groups of components, each performing a major function, which combine to form a building system.

**Building System:**

- Any specific building production process or method.
- Any set of coordinated building components intended for application as a group.

**Ceiling:**

- Finish system at the top of a functional zone, usually suspended from underside of interstitial platform (e.g. acoustical, or GWB or plaster ceiling).
- A combination interstitial platform/ finished ceiling at the top of a functional zone (obsolete).

**Compatibility:** The state of functional, economic, and aesthetic coordination between two or more systems or components.

**Component:** A part, or assembly of parts, in a system.

**Compound Assembly:** A design configuration in which the structural framing changes direction, and/or some service bays are completely internal.

**Conventional Design and Construction:** Existing, traditional building methods are they are currently applied.

**CPM:** Critical Path Method.

**Critical Path:** The particular sequence or path through a work schedule determining the shortest time within which all work can be completed.

**Critical Path Method:** A scheduling technique for the identification and control of work activities on the critical path.

**Design Configuration:** A general building plan type, illustrated by a diagrammatic plan.

**Design Criteria:** Various performance requirements, dimensional rules, descriptions of typical and special conditions, and the like, serving as guidelines in the development of a detailed design from the basic system design.

**Design Determinant:** An independent variable, or general class of such variables, encountered in a design problem, which influences the selection of alternative solutions or the characteristics of a particular solution (e.g. program, site, budget, codes).

**Fast-track:** An accelerated scheduling technique characterized by the overlapping of activities traditionally performed in linear sequence, requiring early commitment to general decisions, but allowing postponement of detailed decisions.

**Fire Compartment:** A unit of area on a building floor enclosed by two-hour fire resistance rated construction on all sides from which there are at least two different exits.

**Fire Section:** Term used in original Red Book, see Fire Compartment.

**Flexibility:**

- Adaptability.
- Having alternatives.

**Functional Space:**

- Habitable room or area not assigned exclusively to building service equipment.
- Space within the functional zone.

**Functional Space Requirement:** A characteristic a particular functional space must have to satisfy a user need or an applicable regulation or standard.

**Functional Unit:** A group of rooms interrelated by shared activities or processes (e.g., nursing unit, intensive care unit). Usually implies close proximity.

**Functional Zone:** The horizontal layer of space between the top of a finished floor and the bottom of the finished ceiling immediately above.

**Generic Design Option:** One of a limited number of alternative general types of solution allowed within the basic design of a particular building subsystem.

**HCS:** Health Care System.

**HVAC:** Heating, Ventilating, Air Conditioning

**Integrated Subsystem:** Any of the pre-coordinated subsystems specifically within the scope of a particular building system.

**Integration:** See Systems Integration.

**Interface:**

- A common boundary between two systems or components.
- A boundary detail designed to maintain a specified relation between adjacent systems or components.

**Interstitial Platform:** The deck system that provides the walk-on surface for the above ceiling (interstitial) service zone; and constitutes the bottom of the two-hour separation between floors (Refer to fire test reports [NBSIR 85-3158](#), Fire Performance of Interstitial Space Construction System; and [NISTIR 5560](#), Fire Performance of an Interstitial Space Construction System). Platform construction is continuous across a service module, except for the service bay.

**Interstitial Space:** Unfinished or non-habitable space utilized for building service subsystems, of sufficient size to accommodate workers and permit maintenance and alteration without disruption of activities in functional spaces. The term usually refers to the portion of the service zone between the finished ceiling and the floor above.

**Modular:**

- Having commensurable dimensions.
- Capable of arrangement with exact fit in more than one sequence or direction.
- Composed of or containing predetermined dimensional and/or functional units; such as repetitive structural bays or service modules.

**Modular Coordination:** Dimensional coordination utilizing commensurable dimensions.

**Module:**

- The common divisor of a set of commensurable dimensions.
- A dimensional pattern restricting the location of a specified building component.
- A unit of space defined by a special set of dimensional and/or functional characteristics.
- See also Planning Module, Service Module, Space Module

**Non-integrated:** Outside the design scope of a particular building subsystem.

**Non-system:** Non-integrated.

**OFM:** Office of Facilities Management.

**Optimize:**

- To maximize desirable characteristics and/or minimize undesirable characteristics.
- To establish functional and economic balance among the performance characteristics of two or more systems or components.

**Planning Module:** A one-story high unit of building volume with specific dimensional and functional characteristics.

**Plan Zone:** A plan area of constant width extending from end-to-end, or side-to-side, of a building or planning module. See Bedroom Zone, Sanitary Zone, and Service Strip.

**Platform:** See Interstitial Platform.

**Prefabrication:** The on-site or off-site advance manufacture of building systems and components traditionally fabricated in-place during installation.

**Primary Subzone:** A horizontal subdivision of the service zone reserved exclusively for distribution of systems or services oriented in a specific direction to the structure.

**Product:** A material, component, or system manufactured off the construction site.

**Prototype System Design:** A basic system design establishing the performance and dimensional limits within which alternative detailed designs may be produced to accommodate specific conditions at various times and places.

**Red Book:** VAHBS Research Study Report, Project 99-R047; U.S. Government Printing Office Stock No. 051-000-00 112-5. The Red Book is available from the VA Technical Information Library (TIL) at <http://www.va.gov/facmgt/standard/bsds.asp>.

**Reserved Zone:** A specified region within a building volume assigned to the exclusive use of one subsystem, or limited step of subsystems, or to a specific function. See Functional Zone, Service Zone, Primary Subzone, and Secondary Subzone.

**Sanitary Zone:** A plan zone in a nursing unit, such as between the patient bedrooms and the corridor, sized to accommodate lavatories, toilet facilities, etc.

**Secondary Subzone:** A vertical subdivision of a primary subzone reserved exclusively for the distribution of a specific service subsystem or group of subsystems.

**Service Bay:** A structural bay specifically designed to provide for mechanical and electrical rooms and/or various kinds of vertical shafts, located at the perimeter of a service module. May be enclosed by shear walls or other lateral bracing systems.

**Service Module:** A planning module containing, and served by, an independent horizontal distribution network; typically including its own air handling unit.

**Service Strip:** A plan zone containing internal service bays.

**Service Zone:** The horizontal layer or building volume between the bottom of a finished ceiling and the top of the finished floor immediately above; and the adjoining service bay. See Interstitial Space.

**Simple Assembly:** A design configuration in which all structure is framed in the same direction and all service bays are external.

**Space Module:** A subdivision of a service module in a patient bedroom area which may be internally organized in various ways to accommodate a range of functions, and which may be incorporated within a variety of design configurations.

**Subsystem:**

- A system considered as a component of a larger or more general system.
- Any component, or group of components, which has internally the characteristics of a system (e.g. the distribution components of a mechanical system).

**Support Area:** All hospital areas outside the bed-care area.

**System:** A set whose elements (termed components) are organized toward a common objective, and are characterized by interdependence in their individual contributions to that objective.

**Systems Analysis:** Examination of the effects of the interactions between the components of a system on the individual performance of those elements and on the total performance of the system.

**Systems Approach:** A strategy of problem definition and solution which emphasizes the interaction between problem elements and between the immediate problem and its larger context, and which specifically avoids traditional methods of independent or ad hoc treatment of the various elements.

**Systems Integration:**

- The combination of a groups of relatively independent parts into a coordinated whole to improve performance through controlled interaction.
- The joint use of a component by two or more systems.

**Unit:**

- A structurally independent assembly performing a specific function or range of functions.
- A functionally related set of people, equipment, spaces, missions, and activities considered collectively for planning and administrative purposes. See Functional Unit.
- A module.

**User Needs:** Those conditions the users of a building consider necessary or desirable as environment or support for their activities, without particular reference to how such conditions are to be provided.

**User Requirements:**

- User needs.
- Performance requirements established directly by a user.

**VA:** Department of Veterans Affairs.

**VA Hospital Building System:** A prototype system design developed by VA for use in the design and construction of new hospital buildings; characterized by modular design and the use of systems approach to the integration of building services and functional or planning modules.

**VAHBS:** VA Hospital Building System.

**VA HCS or VAHCS:** VA Health Care System.

**VAMC:** VA Medical Center.

This page intentionally left blank.