

# Final Report of the VA Research Infrastructure Program

**Veterans Health Administration  
Office of Research and Development  
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# Preface

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From 2005-2010 at the request of Congress, the Department of Veterans Affairs' Office of Research and Development (ORD) performed an in-depth survey and analysis of the physical condition of VA's aging research infrastructure. This report contains detailed results of that assessment and provides important information for the way forward.

The average VA building housing research laboratories and/or vivaria is over 50 years old. Research buildings date back as far as 1897, with many being constructed in the early 20<sup>th</sup> century. Most of these buildings were designed for purposes other than research and were not designed to provide a standard environment to support research laboratories or animals. The laboratories in many of the buildings have been retrofitted from former patient rooms, dormitories, or other structures on hospital grounds. However, recent funding for new construction has provided for buildings specifically designed for research. Having space designed specifically to meet the needs of research is critical in ensuring VA is able to produce the best and most effective research for Veterans.

Inquiry into the condition of VA's research infrastructure is not new. In 1996, the Veterans Health Administration (VHA) Research Realignment Advisory Committee published its final report, in which it found “ . . . *the research infrastructure will need continuing attention in order to maintain the capability and capacity for high quality research.*”

A previous infrastructure survey project began looking at research facilities in 2001 and, over a two year period, conducted approximately 36 site surveys. A leadership change ended this project in 2003.

More recently, ORD was directed by Congress in the 2006 House Appropriations Committee Military Quality of Life and Veterans Affairs and Related Agencies Appropriations Bill to “*undertake a comprehensive review of its research facilities and report to the Congress on the deficiencies found and suggestions for correction of the identified deficiencies.*”

Over the past five years, the VA Research Infrastructure Evaluation and Improvement Project (Research Infrastructure Program) visited the 74 campuses of the largest VA research programs across the country. Working with architectural and engineering experts in the field of science and technology, the team performed a comprehensive study of 171 buildings housing VA research. The team found a range of building conditions which are detailed in this report. The report also details potential costs associated with repairing deficiencies and notes areas where infrastructure has been upgraded during the course of the project.



Since the commencement of this survey many VA facilities have received construction and/or maintenance funding to make improvements to existing research facilities, or to construct new buildings. These improvements have helped to correct many of the deficiencies identified through the Research Infrastructure Program, but many more such improvements are needed in order to create and maintain the strong physical foundation needed for the future. Continued improvements to our research infrastructure will help VA investigators continue to address the unique healthcare challenges of veterans, now and in the future.

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## Section 1. Executive Summary

**VA was directed to “*undertake a comprehensive review of its research facilities and report to the Congress on the deficiencies found and suggestions for correction of the identified deficiencies.*”**

**House Appropriations Committee Military Quality of Life and Veterans Affairs and Related Agencies Appropriations Bill, 2006**

### Background

Report language accompanying the House Appropriations Committee Military Quality of Life and Veterans Affairs, and Related Agencies Appropriations Bill, 2006, directed the Department of Veterans Affairs (VA) to undertake a comprehensive review of its research facilities and report to the Congress on the deficiencies found and suggestions to correct them.

To carry out this assignment, the Office of Research and Development (ORD) established the VA Research Infrastructure Evaluation and Improvement Project (hereinafter referred to as the Research Infrastructure Program). The overall plan for the program was to examine the physical infrastructure for VA research programs by conducting a detailed review of physical structures housing biomedical research laboratories, including containment facilities, and vivaria (animal research facilities), as well as the supporting systems (i.e., piping systems (plumbing); heating, ventilation, and air conditioning (HVAC) systems; electrical; and fire protection) for: 1) physical deficiencies, (2) capacity (to include projected program growth), and (3) suitability of the space to conduct research. All stations with a minimum of \$500,000 in current year VA research funding and with on site biomedical research (74 sites) were assessed beginning with the pilot phase in June 2006 and concluding in December 2010.

To conduct a thorough examination and ensure consistency throughout the system, a comprehensive evaluation instrument (see Appendix B) was developed and used by the architectural and engineering (A&E) experts performing the assessment. In the initial development of the program, the Department’s Facility Condition Assessments (FCA) conducted by the Office of Construction and Facilities Management (CFM) were used to establish the basic framework. However,



significant differences between the two assessment programs were recognized: 1) the FCAs are conducted facility-wide while the Research Infrastructure Program assesses only biomedical laboratories and support spaces (e.g., common instrument rooms), vivaria (animal research facilities), and the plumbing, mechanical, electrical, and fire protection systems that support the specific research space examined; 2) the FCAs are performed from a broad, medical center perspective while the research assessments are performed from a spatially restricted Research Service point of view; and 3) perhaps the most significant difference, the functionality and suitability of the space for conducting research is considered in the research assessments. Research laboratory space is very costly to construct and maintain according to modern standards, and is comparable in cost to surgical spaces which are the most costly within a clinical setting.

Because of these differences, a separate research facility assessment form was developed and used in all of the research assessments. The evaluation instrument is based on the architectural and environmental elements that define a modern biomedical laboratory as described in Section 2 of this report, and enabled review of the space by research design experts in the context of both VA and National Institutes of Health (NIH) standards for research laboratory and vivaria infrastructure. Many VA investigators conduct NIH-funded research in VA laboratories and the space needs to conform to NIH standards.

The instrument was used to evaluate and document deficiencies in five areas:

1. Architectural: exterior and interior construction, floors, walls, ceilings, doors/door hardware, windows, casework/cabinetry, fixed laboratory equipment, environmental conditions and services, and general architectural issues.
2. Mechanical/Piping Systems: central specialty gas, compressed air, laboratory vacuum system, liquid nitrogen, laboratory waste system, safety showers and eyewashes, vivarium systems, specific needs of containment laboratories, and high-purity water systems.
3. Mechanical/HVAC: boiler systems, chilled water systems, air handling systems, exhaust systems, and specific needs of containment laboratories and vivaria.
4. Electrical: energy conservation, electrical distribution including electrical rooms or closets, panel boards, emergency power, specific vivarium needs, fire alarms, communications, lighting, equipment and system monitoring, and security.
5. Fire protection



The following grading criteria were used in review of materials and systems within the research infrastructure:

- A = new or like new condition or “excellent”
- B = above average condition or “very good”
- C = average or workable condition or “average”
- D = poor condition
- F = critical condition or “failing” or “inappropriate”

Only items graded “D” or “F” were identified as deficiencies. Each deficiency was assigned a priority based on the following criteria:

- Priority 1: Immediate needs (within 0-1 year), including corrective action to return components to normal service or operation; stop accelerated deterioration; replace items that are at or beyond their useful life; and/or correct life safety hazards.
- Priority 2: Critical but not immediate (within 1-2 years), including systems or components subject to intermittent interruptions; systems or components subject to rapid deterioration; and/or potential safety hazards.
- Priority 3: Necessary, but not critical (within 3-5 years), including systems or components that require attention to preclude deterioration, downtime, damage, or higher costs if deferred.
- Priority 4: Recommended (within 6-10 years), including sensible improvements to existing conditions and/or improve overall usability or reduce long-term maintenance.
- Priority 5: Code or program enhancements (10 years or more), including items that do not meet current building or fire codes or published agency standards (even if it met codes in effect at the time of construction), and/or items for which action is not required now, but should be considered to be included with any renovation, expansion or major upgrade projects.

The technical survey reports generated by A&E experts included identification of deficiencies, the cost to correct them, and the estimated cost to replace the building (or facility). From the cost data, the Facility Condition Index (FCI), or the cost of deferred maintenance divided by the replacement value of the building, was calculated. The FCI is an industry recognized and accepted means to quantify the condition of a building. An index of over 30% indicates that replacement of the asset should be considered. An index of over 50% is generally considered the threshold over which replacement is likely more cost efficient than correction. (For additional information on FCI, see Section 2, page 2-6.)





## Facility Condition Index of VA Research Buildings

Of the 171 research buildings assessed:

- 152 (or 89%) had an FCI of 10% or higher
- 13 (or 8%) had an FCI of 5% - 10%
- 6 (or 3%) had an FCI of 0% - 5%

Project methodology was developed by Infrastructure Program and A&E staff, and tested at three pilot sites in FY 2006: Central Arkansas Veterans Health System, Little Rock; VA Salt Lake City Health Care System; and VA New York Harbor Health Care System (Manhattan and Brooklyn campuses). Survey teams consisted of A&E experts to conduct the physical survey and identify physical deficiencies, and VA staff to review the space in the context of the local research program and to oversee the process.

### Findings

Research infrastructure assessments and reports have been completed for all research sites surveyed, encompassing 171 buildings at 74 VA campuses covering over 1.7 million square feet of laboratory space including over 4,000 square feet of Biosafety Level (BSL)-3 laboratory space, 567,291 square feet of vivaria (animal facility) space, and 450,505 square feet of administrative/clinical research offices.

The sites surveyed range from small (under 1,000 square feet of laboratory and animal research space) to very large (nearly 90,000 square feet of laboratory and animal research space). The reports indicate that there is a clear need for research infrastructure improvements throughout the system, including many Priority 1 deficiencies that are needed to return to normal operation, stop accelerated deterioration, replace items that are at or beyond their useful life expectancy, and/or correct life safety hazards.

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessments of all 74 sites. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed.



Discipline	Cost to Correct	% of Total
Architectural	\$ 232,986,199	30%
Plumbing	70,295,216	9%
HVAC	333,927,730	43%
Electrical	119,172,306	16%
Fire Protection	17,582,024	2%
<b>Total</b>	<b>\$ 773,963,475</b>	<b>100%</b>

Table 1.1 Overall Cost Summary by Discipline

Priority	Cost to Correct	% of Total
Priority 1	\$ 301,768,836	39%
Priority 2	243,606,249	32%
Priority 3	141,637,708	18%
Priority 4	40,127,547	5%
Priority 5	46,823,135	6%
<b>Total</b>	<b>\$ 773,963,475</b>	<b>100%</b>

Table 1.2 Overall Cost Summary by Priority

While documenting the nearly \$774 million in deficiencies, a pattern of recurring trends became apparent at sites across the nation. These common deficiencies relate to architectural details, as well as the support systems serving research space. Following is a listing of the most commonly identified deficiencies throughout the surveys.

#### Architectural:

- Inappropriate finishes within the research space (e.g., vinyl composition tile rather than sheet vinyl flooring used in tissue culture rooms; the presence of asbestos tile or asbestos within the mastic underneath the tile surface; lack of cleanable monolithic surfaces throughout animal facility space).
- Corrosion of laboratory casework due to chemicals.
- Lack of compliance with accessibility guidelines (e.g., lack of proper clearance due to insufficient aisle or hallway space or due to overcrowding, inappropriate door hardware, lack of access ramps into cold rooms, inappropriate bench heights).
- Damage to ceilings and/or fixtures due to roof, pipe, or window leakage.



- Lack of code compliant safety showers and emergency eyewashes.
- In seismic zones, lack of seismic lips on laboratory shelving or the use of temporary shelving such as stacking boards on bricks.
- Low floor to floor height (e.g., lower than the 14 foot clearance required for VA new construction) limiting accessibility for significant systems upgrades.

Plumbing:

- Lack of proper backflow prevention (protecting hospital and/or public domestic water sources from possible contamination from laboratories and vivaria).
- Lack of separate laboratory waste system.
- Aging plumbing systems with costly leaks.
- Lack of separate laboratory systems for compressed air, vacuum, etc.

Mechanical (HVAC):

- Lack of appropriate air changes within laboratory space.
- Lack of appropriate laboratory exhaust systems or exhaust stacks that are not the required ten feet above the roof.
- Air intakes located in areas with fumes from automobiles or in areas accessible to introduction of toxic materials.
- Lack of appropriate equipment and capacity (coils and controls for dehumidification, cooling, and reheat; refrigeration equipment).
- Lack of proper mechanical space to service the equipment.

Electrical:

- Lack of space in electrical panels for additional circuits, and lack of appropriate capacity of emergency systems.
- Lack of sufficient emergency power.
- Lack of central monitoring (for freezers, HVAC, etc.).
- Lack of transient voltage surge suppression to protect sensitive electronics.
- Lack of ground fault circuit interrupter receptacles on laboratory benches, especially near water sources.
- Lack of ground fault protected and weatherproof receptacles in vivaria.
- Inadequate or inappropriate lighting, including lack of gasketed lighting in vivaria.

Fire Protection:

- Lack of complete sprinkler systems within research space (including space with sprinkler heads located above the ceiling).
- Lack of adequate smoke detection, especially in communication closets.
- Aging fire alarm systems that lack appropriate notification devices (e.g., strobes and voice).



A number of programmatic trends emerged as well. Nearly all the sites surveyed lack central core space for shared equipment and for storage of supplies and other necessary items, resulting in overcrowding within laboratories. There also is a growing need for dedicated space in which to conduct clinical research.

At the same time, the Infrastructure Program staff members participating in the assessments noted some very positive programmatic trends. At nearly every site surveyed, VA medical center leadership expressed their support of the local research program and their interest not only in sustaining the program, but also in promoting its continued growth. With this support comes an understanding that, in order to flourish, the research infrastructure must be well maintained and enhanced whenever possible.

It is important to note that, without the assistance both on site and prior to the assessments from local Facilities Management/Engineering staff, a thorough assessment of VA research infrastructure could not have been conducted. Almost without fail, the staff members who maintain VA clinical and research facilities are knowledgeable, motivated, and do an excellent job for the medical centers, often with scarce resources.

It is equally important to point out that at several facilities, the local Safety Officer was not aware of many safety requirements for research laboratory space, such as requirements for safety showers and emergency eyewashes, particularly with regard to the type of and appropriate placement of units that meet American National Standards Institute (ANSI) safety guidelines which VA subscribes to. Another example of this lack of awareness was with regard to fire alarm systems and the need for appropriate annunciation devices to meet accessibility guidelines. While the few instances encountered were an anomaly, they may be an indicator of a need for specific training with regard to safety and accessibility in a research environment.

#### Remedial Actions

During the course of the program, the VHA Office of Capital Asset Management & Support (OCAMS) has provided substantial funds for remediation of research facility deficiencies and/or for construction of new research facilities.

To upgrade the VA research physical infrastructure, the OCAMS provided \$271,504,560 for NRM and Minor Construction projects from FY 2007-2011.





In addition, major construction projects in Denver, Las Vegas, New Orleans, Omaha, Orlando, and Pittsburgh will add 320,000 square feet of research space.

To upgrade VA research equipment, ORD has expended over \$99 million to purchase equipment for laboratories, common resource rooms, and research animal facilities, and to assist stations with activation funding (following construction or large renovation projects) from FY 2007 through FY 2011. Additionally, in July 2011, ORD provided \$1.1 million to field sites to assist in the remediation of outstanding life safety hazards. An additional \$1.1 million was available for this remediation, but the support was declined by several stations due to their inability to obligate the funds by the end of FY 2011. ORD had hoped to offer this support again in early FY 2012 but was unable to due to funding constraints.

### Future Plans

While funding for minor construction and non-recurring maintenance projects affecting research infrastructure has increased dramatically in the past few years, much remains to be done. ORD is an active participant in the Strategic Capital Investment Planning (SCIP) process and hopes to obtain funding for additional worthy research infrastructure improvements as the program moves forward. VA medical centers will also be able to request NRM funding for projects under \$1 million through a separate NRM process. With the data obtained through the Research Infrastructure Program, ORD is in a position to identify additional sites for improvements using a peer review process.

In August 2011, ORD convened a group of field and Central Office staff to identify specific criteria to be used in the peer review process. Participants included stake holders from four VA medical centers with active research programs, as well as Research Infrastructure Program staff, and representatives of both the Office of Construction and Facilities Management and the VHA Office of Strategic Planning and Analysis. Review criteria as well as the framework for an overall project management plan were developed.

Criteria used in the peer review process included: 1) the need for improvements in research infrastructure (50%); and 2) the vitality of the local research program, including the perceived strength of the academic affiliation (50%). Each of these factors plays a key role in determining the potential for research infrastructure improvements to facilitate a program's sustained momentum in medical research. When the criteria are combined, they figure prominently in increasing the potential for growth of the research program, thus furthering the development of healthcare advances for Veterans.

The project management plan (Management Plan for Identifying VA Medical Facilities for Research Infrastructure Improvement Funding), has two main objectives:



- Identify and develop a detailed peer review process by which ORD can rank VA medical centers (for infrastructure improvement funding) within each VISN and across VISNs using total VA funding data. This objective includes developing the review framework, identifying and appointing a review committee, preparing for and conducting the review, and analyzing the results and utilizing them to inform funding recommendations.

This peer review process occurred in early FY 2012. ORD is using the results to inform SCIP funding recommendations for infrastructure improvements to research space.

- Identify and develop a detailed process by which ORD Research Infrastructure Program staff and CFM staff will coordinate the integration of research infrastructure survey data into CFM's Capital Asset Inventory (CAI), thus enabling the review of infrastructure data specific to research in the SCIP process.

This data integration process, also anticipated to begin in FY 2012, will enhance the CAI resulting in increased accuracy of future facility condition assessments with regard to research space, both stand alone space as well as that research space embedded within a hospital's clinical spaces.

ORD will designate a senior program manager to serve as the liaison officer with network capital asset managers to assist them in the preparation of research-related proposals, and to advise the OCAMS and the SCIP Board in the annual evaluation of research related business plans for major and minor construction and NRM.

ORD will also be working with 10NA8 (Occupational Safety and Health Group) to develop a self-reporting mechanism for the stations to communicate to VACO any outstanding needs for life safety systems. The reports will be reviewed quarterly to track progress toward remediation and compliance with VHA Safety Standards.



### Conclusions

The physical assessments of 74 VA research sites resulted in detailed data on architectural and systems deficiencies, the estimated cost to remediate those deficiencies, and the cost to replace the buildings housing the research space. Overall, VA research space is in need of substantial corrections to bring the space to what would be considered industry standard.

The remaining sections of this document contain detailed information regarding the project methodology (Section 2), a description of each VA research site assessed (Section 3), and appendices with additional clarifying or informational data.

The past two years have resulted in a substantial increase in funding to correct VA research infrastructure deficiencies, many of which were identified during the Research Infrastructure Program assessments. When compared to the nearly \$774 million in identified deficiencies, the corrections and new construction funded in FY 2010-2011 constitute only about 27% of those needed.



## Section 2. Project Methodology

### Introduction

From its inception, the Research Infrastructure Program was viewed as a by-product of the Department's Facility Condition Assessments (FCA) conducted by the Office of Construction & Facilities Management (CFM). In developing the original statement of work (SOW) for the project, the FCA SOW was used to establish the basic framework that included the same scoring system for deficiencies. It quickly became clear, however, that there would be significant differences between the two assessment programs: 1) the FCAs are conducted facility-wide while the Research Infrastructure Program assesses only biomedical laboratories and support spaces (e.g., common instrument rooms), vivaria (animal research facilities), and the plumbing, mechanical, electrical, and fire protection systems that support the specific research space examined; 2) the FCAs are performed from a broad, medical center perspective while the research assessments are performed from a spatially restricted Research Service point of view; and 3) perhaps the most significant difference, the functionality and suitability of the space for conducting research is considered in the research assessments. Research laboratory space is very costly to construct and maintain according to modern standards, and is comparable in cost to surgical spaces which are the most costly within a clinical setting.

Because of these differences, a separate research Facility Assessment form was developed and used in all of the research assessments. This tool enabled review of the space by research design experts in the context of both VA and National Institutes of Health (NIH) standards for research laboratory and vivaria infrastructure. Many VA investigators conduct NIH-funded research in VA laboratories and the research space needs to conform to NIH standards. For that reason pricing was not based on the published VISN costs per square foot but rather on industry cost parameters that were further indexed by geographic location and assessment date. In spite of this, however, overall costs of correcting deficiencies in research space were relatively consistent with FCA results, with the exception of a few outlying sites. Many of the differences in costs can be attributed to review of research space embedded among clinical spaces, as the FCA did not allow for specific pricing of research deficiencies in these spaces.

The Research Infrastructure Program assessments were conducted by a multi-disciplinary team consisting of architectural and engineering (A&E) experts with experience in design and assessment in the science and technology arena. The A&E experts performed the technical assessment of space and support systems, accompanied by one or more staff members of the Research Infrastructure Program office. The VA staff have broad knowledge of the VA research program and met with local research leaders and administrators to discuss the current status of their





program in the context of the research space, as well as the program's needs for future growth. On a number of surveys, additional VA research staff from field sites and/or VA Central Office also participated. In addition to reviewing the local research program in the context of available space, the VA participants also toured the space along with members of the A&E team in order to gain an understanding of the overall quality of the space and of any specific problems that were noted. The A&E team did not assess the "dry laboratory" space used for non-laboratory research (rehabilitation research, health services research, cooperative studies, etc.), general office space, or clinical research units, but the Research Infrastructure Program staff evaluated these spaces for quality, suitability, and availability of expansion space.

The data collected from the Research Infrastructure Program assessments have been identified as a "special project" by CFM and will be added to the CFM database as a subset of the VA Facility Condition Assessments. The addition of research design and construction criteria will enhance the FCA database resulting in increased accuracy of future FCA with regard to research space, both stand alone space as well as that research space embedded within a hospital's clinical spaces. The incorporation of the Research Infrastructure Program assessment data into the FCA database is currently being discussed between CFM and the Office of Research and Development, and is expected to be accomplished in fiscal year 2012.

#### Basic Elements of a Modern Biomedical Research Laboratory<sup>i</sup>

Biomedical research technology has advanced exponentially over recent decades. New technologies and approaches to biomedical problems require cutting edge instrumentation, environmental controls, and a superior infrastructure in biomedical laboratories. This presents a problem for the VA investigator often working in a building that is over 40 years old that may not have the ideal research environment, and can create difficulties recruiting and retaining superior investigators in our VA medical facilities.

The ideal biomedical research laboratory should be responsive to current research needs in terms of space, environment, support services, functions and equipment, safety, and security, while also being perceptive to future needs for possible renovation and expansion. The facility must have inherent flexibility and adaptability to keep pace with the rapid changes continually occurring in the science and technology arena. The ability to rapidly convert and renovate with minimum disruption is mandatory.

Research laboratories consist of multiple types of environments: administrative and office areas, wet bench Biosafety Level (BSL)-2 environments, core laboratories, shared equipment and instrumentation spaces, storage rooms, containment environments (BSL-3 laboratories), and vivaria (animal research facilities).



The physical laboratory environment should provide:

- Places to work alone
- Places to circulate
- Places to go to for support
- Places to work together

The laboratory should be well organized such that it provides space for people and space for equipment. It should be a safe and secure environment and incorporate the needs of VA workers with disabilities.

Research laboratories, and especially the use of BSL-3 environments and the presence of research animals, require environments of higher reliability, greater redundancy and more frequent maintenance than for other types of facilities. This is required because the loss of critical environmental systems resulting in extreme temperatures or the build-up of deleterious gases, such as ammonia and carbon dioxide, in animal housing can negatively affect the health and well being of research animals or result in their death, losing not only valuable and unique research animals but also losing research data. Therefore, the issues of reliability, redundancy and maintainability are of critical importance to the success of biomedical research environments.

- **Reliability** is a measure of the probability of environmental systems to be operational. Because of the extreme consequences of poor equipment selection, all equipment installed in the facility should have proven design, reliability and quality. Important life safety elements such as safety showers and emergency eyewashes must be in compliance with applicable standards, located appropriately, and routinely inspected. Inappropriate selection of seemingly small items such as electrical receptacles can be life safety hazards if ground fault circuit interrupter (GFCI) receptacles are not used near laboratory sinks.
- **Redundancy**, or back-up capacity, is the capability of environmental systems to accommodate a loss of system components while still maintaining the desired environmental conditions. Since the loss of environmental systems (such as power or conditioned air) can have such a negative impact on pressurized containment environments (e.g., BSL-3 spaces), vivaria and the animals within, and the research, adequate redundancy must be provided in all appropriate systems (HVAC, generators, chilling, etc). This can be accomplished through the addition of redundant equipment, i.e., a fan or motor, or the addition of an emergency power generator.
- **Maintainability** includes the ability to regularly inspect and service environmental system components (HVAC, plumbing, fire protection and



some lighting) on a preventive maintenance schedule. It also reflects the need for adequate access to replace major system components in the event of failure. Safety equipment such as chemical fume hoods and biosafety cabinets also require maintainability.

- **Building systems equipment** should be located outside of the laboratories and vivaria for two reasons: 1) to simplify the access to the equipment, and 2) to reduce the possibility of exposing the maintenance personnel to contaminants. This should include all devices that require regular inspection or service, such as air control devices, control valves, filter boxes and isolation valves. The only major system that could be maintained inside such spaces is lighting. Regardless of the location of the building system equipment, adequate service clearances are required around all equipment to accommodate regular servicing procedures, such as reading gauges, replacing filters and pulling of coils. The service clearance must include the necessary space to remove the equipment from its installed location to outside of the facility.

#### Architectural and Engineering Expertise

The assessment of the 74 VA research sites was accomplished through technical expertise provided by three different A&E firms contracted through existing indefinite delivery/indefinite quantity (IDIQ) contracts with the Department. Expertise was sought in design and assessment in the science and technology arena. At least two of the firms selected had previously participated in Facility Condition Assessments at various VA sites conducted through the Office of Construction & Facilities Management. All three of the firms have extensive experience in the design of research laboratories and vivaria, as well as in the assessment of existing facilities.

Flad Architects, based in Madison, WI, joined with Affiliated Engineers, Inc. (AEI), both from their offices in Gainesville, Florida, to conduct the Pilot Phase and two additional assessments, June-September 2006. Flad and AEI also worked closely with VA Research Infrastructure Program staff to develop the standard research Facility Assessment forms (see Appendix B) used by all three firms at all 74 sites.

HDR Architecture, Inc., based in Omaha, Nebraska, initiated the full implementation phase of the project and performed the majority of assessments, beginning in September 2007 through September 2009. Throughout the course of the project, the firm drew from A&E expertise at several of its offices, including Omaha, Atlanta, Cincinnati, Alexandria (VA), Chicago, Charlotte, and three offices in California (Folsom, San Francisco, and Los Angeles).



Cannon Design, based in Grand Island, New York, completed the assessments from March through December 2010. Expertise was drawn from their office in Grand Island, as well as in St. Louis, Houston, and Chicago, IL.

### Technical Evaluation<sup>ii</sup>

The evaluation performed by the A&E team provided an independent, detailed, and documented review of research physical infrastructure conditions and the suitability of the research space for conducting current and projected types of research. Each assessment involved a site visit to, and physical inspection of, the research space at a VA facility concluded by an exit briefing to hospital, research, and Facilities Management/Engineering leadership about the overall condition of the space and systems, with emphasis on any deficiencies that may impact health and/or safety of personnel or research animals.

The number of days a team spent at a survey site varied, based primarily on total square footage of laboratory, support, and vivarium space at each site, but also on the number of individual buildings to be examined.

To ensure consistency throughout the assessments, a comprehensive evaluation instrument (see Appendix B) was developed and used by the A&E experts to evaluate and document deficiencies in five areas:

1. Architectural: exterior and interior construction, floors, walls, ceilings, doors/door hardware, windows, casework/cabinetry, fixed laboratory equipment, environmental conditions and services, accessibility, and general architectural issues.
2. Mechanical/Piping Systems: central specialty gas, compressed air, laboratory vacuum system, liquid nitrogen, laboratory waste system, safety showers and eyewashes, vivarium systems, specific needs of containment laboratories, and high-purity water systems.
3. Mechanical/HVAC: boiler systems, chilled water systems, air handling systems, exhaust systems, and specific needs of containment laboratories and vivaria.
4. Electrical: energy conservation, electrical distribution including electrical rooms or closets, panel boards, emergency power, specific vivarium needs, fire alarms, communications, lighting, equipment and system monitoring, and security.
5. Fire protection.

For each survey the A&E team gathered data on facility conditions using the comprehensive evaluation instrument developed prior to the program's Pilot Phase and provided by VA. A grading system was used to evaluate major building systems (Architectural, Plumbing, Mechanical, Electrical, and Fire Protection).





Each element within each building system (or the portion thereof supporting embedded research space) was graded using the follow criteria:

- A = new or like new condition or “excellent”
- B = above average condition or “very good”
- C = average or workable condition or “average”
- D = poor condition
- F = critical condition or “failing” or “inappropriate”

Only items graded “D” or “F” were identified as deficiencies and costed for correction. A cost was calculated for each deficiency based on the date (month and year) of the survey and the geographic location of the site. Then for each building assessed, the total cost to remediate deficiencies was calculated, as was the total cost to replace that portion of the building dedicated to research. From these two cost figures, a Facility Condition Index (FCI) was calculated for each individual building assessed and, in the case of sites with multiple buildings, for all research space on the campus. As described in the report of each assessment,

*“A Facility Condition Index (FCI) is an industry recognized and accepted means to quantify the condition of an asset, usually a building or facility with a number ranging from 0.00 to 1.00. The index is calculated by dividing the cost of deferred maintenance by the replacement value of the asset. In this case, the replacement value is determined to be the cost for building a new stand alone facility of the same area with equivalent construction and systems (this is standard in the industry even for embedded partial facilities). Because the index is a fraction of 1.00, it is often expressed as a percentage, i.e.: 0.12 = 12%. A high index number indicates a poorer condition. Since the FCI indicates the condition with a number it allows for tracking the condition of a building over time, or provides a means to make a more objective comparison of conditions with other buildings and can help drive decision making for strategic capital spending. The industry accepted parameters for conditions is as follows: Good condition = 0% - 5%; Fair condition = 5% - 10%; and Poor condition = 10% and higher. It is important to highlight that the replacement value is based on the current net assignable area and does not include any area increase to compensate for current space utilization deficiencies such as overcrowding.”*

Caution should be exercised when reviewing the FCI of a given building and making a judgment based solely on the FCI. While the FCI value generally provides a way to gauge the degree of degradation within a building and the cost effectiveness of correcting deficiencies versus replacing the structure, there are some inherent problems. One example encountered during the course of this project is for a building that contained a small amount of research space which resulted in the deficiencies seeming large comparatively and resulting in an FCI higher than what one would expect. In the specific instance encountered, a large historic building that had been entirely gutted and rebuilt from the inside out with new systems and most interior finishes in excellent condition, received an FCI of 14%, resulting in an overall rating of “poor”. This occurred because, while the overall building was fairly large with three levels and a roof penthouse, the laboratory space consisted of only 2,444 net square feet (nsf). This example was an anomaly within the overall project. Generally buildings that received an overall rating of “poor” were also judged to be in poor condition by members of the respective



assessment team, either due to the buildings' appearance and overall deterioration and/or due to excessive deficiencies for support systems.

Each identified deficiency was also assigned a priority for correction based on the judgment of the reviewer. The priorities were defined as described below.

- Priority 1: Immediate needs (within 0-1 year), including corrective action to return components to normal service or operation; stop accelerated deterioration; replace items that are at or beyond their useful life; and/or correct life safety hazards.
- Priority 2: Critical but not immediate (within 1-2 years), including systems or components subject to intermittent interruptions; systems or components subject to rapid deterioration; and/or potential safety hazards.
- Priority 3: Necessary, but not critical (within 3-5 years), including systems or components that require attention to preclude deterioration, downtime, damage, or higher costs if deferred.
- Priority 4: Recommended (within 6-10 years), including sensible improvements to existing conditions and/or improve overall usability or reduce long-term maintenance.
- Priority 5: Code or program enhancements (10 years or more), including items that do not meet current building or fire codes or published agency standards (even if it met codes in effect at the time of construction), and/or items for which action is not required now, but should be considered to be included with any renovation, expansion or major upgrade projects.

#### Specific Scope for each Discipline<sup>iii</sup>

The major portion of the data listed below was collected by the Contractor's personal inspection of the equipment or systems with the assistance of the appropriate VAMC staff.

Laboratories: Research laboratory areas were evaluated for their suitability for the specific research activities being conducted. Biosafety Level 2 and 3 laboratory guidelines found in the latest edition of NIH/CDC BIOSAFETY IN MICROBIOLOGICAL AND BIOMEDICAL LABORATORIES, The NIH Laboratory Design Guidelines, and VA design requirements, as well as industry standards for good laboratory design were used as standards for the assessments. Equipment such as biological safety cabinets and fume hoods were evaluated for performance, life-cycle status, and suitability for the general definition of operations in each laboratory. Based on site specific information, it was determined if the laboratory facilities would meet the short and long term needs of the medical center's research program.

Architectural Systems: The evaluations included a physical inspection of all architectural components having impact upon research space and/or function,



including flooring, wall finishes, ceilings, doors, door hardware, security, cabinetry, countertops, roofs (for buildings dedicated to research or research spaces immediately covered by a roof), flashing, coping, exterior wall assemblies, windows, life safety requirements, handicapped accessibility features, major fixed equipment, environmental conditions, and signage/way finding. The locations of asbestos within a facility were noted but not cost evaluated unless the asbestos was damaged and posing a health threat. Within vivarium space, the inspection also included the potential for ingress of feral animals and/or disease and egress of laboratory animals. Based on the physical inspection, local VA input, and available local data, existing conditions were fully documented using the standard research Facility Assessment forms. Each material or system was graded based on condition, remaining useful life expectancy, and suitability for purpose.

Heating Ventilating and Air conditioning (HVAC) systems: The evaluation included a physical inspection of all HVAC systems including air handlers, exhaust, package equipment, room terminal units, refrigeration equipment, piping, valves, ductwork, room air distribution, controls, indoor air quality issues and other equipment and system components essential for the operation of the HVAC systems used for research buildings and/or embedded research space in the medical center. Within a vivarium, particular attention was paid to technical problems that could lead to the potential for catastrophic loss of research animals. HVAC equipment must be designed, maintained and operated so as to “fail safe” within acceptable temperature conditions for laboratory animals. The evaluation inspected HVAC systems to ensure that in the “fail safe” mode heat was shut off.

Chiller Plant and Distribution System: The evaluation included a physical inspection of the chiller plant and related systems including refrigeration equipment, cooling towers and condenser water pumping systems, primary and secondary chilled water pumping systems, condenser water system, valves, and other equipment and system components essential for the operation of the chiller system. Inspection, testing and calibration data, and maintenance and repair histories were reviewed and facility personnel interviewed. Age, condition, capacity deficiencies, equipment/system efficiency, and equipment controls were documented. Life expectancy, based on the Contractor’s educated analysis, was determined. The ability of the equipment or system to support the function that it was currently serving was evaluated. Any deficiency in capacities, American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. (ASHRAE) system deficiencies, and differences from National Fire Protection Association (NFPA) and other national code requirements, as well as significant deficiencies from VA and/or NIH criteria for similar functional areas and equipment requirements was identified. Any piping flow problems, deteriorated piping problems, or pumping problems were also identified.



Plumbing, Medical Gas, and Fire Sprinkler Systems: The assessment included a physical inspection of all piping systems, including cold and hot water, recirculation systems, hot water heaters, distilled water systems, any applicable medical gas systems, vacuum systems, laboratory drains, and sprinkler systems. Inspection, testing, and calibration data, and maintenance and repair histories were reviewed and facility personnel interviewed. The age, condition, capacity deficiencies, equipment/system efficiency, control of equipment as well as suitability of the systems for research use were documented. Life expectancy, based on the Contractor's educated analysis, was determined. The equipment's ability and suitability to support the function that it was currently serving was also evaluated. Any deficiency in capacities, national plumbing code deficiencies, and significant differences from NFPA and other national code requirements, as well as significant deficiencies from VA criteria for similar functional equipment requirements were noted. Any piping flow problems, deteriorated piping problems, pumping problems etc., were also identified.

Electrical, Lighting, Communications and Signaling Systems, Security: The evaluation included a physical inspection of all research relevant electrical, lighting, communications and signaling systems including incoming electrical service and switchgear, incoming telephone service and switch, main facility fire alarm system, site lighting and security systems, secondary distribution system (transformer, secondary service equipment, risers, panel boards and branch circuit wiring), essential electrical system (all related equipment including fuel oil tanks), interior lighting and power, interior fire alarm system, interior telephone, data, lightning protection system and electrical, signal and telephone closets. Recent maintenance and testing reports and repair histories on electrical equipment were reviewed and any deficiencies documented. Age, condition and any capacity deficiencies for all systems were documented. Life expectancies, based on sample data from the VA or the Contractor's educated analysis, were determined. All equipment's capability to continue to function in the future was also evaluated. National Electrical Code (NEC 70), Standard for Health Care Facilities (NFPA 99), or any other national code deviations or violations as well as any significant deviations from VA requirements for similar systems or equipment requirements were identified.

Structural Systems: Generally, the evaluation included a visual inspection of the structural support members, framing system, floor and roof systems, and load bearing walls forming the infrastructure for research buildings/embedded research space. The types of foundation and structural floor system (including vertical members) were documented from as-built drawings and observation. Any obvious and significant deficiencies in the structural system that can cause life-threatening situations or impact operations or substantially reduce the useful life of the building was identified, including (but not limited to) settlement cracks in floor or walls, corrosion of members affecting their ability to perform, and suitability of the application. The Research Infrastructure Program staff requested the addition of a



structural engineer to the survey team for specific sites only if there were extenuating circumstances relating to the geographic area (i.e., seismic activity) or the age and general condition of buildings to be surveyed.

Outside Steam Distribution Systems: An evaluation of these systems (especially animal facilities) included interviews with the VAMC personnel who maintain the systems and a review of system plot plans furnished by the VAMC. Condition and life expectancy of the steam supply and condensate return piping, along with the steam traps, main isolation valves and the protective enclosures of the systems, were evaluated by the Contractors. This information was used to evaluate the ability and suitability of the system to support the functions currently served as well as any potential programmed change in functions.

#### Common Trends and Deficiencies<sup>iv</sup>

During the first two years of the research infrastructure assessments, a pattern of recurring trends became apparent throughout the surveyed sites. In point of fact, these were not restricted to specific VISNs or areas of the country, but rather were deficiencies that were identified at sites nationwide and throughout the course of the surveys.

These common deficiencies relate to architectural details, as well as the support systems serving research space. Following is a listing of the most commonly identified deficiencies throughout the surveys.

#### Architectural:

- Inappropriate finishes within the research space (e.g., vinyl composition tile rather than sheet vinyl flooring used in tissue culture rooms; the presence of asbestos tile or asbestos within the mastic underneath the tile surface; lack of cleanable monolithic surfaces throughout animal facility space).
- Corrosion of laboratory casework due to chemicals.
- Lack of compliance with accessibility guidelines (e.g., lack of proper clearance due to insufficient aisle or hallway space or due to overcrowding, inappropriate door hardware, lack of access ramps into cold rooms, inappropriate bench heights).
- Damage to ceilings and/or fixtures due to roof, pipe, or window leakage.
- Lack of code compliant safety showers and emergency eyewashes.
- In seismic zones, lack of seismic lips on laboratory shelving or the use of temporary shelving such as stacking boards on bricks.
- Low floor to floor height (e.g., lower than the 14 foot clearance required for VA new construction) limiting accessibility for significant systems upgrades.





### **Mechanical/Plumbing:**

- Lack of proper backflow prevention (protecting hospital and/or public domestic water sources from possible contamination from laboratories and vivaria).
- Lack of separate laboratory waste system.
- Aging plumbing systems with costly leaks.
- Lack of separate laboratory systems for compressed air, vacuum, etc.

### **Mechanical/HVAC:**

- Lack of appropriate air changes within laboratory space.
- Lack of appropriate laboratory exhaust systems or exhaust stacks that are not the required ten feet above the roof.
- Air intakes located in areas with fumes from automobiles or in areas accessible to introduction of toxic materials.
- Lack of appropriate equipment and capacity (coils and controls for dehumidification, cooling, and reheat; refrigeration equipment).
- Lack of proper mechanical space to service the equipment.

### **Electrical:**

- Lack of space in electrical panels for additional circuits, and lack of appropriate capacity of emergency systems.
- Lack of sufficient emergency power.
- Lack of central monitoring (for freezers, HVAC, etc.).
- Lack of transient voltage surge suppression to protect sensitive electronics.
- Lack of ground fault circuit interrupter receptacles on laboratory benches, especially near water sources.
- Lack of ground fault protected and weatherproof receptacles in vivaria.
- Inadequate or inappropriate lighting, including lack of gasketed lighting in vivaria.

### **Fire Protection:**

- Lack of complete sprinkler systems within research space (including space with sprinkler heads located above the ceiling).
- Lack of adequate smoke detection, especially in communication closets.
- Aging fire alarm systems that lack appropriate notification devices (e.g., strobes and voice).

A number of programmatic trends emerged as well. Nearly all the sites surveyed had a lack of central core space for shared equipment and for storage of supplies and other necessary items, resulting in overcrowding within laboratories. There also is a growing need for dedicated space in which to conduct clinical research. Storage space for clinical research records is another major problem with some medical centers leasing off-site space for storage.





### Research Facility Condition Assessment Reports

Following each assessment, a detailed, written report was provided to the station. To ensure consistency throughout the project and to provide the highest quality of report possible, the Research Infrastructure Program staff performed a detailed editorial review of each report to include completeness and accuracy of content, adherence to the established format, appropriate style, and accuracy of cost data presented.

Each report included five specific components.

1. Overall Executive Summary - Prepared by VA Infrastructure Program staff, this summary provided an overview of the specific research program with regard to funding amounts, types of research, and any special programs such as a Center of Excellence. This section also concisely identified the research space by building and type, and included highlights of identified deficiencies. Attached to the overall executive summary was a roster of assessment team members and a roster of station leadership and other individuals who assisted prior to and during the assessment.

The remainder of the report was drafted and completed by the A&E contractor who performed the assessment, with extensive review and editing by VA Research Infrastructure Program staff.

2. Technical Executive Summary – This section of the report included a brief explanation of the purpose of the study and report, the scope of the facility assessment, delineation of major issues and concerns for each building surveyed, total estimated correction costs both by priority and by discipline, calculation of the Facility Condition Index (based on correction cost versus replacement cost), and a summary of findings overall in laboratories, in the vivarium (if applicable), and in the BSL-3 laboratory (if applicable).

3. Building and System Descriptions included a detailed description of each building housing research space, including materials, systems, and major equipment comprising the infrastructure support for research space. Each building or major portion of a building was described in a separate section of the report. For facilities having multiple sites, the descriptions were separated by building within each site.

4. Facility Deficiencies included a full description of the methodology used in performing the cost estimation, identification and detailed description of all deficiencies found in the assessment of the facility, including any material, system or equipment with a grade of “D” or “F”. The estimated cost for replacement or correction (as appropriate) and the priority for correction were provided. Each



deficiency was assigned one of the following disciplines: Architectural, Plumbing, Mechanical/HVAC, Electrical, and Fire Protection. Each deficiency was assigned one of the following priorities: Priority 1 (immediate needs), Priority 2 (critical, but not immediate), Priority 3 (necessary, but not critical), Priority 4 (Recommended), and Priority 5 (Code or Program Enhancements). An overall FCI based on the cost to correct deficiencies vs. cost to replace buildings and supporting systems was provided.

5. Appendices: Each report included the following items within the appendices: glossary of terms (i.e., list of acronyms as developed/approved by VA jointly with the Contractor), photographs of the facility taken during the site survey, cost backup for the assessment, and the VA Research Space Assessment instrument.

It should be noted that, while there were subtle differences between the reports produced by each of the three Contractors that performed the assessment, the overall methodology of assessments and content of reports was consistent throughout the course of the project.



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<sup>i</sup> HDR Architecture, Inc., and Cannon Design.

<sup>ii</sup> Excerpts taken from the Statement of Work for VHA Research Facility Physical Infrastructure Assessment. Some portions were also published as part of the standard report of an infrastructure survey.

<sup>iii</sup> Statement of Work for VHA Research Facility Physical Infrastructure Assessment.

<sup>iv</sup> Initially developed by HDR Architecture, Inc., April 2008 and enhanced by Cannon Design and the Research Infrastructure Program staff.



## Section 3. Description of VA Research Infrastructure

Beginning with the Pilot Phase in June 2006 and progressing through December 2010, a total of 74 VA sites representing all 21 Veterans Integrated Service Networks (VISNs) were assessed. The following pages contain a detailed description of each of the sites surveyed presented in numeric order by VISN, and within each respective VISN in numeric order by station identification number.

The information contained in the station descriptions is based on the report of the respective station's research infrastructure survey, as well as additional input received from the stations regarding improvements made since the time of their assessment.

All stations at which the research space was assessed were asked in May 2011 to respond to nine specific questions pertaining to gain or loss of space; status of any construction and/or renovation projects underway or identified at the time of the assessment; description and status of any renovation or construction projects funded by the American Recovery and Reinvestment Act of 2009 (ARRA), Minor Construction, non-recurring maintenance (NRM), and/or station or VISN funds (particularly with regard to Priority 1 deficiencies). Information on minor construction and (national) NRM funds applied for but not awarded was also requested, as was information on any deficiencies that have not been corrected and have become exacerbated since the time of the assessment. Response rate to this inquiry was 100%.

It is important to note that, because each assessment was considered a "snapshot" of existing conditions as of the date(s) of the assessment, the narrative identifying the research space and describing its condition is written in present tense and, in most instances, is verbatim from the VA executive summary prepared by Research Infrastructure Program staff. Any significant changes in the amount and/or location of space are identified. Status of local infrastructure improvements is current as of September 2011.

For each site, the following information from each station's assessment is included:

### Introductory Information

- Name of VA facility and location (city/state);
- Date(s) of assessment;
- Number of buildings assessed;
- Total cost to correct the deficiencies identified during the assessment;
- Total cost to correct the deficiencies categorized as Priority 1;



- Percentage of total deficiencies categorized as Priority 1 (to be compared to the average percentage of Priority 1 items nationwide of 39%);
- Total cost to replace the buildings (or portions of buildings) housing research space;
- Facility Cost Index (FCI)<sup>1</sup> for all research buildings assessed; and
- Size of the respective VA research program (defined as Very Large, Large, Medium, or Small based on the amount of VA research funding for fiscal year (FY) 2010, as reported by the Office of Research and Development).

(Note: Appendix C contains Summary Cost Information for all stations assessed, sorted by VISN.)

Narrative Summary:

- Background – brief description of the program including type(s) of VA research funded (biomedical, rehabilitation, health services, clinical), description of any special initiatives such as a Center of Excellence (COE), and brief description of the academic affiliate.
- Overview of Research Space – including the number of buildings, square footage surveyed (based on square footage information provided by the facility), general description of each building and location within the building housing research, summary of the condition of research space (based on the technical report prepared by A&E experts, as well as observations made during the assessment, and/or items reported at the assessment exit briefing), and identification of significant deficiencies.
- Other Research Space – In the case of stations with a significant amount of non-laboratory research space such as dry laboratory/office space for health services or rehabilitation research, or a clinical research unit (CRU), this separate section is included.
- Security -- based on the technical report as well as observations made during the assessment, this section identifies the status of research space with regard to requirements for laboratory and animal facility security (as described in VHA Handbook 1200.06, Control of Hazardous Agents in VA Research Laboratories).
- Life Safety Hazards – identification of life safety hazards is based on specific deficiencies identified throughout the project and specifically defined as “life safety hazards” by Cannon Design. It should be noted that, for the most part, these hazards appear as Priority 1 deficiencies, but there are some stations

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<sup>1</sup> A complete definition and example of the Facility Cost Index is provided in Section 2.



for which they are classified with a lower priority. Information regarding the status of these items, i.e., whether or not they have been remediated, is based on response from the respective station. In some locales, a specific item listed herein as a potential Life Safety Hazard may not be relevant if the station has a prior agreement with the authority having jurisdiction. Information on such prior agreements was not made available to the assessment team during surveys.

- Architectural Life Safety Hazards:
  - Firestopping – a number of penetrations through fire rated floors and ceilings are not properly firestopped.
  - Fume hoods – chemical fume hood(s) not operational or not operating properly. (Note: Many of the stations surveyed had one or more fume hoods that were not operational. Since it is normal operational procedure for the facility to take the fume hood out of operation until it can be repaired and certified, this item may not be noted in the summary of facilities unless a hood was specifically noted to be a safety hazard. It is important to note that replacement of fume hoods is costly and is not often accomplished unless done as part of a larger renovation project).
  - Safe egress – egress from a laboratory is in front of a fume hood.
  - Safe egress – casework is configured to restrict egress from the room.
  - Fixed equipment – walk in cold room that cannot be exited without help from outside the unit.
  - Seismic – in seismic zones, presence of “temporary” shelving of concrete blocks and wood without restrained shelving.
  - Seismic – in seismic zones, pendant light fixtures not properly tied back.
  - Seismic – in seismic zones, reagent shelving does not have seismic lips (or shelf guards) to keep items from falling off shelves.
- Plumbing Life Safety Hazards:
  - Need for emergency eyewashes (either do not exist or are a type of unit that does not meet current requirements).
  - Need for safety showers.
  - A sink has an electrical panel situated directly over it – this is a code violation.





- Mechanical Life Safety Hazards:
  - Liquid nitrogen being dispensed in a space with no oxygen sensor.
  - Local exhaust location may be incorrectly tied into building general exhaust rather than fume hood exhaust.
  - Pressure differential such that it is difficult to open door(s).
  - This is a Veterinary Medical Unit (VMU) issue for animal safety: VMU mechanical system controls do not fail heating valves in fail-safe position, increasing risk of overheating animals in the event of equipment failure.
- Electrical Life Safety Hazards:
  - Receptacles – no (or not all) receptacles within six feet of water dispensing are ground fault circuit interrupter (GFCI) type receptacles.
  - Exit lights – stairwell signs do not direct to Exit.
- Fire Protection or Electrical:
  - Need for fire sprinkler system, either full system or extension of coverage.
  - Fire sprinkler heads installed above hard ceilings in some areas.
  - Fire alarm – no smoke detection in communications room/closet.
  - Fire alarm – alarm system has inadequate coverage and/or is lacking notification devices (strobes, voice). Note that in many instances, lack of or insufficient notification devices is actually an accessibility issue.

(Note: Appendix D contains the status of all life safety hazards identified and their current status as reported by each facility. At a few sites the local safety staff did not agree that a deficiency identified constituted a safety hazard. These instances are documented in Appendix D.)

- Improvements Made Since Assessment – based on the response received from the station regarding improvements made or in planning, as well as on information provided by the VHA Office of Capital Asset Management.
- New Construction – based on whether the station has a funded project for construction of a new research building or addition to an existing building, and/or whether the medical facility is scheduled for construction of a new hospital.



- Cost Summary – based on estimated costs to correct deficiencies or replace buildings (or portions of buildings) housing research. These tables are taken verbatim from the technical report compiled and prepared by the A&E firm that assessed the respective facility. The information also contains the Facility Condition Index (FCI) for each building assessed and for all research buildings, campus wide. All cost estimate data prepared by the A&E firms that participated in assessments is based on the month and year of the physical assessment of space, as well as on the geographic location of the facility.

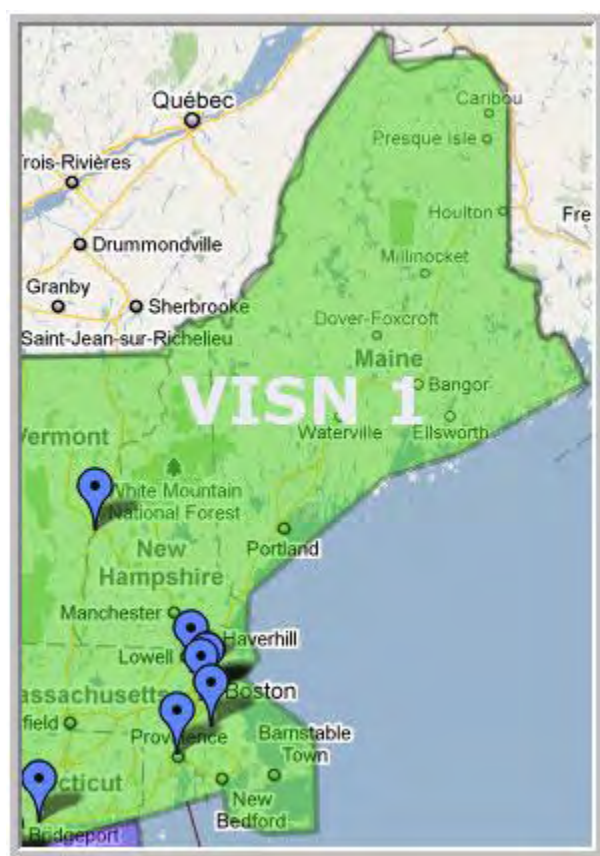
### Section 3. Description of VA Research Infrastructure



### Section 3. Description of VA Research Infrastructure



#### *VISN 1: VA New England Healthcare System*



<i>Sta. ID</i>	<i>VA Site Surveyed</i>	<i>City/State</i>
405	White River Junction VA Medical Center	White River Junction, VT
518	Edith Nourse Rogers Memorial Veterans Hospital	Bedford, MA
523	VA Boston Healthcare System, Jamaica Plain Campus	Jamaica Plain, MA
523A4	VA Boston Healthcare System, West Roxbury Campus	West Roxbury, MA
523A5	VA Boston Healthcare System, Brockton Campus	Brockton, MA
650	Providence VA Medical Center	Providence, RI
689	VA Connecticut Healthcare System	West Haven, CT





***White River Junction VA Medical Center,***

***White River Junction, VT***



**Date(s) of Assessment: October 7-8, 2008**

**Number of Buildings Assessed: 2**

**Total Cost to Correct Deficiencies: \$6,860,000**

**Total Cost, Priority 1 Deficiencies: 475,000 (or 7%)**

**Total Cost to Replace: \$24,406,000**

**Overall Campus FCI: 28%**

**Size of Research Program: Medium (\$2.5 million to \$4.9 million in VA research funding)**





### Background

The White River Junction (WRJ) VA research program is a medium sized program concentrated primarily in biomedical laboratory and health services research, with much lesser funding in clinical research. Previously this program hosted a Research Enhancement Award Program (REAP) funded by Health Services R&D Service (HSR&D). Funding for the REAP ended at the end of fiscal year 2008 just prior to the survey.

In 2008, the WRJ VAMC was named as one of three Rural Health Resource Centers to identify disparities in health care for rural veterans and formulate practices or programs to enhance the delivery of care. The program has a research component. The site also hosts a portion of the VACO staff for the National Center for Patient Safety. Local health services investigators are involved in both of these programs.

The facility's primary academic affiliate is Dartmouth Medical School, located in neighboring Hanover, New Hampshire. The facility is also affiliated with the University of Vermont College of Medicine in Burlington, VT.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting office space were housed in two buildings (Buildings 44 and T-44) on the VA campus with 23,818 nsf of research space (laboratories – 12,859 nsf; VMU – 5,880 nsf; offices – 5,079 nsf). Following is an overview of each building housing research, including its age, configuration, general condition, and description of key architectural and systems deficiencies within each building that existed at the time of the assessment. (Note: Since the time of the assessment, the Research Service has lost 920 square feet of office space and partial use of the conference room in Building 44.)

Building 44 is a three level building constructed in 1991 which houses research laboratories, administrative space, and the VMU. The building was originally designed to have four levels, but was reduced to three because of a budget shortfall. Currently some renovation is underway to create offices in space immediately adjacent to the elevator lobby.

Building T-44, a one level pre-engineered building dating to the late 1980s, houses additional laboratories.

Building 44: Finishes (floors, ceilings, walls) throughout the laboratories have held up fairly well, with most being in good to fair condition. Some walls are in need of patching and painting and are in fair to poor condition. Door hardware throughout the building complies with Federal accessibility guidelines. Emergency showers and eyewashes meet current requirements and are appropriately located. Equipment is causing overcrowding in some of the laboratories.



The staff reported recurring roof leaks during rain events. Replacing/repairing approximately one third of the roof should correct this problem.

Finishes in the VMU are primarily good. There is a significant problem with the ceiling in the cage wash area due to surface peeling caused by hot steam being released.

Most casework in the laboratories is in fair condition, with some laboratories having poorer quality casework due to corrosion. A number of pieces of equipment need to be replaced including fume hoods and one autoclave. The walk-in cold room in the laboratory area is in a state of constant repair. In the VMU, the cage washer is the only equipment and it is in fair condition. The two cold rooms in the VMU are in good operating condition.



**Typical laboratory in Bldg 44.**



**Receptacles near sinks are not ground fault protected. Also note the rusted electrical raceway.**

There are some significant environmental issues with Building 44. Specifically the building is equipped with chillers and air handlers that are oversized for the building. The system designed for the original four level building was installed, even though the building was reduced to three levels because it was thought that an additional level would later be added. The result is over cooling and high condensation in the summer months. Also, the mechanical system has significant deficiencies including the lack of redundancy of major system components. The air handling, air distribution, and exhaust systems are aging and in need of replacement. The Facilities Management Service reported that an upgrade to the HVAC system is planned for the near future.

There are no significant deficiencies with the plumbing system. The system is protected with backflow prevention.



The electrical systems, both normal and emergency power, are in fair condition. The distribution equipment is original to the building, has had little or no documented preventive maintenance, and is in need of replacement. There also is no transient voltage surge suppression (TVSS) equipment to protect sensitive electronic equipment, nor is there ground fault protection on receptacles near sinks.

The building is adequately covered by a fire suppression sprinkler system. Fire alarms are original to the building. A campus-wide fire alarm replacement was scheduled to begin in October 2008.

Building T-44: This modular building has finishes (floors, walls) that appear to be in fair condition. There is a need to replace ceiling tiles and grid throughout the space. The casework is original to the building and needs to be replaced. Fume hoods and the walk-in cold room are old and in need of replacement. The autoclave is in good condition.

Overall, the mechanical systems in Building T-44 are failing and in need of replacement. Plumbing systems are fairly good, although backflow prevention is missing at the service entrance.

The electrical system is nearly 30 years old and in poor condition. The entire building is connected to emergency power. There is no ground fault protection on receptacles near sinks. Lighting is below the recommended level.

Building T-44 does have a fire suppression sprinkler system. The fire alarm system is old but scheduled for immediate replacement.

(Note: Since the time of the assessment, this building has further deteriorated. The roof is leaking causing damage to interior finishes.)



**Fume hood blocking laboratory egress, Bldg T-44.**



### Other Research Space

The health services investigators are not located contiguously, but rather are housed in several buildings, including Building 44, but also in others not assigned to Research Service. Several investigators expressed a need for additional space to accommodate their growing research portfolios.

There currently is no space designated specifically for clinical research. All clinical research studies are performed in clinical space in the hospital. As on many campuses, the White River Junction VAMC is considering the use of leased space for hospital administrative functions in order to free up space for patient care. A new clinical addition to the hospital that is planned for construction will help alleviate overall space deficiencies.

### Security

Access to research space is protected by a combination of proximity cards and hard keys.

### Life Safety Hazards

The following life safety hazards identified during the assessment have not been remediated by the station:

- In both buildings, receptacles near water sources are not ground fault protected.
- In Bldg T-44, a fume hood is blocking laboratory egress.

### Improvements Made Since Assessment:

This station has made and/or initiated improvements following the assessment, including:

Corrections to Priority 2 deficiencies, replacement of HVAC system, Bldg 44 – (funding source unidentified), completed.

Correction of roof leaks, Bldg 44 – part of HVAC replacement project.

Renovation of VMU ceiling and wall finishes – (station funds), completed.

The station submitted an NRM application for renovation of Building T-44 that was not funded.

### New Construction

There is no new construction of research space planned at this station.



### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Correction Cost -- Bldg 44</b>	<b>Correction Cost -- Bldg T44</b>
Architectural	\$1,762,000	\$535,000
Plumbing	\$50,000	\$15,000
HVAC	\$2,467,000	\$385,000
Electrical	\$1,454,000	\$192,000
Fire Protection	\$0	\$0
<b>Total</b>	<b>\$5,733,000</b>	<b>\$1,127,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Bldg. 44</b>	<b>Bldg. T-44</b>
1	\$433,000	\$42,000
2	\$4,300,000	\$922,000
3	\$583,000	\$54,000
4	\$417,000	\$91,000
5	\$0	\$18,000
<b>Total</b>	<b>\$5,733,000</b>	<b>\$1,127,000</b>

**Table 1.2 Cost Summary by Priority**

<b>Building</b>	<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
Bldg 44	\$5,733,000	\$21,470,000	27%
Bldg T-44	\$1,127,000	\$2,936,000	38%
<b>Overall</b>	<b>\$6,860,000</b>	<b>\$24,406,000</b>	<b>28%</b>

**Table 1.3 Facility Condition Index Value**



***Edith Nourse Rogers Memorial Veterans Hospital***

***Bedford, MA***



**Date(s) of Assessment: June 3-4, 2009**

**Number of Buildings Assessed: 3**

**Total Cost to Correct Deficiencies: \$11,718,000**

**Total Cost, Priority 1 Deficiencies: \$696,000 (or 6%)**

**Total Cost to Replace: \$20,213,000**

**Overall Campus FCI: 58%**

**Size of Research Program: Large (\$5 million to \$9.9 million in VA research funding)**





### Background

The Bedford VA research program is a large program, predominantly for health services research, but also with funding for biomedical, clinical, and rehabilitation research. The program is in a growth mode, particularly in biomedical and health services research. The program hosts a highly productive health services research center of excellence (COE), the Center for Health Quality, Outcomes and Economic Research (CHQOER). On the clinical side, the station co-hosts with VA Boston Healthcare System, the Geriatrics Research, Education, and Clinical Center (GRECC) for VISN 1.

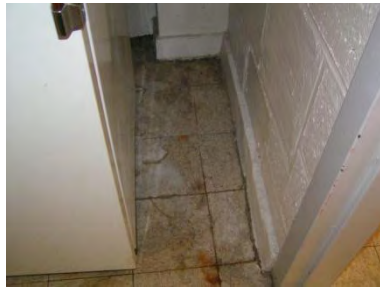
The primary academic affiliate is Boston University School of Medicine.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting office space were housed in three buildings on the VA campus with 38,638 nsf of research space (laboratories – 13,493 nsf; VMU – 1,447 nsf; offices – 23,698 nsf). Following is an overview of each building housing research, including its age, configuration, general condition, and description of key architectural and systems deficiencies within each building that existed at the time of the assessment.

Research laboratory space and the VMU are housed in three buildings (Buildings 17, 18, and 70). Buildings 17 and 18 are both three level (two stories plus basement) buildings constructed in 1929 as nurses' quarters and converted to research space in the 1960s or 1970s. Building 17 has laboratories on all three floors, and houses the VMU on the basement level. In Building 18, laboratories are on the first and second floors. Building 70, constructed in the 1950s, houses laboratory space for the biomedical research program as well as for health services research.

Building 17 is in poor condition (worse condition than Building 18), with poor quality finishes throughout the space, single pane windows, presence of mold, asbestos flooring, severely aging casework, and fixed equipment that is in poor condition. Finishes within the VMU are in better condition than laboratories, but many of the finishes are inappropriate for their purpose (e.g., ceramic tile on walls of animal holding rooms, tile rather than epoxy flooring, wood doors, etc.). There are no emergency showers in Building 17.



**Flooring throughout Bldg 17 is damaged.**



**Mold growing in a Bldg 17 laboratory.**



**Typical laboratory casework, Bldg 17.**

Laboratories in Building 17 are cooled by window air conditioners, and heated with perimeter steam fired radiators. The VMU has a separate heating, ventilation, and air conditioning (HVAC) system, but with window AC units as backup. At the time of the assessment, the team was informed that an upgrade of the VMU HVAC system was being planned.

In Building 18, some renovation was performed in the 1990s, including replacement of windows with more energy efficient, double pane windows, vinyl composition tile flooring rather than asbestos tile, and some casework that is newer and in fair condition. Fixed equipment in this building also is in need of replacement. There are emergency showers, but not all of them are code compliant. Building 18 is cooled by window air conditioners, and heated with perimeter steam fired radiators. Fume hoods provide the only exhaust in laboratories.



**Overall, the laboratories in Bldg 18 are significantly better than in Bldg 17.**



**Asbestos lined fume hood in second floor laboratory.**

Both buildings have a low floor-to-floor height clearance below the 14 foot height recommended by the VA Design Guide. Any extensive renovation of these



buildings, to include new mechanical systems, would prove challenging as there would likely be insufficient space above the ceiling for ductwork and piping. Vertical shafts or separate mechanical space would be necessary, both of which would reduce the amount of usable space within the building.

Both Buildings 17 and 18 lack access ramps as well as elevators to meet accessibility standards. There are no accessible restrooms in either building.

Building 70 has in the past and continues to suffer from extensive water damage due to leakage of the roof as well as the exterior envelope. Many wall finishes are severely damaged, some to the point of the room being closed for use until significant repairs can be made. The biomedical laboratories have poor quality casework and fixed equipment, as well as an electrical system in need of significant upgrade or replacement. As with Buildings 17 and 18, the HVAC system is not appropriate for a laboratory environment.

The research space in all three buildings is protected by a fire suppression sprinkler system. The fire alarms have been recently replaced, but are in need of additional annunciation devices.

#### Other Research Space

Additionally, there is extensive dry laboratory/office space in Building 70 that houses the CHQOER. Clinical research is conducted in space assigned to the GRECC, as well as in clinical spaces. With regard to health services research, this is one of the few stations hosting a COE with sufficient space (in terms of square footage) to accommodate it. However, the quality of the space is severely lacking. The damage to some of the rooms within the COE space is so extensive there may be the potential for exposure to health risks.



**A temporary solution to leakage in a Bldg 70 laboratory. The roof leaks resulting in extensive interior damage.**



**Damage to wall finish caused by water leakage.**



### Security

Access to all research areas is controlled by a combination of proximity cards and hard keys. Buildings 17 and 18 are in need of increased security which could be achieved by relocating the existing equipment (or adding new systems) to the outside entrances of the buildings.

### Life Safety Hazards

The following life safety hazards identified during the assessment have not been remediated by the medical center:

- Emergency showers are needed in Buildings 17 and 18.
- Receptacles near water sources are not ground fault protected.
- The fire alarm system is lacking sufficient annunciation devices for accessibility compliance. (The station advises that a campus-wide fire alarm replacement project is funded for design.)

### Improvements Made Since Assessment:

This station has made and/or initiated improvements following the assessment, including:

Upgrade of VMU mechanical system -- \$765,000 (ARRA funds), completed.

Corrected roof leakage, Building 70 – (station funds), completed.

### New Construction

There is no new construction of research space planned at this station. Two replacement research buildings have been requested through the SCIP process for FY 13 and 14.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.



<b>Discipline</b>	<b>Correction Cost -- Bldg 17</b>	<b>Correction Cost -- Building 18</b>	<b>Correction Cost -- Building 70</b>
Architectural	\$2,545,000	\$940,000	\$1,578,000
Plumbing	\$225,000	\$343,000	\$106,000
HVAC	\$1,670,000	\$1,107,000	\$1,421,000
Electrical	\$653,000	\$449,000	\$495,000
Fire Protection	\$173,000	\$13,000	\$0
<b>Total</b>	<b>\$5,266,000</b>	<b>\$2,852,000</b>	<b>\$3,600,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Bldg 17</b>	<b>Bldg 18</b>	<b>Bldg 70</b>
1	\$240,000	\$237,000	\$219,000
2	\$1,950,000	\$742,000	\$1,556,000
3	\$2,000,000	\$1,172,000	\$1,393,000
4	\$120,000	\$110,000	\$168,000
5	\$956,000	\$591,000	\$264,000
<b>Total</b>	<b>\$5,266,000</b>	<b>\$2,852,000</b>	<b>\$3,600,000</b>

**Table 1.2 Cost Summary by Priority**

<b>Building</b>	<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
Building 17	\$5,266,000	\$8,879,000	59%
Building 18	\$2,852,000	\$6,455,000	44%
Building 70	\$3,600,000	\$4,879,000	74%
<b>Overall</b>	<b>\$11,718,000</b>	<b>\$20,213,000</b>	<b>58%</b>

**Table 1.3 Facility Condition Index Value**



***VA Boston Healthcare System:***

***Jamaica Plain Campus,***

***West Roxbury Campus,***

***Brockton Campus***

**Date(s) of Assessment: September 9-12, 2008**

**Total Cost to Correct Deficiencies: \$11,770,000**

**Total Cost, Priority 1 Deficiencies: \$3,472,000 (or 29%)**

**Total Cost to Replace: \$60,737,000**

**Overall FCI: 19%**

**Size of Research Program: Very Large (over \$10 million in VA research funding)**





### Background

Research at VA Boston Healthcare System (VABHS) constitutes a very large program. VA research funding is very evenly spread among the research disciplines (biomedical, rehabilitation, health services, clinical). The program is highly diverse, with significant laboratory research, but also a significant need for dry laboratory and office space to support major programs.

The program hosts a number of research centers, including the Center for Organization, Leadership, and Management (COLMR), a health services Center of Excellence (COE); the Center for Information Dissemination and Education Resources (CIDER), a health services resource center; the Center for Innovative Visual Rehabilitation, a rehabilitation COE; two centers funded by the Cooperative Studies Program (CSP): a Coordinating Center and the Massachusetts Veterans Epidemiology Research and Information Center (MAVERIC). There is also a biomedical/clinical COE focusing on Schizophrenia and a rehabilitation Research Enhancement Award Program (REAP) focusing on tissue engineering. With regard to patient care, VABHS hosts a Geriatric Research, Education, and Clinical Center (GRECC) and is one of the sites for the National Center for PTSD (NCPTSD). The program also has a significant resource in the Health Care Financing & Economics (HCFE) Program.

Affiliates are Harvard Medical School and Boston University School of Medicine.



***VA Boston Healthcare System:***

***Jamaica Plain Campus***



**Date(s) of Assessment: September 11-12, 2008**

**Number of Buildings Assessed: 2**

**Total Cost to Correct Deficiencies: \$5,704,000**

**Total Cost, Priority 1 Deficiencies: \$1,401,000 (or 25%)**

**Total Cost to Replace: \$29,451,000**

**Overall Campus FCI: 19%**



### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting office space were housed in two buildings (Buildings 1A and 7) on the VA campus with over 23,583 nsf of research space (laboratories – 11,907 nsf; VMU – 8,377 nsf; offices – 3,299 nsf). Following is an overview of each building housing research, including its age, configuration, general condition, and description of key architectural and systems deficiencies within each building that existed at the time of the assessment.

Building 1A, a three story (plus basement) building constructed in 1972 houses laboratories and the VMU on the basement, first, second, and third floors. Generally, finishes are in good condition, although some casework is original to the building and is being replaced as funds are available. The roof was replaced in 2005. There was a major renovation of the HVAC system in 1996. However, there are still significant deficiencies with the mechanical systems, including an aging main air handling unit in need of replacement, an inadequate exhaust fan system, and a lack of redundancy (including in the VMU), among others. The electrical system is in the process of being upgraded. A fire suppression sprinkler system covers the building. The fire alarm system is an older system, but is in good condition. Access to the building and to the VMU is controlled by a security system.



**Typical laboratory casework in Bldg 1A.**



**In the VMU, there is no wall between the cage washer and HVAC equipment.**

Building 7, a single story building constructed in 1950 and renovated in the 1980s, houses a portion of the VMU, specifically large animals and non-human primates. Although nearly 60 years old, Building 7 has been well maintained. The small amount of casework in the building is in good condition.



There are deficiencies in the design of the mechanical system causing the system to show wear. There is no redundancy and the air handling unit is oversized, resulting in cooling and humidification problems during the hotter months. There also is a problem with insulation breaking down and getting into the supply air stream. Emergency power covers the HVAC system in case of power failure. The building is fully protected by a sprinkler system and the fire alarm system is in good condition. Building access is secured by a proximity card system.



**The cage wash area in Bldg 7 has an inappropriate ceiling.**



**A prep/treatment room in the VMU.**

There were no safety shower/eyewash deficiencies noted in Building 1A. In Building 7, a safety shower and eyewash are needed in the cage wash area.

#### Other Research Space

As previously noted, this campus has a significant amount of dry laboratory and office space in Buildings 1A and 9. Building 1A houses clinical research space and a significant amount of dry laboratory and office space for the CSP coordinating center, MAVERIC, tissue engineering REAP, and rehabilitation COE. Generally, the space is in good condition and is adequate for current needs. The health services research space in Building 9 had been renovated just prior to the assessment.

#### Security

Laboratory and VMU areas are appropriately secured with electronic access to laboratory areas and keypad entry to individual laboratories.

#### Life Safety Hazards

The following life safety hazard identified during the assessment has not been remediated by the medical center:



- In Building 7, a safety shower and eyewash are needed in the cage wash area.

#### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Corrections to miscellaneous deficiencies including finishes, upgrades to HVAC and electrical systems, high purity water system, casework, fume hoods, and security, Bldgs 1A and 7 -- \$6,836,000 (NRM FY11), funded.

Applied for funding for addition of two floors to Bldg 1A to enlarge the VMU -- \$9,950,000 (Minor Construction), project does not appear to have been funded.

#### New Construction

The addition of two floors to Building 1A is planned subject to availability of funds.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Building 1A</b>	<b>Building 7</b>
Architectural	\$2,116,000	\$17,000
Plumbing	\$600,000	\$0
HVAC	\$2,394,000	\$192,000
Electrical	\$345,000	\$40,000
Fire Protection	\$0	\$0
<b>Total</b>	<b>\$5,455,000</b>	<b>\$249,000</b>

**Table 1.1 Cost Summary by Discipline**



Priority	Building 1A	Building 7
1	\$1,216,000	\$185,000
2	\$1,184,000	\$16,000
3	\$2,055,000	\$48,000
4	\$600,000	\$0
5	\$400,000	\$0
Total	\$5,455,000	\$249,000

Table 1.2 Cost Summary by Priority

Building	Correction Cost	Replacement Cost	FCI
Bldg 1A	\$5,455,000	\$27,206,000	20%
Bldg 7	\$249,000	\$2,245,000	11%
Overall	\$5,704,000	\$29,451,000	19%

Table 1.3 Facility Condition Index Value







***VA Boston Healthcare System:***

***West Roxbury Campus***



**Date(s) of Assessment: September 10, 2008**

**Number of Buildings Assessed: 4**

**Total Cost to Correct Deficiencies: \$4,333,000**

**Total Cost, Priority 1 Deficiencies: \$1,575,000 (or 36%)**

**Total Cost to Replace: \$24,567,000**

**Overall Campus FCI: 18%**



### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting office space were housed in four buildings on the VA campus with 18,603 nsf of research space (laboratories – 14,077 nsf; VMU – 2,902 nsf; offices – 1,624 nsf). Following is an overview of each building housing research, including its age, configuration, general condition, and description of key architectural and systems deficiencies within each building that existed at the time of the assessment.

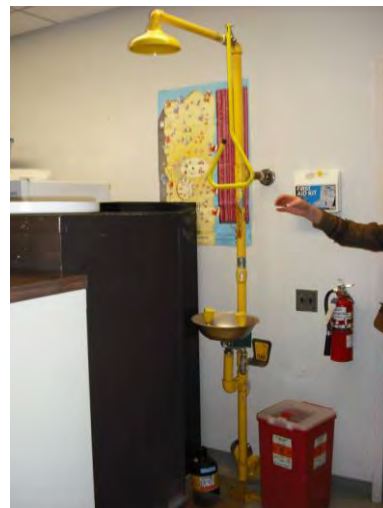
Building 3, a three story building constructed in 1983, primarily houses clinical functions, but has research laboratories on the second floor. The laboratory space is aesthetically in good condition, including finishes, casework, and equipment. The building's roof was replaced in 2007.

Both the mechanical and electrical systems are about 20 years old, with the mechanical system being in need of upgrade and/or replacement. The electrical system has been well maintained and is in good condition, overall. Lighting fixtures have not yet been upgraded to T8 type fixtures and generally provide insufficient lighting for a laboratory environment. There is emergency egress lighting. There is no equipment connected to a central monitoring system.

Building 3 is protected by a fire suppression sprinkler system. The fire alarm system is aging, but is in good condition. Security is maintained through a proximity card system. Technically, Bldg 3 is rated "poor" primarily due to deficiencies with the HVAC system.



**Laboratories in Bldg 3  
are aesthetically pleasing.**



**Safety showers and  
eyewash units are  
appropriate.**



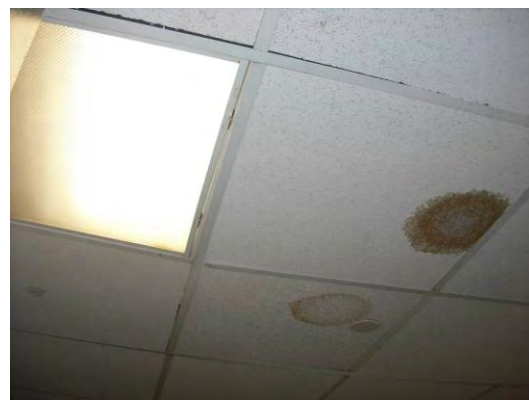
**The autoclave and glassware washer in Bldg 3 are in fair condition, but are reaching the end of their useful lives.**

The VMU is housed primarily in Building 20 (single story building constructed in 1950), with supplemental space in Buildings 22 and 30 (1960). The finishes in Building 20 are generally in fair to good condition. There are significant problems with leakage from windows and the roof, both of which need to be replaced. The casework in the building is in poor condition and equipment (autoclave and cage washer) is in need of replacement.

The mechanical system is aging and generally in poor condition, with no redundancy, insufficient exhaust, and inadequate humidity control. The electrical system is about 40 years old and has exceeded its useful life. The emergency power system also is aging, but has been well maintained although finding replacement parts is becoming difficult. Lighting levels are poor and wet areas in the VMU either do not have gasketed fixtures or the gasketing system is inappropriate.



**An inappropriate ceiling in the autoclave room, Bldg 20.**



**VMU space should have hard ceilings, not acoustic tile. This tile ceiling is damaged. Also note the lack of a gasket on the lighting fixture.**



Building 20 has a fire suppression sprinkler system and a fairly new fire alarm system. A security system is in place to control building access. The building is also equipped with interior motion sensors.

Buildings 22 and 30, both unsuitable for long-term housing of animals, are used for surgery and procedures, respectively. Finishes in both buildings are generally in poor condition, both roofs leak, and electrical service is in poor condition. The HVAC system in Building 22 is in poor condition and cannot adequately service the building for housing animals.

Building 30's HVAC was upgraded in 2003, but because of its location in the ceiling plenum, it is difficult to service and is unlikely to provide the appropriate number of air changes for an animal housing environment. Both buildings have sprinkler systems, but the fire alarm systems are in poor condition. Security is in place to prevent unauthorized access to both buildings.



**The exterior of Bldgs 22 and 30, two Quonset huts built in the 1960s and used for animal surgery and procedures. Both buildings are slated for demolition.**

It should be noted that, since the time of the assessment, an addition to Building 20 has been constructed and the existing space has been renovated through a Minor Construction project that also included demolition of Buildings 22 and 30.

#### Security

Access to the space is appropriately controlled with electronic security.

#### Life Safety Hazards

The only life safety hazards identified were in the two VMU outbuildings (bldgs 22 and 30) identified for demolition in the Minor Construction project.



### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Correction of miscellaneous deficiencies identified in Building 3 -- \$4,097,000 (NRM FY10), funded, status unknown.

Renovation of Bldg 20 (VMU), construction of an addition to Bldg 20, and demolition of Bldgs 22 and 30 -- \$8,000,000 (Minor Construction FY11), completed.

### New Construction

There is no additional new construction of research space planned at this station.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Bldg 3</b>	<b>Bldg 20</b>	<b>Bldg 22</b>	<b>Bldg 30</b>
Architectural	\$370,000	\$109,000	\$133,000	\$22,000
Plumbing	\$531,000	\$75,000	\$14,000	\$0
HVAC	\$1,479,000	\$281,000	\$116,000	\$116,000
Electrical	\$592,000	\$293,000	\$101,000	\$101,000
Fire Protection	\$0	\$0	\$0	\$0
<b>Total</b>	<b>\$2,972,000</b>	<b>\$758,000</b>	<b>\$364,000</b>	<b>\$239,000</b>

**Table 1.1 Cost Summary by Discipline**



Priority	Bldg 3	Bldg 20	Bldg 22	Bldg 30
1	\$891,000	\$340,000	\$231,000	\$113,000
2	\$1,223,000	\$0	\$14,000	\$0
3	\$31,000	\$322,000	\$119,000	\$10,000
4	\$0	\$0	\$0	\$116,000
5	\$827,000	\$96,000	\$0	\$0
Total	\$2,972,000	\$758,000	\$364,000	\$239,000

Table 1.2 Cost Summary by Priority

Building	Correction Cost	Replacement Cost	FCI
Bldg 3	\$2,972,000	\$18,063,000	16%
Bldg 20	\$758,000	\$3,613,000	21%
Bldg 22	\$364,000	\$1,236,000	29%
Bldg 30	\$239,000	\$1,655,000	14%
Overall	\$4,333,000	\$24,567,000	18%

Table 1.3 Facility Condition Index Value





***VA Boston Healthcare System:***

***Brockton Campus***



**Date(s) of Assessment: September 9, 2008**

**Number of Buildings Assessed: 2**

**Total Cost to Correct Deficiencies: \$1,733,000**

**Total Cost, Priority 1 Deficiencies: \$496,000 (or 29%)**

**Total Cost to Replace: \$6,719,000**

**Overall Campus FCI: 26%**





### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting office space were housed in two buildings (Buildings 44 and 46) on the VA campus with 5,553 nsf of research space (laboratories – 3,768 nsf; VMU – 853 nsf; offices – 932 nsf). Following is an overview of each building housing research, including its age, configuration, general condition, and description of key architectural and systems deficiencies within each building that existed at the time of the assessment.

Buildings 44 and 46 are both single story buildings constructed in the 1950s. Laboratories are housed in both buildings, while Building 46 also houses the VMU.

Both buildings 44 and 46 are generally in poor condition, with windows in need of replacement, interior finishes in fair to poor condition, inoperable laboratory equipment, and seriously inadequate and deficient mechanical and electrical systems. The laboratory casework in Building 44 is in need of replacement, while Building 46 has casework in good condition. Both buildings have emergency eyewash units but there are no safety showers in either building.

Both buildings are protected by a fire suppression sprinkler system, but the fire alarm systems are in poor condition.



**Ceiling damage in Bldg 44.**



**Damaged flooring and rusted casework in Bldg 44.**

### Section 3. Description of VA Research Infrastructure



**Access to electric panel blocked by equipment in Bldg 44.**



**Typical Bldg 44 laboratory.**



**In Bldg 46, damage to an animal holding room ceiling.**



**Old style electrical panel in Bldg 46.**



### Other Research Space

The Schizophrenia COE is housed in Psychiatry Service space in Building 5, which includes offices as well as clinical research space. Additional psychiatry clinical research is conducted in clinical space in Building 2.

### Security

Access to both buildings is controlled by proximity cards and keyed locks on internal doors. There are outside security cameras outside both buildings.

### Life Safety Hazards

The following life safety hazards identified during the assessment have not been remediated by the medical center:

- Fire alarm systems in both buildings are in poor condition. (The station advises that a fire alarm project is funded in FY11.)
- There are no safety showers in either building. (Note: The station advises that the Safety Officer questions the need for safety showers in the research buildings.)

### Improvements Made Since Assessment:

The station applied for both Minor Construction and NRM funding in FY11 to replace the VMU and make corrections identified in the assessment. Neither project appears to have been funded.

### New Construction

There is no new construction of research space planned at this station.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.



<b>Discipline</b>	<b>Building 44</b>	<b>Building 46</b>
Architectural	\$367,000	\$114,000
Plumbing	\$75,000	\$8,000
HVAC	\$365,000	\$316,000
Electrical	\$181,000	\$307,000
Fire Protection	\$0	\$0
<b>Total</b>	<b>\$988,000</b>	<b>\$745,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Building 44</b>	<b>Building 46</b>
1	\$238,000	\$258,000
2	\$471,000	\$225,000
3	\$49,000	\$48,000
4	\$56,000	\$0
5	\$174,000	\$214,000
<b>Total</b>	<b>\$988,000</b>	<b>\$745,000</b>

**Table 1.2 Cost Summary by Priority**

<b>Building</b>	<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
Bldg 44	\$988,000	\$2,882,000	34%
Bldg 46	\$745,000	\$3,837,000	19%
<b>Overall</b>	<b>\$1,733,000</b>	<b>\$6,719,000</b>	<b>26%</b>

**Table 1.3 Facility Condition Index Value**





***Providence VA Medical Center,***

***Providence, RI***



**Date(s) of Assessment: June 2, 2009**

**Number of Buildings Assessed: 2**

**Total Cost to Correct Deficiencies: \$3,622,000**

**Total Cost, Priority 1 Deficiencies: \$615,000 (or 17%)**

**Total Cost to Replace: \$12,810,000**

**Overall Campus FCI: 28%**

**Size of Research Program: Large (\$5 million to \$9.9 million in VA research funding)**





### Background

The Providence VAMC supports a large research program with funding predominantly for rehabilitation and clinical research, but also in lesser amounts for biomedical and health services research. The program is in a growth mode, particularly in rehabilitation and clinical research. The program hosts a highly regarded rehabilitation COE, the Center for Restorative and Regenerative Medicine, and a health services REAP.

The academic affiliates are the Warren Alpert Medical School of Brown University, located about two miles from the VA campus, as well as Harvard School of Dental Medicine and the University of Rhode Island College of Pharmacy.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and office space were housed in two buildings (Buildings 9 and 35) on the VA campus with 14,427 nsf of research space (laboratories – 7,495 nsf; VMU – 2,341 nsf; offices – 4,591 nsf). Following is an overview of the buildings housing laboratories and animal research space, including their age, configuration, general condition, and description of key architectural and systems deficiencies within each building that existed at the time of the assessment.

Research at the Providence VAMC is housed in space that is in need of significant upgrades and also is insufficient to accommodate the local research program.

In addition to research laboratory and VMU space in Buildings 9 and 35, the program previously occupied additional laboratory space in Bldg 7, but lost the space several years ago. Although not formally assessed by the A&E team, the four laboratories currently occupied by Biomedical Engineering were noted to have been renovated about 20 years ago and would provide some much needed additional laboratory space if regained to research and renovated. (Note: the station has subsequently reported that an HVAC upgrade project for this building has been funded. The Research Service is hoping to regain use of the laboratories in Bldg 7.)

Building 9 is a two level (one story plus basement) building constructed in 1948 as the campus laundry. The first floor currently houses the VMU. This building has significant problems with leakage from pipes, as well as high humidity and heating due to steam piping below the building. Consequently, there is damage to some finishes throughout the building. Casework and fixed equipment is aging and in need of replacement. There also is no accessibility ramp into the building.





With regard to systems, the mechanical system has the most significant deficiencies including a need for a new air handling unit (AHU) that meets guidelines for a laboratory environment, even though the current AHU is only about ten years old. Overall, the electrical system is in fair condition.



**Left photo: There is no exhaust canopy over the cage washer to catch steam when the cycle is complete and the door opened. This will result in damage to finishes within the cage wash area.**



**Right photo: The ceiling in the cage wash area is already showing damage from excess steam filling the room.**

Building 35 is one of the newer buildings surveyed, having been constructed in 1997. Originally built as a research facility, Building 35 houses laboratories, support spaces, and the Research Service administrative offices on two floors. This building has some water damage to finishes due to roof leakage. Casework appears to be in good condition, but the wood cabinetry used is not of a quality needed for a research laboratory environment. Fume hoods and autoclaves are in good condition, but some of the biological safety cabinets (BSC) are in need of either repair or replacement. This building also lacks emergency showers. Finally, it is noteworthy to mention that, although this building was completed in 1997, it suffered a failure of the heating, ventilation, and air conditioning (HVAC) system in 2005. Significant mechanical system deficiencies were noted during the assessment.



**At the time of the assessment, the roof on Bldg 35 had significant leakage.**



**The wood casework in Bldg 35 is not of an appropriate quality for use in research laboratories.**

The research space in both buildings is protected by a fire suppression sprinkler system. The fire alarms are being replaced as part of a campus-wide upgrade.

There are no safety showers in either building and no emergency eyewash in the VMU.

#### Other Research Space

The rehabilitation COE is currently housed at Brown University, but will move to the VA campus upon the completion of Building 32. Formerly the campus gymnasium, this building was converted into dry laboratory space with total renovation of the existing footprint and new space added around the perimeter. The project was funded through VA Minor Construction. It is important to note that, because the original budget was severely cut at VA Central Office, the project will not include some features originally planned for the COE. (Note: this building is now complete and occupied. Additional work will be done to finish out biomedical laboratory space within the building.)

At the time of the assessment, the health services REAP was temporarily on campus in a modular building that had to be vacated by fall 2009. The REAP was planning to move to leased space, as have other administrative functions of the hospital.

Clinical research at the Providence VAMC is conducted in a number of places, depending on medical specialty, including the main hospital, the building housing the REAP, and in Building 35.



### Security

Access to all research areas is controlled by a combination of proximity cards, key pads, and cameras. There is local interest in upgrading the system to include motion detection, wire mesh screening on ground floor windows, and spot welding on exterior door hinges.

### Life Safety Hazards

The following life safety hazards identified in the assessment have been remediated:

- Safety showers have been installed in Bldg 35.
- An emergency eyewash has been installed in the VMU.

The following additional life safety hazard identified in the assessment has not been remediated:

- There is no safety shower in the VMU. (The station advises that Facilities Management Service will ensure a shower is installed.)

### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Completed construction of Bldg 32 (13,000 sq ft), location of Rehabilitation Center of Excellence – (Minor Construction), completed/opened January 2010.

Correction of electrical system deficiencies, Bldgs 9 and 35 -- \$1,175,000 (NRM FY10), funds received/in planning.

Upgrade of security system, Bldgs 9 and 35 – (NRM FY11), in progress.

Planning project to finish out biomedical laboratory space, Bldg 32 -- \$705,000 (NRM FY11), design contract awarded.

Correction of Priority 3/4 deficiencies, Bldg 9 HVAC -- \$1,250,000 (NRM FY11), funds received/in planning.

Upgrade of HVAC, Bldg 7 (the program hopes to regain this space for research) -- \$635,000 (NRM FY11), funds received/in planning.

### New Construction

There is no additional new construction of research space planned at this station.



### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Correction Cost - Bldg 9</b>	<b>Correction Cost - Bldg 35</b>
Architectural	\$657,000	\$484,000
Plumbing	\$21,000	\$383,000
HVAC	\$656,000	\$1,186,000
Electrical	\$30,000	\$150,000
Fire Protection	\$55,000	\$0
<b>Total</b>	<b>\$1,419,000</b>	<b>\$2,203,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Bldg 9</b>	<b>Bldg 35</b>
1	\$300,000	\$315,000
2	\$397,000	\$430,000
3	\$309,000	\$386,000
4	\$300,000	\$781,000
5	\$113,000	\$291,000
<b>Total</b>	<b>\$1,419,000</b>	<b>\$2,203,000</b>

**Table 1.2 Cost Summary by Priority**

<b>Building</b>	<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
Bldg 9	\$1,419,000	\$3,049,000	47%
Bldg 35	\$2,203,000	\$9,761,000	23%
<b>Overall</b>	<b>\$3,622,000</b>	<b>\$12,810,000</b>	<b>28%</b>

**Table 1.2 Facility Condition Index Value**



***VA Connecticut Healthcare System,***

***West Haven Campus***



**Date(s) of Assessment: May 6-8, 2008**

**Number of Buildings Assessed: 6**

**Total Cost to Correct Deficiencies: \$14,771,000**

**Total Cost, Priority 1 Deficiencies: \$5,035,000 (or 34%)**

**Total Cost to Replace: \$50,333,000**

**Overall Campus FCI: 29%**

**Size of Research Program: Very Large (over \$10 million in VA research funding)**





### Background

The research program at VA Connecticut Healthcare System is funded from all disciplines, with the heaviest concentrations in clinical and rehabilitation research. The program hosts a rehabilitation COE focusing on restoration of nervous system function, a Cooperative Studies Program Coordinating Center (CSPCC), and a Clinical Epidemiology Research Center. The local research program is consistently among the top ten VA research programs with regard to funding.

The VA Connecticut Healthcare System is academically affiliated with Yale University in nearby New Haven.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting office space were housed in six buildings on the VA campus with over 37,000 nsf of research space (laboratories – 30,175 nsf; VMU – 6,682 nsf; offices – 362 nsf). A new building, which is an addition to Building 34, was being constructed at the time of the assessment.

Generally, most of the laboratory and VMU space on the West Haven campus is in buildings constructed in 1918 and in various states of disrepair. The buildings are served by electrical systems (both normal power and emergency power) that feed the entire campus. In particular, the emergency power system is beyond its useful life and needs to be replaced. There also is no separation between normal and life safety loads.

For a number of years the program has tried to obtain construction funds through VACO for construction of a new, stand-alone research building but to date has been unsuccessful beyond the design phase. Although the research program flourishes in its current space, it clearly would benefit from newly constructed or significantly renovated research space, not only to better accommodate current investigators and programs, but also to continue to grow the program.

Following is an overview of the buildings housing research laboratories and animal research space, including their age, configuration, general condition, and description of key architectural and systems deficiencies within each building that existed at the time of the assessment.

Building 2 was constructed in 1953 as the main hospital for the West Haven Campus. Research is currently conducted on floors five, seven, and eight. Additional laboratory space on the ground floor is currently unusable due to severe damage from steam piping leaks. Research management would like to see the





ground floor space renovated for housing freezers. (Note: Funding to convert the ground floor space to freezer storage has since been awarded.)

Some of the laboratories on the seventh floor were extensively renovated in 2006. In addition to upgrading finishes and casework within the laboratories, corrections were made to both the electrical and mechanical systems. Both the seventh and fifth floor laboratories have casework and equipment in fair to good condition.

The main VMU is housed on the eighth floor. Major equipment in the VMU is in need of replacement, including the cage washer and bedding dump. Some of the casework throughout the space is also at the end of its useful life.

The Building 2 plumbing system is combined for the research, VMU, and clinical spaces. Due to the risk for contamination of the campus domestic water supply, the plumbing systems need to be separated.



**This is typical of a renovated laboratory in Building 2.**



**This space on the first floor that has been severely water damaged will be renovated to house freezers.**

Building 3 was constructed in 1918 and houses research laboratories on both floors of the two story building. As with aging buildings on many VA campuses, Building 3 has not been well maintained and is showing significant deterioration in finishes (floors, walls, ceilings) as well as systems. Both the piping for the plumbing system and the ventilation system are in need of replacement. There also is a need for additional safety showers in the building.



**Window AC units are used to cool laboratories in Bldg 3.**



**This air handling unit in Bldg 3 was in failing condition at the time of the assessment.**

Building 4 dates to 1918. As with Building 3, this building also has been minimally maintained although a new heating, ventilation, and air conditioning (HVAC) system was installed a few years ago. No other significant renovation has been performed in this building which houses laboratories on the second floor. The roof of Building 4 leaks at some of the dormers.



**An outdated laboratory in Building 4.**



**Damage at a laboratory window, Building 5.**

Building 5 was constructed in 1918, has not been renovated in the recent past, and has been minimally maintained. Laboratories and a small satellite VMU are housed on the first and second floor of this three story building. Mechanical systems are in need of replacement.

Building 7 is another vintage 1918 building that has not been well maintained. The entire first floor is unusable due to extensive damage caused by flooding, and the



second floor is not in much better shape. Mold is present in the building and the systems are in need of replacement.



**Examples of water damage to walls and ceiling in Building 7.**

Buildings 34 and 34A house the rehabilitation COE. Building 34 was completed in 1986, and an addition to it (Building 34A) is in the final stages of construction. As part of the new construction on the addition, the HVAC system supporting Building 34 was replaced. Overall, these buildings constructed with support from Yale University and Paralyzed Veterans of America (PVA) clearly provide the best research space on the campus. In addition to laboratories for bench science, the buildings house space for clinical research as well as a small satellite VMU not currently in use.

The overall physical condition of Buildings 34 and 34A is excellent.



**Constructed in 1986 with a recent addition, Bldgs 34/34A are welcome additions to the West Haven VAMC campus.**

All research space reviewed is fully protected by fire suppression sprinkler systems. The buildings generally have fire alarm systems that would not meet current code requirements. Laboratories are lacking annunciation devices, with the exception of Building 34A.

The space has emergency eyewashes and safety showers, but would benefit from additional units. Also, some buildings have only self-contained eyewashes and should have plumbed units. Several laboratories in Building 2 have no eyewash.

#### Structural Evaluation

Because of the age of some of the buildings housing research, the A&E team included a structural engineer who reviewed Buildings 3, 4, 5, and 7. The evaluation was based on observation of the buildings along with review of structural analyses conducted in 1990. The review concluded that there are no structural failures, but the buildings clearly have some cracking due to their relative age. The review concluded that an in-depth structural analysis should be performed.

#### Other Research Space

In addition to the buildings previously described, the West Haven campus houses several research entities in dry laboratory/office space in Buildings 35 and 35A. These buildings are new modular construction, with a brick facade giving the appearance of a permanent structure. The buildings house offices and dry laboratories for use by the CSPCC and the Epidemiology Center. Because these buildings do not house biomedical laboratories or vivarium space, they were not assessed by the A&E team.



Building 1, which houses clinical space, has a small designated clinical research unit (CRU) that is well utilized but has significant deficiencies with regard to patient privacy. Rather than having separate rooms for patients, they are treated in “booths” that are separate but are very close together and not sound proof. This can create problems when multiple patients are being treated simultaneously.

With increasing numbers of investigators engaging in and/or interested in conducting clinical research, additional space would clearly benefit the program, particularly if space contiguous to the current CRU could be identified.

The clinical research space in Building 1 also was not evaluated by the A&E team.

Overall, research at VA Connecticut Healthcare System, West Haven Campus, is housed in severely aging space rated in the “poor” range. In spite of the lack of suitable research space, the program continues to flourish due to the quality of program leadership combined with the tenacious spirit of the local investigators. The new addition to Building 34 will be of tremendous benefit to the program, but the remaining laboratory space will continue to be challenging without significant upgrades. There is ample land available on campus for an additional research laboratory building, should funding become available.

#### Security

Access to research space is appropriately secured.

#### Life Safety Hazards

The following life safety hazard identified during the assessment has been remediated:

- Some additional safety showers and eyewashes have been installed in the research areas.

The following additional life safety hazard has not been remediated:

- Fire alarm system improvements are needed, with the exception of Building 34A. Laboratories lack annunciation devices for accessibility compliance, and the location of devices in corridors does not appear to meet code.

#### Improvements Made Since Assessment:

This station has initiated several improvements following the assessment, including:

Upgrade of HVAC system, Bldgs 3, 5, and 7 -- \$416,500 for design (NRM FY11), in contracting.





Upgrade of VMU HVAC controls, Bldg 2 -- \$163,000 for design (NRM FY11), in contracting.

Renovation of severely damaged space for freezer farm, Bldg 2 -- \$780,000 (NRM FY11), in contracting.

### New Construction

There is no new construction of research space planned at this station.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>All Bldgs</b>
Architectural	\$4,610,000
Plumbing	\$538,000
HVAC	\$6,065,000
Electrical	\$3,498,000
Fire Protection	\$60,000
<b>Total</b>	<b>\$14,771,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>All Bldgs</b>
1	\$5,035,000
2	\$5,710,000
3	\$3,989,000
4	\$36,000
5	\$1,000
<b>Total</b>	<b>\$14,771,000</b>

**Table 1.2 Cost Summary by Priority**





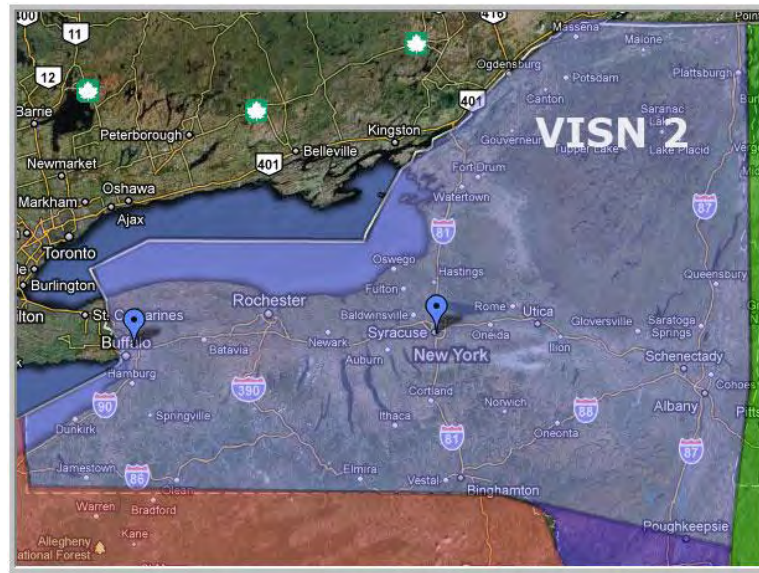
<b>Building</b>	<b>Corrections</b>	<b>Replacement</b>	<b>FCI</b>
Bldg 2	\$8,096,000	\$25,725,000	31%
Bldg 3	\$1,830,000	\$3,914,000	47%
Bldg 4	\$954,000	\$4,878,000	20%
Bldg 5	\$1,357,000	\$5,938,000	23%
Bldg 7	\$1,608,000	\$4,104,000	39%
Bldg 34	\$926,000	\$5,774,000	16%
Overall	\$14,771,000	\$50,333,000	29%

**Table 1.3 Facility Condition Index Value**





## ***VISN 2: VA Healthcare Network Upstate New York***



<i><b>Sta. ID</b></i>	<i><b>VA Site Surveyed</b></i>	<i><b>City/State</b></i>
<i><b>528</b></i>	<i><b>VA Western New York Healthcare System</b></i>	<i><b>Buffalo, NY</b></i>
<i><b>670</b></i>	<i><b>Syracuse VA Medical Center</b></i>	<i><b>Syracuse, NY</b></i>





***VA Western New York Healthcare System,  
Buffalo, NY***



**Date(s) of Assessment: August 11-13, 2009**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$7,090,000**

**Total Cost, Priority 1 Deficiencies: \$946,000 (or 13%)**

**Total Cost to Replace: \$45,022,000**

**Overall Campus FCI: 16%**

**Size of Research Program: Small (under \$2.5 million in VA research funding)**



### Background

The research program at the Buffalo VAMC is a small program concentrated primarily in biomedical research, with some funding for clinical and health services research.

The Buffalo VAMC is academically affiliated with the State University of New York at Buffalo School of Medicine and Biomedical Sciences, located across the street from the VA campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in a single building (Building 20) on the VA campus with just under 37,000 nsf of research space (laboratories – 22,766 nsf; VMU – 12,488 nsf; offices – 1,576 nsf). Following is an overview of Building 20, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Building 20 was constructed in 1991 as a research facility. It is a four level structure, with three floors above ground and a basement. The VMU occupies the basement, while research laboratories, support space, and offices are on the first and second floors. The entire third floor houses mechanical and utility equipment. With the mechanical space indoors, the equipment is protected from exposure to the elements and will have a prolonged life expectancy.



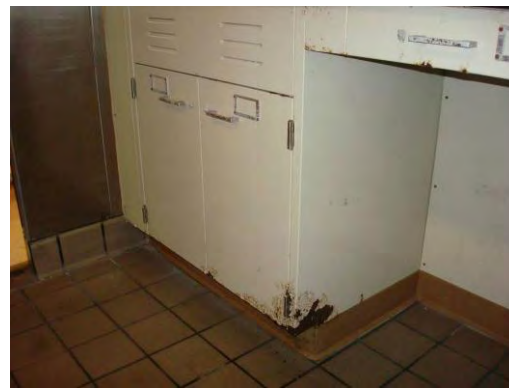
**The entire third floor of Building 20 houses mechanical and utility space, protecting equipment from the elements. Shown here are inline fume hood exhaust fans with inlet HEPA cabinets.**





With regard to overall physical appearance, the Buffalo VAMC has high quality research space. Building 20 is also perhaps the most desirable building on the Buffalo VAMC campus, as most of the main hospital building does not currently have a central HVAC system.

Most of the finishes (walls, floors, ceilings) within the laboratories and VMU are in good condition, with some in need of minor repair. Most casework is in good to fair condition, but some casework has corrosion and doors and/or drawers not easily operable. Most of the doors within the building have hardware that meets current accessibility guidelines.



**Left photo: Most laboratory casework is in good condition. However, some have base cabinets with corrosion (right photo) and drawers that are difficult to open.**



**A receptacle protected with transient voltage surge suppression (TVSS).**



**The cage washer in the VMU has been refurbished since the time of the assessment.**



Fixed equipment in the laboratories is, for the most part, in good operating condition. There are two dishwashers in need of replacement and, in the VMU, the cage washer is aging and should be considered for replacement in the near future. (Note: Since the assessment, the cage washer has been refurbished.)

Safety showers and eyewashes are not in compliance with current standards. The showers do not have eyewash bowls installed with them and the eyewashes in laboratories are of a type that is not considered appropriate (drench hoses). The units also do not have water temperature regulators.

With regard to plumbing, the most significant deficiency is the lack of backflow protection to separate the laboratory water system from the hospital water system. There is a backflow preventer installed where the water enters the building, but it is currently being bypassed due to a water pressure problem that needs to be resolved.

All laboratory and VMU areas are fully covered by a fire suppression sprinkler system. The fire alarm system is lacking in notification device coverage (annunciation devices are limited to corridors). There is only limited smoke detection equipment.

The most costly deficiencies identified in Building 20 are associated with the mechanical system. Mechanical equipment is original to the building, but is in good operating condition and is reliable. The major deficiencies with regard to the system pertain to humidification, ductwork (which is discharging dust into the laboratories), air diffusers and exhaust fans. Also, the VMU is in need of a back-up HVAC system for redundancy and protection of the animals.

Overall, the electrical system is in good condition. The equipment has been well maintained and the main electrical service primary switchgear was recently replaced. Sufficient emergency power is available. However, the chiller which serves both the laboratories and the VMU is not on emergency power to ensure back-up cooling in the event of a power outage.

There are plentiful receptacles within the laboratories and they are equipped with transient voltage surge suppression (TVSS) to protect electronic equipment. One thing lacking in both the laboratories and the VMU is ground fault circuit interrupter (GFCI) outlets near water sources. They should be installed to ensure safety of personnel.

There is no emergency lighting in the laboratories. Lighting fixtures throughout the spaces have been upgraded to current technology and fixtures in the VMU are appropriately gasketed.



At the time of the survey, there was an ongoing problem involving the Edstrom system used for monitoring space conditions in the VMU. The way the system was set up, it was alarming only to the supervisor's office within the VMU including during the evening hours. This issue was discussed with the medical center director, engineering, and information technology staff and, at last report, had been resolved to enable the supervisor to receive alarms at home via remote computer access.

#### Other Research Space

Clinical research is conducted in a clinical research unit (CRU) within the pulmonary section and equipped with patient exam and procedure space, as well as office space for study coordinators. Some clinical research is also done in clinics throughout the facility. There is also a small amount of dry laboratory space on the tenth floor of the hospital in which health services research is conducted.

#### Security Issues

Access to Building 20 is controlled via electronic card reader. There is additional security to restrict access to the VMU.

#### Life Safety Issue

The following life safety hazards identified during the assessment have been or are in the process of being remediated by the medical center:

- The fire alarm system is being upgraded to include sufficient annunciation devices and smoke detection.
- Safety showers and emergency eyewashes have been installed to meet current requirements. (This deficiency was funded by ORD for correction.)

The following additional life safety hazard identified during the assessment has not been remediated:

- Receptacles near water sources are lacking ground fault protection.

#### Improvements Made Since Assessment

This station has made significant progress on improvements following the assessment, including:

Correction of Priority 1 deficiency, backflow preventer at domestic water service entrance was being bypassed due to low suction head on the domestic water distribution pumps – Est. \$37,500 (ARRA funds), completed.

Correction of Priority 2 deficiency, fire alarm system annunciation was limited only to corridors – Est. \$762,570 (ARRA funds), project in bidding.



Correction of Priority 3 deficiency, domestic hot water heater in need of replacement – Est. \$50,000 (ARRA funds, part of energy conservation project), in design phase.

Correction of Priority 4 deficiency, fume hood/laboratory exhaust was not configured correctly to meet NIH guidelines – Est. \$453,750 (ARRA, part of energy conservation project), in design phase.

Correction of Priority 2 deficiency, cabinets under chemical fume hoods in need of replacement with cabinets appropriate for chemical storage – (station funds), completed.

Correction of Priority 2 deficiency, some wall finishes and corroded doors in need of repair, some ceiling tiles in need of replacement, some vent covers in need of repair or replacement, and some floors in need of repair – (station funds), completed.

Correction of Priority 2 deficiency, cage washer in VMU beyond useful life – (VACO ORD funds for refurbishment), completed.

Correction of Priority 2 deficiency, bottle water and glassware washer beyond useful life – (station funds for refurbishment), completed.

Correction of Priority 5 deficiency, room signage does not meet UFAS/ADAAG guidelines – (station funds), completed.

#### New Construction

There is no new construction for research planned for this campus.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.



<b>Discipline</b>	<b>Correction Cost</b>
Architectural	\$1,278,000
Plumbing	\$959,000
HVAC	\$3,571,000
Electrical	\$1,282,000
Fire Protection	\$0
<b>Total</b>	<b>\$7,090,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Correction Cost</b>
1	\$946,000
2	\$2,236,000
3	\$618,000
4	\$2,682,000
5	\$608,000
<b>Total</b>	<b>\$7,090,000</b>

**Table 1.2 Cost Summary by Priority**

<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
\$7,090,000	\$45,022,000	16%

**Table 1.3 Facility Condition Index Value**







***Syracuse VA Medical Center,***

***Syracuse, NY***



**Date(s) of Assessment: September 13-14, 2007**

**Number of Buildings Assessed: 2**

**Total Cost to Correct Deficiencies: \$9,878,000**

**Total Cost, Priority 1 Deficiencies: \$5,830,000 (or 59%)**

**Total Cost to Replace: \$23,068,000**

**Overall Campus FCI: 43%**

**Size of Research Program: Small (under \$2.5 million in VA research funding)**



### Background

The research program at the Syracuse VAMC is a small program. Historically, research funding has been primarily for biomedical research. Rehabilitation research is gaining momentum in the program, particularly with close proximity to the Institute on Human Performance (IHP), a facility dedicated to biomedical and clinical research, rehabilitation and education located at the affiliate.

The Syracuse VAMC is academically affiliated with the State University of New York Upstate Medical University (SUNY-UMU), as well as SUNY programs in health sciences including dentistry, nursing, pharmacy, physical and occupational therapy, psychiatry, psychology, social work, and healthcare administration.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in two buildings on the VA campus with just over 22,000 nsf of research space. Building D has 18,524 nsf (laboratories – 13,829 nsf (including two BSL-3 laboratories); VMU – 2,799 nsf (including an ABSL-3 laboratory); offices – 1,896 nsf) and houses laboratories on the second, third, and fourth floors, the VMU on the basement level, and administrative offices on the first floor. Building D was constructed in 1965 and is attached to the main hospital building. Building 16, constructed in 1985, provides 3,667 nsf of supplemental space to the VMU.

Following is an overview of each building housing research, including its age, configuration, general condition, and description of key deficiencies within each building that existed at the time of the assessment.

Research laboratory space is located on multiple floors of the over 40 year old facility. The building and supporting systems have been well maintained but many systems and materials are reaching or have already reached the end of their expected life cycles.

Throughout the laboratory areas, the metal casework is generally near or at the end of its life, with much of it having rust or peeling paint. Many of the countertops also need to be replaced. There is a significant amount of asbestos tile present throughout the laboratory areas, although some tile has been replaced. Some rooms being used for tissue culture should have sheet vinyl flooring rather than tile, making the surface easier to maintain. Fixed equipment is generally in fair condition with some having been replaced in recent years. There is one inoperable common cold room being used for storage.

Support space for use of common resource (CORE) equipment and/or common storage is generally lacking in the facility.



**Several laboratories have badly corroded sinks.**



**Inaccessible safety shower with equipment requiring electricity below. Safety shower deficiencies have been corrected.**

Mechanical systems are aging, but have been well maintained. Although they do not require immediate replacement, they should be considered for replacement as funds become available.

The electrical power systems are beyond their life expectancy, although they have been well maintained. Emergency power is available in the laboratories, but should be increased to accommodate the elevator which currently is not on emergency power. Lighting levels are too low for a laboratory environment.

Plumbing systems in both laboratories and the VMU lack the appropriate backflow prevention to protect the hospital from the possibility of contamination from laboratory water. While there has been some leakage of water into the building crawl space around the domestic water pipe entrance, it appears to be caused by rainwater rather than piping leaks. This should be further investigated.

There are two biosafety level (BSL)-3 laboratories and one ABSL-3 laboratory in building D. A detailed review of these laboratories revealed some deficiencies in the exhaust system. To summarize, the grilles, ductwork, and leaky dampers now connecting the BSL-3 laboratories to the building general exhaust should be removed and the duct openings completely sealed. In addition, there is only a single exhaust fan servicing each of the BSL-3/ABSL-3 laboratories. A second redundant fan should be installed for each space to ensure continuous exhaust in the event of failure of a single fan. These fans should be supplied from emergency power to maintain proper exhaust and pressure control during a power failure.



There are a number of additional items identified that need to be addressed, including inappropriate chemical storage, and lack of safety features on fume hoods.

#### Security Issues

The laboratory areas are secured by a controlled entrance point and additional keyed access. There is additional security for the BSL-3 and ABSL-3 laboratories. Building 16 has no security system at present, but is not being actively used for research purposes.

#### Life Safety Hazards

The following life safety hazards identified during the assessment have been remediated by the medical center:

- Safety showers and emergency eyewashes have been installed to meet current requirements.
- Receptacles with ground fault protection have been installed near water sources.

The following additional life safety hazard has not been corrected to date.

- Building D sprinkler heads need to be relocated.

#### Improvements Made Since Assessment

This station has made some progress on improvements following the assessment, including:

Correction of Priority 1 (life safety hazards) deficiencies, Building D, emergency eyewashes and safety showers in all laboratory areas – (station funds), completed.

Correction of Priority 1 (life safety hazards) deficiencies, Building D, ground fault protected receptacles near water sources – (station funds), completed.

Correction of mechanical system deficiency, test and balance VMU air handling equipment, Building D – (station funds), completed.

Correction of Priority 1 deficiency, emergency power, Building 16 -- \$100,000 (ARRA funds), completed.

Correction of Priority 2 deficiency, replacement of lighting fixtures with energy efficient models, Buildings D and 16 – (ARRA funds), completed.

Correction of Priority 1 deficiency, replacement of electric panels, Buildings D and 16 – (ARRA funds), completed.



Correction of Priority 3 deficiency, lack of electronic security on elevator, Building D – (station funds), in planning for FY11 completion.

Correction of Priority 1 deficiency, complete unfinished wall in storage space, Building D – (station funds), completed.

Renovation of office space and secured filing space, Building D – (station funds), completed.

Renovation of additional office space, Building D – (station funds), in planning for FY11 completion.

#### New Construction

There is no new construction for research planned for this campus.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Correction Cost - Bldg D</b>	<b>Correction Cost - Bldg 16</b>
Architectural	\$993,000	\$591,000
Plumbing	\$808,000	\$180,000
HVAC	\$4,587,000	\$796,000
Electrical	\$1,820,000	\$0
Fire Protection	\$79,000	\$24,000
<b>Total</b>	<b>\$8,287,000</b>	<b>\$1,591,000</b>

**Table 1.1 Cost Summary by Discipline**



Priority	Bldg D	Bldg 16
1	\$4,908,000	\$922,000
2	\$1,646,000	\$318,000
3	\$1,433,000	\$148,000
4	\$166,000	\$203,000
5	\$134,000	\$0
Total	\$8,287,000	\$1,591,000

Table 1.2 Cost Summary by Priority

Building	Correction Cost	Replacement Cost	FCI
Building D	\$8,287,000	\$19,154,000	43%
Building 16	\$1,591,000	\$3,914,000	41%
Overall	\$9,878,000	\$23,068,000	43%

Table 1.3 Facility Condition Index Value





### ***VISN 3: VA NY/NJ Veterans Healthcare Network***



<b><i>Sta. ID</i></b>	<b><i>VA Site Surveyed</i></b>	<b><i>City/State</i></b>
<b><i>526</i></b>	<b><i>James J. Peters VA Medical Center</i></b>	<b><i>Bronx, NY</i></b>
<b><i>561</i></b>	<b><i>VA New Jersey Health Care System</i></b>	<b><i>East Orange, NJ</i></b>
<b><i>630</i></b>	<b><i>VA NY Harbor Healthcare System, Manhattan Campus</i></b>	<b><i>New York, NY</i></b>
<b><i>630A4</i></b>	<b><i>VA NY Harbor Healthcare System, Brooklyn Campus</i></b>	<b><i>Brooklyn, NY</i></b>
<b><i>632</i></b>	<b><i>Northport VA Medical Center</i></b>	<b><i>Northport, NY</i></b>

### Section 3. Description of VA Research Infrastructure





***James J. Peters VA Medical Center,  
Bronx, NY***



**Date(s) of Assessment: August 25-26, 2010**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$15,171,000**

**Total Cost, Priority 1 Deficiencies: \$776,000 (or 5%)**

**Total Cost to Replace: \$75,596,000**

**Overall Campus FCI: 20%**

**Size of Research Program: Large (\$5 million to \$9.9 million in VA research funding)**



### Background

The research program at the James J. Peters VAMC is a large program that falls in the top 30% of VA research programs nationwide and is experiencing growth. VA funding is predominantly for rehabilitation research, with lesser amounts for biomedical, health services, and clinical research. Currently the James J. Peters VAMC hosts a rehabilitation COE focusing on the Medical Consequences of Spinal Cord Injury and a health services REAP on Health Care Across Systems and Sites of Care. With regard to clinical programs, the facility hosts a Mental Illness Research, Education and Clinical Center (MIRECC) and a Geriatric Research, Education and Clinical Center (GRECC), both of which have research components.

The program has a long, impressive history of excellence in research, with former investigators winning numerous high level recognition awards, including the late Dr. Rosslyn Yalow, Nobel laureate (1977), an Albert Lasker Basic Medical Research Award recipient (Dr. Yalow, 1976), and seven VA William S. Middleton awardees (Drs. Berson, Yalow, Ulick, Sterling, Gross, Lieber, and Herbert).

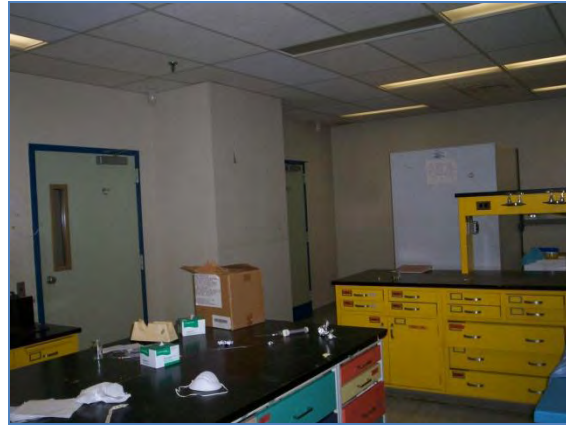
The academic affiliate is Mount Sinai School of Medicine.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in a single building (Building 105) on the VA campus with 52,000 nsf of research space (laboratories – 25,000 nsf; VMU – 15,000 nsf; offices – 12,000 nsf). Following is an overview of Building 105, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

The space housing research laboratories and the VMU is contiguous space within a single building dedicated to research. Building 105 has five floors above ground that house research laboratories and the Research Service administrative offices, a basement (ground floor) which houses the VMU, and a crawlspace (sub-basement) for service distribution. The building, which dates to 1979, is connected to the main hospital via a walkway on the first and ground floors.

The biomedical laboratories on the second and third floors have been renovated with new casework, equipment, and finishes. The casework has a good appearance, but it is not of a quality recommended for use in a laboratory environment. The base cabinets should be replaced with industry standard cabinets. Countertops are appropriate, but in each of the renovated laboratories there is a mysterious cut out section of the countertop near the sink. These sections are recommended for replacement. Remaining floors have yet to be renovated and have aging furnishings and finishes.

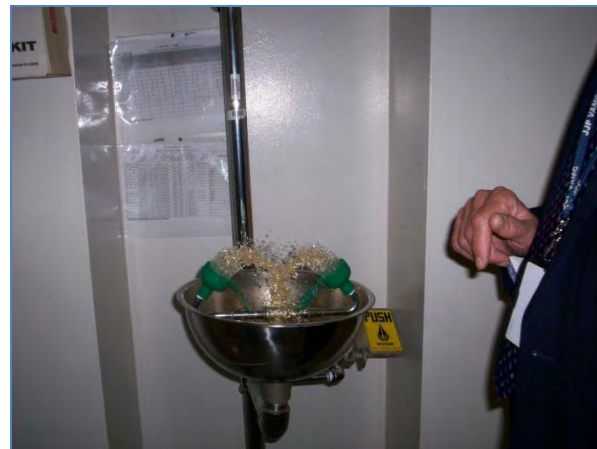


**Left photo: A renovated laboratory. Note the odd cut out area adjacent to the sink which has no apparent purpose. The right photo shows a laboratory that has not yet been renovated.**

There is a significant problem with leakage around the windows, particularly at the northwest corner of the building where interior finishes are water damaged. All windows in the building need to be replaced.



**Water leakage around windows has caused significant damage to finishes.**



**Some emergency eyewashes produce discolored water due to pipe corrosion.**





The VMU is in need of extensive renovation, but right now is scheduled to get only a new heating, ventilation, and air conditioning (HVAC) system and replacement of the acoustic panel ceiling (APC) in the corridors. To meet industry standard, the facility should have hard ceilings throughout. There are hard ceilings in the animal rooms and many of them are in need of repair.

Large equipment in the VMU is in good condition, but is in need of exhaust hoods to prevent steam from further damaging interior finishes. (Note: ORD has provided funding to remediate this deficiency.) Some penetrations were noted, specifically a wall in the VMU mechanical room through which a vine is growing, and a gap in the ceiling through which a squirrel reportedly entered the VMU from the loading dock area. Close attention to security of the loading dock door would also be helpful to alleviate the latter problem.

With regard to the building's mechanical systems, there are significant deficiencies that constitute the major portion of the estimated cost to renovate Building 105. All of the major components are original to the building and in need of replacement. Additionally, there are some components which do not meet guidelines for a laboratory or animal research environment.

The electrical system currently has a fairly robust distribution system, but the equipment is obsolete. Presumably this will be remedied during an upcoming campus-wide electrical upgrade. The entire building is covered by back-up power. There are some problems when the system switches from back-up to normal, as there is an inrush that causes power outages.

There is no transient voltage surge suppression (TVSS) to protect sensitive electronics, and some of the receptacles near water sources are not ground fault circuit interrupter (GFCI) protected.

Lighting has been upgraded for energy efficiency. The light fixtures in the VMU are gasketed as appropriate.

Currently the building does not have an equipment monitoring system for high value cold rooms, freezers and refrigerators. Such a system would be particularly invaluable to the brain bank freezers that will be consolidated on the fifth floor following renovation.

The space is adequately covered by safety showers and eyewashes, but some of them have very discolored water coming from them when first activated. This is most likely caused by pipe corrosion. Tempered water mixing valves have been installed at some of the units, but they are needed at all safety showers and eyewashes.





The research space is partially covered by a wet pipe sprinkler system, but sprinklers are lacking in laboratories that have not been renovated, as well as in the VMU and in corridors. The fire alarm system was upgraded in the past few years. It was noted that in the VMU the fire alarm system had been disconnected.

#### Other Research Space

At the time of the assessment, the rehabilitation COE was in very cramped space (estimated to be about 1,300 square feet) in the spinal cord injury (SCI) clinic. The SCI program will be gaining a new building on campus, and the rehabilitation COE will be moved to new space of about 5,000 square feet on the seventh floor of the hospital. This center is a long standing, well established center that clearly is in dire need of additional space for laboratories as well as offices. The new space is being renovated in-house by Facilities Management Service staff and will be well suited to the center.

The health services REAP is housed within the hospital in space shared with the GRECC. They will be relocating to other space but, at the time of the assessment, the exact location was unknown. This group is in a growth mode and will soon outgrow their available space.

There is no designated space for clinical research. It is being conducted in the clinics at present. With about \$1.5 million in VA clinical research funds, the program clearly would benefit and likely expand the clinical research program if appropriate designated space should become available.

Hospital leadership is highly supportive of research, and has provided funding for space improvements as well as much needed additional space.

#### Security

There is appropriate electronic security throughout the laboratory areas. However, several security concerns were noted in the VMU. There is no additional security on the elevator going to the basement from upper research floors. There is a new scan system installed for entry into the animal housing areas and the individual rooms, but at the time of the assessment the system was not activated because some of the staff does not yet have access cards. Some cameras are also needed (elevator lobby, exits to outside of building, back stairwell).

#### Life Safety Hazards

The following life safety hazard identified during the assessment is in the process of being remediated:

- An oxygen sensor will be installed in the room where liquid nitrogen is being dispensed. (ORD has provided funding to correct this deficiency.)



The following additional life safety hazards identified during the assessment have not been remediated by the medical center:

- A local exhaust location may be incorrectly tied into building general exhaust rather than the fume hood exhaust.
- The building is not fully covered by a sprinkler system. (This deficiency is expected to be corrected with upcoming NRM projects.)
- Exit signs and egress lighting do not have batteries or generator connection.
- Some receptacles near water sources are not ground fault protected.

#### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Renovation of fourth and fifth floor laboratories, including HVAC, fire safety, and security upgrades -- \$9,000,000 (NRM FY11), in design.

Replacement of HVAC for the VMU -- \$3.54 million (ARRA funds), to start FY11.

Completion of space renovation for the Rehabilitation Center -- \$853,442 (2008 Emergency Supplement), completed.

#### New Construction

There is no construction of a new research building planned at this station. However, the fourth and fifth floors of the research building will be extensively renovated.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.



<b>Discipline</b>	<b>Bldg. 105</b>
Architectural	\$3,646,000
Plumbing	\$1,100,000
HVAC	\$8,817,000
Electrical	\$1,260,000
Fire Protection	\$348,000
<b>Total</b>	<b>\$15,171,000</b>

Table 1.1 Cost Summary by Discipline

<b>Priority</b>	<b>Bldg. 105</b>
1	\$776,000
2	\$7,106,000
3	\$7,248,000
4	\$0
5	\$41,000
<b>Total</b>	<b>\$15,171,000</b>

Table 1.2 Cost Summary by Priority

<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
\$15,171,000	\$75,596,000	20%

Table 1.3 Facility Condition Index Value





***VA New Jersey Health Care System,  
East Orange Campus***



**Date(s) of Assessment: October 20-21, 2010**

**Number of Buildings Assessed: 3**

**Total Cost to Correct Deficiencies: \$8,653,000**

**Total Cost, Priority 1 Deficiencies: \$1,400,000 (or 16%)**

**Total Cost to Replace: \$35,793,000**

**Overall Campus FCI: 24%**

**Size of Research Program: Medium (\$2.5 million to \$4.9 million in VA research funding)**



### Background

The VA New Jersey Health Care System research program focuses almost entirely on biomedical and health services research. The program hosts a health services REAP, the Center for Healthcare Knowledge Management for Chronic Complex Illness. There also is one of only three (nationwide) War Related Illness & Injury Study Centers (called WRIISC), an entity funded by clinical dollars but with a strong research component. This group works very closely with the health services investigators.

The primary academic affiliate is the University of Medicine and Dentistry of New Jersey located approximately four miles away.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in three buildings on the VA campus with 26,665 nsf of research space (laboratories – 15,350 nsf; VMU – 7,597 nsf; offices – 3,718 nsf). Following is an overview of the buildings, including their age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

The number of buildings and their dispersion throughout the campus is less than ideal for the biomedical investigators, as it does not encourage sharing of ideas and equipment. In terms of laboratories, there appears to be a sufficient amount of space for biomedical research.

Generally, all of the buildings housing research laboratories on the East Orange campus are in poor condition. All three buildings share the following deficiencies: 1) interior finishes and/or casework and fixed equipment in need of upgrade due to age or water damage; 2) need for separation of industrial and potable water supplies; 3) need to significantly upgrade mechanical systems; and 4) lack of transient voltage surge suppression (TVSS) to protect sensitive electronics in the laboratories. Following is additional information on research space within each building assessed.

Building 1, which is the main hospital building constructed in 1950, is a large “H” shaped structure with 14 floors above ground, a penthouse, and a basement. Building 1 houses a few laboratories on the fourth and ninth floors. Deficiencies include:

- In the ninth floor laboratories, the windows sills had dead insects on them. It was unclear how they had gotten into the space, but their entry may indicate the need to reseal the windows.





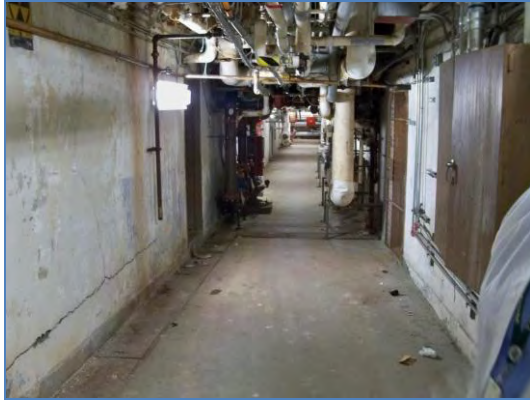
- There is a deionized (DI) water system in place on the fourth floor. Investigators in ninth floor laboratories must go to the fourth floor to obtain DI water if needed.
- There are no safety showers available to investigators in Building 1. Some of the laboratories have emergency eyewashes.
- Laboratory compressed air and vacuum are both available through the medical systems, rather than from separate laboratory systems as required by the National Fire Protection Association standards.



**Window and wall conditions in the Building 1 laboratories are generally poor. There also is evidence of insect intrusion on window sills.**

Building 7 houses laboratories on the first floor and the VMU on the basement level. This building was constructed in 1950 and renovated in 1994. The first floor is in significantly better condition than the basement. Of the total cost for deficiencies noted in this building, 97% are for the basement level. Following is a brief summary of the condition of Building 7.

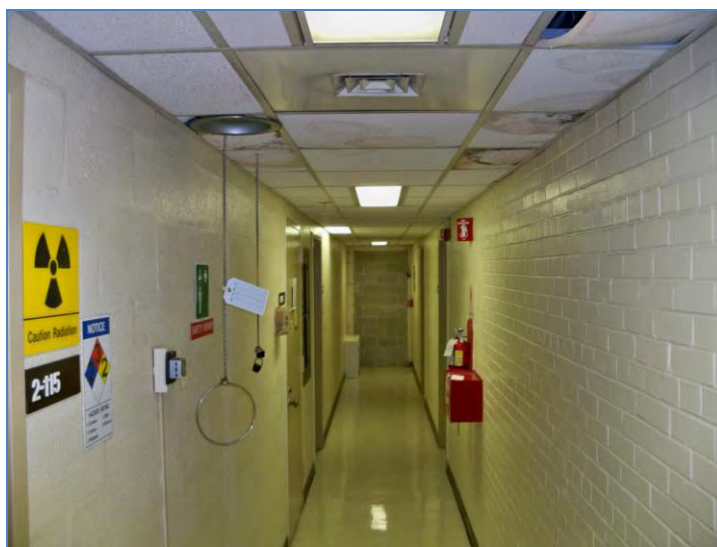
- The laboratories on the first floor of Building 7 were renovated in 1994 and are in the best condition of all laboratories on the campus.
- There are problems with the exterior of the building. The foundation is cracking and there are holes in the walls in several locations, potentially allowing vermin to enter. Some of the exterior windows are original to the building (circa 1950).
- The basement VMU is below grade and is subject to severe flooding. The facility has used sandbags around the building near exits in an attempt to stop water infiltration, but without much success. It was reported that after a heavy rain, as much as two inches of water can be standing throughout the basement.
- The flooding issues with the basement pose another serious problem, i.e., it can be difficult to open the exterior doors when there is water outside. Additionally, the sandbags can drift in front of a door blocking egress.



**Left photo: The foundation wall in the basement of Building 7 is cracking and showing signs of water pressure from the exterior. At right, an egress door from the VMU where water builds up after it rains.**

Building 11 has two floors of laboratories of which only a few are currently in use. This building was constructed in 1965 and was renovated (and an addition was built) approximately 20-25 years ago. Building 11 has two floors above ground and a partial basement. Following is a brief summary of findings for Building 11.

- This building also has serious problems. There is evidence of extensive water damage throughout the interior, there is deterioration at the exterior of the building, the roof is in need of replacement, the windows are original to the building (circa 1965), and there likely is mold within the building.
- There is no emergency power available to Building 11.
- There is no electronic security at Building 11.



**In Building 11, a narrow corridor with ceiling panels showing water stains and mold.**



In Buildings 7 and 11, laboratory eyewashes are either not present or inappropriate in type. There are no eyewashes in the VMU.

The fire alarm system in Buildings 1, 7 and 11 is in good condition. Buildings 1, 7, and 11 are fully covered by a wet-pipe sprinkler system.

#### Other Research Space

The health services REAP and the WRIISC are co-located on the eleventh floor of Building 1. There currently is insufficient space for the groups to grow in their current location. However, there is a strong need for the REAP and WRIISC to remain co-located in contiguous space, as they share administrative resources between the two entities and they collaborate extensively. At the time of the assessment, there were a few offices among the REAP/WRIISC space assigned to staff from other parts of the hospital. The ideal solution would be to relocate these staff to other space within the hospital, reassigning their eleventh floor space to the REAP/WRIISC. There did not appear to be another obvious solution to the problem.

#### Security

There is no electronic security separating the research laboratories from clinical space in Building 1. There is no electronic security at Building 11.

#### Life Safety Hazards

The following life safety hazard identified during the assessment is being remediated by the medical center:

- GFCI receptacles are being installed in all research locations within six feet of water dispensing including the VMU.

The following additional life safety hazard has not been addressed by the medical center:

- Safety showers and emergency eyewashes do not meet current requirements.

#### Improvements Made Since Assessment:

This station has made and/or initiated the following improvements following the assessment, including:

The repair of the Building 1 and Building 7 roofs is included in project 56109103 which was expected to be funded in June 2011. The repair of the Building 11 roof included the NRM project 56109 (totaling \$495,000 and including the repair of Building 2). (Note: funding status of the above projects is unclear. The station applied for NRM FY11 funding for corrections to Building 11, but the project was not funded.)



Local planning is underway to correct the non-GFCI receptacles in Buildings 1, 7, 11.

#### New Construction

There is no new construction of research space planned at this station.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Correction Cost -- Bldg 1</b>	<b>Correction Cost -- Building 7</b>	<b>Correction Cost -- Building 11</b>
Architectural	\$436,000	\$1,465,000	\$807,000
Plumbing	\$234,000	\$477,000	\$291,000
HVAC	\$497,000	\$2,611,000	\$1,121,000
Electrical	\$71,000	\$230,000	\$413,000
Fire Protection	\$0	\$0	\$0
<b>Total</b>	<b>\$1,238,000</b>	<b>\$4,783,000</b>	<b>\$2,632,000</b>

**Table 1.1 Cost Summary by Discipline**



Priority	Bldg 1	Bldg 7	Bldg 11
1	\$152,000	\$808,000	\$440,000
2	\$723,000	\$895,000	\$802,000
3	\$305,000	\$2,847,000	\$1,261,000
4	\$0	\$0	\$0
5	\$58,000	\$233,000	\$129,000
Total	\$1,238,000	\$4,783,000	\$2,632,000

Table 1.2 Cost Summary by Priority

Building	Correction Cost	Replacement Cost	FCI
Building 1	\$1,238,000	\$3,260,000	38%
Building 7	\$4,783,000	\$24,691,000	19%
Building 11	\$2,632,000	\$7,841,000	34%
Overall	\$8,653,000	\$35,792,000	24%

Table 1.3 Facility Condition Index Value

### Section 3. Description of VA Research Infrastructure







***VA New York Harbor Healthcare System:***

***Manhattan Campus***



**Date(s) of Assessment: August 15-17, 2006 (Pilot Site)**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$13,269,100**

**Total Cost, Priority 1 Deficiencies: \$1,363,200 (or 10%)**

**Total Cost to Replace: \$17,500,000**

**Overall Campus FCI: 76%**

**Size of Research Program: Medium (\$2.5 million to \$4.9 million in VA research funding)**



### Background

This VA research program is a medium sized program of predominantly biomedical research. Its primary academic affiliate is New York University School of Medicine.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in a single building (the main hospital building) on the VA campus with nearly 36,000 nsf of research space (laboratories – 27,000 nsf (including a BSL-3 laboratory); VMU – 7,144 nsf; offices – 1,450 nsf). Following is an overview of the building housing research, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

The main hospital building was constructed in 1950. Research is distributed over several floors (13, 14, 16, 17, and 18) with some interspersed among clinical space which is less than ideal. The 18<sup>th</sup> floor is dedicated to research and houses the BSL-3 laboratory and the VMU. Other than on the 18<sup>th</sup> floor, the space is not contiguous making the program's seven core facilities less than ideally accessible to all investigators.

Generally, the building is showing its more than 50 years of age, and fixtures within research laboratories are reaching the end of their life expectancy. With few exceptions, casework, flooring, and equipment need to be replaced. There is significant congestion throughout the laboratories creating what could be life safety concerns in the event of an emergency.

There are also significant problems with airflow throughout the building. Due to the age of the facility but also because research space is scattered throughout the building, air flow systems are not consistent with modern laboratory and vivaria standards. In some instances, the method of air delivery within laboratories may be interfering with the proper performance (and safety) of fume hoods.

There have been ongoing problems with roof leakage which impacts the 18<sup>th</sup> floor and has resulted in damage to the building, casework, and/or fixtures, as well as damage to or loss of equipment and computers.

There is a small BSL-2 and BSL-3 laboratory suite housed on the 18<sup>th</sup> floor in which an extensive program of AIDS/HIV research is conducted. The A&E experts identified a number of physical deficiencies in the space including penetrations in the walls and ceiling in need of repair in order to maintain proper containment of contaminated materials. There also are windows in the exterior wall which could result in a break in biocontainment capability. The BSL-3 laboratory is lacking redundancy for the dedicated supply and exhaust fans. In the event of a power failure, negative air pressure will be lost. Space pressure monitoring and alarming



is provided only inside the BSL-3 suite but should also be provided for the anteroom to prevent entry under hazardous conditions. Also in the anteroom there should be a hand wash sink to comply with the *Biosafety in Microbiological and Biomedical Laboratories* (BMBL) guidelines.

Facility leadership and local engineers were very responsive to problems identified in the BSL-3 laboratory. Following the survey, local engineers provided an update, stating that the following repairs were completed very quickly: “sealing the annular space around the sprinkler heads, sealing around light fixtures, installing the handle to the shower, sealing of holes in sheet rock wall.”



**Equipment stored in corridors creates crowded conditions and blocks egress.**

The vivarium is crowded, having less than optimal space for housing animals and insufficient storage space. The HVAC system is on emergency power, but there is no redundancy for the supply or exhaust fans, leaving the system vulnerable to outages including those necessitated by routine maintenance.

There is approximately 15,000 square feet of research space leased to New York University, including a fairly significant piece on the 18<sup>th</sup> floor. It was noted that this space has been renovated by the affiliate and is in far better condition than those laboratory spaces occupied by VA investigators. This leased space was not included as part of the technical A&E survey.

All laboratory areas are protected by a wet pipe sprinkler system. The fire alarm system is in good condition.

No deficiencies were noted with regard to safety showers and emergency eyewashes.



### Security

The hospital has full security measures in place upon lobby entry, including metal detectors, x-ray machines, security guards, and identification checks. Research space is protected by swipe card key or other security systems. There is an additional level of security for entry into the BSL-3 suite.

### Life Safety Hazards

The following life safety hazard identified during the assessment is in the process of being remediated by the medical center:

- A flammable storage room does not have fire rated walls. It also has a wood door that is in poor condition and inappropriate for its function. (Note: this deficiency will be corrected as part of an FY11 NRM project.)

### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Correction of Priority 1 deficiencies and laboratory/VMU upgrades, including upgrade of two laboratories, correction of VMU deficiencies, fire wall separation, HVAC upgrade, and fume hoods -- \$1 million (NRM FY11), A/E design is 95% complete and funding for construction was approved for FY11.

Correction of Priority 1 deficiencies – Replacement of roof and flashing, will be repaired as part of another NRM project (#630-07-110ES, "Roof Replacement/Weatherproofing") which is currently 75% complete and scheduled to be completed in mid-June 2011.

Correction of Priority 1 deficiencies related to pipe insulation has been completed-- VISN funded project "Reusable Insulation Jackets for energy Savings", estimated cost \$5,000.

### New Construction

There is no new construction of research space planned at this station.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.



(Note: The cost tables below include deficiencies identified at both the Manhattan and Brooklyn campuses.)

<b>Discipline</b>	<b>Correction Cost</b>
Architectural	\$7,225,300
Plumbing	\$85,100
HVAC	\$10,176,100
Electrical	\$316,500
Fire Protection	\$2,000
<b>Total</b>	<b>\$17,805,000</b>

**Table 1.1 Cost Summary by Discipline  
(Manhattan and Brooklyn Campuses)**

<b>Priority</b>	<b>Correction Cost</b>
1	\$1,493,600
2	\$954,700
3	\$4,863,600
4	\$1,056,100
5	\$9,437,000
<b>Total</b>	<b>\$17,805,000</b>

**Table 1.2 Cost Summary by Priority  
(Manhattan and Brooklyn Campuses)**

<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
\$13,269,100	\$17,500,000	76% (Manhattan)
\$4,535,900	\$9,300,000	49% (Brooklyn)
\$17,805,000	\$26,800,000	66% (overall)

**Table 1.3 Facility Condition Index Value**







***VA New York Harbor Healthcare System:***

***Brooklyn Campus***



**Date(s) of Assessment: August 15-17, 2006 (Pilot Site)**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$4,535,900**

**Total Cost, Priority 1 Deficiencies: \$ 127,400 (or 3%)**

**Total Cost to Replace: \$9,300,000**

**Overall Campus FCI: 49%**

**Size of Research Program: Small (under \$2.5 million in VA research funding)**



### Background

This facility has a small research program almost entirely comprised of biomedical research. SUNY Downstate Medical Center (State University of New York Health Science Center at Brooklyn) is the primary academic affiliate of the Brooklyn campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories and the Veterinary Medical Unit (VMU) were housed in the main hospital building with just over 17,000 nsf of research space (laboratories – 10,728 nsf and VMU – 6,985 nsf). Following is an overview of the building housing research, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

The Brooklyn hospital is a 17 story wing behind a six story wing connected by an extension. The research space is located primarily on the third floor with some laboratories located on the seventh floor. The VMU is on the basement level. Several laboratories have been renovated and are in significantly better condition than those that have not been upgraded. Approximately half of the laboratory casework is in need of replacement.

Airflow at this facility is inadequate for a research environment. The system was installed in 1970 and is in good condition considering its age of 35 years, but is not consistent with modern laboratory and vivaria standards. Several fume hoods are being inappropriately used for storage and contain large amounts of potentially hazardous materials. Roof leakage is not an issue with research space, as the space is not located on the top floor of the hospital.



**The cage washer in the animal facility.**



The vivarium appears to have ample space. However, there have been two ongoing problems with water leakage that have significantly damaged the floor. 1) The vivarium is below grade and the outside grade does not adequately drain water away from the building. In heavy rainfall, water comes rushing in through an external door and down a stairwell, flooding the vivarium floor. 2) There is also a problem with flooding from overflow of the mop sink during annual fire protection inspections. The plumbing engineer on the A&E team provided a fairly simple and cost effective repair for both of these problems.

All laboratory areas are protected by wet pipe sprinkler systems. The fire alarm system is appropriate.

No deficiencies were noted with regard to safety showers and emergency eyewashes.

#### Security

The hospital has full security measures in place upon lobby entry, including metal detectors, x-ray machines, security guards, and identification checks. Research space is protected by swipe card key or other security systems.

#### Life Safety Hazards

No significant issues affecting life safety were identified.

#### Improvements Made Since Assessment:

This station has made and/or initiated some improvements following the assessment, including:

Correction of the severe flooding in the VMU – (station funding), completed.

While the station reported that some NMR funding was applied for and approved, there is no detailed information as to the use of these funds. The station appears to have been funded approximately \$65,000 in FY08 NRM funding.

#### New Construction

There is no new construction of research space planned at this station.

#### Cost Summary

Refer to the Cost Summary section for the Manhattan Campus (page 3-95).





***Northport VA Medical Center,***

***Northport, NY***



**Date(s) of Assessment: July 29-30, 2009**

**Number of Buildings Assessed: 2**

**Total Cost to Correct Deficiencies: \$18,205,000**

**Total Cost, Priority 1 Deficiencies: \$4,500,000 (or 25%)**

**Total Cost to Replace: \$31,030,000**

**Overall Campus FCI: 59%**

**Size of Research Program: Small (under \$2.5 million in VA research funding)**



### Background

The Northport VA research program is considered a small program, with funding predominantly for biomedical research. Some clinical research is also conducted.

The academic affiliate is State University of New York (SUNY) Medical School at Stony Brook located approximately 12 miles from the Northport VAMC campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in two buildings (Buildings 61 and 62) on the VA campus with 28,696 nsf of research space (laboratories – 13,550 nsf; VMU – 6,883 nsf; offices – 8,263 nsf). Following is an overview of the buildings, including their age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

It should be noted that, according to the Facilities Management Service, projects for roof replacements, tuck pointing, and fire sprinklers were in planning stages and/or funded at the time of the assessment.

Both buildings 61 and 62 were constructed in 1928. Both are three level buildings (two stories plus basement) in need of extensive exterior work (tuck pointing, roof repair) to correct chronic leakage problems that have resulted in extensive damage to interior finishes. Neither building is adequately equipped for accessibility. They lack ramps, accessible restrooms, and proper signage. Neither building was originally constructed as a research facility.

Generally none of the laboratories are cooled or ventilated by a central system, but rather are served by window air conditioning units. There is an HVAC system serving the VMU, but it does not have appropriate redundancy. Heating is achieved through perimeter steam radiators.

At the time of the survey, the electrical service entrance feeder for buildings 61 and 62, as well as other buildings on the campus, was being repaired. Electrical service was being provided by the emergency power system which is in fair condition.

Building 61 has undergone some renovations over the years, including the VMU housed on the second floor in 1986, and more recently some of the first floor research laboratories. Except for the renovated laboratories, casework and fume hoods are in need of replacement. Emergency eyewashes and showers do not meet current standards. The domestic water supply serving the research spaces is not separated from potable water with backflow prevention. There is no central





exhaust system for the laboratories, only fume hoods. The VMU does have central exhaust.

Building 62 houses research laboratories and support spaces on the second floor. As with Building 61, most of the finishes in Building 62 are in need of correction due to water damage and aging. All casework and fume hoods need to be replaced.

Safety showers and eyewashes are in need of replacement with devices that comply with current standards.

The research space is only partially protected by a fire suppression sprinkler system (75%). Areas that are not covered do not have smoke detection devices. The fire alarm system is in fair condition and lacks sufficient annunciation devices.



**The four photos above show examples of water damaged finishes in Building 61.**





**In Building 62, a newer fume hood in a recently renovated laboratory.**



**Building 62 also has water damage.**

### Security

Access to all research areas is controlled by card readers and closed circuit TV (CCTV). In Building 62, the elevator is equipped to control access to the second floor laboratories.

### Life Safety Hazards

The following life safety hazards identified during the assessment are being or have been remediated by the medical center:

- Ground fault protected receptacles and exit lights have been/will be installed.
- Fire alarms and sprinkler system will be upgraded.
- Safety showers and eyewashes that meet current requirements have been installed. (ORD provided funding to remediate this deficiency.)

The following additional life safety hazard was identified and no report of remediation has been received:

- In at least one laboratory, a fume hood is next to the door potentially blocking egress in case of emergency involving the fume hood.

### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Correction of Priority 1 deficiencies, ground fault protected receptacles and exit lights have been or will be installed as part of NRM renovation projects.



Correction of Priority 1 deficiencies, sprinkler systems and fire alarms will be upgraded by an NRM project.

Renovation of research laboratories in Building 61, first floor is to be completed by June 30, 2011--\$865,000 (NRM project with funds provided by AARA (American Recovery and Reinvestment Act of 2009); actual budget is \$495,000.

Upgrade VMU space in Building 61, second floor to be completed by June 30, 2011--\$369,298 (NRM).

Renovation of Building 62, second floor, completed and occupied March 31, 2011--\$427,000.

The station applied for FY11 NRM funding to create patient exam rooms (for clinical research) in Building 200. This project was not approved for funding.

#### New Construction

There is no new construction of research space planned at this station.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Correction Cost - Bldg 61</b>	<b>Correction Cost - Bldg 62</b>
Architectural	\$4,657,000	\$3,473,000
Plumbing	\$367,000	\$361,000
HVAC	\$4,709,000	\$2,876,000
Electrical	\$821,000	\$563,000
Fire Protection	\$219,000	\$159,000
<b>Total</b>	<b>\$10,773,000</b>	<b>\$7,432,000</b>

**Table 1.1 Cost Summary by Discipline**



<b>Priority</b>	<b>Correction Cost - Bldg 61</b>	<b>Correction Cost - Bldg 62</b>
Priority 1	\$2,800,000	\$1,700,000
Priority 2	\$7,112,000	\$4,863,000
Priority 3	\$744,000	\$626,000
Priority 4	\$0	\$0
Priority 5	\$117,000	\$243,000
<b>Total</b>	<b>\$10,773,000</b>	<b>\$7,432,000</b>

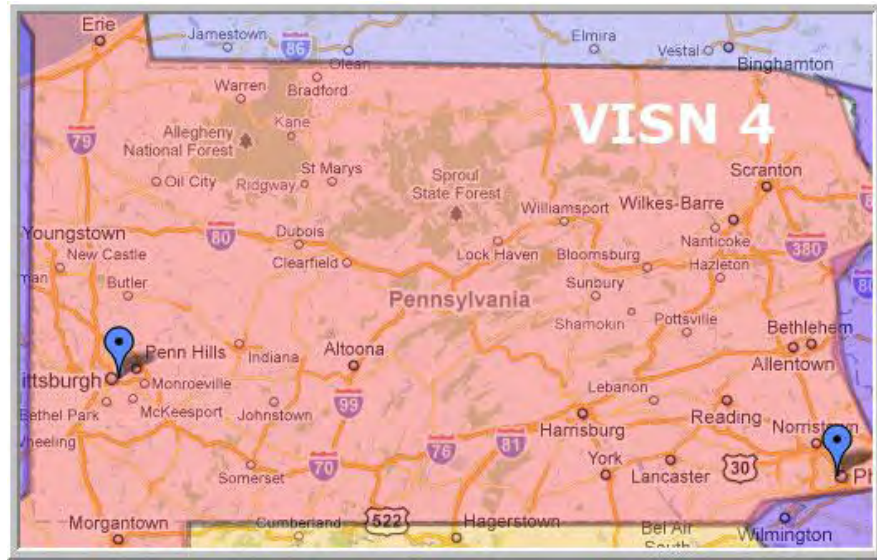
**Table 1.2 Cost Summary by Priority**

<b>Building</b>	<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
Bldg 61	\$10,773,000	\$21,282,000	51%
Bldg 62	\$7,432,000	\$9,748,000	76%
<b>Overall</b>	<b>\$18,205,000</b>	<b>\$31,030,000</b>	<b>59%</b>

**Table 1.3 Facility Condition Index Value**



## VISN 4: VA Healthcare – VISN 4



<i>Sta. ID</i>	<i>VA Site Surveyed</i>	<i>City/State</i>
642	Philadelphia VA Medical Center	Philadelphia, PA
646	VA Pittsburgh Healthcare System, University Drive Div	Pittsburgh, PA





## ***Philadelphia VA Medical Center***

### ***Philadelphia, PA***



**Date(s) of Assessment: October 24-25, 2007**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$12,296,000**

**Total Cost, Priority 1 Deficiencies: \$1,823,000 (or 15%)**

**Total Cost to Replace: \$37,420,000**

**Overall Campus FCI: 33%**

**Size of Research Program: Medium (\$2.5 million to \$4.9 million in VA research funding)**





### Background

The Philadelphia VAMC hosts a medium sized research program of predominantly health services and biomedical research. Research emphasis areas include substance abuse, nutrition, weight loss, rheumatology-immunology, cardiology, gastroenterology, Hepatitis C, Parkinson's disease, mental illness, and health services research. The research program hosts a health services COE, the Center for Health Equity Research and Promotion (CHERP) which is co-located at the Pittsburgh VAMC. The Philadelphia VAMC is affiliated with the University of Pennsylvania School of Medicine and School of Dental Medicine.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in a single building (Building 21) on the VA campus with nearly 35,000 nsf of research space (laboratories – 21,774 nsf; VMU – 5,130 nsf; offices – 7,877 nsf). Following is an overview of Building 21, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Building 21, a separate building attached to the main hospital, was constructed in 1977. There are five floors above ground plus a full basement. The first floor houses Research Service administrative offices and an animal surgery suite. The second, third, fourth and fifth floors house research laboratories. The VMU is housed on the basement level.

Laboratories: A major renovation of the fourth floor was completed in 2005 and the third floor was renovated in 2007. These laboratories are of modern laboratory design with new casework, equipment, finishes, safety features, and environment. Completing these renovations in phases enabled the facility to use “lessons learned” from the 2005 renovation in the design and construction of the third floor in 2007. The second and fifth floors date to the original 1977 construction, although the fifth floor was partially renovated in 1997.



**The photo at left shows a typical non-renovated laboratory on the second and fifth floors. A renovated laboratory is shown in the photo at right.**



Mechanical and electrical systems in Building 21 are being replaced as spaces are being renovated. Two new air handling units have been installed in the penthouse of Building 21 along with a new central exhaust system with sufficient capacity to meet current demands and the increased demands of future renovation. The emergency and normal power systems were upgraded in 2001, although any further expansion of space should include a full renovation of the electrical systems to meet demand. The fire alarm system is scheduled for replacement and is currently in the design phase.

There have been and continue to be problems with inconsistent temperature control, including on the recently renovated fourth floor. There also are problems with exhaust from emergency generators adjacent to Building 21 being drawn into the ventilation system.



**A new air handling unit serving the research space.**



**New laboratory vacuum pumps. This station has consistently upgraded systems when renovating laboratories.**

The building is completely covered by a wet pipe sprinkler system. At the time of the assessment, the hospital was undertaking a facility-wide fire alarm replacement project that was in design phase.

No deficiencies were noted with regard to safety showers and emergency eyewash units.

#### Other Research Space

The CHERP is currently housed in approximately 4,000 square feet of dry laboratory space within the hospital. The hospital space occupied by the CHERP is problematic in many ways – the amount of space is insufficient for optimal functioning of the center and the quality of the space is seriously lacking. There is no central air conditioning or heating, resulting in excessive heat in the summer



months and overall poor ventilation. There have been problems with the roof leaking (which the hospital is addressing) and there is mold present within the space.

There is no space designated specifically for clinical research. The lack of dedicated clinical research space has been challenging for the program, particularly with increased emphasis on clinical research by Central Office. There is insufficient space for study coordinators and barely adequate space for recruiting, interviewing, and examining research subjects/patients. The MIRECC, housed within the hospital, has completely maxed out its space but has been and continues to be very supportive of clinical researchers allowing use of the center's limited examination and interview rooms by non-MIRECC investigators.

#### Security

Access to the research space is controlled by a card reader security system.

#### Life Safety Hazards

The following life safety hazard identified during the assessment is in the process of being remediated by the medical center.

- Receptacles near water sources are being provided with ground fault protection.

#### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Correction of Priority 1 life safety hazard, replacement of electrical receptacles near water sources with GFCI type receptacles – (station funds), in progress, approximately 50% complete.

Replacement of chillers -- \$1.7 million (NRM FY11), completed.

Replacement of Building 21 elevator -- \$185,000 (NRM), completed.

Renovation of second floor laboratories including electrical distribution gear and air handlers -- \$5.6 million for construction (NRM), in design phase. Construction expected to begin January 2012.

Renovation of basement (VMU) and first floor offices -- \$400,000 for design (NRM), in A/E selection.

Station applied for FY11 NRM funds to renovate fifth floor laboratories – not approved for funding.



### New Construction

There is no new construction of a research building planned at this station.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Correction Cost</b>
Architectural	\$1,196,000
Plumbing	\$2,955,000
HVAC	\$5,487,000
Electrical	\$2,658,000
Fire Protection	\$0
<b>Total</b>	<b>\$12,296,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Correction Cost</b>
1	\$1,823,000
2	\$1,464,000
3	\$704,000
4	\$5,808,000
5	\$2,497,000
<b>Total</b>	<b>\$12,296,000</b>

**Table 1.2 Cost Summary by Priority**



Correction Cost	Replacement Cost	FCI
\$12,296,000	\$37,420,000	33%

**Table 1.3 Facility Condition Index Value**



***VA Pittsburgh Healthcare System,***

***University Drive Division***



**Date(s) of Assessment: August 20-21, 2009**

**Number of Buildings Assessed: 2**

**Total Cost to Correct Deficiencies: \$6,913,000**

**Total Cost, Priority 1 Deficiencies: \$1,939,000 (or 28%)**

**Total Cost to Replace: \$23,799,000**

**Overall Campus FCI: 29%**

**Size of Research Program: Very Large (over \$10 million in VA research funding)**





### Background

VA Pittsburgh Healthcare System (VAPHS) has three major health facilities. The primary research functions involving biomedical laboratories and animal studies are located at the University Drive Division. The very large research program is well balanced with funding primarily in biomedical, health services, and rehabilitation research, but also for clinical research. The program hosts two research COEs: 1) the Center for Health Equity Research and Promotion (CHERP), a health services initiative, and 2) the VA COE in Wheelchairs and Associated Rehabilitation Engineering, a rehabilitation research COE. These two centers are highly productive, together accounting for the majority of VA research funding.

The academic affiliate is the University of Pittsburgh School of Medicine located near the VAPHS University Drive Division campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting office space were housed in two buildings on the VA campus with a combined total of just under 23,000 nsf of research space (laboratories – 13,572 nsf; VMU – 5,712 nsf; offices – 3,464 nsf). Following is an overview of each building housing research, including its age, configuration, general condition, and description of key architectural and systems deficiencies within each building that existed at the time of the assessment.

Building 1 is a 13 level (11 floors above ground, plus a ground floor and basement) concrete building constructed in the early 1950s as a multifunctional clinical facility (hospital). Research laboratories are housed on part of the first and second floors. The laboratories were renovated in 2005, including upgrading existing laboratories and converting clinical space to research laboratories. Finishes (walls, ceilings, floors) are generally in good condition, with some minor damage in a few areas. Casework and fixed equipment are in good condition as well.



**Building 1 research spaces: the left photo shows a recently renovated laboratory. The photo at right shows a cold room that is lacking a ramp for accessibility.**





The most noteworthy deficiencies include a lack of backflow prevention to isolate the water supply from the campus potable water system, lack of dedicated vacuum and compressed air systems, and lack of redundancy on mechanical systems.

Building 6 is a three level (two floors above ground, plus a basement (ground floor)) concrete building constructed in the early 1950s as nurses' quarters. The VMU is housed on the ground floor, with laboratories occupying the first and second floors.

The building appears to have the original roof which needs to be replaced. Exterior windows are also in need of replacement.



**In Building 6 equipment delivered for use on the upper floor must come through this exterior second floor door. There is no elevator in the building.**



**Building 6 has many challenges. This very low exposed ductwork is one of them.**

One of the most challenging deficiencies in Building 6 is the lack of a ceiling, i.e., sprinklers, ducts, pipes, and conduits are exposed, some as low as six feet above the floor. Not only does this create potential hazards within the building, it also limits the potential for significant renovation. Another significant deficiency is the lack of accessibility both to enter the building and to access floors, as there are no ramps and no elevator. With the exception of an addition to the VMU which was added in the 1980s, door hardware does not comply with accessibility guidelines.

In the laboratories, many of the finishes are damaged and in need of upgrade or replacement. Flooring as well as the mastic used to adhere the flooring contains asbestos.



Building 6 also lacks backflow prevention to isolate the laboratory water supply, and lacks redundancy in the mechanical systems. There are significant electrical and plumbing deficiencies as well.

Both buildings are protected by a fire suppression sprinkler system. Fire alarm systems are in good condition. However, in Building 6 some laboratory areas do not have visual annunciators (strobes) to comply with accessibility guidelines.

Some but not all of the laboratories have emergency eyewashes. There are no safety showers in either building.

#### Other Research Space

At the time of the assessment, a small amount of laboratory space was occupied at the Highland Drive Division. However, that space was to be vacated in the near future and the investigators moved to University Drive. Also at Highland Drive are the two COEs, one of which (the CHERP) will be relocating to the University Drive Division. The rehabilitation COE will be relocating to leased space. It is worth noting that this program requires an extensive amount of space, including open, flexible space in which to simulate a real world environment for testing wheelchairs.

At present, clinical research is conducted in various clinics throughout the hospital.

#### Security

While it is preferable that research laboratory space is housed in contiguous space separate from patient care areas that is not always possible. The laboratories in Building 1 are housed in areas adjoining clinical spaces and in which patients and non-research personnel must have access. However, entry to laboratories and other research space is controlled by a security system requiring card key for access. There also is closed circuit TV (CCTV) monitoring the areas.

Access to building 6 is fully controlled by card readers and CCTV.

#### Life Safety Hazard

The following life safety hazards were identified during the assessment. Based on information received from the medical center, these issues appear to have not yet been remediated.

- There are no safety showers in either research building.
- Electrical receptacles near water sources are not ground fault protected.
- Chemical fume hood is located next to egress from a laboratory (2E138 and 2E139).
- Fire alarm strobes are missing in laboratories (Building 6). (Note: the local Safety Officer disagrees with the need for fire alarm strobes.)



- Some fire sprinkler heads appear to be blocked by exposed ductwork (Building 6).

#### Improvements Made Since Assessment:

This station has made and/or initiated improvements following the assessment, including:

Replacement of emergency power system – (ARRA funds), completed.

Replacement of domestic water system – (ARRA funds), completed.

#### New Construction

This facility has funding to construct a new three story, 75,000 square foot building which will house the CHERP, Research Service administrative offices, a clinical trials center, and about 15,000 square feet of laboratory space, in addition to the GRECC and the MIRECC. The building will not accommodate all of the program's laboratory needs, nor will it house an animal facility. The construction contract is awarded and the project is scheduled to begin in June 2011, with a completion date of March 2013 and occupancy in June 2013.

Additionally, the station applied for minor construction funding in FY11 to construct an addition to the new research building that will house the VMU. This project has been funded for design.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.



<b>Discipline</b>	<b>Correction Cost - Bldg 1</b>	<b>Correction Cost - Bldg 6</b>
Architectural	\$166,000	\$2,632,000
Plumbing	\$281,000	\$359,000
HVAC	\$887,000	\$1,711,000
Electrical	\$39,000	\$726,000
Fire Protection	\$0	\$112,000
<b>Total</b>	<b>\$1,373,000</b>	<b>\$5,540,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Bldg 1</b>	<b>Bldg 6</b>
1	\$9,000	\$1,930,000
2	\$1,052,000	\$2,694,000
3	\$30,000	\$304,000
4	\$70,000	\$134,000
5	\$212,000	\$478,000
<b>Total</b>	<b>\$1,373,000</b>	<b>\$5,540,000</b>

**Table 1.2 Cost Summary by Priority**

<b>Building</b>	<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
Bldg 1	\$1,373,000	\$11,046,000	12%
Bldg 6	\$5,540,000	\$12,753,000	43%
<b>Overall</b>	<b>\$6,913,000</b>	<b>\$23,799,000</b>	<b>29%</b>

**Table 1.3 Facility Condition Index Value**



## ***VISN 5: VA Capitol Health Care Network***



<i>Sta. ID</i>	<i>VA Site Surveyed</i>	<i>City/State</i>
<b>512</b>	<b><i>VA Maryland Health Care System, Baltimore VAMC</i></b>	<b><i>Baltimore, MD</i></b>
<b>688</b>	<b><i>Washington DC VA Medical Center</i></b>	<b><i>Washington, DC</i></b>







***VA Maryland Health Care System,***

***Baltimore, MD***



**Date(s) of Assessment: March 6-7, 2008**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$6,636,000**

**Total Cost, Priority 1 Deficiencies: \$1,113,000 (or 17%)**

**Total Cost to Replace: \$62,890,000**

**Overall Campus FCI: 10%**

**Size of Research Program: Very Large (over \$10 million in VA research funding)**



### Background

This very large research program focuses primarily on biomedical, rehabilitation, and clinical research, with lesser funding in health services research. The program hosts two REAPs, on strategies in therapeutic development of neurodegenerative disease, and stroke disability reduction and disease prevention. It also hosts a rehabilitation COE focused on task oriented exercise and robotics in neurological disease. In addition to these VA research funded activities, the facility is also the site of a GRECC, a MIRECC, and a Multiple Sclerosis COE, all of which are funded by the medical care appropriation but also are engaged in research.

The facility is affiliated academically with the University of Maryland School of Medicine which is located adjacent to the VAMC campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting office space were housed in the main hospital building on the VA campus with over 48,000 nsf. A BSL-3 laboratory is housed in the VMU. Following is an overview of the building housing research, including its age, configuration, general condition, and description of key architectural and systems deficiencies within the building that existed at the time of the assessment.

The Baltimore VA hospital is an eight level building (seven floors above ground, plus a basement) with research laboratories on the third floor and the VMU on the basement level. A containment laboratory (Animal Biosafety Level (ABSL)-3 laboratory) is located in the VMU. Although construction of the building was completed in 1992, the building was designed in the 1970s. By the time the building was completed and occupied, the Research Service was already space deficient. As the research program has grown over the years, space to house it is now severely lacking.

The facility leases space from the affiliate (located next to the VAMC) and currently there are approximately 15 investigators housed there, either in leased space or with off-site waivers. The VAMC is attempting to expand the amount of leased space, as the hospital is completely landlocked.

The general appearance of the laboratories and the VMU is very good. Generally, finishes including walls, floors, and ceilings are in very good condition, with a few exceptions where there has been water seepage. In the VMU, some of the flooring has been damaged due to water leakage and should be repaired.

The laboratory casework and countertops have been well maintained and are in good condition. The major equipment is operational. The biggest deficiency in



**Lack of space for freezers and other large equipment results in crowded laboratories and blocked egress.**

terms of the laboratories themselves is crowding due to the lack of adequate storage and support space for large equipment such as freezers.

Generally, air quality is good, but there are some laboratory areas with soot accumulation on air vents. There also has been and continues to be a problem with odors (apparently from truck exhaust fumes) penetrating laboratory areas. The area affected is located near a loading dock for an adjacent university building, and the outside fresh air intakes have been raised in an attempt to resolve the problem.

For the most part, the building mechanical system has been well maintained and is in good condition, although the VMU is lacking redundancy on air supply and exhaust systems, and the exhaust fans on some of the Biological Safety Cabinets (BSC), including in the ABSL-3 laboratory, should be replaced.

The electrical system overall is in good condition. There is a lack of sufficient emergency power receptacles in the laboratories, and no central monitoring for freezers and other critical equipment. The VMU is lacking sufficient normal power receptacles for small equipment.



The laboratories have emergency lighting, but the VMU does not. Battery pack emergency lights should be installed in the VMU.



With regard to safety, the research space is fully covered by a sprinkler system. There are insufficient fire alarm strobe lights in the laboratory area as well as the ABSL-3 area of the VMU.

Safety showers are appropriately located in the corridors, but there are no eyewashes at the showers. Eyewashes are installed in each of the laboratories at the sink.

#### Other Research Space

The hospital has provided space for designation as a clinical research unit (CRU). Currently the CRU has about four to five patient exam rooms, three rooms for study coordinators, file storage, and a room for the robotics program. The space is supplemented by clinical space, particularly for research using inpatients. With the significant amount of clinical research funding at VAMHCS, particularly for cooperative studies, the program would benefit from an expansion of the CRU space.

#### Security

Research space is appropriately protected with a card reader security system. A more extensive system protects the VMU, particularly the ABSL-3 laboratory.

#### Life Safety Hazards

The following life safety hazards identified during the assessment have been or are in planning to be remediated by the medical center:

- Fire alarm system is being upgraded. (Note: Lack of sufficient strobes did not meet accessibility guidelines.)
- Code compliant safety showers and eyewashes are being installed.
- Receptacles near water sources are being replaced with ground fault protected receptacles.

#### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Corrected Priority 1 deficiencies with ABSL-3 mechanical system -- \$836,682 (non-profit corporation), completed.

Planning upgrade of research laboratories -- \$550,000 design and construction (NRM FY11), preparing for design phase.

Planning renovation of VMU and ABSL-3 laboratory -- \$550,000 design and construction (NRM FY11), preparing for design phase.



Corrected or planning to correct a significant number of Priority 1, 2, or 3 deficiencies, including some life safety hazards, identified in the assessment report – \$2,625,000 (station funds), in progress.

#### New Construction

There are no plans for a new research building at this facility. Planned renovation at this campus includes upgrade of research laboratories and renovation of the animal research facility, as well as expansion of the Research Service administrative area, and additional space for the rehabilitation COE.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

Discipline	Correction Cost
Architectural	\$609,000
Plumbing	\$311,000
HVAC	\$5,008,000
Electrical	\$708,000
Fire Protection	\$0
Total	\$6,636,000

**Table 1.1 Cost Summary by Discipline**

Priority	Correction Cost
1	\$1,113,000
2	\$1,196,000
3	\$4,252,000
4	\$75,000
5	\$0
Total	\$6,636,000

**Table 1.2 Cost Summary by Priority**



Correction Cost	Replacement Cost	FCI
\$6,636,000	\$62,890,000	10%

**Table 1.3 Facility Condition Index Value**





## ***Washington DC VA Medical Center***

### ***Washington, DC***



**Date(s) of Assessment: November 7-8, 2007**

**Number of Buildings Assessed: 2**

**Total Cost to Correct Deficiencies: \$10,300,000**

**Total Cost, Priority 1 Deficiencies: \$3,060,000 (or 30%)**

**Total Cost to Replace: \$34,102,000**

**Overall Campus FCI: 30%**

**Size of Research Program: Small (under \$2.5 million in VA research funding)**



### Background

Research funding for this small program is fairly equally distributed among three of the research disciplines (biomedical, clinical, and rehabilitation) with lesser amounts for health services research and cooperative studies. The facility is affiliated academically with three institutions: Georgetown University School of Medicine, George Washington University School of Medicine, and Howard University College of Medicine.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting office space were housed in two buildings on the VA campus with over 41,000 nsf of research space (laboratories – 29,564 nsf; VMU – 5,952 nsf; offices – 5,023 nsf; storage – 762 nsf). Following is an overview of each building housing research, including its age, configuration, general condition, and description of key architectural and systems deficiencies within each building that existed at the time of the assessment.

Most of the research laboratory and Veterinary Medical Unit (VMU) space is located within Building 4, which was constructed as a dedicated research facility in 1972. There are also research activities ongoing in space within the main hospital building. The two buildings are connected at each level of Building 4.

Considering many laboratories were being used for storage and/or appeared vacant at the time of the survey, it appears that the amount of laboratory space is sufficient for the current program but would not allow for significant growth which the current leadership seeks. Space in the VMU is more than sufficient, with approximately 50% being under contract with the nearby Children's National Medical Center. Even with the space utilized by Children's Hospital, the facility is only at about 50% capacity.

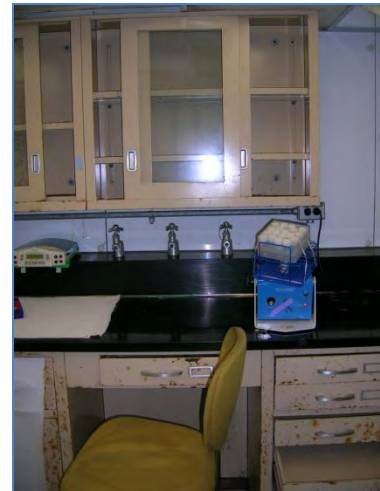
As in many medical centers, dedicated space for clinical research is limited. Currently, former laboratory space in the main hospital building is being used as offices for patient interviews and study coordination.

The medical center director is highly motivated to relocate administrative functions outside the hospital, freeing up valuable clinical space for the increasing veteran patient load. Research leadership is hopeful that Research Service administration can also relocate to enable not only renovation of current laboratory space, but also an increase in the amount of laboratory space.

The condition of research space at the Washington, DC VAMC -- particularly within Building 4 -- is generally in poor condition. Although the building appears to be architecturally sound, the systems, finishes, equipment, and furnishings are at the



end of their useful lives. A few laboratories have been renovated, but corrections made were primarily cosmetic.



**The photo at left shows a recently renovated laboratory. Most of the laboratory space has not been renovated. The photo at right shows casework from a laboratory in need of renovation.**

There have been and continue to be roof leaks that have caused damage throughout the space, including in laboratories that were recently remodeled.



**Water damage in a laboratory.**



**Although this cold room is operational, it has significant physical damage.**

Mechanical systems, which also have exceeded their lifespan, were not upgraded or replaced. The electrical system is original to the building and, in some instances, cannot easily be repaired due to non-availability of replacement parts. The entire



power distribution system is outdated and the available capacity is not adequate for projected loads of a modern laboratory building. Overall, the system is in poor condition and needs to be replaced.

The chemical fume hoods are not all operational. They also are not equipped with low air-flow alarms. Some of the hoods are original to the building and are outdated.

Veterinary Medical Unit (VMU): As is the case at many facilities, the condition of the VMU is good and the facility is obviously well maintained. Some of the equipment (cage washer, autoclave, and watering system) is new and in excellent condition. There are some limitations including lack of a central temperature monitoring system and partial fire sprinkling. (ORD recently provided funds for a temperature monitoring system.)

The cage wash area is located in a separate space within the main hospital building. The two spaces are connected by an open (to the sides) walkway with inadequate lighting and insufficient security. Temperature control and ventilation within the cage wash space is problematic.

With regard to safety, it appears that smoke detection coverage is partial, as is coverage by fire sprinklers. Smoke detection is limited to the ends of hallways. The fire alarm system had recently been upgraded.

Safety showers and emergency eyewashes are missing from many laboratories. (ORD provided funds to correct shower and eyewash deficiencies.)

### Security

The security system uses proximity card readers and cameras at each building entrance. There is potential for security problems in the open walkway separating the VMU in Building 4 to the cage wash space. Enclosing the space will help resolve this and other weather related issues.

### Life Safety Hazards

The following life safety hazards identified during the assessment have been or are being remediated by the medical center.

- The sprinkler system and smoke detection were extended for full coverage.
- Safety showers and emergency eyewashes are being upgraded to meet current requirements. (ORD provided funds for this correction.)



The following additional life safety hazard identified during the assessment has not been remediated:

- Receptacles near water sources are lacking ground fault protection.

Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Planning construction of new research building – \$9.6 million (Minor Construction), foundation work to begin in summer 2011.

Renovation of existing laboratories (2,500 square feet) in Building 4 -- \$600,000 (NRM), in progress, to be completed by summer 2011.

Renovation of VMU (2,000 sq ft), including new dedicated heating, ventilation, and air conditioning (HVAC) system -- \$750,000 (ARRA funds), work in progress but stalled due to contractual difficulties.

Replacement of fixed equipment (sterilizer, cage washer) -- \$250,000 (VACO ORD SHEEP), completed.

Replacement of fire sprinkler system for Building 4 -- \$1,000,000 (station funds), completed.

Correction of the following deficiencies with station funds: roof repairs, miscellaneous repairs in the VMU, Building 4 security system upgrade.

New Construction

A new research building (Minor Construction Project) will be constructed adjacent to the current research building (Building 4), with estimated completion in fall 2013.

Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.



<b>Discipline</b>	<b>Correction Cost - Bldg 4 (Research Bldg)</b>	<b>Correction Cost - Main Hosp.</b>
Architectural	\$606,000	\$309,000
Plumbing	\$2,017,000	\$0
HVAC	\$4,180,000	\$186,000
Electrical	\$2,345,000	\$158,000
Fire Protection	\$499,000	\$0
<b>Total</b>	<b>\$9,647,000</b>	<b>\$653,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Bldg 4</b>	<b>Main Hosp.</b>
1	\$2,954,000	\$106,000
2	\$3,494,000	\$378,000
3	\$2,013,000	\$169,000
4	\$712,000	\$0
5	\$474,000	\$0
<b>Total</b>	<b>\$9,647,000</b>	<b>\$653,000</b>

**Table 1.2 Cost Summary by Priority**

<b>Building</b>	<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
Building 4	\$9,647,000	\$22,336,000	43%
Main Hospital	\$653,000	\$11,766,000	6%
<b>Overall</b>	<b>\$10,300,000</b>	<b>\$34,102,000</b>	<b>30%</b>

**Table 1.3 Facility Condition Index Value**





## VISN 6: VA Mid-Atlantic Health Care Network



<i>Sta. ID</i>	<i>VA Site Surveyed</i>	<i>City/State</i>
558	Durham VA Medical Center	Durham, NC
652	Hunter Holmes McGuire VA Medical Center	Richmond, VA







## ***Durham VA Medical Center***

***Durham, NC***



**Date(s) of Assessment: November 18-20, 2008**

**Number of Buildings Assessed: 5**

**Total Cost to Correct Deficiencies: \$10,018,000**

**Total Cost, Priority 1 Deficiencies: \$3,667,000 (or 37%)**

**Total Cost to Replace: \$41,779,000**

**Overall Campus FCI: 24%**

**Size of Research Program: Very Large (over \$10 million in VA research funding)**



### Background

VA research funding for this very large program is concentrated primarily in health services and biomedical laboratory research, with lesser funding in clinical and rehabilitation research. The Durham research program hosts a number of special initiatives, including the Center for Health Services Research in Primary Care, a health services COE; an Epidemiologic Research and Information Center (ERIC); and a REAP focusing on peripheral nerve regeneration. On the clinical side, the Durham VAMC hosts the GRECC and the MIRECC for VISN 6, both of which have a strong research component.

The Durham VAMC is academically affiliated with Duke University School of Medicine located across the street from the VA campus, as well as East Carolina University Brody School of Medicine and University of North Carolina School of Dentistry.

### Overview of Research Space

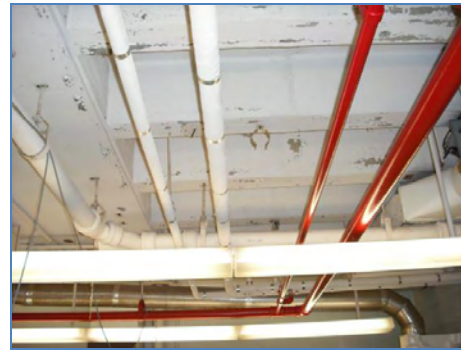
At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), dry laboratories/offices, and clinical research space were housed in five buildings on the VA campus with over 58,000 nsf of research space (laboratories - 28,483 nsf; VMU – 13,751 nsf; offices – 15,783 nsf). A sixth building not assigned to Research Service housed the MIRECC administrative offices and clinical research space. Following is an overview of each building housing research at the time of the assessment, including its age, configuration, general condition, and description of key architectural deficiencies within each building that existed at the time of the assessment. Deficiencies in support systems which are common across many of the buildings are summarized separately.

Building 1 is the main hospital building for the campus and is a multi-story, multi-wing building that was constructed in 1953. At the time of the assessment, Building 1 housed most of the laboratories for biomedical research on the ground, first, second, third, and fourth floors of E Wing, and other small pockets of space on A and C Wings.

Generally, the finishes, casework, and fixed equipment in the Building 1 laboratories were found to be beyond their useful lives and in need of replacement. Some laboratories have bench tops of plastic laminate which is an inappropriate material for use in a laboratory. In many of the laboratories, the “ceiling” consists of a painted finish on the underside of the concrete structure above and, in some cases, the paint is peeling. There also is asbestos in the mastic used to adhere floor tiles.



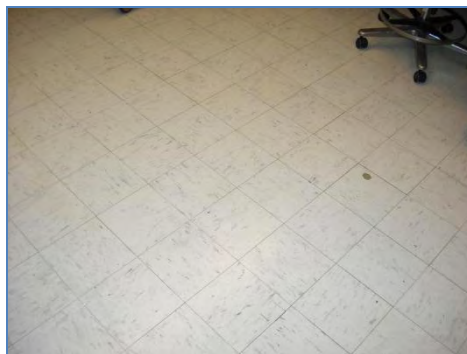
**Example of corroded laboratory casework in Building 1.**



**Example of paint peeling from overhead structure in Building 1.**

Building 6 is a single story structure built in 1953. At the time of the assessment, it housed a mixture of laboratories for bench science and dry laboratories/offices used by the ERIC. The laboratory space in this building is a mixture of older finishes in poor condition with some that have been updated. The casework is beyond its useful life, but several pieces of fixed equipment are in good to fair condition. (Note: Since the time of the assessment, this building (approximately 4,900 nsf) was vacated by Research Service and has been transferred to the MIRECC.)

Building 10, a one story building dating to 1953, houses one laboratory and associated office space. Clinical study coordinators associated with the shingles study also utilize space in Building 10. The single laboratory in Building 10 has finishes, including asbestos tile flooring, in good condition, but casework and fixed equipment are in need of replacement.



**Asbestos flooring in Building 10 has been well maintained.**

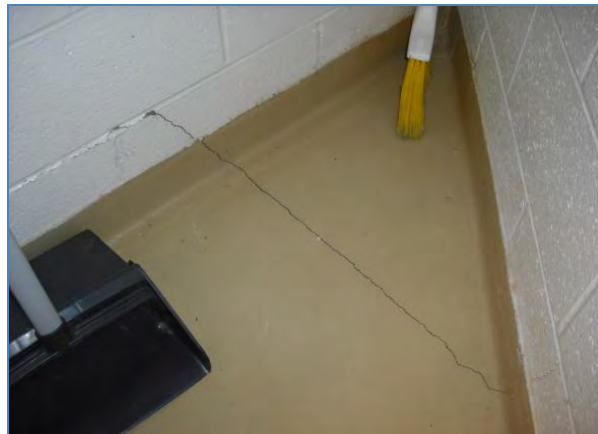
Building 14, which was originally constructed in 1956 with additions built in 1987 and the mid-1990s, primarily houses the VMU. A few research laboratories are also located in Building 14.



Just prior to the assessment, there had been excavation adjacent to Building 14 that caused some cracking and shifting of the foundation and exterior walls. The medical center undertook a detailed study of the problem that resulted in recommendations that had not yet been completed at the time of the assessment. There also were some roof leaks noted at the joint between the original building and the addition.



**Cracks in exterior wall, Bldg 14.**



**Cracks from the exterior wall across the floor of Building 14.**

Most of the interior finishes in the building are in good condition. Fixed equipment was in the process of being updated at the time of the assessment. The rack cage washer was inoperable and a new unit had been ordered. The tunnel washer was in good operating condition.

The two laboratories in this building are in good condition, the best of any laboratory space on the campus.

Building 16, a “temporary” building constructed in 1970, houses research laboratories primarily for the REAP on the first floor, and (at the time of the assessment) dry laboratory/office space for the HSR&D COE on the second floor. There are some structural problems with this building. Specifically there is a portion of the exterior wall that has pulled away from the floor causing a separation at the floor line in some of the laboratories. The interior has finishes mostly in fair condition, but casework and fixed equipment is generally all beyond its useful life expectancy showing severe corrosion. There are no major equipment items such as a cold room, autoclave, or glassware washer available to the researchers in this building.



**A typical laboratory in Building 16.**

#### Deficiencies in Building Support Systems

The buildings housing research are aging and significant deficiencies were identified in the systems (plumbing, mechanical, electrical) serving the research space. All or most of the buildings share the following systems deficiencies: 1) lack of appropriate separation between industrial and potable water supplies; 2) lack of tempered water for emergency eyewashes and safety showers; 3) aging or inappropriate air handling units to serve the research environment; 4) mechanical system controls that are obsolete and should be updated to direct digital controls; 5) insufficient emergency power; and 6) lack of surge suppression to protect sensitive electronics.

There are emergency eyewash units and safety showers installed throughout the research space, although they are not provided tempered water which is a requirement.

Most of the buildings are fully covered by wet pipe sprinkler systems, with the exception of Building 16. Fire alarm systems are older models.

#### Other Research Space

A portion of the health services research group as well as the Research Service administrative offices were also housed in Building 1 at the time of the assessment. The GRECC, which brings in approximately \$4 million in research funding per year, occupies clinical space in Building 1 including three laboratories, common tissue culture and equipment space, a conference room, and offices/dry laboratory space. GRECC investigators commonly use the conference room for enrolling research subjects, as the only other available space is in cubicles which lack privacy. Patients undergoing functional testing can frequently be seen in the hallway due to the lack of available space.





A sixth building (Building 5) which is not assigned to Research Service, housed the MIRECC, including office and dry laboratory space as well as some limited space for clinical research. Investigators from the MIRECC also use laboratories for bench science in Building 16.

At the time of the assessment, health services research was scattered among three buildings on the VA campus. Since then approximately 10,000 square feet of office space has been leased in downtown Durham, slightly over two miles from the medical center. As previously noted, Building 6 which previously housed the health services center and the ERIC has been lost from Research Service, as has the second floor office space in Building 16.

#### Security

There is appropriate electronic security throughout the research areas with the exception of the Building 1 laboratories which are located in clinical areas. Those laboratories have keyed locks.

#### Life Safety Hazards

The following life safety hazard identified during the assessment has been remediated by the medical center.

- Fire alarm systems have been replaced as part of campus-wide project.

The following additional deficiency falls under the category of “life safety hazard” and has not been corrected to date.

- Building 16 is lacking fire sprinkler coverage.

#### Improvements Made Since Assessment

This station has made and/or initiated significant improvements following the assessment, including:

Correction of Priority 1 and 2 deficiencies, Building 1, E-wing -- \$1,300,000 (NRM FY11), in design.

Correction of deficiencies (Priorities 1-5), Building 10 -- \$440,000 (NRM FY11), in design.

Correction of electrical deficiencies, Building 1, E-wing -- \$880,000 (NRM FY11), completed.

Replacement of fume hoods, Building 1, E-wing and Building 16 -- \$850,000 (NRM FY10), ongoing/50% complete.



Replacement of casework, plumbing fixtures and gas outlets, Building 1, E-wing -- \$2,100,000 (NRM FY11), in design.

Correction of mechanical system and major electrical deficiencies, Building 14 -- \$5,000,000 (VISN funds), completed.

#### New Construction

The station will be gaining a new research building (Building 15) with 46,250 gross square feet of laboratory and office space, to be constructed adjacent to Building 14. The project is scheduled for completion in June 2012.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

Discipline	Bldg 1	Bldg 6	Bldg 10	Bldg 14	Bldg 16	Total
Architectural	\$2,469,000	\$398,000	\$95,000	\$158,000	\$621,000	\$3,741,000
Plumbing	\$590,000	\$163,000	\$72,000	\$44,000	\$130,000	\$999,000
HVAC	\$248,000	\$495,000	\$61,000	\$1,264,000	\$602,000	\$2,670,000
Electrical	\$1,340,000	\$272,000	\$181,000	\$295,000	\$299,000	\$2,387,000
Fire Protection	\$0	\$0	\$0	\$149,000	\$72,000	\$221,000
<b>Total</b>	<b>\$4,647,000</b>	<b>\$1,328,000</b>	<b>\$409,000</b>	<b>\$1,910,000</b>	<b>\$1,724,000</b>	<b>\$10,018,000</b>

**Table 1.1 Cost Summary by Discipline**



Priority	Bldg 1	Bldg 6	Bldg 10	Bldg 14	Bldg 16	Total
1	\$1,408,000	\$257,000	\$243,000	\$980,000	\$779,000	\$3,667,000
2	\$1,075,000	\$577,000	\$111,000	\$712,000	\$339,000	\$2,814,000
3	\$1,992,000	\$494,000	\$52,000	\$218,000	\$563,000	\$3,319,000
4	\$172,000	\$0	\$3,000	\$0	\$43,000	\$218,000
5	\$0	\$0	\$0	\$0	\$0	\$0
<b>Total</b>	<b>\$4,647,000</b>	<b>\$1,328,000</b>	<b>\$409,000</b>	<b>\$1,910,000</b>	<b>\$1,724,000</b>	<b>\$10,018,000</b>

Table 1.2 Cost Summary by Priority

Building	Correction Cost	Replacement Cost	FCI
Bldg 1	\$4,647,000	\$22,003,000	21%
Bldg 6	\$1,328,000	\$2,379,000	56%
Bldg 10	\$409,000	\$417,000	98%
Bldg 14	\$1,910,000	\$13,858,000	14%
Bldg 16	\$1,724,000	\$3,122,000	55%
Overall	\$10,018,000	\$41,779,000	24%

Table 1.3 Facility Condition Index Value



### ***Hunter Holmes McGuire VA Medical Center***

***Richmond, VA***



**Date(s) of Assessment: November 17-18, 2010**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$4,240,000**

**Total Cost, Priority 1 Deficiencies: \$636,000 (or 15%)**

**Total Cost to Replace: \$34,791,000**

**Overall Campus FCI: 12%**

**Size of Research Program: Small (under \$2.5 million in VA research funding)**



### Background

The research program in Richmond is a small program, with funding predominantly for biomedical research, but there is also clinical and rehabilitation funding, as well as a small amount of health services research funding. The academic affiliate is Virginia Commonwealth University, Medical College of Virginia located a few miles from the VA campus in downtown Richmond.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the VMU, and associated offices were housed in a single building (Building 500) with over 31,000 nsf of research space (laboratories – 16,258 nsf; VMU – 9,730 nsf; offices – 5,444 nsf). Following is an overview of the research space in Building 500, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Building 500 is the main hospital building for the campus and is a multi-story building constructed in 1983. The building has five floors above ground, a basement, and roof penthouses. Laboratories are located on the third floor and the VMU on the basement level. The Research Service administrative offices are also on the third floor, and there is a small clinical research unit that was not part of the assessment on the fifth floor.

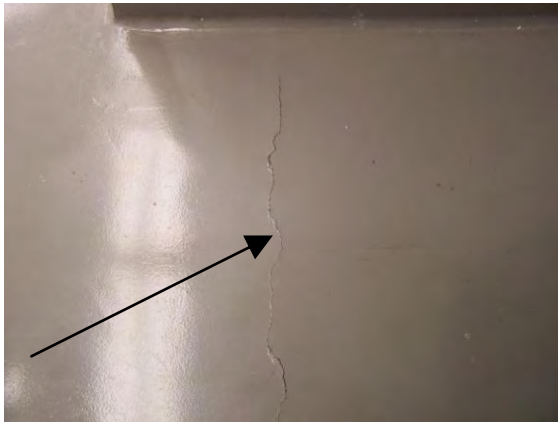
Generally, the overall building and the research space have been well maintained and have a good appearance. The building was constructed with a very high floor to floor height and six feet of interstitial space between floors. This allows easier access to utilities for maintenance or renovation without having to go through laboratory spaces for access. The windows are original to the building, but were noted to be in good condition although a few leaks have occurred where resealing is needed.

In many of the laboratories, finishes and casework remain in good condition due to maintenance over the years, but some of the laboratories have some damage and/or corrosion has occurred. Spaces used for tissue culture should have surfaces such as ceilings and flooring that are monolithic. As with many aging buildings, there were some accessibility limitations identified including incorrect door hardware, as well as the heights of showers, eyewashes, fume hoods, and gas nozzles.

The VMU also has been very well maintained and most finishes and casework are in good to fair condition. There are some cracks in the flooring in several areas that could be from initial settlement or they could be an indication of movement in the building foundation.



**Most laboratory casework is in good to fair condition (left photo) but in some spaces there is severe corrosion in the lower cabinets (right photo).**



**Some cracking has developed in the epoxy flooring in the VMU.**



**Also in the VMU, this wall behind a faucet has developed cracks.**

As with many aging medical centers, the deficiencies in support systems constitute the majority (65%) of correction costs identified. Deficiencies identified with plumbing included lack of separation of laboratory and potable water systems and lack of tempered water supply to emergency eyewashes.

Major mechanical system deficiencies include an aging air handling unit serving the VMU that does not meet VA standards. Also in the VMU the controls are designed to fail in the open position, increasing risk of overheating the space in case of equipment failure. This deficiency was identified as urgent and in need of immediate correction. It should be noted that the medical center has recently replaced one of the air handlers serving the laboratories and the second unit was planned for replacement.





With regard to the electrical system, there is no emergency power supplied to the chiller so currently only a portion of the mechanical equipment is served by emergency power. To meet VA standards for facilities with a VMU, a separate chiller should be installed to serve the animal facility and it should be connected to emergency power.

There are no safety showers serving the research space. Most of the laboratories have emergency eyewashes but a few more are needed. Tempered water should be provided to both showers and eyewash units.

#### Security

The VMU is appropriately secured with electronic security and cameras at all entrances. Animal rooms have keyed locks controlled by staff. There is no electronic security in the laboratory area. Card readers and cameras are recommended.

#### Life Safety Hazards

The following life safety hazards identified during the assessment have been put into an action plan for correction on a priority basis.

- The HVAC controls serving the VMU are set to fail in the incorrect position, which could result in overheating of VMU spaces.
- Need to install safety showers throughout the research area. (This deficiency is in the process of being corrected. However, additional funding is needed.)
- Need to ensure that all electrical receptacles near water sources are ground fault protected.
- Need to install oxygen sensors in rooms where liquid nitrogen is in use.
- Additional flammable storage cabinets are needed in the laboratories. (The station has purchased and installed 11 cabinets and eight more are needed. Additional funding is needed to complete this action.)

#### Improvements Made Since Assessment

This station has made or initiated the following improvements following the assessment:

Acquisition of additional flammable storage cabinets – local funding augmented by ORD funding of \$62,500.

Replacement of flickering light fixture in the VMU with gasketed fixture – \$275 (station funds), completed.

All other Priority 1 deficiencies are being addressed in an action plan for correction, with life safety hazards having priority.



### New Construction

There is no new construction for research planned for this campus.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Bldg. 500</b>
Architectural	\$1,486,000
Plumbing	\$633,000
HVAC	\$1,266,000
Electrical	\$784,000
Fire Protection	\$71,000
<b>Total</b>	<b>\$4,240,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Bldg. 500</b>
1	\$636,000
2	\$662,000
3	\$2,231,000
4	\$161,000
5	\$550,000
<b>Total</b>	<b>\$4,240,000</b>

**Table 1.2 Cost Summary by Priority**

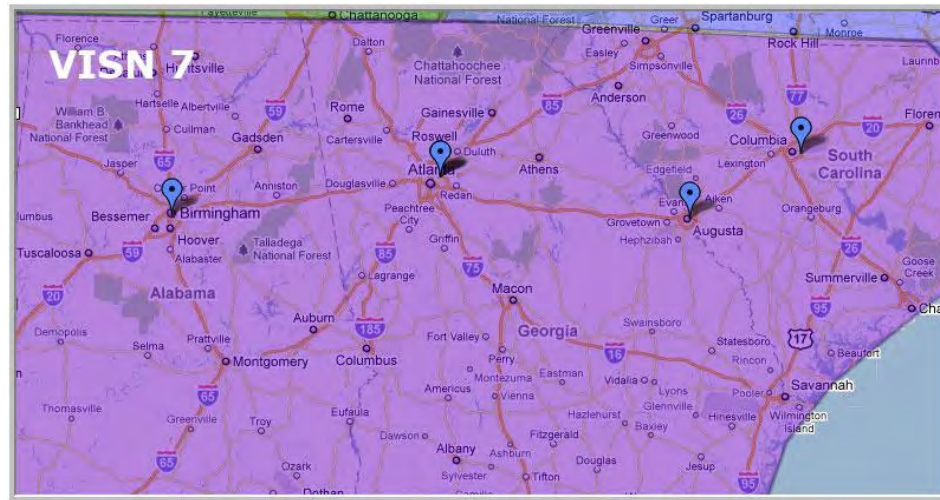
<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
\$4,240,000	\$34,791,000	12%

**Table 1.3 Facility Condition Index Value**





## VISN 7: VA Southeast Network



<i>Sta. ID</i>	<i>VA Site Surveyed</i>	<i>City/State</i>
<b>508</b>	<b>Atlanta VA Medical Center</b>	<b>Decatur, GA</b>
<b>509</b>	<b>Charlie Norwood VA Medical Center</b>	<b>Augusta, GA</b>
<b>521</b>	<b>Birmingham VA Medical Center</b>	<b>Birmingham, AL</b>
<b>544</b>	<b>Wm. Jennings Bryan Dorn VA Medical Center</b>	<b>Columbia, SC</b>





## ***Atlanta VA Medical Center***

***Decatur, GA***



**Date(s) of Assessment: April 24-25, 2008**

**Number of Buildings Assessed: 2**

**Total Cost to Correct Deficiencies: \$6,272,000**

**Total Cost, Priority 1 Deficiencies: \$629,000 (or 10%)**

**Total Cost to Replace: \$41,181,000**

**Overall Campus FCI: 15%**

**Size of Research Program: Very Large (over \$10 million in VA research funding)**





### Background

Funding for this very large VA research program is concentrated heavily in biomedical and rehabilitation research, with lesser funding in health services and clinical research. The program hosts a rehabilitation COE and (at the time of the assessment) a Targeted Research Enhancement Program (TREP) in health services research. In addition to these VA research funded activities, the Atlanta VAMC is also the site of a GRECC co-located at the Birmingham VAMC, which is funded by the medical care appropriation but also participates in research.

The facility is affiliated academically with Emory University School of Medicine, Morehouse School of Medicine, and other academic institutions.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), dry laboratories/offices, and clinical research space were housed in two buildings on the VA campus with over 50,000 net square feet (nsf) of research space (laboratories – 36,273 nsf; VMU – 10,597 nsf; offices – 3,850 nsf). Following is an overview of each building housing research, including its age, configuration, general condition, and description of key architectural and systems deficiencies within each building that existed at the time of the assessment.

The research laboratory and Veterinary Medical Unit (VMU) are housed in two buildings on the Atlanta VAMC campus. Building A (also referred to as the Clinical Addition) was constructed in the mid-1990s, and houses laboratories on the fourth and fifth floors, the VMU on the fourth floor, and the Research Service administrative offices on the fifth floor. Building A encompasses the majority of research space on the campus (approximately 40,000 nsf). The former BSL-3 laboratory has been decommissioned.

Building C, which is the main hospital building, houses some laboratories (approximately 6,000 nsf) on the 12<sup>th</sup> floor in converted patient rooms. The building was originally constructed in 1968 and the 12<sup>th</sup> floor space was renovated into laboratories in 1995.

It would appear that the most pressing problem for this program is the lack of sufficient space. The research laboratories, while in good condition, are relatively small and overcrowded. At the time of the assessment, the laboratories were approximately 98% occupied. The empty laboratory space observed was due to the recent loss of an investigator. However, with recruitments underway, the space would soon be occupied. There simply is no additional research laboratory space available.



The Atlanta VAMC has been working on a plan to construct a new building – approximately 72,500 gross square feet – at a cost of \$17.4 million. The Atlanta Research & Education Foundation would provide funding for the building which would include space to be leased to Emory University. At the time of the survey, the project was stalled due to cost overrun from the original estimate of \$13.5 million. (Note: In 2009, the Atlanta VA accepted a donation from the non-profit corporation to update Bldg 13 for additional research space. The building provides approximately 2,000 square feet of additional dry laboratory space and houses the health services, emerging infections, and mental health research groups. The facility will seek additional space through the SCIP process.)

Generally, the laboratories and VMU facilities are in good condition, in large part due to the high level of maintenance and housekeeping provided by the local engineering staff. Finishes, casework, and major equipment throughout the space are generally good, particularly in Building A. It is important to note that Building A was specifically designed to house research laboratories and was constructed with finishes and support systems appropriate for a research environment.



**Generally, the laboratories and support spaces in Building A are in good condition including casework and finishes, fixed equipment, and safety requirements.**

The building's support systems – mechanical and electrical – are generally in good condition, but there are some deficiencies. The mechanical system does not provide redundant support and exhaust to maintain cooling and ventilation in the VMU in the event of primary system failure. Also, the air cooled chillers supplying standby chilled water to the VMU are in failing condition, as are the air cooled condensing units for the environmental rooms.

The primary deficiency in the electrical system is the lack of transient voltage surge suppression on the switchboards and distribution panels serving the laboratories and the VMU.

The laboratories in Building C were retrofitted in space previously designed and used for patient care, so the configurations of the space as well as the systems are



not ideal for a research laboratory environment. The support systems in Building C are not in good condition. The mechanical system is failing. The HVAC system uses recirculated air and lacks exhaust air control, so pressurization cannot be obtained. The electrical system is also in poor condition, including emergency power.

Neither building has a central monitoring system for freezers and refrigerators.

The research areas in both buildings are protected by a sprinkler system. Fire alarm systems in both buildings are appropriate and in good condition.

The research space is appropriately covered by emergency showers and eyewash units.

#### Other Research Space

Building C also houses the Atlanta Vision Loss Center, the rehabilitation COE, on the 12<sup>th</sup> floor; the health services TREP on the 11<sup>th</sup> floor; and the Atlanta Research & Education Foundation Clinical Studies Center on the 11<sup>th</sup> floor. All of these research activities would benefit from increased space, but expansion within Building C would be difficult, considering the clinical needs of the hospital. Currently the Atlanta Vision Loss Center is crowded into space far too small to accommodate it, particularly considering the need for patient testing. The health services group has grown significantly in recent years, but there currently is no space for additional growth. The Clinical Studies Center, which includes several exam rooms, offices for study coordinators, and equipment is used by a number of investigators and is very crowded. If additional space cannot be obtained at the hospital, leased space may be needed for record storage.

#### Security

Research space is appropriately protected with a card reader security system and closed circuit television cameras at building entrances.

#### Life Safety Hazards

None identified

#### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Renovation of approximately 2,000 square feet of dry laboratory/office space in Building 13 to house health services and other research – (non-profit corporation), completed.



Planning to enclose atrium to provide additional office space for research as well as space to house research freezers (estimated 800 square feet per floor, at least two floors) -- \$1,906,228 (NRM FY11), design underway.

Correction of Priority 1 deficiencies, including replacement of cracked window and cracked sink, repair of ceiling penetrations – (station funds), completed.

Correction of Priority 1 deficiency (lighting levels) – (non-profit corporation), completed.

Correction of electrical and plumbing systems throughout hospital, including 12<sup>th</sup> floor laboratory area – (station funds), completed.

Renovation of 12<sup>th</sup> floor laboratories to include new casework and correction of some other deficiencies – (station fund), completed.

#### New Construction

Aside from the plans to enclose the atrium creating more space for research, there currently is no new construction of research space planned at this station. However, the station plans to submit a request for 95,000 additional square feet of research space through the SCIP process.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Correction Cost - Bldg A</b>	<b>Correction Cost - Bldg C</b>
Architectural	\$751,000	\$91,000
Plumbing	\$1,047,000	\$307,000
HVAC	\$2,116,000	\$938,000
Electrical	\$625,000	\$245,000
Fire Protection	\$40,000	\$112,000
<b>Total</b>	<b>\$4,579,000</b>	<b>\$1,693,000</b>

**Table 1.1 Cost Summary by Discipline**



Priority	Bldg A	Bldg C
1	\$350,000	\$279,000
2	\$1,626,000	\$835,000
3	\$2,400,000	\$579,000
4	\$203,000	\$0
5	\$0	\$0
Total	\$4,579,000	\$1,693,000

Table 1.2 Cost Summary by Priority

Building	Correction Cost	Replacement Cost	FCI
Building A	\$4,579,000	\$34,955,000	13%
Building C	\$1,693,000	\$6,226,000	27%
Overall	\$6,272,000	\$41,181,000	15%

Table 1.3 Facility Condition Index Value



## ***Charlie Norwood VA Medical Center***

***Augusta, GA***



**Date(s) of Assessment: December 2-3, 2008**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$7,812,000**

**Total Cost, Priority 1 Deficiencies: \$1,682,000 (or 6%)**

**Total Cost to Replace: \$27,019,000**

**Overall Campus FCI: 29%**

**Size of Research Program: Medium (\$2.5 million to \$4.9 million in VA research funding)**





### Background

The local VA research program is a medium-sized program, with funding predominantly for biomedical research, but also in lesser amounts for clinical research. The program has been in a growth mode in recent years.

The academic affiliate is the Medical College of Georgia (MCG) located adjacent to the Downtown Division campus.

### Overview of Research Space

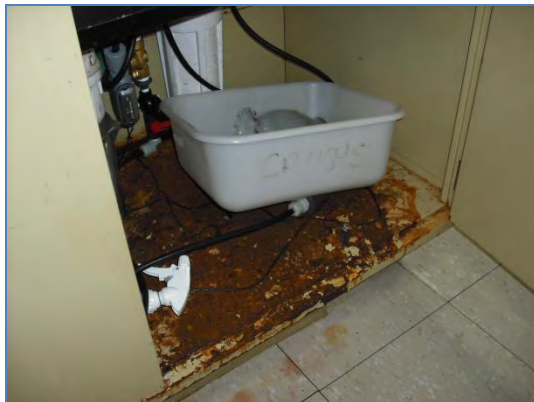
At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting office space were housed in one building (Building 801, B Wing) on the VA campus with 30,366 nsf of research space (laboratories – 15,827 nsf; VMU – 9,918 nsf; offices – 4,621 nsf). Following is an overview of Building 801, B Wing, including its age, configuration, general condition, and description of key architectural and systems deficiencies within the building that existed at the time of the assessment.

Research space at the Charlie Norwood VAMC is housed at the Downtown Division, on B Wing of the main hospital building (Bldg 801) which was constructed in 1980. Laboratories occupy the fifth and sixth floors, with the fifth floor also housing the Research Service administrative offices. The Veterinary Medical Unit (VMU) is on the fourth floor. There has been an effort to centralize equipment into common use space on each laboratory floor. There also are two tissue culture facilities on each floor.

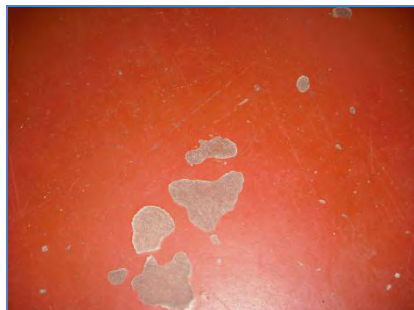
Although the program is in a growth mode, the amount of laboratory space appears to be sufficient. Currently there is some laboratory space being leased to the affiliate during construction of a new MCG research building.

In the laboratories and the VMU, most finishes (walls, floors, and ceilings) are in good to fair condition. Some of the finishes in tissue culture spaces, such as the acoustical tile ceilings, are inappropriate as they can be difficult to keep clean. The metal casework is in poor condition. It is original to the building and is showing significant corrosion. The laboratories generally have a good layout with sufficient spacing between benches. There are no windows in the laboratories.

Most of the fume hoods are also original to the building and are in poor condition, although they are certified. There are some hoods with asbestos liners. The six walk-in cold rooms are all in failing condition and should be repaired or replaced. Several other pieces of equipment are in good operating order, including two autoclaves and a glass washer. In the VMU, the cage washer suffers frequent breakdowns and should be replaced.



**While many of the interior finishes are in good condition overall, the laboratory casework is original to the building and much of it is severely corroded, particularly beneath sinks. The VMU cage washer (right photo) is also original equipment and has frequent breakdowns.**



**(Left photo): In the VMU, some flooring is damaged. (Right photo): This chilled water pipe is severely rusted.**

Door hardware is generally knobs rather than the lever type handles that meet Federal accessibility guidelines. There are no ramps into cold rooms.

With regard to plumbing, the research areas are provided water from the hospital system. There is a long standing problem with cross connection in the system which results in inability to achieve proper water temperature. There is a local project underway to replace the water heating system for the entire building. Additionally, there is no backflow prevention between the laboratory and clinical areas, creating the potential for contamination. Fixtures at laboratory sinks are aging but in fair condition.

Mechanical systems are original to the building and generally in failing condition. There currently is a plan to replace all of the air handling units, with the one



serving the fourth floor VMU scheduled for replacement in 2009. The air handler serving the VMU is on emergency power, but there is no redundancy in the event of equipment failure.

With regard to the electrical system, the normal power system is in good condition although it is approaching the end of its rated life (30 years). Most panel boards do not have sufficient space for expansion. There is no transient voltage surge suppression on either the main switchboard, distribution panel boards, or branch circuit panel boards. There do not appear to be enough emergency power receptacles in the laboratories, particularly at benches.

Refrigerators, freezers, and walk-in cold rooms are locally alarmed, but are not connected to a central alarm system.

Lighting has not yet been converted to T8 fixtures. The VMU lighting in wet areas is not properly protected with gaskets.

All laboratory and VMU areas are fully covered by a fire suppression sprinkler system. The fire alarm system is in good condition.

Safety showers are appropriately located, but some laboratories are lacking an eyewash unit. Additionally, the eyewashes are not currently provided with tempered water.

#### Other Research Space

Clinical research takes place at the Uptown Division in clinic space.

#### Security

Access to research areas is controlled by card readers and chip embedded keys. The hospital also has closed circuit television cameras at the exterior of the building as well as in the lobby.

#### Life Safety Hazards

The following life safety hazard identified in the assessment has been remediated by the medical center.

- Additional eyewash units are needed in laboratories. (ORD has provided funding to correct this deficiency.)

#### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:



Correction of multiple Priority 1-3 deficiencies on all three floors of the research wing, including replacement of air handling units and ductwork – (station funds), work completed. Currently resolving problems with the contractor pertaining to positive/negative air pressure.

#### New Construction

There is no new construction of research space planned at this station.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

Discipline	Correction Cost
Architectural	\$3,286,000
Plumbing	\$657,000
HVAC	\$2,290,000
Electrical	\$1,579,000
Fire Protection	\$0
Total	\$7,812,000

**Table 1.1 Cost Summary by Discipline**

Priority	Correction Cost
1	\$1,682,000
2	\$2,433,000
3	\$3,664,000
4	\$33,000
5	\$0
Total	\$7,812,000

**Table 1.2 Cost Summary by Priority**



Correction Cost	Replacement Cost	FCI
\$7,812,000	\$27,019,000	29%

**Table 1.3 Facility Condition Index Value**



## ***Birmingham VA Medical Center***

***Birmingham, AL***



**Date(s) of Assessment: December 14, 2010**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$1,147,000**

**Total Cost, Priority 1 Deficiencies: \$177,000 (or 15%)**

**Total Cost to Replace: \$8,626,000**

**Overall Campus FCI: 13%**

**Size of Research Program: Large (\$5 million to \$9.9 million in VA research funding)**





### Background

The Birmingham VA research program has been in a growth mode and is now considered a large program. VA funding is predominantly for biomedical research, with other significant funding for health services and rehabilitation research. The program hosts a health services REAP, the Center for Surgical, Medical Acute Care Research and Transitions (C-SMART).

The academic affiliate is the University of Alabama-Birmingham (UAB) located adjacent to the VAMC.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories were housed in one building on the VA campus with 6,505 nsf of laboratory space. Following is an overview of the building housing research, including its age, configuration, general condition, and description of key architectural and systems deficiencies within each building that existed at the time of the assessment.

The Birmingham VAMC, located in downtown Birmingham, is completely landlocked. There are several connector buildings constructed as “bridges” over the top of city streets that separate the VAMC from neighboring UAB, the research building being one of them. The Research Wing, constructed in 1967, houses biomedical laboratories on the fourth and fifth floors. There is no animal research facility at the Birmingham VAMC. Any investigators engaged in animal research must house them at the affiliate.

It is important to note that the research program has a significant lack of space. An agreement between previous hospital and research leadership resulted in the Research Service losing laboratory space to the hospital for clinical use, in return for complete renovation of the remaining laboratories. While the renovation resulted in beautiful new laboratories, there is only enough space to house approximately 50% of the biomedical investigators.

The new hospital director and the new research leadership are highly motivated to continue to build the program, but currently lack the space to do so. With no campus space available to develop, it would seem that the best avenue for space growth would be a lease, either with the affiliate or in privately owned space.

At the time of the assessment, the laboratory renovation had been completed with the exception of data lines and installation of a door with electronic security to separate the clinical research area from the laboratories.

Nearly all of the laboratories are identical, with one or two having a slightly different floor plan. Finishes are in excellent condition and consist of resinous



epoxy flooring and walls of epoxy painted drywall. Ceilings are exposed and painted black. The casework is metal with wood fronts and glassed front metal wall cabinets with sliding doors. Countertops and sinks are of epoxy resin. The configuration consists of a fixed casework system on the walls and a pair of low (desk height) tables in the center. One laboratory has an accessible laboratory unit. Initially the plan called for an accessible unit in each laboratory, but due to excessive costs this was reduced to one laboratory. This is something not usually seen in VA laboratories and speaks well for the facility.



**Finishes, casework, and countertops in the newly renovated laboratories are in excellent condition. However, an aging fume hood has been placed in this laboratory.**



**This landlocked VA facility has several “bridge” buildings that are connected to the VAMC and to UAB, above downtown streets. The building above is the Research Wing.**

Only one of the new laboratories has a fume hood which, unfortunately, is an old, corroded unit that should be replaced.

There is one laboratory that was not included in the renovation and was occupied at the time of the assessment. This laboratory is generally in good condition, but has some inappropriate finishes (e.g., fabric front upper cabinets) and houses some aging equipment that should be replaced.

While the new laboratories provide an excellent environment for research, it is unfortunate that the building support systems (plumbing, mechanical, electrical) were not upgraded as part of the renovation. The mechanical system in particular has fairly extensive deficiencies that account for over half of the total cost to correct deficiencies in the Research Wing.



**While the laboratories are newly renovated, the building's support systems are severely aging and deficient. The photo at left is the compressed air system in poor condition. At right is a steam leak in mechanical space.**

On the plumbing side, like many VA facilities this building lacks separation of the laboratory and potable water systems. Also, the laboratory vacuum and compressed air systems are in poor condition.

Deficiencies with the mechanical system include air systems that do not provide redundancy and pressure independent control. The heating hot water system (which provides hot water to the building) is in poor condition and in need of replacement.

Not all of the mechanical system is served by emergency power. When power is lost, the chiller plant is removed from service to prevent overload of the standby generator. Because there is no animal research facility in the building, there is no requirement by VA and NIH standards to correct this. Before the laboratories are occupied, the air systems will need to be rebalanced to alleviate the severe negative pressure conditions observed during the assessment. Also, at the time of the assessment it was very cold outside and some of the laboratory space was also quite cold. The space plans identified individual controlled thermostats in each laboratory, but not all laboratories had them at the time of the assessment.

The electrical system is in somewhat better condition, but lacks surge suppression and electrical panels lack capacity for expansion. Lighting levels within the laboratories are low by VA standards. The laboratories have windows so there is natural light but it is insufficient to offset the illumination deficiency.

The building is fully covered by a wet-pipe sprinkler system. The fire alarm system is in good condition, but the corridors in the laboratory areas lack visual and/or audio fire alarm devices. There also is no smoke detector in the communications room.



There are emergency eyewashes with tempered water in the laboratories. There are no emergency showers available in the laboratory areas.

#### Other Research Space

The fourth floor also houses a small clinical research unit with a reception/waiting area and three exam rooms. The unit will be a nice addition to the program, providing an opportunity to expand clinical research. The REAP occupies leased space at the affiliate.

#### Security

There is appropriate electronic security (card readers and cameras) at the entrances to the laboratory areas from floors of the adjacent buildings. However, there is uncontrolled access to the research areas from the elevator. Also, the new door that will be installed to separate the fourth floor laboratories from the clinical research unit will require security.

#### Life Safety Hazards

The following life safety hazards identified in the assessment have been or are in the process of being remediated by the medical center:

- Visual and/or audio fire alarm devices have been installed in the corridors.
- A smoke detector will be installed in the communications room as the room is completed.
- Emergency showers have been installed in the laboratory areas. (ORD provided funding to correct this deficiency.)

#### Improvements Made Since Assessment:

In the short time since the assessment, no other actions have been completed. However, the Director has asked for an engineering report by the end of May 2011 addressing how the deficiencies identified in the assessment will be resolved.

#### New Construction

There is no new construction of research space planned at this station.



### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Research Wing</b>
Architectural	\$90,000
Plumbing	\$210,000
HVAC	\$712,000
Electrical	\$133,000
Fire Protection	\$2,000
<b>Total</b>	<b>\$1,147,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Research Wing</b>
1	\$177,000
2	\$84,000
3	\$810,000
4	\$30,000
5	\$46,000
<b>Total</b>	<b>\$1,147,000</b>

**Table 1.2 Cost Summary by Priority**

<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
\$1,147,000	\$8,626,000	13%

**Table 1.3 Facility Condition Index Value**



***Wm. Jennings Bryan Dorn VA Medical Center***

***Columbia, SC***



**Date(s) of Assessment: December 4-5, 2008**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$4,635,000**

**Total Cost, Priority 1 Deficiencies: \$1,383,000 (or 30%)**

**Total Cost to Replace: \$8,093,000**

**Overall Campus FCI: 57%**

**Size of Research Program: Small (under \$2.5 million in VA research funding)**





### Background

This facility has a small research program consisting almost entirely of biomedical research. The academic affiliate is the University of South Carolina School of Medicine located adjacent to the VA campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting office space were housed in two adjoining buildings (Building 9/9A) that, for purposes of the assessment, were considered one building, on the VA campus with just over 10,000 nsf of research space (laboratories – 6,439 nsf; VMU – 1,562 nsf; offices – 2,277 nsf). Following is an overview of the building housing research, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Building 9, originally constructed in 1930 as the fire station, was later converted to research laboratories. Building 9A, which has one floor of laboratories, was added in 1989. The VMU has space in both Buildings 9 and 9A.

Overall, the laboratory space is clean and has been well maintained, although many of the finishes as well as the casework are showing their age. There has been some renovation performed. Those laboratories that have been renovated have new casework and finishes, and are in very good condition.



**This laboratory space was being renovated at the time of the assessment.**



**A typical laboratory in Building 9A.**

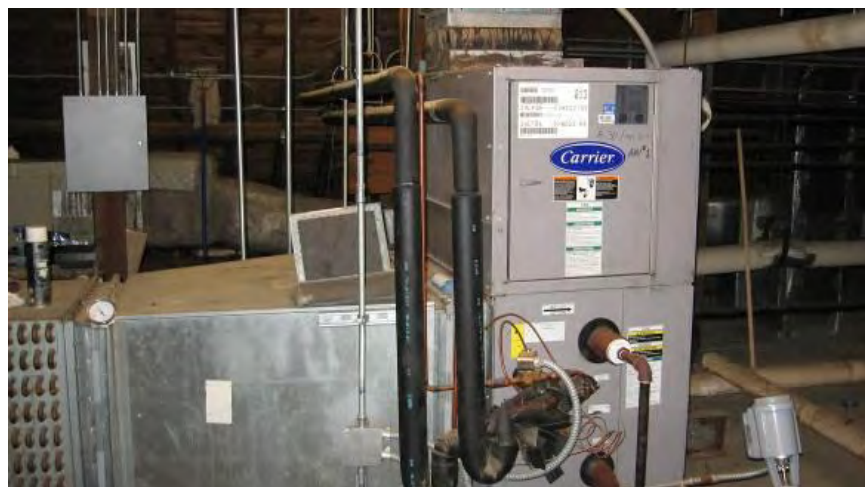


Most of the fume hoods are in poor condition and in need of replacement. One of three walk-in cold rooms is in failing condition. Two autoclaves are each at the end of their useful lives and should be replaced, as well. At the time of the assessment, the VMU did not have a cage washer, but rather was contracting with the affiliate for this service.

Door hardware generally consists of knobs rather than the lever type handles that meet Federal accessibility guidelines.

With regard to plumbing, the system piping overall is in good condition. There are some aging fixtures in laboratories that have not been renovated and many of those are in poor condition. There is backflow prevention between the building and the campus water system, but there is no backflow prevention separating laboratory or VMU water from potable water in the building. This raises the potential for contamination.

There are a number of deficiencies with the mechanical system. Air handling units as well as the air distribution system serving Building 9 are in poor or failing condition and should be replaced. The smaller air handling units serving the VMU are also in need of replacement along with their duct systems. There is emergency power for the cooling and ventilation system in Building 9, but no redundancy in the event of equipment failure. The rooftop stacks for the exhaust system are inadequate, although the exhaust fans are in fair condition.



**During the assessment, air handling units serving the original part of the building as well as the VMU were found to be in failing condition.**



With regard to the electrical system, the normal power system is in good condition although in Building 9A it is approaching the end of its rated life (30 years). Most panel boards do not have sufficient space for expansion in Building 9. There is no transient voltage surge suppression (TVSS) on the main switchboard, distribution panel boards, or branch circuit panel boards. In Building 9A, there do not appear to be enough emergency power receptacles in the laboratories, particularly at benches.

Refrigerators, freezers, and walk-in cold rooms are locally alarmed, but are not connected to a central alarm system.

Lighting has not yet been converted to T8 fixtures. Lighting levels in the laboratories appear to be adequate. No energy saving initiatives such as occupancy sensors are in use. In the VMU, lighting fixtures in wet areas are not properly protected with gaskets.

Building 9 has no fire suppression sprinkler system, but Building 9A is fully covered by sprinklers. The fire alarm system is in good condition. Both buildings have smoke detection.

Safety showers and eyewashes are provided in appropriate locations throughout the space.

#### Other Research Space

There is some office space in the main hospital designated for clinical research study coordination. At the time of the survey, one of the offices was about to be lost to a clinical service. Exam rooms in clinical space are used to see patients enrolled in studies.

#### Security

Access to research areas is controlled by card readers and keyed internal doors. Security screens were recently installed on windows.

#### Life Safety Hazards

The following life safety hazard identified during the assessment will be remediated by the medical center as part of a funded NRM project:

- A sprinkler system will be installed in Building 9.

#### Improvements Made Since Assessment:

This station has made and/or initiated several improvements following the assessment, including:



Planning renovation of laboratories (Note: This project will correct a significant number of deficiencies identified in the assessment) -- \$2,310,000 (NRM FY11), in planning.

Planning renovation of VMU to accommodate new cage washer -- \$242,000 (NRM FY11), in planning.

Correction of Priority 2 deficiencies, upgrade of Building 9 HVAC system -- \$275,000 (NRM FY10), completed. (Note: This project was not performed up to standards and must be remediated. Two of the new units have failed.)

### New Construction

There is no new construction of research space planned at this station.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

Discipline	Correction Cost
Architectural	\$1,165,000
Plumbing	\$602,000
HVAC	\$2,045,000
Electrical	\$653,000
Fire Protection	\$170,000
Total	\$4,635,000

**Table 1.1 Cost Summary by Discipline**

Priority	Correction Cost
1	\$1,383,000
2	\$1,542,000
3	\$1,635,000
4	\$75,000
5	\$0
Total	\$4,635,000

**Table 1.2 Cost Summary by Priority**



Correction Cost	Replacement Cost	
\$4,635,000	\$8,093,000	57%

**Table 1.3 Facility Condition Index Value**



## VISN 8: VA Sunshine Healthcare Network



<i>Sta. ID</i>	<i>VA Site Surveyed</i>	<i>City/State</i>
516	Bay Pines VA Healthcare System	Bay Pines, FL
546	Miami VA Healthcare System	Miami, FL
573	North Florida/South Georgia Veterans Health System, Malcom Randall VA Medical Center	Gainesville, FL
673	James A. Haley Veterans' Hospital	Tampa, FL







***VA Bay Pines Healthcare System,***

***Bay Pines, FL***



**Date(s) of Assessment: March 18-19, 2010**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$4,077,000**

**Total Cost, Priority 1 Deficiencies: \$1,582,000 (or 39%)**

**Total Cost to Replace: \$20,376,000**

**Overall Campus FCI: 20%**

**Size of Research Program: Small (under \$2.5 million in VA research funding)**



### Background

This small research program has been in a steady growth mode the past few years. VA funding is predominantly for biomedical research, with a smaller amount for rehabilitation research (auditory function) and clinical research. The program has a small core group of investigators, most of whom work in the neurosciences and some of whom have been continuously funded for a number of years. The group is co-located and is highly collaborative.

The academic affiliate is the University of South Florida (USF) College of Medicine located about 40 miles away in Tampa. USF has a campus in St. Petersburg, but it is not a medical campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and office space were housed in a single building (Building 23) on the VA campus with 16,782 nsf of research space (laboratories – 12,200 nsf; VMU – 2,282 nsf; offices – 2,300 nsf). Following is an overview of Building 23, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Building 23 is a two story building constructed in 1977. Research occupies only the second floor. The Research Service administrative offices are housed in a small office suite nearby in Building 22. Both of these buildings are adjoining to the main hospital.

The research area has several common resource (CORE) spaces that are fairly well equipped. Because of the distance to the affiliate, CORE equipment is needed on station. There is no CORE tissue culture space.

With regard to general appearance, Building 23 has been very well maintained for a building that is over 30 years old. The station is already planning replacement windows. There is a major roofing project planned for the campus, but it was unclear if Building 23 is included. The roof is in fairly bad condition and is causing leakage and damage throughout the research space.

Laboratories are not laid out particularly well and are crowded due to a lack of storage, a problem typically seen in VA research laboratories. In some areas there are accessibility issues due to limited space and lack of adequate egress. Casework is old and in fairly poor condition, although countertops have held up fairly well considering their age. Drawers and doors in the casework are hard to open throughout the laboratories. Some of the laboratories were apparently renovated in 1993, but used casework was taken from clinical areas and moved to research. In



terms of overall condition, there is really no difference between the laboratories that were renovated and those that were not.



**The photo at left shows a typical laboratory in Bldg 23, with the original fume hood in place. Shown at right is the condition of casework, typical throughout the space. Note the corrosion.**

There is a sprinkler system in the building, although it does not cover all areas. It should be extended and also upgraded. Smoke detection exists throughout the space and fire alarms are all in good condition.

While safety showers and eyewashes are of the appropriate type, there are not enough of them to adequately cover the space. Additional units should be installed and tempered water should be added.

The recent renovation of the animal facility added a significant amount of space, although the unit is still very small but adequate for current usage.

With regard to the Building 23 mechanical system, the VMU has a new HVAC system which is also benefiting the rest of the research space. Also, controls are in the process of being upgraded to digital. Exhaust fans need to be replaced and a standby heating hot water system is needed. It is obvious that there are significant pressurization problems on the second floor. When departing through the double doors out to the elevator lobby, the doors are extremely hard to push open. Airflow monitoring should be undertaken.

On the plumbing side, backflow prevention is needed at the building and also in some of the laboratories. Additionally there is no separation between the sprinkler system water and domestic water. The domestic water system really needs to be replaced.



Gas needs to be separated from that used by Dental Service. The deionized (DI) water system is not very accessible to investigators.

The electrical system is in fairly good shape, but more circuits are needed for benches in laboratories. Also emergency power receptacles are somewhat sporadic in the laboratories. Critical items such as freezers, fume hood exhaust, and alarms are covered by emergency power and the VMU is fully covered. Ground fault circuit interrupter (GFCI) receptacles are needed next to sinks. Transient voltage surge suppression (TVSS) is needed throughout the space. Lighting levels tend to be low.

#### Other Research Space

There is no designated clinical research space on the Bay Pines campus. Clinical research is primarily conducted in various clinics throughout the hospital. During the survey, several investigators expressed interest in clinical research if adequate space was available.

It is important to note that the local research program has very strong support from hospital management. Examples of recent support (just prior to the assessment) include an investment of \$330,000 in needed improvements to the animal facility (including purchase of an autoclave), renovation (painting, carpet, furniture) of the Research Service administrative offices, a similar renovation of a conference room dedicated to research, and construction of an auditory laboratory for clinical research in a small room adjoining the conference room.

#### Security

Access to the research space is controlled via electronic security and cameras. Additional security protects the entrance to the VMU.

#### Life Safety Hazards

The following life safety hazards identified during the assessment have been remediated (or are in planning for remediation) by the medical center:

- Additional safety showers and emergency eyewashes have been installed.
- Receptacles near water sources will be replaced with ground fault protected receptacles (will be remediated as part of Minor Construction project).
- The sprinkler system will be extended for full coverage (will be remediated as part of Minor Construction project).

#### Improvements Made Since Assessment:

This station has made and/or initiated improvements following the assessment, including:

Correction of Priority 1 deficiency, replacement of roof – (station NRM), currently ongoing.



Installation of additional eyewash units and safety showers -- \$10,000 (station funds), complete.

Construction of new research building as an addition to Building 23 – est. \$7 million (Minor Construction), in design.

#### New Construction

A few years ago, the station submitted a minor construction application for a new research building of 22,739 gross square feet at a cost of \$6.9 million. The project was approved. The design phase was funded in FY10 and the contract was nearing the award stage at the time of the assessment. Construction is tentatively scheduled to start in May 2011 and take approximately 18 months. Following discussions during the survey, plans were formed for Research Service to work jointly with engineering to ensure that the design of the building meets the needs of investigators. The new building is not seen as a replacement for the current space, but rather an augmentation to it. It will adjoin Building 23 at one end and will house a larger VMU to accommodate what is hoped will be a continually growing program. At some point following the construction, the laboratories in Building 23 can then be remodeled as funds become available.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Correction Cost</b>
Architectural	\$1,813,000
Plumbing	\$886,000
HVAC	\$881,000
Electrical	\$138,000
Fire Protection	\$359,000
<b>Total</b>	<b>\$4,077,000</b>

**Table 1.1 Cost Summary by Discipline**





Priority	Correction Cost
1	\$1,582,000
2	\$734,000
3	\$1,578,000
4	\$159,000
5	\$24,000
Total	\$4,077,000

**Table 1.2 Cost Summary by Priority**

Correction Cost	Replacement Cost	FCI
\$4,077,000	\$20,376,000	20%

**Table 1.3 Facility Condition Index Value**



***Miami VA Healthcare System,***

***Miami, FL***



**Date(s) of Assessment: February 24-25, 2009**

**Number of Buildings Assessed: 3**

**Total Cost to Correct Deficiencies: \$11,124,000**

**Total Cost, Priority 1 Deficiencies: \$2,458,000 (or 22%)**

**Total Cost to Replace: \$42,234,000**

**Overall Campus FCI: 26%**

**Size of Research Program: Medium (\$2.5 million to \$4.9 million in VA research funding)**



### Background

This medium sized research program is focused predominantly on biomedical research. Following Hurricane Katrina in 2005, Dr. Andrew V. Schally, winner of the Nobel Prize for Medicine in 1977, relocated his research program from New Orleans to the Miami VAMC. At one time this program hosted a rehabilitation COE. The facility hosts a GRECC that is actively engaged in research.

The facility is affiliated academically with the University of Miami School of Medicine, located near the VA campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and office space were housed in four buildings on the VA campus with nearly 41,000 nsf of research space (laboratories – 29,653 nsf; VMU – 7,556 nsf; offices – 3,646 nsf). Following is an overview of each building housing research, including its age, configuration, general condition, and description of key architectural and systems deficiencies within each building that existed at the time of the assessment. Overall, research at the Miami VAMC is housed in aging space that is rated in poor condition.

Building 1, the main hospital building, houses research laboratories on the second floor. Building 7 houses laboratories on the third floor and the Veterinary Medical Unit (VMU) on the first floor. (Note: The station would like to expand available research space by adding three floors to the top of Building 7. This building was originally designed with additional floors, but built with less due to a funding shortfall.) Buildings 8 and 9 are two modular buildings adjacent to each other and joined by a common entry. For purposes of the assessment, they were considered one unit (Building 8/9).

The main hospital building, Building 1 is a 12 story building constructed in 1968. Part of the second floor houses research. The laboratories in this building are very dated, with casework, bench tops, and equipment that have reached the end of their useful lives. Deficiencies were noted with regard to safety, specifically with regard to eyewash stations. The eyewashes located within laboratories are of an inappropriate type. Also, safety showers in hallways should have eyewashes with them, but they are lacking. There also is inadequate backflow protection between the domestic water systems serving both the clinical and research areas. This situation should be corrected, as there is potential for contamination of the water supply in clinical areas. The medical vacuum system and oxygen system also raise concerns. The clinical and research areas are served by the same systems. Lastly, the fire alarm system is in good condition, but it lacks speakers and strobe lights. There also are no smoke detectors in the corridors.



**The photo at left shows a typical laboratory in Bldg 1. Some casework has been painted to extend its life, but generally casework is older and in need of replacement. Some laboratory spaces have severely corroded casework as shown in the next two photos.**

There are a number of deficiencies with the mechanical system. The electrical system, which is in fair condition, has limited capability for expansion and there also is no transient voltage surge suppression on the system. Emergency power is in ample supply.

Building 7 was constructed in 1980 and houses laboratories on the third floor and the VMU on the first floor. Most of the casework and equipment are original to the building and should be replaced. There are some safety concerns with this building as well. Some of the laboratories do not have access to a safety shower. New showers with eyewashes should be located in the corridors to be fully accessible. There is no safety shower in the VMU. Neither showers nor eyewashes are provided with temperature controlled water. Backflow protection is lacking between this building and Building 1 which is the source for water. The fire alarm system in Building 7 is lacking speakers and strobes.

With regard to the mechanical system, it is imperative that the air handling unit serving the VMU be set to fail in the "off" position. At the time of the assessment, it was set to fail in "full heat" position and could cause catastrophic loss of animals in the event of failure.

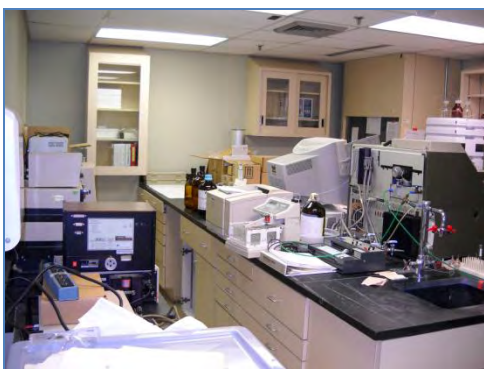
Some of the walls in Building 7 laboratories have been damaged due to water leakage around windows. The VMU is generally in very good condition, with the exception of the corridor flooring. It was incorrectly installed without the grit necessary to prevent slippery conditions when wet. The survey team was informed that this deficiency was already scheduled for correction.



**In Building 7, there is extensive leakage around the exterior windows that has caused significant damage to interior finishes.**

Although Buildings 8 and 9 technically are two separate buildings, they are located adjacent to each other with a common entry. Buildings 8 and 9 also have very common finishes and systems, and so were treated as one building in the assessment. Built in 1983, Buildings 8/9 are one story modular buildings. As on many VA campuses, they were installed as a “temporary” solution to overcrowding, but have now been in use for nearly 30 years.

Most of the casework in this building needs to be replaced, but most of the equipment is in good working order. There were safety deficiencies noted, including lack of emergency showers (the one shower in the building is in a laboratory that is kept locked).



**Crowded laboratory conditions.**



**Dead insects in the drawer of a base cabinet.**





The mechanical system is generally unsuitable for a research laboratory environment, as returned air is circulated throughout the building and an inadequate supply of fresh air is brought in. There is a significant deficiency with regard to safety is the use of hydrogen fluoride gas in a hood in Room 128. The technical evaluation of the space contains detailed information regarding this situation along with a remedy to correct it.

All laboratory areas (in all buildings) are covered by sprinkler systems.

#### Other Research Space

There is no space allocated specifically for clinical research. Human studies are conducted in clinical space.

#### Security

Access to research space is protected by card readers at building entrances and appears to be appropriate.

#### Life Safety Hazards

The following life safety hazard identified during the assessment is in the process of being remediated:

- Emergency showers and eyewashes will be updated to meet current requirements (ORD provided funds to correct this problem).

The following life safety hazards identified during the assessment have not been remediated by the medical center:

- There are no smoke detectors.
- The fire alarm system lacks annunciators (this is an accessibility issue).
- There is inappropriate use of hydrogen fluoride gas in Building 8/9, room 128.
- Receptacles near water sources are not ground fault protected.

It was also noted during the assessment that the HVAC controls in the VMU were set to fail in the incorrect position. This was noted in the exit briefing and the survey report as an urgent matter that needed immediate correct.

#### Improvements Made Since Assessment:

This station has made and/or initiated some improvements following the assessment, including:

Correction of wall, ceiling, and floor finishes in all laboratories, research offices and corridors, funding source unknown.





Replacement of air handlers in Building 1, funding source unknown.

### New Construction

There is no new construction of research space planned at this station. However, the station is requesting additional floors be added to Bldg 7 through the SCIP process.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Correction Cost -- Bldg 1</b>	<b>Correction Cost -- Building 7</b>	<b>Correction Cost -- Building 8/9</b>
Architectural	\$3,208,000	\$2,388,000	\$308,000
Plumbing	\$280,000	\$288,000	\$67,000
HVAC	\$1,500,000	\$1,285,000	\$67,000
Electrical	\$937,000	\$612,000	\$184,000
Fire Protection	\$0	\$0	\$0
<b>Total</b>	<b>\$5,925,000</b>	<b>\$4,573,000</b>	<b>\$626,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Bldg 1</b>	<b>Bldg 7</b>	<b>Bldg 8/9</b>
1	\$1,620,000	\$623,000	\$215,000
2	\$1,868,000	\$1,756,000	\$102,000
3	\$2,257,000	\$2,167,000	\$303,000
4	\$180,000	\$27,000	\$6,000
5	\$0	\$0	\$0
<b>Total</b>	<b>\$5,925,000</b>	<b>\$4,573,000</b>	<b>\$626,000</b>

**Table 1.2 Cost Summary by Priority**



<b>Building</b>	<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
Building 1	\$5,925,000	\$18,536,000	32%
Building 7	\$4,573,000	\$22,077,000	21%
Building 8/9	\$626,000	\$1,622,000	39%
Overall	\$11,124,000	\$42,234,000	26%

**Table 1.3 Facility Condition Index Value**





***North Florida/South Georgia Veterans Healthcare System,  
Malcom Randall VA Medical Center,  
Gainesville, FL***



**Date(s) of Assessment: April 13-14, 2010**

**Number of Buildings Assessed: 2**

**Total Cost to Correct Deficiencies: \$9,629,000**

**Total Cost, Priority 1 Deficiencies: \$2,933,000 (or 30%)**

**Total Cost to Replace: \$43,993,000**

**Overall Campus FCI: 22%**

**Size of Research Program: Large (\$5 million to \$9.9 million in VA research funding)**



### Background

This large research program focuses predominantly on rehabilitation research, with a COE, the Brain Rehabilitation Research Center (BRRRC), and a joint rehabilitation and health services research REAP, the Rehabilitation Outcomes Research Center (RORC). There also is fairly significant biomedical research as well as clinical research. The GRECC at this facility is also actively engaged in research. The program is home to several Research Career Scientists/Senior Research Career Scientists.

The academic affiliate is the University of Florida (UF) College of Medicine located adjacent to the NF/SGVHS campus and connected via an underground tunnel.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting office space were housed in two buildings on the VA campus with over 38,000 nsf of research space (laboratories – 28,000 nsf; VMU – 3,727 nsf; offices – 6,810 nsf). Following is an overview of Buildings 1 and 11, including their age, configuration, general condition, and description of key architectural and systems deficiencies within each building that existed at the time of the assessment.

The majority of research space, including biomedical laboratories and support spaces, and a few Research Service administrative offices, is housed in Building 1, which is the main hospital building. Building 1 was constructed in 1965 (occupied in 1967) and has six floors (five floors above ground plus a basement and mechanical penthouses). The E wing, which houses much of the research space, was added to the building in the early 1980s. Research occupies space on the basement, third, fourth, and fifth floors and is distributed among clinical spaces, requiring electronic security on every laboratory entrance rather than on main entrances to laboratory areas. While it is preferable that research laboratory space be housed in contiguous space separate from patient care areas that is not always possible. The hospital has done an admirable job in addressing the security and ensuring that patients do not have access to laboratory and other research areas.

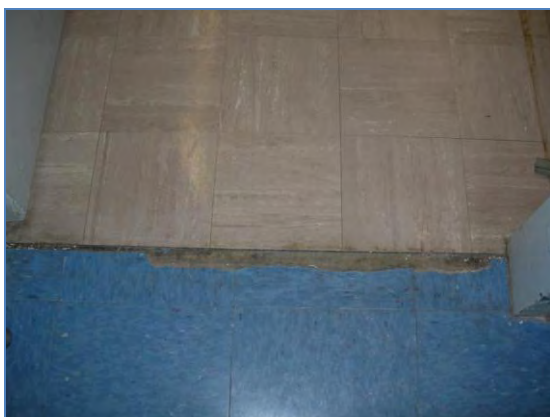
With regard to Building 1, the exterior of the building as well as the foundation and the roof are in good condition, with the roof having recently been replaced. Windows are original to the building and some have had leakage. Finishes (floors, ceilings, walls), casework, and fixed equipment in the laboratories on the basement level are clearly in worse shape than that on the upper floors. The casework and fume hoods are severely aging and should be replaced, as should freezers and cold rooms. The flooring on the basement level appears to be asbestos tile which would need to be abated in the event of renovation, significantly increasing the cost. In the newer laboratories on upper floors, some of the casework is in fairly good condition although there is some corrosion throughout much of the space. Several



laboratories on the third floor were renovated recently for a new investigator and are in excellent condition.



**Some of the laboratories in Building 1 are very crowded. In this one, the fume hood is being used for storage.**



**Some laboratories have evidence of damage within such as this damaged floor at a laboratory entrance (left photo) and the stained ceiling tiles caused by leakage (right photo).**

Some items such as freezers and other equipment are stored inappropriately, i.e., in spaces without appropriate ventilation. As in many VA facilities, laboratories are generally very crowded, with little regard for appropriate clearance and accessibility due to lack of storage and/or lack of appropriate space for equipment.

Emergency showers and eyewashes do not meet requirements in this building. There apparently were showers in the hallways throughout the laboratory areas, but they have been removed. Currently eyewash drench hoses are provided at laboratory sinks.





Appropriate showers and eyewashes that meet current requirements should be installed in the corridors and tempered water supply should be provided.

With regard to mechanical systems, the air handling units serving Building 1 are aging and are chronically leaking. Condensation from the units is wasting a significant amount of water and in general is not energy efficient. If the mechanical systems were replaced, there would be a huge potential for energy/cost savings. The AHUs should be replaced along with various other components of the mechanical system including exhaust fans. It should also be noted that the construction of the new bed tower will provide improved ventilation to at least portions of Building 1.

Plumbing fixtures (the sinks and faucets) are generally new and in good condition. There is backflow prevention at the building domestic water entrance. However, there is no separation of systems serving the laboratories from potable water. The domestic hot water system is in good condition.

The electrical system has been well maintained but components are functionally obsolete. There currently is inadequate receptacle placement and circuitry throughout the laboratories. The system lacks transient voltage surge suppression and GFCI type receptacles near sinks. Receptacles also are not labeled appropriately. There is appropriate coverage of emergency power.

It should be noted that, in conjunction with the major construction of the new bed tower, there will be some mechanical and electrical enhancements made to Building 1, some of which may overlap with deficiencies identified in this report.



**The open hatch at the base of the exterior of Bldg 11 provides a potential inlet for vermin.**



**An open joint at the exterior of Building 11.**



The VMU is housed in Building 11, a smaller building adjacent to Building 1. Building 11 was constructed in approximately 1976, originally as administrative (office) space. It was converted to house the VMU in 1981. Some fairly extensive renovation including a new HVAC system, new storage, and a new cage washer occurred in 2006.

The exterior of Building 11 is generally in good condition although some cracks and missing mortar appear in a few places. Before the recent renovation, there was significant leakage through the walls. Although repairs have been made and the leakage stopped, it is recommended that the new drains be checked to ensure they are working properly and that mold is not forming within the walls.

The building's HVAC system was upgraded in 2006, but there are still some problems with humidity control. There also is not full redundancy of the system in the event of equipment failure. So although the system is new, it does not meet standards for animal research facilities and should be upgraded appropriately or replaced.

Backflow prevention is inadequate to ensure appropriate separation between the VMU water supply and potable water. Backflow prevention devices should be installed to prevent cross-contamination.

The electrical system has been well maintained and is generally in good condition, but lacks TVSS and GFCI wash down receptacles. Also, the lighting fixtures are not appropriately gasketed to meet VA standards for animal facilities.

The sprinkler systems in both Buildings 1 and 11 provide only partial coverage. In Building 1, the sprinkler heads appear to be original and are corroded and in need of replacement. The fire alarm systems are in good condition, but there is no voice communication system in the buildings, rather a chime sound system is used. The chime system should be replaced with a voice communication system.

#### Other Research Space

Although Building 12 (which houses dry laboratory space for the BRRC) was not assessed by the A&E team, it should be noted that it has little security. There is nothing to prevent a visitor from entering the BRRC space via the elevator. There also is a problem with keyed locks which generally use the same key throughout the space. (Note: immediately following the survey, FMS addressed problems with the key system in Building 12.)

It should be noted that this campus has a critical space shortage throughout, a fact recognized by the Capital Asset Realignment for Enhanced Services (CARES) Commission. Currently a new bed tower is being constructed to address patient



privacy needs and will enable movement of some clinical functions out of Building 1. The Research Service has requested space currently assigned as the Eye Clinic on the fourth floor of Building 1, to be designated a clinical research unit (CRU). This space will likely become available when the new bed tower is complete, although the outcome of space to be vacated in Building 1 has yet to be determined.

There is no designated clinical research space at the Gainesville VA campus, other than that assigned to the BRRC. The majority of BRRC space is in Building 12 (nursing home), with several offices occupying the fifth floor of Building 1 (space that previously housed the Research Service administrative offices). Except for that conducted in the COE, clinical research is somewhat limited and hindered by lack of appropriate space. The space in Building 12, which includes several “labs”, is extremely crowded allowing no room for growth of the center. The BRRC needs to be on site at the VA campus because its patient base needs to be close to the hospital in the event of medical emergency.

Additional dry laboratory (office) space leased at the Commerce Building in downtown Gainesville houses some Research Service administrative staff, as well as the RORC, and three functions supported by VA Central Office (the Rural Health program, the Research Infrastructure Program, and the National Center for Occupational Health and Infection Control (COHIC)). The space is approximately two miles from the VA campus.

#### Security

There is appropriate electronic security throughout the laboratory areas of Building 1. Because of the distribution of space among clinical space, each laboratory or other space such as common instrument rooms has its own security system at the entry.

Building 11 has electronic security at outdoor entrances. It should have security cameras but does not have them at present.

#### Life Safety Hazards

The following life safety hazards identified during the assessment have not been remediated by the medical center:

- There are no safety showers in the research laboratory areas and some emergency eyewash units are of an inappropriate type.
- Buildings 1 and 11 are only partially protected by a sprinkler system.
- Ground fault protected receptacles are not provided in areas near water sources.



#### Improvements Made Since Assessment:

This station has made and/or initiated some improvements following the assessment, including:

Correction of undisclosed Priority 1 deficiencies in several laboratories, unknown source of funding.

Renovation of rooms D112/D115 (no additional information provided), completed.

Renovation of laboratory in E-wing -- \$225,000 (NRM FY11).

#### New Construction

At this time there is no new construction of research space planned at this station. However, the station has proposed a major construction project (combination clinical/research building) through the SCIP process.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Correction Cost - Bldg. 1</b>	<b>Correction Cost - Bldg. 11</b>
Architectural	\$1,952,000	\$275,000
Plumbing	\$1,427,000	\$48,000
HVAC	\$4,267,000	\$388,000
Electrical	\$613,000	\$109,000
Fire Protection	\$498,000	\$52,000
<b>Total</b>	<b>\$8,757,000</b>	<b>\$872,000</b>

**Table 1.1 Cost Summary by Discipline**



Priority	Bldg. 1	Bldg. 11
1	\$2,858,000	\$75,000
2	\$4,492,000	\$423,000
3	\$1,389,000	\$339,000
4	\$0	\$15,000
5	\$18,000	\$20,000
<b>Total</b>	<b>\$8,757,000</b>	<b>\$872,000</b>

Table 1.2 Cost Summary by Priority

Building	Correction Cost	Replacement Cost	FCI
Bldg 1	\$8,757,000	\$39,271,000	22%
Bldg 11	\$872,000	\$4,722,000	18%
Overall	\$9,629,000	\$43,993,000	22%

Table 1.3 Facility Condition Index Value



***James A. Haley Veterans' Hospital,  
Tampa, FL***



**Date(s) of Assessment: March 16-17, 2010**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$9,567,000**

**Total Cost, Priority 1 Deficiencies: \$3,727,000 (or 39%)**

**Total Cost to Replace: \$30,200,000**

**Overall Campus FCI: 32%**

**Size of Research Program: Large (\$5 million to \$9.9 million in VA research funding)**





### Background

This large VA research program has been in a steady growth mode in recent years. VA funding is fairly evenly split among biomedical research, rehabilitation research, and health services research. The program is home to three Research Career Scientists and one Senior Research Career Scientist. A rehabilitation COE focuses on rehabilitation strategies for returning veterans from OEF/OIF, specifically those coming out of the Polytrauma Center at the James A. Haley Veterans' Hospital (JAHVH).

The academic affiliate is the University of South Florida (USF) College of Medicine located adjacent to the JAHVH campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting office space were housed in a single building (Building 2) on the VA campus with 31,160 nsf of research space (laboratories – 18,732 nsf; VMU – 8,325 nsf; offices – 4,103 nsf). Following is an overview of Building 2, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Building 2 is a three level building (ground floor, first floor, second floor) constructed in 1972. The ground floor houses the VMU and several (about five) laboratories occupied by investigators with animal studies. Laboratories and support spaces are on the first and second floors, and the Research Service administrative offices are housed on the second floor.

With regard to general appearance, Building 2 has been very well maintained for a building that is nearly 40 years old with mostly original components. However, it does have some significant deficiencies. The station is already planning several improvements including exterior tuck pointing (there are cracks in the exterior), replacement windows, and extensive roof repairs. The roof is in terrible condition and is causing extensive leakage throughout the building. Engineering has been very creative in rigging some contraptions to catch the leakage without further damage to the building's interior whenever possible. Unfortunately the ceilings and walls are plaster, so it is possible there will be additional water damage from current leaks that have not yet presented themselves. There is also a major electrical service project (funded through major construction) involving the whole campus which will benefit Building 2 with regard to normal power. Last but not least, an upgrade of the fire alarm system is planned.



Although the team was aware of these planned corrections, deficiencies that existed at the time of survey were identified and costed.



**Examples of (left to right): interior cracking, exterior cracking, roof deterioration.**



**The photo at left depicts typical condition of casework in the laboratories. The photo at right show what can happen when an inappropriate finish (plastic laminate countertop) is used in a laboratory environment.**

There is asbestos throughout the building – in the floor tiles, in the ceilings, in the walls, everywhere. Laboratories are extremely small with the largest being about 400 square feet, and others 200 square feet. Most investigators have multiple laboratories, and they usually are not co-located. In some instances, they are on two different floors.

Casework and countertops are original to the building. Some of the casework has been painted so looks better than others, but drawers and doors stick. Some casework has fairly extensive corrosion around the doors, particularly under sinks. There is one laboratory in the VMU that has been remodeled, funded by the medical center. It is very attractive and, considering the small size of it, is fairly well designed.



Cold rooms need to be replaced, as do fume hoods. There is little space that could legitimately be called CORE facilities. For the most part, investigators use CORE facilities at USF (which is immediately across the street from the VA campus).

In the animal facility, there are epoxy floors with hard ceilings in the animal rooms, with hallways having vinyl composition tile and acoustical tile. Walls are of concrete masonry units.

The VMU has a new cage washer, although there are some mechanical system issues with the room that cause significant steam to enter the corridors.

With regard to the Building 2 mechanical system, the number one problem is the exhaust system which not only needs to be replaced but also redesigned to increase airflows. Air handling units also need to be replaced (and redundancy provided for the VMU), and the chiller needs a back-up system for the summer months.

On the plumbing side, there is no separation of the water supply (laboratory vs. domestic in Bldg 2, and Bldg 2 vs. hospital). Similarly the compressed air, vacuum, and oxygen systems need to be separated from clinical systems.

With regard to the electrical system, more circuits are needed in order to increase power distribution. Emergency lighting is inadequate although the VMU is fully covered. Lighting has already been upgraded to T8, but gasketed fixtures are needed in the VMU.

Building 2 is only partially covered by a wet pipe sprinkler system. There are also some deficiencies with the fire alarm system, specifically lack of visuals in required areas, lack of voice communications, and lack of accessibility. Safety showers/eyewashes should be replaced to be in compliance.

#### Other Research Space

There is no designated clinical research space at JAHVH. Except for that conducted in the COE, clinical research is conducted in various clinics throughout the hospital.

After occupying several different leased spaces (e.g., a grocery store, a flea market), the COE is now in approximately 30,000 square feet of leased space funded by VISN 8 and located about five miles from the VA and USF campuses. The COE has four gait laboratories (one with a Lokomat) as well as an amputee clinic, a pressure ulcer laboratory, a biomechanics research laboratory, an engineering laboratory, and an advanced prosthetics laboratory. It is an impressive operation, but is somewhat hindered by the extremely dysfunctional layout of the space. It appears that the individuals who designed the space did so with little regard to specific requests by the COE. For example, the laboratory space was placed around the perimeter



where windows are located, necessitating the purchase of blackout blinds to make the space suitable. There is also some totally wasted space, hallways that go nowhere, and the need to go through several levels of security just to use the restroom. The main conference room can only accommodate half of the COE staff. Consequently, the general staff meetings are now held in the lobby. In spite of the poorly designed space, the COE is incredibly productive, and has picked up some additional office space in order to bring on additional staff. However, at the time of the assessment, the new space was not usable due to the lack of furniture, computers, and telephones.

The biggest hurdle this group has pertains to data security and patient privacy, as they frequently go back and forth to the VA campus to see patients, and also make home visits to patients. Carrying patient data from site to site has proven to be difficult in light of the stringent VA data security regulations. They would benefit significantly if they could relocate to the VA campus. Such a move might also impact positively on recruitment of PhDs from the affiliate.

Research at the James A. Haley Veterans' Hospital is housed in space that is nearly 40 years old and, while it has been well maintained, is in need of some significant upgrades. Considering the caliber of the research program at JAHVH, the program would benefit significantly from a new state-of-the-art research building, particularly one with sufficient space to house the Rehabilitation COE as well as biomedical, clinical, and animal research.

#### Security

Access to the entire building is controlled via electronic security, with additional security on the entrance to the VMU.

#### Life Safety Hazards

The following life safety hazards identified during the assessment have not been remediated by the medical center:

- Partial protection of research areas by the sprinkler system.
- Fire alarm system has no visual/voice annunciation (an accessibility issue). The planned campus-wide fire alarm upgrade may resolve this deficiency.
- Showers and eyewashes are not in compliance with latest standards.

#### Improvements Made Since Assessment:

This station has made and/or initiated some improvements following the assessment, including:

Fire alarm system corrections are being made campus wide, unknown source of funding (this was reported to be in planning at the time of the assessment).



Renovation of building facade --\$500,000 (NRM), design complete.

Upgrade of windows --\$250,000 (NRM), in construction.

Upgrade of exhaust system -- \$750,000 (ARRA funds), in construction.

#### New Construction

At present there is no new construction of research space planned at this station. However, the station is pursuing funds to perform a complete renovation of research space through the SCIP process.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Correction Cost</b>
Architectural	\$4,139,000
Plumbing	\$1,470,000
HVAC	\$2,723,000
Electrical	\$876,000
Fire Protection	\$359,000
Total	\$9,567,000

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Correction Cost</b>
1	\$3,727,000
2	\$4,206,000
3	\$1,324,000
4	\$120,000
5	\$190,000
Total	\$9,567,000

**Table 1.2 Cost Summary by Priority**



Correction Cost	Replacement Cost	FCI
\$9,567,000	\$30,200,000	32%

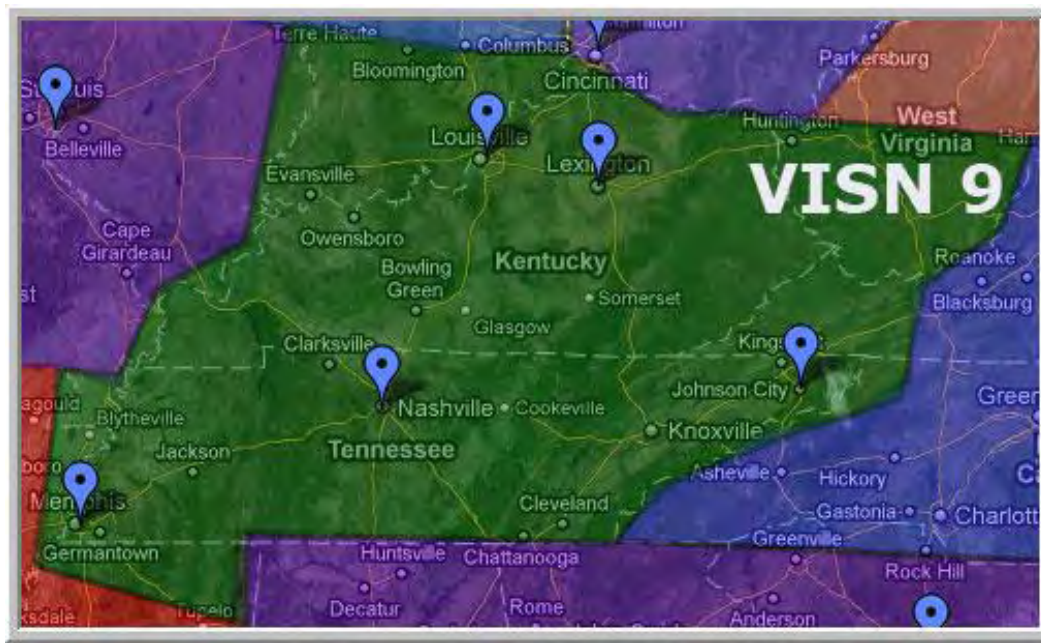
**Table 1.3 Facility Condition Index Value**







## VISN 9: VA Mid South Healthcare Network



<i>Sta. ID</i>	<i>VA Site Surveyed</i>	<i>City/State</i>
596	Lexington VA Medical Center, Cooper Drive Division	Lexington, KY
603	Robley Rex VA Medical Center	Louisville, KY
614	Memphis VA Medical Center	Memphis, TN
621	James H. Quillen VA Medical Center	Mountain Home, TN
626	Tennessee Valley Healthcare System, Nashville Campus	Nashville, TN





***Lexington VA Medical Center,***

***Cooper Drive Division,***

***Lexington, KY***



**Date(s) of Assessment: May 19-20, 2009**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$4,561,000**

**Total Cost, Priority 1 Deficiencies: \$1,740,000 (or 38%)**

**Total Cost to Replace: \$28,017,000**

**Overall Campus FCI: 16%**

**Size of Research Program: Small (Under \$2.5 million in VA research funding)**



### Background

The Lexington VA Medical Center (VAMC) is a two-division facility with a small research program focused primarily on biomedical and clinical research. The research program of the Lexington VAMC is located at the Cooper Drive Division, adjacent to the academic affiliate, the University of Kentucky College of Medicine.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in a single building (Building CA) on the VA campus with 27,147 nsf of research space (laboratories – 17,136 nsf; VMU – 8,044 nsf; offices – 1,967 nsf). Following is an overview of Building CA, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Building CA (Clinical Addition) is attached to the main hospital and was constructed in 1989. Laboratories occupy the third and fourth floors, with the fourth floor also housing the Research Service administrative offices. The VMU is also on the fourth floor.

When constructed, Building CA was capable of housing two additional floors on top of the existing four floors. Leadership is interested in adding additional space in order to optimally grow the research program.

As is the case with many of VA's academic affiliates, the University of Kentucky has developed an extensive array of clinical and research facilities on its campus, including new, state-of-the-art laboratories. However, VA investigators performing research at the university continue to perform their animal work at the VA. The available facilities as well as the management of the VMU make it the preferred site for animal research.

There is a shortage of dry laboratory/office space at the VAMC which could hinder any development of rehabilitation and/or health services research programs.

Generally the laboratory space is in fairly good condition, although there is damage to some of the wall, ceiling, and floor finishes due to water leakage. There have been chronic leaks from the roof, around windows, and through some exterior walls. Some of the casework is corroding as well. Facility engineering staff reported that the roof is being replaced.

As with many facilities, tissue culture space has inappropriate finishes (tile flooring and acoustical tile ceilings) that do not lend themselves well to cleaning. A few of



the laboratories are sectioned off with temporary partitions of a type to be found in an office environment. They are not appropriate for use in a laboratory.

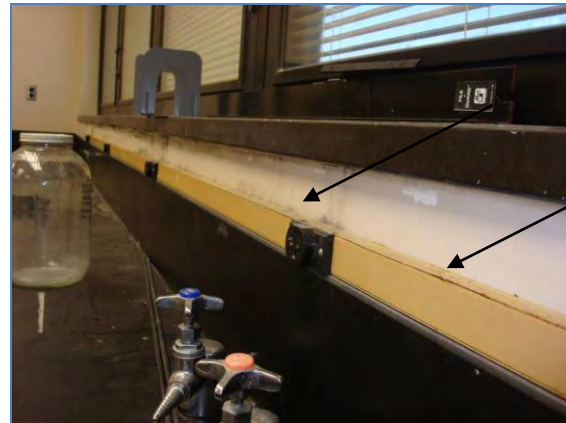
The space is well covered by eyewashes at laboratory sinks, but the safety showers do not meet current requirements (the showers in the corridors do not have accompanying eyewashes). This facility does have lever type door hardware (rather than knobs) that complies with the accessibility guidelines.



**(Left photo): Some laboratories have very tight spacing between benches. (Right photo): A wider view of a laboratory unoccupied at the time of the assessment.**



**A movable partition used to separate laboratories – this is inappropriate.**



**Evidence of leakage beneath a window (rusted electrical raceway, mold growth).**

Fixed equipment (autoclaves, fume hoods, and cold rooms) in the laboratory areas is in good working condition. The VMU reported that several new pieces of equipment, including a pass through autoclave and a tunnel washer were recently funded from VACO.





With regard to mechanical systems, the VMU suffers from inadequate steam for cage washing. The deficiency appears to be due to inadequately sized steam lines from the University which provides the high pressure steam. The major mechanical equipment is original to the building and, although it has been well maintained and is operational, is beyond its useful life and is beginning to develop problems. The temperature in animal rooms within the VMU is monitored centrally, around the clock.

There is no backflow prevention between the main hospital water system and the system serving the laboratories and VMU.

With regard to the electrical system, again the 20 year old system has been very well maintained and continues to service the facility. There is ample capacity for expansion of the research space. Necessary equipment such as refrigerators, freezers, fume hoods, egress lighting and some receptacles within laboratories are served by emergency power. There is no transient voltage surge suppression to protect sensitive electronic equipment. Ground fault circuit interrupter receptacles are provided near sinks.

Lighting has not yet been converted to T8 fixtures. The VMU lighting in wet areas is not adequately protected with gaskets.

All laboratory and VMU areas are fully covered by a fire suppression sprinkler system. The space is also covered by smoke detectors. The fire alarm system is in good condition, although there are no alarm initiation devices (strobes) within the laboratories.

#### Other Research Space

The facility submitted a minor construction proposal (that was not funded) to add a fifth floor to Building CA, for the purpose of providing new, state-of-the-art laboratory space and renovating existing space on the third floor to create a Research Outpatient Clinic. Currently, clinical research at the Lexington VAMC is conducted in the clinics as space is available. The University of Kentucky recently created a designated clinical research unit that has been extremely successful. Having such a unit at the VAMC would promote the growth of clinical research at the facility.

#### Security

Access to research areas is controlled by card readers. The VMU also has keypads at each animal room entrance. Cameras monitor VMU access.



### Life Safety Hazards

The following life safety hazards identified during the assessment are in the process of being remediated by the medical center (ORD provided funding to correct both of these deficiencies):

- The fire alarm system will be updated to include strobes within the laboratories.
- The safety shower/eyewash deficiency will be remediated.

### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Repair of floor in VMU -- \$87,400 (NRM FY10), completed.

### New Construction

There is no new construction of research space currently planned at this station.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

Discipline	Correction Cost
Architectural	\$2,820,000
Plumbing	\$212,000
HVAC	\$84,000
Electrical	\$1,445,000
Fire Protection	\$0
Total	\$4,561,000

**Table 1.1 Cost Summary by Discipline**



Priority	Correction Cost
1	\$1,740,000
2	\$1,872,000
3	\$853,000
4	\$84,000
5	\$12,000
Total	\$4,561,000

**Table 1.2 Cost Summary by Priority**

Correction Cost	Replacement Cost	FCI
\$4,561,000	\$28,017,000	16%

**Table 1.3 Facility Condition Index Value**



***Robley Rex VA Medical Center,***

***Louisville, KY***



**Date(s) of Assessment: May 21, 2009**

**Number of Buildings Assessed: 3**

**Total Cost to Correct Deficiencies: \$7,442,000**

**Total Cost, Priority 1 Deficiencies: \$3,069,000 (or 41%)**

**Total Cost to Replace: \$14,494,000**

**Overall Campus FCI: 51%**

**Size of Research Program: Medium (\$2.5 million to \$4.9 million in VA research funding)**



### Background

The Robley Rex VAMC in Louisville has a medium-sized research program focused mainly on biomedical research. Funding for the program has been fairly steady over the last few years. The program is particularly strong in surgical research.

The academic affiliate is the University of Louisville, School of Medicine, located in downtown Louisville about five miles from the VA campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in three buildings (Buildings 1, 12, and 19) on the VA campus with 16,360 nsf of research space (laboratories – 8,497 nsf; VMU – 3,962 nsf; offices – 3,901 nsf). Following is an overview of the buildings, including their age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Building 1 is the main hospital building, constructed in 1952. Research occupies a portion of both the eighth and ninth floors of the ten story (plus basement) building. The space consists of laboratories, support spaces, and the Research Service administrative offices. Overall, the space in Building 1 is a mix of renovated space with newer casework and aging space that needs total renovation. Some of the wall, ceiling, and floor finishes are damaged due to water leakage. Fume hoods have exceeded their useful life and should be replaced. With regard to systems, the domestic water supply feeding the hospital is not separated and protected from the laboratory water system. There also are significant deficiencies with the HVAC systems.



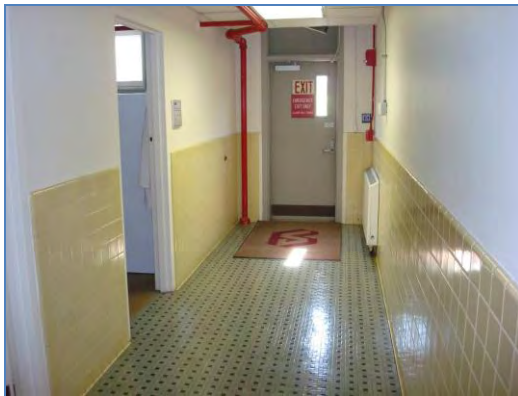
**The photos above show the significant difference between a renovated laboratory (at left) and a non-renovated laboratory (right photo) in Building 1.**





**Roof leaks have resulted in some water damage in Building 1. Both photos above show damage that has partially been repaired.**

Building 12, which houses the VMU, is in the best condition of the three buildings housing research. Most of the finishes within the building are in fairly good condition, although some have been damaged by water leakage. The casework is all beyond its useful life and in need of replacement. The biggest concern in this building is the lack of appropriate redundancy in some of the major systems. Although there are rooftop units with direct expansion cooling to provide back-up to the mechanical system in case of failure, the units do not meet the specific guidelines set forth for animal research facilities. The cage washer is in need of replacement.



**Building 12 which houses the VMU is in the best condition of all research space on the campus. Shown above at left is the interior view of the VMU's main entrance. The right photo shows a procedural laboratory.**





Building 19, a three level out building constructed in the 1940s, houses research laboratories on both floors. This building is in very poor condition and is not suitable to house research laboratories. The furnishings (casework) and equipment are all in poor condition. The sanitary waste pipes are cracking, plumbing fixtures are all beyond their lifespan, most of the mechanical system is in need of replacement, and there is no emergency power serving Building 19.



**By contrast, Building 19 is in poor condition and not suitable to house research laboratories. The photo at left shows what is likely the worst laboratory in Building 19. The photo at right shows vinyl asbestos tile flooring in Building 19.**

The research space in all three buildings is only partially protected by a wet pipe sprinkler system. The fire alarm systems are aging and need to be replaced. (Note: Since the time of the assessment, fire alarm systems have been updated.)

Emergency showers do not meet current requirements.

It is important to note that a new hospital to replace the current aging facility is in the planning stages and is expected to be completed over the next few years. The Research Program has been approved for approximately 27,000 net square feet of space in the new facility, slightly more than a 50% increase from the current allocation. Hopefully this will be sufficient to bring investigators currently housed off-site into VA laboratory space, but will not be sufficient to significantly grow the program.

#### Other Research Space

There currently is no dedicated clinical research space on the VA campus.



### Security

Access to all research areas is controlled by card readers. There are also a number of cameras monitoring the campus from building roofs, in parking lots, at building entrances, and in elevator lobbies.

### Life Safety Hazards

The following life safety hazards identified during the assessment have been remediated:

- Fire alarm systems have been replaced.
- Emergency showers and eyewash deficiencies have been corrected (ORD provided funds to correct this deficiency).

The following additional life safety hazards identified during the assessment have not been remediated:

- Buildings 12 and 19 need to have a full coverage sprinkler system installed.
- Some receptacles near water sources are lacking ground fault protection.

### Improvements Made Since Assessment:

This station has made and/or initiated improvements following the assessment, including:

Correction of mechanical system deficiencies, Bldg 1 – (station funds), completed.

Replacement of cage washer in VMU, Bldg 12 -- \$65,759 (VACO ORD LAMB) and \$8,100 freight/installation (station funds), in progress.

Correction of Priority 1 life safety hazard, installed new fire alarm system – (station funds), completed.

Correction of miscellaneous Priority 2 and 3 deficiencies, including repair of damaged finishes, mechanical system deficiencies – (station funds), completed.

### New Construction

This station is scheduled for a replacement hospital, with the site still to be determined. Research will be allocated space in the new facility.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by



priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Correction Cost -- Bldg 1</b>	<b>Correction Cost -- Building 12</b>	<b>Correction Cost -- Building 19</b>
Architectural	\$1,307,000	\$265,000	\$952,000
Plumbing	\$375,000	\$85,000	\$42,000
HVAC	\$1,589,000	\$215,000	\$922,000
Electrical	\$883,000	\$286,000	\$313,000
Fire Protection	\$64,000	\$72,000	\$72,000
<b>Total</b>	<b>\$4,218,000</b>	<b>\$923,000</b>	<b>\$2,301,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Bldg 1</b>	<b>Bldg 12</b>	<b>Bldg 19</b>
1	\$2,133,000	\$430,000	\$506,000
2	\$1,279,000	\$278,000	\$867,000
3	\$759,000	\$107,000	\$486,000
4	\$6,000	\$108,000	\$366,000
5	\$41,000	\$0	\$76,000
<b>Total</b>	<b>\$4,218,000</b>	<b>\$923,000</b>	<b>\$2,301,000</b>

**Table 1.2 Cost Summary by Priority**

<b>Building</b>	<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
Building 1	\$4,218,000	\$7,431,000	57%
Building 12	\$923,000	\$4,609,000	20%
Building 19	\$2,301,000	\$2,454,000	94%
<b>Overall</b>	<b>\$7,442,000</b>	<b>\$14,494,000</b>	<b>51%</b>

**Table 1.3 Facility Condition Index Value**



***Memphis VA Medical Center,***

***Memphis, TN***



**Date(s) of Assessment: January 17-18, 2008**

**Number of Buildings Assessed: 2**

**Total Cost to Correct Deficiencies: \$16,614,000**

**Total Cost, Priority 1 Deficiencies: \$5,660,000 (or 34%)**

**Total Cost to Replace: \$51,185,000**

**Overall Campus FCI: 32%**

**Size of Research Program: Medium (\$2.5 million to \$4.9 million in VA research funding)**



### Background

This medium sized program focuses mainly on biomedical research, with lesser amounts in the other research disciplines (primarily health services research, but also very small amounts in rehabilitation and clinical research). Its strengths have traditionally been and continue to be autoimmune disease, arthritis, and rheumatology. Neurology, which used to be a program focus area, is making a comeback as there is a strong neuroscience program at the affiliate. Currently focused primarily on Multiple Sclerosis, program leaders would like to develop additional areas of research such as traumatic brain injury.

The facility is affiliated academically with the University of Tennessee, College of Medicine which is located adjacent to the VAMC campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in two buildings (Buildings 1 and 7) on the VA campus with 46,529 nsf of research space (laboratories – 35,610 nsf; VMU – 6,791 nsf; offices – 4,128 nsf). Following is an overview of the buildings, including their age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

The research laboratory and Veterinary Medical Unit (VMU) space is housed on the ground floor of the main hospital building (Building 1) and the ground floor (basement) of Building 7. The research space in Building 1 consists of the VMU and some laboratories which generally are in poor condition. Constructed in 1967, the building underwent seismic corrections in 2006-2007 which included some laboratory upgrades. At the time of the assessment, there was a minor construction project scheduled to begin in late FY 2008 to renovate the VMU and increase its capacity, as well as some of the adjoining space. Some of the laboratories in the general area will not be upgraded due to increasing costs for the project. The remaining (and somewhat newer, dating to the late 1980s) laboratories are in Building 7.

Research space in Building 1 is generally in a state of disrepair, with finishes in poor condition and aging laboratory casework. Previous attempts to upgrade the space have primarily been cosmetic. As noted previously, a major renovation of the VMU and adjoining space was to begin in FY08, thus significantly increasing the VMU space as well as creating functional dry laboratory space. The renovation includes upgrades of mechanical and electrical systems.





**The photos above and below show Building 1 laboratory space in disrepair and in need of significant renovation.**



Research space in Building 7 has fared much better. Dating to the late 1980s, it has obviously been well maintained and most of the aging casework is in good condition. There is a lack of adequate storage, so the laboratories are very crowded. Major equipment is in good working condition. The mechanical systems are aging, but have been well maintained. There is a lack of emergency power for the laboratories, although the emergency generator is in good condition and has adequate capacity. There also is a lack of central monitoring of freezers and other equipment.





Veterinary Medical Unit (VMU): The condition of the VMU is generally fair to poor and it will benefit significantly from the planned renovation. The facility is well kept and clean, but is in need of modernization.

The research space is fully covered by a sprinkler system. Fire alarm systems are in good operating condition.

For the most part, safety showers are readily available to laboratories. Some laboratory sinks are missing eyewashes or have a unit that does not meet current requirements.

#### Other Research Space

Currently there is no designated clinical research space -- research subjects are seen in clinical space. It should be noted that the Memphis VAMC is the lead VA site for the largest and to date most definitive hypertension trial in the world: the Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT). Under the direction of Dr. William Cushman, this trial led to the discovery of a relatively inexpensive treatment for high blood pressure. Dr. Cushman also coordinates the VHA multi-site trial ACCORD: Action to Control Cardiovascular Risks in Diabetes.

The Minor Construction project involved reconfiguring a few existing laboratories as well as space not currently assigned to Research Service into office/dry lab space for health services and clinical research.

#### Security

Research space, including the VMU, is adequately protected with security card readers.

#### Life Safety Hazards

The following life safety hazard identified during the assessment has been remediated by the medical center:

- Emergency eyewashes have been replaced with a type unit that meets current requirements. All laboratories now have emergency eyewashes.

#### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Renovation of Building 1 research space including the VMU -- \$6,586,000 (Minor Construction), to be completed June 2011.



Planning upgrade of HVAC, plumbing, electrical systems as well as asbestos abatement -- \$2.09 million (NRM), to begin fall 2011. This project will remediate many additional deficiencies identified in the assessment.

Correction of emergency eyewash deficiency – \$5,000 (station funds), completed.

#### New Construction

There is no new construction of research space planned at this station.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

Discipline	Correction Cost - Bldg 1	Correction Cost - Bldg 7
Architectural	\$1,222,000	\$1,230,000
Plumbing	\$435,000	\$733,000
HVAC	\$3,828,000	\$6,567,000
Electrical	\$1,280,000	\$1,319,000
Fire Protection	\$0	\$0
Total	\$6,765,000	\$9,849,000

**Table 1.1 Cost Summary by Discipline**

Priority	Bldg 1	Bldg 7
1	\$3,194,000	\$2,466,000
2	\$2,451,000	\$2,056,000
3	\$749,000	\$601,000
4	\$189,000	\$3,965,000
5	\$182,000	\$761,000
Total	\$6,765,000	\$9,849,000

**Table 1.2 Cost Summary by Priority**



<b>Building</b>	<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
Building 1	\$6,765,000	\$19,924,000	34%
Building 7	\$9,849,000	\$31,261,000	32%
Overall	\$16,614,000	\$51,185,000	32%

**Table 1.3 Facility Condition Index Value**



***James H. Quillen VA Medical Center,***

***Mountain Home, TN***



**Date(s) of Assessment: December 9, 2010**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$412,000**

**Total Cost, Priority 1 Deficiencies: \$16,000 (or 4%)**

**Total Cost to Replace: \$2,941,000**

**Overall Campus FCI: 14%**

**Size of Research Program: Small (Under \$2.5 million in VA research funding)**



### Background

Research funding for this small program is focused mainly on rehabilitation research. The program hosts a REAP focusing on auditory and vestibular dysfunction. There is minimal biomedical research funding.

The academic affiliate is East Tennessee State University, James H. Quillen College of Medicine which is housed on the VA campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories and offices were housed in a single building (Building 5) on the VA campus with 5,504 nsf of research space (laboratories – 2,444 nsf and offices – 3,060 nsf). Following is an overview of Building 5, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Building 5 was constructed in 1905 and is on the National Register of Historic Places. In 2001, the building was gutted and totally remodeled, including new systems as well as interior finishes. The three level building houses the laboratory space on the ground level, mechanical space on the first floor, and the Research Service administrative space on the second floor. There are three laboratories and some support spaces, but no animal research facility. The building has shell space currently used for storage that could be built out into additional laboratories or dry laboratory space if funding becomes available. Overall the space is well designed and in good physical condition.



**(Left photo): The overall laboratory design incorporates a light well that links the mechanical space to the laboratories, accommodating utilities and ductwork well while allowing natural light into the spaces. (Right photo): General view of laboratory casework.**



The exterior of the building has some problems that need attention. There are open joints in the coping stones at the roof parapets that need to be resealed, paint is peeling on the metal dormers, and the metal roof soffit grill is rusting. There is a chronic problem in the front of the building where the gutters overflow, as they are not large enough. The gutters should be replaced with larger units.

There is some damage to interior finishes caused by leaks from equipment. Also, the finishes in tissue culture space are not appropriate for the function. In tissue culture areas, the floor and ceiling surfaces should be monolithic for ease in cleaning.

With regard to plumbing, the laboratory water is not appropriately separated from potable water with backflow protection. Also the faucet on the deionized water system is leaking and should be replaced.

Mechanical system deficiencies include exhaust systems that need to be separated (general exhaust vs. fume hood exhaust) and controls need a new front end system (the current front end lacks compatibility).

The electrical system lacks surge protection. There also is no lightning protection system for the building and the laboratory receptacles are not an appropriate type for laboratories.

The building is fully covered by a wet pipe sprinkler system and the fire alarm system is relatively new and in good condition.

Safety showers and emergency eyewashes are installed and located appropriately within the space.

#### Other Research Space

The rehabilitation REAP has a small amount of space that the medical center renovated. The program has potential to grow but would not have contiguous space in which to expand.

#### Security

The building does not have electronic access control or closed circuit television monitoring. There is a waiver in place with the Office of Research and Development, VHA Central Office to cover the lack of electronic security.





### Life Safety Hazards

The following life safety hazard identified during the assessment has been remediated by the medical center:

- An oxygen sensor was installed in a room in which liquid nitrogen was being used.

### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Correction of Priority 1 deficiency, installation of oxygen sensor in room where liquid nitrogen is in use – (station funds), completed.

Correction of remaining Priority 1 deficiencies – (station funds), in progress by local Engineering.

Correction of Priority 2 and 3 deficiencies – Planning and Projects Section, Engineering Service is working on a plan to correct these deficiencies as part of a renovation project.

### New Construction

There is no new construction of research space planned at this station.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Bldg. 5</b>
Architectural	\$132,000
Plumbing	\$16,000
HVAC	\$155,000
Electrical	\$109,000
Fire Protection	\$0
<b>Total</b>	<b>\$412,000</b>

**Table 1.1 Cost Summary by Discipline**



Priority	Bldg. 5
1	\$16,000
2	\$237,000
3	\$122,000
4	\$0
5	\$37,000
<b>Total</b>	<b>\$412,000</b>

**Table 1.2 Cost Summary by Priority**

Correction Cost	Replacement Cost	FCI
\$412,000	\$2,941,000	14%

**Table 1.3 Facility Condition Index Value**





***Tennessee Valley Healthcare System,***

***Nashville Campus,***

***Nashville, TN***



**Date(s) of Assessment: December 4-5, 2007**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$15,063,000**

**Total Cost, Priority 1 Deficiencies: \$5,219,000 (or 35%)**

**Total Cost to Replace: \$35,495,000**

**Overall Campus FCI: 42%**

**Size of Research Program: Large (\$5 million to \$9.9 million in VA research funding)**



### Background

Funding for this large research program is predominantly for biomedical research, but also in lesser amounts for the other research disciplines (rehabilitation, health services, and clinical research). The facility is the site of a VA Research Clinical Center of Excellence, one of only two nationwide, as well as a health services program. There also is a GRECC funded through the medical care appropriation with a significant research component.

The primary academic affiliation for the Nashville VAMC is Vanderbilt University School of Medicine.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and offices were housed in a single building (the ACRE Building) on the VA campus with nearly 34,000 nsf of research space (laboratories – 23,055 nsf; VMU – 6,691 nsf; offices – 1,922 nsf; storage – 1,985 nsf). Following is an overview of the building, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

The Ambulatory Care and Research Expansion (ACRE) Building was constructed in the early 1980s and is connected to the main hospital. Research laboratories are housed on the third, fourth, and fifth floors. The VMU occupies the sixth floor, and Research Service administrative spaces are on the second floor. Overall, research at the Nashville VAMC is housed in an aging, overcrowded facility with fairly significant infrastructure deficiencies.

Laboratories are relatively small – most are 200-400 square feet and have original finishes and fixtures. Laboratory areas are contiguous and completely separate from other functions within the hospital.

The laboratories on the third and fourth floors are original construction with poor lighting and poor environmental conditions throughout. Floors are in poor condition with some tiles attached to the floor with tape. Stained ceiling tiles indicate leakage. Casework is in poor condition. Furnace filters are placed over air vents to minimize dispersion of particulates from the ductwork. Corrosion is evident in cold rooms, the worst of which shows signs of mold. Walls have not been painted in several years. There also is leakage of water and air around windows that are not properly gasketed. The fifth floor laboratories are in somewhat better condition. Overall, equipment is aging and in need of replacement.



One problem that stood out during the assessment of laboratories was the obvious lack of attention to housekeeping in the research spaces, particularly the flooring in common hallways which would benefit significantly from regularly servicing.



**Since the time of the space assessment, this station has renovated one floor of laboratories and obtained funds to renovate the remaining space. The three photos above show typical laboratories as they appeared at the time of the assessment (December 2007). The photos below show renovated space on the fifth floor. At left is the open floor plan being utilized in the new laboratory design. The photo at right shows one of two animal procedure rooms also located on the fifth floor.**



The VMU is well maintained. Currently there is ample capacity for mice and rats. However, if the animals currently housed at the affiliate were required to be moved to the VAMC, there would not be adequate capacity. The VMU experienced the failure of an air handler in August 2007. Research management, VMU staff, and engineering responded appropriately and prevented the loss of any animals, but ongoing experiments were interrupted causing investigators to lose valuable results. Currently there is a project in design phase to replace the two air handling units that serve the VMU.





The facility previously had a BSL-3 laboratory that was decommissioned several years ago. Fairly extensive renovations would be required for the facility to be used as a containment facility in the future.

The building is fully covered by a sprinkler system. The fire alarm system is relatively new and in good condition.

Some safety showers and emergency eyewashes do not meet current requirements.

#### Security

The laboratory areas are secured by controlled access points from the staircases and common areas connecting the research wing to the hospital. There are security cameras installed in elevator lobbies.

#### Life Safety Hazards

The following life safety hazard identified during the assessment has been partially remediated by the medical center and will be completed as part of upcoming laboratory renovation projects:

- Some safety showers and emergency eyewashes do not meet current requirements. (This deficiency was corrected in the renovation of laboratory space on the fifth floor.)

#### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Renovation of laboratories, Phase I -- \$4,303,000 (ARRA funds), completed.

Upgrade and paralleling of generator -- \$1,890,000 (ARRA funds), completed.

Renovation of laboratories, Phase II (fourth floor) – \$5,060,000 (NRM FY11), construction out for bid.

Renovation of laboratories, Phase III (third floor) -- \$5,106,000 (NRM FY11), design out for bid. Construction expected in FY12.

#### New Construction

There is no new construction of research space planned at this station. There is extensive renovation planned for existing research space.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by



discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Correction Cost</b>
Architectural	\$4,411,000
Plumbing	\$1,437,000
HVAC	\$7,110,000
Electrical	\$2,105,000
Fire Protection	\$0
<b>Total</b>	<b>\$15,063,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Correction Cost</b>
1	\$5,219,000
2	\$6,857,000
3	\$1,497,000
4	\$350,000
5	\$1,140,000
<b>Total</b>	<b>\$15,063,000</b>

**Table 1.2 Cost Summary by Discipline**

<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
\$15,063,000	\$35,495,000	42%

**Table 1.3 Facility Condition Index Value**





## VISN 10: VA Healthcare System of Ohio



<i>Sta. ID</i>	<i>VA Site Surveyed</i>	<i>City/State</i>
539	Cincinnati VA Medical Center	Cincinnati, OH
541	Louis Stokes VA Medical Center	Cleveland, OH

### Section 3. Description of VA Research Infrastructure





## ***Cincinnati VA Medical Center***

***Cincinnati, OH***



**Date(s) of Assessment: September 9-10, 2009**

**Number of Buildings Assessed: 2**

**Total Cost to Correct Deficiencies: \$8,655,000**

**Total Cost, Priority 1 Deficiencies: \$1,928,000 (or 22%)**

**Total Cost to Replace: \$21,364,000**

**Overall Campus FCI: 41%**

**Size of Research Program: Medium (\$2.5 million to \$4.9 million in VA research funding)**





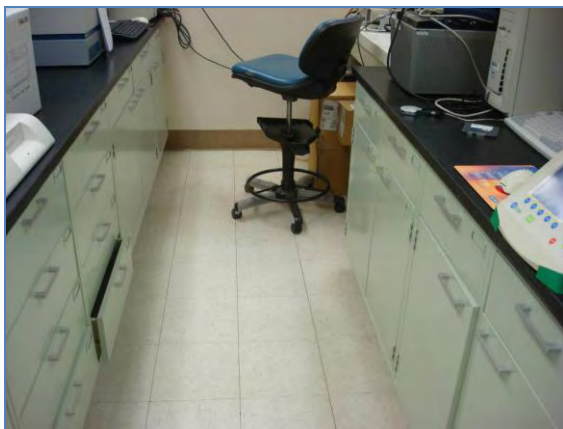
### Background

This medium sized research program focuses predominantly on biomedical research. The station is affiliated with the University of Cincinnati College of Medicine located adjacent to and less than a mile from the VA campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and offices were housed in two buildings (Buildings 1 and 15) on the VA campus with 21,858 nsf of research space (laboratories – 14,907 nsf; VMU – 3,402 nsf; offices – 3,549 nsf). The two buildings are interconnected by a bridge at the third and fourth levels, and an underground corridor at the basement level. Following is an overview of both buildings, including their age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Building 1 is the main hospital building constructed in 1951 with ten levels (nine floors above ground plus a basement) and a penthouse. Research laboratories are housed on the fourth floor, having been converted from prior clinical space in the 1980s. The laboratories are overcrowded, with insufficient clearances exacerbated by equipment stored in the laboratories. Most floor and wall finishes are in good condition, although some have minor damage. Some ceiling tiles are damaged due to water leakage from overhead steam pipes. Laboratory casework is aging, and some has significant corrosion. Most fixed equipment is in good operational condition.



**Laboratories in Building 1 were retrofitted into former clinical space. There are insufficient clearances between benches (left photo above) and general overcrowding due to lack of sufficient storage space.**



The most costly deficiencies in Building 1 are related to the mechanical systems. The air handling unit serving the research laboratories is not of an appropriate type to serve a research environment and it is beyond its useful life. The exhaust system is inadequate and also does not have the minimum ten foot vertical discharge stack required by both NIH and VA design guidelines. The older type pneumatic controls are still in use on the AHU and other mechanical system equipment.

Another significant deficiency is the lack of backflow prevention to protect the water supply throughout the hospital from the domestic water supply in the laboratory areas. Research and clinical areas also share vacuum systems which is inappropriate.

The electrical system serving the research laboratory area is currently being upgraded, both for normal and emergency power.

Building 15 is a five level (four levels above ground plus a basement) building constructed in 1972 as a research building. It currently houses laboratories on the second through fourth floors and the Veterinary Medical Unit (VMU) on the first floor. The basement houses mechanical and electrical equipment. Most finishes within Building 15 are in good to fair condition, although the interior partitions between laboratories are not of a type appropriate for a research environment. The VMU is in good condition, although the epoxy floor is in need of replacement. The team was informed during the survey that the contractor who updated the floor did not do an adequate job and is redoing the work in several areas within the VMU.

Casework and fixed equipment in the laboratories are in need of replacement. Equipment in the VMU is in good condition, and the station was recently awarded funding for a new cage washer. There also are fairly significant systems deficiencies in Building 15. Specifically, the AHU serving the VMU is beyond its useful life and is unable to maintain temperature and humidity. The current system also is not adequate for the cooling and heating load within the VMU and it is not served by emergency power.



**The laboratories in Building 15 are in need of renovation. The photo at left shows typical laboratory casework with inappropriate plastic laminate countertops. At right, the epoxy flooring in the VMU was deteriorating in spite of being recently updated. The contractor who performed the work was correcting the problem areas.**

The electrical system is deficient in several areas. The equipment is aging and in poor condition. Although it has been well maintained, replacement parts are becoming very difficult to obtain. The capacity of the current system cannot be increased. The emergency system also is deficient. No air handling or exhaust equipment is served by emergency power, nor are receptacles feeding refrigerators and freezers. The only back-up power in the VMU is for emergency lighting.

Both buildings are protected by a fire suppression sprinkler system. New fire alarm systems were installed in 2002.

Building 15 has a number of safety showers and eyewashes that do not meet requirements either for the type of unit or the location.

#### Other Research Space

In addition to laboratory space in Building 1, the program also has a General Clinical Research Center (GCRC) located in space on the fourth floor. Part of the renovation of this clinical research space was funded by the University of Cincinnati. The GCRC consists of two monitored rooms, a fully equipped cardio-pulmonary physiology laboratory with radiographic capability and equipment for noninvasive cardiac assessments, an exercise laboratory, a sleep laboratory, an investigational pharmacy, a phlebotomy and sample processing laboratory, a nurses' station, and five outpatient examination rooms. There is additional storage and freezer support space in an adjacent building. The clinical research space and the operation/staffing of the GCRC are an impressive part of the Cincinnati VAMC research program.



### Security

Electronic card key systems control access to research spaces in both buildings. At the time of the assessment, a problem existed with regard to the system in Building 15, i.e., although the system is supposed to alarm to the campus Police Service, it only rang locally within the building. Immediately following the assessment the station was working to resolve this technical problem.

### Life Safety Hazards

The following life safety hazards identified during the assessment have not been remediated by the medical center, but the ones affecting Building 15 are expected to be resolved during the upcoming renovation.

- Not all receptacles near water sources are ground fault protected (both buildings).
- Safety showers and eyewash units in Building 15 do not meet requirements.

### Improvements Made Since Assessment:

This station has made and/or initiated improvements following the assessment, including:

Planning construction of new research building (see “New Construction” below).

Renovation of laboratories (Phase 2), Building 15 -- \$900,000 (NRM FY10), design complete. Awaiting additional funds for construction.

### New Construction

A building formerly used for research (Building 5) has been demolished for the creation of a new research building funded through the Minor Construction mechanism. The first phase (first two floors) has completed design and is expected to break ground in early 2012. The second phase (two additional floors) should begin design in early 2012. Construction of the new research building will help this program continue to build on its solid foundation.

Additionally, renovation of laboratories in Building 15 has been funded through NRM and will begin soon.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.



<b>Discipline</b>	<b>Correction Cost - Bldg 1</b>	<b>Correction Cost - Bldg 15</b>
Architectural	\$183,000	\$1,842,000
Plumbing	\$276,000	\$207,000
HVAC	\$3,184,000	\$1,208,000
Electrical	\$511,000	\$1,244,000
Fire Protection	\$0	\$0
<b>Total</b>	<b>\$4,154,000</b>	<b>\$4,501,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Bldg 1</b>	<b>Bldg 15</b>
1	\$667,000	\$1,261,000
2	\$1,265,000	\$2,036,000
3	\$120,000	\$315,000
4	\$1,110,000	\$813,000
5	\$992,000	\$76,000
<b>Total</b>	<b>\$4,154,000</b>	<b>\$4,501,000</b>

**Table 1.2 Cost Summary by Priority**

<b>Building</b>	<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
Bldg 1	\$4,154,000	\$8,578,000	48%
Bldg 15	\$4,501,000	\$12,786,000	35%
<b>Overall</b>	<b>\$8,655,000</b>	<b>\$21,364,000</b>	<b>41%</b>

**Table 1.3 Facility Condition Index Value**



***Louis Stokes VA Medical Center,***

***Cleveland, OH***



**Date(s) of Assessment: July 22-23, 2010**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$5,176,000**

**Total Cost, Priority 1 Deficiencies: \$439,000 (or 8%)**

**Total Cost to Replace: \$40,939,000**

**Overall Campus FCI: 13%**

**Size of Research Program: Very Large (Over \$10 million in VA research funding)**





### Background

This very large research program falls in the top 15 of all VA research programs and is in the top 20 programs for overall research funding. VA funding for this program increased dramatically over the past few years. About half of the VA funding is for rehabilitation research, as the program hosts two rehabilitation COEs. There also is significant funding for biomedical and clinical research, and some funding for health services research.

The academic affiliate is Case Western Reserve University, the Schools of Medicine, Dentistry, and the Frances Payne Bolton School of Nursing. The university is located near the VA campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and offices were housed in a single building (Building 1 K-Wing) on the Wade Park campus with over 35,000 nsf of research space (laboratories – 23,755 nsf; VMU – 5,644 nsf; offices – 6,371 nsf). Following is an overview of Building 1 K-Wing, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

K-Wing was constructed in approximately 1974 and houses laboratories on the first and second floors, and the VMU on the basement level. The laboratories were renovated within the past ten years and the VMU is undergoing two planned phases of renovation which will likely correct many if not all of the deficiencies identified in the assessment.

With the exception of two rooms, laboratories on the first and second floors have been renovated over the past ten years and are in very good condition with new floor, ceiling, and wall finishes, as well as casework and fixed equipment. The two rooms not previously renovated would benefit significantly from improvements. It was also noted that the location of some fixed equipment (glassware washers and sterilizers in an elevator alcove) is less than ideal for the purpose, as heat builds up when the equipment is operational.

The roof is about ten years old and, with the exception of some areas onto which construction debris has fallen, is in good condition. Windows are original to the building and should be replaced for energy savings and to reduce opportunity for leakage.

By far the most significant deficiencies in the space are with the plumbing and mechanical systems. On the plumbing side, there is no appropriate separation



between laboratory and potable water, nor is there separation between laboratory and medical systems for compressed air, vacuum, and oxygen.



**(Left photo): This new fume hood (in a renovated laboratory) has a removable flammable storage cabinet. The hood converts to an accessible hood. (Right photo): One of two laboratory spaces that has not been renovated.**

Emergency showers and eyewashes are appropriate and provided with tempered water. Smoke detection devices should be located in the corridors where sprinklers are currently lacking. The fire alarm system is in good condition.

A wet pipe sprinkler system runs throughout laboratory areas, but is not present in the corridors. The system should be extended to ensure full coverage for enhanced fire protection.

The extensive mechanical system deficiencies include need for new air handling units, rebalancing of the system, and a new cage wash exhaust system in the VMU. It should be noted that one of the two air handling units serving the VMU is only about two years old and in good condition, but lacks some features required for animal research facilities. A new air handling unit will be installed as part of the VMU renovation. The mechanical deficiencies constitute a significant portion (over 50%) of the correction costs identified in this report.

Both normal and emergency electrical systems are in relatively good condition, with the exception of some aging panel boards that should be replaced to increase capability of expansion. It was noted that there is no surge suppression on the switchboards or distribution panels. Also, in some locations (on the second floor and in the VMU) near water sources receptacles are lacking ground fault protection.

With regard to lighting, overall the system is in good condition. In the VMU, however, the fixtures need to be gasketed to protect against water infiltration.



### Other Research Space

Dry laboratory and patient interview space for the Center for Functional Electrical Stimulation (FES) is housed in a beautiful, recently constructed suite in the hospital, while the administrative staff of FES is in leased space off-site. The FES is a very large, well established COE and there is insufficient space on the VA campus to house the center in its entirety. It was noted that the computer room does not have emergency power which should be added. This situation has caused some extensive delays in processing data due to power outage.

The Center for Advanced Platform Technology (APT) is currently in “swing space” awaiting designation and renovation of space elsewhere in the hospital for investigators and administrative staff. The APT has laboratories on the basement level of the hospital and some biomedical laboratory space on the second floor of K-Wing.

The hospital leadership is highly supportive of research, and has provided extensive space for the program. The Engineering Service is managing an extensive array of construction and renovation projects while also providing excellent support for research.

### Security

There is appropriate electronic security throughout the laboratory and animal research areas.

### Life Safety Hazards

The following life safety hazards identified during the assessment have not been remediated by the medical center:

- The research space is covered by a wet pipe sprinkler system, but corridors are lacking sprinklers. Smoke detection devices should be located in the corridors where sprinklers are currently lacking.
- Not all receptacles near water sources are ground fault protected.

### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Renovation of VMU, Phase 1 -- \$4 million (NRM FY09), in progress, estimated completion September 2011.

Renovation of VMU, Phase 2 -- (ARRA funds), estimated completion in 2012.



Renovation of approximately 15,000 square feet of basement level space into research laboratories -- \$4,560,000 (Minor Construction), in progress, estimated completion July 2011.

Renovation of additional 10,000 square feet of basement level space into research laboratories -- \$3,120,000 (ARRA), approved for design FY11, construction FY12.

Planned renovation of existing research laboratories, K-Wing -- \$6,930,000, submitted for consideration under FY13 SCIP plan.

Planned renovation of current pharmacy space into clinical research unit, Building 1 (station funds) – estimated completion summer 2013.

### New Construction

There is extensive construction underway at the Wade Park campus as the facility enlarges to consolidate with the Brecksville campus. In addition to construction of a bed tower and extensive renovations to clinical areas of the facility, research space is being expanded as well. There currently are plans to completely renovate extensive laboratory space on the basement level and create a new clinical research unit (CRU) on the first floor of the hospital in order to consolidate clinical research activities and make the facilities accessible to patients. The CRU will include space for patient examinations, blood draw, file storage, offices (for study coordinators), a reception area, and a waiting room.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Bldg. 1</b>
Architectural	\$378,000
Plumbing	\$934,000
HVAC	\$3,291,000
Electrical	\$283,000
Fire Protection	\$290,000
<b>Total</b>	<b>\$5,176,000</b>

**Table 1.1 Cost Summary by Discipline**



<b>Priority</b>	<b>Bldg. 1</b>
1	\$439,000
2	\$2,777,000
3	\$1,960,000
4	\$0
5	\$0
<b>Total</b>	<b>\$5,176,000</b>

**Table 1.2 Cost Summary by Priority**

<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
\$5,176,000	\$40,939,000	13%

**Table 1.3 Facility Condition Index Value**



## VISN 11: Veterans in Partnership



<i>Sta. ID</i>	<i>VA Site Surveyed</i>	<i>City/State</i>
506	VA Ann Arbor Healthcare System	Ann Arbor, MI
553	John D. Dingell VA Medical Center	Detroit, MI
583	Richard L. Roudebush VA Medical Center	Indianapolis, IN







***VA Ann Arbor Healthcare System,***

***Ann Arbor, MI***



**Date(s) of Assessment: November 5-7, 2008**

**Number of Buildings Assessed: 2**

**Total Cost to Correct Deficiencies: \$7,279,000**

**Total Cost, Priority 1 Deficiencies: \$1,625,000 (or 22%)**

**Total Cost to Replace: \$39,335,000**

**Overall Campus FCI: 19%**

**Size of Research Program: Very Large (over \$10 million in VA research funding)**



### Background

VA research funding for this very large program is focused primarily in biomedical laboratory and health services research, with lesser funding in clinical and rehabilitation research. This program hosts a health services COE, the Center for Clinical Management Research, the Coordinating Center for the Diabetes Mellitus Quality Enhancement Research Initiative (QUERI), and a REAP focusing on pulmonary disease. There is also a GRECC with an active research component.

The academic affiliate is the University of Michigan (UM) School of Medicine located near the VA campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories and the Veterinary Medical Unit (VMU) were housed in two buildings on the VA campus with a combined total of just under 34,000 nsf of research space (laboratories – 24,104 nsf; VMU – 7,005 nsf; offices – 2,868 nsf). Following is an overview of each building housing research, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Building 22, constructed in 1971, is a two story building with research laboratories on both floors. This 40 year old building has had little in the way of renovations over the years, but has been well maintained. Most wall, floor, and ceiling finishes are in good condition, although some of the flooring was installed with mastic containing asbestos. A few laboratories have had casework replaced, but most of the casework is original to the building and in need of replacement. Some equipment is nearing or at the end of its useful life (fume hoods, one cold room) and should be replaced. The autoclave and glassware washer are in good condition. Emergency showers are appropriately located in hallways, but do not include eyewashes. There are eyewashes in the laboratories, but they are dated and should be replaced.

With regard to systems, the electrical system (including emergency power) is in good condition. However, there is no central monitoring system in use. The mechanical systems are in need of replacement in order to ensure proper temperature and humidity control and to ensure redundancy on the exhaust and air supply systems.

The building is fully covered by a fire suppression sprinkler system and has adequate fire alarm protection. However, there are no strobe lights included on the system.



**The space in Buildings 22 and 31 are dramatically different. The photos above of Building 22 are indicative of the space and the systems having had little or no updates in the past 40 years. (Left: a typical Bldg 22 laboratory; right: the heating hot water heat exchanger that is original to the building.)**

**The photos below are of Building 31. (Left: a typical Bldg 31 laboratory; right: the seamless flooring used in the laboratories is cracking at corners and at the base of cabinets.)**



Building 31 was constructed in 1995. It is a three level building (two floors above ground, plus a basement) that houses laboratories on the top two floors and the VMU on the basement level. Building 31 has very well designed laboratories and support spaces, and laboratory finishes and casework are in good condition. The one exception is a problem with the flooring at the base of casework where the seamless vinyl is cracking.



Several equipment items in the VMU are problematic, including the cage rack washer, tunnel washer, and autoclaves. There are two cold rooms that experience chronic mold.

There also have been some problems experienced with the mechanical system. Specifically, in the laboratory areas there are dirt particulates coming from the system. This problem has been extensively investigated, but so far the source has not been determined. There also are deficiencies with regard to humidity with relation to one specific air handling unit. Finally, there are significant odors and problems with room pressurization experienced in the VMU on the basement level. While some temporary 'fixes' might help these situations, the problems should be further studied to determine their cause and corrective action taken. Once that is accomplished, the system should be rebalanced.

As with Building 22, the electrical system overall in Building 31 is good. However, the building lacks a central monitoring system and needs to have strobe lights added to the otherwise good fire alarm system. The building is fully protected by a sprinkler system. Emergency showers with eyewashes are appropriately located in the corridors. The eyewashes at laboratory sinks, however, are an incorrect type.

#### Other Research Space

The Center for Clinical Management Research formerly occupied off-site leased space, but moved back to the VA campus about five years ago. Currently the center primarily occupies space on the third floor of the main hospital building. Supplemental space is located in a temporary building on campus (T-4) which houses approximately ten staff. To accommodate recent growth, the Center has acquired a former biomedical laboratory that still has its built-in casework as well as several large pieces of equipment. The laboratory has been made into office space by placing desks between the laboratory benches with the intent of housing eight staff. The Center and QUERI currently have over 30 investigators and a large staff, and expect to exceed their current space capacity within the next two years if not sooner.

The GRECC occupies space in Building 28 which also houses an extended care facility. The space consists of a mixture of offices and laboratories. Some GRECC investigators conduct their research at UM in space that would be very costly to duplicate at the VAMC.

It is noteworthy to mention that the Research Service occupies perhaps the least amount of administrative/office space seen to date. There is so little space available that the ACOS/R&D has given up his office to be shared by two staff, while he works from an office in Department of Medicine space.



There is no space dedicated for clinical research. All clinical research studies occur in clinical areas.

#### Security

Access to research space is protected by card readers at building entrances. The VMU has an Edstrom Watchdog System with touch key pads at the entrances and at each animal room. The elevator to the VMU is controlled by a card reader.

#### Life Safety Hazards

The following life safety hazard identified in the assessment is in the process of being remediated:

- Safety showers and emergency eyewashes that meet current requirements will be installed. (Project to be completed in FY 2012.)

The following additional life safety hazard identified during the assessment has not been remediated by the medical center:

- The fire alarm system is lacking strobe lights (which is an accessibility issue).

#### Improvements Made Since Assessment

This station has made and/or initiated significant improvements following the assessment, including:

Correction of Priority 1 deficiency, replacement of eyewashes and safety showers – (station funds), in design, to be completed in FY12.

Correction of exterior building deficiencies, Building 22 – \$165,000 (NRM FY10), completed.

Correction of mechanical system deficiency, i.e., installed variable volume controls, Building 31 -- \$210,000 (NRM FY10), completed.

Completion of master plan, Building 22 -- \$150,000 (NRM FY11), underway.

Replacement of flooring -- \$50,000 (NRM FY11), pending outcome of Building 22 master plan.

Replacement of countertops -- \$35,000 (NRM FY11), pending outcome of Building 22 master plan.

#### New Construction

There is no new construction for research planned for this campus.





### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Correction Cost - Bldg 22</b>	<b>Correction Cost - Bldg 31</b>
Architectural	\$1,550,000	\$991,000
Plumbing	\$15,000	\$0
HVAC	\$954,000	\$3,102,000
Electrical	\$226,000	\$441,000
Fire Protection	\$0	\$0
<b>Total</b>	<b>\$2,745,000</b>	<b>\$4,534,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Bldg 22</b>	<b>Bldg 31</b>
1	\$390,000	\$1,235,000
2	\$586,000	\$1,040,000
3	\$1,394,000	\$1,659,000
4	\$375,000	\$600,000
5	\$0	\$0
<b>Total</b>	<b>\$2,745,000</b>	<b>\$4,534,000</b>

**Table 1.2 Cost Summary by Priority**

<b>Building</b>	<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
Building 22	\$2,745,000	\$10,602,000	26%
Building 31	\$4,534,000	\$28,733,000	16%
<b>Overall</b>	<b>\$7,279,000</b>	<b>\$39,335,000</b>	<b>19%</b>

**Table 1.3 Facility Condition Index by Value**



***John D. Dingell VA Medical Center,***

***Detroit, MI***



**Date(s) of Assessment: April 28-29, 2010**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$6,419,000**

**Total Cost, Priority 1 Deficiencies: \$2,178,000 (or 34%)**

**Total Cost to Replace: \$54,161,000**

**Overall Campus FCI: 12%**

**Size of Research Program: Medium (\$2.5 million to 4.9 million in VA research funding)**



### Background

This medium sized research program is primarily funded for biomedical research, with a fairly new component of rehabilitation research focused on traumatic brain injury and a growing clinical research program. The program has several Research Career Scientists/Senior Research Career Scientists, as well as Career Development program awardees.

The program is academically affiliated with Wayne State University School of Medicine located adjacent to the VA campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting office space were housed in a single building (Building 100) on the VA campus with just over 42,000 nsf of research space (laboratories – 24,000 nsf; VMU – 15,000 nsf; offices – 3,300 nsf). Following is an overview of Building 100, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Building 100, also known as the Red Tower, was constructed in 1996 and is a six story building (five floors above ground plus a basement) with mechanical penthouse. The building has been very well maintained and has all original finishes, systems, and equipment. However, the building is reaching the age at which systems are beginning to wear and are in need of correction or replacement. This will lead to increased workload for engineering/maintenance staff over the next few years. There also appear to have been some items that were not well done when the building was constructed. An example of this is the piping for the sprinkler system which is of inferior grade and is now requiring replacement, not only in the research space but throughout the hospital.



**Building 100 is at the age where significant problems will begin to show. (Left: The roof is not leaking yet, but it is beginning to deteriorate. Center: Evidence of leakage and corrosion at an air handling unit. Right: Standing water in an air handling unit.**



The facility has ample research laboratory space to house its current program and allow future growth. Generally, the finishes are good, laboratory casework is in good condition, and most fixed equipment is in good condition with a few exceptions. One autoclave (fourth floor) and the cage washer in the VMU should be replaced.

There generally is a lack of adequate storage and laboratories are cluttered with boxes and other items that are crowding the space. There are a few areas that generally are not accessible because of the overcrowding.

The VMU is quite large and is one of the nicer VA animal facilities assessed.

The roof is original to the building and, although there do not seem to be leaks currently, there is some ponding of water which indicates inadequate drainage.

With regard to plumbing, there is no backflow protection between laboratory and potable water systems. Backflow prevention should be installed to prevent cross-contamination.

The aging mechanical systems are becoming problematic. There are a number of issues including water standing in an air handling unit, a leaking pumping system, lack of redundancy (for cooling) in the VMU, and problems with the steam heating/humidification system. The energy recovery unit also is leaking. There is no redundancy in exhaust for laboratories. The HVAC system in the VMU is on emergency power, but the laboratory HVAC is not served by emergency power. Controls are being replaced but about 90% are still the old, pneumatic type. The domestic hot water system is aging and needs replacement.

Most of the key electrical system deficiencies focus on energy conservation, including the need to convert lighting fixtures to T8 or T5 lamps, and some issues with the electrical distribution system. Also, there is no transient voltage surge suppression on the system. Lighting fixtures in the VMU are the (appropriate) gasketed type fixtures for use in wet areas.

The research space is fully covered by a wet pipe sprinkler system. The piping is reported to be leaking and is in need of replacement. The fire alarm system is lacking alarm initiation devices in the laboratories.

Emergency eyewashes and safety showers are installed in all of the laboratories. However, tempered water is not provided to the units as required.



### Security Issues

There is appropriate electronic security throughout the laboratory and animal research areas.

### Life Safety Hazards

The following life safety hazards identified during the assessment have been or are in the process of being remediated by the medical center:

- A safety shower and emergency eyewash were installed in the cage wash area of the VMU.
- An emergency eyewash has been installed in the darkroom (B4307). A safety shower is in the process of being installed. (ORD provided funds to correct this deficiency.)

The following additional deficiency falls under the category of “life safety hazard” and has not been addressed to date:

- Electrical receptacles within six feet of water sources are not ground fault protected.

### Improvements Made Since Assessment

This station has made and/or initiated the following improvements following the assessment:

Correction of two Priority 1 deficiencies, replaced two cage washers in the VMU -- \$279,741 (VACO ORD Shared Equipment Program), completed.

Installed emergency eyewash and shower in the cage wash area of the VMU -- (station funds), completed. Emergency eyewash installed in darkroom (funded by ORD). The safety shower also needed in the darkroom is in the process of being remediated.

### New Construction

There is no new construction for research planned for this campus.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.



<b>Discipline</b>	<b>Bldg. 100</b>
Architectural	\$1,313,000
Plumbing	\$985,000
HVAC	\$3,213,000
Electrical	\$579,000
Fire Protection	\$329,000
<b>Total</b>	<b>\$6,419,000</b>

Table 1.1 Cost Summary by Discipline

<b>Priority</b>	<b>Bldg. 2</b>
1	\$2,178,000
2	\$2,593,000
3	\$992,000
4	\$656,000
5	\$0
<b>Total</b>	<b>\$6,419,000</b>

Table 1.2 Cost Summary by Priority

<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
\$6,419,000	\$54,161,000	12%

Table 1.3 Facility Condition Index Value







***Richard L. Roudebush VA Medical Center,  
Indianapolis, IN***



**Date(s) of Assessment: June 12-13, 2008**

**Number of Buildings Assessed: 2 wings of 1 building**

**Total Cost to Correct Deficiencies: \$2,698,000**

**Total Cost, Priority 1 Deficiencies: \$343,000 (or 13%)**

**Total Cost to Replace: \$29,667,000**

**Overall Campus FCI: 9%**

**Size of Research Program: Large (\$5 million to \$9.9 million in VA research funding)**



### Background

Funding for this large VA research program is concentrated heavily in biomedical and health services research, with significantly lesser funding for rehabilitation and clinical research. The program hosts a health services COE as well as a QUERI Center.

The academic affiliate is Indiana University School of Medicine.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories were housed in two wings of the main hospital building with over 38,000 nsf of research space (laboratories – 24,960 nsf (including a BSL-3 laboratory) and offices – 13,509 nsf). There is no animal research facility at this station. Following is an overview of each wing housing research, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

C Wing, constructed in 1952, houses laboratories on the third, sixth, seventh, and eighth floors. The BSL-3 laboratory suite was constructed in 2003. There has been discussion regarding the possible decommissioning of the BSL-3, since its use within research has declined. However, the hospital would benefit from being able to use the laboratory for clinical purposes.

D Wing, constructed in 1982, was originally designed as a research facility. Currently, however, laboratories occupy only the second and third floors.



**Endocrinology analytical core laboratory**



**A typical laboratory**



There currently is a significant amount of unoccupied laboratory space at this facility, some of which has been upgraded and is targeted for possible recruitments. It would seem logical to relocate some investigators from the older, unimproved laboratories to the newly renovated ones, thus being able to more effectively allocate the laboratory space while recouping space for conversion to badly needed offices. The research leadership has considered relocating the Research Service administrative offices to what is now laboratory space on the seventh floor of C Wing. This would seem to be counterproductive, since it is less space than currently needed for administrative functions.

Generally, all of the laboratories are in good condition, in large part due to the high level of maintenance provided by the medical center. The “worst” laboratories at this facility are in better condition than the “best” laboratories at many other medical centers.

In terms of support systems, the mechanical systems in C Wing are the most deficient. One of the five air handling units needs to be replaced and some of the hood exhaust systems do not meet current design standards. There also is no central backflow protection on the incoming laboratory water systems to protect the hospital system from accidental contamination.

Plans are underway to replace the electrical power system, although the system has been well maintained and is in fair condition. Emergency power is also being replaced, as the generators have limited capacity. Currently there are laboratories housing refrigerators and freezers not on emergency power. Central monitoring for equipment and lighting is lacking.

All laboratory areas are fully covered by a wet pipe sprinkler system. Fire alarm systems are appropriate and in good condition.

Safety showers are in or accessible to laboratory areas. Some laboratories are missing emergency eyewashes.

#### Other Research Space

The health services COE and QUERI Center occupy space primarily on the sixth floor, with overflow space on the second and fifth floors. The health services group has been growing at a rate of 30% per year and is predicting an increase of 20 FTE by the end of 2008. Additional dry laboratory space is needed in order to maintain their momentum. (Note: Since the time of the assessment, additional office space (approximately 3,100 square feet) was provided for health services research by the medical center.)

There is a small designated clinical research unit (CRU) consisting of five rooms that are shared with the sleep clinic which uses the space at night. There is no



space for files or study coordinators (they are spread out in clinical space) and there are currently no plans to expand the unit.

#### Security Issues

Security is challenging due to the location of research laboratories in close proximity to clinical space. The exception is the BSL-3 laboratory which has access controlled by card readers.

#### Life Safety Hazards

The following life safety hazard identified during the assessment has been remediated by the medical center.

- Emergency eyewash units were installed in the laboratories on both C and D wings.

#### Improvements Made Since Assessment

This station has made and/or initiated the following improvements following the assessment:

Renovation of third floor research laboratory -- \$40,000 (funding source unidentified), underway for completion in August 2011.

Correction of safety deficiencies, C and D wings, including Priority 1 life safety hazard (install eyewashes) and asbestos abatement -- \$45,000 (NRM FY10), completed.

Upgrade of emergency power, C and D wings -- \$200,000 (NRM FY10), completed.

Planning replacement of exhaust fans -- \$750,000, planned future project.

Planning replacement of air handling units -- \$750,000, planned future project.

#### New Construction

The facility has applied for minor construction funding (for FY13) for a new 16,000 square foot research building at a cost of \$9.8 million.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.



<b>Discipline</b>	<b>Corrections Cost - C Wing</b>	<b>Corrections Cost - D Wing</b>
Architectural	\$131,000	\$97,000
Plumbing	\$532,000	\$166,000
HVAC	\$1,068,000	\$503,000
Electrical	\$0	\$201,000
Fire Protection	\$0	\$0
<b>Total</b>	<b>\$1,731,000</b>	<b>\$967,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>C Wing</b>	<b>D Wing</b>
1	\$318,000	\$25,000
2	\$125,000	\$421,000
3	\$743,000	\$295,000
4	\$525,000	\$4,000
5	\$20,000	\$222,000
<b>Total</b>	<b>\$1,731,000</b>	<b>\$967,000</b>

**Table 1.2 Cost Summary by Priority**

<b>Building</b>	<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
C Wing	\$1,731,000	\$20,047,000	9%
D Wing	\$967,000	\$9,620,000	10%
<b>Overall</b>	<b>\$2,698,000</b>	<b>\$29,667,000</b>	<b>9%</b>

**Table 1.3 Facility Condition Index Value**







## VISN 12: VA Great Lakes Health Care System



<i>Sta. ID</i>	<i>VA Site Surveyed</i>	<i>City/State</i>
<i>537</i>	<i>Jesse Brown VA Medical Center</i>	<i>Chicago, IL</i>
<i>578</i>	<i>Edward Hines Jr. VA Hospital</i>	<i>Hines, IL</i>
<i>607</i>	<i>William S. Middleton Memorial Veterans' Hospital</i>	<i>Madison, WI</i>
<i>695</i>	<i>Clement J. Zablocki VA Medical Center</i>	<i>Milwaukee, WI</i>





***Jesse Brown VA Medical Center,  
Chicago, IL***



**Date(s) of Assessment: September 22-23, 2009**

**Number of Buildings Assessed: 2**

**Total Cost to Correct Deficiencies: \$4,799,000**

**Total Cost, Priority 1 Deficiencies: \$2,393,000 (or 50%)**

**Total Cost to Replace: \$44,187,000**

**Overall Campus FCI: 11%**

**Size of Research Program: Large (\$5 million to \$9.9 million in VA research funding)**



### Background

VA research funding for this large research program is predominantly for biomedical research, but there is also VA funding in lesser amounts for rehabilitation, health services, and clinical research.

The academic affiliates are Feinberg School of Medicine of Northwestern University (located in downtown Chicago) and University of Illinois at Chicago Medical School (located near the VA campus).

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in two building (Buildings 11A and 11B) on the VA campus with 40,906 nsf of research space (laboratories – 22,013 nsf; VMU – 8,572 nsf; offices – 10,321 nsf). (There is additional dry laboratory space for rehabilitation and health services research.) Following is an overview of both buildings, including their age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Both buildings 11A and 11B were constructed in 1955 and renovated in the 1990s. Both are seven story towers attached to the main hospital. Laboratories are generally small and overcrowded, either due to the configuration or because of large equipment stored within. There is little or no common instrument space available for researchers.

Building 11A houses laboratories on part of the fifth and sixth floors, and the entire seventh floor. Generally the laboratory finishes (walls, floors, ceilings), casework and fixed equipment are in good to fair condition with some exceptions. Some of the flooring is of vinyl asbestos tile that should be replaced. Some of the safety showers and eyewashes are either poorly located or are missing.



**A typical 3-bay laboratory in Bldg 11A.**



**This laboratory being renovated in 2009 still is not complete.**





**More views of Building 11A – at left, a dirty HVAC diffuser and ceiling tiles. At right, the ceiling shows evidence of leaks.**

**Below, corrosion is prevalent throughout the space (left photo: corroded epoxy sink; at right, rusted sink cabinet). Both photos below were taken on the seventh floor.**



There is no central backflow prevention to separate laboratory water from potable water within the building. Mechanical systems are in fair condition. The exhaust system does not have the appropriate vertical stacks for discharging from the building and should be corrected. Electrical systems (normal and emergency) are in fair condition.

Funding was provided by VA Central Office to convert about 8,000 square feet of former office space into laboratories to accommodate investigators following the merger with the Lakeside VAMC. However, the funding was insufficient to complete the renovation. It is estimated that at least an additional \$300,000 is needed to complete the project.





Building 11B houses the VMU on the seventh floor. This building has roof leaks which have caused damage to some of the ceilings. Fixed equipment is in good condition. Safety showers and eyewashes are compliant with current standards. There is no central backflow prevention to separate the VMU water from the building's potable water.

The VMU is in the process of becoming a barrier facility. One deficiency that has hindered this is the lack of sufficient steam for the cage washing equipment. Because of insufficient pressure, the equipment is run on an extended cycle to achieve the appropriate temperature.

A backup air cooled chiller serves the VMU, but its capacity is shared outside the facility. There is no redundant cooling system. There also is no emergency power for back-up of the cooling system in the event of power outage.



**A procedure room in the VMU.**



**Evidence of leakage in the VMU.  
A significant leak in May 2010  
necessitated evacuation of animals.**

All of the research space is protected by a fire suppression sprinkler system. Fire alarm systems are fully addressable and in good condition.

#### Other Research Space

A rehabilitation research group is housed in leased space. Health Services research is conducted in VA office space outside the research area. With additional health services investigators planning to relocate to the Jesse Brown VAMC from the Hines VAMC, additional office space will be needed.

Clinical research is currently conducted in the various clinics.

#### Security Issues

Access to all research areas is controlled by card readers. Closed circuit television (CCTV) monitoring is recommended for the corridor leading to the VMU.



### Life Safety Hazards

The following life safety hazard identified during the assessment is in the process of being remediated by the medical center:

- In Building 11, safety showers and/or eyewashes will be installed where needed and the type of unit will be corrected where necessary. (ORD provided funding to correct this deficiency. Additional funds are needed to complete this action.)

The following additional life safety hazard identified during the assessment has not been remediated by the medical center:

- Receptacles near water sources are not ground fault protected.

### Improvements Made Since Assessment:

No improvements have been made to the research space. Continued roof leaks have caused evacuation of the affected space, including one affecting the animal facility. There still is no emergency power for the laboratory or animal research space; only three emergency outlets have been installed for freezers. Additionally, safety deficiencies still exist.

Laboratory construction project (Building 11A) that was underway at the time of the assessment has not been completed.

Lastly, there is no indication that the station has applied for any non-recurring maintenance funds for research improvements.

### New Construction

There is no new construction of research space planned at this station.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.



<b>Discipline</b>	<b>Correction Cost - Bldg 11A</b>	<b>Correction Cost - Bldg 11B</b>
Architectural	\$1,626,000	\$81,000
Plumbing	\$106,000	\$138,000
HVAC	\$703,000	\$1,223,000
Electrical	\$726,000	\$196,000
Fire Protection	\$0	\$0
<b>Total</b>	<b>\$3,161,000</b>	<b>\$1,638,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Bldg 11A</b>	<b>Bldg 11B</b>
1	\$1,238,000	\$1,155,000
2	\$1,019,000	\$354,000
3	\$817,000	\$129,000
4	\$0	\$0
5	\$87,000	\$0
<b>Total</b>	<b>\$3,161,000</b>	<b>\$1,638,000</b>

**Table 1.2 Cost Summary by Priority**

<b>Building</b>	<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
Bldg 11A	\$3,161,000	\$31,733,000	10%
Bldg 11B	\$1,638,000	\$12,454,000	13%
<b>Overall</b>	<b>\$4,799,000</b>	<b>\$44,187,000</b>	<b>11%</b>

**Table 1.3 Facility Condition Index Value**



## ***Edward Hines Jr. VA Hospital***

***Hines, IL***



**Date(s) of Assessment: November 27-30, 2007**

**Number of Buildings Assessed: 4 (including North Chicago)**

**Total Cost to Correct Deficiencies: \$34,032,000**

**Total Cost, Priority 1 Deficiencies: \$25,354,000 (or 75%)**

**Total Cost to Replace: \$103,310,000**

**Overall Campus FCI: 33%**

**Size of Research Program: Very Large (Over \$10 million in VA research funding)**



### Background

The research program at this facility is very large, with VA research funding nearly equally distributed among the four research disciplines (biomedical, clinical, rehabilitation, and health services). The local research program includes the Center for Management of Complex Chronic Care (CMC<sup>3</sup>), a health services COE; the VA Information Resource Center (VIREC), a health services resource center; the Coordinating Center for the QUERI on Spinal Cord Injury; a CSP Coordinating Center (CPSCC); and a rehabilitation REAP.

The facility is affiliated academically with approximately 70 colleges and universities, and is institutionally affiliated with Loyola University of Chicago, Stritch School of Medicine and University of Illinois, Chicago College of Medicine.

### Overview of Research Space

The Hines research program is responsible for oversight of research at the North Chicago facility, so space at the North Chicago campus was also included in this survey.

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices on the Hines VAMC campus were housed in three buildings (Buildings 1, 200, and 229) on the VA campus with 67,694 nsf of research space (laboratories – 36,296 nsf; VMU – 28,463 nsf; offices – 2,935 nsf). On the North Chicago campus, a small amount of laboratory and office space (4,914 nsf (laboratories – 2,647 nsf and offices – 2,267 nsf)) is housed in Building 1. Following is an overview of each building, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

It should be noted that the Hines VAMC research program is among the largest and most productive in the VA system. It is also among the top sites with regard to the amount of combined laboratory (wet and dry), office, and vivarium space available for research. Currently there is sufficient laboratory and/or office space for most programs, although additional growth is anticipated, particularly with regard to the CSPCC; and in some instances, collaborating investigators are not co-located. There currently is no space designated for clinical research other than a very small amount of space in the main hospital.

The medical center director is highly motivated to find alternative research space for the program as well as other clinical and administrative functions housed in Building 1 and, at the time of the assessment had already relocated several functions from the building. As functions relocate from the building, their previous space in Building 1 remains vacant. There may be opportunities in the future to obtain alternative and/or additional research space off campus. It is also important



to note that there appears to be sufficient land available on the Hines campus for construction of one or more new buildings.

The condition of research space at the Hines VAMC, primarily in Building 1, is substandard. Other than the overall large amount of space and the relatively large size of individual laboratories, there is little that can be said about the space that is positive. Constructed in the 1920s, the overall unacceptable condition of the building ranges from architectural features (deteriorating interior walls; leaking windows original to the building; leaking roof; vinyl asbestos floor tiles; corroded ceiling framework; laboratory casework with peeling paint, corrosion and general discoloration; non-operational equipment; sagging floors and ceilings; and significant damage from water leaks), to mechanical systems (very poor air quality due to friable fiberglass insulation in ductwork; deteriorating domestic water distribution system; and ineffective heating and cooling systems; to name a few), to electrical systems (lack of emergency power for mechanical systems; severely aging electrical distribution system; poor lighting; damage to valuable computers and other research equipment due to repeated voltage surges), to life safety systems (lack of sprinkler system; limited coverage by smoke detectors; limited annunciation devices; lack of emergency eyewashes at emergency showers; and severely discolored (orange-brown) water coming from eyewashes).

The need for maintenance within the building, as well as on the entire aging Hines campus, is constant. During the assessment several “emergency” situations arose on campus including a water main break. Still, investigators and research administrators engage in some rather creative strategies to improve their environment, including fastening (with tape) air conditioning filters to the bottom of air distribution vents to keep the friable insulation, dirt, and other particulate matter from further polluting laboratory air and/or ruining research samples and experiments. It is painfully obvious that the scientists at the Hines VAMC are very passionate about their research and are determined to not let the physical condition of the building deter them. During the assessment users were highly participatory and reported a wide range of space problems, the most prevalent of which focused on poor air quality, inappropriate heating/cooling, and/or building penetration by flora coming through windows. In spite of all this, the local research program remains highly productive with investigators who are enthusiastic about their respective research programs and are highly engaged in mentoring and collaborating.

Veterinary Medical Unit (VMU): As is the case at many facilities, the condition of the VMU is significantly better than the laboratory and office space. Within the VMU, the HVAC system was replaced a few years ago as required by AALAC, and the space has significantly better temperature regulation and monitoring.





Currently there is a minor construction project pending to provide emergency electrical power and an overhead sprinkler system. The space is also very well kept and is frequently repainted.

It is a very large facility by VA VMU standards and, at the time of the survey, was under capacity. Of particular note in the facility is the former hospital operating room suite which now serves as surgical space for animals.



**Examples of the poor conditions in Building 1 include (above, left to right): Some original exterior windows remain on the building; a laboratory user's solution to friable insulation dust coming from diffusers; and a dead roach in a laboratory.**

**Below, left to right: a few laboratories have newer casework and fume hoods and a significantly better appearance; most laboratories have not fared as well; and a vine growing through a window from the exterior.**



Most of Building 1 is not covered by a fire sprinkler system. Building 229 has no sprinkler system. Building 1 at North Chicago has no sprinkler system.

Fire alarm systems are adequate in Bldg 1 and 229. North Chicago has an older system that does not appear to provide sufficient coverage.

Building 1 and Bldg 1, North Chicago: Safety showers and eyewashes are producing rusty looking water. The piping is in need of replacement.



### Security

The security system within Building 1 is fully operational and appropriate in limiting access to research areas. The system within Building 1 uses swipe cards with additional keypad password. Several closed circuit TV cameras are located in key locations. The system is on emergency power. Building 229 also has electronic security.

The other research space (including at North Chicago) is not protected by electronic security.

### Life Safety Hazards

A number of life safety hazards were identified at this facility, including:

- Safety showers/eyewashes do not meet current requirements (some showers are lacking eyewash units, some shower pull handles are not accessible).
- Receptacles near water sources are not ground fault protected.
- Sprinkler system coverage is partial and smoke detection is limited.
- Liquid nitrogen is being used in an area without an oxygen sensor.

Work orders have been submitted to resolve the electrical receptacle and liquid nitrogen issues. Additionally, ORD provided funds to correct the safety shower and eyewash deficiency.

The station noted that complete renovation of Building 1 (Hines) is included in the campus master plan pending availability of funds.

### Improvements Made Since Assessment:

This station has made plans for improvements following the assessment, including:

Renovation of Building 1 is included in the Hines Strategic Capital Investment Plan. Pending approval and funding availability, fire stopping floors and ceiling penetrations may begin as soon as FY14.

Submitted work orders for installation of oxygen sensors and ventilation evaluation in two common resource rooms having liquid nitrogen storage tanks.

Submitted request for VISN funds (\$50,000) to upgrade and supplement existing safety showers and eyewashes. (This was subsequently funded by ORD.)

Performed inspection on all fume hoods within Research Service for proper function. Some hoods have been taken out of service and are being considered for removal and replacement. Work orders for repair of minor malfunctions have been submitted.



Work orders have been submitted to install ground fault protected receptacles where needed near water sources.

### New Construction

There is no new construction of research space planned at this station at this time. While the station continues to compete for VA Minor Construction funding to make improvements on current space, that is clearly not the best long term solution for the Hines VA research program. A new research building, either constructed with VA funding on the Hines campus or obtained through an enhanced use lease is a much more viable solution.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

**Note:** For this facility, only the corrections costs are shown for Building 200 due to the very small amount of research space within the building. If the replacement cost were to be calculated, it would significantly distort the overall FCI for the campus.

Discipline	Corrections Cost			
	Bldg. 1	Bldg. 200	Bldg. 229	N. Chicago
Architectural	\$7,082,000	\$76,000	\$25,000	\$658,000
Plumbing	\$2,859,000	\$0	\$59,000	\$167,000
HVAC	\$15,041,000	\$0	\$484,000	\$1,204,000
Electrical	\$3,465,000	\$0	\$0	\$761,000
Fire Protection	\$1,788,000	\$0	\$59,000	\$304,000
Total	\$30,235,000	\$76,000	\$627,000	\$3,094,000

**Table 1.1 Cost Summary by Discipline**



Priority	Bldg. 1	Bldg. 200	Bldg. 229	N. Chicago
1	\$22,556,000	\$13,000	\$561,000	\$2,224,000
2	\$3,724,000	\$1,000	\$0	\$508,000
3	\$2,074,000	\$62,000	\$7,000	\$46,000
4	\$2,000	\$0	\$0	\$0
5	\$1,879,000	\$0	\$59,000	\$316,000
Total	\$30,235,000	\$76,000	\$627,000	\$3,094,000

**Table 1.2 Cost Summary by Priority**

	Corrections	Replacement	FCI
Building 1	\$30,235,000	\$87,699,000	34%
Building 200	\$76,000	----	----
Building 229	\$627,000	\$2,546,000	25%
N. Chicago	\$3,094,000	\$13,065,000	24%
Overall	\$34,032,000	\$103,310,000	33%

**Table 1.3 Facility Condition Index Value**





***William S. Middleton Memorial Veterans' Hospital,  
Madison, WI***



**Date(s) of Assessment: October 16-17, 2007**

**Number of Buildings Assessed: 3**

**Total Cost to Correct Deficiencies: \$8,555,000**

**Total Cost, Priority 1 Deficiencies: \$5,751,000 (or 67%)**

**Total Cost to Replace: \$20,620,000**

**Overall Campus FCI: 41%**

**Size of Research Program: Medium (\$2.5 million to \$4.9 million in VA research funding)**





### Background

This medium sized research program has traditionally focused predominantly on biomedical research. The facility is the site of a GRECC with a very active research program focusing on aphasia, dementia, osteoporosis, and health services research on the functional decline in the continuum of geriatric care.

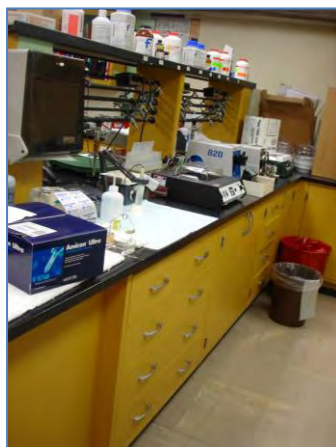
The Madison VAMC is academically affiliated with the University of Wisconsin Medical School and Hospital.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in three buildings (Building 1, A, C, and D wings; Building 13, G Wing; and Building 12) on the VA campus with 33,542 nsf of research space (laboratories – 26,948 nsf; VMU – 5,500 nsf; offices – 1,209 nsf). Following is an overview of each building, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Construction of the buildings dates to 1949 (Building 1) and the 1960s. Additions to Building 12 were constructed in the 1980s and in 1992.

Building 1, which is the original hospital on the Madison VA campus, was constructed in 1949. Biomedical research laboratories are dispersed among the three wings of Building 1, as well as G Wing, Building 13. Condition of the laboratories varies somewhat dramatically, with the space on the fourth floor of C Wing being in the worst condition partly due to its age (over 40 years), but also because of damage from a major roof leak. This space is generally in substandard condition.



**Two views of A wing: laboratory casework and electron microscope.**



**C Wing laboratories are in the worst condition. Shown above are (left to right): typical C Wing laboratory casework; damaged sink in a C Wing laboratory; and wall damage.**

The facility has submitted a minor construction proposal several times to renovate the space in a more modern open configuration, as well as make necessary systems corrections for Building 12. The animal facility is in need of appropriate mechanisms to ensure proper temperature and humidity settings for animal housing areas.



**A typical D Wing laboratory.**



**The GRECC laboratories, also on D Wing, are the best laboratories at the Madison VAMC.**

Overall, the dispersion of laboratory space has made it virtually impossible to co-locate investigators with similar research foci. The condition of some laboratories has not only hindered recruitment of new investigators, but also has resulted in a lack of suitable space for some current investigators. There is also a general lack of storage space throughout the research areas.



It is important to point out that laboratory space (as well as offices) was renovated for the GRECC in the 1990s, along with an expansion of Building 12 to house the Shared Aging Rodent Facility (SARF). The GRECC laboratories are an excellent example of modern laboratory design and are a dramatic contrast to other laboratory space in the facility, particularly the laboratories on the fourth floor of C Wing.

With regard to laboratory equipment, the program has had limited success in applying to the Shared Equipment Evaluation Program (ShEEP) for funding, primarily due to the requirement for matching funds, and as a result has a fairly significant need for upgraded equipment as well as support for getting new equipment installed. At the time of the assessment it was noted that a glass washer purchased three years ago for installation in C Wing still had not been installed, although it is clearly needed.

In addition to significant deficiencies with the overall physical condition of some laboratory space as previously described (including the presence of asbestos tile), there also are significant deficiencies with the HVAC systems, as well as electrical systems.

The space is covered by sprinkler systems and relatively new fire alarm systems. It was noted that placement of some fire alarm notification devices may not meet current standards.

A number of safety concerns were also noted, including inappropriate chemical storage, lack of safety features on fume hoods, and lack of compliance with current requirements for emergency showers and eyewash units.

#### Security

The facility's security system uses proximity cards. Installation was being completed during the survey. While the system is of good quality, there appear to be software problems that were being addressed.

#### Life Safety Hazards

The following life safety hazards identified during the assessment have been or are in the process of being remediated by the medical center.

- Fume hoods that were not operational or were operating improperly have been repaired, replaced, or decommissioned.
- Updated safety showers and emergency eyewashes have been installed. (ORD provided funding to correct this deficiency.)



Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Renovation of research laboratories and correction of roof leaks, Building 1, C Wing, to be completed by mid-2012 – (ARRA funds), design almost complete, construction to begin immediately following.

Retrofitting of one laboratory to cell-culture, BSL-2 space, Building 1, D Wing – (ARRA funds), in progress.

Decommissioning of a cold room into a quiet/study/computer-access room serving an entire floor of laboratories, Building 1, D Wing – (ARRA funds), in progress.

Correction of roof deficiency, Building 12 – \$150,000 (VISN NRM), completed.

Correction of roof leak, Building 13, G Wing -- \$220,000 (VISN NRM), project has been awarded.

Correction of mechanical system deficiencies (to correct temperature fluctuations), Building 13, G Wing – (VISN NRM), in design phase.

Replacement of heating, ventilation, and air conditioning (HVAC) system in VMU, Building 12 -- (VISN NRM), in planning.

Correction of electrical system deficiency, lack of emergency power, Building 1, D Wing -- \$15,000 (station funds), completed.

Construction of penthouse over HVAC equipment on roof of Building 1, C Wing – (station funds), completed.

Correction of all fume hood deficiencies, either by repair, decommission, or plans for replacement.

Correction of other miscellaneous deficiencies identified in the assessment, including removal of biological safety cabinet, repair of temperature control, sealing of windows, replacement of ceiling tiles, replacement of fixed equipment (autoclave), repair of exhaust above cage washer, and repair of cold room – (station funds), completed.

New Construction

There is no new construction of research space planned at this station.



### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

Discipline	Corrections Cost				
	A Wing	C Wing	D Wing	G Wing	Bldg. 12
Architectural	\$252,000	\$1,251,000	\$413,000	\$801,000	\$733,000
Plumbing	\$219,000	\$205,000	\$281,000	\$213,000	\$208,000
HVAC	\$299,000	\$1,235,000	\$565,000	\$546,000	\$476,000
Electrical	\$220,000	\$112,000	\$305,000	\$128,000	\$93,000
Fire Protection	\$0	\$0	\$0	\$0	\$0
Total	\$990,000	\$2,803,000	\$1,564,000	\$1,688,000	\$1,510,000

**Table 1.1 Cost Summary by Discipline**

Priority	A Wing	C Wing	D Wing	G Wing	Bldg. 12
1	\$579,000	\$1,730,000	\$959,000	\$1,230,000	\$1,253,000
2	\$188,000	\$860,000	\$355,000	\$363,000	\$189,000
3	\$223,000	\$136,000	\$211,000	\$82,000	\$51,000
4	\$0	\$0	\$0	\$0	\$0
5	\$0	\$77,000	\$39,000	\$13,000	\$17,000
Total	\$990,000	\$2,803,000	\$1,564,000	\$1,688,000	\$1,510,000

**Table 1.2 Cost Summary by Priority**

	Corrections	Replacement	FCI
A Wing	\$990,000	\$2,020,000	49%
C Wing	\$2,803,000	\$5,394,000	52%
D Wing	\$1,564,000	\$2,572,000	61%
G Wing	\$1,688,000	\$4,529,000	37%
Building 12	\$1,510,000	\$6,105,000	25%
Overall	\$8,555,000	\$20,620,000	41%

**Table 1.3 Facility Condition Index Value**





***Clement J. Zablocki VA Medical Center,  
Milwaukee, WI***



**Date(s) of Assessment: July 15-17, 2008**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$53,993,000**

**Total Cost, Priority 1 Deficiencies: \$43,580,000 (or 81%)**

**Total Cost to Replace: \$73,158,000**

**Overall Campus FCI: 74%**

**Size of Research Program: Medium (\$2.5 million to \$4.9 million in VA research funding)**





### Background

This facility has a highly viable medium sized research program, with investigators who have invested significant portions of their careers to clinical and research endeavors. There is a high degree of collaboration among the investigators. VA research funding is concentrated in Biomedical Laboratory research, with significantly lesser amounts in the other research disciplines (rehabilitation, health services, clinical).

The facility is affiliated academically with the Medical College of Wisconsin (MCW), located a few miles from the VA campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in a single building (Building 70) on the VA campus with 73,719 nsf of research space (laboratories – 42,275 nsf; VMU – 13,357 nsf; offices – 18,087 nsf). (There is additional research space in other buildings on the VA campus.) Following is an overview of Building 70, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Building 70 was constructed in 1925 as the main hospital. The building was renovated into laboratories in the 1960s when the new hospital was constructed. Research space occupies a significant portion of Building 70, i.e., three levels of Wing A, two levels of Wing B, two levels of Wing C, two levels of Wing D, and about a third of one level of Wing E. The VMU is housed in Wing B.

The condition of research space at the Milwaukee VAMC is generally poor, primarily due to the lack of central ventilation in the laboratory areas, the significant aging of finishes and casework throughout the space, the windows which leak air and water into the space, the seriously aging electrical system, and the lack of fire protection throughout the building.



**Damaged finishes in the VMU include (left to right) flooring in front of the cage washer, ceilings, and an exterior door.**



The laboratory and office areas are generally heated and cooled by steam radiators and window type air conditioners, respectively. These types of systems, while regulating air temperature, do not provide 100% outdoor air for proper exhaust, nor do they allow pressurization. Although the space could be significantly improved with central ventilation, the building design does not allow for ventilation ducts and piping above the laboratory space.



**Typical heating and cooling units in laboratories.**



**Evidence of water damage is prevalent.**

Most interior finishes are generally in fair condition, with some deterioration noted. Since the roof leaks, deterioration is likely to continue as the building continues to experience water damage. The casework, as well as laboratory equipment, is generally original to the space and in need of replacement. In addition to suffering from corrosion and other deterioration, the casework is not optimally configured (i.e., the countertops are only 24" deep). Some of the flooring contains asbestos.

There is a lack of backflow prevention on the laboratory water system to provide separation from the domestic water supply. This is a potential health concern that needs to be corrected. It was also reported that there have been sewage back-ups that have resulted in damage to research offices and/or laboratories located below a restroom.

The electrical systems, both normal and emergency power, are beyond their useful life and in need of replacement. Emergency power primarily covers life safety functions and the cooling system in the VMU.

With regard to safety, only about 20% of the building is protected by a wet pipe fire suppression system. Additionally, the fire alarm system is old and some devices are nonfunctional. (Note: Since the time of the assessment, the fire alarm system has been updated.)



Placement of safety showers and emergency eyewashes is generally good, but the facility should ensure that they are complying with current requirements with regard to all laboratories using hazardous materials.

Veterinary Medical Unit (VMU): The VMU has occupied its current location on B Wing since the early 1980s. The space housing the VMU is the only research space served by a central ventilation system, although it is original to the 1980s renovation and in need of upgrading. Generally, the finishes within the VMU are in fairly good shape. There is some wall deterioration, particularly in animal rooms, and the floor is damaged in the surgery scrub area. There are some ceiling finishes in need of repair as well.

The facility is in need of additional space to house animals, as the facility was near capacity for rodent housing at the time of the survey.

#### Other Research Space

In addition to the laboratory and VMU space in Building 70, a separate building funded by the Department of Transportation and MCW houses a vehicular crash laboratory, the only noncommercial facility of its kind in the United States. A second building which will enable expansion of this program is currently under construction.

There is very limited space for clinical research in the main hospital. At the time of the assessment, clinical studies could not be conducted in Building 70 because the Code Team did not respond to Building 70 due to security and radiation concerns.

Overall, the program is in need of additional and improved laboratory, clinical, and support space, not only to continue at its current level, but also to expand into other areas of research.

#### Security

The security system uses proximity card readers to enter the laboratory areas and individual laboratories have keyed locks. There are security cameras at all VMU entrances. All animal holding areas have electronic locks with key pads.

#### Life Safety Hazards

The following life safety hazard identified during the assessment has been remediated by the medical center.

- The aging fire alarm system has been replaced.



The following additional deficiencies that fall under the category of “life safety hazard” have not been addressed.

- Fire sprinkler protection covers only about 20% of Building 70.
- Additional shower and eyewash units may be needed.

Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Upgrade of emergency power system, Building 70 -- \$5,392,609 (NRM FY10), underway to be completed late FY11.

Correction of Priority 1 deficiency, replaced roof of Building 70, D Wing -- \$102,000 (funding source unknown), completed.

Partial tuck pointing of Building 70 – (station funds), completed.

Repair of roof drains, Building 1, C and D wings – (station funds), completed.

Installation of additional electronic security – (station funds), completed.

Planning replacement of roofs, Bldg 70, C Wing; Bldg 70, A and B Wings; Bldg 70, E and K Wings –\$506,500 (NRM FY11), approved for funding.

Planning correction of mechanical system deficiencies, replacement of steam heating and window HVAC units – unfunded, project in planning awaiting availability of funds.

New Construction

There is no new construction of research space planned at this station.

It is worth noting that the VA campus is very green and quite attractive, with several registered historic buildings dating to the civil war era. While these buildings contribute to the overall beauty of the campus, they do not lend themselves well to renovation and upgrading into modern medical and laboratory facilities. There is land available on the campus for construction of a new research building, should funding become available. There are plans to construct a new Spinal Cord Injury (clinical) building.

There is a significant amount of new, state-of-the-art research laboratory space on the MCW campus, but there is a possibility of partnering to build research space on the VA campus. There is an existing footprint for a previously started (and not completed) biotech center halted by the city.



### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Correction Cost</b>
Architectural	\$14,122,000
Plumbing	\$7,041,000
HVAC	\$17,974,000
Electrical	\$13,016,000
Fire Protection	\$1,840,000
<b>Total</b>	<b>\$53,993,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Correction Cost</b>
1	\$43,580,000
2	\$9,731,000
3	\$516,000
4	\$0
5	\$166,000
<b>Total</b>	<b>\$53,993,000</b>

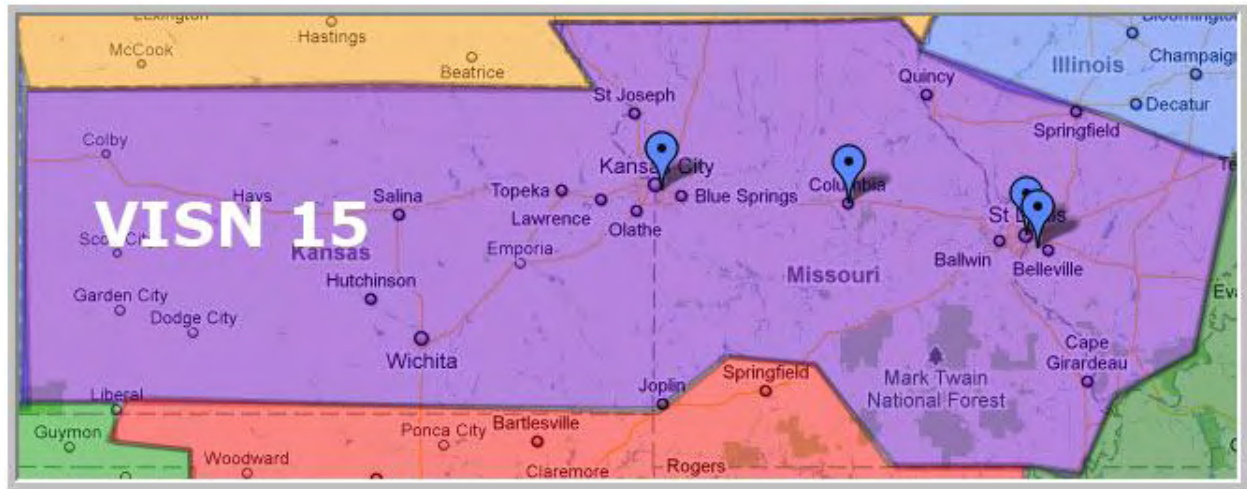
**Table 1.2 Cost Summary by Priority**

<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
\$53,993,000	\$73,158,000	74%

**Table 1.3 Facility Condition Index Value**



## VISN 15: VA Heartland Network



<i>Sta. ID</i>	<i>VA Site Surveyed</i>	<i>City/State</i>
<i>543</i>	<i>Harry S. Truman Memorial Veterans' Hospital</i>	<i>Columbia, MO</i>
<i>589</i>	<i>Kansas City VA Medical Center</i>	<i>Kansas City, MO</i>
<i>657</i>	<i>St. Louis VA Medical Center</i>	<i>St. Louis, MO</i>







***Harry S. Truman Memorial Veterans' Hospital,  
Columbia, MO***



**Date(s) of Assessment: August 12-13, 2010**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$3,038,000**

**Total Cost, Priority 1 Deficiencies: \$314,000 (or 10%)**

**Total Cost to Replace: \$35,490,000**

**Overall Campus FCI: 9%**

**Size of Research Program: Medium (\$2.5 million to \$4.9 million in VA research funding)**



### Background

In recent years, this medium sized research program has been in a steady growth mode, nearly tripling its VA research funding. The program focuses predominantly on biomedical research, but there is also active health services and clinical research. There is strong local interest in building the health services and clinical research programs, as well as developing a program in rehabilitation research. The research program has investigators funded through the Career Development and Research Career Scientist programs. There is high interest in radiopharmaceutical studies and, of particular note is the VA Biomolecular Imaging Center (BIC). The primary purpose of the BIC is to make high-resolution anatomic and molecular imaging capabilities readily available to VA and university investigators who utilize conventional and immunocompromised animal models as a component of their research programs. With its SPECT, CT/PET, and MRI systems, the BIC has supported research activities related to cancer detection and treatment as well as many other radiopharmaceutical applications.

The academic affiliate is the University of Missouri, Columbia School of Medicine located adjacent to the VA campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in a single building (Building 1) on the VA campus with 30,383 nsf of research space (laboratories – 23,804 nsf; VMU – 4,205 nsf; offices – 2,374 nsf). Following is an overview of Building 1, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

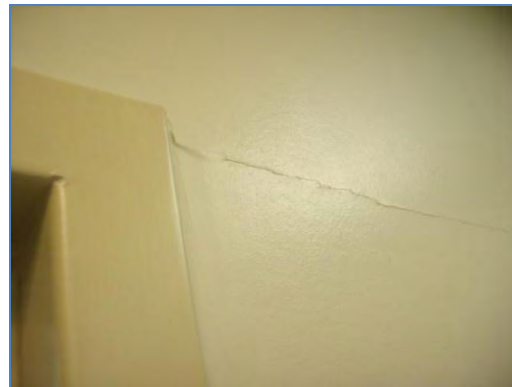
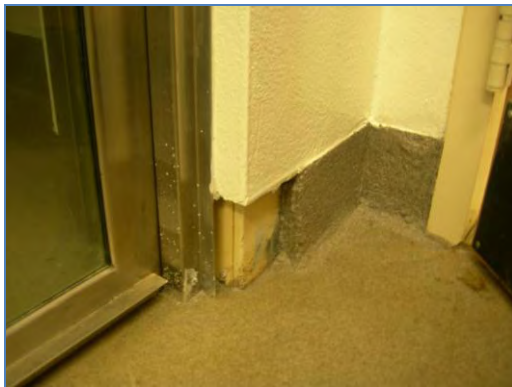
Building 1 is the main hospital which was constructed in 1972. The laboratories and the VMU are on the basement level, wings A, B, and F in space that is not contiguous but is very closely located. At the time of the assessment, the administrative offices were housed on another floor within Building 1, but were scheduled to relocate.

With the exception of the laboratories in Wing A, all of the laboratories have been renovated recently, including a large area of Wing B in which smaller laboratories were updated into two large spaces with an open floor plan, and some brand new laboratories in Wing F that were just being completed at the time of the assessment. Laboratories are generally in good condition, except those in Wing A which need updated finishes, casework, and fixed equipment. The only consistent deficiencies identified throughout all laboratories are the lack of seismic restraints on shelving and, in some instances, lack of door closers to help promote optimal mechanical system efficiency.



**With the exception of A Wing, laboratory space has been renovated. The photo at left shows an A wing laboratory. The photo at right shows a recently completed but not yet occupied laboratory on F Wing.**

The VMU has undergone renovation and is in good condition, but some of the finishes are inappropriate for use in an animal research facility. Industry standards call for monolithic floors and ceilings in the corridors similar to those in the animal holding rooms. Perhaps the biggest problem in the VMU is the layout which does not provide for optimal transport of clean and dirty cages.



**There are a few damaged finishes in the space. The photo at left shows damage to a wall base in the VMU. At right, the drywall around a door frame is cracked.**

Piping systems need to be updated with separate water supplies for laboratory and domestic use and appropriate backflow protection. The laboratory waste system also is not separate, nor is laboratory vacuum which currently is provided through the medical vacuum system.

With regard to the mechanical system, the biggest concern is the lack of a separate air handling unit to service the VMU. At present, one unit serves the animal facility as well as laboratories in Wing A. According to the local engineering staff, a project



is in planning to provide separation. The existing Wing A unit as well as the one serving Wing B are aging and in need of replacement. Wing F has a fairly new air handling unit, installed about eight years ago. The exhaust system also is in need of updating, as are controls for Wings A and B.

Electrical equipment is well maintained but needs a few updates. There is a need for additional capacity in the emergency system, as well as the need for transient voltage surge suppression to protect electronics, ground fault protected receptacles near all water sources, and updated raceways. In the VMU, lighting fixtures are not gasketed as they should be, nor are there wash down type receptacles.

It should be noted that many of the deficiencies identified are items for which projects are either already underway or in planning locally. It was obvious during the assessment that the Facilities Management Service (FMS) at this VA does a very good job maintaining spaces, equipment, and support services, and the FMS obviously receives strong support from hospital leadership.

Building 1 is fully covered by a wet-pipe sprinkler system. However, there are no fire alarm pull stations or voice communication devices in the corridors.

There are emergency eyewashes at the sinks in all three laboratory wings. Combination safety shower and eyewash units also are located in areas where hazardous chemicals are used. All showers and eyewashes are supplied with tempered water.

Overall, the research program at the Harry S. Truman Memorial Veterans' Hospital has very nice facilities, most of which have been recently updated. The program would benefit from renovation of Wing A laboratories as well as some system upgrades.

#### Other Research Space

There is a very small amount of space designated for health services/clinical research, but it will be lost to the hospital when research project funding ends. Other clinical research occurs in the clinics. In order to build the health services and clinical research programs, it will be important to identify dedicated space in the future.

#### Security

There is appropriate electronic security (card readers) throughout the research areas, as well as additional security protecting the BIC and the VMU. Cameras are also located throughout the space at entrance doors for each of the research areas.



### Life Safety Hazards

The following life safety hazards identified during the assessment have been remediated by the medical center:

- In newly renovated laboratories, seismic lips have been added to reagent shelving.
- Liquid nitrogen is no longer being dispensed in space without oxygen sensors.

The following additional life safety hazards identified are in planning for correction by the local engineering staff in FY12:

- Receptacles within six feet of water dispensing will be changed to ground fault protected receptacles.
- The fire alarm system will be upgraded to meet NFPA 72 requirements (new manual pull stations and voice communication devices are needed).

### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Completed renovation of laboratories in F Wing, in process of occupying space.

Correction of miscellaneous Priority 1 deficiencies and others are in planning for correction:

- Replacement of damaged acoustic panels, \$400 (station funds), completed.
- Replacement of flooring in tissue culture space, in 5 year plan for replacement.
- Correction of deficiency involving housing of research animals in room with autoclave/sterilizer – animals have been removed from the room.
- Correction of use of liquid nitrogen without oxygen sensor in room (life safety hazard) -- no longer dispensing liquid oxygen in the affected rooms.
- Correction of deficiency with water system (need to separate industrial and domestic water, add backflow prevention) – this will be submitted as a future NRM project.
- Correction of deficiency with electrical receptacles in VMU (not wash down type) -- \$2,000 (station funds), pending work order.
- Correction of deficiency with lighting fixtures in VMU (not gasketed) – this will be submitted as a future NRM project.
- Correction of electrical deficiency, metal raceways have wrong type of receptacles – this will be submitted as a future NRM project.
- Correction of electrical deficiency, insufficient circuits for emergency receptacles – this will be submitted as a future NRM project.





The following additional projects have been undertaken:

Facility provided matching funds for update of console/computer for the MRI in the Biomolecular Imaging Center (VACO ORD SHEEP).

Facility provided matching funds for purchase of confocal microscope (VACO ORD SHEEP).

Facility provided matching funds for purchase of steam sterilizer (VACO ORD SHEEP).

Correction of deficiency with fixed equipment, installed steam dam over the steam sterilizer in room A-029 (station funds), completed.

Continuing ongoing laboratory vacuum system project (station funds).

#### New Construction

There is no new construction of research space planned at this station.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.



<b>Discipline</b>	<b>Bldg 1</b>
Architectural	\$751,000
Plumbing	\$244,000
HVAC	\$1,014,000
Electrical	\$963,000
Fire Protection	\$66,000
<b>Total</b>	<b>\$3,038,000</b>

Table 1.1 Cost Summary by Discipline

<b>Priority</b>	<b>Bldg 1</b>
1	\$314,000
2	\$262,000
3	\$2,089,000
4	\$96,000
5	\$277,000
<b>Total</b>	<b>\$3,038,000</b>

Table 1.2 Cost Summary by Priority

<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
\$3,038,000	\$35,490,000	9%

Table 1.3 Facility Condition Index Value

### Section 3. Description of VA Research Infrastructure





***Kansas City VA Medical Center,***

***Kansas City, MO***



**Date(s) of Assessment: July 7-8, 2009**

**Number of Buildings Assessed: 2**

**Total Cost to Correct Deficiencies: \$17,501,000**

**Total Cost, Priority 1 Deficiencies: \$11,086,000 (or 63%)**

**Total Cost to Replace: \$33,957,000**

**Overall Campus FCI: 52%**

**Size of Research Program: Small (Under \$2.5 million in VA research funding)**



### Background

This small research program focuses predominantly on biomedical research. The academic affiliates are the University of Kansas School of Medicine and the University of Missouri-Kansas City.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in two buildings (Buildings 6 and 15) on the VA campus with 32,619 nsf of research space (laboratories – 18,126 nsf; VMU – 8,203 nsf; offices – 6,290 nsf). Following is an overview of both buildings, including their age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Building 6 is a two level (one story plus basement) building constructed in 1948 as the campus laundry. The first floor was converted to a vivarium to house the VMU in 1981. An addition was added to the building in 1985. There are a number of problems with this building ranging from deteriorating and/or inappropriate finishes, fixed equipment in need of replacement (including the cage washer), lack of backflow protection on the water system, insufficient emergency power, inadequate mechanical systems, and poor lighting with inappropriate fixtures for a wet environment.



**The photos above show damaged finishes in the VMU. From left to right, damaged epoxy floor; peeling paint on a ceiling; and a significant wall crack. The photo below shows corroded casework in an animal procedure room.**





Building 15 was constructed in 1973 as a research building, but not all of the floors are occupied by research. Laboratories and the Research Service administrative offices are housed on the first through fifth floors of the ten level building. The most prominent physical deficiencies in the laboratories are the lack of ceilings and the use of temporary partitions to separate laboratory spaces, neither of which is appropriate for a laboratory environment. Additionally, the finishes are generally beyond their useful life, the safety showers and eyewashes are not compliant with current guidelines, and there are significant deficiencies with both the mechanical and electrical systems.



**In Building 15, a laboratory with no ceiling and a wall of temporary panels.**



**A laboratory in Building 15.**

Both buildings are protected by a fire suppression sprinkler system. In Building 15, the sprinkler heads are not appropriately located. The fire alarm systems are fairly new in both buildings.

Eyewashes and safety showers do not meet current requirements.

### Security

Access to all research areas is controlled by a combination of card readers and hard keys. There is a lack of adequate security on outside entrances into the VMU, and the elevator in Building 15 does not adequately restrict access to laboratory areas.

### Life Safety Hazards

The following life safety hazards identified in the assessment have not been remediated by the medical center:

- In Building 15, the fire sprinkler heads are not appropriately located.
- Eyewashes and safety showers do not meet current requirements (showers in corridors lack eyewash units).





### Improvements Made Since Assessment:

The station has applied for the following FY11 NRM projects that are approved for funding:

Planning mechanical and plumbing system corrections, Building 15 -- \$275,000/\$3,025,000 (NRM FY11).

Renovation of VMU, Building 6 -- \$500,000/\$7,500,000 (NRM FY11).

Upgrade of HVAC system, Building 6 -- \$1,120,000/\$1,200,000 (NRM FY11).

### New Construction

There is no new construction of research space planned at this station.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

Discipline	Correction Cost - Bldg 6	Correction Cost - Bldg 15
Architectural	\$1,224,000	\$4,565,000
Plumbing	\$170,000	\$147,000
HVAC	\$2,028,000	\$5,197,000
Electrical	\$729,000	\$3,338,000
Fire Protection	\$0	\$103,000
Total	\$4,151,000	\$13,350,000

**Table 1.1 Cost Summary by Discipline**



Priority	Bldg 6	Bldg 16
1	\$2,926,000	\$8,160,000
2	\$1,060,000	\$4,541,000
3	\$123,000	\$552,000
4	\$0	\$0
5	\$42,000	\$97,000
Total	\$4,151,000	\$13,350,000

Table 1.2 Cost Summary by Priority

Building	Correction Cost	Replacement Cost	FCI
Bldg 6	\$4,151,000	\$11,711,000	35%
Bldg 15	\$13,350,000	\$22,246,000	60%
Overall	\$17,501,000	\$33,957,000	52%

Table 1.3 Facility Condition Index Value





***St. Louis VA Medical Center,***

***St. Louis, MO***



**John Cochran Division**



**Jefferson Barracks Division**

**Date(s) of Assessment: August 10-11, 2010**

**Number of Buildings Assessed: 4**

**Total Cost to Correct Deficiencies: \$9,193,000**

**Total Cost, Priority 1 Deficiencies: \$833,000 (or 8%)**

**Total Cost to Replace: \$33,591,000**

**Overall Campus FCI: 27%**

**Size of Research Program: Medium (\$2.5 million to \$4.9 million in VA research funding)**



### Background

VA funding for this medium sized research program is predominantly for biomedical research, with lesser amounts for the other research disciplines but with all of them being represented.

The facility has two medical school affiliates, St. Louis University and Washington University, both in fairly close proximity to the John Cochran Division campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and offices were housed on two campuses in a combined total of 24,892 nsf of space. On the John Cochran Division campus, research is housed in three buildings (Buildings 1, 6/6A, and 7/7A) on the VA campus with 18,100 nsf of research space (laboratories – 8,837 nsf; VMU – 7,964 nsf; offices – 1,299 nsf). On the Jefferson Barracks Division campus, research is housed in Building 1 with 6,792 nsf of research space (laboratories – 4,792 nsf and VMU – 2,000 nsf). The two campuses are approximately 20 miles apart, making collaborations among investigators at the two campuses difficult. Following is an overview of the buildings on both campuses, including their age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Generally, all of the buildings housing research on the John Cochran Division campus are in poor condition. All of the buildings share the following deficiencies: 1) evidence of exterior deterioration and/or foundation cracking; 2) lack of seismic restraints at reagent shelving (required due to proximity to New Madrid seismic zone); 3) need for separation of industrial and potable water supplies; 4) need to significantly upgrade mechanical systems (particularly in Buildings 6/6A and 7/7A); 5) lack of transient voltage surge suppression (TVSS) to protect sensitive electronics in the laboratories; and 6) lack of lightning protection.

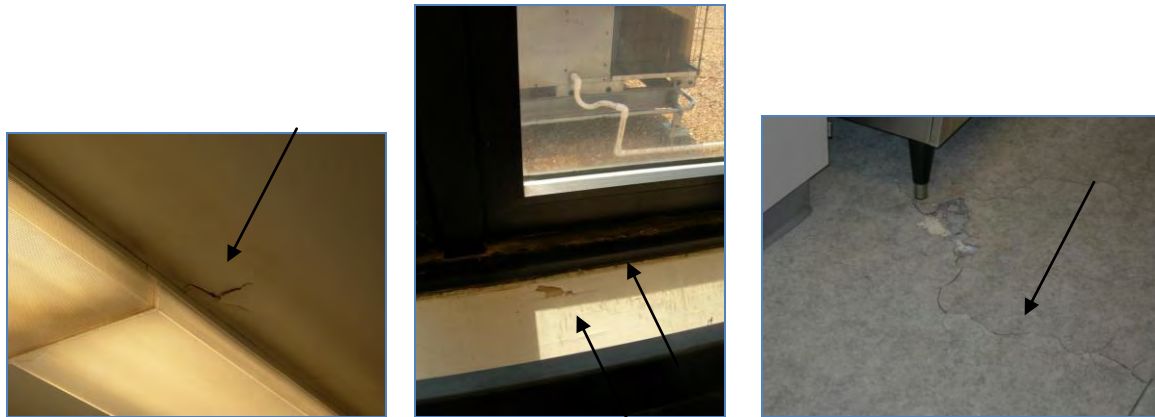
Building 1, the main hospital building, has nine floors above ground, a basement, and two penthouse levels and was constructed in 1953. Research laboratories are housed on the ninth floor and supporting glassware washing and sterilizing equipment is on the eighth floor. Some of the laboratories were renovated in 2002.

Laboratories that were renovated in 2002 are in fairly good condition with updated finishes, casework, and bench tops. The remaining laboratories are in need of updating. Most of the fixed equipment is in good condition with the exception of fume hoods in laboratories that have not been updated and a walk-in cold room in



poor condition. The glass washing and sterilizing equipment are in good to fair condition, but both are in need of exhaust hoods to protect interior finishes from steam.

The transformer room and the communications rooms do not have adequate cooling.



**The photos above show damaged finishes in Building 1 research space.**

Buildings 6/6A (which function as one building, hereafter referred to as Building 6), is a single story building constructed in 1953 with a two level addition built in 1969. Building 6 houses the VMU. Overall, this building is in poor condition, with finishes that do not meet industry standards for animal research facilities, deteriorated casework, and a cage washer that is in need of replacement.

The electrical system needs a number of improvements, including replacement of four branch panels and the addition of emergency power. Receptacles are not ground fault protected, nor do they have weatherproof covers (for wash down). Lighting fixtures are not gasketed as they should be in an animal facility.

The building lacks a full coverage sprinkler system and fire detection devices are missing from the corridors and closets.





**Rusted exposed piping in an animal use area.**



**Damaged roof membrane, Bldg 6.**

Buildings 7/7A (which function as one building, hereafter referred to as Building 7), is a single story building (with a basement and penthouse) constructed in 1953 with a single level addition built in 1987. Building 7 houses laboratories on one floor. At the time of the assessment, it was mostly unoccupied.

There has been significant water damage to this building. In addition to the common deficiencies described above, Building 7 has significantly aging/damaged finishes as well as casework throughout. Although the roof was replaced fairly recently, there is evidence of possible continued leakage into the building.



**Views of Building 7: (left to right) a typical laboratory, a water damaged ceiling, and an aging heat exchanger.**

The building shares deficiencies in common with Building 6, i.e., lack of emergency power, lack of GFCI receptacles, and lack of a full coverage sprinkler system.



In summary, in order to be used as a functional/viable research facility, Building 7 would require significant renovation.

At the Jefferson Barracks Division campus, research laboratories and a small VMU are housed in Building 1 on the third floor. Building 1 was constructed in 1900 and originally served as the Commandant's headquarters building on what was then a military installation. The historic building has been lovingly renovated while maintaining the historic integrity of the building. Most of the third floor research space was recently renovated. However, Building 1 is in need of significant systems upgrades.

Most of the laboratories on the third floor of Building 1 have been recently renovated and are in good condition, with updated finishes and mostly new casework. In a few places older casework was reused and some of it has deteriorated and should be replaced. The laboratories that were updated have new fume hoods and biosafety cabinets, also in good condition. The laboratory space that has not been renovated is in need of updated finishes, casework, and fixed equipment.



**Two views of Building 1, Jefferson Barracks Division. At left, casework in a newly renovated laboratory. At right, the VMU has been nicely renovated.**

The VMU housed at this campus is small, but has been very nicely renovated and is in good condition. The cage washer is about 15 years old and in fair condition. Both the cage washer and glassware washer need to have an exhaust hood installed to catch steam and odors, and protect interior finishes.



Building 1 shares many of the same common deficiencies found at the John Cochran Division campus, including a need for upgraded mechanical equipment, need for separation of industrial and potable water, and need for TVSS to protect electronics in the laboratories. The building is covered by emergency power and has a fully functional lightning protection system.

Only two of the four buildings are fully covered by a wet-pipe sprinkler system (Building 1, John Cochran Division and Building 1, Jefferson Barracks Division). Buildings 6 and 7 (John Cochran Division) are only partially protected.

The same can be said for safety showers and eyewashes. Building 6 (John Cochran Division) lacks plumbed showers and eyewashes, and Building 7 needs to have eyewashes added at laboratory sinks.

#### Other Research Space

The Research Service administrative offices and additional office/dry laboratory space for health services research are housed in leased space about three blocks from the John Cochran VA campus.

#### Security

There is appropriate electronic security throughout the laboratory and animal research areas.

#### Life Safety Hazards

The following life safety hazards identified during the assessment are in the process of being remediated:

- On the JC Division campus, Building 6 lacks plumbed safety showers and eyewash units. Building 7 needs to have eyewashes installed at laboratory sinks. (ORD provided funding to correct this deficiency.)
- Seismic lips are needed on reagent shelving at both campuses. (ORD provided funding to correct this deficiency.)

The following additional life safety hazards have not been remedied by the medical center:

- Buildings 6 and 7, JC Division campus, are only partially covered by a sprinkler system.
- Smoke detection is lacking.
- Not all receptacles near water sources are ground fault protected.



### Improvements Made Since Assessment:

No improvements have been made at this time. The engineering service has identified several that can be accomplished internally if Research Service generates work requests.

### New Construction

The St. Louis VAMC will be experiencing an influx of construction in the near future, primarily for clinical facilities, but also will gain a new stand-alone research building on the John Cochran Division campus, with its exact location still to be determined. Negotiations with property owners are ongoing.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>John Cochran Div.</b>	<b>Jefferson Barracks Div.</b>
Architectural	\$1,882,000	\$504,000
Plumbing	\$1,113,000	\$429,000
HVAC	\$3,198,000	\$1,012,000
Electrical	\$892,000	\$89,000
Fire Protection	\$74,000	\$0
<b>Total</b>	<b>\$7,159,000</b>	<b>\$2,034,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>JC Div.</b>	<b>JB Div</b>
1	\$777,000	\$56,000
2	\$3,137,000	\$966,000
3	\$2,935,000	\$974,000
4	\$70,000	\$0
5	\$240,000	\$38,000
<b>Total</b>	<b>\$7,159,000</b>	<b>\$2,034,000</b>

**Table 1.2 Cost Summary by Priority**



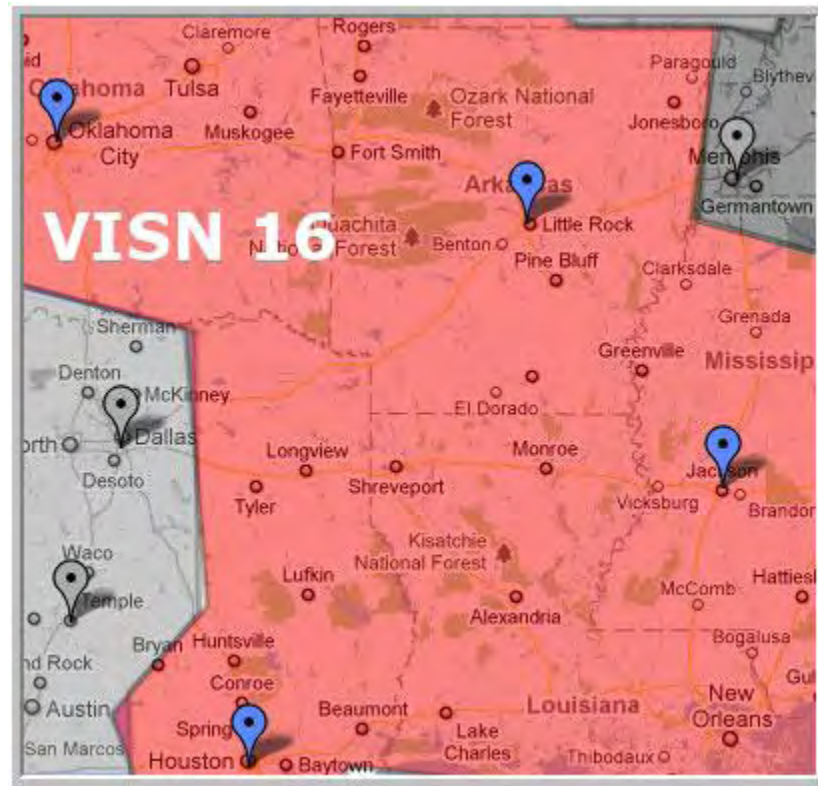
<b>Campus</b>	<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
John Cochran	\$7,159,000	\$23,944,000	30%
Jefferson Barracks	\$2,034,000	\$9,647,000	21%
Overall	\$9,193,000	\$33,591,000	27%

**Table 1.3 Facility Condition Index Value**





## VISN 16: South Central VA Health Care Network



<i>Sta. ID</i>	<i>VA Site Surveyed</i>	<i>City/State</i>
580	Michael E. DeBakey VA Medical Center	Houston, TX
586	G.V. (Sonny) Montgomery VA Medical Center	Jackson, MS
598	Central Arkansas Veterans Healthcare System, John L. McClellan Memorial Veterans Hospital	Little Rock, AR
635	Oklahoma City VA Medical Center	Oklahoma City, OK







***Michael E. DeBakey VA Medical Center,  
Houston, TX***



**Date(s) of Assessment: March 26-28, 2008**

**Number of Buildings Assessed: 3**

**Total Cost to Correct Deficiencies: \$8,673,590**

**Total Cost, Priority 1 Deficiencies: \$622,350 (or 7%)**

**Total Cost to Replace: \$63,377,000**

**Overall Campus FCI: 14%**

**Size of Research Program: Large (\$5 million to \$9.9 million in VA research funding)**



### Background

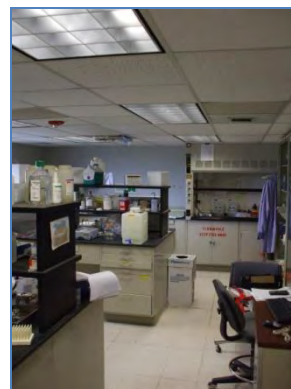
VA research funding for this large research program is spread among all four of the research disciplines (health services research, biomedical research, clinical research, and rehabilitation research).

The facility has a very strong academic affiliation with Baylor College of Medicine located adjacent to the VA campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in three buildings (Buildings 100, 109, and 110) on the VA campus with nearly 51,146 nsf of research space (laboratories – 36,109 nsf; VMU – 10,198 nsf; offices – 4,839 nsf). Following is an overview of the buildings, including their age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

The main hospital (Bldg 100), built in 1991, is a beautiful building with state-of-the-art clinical facilities. As might be expected, the biomedical laboratories housed in Building 100 are in the best condition of all laboratory space on the campus. Only very minor deficiencies in these laboratories were identified, with the primary problem being lack of access to safety showers. The overall condition of the laboratories in Building 100 is excellent.



**Examples of typical laboratories in all three buildings on the Houston VA campus: from left to right, Building 100, Building 109, and Building 110.**

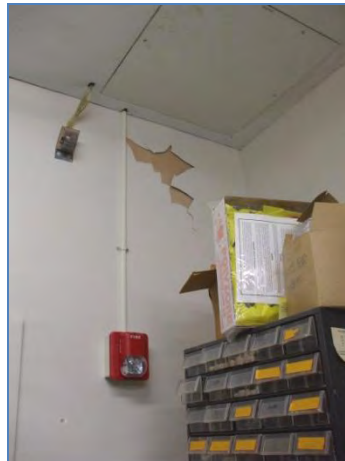
Building 109 is the primary research building, having been constructed for that purpose in 1978. Building 109 houses laboratories on two floors above ground and the VMU is on the basement level. Generally, the finishes and systems in this building have been well maintained, although there is evidence of water damage due to roof and/or pipe leakage. The casework in the first floor laboratories is in much better shape than on the second floor. In general, there appears to be a difference in upkeep between the two floors, with the first floor being in better



condition and receiving significantly better housekeeping support. Most of the large equipment in Building 109 is in working order, with a few exceptions (e.g., the environmental room (rm 129A) which is in failing condition). Improvements and preventive maintenance to the systems throughout this building have been accomplished, keeping it in fairly good working order. In this building some laboratories are missing eyewashes and one safety shower is inoperable.

As is the case at many sites, the VMU is in good condition and shows evidence of a high level of upkeep by the staff. There were some deficiencies noted, however, primarily with lighting, emergency power, and lack of redundancy in the exhaust system. There is a sprinkler system throughout the VMU (with the exception of one room), but there are no fire sprinklers on the other two floors of the building.

The laboratories in Building 110 are in poor condition, as is the building in general. Constructed in 1943, it contains finishes and systems that have not been well maintained and are now beyond their useful lives. With regard to architecture, the walls need to be patched and painted, and there is mold present in some parts of the building. The roof leaks, the laboratory casework is well beyond its useful life, and many pieces of laboratory equipment are non-operational. Further, the plumbing, mechanical, and electrical systems all need to be replaced for the building to remain viable. With regard to safety, there is no sprinkler system within the building. In addition to the lack of preventive and ongoing maintenance within this building, there appears to be a lack of attention to housekeeping as well.



**The photos above are examples of corroded casework (left), damaged finishes (center), and crowded conditions (right) in Building 109.**

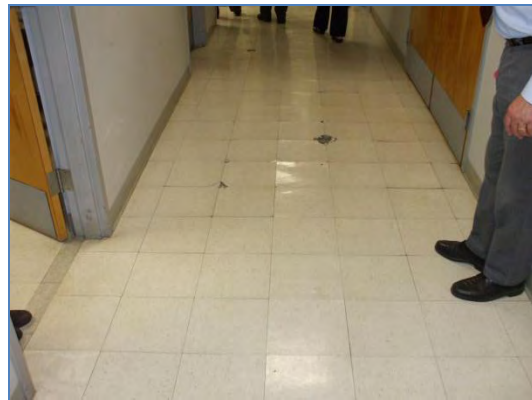
#### Other Research Space

Building 100 also houses the Research Commons, which was provided by the medical center leadership as dedicated space for clinical research. This clinical research space is quite expansive (with approximately 3,000 square feet) and very



functional in terms of accommodating exam rooms, waiting space for patients, and work space for study coordinators. The unit also houses a specimen processing lab.

The leased space housing the HSR&D center of excellence consists of approximately 36,000 square feet in the historic Nabisco building, a building adjacent to the VA campus, which has been converted to house a number of medically affiliated groups. This is excellent space, with room to accommodate further growth of the center. The lease is fully funded by the medical center.



**The laboratories in Building 110 are in the worst condition. The photo at left shows a dirty and corroded air diffuser. At right, the tile flooring in the corridor is damaged.**

#### Security

Research space, including the VMU, is adequately protected with security card readers and closed circuit television (CCTV). The VMU also has a dedicated elevator protected with a card reader.

#### Life Safety Hazards

The following life safety hazards identified during the assessment have been remediated by the medical center:

- Buildings 109 and 110 are now fully covered by sprinkler systems.
- Fire alarm systems in Buildings 109 and 110 have been updated.
- In the VMU, receptacles near water sources have been replaced with ground fault protected receptacles.

The following additional life safety hazard has not been remediated:

- Some spaces are lacking safety showers and/or emergency eyewashes.





### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Upgraded electrical system in the VMU, Bldg 109 – \$250,000 (NRM FY10), nearing completion.

Installation of door closers on laboratory doors, \$10,000 (station funds), completed.

Installation of stack extension for emergency generators, Bldg 109 -- \$15,000 (station funds), completed.

Installation of new secured doors at the VMU loading dock -- \$3,500 (station funds), completed.

### New Construction

There is no new construction of research space planned at this station.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Correction Cost -- Bldg 100</b>	<b>Correction Cost -- Building 109</b>	<b>Correction Cost -- Building 110</b>
Architectural	\$46,700	\$1,025,700	\$1,125,700
Plumbing	\$47,030	\$497,380	\$223,200
HVAC	\$18,810	\$2,012,600	\$1,604,200
Electrical	\$0	\$799,700	\$823,800
Fire Protection	\$0	\$298,070	\$150,700
<b>Total</b>	<b>\$112,540</b>	<b>\$4,633,450</b>	<b>\$3,927,600</b>

**Table 1.1 Cost Summary by Discipline**





Priority	Bldg 100	Bldg 109	Bldg 110
1	\$100,000	\$214,450	\$307,900
2	\$0	\$1,716,500	\$1,925,200
3	\$12,540	\$2,669,500	\$1,694,500
4	\$0	\$33,000	\$0
5	\$0	\$0	\$0
Total	\$112,540	\$4,633,450	\$3,927,600

Table 1.2 Cost Summary by Priority

Building	Correction Cost	Replacement Cost	FCI
Building 100	\$112,540	\$7,769,000	1%
Building 109	\$4,633,450	\$36,935,000	13%
Building 110	\$3,927,600	\$18,673,000	21%
Overall	\$8,673,590	\$63,377,000	14%

Table 1.3 Facility Condition Index Value



***G. V. (Sonny) Montgomery VA Medical Center,  
Jackson, MS***



**Date(s) of Assessment: December 11-12, 2007**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$6,647,000**

**Total Cost, Priority 1 Deficiencies: \$5,001,000 (or 75%)**

**Total Cost to Replace: \$7,825,000**

**Overall Campus FCI: 85%**

**Size of Research Program: Small (Under \$2.5 million in VA research funding)**



### Background

The primary research focus of this small program has historically been basic science. VA research funding is predominantly for biomedical research with very small amounts for the other research disciplines.

The Jackson VAMC is affiliated with the University of Mississippi Medical Center and several smaller academic institutions.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and offices were housed in a single building on the VA campus with 20,345 nsf of research space (laboratories – 9,728 nsf; VMU – 7,609 nsf; offices – 3,008 nsf). Following is an overview of the research building, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

The space is housed in the Research and Education (R&E) Building, a five story (plus basement and sub-basement) building constructed in 1978 and attached to the main hospital. The research laboratories and the vivarium occupy the sub-basement, basement, third, and fourth floors. There have been two renovations in the research space since the building was constructed – in 1997 (sub-basement) and 2001 (selected laboratories received new casework and paint).

By far the most significant deficiencies in the space pertain to mechanical and life safety systems. Specifically, the laboratories and vivarium are not served by separate HVAC systems, but rather share recirculated air. There also is no redundancy on the system. Quality of the air is very poor and was found to have what is believed to be small pieces of friable fiberglass insulation being dispersed through the ventilation system. The estimated cost of correcting mechanical deficiencies is significant and is more than 50% of the total correction costs.

The space was found to lack important life safety features such as a sprinkler system and fire dampers in the ventilation system. There also are problems with the fire alarm system, although it is only ten years old. In addition to problems associated with poor quality installation, the fire alarm system detects fire/smoke and provides notification only in the building corridors.

Emergency eyewashes at laboratory sinks do not comply with current requirements. Some emergency showers are also needed.

Overall, research space at the Jackson VAMC is housed in a thirty year old facility that has been well maintained but is lacking adequate mechanical systems to support it. Life safety systems are also lacking. These deficiencies result in the



inability to achieve optimal functionality in the space and, more importantly, create serious health and safety risks.



**Left photo: Having a sink directly beneath an electric panel is a significant safety concern. Right photo: Storage of equipment within the laboratories results in lack of accessibility.**

### Security

Access to the research space is controlled by a system using proximity cards.

### Life Safety Hazards

The following life safety hazard identified during the assessment is in the process of being remediated:

- A sprinkler system is being installed in the building (funded by NRM).

The following additional life safety hazards identified during the assessment have not been remediated:

- Receptacles in the VMU are not ground fault protected.
- Eyewashes are needed in the laboratories (current units do not meet requirements).
- Safety showers are needed.
- The fire alarm system is deficient (poor installation, limited smoke detection and notification).
- In at least one laboratory, an electric panel is located over a sink.
- There are no fire dampers in the ventilation system.



### Improvements Made Since Assessment:

This station has made and/or initiated some improvements following the assessment, including:

Replacement of the HVAC system and windows are in progress.

Installing sprinkler system in research building -- \$450,000 (NRM FY11).

### New Construction

There is no new construction of research space planned at this station.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

Discipline	Correction Cost
Architectural	\$1,453,000
Plumbing	\$629,000
HVAC	\$3,474,000
Electrical	\$828,000
Fire Protection	\$263,000
Total	\$6,647,000

**Table 1.1 Cost Summary by Discipline**

Priority	Correction Cost
1	\$5,001,000
2	\$1,151,000
3	\$178,000
4	\$0
5	\$317,000
Total	\$6,647,000

**Table 1.2 Cost Summary by Priority**



Correction Cost	Replacement Cost	FCI
\$6,647,000	\$7,825,000	85%

**Table 1.3 Facility Condition Index Value**







***Central Arkansas Veterans Healthcare System,  
John L. McClellan Memorial Veterans Hospital  
Little Rock, AR***



**Date(s) of Assessment: June 20-21, 2006 (Pilot Site)**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$3,344,835**

**Total Cost, Priority 1 Deficiencies: \$1,741,186 (or 52%)**

**Total Cost to Replace: \$25,312,985**

**Overall Campus FCI: 13%**

**Size of Research Program: Large (\$5 million to \$9.9 million in VA research funding)**



### Background

VA research funding for this large program is predominantly for biomedical research, with lesser funding in the other three research disciplines. At the time of the assessment, the program hosted a health services COE, a QUERI coordinating center, and a REAP focusing on diabetes.

The principal affiliate is the University of Arkansas for Medical Sciences (UAMS), located next to the VAMC and connected via a pedestrian bridge.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in a portion of the main hospital on the VA campus with 46,661 nsf of research space (laboratories – 40,481 nsf (including a BSL-3 laboratory) and the VMU – 6,180 nsf). Following is an overview of the research space, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

The research laboratory space is housed in a portion of the main hospital building. Most of the laboratory space was constructed in 1984. Although the laboratories feature good design, they are showing their more than 20 years of age. Through appropriated funding of over \$2 million in FY01, approximately 6,000 square feet of new laboratory space, including 443 square feet for a BSL-3 facility, was completed in 2005. Prior to the assessment, the BSL-3 had been inspected and certified.

Most laboratories are fairly spacious with an island configuration that includes sinks. A number of these sinks need replacement and have contributed to deterioration of surrounding casework and countertops. Casework, in general, is in moderately good condition but could use repainting or, in some cases, replacement.



### **Examples of typical laboratory conditions at the Little Rock VAMC.**



In the laboratory area, there are insufficient numbers of emergency showers in the halls and the location of many eyewash stations makes them somewhat inaccessible if needed in an emergency situation.

In general, laboratories are very cluttered with at least two of them appearing to be used more as storage areas than functional laboratory space. Storage space is at a premium and, in some instances, is creating problems that could be very hazardous (e.g., storage of chemicals). A recent local mandate to remove freezers and refrigerators from hallways has resulted in extremely crowded conditions in some areas and even partial obstruction of doorways.

There are a number of areas in which fume hoods were not connected. In one space, it was noted that a fume hood designated for use with perchloric acid is no longer functional and currently is used for storage. It should be removed, but to do so will be very costly because perchloric crystals in the ductwork create a potential for explosion and require specialized handling for safe disassembly.

Signage on doors throughout the research space is spotty, either incomplete or absent. Research is currently developing a signage system in compliance with hospital regulations for door attachments.

Newly-constructed laboratories: The newest research space was completed in 2005. This space includes 343 square feet for a BSL-3 facility. (A previously existing BSL-3 laboratory in the VMU has been deactivated.) The laboratories were designed with modular casework to ensure flexibility. In addition to laboratories, the space houses a tissue culture core facility and a freezer room. It was noted that an incorrect type of eyewash unit (hand held) is installed in these laboratories.

The addition of the new space created a corridor area that is parallel to an existing corridor. There is a local project being considered to open access to both corridors thereby sealing the one ending in a dead end and using resulting space for storage or location of ultra-low freezers.

It was noted that exterior walls of the laboratories do not extend to the structural ceiling but rather to the suspended ceiling and light fixtures. This compromises effective, balanced negative air flow requirements for laboratory work spaces.

Systems: Aging of plumbing systems throughout the hospital has resulted in leakage from upper floors into the research areas located in the basement. There are also roof leaks in research space which has resulted in damage to or loss of equipment or computers, as well as building, casework and fixture damage. To date there has been no harm to research animals or loss of research data.



The HVAC system is also aging and will require increasing involvement by Engineering Service personnel. At some point, replacement of major components will need to occur. The potential for a breakdown impacts negatively on equipment functionality, thus affecting the welfare of animals, as well as the safety of stored specimens and cultures.

The primary concern expressed by both research management and investigators is that the need for electrical utilities exceeds the capacity of the current system. Designed 20 years ago, the system does not allow for adequate power in each laboratory, particularly with evolving technology requiring greater power supply. In addition, the proliferation of ultra-sensitive equipment requires emergency power source capability. Currently limited emergency power is available in the laboratory areas.

The building is covered by a sprinkler system and the fire alarm system is in good condition.

The newer laboratories have hand held eyewashes that do not meet current requirements. Also, there appears to be insufficient safety showers to be accessible from all laboratories.

There were a number of Priority 1 deficiencies identified with the newly built/certified BSL-3 laboratory.

#### Other Research Space

The health services center and the QUERI coordinating center are located at the North Little Rock VAMC in approximately 6,000 square feet of space that also houses the MIRECC. The space occupied is office space to which a number of renovations have occurred over the past 15 years.

#### Security

Electronic access security is in place for the perimeter of all research space, and a secondary system monitors the VMU. The system monitors access only. There is no record taken of egress from the areas. A surveillance camera can monitor egress from the VMU.

A cesium irradiator is located within the VMU and an additional electronic access system restricts entry to authorized users.

Surveyors noted that the air intake for the newly constructed laboratory addition is located in the parking lot area and is only six inches above grade. This is a potentially dangerous situation in the context of bioterrorism.



### Life Safety Hazards

The following life safety hazard identified during the assessment has been remediated by the medical center:

- Safety showers and emergency eyewashes that meet requirements have been installed.

### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Correction of deficiencies with BSL-3 laboratory -- \$10,000 (station funds), completed. The station reported that the BSL-3 laboratory has been recertified.

Correction of receptacles in VMU that were not water proof -- \$700 (station funds), completed.

### New Construction

There is no new construction of research space planned at this station.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Correction Cost</b>
Architectural	\$953,199
Plumbing	\$102,906
HVAC	\$1,585,220
Electrical	\$684,556
Fire Protection	\$18,954
<b>Total:</b>	<b>\$3,325,881</b>

**Table 1.1 Cost Summary by Discipline**





Priority	Correction Cost
1	\$1,741,186
2	\$767,899
3	\$240,268
4	\$283,747
5	\$311,735
Total:	\$3,344,835

**Table 1.2 Cost Summary by Priority**

Correction Cost	Replacement Cost	
\$3,344,835	\$25,312,985	13%

**Table 1.3 Facility Condition Index Value**



***Oklahoma City VA Medical Center,***

***Oklahoma City, OK***



**Date(s) of Assessment: August 20-21, 2008**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$13,024,000**

**Total Cost, Priority 1 Deficiencies: \$7,945,000 (or 61%)**

**Total Cost to Replace: \$21,688,000**

**Overall Campus FCI: 60%**

**Size of Research Program: Small (Under \$2.5 million in VA research funding)**



### Background

VA research funding for this small program is predominantly for biomedical research. The academic affiliate is the University of Oklahoma Medical School which is located adjacent to the VA campus.

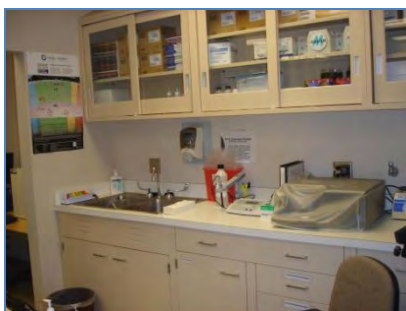
### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in a single building (Building 19) on the VA campus with just over 20,000 nsf of research space (laboratories – 12,113 nsf; VMU – 7,118 nsf; offices – 2,023 nsf). Following is an overview of Building 19, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

The research laboratories and VMU are housed in Building 19, which was constructed in 1972 as a research wing addition to the main hospital. Laboratories are on three floors. The ground floor is primarily mechanical space and there is a mechanical penthouse as well. The three story addition that houses the VMU was added to Building 19 in 1990.



**Interior spaces of Building 19 show evidence of water damage caused by the exterior seals between pre-cast panels (mechanical vertical shaft) either missing or deteriorated (left photo). At right, a deteriorated laboratory ceiling.**



**Typical laboratory views. Note the shallow countertops (24 inches rather than the standard of 30) at left, and tight working conditions on other two photos.**



Overall, the laboratory space is in poor condition. Nearly half the cost to correct deficiencies is for the mechanical system which has exceeded its useful life and is unable to serve the building adequately. There also are significant architectural deficiencies, primarily due to leakage from the exterior of the building where the seal between concrete panels (that encase the mechanical shafts) has disintegrated, allowing moisture and air leakage and causing water damage throughout the building. No problems with the roof were identified.

There has been some renovation in laboratories on the first and third floors, primarily of a cosmetic nature. The second floor laboratories still have original casework and finishes in place. In the laboratories remodeled in 1992, small laboratories were combined to create larger and more open spaces that are not well designed and contain inefficient space.

Most of the fume hoods in the laboratory areas are original to the building and are in need of replacement. One of the two cold rooms and the warm room have exceeded their useful lives. The laboratory area autoclave is in good operating condition.

The electrical systems are aging and have been well maintained, but they are at the point where replacement parts are difficult to obtain. The entire building, including lighting, is supported by emergency power.

Lighting levels are low and have not yet been upgraded to newer, more energy efficient fixtures.

There is no central monitoring of freezers or fume hoods.

The entire building is protected by a wet pipe fire sprinkler system. However, the system is old and needs to be replaced. The fire alarm system was replaced about ten years ago and is in good condition.

Veterinary Medical Unit: The VMU occupies three floors and has spaces appropriately separated for specific functions (e.g., large animal housing, small animal housing, etc.). Finishes throughout the space are generally in good to fair condition.

The most significant deficiency identified in the VMU is the lack of an operational cage washer. The station had requested funding for a new cage washer when availability of funds was announced by VA Central Office, but the request was not approved for funding. Since that time, the washer has become completely inoperable. The unit is old and replacement parts are no longer available. There is a tunnel washer in the VMU, but it is also original equipment and barely operable.



Currently VMU staff is using portable water pressure washers to clean the cage racks. However, the racks cannot be sterilized by this method. (Note: Following the assessment, the medical center purchased two new cage washers for the facility.)

Mechanical systems serving the VMU are original to the building and in need of upgrading. Additionally, there currently is no redundancy for the HVAC system in the VMU.

With regard to electrical systems, there are some fixtures (lighting fixtures, receptacles) that are not appropriately waterproofed.

#### Other Research Space

There is a small area housing offices and exam rooms dedicated for clinical research. The space appears to be adequate to support current levels of clinical research.

#### Security

Access to research space is controlled with a combination of proximity cards and hard keys, and appears to be adequate. The system is on emergency power.

#### Life Safety Hazards

The following life safety hazards identified during the assessment are expected to be remediated by the medical center in conjunction with laboratory space renovation or are being remediated:

- Emergency showers and eyewashes do not meet current requirements. (ORD provided funding to remediate this deficiency.)
- The sprinkler system is in poor condition (leaks) and should be replaced.

#### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Upgrade of mechanical system, laboratory areas, Bldg 19 – (NRM), in planning.

Upgrade of mechanical system, VMU, Bldg 19 – (NRM), in planning.

Upgrade of electrical system, Bldg 19 – funds have been requested from VISN 16.

Renovation of laboratory area including laboratories, common areas, and offices is planned -- \$4,200,000 (NRM FY11), in planning/design, expected to begin January 2012.



Correction of Priority 1 deficiency, replacement of both cage washers in VMU -- \$749,000 (station funds), completed.

Correction of insulation and leakage issues with exterior envelope – (station funds), completed.

#### New Construction

There is no new construction of research space planned at this station. However, extensive renovation of the laboratory space is in planning.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

Discipline	Correction Cost
Architectural	\$3,218,000
Plumbing	\$1,678,000
HVAC	\$5,824,000
Electrical	\$1,989,000
Fire Protection	\$315,000
Total	\$13,024,000

**Table 1.1 Cost Summary by Discipline**

Priority	Correction Cost
1	\$7,945,000
2	\$4,957,000
3	\$0
4	\$0
5	\$122,000
Total	\$13,024,000

**Table 1.2 Cost Summary by Priority**



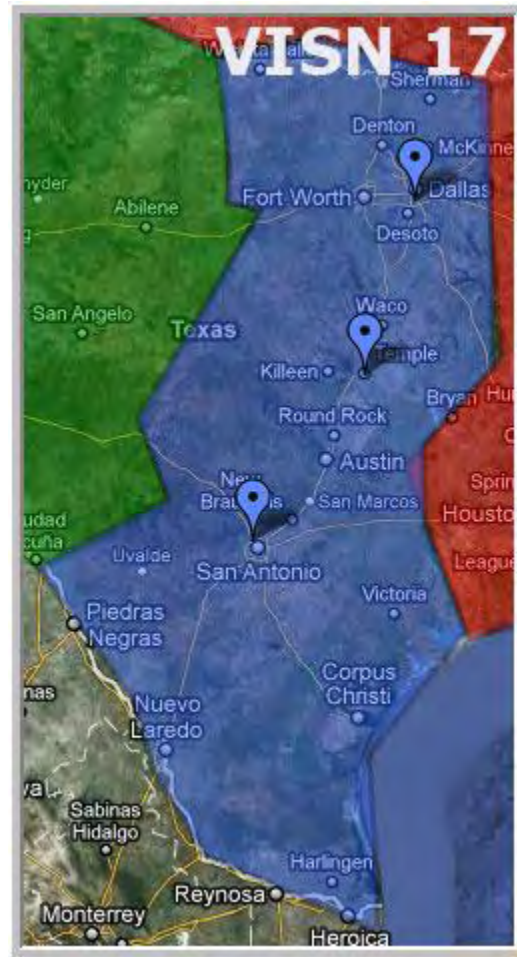


Correction Cost	Replacement Cost	FCI
\$13,024,000	\$21,688,000	60%

**Table 1.3 Facility Condition Index Value**



## VISN 17: VA Heart of Texas Health Care Network



<i>Sta. ID</i>	<i>VA Site Surveyed</i>	<i>City/State</i>
<i>549</i>	<i>VA North Texas Health Care System: Dallas VA Medical Center</i>	<i>Dallas, TX</i>
<i>671</i>	<i>South Texas Veterans Health Care System, Audie L. Murphy VA Hospital</i>	<i>San Antonio, TX</i>
<i>674</i>	<i>Central Texas Veterans Health Care System, Olin E. Teague Veterans' Medical Center</i>	<i>Temple, TX</i>





***VA North Texas Health Care System:***

***Dallas VA Medical Center,***

***Dallas, TX***



**Date(s) of Assessment: April 14-15, 2009**

**Number of Buildings Assessed: 2**

**Total Cost to Correct Deficiencies: \$17,106,000**

**Total Cost, Priority 1 Deficiencies: \$ 4,080,000(or 24%)**

**Total Cost to Replace: \$36,322,000**

**Overall Campus FCI: 47%**

**Size of Research Program: Medium (\$2.5 million to \$4.9 million in VA research funding)**



### Background

The research program at the Dallas VAMC has a rich history, including four previous recipients of VA's prestigious Middleton Award among the local investigators. VA research funding for this medium sized program is concentrated primarily in biomedical and rehabilitation research, with lesser funding for clinical and health services research.

The facility is affiliated academically with the University of Texas Southwestern Medical School at Dallas, located northwest of downtown Dallas and at significant driving distance from the VA campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting office space were housed in two buildings on the VA campus with over 44,000 nsf of research space (laboratories – 21,870 nsf; VMU – 11,532 nsf; offices – 11,031 nsf). Following is an overview of each building housing research, including its age, configuration, general condition, and description of key architectural and systems deficiencies within each building that existed at the time of the assessment.

The research laboratory and VMU space is housed in two buildings on the Dallas VA campus. Building 3, constructed in 1940, was extensively renovated and converted to research laboratories and support space in 1989. Laboratories occupy both floors of the building (first floor and basement). Building 43, which houses laboratories, offices and support space on the first and second floors, was built in 1978. The VMU is housed in the basement. An addition to the VMU was constructed in 1992.

Building 3 has had no significant renovation since being converted to research laboratory space in 1989. As might be expected, the finishes, laboratory furnishings, and equipment are aging and in need of replacement, although the space overall has been well maintained. The clay roof was restored in 1995 and no current leaks are reported. There was previously a problem with leakage through the exterior envelope. Following a recent tuck pointing project, the leakage appears to have been corrected. Some evidence of water damage to inside perimeter walls and adjacent ceilings remains to be corrected.

Generally hardware on interior doors does not meet accessibility standards and should be replaced with appropriate lever type handles.

Safety showers in the hallways do not have the required eyewashes located nearby. The eyewashes inside laboratories are of a type that is no longer considered appropriate.



There are significant deficiencies in the mechanical and electrical systems. The air handling units are not of an appropriate type for a laboratory environment, i.e., they do not provide 100% outside air. The system does not provide humidity control, thus the space suffers from a significant humidity problem. There also is no redundancy in the system, nor is the system supported by emergency power.



**Photos above show conditions in Building 3 laboratories: at left, a corroded and stained countertop and, at right, corrosion on laboratory casework.**

**Building 43 also has many fixtures beyond useful life expectancy (photos below).**



The electrical system is also aging, and there is not ample capacity in the emergency power system to fully support the building. Ground fault protected receptacles are not consistently placed throughout the space where they should be, i.e., near sinks. There also is no transient voltage surge suppression to protect sensitive electronics. There is no emergency lighting in the laboratory areas.

Building 43, constructed in 1978, also has aging finishes, furnishings, and equipment, although it also has been well maintained. Most of the vinyl composition tile flooring was installed using mastic with asbestos. Like Building 3,





this building lacks accessible door hardware and appropriate eyewashes. The roof was recoated in 2008.

The mechanical system that serves the laboratories and the original part of the VMU is original to the building, lacks redundancy, and is in need of replacement. The system that was installed with the 1992 VMU addition is appropriate for an animal facility, as it is a 100% outside air system and has redundancy. In the VMU, the controls are appropriately set to fail in the “cool” position to protect the animals in case of equipment failure.

The electrical system also is original to the building and in need of replacement. Emergency power capacity is somewhat limited.

Building 3 is covered by a sprinkler system, but Building 43 is only partially protected. Fire alarm systems are fairly new, but they lack addressable notification devices.

#### Other Research Space

Hospital leadership provided significant space about five years ago for the establishment of a clinical research unit (CRU). The unit, which houses six exam rooms, pharmaceutical storage, nurses’ station, and office space for study coordinators, is one of the best organized and largest clinical research units seen to date in research infrastructure surveys. (Note: The Research Service has recently been notified it will lose its current Clinical Research Unit but will be given space in another area resulting in a net loss of about 30 percent.)

#### Security

Access to research space is protected by a keypad system.

#### Life Safety Hazards

The following life safety hazards identified during the assessment have been remediated by the medical center:

- Updated emergency eyewash units have been replaced in Building 3.
- A new fire alarm system was installed in Building 43, but it still does not have addressable notification devices. (This is an accessibility issue.)

The following additional life safety hazards have not been remediated:

- Building 43 is lacking ground fault protected receptacles near water sources.
- Building 43 is lacking full sprinkler system coverage.



### Improvements Made Since Assessment:

This station has made and/or initiated the following improvements following the assessment.

Correction of Priority 1 deficiency, emergency eyewash units in Bldg 3 – (station funds), completed.

Correction of Priority 1 deficiency, provided monitoring for -80 degree freezers – (station funds), completed.

Installation of new fire alarm system, Bldg 43 – (station funds), completed. (Note: the system still does not have addressable notification devices that meet accessibility guidelines.)

### New Construction

There is no new construction of research space planned at this station.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Correction Cost - Bldg 3</b>	<b>Correction Cost - Bldg 43</b>
Architectural	\$2,561,000	\$3,843,000
Plumbing	\$63,000	\$35,000
HVAC	\$2,042,000	\$4,897,000
Electrical	\$1,322,000	\$1,912,000
Fire Protection	\$0	\$431,000
<b>Total</b>	<b>\$5,988,000</b>	<b>\$11,118,000</b>

**Table 1.1 Cost Summary by Discipline**



Priority	Bldg 3	Bldg 43
1	\$1,358,000	\$2,722,000
2	\$2,568,000	\$1,886,000
3	\$1,951,000	\$5,707,000
4	\$111,000	\$803,000
5	\$0	\$0
Total	\$5,988,000	\$11,118,000

Table 1.2 Cost Summary by Priority

Building	Correction Cost	Replacement Cost	FCI
Building 3	\$5,988,000	\$11,942,000	50%
Building 43	\$11,118,000	\$24,380,000	46%
Overall	\$17,106,000	\$36,322,000	47%

Table 1.3 Facility Condition Index Value



***South Texas Veterans Health Care System,***

***Audie L. Murphy VA Hospital***

***San Antonio, TX***



**Date(s) of Assessment: September 21-22, 2006 (Post-Pilot Site)**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$ 2,659,450**

**Total Cost, Priority 1 Deficiencies: \$69,800 (or 3%)**

**Total Cost to Replace: \$13,800,000**

**Overall Campus FCI: 19%**

**Size of Research Program: Large (\$5 million to \$9.9 million in VA research funding)**



### Background

VA research funding for this large program is primarily for biomedical research with additional funding for health services and the other research disciplines. The program hosts a COE in Basic and Translational HIV/AIDS Research and Training, as well as a REAP focusing on “Genes, Environment, and Oxidative Stress in Neurodegenerative Disease.” The program also hosts a health services REAP, the Veterans Evidence-Based Research, Dissemination, and Implementation Center (VERDICT) which focuses on identifying new opportunities for improving care within the clinical microsystem for veterans with healthcare problems that are complex, that have resisted standard methods of quality improvement, and/or are understudied. The facility also is the site of a GRECC and a General Clinical Research Center (GCRC) funded by the National Institutes of Health (NIH).

The academic affiliate is the University of Texas Health Science Center at San Antonio located adjacent to the VA campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories and the Veterinary Medical Unit (VMU) were housed in a single building on the VA campus with over 45,000 nsf of research space (laboratories – 30,400 nsf and VMU – 15,100 nsf). Following is an overview of the building housing research, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

The research space is distributed throughout two floors (second and third floors) of the seven floor hospital building that was constructed in 1970. The space includes a vivarium adjacent to the laboratories on the second floor.

Laboratories: Research space is located in multiple areas of the 30 year old facility. The hospital has been well maintained but many systems and materials are reaching the end of their expected life cycles.

Research laboratories are located on portions of the second and third floors. Except for the third floor laboratories which were recently renovated, the casework is showing age. Rust is visible and the epoxy countertops are faded and worn. The flooring is also showing its age.

There has been some renovation of the second floor laboratories which consists of removing walls to convert contiguous small spaces into more usable laboratory space. Walls and casework have been painted and lighting fixtures replaced. These laboratories are vastly improved but give the impression of less than a modern working environment with odd dimensions and less than fully functional space. There is a local plan to continue renovating this floor, but availability of funds is a key issue.





**The photos above and below are indicative of research space at the Audie L. Murphy Memorial Veterans Hospital.**



Veterinary Medical Unit (VMU): The VMU is located on the second floor adjacent to laboratories. Access is controlled by a card reader. It is a well maintained and clean facility with one of the highest animal census in the VA system. One problem noted, however, is that there is a very strong odor noticeable upon entry in an area where caging has not been transitioned to ventilated caging systems. Use of ventilated systems in other areas of the facility make a noticeable difference.





Systems: Problems relate to the aging of the facility and the end of the expected life of equipment. The most costly deficiencies are for HVAC improvements, specifically a need for additional electronic monitoring on equipment and connecting it to the existing DDC control system. Correcting this will enable evidence of problems with the system before they become emergent. Other costly HVAC deficiencies involve the exhaust system.

There are several problems identified by local staff with electrical power, including lack of emergency power for air handler supply units and central exhaust fans. Overall the electrical system was found to be in fair condition, although the system is clearly nearing the end of its expected life cycle.

Pipe leaks from the HVAC system in the interstitial spaces above the laboratories have resulted in some damage to computers and equipment as well as to the building, casework and fixtures.

Other significant issues identified include the lack of a sprinkler system in the partially completed construction area on the second floor, improper fume exhaust discharge, inactive monitoring system for equipment installed in the interstitial spaces, and a locked fire exit door leading from the vivarium.

Sink mounted eyewash stations do not meet current requirements and should be replaced. There are several emergency showers that are poorly located or physically blocked for quick access. Chemical storage issues are evident with corroded containers, inappropriate separation of chemicals, excess amounts of flammables, and in several instances lack of proper chemical storage cabinets. Lack of adequate space has resulted in cluttered laboratories and awkward placement of instrumentation (including in front of electrical panels).

No ground fault protected receptacles are present in the second floor laboratories at locations near sinks.

#### Other Research Space

The GCRC is located on the seventh floor of the hospital. A project (over \$400,000) to renovate/expand space in the GCRC has been approved to be equally funded by the NIH and VA using local station funds. The project will expand GCRC space by 5,000 square feet.

The VERDICT is being relocated a second time due to the hospital's need for additional clinical space. The space that currently houses the REAP was formerly clinical space converted to office space. After the REAP relocates, the space will be converted back to clinical space. The new space for the REAP is about 20% smaller than the space currently occupied. This will be a temporary situation with another move expected in 2009-2010.



At the time of the assessment, there were a number of renovation projects either recently completed or underway. Existing hospital space had been converted to research laboratories on the third floor. Unit 3A was converted into six research wet laboratories with two common use rooms. This project was funded from minor construction funds (\$532,000) and was completed in 1999. Unit 3B (was converted into four wet laboratories, seven common use rooms, seven investigator offices, and one investigator administrative office. This project was funded through non-recurring maintenance (NRM) funds (\$429,000) and was completed in 2001.

Within the VMU, there is a large area originally designed to be a BSL-3 facility. The project was initiated in 2002 with station level funds, but was delayed due to contracting issues. Subsequently, VHA mandated that no BSL-3 construction could occur without central approval. As a result, the project was placed on hold when it was approximately 50% complete. The space is currently being used for storage. Updated information received from San Antonio after the survey indicates that the space will be developed as a BSL-2 laboratory when funds are available.

At the time of the assessment, a large area of new research space (Infectious Disease/Immunology) was under construction on the second floor. This project had been temporarily halted pending additional funds, although the survey team was told that the project would resume in October 2006 with expected completion in March 2007. Updated information obtained from the station indicates that the project would resume in June 2007 with an estimated completion in September 2007. This new construction project (Phase I) was started in October 2004 with a projected cost of \$4.9 million in minor construction funds. It specifies 6,400 square feet of wet laboratory space designed to hold a large multi-investigator laboratory (up to six principal investigators, eight common use areas, nine offices, and conference rooms). Phase II of the project (\$176,647, design only) would house laboratories, offices, and conference space for the aging research program in 4,500 square feet adjacent to the Phase I construction.

There are also plans to renovate existing research space on the second floor, consolidating several laboratories into single laboratories and making aesthetic corrections to others. Cost of this project is estimated to be between \$50,000 and \$80,000. Completion of these projects would increase the existing on-site biomedical laboratory space at the VAMC by 70%.

#### Security

Card reader systems are in place throughout the research space to control access to research areas by unauthorized persons (staff and patients).



### Life Safety Hazards

The following life safety hazard identified during the assessment is in the process of being remediated:

- Updated emergency eyewashes will be installed. (ORD provided funding to remediate this deficiency.)

The following additional life safety hazards identified during the assessment have not been remediated by the medical center:

- Coverage by the sprinkler system is partial.
- The second floor laboratories are missing ground fault protection on receptacles near water sources.

### Improvements Made Since Assessment:

This station has made and/or initiated improvements following the assessment, including:

Renovation of administration area, two laboratories, and part of the VMU -- \$589,924 (NRM FY10), in progress.

### New Construction

There is no new construction of research space planned at this station.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

Discipline	Correction Cost
Architectural	\$515,500
Plumbing	\$41,200
HVAC	\$2,015,000
Electrical	\$83,750
Fire Protection	\$4,000
Total	\$2,659,450

**Table 1.1 Cost Summary by Discipline**



Priority	Correction Cost
1	\$69,800
2	\$1,374,550
3	\$165,200
4	\$974,200
5	\$75,700
Total	\$2,659,450

**Table 1.2 Cost Summary by Priority**

Correction Cost	Replacement Cost	
\$2,659,450	\$13,800,000	19%

**Table 1.3 Facility Condition Index Value**





***Central Texas Veterans Health Care System,***

***Olin E. Teague Veterans' Medical Center***

***Temple, TX***



**Date(s) of Assessment: December 2-3, 2010**

**Number of Buildings Assessed: 2**

**Total Cost to Correct Deficiencies: \$2,842,000**

**Total Cost, Priority 1 Deficiencies: \$622,000 (or 22%)**

**Total Cost to Replace: \$37,652,000**

**Overall Campus FCI: 8%**

**Size of Research Program: Small (Under \$2.5 million in VA research funding)**





### Background

This small research program has more than tripled its VA funding in four years. The majority of VA funding is for biomedical research. Major areas of focus for biomedical research are digestive diseases, neuroscience, and cardiology. The facility hosts the VISN 17 Center of Excellence for Research on Returning War Veterans at the Waco campus.

The academic affiliate is Texas A&M University College of Medicine, specifically its campus at Scott & White Hospital which is within two miles of the Temple VA campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories and supporting office space were housed in two buildings on the VA campus with just under 43,000 nsf of research space (laboratories -- 30,880 nsf and offices -- 12,083 nsf). Following is an overview of each building housing research, including its age, configuration, general condition, and description of key architectural and systems deficiencies within each building that existed at the time of the assessment.

The Olin E. Teague Veterans' Medical Center currently houses biomedical research laboratories in two buildings: Building 162, a 1960s era building that houses a small amount of laboratory space as well as hospital administrative and clinical functions, and Building 205 which was constructed in 2002 as a research facility and which houses only research. There currently is no animal research facility at this VAMC.

Building 162 is slated for demolition in the near future, so current laboratory occupants will be relocated. Although there are no plans to retain Building 162 or to further renovate laboratory space, the assessment was conducted as a "snapshot" of research space as of December 2010, so deficiencies in Building 162 were identified and priced per standard survey procedure. It is hoped that the recommendations to improve laboratory space in Building 162 will be useful as the facility moves forward with further laboratory construction and/or renovation projects.

In Building 205, laboratories on the third floor were completed with initial construction of the building. The second floor was initially left as shell space, but has since been built out into laboratories. The first floor houses office and conference space. The facility has plans to expand Building 205 with additional laboratory space as well as an animal research facility.

Most of the laboratory space is relatively new and in good physical condition. Even the laboratories in Building 162 which were renovated in 1999 have an overall good appearance. But there are still some significant deficiencies with the space.



Building 162 is a single story building that, over the years, has experienced extensive water damage. Even the renovated laboratories which generally have newer casework and finishes show signs of leakage, particularly on the ceilings. There is some evidence of mold within the building. In addition to leakage from the roof, windows, and doors, Building 162 also suffers from poor drainage around the exterior of the building.

With regard to systems, Building 162 has a laboratory water system separate from potable water, but there is no backflow protection in place. Most plumbing fixtures are in good condition and laboratory waste piping was replaced approximately ten years ago.

The mechanical system has the most costly deficiencies identified, including supply air and exhaust systems that do not provide redundancy or pressure independent control, and rooftop piping and insulation that is deteriorated. The building is served by three air handling units that were replaced about ten years ago, but they do not meet NIH or VA guidelines for research laboratories.

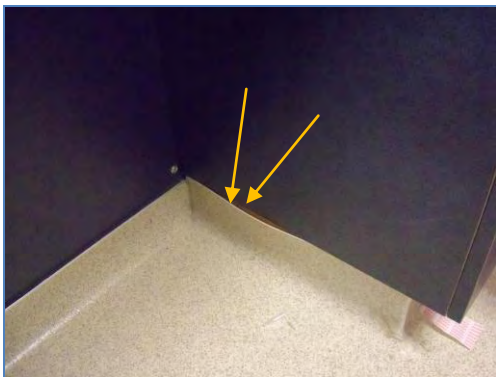
There are some deficiencies with the electrical system, but they are minimal in terms of cost. The system lacks transient voltage surge suppression (TVSS) to protect sensitive electronics and the receptacles near water sources are not ground fault protected. Some lighting fixtures in the laboratories are not well located and, as a result, cast shadows on the bench tops. Lighting would be improved with the addition of task lighting. There is no central monitoring system available to this building for remote monitoring of high value freezers and refrigerators.



**At left above, laboratory casework is generally in good condition but interior finishes are damaged due to water leakage. At right, deteriorated piping and insulation at a rooftop air handling unit.**



Building 205 is a three story building with two floors of laboratories and support space. All of the space has a very good appearance, although it is evident that the quality of finishes, such as stippled paint on walls, as well as a modest quality laminate casework on the third floor will deteriorate at a much faster rate than those used in the second floor build out. Also in the third floor laboratories the sheet vinyl flooring is pulling away from the casework and seams are opening up. This problem should be remedied before more extensive deterioration becomes a problem. The laboratory layout is good and there is separate but closely located space for large equipment and tissue culture.



**The third floor laboratories in Building 205 have some deficient finishes. At left, the sheet vinyl flooring is pulling away from the base of casework. The photo at right shows stippled paint in a tissue culture space that is chipping off.**

There are several deficiencies identified with the construction that may be under warranty and correctable by the original contractor, including poor installation of a cold room and windows that are leaking.

With regard to plumbing, backflow protection to isolate the potable water and laboratory water is not present, but should be provided.

Even in this newer building, there are mechanical system deficiencies, including two air handling units that are relatively new, but do not provide redundancy and apparently are not sized for handling summer cooling loads. Consideration should be given to replacing the units. There are some air balance issues that may be related to the build out of the second floor and that need to be remedied.

There is a problem in the main electrical room where the sprinkler piping passes through the dedicated electrical space above the main switchboard. This is a code violation. Most other aspects of the electrical system are in good condition, except that the receptacles near water sources lack ground fault protection. The facility



plans to install a central monitoring system which the high value freezers, cold rooms, and other equipment can be connected to for remote monitoring.

Both buildings are fully covered by wet pipe sprinkler systems and have fire alarm systems in good condition.

There are no emergency showers available in the laboratory areas. (Note: The Safety Officer performed a study and reported that safety showers are not required due to limited use of chemicals.)

#### Security

There is appropriate electronic security controlling access to research laboratories in both buildings.

#### Life Safety Hazards

The following life safety hazard identified during the assessment has not been remediated by the station:

- The laboratory areas have no safety showers (both buildings). (Note: the Safety Officer performed a study and reported that safety showers are not required due to limited use of chemicals.)

The following additional life safety hazard is in the process of being remediated:

- Receptacles near water sources are not ground fault protected (both buildings).

#### Improvements Made Since Assessment:

This station has made and/or initiated improvements following the assessment, including:

Replacement of ceiling tiles, Bldg 205 – (station funds), completed.

Inspection and certification of fume hoods, Building 205 – (station funds), completed.

Performed air balancing on second floor. Building 205 – (station funds), completed.

Planning installation of central monitoring system – (ORD funding).

#### New Construction

A minor construction project consisting of an addition to Building 205 is planned. Funding has been approved only for the design phase at this time with construction funding still outstanding.



### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Bldg. 162</b>	<b>Bldg. 205</b>
Architectural	\$503,000	\$126,000
Plumbing	\$352,000	\$318,000
HVAC	\$754,000	\$669,000
Electrical	\$68,000	\$52,000
Fire Protection	\$0	\$0
<b>Total</b>	<b>\$1,677,000</b>	<b>\$1,165,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Bldg. 162</b>	<b>Bldg. 205</b>
1	\$447,000	\$175,000
2	\$160,000	\$167,000
3	\$920,000	\$759,000
4	\$0	\$1,000
5	\$150,000	\$63,000
<b>Total</b>	<b>\$1,677,000</b>	<b>\$1,165,000</b>

**Table 1.2 Cost Summary by Priority**

	<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
Bldg 162	\$ 1,677,000	\$ 6,757,000	25%
Bldg 205	\$ 1,165,000	\$ 30,895,000	4%
Overall	\$ 2,842,000	\$ 37,652,000	8%

**Table 1.3 Facility Condition Index Value**





## VISN 18: VA Southwest Health Care Network



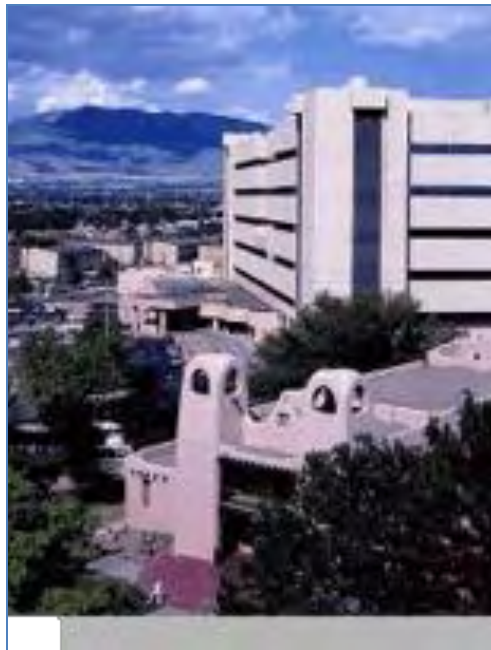
<i>Sta. ID</i>	<i>VA Site Surveyed</i>	<i>City/State</i>
<b>501</b>	<b><i>New Mexico VA Health Care System, Raymond G. Murphy VA Medical Center</i></b>	<b><i>Albuquerque, NM</i></b>
<b>644</b>	<b><i>Phoenix VA Health Care System, Carl T. Hayden VA Medical Center</i></b>	<b><i>Phoenix, AZ</i></b>
<b>678</b>	<b><i>Southern Arizona VA Health Care System</i></b>	<b><i>Tucson, AZ</i></b>







***New Mexico Health Care System,  
Raymond G. Murphy VA Medical Center,  
Albuquerque, NM***



**Date(s) of Assessment: September 25-25, 2007**

**Number of Buildings Assessed: 2**

**Total Cost to Correct Deficiencies: \$7,656,000**

**Total Cost, Priority 1 Deficiencies: \$816,001 (or 11%)**

**Total Cost to Replace: \$19,996,000**

**Overall Campus FCI: 38%**

**Size of Research Program: Very Large (over \$10 million in VA research funding)**



### Background

The majority of funding for this very large research program is for the Cooperative Studies Program Clinical Research Pharmacy Coordinating Center (CSP CRPCC) established in 1972 and based at the Albuquerque VAMC. There is also funding for the other research disciplines but in significantly lesser amounts.

The facility is academically affiliated with the University of New Mexico (UNM) School of Medicine, the only medical school in the state of New Mexico, located approximately three miles from the VA campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in two buildings (Building 10 and 11) on the VA campus with 15,858 nsf of research space (laboratories – 8,231 nsf; VMU – 6,530 nsf; offices – 1,097 nsf). Following is an overview of the buildings, including their age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

It should be noted that both Buildings 10 and 11 were constructed in the 1930s and are national and state registered historic buildings. While the buildings add to the overall beauty and historic charm of the Albuquerque VA campus, their maintenance and renovation are challenging.

Renovation of research laboratories in Building 10 was recently completed. The renovation included reconfiguration of smaller, individual laboratories into larger, modern laboratory spaces to accommodate five laboratory groups. In addition, there were several system upgrades completed. The renovation project took three years to complete.

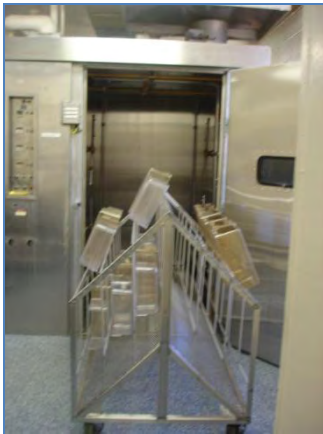


**The roof of Building 10 was not replaced when the laboratory space was renovated. A roof replacement project is current in contracting. The photo at left shows bubbled roof layer (red arrows) and broken roof layer (yellow arrow). At right is a newly renovated laboratory.**



The Building 10 laboratories are in excellent condition. Still, there are some deficiencies including an autoclave with no canopy hood for exhaust, accessibility deficiencies (e.g., no ramp in the cold room), and several plumbing deficiencies. By far the most costly deficiencies identified with Building 10 are for the condition of the roof (which was not replaced during the renovation) and the need to replace some aging systems not upgraded during the renovation. It was noted that several safety showers are missing eyewash units. The laboratory area is covered by a sprinkler system. The Building 10 fire alarm system is in good condition.

The VMU is located in an addition (South Wing) to Building 10 constructed in the 1970s. Generally, the interior construction of the VMU is in good condition, but there are several problems including roof leakage, peeling epoxy floor finishes, and some significant equipment that is inoperable or continuously fails. The VMU area is not covered by a sprinkler system.



**The VMU in Building 10 (pictured above) will be renovated beginning in FY 2012.**

Laboratories in Building 11 are generally showing their age (they were last renovated in the 1970s). However, some of the laboratories appear to have had a limited upgrade in about the past ten years. Generally, there are significant deficiencies with the mechanical and electrical systems within this building, as well as with meeting accessibility guidelines.

Building 11 is fully covered by a sprinkler system and the fire alarm system is in good condition.

#### Other Research Space

A clinical research area is housed among clinical space in Building 1 and a Magnetoencephalography (MEG) imaging core facility housed in the basement of Building 49.



The CSP CRPCC is located in leased space of approximately 68,000 square feet two miles from the VA campus.



**A typical Building 11 laboratory.**

#### Security

A card reader system controls entry into research space and appears to be adequate. However, there are significant security issues associated with the leased space housing the CSP CRPCC. The survey team noted that some of the problems experienced in this facility may be due to the security fence and signage posted prominently around the building's perimeter. While the fencing and security gate are a good idea particularly considering the nature of the center's business, the signage could be considered "overkill" as it could draw undue attention.

#### Life Safety Hazards

The following life safety hazard identified during the assessment has been remediated by the medical center.

- Some eyewash units were added in Building 10.

The following additional life safety hazard is expected to be remediated as part of the Minor Construction Project for Building 10.

- The VMU is not protected by a sprinkler system.

#### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:





Minor construction project to renovate the VMU and add an addition of about 10,000 square feet of laboratory space to Building 10, correcting all remaining deficiencies identified for Building 10 in the process – est. \$8.9 million total (Minor Construction FY11), near end of design phase, construction to begin in 2012.

Construction of modular building to house Research Service administrative offices -- \$418,000 (station funds), to be completed May 2011 except furnishings.

Construction of modular laboratory building -- \$500,000 (station funds), tentatively to be completed by September 2011.

Correction of Priority 3 deficiencies, replacement of roof, Building 10 (and Building 12 which houses Research Service administrative offices) -- \$350,000 (station funds), in acquisition.

Correction of Priority 2 deficiency, replacement of cage washer in VMU -- (VACO ORD), completed.

Correction of miscellaneous Priority 1 deficiencies, Buildings 10 and 11 – (station funds), complete.

Correction of Priority 1 deficiency, lack of emergency power for freezers -- \$5,000 (station funds), completed.

Correction of Priority 1 deficiency, lack of alarm system for freezers and VMU animal rooms -- \$29,000 (station research funds), completed.

#### New Construction

This station has submitted through the Strategic Capital Investment Program (SCIP) for FY12 and subsequently for FY13, a major construction project for a 250,000 gross square foot building to house the entire research program. Approval of this project is pending. (In the interim, the station has applied for a major lease to house the Cooperative Studies Pharmacy.) The CSP CRPCC, which is growing at the rate of 15% per year, would occupy approximately 138,000 square feet within the building. In addition to integrating the entire local research program, local leaders envision state-of-the-art research space that would help facilitate recruitment of new investigators to the program.

There will be an addition to Building 10 to house laboratories as well as renovation of the VMU.





### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Correction Cost - Bldg 10</b>	<b>Correction Cost - Bldg 11</b>
Architectural	\$1,034,000	\$497,000
Plumbing	\$166,000	\$739,000
HVAC	\$2,460,000	\$1,952,000
Electrical	\$343,000	\$287,000
Fire Protection	\$178,000	\$0
<b>Total</b>	<b>\$4,181,000</b>	<b>\$3,475,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Bldg 10</b>	<b>Bldg 11</b>
1	\$694,000	\$122,000
2	\$205,000	\$1,987,000
3	\$2,989,000	\$740,000
4	\$205,000	\$538,000
5	\$88,000	\$88,000
<b>Total</b>	<b>\$4,181,000</b>	<b>\$3,475,000</b>

**Table 1.2 Cost Summary by Priority**

<b>Building</b>	<b>Corrections Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
Bldg 10	\$4,181,000	\$15,817,000	26%
Bldg 11	\$3,475,000	\$4,179,000	83%
<b>Overall</b>	<b>\$7,656,000</b>	<b>\$19,996,000</b>	<b>38%</b>

**Table 1.3 Facility Condition Index Value**



***Phoenix VA Health Care System,  
Carl T. Hayden VA Medical Center,  
Phoenix, AZ***



**Date(s) of Assessment: May 20, 2008**

**Number of Buildings Assessed: 2**

**Total Cost to Correct Deficiencies: \$1,039,000**

**Total Cost, Priority 1 Deficiencies: \$ 688,000 (or 66%)**

**Total Cost to Replace: \$11,909,000**

**Overall Campus FCI: 9%**

**Size of Research Program: Small (Under \$2.4 million in VA research funding)**



### Background

This small research program is concentrated primarily in biomedical research. The academic affiliate is the University of Arizona School of Medicine. There are also affiliations with multidisciplinary Phoenix Independent Residency Programs. Until recently, there was no medical school located in Phoenix. A medical school established jointly by the University of Arizona (located in Tucson) and Arizona State University (in Phoenix) recently completed its fourth year.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, an unused vivarium, and offices were housed in two buildings (Buildings 21 and 21B) on the VA campus with 13,020 nsf of research space (laboratories – 7,117 nsf; vivarium – 1,075 nsf; offices – 4,828 nsf). Following is an overview of the buildings, including their age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

The research laboratories and a vivarium intended for use as the VMU are in two adjacent buildings: Building 21, which houses laboratories and the Research Service administrative offices, and Building 21B, a very small modular building houses the vivarium.

Although Building 21 was originally constructed (in the 1970s) as a laboratory building leased to the Centers for Disease Control and Prevention (CDC), the space was later renovated into offices and then converted back into laboratories. There currently are four research laboratories which were renovated by the medical center about five years ago. The hospital has submitted a Minor Construction Proposal which, if funded, would renovate and expand the existing space with additional wet laboratories. Leadership is interested in expanding the research program, particularly now that a medical school has been established in Phoenix, thus expanding opportunities for recruitment at the VAMC.

The vivarium, although constructed in approximately 2001, has never been approved by VA Central Office for use as an animal research facility and is not accredited. Animals used in research are currently housed at Arizona State University approximately 20 miles from the VA campus. It is estimated that five to seven current investigators would use the vivarium if it was activated.

Overall, the laboratory space appears to be in good condition, although there are some deficiencies, primarily with support systems. Most finishes within the laboratory areas, including walls, floors, and ceilings are in good condition. The casework, which is metal with epoxy resin countertops, is new and in excellent condition.



**The photos above show typical laboratory conditions in Building 21. The photo at right also shows a safety shower and emergency eyewash that meet current requirements.**



**The photo above shows the deteriorated condition of the Building 21 roof at the time of the assessment. The roof has since been repaired.**

**At right, the cage washer in Bldg 21B is a relatively small unit.**



Problems with the space include leaks from the roof during and following rain, temperature and humidity irregularities, and lack of emergency power for mechanical systems. On the roof, there is significant cracking around the rooftop mechanical equipment. An area of the roof at least as large as the laboratories should be patched to correct the problem.

Although the HVAC system is relatively new (less than ten years old) and in good condition, it is not an appropriate system for a laboratory environment. Further,



the HVAC system is not on emergency power. Although not required for laboratories, it is desirable to have back-up power for HVAC, particularly in a desert environment.

The primary plumbing deficiency is lack of backflow prevention to provide separation between the campus domestic water and the laboratories.

Fume hoods throughout the laboratory space are in excellent condition. An autoclave is non-operational due to a failing electronic panel. The autoclave also lacks an exhaust canopy hood to exhaust hot steam.

Lighting has been upgraded and is appropriate for the laboratory environment.

The building fire alarm system is old and replacement parts are difficult to obtain. There also is no central monitoring of the alarm system, nor is there monitoring of other important laboratory components such as freezers. The building is protected with a wet pipe fire suppression system.

Vivarium: The modular building constructed as a vivarium has never been used for that purpose. Generally modular construction is only used to house a vivarium as a temporary solution, as modular construction deteriorates much more rapidly than permanent construction. Although the interior space has appropriate finishes for use as a vivarium, there are several deficiencies, specifically the presence of leaks in the roof, the lack of backflow prevention on the water system, and lack of redundancy as well as emergency power on the HVAC system.

There is one piece of equipment in the space, i.e., a small cage washer that is operational.

It is difficult to judge how functional the building would be if approved to house a VMU. Perhaps the biggest limitation is its size. Although it is designed to house a relatively small animal census, the building lacks adequate space for staging. The small cage washer would also significantly limit the capacity. However, activation of Building 21B as a VMU would boost the station's ability to grow the research program.

Building 21 has an old fire alarm system in need of replacement. There is no fire alarm in Building 21B.

There were no deficiencies noted with regard to safety showers and eyewashes.

#### Other Research Space

At the time of the survey, a small amount of space in the hospital designated for clinical research was undergoing renovation following a significant plumbing leak





caused by a contractor error. Four patient exam rooms were recently lost to a clinical service, so the unit has very limited examination space, no designated patient waiting space, and small offices shared by multiple occupants. Currently there are five studies, including one multi-site trial underway in the space.

#### Security Issues

Access to research space is controlled with a combination of proximity cards and hard keys. The entrance to Bldg 21B is further controlled with closed circuit television (CCTV) cameras.

#### Life Safety Hazards

The following life safety hazard identified during the assessment has been remediated by the medical center:

- The older fire alarm system in Building 21 has been replaced.

#### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Minor Construction Project, renovation of Building 21 to increase laboratory space while slightly decreasing administrative space – est. \$8.6 million (Minor Construction), ongoing, to be completed by August 2011.

Corrected Priority 1 deficiency, roof leaks, Building 21 – corrected during Minor Construction project.

Corrected Priority 1 emergency power deficiencies, Building 21 – corrected during Minor Construction project.

Corrected Priority 1 fire alarm deficiency, Building 21 – corrected during Minor Construction project.

Corrected Priority 4 HVAC deficiencies, Building 21 – corrected during Minor Construction project.

#### New Construction

There is no new construction of research space planned at this station after completion of the ongoing Minor Construction Project.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by





priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Corrections Cost - Bldg 21</b>	<b>Corrections Cost - Bldg 21b</b>
Architectural	\$342,000	\$43,000
Plumbing	\$16,000	\$16,000
HVAC	\$355,000	\$90,000
Electrical	\$152,000	\$25,000
Fire Protection	\$0	\$0
<b>Total</b>	<b>\$865,000</b>	<b>\$174,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Bldg. 21</b>	<b>Bldg. 21b</b>
1	\$514,000	\$174,000
2	\$59,000	\$0
3	\$35,000	\$0
4	\$255,000	\$0
5	\$2,000	\$0
<b>Total</b>	<b>\$865,000</b>	<b>\$174,000</b>

**Table 1.2 Cost Summary by Priority**

<b>Building</b>	<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
Building 21	\$865,000	\$10,349,000	8%
Building 21b	\$174,000	\$1,560,000	11%
<b>Overall</b>	<b>\$1,039,000</b>	<b>\$11,909,000</b>	<b>9%</b>

**Table 1.3 Facility Condition Index Value**



***Southern Arizona VA Health Care System,  
Tucson, AZ***



**Date(s) of Assessment: May 21-22, 2008**

**Number of Buildings Assessed: 5**

**Total Cost to Correct Deficiencies: \$8,814,000**

**Total Cost, Priority 1 Deficiencies: \$1,134,000 (or 13%)**

**Total Cost to Replace: \$31,112,000**

**Overall Campus FCI: 28%**

**Size of Research Program: Small (Under \$2.5 million in VA research funding)**



### Background

This small research program is concentrated primarily in clinical and biomedical research. The SAVAHCS is academically affiliated with the University of Arizona Colleges of Medicine, Nursing, and Pharmacy.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories and the Veterinary Medical Unit (VMU) were housed in five buildings on the VA campus with nearly 35,000 nsf of research space (laboratories – 25,477 nsf (including a BSL-3 laboratory) and VMU – 9,328 nsf). Following is an overview of the buildings, including their age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

It is worth noting that the Tucson campus is one of the most architecturally distinctive and beautiful campuses in the VA system, with the hospital being of Spanish style with tile roofing and other support buildings on campus reflecting the same style. The combination of the architecture, which has been well maintained, and the surrounding desert and mountains is quite striking and provides a very scenic and hospitable environment for veterans. As new buildings are constructed on the campus, there is an obvious concerted effort to tie them in architecturally with the older buildings. The result is impressive.

The research laboratories are housed in five different buildings, one of which also houses the VMU. The age of the buildings ranges from 1938 to 2008, and their condition and suitability for laboratory space is reflected in their respective vintage. There is a BSL-3 laboratory in Building 56 near the VMU.

Building 6 was constructed in 1938 as a nursing dormitory which later evolved into office space. Laboratories were configured in this building in the mid 1980s. An elevator, which makes the building only partially accessible, was installed in 2008. Laboratories occupy over half the space within Building 6, although it is not an appropriate building for research. There is no central HVAC in the laboratory space and the floor-to-floor height would not allow for an appropriate system to be installed. Ducting could be accomplished, but air exchanges would not be adequate for a laboratory environment. Currently the laboratories on the first floor are cooled with direct expansion air conditioning units that use indirect gas fired heat. The second floor laboratories have through the wall or window AC units. The basement, which houses mechanical space and a research file storage space, is not cooled or heated.

There are several laboratories on the first floor which do not meet the Americans with Disabilities Act (ADA) guidelines for accessibility. Additionally, the laboratory casework and bench tops, which have been retrofitted to the available space, are inadequate being only 24" deep (the standard depth for laboratories is 30"). The



casework is severely aging and it is possible that it was not new at the time of its installation.



**Above left, a typical laboratory in Building 6. At right, this view of the exterior shows the window air conditioning units.**

Only part of the building is protected with fire sprinklers and the alarm system is an older system with no annunciation devices in the laboratories. Additionally, piping for the plumbing system is in poor condition.

With regard to the electrical system, the lighting is very dim and emergency power is limited, but is in the process of being upgraded.

Research administration is very concerned about the file storage space in the basement. The files are stored on shelving, but could be better protected by utilizing plastic (waterproof) file boxes of some type. There are cracks in the concrete walls and floors, as well as extensive piping overhead and several windows, so there are multiple opportunities for leakage and resulting mold in this space. There is also a possibility that asbestos is present and the space does not have a fire protection system.

Overall, the laboratory space in Building 6 is in poor condition.

Building 10 is a pre-engineered metal building dating to 1977. This type of building is not ideal for a laboratory environment, as it is difficult to control pressurization, temperature, and humidity. There are significant deficiencies within this building, particularly with regard to mechanical systems.

With regard to safety, the building is not protected by fire sprinklers, nor do the laboratories have annunciation devices. There is no emergency power within the building.

Building 10 received the worst rating of all buildings on the Tucson campus.



**The photo at left shows a typical Building 10 laboratory. At right, the few laboratory spaces in Building 38 are expected to be lost for medical records storage.**

Building 38, constructed in the 1950s, is used primarily for clinical services, but there are some research laboratories in the basement. However, it was noted by the Research Service that the laboratory and accompanying office space in this building is being lost for Medical Records storage. This building has significant deficiencies with regard to architecture, primarily due to the presence of vinyl asbestos tile flooring. As with Building 10, there also are extensive mechanical deficiencies in Building 38, including inadequate capacity for the air handling unit, lack of redundancy on cooling equipment, lack of humidification, and lack of a 100% outside air system. Additionally, there is no central exhaust system for fume hoods.

With regard to safety, the building does have a fire sprinkler system, but no annunciation devices are located in laboratory spaces.

Lighting has been upgraded, but there is limited emergency power with only about half the freezers being connected.

The Building 38 laboratories are rated poor.

Building 56, which houses the VMU and the BSL-3 laboratory, was built in 1980, with an addition in 1987. The containment laboratory was converted in 2001. Finishes in the VMU are in very good condition. There is a need to install a canopy hood on the cage washer to help reduce heat in the cage wash area.

Nearly two thirds of the corrections cost for this building is for mechanical systems, as the building is served by two aging air handling units. The electrical system is in good condition, although it has limited capacity. There is emergency power to the building. There is a monitoring system for the BSL-3 laboratory.





**Above left, the VMU cage washer (Building 56) lacks an exhaust hood over the door to catch escaping steam. This can cause damage to interior finishes such as the corrosion seen in the roof metal deck of the cage washer room (photo at right).**

Deficiencies noted for the BSL-3 laboratory include lack of a “bag in/bag out” high efficiency particulate air (HEPA) filter on the exhaust duct. There also do not appear to be visual indicators to provide information on the air pressure differential between the outside hallway and the anteroom. There is an audible alarm to notify if the pressure differential is exceeded between the hallway and ante-room, as well as the ante-room and laboratory.

With regard to safety, only the BSL-3 laboratory is protected with a fire sprinkler system.

Building 78 is one of the newest buildings on campus, having been completed in March 2008 and was not yet occupied during the assessment. This is a beautiful, modern laboratory building with well designed laboratories that will accommodate equipment without being overcrowded.

**(At right) Building 78 is a beautiful new addition to the campus that provides modern, well designed laboratory space.**







**Above left, the new laboratory space in Building 78 is well designed. The photo at right shows the equipment bay in each laboratory that allows placement of needed equipment without creating crowded conditions.**

Judging by its overall design, functionality, and appearance, Building 78 would subjectively be rated good if not excellent, although its technical rating is “fair.”

Several buildings have fire sprinkler and/or fire alarm deficiencies. Buildings 10 and 38 have no sprinkler system (Bldg 10 will be corrected in the planned VISN project in FY12). Building 6 is only partially covered by a sprinkler system. In Building 56, only the BSL-3 laboratory has sprinkler coverage. Buildings 6, 10 and 38 all need either a new fire alarm system or an upgraded system with annunciation devices.

#### Other Research Space

Some clinical study coordinators are housed in a sixth building that is not assigned to Research Service.

#### Security Issues

Access to research space throughout the campus is controlled with a combination of proximity cards and hard keys, with the exception of Bldg 38 which is controlled by hard key only. Access to the BSL-3 laboratory is appropriately limited.

#### Life Safety Hazards

The following life safety hazards identified during the assessment have been remediated:

- A new fire alarm system has been installed in Building 6.
- Safety shower and eyewash deficiency in Building 38 has been corrected.

The following additional life safety hazards identified during the assessment have not been remediated:



- Several buildings have fire sprinkler and/or fire alarm deficiencies. Buildings 10 and 38 have no sprinkler system (Bldg 10 will be corrected in the planned VISN project in FY12). Building 6 is only partially covered by a sprinkler system. In Building 56, only the BSL-3 laboratory has sprinkler coverage. Buildings 10 and 38 all need either a new fire alarm system or an upgraded system with notification devices (Building 10 will be corrected in the planned VISN project in FY12).

#### Improvements Made Since Assessment:

This station has made and/or initiated improvements following the assessment, including:

Planning project to correct all identified deficiencies in Building 10 – (VISN funds), currently in design. This design will be used to apply for future NRM funding (est. \$1.8 million).

Planning project to replace air handling systems (all identified deficiencies) in the VMU, Building 56, with anticipated project commencement in FY12 – est. \$85,000 design, \$700,000 construction (VISN funds).

#### New Construction

There is no new construction of research space currently planned at this station. However, the station has applied for funding for a new research building to be constructed adjacent to Building 79. It would be considered the “twin” of Building 78 which was completed in 2008.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.



<b>Discipline</b>	<b>Corrections Cost - Bldg 6</b>	<b>Corrections Cost - Bldg 10</b>	<b>Corrections Cost - Bldg 38</b>	<b>Corrections Cost - Bldg 56</b>	<b>Corrections Cost - Bldg 78</b>
Architectural	\$718,000	\$537,000	\$1,714,000	\$18,000	\$48,000
Plumbing	\$108,000	\$44,000	\$262,000	\$84,000	\$0
HVAC	\$1,022,000	\$497,000	\$1,765,000	\$744,000	\$195,000
Electrical	\$252,000	\$60,000	\$422,000	\$180,000	\$0
Fire Protection	\$94,000	\$50,000	\$0	\$0	\$0
<b>Total</b>	<b>\$2,194,000</b>	<b>\$1,188,000</b>	<b>\$4,163,000</b>	<b>\$1,026,000</b>	<b>\$243,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Bldg 6</b>	<b>Bldg 10</b>	<b>Bldg 38</b>	<b>Bldg 56</b>	<b>Bldg 78</b>
1	\$217,000	\$45,000	\$662,000	\$162,000	\$48,000
2	\$714,000	\$641,000	\$845,000	\$728,000	\$0
3	\$140,000	\$107,000	\$328,000	\$0	\$35,000
4	\$0	\$0	\$66,000	\$80,000	\$0
5	\$1,123,000	\$395,000	\$2,262,000	\$56,000	\$160,000
<b>Total</b>	<b>\$2,194,000</b>	<b>\$1,188,000</b>	<b>\$4,163,000</b>	<b>\$1,026,000</b>	<b>\$243,000</b>

**Table 1.2 Cost Summary by Priority**

<b>Building</b>	<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
Building 6	\$2,194,000	\$5,982,000	37%
Building 10	\$1,188,000	\$2,559,000	46%
Building 38	\$4,163,000	\$11,908,000	35%
Building 56	\$1,026,000	\$6,569,000	16%
Building 78	\$243,000	\$4,094,000	6%
<b>Overall</b>	<b>\$8,814,000</b>	<b>\$31,112,000</b>	<b>28%</b>

**Table 1.3 Facility Condition Index Value**



## VISN 19: Rocky Mountain Network



<i>Sta. ID</i>	<i>VA Site Surveyed</i>	<i>City/State</i>
554	VA Eastern Colorado Health Care System	Denver, CO
660	VA Salt Lake City Health Care System	Salt Lake City, UT





***VA Eastern Colorado Health Care System,  
Denver, CO***



**Date(s) of Assessment: September 29-30, 2010**

**Number of Buildings Assessed: 4**

**Total Cost to Correct Deficiencies: \$8,720,000**

**Total Cost, Priority 1 Deficiencies: \$1,002,000 (or 11%)**

**Total Cost to Replace: \$50,854,000**

**Overall Campus FCI: 17%**

**Size of Research Program: Large (\$5 million to \$9.9 million in VA research funding)**





### Background

VA funding for this large program is primarily for biomedical research, with other significant funding for health services and clinical research, and lesser funding for rehabilitation research. The program hosts a health services REAP, the Colorado REAP to Improve Care Coordination (CRICC), as well as a portion of the coordinating center for the Ischemic Heart Disease QUERI, and the VA Cardiovascular Assessment, Reporting, and Tracking System for Cath Labs (CART-CL). In biomedical research, the program hosts a Schizophrenia Center. On the clinical side, the facility hosts a MIRECC.

The primary academic affiliate is the University of Colorado Health Sciences Center, which previously was located adjacent to the VA campus in Denver. Now located in nearby Aurora on the site of the former Fitzsimons Army Medical Center, the Anschutz Medical Campus is the world's only completely new education, research and patient care facility and the largest academic health center between Chicago, Texas, and the West Coast.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in four buildings (Buildings 1, 19, 21, and 23) on the VA campus with a combined total of 39,715 nsf of research space (laboratories – 29,284 nsf; VMU – 7,980 nsf; offices – 2,451 nsf). Following is an overview of the buildings, including their age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Generally, all of the buildings housing research on the Denver VAMC campus are in poor condition. All four buildings share the following deficiencies: 1) interior finishes and/or casework and fixed equipment in need of upgrade due to age or water damage; 2) need for separation of industrial and potable water supplies; 3) need to significantly upgrade mechanical systems; 4) lack of transient voltage surge suppression to protect sensitive electronics in the laboratories; and 5) need to correct accessibility deficiencies. Following is additional information on research space within each building assessed.

Building 1 is the main hospital building constructed in 1951 and renovated in 1986. The building has nine floors above ground, plus a basement and penthouse, with research laboratories occupying a portion of the ninth floor. The laboratories were retrofitted into former offices and patient bedrooms.

To bring these laboratories up to current standards would require complete renovation. In addition to the deficiencies due to age and/or water infiltration, areas in which tissue culture work is performed are not appropriate, i.e., the floors, walls and ceilings should all be monolithic water resistant surfaces. Additionally



some laboratories are lacking appropriate access to emergency eyewashes and safety showers.

With regard to fixed equipment, there is a 4 degree C walk-in cold room that should be replaced. An autoclave/sterilizer located in common space is in good condition, but needs to have an exhaust hood installed over it to catch steam and odors, and prevent further damage to interior finishes.



**In Building 1, some wall finishes are damaged due to water leakage (left photo). The right photo shows piping and support penetrations with fire sealant at the acoustic ceiling. This will not provide a fire separation.**

Buildings 19 and 21 are two neighboring buildings constructed separately (in 1954 and 1971, respectively) that adjoin and share some spaces, including the VMU. Both buildings have three floors above ground plus a basement.



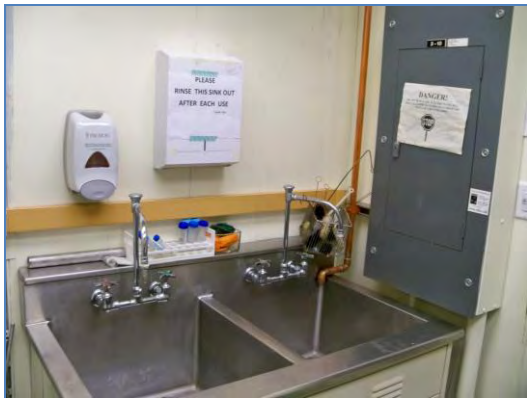
**Two views of the VMU in Building 19. At left, the metal ceiling grid is rusting and is an inappropriate surface in an animal facility. At right, plastic (at the arrow) is protecting clean cages from leakage.**



Both Buildings 19 and 21 have recently renovated laboratories on the third floor and other, non-renovated laboratory space on the first and second floors. The VMU occupies space in both basements and on part of the first floor of Building 19. The VMU can be entered directly from either building without going outside the building.

In both buildings the third floor laboratories that were renovated in approximately 2003-2004 are in good condition, but laboratories on the other two floors are in need of complete renovation, including finishes and casework. Space within the VMU is mixed, as part of it has been renovated. Some of the spaces such as animal holding rooms and support spaces have inappropriate finishes rather than the monolithic finishes that meet industry standard. There are three rooms on the west side of Building 19 that are not appropriate for use as VMU support space. This space was originally the dog run and is now used for storage, but there have apparently been some problems with leaks from ceiling pipes and the ceilings are very low. Both the rack and tunnel cage washers are in good condition.

There is a problem involving the VMU mechanical system that is significant and needs to be addressed urgently. The heating, ventilation, and air conditioning (HVAC) controls are set incorrectly. The valve controls must be set to fail closed, otherwise failure of the system will result in overheating of the space and animals. Currently the valve controls are incorrectly set to fail open. The local engineering group indicated their awareness of this problem and their intent to resolve it quickly. Follow-up should be performed to ensure it has been corrected. (Note: the station reports that this deficiency has been corrected.)



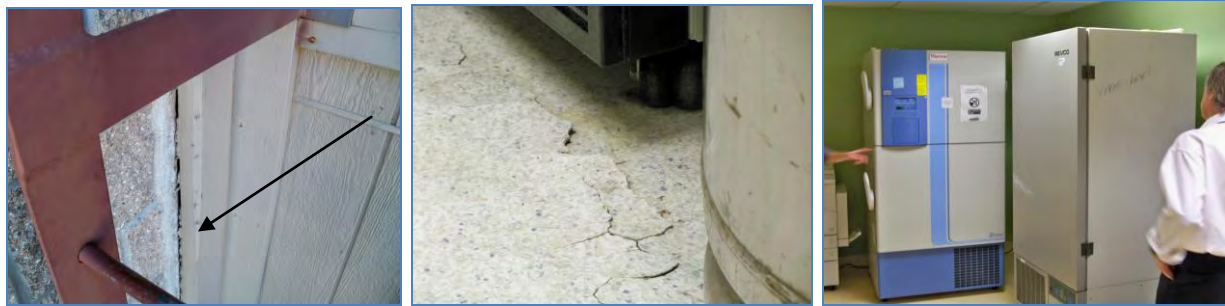
**(Left) In Building 21, room 21-310, there is an electric panel over a sink. The photo at right shows damaged flooring in Building 21.**

Building 23 is a modular structure built in 2002 which houses laboratories on each of its two floors. This building has some significant structural deficiencies, including a sub-standard foundation that is causing wall panels to warp and doors



to constantly need alignment. Additionally, the elevator enclosure is leaning away from the main structure. There also is some damage to the interior of the building caused by water leakage.

A problem that was noted during the assessment was failure of a freezer that was not on emergency power and also not alarmed. Additionally, equipment in this building is stored inappropriately in the corridor.



**As shown above, Building 23 does not provide a proper environment for research. From left to right, evidence of significant structural deficiencies (elevator shaft is separating from the building); damage to flooring caused by thermal shock; and Ultra-low temperature freezers located in a corridor, not connected to emergency power and not monitored for failure (during the assessment, one of them had failed without anyone knowing).**

All of the buildings are fully covered by wet-pipe sprinkler systems and fire alarm systems are in good condition.

There is some need for additional emergency eyewashes and safety showers throughout the space.

#### Other Research Space

Additional space houses the Research Service administrative offices, as well as dry laboratories and offices for rehabilitation, health services, and clinical research.

Currently leadership and staff from the REAP, QUERI, and CART-CL are housed in leased space across the street from the VA campus. Last fall the medical center announced that these groups would be housed along with research administration at the new campus, rather than continuing to occupy leased space. This would limit the available space to these research groups, thus jeopardizing their potential to grow and to bring increased VERA funds to the hospital. It should be noted that CART-CL receives funds for leasing space within its budget, thus lessening the burden to the medical center.





There currently are several biomedical programs housed at the affiliate, including the Schizophrenia center, due to lack of sufficient laboratory space at the VA campus and the need for specialized equipment.

#### Security

There is appropriate electronic security throughout the laboratory and animal research areas. Video surveillance is needed with regard to the VMU.

#### Life Safety Hazards

The following life safety hazard identified during the assessment has been corrected:

- In the VMU, the HVAC controls which were set to fail in the open position have been reset correctly.

The following additional life safety hazards identified during the assessment have not been corrected:

- Additional emergency eyewashes and safety showers are needed throughout the space (all buildings).
- In Bldg 1, a number of penetrations have firestopping at the acoustic panel ceiling.
- In Bldg 1, there is no smoke detection in the communications room serving research.
- In Bldgs 19 and 23, there is liquid nitrogen in use in areas with no oxygen sensor.
- In Bldgs 19 and 21, there are receptacles near water sources that are not ground fault protected.
- In Bldg 21 (room 21-310) there is a sink with an electrical panel located above it.
- In Bldg 21, there is a laboratory in which desk space is located directly across from the fume hood.

#### Improvements Made Since Assessment:

This station has made the following improvement following the assessment:

Corrected Priority 1 deficiency, HVAC controls in the VMU set to fail in the open position – complete.

#### New Construction

Following many years of planning and awaiting availability of funds, the facility will move to the Fitzsimons site, tentatively in 2014. Plans for new research space include a standalone building to house the VMU and laboratories with three floors above ground and a basement. The laboratories will be arranged in an open concept



often used in current laboratory design, with common instrument space adjacent to the laboratories and offices on the outside hallway. Each floor will have a conference room. The design will accommodate nine individual laboratory modules per floor.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Correction Cost - Bldg 1</b>	<b>Correction Cost - Bldg 19</b>	<b>Correction Cost - Bldg 21</b>	<b>Correction Cost - Bldg 23</b>
Architectural	\$314,000	\$376,000	\$654,000	\$948,000
Plumbing	\$205,000	\$233,000	\$294,000	\$269,000
HVAC	\$537,000	\$1,668,000	\$1,200,000	\$1,357,000
Electrical	\$75,000	\$170,000	\$319,000	\$101,000
Fire Protection	\$0	\$0	\$0	\$0
<b>Total</b>	<b>\$1,131,000</b>	<b>\$2,447,000</b>	<b>\$2,467,000</b>	<b>\$2,675,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Bldg. 1</b>	<b>Bldg. 19</b>	<b>Bldg. 21</b>	<b>Bldg. 23</b>
1	\$83,000	\$94,000	\$60,000	\$765,000
2	\$403,000	\$499,000	\$1,172,000	\$726,000
3	\$473,000	\$1,118,000	\$387,000	\$294,000
4	\$34,000	\$183,000	\$206,000	\$88,000
5	\$138,000	\$553,000	\$642,000	\$802,000
<b>Total</b>	<b>\$1,131,000</b>	<b>\$2,447,000</b>	<b>\$2,467,000</b>	<b>\$2,675,000</b>

**Table 1.2 Cost Summary by Priority**





<b>Building</b>	<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
Building 1	\$1,131,000	\$7,813,000	14%
Building 19	\$2,447,000	\$16,747,000	15%
Building 21	\$2,467,000	\$12,553,000	20%
Building 23	\$2,675,000	\$13,741,000	19%
Overall	\$8,720,000	\$50,854,000	17%

**Table 1.3 Facility Condition Index Value**



***VA Salt Lake City Health Care System,  
Salt Lake City, UT***



**Date(s) of Assessment: July 17-19, 2006 (Pilot Site)**

**Number of Buildings Assessed: 7**

**Total Cost to Correct Deficiencies: \$4,919,700**

**Total Cost, Priority 1 Deficiencies: \$1,800,500 (or 37%)**

**Total Cost to Replace: \$28,200,000**

**Overall Campus FCI: 17%**

**Size of Research Program: Large (\$5 million to \$9.9 million in VA research funding)**



### Background

VA research funding for this large program is predominantly for biomedical research with some lesser funding in the other disciplines. At the time of the assessment, the program hosted a health services Targeted Research Enhancement Program (TREP), the Informatics, Decision Enhancement, and Surveillance (IDEAS) Center, which is now a funded REAP. The facility also is the site of a GRECC as well as a MIRECC, both funded by the medical care appropriation but with research components. Additionally, there are two significant programs in rehabilitation research focusing on orthopedics and speech pathology.

Its principal affiliate is the University of Utah School of Medicine, which is physically located adjacent to the VAMC. Other affiliations include Huntsman Cancer Institute, Howard Hughes Medical Institute at the University of Utah, and LDS Hospital.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in seven buildings on the VA campus with a combined total of 85,237 gsf of research laboratory and animal facility space (laboratories – 59,576 gsf and VMU – 25,661 gsf). Following is an overview of the buildings, including their age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

The space is distributed among seven buildings, with the majority of laboratory space being housed in Building 2. In addition to laboratories, the Research Service administrative offices are also housed in Building 2.

Building 2, a building originally constructed as clinical space and converted to research laboratories beginning in the 1980s, houses the majority of laboratory space retrofitted into former patient care space, so the configuration is less than optimal for research. Generally the space is overcrowded and lacks adequate storage. Overall, the condition of finishes and casework is good, with some exceptions where replacement is needed. There have been ongoing problems in this building with dust infiltration through windows and damage caused by roof leaks.

The newest research space, an addition (“D” wing) to Building 2, was completed in 1995. The laboratories in this part of the building are in excellent condition.

There is significant local interest in adding additional laboratory space in Building 2. A proposal is currently pending at VA Central Office. If funded, this proposal would enable the renovation of additional laboratory space that is currently unused due to its state of disrepair. There are a number of key issues that would need to be corrected including asbestos abatement, presence of lead-based paint, rust in



eyewash stations, and seismic deficiencies. The project would also enable reroofing of Building 2 and correction of systems deficiencies.

Laboratories in Building 14 (the main hospital building) were converted from clinical space in 1984 and are in fair condition, with casework showing its age. Crowding in these laboratories could be alleviated if dedicated space for freezers and other equipment was available.

There are numerous problems with laboratory space in Building 45, as it is of modular construction and suffers from roof leakage, flexible flooring, and windows that are not adequately secured.



**(Above left) Building 2 houses the newest laboratory space on the campus and provides the best opportunity for expansion of space. (Above right) Building 7, with its two component buildings joined by a modular structure (see arrow), is not an optimal environment for a VMU.**

Veterinary Medical Unit (VMU): The space most in need of significant repair or replacement is the vivarium, which consists of two permanent buildings sandwiching a modular unit. While each of the separate structures is in fair to good condition, the overall effect of the joined units is far less than optimal for use as a vivarium. Nearly every room in the building has multiple penetrations (pipes, ducts, open floor drains, etc.) with few of them being sealed so there is opportunity for vermin intrusion. In addition to Building 7 which houses the vivarium, there are several other structures associated with animal care (Buildings 30, 35, and 37).

Systems: The HVAC system that serves the older sections of Building 2 is inappropriate for use in modern research laboratories. The vivarium also suffers from inadequate HVAC as well as potential for catastrophic loss of animals due to lack of emergency power to the central chillers. There is insufficient emergency power for all the research space, as it consists of a series of generators in various locations rather than a central power system. Some buildings utilize portable generators.



Only three of the buildings (2, 14, 45) are fully protected by a fire sprinkler system and with an adequate fire alarm system. Building 7 has a partial coverage sprinkler system, while Buildings 30, 35, and 37 have no sprinkler coverage and no fire alarm.

Overall, the research laboratory space at the Salt Lake City VAMC is functional, but some buildings housing research space are significantly deteriorating. The new research wing (to Building 2) constructed in 1995 clearly shows the potential for the space if funds were available for renovation and/or new construction.

#### Security

Generally space appears to be adequately secured with card readers and/or cipher locks limiting access to laboratory space. However, the windows in Building 45 have been breached from the exterior of the building.

#### Life Safety Hazards

The following life safety hazard identified in the assessment has been remediated by the station:

- In the VMU, an emergency eyewash and safety shower have been installed in the cage wash area.

The following additional life safety hazards identified in the assessment have not been remediated:

- Several buildings are lacking fire sprinklers and fire alarm systems. (ORD provided funds to update the fire alarm system in Building 7.)

#### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Renovation of 7,000 square feet of laboratory space, to correct a number of deficiencies identified in the assessment -- \$5,605,000 (Minor Construction), ongoing in construction phase, to be completed March 2012.

Expansion of Building 2 (to add a second story of 13,830 square feet) for laboratory space -- \$7,150,000 (Minor Construction), ongoing in construction phase, to be completed May 2012.

Renovation of Building 2 laboratories and Building 30 VMU space, will correct many deficiencies identified in the assessment -- \$1,470,000 (NRM FY10), ongoing in construction phase, to be completed January 2012.



Renovation of Building 2, converting former clinical space to laboratories – \$1,501,000 (NRM FY11), design phase complete, pending award for construction.

Correction of miscellaneous Priority 1 deficiencies completed, including: providing standby power for the VMU (Bldg 7), making corrections to the Bldg 2 mechanical system, providing monitoring of environmental conditions in the Bldgs 30 and 37, making corrections to Bldg 45 mechanical system, providing industrial hot and cold water supply for the VMU, installing emergency shower and eyewash in cage wash area of the VMU, and replacing fume hood faucets (station funds), completed.

Initiated correction of miscellaneous Priority 1 deficiencies, including: providing surge suppression for electrical system, adding fire sprinkler to communication closet, and providing monitoring for a portion of the mechanical system in VMU – (station funds), in progress.

#### New Construction

There is currently ongoing construction for the Minor Construction projects previously described.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Corrections Cost</b>
Architectural	\$2,055,700
Plumbing	\$63,500
HVAC	\$2,169,400
Electrical	\$630,800
Fire Protection	\$300
<b>Total</b>	<b>\$4,919,700</b>

**Table 1.1 Cost Summary by Discipline**





Priority	Corrections Cost
1	\$1,800,500
2	\$1,638,100
3	\$1,048,700
4	\$5,700
5	\$426,700
Total	\$4,919,700

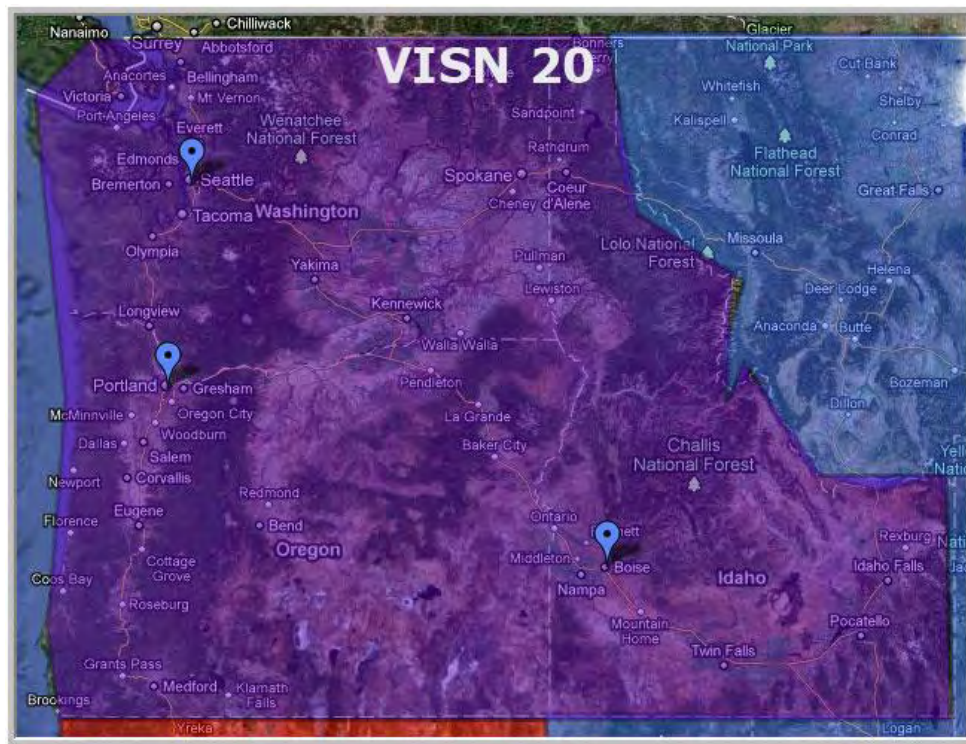
Table 1.2 Cost Summary by Priority

Bldg	Corrections Cost	Replacement Cost	FCI
2	\$1,006,900	\$16,500,000	6%
7	\$3,102,700	\$7,500,000	41%
14	\$30,800	\$3,000,000	1%
30	\$12,000	\$80,000	15%
35	\$35,000	\$140,000	25%
37	\$72,600	\$280,000	26%
45	\$194,700	\$700,000	28%
General	\$465,000		N/A (central systems)
Overall	\$4,919,700	\$28,200,000	17%

Table 1.3 Facility Condition Index Value



## VISN 20: Northwest Network



<i>Sta. ID</i>	<i>VA Site Surveyed</i>	<i>City/State</i>
<b>531</b>	<b>Boise VA Medical Center</b>	<b>Boise, ID</b>
<b>648</b>	<b>Portland VA Medical Center</b>	<b>Portland, OR</b>
<b>663</b>	<b>VA Puget Sound Health Care System, Seattle Division</b>	<b>Seattle, WA</b>

### Section 3. Description of VA Research Infrastructure





***Boise VA Medical Center,***

***Boise, ID***



**Date(s) of Assessment: July 20, 2006**

**Number of Buildings Assessed: 2**

**Total Cost to Correct Deficiencies: \$852,900**

**Total Cost, Priority 1 Deficiencies: \$313,400 (or 37%)**

**Total Cost to Replace: \$6,400,000**

**Overall Campus FCI: 13%**

**Size of Research Program: Small (Under \$2.5 million in VA research funding)**



### Background

The Boise VAMC research program is a small program, with most funding being for biomedical research. Its primary academic affiliate is the University of Washington School of Medicine located in Seattle. The facility also has affiliations within the state of Idaho, including Boise State University School of Nursing and the Idaho State University College of Pharmacy in Pocatello. There is no medical school within Idaho.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories and the Veterinary Medical Unit (VMU) were housed in two buildings (Buildings 67 and 109) on the VA campus with 18,404 nsf of research space (laboratories – 10,050 nsf and VMU – 8,354 nsf). Following is an overview of the buildings, including their age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Research laboratories are housed in Building 67 which was constructed in 1933. The space was converted from former clinical laboratory space to research laboratories in 1978. Some renovations have been done and, overall, the condition of finishes and casework is fair to good, with some exceptions where specific damage has occurred. Laboratory areas are generally crowded. There are no areas of research space affected by roof conditions.

One problem noted regarding flooring is the presence of a covered trench (for access to steam piping) in some of the laboratories. Since the system appears to be inactive, the trench should be filled to eliminate the possibility of vermin intrusion through it.



**At left, Building 67 houses research laboratories in converted clinical laboratory space. At right, rooftop equipment on Building 109.**



The vivarium is located within a fairly new building (Building 109), having been constructed in 1991. Overall, the condition of finishes within the VMU is excellent. A few deficiencies were noted, primarily involving cracks in the floor and walls due to settling, and the inadequacy of steam pressure for cage washing equipment. Also, the sheep pen is located on the perimeter of the campus, making it vulnerable to vandalism. Consideration should be given to relocating it closer to the VMU.

Systems: Of primary concern is the condition of air chiller and air handling equipment, both of which are reaching the end of their useful life. These systems should be replaced and constitute the most costly deficiencies in central systems. Air flow is insufficient for laboratory space by today's standards.

In contrast, the electrical system overall is robust with plenty of power distribution.

Building 67 is fully covered by a sprinkler system, while Building 109 is partially covered. The fire alarm system has audible horns rather than a voice communication system.

#### Security

Generally space appears to be adequately secured with an electronic system for entry, but there is no system to monitor egress.

#### Life Safety Hazards

The following life safety hazard identified in the assessment is in the process of being remediated:

- A work order has been submitted to install a safety shower and eyewash unit in the VMU near the cage wash.

The following additional life safety hazard identified during the assessment has not been remediated by the medical center:

- Building 109 has only partial sprinkler coverage.

#### Improvements Made Since Assessment:

This station has made and/or initiated improvements following the assessment, including:

Replacement of boiler for VMU -- \$400,000 (VISN funds), in progress.

Replacement of cage washer in VMU – (VACO ORD LAMB), will be installed July 2011.





Construction of new research bldg – Est. \$6.8 million (Minor Construction), in progress with completion expected 2012.

### New Construction

A new research and education building is being constructed on this campus, with estimated completion in January 2012. The project was funded through Minor Construction.

The facility previously indicated the need for a BSL-3 laboratory, for research involving *Bacillus anthracis*, *Staphylococcus enterotoxin B*, Influenza H5N1, and HIV. Although there does not appear to be specific discussion about a BSL-3 in the Minor Construction application, it is assumed that the new research and education building is the desired site for such a facility should it be constructed.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

Discipline	Correction Cost
Architectural	\$281,400
Plumbing	\$12,900
HVAC	\$497,400
Electrical	\$61,200
Fire Protection	\$0
Total	\$852,900

**Table 1.1 Cost Summary by Discipline**

Priority	Correction Cost
1	\$313,400
2	\$261,300
3	\$93,400
4	\$184,800
5	\$0
Total	\$852,900

**Table 1.2 Cost Summary by Priority**



<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
\$658,300	\$2,800,000	23% (Bldg 67)
\$194,600	\$3,600,000	5% (Bldg 109)
\$852,900	\$6,400,000	13% (overall)

**Table 1.3 Facility Condition Index Value**





***Portland VA Medical Center,***

***Portland, OR***



**Date(s) of Assessment: June 3-5, 2008**

**Number of Buildings Assessed: 4**

**Total Cost to Correct Deficiencies: \$13,774,000**

**Total Cost, Priority 1 Deficiencies: \$2,128,000 (or 15%)**

**Total Cost to Replace: \$84,362,000**

**Overall Campus FCI: 16%**

**Size of Research Program: Very Large (Over \$10 million in VA research funding)**



### Background

The Portland VAMC research program is a very large program, with research from all disciplines, but with the heaviest concentrations in biomedical and rehabilitation research. The program hosts a rehabilitation COE and a health services REAP. The Portland VAMC research program is consistently among the top five or six programs nationwide with regard to VA funding.

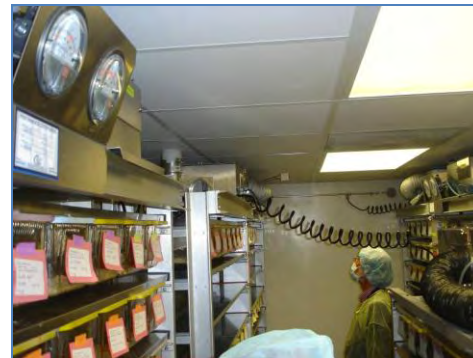
The Portland VAMC is academically affiliated with Oregon Health Sciences University, located adjacent to the VAMC and easily accessible via a sky bridge.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in four buildings on the VA campus with nearly 83,000 nsf of research space (laboratories – 51,631 nsf (including a BSL-3 laboratory); VMU – 13,781 nsf; offices – 17,389 nsf). Following is an overview of the buildings, including their age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

There were two items noted during the survey that pertain to all of the research buildings, and affect the cost to correct deficiencies. First, the emergency generators which serve the entire campus, including research, need to be replaced. This deficiency accounts for a large portion of the cost to correct electrical deficiencies identified in the report. The second item is the possible need for additional seismic support and restraint to plumbing and mechanical systems.

Building 6 was constructed in 1928 as a nursing dormitory. Now housing a variety of laboratories, offices, and a small vivarium, the building was extensively renovated in 1997 including the installation of a new HVAC system and a new roof. Building 6 is a three story building with laboratories on half the second floor. The VMU occupies half the first floor.



**In Building 6, laboratories (left photo) and the VMU space (right photo) were retrofitted into a former dormitory that really is not suitable for research.**



The laboratories generally appear to be in good condition, although many of the finishes are inappropriate for a laboratory environment. The building as a whole is not appropriate for laboratories or a VMU primarily due to low ceilings, narrow corridors, and lack of support space.

The small VMU located on the first floor houses a breeding colony. Some of the finishes in the VMU are inappropriate for a vivarium including vinyl faced panel ceilings rather than hard ceilings. The flooring throughout the space is, at best, in fair condition, and is in failing condition in the staging room and the cage wash mechanical room.

Building 101 was constructed in 1988, with the upper three floors of the six story building housing research functions. Laboratories are located on the fourth and fifth floors, and the main VMU is on the sixth floor.

Although the laboratory space in Bldg 101 is in better condition than at many other sites previously surveyed, the space is overcrowded and the casework is original to the building. Equipment is in good/operational condition. There are some deficiencies with building systems which account for a significant portion of the estimated correction costs.

The problem with overcrowding of research areas is particularly evident in the VMU, where there is insufficient space in the animal housing rooms to accommodate volume. There also are some wall finishes in the VMU in need of repair.



**The photos above show two views of typical Building 101 laboratory space. Note the crowded conditions due to lack of storage and equipment space, sometimes impeding accessibility.**





As noted previously, Buildings 103 and 104 were constructed in 1999. Building 103 houses larger modular laboratories and shared support space, a design very appropriate for modern, state of the art laboratory facilities. This building houses the BSL-3 laboratory, as well as a small VMU facility. Building 104 houses laboratories on the second floor.

These buildings represent exemplary examples of recently constructed VA research space. However, there are some deficiencies such as lack of canopy exhaust hoods on autoclaves (in the non-containment laboratories), lack of redundancy on air handlers (including the VMU space in Building 103), the placement of vacuum breakers inside fume hoods, and lack of ground fault circuit interrupter protection on receptacles near water sources. It was also noted that the electrical system should be set up for a preventive maintenance program to evaluate it and ensure its continuity as it ages.

There were no deficiencies noted for the BSL-3 laboratory.

It should be noted that without the prorated cost to replace emergency generators, the overall ratings for these two buildings would have been significantly lower, better reflecting the actual physical condition of the buildings and suitability of the research space.



**The photos above show typical laboratories in Building 103. Building 104 laboratories are shown in the photos below.**





All research space reviewed is fully protected by fire suppression sprinkler systems. The buildings' alarm systems have been upgraded as part of a campus-wide effort.

#### Other Research Space

The research buildings also accommodate dry laboratory space for the COE and REAP, as well as administrative office space for the Research Service.

Building 6 houses the health services REAP. Although their space is currently adequate, they are likely to need additional space in the not too distant future. In spite of the new roof on the building, there are leaks into the office space on the third floor.

Perhaps the most innovative space solution has been the construction of dry laboratory space to house the National Center for Rehabilitative Auditory Research, the rehabilitation COE. This space, created from a floor of a parking garage, was completed in 2006 and provides 21,000 square feet of contiguous space for state of the art evaluation and testing booths and a hearing aid laboratory along with office, conference, and patient waiting space. Perhaps the most impressive aspect of the facility is the fully anechoic chamber to enable "echo free" testing for hearing aid research, sound localization studies, acoustic transducer studies, and other research related to hearing loss.

This station has benefited over the years from a significant investment of resources by the medical center and the VISN, as well as from VA Central Office and a direct appropriation. The resources have supported both renovation of existing space as well as construction of new research space. Examples include the Cancer Research Building (Building 103) and the adjacent Building 104 constructed in 1999, two buildings housing laboratories and other research space that are among the best examples of research infrastructure surveyed to date.

#### Security

All research spaces are appropriately protected by security systems. It should be noted that, during the review of the BSL-3 laboratory, the alarm sounded due to the length of time the door was left open for entry. The response by campus security was immediate and appropriate.

#### Life Safety Hazards

The following life safety hazard was identified during the assessment. It was not reported by the station whether this specific deficiency has been corrected.

- Receptacles near water sources need ground fault protection.



Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Renovation of space in Bldgs 6, 101 and 103, including remediation of some deficiencies identified in the assessment -- \$480,000 (NRM FY10), partially complete. Remaining projects estimated for completion October 2011.

Upgrade of Building 101 laboratories -- \$300,000 (NRM FY11), design completed, awaiting contract award.

Installation of new cage washer for VMU -- \$130,000 (VACO ORD LAMB), completed.

Correction of floor and wall finishes in VMU (cage wash area) -- \$250,000 (station funds), completed.

Replacement of Bldg 6 chillers -- \$160,000 (station funds), completed.

Replacement of roof, Bldg 6 -- \$240,000 (station funds), completed.

Painting in Bldg 6 – (station funds), completed.

Planning correction of a number of Priority 1 deficiencies in Bldg 101 -- \$750,000 (station NRM), planned for FY11.

Replacement of cooling system in cold rooms campus wide – (station NRM), completed.

Installation of central monitoring system for critical freezers and refrigerators campus wide – (station NRM), FY11 project.

Renovation of administration space for Research Service -- \$140,000 (station funds), completed.

Upgrade of Bldg 101 elevators – \$160,000 (station NRM), completed.

A number of additional projects were reported to be in planning for FY11, including replacement of hot water loop to laboratories in Bldg 101 (\$200,000), correction of finishes in Bldg 101 (\$200,000), upgrade of exhaust system for laminar flow and chemical hoods, Bldgs 101, 103, and 104 (\$250,000), installation of a cover and storage space for loading dock (\$350,000), and creation of additional storage for research (\$300,000).



### New Construction

There is no new construction of research space planned at this station.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Corrections Cost - Bldg 6</b>	<b>Corrections Cost - Bldg 101</b>	<b>Corrections Cost - Bldg 103</b>	<b>Corrections Cost - Bldg 104</b>
Architectural	\$217,000	\$1,819,000	\$461,000	\$99,000
Plumbing	\$0	\$170,000	\$118,000	\$0
HVAC	\$1,072,000	\$2,362,000	\$1,216,000	\$257,000
Electrical	\$1,319,000	\$1,695,000	\$1,636,000	\$1,333,000
Fire Protection	\$0	\$0	\$0	\$0
<b>Total</b>	<b>\$2,608,000</b>	<b>\$6,046,000</b>	<b>\$3,431,000</b>	<b>\$1,689,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Bldg 6</b>	<b>Bldg 101</b>	<b>Bldg 103</b>	<b>Bldg 104</b>
1	\$645,000	\$795,000	\$592,000	\$96,000
2	\$608,000	\$2,472,000	\$1,190,000	\$245,000
3	\$1,290,000	\$2,580,000	\$1,648,000	\$1,348,000
4	\$65,000	\$0	\$0	\$0
5	\$0	\$199,000	\$1,000	\$0
<b>Total</b>	<b>\$2,608,000</b>	<b>\$6,046,000</b>	<b>\$3,431,000</b>	<b>\$1,689,000</b>

**Table 1.2 Cost Summary by Priority**



<b>Building</b>	<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
Building 6	\$2,608,000	\$5,587,999	47%
Building 101	\$6,046,000	\$35,483,000	17%
Building 103	\$3,431,000	\$35,153,000	10%
Building 104	\$1,689,000	\$8,139,000	21%
Overall	\$13,774,000	\$84,362,999	16%

**Table 1.3 Facility Condition Index Value**



***VA Puget Sound Health Care System,***

***Seattle Division***

***Seattle, WA***



**Date(s) of Assessment: May 11-13, 2010**

**Number of Buildings Assessed: 6**

**Total Cost to Correct Deficiencies: \$10,511,000**

**Total Cost, Priority 1 Deficiencies: \$2,054,000 (or 20%)**

**Total Cost to Replace: \$80,568,000**

**Overall Campus FCI: 13%**

**Size of Research Program: Very Large (Over \$10 million in VA research funding)**





### Background

With regard to VA funding, the local research program falls in the top five of all research programs and is in the top ten for overall research funding. The majority of VA funding for this very large program is for biomedical research, with large amounts in all the other disciplines as well. The program hosts a rehabilitation COE, the Center of Excellence for Limb Loss Prevention and Prosthetic Engineering; a health services COE, Northwest Center for Outcomes Research in Older Adults; two QUERIs, Ischemic Heart Disease (IHD) and Spinal Cord Injury (SCI) which is jointly hosted by the Hines VAMC in Chicago. The program also has three REAPs in biomedical science – Diabetes, Mental Health, and Obesity, as well as an Epidemiology Research and Information Center (ERIC) funded by CSP. With regard to clinical programs, the facility hosts both a MIRECC and a GRECC with active research components

The academic affiliate is the University of Washington School of Medicine. The university is located a few miles from the VA campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and offices were housed in six buildings on the VA campus with nearly 68,000 nsf of research space (laboratories – 43,182 nsf; VMU – 12,438 nsf; offices – 11,912 nsf). Following is an overview of the buildings, including their age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Overall, the facility has a mixture of old and somewhat newer research space. Biomedical and animal research occupies six buildings on the VA campus: Buildings 1, 8, 11, 13, 23, and 34. Laboratories are located in Buildings 1, 8, and 13. The animal facility is spread among Buildings 11, 23, and 34. This rather widespread distribution of research space is somewhat detrimental, particularly with regard to security requirements for research laboratories and animal facilities.

The three biomedical REAPs appear to be generally pleased with their laboratory space allocation, although it is not contiguous. Some of the investigators were temporarily housed in Building 8 while Building 13 was being renovated. The “two year” renovation took four years to complete and they are very happy to be back in Building 13. Also there are a few investigators from the American Lake campus in Tacoma who have moved into Building 13.

Much of the laboratory space has a good appearance as there have been some renovation projects over the years. But there are still some significant deficiencies with the space.

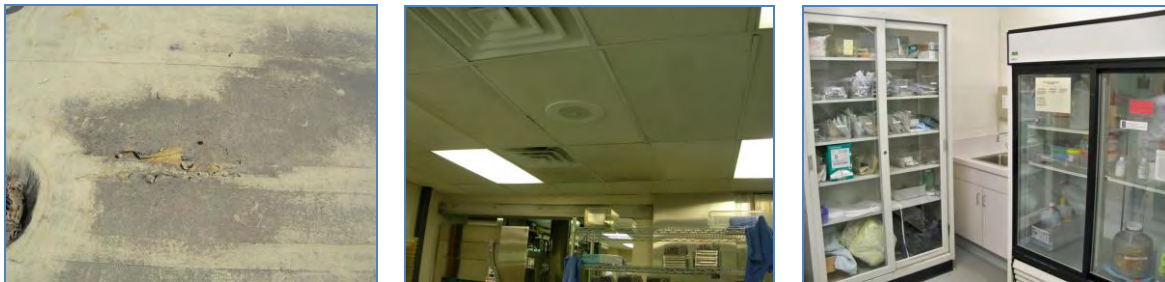


The buildings range in age from 1950 construction (Buildings 1 and 8) to 1995 (Building 34), with the others being constructed primarily in the 1960s. Several of the buildings have had fairly significant renovations, with the most recent being in Buildings 8 and 13.

There are a lot of problems with leakage and resulting water damage, primarily due to rooftop penetrations. Building 13 has a newer roof that may be under warranty. It is not sloped correctly and water is ponding so leaks may not be far behind. Overall, laboratory space is generally not well designed, making it somewhat crowded and inaccessible. Storage space is badly lacking.

Most of the laboratories have casework that is either new due to recent renovation or has been well maintained and is still in fairly good condition. Several large pieces of fixed equipment are in need of replacement including cold rooms in Buildings 1, 8, and 34. The cage rack washer in Building 23 is leaking and causing extensive damage to space below the cage wash area. Also some of the fume hoods are in need of replacement.

The main animal facility is in Building 34, with some smaller spaces in neighboring buildings (11 and 23). Those buildings really are not suitable for use as a VMU, particularly the room adjacent to the mechanical room in Building 11 that is being used for animal housing. There is potential for overheating of animals as long as they occupy that space. It is anticipated that many of the problems in the VMU buildings will be resolved with the additional space to be added onto Building 34.



**Above, the animal research facility occupies space in three buildings. From left to right, roof damage on Building 13, an inappropriate ceiling finish in the cage wash area of Building 23, and an overcrowded procedure room in Building 34.**

Generally the mechanical systems throughout the buildings need to be upgraded or replaced, particularly in Building 1. This will clearly be the most costly of the recommended corrections to most of the buildings. The recent renovation of Building 13 included HVAC upgrade, but much work had to be done after the renovation was completed as the system was not operating the way it should and it still experiences some problems. Care should be taken to ensure that any new mechanical systems installed meet VA design guidelines, particularly in buildings housing animal research.

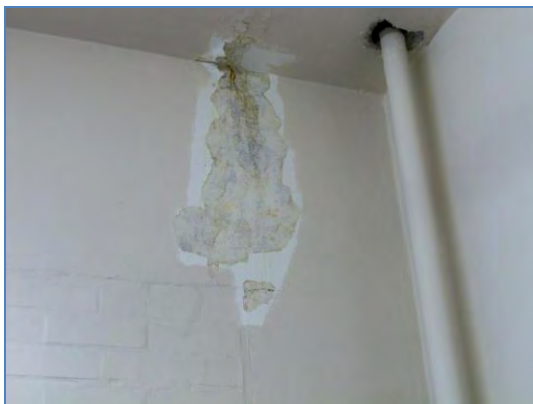


With regard to the electrical system, there are some system enhancements currently underway that will impact positively on the overall system. The emergency system for Building 1 also needs to be upgraded. There is no transient voltage surge suppression in any of the buildings, and very few ground fault protected receptacles where they are needed. Some of the VMU spaces do not have gasketed light fixtures and many light fixtures have not yet been upgraded for energy efficiency. There is no central monitoring system for the equipment in any of the research buildings. It is recommended that a system be purchased and installed at a central location (e.g., Building 1 or 101) with network connections in the other research buildings.



**Above, leaks are prevalent in Building 1, due to roof leakage, mechanical equipment, and penetrations.**

**Below (left), Building 8 also has leakage problems causing damage to interior finishes. At right, an aging fume hood in a Building 8 laboratory.**



### Safety

Not all of the research buildings are fully covered by a wet pipe sprinkler system. Only Buildings 1 and 13 have full coverage systems, while Buildings 8, 11, and 34



are partially covered. Building 23 has no sprinkler system. The fire alarm systems are in good condition, but smoke detection is lacking, particularly in the buildings with partial or no sprinkler coverage.

Safety showers and emergency eyewashes meet current requirements with the exception of the cage wash area in Building 23 (a unit is required).

#### Other Research Space

Currently the rehabilitation COE is in space split among three buildings: Building 1 (administrative offices), Building 13, and Building 100, the main hospital in which the Center's laboratory space is housed. While the Center currently has enough space to house its varied functions, it will fare much better when housed in contiguous space.

The health services COE, QUERIs, and the ERIC are in leased space in downtown Seattle. The space is well designed and very well utilized to the point of needing additional space. (Note: since the time of the assessment additional space has been leased.)

There currently is a sizeable clinical research unit (CRU) housed in Building 100 along with a Diabetes Research Group. Both functions will be relocated shortly, with the Diabetes group gaining a suite of offices, but the CRU downsizing a bit. The space they currently occupy is being converted to clinical functions.

#### Security

There is appropriate electronic security throughout the laboratory and animal research areas.

#### Life Safety Hazards

The following life safety hazard identified during the assessment is in the process of being remediated:

- Seismic issue: Some laboratories need to have temporary shelving replaced with permanent shelving, and some reagent shelving needs seismic lips installed. (ORD has provided funding to remediate this deficiency.)

The following additional life safety hazards identified during the assessment have not yet been remediated by the medical center. The engineering staff is reviewing deficiencies and developing a plan for correction.

- The buildings housing VMU space (11, 23, 34) have mechanical system controls set to fail in the incorrect position. This can lead to overheating of animals and is in urgent need of remediation.



- Not all research buildings are covered by sprinkler systems and smoke detection is lacking in buildings without sprinklers.
- Receptacles near water sources are not ground fault protected.
- In Bldg 23, a safety shower/eyewash unit are required in the cage wash area.

#### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Planning correction of Priority 1 deficiencies, particularly those affecting life safety -- local engineering staff are developing a plan to correct.

Replacement of HVAC, Bldg 12 -- \$618,000 (ARRA funds), nearing completion.

Upgrade of electrical distribution, Bldg 11 -- \$490,000 (NRM FY10), status not reported.

Upgrade of electrical distribution, Bldg 23 -- \$427,000 (NRM FY10), status not reported.

Renovation of laboratory space including upgrade of fume hoods, upgrade of exhaust systems, improved humidification, upgrade of controls, and repair of roofs -- \$900,000 (NRM FY11), funded.

Construction of addition to Bldg 34 -- contract awarded, estimated completion 12-18 months.

Construction of new building (101) -- design complete, estimated completion 2014 or 2015.

#### New Construction

Two additional construction projects are expected in the near future. The first will add space to Building 34 with an extension of the first floor and the addition of a second floor. A major construction project will add Building 101, which will house the COEs, some biomedical research, the Research Service administrative offices, a clinical research unit, and several mental health (clinical) functions.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.





Discipline	All Bldgs
Architectural	\$3,108,000
Plumbing	\$2,071,000
HVAC	\$4,753,000
Electrical	\$520,000
Fire Protection	\$59,000
<b>Total</b>	<b>\$10,511,000</b>

Table 1.1 Cost Summary by Discipline

Priority	Bldg. 1
1	\$2,054,000
2	\$2,124,000
3	\$5,727,000
4	\$483,000
5	\$123,000
<b>Total</b>	<b>\$10,511,000</b>

Table 1.2 Cost Summary by Priority

Building	Correction Cost	Replacement Cost	FCI
Bldg 1	\$6,585,000	\$37,635,000	17%
Bldg 8	\$702,000	\$6,395,000	11%
Bldg 11	\$808,000	\$5,454,000	15%
Bldg 13	\$805,000	\$18,507,000	4%
Bldg 23	\$946,000	\$4,184,000	23%
Bldg 34	\$665,000	\$8,411,000	8%
Overall	\$10,511,000	\$80,568,000	13%

Table 1.3 Facility Condition Index Value







## ***VISN 21: Sierra Pacific Network***



<i>Sta. ID</i>	<i>VA Site Surveyed</i>	<i>City/State</i>
<i>612</i>	<i>VA Northern California Health Care System, Sacramento Valley Division</i>	<i>Mather, CA</i>
<i>612</i>	<i>VA Northern California Health Care System, East Bay Division</i>	<i>Martinez, CA</i>
<i>640</i>	<i>VA Palo Alto Health Care System</i>	<i>Palo Alto, CA</i>
<i>662</i>	<i>San Francisco VA Medical Center</i>	<i>San Francisco, CA</i>

### Section 3. Description of VA Research Infrastructure





***VA Northern California Health Care System,***

***Sacramento Valley Division***

***Mather, CA***



**Date(s) of Assessment: September 14, 2010**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$1,066,000**

**Total Cost, Priority 1 Deficiencies: \$11,000 (or 1%)**

**Total Cost to Replace: \$23,751,000**

**Overall Campus FCI: 4%**

**Size of Research Program: Medium (\$2.5 million to \$4.9 million in VA research funding) (Note: this applies to the integrated facility and covers both the Mather and Martinez sites.)**



### Background

Most of the VA funding for this program is for biomedical and clinical research, with additional funding for rehabilitation research. At the Mather campus (Sacramento Valley Division), the program hosts a General Clinical Research Center (GCRC), a joint venture with the University of California, Davis. The program is working toward enhancing its ongoing research focusing on traumatic brain injury with the goal of hosting a rehabilitation COE.

The academic affiliate is the University of California, Davis (UC-Davis). The program also has close ties and research collaborations with both UC-Berkeley and UC-San Francisco.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories and supporting offices were housed in a single building (Building 700) on the VA campus with 17,494 nsf of research space (laboratories – 16,400 nsf and offices – 1,094 nsf). Following is an overview of Building 700, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

The Sacramento Valley Division, on the former site of Mather Air Force Base, houses biomedical laboratories on the fifth floor of Building 700. A five story hospital/research tower, Building 700 was constructed in 2003 following significant damage sustained by the former hospital at Martinez in the 1989 Loma Prieta earthquake. Rather than rebuild the hospital at Martinez, VA opted to decentralize services in northern California and relocate the facility using the existing base hospital at Mather AFB and expanding it to accommodate full medical center services.

Building 700 is a modern, seismically correct building with exterior and interior finishes, casework, and fixed equipment in good condition. When compared to buildings at sites previously assessed, Building 700 has relatively minor deficiencies which include a need for exhaust hoods over autoclaves and glass washers to collect odors and steam, and protect finishes; a need for separation of laboratory and potable water; a recommendation to replace two air handling units and exhaust fans and ducting to better serve a laboratory environment; a need for surge suppression to protect sensitive electronics in the laboratories; and a need for updated lighting fixtures in some spaces. Overall, the research space is well designed and is in good condition.

There is one room near the laboratories that currently houses a sterilizer that is not being used. The research leadership would like to consider converting the room to another purpose if it can be done at little cost. Two suggestions discussed were to



either use the room to house freezers (if the mechanical system can accommodate the heat load) or to convert it to common tissue culture space.



**(Left photo) Typical casework in the Mather campus laboratories.**

**(Right photo) Typical safety shower with emergency eyewash in laboratory area corridor.**

There is no Veterinary Medical Unit (VMU) on the campus. Investigators engaged in animal research house animals at UC-Davis.

Emergency eyewashes and safety showers are provided as required.

Building 700 is fully protected by a wet pipe sprinkler system. The fire alarm system is also in good condition.

#### Other Research Space

The GCRC, a joint venture with UC-Davis, is also housed in Building 700. The GCRC is an impressive clinical research facility with nine beds, a laboratory, reception/waiting area, file storage, nurses' station, rooms for obtaining patient consent, and an exercise facility. Both VA and non-VA patients are enrolled in studies conducted at the GCRC.

Research Service administrative offices and dry laboratory space are housed in Buildings 722 and 807.

#### Security

There is appropriate electronic security for the research laboratory area.

#### Life Safety Hazards

The following life safety hazard identified during the assessment has not been remediated:

- Liquid nitrogen is being dispensed in rooms without oxygen sensors.





### Improvements Made Since Assessment:

Planning renovation of laboratory (wet laboratory) into dry laboratory space -- \$275,000 (NRM FY11).

### New Construction

There is no new construction of research space planned at this station.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Bldg. 700</b>
Architectural	\$37,000
Plumbing	\$80,000
HVAC	\$934,000
Electrical	\$15,000
Fire Protection	\$0
<b>Total</b>	<b>\$1,066,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Bldg. 700</b>
1	\$11,000
2	\$635,000
3	\$420,000
4	\$0
5	\$0
<b>Total</b>	<b>\$1,066,000</b>

**Table 1.2 Cost Summary by Priority**

<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
\$1,066,000	\$23,751,000	4%

**Table 1.3 Facility Condition Index Value**



***VA Northern California Health Care System,***

***East Bay Division***

***Martinez, CA***



**Date(s) of Assessment: September 15, 2010**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$983,000**

**Total Cost, Priority 1 Deficiencies: \$42,000 (or 4%)**

**Total Cost to Replace: \$2,108,000**

**Overall Campus FCI: 47%**

**Size of Research Program: Medium (\$2.5 million to \$4.9 million in VA research funding) (Note: this applies to the integrated facility and covers both the Mather and Martinez sites.)**



### Background

Most of the VA funding for this program is for biomedical and clinical research, with additional funding for rehabilitation research. The Martinez campus (East Bay Division) hosts an Alzheimer's Disease Center funded by the state of California and the NIH, as well as the Center for Aphasia and Related Disorders funded by the NIH. The program is working toward enhancing its ongoing research focusing on traumatic brain injury with the goal of hosting a rehabilitation COE.

The academic affiliate is the University of California, Davis (UC-Davis). The program also has close ties and research collaborations with both UC-Berkeley and UC-San Francisco.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories and supporting offices were housed in a single building (Building R-1) on the VA campus with 2,455 nsf of research space (laboratories – 1,455 nsf and offices – 1,000 nsf). Following is an overview of Building R-1, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Biomedical laboratories are housed in Building R-1, a one story building constructed in 1980. Laboratories are clustered in the west end of the building. Seismic retrofitting on Building R-1 includes tie down of utility poles and anchoring of heavy equipment.

Although Building R-1 is showing some signs of aging, overall finishes and casework in this building are in fairly good condition, with the exception of the laboratory flooring which is original to the building and in need of replacement. Fume hoods also are original and have exceeded their useful lives. Laboratory and potable water systems are not properly separated.



**(Left photo) Typical laboratory space in Building R-1. (Right photo) Sheet vinyl flooring that has been patched.**



Space being used for tissue culture does not have appropriate finishes and should be renovated to include epoxy painted drywall ceiling, sheet vinyl flooring, and epoxy painted walls to promote a clean environment.

There are several mechanical system deficiencies that are either related to the original design and configuration of the building or are due to aging of the equipment. Air handlers lack appropriate redundancy and control typically found in a laboratory environment. Exhaust systems also are lacking redundancy, control, and stainless steel ducting.

With regard to the electrical system, there is no surge suppression to protect electronics in the laboratories, and there is insufficient emergency power.

There previously was a VMU on the Martinez campus in Building R-3, but it has closed and research animals are housed at UC-Davis. The former VMU space is being considered for renovation into clinical space.

Building R-1 is fully protected by a wet pipe sprinkler system. The fire alarm system is also in good condition.

#### Other Research Space

At the Martinez campus, dry laboratory space for neuroscience research is scattered in several buildings. The Center for Aphasia and Related Disorders is housed in Administrative Building 2 (AB2), a building slated for demolition due to mold and other problems. It was noted during the assessment that this center will be relocating to alternative space, possibly to space that is equipped as a large biomedical laboratory and is currently being used to house information technology staff. Room 101 (in Building R-1) could be upgraded for use as biomedical laboratories and, if updated, could provide additional, contiguous laboratory space for the research program. Although there was no indication from station leadership that this space would convert back to biomedical laboratory use, the A&E team assessed it and has provided a breakdown of estimated costs (\$309,000) to renovate the space. Note that these costs have not been included in the calculation of overall campus renovation and replacement costs, nor in the calculation of the FCI for the East Bay Division.

VANCHCS leadership is very supportive of developing a rehabilitation research COE for the research program to be housed on the Martinez campus. Additional dry laboratory space will be needed to house such a program. Development of a proposal for construction funding is being considered locally.



### Life Safety Hazards

The following life safety hazard identified during the assessment has not been reported as remediated:

- Some areas are lacking safety showers and/or emergency eyewashes.

### Security

There is appropriate electronic security for research space at both campuses. However, at the Martinez campus, the laboratories are within a block of space that houses other functions and must have open access. It is recommended that the individual laboratory doors be equipped with electronic security.

### Improvements Made Since Assessment:

This station has made and/or initiated improvements following the assessment, including:

Renovation of space in Building R-1 for Center for Aphasia & Related Research -- \$1,650,000 (NRM FY11).

Renovation of Building 4 -- \$1,150,000 (NRM FY11).

### New Construction

There is no new construction of research space planned at this station.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Bldg. R-1</b>
Architectural	\$88,000
Plumbing	\$236,000
HVAC	\$629,000
Electrical	\$30,000
Fire Protection	\$0
<b>Total</b>	<b>\$983,000</b>

**Table 1.1 Cost Summary by Discipline**



Priority	Bldg. R-1
1	\$42,000
2	\$686,000
3	\$252,000
4	\$0
5	\$3,000
<b>Total</b>	<b>\$983,000</b>

**Table 1.2 Cost Summary by Priority**

Correction Cost	Replacement Cost	FCI
\$983,000	\$2,108,000	47%

**Table 1.3 Facility Condition Index Value**







***VA Palo Alto Health Care System,***

***Palo Alto, CA***



**Date(s) of Assessment: November 2-4, 2010**

**Number of Buildings Assessed: 9**

**Total Cost to Correct Deficiencies: \$14,801,000**

**Total Cost, Priority 1 Deficiencies: \$2,820,000 (or 19%)**

**Total Cost to Replace: \$106,789,000**

**Overall Campus FCI: 14%**

**Size of Research Program: Very Large (Over \$10 million in VA research funding)**



### Background

The VA Palo Alto Health Care System (VAPAHCS) research program is one of the largest in the country. VA funding is from all disciplines (biomedical, rehabilitation, clinical, and health services). The program hosts the VA DNA Bank Genomics Program, an AIDS Research Center, a health services COE, the Center for Health Care Evaluation, as well as a QUERI on Chronic Heart Failure, a rehabilitation COE on bone and joint rehabilitation, a CSP Coordinating Center, and the Health Economics Resource Center (HERC). There also is one of three War Related Illness and Injury Study Centers (WRIISC). The facility also hosts a GRECC and a MIRECC.

The primary academic affiliate is the Stanford University School of Medicine located near the Palo Alto campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in nine buildings on the VA campus with over 77,000 nsf of research space (laboratories – 56,966 nsf; VMU – 10,905 nsf; offices – 9,638 nsf). Following is an overview of the buildings, including their age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

The VAPAHCS houses biomedical laboratories and the VMU on the Palo Alto Division campus. There are nine buildings in which laboratory and/or animal research activities are present included in this assessment: Buildings 2, 4, 7, 51, 54, 100, 101, MB3, and MB4.

The Palo Alto area is located in a very high seismic region. With the exception of Buildings 100 and 101, none of the research buildings fully meets seismic requirements. In buildings without seismic bracing, there are some non-structural seismic corrections such as anchorage of mechanical equipment to walls and floors, but not all equipment is anchored. There also are seismic restraints on reagent shelving within the laboratories.

All of the buildings housing research on the Palo Alto campus are technically rated in poor condition, although some have a significantly better appearance than others. Many of the most costly deficiencies identified pertain to the plumbing, mechanical, and/or electrical systems, including the following deficiencies that most or all of the buildings have in common: 1) need for separation of industrial and potable water supplies to prevent contamination of domestic water; 2) need to significantly upgrade mechanical systems (including replacement of air handling units, exhaust systems, controls, and/or other components); 3) lack of transient voltage surge suppression to protect sensitive electronics in the laboratories; and 4) need for



remote monitoring of high value freezers, refrigerators, and cold rooms. The following summaries include additional deficiencies pertaining to architectural elements for each building assessed.

Building 2 is a three level (two floors above ground plus a basement) circa 1960 building that houses a very small research component: an imaging unit on the basement level. The suite of rooms includes a dark room, equipment room, environmental room, a small laboratory, and storage space. The Electron Microscope housed in the space is in working order but is aging and is not state-of-the-art technology. The interior finishes in the space are deteriorated and there are accessibility limitations throughout. There are no safety showers or emergency eyewashes accessible to the space. (Note: Since the time of the assessment the station has decommissioned the research space in Building 2.)

Building 4 also was constructed in 1960 and is a three story building. There is a small area on the third floor that houses research laboratories that have been renovated within the past ten years. The finishes and casework are in good condition, although some finishes are inappropriate for the space. The windows appear to be original to the building and are in need of replacement.

There are some significant temperature differentials within the laboratory space and, within a single laboratory, there are severe temperature fluctuations which adversely impact on laboratory operations.

Building 7 is a single story building that houses primarily clinical functions, but has a small amount of laboratory space that was recently renovated. There are a number of problems with fixed equipment in this building, include several fume hoods that are aging and need to be replaced, as well as two aging cold rooms, one of which smells of mold and has rust in the interior.

Building 51 is a pre-fabricated metal building constructed in 1980 and renovated in 1996. This two story building recently had a single story addition constructed. Most of the space in Building 51 is dry laboratory/office space for rehabilitation research, but there is one laboratory in the new building addition that was included in the assessment. Architecturally the laboratory is in very good condition, but has a significant safety deficiency in that placement of the fume hood (which can be a source of hazard) with relation to work stations could prevent safe egress from the laboratory. This arrangement should be remediated before the laboratory is occupied.

Building 54 is a two story building of pre-fabricated metal that was constructed in 1981 and renovated in 1990 and again in 2005-2006. Building 54 houses the VMU in its entirety. It has been very well maintained.



The original cage washing equipment was left in place when new equipment was acquired to be used as back-up if needed. The unit is beyond its useful life expectancy and should be replaced if back-up equipment is going to be maintained. In some of the animal holding rooms, the sprinkler system was installed above the finished ceilings in the rooms. This needs to be resolved as it is a significant safety issue.



**Photos above show the new laboratory space in Building 51. This high quality laboratory has a potential egress problem with the work station located next to the fume hood. In case of emergency originating in the fume hood, there is no secondary egress for someone who may be working at the desk area. A similar situation exists in Building 101 (photo, bottom left). At bottom right, the laboratories in Bldgs MB3/MB4 are in poor condition.**



Building 100 is a five story building (four levels above ground, plus basement and penthouse) and Building 101 is a four story building constructed in 1997 and 1996, respectively to replace the former hospital and research buildings decommissioned after the 1989 earthquake. Research laboratories are housed on portions of the third and fourth floor of Building 100 and on the fourth floor of Building 101.



Both of these buildings have significant mechanical system deficiencies that comprise over 75% of the identified deficiencies. Architecturally they both have interior finishes, casework, and most fixed equipment in good condition. There are some tissue culture spaces that are not finished appropriately with monolithic floors and ceilings. Also some of the laboratories are missing emergency eyewash units.

A significant problem in both Buildings 100 and 101 is that some work stations within laboratories are located immediately adjacent to a fume hood. This is a potentially dangerous situation as the fume hood can be a source of hazard that could prevent a laboratory occupant from safely exiting the laboratory.

Buildings MB3 and MB4 are two modular buildings constructed in 1990 and are both on the campus master plan for future demolition. Currently the laboratories are primarily used as “swing space” when needed. These two buildings really do not provide an appropriate environment in which to conduct research. Most interior finishes and casework are in poor condition and the cold room in MB3 is not operational.

With the exception of animal holding rooms in Building 54, all of the buildings are fully covered by wet pipe sprinkler systems. Fire alarm systems are appropriate and in good condition. However, the system in Building 54 uses horns for notification rather than voice which is recommended for animal facilities. Emergency eyewash units and safety showers are located throughout the research space, with the exception of Building 2. Some of the buildings need some additional eyewash units at laboratory sinks or need to install a different type of unit.

#### Other Research Space

The rehabilitation COE is housed in Building 51. Other research functions requiring dry laboratory and/or office space are housed at the Menlo Park Division and in leased space within the Palo Alto community.

#### Security

There is appropriate electronic security throughout the laboratory and animal research areas. Video surveillance is needed for the VMU.

#### Life Safety Hazards

The following life safety hazard identified during the assessment has been remediated by the medical center:

- Safety showers and emergency eyewashes were installed where needed.

The station is currently developing a plan to address the remaining high priority deficiencies including the following life safety hazards: lack of smoke detection in





communications closet (Building 4); unsafe egress issues (Buildings 51, 100, 101); sprinkler system extension needed (Building 54).

#### Improvements Made Since Assessment:

This station has made and/or initiated improvements following the assessment, including:

Renovating gait laboratory and modifying space for wet laboratory research – \$1,650,000 (NRM FY11).

Planning two new Minor Construction projects (\$9.9 million each) funded in FY11. Both projects are for dry laboratory/office space and are the Genomics Medicine Research Center and the Public Health Translational Research Center.

#### New Construction

The VAPAHCS has been approved for funding of a new major construction project that will house Ambulatory Care, the research animal facility, and two floors of research laboratories.

Several of the buildings currently housing research functions including Buildings 2, 4, 54, MB3, and MB4, are slated for demolition following planned new construction on the campus. The laboratory space currently in Building 7 will revert to clinical space.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>All Bldgs</b>
Architectural	\$2,114,000
Plumbing	\$1,968,000
HVAC	\$9,707,000
Electrical	\$803,000
Fire Protection	\$209,000
<b>Total</b>	<b>\$14,801,000</b>

**Table 1.1 Cost Summary by Discipline**



Priority	All Bldgs
1	\$2,820,000
2	\$1,503,000
3	\$2,505,000
4	\$7,142,000
5	\$831,000
<b>Total</b>	<b>\$14,801,000</b>

Table 1.2 Cost Summary by Priority

Building	Correction Cost	Replacement Cost	FCI
Bldg 2	\$383,000	\$1,096,000	35%
Bldg 4	\$1,655,000	\$12,238,000	14%
Bldg 7	\$1,027,000	\$9,347,000	11%
Bldg 51	\$199,000	\$1,540,000	13%
Bldg 54	\$2,197,000	\$17,159,000	13%
Bldg 100	\$3,714,000	\$32,181,000	12%
Bldg 101	\$3,099,000	\$22,392,000	14%
Bldgs MB3-4	\$2,527,000	\$10,836,000	23%
<b>Overall</b>	<b>\$14,801,000</b>	<b>\$106,789,000</b>	<b>14%</b>

Table 1.3 Facility Condition Index Value





***San Francisco VA Medical Center,***

***San Francisco, CA***



**Date(s) of Assessment: August 5-7, 2008**

**Number of Buildings Assessed: 6**

**Total Cost to Correct Deficiencies: \$40,892,000**

**Total Cost, Priority 1 Deficiencies: \$14,797,000 (or 36%)**

**Total Cost to Replace: \$90,611,000**

**Overall Campus FCI: 45%**

**Size of Research Program: Very Large (Over \$10 million in VA research funding)**



### Background

VA research funding for this very large program is concentrated primarily in biomedical research, with lesser funding in health services, clinical, and rehabilitation research. The San Francisco VAMC research program hosts a health services REAP, the Program to Improve Care for Veterans with Complex Comorbid Conditions, as well as two biomedical and/or clinical REAPs and the Center for Imaging of Neurodegenerative Diseases (CIND) funded by the NIH. On the clinical side, the facility hosts a Parkinson's Disease Research, Education, and Clinical Center (PADRECC).

The San Francisco VAMC is academically affiliated with the University of California, San Francisco School of Medicine.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in six buildings on the VA campus with nearly 67,000 nsf of research space (laboratories – 39,913 nsf; VMU – 19,976 nsf; offices – 6,973 nsf). Following is an overview of the buildings, including their age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

As detailed in the technical evaluation, laboratories are housed in Buildings 1, 2/4/5,<sup>1</sup> 6, and 12.<sup>2</sup> The main VMU is housed in Building 12, with additional support space in Buildings 17 and 21. With the exception of Building 17, a modular structure built in 2002, all of the buildings housing laboratories and/or VMU space were constructed in 1934. Only Building 12 which had additions constructed in 1967 and 1984 has undergone a full-scale remodel including support systems.

With the exception of Building 17, none of the buildings housing laboratories or animal research space were originally constructed for that purpose. The buildings lack many features that would enhance the research environment. For example, the majority of the buildings do not have a central HVAC system. While this is not uncommon in the San Francisco Bay area, current standards for research laboratories require improved ventilation for containment and safety purposes, as well as general control over temperature and humidity for comfort. Additionally, none of the buildings meet the guidelines of the VA Design Guide with regard to vertical spacing. A floor-to-floor height of at least 14 feet is recommended to ensure there is sufficient space above the ceiling for ductwork and piping. Any extensive

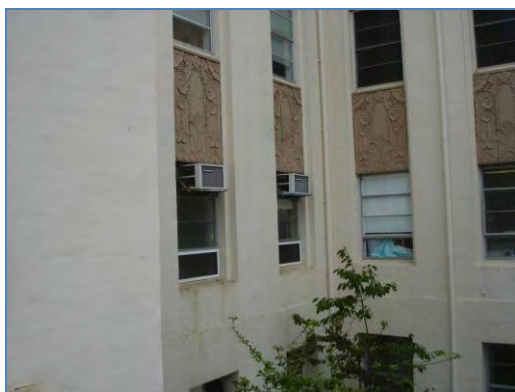
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<sup>1</sup> While buildings 2, 4, and 5 are actually separate buildings, they adjoin and thus are considered by the local Engineering Service as a single building.

<sup>2</sup> One laboratory is located in the basement of Building 8. This space was not included in the assessment. Additionally, some former research laboratories housed in Building 203 are being converted to clinical space and also were not assessed.



renovation of these buildings, to include installation of a new mechanical system, would prove challenging and would require creation of separate mechanical space or the use of vertical shafts which would reduce the amount of usable space within the building. It should also be noted that the buildings' aging electrical systems would require upgrading if central HVAC were to be installed.



**(Above left) Many buildings on the San Francisco campus are lacking central ventilation systems, as pictured here in Building 1. (Above right) A laboratory in Building 2/4/5. Note the lack of seismic lips on the reagent shelving above the casework.**

**(Photos below are of Building 12) Left to right: Note the lack of ceiling and the stains from leakage; a damaged wall; and very crowded conditions in a laboratory.**



There is significant overcrowding throughout the laboratories in most, if not all of the buildings reviewed, primarily due to the presence of large equipment such as freezers and refrigerators within the laboratories rather than in common areas. The crowding is exacerbated by the inadequate structural spacing between laboratory benches and, in some instances, may not meet accessibility standards. Some equipment is also being stored in hallways, having the potential to block





building emergency egress. Creation of common use space for large equipment would be of significant benefit. However, at present there is no space available for this purpose.

Throughout the laboratory space, finishes are generally in good to fair condition for their age although some of the finishes are inappropriate (e.g., vinyl composition tile flooring rather than sheet vinyl in tissue culture rooms). With the exception of Building 4, casework is severely corroded and in need of replacement. Some equipment including fume hoods, cold rooms, and one cage washer are inoperable or have exceeded their useful lives and should be replaced.

The VA Medical Center has upgraded seismically a limited number of buildings. Although the buildings survived a major earthquake in 1988, it is highly recommended that the structural conditions of all buildings on the campus be reviewed by a qualified licensed structural engineer to determine an appropriate course of action for each building.

With regard to accessibility, doors throughout the research spaces have knobs rather than the lever type handles that meet accessibility guidelines.



**The coastal environment has been very harsh to equipment, as seen in the mechanical system components above.**

With the exception of Building 21, all of the buildings housing laboratories and/or VMU spaces are protected by a fire suppression sprinkler system. Three of the buildings (Bldg 1, 2/4/5, and 6) have aging fire alarm systems that are in poor condition. The alarm systems in Buildings 12 and 17 are newer systems. Building 21 has no fire alarm.

Most safety showers and eyewashes are appropriately located, but some do not have sufficient water pressure to meet flow rate requirements. Another shortfall with regard to plumbing is the general lack of appropriate backflow prevention to protect the domestic water supply from contamination.



### Other Research Space

The health services REAP is housed primarily in recently renovated dry laboratory/office space in Building 1. Additional staff is being “temporarily” housed in Building 11, which formerly was the medical center director’s quarters and was renovated into office space. This arrangement is crowded but accommodates the current staffing of the REAP, although it is less than optimal as support staff are in Building 11 while the investigators and main REAP activity remain in Building 1. It is clear that alternative or additional space will need to be identified to accommodate planned future growth of this program.

Additional dry laboratory/office space occupies Building 13, a former warehouse constructed in 1934 and renovated a few years ago with VA Central Office funding. This space houses the Center for Imaging of Neurodegenerative Diseases (CIND) which is funded by the National Institutes of Health (NIH). Building 13 houses over 70 faculty and staff, as well as two research magnetic resonance imaging (MRI) systems, in approximately 10,000 square feet. While the space is very well organized and attractive, there are significant problems inherent in the remodel, primarily with the mechanical system including “hot spots” and “cold spots” throughout the building, lack of air flow in the back portion of the first floor and in two patient interview rooms, and noise in the ventilation system among others. Additionally, there are plumbing problems which include dysfunctional toilets, particularly on the second floor.

Lastly, a small Clinical Research Unit (CRU) is housed in Building 203. While the approximate \$1 million per year in clinical research funding is not a significant part of this program’s VA research funding, it is a significant amount for clinical research. Clearly the program would benefit from additional space dedicated for that purpose.

### Security

Installation of a new security system (card reader type) was being completed at the time of the assessment. Several buildings reviewed had the new system installed, but the card readers had not yet been activated. It is important to note that the spaces housing the VMU functions were appropriately secured.

### Life Safety Hazards

The following life safety hazard identified during the assessment has been remediated by the medical center:

- Installed safety showers and eyewashes where needed.

The following additional life safety items identified during the assessment are in planning and/or will be remediated in conjunction with funded NRM projects.



- Need for upgraded sprinkler system (Bldgs 2/4/5).
- Need sprinkler system (Bldg 21).
- Need new fire alarm systems (Bldgs 1, 2/4/5, 6, 21).
- Need ground fault protected receptacles near water sources (Bldgs 6 and 12).
- Need seismic lips on reagent shelving.

#### Improvements Made Since Assessment:

This station has made and/or initiated improvements following the assessment, including:

Many of the high priority deficiencies are expected to be remediated with projects funded (total of \$7.2 million) through NRM FY11, as the station has 12 projects on the list of those approved for funding. These projects include laboratory and VMU renovations, upgrade of emergency power, replacement of fixed equipment (cold rooms), and replacement of exhaust fans in a number of buildings housing research.

Additionally, a seismic retrofit project for Buildings 1, 6, and 8 is in planning and will be funded, tentatively in FY15.

#### New Construction

A new vivarium (rodent facility) will be constructed beginning December 2011 (\$9.3 million, Minor Construction). Construction of Building 16 annex is currently underway to create slightly over 4,000 square feet of laboratory space. Also, a new research building (Building 40) is in planning (pending final approval) to replace Building 12.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.



Discipline	All Bldgs
Architectural	\$18,226,000
Plumbing	\$1,551,000
HVAC	\$19,085,000
Electrical	\$1,992,000
Fire Protection	\$38,000
Total	\$40,892,000

Table 1.1 Cost Summary by Discipline

Priority	All Bldgs
1	\$14,797,000
2	\$24,976,000
3	\$665,000
4	\$198,000
5	\$256,000
Total	\$40,892,000

Table 1.2 Cost Summary by Priority

Building	Correction Cost	Replacement Cost	FCI
Bldg 1	\$5,147,000	\$7,017,000	73%
Bldg 2/4/5	\$21,898,000	\$35,066,000	62%
Bldg 6	\$2,868,000	\$4,547,000	63%
Bldg 12	\$9,955,000	\$38,724,000	26%
Bldg 17	\$574,000	\$3,420,000	17%
Bldg 21	\$450,000	\$1,837,000	24%
Overall	\$40,892,000	\$90,611,000	45%

Table 1.3 Facility Condition Index Value





## ***VISN 22: Desert Pacific Healthcare Network***



<i>Sta. ID</i>	<i>VA Site Surveyed</i>	<i>City/State</i>
600	VA Long Beach Healthcare System	Long Beach, CA
605	VA Loma Linda Healthcare System	Loma Linda, CA
664	VA San Diego Healthcare System	San Diego, CA
691	VA Greater Los Angeles Healthcare System, West Los Angeles VAMC	Los Angeles, CA
691A4	VA Greater Los Angeles Healthcare System, Sepulveda Ambulatory Care Center	North Hills, CA







***VA Long Beach Healthcare System,  
Long Beach, CA***



**Date(s) of Assessment: February 25-26, 2008**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$11,018,000**

**Total Cost, Priority 1 Deficiencies: \$5,638,000 (or 51%)**

**Total Cost to Replace: \$40,097,000**

**Overall Campus FCI: 27%**

**Size of Research Program: Medium (\$2.5 million to \$4.9 million in VA research funding)**



### Background

VA research funding for this medium sized program is concentrated in biomedical research, with significantly lesser amounts in the other research disciplines (rehabilitation, health services, clinical).

The facility is affiliated academically with several institutions, primarily the University of California Irvine School of Medicine which is located at some distance (approximately 25 miles) from the VAMC. A secondary affiliate, California State Long Beach, is located adjacent to the VAMC campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in a single building (Building 138) on the VA campus with 33,368 nsf of research space (laboratories – 19,239 nsf (including a BSL-3 laboratory); VMU – 7,577 nsf; offices – 6,552 nsf). Following is an overview of Building 138, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Building 138 was constructed as a dedicated research facility in 1985. The building has two floors above ground and a basement.

The amount of laboratory space is sufficient for the current program but would not allow for significant growth which the current leadership seeks. The amount of space in the VMU is more than sufficient.

The condition of research space at the Long Beach VAMC is generally poor, primarily due to the need to replace the building mechanical system and the aging laboratory casework and finishes. There also is significant leakage within Building 138 due to improper sealing of the exterior walls, inadequately sealed windows, and infiltration by the roots of large Ficus trees near the building. Some of the leakage results from lawn irrigation. Although the roof was replaced a few years ago, there is evidence of past roof leakage in the interior space. Continued leakage has negative environmental and employee health impacts, including significant potential for mold.

Most mechanical systems are in failing condition and need to be replaced. The air handling systems were replaced in 2006, but are inadequate. Additionally, there appears to be fiberglass insulation in the ductwork which has become friable and is being distributed through the ventilation system. There are significant leaks in the plumbing system including connections to autoclaves and the glass washer. The survey team noted that in the laboratory areas, a significant number of faucets were leaking.



**(From above left, clockwise):**

**Corroded conditions beneath a laboratory sink; a typical laboratory with crowded conditions; ficus tree roots trying to grow into the building; and a typical laboratory sink.**



Most of the large equipment is in good condition, with the exception of the cage washer in the VMU which, although its internal system was recently overhauled, is corroding on the interior and the doors. There also is no sealing gasket at the door. The cold rooms were being replaced at the time of the survey.

No significant deficiencies were identified in the BSL-3.

Veterinary Medical Unit (VMU): As is the case at many facilities, the condition of the VMU is generally good and the facility is obviously well maintained although, at the time of the assessment, there were a significant number of outstanding maintenance requests. There also are cracks noted in the foundation and reports of leakage from lawn irrigation.

Building 138 will soon be undergoing seismic corrections. These corrections will not be structural, but rather will entail the bolting down of freezers and other heavy



equipment, as well as securing overhead piping. This project is expected to cause significant disruption (due to noise) in the VMU.

With regard to safety, the building is protected by a sprinkler system which has some leakage. The fire alarm system is old, but is scheduled for replacement this year. There is limited smoke detection equipment.

Emergency eyewashes are provided, but do not meet accessibility requirements and should be replaced. Safety showers are adequate.

#### Other Research Space

There is designated clinical research space in two wings of Building 128. Research administration is housed in a temporary modular structure (Building 162) that will be replaced with a clinical building at some future date. The station has a minor construction proposal pending to replace the Research Service administrative space.

As in many medical centers, dedicated space for clinical research is limited. Although there is a dedicated clinical research unit, the demand for usage is high and many investigators continue to see research subjects in clinical space.

#### Security

The security system uses proximity card readers at all entrances to the building, VMU, and the BSL-3.

#### Life Safety Hazards

The following life safety hazards identified during the assessment have been remediated:

- Seismic zone – non-structural upgrade was completed in 2010.
- The fire alarm system was upgraded.

The following additional life safety hazards identified during the assessment are expected to be remediated as part of upcoming projects:

- Receptacles near water sources are not ground fault protected (to be completed – part of electrical system upgrade project).
- Eyewash units in need of upgrade (units are of an inappropriate type and are not accessible) (to be addressed as part of upcoming project).

#### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:



Correction of HVAC deficiencies (upgrade) – funding source unknown, tentative completion fall 2011.

Correction of electrical deficiencies (upgrade) – funding source unknown, design nearing completion; tentative start of upgrade June 2011.

Seismic non-structural upgrade – completed 2010.

Upgrade of fire alarm system – completed 2010.

### New Construction

There is no new construction of research space planned at this station.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

Discipline	Correction Cost
Architectural	\$3,136,000
Plumbing	\$858,000
HVAC	\$4,727,000
Electrical	\$2,297,000
Fire Protection	\$0
Total	\$11,018,000

**Table 1.1 Cost Summary by Discipline**

Priority	Correction Cost
1	\$5,638,000
2	\$3,537,000
3	\$1,246,000
4	\$26,000
5	\$571,000
Total	\$11,018,000

**Table 1.2 Cost Summary by Priority**





Correction Cost	Replacement Cost	FCI
\$11,018,000	\$40,097,000	27%

**Table 1.3 Facility Condition Index Value**



***VA Loma Linda Healthcare System,***

***Loma Linda, CA***



**Date(s) of Assessment: February 27-28, 2008**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$15,902,000**

**Total Cost, Priority 1 Deficiencies: \$10,580,000 (or 67%)**

**Total Cost to Replace: \$36,369,000**

**Overall Campus FCI: 44%**

**Size of Research Program: Medium (\$2.5 million to \$4.9 million in VA research funding)**



### Background

VA research funding for this medium sized program is concentrated in biomedical research, with significantly lesser amounts in rehabilitation and clinical research.

The academic affiliate is Loma Linda University School of Medicine. Discussions are underway with two additional institutions to become affiliates: 1) University of California, Riverside, which is currently developing a new medical school; and 2) California State University, San Bernardino.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in a single building (Building 1) on the VA campus with nearly 37,000 nsf of research space (laboratories – 15,469 nsf; VMU – 9,542 nsf; offices – 11,931 nsf). Following is an overview of Building 1, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

The research laboratories and VMU are spread out among four floors of the main hospital building (Building 1) which was constructed in 1977. Laboratories are located contiguously on the second, third, and fourth floors, while the VMU is on the first floor. The Research Service occupies administrative space adjacent to laboratories on the second floor.

As is the case with many VA medical centers, the entire facility is space deficient. Construction of a new building is planned to expand clinical space, but no additional research space is planned. There currently is little or no space available to expand the program.

An extensive remodeling project was underway in the VMU at the time of the assessment. In addition to renovating the animal holding rooms and converting several rooms within the VMU to laboratories, the HVAC system will also be replaced. However, the facility did not include a central monitoring system for HVAC due to funding constraints. In order to prevent catastrophic overheating in VMU space, the current VA HVAC Design Manual requires a system to monitor temperature and humidity within animal holding rooms.

The research space at the Loma Linda VAMC is rated in poor condition. The relatively high Facility Condition Index (FCI) (44%) resulted primarily from the improper design of the building mechanical system, the general aging of laboratory furnishings and finishes, and the need for asbestos abatement throughout the space. But although the space is technically rated poor, its general overall appearance is good because it has been well maintained.



Most finishes within the laboratory areas, including walls, floors, and ceilings are in good condition, particularly considering their age. The vinyl tile flooring throughout the space was glued with asbestos mastic, so replacement of the floor will require significant asbestos abatement. Casework is in relatively good condition and has been maintained by painting the interior to retard corrosion, although some corrosion is present.

There have been leaks in portions of the space, some due to water from the rooftop water treatment unit and some from interstitial piping.

Most major equipment is in good working condition although the cold rooms have recurring maintenance requirements and are recommended for replacement. The cage washer in the VMU is original to the facility and is being replaced as part of the renovation project. The Research Service has been able to obtain new equipment through the Shared Equipment Evaluation Program (ShEEP) with matching funds from the hospital.



**(Left photo) A typical laboratory. (Right photo) Accessibility in some laboratories is restricted.**

The mechanical systems associated with HVAC are deficient, particularly with regard to capacity, and are recommended for replacement. There are also some plumbing deficiencies including lack of backflow prevention.

The entire facility is on emergency power although the system is not segregated from the normal power distribution system. In terms of the overall electrical system, it is over 30 years old and there is no indication of a documented preventive maintenance program.

Veterinary Medical Unit (VMU): As noted previously, the VMU was undergoing a renovation during the assessment. The small portion observable was in good condition. There was one item noted that raised concern, however. On the north corridor exterior wall, there is a large glass panel that has been painted to disguise



it from the outside. There previously was an incident in this area in which an automobile was accidentally driven into the wall. Although the panel is alarmed, it does raise concerns with regard to VMU security.

BSL-2+ laboratory: The facility has a special containment laboratory rated BSL-2+ in which HIV research is performed. The laboratory has been very well maintained. The only problem noted was the tile flooring which should be replaced with sheet vinyl.

With regard to safety, the building is protected with a wet pipe fire suppression system and a new full voice-command fire alarm system. No deficiencies were noted with regard to safety showers and emergency eyewashes.

#### Security

The security system is a mixture of proximity cards and keys. There are, however, some laboratories with an exit into common hospital corridor space. While these doors remain locked, they have caused concern locally. The facility obtained a waiver from the Office of Research and Development (ORD) for doors that pose minimal security risk. Remaining doors are being converted to key card/swipe locks, but product deficiencies have made completion of the project difficult.

#### Life Safety Hazards

The following life safety hazard identified during the assessment has not been remediated by the medical center:

- Receptacles near water sources are not ground fault protected.

#### Improvements Made Since Assessment:

This station has made and/or initiated improvements following the assessment, including:

Upgrade of flooring and casework in laboratories, including installation of new emergency eyewashes – (local funding), in planning.

Upgrade of HVAC system throughout Building 1 – (station funds), completed.

Renovation of VMU – (Minor Construction), completed.

#### New Construction

There is no new construction of research space planned at this station.



### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

<b>Discipline</b>	<b>Correction Cost</b>
Architectural	\$5,330,000
Plumbing	\$719,000
HVAC	\$4,843,000
Electrical	\$5,010,000
Fire Protection	\$0
<b>Total</b>	<b>\$15,902,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Correction Cost</b>
1	\$10,580,000
2	\$3,750,000
3	\$57,000
4	\$26,000
5	\$1,489,000
<b>Total</b>	<b>\$15,902,000</b>

**Table 1.2 Cost Summary by Priority**

<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
\$15,902,000	\$36,369,000	44%

**Table 1.3 Facility Condition Index Value**







***VA San Diego Healthcare System,***

***San Diego, CA***



**Date(s) of Assessment: February 5-7, 2008**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$28,694,000**

**Total Cost, Priority 1 Deficiencies: \$17,148,000 (or 60%)**

**Total Cost to Replace: \$93,637,000**

**Overall Campus FCI: 31%**

**Size of Research Program: Very Large (Over \$10 million in VA research funding)**



### Background

VA research funding for this very large program is concentrated primarily in biomedical and clinical research, with lesser amounts in the other research disciplines (rehabilitation and health services).

The facility is affiliated academically with the University of California, San Diego (UCSD) School of Medicine, located adjacent to the VAMC campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in a single building (Building 1) on the VA campus with over 83,000 nsf of research space (laboratories – 49,083 nsf (including a BSL-3 laboratory); VMU – 15,312 nsf; offices – 18,976 nsf). Following is an overview of Building 1, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Building 1 is the main hospital building and was constructed in 1972. The building has seven levels (six floors above ground, plus a basement) and Research Service occupies the entire sixth floor. Space is organized into four wings with the central space housing the elevator and Research Service administrative offices. There are two BSL-3 laboratories, only one of which is currently in use.

It should be noted that during the survey, seismic corrections to the building were underway (\$75 million project due for completion in June 2008). During the project, the Research Space Committee was extremely active due to the requirement to vacate laboratories in affected areas of the building.



**Examples of overcrowded conditions in research laboratories.**



**Examples of laboratory casework in poor condition.**

Overall, research at the San Diego VAMC is housed in aging space that is in poor condition, is overcrowded, and needs to be significantly renovated. The condition is generally poor, primarily due to the need to replace mechanical systems as well as aging casework and finishes (including the ceiling) and several pieces of large equipment in the laboratories. The space is generally very crowded, with little room for effective storage. There are some areas within the laboratory wings that have accessibility constraints and could compromise safety in the event of an emergency.

While many mechanical systems have been replaced fairly recently, they lack the capacity to maintain proper air exchange rates and pressures for laboratories. The ductwork is original to the building and is in poor condition. The general exhaust system also is aging and in need of replacement.

The electrical system is in good condition, with much of it having been replaced a few years ago. There is sufficient capacity and a significant amount of space is served by emergency power.

Much of the large equipment is in good condition, including cold rooms and autoclaves. Monitoring is on all walk-in coolers and some freezers. The facility is in the process of installing a wireless monitoring system for all such equipment.

With regard to safety, the space is fully covered by a sprinkler system although the system is original to the building and has leaks. The campus-wide fire alarm system was replaced in 2005. The laboratories have eyewash units but they are not of an appropriate type to meet current requirements.

BSL-3 Laboratory: No significant deficiencies were identified in the BSL-3.

Veterinary Medical Unit (VMU): The condition of the VMU is generally good and the facility is obviously well maintained. Ceilings in some rooms are inappropriate due to the potential for damage from steam. Census in the VMU was very low at the time of the survey, due to the ongoing seismic project.



### Other Research Space

There is some designated clinical research space for psychiatry in a separate, modular building constructed by the local non-profit research foundation, Veterans Medical Research Foundation (VMRF). The building also houses health services research investigators and VMRF administrative space. No other clinical research space has been designated, so investigators see research subjects in clinical space. This creates significant constraints due to the increasing patient load at the hospital.

A significant number of investigators are located off-site in leased space at the affiliate and additional investigators have off-site waivers. While the leased space was not evaluated by the A&E team, the space was reviewed programmatically. The VAMC leases about 20,000 square feet in the Stein Building on the UCSD campus. Located very close to the VAMC, the space is significantly newer than the VA laboratories and is in good condition, but is extremely overcrowded. Currently there is no storage available and no expansion capability.

A minor construction project to renovate laboratory space has been submitted several times, but not funded. The facility is landlocked, so there is little hope for constructing a new building. If funds for renovation could be obtained, it is likely that 'swing space' could be located (for lease) at the affiliate. The VMRF has also developed a proposal to increase the size of their building, thus providing some needed laboratory space.

### Security

The security system uses keypads at the entrance to each wing. Additionally, the elevators require key card entry to the research area. A security guard is posted in the central lobby area. Cameras are in place in areas requiring additional security. The BSL-3 laboratory also has additional security.

### Life Safety Hazards

The following life safety hazards identified during the assessment have not been remediated, but are expected to be corrected during upcoming renovation projects:

- Receptacles near water sources are not ground fault protected.
- Emergency eyewashes do not meet current requirements (they are of an inappropriate type).

### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Completed seismic (structural) upgrade of the entire building.



Replacement of air handling equipment – (funding source unidentified), complete.

Replacement of fume hoods -- \$1.8 million (NRM FY10), in progress.

Renovation of laboratories to correct deficiencies identified in assessment (electrical, mechanical, plumbing) and provide new floor plan -- \$9,960,000 (Minor Construction FY11), pending contract.

### New Construction

This station has pursued a major construction project for a research building for several years. As this approach was not approved, the station is now pursuing smaller Minor Construction projects to completely renovate the existing laboratory and VMU space.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

Discipline	Correction Cost
Architectural	\$9,891,000
Plumbing	\$2,464,000
HVAC	\$13,003,000
Electrical	\$1,824,000
Fire Protection	\$1,512,000
Total	\$28,694,000

**Table 1.1 Cost Summary by Discipline**





Priority	Correction Cost
1	\$17,148,000
2	\$8,438,000
3	\$1,761,000
4	\$534,000
5	\$813,000
Total	\$28,694,000

**Table 1.2 Cost Summary by Priority**

Correction Cost	Replacement Cost	FCI
\$28,694,000	\$93,637,000	31%

**Table 1.3 Facility Condition Index Value**



***VA Greater Los Angeles Healthcare System:***

***West Los Angeles Campus,***

***Sepulveda Campus***

**Date(s) of Assessment: March 31-April 2, 2009 (Sepulveda)**

**April 27-30, 2009 (West Los Angeles)**

**Total Cost to Correct Deficiencies: \$87,437,000**

**Total Cost, Priority 1 Deficiencies: \$45,372,000 (or 52%)**

**Total Cost to Replace: \$182,852,000**

**Overall FCI: 48%**

**Size of Research Program: Very Large (Over \$10 million in VA research funding) (Note: this applies to the integrated facility and covers both the West Los Angeles and Sepulveda sites.)**



### Background

The VA Greater Los Angeles Healthcare System is an integrated healthcare system serving veterans in the greater Los Angeles area through its main hospital at West Los Angeles, and outpatient care at four ambulatory care centers and several Community Based Outpatient Clinics (CBOCS). Research is conducted and housed at both the West Los Angeles site and the Sepulveda Ambulatory Care Center in North Hills. The two sites are approximately 15 miles apart.

Together, the two sites comprise a very large research program. (Individually the West Los Angeles program is very large (over \$10 million) and the Sepulveda program is large (\$5 million to \$9.9 million). Funding at the West Los Angeles Campus is primarily for biomedical research, with lesser amounts for clinical, health services, and rehabilitation research. At Sepulveda, VA research funding is spread predominantly between biomedical and health services research with a smaller amount for clinical research. Both programs are highly diverse, with significant biomedical laboratory research, but also with significant research in need of dry laboratory, clinical, and office space to support major programs.

The program hosts a health services COE, the Center for the Study of Healthcare Provider Behavior, which is based at the Sepulveda campus, but also has investigators at the West Los Angeles campus. The facility hosts a GRECC, which is housed on both campuses; a Parkinsons Disease Research, Education and Clinical Center (PADRECC) located at the West Los Angeles campus; and a MIRECC also on the West Los Angeles campus.

The facility is affiliated with the UCLA David Geffen School of Medicine, the USC School of Medicine, and Advanced Practice Nursing Programs sponsored by local universities.



***VA Greater Los Angeles Healthcare System,  
West Los Angeles VA Medical Center,  
Los Angeles, CA***



**Date(s) of Assessment: April 27-30, 2009**

**Number of Buildings Assessed: 8**

**Total Cost to Correct Deficiencies: \$70,557,000**

**Total Cost, Priority 1 Deficiencies: \$35,294,000 (or 50%)**

**Total Cost to Replace: \$136,467,000**

**Overall Campus FCI: 52%**



### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices on the West Los Angeles Campus were housed in eight buildings with over 172,000 nsf of research space (laboratories – 105,321 nsf; VMU – 14,598 nsf; offices – 52,252 nsf). Following is an overview of the buildings, including their age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Biomedical and animal research at the West Los Angeles campus is currently housed in eight buildings: Buildings 113, 114, 115, 117, 210, 212, 258, and 304. Additionally, Building 337 was recently renovated into a barrier facility for the VMU. At the time of the assessment, the building had not yet been activated and was not formally assessed. However, it appears to be in excellent condition and will be a valuable asset to the program.

Many of the research buildings have very similar deficiencies. With the exception of Building 304, the buildings were built in the 1930s or 1940s. While there have been cosmetic improvements in some of the areas, no major renovations to include systems improvements have occurred with the exception of Building 337. In the majority of the buildings there is no central ventilation system. Since none of the buildings meet VA Guidelines for vertical spacing between floors (at least 14 feet), it would be extremely difficult to update any of these buildings to house modern research laboratories with an appropriate environment for research. Other issues shared among the buildings is significant overcrowding, a lack of backflow prevention to separate laboratory and potable water systems, and outdated electrical systems. Several of the buildings lack fire sprinkler systems.

Building 304 is a three level building constructed in 1957. It is located on the south side of the very large campus adjacent to the hospital and away from the other research buildings. Research occupies a small area on the first floor and greater than half of the second floor including laboratories and offices. The rest of the building houses clinical functions. Although newer than the other research buildings, there are significant deficiencies with Building 304 as well. Finishes throughout the space are generally in good to fair condition. The second floor laboratories have been renovated in prior years and are in better condition than those on the first floor. Fume hoods need to be replaced and there are significant deficiencies with both the mechanical and electrical systems.

### Seismic Corrections

It should be noted that some, but not all of the buildings on both campuses have been seismically upgraded. The station is continuing this process as funds become available.



**Conditions in Building 113**



**Conditions in Building 114 (note the spider at right)**



**Conditions in Building 115. The photo at right shows chipped asbestos tile.**





Currently, seismic retrofitting of Bldgs 114 and 115 is in the planning stage. The facility is opposed to this project, as the buildings are in need of replacement with a modern research facility.

With regard to safety, showers and emergency eyewashes do not meet current requirements in most of the buildings (Bldgs 113, 114, 115, 210, 212, 258 (needs eyewash in common instrument room), 304 (in one laboratory)).

Buildings 210, 212, and 258 are covered by a sprinkler system. Sprinkler coverage is partial in Buildings 113 and 304. There is no sprinkler coverage in Buildings 114, 115, and 117. Fire alarm systems are in poor condition and in need of replacement in all eight buildings.



**Conditions in Building 117 which houses a portion of the VMU. Note the water standing in the basement in the photo at right. (The basement houses mechanical equipment, not animal research space.)**



**From left to right, damaged asbestos flooring in Building 210; a damaged wall finish in Building 212; and a laboratory in Building 258.**

#### Other Research Space

Health services research and clinical research are housed within the main hospital, Building 500. The dry laboratory (office) space is in good condition but crowding will soon be a problem if it is not already. With the center anticipating hiring additional investigators and staff, additional space will need to be identified.



Clinical research is conducted in space housing the PADRECC and in Cardiology clinical space. As with many medical centers with clinical research space, the space is well utilized and storage space, particularly for study files, is at a premium.

Overall, research at Greater Los Angeles Healthcare System is in space that is severely aging and technically rated as “poor”. Many of these buildings are not able to be salvaged in a cost effective manner. Through creative management and a supportive hospital administration, the research program remains healthy and is thriving. However, continued expansion of the program, particularly in the health services arena, is already being threatened by insufficient space.

#### Security

Research buildings are appropriately protected from unauthorized access by security systems. The staff reported that the system protecting research space at the West Los Angeles campus is in need of upgrading. The system has been difficult to maintain.

#### Life Safety Hazards

The following life safety hazards were identified during the assessment. The station is planning to remediate these deficiencies as funds become available.

- Receptacles near water sources are not ground fault protected (all research buildings).
- Some buildings are not covered by a sprinkler system or are only partially covered.
- All buildings need new fire alarm systems (old systems, no annunciators).
- Most of the buildings need code compliant emergency eyewashes and safety showers. (Some showers are lacking eyewashes, some units are of the wrong type.)

#### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

The local engineering group has been working to correct high priority deficiencies as local funds become available. Information on specific projects completed or underway was not provided by the facility.

Renovation of laboratories, Bldg 114 (project was planned prior to the assessment) – \$4,280,000 (Minor Construction), project delayed due to contractual disputes.

Renovation of Bldg 337 into animal barrier facility (project was near completion at time of assessment) – due to hiring delays and code issues with the back-up generator, this building is not yet complete and occupied.



Renovation of laboratory space, Bldg 258 – \$570,000 (NRM FY10), nearing completion.

Several renovation projects have been funded by the VA non-profit corporation, including: renovation of laboratory space in Bldg 304, renovation of several rooms in Bldg 113, creation of a common freezer area in Bldg 115, creation of new laboratories in Bldg 114, renovation of two laboratories in Bldg 115, and HVAC upgrades in Bldg 114.

ORD provided funding (\$100,000) to replace fabric covered furnishings in research laboratories with furnishings of appropriate materials to meet laboratory standards. This funding is intended for use at both the West Los Angeles and Sepulveda campuses.

#### New Construction

This facility has been applying for Major and/or Minor Constructions funds for quite some time. Status of any recent requests through the SCIP process is not known..

It should be noted that, as part of its deliberations and final report, the Capital Asset Realignment for Enhanced Services (CARES) Commission recommended a new, standalone research building on the West Los Angeles campus to be funded by VA Major Construction funds. As a result of the assessments of the West Los Angeles and Sepulveda campuses, the Research Infrastructure Program concurs on that recommendation. Continuing to fund renovations in the severely aging buildings, particularly on the West Los Angeles campus would be an unwise investment.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.



Discipline	All Bldgs
Architectural	\$21,359,000
Plumbing	\$8,065,000
HVAC	\$22,050,000
Electrical	\$16,931,000
Fire Protection	\$2,152,000
Total	\$70,557,000

Table 1.1 Cost Summary by Discipline

Priority	All Bldgs
1	\$35,294,000
2	\$19,728,000
3	\$6,936,000
4	\$1,717,000
5	\$6,882,000
Total	\$70,557,000

Table 1.2 Cost Summary by Priority

Bldg	Correction Cost	Replacement Cost	FCI
113	\$17,147,000	\$38,054,000	45%
114	\$16,207,000	\$32,964,000	49%
115	\$17,426,000	\$35,516,000	49%
117	\$3,203,000	\$3,838,000	83%
210	\$3,881,000	\$4,487,000	86%
212	\$2,435,000	\$5,189,000	47%
258	\$2,438,000	\$2,019,000	121%
304	\$7,820,000	\$14,400,000	54%
Overall	\$70,557,000	\$136,467,000	52%

Table 1.3 Facility Condition Index Value





***VA Greater Los Angeles Healthcare System,***

***Sepulveda Ambulatory Care Center***

***North Hills, CA***



**Date(s) of Assessment: March 27 – April 2, 2009**

**Number of Buildings Assessed: 5**

**Total Cost to Correct Deficiencies: \$16,880,000**

**Total Cost, Priority 1 Deficiencies: \$10,078,000 (or 60%)**

**Total Cost to Replace: \$46,385,000**

**Overall Campus FCI: 36%**





### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices on the Sepulveda campus were housed in five buildings with nearly 49,000 nsf of research space (laboratories – 36,672 nsf; VMU – 4,087 nsf; offices – 7,732 nsf). Following is an overview of the buildings, including their age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

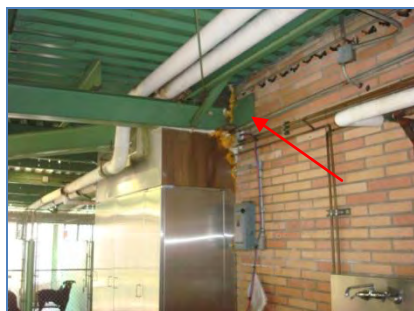
Four of the five buildings housing biomedical and/or animal research were originally constructed in 1954 and, thus do not lend themselves well to accommodating research laboratories without major renovation.

Building 1 is a three level building constructed in 1954. The laboratories are housed on the basement level, with Research Service administrative offices on the first floor. These laboratories are in substandard condition, and would require a significant investment to renovate them to an acceptable level. The leadership has already planned to relocate the laboratories out of this building, a move that also was recommended in the station's Facility Condition Assessment (FCA). The plan for relocating the investigators is dependent on renovation and/or construction previously planned and/or funded.



**Left to right (above), a Building 1 laboratory with significant damage to asbestos flooring; a typical laboratory in Building 7; a window mounted "exhaust" fan, Building 62.**

**Left to right (below), part of the Building 47 cage washer is outdoors (the arrow is pointing to a bird's nest); Building 103 also has an outdoor cage washer.**





Building 7 is a two level building (one story plus basement) originally constructed in 1954, with an addition built in 1995. Part of the building underwent a major renovation, including an upgrade of the electrical system, in 2001 following damage caused by the 1994 North Ridge earthquake. Of all the research buildings on the Sepulveda campus, Building 7 is by far in the best condition. Even so, this building has some significant deficiencies including substandard casework in the basement laboratories, a roof that leaks and needs to be replaced, a lack of emergency eyewash stations, lack of backflow protection to separate laboratory and potable water, and mechanical system deficiencies.

Building 47 is a single story building constructed in 1954 that houses a portion of the Veterinary Medical Unit (VMU). This building has had some improvements over the years, including new flooring, and a relatively new cage washer that currently is inoperable. Part of the problem with the cage washer is that it is located outside the building with full exposure to weather, birds, and small animals. The dog runs are located outside of the building as well. The survey team was informed that a project was funded to provide a new HVAC system in this building beginning in June 2009.

Building 62 is a two story building also constructed in 1954 as residents' quarters. Currently, the first floor houses offices used by VMU staff and there are research laboratories on the second floor which have been abandoned in place. Overall, Building 62 is in substandard condition. The station had discussed possibly applying for minor construction funds to renovate the laboratories. It would be much more cost effective and efficient to construct a new building than attempt to renovate this one.

Building 103 is a comparatively new, single story building dating to 1986 and used entirely for animal research activities. While it is AAALAC accredited, it suffers from aging finishes, failing large equipment that, as in Building 47, is located outside the building and exposed to the elements (cage washer, bottle washer, and autoclave). There are also significant mechanical deficiencies and there is no fire sprinkler system.

With regard to safety, emergency showers and eyewashes do not meet current requirements in Buildings 1, 7, and 62.

Full sprinkler coverage is provided for Buildings 1, 7, and 62. Partial sprinkler coverage is provided in Building 47. There is no sprinkler coverage in Buildings 103. This building does have a newer fire alarm system. Fire alarm systems are in poor condition in Buildings 1, 7, 47, and 62.



### Other Research Space

The health services COE shares Building 25 with the GRECC. This building houses only dry laboratory (office) space and so was not included in the technical assessment. The building was constructed in the mid 1950s and has housed the COE for the past five years. This center is highly productive and anticipates significant growth beyond the building's capacity in the not too distant future. There is an open area in the front of the building that could be renovated into additional office space if funds were available. There potentially is expansion room available in another building on the campus, but that would not allow the center to be contiguously located. With a number of the investigators already located at the West Los Angeles campus, it is highly desirable to keep the Sepulveda based group in one contiguous location.

There are problems with the building's condition as well. There are holes in some of the walls which have led to penetration by black widow spiders which are native to the area. There appear to be significant air handling issues that result in temperature fluctuations and noise in the system. There is also a problem with water leakage. While the lack of space is clearly a handicap to these programs, the health services servers are located at Sepulveda along with the IRM Service for the integrated facility. They would like to somehow remain in one place. In addition, the bulk of the investigators located at Sepulveda have no clinical responsibilities in contrast to their colleagues located at the West Los Angeles campus. (Note: since the time of the assessment, the health services group has been assigned additional space (approximately 3,000 square feet) in Building 22.)

### Security

Research buildings are appropriately protected from unauthorized access by security systems.

### Life Safety Hazards

The following life safety hazards were identified during the assessment. The station is planning to remediate these deficiencies as funds become available.

- Receptacles near water sources are not ground fault protected.
- Some buildings are not covered by a sprinkler system or are only partially covered.
- Most of the buildings need new fire alarm systems.
- Three of the buildings need code compliant emergency eyewashes and safety showers.

### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:



The local engineering group has been working to correct high priority deficiencies as local funds become available. Information on specific projects completed or underway was not provided by the facility.

Replacement of HVAC, Bldg 103 -- \$1,060,507 (ARRA funds), near completion.

Replacement of HVAC, Bldg 47 -- \$1,336,177, awaiting completion of Bldg 103 work (to relocate animals).

Replacement of HVAC, Bldg 7 -- \$2,081,399, in progress.

Renovation of Bldg 103, enclose fixed equipment -- \$979,800 (NRM FY11), in design phase.

Renovation of Bldg 47, enclose fixed equipment -- \$816,500 (NRM FY11), in design phase.

ORD provided funding (\$100,000) to replace fabric covered furnishings in research laboratories with furnishings of appropriate materials to meet laboratory standards. This funding is intended for use at both the West Los Angeles and Sepulveda campuses.

#### New Construction

There is no new construction of research space planned at this station.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.



Discipline	All Bldgs
Architectural	\$7,918,000
Plumbing	\$1,232,000
HVAC	\$6,564,000
Electrical	\$961,000
Fire Protection	\$205,000
Total	\$16,880,000

Table 1.1 Cost Summary by Discipline

Priority	All Bldgs
1	\$10,078,000
2	\$5,560,000
3	\$856,000
4	\$151,000
5	\$235,000
Total	\$16,880,000

Table 1.2 Cost Summary by Priority

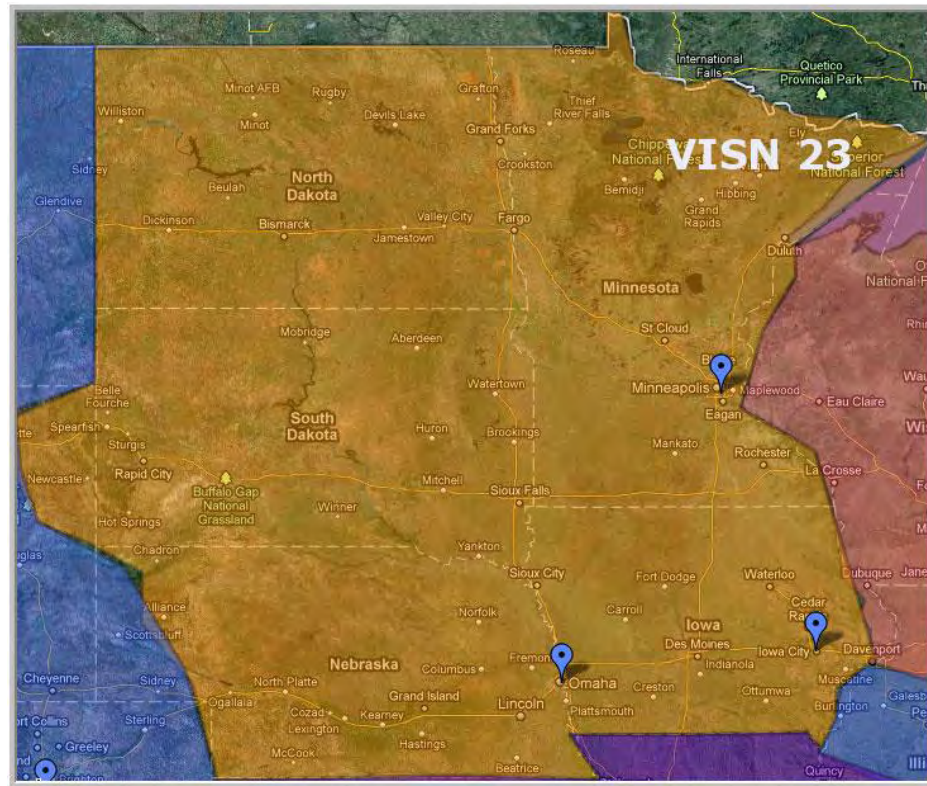
Building	Correction Cost	Replacement Cost	FCI
Bldg 1	\$8,628,000	\$14,143,000	61%
Bldg 7	\$3,165,000	\$27,020,000	12%
Bldg 47	\$1,965,000	\$1,923,000	102%
Bldg 62	\$1,381,000	\$1,189,000	116%
Bldg 103	\$1,741,000	\$2,110,000	83%
Overall	\$16,880,000	\$46,385,000	36%

Table 1.3 Facility Condition Index Value





## VISN 23: VA Midwest Health Care Network



<i>Sta. ID</i>	<i>VA Site Surveyed</i>	<i>City/State</i>
<b>584</b>	<b><i>Iowa City VA Health Care System</i></b>	<b><i>Iowa City, IA</i></b>
<b>618</b>	<b><i>Minneapolis VA Health Care System</i></b>	<b><i>Minneapolis, MN</i></b>
<b>636</b>	<b><i>VA Nebraska-Western Iowa Health Care System</i></b>	<b><i>Omaha, NE</i></b>







***Iowa City VA Health Care System,***

***Iowa City, IA***



**Date(s) of Assessment: June 9-10, 2010**

**Number of Buildings Assessed: 4**

**Total Cost to Correct Deficiencies: \$5,043,000**

**Total Cost, Priority 1 Deficiencies: \$297,000 (or 6%)**

**Total Cost to Replace: \$37,411,000**

**Overall Campus FCI: 13%**

**Size of Research Program: Very Large (Over \$10 million in VA research funding)**



### Background

With regard to VA funding, this very large research program falls in the top 20 of all research programs and is in the top ten programs for overall research funding. Most of the funding is for biomedical research, but there also is significant funding for a health services research REAP, a rehabilitation research COE, and some funding for clinical research.

The academic affiliate is the University of Iowa, Carver College of Medicine, located adjacent to the Iowa City VAMC, as well as on the Oakdale campus approximately five miles away.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), dry laboratories, and supporting offices were housed in four buildings on the VA campus with 30,582 nsf of research space (laboratories – 23,549 nsf; VMU – 5,241 nsf; offices – 1,792 nsf). Following is an overview of the buildings including their age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Historically there has been insufficient space on the VA campus to house the entire research program, requiring a significant number of investigators to be housed in leased space at the affiliate on both the main College of Medicine campus near the VAMC as well as on the Oakdale campus a few miles away. It is important to note that it is unlikely that the entire research program could be housed on the VA campus without at least doubling (and possibly tripling) the amount of laboratory space. The campus is relatively land locked so any additional buildings may have to be located on the university campus.

Currently biomedical research is conducted in a group of laboratories in Building 1 (the main hospital building), as well as in two new buildings, Building 40 completed in 2005 and Building 41 completed in 2007. A third new building (Building 42) which will house the Veterinary Medical Unit (VMU) and dry laboratory space is currently being constructed and nearing completion, while Building 3, a significantly aging building that previously housed biomedical laboratories including a biosafety level (BSL)-3 laboratory, is being demolished.

The end goal of the construction and some renovation projects underway is to relocate all of research together to enhance investigator collaborations. In order to reach this goal, the facility is seeking additional renovation funds to build out biomedical laboratories in current shell space on the basement level of Building 40. These additional laboratories will enable relocation of investigators currently housed in Building 1. Some of the research conducted in Building 1 involves animals which must be transported there from the VMU. Creating additional



laboratory space in Building 40 will enable this animal research to be housed much closer to the VMU, thus alleviating the need to transport animals into the hospital building.

Building 1 is a ten story (plus mechanical penthouse, basement, and sub-basement) building constructed in 1953 which serves as the main clinical building on the Iowa City VAMC campus. Research laboratories are located on the tenth floor.

The roof is in fair condition, having been replaced approximately 18 years ago. But there are leakage points on the roof resulting in water damage inside the building. Windows were replaced in approximately the mid 1990s and are in good condition. The interior of the laboratory areas is generally in poor condition. Most of the finishes as well as casework and fixed equipment are in need of replacement. Ideally these laboratories will be abandoned and relocated to another building on campus when renovation funds become available. As it stands now, the space is in need of complete renovation to make it more suitable for laboratory use. There are insufficient emergency showers and eyewashes to meet requirements, and some of the showers are not fully accessible.



**Above, deteriorated wall and ceiling finishes (left) and casework (right) in Building 1 laboratories.**

Laboratory water is not properly separated from domestic water, nor is laboratory vacuum. Plumbing fixtures are aging and in need of replacement. The building is fully covered by a sprinkler system.

Building 1 is in need of significant mechanical system upgrades, including new air handling units, exhaust system, and digital controls. The electrical system is in relatively good condition, although some receptacles near water sources are lacking ground fault protection and the distribution panels are lacking surge suppression.

Building 2 is a two story building dating to 1951 which currently houses the VMU. The building was not originally designed as an animal facility, but rather was



retrofitted for that purpose. With its low ceilings, narrow corridors, and existing floor plan that does not enable clear separation between clean and dirty materials it is not well suited as an animal research facility.

Interior finishes are generally inappropriate for an animal facility. Both the floors and ceilings should be monolithic. Some of the equipment is in need of replacement. The freight elevator is original to the building and is in such poor condition it should not be used. Ventilation is inadequate as evidenced by odors in animal rooms.



**Bldg 2: ponding water on the roof (left) and deteriorating exhaust equipment.**

The mechanical system is aging and in need of significant upgrade. The electrical system is in relatively good condition. Some receptacles near water sources are lacking ground fault protection and the distribution panels are lacking surge suppression. Being in an animal facility, receptacles should have weather proof covers as well.

Buildings 40 and 41 are comparable and were constructed just two years apart. Both are in excellent condition overall, but do have some deficiencies, primarily with the mechanical systems.

The laboratories in Buildings 40 and 41 are designed in an open floor plan, with equipment storage separated from bench areas. The buildings utilize modern laboratory design to maximize investigator interaction and sharing of equipment. The only notable architectural deficiencies are the presence of inappropriate finishes in tissue culture spaces (i.e., tile flooring and acoustic panel ceilings rather than monolithic finishes) and cracking of the foundation evidenced at the basement slab of Building 40. This cracking will need to be repaired before the planned build out of the basement into additional laboratories. Emergency showers and eyewashes are appropriate.





With regard to mechanical systems, users report significant problems since the buildings' completion, including insufficient airflow and temperature fluctuations. Efforts to correct the problems have been ongoing. An energy recovery unit is planned for installation which hopefully will remedy the chronic problems.



**This casework (pictured in Bldg 40) is typical of the laboratories in both Buildings 40 and 41. Note the receptacles over the sinks are properly ground fault protected.**

All of the buildings are protected by sprinkler systems. The fire alarm systems are in good condition, but there is no voice communication system in the buildings, rather a chime sound system is used. The chime system should be replaced with a voice communication system.

Safety showers and eyewashes are provided where required and are of an appropriate type, with the exception of the VMU.

#### Other Research Space

Dry laboratory space for the health services REAP and the rehabilitation COE is currently in Building 1, but will relocate to Building 42 when it is completed. The Rural Health Resource Center is already housed in new space in Building 40.

Currently most clinical research is conducted in various clinics throughout the hospital, rather than in a designated clinical research unit (CRU). A CRU would be invaluable to continue growing the clinical research program.

#### Security Issues

There is appropriate electronic security throughout the laboratory and animal research areas.





### Life Safety Hazards

The following life safety hazards identified during the assessment have not been remediated by the medical center:

- Eyewash/safety shower units should be added in Building 2 in the cage wash area and within range of the chemical fume hood. (Note: Research will be moving out of Building 2 in the near future.)
- In Buildings 1 and 2, receptacles near water sources are not ground fault protected. (Note: Research will be moving out of Building 2 in the near future, and out of Building 1 following renovation of basement level space in Building 40.)

### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:

Completed construction of Building 42 with the exception of minor issues in the VMU area (Minor Construction).

Completed energy upgrades to mechanical system, Buildings 40 and 41 – \$660,000 (ARRA funds), completed.

Planning to build out shell space in basement level of Building 40 into laboratories - \$700,000 (NRM FY11).

### New Construction

There is no additional new construction of research space planned at this station.

### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.



<b>Discipline</b>	<b>Correction Cost - Bldg 1</b>	<b>Correction Cost - Bldg 2</b>	<b>Correction Cost - Bldg 40</b>	<b>Correction Cost - Bldg 41</b>
Architectural	\$581,000	\$637,000	\$56,000	\$29,000
Plumbing	\$301,000	\$146,000	\$123,000	\$0
HVAC	\$1,188,000	\$849,000	\$477,000	\$314,000
Electrical	\$116,000	\$63,000	\$76,000	\$87,000
Fire Protection	\$0	\$0	\$0	\$0
<b>Total</b>	<b>\$2,186,000</b>	<b>\$1,695,000</b>	<b>\$732,000</b>	<b>\$430,000</b>

Table 1.1 Cost Summary by Discipline

<b>Priority</b>	<b>Bldg. 1</b>	<b>Bldg. 2</b>	<b>Bldg. 40</b>	<b>Bldg. 41</b>
1	\$40,000	\$200,000	\$26,000	\$31,000
2	\$832,000	\$1,064,000	\$215,000	\$262,000
3	\$1,285,000	\$412,000	\$482,000	\$132,000
4	\$0	\$0	\$0	\$5,000
5	\$29,000	\$19,000	\$9,000	\$0
<b>Total</b>	<b>\$2,186,000</b>	<b>\$1,695,000</b>	<b>\$732,000</b>	<b>\$430,000</b>

Table 1.2 Cost Summary by Priority

<b>Building</b>	<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
Building 1	\$2,186,000	\$9,168,000	24%
Building 2	\$1,695,000	\$7,079,000	24%
Building 40	\$732,000	\$9,556,000	8%
Building 41	\$430,000	\$11,608,000	4%
<b>Overall</b>	<b>\$5,043,000</b>	<b>\$37,411,000</b>	<b>13%</b>

Table 1.3 Facility Condition Index Value





## ***Minneapolis VA Health Care System***

### ***Minneapolis, MN***



**Date(s) of Assessment: October 28-30, 2008**

**Number of Buildings Assessed: 2**

**Total Cost to Correct Deficiencies: \$14,634,000**

**Total Cost, Priority 1 Deficiencies: \$7,543,000 (or 52%)**

**Total Cost to Replace: \$81,350,000**

**Overall Campus FCI: 18%**

**Size of Research Program: Very Large (Over \$10 million in VA research funding)**



### Background

VA research funding for this very large program is concentrated primarily in biomedical and health services research, with lesser but significant funding in clinical and rehabilitation research. Currently this program hosts the Center for Chronic Disease Outcomes Research (CCDOR), a health services COE, a Clinical Research COE, and the Polytrauma and Blast-Related Injuries QUERI. The Brain Science Center, another significant research program hosted by the Minneapolis VAMC, is an interdisciplinary research institute and training center funded through an endowment from the American Legion family of Minnesota and the University of Minnesota. The facility also hosts the GRECC for VISN 23.

The facility is affiliated academically with the University of Minnesota Schools of Medicine and Dentistry, located in Minneapolis approximately seven miles from the VA campus.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and offices were housed in two buildings (Buildings 49 and 70) on the VA campus with nearly 79,000 nsf of research space (laboratories – 43,666 nsf; VMU – 14,293 nsf; offices – 20,925 nsf). Following is an overview of the buildings, including their age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Building 70, the main hospital building constructed in 1988, houses laboratories and support functions on the third and fourth floors at the east end of the building. Building 70 also houses the Research Service administrative offices on the third floor.



**Two examples of Building 70 laboratories.**



Finishes (floors, ceilings, walls) in the Building 70 laboratories are generally in good to fair condition, although some finishes are inappropriate. For example, vinyl composition tile flooring and acoustic panel ceilings are used in tissue culture areas. Normally, sheet vinyl flooring and smooth ceilings are used for such space to facilitate cleaning. Although original to the building, most of the laboratory casework is in fair condition. In some laboratories the casework is severely corroded. Most of the laboratory equipment (fume hoods, autoclaves, and glass washers) are operable and in good to fair condition. Although the cold rooms are in good condition, they apparently have experienced some internal corrosion due to high levels of condensation. The condensation also creates a high potential for mold growth in the cold rooms.

There are significant deficiencies in the mechanical systems in Building 70. Specifically, the air handlers need to be replaced. They are original to the building and in poor condition. Additionally, the units are not served by emergency power and there is no redundancy present. Air distribution systems are also in poor condition and the exhaust systems are nearing the end of their useful lives.

Overall, the electrical system is in good condition. Although it is 20 years old, it has been well maintained. There are some fairly minor deficiencies including the lack of transient voltage surge suppression. The emergency power system is in fair condition. There is some equipment (fume hoods) and lighting not connected to emergency power.

Building 49, a free standing building constructed in the 1960s, houses the Veterinary Medical Unit (VMU) on the basement and first floors, and laboratories on the second floor.

After the new hospital was constructed, a portion of Building 49 (two thirds of the basement and three quarters of the first floor) was renovated in 1991 into a vivarium which currently houses the VMU. Although the VMU space appears to be in fairly good condition, there are a number of problems experienced on a day-to-day basis. Specifically, there are insufficient animal housing rooms, a lack of ventilated animal housing, a lack of storage space, flooring that needs to be repaired or replaced, deficient equipment (including ultra-low freezers, the tunnel washer, autoclaves, obsolete imaging equipment), problems with the mechanical system (an aging air handling system in need of replacement, exhaust systems and chiller in failing condition, a lack of emergency power on the HVAC system and lack of humidity control), and an aging automatic watering system for which replacement parts are no longer available.

In addition to the VMU, Building 49 houses laboratory space on the second floor. This space suffers from the same mechanical system deficiencies as the VMU, and





**(Left) A laboratory in Building 49. (Right) Animal housing booths in the VMU.**

has deficient casework and finishes, as well. Although the condition of most finishes appears good to fair, the laboratories have no ceiling but rather are open to the roof above. Most of the casework and equipment (e.g., fume hoods, biological safety cabinet, cold rooms, glass wash equipment) is beyond its useful life and in need of replacement.

#### Other Research Space

The CCDOR is housed on 2E and 3E of Building 70. This office and dry laboratory space experiences recurring leakage during heavy rain in about five rooms (2E107, 2E109, 2E115, 3E115, and 3E117). The cause of the leakage has not been determined and corrected. Otherwise, the space is in good condition, although being carved from former patient rooms it is not efficiently organized.

Several additional research functions/activities are housed in space not assigned to Research Service, including the GRECC which has office and laboratory space, as well as a small amount of clinical research space in Building 70, as well as laboratories on the second floor of Building 49. Approximately one fourth of the GRECC's space was lost over the past year despite experiencing an increase in staffing.

The Brain Science Center, although a very large and productive research entity, is housed in clinical space. Some additional services (i.e., Magnetic Resonance Imaging (MRI)) are provided at the affiliate.

There is some psychology clinical research performed in space currently assigned to Engineering Service in Building T-68. This group, also connected with the CCDOR, appears to be very productive in terms of research yet suffers from a major lack of space.

There is a great need for other space to conduct clinical research. Currently research subjects are being seen in whatever available space can be borrowed for



the duration of an examination and/or interview. This research program brings in over \$2 million annually for VA funded clinical research studies, yet has no designated space in which to coordinate and conduct the studies.

It is also noteworthy to mention that the facility has a lack of available storage space, not just for research but hospital-wide. While this is not a new problem, it appears to be of epidemic proportions at the Minneapolis VAMC. Currently there are some files and equipment being stored at a nearby facility (Fort Snelling), at least some of which cannot be accessed due to the presence of lead paint, asbestos, and other health related concerns. In addition to what is currently in storage, the hospital estimates an immediate need for about 10,000 square feet in storage space just for records. One solution currently being studied is the possibility of purchasing a building dedicated for storage. There are, of course, security concerns with any files and other items stored off the VA campus and possible solutions to these concerns are being explored.

With regard to safety Building 49 is only partially protected by a fire suppression sprinkler system. The current fire alarm systems in both buildings are insufficient, but are scheduled for replacement in 2009.

Safety showers in both buildings do not meet current requirements.

#### Security

Access to research space is protected by a combination of proximity cards and hard keys. The security system is on emergency power.

#### Life Safety Hazards

The following life safety hazards identified during the assessment have been remediated by the medical center:

- Fire alarm systems have been replaced (campus-wide project).
- Emergency eyewashes have been upgraded.

The following additional life safety hazards identified during the assessment have not been remediated:

- Safety showers do not meet current requirements (not properly located).
- Building 49 is only partially protected by a fire sprinkler system.

#### Improvements Made Since Assessment:

This station has made and/or initiated significant improvements following the assessment, including:



Correction of Priority 1/2 deficiencies, design phase for upgrade of HVAC system, Building 49 – \$180,000 (ARRA funds), design complete.

Upgrade of Building 49 VMU HVAC -- \$2,000,000 (NRM FY11), pending.

Replacement of air compressor -- \$150,000 (NRM Fy11), pending.

Correction of Priority 5 deficiency, upgraded emergency eyewashes, campus-wide – (ARRA funds), completed.

Correction of Priority 2 deficiency, upgrade of fire alarm system, campus-wide – ongoing (VMU pending).

Renovation of Building 9 to create office space -- \$300,000 (NRM FY11), pending.

Renovation of VMU, Building 49 -- \$400,000, pending.

Correction of Priority 1 deficiency, replaced cage washer in VMU – (station funds), completed.

Correction of Priority 1 deficiency, purchased new autoclave for VMU – (station funds), completed.

Correction of Priority 1 deficiency, decommissioning glass washer/dryer no longer used – turn in of equipment pending.

Completed desiccant dryer project (campus-wide).

#### New Construction

There is no new construction of research space planned at this station.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.



<b>Discipline</b>	<b>Correction Cost - Bldg 49</b>	<b>Correction Cost - Bldg 70</b>
Architectural	\$2,850,000	\$2,079,000
Plumbing	\$280,000	\$140,000
HVAC	\$3,000,000	\$3,740,000
Electrical	\$1,252,000	\$799,000
Fire Protection	\$494,000	\$0
<b>Total</b>	<b>\$7,876,000</b>	<b>\$6,758,000</b>

**Table 1.1 Cost Summary by Discipline**

<b>Priority</b>	<b>Bldg 49</b>	<b>Bldg 70</b>
1	\$3,960,000	\$3,583,000
2	\$3,156,000	\$2,288,000
3	\$433,000	\$174,000
4	\$50,000	\$126,000
5	\$277,000	\$587,000
<b>Total</b>	<b>\$7,876,000</b>	<b>\$6,758,000</b>

**Table 1.2 Cost Summary by Priority**

<b>Building</b>	<b>Correction Cost</b>	<b>Replacement Cost</b>	<b>FCI</b>
Building 49	\$7,876,000	\$30,997,000	25%
Building 70	\$6,758,000	\$50,353,000	13%
<b>Overall</b>	<b>\$14,634,000</b>	<b>\$81,350,000</b>	<b>18%</b>

**Table 1.3 Facility Condition Index Value**





***VA Nebraska-Western Iowa Health Care System,  
Omaha, NE***



**Date(s) of Assessment: September 5-6, 2007**

**Number of Buildings Assessed: 1**

**Total Cost to Correct Deficiencies: \$7,271,000**

**Total Cost, Priority 1 Deficiencies: \$3,928,000 (or 54%)**

**Total Cost to Replace: \$30,759,000**

**Overall Campus FCI: 24%**

**Size of Research Program: Medium (\$2.5 million to \$4.9 million in VA research funding)**





### Background

The primary research focus of this medium sized program has historically been biomedical, but is transitioning to focus more on translational and clinical research, specifically on diagnostic and therapy options as well as disease prevention. Some specific foci include liver disease, rehabilitation, rheumatoid arthritis, and alcoholism. The program hosted a COE in alcohol research from 1991-2006. VA research funding is predominantly for biomedical research with significantly lesser amounts for the other research disciplines (rehabilitation, health services and clinical) within the VA research program.

The Omaha VAMC has active affiliation agreements with the University of Nebraska College of Medicine (UNMC) and Creighton University School of Medicine. Both institutions are located in close proximity to the Omaha VAMC.

### Overview of Research Space

At the time of the research infrastructure assessment, research laboratories, the Veterinary Medical Unit (VMU), and supporting offices were housed in a single building (Building 15) on the VA campus with over 28,000 nsf of research space (laboratories – 15,864 nsf; VMU – 7,841 nsf; offices – 4,660 nsf). Following is an overview of Building 15, including its age, configuration, general condition, and description of key architectural and systems deficiencies that existed at the time of the assessment.

Building 15 is a four story building constructed in the mid 1970s and attached to the main hospital. The majority of laboratories are on the second and third floors with several laboratories in the basement. Research Service administrative offices are housed on the hospital's 12<sup>th</sup> floor in a small modular addition to the roof.

Other than an addition to the vivarium, there has been no other construction or renovation to the research building in the past ten years. The only previous renovation noted was replacement of windows a number of years ago.

The building and supporting systems have been well maintained but many systems and materials are reaching or have already reached the end of their expected life cycles. Throughout the laboratory areas, the metal casework is generally near or at the end of its life cycle, although some of the casework is in at least fair condition. There are problems with flooring in some of the laboratory areas, primarily with the type of flooring used as being inappropriate for a laboratory environment. Fixed equipment is overall in fair condition with some having been replaced in recent years. Some cracks in interior walls were noted. While these cracks may not necessarily be due to structural problems, they are in some cases allowing water leakage.



**(Left) A typical laboratory in Building 15. (Right) Cracks were noted on interior walls throughout the space.**

The electrical power system is beyond its life expectancy. Not only are replacement parts no longer available, the system has limited emergency power capability. Air handling systems are well past their useful life, are unreliable, and have no redundancy or emergency capability including in the VMU.

Plumbing systems are appropriate for the space and generally are in good condition, with relatively minimal problems noted as compared to other systems.

The laboratories have obviously been well utilized. There currently is very little unoccupied laboratory space available for recruitment efforts.

Veterinary Medical Unit (VMU): The VMU is located on the first floor with controlled access. It is a well maintained and clean facility, although it experiences problematic inconsistencies in ventilation and humidity control. The cage washing area needs some improvement as there currently is no barrier between clean and dirty caging.

The building is not fully covered by a sprinkler system. The fire alarm system is in good condition. Safety showers and eyewashes do not meet current requirements.

#### Other Research Space

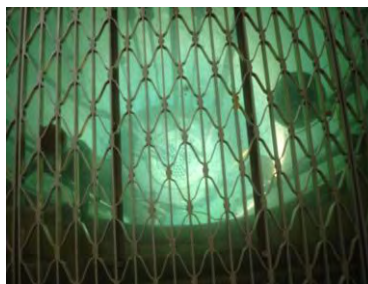
With regard to clinical research, the hospital donated former administrative space to research approximately two years ago and converted the space to create a Clinical Research Unit (CRU). The space currently houses the Institutional Review Board (IRB) administrator and accommodates various investigators for clinical research. Research leadership would like to further develop the CRU to include support of nursing and administrative personnel and increased statistical and study design support through joint ventures with the affiliates. Locally plans are



underway to submit a proposal to the National Institutes of Health (NIH) for a Clinical Translational Science Award (CTSA) in the near future.

One highly unusual aspect of the space is the presence of a nuclear reactor in the basement of the hospital. The reactor was in continuous safe operation since 1959 and served as a regional research and training resource for local institutions including universities, medical centers, and a power company. Originally funded and controlled directly by VACO, control of the reactor was transferred to the Omaha VAMC in the late 1960s and funding was provided through the Merit Review Program. The hospital approached VACO in 1999 to determine whether funding would continue to be available to maintain it or, if not, if decommissioning would be possible.

A decommissioning effort began following the terrorist attacks of September 11, 2001, when concern for such facilities was heightened. At significant cost, a project funded and overseen by VACO was initiated to transfer enriched uranium fuel rods to another reactor operated by the U.S. Geological Survey. The decommissioning process is lengthy, however, and still is not complete although it has been about five years since removal of the rods. (Note: The project to remove the nuclear reactor from the basement of this hospital which was initiated approximately ten years ago by VHA has still not been completed. It is likely that the final resolution will come prior to demolition of the current hospital.)



**One highly unusual aspect of the space is the presence of a nuclear reactor in the basement of the hospital. The reactor was in continuous safe operation since 1959 and served as a regional research and training resource for local institutions including universities, medical centers, and a power company.**

#### Security

A card reader system controls entry into building 15 and into some laboratory areas. Doors within the building are controlled with manual keyed locks.

#### Life Safety Hazards

The following life safety hazards identified during the assessment have not been corrected:

- The building is not fully covered by a sprinkler system.



- Safety showers and eyewashes do not meet current requirements (some spaces are lacking coverage, some units are inappropriate type).

#### Improvements Made Since Assessment:

This station reports no resolution of deficiencies or other improvements since the time of the assessment.

#### New Construction

This station is scheduled to have a replacement hospital built. Research Service will be assigned 54,000 gross square feet of space within the new facility.

#### Cost Summary

The tables below summarize the costs associated with correcting the deficiencies identified during the site assessment. Table 1.1 provides a cost summary by discipline (architectural, mechanical, etc.). Table 1.2 provides a cost summary by priority so that the most immediate concerns can be addressed. Table 1.3 provides the Facility Condition Index (FCI) value.

Discipline	Correction Cost
Architectural	\$1,989,000
Plumbing	\$535,000
HVAC	\$1,977,000
Electrical	\$348,000
Fire Protection	\$2,422,000
Total	\$7,271,000

**Table 1.1 Cost Summary by Discipline**

Priority	Correction Cost
1	\$3,928,00
2	\$137,000
3	\$1,536,000
4	\$1,306,000
5	\$164,000
Total	\$7,271,000

**Table 1.2 Cost Summary by Priority**



Correction Cost	Replacement Cost	FCI
\$7,271,000	\$30,759,000	24%

**Table 1.3 Facility Condition Index Value**



## APPENDIX A. GLOSSARY OF TERMS

AAALAC Association for Assessment and Accreditation of Laboratory Animal Care International

AC Air Conditioning

ACH Air Changes per Hour

ACM Asbestos Containing Material

ACOS/R&D Associate Chief of Staff for Research (at a VA facility)

ADA Americans with Disabilities Act

ADAAG ADA Accessibility Guidelines for Buildings and Facilities

A&E Architectural and Engineering

AHR Animal Holding Room

AHU Air Handling Unit

ANSI American National Standards Institute

AO/R&D Administrative Officer for Research (at a VA facility)

APC Acoustic Panel Ceiling

ARF Animal Research Facility

ASU Air Supply Unit

ATS Automatic Transfer Switch

ATU Air Terminal Unit

BAS Building Automation System

BLR&D Biomedical Laboratory Research and Development Service

BMBL Biosafety in Microbiological and Biomedical Laboratories

BSC Biological Safety cabinet

BSL Biosafety Level, as defined in the BMBL, as in "BSL-3 Lab"

CAT Cable and telephone (used to describe a specific type of cable)

CAV Constant Air Volume

CCTV Closed Circuit TV

CDC Centers for Disease Control and Prevention

CHW Chilled Water

CMU Concrete Masonry Unit (concrete block)

COE Center of Excellence

COS Chief of Staff

CRADO Chief Research and Development Officer

CSR&D Clinical Science Research and Development Service





## Appendix A. Glossary of Terms

CRU	Clinical Research Unit
CUP	Central Utility Plant
CV	Constant Volume (type of air flow system and controls)
CW	Condenser Water (mechanical)/Cold Water (plumbing)
DDC	Direct Digital Control
DI	Deionized (as in DI Water)
DX	Direct Expansion Refrigeration
EIA	Electronic Industries Alliance
ECC	Engineering Control Center
EMCS	Energy Management and Control System
FCI	Facility Condition Index
FCU	Fan Coil Unit
FEX	Fume Exhaust
FY	Fiscal Year
GEX	General Exhaust
GFCI	Ground Fault Circuit Interrupter
GHW	Glycol Heating Water
GRECC	Geriatric Research, Education, and Clinical Center
GSF	Gross Square Feet
GWB	Gypsum Wall Board (drywall)
HEPA	High Efficiency Particulate Air (Filter)
HEX	Heat Exchanger
HHW	Heating Hot Water
HSR&D	Health Services Research and Development Service
HVAC	Heating, Ventilation, & Air Conditioning
HW	Hot Water
IAQ	Interior Air Quality
IDF	Intermediate Data Frame
IESNA	Illuminating Engineering Society of North America
KVA	Kilovolt-ampere
KW	Kilowatt
Kwhr	Kilowatt hour
LED	Light Emitting Diode
LPS	Low Pressure Steam
MDF	Main Data Frame



MEP	Mechanical, Electrical, Plumbing (engineering disciplines or systems)
MIRECC	Mental Illness Research, Education, and Clinical Center
NASF	Net Assignable Square Feet
NEC	National Electrical Code
NIH	National Institutes of Health
NFPA	National Fire Protection Association
NSF	Net Usable Square Feet
NSPC	National Standard Plumbing Code
OA	Outside Air
ORD	Office of Research and Development (within VA Central Office)
OSHA	Occupational Safety and Health Administration
PADRECC	Parkinson's Disease Research, Education, and Clinical Center
PBX	Private Branch Exchange
PC	Personal Computer
PF	Power Factor
PI	Principal Investigator
POU	Point of Use
PVC	Poly Vinyl Chloride (piping)
REAP	Research Enhancement Award Program
RO	Reverse Osmosis
RR&D	Rehabilitation Research and Development Service
SEFA	Scientific Equipment and Furniture Association
SOP	Standard Operating Procedure
THHN	Type of insulation for conductors (flame-retardant, heat-resistant thermoplastic)
TIA	Telecommunications Industry Association
TREP	Targeted Research Enhancement Program
TVSS	Transient Voltage Surge Suppression
UFAS	Uniform Federal Accessibility Standards
VACO	VA Central Office
VAMC	VA Medical Center
VAT	Vinyl Asbestos Tile
VAV	Variable Air Volume (type of air flow system and controls)
VB	Vacuum Breaker
VCT	Vinyl Composition Tile flooring



## Appendix A. Glossary of Terms

VFD	Variable Frequency Drive
VHA	Veterans Health Administration
VISN	Veterans Integrated Service Network
VMU	Veterinary Medical Unit
WG	Water Gauge
XHHW	Designation for a specific insulation material, temperature rating, and condition of use (suitable for wet locations) for electrical wire and cable. It stands for “ <b>X</b> LP (cross-linked polyethylene) <b>H</b> igh <b>H</b> eat-resistant and <b>W</b> ater-resistant”.



## **APPENDIX B. VA RESEARCH SPACE ASSESSMENT INSTRUMENT**

The following pages include the checklists used for conducting physical assessments of research facilities. Using this instrument, the architectural assessment was performed room by room with a checklist for each room the team inspected included here; 100% of the research laboratories and vivarium space assigned to research were inspected. The plumbing/mechanical electrical assessments were performed by system and a checklist for each system encountered is included.



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# Facility Assessment

## VA Research Space Assessment

Project Name \_\_\_\_\_

A/E Project Number \_\_\_\_\_

Location \_\_\_\_\_

Client Project Number \_\_\_\_\_

Laboratory Name & Number \_\_\_\_\_

Date \_\_\_\_\_

**Condition Grades:**    *A = Excellent*    *B = Good*    *C = Fair*    *D = Poor*    *F = Failing*

**TYPE OF LAB:**    ☐ Wet Lab    ☐ Dry Lab    ☐ Support    ☐ BSL-2    ☐ BSL-3    ☐ Vivarium    ☐ ABSL-2    ☐ ABSL-3

### 1) FLOORS

<u>System?</u>	<u>Appropriate?</u>	<u>Condition?</u>	<u>Remarks:</u>
<input type="checkbox"/> Vinyl Tile	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Seamless Vinyl	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Epoxy	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Carpet	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Sealed Concrete	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Base	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> Integral <input type="checkbox"/> Applied <input type="checkbox"/> None
<input type="checkbox"/> Other _____	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____

### 2) WALLS

<u>System?</u>	<u>Appropriate?</u>	<u>Condition?</u>	<u>Remarks:</u>
<input type="checkbox"/> Drywall	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Masonry	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Paint	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> Epoxy <input type="checkbox"/> Latex <input type="checkbox"/> _____
<input type="checkbox"/> Composite Panel System	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Reinforced Epoxy Coating	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Other _____	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____

### 3) CEILING

<u>System?</u>	<u>Appropriate?</u>	<u>Condition?</u>	<u>Remarks:</u>
<input type="checkbox"/> Acoustic Lay-In Panels	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Coated Lay-In Panels	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Painted Cement Plaster	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> Epoxy <input type="checkbox"/> Latex <input type="checkbox"/> _____
<input type="checkbox"/> Painted Drywall	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> Epoxy <input type="checkbox"/> Latex <input type="checkbox"/> _____
<input type="checkbox"/> Exposed Structure	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Other _____	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____

### 4) DOORS/SECURITY

<u>System?</u>	<u>Appropriate?</u>	<u>Condition?</u>	<u>Remarks:</u>
<input type="checkbox"/> Wood	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Hollow Metal	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Plastic Laminate	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Aluminum	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Hollow Metal Frame	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Wood Frame	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Security (locking)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> Keyed <input type="checkbox"/> Card reader <input type="checkbox"/> None
<input type="checkbox"/> View Window	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> ½ Glass <input type="checkbox"/> _____
<input type="checkbox"/> Other _____	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____



## 5) CASEWORK/CABINETRY

<u>System?</u>	<u>Appropriate?</u>	<u>Condition?</u>	<u>Remarks:</u>
<input type="checkbox"/> Base	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> Wood <input type="checkbox"/> Plas Lam <input type="checkbox"/> Metal
<input type="checkbox"/> Uppers Shelving	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> Wall Cabs <input type="checkbox"/> Open
<input type="checkbox"/> Tops St Steel	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> Epoxy <input type="checkbox"/> P Lam <input type="checkbox"/>
<input type="checkbox"/> Fixed <input type="checkbox"/> Mobile <input type="checkbox"/> Ht Adjustable	<input type="checkbox"/> Umbilical	<input type="checkbox"/> Drying Rack	<input type="checkbox"/> Flammable Cabinet <input type="checkbox"/> Acid Storage Cabinet
<input type="checkbox"/> Other _____	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____

## 6) FIXED LABORATORY EQUIPMENT

<u>System?</u>	<u>Appropriate?</u>	<u>Condition?</u>	<u>Remarks:</u>
<input type="checkbox"/> Fume Hood	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> Current Certification? <input type="checkbox"/> _____
	<input type="checkbox"/> Chemical	<input type="checkbox"/> Radio-Isotope	<input type="checkbox"/> Perchloric <input type="checkbox"/> Walk-In <input type="checkbox"/> Snorkel (POU)
<input type="checkbox"/> Bio-Safety Cabinet	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
Class _____ Type _____	<input type="checkbox"/> Vented	<input type="checkbox"/> Recirculating	<input type="checkbox"/> Laminar Flow <input type="checkbox"/> Thimble Connection
<input type="checkbox"/> Glass Ware Washer	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
	<input type="checkbox"/> Steam	<input type="checkbox"/> Electric	<input type="checkbox"/> Free Standing <input type="checkbox"/> Undercounter
<input type="checkbox"/> Autoclave	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Steam	<input type="checkbox"/> Electric	<input type="checkbox"/> Freestanding	<input type="checkbox"/> Recessed <input type="checkbox"/> Double Door <input type="checkbox"/> Single door
<input type="checkbox"/> Cold Room	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Cage/Rack Washer	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> Pit Mtd <input type="checkbox"/> _____
<input type="checkbox"/> Tunnel Cage Washer	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Surgery/Exam Table	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Surgical/Exam Light	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> Clg Mtd <input type="checkbox"/> Dual Hd <input type="checkbox"/> _____
<input type="checkbox"/> Pass Through Box	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Other _____	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Other _____	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____
<input type="checkbox"/> Other _____	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> F	<input type="checkbox"/> _____

## 7) ENVIRONMENTAL CONDITIONS & SERVICES

<u>Concern?</u>	<u>Remarks:</u>
<input type="checkbox"/> Air Quality: <input type="checkbox"/> Odor <input type="checkbox"/> Fumes <input type="checkbox"/> Temperature <input type="checkbox"/> Humidity	<input type="checkbox"/> _____
<input type="checkbox"/> Static Air Pressure: <input type="checkbox"/> Positive <input type="checkbox"/> Neutral <input type="checkbox"/> Negative	<input type="checkbox"/> _____
<input type="checkbox"/> Vibration: <input type="checkbox"/> Source of <input type="checkbox"/> Sensitive to <input type="checkbox"/> Needs Isolation	<input type="checkbox"/> _____
<input type="checkbox"/> Noise: <input type="checkbox"/> Source of <input type="checkbox"/> Sensitive to <input type="checkbox"/> Needs Isolation	<input type="checkbox"/> _____
<input type="checkbox"/> Lab Sink <input type="checkbox"/> Cup Sink <input type="checkbox"/> Floor Drain <input type="checkbox"/> Emergency Shower <input type="checkbox"/> Eye Wash	<input type="checkbox"/> _____
<input type="checkbox"/> Utilities: <input type="checkbox"/> Lab Air <input type="checkbox"/> Vacuum <input type="checkbox"/> Natural Gas <input type="checkbox"/> High Purity Water	<input type="checkbox"/> _____
<input type="checkbox"/> Fixtures: <input type="checkbox"/> Size/Qty <input type="checkbox"/> Qty/Type Fittings? <input type="checkbox"/> Appropriate Materials	<input type="checkbox"/> _____
<input type="checkbox"/> Lighting: <input type="checkbox"/> Fluorescent <input type="checkbox"/> Incandescent <input type="checkbox"/> Inadequate Light Level	<input type="checkbox"/> _____
<input type="checkbox"/> Electrical: <input type="checkbox"/> Outlets Qty <input type="checkbox"/> No of Circuits <input type="checkbox"/> Inadequate EP for Critical Equipment	<input type="checkbox"/> _____

## 8) GENERAL

Quantify Scope If Replacement or Correction Indicated (any system grade "D" or "F"):

<input type="checkbox"/> System: _____	<input type="checkbox"/> Scope _____
<input type="checkbox"/> System: _____	<input type="checkbox"/> Scope _____
<input type="checkbox"/> System: _____	<input type="checkbox"/> Scope _____

Remarks: \_\_\_\_\_

## HVAC SYSTEMS:

# Facility Assessment

## VA Research Space Assessment

Project Name \_\_\_\_\_

A/E Project Number \_\_\_\_\_

Location \_\_\_\_\_

Client Project Number \_\_\_\_\_

Laboratory Name & Number \_\_\_\_\_

Date \_\_\_\_\_

**Condition Grades:**    *A = Excellent*    *B = Good*    *C = Fair*    *D = Poor*    *F = Failing*

### 1) BOILER SYSTEMS

#### System Type

☐ Steam

Brief Description (optional): \_\_\_\_\_

☐ Heating Hot Water

#### Fuel Type

☐ Natural Gas

☐ Propane

☐ Other \_\_\_\_\_

#### System Capacity

☐ System Capacity (MBH)

Brief Description (optional): \_\_\_\_\_

☐ Firm Capacity (MBH)

☐ Laboratory Load (MBH)

☐ Other \_\_\_\_\_

#### System Redundancy

☐ Boilers

☐ Yes    ☐ No

☐ Deaerator

☐ Yes    ☐ No

☐ Boiler Feed Pumps

☐ Yes    ☐ No

☐ Condensate Return Pumps

☐ Yes    ☐ No

☐ Heating Hot Water Converter (1)

☐ Yes    ☐ No

☐ Heating Hot Water Pumps (1)

☐ Yes    ☐ No

☐ Other \_\_\_\_\_

☐ Yes    ☐ No

(1) May not be required

#### Is System Appropriate for This Lab?

☐ Components on Back-Up Power?

☐ Yes    ☐ No

☐ Supporting controls on Back-Up Power?

☐ Yes    ☐ No

☐ Other \_\_\_\_\_

☐ Yes    ☐ No

#### Explain If "No":

#### What Is Condition of System Components?

#### Explain

#### (optional):

☐ Overall    ☐ A (excellent)    ☐ B (good)    ☐ C (fair)    ☐ D (poor)    ☐ F (failing)

☐ Boiler    ☐ A (excellent)    ☐ B (good)    ☐ C (fair)    ☐ D (poor)    ☐ F (failing)

☐ Deaerator    ☐ A (excellent)    ☐ B (good)    ☐ C (fair)    ☐ D (poor)    ☐ F (failing)

☐ Boiler Feed Pumps    ☐ A (excellent)    ☐ B (good)    ☐ C (fair)    ☐ D (poor)    ☐ F (failing)

☐ Cond. Ret. Pumps    ☐ A (excellent)    ☐ B (good)    ☐ C (fair)    ☐ D (poor)    ☐ F (failing)

☐ Controls    ☐ A (excellent)    ☐ B (good)    ☐ C (fair)    ☐ D (poor)    ☐ F (failing)

☐ Piping    ☐ A (excellent)    ☐ B (good)    ☐ C (fair)    ☐ D (poor)    ☐ F (failing)

☐ Piping Specialties    ☐ A (excellent)    ☐ B (good)    ☐ C (fair)    ☐ D (poor)    ☐ F (failing)

☐ Other \_\_\_\_\_    ☐ A (excellent)    ☐ B (good)    ☐ C (fair)    ☐ D (poor)    ☐ F (failing)

Quantify Scope If Replacement Indicated: \_\_\_\_\_

("D" or "F" grade)

Remarks: \_\_\_\_\_

### 2) CHILLED WATER SYSTEM

System Type

- ☐ Air Cooled  
☐ Water Cooled  
☐ Central Plant System  
☐ Building Dedicated System

Brief Description (optional):

---

---

---

System Capacity

- ☐ System Capacity (tons)  
☐ Firm Capacity (tons)  
☐ Laboratory Load (MBH)

Brief Description (optional):

---

---

---

☐ Other

System Redundancy

- |  |                              |                             |
|--|------------------------------|-----------------------------|
| <input type="checkbox"/> Chillers            | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> CHW Pumps           | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Cooling Towers      | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Cooling Tower Pumps | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Other _____         | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

---

---

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---

Is System Appropriate for This Lab?

- |  |                              |                             |
|--|------------------------------|-----------------------------|
| <input type="checkbox"/> Components on Back-Up Power?          | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Supporting Controls on Back-Up Power? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Other _____                           | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Explain If "No":

---

---

---

Condition of System Components

Explain

(optional):

- |   |  |                                   |                                   |                                   |                                      |
|---|--|-----------------------------------|-----------------------------------|-----------------------------------|--------------------------------------|
| <input type="checkbox"/> Overall            | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) |
| <input type="checkbox"/> Chiller            | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) |
| <input type="checkbox"/> CHW Pumps          | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) |
| <input type="checkbox"/> Cooling Towers     | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) |
| <input type="checkbox"/> CW Pumps           | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) |
| <input type="checkbox"/> Controls           | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) |
| <input type="checkbox"/> Piping             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) |
| <input type="checkbox"/> Piping Specialties | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) |
| <input type="checkbox"/> Other _____        | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) |

---

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Quantify Scope If Replacement Indicated:

("D" or "F" grade)

---

Remarks:

---

---

### 3) AIR HANDLING SYSTEMS

#### Area Served

- ☐ BSL-2
- ☐ BSL-3
- ☐ Vivarium
- ☐ Other

Description:

---

---

#### Room Features

- ☐ Barriers ☐ Full Height Perimeter Walls ☐ Double Door Entry Vestibule
- ☐ Space Maintained under Negative Air Pressure
- ☐ Room Temperature and Humidity Monitoring
- ☐ Room Differential Air Pressure Monitoring

#### System Features

- ☐ 100% Outside Air
  - ☐ Air Exchange ☐ 12 ACH ☐ 15 ACH ☐ Other \_\_\_\_\_ ACH ☐ Unknown
  - ☐ Airflow Control ☐ VAV ☐ CV
  - ☐ Preheat Coil ☐ Steam ☐ Heating Hot Water
  - ☐ Cooling Coil ☐ Chilled Water ☐ DX
  - ☐ Supply Fan ☐ Redundant Fan ☐ Fan Isolation Dampers
  - ☐ Filters ☐ Pre \_\_\_\_\_ % ☐ Final \_\_\_\_\_ %
  - ☐ Backup Power ☐ Unit ☐ Controls
- ☐ Humidifier
- ☐ Pressure Independent Control
  - ☐ Individual Room Temperature Control ☐ Yes ☐ No
  - ☐ Individual Room Humidity Control ☐ Yes ☐ No
  - ☐ Air Distribution ☐ Standard Diffuser ☐ Laminar Flow Diffuser

#### Duct Construction

- ☐ Stainless Steel
- ☐ Galvanized Steel

#### Is this System Appropriate for This Lab?

- ☐ Supply Fan Construction ☐ Yes ☐ No
- ☐ System Controls (pressure) ☐ Yes ☐ No
- ☐ System Acoustics ☐ Yes ☐ No
- ☐ Other \_\_\_\_\_ ☐ Yes ☐ No

#### Explain If "No":

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#### Condition of System

##### (optional):

- ☐ Overall ☐ A (excellent) ☐ B (good) ☐ C (fair) ☐ D (poor) ☐ F (failing)
- ☐ Air Handlers ☐ A (excellent) ☐ B (good) ☐ C (fair) ☐ D (poor) ☐ F (failing)
- ☐ Ductwork ☐ A (excellent) ☐ B (good) ☐ C (fair) ☐ D (poor) ☐ F (failing)
- ☐ Isolation Dampers ☐ A (excellent) ☐ B (good) ☐ C (fair) ☐ D (poor) ☐ F (failing)
- ☐ Other \_\_\_\_\_ ☐ A (excellent) ☐ B (good) ☐ C (fair) ☐ D (poor) ☐ F (failing)

#### Explain

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Quantify Scope If Replacement Indicated:

("D" or "F" grade)

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Remarks:

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Area Served

- Description:

☐ None/Not Applicable

- Brief Description (optional):

- Airflow Control

- ☐ CV

☐ Stainless Steel

- Is this System Appropriate for This Lab?

Explain If “No”:

- 
- 
- 
- 
- 
- 

(optional):

- ### Explain

Quantify Scope If Replacement Indicated:

("D" or "F" grade)

Remarks:

# Facility Assessment

## VA Research Space Assessment

Project Name \_\_\_\_\_

A/E Project Number \_\_\_\_\_

Location \_\_\_\_\_

Client Project Number \_\_\_\_\_

Laboratory Name & Number \_\_\_\_\_

Date \_\_\_\_\_

**Condition Grades:**     *A = Excellent*    *B = Good*    *C = Fair*    *D = Poor*    *F = Failing*

### PLUMBING SYSTEMS:

#### 1) LABORATORY WASTE SYSTEM

What Is System Type:

- ☐ None/Not Applicable
- ☐ Separate Piped System
- ☐ Combined with Sanitary
- ☐
- ☐
- ☐
- ☐ Other \_\_\_\_\_

Brief Description (optional): \_\_\_\_\_

Is this System Appropriate for This Lab?

- |                  |                              |                             |
|------------------|------------------------------|-----------------------------|
| ○ Neutralization | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| ○ pH Sampling    | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| ○                | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| ○                | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| ○ Other _____    | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Explain If "No":

What Is Condition of System?

- |                     |                            |                            |                            |                            |                            |
|---------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| ○ Overall           | <input type="checkbox"/> A | <input type="checkbox"/> B | <input type="checkbox"/> C | <input type="checkbox"/> D | <input type="checkbox"/> F |
| ○ Central Equipment | <input type="checkbox"/> A | <input type="checkbox"/> B | <input type="checkbox"/> C | <input type="checkbox"/> D | <input type="checkbox"/> F |
| ○ POU Equipment     | <input type="checkbox"/> A | <input type="checkbox"/> B | <input type="checkbox"/> C | <input type="checkbox"/> D | <input type="checkbox"/> F |
| ○ Piping/Fittings   | <input type="checkbox"/> A | <input type="checkbox"/> B | <input type="checkbox"/> C | <input type="checkbox"/> D | <input type="checkbox"/> F |
| ○ Other _____       | <input type="checkbox"/> A | <input type="checkbox"/> B | <input type="checkbox"/> C | <input type="checkbox"/> D | <input type="checkbox"/> F |

Explain (optional):

Quantify Scope If Replacement Indicated: \_\_\_\_\_

("D" or "F" grade)

Remarks: \_\_\_\_\_



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# Facility Assessment

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Project Name \_\_\_\_\_

A/E Project Number \_\_\_\_\_

Location \_\_\_\_\_

Client Project Number \_\_\_\_\_

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Date \_\_\_\_\_

**Condition Grades:**     *A = Excellent*    *B = Good*    *C = Fair*    *D = Poor*    *F = Failing*

### PLUMBING SYSTEMS:

#### 1) HIGH PURITY WATER SYSTEM

What Is System Type:

☐ None/Not Applicable

☐ De-ionized

☐ Distilled

☐ Reverse Osmosis

☐ Central (House)

☐ Point-of-Use

☐ Other \_\_\_\_\_

Brief Description (optional): \_\_\_\_\_

Is this System Appropriate for This Lab?

○ Pretreatment Equipment

☐ Yes

☐ No

○ Type of System for Quality Required

☐ Yes

☐ No

○ Distribution System for Quality Required

☐ Yes

☐ No

○ Piping Material for Quality Required

☐ Yes

☐ No

○ Minimum Velocities (if known)

☐ Yes

☐ No

○ Maximum Dead Leg Length (if known)

☐ Yes

☐ No

○ Other \_\_\_\_\_

☐ Yes

☐ No

Explain If "No":

What Is Condition of System?

○ Overall

☐ A

☐ B

☐ C

☐ D

☐ F

○ Central Equipment

☐ A

☐ B

☐ C

☐ D

☐ F

○ POU Equipment

☐ A

☐ B

☐ C

☐ D

☐ F

○ Piping/Fittings

☐ A

☐ B

☐ C

☐ D

☐ F

○ Other \_\_\_\_\_

☐ A

☐ B

☐ C

☐ D

☐ F

Explain (optional):

Quantify Scope If Replacement Indicated: \_\_\_\_\_

("D" or "F" grade)

Remarks: \_\_\_\_\_

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Project Name \_\_\_\_\_

A/E Project Number \_\_\_\_\_

Location \_\_\_\_\_

Client Project Number \_\_\_\_\_

Laboratory Name & Number \_\_\_\_\_

Date \_\_\_\_\_

**Condition Grades:**     *A = Excellent*    *B = Good*    *C = Fair*    *D = Poor*    *F = Failing*

### PLUMBING SYSTEMS:

#### 1) COMPRESSED AIR

What Is System Type:

- ☐ None/Not Applicable
- ☐ Liquid Ring
- ☐ Reciprocating
- ☐ Oil Lubed
- ☐ Oil-Less (No oil in air stream)
- ☐ Oil-Free (No oil in compressor)
- ☐ Other \_\_\_\_\_

Brief Description (optional): \_\_\_\_\_

Is this System Appropriate for This Lab?

- |   |                              |                             |
|---|------------------------------|-----------------------------|
| ○ Type of compressors                   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| ○ Piping Material                       | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| ○ Operating Pressures                   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| ○ Receiver                              | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| ○ Isolation for BSL-3/4                 | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| ○ Air Dryer (Desiccant or Refrigerated) | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| ○ Redundancy                            | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| ○ Other _____                           | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Explain If "No":

What Is Condition of System?

- |               |                            |                            |                            |                            |                            |
|---------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| ○ Overall     | <input type="checkbox"/> A | <input type="checkbox"/> B | <input type="checkbox"/> C | <input type="checkbox"/> D | <input type="checkbox"/> F |
| ○ Compressors | <input type="checkbox"/> A | <input type="checkbox"/> B | <input type="checkbox"/> C | <input type="checkbox"/> D | <input type="checkbox"/> F |
| ○ Dryers      | <input type="checkbox"/> A | <input type="checkbox"/> B | <input type="checkbox"/> C | <input type="checkbox"/> D | <input type="checkbox"/> F |
| ○ Controls    | <input type="checkbox"/> A | <input type="checkbox"/> B | <input type="checkbox"/> C | <input type="checkbox"/> D | <input type="checkbox"/> F |
| ○ Other _____ | <input type="checkbox"/> A | <input type="checkbox"/> B | <input type="checkbox"/> C | <input type="checkbox"/> D | <input type="checkbox"/> F |

Explain (optional):

Quantify Scope If Replacement Indicated: \_\_\_\_\_

("D" or "F" grade)

Remarks: \_\_\_\_\_

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Project Name \_\_\_\_\_

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Location \_\_\_\_\_

Client Project Number \_\_\_\_\_

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Date \_\_\_\_\_

**Condition Grades:**    *A = Excellent*    *B = Good*    *C = Fair*    *D = Poor*    *F = Failing*

### PLUMBING SYSTEMS:

#### 1) LAB VACUUM SYSTEM

What Is System Type:

☐ None/Not Applicable

☐ Liquid Ring

☐ Rotary Vane

☐

☐

☐

☐ Other \_\_\_\_\_

Brief Description (optional): \_\_\_\_\_

Is this System Appropriate for This Lab?

○ Operating Pressures

☐ Yes

☐ No

○ Redundant Vacuum Pumps

☐ Yes

☐ No

○ Inlet filters for BSL-3/4

☐ Yes

☐ No

○ Point of use when appropriate

☐ Yes

☐ No

○ Other \_\_\_\_\_

☐ Yes

☐ No

Explain If "No":

What Is Condition of System?

○ Overall

☐ A

☐ B

☐ C

☐ D

☐ F

○ Central Equipment

☐ A

☐ B

☐ C

☐ D

☐ F

○ POU Equipment

☐ A

☐ B

☐ C

☐ D

☐ F

○ Piping/Fittings

☐ A

☐ B

☐ C

☐ D

☐ F

○ Other \_\_\_\_\_

☐ A

☐ B

☐ C

☐ D

☐ F

Explain (optional):

Quantify Scope If Replacement Indicated: \_\_\_\_\_

("D" or "F" grade)

Remarks: \_\_\_\_\_



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## VA Research Space Assessment

Project Name

A/E Project Number

Location

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Laboratory Name & Number

Date

**Condition Grades:**    *A = Excellent*    *B = Good*    *C = Fair*    *D = Poor*    *F = Failing*

### PLUMBING SYSTEMS:

#### 1) BSL3 LABORATORIES

What Is System Type:

- ☐ None/Not Applicable
- ☐ Industrial Hot and Cold Water
- ☐ Laboratory Waste
- ☐ Laboratory Compressed Air
- ☐ Laboratory Vacuum
- ☐ Cylinder Gases
- ☐ Autoclave
- ☐ Shower
- ☐ Fire Protection Sprinklers
- ☐ Other \_\_\_\_\_

Brief Description (optional): \_\_\_\_\_

Is this System Appropriate for This Lab?

- |  |                              |                             |
|--|------------------------------|-----------------------------|
| <input type="checkbox"/> Industrial Water Backflow Preventers  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Sink Deep-Seal Traps                  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Sink "Kill" Tanks                     | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Shower "Kill" Tank                    | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> HEPA Filters on Laboratory Waste Vent | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> HEPA Filters on Laboratory Vacuum     | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Check Valves on Non-Water Services    | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Double Interlock Preaction Sprinklers | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> Other _____                           | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Explain If "No":

What Is Condition of System?

- |  |                            |                            |                            |                            |                            |
|--|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| <input type="checkbox"/> Overall           | <input type="checkbox"/> A | <input type="checkbox"/> B | <input type="checkbox"/> C | <input type="checkbox"/> D | <input type="checkbox"/> F |
| <input type="checkbox"/> Central Equipment | <input type="checkbox"/> A | <input type="checkbox"/> B | <input type="checkbox"/> C | <input type="checkbox"/> D | <input type="checkbox"/> F |
| <input type="checkbox"/> POU Equipment     | <input type="checkbox"/> A | <input type="checkbox"/> B | <input type="checkbox"/> C | <input type="checkbox"/> D | <input type="checkbox"/> F |
| <input type="checkbox"/> Piping/Fittings   | <input type="checkbox"/> A | <input type="checkbox"/> B | <input type="checkbox"/> C | <input type="checkbox"/> D | <input type="checkbox"/> F |
| <input type="checkbox"/> Other _____       | <input type="checkbox"/> A | <input type="checkbox"/> B | <input type="checkbox"/> C | <input type="checkbox"/> D | <input type="checkbox"/> F |

Explain (optional):

Quantify Scope If Replacement Indicated: \_\_\_\_\_

("D" or "F" grade)

Remarks: \_\_\_\_\_

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A/E Project Number

Location

Client Project Number

Laboratory Name & Number

Date

**Condition Grades:**    *A = Excellent*    *B = Good*    *C = Fair*    *D = Poor*    *F = Failing*

### PLUMBING SYSTEMS:

#### 1) VIVARIUM SYSTEMS

What Is System Type:

☐ None/Not Applicable

☐ Animal Watering

☐ Necropsy

☐ Procedure Rooms

☐ Cage Wash

☐

☐ Other \_\_\_\_\_

Brief Description (optional): \_\_\_\_\_

Is this System Appropriate for This Lab?

○ Pretreatment for Animal Watering

☐ Yes

☐ No

○ Proper Utilities in Necropsy

☐ Yes

☐ No

○ Proper Utilities in Procedure Rooms

☐ Yes

☐ No

○ Appropriate Drainage in Animal Holding

☐ Yes

☐ No

○ Other \_\_\_\_\_

☐ Yes

☐ No

Explain If "No":

What Is Condition of System?

○ Overall    ☐ A    ☐ B    ☐ C    ☐ D    ☐ F

○ Central Equipment    ☐ A    ☐ B    ☐ C    ☐ D    ☐ F

○ POU Equipment    ☐ A    ☐ B    ☐ C    ☐ D    ☐ F

○ Piping/Fittings    ☐ A    ☐ B    ☐ C    ☐ D    ☐ F

○ Other \_\_\_\_\_    ☐ A    ☐ B    ☐ C    ☐ D    ☐ F

Explain (optional):

Quantify Scope If Replacement Indicated: \_\_\_\_\_

("D" or "F" grade)

Remarks: \_\_\_\_\_

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Location \_\_\_\_\_

Client Project Number \_\_\_\_\_

Laboratory Name & Number \_\_\_\_\_

Date \_\_\_\_\_

**Condition Grades:**     *A = Excellent   B = Good   C = Fair   D = Poor   F = Failing*

### **PLUMBING SYSTEMS:**

#### **1) CENTRAL SPECIALTY GAS (CO<sub>2</sub>, He, N<sub>2</sub>, ETC) – Complete a separate form for each type gas**

What Is System Type:

- ☐ None/Not Applicable
- ☐ Manifold – two banks
- ☐ Regulator – single bottle
- ☐
- ☐
- ☐
- ☐ Other \_\_\_\_\_

Brief Description (optional): \_\_\_\_\_

Is this System Appropriate for This Lab?

- |  |                              |                             |
|--|------------------------------|-----------------------------|
| ○ Automatic Switchover Manifold          | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| ○ Automatic Resetting for Full Cylinders | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| ○ Appropriate Number of Cylinders        | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| ○ Piping Material for Type Gas           | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| ○ Other _____                            | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Explain If “No”:

What Is Condition of System?

- |                     |                            |                            |                            |                            |                            |
|---------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| ○ Overall           | <input type="checkbox"/> A | <input type="checkbox"/> B | <input type="checkbox"/> C | <input type="checkbox"/> D | <input type="checkbox"/> F |
| ○ Central Equipment | <input type="checkbox"/> A | <input type="checkbox"/> B | <input type="checkbox"/> C | <input type="checkbox"/> D | <input type="checkbox"/> F |
| ○ POU Equipment     | <input type="checkbox"/> A | <input type="checkbox"/> B | <input type="checkbox"/> C | <input type="checkbox"/> D | <input type="checkbox"/> F |
| ○ Piping/Fittings   | <input type="checkbox"/> A | <input type="checkbox"/> B | <input type="checkbox"/> C | <input type="checkbox"/> D | <input type="checkbox"/> F |
| ○ Other _____       | <input type="checkbox"/> A | <input type="checkbox"/> B | <input type="checkbox"/> C | <input type="checkbox"/> D | <input type="checkbox"/> F |

Explain (optional):

Quantify Scope If Replacement Indicated: \_\_\_\_\_

(“D” or “F” grade)

Remarks: \_\_\_\_\_

\_\_\_\_\_



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Project Name \_\_\_\_\_

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Date \_\_\_\_\_

**Condition Grades:**    *A = Excellent*    *B = Good*    *C = Fair*    *D = Poor*    *F = Failing*

### PLUMBING SYSTEMS:

#### 1) LIQUID NITROGEN

What Is System Type:

☐ None/Not Applicable

☐ Central Distribution

☐ Point-of-Use (Dewars)

☐ Bulk Reserve

☐ Dewar Reserve

☐

☐ Other \_\_\_\_\_

Brief Description (optional): \_\_\_\_\_

Is this System Appropriate for This Lab?

○ Appropriate Reserve Capacity

☐ Yes

☐ No

○ Appropriate Controls

☐ Yes

☐ No

○ Appropriate System Capacity

☐ Yes

☐ No

○ Piping Material for Type Gas

☐ Yes

☐ No

○ Other \_\_\_\_\_

☐ Yes

☐ No

Explain If "No":

What Is Condition of System?

○ Overall    ☐ A    ☐ B    ☐ C    ☐ D    ☐ F

○ Central Equipment    ☐ A    ☐ B    ☐ C    ☐ D    ☐ F

○ POU Equipment    ☐ A    ☐ B    ☐ C    ☐ D    ☐ F

○ Piping/Fittings    ☐ A    ☐ B    ☐ C    ☐ D    ☐ F

○ Other \_\_\_\_\_    ☐ A    ☐ B    ☐ C    ☐ D    ☐ F

Explain (optional):

Quantify Scope If Replacement Indicated: \_\_\_\_\_

("D" or "F" grade)

Remarks: \_\_\_\_\_

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# Facility Assessment

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Project Name \_\_\_\_\_

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Date \_\_\_\_\_

**Condition Grades:**    *A = Excellent*    *B = Good*    *C = Fair*    *D = Poor*    *F = Failing*

### PLUMBING SYSTEMS:

#### 1) FIRE PROTECTION SYSTEM

What Is System Type:

☐ None/Not Applicable

☐ Wet Pipe

☐ Dry Pipe

☐ Preaction

☐

☐

☐ Other \_\_\_\_\_

Brief Description (optional): \_\_\_\_\_

Is this System Appropriate for This Lab?

o Separate Zone for Lab

☐ Yes

☐ No

o Proper Separation for Lab Type

☐ Yes

☐ No

o Proper Zone Control Configuration

☐ Yes

☐ No

o Proper Notification to FA

☐ Yes

☐ No

o Other \_\_\_\_\_

☐ Yes

☐ No

Explain If "No":

What Is Condition of System?

o Overall

☐ A

☐ B

☐ C

☐ D

☐ F

o Central Equipment

☐ A

☐ B

☐ C

☐ D

☐ F

o POU Equipment

☐ A

☐ B

☐ C

☐ D

☐ F

o Piping/Fittings

☐ A

☐ B

☐ C

☐ D

☐ F

o Other \_\_\_\_\_

☐ A

☐ B

☐ C

☐ D

☐ F

Explain (optional):

Quantify Scope If Replacement Indicated: \_\_\_\_\_

("D" or "F" grade)

Remarks: \_\_\_\_\_

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## VA Research Space Assessment

Project Name

A/E Project Number

Location

Client Project Number

Laboratory Name & Number

Date

**Condition Grades:**    *A = Excellent*    *B = Good*    *C = Fair*    *D = Poor*    *F = Failing*

### ELECTRICAL SYSTEMS:

#### 1) ENERGY CONSERVATION

What Is System Type:

- ☐ None/Not Applicable
- ☐ Fluorescent Light Fixtures have electronic ballasts with either T5 or T8 type lamps
- ☐ Lighting controlled by occupancy sensors
- ☐ Programmable lighting controllers with warning of an impending off cycle
- ☐ Rapid start, electronic ballasts used where fluorescent lighting is controlled by occupancy sensors
- ☐ Localized switching is used in lieu of large-area switching
- ☐ Labs switched in 3.4 m x 3.4 m (11' x 11') groups
- ☐ Multilevel switching provided for control of rooms with three-lamp fixtures
- ☐ Day light compensation used in spaces with significant amount of exterior glass or skylights
- ☐ LED type exit lights used
- ☐ Other \_\_\_\_\_

Brief Description (optional): \_\_\_\_\_

Is this System Appropriate for This Lab?

- |                                   |                              |                             |
|-----------------------------------|------------------------------|-----------------------------|
| <input type="radio"/>             | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="radio"/>             | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="radio"/>             | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="radio"/>             | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="radio"/> Other _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Explain If "No":

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

What Is Condition of System?

(optional):

- |                                   |  |                                   |                                   |                                   |                                      |
|-----------------------------------|--|-----------------------------------|-----------------------------------|-----------------------------------|--------------------------------------|
| <input type="radio"/> Overall     | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) |
| <input type="radio"/>             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) |
| <input type="radio"/>             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) |
| <input type="radio"/>             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) |
| <input type="radio"/> Other _____ | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) |

Explain

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Quantify Scope If Replacement Indicated: \_\_\_\_\_

("D" or "F" grade)

Remarks: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



## 2) ELECTRICAL DISTRIBUTION (REGARDING ELECTRICAL ROOMS OR CLOSETS)

### What Is System Type:

- ☐ Required clearances per National Electrical Code (NEC) met
- ☐ Transformers provided with adequate environmental conditioning to limit the temperature to 30°C (86°F)
- ☐ Space void of piping, ducts, leak protection apparatus or other equipment foreign to the electrical installation installed in the dedicated electrical space above switchboards or panelboards per NEC

## 3) ELECTRICAL DISTRIBUTION

### What Is System Type:

- ☐ Distribution of loads segregated into like groups based on function or type of load such as laboratories, vivarium, health care, office, etc.
- ☐ Voltage transformation or an NEC compliant neutral-to-ground connection located within \_\_\_\_\_ m ( \_\_\_\_\_ ft) <<need to quantify this requirement>> of the load served
- ☐ Metallic conduit is used to provide a redundant ground path
- ☐ Metallic construction used (Regarding surface metal raceway)
- ☐ Emergency circuits wired in separate channels from normal circuits (Regarding surface metal raceway)
- ☐ Two levels of transient voltage surge suppression (TVSS) are provided
- ☐ Category C TVSS protection provided at the service entrance
- ☐ Category B TVSS protection provided at the distribution panel
- ☐ Transformers serving high harmonic content loads (60% or more of nonlinear loads) K-13 rated with 200% rated neutral from the transformer to the panel
- ☐ Receptacles in a NEMA 5-20R configuration
- ☐ Receptacles ground prongs are mounted in the up position
- ☐ Emergency/standby receptacles clearly identified
- ☐ The receptacles mounted within 610 mm (2 ft) of water dispensing are ground fault interrupter (GFI) type
- ☐ The laboratory benches provided with receptacles installed 600 mm (2 ft) on center in surface metal raceway

## 4) ELECTRICAL DISTRIBUTION (REGARDING PANELBOARDS)

### What Is System Type:

- ☐ Circuit breakers bolt-on type
- ☐ The main circuit breaker provided in the same enclosure, closet or room
- ☐ No branch circuits serve loads located in a different building, area or floor
- ☐ The panel and branch circuits properly labeled
- ☐ Buses constructed of copper material
- ☐ A 200% rated neutral bus provided for panels serving 60% nonlinear loads
- ☐ A door-in-door type panel cover
- ☐ Panelboards serving research labs located within a \_\_\_\_\_ m ( \_\_\_\_\_ ft) << need to quantify this requirement>> radius of the laboratory area served {Regarding *Research (Wet Labs/Dry Labs/BSL2/BSL3)*}
- ☐ Panelboards located in a service corridor outside the research laboratory served {Regarding *Research (Wet Labs/Dry Labs/BSL2/BSL3)*}
- ☐ Other \_\_\_\_\_

Brief Description (optional): \_\_\_\_\_

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Is this System Appropriate for This Lab?

- |                                   |                              |                             |
|-----------------------------------|------------------------------|-----------------------------|
| <input type="radio"/>             | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="radio"/>             | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="radio"/>             | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="radio"/>             | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="radio"/> Other _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Explain If "No":

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What Is Condition of System?

(optional):

- |                                   |  |                                   |                                   |                                   |                                      |
|-----------------------------------|--|-----------------------------------|-----------------------------------|-----------------------------------|--------------------------------------|
| <input type="radio"/> Overall     | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) |
| <input type="radio"/>             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) |
| <input type="radio"/>             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) |
| <input type="radio"/>             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) |
| <input type="radio"/> Other _____ | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) |

Explain

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Quantify Scope If Replacement Indicated:

("D" or "F" grade)

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Remarks:

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## 5) ELECTRICAL DISTRIBUTION (REGARDING EMERGENCY POWER)

What Is System Type:

☐ The following loads connected to emergency power; are these loads in addition to any code required loads

- ☐ One luminaire per lab module with one switch per lab
- ☐ Biological safety cabinets
- ☐ Lab equipment alarm/monitoring system
- ☐ Fume hood exhaust fans
- ☐ Laboratory supply fans to ensure safe pressurization in the research labs when the fume exhaust fans are in operation
- ☐ Chilled water/heating hot water equipment serving the research labs only to ensure proper environmental conditions are maintained due to the high percentage of outside air. Consideration for not connecting to emergency power may be given to research labs located in moderate climate areas
- ☐ High-value specimen refrigerators, freezers, cold rooms, warm rooms, etc.
- ☐ Incubators
- ☐ One elevator per bank of elevators
- ☐ Other \_\_\_\_\_

Brief Description (optional):

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Is this System Appropriate for This Lab?

- |                                   |                              |                             |
|-----------------------------------|------------------------------|-----------------------------|
| <input type="radio"/>             | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="radio"/>             | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="radio"/>             | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="radio"/>             | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="radio"/> Other _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Explain If "No":

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What Is Condition of System?

Explain

(optional):

- |               |  |                                   |                                   |                                   |                                      |       |
|---------------|--|-----------------------------------|-----------------------------------|-----------------------------------|--------------------------------------|-------|
| ○ Overall     | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |
| ○             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |
| ○             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |
| ○             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |
| ○ Other _____ | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |

Quantify Scope If Replacement Indicated: \_\_\_\_\_  
("D" or "F" grade) \_\_\_\_\_

Remarks: \_\_\_\_\_  
\_\_\_\_\_

**6) ELECTRICAL DISTRIBUTION (VIVARIUM INCLUDING ABSL2 AND ABSL3)**

What Is System Type:

- ☐ Conduits in vivariums concealed
- ☐ Surface mounted conduits in washdown areas IMC or rigid galvanized steel with threaded couplings
- ☐ Conduits in vivarium areas sealed with a non-hardening sealant such as Duxseal at each device/junction box or seal-off fittings are provided in conduits penetrating vivarium walls with a potting compound poured into the fitting
- ☐ The isolated power panel provided serving branch circuits (Regarding vivarium operating room requirements)
- ☐ Branch circuit conductors provided with type XHHW insulation and #10 AWG ground conductors (Regarding vivarium operating room requirements)
- ☐ The isolated conductor colors orange and brown
- ☐ The following loads connected to emergency power; are these loads in addition to any code required loads?
  - Operating rooms
  - Ventilated animal cages and cage systems
  - CCTV cameras and equipment
  - Security system
  - Supply and exhaust fans serving the animal areas only.
  - Chilled water/heating hot water equipment serving the animal areas only to ensure proper environmental conditions are maintained due to the high percentage of outside air.
  - Animal area environmental monitoring system
  - One elevator per bank of elevators
- ☐ Other \_\_\_\_\_

Brief Description (optional): \_\_\_\_\_  
\_\_\_\_\_

Is this System Appropriate for This Lab?

Explain If "No":

- |               |                              |                             |       |
|---------------|------------------------------|-----------------------------|-------|
| ○             | <input type="checkbox"/> Yes | <input type="checkbox"/> No | _____ |
| ○             | <input type="checkbox"/> Yes | <input type="checkbox"/> No | _____ |
| ○             | <input type="checkbox"/> Yes | <input type="checkbox"/> No | _____ |
| ○             | <input type="checkbox"/> Yes | <input type="checkbox"/> No | _____ |
| ○ Other _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No | _____ |

\_\_\_\_\_

What Is Condition of System?

Explain

(optional):

- |               |  |                                   |                                   |                                   |                                      |       |
|---------------|--|-----------------------------------|-----------------------------------|-----------------------------------|--------------------------------------|-------|
| ○ Overall     | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |
| ○             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |
| ○             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |
| ○             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |
| ○ Other _____ | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |

Quantify Scope If Replacement Indicated: \_\_\_\_\_  
("D" or "F" grade) \_\_\_\_\_

Remarks: \_\_\_\_\_

**7) FIRE ALARM**

What Is System Type:

- ☐ Wiring installed in a metal conduit
- ☐ Smoke detectors are installed in corridors 1.5 m (5 ft) or wider
- ☐ Are corridors equipped with ionization-type smoke detectors if the building is not fully sprinklered or if the width of the corridor is greater than 1.5 m (5 ft)?
- ☐ a voice communication system provided in the animal holding/procedure areas
- ☐ the fire alarm speakers sound a "slow whoop" signal at 90-110 db for one cycle (4.1 seconds) followed by a repeated voice evacuation message; does the voice message continue until the fire alarm control panel is reset or the "alarm silence" switch is activated
- ☐ Other \_\_\_\_\_

Brief Description (optional): \_\_\_\_\_

Is this System Appropriate for This Lab?

Explain If "No":

- |               |                              |                             |       |
|---------------|------------------------------|-----------------------------|-------|
| ○             | <input type="checkbox"/> Yes | <input type="checkbox"/> No | _____ |
| ○             | <input type="checkbox"/> Yes | <input type="checkbox"/> No | _____ |
| ○             | <input type="checkbox"/> Yes | <input type="checkbox"/> No | _____ |
| ○             | <input type="checkbox"/> Yes | <input type="checkbox"/> No | _____ |
| ○ Other _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No | _____ |

What Is Condition of System?

Explain

(optional):

- |               |  |                                   |                                   |                                   |                                      |       |
|---------------|--|-----------------------------------|-----------------------------------|-----------------------------------|--------------------------------------|-------|
| ○ Overall     | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |
| ○             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |
| ○             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |
| ○             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |
| ○ Other _____ | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |

Quantify Scope If Replacement Indicated: \_\_\_\_\_  
("D" or "F" grade) \_\_\_\_\_

Remarks: \_\_\_\_\_

## 8) COMMUNICATIONS

### What Is System Type:

- ☐ A cable tray is provided for cable pathway to the main distribution frame (MDF), building distribution frame (BDF) or intermediate distribution frame (IDF)
- ☐ Are the MDF, BDF and IDF rooms environmentally conditioned meeting the following requirements?
  - ☐ Is there dedicated temperature control?
  - ☐ Is the temperature: 5-25°C (41-77°F)?
  - ☐ Is the relative humidity: 30-60%?
- ☐ Are the MDF, IDF and BDF rooms located so that the horizontal cabling from the telecommunications outlet to the MDF, BDF or IDF is not greater than 90 m ( 295 ft)?
- ☐ Are the Emergency/standby receptacles are provided in the MDF, BDF or IDF rooms?
- ☐ Regarding MDF, BDF or IDF room requirements:
  - ☐ Is the Minimum size: 9 m<sup>2</sup> (100 ft<sup>2</sup>)?
  - ☐ Is it located to serve a maximum area of 900 m<sup>2</sup> (10,000 ft<sup>2</sup>)?
- ☐ Other \_\_\_\_\_

Brief Description (optional): \_\_\_\_\_

### Is this System Appropriate for This Lab?

### Explain If "No":

- |                                   |                              |                             |       |
|-----------------------------------|------------------------------|-----------------------------|-------|
| <input type="radio"/>             | <input type="checkbox"/> Yes | <input type="checkbox"/> No | _____ |
| <input type="radio"/>             | <input type="checkbox"/> Yes | <input type="checkbox"/> No | _____ |
| <input type="radio"/>             | <input type="checkbox"/> Yes | <input type="checkbox"/> No | _____ |
| <input type="radio"/>             | <input type="checkbox"/> Yes | <input type="checkbox"/> No | _____ |
| <input type="radio"/> Other _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No | _____ |

### What Is Condition of System? (optional):

### Explain

- |                                   |  |                                   |                                   |                                   |                                      |       |
|-----------------------------------|--|-----------------------------------|-----------------------------------|-----------------------------------|--------------------------------------|-------|
| <input type="radio"/> Overall     | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |
| <input type="radio"/>             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |
| <input type="radio"/>             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |
| <input type="radio"/>             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |
| <input type="radio"/> Other _____ | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |

Quantify Scope If Replacement Indicated: \_\_\_\_\_  
("D" or "F" grade) \_\_\_\_\_

Remarks: \_\_\_\_\_

\_\_\_\_\_

## 9) LIGHTING

What Is System Type:

- ☐ The Offices 500-800 lux (50-80 fc) (Regarding lighting levels)
- ☐ The Laboratories 800-1,075 lux (80-107.5 fc) (Regarding lighting levels)
- ☐ The Lab equipment rooms 325-525 lux (32.5-52.5 fc) (Regarding lighting levels)
- ☐ Do lighting intensity and uniformity provide shadow-free illumination of the work surface?
- ☐ Are the luminaires in BSL3 labs sealed and gasketed with inverted prismatic lens to provide a smooth surface for cleaning?
- ☐ Lighting control in animal holding rooms dimmable and have time of day automatic control
- ☐ Other \_\_\_\_\_

Brief Description (optional): \_\_\_\_\_

Is this System Appropriate for This Lab?

- |                                   |                              |                             |
|-----------------------------------|------------------------------|-----------------------------|
| <input type="radio"/>             | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="radio"/>             | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="radio"/>             | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="radio"/>             | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="radio"/> Other _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Explain If "No":

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

What Is Condition of System?

(optional):

- |                                   |  |                                   |                                   |                                   |                                      |
|-----------------------------------|--|-----------------------------------|-----------------------------------|-----------------------------------|--------------------------------------|
| <input type="radio"/> Overall     | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) |
| <input type="radio"/>             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) |
| <input type="radio"/>             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) |
| <input type="radio"/>             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) |
| <input type="radio"/> Other _____ | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) |

Explain

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Quantify Scope If Replacement Indicated: \_\_\_\_\_

("D" or "F" grade)

Remarks: \_\_\_\_\_

## 10) MONITORING

What Is System Type:

- ☐ Is lab equipment (such as freezers which need to be monitored for alarm conditions) monitored
- ☐ Other \_\_\_\_\_

Brief Description (optional): \_\_\_\_\_

Is this System Appropriate for This Lab?

- |                                   |                              |                             |
|-----------------------------------|------------------------------|-----------------------------|
| <input type="radio"/>             | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="radio"/>             | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="radio"/>             | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="radio"/>             | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="radio"/> Other _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Explain If "No":

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

What Is Condition of System?

Explain

(optional):

- |               |  |                                   |                                   |                                   |                                      |       |
|---------------|--|-----------------------------------|-----------------------------------|-----------------------------------|--------------------------------------|-------|
| ○ Overall     | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |
| ○             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |
| ○             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |
| ○             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |
| ○ Other _____ | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |

Quantify Scope If Replacement Indicated: \_\_\_\_\_  
("D" or "F" grade) \_\_\_\_\_

Remarks: \_\_\_\_\_  
\_\_\_\_\_

**11) SECURITY**

What Is System Type:

- ☐ An access control system provided for the vivarium areas (Regarding MDF, BDF or IDF room requirements)
- ☐ Other \_\_\_\_\_

Brief Description (optional): \_\_\_\_\_  
\_\_\_\_\_

Is this System Appropriate for This Lab?

Explain If "No":

- |               |                              |                             |       |
|---------------|------------------------------|-----------------------------|-------|
| ○             | <input type="checkbox"/> Yes | <input type="checkbox"/> No | _____ |
| ○             | <input type="checkbox"/> Yes | <input type="checkbox"/> No | _____ |
| ○             | <input type="checkbox"/> Yes | <input type="checkbox"/> No | _____ |
| ○             | <input type="checkbox"/> Yes | <input type="checkbox"/> No | _____ |
| ○ Other _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No | _____ |

What Is Condition of System?

Explain

(optional):

- |               |  |                                   |                                   |                                   |                                      |       |
|---------------|--|-----------------------------------|-----------------------------------|-----------------------------------|--------------------------------------|-------|
| ○ Overall     | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |
| ○             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |
| ○             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |
| ○             | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |
| ○ Other _____ | <input type="checkbox"/> A (excellent) | <input type="checkbox"/> B (good) | <input type="checkbox"/> C (fair) | <input type="checkbox"/> D (poor) | <input type="checkbox"/> F (failing) | _____ |

Quantify Scope If Replacement Indicated: \_\_\_\_\_  
("D" or "F" grade) \_\_\_\_\_

Remarks: \_\_\_\_\_  
\_\_\_\_\_



## Appendix C. Summary Cost Data

VISN	Sta. ID	VA Medical Facility	Sites	Bldgs	Corrections	Priority 1 Deficiencies	Replacement	Campus FCI
1	405	White River Junction (VT) VAMC	1	2	\$ 6,860,000	7%	\$ 24,406,000	28%
1	518	Edith Nourse Rogers Memorial Veterans Hospital, Bedford, MA	1	3	\$ 11,718,000	6%	\$ 20,213,000	58%
1	523	VA Boston (MA) Health Care System	3	8	\$ 11,770,000	29%	\$ 60,737,000	19%
1	650	Providence (RI) VAMC	1	2	\$ 3,622,000	17%	\$ 12,810,000	28%
1	689	VA Connecticut Healthcare System, West Haven, CT	1	6	\$ 14,771,000	34%	\$ 50,333,000	29%
		<b>VISN 1 Totals:</b>	<b>7</b>	<b>21</b>	<b>\$ 48,741,000</b>	<b>19% (average)</b>	<b>\$ 168,499,000</b>	
2	528	VA Western New York Healthcare System, Buffalo, NY	1	1	\$ 7,090,000	13%	\$ 45,022,000	16%
2	670	Syracuse (NY) VAMC	1	2	\$ 9,878,000	59%	\$ 23,068,000	43%
		<b>VISN 2 Totals:</b>	<b>2</b>	<b>3</b>	<b>\$ 16,968,000</b>	<b>36% (average)</b>	<b>\$ 68,090,000</b>	
3	526	James J. Peters VA Medical Center, Bronx, NY	1	1	\$ 15,171,000	5%	\$ 75,596,000	20%
3	561	VA New Jersey Health Care System, East Orange, NJ	1	3	\$ 8,653,000	16%	\$ 35,793,000	24%
3	630	VA New York Harbor Healthcare System, Manhattan and Brooklyn, NY	2	2	\$ 17,805,000	8%	\$ 26,800,000	66%
3	632	Northport (NY) VA Medical Center	1	2	\$ 18,205,000	25%	\$ 31,030,000	59%
		<b>VISN 3 Totals:</b>	<b>5</b>	<b>8</b>	<b>\$59,834,000</b>	<b>16% (average)</b>	<b>\$169,219,000</b>	
4	642	Philadelphia (PA) VA Medical Center	1	1	\$ 12,296,000	15%	\$ 37,420,000	33%
4	646	VA Pittsburgh (PA) Healthcare System, Univ. Drive	1	2	\$ 6,913,000	28%	\$ 23,799,000	29%
		<b>VISN 4 Totals:</b>	<b>2</b>	<b>3</b>	<b>\$19,209,000</b>	<b>22% (average)</b>	<b>\$ 61,219,000</b>	

## Appendix C. Summary Cost Data

VISN	Sta. ID	VA Medical Facility	Sites	Bldgs	Corrections	Priority 1 Deficiencies	Replacement	Campus FCI
5	512	VA Maryland Health Care System, Baltimore, MD	1	1	\$ 6,636,000	17%	\$ 62,890,000	10%
5	688	Washington DC VA Medical Center	1	2	\$ 10,300,000	30%	\$ 34,102,000	30%
		<b>VISN 5 Totals:</b>	<b>2</b>	<b>3</b>	<b>\$16,936,000</b>	<b>24% (average)</b>	<b>\$ 96,992,000</b>	
6	558	Durham (NC) VA Medical Center	1	5	\$ 10,018,000	37%	\$ 41,779,000	24%
6	652	Hunter Holmes McGuire VA Medical Center, Richmond, VA	1	1	\$ 4,240,000	15%	\$ 34,791,000	12%
		<b>VISN 6 Totals:</b>	<b>2</b>	<b>6</b>	<b>\$ 14,258,000</b>	<b>26% (average)</b>	<b>\$ 76,570,000</b>	
7	508	Atlanta (GA) VA Medical Center	1	2	\$ 6,272,000	10%	\$ 41,181,000	15%
7	509	Charlie Norwood VA Medical Center, Augusta, GA	1	1	\$ 7,812,000	6%	\$ 27,019,000	29%
7	521	Birmingham (AL) VA Medical Center	1	1	\$ 1,147,000	15%	\$ 8,626,000	13%
7	544	Wm. Jennings Bryan Dorn VA Medical Center, Columbia, SC	1	1	\$ 4,635,000	30%	\$ 8,093,000	57%
		<b>VISN 7 Totals:</b>	<b>4</b>	<b>5</b>	<b>\$ 19,866,000</b>	<b>15% (average)</b>	<b>\$ 84,919,000</b>	
8	516	Bay Pines (FL) VA Healthcare System	1	1	\$ 4,077,000	39%	\$ 20,376,000	20%
8	546	Miami (FL) VA Healthcare System	1	3	\$ 11,124,000	22%	\$ 42,234,000	26%
8	573	North Florida/South Georgia Veterans Health System, Gainesville, FL	1	2	\$ 9,629,000	30%	\$ 43,993,000	22%
8	673	James A. Haley Veterans' Hospital, Tampa, FL	1	1	\$ 9,567,000	39%	\$ 30,200,000	32%
		<b>VISN 8 Totals:</b>	<b>4</b>	<b>7</b>	<b>\$ 34,397,000</b>	<b>33% (average)</b>	<b>\$ 136,803,000</b>	

## Appendix C. Summary Cost Data

VISN	Sta. ID	VA Medical Facility	Sites	Bldgs	Corrections	Priority 1 Deficiencies	Replacement	Campus FCI
9	596	Lexington (KY) VA Medical Center, Cooper Drive Div.	1	1	\$ 4,561,000	38%	\$ 28,017,000	16%
9	603	Robley Rex VA Medical Center, Louisville, KY	1	3	\$ 7,442,000	41%	\$ 14,494,000	51%
9	614	Memphis (TN) VA Medical Center	1	2	\$ 16,614,000	34%	\$ 51,185,000	32%
9	621	James H. Quillen VA Medical Center, Mountain Home, TN	1	1	\$ 412,000	4%	\$ 2,941,000	14%
9	626	Tennessee Valley Healthcare System, Nashville, TN	1	1	\$ 15,063,000	35%	\$ 35,495,000	42%
		<b>VISN 9 Totals:</b>	<b>5</b>	<b>8</b>	<b>\$ 44,092,000</b>	<b>30% (average)</b>	<b>\$ 132,132,000</b>	
10	539	Cincinnati (OH) VA Medical Center	1	2	\$ 8,655,000	22%	\$ 21,364,000	41%
10	541	Louis Stokes VA Medical Center, Cleveland, OH	1	1	\$ 5,176,000	8%	\$ 40,939,000	13%
		<b>VISN 10 Totals:</b>	<b>2</b>	<b>3</b>	<b>\$ 13,831,000</b>	<b>15% (average)</b>	<b>\$ 62,303,000</b>	
11	506	VA Ann Arbor (MI) Healthcare System	1	2	\$ 7,279,000	22%	\$ 39,335,000	19%
11	553	John D. Dingell VA Medical Center, Detroit, MI	1	1	\$ 6,419,000	34%	\$ 54,161,000	12%
11	583	Richard L. Roudebush VA Medical Center, Indianapolis, IN	1	1	\$ 2,698,000	13%	\$ 29,667,000	9%
		<b>VISN 11 Totals:</b>	<b>3</b>	<b>4</b>	<b>\$ 16,396,000</b>	<b>23% (average)</b>	<b>\$ 123,163,000</b>	
12	537	Jesse Brown VA Medical Center, Chicago, IL	1	2	\$ 4,799,000	50%	\$ 44,187,000	11%
12	578	Edward Hines Jr. VA Hospital, Hines, IL	2	4	\$ 34,032,000	75%	\$ 103,310,000	33%
12	607	William S. Middleton Memorial Veterans' Hospital, Madison, WI	1	3	\$ 8,555,000	67%	\$ 20,620,000	41%
12	695	Clement J. Zablocki VA Medical Center, Milwaukee, WI	1	1	\$ 53,993,000	81%	\$ 73,158,000	74%
		<b>VISN 12 Totals:</b>	<b>5</b>	<b>10</b>	<b>\$ 101,379,000</b>	<b>68% (average)</b>	<b>\$ 241,275,000</b>	

## Appendix C. Summary Cost Data

VISN	Sta. ID	VA Medical Facility	Sites	Bldgs	Corrections	Priority 1 Deficiencies	Replacement	Campus FCI
15	543	Harry S. Truman Memorial Veterans' Hospital, Columbia, MO	1	1	\$ 3,038,000	10%	\$ 35,490,000	9%
15	589	Kansas City (MO) VA Medical Center	1	2	\$ 17,501,000	63%	\$ 33,957,000	52%
15	657	St. Louis (MO) VA Medical Center	2	4	\$ 9,193,000	8%	\$ 33,591,000	27%
		<b>VISN 15 Totals:</b>	<b>4</b>	<b>7</b>	<b>\$ 29,732,000</b>	<b>27% (average)</b>	<b>\$ 103,038,000</b>	
16	580	Michael E. DeBakey VA Medical Center, Houston, TX	1	3	\$ 8,673,590	7%	\$ 63,377,000	14%
16	586	G.V. (Sonny) Montgomery VA Medical Center, Jackson, MS	1	1	\$ 6,647,000	75%	\$ 7,825,000	85%
16	598	Central Arkansas Veterans Healthcare System, John L. McClellan Memorial Veterans Hospital, Little Rock, AR	1	1	\$ 3,344,835	52%	\$ 25,312,985	13%
16	635	Oklahoma City (OK) VA Medical Center	1	1	\$ 13,024,000	61%	\$ 21,688,000	60%
		<b>VISN 16 Totals:</b>	<b>4</b>	<b>6</b>	<b>\$ 31,689,425</b>	<b>49% (average)</b>	<b>\$ 118,202,985</b>	
17	549	VA North Texas Health Care System: Dallas (TX) VA Medical Center	1	2	\$ 17,106,000	24%	\$ 36,322,000	47%
17	671	South Texas Veterans Health Care System, Audie L. Murphy VA Hospital, San Antonio, TX	1	1	\$ 2,659,450	3%	\$ 13,800,000	19%
17	674	Central Texas Veterans Health Care System, Olin E. Teague Veterans' Medical Center, Temple, TX	1	2	\$ 2,842,000	22%	\$ 37,652,000	8%
		<b>VISN 17 Totals:</b>	<b>3</b>	<b>5</b>	<b>\$ 22,607,450</b>	<b>16% (average)</b>	<b>\$ 87,774,000</b>	

## Appendix C. Summary Cost Data

VISN	Sta. ID	VA Medical Facility	Sites	Bldgs	Corrections	Priority 1 Deficiencies	Replacement	Campus FCI
18	501	New Mexico VA Health Care System, Raymond G. Murphy VA Medical Center, Albuquerque, NM	1	2	\$ 7,656,000	11%	\$ 19,996,000	38%
18	644	Phoenix (AZ) VA Health Care System, Carl T. Hayden VA Medical Center	1	2	\$ 1,039,000	66%	\$ 11,909,000	9%
18	678	Southern Arizona VA Health Care System, Tucson, AZ	1	5	\$ 8,814,000	13%	\$ 31,112,000	28%
		<b>VISN 18 Totals:</b>	<b>3</b>	<b>9</b>	<b>\$ 17,509,000</b>	<b>30% (average)</b>	<b>\$ 63,017,000</b>	
19	554	VA Eastern Colorado Health Care System, Denver, CO	1	4	\$ 8,720,000	11%	\$ 50,854,000	17%
19	660	VA Salt Lake City Health Care System, Salt Lake City, UT	1	7	\$ 4,919,700	37%	\$ 28,200,000	17%
		<b>VISN 19 Totals:</b>	<b>2</b>	<b>11</b>	<b>\$ 13,639,700</b>	<b>24% (average)</b>	<b>\$ 79,054,000</b>	
20	531	Boise (ID) VA Medical Center	1	2	\$ 852,900	37%	\$ 6,400,000	13%
20	648	Portland (OR) VA Medical Center	1	4	\$ 13,774,000	15%	\$ 84,362,000	16%
20	663	VA Puget Sound Health Care System, Seattle, WA	1	6	\$ 10,511,000	20%	\$ 80,568,000	13%
		<b>VISN 20 Totals:</b>	<b>3</b>	<b>12</b>	<b>\$ 25,137,900</b>	<b>21% (average)</b>	<b>\$ 171,330,000</b>	
21	612	VA Northern California Health Care System, Sacramento Valley (Mather, CA) and East Bay (Martinez, CA) Divisions	2	2	\$ 2,049,000	3%	\$ 25,859,000	8%
21	640	VA Palo Alto (CA) Health Care System	1	9	\$ 14,801,000	19%	\$ 106,789,000	14%
21	662	San Francisco (CA) VA Medical Center	1	6	\$ 40,892,000	36%	\$ 90,611,000	45%
		<b>VISN 21 Totals:</b>	<b>4</b>	<b>17</b>	<b>\$ 57,742,000</b>	<b>19% (average)</b>	<b>\$ 223,259,000</b>	

## Appendix C. Summary Cost Data

VISN	Sta. ID	VA Medical Facility	Sites	Bldgs	Corrections	Priority 1 Deficiencies	Replacement	Campus FCI
22	600	VA Long Beach (CA) Healthcare System	1	1	\$ 11,018,000	51%	\$ 40,097,000	27%
22	605	Jerry L. Pettis Memorial VA Medical Center, VA Loma Linda (CA) Healthcare System	1	1	\$ 15,902,000	67%	\$ 36,369,000	44%
22	664	VA San Diego (CA) Healthcare System	1	1	\$ 28,694,000	60%	\$ 93,637,000	31%
22	691	VA Greater Los Angeles HCS: West Los Angeles, CA	1	8	\$ 70,557,000	50%	\$ 136,467,000	52%
22	691A4	VA Greater Los Angeles HCS: Sepulveda, CA	1	5	\$ 16,880,000	60%	\$ 46,385,000	36%
		<b>VISN 22 Totals:</b>	<b>5</b>	<b>16</b>	<b>\$ 143,051,000</b>	<b>58% (average)</b>	<b>\$ 352,955,000</b>	
23	584	Iowa City (IA) VA Health Care System	1	4	\$ 5,043,000	6%	\$ 37,411,000	13%
23	618	Minneapolis (MN) VA Health Care System	1	2	\$ 14,634,000	52%	\$ 81,350,000	18%
23	636	VA Nebraska-Western Iowa Health Care System, Omaha, NE	1	1	\$ 7,271,000	54%	\$ 30,759,000	24%
		<b>VISN 23 Totals:</b>	<b>3</b>	<b>7</b>	<b>\$ 26,948,000</b>	<b>37% (average)</b>	<b>\$ 149,520,000</b>	

## Appendix D. Summary of Life Safety Hazards

VISN	Sta. ID.	VA Medical Facility	Life Safety/Remediated	Life Safety/Not Remediated	In Progress
1	405	White River Junction (VT) VAMC		Receptacles near water sources are not ground fault protected. In T-44, a fume hood is blocking egress.	
1	518	Edith Nourse Rogers Memorial Veterans Hospital, Bedford, MA		Receptacles near water sources are not ground fault protected. Need emergency showers in Buildings 17 and 18. Fire alarm system needs annunciation devices (accessibility issue).	Station is funded for design of new fire alarm system, campus-wide.
1	523	VA Boston (MA) HCS: Jamaica Plain Campus		A safety shower and eyewash are needed in the cage wash area of Bldg 7.	
1	523	VA Boston (MA) HCS: West Roxbury Campus		Safety showers/eyewashes needed in Buildings 22 and 30. Buildings are slated for demolition, making this a moot point.	
1	523	VA Boston (MA) HCS: Brockton Campus		No safety showers in Buildings 44 and 46 (the local safety officer questions the need for showers). Both buildings need new fire alarm systems.	Station is funded for fire alarm improvements this fiscal year.
1	650	Providence (RI) VAMC	Installed safety showers in laboratory building and an emergency eyewash in VMU (cage wash area).	No safety shower in the VMU (cage wash area).	
1	689	VA Connecticut Healthcare System, West Haven, CT	Additional safety showers and eyewashes have been installed.	Fire alarm system improvements are needed (in all but Buildings 34/34A). Annunciation devices are lacking (accessibility issue) and/or are not located appropriately.	
2	528	VA Western New York Healthcare System, Buffalo, NY	Deficiencies with safety showers and eyewashes have been corrected.	Receptacles near water sources are not ground fault protected.	Fire alarm system upgrade is underway (adding annunciation devices and smoke detection).



## Appendix D. Summary of Life Safety Hazards

VISN	Sta. ID.	VA Medical Facility	Life Safety/Remediated	Life Safety/Not Remediated	In Progress
2	670	Syracuse (NY) VAMC	Installed ground fault protected receptacles near water sources. Installed safety showers and eyewashes that meet requirements.	Building D sprinkler heads need to be relocated.	
3	526	James J. Peters VA Medical Center, Bronx, NY		Exhaust may be tied into building general exhaust rather than fume hood exhaust; oxygen sensor needed where liquid nitrogen is dispensed; needs full coverage sprinkler system; exit signs and egress lighting do not have batteries or generator connection; and some receptacles near water sources are not ground fault protected.	ORD provided funding for oxygen sensors. Sprinkler system will be extended in upcoming renovation projects.
3	561	VA New Jersey Health Care System, East Orange, NJ		Safety showers and eyewashes do not meet current requirements.	Receptacles near water sources are being replaced with ground fault protected receptacles.
3	630	VA New York Harbor Healthcare System, Manhattan and Brooklyn, NY		Manhattan campus: A flammable storage room does not have fire rated walls.	Deficiency will be corrected as part of an FY11 NRM project.
3	632	Northport (NY) VA Medical Center	Deficiencies with safety showers and eyewashes have been corrected.	In one laboratory, a fume hood is next to the door blocking egress.	Ground fault protected receptacles and exit lights are being installed. Fire alarms and sprinkler systems are being upgraded.
4	642	Philadelphia (PA) VA Medical Center			Receptacles near water sources are being updated with ground fault protection where needed.

## Appendix D. Summary of Life Safety Hazards

VISN	Sta. ID.	VA Medical Facility	Life Safety/Remediated	Life Safety/Not Remediated	In Progress
4	646	VA Pittsburgh (PA) Healthcare System, Univ. Drive Divison		There are no safety showers in either building, no ground fault protected receptacles near water sources, fume hood is blocking egress from a laboratory, some sprinkler heads are blocked in Building 6, fire alarm strobes are missing in Building 6 laboratories. (Local safety officer questions the need for fire alarm strobes.)	
5	512	VA Maryland Health Care System, Baltimore, MD			Fire alarm system being upgraded; safety showers are being upgraded to include eyewashes; ground fault protected receptacles are being installed near water sources.
5	688	Washington DC VA Medical Center	The sprinkler and fire alarm systems have been upgraded to provide full coverage.	Safety showers and emergency eyewashes do not meet current requirements. Not all receptacles near water sources are ground fault protected.	ORD provided funding for showers and eyewashes, project is scheduled for completion.
6	558	Durham (NC) VA Medical Center	Fire alarm systems have been upgraded.	Building 16 lacks sprinkler coverage.	
6	652	Hunter Holmes McGuire VA Medical Center, Richmond, VA		Safety showers are needed; HVAC controls in VMU are set to fail in the wrong position; some receptacles near water sources are not ground fault protected; and oxygen sensors are needed in rooms where liquid nitrogen is dispensed.	The local Facilities Management Service is planning to remediate the deficiencies on a priority basis and as funds become available. ORD provided funding to offset purchase of flammable storage cabinets (already ordered by the station) and also for safety showers. Additional funds are needed to complete.
7	508	Atlanta (GA) VA Medical Center			

## Appendix D. Summary of Life Safety Hazards

VISN	Sta. ID.	VA Medical Facility	Life Safety/Remediated	Life Safety/Not Remediated	In Progress
7	509	Charlie Norwood VA Medical Center, Augusta, GA	Deficiencies with eyewash units have been corrected.		
7	521	Birmingham (AL) VA Medical Center	Fire alarm system: visual and/or audio fire alarm devices have been installed in corridors. Safety showers have been installed.		A smoke detector will be installed in the communications room.
7	544	William Jennings Bryan Dorn VA Medical Center, Columbia, SC		Building 9 has no sprinkler system.	Deficiency will be corrected as part of an FY11 NRM project.
8	516	Bay Pines (FL) VA Healthcare System	Showers and eyewashes have been added.	Receptacles near water sources not ground fault protected, sprinkler system has only partial coverage.	Both deficiencies to be remediated as part of Minor Construction project.
8	546	Miami (FL) VA Healthcare System		VMU mechanical system controls are set to fail in the incorrect position. Emergency showers and eyewashes do not meet current requirements. There are no smoke detectors. The fire alarm system is lacking annunciators (accessibility issue). There is inappropriate use of hydrogen fluoride in Bldg 8/9, rm 128. Receptacles near water sources not ground fault protected.	ORD provided funding to remediate safety shower deficiency.
8	573	North Florida/South Georgia Veterans Health System, Gainesville, FL		There are no emergency showers and some eyewashes are not of the appropriate type. Both Buildings 1 and 11 are only partially covered by sprinkler systems. Receptacles near water sources are not ground fault protected.	

## Appendix D. Summary of Life Safety Hazards

VISN	Sta. ID.	VA Medical Facility	Life Safety/Remediated	Life Safety/Not Remediated	In Progress
8	673	James A. Haley Veterans' Hospital, Tampa, FL		Space is only partially covered by sprinkler system. Emergency eyewashes and showers do not meet current requirements.	The fire alarm system is being upgraded (campus-wide).
9	596	Lexington (KY) VA Medical Center, Cooper Drive Div.		There are no fire alarm strobes in the laboratories (accessibility issue). Safety showers in corridors are lacking eyewash units.	ORD provided funding for correction of shower/eyewash deficiency and addition of fire alarm annunciators.
9	603	Robley Rex VA Medical Center, Louisville, KY	Fire alarm systems have been upgraded. Deficiencies with safety showers and eyewashes have been corrected.	Buildings 12 and 19 have only partial sprinkler coverage. Some receptacles near water sources are lacking ground fault protection.	
9	614	Memphis (TN) VA Medical Center	Emergency eyewashes have been replaced with code compliant units.		
9	621	James H. Quillen VA Medical Center, Mountain Home, TN	Oxygen sensor was installed in a room in which liquid nitrogen was being used.		
9	626	Tennessee Valley Healthcare System, Nashville, TN	Safety showers and eyewashes have been upgraded to meet current requirements on the fifth floor (renovation completed on fifth floor).	Safety showers and emergency eyewashes do not meet current requirements.	Safety showers and emergency eyewashes will be corrected throughout the research laboratory space as it is renovated.
10	539	Cincinnati (OH) VA Medical Center		In both Buildings 1 and 15, some receptacles near water sources are not ground fault protected. In Building 15, safety showers and eyewashes do not meet requirements.	The renovation of Building 15 will resolve the issues affecting that building.

## Appendix D. Summary of Life Safety Hazards

VISN	Sta. ID.	VA Medical Facility	Life Safety/Remediated	Life Safety/Not Remediated	In Progress
10	541	Louis Stokes VA Medical Center, Cleveland, OH		Corridors are lacking fire sprinklers. Smoke detection devices should be in areas not covered by sprinkler system. Not all receptacles near water sources are <u>ground fault protected</u> .	
11	506	VA Ann Arbor (MI) Healthcare System		Fire alarm system is lacking strobe lights (accessibility issue). Eyewashes in Building 31 are handheld rather than hands-free units. In Building 22, safety showers in corridors lack eyewash units.	A project to correct safety shower and eyewash deficiencies is expected to be completed in FY12.
11	553	John D. Dingell VA Medical Center, Detroit, MI	Emergency eyewash and shower have been installed in the cage wash area of the VMU and in a <u>darkroom</u> .	Not all receptacles near water sources are ground fault protected.	
11	583	Richard L. Roudebush VA Medical Center, Indianapolis, IN	Emergency eyewashes have been installed where required.		
12	537	Jesse Brown VA Medical Center, Chicago, IL		In Building 11, safety showers and eyewashes do not meet current requirements (either located inappropriately or wrong type of unit). Receptacles near water sources are not ground fault protected.	ORD provided funding for correction of shower/eyewash deficiency. Additional funds are needed to complete the project.

## Appendix D. Summary of Life Safety Hazards

VISN	Sta. ID.	VA Medical Facility	Life Safety/Remediated	Life Safety/Not Remediated	In Progress
12	578	Edward Hines Jr. VA Hospital, Hines, IL	Fume hood inspection performed.	Safety showers and eyewashes do not meet current requirements (some showers are lacking eyewashes, some showers have pull handles that are not accessible, some eyewashes are the incorrect type of unit); oxygen sensors are needed in areas where liquid nitrogen is in use; receptacles near water sources are not ground fault protected. There is only partial sprinkler system coverage and limited smoke detection.	ORD provided funding for correction of shower/eyewash deficiency. Work orders have been submitted to correct remaining life safety deficiencies.
12	607	William S. Middleton Memorial Veterans' Hospital, Madison, WI	Fume hoods not operating properly have been repaired, replaced, or decommissioned. Additional showers and eyewashes have been installed.		
12	695	Clement J. Zablocki VA Medical Center, Milwaukee, WI	Fire alarm system has been upgraded.	Building 70 has only partial sprinkler coverage. Some additional safety showers and eyewashes are needed.	
15	543	Harry S. Truman Memorial Veterans' Hospital, Columbia, MO	Seismic lips have been installed on reagent shelving. Liquid oxygen is no longer being dispensed in an area without an oxygen sensor.	Receptacles near water sources are not ground fault protected. The fire alarm system needs manual pull stations and voice communication devices (accessibility issue).	The following items are expected to be remediated in FY12: electrical receptacles and fire alarm system upgrade.
15	589	Kansas City (MO) VA Medical Center		Building 15 sprinkler heads are not appropriately located. Safety showers and eyewashes do not meet current requirements (showers in corridors lack eyewash units).	

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VISN	Sta. ID.	VA Medical Facility	Life Safety/Remediated	Life Safety/Not Remediated	In Progress
15	657	St. Louis (MO) VA Medical Center, John Cochran and Jefferson Barracks Divisions		Buildings 6 and 7, John Cochran Division, are only partially covered by sprinkler system. Smoke detection is lacking. Building 6 lacks plumbed eyewashes and safety showers. Building 7 needs eyewashes at laboratory sinks. Not all receptacles near water sources are ground fault protected. Seismic lips are needed on reagent shelving.	ORD provided funding for shower and eyewash unit deficiencies, and for installation of seismic lips.
16	580	Michael E. DeBakey VA Medical Center, Houston, TX	Sprinkler systems have been installed/extended and fire alarm systems updated in Buildings 109 and 110. Ground fault protected receptacles have been installed near water sources in the VMU.	Some spaces are lacking safety showers and/or eyewashes.	
16	586	G.V. (Sonny) Montgomery VA Medical Center, Jackson, MS		There is no sprinkler system. Receptacles near water sources are not ground fault protected. Some spaces are not covered by safety showers. Some eyewashes do not meet current requirements (wrong type of unit). The fire alarm system is deficient (needs more annunciators - accessibility issue). In at least one laboratory, an electric panel is over a sink. There are no fire dampers in the ventilation system.	A sprinkler system is being installed, funded by NRM FY11.
16	598	Central Arkansas Veterans Healthcare System, John L. McClellan Memorial Veterans Hospital, Little Rock, AR	Deficiencies with safety showers and eyewashes have been corrected.		



## Appendix D. Summary of Life Safety Hazards

VISN	Sta. ID.	VA Medical Facility	Life Safety/Remediated	Life Safety/Not Remediated	In Progress
16	635	Oklahoma City (OK) VA Medical Center	Deficiencies with safety showers and eyewashes have been corrected.	The sprinkler system is in poor condition and should be replaced.	A renovation is planned for the laboratory space that should correct the sprinkler system deficiency.
17	549	VA North Texas Health Care System: Dallas (TX) VA Medical Center	Emergency eyewash units have been installed in Building 3. A new fire alarm system was installed in Building 43, but it still does not have addressable notification devices.	Building 43 is lacking ground fault protected receptacles near water sources. Building 43 is only partially covered by a sprinkler system.	
17	671	South Texas Veterans Health Care System, Audie L. Murphy VA Hospital, San Antonio, TX		Sprinkler system coverage is partial. Emergency eyewashes do not meet requirements (wrong type of unit). The second floor laboratories do not have ground fault protected receptacles near water sources.	ORD provided funding for emergency eyewash units.
17	674	Central Texas Veterans Health Care System, Olin E. Teague Veterans' Medical Center, Temple, TX		Buildings 162 and 205 lack safety showers. (The local safety officer reported showers are not needed due to low chemical usage.) Also, in both buildings receptacles near water sources are not ground fault protected. (Note: Bldg 162 is being decommissioned.)	Receptacles in Bldg 205 are being updated with ground fault protection.
18	501	New Mexico VA Health Care System, Raymond G. Murphy VA Medical Center, Albuquerque, NM	Eyewash units have been added to Building 10.	No sprinkler system in VMU.	A sprinkler system will be installed during upcoming construction/renovation.
18	644	Phoenix (AZ) VA Health Care System, Carl T. Hayden VA Medical Center	Replaced fire alarm system in Building 21.		
18	678	Southern Arizona VA Health Care System, Tucson, AZ	Installed new fire alarm in Building 6. Corrected shower/eyewash deficiency in Building 38.	Several buildings (6, 10, 56) are lacking sprinkler system coverage. Bldg 10 needs a new fire alarm system.	Sprinkler and fire alarm deficiencies in Building 10 will be corrected with upcoming NRM project.

## Appendix D. Summary of Life Safety Hazards

VISN	Sta. ID.	VA Medical Facility	Life Safety/Remediated	Life Safety/Not Remediated	In Progress
19	554	VA Eastern Colorado Health Care System, Denver, CO	In the VMU, HVAC controls have been corrected to fail in the proper position to prevent overheating.	Safety showers and eyewashes do not meet current requirements (insufficient units). In Building 1: a number of penetrations have firestopping at the acoustic panel ceiling; and there is no smoke detection in the communications room serving research. In Buildings 19 and 23, there is liquid nitrogen in use without an oxygen sensor. In Buildings 19 and 21, there are receptacles near water sources that are not ground fault protected. In Building 21, there is a sink with an electric panel over it; and there is a laboratory in which desk space is in front of a fume hood.	
19	660	VA Salt Lake City Health Care System, Salt Lake City, UT	A safety shower and emergency eyewash have been installed in the VMU cage wash area.	Bldg 7 (VMU) is lacking full sprinkler system coverage, as are the outbuildings that support the VMU. The outbuildings also have no fire alarm systems.	ORD provided funding for improvements to fire alarm system, Building 7.
20	531	Boise (ID) VA Medical Center		Bldg 109 has only partial sprinkler coverage. No safety shower and eyewash in the VMU cage wash area.	A work order has been submitted for a shower and eyewash unit in the VMU cage wash area.
20	648	Portland (OR) VA Medical Center		Receptacles near water sources need ground fault protection.	

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VISN	Sta. ID.	VA Medical Facility	Life Safety/Remediated	Life Safety/Not Remediated	In Progress
20	663	VA Puget Sound Health Care System, Seattle, WA		Buildings 11, 23, and 34 housing VMU space have mechanical system controls set incorrectly; not all space is covered by sprinkler systems and smoke detection is lacking where sprinklers are missing; in seismic zone, temporary shelving needs to be replaced with permanent shelving, also some seismic lips missing on shelving; receptacles near water sources are not ground fault protected; Building 23, needs a shower/eyewash in the cage wash area.	ORD provided funding for seismic lips. Engineering staff is developing a plan to correct the remaining life safety issues.
21	612	VA Northern California Health Care System, Sacramento Valley (Mather, CA) and East Bay (Martinez, CA) Divisions		Mather campus: Liquid nitrogen is being dispensed in a room without an oxygen sensor. Martinez campus: Safety showers and/or eyewashes are missing at some locations.	
21	640	VA Palo Alto (CA) Health Care System	Safety showers and eyewashes have been upgraded to meet current requirements (some spaces were missing eyewashes and/or showers).	No smoke detection in communications closet (Building 4); unsafe egress issues (Buildings 51, 100, 101); needs sprinkler system extension (Building 54).	The station is currently developing a plan to address the high priority deficiencies.
21	662	San Francisco (CA) VA Medical Center	Corrected deficiencies with regard to safety showers and emergency eyewashes.	Need sprinkler system (Building 21); need upgraded sprinkler system (Buildings 2/4/5); need new fire alarm systems (Buildings 1, 2/4/5, 6, 21); need ground fault protected receptacles near water sources (Building 6 and 12); seismic lips are needed on reagent shelving.	The station reported that the pending items are in planning or will be remediated in conjunction with funded projects. ORD provided funding toward remediation of deficiencies.

## Appendix D. Summary of Life Safety Hazards

VISN	Sta. ID.	VA Medical Facility	Life Safety/Remediated	Life Safety/Not Remediated	In Progress
22	600	VA Long Beach (CA) Healthcare System	Fire alarm system replaced. Completed seismic non-structural upgrade.	Need ground fault protected receptacles near water sources; eyewash units need to be upgraded (units do not meet current code and are not accessible).	The pending life safety deficiencies are expected to be remediated as part of upcoming projects.
22	605	Jerry L. Pettis Memorial VA Medical Center, VA Loma Linda (CA) Healthcare System		Receptacles near water sources are not ground fault protected.	
22	664	VA San Diego (CA) Healthcare System		Need ground fault protected receptacles near water sources and emergency eyewashes do not meet current requirements (the type of unit does not meet current code).	The deficiencies are expected to be remediated with upcoming renovation projects.
22	691	VA Greater Los Angeles HCS: West Los Angeles, CA		Receptacles near water sources are not ground fault protected; some buildings have partial or no sprinkler system coverage; all buildings need updated fire alarm systems; and most buildings need code compliant safety showers and eyewashes.	The station reports that high priority items are being resolved as funding becomes available, but did not report on the status of the specific life safety hazards. ORD provided funding to remediate issues with regard to fabric covered furnishings at both West LA and Sepulveda campuses.
22	691A4	VA Greater Los Angeles HCS: North Hills, CA		Receptacles near water sources are not ground fault protected; some buildings have partial or no sprinkler system coverage; most of the buildings need new fire alarm systems; and three of the buildings need code compliant safety showers and eyewashes.	The station reports that high priority items are being resolved as funding becomes available, but did not report on the status of the specific life safety hazards. ORD provided funding to remediate issues with regard to fabric covered furnishings at both West LA and Sepulveda campuses.

## Appendix D. Summary of Life Safety Hazards

VISN	Sta. ID.	VA Medical Facility	Life Safety/Remediated	Life Safety/Not Remediated	In Progress
23	584	Iowa City (IA) VA Health Care System		Safety shower and eyewash unit are needed in the cage wash area of Building 2 and near the fume hood. In the older buildings, receptacles near water sources are not ground fault protected. These older buildings will be vacated by research in the near future and the problems will become moot.	
23	618	Minneapolis (MN) VA Health Care System	The fire alarm systems have been replaced. Emergency eyewashes have been upgraded.	Safety showers do not meet current requirements (not appropriately located). Building 49 has only partial sprinkler system coverage.	
23	636	VA Nebraska-Western Iowa Health Care System, Omaha, NE		The building is not fully covered by a sprinkler system. Safety showers and eyewashes do not meet current requirements (some spaces are lacking shower and/or eyewash, some units are not of the appropriate type).	This station will be gaining a new hospital and research space in the future.

## Appendix E. Improvements Funded by Stations and VISNs

VISN	VA Medical Facility	Reported locally funded projects:	Reported VISN funded projects:	Comment
1	White River Junction (VT) VAMC	Corrected deficiencies in VMU (ceiling and wall finishes).	None reported	Some improvements reported without funding source identified (HVAC replaced, corrected roof leaks).
1	Edith Nourse Rogers Memorial Veterans Hospital, Bedford, MA	Corrected roof leakage, bldg 70.	None reported	
1	VA Boston (MA) HCS: Jamaica Plain Campus	None reported	None reported	
1	VA Boston (MA) HCS: West Roxbury Campus	None reported	None reported	
1	VA Boston (MA) HCS: Brockton Campus	None reported	None reported	
1	Providence (RI) VAMC	Safety showers and eyewashes installed. Will also follow-up with a shower in the VMU cage wash area.	None reported	
1	VA Connecticut Healthcare System, West Haven, CT	Safety showers and eyewashes installed.	None reported	
2	VA Western New York Healthcare System, Buffalo, NY	Fire alarm system upgraded. Cabinets under fume hoods replaced with chemical storage cabinets. Some wall, ceiling, and floor finishes corrected and vent covers replaced. Bottle water and glassware washer refurbished. Room signage upgraded to meet ADA guidelines.	None reported	
2	Syracuse (NY) VAMC	Safety showers and eyewashes installed. Ground fault protected receptacles installed near water sources. Tested and balanced VMU air handling equipment. Installed electronic security for elevator. Completed unfinished wall in storage space. Renovated office and file space. Renovated additional office space.	None reported	

## Appendix E. Improvements Funded by Stations and VISNs

VISN	VA Medical Facility	Reported locally funded projects:	Reported VISN funded projects:	Comment
3	James J. Peters VA Medical Center, Bronx, NY	Completed renovation of new space for Rehabilitation research center.	None reported	
3	VA New Jersey Health Care System, East Orange, NJ	Ground fault protected receptacles are being installed near water sources.	None reported	
3	VA New York Harbor Healthcare System, Manhattan and Brooklyn, NY	at Brooklyn campus: corrected flooding problem in VMU.	at NYC campus: corrected deficiencies related to pipe insulation (energy savings project).	
3	Northport (NY) VA Medical Center	None reported	None reported	
4	Philadelphia (PA) VA Medical Center	Ground fault protected receptacles are being installed near water sources.	None reported	
4	VA Pittsburgh (PA) Healthcare System, Univ. Drive Division	None reported	None reported	
5	VA Maryland Health Care System, Baltimore, MD	Have corrected or planning to correct a number of Priority 1, 2 or 3 deficiencies. Corrected deficiencies with ABSL-3 mechanical system (local non-profit).	None reported	
5	Washington DC VA Medical Center	Sprinkler system and smoke detection have been extended for full coverage. Corrected roof deficiencies, upgraded security system, and made miscellaneous repairs to the VMU.	None reported	
6	Durham (NC) VA Medical Center	Fire alarm system upgraded.	Corrected mechanical system and major electrical system deficiencies in VMU.	
6	Hunter Holmes McGuire VA Medical Center, Richmond, VA (This station reports that Engineering has developed an action plan to remediate deficiencies as funds become available.)	Used local funding augmented by ORD funds to purchase additional flammable storage cabinets. Corrected deficient light fixture in VMU.	None reported	



## Appendix E. Improvements Funded by Stations and VISNs

VISN	VA Medical Facility	Reported locally funded projects:	Reported VISN funded projects:	Comment
7	Atlanta (GA) VA Medical Center	Renovated approximately 2,000 sq ft of office space for health services research (local non-profit). Repaired ceiling penetrations, replaced cracked window and cracked sink, upgraded lighting levels (non-profit funds), corrected electrical and plumbing system deficiencies, and renovated some labs with new casework and other improvements.	None reported	
7	Charlie Norwood VA Medical Center, Augusta, GA	Corrected multiple priority 1-3 deficiencies including replacement of air handling units and ductwork.	None reported	
7	Birmingham (AL) VA Medical Center	Installed appropriate fire alarm notification devices in corridors. (Note: just prior to the survey, the hospital and funded a complete renovation of research lab space.)	None reported	
7	William Jennings Bryan Dorn VA Medical Center, Columbia, SC	None reported	None reported	
8	Bay Pines (FL) VA Healthcare System	Installed safety showers and emergency eyewashes.	None reported	
8	Miami (FL) VA Healthcare System	None reported	None reported	Reported corrections to wall, ceiling and floor finishes without identifying funding source. Replaced air handlers, also no funding source identified.
8	North Florida/South Georgia Veterans Health System, Gainesville, FL	Corrected some unidentified Priority 1 deficiencies.	None reported	

## Appendix E. Improvements Funded by Stations and VISNs

VISN	VA Medical Facility	Reported locally funded projects:	Reported VISN funded projects:	Comment
8	James A. Haley Veterans' Hospital, Tampa, FL	None reported	None reported	Fire alarm system was in planning at time of assessment, funding source unknown.
9	Lexington (KY) VA Medical Center, Cooper Drive Div.	None reported	None reported	
9	Robley Rex VA Medical Center, Louisville, KY	Fire alarm systems have been replaced. Corrected mechanical system deficiencies, Bldg 1. Funded installation of new cage washer for VMU. Corrected miscellaneous priority 2 and 3 deficiencies.	None reported	
9	Memphis (TN) VA Medical Center	Emergency eyewash deficiencies were corrected.	None reported	
9	James H. Quillen VA Medical Center, Mountain Home, TN	Installed oxygen sensor in room where liquid nitrogen is used. Corrected miscellaneous priority 1 deficiencies.	None reported	
9	Tennessee Valley Healthcare System, Nashville, TN	None reported	None reported	
10	Cincinnati (OH) VA Medical Center	None reported	None reported	
10	Louis Stokes VA Medical Center, Cleveland, OH	Station is planning to renovate former pharmacy space into clinical research unit.	None reported	
11	VA Ann Arbor (MI) Healthcare System	Correcting safety shower and eyewash deficiencies (will be done in FY12).	None reported	
11	John D. Dingell VA Medical Center, Detroit, MI	Installed safety shower and eyewash in VMU cage wash area.	None reported	
11	Richard L. Roudebush VA Medical Center, Indianapolis, IN	Installed emergency eyewash units where needed.	None reported	Renovation of third floor laboratory (funding source unidentified).
12	Jesse Brown VA Medical Center, Chicago, IL	None reported	None reported	

## Appendix E. Improvements Funded by Stations and VISNs

VISN	VA Medical Facility	Reported locally funded projects:	Reported VISN funded projects:	Comment
12	Edward Hines Jr. VA Hospital, Hines, IL	Performed fume hood inspection, taking some hoods out of service. Research has submitted work orders on a number of items, pending resolution by FMS.	None reported	
12	William S. Middleton Memorial Veterans' Hospital, Madison, WI	Fume hoods that were not operating properly have been repaired, replaced, or decommissioned. Provided emergency power to Bldg 1, D wing. Constructed penthouse over HVAC equipment. Corrected miscellaneous other deficiencies (sealed windows, replaced ceiling tiles, replaced an autoclave, repaired exhaust above cage washer, repaired cold room).	Corrected roof deficiencies, Bldgs 12 and 13. Corrected mechanical system deficiencies related to temperature fluctuations, Planning to fund replacement of HVAC system in VMU.	
12	Clement J. Zablocki VA Medical Center, Milwaukee, WI	Fire alarm system has been replaced. Performed partial tuck pointing. Repaired roof drains. Installed electronic security.	None reported	Replaced roof, funding source unidentified.
15	Harry S. Truman Memorial Veterans' Hospital, Columbia, MO	Seismic lips have been added to reagent shelving. Remediated deficiency related to liquid oxygen use. Planning to provide ground fault protected receptacles (FY12 project). Fire alarm system will be upgraded (FY12 project). Replaced ceiling tiles. Provided wash down receptacles in VMU. Installed exhaust canopy over steam sterilizer. Continued ongoing laboratory vacuum project.	None reported	
15	Kansas City (MO) VA Medical Center	None reported	None reported	

## Appendix E. Improvements Funded by Stations and VISNs

VISN	VA Medical Facility	Reported locally funded projects:	Reported VISN funded projects:	Comment
15	St. Louis (MO) VA Medical Center, John Cochran and Jefferson Barracks Divisions	None reported	None reported	
16	Michael E. DeBakey VA Medical Center, Houston, TX	Installed door closers on laboratory doors. Installed stack extension for emergency generators. Installed new secure doors at VMU loading dock. Sprinkler system deficiencies have been corrected. Fire alarm systems have been upgraded. In the VMU, ground fault protected receptacles have been installed.	None reported	
16	G.V. (Sonny) Montgomery VA Medical Center, Jackson, MS	None reported	None reported	Replacement of HVAC system and windows is in progress, no funding source identified.
16	Central Arkansas Veterans Healthcare System, John L. McClellan Memorial Veterans Hospital, Little Rock, AR	Corrected deficiencies in the BSL-3 lab. Corrected VMU receptacles (were not water proof).	None reported	
16	Oklahoma City (OK) VA Medical Center	Replaced both cage washers in the VMU. Corrected insulation and leakage problems with building exterior envelope.	None reported	
17	VA North Texas Health Care System: Dallas (TX) VA Medical Center	Installed emergency eyewash units where needed. Provided monitoring system for -80 degree freezers. Installed new fire alarm system.	None reported	
17	South Texas Veterans Health Care System, Audie L. Murphy VA Hospital, San Antonio, TX	None reported	None reported	
17	Central Texas Veterans Health Care System, Olin E. Teague Veterans' Medical Center, Temple, TX	Replaced damaged ceiling tiles. Inspected/certified fume hoods. Performed air balancing, 2nd floor, bldg 205.	None reported	

## Appendix E. Improvements Funded by Stations and VISNs

VISN	VA Medical Facility	Reported locally funded projects:	Reported VISN funded projects:	Comment
18	New Mexico VA Health Care System, Raymond G. Murphy VA Medical Center, Albuquerque, NM	Some eyewash units have been added where needed. Constructed modular bldg to house Research Service administration. Constructed modular laboratory building. Replaced roof. Corrected miscellaneous priority 1 deficiencies. Provided additional emergency power for freezers. Installed alarm system for freezers and VMU.	None reported	
18	Phoenix (AZ) VA Health Care System, Carl T. Hayden VA Medical Center	None reported	None reported	
18	Southern Arizona VA Health Care System, Tucson, AZ	Installed new fire alarm system, bldg 6. Corrected safety shower/eyewash deficiency.	Project in planning/design to correct deficiencies in Bldg 10. Planning project to replace air handling units in VMU.	
19	VA Eastern Colorado Health Care System, Denver, CO	Corrected HVAC controls (to fail in correct position).	None reported	
19	VA Salt Lake City Health Care System, Salt Lake City, UT	Installed safety shower and eyewash in VMU cage wash area. Corrected miscellaneous deficiencies (provided standby power to VMU, corrected Bldg 2 mechanical system, provided monitoring system, provided industrial hot and cold water for VMU, replaced fume hood faucets). Corrected additional priority 1 deficiencies including providing surge suppression for electrical system, etc.).	None reported	
20	Boise (ID) VA Medical Center	None reported	Replaced boiler for VMU.	

## Appendix E. Improvements Funded by Stations and VISNs

VISN	VA Medical Facility	Reported locally funded projects:	Reported VISN funded projects:	Comment
20	Portland (OR) VA Medical Center	Corrected floor and wall finishes in VMU cage wash area. Replaced Bldg 6 chillers. Replaced Bldg 6 roof. Painted Bldg 6. Replaced cooling system in cold rooms. Installed central monitoring system. Renovated Research administrative space. Upgraded elevator. Planning additional Priority 1 corrections.	None reported	A number of other projects in planning were noted, without identification of funding sources.
20	VA Puget Sound Health Care System, Seattle, WA (This station reports that Engineering has developed an action plan to remediate deficiencies as funds become available.)	Local engineering developing a plan to correct priority 1 deficiencies, especially life safety issues.		
21	VA Northern California Health Care System, Sacramento Valley (Mather, CA) and East Bay (Martinez, CA) Divisions	None reported	None reported	
21	VA Palo Alto (CA) Health Care System (This station reports that Engineering has developed an action plan to remediate deficiencies as funds become available.)	Safety showers and emergency eyewashes were installed where needed. Developing a plan to correct other high priority issues.	None reported	
21	San Francisco (CA) VA Medical Center (This station reports that pending items are in planning and/or will be remediated in conjunction with funded projects. ORD provided funds toward remediation.)	None reported	None reported	Safety showers and eyewashes have been installed where needed (funding source not identified).

## Appendix E. Improvements Funded by Stations and VISNs

VISN	VA Medical Facility	Reported locally funded projects:	Reported VISN funded projects:	Comment
22	VA Long Beach (CA) Healthcare System	Upgraded fire alarm system.	None reported	Reported several projects without funding source identified (electrical upgrade, HVAC upgrade).
22	Jerry L. Pettis Memorial VA Medical Center, VA Loma Linda (CA) Healthcare System	Planning to upgrade flooring and casework in laboratories. Upgraded HVAC system.	None reported	
22	VA San Diego (CA) Healthcare System	None reported	None reported	Air handling equipment replaced, funding source not identified.
22	VA Greater Los Angeles HCS: West Los Angeles, CA (This station reports that high priority items will be remediated as funds become available.)	Several small renovation projects funded by local non-profit. Local FMS reports they are working to correct high priority deficiencies as funds become available.	None reported	
22	VA Greater Los Angeles HCS: North Hills, CA (This station reports that high priority items will be remediated as funds become available.)	Local FMS reports they are working to correct high priority deficiencies as funds become available.	None reported	
23	Iowa City (IA) VA Health Care System	None reported	None reported	
23	Minneapolis (MN) VA Health Care System	Fire alarm systems replaced. Emergency eyewashes have been installed. Replaced cage washer in the VMU. Purchased new autoclave for the VMU. Completed desiccant dryer project.	None reported	
23	VA Nebraska-Western Iowa Health Care System, Omaha, NE	None reported	None reported	



## Appendix F. Station Listing by State

State	City	VISN	Sta ID	VA Medical Facility
AL	Birmingham	7	521	Birmingham VA Medical Center
AR	Little Rock	16	598	Central Arkansas Veterans Healthcare System, <u>John L. McClellan Memorial Veterans Hospital</u>
AZ	Phoenix	18	644	Phoenix VA Health Care System, Carl T. Hayden <u>VA Medical Center</u>
AZ	Tucson	18	678	Southern Arizona VA Health Care System
CA	Loma Linda	22	605	Jerry L. Pettis Memorial VA Medical Center, VA <u>Loma Linda Healthcare System</u>
CA	Long Beach	22	600	VA Long Beach Healthcare System
CA	Los Angeles	22	691	VA Greater Los Angeles Healthcare System, West <u>Los Angeles VAMC</u>
CA	Martinez	21	612	VA Northern California Health Care System, East <u>Bay Division</u>
CA	Mather	21	612	VA Northern California Health Care System, <u>Sacramento Valley Division</u>
CA	Palo Alto	21	640	VA Palo Alto Health Care System
CA	San Diego	22	664	VA San Diego Healthcare System
CA	San Francisco	21	662	San Francisco VA Medical Center
CA	Sepulveda	22	665	VA Greater Los Angeles Healthcare System, <u>Sepulveda Ambulatory Care Center</u>
CO	Denver	19	554	VA Eastern Colorado Health Care System
CT	West Haven	1	689	VA Connecticut Healthcare System, West Haven <u>Campus</u>
DC	Washington	5	688	Washington DC VA Medical Center
FL	Bay Pines	8	516	Bay Pines VA Healthcare System
FL	Gainesville	8	573	North Florida/South Georgia Veterans Health <u>System, Malcom Randall VA Medical Center</u>
FL	Miami	8	546	Miami VA Healthcare System
FL	Tampa	8	673	James A. Haley Veterans' Hospital
GA	Augusta	7	509	Charlie Norwood VA Medical Center
GA	Decatur	7	508	Atlanta VA Medical Center
IA	Iowa City	23	584	Iowa City VA Health Care System
ID	Boise	20	531	Boise VA Medical Center
IL	Chicago	12	537	Jesse Brown VA Medical Center
IL	Hines	12	578	Edward Hines Jr. VA Hospital
IN	Indianapolis	11	583	Richard L. Roudebush VA Medical Center
KY	Lexington	9	596	Lexington VA Medical Center, Cooper Drive <u>Division</u>
KY	Louisville	9	603	Robley Rex VA Medical Center
MA	Bedford	1	518	Edith Nourse Rogers Memorial Veterans Hospital
MA	Brockton	1	523	VA Boston Healthcare System, Brockton Campus

## Appendix F. Station Listing by State

State	City	VISN	Sta ID	VA Medical Facility
MA	Jamaica Plain	1	523	VA Boston Healthcare System, Jamaica Plain Campus
MA	West Roxbury	1	523	VA Boston Healthcare System, West Roxbury Campus
MD	Baltimore	5	512	VA Maryland Health Care System
MI	Ann Arbor	11	506	VA Ann Arbor Healthcare System
MI	Detroit	11	553	John D. Dingell VA Medical Center
MN	Minneapolis	23	618	Minneapolis VA Health Care System
MO	Columbia	15	543	Harry S. Truman Memorial Veterans' Hospital
MO	Kansas City	15	589	Kansas City VA Medical Center
MO	St. Louis	15	657	St. Louis VA Medical Center, John Cochran and Jefferson Barracks Divisions
MS	Jackson	16	586	G.V. (Sonny) Montgomery VA Medical Center
NC	Durham	6	558	Durham VA Medical Center
NE	Omaha	23	636	VA Nebraska-Western Iowa Health Care System
NJ	East Orange	3	561	VA New Jersey Health Care System, East Orange Campus
NM	Albuquerque	18	501	New Mexico VA Health Care System, Raymond G. Murphy VA Medical Center
NY	Bronx	3	526	James J. Peters VA Medical Center
NY	Brooklyn	3	630	VA New York Harbor Healthcare System, Brooklyn Campus
NY	Buffalo	2	528	VA Western New York Healthcare System
NY	New York	3	630	VA New York Harbor Healthcare System, Manhattan Campus
NY	Northport	3	632	Northport VA Medical Center
NY	Syracuse	2	670	Syracuse VA Medical Center
OH	Cincinnati	10	539	Cincinnati VA Medical Center
OH	Cleveland	10	541	Louis Stokes VA Medical Center
OK	Oklahoma City	16	635	Oklahoma City VA Medical Center
OR	Portland	20	648	Portland VA Medical Center
PA	Philadelphia	4	642	Philadelphia VA Medical Center
PA	Pittsburgh	4	646	VA Pittsburgh Healthcare System, University Drive Division
RI	Providence	1	650	Providence VA Medical Center
SC	Columbia	7	544	William Jennings Bryan Dorn VA Medical Center
TN	Memphis	9	614	Memphis VA Medical Center
TN	Mountain Home	9	621	James H. Quillen VA Medical Center
TN	Nashville	9	626	Tennessee Valley Healthcare System

## Appendix F. Station Listing by State

State	City	VISN	Sta ID	VA Medical Facility
TX	Dallas	17	549	VA North Texas Health Care System: Dallas VA Medical Center
TX	Houston	16	580	Michael E. DeBakey VA Medical Center
TX	San Antonio	17	671	South Texas Veterans Health Care System, Audie L. Murphy VA Hospital
TX	Temple	17	674	Central Texas Veterans Health Care System, Olin E. Teague Veterans' Medical Center
UT	Salt Lake City	19	660	VA Salt Lake City Health Care System
VA	Richmond	6	652	Hunter Holmes McGuire VA Medical Center
VT	White River Junction	1	405	White River Junction VA Medical Center
WA	Seattle	20	663	VA Puget Sound Health Care System, Seattle Division
WI	Madison	12	607	William S. Middleton Memorial Veterans' Hospital
WI	Milwaukee	12	695	Clement J. Zablocki VA Medical Center

## Appendix G. Station Listing by VISN

VISN	Sta. ID.	VA Medical Facility	City/State
1	405	White River Junction VA Medical Center	White River Junction, VT
1	518	Edith Nourse Rogers Memorial Veterans Hospital	Bedford, MA
1	523	VA Boston Healthcare System, Jamaica Plain Campus	Jamaica Plain, MA
1	523	VA Boston Healthcare System, West Roxbury Campus	West Roxbury, MA
1	523	VA Boston Healthcare System, Brockton Campus	Brockton, MA
1	650	Providence VA Medical Center	Providence, RI
1	689	VA Connecticut Healthcare System, West Haven Campus	West Haven, CT
2	528	VA Western New York Healthcare System	Buffalo, NY
2	670	Syracuse VA Medical Center	Syracuse, NY
3	526	James J. Peters VA Medical Center	Bronx, NY
3	561	VA New Jersey Health Care System, East Orange Campus	East Orange, NJ
3	630	VA New York Harbor Healthcare System, Manhattan Campus	New York, NY
3	630	VA New York Harbor Healthcare System, Brooklyn Campus	Brooklyn, NY
3	632	Northport VA Medical Center	Northport, NY
4	642	Philadelphia VA Medical Center	Philadelphia, PA
4	646	VA Pittsburgh Healthcare System, University Drive Division	Pittsburgh, PA
5	512	VA Maryland Health Care System	Baltimore, MD
5	688	Washington DC VA Medical Center	Washington, DC
6	558	Durham VA Medical Center	Durham, NC
6	652	Hunter Holmes McGuire VA Medical Center	Richmond, VA
7	508	Atlanta VA Medical Center	Decatur, GA
7	509	Charlie Norwood VA Medical Center	Augusta, GA
7	521	Birmingham VA Medical Center	Birmingham, AL
7	544	William Jennings Bryan Dorn VA Medical Center	Columbia, SC
8	516	Bay Pines VA Healthcare System	Bay Pines, FL
8	546	Miami VA Healthcare System	Miami, FL
8	573	North Florida/South Georgia Veterans Health System, Malcom Randall VA Medical Center	Gainesville, FL
8	673	James A. Haley Veterans' Hospital	Tampa, FL
9	596	Lexington VA Medical Center, Cooper Drive Div.	Lexington, KY
9	603	Robley Rex VA Medical Center	Louisville, KY
9	614	Memphis VA Medical Center	Memphis, TN
9	621	James H. Quillen VA Medical Center	Mountain Home, TN

## Appendix G. Station Listing by VISN

VISN	Sta. ID.	VA Medical Facility	City/State
9	626	Tennessee Valley Healthcare System	Nashville, TN
10	539	Cincinnati VA Medical Center	Cincinnati, OH
10	541	Louis Stokes VA Medical Center	Cleveland, OH
11	506	VA Ann Arbor Healthcare System	Ann Arbor, MI
11	553	John D. Dingell VA Medical Center	Detroit, MI
11	583	Richard L. Roudebush VA Medical Center	Indianapolis, IN
12	537	Jesse Brown VA Medical Center	Chicago, IL
12	578	Edward Hines Jr. VA Hospital	Hines, IL
12	607	William S. Middleton Memorial Veterans' Hospital	Madison, WI
12	695	Clement J. Zablocki VA Medical Center	Milwaukee, WI
15	543	Harry S. Truman Memorial Veterans' Hospital	Columbia, MO
15	589	Kansas City VA Medical Center	Kansas City, MO
15	657	St. Louis VA Medical Center, John Cochran and Jefferson Barracks Divisions	St. Louis, MO
16	580	Michael E. DeBakey VA Medical Center	Houston, TX
16	586	G.V. (Sonny) Montgomery VA Medical Center	Jackson, MS
16	598	Central Arkansas Veterans Healthcare System, John L. McClellan Memorial Veterans Hospital	Little Rock, AR
16	635	Oklahoma City VA Medical Center	Oklahoma City, OK
17	549	VA North Texas Health Care System: Dallas VA Medical Center	Dallas, TX
17	671	South Texas Veterans Health Care System, Audie L. Murphy VA Hospital	San Antonio, TX
17	674	Central Texas Veterans Health Care System, Olin E. Teague Veterans' Medical Center	Temple, TX
18	501	New Mexico VA Health Care System, Raymond G. Murphy VA Medical Center	Albuquerque, NM
18	644	Phoenix VA Health Care System, Carl T. Hayden VA Medical Center	Phoenix, AZ
18	678	Southern Arizona VA Health Care System	Tucson, AZ
19	554	VA Eastern Colorado Health Care System	Denver, CO
19	660	VA Salt Lake City Health Care System	Salt Lake City, UT
20	531	Boise VA Medical Center	Boise, ID
20	648	Portland VA Medical Center	Portland, OR
20	663	VA Puget Sound Health Care System, Seattle Division	Seattle, WA
21	612	VA Northern California Health Care System, Sacramento Valley Division	Mather, CA
21	612	VA Northern California Health Care System, East Bay Division	Martinez, CA
21	640	VA Palo Alto Health Care System	Palo Alto, CA
21	662	San Francisco VA Medical Center	San Francisco, CA
22	600	VA Long Beach Healthcare System	Long Beach, CA

## Appendix G. Station Listing by VISN

VISN	Sta. ID.	VA Medical Facility	City/State
22	605	Jerry L. Pettis Memorial VA Medical Center, VA Loma Linda Healthcare System	Loma Linda, CA
22	664	VA San Diego Healthcare System	San Diego, CA
22	691	VA Greater Los Angeles Healthcare System, West Los Angeles VAMC	Los Angeles, CA
22	665	VA Greater Los Angeles Healthcare System, Sepulveda Ambulatory Care Center	Sepulveda, CA
23	584	Iowa City VA Health Care System	Iowa City, IA
23	618	Minneapolis VA Health Care System	Minneapolis, MN
23	636	VA Nebraska-Western Iowa Health Care System	Omaha, NE