



 Virginia Department of
Behavioral Health &
Developmental Services

Preplanning Study

Central State Hospital Full Replacement 2018

Project # 720-18165

Central State Hospital, Petersburg, Virginia

December 1, 2018 rev.1



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Executive Summary

The existing Central State Hospital is comprised of a variety of very old buildings that have outlived their usefulness. The buildings are functionally and technologically obsolete and energy inefficient. The average age of the in-use buildings is 65 years. Central State Hospital serves both forensic and civil populations and has the only maximum security forensic program within the Commonwealth of Virginia.

Pursuant to the directive outlined by the 2018 Special Session I Act of General Assembly, Chapter 2 Item C-43.50; the Department of General Services (DGS) in cooperation with the Department of Behavioral Health and Developmental Services (DBHDS) developed a plan providing for the replacement of Central State Hospital to include phasing options. Succinctly, the project is to provide 300 patient beds, 111 for the maximum security zone of the facility and 189 beds for the civil/forensic, non-maximum security zone.

The new facility will consolidate all campus patient services and operational functions from the 23 buildings currently occupied (roughly 608,000 square feet) into a single, self-contained facility of approximately 456,000 square feet and, in the process allow development of a state-of-the-art facility much like Western State Hospital.

Specifically the new facility will contain:

- Administrative space for admissions, executive management, human resources, program staff, etc.
- Court space for hearings and legal matters related to commitments/releases
- Visitation space for civil and maximum security patients
- Patient dining and food services
- Treatment Malls providing educational, vocational, recreational and treatment spaces for both civil and maximum security patients. These two patient populations cannot share treatment space due to security restrictions.
- Pharmacy
- Patient examination and assessment space (both psychological and physiological)
- Laboratory for infection control and biological testing
- Laundry
- Kitchen
- Central Security offices
- Buildings and Grounds maintenance and materials management support areas
- Energy plant to serve the new facility

DGS and DBHDS considered several sites on the existing Central State Hospital campus. The selected site straddles Accomac Street and is adjacent to the Civil War Fort Whitworth and cemetery. This site was chosen following collaboration with the Division

of Real Estate Services (DRES) and Central State Hospital staff for optimal building location with respect to operational needs and the Commonwealth's best use of the land.

The new facility on the selected site will result in:

- Construction of new water and sewer services connecting to Dinwiddie County service lines and abandonment of 37 miles of failing pipes.
- Elimination of Central State Hospital's responsibility for maintenance and repairs of major utility distribution systems.
- Improved site features and infrastructure including lighting, parking, storm water management and water and sewer lines.
- Consolidation of the campus area from approximately 600 acres to 30-40 acres with the balance of the land then being available for surplus declaration and sale. To enhance the sale ability of the land, once the new facility is completed, all of the existing buildings will be demolished creating a brownfield site attractive to developers.

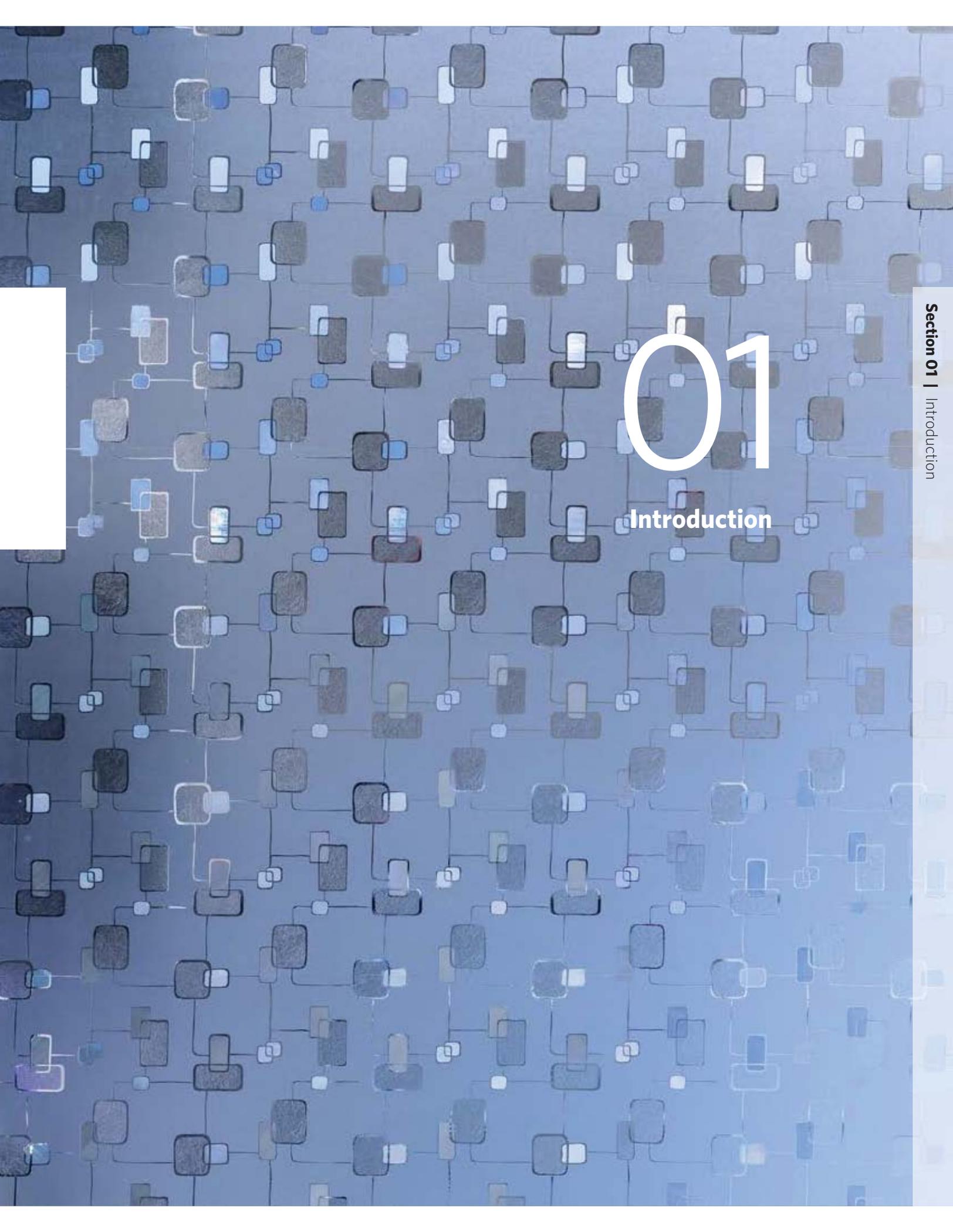
It is projected that the total project cost of the new replacement hospital, based on the information and estimates provided in this Study, will be as shown below.

If designed and built in:

- **A single phase – \$385,424,642 84 months June 2026 completion**
- **Two phases – \$421,195,577 117 months March 2029 completion**
- **Three phases – \$451,442,615 162 months June 2032 completion**

The above numbers include construction costs, demolition costs, soft costs and costs for the contingency repairs, maintenance reserve foreseeable prior to new facility completion and operational and maintenance impacts. The costs and durations assume that approval for the project is given by July 1, 2019 and where multi-phased, the next phase(s) begin immediately after the previous phase. The increase to the project cost per month from that date is approximately \$1.3 million for the single-phase option and \$1.4 million for the two-phase option.

A hybrid phasing approach, defined as a single designer responsible for the total project's design in the initial phase but with two consecutive construction phases, could be used. This approach would take 87 months (7 ¼ years) and potentially save \$15,000,000 over the two-phased option above.



01

Introduction



1 Introduction

From its founding in 1869 until the passage of the Civil Rights Act of 1964, Central State Hospital served and treated only African-American Mentally Ill, Mentally Retarded, Geriatric and Criminally Insane patients from the entire state of Virginia. In 1967 the Hospital opened its doors to accept patients regardless of race or national origin.

The new Central State Hospital facility will replace the existing facility, which is antiquated, maintenance-intensive, staff inefficient, and often unsafe. The new facility has been programmed to meet all of the patients' day-to-day living, therapeutic treatment, educational/vocational, recreational, health and safety and other basic needs. Similarly, the operational, administrative, training, well-being, safety, security, and other requirements of and for staff were considered.

The facility program meets all national and state space standards for an in-patient psychiatric facility and is intended, when designed and built, to represent an advancement of existing "best practices" for this facility type. It will offer planning and design enhancements that can only be achieved in the hands of architects who are well versed in the design of this highly specialized type of facility.

That said, it is incumbent upon the Commonwealth to select the final planning and design team carefully, to ensure that the outcome of the new facility reflects the above aspirations and represent a responsible yet creative use of taxpayer monies. This would include a facility that is staff-efficient, safe, secure, operationally efficient, easily maintainable, and long-lasting.

Finally, the facility's performance in terms of best achievable practices in sustainability and environmental stewardship should be maximized within the allowable project budget.

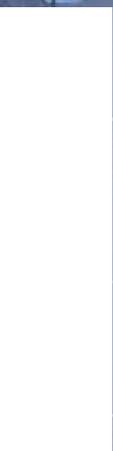
One of the many unique factors about the new Central State Hospital is that it must effectively, efficiently, and safely manage a number of differing populations within two distinct patient communities — one for maximum security patients and one for civil and forensic patients. These communities require complete separation for reasons of safety and security. To effectively provide this separation, many programmatic components are replicated for each community; while select others are provided for one patient population but not the other, depending on need.

Due to differing numbers in the populations of the communities, program spaces and quantities have been sized and distributed accordingly. This careful allotment of area within the facility is the result of detailed and exhaustive efforts on the part of both the client/user groups and the consultant team assembled to deliver this work product. In taking such a detailed and meticulous approach, the Commonwealth can be confident that every effort has been made to create maximum efficiency of treatment in the minimum amount of space required.

On the pages that follow are narratives that describe the major facets of the planning and design intent for the new Central State Hospital project allowed at this early stage of development. It is our hope that as the project achieves funding and goes into detailed design, that this report will be elaborated upon and refined with the critical input of the client and user groups. In so doing, the Commonwealth can expect a state-of-the-art psychiatric facility that can serve as a model for other states planning similar facilities.

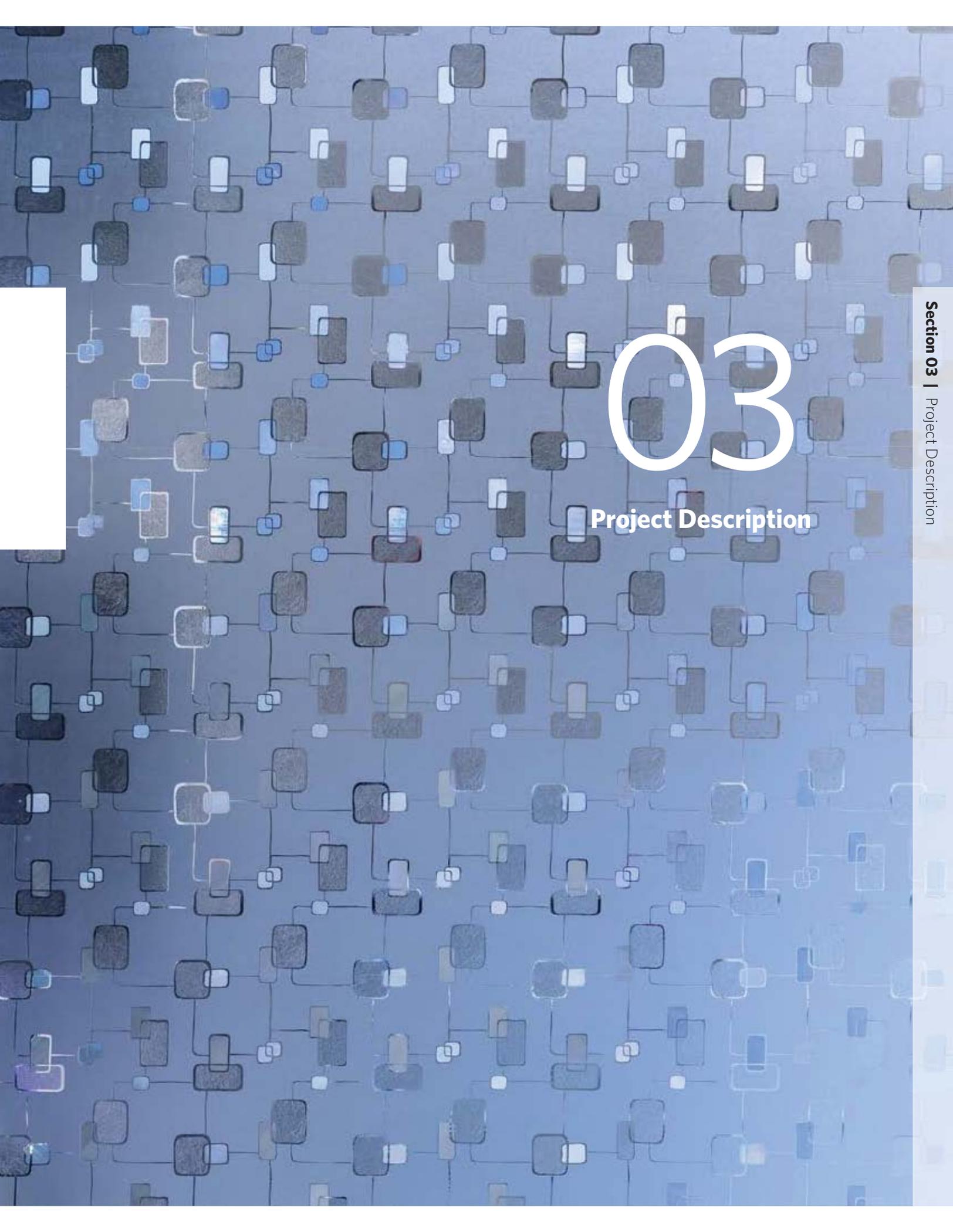
02

Acknowledgements



2 Acknowledgements

The management, programming, and planning team of HDR Architecture is grateful for the participation, inspiration, confidence, and enduring resolution of the following individuals without whose participation this effort could not have occurred: Chinh Vu DGS Project Director, Michael Gilbert DGS/McDonough Bolyard Peck (MBP) Project Manager, Marshall Wilson DBHDS Office of Architectural and Engineering Director, Norman Downey, Project Manager Wiley/Wilson, Rachel Shelton, State Review Architect, Division of Engineering and Building (DEB), Mike Gray, DEB, Project Estimator, Rebecca Vauter, Central State Hospital Director; Ann Bailey, Central State Hospital Assistant Director; and all of the DGS, DEB, DRES, Central State Hospital and DBHDS Central Office Staff who provided their valuable input.



03

Project Description



3 Project Description

The Department operates nine mental health facilities, three of which are major mental health hospitals:

- Eastern State Hospital
- Western State Hospital
- Central State Hospital

Both Western State Hospital and Eastern State Hospital have newer facilities; Western State Hospital was completed in 2013 and Eastern State Hospital in 2008. In both facilities, patients are housed in modern, effective, and efficient structures. Central State Hospital remains has not been updated, and it houses the most difficult population in the system.

Central State Hospital serves both forensic and civil populations. With the only Maximum Security Forensic program, Central State Hospital provides services to the entire Commonwealth.

The Maximum Security Forensic population at Central State Hospital is housed in Building 39, which was constructed in 1950. While renovations have occurred, the basic 65-year old building and its systems remain unchanged. Much has been learned since 1950 about the design of mental health hospitals, specifically about the care and treatment of forensic patients in a maximum security environment.

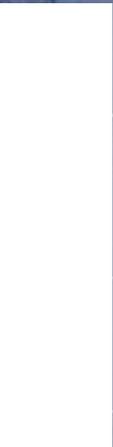
Several other buildings are used to serve the non-maximum security civil and forensic populations as well as providing for administrative support functions. The inherent difficulties with the layout of the existing building do not lend themselves to be the most effective environments for safety, security and patient well-being. The physical structures are literally falling apart. The mechanical and electrical systems of the various buildings are not energy efficient, consistently ineffective and maintenance intensive. The systems are not only beyond their useful life, they are technologically obsolete.

The proposed project will replace 23 buildings currently in use with a single structure. The new building will contain patient quarters, treatment facilities, and administrative/support services, including security, dining facilities, support services such as food preparation, building and grounds, transportation, and warehouse.

The new hospital will be capable of serving 300 patients when completed. The support services will be designed to support expansion for an additional 48 patients. Of the initial 300 patient rooms, 111 will be maximum security patients and 189 forensic/civil patients.

A two-story structure is envisioned, with secure enclosed courtyards for outdoor activities. An integrated system of security, safety, and information technology will allow for far greater efficiencies than currently exist. The entire building will, at a minimum, meet LEED® Silver criteria.

Once the project is completed, Central State Hospital will have a smaller building area. The new hospital will be far more effectual from both a treatment and management perspective and much more efficient to operate and staff.



04

Physical Description and Environmental Considerations



4 Physical Description and Environmental Considerations

The design of a modern, state-of-the-art state psychiatric facility is a careful balance among budget, appearance, internal environment, amenity, safety, security, staffing, operational and maintenance efficiencies. By properly addressing all of the above — and using well-trained and capable staff — it can be expected that the facility will contain all of the elements that will directly result in successful treatment outcomes, staff attraction, retention and enhanced performance, and safety and security for patients, staff, and the community.

The program and conceptual facility layout provided in this document are just the basic “kit of parts” that begins to describe how this facility can fulfill the above-stated objectives. It is in the execution of the detailed design that all of these critical factors come together to create a whole that is greater than the sum of its parts. A design team experienced in this specific facility type is essential to the project’s success.

4.1 Exterior Objectives

Central State Hospital is an important member of the local and state community and its architecture should reflect its stature. It should be complementary to the local architectural context and reflect as much as possible a non-imposing, non-threatening residential character. The hospital is a place of healing and personal discovery and should inspire those who reside and work there. At the same time, it must be built in a manner that is cost-effective and provides for ease of maintenance. Thus, it is important that every effort be made to explore appropriate design and building solutions that respect and respond to both criteria.

The final site plan should include outdoor recreation and related areas, especially larger recreation fields and/or gardens and walking/running paths. Efforts should be made to provide appropriate screening of patients in these areas from public view and to minimize the opportunity for contraband finding its way into the facility.

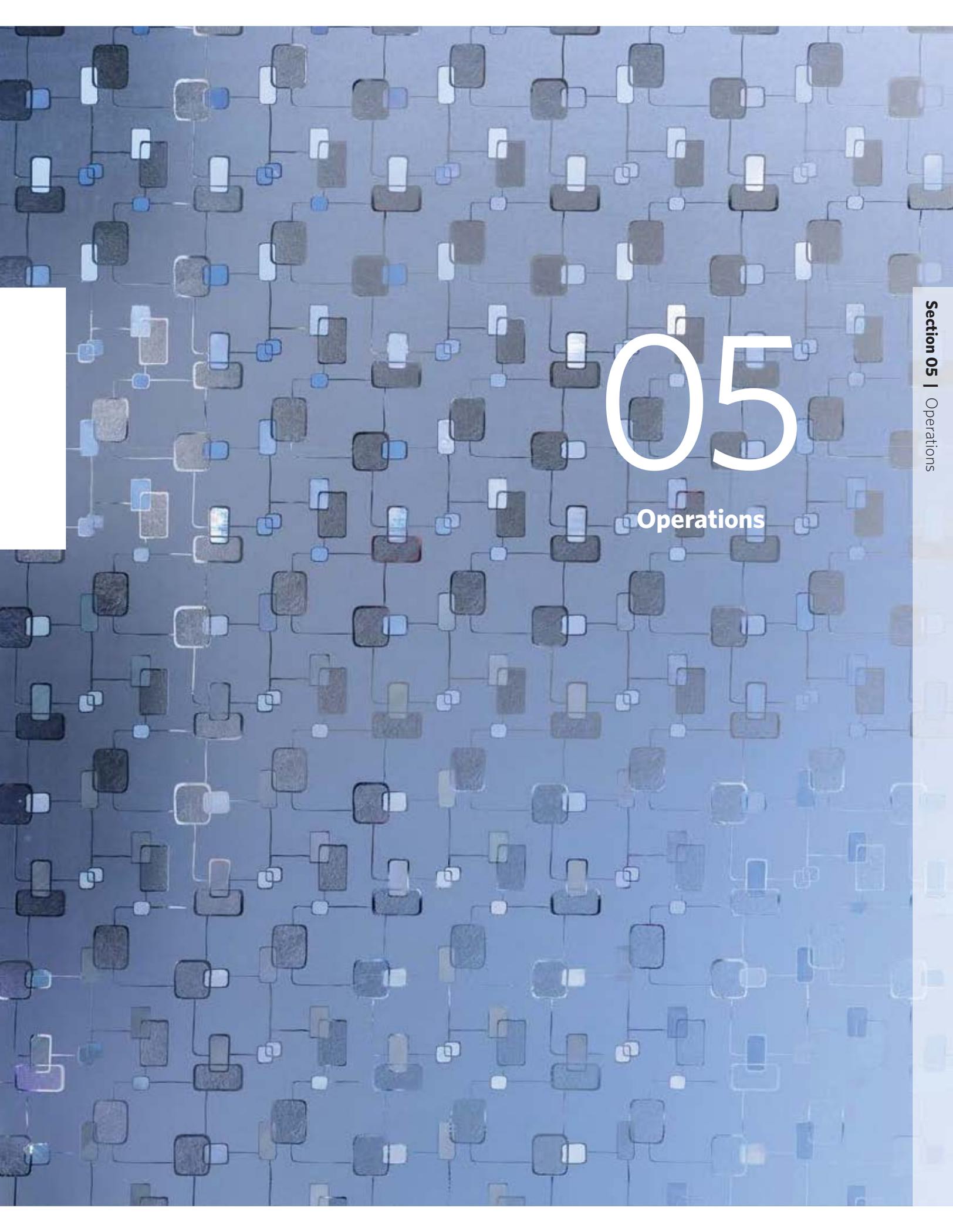
The maximum security side of facility will be surrounded by a double “candy-cane” style security fence which can make it difficult to achieve the objectives described above. The Civil/forensic side will have a secure fence but not a “candy-cane” style. Therefore, it is important to be creative in how the fence and its surroundings are designed to minimize its obtrusiveness. Designs using berms, landscape and hardscape features, decorative retaining walls, and actually designing the perimeter to include sections of fence and wall, incorporating undulations in the fences and/or walls can all contribute to a less threatening, less correctional-appearing perimeter, and a friendlier presence in the community.

4.2 Interior Objectives

The major design focus for the project should be applied to the interior patient and staff areas of the facility. For a truly effective treatment and rehabilitative environment, special attention must be paid to designing for an abundance of natural light, views to the

outdoors (sky, gardens, courtyards, sculpture gardens, etc.), use of color and pattern, spatial variety, formal and informal spaces for programming and socializing, way finding, and transparency. Small, enclosed, and claustrophobic spaces; narrow, dead-end corridors must be avoided. All of these considerations will benefit the well-being and behavior of both patients and staff alike, contributing to a safer operation, enhanced human performance, and more effective treatment.

Overall, a purely institutional character should be minimized (if not eliminated to the extent possible) while focus on more normative, residential-style qualities should be heightened. The term “normative” refers to the experience that users would have in the “real world.” Living units should feel home-like. Program, education, and vocational areas should feel school-like, while the central treatment malls should emulate a town center. In creating a variety of familiar experiences throughout the facility, as well as comfortable, familiar individual spaces, a stimulating daily journey can be achieved to help normalize the experience of patients, therefore enhancing their response to treatment. In turn, this same approach creates a much more treatment-amenable, comfortable, and safe working environment for staff.



05

Operations

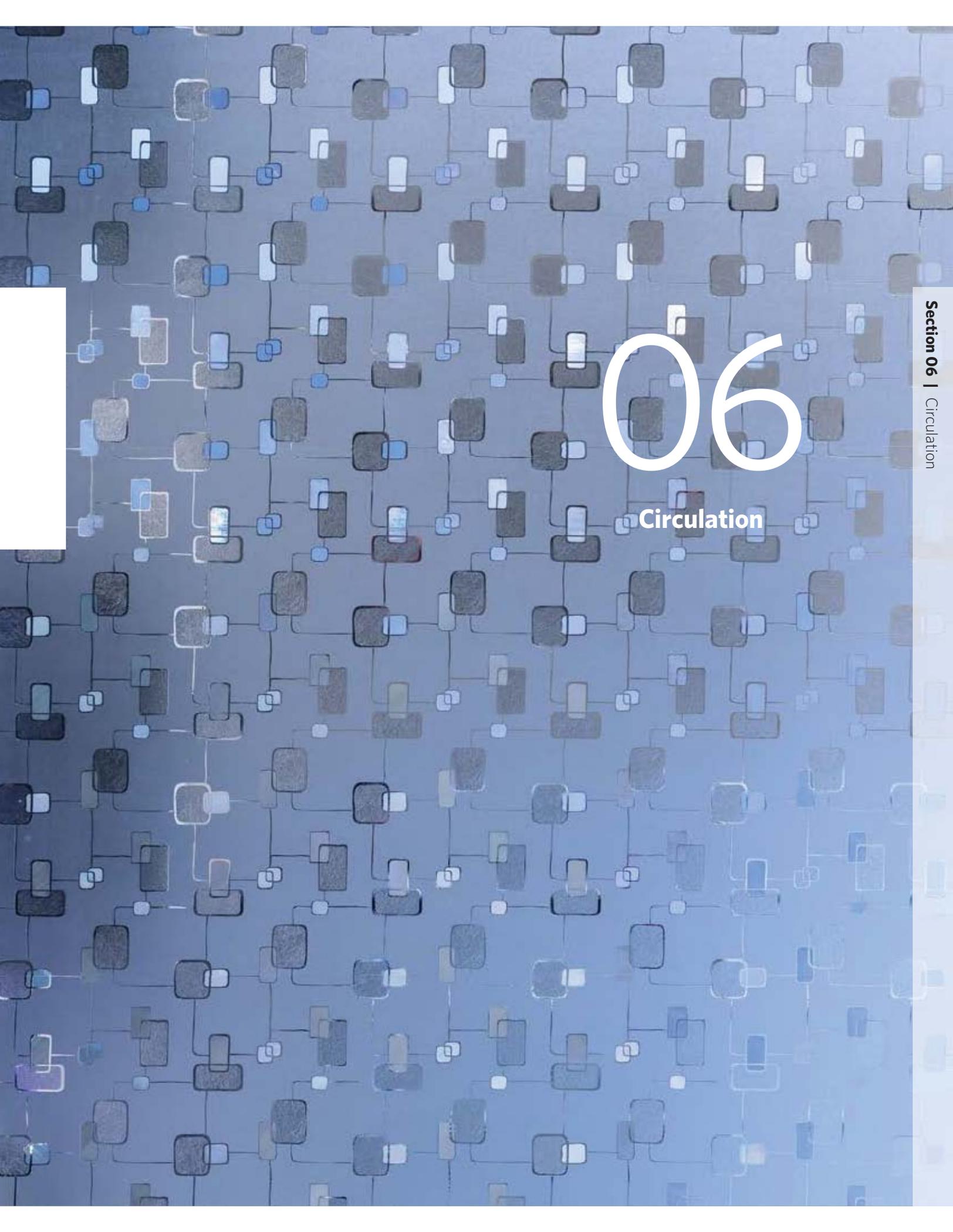
5 Operations

The operational aspects of the new Central State Hospital include greater staffing efficiency, ease of movement, durability, minimal maintenance, and safety and security, to name a few. The single most expensive aspect of operating a facility of this type and size is staffing. After the initial capital cost of construction and outfitting, cost of staffing is an ongoing expense that far outweighs any other cost. Therefore, the facility must be planned and designed to be operated efficiently with the staff required to meet required treatment, service, maintenance, safety and security needs.

Clear circulation, unobstructed lines of sight, easy monitoring of patient activities and movement all help to minimize the number of staff required to maintain a safe and secure facility. Other considerations include a practical layout of the living units and functional spaces that are used by patients, a durable facility that requires minimal maintenance. The better the design, the fewer auxiliary staff will be required to operate the facility, resulting in tangible savings over the life of the facility.

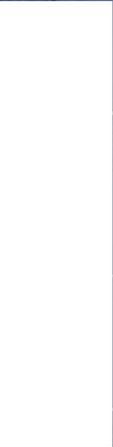
During the detailed planning and design of the facility, it is imperative to focus on how people move through and use the facility's many departments not just the building, finish materials and furnishings. With careful consideration and response, this project can be designed to require a minimal number of auxiliary staff resulting in considerable saving to ongoing staffing costs. Sound planning and design will also require less security staff to maintain safety in the day-to-day operations of the facility.

In the end, the facility is there to support the treatment mission in the most effective manner possible. It is a vehicle for the delivery of these services but must also allow all of the staff to deliver their respective services safely and efficiently. A well-designed facility can accomplish these goals while enhancing patients' treatment and staff performance.



06

Circulation



6 Circulation

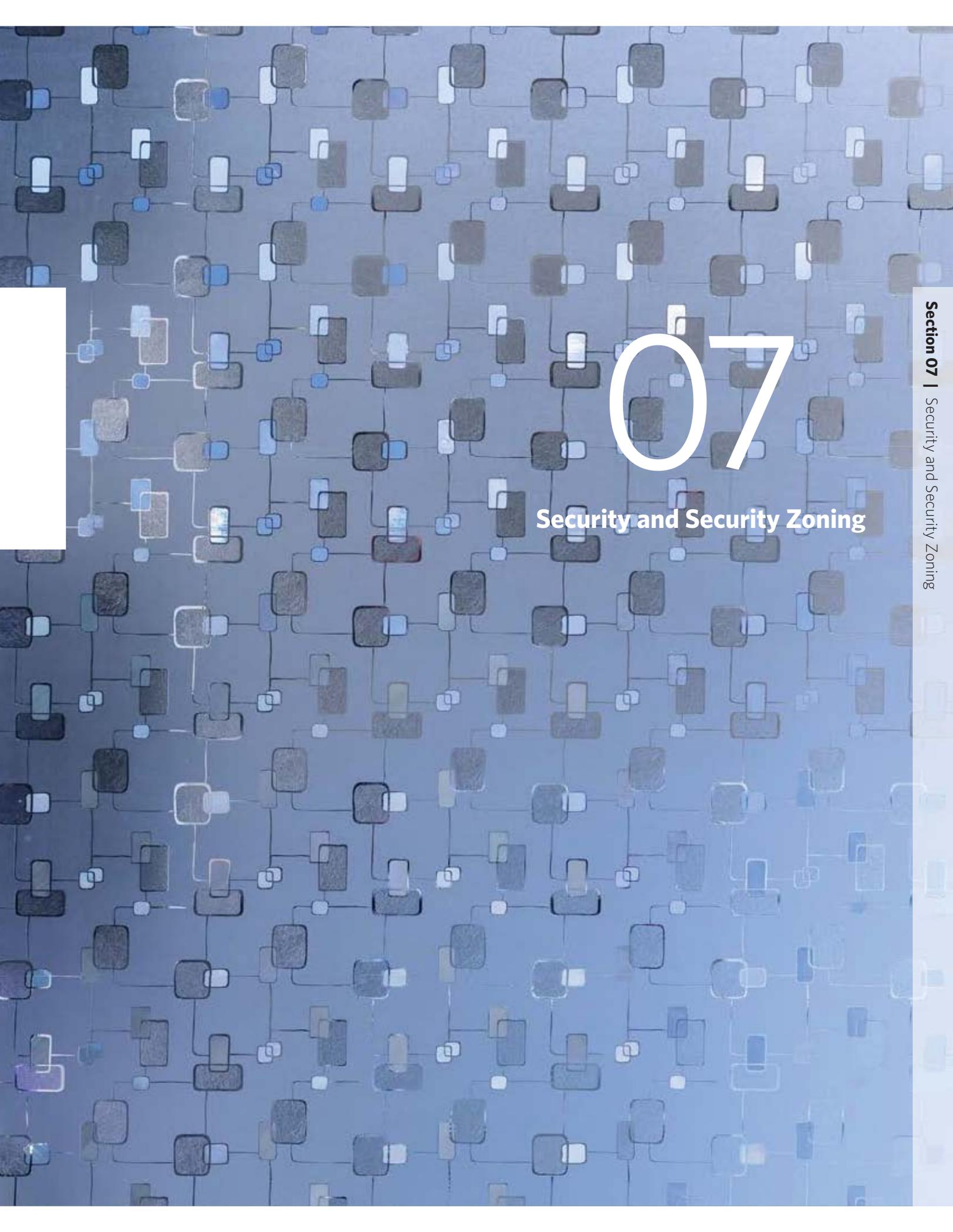
Simple and well-monitored circulation is an important planning consideration for any secure psychiatric facility. Safety, security, rapid emergency response, facility evacuation and the ease of way finding throughout the facility all depend on clear and simple circulation.

Ample corridor width is also important to allow for ease of movement and enhanced monitoring. The main circulation corridors of the new Central State Hospital, as currently envisioned, will consist of two primary corridors in cruciform configuration around the large central courtyard. One corridor leads from the lobby/central control/visitation node to the back-of-house support areas. The other corridor leads from one living community to the other. Secondary circulation is provided to allow ease of movement within each living community and between living units, programs spaces, support areas and the primary circulation corridors. Each living community will have its own dedicated, simple corridor system that contains secondary security observation posts for monitoring patient movement within each community. Access to the actual living units will be controlled in all cases, with sally ports at the maximum security units' entries and control doors at the civil/forensic units' entries.

Tertiary circulation is provided to allow for movement of staff and goods through the facility at large. All tertiary corridors would be considered staff-only, except in cases where "privileged" patients may assume support roles within the facility. This is purely an operational consideration, but the strategic placement of control doors and sally ports will allow for any combination of access according to programmatic and operational preferences.

Efficient circulation is all about finding your way. This will be accomplished and enhanced primarily by how the circulation paths are designed using landmarks and visual locational cues along the journey. This supported by clear signage and color-coding applied in a variety of ways will facilitate way finding.

In the detailed planning and design of the facility, every effort should be made to avoid dead-end corridors or long corridors with just a door at one end. Attention to these areas of circulation are important in providing an appropriately therapeutic environment where patients (especially those on psychotropic medications) aren't disturbed by the appearance of being "trapped" at the end of a long tunnel-like corridor. This too is an important factor in way finding.



07

Security and Security Zoning

7 Security and Security Zoning

The overall security approach for the new Central State Hospital project is similar to other projects of this type. The perimeter of the facility is necessarily controlled using a medium-level security fence line and vehicular/pedestrian sally ports as described below. The internal security in a modern psychiatric facility catering to patients of varying acuity levels and types of commitment is specifically responsive to the requirements for each sector of the population within the facility's two patient residential communities.

Our philosophy regarding psychiatric facility security is two-fold; one, the physical facility planning and second the use of electronic systems. The physical relies on lines of sight, wall construction, sallyports, etc. and accounts for the first line of safe and secure operations. The electronic systems (locking/control mechanisms, CCTV, duress alarms, etc.) provides a secondary means of supporting the security needs at the facility. A well-planned facility will have clear, un- obstructed lines of sight throughout and the ability to minimize staffing by providing easy monitoring of patient activities and movement.

In a modern psychiatric facility, and to the extent allowable for the intended mode of operations, our belief is "maximum security outside, maximum freedom inside." This approach allows for the most "normative" living environment possible for the patients, providing physical and electronic controls as required to maintain the acceptable degree of safety and security for staff, patients, and the community.

7.1 Perimeter Security

Perimeter security for the maximum security side of the facility will consist of a double "candy cane"-style security fence with no- climb mesh enclosing the maximum security pods and all of its component parts identified within the space program. There will be a 30-foot setback between the fence and any buildings within the perimeter, and a 20-foot separation between the two fences. The fence will be topped with concertina wire or a similar application.

The Civil/Forensic areas will have security fence with no- climb mesh surrounding the entire facility. There is a 30-foot setback between the fence and any buildings within the perimeter. A patrol road will be generally routed along the exterior of the fence line to entire facility to monitor the integrity of the fence and to ensure that the campus is secure and provide emergency access.

Breaks in the fence line will occur at two points. One will be the open vehicular sally port with control gates. These gates will only open one at a time to allow access for delivery, maintenance, and other service vehicles into the secure service yard. The second point will be where the two fences meet the administration building on both ends, extending from which will be the public and staff lobby and secure pedestrian sally port allowing access into the secure portion of the facility. The administration (Front of House, FOH) building is technically outside of the secure perimeter, but is also an integral part of the perimeter. Careful attention will need to be paid in how the fence line meets the building in order to maintain the same level of secure perimeter throughout for each program type.

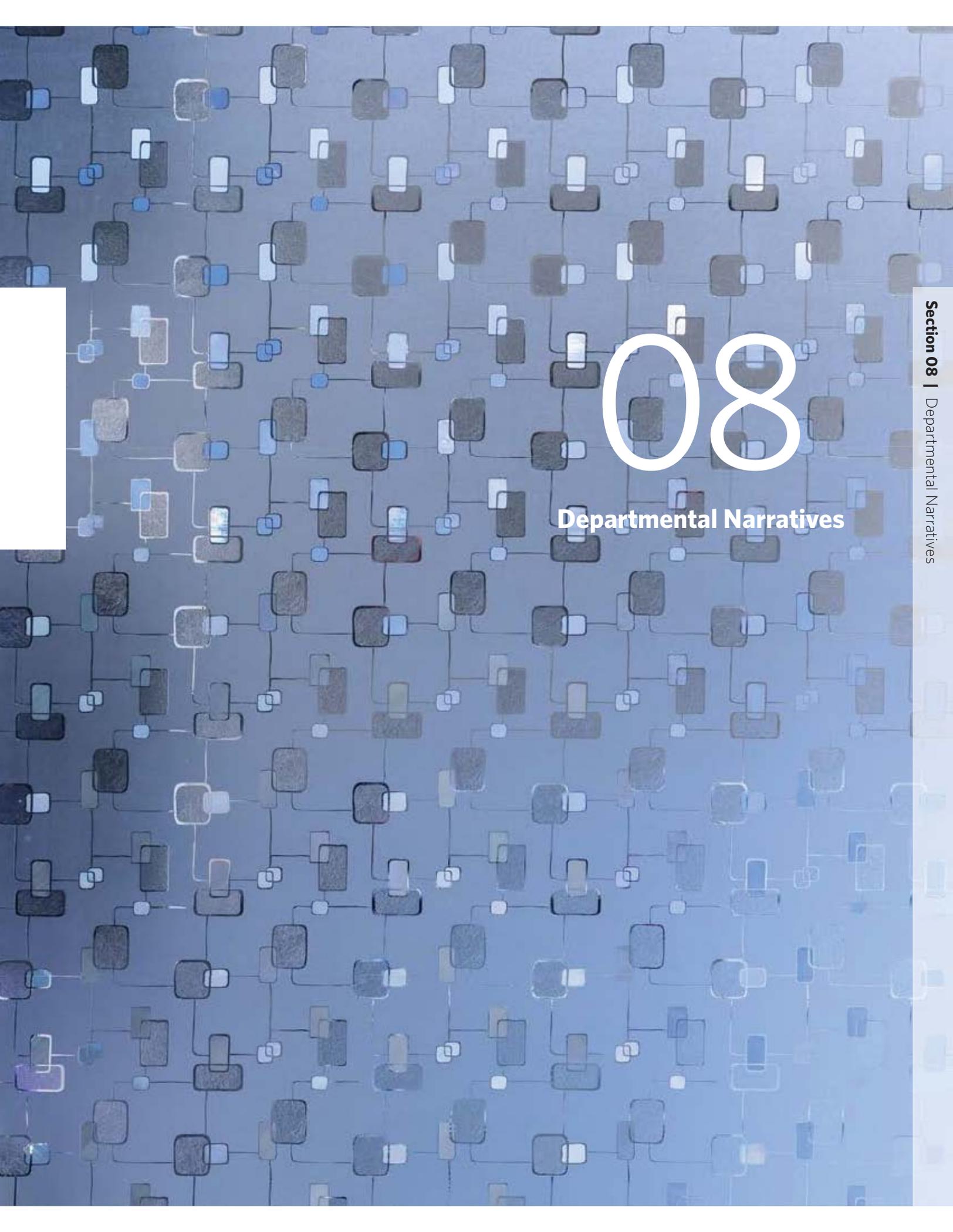
7.2 Internal Security

As stated above, well-informed, intelligent planning by a designer experienced in this building type is one of the most critical elements in creating a safe and secure facility. It is imperative that staff have, as a first line of safe operations, the ability to visually monitor patient activities and all movement throughout the facility. This factor should apply not only to areas designated for daily patient use, but also in areas designated as “staff-only.”

Separation of the maximum security population from the civil/forensic population will be accomplished by providing no direct patient access from one community to the other. In essence, they are treated as two separate facilities. The exception to this is where staff-only control access doors will be provided between the two communities. However, even these will be designed as sally ports monitored from central control to ensure that there is no contact between the two populations.

All areas of the facility and its two communities will offer varying degrees of access and movement for both patients and staff using a combination of control doors and sally ports placed strategically throughout the facility. Efforts will be made to ensure that anyone traversing through the facility can do so in an expeditious yet controlled manner. It is anticipated that a card-/chip-banded access system will be utilized for both staff and patients to allow complete control over who goes where while at the same time allowing security staff to monitor and log this movement utilizing their control system.

A staff duress system, with transmitters carried on-person will allow security to immediately locate and respond to emergency situations that may arise anywhere within the facility.



08

Departmental Narratives

8 Departmental Narratives

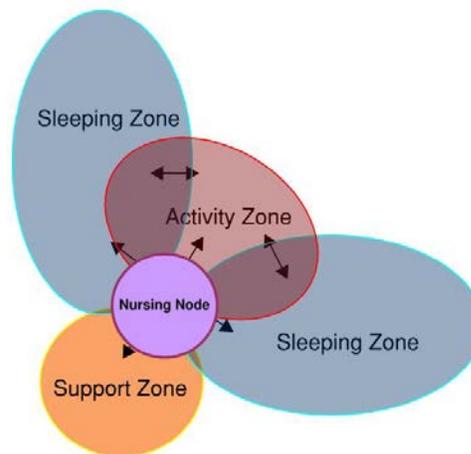
8.1 Living Units

All of the living units have been programmed to provide nearly identical floor plates for ease of use among all staff members who may migrate from one unit to another. This familiarity helps to enhance delivery of services, efficiency of operations, safety and security.

Each living unit has a separate, staff-only service and access corridor. This gives the staff a safe “back-of-house” zone from which they can enter and exit the unit without direct contact with patients if needed. This zone also allows service personnel to access the unit for a variety of maintenance, security and service needs without introducing them to the patient population and potentially disrupting daily on-unit activities.

Because of the dual populations the hospital must serve, two living unit concepts are employed; one for maximum security patients and another for civil/forensic patients. Every unit is planned with an activity zone, sleeping zone, support services zone and a nursing center. In the maximum security units, most patient sleeping rooms are situated directly on or adjacent to the activity zone to maximize staff views to patient sleeping rooms and access to each room door.

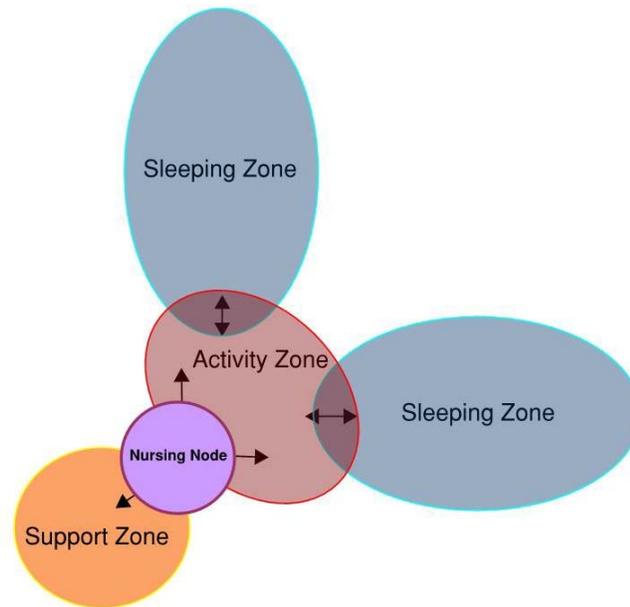
Figure 8-1. Living Unit Pod – Maximum Security



Living Unit Pod - Maximum Security

This is in contrast to the civil/forensic living units, where the patient sleeping units are located away from the activity zone. The design provides patients with “observable” privacy in their sleeping zones.

Figure 8-2. Living Unit Pod – Civil/Forensic



Living Unit Pod - Civil / Forensic

Each living unit has a variety of dedicated spaces to support the patient population and offer a variety of various daily activities. Spaces include quiet and active program rooms, comfort room, group room, exam/physical survey room, enclosed outdoor patio, consultation room, and seclusion rooms. This level of variety promotes variation in daily patient activities and enhanced operational flexibility as the facilitation of services and treatment may change over time.

Toilets and showers are also centrally located off the unit core to allow staff maximum observation and management of their use. In addition to the centrally located toilet facilities, the patients will have specially designed en suite toilet facilities that can be managed by staff as necessary.

Other program spaces within the unit (including the above) are traditionally included in psychiatric nursing units as required by current planning standards.

Special focus during design should be placed on the provision of non-institutional, residential “feel” finishes and furnishings. Use of carpet or carpet tile where possible is recommended. Acoustics are extremely important in creating a calm and treatment-amenable environment. Abundant light and views are also required to help provide a normative environment.

Each living unit will have access to an outdoor recreation area with both active and passive zones. Where living units are on the second floor, a stairway to that area, fully glazed to maximize observation of patient movement, should be provided. Generally the major differences are:



8.1.1.1 Maximum Security Housing

- Unit entry is through a secure sally port for enhanced security and control.
- Sleeping rooms are on or very close to the activity zone.

8.1.1.2 Civil/Forensic Housing

- Units have electronically and manually operable doors.
- Sleeping rooms are located away from the activity zone.

8.2 Programs

8.2.1 Admissions

The admissions program is a suite for entry and processing of new patients that will be located at both the maximum security and civil transportation component hubs. Generally maximum security patients are scheduled for arrival, this allows the admissions staff to operate both areas and move where needed.

Admissions should be as comfortable as possible in finish and furnishings balanced with the need for enhanced durability and security. The admissions process is traditionally one in which patients feel at their most vulnerable and on edge. A soothing environment will help to calm patients and consequently create a safer, more expedient admissions process.

8.2.2 Program Staff

This department within the secure perimeter is just beyond the main administration building, which is outside of the secure perimeter. Program staff (psychologists, therapists, social workers, and support staff) will go through the lobby and security directly to their office areas and to the core of the facility to serve their treatment mission. The environment should be professional and similar to a typical office appearance. There should be abundant daylight via windows and/or skylights to create the healthiest and most productive work environment.

8.2.3 Visitation

For the non-maximum security patients, visitation will occur on the unit. Visitation facilities off-unit but inside the secure perimeter, are provided for the maximum security patients to maintain visitor safety and patient security. The visitation suite will be located beyond the lobby and initial pedestrian sally port entry to the facility. Areas will be dedicated for both patient and visitor processing, including waiting, search area and restrooms. Additional sally ports will be provided to prevent patients from accessing staff and public-only areas. A security station and vending machines will be located in the main visitation room.

The facility will provide for contact and non-contact visitation, as well as private rooms for attorney-patient consultations. Directly adjacent to the visitors' entry will be a judicial component with a small courtroom, judge's office, and waiting area for on-site hearings.

The environment should be non-institutional and friendly in appearance and feel, while providing the necessary degree of durability, supervision and security. There may be an outdoor visiting area for use during clement weather, directly observable from the security station.

8.2.4 Patient Dining

The dining rooms will serve the civil/forensic population and maximum security population located within their separate building in the new complex. The dining rooms are not sized for all patients to be able to dine off the unit as on unit dining is also provided. Both populations need to have the flexibility to dine on unit based on level of acuity. Each housing unit will have a small food break out area. The dining room for both populations should be adjacent to the food service kitchen for ease and efficiency of service. The location should take advantage of exterior access views with large windows overlooking the outdoors.

8.2.5 Treatment Mall

The treatment malls (one for maximum security and one for civil/forensic patients) are the figurative “town squares” of the facility and contain all programs available to the patients, including treatment, education, vocation, and amenities such as a library, computer rooms, recreation, and other service and support components. These areas are an important part of a patient’s daily journey and should reinforce a positive and desirable routine. Thus, they should be designed in a way that emulates a public mall or “main street,” with storefronts, signage, colors, and materials that normalize the environment to allow patients to be more open to treatment and other activities.

Since this is a highly structured living situation, accommodation should be made wherever possible for informal seating and meeting places to encourage unscheduled conversation and activities between patients or patients and staff. This approach will help in making positive interaction and thus communication between and among all users a natural and desirable feature of the design.

Education

The education components of each treatment mall consist of classrooms, arts and crafts, computer rooms, library, and support spaces. These areas should be designed with abundant light and large windows to the mall for easy observation and with good acoustics in mind. The glass may be fritted (up to approximately 4- to 5-feet high) to prevent distraction to the patients from passers-by). This area should emulate a high school or junior college classroom environment.

Vocational Services

Vocational Services are provided only for the civil/forensic patient population. This suite is composed of labs and classrooms, a computer lab, and areas for car wash, horticulture (including a greenhouse), housekeeping, and instruction and support areas. To gain entry to this suite, patients with the appropriate acuity must pass through a security portal to prevent patients from obtaining contraband from the workshops.



Associated with this project component is a program named “Threads” in which donated clothing and other articles are taken in, repaired and cleaned as needed, and offered for free or at a minimal costs to patients who need them. It can best be equated to a thrift shop for the patients.

As with the education components, they should be designed with abundant light, large windows to the mall for easy observation and with good acoustics in mind. This department should also emulate a high school or junior college classroom environment.

Recreation Services

Both the maximum security and civil/forensic communities have nearly identical amenities in this area, including gymnasiums (half-sized for maximum security), physical therapy, and weight rooms. The civil/forensic gymnasium will have a dedicated multi-purpose room/stage area attached. There are also staff offices and support areas.

As with all areas within the hospital, good acoustics are important. Natural light into the gym areas is important, taking into consideration the positioning of clerestory windows to prevent glare on the floor.

Shared Patient Services

This series of program support components are of a variety that the designer can be quite creative in its appearance. These components form the heart of the treatment malls, and are much like the center of town, with multiple store fronts. Each community’s mall includes:

- Group therapy rooms
- Multi-denominational worship room
- Barber/beautician
- Game room
- Independent living skills lab
- Music therapy rooms
- Meditation rooms
- Exam/physical survey rooms

As with all other “public” areas of the communities, transparency for ease of patient monitoring is of great importance, as is the creation of as normative environment as possible. If possible, centralized gardens (or “parks”) should be located directly off the malls so that patients can walk freely from inside. This feature will also introduce views and light into the mall. Other considerations for the malls are park-like benches and informal seating areas and a wider area in the center of this most active part of the mall.

8.3 Support

The support areas of the hospital consist of both administrative and service areas where each should be designed according to use and with a modern professional design aesthetic.

8.3.1 Public Lobby

This area should be designed to a standard as would be the case in any new community hospital. The environment should be bright, pleasant and welcoming. Warm materials, color palettes, and furnishings should set the tone for a safe and calm place of arrival. Video information kiosks and other modern amenities to assist in dissemination of information and way finding are desirable. The reception station should be front and center and have good line of sight throughout the lobby, including the screening area and public toilet entries.

8.3.2 Central Control/Security

This area is the most secure component in the facility and must be designed and built as such. Ideally, security will have direct access from a non-secure part of the facility, and will also have direct line of sight into the lobby. On the other hand, central control needs to be located at the crossroads of the two primary circulation corridors to have the ability to directly observe patient and staff movement. These two directives are somewhat at odds and will need to be carefully studied during the schematic design phase of the project.

8.3.3 Executive Administration, Human Resources and Staff Development

All of these are traditional administrative office areas that have been collocated to maximize efficiency by sharing support functions such as restrooms, work and copy rooms, storage, housekeeping, and other needs.

Special attention to a modern and pleasant working environment is important, as is abundant daylight with windows where possible and skylights or monitors where necessary. If possible, internal office areas should have clerestories and/or glazed transoms over doors to allow as much daylight as possible from adjacent areas.

8.3.4 Kitchen

The kitchen will provide space to receive and store ingredients, prepare, cook and distribute meals to the patients as necessary based upon the particular needs of the patients and of the units. The on unit meals will be supported by a cook/chill program. Each unit will house an area to distribute food once delivered to the unit.

8.3.5 Transportation

There are two separate sides to transportation, one for maximum security patients and one for the civil/forensic population. Each side has unique staffing requirements that reflect the different security needs of the patient population served.

The design of these components should generally follow that of the admissions unit described in 8.2.1 above.

There is also a vehicle support function to the transportation department, which is in a separate location inside the secured service yard. This may also be accessed by some patients as part of their vocational training.



8.3.6 Housekeeping

This component is strictly utilitarian in design and layout and should be located directly adjacent to the maintenance/materials management department and loading dock for the satellite kitchen. It may also be used for vocational training of privileged patients.

8.3.7 Maintenance/Material Management

This component is also strictly utilitarian in design and layout and should be located directly adjacent to housekeeping and the loading dock for the kitchen. It may also be used for vocational training of privileged patients.

8.3.8 Energy Plant

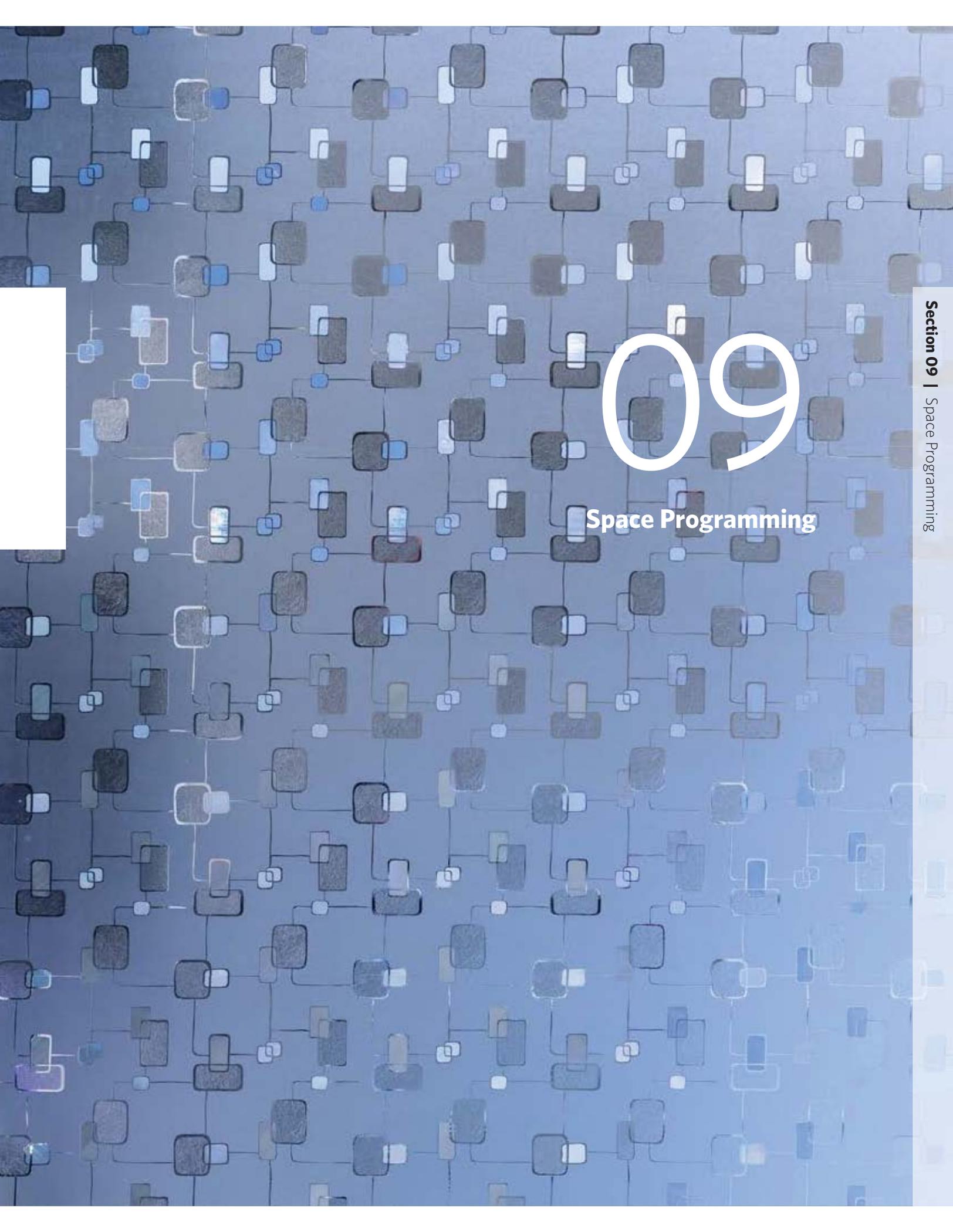
The energy plant should be directly adjacent to the materials management component and contiguous with the rest of the building in order to minimize construction costs. It should be secure from access to any patients.

8.3.9 Medical/Dental

The medical and dental should be adjacent to the treatment malls of both the civil/forensic and maximum security population. Both of these clinics are providing outpatient services. The most common of these room types and uses will exist on both units, but the more costly type rooms will be located in a way they can be shared as these uses are only a few times a month by maximum security patients and can be scheduled. It should be secure from access to any patients.

8.3.10 Pharmacy

The pharmacy should be directly adjacent to the materials management component and contiguous with the off stage areas of building in order to minimize construction costs and safety. It should be secure from access to any patients.



09

Space Programming

9 Space Programming

To develop the program for the new hospital, numerous meetings with the end users, leadership staff, DGS and DBHDS were held. These meetings informed the designers on the current operational and functional characteristics of Central State Hospital and the ideals the staff hoped the new hospital would embody. Space programming is the subsequent process in which the collected data is combined with best practices and developed into space requirements. On the next page is the summary of the square footages derived from the space programming effort. The full space program is included in Appendix A.

In addition to using the HDR team's experience in designing behavioral health facilities, referencing the current standards and guidelines listed in the concept narratives, it was decided during the programming sessions that a direct comparison to the Western State Hospital replacement should be created for reference. The HDR team conducted interviews with Western State Hospital Staff regarding the performance of the existing Facility during the design of the 56 bed expansion project. These lessons learned have been applied to the recommended program for the Central State Hospital Replacement. The HDR team used this information and experience to create the Western State vs. Central State comparison for reference during the programming working sessions.

The majority of the stakeholders on the Central State Hospital preplanning team, DBHDS and DGS team have visited the Western State Hospital project for a visual comparison of a new behavioral health facility. Because of this, the HDR team felt that we needed to create a program summary of the actual built facility was needed for comparison. The entire team used these actual square footages for validation and confirmation of the required program space for each area within the Central State Hospital departments.

Architectural Program
Central State Hospital

Space Program Summary Central State Hospital

Departments	Maximum Security	Civil/Forensic	Total	
I. LIVING UNITS				
A. MAXIMUM SECURITY				
	NSF		NSF	DGSF
1. Long Term - 22 beds (Org. 28 Beds)	8,638		8,748	1.6
2. Long Term - 22 (Org. 28 Beds)	8,638		8,748	1.6
3. Long Term - 22 beds (Org. 15 Beds)	8,638		8,748	1.6
4. Admissions - 15 beds (Org. 15 Beds)	6,956		7,096	1.6
5. Admissions - 15 beds (Org. 15 Beds)	6,956		7,096	1.6
6. Admissions - 15 beds (Org. 15 Beds)	6,956		7,096	1.6
Subtotal MAX HOUSING			47,532	76,051
B. CIVIL / FORENSIC				
			NSF	
1. Civil Admissions - 15 Bed (Org. 24 Beds)	7,157		7,157	1.6
2. Civil Admissions - 15 Bed (Org. 24 Beds)	7,157		7,157	1.6
3. Civil Admissions - 15 Bed (Org. 24 Beds)	7,157		7,157	1.6
4. Civil / Med / Cog - 24 Beds (Org. 24 Beds)	9,759		9,759	1.6
5. Civil / Intermediate- 24 Beds (Org. 24 Beds)	8,639		8,639	1.6
6. Civil / Intermediate- 24 Beds (Org. 24 Beds)	8,639		8,639	1.6
7. Civil / Intermediate- 24 Beds (Org. 24 Beds)	8,639		8,639	1.6
8. Civil / Intermediate -24 Beds (Org. 0 Beds)	8,639		8,639	1.6
9. Civil / Intermediate - 24 Beds (Org. 0 Beds)	8,639		8,639	1.6
Subtotal CIVILHOUSING			74,425	119,080
Subtotal HOUSING			121,957	195,131
II. PROGRAMS				
A. ADMISSIONS				
			NSF	DGSF
			6,620	1.6
B. PROGRAM STAFF				
			15,264	1.6
C. VISITATION				
	NSF	NSF		
	2,456	1,265	3,721	1.6
D. PATIENT DINING				
	1,160	2,240	3,400	1.6
E. TREATMENT MALL				
1. Education Services	3,021	4,049	7,070	1.6
2. Vocational Services	2,441	4,219	6,660	1.6
3. Recreation Services	4,841	7,747	12,588	1.6
4. Shared Resident Services	7,758	11,656	19,414	1.6
Subtotal PROGRAMS			74,737	119,579
III. SUPPORT				
			NSF	DGSF
A. PUBLIC LOBBY			2,075	1.6
B. CENTRAL CONTROL/SECURITY			2,965	1.6
C. EXECUTIVE ADMINISTRATION			13,955	1.6
D. HUMAN RESOURCES			1,823	1.6
E. STAFF DEVELOPMENT			6,502	1.6
G. KITCHEN			9,837	1.6
H. TRANSPORTATION			2,348	1.6
J. HOUSEKEEPING			1,090	1.6
K. MAINTENANCE/MATERIAL MANAGEMT			12,274	1.6
L. ENERGY PLANT			10,600	1.6
M. MEDICAL / DENTAL			8,665	1.6
N. PHARMACY			5,385	1.6
O. LAUNDRY			4,835	1.6
P. MAINTENANCE / BUILDING AND GROUNDS			5,678	1.6
Subtotal SUPPORT			88,032	140,851
Total Net Square Feet			284,726	
Total Departmental Gross				455,562
Building Grossing Factor				1
Total Gross Square Feet				455,562

NSF = Net Square Feet
 DGSF = Departmental Gross Square Feet



Western State Hospital – Central State Hospital Comparisons

Unlike Central State Hospital, Western State Hospital is a civil/forensics commitment facility only. Central State Hospital serves a dual purpose it is both a civil/forensics commitment and a maximum security commitment facility. This means that majority of the patient care and treatment areas for these behavioral health populations must be dedicated and separate spaces. The following sections provide a high-level summary's of the Western State Hospital -- Central State Hospital comparison.

9.1 Program Space

Planned program space is larger than WSH because of the need for separate programming areas for minimum security and maximum security patients. These two groups of patients cannot share space for security reasons. The minimum security population is akin to that in every other state hospital, and has regular community access as well as a greater array of therapeutic objects and environmental enhancements. The maximum security population poses a risk level more akin to that of a prison population, and regularly houses individuals charged with, and convicted of, violent felonies. This population has occasionally included capital defendants and death row inmates. The maximum security portion of the hospital requires a hardened environment carefully crafted to avoid patient access to anything that could be crafted into a weapon or used to facilitate an escape. Hence, separate patient, programming, and other spaces are necessary. In addition, the planned program space for maximum security includes a specialized visitation area that allows for non-contact visitation, and the attorney visits that are a common need for this population. There is a separate dining area in maximum security (and in addition, WSH has noted that theirs is undersized). Finally, there is a separate gym and recreation area for maximum security patients.

9.2 Central Security

CSH employs a Department of Public Safety, which is analogous to the security force at WSH. This department is responsible for safety of campus grounds in general and does not have any patient care or custody responsibilities. In addition to campus security, the maximum security program at CSH employs a Forensic Security Department, which is a workforce of individuals who work inside the secure perimeter of maximum security providing care and custody services directly to this high-security population. They also provide secure transportation of high-risk forensic patients. This specialized function is unique to the maximum security setting and is the reason the CSH plan requires more square footage for security than the WSH plan does.

9.3 Staff Development

WSH has noted that their staff development and training areas are significantly undersized and have presented severe operational challenges. Therefore, additional space was planned for this function within CSH. In addition, the staff development area of the CSH plan includes a staff gym area. This is considered a critical need due to the extraordinary stress levels experienced by staff working not only with individuals who have serious mental illnesses and frequently engage in dangerous behaviors; but also with individuals in maximum security who are considered the riskiest individuals within the state hospital system. Many staff work overtime, double shifts, and long work weeks.

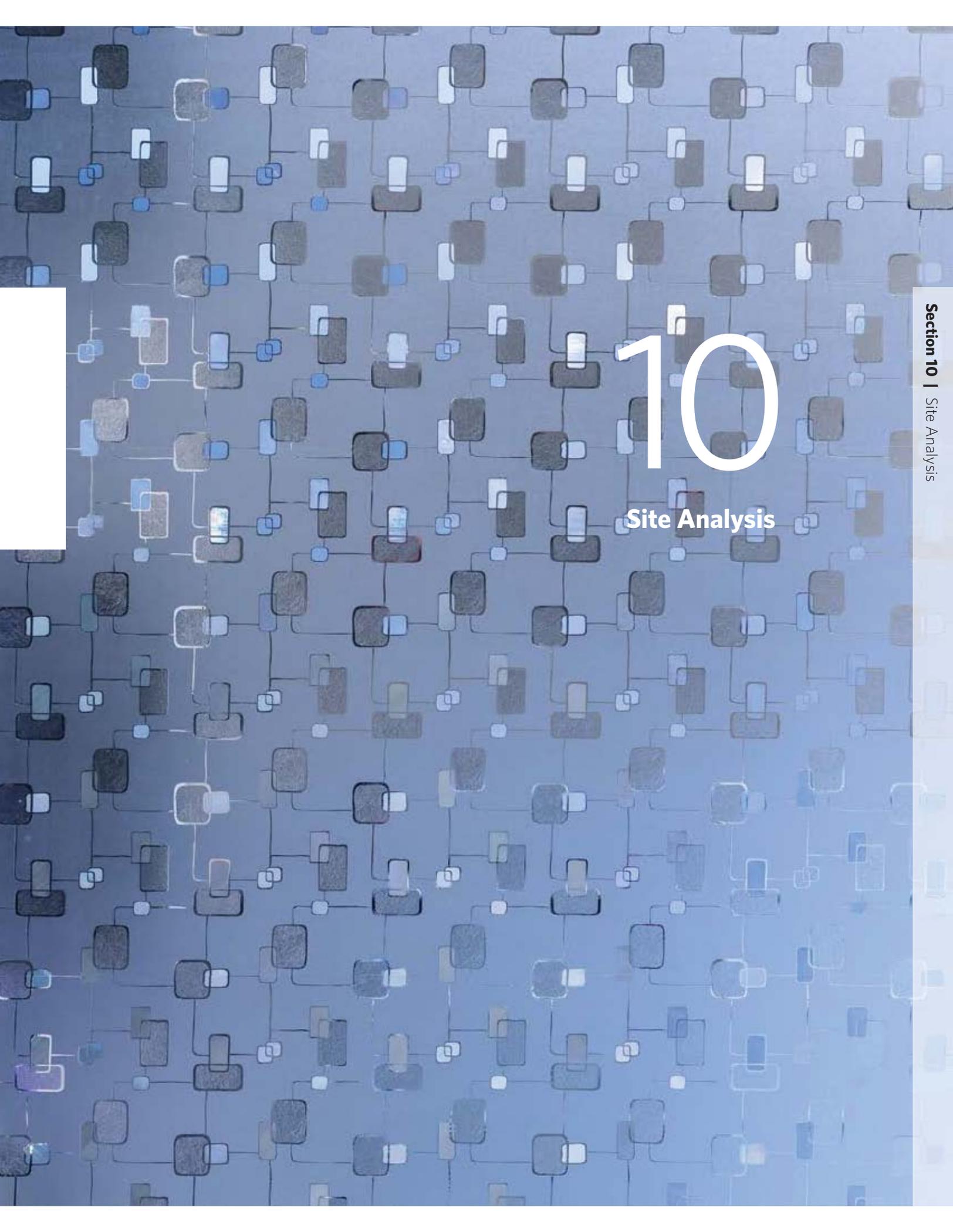
The inherent daily trauma of working with a dangerous population makes it critical for the hospital to provide opportunities for staff to engage in basic self-care in a psychologically safe space away from patients.

9.4 Clinic

The planned CSH clinic is larger than that at WSH because of the necessity of creating a separate waiting room for maximum security patients; and because increased square footage was necessary in both hallways and exam/treatment rooms to accommodate a 2-person escort of maximum security patients in addition to the standard space. All areas accessible to maximum security patients have also been sized to accommodate transport and ambulatory restraints.

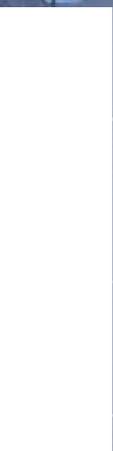
9.5 Warehouse

The planned CSH space is larger than the WSH space for two reasons. First, WSH has indicated that their warehouse area is significantly undersized, and we are attempting to correct that. Second, we are planning core functions for an eventual 348-bed hospital and the warehouse is intended to serve that eventual space.



10

Site Analysis



10 Site Analysis

Several sites were explored during the preplanning period. The overall footprint as developed was used to determine site space requirements. The area directly north of the site was assumed off limits due to the uncertain future use of Buildings 66, 81, and 82. Site constraints around the Hiram W. Davis Medical Center include a 500-foot setback requirement off of State Route 1 and a Civil War fort and cemetery. Other parameters evaluated included location of existing utilities, disturbance of natural resources, site grading cost, and demolition cost.

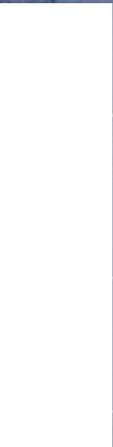
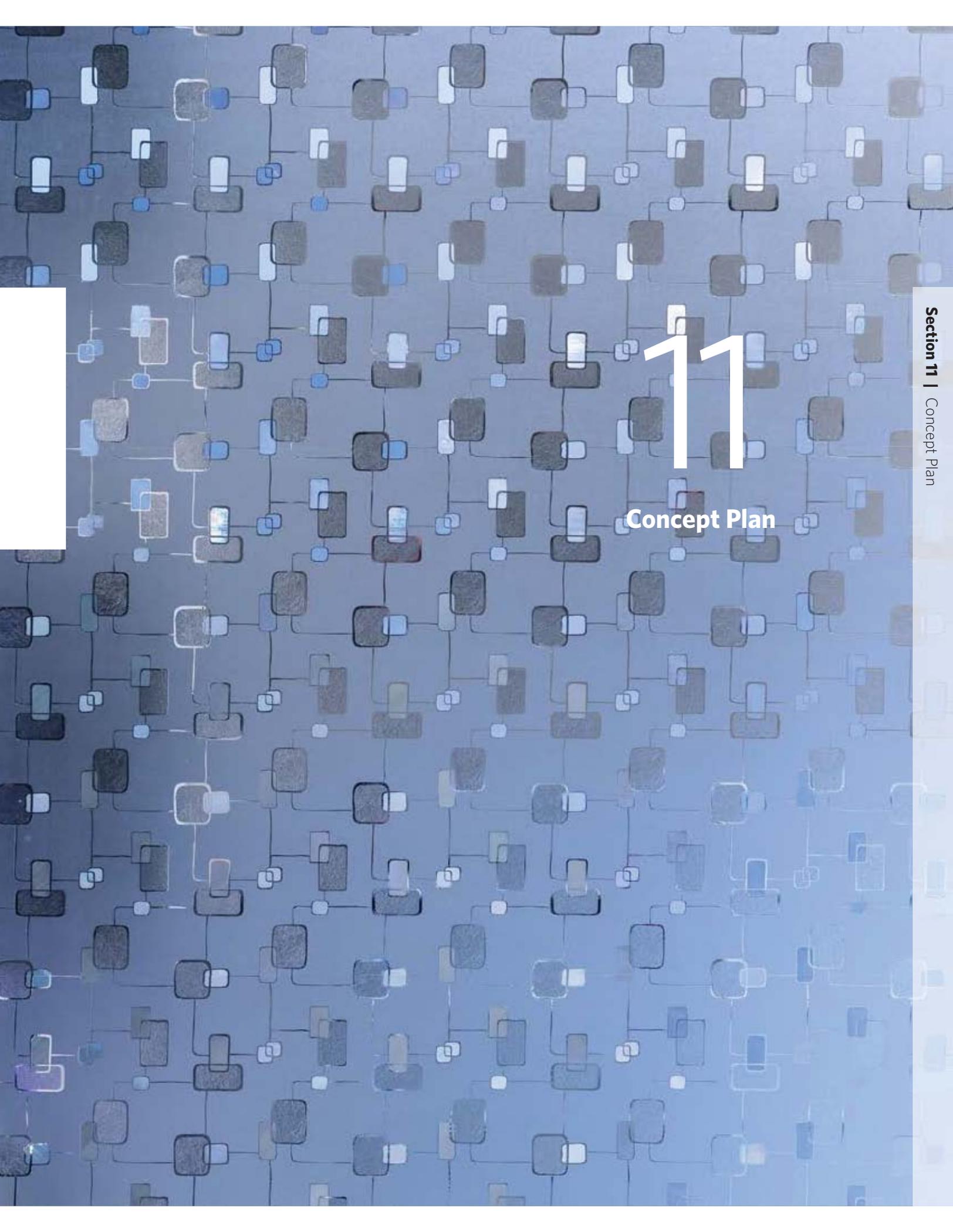
Figure 10-1. Site Location Options



The existence of steep slopes makes location D highly undesirable. Expansion in the location B area is restricted by the marketability of the land along US Route 1. Locations A and C are fairly similar in character. The difference lies in the extra cost required for demolition at location C and the marketability of this land. Therefore, Site Option A was determined to be the most desirable location. During concept development

it was requested that we shift the proposed future location as far south of option A (Parcel 1), as possible.

A number of site development strategies were considered, concentrating upon the options immediately south of location A. Property location A, B and C have potential for real estate value to the Commonwealth. The Land south of location A (Parcel 4) is unlikely to bring significant sale value due to the presence of complications from historic sites, steep grade, wetlands, access and a cemetery. Ultimately, working closely with DGS and the DRES, it was determined that the south location A as shown in figure 3 would maximize the land available to surplus while the demolition of the existing campus building would increase the attractiveness of the site to developers. All of these decisions results in making best use of potential sites for the new facility and increase the marketability of the land vacated.



1

Concept Plan

11 Concept Plan

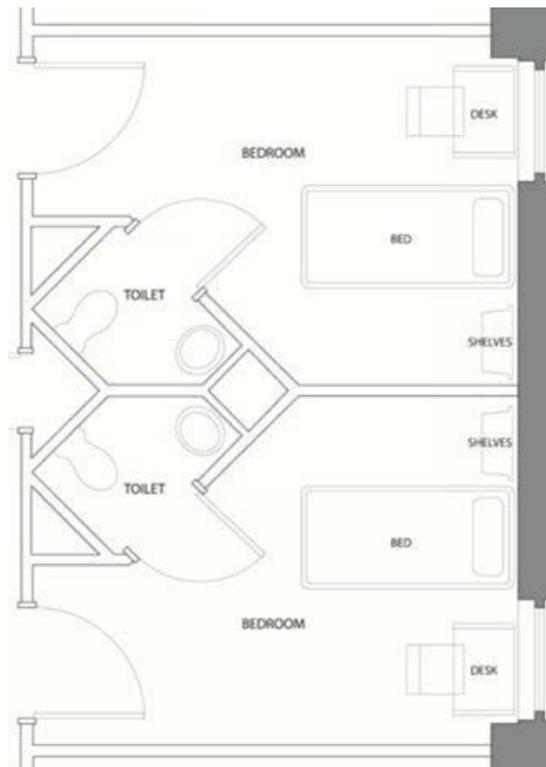
The program and conceptual facility layout provided in this Study are just the basic “kit of parts” that describes how the facility can fulfill the previously stated objectives. It is in the execution of the detailed design that all of these critical factors come together to create a whole that is greater than the sum of its parts. A design team experienced in this specific facility type is essential to the project’s success.

As with most design challenges there are multiple solutions. Many factors must be considered when developing a concept for a new facility. Constraints such as budget, staffing, operational treatment model, and available sites are just some of the many issues to consider.

After numerous meetings with hospital staff, executive staff, and DBHDS personnel to develop the program elements for the new hospital, we began to understand how certain building elements would function and whether those elements were appropriate for the hospital.

For example, there was an in-depth discussion about whether en suite toilet rooms were appropriate for the hospital’s population. It was decided that en suite toilets should be provided for all patients. Accordingly, the Western State Hospital patient rooms are appropriate for the Central State Hospital maximum security and civil/forensic populations. The bedrooms with en suite toilets will be approximately 150 net square feet in area for ADA and 130 net square feet for non ADA.

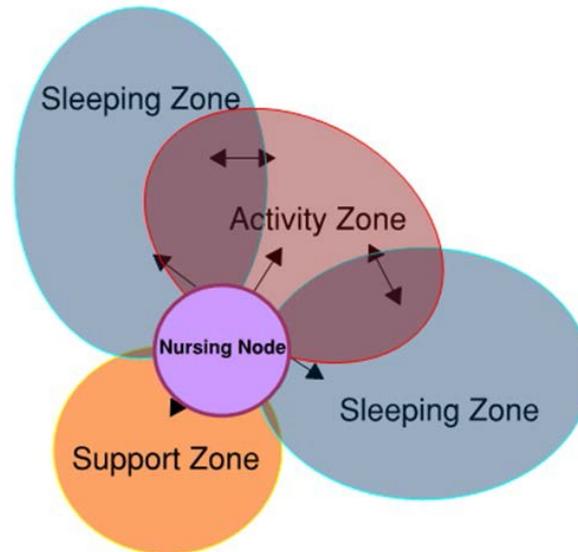
Figure 11-1. Typical Civil/Forensic and Maximum Security Patient Rooms



11.1 Living Units Pods

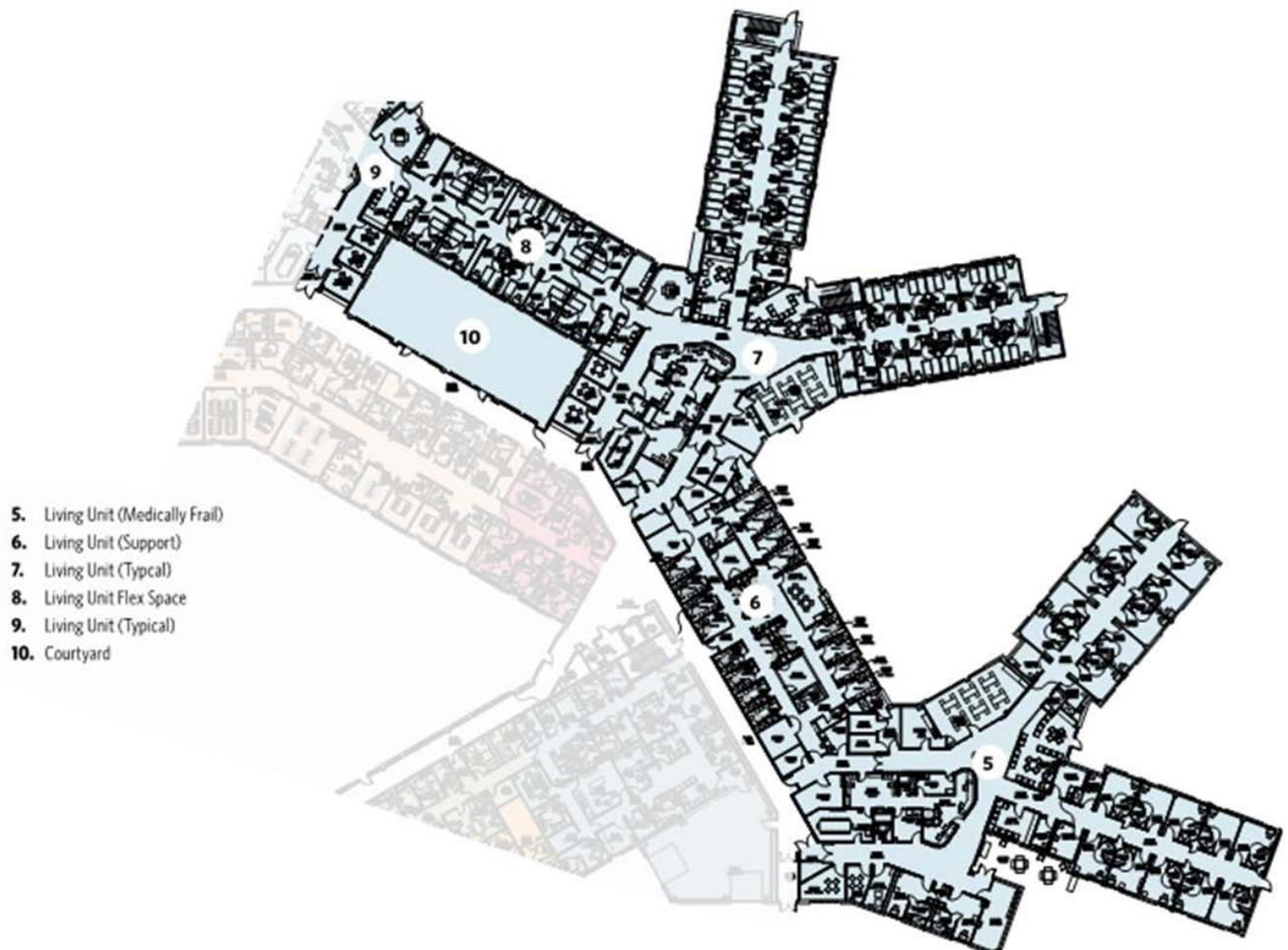
As discussed in the departmental narratives, two living unit concepts are used to accommodate the two populations that are served. The diagrams below illustrate these concepts.

Figure 11-2. Living Unit Pod – Maximum Security



In a more detailed look, each living unit will have a separate, staff-only service and access corridor and a central day and/or dining core to maximize staff observation of patient activities and movement. The maximum security unit is designed with most patient sleeping rooms situated directly on or near-adjacent to the core. The above diagram shows the relationship of the sleeping, activity, and support zones with the nursing node. This arrangement emphasizes the intense patient observability that is central to a maximum security environment.

Figure 11-3. Western State Hospital Living Unit



Likewise, the civil/forensic living unit will have a separate, staff-only service and access corridor and a central day and/or dining core to maximize staff observation of patient activities and movement. However, the civil/forensic living unit places the sleeping zone farther from the nursing node and is not as intimate with the activity zone, all while providing patient “observable privacy.” This relationship, as shown in the diagram below, helps to create a more normative environment for patients.

The figure below shows how the Living Pod bubble diagram was translated into the Patient Care Units at Western State Hospital.

Figure 11-4. Living Pod – Civil/Forensic

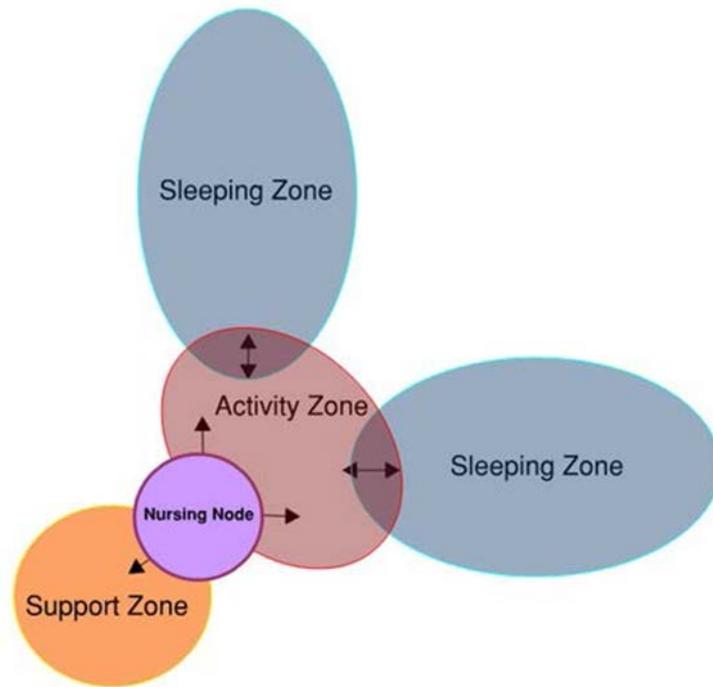
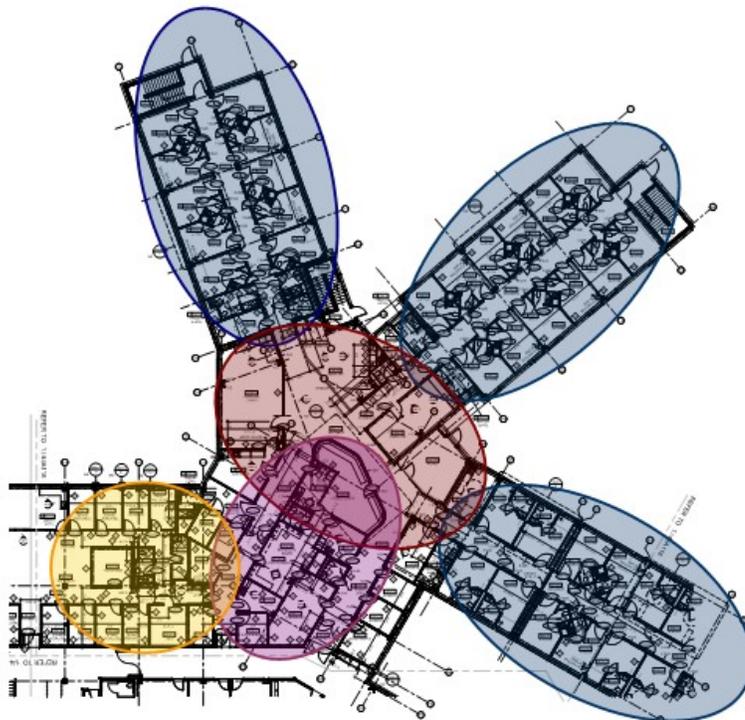


Figure 11-5. WSH Living Unit

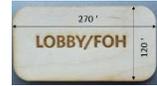




11.2 Facility Zoning

The facility consists of four major zones: maximum security, civil/forensic, administrative and support. This zoning approach recognizes that two distinct security and treatment modalities will exist at the new facility. Using living unit concepts above, the following scaled planning blocks were developed:

Lobby / Front of House – Lobby, Security, Clinic, Executive Administration Human Resources and Staff Development



Support / Back of House – Housekeeping Materials Management Laundry, Kitchen, Maintenance and Pharmacy



Central Energy Plant – Sized for 48 bed expansion



Admissions – Two units are provided one for civil/forensic and one for maximum



Civil Living Units – Six 24-Bed Units and Three 15-Bed Admissions Units



Maximum Security Living Units – Four 22-Bed Units and Two 15-Bed Admissions Units



Maximum Security Treatment Mall -- Education, Vocation, Recreation, Shared Resident Services Program Staff, Visitation, Dining and Transportation



Civil Treatment Mall – Education, Vocation, Recreation, Shared Resident Services Program Staff, Visitation, Dining and Transportation

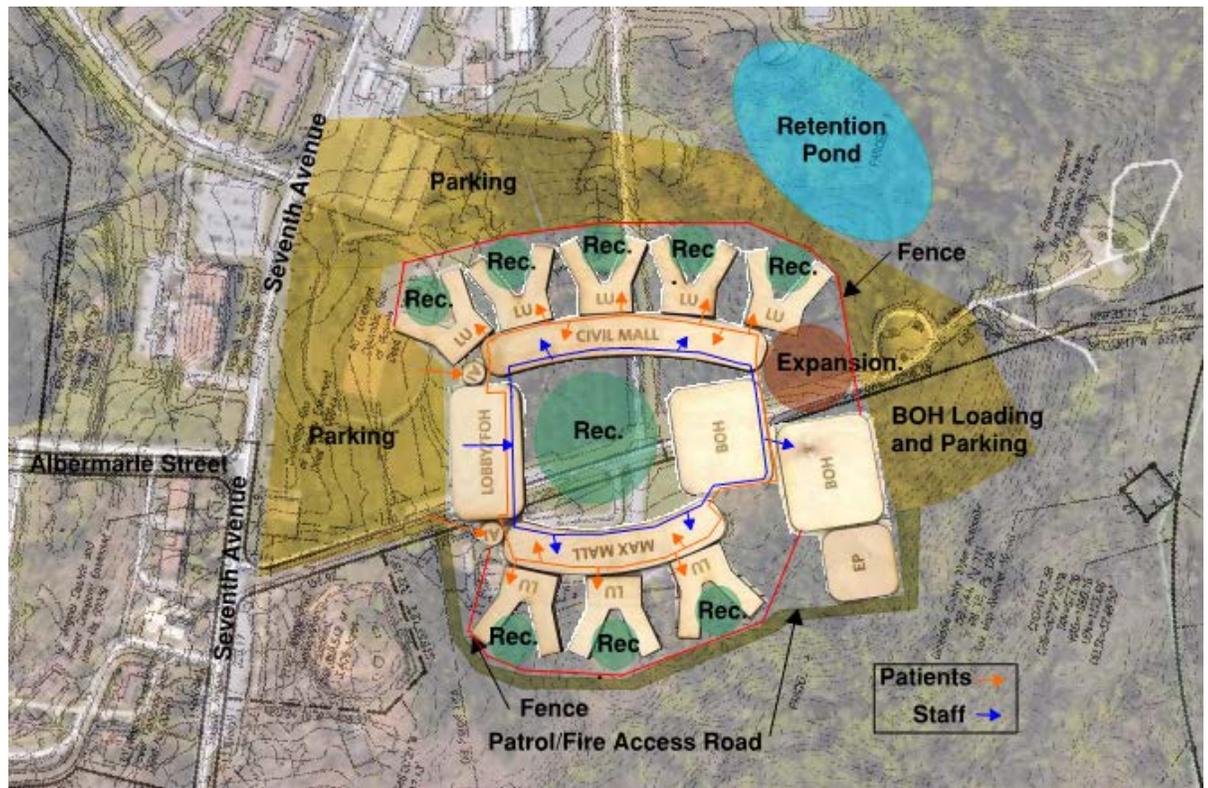


Additional details about the planning blocks can be found in Appendix B.

11.3 Facility Layout

Using the planning blocks and overlaying them on a same scaled topographical site plan, various layout could be explored. Based upon the concepts and principles noted throughout this study, the new Central State Hospital could have a layout very similar to the plan in Figure 9

Figure 11-6. Concept Plan



This concept organizes the building components around an open courtyard, with strategic placement of the complex generally to the southern portion of property at location A. The public-oriented shared “core” elements are located to the southwest corner of the complex, facing the vehicular approaches from Albermarle Street to the west. Housing units for civil and maximum security patients and the “back of house” elements complete a circular formation around the courtyard, providing a closed loop. Parking is located in a decentralized strategy, with potential for dedicated lots for staff, visitors, and service purposes.

The building organization maximizes access to daylight, provides a continuous closed circulation system, and offers a secure outdoor courtyard. The public shared elements are located to the southwest, the “back of house” shared elements are to the northeast, with the two housing units framing the courtyard and forming a connected system of circulation with excellent separation of public and service as well as clear zoning of housing security.



12

Concept Schematic Narratives

12 Concept Schematic Narratives

12.1 Introduction

The following section provides a schematic narrative for creating a cost estimate for the concepts. The concept schematic narratives assume the basis of design is a 300 bed replacement facility with infrastructure to also support a future 48 bed expansion

In terms of compliance with the High Performance Buildings Act and energy conservation requirements these narratives have chosen the path of LEED version 4.0.

12.2 Civil

12.2.1 Design Criteria

The site and associated improvements will be designed to meet all applicable standards, codes, and regulations of the Authorities Having Jurisdictions (AHJ). At a minimum this will include review and approval from the Virginia Department of Transportation and the Virginia Department of Environmental Quality (DEQ). Additional agencies that may require approval include the Virginia Department of Conservation; the Virginia Department of Historical Resources, Dinwiddie County Water Authority, other Dinwiddie County agencies as appropriate and Appomattox River Water Authority. If Federal wetlands or waters are to be disturbed, review and permitting may be required by the US Army Corps of Engineers (USACE). Depending on the nature of the disturbance and whether it is covered under the Nationwide Permit 39 or the Virginia SPGP-01 it may require additional DEQ review instead of USACE.

As design progresses, the final materials, systems, and infrastructure selections will be made with input from the appropriate regulatory agency and end user to ensure the operation is efficient and the systems are easily maintainable. All aesthetic characteristics involving the site will be coordinated with the required Commonwealth entities.

Existing utilities may be required to be relocated during the construction. At no time will existing utility service be interrupted. Temporary services will be designed and installed to serve existing buildings.

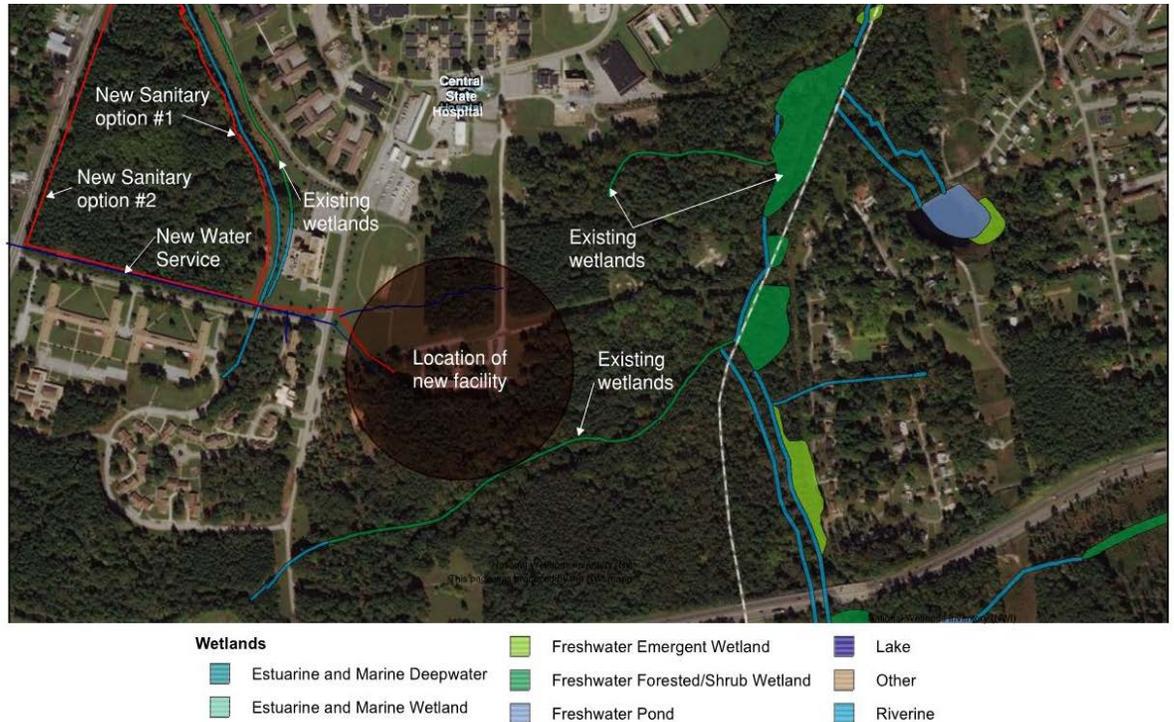
Existing buildings abandoned, and where appropriate infrastructure, will be decommissioned for safety and security after each phase. When the project is completed, all buildings will be demolished.

12.2.2 Site Construction

A geotechnical investigation has not been performed at the project site. This will be performed once a final site location has been selected during design and a preliminary site layout completed. The geotechnical investigation will determine soil bearing capacity for the building foundation and pavement design as well as provide the depth to groundwater and rock. Infiltration tests will also be performed to determine appropriate stormwater practices.

The existing site for Parcel 1 is relatively flat, with maximum grades near 6 percent. Barring the existence of a great amount of unsuitable soils, the site will be designed to be balanced, meaning no additional material will be transferred onto or away from the site.

Figure 12-1. Utility Concept and Options



The existing site for Parcel 4 slopes down to the wetland that runs through the center of the site. This large area with steep slopes will make balancing the site very unlikely due to the assumed quality of the soils in this area as well as the large grade difference across the site. It is anticipated that fill material will be needed for this site which could be achieved by using soils from Parcel 1 or purchased from offsite areas.

12.2.3 Stormwater Management

The development of the site will result in a significant increase in stormwater runoff. Compliance with Commonwealth regulations may be achieved on site by using a combination of practices such as infiltration basins and grass swales. Another strategy to achieve compliance would be to change the land use of the surrounding abandoned building sites. These buildings and the associated impervious and managed turf could be removed and the area left as a conservation easement. This strategy could have a large impact on the site-related stormwater management cost. Regardless of offsite strategies, additional stormwater detention will be required and could be achieved by constructing a dry detention pond or underground detention basin storage. Other strategies that should be considered for their feasibility in the planning stage include a wet pond feature and rainwater harvesting.

In general, the parking and lawn areas will be graded to grass swales. Stormwater from yard inlets and the roof drains will be collected in an underground pipe network. All stormwater will be directed to a detention structure prior to leaving the site.



There are many options to achieve stormwater compliance. To ensure that the most cost-effective solution for both implementation and long-term maintenance is chosen, it is imperative that the designer coordinate closely with the Commonwealth to evaluate all possibilities.

12.2.4 Sanitary Sewer

The existing sanitary sewer system on site is old and in poor condition. Due to its poor condition and the potential of selling off future parcels on site, new sewer lines should be constructed to connect to the Dinwiddie County Water Authority (DCWA) trunk sewer. Two ways of achieving this are discussed below.

Both of the proposed layouts for the future CSH facility are capable of being served by gravity sewer. The recommended gravity sewer alignment will run from the future site behind the existing Hiram W. Davis Hospital and follow an existing creek line to tie into the DCWA trunk sewer along Cattail Run Creek. The creek line behind Hiram Davis is a natural dividing line between the proposed parcels and potential future development of the site. A gravity sewer along the creek line will provide sewer service for the new facility and also provides the potential for sewer service for neighboring parcels. It is unlikely that future development would alter the natural drainage of the site due to cost implications.

The new sewer line size will need to be confirmed during design to ensure it has capacity to provide service to the new facility and surrounding parcels. It is estimated approximately 4,200 linear feet of 12" to 15" sewer and associated manholes will be required for the sewer alignment. Each manhole along the sewer alignment will provide a potential connection point to provide sewer service to the neighboring parcels along the creek. A section of the sewer alignment will run through an existing forested area and wetlands. Approximately 1.6 acres of trees will need to be cleared for the sewer alignment. A delineation will need to be performed during the design phase to determine the wetland extents and project impacts. Sewer utility alignments are typically considered temporary impacts and permitted by USACE under the Nationwide Permit 12.

An alternate option to installing a gravity sewer is to construct a pump station to provide the sewer service. The station would be located behind the proposed hospital and pump the wastewater through a force main to the DCWA system. The force main would run from the proposed site west along Albemarle Street then turn north along State Route 1 to tie into the DCWA trunk sewer on the north side of Cattail Run Creek. This alignment of following the roads will not divide the parcels and provide access in case of maintenance or repairs. It is estimated approximately 5,500 linear feet of 6" force main will be required. The force main size and capacity will need to be confirmed during the design phase. Some tree clearing may be required along Route 1 for the force main depending on the location of existing utilities. In addition, the alignment of the force main along State Route 1 will need to be coordinated with the Virginia Department of Transportation (VDOT) regarding any future roadway expansion projects. The pump station will require a minimum of two (2) redundant pumps and a backup power source in accordance with Virginia Department of Environmental Quality Sewage Collection and Treatment Regulations. The pump station will require monitoring of alarms and regular maintenance of equipment to ensure proper operation.

12.2.5 Power Distribution

The project will utilize the existing 3-phase power distribution lines that are located to the east of the Hiram W. Davis Medical Center. Connection to the existing distribution lines will be coordinated with Dominion Power. Power will be provided to all on-site signage, lighting, security, and other miscellaneous improvements. Existing easements and power lines will need to be relocated.

12.2.6 Natural Gas

A natural gas line and station are present on site. In both options the gas line and station will need to be relocated around the northern end of the site. Coordination with the utility company to determine exact route, meet all applicable requirements and any easements needed will be necessary. It will also be necessary to determine if the existing gas line feeds any other uses downstream in order to ensure there is no downtime for any other existing customers during construction.

12.2.7 Water

Water is currently being provided to the site by Appomattox River Water Authority. Two elevated water tanks are on the existing campus to provide water for fire protection.

Water is currently being provided to the site by Appomattox River Water Authority. Two existing elevated tanks were constructed on the site to provide fire protection. Due to the changes to the use of the facility, water usage has been greatly reduced, causing issues with the residual chlorine of the potable water. The recommended solution would be to connect to the Dinwiddie County Water Authority waterline located at State Route 1 and abandon the existing water towers on site and make a new connection to the existing water distribution piping. The recommended waterline alignment will run from the proposed site west along Albemarle Street to the intersection of State Route 1. It is estimated approximately 2,800 linear feet of waterline will be required. The waterline could be installed with stub-outs for future connections to the neighboring parcels along Albemarle Street. It is anticipated that VDOT will require a casing pipe to be bore and jacked across State Route 1 for the waterline construction, Additional evaluation will be required to further determine the most cost-effective solution to effectively provide domestic and fire demands at the new hospital while dealing with the reduced demand that will result throughout the remaining site. The waterline will be designed such that adequate flows will be provided to the property and the phasing of selling off property will not adversely affect the water distribution system in the future.

12.2.8 Asphalt Paving

Asphalt paving will be used for all on-site drives and parking areas. Final pavement design recommendations will be provided by the geotechnical engineer. Drive aisle and fire access will be coordinated with the fire marshal to ensure emergency access requirements are met. Heavy duty and light duty pavement will be placed so that emergency vehicles and large vehicles do not destroy the asphalt or degrade the surface beyond what is typical for the life cycle of this pavement material.



12.2.9 Concrete Paving

Concrete pavement is proposed for all sidewalks, plazas, and loading areas.

12.2.10 Fences and Gates

Fences and gates will be placed as necessary to limit access to the site. Additional areas that may require fencing include the stormwater detention pond.

12.2.11 Soil Preparation, Turf and Grasses, and Plants

The final design will include a detailed landscape plan showing limits of turf grass, plant type, trees, shrubs, and irrigation.

12.2.12 Telephone, Data, Communications

Existing communication lines are located to the east of the Hiram W. Davis Medical Center. The proposed site will be served by all necessary telephone, data, and communications required and will be routed through the proposed site accordingly.

12.3 Architectural

12.3.1 Design Criteria

The Architectural design will comply with the requirements of all applicable codes and standards.

12.3.2 Codes, Design Guidelines, and Material Standards

Applicable codes include but are not limited to:

- 2015 Virginia Uniform Statewide Building Code (VUSBC)
- 2015 Virginia Construction Code (VCC)
- 2015 VIRGINIA STATEWIDE FIRE PREVENTION CODE
- The Facilities Guidelines Institute: Guidelines for Design and Construction of Hospitals
- 2018 The Facilities Guidelines Institute: Behavioral Health Design Guide Edition 7.3
- 2018 NFPA 101
- 2010 ADA Standards for Accessible Design
- Construction and Professional Services Manual (current edition)

12.3.3 Construction Type and Use Group

- Construction type of the proposed concept is proposed to be type I-B--Fire Resistive Non-Combustible. Fire walls would not be required. Building would not exceed 4 stories of allowable height. Current concept is 2 stories with unlimited area per floor.
- 2 Hr. Exterior Walls (load Bearing)

- 2 Hr. Structural Frame
- 2 Hr. Ceiling/Floor Separation
- 1 Hr. Ceiling/Roof Assembly
- Use group for the concept would be I-2 with mixed uses, with any required these separation per code of B use group, various A use groups to be further defined in full design.

12.3.4 Exterior Architectural Design and Core Elements

12.3.4.1 Exterior Wall

- Pre-cast insulated concrete panels with a combination of sandblasted finish and brick veneer inserts. Allow 50% of area sandblasted finish and 50% of area brick veneer inserts. Precast concrete will have custom aggregate mixture and white cement matrix.
- Brick Color: standard manufacturer's colors and finishes.
- Wall system is to have value of R-23 minimum.

12.3.4.2 Exterior Windows, Doors and Louvers

- Aluminum clear anodized storefront window framing system with insulated glazing;
- At patient access areas, provide 1" insulated glass system at exterior with tempered and laminated glass panels and ½" tempered glass interior safety panel
- At areas with no patient access, provide 1" insulated glass system with tempered and laminated glass panels
- Windows are primarily inoperable. Those that are operable within patient areas shall be provided with security screens with access areas keyed locks on interior face. Horizontal blinds are integral to the window unit.
- All non-patient area windows are to be ½" tempered laminated glass.
- Aluminum clear anodized doors and frames with ½" tempered clear glass
- Aluminum clear anodized louvers and integral profiled vertical and horizontal mullions and glass.

12.3.4.3 Roofing System

- For pitched roofs – standing seam metal roof (steel with fluorocarbon finish) in manufacturer standard colors. Roof concept based on UL P-515 with roofing insulation on the top cord of the light gage steel truss. Minimum roof R-values of R-30ci or R-38 for attic.
- For flat roofs – built-up roof sloped to drain with tapered insulation, protection board and vapor barrier, and minimum roof R-values of R-40ci.



12.3.4.4 Miscellaneous Metal Work

- Painted galvanized metal parapet caps, overflow scuppers, coping, exposed flashing and metal railings
- Architecture metal work for railings

12.3.4.5 Vertical Transportation

- Stairs shall be metal pan, concrete filled
- Elevators shall be hydraulic elevators with two (2) stops each. Elevator interior finishes shall be stainless steel. Elevators shall have glass doors for safety reasons.

12.3.5 Interior Architectural Design

12.3.5.1 Floor and Base Finish Materials

- Carpet tile with rubber base in office areas, waiting rooms, consult rooms and office corridors areas where carpet is appropriate for the activity.
- Resilient vinyl tile with rubber base in staff and heavy traffic corridors, storage rooms and clean & soiled rooms
- Rubber sheet goods with integral base in patient rooms, seclusion rooms and patient group/activity rooms where rubber sheet goods are appropriate for the activity
- Fluid Applied Flooring – epoxy based in patient toilet/shower rooms and private toilet rooms. Provide ceramic tile wainscot, 54" AFF in all patient/private/public toilet rooms.
- Sealed concrete floors with rubber base in mechanical, electrical, telecom/security equipment rooms and loading dock areas
- Recessed Walk-off mat in all entrance vestibule areas.

12.3.5.2 Interior Partitions

- Typical partition is 3-5/8" metal stud wall with sound attenuation batts and Type X 5/8" impact resistant gypsum wall board both sides to structural deck above.
- Partitions in patient units shall be 3-5/8" metal studs with sound attenuation batts and acrovyn wall protection to 10'-0" AFF with 5/8" impact resistant drywall.
- Corridor side walls in patient units to be similar construction to partitions within patient units but with acrovyn wall protection to 10'-0" AFF with 5/8" impact resistant drywall.
- Furred partition is 1-5/8" metal stud furred partition with Type X 5/8" gypsum wall board, one side only, for plumbing chases.
- Plumbing wall partition is 6" metal stud wall with 5/8" FR gypsum wall board both sides to structural deck above to conceal plumbing fixture supply or drainage piping or fixture carriers.

- 1-hour fire-rated smoke and fire-rated partitions, where required for room enclosure or smoke compartmentalization.
- 2-hour fire-rated smoke and fire-rated partitions, where required for room enclosure or smoke compartmentalization.

12.3.5.3 Ceiling and Finish Materials

- Suspended acoustical tile ceiling materials with high STC rating used in corridors, office areas, consult rooms, large storage areas, clean and soiled rooms, etc.
- In patient corridor areas, group rooms, dining and day rooms, etc. acoustical tile ceilings shall be installed at 10'-0" AFF, typical. In Maximum Security corridor areas, group rooms, dining and day rooms, etc. use gypsum wallboard ceiling materials with acoustical ceiling panels where appropriate for sound control
- Gypsum wallboard ceiling materials used in public, private and patient bedrooms, toilet rooms, shower areas, janitor/housekeeping closets, secure areas etc.
- In patient bedrooms, toilet rooms, shower areas, gypsum wall board ceilings shall be installed at 10'-0" AFF, typical.
- Provide access panels in ceilings as required by code. Access panels shall meet adjacent wall/ceiling fire rating. All access panels' doors shall be spring loaded and provided with keyed entry and installed with tamper resistant screws.

12.3.5.4 Interior Windows and Doors

- Solid wood doors, stained, shall be used for offices, patient exam rooms, patient rooms, toilet rooms, closets, etc.
- Hollow metal doors, painted in penthouses areas and loading area
- Office/Patient areas:
 - All interior windows in patient areas to be 1/2" tempered glass or equal in hollow metal frames.
 - All other interior windows to be 1/2" tempered glass.

12.3.5.5 Casework

- Public Areas:
 - Case fronts and doors – plastic laminate veneer finish on medium density fiber board (MDF) substrate and water resistant MDF in wet areas. Color selection from standard manufacturer's color range. All casework to be fully lockable.
 - Handles on casework to be recessed, typ.
 - Countertops and backsplash – solid surface materials from manufacturer's standard color range.
- Patient Areas:
 - Door-less cubbies to be provided for patient's belongings. Cubbies shall be bolted to wall with tamper resistant screws.



12.4 Fixtures, Furniture, and Equipment

The behavioral healthcare furniture, fixtures, and equipment will be specified to assist in the care of patients in behavioral health environments. Behavioral healthcare furniture needs to be designed to meet the unique needs of patients, combining durability and safety with comfort and aesthetic. Furniture for behavioral healthcare units must provide patients with a calming and safe environment. In addition, furniture and seating products should not have surface joints or seams as to mitigate the growth of bacteria.

12.5 Structural

12.5.1 Design Criteria

Structural design will comply with the design guidelines of all applicable codes and standards of the authorities having jurisdiction.

12.5.2 Codes, Design Guidelines, and Material Standards

- 2015 Virginia Uniform Statewide Building Code (VUSBC)
- 2015 Virginia Construction Code (VCC)
- American Society of Civil Engineers (ASCE), Minimum Design Loads for Buildings and Other Structures ASCE 7-10
- American Concrete Institute (ACI): Building Code Requirements for Structural Concrete ACI 318-11
- American Institute of Steel Construction (AISC): AISC Manual of Steel Construction, 14th Edition
- American Welding Society (AWS): AWS D1.1, D3.1, & D1.4
- Steel Deck Institute (SDI): SDI Diaphragm Design Manual
- American Society for Testing and Materials (ASTM): material standards as noted
- American Iron and Steel Institute (AISI): AISI Specifications for Design of Cold Formed Steel Structural Members
- Steel Joist Institute (SJI): SJI Catalog of Standard Specifications and Load Tables for Steel Joists and Joist Girders
- American Concrete Institute (ACI): ACI Building Code Requirements and Specifications for Masonry Structures (ACI 530-11 and ACI 530.1-11)

12.5.3 Foundations

Building foundations will be designed based upon recommendations set forth in the geotechnical report. As stated earlier, no geotechnical investigation has occurred for this site. Therefore, the method of excavation, site preparation, ground water mitigation and foundation design for the proposed site have not yet been determined. For pricing purposes it is assumed that a conventional shallow foundation system will be used. Frost depth is 18", which means footing depth will likely be determined by other considerations.

With a shallow foundation system, the columns will be supported on individual square footings approximately 1'-8" below the finished first floor elevation. The exterior precast panels will bear on a continuous strip footing poured integral with the exterior column footings.

The project site contains existing buildings; as part of this project, all structures in the area of the new hospital will be demolished. The foundations of the existing building should be removed within the new building footprint. If outside the building footprint, they may be abandoned in place below grade.

12.5.4 Superstructure

For floors on grade, concrete slabs reinforced with welded wire reinforcing over a vapor retarder and graded stone capillary layer will be used. Typical slabs on grade will be 4-inch thick and slabs in mechanical areas will be 6-inch thick. Anticipated column spacing will be approximately 30 feet.

On elevated floors, a 5 ¼" composite concrete slab over steel deck system supported by steel framing will be used. The 5 ¼" composite slab system will be 3 ¼" light-weight concrete over 2" composite deck (20 gage galvanized, UL D925). The slab's supporting steel framing will use 9'-0" on center spaced steel wide-flange beams made composite with the concrete slab by headed studs.

The roof will be a steel roof deck supported by structural open web steel bar joist framing. The steel roof deck will be type "B" galvanized roof deck (20 gage, UL P732).

In the main building, lateral loads will be resisted by precast concrete exterior wall panels; where additional bracing is required, vertical steel X-bracing or interior 8-inch masonry shear walls at stairs and elevators will be used. Loads will be distributed to the vertical elements by roofs and floors acting as diaphragms.

In support buildings, lateral loads will be resisted by exterior masonry shear walls and/or steel framing. Pre-engineered metal buildings may be an option if permitted by the fire-rating.

12.5.5 Materials of Construction

- Concrete 28-day strength:
 - Footings: 3,000 psi
 - Slab on deck: 3,000 psi (coordinate with final UL rating)
 - Concrete exposed to weather: 4,500 psi, air entrained
 - Other concrete: 4,000 psi
 - Precast Concrete wall panels (insulated): 5,000 psi
- Reinforcing steel bars: ASTM A615, Grade 60, Fy = 60 ksi
- Welded wire fabric: ASTM A185
- Structural Steel
 - Wide Flange and Tee shapes: ASTM A992, Fy = 50 ksi

- Angles, channels and plates: ASTM A36, $F_y = 36$ ksi
- Hollow steel sections (HSS): ASTM A500, Grade B, $F_y = 46$ ksi
- Pipe: ASTM A53, Grade B, $F_y = 35$ ksi
- Anchor Bolts: ASTM F1554, $F_y = 33$ ksi
- Welding Electrodes E70XX
- Metal Roof Deck: Galvanized ASTM A653, G60 $F_y = 33$ ksi
- Metal Composite Floor Deck: ASTM A653, G60 $F_y = 33$ ksi
- Masonry:
 - Concrete Masonry Units (CMU): $F'_m = 1,500$ psi Grout: ASTM C476 $F'_c = 3000$ psi
 - Mortar: ASTM C270, Type M or S
 - Joint Reinforcement: ASTM A82 - ladder type in CMU walls

12.5.6 Design Loads

Design loads will meet or exceed the minimum requirements of the VUSBC and VCC. The structure will be designed to support all loads as required by the Code such as the weight of the structure, partitions, flooring, ceiling, sprinklers, file storage, mechanical equipment, roofing, and all other built-in installations.

- Floor Live Loads (minimum):
 - Typical floor areas (unless noted otherwise): 100 psf
 - Corridors: 100 psf
 - Stairs: 100 psf
 - Electrical rooms: 100 psf
 - Mechanical rooms: 150 psf
 - Main (central) Mechanical and Electrical rooms: 250 psf
- Roof: 30 psf (not reducible)
- Risk Category III
 - See IBC Table 1604.5.
- Snow loads:
 - Ground snow load: 20 PSF
 - Snow exposure factor (C_e): 1.0
 - Snow load importance factor (I_s): 1.10 (Risk Category III)
 - Thermal factor (c_t): 1.0 (heated)
 - Flat roof snow load (p_f): 16 psf + drift
 - Drifting snow: as required by ASCE 7

- Wind loads:
 - Basic wind speed: 120 mph (3 second gust) (Vult)
 - Nominal Design Wind Speed: 93 mph (Vasd)
 - Wind exposure: C
 - Internal pressure coefficients (gcpi): ± 0.18
 - Velocity Pressure (qh): varies with height of building
- Seismic Loads:
 - Importance Factor (Ie): 1.25 (Risk Category III)
 - Mapped Spectral Response Accelerations: $S_s = 0.165$ $S_1 = 0.061$
 - Site Class (to be confirmed by geotech report): D
 - Spectral Response Coefficients: $S_{ds} = 0.176$ $S_{d1} = 0.097$
 - Seismic Design Category: B
 - Basic Seismic Force-Resisting System and Response Modification Factor (R):
 - Main Building -- Ordinary Precast Concrete Shear Walls (R=4.0)
 - Support Buildings -- Ordinary Reinforced Masonry Shear Walls (R=2.0)
 - Analysis Procedure: Equivalent Lateral Force Procedure
 - Soil Bearing Pressure: As determined by the geotechnical investigation
 - Minimum frost depth: 18" below grade

12.6 Mechanical

12.6.1 Design Criteria

The design of the heating, ventilating and air conditioning systems will comply with the design guidelines of all applicable codes and standards of the authorities having jurisdiction.

12.6.2 Codes, Design Guidelines, and Material Standards

- 2015 Virginia Uniform Statewide Building Code
- 2015 Virginia Mechanical Code
- 2015 Virginia Energy Conservation Code
- 2015 International Energy Conservation Code
- ANSI/ASHRAE Standard 62.1: Ventilation for Acceptable Indoor Air Quality
- ANSI/ASHRAE Standard 170: Ventilation of Health Care Facilities
- ANSI/ASHRAE 90.1: Energy Standard for Buildings except Low-Rise Residential Buildings



- Sheet Metal and Air Conditioning Contractors' National Association - Standards for Ductwork Design
- Virginia Statewide Fire Prevention Code
- National Fire Protection Association Standards
- 2018 The Facilities Guidelines Institute: Guidelines for Design and Construction of Hospitals
- 2017 ASHRAE Handbook Fundamentals: Climatic Design Information
- 2015 Virginia Energy Conservation Code Compliance Path – ASHRAE 90.1 Normative Appendix G Performance Rating Method.

12.6.3 Site Utility Systems

Domestic water, sanitary sewer, and storm water drainage, natural gas and electrical systems will be extended to the corresponding services discussed in the Civil Section.

12.6.4 Central Plant Equipment

The heating and cooling plants for the proposed facility will be stand-alone. Water-cooled centrifugal chillers and cooling towers will be used for chilled water production. The central chilled water plant will use N+1 chillers, where N is the number of chillers in operation to meet the total cooling demand and 1 is the installed standby chiller. The capacity of the standby chiller will match the capacity of the largest installed chiller. All plant components, condensers, chilled water piping and controls will be sized and selected to match the N+1 requirement.

Heating water will be provided by fully condensing natural gas-fired boilers. The boilers plant will use N+1 boilers, where N is the number of boilers in operation to meet the total heating demand and 1 is the installed standby boiler. Boilers will be dual-fuel, firing on natural gas and liquid propane gas. Boiler stacks will be individual, factory-fabricated double wall AL29-4C stainless steel lined. Combustion air will be provided by direct ventilation.

12.6.4.1 Air Handling Systems (Option 1)

Central variable air volume (VAV), air-handling units will be located in mechanical rooms throughout the facility. In patient bedroom wings and other areas, dedicated outside air units (DOAS) with energy recovery wheels, providing 100-percent outside air, will supply ventilation air at a constant volume. The dedicated outside supply air is fully conditioned to provide required outside air ventilation and dehumidification. VAV terminal units will be provided with hot water reheat. Central air-handling units and outside air ventilation units serving patient rooms and other patient care areas will be provided with MERV 8 cartridge pre-filters and MERV 13 final filters, based on ASHRAE 52.2-2012. Specialty areas requiring additional filtration will use MERV 14 final filters downstream of all cooling coils and supply fan. Four pipe fan coil units or cabinet heaters will be provided in stairways, vestibules, and miscellaneous spaces to offset heat and cooling loads. Unit heaters will be used in mechanical and electrical equipment rooms. Air handling units with return fans will have an airside economizer, which allows the utilization of up to 100-

percent outside air for economizer cooling. Variable volume terminal reheat units will reduce the airflow to minimum values for proper ventilation prior to allowing reheat.

12.6.4.2 Blower Coils and Fan Coil Units (Option 2)

DOAS with energy recovery wheels will be large enough to serve the entire facility. Localized zone heating and cooling will be provided via 4-pipe VAV blower coils and/or VAV fan coil units. There may be some instances, where a small localized VAV system will be required with this scheme. Examples include a small pharmacy that mixes chemo medicines or a lab area, both examples potentially require space pressure control. This scheme will use the central plant; however, a heat recovery chiller will be added to the central plant. The heat recovery chiller will be capable of creating hot water and chilled water at the same time. Hot water will be used for heating the facility and preheating domestic hot water.

12.6.4.3 Water Source Heat Pumps (Option 3)

Dedicated outside air water source heat pumps with energy recovery wheels will be large enough to serve the entire facility. Localized zone heating and cooling will be provided via smaller VAV water source heat pump air handling units. As with Option 2 there may be some instances where a small localized VAV system will be required. The water source system would utilize a condenser water loop around the facility (2-pipe). The central plant would still use condensing boilers to add heat to the condenser loop; however, the chilled water side of the central plant would change to cooling towers for heat rejection with heat recovery chiller(s) blended in to preheat domestic hot water.

12.6.4.4 Air Distribution

- Ductwork: All ductwork will be constructed in accordance with SMACNA standards.
- Air terminal units in those areas served by central AHU's with variable volume airflow will accomplish space temperature control.
- Diffusers, registers and grilles: Diffusers, registers and grilles in patient care areas will be security type, prohibiting the insertion of foreign objects and designed to be suicide resistant.
 - Diffusers: Diffusers in non-patient care areas will be aluminum, high induction, modular faced directional type.
- Exhaust systems: Exhaust systems will provide central exhaust by area to combine exhaust air for energy recovery via energy recovery wheels.
 - Exhaust terminations will be located in excess of the minimum distances required by ASHRAE 62.1.
 - Provide an independent exhaust fan system for isolation rooms with bag in/bag out filtration system.
 - Provide an independent exhaust fan system for each kitchen hood.
 - Provide an independent exhaust fan system for each dishwasher hood.
 - Provide an independent exhaust fan system for pharmacy hood exhaust.
 - Provide an independent exhaust fan system for general pharmacy exhaust.



- Piping systems: Piping will be type L copper with brazed joints through 2-½ inches and schedule 40 black steel with butt-welded and flanged joints 3 inches and up. Hydronic piping systems will be sized based on ASHRAE 90.1 requirements or a maximum of 7 feet-per-second, and a maximum pressure drop of 4 feet per 100 feet. Inline circulators will be used for pumps under 1/2 HP and those 1/2 HP and larger will be base-mounted, end suction or vertical/horizontal split case type.
- Vibration and Noise Control: In order to provide a vibration and noise free environment in the building and to prevent transmission of noise to the adjacent buildings, the following will be incorporated into the design.
 - All air-handling units will have internally isolated fans.
 - Freestanding fans and pumps will be mounted on inertia bases and isolated from the structure by spring isolators. (If installed on floors other than the ground floor.)
 - In mechanical equipment rooms and other areas where necessary, ducts and large pipes will be supported on spring type hangers.
 - Air handling units will have double wall rigid polyurethane foam insulated cabinet construction.
 - Air terminal units will have sound attenuators downstream to minimize noise transmission into the room.

12.6.5 Insulation

- HVAC Systems
 - Hot water piping insulation will be pre-formed fiberglass with all-service jacket and self-sealing lap.
 - Chilled water piping insulation will be pre-formed fiberglass with all-service jacket and self-sealing lap.
 - Duct insulation will be fiberglass blanket with all-service jacket.
 - Thickness for all systems will conform to the International Energy Conservation Code and LEED v.4.

12.6.6 Seismic Restraint

A seismic design category level B has been presumed. (Reference the Design Load Section for further details.)

- Mechanical systems shall have a component importance factor of 1.5.

12.6.7 Automatic Temporary Controls

For all equipment, including air terminal units, direct digital controls will be utilized. Automatic valves and dampers will have electric actuators. Automatic reset of temperature and air volume will be used to reduce energy consumption during unoccupied periods. A signal from the fire alarm system or from smoke detectors in the duct will initiate automatic unit shut-down. In units having airside economizer, smoke evacuation may be initiated manually.

Air handling units with return fans will have an airside economizer, which allows the utilization of 100% outside air for free cooling. Variable volume terminal reheat units will reduce the airflow to minimum prior to allowing reheat.

In areas not continuously occupied, automatic reset of temperature and air volume will be used to reduce energy consumption during unoccupied periods.

A signal from the fire alarm system or from smoke detectors in the ducts will initiate automatic unit shut-down. In units having airside economizer, smoke evacuation may be initiated manually.

12.6.8 System Testing and Balancing

- Waterside
 - The system will be leak tested, and pumps and other equipment will be checked for alignment and proper operation. Flow through pumps will be measured and properly adjusted. Motor amperage will be read and recorded.
- Air side
 - High-pressure supply and return ducts will be tested for leaks. System fans will be checked for proper rotation and balance, and all drive sheaves will be adjusted for proper airflow. Motor amperage will be read and recorded. Airflow at all terminal units, diffusers, registers, and grilles will be adjusted to specifications and recorded.

12.7 Plumbing

12.7.1 Design Criteria, Codes, and Material Standards

Codes and Guidelines: The design of the plumbing system will meet the design guidelines of all applicable standards and codes of the AHJ, including:

- 2015 Virginia Uniform Statewide Building Code
- 2015 Virginia Plumbing Code
- Virginia Energy Conservation Code
- 2018 The Facilities Guidelines Institute: Guidelines for Design and Construction of Hospitals

12.7.2 Domestic Water System

- Installation of new domestic water service will be extended from the site water main. New domestic cold, hot, and hot circulating water distribution piping will be installed to service the plumbing fixtures and equipment. Domestic hot water will be provided with independent dual fuel condensing boilers. A 500-gallon storage buffer tank will be utilized to absorb peak domestic hot water demands. Adequate pressure is anticipated to be available from the new water line connected to route1, and pressures should be verified during design. Smart metering will be provided.



- Type "L" copper tubing with wrought copper or cast brass fittings and solder joints will be used. The pipe joints will be formed with code-approved, "lead free" solder and flux. The piping will be insulated with rigid fiberglass pipe insulation having an all service jacket and self-sealing lap joint.

12.7.3 Sanitary System

- The installation of a new sanitary sewer system will be extended from the site sewer.
- Horizontal collection into the building drain will occur below the lowest floor slab and exit by gravity to the site sanitary sewer. Minimum size of below grade piping shall be 4 inches. Cleanouts will be provided per code and as required to assist in proper maintenance of these lines.
- Service-weight, cast-iron soil pipe and fittings will be used for all sizes above ground with no-hub clamped joints using a one-piece neoprene gasket with stainless steel shield and retaining clamps. PVC DWV piping and fittings will be used for the portions of the system that will be underground.

12.7.4 Stormwater System

- Stormwater will be collected using drains of style, size, and quantity consistent with the area being drained. The internal roof leaders will generally be routed vertically from the drains to below the lowest floor slab where they will be collected horizontally and discharged by gravity to the site storm sewer. Where roof scuppers cannot be used, a secondary roof drain system will be provided. Cleanouts will be provided per code and as required to assist in proper maintenance of these lines.
- Service-weight, cast-iron soil pipe and fittings will be used for all sizes above ground with no-hub clamped joints using a one-piece neoprene gasket with stainless steel shield and retaining clamps. PVC DWV piping and fittings will be used for the portions of the system that will be underground.

12.7.5 Plumbing Fixtures

12.7.5.1 General

- The quantity of fixtures will comply with the requirements of the codes and the functional requirements of the facility. Fixtures suitable for use by the physically handicapped will be provided. The plumbing fixtures and associated trim will incorporate water-conserving features. All exposed waste and supply piping will be chrome plated. In the sections that follow, a general description of the fixtures is presented. All fixtures provided in patient use areas shall be anti-ligature.
- Water Closets – Public Use
 - Vitreous china, wall hung, elongated bowl, siphon jet, water conserving design, with chrome plated electronic automatic flush valve using 1.28 gallons per flush (gpf), open front seat with wall hung water closet carrier. ADA mounting height will be 17 inches from lip to finished floor. Urinals will be vitreous china, wall hung, blowout flushing action, water conserving design, with chrome-plated

electronic automatic flush valve using 0.125 gpf, and wall hung. ADA mounting height will be 17 inches from lip to finished floor.

- Lavatories – Public Use
 - Lavatories will be vitreous china, counter mounted oval; nominal size 20 x 17 inches. Trim will include vandal-resistant center set (4-inch center) commercial grade chrome plated brass electronic faucet, chrome plated brass grid drain, chrome plated brass P trap and trap nipple, and chrome plated flexible risers with loose key stops. The faucet will be provided with a 0.5 gpm flow-restricting device with ASSE point of use thermostatic mixing valve.
- Showers – Public Use
 - Provide pressure balancing vandal resistant mixing valve with temperature limit stop adjustable volume control, timer, and variable spray pattern head. Provide ASSE thermostatic mixing valves.
- Water Coolers – Public Use on Unit areas Anti-ligature
 - Self-contained unit with chrome-plated bubbler and self-closing push bars on front and both sides. It will be ADA-accessible, wall-hung on floor-mounted carrier. Unit will be certified to be "lead free" in accordance with the Safe Drinking Water Act.
- Mop Sinks – All Areas
 - Provide molded stone or terrazzo, 24 x 36 inches' one-piece basin, cast-in drain with dome strainer and bumper guards on all exposed sides. Chrome plated brass combination service sink faucet with integral vacuum breaker, 3/4-inch threaded hose end spout, indexed four arm handles, adjustable wall brace, and integral stops.

12.7.5.2 Drains and Cleanouts

- Floor and Shower Drains
 - Cast iron body, bottom outlet, clamping collar, seepage flange, and weep holes. Floor drains in finished spaces and shower drains will be light duty with a nickel alloy square or round strainer. Floor drains in mechanical rooms and similar areas will be medium depth sumps with heavy duty tractor type grates.
- Roof Drains
 - Provide coated cast iron body, large sump, bottom outlet, non-puncturing clamping ring with integral gravel stop, removable mushroom type dome strainer, bearing pan, and under deck clamp. Overflow drains where used shall be provided with a 2-inch high internal dam.
- Cleanouts
 - Wall Cleanout: Coated cast iron, cleanout tee with tapered thread bronze plug, and round or square stainless steel secured access cover.
- Floor Cleanout:



- Coated cast iron, inside caulk connection with taper thread bronze plug, adjustable housing, and secured round or square nickel alloy top. A clamping ring and flange will be provided at waterproof membranes.

12.7.6 Plumbing Systems Installation

- Domestic Cold, Hot, and Recirculating water insulation will be pre-formed fiberglass with all-service jacket and self-sealing lap.
- Storm drainage insulation will be pre-formed fiberglass with all-service jacket and self-sealing lap.
- Roof drain sumps will be fiberglass blanket with all-service jacket.
- Thickness for all systems will conform to the Energy Conservation Code

12.8 Electrical

12.8.1 Codes, Design Guidelines, and Material Standards

- 2015 Virginia Uniform Statewide Building Code (VUSBC)
- 2014 NEC (NFPA 70)
- Virginia Energy Conservation Code
- 2018 The Facilities Guidelines Institute: Guidelines for Design and Construction of Hospitals

12.8.2 Lighting

All facility lighting will be LED-based for energy efficiency and reduced maintenance costs. In the living units, a warmer color temperature LED, such as 2700 Kelvin or lower, will be used to produce a calming and relaxing mood. In most other areas, 4100 Kelvin will help produce alertness and generally increase focus on a task. Tunable white fixtures will be provide in nurse work and patient areas; tunable white allows the fixture's color temperature to be changed by a central computer system. LED light fixtures will be selected with a minimum efficiency of 100 lumens/watt of input power. LED control system to be low voltage distribution system with full controllability for the Staff and Patients as appropriate for this type of facility.

The Illumination Engineering Society of North America (IES) has established recommended illumination levels for various types of spaces. The facility will be illuminated at the maximum level within the IES recommended range which also meets the ASHRAE 90.1-2013 power density levels for the space use.

As LED lighting advancements have been made, virtually all LED fixtures are equipped with dimming capabilities; therefore, in lieu of switching fixtures abruptly on and off in certain areas, they can be dimmed down over time with no activity. Also, all fixtures can be evenly dimmed for "night lighting" in lieu of having only every third or fourth on for egress or surveillance reasons.

12.8.3 Site Lighting

- Exterior building lighting will include the following:
 - LED surface wall packs at exterior doors
 - LED pole parking lighting
 - LED ground or wall mounted accent lighting
 - Exterior lighting will meet LEED requirements for light pollution reduction.

12.8.4 Power

The site will receive electric power from redundant 3000 kVA utility transformers operating at 480Y/277 VAC. A 5000 amp, main-tie-generator-tie-main, UL 1558 switchgear lineup will power the facility from the central plant and allow for some level of concurrent maintenance and redundancy at the incoming service. The switchgear will be able to perform a closed transition transfer to and from the generator bus. Automatic transfer switches shall be manufactured by ASCO 7000 series or equal and shall have a minimum of 10 years' experience. Each manufacturer specified shall be approved by the utility company in schematic design.

The power distribution system will be primarily below grade into dedicated electrical rooms in each building service area. All branch circuits will be supplied with dedicated neutrals so circuit breaker handle-ties will not be required.

Branch circuits will be supplied by arc fault circuit interrupters in the living areas, or ground fault circuit interrupters where required in bathrooms.

12.8.4.1 Uninterruptable Power Supply

The following systems will be provided with a UPS: video surveillance, door control, selected lighting circuits, computer rooms guard and nurse stations.

12.8.4.2 Emergency Power (10 second requirement)

The site will be provided with multiple diesel generators (Listed to UL2200) designed with on-board paralleling to a common generator bus. This bus will be provided with a hybrid reactive/resistive load bank sized for one generator. Each generator will be sized for the emergency power requirements of the facility: egress lighting, life support, fire alarm, elevators, and door control. UL Listing shall include housings where the generator is located exterior to the building(s).

12.8.4.3 Legally Required Standby Power (60 second requirement)

Once additional generators are available, the legally required standby loads (NEC 700 emergency loads) will be energized via dedicated automatic transfer switches. These include exterior lighting, video surveillance, smoke evacuation, HVAC systems for equipment rooms serving emergency and legally required standby loads, and clinic areas.



12.8.4.4 Optional Standby Power

Optional standby power does not have any requirements for power within the code, but industry practice typically provides for several priority levels. As additional generator capacity is brought online, more optional standby power is available. If all generation capacity is available, essentially the entire facility will be on generator power via shared automatic transfer switches and selective load shedding schemes. Separation shall be maintained between emergency loads and optional standby loads.

- Administrative areas:
 - The first optional standby priority level supplies power to all of the facility's administrative functions.
- Food service:
 - Food service is the next priority level.
- Remaining loads:
 - Once all prioritized loads are powered, the building's remaining loads can receive power as generator capacity is available.

12.9 Security and Special Systems

12.9.1 Codes, Design Guidelines, and Material Standards

- 2015 Virginia Uniform Statewide Building Code
- 2014 NEC (NFPA 70)
- 2018 The Facilities Guidelines Institute: Guidelines for Design and Construction of Hospitals

12.9.2 Door Control

- The door control system will be a detention-grade, PLC-based access control system using a mixture of 13.56 MHz proximity card readers in some areas and personnel supervised (central control only) operation in most areas. Biometric hand scanners are an option in certain areas where a higher level of authentication is required, but personnel supervised operation is not necessary.
- Central control will have the capability of taking control away from local control areas in the living quarters and other areas of the facility in case of an emergency.

12.9.3 Video Surveillance

- With the decreasing cost of today's technology, high-definition IP-based video surveillance is where the entire industry is moving, with much of the industry only offering these type of systems. With 1080p high-definition camera and advanced analytics becoming the standard, today's video surveillance technology is a significant aid to security personnel tasked with monitoring multiple video streams.

- Although Ethernet-based, the video surveillance system will operate on dedicated network switches, which are not on the facility's IT network. This provides a stable, ongoing platform for the video surveillance system as IT networks are upgraded over the years.
- Central digital video recorders will be standard IT file servers with large storage arrays to archive the pre-compressed video from the surveillance camera network.

12.9.4 Security Intercom

- Although the security intercom system could be integrated into the facility's IP-based phone system, keeping it on its own switches, or those also serving the video surveillance system on a dedicated VLAN, would keep it more stable through future IT upgrade cycles. The security intercom system will still be IP-based with similar, or the same Session Initiation Protocol (SIP)-based, power-over-Ethernet (POE) handsets as the administrative phone system.
- For areas requiring detention-grade push-to-talk wall intercoms, standard intercom hardware would be used, but converted to SIP with a hardware module. This will provide a common platform for all IP telephony. With all SIP-based devices, a common phone system could be used with internal partitioning for both security and administrative use.

12.10 Fire Alarm and Fire Protection

12.10.1 Codes, Design Guidelines, and Material Standards

- 2015 Virginia Uniform Statewide Building Code
- 2014 NEC (NFPA 70)
- 2015 VIRGINIA STATEWIDE FIRE PREVENTION CODE
- 2018 NFPA 101
- 2018 The Facilities Guidelines Institute: Guidelines for Design and Construction of Hospitals

12.10.2 Fire Alarm

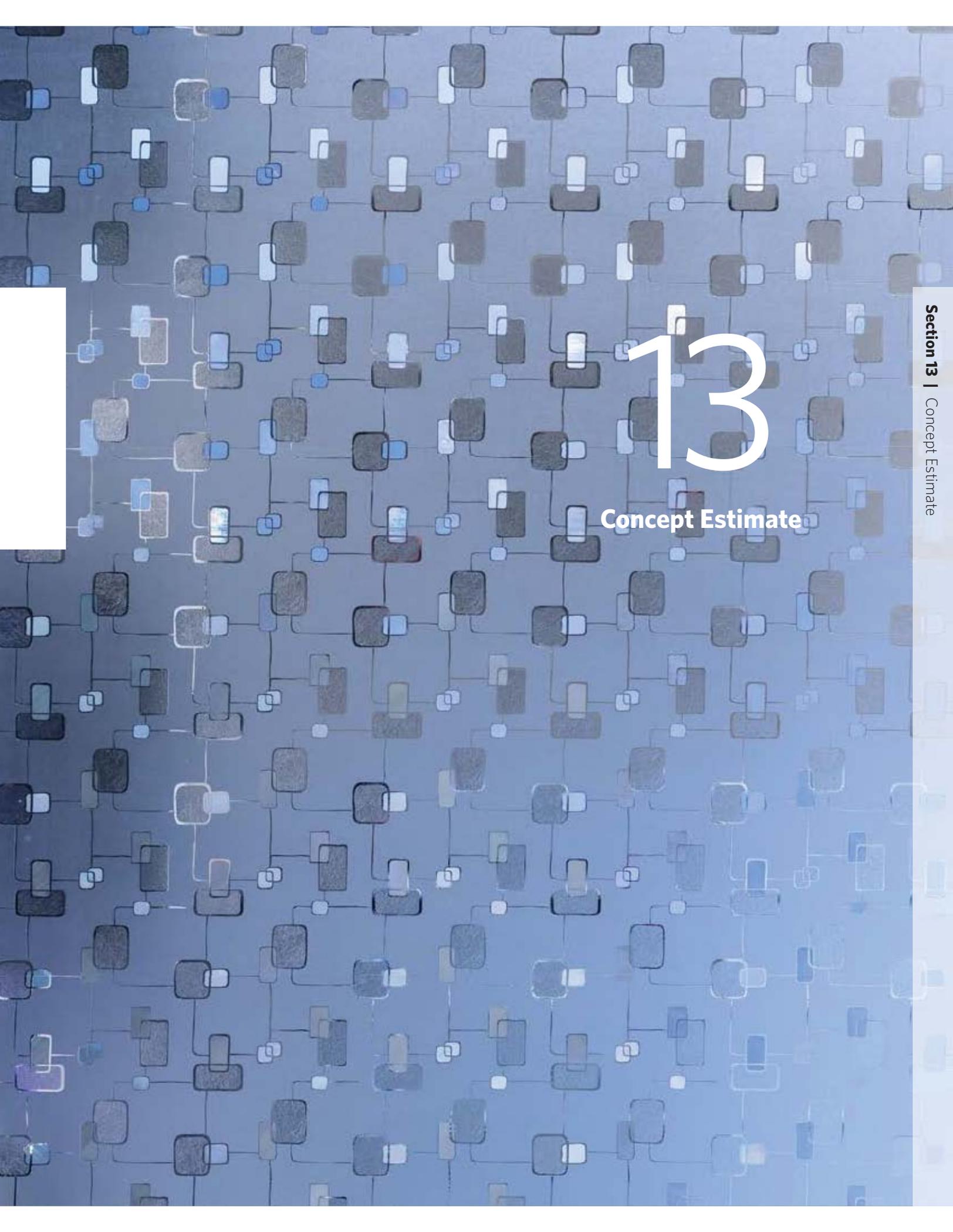
- The facility will be provided with an analog/addressable fire alarm system in accordance with the occupancy requirements. Each of the alarm devices shall transmit a unique, addressable signal to the building's fire alarm control panel. The control panel will send the alarm signals to the supervising station to initiate fire department emergency response.
- The fire alarm system will interface with the sprinkler system, HVAC system for unit shutdown and smoke damper control, door hold-open devices for door release, elevator systems for shunt tripping and recall functions, and other necessary supervision (e.g. life safety generators, fire pumps, emergency power monitoring, etc.).



- Occupant evacuation notification will be initiated by the fire alarm system and will be via strobes and speaker or horns. Spacing and location of audible and visual notification will be compliant with ADA standards, NFPA 72, and state and local codes.
- The facility will be provided throughout with a UL fire alarm system in accordance with the occupancy. Central control will be responsible for responding to alarms and supervisory trouble signals and determining the appropriate action.

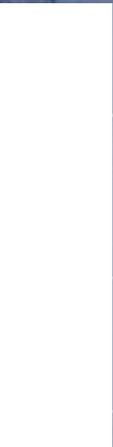
12.10.3 Fire Protection

- Fire protection will be provided by fire hydrant systems and automatic sprinkler systems. The fire hydrants will be located as required by the fire marshal to provide adequate coverage. Remote fire department connections attached to the sprinkler systems will be located as close as possible to exterior fire hydrants for ease of fire department operations.
- Backflow prevention will be required on the fire water supply line. This will be located in an external fire connection vault or inside the building if space is available and the required access can be provided.
- Wet pipe automatic sprinkler systems designed and installed in accordance with NFPA 13 will be provided to protect all areas of the building. The sprinkler system will be hydraulically calculated based upon recent water flow test information. The sprinkler system will be monitored for alarm and supervisory functions by the building's addressable fire alarm system. System status will be annunciated on the fire alarm control panel.
- The wet pipe sprinkler system will be designed to minimize water supply pressure requirements. If the results of the hydraulic calculations indicate a lack of water supply pressure, a fire pump will be provided in accordance with NFPA 20 and NFPA 70.
- If necessary, a Class 1, Manual, Wet Standpipe system shall be provided for the building with fire hose valves located in the exit stairwells or remote sections of the buildings. The standpipe riser will be combined w with the sprinkler risers when both are provided in the same stairwell.



13

Concept Estimate





13 Concept Estimate

A detailed cost estimate of the proposed full replacement of Central State Hospital was performed to determine the likely cost of the selected concept. Specifically, the preferred concept was estimated in the following ways:

- As a single-phased project
- As a two-phased project, and
- As a three-phased project.

HDR’s estimate used as a basis for its estimate the conceptual diagrams, square footages generated in the programming, selected site, conceptual schematic narratives and proposed schedules and phasing; all of which are provided within this report.

To validate the approximate cost of the concept, a second and independent cost estimate was prepared by MBP using the same information as HDR’s estimate. Both estimates include input from DEB on the escalation factor to be applied to the project cost. The escalation factor applied is 4.5% per year compounded yearly.

Below is a summary of HDR’s cost estimates. In the Appendices we have the full detail of the concept pricing by HDR and MBP.

Table 13-1. Summary Total Project Costs

Single Phase	\$385,424,642
Two Phase	\$421,195,577
Three Phase	\$451,442,615

Another approach to the two-phased projects above would be to hire one designer and two contractors (Alternate Designer Approach). Using this approach a single designer would be procured to design the project for two independent, but sequential construction phases. This approach would save approximately 27 months of overall project schedule for a “two-phased” project. This in turn would lower the overall project cost by approximately 15 million dollars in cost escalation.

Project “soft costs” are 25 percent of the total project cost. Demolition costs are also included in the total project costs above. We have also determined that \$500,000 is a suitable value for “mothballing” the structures at the end of construction should it be decided to do this in lieu of demolition. This is not shown on the cost estimate.

Maintenance costs and reserves for the existing facility to be replaced are not typically included in calculations for the cost of the project, however we have included them in the total project cost above. The current facility is in such bad condition that it is incumbent upon us to include the extraordinary costs that are going to be required to continue to maintain buildings’ functionality until the new facility is completed. Therefore we have included in the Project Costs monies based upon the Facilities Assessment report in the following summary. A detailed review of these needs and extraordinary costs are discussed in Appendix H.

Additional Operational and Routine Maintenance Costs

Phasing will result in having the staff and patients spread out to multiple, non-contiguous locations. All phasing options would result in the increased costs of maintaining two separate energy plants. With a new facility there will be both new maintenance responsibilities and staffing efficiencies. If the project is phased, it is likely that those Physical Plant Services and operational efficiencies will not be realized until the ultimate completion of the project. The additional staff required would include, registered nurses (RN), direct service associate (DSA), recreational therapy (RT), department public services (DPS) officers and physical plant services (PPS) personal. Accordingly, we have quantized on a high level the impact of operational and routine maintenance costs for two-phase and three-phase scenarios below:

Table 13-2. Two Phase Operational & Maintenance Cost Impact (7/1/2024 – 3/31/2029):

Utilities and Staff	\$2.4/yr x 5 yrs	\$12,000,000
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Table 13-3. Three Phase Operational & Maintenance Cost Impact (4/1/2024 – 4/1/2032):

*Utilities and Staff	*\$2.6M/yr x 8 yrs	\$ 20,842,105
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Figure 13-1 Maintenance Reserve Costs (in \$ millions)

CSH Existing Building Critical Projection							
Bldg No	Building Use	Single Phase Option	Two Phase Option		Three Phase Option		
		Phase 1 (5 yrs-in \$M)	Phase 1 (5 yrs)	Phase 2 (<10 yrs)	Phase 1 (5 yrs)	Phase 2 (10 yrs)	Phase 3 (>10 yrs)
59	Security	\$ 0.35	\$ 0.35		\$ 0.35		
52	Boiler Plant	\$ 1.10	\$ 1.10		\$ 1.10		
39	Maximum Security	\$ 2.70	\$ 2.70		\$ 2.70		
113	Administration	\$ 0.11	\$ 0.11		\$ 0.11	\$ 0.60	
111	Administration	\$ 1.00	\$ 1.00		\$ 1.00		
96	Housing	\$ 6.40	\$ 6.40		\$ 6.40		
112	Food Services	\$ 1.20	\$ 1.20		\$ 1.20		
120	Warehouse	\$ 1.40	\$ 1.40		\$ 1.40		
94	Housing	\$ 0.11	\$ 0.11	\$ 1.30	\$ 0.11		\$ 1.30
95	Housing	\$ 0.11	\$ 0.11	\$ 1.30	\$ 0.11		\$ 1.30
43	Training	\$ 0.11	\$ 0.11		\$ 0.11		
51	Laundry	\$ 2.30	\$ 2.30		\$ 2.30		\$ 3.00
114	Treatment Mall	\$ 0.11	\$ 0.11	\$ 1.70	\$ 0.11	\$ 1.70	
93	Housing	\$ 5.50	\$ 5.50		\$ 5.50		
Civil	Utilities	\$ 0.60	\$ 0.60		\$ 0.60		
Total		\$ 23.10	\$ 23.10	\$ 4.30	\$ 23.10	\$ 2.30	\$ 5.60



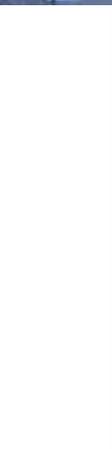
Figure 13-2. Concept Cost Analysis Comparison / HDR and MBP

Estimate Summary Comparisons							
	Phase	Phase Description (SF)	Construction Cost	Escalated Cost	Escalated Cost Plus Soft Costs	(Es Cost + Soft) / SF	Difference
HDR 1 Phase	1	Living -196K; Programs - 116K; Support 145K	\$214,734,044	\$274,000,640	\$342,500,800	\$751	
	2	Maintenance Reserve Contingency*			\$23,100,000	\$51	
	3	Demolition of Existing Campus			\$19,823,842		
			\$214,734,044	\$274,000,640	\$385,424,642	\$845	\$19,795,226
MBP 1 Phase	1	Living -196K; Programs - 116K; Support 145K	\$212,947,300	\$271,722,020	\$362,296,026	\$794	4.89%
	2	Maintenance Reserve Contingency*			\$23,100,000	\$51	
	3	Demolition of Existing Campus			\$19,823,842		
			\$212,947,300	\$271,722,020	\$405,219,868	\$888	
HDR 2 Phases	1	Living -77K; Programs - 54K; Support 141K	\$121,392,650	\$148,231,971	\$197,642,579	\$727	
	2	Living -119K; Programs - 66K; Support 0K	\$80,607,198	\$121,326,350	\$161,768,426	\$877	
	3	Additional Utilities & Staffing			\$12,000,000		
	4	Demolition of Existing Campus			\$22,384,572		
	5	Maintenance Reserve Contingency*			\$27,400,000	\$60	
			\$201,999,848	\$269,558,321	\$421,195,577	\$923	\$18,906,611
MBP 2 Phases	1	Living -77K; Programs - 54K; Support 141K	\$129,481,513	\$158,109,241	\$210,812,321	\$776	4.30%
	2	Living -119K; Programs - 66K; Support 0K	\$83,465,787	\$125,628,971	\$167,505,295	\$908	
	3	Additional Utilities & Staffing			\$12,000,000		
	4	Demolition of Existing Campus			\$22,384,572		
	5	Maintenance Reserve Contingency*			\$27,400,000	\$60	
			\$212,947,300	\$283,738,213	\$440,102,188	\$965	
HDR 3 Phases	1	Living -77K; Programs - 54K; Support 115K	\$112,775,177	\$136,956,184	\$182,608,200	\$741	
	2	Living -34K; Programs - 66K; Support 5K	\$44,526,824	\$65,187,660	\$86,916,858	\$829	
	3	Living -85K; Programs - 0K; Support 21K	\$45,146,155	\$78,823,510	\$105,097,987	\$1,000	
	4	Additional Utilities & Staffing			\$20,842,105		
	5	Demolition of Existing Campus			\$24,977,465		
	6	Maintenance Reserve Contingency*			\$31,000,000	\$68	
			\$202,448,155	\$280,967,354	\$451,442,615	\$989	\$18,270,921
MBP 3 Phases	1	Living -77K; Programs - 54K; Support 115K	\$120,862,267	\$146,777,291	\$195,703,054	\$794	3.89%
	2	Living -34K; Programs - 66K; Support 5K	\$45,694,896	\$66,897,728	\$89,196,970	\$851	
	3	Living -85K; Programs - 0K; Support 21K	\$46,390,137	\$80,995,457	\$107,993,942	\$1,027	
	4	Additional Utilities & Staffing			\$20,842,105		
	5	Demolition of Existing Campus			\$24,977,465		
	6	Maintenance Reserve Contingency*			\$31,000,000	\$68	
			\$212,947,300	\$294,670,475	\$469,713,536	\$1,030	

*Note - Includes recommended contingency for maintenance reserve repairs foreseeable prior to new facility completion.

14

Concept Phasing and Schedule



14 Concept Phasing and Schedule

This study required the comparison of various phasing approaches for delivering design/construction of the selected concept.

While there are various project delivery methods, for the purposes of this study, the traditional Design-Bid-Build approach is the delivery method used in developing the conceptual schedule for the project.

Design-Bid-Build is a methodology where an owner contracts separately and first with a design entity, and second with a construction entity that is independent of the design entity. Plans and specifications are prepared by a licensed architect/engineer (designer); construction is awarded to a general contractor (builder) through a competitive bid process. This is the most often used form of project delivery by governments in the United States, and especially common among public owners with requirements to select the lowest bidder.

The base schedule incorporates the following principal activities:

- Designer Procurement
- Design
- Bidding and Award (Contractor Procurement)
- Construction

These principal activities incorporate many sub-activities; for example, the Design activities includes not just the actual design work by the designer, but also the standard regulatory reviews required by the Construction and Professional Services Manual.

The primary goal here is to compare the time required to provide a complete replacement hospital if it were phased in one, two or three distinct and separate phases. “Distinct and separate” in this case meaning that the principal activities above would be repeated for each phase. For the three-phase scenario this could lead to three designers and three contractors working to provide a complete 300 bed replacement hospital.

The Phases studied were:

- Single-Phase Design and Single Construction Phase
- Two Design and Two Construction Phases
- Three Design and Three Construction Phases

An alternate phasing arrangement is a single design phase but with two distinct and separate construction phases. This arrangement, while 6 months longer than the “Single-Phase Design and Single Construction Phase” schedule, it is 27 months shorter than the “Two Design and Two Construction Phases” schedule.

Typically, Commonwealth design funding would provide for designer procurement/design start of July 1 in any given year. Accordingly, the schedules provided in this preplanning study are all predicated on the authorization of this project being provided by July 1, 2019.

Below is a comparison of the various phased options.

Table 14-1. Phased Schedule Comparison

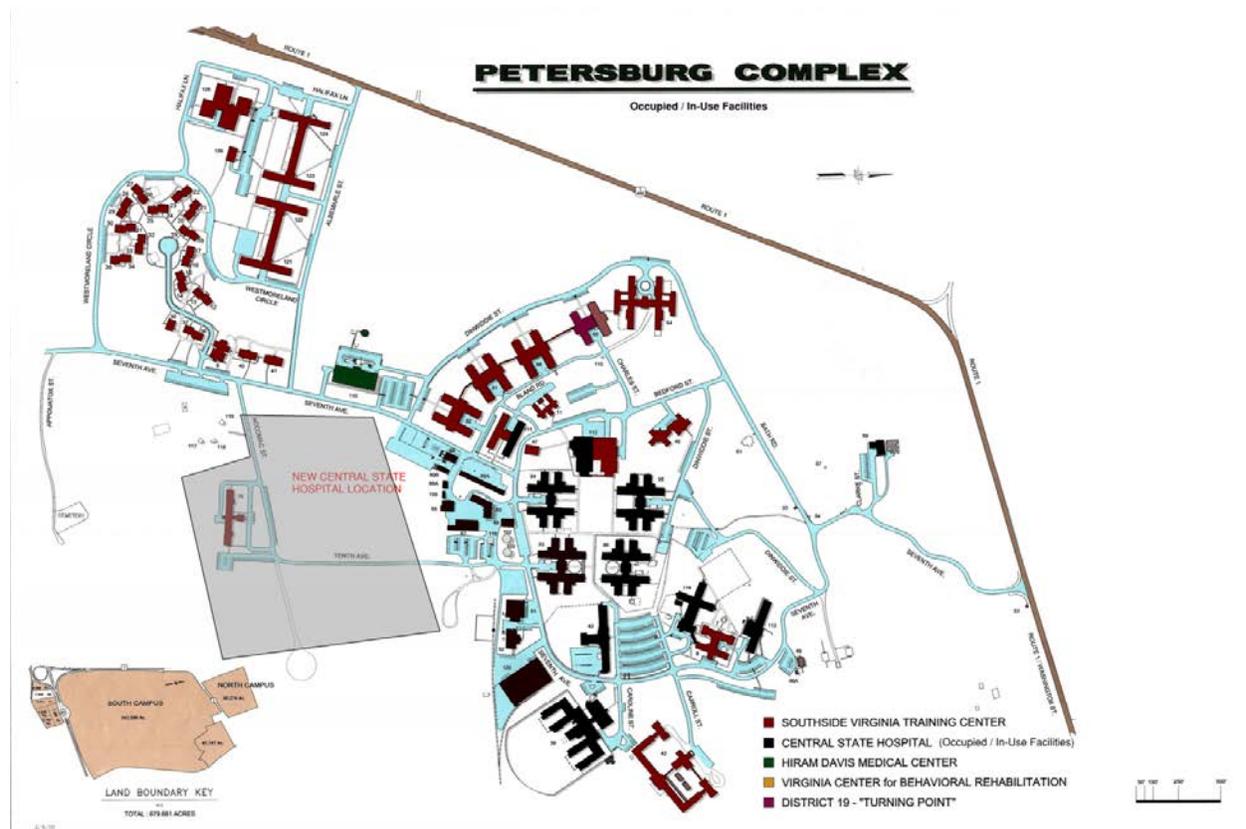
Phase Name	Duration (Months)			Start	Finish
	Design	Construction	Total		
Single Phase (1 designer/1 contractor)	30	51	81 months	1-Jul-19	31-Mar-26
Two Phase (2 designers/2 contractors)	54	60	114 months	1-Jul-19	31-Dec-28
*Three Phase (3 designer/3 contractors)	73	86	159 months	1-Jul-19	29-Mar-32
Hybrid Two Phase (1 designer/2 contractors)	33	54	87 months	1-Jul-19	30-Sep-26

* Does not include FFE and transition relocation of operations, assumed to be 3 months per phase.

14.1 Existing Buildings Currently In Use

This study includes the assessment of the existing building on the central state hospital campus. A detailed review of this assessment is in appendix H. Below is a current campus map of the building currently in use.

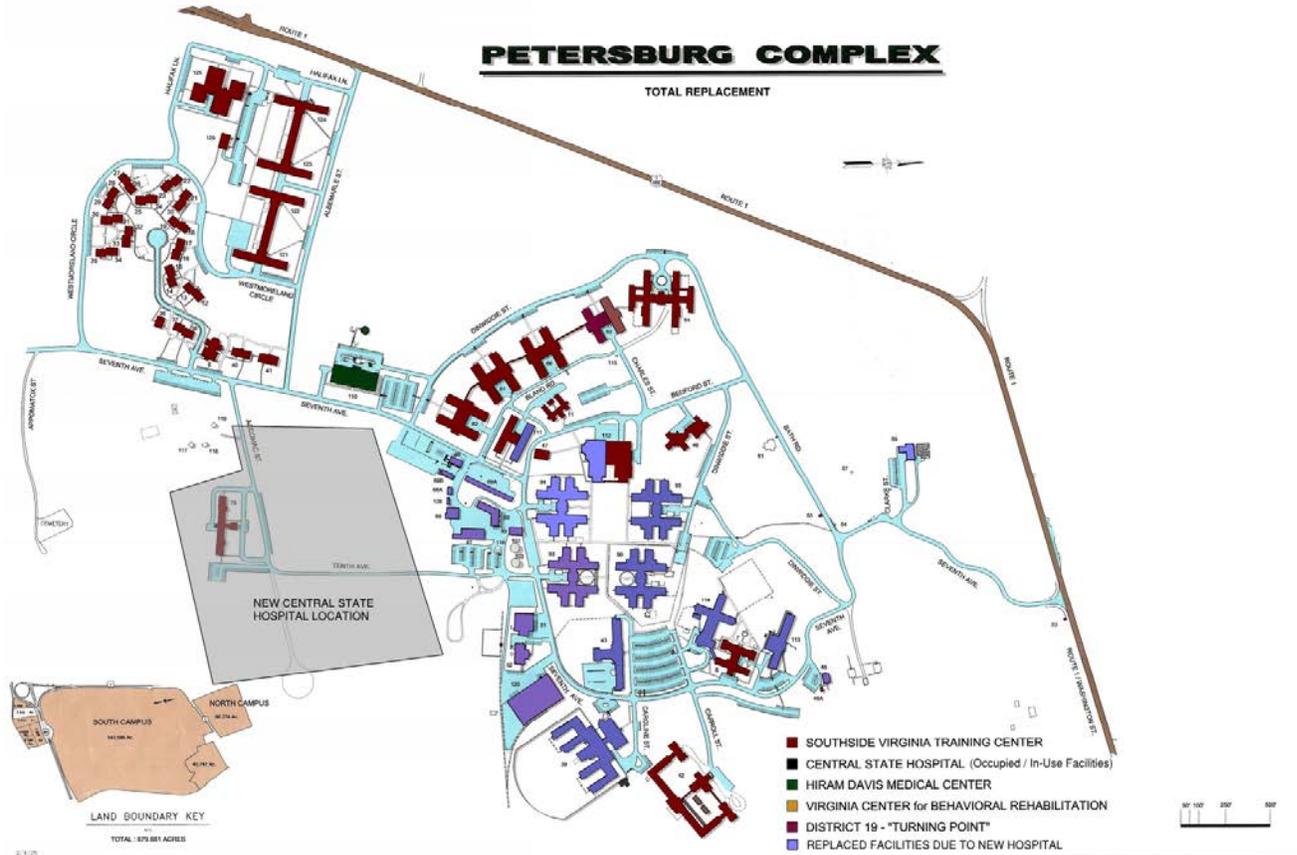
Figure 14-1. Facilities Currently in Use



14.2 Single-Phase Project

The following sections details project cost for a single-phase construction. This option delivers a new facility the fastest and also at the lowest cost to the Commonwealth of Virginia.

Figure 14-2. Total Replacement of Current Facilities in a Single Phase



*Demolition of all buildings at the end of this phase

Figure 14-3. Program Single Phase

PHASE 1

Living Units:

	NSF	GSF
Max living units (3-22 Bed Units)	14,805	23,688
Max Patient Support (3-22 Bed Units)	7,599	12,158
Max Staff Areas (3-22 Bed Units)	2,340	3,744
Max Unit Support (3-22 Bed Units)	2,070	3,312
Max living units (3-15 Bed Units)	10,305	16,488
Max Patient Support (3-15 Bed Units)	6,573	10,517
Max Staff Areas (3-15 Bed Units)	2,340	3,744
Max Unit Support (3-15 Bed Units)	2,070	3,312
Civil living units (3-15 Bed Units)	10,575	16,920
Civ. Patient Support (3-15 Bed Units)	6,456	10,330
Civ. Staff Areas (3-15 Bed Units)	2,340	3,744
Civ. Unit Support (3-15 Bed Units)	2,070	3,312
Civil living units (5-24 Bed Units)	21,680	34,688
Civ. Patient Support (5-24 Bed Units)	14,215	22,744
Civ. Staff Areas (5-24 Bed Units)	4,150	6,640
Civil living units (1-24 Bed Unit)	3,150	5,040
Civ. Patient Support (1-24 Bed Unit)	5,196	8,314
Civ. Staff Areas (1-24 Bed Unit)	2,963	4,741
Civ. Unit Support (1-24 Bed Unit)	830	1,328
Civil Prog. Staff Offices	650	1,040
	122,377	195,803

Programs:

	NSF	GSF
Admissions	5,318	8,509
Admissions Admin.	1,302	2,083
Max Prog. Staff offices	4,448	7,117
Max Prog. Staff Support Areas	990	1,584
Max Visitation: Res. Processing	339	542
Max Visitation: Visitation	1,272	2,035
Max Visitation: Ent./Processing - Check-in	175	280
Max Visitation: Ent./Processing - Judicial	670	1,072
Max Patient Dining	1,160	1,856
Max Treatment Mall: Education Areas	2,250	3,600
Max Treatment Mall: Educ. Staff & Support	771	1,234
Max Treatment Mall: Vocational Areas	1,950	3,120
Max Treatment Mall: Voc. Staff & Support	491	786
Max Treatment Mall: Rec. Area	4,230	6,768
Max Treatment Mall: Rec. Office/Support	611	978
Max Treatment Mall: Shared Res. Pt. Areas	7,378	11,805
Max Treatment Mall: Shared Res. Staff/Sup.	380	608
Civ. Visitation: Ent./Processing - Check-in	200	320
Civ. Visitation: Ent./Processing - Judicial	670	1,072
Civil Prog. Staff Offices	6,856	10,970
Civil Prog. Staff Support Areas	990	1,584
Civ. Visitation: Res. Processing	395	632
Civ. Visitation: Visitation	0	-
Civ. Patient Dining	2,240	3,584
Civ. Treatment Mall: Education Areas	3,050	4,880
Civ. Treatment Mall: Educ. Staff & Support	999	1,598
Civ. Treatment Mall: Vocational Areas	3,600	5,760
Civ. Treatment Mall: Voc. Staff & Support	619	990
Civ. Treatment Mall: Rec. Area	6,750	10,800
Civ. Treatment Mall: Rec. Office/Support	997	1,595
Civ. Treatment Mall: Shared Res. Pt. Areas	10,920	17,472
Civ. Treatment Mall: Shared Res. Staff/Sup.	736	1,178
	72,757	116,411



Support:	NSF	GSF
Public Lobby	2,075	3,320
Central Control / Security	1,409	2,254
Central Control / Sec. Admin	1,556	2,490
Housekeeping	1,090	1,744
Material Management - Receiving Area	680	1,088
Energy Plant	10,600	16,960
Satellite Kitchen	9,837	15,739
Transportation - Civil	604	966
Transportation - Max	1,004	1,606
Vehicle Support	740	1,184
Laundry	4,835	7,736
Warehouse - Office Area	1,115	1,784
Warehouse - Storage Area	10,479	16,766
Maint. Bldg. Admin.	1,738	2,781
Maint. Bldg. Workshops	3,940	6,304
Maint. Bldg. Grounds	0	-
Pharmacy - Admin/Staff	2,565	4,104
Pharmacy - Prep	2,820	4,512
Clinic / Admin	4,371	6,994
Clinic - dental	890	1,424
Clinic - lab	1,824	2,918
Clinic - PT	805	1,288
Clinic - Neurology	775	1,240
Executive Admin. - Staff	2,566	4,106
Executive Admin. - Support	2,679	4,286
Executive Admin. - IT	896	1,434
Executive Admin. - Health Info. Man.	1,200	1,920
Executive Admin. - Financial Serv. & Proc.	3,050	4,880
Executive Admin. - Qual. & Risk Man.	994	1,590
Executive Admin. - Patient Rel.	740	1,184
Executive Admin. - Forensic Eval. Team	1,240	1,984
Executive Admin. - Conf. & Support Center	2,570	4,112
HR - Admin.	1,184	1,894
HR - Support	639	1,022
Staff Development	1,192	1,907
Staff Development - Training	4,950	7,920
Staff Development - Short Term Housing	360	576
Staff Development - Emp. Health	0	-
	90,012	144,019

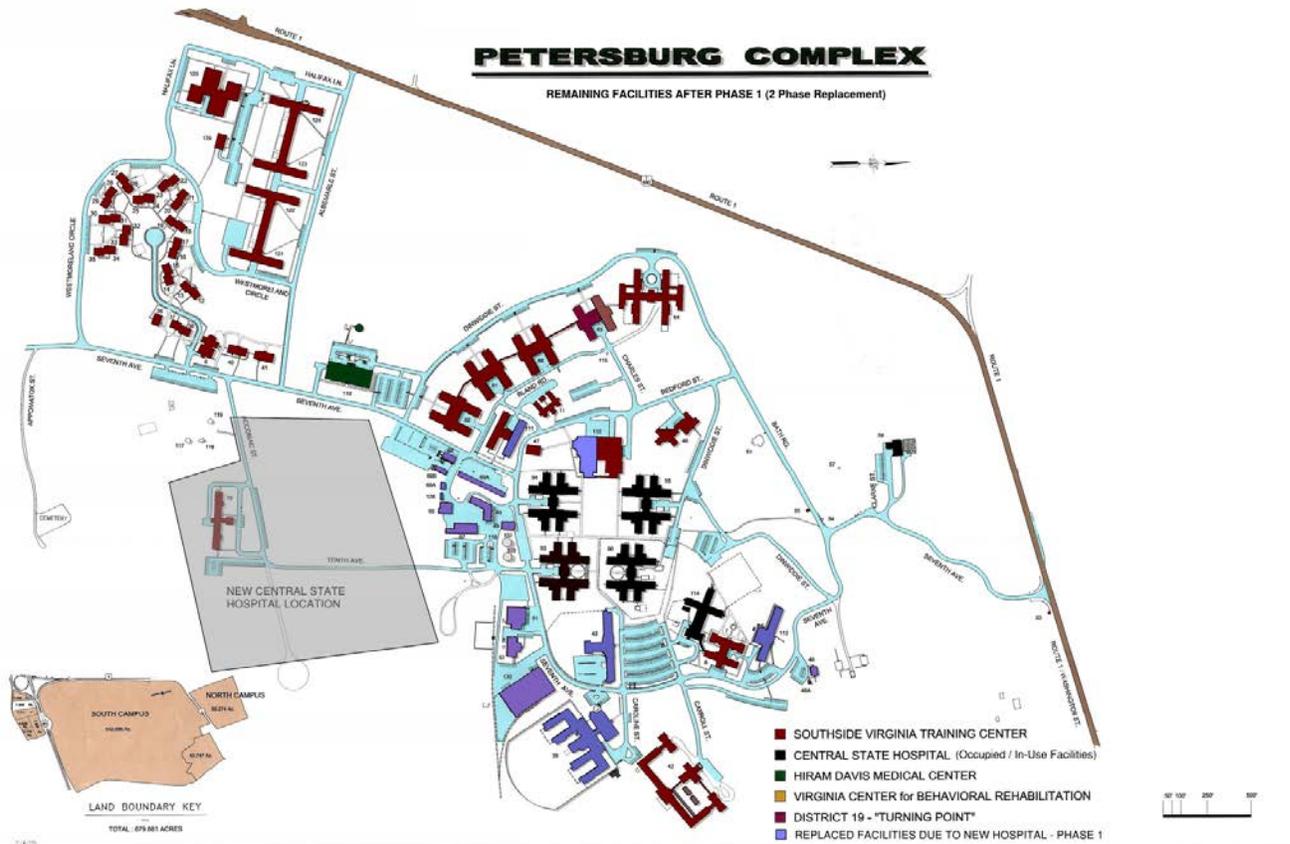
Sitework	NSF	GSF
Sitework	285,146	456,234

Sub-totals Phase 1 Construction **285,146 456,234**

14.3 Two-Phased Project

The following sections details project cost for two-phase construction. This option delivers a new facility the second fastest and provides the second lowest cost to the Commonwealth of Virginia.

Figure 14-4. Two-Phased Remaining Facilities after Phase 1



*Demolition of all buildings at the end of phase 2

14.4 Three-Phased Project

The following sections details project cost for three phases of construction. This option delivers a new facility the slowest and also at the highest cost to the Commonwealth of Virginia.

Figure 14-6. Remaining Facilities after Phase 1

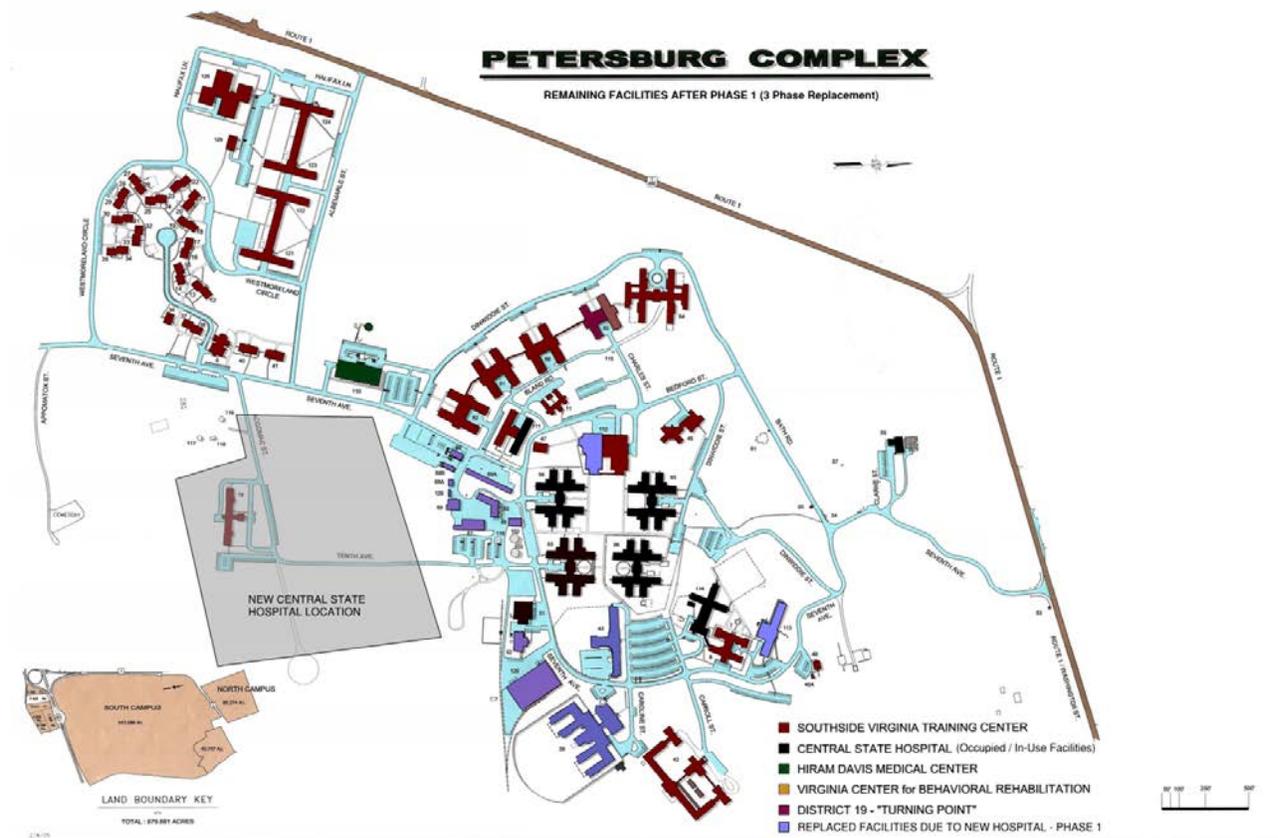
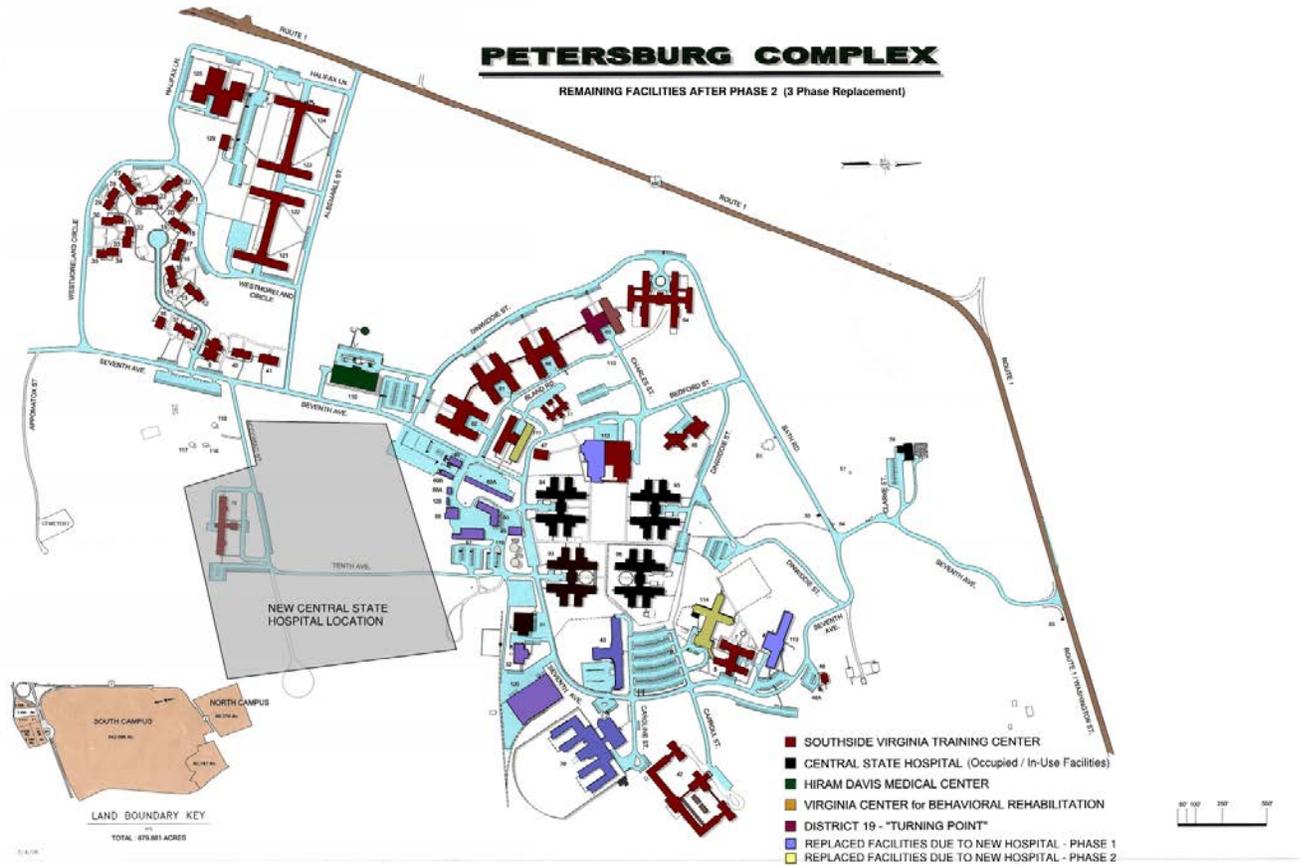


Figure 14-7. Remaining Facilities after Phase 2



*Demolition of all buildings at the end of phase 3



A

Architectural Space Programming

Space Program Summary Central State Hospital

Departments

Maximum Security	Civil/ Forensic	Total
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I. LIVING UNITS

A. MAXIMUM SECURITY

1. Long Term - 22 beds (Org. 28 Beds)
2. Long Term - 22 (Org. 28 Beds)
3. Long Term - 22 beds (Org. 15 Beds)
4. Admissions - 15 beds (Org. 15 Beds)
5. Admissions - 15 beds (Org. 15 Beds)
6. Admissions - 15 beds (Org. 15 Beds)

	NSF	NSF	DGSF
.....	8,638	8,748	1.6
.....	8,638	8,748	1.6
.....	8,638	8,748	1.6
.....	6,956	7,096	1.6
.....	6,956	7,096	1.6
.....	6,956	7,096	1.6
Subtotal MAX HOUSING		47,532	76,051

B. CIVIL / FORENSIC

1. Civil Admissions - 15 Bed (Org. 24 Beds)
2. Civil Admissions - 15 Bed (Org. 24 Beds)
3. Civil Admissions - 15 Bed (Org. 24 Beds)
4. Civil / Med / Cog - 24 Beds (Org. 24 Beds)
5. Civil / Intermediate- 24 Beds (Org. 24 Beds)
6. Civil / Intermediate- 24 Beds (Org. 24 Beds)
7. Civil / Intermediate- 24 Beds (Org. 24 Beds)
8. Civil / Intermediate -24 Beds (Org. 0 Beds)
9. Civil / Intermediate - 24 Beds (Org. 0 Beds)

	NSF	NSF	DGSF
.....	7,157	7,157	1.6
.....	7,157	7,157	1.6
.....	7,157	7,157	1.6
.....	9,759	9,759	1.6
.....	8,639	8,639	1.6
.....	8,639	8,639	1.6
.....	8,639	8,639	1.6
.....	8,639	8,639	1.6
.....	8,639	8,639	1.6
.....	8,639	8,639	1.6
Subtotal CIVILHOUSING		74,425	119,080

Subtotal HOUSING

121,957 195,131

II. PROGRAMS

- A. ADMISSIONS
- B. PROGRAM STAFF
- C. VISITATION
- D. PATIENT DINING
- E. TREATMENT MALL

	NSF	NSF	DGSF
.....		6,620	1.6
.....		15,264	1.6
.....	2,456	1,265	3,721
.....	1,160	2,240	3,400

1. Education Services
2. Vocational Services
3. Recreation Services
4. Shared Resident Services

.....	3,021	4,049	7,070
.....	2,441	4,219	6,660
.....	4,841	7,747	12,588
.....	7,758	11,656	19,414

Subtotal PROGRAMS

74,737 119,579

III. SUPPORT

- A. PUBLIC LOBBY
- B. CENTRAL CONTROL/SECURITY
- C. EXECUTIVE ADMINISTRATION
- D. HUMAN RESOURCES
- E. STAFF DEVELOPMENT
- G. KITCHEN
- H. TRANSPORTATION
- J. HOUSEKEEPING
- K. MAINTENANCE/MATERIAL MANAGEMT
- L. ENERGY PLANT
- M. MEDICAL / DENTAL
- N. PHARMACY
- O. LAUNDRY
- P. MAINTENANCE / BUILDING AND GROUNDS

	NSF	NSF	DGSF
.....		2,075	1.6
.....		2,965	1.6
.....		13,955	1.6
.....		1,823	1.6
.....		6,502	1.6
.....		9,837	1.6
.....		2,348	1.6
.....		1,090	1.6
.....		12,274	1.6
.....		10,600	1.6
.....		8,665	1.6
.....		5,385	1.6
.....		4,835	1.6
.....		5,678	1.6

Subtotal SUPPORT

88,032 140,851

Total Net Square Feet	284,726
Total Departmental Gross	455,562
Building Grossing Factor	1
Total Gross Square Feet	455,562

NSF = Net Square Feet
DGSF = Departmental Gross Square Feet

I.A. PATIENT LIVING UNITS - MAXIMUM: 22-BED UNIT

Space Name				Notes
Unit Total Net Square Feet:				8,748
Number of Units:				3
Total Departmental Net Square Feet:				26,244
1. PATIENT LIVING UNIT	Quantity	Each	Net Square Feet	
1 Patient Room - Single	19	130	2,470	100 s.f. unencumbered floor space.
2 Patient Room - Single; ADA	3	150	450	100 s.f. unencumbered floor space.
3 Patient Toilet Room - En Suite	19	55	1045	No showers
4 Patient Toilet Room - En Suite ADA	3	80	240	Provide ADA Shower
5 Shower Room - ADA	3	100	300	Single use; toilet; lavatory; shower stall roll in type
6 Shower Room - Non ADA	2	80	160	Single use; toilet; lavatory; shower stall
7 Tub Room	1	80	80	One Required Per FGI
		NSF:	4,745	
2. PATIENT SUPPORT				
1 Day Room	22	35	770	Lounge seating, game table, TV viewing & space for playing Wii (35sf pp per FGI Guidelines used for both Social and Dining). Provide +-20sf storage closet or casework & small lockers below room divider counter for patient articles. 80% utilization =>23
2 Dining / Activity / Quiet Room	22	15	330	Four or six-person dining tables when sepereted dinning is needed. (15sf pp for Planning)
3 Comfort / "Chill-Out" Quiet Room	2	80	160	"Soft" room, acoustically isolated (80sf min. per FGI Guidelines)
4 Patient Toilet - ADA	1	55	55	Single use; toilet; lavatory; ADA.
5 Patient Toilet - Non ADA	1	40	40	Single use; toilet; lavatory; non-ADA.
6 Patient Laundry Alcove	1	120	120	Full visual supervision & ability to lock. 2 washers & 2 dryers.
7 Galley	1	100	100	Refrig, micro, ice, counter. Ability to inhibit patient access. Room
8 Group Room	1	250	250	Provide space for 12 patients (225 sf min. per FGI Guidelines)
9 Seclusion Room	1	80	80	Adjacent to Nurse Station
10 Seclusion Vestibule	1	60	60	Provide sound isolation
11 Seclusion Tilt. / Shower	1	80	80	ADA
12 Exam/Physical Survey Room/Consultation	1	120	120	Handwash sink, also doubles as a Consultation per 1 per 12 beds
13 Consultation Room	1	100	100	Provide 1 per 12 beds per FGI Guidelines. Doubles as Visitation
14 Soiled Linen Cart Staging	1	20	20	Alcove - bed-linens only. Included as part of Unit support space
15 Phone / Video cubicles	4	12	48	Sound attenuated partial-height cubicles for privacy. 36" w. x 48" d.
16 Enclosed Patio	1	200	200	Weather protected
		NSF:	2,533	
3. STAFF AREAS				
1 Nurse Station	1	200	200	May be connected to adjacent unit
2 Nurse Work Room	1	150	150	Away from patient areas - connected to N.S. via short, open corridor. Open workstations.
3 Medications Room	1	100	100	Provide direct access from N.S. & window to unit common area. May be shared with adjacent unit, 2 small refig. 1 pixus
4 Wheelchair Storage	0	20	0	Provided in core factor
5 Staff Toilet - Unisex	1	55	55	May be shared with adjacent unit
6 Conference Room	1	200	200	8 persons @ 25s.f. pp. Access off main unit entry corridor as well as staff
7 Staff Break Room	1	75	75	1 shared Break Room at 250sf for 3 units. See Program Staff.
		NSF:	780	
4. UNIT SUPPORT				
1 Food Cart Recess/Charging Station	1	150	150	Verify size & power requirements w/ consultants. Locate near unit entry.
2 Housekeeping	1	80	80	Mop sink includes chem storage / Access to staff only
3 Housekeeping - chemical closet	0	20	0	Provide as Housekeeping Above, Mop sink includes chem storage / Access to staff only
4 Unit / Medical Equipment Storage	1	100	100	
5 Clean Clothing / Linen Storage	1	80	80	Pass-through from shower room and access from staff-only corridor if possible.
6 Soiled Clothing / Linen Storage	1	80	80	Pass-through from shower room and access from staff-only corridor if possible.
7 Patient Property Room	1	20	20	Individual small lockers behind NS.22 lockers 12x12
8 Supply Storage	1	100	100	
9 Hazardous Waste Closet	0	20	0	Provided as Housekeeping Above, Mop sink includes chem storage / Access to staff only
10 Entry Sallyport	1	80	80	Living unit entry from main corridor.
11 IT Distribution Room	0	60	0	Included in grossing factors
		0 NSF:	690	

I.A. PATIENT LIVING UNITS - MAXIMUM: 15-BED UNIT

Space Name				Notes
Department Total Net Square Feet:				7,096
Number of Units:				3
Total Departmental Net Square Feet:				21,288
1. PATIENT LIVING UNIT	Quantity	Each	Net Square Feet	
1 Patient Room - Single	13	130	1,820	100 s.f. unencumbered floor space.
2 Patient Room - Single; ADA	2	150	300	100 s.f. unencumbered floor space.
3 Patient Toilet Room - En Suite	13	55	715	
4 Patient Toilet Room - En Suite ADA	2	80	160	Roll-in shower for ADA. No showers in any patient rooms
5 Shower Room - ADA	2	100	200	Single use; toilet; lavatory; shower stall; all ADA, Re-Named
6 Shower Room - Non ADA	2	80	160	Single use; toilet; lavatory; shower stall; non-ADA. All should be ADA, Re-Named
7 Tub Room	1	80	80	One Required, new scope
		NSF:	3,435	
2. PATIENT SUPPORT		NSF:		
1 Day Room	15	35	525	Lounge seating, game table, TV viewing & space for playing Wii (35sf pp per FGI Guidelines used for both Social and Dining). Provide +20sf storage closet or casework & small lockers below room divider counter for patient articles.
2 Dining / Activity / Quiet Room	15	15	225	Four or six-person dining tables (15sf pp for Planning).
3 Comfort / "Chill-Out" Room	2	80	160	"Soft" room, acoustically isolated (80sf min. per FGI Guidelines)
4 Patient Toilet - ADA	1	55	55	Single use; toilet; lavatory; ADA.
5 Patient Toilet - Non ADA	1	40	40	Single use; toilet; lavatory; non-ADA.
6 Patient Laundry Alcove	1	80	80	Full visual supervision & ability to lock. 1 washer & 1 dryer.
7 Galley	1	100	100	Refrig, micro, ice, counter. Ability to inhibit patient access. Room
8 Group Room	1	250	250	
9 Seclusion Room	2	80	160	Adjacent to Nurse Station, Re-named
10 Seclusion Vestibule	1	60	60	Provide sound isolation
11 Seclusion Tit. / Shower	1	80	80	ADA, moved was number 16, Renamed
12 Exam/Physical Survey Room/Consultation	1	120	120	Handwash sink, also doubles as a Consultation per 1 per 12 beds
13 Consultation Room	1	100	100	Provide 1 per 12 beds per FGI Guidelines. Doubles as Visitation
14 Soiled Linen Cart Staging	0	40	0	Alcove - bed-linens only. Include as part of the Unit support space.
15 Phone / Video cubicles	3	12	36	Sound attenuated partial-height cubicles for privacy. 36" w. x 48" d.
16 Enclosed Patio	1	200	200	Weather protected
		NSF:	2,191	
3. STAFF AREAS				
1 Nurse Station	1	200	200	4 work areas
2 Nurse Work Room	1	150	150	Away from patient areas - connected to N.S. via short, open corridor.
3 Medications Room	1	100	100	Provide direct access from N.S. window to unit common area.
4 Wheelchair Storage	0	10	0	In Equipment
5 Staff Toilet - Unisex	1	55	55	
6 Conference Room	1	200	200	8 persons @ 25s.f. pp. Access off main unit entry corridor as well as staff corridor.
7 Staff Break Room	1	75	75	1 shared Break Room at 250sf for 3 units. See Program Staff.
		NSF:	780	
4. UNIT SUPPORT				
1 Food Cart Recess/Charging Station	1	150	150	Verify size & power requirements w/ consultants. Locate near unit entry.
2 Housekeeping	1	80	80	Mop sink includes chem storage / Access to staff only
3 Housekeeping - chemical closet	0	20	0	Provided as Housekeeping Above, Mop sink includes chem storage / Access to staff only
4 Unit / Medical Equipment Storage	1	100	100	
5 Clean Clothing / Linen Storage	1	80	80	Pass-through from shower room and access from staff-only corridor if possible.
6 Soiled Clothing / Linen Storage	1	80	80	Pass-through from shower room and access from staff-only corridor if possible.
7 Patient Property Room	1	20	20	Individual small lockers behind NS. 15 lockers 12x12
8 Supply Storage	1	100	100	
9 Hazardous Waste Closet	0	20	0	Provided as Housekeeping Above, Mop sink includes chem storage / Access to staff only
10 Entry Sallyport	1	80	80	Living unit entry from main corridor.
11 IT Distribution Room	0	60	0	Included in grossing factors
		NSF:	690	

I.A. PATIENT LIVING UNITS - CIVIL: 15-BED UNIT

Space Name				Notes
Department Total Net Square Feet:				7,157
Number of Units:				3
Total Departmental Net Square Feet:				21,471
1. PATIENT LIVING UNIT				
	Quantity	Each	Net Square Feet	
1 Patient Room - Single	11	130	1,430	100 s.f. unencumbered floor space.
2 Patient Room - Single; ADA	4	150	600	100 s.f. unencumbered floor space.
3 Patient Toilet Room - En Suite	11	55	605	No Shower
4 Patient Toilet Room - En Suite ADA	4	80	320	No Shower
5 Shower Room - ADA	3	100	300	
6 Shower Room - Non ADA	1	80	80	
7 Tub Room	1	80	80	One Required
			NSF:	3,415
2. PATIENT SUPPORT				
			NSF:	
1 Day Room	15	35	525	Lounge seating, game table, TV viewing & space for playing Wii (35sf pp per FGI Guidelines used for both Social and Dining). Provide +-20sf storage closet or casework & small lockers below room divider counter for patient articles.
2 Dining / Activity / Quiet Room	15	15	225	Four or six-person dining tables (15sf pp for Planning).
3 Comfort / "Chill-Out" Room	2	80	160	"Soft" room, acoustically isolated (80sf min. per FGI Guidelines)
4 Patient Toilet - ADA	1	55	55	Single use; toilet; lavatory; ADA.
5 Patient Toilet - Non ADA	1	40	40	Single use; toilet; lavatory; non-ADA.
6 Patient Laundry Alcove	1	80	80	Full visual supervision & ability to lock. 1 washer & 1 dryer.
7 Galley	1	100	100	Refrig, micro, ice, counter. Ability to inhibit patient access. Room
8 Group Room	1	250	250	
9 Seclusion Room	2	80	160	Adjacent to Nurse Station
10 Seclusion Vestibule	1	61	61	Provide sound isolation
11 Seclusion Tlt. / Shower	2	80	160	ADA
11 Exam/Physical Survey Room/Consultation	1	120	120	Handwash sink, also doubles as a Consultation per 1 per 12 beds
12 Consultation Room	1	100	100	Provide 1 per 12 beds per FGI Guidelines. Doubles as Visitation
13 Soiled Linen Cart Staging	0	40	0	Alcove - bed-linens only. Include as part of the Unit support space.
14 Phone / Video cubicles	3	12	36	Sound attenuated partial-height cubicles for privacy. 36" w. x 48" d.
15 Enclosed Patio	1	200	200	Weather protected
			NSF:	2,272
3. STAFF AREAS				
1 Nurse Station	1	200	200	4 work areas
2 Nurse Work Room	1	150	150	Away from patient areas - connected to N.S. via short, open corridor.
3 Medications Room	1	100	100	Provide direct access from N.S. window to unit common area.
4 Wheelchair Storage	0	10	0	In Equipment
5 Staff Toilet - Unisex	1	55	55	
6 Conference Room	1	200	200	8 persons @ 25s.f. pp. Access off main unit entry corridor as well as staff corridor.
7 Staff Break Room	1	75	75	1 shared Break Room at 250sf for 3 units. See Program Staff.
			NSF:	780
4. UNIT SUPPORT				
1 Food Cart Recess/Charging Station	1	150	150	Verify size & power requirements w/ consultants. Locate near unit entry.
2 Housekeeping	1	80	80	Mop sink includes chem storage / Access to staff only
3 Housekeeping - chemical closet	0	20	0	Provide as Housekeeping Above, Mop sink includes chem storage / Access to staff only
4 Unit / Medical Equipment Storage	1	100	100	May be more than one closet/cabinets. Combined with Equip/Supply storage
5 Clean Clothing / Linen Storage	1	80	80	Pass-through from shower room and access from staff-only corridor if possible.
6 Soiled Clothing / Linen Storage	1	80	80	Pass-through from shower room and access from staff-only corridor if possible.
7 Patient Property Room	1	20	20	Individual small lockers behind NS.Provide 15 lockers 12x12
8 Supply Storage	1	100	100	
9 Hazardous Waste Closet	0	20	0	Provided as Housekeeping Above, Mop sink includes chem storage / Access to staff only
10 Entry Sallyport	1	80	80	Living unit entry from main corridor.
11 IT Distribution Room	0	60	0	Included in grossing factors
			NSF:	690

I.B. PATIENT LIVING UNITS - CIVIL: 24-BED UNIT

Space Name			Notes
Department Total Net Square Feet:			8,639
Number of Units:			5
Total Departmental Net Square Feet:			43,195
1. PATIENT LIVING UNIT	Quantity	Each	Net Square Feet
1 Patient Room - Single	20	130	2,800 100 s.f. unencumbered floor space.
2 Patient Room - Single; ADA	4	150	600 100 s.f. unencumbered floor space.
3 Patient Toilet Room - En Suite	20	20	400
4 Patient Toilet Room - En Suite ADA	4	39	156 Roll-in shower for ADA. No showers in patient rooms
5 Shower Room - ADA	3	80	240 Single use; toilet; lavatory; shower stall; all ADA.
6 Shower Room - Non ADA	1	60	60 Single use; toilet; lavatory; shower stall; non-ADA.All ADA
7 Tub Room	1	80	80 One Required, New scope
	NSF:		4,336
2. PATIENT SUPPORT			
1 Day Room	24	35	840 Lounge seating, game table, TV viewing & space for playing Wii (35sf pp per FGI Guidelines used for both Social and Dining). Provide +-20sf storage closet or casework & small lockers below room divider counter for patient articles. 80% Utilization
2 Dining / Activity / Quiet Room	24	15	360 Four or six-person dining tables (15sf pp for Planning)
3 Comfort / "Chill-Out" Room	2	80	160 "Soft" room, acoustically isolated (80sf min. per FGI Guidelines)
4 Patient Toilet - ADA	1	55	55 Single use; toilet; lavatory; ADA.
5 Patient Toilet - Non ADA	1	40	40 Single use; toilet; lavatory; non-ADA.
6 Patient Laundry Alcove	1	120	120 Full visual supervision & ability to lock. 2 washers & 2 dryers.
7 Galley	1	100	100 Refrig, micro, ice, counter. Ability to inhibit patient access.Room
8 Group Room	1	250	250
9 Reinforcement	1	80	80 Added Scope
10 Seclusion Room	1	80	80 Adjacent to Nurse Station
11 Seclusion Vestibule	1	60	60 Provide sound isolation
12 Seclusion Tit. / Shower	1	80	80 ADA, moved from number 18
13 Exam/Physical Survey Room / Consultation	1	120	120 Handwash sink, also doubles as a Consultation per 1 per 12 beds
14 Consultation Room	1	100	100 Provide 1 per 12 beds per FGI Guidelines. Doubles as Visitation
15 Soiled Linen Cart Staging	0	20	0 Alcove - bed-linens only. Include in unit support space space
16 Phone / Video cubicles	4	12	48 Sound attenuated partial-height cubicles for privacy. 36" w. x 48" d.
17 Enclosed Patio	1	200	200 Weather protected
18 Visitation Room	1	150	150 Able to enter from unit and outside unit two doors
	NSF:		2,843
3. STAFF AREAS			
1 Nurse Station	1	200	200 May be connected to adjacent unit
2 Nurse Work Room	1	150	150 Away from patient areas - connected to N.S. via short, open corridor. Open workstations.
3 Medications Room	1	100	100 Provide direct access from N.S. & dutch door to unit common area. May be shared with adjacent unit
4 Wheelchair Storage	0	20	0 Alcove Off unit storage
5 Staff Toilet - Unisex	1	55	55 May be shared with adjacent unit
6 Conference Room	1	250	250 18 persons @ 25s.f. pp. Access off main unit entry corridor as well as staff corridor.
7 Staff Break Room	1	75	75 1 shared Break Room at 250sf for 3 units Units. See Program Staff.
	NSF:		830
4. UNIT SUPPORT			
1 Food Cart Recess/Charging Station - now dining prep	1	150	150 Verify size & power requirements w/ consultants. Locate near unit entry.
2 Housekeeping	1	80	80 Mop sink
3 Housekeeping - chemical closet	0	20	0 Provide per Housekeeping Above, Mop sink includes chem storage / Access to staff only
4 medical Equipment Storage	1	100	100
5 Clean Clothing / Linen Storage	1	80	80 Pass-through from shower room and access from staff-only corridor if possible.
6 Soiled Clothing / Linen Storage	1	80	80 Pass-through from shower room and access from staff-only corridor if possible.
7 Patient Property Room	1	40	40 Alcove on unit side behind NS. 24 lockers 12x12. With USB ports
8 Supply Storage	1	100	100
9 Hazardous Waste Closet	0	20	0 Provide on Housekeeping Above
10 IT Distribution Room	0	30	0 Shared between units, 1 120nsf per 20000 GSF Included in grossing factors
11 Entry Sallyport	0	80	0 Not required for this security level.
	NSF:		630

I.B. PATIENT LIVING UNITS - CIVIL: 24-BED UNIT Medical / Cog

Space Name			Notes
Department Total Net Square Feet:		9,759	
Number of Units:		1	
Total Departmental Net Square Feet:		9,759	
1. PATIENT LIVING UNIT	Quantity	Each	Net Square Feet
1 Patient Room - Single	0	130	0
2 Patient Room - Single - ADA Isolation room	2	240	480
3 Patient Room - Single; ADA	22	150	3,300
4 Patient Toilet Room - En Suite	0	20	0
5 Patient Toilet Room - En Suite ADA	24	39	936
6 Shower Room - ADA	4	80	320
7 Shower Room - Non ADA	0	60	0
8 Tub Room	2	80	160
		NSF:	5,196
2. PATIENT SUPPORT			
1 Day Room	24	35	840
			Lounge seating, game table, TV viewing & space for playing Wii (35sf pp per FGI Guidelines used for both Social and Dining). Provide +-20sf storage closet or casework & small lockers below room divider counter for patient articles. 80% Utilization
2 Dining / Activity / Quiet Room	24	20	480
			Four or six-person dining tables (15sf pp for Planning)
3 Comfort / "Chill-Out" Room	2	80	160
			"Soft" room, acoustically isolated (80sf min. per FGI Guidelines)
4 Patient Toilet - ADA	1	55	55
			Single use; toilet; lavatory; ADA.
5 Patient Toilet - Non ADA	1	40	40
			Single use; toilet; lavatory; non-ADA.
6 Patient Laundry Alcove	1	120	120
			Full visual supervision & ability to lock. 2 washers & 2 dryers.
7 Galley	1	100	100
			Refrig, micro, ice, counter. Ability to inhibit patient access.Room
8 Group Room	1	250	250
9 Reinforcement	1	80	80
10 Seclusion Room	1	80	80
			Adjacent to Nurse Station
11 Seclusion Vestibule	1	60	60
			Provide sound isolation
11 Seclusion Tlt. / Shower	1	80	80
			ADA
12 Exam/Physical Survey Room / Consultation	1	140	140
			Handwash sink, also doubles as a Consultation per 1 per 12 beds, Larger due to unit
13 Consultation Room	1	100	100
			Provide 1 per 12 beds per FGI Guidelines. Doubles as Visitation
14 Soiled Linen Cart Staging	0	20	0
			Alcove - bed-linens only. Include in unit support space space
15 Phone / Video cubicles	4	12	48
			Sound attenuated partial-height cubicles for privacy. 36" w. x 48" d.
16 Enclosed Patio	1	200	200
			Weather protected
17 Visitation Room	1	150	150
			Able to enter from unit and outside unit two doors
		NSF:	2,983
3. STAFF AREAS			
1 Nurse Station	1	200	200
			May be connected to adjacent unit
2 Nurse Work Room	1	150	150
			Away from patient areas - connected to N.S. via short, open corridor. Open workstations.
3 Medications Room	1	100	100
			Provide direct access from N.S. & dutch door to unit common area. May be shared with adjacent unit
4 Wheelchair Storage	0	20	0
			Alcove Off unit storage
5 Staff Toilet - Unisex	1	55	55
			May be shared with adjacent unit
6 Conference Room	1	250	250
			18 persons @ 25s.f. pp. Access off main unit entry corridor as well as staff corridor.
7 Staff Break Room	1	75	75
			1 shared Break Room at 250sf for 3 units Units. See Program Staff.
		NSF:	830
4. UNIT SUPPORT			
1 Food Cart Recess/Charging Station - now dining prep	1	150	150
			Verify size & power requirements w/ consultants. Locate near unit entry.
2 Housekeeping	1	80	80
			Mop sink
3 Housekeeping - chemical closet	0	20	0
			Provide a Housekeeping Above, Mop sink includes chem storage / Access to staff only
4 Medical Equipment Storage	1	200	200
5 Clean Clothing / Linen Storage	1	80	80
			Pass-through from shower room and access from staff-only corridor if possible.
6 Soiled Clothing / Linen Storage	1	80	80
			Pass-through from shower room and access from staff-only corridor if possible.
7 Patient Property Room	1	60	60
			Alcove on unit side behind NS. 24 lockers 12x12. With USB ports
8 Supply Storage	1	100	100
9 Hazardous Waste Closet	0	20	0
			Provide as Housekeeping Above, Mop sink includes chem storage / Access to staff only
10 IT Distribution Room	0	30	0
			Shared between units, 1 120nsf per 20000 GSF Included in grossing factors
11 Entry Sallyport	0	80	0
			Not required for this security level.
		NSF:	750

II-A. PROGRAMS: ADMISSIONS

Space Name				Notes
Department Total Net Square Feet:				6,620
Admissions	Quantity	Each	Net Square Feet	
1 Drive-thru vehicle garage - receiving & transport	2	1,400	2,800	Four vehicles side by side plus circulation. Handicap van accessible. Largest vehicle needs to be accommodated: 12 passenger bus with 2 wheelchairs in the back. Gun lockers. Waiting bench for officers. Property is handed off in garage. One for each Max and Civil
2 Pedestrian Sallyport	2	120	240	Sized for gurney and escorts. One for each Max and Civil
3 Patient Waiting Area	2	120	240	Accommodate 6. 1 Max and 1 Civil
4 Processing Counter	2	140	280	Space for two staff. One for each Max and Civil
5 Search Room	0	64	0	Deleted by CSH
6 Patient Toilet	2	55	110	Next to resident waiting. One for each Max and Civil
7 Patient Shower	4	40	160	Outer dressing area. Can be designed & functional at 40sf. Both Max and Civil
8 Patient Interview / Holding / Search	4	80	320	Fixed table and chairs. Include Search 2 per side Max and Civil
9 Exam Room	2	100	200	Design to Max standrad, One for each Max and Civil
10 Clothing Storage	2	120	240	Including space for washer/dryer. One for each Max and Civil
11 Temporary Property Room	2	80	160	Long-term property storage at warehouse, One for each Max and Civil
12 Equipment Storage	2	100	200	Enlarged to include Medical Equip. One for each Max and Civil
13 Clean Utility Room	2	60	120	One for each Max and Civil
14 Soiled Utility Room	2	60	120	One for each Max and Civil
15 Staff Toilet	0	55	0	Deleted by CSH - use staff toilet in admissions administration
16 Medical Equipment	0	60	0	Combine w/ Equipment Storage above.
17 Food Pantry	2	24	48	Kitchenette recess, One for each Max and Civil
18 Housekeeping	2	40	80	One for each Max and Civil
19 Safe	0	10	0	Secure patient vaultables Included in Departmental grossing factor 1 per side
			NSF:	5,318
Admissions Administration				
1 Admissions Nurse	1	80	80	Located on Civil side
2 Admissions Clerk	1	80	80	Located on Civil side
3 Intake Coordinator/Benefits/Social work RN	8	64	512	Cubes, 6 Located on Civil side, 2 located on Max side
4 Staff Toilet	2	55	110	One for each Max and Civil
5 Staff Work Room	2	120	240	One for each Max and Civil
6 Coffe Bar Area	2	40	80	One for each Max and Civil
7 Admin. On Duty (AOD)	2	100	200	Enclosed office, Located on Civil side
			NSF:	1,302



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II.B. PROGRAMS: PROGRAM STAFF

Space Name				Notes
Department Total Net Square Feet:				15,264
Staff Offices	Quantity	Each	Net Square Feet	
1 Forensic Psychologists	0	100	0	Program staff office space to be confirmed. Accounted for in Exec Admin
2 Treatment Psychologists	15	100	1,500	Staff per CSH. Move to units. 1 per unit.
3 Therapists	15	80	1,200	Office suites may be used 4-5 staff per suite at 80 nsf per => 320nsf or 400 nsf.. Needs to be split between Max and Civil.
4 Social Workers	15	100	1,500	Staff per CSH Move to units. 1 per unit
5 Psychiatrists	15	100	1,500	Staff per CSH. Move to units. 1 per unit
6 SW Supervisors	2	100	200	1 in Civil. 1 in Max
7 Psychology Supervisor	4	100	400	Staff per CSH. 1 Max 3 Civil
8 Nurse Mang.	15	100	1,500	Move to units. 1 per unit
9 Nurse Cord.	5	100	500	3 Civil 2 Max
10 primary Care Providers	5	100	500	2 per Max , 3 per Civil / Central location
11 Behavior Team	3	64	192	Open work space, Civil
12 Psychology Assistants	5	64	320	2 Max, 3 Civil open Work Space
13 Students	9	64	576	4 max 5 civil, Open work space
14 Students NP/PA & Shared	15	64	960	1 per unit shared
15 TDO Coordinators	2	64	128	Civil
16 Social Work Assistants	2	64	128	Civil
17 Social Work Floaters	2	100	200	Max
NSF:			11,304	
Staff Support Areas				
1 Copy/Workroom	2	140	280	1 Each Civil and Max
2 Storage	2	80	160	1 Each Civil and Max
3 Breakroom	2	160	320	1 Each Civil and Max
4 Female Staff Toilet	2	160	320	1 Each Civil and Max
5 Male Staff Toilet	2	140	280	1 Each Civil and Max
6 Housekeeping	2	60	120	1 Each Civil and Max
7 Program & Unit Staff Break Room	2	250	500	Kitchenette. Shared for all Program & Unit Staff
NSF:			1,980	
Patient Relations				
1 Director of Patient Relations and Recovery	1	120	120	Moved from Exec. Admin.
2 PR Coordinator	1	100	100	Moved from Exec. Admin.
2 STEP Coordinator	1	100	100	Moved from Exec. Admin.
3 Work Program Spec.	2	64	128	Moved from Exec. Admin.
4 Peer Support Specialist	2	64	128	Moved from Exec. Admin.
5 Administrative Assistant	1	64	64	Moved from Exec. Admin.
6 Storage	1	100	100	Moved from Exec. Admin.
7 Large Storage	0	0	0	. In warehouse
NSF:			740	
Forensic Evaluation Team				
1 Supervisor	1	120	120	Moved from Exec. Admin.
2 Forensic Evaluators/Coordinators	4	100	400	Added 2 Forensic Coordinators. Cubes / Moved from Exec. Admin.
3 Administrative Assistant	5	64	320	Moved from Exec. Admin.
4 Post Doctoral Fellow	1	100	100	Moved from Exec. Admin.
5 Admission Officer / Social Worker	2	80	160	Moved from Exec. Admin.
6 Evaluation Files Room	1	100	100	Moved from Exec. Admin.
7 Workroom	0	120	0	See Conference / Administrative Support Center
8 Conference Room	0	200	0	See Conference / Administrative Support Center
9 Coffee Bar	1	40	40	Kitchenette recess / Moved from Exec. Admin.
1 NSF:			1,240	

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II.C. PROGRAMS: VISITATION

Space Name	Maximum Security			Civil/Forensic			Notes
	Qty	Each	Net Sq Feet	Qty	Each	Net Sq Feet	
Department Total NSF:	2,456			1,265			
Resident Processing	Qty	Each	Net Sq Feet	Qty	Each	Net Sq Feet	
1 Resident Sallyport	1	100	100	1	120	120	
2 Resident Search	1	64	64	1	100	100	Revised size to match Admissions
3 Resident Toilet	1	55	55	1	55	55	ADA
4 Resident Waiting	1	120	120	1	120	120	Bench seating.
	NSF:	339		NSF:	395		
Visitation							
1 Contact Visitation Room	1	400	400	0	800	0	30 person total - civil 20 persons total - maximum 20nsf/person
2 Small Contact Visitation Room	0	0	0	0	160	0	6 persons each
3 Non-Contact Visit Booths - ADA	4	70	280	0	0	0	
4 Contact Visitation - Attorney	4	120	480	0	0	0	No need for Contact visitation - Attorney Civil/Forensic?!?
5 Multi-purpose Visitation	0	150	0	0	150	0	Six persons; accommodate court video equipment. What other function besides visitation?
6 Visitation Officer	1	64	64	0	64	0	Supervision of special visit areas; controls access to special visitation areas.
7 Vending	1	48	48	0	48	0	
8 Staff Station	0	20	0	0	20	0	
	NSF:	1,272		NSF:	0		
Visitor Entrance / Processing							
1 Visitor Sallyport/Search	1	120	120	1	120	120	
2 Lobby	0	200	0	0	200	0	With lockers. Provide at Main Lobby.
3 Search	0	64	0	0	0	0	
4 Security Station	0	25	0	1	25	25	Provide at Main Lobby.
5 Visitor Toilet	1	55	55	1	55	55	ADA, Unisex
	NSF:	175		NSF:	200		
Visitor Entrance / Processing							
1 Judicial Courtroom	1	320	320	1	320	320	Judge & lawyer from outside. Patient, patient support (social worker), Family member. Security. Vidio
2 Consult. Office	1	120	120	1	120	120	
3 Family Waiting	1	120	120	1	120	120	
4 Patient Toilet	1	55	55	1	55	55	
5 Staff Toilet	1	55	55	1	55	55	
	NSF:	670		NSF:	670		

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II-D. PROGRAMS: PATIENT DINING

Space Name	Maximum Security			Civil/Forensic			Notes
Department Total NSF:			1,160			2,240	
Subname	Qty	Each	Net Sq Feet	Qty	Each	Net Sq Feet	
1 Patient Dining - Maximum Security	2	480	960	0	0	0	22-person dining hall serving one ward at one time; allow 15 nsf per person plus 100 nsf serving aisle and 50 nsf tray return/counter; railing to divide space into two areas. Max Security eats exclusively on the ward
2 Patient Dining - Civil/Forensic	0	0	0	2	1,020	2,040	48-person dining halls serving two wards at one time; allow 15 nsf per person plus 200 nsf serving aisle and 100 nsf tray return/counter; railing to divide space into two areas; railing to divide space into two areas.
3 Retherm/Serving Pantry	1	200	200	1	200	200	Serving two dining rooms; blind serving line; determine equipment needs for room size.
			NSF: 1,160			NSF: 2,240	



II.E. PROGRAMS: TREATMENT MALL - Education Services

Space Name	Maximum Security			Civil/Forensic			Notes
Department Total NSF:	3,021			4,049			
Resident Education Areas	Qty	Each	Net Sq Feet	Qty	Each	Net Sq Feet	
1 Education Classroom / Multi.	1	500	500	2	500	1,000	15 residents + 2 staff per classroom; dry erase boards; full height cabinets-lockable; 8 ft length; file cabinets.
2 Education Classroom / Multi. Storage	1	40	40	1	40	40	Locate in each classroom; lockable door access.
3 Arts and Crafts - "Clean"	1	400	400	1	500	500	Abundant storage; adjacent to "Dirty" Arts and Crafts room; full
4 Arts and Crafts Materials Storage	1	100	100	1	100	100	
5 Arts and Crafts Project Storage	1	100	100	1	100	100	
6 Arts and Crafts - "Dirty"	1	200	200	1	200	200	Wet area; abundant storage; adjacent to other "Clean" Arts and Crafts; full glass between.
7 Library	1	500	500	1	700	700	Lounge seating for music listening; tables/chairs; shelving for books and audio material.25nsf/person
8 Library Workroom	1	100	100	1	100	100	
9 Computer Room	1	200	200	1	200	200	Adjacent to Library with glass separation for sound isolation; adjacent to Vocational Education Computer Lab.
10 Patient Toilet	2	55	110	2	55	110	Single occupant; visible from staff locations which provide continual observation.
	NSF: 2,250			NSF: 3,050			
Staff and Support							
1 Arts and Crafts Instructor Workspace	1	100	100	2	100	200	Between Dirty and Clean Arts and Crafts with observation of both.
2 Teacher Offices	4	64	256	6	64	384	Open Cubes
3 Teacher Supervisor	1	100	100	1	100	100	
4 Teacher Workroom	1	140	140	1	140	140	
5 Teacher Toilet	1	55	55	1	55	55	Unisex
6 Shared Education Storage	1	120	120	1	120	120	
	NSF: 771			NSF: 999			

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III.B. PROGRAMS: TREATMENT MALL -- Vocational Services

Space Name	Maximum Security			Civil/Forensic			Notes
	Qty	Each	Net Sq Feet	Qty	Each	Net Sq Feet	
Department Total NSF:	2,441			4,219			
Patient Vocational Areas	Qty	Each	Net Sq Feet	Qty	Each	Net Sq Feet	
1 Vocational Lab large	0	800	0	1	800	800	Multi-purpose; access to exterior; access to a loading area for panel trucks.
2 Vocational Lab Small	1	600	600	1	600	600	No exterior Access for Max side.
3 Vocational Classroom	1	400	400	1	400	400	Space for 15 patients in each Civil Computer Lab and 10 patients in each Max Computer Lab. Includes computers
4 Computer Lab	0	240	0	0	200	0	
5 Patient Toilet	2	55	110	4	55	220	Single occupant; restricted access.
6 Vocational Storage	1	80	80	1	80	80	Directly accessible from each Vocational Lab.
7 Greenhouse	1	180	180	1	540	540	Prefabricated structure directly connected to building.
8 Greenhouse Storage	1	40	40	1	40	40	
9 Housekeeping Staging	0	200	0	0	200	0	Vocational opportunity for Civil patients only; shelving; storage of floor buffers distributed strategically throughout facility w/ charging ("Garages"); determine quantity with building layout. Moved to housekeeping
10 Search Area	1	60	60	0	0	0	Small sit down station; search area; metal detector.
11 Queuing Area	0	0	0	0	0	0	In-processing & out-processing; approx. 10 residents; metal detector.
12 Recycling Area	0	0	0	1	400	400	Vocational opportunity for Civil patients only; holding/sorting; ventilated; additional covered outdoor space or direct access to dumpsters; wet space.
13 Secure Tool Storage	1	80	80	1	120	120	For access by Civil patients only; check-in and check-out counter with storage shelving.
14 "Threads" Clothing Laundry	1	200	200	1	200	200	Verify size and function.
15 "Threads" Clothing Storage	1	120	120	1	120	120	Verify size and function.
16 "Threads" Clothing Receiving	1	80	80	1	80	80	Verify size and function.
	NSF: 1,950			NSF: 3,600			
Staff and Support							
1 Vocational Staff Support	4	64	256	6	64	384	open cubes
2 Vocational Supervisor	1	100	100	1	100	100	
3 Staff Toilet	1	55	55	1	55	55	
4 Housekeeping	1	80	80	1	80	80	
5 IT Distribution Room	0	0	0	0	120	0	Spaced according to floor plan configuration. Included in grossing factor
	NSF: 491			NSF: 619			



II.B. PROGRAMS: TREATMENT MALL -- Recreation Services

Space Name	Maximum Security			Civil/Forensic			Notes
	Qty	Each	Net Sq Feet	Qty	Each	Net Sq Feet	
Department Total NSF:	4,841			7,747			
Patient Recreation Area:	Qty	Each	Net Sq Feet	Qty	Each	Net Sq Feet	
1 Gymnasium	1	3,120	3,120	1	5,640	5,640	Half-court (42' x 50' plus 5' edge zone) each gymnasium with operable wall separating Maximum and Civil sides. Half court Max Security, Full court Civil/Forensic
2 Stage/Multipurpose Room	1	200	200	1	200	200	Located on Civil patient side; movable wall opening to Gymnasium; raised floor with ramp access.
3 Resident Toilet	2	55	110	2	55	110	Single occupant; restricted access.
4 OT Room	1	300	300	1	300	300	Move both to the Clinic and keep separate but secure
5 Exercise/Weight Room	1	500	500	1	500	500	
	NSF: 4,230			NSF: 6,750			
Office/Support:							
1 Recreation Support Staff	4	64	256	8	64	512	open cubes
2 Recreation Supervisor	1	100	100	2	100	200	
3 Staff Toilet	1	55	55	1	55	55	
4 Gymnasium Storage	1	120	120	1	150	150	Storage for chairs and other equipment; directly accessible to Gym.
5 Physical Therapy Storage	1	80	80	1	80	80	Directly accessible from Physical Therapy Rooms.
	NSF: 611			NSF: 997			

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II-B. PROGRAMS: TREATMENT MALL -- Shared Resident Services

Space Name	Maximum Security			Civil/Forensic			Notes
	Qty	Each	Net Sq Feet	Qty	Each	Net Sq Feet	
Department Total NSF:	7,758			11,656			
Patient Areas	Qty	Each	Net Sq Feet	Qty	Each	Net Sq Feet	
1 Therapy Mall	1	2,000	2,000	1	2,000	2,000	Break-out and community space.
2 Group Therapy Rooms	8	256	2,048	14	256	3,584	Up to 12 residents and two staff.
3 Mock Courtroom	1	300	300	1	300	300	
4 Market Store	1	500	500	1	1,000	1,000	Vocational opportunity; prep and cook; booth seating; salad-bar; coffee bar; socializing and gathering; access to patio with clear lines of sight.
5 Multi-denominational Worship	1	300	300	1	800	800	Accommodates 20 Maximum and 60 Civil patients; special character space.
6 Barber/Beautician	1	150	180	1	150	150	Hospital employed beauticians; vocational opportunity. Inculde Work station
7 Game Room	1	400	400	1	800	800	Fooze ball; pong pong; pool table; video games.
8 Independent Living Skills Lab	1	550	550	1	550	550	Training program for ADL - efficiency apartment. Some groups up to 8 + 2 staff.Seating as well as counter. Dual purpose - dining room table, kitchen, laundry/stackables, bed, bathroom. All ADA. Is this needed on the Max security side?
9 Music Therapy Room	1	400	400	1	500	500	8-10 people; group and individual performance and practice; use gym stage for larger practices/performance; soundproof.
10 Loop Area Large Group Room	0	256	0	1	256	256	Separated from other program spaces in a suite for patients who respond better with separation from other activities.
11 Loop Area Small Group Room	0	160	0	0	140	0	Separated from other program spaces in a suite for patients who respond better with separation from other activities.
12 Loop Area Computer Room	0	140	0	0	140	0	Separated from other program spaces in a suite for patients who respond better with separation from other activities.
13 Mediation Rooms	2	140	280	4	140	560	Is this in lieu of the Contact Visitation-Attorney rooms?!?
14 Exam/Physical Survey Room	1	120	120	1	120	120	One per "side" moved from being On-Unit Hand wash sink
15 Clothing Store	1	300	300	1	300	300	Supported from Voc.
	NSF: 7,378			NSF: 10,920			
Staff/Support							
1 Market Store Storage	1	80	80	1	80	80	
2 Religious Storage	1	40	40	1	40	40	Directly adjacent to Multi-denominational Worship.
3 Multi-purpose Storage	1	140	140	1	140	140	
4 Barber/Beautician Storage	0	40	0	0	40	0	Provide in storage locakable in Barber/Beautician.
5 Chaplain's Office	0	0	0	1	100	100	Locate on Civil side.
6 Music Therapy Storage	1	120	120	1	120	120	Shelving for instruments; accommodate drums, keyboards, piano.
7 Loop Area Staff Work space	0	64	0	4	64	256	Open Cubes
	NSF: 380			NSF: 736			



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III.A. SUPPORT: PUBLIC LOBBY

Space Name				Notes
Department Total Net Square Feet:	2,075			
Subname	Quantity	Each	Net Square Feet	
1 Vestibule	1	140	140	
2 Public Lobby	1	1,000	1,000	
3 Public Locker	1	100	100	Open to the Lobby and secure. Z lockers. Provide 60
4 Public Lobby Toilet - Male	1	55	55	ADA.
5 Public Lobby Toilet - Female	1	55	55	ADA.
6 Public Safety Screening	1	100	100	Walk-thru metal detector; package screening.
7 Public Safety Queuing Space	1	0	0	
8 Public Safety Station	1	250	250	Changed Name from Recp. 2 people
9 Public Safety Office	1	120	120	Director
10 Reception Staff Station	0	200	0	
11 Staff Toilet	1	55	55	Toilet for Reception Staff
12 Public Safety Storage	1	40	40	Combined with Public safety Station
13 Package Receiving Room	0	100	0	Temporary holding of packages dropped off. Move to warehouse program
14 Package/mail Screening	0	80	0	For maximum security. Move to maximum security program . Moved to CC
15 Gift Shop	1	100	100	Space for display of patient created items; resolve cashier location.
16 Vending	1	60	60	Off of Lobby
NSF:			2,075	



III-B. SUPPORT: CENTRAL CONTROL/SECURITY

Space Name				Notes
Department Total Net Square Feet:				2,965
Central Control	Quantity	Each	Net Square Feet	
1 Central Control Room	1	300	300	
2 Control Center Toilet	1	55	55	
3 Electronic Security/IT Headend	1	200	200	
4 Equipment Room	1	120	120	Protective Gear Storage
5 Sallyport Access	1	64	64	CC needs dedicated Sallyport.
6 Screening / X-Ray and Walk thur.	1	150	150	
7 Queuing Space	1	150	150	
8 Package/mail Screening	1	120	120	For maximum security.
9 Staff Lockers	1	250	250	For maximum security. 100 lockers. Z lockers
10 Unisex bathrooms	2	55	110	At Staff Lockers
			NSF:	1,409
Security Administration				Locate Security Administration near Maximum Security.
1 Forensic Security Director	1	120	120	
2 Administrative Assistant	1	64	64	
3 Work Room	1	250	250	In Secure Area 6 people Define area better for size
4 Forensic Security Director	0	0	0	
5 Interview/Conference Room	0	0	0	
6 Lieutenants Office (Shared)	3	64	192	Open office for three staff maximum at one time.
7 Equipment Storage	1	80	80	Radio equipment and general storage for Lieutenants.
8 Surveillance Room	1	80	80	reviewing videos
9 Locksmith	0	140	0	Moved to PPS.No office.
10 Shift Office	1	250	250	10 to 14 staff. Touch down spaces
11 Security Captains/Supervisors	3	100	300	Cubes. Secured Workroom for 3 staff.
12 Special Mang. Tech. Supervisor	1	100	100	
13 File Storage	1	120	120	
			NSF:	1,556

III.C. SUPPORT: EXECUTIVE ADMINISTRATION

Space Name				Notes
Department Total Net Square Feet:				13,955
Executive Staff	Quantity	Each	Net Square Feet	
1 Director of Central State Hospital	1	150	150	
2 Asst. Director of Administration	1	120	120	
3 Clinical Director	1	120	120	
4 Director Rehab.	1	120	120	
5 Director Social Work	1	120	120	
6 Director of Psychology	1	120	120	
7 Forensic Security Director	0	0	0	Assigned to Central Control/Security.-should be in Max
8 Patient Relations Recovery Director	0	120	0	In Patient Relations
9 Medical Director	1	120	120	
10 Chief Nurse Executive	1	120	120	
11 Asst. Chief Nurse Executive	2	100	200	
12 Executive Administrative Asst.	2	96	192	
13 Administrative Assistants	6	64	384	
14 Central Office Hoteling	6	100	600	
15 Internal Investigations	2	100	200	Need to have closed space
NSF:				2,566
Administration Support				
1 Reception Area	1	144	144	4 visitors.
2 Shared/Large Conference Room	1	400	400	20 persons (10 persons x 25 nsf plus 8 persons x 15 nsf).
3 Galley	1	80	80	Adjacent to conf rooms
4 Medium Conference Room	1	250	250	10 persons (10 x 25 nsf).
5 Conference Room Storage	1	100	100	
6 Executive Conference Room	1	270	270	12 persons (10 x 25 nsf plus 2 x 15 nsf); adjacent to Facility Director's office.
7 Copy/Workroom	1	180	180	
8 Secure Supply Storage	1	120	120	
9 Administrative File Room	1	120	120	
10 Housekeeping	1	80	80	
11 Mail Room	1	120	120	
12 Female Staff Restroom	1	200	200	Seems excessive
13 Male Staff Restroom	1	180	180	
14 Administrative Breakroom	1	300	300	
15 Lactation Room	1	80	80	
16 Trash/Recycling Holding	0	40	0	
17 IT Distribution Room	0	120	0	In grossing factor
18 Staff Toilet	1	55	55	Adjacent to Dir. Office
NSF:				2,679
IT Administration				
1 Director of IT	1	120	120	
2 Application Development	2	100	200	Open office cubicles for two staff plus work area.
3 Tech Support	3	64	192	Open office cubicles for two staff plus work area.
4 Storage	1	80	80	
5 Administrative Assistant / Telecom. Coordinator	1	64	64	Workstation
6 Computer Lab / Training / Group Planning	1	240	240	Allow for up to 8 computer stations.
NSF:				896

III.C. SUPPORT: EXECUTIVE ADMINISTRATION

Space Name				Notes
Health information Management				
1 HIM Supervisor	1	100	100	
2 Administrative Assistant	0	64	0	Delete
3 Program Support Technician	4	64	256	
4 Medical Records Clerk	0	64	0	Move to nurses stations, 64 sf per unit
5 Transcriptionist	1	100	100	
6 Admission Clerk	1	64	64	Move to Admissions, 64 sf.
7 Physician Review Room	1	40	40	
8 Work Room	1	140	140	
9 Microfilm Room	1	100	100	Records archive/Microfilm and Statistics storage digitized and collocated in 300nsf room instead of 3 rooms at 460 nsf
10 Statistics Storage	1	100	100	
11 Large Conference Room	0	400	0	20 persons (10 x 25 nsf plus 10 x 15 nsf).
12 Records Archive	1	100	100	Assumes EMR. No EMR as yet
13 Server Room	1	80	80	Verify size requirement (and use)
14 Housekeeping	1	80	80	
15 Coffee Bar/ off corridor	1	40	40	In lieu of break room (Look at total and confirm it is covered in general)
		NSF:	1,200	
Financial Services and Procurement				
1 Reception Area	1	120	120	4 persons.
2 Director of Finance	1	120	120	
3 Administrative Assistant	1	100	100	
4 Supervisor	1	100	100	
5 Payroll Supervisor	1	100	100	Secured suite including Payroll Technicians and Timekeepers.
6 Payroll Technicians	5	64	320	Open office cubicle in secured suite with Payroll Supervisor and File Room.
7 Timekeepers	4	64	256	
8 Timekeeping/Payroll File Room	1	64	64	
9 Buyer Supervisor	1	100	100	
10 Buyers (Procurement Officers)	3	64	192	Open office cubicles in secured suite with public counter access.
11 Cashiers	2	64	128	
12 Cost Accountant	1	100	100	
13 Accounting Manager	1	100	100	
14 Accounts Payable Supervisor	1	100	100	
15 Accounts Payable Technicians	3	64	192	Open office cubicles; adjacent to File Room.
16 Reimbursement Technicians	3	64	192	Open office cubicles.
17 Safe	1	16	16	
18 Accounts Payable File Room	1	240	240	
19 Departmental Storage Room	1	100	100	
20 Work / Copy Area	1	120	120	
21 Medium Conference Room	1	250	250	10 persons (10 x 25 nsf).
22 Coffee Bar	1	40	40	
		NSF:	3,050	
Quality and Risk Management				
1 Director of Risk and Quality Management	1	120	120	
2 QA Support Technician	0	64	0	Delete
3 Operations/EEOC Manager	1	100	100	
4 Risk Analyst	1	100	100	
5 Hospital Administrative Assistant	0	100	0	Locate at Living Units: 2 on Civil, 1 on Max. Office manager, safety, work orders, special patient orders, etc. Name Change. Working on unit
6 Quality Manager	1	100	100	
7 Policy Coordinator	1	100	100	
8 Data Analyst	1	100	100	
9 Small Conference Room	1	150	150	6 persons (6 x 25 nsf).
10 Work/Copy Area	1	120	120	
11 Coffee Bar	1	40	40	
12 Administrative Assistant	1	64	64	
		NSF:	994	
Administration Conference and Support Center				
1 Conference Room - Large	1	600	600	Dividable into 2.
2 Conference Room - Medium	1	250	250	
3 Conference Room - Small	2	120	240	
4 Work Room / Copy Center / Supplies	1	240	240	Central - shared for all Administration. Ample casework and counters.
5 Central Supply Storage	1	100	100	
6 Staff Break Room	1	300	300	All Admin. Staff.
7 Toilets - Male	1	300	300	
8 Toilets - Female	1	400	400	
9 Trash Holding	1	60	60	
10 Housekeeping	1	80	80	
		NSF:	2,570	

III.D. SUPPORT: HUMAN RESOURCES

Space Name				Notes
Department Total Net Square Feet:				1,823
Human Resources Administration	Quantity	Each	Net Square Feet	
1 Regional HR Director	1	120	120	
2 Regional Assist. HR Director	1	100	100	
3 Employment and Recruitment Manager	1	100	100	
4 Senior Recruiter	1	100	100	
5 Senior Recruiter/WP Analyst	1	100	100	
6 Worker Compensation Case Manager	1	100	100	
7 Employee Relations Analyst	1	100	100	
8 Employee Relations Specialist	1	100	100	
9 VSDP Coordinator	1	100	100	
10 Benefits Administrator	1	100	100	
11 Customer Service Supervisor	1	100	100	
12 Timekeeper	0	100	0	
13 Administrative Assistant	1	64	64	open work area
			NSF:	1,184
Human Resources Support				
1 Reception Room	1	144	144	4 persons.
2 Interview Room / Conference	1	175	175	6 to 8 people - Near other conference rooms
3 Badging Room	1	80	80	
4 Workroom	0	120	0	See Conference / Administrative Support Center
5 Records	1	200	200	Up to 3 years of former staff files seperated from active files. ACTIVE VS. INACTIVE FILES. For CSH Currently not budgeted for digitizing. CONFIRM. Files will be digitized. If not room needs to grow to 500 sf.
6 Male Staff Toilet	0	160	0	See Conference / Administrative Support Center
7 Female Staff Toilet	0	160	0	See Conference / Administrative Support Center
8 Housekeeping	0	60	0	See Conference / Administrative Support Center
9 Supply Storage	0	120	0	See Conference / Administrative Support Center
10 Coffee Bar	1	40	40	Kitchenette recess
			NSF:	639

III.E. SUPPORT: STAFF DEVELOPMENT

Space Name				Notes
Department Total Net Square Feet:				6,502
Staff Development	Quantity	Each	Net Square Feet	
1 Director of Training	1	120	120	
2 Nurse Educator	3	100	300	
3 Training Coordinator/Supervisor	2	64	128	
3 Mentors	5	64	320	
4 Admin. Support	2	64	128	
5 Mentor Supervisor	1	96	96	
6 Workroom	0	140	0	See Conference / Administrative Support Center
7 File Room	1	100	100	
8 Supply Storage	0	80	0	See Conference / Administrative Support Center
9 Break Room	0	120	0	See Conference / Administrative Support Center
10 Male Staff Toilet	0	140	0	See Conference / Administrative Support Center
11 Female Staff Toilet	0	140	0	See Conference / Administrative Support Center
12 Housekeeping	0	60	0	See Conference / Administrative Support Center
13 IT Distribution Room	0	120	0	Included in grossing factor
NSF:				1,192
Training Space				
1 Training Pre-function Space	1	400	400	
2 Training Classroom	1	800	800	40 persons (40 x 20 nsf)
3 Nurse Training Classroom	1	240	240	Nurses Lab
4 Computer Training Room (Lab)	1	250	250	Size for 25 computer stations
5 Multipurpose Room	1	1,500	1,500	Dividable. CPR - 15+ people, equipment and maneuvering space; sink, storage, etc., TOVA (Therapeutic Options of Virginia) - open space. Behavioral response. Mats, classroom, etc. 20 people +/-, Forensic Security.
6 Training Supply Storage	1	120	120	Ensure adequate storage all around - chairs, tables mats/equipments, AV, etc.
7 Multipurpose Room Storage	1	80	80	
8 CPR Equipment Storage	1	120	120	
9 Physical Fitness Room	1	800	800	
10 Male Lockers/Showers/Toilet	1	320	320	
11 Female Lockers/Showers/Toilet	1	320	320	
12 Trash/Recycling Holding	0	40	0	In Core Factor
NSF:				4,950

III.E. SUPPORT: STAFF DEVELOPMENT

Space Name				Notes
Short-Term Housing				
1 Student Bedroom	0	130	0	Opens to Student Lounge.
2 Student Toilet/Shower	0	45	0	Opens to Student Bedroom.
3 Student Toilet/Shower - ADA	0	60	0	Opens to Student Bedroom.
4 Student Lounge	0	200	0	
5 Medical Officer of the Day Studio Apartment	1	300	300	Close to Admissions
6 Medical Officer of the Day Toilet/Shower - ADA	1	60	60	Opens to Studio Apartment.
NSF:				360
Employee Health				
1 Employee Health/Infection Control Office	0	100	0	Move to Clinic
2 Exam/Interview	0	120	0	Move to Clinic, Biometric screening, vaccinations, PPDs, checkups. Sink, Refig. - Possible move to Clinic
3 Employee Health Files	0	0	0	Move to Clinic , Active and retired employee health files. Verify size. Record digitized active records kept in Employee Health Office above.
4 Admin Assit.	0	64	0	Mova To Clinic
NSF:				0



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III.G. SUPPORT: KITCHEN

Space Name				Notes
Department Total Net Square Feet:			9,837	
Subr Satellite Kitchen	Quantity	Each	Net Square Feet	Space program derived from Wiley Wilson-DM&A Webb study.
1 Receiving Dock	1	200	200	General receiving staging area; adjacent to storage and preparation areas.
2 Dry Storage Room	2	400	800	
3 Walk-in Cooler (Produce)	2	200	400	
4 Walk-in Cooler (Dairy)	2	200	400	
5 Walk-in Cooler (Trayed Food)	3	400	1,200	Space for 15 carts per cooler. 45 total; actual cart quantity to be determined.
6 Walk-in Cooler (Bulk Food)	2	250	500	
7 Walk-in Cooler (Canned Food)	1	200	200	
8 Walk-in Freezer	2	250	500	Could be three coolers. 1 large two smaller
9 Preparation Area	1	750	750	
10 Tray Assembly Area	1	900	900	
11 Cart Staging Area	1	300	300	Directly adjacent to Tray Assembly Area.
12 Production Cooking	1	825	825	Area for scratch cooking; adjacent to Preparation Area.
13 Dish Wash & Cart Wash	1	650	650	
14 Pot Wash	1	175	175	Adjacent to Preparation Area.
15 Special Diets Preparation Room	0	325	0	Combined with production
16 Dietician Office	3	100	300	
17 Director's Office	1	120	120	
18 Mang. Office	3	100	300	Patinet Service, Food Production
19 Workstations / Food Service Supervisor	6	64	384	Includes Food Production support Admin near Dir. Move to new line
20 Workstations / Diet	2	64	128	Shared Office one room
21 Female Staff Toilet	1	200	200	
22 Staff Lockers	1	75	75	
23 Housekeeping	1	80	80	
24 Retherm Docking Area	1	200	200	Space for 6 carts; calculate 13.5 meals per cart (including contingency factor).
25 Break Room	1	250	250	25 staff
	NSF:		9,837	



III.H. SUPPORT: TRANSPORTATION

Space Name				Notes
Department Total Net Square Feet:				2,348
Maximum Security Transport	Quantity	Each	Net Square Feet	Locate Maximum Security Transport near Admissions.
1 SST Supervisor	1	100	100	
2 SST Transport Officers	8	48	384	Open office cubicles for floating staff.
3 SST Transport Conference	0	250	0	Seating for 10.
4 SST Equipment Room	1	80	80	Restraint equipment.
5 Staff Toilet	1	55	55	
6 Max Security Patient Staging	1	120	120	
7 Max Security Patient Toilet	1	55	55	
8 Max Security Patient Changing	1	50	50	
9 Max Security Holding	1	40	40	Single occupant; fixed seating; space for wheelchair.
10 Sallyport	1	120	120	
NSF:				1,004
Civil Transport	Quantity	Each	Net Square Feet	
1 Director of Transportation	0	120	0	
2 Supervisor	1	100	100	
3 Administrative Assistant	1	64	64	
4 Bull Pen/Conference Room	1	240	240	Current 13 drivers; plan for 10 drivers; conference table; counter space on sides.
5 Workroom	0	120	0	
6 Staff Toilet	2	60	120	
7 Housekeeping	1	80	80	
NSF:				604
Vehicle Support	Quantity	Each	Net Square Feet	
1 Repair Bay	0	600	0	Verify size requirements; min. vehicle size 36' long; 20' clear height.
2 Mechanics Office area	0	64	0	
3 Toilet/Shower/Locker	2	100	200	Lockers in corridor directly adjacent to toilets.Shared with maintenance
4 Car Wash	1	500	500	Provided an Interior space
5 Parts Storage	0	200	0	
6 Compressor Room	1	40	40	
7 Housekeeping	0	60	0	Shared space
8 CSH Vehicle Parking	1	0	0	Exterior space.
9 Fueling Stations	1	0	0	Fueling will be offsite. Small above tanks for diesel and unleaded.275 gallons each
NSF:				740

III.J. SUPPORT: HOUSEKEEPING

Space Name				Notes
Department Total Net Square Feet:	1,090			
	Quantity	Each	Net Square Feet	Locate Maximum Security Transport near Admissions.
1 Director / Hosekeeping -Laundry	1	100	100	
1 Supervisor Office	1	100	100	
2 Mang. Office	1	100	100	
3 Supply distribution area	1	300	300	
4 Toilet/Shower/Locker	1	250	250	20 staff
5 Common Housekeeping large units	2	120	240	One unit on each side / Civil and Max
	NSF:		1,090	



III.K. SUPPORT: MATERIAL MANAGEMENT

Space Name				Notes
Department Total Net Square Feet:	12,274			
1 Receiving Area	Quantity: 1	Each: 400	Net Square Feet: 400	Two rollup dock doors for panel van use.
2 Housekeeping	Quantity: 1	Each: 80	Net Square Feet: 80	
3 Recycling/Refuse Holding	Quantity: 1	Each: 200	Net Square Feet: 200	Provide protected outdoor trash lean-to" for large bins.
NSF:			680	
Office Area	Quantity	Each	Net Square Feet	Locate Maximum Security Transport near Admissions.
1 Director of Warehouse	1	120	120	
2 Warehouse Supervisor	1	100	100	
3 Receiving Specialist	2	64	128	
4 Warehouse Control Specialist	3	64	192	
5 Work/Copy Room	1	140	140	
6 Mail Room	1	200	200	
7 Break Room	1	180	180	
8 Staff Toilet	1	55	55	
NSF:			1,115	
Warehouse Area	Quantity	Each	Net Square Feet	
1 Receiving Area	1	1,200	1,200	
2 High Bay Storage	1	5,000	5,000	Area based on WSH plus 15%.
3 Central Stores	1	500	500	Area based on WSH plus 15%.
4 Clothing Storage	1	600	600	Area based on WSH plus 15%.
5 Volunteer Storage	1	500	500	Area based on WSH plus 15%.
6 Patient Property Storage	1	1,700	1,700	Area based on WSH plus 15%.
7 Medical Supplies Storage	1	500	500	
8 Oxygen Storage	1	120	120	
9 Staff Toilet/Shower	1	70	70	
10 Housekeeping	1	80	80	
11 Emergency Shower	1	9	9	
12 Climate Controlled Stor.	1	120	120	This assumes that all records are digital
13 Refig. Storage - Medical / Phy.	1	80	80	
NSF:			10,479	

III.L. SUPPORT: ENERGY PLANT

Space Name				Notes
Department Total Net Square Feet:	10,600			
Energy Plant	Quantity	Each	Net Square Feet	
1 Central Energy Plant	1	8,400	8,400	
2 Electrical Room	1	1,800	1,800	
3 Emergency Generator	0	1,800	0	Located outside not covered
4 Equipment Storage	1	200	200	
5 Stationary Engineer / Control	1	200	200	
	NSF:		10,600	

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III.M. SUPPORT: Clinic

Space Name				Notes	
Department Total Net Square Feet:		8,665			
Clinic / Admin	Quantity	Each	Net Square Feet		
1 Audiology	1	300	300	Civil and Max clinic / Room must be able to hold 5 people	
2 Audiology work	1	100	100	Civil and Max clinic / Room must be able to hold 5 people	
3 Radiology / Workroom	1	300	300	Civil and Max clinic / Room must be able to hold 5 people	
4 Sterile Procedure Processing	1	105	105		
5 Clinic Ortho/POD Treatment/Procedure Civil	1	160	160		
6 Clinic Ortho/POD Treatment/Procedure Max	1	200	200	Room must be able to hold 5 people	
7 Exam Room / OB Civil	2	120	240		
8 Exam Room / OB Max	1	140	140	Room must be able to hold 5 people	
9 Clinic Treatment (OPHTHAL)	1	140	140	Civil and Max clinic / Room must be able to hold 5 people	
10 Equip storage	2	100	200	One each side of clinic, Max and Civil.	
11 Clinic Waiting, Civil	1	400	400	Located to have visibility to Reception	
12 Clinic Waiting, Max	1	200	200	Located to have visibility to Reception	
13 Reception	1	80	80	Located to have visibility to both Max and Civil waiting	
14 Clinical Support	1	110	110		
15 Dir. / Head Dr.	1	120	120		
16 Visiting Doctor's work space	3	64	192	Provide two on civil side one on Max side	
17 EH/IC Office	1	120	120		
18 EH/IC Tech.	1	84	84		
19 EH/IC Treatment	1	200	200		
20 Medical Waste Storage	2	30	60	Provide one on civil side one on Max side	
21 Clean Storage	2	130	260	Provide one on civil side one on Max side	
22 Soiled Holding	2	110	220	Provide one on civil side one on Max side	
23 Patient Toilet's	4	55	220	One Located at the waiting room each side civil and Max, one each side in clinic	
24 Storage	2	30	60	Provide one on civil side one on Max side	
24 Sally Port	2	80	160	Provide for Max side access	

NSF: 4,371

Dental Suite	Quantity	Each	Net Square Feet	
1 Dentist Dir.	1	120	120	Civil and Max clinic
2 Dentist Treatment	1	150	150	Civil and Max clinic / Room must be able to hold 5 people
3 Dentist Treatment (ADA)	1	150	150	Civil and Max clinic / Room must be able to hold 5 people
4 Medical Gas	1	40	40	Civil and Max clinic
5 X-Ray PANO	1	60	60	Civil and Max clinic
6 Storage	1	50	50	Civil and Max clinic
7 Dark Room Lab	1	40	40	Civil and Max clinic
8 Lab Processing / work	1	80	80	Civil and Max clinic
9 Dental / Sterile	1	120	120	Civil and Max clinic
10 Dental AA	1	80	80	Civil and Max clinic

NSF: 890

Laboratory	Quantity	Each	Net Square Feet	
1 Main Lab	1	1,000	1,000	
2 Micro Lab	1	120	120	
3 Lab Dir.,	1	120	120	
4 Lab Tech	1	64	64	
5 File Storage	1	100	100	
5 Blood Draw Civil	1	120	120	
6 Blood Draw Max	1	120	120	
7 Conf. / Break Room	1	100	100	
8 Lab SEC Work Room	1	80	80	

NSF: 1,824



III.M. SUPPORT: Clinic

Space Name				Notes
Physical Therapy	Quantity	Each	Net Square Feet	
1 Physical Therapy Activity Area	1	550	550	Max side would move staff to Exercise room for PT on max side, no Max in PT
2 Storage	1	100	100	
3 Office	1	100	100	
4 Patient Toilet	1	55	55	

	NSF:	805	
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Neurology	Quantity	Each	Net Square Feet	
1 NEURO TEST/BIO	1	120	120	
2 NEURO AA	1	80	80	
3 NEURO Dir.	1	120	120	
4 NEURO TEST (2 Rooms)	1	120	120	
5 NEURO Test / Observation	1	80	80	
6 NEURO Tech.	1	80	80	
7 Office / Post - Doc.	1	120	120	
8 Patient Toilet	1	55	55	

	NSF:	775	
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III.N. SUPPORT: Pharmacy

Space Name			Notes
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Department Total Net Square Feet: **5,385**

Administration / Staff	Quantity	Each	Net Square Feet	
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1 Dir Pharmacy Office	1	120	120	Same As WSH
2 Clinical Pharmacy Office	1	120	120	Same As WSH
3 Clinical Pharmacy Office	1	120	120	Same As WSH
4 Office Shared (2 People)	1	200	200	Same As WSH
5 Flex Office	1	120	120	Same As WSH
6 Records / File Storage	1	250	250	Same As WSH
7 Open Office Area	1	1,200	1,200	Work area for 4 to 6 people @ 64sf, plus internal circulation to main open dept areas, Same As WSH
8 Conf. Break Room	1	285	285	Same As WSH
9 Staff Toilet	2	55	110	Same As WSH
10 Coffee Bar	1	40	40	Kitchenette recess

NSF: 2,565

Pharmacy Prep / Work	Quantity	Each	Net Square Feet	
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1 Pick TAB Area	1	580	580	Same As WSH
2 Drug Control	1	100	100	Same As WSH
3 Emergency Cart Storage	1	245	245	2 doors one from Materials Dept , Same As WSH
4 Pass Discharge	1	170	170	Same As WSH
5 PYXIS CCCA/FLEX	1	260	260	Same As WSH
6 Unit Dose	1	140	140	Same As WSH
7 Bulk Storage	1	345	345	Same As WSH
8 Compound Area	1	80	80	Same As WSH
9 Computer Stations	1	420	420	Same As WSH
10 WTG Area	1	80	80	Same As WSH
11 Pharmacy / Doc. PYXIS Station	2	100	200	Central Located off corridors but one each end of housing units / Same as WSH Civil Side
12 Pharmacy / Doc. PYXIS Station	2	100	200	Central Located off corridors but one each end of housing units / Same as WSH - Max Side (Added due to Max.)

NSF: 2,820



III.O. SUPPORT: LAUNDRY

Space Name				Notes
Department Total Net Square Feet:	4,835			
Subname	Quantity	Each	Net Square Feet	
1 Soiled Sort Area	1	1,400	1,400	Similar to WSH space.
2 Clean Sorting/Drying/Ironing	1	2,000	2,000	Similar to WSH space. Dryer separate at WSH
3 Distribution Area	1	800	800	Similar to WAH: Near dock, outside access, ozonator (odor)
4 Supervisor Office	1	100	100	Similar to WSH space.
5 Staff Toilet	1	55	55	Similar to WSH space.
6 Housekeeping	1	80	80	
7 Laundry Storage	1	400	400	Similar to WSH space.
			NSF:	4,835

III.P. SUPPORT: MAINTENANCE/BUILDING AND GROUNDS

Space Name				Notes
Department Total Net Square Feet:				5,678
Administration	Quantity	Each	Net Square Feet	
1 PPS Director	1	120	120	
2 Maintenance Supervisor	4	100	400	
3 Administrative Assistant	2	64	128	
4 Workroom	1	120	120	
5 Breakroom/Conference Room	1	250	250	All staff mtgs (monthly) - 35 people. Could use "Training Center"
6 Files/Records	1	0	0	Combine w/ Plan Room
7 Toilet/Shower/Locker	2	200	400	Share with Transporation. 25 staff.
8 Conference Room	1	200	200	10-12 people
9 Plan Room	1	120	120	Plan racks although most are digitized. Plotter. Verify size requirement.
			NSF:	1,738
Workshops	Quantity	Each	Net Square Feet	
1 Carpentry	1	1,000	1,000	Dedicated storage at each shop.
2 Electrical	1	600	600	Dedicated storage at each shop.
3 Plumbing	1	600	600	Dedicated storage at each shop.
4 HVAC	1	600	600	Dedicated storage at each shop.
5 Hazardous Materials Collection	1	150	150	Dedicated storage at each shop.
6 General Storage	1	100	100	
7 Paint Shop	1	200	200	Dedicated storage at each shop,
8 Parts Inventory	0	0	0	At warehouse
9 Combustibles Storage	1	250	250	Verify, location. Fuels, volitiles, free-standing metal building w/ containment floor.
10 Corporation Yard	0	0	0	Outdoor covered and uncovered storage
11 Foreman	5	64	320	Open Work Space
12 Welding Booth	1	120	120	
			NSF:	3,940
Grounds	Quantity	Each	Net Square Feet	
1 Grounds Equipment	0	800	0	Not covered / Use Warehouse if Indoor
2 Outdoor Storage/Grounds Yard	0	3,700	0	Not covered / Use Warehouse if Indoor
			NSF:	0



B

Facility Planning Blocks

Facility Planning Blocks

After the development of the program was completed, departments and areas most logically would be adjacent or nearby were determined. Using the square footages for those department, a basic planning block was developed. The blocks were scaled to maintain a size that would reflect their actual relationship to each other.

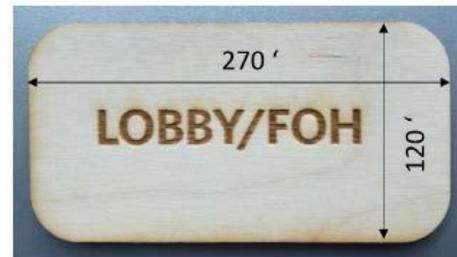
Planning blocks below show the program spaces that are included in that basic block. The square footages are shown for both the first and second floors and the scaled dimensions of the blocks are also shown. Using these blocks and a map of the site of the scale allowed the team to explore various configuration.

The planning block are only a tool to reach a viable concept to price. During the actual design of the facility other viable concepts may emerge for consideration.

PROGRAM SUMMARY- PLANNING BLOCKS

BLOCK 1- LOBBY/FOH

	1	2
LOBBY	3320	
SECURITY	4744	
CLINIC	13826	
EXECUTIVE ADMIN.		22328
HR		2917
STAFF DEVELOPMENT	10403	
TOTAL	32293	25245



PROGRAM SUMMARY- PLANNING BLOCKS

BLOCK 2- SUPPORT

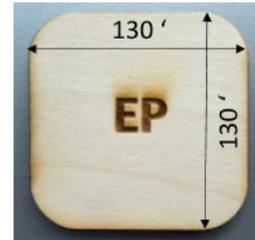
	1	2
HOUSEKEEPING	1744	
MATERIAL MANAGEMENT	18550	
LAUNDRY	7036	
KITCHEN	15739	
MAINTENANCE	17373	
PHARMACY	8616	
TOTAL	69758	



PROGRAM SUMMARY- PLANNING BLOCKS

BLOCK 3- CENTRAL ENERGY PLANT

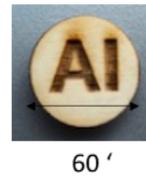
	1	2
TOTAL	16960	



PROGRAM SUMMARY- PLANNING BLOCKS

BLOCK 4- ADMISSIONS INTAKE (2)

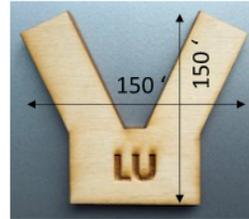
	1	2
TOTAL	6325	



PROGRAM SUMMARY- PLANNING BLOCKS

BLOCK 6- CIVIL LIVING UNITS (9 TOTAL)

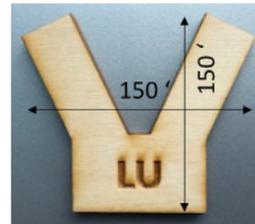
	1	2
CIVIL LU 24 BEDS INT (5)	40506	27004
CIVIL LU 24 BEDS MK (1)		15422
CIVIL ADMISSIONS 15 BEDS (3)	22278	11139
TOTAL	62784	80569



PROGRAM SUMMARY- PLANNING BLOCKS

BLOCK 5- MAXIMUM SECURITY LIVING UNITS (6 TOTAL)

	1	2
MAXIMUM LU 22 BEDS	27642	13821
MAXIMUM ADMIT 15 BEDS	11130	22260
TOTAL	38772	36081



PROGRAM SUMMARY- PLANNING BLOCKS

BLOCK 7- MAXIMUM SECURITY MALL

	1	2
EDUCATION	2417	2417
VOCATIONAL	1953	1953
RECREATION	3873	3873
SHARED RESIDENT SVCS	6206	6206
PROGRAM STAFF	4250	4250
VISITATION	3930	
DINING	928	928
TRANSPORT	1606	
TOTAL	25164	19627

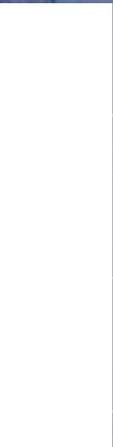


PROGRAM SUMMARY- PLANNING BLOCKS

BLOCK 8- CIVIL MALL

	1	2
EDUCATION	3602	2876
VOCATIONAL	3753	2997
RECREATION	6892	5503
SHARED RESIDENT SVCS	10369	8280
PROGRAM STAFF	7091	5663
VISITATION	2024	
DINING	1993	1591
TRANSPORT	2150	
TOTAL	37874	26911





Concept Cost Estimate - Single Phase

**DGS / DBHDS Central State Hospital Replacement
Single Phase
Petersburg, Virginia**

Preplanning Study / Cost Analysis

BCC Job No.: 18-10-0139 / DBHDS 720-18165

12/1/2018 Rev. 1



Preplanning Study / Cost Analysis	BCC Building Cost Consultants, Inc. DGS / DBHDS Central State Hospital Replacement Single Phase Petersburg, Virginia BCC Job No.: 18-10-0139 / DBHDS 720-18165	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
Rev 9 1/2018 Re					
ITEM	DESCRIPTION				
Single Phase - Phase 1 (Page 3)					
Sitework (Pages 4-5)					
1	Remove existing building.	34,445	S.F.	10.00	\$344,450.00
2	Clear and grub.	1,300,000	S.F.	0.10	130,000.00
3	Tree clearing.	1.3	Acres	17,500.00	22,750.00
4	Bulk excavation - cut and fill on site.	100,000	C.Y.	12.00	1,200,000.00
5	Fine grading and site layout.	1,300,000	S.F.	0.15	195,000.00
6	Storm retention pond.	75,000	S.F.	2.00	150,000.00
7	Site utilities:				
	8" waterline.	2,800	L.F.	80.00	224,000.00
	12" - 15" sanitary sewer.	4,200	L.F.	150.00	630,000.00
	8" fire line.	2,800	L.F.	80.00	224,000.00
	12" storm sewer.	12,500	L.F.	50.00	625,000.00
	15" storm sewer.	8,400	L.F.	60.00	504,000.00
	24" storm sewer.	2,900	L.F.	75.00	217,500.00
	6" natural gas line.	2,800	L.F.	45.00	126,000.00
	Primary electrical feeder - empty conduits.	2,800	L.F.	65.00	182,000.00
	Secondary feeders - 100' x 2 each =	200	L.F.	500.00	100,000.00
	Communication feeders.	5,600	L.F.	35.00	196,000.00
	Various utility manholes.	10	EA.	4,500.00	45,000.00
8	Parking and drive lights.	44	EA.	4,250.00	187,000.00
9	Pedestrian lights.	16	EA.	1,650.00	26,400.00
10	Concrete curb.	12,000	L.F.	15.00	180,000.00
11	Concrete parking and drive paving - 270,000 S.F. / 9 =	30,000	S.Y.	55.00	1,650,000.00
12	Concrete sidewalks.	20,000	S.F.	6.00	120,000.00
13	Rock fireline road - 1,400' x 24' = 33,600 S.F. / 9 =	3,700	S.Y.	15.00	55,500.00

Preplanning Study / Cost Analysis Rev 9 1/2018 Re	BCC Building Cost Consultants, Inc. DGS / DBHDS Central State Hospital Replacement Single Phase Petersburg, Virginia BCC Job No.: 18-10-0139 / DBHDS 720-18165	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
ITEM	DESCRIPTION				
Single Phase - (Page 2)					
Sitework (Pages 4-5)					
14	Recreation areas: Small - 5,000 S.F. Large - 13,000 S.F.	8 3	EA. EA.	55,000.00 75,000.00	440,000.00 225,000.00
15	14' anti-climb chain link fence.	4,000	L.F.	150.00	600,000.00
16	Silt fence at site perimeter.	5,200	L.F.	3.50	18,200.00
17	Fire hydrants and piping.	2	EA.	7,500.00	15,000.00
18	Main entrance sign.	1	EA.	30,000.00	30,000.00
19	Flagpoles and concrete bases.	2	EA.	6,500.00	13,000.00
20	Parking and directional signs.	48	EA.	725.00	34,800.00
21	Sod and irrigation around building / parking.	150,000	S.F.	1.50	225,000.00
22	Seed and no irrigation.	250,000	S.F.	0.20	50,000.00
23	Landscaping - trees, shrubs and plantings.	1	L.S.	250,000.00	250,000.00
24	Courtyard landscaping.	1	L.S.	50,000.00	50,000.00
SUBTOTAL =					\$9,285,600.00

Preplanning Study / Cost Analysis	BCC Building Cost Consultants, Inc. DGS / DBHDS Central State Hospital Replacement Single Phase Petersburg, Virginia BCC Job No.: 18-10-0139 / DBHDS 720-18165	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
Rev 9 1/2018 Re					
ITEM	DESCRIPTION				
Single Phase - Phase 1 (Page 3)					
Living Units (Page 6)					
1	Max living units (3-22 Bed Units).	23,688	S.F.	390.00	\$9,238,320.00
2	Max Patient Support (3-22 Bed Units).	12,158	S.F.	340.00	4,133,720.00
3	Max Staff Areas (3-22 Bed Units).	3,744	S.F.	330.00	1,235,520.00
4	Max Unit Support (3-22 Bed Units).	3,312	S.F.	360.00	1,192,320.00
5	Max living units (3-15 Bed Units).	16,488	S.F.	390.00	6,430,320.00
6	Max Patient Support (3-15 Bed Units).	10,517	S.F.	340.00	3,575,780.00
7	Max Staff Areas (3-15 Bed Units).	3,744	S.F.	330.00	1,235,520.00
8	Max Unit Support (3-15 Bed Units).	3,312	S.F.	360.00	1,192,320.00
9	Civil living units (3-15 Bed Units).	16,920	S.F.	365.00	6,175,800.00
10	Civ. Patient Support (3-15 Bed Units).	10,330	S.F.	345.00	3,563,850.00
11	Civ. Staff Areas (3-15 Bed Units).	3,744	S.F.	350.00	1,310,400.00
12	Civ. Unit Support (3-15 Bed Units).	3,312	S.F.	340.00	1,126,080.00
13	Civil living units (5-24 Bed Units).	34,688	S.F.	365.00	12,661,120.00
14	Civ. Patient Support (5-24 Bed Units).	22,744	S.F.	345.00	7,846,680.00
15	Civ. Staff Areas (5-24 Bed Units).	6,640	S.F.	350.00	2,324,000.00
16	Civil living units (1-24 Bed Unit).	5,040	S.F.	365.00	1,839,600.00
17	Civ. Patient Support (1-24 Bed Unit).	8,314	S.F.	345.00	2,868,330.00
18	Civ. Staff Areas (1-24 Bed Unit).	4,741	S.F.	350.00	1,659,350.00
19	Civ. Unit Support (1-24 Bed Unit).	1,328	S.F.	340.00	451,520.00
20	Civil Prog. Staff Offices.	1,040	S.F.	325.00	338,000.00
	SUBTOTAL =	195,804	S.F.	\$359.54	\$70,398,550.00
Programs (Pages 6-7)					
1	Admissions.	8,509	S.F.	315.00	\$2,680,340.00
2	Admissions Admin.	2,083	S.F.	330.00	687,390.00
3	Max Prog. Staff offices.	7,117	S.F.	335.00	2,384,200.00
4	Max Prog. Staff Support Areas.	1,584	S.F.	335.00	530,640.00
5	Max Visitation: Res. Processing.	542	S.F.	370.00	200,540.00
6	Max Visitation: Visitation.	2,035	S.F.	370.00	752,950.00
7	Max Visitation: Ent./Processing - Check-in.	280	S.F.	365.00	102,200.00
8	Max Visitation: Ent./Processing - Judicial.	1,072	S.F.	370.00	396,640.00
9	Max Patient Dining.	1,856	S.F.	325.00	603,200.00
10	Max Treatment Mall: Education Areas.	3,600	S.F.	340.00	1,224,000.00
11	Max Treatment Mall: Educ. Staff & Support.	1,234	S.F.	340.00	419,560.00
12	Max Treatment Mall: Vocational Areas.	3,120	S.F.	345.00	1,076,400.00
13	Max Treatment Mall: Voc. Staff & Support.	786	S.F.	345.00	271,170.00

Preplanning Study / Cost Analysis	BCC Building Cost Consultants, Inc. DGS / DBHDS Central State Hospital Replacement Single Phase Petersburg, Virginia BCC Job No.: 18-10-0139 / DBHDS 720-18165	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
Rev 9 1/2018 Re					
ITEM	DESCRIPTION				
Single Phase - Phase 1 (Page 3)					
Programs (Pages 6-7)					
14	Max Treatment Mall: Rec. Area.	6,768	S.F.	330.00	2,233,440.00
15	Max Treatment Mall: Rec. Office/Support.	978	S.F.	335.00	327,630.00
16	Max Treatment Mall: Shared Res. Pt. Areas.	11,805	S.F.	340.00	4,013,700.00
17	Max Treatment Mall: Shared Res. Staff/Sup.	608	S.F.	340.00	206,720.00
18	Civ. Visitation: Ent./Processing - Check-in.	320	S.F.	355.00	113,600.00
19	Civ. Visitation: Ent./Processing - Judicial.	1,072	S.F.	360.00	385,920.00
20	Civil Prog. Staff Offices.	10,970	S.F.	325.00	3,565,250.00
21	Civil Prog. Staff Support Areas.	1,584	S.F.	325.00	514,800.00
22	Civ. Visitation: Res. Processing.	632	S.F.	360.00	227,520.00
23	Civ. Visitation: Visitation.	0	S.F.	355.00	0.00
24	Civ. Patient Dining.	3,584	S.F.	315.00	1,128,960.00
25	Civ. Treatment Mall: Education Areas.	4,880	S.F.	330.00	1,610,400.00
26	Civ. Treatment Mall: Educ. Staff & Support.	1,598	S.F.	330.00	527,340.00
27	Civ. Treatment Mall: Vocational Areas.	5,760	S.F.	335.00	1,929,600.00
28	Civ. Treatment Mall: Voc. Staff & Support.	990	S.F.	335.00	331,650.00
29	Civ. Treatment Mall: Rec. Area.	10,800	S.F.	320.00	3,456,000.00
30	Civ. Treatment Mall: Rec. Office/Support.	1,595	S.F.	325.00	518,380.00
31	Civ. Treatment Mall: Shared Res. Pt. Areas.	17,472	S.F.	330.00	5,765,760.00
32	Civ. Treatment Mall: Shared Res. Staff/Sup.	1,178	S.F.	330.00	388,740.00
	SUBTOTAL =	116,412	S.F.	\$331.36	\$38,574,640.00
Support (Pages 7-8)					
1	Public Lobby.	3,320	S.F.	270.00	\$896,400.00
2	Central Control / Security.	2,254	S.F.	310.00	698,740.00
3	Central Control / Sec. Admin.	2,490	S.F.	310.00	771,900.00
4	Housekeeping.	1,744	S.F.	320.00	558,080.00
5	Material Management - Receiving Area.	1,088	S.F.	240.00	261,120.00
6	Energy Plant.	16,960	S.F.	280.00	4,748,800.00
7	Satellite Kitchen.	15,739	S.F.	350.00	5,508,650.00
8	Transportation - Civil.	966	S.F.	260.00	251,160.00
9	Transportation - Max.	1,606	S.F.	260.00	417,560.00
10	Vehicle Support.	1,184	S.F.	170.00	201,280.00
11	Laundry.	7,736	S.F.	320.00	2,475,520.00
12	Warehouse - Office Area.	1,784	S.F.	210.00	374,640.00
13	Warehouse - Storage Area.	16,766	S.F.	180.00	3,017,880.00
14	Maint. Bldg. Admin.	2,781	S.F.	320.00	889,920.00



Virginia DBHDS Central State Hospital
 Planning Study - Draft Cost Estimate
 Petersburg, Virginia
 Cost Analysis Date: 11/1/2018

CONCEPTUAL ESTIMATE

BUILDING CONCEPT

Option One	NTP	Completion	Mid Point	Annual Esc.	Effective Esc.
Phase 1	7/1/2022	3/31/2026	5/15/2024	4.50%	27.60%

	Phase	Phase Description (SF)	Building SF	Construction Cost	Escalated Cost	Escalated Cost Plus Soft Costs	Cost / SF	Esc. Cost / SF	(Es Cost + Soft) / SF
1	1	Living -196K; Programs - 116K; Support 145K	456,234	\$212,947,300	\$271,722,020	\$362,296,026	\$467	\$596	\$794
	2	Demolition of Existing Campus				\$19,823,842			
	3	Maintenance Reserve Contingency *				\$23,100,000			\$51
		Total	456,234	\$212,947,300	\$271,722,020	\$405,219,868	\$467	\$596	\$888

*Note - Includes recommended contingency for maintenance reserve repairs foreseeable prior to new facility completion.



Conceptual Estimate	Virginia DBHDS Central State Hospital Planning Study - Draft Cost Estimate Petersburg, Virginia	GROSS SQUARE FEET	COST PER SF	COST TOTAL
BUILDING CONCEPT				
DESCRIPTION				
Option One				
Living Units:				
1.1	Max living units (3-22 Bed Units)	23,688	\$501.58	\$11,881,396
1.2	Max Patient Support (3-22 Bed Units)	12,158	\$501.58	\$6,098,394
1.3	Max Staff Areas (3-22 Bed Units)	3,744	\$501.58	\$1,877,911
1.4	Max Unit Support (3-22 Bed Units)	3,312	\$501.58	\$1,661,229
2.1	Max living units (3-15 Bed Units)	16,488	\$496.50	\$8,186,302
2.2	Max Patient Support (3-15 Bed Units)	10,517	\$496.50	\$5,221,598
2.3	Max Staff Areas (3-15 Bed Units)	3,744	\$496.50	\$1,858,898
2.4	Max Unit Support (3-15 Bed Units)	3,312	\$496.50	\$1,644,410
3.1	Civil living units (3-15 Bed Units)	16,920	\$461.56	\$7,809,547
3.2	Civ. Patient Support (3-15 Bed Units)	10,330	\$461.56	\$4,767,701
3.3	Civ. Staff Areas (3-15 Bed Units)	3,744	\$461.56	\$1,728,070
3.4	Civ. Unit Support (3-15 Bed Units)	3,312	\$461.56	\$1,528,677
4.1	Civil living units (5-24 Bed Units)	34,688	\$467.35	\$16,211,598
4.2	Civ. Patient Support (5-24 Bed Units)	22,744	\$467.35	\$10,629,514
4.3	Civ. Staff Areas (5-24 Bed Units)	6,640	\$467.35	\$3,103,235
4.4	Civil living units (1-24 Bed Unit)	5,040	\$467.35	\$2,355,467
4.5	Civ. Patient Support (1-24 Bed Unit)	8,314	\$467.35	\$3,885,400
4.6	Civ. Staff Areas (1-24 Bed Unit)	4,741	\$467.35	\$2,215,635
4.7	Civ. Unit Support (1-24 Bed Unit)	1,328	\$467.35	\$620,647
5	Civil Prog. Staff Offices	1,040	\$478.01	\$497,135
Programs:				
6.1	Admissions	8,509	\$430.89	\$3,666,326
6.2	Admissions Admin.	2,083	\$430.89	\$897,623
6.3	Max Prog. Staff offices	7,117	\$430.89	\$3,066,532
6.4	Max Prog. Staff Support Areas	1,584	\$430.89	\$682,524
7.1	Max Visitation: Res. Processing	542	\$471.28	\$255,623
7.2	Max Visitation: Visitation	2,035	\$471.28	\$959,153
7.3	Max Visitation: Ent./Processing - Check-in	280	\$471.28	\$131,959
7.4	Max Visitation: Ent./Processing - Judicial	1,072	\$471.28	\$505,214
8	Max Patient Dining	1,856	\$417.42	\$774,734
9.1	Max Treatment Mall: Education Areas	3,600	\$430.89	\$1,551,191
9.2	Max Treatment Mall: Educ. Staff & Support	1,234	\$430.89	\$531,541
10.1	Max Treatment Mall: Vocational Areas	3,120	\$437.62	\$1,365,371



Conceptual Estimate	Virginia DBHDS Central State Hospital Planning Study - Draft Cost Estimate Petersburg, Virginia	GROSS SQUARE FEET	COST PER SF	COST TOTAL
BUILDING CONCEPT				
DESCRIPTION				
Option One				
10.2	Max Treatment Mall: Voc. Staff & Support	786	\$437.62	\$343,793
11.1	Max Treatment Mall: Rec. Area	6,768	\$424.15	\$2,870,673
11.2	Max Treatment Mall: Rec. Office/Support	978	\$424.15	\$414,653
11.3	Max Treatment Mall: Shared Res. Pt. Areas	11,805	\$424.15	\$5,007,051
11.4	Max Treatment Mall: Shared Res. Staff/Sup.	608	\$424.15	\$257,886
12.1	Civ. Visitation: Ent./Processing - Check-in	320	\$471.28	\$150,810
12.2	Civ. Visitation: Ent./Processing - Judicial	1,072	\$471.28	\$505,214
13.1	Civil Prog. Staff Offices	10,970	\$430.89	\$4,726,651
13.2	Civil Prog. Staff Support Areas	1,584	\$430.89	\$682,524
14.1	Civ. Visitation: Res. Processing	632	\$471.28	\$297,850
ALTERNATE CONCEPT	Civ. Visitation: Visitation	0	\$471.28	\$0
15	Civ. Patient Dining	3,584	\$417.42	\$1,496,038
16.1	Civ. Treatment Mall: Education Areas	4,880	\$430.89	\$2,102,726
16.2	Civ. Treatment Mall: Educ. Staff & Support	1,598	\$430.89	\$688,729
17.1	Civ. Treatment Mall: Vocational Areas	5,760	\$437.62	\$2,520,685
17.2	Civ. Treatment Mall: Voc. Staff & Support	990	\$437.62	\$433,418
18.1	Civ. Treatment Mall: Rec. Area	10,800	\$424.15	\$4,580,861
18.2	Civ. Treatment Mall: Rec. Office/Support	1,595	\$424.15	\$676,610
18.3	Civ. Treatment Mall: Shared Res. Pt. Areas	17,472	\$424.15	\$7,410,815
18.4	Civ. Treatment Mall: Shared Res. Staff/Sup.	1,178	\$424.15	\$499,484
Support:				
19	Public Lobby	3,320	\$363.56	\$1,207,021
20.1	Central Control / Security	2,254	\$417.42	\$941,034
20.2	Central Control / Sec. Admin	2,490	\$417.42	\$1,039,212
21.1	Housekeeping	1,744	\$430.89	\$751,466
21.2	Material Management - Receiving Area	1,088	\$430.89	\$468,804
22	Energy Plant	16,960	\$377.03	\$6,394,354
23	Satellite Kitchen	15,739	\$471.28	\$7,417,602
24.1	Transportation - Civil	966	\$350.10	\$338,332
24.2	Transportation - Max	1,606	\$350.10	\$562,393



Conceptual Estimate	Virginia DBHDS Central State Hospital Planning Study - Draft Cost Estimate Petersburg, Virginia			
	BUILDING CONCEPT	GROSS SQUARE FEET	COST PER SF	COST TOTAL
	DESCRIPTION			
Option One				
24.3	Vehicle Support	1,184	\$350.10	\$414,513
25.1	Laundry	7,736	\$322.89	\$2,497,877
25.2	Warehouse - Office Area	1,784	\$322.89	\$576,036
25.3	Warehouse - Storage Area	16,766	\$322.89	\$5,413,703
25.4	Maint. Bldg. Admin.	2,781	\$322.89	\$897,893
25.5	Maint. Bldg. Workshops	6,304	\$322.89	\$2,035,499
25.6	Maint. Bldg. Grounds	0	\$322.89	\$0
26.1	Pharmacy - Admin/Staff	4,104	\$573.65	\$2,354,239
26.2	Pharmacy - Prep	4,512	\$573.65	\$2,588,286
26.3	Clinic / Admin	6,994	\$573.65	\$4,011,844
26.4	Clinic - dental	1,424	\$573.65	\$816,870
26.5	Clinic - lab	2,918	\$573.65	\$1,674,126
26.6	Clinic - PT	1,288	\$573.65	\$738,855
26.7	Clinic - Neurology	1,240	\$573.65	\$711,320
27.1	Executive Admin. - Staff	4,106	\$383.76	\$1,575,558
27.2	Executive Admin. - Support	4,286	\$383.76	\$1,644,941
27.3	Executive Admin. - IT	1,434	\$383.76	\$550,156
27.4	Executive Admin. - Health Info. Man.	1,920	\$383.76	\$736,816
27.5	Executive Admin. - Financial Serv. & Proc.	4,880	\$383.76	\$1,872,740
27.6	Executive Admin. - Qual. & Risk Man.	1,590	\$383.76	\$610,329
27.7	Executive Admin. - Patient Rel.	1,184	\$383.76	\$454,370
27.8	Executive Admin. - Forensic Eval. Team	1,984	\$383.76	\$761,376
27.9	Executive Admin. - Conf. & Support Center	4,112	\$383.76	\$1,578,014
28.1	HR - Admin.	1,894	\$370.29	\$701,483
28.2	HR - Support	1,022	\$370.29	\$378,588
29.1	Staff Development	1,907	\$363.56	\$693,382
29.2	Staff Development - Training	7,920	\$363.56	\$2,879,398
29.3	Staff Development - Short Term Housing	576	\$363.56	\$209,411
29.4	Staff Development - Emp. Health	0	\$363.56	\$0
	Building Subtotal	456,234	\$443.49	\$202,334,866
Sitework				
30	Site Preparation			\$3,213,722
31	Utilities			\$1,509,051
32	Site Improvements + Additional Overlay			\$3,336,863
33	Stormwater Management			\$1,082,695
34	Sidewalk			\$157,657
35	Lighting			\$606,060
36	Landscaping			\$706,387



Conceptual Estimate	Virginia DBHDS Central State Hospital Planning Study - Draft Cost Estimate Petersburg, Virginia			
	BUILDING CONCEPT	GROSS SQUARE FEET	COST PER SF	COST TOTAL
	DESCRIPTION			
Option One				
37	Sitework Total		\$23.26	\$10,612,434
38	Construction Total		\$467	\$212,947,300
39	Escalation		27.60%	\$58,774,720
40	Escalated Construction Total		\$596	\$271,722,020
41	Soft Costs (25% of Escalated Total Cost)			\$90,574,007
42	Escalated Total		\$794	\$362,296,026

(09/18)

FY 2019 Project Planner

OVERVIEW

Project name	CSH/SSVTC Building Demolition		
Agency	DBHDS		
Project Code			
Project Type	DEMOLITION		
Biennium			
Budget Round			
Request Origin	Agency		
Project Location	Petersburg, VA		
Facility/Campus			
Source of Request			
Infrastructure Element			
Contains significant technology costs?			
Contains significant energy costs?			
Contact			

PROJECT BUDGET

	Amount (current date)	Amount (mid-construction)	Comments
Acquisition	-	-	(acquisition not escalated)
Construction	16,682,258	17,867,883	
Design & Related Services	1,253,725	1,342,829	
Inspection & Testing Services	40,000	42,843	
Project Management & Other Costs	198,800	212,929	
Furnishings & Movable Equipment	-	-	
Construction Contingency	333,645	357,358	
TOTAL PROJECT BUDGET	18,508,428	19,823,842	

PHASES

	Amount	Comments
Detailed Planning	727,884	List any unusual Detailed Planning requirements in comments
Construction	18,508,428	
Equipment Purchase	-	

SCOPE

	Amount	Comments
Total square foot (per form DGS-30-219)	1,223,949	
Net # of New Parking Spaces - Surface Lot		
Net # of New Parking Spaces - Parking Deck		
Site Size (acres)		

SCHEDULE

	Dates	Comments
Start of design	7/1/2021	
Start of construction	1/1/2022	
Mid-Point of Construction	7/2/2022	
Date of occupancy	1/1/2023	
Annual Escalation Rate	4.5%	
Current Date	11/27/2018	

(09/18)

Agency Narrative

Agency Description

Demolition of approximately 1.25 million square feet of buildings, most of which are masonry and steel frame construction. However, approximately 75,000 SF of space is wood frame construction. It is assumed that all of the buildings will require asbestos and lead abatement. Demolition of the below grade structures/footings and utilities is not required. The site at demolished buildings is to be graded to provide positive drainage and seeded only. Site features such as roads, sidewalks, etc. are to remain. It is assumed that no site environmental remediation is required.

Justification

Alternatives Considered

Costing Methodology



D

Concept Cost Estimate - Two Phases

**DGS / DBHDS Central State Hospital Replacement
Preplanning Study - Preferred Option - Two Phases
Petersburg, Virginia**

Preplanning Study / Cost Analysis

BCC Job No.: 18-10-0139 / DBHDS 720-18165

12/1/2018 Rev. 1



Preplanning Study / Cost Analysis Rev 9 1/2018 Re	BCC Building Cost Consultants, Inc. DGS / DBHDS Central State Hospital Replacement Preplanning Study - Preferred Option - Two Phases Petersburg, Virginia BCC Job No.: 18-10-0139 / DBHDS 720-18165	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
ITEM	DESCRIPTION				
FINAL SUMMARY SHEET		Cost Per Square Foot			
	Two Phases - (Page 2)	456,234	S.F.	\$787.78	\$359,411,005.48
NOTE:	The following mark-ups are included in the above costs:				
	General Conditions, Overhead, Profit, Insurance and Bond -	15%			
	Design Contingency -	10%			
	Escalation to Midpoint of Construction (4.5% per year):				
	Two Phases - Phase 1 (November 1, 2018 to May 16, 2013) -	22.11%			
	Two Phases - Phase 2 (November 1, 2018 to February 15, 2028) -	50.52%			

QUALIFICATIONS

- 1 No sales tax is included. Assumed facility is tax exempt.
- 2 No asbestos removal is included.
- 3 The estimated construction costs assumed the project will be competitively bid with a minimum of 3-4 bidders.
- 4 Assumed construction to be during normal working hours.
- 5 The construction costs shall be used for budgeting and planning purposes only
and shall not be used as an actual bid as given by a contractor to build the project.
- 6 The construction totals are rounded to the nearest \$10.00.

Preplanning Study / Cost Analysis Rev 9 1/2018 Re	BCC Building Cost Consultants, Inc. DGS / DBHDS Central State Hospital Replacement Preplanning Study - Preferred Option - Two Phases Petersburg, Virginia BCC Job No.: 18-10-0139 / DBHDS 720-18165	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
ITEM	DESCRIPTION				
SUMMARY SHEET		Cost Per Square Foot			
Two Phases - Phase 1 (Page 3)					
	Living Units (Page 6)	76,963	S.F.	\$366.85	\$28,233,820.00
	Programs (Page 6)	53,977	S.F.	\$335.53	18,110,720.00
	Support (Page 7)	140,849	S.F.	\$283.28	39,899,970.00
	SUBTOTAL =				\$86,244,510.00
	Construction Total with General Conditions, Overhead, Profit, Insurance, Bond,				\$133,221,160.00
	COST PER SQUARE FOOT FOR	271,789	S.F.	=	\$490.16
Two Phases - Phase 2 (Page 3)					
	Living Units (Page 8)	118,840	S.F.	\$355.18	\$42,209,850.00
	Programs (Pages 8)	65,603	S.F.	\$327.87	21,509,360.00
	Support - None Included				
	SUBTOTAL =				\$63,719,210.00
	Construction Total with General Conditions, Overhead, Profit, Insurance, Bond,				\$121,326,350.00
	COST PER SQUARE FOOT FOR	184,443	S.F.	=	\$657.80

Preplanning Study / Cost Analysis Rev 9 1/2018 Re	BCC Building Cost Consultants, Inc. DGS / DBHDS Central State Hospital Replacement Preplanning Study - Preferred Option - Two Phases Petersburg, Virginia BCC Job No.: 18-10-0139 / DBHDS 720-18165	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
ITEM	DESCRIPTION				
Two Phases - (Page 2)					
Sitework (Pages 4-5)					
1	Remove existing building.	34,445	S.F.	10.00	\$344,450.00
2	Clear and grub.	1,300,000	S.F.	0.10	130,000.00
3	Tree clearing.	1.3	Acres	17,500.00	22,750.00
4	Bulk excavation - cut and fill on site.	100,000	C.Y.	12.00	1,200,000.00
5	Fine grading and site layout.	1,300,000	S.F.	0.15	195,000.00
6	Storm retention pond.	75,000	S.F.	2.00	150,000.00
7	Site utilities:				
	8" waterline.	2,800	L.F.	80.00	224,000.00
	12" - 15" sanitary sewer.	4,200	L.F.	150.00	630,000.00
	8" fire line.	2,800	L.F.	80.00	224,000.00
	12" storm sewer.	12,500	L.F.	50.00	625,000.00
	15" storm sewer.	8,400	L.F.	60.00	504,000.00
	24" storm sewer.	2,900	L.F.	75.00	217,500.00
	6" natural gas line.	2,800	L.F.	45.00	126,000.00
	Primary electrical feeder - empty conduits.	2,800	L.F.	65.00	182,000.00
	Secondary feeders - 100' x 2 each =	200	L.F.	500.00	100,000.00
	Communication feeders.	5,600	L.F.	35.00	196,000.00
	Various utility manholes.	10	EA.	4,500.00	45,000.00
8	Parking and drive lights.	44	EA.	4,250.00	187,000.00
9	Pedestrian lights.	16	EA.	1,650.00	26,400.00
10	Concrete curb.	12,000	L.F.	15.00	180,000.00
11	Concrete parking and drive paving - 270,000 S.F. / 9 =	30,000	S.Y.	55.00	1,650,000.00
12	Concrete sidewalks.	20,000	S.F.	6.00	120,000.00
13	Rock fireline road - 1,400' x 24' = 33,600 S.F. / 9 =	3,700	S.Y.	15.00	55,500.00

Preplanning Study / Cost Analysis Rev 9 1/2018 Re	BCC Building Cost Consultants, Inc. DGS / DBHDS Central State Hospital Replacement Preplanning Study - Preferred Option - Two Phases Petersburg, Virginia BCC Job No.: 18-10-0139 / DBHDS 720-18165	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
ITEM	DESCRIPTION				
Two Phases - (Page 2)					
Sitework (Pages 4-5)					
14	Recreation areas: Small - 5,000 S.F. Large - 13,000 S.F.	8 3	EA. EA.	55,000.00 75,000.00	440,000.00 225,000.00
15	14' anti-climb chain link fence.	4,000	L.F.	150.00	600,000.00
16	Silt fence at site perimeter.	5,200	L.F.	3.50	18,200.00
17	Fire hydrants and piping.	2	EA.	7,500.00	15,000.00
18	Main entrance sign.	1	EA.	30,000.00	30,000.00
19	Flagpoles and concrete bases.	2	EA.	6,500.00	13,000.00
20	Parking and directional signs.	48	EA.	725.00	34,800.00
21	Sod and irrigation around building / parking.	150,000	S.F.	1.50	225,000.00
22	Seed and no irrigation.	250,000	S.F.	0.20	50,000.00
23	Landscaping - trees, shrubs and plantings.	1	L.S.	250,000.00	250,000.00
24	Courtyard landscaping.	1	L.S.	50,000.00	50,000.00
SUBTOTAL =					\$9,285,600.00

Preplanning Study / Cost Analysis	BCC Building Cost Consultants, Inc. DGS / DBHDS Central State Hospital Replacement Preplanning Study - Preferred Option - Two Phases Petersburg, Virginia BCC Job No.: 18-10-0139 / DBHDS 720-18165	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
Rev 9 1/2018 Re					
ITEM	DESCRIPTION				
Two Phases - Phase 1 (Page 3)					
Living Units (Page 6)					
1	Max living units (3-22 Bed Units).	23,688	S.F.	390.00	\$9,238,320.00
2	Max Patient Support (3-22 Bed Units).	12,158	S.F.	340.00	4,133,720.00
3	Max Staff Areas (3-22 Bed Units).	3,744	S.F.	330.00	1,235,520.00
4	Max Unit Support (3-22 Bed Units).	3,312	S.F.	360.00	1,192,320.00
5	Max living units (3-15 Bed Units).	16,488	S.F.	390.00	6,430,320.00
6	Max Patient Support (3-15 Bed Units).	10,517	S.F.	340.00	3,575,780.00
7	Max Staff Areas (3-15 Bed Units).	3,744	S.F.	330.00	1,235,520.00
8	Max Unit Support (3-15 Bed Units).	3,312	S.F.	360.00	1,192,320.00
SUBTOTAL =		76,963	S.F.	\$366.85	\$28,233,820.00
Programs (Page 6)					
1	Admissions.	8,509	S.F.	315.00	\$2,680,340.00
2	Admissions Admin.	2,083	S.F.	330.00	687,390.00
3	Max Prog. Staff offices.	7,117	S.F.	335.00	2,384,200.00
4	Max Prog. Staff Support Areas.	1,584	S.F.	335.00	530,640.00
5	Max Visitation: Res. Processing.	542	S.F.	370.00	200,540.00
6	Max Visitation: Visitation.	2,035	S.F.	370.00	752,950.00
7	Max Visitation: Ent./Processing - Check-in.	280	S.F.	365.00	102,200.00
8	Max Visitation: Ent./Processing - Judicial.	1,072	S.F.	370.00	396,640.00
9	Max Patient Dining.	1,856	S.F.	325.00	603,200.00
10	Max Treatment Mall: Education Areas.	3,600	S.F.	340.00	1,224,000.00
11	Max Treatment Mall: Educ. Staff & Support.	1,234	S.F.	340.00	419,560.00
12	Max Treatment Mall: Vocational Areas.	3,120	S.F.	345.00	1,076,400.00
13	Max Treatment Mall: Voc. Staff & Support.	786	S.F.	345.00	271,170.00
14	Max Treatment Mall: Rec. Area.	6,768	S.F.	330.00	2,233,440.00
15	Max Treatment Mall: Rec. Office/Support.	978	S.F.	335.00	327,630.00
16	Max Treatment Mall: Shared Res. Pt. Areas.	11,805	S.F.	340.00	4,013,700.00
17	Max Treatment Mall: Shared Res. Staff/Sup.	608	S.F.	340.00	206,720.00
SUBTOTAL =		53,977	S.F.	\$335.53	\$18,110,720.00

Preplanning Study / Cost Analysis Rev 9 1/2018 Re	BCC Building Cost Consultants, Inc. DGS / DBHDS Central State Hospital Replacement Preplanning Study - Preferred Option - Two Phases Petersburg, Virginia BCC Job No.: 18-10-0139 / DBHDS 720-18165	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
ITEM	DESCRIPTION				
Two Phases - Phase 1 (Page 3)					
Support (Page 7)					
1	Public Lobby.	3,320	S.F.	270.00	\$896,400.00
2	Central Control / Security.	2,254	S.F.	310.00	698,740.00
3	Central Control / Sec. Admin.	2,490	S.F.	310.00	771,900.00
4	Executive Admin. - Staff.	4,106	S.F.	310.00	1,272,860.00
5	Executive Admin. - Support.	4,286	S.F.	310.00	1,328,660.00
6	Executive Admin. - IT.	1,434	S.F.	310.00	444,540.00
7	Executive Admin. - Health Info. Man.	1,920	S.F.	310.00	595,200.00
8	Executive Admin. - Financial Serv. & Proc.	4,880	S.F.	310.00	1,512,800.00
9	Executive Admin. - Qual. & Risk Man.	1,590	S.F.	310.00	492,900.00
10	Clinic / Admin.	6,994	S.F.	220.00	1,538,680.00
11	Clinic - dental.	1,424	S.F.	340.00	484,160.00
12	Clinic - lab.	2,918	S.F.	360.00	1,050,480.00
13	Clinic - PT.	1,288	S.F.	315.00	405,720.00
14	Clinic - Neurology,	1,240	S.F.	310.00	384,400.00
15	Executive Admin. - Conf. & Support Center.	4,112	S.F.	310.00	1,274,720.00
16	HR - Admin.	1,894	S.F.	295.00	558,730.00
17	HR - Support.	1,022	S.F.	295.00	301,490.00
18	Staff Development.	1,907	S.F.	285.00	543,500.00
19	Staff Development - Training.	7,920	S.F.	285.00	2,257,200.00
20	Staff Development - Short Term Housing.	576	S.F.	270.00	155,520.00
21	Staff Development - Emp. Health	0	S.F.	270.00	0.00
22	Housekeeping.	1,744	S.F.	320.00	558,080.00
23	Material Management - Receiving Area.	1,088	S.F.	240.00	261,120.00
24	Energy Plant.	16,960	S.F.	280.00	4,748,800.00
25	Satellite Kitchen.	15,739	S.F.	350.00	5,508,650.00
26	Warehouse - Office Area.	1,784	S.F.	210.00	374,640.00
27	Warehouse - Storage Area.	16,766	S.F.	180.00	3,017,880.00
28	Pharmacy - Admin/Staff.	4,104	S.F.	305.00	1,251,720.00
29	Pharmacy - Prep.	4,512	S.F.	345.00	1,556,640.00
30	Transportation.	966	S.F.	260.00	251,160.00
31	Vehicle Support.	1,184	S.F.	170.00	201,280.00
32	Laundry.	7,736	S.F.	320.00	2,475,520.00
33	Maint. Bldg. Admin.	2,781	S.F.	320.00	889,920.00
34	Maint. Bldg. Workshops.	6,304	S.F.	225.00	1,418,400.00
35	Maint. Bldg. Grounds.	0	S.F.	190.00	0.00
36	Transportation - Max.	1,606	S.F.	260.00	417,560.00
	SUBTOTAL =	140,849	S.F.	\$283.28	\$39,899,970.00

Preplanning Study / Cost Analysis	BCC Building Cost Consultants, Inc. DGS / DBHDS Central State Hospital Replacement Preplanning Study - Preferred Option - Two Phases Petersburg, Virginia BCC Job No.: 18-10-0139 / DBHDS 720-18165	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
Rev 9 1/2018 Re					
ITEM	DESCRIPTION				
Two Phases - Phase 2 (Page 3)					
Living Units (Page 8)					
1	Civil living units.	34,688	S.F.	365.00	\$12,661,120.00
2	Civ. Patient Support (5-24 Bed Units).	22,744	S.F.	345.00	7,846,680.00
3	Civ. Staff Areas (5-24 Bed Units).	6,640	S.F.	350.00	2,324,000.00
4	Civ. Unit Support (5-24 Bed Units).	5,040	S.F.	340.00	1,713,600.00
5	Civil living units (1-24 Bed Unit).	8,314	S.F.	365.00	3,034,610.00
6	Civ. Patient Support (1-24 Bed Unit).	4,741	S.F.	345.00	1,635,650.00
7	Civ. Staff Areas (1-24 Bed Unit).	1,328	S.F.	350.00	464,800.00
8	Civ. Unit Support (1-24 Bed Unit).	1,040	S.F.	340.00	353,600.00
9	Civil living units (2-15 Bed Units).	11,280	S.F.	365.00	4,117,200.00
10	Civ. Patient Support (2-15 Bed Units).	6,886	S.F.	345.00	2,375,670.00
11	Civ. Staff Areas (2-15 Bed Units).	2,496	S.F.	350.00	873,600.00
12	Civ. Unit Support (2-15 Bed Units).	2,208	S.F.	340.00	750,720.00
13	Civil living units (1-15 Bed Units).	5,640	S.F.	365.00	2,058,600.00
14	Civ. Patient Support (1-15 Bed Units).	3,443	S.F.	345.00	1,187,840.00
15	Civ. Staff Areas (1-15 Bed Units).	1,248	S.F.	350.00	436,800.00
16	Civ. Unit Support (1-15 Bed Units).	1,104	S.F.	340.00	375,360.00
	SUBTOTAL =	118,840	S.F.	\$355.18	\$42,209,850.00
Programs (Pages 8)					
1	Civ. Visitation: Ent./Processing - Check-in.	320	S.F.	355.00	\$113,600.00
2	Civ. Visitation: Ent./Processing - Judicial.	1,072	S.F.	360.00	385,920.00
3	Civ. Patient Dining.	3,584	S.F.	315.00	1,128,960.00
4	Civ. Treatment Mall: Education Areas.	4,880	S.F.	330.00	1,610,400.00
5	Civ. Treatment Mall: Educ. Staff & Support.	1,598	S.F.	330.00	527,340.00
6	Civ. Treatment Mall: Vocational Areas.	5,760	S.F.	335.00	1,929,600.00
7	Civ. Treatment Mall: Voc. Staff & Support.	990	S.F.	335.00	331,650.00
8	Program Staff - Forensic Eval. Team.	1,984	S.F.	330.00	654,720.00
9	Program Staff - Patient Rel.	1,184	S.F.	330.00	390,720.00
10	Civ. Treatment Mall: Rec. Area.	10,800	S.F.	320.00	3,456,000.00
11	Civ. Treatment Mall: Rec. Office/Support.	1,595	S.F.	325.00	518,380.00
12	Civ. Treatment Mall: Shared Res. Pt. Areas.	17,472	S.F.	330.00	5,765,760.00
13	Civ. Treatment Mall: Shared Res. Staff/Sup.	1,178	S.F.	330.00	388,740.00
14	Civil Prog. Staff Offices.	10,970	S.F.	325.00	3,565,250.00
15	Civil Prog. Staff Support Areas.	1,584	S.F.	325.00	514,800.00
16	Civ. Visitation: Res. Processing.	632	S.F.	360.00	227,520.00
17	Civ. Visitation: Visitation.	0	S.F.	355.00	0.00
	SUBTOTAL =	65,603	S.F.	\$327.87	\$21,509,360.00

Preplanning Study / Cost Analysis Rev 9 1/2018 Re	BCC Building Cost Consultants, Inc. DGS / DBHDS Central State Hospital Replacement Preplanning Study - Preferred Option - Two Phases Petersburg, Virginia BCC Job No.: 18-10-0139 / DBHDS 720-18165	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
ITEM	DESCRIPTION				



Virginia DBHDS Central State Hospital
 Planning Study - Draft Cost Estimate
 Petersburg, Virginia
 Cost Analysis Date: 11/1/2018

CONCEPTUAL ESTIMATE

BUILDING CONCEPT

Option Two	NTP	Completion	Mid Point	Annual Esc.	Effective Esc.
Phase 1	4/1/2022	6/30/2024	5/16/2023	4.50%	22.11%
Phase 2	4/1/2027	12/31/2028	2/15/2028	4.50%	50.52%

Phase	Phase Description (SF)	Building SF	Construction Cost	Escalated Cost	Escalated Cost Plus Soft Costs	Cost / SF	Esc. Cost / SF	(Es Cost + Soft) / SF
1	Living -77K; Programs - 54K; Support 141K	271,790	\$129,481,513	\$158,109,241	\$210,812,321	\$476	\$582	\$776
2	Living -119K; Programs - 66K; Support 0K	184,443	\$83,465,787	\$125,628,971	\$167,505,295	\$453	\$681	\$908
3	Additional Utilities & Staffing				\$12,000,000			
4	Demolition of Existing Campus				\$22,384,572			
5	Maintenance Reserve Contingency *				\$27,400,000			\$60
	Total	456,234	\$212,947,300	\$283,738,213	\$440,102,188	\$467	\$622	\$965

*Note - Includes recommended contingency for maintenance reserve repairs foreseeable prior to new facility completion.



Conceptual Estimate	Virginia DBHDS Central State Hospital Planning Study - Draft Cost Estimate Petersburg, Virginia	GROSS SQUARE FEET	COST PER SF	COST TOTAL
BUILDING CONCEPT				
DESCRIPTION				
Option Two				
Phase 1				
Living Units:				
1.1	Max living units (3-22 Bed Units)	23,688	\$501.58	\$11,881,396
1.2	Max Patient Support (3-22 Bed Units)	12,158	\$501.58	\$6,098,394
1.3	Max Staff Areas (3-22 Bed Units)	3,744	\$501.58	\$1,877,911
1.4	Max Unit Support (3-22 Bed Units)	3,312	\$501.58	\$1,661,229
2.1	Max living units (3-15 Bed Units)	16,488	\$496.50	\$8,186,302
2.2	Max Patient Support (3-15 Bed Units)	10,517	\$496.50	\$5,221,598
2.3	Max Staff Areas (3-15 Bed Units)	3,744	\$496.50	\$1,858,898
2.4	Max Unit Support (3-15 Bed Units)	3,312	\$496.50	\$1,644,410
Programs:				
6.1	Admissions	8,509	\$430.89	\$3,666,326
6.2	Admissions Admin.	2,083	\$430.89	\$897,623
6.3	Max Prog. Staff offices	7,117	\$430.89	\$3,066,532
6.4	Max Prog. Staff Support Areas	1,584	\$430.89	\$682,524
7.1	Max Visitation: Res. Processing	542	\$471.28	\$255,623
7.2	Max Visitation: Visitation	2,035	\$471.28	\$959,153
7.3	Max Visitation: Ent./Processing - Check-in	280	\$471.28	\$131,959
7.4	Max Visitation: Ent./Processing - Judicial	1,072	\$471.28	\$505,214
8	Max Patient Dining	1,856	\$417.42	\$774,734
9.1	Max Treatment Mall: Education Areas	3,600	\$430.89	\$1,551,191
9.2	Max Treatment Mall: Educ. Staff & Support	1,234	\$430.89	\$531,541
10.1	Max Treatment Mall: Vocational Areas	3,120	\$437.62	\$1,365,371
10.2	Max Treatment Mall: Voc. Staff & Support	786	\$437.62	\$343,793
11.1	Max Treatment Mall: Rec. Area	6,768	\$424.15	\$2,870,673
11.2	Max Treatment Mall: Rec. Office/Support	978	\$424.15	\$414,653
11.3	Max Treatment Mall: Shared Res. Pt. Areas	11,805	\$424.15	\$5,007,051
11.4	Max Treatment Mall: Shared Res. Staff/Sup.	608	\$424.15	\$257,886
Support:				
19	Public Lobby	3,320	\$363.56	\$1,207,021
20.1	Central Control / Security	2,254	\$417.42	\$941,034
20.2	Central Control / Sec. Admin	2,490	\$417.42	\$1,039,212
21.1	Housekeeping	1,744	\$430.89	\$751,466
21.2	Material Management - Receiving Area	1,088	\$430.89	\$468,804



Conceptual Estimate	Virginia DBHDS Central State Hospital Planning Study - Draft Cost Estimate Petersburg, Virginia	GROSS SQUARE FEET	COST PER SF	COST TOTAL
BUILDING CONCEPT				
DESCRIPTION				
Option Two				
22	Energy Plant	16,960	\$377.03	\$6,394,354
23	Satellite Kitchen	15,739	\$471.28	\$7,417,602
24.1	Transportation - Civil	966	\$350.10	\$338,332
24.2	Transportation - Max	1,606	\$350.10	\$562,393
24.3	Vehicle Support	1,184	\$350.10	\$414,513
25.1	Laundry	7,736	\$322.89	\$2,497,877
25.2	Warehouse - Office Area	1,784	\$322.89	\$576,036
25.3	Warehouse - Storage Area	16,766	\$322.89	\$5,413,703
ALTERNATE CONCEPT	Maint. Bldg. Admin.	2,781	\$322.89	\$897,893
25.5	Maint. Bldg. Workshops	6,304	\$322.89	\$2,035,499
25.6	Maint. Bldg. Grounds	0	\$322.89	\$0
26.1	Pharmacy - Admin/Staff	4,104	\$573.65	\$2,354,239
26.2	Pharmacy - Prep	4,512	\$573.65	\$2,588,286
26.3	Clinic / Admin	6,994	\$573.65	\$4,011,844
26.4	Clinic - dental	1,424	\$573.65	\$816,870
26.5	Clinic - lab	2,918	\$573.65	\$1,674,126
26.6	Clinic - PT	1,288	\$573.65	\$738,855
26.7	Clinic - Neurology	1,240	\$573.65	\$711,320
27.1	Executive Admin. - Staff	4,106	\$383.76	\$1,575,558
27.2	Executive Admin. - Support	4,286	\$383.76	\$1,644,941
27.3	Executive Admin. - IT	1,434	\$383.76	\$550,156
27.4	Executive Admin. - Health Info. Man.	1,920	\$383.76	\$736,816
27.5	Executive Admin. - Financial Serv. & Proc.	4,880	\$383.76	\$1,872,740
27.6	Executive Admin. - Qual. & Risk Man.	1,590	\$383.76	\$610,329
27.9	Executive Admin. - Conf. & Support Center	4,112	\$383.76	\$1,578,014
28.1	HR - Admin.	1,894	\$370.29	\$701,483
28.2	HR - Support	1,022	\$370.29	\$378,588
29.1	Staff Development	1,907	\$363.56	\$693,382
29.2	Staff Development - Training	7,920	\$363.56	\$2,879,398
29.3	Staff Development - Short Term Housing	576	\$363.56	\$209,411
29.4	Staff Development - Emp. Health	0	\$363.56	\$0
Phase 1 Building Subtotal		271,790		\$118,994,078
Sitework				
30	Site Preparation			\$3,213,722
31	Utilities			\$1,509,051
32	Pavement			\$3,211,863



Conceptual Estimate	Virginia DBHDS Central State Hospital Planning Study - Draft Cost Estimate Petersburg, Virginia	GROSS SQUARE FEET	COST PER SF	COST TOTAL
BUILDING CONCEPT				
DESCRIPTION				
Option Two				
33	Stormwater Management			\$1,082,695
34	Sidewalk			\$157,657
35	Lighting			\$606,060
36	Landscaping			\$706,387
37	Phase 1 Sitework Total			\$10,487,434
38	Phase 1 Construction Total		\$476	\$129,481,513
39	Phase 1 Escalation		22.11%	\$28,627,729
40	Phase 1 Escalated Construction Total		\$582	\$158,109,241
41	Soft Costs (25% of Escalated Total Cost)			\$52,703,080
42	Phase 1 Escalated Total		\$776	\$210,812,321
Phase 2				
Living Units:				
3.1	Civil living units (3-15 Bed Units)	16,920	\$461.56	\$7,809,547
3.2	Civ. Patient Support (3-15 Bed Units)	10,330	\$461.56	\$4,767,701
3.3	Civ. Staff Areas (3-15 Bed Units)	3,744	\$461.56	\$1,728,070
3.4	Civ. Unit Support (3-15 Bed Units)	3,312	\$461.56	\$1,528,677
4.1	Civil living units (5-24 Bed Units)	34,688	\$467.35	\$16,211,598
4.2	Civ. Patient Support (5-24 Bed Units)	22,744	\$467.35	\$10,629,514
4.3	Civ. Staff Areas (5-24 Bed Units)	6,640	\$467.35	\$3,103,235
4.4	Civil living units (1-24 Bed Unit)	5,040	\$467.35	\$2,355,467
4.5	Civ. Patient Support (1-24 Bed Unit)	8,314	\$467.35	\$3,885,400
4.6	Civ. Staff Areas (1-24 Bed Unit)	4,741	\$467.35	\$2,215,635
4.7	Civ. Unit Support (1-24 Bed Unit)	1,328	\$467.35	\$620,647
5	Civil Prog. Staff Offices	1,040	\$478.01	\$497,135
Programs:				
12.1	Civ. Visitation: Ent./Processing - Check-in	320	\$471.28	\$150,810
12.2	Civ. Visitation: Ent./Processing - Judicial	1,072	\$471.28	\$505,214
13.1	Civil Prog. Staff Offices	10,970	\$430.89	\$4,726,651
13.2	Civil Prog. Staff Support Areas	1,584	\$430.89	\$682,524
14.1	Civ. Visitation: Res. Processing	632	\$471.28	\$297,850
14.2	Civ. Visitation: Visitation	0	\$471.28	\$0
15	Civ. Patient Dining	3,584	\$417.42	\$1,496,038



Conceptual Estimate	Virginia DBHDS Central State Hospital Planning Study - Draft Cost Estimate Petersburg, Virginia	GROSS SQUARE FEET	COST PER SF	COST TOTAL
BUILDING CONCEPT				
DESCRIPTION				
Option Two				
16.1	Civ. Treatment Mall: Education Areas	4,880	\$430.89	\$2,102,726
16.2	Civ. Treatment Mall: Educ. Staff & Support	1,598	\$430.89	\$688,729
17.1	Civ. Treatment Mall: Vocational Areas	5,760	\$437.62	\$2,520,685
17.2	Civ. Treatment Mall: Voc. Staff & Support	990	\$437.62	\$433,418
18.1	Civ. Treatment Mall: Rec. Area	10,800	\$424.15	\$4,580,861
18.2	Civ. Treatment Mall: Rec. Office/Support	1,595	\$424.15	\$676,610
18.3	Civ. Treatment Mall: Shared Res. Pt. Areas	17,472	\$424.15	\$7,410,815
18.4	Civ. Treatment Mall: Shared Res. Staff/Sup.	1,178	\$424.15	\$499,484
27.7	Executive Admin. - Patient Rel.	1,184	\$383.76	\$454,370
27.8	Executive Admin. - Forensic Eval. Team	1,984	\$383.76	\$761,376
	Phase 2 Building Subtotal	184,443		\$83,340,787
Sitework				
30	Site Preparation			
31	Utilities			
32	Site Improvements			\$125,000
33	Stormwater Management			
34	Sidewalk			
35	Lighting			
36	Landscaping			
37	Phase 2 Sitework Total			\$125,000
38	Phase 2 Construction Total		\$452.53	\$83,465,787
39	Phase 2 Escalation		50.52%	\$42,163,184
40	Phase 2 Escalated Construction Total		\$681.13	\$125,628,971
41	Soft Costs (25% of Escalated Total Cost)			\$41,876,323
42	Phase 2 Escalated Total		\$908.17	\$167,505,295
38	Construction Total		\$467	\$212,947,300
39	Escalation (Phase I & II)			\$70,790,913
40	Escalated Construction Total		\$622	\$283,738,213
41	Soft Costs (25% of Escalated Total Cost)			\$94,579,404
42	Phase 2 Escalated Total		\$829	\$378,317,617

FY 2019 Project Planner

OVERVIEW

Project name	CSH/SSVTC Building Demolition		
Agency	DBHDS		
Project Code			
Project Type	DEMOLITION		
Biennium			
Budget Round			
Request Origin	Agency		
Project Location	Petersburg, VA		
Facility/Campus			
Source of Request			
Infrastructure Element			
Contains significant technology costs?			
Contains significant energy costs?			
Contact			

PROJECT BUDGET

	Amount (current date)	Amount (mid-construction)	Comments
Acquisition	-	- (acquisition not escalated)	
Construction	16,682,258	17,867,883	
Design & Related Services	1,253,725	1,342,829	
Inspection & Testing Services	40,000	42,843	
Project Management & Other Costs	198,800	212,929	
Furnishings & Movable Equipment	-	-	\$22,384,572 - escalated for the two phase option to 12/31/2028
Construction Contingency	333,645	357,358	
TOTAL PROJECT BUDGET	18,508,428	19,823,842	

PHASES

	Amount	Comments
Detailed Planning	727,884	List any unusual Detailed Planning requirements in comments
Construction	18,508,428	
Equipment Purchase	-	

SCOPE

	Amount	Comments
<u>Total square foot (per form DGS-30-219)</u>	1,223,949	
Net # of New Parking Spaces - Surface Lot		
Net # of New Parking Spaces - Parking Deck		
Site Size (acres)		

SCHEDULE

	Dates	Comments
Start of design	7/1/2021	
Start of construction	1/1/2022	
Mid-Point of Construction	7/2/2022	
Date of occupancy	1/1/2023	
Annual Escalation Rate	4.5%	
Current Date	11/27/2018	

(09/18)

Agency Narrative

Agency Description

Demolition of approximately 1.25 million square feet of buildings, most of which are masonry and steel frame construction. However, approximately 75,000 SF of space is wood frame construction. It is assumed that all of the buildings will require asbestos and lead abatement. Demolition of the below grade structures/footings and utilities is not required. The site at demolished buildings is to be graded to provide positive drainage and seeded only. Site features such as roads, sidewalks, etc. are to remain. It is assumed that no site environmental remediation is required.

Justification

Alternatives Considered

Costing Methodology



E

Concept Cost Estimate - Three Phases

**DGS / DBHDS Central State Hospital Replacement
Preplanning Study - Preferred Concept - Three Phases
Petersburg, Virginia**

Preplanning Study / Cost Analysis

BCC Job No.: 18-10-0139 / DBHDS 720-18165

12/1/2018 Rev. 1



Preplanning Study / Cost Analysis Rev 9 1/2018 Re	BCC Building Cost Consultants, Inc. DGS / DBHDS Central State Hospital Replacement Preplanning Study - Preferred Concept - Three Phases Petersburg, Virginia BCC Job No.: 18-10-0139 / DBHDS 720-18165	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
ITEM	DESCRIPTION				
FINAL SUMMARY SHEET		Cost Per Square Foot			
	Three Phases - (Page 2)	456,234	S.F.	\$821.12	\$374,623,045.68
NOTE:	The following mark-ups are included in the above costs:				
	General Conditions, Overhead, Profit, Insurance and Bond -	15%			
	Design Contingency -	10%			
	Escalation to Midpoint of Construction (4.5% per year):				
	Three Phases - Phase 1 (November 1, 2018 to March 1, 2023) -	21.44%			
	Three Phases - Phase 2 (November 1, 2018 to June 30, 2027) -	46.40%			
	Three Phases - Phase 1 (November 1, 2018 to June 30, 2031) -	74.60%			
QUALIFICATIONS					
1 No sales tax is included. Assumed facility is tax exempt.					
2 No asbestos removal is included.					
3 The estimated construction costs assumed the project will be competitively bid with a minimum of 3-4 bidders.					
4 Assumed construction to be during normal working hours.					
5 The construction costs shall be used for budgeting and planning purposes only and shall not be used as an actual bid as given by a contractor to build the project.					
6 The construction totals are rounded to the nearest \$10.00.					

Preplanning Study / Cost Analysis Rev 9 1/2018 Re	BCC Building Cost Consultants, Inc. DGS / DBHDS Central State Hospital Replacement Preplanning Study - Preferred Concept - Three Phases Petersburg, Virginia BCC Job No.: 18-10-0139 / DBHDS 720-18165	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
ITEM	DESCRIPTION				

Preplanning Study / Cost Analysis Rev 9 1/2018 Re	BCC Building Cost Consultants, Inc. DGS / DBHDS Central State Hospital Replacement Preplanning Study - Preferred Concept - Three Phases Petersburg, Virginia BCC Job No.: 18-10-0139 / DBHDS 720-18165	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
ITEM	DESCRIPTION				
SUMMARY SHEET - Continued		Cost Per Square Foot			
Three Phases - Preferred Option - Phase 1 (Page 3)					
	Living Units (Page 6)	76,963	S.F.	\$366.85	\$28,233,820.00
	Programs (Page 6)	53,977	S.F.	\$335.53	18,110,720.00
	Support (Page 7)	115,392	S.F.	\$283.67	32,733,330.00
	SUBTOTAL =				\$79,077,870.00
	Construction Total with General Conditions, Overhead, Profit, Insurance, Bond,				\$121,480,690.00
	COST PER SQUARE FOOT FOR	246,332	S.F.	=	\$493.16
Three Phases - Preferred Option - Phase 2 (Page 3)					
	Living Units (Pages 8)	34,306	S.F.	\$354.93	\$12,176,130.00
	Programs (Pages 8)	65,606	S.F.	\$327.87	21,510,350.00
	Support (Pages 8)	4,880	S.F.	\$310.00	1,512,800.00
	SUBTOTAL =				\$35,199,280.00
	Construction Total with General Conditions, Overhead, Profit, Insurance, Bond,				\$65,187,660.00
	COST PER SQUARE FOOT FOR	104,792	S.F.	=	\$622.07
Three Phases - Preferred Option - Phase 3 (Page 3)					
	Living Units (Page 9)	84,535	S.F.	\$355.29	\$30,034,060.00
	Programs - None Included				
	Support (Page 9)	20,577	S.F.	\$274.77	5,653,840.00
	SUBTOTAL =				\$35,687,900.00
	Construction Total with General Conditions, Overhead, Profit, Insurance, Bond,				\$78,823,510.00
	COST PER SQUARE FOOT FOR	105,112	S.F.	=	\$749.90

Preplanning Study / Cost Analysis Rev 9 1/2018 Re	BCC Building Cost Consultants, Inc. DGS / DBHDS Central State Hospital Replacement Preplanning Study - Preferred Concept - Three Phases Petersburg, Virginia BCC Job No.: 18-10-0139 / DBHDS 720-18165	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
ITEM	DESCRIPTION				
Three Phases - (Page 2)					
Sitework (Pages 4-5)					
1	Remove existing building.	34,445	S.F.	10.00	\$344,450.00
2	Clear and grub.	1,300,000	S.F.	0.10	130,000.00
3	Tree clearing.	1.3	Acres	17,500.00	22,750.00
4	Bulk excavation - cut and fill on site.	100,000	C.Y.	12.00	1,200,000.00
5	Fine grading and site layout.	1,300,000	S.F.	0.15	195,000.00
6	Storm retention pond.	75,000	S.F.	2.00	150,000.00
7	Site utilities:				
	8" waterline.	2,800	L.F.	80.00	224,000.00
	12" - 15" sanitary sewer.	4,200	L.F.	150.00	630,000.00
	8" fire line.	2,800	L.F.	80.00	224,000.00
	12" storm sewer.	12,500	L.F.	50.00	625,000.00
	15" storm sewer.	8,400	L.F.	60.00	504,000.00
	24" storm sewer.	2,900	L.F.	75.00	217,500.00
	6" natural gas line.	2,800	L.F.	45.00	126,000.00
	Primary electrical feeder - empty conduits.	2,800	L.F.	65.00	182,000.00
	Secondary feeders - 100' x 2 each =	200	L.F.	500.00	100,000.00
	Communication feeders.	5,600	L.F.	35.00	196,000.00
	Various utility manholes.	10	EA.	4,500.00	45,000.00
8	Parking and drive lights.	44	EA.	4,250.00	187,000.00
9	Pedestrian lights.	16	EA.	1,650.00	26,400.00
10	Concrete curb.	12,000	L.F.	15.00	180,000.00
11	Concrete parking and drive paving - 270,000 S.F. / 9 =	30,000	S.Y.	55.00	1,650,000.00
12	Concrete sidewalks.	20,000	S.F.	6.00	120,000.00
13	Rock fireline road - 1,400' x 24' = 33,600 S.F. / 9 =	3,700	S.Y.	15.00	55,500.00

Preplanning Study / Cost Analysis Rev 9 1/2018 Re	BCC Building Cost Consultants, Inc. DGS / DBHDS Central State Hospital Replacement Preplanning Study - Preferred Concept - Three Phases Petersburg, Virginia BCC Job No.: 18-10-0139 / DBHDS 720-18165	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
ITEM	DESCRIPTION				
Three Phases - (Page 2)					
Sitework (Pages 4-5)					
14	Recreation areas: Small - 5,000 S.F. Large - 13,000 S.F.	8 3	EA. EA.	55,000.00 75,000.00	440,000.00 225,000.00
15	14' anti-climb chain link fence.	4,000	L.F.	150.00	600,000.00
16	Silt fence at site perimeter.	5,200	L.F.	3.50	18,200.00
17	Fire hydrants and piping.	2	EA.	7,500.00	15,000.00
18	Main entrance sign.	1	EA.	30,000.00	30,000.00
19	Flagpoles and concrete bases.	2	EA.	6,500.00	13,000.00
20	Parking and directional signs.	48	EA.	725.00	34,800.00
21	Sod and irrigation around building / parking.	150,000	S.F.	1.50	225,000.00
22	Seed and no irrigation.	250,000	S.F.	0.20	50,000.00
23	Landscaping - trees, shrubs and plantings.	1	L.S.	250,000.00	250,000.00
24	Courtyard landscaping.	1	L.S.	50,000.00	50,000.00
SUBTOTAL =					\$9,285,600.00

Preplanning Study / Cost Analysis	BCC Building Cost Consultants, Inc. DGS / DBHDS Central State Hospital Replacement Preplanning Study - Preferred Concept - Three Phases Petersburg, Virginia BCC Job No.: 18-10-0139 / DBHDS 720-18165	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
Rev 9 1/2018 Re					
ITEM	DESCRIPTION				
Three Phases - Preferred Option - Phase 1 (Page 3)					
Living Units (Page 6)					
1	Max living units (3-22 Bed Units).	23,688	S.F.	390.00	\$9,238,320.00
2	Max Patient Support (3-22 Bed Units).	12,158	S.F.	340.00	4,133,720.00
3	Max Staff Areas (3-22 Bed Units).	3,744	S.F.	330.00	1,235,520.00
4	Max Unit Support (3-22 Bed Units).	3,312	S.F.	360.00	1,192,320.00
5	Max living units (3-15 Bed Units).	16,488	S.F.	390.00	6,430,320.00
6	Max Patient Support (3-15 Bed Units).	10,517	S.F.	340.00	3,575,780.00
7	Max Staff Areas (3-15 Bed Units).	3,744	S.F.	330.00	1,235,520.00
8	Max Unit Support (3-15 Bed Units).	3,312	S.F.	360.00	1,192,320.00
	SUBTOTAL =	76,963	S.F.	\$366.85	\$28,233,820.00
Programs (Page 6)					
1	Admissions.	8,509	S.F.	315.00	\$2,680,340.00
2	Admissions Admin.	2,083	S.F.	330.00	687,390.00
3	Max Prog. Staff offices.	7,117	S.F.	335.00	2,384,200.00
4	Max Prog. Staff Support Areas.	1,584	S.F.	335.00	530,640.00
5	Max Visitation: Res. Processing.	542	S.F.	370.00	200,540.00
6	Max Visitation: Visitation.	2,035	S.F.	370.00	752,950.00
7	Max Visitation: Ent./Processing - Check-in.	280	S.F.	365.00	102,200.00
8	Max Visitation: Ent./Processing - Judicial.	1,072	S.F.	370.00	396,640.00
9	Max Patient Dining.	1,856	S.F.	325.00	603,200.00
10	Max Treatment Mall: Education Areas.	3,600	S.F.	340.00	1,224,000.00
11	Max Treatment Mall: Educ. Staff & Support.	1,234	S.F.	340.00	419,560.00
12	Max Treatment Mall: Vocational Areas.	3,120	S.F.	345.00	1,076,400.00
13	Max Treatment Mall: Voc. Staff & Support.	786	S.F.	345.00	271,170.00
14	Max Treatment Mall: Rec. Area.	6,768	S.F.	330.00	2,233,440.00
15	Max Treatment Mall: Rec. Office/Support.	978	S.F.	335.00	327,630.00
16	Max Treatment Mall: Shared Res. Pt. Areas.	11,805	S.F.	340.00	4,013,700.00
17	Max Treatment Mall: Shared Res. Staff/Sup.	608	S.F.	340.00	206,720.00
	SUBTOTAL =	53,977	S.F.	\$335.53	\$18,110,720.00

Preplanning Study / Cost Analysis Rev 9 1/2018 Re	BCC Building Cost Consultants, Inc. DGS / DBHDS Central State Hospital Replacement Preplanning Study - Preferred Concept - Three Phases Petersburg, Virginia BCC Job No.: 18-10-0139 / DBHDS 720-18165	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
ITEM	DESCRIPTION				
Three Phases - Preferred Option - Phase 1 (Page 3)					
Support (Page 7)					
1	Public Lobby.	3,320	S.F.	270.00	\$896,400.00
2	Central Control / Security.	2,254	S.F.	310.00	698,740.00
3	Central Control / Sec. Admin.	2,490	S.F.	310.00	771,900.00
4	Housekeeping.	1,744	S.F.	320.00	558,080.00
5	Material Management - Receiving Area.	1,088	S.F.	240.00	261,120.00
6	Energy Plant.	16,960	S.F.	280.00	4,748,800.00
7	Clinic / Admin.	6,994	S.F.	220.00	1,538,680.00
8	Clinic - dental.	1,424	S.F.	340.00	484,160.00
9	Clinic - lab.	2,918	S.F.	360.00	1,050,480.00
10	Clinic - PT.	1,288	S.F.	315.00	405,720.00
11	Clinic - Neurology.	1,240	S.F.	310.00	384,400.00
12	Satellite Kitchen.	15,739	S.F.	350.00	5,508,650.00
13	Warehouse - Office Area.	1,784	S.F.	210.00	374,640.00
14	Warehouse - Storage Area.	16,766	S.F.	180.00	3,017,880.00
15	Pharmacy - Admin/Staff.	4,104	S.F.	305.00	1,251,720.00
16	Pharmacy - Prep.	4,512	S.F.	345.00	1,556,640.00
17	Executive Admin. - Staff.	4,106	S.F.	310.00	1,272,860.00
18	Executive Admin. - Support.	4,286	S.F.	310.00	1,328,660.00
19	Executive Admin. - IT.	1,434	S.F.	310.00	444,540.00
20	Executive Admin. - Health Info. Man.	1,920	S.F.	310.00	595,200.00
21	Executive Admin. - Qual. & Risk Man.	1,590	S.F.	310.00	492,900.00
22	Executive Admin. - Conf. & Support Center.	4,112	S.F.	310.00	1,274,720.00
23	Staff Development - Short Term Housing.	576	S.F.	270.00	155,520.00
24	HR - Admin.	1,894	S.F.	295.00	558,730.00
25	HR - Support.	1,022	S.F.	295.00	301,490.00
26	Staff Development.	1,907	S.F.	285.00	543,500.00
27	Staff Development - Training.	7,920	S.F.	285.00	2,257,200.00
28	Staff Development - Emp. Health.	0	S.F.	270.00	0.00
	SUBTOTAL =	115,392	S.F.	\$283.67	\$32,733,330.00

ITEM	DESCRIPTION	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
Preplanning Study / Cost Analysis					
BCC Building Cost Consultants, Inc.					
DGS / DBHDS Central State Hospital Replacement					
Preplanning Study - Preferred Concept - Three Phases					
Petersburg, Virginia					
BCC Job No.: 18-10-0139 / DBHDS 720-18165					
Rev 9					
1/2018 Re					
Three Phases - Preferred Option - Phase 2 (Page 3)					
Living Units (Pages 8)					
1	Civil living units (3-15 Bed Units).	16,920	S.F.	365.00	\$6,175,800.00
2	Civ. Patient Support (3-15 Bed Units).	10,330	S.F.	345.00	3,563,850.00
3	Civ. Staff Areas (3-15 Bed Units).	3,744	S.F.	350.00	1,310,400.00
4	Civ. Unit Support (3-15 Bed Units).	3,312	S.F.	340.00	1,126,080.00
SUBTOTAL =		34,306	S.F.	\$354.93	\$12,176,130.00
Programs (Pages 8)					
1	Civ. Visitation: Ent./Processing - Check-in.	320	S.F.	355.00	\$113,600.00
2	Civ. Visitation: Ent./Processing - Judicial.	1,072	S.F.	360.00	385,920.00
3	Civil Prog. Staff Offices.	10,970	S.F.	325.00	3,565,250.00
4	Civil Prog. Staff Support Areas.	1,584	S.F.	325.00	514,800.00
5	Civ. Visitation: Res. Processing.	632	S.F.	360.00	227,520.00
6	Civ. Visitation: Visitation.	0	S.F.	355.00	0.00
7	Civ. Patient Dining.	3,584	S.F.	315.00	1,128,960.00
8	Program Staff - Forensic Eval. Team.	1,984	S.F.	330.00	654,720.00
9	Program Staff - Patient Rel.	1,184	S.F.	330.00	390,720.00
10	Civ. Treatment Mall: Education Areas.	4,880	S.F.	330.00	1,610,400.00
11	Civ. Treatment Mall: Educ. Staff & Support.	1,598	S.F.	330.00	527,340.00
12	Civ. Treatment Mall: Vocational Areas.	5,760	S.F.	335.00	1,929,600.00
13	Civ. Treatment Mall: Voc. Staff & Support.	990	S.F.	335.00	331,650.00
14	Civ. Treatment Mall: Rec. Area.	10,800	S.F.	320.00	3,456,000.00
15	Civ. Treatment Mall: Rec. Office/Support.	1,595	S.F.	325.00	518,380.00
16	Civ. Treatment Mall: Shared Res. Pt. Areas.	17,475	S.F.	330.00	5,766,750.00
17	Civ. Treatment Mall: Shared Res. Staff/Sup.	1,178	S.F.	330.00	388,740.00
SUBTOTAL =		65,606	S.F.	\$327.87	\$21,510,350.00
Support (Pages 8)					
1	Executive Admin. - Financial Serv. & Proc.	4,880	S.F.	310.00	\$1,512,800.00
SUBTOTAL =		4,880	S.F.	\$310.00	\$1,512,800.00

Preplanning Study / Cost Analysis Rev 9 1/2018 Re	BCC Building Cost Consultants, Inc. DGS / DBHDS Central State Hospital Replacement Preplanning Study - Preferred Concept - Three Phases Petersburg, Virginia BCC Job No.: 18-10-0139 / DBHDS 720-18165	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
ITEM	DESCRIPTION				
Three Phases - Preferred Option - Phase 3 (Page 3)					
Living Units (Page 9)					
1	Civil living units (5-24 Bed Units).	34,688	S.F.	365.00	\$12,661,120.00
2	Civ. Patient Support (5-24 Bed Units).	22,744	S.F.	345.00	7,846,680.00
3	Civ. Staff Areas (5-24 Bed Units).	6,640	S.F.	350.00	2,324,000.00
4	Civ. Unit Support (5-24 Bed Units).	5,040	S.F.	340.00	1,713,600.00
5	Civ. Living Unit (1-24 Bed Unit).	8,314	S.F.	365.00	3,034,610.00
6	Civ. Patient Support (1-24 Bed Unit).	4,741	S.F.	345.00	1,635,650.00
7	Civ. Staff Area (1-24 Bed Unit).	1,328	S.F.	350.00	464,800.00
8	Civ. Unit Support (1-24 Bed Unit).	1,040	S.F.	340.00	353,600.00
SUBTOTAL =		84,535	S.F.	\$355.29	\$30,034,060.00
Support (Page 9)					
1	Transportation.	966	S.F.	260.00	\$251,160.00
2	Transportation - Max.	1,606	S.F.	260.00	417,560.00
3	Vehicle Support.	1,184	S.F.	170.00	201,280.00
4	Laundry.	7,736	S.F.	320.00	2,475,520.00
5	Maint. Bldg. Admin.	2,781	S.F.	320.00	889,920.00
6	Maint. Bldg. Workshops.	6,304	S.F.	225.00	1,418,400.00
7	Maint. Bldg. Grounds.	0	S.F.	190.00	0.00
SUBTOTAL =		20,577	S.F.	\$274.77	\$5,653,840.00



Virginia DBHDS Central State Hospital
 Planning Study - Draft Cost Estimate
 Petersburg, Virginia
 Cost Analysis Date: 11/1/2018

CONCEPTUAL ESTIMATE

BUILDING CONCEPT

Option Three	NTP	Completion	Mid Point	Annual Esc.	Effective Esc.
Phase 1	4/1/2022	3/31/2024	4/1/2023	4.50%	21.44%
Phase 2	10/1/2026	3/28/2028	6/30/2027	4.50%	46.40%
Phase 3	10/1/2030	3/29/2032	6/30/2031	4.50%	74.60%

Phase	Phase Description (SF)	Building SF	Construction Cost	Escalated Cost	Escalated Cost Plus Soft Costs	Cost / SF	Esc. Cost / SF	(Es Cost + Soft) / SF
1	Living -77K; Programs - 54K; Support 115K	246,333	\$120,862,267	\$146,777,291	\$195,703,054	\$491	\$596	\$794
2	Living -34K; Programs - 66K; Support 5K	104,789	\$45,694,896	\$66,897,728	\$89,196,970	\$436	\$638	\$851
3	Living -85K; Programs - 0K; Support 21K	105,112	\$46,390,137	\$80,995,457	\$107,993,942	\$441	\$771	\$1,027
4	Additional Utilities & Staffing				\$20,842,105			
5	Demolition of Existing Campus				\$24,977,465			
6	Maintenance Reserve Contingency *				\$31,000,000			\$68
	Total	456,234	\$212,947,300	\$294,670,475	\$469,713,536	\$467	\$646	\$1,030

*Note - Includes recommended contingency for maintenance reserve repairs foreseeable prior to new facility completion.



Conceptual Estimate	Virginia DBHDS Central State Hospital Planning Study - Draft Cost Estimate Petersburg, Virginia	GROSS SQUARE FEET	COST PER SF	COST TOTAL
BUILDING CONCEPT				
DESCRIPTION				
Option Three				
Phase 1				
Living Units:				
1.1	Max living units (3-22 Bed Units)	23,688	\$501.58	\$11,881,396
1.2	Max Patient Support (3-22 Bed Units)	12,158	\$501.58	\$6,098,394
1.3	Max Staff Areas (3-22 Bed Units)	3,744	\$501.58	\$1,877,911
1.4	Max Unit Support (3-22 Bed Units)	3,312	\$501.58	\$1,661,229
2.1	Max living units (3-15 Bed Units)	16,488	\$496.50	\$8,186,302
2.2	Max Patient Support (3-15 Bed Units)	10,517	\$496.50	\$5,221,598
2.3	Max Staff Areas (3-15 Bed Units)	3,744	\$496.50	\$1,858,898
2.4	Max Unit Support (3-15 Bed Units)	3,312	\$496.50	\$1,644,410
Programs:				
6.1	Admissions	8,509	\$430.89	\$3,666,326
6.2	Admissions Admin.	2,083	\$430.89	\$897,623
6.3	Max Prog. Staff offices	7,117	\$430.89	\$3,066,532
6.4	Max Prog. Staff Support Areas	1,584	\$430.89	\$682,524
7.1	Max Visitation: Res. Processing	542	\$471.28	\$255,623
7.2	Max Visitation: Visitation	2,035	\$471.28	\$959,153
7.3	Max Visitation: Ent./Processing - Check-in	280	\$471.28	\$131,959
7.4	Max Visitation: Ent./Processing - Judicial	1,072	\$471.28	\$505,214
8	Max Patient Dining	1,856	\$417.42	\$774,734
9.1	Max Treatment Mall: Education Areas	3,600	\$430.89	\$1,551,191
9.2	Max Treatment Mall: Educ. Staff & Support	1,234	\$430.89	\$531,541
10.1	Max Treatment Mall: Vocational Areas	3,120	\$437.62	\$1,365,371
10.2	Max Treatment Mall: Voc. Staff & Support	786	\$437.62	\$343,793
11.1	Max Treatment Mall: Rec. Area	6,768	\$424.15	\$2,870,673
11.2	Max Treatment Mall: Rec. Office/Support	978	\$424.15	\$414,653
11.3	Max Treatment Mall: Shared Res. Pt. Areas	11,805	\$424.15	\$5,007,051
11.4	Max Treatment Mall: Shared Res. Staff/Sup.	608	\$424.15	\$257,886
			\$0.00	
Support:				
19	Public Lobby	3,320	\$363.56	\$1,207,021
20.1	Central Control / Security	2,254	\$417.42	\$941,034
20.2	Central Control / Sec. Admin	2,490	\$417.42	\$1,039,212
21.1	Housekeeping	1,744	\$430.89	\$751,466
21.2	Material Management - Receiving Area	1,088	\$430.89	\$468,804
22	Energy Plant	16,960	\$377.03	\$6,394,354



Conceptual Estimate	Virginia DBHDS Central State Hospital Planning Study - Draft Cost Estimate Petersburg, Virginia	GROSS SQUARE FEET	COST PER SF	COST TOTAL
BUILDING CONCEPT				
DESCRIPTION				
Option Three				
23	Satellite Kitchen	15,739	\$471.28	\$7,417,602
25.2	Warehouse - Office Area	1,784	\$322.89	\$576,036
25.3	Warehouse - Storage Area	16,766	\$322.89	\$5,413,703
26.1	Pharmacy - Admin/Staff	4,104	\$573.65	\$2,354,239
26.2	Pharmacy - Prep	4,512	\$573.65	\$2,588,286
26.3	Clinic / Admin	6,994	\$573.65	\$4,011,844
26.4	Clinic - dental	1,424	\$573.65	\$816,870
26.5	Clinic - lab	2,918	\$573.65	\$1,674,126
ALTERNATE CONCEPT	Clinic - PT	1,288	\$573.65	\$738,855
26.7	Clinic - Neurology	1,240	\$573.65	\$711,320
27.1	Executive Admin. - Staff	4,106	\$383.76	\$1,575,558
27.2	Executive Admin. - Support	4,286	\$383.76	\$1,644,941
27.3	Executive Admin. - IT	1,434	\$383.76	\$550,156
27.4	Executive Admin. - Health Info. Man.	1,920	\$383.76	\$736,816
27.6	Executive Admin. - Qual. & Risk Man.	1,590	\$383.76	\$610,329
27.9	Executive Admin. - Conf. & Support Center	4,112	\$383.76	\$1,578,014
28.1	HR - Admin.	1,894	\$370.29	\$701,483
28.2	HR - Support	1,022	\$370.29	\$378,588
29.1	Staff Development	1,907	\$363.56	\$693,382
29.2	Staff Development - Training	7,920	\$363.56	\$2,879,398
29.3	Staff Development - Short Term Housing	576	\$363.56	\$209,411
29.4	Staff Development - Emp. Health	0	\$363.56	\$0
Phase 1 Building Subtotal		246,333		\$110,374,833
Sitework				
30	Site Preparation			\$3,213,722
31	Utilities			\$1,509,051
32	Site Improvements			\$3,211,863
33	Stormwater Management			\$1,082,695
34	Sidewalk			\$157,657
35	Lighting			\$606,060
36	Landscaping			\$706,387
37	Phase 1 Sitework Total			\$10,487,434
38	Phase 1 Construction Total		\$491	\$120,862,267
39	Phase 1 Escalation		21.44%	\$25,915,024



Conceptual Estimate	Virginia DBHDS Central State Hospital Planning Study - Draft Cost Estimate Petersburg, Virginia	GROSS SQUARE FEET	COST PER SF	COST TOTAL
BUILDING CONCEPT				
DESCRIPTION				
Option Three				
40	Phase 1 Escalated Construction Total		\$596	\$146,777,291
41	Soft Costs (25% of Escalated Total Cost)			\$48,925,763
42	Phase 1 Escalated Total		\$794	\$195,703,054
Phase 2				
Living Units:				
3.1	Civil living units (3-15 Bed Units)	16,920	\$461.56	\$7,809,547
3.2	Civ. Patient Support (3-15 Bed Units)	10,330	\$461.56	\$4,767,701
3.3	Civ. Staff Areas (3-15 Bed Units)	3,744	\$461.56	\$1,728,070
3.4	Civ. Unit Support (3-15 Bed Units)	3,312	\$461.56	\$1,528,677
Programs:				
12.1	Civ. Visitation: Ent./Processing - Check-in	320	\$471.28	\$150,810
12.2	Civ. Visitation: Ent./Processing - Judicial	1,072	\$471.28	\$505,214
13.1	Civil Prog. Staff Offices	10,970	\$430.89	\$4,726,651
13.2	Civil Prog. Staff Support Areas	1,584	\$430.89	\$682,524
14.1	Civ. Visitation: Res. Processing	632	\$471.28	\$297,850
14.2	Civ. Visitation: Visitation	0	\$471.28	\$0
15	Civ. Patient Dining	3,584	\$417.42	\$1,496,038
27.7	Executive Admin. - Patient Rel.	1,184	\$383.76	\$454,370
27.8	Executive Admin. - Forensic Eval. Team	1,984	\$383.76	\$761,376
16.1	Civ. Treatment Mall: Education Areas	4,880	\$430.89	\$2,102,726
16.2	Civ. Treatment Mall: Educ. Staff & Support	1,598	\$430.89	\$688,729
17.1	Civ. Treatment Mall: Vocational Areas	5,760	\$437.62	\$2,520,685
17.2	Civ. Treatment Mall: Voc. Staff & Support	990	\$437.62	\$433,418
18.1	Civ. Treatment Mall: Rec. Area	10,800	\$424.15	\$4,580,861
18.2	Civ. Treatment Mall: Rec. Office/Support	1,595	\$424.15	\$676,610
18.3	Civ. Treatment Mall: Shared Res. Pt. Areas	17,472	\$424.15	\$7,410,815
18.4	Civ. Treatment Mall: Shared Res. Staff/Sup.	1,178	\$424.15	\$499,484
Support:				
27.5	Executive Admin. - Financial Serv. & Proc.	4,880	\$383.76	\$1,872,740
Phase 2 Building Subtotal		104,789		\$45,694,896
Sitework				



Conceptual Estimate	Virginia DBHDS Central State Hospital Planning Study - Draft Cost Estimate Petersburg, Virginia	GROSS SQUARE FEET	COST PER SF	COST TOTAL
BUILDING CONCEPT				
DESCRIPTION				
Option Three				
30	Site Preparation			
31	Utilities			
32	Site Improvements			
33	Stormwater Management			
34	Sidewalk			
35	Lighting			
36	Landscaping			
37	Phase 2 Sitework Total			\$0
38	Phase 2 Construction Total		\$436.07	\$45,694,896
39	Phase 2 Escalation		46.40%	\$21,202,832
40	Phase 2 Escalated Construction Total		\$638.41	\$66,897,728
41	Soft Costs (25% of Escalated Total Cost)			\$22,299,242
42	Phase 2 Escalated Total		\$851.21	\$89,196,970
Phase 3				
Living Units:				
4.1	Civil living units (5-24 Bed Units)	34,688	\$467.35	\$16,211,598
4.2	Civ. Patient Support (5-24 Bed Units)	22,744	\$467.35	\$10,629,514
4.3	Civ. Staff Areas (5-24 Bed Units)	6,640	\$467.35	\$3,103,235
4.4	Civil living units (1-24 Bed Unit)	5,040	\$467.35	\$2,355,467
4.5	Civ. Patient Support (1-24 Bed Unit)	8,314	\$467.35	\$3,885,400
4.6	Civ. Staff Areas (1-24 Bed Unit)	4,741	\$467.35	\$2,215,635
4.7	Civ. Unit Support (1-24 Bed Unit)	1,328	\$467.35	\$620,647
5	Civil Prog. Staff Offices	1,040	\$478.01	\$497,135
Programs:				
Support:				
24.1	Transportation - Civil	966	\$350.10	\$338,332
24.2	Transportation - Max	1,606	\$350.10	\$562,393
24.3	Vehicle Support	1,184	\$350.10	\$414,513
25.1	Laundry	7,736	\$322.89	\$2,497,877
25.4	Maint. Bldg. Admin.	2,781	\$322.89	\$897,893
25.5	Maint. Bldg. Workshops	6,304	\$322.89	\$2,035,499
25.6	Maint. Bldg. Grounds	0	\$322.89	\$0
	Phase 3 Building Subtotal	105,112		\$46,265,137



Conceptual Estimate	Virginia DBHDS Central State Hospital Planning Study - Draft Cost Estimate Petersburg, Virginia	GROSS SQUARE FEET	COST PER SF	COST TOTAL
BUILDING CONCEPT				
DESCRIPTION				
Option Three				
Sitework				
30	Site Preparation			
31	Utilities			
32	Site Improvements			\$125,000
33	Stormwater Management			
34	Sidewalk			
35	Lighting			
36	Landscaping			
37	Phase 3 Sitework Total			\$125,000
38	Phase 3 Construction Total		\$441.34	\$46,390,137
39	Escalation		74.60%	\$34,605,320
40	Phase 3 Escalated Construction Total		\$770.56	\$80,995,457
41	Soft Costs (25% of Escalated Total Cost)			\$26,998,485
42	Phase 3 Escalated Total		\$1,027.42	\$107,993,942
38	Construction Total		467	\$212,947,300
39	Escalation (Phase I, II, III)			\$81,723,175
40	Escalated Construction Total		646	\$294,670,475
41	Soft Costs (25% of Escalated Total Cost)			\$98,223,491
42	Escalated Total		861	\$392,893,966

FY 2019 Project Planner

OVERVIEW

Project name	CSH/SSVTC Building Demolition		
Agency	DBHDS		
Project Code			
Project Type	DEMOLITION		
Biennium			
Budget Round			
Request Origin	Agency		
Project Location	Petersburg, VA		
Facility/Campus			
Source of Request			
Infrastructure Element			
Contains significant technology costs?			
Contains significant energy costs?			
Contact			

PROJECT BUDGET

	Amount (current date)	Amount (mid-construction)	Comments
Acquisition	-	-	(acquisition not escalated)
Construction	16,682,258	17,867,883	
Design & Related Services	1,253,725	1,342,829	
Inspection & Testing Services	40,000	42,843	
Project Management & Other Costs	198,800	212,929	
Furnishings & Movable Equipment	-	-	
Construction Contingency	333,645	357,358	
TOTAL PROJECT BUDGET	18,508,428	-19,823,842	\$24,977,465 - escalated for the three phase option to 3/29/2032

PHASES

	Amount	Comments
Detailed Planning	727,884	List any unusual Detailed Planning requirements in comments
Construction	18,508,428	
Equipment Purchase	-	

SCOPE

	Amount	Comments
Total square foot (per form DGS-30-219)	1,223,949	
Net # of New Parking Spaces - Surface Lot		
Net # of New Parking Spaces - Parking Deck		
Site Size (acres)		

SCHEDULE

	Dates	Comments
Start of design	7/1/2021	
Start of construction	1/1/2022	
Mid-Point of Construction	7/2/2022	
Date of occupancy	1/1/2023	
Annual Escalation Rate	4.5%	
Current Date	11/27/2018	

(09/18)

Agency Narrative

Agency Description

Demolition of approximately 1.25 million square feet of buildings, most of which are masonry and steel frame construction. However, approximately 75,000 SF of space is wood frame construction. It is assumed that all of the buildings will require asbestos and lead abatement. Demolition of the below grade structures/footings and utilities is not required. The site at demolished buildings is to be graded to provide positive drainage and seeded only. Site features such as roads, sidewalks, etc. are to remain. It is assumed that no site environmental remediation is required.

Justification

Alternatives Considered

Costing Methodology

F

Alternate Two Phased Project

Alternate Two-Phase Project

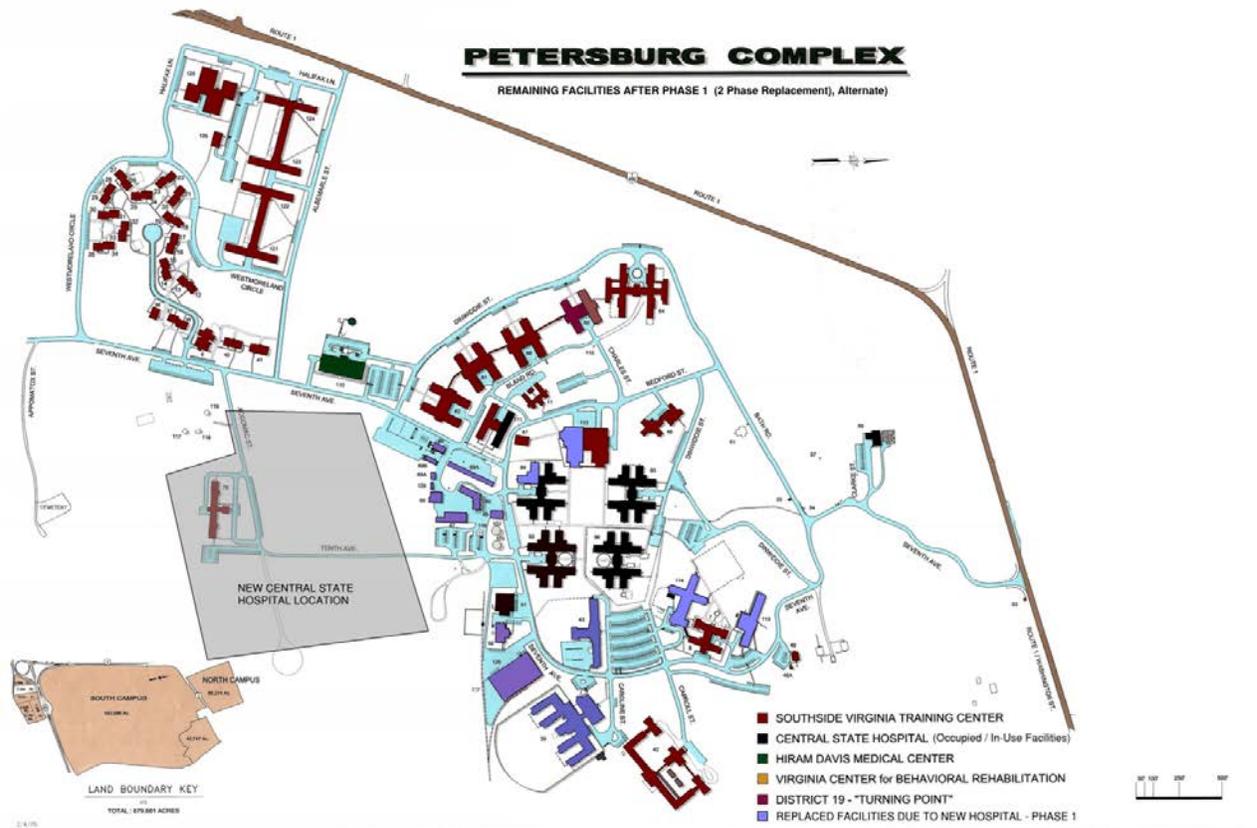
The following sections details project cost for alternate two-phase construction. This option delivers a new facility the second fastest and provides the second lowest cost to the Commonwealth of Virginia. This phase is not preferred in comparison to the other two-phase solution. Sequencing of unit types to be replaced is not based on the facility needs and the condition of the buildings as noted in the facility assessment.

Table F 1. Phased Schedule Comparison

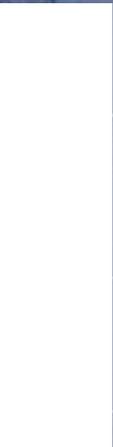
Phase Name	Duration (Months)			Start	Finish
	Design	Construction	Total		
Alternate Two Phase (2 designers/2 contractors)	57	60	117	1-Jul-19	30-Mar-29

* Does not include FFE and transition relocation of operations, assumed to be 3 months per phase.

Figure F-1. Alternate Remaining Facilities after Phase 1



***Demolition of all buildings at the end of phase 2**



G

Concept Cost Estimate - Alternate Two Phase



Figure G-1. Maintenance Reserve Cost (in \$Millions)

		CSH Existing Building Critical Projection	
Bldg No	Building Use	Alt. Two Phase Option	
		Phase 1 (5 yrs in \$M)	Phase 2 (<10 yrs)
59	Security	\$ 0.35	
52	Boiler Plant	\$ 1.10	
39	Maximum Security	\$ 2.70	
113	Administration	\$ 0.11	
111	Administration	\$ 1.00	
96	Housing	\$ 6.40	
112	Food Services	\$ 1.20	
120	Warehouse	\$ 1.40	
94	Housing	\$ 0.11	\$ 1.30
95	Housing	\$ 0.11	\$ 1.30
43	Training	\$ 0.11	
51	Laundry	\$ 2.30	
114	Treatment Mall	\$ 0.11	
93	Housing	\$ 5.50	
Civil	Utilities	\$ 0.60	
Total		\$ 23.10	\$ 2.60

Table G-1. Two Phase Alternate Operational & Maintenance Cost Impact (04/1/2025 – 4/1/2019)

*Utilities and Staff	*\$2.6M/yr x 4 yrs	\$ 10,736,843
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*See section 13 for additional details

Figure G-3. Estimate Phase 2 Alternate

Alternate Two-Phase							
<u>Estimate Summary Comparisons</u>							
	Phase	Phase Description (SF)	Construction Cost	Escalated Cost	Escalated Cost Plus Soft Costs	(Es Cost + Soft) / SF	Difference
Alternate HDR 2 Phases	1	Living -111K; Programs - 119K; Support 115K	\$154,389,095	\$191,662,150	\$255,549,469	\$738	
	2	Living -85K; Programs - 0K; Support 25K	\$47,058,039	\$72,000,090	\$96,000,096	\$873	
	3	Additional Utilities & Staffing			\$10,736,843		
	4	Demolition of Existing Campus			\$22,622,297		
	5	Maintenance Reserve Contingency*			\$25,700,000	\$56	
			\$201,447,133	\$263,662,240	\$410,608,705	\$900	\$19,499,142
Alternate MBP 2 Phases	1	Living -111K; Programs - 119K; Support 115K	\$164,684,423	\$204,443,006	\$272,590,673	\$787	
	2	Living -85K; Programs - 0K; Support 25K	\$48,262,877	\$73,843,526	\$98,458,034	\$895	
	3	Additional Utilities & Staffing			\$10,736,843		
	4	Demolition of Existing Campus			\$22,622,297		
	5	Maintenance Reserve Contingency*			\$25,700,000	\$56	
			\$212,947,300	\$278,286,531	\$430,107,848	\$943	

*Note - Includes recommended contingency for maintenance reserve repairs foreseeable prior to new facility completion.

**Virginia DBHDS Central State Hospital
Preplanning Study - Preferred Option - Alternate - 2 Phases
Petersburg, Virginia**

Preplanning Study / Cost Analysis

BCC Job No.: 18-10-0139 / DBHDS 720-18165

12/1/2018 Rev. 1



Preplanning Study / Cost Analysis Rev 9 1/2018 Re	BCC Building Cost Consultants, Inc. Virginia DBHDS Central State Hospital Preplanning Study - Preferred Option - Alternate - 2 Phase Petersburg, Virginia BCC Job No.: 18-10-0139 / DBHDS 720-18165	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
ITEM	DESCRIPTION				
FINAL SUMMARY SHEET		Cost Per Square Foot			
APPENDIX - 2 Phase Alternate					
	Two Phases - Alternate - (Page 3)	456,234	S.F.	\$770.55	\$351,549,565.13
NOTE: The following mark-ups are included in the above costs:					
	General Conditions, Overhead, Profit, Insurance and Bond -	15%			
	Design Contingency -	10%			
	Phase 1 (November 1, 2018 to September 30, 2023) -	24.14%			
	Phase 2 (November 1, 2018 to June 30, 2028) -	53.00%			
QUALIFICATIONS					
1	No sales tax is included. Assumed facility is tax exempt.				
2	No asbestos removal is included.				
3	No costs are included for furniture, furnishings or movable equipment.				
4	No costs are included for major fixed equipment.				
5	The estimated construction costs assumed the project will be competitively bid with a minimum of 3-4 bidders.				
6	Assumed construction to be during normal working hours.				
7	The construction costs shall be used for budgeting and planning purposes only and shall not be used as an actual bid as given by a contractor to build the project.				
8	The construction totals are rounded to the nearest \$10.00.				

Preplanning Study / Cost Analysis Rev 9 1/2018 Re	BCC Building Cost Consultants, Inc. Virginia DBHDS Central State Hospital Preplanning Study - Preferred Option - Alternate - 2 Phase Petersburg, Virginia BCC Job No.: 18-10-0139 / DBHDS 720-18165	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
ITEM	DESCRIPTION				
SUMMARY SHEET - Continued		Cost Per Square Foot			
Two Phases - Alternate - Preferred Option - Phase 1 (Page 3)					
	Living Units (Page 6)	111,269	S.F.	\$363.17	\$40,409,950.00
	Programs (Pages 6-7)	119,580	S.F.	\$331.33	39,620,080.00
	Support (Pages 7-8)	115,392	S.F.	\$283.67	32,733,330.00
	SUBTOTAL =				\$112,763,360.00
	Construction Total with General Conditions, Overhead, Profit, Insurance, Bond, Design Contingency and Escalation =				\$177,080,310.00
	COST PER SQUARE FOOT FOR	346,241	S.F.	=	\$511.44
Two Phases - Alternate - Preferred Option - Phase 2 (Page 3)					
	Living Units (Page 9)	84,535	S.F.	\$355.29	\$30,034,060.00
	Programs - None Included				
	Support (Page 9)	25,457	S.F.	\$281.52	7,166,640.00
	SUBTOTAL =				\$37,200,700.00
	Construction Total with General Conditions, Overhead, Profit, Insurance, Bond, Design Contingency and Escalation =				\$72,000,090.00
	COST PER SQUARE FOOT FOR	109,992	S.F.	=	\$654.59

ITEM	DESCRIPTION	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
APPENDIX - 2 Phase Alternate					
Sitework (Pages 4-5)					
1	Remove existing building.	34,445	S.F.	10.00	\$344,450.00
2	Clear and grub.	1,300,000	S.F.	0.10	130,000.00
3	Tree clearing.	1.3	Acres	17,500.00	22,750.00
4	Bulk excavation - cut and fill on site.	100,000	C.Y.	12.00	1,200,000.00
5	Fine grading and site layout.	1,300,000	S.F.	0.15	195,000.00
6	Storm retention pond.	75,000	S.F.	2.00	150,000.00
7	Site utilities:				
	8" waterline.	2,800	L.F.	80.00	224,000.00
	12" - 15" sanitary sewer.	4,200	L.F.	150.00	630,000.00
	8" fire line.	2,800	L.F.	80.00	224,000.00
	12" storm sewer.	12,500	L.F.	50.00	625,000.00
	15" storm sewer.	8,400	L.F.	60.00	504,000.00
	24" storm sewer.	2,900	L.F.	75.00	217,500.00
	6" natural gas line.	2,800	L.F.	45.00	126,000.00
	Primary electrical feeder - empty conduits.	2,800	L.F.	65.00	182,000.00
	Secondary feeders - 100' x 2 each =	200	L.F.	500.00	100,000.00
	Communication feeders.	5,600	L.F.	35.00	196,000.00
	Various utility manholes.	10	EA.	4,500.00	45,000.00
8	Parking and drive lights.	44	EA.	4,250.00	187,000.00
9	Pedestrian lights.	16	EA.	1,650.00	26,400.00
10	Concrete curb.	12,000	L.F.	15.00	180,000.00
11	Concrete parking and drive paving - 270,000 S.F. / 9 =	30,000	S.Y.	55.00	1,650,000.00
12	Concrete sidewalks.	20,000	S.F.	6.00	120,000.00
13	Rock fireline road - 1,400' x 24' = 33,600 S.F. / 9 =	3,700	S.Y.	15.00	55,500.00

Preplanning Study / Cost Analysis Rev 9 1/2018 Re	BCC Building Cost Consultants, Inc. Virginia DBHDS Central State Hospital Preplanning Study - Preferred Option - Alternate - 2 Phase Petersburg, Virginia BCC Job No.: 18-10-0139 / DBHDS 720-18165	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
ITEM	DESCRIPTION				
APPENDIX - 2 Phase Alternate					
Sitework (Pages 4-5)					
14	Recreation areas: Small - 5,000 S.F. Large - 13,000 S.F.	8 3	EA. EA.	55,000.00 75,000.00	440,000.00 225,000.00
15	14' anti-climb chain link fence.	4,000	L.F.	150.00	600,000.00
16	Silt fence at site perimeter.	5,200	L.F.	3.50	18,200.00
17	Fire hydrants and piping.	2	EA.	7,500.00	15,000.00
18	Main entrance sign.	1	EA.	30,000.00	30,000.00
19	Flagpoles and concrete bases.	2	EA.	6,500.00	13,000.00
20	Parking and directional signs.	48	EA.	725.00	34,800.00
21	Sod and irrigation around building / parking.	150,000	S.F.	1.50	225,000.00
22	Seed and no irrigation.	250,000	S.F.	0.20	50,000.00
23	Landscaping - trees, shrubs and plantings.	1	L.S.	250,000.00	250,000.00
24	Courtyard landscaping.	1	L.S.	50,000.00	50,000.00
SUBTOTAL =					\$9,285,600.00

Preplanning Study / Cost Analysis Rev 9 1/2018 Re	BCC Building Cost Consultants, Inc. Virginia DBHDS Central State Hospital Preplanning Study - Preferred Option - Alternate - 2 Phase Petersburg, Virginia BCC Job No.: 18-10-0139 / DBHDS 720-18165	QTY. NO. UNITS	QTY. UNIT	MATERIAL & LABOR PER UNIT	MATERIAL & LABOR TOTAL
ITEM	DESCRIPTION				
Two Phases - Alternate - Preferred Option - Phase 2 (Page 3)					
Living Units (Page 9)					
1	Civil living units (5-24 Bed Units).	34,688	S.F.	365.00	\$12,661,120.00
2	Civ. Patient Support (5-24 Bed Units).	22,744	S.F.	345.00	7,846,680.00
3	Civ. Staff Areas (5-24 Bed Units).	6,640	S.F.	350.00	2,324,000.00
4	Civ. Living Unit (1-24 Bed Unit).	8,314	S.F.	365.00	3,034,610.00
5	Civ. Patient Support (1-24 Bed Unit).	4,741	S.F.	345.00	1,635,650.00
6	Civ. Staff Area (1-24 Bed Unit).	1,328	S.F.	350.00	464,800.00
7	Civ. Unit Support (5-24 Bed Units).	5,040	S.F.	340.00	1,713,600.00
8	Civ. Unit Support (1-24 Bed Unit).	1,040	S.F.	340.00	353,600.00
SUBTOTAL =		84,535	S.F.	=	\$30,034,060.00
Support (Page 9)					
1	Transportation - Civil.	966	S.F.	260.00	\$251,160.00
2	Transportation - Max.	1,606	S.F.	260.00	417,560.00
3	Laundry.	7,736	S.F.	320.00	2,475,520.00
4	Vehicle Support.	1,184	S.F.	170.00	201,280.00
5	Maint. Bldg. Admin.	2,781	S.F.	320.00	889,920.00
6	Maint. Bldg. Workshops.	6,304	S.F.	225.00	1,418,400.00
7	Maint. Bldg. Grounds.	0	S.F.	190.00	0.00
8	Executive Admin. - Financial Serv. & Proc.	4,880	S.F.	310.00	1,512,800.00
SUBTOTAL =		25,457	S.F.	=	\$7,166,640.00



Virginia DBHDS Central State Hospital
 Planning Study - Draft Cost Estimate
 Petersburg, Virginia
 Cost Analysis Date: 11/1/2018

**ALTERNATE TWO-PHASE
 CONCEPTUAL ESTIMATE**

BUILDING CONCEPT

Option Four	NTP	Completion	Mid Point	Annual Esc.	Effective Esc.
Phase 1	4/1/2022	3/31/2025	9/30/2023	4.50%	24.14%
Phase 2	10/1/2027	3/30/2029	6/30/2028	4.50%	53.00%

Phase	Phase Description (SF)	Building SF	Construction Cost	Escalated Cost	Escalated Cost Plus Soft Costs	Cost / SF	Esc. Cost / SF	(Es Cost + Soft) / SF
1	Living -111K; Programs - 119K; Support 115K	346,242	\$164,684,423	\$204,443,006	\$272,590,673	\$476	\$590	\$787
2	Living -85K; Programs - 0K; Support 25K	109,992	\$48,262,877	\$73,843,526	\$98,458,034	\$439	\$671	\$895
3	Additional Utilities & Staffing				\$10,736,843			
4	Demolition of Existing Campus				\$22,622,297			
5	Maintenance Reserve Contingency *				\$25,700,000			\$56
	Total	456,234	\$212,947,300	\$278,286,531	\$430,107,848	\$467	\$610	\$943

*Note - Includes recommended contingency for maintenance reserve repairs foreseeable prior to new facility completion.



Conceptual Estimate	Virginia DBHDS Central State Hospital Planning Study - Draft Cost Estimate Petersburg, Virginia		GROSS SQUARE	COST	COST
	ALTERNATE TWO-PHASE				
	DESCRIPTION				
Option Four					
Phase 1					
Living Units:					
1.1	Max living units (3-22 Bed Units)		23,688	\$501.58	11,881,396
1.2	Max Patient Support (3-22 Bed Units)		12,158	\$501.58	6,098,394
1.3	Max Staff Areas (3-22 Bed Units)		3,744	\$501.58	1,877,911
1.4	Max Unit Support (3-22 Bed Units)		3,312	\$501.58	1,661,229
2.1	Max living units (3-15 Bed Units)		16,488	\$496.50	8,186,302
2.2	Max Patient Support (3-15 Bed Units)		10,517	\$496.50	5,221,598
2.3	Max Staff Areas (3-15 Bed Units)		3,744	\$496.50	1,858,898
2.4	Max Unit Support (3-15 Bed Units)		3,312	\$496.50	1,644,410
3.1	Civil living units (3-15 Bed Units)		16,920	\$461.56	7,809,547
3.2	Civ. Patient Support (3-15 Bed Units)		10,330	\$461.56	4,767,701
3.3	Civ. Staff Areas (3-15 Bed Units)		3,744	\$461.56	1,728,070
3.4	Civ. Unit Support (3-15 Bed Units)		3,312	\$461.56	1,528,677
Programs:					
6.1	Admissions		8,509	\$430.89	3,666,326
6.2	Admissions Admin.		2,083	\$430.89	897,623
6.3	Max Prog. Staff offices		7,117	\$430.89	3,066,532
6.4	Max Prog. Staff Support Areas		1,584	\$430.89	682,524
7.1	Max Visitation: Res. Processing		542	\$471.28	255,623
7.2	Max Visitation: Visitation		2,035	\$471.28	959,153
7.3	Max Visitation: Ent./Processing - Check-in		280	\$471.28	131,959
7.4	Max Visitation: Ent./Processing - Judicial		1,072	\$471.28	505,214
8	Max Patient Dining		1,856	\$417.42	774,734
9.1	Max Treatment Mall: Education Areas		3,600	\$430.89	1,551,191
9.2	Max Treatment Mall: Educ. Staff & Support		1,234	\$430.89	531,541
10.1	Max Treatment Mall: Vocational Areas		3,120	\$437.62	1,365,371
10.2	Max Treatment Mall: Voc. Staff & Support		786	\$437.62	343,793
11.1	Max Treatment Mall: Rec. Area		6,768	\$424.15	2,870,673
11.2	Max Treatment Mall: Rec. Office/Support		978	\$424.15	414,653
11.3	Max Treatment Mall: Shared Res. Pt. Areas		11,805	\$424.15	5,007,051
11.4	Max Treatment Mall: Shared Res. Staff/Sup.		608	\$424.15	257,886
12.1	Civ. Visitation: Ent./Processing - Check-in		320	\$471.28	150,810
12.2	Civ. Visitation: Ent./Processing - Judicial		1,072	\$471.28	505,214
13.1	Civil Prog. Staff Offices		10,970	\$430.89	4,726,651



Conceptual Estimate	Virginia DBHDS Central State Hospital Planning Study - Draft Cost Estimate Petersburg, Virginia			
	ALTERNATE TWO-PHASE	GROSS SQUARE	COST	COST
	DESCRIPTION			
Option Four				
13.2	Civil Prog. Staff Support Areas	1,584	\$430.89	682,524
14.1	Civ. Visitation: Res. Processing	632	\$471.28	297,850
14.2	Civ. Visitation: Visitation	0	\$471.28	0
15	Civ. Patient Dining	3,584	\$417.42	1,496,038
16.1	Civ. Treatment Mall: Education Areas	4,880	\$430.89	2,102,726
16.2	Civ. Treatment Mall: Educ. Staff & Support	1,598	\$430.89	688,729
17.1	Civ. Treatment Mall: Vocational Areas	5,760	\$437.62	2,520,685
17.2	Civ. Treatment Mall: Voc. Staff & Support	990	\$437.62	433,418
ALTERNATE CONCEPT				
18.1	Civ. Treatment Mall: Rec. Area	10,800	\$424.15	4,580,861
18.2	Civ. Treatment Mall: Rec. Office/Support	1,595	\$424.15	676,610
18.3	Civ. Treatment Mall: Shared Res. Pt. Areas	17,472	\$424.15	7,410,815
18.4	Civ. Treatment Mall: Shared Res. Staff/Sup.	1,178	\$424.15	499,484
27.7	Executive Admin. - Patient Rel.	1,184	\$383.76	454,370
27.8	Executive Admin. - Forensic Eval. Team	1,984	\$383.76	761,376
Support:				
19	Public Lobby	3,320	\$363.56	1,207,021
20.1	Central Control / Security	2,254	\$417.42	941,034
20.2	Central Control / Sec. Admin	2,490	\$417.42	1,039,212
21.1	Housekeeping	1,744	\$430.89	751,466
21.2	Material Management - Receiving Area	1,088	\$430.89	468,804
22	Energy Plant	16,960	\$377.03	6,394,354
23	Satellite Kitchen	15,739	\$471.28	7,417,602
25.2	Warehouse - Office Area	1,784	\$322.89	576,036
25.3	Warehouse - Storage Area	16,766	\$322.89	5,413,703
26.1	Pharmacy - Admin/Staff	4,104	\$573.65	2,354,239
26.2	Pharmacy - Prep	4,512	\$573.65	2,588,286
26.3	Clinic / Admin	6,994	\$573.65	4,011,844
26.4	Clinic - dental	1,424	\$573.65	816,870
26.5	Clinic - lab	2,918	\$573.65	1,674,126
26.6	Clinic - PT	1,288	\$573.65	738,855
26.7	Clinic - Neurology	1,240	\$573.65	711,320



Conceptual Estimate	Virginia DBHDS Central State Hospital Planning Study - Draft Cost Estimate Petersburg, Virginia			
	ALTERNATE TWO-PHASE		GROSS SQUARE	COST
	DESCRIPTION			COST
Option Four				
27.1	Executive Admin. - Staff	4,106	\$383.76	1,575,558
27.2	Executive Admin. - Support	4,286	\$383.76	1,644,941
27.3	Executive Admin. - IT	1,434	\$383.76	550,156
27.4	Executive Admin. - Health Info. Man.	1,920	\$383.76	736,816
27.6	Executive Admin. - Qual. & Risk Man.	1,590	\$383.76	610,329
27.9	Executive Admin. - Conf. & Support Center	4,112	\$383.76	1,578,014
28.1	HR - Admin.	1,894	\$370.29	701,483
28.2	HR - Support	1,022	\$370.29	378,588
29.1	Staff Development	1,907	\$363.56	693,382
29.2	Staff Development - Training	7,920	\$363.56	2,879,398
29.3	Staff Development - Short Term Housing	576	\$363.56	209,411
29.4	Staff Development - Emp. Health	0	\$363.56	0
	Phase 1 Building Subtotal	346,242		154,196,989
Sitework				
30	Site Preparation			3,213,722
31	Utilities			1,509,051
32	Site Improvements			3,211,863
33	Stormwater Management			1,082,695
34	Sidewalk			157,657
35	Lighting			606,060
36	Landscaping			706,387
37	Phase 1 Sitework Total			10,487,434
38	Phase 1 Construction Total		\$476	164,684,423
39	Phase 1 Escalation		24.14%	39,758,583
40	Phase 1 Escalated Construction Total		\$590	204,443,006
41	Soft Costs (25% of Escalated Total Cost)			\$68,147,668
42	Phase 1 Escalated Total		\$787	272,590,673
Phase 2				
Living Units:				
4.1	Civil living units (5-24 Bed Units)	34,688	\$467.35	16,211,598
4.2	Civ. Patient Support (5-24 Bed Units)	22,744	\$467.35	10,629,514
4.3	Civ. Staff Areas (5-24 Bed Units)	6,640	\$467.35	3,103,235
4.4	Civil living units (1-24 Bed Unit)	5,040	\$467.35	2,355,467
4.5	Civ. Patient Support (1-24 Bed Unit)	8,314	\$467.35	3,885,400
4.6	Civ. Staff Areas (1-24 Bed Unit)	4,741	\$467.35	2,215,635



Conceptual Estimate	Virginia DBHDS Central State Hospital Planning Study - Draft Cost Estimate Petersburg, Virginia			
	ALTERNATE TWO-PHASE	GROSS SQUARE	COST	COST
	DESCRIPTION			
Option Four				
4.7	Civ. Unit Support (1-24 Bed Unit)	1,328	\$467.35	620,647
5	Civil Prog. Staff Offices	1,040	\$478.01	497,135
Programs:				
Support:				
24.1	Transportation - Civil	966	\$350.10	338,332
24.2	Transportation - Max	1,606	\$350.10	562,393
24.3	Vehicle Support	1,184	\$350.10	414,513
25.1	Laundry	7,736	\$322.89	2,497,877
25.4	Maint. Bldg. Admin.	2,781	\$322.89	897,893
25.5	Maint. Bldg. Workshops	6,304	\$322.89	2,035,499
25.6	Maint. Bldg. Grounds	0	\$322.89	0
27.5	Executive Admin. - Financial Serv. & Proc.	4,880	\$383.76	1,872,740
Phase 2 Building Subtotal		109,992		48,137,877
Sitework				
30	Site Preparation			
31	Utilities			
32	Site Improvements			125,000
33	Stormwater Management			
34	Sidewalk			
35	Lighting			
36	Landscaping			
37	Phase 2 Sitework Total			125,000
38	Phase 2 Construction Total		\$439	48,262,877
39	Phase 2 Escalation		53.00%	25,580,649
40	Phase 2 Escalated Construction Total		\$671	73,843,526
41	Soft Costs (25% of Escalated Total Cost)			\$24,614,508
42	Phase 2 Escalated Total		\$895	98,458,034
38	Construction Total		\$467	212,947,300
39	Escalation (Phase I, II,)			65,339,231
40	Escalated Construction Total		\$610	278,286,531
41	Phase 2 Soft Costs (25% Construction Cost)			\$92,762,176



Conceptual Estimate	Virginia DBHDS Central State Hospital Planning Study - Draft Cost Estimate Petersburg, Virginia			
	ALTERNATE TWO-PHASE	GROSS SQUARE	COST	COST
	DESCRIPTION			
Option Four				
42		Escalated Total	\$813	371,048,708

FY 2019 Project Planner

OVERVIEW

Project name	CSH/SSVTC Building Demolition		
Agency	DBHDS		
Project Code			
Project Type	DEMOLITION		
Biennium			
Budget Round			
Request Origin	Agency		
Project Location	Petersburg, VA		
Facility/Campus			
Source of Request			
Infrastructure Element			
Contains significant technology costs?			
Contains significant energy costs?			
Contact			

PROJECT BUDGET

	Amount (current date)	Amount (mid-construction)	Comments
Acquisition	-	- (acquisition not escalated)	
Construction	16,682,258	17,867,883	
Design & Related Services	1,253,725	1,342,829	
Inspection & Testing Services	40,000	42,843	
Project Management & Other Costs	198,800	212,929	
Furnishings & Movable Equipment	-	-	
Construction Contingency	333,645	357,358	
TOTAL PROJECT BUDGET	18,508,428	19,823,842	\$22,622,297 - escalated for the alternate two phase option to 3/30/2029

PHASES

	Amount	Comments
Detailed Planning	727,884	List any unusual Detailed Planning requirements in comments
Construction	18,508,428	
Equipment Purchase	-	

SCOPE

	Amount	Comments
Total square foot (per form DGS-30-219)	1,223,949	
Net # of New Parking Spaces - Surface Lot		
Net # of New Parking Spaces - Parking Deck		
Site Size (acres)		

SCHEDULE

	Dates	Comments
Start of design	7/1/2021	
Start of construction	1/1/2022	
Mid-Point of Construction	7/2/2022	
Date of occupancy	1/1/2023	
Annual Escalation Rate	4.5%	
Current Date	11/27/2018	

(09/18)

Agency Narrative

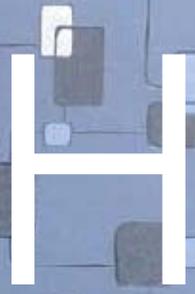
Agency Description

Demolition of approximately 1.25 million square feet of buildings, most of which are masonry and steel frame construction. However, approximately 75,000 SF of space is wood frame construction. It is assumed that all of the buildings will require asbestos and lead abatement. Demolition of the below grade structures/footings and utilities is not required. The site at demolished buildings is to be graded to provide positive drainage and seeded only. Site features such as roads, sidewalks, etc. are to remain. It is assumed that no site environmental remediation is required.

Justification

Alternatives Considered

Costing Methodology



Central State Hospital Building Assessment



Central State Hospital

Building Assessment

Final

October 12, 2018

Virginia Department of General Services



Central State Hospital Building Assessment

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Building 111 Administrative Offices

Building 112 Food Services Kitchen

Building 113 Administration Building

Building 114 Treatment Mall

Building 120 Warehouse

Civil Utilities

Introduction



Central State Hospital Building Assessments



INTRODUCTION

The purpose of this building assessment study is to determine the economic and technical service life for the following buildings located on the Department of Behavioral Health and Developmental Services (DBHDS) Central State Hospital (CSH) campus:

- Building 39 – Maximum Security
- Building 43 – Training and Administration
- Building 51 – Laundry
- Building 52 – Boiler Plant
- Building 59 – Public Safety
- Building 94 – Psychosocial Rehabilitation
- Building 95 – Long Term Intensive Care
- Building 96 – Step Down Forensic Unit
- Building 111 – Administrative Offices
- Building 112 – Food Services Kitchen
- Building 113 – Administration Building
- Building 114 – Treatment Mall
- Building 120 - Warehouse

The buildings included in this assessment program are integral to the continued operations and mission of the DBHDS CSH program and were generally found to be in disrepair and failing condition. The basis for the assessment program focused on the overall observed condition of the facility, mechanical and electrical equipment information, functional operations of the fire alarm and life safety equipment, and information collected from maintenance records and discussions with staff maintenance personnel. The average age of these buildings is 65 years and many of the buildings continue to operate with original equipment.

Building 39 – Maximum Security is the only facility of this type in the Commonwealth of Virginia and has significant concern for the mechanical and electrical systems. The mechanical and electrical equipment has exceeded its service life and replacement parts are no longer available for repairs. Repair costs to maintain the building in a serviceable condition for five to ten years are estimated to be \$3,583,818.

Building 43 – Training and Administration is one of the older buildings on the CSH campus. The mechanical and electrical equipment has exceeded its service life and replacement parts are no longer available for repairs. Repair costs to maintain the building in a serviceable condition for five to ten years are estimated to be \$2,405,033; however, if equipment failures occur before repairs are completed we understand the staff and training functions may be relocated to other CSH building, either temporarily or permanently.

Building 51 – Laundry, the Laundry provides services to CSH, Hiram Davis Medical Center, Virginia Center for Behavioral Rehabilitation and Piedmont Geriatric Hospital and is in fair condition. Primary concerns for this building include aging mechanical and electrical equipment with repair cost to maintain the building in a serviceable condition for five to ten years estimated to be \$2,976,342. The Laundry processes approximately 1.7M pounds of laundry per year. Costs to replicate these services through independent contractors is estimated to be \$1.00 per pound.

Building 52 – Boiler Plant includes four steam generating boilers for heating, domestic hot water and equipment sterilization for the CSH Campus. The four boilers were refurbished fifteen years ago; however, the boiler controls were not included in the refurbishment. The controls and SCADA system are outdated, generally not functional, and require manual operation to reset the boilers after an outage. Boiler control replacement parts are no longer available due to the age of the equipment. Repair costs to maintain the boiler plant in a serviceable condition for five to ten years are estimated to be \$1,464,696.

Building 59 – Public Safety is the central receiving facility for the campus fire alarm and security systems. It also houses the primary pumping system for domestic water and fire sprinkler water storage tanks serving the CSH campus. For this reason Building 59 is an essential facility for CSH. The building is in failing condition with a service life of less than two years. Repair costs to maintain the building in a serviceable condition for five to ten years are estimated to be \$351,126 and includes replacement of the heating unit, roof replacement and replacement costs for the campus water supply pump system.

Building 94 - Psychosocial Rehabilitation, 95 - Long Term Intensive Care and 96 - Step Down Forensic Unit are identical buildings and in fair condition. Building 94 and Building 95 mechanical and electrical systems were recently replaced and observed to be in good condition. Building 96 mechanical and electrical systems are original to the building and in failing condition. The 90's buildings currently are used for resident housing. In the event of equipment failure the Continuation of Operation Plan is to relocate the residents to other buildings on the CSH campus. Repair costs to maintain Building 96 in a serviceable condition for five to ten years are estimated to be \$1,254,928.

Building 111 – Administrative Offices is in failing condition due to the age and condition of the electrical and mechanical systems. Building 111 is used by administrative support staff and is considered a non-essential building to CSH. The mechanical and electrical equipment has exceeded its service life and replacement parts are no longer available for repairs. Repair costs to maintain the building in a serviceable condition for five to ten years are estimated to be \$550,597; however, if equipment failures occur before repairs are completed we understand the staff and training functions may be relocated to other CSH building, either temporarily or permanently.

Building 112 – Food Services Kitchen is in failing condition due to the age and condition of the electrical and mechanical systems. Building 112 is the central food preparation kitchen for the staff and residents at CSH. The kitchen operations are inefficient due the size of the facility and the age of the food preparation equipment. Repair costs to maintain the building in a serviceable condition for five to ten years are estimated to be \$7,549,841.

Building 113 – Administration Building is in failing condition due to the age and condition of the electrical and mechanical systems and interior water damage in the basement. Building 113 is used by administrative support staff and is considered a non-essential building to CSH. The mechanical and electrical equipment has exceeded its service life and replacement parts are no longer available for repairs. Repair costs to maintain the building in a serviceable condition for five to ten years are estimated to be \$4,711,471; however, if equipment failures occur before repairs are completed we understand the staff and training functions may be relocated to other CSH building, either temporarily or permanently.

Building 114 – Treatment Mall is used for patient care, treatment and training functions and is in fair condition. We believe Building 114 has a remaining service life of seven to ten years with continued annual maintenance and required repairs of essential equipment. Repair costs to maintain the building in a serviceable condition for five to ten years are estimated to be \$1,672,254.

Building 120 – Warehouse, the primary concern for Building 120 is the structural integrity of the exterior wall system. We understand that remedial repairs to the exterior masonry wall have not been effective in stabilizing the walls and further investigation is ongoing to determine the cause of the wall damage. There are no other facilities on site available for warehouse services. In the event Building 120 is determined to be unsafe for occupancy, we estimate the cost for outsourcing warehouse storage is \$1,393,330.

The CSH campus utility infrastructure (domestic water, fire protection, sewer and steam distribution) is original to the campus with ongoing repairs to failing service lines. Repair costs to maintain the campus utility system in a serviceable condition for five to ten years are estimated to be \$3,517,000.

The building and utilities assessment program identifies the observed condition of each building and provides a high level summary report of our findings. Included with each building is a rough order of magnitude for essential repairs to maintain the building for a period of five to ten years. In addition, we include in the building assessment report an emergency contingency fund to address immediate repairs to essential equipment in the event of component failure in support of the DBHDS Continuation of Operation Plan.

Executive Summary



Central State Hospital Building Assessments



EXECUTIVE SUMMARY

Central State Hospital (CSH) serves both the forensic and civil populations and has the only Maximum Security Forensic program within the Commonwealth. The CSH campus is made up of a variety of very old buildings that are beyond their useful life, and has the oldest patient care buildings in the Department of Behavioral Health and Developmental Services (DBHDS) system.

The DBHDS has undertaken a preplanning study to determine the scope and cost of a new replacement hospital. In conjunction with this preplanning study, this report outlines a building assessment program for existing CSH buildings essential to the operation and mission of the DBHDS. The study identifies the estimated serviceable life expectancy of the building, a rough order of magnitude cost for continued operation of the building for a period of five to ten year, and a recommended contingency budget to address the DBHDS Continuation of Operation Plan for essential equipment repairs in the event of equipment failure. The results of the assessment program are as follows:

1. The basis for the assessment program presents our finding for the overall observed condition of the facility, mechanical and electrical equipment information, functional operations of the fire alarm and life safety equipment, and information collected from maintenance records and discussions with staff maintenance personnel.
2. The average age of the essential buildings is 65 years and many of these buildings continue to operate with original equipment.
3. The recommended contingency budget established for the DBHDS Continuation of Operation Plan is \$11,310,000.
4. The recommended budget for critical equipment and life safety systems repairs to maintain the facilities for a period of five to ten years is \$37,600,000.
5. Refer to the CSH Building Assessment Rating and Critical Cost matrix on the following page for a building review summary.

CSH Building Assessment Rating and Critical Cost Projection

Bldg No	Building Use	Building Systems	Mechanical Systems	Plumbing Systems	Electrical Systems	Fire Protection Systems	Overall Rating	Contingency Up To five Years Costs (M)	Critical Five to Ten Year Cost (M)
59	Security	2	1	1	1.5	None	1.4	\$0.35	
52	Boiler Plant	2.5	0	0	2.3	4	1.8	\$1.10	\$1.50
39	Forensic	1.5	2	2.2	3.4	1.8	2.2	\$2.70	\$3.60
113	Administration	1	1.8	1.8	1.8	4.5	2.2	\$1.00	\$4.70
111	Administration	2.5	2	2.6	2.6	2	2.3	\$0.11	\$0.60
96	Housing	3	2	2	2.5	2.3	2.4	\$0.11	\$6.40
112	Food Services	3.4	2	2.6	2.7	2	2.5	\$1.20	\$7.60
120	Warehouse	3	1.5	2.4	2.5	3	2.5	\$1.40	
94	Housing	3.6	3.6	2.5	2.5	2.3	2.9	\$0.11	\$1.30
95	Housing	3.6	3.6	2.5	2.5	2.3	2.9	\$0.11	\$1.30
43	Training	3.2	2.5	2.5	3.2	3.7	3.0	\$0.11	\$2.40
51	Laundry	3.2	3.4	2.5	3	None	3.0	\$2.30	\$3.00
114	Training	3.5	4.5	3.2	3.6	4.5	3.9	\$0.11	\$1.70
Civil	Utilities							\$0.60	\$3.50
Total Project Costs									\$37.60
1	Failed Condition 0-1 Year Service Life	System/Service Function requires immediate replacement.							
2	Poor Condition 2-3 Year Service Life	System/Service Function is at the end of its service life.							
3	Fair Condition 4-6 Year Service Life	System/Service Function is nearing the end of its service life.							
4	Moderate Condition 7-9 Year Service Life	System/Service Function is est to continue working with scheduled maintenance.							
5	Good Condition 10+ Year Service Life	System/Service Function is in general good condition.							
Contingency cost covers Continuation of Operation Plan (COP).									
Contingency plan will relocate staff and building functions.									

Building

39

Maximum Security



Central State Hospital Building Assessments



BUILDING 39 – Maximum Security

Building 39 is the only maximum security forensic unit in the Commonwealth of Virginia, and it is in failing condition. Significant concerns for this facility include the heating, ventilation and air conditioning (HVAC) system, roof system, fire alarm system, and the standby electrical generator system. The facility serves approximately 110 patients and is in significant disrepair with an overall facility assessment service life of two to three years without major renovation.

We estimate the cost for essential repairs of deficient and failing building systems, life safety protection, and security systems to maintain the building for a period of five to ten years is \$3,583,818. We recommend as a minimum, a contingency fund of \$2,692,373 be allocated for emergency HVAC and electrical equipment repairs. The contingency fund shall be used to maintain the facility for its intended service and operation in the event the identified suggested critical repair work is not completed and there are essential system component failures.

The above estimates represent only critical or essential costs and do not include costs to maintain the facility for its intended use over the next ten years. Additional cost information is provided at the end of this assessment.

Building Envelope

The roof membrane system needs immediate replacement along with portions of the roof structural system due to roof membrane failure and continued water intrusion. A limited area, single-ply membrane re-roofing project on Wards 2 and 6 occurred approximately 10 to 12 years ago. The remaining roof system is an asphalt, multiple-ply built-up roofing system (BUR). The BUR is beyond its warranty and useful life span. A newer building addition is nearly 20 years old and its BUR is observed to be in poor or failing condition.

The exterior masonry system is observed to be in severe deterioration, allowing moisture to enter the building. Contributing factors to the exterior wall deterioration include:

- Old, failing roofing
- Lack of roof and coping flashing
- Lack of masonry control joints for expansion
- Improper wall design allowing water to drain into walls
- No weeps, no masonry ventilation, no base flashing for drainage
- Little or no insulation at the exterior walls
- No vapor/continuous air barrier at the exterior walls
- Existing solid masonry walls cannot dry out
- Existing original building was not designed for HVAC (needs to dry out)
- Deferred maintenance due to funding

The poor physical condition of Building 39 is jointly affected by its age, its dated construction, limited funding for maintenance, and its services for forensics patients. The housing of residents who have been determined by the judicial system to be criminally insane indicates the type of physical restraint required of this type of facility, the need to withstand severe physical abuse, and provide physical means of protection for both residents and staff. The facility interiors and exterior recreation areas reflect these conditions.



These photos depict the building's failing exterior wall conditions. The photos on the left show damaged masonry. The photos on the right show severe moisture damage.





The Resident Wards

Hard finishes are required for all resident wards: terrazzo in common areas, stained concrete in resident sleeping rooms, and full mud set ceramic tile in toilet and shower rooms. The ceilings were originally painted concrete and later remediated with glued-on 12x12 acoustic tile when air conditioning was added to the sleeping wards.

- The ceilings in the corridors of the sleeping areas do not meet code for minimum height on exit corridors. They are less than 7-feet high.
- The acoustic tile in the wards is hazardous. They contain 1 x 2-inch metal strips to align the 12 x 12-inch tile before they are glued down. These are removable when tiles are popped off and can be sharpened similar to razor blade-like devices.
- Wood door veneers are repeatedly peeled off in sleeping rooms. All doors into the resident wards and sleeping areas require replacement.
- Non-ligature door openers are difficult for residents to use if gripping. The remediation can be used for hanging.
- All tables and chairs in the group areas are bolted down to prevent violence or destruction.
- All the flooring is the original terrazzo, ceramic tile, or exposed concrete with sealer. Floor surfaces and finishes are in disrepair and in heavy travel areas are failing.
- All resident rooms have stained or sealed concrete floors due to abuse.
- All observing interior windows are wire glass, which is no longer used as fire-rated glazing due to its potential hazard when broken.
- All wire glass is covered with ¼- to ½-inch thick plastic glazing. If both types of glazing become fractured, wire glass can be used to harm staff or residents. All nurses' station observatory windows facing the resident wards require replacement of both frames and glazing systems.
- Dirty linen storage is an outdated use. Modern sanitary conditions and health code requirements state soiled linen should be removed immediately and not stored on the ward. These closets are repurposed on each ward as storage closets.

Treatment Areas

Treatment areas are available to patients on the first and second floors of the front administrative/ treatment wing of Building 39. The treatment/administration areas are newer additions/ renovations. Most of the issues involving the front administration/ treatment areas involve water intrusion at the exterior walls, exterior windows and roof; inappropriate building materials in high-use and resident areas; and transition areas not allocated for multiple residents waiting.

There are numerous roof leaks throughout the facility. The damage is evident in the suspended acoustic tiles and in the painted gypsum ceilings. In some locations the gypsum ceiling system has fallen due to the amount of moisture in the ceilings and there is a concern for mold and mildew growth.

Exterior walls in the addition were designed to have water drawn into the exterior walls and tie into the sub-grade drainage system. This design was inherently faulty by allowing water within the 2-wythe masonry walls.

- All of the 12 x 12 acoustic adhered tiles are damaged by water leaks, abuse, or popping off due to water damage. This material should be removed from any ceiling within an arm's length from a resident due to the metal strip within the tiles used for alignment.
- All walls should be painted where water leaks stained the painted walls.



- All vinyl floor tile in high traffic or resident treatment areas should be replaced with a more durable material due to damage inflicted, high traffic, or type of use.
- All terrazzo floors appear in good condition unless otherwise cracked at joints, stress area, or transitions to other floor materials. They are cracked where heavy materials have rolled over the finish.
- Newly admitted patients enter through a secure entry and wait to be processed in a holding area with observation space. Materials used in these areas need to be more durable as they may be subjected to greater damage depending on the stability of the incoming resident. All storefront doors and systems entering the west gate need replacing. Stick-built storefront systems are insubstantial for the abuse they receive.
- Wood veneer doors are inappropriate on treatment rooms. Where training or learning centers are used with staff involvement, it is more appropriate to have wood veneer doors.
- Training and relaxation rooms need different finishes to reinforce their specific use and goals. For instance, relaxation rooms, with cooler paint hues and softer finishes, are both calming and a reward for residents. They are inappropriate for day rooms, where residents congregate and are often disruptive.
- There are no waiting spaces outside the training areas for residents who are waiting their turn. Currently, they are seated in chairs in a corridor. Seating in exit egress corridors does not meet the life safety code. A nearby seating area would be beneficial.
- Painted masonry is appropriate in corridors, stairways, and high traffic areas with residents and staff. Lighter colors require more frequent painting.
- Steel doors with borrowed lights are appropriate. The glazing needs to be safety laminated or tempered glazing. The doors need to be heavy duty or extra heavy duty.
- Toilet rooms need durable materials. The ceramic tile floor, base, and walls appear in good condition and help maintain a clean environment. Toilet accessories and toilet compartments appear to be in good working order and appropriate for the spaces used.



Interior ceiling damage due to duct insulation failure



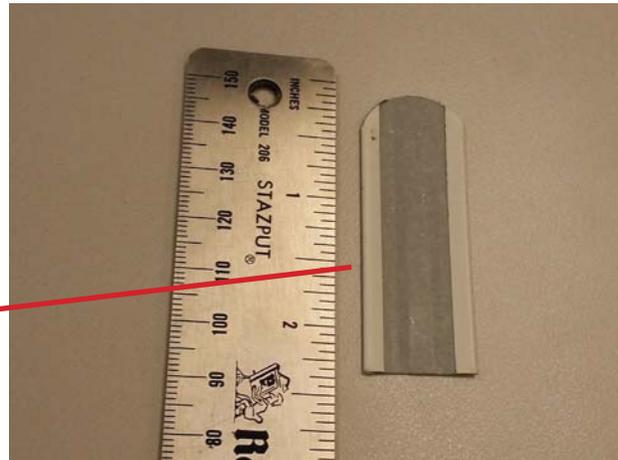
Administrative Areas

The administrative wing of the new addition is appropriately organized for support staff environments separated from the residential areas. The exterior conditions are similar to the existing for the same reasons as listed herein: water and moisture intrusion, lack of flashing, lack of masonry weeps, and an inappropriate exterior wall design that drains water to the inside of the double wythe walls. The damage to the interior finishes is evident on both the first and second floors in their finishes.

- All perimeter exterior walls require remediation for water intrusion: provide waterproofing spray 18 inches up from floor. Repaint all perimeter walls, provide new 2 x 2 carpet tiles, vinyl bases, and new 2 x 2 acoustic ceiling tiles where damaged.
- All VCT at corridors need replacing with either terrazzo or resilient rubber tile.
- All wire glass should be replaced with either tempered or laminated safety glazing.
- All offices on the second floor and within the wards require upgraded floor finishes, vinyl base, wall paint, and 2 x 2 acoustic ceiling tiles.
- All access doors within corridors need view panels or borrowed lights to identify who is on the other side of the door. Doors rated up to 1½ hours can incorporate limited area view panels.
- Wood veneer doors are appropriate in administrative offices or training rooms where residents are supervised.



Interior ceiling damage due to duct masonry failure



Close-up of metal strip in ceiling



Ceiling collapse, temporary repair, staining on temporary repair near windows



- Toilet rooms contain smaller 2 x 2 mosaic ceramic tiles, which have been displaced by repair work over time. Toilet room ceilings are sagging. We suggest updated finishes to all administrative toilet rooms to include large ceramic tiles, tile base, wainscoting, and painted wall finishes above with 2 x 2 moisture-resistant acoustic ceiling tiles.
- The sally port is noticeably out of date. Improvements include updated security monitoring, electronic releasing devices, and newer weapons detection in addition to the security wandering of individuals. The physical condition can be improved with better laminated security glazing, improved sight lines, and larger interstitial spaces between secure doors. An updated intercom/communication devices would provide better safety features for staff and visitors.
- There is a noticeable lack of waiting areas for both administrative visitors and resident visitors. There is no independent waiting in the admissions/ observation area. Administrative visitors and resident visitors need separate observation areas.

Exterior Conditions

- In addition to the existing conditions of the walls, parapets, and roofing (which have contributed to the deterioration of the existing wall), the exterior walls would have benefited from control joints with the appropriate sealants and expansion materials. The existing brick with efflorescence requires remediation. Concerns about the integrity of the existing cast stone to brick connection require further inspection.
- Replace all operable windows that are no longer operable. New exterior windows with operable, thermally broken frames and insulated tinted glazing will help improve the thermal efficiency of the exterior wall. Security screens are required on all operable resident room windows.
- When reroofing the building, the existing coping requires removing and installing flashing. An alternate solution is to provide a prefinished metal coping over the exposed existing cast stone coping.
- The roof will benefit from a more taper insulation to get rid of the ponding water.
- It will benefit the existing administration area to provide a different method to move water off the existing roof. The existing design to bring water into the 2-wythe wall is failing.
- The exterior doors, door hardware, and locking devices have reached their life of useful service to CSH. They should all be replaced with galvanized doors and frames, factory primed, and set for new security grade hardware. All locking devices should be the most secure and heaviest duty available for institution use, and should be keyed to a master system.
- Additional signage to help visitors determine the appropriate entrance and the appropriate parking lot available.

Mechanical/Plumbing Systems

Summary

HVAC serving Building 39 consist of various air handling units served by water cooled chillers and steam to hot water converters. The chilled water plant contains an ice storage system with nine ice storage tanks located on grade near the mechanical room. This system appears to be abandoned and not in use. A renovation occurred in 2001 to replace failing equipment throughout the building. The extent of this renovation appears related to maintenance of failing equipment and was undefined in the assessment. Four rooftop air handling units were replaced in 2018.



The heating water pumps appear in poor condition, with much of the piping and valves showing signs of rust and deterioration. The steam to hot water converters are past their median life expectancy and should be replaced.

Four of the six roof-top air handling units were replaced in 2018; however, the testing and balancing report performed at this time identifies the majority of the fan powered terminal boxes associated with these units are malfunctioning and not controlling properly. It is assumed that the issues found with the terminal boxes are representative of all the terminal boxes serving the building since they were all installed during the 2001 renovation. The air handling units that were replaced during this renovation in 2001 are in fair condition, but some leaks around control valves were identified.

The air handling units that were not replaced in 2001 are in poor condition and should be replaced. The eight air handling units serving the wards are installed in very small mechanical rooms that do not allow for proper clearances for maintenance access. Replacing these units in-kind may not be possible without additional modifications to the building structure to allow for required maintenance clearances. Maintenance staff noted that several of the exhaust fans are not running and have been an ongoing maintenance issue.

Much of the piping and ductwork distribution is very old and causes maintenance problems. Pin-hole sized leaks are routinely occurring in the distribution piping that must be patched to prevent water damage to other building materials. Pipe insulation in the mechanical room has corroded in some places and is missing on several runs of pipe. This results in a loss of efficiency due to heat loss from the pipe to the room air, and it poses a safety issue with exposed hot water and steam piping. It is not clear how much, if any, of the insulation contains asbestos.



Cooling tower is in failing condition, as evidenced by leaks and algae growth



Chilled water pumps show signs of rust



Below is a table summarizing the age and condition of the major equipment in the building.

Existing Equipment Age and Median Life Expectancy Based on 2015 ASHRAE Applications					
Equipment Description	Quantity	Installation Date	Median Life Expectancy (years)	Current Age (years)	Remarks
Roof Top Air Handling Units	4	2018	15	<1	--
Roof Top Air Handling Units	2	unknown	15	unknown	1
Air Handling Units	7	unknown	20	unknown	1
Air Handling Units	10	2001	20	17	--
VAV Fan Powered Terminal Boxes	52	2001	20	17	--
Exhaust Fans	46	2001	25	17	--
Water Cooled Chillers	2	2001	20	17	--
Cooling Tower	1	2001	20	17	--
Ice Storage Tanks	9	2001		17	Decommissioned
Chilled Water Pumps	8	2001	20	17	--
Condenser Water Pumps	2	2001	20	17	--
Hot Water Pumps	6	2001	20	17	--
Hot Water Converters	2	unknown	24	unknown	1
Domestic Hot Water Converters	2	unknown	24	unknown	1
Steam Condensate Pumps	2	2001	15	24	--
Remarks: Legend: 1. Equipment installed before 2001 renovation.					



Inside one of the old roof top air handling units. The end of the chilled water coil is showing signs of rust and deterioration



Hot water pumps and piping show visible signs of rust and deterioration



General Condition of HVAC Systems

Most of the major equipment is approaching its median service life and appears in poor condition. The pumps in the chiller room have excessive amounts of rust showing and the cooling tower has visible signs of scale build up and algae growth on the exterior. Several small leaks can be identified in the piping, leading to in puddles of water inside the mechanical room.

Conclusions and Recommendations

The major equipment serving the building is either approaching or beyond its median service life and may begin to fail over the next few years. With routine maintenance and repairs, it is feasible for the systems to operate for the next five years. However, after that time the major equipment may begin to fail and require excessive maintenance.

Replacing equipment in kind may not be feasible for this building due to the limited access to the air handling units as currently installed. Based on the median life expectancy and the visual inspection of equipment, a complete building renovation should take place to include replacing the distribution piping and ductwork.

Electrical Systems

Summary

The electrical systems serving Building 39 consists of a 2000A/480v/3-phase service with a 1,000kw diesel generator for life safety and stand-by power. Building 39 is served from a pad-mounted utility transformer located adjacent to the building.

Electrical Power Systems

The main electrical service equipment was replaced in the last five years and is in good condition. The 1,000kw generator appears to be in good condition; however, it was installed in 1998 and is reaching the end of its expected service life.

The distribution panels located in a basement mechanical room are older panels but are still serviceable. The damp location has started to rust the panels, which will cause problems in the near future. The telephone equipment is also located in this room and shows accelerated aging. All equipment located in this room should be moved to a service area with better environmental control.

The remaining interior electrical panels throughout the building are older panels but are still serviceable.

Conclusions and Recommendations

The electrical system of the building is in acceptable condition for the next five to ten years. At that time, the interior panels will reach the age where replacement parts will become an issue and no longer be serviceable. The emergency generator is close to the end of its serviceable



New electrical service and automatic transfer switch



Existing 1000kw diesel generator



Telephone equipment in unconditioned space



Electrical panel in basement



Typical interior electrical panel

life and requires replacement within the next four to six years. Our immediate concerns for the current electrical service are related to the potential for failure of the standby generator and the lack of a secondary connection point (plug) to allow a temporary generator setup. If there is a utility failure and the emergency generator fails, it may require several days for a replacement installation to support the building's electrical service.

Fire Alarm and Sprinkler Systems

Building Construction

Building 39 is an existing healthcare occupancy that has two stories, a basement, and is fully sprinklered. The construction is classified as Type II (222) per NFPA and is permitted to have greater than four stories per NFPA 101 Chapter 19 for a fully sprinklered building.



Fire Suppression

The building has a 6-inch incoming fire line located in the basement that is transitioned to a 4-inch sprinkler pipe that feeds the buildings sprinkler system. The building sprinkler system is provided with a post indicator valve (PIV) on the fire line and a fire department connection (FDC) on the front of the building to allow the fire department to provide additional water and pressure for the sprinkler system. The building is also provided with a preaction sprinkler system serving the elevator machine room. The sprinklers are quick response. The fire suppression system is in good working order and capable of being serviced for the next 10 years.

Fire Alarm

The building is also provided with a fire alarm system. The fire alarm control panel is a Simplex 4100U. The current system monitors smoke detectors for the elevator machine room and lobbies, pull stations, smoke detectors at doors in the smoke barriers, and powers the horns and strobes. The fire alarm system also monitors the sprinkler system flow and tamper switches, as well as, the preaction system. The fire alarm system reports to the Public Safety Office (located at Building 59) via a transceiver. The fire alarm system is in failing condition and requires replacement. We understand the fire alarm system continuously identifies alarms throughout the building without cause.

Egress

The building is provided with corridors that meet the minimum 48-inch requirement. The doors and stairs also meet the minimum requirement of 32 inches. Additionally, the areas throughout the building are provided with a minimum of two means of egress.

Building Construction Cost Estimates

Included with each building assessment is a construction cost estimate for essential repairs of deficient and failing building systems, life safety protection and security systems to maintain the building for a period of five to ten years. We include two levels of cost estimates.

Level 1: Repair and/or replacement of essential materials, equipment systems and code deficiencies that in the event of failure would render the building non fictional for its intended use within five to ten years.

Level 2: Identifies a contingency repair or replacement fund to address costs for an ongoing maintenance and repairs program with a plan to continue building operations for three to five years with only short term primary services outages. In some cases the options under the level three estimate is to relocate patients and staff to other buildings for short term or long term durations.

PHYSICAL CONDITIONS AND AREA LIST - CRITICAL FIVE TO TEN YEARS

Physical Material Condition Escalated to 6/1/2021 Comments

Bldg number	Area (SF)	Material description (generic type)	Unit Cost (\$USD)	Contract Cost (\$USD)	System Failure Within Two to Five Years Likely	Comments
Bldg 39	1	Fire Alarm/Smoke/Panels Replacement	\$ 459,190.00	\$459,190		Fire alarm life safety systems requires replacement due to age and the number of false alarms. False alarms are medically detrimental to the patient population.
Bldg 39	1	1000 Kw Diesel Generator	\$ 668,583.63	\$668,584		The emergency generator is in failing condition. The generator supports the life safety and security systems for the facility.
Bldg 39	62,050	HVAC System Replacement	\$ 25.05	\$1,554,353		The heating and cooling systems are failing and require replacement. We estimate 50% of units to fail within two years. Costs include building repairs and building code compliance associated with the replacement.
Bldg 39	1	Equipment Connections	\$ 5,744.31	\$5,744		Temporary electrical, heating and cooling connections are required for connection of modular equipment if the facility experiences equipment failures.
Bldg 39		Base Construction Cost Escalated		\$2,687,870		
Bldg 39		<i>Soft Costs (25%) Total Project Costs</i>		<i>\$895,948</i>		
Bldg 39		Total Project Cost		\$3,583,818		

PHYSICAL CONDITIONS AND AREA LIST - CONTINGENCY UP TO FIVE YEARS

Physical Material Condition Escalated to 6/1/2021 Comments

Bldg number	Area (SF)	Material description (generic type)	Unit Cost (\$USD)	Contract Cost (\$USD)	System Failure Within Two to Five Years Likely
Bldg 39	124,105	Fire alarm / damper	\$ 3.70	\$459,189	Fire alarm life safety systems requires replacement due to age and the number of false alarms. False alarms are detrimental to the patient population.
Bldg 39	62,050	HVAC	\$ 25.05	\$1,554,353	The heating and cooling systems are failing and require replacement. We estimate 50% of units to fail within two years. Costs include building repairs and building code compliance associated with the replacement.
Bldg 39	1	MEP connections	\$ 5,744.00	\$5,744	Temporary electrical, heating and cooling connections are required for connection of modular equipment if the facility experiences equipment failures.
Bldg 39		Base Construction Cost Escalated		\$2,019,285	
Bldg 39		<i>Soft Costs (25%) Total Project Costs</i>		<i>\$673,088</i>	
Bldg 39		Total Project Cost		\$2,692,373	

Building

43

Training/Administration



Central State Hospital Building Assessments



BUILDING 43 – Training/Administration

Building 43 is one of the earlier buildings on the hospital campus, dating back to 1939. The building is used for training and administrative activities, but it is in failing condition. It has an overall facility assessment service life of four to six years without major renovation.

We estimate the cost for essential repairs of deficient and failing building systems, life safety protection and security systems to maintain the building for a period of five to ten years is \$2,405,033. We recommend as a minimum, a contingency fund of \$106,666 be allocated for staff relocation in the event there are essential system component failures and repair or replacement work is not completed or feasible.

The above estimates represent only critical or essential costs and do not include costs to maintain the facility for its intended use over the next ten years. Additional cost information is provided at the end of this assessment.

Built in the late 1930s, the Art Deco design features cast stone details, window brick molding, brick banding, and a cast stone basement facade. It is unique with its open area porches that were originally designed to provide its residents with access to healthful, open air and the exterior environment. It was originally designed as a two-story building with walk-out basement access for services and its three distinct patient wards separated by a central core. It is also unique for its method of providing steam heat to resident wards through half-height partitions containing steam pipes which open at the top, above five feet, and provide heat to residents.



Building exterior, abandoned second floor

The facility has outlived its innovative design and has seen numerous remodels over its lifetime for the heating and cooling systems and occupancies. The heating design has been updated to a heat pump and window unit system presumably due to the age of the utilities serving this building and the high cost in maintaining these systems. The building no longer houses patients and strictly contains administrative staff, trainers, psychologists, and support tenants. The building received a new roof system in 2004 with a ten year remaining service warranty. The roof deck was completely replaced with metal pan roofing, rigid insulation, tapered insulation, and key roofing material and flashing. The front entrance and all copings were revised with an appropriate prefinished metal coping and panel system. It appears appropriate to the overall 1930s design of the building. The entire second floor was gutted and completely available for rehabilitation.



Building exterior, abandoned second floor



The facility is not ADA compliant. It does not have building-accessible ramps, ADA-compliant hardware, elevators, stairs with areas of refuge, or a security system. There are pull stations and an existing fire alarm system within the building.

Building Rehabilitation for Continued Use

Rehabilitating this building requires extensive work on all major building systems and compliance with the Virginia Uniform Statewide Building Code and the Virginia Rehabilitation Code. The more areas affected by new work, the more stringent the compliance to the most recent code. The roof and exterior condition of the building is observed to be in fair to good condition and therefore it is reasonable to consider moderate renovation for a continued use of eight to ten years. A longer period of time will require a more significant renovation plan and may not be feasible at this time.

- Accessible parking, accessible path to an accessible entrance
- A code-compliant sized elevator to serve the basement, first, and second floors
- Additional insulation and air barrier at the inside face of the exterior wall where possible
- Replacement of all operable wood windows with energy-efficient, operable prefinished windows with insulated glazing panels in the entire second floor
- Updated communication, electrical, and HVAC services
- Upgraded exterior lighting and security; the rear fence is easily entered
- Install rails or screens at the open air porches
- Existing cast stone basement surfaces, and brick masonry requires cleaning and removal of moss and algae
- Existing sidewalks, cast stone surfaces, and poured concrete walls require repair to spalling surfaces and cracked concrete masonry
- Replacement of all exterior doors and door hardware

Interior Conditions

Various administrative departments have been housed in Building 43. Its former patient wards have been reasonably transformed in the basement and first floor to separate suites in each wing.

The central core serves as stair access, and each suite has an exit access stair at the farthest end for direct exit to the exterior.

The stairs are old and do not meet the current code for handrails, rise and run limitations. However, they are reasonably safe and still have steam heat. They all have natural daylighting. All stairs need to be refurbished and require HVAC.

Ceilings in the basement include adhered 12x12 tiles, painted concrete, or gypsum. Piping, conduits, and communication conduits are exposed. The lights are surface mounted or suspended. Existing ceiling fans are in use. IT cabling is exposed in the CSH-controlled areas.

Ceilings in the tenant areas are 2x2 suspended ceiling tile and grid. All lights are troffer style lights with wall-mounted emergency egress light. HVAC vents are grid mounted and all cabling and conduits are concealed. The walls are painted gypsum with a central corridor aligning with the previous central access of the former patient wards.



The doors in the tenant areas are 20 minute rated wood veneer doors with appropriate ADA-compliant lever handles. All interior doors have 36-inch clear passage. Egress doors have exit lighting and signage. There is UL-compliant flush panic hardware at each exit on the corridor.

The first floor rehabilitations vary per each wing in compliance with current codes. Being used as office space, some of the existing administrative offices have panic hardware at the exits. Emergency corridor lights, directional lighted signs, fire station pulls, and fire alarms are not evident in one corridor but exist in another. The lighted exit signs, fire alarm strobes, and fire extinguishers are existing.

Wood veneer doors are used throughout the first floor on each wing, but not all doors are 20-minute compliant doors.

The first floor central suite is an open office suite that adapted the location of half height walls to revised full height partitions between offices similar to cubicle design without doors. The suite is closed with an exit egress stair at the end with exit signs and fire strobes.

All ceilings and lights in the first floor suites are suspended 2x2 acoustic ceiling tiles with troffer lights.

All carpeted flooring is in the suites, with the exception of the central core, one entrance area, and one central corridor within one suite, all of which are small, 1x2 mosaic ceramic tiles.

All toilet rooms, except those in the tenant space, have mismatched 1x2 mosaic tile floor remaining from the original installation and are mismatched after the many repairs and alterations.

Lavatories, accessories, and toilet fixtures appear to somewhat updated in various locations. Many of the existing walls are painted CMU masonry. Chases have been rebuilt of gypsum board and stud construction for wall hung toilet fixtures in gang toilets.



Second floor space

Second Floor

The second floor of Building 43 is not occupied and appears to be partially gutted with a great deal of the renovation construction abandoned in place. Two of the wards still have the remaining half walls in place. Some of the steam piping has been removed and some of the doors along the main corridor remain. Original marble/granite toilet and shower partitions remain. Some of the lavatories



and toilets have been removed. All of the glazed block at the toilets, shower rooms, half-height steam access walls, and at the perimeter of each ward remain.

The existing masonry walls stop short of the structure and have plaster and lath from top of the masonry to within 2 feet of the new steel roof deck above. There is no existing ceiling remaining in any of the second floor wards except at the end stairs.

The majority of the second floor windows are still in place and are boarded up. All operable windows require demolition and replacement with operable thermally broken windows frames with energy efficient insulated glazing panels.

All of the glazed CMU masonry needs to be covered with insulation and finished with gypsum wallboard, studs, and paint.

A thorough evaluation of possible lead paint, asbestos, and air quality issues should be performed if not already documented by the facility. Remediation of possible asbestos mastic and other contaminants should be anticipated.

All existing mosaic tile floors should be removed and disposed for future work.

All toilet rooms should be demolished entirely. All existing marble slabs should be recycled.

All existing abandoned electrical wire, conduits, and outdated electrical boxes should be removed and replaced. The relocation of electrical services should be considered for access and security.

All flooring should be abraded and resurfaced with leveling compounds. All divisions between possible suites should be removed and rebuilt as code-compliant 1-hour smoke partitions or as designated by the building official's interpretation of the current Virginia Rehabilitation Code.

Fire alarm services and emergency lighting should be provided to the second floor for future rehabilitation and possible fit-out.

Core Functions, Accessibility, and Vertical Areas

The existing building does not meet current code for accessibility, stair access, smoke or fire resistance in the central core. The existing toilets do not meet any of the current codes. There could be possible lead paint on all of the existing second floor windows and possible asbestos floating around after the steel deck replacement. The corridor walls do not extend to the deck.

All core walls on the central corridor and adjoining the stair should be extended with gypsum board to the underside of the deck for code compliance for 1-hour rated corridor walls.

All stairs should be further evaluated for compliance to current code. Possible handrail replacement, nosing, and tread non-slip materials and clearances may require minor construction. Emergency lighting levels should be evaluated.

The central monumental stair will require remodeling for access requirements. It is not a completely enclosed stair and has space limitations for compliance. Further investigation and evaluation for possible remediation is required.

Consider future sprinkling of the entire building and adding an elevator to serve all three floors.

Some of the service rooms directly off the corridor may have other uses since the services for treatment centers or ward buildings are no longer needed.



All central corridor doors should be replaced with UL rated doors, frames, and compliant door hardware. Toilet rooms on the corridor should be completely replaced with code-compliant fixtures and toilet accessories for accessibility. All toilet rooms require durable finishes and sustainable features. Access to service panels should be secured in code-compliant closets with master keyed lockable doors.



Electrical panels on the second floor

Exterior Conditions

The existing roof, roof deck, and some of the structural members were replaced due to condition in 2004. The roofing is a key roof system with a 25-year warranty. The roof is in good shape. One roof drain needed to be unclogged, but otherwise the roof drained as designed. Portions of the existing exterior have condition issues that need addressing but can remain functional for some time.

Some of the exterior cast concrete walls and lintels need crack repairs. One or more precast lintels or sill may require repair or replacement.

Some of the exterior brick is experiencing efflorescence from previous delayed maintenance. Consider possible cleaning and closer examination to determine any serious damage. Brick repointing and flashing may be recommended.

All open porches need new framed insect screens and fall protection. All porches need the drains cleaned out, the flooring replaced, exposed concrete ceiling painted, and lighting improved.

There is little or no security lighting, cameras or monitoring of this building. The fence is easily accessed from the exterior.

There is no code-compliant ramp to this building from the basement or first floor. There is no code-compliant accessible parking or path of ingress to the building.

There is limited signage directing staff or visitors to the appropriate entrance.



We observed no immediate fire plugs or fire lane access although there is clear space completely around the facility.

Mechanical/Plumbing Systems

Summary

The HVAC systems serving Building 43 consist of split system heat pumps and window air conditioner units. Five heat pumps are located on grade along the building with the air handling units located in the ceiling plenum of the first floor. Outside air is ducted from various rooms around the building containing window air conditioners. The second floor is abandoned with no operable heating or cooling systems.

General Condition of HVAC Systems

The ages of the heat pumps vary from six to 21 years old. Since outside air is ducted directly to the return for each air handling unit, humidity in the space continually fluctuates as the heat pumps turn on and off resulting in poor indoor air quality throughout the building. Furthermore, it is suspected that ventilation rates are lower than the code-required values for the spaces served.



Indoor air handling unit located in ceiling plenum



Heat pumps and window air conditioner

Conclusions and Recommendations

The two heat pumps that are 21 years old should be replaced within the next few years to prevent unexpected periods without heating and cooling. When these units are replaced, ventilation rates should be verified and adjusted to meet current codes. Due to the simplicity and decentralization of the HVAC systems for this building, window units and heat pumps could be replaced as they approach their median life expectancy to keep the building operational. Without an upgrade to a commercial HVAC system such as a variable air volume system or the addition of a dedicated outdoor air system, the building will continue to suffer from poor indoor air quality with fluctuating levels of humidity.



Below is a table summarizing the age and condition of the major equipment in the building.

Existing Equipment Age and Median Life Expectancy Based on 2015 ASHRAE Applications				
Equipment Description	Quantity	Installation Date	Median Life Expectancy (years)	Current Age (years)
Heat Pump	1	2010	15	8
Heat Pump	1	2011	15	7
Heat Pump	1	1997	15	21
Heat Pump	1	1997	15	21
Heat Pump	1	2012	15	6
Window Air Conditioners	16	Various	10	Various

Electrical Systems

Summary

The electrical systems serving Building 43 consist of a 1200A/208v/3 phase service with a 300kw diesel generator for life safety and stand-by power. The building is served from a pad-mounted utility transformer located adjacent to the building.

Electrical Power Systems

The main electrical service equipment has been replaced in the last five years and is in good condition. The existing 300kw diesel generator was installed in 2007 and is in good working condition.

Most of the interior panels are in good condition. A couple of panels have passed their serviceable life and replacement parts can no longer be found. If there is a failure, it will take several days to replace these panels.

In some panels, the new service entrance cabling is spliced directly to the existing wire cable system resulting in the new service relying on the old interior wire cable for distribution service. The distribution wire is observed to be original to the building and therefore has reached the end of its serviceable life.

Conclusions and Recommendations

The electrical service primary equipment is in acceptable condition. Some interior panels and wiring are no longer serviceable and may cause outages in parts of the building for days. There is no secondary connection point in the electrical system to allow a temporary generator to be connected to the electrical system. If there is a utility failure and the stand-by generator was to fail, it would require several days to disconnect the existing generator and connect the temporary generator to the existing electrical system.



New electrical service main panel



New automatic transfer switches



Existing 300kw diesel generator



Interior distribution panels



Interior distribution panels



Interior distribution panels/interior wiring



Fire Alarm and Sprinkler Systems

Building Construction

Building 43 is an existing business occupancy that has two stories with a basement and is not sprinklered. The construction is classified as Type II (000) per NFPA. There are no minimum construction requirements for this occupancy type per NFPA 101.

Fire Suppression

The building is not provided with fire suppression and is not required to be per the construction type, occupancy, and height and area.

Fire Alarm

The building is provided with a fire alarm system. The existing system has a Simplex 4010 fire alarm control panel. The current system monitors a smoke detector at the panel, pull stations and powers the horns and strobes. The fire alarm system reports to the Public Safety Office (located at Building 59) via a transceiver. The fire alarm system is in good working order and capable of being serviced for the next 10 years.

Egress

The building is provided with corridors that meet the minimum 44-inch requirement. The doors and stairs also meet the minimum requirement of 32 inches. Additionally, the areas throughout the building are provided with a minimum of two means of egress.

Building Construction Cost Estimates

Included with each building assessment is a construction cost estimate for essential repairs of deficient and failing building systems, life safety protection and security systems to maintain the building for a period of five to ten years. We include two levels of cost estimates.

Level 1: Repair and/or replacement of essential materials, equipment systems and code deficiencies that in the event of failure would render the building non functional for its intended use within five to ten years.

Level 2: Identifies a contingency repair or replacement fund to address costs for an ongoing maintenance and repairs program with a plan to continue building operations for three to five years with only short term primary services outages. In some cases the options under the level three estimate is to relocate patients and staff to other buildings for short term or long term durations.

PHYSICAL CONDITIONS AND AREA LIST - CRITICAL FIVE TO TEN YEARS

Physical Material Condition		Escalated to 6/1/2021		Comments	
Bldg number	Area (SF)	Material description (generic type)	Unit Cost (\$USD)	Contract Cost (\$USD)	System Failure Within Two to Five Years Likely
Bldg 43	2	New Heat Pumps	\$187,918.94	\$375,838	Mechanical equipment is past is serviceable life and requires replacement.
Bldg 43	50,630	HVAC System Replacement	\$28.09	\$1,422,197	Mechanical equipment is past is serviceable life and requires replacement. Costs include equipment replacement, system hydronic piping and architectural feature replacement due to equipment work.
Bldg 43	1	Generator Secondary Connection Point	\$5,744.31	\$5,744	Temporary electrical, heating and cooling connections are required for connection of modular equipment if the facility experiences equipment failures.
Bldg 43		Base Construction Cost Escalated		\$1,803,779	
Bldg 43		<i>Soft Costs (25%) Total Project Costs</i>		<i>\$601,254</i>	
Bldg 43		Total Project Cost		\$2,405,033	

PHYSICAL CONDITIONS AND AREA LIST - CONTINGENCY UP TO FIVE YEARS

Physical Material Condition		Escalated to 6/1/2021		Comments	
Bldg number	Area (SF)	Material description (generic type)	Unit Cost (\$USD)	Contract Cost (\$USD)	System Failure Within Two to Five Years Likely
Bldg 43	1	Move staff to other admin	\$80,000.00	\$80,000	
Bldg 43		Base Construction Cost Escalated		\$80,000	
Bldg 43		<i>Soft Costs (25%) Total Project Costs</i>		<i>\$26,666</i>	
Bldg 43		Total Project Cost		\$106,666	

Building

51

Laundry



Central State Hospital Building Assessments



BUILDING 51 - LAUNDRY

Building 51 is currently being used as the Central State Hospital laundry and is an essential facility for the Department of Behavioral Health and Developmental Services (DBHDS) operation at other sites. Building 51 provides laundry service to Piedmont Geriatric Hospital, Hiram Davis Medical Center and the Virginia Center for Behavioral Rehabilitation. We observed the facility to be in fair condition. Moderate repairs or replacement of the primary building systems are required for the building to remain in operation.

Due to the condition of the major building components and systems, the overall facility assessment service life is four to six years without major renovations. We estimate the cost for essential repairs of deficient and failing building systems, life safety protection and security systems to maintain the building for a period of five to ten years is \$2,976,342. If the repairs are not completed, we recommend the DBHDS initiate a contingency contract plan for out sourcing laundry services and appropriate \$2,266,661 for a five year contract.

The above estimates represent only critical or essential costs and do not include costs to maintain the facility for its intended use over the next ten years. Additional cost information is provided at the end of this assessment.

Building Summary

The existing building is a single story, rectangle-shaped masonry and concrete building with basement. This building was originally built in 1952 and has had a series of additions and renovations over the years. The major addition was constructed in 1973. This building has a flat roof and has a raised clerestory section in the middle of the building to provide daylighting into the building. Building height is approximately 24 feet from the main floor level to the high clerestory roof. Building height is approximately 14 feet from the main floor level to the main roof. The building's exterior windows appear to be original to the building construction and additions. All the exterior windows need to be replaced given their age and condition. Thermally efficient windows and glazing are recommended for the replacement. Exterior doors are hollow metal.

The original drawings indicate the main floor area is approximately 11,630 SF and the loading dock area is approximately 225 SF. The building is located next to the campus boiler plant with the building loading dock and parking facing north.

The building is noncombustible. The original building is Construction Type IIA with cast-in-place concrete construction for the columns, beams and roof decking. The building addition would be considered a Construction Type IIB. Overall, the building Construction Type would be classed as Type IIB given the less stringent of the two apparent construction types. The building does not contain sprinklers.

The building has a low slope (flat) roof over the cast-in-place and metal deck decking. The roof is a single-ply membrane roofing over rigid insulation that appears to be in good condition. The exterior metal wall flashing appears to be original and re-used for the previously installed roof. The main roof is served by internal roof drains. The high roof is served by gutter and downspouts that drain to the main roof and splash-blocks.

The building has primarily concrete foundations per the original drawings. The exterior walls are masonry containing brick veneer and a concrete masonry unit (CMU) backup wall that is exposed to the interior of the building. The cast-in-place concrete construction (columns and beams are exposed to the exterior). The interior walls are CMU construction. The main floors are exposed sealed concrete. The existing building has a ramp to the main floor level and the building has



some disability accommodations but would not be considered fully compliant with current ADA compliance standards.

The restroom facilities are currently not ADA compliant and should be refurbished with new finishes. The toilet fixtures and toilet accessories should be replaced. It is also recommended that a new handicap unisex toilet room be provided.

Interior Conditions

The following items were observed to be in poor or failing condition:

- All interior walls need scraping, patching, and painting.
- Retain the existing toilet rooms but replace all plumbing fixtures, accessories, and services. Provide a new ADA-compliant unisex toilet room near or adjacent to the existing toilet rooms to limit demolition and required new work, especially water and sanitary piping.
- Replace all existing toilet room finishes and paint the walls.
- Replace the existing mezzanine railing with OSHA-compliant railing with “toe” plates.
- Relocate the interior ladder to the roof and replace with a new OSHA-compliant and easily accessed ladder.

Existing Interiors

The exterior main structure and wall assemblies are in good condition. Most of the corrections should be considered regular maintenance items. We observed the following exterior conditions that will need to be addressed:

- The existing exterior hollow metal passage doors appear to be original construction and are in poor condition. We recommend that these doors be replaced and not repaired. The new doors should be heavy-duty hollow doors/frames and hardware.
- All the exterior windows need to be replaced given their age and condition. Thermally efficient windows, frames, and glazing are recommended for this replacement.
- The existing black, single-ply flat roof is in good condition and will not need to be replaced at this time. The existing metal fascia/coping, metal gutters, and downspouts are in fair to good condition and only need to be replaced when any new roofing is considered.
- Exterior railings should be replaced with new code-compliant railing.
- Many areas of the existing exterior brickwork has to be repaired and/or repointed. These areas allow water intrusion and will continue to worsen over time due to the freeze/thaw yearly occurrence.
- Although limited, some efflorescence is evident in the existing brickwork. This should be removed. Efflorescence is caused by water intrusion and leaching through the brick.
- The brick masonry and the concrete walls show staining from algae, mold, or landscaping.

Mechanical/Plumbing Systems

Summary

The HVAC systems serving Building 51 consist of a roof top unit, duct-mounted cooling coils, exhaust fans, and unit heaters. Before 2003, two heating and ventilating units provided 100% outside air to the building and used steam heating coils. In 2003, these units were removed and replaced



with duct-mounted steam coils. On the exterior side of the wall, the intake louvers were removed and the ductwork was extended and provided with duct-mounted cooling coils. These cooling coils are served by two condensing units, one located on the roof and the other on grade. A rooftop air handling unit was installed and ducted to the new duct-mounted cooling coils. A return duct from the space was routed above the roof to the return side of the new air handler.

The roof-mounted heating and ventilating unit serving the area behind the washers is no longer operating and has been abandoned in place.

The break room is served by a split system heat pump with auxiliary electric heat. The heat pump is located on the roof.

A steam to hot water converter is located in the basement to provide domestic hot water for the facility.

General Condition of HVAC Systems

The HVAC systems were renovated within the past 15 years and appear in fair condition. The refrigerant piping between the condensing unit and the duct-mounted cooling coils are in poor condition and show signs of rust and deterioration. The refrigerant pipe insulation is damaged and missing in multiple locations. The heat pump and various exhaust fans are also past their median life expectancy.



Duct-mounted steam coils



Refrigerant piping on roof

Conclusions and Recommendations

The building should be able to operate without major renovations for the next six years with routine maintenance and repairs. The refrigerant piping should be further inspected and insulation repaired to ensure continued reliability and prevent the risk of leaks. The heat pump serving the break room is beyond its useful life and should be replaced within the next five years.



Below is a table summarizing the age and condition of the major equipment in the building.

Existing Equipment Age and Median Life Expectancy Based on 2015 ASHRAE Applications				
Equipment Description	Quantity	Installation Date	Median Life Expectancy (years)	Current Age (years)
Roof Top Air Handling Unit	1	2003	20	15
Duct-Mounted Cooling Coil and Condensing Units	2	2003	20	15
Duct-Mounted Steam Coils	2	2003	20	15
Heat Pump	1	1994	15	24
Exhaust Fans	6	1986	25	32
Steam to Domestic Hot Water Converter	2	2004	24	14

Electrical Systems

Summary

The electrical systems serving Building 51 consist of a 1000A/208v/3 phase service with a 1000kw diesel generator for standby power. The building is served from pole-mounted utility transformers

General Condition of Electrical Systems

The main electrical service equipment is in good condition but will reach the end of its serviceable life in the next five to ten years.



Existing electrical service



Pole mounted utility transformers



Most of the interior distribution panels have reached the end of their serviceable life and replacement parts are no longer available.



Existing interior distribution panels

The distribution panels located in the basement mechanical room are older panels but are still serviceable. The damp location has started to rust the panels, which will cause problems in the near future. The telephone equipment is also located in this room and is showing sign of age and should not be in a damp location.

The interior lighting system does not meet today's emergency egress lighting requirements. Additional battery egress fixtures should be added to the main working areas.



Building interior lighting system

Conclusions and Recommendations

The electrical service primary equipment is in acceptable condition. Some interior panels and wiring are no longer serviceable and may cause outages in parts of the building for days. There is no secondary connection point in the electrical system to allow a temporary generator to be connected to the electrical system. If there is a utility failure and the stand-by generator was to fail, it would require several days to disconnect the existing generator and connect the temporary generator to the existing electrical system.

Fire Alarm and Sprinkler Systems

Building Construction

Building 51 is an existing industrial occupancy that has one story without a basement and is not sprinklered. The construction is classified as Type I (332) per NFPA. There are no minimum construction requirements for this occupancy type per NFPA 101. Fire Suppression.



Fire Suppression

The building is not provided with fire suppression and is not required to be per the construction type, occupancy, and height and area.

Fire Alarm

The building is also not provided with a fire alarm system.

Egress

The building is provided with doors and stairs that meet the minimum requirement of 32 inches. Additionally, the areas throughout the building are provided with a minimum of two means of egress.

Building Construction Cost Estimates

Included with each building assessment is a construction cost estimate for essential repairs of deficient and failing building systems, life safety protection and security systems to maintain the building for a period of five to ten years. We include two levels of cost estimates.

Level 1: Repair and/or replacement of essential materials, equipment systems and code deficiencies that in the event of failure would render the building non functional for its intended use within five to ten years.

Level 2: Identifies a contingency repair or replacement fund to address costs for an ongoing maintenance and repairs program with a plan to continue building operations for three to five years with only short term primary services outages. In some cases the options under the level three estimate is to relocate patients and staff to other buildings for short term or long term durations.

PHYSICAL CONDITIONS AND AREA LIST - CRITICAL FIVE TO TEN YEARS

Physical Material Condition Escalated to 6/1/2021 Comments

Bldg number	Area Material description (SF) (generic type)	Unit Cost (\$USD)	Contract Cost (\$USD)	System Failure Within Two to Five Years Likely
Bldg 51	11,630 HVAC System Replacement	\$93.63	\$1,088,916.90	Mechanical equipment is past is serviceable life and requires replacement. Costs include equipment replacement, system hydronic piping and architectural feature replacement due to equipment work.
Bldg 51	11,630 Electrical System Replacement	\$98.31	\$1,143,345.30	Electrical equipment is past is serviceable life and requires replacement. Costs include equipment replacement and temporary service connections.
Bldg 51	Base Construction Cost Escalated		\$2,232,262	
Bldg 51	<i>Soft Costs (25%) Total Project Costs</i>		<i>\$744,080</i>	
Bldg 51	Total Project Cost		\$2,976,342	

PHYSICAL CONDITIONS AND AREA LIST - CONTINGENCY UP TO FIVE YEARS

Physical Material Condition **Escalated to 6/1/2021** **Comments**

Bldg number	Area Material description (SF) (generic type)	Unit Cost (\$USD)	Contract Cost (\$USD)	Comments
Bldg 51	1 Outsource Laundry Service One Year (1.7M Pounds Annually)	\$1,700,000.00	\$1,700,000.00	System Failure Within Two to Five Years Likely
Bldg 51	Base Construction Cost Escalated		\$1,700,000	
Bldg 51	<i>Soft Costs (25%) Total Project Costs</i>		<i>\$566,661</i>	
Bldg 51	Total Project Cost		\$2,266,661	

Building

52

Boiler Plant



Central State Hospital Building Assessments



BUILDING 52 – BOILER PLANT

Building 52 is the main steam heating plant for the hospital campus and it is in poor condition. Moderate repairs to or replacement of the primary building systems are required for the building to remain in operation. The four boilers and associated boiler equipment are in failing condition and require extensive repair and replacement of the boiler control system and major equipment components. Failure of the boiler controls system and possible shut down of the boilers operations will stop all steam heating on the campus. The building is currently not occupied and boiler supervision is contracted to a private contractor.

Due to the condition of the major building components, systems, and boiler equipment, the overall facility assessment service life is one to two years without major renovations. We estimate the cost for essential repairs of deficient and failing building systems, boiler equipment, life safety protection and security systems to maintain the building for a period of five to ten years is \$1,464,696. We recommend as a minimum, a contingency fund of \$1,089,113 be allocated for emergency boiler equipment and electrical equipment repairs. The contingency fund shall be used to maintain the facility for its intended service and operation in the event the identified suggested critical repair work is not completed and there are essential system component failures.

The above estimates represent only critical or essential costs and do not include costs to maintain the facility for its intended use over the next ten years. Additional cost information is provided at the end of this assessment.

Building Summary

The existing 15,610 SF building is a multi-story masonry building that includes the main boiler operations floor, a full basement, second floor equipment mezzanine, and an abandoned coal conveyor service mezzanine. This building was originally built in 1952 with multiple levels of flat roofs over the office and administrative areas, the main area of the boiler plant floor, and the tallest in the raised area adjacent to a conveyor area. The building has multiple pivot-type exterior windows throughout the building that were observed to be used for ventilation. The exterior doors are painted rail and style type wood doors with clear, single-pane vision glass in steel frames. The exterior loading dock doors are existing motor-operated, metal coiling doors on the main floor. The basement has old overhead sliding doors with manual operation.

The building is noncombustible, construction type IIB with a low slope (flat) roofs, steel columns and roof structure, and cast concrete floor slabs and foundations walls. The building does not contain sprinklers. The building does have emergency strobe lights, exit lights and fire alarm pull stations, but no notification systems. The exterior walls are solid brick masonry and is exposed to the interior of the building. The interior walls are mostly painted brick or painted concrete masonry units (CMU). The main floors are sealed concrete, and the administrative and toilet areas are painted concrete. There are both men's and women's single toilet and shower facilities. The existing building is not considered accessible for the disabled.

The existing built-up roof is failing or has failed. There is evidence of many patching and flashing repairs over the years. There is no evidence of flashing under any of the existing precast concrete copings around the perimeter of every level of roof. There is old, through-wall copper counter flashing over aged, roofing base flashing. All the existing windows above the roof indicate rusted steel lintels and water damage around the heads and sills. Bricks between windows and below the scuppers indicate the worst efflorescence and water damage, but is not limited to just these areas. It is extremely visible around all of the louver on both interior and exterior faces. The results include



heavy, dark, black mold formations, rusting steel, and stained concrete and brick. All of the boiler stacks require immediate repairs for leaking around the roof penetrations.

We recommend replacing the existing exterior coiling doors with new, heavy-duty, and energy-efficient coiling doors and new operators and controls. The exterior concrete retaining walls to access the basement show severe staining and cracking. All exterior wood stile and panel doors need to be replaced with insulated metal doors with tempered glazing. All of the exterior pivot windows need to be replaced with more energy efficient windows with tinted glazing.

We recommend providing a new exterior ADA-compliant access into the existing facility via a new ramp or lift. Accessible parking, an accessible route, and accessible toilet facilities should also be provided.

Interior Conditions

This building needs maintenance to its interior finishes and systems. All interior walls need scraping, patching, and painting.

- Scrape, patch, and paint all interior walls.
- Retain the existing toilet rooms; however, replace all plumbing fixtures, accessories, and services. Provide a new handicap unisex toilet room near or adjacent to the existing toilet rooms to limit demolition and required new work especially water and sanitary piping.
- Replace all existing toilet room finishes and paint the walls.
- Replace the existing mezzanine railing with OSHA-compliant railing with toe plates.
- Relocate the interior ladder to the roof and replace with one that is OSHA-compliant and easily accessed. There is no safety cage above 6 feet. There is no access to the front facing, lower roofs from either the interior or from the highest roof above. The rear lower roof can be accessed from the catwalks, ships ladder, and an exterior door.

Exterior Conditions

The exterior condition of this building is observed to be poor due to the extent of the masonry and roof systems deterioration. We observed the following exterior conditions:

- The existing exterior wood stile and rail doors with single-pane, non-safety glass appear to be original and are currently functional. We recommend replacing these doors with heavy-duty insulated hollow metal doors and hardware. All of the door hardware requires replacement for security, energy efficiency, and continued access.
- Although mostly functioning, the existing exterior pivot windows should be replaced with new energy-efficient units.
- The existing ballasted built-up asphalt roof is in poor condition and will need to be replaced. A new, heavy-duty, single-ply white EPDM roof should be installed. White roof material will greatly improve the mechanical system's efficiency.
- With the new roof, the all-metal and membrane flashing will need to be replaced. A prefinished metal coping should be provided to divert water penetration at the coping top. The existing metal roof drains and lined overflow scuppers need to be replaced.
- New rooftop mechanical equipment curbs and roof access hatch should be replaced with the new roof installation. New walkway pads are also recommended to be replaced. All rooftop penetrations will need to be replaced with the new roof installation.



- While existing exterior brickwork may be repaired and/or repointed, it would be less costly to build a new masonry wall with proper flashing, construction joints, expansion joints, brick vents, and weeps. The walls and cracking in the mortar joints and the brick will allow water intrusion and will continue to worsen over time due to the yearly freeze/thaw.
- Extensive mold and efflorescence is evident in the existing brickwork. This should be removed. Even with the new roof installed, this condition may not be eliminated. Efflorescence is caused by water intrusion and leaching through the brick. Sufficient conditions in the construction of the aging building indicate other sources of water intrusion.
- The base of the brick masonry and the concrete walls show staining from water damage, rusting hand railing, algae, mold, or landscaping.

Mechanical/Plumbing Systems

Summary

Building 52 is the boiler plant that provides steam to multiple other CSH facilities. The building does not have a central heating or cooling system, but contains various steam unit heaters, window air conditioners, and exhaust fans.

General Condition of HVAC Systems

The unit heaters appear in fair condition with no major items to be noted. The steam pipe insulation serving the unit heaters appear in good condition.



Boiler Plant (B1) with controller



Steam unit heater

Conclusions and Recommendations

Unless the use of the building changes, there is no need to replace or upgrade the equipment serving the building at this time. The window air conditioning unit serving the office may be replaced with a ductless split system to increase energy efficiency and would only be considered at a time when the window units no longer function.



Electrical Systems

Summary

The electrical systems serving Building 52 consist of an 800A/480v/3 phase service with a 500kw diesel generator for stand by power. The building is served from a pad-mounted utility transformer adjacent to the building.

General Condition of Electrical Systems

The main electrical service equipment, 500kw generator, and distribution panels were replaced in 2004 and are in good condition.



Electrical service and automatic transfer switch



Existing 500kw diesel generator



Existing motor control center



Flooded basement

The existing motor control center is older than the rest of the electrical systems in the building and the replacement parts for this unit will become difficult to locate in the next five to six years.



The distribution panels located in the basement are exposed to flooding during rain events. While on site we observed this condition and understand this is a common occurrence when there is a significant rainfall. We also noted the sump pump in this area did not operate. We believe the water is coming from the adjacent steam distribution tunnels and is the result of infiltration throughout the system.

The existing generator is set up as standby power only and does not meet the emergency lighting code. Additional emergency lighting fixtures are required to meet code.



Interior lighting

Conclusions and Recommendations

The building's electrical system is in good condition; however, within the next eight to ten years the motor control center will reach the age that replacement parts will become an issue and no longer be serviceable. The emergency generator is 14 years old and should be replaced in the next six years. There is no secondary connection point in the electrical system to allow a temporary generator to be connected to the existing electrical system. If there is a utility failure and the standby generator also fails it will require several days to disconnect the existing generator and connect the temporary generator to the existing electrical system.

Fire Alarm and Sprinkler Systems

Building Construction

Building 52 is an existing industrial occupancy that has one story, mezzanine and a basement and is not sprinklered. The construction is classified as Type II (000) per NFPA. There are no minimum construction requirements for this occupancy type per NFPA 101.

Fire Suppression

The building is not provided with fire suppression and is not required to be per the construction type, occupancy, and height and area.

Fire Alarm

The building is provided with a fire alarm system. The existing system has a Siemens FS-250 fire alarm control panel. The current system monitors a smoke detector at the panel and pull stations, and it powers the horns and strobes. The fire alarm system reports to the public safety office (in Building 59) via a transceiver. The fire alarm system is in good working order and should be capable of being serviced for the next 10 years.

Egress

The building is provided with doors and stairs that meet the minimum requirement of 32 inches. Additionally, the areas throughout the building are provided with a minimum of two means of egress.



Boiler System and Equipment

Summary

Building 52, the CSH boiler plant, was reconfigured 15 years ago to replace the original coal-fired boilers with a dual-fuel, natural gas fuel/oil fired boiler system. Annual boiler equipment maintenance has not been performed and no significant plant control calibration modifications have occurred in the facility for the last 15 years, resulting in the potential for a catastrophic failure of the campus heating system. CSH has a boiler maintenance contract for basic services and this has resulted in an effective chemical treatment program and regular boiler blowdown. However, there has been no equipment or control maintenance since the boilers were converted to the dual-fuel system. As a result, the associated controls, primary boiler components, and support equipment are at the end of their serviceable life and require replacement.

Replace DA Tank Manway

The existing manway is heavily corroded and was difficult to seal after the Deaerator (DA) tank inspection in May 2018. Effective sealing of the existing manway is not expected at the next opening event. Therefore, replacing the manway to keep the DA tank operational is required.

Replace DA Tank Blowdown Piping

Existing blowdown piping is obstructed and prevents draining or regular blowdown of sediment. This sediment buildup encourages corrosion and shortens the life of the tank. To maintain service of this vessel, the blowdown piping and valves need to be replaced to remove sedimentation from the bottom of the tank.

Upgrade Boiler Controls (B1-B4)

Existing boiler controls and associated field devices are at the end of their useful life. Existing control components are single sourced with limited industry knowledge to allow for effective service. As a result, local support for the centralized control system does not exist and response time for onsite service requests from the original equipment manufacturer have been poor. A control failure in any of the three central control centers will shut down the entire boiler plant for an extended period of time. Boiler service companies in the region have limited knowledge of the existing boiler control system and little to no availability to parts. Given the central control strategy employed with this system there is great exposure to total steam loss if the control system fails.

Replace SCADA with Data Acquisition and Visualization for Energy Management

The existing SCADA (Supervisory Control And Data Acquisition) system is operating on an unsupported software platform. The OEM has indicated that they will not be able to support this system when a failure occurs and recommend immediate replacement. Without the SCADA system, fuel consumption data for determining compliance with VA-DEQ air emission reporting under the air quality program is unavailable and the facility is non-compliant with DEQ's air quality program requirements.

Replace Stop/Check Valves (B1-B4)

The stop/check valve on Boiler 1 (B1) has failed (crack in the casting) and is releasing high pressure steam into the boiler plant. The same valve on Boiler 1 has failed (check valve seat is worn) resulting in routine flooding of the boiler. Boilers 2 (B2) and 3 (B3) exhibit a lower level of water infiltration when not in service. However, given the failed state of two of the four valves and the degradation of the other two, all four should be replaced.



Rebuild Oil Controllers for No. 2 Fuel Oil Combustion (B1 & B2)

Although No. 2 fuel oil is the back-up fuel for CSH, the existing oil controllers cannot properly meter the fuel to the burners. Seals are leaking, and metering valves are not functioning. The existing strategy is to employ fuel oil on B1 and B2. These oil controllers will need to be refurbished before CSH will have an alternative backup fuel available to burn.

Replace PRV Station Valves (2 Inch and 8 Inch with Pneumatic Controllers)

The existing pressure reducing valve (PRV) stations have remained in service for over 15 years and are at end of life. These valves meter steam to the entire CSH campus apart from the laundry. Proper steam flow and pressure regulation to downstream devices are controlled by these stations. We have experienced downstream pressure variations including pressure loss due to poor valve response, which affected sterilization activities in the kitchen. Given the large influence these valves have on both the operation of downstream equipment, as well as the energy cost associated with delivering quality steam, they should be replaced.

Re-bed Water Softener Resin and Service Valves

The age and condition of the zeolite resin contained in the vessels is unknown. Because the softeners supply makeup water to the entire steam plant, the softened water quality is critical to the facility water chemistry. The resulting boiler scale and corrosion control directly affects both heat transfer efficiency and usable life.

Replace Surface Blowdown Piping on Boilers (B1-B4)

A section of the surface blowdown piping on B2 recently failed and required replacement as live steam and hot water were released into the boiler plant creating a personnel safety hazard. This failure led to a cursory evaluation of additional blowdown piping all of which was found to be heavily corroded. Blowdown piping is subject to heavy corrosion due to the extreme variations in operating temperature and the resulting presence of oxygen at high concentrations.

Replace ASCO Valves on Gas Trains (B1-B4)

The motorized ASCO valves that are part of the gas train safety circuit are 15 years old and have begun to show signs of leakage. Additionally, the proof of closure safety switches contained within the valves' actuators are beginning to fail. The flame safeguard will not allow the boiler to fire without the proof of closure switches verifying the position of the valves, which makes the boiler useless. Good safety practices will not allow the boiler to operate with a leaking gas valve, also rendering it useless.

Building Construction Cost Estimates

Included with each building assessment is a construction cost estimate for essential repairs of deficient and failing building systems, life safety protection and security systems to maintain the building for a period of five to ten years. We include two levels of cost estimates.

Level 1: Repair and/or replacement of essential materials, equipment systems and code deficiencies that in the event of failure would render the building non functional for its intended use within five to ten years.

Level 2: Identifies a contingency repair or replacement fund to address costs for an ongoing maintenance and repairs program with a plan to continue building operations for three to five years with only short term primary services outages. In some cases the options under the level three estimate is to relocate patients and staff to other buildings for short term or long term durations.

PHYSICAL CONDITIONS AND AREA LIST - CRITICAL FIVE TO TEN YEARS

Physical Material Condition

Escalated to 6/1/2021

Comments

Bldg. number	Area (SF)	Material description (generic type)	Unit Cost (\$USD)	Contract Cost (\$USD)	System Failure Within Two to Five Years Likely
Bldg. 52	7,922	Roofing-single ply membrane over 5" rigid insulation and with all flashings/accessories	\$10.75	\$85,140	The roof, flashing and drainage systems have failed and allow rain water to enter the plant. Water collects in the basement electrical switchgear room.
Bldg. 52	480	Metal fascia/copings	\$56.20	\$26,976	The roof, flashing and drainage systems have failed and allow rain water to enter the plant. Water collects in the basement electrical switchgear room.
Bldg. 52	10	rooftop curbs	\$2,012.70	\$20,127	The roof, flashing and drainage systems have failed and allow rain water to enter the plant. Water collects in the basement electrical switchgear room.
Bldg. 52	1	Incom MCC MCB NEMA 600A	\$55,581.98	\$55,582	Replace MCC due to age and available replacement parts.
Bldg. 52	1	Boiler DA Tank	\$12,000.00	\$12,000	Boiler equipment is in need of critical repair and replacement. Most equipment is no longer serviceable and if failure occurs the CSH Campus would be without a heating source and domestic hot water. There is no backup system for the steam boiler plant.
Bldg. 52	4	Boilers	\$157,500.00	\$630,000	The Boiler control system and SCADA system are past their serviceable life. Replacement parts are not available. CSH campus central heating and domestic hot water heating is provided by the boiler plant.
Bldg. 52	70,000	Fuel Oil Polishing Cost / Gallon	\$1.22	\$85,400	The 70K fuel tank oil supplied has not been maintained in 15 years. Polishing of the fuel is required before using.
Bldg. 52	4	Boiler Equipment Oil	\$31,150.00	\$124,600	The Fuel oil pump and system requires replacement due to the age of equipment and lack of maintenance.
Bldg. 52	4	Boiler Equipment Gas	\$14,675.00	\$58,700	The gas system is failing and requires replacement due to age and lack of maintenance.
Bldg. 52		Base Construction Cost Escalated		\$1,098,525	
Bldg. 52		<i>Soft Costs (25%) Total Project Costs</i>		<i>\$366,171</i>	
Bldg. 52		Total Project Cost		\$1,464,696	

PHYSICAL CONDITIONS AND AREA LIST - CONTINGENCY UP TO FIVE YEARS

Physical Material Condition Escalated to 6/1/2021 Comments

Bldg. number	Area (SF)	Material description (generic type)	Unit Cost (\$USD)	Contract Cost (\$USD)	System Failure Within Two to Five Years Likely
Bldg. 52	4	Boilers	\$157,500.00	\$630,000	The Boiler control system and SCADA system are past their serviceable life. Replacement parts are not available. CSH campus central heating and domestic hot water heating is provided by the boiler plant.
Bldg. 52	1	Water Infiltration	\$80,000.00	\$80,000	Unit costs for repair and installation of sump pump system.
Bldg. 52	7,922	Roofing-single ply membrane over 5" rigid insulation and with all flashings/accessories	\$10.75	\$85,140	The roof, flashing and drainage systems have failed and allow rain water to enter the plant. Water collects in the basement electrical switchgear room.
Bldg. 52	1	MEP Connections	\$21,697.00	\$21,697	Temporary electrical, heating and cooling connections are required for connection of modular equipment if the facility experiences equipment failures.
Bldg. 52		Base Construction Cost Escalated		\$816,837	
Bldg. 52		<i>Soft Costs (25%) Total Project Costs</i>		<i>\$272,276</i>	
Bldg. 52		Total Project Cost		\$1,089,113	

Building

59

Public Safety Building



Central State Hospital Building Assessments



BUILDING 59 – PUBLIC SAFETY BUILDING

Building 59 houses the hospital campus public safety staff. It was converted from its intended use as a water treatment plant. Very little maintenance or repair work has been performed on the building systems. The observed overall facility assessment service life is less than one year without major renovations. The basis for this assessment is the potential for catastrophic failure of the main electrical service without serviceable replacement components. This building is the central monitoring location for the campus fire alarm reporting system.

We estimate the contingency cost for essential repairs of deficient and failing building systems, life safety protection and security systems to maintain the building for a period of five years is \$351,126. We recommend the contingency fund of \$351,126 be allocated for heating equipment replacement, electrical equipment replacement, roof replacement and repairs to the campus water supply pump system. The contingency fund shall be used to maintain the facility for its intended service and operation in the event the identified suggested critical repair work is not completed and there are essential system component failures.

The above estimate represent only critical or essential costs and do not include costs to maintain the facility for its intended use over the next ten years. Additional cost information is provided at the end of this assessment.

Building Summary

The existing 8,300 SF building is a two-story, rectangle-shaped masonry building with a wood-framed garage addition. The original rectangular building was built in 1961 as the water treatment plant. This building has remnants of its original use in both the yard on the upper level and within the building, including existing pumps, tanks, piping, valves, and fresh water tanks. An attached wood construction garage was added sometime after the conversion to the public safety building. The attached garage connects at the first floor level. The second floor of the original building walks out to the higher grade where abandoned sewage storage tanks remains inactive.

The original building has a flat roofs, precast concrete tee slabs at the roof structure, cast concrete columns and beams, and cast concrete floor slabs and foundations walls. These walls appear to act as retaining walls for the grade as it drops to the first floor. The garage has wood-framed walls, plywood sheathing, wood siding, and a concrete slab on grade. The different construction types are not separated.

The buildings do not contain sprinklers, emergency strobe lights, exit lights, fire alarm pull stations, or fire notification systems. The exterior walls are solid brick and CMU masonry on each end, solid concrete below grade, and a glass wall glazing system along the longest sides (east and west) of the building. The main roof is a low-slope, asphalt built-up roof with interior roof drains. The perimeter of the low-slope roof has a silver-finished fascia/gravel stop. The garage has pre-engineered wood trusses, plywood sheathing, and an asphalt shingle roof.

The interior walls are exposed concrete and CMU on the first floor and painted CMU or gypsum on the second floor or. The first floors are sealed concrete, painted or vinyl tile. The second floor administrative offices and toilet areas are either carpet or vinyl tile. There are both men's and women's single toilet facilities. The existing building is not considered accessible for the disabled.

The building housing providing administrative offices and support areas for the campus police and safety officers. It provides storage for riot gear, bulletproof vests, helmets, and other gear. Lockers, files, and fire extinguishers are also stored here. No guns or ammunition safes were observed.



The original building is in poor condition, exhibiting deferred maintenance on many essential building systems. The building remains functional for the campus public safety officers, maintenance equipment, and public safety equipment, including public safety vehicles.

The exterior of the building slopes dramatically from east to west, permitting entrances on the second floor and on the first floor. To the east of the second floor entrance, we observed a ground sewage storage tank. The tank is empty and not used.

- The water treatment plant equipment (pumps, valves, piping, storage tanks, and open pits) remain and are abandoned.
- This area is surrounded by a four-foot-high fence, which is open at the top and provides limited access and protection. It is also a safety hazard.



Abandoned open tanks

The open tanks and low fencing presents a safety issue and should be remediated.

Interior Conditions

The first floor still contains the equipment used when the building served as the water treatment plant. A very large clean water wood tank is on the first floor. Open floor pits present a safety hazard. Scrape, patch, and paint all interior walls.



Abandoned equipment from water treatment plant

The toilet rooms are not ADA compliant in their current configuration and it would be difficult to make them compliant. Consideration for one unisex ADA-compliant toilet and one unisex standard size should be considered. All toilet fixtures, lavatories, and accessories require replacement due to condition.



Equipment storage



Office space

Exterior Conditions

The following items were observed to be in poor or failing condition and require repair or replacement:

- The roof systems are failing and past their life span.
- The original building roof drains leak and are generally not functional.
- The garage gutter and downspouts show age and need replacement. The downspouts drain at grade and have contributed to deterioration of the wood siding.
- The brick end walls are cracked, show indications of water intrusion, and require repair. There is also evidence of mold and mildew on these walls.

The existing window glazing system is similar to other buildings on campus. They are beginning to show similar deterioration but are in better condition.

- The windows are hopper style operable windows.
- They are single-pane, clear glass windows in a clear aluminum frame. The window frames are inefficient.
- There appears to be no flashing or sealants remaining around their terminations to masonry jambs, sills, or prefinished metal fascia over concrete structure.
- Many of the windows have through-the-wall air conditioning units in the lower panels.

There is a handicap parking place marked on the second floor entrance, but it does not meet ADA code. There remains a 4-inch minimum high step up into the building.

- If accessibility is needed, it requires a compliant parking space, signage, a compliant ramp with an accessible landing, and a compliant accessible path into and throughout the building.
- The first floor should have similar accommodations on the exterior without elevator access.
- All existing paving needs to be improved.

The exterior stairway to the first floor is wood with non-code compliant wood vertical/horizontal spacing on its members.



- The stairway's height doesn't meet code and appears to residential-style stairs.
- There is a sign warning that the stairs are slippery when wet. Some safety concerns are noted about this stair.
- The solid brick retaining wall shows severe water staining in the brick, efflorescence, and mold. It would benefit from power washing.

The existing exterior doors appear serviceable, but should be replaced. The hardware needs to be replaced with commercial-grade hardware. The current door hardware seems to be a mix of commercial grade and residential grade hardware.

- Some of the doors do not appear to be secure.
- Unsecured doors in a public safety building where guns, riot equipment, and other gear is stored is a potential serious problem.
- All doors on the wood-framed garage are residential. All of its doors, including overhead doors, need to be replaced.

The existing exterior coiling doors should be replaced with new, heavy-duty, energy-efficient coiling doors and new operators and controls.

Mechanical/Plumbing Systems

Summary

The HVAC systems serving Building 59 consist of various through-the-wall air conditioners, window air conditioners, and a gas-fired boiler that provides heating water for unit heaters and convectors. The natural gas-fired boiler is located in a ground floor mechanical room, and has a capacity of 700 kbtu/hr. Two hot water pumps circulate heating water to two separate zones in the building.

General Condition of HVAC Systems

The exact age of the through-the-wall air conditioners and window units are unknown, but they will likely need to be replaced within the next five years. It could not be confirmed whether or not these air conditioners provide code-required ventilation to the spaces.

The unit heaters in the building are in poor condition and will need to be replaced within the next three to four years.

The boiler has exceeded its median life expectancy. It should be replaced in the next two years with a high-efficiency, condensing gas fired boiler. One of the pumps appears in fair condition and should last several more years with routine maintenance. The other pump appears much older and will likely need to be replaced in the next year.



Hot water heating boiler system



Pipe insulation in the mechanical room has corroded in some places and is missing on several runs of pipe. This leads to lost efficiency due to heat loss from the pipe to the room air. It also poses a safety issue with exposed hot water piping. It is not clear how much, if any, of the insulation contains asbestos.

Below is a table summarizing the age and condition of the major equipment in the building.

Existing Equipment Age and Median Life Expectancy Based on 2015 ASHRAE Applications				
Equipment Description	Quantity	Installation Date	Median Life Expectancy (years)	Current Age (years)
Gas-fired Boiler	1	1987	21	31
Through-the-Wall Air Conditioners	4	Unknown	10	--
Window Air Conditioners	4	Unknown	15	--
Unit Heaters	8	Unknown	20	--

Conclusions and Recommendations

To improve air quality and ensure reliable operation, the building requires a central heating and cooling system. If upgrading the building systems is not feasible, the through-the-wall units and window air conditioners should be replaced in five years to ensure reliability.

The boiler and heating water pumps should be replaced within the next two years due to their age and condition. It may be possible to reuse most of the distribution piping; however, this will result in continued maintenance due to the age of the systems. Pin-hole sized leaks are occurring regularly in the piping, which requires maintenance personnel to make repairs on a routine basis.

Electrical Systems

Summary

The electrical systems serving Building 59 consist of a 1000A/240v/3 phase Delta service with a 49kw diesel generator for stand by power. The building is served from pole-mounted utility transformers.

General Condition of Electrical Systems

The electrical system has far exceeded its serviceable life. The 49kw generator was relocated from another location in 2000. It has also exceeded its expected service life. The main service breaker and the generator breaker are not coordinated so the building could overload the generator without affecting the main service breaker. This means the load in the building could reach a level the generator could not handle but this would not be known until the generator was needed in an emergency and would fail.

Conclusions and Recommendations

The entire electrical distribution system and generator system are no longer serviceable. The interior lighting does not meet emergency lighting codes.



Electrical service and automatic transfer switch



Existing electrical panels

Fire Suppression

The building is not provided with fire suppression and is not required to be per the construction type, occupancy, and height and area.

Fire Alarm

The building is not provided with a fire alarm system. It does have a transceiver that receives the alarm and trouble and supervisory signals from all of the buildings with fire alarm control panels.

Egress

The building is provided with doors and stairs that meet the minimum requirement of 32 inches. Additionally, the areas throughout the building are provided with a minimum of two means of egress.



Fire Alarm and Sprinkler Systems

Building Construction

Building 59 is an existing business and storage occupancy that has one story with a basement and lower level walkout. It is not sprinklered. The construction is classified as Type II (000) per NFPA. There are no minimum construction requirements for this occupancy type per NFPA 101.

Building Construction Cost Estimates

Included with each building assessment is a construction cost estimate for essential repairs of deficient and failing building systems, life safety protection and security systems to maintain the building for a period of five to ten years. We include two levels of cost estimates.

Level 1: Repair and/or replacement of essential materials, equipment systems and code deficiencies that in the event of failure would render the building non functional for its intended use within five to ten years.

Level 2: Identifies a contingency repair or replacement fund to address costs for an ongoing maintenance and repairs program with a plan to continue building operations for three to five years with only short term primary services outages. In some cases the options under the level three estimate is to relocate patients and staff to other buildings for short term or long term durations.

PHYSICAL CONDITIONS AND AREA LIST - CRITICAL FIVE TO TEN YEARS

Physical Material Condition

Escalated to 6/1/2021

Comments

Bldg number	Area (SF)	Material description (generic type)	Unit Cost (\$USD)	Unit Cost (\$USD)	Unit Cost (\$USD)	Comments
Bldg 59	3,525	Roofing-single ply membrane over 5" rigid insulation and with all flashings/accessories	\$7.35	\$25,908.75		The roof system over the main building is failing in many locations and presents a health hazard and safety concern.
Bldg 59	1	MEP Temporary Service Connections	\$21,697.00	\$21,697.00		Install electrical and piping connections for temporary equipment install.
Bldg 59	3	Campus Water Supply Pumps	\$2,540.00	\$7,620.00		Water pumps are at the end of their useful life and require replacement. Pumps provide water service for domestic and fire protection.
Bldg 59	3	Panel Board 120/208V 400A	\$49,373.26	\$148,119.78		Main electrical gear is at the end of its service life and replacement parts are not available. Electrical failure will cause the campus security system and fire alarm system to fail.
Bldg 59	1	Mechanical Boiler Replacement	\$60,000.00	\$60,000.00		Mechanical systems are at the end of their service life and replacement parts are not available. Replace boiler.
Bldg 59		Base Construction Cost Escalated		\$263,346		
Bldg 59		<i>Soft Costs (25%) Total Project Costs</i>		<i>\$87,781</i>		
Bldg 59		Total Project Cost		\$351,126		

PHYSICAL CONDITIONS AND AREA LIST - CONTINGENCY UP TO FIVE YEARS

Physical Material Condition

Escalated to 6/1/2021

Comments

Bldg number	Area (SF)	Material description (generic type)	Unit Cost (\$USD)	Unit Cost (\$USD)	Unit Cost (\$USD)	Comments
Bldg 59	3	Panel Board 120/208V 400A	\$49,373.26	\$148,120		System Failure Within Two to Five Years Likely
Bldg 59	3,525	Roofing-single ply membrane over 5" rigid insulation and with all flashings/accessories	\$7.35	\$25,909		Main electrical gear is at the end of its service life and replacement parts are not available. Electrical failure will cause the campus security system and fire alarm system to fail.
Bldg 59	1	Gas-fired Boiler	\$60,000.00	\$60,000		The roof system over the main building is failing in many locations and presents a health hazard and safety concern.
Bldg 59	1	MEP Connections	\$21,697.00	\$21,697		Mechanical systems are at the end of their service life and replacement parts are not available. Replace boiler.
Bldg 59	3	Campus Water Supply Pumps	\$2,540.00	\$7,620		Install electrical and piping connections for temporary equipment install.
Bldg 59		Base Construction Cost Escalated		\$263,346		Water pumps are at the end of their useful life and require replacement. Pumps provide water service for domestic and fire protection.
Bldg 59		<i>Soft Costs (25%) Total Project Costs</i>		<i>\$87,781</i>		
Bldg 59		Total Project Cost		\$351,126		

Building

94

Psychosocial Rehabilitation



Central State Hospital Building Assessments



BUILDING 94 – PSYCHOSOCIAL REHABILITATION

Building 94 is one of four identical buildings that serve specific resident populations. Each of the four buildings is a single story, H-shaped building with four separate wards connected by a main entrance area and service entrance centrally located within the connecting corridor. During our assessment, Wards 1 and 4 were used for residents and Wards 2 and 3 were used for support offices and counseling. Building 94 has an overall facility assessment service life of four to six years without major renovation.

We estimate the cost for essential repairs of deficient and failing building systems, life safety protection and security systems to maintain the building for a period of five years is \$1,254,928. If the essential repairs are not completed and system failures require closure of the building due to unsafe conditions, we understand that the building occupants would be moved to either Building 95 or Building 96. The cost of the move, if necessary, is estimated at \$106,666.

The above estimate represent only critical or essential costs and do not include costs to maintain the facility for its intended use over the next ten years. Additional cost information is provided at the end of this assessment.

Building Summary

Building 94 is a noncombustible masonry construction building with roof joists at the low slope roof areas and light gage steel trusses and framing members at the medium sloped roofs areas. The building is classified as IIB construction type, I2 Psychiatric Hospitals as the occupancy classification. The buildings are sprinklered and have fire alarm systems and notification systems.

Building Envelope

Building 94 was constructed in 1969 and has received numerous systems renovations for life safety improvements, mechanical improvements, fire alarm systems, and reroofing. The courtyards were improved with enclosures, trellises, landscaping, and paving for residents in 1994. The building remains occupied and has continuously served the residents as originally intended since 1969.

The building is in close proximity to Buildings 93, 95, and 96. All buildings have identical footprints, floor plans, and similar organization of services. Each building may differ slightly having been built or renovated by different contractors and at different times over the course of their respective histories. All buildings are centrally located to the overall hospital campus and adjacent to the kitchen and dining hall, Building 120. Its exterior grounds are relatively flat in most areas.

Exterior Water Drainage Conditions

Building renovations in 2009 included a roof replacement project using an EPDM membrane system on the low sloped roof and asphalt shingles on the sloped roofs. The interior roof drainage system was abandoned and the new drainage system includes side drains to a gutter system with down spouts. Due to the relatively flat grade around the building, drainage away from the building is an issue. Rainwater ponds in the areas between building wings, courtyards, and runs under existing door openings, weeping back into the building where floors are at grade. Attempts have been made to remediate this problem by redirecting rain from the down spouts through black plastic drainage pipe running along the surface of the grade. This effort has not been successful.

The areas over the central part of each building contain large HVAC equipment on raised support systems with a grated catwalk around the equipment. There is a remaining roof drain and its overflow drain under this equipment. This area of the low sloped roof appears to drain quite well.



Its drainage is tied to the subgrade drainage system.

Those exterior areas requiring rehabilitation and renovation would include some of the following.

The facility requires:

- Revised grading and landscaping to provide drainage away from all exterior doors
- Design of subgrade drainage for storm drainage from downspouts
- Addition of yard drains where applicable
- Addition of accessible parking near facilities

Interior Conditions

Each of the Ward areas, both administrative and residential/treatment areas, have sustained moisture damage from storm water seeping under doors or through the exterior walls. Other areas also have remedial moisture damage.



Patient wing corridor

- The existing terrazzo flooring in the dayrooms are cracked and portions missing at exterior doors. This is outside the larger secure side with the courtyards and is facing the areas not draining well.
- The exterior walls facing the sides with drainage issues exhibit signs of moisture in the walls. The paint is peeling at the base of the walls and the ceramic tile is failing. Indications of cracking and spalling are apparent at corners.
- Cracking at the joints in the terrazzo is typical throughout the facility.
- Ceilings within the dayrooms indicate moisture damage and are stained and sagging.
- Ceilings in the raised portion of central corridor indicate moisture damage from condensate lines of the HVAC units.
- All ceilings and lights in the dayrooms and the raised portion of the central corridor are suspended 2x2 acoustic ceiling tiles with troffer lights. All dayrooms have natural daylight from exterior windows and clerestory windows. Dayroom windows and resident bedroom windows are operable and covered with security screens.
- Ceilings in the lower roof of the central corridor, the ward corridors, and resident/offices toilet and shower rooms are painted gypsum. Lights are recessed, wall mounted, or surface mounted.
- All carpeted flooring is in the administrative/office areas. All vinyl flooring is located in treatment rooms. The nurses' stations, toilet, and shower rooms are 1x2 mosaic ceramic tile. All of the resident rooms, utility rooms, dayrooms, ward corridors, central corridors, and portions of the shower rooms are terrazzo fluid applied flooring with ceramic tile base.
- Where severe moisture intrusion and flooding has occurred, the ceramic tile base at the exterior walls of the dayrooms is kicked out away from the vertical wall. This needs to be remediated.
- Lavatories, accessories, and toilet fixtures appear to have been updated in various locations. Newer stainless steel toilet partitions have been used, but none of the toilet accessories are mounted at accessible heights or meet ADA standards. None of the shower stalls comply with ADA standards for accessibility and no ADA-compliant seats were found. The 1 x 2 mosaic tile



appears to be in good shape and may have been replaced during a renovation. The working order of the fixtures was not tested.

- All interior walls need scraping, patching, and painting.
- All interior windows with wire glazing need to be replaced. Efforts to cover with Plexiglas have failed in both resident wards. Maintenance personnel continue having to replace broken Plexiglas. If the residents continually hit the Plexiglas in the same location, both Plexiglas and wire glass will break.
- All interior doors with wire glass need to be replaced.

Exterior Conditions

In addition to the issues with storm water drainage, portions of the building are in need of repair.

- The fascia board below the newly added gutters has peeling paint and exposed wood. Scraping, priming, and painting with a high quality exterior paint is required immediately.
- Some of the brick shows signs of water damage near areas where the down spouts output water on the splash blocks. Areas of concrete paving near the downspouts appear to have spalling and staining issues. De-icers may have contributed to the condition of the exterior concrete.



Exterior damage condition

- Some of the exterior brick is experiencing efflorescence from previous delayed maintenance. Possible cleaning and closer examination to determine any serious damage should be considered. Brick repointing and flashing may be recommended.
- Bottoms of the exterior doors and frames are rusting and showing damage from water intrusion.
- All existing storefront glazing, frames, associated doors, and steel doors with borrowed lights require replacement. Replace all exterior panels surrounding exterior doors.
- All exterior windows are showing signs of their age. Some have become inoperable and some are rusted. Some have been repaired when new security screens were added. Both need to be replaced all around Wards 1 and 4. Wards 2 and 3 will only require window replacement.
- The existing roof is relatively new. The new gutters on the low sloped roof appear to be undersized for heavy rainfall. Water overshoots the gutters in heavy rains.
- The low-slope roofs do not meet the state standard of ¼-inch per foot tapered insulation. Ponding water was observed at one location adjacent to an expansion joint on the roof. The facility's maintenance personnel indicated that this reroofing removed all of the existing roof drains on the low-sloped sections in lieu of the new gutters and downspouts.
- We discovered existing roof drains and one overflow in the central roof directly under the HVAC equipment stand. The roof was dry in this area.



Mechanical/Plumbing Systems

Summary

The HVAC systems serving Building 94 consist of various rooftop air handling units with single duct variable air volume terminal boxes. Chilled water is produced by an air-cooled chiller and hot water is produced by a steam to hot water converter. The building underwent a major HVAC renovation in 2014. All major equipment was replaced. The interior domestic water service is original to the building and is in fair condition. Visual observation of the domestic water service lines include copper supply pipe for distribution and a combination of steel, iron, and plastic piping for waste. The hydronic piping system was observed to be in failing condition. The hydronic piping system is the original piping and observed to have several repairs and replacement sections. We understand leaks in the system is a continuing maintenance problem.



Air-cooled chiller

General Condition of HVAC Systems

The HVAC equipment and systems serving the building are relatively new and appear in good working condition. Portions of the pipe and pipe insulation in the mechanical room were replaced in the recent renovation. Some of the older runs are corroded and missing insulation, resulting in a loss of efficiency.

Conclusions and Recommendations

Due to the recent renovation of this building, no changes are necessary to the major equipment. Much of the older hydronic distribution piping and ductwork has been re-used and will require continued maintenance to the age of the systems. Pin-hole sized leaks are occurring regularly in the piping, which requires maintenance personnel to make repairs on a routine basis.

Electrical Systems

Summary

The electrical system serving Building 94 consists of a 600A/480v/3 phase service with a 194kw diesel generator for standby power. The building receives primary services from a pad-mounted utility transformer adjacent to the building.

General Condition of Electrical Systems

The standby generator system was added in 1999 along with a 600 amp service disconnect next to the automatic transfer switch. The generator is rated for 300 amp at 480v indicating the primary main service and the generator are not coordinated. Coordination between the primary main service and the standby generator is critical for protection from overloading of the generator and potential failure.



Shell and tube heat exchanger



Mechanical room piping

The generator system has been installed as a standby power generator. This means the generator system cannot be used as a life safety power source for emergency lighting. The building lighting system does not have the required battery backup for the egress lighting but depends on the generator to provide the emergency power. This is not code compliant and should be addressed.

The original service switchgear was left in place to serve as the interior distribution system. This switchgear was installed in 1988 and has reached the end of its serviceable life. These type of switches require yearly maintenance, which has not been maintained. This leads to operational failure when opening or closing the device. This means if you turn the switch off it may not come back on.

The remaining interior distribution panels are of varying age. Some have reached the end of their serviceable life and others have been replaced and are in good condition.

Conclusions and Recommendations

The original service switchgear should be replaced. If there is a failure it would separate the building from the generator system and the building would be without power for several weeks. The standby generator is not coordinated with the building service and should be evaluated to either be upgraded or the building service reduced. The standby generator has nearly reached the end of its serviceable life and should be replaced in the next five years. There is no secondary connection point in the electrical system to allow a temporary generator to be connected to the existing electrical system. If there is a utility failure and the emergency generator fails it will require several days to disconnect the existing generator and connect the temporary generator to the existing electrical system.



194 kw generator



Service disconnect and ATS



Original service switchgear



Original panels



Replacement panels

Fire Alarm and Sprinkler Systems

Building 94 is not compliant with current fire safety features and requires remedial repairs and building modifications to address these issues. A previous study completed by the Department of Behavioral Health and Developmental Services (DBHDS) identified the need for building compliance for smoke compartments and barriers. Three smoke compartments were recommended for proper control of the building along with the removal of sixteen smoke dampers and installation of four roof mounted smoke evacuation vents. The cost to complete this work is estimated at \$600,000 without escalation.



Building Construction

Building 94 is an existing healthcare occupancy that has one story without a basement and is fully sprinklered. The construction is classified as Type III (200) per NFPA and is permitted to have one story per NFPA 101 Chapter 19 for a fully sprinklered building. Inspection access to fire dampers is not available and requires installation access doors to allow inspection. All fire and smoke dampers must have adequate access for maintenance which is undetermined at this time due to the limitations of access.

Fire Suppression

The building has a 6-inch incoming fire line located in the mechanical/sprinkler closet that transitions to 4-inch sprinkler pipe that feeds the building's sprinkler system. The 6-inch incoming line is not equipped with a backflow preventer separating the fire sprinkler line from the domestic water line. The building sprinkler system is provided with a post indicator valve (PIV) on the fire line and a fire department connection (FDC) on the front of the building to allow the fire department to provide additional water and pressure for the sprinkler system. The building is also provided with a dry pipe sprinkler system that is for the attic. The sprinklers are standard response.

Fire Alarm

The building is also provided with a fire alarm system. The existing system fire alarm control panel is a Siemens MXL-IQ. The current system monitors the smoke detector at the panel and pull stations, and it powers the horns and strobes. The fire alarm system also monitors the sprinkler system flow and tamper switches and the dry pipe system. The fire alarm system reports to the Public Safety Office (located at Building 59) via a transceiver. The fire alarm system is in good working order and should be capable of being serviced for the next two to three years. Siemens is discontinuing the manufacturing of the MXL panel and associated fire alarm devices.

Egress

The building is provided with corridors that meet the minimum 48-inch requirement. The doors also meet the minimum requirement of 32 inches. Additionally, the areas throughout the building are provided with a minimum of two means of egress.

Building Construction Cost Estimates

Included with each building assessment is a construction cost estimate for essential repairs of deficient and failing building systems, life safety protection and security systems to maintain the building for a period of five to ten years. We include two levels of cost estimates.

Level 1: Repair and/or replacement of essential materials, equipment systems and code deficiencies that in the event of failure would render the building non functional for its intended use within five to ten years.

Level 2: Identifies a contingency repair or replacement fund to address costs for an ongoing maintenance and repairs program with a plan to continue building operations for three to five years with only short term primary services outages. In some cases the options under the level three estimate is to relocate patients and staff to other buildings for short term or long term durations.

PHYSICAL CONDITIONS AND AREA LIST - CRITICAL FIVE TO TEN YEARS

Physical Material Condition

Escalated to 6/1/2021

Comments

Bldg number	Area (SF)	Material description (generic type)	Unit Cost (\$USD)	Unit Cost (\$USD)	System Failure Within Two to Five Years Likely (generic type)
Bldg 94	38,443	Fire Safety Duct, Fire Alarm, Smoke Barriers	\$17.56	\$675,059	Critical repairs due to citations from the Fire Marshall. Smoke and fire dampers do not operate and are not accessible. Building is not code compliant due to previous renovations and interior changes.
Bldg 94	1	Diesel Generator 200 kW	\$184,799.07	\$184,799	The emergency generator is in failing condition. The generator supports the life safety and security systems for the facility as well as the resident population.
Bldg 94	1	Equipment Connection	\$21,697.06	\$21,697	Temporary electrical, heating and cooling connections are required for connection of modular equipment if the facility experiences equipment failures.
Bldg 94	1	Switch Gear 480/277V	\$59,643.01	\$59,643	The main electrical switch gear is original to the building and is no longer serviceable for repairs.
Bldg 94		Base Construction Cost Escalated		\$941,198	
Bldg 94		<i>Soft Costs (25%) Total Project Costs</i>		<i>\$313,730</i>	
Bldg 94		Total Project Cost		\$1,254,928	

PHYSICAL CONDITIONS AND AREA LIST - CONTINGENCY UP TO FIVE YEARS

Physical Material Condition		Escalated to 6/1/2021		Comments	
Bldg number	Area (SF)	Material description (generic type)	Unit Cost (\$USD)	Contract Cost (\$USD)	
Bldg 94	1	Move staff to other admin	\$80,000.00	\$80,000	System Failure Within Two to Five Years Likely
Bldg 94		Base Construction Cost Escalated		\$80,000	
Bldg 94		<i>Soft Costs (25%) Total Project Costs</i>		\$26,666	
Bldg 94		Total Project Cost		\$106,666	

Building

95

Long Term Intensive Treatment



Central State Hospital Building Assessments



BUILDING 95 – LONG TERM INTENSIVE TREATMENT

The existing building is one of four identical buildings that serves specific resident populations. Each of the four buildings is a single story, H-shaped building with four separate wards connected by a main entrance area and service entrance centrally located within the connecting corridor. During our assessment, Wards 1 and 4 were used for residents and Wards 2 and 3 were used for support staff offices and counseling. Building 95 has an overall facility assessment service life of four to six years without major renovation.

We estimate the cost for essential repairs of deficient and failing building systems, life safety protection and security systems to maintain the building for a period of five years is \$1,254,928. If the essential repairs are not completed and system failures require closure of the building due to unsafe conditions, we understand that the building occupants would be moved to either Building 94 or Building 96. The cost of the move, if necessary, is estimated at \$106,666.

The above estimate represent only critical or essential costs and do not include costs to maintain the facility for its intended use over the next ten years. Additional cost information is provided at the end of this assessment.

Building Summary

Building 95 is a noncombustible masonry construction building with roof joists at the low slope roof areas and light gage steel trusses and framing members at the medium sloped roofs areas. The building is classified as IIB construction type, I2 Psychiatric Hospitals as the occupancy classification. The buildings are sprinklered and have fire alarm systems and notifications systems

Building Envelope

Building 95 was constructed in 1969 and has received numerous systems renovations for life safety improvements, mechanical improvements, fire alarm systems, and reroofing. The courtyards were improved with enclosures, trellises, landscaping, and paving for residents in 1995. The building is occupied and has served the residents as intended since 1969.

Building 95 is close in proximity to Buildings 93, 94, and 96. All buildings have identical footprints, floor plans, and similar organization of services. Each building may differ slightly having been built or renovated by different contractors and at different times over the course of their respective histories. All buildings are centrally located to the overall Central State Hospital campus and adjacent to the kitchen and dining hall, Building 120. Its exterior grounds are relatively flat in most areas.

Exterior Water Drainage Conditions

Building renovations in 2009 included a roof replacement project using an EPDM membrane system on the low sloped roof and asphalt shingles on the sloped roofs. The interior roof drainage system was abandoned and the new drainage system includes side drains to a gutter system with down spouts. Due to the relatively flat grade around the building, drainage away from the building is an issue. Rainwater ponds in the areas between building wings, courtyards, and runs under existing door openings, weeping back into the building where floors are at grade. Attempts have been made to correct this problem by redirecting rain from the down spouts through black plastic drainage pipe running along the surface of the grade. This effort has not been successful.

The areas over the central part of each building contain large HVAC equipment on raised support systems with a grated catwalk around the equipment. There is a remaining roof drain and its overflow drain under this equipment. This area of the low sloped roof appears to drain quite well.



Its drainage is tied to the subgrade drainage system.

Those exterior areas requiring rehabilitation and renovation would include some of the following. The facility requires:

- Revised grading and landscaping to provide drainage away from all exterior doors
- Design of subgrade drainage for storm drainage from downspouts
- Addition of yard drains where applicable
- Addition of accessible parking near facilities

Interior Conditions

Each of the ward areas, both administrative and residential/treatment areas, have sustained moisture damage from storm water seeping under doors or through the exterior walls. Other areas also have remedial moisture damage.



Plumbing chase with dead end service lines. Concerns for Legionella bacterial development in this type of condition

- The existing terrazzo flooring in the dayrooms are cracked and portions missing at exterior doors. This is outside the larger secure side with the courtyards and is facing the areas not draining well.
- The exterior walls facing the sides with drainage issues exhibit signs of moisture in the walls. The paint is peeling at the base of the walls and the ceramic tile is failing. Indications of cracking and spalling are apparent at corners.
- Cracking at the joints in the terrazzo is typical throughout the facility.
- Ceilings within the dayrooms indicate moisture damage and are stained and sagging.
- Ceilings in the raised portion of central corridor indicate moisture damage from condensate lines of the HVAC units.
- All ceilings and lights in the dayrooms and the raised portion of the central corridor are suspended 2x2 acoustic ceiling tiles with troffer lights. All dayrooms have natural daylight from exterior windows and clerestory windows. Dayroom windows and resident bedroom windows are operable and covered with security screens.
- Ceilings in the lower roof of the central corridor, the ward corridors, and resident/offices toilet and shower rooms are painted gypsum. Lights are recessed, wall mounted, or surface mounted.
- All carpeted flooring is in the administrative/office areas. All vinyl flooring is located in treatment rooms. The nurses' stations, toilet, and shower rooms are 1x2 mosaic ceramic tile. All of the resident rooms, utility rooms, dayrooms, ward corridors, central corridors, and portions of the shower rooms are terrazzo fluid applied flooring with ceramic tile base.
- Where severe moisture intrusion and flooding has occurred, the ceramic tile base at the exterior walls of the dayrooms is kicked out away from the vertical wall. This needs to be remediated.
- Lavatories, accessories, and toilet fixtures appear to have been updated in various locations. Newer stainless steel toilet partitions have been used, but none of the toilet accessories are



mounted at accessible heights or meet ADA standards. None of the shower stalls comply with ADA standards for accessibility and no ADA-compliant seats were found. The 1 x2 mosaic tile appears to be in good shape and may have been replaced during a renovation. The working order of the fixtures was not tested.

- All interior walls need scraping, patching, and painting.
- All interior windows with wire glazing need to be replaced. Efforts to cover with Plexiglas have failed in both resident wards. Maintenance personnel continue having to replace broken Plexiglas. If the residents continually hit the Plexiglas in the same location, both Plexiglas and wire glass will break.
- All interior doors with wire glass need to be replaced.

Exterior Conditions

In addition to the issues with storm water drainage, portions of the building construction are in need of maintenance repair.

- The fascia board below the newly added gutters has peeling paint and exposed wood. Scraping, priming, and painting with a high quality exterior paint is required immediately.
- Some of the brick shows signs of water damage near areas where the down spouts output water on the splash blocks. Areas of concrete paving near the downspouts appear to have spalling and staining issues. De-icers may have contributed to the condition of the exterior concrete.
- Some of the exterior brick is experiencing efflorescence from previous delayed maintenance. Possible cleaning and closer examination to determine any serious damage should be considered. Brick repointing and flashing may be recommended.
- Bottoms of the exterior doors and frames are rusting and showing damage from water intrusion.
- All existing storefront glazing, frames, associated doors, and steel doors with borrowed lights require replacement. Replace all exterior panels surrounding exterior doors.
- All exterior windows are showing signs of their age. Some have become inoperable and some are rusted. Some have been repaired when new security screens were added. Both need to be replaced all around Wards 1 and 4. Wards 2 and 3 will only require window replacement.
- The existing roof is relatively new. The new gutters on the low sloped roof appear to be undersized for heavy rainfall. Water overshoots the gutters in heavy rains.



Site drainage concerns noted typically around the building



- The low-slope roofs do not meet the state standard of ¼-inch per foot tapered insulation. Ponding water was observed at one location adjacent to an expansion joint on the roof. The facility's maintenance personnel indicated that this reroofing removed all of the existing roof drains on the low-sloped sections in lieu of the new gutters and downspouts.
- We discovered existing roof drains and one overflow in the central roof directly under the HVAC equipment stand. The roof was dry in this area.

Mechanical/Plumbing Systems

Summary

The heating, ventilation, and air conditioning (HVAC) systems serving Building 95 consist of various rooftop air handling units with single duct variable air volume terminal boxes. Chilled water is produced by an air cooled chiller and hot water is produced by a steam to hot water converter.

The building underwent a major HVAC renovation in 2014. All major equipment was replaced. The interior domestic water service is original to the building and is in fair condition. Visual observation of the domestic water service lines include copper supply pipe for distribution and a combination of steel, iron, and plastic piping for waste. The hydronic piping system was observed to be in failing condition. The hydronic piping system is the original piping and observed to have several repairs and replacement sections. We understand leaks in the system is a continuing maintenance problem.



Air-cooled chiller

General Condition of HVAC Systems

The HVAC equipment and systems serving the building are relatively new and appear in good working condition. Portions of the pipe and pipe insulation in the mechanical room were replaced in the recent renovation. Some of the older runs are corroded and missing insulation, resulting in a loss of efficiency.

Conclusions and Recommendations

Due to the recent renovation of this building, no changes are necessary to the major equipment. Much of the older hydronic distribution piping and ductwork has been re-used and will require continued maintenance to the age of the systems. Pin-hole sized leaks are occurring regularly in the piping, which requires maintenance personnel to make repairs on a routine basis.

Electrical Systems

Summary

The electrical system serving Building 94 consists of a 600A/480v/3 phase service with a 194kw diesel generator for standby power. The building receives primary services from a pad-mounted utility trans-



Shell and tube heat exchanger



Mechanical room piping

The generator system has been installed as a standby power generator. This means the generator system cannot be used as a life safety power source for emergency lighting. The building lighting system does not have the required battery backup for the egress lighting but depends on the generator to provide the emergency power. This is not code compliant and should be addressed.

The original service switchgear was left in place to serve as the interior distribution system. This switchgear was installed in 1988 and has reached the end of its serviceable life. These type of switches require yearly maintenance, which has not been maintained. This leads to operational failure when opening or closing the device. This means if you turn the switch off it may not come back on.

The remaining interior distribution panels are of varying age. Some have reached the end of their serviceable life and others have been replaced and are in good condition.

Conclusions and Recommendations

The original service switchgear should be replaced. If there is a failure it would separate the building from the generator system and the building would be without power for several weeks. The standby generator is not coordinated with the building service and should be evaluated to either be upgraded or the building service reduced. The standby generator has nearly reached the end of its serviceable life and should be replaced in the next five years. There is no secondary connection point in the electrical system to allow a temporary generator to be connected to the existing electrical system. If there is a utility failure and the emergency generator fails it will require several days to disconnect the existing generator and connect the temporary generator to the existing electrical system.



194 kw generator



Service disconnect and ATS



Original service switchgear



Original panels



Replacement panels

Fire Alarm and Sprinkler Systems

Building 94 is not compliant for current fire safety features and requires remedial repairs and building modifications to address these issues. Based on a previous study completed by the Department of Behavioral Health and Developmental Services (DBHDS) the report identified the need for building compliance for smoke compartments and barriers. Three smoke compartments were recommended for proper control of the building along with the removal of sixteen smoke dampers and installation of four roof mounted smoke evacuation vents. The cost to complete this work is estimated at \$600,000 without escalation.

Building Construction

Building 94, a patient care facility, is an existing healthcare occupancy that has one story without a basement and is fully sprinklered. The construction is classified as Type III (200) per NFPA and is



permitted to have one story per NFPA 101 Chapter 19 for a fully sprinklered building. Inspection access to fire dampers is not available and requires installation access doors to allow inspection. All fire and smoke dampers must have adequate access for maintenance which is undetermined at this time due to the limitations of access.

Fire Suppression

The building has a 6-inch incoming fire line located in the mechanical/sprinkler closet that transitions to 4-inch sprinkler pipe that feeds the building's sprinkler system. The 6-inch incoming line is not equipped with a backflow preventer separating the fire sprinkler line from the domestic water line. The building sprinkler system is provided with a post indicator valve (PIV) on the fire line and a fire department connection (FDC) on the front of the building to allow the fire department to provide additional water and pressure for the sprinkler system. The building is also provided with a dry pipe sprinkler system that is for the attic. The sprinklers are standard response.

Fire Alarm

The building is also provided with a fire alarm system. The existing system fire alarm control panel is a Siemens MXL-IQ. The current system monitors the smoke detector at the panel and pull stations, and it powers the horns and strobes. The fire alarm system also monitors the sprinkler system flow and tamper switches and the dry pipe system. The fire alarm system reports to the Public Safety Office (located at Building 59) via a transceiver. The fire alarm system is in good working order and should be capable of being serviced for the next two to three years. Siemens is discontinuing the manufacturing of the MXL panel and associated fire alarm devices.

Egress

The building is provided with corridors that meet the minimum 48-inch requirement. The doors also meet the minimum requirement of 32 inches. Additionally, the areas throughout the building are provided with a minimum of two means of egress.

Building Construction Cost Estimates

Included with each building assessment is a construction cost estimate for essential repairs of deficient and failing building systems, life safety protection and security systems to maintain the building for a period of five to ten years. We include two levels of cost estimates.

Level 1: Repair and/or replacement of essential materials, equipment systems and code deficiencies that in the event of failure would render the building non functional for its intended use within five to ten years.

Level 2: Identifies a contingency repair or replacement fund to address costs for an ongoing maintenance and repairs program with a plan to continue building operations for three to five years with only short term primary services outages. In some cases the options under the level three estimate is to relocate patients and staff to other buildings for short term or long term durations.

PHYSICAL CONDITIONS AND AREA LIST - CRITICAL FIVE TO TEN YEARS

Physical Material Condition Escalated to 6/1/2021 Comments

Bldg number	Area (SF)	Material description (generic type)	Unit Cost (\$USD)	Unit Cost (\$USD)	System Failure Within Two to Five Years Likely
Bldg 95	38,443	Fire Safety Duct, Fire Alarm, Smoke Barriers	\$17.56	\$675,059	Critical repairs due to citations from the Fire Marshall. Smoke and fire dampers do not operate and are not accessible. Building is not code compliant due to previous renovations and interior changes.
Bldg 95	1	Diesel Generator 200 kW	\$184,799.07	\$184,799	The emergency generator is in failing condition. The generator supports the life safety and security systems for the facility as well as the resident population.
Bldg 95	1	Equipment Connection	\$21,697.06	\$21,697	Temporary electrical, heating and cooling connections are required for connection of modular equipment if the facility experiences equipment failures.
Bldg 95	1	Switch Gear 480/277V	\$59,643.01	\$59,643	The main electrical switch gear is original to the building and is no longer serviceable for repairs.
Bldg 95		Base Construction Cost Escalated		\$941,198	
Bldg 95		<i>Soft Costs (25%) Total Project Costs</i>		<i>\$313,730</i>	
Bldg 95		Total Project Cost		\$1,254,928	

PHYSICAL CONDITIONS AND AREA LIST - CONTINGENCY UP TO FIVE YEARS

Physical Material Condition		Escalated to 6/1/2021			Comments
Bldg number	Area (SF)	Material description (generic type)	Unit Cost (\$USD)	Contract Cost (\$USD)	System Failure Within Two to Five Years Likely
Bldg 95	1	Move staff to other admin	\$80,000.00	\$80,000	
Bldg 95		Base Construction Cost Escalated		\$80,000	
Bldg 95		<i>Soft Costs (25%) Total Project Costs</i>		<i>\$26,666</i>	
Bldg 95		Total Project Cost		\$106,666	

Building

96

Step Down Forensics Unit



Central State Hospital Building Assessments



BUILDING 96 – STEP DOWN FORENSICS UNIT

The existing building is one of four identical buildings that serves specific resident populations. Each of the four buildings is a single story, H-shaped building with four separate wards connected by a main entrance area and service entrance centrally located within the connecting corridor. Building renovations in 2002 converted this facility to a step down forensic unit. Wards 1, 3, and 4 became resident wards. Ward 2 housed training and administration areas. Building 96 does not have an active population and was observed to be in poor condition with an overall facility assessment service life of three to four years without major renovation.

We estimate the cost for essential repairs of deficient and failing building systems, life safety protection and security systems to maintain the building for a period of five to ten years is \$5,981,799. If the essential repairs are not completed and system failures require closure of the building due to unsafe conditions, we understand that the building occupants would be moved to either Building 94 or Building 95. The cost of the move, if necessary, is estimated at \$106,666.

The above estimates represent only critical or essential costs and do not include costs to maintain the facility for its intended use over the next ten years. Additional cost information is provided at the end of this assessment.

Building Summary

Building 96 is a noncombustible masonry construction building with roof joists at the low slope portions and light gage steel trusses and framing members at the medium sloped roofs. The building is classified as IIB Construction Type, I2 Psychiatric Hospitals as the occupancy classification. The building is sprinklered and has a fire alarm and notifications system.

Building Envelope

Building 96 was constructed in 1969 and has received numerous systems renovations for life safety improvements, mechanical improvements, fire alarm systems, and roof replacement. In 2004, the building was converted to a step down unit for forensics residents previously housed in Building 39. The building underwent strategic safety upgrades, hardened walls, and replaced doors and frames for stronger units. The building received secure perimeter fencing similar to the fencing around Building 39. The building is currently unoccupied and the security gates installed around the building remain open. The toilet and shower rooms were upgraded to current ADA requirements. One tub area remained.

The roof system is nearing the end of its service life and requires replacement. Roof repairs have been ongoing to address drainage issues and roof leaks that are causing interior systems damage.

Exterior site conditions requiring rehabilitation and renovation include the following:

- Remove the security fence and guarded gate. These items are maintenance issues and not required for the current building activities.
- Revise grading and landscaping to provide drainage away from all exterior doors.
- Design subgrade drainage for storm drainage from roof drain system.
- Add yard drains where applicable.
- Add accessible parking convenient to the building.



Interior Conditions

Each of the ward areas, both administrative and residential/treatment areas, have sustained moisture damage from storm water seeping under doors or through the exterior walls. Other areas also have remedial moisture damage.

- The existing terrazzo flooring in the dayrooms are cracked and portions missing at exterior doors. This is outside the larger secure side with the courtyards and is facing the areas not draining well.
- Any renovations to the toilets, showers, and treatment rooms where mismatched flooring remains should be renovated with new flooring.
- Cracking at the joints in the terrazzo is typical throughout the facility.
- Ceilings in the dayrooms were observed to have moisture damage resulting in stained and sagging conditions. Each of the identical buildings has experienced ceiling damage due to roof failure and possibly related to moisture and condensate for mechanical equipment.
- Ceilings in the raised portion of central corridor indicate moisture damage from condensate lines of the mechanical equipment.
- All ceilings and lights in the dayrooms and the raised portion of the central corridor are suspended 2x2 acoustic ceiling tiles with troffer lights. All dayrooms have natural daylight from exterior windows and clerestory windows. Dayroom windows and resident bedroom windows are operable and covered with security screens.
- Ceilings in the lower roof of the central corridor, the ward corridors, and resident/offices toilet and shower rooms are painted gypsum. Lights are recessed, wall mounted, or surface mounted.
- All carpeted flooring is in the administrative/office areas. All vinyl flooring is located in treatment area classrooms, laundry, cooking and the store. The nurses' stations, toilet, and shower rooms are 1x2 mosaic ceramic tile. All of the resident rooms, utility rooms, dayrooms, ward corridors, central corridors, and portions of the shower rooms are terrazzo fluid applied flooring with ceramic tile base.
- Where severe moisture intrusion and flooding has occurred, the ceramic tile base at the exterior walls of the dayrooms is kicked out away from the vertical wall. This needs to be remediated.
- Lavatories, accessories, and toilet fixtures appear to have been updated in this location. Newer stainless steel toilet partitions have been used. The conversion to a step down forensics unit included accessible toilets, showers, lavatories, and toilet accessories that meet ADA standards. However, because the step down forensics unit has been abandoned the toilet fixtures may not be in good working order.
- All interior walls need scraping, patching, and painting.
- All interior windows with wire glazing need to be replaced. Efforts to cover with Plexiglas



Patient wing corridor



have failed in both resident wards. Maintenance personnel continue having to replace broken Plexiglas. If the residents continually hit the Plexiglas in the same location, both Plexiglas and wire glass will break.

- All interior doors with wire glass need to be replaced.

Exterior Conditions

In addition to the issues with storm water drainage, portions of the building construction are in need of maintenance repair.

- All exterior fascia board and existing gutters need to be scraped, primed, and painted. Rusted out gutters and downspouts should be replaced.
- Some of the exterior brick is experiencing efflorescence from previous delayed maintenance. Possible cleaning and closer examination to determine any serious damage should be considered. Brick repointing and flashing may be recommended.
- Bottoms of the exterior doors and frames are rusting and showing damage from water intrusion.
- All existing storefront glazing, frames, associated doors, and steel doors with borrowed lights require replacement. Replace all exterior panels surrounding exterior doors.
- All exterior windows are showing signs of their age. Some have become inoperable and some are rusted. Some have been repaired when new security screens were added. Both need to be replaced all around Wards 1 and 4. Wards 2 and 3 will only require window replacement.

Mechanical/Plumbing Systems

Summary

The HVAC systems serving Building 96 consist of various rooftop air handling units served by an air-cooled chiller and steam to hot water converter. Chilled water is produced by an air cooled chiller and hot water is produced by a steam to hot water converter. A renovation in 1987 removed the original DX cooling equipment and installed an air cooled chiller with pumps and new distribution piping to serve new air handling units. The ductwork and hot water piping distribution systems are from the original construction and no major renovation has occurred since 1987. Several years ago an air cooled chiller was relocated from another building and replaced the one serving this building. The hydronic piping system was observed to be in failing condition. The hydronic piping system is the original piping and observed to have several repairs and replacement sections. We understand leaks in the system is a continuing maintenance problem.

Building heat is provided by campus steam service and utilizes a steam to hot water converter to produce hot water. The heating water system has been modified since the original design, which included nine separate pumps, one for each heating zone in the building. The current configuration consists of 2-way valves in lieu of zone pumps and a central hot water pump to distribute to the entire building.

Most of the equipment in the building operates with pneumatic controls.

General Condition of HVAC Systems

The HVAC equipment and systems serving the building are relatively new and appear in good working condition. Portions of the pipe and pipe insulation in the mechanical room were replaced in the recent renovation. Some of the older runs are corroded and missing insulation, resulting in a loss of efficiency.



Air handling unit located in penthouse



Air-cooled chiller



Heating water pump



Piping in mechanical room

Pipe insulation in the mechanical room is missing on several runs of pipe resulting in a loss of efficiency due to heat loss from the pipe to the room air. This poses a safety issue with exposed hot water and steam piping. In areas where the insulation is missing, the piping was observed to be severely corroded. It is not clear how much, if any, of the insulation contains asbestos.



The table below summarizes the age and condition of the major equipment in the building.

Existing Equipment Age and Median Life Expectancy Based on 2015 ASHRAE Applications				
Equipment Description	Quantity	Installation Date	Median Life Expectancy (years)	Current Age (years)
Air-Cooled Chiller	1	2010	20	8
Chilled Water Pump	2	1987	20	31
Air Handling Units	8	1987	20	31
VAV Terminal Boxes	25	1987	20	31
Hot Water Convactor	1	before 1987	24	--
Hot Water Pump	1	before 1987	20	--

Conclusions and Recommendations

The major equipment serving the building are beyond their median service life and may begin to fail over the next few years. Replacing equipment in-kind may not be feasible for this building due to the limited access of the air handling units as currently installed. A renovation similar to the one that occurred for Buildings 94 and 95 will be required to update the HVAC systems and bring the building up to current code. This may require locating new air handling units on a structural platform above the flat roof and replacing all major equipment.

It may be possible to re-use most of the distribution piping and ductwork; however, this will result in continued maintenance upkeep due to the age of the systems. Pin-hole sized leaks are occurring regularly in the piping, which requires maintenance personnel to make repairs on a routine basis.

Electrical Systems

Summary

The electrical power systems serving Building 96 consists of a 600A/480v/3 phase service with a 194kw diesel generator for standby power. The building is served from a pad-mounted utility transformer adjacent to the building.



194 kw generator

General Condition of Electrical Systems

The standby generator system was added in 1999 along with a 600 amp service disconnect next to the automatic transfer switch. The generator is rated for 300 amp at 480v indicating the primary main service and the generator are not coordinated. Coordination between the primary main service and the standby generator is critical for protection from overloading of the generator and potential failure.



The generator system has been installed as a standby power generator. This means the generator system cannot be used as a life safety power source for emergency lighting. The building lighting system does not have the required battery backup for the egress lighting but depends on the generator to provide the emergency power. This is not code compliant and should be addressed.

The original service switchgear was left in place to serve as the interior distribution system. This switchgear was installed in 1988 and has reached the end of its serviceable life. These type of switches require yearly maintenance, which has not been maintained. This leads to operational failure when opening or closing the device. This means if you turn the switch off it may not come back on.

The remaining interior distribution panels are of varying age. Some have reached the end of their serviceable life and others have been replaced and are in good condition.

Conclusions and Recommendations

The original service switchgear should be replaced. If there is a failure it would separate the building from the generator system and the building would be without power for several weeks. The standby generator is not coordinated with the building service and should be evaluated to either be upgraded or the building service reduced. The standby generator has nearly reached the end of its serviceable life and should be replaced in the next five years. There is no secondary connection point in the electrical system to allow a temporary generator to be connected to the existing electrical system. If there is a utility failure and the emergency generator fails it will require several days to disconnect the existing generator and connect the temporary generator to the existing electrical system.



Service disconnect and ATS



Original service switchgear



Original panels



Replacement panels

Fire Alarm and Sprinkler Systems

Building 96 is not compliant for current fire safety features and requires remedial repairs and building modifications to address these issues. Based on a previous study completed by the Department of Behavioral Health and Developmental Services (DBHDS), the report identified the need for building compliance for smoke compartments and barriers. Three smoke compartments were recommended for proper control of the building along with the removal of sixteen smoke dampers and installation of four roof mounted smoke evacuation vents. The cost to complete this work is estimated at \$600,000 without escalation.

Building Construction

The building is an existing healthcare occupancy that has one story without a basement and is fully sprinklered. The construction is classified as Type III (200) per NFPA and is permitted to have one story per NFPA 101 Chapter 19 for a fully sprinklered building. Inspection access to fire dampers is not available and requires installation access doors to allow inspection. All fire and smoke dampers must have adequate access for maintenance which is undetermined at this time due to the limitations of access.

Fire Suppression

The building has a 6-inch incoming fire line located in the mechanical/sprinkler closet that transitions to 4-inch sprinkler pipe that feeds the building's sprinkler system. The 6-inch incoming line is not equipped with a backflow preventer separating the fire sprinkler line from the domestic water line. The building sprinkler system is provided with a post indicator valve (PIV) on the fire line and a fire department connection (FDC) on the front of the building to allow the fire department to provide additional water and pressure for the sprinkler system. The building is also provided with a dry pipe sprinkler system that is for the attic. The sprinklers are standard response.



Fire Alarm

The building is also provided with a fire alarm system. The existing system fire alarm control panel is a Simplex 4100U. The current system monitors the smoke detector at the panel and pull stations, and it powers the horns and strobes. The fire alarm system also monitors the sprinkler system flow and tamper switches and the dry pipe system. The fire alarm system reports to the Public Safety Office (located at Building 59) via a transceiver. The fire alarm system is in good working order and should be capable of being serviced for the next 10 years.

Egress

The building is provided with corridors that meet the minimum 48-inch requirement. The doors also meet the minimum requirement of 32 inches. Additionally, the areas throughout the building are provided with a minimum of two means of egress.

Building Construction Cost Estimates

Included with each building assessment is a construction cost estimate for essential repairs of deficient and failing building systems, life safety protection and security systems to maintain the building for a period of five to ten years. We include two levels of cost estimates.

Level 1: Repair and/or replacement of essential materials, equipment systems and code deficiencies that in the event of failure would render the building non functional for its intended use within five to ten years.

Level 2: Identifies a contingency repair or replacement fund to address costs for an ongoing maintenance and repairs program with a plan to continue building operations for three to five years with only short term primary services outages. In some cases the options under the level three estimate is to relocate patients and staff to other buildings for short term or long term durations.

PHYSICAL CONDITIONS AND AREA LIST - CRITICAL FIVE TO TEN YEARS

Physical Material Condition

Escalated to 6/1/2021

Comments

Bldg number	Area (SF)	Material description (generic type)	Unit Cost (\$USD)	Contract Cost (\$USD)	System Failure Within Two to Five Years Likely
Bldg 96	38,443	Mechanical System	\$100.00	\$3,844,300.00	Mechanical equipment is past its serviceable life and requires replacement. Costs include equipment replacement, system hydronic piping and architectural feature replacement due to equipment work.
Bldg 94	1	Fire Safety Duct, Fire Alarm, Smoke Barriers	\$675,000.00	\$675,000.00	Critical repairs due to citations from the Fire Marshall. Smoke and fire dampers do not operate and are not accessible. Building is not code compliant due to previous renovations and interior changes.
Bldg 96	1	Diesel Generator 200 KW	\$184,799.07	\$184,799.07	The emergency generator is in failing condition. The generator supports the life safety and security systems for the facility as well as the resident population.
Bldg 96	1	Equipment Connection	\$21,697.06	\$21,697.06	Temporary electrical, heating and cooling connections are required for connection of modular equipment if the facility experiences equipment failures.
Bldg 96	1	Switch Gear 480/277V	\$59,643.01	\$59,643.01	The main electrical switch gear is original to the building and is no longer serviceable for repairs.
Bldg 96		Subtotal (Contract Cost)		\$4,785,439.14	
Bldg 96		<i>Contingency/Soft Costs (25%)</i>		<i>\$1,196,359.79</i>	
Bldg 96		Total Project Cost		\$5,981,798.93	

PHYSICAL CONDITIONS AND AREA LIST - CONTINGENCY UP TO FIVE YEARS

Physical Material Condition **Escalated to 6/1/2021** **Comments**

Bldg number	Material description (generic type)	Area (SF)	Unit Cost (\$USD)	Contract Cost (\$USD)	System Failure Within Two to Five Years Likely	Comments
Bldg 96	1 HVAC - Temp Repairs		\$25,000.00	\$25,000.00		Mechanical equipment is past is serviceable life and requires replacement. Costs include equipment replacement, system hydronic piping and architectural feature replacement due to equipment work.
Bldg 96	1 MEP Connections		\$25,000.00	\$25,000.00		Mechanical equipment is past is serviceable life and requires replacement. Costs include equipment replacement, system hydronic piping and architectural feature replacement due to equipment work.
Bldg 96	Subtotal (Contract Cost)			\$50,000.00		
Bldg 96	<i>Contingency/Soft Costs (25%)</i>			<i>\$12,500.00</i>		
Bldg 96	Total Project Cost			\$62,500.00		

Building

111

Administration Offices



Central State Hospital Building Assessments



BUILDING 111 – ADMINISTRATION OFFICES

Building 111 is currently being used as Administration Support Services. It is in failing condition and is not fully occupied. Significant repairs or replacement of the primary building systems is required for the building to remain in operation. Due to the condition of the major building components and systems, the overall facility assessment service life is two to three years without major renovations.

We estimate the cost for essential repairs of deficient and failing building systems, life safety protection and security systems to maintain the building for a period of five to ten years is \$550,597. We recommend as a minimum, a contingency fund of \$66,667 be allocated for staff relocation in the event there are essential system component failures and repair or replacement work is not completed or feasible.

The above estimates represent only critical or essential costs and do not include costs to maintain the facility for its intended use over the next ten years. Additional cost information is provided at the end of this assessment.

Building Summary

The existing building was built in 1958. It is a single story, elongated H-shaped building that originally was a patient ward building. It was renovated for other uses over time and was once used for IT VITA services. Some of the computer labs, acoustic ceilings, limited area sprinkler systems, and raised flooring remain. Renovations in 1978 included window and metal siding replacement in and replacement of some portions of the heating and air conditioning systems.

The building is noncombustible, construction type IIB building with a low slope roof and steel trusses and framing members. The building has limited area sprinklers in the computer labs, but is not sprinklered in other areas. The corridor walls extend to the roof deck; however, the walls and the interior doors are not identified as fire rated assemblies. Interior doors do not have door closers or positive latching doors except for mechanical closets. The building does have a fire alarm pull station but no notification systems. It has poured concrete foundations, masonry end walls, and metal panels and strip windows throughout. The existing building is ADA accessible at the main entrance via a short ramp that is not connected to accessible parking.

The existing facility is old and most of the systems require replacement. Deferred maintenance has left the utilities serving this facility in need of many upgrades. The roof is old and past its service life.

Interior Conditions

This building needs maintenance to its exterior and interior. The toilet facilities need to be replaced entirely.

- All interior walls need scraping, patching, and painting.
- Replace all toilet rooms, plumbing fixtures, services, and toilet partitions. The existing toilets have handicapped stalls, but not all fixtures meet the requirements for ADA. Minor accessibility corrections need to be addressed, for example:
 - Drain pipe requires insulation or coverage
 - Mirrors need to be the correct size and lowered
 - Faucets need to be batwing or accessible
 - Paper towels need to be at the correct height
 - Light switches need to be automatic or at the correct height



- Replace all toilet room finishes and replace flooring and base. Paint the walls.
- Replace all vinyl flooring.
- Replace all carpet with 2 x 2 carpet tiles.
- All corridor doors need to be 20-minute doors because the building is not sprinklered and the area and calculated occupancy is greater than 15 people.
- All dutch doors need to be replaced with solid, 20-minute doors.
- All of the unused equipment, banker box paper storage, file cabinet storage, and outdated equipment needs to be removed.



Deteriorated equipment in mechanical equipment closet

Exterior Conditions

Though the building hasn't been renovated since 1976, the exterior conditions are in fair condition. Most of the corrections should be considered regular maintenance items. We observed the following exterior conditions:

- The exterior doors require replacement. All of the door hardware requires replacement for security, energy efficiency, and continued access.
- Existing lintels over the doors in masonry opening need to be scraped and painted as a part of routine maintenance.
- Some efflorescence is evident in the existing brick ends, particularly around the service areas and louvers.
- The base of the brick masonry and the concrete walls show staining from algae and landscaping. Concrete sidewalks, stairs, landings, and foundations show their age from staining and de-icers.
- The exterior of all metal panel siding, prefinished strip window frames, steel doors and frames, prefinished gutters and downspouts have faded in color. These are all past their life expectancy for color retention for prefinished materials. They indicate staining and powdery residue from leaking gutters and overflow.



- The windows are operable sliders in the strip windows. They have screens and appear to be in working order. The prefinished metal panel overhangs with soffits and shades the windows against sun glare and heat. The glazing is tinted, insulated panels. They may require updating, but the need is not immediate.



Mechanical equipment exterior conditions

Mechanical/Plumbing Systems

Summary

The heating, ventilation and air conditioning (HVAC) systems serving Building 111 consist of various air handling units, computer room air conditioners, and an air cooled chiller. The air cooled chiller is located outside on grade and is piped to a single chilled water pump. Chilled water, steam, and condensate lines are routed to each of the five air handling units. Various exhaust fans are located on the roof.

The air handling units have not been replaced since the 1978 renovation. The chiller was replaced in 2001.

The building contains two computer room air conditioners consisting of a floor-mounted air handling unit in the room being served and an outdoor condensing unit located on grade. One grade-mounted air handling unit is ducted into the plenum space of the building.

General Condition of HVAC Systems

The air handling units have exceeded their useful life and appear in poor condition. The unit casings are showing signs of rust and deterioration and several of the flexible duct connectors are dry rotted with several punctures.

The air-cooled chiller is showing signs of age (such as rust), but it does not have any specific issues at this time. The chilled water pump appears in poor condition. It is dirty and showing signs of rust and deterioration.

The computer room air conditioners and grade-mounted air handling unit appear in fair condition with no major issues at this time.



Pipe insulation in the mechanical room has corroded in some places and is missing on several runs of pipe. This reduces efficiency due to heat loss from the pipe to the room air. It also poses a safety issue with exposed steam piping. It is not clear how much, if any, of the insulation contains asbestos.



Indoor air handler serving center core area



Indoor air handling unit (typical of four units)



Air-cooled chiller



Chilled water pump



Below is a table summarizing the age and condition of the major equipment in the building.

Existing Equipment Age and Median Life Expectancy Based on 2015 ASHRAE Applications				
Equipment Description	Quantity	Installation Date	Median Life Expectancy (years)	Current Age (years)
Air-Cooled Chiller	1	2001	20	17
Chilled Water Pump	1	2001	20	17
Indoor Air Handling Units	5	1977	20	41
Grade Mounted Air Handling Units	1	2005	20	13
Computer Room Air Conditioners	2	2001	20	17

Conclusions and Recommendations

The air handling units serving the building are beyond their median service life and may begin to fail over the next few years. Replacing equipment in-kind may require custom units for this building due to the limited access of the air handling units as currently installed. These five units should be replaced at the next opportunity.

The air-cooled chiller and chilled water pump should continue to operate for another five years with routine maintenance. Since the building only has one chilled water pump, there is no redundancy if the pumps fails or must be isolated for maintenance. A second pump should be provided if redundancy is desired.

The computer room air conditioning units and grade-mounted air handler are still within their median life expectancy and should continue to operate for at least another five years with routine maintenance.

It may be possible to reuse most of the distribution piping and ductwork; however, this will result in continued maintenance upkeep due to the age of the systems. Pinhole-sized leaks are occurring regularly in the piping requiring maintenance personnel to make repairs on a routine basis.



Grade mounted air handler and computer room air conditioner condensing unit

Electrical Systems

Summary

The electrical system serving Building 111 consists of a 600A/480v/3 phase service with a 194kw diesel generator for standby power. The building receives primary services from a pad-mounted utility transformer adjacent to the building.



General Condition of Electrical Systems

The generator system was added in 2005, as was a 1200 amp service disconnect next to the automatic transfer switch. The generator system is 13 years old and should be replaced within the next seven years.



300kw generator



Service disconnect and ATS

The generator system has been installed as a standby power generator. This means the generator system cannot be used as a life safety power source for emergency lighting. The building lighting system does not have the required battery backup for the egress lighting but depends on the generator to provide the emergency power. This is not code compliant and should be addressed.

The main distribution panels have been replaced as well as most of the interior panels and are in good condition. Some of the smaller distribution panels in the building have reached the end of their serviceable life and should be replaced.



Main distribution panel



Original small distribution panels



Conclusions and Recommendations

The overall condition of the electrical system is good. The emergency generator should be replaced in the next seven years. There is no secondary connection point in the electrical system to allow a temporary generator to be connected to the existing electrical system. If there is a utility failure and the standby generator fails it will require several days to disconnect the existing generator and connect the temporary generator to the existing electrical system.

Fire Alarm and Sprinkler Systems

Building 111 is an existing business occupancy that has one story without a basement and is not sprinklered. The construction is classified as Type II (000) per NFPA. There are no minimum construction requirements for this occupancy type per NFPA 101.

Fire Suppression

The building is not provided with fire suppression and is not required to be per the construction type, occupancy, and height and area. The building is provided with three FM-200 systems for IT and records areas. Only the IT server room is currently provided with an operational FM-200 system, which is operated by a Siemens MXL panel.

Fire Alarm

The building is also provided with a fire alarm system. The existing system has a fire alarm control panel that is a Sentrol E.S.L 1500 series. The current system monitors the smoke detector at the panel and pull stations, and it powers the horns and strobes. The fire alarm system also monitors the FM-200 systems. The fire alarm system reports to the Public Safety Office (located at Building 59) via a transceiver. The fire alarm system is in good working order and should be capable of being serviced for the next two to three years. Parts are available via e-Bay. The Sentrol system was originally made in 2001 and is a fairly old system that should be considered for replacement. Additionally, Siemens is discontinuing the manufacturing of the MXL panel and associated fire alarm devices.

Egress

The building is provided with doors that meet the minimum requirement of 32 inches. Additionally, the areas throughout the building are provided with a minimum of two means of egress.

Building Construction Cost Estimates

Included with each building assessment is a construction cost estimate for essential repairs of deficient and failing building systems, life safety protection and security systems to maintain the building for a period of five to ten years. We include two levels of cost estimates.

Level 1: Repair and/or replacement of essential materials, equipment systems and code deficiencies that in the event of failure would render the building non functional for its intended use within five to ten years.

Level 2: Identifies a contingency repair or replacement fund to address costs for an ongoing maintenance and repairs program with a plan to continue building operations for three to five years with only short term primary services outages. In some cases the options under the level three estimate is to relocate patients and staff to other buildings for short term or long term durations.

PHYSICAL CONDITIONS AND AREA LIST - CRITICAL FIVE TO TEN YEARS

Physical Material Condition

Escalated to 6/1/2021

Comments

Bldg number	Area (SF)	Material description (generic type)	Unit Cost (\$USD)	Contract Cost (\$USD)	System Failure Within Two to Five Years Likely
Bldg 111	22,675	roofing-low-slope single ply	\$8.98	\$203,621.50	Roof is in failing condition with multiple area of leaks and damaged insulation. Interior water damage noted. Health and safety concerns for continued water damage.
Bldg 111	1	Diesel Generator 200 kW	\$215,159.03	\$215,159.03	The emergency generator is in failing condition. The generator supports the life safety and security systems for the facility.
Bldg 111	1	Equipment Connection	\$21,697.06	\$21,697.06	Temporary electrical, heating and cooling connections are required for connection of modular equipment if the facility experiences equipment failures.
Bldg 111		Subtotal (Contract Cost)		\$440,478	
Bldg 111		<i>Contingency/Soft Costs (25%)</i>		<i>\$110,119</i>	
Bldg 111		Total Project Cost		\$550,597	

PHYSICAL CONDITIONS AND AREA LIST- CONTINGENCY UP FIVE

Physical Material Condition Escalated to 6/1/2021 Comments

Bldg number	Area (SF)	Material description (generic type)	Unit Cost (\$USD)	Contract Cost (\$USD)	System Failure Within Two to Five Years Likely
Bldg 111	1	Staff Relocation	\$50,000.00	\$50,000.00	Roof is in failing condition with multiple area of leaks and damaged insulation. Interior water damage noted. Health and safety concerns for continued water damage.
Bldg 111	Base Construction Cost Escalated			\$50,000	
Bldg 111	<i>Soft Costs (25%) Total Project Costs</i>			<i>\$16,667</i>	
Bldg 111	Total Project Cost			\$66,667	

Building

112

Food Services Kitchen



Central State Hospital Building Assessments



BUILDING 112 – FOOD SERVICES KITCHEN

Building 112 is currently being used as the food services kitchen and it is in failing condition. Significant repairs or replacement of the primary building systems are required for the building to remain in operation. Due to the condition of the major building components and systems, the overall facility assessment service life is two to three years without major renovations.

We estimate the cost for essential repairs of deficient and failing building systems, life safety protection and security systems to maintain the building for a period of five to ten years is \$7,549,841. We recommend as a minimum, a contingency fund of \$1,177,138 be allocated for emergency HVAC and electrical equipment repairs. The contingency fund shall be used to maintain the facility for its intended service and operation in the event the identified suggested critical repair work is not completed and there are essential system component failures.

The above estimates represent only critical or essential costs and do not include costs to maintain the facility for its intended use over the next ten years. Additional cost information is provided at the end of this assessment.

Building Summary

Building 112 is a single-story building with a partial basement. It was constructed in 1958 to serve as a commercial kitchen and dining hall for Southside Virginia Training Center (SVTC) and Central State Hospital. With the closure of SVTC, the main kitchen and dining area are oversized for the current CSH population, resulting in inefficient operation for staff and food preparation. The kitchen has been maintained in fair condition, updated in areas of significant need, and it remains in compliance with the Virginia Uniform Statewide Building Code after the 2005 renovation work. The most recent repair project included replacing several sections of plumbing pipe in the building's crawl space due to leaking pipes and failed valves. This work appears to be part of an ongoing infrastructure piping problem and requires a complete domestic plumbing system replacement within two to three years.

The facility was built with concrete structure, brick composite walls on the exterior, masonry interior walls, ribbon window systems, and clerestory lighting in the kitchen areas. It benefits from a large amount of natural light from the exterior windows and clerestory lighting. Light fixtures are seldom needed within the kitchen areas. The building is not sprinklered except as provided by the cooking exhaust hoods. There are fire alarm pull stations and fire extinguishers throughout the building. The building is only ADA compliant for accessibility from the front of the building via the front courtyard. All other access points require climbing stairs.

The exhaust hoods over the cooking areas were installed in 2007 and observed to be in good condition. The exhaust hoods include an independent fire suppression system designed for this application. The kitchen includes refrigerator coolers, freezers, cold pre-prep rooms, and cold prep rooms along with the standard food service cooking equipment.

The kitchen, in its current configuration, is significantly oversized to efficiently serve the CSH campus. Several studies have been completed outlining plans for changes in the operation of the kitchen; however, none have been implemented and we understand there are no plans for operational changes to this facility.

The construction of the building does not provide good air barrier protection and is thermally inefficient resulting in higher than normal operating cost for the building environment.



Interior Conditions

The front dining room area has been renovated to an administrative office and document storage for medical records. This conversion changes the building code classification due to the storage of paper documents and requires the area to be sprinklered. There was no indication of fire-rated separation between the kitchen area and the record storage area.

Although the cooking areas have hoods with automatic fire suppression and smoke detection, we have concerns about paper storage being in proximity to areas with fryers, ovens, and griddles due to the possibility of grease fires.

Other dining rooms have been repurposed as craft rooms or meeting areas. It seems inappropriate for these rooms to be closely positioned to areas of food preparation and food storage.

The existing facility is aging and its systems have been replaced and updated as required over time. The building has served its purpose well, but it has environmental and usability issues that will be very expensive to correct.

- Some of the coolers are unused and have been repurposed as junk storage rooms.
- Large open areas adjacent to the dish washing area are under used. It was previously used as scullery for large pot washing pre-wash, cart wash, and trash can wash. These items are not needed in great numbers as in the past.
- The dishwashing conveyors and the dishwashing machines are much smaller than the wash area was previously designed to accommodate. The newer, updated equipment requires less space, less energy, and less time.
- The amount of hoods, ovens, griddles, fryers, proofing ovens, ranges, and large soup pots are less than half the amount this space was originally designed for.
- The baking kitchen is less than $\frac{1}{3}$ the size it was designed to accommodate. The bread making and conveyor style oven is only used about twice weekly.
- The dirty cart storage and clean cart storage is nearly unused because the function of the dining hall has been reduced to a commercial kitchen that serves the residents in prepared trays that are delivered to each resident building for consumption.



Food storage areas



Food preparation areas

- The cooking-to-serve line is obsolete in this building as the food is no longer served to the general population in this facility.
- CSH staff and kitchen staff working on the premises are permitted to eat in the dining hall, but it is more the exception than the rule.

Exterior Conditions

Window shading devices reduce the glare and sun exposure on the existing windows. The roof is a membrane roof installed within the last 10 years. The building has little insulation in the walls or on the roof. The glazing is clear, single paned, single hung in ribbon frames:

- All the exterior doors require replacement. All of the door hardware requires replacement for security, energy efficiency, and continued access.
 - The aluminum storefront entrance and vestibule can see daylight around all perimeters.
 - Exterior steel door and frames are rusting out.
- The existing roof needs to be replaced.
- The exterior poured concrete retaining wall at the basement roll-up door and drive is showing signs of wear including staining, spalling, and minor cracking.
- The loading dock above the wall seems oversized. Parking in the loading dock area should only accommodate delivery or trucks servicing the facility.
- The overhead doors need replacing with newer, more energy-efficient insulated overhead doors.
- Some efflorescence is evident in the existing brick walls, particularly around the north elevation, below the dock. Brick shows water damage around the base of the building adjacent to the unexcavated areas (crawl space). Weeps and foundation vents are evident at the first floor level. Domestic water piping was observed to be repaired in several locations around the perimeter of the building and we understand this is the result of frozen pipes during the winter months.
- Several large holes around the perimeter of the building open the building up to water intrusion and vermin below the first floor.



- The base of the brick masonry and the concrete walls show staining from algae and landscaping. Concrete sidewalks, stairs, landings, and foundations show their age from landscaping, staining, and de-icers.
- The exterior of all metal panel infill, prefinished strip window frames and steel doors and frames indicate fading of paint and exhibit rust and other contaminants. The ribbon window systems exceeded their life expectancy.
- The windows are operable, single-hung in ribbon window frame systems with infill panels above and below. The glass is clear, single-pane operable divided units. They should be replaced if considering energy improvements.

Summary

The HVAC systems serving Building 112 consist of various roof top air conditioning units, indoor air handling units, an air cooled chiller, and steam unit heaters. A 100-ton air cooled chiller is located outside on grade.

The building was originally built in 1958 and has undergone several HVAC modifications. A major renovation in 1991 added four roof top air handling units and replaced the kitchen exhaust fans. The air-cooled chiller was replaced in 2006.

General Condition of HVAC Systems

The condition of the HVAC equipment generally appears to be in poor condition with visible signs of rust, loose panels, and damaged components. One of the indoor air handling units located in the ceiling above one of the entry vestibules is disassembled and nonfunctional. Another air handling unit located adjacent to this one had visible signs of condensation forming on the unit and dripping on the floor. There was a scent of mildew in the room.

The various rooftop units on the building are still working, but are past their useful life and show signs of deterioration inside the unit. A compressor was recently replaced on one of the units. The basement contains several compressors that serve refrigerated rooms in the kitchen. The compressors are piped to a condenser water system and to a cooling tower located inside the



Indoor air handling unit disassembled and nonfunctional



Indoor air handling unit with condensation forming on unit casing



Rooftop air handling unit



Inside of rooftop air handling unit



Condenser water pump for refrigerator compressives



Chilled water pump

basement. The cooling tower and condenser water pump are past their useful life. A different configuration of condensing units should be considered for the refrigerated equipment.

The air-cooled chiller, replaced in 2006, appears in good working condition, but the chilled water pump appears much older and in poor condition. A large puddle was noted around the chilled water pump due to a nearby leak in the piping.

Pipe insulation in the mechanical room has corroded in some places and is missing on several runs of pipe resulting in a loss of efficiency due to heat loss from the pipe to the room air and poses a safety issue with exposed hot water and steam piping. It is not clear how much, if any, of the insulation contains asbestos.



Below is a table summarizing the age and condition of the major equipment in the building.

Existing Equipment Age and Median Life Expectancy Based on 2015 ASHRAE Applications				
Equipment Description	Quantity	Installation Date	Median Life Expectancy (years)	Current Age (years)
Rooftop Air Handling Units	4	1991	20	27
Indoor Air Handling Units	5	before 1991	20	>27
Air-Cooled Chiller	1	2006	20	12
Chilled Water Pump	unknown	2005	20	--
Exhaust Fans	9	1991	20	27
Cooling Tower for Refrigerator Compressors	1	2001	20	27
Condenser Water Pump for Refrigerator Compressors	1	1991	20	27

Conclusions and Recommendations

Most of the HVAC equipment is past its useful life and needs to be replaced. Due to the complex nature of a commercial kitchen and the changes that have occurred over time, it is likely the system serving this area is not compliant with current building codes with regard to exhaust airflow rates, make up air rates and temperatures, and refrigerant monitoring. In order to ensure safe and efficient operation of the kitchen, a full HVAC renovation is required for the kitchen and dining area. The smell of mildew throughout much of the building is a sign of water damage and should be addressed as soon as possible.

Electrical Systems

Summary

The electrical systems serving Building 112 consist of a 2000A/208v/3 phase service with a 350kw diesel generator for standby power. The building is served from a pad-mounted utility transformer adjacent to the building.

General Condition of Electrical Systems

The generator system was added in 1999 as well as a 2000 amp service disconnect next to the automatic transfer switch. The generator system is 19 years old and should be replaced in the next three years.

The generator system has been installed as a standby power generator. This means the generator system cannot be used as a life safety power source for emergency lighting. The building lightings system does not have the required battery backup for the egress lighting but depends on the generator to provide the emergency power. This is not code compliant and should be addressed.

The main distribution panels have been replaced as well as most of the interior panels and are in good condition. Some of the smaller distribution panels in the building have reached the end of their serviceable life and should be replaced.



The main distribution panel and the motor control center are original and have reached the end of their serviceable life. The rest of the internal panels have four to five years left in their serviceable life and replacement parts will be difficult to find due to the age and manufacture of the equipment.



300kw generator



Service disconnect and ATS



Main distribution panel



Motor control center

Conclusions and Recommendations

The overall condition of the electrical system is poor and will become an operational problem in the next four to six years. The emergency generator should be replaced within the next three years. There is no secondary connection point in the electrical system to allow a temporary generator to be connected to the existing electrical system. If there is a utility failure and the standby generator also fails it will require several days to disconnect the existing generator and connect the temporary generator to the existing electrical system.



Fire Alarm and Sprinkler Systems

Building Construction

Building 112 is a kitchen and medical records storage occupancy that has one story with a basement and is not sprinklered. The construction is classified as Type II (111) per NFPA. There are no minimum construction requirements for this occupancy type per NFPA 101.

Fire Suppression

The building is not provided with fire suppression and is not required to be per the construction type, occupancy, and height and area. However, changes to the construction type and occupancy is required if the medical records storage is planned to continue in this facility. The kitchen hoods are provided with fire suppression systems.

Fire Alarm

The building is provided with a fire alarm system. The existing system has a fire alarm control panel that is a Simplex 4002. The current system monitors the smoke detector at the panel, pull stations, and the kitchen hood system. It also powers the horns and strobes. The fire alarm system reports to the Public Safety Office (located at Building 59) via a transceiver. The fire alarm system is in good working order and should be capable of being serviced for the next two to three years. However, parts are no longer available. The Simplex system was originally made in 1980s and this fairly old system should be replaced.

Egress

The building is provided with doors that meet the minimum requirement of 32 inches. Additionally, the areas throughout the building are provided with a minimum of two means of egress.

Building Construction Cost Estimates

Included with each building assessment is a construction cost estimate for essential repairs of deficient and failing building systems, life safety protection and security systems to maintain the building for a period of five to ten years. We include two levels of cost estimates.

Level 1: Repair and/or replacement of essential materials, equipment systems and code deficiencies that in the event of failure would render the building non functional for its intended use within five to ten years.

Level 2: Identifies a contingency repair or replacement fund to address costs for an ongoing maintenance and repairs program with a plan to continue building operations for three to five years with only short term primary services outages. In some cases the options under the level three estimate is to relocate patients and staff to other buildings for short term or long term durations.

PHYSICAL CONDITIONS AND AREA LIST - CRITICAL FIVE TO TEN YEARS

Physical Material Condition Escalated to 6/1/2021

Comments

Bldg number	Area (SF)	Material description (generic type)	Unit Cost (\$USD)	Contract Cost (\$USD)	Comments
Bldg 112	56,712	Mechanical System, Full Replacement	\$93.63	\$5,309,945	Mechanical equipment is past its serviceable life and requires replacement. Costs include equipment replacement, system hydronic piping and architectural feature replacement due to equipment work.
Bldg 112	1	1 Panel Board 400A	\$58,886.86	\$58,887	The electrical panel is no longer serviceable and may not operate in an emergency condition. Replacement required.
Bldg 112	1	Incom MMC MCB NEMA 600A	\$56,707.20	\$56,707	The electrical panel is no longer serviceable and may not operate in an emergency condition. Replacement required.
Bldg 112	1	Diesel Generator 300 kW	\$215,159.03	\$215,159	The emergency generator is in failing condition. The generator supports the life safety and security systems for the facility as well as the resident population.
Bldg 112	1	Equipment Connection	\$21,697.06	\$21,697	Temporary electrical, heating and cooling connections are required for connection of modular equipment if the facility experiences equipment failures.
Bldg 112		Base Construction Cost Escalated		\$5,662,395	
Bldg 112		<i>Soft Costs (25%) Total Project Costs</i>		<i>\$1,887,446</i>	
Bldg 112		Total Project Cost		\$7,549,841	

PHYSICAL CONDITIONS AND AREA LIST - CONTINGENCY UP TO FIVE YEARS

Physical Material Condition Escalated to 6/1/2021 Comments

Bldg number	Area (SF)	Material description (generic type)	Unit Cost (\$USD)	Contract Cost (\$USD)	Comments
Bldg 112	1	Generator / Aux. Power	\$215,159.00	\$215,159.00	The emergency generator is in failing condition. The generator supports the life safety and security systems for the facility as well as the resident population.
Bldg 112	1	HVAC	\$530,000.00	\$530,000.00	Mechanical equipment is past its serviceable life and requires replacement. Costs include equipment replacement, system hydronic piping and architectural feature replacement due to equipment work.
Bldg 112	1	Main Electrical	\$116,000.00	\$116,000.00	The electrical panel is no longer serviceable and may not operate in an emergency condition. Replacement required.
Bldg 112	1	MEP Connections	\$21,697.00	\$21,697.00	Temporary electrical, heating and cooling connections are required for connection of modular equipment if the facility experiences equipment failures.
Bldg 112		Base Construction Cost Escalated		\$882,856	
Bldg 112		<i>Soft Costs (25%) Total Project Costs</i>		<i>\$294,282</i>	
Bldg 112		Total Project Cost		\$1,177,138	

Building

113

Administration Building



Central State Hospital Building Assessments



BUILDING 113 – ADMINISTRATION BUILDING

Building 113 is currently being used for patient care administrative functions and is in failing condition. The building is a single story structure with a partial basement. Significant repairs or replacement of the primary building systems are required for the building to remain in operation. Due to the condition of the major building components and systems, the overall facility assessment service life is two to three years without major renovations.

We estimate the cost for essential repairs of deficient and failing building systems, life safety protection and security systems to maintain the building for a period of five to ten years is \$4,711,471. We recommend as a minimum, a contingency fund of \$1,008,096 be allocated for emergency HVAC repairs, electrical equipment repairs and mold remediation. The contingency fund shall be used to maintain the facility for its intended service and operation in the event the identified suggested critical repair work is not completed and there are essential system component failures.

The above estimates represent only critical or essential costs and do not include costs to maintain the facility for its intended use over the next ten years. Additional cost information is provided at the end of this assessment.

Building Summary

Building 113 is a long building with a squat, intersecting T-shaped addition extending to the back. There is a partial basement in the back addition with a loading dock. Building 113 was originally constructed in 1958 and used as a patient care and housing facility for Southside Virginia Training Center (SVTC). The building was renovated for various interior improvements over time. It's used for administrative staffing with limited patient housing services. The existing facility treats many different types of behavioral issues and requires very durable, long-lasting finishes.

The building has sprinklers throughout and full height, non-combustible light weight CMU corridor walls. The building does have fire alarm pull stations, strobes and emergency lights but no notification systems. The existing building is ADA-accessible at the main entrance and loading dock via short ramps. It is not connected to ADA-accessible parking. The building has an elevator and most of the toilet rooms received renovations under an earlier version of the ADA accessibility code.

The building systems have not received significant renovations and many of the systems are original or were modified through a building maintenance program. The building's roof was replaced with an EPDM single-ply membrane within the last 10 years and observed to be in good condition.

Interior Conditions

The interior building architectural systems are failing and do not meet current building codes. The toilet facilities need to be replaced in their entirety. The toilet fixtures, toilet accessories, and floor and wall finishes are in poor condition. Some units are not functional. ADA accessibility accommodations for approaches, fixture heights, assist device reaches, and clearances were not compliant.

Many of the interior finishes have reached the end of their useful life. Many floors are cracked, some vinyl tile sections are not adhered, and the 12 x 12 adhered ceiling tile requires replacement.

Building 113 has been renovated from patient care rooms to administrative offices and some interior walls have been removed or relocated. It was noted during our assessment that air circulation in these areas is not adequate for a work environment. A great majority of the offices exhibit signs of mold and staining on the outer walls and in some areas on the ceiling. Due to the observed mold conditions the assessment team ended their study for the interior areas. The following is a summary of needed interior repairs:



- All interior walls need scraping, patching, and painting. The worst conditions are in the basement and first floor offices.
- All interior ceilings require either painting or acoustic tile replacement.
- Replace all toilet rooms, plumbing fixtures, services, and toilet partitions. Renovate all toilet rooms to meet ADA requirements. Minor accessibility corrections need to be addressed, for example:
 - Drain pipe requires insulation or coverage
 - Mirrors need to be the correct size and lowered
 - Faucets need to be lever handle or otherwise accessible
 - Paper towels need to be at the correct height
 - Light switches need to be automatic or at the correct height
 - Access widths to lavatories need to meet minimum ADA standards
- Replace all toilet room finishes, wall ceramic tile, ceramic tile flooring, and base. Paint the walls and ceilings.
- Replace all vinyl flooring in corridors, service areas, kitchenettes, and circulation areas.
- Replace all carpet with 2 x 2 carpet tiles in administrative offices.



Utility sinks and janitorial areas

Exterior Conditions

During our assessment we observed significant water damage in and around the lower levels of the building. Maintenance determined that much of the water damage can be attributed to failing storm drainage systems. We can verify water entering the basement during heavy rains through seepage, possible leaking of rain leaders, condensate from interior lines, and possible plumbing leaks. The basement and the lower offices show signs of water intrusion and the vinyl tile adhesion is failing. On the exterior, the brick walls and foundations indicate more evidence of moisture accumulation, failed masonry joints, or stress cracking. Around the perimeter of the building, we observed mold, algae, and efflorescence on the foundation level and along the precast concrete bands at the floor lines. We also observed this condition on the ribbon window system lower panels and frames, along with rust and staining of the frames. The following is a summary of needed exterior repairs:



- All the exterior doors require replacement. All of the door hardware requires replacement for security, energy efficiency, and continued access.
 - The storefront entrance and vestibule can see daylight around all perimeters.
 - Exterior steel door and frames are rusting out. Some still contain wire glass view panels.
- North-facing brick walls, concrete floor slabs/bands, window frames, and window infill panels show some staining, mold, and algae growth.
- Some efflorescence is evident in the existing brick walls, particularly on the upper levels. Some of the brick panel walls are cracked, but weeps are not evident at the first floor level. Cast stone window sills near grade are cracked beyond repair.
- The base of the brick masonry and the concrete walls show staining from algae and landscaping. Concrete sidewalks, stairs, landings, and foundations show their age from landscaping, staining, and de-icers.
- The exterior of all metal panel infill, prefinished strip window frames, and steel doors and frames indicate fading of paint and exhibit rust and other contaminants. The ribbon window systems exceeded their life expectancy.
- The windows are operable hopper and awning style windows in ribbon window frame systems with infill panels above and below. They have interior secure patient screens and appear to be in working order. The glass is clear, single-pane operable divided units. They should be replaced if considering energy improvements.

Mechanical/Plumbing Systems

Summary

The HVAC systems serving Building 113 consist of three air handling units in the basement mechanical room and various hot water unit heaters and convectors. Chilled water is provided by an air cooled chiller located outside on grade and hot water is provided by a steam to hot water converter with three hot water pumps, one for each heating zone.

The original building contained a water cooled chiller and cooling tower. In the early 2000s (specific date was not available during our inspection), the chiller and cooling tower were replaced with an air cooled chiller. The hot water converter and three air handling units appear to be from the original construction. HVAC upgrades have occurred to replace the pneumatic control valves and dampers with electronic actuators.

General Condition of HVAC Systems

The three air handling units are in poor condition and show severe signs of deterioration on the unit casing as well as ductwork connections. The flexible duct connectors have dry rotted in some places, with large holes open to the mechanical room. Air can be felt leaking through several joints in the air handling units. The interior portions of the units are dirty and could be contributing to poor indoor air quality.

The hot water pumps appear in fair condition, but the chilled water pump is older and appears in poor condition. Much of the hot water and chilled water piping and valves show signs of rust and deterioration.



Air handling unit



Dry rotted flexible duct connector



Air handling unit with damaged ductwork and insulation



Chilled water pump



Corroded chilled water valve



Below is a table summarizing the age and condition of the major equipment in the building.

Existing Equipment Age and Median Life Expectancy Based on 2015 ASHRAE Applications				
Equipment Description	Quantity	Installation Date	Median Life Expectancy (years)	Current Age (years)
Indoor Air Handling Units	3	1958	20	60
Air-Cooled Chiller	1	unknown	20	--
Chilled Water Pump	1	unknown	20	--
Steam to Hot Water Converter	1	1958	24	60
Hot Water Pump	3	unknown	20	--

Conclusions and Recommendations

The air handling units and associated ductwork and piping are far past their useful life and should be replaced as soon as possible. It may be possible to keep the air cooled chiller online for several more years, but all associated piping and pumps should be replaced. For an HVAC renovation of this size, consider alternative systems that will ensure a life cycle cost-effective system that meets the needs of the building users. Variable speed pumping systems and variable air volume air handling systems would increase energy efficiency and improve indoor air quality.

Electrical Systems

Summary

The electrical systems serving Building 113 consist of a 1200A/208v/3 phase service with a 250kw diesel generator for life safety and standby power. The building is served from a pad-mounted utility transformer adjacent to the building.

General Condition of Electrical Systems

The main electrical service equipment has been replaced in the last ten years and is in good condition. The 250kw standby generator appears to be in fair condition; however, it was manufactured in 1997 and is reaching the end of its expected service life. The distribution panels are older and have reached the end of their serviceable life.

Conclusions and Recommendations

The building's electrical system is not reliable. Because this building houses the communication head end equipment for the campus, an outage will have a significant effect on the operations of CSH. The standby generator has nearly reached the end of its serviceable life and should be replaced in the next four years. There is no secondary connection point in the electrical system to allow a temporary generator to be connected to the existing electrical system. If there is a utility failure and the standby generator also fails it will require several days to disconnect the existing generator and connect the temporary generator to the existing electrical system.



New electrical service and automatic transfer switch



Existing 250kw diesel generator



Electrical distribution panels



Telephone equipment



Fire Alarm and Sprinkler Systems

Building Construction

Building 113 is an existing business occupancy that has two stories with a basement and is not sprinklered. The construction is classified as Type II (000) per NFPA. There are no minimum construction requirements for this occupancy type, per NFPA 101.

Fire Suppression

The building is not provided with fire suppression and is not required to be per the construction type, occupancy, and height and area.

Fire Alarm

The building is provided with a fire alarm system. The existing system has a fire alarm control panel that is a Simplex 4010. The current system monitors the smoke detector at the panel, pull stations, and it powers the horns and strobes. The fire alarm system reports to the Public Safety Office (located at Building 59) via a transceiver. The fire alarm system is in good working order and should be capable of being serviced for the next 10 years.

Egress

The building is provided with stairs and doors that meet the minimum requirement of 32 inches. Additionally, the areas throughout the building are provided with a minimum of two means of egress.

Building Construction Cost Estimates

Included with each building assessment is a construction cost estimate for essential repairs of deficient and failing building systems, life safety protection and security systems to maintain the building for a period of five to ten years. We include two levels of cost estimates.

Level 1: Repair and/or replacement of essential materials, equipment systems and code deficiencies that in the event of failure would render the building non functional for its intended use within five to ten years.

Level 2: Identifies a contingency repair or replacement fund to address costs for an ongoing maintenance and repairs program with a plan to continue building operations for three to five years with only short term primary services outages. In some cases the options under the level three estimate is to relocate patients and staff to other buildings for short term or long term durations.

PHYSICAL CONDITIONS AND AREA LIST - CRITICAL FIVE TO TEN YEARS

Physical Material Condition Escalated to 6/1/2021

Comments

Bldg number	Area (SF)	Material description (generic type)	Unit Cost (\$USD)	Contract Cost (\$USD)	System Failure Within Two to Five Years Likely
Bldg 113	21,000	roofing-low-slope single ply	\$8.98	\$188,580.00	Roof is in failing condition with multiple leak areas and damaged insulation. Interior water damage noted. Health and safety concerns may result from water damage.
Bldg 113	32,870	Mechanical System, Full Replacement	\$93.63	\$3,077,618	Mechanical equipment is past is serviceable life and requires replacement. Costs include equipment replacement, system hydronic piping and architectural feature replacement due to equipment work.
Bldg 113	1	Panel Board 400A	\$49,376.69	\$49,377	The electrical panel is no longer serviceable and may not operate in an emergency condition. Replacement required.
Bldg 113	1	Equipment Connection	\$21,697.06	\$21,697	Temporary electrical, heating and cooling connections are required for connection of modular equipment if the facility experiences equipment failures.
Bldg 113	1	250kW Generator	\$196,340.15	\$196,340	The emergency generator is in failing condition. The generator supports the life safety and security systems for the facility as well as the resident population.
Bldg 113		Base Construction Cost Escalated		\$3,533,612	
Bldg 113		<i>Soft Costs (25%) Total Project Costs</i>		<i>\$1,177,859</i>	
Bldg 113		Total Project Cost		\$4,711,471	

PHYSICAL CONDITIONS AND AREA LIST - CONTINGENCY UP TO FIVE YEARS

Physical Material Condition Escalated to 6/1/2021 Comments

Bldg number	Area (SF)	Material description (generic type)	Unit Cost (\$USD)	Contract Cost (\$USD)	Comments
Bldg 113	1	Mold Remediation	\$85,000.00	\$85,000	Mold conditions in basement and lower level spaces.
Bldg 113	1	HVAC	\$600,000.00	\$600,000	Mechanical equipment is past is serviceable life and requires replacement. Costs include equipment replacement, system hydronic piping and architectural feature replacement due to equipment work.
Bldg 113	1	Main Electrical	\$49,377.00	\$49,377	The electrical panel is no longer serviceable and may not operate in an emergency condition. Replacement required.
Bldg 113	1	MEP Connections	\$21,697.00	\$21,697	Temporary electrical, heating and cooling connections are required for connection of modular equipment if the facility experiences equipment failures.
Bldg 113		Base Construction Cost Escalated		\$756,074	
Bldg 113		<i>Soft Costs (25%) Total Project Costs</i>		<i>\$252,022</i>	
Bldg 113		Total Project Cost		\$1,008,096	

Building

114

Treatment Mall



Central State Hospital Building Assessments



BUILDING 114 – Treatment Mall

Building 114 is currently used for patient care, treatment, and training functions and is in fair condition. The building is a two story structure with a partial basement and was constructed in the late 1950s. Significant repairs or replacement of the primary building systems over the years have maintained this building in better condition than most buildings on the hospital campus, with an overall facility assessment service life is seven to nine years without major renovations.

We estimate the cost for essential repairs of deficient and failing building systems, life safety protection and security systems to maintain the building for a period of five years is \$1,672,254. Building 114 is currently used as a training facility and in the event there are essential system component failures and repair or replacement work is not completed or feasible, the training programs may be moved to other buildings on the CSH campus. If this becomes necessary, the move is estimated to cost \$106,666.

The above estimate represent only critical or essential costs and do not include costs to maintain the facility for its intended use over the next ten years. Additional cost information is provided at the end of this assessment.

Building Summary

The existing building is an elongated cruciform shaped building. It has continually been used for intensive patient treatment and training. This building was originally built between 1957 and 1961 as a patient care and housing facility for Southside Virginia Training Center. It was recently converted to its current use. Building 114 treats many different types of behavioral issues and requires very durable, long-lasting finishes.

Building 114 is noncombustible, construction type IAB building with a low slope roof over rigid insulation on a precast concrete plank roof, precast concrete plank floor structure, concrete columns and miscellaneous steel framing members. The exposed perimeter walls are non-load-bearing masonry composite walls and infill full height ribbon window wall systems. The building has sprinklers throughout and full height, noncombustible lightweight masonry block walls in the corridor. The building has fire alarm pull stations, strobes, and emergency lights but no notification systems. The existing building is ADA accessible at the main entrance and loading dock via short ramps. It does not have ADA-accessible parking. The building has an elevator and most of the toilet rooms received renovation to an earlier version of the accessibility code.



Mold and damaged foundation wall



Apparent interior wall plumbing issue resulting in damage and mold on foundation wall



Mold and damaged foundation wall

Building 114 is in fair condition for its age and has been maintained better than most buildings on the hospital campus. The most significant concern observed during our site visit is major water damage at the lower levels. Maintenance has determined that much of the water damage can be attributed to failing perimeter storm drainage systems. We can verify water entering the basement during heavy rains through seepage, possible leaking of rain leaders, condensate from interior lines, and possible plumbing leaks. The basement and other lower floors show signs of spalling concrete, sagging ceilings, and vinyl floor tile adhesion failing. On the exterior, the poured concrete foundation indicates more evidence of moisture accumulation than failed joints or stress cracking. Around the perimeter of the building,

we discovered mold, algae, and rust stains on the concrete foundation, some on the exposed concrete of the second floor concrete band, and on the ribbon window systems lower panels and frames. Although the ribbon wall systems along the north-facing elevations were not listed on the CSH infrastructure projection, we discovered some rusting there.

Interior space conditions require replacement and upgrades. The toilet facilities need to be replaced entirely. The toilet fixtures, accessories, and floor and wall finishes are in poor condition with some units not functional. Accommodations for approaches, fixture heights, assist device reaches, and clearances were not ADA-compliant.

Many of the interior finishes have reached the end of their useful life. Many floors are cracked, vinyl tile flooring is coming up due to loss of adhesion, and much of the ceiling tile requires replacing. The following is a summary of needed interior repairs:

- All interior walls need scraping, patching, and painting especially in the basement.
- All interior ceilings require either painting or acoustic tile replacement.
- Replace all toilet rooms, all plumbing fixtures, services, and toilet partitions. The existing toilets have handicap stalls, but not all fixtures meet the requirements for ADA. Minor accessibility corrections need to be addressed, for example:
 - Drain pipe requires insulation or coverage
 - Mirrors need to be the correct size and lowered



Typical condition throughout the building, water staining on ceiling tile



- Faucets need to be lever handle or otherwise accessible
- Paper towels need to be at the correct height
- Light switches need to be automatic or at the correct height
- Access widths to lavatories need to meet minimum ADA standards.
- Replace all toilet room finishes and replace the flooring and base. Paint the walls.
- Replace all vinyl flooring in corridors, treatment areas, classrooms, and other patient areas.
- Replace all carpet with 2 x 2 carpet tiles in administrative areas.

The following is a summary of needed exterior repairs:

- All the exterior doors require replacement. All of the door hardware requires replacement for security, energy efficiency, and continued access.
 - The storefront entrance and vestibule can see daylight around all perimeters.
 - Exterior steel door and frames are rusting out. Some still contain wire glass view panels.
- North-facing brick walls, concrete foundations, window frames, and window infill panels show severe staining, mold, and algae growth.
- Some efflorescence is evident in the existing brick walls, particularly on the upper levels. No brick vents are within the upper part of the walls, but weeps are evident at the first floor level.
- The base of the brick masonry and the concrete walls show staining from algae and landscaping. Concrete sidewalks, stairs, landings, and foundations show their age from landscaping, staining, and de-icers.
- The exterior of all metal panel infill, prefinished strip window frames, and steel doors and frames indicate fading of paint and exhibit rust and other contaminants. The ribbon window systems exceeded their life expectancy.
- The windows are operable double-hung in ribbon window frame systems with infill panels above and below. They have interior secure patient screens and appear to be in working order. The glass is clear, single-pane operable divided units. They should be replaced if considering energy improvements.

Mechanical/Plumbing Systems

Summary

Building 114 underwent HVAC replacement in 2009 with all major equipment being replaced. Much of the piping and ductwork was reused. The HVAC systems consist of four 100% outside air units located on grade at different locations around the building and a combination of small air handling units and fan coil units. Chilled water is provided by an air cooled chiller. Building heat is provided by camp steam service and uses a steam to hot water converter to produce hot water.

General Condition of HVAC Systems

The HVAC equipment and systems serving this building are less than 10 years old and appear in good working order. Some locations on the second floor are not served by the outside air units, but rather small air handling units with outside air directly to the return side of the units. These spaces had a noticeably lower air quality than other parts of the building. Indoor air quality could be improved with more sophisticated controls to limit swings in humidity or by providing a separate 100% outside air unit for these spaces.



Air-cooled chiller



100% outside air unit



Indoor air handling unit

This table summarizes the age and condition of the major equipment in the building.

Existing Equipment Age and Median Life Expectancy Based on 2015 ASHRAE Applications				
Equipment Description	Quantity	Installation Date	Median Life Expectancy (years)	Current Age (years)
Steam Unit Heaters	0	1967	20	51
Exhaust Fans	0	1967	20	51
Split System Air Conditioner	1	2005	15	13
Through-the-Wall Air Conditioners	3	unknown	15	--

Building

114

Treatment Mall



Central State Hospital Building Assessments



Conclusions and Recommendations

Due to the HVAC renovation in 2009, the building should continue to operate with routine maintenance for at least another 10 years without major equipment failures. Revisions could be made to portions of the second floor to improve air quality, but they are not necessary to keep the building operational.

Electrical Systems

Summary

The electrical systems serving Building 114 consist of a 2500A/208v/3 phase service with a 750kw diesel generator for life safety and standby power. The building is served from a pad-mounted utility transformer adjacent to the building.

Electrical Power Systems

The main electrical service equipment has been replaced within the last five years and is in good condition. The 750kw generator was installed in 2007 and is in good condition. We believe the remaining serviceable life of each item is ten years before equipment replacement parts are no longer available.

The distribution panels located throughout the facility are in fair condition and have eight to ten years of serviceable life remaining.



Electrical service and automatic transfer switch



750kw diesel generator



Main distribution board



Typical electrical panel



Typical electrical panel

The remaining interior electrical panels throughout the building are older panels but are still serviceable. The remaining serviceable life of the secondary distribution panels is approximately two to three years.

Conclusions and Recommendations

The main electrical system for Building 114 is in good condition with a serviceable life of eight to ten years. The distribution panels are nearing the end of their serviceable life and require replacement within the next two to three years. There is no secondary connection point in the electrical system to allow a temporary generator to be connected to the existing electrical system. If there is a utility failure and the standby generator also fails it will require several days to disconnect the existing generator and connect the temporary generator to the existing electrical system.



Fire Alarm and Sprinkler Systems

Building Construction

Building 39 is an existing healthcare occupancy that has two stories and a basement. It is fully sprinklered. The construction is classified as Type I (332) per NFPA and is permitted to have greater than four stories per NFPA 101 Chapter 19 for a fully sprinklered building.

Fire Suppression

The building has a 6-inch incoming fire line located in the basement that transitions to 4-inch sprinkler pipe that feeds the building's sprinkler system. The building sprinkler system is provided with a post indicator valve (PIV) on the fire line and a fire department connection (FDC) on the front of the building to allow the fire department to provide additional water and pressure for the sprinkler system. The sprinklers are standard response.

Fire Alarm

The building is also provided with a fire alarm system. The existing system has a fire alarm control panel is a Simplex 4100U. The current system monitors smoke detectors for the elevator machine room, lobbies and corridors, heat detectors, pull stations, and the smoke detectors at doors in the smoke barriers. It also powers the horns and strobes. The fire alarm system monitors the sprinkler system flow and tamper switches. It reports to the Public Safety Office (located at Building 59) via a transceiver. The fire alarm system is in good working order and should be capable of being serviced for the next 10 years.

Egress

The building is provided with corridors that meet the minimum 48-inch requirement. The doors and stairs also meet the minimum requirement of 32 inches. Additionally, the areas throughout the building are provided with a minimum of two means of egress.

Building Construction Cost Estimates

Included with each building assessment is a construction cost estimate for essential repairs of deficient and failing building systems, life safety protection and security systems to maintain the building for a period of five to ten years. We include two levels of cost estimates.

Level 1: Repair and/or replacement of essential materials, equipment systems and code deficiencies that in the event of failure would render the building non functional for its intended use within five to ten years.

Level 2: Identifies a contingency repair or replacement fund to address costs for an ongoing maintenance and repairs program with a plan to continue building operations for three to five years with only short term primary services outages. In some cases the options under the level three estimate is to relocate patients and staff to other buildings for short term or long term durations.

PHYSICAL CONDITIONS AND AREA LIST - CRITICAL FIVE TO TEN YEARS

Physical Material Condition Escalated to 6/1/2021 Comments

Bldg number	Area (SF)	Material description (generic type)	Unit Cost (\$USD)	Contract Cost (\$USD)	System Failure Within Two to Five Years Likely
Bldg 114	26,600	roofing-low-slope single ply	\$8.98	\$238,868	Roof is in failing condition with multiple leak areas and damaged insulation. Interior water damage noted.
Bldg 114	53,371	Mechanical System, Minor Replacement	\$17.56	\$937,195	Some mechanical equipment is past its serviceable life and requires replacement. Costs include equipment replacement, system hydronic piping and architectural feature replacement due to equipment work.
Bldg 114	1	Panel Board 400A	\$56,433.88	\$56,434	The electrical panel is no longer serviceable and may not operate in an emergency condition. Replacement required.
Bldg 114	1	Equipment Connection	\$21,697.06	\$21,697	Temporary electrical, heating and cooling connections are required for connection of modular equipment if the facility experiences equipment failures.
Bldg 114		Base Construction Cost Escalated		\$1,254,194	
Bldg 114		<i>Soft Costs (25%) Total Project Costs</i>		<i>\$418,060</i>	
Bldg 114		Total Project Cost		\$1,672,254	

PHYSICAL CONDITIONS AND AREA LIST - CONTINGENCY UP TO FIVE YEARS

Physical Material Condition		Escalated to 6/1/2021		Comments
Bldg number	Area (SF)	Material description (generic type)	Unit Cost (\$USD)	Contract Cost (\$USD)
Bldg 114	1	Move staff to other admin	\$80,000.00	\$80,000
Bldg 114		Base Construction Cost Escalated		\$80,000
Bldg 114		<i>Soft Costs (25%) Total Project Costs</i>		<i>\$26,666</i>
Bldg 114		Total Project Cost		\$106,666

System Failure Within Two to Five Years Likely

Building

120

Warehouse



Central State Hospital Building Assessments



BUILDING 120 – Warehouse

Building 120 is one of the older buildings on the hospital campus, dating back to 1966. Building 120 is used as a central receiving, shipping, and warehouse facility and is in failing condition. It has an overall facility assessment service life of two to three years without major renovation.

We recommend as a minimum, a contingency fund of \$1,393,330 be allocated for emergency off site warehouse storage in the event Building 120 is determined to be unsafe due to reported structural deficiencies. Off site warehousing is recommended due to the warehousing operations required for offloading and loading of supplies and equipment and that no other buildings on campus provide the needed space and are suitable for this type of operation.

The above estimates represent only critical or essential costs and do not include costs to maintain the facility for its intended use over the next ten years. Additional cost information is provided at the end of this assessment.

Building Summary

Building 120 is a single story, rectangle-shaped masonry building. This building has a flat roof and a shed/canopy to the south of the building. The building does not have any exterior windows except for the administration offices on the west side of the building. The exterior doors are hollow metal. The exterior loading dock doors are motor operated, metal coiling doors. The building's main floor area is approximately 38,800 SF and the loading dock areas are 1,200 SF.

The building is used as a central area for receiving and storing all materials that are received to the complex and dispersed to other buildings on the campus. The building contains several walk-in coolers and freezers; however, mechanically, the equipment requires replacement due to equipment age and reliability.

The building contains several walk-in coolers and freezers that will require replacement due equipment age and unavailability of replacement parts. There was no refrigerant monitoring safety system observed in this facility.

It is also recommended that the existing exterior coiling doors be replaced with new, heavy-duty energy-efficient coiling doors and new operators and controls.

Although not required or requested, it is recommended to paint all interior walls and surfaces for dust and dirt control and to improve the overall appearance of the facility.

Interior Conditions

This building needs some maintenance to its interior areas. The following is a summary list of items requiring repair or replacement:

- Scrape, patch, and paint all interior walls.
- Provide a new exterior ADA-compliant entrance with a new ramp or lift.
- Retain the existing toilet rooms; however, replace all plumbing fixtures, accessories, and services. Provide a new ADA-compliant unisex toilet room near or adjacent to the existing toilet rooms to limit demolition and required new work, especially water and sanitary piping.
- Replace all existing toilet room finishes and paint the walls.
- Replace the existing mezzanine railing with OSHA-compliant railing with “toe” plates.
- Relocate and replace the interior ladder to the roof so it is OSHA compliant and easy to access.



Exterior Conditions

Though the building was built in 1966, the exterior conditions are in fair condition. Most of the corrections should be considered regular maintenance items. We observed the following conditions:

- The existing exterior hollow metal doors appear to be mostly original and are currently functional. It is recommended, however, that these doors should be replaced with heavy duty hollow doors and hardware. All of the door hardware requires replacement for security, energy efficiency, and continued access.
- Although adequate and apparently functioning, the four existing exterior windows are recommended to be replaced with new energy-efficient units.
- The existing black, single-ply flat roof is in poor condition and will need to be replaced. It is recommended that a new heavy-duty, single-ply white EPDM roofing be installed. White roof material will improve the mechanical system's efficiency.
- With the new roof, the existing metal fascia/coping trim will need to be replaced. The existing metal gutters and downspouts on the sheds should also be replaced.
- New rooftop mechanical equipment curbs and the roof access hatch should be replaced with the new roof installation. New walkway pads are also recommended to be replaced. All rooftop penetrations will need to be replaced with the new roof installation.
- With the new roof the existing interior roof drains are to be inspected and be made operational. New strainers are to be installed at each roof drain. Any rooftop equipment structural supports that are not in use or needed for new equipment should be removed. Any supports that are remaining are to be cleaned, prepped, and painted.
- New exterior railings should be replaced with new code-compliant railing.
- Many areas of the existing exterior brickwork have to be repaired and/or repointed. These areas will allow water intrusion and will continue to worsen over time due to the yearly freeze/thaw.
- Although limited, some efflorescence is evident in the existing brickwork. This should be removed. Efflorescence is caused by water intrusion and leaching through the brick. Once the new roof is installed, this condition should be eliminated.
- The base of the masonry and the concrete walls show staining from algae, mold, or landscaping.

Mechanical/Plumbing Systems

Summary

The HVAC systems serving Building 120 consist of various steam unit heaters and exhaust fans for the warehouse, through-the-wall air conditioners for office spaces, and a split system air conditioner serving a storage room.

General Condition of HVAC Systems

The steam unit heaters and exhaust fans serving the warehouse are beyond their useful life and appear in failing condition. During our assessment we observed that some of the exhaust fans were not running when they should have been, causing the air in the warehouse to become hot and stagnant in some locations. Users have placed several floor-mounted fans throughout the warehouse to provide air circulation in an attempt to improve indoor air quality.

The split system serving the storage room appears in fair condition, but is approaching its median life expectancy. The age of the through-the-wall air conditioners could not be determined, but they



also appear to be in fair condition.



Steam unit heater



Rooftop exhaust fan



Split system air conditioner



Through-the-wall air conditioner

This table summarizes the age and condition of the major equipment in the building.

Existing Equipment Age and Median Life Expectancy Based on 2015 ASHRAE Applications				
Equipment Description	Quantity	Installation Date	Median Life Expectancy (years)	Current Age (years)
Steam Unit Heaters	0	1967	20	51
Exhaust Fans	0	1967	20	51
Split System Air Conditioner	1	2005	15	13
Through-the-Wall Air Conditioners	3	unknown	15	--



Conclusions and Recommendations

The steam unit heaters and exhaust fans serving the building are past their useful life and should be replaced. Consideration should be given to providing ceiling fans throughout the building to assist in air circulation and negate the need for user-provided, floor-mounted fans.

The split system air conditioner and through-the-wall air conditioners have a limited service life and require replacement within the next five years.

Electrical Systems

Summary

The electrical systems serving Building 120 consist of a 600A/208v/3 phase service with a 100kw diesel generator for standby power. The building is served from a pad-mounted utility transformer located adjacent to the building.

General Conditions of Electrical Systems

The generator system was installed in 1999 and included a 600 amp service disconnect next to the automatic transfer switch. The generator is rated for 300 amp service at 208v. Based on our observation the generator installation and main electric service are not coordinated. This means the building load could increase and overload the generator and this would not be known until the generator is needed and fails.



100kw generator



Service disconnect and ATS

The generator system has been installed as a standby power generator. This means the generator system cannot be used as a life safety power source for emergency lighting. The building lighting system does not have the required battery backup for the egress lighting but depends on the generator to provide the egress lighting power. This is not code compliant and should be addressed.



Typical electrical panel



Original service panel board

The original service panel board was left in place to serve as the interior distribution system. This panel board is a Federal Pacific and is no longer in production. It has reached the end of its serviceable life.

The remaining interior distribution panels are also Federal Pacific panels and are no longer in production. They too have reached the end of their serviceable life.

Conclusions and Recommendations

The original service switchgear should be replaced. If there is a failure it would separate the building from the generator system and the building would be without power for several weeks. The emergency generator is not coordinated with the building service and should be evaluated to either be upgraded or the building service reduced. The standby generator has reached the end of its serviceable life and should be replaced. There is no secondary connection point in the electrical system to allow a temporary generator to be connected to the electrical system. If there is a utility failure and the standby generator fails, it would require several days to disconnect the existing generator and connect the temporary generator to the existing electrical system.

Fire Alarm and Suppression Systems

Building Construction

Building 120 is an existing storage occupancy that has one story without a basement and is not sprinklered. The construction is classified as Type II (222) per NFPA. There are no minimum construction requirements for this occupancy type per NFPA 101.

Fire Suppression

The building is not provided with fire suppression and is not required to be per the construction type, occupancy, and height and area.

Fire Alarm

The building is provided with a fire alarm system. The existing system has a fire alarm control panel that is manufactured by Standard. The current system monitors heat detectors and pull stations and



it powers the horns. The fire alarm system reports to the public safety office (located at Building 59) via a transceiver. The fire alarm system is in good working order. However, it is an old 120 VAC system that is no longer manufactured and should be considered for replacement.

Egress

The building is provided with doors that meet the minimum requirement of 32 inches. Additionally, the areas throughout the building are provided with a minimum of two means of egress.

Building Construction Cost Estimates

Included with each building assessment is a construction cost estimate for essential repairs of deficient and failing building systems, life safety protection and security systems to maintain the building for a period of five to ten years. We include two levels of cost estimates.

Level 1: Repair and/or replacement of essential materials, equipment systems and code deficiencies that in the event of failure would render the building non functional for its intended use within five to ten years.

Level 2: Identifies a contingency repair or replacement fund to address costs for an ongoing maintenance and repairs program with a plan to continue building operations for three to five years with only short term primary services outages. In some cases the options under the level three estimate is to relocate patients and staff to other buildings for short term or long term durations.

PHYSICAL CONDITIONS AND AREA LIST - CONTINGENCY UP TO FIVE YEARS

Physical Material Condition **Escalated to 6/1/2021** **Comments**

Bldg number	Area (SF)	Material description (generic type)	Unit Cost (\$USD)	Contract Cost (\$USD)	Comments
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Bldg 120	5	Temp Offsite Warehouse/ Five Years	\$209,000.00	\$1,045,000	System Failure Within Two to Five Years Likely
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Bldg 120	Base Construction Cost Escalated			\$1,045,000	
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Bldg 120	Soft Costs (25%) Total Project Costs			\$348,330	
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Bldg 120	Total Project Cost			\$1,393,330	
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Civil Utilities



Central State Hospital Building Assessments



CIVIL UTILITIES

Water Distribution System

The Central State Hospital currently obtains water directly from the Appomattox River Water Authority (ARWA) via a 10-inch waterline. This waterline serves as the main feed to the water distribution system for CSH and traverses approximately 2,500 LF from the north side of Boydton Plank Road (Route 460) until it reaches Building 59 (site of the old CSH Water Treatment Facility). All of the buildings on site are served by this common water distribution system. The majority of the water distribution system is comprised of cast iron and transite pipe. Cast iron pipe was typically used for water lines up through the 1950s until other materials such as ductile iron pipe and transite pipe became available.

Transite pipe was used from the 1960s until it was phased out in the 1970s and 1980s. In reviewing the material of the existing waterlines, it is assumed that the majority of the water distribution system is at least 40 years or older. Typically transite pipe is projected to have a life expectancy of 50 to 75 years.

The life expectancy of cast iron water pipe can vary from 50 to 100 years depending on the thickness class of the pipe. Based on the above, it is expected that the majority of the water distribution system will be approaching its life expectancy within the next 5 to 15 years and is recommended to be replaced. It is estimated approximately 12,500 LF of 4- to 12-inch waterline will need to be replaced. In lieu of replacing the 10-inch waterline connection to ARWA, it is recommended that the CSH facility connect to the Dinwiddie County Water Authority (DCWA) water distribution system at the intersection of Route 1 and Albemarle Street. An advantage of this connection is that DCWA would be responsible for the maintenance of the waterline from the connection point to the water meter location on site. This would allow the facility to abandon the ARWA connection and reduce the amount of waterline that the DBHDS would be responsible for maintaining.

The existing water distribution system serves to provide both potable drinking water and fire demand. As part of a previous report, we assessed the occupied buildings for current code compliant backflow prevention devices on the fire systems. The Virginia Construction Code requires any new sprinkler system to protect the potable water supply against backflow in accordance with the applicable provision of the International Plumbing Code Section P2902. Building 39 was the only building confirmed to have the appropriate device compliant with current code. It is our recommendation that current code compliant backflow prevention devices are installed for the older buildings to ensure protection of the potable water supply. A summary of these findings regarding the buildings included in this assessment is shown in the table on page 2 of this report.



Building No.	Backflow Prevention Required	Backflow Prevention Installed per Current Code	Additional Backflow Prevention Devices Recommended
39	Yes	Yes	
43	No	N/A	
51	No	N/A	
52	No	N/A	
59	No	N/A	
94	Yes	No	1
95	Yes	No	1
96	Yes	No	1
111	No	N/A	
112	No	N/A	
113	No	N/A	
114	No	N/A	
120	No	N/A	
		Total	3

Sanitary Sewer System

The sanitary sewer system at CSH is comprised of two main sewer lines. One line wraps around the north side of the main campus generally following along Seventh Avenue and provides service to Buildings 112, 113, and assumed to provide service for Building 59. The main sewer line around the south side of the main campus provides service to Buildings 39, 43, 51, 52, 94, 95, 96, 111, 114, and 120. Sections of both of the main sewer lines and several of the building lateral connections have been replaced in the last 10 years. The remaining sections of sewer are recommended for replacement.

The two sewer lines converge together on the north east side of the property and combine into one sewer line that conveys all the flow to the Dinwiddie County Water Authority (DCWA) trunk sewer. This sewer line has experienced clogging and backups in the past. It is recommended that a sewage grinder is installed and this line is replaced to reduce backups if the buildings are to remain in service. The sewer line construction will require other associated work such as pavement restoration, demolition, abandoning of utilities, tree clearing, and site restoration. In addition, the main sewer line runs across the old dam for what use to be a pond on the property that received flow from Cattail Run Creek. A culvert that conveys flow for Cattail Run Creek through the dam has been compromised and is undermining the existing dam that the sewer line is built on. This will need to be repaired to maintain the existing sewer service for all of CSH. The dam embankment condition is under investigation and the repair costs are to be determined.



Based on the above, it is estimated approximately 6,400 LF of sewer line and 56 manholes need rehabilitation. A summary of the laterals and downstream sewer lines for the buildings is summarized in the table below.

Building No.	Lateral in Need of Replacement	Sewer Line Downstream in Need of Replacement	Remarks
39	No	No	
43	No	No	
51	Yes	Yes	
52	Yes	Yes	
59	unknown	No	
94	Yes	Yes	
95	Yes	Yes	
96	Yes	Yes	
111	Yes	Yes	
112	No	No	
113	No	No	
114	No	No	
120	No	No	
All Buildings	N/A	Yes	Main sewer line across dam

Steam Utilities

Steam is distributed from the heating plant to the buildings through several pipelines and tunnels. It is our understanding from discussions with DBHDS staff that various sections of the steam utilities are in poor condition and in need of replacement. DBHDS staff has reported field observations of steam vapor coming out of the ground in various places across the CSH campus. Though we have not performed an evaluation of the steam utilities, we recommend that these steam leaks are investigated and repaired.

Utilities System Summary

The table on page 3 summarizes the estimated utilities that will be required to maintain service to the buildings included in this assessment.



Item	Unit	Quantity	Cost/Unit	Cost	Repair Contingency
Waterline ¹	Linear Feet	12,500	\$100	\$1,250,000	\$125,000
Backflow Prevention Devices	Each	3	\$45,000	\$135,000	\$20,000
Sanitary Sewer Line ²	Linear Feet	6,400	\$118	\$755,000	
Sanitary Sewer Manholes	Each	56	\$4500	\$252,000	
Sanitary Sewage Grinder	Lump Sum	1	\$250,000	\$250,000	
Sanitary Sewer Miscellaneous Work ³	Lump Sum	1	\$425,000	\$425,000	
Sanitary Sewer Repairs ⁴	Lump Sum	1	\$250,000	\$250,000	\$250,000
Dam Repairs ⁵	Lump Sum	1	\$200,000	\$200,000	\$200,000
Steam Utilities	Linear Feet	TBD	TBD	TBD	
Total				\$3,517,000	\$595,000

Notes:

1. Water line costs estimate includes fittings, hydrants, and restoration
2. Sanitary sewer line cost estimate includes pipe materials, excavation, and installation costs.
3. Sanitary sewer miscellaneous work includes demolition, abandoning of existing utilities, tree clearing, pavement restoration, and site restoration.
4. Embankment repair costs are under investigation and are yet to be determined.
5. The extent of the dam repairs required are under evaluation and to be determined. The cost presented here is a general estimate. This cost will be defined further once the dam repairs are determined.



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