SYMMES HOSPITAL REUSE AND FEASIBILITY PLAN

BUILDING INVENTORY AND
STRUCTURAL AND MECHANICAL ANALYSIS

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INVENTORY OF BUILDINGS

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A. Review of Available Drawings of Existing Buildings

In late July 2002, Donham & Sweeney met with the on-site representative for Sodexho Marriott, the facilities management company assisting the Town of Arlington with the daily management of the Symmes Hospital complex. Donham & Sweeney obtained copies of plans for all the main complex hospital buildings, and the old Nurses' quarters, (referred to as the Nurses' Building), as well as digital CADD files of all floor plans for the main hospital complex. The available existing drawings consist of partial sets of the original construction plans for the North Building and South Building emergency room addition, as well as an assortment of leasing and renovation plans of the East, West and South Buildings. At least one plan of each floor for every building is available. A nearly complete set of the original 1917 construction blue prints for the Nurses' quarters, as well as a fourth floor plan of the entire building with the1930's addition is also available.

B. Review of Existing Consultant Reports

There are two existing consultant reports, which assess the condition of the Symmes Hospital complex site and building. The first report, Property Condition & Engineering Assessment was prepared by TWB Associates, Inc. for the Town of Arlington, in September of 2001. Sodexho Marriott Services prepared the second report, Healthcare Facilities Condition Evaluation, for Lahey in October of 1999. Donham & Sweeney verified these documents by observation of the existing buildings and found them to be generally correct and accurate. Any inconsistencies or errors discovered in the reports as a result of our field survey are noted in the text that follows.

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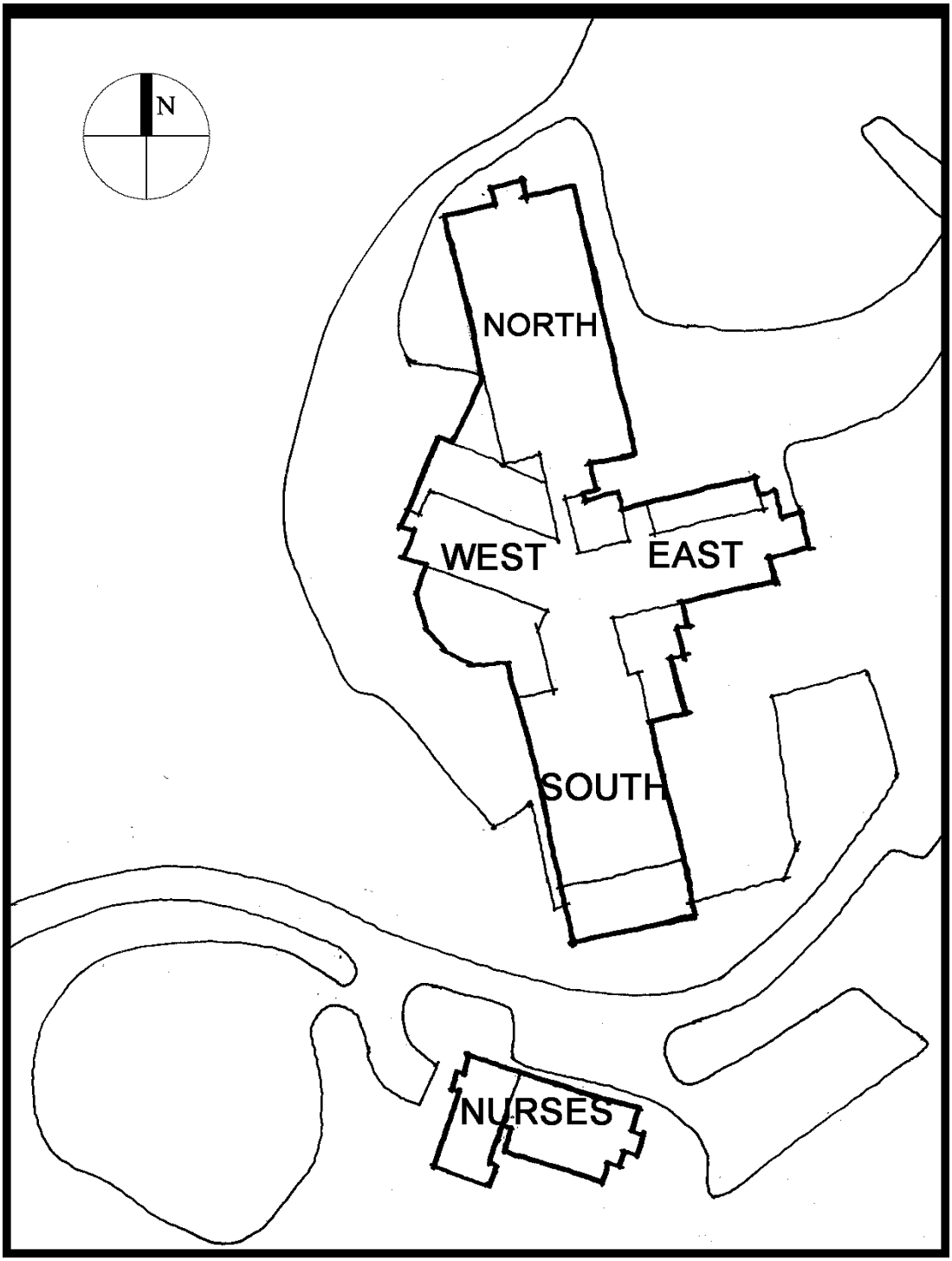
C. Site Plan of Existing Buildings



D. Square Footage and Use Analysis

The total gross square footage of the four hospital buildings and connecting core was calculated, from the digital plans provided, to be 170,500 sf. This agrees with the total gross floor area sited in the 2001 Property Condition and Engineering Assessment report commissioned by the Town.

Floor Area of Existing Hospital Buildings

	NORTH	EAST	SOUTH	WEST	FLOOR TOTAL
basement			15,656		15,656
first floor		9,440	17,471	10,441	37,352
second floor	14,071	8,299	11,268	4,810	38,448
third floor	14,071	6,834	11,268	4,741	36,914
fourth floor	14,071	6,834	11,544	4,166	36,615
subtotal	42,213	31,407	67,207	24,158	
building cores	5,499				
TOTAL	170,484				

Floor Area of Nurses Building

	NURSES
first floor	5,094
second floor	5,336
third floor	5,861
fourth floor	5,861
fifth floor	2,709
TOTAL	24,861

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E. Table of Square Footage by Use

FLOOR	NORTH	EAST	SOUTH	WEST	NURSES
basement			Mechanical (4,071 sq.ft.) Bldg. Support (4,077 sq.ft.) Records & I.S. (2,742 sq.ft.) Other (4,766 sq.ft.)		
first floor		Lahey Clinic (8,240 sq.ft.) Mechanical (1,200 sq.ft.)	Reception (1,528 sq.ft.) Radiology (1,204 sq.ft.) Vacant (14,739 sq.ft.)	Cafeteria (8,020 sq.ft.) Vacant (2,421 sq.ft.)	Vacant (5,094 sq.ft.)
second floor	HealthSouth (4,159 sq.ft.) Mechanical (2,963 sq.ft.) Vacant (6,949 sq.ft.)	Lahey Clinic (8,299 sq.ft.)	Vacant (11,268 sq.ft.)	Vacant (4,810 sq.ft.)	Vacant (5,336 sq.ft.)
third floor	Vacant (14,071 sq.ft.)	Lahey Clinic (6,834 sq.ft.)	Vacant (11,268 sq.ft)	Vacant (4,741 sq.ft.)	Vacant (5,861 sq.ft.)
fourth floor	Vacant (14,071 sq.ft.)	Lahey Clinic (6,834 sq.ft.)	Vacant (11,544 sq.ft.)	Vacant (4,166 sq.ft.)	Vacant (5,861 sq.ft.)
fifth floor					Vacant (2,709 sq.ft.)
subtotal	42,213 sq.ft	31,407 sq.ft.	67,207 sq.ft.	24,158 sq.ft.	24,861 sq.ft.
building cores	5,499 sq.ft.				
TOTAL SQ. FT.	170,484 sq.ft.				24,861 sq.ft.

USES	BUILDINGS				USES
	NORTH	EAST	SOUTH	WEST	TOTAL
HealthSouth	4,159 sq.ft.	0 sq.ft.	0 sq.ft.	0 sq.ft.	4,159 sq.ft.
Lahey Clinic	0 sq.ft.	30,207 sq.ft.	0 sq.ft.	0 sq.ft.	30,207 sq.ft.
Radiology	0 sq.ft.	0 sq.ft.	1,204 sq.ft.	0 sq.ft.	1,204 sq.ft.
Records & I.S.	0 sq.ft.	0 sq.ft.	2,742 sq.ft.	0 sq.ft.	2,742 sq.ft.
Bldg. Support	0 sq.ft.	0 sq.ft.	4,077 sq.ft.	0 sq.ft.	4,077 sq.ft.
Other	0 sq.ft.	0 sq.ft.	4,766 sq.ft.	0 sq.ft.	4,766 sq.ft.
Cafeteria	0 sq.ft.	0 sq.ft.	0 sq.ft.	8,020 sq.ft.	8,020 sq.ft.
Reception	0 sq.ft.	0 sq.ft.	1,528 sq.ft.	0 sq.ft.	1,528 sq.ft.
Mechanical	2,963 sq.ft.	1,200 sq.ft.	4,071 sq.ft.	0 sq.ft.	8,234 sq.ft.
Vacant	35,091 sq.ft.	0 sq.ft.	48,819 sq.ft.	16,138 sq.ft.	100,048 sq.ft.

F. Descriptions of Square Footage and Use

Nurses' Building

The Nurses' Building, located on the south side of the main access drive, down hill from the hospital complex, was built at the same time as the original East Building (about 1917) and houses approximately 26,000 sf on 5 floors (the Sodexho study cites 32,000 sf and the TWB report cites 50,000 sf). As the building is located on the steep part of the site, the main entry is from the uphill side, into what is effectively the third floor of the building. The main building was originally built as a Nurses' quarters. A newer wing addition was constructed off the west side of the original structure in the 1930s, and appears to have been designed for office use rather then the dormitory function of the original building. (The 1999 Sodexho study states that the wing was built to house a nursing education program.) The wing addition is 4 floors. Both the original Nurses' quarters, and the wing addition, are currently vacant and in an ever worsening state of disrepair and deterioration. The fifth floor of the original structure currently has multiple broken windows, is infested with pigeons, and is effectively open to the weather. (It should be noted that pigeon guano is required to be handled as a hazardous substance.)

North Building

The North Building, built in 1982, consists of 42,213 sf on 3 floors (designated 2, 3 & 4 in terms of the floor nomenclature of the complex) including a sub-basement within the boiler room, an elevator core and hallway at the first floor, and a stair tower at the north end. The 1999 Sodexho survey erroneously cites the building as comprising 4 major floors with a sub-basement for a total 61,000 sf. The top two floors were designed for in-patient use. A double corridor rings nursing stations and service functions in the inner section, with patient rooms located along the exterior wall. Floors 3 and 4 are now vacant and unused. The bottom floor (floor 2) was designed to house clinical and office space and the main boiler room with its sub-basement. The boiler room continues to serve as the high-pressure boiler plant for the complex. Currently, HealthSouth maintains limited space in on the second floor. At the time of the field visit, D&S was advised that the building management intends to relocate the last remaining medical functions and close down the North Building with the exception of the boiler room.

East Building

The East Building was built around 1909 and was substantially renovated in the mid 1990s. The building comprises 31,400 (the 1999 Sodexho study cites 34,000 sf) on 4 floors. The first floor was originally built as below grade basement, but is now the entry level for the complex due to the lowering of the ground elevation around the building. Presently, Lahey Clinic maintains a pediatrics clinic, geriatrics clinic and internists offices on all four floors of the building. An abandoned (although it still contains active steam piping) one-story boiler room is located off the first floor corridor to the north.

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South Building

The South Building was built around 1964 and consists of 67,200 sf on 5 floors. Like the North Building, floors 2, 3 and 4 were designed for an in-patient use, with the typical hospital layout of double corridor and center service spaces. These floors are currently mothballed. The first floor consists of the main reception area and associated double elevator bank, laboratory/clinical space most of which is still in use, and the vacant two-story addition at the southern end of the building built as the hospital emergency room. The emergency room complex is a more recent addition to the building, built at the same time as the North Building. Due to the topography of the site and the proximity of ledge, the South Building basement is the only space below the first floor. The basement houses maintenance, mechanical, housekeeping and records space, most of which appear to be in active use.

West Building

The January 2002 SAC report and September 2001 TWB Property Conditions Report indicate the West Building was built in the late 1940s or early 1950s. This date is consistent with the visual age of the architecture and building systems. The 1999 Sodexho report's claim that the West Building was built in 1964, at the same time as the South Building, is obviously not correct. The West Building consists of 24,200 sf on 4 floors, including the currently used first floor cafeteria and kitchen area, and lab. The building was designed to house medical offices with individual offices located on either side of a central corridor. An exit stair tower is located at the west end of the building. With the exception of the first floor lab and dining facilities, the upper 3 floors are vacant and unused.

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A. Analysis of Building Enclosure System (walls, windows, roofing)

Nurses' Building

The Nurses' Building is of brick bearing wall construction, similar to the East Building. The mortar appears moderately weathered with small gaps and cracks in many of the brick joints. These cracks are a likely source of active water infiltration, particularly under conditions of wind blown rain. The masonry wall shows some limited areas of repointing. These areas are particularly noticeable, as the mortar used does not match the color of the original. The 4-story sleeping porch section on the rear of the building, is constructed entirely of wood. In general, the wood is badly weathered, rotted in places, and in need of paint and caulking. The entry portico on the front side of the building is of similar construction and condition. The wood cornice on the original dormitory building is in need of repainting and caulking, although the wood itself looks to be generally sound. The metal flashing should likely be replaced. An unsightly concrete entry ramp at the main entry, which is obviously not original to the building, is spalling is places.

The Nurses' Building appears to have been fitted with the similar vinyl clad double-glazed double hung replacement windows as were used in the East Building (see the comments under the East Building). No jamb caulking was applied between the aluminum brickmold panning and the brick. It is unknown if the window frames behind the panning are caulked to prevent water infiltration at the jamb.

The built-up tar and gravel roof at the original Nurses' dormitory building, and that above the sleeping porch in the rear are in very poor condition. Active water leakage is likely. The metal coping at the parapet is extremely rusted and is causing staining of the brick wall below. The roof should be completely replaced. The roof above the wing addition is single ply rubber (EPDM) glued to insulation board, and appears to have been installed around 1990, at the same time as the South and West Buildings. At 12 years old the roof is likely approaching the end its warranty period.

North Building

The North Building is brick veneer insulated cavity wall over metal stud backup construction. In general, the brick appears to be in good shape. The mortar is also in good condition, as would be expected of a 20 year old building. On the west elevation, moderate surface discoloration of the brick below the window openings is likely due to water collection and runoff from the recessed window openings. It is unclear if this condition suggests the possibility that water penetrating to the wall cavity. However, there are early signs of deterioration to the mortar joints at the outside face.

The North Building windows are anodized bronzed aluminum frames with double-glazed fixed and casement units and aluminum spandrel panels, all of which appear to be in good working order. Several spandrel panels on the east side at grade (2nd floor) have

been pushed out at the bottom from the inside, and need repair. The caulking around the windows and at brick expansion joints appears to be original, and is badly cracked and failing. This is a likely and active source of water infiltration. The entire building should be re-caulked.

The roof of the North Building is a ballasted rubber membrane with an aluminum gravelstop. No roof leaks are reported, and the membrane and flashing appear to be in good condition. The age is not known. However, it appears to be part of the original construction, and has undoubtedly reached the end of its warranty period.

West Building

The West Building appears to be brick bearing wall construction. The mortar is moderately weathered but not significantly deteriorated. Small gaps and cracks are prevalent in many of the brick joints and are a likely source of active water infiltration, particularly under conditions of wind blown rain. On the north elevation, significant discoloration as well as some efflorescence is visible below the windowsills. Efflorescence indicates water penetration of the masonry. At the northwest corner and west elevation some of the bricks are spalling.

The West Building windows are original single glazed steel casement with hoppers or fixed panel below. Much of the exterior paint finish has worn off. The frames show signs of surface rust, which is causing some staining of the brick wall below. The glazing compound around individual window panes appears to be original and is failing. The caulking at the jamb, sill and head is old and cracking. The existing windows, which may have been of reasonable quality when installed, lack the thermal capacity by today's standards, and have further suffered from years of deferred maintenance.

The roof of the West Building is a ballasted rubber membrane with an aluminum gravelstop. No active leaks are reported, and the membrane and flashing appear to be in good condition. The factory applied date stamp on the rubber membrane indicates the roof was likely installed around 1990, at the same time as the South roof and the Nurses' Wing roof. At 12 years old the roof is likely approaching the end its warranty period.

South Building

Unlike the other buildings in the complex constructed mostly of brick, the South Building is clad in an aluminum curtainwall system over a large portion of the east and west elevations. Full height brick wraps the south end and building connection walls. The brick and mortar appear in good condition, although the workmanship of masonry in some areas is not of the highest quality. The buildings structural concrete floor and roof slabs extend in a cantilever condition 2-3 feet beyond the outside face of the curtain wall. This detail, which was presumably intended to provide sun shading in the summer, is extremely energy inefficient in the winter, effectively transforming the building into a giant fin-tube radiator. Given this condition, potential renovation plans might consider extending the exterior walls beyond the edge of the existing slab, thus eliminating the

thermal loss problem, and potentially gaining a significant amount of leaseable area on the interior. The structural implications of such modifications are not known. The cantilevered slabs show signs of cracking all the way back to the building face.

The two-story emergency room section at the south end of the building was built at the same time as the North Building and is of similar construction (see comments above). The brick cavity wall sits on an exposed above grade cast-in-place concrete foundation wall.

The aluminum curtainwall system in the South Building combines sliding single glazed window units and sliding storm windows and screens, and aluminum spandrel panels. In general, the windows operate with some difficulty. The aluminum frame is heavily pitted and weathered. The curtainwall systems at the single-story Entry Lobby and the Dining Room additions appear to be of similar type and condition. There are signs of water penetration of the curtainwall.

The South Building roof is a ballasted rubber membrane with an aluminum gravelstop. No active leaks are reported, and the membrane and flashing appear to be in good condition. The factory applied date stamp on the rubber membrane indicates it was likely installed around 1990, at the same time as the West Building roof. The lower emergency room roof is also a ballasted rubber membrane with an aluminum gravelstop and appears to be in similar condition. The entry vestibule roof is a ballasted rubber membrane with an aluminum gravelstop. The age is unknown. The integrity of the rigid insulation below the membrane is suspect, however, as the roof surface appears uneven and humpy, and gives way under foot in places.

East Building

The East Building is brick bearing wall adorned with limestone or precast concrete windowsills, keystones, medallions and horizontal banding and cornice. In general, the mortar is moderately weathered. Small gaps and cracks are prevalent in many of the brick joints and are a likely source of active water infiltration, particularly under conditions of wind blown rain. More severe deterioration of the mortar and brick is evident below the windowsills on the 2nd floor south elevation, particularly around the air conditioning grills. Similar deterioration is evident in the vicinity of the rear fire escape on the north side. Some spalling bricks are visible on the east elevation of the building. The exposed rubble basement wall looks to be in good shape.

Many of the vertical mortar joints between the sections of precast water table and the upper horizontal banding are open and exposed to the weather. Repointing is needed. The recent cladding of the original projecting cornice with 8' long sheets of bent aluminum is extremely unfortunate, particularly now that the fasteners have begun to rust, staining the butt ends of the aluminum, creating a regular pattern of vertical streaking down the face of the cornice.

The East Building was recently fitted with vinyl clad double-glazed double hung replacement windows (mid 1990s). Members of the maintenance staff with whom we

spoke indicated that the original windows had a divided light pattern. The current 1 over 1 configuration looks awkwardly plain given the sash size and building vintage. According to the maintenance staff, the windows do not seal properly and are difficult to operate. The caulking at the aluminum panning, on the exterior, appears to be holding.

The East Building roof appears to have been replaced at the same time as the interior renovation. The stamp on the rubber membrane indicates a 1997 date. The roof is an unballasted glued down single ply membrane. No active leaks are reported, and the membrane and flashing appear to be in good condition.

Miscellaneous Low Roof Structures

The built-up roof at Dining Room appears to be original to the structure, and is need of replacement immediately.

The roof over the one-story Lab structure, located on the west side between the West and North Buildings, is a glued down single-ply EPDM which, given the date stamp on the membrane, appears to have been installed after 1995. A large area of ponding due to improper roof pitch is evident adjacent to the West Building wall. This condition will likely decrease the life expectancy of the rubber membrane.

The built-up roof above the abandoned Boiler Room on the east side, between the North and East Buildings, is well beyond its useful life, actively leaking, and in need of replacement.

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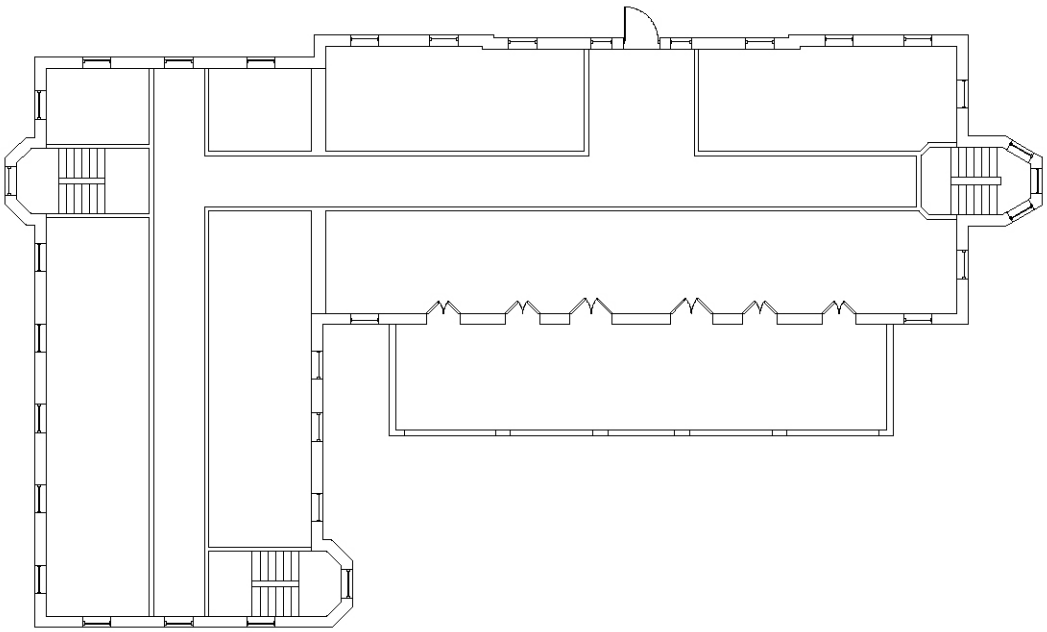
B. Description of Structural Systems and Suitability for Reuse



Nurses' Building

The original wing of the Nurses' Building is constructed on concrete foundations, which bear directly on ledge (a portion of ledge is visible in the basement). The exterior walls appear to be constructed of solid masonry, except for the four-story sleeping porch structure in the rear of the building, which appears to be wood frame bearing on concrete piers. The typical floor framing is 2 x 9 wood joists at 16" o.c., which span 12' between perimeter masonry bearing walls and the main central corridor walls on the interior. The floor joists are supported at the interior on steel beams. Vertical loads are transfer to basement footings via stacked steel lally columns interrupted by the horizontal steel beams.

Only one drawing of the 1930s wing addition was available. This plan, as well as the field survey confirms the 1999 Sodexho report's assertion that the floor structure in the addition is a poured concrete slab. The plan appears to indicate similar primary structure of perimeter masonry bearing walls, and interior steel beam and columns organized about a central corridor.

Floor to floor heights for each floor vary, with the basement and first floor at 11'-0" and 11'-4" respectively, third and fourth floors at 9'-6 and the fifth floor to roof dimension at 11'-6. The available section drawings indicate the roof structure is likely to be flat trusses with a structural depth of about 2'-10". The depth of the typical floor structure is ± 12". Structural details indicate that the steel beams at the corridor walls are partially flush framed for an overall depth of structure of ± 18".

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Based on the size and configuration of the typical floor plate, the Nurses' Building could reasonably be renovated to accommodate housing or office use. Generally, housing requires a maximum plan depth from the corridor wall to perimeter wall of 22'-28'. This is generally due to the requirement that bedroom spaces have windows, but deeper unit plan dimensions also tend to result in further plan inefficiencies. At 32' deep for the original building, and 33' deep for the wing addition, a single loaded configuration with the corridor at one side, (slightly inefficient but very pleasant nonetheless on above grade floors) would work for housing.

The integrity of the existing structure is unknown given the limited observation possible. No significant existing structural problems were noted, (the broken fifth floor windows and likely failing main roof not withstanding). Based upon an initial structural analysis of the existing spans, the existing floor system appears is be sufficient, with little modification, to support code required live loads for housing or office use. The code requires live load capacities of 40 psf for living space, 50 psf for general office, and 80 psf for corridors. The existing structure would likely require reinforcing to meet the 100 psf live load requirement for public/lobby space within a housing or office use.

Given the structural clearances, the available mechanical plenum heights would be about 1'-9" on the lower two floors, and about 3" (barely enough for sprinkler piping) on the upper floors, assuming an 8'-0" hung ceiling. Introduction of new HVAC systems would require careful coordination with the existing structure during the design and installation. For a housing use, many of the utilities could likely be stacked vertically avoiding conflict with the existing structure. For an office use however, available plenum heights would likely eliminate the use of horizontally distributed conditioned air systems. Other types of systems such as constant temperature water source heat pump systems, which require less plenum, are possible alternatives. In any event, because of space limitations, the installation of new mechanical, electrical, and plumbing (MEP) systems would cost more than in a new building.

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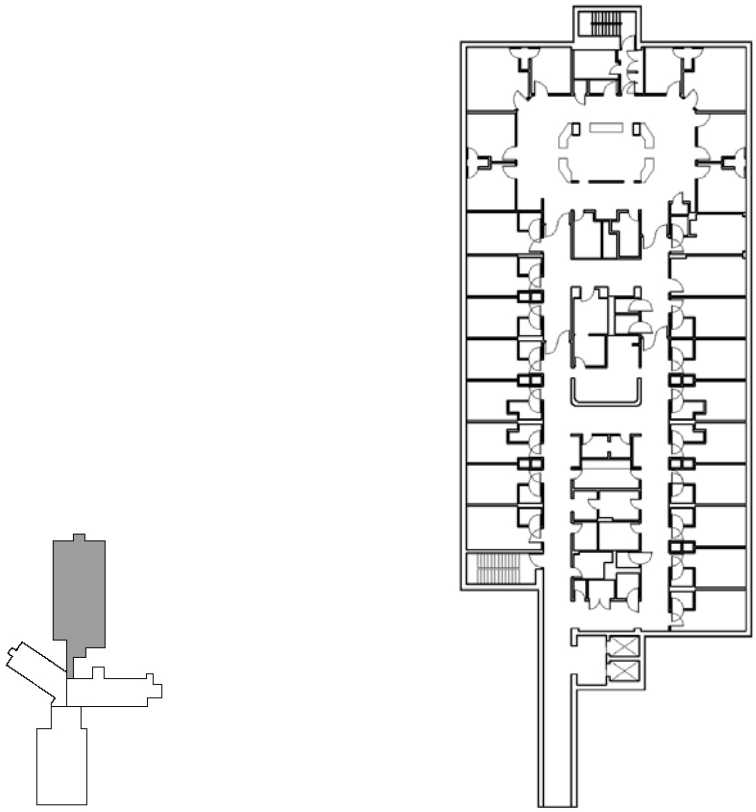

The North Building

The North Building is the most recently constructed of all the buildings in the complex and, as such, contains many modern construction details. Building foundations appears to be spread footing bearing directly on bedrock. The framing system consists of cast-in-place reinforced concrete columns, which support a two-way waffle slab at each floor. While the 2001 TWB report, commissioned for the Town, indicates some areas of bar joists, our survey noted only the typical concrete construction including the roof structure. The exterior wall appears to be typical brick cavity wall construction with metal stud backup.

The structural grid is organized around three bays across the short axis of the building, with the outside bays at 32' and the center bay at 18', for a total building width of 82'. The long axis is divided into regular 24' bays.

The 3 main floors generally align with the floor levels in the rest of the complex. A small ramp is required between the North Building corridors and the main core. In the North Building, the floor-to-floor height for floors 2 and 3 is 11'-6" with a slab thickness of 14". Since this type of structural system requires no dropped beams below the depth of the waffle slab, the effective plenum height below the structure (given an 8'-0" ceiling) would be 2'-2". The fourth floor is slightly taller at 12'-10" from the fourth floor slab to the roof and 11'-8" to the underside of structure.

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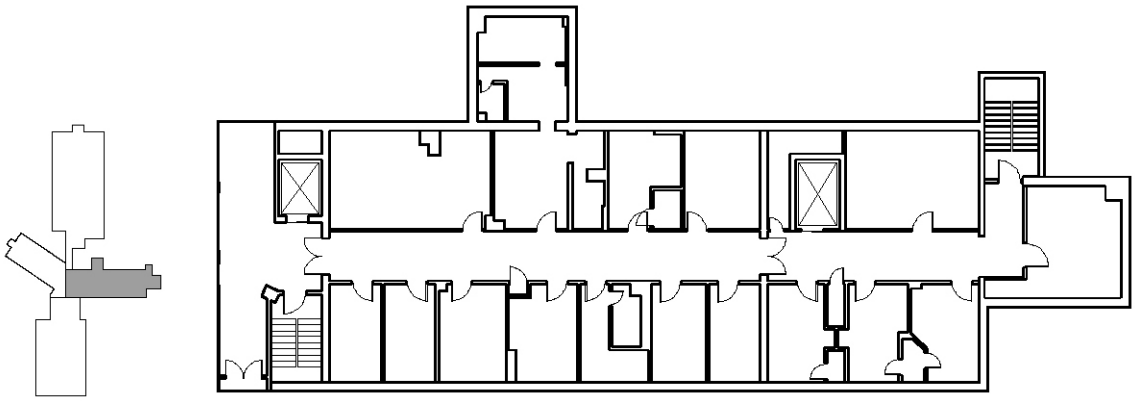
In its present floor plate configuration, the North Building would not be well suited for conversion to housing use. Given an overall depth of 82' a double loaded center corridor configuration would yield highly inefficient and/or overly large dwelling units. As mentioned earlier, the maximum efficient dwelling unit depth is typically 22'-28'. Square foot rents would need to be adjusted downward in order to meet the market. This is not to say that the North Building, with significant structural modifications, could not be adapted to a housing use. The creation of an open atrium or courtyard space in the center bay is one example of such a possible modification.

An office use, on the other hand, could be easily adapted to either the existing double corridor configuration, or a center double loaded circulation, depending on the type of office space desired. The capacity of the existing structure for either use is not an issue in the North Building.

The configuration of the building's envelope and the high ratio of window to wall surface, (continuous strip windows are set between the structural columns) would allow for extremely pleasant and light spaces for either office or housing use.

Given existing structural clearances and floor-to-floor heights, the North Building is ideally suited to accommodate the type of HVAC required for office use. Although a detailed mechanical analysis of the existing systems is not within the scope of this report, it is likely that the existing HVAC could be adapted for an office use. Conversion to a housing use would likely require a major or complete overhaul of the existing HVAC distribution system.



East Building

Unlike the other three buildings in the complex, and similar to the Nurses' Building, the East Building is constructed of exterior masonry brick bearing wall and wood floor joists construction. The structural grid is divided into 3 bays across the building, with outside bays at 18' and a narrow 8' bay at the center. Interior beam loads are supported by 8 x 8 wood posts spaced about 12' apart, along the two center bearing partitions. The first floor is concrete slab on grade, (it was originally the basement level). The structure at floors 2 and 3 is fire rated from the underside, with gypsum board applied over the original plaster and lath ceiling. As such, observation of the actual floor joists is nearly impossible on these levels. The existing floor system was determined to be 2" x 10" (or possibly 2" x 9") wood joists at 16" on center, running perpendicular to the outside walls for a maximum clear span of about 17'. The field survey revealed that significant shoring up of the original structural system has been done, apparently during the recent renovations in the mid 1990's. The structural reinforcing includes installation of steel beams (some as deep as 14") and steel tube columns along the center corridor bearing walls, and in other areas of concentrated loads. Given the recent structural reinforcing work, it is it is reasonable to assume the existing structural capacity would accommodate a conversion to housing or office use, similar to its current use.

At 44' wide on the upper floors, the East Building could be converted to a housing use, although inefficiently. Similar to the West Building, possible plan configurations include a perimeter single-loaded corridor with overly deep units (around 38'), or a double loaded corridor with shallower units at about 18'-19'. Floors 1 and 2 offer slightly different opportunities dimensionally, as they include a two-story addition along most of the north side of the building. On the second level (the first level is below grade), the floor plate is about 61', which would allow for a 27' unit depth with a double loaded corridor configuration.

Much of the mechanical systems in the East Building are new or upgraded as of the recent renovation work. New roof mounted HVAC units feed ducted air systems on the lower floors. Most of the plumbing and sprinkler systems appear new or upgraded to serve the building in its current form. As it is currently serving as a medical office building, a conversion to general office in the future might require minimal modifications to the existing mechanical systems. A conversion to housing use would likely require

more significant changes.

Floor heights match that of the rest of the buildings with a typical floor-to-floor dimension of 11'-4". However, the existing mechanical plenum space, below the fire rated floor system ranges from only from 1'-0" to about 1'-9". This depth is quite limiting for office uses. The hung ceiling is actually located at about 7'-10" on floors 1, 2, and 3. Based on the combustible construction type, it is highly likely that the existing rated floor would need to be maintained for housing or office use.

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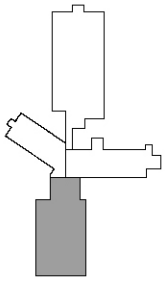
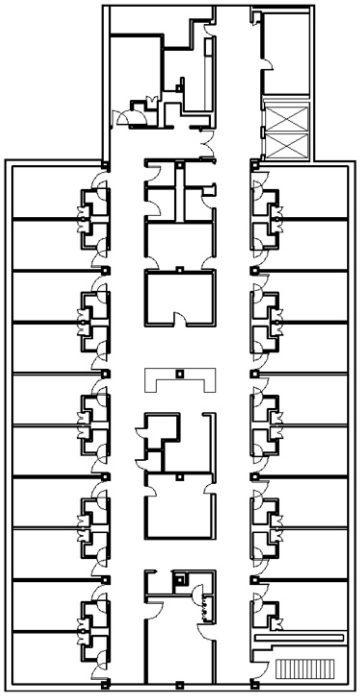
STRUCTURAL AND MECHANICAL ANALYSIS





South Building

Like the North and West Buildings, the South Building is a cast-in-place reinforced concrete structure. The 5-story section built in 1964 is a one-way concrete pan joist system, while the 2-story emergency room section, built in 1982, is a two-way waffle slab system. The structural grid is divided into 4 bays across the width of the building with outside bays at 22' and inside bays at 17', for a total building width of 78'. The grid is divided into equal bays of 24' along its long axis.

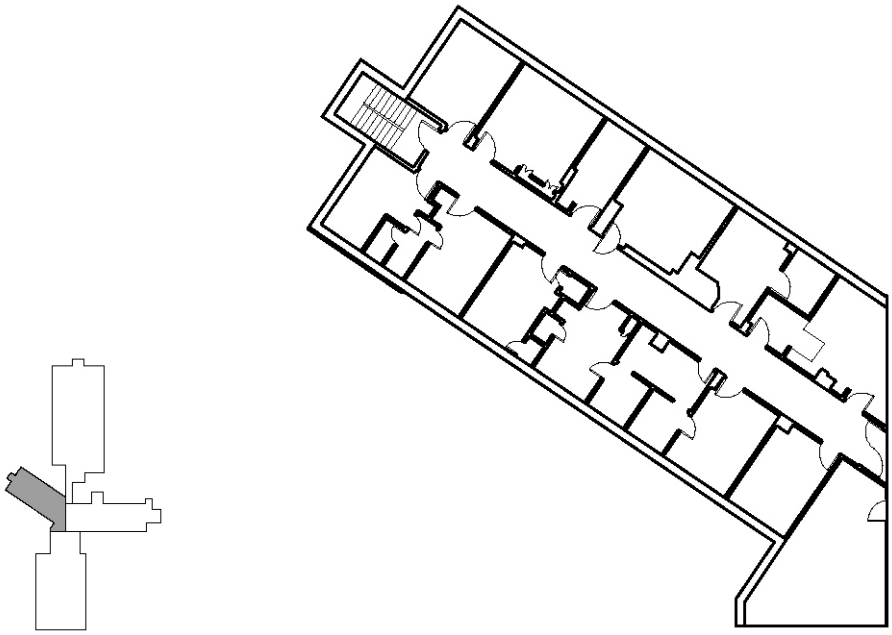
Floor-to-Floor heights are close to the West Building at the typical 11'-4" for all levels, including the first floor. Unlike the West Building and similar to the North Building, the one-way pan joist system offers integral beams, which sit flush with bottom of the concrete floor joists. The floor assembly is 1'-0" deep and offers a clear floor to structure dimension, in all directions, of 10'-4". Assuming an 8'-0" hung ceiling, the existing clearances offer a potential mechanical plenum space of just over 2'-0". This is tight, but not impossibly so, for a horizontally distributed ducted air system with sprinkler piping below.

Like the North Building, the South Building at 78' is not optimal for conversion to a housing use, assuming a double loaded corridor configuration. The center line of columns would require that the central corridor be located to one side, with a dwelling unit depths of 39'on one side and 33' on the other. As with the North Building, given modification, (additional stairs, etc.) the buildings could likely be made to accommodate a housing use. Certainly, the existing curtainwall construction on the exterior offers more flexibility and opportunity for access to natural light then does the adjacent West

Building with its small windows and rigid masonry bearing wall construction. As with the other building, the South Building would be ideal for a general office use.

SYMMES HOSPITAL REUSE AND FEASIBILITY PLAN

BUILDING INVENTORY AND
STRUCTURAL AND MECHANICAL ANALYSIS



West Building

The West Building is a cast-in-place reinforced concrete structure with dropped panel one-way flat slab floor construction spanning between the exterior wall and the center corridor wall. The exterior wall appears to be solid masonry. The structural grid is divided into two 18' wide side bays separated by an 8' center bay with an overall building width of 44'. The column spacing at the corridor wall is generally 14' with slight variations from bay to bay. The typical 12" wide columns are staggered with respect to each other on either side of the corridor. A continuous 12" deep dropped concrete beam carries the one-way slab above an infill corridor wall constructed of clay tile. A stair tower sits partially engaged at the west end.

The first floor elevation of the West Building is about one foot higher than typical, for a floor-to-floor of 10'-3". Second, third and fourth floor-to-floor/roof are slightly less than the North Building at 11'-3". The typical underside of slab dimension measures 10'-8" with the bottoms of the corridor beams sitting 12" lower at 9'-8". Assuming an 8'-0" hung ceiling, possible mechanical plenum heights parallel to the corridor would be about 3'-0" or 2'-0" crossing under the dropped beam. These clearances are reasonable for a horizontally distributed ducted air system with sprinkler piping below.

Given the existing 44' depth floor plate (38' interior dimension), a conversion to housing in the West Building appears dimensionally feasible, if not ideal. Possible plan configurations include a double loaded central corridor with shallow (17' deep) but wider dwelling units (likely 3 per side) or single loaded side corridor with deeper (± 32'deep) narrower units. Both configurations would undoubtedly result in less then efficient units. However, given the small number and size of existing window openings typical of this type of bearing wall construction, the central corridor plan appears to be the more

reasonable of the two options for a housing use. As it was designed as such, the building could easily be reused for office use in its present configuration or, given the nature of the construction, the center corridor could be eliminated to accommodate a more open plan.

C. Architectural Access Analysis of Existing Buildings

The Nurses Building toilet rooms are not accessible. There is no elevator in this building, and several of the paths of travel are not compliant. In addition, the fire alarm does not appear to meet the requirements of the Massachusetts Architectural Access Board (MAAB) with regards to visual and audible alerts.

The paths of travel in the main hospital building complex appear to comply with the requirements of the MAAB. Ramps slopes appear to be acceptable and corridor widths, given the previous use as a hospital, are much larger than those required by the code. There are six elevators in the building. The four newer elevator cabs, located in the South and North Buildings, comply with the MAAB in regards to cab size. The controls in these cabs appear to be in compliance, but further study needs to be done to determine if the mounting heights are correct and if the hands-free phones and audible alerts are in working order. The two elevators located in the East Building are smaller and do not appear to meet the minimum requirements for cab size. The controls are also non-complaint. However, due to the proximity of the other elevators, these cabs may not need to be upgraded.

The bathrooms in the patient rooms appear to be in compliance with the MAAB. However, the TWB Report states that common area toilets are not in compliance. They may need grab bars, sinks and toilets mounted at the correct heights, and may even need to be enlarged to accommodate wheelchair turning radius.

The fire alarms system in the main building does not appear to be in compliance with the MAAB. The TWB Report states that it would not be possible to upgrade the current system; a new replacement system would be required.