Muskoka Algonquin Healthcare Master Plan Status Report January 2016

Issued January 21, 2016

EXECUTIVE SUMMARY

INTRODUCTION

In 2012, Muskoka Algonquin Healthcare (MAHC) began working through the Ministry of Health and Long-Term Care's capital planning process. This Master Plan Status report contains elements of a Stage 1 submission to form a high level summary document. For reference, some supporting background information is included as appendices to this document.

At MAHC, this planning is known as "Hospital Care for Our Future Generations". It is about planning for the critical and acute care needs for Muskoka and East Parry Sound in the year 2030 and beyond. The status quo is not an option for the future.

As part of the first stage of the planning process, MAHC developed a master program and master plan components to support a pre-capital submission to the Ministry of Health and Long-Term Care.

The Master Program (under separate cover) projects the services provided, and this report outlines the facilities where these services will be delivered. This ensures that investments in the services, in the buildings, and most importantly in the people the hospital serves, are thoughtful, appropriate, and effectively meet demands for the year 2030 and beyond.

This master plan status report is organized in four sections. This document needs to be read in conjunction with the master program.

The **Existing Site Conditions** considers building condition and potential use of existing buildings and systems.

The **Options for Development** defines options for long-term development strategies for specific sites and/or campuses to support the Master Program.

The **Evaluation of Options** gives basis for evaluating different models or site/building options.

The **Preferred Option** describes in greater detail the option selected for development.

Muskoka Algonquin Healthcare's mission is to Proudly Serve its Communities by Delivering Best Patient Outcomes with High Standards and Compassion with a vision of Outstanding Care that is Patient and Family Centered. High-quality, safe care for Muskoka and East Parry Sound is our number one priority.

Presently, the hospital buildings are old and the current infrastructure at both MAHC sites is classified as fair to poor. The facilities do not meet current health care standards for infection prevention and control and are not well positioned to meet evolving

standards in health care.

The planning process has included extensive public input, received through nine community sessions and additional meetings with stakeholders, that has been of critical value to the process. Nine options for development were originally proposed which were narrowed down to six options and further refined to three viable options. A full analysis of every option has been completed, with the final three options scored in order to determine the best options for based on the criteria developed.

The master plan proposes one centrally located hospital as the preferred model for the year 2030 and beyond to ensure safe, high-quality, sustainable health care for Muskoka/East Parry Sound.

The one hospital model best meets the objective of providing high-quality, safe patient care that meets health care standards, protects the viability of core services, creates a stable environment that attracts and retains doctors and sub-specialties, and offers optimal working conditions that help to recruit staff, all under one roof within a financially sustainable model both initially and from an operating perspective.

Following Ministry review and support for the pre-capital submission, MAHC will begin the next step in the capital planning process which is the Stage 1 submission. This future submission will include a full Master Program and Master Plan and will require more detailed planning and further stakeholder consultation.

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PHYSICAL SPACE REQUIREMENTS

INTRODUCTION

Projected spare requirements have been developed for the three service delivery options:

Option 1: Two, Full Service Acute Care Sites

Option 2: Two, Centres of Focus

Option 3: One, Centralized Full Service Acute Care Site

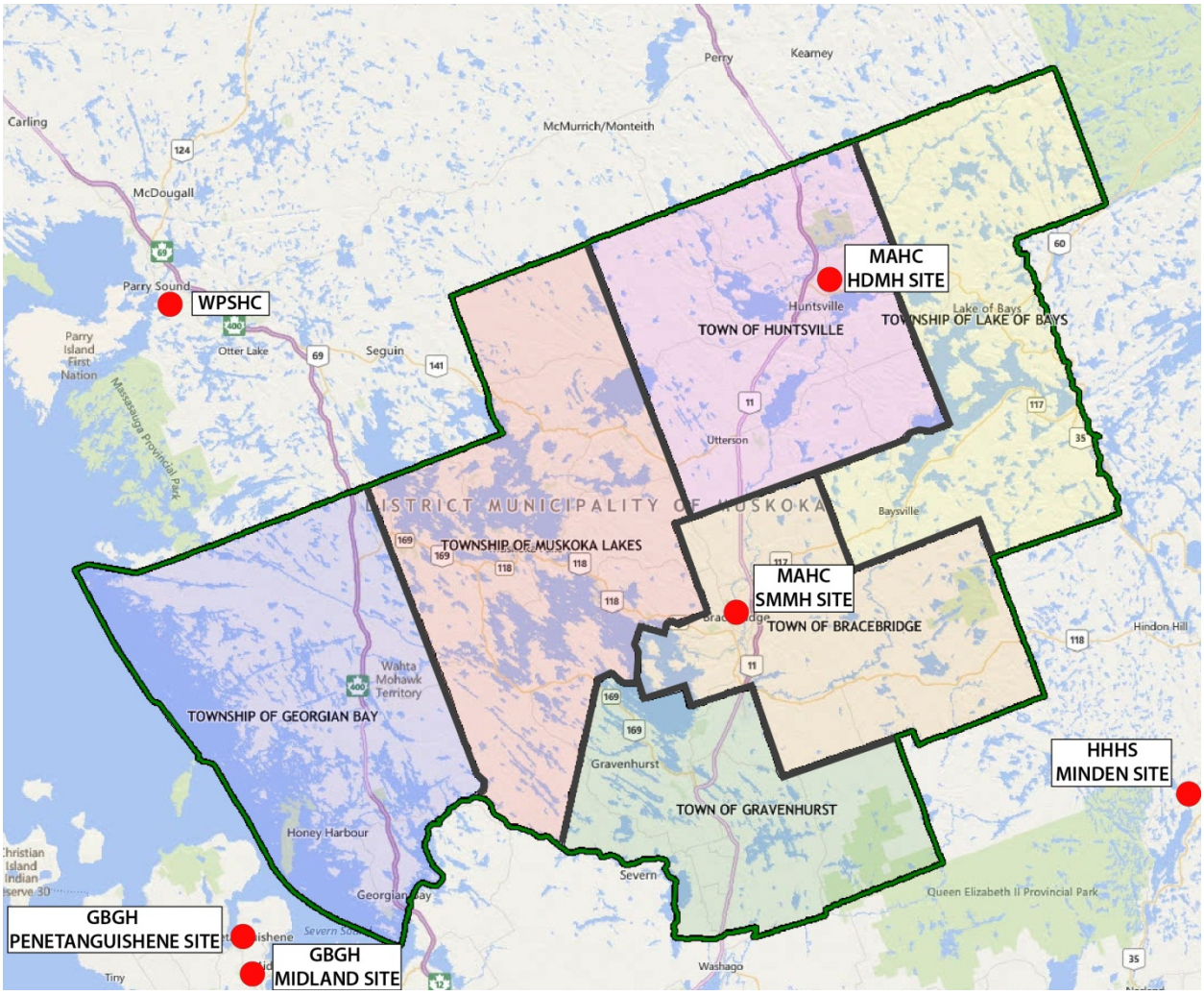
Details of the space requirements are outlined in the Master Program submitted by RPG under separate cover.

EXISTING SITE CONDITIONS

REGIONAL CONTEXT

Muskoka Algonquin Healthcare (MAHC) is a multi-site healthcare organization providing acute care services at the Huntsville District Memorial Hospital (HDMH) in Huntsville and the South Muskoka Memorial Hospital (SMMH) in Bracebridge. MAHC is located within the District Municipality of Muskoka and is part of the North Simcoe Muskoka Local Health Integrated Network (NSM LHIN).

Regional Map **District of Muskoka map**



HUNTSVILLE DISTRICT MEMORIAL HOSPITAL (HDMH)

Physical Factors

The Huntsville District Memorial Hospital is located within the Town of Huntsville, north of the downtown core. The site is located east of Highway 11 on Highway 60, 45km west of Algonquin Provincial Park. The site is surrounded mainly by forest. There are residential communities located to the east across Muskoka District Road Hwy 3 and a retail area located to the south across Highway 60. Fairy Lake is located to the south-east of the site, the elevation provides views to the lake below.

The site is bounded by Highway 60 on the west and south, Muskoka District Road Hwy 3 on the East and Earls Road to the north. All site access occurs from Muskoka District Road Hwy 3, with a seasonal road access to Earls Road to the north. A Helipad is located north of the hospital building.

The site slopes down towards Fairy Lake, in a south-east direction. There is approximately a 32 meter change in grade from the top of the site to the bottom. This slope provides scenic views over the lake.

The prevailing winds on the site come from the north west. The summer days are long with most of the site getting direct sunlight,

and the winter days are short with low sun angles.

Context

Site access / circulation

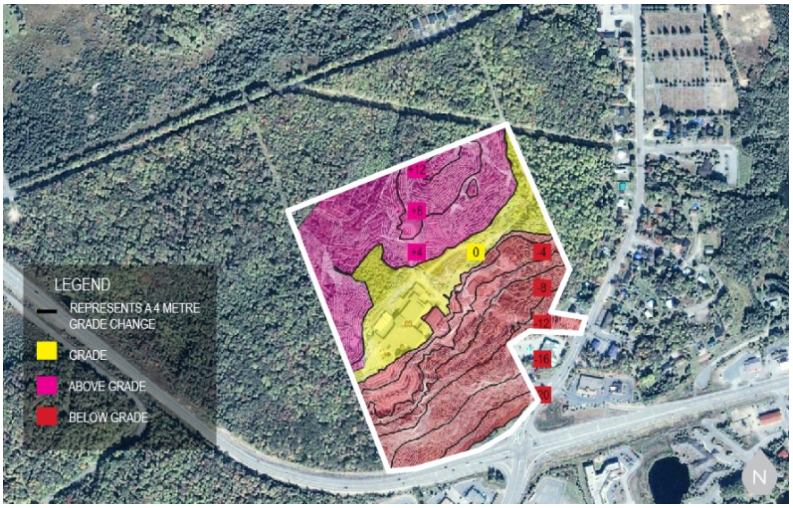
Site access / circulation

Site Statistics

The HDMH site is approximately 42 acres. Across the site there is a total of 32-meter change from south to north.

Existing building plans and a site survey are available, however given their age, they will need to be verified and updated as part of the Stage 1 development of the Master Plan.

Topography



Climate

Cultural Factors

The site was originally developed in 1978. One expansion of the hospital occurred in 2005 when the day surgery / endoscopy addition was added.

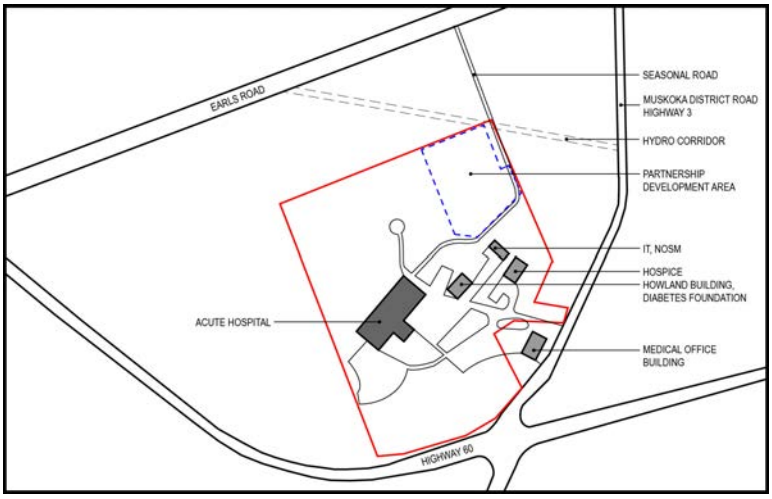
1978

2005

Existing site usages

This diagram illustrates the existing site conditions. Along with an acute hospital, the site also hosts a hospice, the Howland Building, which is run by the Algonquin Family Health Team and third building containing IT services and Northern Ontario School of Medicine (NOSM) teaching facilities. A medical office building is located just outside the site boundaries along Highway 3.

Existing site usages



Allied health providers site development

MAHC has been approached with options for allied health providers to develop facilities on the HDMH site. One such partner is the relocated Fairvern Long-term Care facility.

If HDMH site is to be redeveloped as a hospital the proposed location of Fairvern uses the most cost effective site area for a proposed new build of the hospital.

Any master plan option contemplating the use of the existing HDMH, would require close coordination with the proposed design of the Fairvern facility in order to maximize the cost effective

opportunity for MAHC.

At the completion of a new proposed hospital and the Fairvern project, the HDMH site would be close to being fully developed with limited future developable land.

Regulatory Factors

HDMH Site zoning requirements

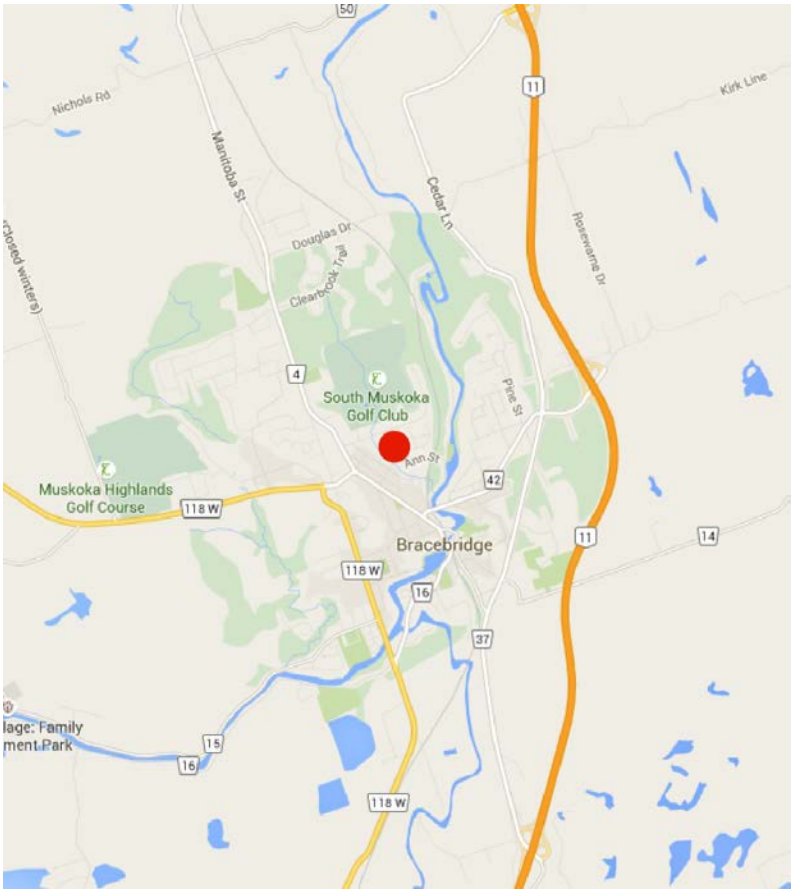
Zoning		Institutional (IN)
Building Height Limit		11 meters (maximum)
Setback Requirements		
- Front Yard (minimum)		7 meters
- Front Yard abutting a watercourse (minimum)		20 meters
- Interior Side Yard (minimum)		15 meters
- Interior Side Yard (abutting a residential zone) (minimum)		15 meters
- Exterior Side Yard (minimum)		15 meters
- Rear Yard (minimum)		15 meters
- Setbacks from Streams (on site) (minimum)	Cold Water – 30 meters	Warm Water – 20 meters
Off-street parking requirements		
- Standard spaces	1 parking space for each dwelling or rooming unit plus 1 parking space per 100 square meters (1076.4 sq. ft.) of gross floor area used for medical of personal services.	
- Accessible spaces	Total number of parking spaces required	Minimum accessible spaces
	1-25	1
	26-50	2
	51-75	3

	76-100	4
	101 and beyond	5 spaces plus 1 additional space for each 50 spaces beyond 150 spaces
- Loading dock spaces	Facility floor area (square metres)	Minimum number of loading docks
	300 to 2,300	1
	2,300 to 7,360	2
	for each floor area increment of 9,200 or part thereof over 7,360	1 additional
Landscaping Requirements		
- Landscape Buffer	A landscaped buffer shall be provided along the full outer perimeter of the parking lot in accordance with the following. Landscaped buffer not abutting a street: 1.5 meters (minimum width for a parking lot containing more than 10 but less than 100 spaces) 3 meters (minimum width for a parking lot containing 100 or more parking spaces)	
-Landscape within parking lots	Interior landscaping within parking lots containing 50 or more parking spaces shall be provided. A reduction in the number of parking spaces, to a maximum of 10%, may be permitted in exchange for an equivalent or greater area of interior landscaping within a parking lot.	

SOUTH MUSKOKA MEMORIAL HOSPITAL (SMMH)

Physical Factors

The South Muskoka Memorial Hospital is centrally located within the Town of Bracebridge, west of Highway 11. The site is surrounded by residential communities with a golf course to the north, across Liddard Street. A ravine intersects the north-west corner of the site.



The site is bounded by Liddard Street to the north, Aubrey Street to the east, Ann Street to the south and a ravine to the west. Primary access occurs from Ann Street and is used by the public and emergency vehicles. Secondary access occurs from Liddard Street and is used by staff and service vehicles. A Helipad is located north of the hospital near Liddard Street.

The site of the existing South Muskoka Memorial Hospital site is mainly flat, with only a 5 meter grade change over the buildable site, sloping towards the south. As such, there are few particularly scenic views from the site. There is a significant slope, at the

ravine along the south west border of the site.

The prevailing winds on the site come from the north west. The summer days are long with most of the site getting direct sunlight, and the winter days are short with low sun angles.

Context

Site access / circulation

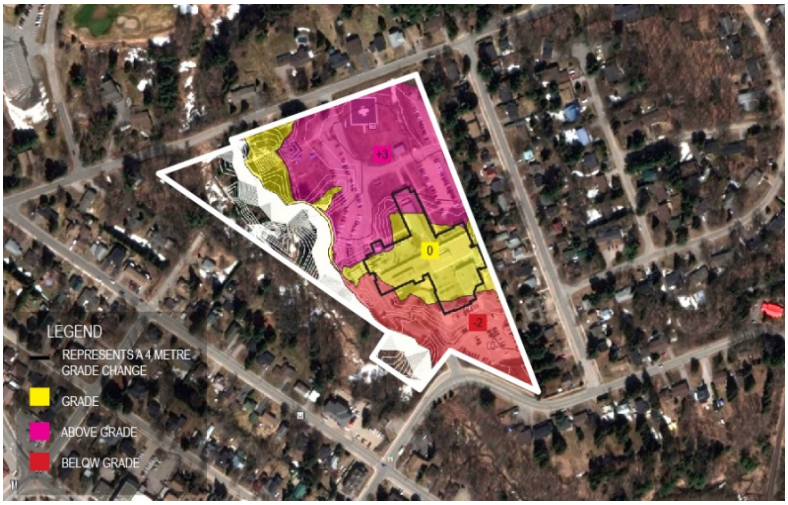
site access / circulation

Site Statistics

The SMMH site is relatively small (approximately 11 acres) which is further compromised by the fact that current hospital occupies much of the developable land.

Existing building plans and a site survey are available, however given their age, they will need to be verified and updated as part of the Stage 1 development of the Master Plan.

Topography



Climate

Cultural Factors

The site was originally developed in 1964. There were multiple additions made to the original building in 1970, 2000, and 2005.

1964

1970

2000

2005

Regulatory Factors

SMMH Site zoning requirements

Zoning	Site has four different zoning for various portions of the site Institutional (I) Institutional Exceptions (I-1) Environmental Protection Zone (EP1) Low Density Residential (R1)	
Building Height Limit	10.5 meters (maximum)	
Setback Requirements		
- Front Yard (minimum)	7.5 meters	
- Interior Side Yard (minimum)	7.5 meters	
- Exterior Side Yard (minimum)	7.5 meters	
- Rear Yard (minimum)	7.5 meters	
- Setbacks from centerline of road (minimum)	Provincial – 26 meters	
	District – 20.5 meters	
	Other – 17.5 meters	
Lot coverage (maximum)	50%	
Off-street parking requirements		
- Standard spaces	3 parking spaces for every 4 beds	
- Accessible spaces	Total number of parking spaces required	Minimum accessible spaces
	1-30	1
	21-60	2
	61-100	3
	For each additional 30 spaces or part thereof	1 space to a maximum of 12 spaces
Landscaping Requirements		
- Area	The minimum landscaped area required is 30%.	
- Visual Barrier	A visual barrier shall be required from the developer of an Institutional Zone if it abuts an interior side lot linear rear lot line in a Residential Zone. Such visual barrier shall act as a screen between uses and be constructed to a minimum height of 1.5 meters, but shall not permit to exceed a height of 1 meter within a sight triangle.	

SUMMARY

Generally the SMMH site will provide challenges for redevelopment. The size of the lot is below contemporary standards for health care facilities of the contemplated size. Nevertheless, the location and topography of the site are suitable for use and redevelopment.

The HDMH site is suitable for redevelopment in terms of size and location. However, the challenge in redeveloping this site is the proportion of currently available site area that has a high degree of topographic variation and other pending redevelopment of a long term care facility. These factors limit hospital redevelopment opportunities and require careful consideration.

EXISTING BUILDING CONDITION

OVERVIEW

The HDMH site was built in 1978 and SMMH site was built 1964. Facility condition assessments conducted by the Ministry for both sites in 2012 determined that the SMMH site is in the poor range and the HDMH site is in the poor range. The Building Condition Assessments conducted in 2014 by Stantec Consulting as part of the Hospital's Master Plan reinforced the findings of the 2012 assessment (refer to Appendix A for these documents).

Preliminary engineering designs conducted by Stantec Consulting indicate that all options that involve the existing facilities would require a complete replacement of all mechanical and electrical systems in order to support the program needs identified in the master program. The existing building envelope would require upgrading to maintain a reasonable performance level.

Assessing the potential scope of Mechanical and Electrical systems work for the sites involved the following considerations: building age (some systems and equipment are original to the building construction), equipment age and condition (where equipment has been replaced or original infrastructure supplemented), building condition assessment findings, current minimum code and industry standard servicing requirements and proposed future usage. Additionally, since this report supports an overall master planning exercise, consideration was given to the fact that implementation of these measures would not be initiated in the immediate future, but could be undertaken in as much as 5-10 years from the date of the publishing of the report.

The conclusion from the above considerations was that the majority of the mechanical and electrical equipment and systems would require replacement due to service life issues or the elements not being capable of supporting the proposed future usage. This conclusion extends to site services which will also require replacement and upgrade to ensure the facilities can reliably meet the operational needs for the foreseeable future.

While the existing buildings could be considered for part of the redevelopment, the existing spaces are not ideal for current clinical standards. Structurally, the existing buildings do not support current clinical standards; both the low floor-to-floor heights and existing dense column spacing make renovation less than ideal. The resultant layout in renovated space would be compromised in its clinical functionality. Furthermore, seismic upgrades would likely be required to the existing structure in order to meet current codes. Finally, based on verbal feedback from the hospital facility representative at the SMMH site, the existing slab is a post-tensioned system. While existing drawings were not available that could confirm the existing structural system, given the likelihood of this system being used, any renovation at the SMMH would be highly complicated and costly.

OPTIONS FOR DEVELOPMENT

OVERVIEW

As part of the development of the Master Plan, decisions regarding the long-term redevelopment of existing facilities required careful consideration. Nine development variations were reviewed over the span of a year and a half (refer to Appendix B) and ultimately, three development options evolved and were considered and comprise the focus of this high level summary:

Option 1: Two, Full Service Acute Care Sites; construct new facilities at both the HDMH (Huntsville) and SMMH (Bracebridge) sites to accommodate the local requirements to create two acute care facilities.

Option 2: Two, Centres of Focus; renovate existing and construct new space at both HDMH and SMMH to accommodate the local requirements for ambulatory and acute care space at both sites, providing distinct and specialized services at each site, thus creating two centres of focus.

Option 3: **One, Centralized Full Service Acute Care Site**; provide a new state of the art hospital centrally located and decomission the existing MAHC facilities upon completion.

Options 1 and 2 were reviewed considering the utilization of the existing HDMH and SMMH sites.

DESCRIPTION OF OPTIONS

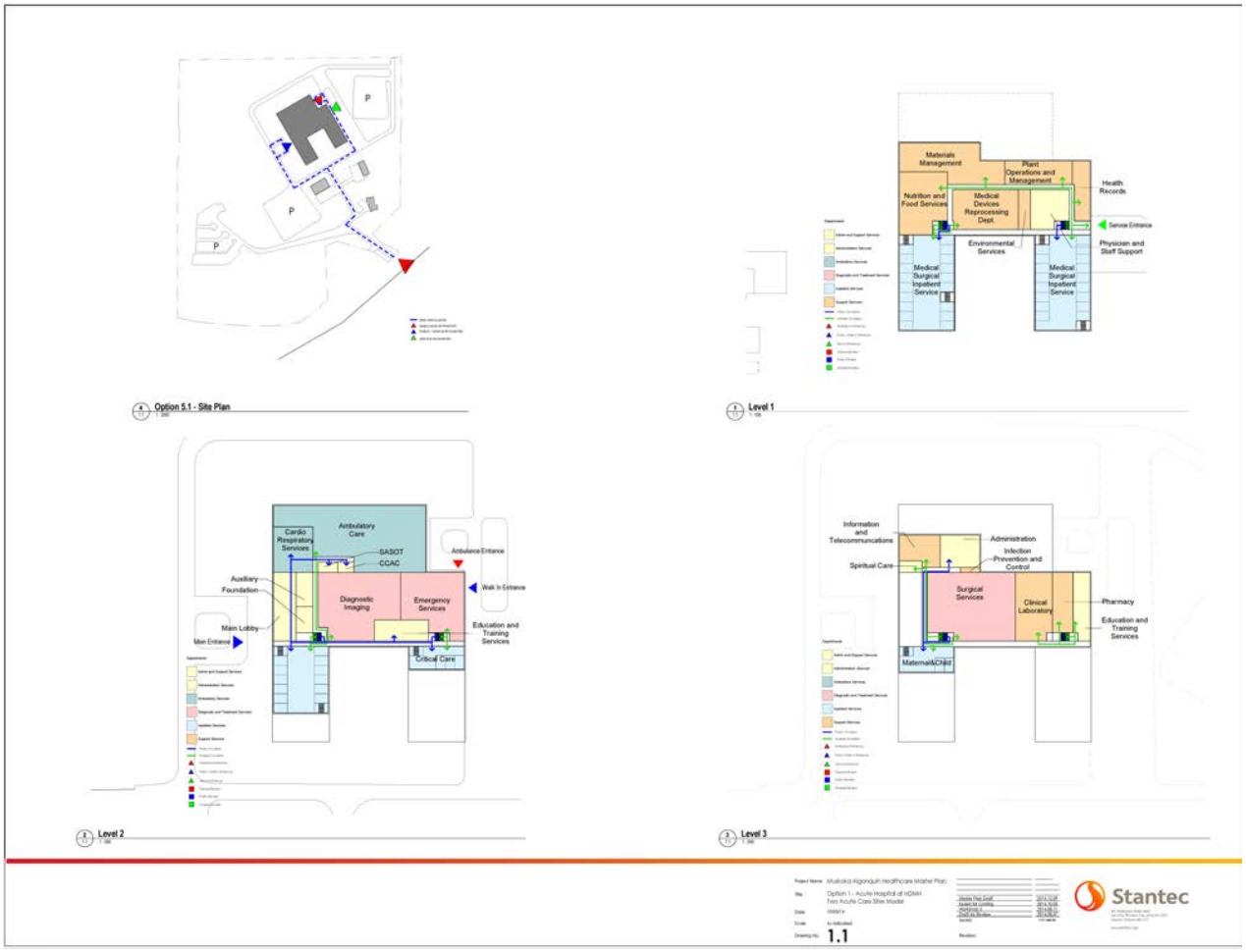
Option 1

Two, full service acute care hospitals, one on the HDMH site, one on the SMMH site

At HDMH, a new full service acute care hospital would be built on the existing site adjacent to the existing hospital. The building would be a slab on grade with 3 levels above ground with a mechanical penthouse. The new hospital would be constructed with systems and materials typical of current hospital construction. Views of the adjacent lake would be maximized through the siting of the building. All spaces internally would be designed with current standards for size, location and adjacency to other departments. The existing building, once the hospital function moves out, would be surplus and could be sold to other service providers or demolished. Extensive site work would need to occur to maintain site access during construction and provide the required vehicular circulation and parking around the existing and new buildings on the site. The existing topography of the site would make this option more of a challenge than would occur on a flat site.

It is estimated that this option would be built in one construction stage over an estimated 3 ½ years of construction. There would be follow-up site construction after the main project was completed.

Option 1: HDMH Site



Option 1

Two, full service acute care hospitals, one on the HDMH site, one on the SMMH site

At SMMH, a new full service acute care hospital would be built on the existing site adjacent to the existing hospital. The building would have 1 level below ground and 3 levels above ground with a mechanical penthouse. The new hospital would be constructed with systems and materials typical of current hospital construction. All spaces internally would be designed with current standards for size, location and adjacency to other departments. The existing building, once the hospital function moves out, would be surplus and could be sold to other service providers or demolished. Extensive site work would need to occur to maintain site access during construction and provide the required vehicular circulation and parking around the new building on the site. The existing lot size and restriction due to the existing ravine would make this option more of a challenge than would occur on a greenfield site.

It is estimated that this option would be built in one construction stage over an estimated 3 ½ years of construction. There would be follow-up site construction after the main project was completed.

Option 1: SMMH Site

Area

Master Plan Area

	Existing Area (CGSF)[1]		Projections (CGSF)		
	HDMH	SMMH	Year 5	Year 10	Year 20
OPTION 1: TWO FULL SERVICE ACUTE SITES	**76,730**	**84,415**	**276,533**	**294,545**	**333,852**
SITE #1: ACUTE CARE HOSPITAL (HDMH)					
Clinical Program and Services	44,100	n/a	64,143	66,865	77,292
Clinical Support Services	10,410	n/a	22,420	24,540	27,640
Education and Training Service	n/a	n/a	5,500	5,500	6,000
Admin and General Support Services	21,210	n/a	42,300	43,600	48,000
Community Services - On-site	650	n/a	900	900	1,200
SUBTOTAL: CGSF	***76,370***	***n/a***	***132,263***	***141,405***	***160,132***
SITE #2: ACUTE CARE HOSPITAL (SMMH)					
Clinical Program and Services	n/a	48,090	77,150	83,600	97,280
Clinical Support Services	n/a	12,460	19,920	21,040	23,140
Education and Training Service	n/a	1,230	4,500	4,500	4,800
Admin and General Support Services	n/a	22,310	42,300	43,600	48,000
Community Services - On-site	n/a	325	400	400	500
SUBTOTAL: CGSF	***n/a***	***84,415***	***144,270***	***153,140***	***173,720***

A more detailed area table, listing space by department/component, is included in the Master Program (under separate cover).

Planning Considerations

Patient and Family Centred Care

Quality of Space

- New hospitals will have the opportunity to maximize light, views and room sizes

Efficient Use of Space

- New hospitals will have the opportunity to maximize clinical and operational adjacencies

Circulation and flow

- New hospitals will have the opportunity to provide optimal clinical flow and separation of public and clinical circulation

Design

Future Growth

- Flexibility and growth potential on HDMH site is challenged by the existing site topography
- Flexibility and growth potential on SMMH site is poor due to size of property

Community Connection

- Opportunity for community connection on HDMH site is good
- Community connection on SMMH site is poor due to required scale (height) of new building that will be significantly larger than surrounding neighbourhood

Site and Building Utilization

- Existing site is reused in each option, however some civil (site servicing) will be required on the HDMH site

Construction

Construction Phasing

- Will require 1 phase

Impact on Ongoing operations

- Construction of new hospitals adjacent to existing hospital will result in impact on ongoing operations on the site. There will be a need to separate construction traffic from hospital traffic

Construction Duration

- Approximately 3 ½ years

Land Acquisition Cost

- None

Advantages

- Within the new building there is the ability to meet clinical adjacencies and space requirements
- Within the new building there is the ability to meet engineering design and system requirements
- Would maintain current access to care (travel distance to facilities) for those within the catchment area

Disadvantages

- Limited site area at SMMH results in lower potential to accommodate future expansion
- Operational impact has a greater duplication of services
- Scale of SMMH site development has significant impact on surrounding community context
- Proximity of new construction on SMMH site to existing hospital will make construction challenging
- Proximity of new construction on SMMH site to ravine / protected areas will make construction challenging
- The general topography of the HDMH site constrains the actual area available for redevelopment without considering more extraordinary and costly construction works
- The topography of the HDMH site will make new construction challenging in order to maintain access to the existing hospital during construction
- The proposed redevelopment of the long term care facility (ie. Fairvern, reference Appendix D) would limit redevelopment opportunities for HDMH and constrain future growth and flexibility for the hospital

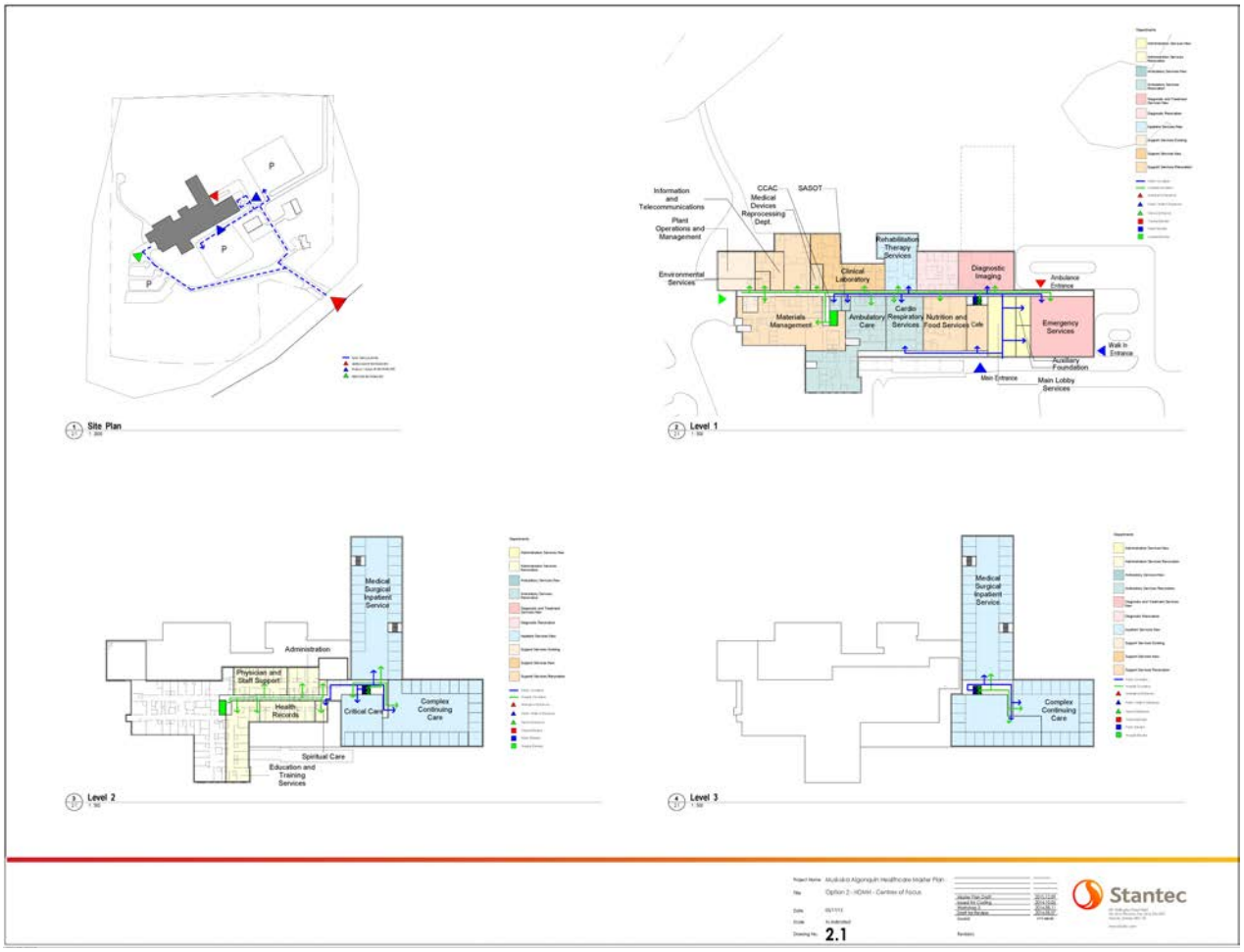
Option 2

Two centres of focus; renovation/addition of HDMH and SMMH

At HDMH, the existing hospital building would be renovated and an addition would be added to accommodate its re-use as a centre of focus. Where possible, existing functions that are required in the centre of focus (for example materials management) would remain in their current location. Support services departments would require minimal renovations, while the clinical departments would be completely renovated within the existing building. In the case of Diagnostic Imaging, Ambulatory Care and Inpatient Services, a new inpatient wing would be added onto the north side of the existing building. The resultant clinical spaces would be brought up to current space and adjacency standards. As the work will be within an existing building, there may be some less than ideal clinical spaces due to the building constraints. All engineering systems would be brought up to current codes. All building envelope components would be upgraded as required. The extent of site work would be limited to servicing upgrades. The existing roads, parking lots and sidewalks would remain.

Multiple construction stages would be required to maintain functionality of existing building at all times. Construction duration would be dependent on number of phases, and extent of renovations.

Option 2: HDMH Site



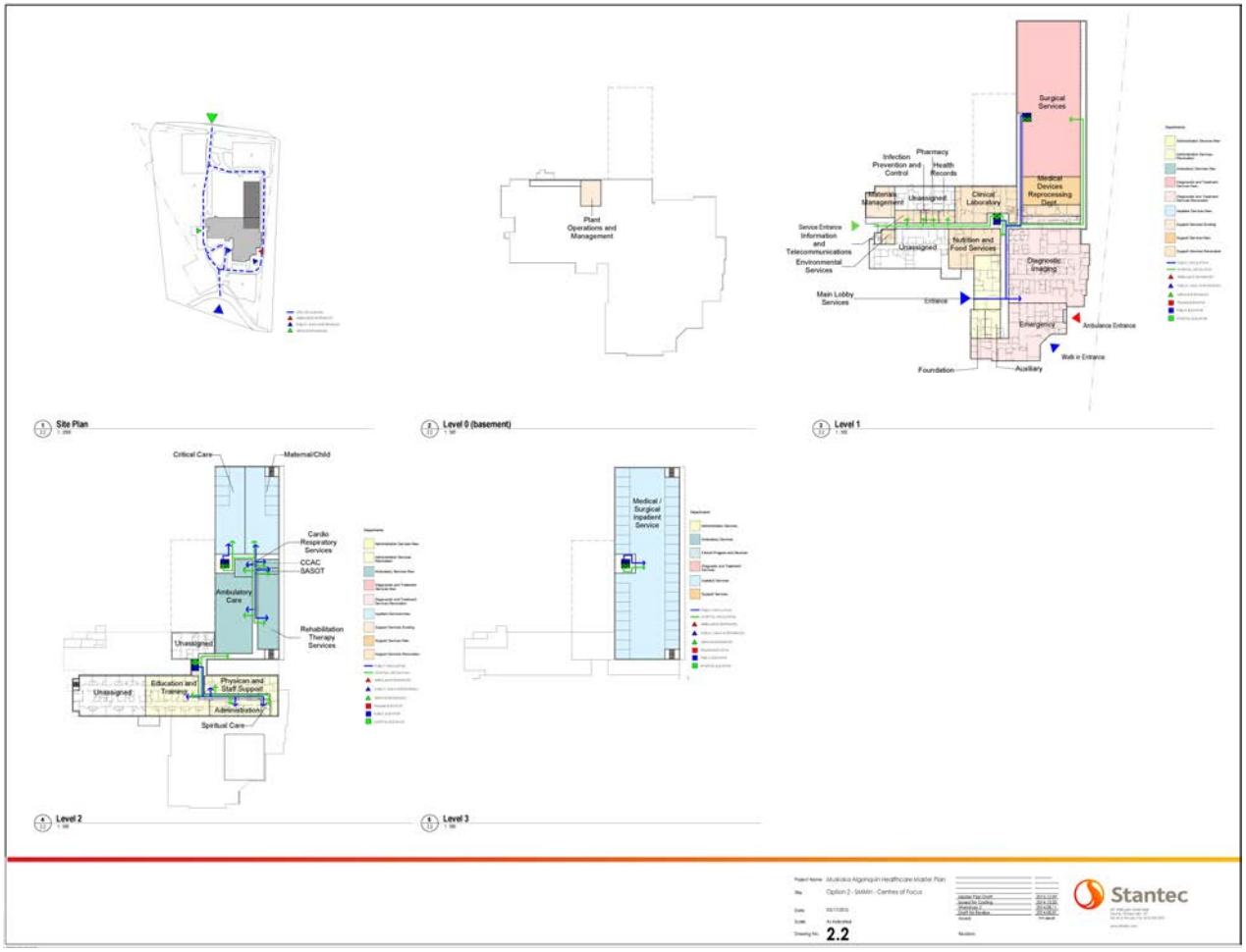
Option 2

Two centres of focus; renovation/addition of HDMH and SMMH

At SMMH the existing hospital building would be renovated and an addition would be added to accommodate its re-use as a centre of focus. Where possible, existing functions that are required in the centre of focus (for example materials management) would remain in their current location. Support services departments would require minimal renovations, while the clinical departments would be completely renovated within the existing building. In the case of Diagnostic Imaging and Inpatient Services, a new tower would be added onto the north and east sides of the existing building. The resultant clinical spaces would be brought up to current space and adjacency standards. As the work will be within an existing building, there may be some less than ideal clinical spaces due to the existing building physical constraints. All engineering systems would be brought up to current codes. All building envelope components would be upgraded as required. The extent of site work would be limited to servicing upgrades. The existing roads, parking lots and sidewalks would remain. Some roads would be added to provide access to the new locations of ambulance and patient entrances.

Multiple construction stages would be required to maintain functionality of existing building at all times. Construction duration would be dependent on number of phases, and extent of renovations.

Option 2: SMMH Site



Area

Master Plan Area

	Existing Area (CGSF)[1]		Projections (CGSF)		
	HDMH	SMMH	Year 5	Year 10	Year 20
OPTION 2: CENTRES OF FOCUS (HYBRID)	**76,370**	**84,415**	**246,260**	**253,970**	**291,600**
SITE #1: ACUTE CARE HOSPITAL					
Clinical Program and Services	n/a	n/a	61,065	63,795	72,195
Clinical Support Services	n/a	n/a	20,790	21,290	23,790
Education and Training Service	n/a	n/a	5,500	5,500	6,000
Admin and General Support Services	n/a	n/a	26,095	26,095	28,675
Community Services - On-site	n/a	n/a	700	700	900
SUBTOTAL: CGSF	***n/a***	***n/a***	***114,150***	***117,380***	***131,560***
SITE #2: ACUTE CARE HOSPITAL					
Clinical Program and Services	n/a	n/a	68,205	72,335	86,075
Clinical Support Services	n/a	n/a	22,190	22,540	26,390
Education and Training Service	n/a	n/a	4,500	4,500	5,000
Admin and General Support Services	n/a	n/a	36,515	36,515	41,675
Community Services - On-site	n/a	n/a	700	700	900
SUBTOTAL: CGSF	***n/a***	***n/a***	***132,110***	***136,590***	***160,040***

A more detailed area table, listing space by department/component, is included in the Master Program (under separate cover).

Planning Considerations

Patient and Family Centred Care

Quality of Space

- Renovated building may have compromised quality of space due to existing building conditions

Efficient Use of Space

- Renovated building may have compromised clinical and operational adjacencies due to existing building conditions

Circulation and flow

- Renovated hospital will have compromised clinical flow and separation of public and clinical circulation

Design

Future Growth

- Flexibility and growth potential on HDMH site is reasonably good provided coordinated site planning with potential Fairvern development; existing building is larger than required for the programmed Admin and General Support Services, so some internal future growth is possible (within the constraints of the existing conditions)
- The size of the SMMH site is below contemporary standards for health care facilities of the contemplated size and therefore has limited growth opportunity

Community Connection

- Opportunity for community connection on both sites is good

Site and Building Utilization

- Existing HDMH site is reused, however some civil (site servicing) will be required
- On HDMH site, existing building envelope (roof, walls, windows) are in reasonable condition but will require ongoing maintenance
- On SMMH site, existing building envelope (roof, walls, windows) are in reasonable condition but will require ongoing maintenance
- Existing structure on SMMH is not conducive for major renovations, an ambulatory care centre could be developed within current building, but final design and layout will be dependent on existing conditions
- Reuse of the SMMH and HDMH buildings will require replacement of all major mechanical and electrical systems

Construction

Construction Phasing

- Will require multiple phases at both HDMH and SMMH sites

Impact on Ongoing operations

- Renovation of HDMH will have significant impact on existing operations and will need to employ IPAC and other measures to maintain safety and operation of hospital functions
- Renovation of SMMH will have significant impact on existing operations and will need to employ IPAC and other measures to maintain safety and operation of hospital functions

Construction Duration

- Final duration will vary, but will be more than 5 years depending on number of phases at HDMH and SMMH sites

Land Acquisition Cost

None

Advantages

- Renovation of existing buildings would reuse existing physical assets
- Operational efficiencies in the Option 2, centres of focus model would reduce duplication of services between sites

Disadvantages

- May pose challenges for access to specific care (travel distance to facilities) for those within the catchment area
- In terms of design, renovated spaces may not be able to achieve optimal clinical adjacency and space needs thereby compromising the ability to achieve operational efficiencies
- Within the existing SMMH building there would be challenges to meet current codes and standards (including structural and other engineering system requirements)
- The total duration of construction would be longer – renovations would commence after new acute hospital is built and services moved

Option 3

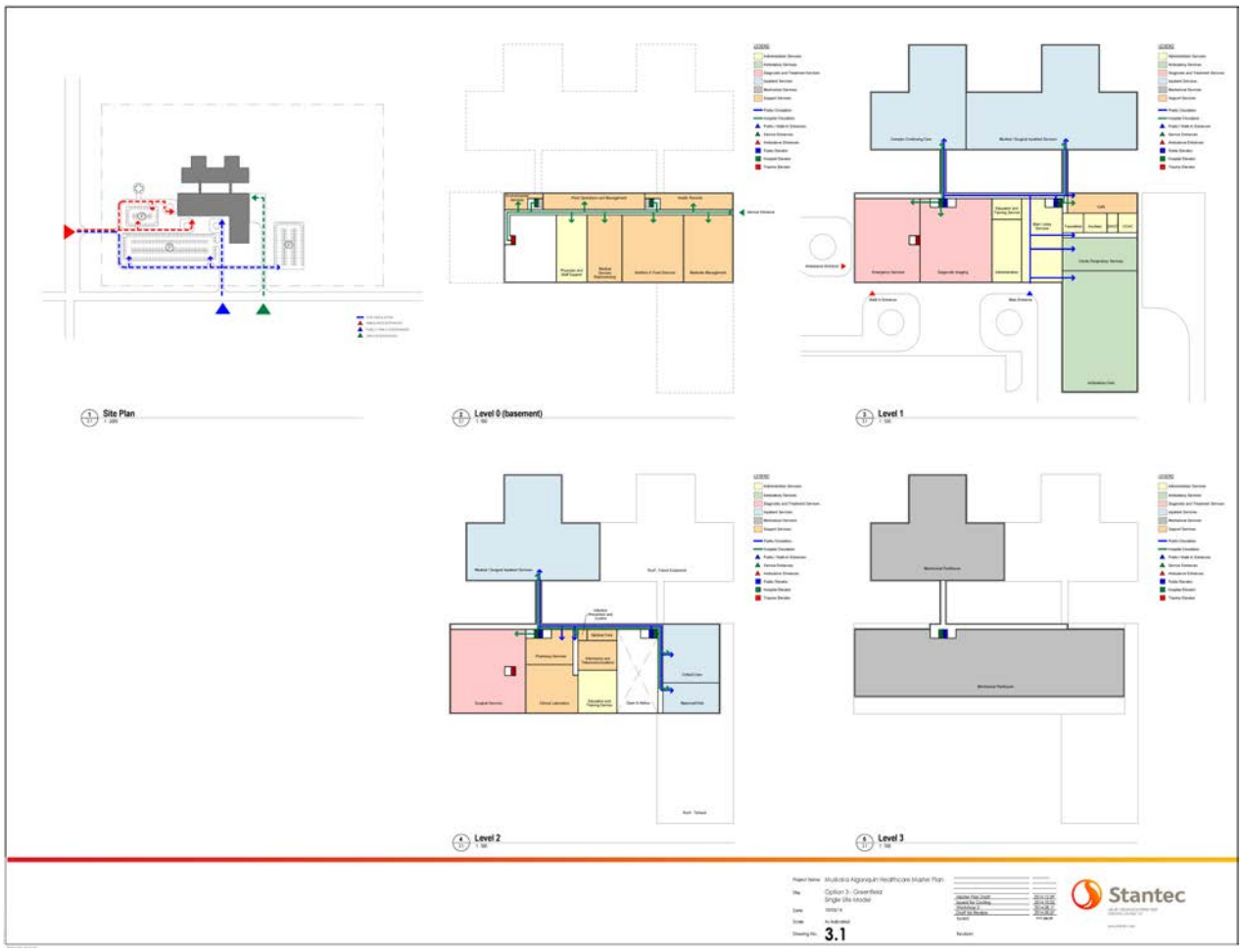
One, centralized full service acute care hospital on a greenfield site within the District of Muskoka

A new full service acute care hospital would be built on a greenfield site. The building would have 1 level below ground and 3 levels above ground with a mechanical penthouse. The new hospital would be constructed with systems and materials typical of current hospital construction. All spaces internally would be designed with current standards for size, location and adjacency to other departments. Site work would need to occur to provide the required vehicular circulation and parking around the buildings on the site.

The location for this option has not been selected, however it would be required to be centrally located.

It is estimated that this option would be built in one construction stage over an estimated 3 ½ years of construction.

Option 3: New, centrally located site



Area

Master Plan Area

	Existing Area (CGSF)[1]		Projections (CGSF)		
	HDMH	SMMH	Year 5	Year 10	Year 20
OPTION 3: ONE HOSPITAL (CENTRALLY LOCATED)	**76,370**	**84,415**	**204,797**	**215,791**	**245,843**
Clinical Program and Services	44,100	48,090	121,677	127,451	147,283
Clinical Support Services	10,410	12,460	27,320	29,740	32,960
Education and Training Service	n/a	1,230	5,500	5,500	6,000
Admin and General Support Services	21,210	22,310	49,000	51,700	57,900
Community Services - On-site	650	325	1,300	1,400	1,700

A more detailed area table, listing space by department/component, is included in the Master Program (under separate cover).

Planning Considerations

Patient and Family Centred Care

Quality of Space

- New hospital will have the opportunity to maximize light, views and room sizes

Efficient Use of Space

- New hospital will have the opportunity to maximize clinical and operational adjacencies

Circulation and flow

- New hospital will have the opportunity to provide optimal clinical flow and separation of public and clinical circulation

Design

Future Growth

- Flexibility and growth potential on greenfield site is good

Community Connection

- Scale and location of larger regional hospital will have significant impact on community. Scale of building will be significant.

Site and Building Utilization

- Existing physical assets of both HDMH and SMMH site will become surplus.

Construction

Construction Phasing

- Will require 1 phase

Impact on Ongoing Operations

- Construction of new greenfield hospital will have no impact on existing hospital operations

Construction Duration

- Approximately 3 ½ years

Land Acquisition Cost

Will require costs to acquire land and to provide municipal services to the new site.

Advantages	• Ease of construction • Ability to provide optimal clinical adjacencies and space requirements • Ability to meet ideal engineering design and system requirements • Should represent opportunity to achieve operational efficiencies • No duplication of services
Disadvantages	• One site may pose challenges for access to care (travel distance to hospital) for those within the catchment area • Limited ability to phase over time – requires all programs are configured new on opening day

ENGINEERING DESCRIPTION

Introduction

The following engineering description is based on a report prepared by Stantec Consulting in support of the master plan development.

The purpose of this report is to provide a high level scope of the structural, mechanical and electrical work required to support the costing of development options for upgrading the Muskoka Algonquin Healthcare (MAHC) facilities to accommodate additional ambulatory and acute care departments. The existing MAHC facilities consist of Huntsville District Memorial Hospital (HDMH) located in Huntsville, Ontario and South Muskoka Memorial Hospital (SMMH) located in Bracebridge, Ontario.

The three options for the redevelopment of the sites are briefly described below, subsequent parts of this section outline the specific structural, mechanical and electrical systems work proposed.

Option 1: Two, Full Service Acute Care Sites; Construct new facilities at both the HDMH and SMMH sites to accommodate the local requirements to create two acute care facilities.

Option 2: Two, Centres of Focus; Renovate and construct new additions to both HDMH and SMMH to accommodate the local requirements for additional ambulatory and acute care space at both sites, providing specialized services at each site, thus creating two centres of focus.

Option 3: One, Centralized Full Service Acute Care Site; Provide a new state of the art hospital centrally located and decommission the existing MAHC facilities upon completion. The approximate size of the new hospital will be 302,107 square feet.

Structural

Overview

The original SMMH building was constructed in 1964 and appears to be a two-storey reinforced concrete structure with a steel framed penthouse roof and no basement. Subsequent expansions of the original building were undertaken in 2000: a one-storey steel building with a basement to the West and a single-storey steel building with a steel penthouse and no basement to the south of the original building.

Structural drawings for the expansions are available, but not for the original building.

The original HDMH building was constructed in 1978 and is a 2 storey structural steel building with a penthouse and no basement. The floor framing of the original building appears to be concrete on metal deck supported on open web steel joists. The roof framing is a metal deck supported on steel beams.

The original building was expanded to include Nuclear Medicine building and Day surgery building. Both buildings are 1-storey buildings with no basement.

The structural drawings for the original building and the Day Surgery building are available but not for the Nuclear Medicine building.

A visual inspection of both buildings was conducted by Stantec on August 13, 2014.

Option 1

Two, Full Service Acute Care Sites

For option 1, it is assumed that 2 new facilities will be constructed at each site and also that there will be no renovation work in the existing buildings.

The following structural work will be required for the construction of new facilities at each site.

Site Services:

- Geotechnical investigation report by a geotechnical company
- Independent inspection company on site during construction
- Design shoring system to protect against existing building if new building has a basement and is located close to existing

Structural Systems:

- Design new building to current OBC code, NBC structural commentaries and any local amendments
- Environmental loads (Wind, Snow and Earthquake) will be calculated for Post disaster building, B2-Occupancy.
- Excavation and shoring at new sites
- Construct new concrete footings/caissons depending on the geotechnical recommendations.
- Construct new concrete slabs /concrete slab on metal deck for the floors
- Construct new columns, walls and beams.
- Construct new penthouse roof
- Design equipment support to meet post-disaster building requirement

Option 2

Two, Centres of Focus; Renovate existing facilities and add new space at each site

Renovation

The structural work required in the existing facilities will depend whether the performance level of the existing structural elements will be reduced after the proposed renovation. This can happen if there is a change in major occupancy, change in the occupant load or increase in the live load. Should there be an increase in the occupant or live load, compensating construction will be carried out to bring the performance of the existing buildings to the level of the new loading. Full structural investigation will be carried out to assess the structural adequacy of the existing structural elements for the new loading and remedial measures to restore the structural stability and integrity will be provided.

For option 2 the following Structural work below may be required for the renovation of the existing facility.

Site Services:

- Independent inspection company on site during demolition and construction

Structural Systems:

- Review existing structural elements to the new loading and reinforce them if required
- Review existing building footings
- Review existing building columns
- Review existing building floors
- Cut new floor openings and fill existing ones
- Upgrade existing lateral load transfer system
- Upgrade equipment support to post-disaster requirement

New Construction.

The following structural work will be required for the construction of new facilities at each site.

Site Services:

- Geotechnical investigation report by a geotechnical company
- Independent inspection company on site during construction
- Design shoring system to protect against existing building if new building has a basement and is located close to existing

Structural Systems:

- Design new building to current OBC code, NBC structural commentaries and any local amendments
- Environmental loads (Wind, Snow and Earthquake) will be calculated for Post disaster building, B2-Occupancy.
- Construct new concrete footings/piles
- Construct new concrete slabs /concrete slab on metal deck for the floors
- Construct new columns, walls and beams
- Construct new penthouse roof
- Design equipment support to meet post-disaster building requirement

Option 3

One, Centralized Full Service Acute Care Site

The following structural work will be required for the construction of a new facility.

Site Services:

- Geotechnical investigation report by a geotechnical company
- Independent inspection company on site during construction
- Design shoring system to protect against existing building if new building has a basement and is located close to existing

Structural Systems:

- Design new building to current OBC code, NBC structural commentaries and any local amendments
- Environmental loads (Wind, Snow and Earthquake) will be calculated for Post disaster building, B2-Occupancy.
- Excavation and shoring at new sites
- Construct new concrete footings/caissons depending on the geotechnical recommendations.
- Construct new concrete slabs /concrete slab on metal deck for the floors
- Construct new columns, walls and beams.
- Construct new penthouse roof
- Design equipment support to meet post-disaster building

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Mechanical

Overview

Assessing the potential scope of Mechanical systems work for the sites involved the following considerations: building age (some systems and equipment are original to the building construction), equipment age and condition (where equipment has been replaced or original infrastructure supplemented), building condition assessment findings, current minimum code and industry standard servicing requirements, and proposed future usage. Additionally, since this report supports an overall master planning exercise, consideration was given to the fact that implementation of these measures would not be initiated in the immediate future, but could be undertaken in as much as 5-10 years from the date of the publishing of the report.

The conclusion from the above analysis criteria was that the majority of the equipment and systems would require replacement due to service life issues or the elements not being capable of supporting the proposed future usage. This conclusion extends to the site services for the sites that will also require replacement and upgrade to ensure the facilities can reliably meet the operational needs for the foreseeable future.

Option 1

Two, Full Service Acute Care Sites

For option 1 the following Mechanical items will be required for the new hospital.

Site Services:

- Two potable water services from the local utility provider, originating from independent mains
- Two fire protection water services from the local utility provider, originating from independent mains
- Sanitary drain site service from the local utility provider
- Storm drain site service from the local utility provider
- Natural gas service from the local utility provider
- Back-up fuel oil storage tank system to support emergency generator plant operation for 72 hours
- Back-up fuel oil storage tank system to support boiler plant operation for 24 hours
- Bulk oxygen supply system (main and reserve storage tanks, vaporizer, controls, piping to building, and enclosure)

Plumbing Systems:

- Domestic cold water distribution with redundant building risers to provide for future changes in use of the spaces
- Domestic hot water distribution (and hot water recirculation) with redundant building risers to provide for future changes in use of the spaces
- Instantaneous domestic hot water heaters
- Dedicated domestic hot water systems for MDR and food services
- Dedicated reverse osmosis water system for MDR
- Sanitary drain and vent systems to serve all fixtures and loads in the buildings
- Storm drainage system to handle conventional and green roof areas

Fire Protection Systems:

- Wet sprinkler coverage for all areas of the buildings
- Dry sprinkler coverage for areas subject to freeze risk
- Stand pipe coverage based on code and underwriter requirements
- Pre-action system use for rooms with critical medical (DI and OR areas) or computer equipment
- Inert gas suppression system for the data centre
- Fire extinguishers through-out the building

Medical Gas Systems:

- Medical air plant (redundant compressors and cylinder banks) and distribution to clinical areas of the building
- Medical vacuum plant (redundant pumps) and distribution to clinical areas of the building
- Laboratory air and vacuum plants (redundant compressors, cylinder banks, and pumps) and distribution to laboratory
- Cylinder bank supply systems for nitrous-oxide, carbon-dioxide, and nitrogen, and distribution to clinical treatment areas of the building
- Anaesthetic gas scavenging plant (redundant pumps) and distribution to clinical treatment areas of the building
- Medical gas outlets provided in clinical spaces in accordance with CSA Z7396.1-12, including alarm panels and monitoring
- Piping distribution for oxygen, medical air, and medical vacuum to include redundant risers to provide for future changes in use of the spaces

Heating Systems:

- Gas fired (with back-up secondary fuel oil capability) hot water boiler plant
- Primary/secondary heating water distribution piping system
- Heating glycol systems for loads subject to freeze conditions (air handling unit coils)
- Gas fired (with back-up secondary fuel oil capability) steam boiler plant

Steam distribution system

- Dedicated heating terminals at entrance points

Cooling Systems:

- Chilled water cooling plant consisting of water cooled chillers, cooling towers, and pumps
- Chilled water and condenser water piping systems
- Critical cooling system as a sub-set of the main chilled water system, with select equipment on emergency power system
- Dedicated fan coil and computer room cooling units to handle critical room cooling loads

Ventilation Systems:

- Central air handling units to provide ventilation and heating and cooling for all clinical and support spaces
- Redundant air handling units provided for the surgical services, emergency services, and diagnostic imaging

departments
- Sanitary and general exhaust systems to serve all areas of the building
- Process exhausts provided for the MDR department, laboratory, food services, pharmacy, and other distributed clinical services

Option 2

Two, Centres of Focus

HDMH (Huntsville) site

For option 2, the following Mechanical items will be required for the renovation and expansion at HDMH. As this option entails the renovation of a functioning health care facility, phasing will be required to maintain the critical existing systems during construction.

- Site Services:
- Two potable water services from the local utility provider, originating from independent mains
- Two fire protection water services from the local utility provider, originating from independent mains
- Sanitary drain site service from the local utility provider
- Storm drain site service from the local utility provider
- Natural gas service from the local utility provider
- Back-up fuel oil storage tank system to support emergency generator plant operation for 72 hours
- Back-up fuel oil storage tank system to support boiler plant operation for 24 hours
- Bulk oxygen supply system (main and reserve storage tanks, vaporizer, controls, piping to building, and enclosure)

Plumbing Systems:

- Domestic cold water distribution with redundant building risers to provide for future changes in use of the spaces
- Domestic hot water distribution (and hot water recirculation) with redundant building risers to provide for future changes in use of the spaces
- Instantaneous domestic hot water heaters
- Dedicated domestic hot water systems for MDR and food services
- Dedicated reverse osmosis water system for MDR
- Sanitary drain and vent systems to serve all fixtures and loads in the buildings
- Storm drainage system to handle conventional and green roof areas

Fire Protection Systems:

- Wet sprinkler coverage for all areas of the buildings
- Dry sprinkler coverage for areas subject to freeze risk
- Stand pipe coverage based on code and underwriter requirements
- Pre-action system use for rooms with critical medical (DI areas) or computer equipment
- Inert gas suppression system for the data centre

- Fire extinguishers through-out the building

Medical Gas Systems:

- Medical air plant (redundant compressors and cylinder banks) and distribution to clinical areas of the building
- Medical vacuum plant (redundant pumps) and distribution to clinical areas of the building
- Cylinder bank supply systems for nitrous-oxide, carbon-dioxide, and nitrogen, and distribution to clinical treatment areas of the building
- Medical gas outlets provided in clinical spaces in accordance with CSA Z7396.1-12, including alarm panels and monitoring
- Piping distribution for oxygen, medical air, and medical vacuum to include redundant risers to provide for future changes in use of the spaces

Heating Systems:

- Gas fired (with back-up secondary fuel oil capability) hot water boiler plant
- Primary/secondary heating water distribution piping system
- Heating glycol systems for loads subject to freeze conditions (air handling unit coils)
- Dedicated heating terminals at entrance points
- Gas fired (with back-up secondary fuel oil capability) steam boiler plant
-

Cooling Systems:

- Chilled water cooling plant consisting of water cooled chillers, cooling towers, and pumps
- Existing chiller and cooling tower (approx.. capacity of 300 tons) to be integrated into the new plant design
- Chilled water and condenser water piping systems
- Critical cooling system as a sub-set of the main chilled water system, with select equipment on emergency power system
- Dedicated fan coil and computer room cooling units to handle critical room cooling loads

Ventilation Systems:

- Central air handling units to provide ventilation and heating and cooling for all clinical and support spaces
- Sanitary and general exhaust systems to serve all areas of the building
- Process exhausts provided for the MDR department, food

services, pharmacy, and other distributed clinical services

SMMH (Bracebridge) site

For option 2, the following Mechanical items will be required for the renovation of the existing facility and the construction of a new hospital at the SMMH site.

Site Services:

- Two potable water services from the local utility provider, originating from independent mains
- Two fire protection water services from the local utility provider, originating from independent mains
- Sanitary drain site service from the local utility provider
- Storm drain site service from the local utility provider
- Natural gas service from the local utility provider
- Back-up fuel oil storage tank system to support emergency generator plant operation for 72 hours
- Back-up fuel oil storage tank system to support boiler plant operation for 24 hours
- Bulk oxygen supply system (main and reserve storage tanks, vaporizer, controls, piping to building, and enclosure)

Plumbing Systems:

- Domestic water booster pump set
- Domestic cold water distribution with redundant building risers to provide for future changes in use of the spaces
- Domestic hot water distribution (and hot water recirculation) with redundant building risers to provide for future changes in use of the spaces
- Instantaneous domestic hot water heaters
- Dedicated domestic hot water systems for MDR and food services
- Dedicated reverse osmosis water system for MDR
- Sanitary drain and vent systems to serve all fixtures and loads in the buildings
- Storm drainage system to handle conventional and green roof areas

Fire Protection Systems:

- Fire pump set to serve sprinkler and standpipe systems
- Wet sprinkler coverage for all areas of the buildings
- Dry sprinkler coverage for areas subject to freeze risk
- Stand pipe coverage
- Pre-action system use for rooms with critical medical (DI and OR areas) or computer equipment
- Inert gas suppression system for the data centre

- Fire extinguishers through-out the building

Medical Gas Systems:

- Medical air plant (redundant compressors and cylinder banks) and distribution to clinical areas of the building
- Medical vacuum plant (redundant pumps) and distribution to clinical areas of the building
- Laboratory air and vacuum plants (redundant compressors, cylinder banks, and pumps) and distribution to laboratory
- Cylinder bank supply systems for nitrous-oxide, carbon-dioxide, and nitrogen, and distribution to clinical treatment areas of the building
- Anaesthetic gas scavenging plant (redundant pumps) and distribution to clinical treatment areas of the building
- Medical gas outlets provided in clinical spaces in accordance with CSA Z7396.1-12, including alarm panels and monitoring
- Piping distribution for oxygen, medical air, and medical vacuum to include redundant risers to provide for future changes in use of the spaces

Heating Systems:

- Gas fired (with back-up secondary fuel oil capability) hot water boiler plant
- Primary/secondary heating water distribution piping system
- Heating glycol systems for loads subject to freeze conditions (air handling unit coils)
- Dedicated heating terminals at entrance points
- Gas fired (with back-up secondary fuel oil capability) steam boiler plant
-

Cooling Systems:

- Chilled water cooling plant consisting of water cooled chillers, cooling towers, and pumps
- Chilled water and condenser water piping systems
- Critical cooling system as a sub-set of the main chilled water system, with select equipment on emergency power system
- Dedicated fan coil and computer room cooling units to handle critical room cooling loads

Ventilation Systems:

- Central air handling units to provide ventilation and heating and cooling for all clinical and support spaces

- Redundant air handling units provided for the surgical services, emergency services, and diagnostic imaging departments
- Sanitary and general exhaust systems to serve all areas of the building
- Process exhausts provided for the MDR department, laboratory, food services, pharmacy, and other distributed clinical services

Option 3

One, Centralized Full Service Acute Care Site

For option 3, the following Mechanical items will be required for the new hospital.

Site Services:

- Two potable water services from the local utility provider, originating from independent mains
- Two fire protection water services from the local utility provider, originating from independent mains
- Sanitary drain site service from the local utility provider
- Storm drain site service from the local utility provider
- Natural gas service from the local utility provider
- Back-up fuel oil storage tank system to support emergency generator plant operation for 72 hours
- Back-up fuel oil storage tank system to support boiler plant operation for 24 hours
- Bulk oxygen supply system (main and reserve storage tanks, vaporizer, controls, piping to building, and enclosure)

Plumbing Systems:

- Domestic cold water distribution with redundant building risers to provide for future changes in use of the spaces
- Domestic hot water distribution (and hot water recirculation) with redundant building risers to provide for future changes in use of the spaces
- Instantaneous domestic hot water heaters
- Dedicated domestic hot water systems for MDR and food services
- Dedicated reverse osmosis water system for MDR
- Sanitary drain and vent systems to serve all fixtures and loads in the buildings
- Storm drainage system to handle conventional and green roof areas

Fire Protection Systems:

- Wet sprinkler coverage for all areas of the buildings
- Dry sprinkler coverage for areas subject to freeze risk
- Stand pipe coverage based on code and underwriter requirements
- Pre-action system use for rooms with critical medical (DI and OR areas) or computer equipment
- Inert gas suppression system for the data centre
- Fire extinguishers through-out the building

Medical Gas Systems:

- Medical air plant (redundant compressors and cylinder banks) and distribution to clinical areas of the building
- Medical vacuum plant (redundant pumps) and distribution to clinical areas of the building
- Laboratory air and vacuum plants (redundant compressors, cylinder banks, and pumps) and distribution to laboratory
- Cylinder bank supply systems for nitrous-oxide, carbon-dioxide, and nitrogen, and distribution to clinical treatment areas of the building
- Anaesthetic gas scavenging plant (redundant pumps) and distribution to clinical treatment areas of the building
- Medical gas outlets provided in clinical spaces in accordance with CSA Z7396.1-12, including alarm panels and monitoring
- Piping distribution for oxygen, medical air, and medical vacuum to include redundant risers to provide for future changes in use of the spaces

Heating Systems:

- Gas fired (with back-up secondary fuel oil capability) hot water boiler plant
- Primary/secondary heating water distribution piping system
- Heating glycol systems for loads subject to freeze conditions (air handling unit coils)
- Dedicated heating terminals at entrance points
- Gas fired (with back-up secondary fuel oil capability) steam boiler plant

Cooling Systems:

- Chilled water cooling plant consisting of water cooled chillers, cooling towers, and pumps
- Chilled water and condenser water piping systems
- Critical cooling system as a sub-set of the main chilled water system, with select equipment on emergency power system
- Dedicated fan coil and computer room cooling units to handle critical room cooling loads

Ventilation Systems:

- Central air handling units to provide ventilation and heating and cooling for all clinical and support spaces
- Redundant air handling units provided for the surgical services, emergency services, and diagnostic imaging

departments
- Sanitary and general exhaust systems to serve all areas of the building
- Process exhausts provided for the MDR department, laboratory, food services, pharmacy, and other distributed clinical services

Electrical

Overview

Assessing the potential scope of Electrical systems work for the sites involved the following considerations: building age (some systems and equipment are original to the building construction), equipment age and condition (where equipment has been replaced or original infrastructure supplemented), building condition assessment findings, current minimum code and industry standard servicing requirements, and proposed future usage. Additionally, since this report supports an overall master planning exercise, consideration was given to the fact that implementation of these measures would not be initiated in the immediate future, but could be undertaken in as much as 5-10 years from the date of the publishing of the report.

The conclusion from the above analysis criteria was that the majority of the equipment and systems would require replacement due to service life issues or the elements not being capable of supporting the proposed future usage.

Option 1

Option 1: Two, Full Service Acute Care Sites

For option 1, the following electrical items will be required for each of the the two new hospitals.

Electrical Distribution:

- Two incoming fully redundant hydro services from the local utility provider
- Double ended high voltage switchgear
- Two transformers from the high voltage down to 347/600V each sized at 2,000kVA
- Two emergency 600V diesel generators sized at 1,000kW each
- Paralleling switchgear for the new generators sized at 2,000A
- Double ended 600V switchboard with vital/delayed vital and conditional sides sized at 2000A
- 600V distribution system from the double ended switchboard throughout the hospital
- Local 600V:120/347V transformers within electrical rooms
- Local double ended 120/208V vital/delayed vital and conditional panelboards within electrical rooms
- Two 600V UPS's sized at 400kW each and UPS distribution system within hospital

Low Voltage Systems:

- Two incoming fully redundant 12 strand fibre cables from the local service provider
- Two incoming fully redundant 100 pair copper cables from the local service provider
- Two redundant core switches for IT system located in main data centre
- The systems which are required to be distributed throughout hospital include: data, voice, nurse call, fire alarm, access control, CCTV, paging, sound masking, distributed antenna system, RTLS, intercom, clocks, DALI lighting control, wireless access points, patient entertainment system, etc

Option 2

Option 2: Two, Centres of Focus;

HDMH

For option 2, (centres of focus) , the following electrical items will be required for the renovation at HDMH. Because this option includes renovating HDMH, phasing will be required to maintain the existing critical systems during construction.

Electrical Distribution:

- One new 44kV hydro service from the local utility provider
- One new 44kV:347/600V 1000kVA transformer for redundancy
- One new 600V emergency diesel generator sized at 500kW
- New 1000A paralleling switchgear
- New double ended 600V switchboard with vital/delayed vital and conditional sides sized at 1000A
- 600V distribution system from the double ended switchboard throughout the hospital
- Local 600V:120/347V transformers within electrical rooms
- Local double ended 120/208V vital/delayed vital and conditional panelboards within electrical rooms
- Upgrade the electrical system of the renovated areas

Low Voltage Systems:

- One new incoming 12 strand fibre cable from the local service provider for redundancy
- One new incoming 100 pair copper cable from the local service provider for redundancy
- One new redundant core switch for the IT system for redundancy
- New systems for the addition and upgrade all of the low voltage systems throughout the existing hospital including: data, voice, nurse call, fire alarm, access control, CCTV, paging, sound masking, distributed antenna system, RTLS, intercom, clocks, DALI lighting control, wireless access points, patient entertainment system, etc.

SMMH

For option 2 the following electrical items will be required for the new hospital at the SMMH site.

Electrical Distribution:

- One new incoming hydro service from the local utility provider
- Double ended high voltage switchgear

- one new transformer from the high voltage down to 347/600V each sized at 2,500kVA
- One new 600V emergency diesel generator sized at 500kW
- New 1000A paralleling switchgear
- New double ended 600V switchboard with vital/delayed vital and conditional sides sized at 1000A
- 600V distribution system from the double ended switchboard throughout the hospital
- Local 600V:120/347V transformers within electrical rooms
- Local double ended 120/208V vital/delayed vital and conditional panelboards within electrical rooms
- Upgrade the electrical system of the renovated areas

Low Voltage Systems:

- One new incoming 12 strand fibre cable from the local service provider for redundancy
- One new incoming 100 pair copper cable from the local service provider for redundancy
- One new redundant core switch for the IT system for redundancy
- New systems for the addition and upgrade all of the low voltage systems throughout the existing hospital including: data, voice, nurse call, fire alarm, access control, CCTV, paging, sound masking, distributed antenna system, RTLS, intercom, clocks, DALI lighting control, wireless access points, patient entertainment system, etc.

Option 3

Option 3: One, Centralized Full Service Acute Care Site;

For option 3, the following electrical items will be required for the new hospital at the HDMH site.

Electrical Distribution:

- Two incoming fully redundant hydro services from the local utility provider
- Double ended high voltage switchgear
- Two transformers from the high voltage down to 347/600V each sized at 3000kVA
- Two emergency 600V diesel generators sized at 1,250kW each
- Paralleling switchgear for the new generators sized at 3,000A
- Double ended 600V switchboard with vital/delayed vital and conditional sides sized at 3000A
- 600V distribution system from the double ended switchboard throughout the hospital
- Local 600V:120/347V transformers within electrical rooms
- Local double ended 120/208V vital/delayed vital and conditional panelboards within electrical rooms
- Two 600V UPS's sized at 300kW each and UPS distribution system within hospital

Low Voltage Systems:

- Two incoming fully redundant 12 strand fibre cables from the local service provider
- Two incoming fully redundant 100 pair copper cables from the local service provider
- Two redundant core switches for IT system located in main data centre
- The systems which are required to be distributed throughout hospital include: data, voice, nurse call, fire alarm, access control, CCTV, paging, sound masking, distributed antenna system, RTLS, intercom, clocks, DALI lighting control, wireless access points, patient entertainment system, etc.

PROJECT COST SUMMARY

A cost estimate for the six options for development was prepared by Handscomb Ltd, and is included as Appendix C. These options were then reduced to three preferred alternatives.

The projected costs were then reduced based on revisions made to the Pre-Capital Submission in October 2015, which, at the direction of the North Simcoe Muskoka LHIN, included reduced space needs.

The following cost estimate summary is based on a cost-per-square-foot analysis of the Hanscomb cost estimate. Further analysis and refinement of the estimated costs will be required as part of further capital planning stages.

Table 6: Total Project Cost

OPTION	AREA (BGSF)	TOTAL REDEVELOPMENT COST	APPROXIMATE LOCAL SHARE COST
Option 1: Two, Full Service Acute Care Sites; construct new facilities at both the HDMH (Huntsville) and SMMH (Bracebridge) sites to accommodate the local requirements to create two acute care facilities.	412,363 SF	$475,479,414	$114,115,059
Option 2: Two, Centres of Focus; renovate and construct new additions to both HDMH and SMMH to accommodate the local requirements for additional ambulatory and acute care space at both sites, providing specialized services at each site, thus creating two centres of focus.	355,558 SF	$365,852,176	$87,804,522
Option 3: One, Centralized Full Service Acute Care Site; provide a new state of the art hospital centrally located and decommission the existing MAHC facilities upon completion.	302,107 SF	$348,985,661	$83,756, 559

EVALUATION OF OPTIONS

INTRODUCTION

Preliminary consultation and analysis reduced the initial 9 redevelopment options (refer to Appendix B) to three final options. For ease of reference and communication, these options were renumbered as follows.

- **Option 1:** Two, Full Service Acute sites
- **Option 2:** Two, Centres of Focus
- **Option 3:** One Centralized Full Service Acute Care site

Information sessions were held with the community as well as meetings with both the District of Muskoka and the municipal leadership of the towns within the district regarding the redevelopment options.

Based on the various workshops and sessions held with the MAHC Ad-Hoc Steering Committee, internal and external stakeholders and consultants, the Steering Committee developed criteria based upon Ministry evaluation criteria, along with criteria specific for MAHC's needs and environment.

The criteria listed below was utilized to complete the analysis of the options under consideration

EVALUATION CRITERIA

Table 7: Master Plan Options Evaluation Criteria

CRITERIA	SUB-CRITERIA
Patient and Family Centered Care	Quality of space Efficient use of space Flow of public, patients and staff
Design	Ability to accommodate future growth & changes Community connection Site & building utilization
Construction	Construction phasing and ease of implementation Impact on ongoing operations Duration of construction
Financial	Capital cost – building & site Operating Cost – initial & ongoing Funding capability – Capital needs & redevelopment needs
Approvals	Alignment with MOHLTC / LHIN priorities Municipal support District of Muskoka support
Community Support	Community feedback Travel times Market share Recruitment & retention of staff / physicians / volunteers

RESULT

The Master Program/Master Plan Ad-Hoc Steering Committee completed an exhaustive evaluation of the final three options. Each Committee member was requested to rate each of the options based on the criteria and sub criteria outlined above. Committee members discussed the results at length and focused discussion on determining the model that would best provide safe, quality, sustainable health care in the year 2030 and beyond.

The result of this process was that the option that proposed one hospital in a central Muskoka location was selected as the preferred option.

The following table is a record of the scoring generated by the Master Program/Master Plan Ad-Hoc Steering Committee. The numerical values are the sum of the individual score assigned by each committee member. The values are coloured in a range from green to red, with green being the best score and red being the worst score for each criteria.

Option Evaluation **Table 8: Master Plan Options Evaluation Summary**

Evaluation Criteria	Total	Option 1	Option 2	Option 3
		Two, Full Service Acute Care sites	Two, Centres of Focus	One Centralized Full Service Acute Care site
Patient and Family Centered Care	255	149	148	247
Quality of space	85	50	50	83
Efficient use of space	85	49	53	82
The flow of public, patients and staff	85	50	45	82
Design	255	157	138	200
Ability to accommodate future growth and changes	85	42	43	83
Community connection	85	67	49	55
Site and building utilization	85	48	46	62
Construction	255	134	140	234
Construction phasing and ease of implementation	85	48	49	74
Impact on ongoing operations	85	41	41	81
Duration of construction	85	45	50	79
Financial	510	301	315	378
Capital cost - Building	85	36	55	80
Capital cost -Site	85	65	68	41
Operational cost - Initial	85	48	50	53
Operational cost - Ongoing	85	33	51	84
Fundraising capability - Capital needs	85	59	44	63
Fundraising capability - Redevelopment needs	85	60	47	57
Approvals	255	188	138	159
Alignment with MOHLTC / LHIN priorities	85	30	42	82
Municipal Support	85	80	36	45
District of Muskoka Support	85	78	60	32
Community Support	340	294	167	259
Community feedback	85	78	32	55
Travel times	85	80	51	60
Market Share	85	77	51	68
Recruitment and retention of staff/physicians/volunteers	85	59	33	76
Total	1870	1223	1046	1477

PREFERRED OPTION

INTRODUCTION

The preferred development concept for the MAHC master plan is a single site located centrally within the hospital catchment area. This concept would embody a campus-of-care approach to ensure safe, high-quality and sustainable health care at MAHC.

The new full service acute care hospital would be built on a Greenfield site. The building would have one level below ground and three levels above ground including the mechanical penthouse. The new hospital would be constructed with systems and materials typical of current hospital construction. All spaces internally would be designed with current standards for size, location and adjacency to other departments. Site work would need to occur to provide the required vehicular circulation and parking around the buildings on the site.

It is assumed that the facility could be built in one construction stage and would take approximately 3½ years to construct. At this point the development concept is preliminary and will undergo further refinement in the Stage 1 process.

SITE REQUIREMENTS

While a specific site location has not been identified at this early stage of planning, a location between Huntsville and Bracebridge will be selected in the next stage of planning in order to optimize travel time and access to services for the MAHC catchment population.

The following table is a high level summary of requirements for the single site replacement hospital envisioned by the master plan. This data was developed by reviewing the preliminary MAHC Master Program and is used for initial discussion only. Specific requirements will need to be developed as part of the Stage 1 process.

Table 9: Preliminary Site Requirements

ITEM	REQUIREMENT
Size	50 acres of developable land (i.e. not constrained with environmental features) is ideal
Shape and Geometry	Parcel has a regular shape and is of good proportion
Topography	Site should require minimal retaining walls in parking areas and along proposed roads and with suitable geotechnical characteristics
Road Frontage	Frontage on at least 2 roads (Established or Potential), one of which is arterial
Helicopter Flight Potential	Minimal restrictions on flight path elevations
Fire Protection Water Services	Fully redundant (2), each line 200 dia.
Sanitary Drain Service	375 dia
Storm Drain Service	500 dia
Natural Gas Service	30,000 CFH
Power Services	Fully redundant (2), each rated at 3MVA
Telephone and Data Services	Fully redundant, 2 fibre and 2 copper

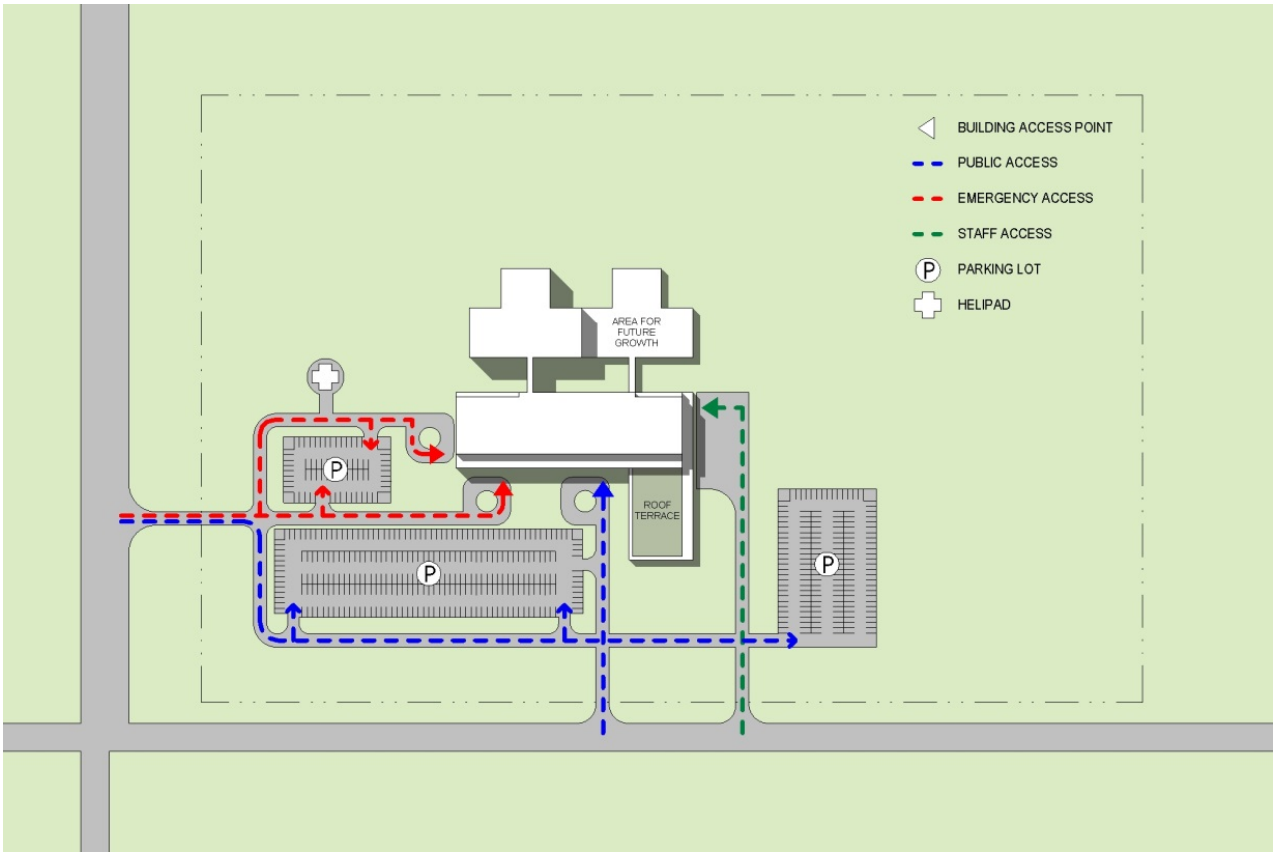
SITE DESIGN

The Development Concept site plan provides frontage on two roads. This allows for a clear separation of onsite circulation via three entrances and distinct site circulation routes based on type of usage. The primary access is for public and staff and provides drop-off at the main entry door and access to the primary parking lot. The secondary access is for the Emergency Department proving access for both public and emergency vehicles to the Emergency Department and dedicated parking lot. These two lots and internal roads are connected to allow circulation between these two entry points. The final access point is the service entry which is dedicated to hospital operational traffic (deliveries, etc.). The service lot and loading dock area accessed via this entry.

The total onsite parking requirements are estimated to be 396 spaces (10 year horizon).

Site plan

Development Concept



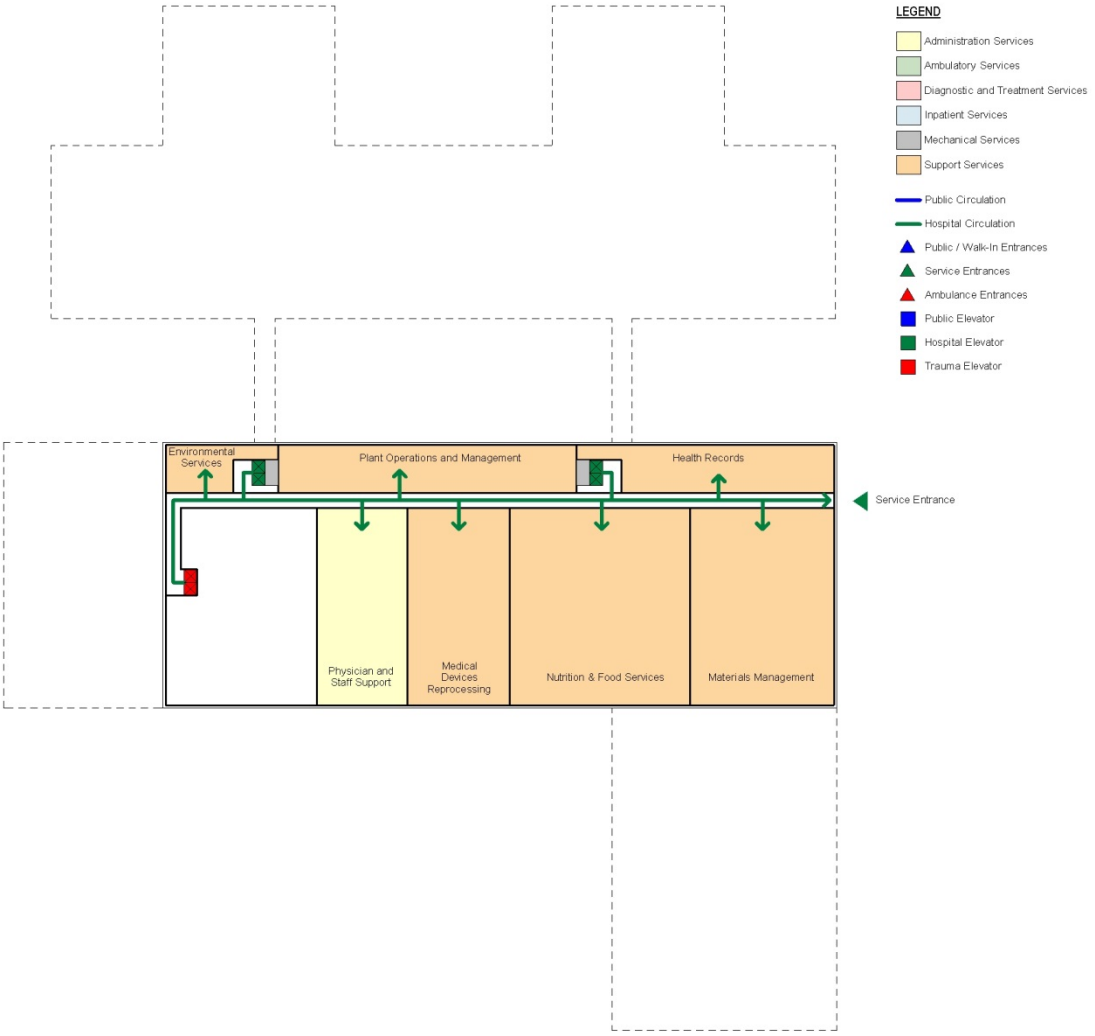
BUILDING DESIGN

The hospital building area is 302,107 BGSF organized into three major components grouped around the entry lobby. The hospital will have one level below ground and three levels above ground including the mechanical penthouse. Levels 1 and 2 will contain the diagnostic and treatment functions. Adjacent to the entry will be a one-story wing containing the ambulatory and outpatient services. The inpatient units will be housed in a separate parallel wing, connected to the facility at various points by corridors off of the main public circulation route. Two smaller units (Complex Continuing Care and Maternal/Child) will be located on the roof of the ambulatory care wing and having access to a rooftop green space.

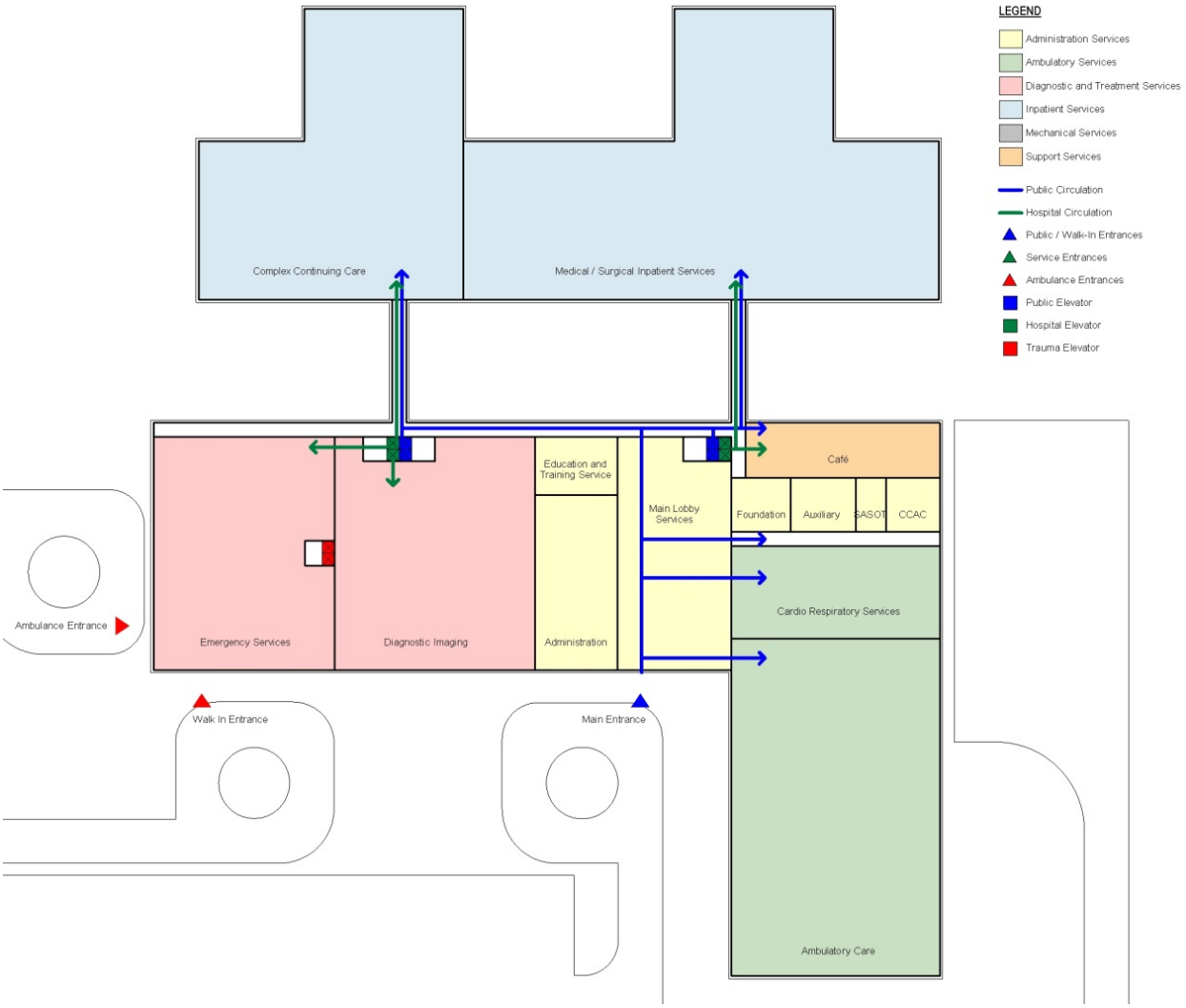
The facility will have the opportunity to maximize light, views and room sizes while providing ideal clinical and operational adjacencies. Public and clinical circulation will be separated. Future growth required for the inpatient unit would be achieved via horizontal expansion at the second floor of the inpatient wing.

An illustration of the proposed building model is included on the following pages.

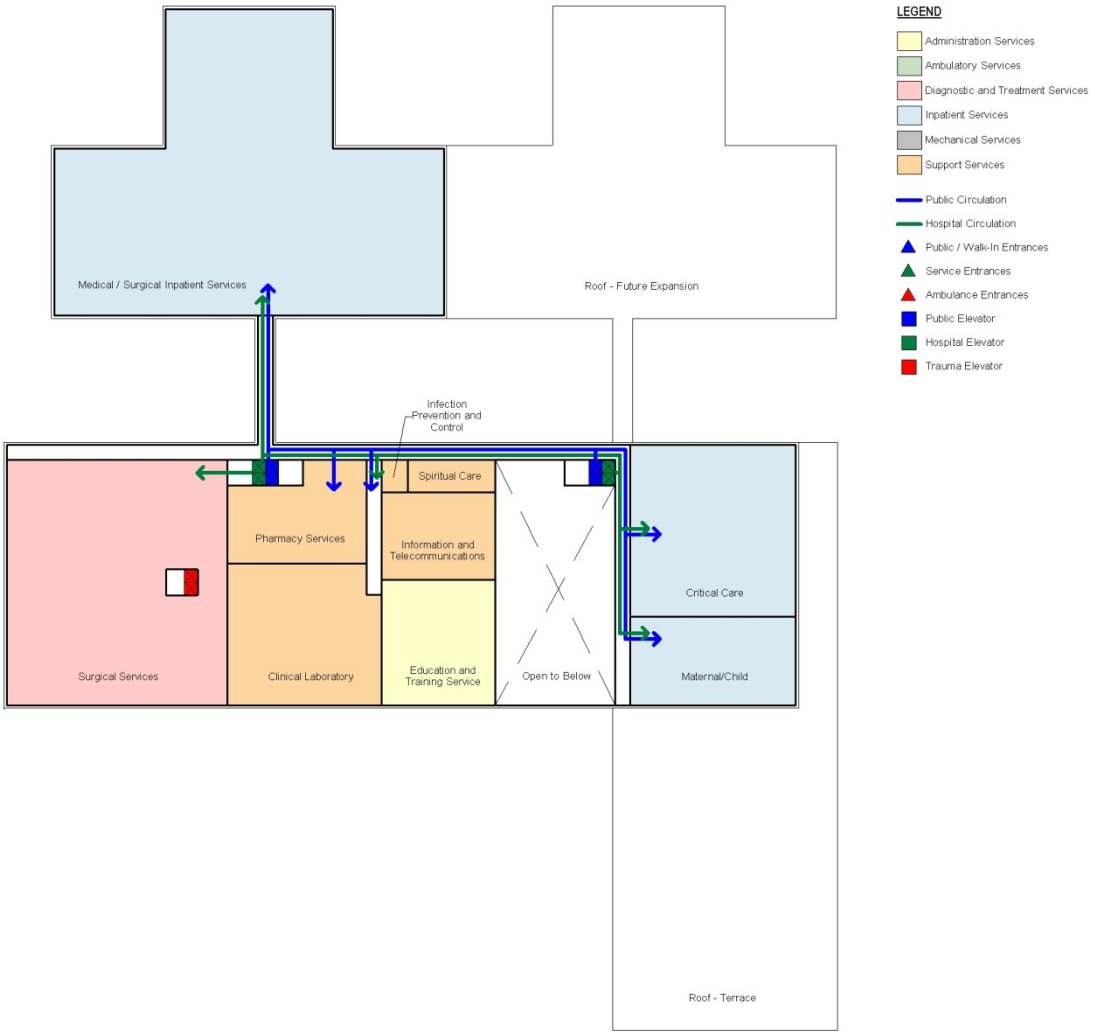
Figure D-2: Development Concept Blocking Plans



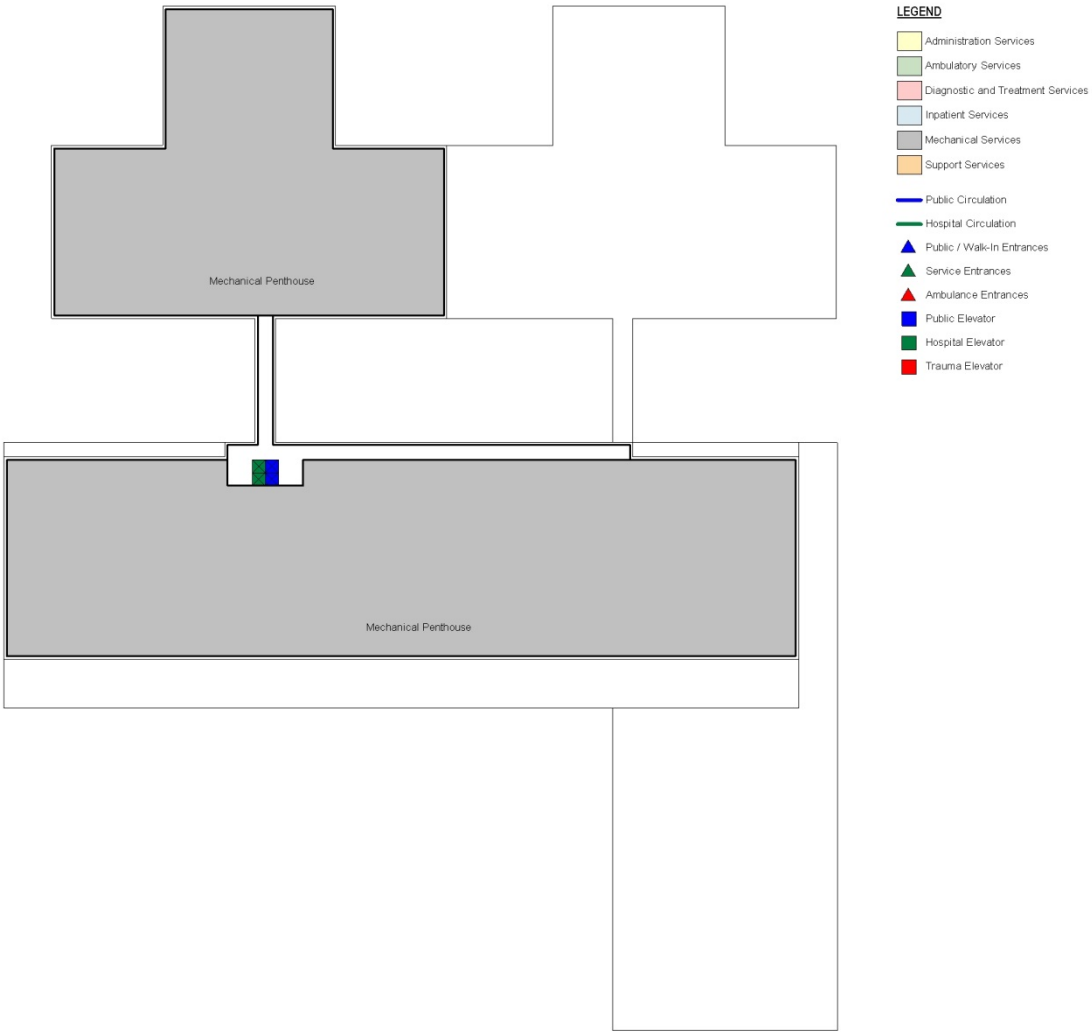
Basement


LEGEND
Administration Services
Ambulatory Services
Diagnostic and Treatment Services
Inpatient Services
Mechanical Services
Support Services
Public Circulation
Hospital Circulation
Public / Walk-In Entrances
Service Entrances
Ambulance Entrances
Public Elevator
Hospital Elevator
Trauma Elevator
Complex Continuing Care
Medical / Surgical Inpatient Services
Education and Training Service
Main Lobby Services
Café
Foundation
Auxiliary
SASOT
CCAC
Cardio Respiratory Services
Ambulance Entrance
Emergency Services
Diagnostic Imaging
Administration
Walk In Entrance
Main Entrance
Ambulatory Care

Level 1


LEGEND
Administration Services
Ambulatory Services
Diagnostic and Treatment Services
Inpatient Services
Mechanical Services
Support Services
Public Circulation
Hospital Circulation
Public / Walk-In Entrances
Service Entrances
Ambulance Entrances
Public Elevator
Hospital Elevator
Trauma Elevator
Medical / Surgical Inpatient Services
Roof - Future Expansion
Infection Prevention and Control
Spiritual Care
Pharmacy Services
Information and Telecommunications
Critical Care
Surgical Services
Clinical Laboratory
Education and Training Service
Open to Below
Maternal/Child
Roof - Terrace

Level 2


Mechanical Penthouse
Mechanical Penthouse
LEGEND
Administration Services
Ambulatory Services
Diagnostic and Treatment Services
Inpatient Services
Mechanical Services
Support Services
Public Circulation
Hospital Circulation
Public / Walk-In Entrances
Service Entrances
Ambulance Entrances
Public Elevator
Hospital Elevator
Trauma Elevator

Level 3