

Whitehorse General Hospital Campus Strategic Facilities Plan and Master Plan Phase 2 Report

Yukon Hospital Corporation
Department of Health and Social Services, Government of Yukon

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Submitted by:

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BACKGROUND

Two Master Plan options were explored in the Gaming Session as described in the Phase 1 Report, a 'Hillside' and a 'Riverside' option. The option names reflected the location on the site of new inpatient units. To be realized, the Riverside option would have required near immediate demolition of the Thomson Centre. A riverside location of the new inpatient units would have provided remarkable views for inpatients, but after consideration, the Steering Committee determined that the Thomson Centre should remain on the site.



Figure 1.0 User Group Participation during Functional Gaming Session

The Steering Committee also asked that Stantec review the Phase 1 Strategic Facilities Plan to determine if the use of Lean principles in programming space, would result in any reduction in overall floor area. Stantec conducted several workshops in Whitehorse with Multi-disciplinary Study Teams (MDSTs) before determining that the application of Lean principles and processes within the hospital and within related non-hospital services could result in a reduction in program area. Lean planning is described at a high level below.

Understanding the Lean Master Program

The implications of using Lean planning principles on the Master Program and the Master Planning for the Whitehorse General Hospital site are significant and deviate from the traditional programming/planning model. Stantec's approach to applying Lean principles to the Master Program is based on the "Cellular Hospital" concept. Based on optimized patient flows, patient care teams pull services to the patient to create radical improvements to the operational efficiency, space utilization, patient movement, and handoffs between departments.

To maximize efficiencies, traditional hospital department 'silos' are broken down in the Lean model to reveal patient care teams. These teams are multi-disciplinary and focus on producing specific and pre-defined outcomes. The spaces that have been determined to support the delivery of these outcomes are called platforms. Rather than formulating space requirements based on traditional departments, platforms group a series of spaces required to produce defined outcomes. Another important factor in this model is that staff, teams, and traditional departments do not have ownership of space, but rather have the opportunity to utilize resources (including space) to respond to patient care needs.

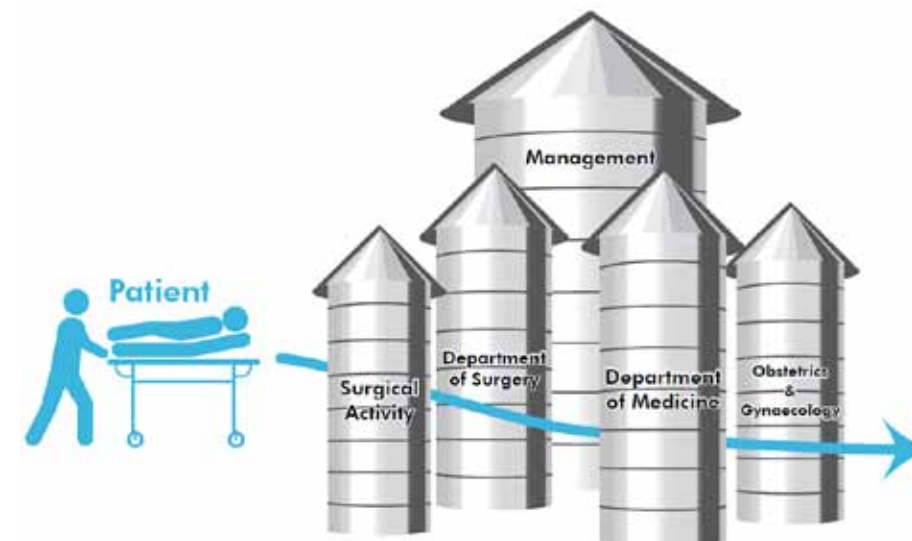


Figure 2.0 Traditional approach to planning often results in 'Silos'

A key component in creating a Lean environment is the provision of space to be program adaptable and universally equipped. This approach provides both the flexibility to respond to daily fluctuations in utilization of space by 'like' programs and long term flexibility to respond to changes in program requirements. The benefit of understanding the operations and utilization of each service team is the opportunity to increase capacity within existing physical space. Standardization of room typologies provides opportunities to maximize operational efficiency, patient safety, and the built environment.¹

¹ Chambers, David (2009) Efficient Healthcare: Overcoming Broken Paradigms. Rice University, Houston
Black, John. R. (2008). The Toyota Way to Healthcare Excellence: Increase Efficiency and Improve Quality with Lean. Healthcare Administration Press.

Critical to the success of this approach is an understanding of the importance of universal spaces. Through creating universal space typologies that are program adaptable, the hospital can manage fluctuations in patient needs and populations, as well as maximize space utilization over the continuum of the daily, weekly, and yearly cycles.

Assumptions Made to Support the Lean Program

1. Establish continuous Lean Process
2. Enhance home care programs – eg home IV therapy
3. Establish community-based hospice/palliative program
4. Implement discharge program to meet 5-day Length Of Stay
5. Alternate Level Care Length Of Stay at 28-days (instead of designation at 30 days)
6. Implement activation unit
7. Community Mental Health TBD
8. Increased Continuing Care capacity
9. EMS to be relocated on site
10. Thomson Centre to be used for Continuing Care
11. Buildings #2 & #4 remain as is, #4 or both are eventually removed
12. First Nations Healing Room remains, but with a new access
13. Emergency Department will have a Clinical Decision Unit (CDU)
14. MRI to start construction in the summer of 2013 as a stand-alone phase

Departmental Program Areas

The following Table 1.0 summarizes the departmental program areas for 2025 and 2035 for both the Traditional and Lean program:

	Year	2025	2035
Traditional Program		24,061sm	28,433sm
Lean Program		18,480sm	22,533sm
	Δ	5,581sm	5,900sm

Table 1.0: Departmental Gross Area Comparison of Traditional and Lean Program.

The following Table 2.0 summarizes the total inpatient bed requirement, including mental health inpatient and ICU beds for 2025 and 2035 for both the Traditional and Lean program:

	Year	2025	2035
Traditional Program		99 beds	136 beds
Lean Program		80 beds	101 beds
	Δ	19 beds	35 beds

Table 2.0: Comparison of Traditional and Lean Program and number of required beds.

The following Table 3.0 lists all departmental program areas for 2025 and 2035 for both the Traditional space program and the Lean program:

	EXISTING 2011		OPTION A: 2025		OPTION B: 2025 (Lean)			OPTION A: 2035		OPTION B: 2035 (Lean)		
	Total Beds	Existing CGSM-2011	Total Beds	Projected CGSM-2025	Total Beds	Planning Factor	Projected CGSM-2025	Total Beds	Projected CGSM-2035	Total Beds	Planning Factor	Projected CGSM-2035
Inpatients												
Inpatient (Med/Surg)		1937	81	6480	59	80	4720	112	8960	75	80	6000
ICU		62	(4)	307	3	80	240.0	(6)	373	4	80.0	320.0
Maternity (UDRPs)		365	7	440	8	80	640.0	8	510.0	10	80.0	800.0
Mental Health (Inpatient)		238	5	389	10	70	703	6	415	12	70	812
Palliative		0	6	507	0			10	646	0		
Total	0	2602	99	8123	80		6303	136	10,904	101		7,932
										101		
	EXISTING 2011		OPTION A: 2025		OPTION B: 2025 (Lean)			OPTION A: 2035		OPTION B: 2035 (Lean)		
	Total Treatment Rooms	Existing CGSM-2011	Total Treatment Rooms	Projected CGSM	Total Treatment Rooms	Planning Factor	Projected CGSM 2025	Total Treatment Rooms	Projected CGSM	Total Treatment Rooms	Planning Factor	Projected CGSM 2035
Interventional												
Surgery		585		1086	2	100	200		1086	3	100	300
PACU					4	30	120			5	30	150
Endoscopy		0			1	75	75			1	75	75
Medical Imaging		400		1230					1626			
CT Scanner					1	100	100			1	100	100
General X-ray					3	100	300			4	100	400
Mammography					1	50	50			1	50	50
Ultrasound					3	50	150			4	50	200
Bone Densitometry					1	50	50			1	50	50
Nuclear Medicine					1	150	150			1	150	150
MRI				151	1	150	150		151	1	150	150
Total	0	985		2467			1345		2863			1625
	EXISTING 2011		OPTION A: 2025		OPTION B: 2025 (Lean)			OPTION A: 2035		OPTION B: 2035 (Lean)		
	Total Treatment Rooms	Existing CGSM-2011	Total Treatment Rooms	Projected CGSM 2025	Total Treatment Rooms	Planning Factor	Projected CGSM 2025	Total Treatment Rooms	Projected CGSM 2035	Total Treatment Rooms	Planning Factor	Projected CGSM 2035
Universal Care												
Emergency Exam/Treatment			11	1230	12	90	1080	13	1394	14	90	1260
Trauma		322	2		1	120	120	2		1	120	120
Minor Procedure				1484	1	75	75		1484	1	75	75
Ambulatory Clinics		563			25	30	750			26	30	780
Chemotherapy					4	30	120			6	30	180
Day Surgery		139		288	12	40	480		314	12	40	480
Haemodialysis visits		0		232	6	40	240		277	8	40	320
Cardiac Stress Testing		-		0	1	50	50		0	1	50	50
Mental Health (OutPatient Services)		330		740	4	40	160		883	6	40	240
Private Physician Clinics		255		355					255			
Total	0	1024		4329			3075		4607			3505
	EXISTING 2011		OPTION A: 2025		OPTION B: 2025 (Lean)			OPTION A: 2035		OPTION B: 2035 (Lean)		
	Total Rooms	Existing CGSM-2011	Total Rooms	Projected CGSM 2025	Total Rooms	Planning Factor	Projected CGSM 2025	Total Rooms	Projected CGSM 2035	Total Rooms	Planning Factor	Projected CGSM 2035
Clinical Support Services												
Lab		350		469	80	7	560		510	101	7	704
Pharmacy		183		312	80	5	400		375	101	5	503
PT/OT/Language		726		825	10	50	500		825	12	50	600
First Nations Healing room		103		103	1	100	100		103	1	100	100
First Nations Central		279		356	1	350	350		363	1	350	350
Red Cross Equipment Loan		0		0	1	75	75		0	1	75	75
Total	0	1374		2065			1985		2176			2332

	EXISTING 2011		OPTION A: 2025		OPTION B: 2025 (Lean)			OPTION A: 2035		OPTION B: 2035 (Lean)		
		Existing CGSM-2011	Total Rooms	Projected CGSM 2025	Total Rooms	Planning Factor	Projected CGSM 2025	Total Rooms	Projected CGSM 2035	Total Rooms	Planning Factor	Projected CGSM 2035
Logistics												
Material Management		726		878	80	9	720		980	101	9	905
Food Services		667		785	80	11	880		853	101	11	1107
Maintenance & Operations		131		455	80	6	480		455	101	6	604
Housekeeping		20		167	80	2	160		203	101	2	201
Laundry		290		400	80	4	320		475	101	4	402
Stores		123		250	80	3	240		250	101	3	302
Bio-Med		42		140	80	1.5	120		170	101	1.5	151
On-Call Room		40		40	2	25	50		58	2	25	50
Morgue		55		53	1	50	50		59	1	50	50
SPD		159		190	2	100	200		215	2	100	200
Total	0	1957		3358			3221		3718			3972
	EXISTING 2011		OPTION A: Minimal		OPTION B: 2025 (Lean)			OPTION A: Minimal		OPTION B: 2035 (Lean)		
		Existing CGSM-2011	Total Rooms	Projected CGSM	Total Rooms	Planning Factor	Projected CGSM 2025	Total Rooms	Projected CGSM 2035	Total Rooms	Planning Factor	Projected CGSM 2035
Administration												
Health Records		236		328	80	5	400		362	101	5	503
Admissions		601		700	80	2	160		700	101	2	201
Reception/Switchboard		0										
Public Space		0		0	80	6	480		0	101	6	604
Office - Facility Administration		618		603	80	3	240		699	101	3	302
Meeting Space		155		471	80	4	320		471	101	4	402
Information Systems		163		319	80	3	240		365	101	3	302
Foundation		0		0	80	1	80		0	101	1	101
Data Centre		32		165	1	150	150		165	1	150	150
Child Daycare Services		204		408					408			
Staff Support Space		562		870	80	6	480		995	101	6	604
Total	0	1610		3864			2551		4165			3168
Sub - Total Area				24,206			18,480		28,433			22,533
	EXISTING 2011		OPTION A: Minimal		OPTION B: 2025 (Lean)			OPTION A: Minimal		OPTION B: 2035 (Lean)		
		Existing CGSM-2011	Total Rooms	Projected CGSM	Total Rooms	Planning Factor	Projected CGSM	Total Rooms	Projected CGSM	Total Rooms	Planning Factor	Projected CGSM
Campus Learning Space												
Campus Learning Center				257	1	250	850		289	1	250	850
Work Space				0	12	6	72		0	12	6	72
Total	0	0		257			922		289			922
Total Campus Area		9,552		24,463			19,402		28,722			23,455

Development of the Strategic Master Facilities Plan

The results of the Lean Program Review were presented to the Steering Committee and the Lean Program accepted as the basis for development of the Phase 2 Strategic Master Facilities Plan.

Stantec focused attention on development of the Hillside option from the Gaming Session. The Steering Committee asked that the Hillside option be developed to allow a practical sequence of phasing of implementation to accommodate the 2025 program and the 2035 program, with flexibility in the timing, size and sequencing of the phases.

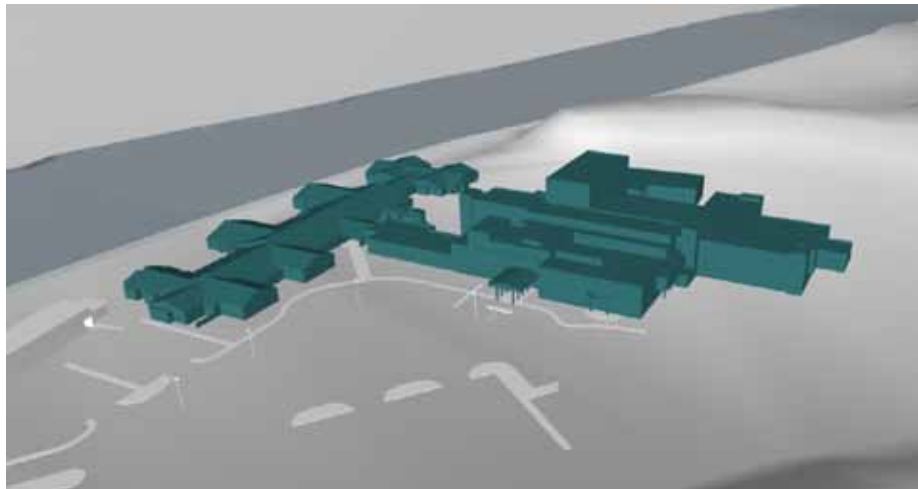


Figure 3.0 The existing WGH and Thomson Centre shown in a 3D model

Given concerns about the overall cost of the redevelopment program, Stantec recommended that the existing inpatient units on Level 2 of the 1997 building be retained, with new inpatient units constructed as required to meet growth in the inpatient bed requirement. Although the rooms in the 1997 building are smaller than current North American best practice, they are similar to current standards in other countries such as the UK and Australia. The bed mix on the existing units is predominantly single room and the cross-hall layout of the units is considered by Stantec as supportive of communication within the inpatient care team.

The direction to proceed with development of a 'Hillside' Strategic Master Facilities Plan with existing inpatient units retained had a significant impact on planning.

The initial priorities for development were identified as:

1. New MRI Suite
2. New Emergency Department
3. Additional Inpatient Beds

The Lean Program for 2025 required 80 inpatient beds. By including a new 10-bed inpatient Mental Health Unit in the first phase of construction, 8 single inpatient rooms in the 1997 building wing vacated by the existing mental health unit could be reassigned as med/surg beds. This, together with 3 new ICU beds adjacent to the new emergency department would increase the total number of beds from the current 55 to 70, a mid-way point between the current bed number and the 2025 requirement of 80 beds.

Building #4 was first explored as a location for the new Mental Health Inpatient Unit. An addition to the building would allow the co-location of both the outpatient and inpatient components of the mental health program. A logistics and patient transfer tunnel was considered as a means by which to transfer patients to the Mental Health Inpatient unit and to provide logistical services to both the new Mental Health Unit and to the Thomson Centre. A location above the proposed new Emergency Department was developed as an alternative. Accessible and secure outdoor space for Mental Health patients could be provided, with additional recreational outdoor space possible over the new 2-vehicle ambulance bay.

The alternative location for the Mental Health Unit above the new Emergency Department was chosen over the Building #4 location, initiating, with the New MRI at the east end of the existing atrium at Ground (entry) Level, the first phase of a new East Wing for the hospital. The new East Wing could be constructed in as many as 4 phases (Phases 1, 2, 4 and 5 of the rebuild option). Phases 1 and 2 would each have building services space at Level 3 to act as a cushion for an eventual 2-level vertical expansion, with each level accommodating a 24-bed inpatient unit. These units would have ideal access from the Emergency Department, suggesting use for medical inpatients.

Phase 1 would require removal/relocation of the existing Ambulance Station. A new Ambulance Station has been included in Phase 1a, along with a new Data Centre. Phase 1 will also include a significant reorganization of the public parking and access roads on the site, as described in the Site Development section of this report.

The location of all services within the hospital and the proposed phasing for the rebuild option is described in the Phasing Drawings section of this report.

Disruptions to Ongoing Operations and Flexibility in Phasing

The existing Emergency Department is land-locked in the centre of Grade Level of the existing hospital, which precluded expansion of the existing Emergency Department in its current location. By establishing a new Emergency

Department, space vacated by the existing Emergency Department will allow expansion of the existing Diagnostic Imaging Department with minimal disruption to existing operations of either department. Similarly, establishing a new Logistics Centre will allow a new Interventional Centre to be constructed in space vacated by all existing logistical services, again with minimal disruption to ongoing medical or logistical services.

The existing Pharmacy Department will be relocated to the logistical centre in Phase 2, and the existing Health Records department will be relocated to the current Diagnostic Imaging space at the start of Phase 3. Several other services located within the Old South Wing would, with the phasing strategy described in this report, require temporary accommodation on or off-site to allow demolition of the Old South Wing and construction of a New South Wing in the same location.

Accelerating construction of Phase 4 to core and shell stage only could provide temporary accommodation for the dislocated services within the Old South Wing. Most of these services require administrative or lightly serviced ambulatory clinic type space. These could be accommodated within the Phase 4 shelled space. These types of functions typically have a higher 'churn rate' than other hospital services, meaning that more frequent spatial reconfigurations are required to maintain fit to program. Use of a movable wall system for these areas would reduce the combined cost of the interim and final accommodation, provide long term flexibility and reduce land fill.

Overall Quality of a Rebuild Option

Over 90% of the construction required to meet the 2035 program will be new construction, with less than 10% renovation. Only the cafeteria, laboratory, and the 55-bed inpatient unit's boiler plant would not be substantively renewed at completion of the 2030 program.

Benefit of Phasing and Important Services in New Space

Only one of the two options would be required to complete the costing for the first scheduled meeting with the Steering Committee in September 2011. This will inform the commencement of Phase 2, the Master Facility Plan stage and will include the development of the two Master Plan concepts to accommodate the Master Program at each of the 10, and 25 year horizons of the study, with interim moves identified. Phasing diagrams will identify the relative complexity of renovations required to inform costing of the options and a Master Development Table will be generated identifying each development component in sequence by location, area and type. Significant differences between site and infrastructure

development will be identified for comparative costing.

Phasing diagrams will include options for 2020, 2025 and 2035.

Our building engineers will continue to develop recommendations pertaining to system renovations, upgrades and new systems descriptions. Systems recommendations will include:

- Redundant systems (For example; water, fuel sources, power)
- Emergency/Life support systems (For example; fire alarm, nurse-call, fire suppression, medical gases)
- IT/Data/Communication services, including potential for wireless systems
- Security systems, including a threat review
- Potential for sustainability and energy conservation measures, including alternative energy (thermal and power) sources
- Traffic control and access, including a “response” review (public and emergency services access)
- Infrastructure services (For example; water, sanitary sewer, and storm drainage)

BUILDING SERVICES SYSTEMS (MECHANICAL AND ELECTRICAL)

The Building Services Systems described herein were conceived to complement the Master Plan. The primary focus was to address constructability issues. The founding principles are:

1. Patient Safety
2. Continuity of Service
3. Scalability
4. Meeting all applicable Building Codes
5. Capitalize on opportunities for improved systems performance, capacity, redundancy and safety

The systems involved include:

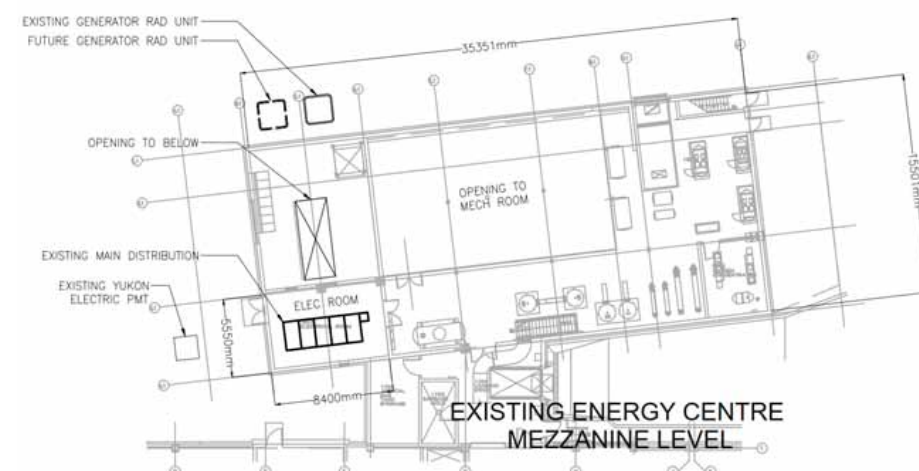
1. HVAC (Heating, Ventilation and Air Conditioning)
2. Plumbing
3. Medical gases
4. Fire Suppression (Sprinklers)
5. Power Distribution System
6. Normal Power Distribution
7. Emergency Power Distribution
8. Interior Lighting System
9. Exterior Lighting System
10. Lighting Control System

11. Fire Alarm System
12. Nurse Call System
13. Structured Cabling System
14. Public Address System
15. Security System
16. Clock System
17. Intercommunications System

EXISTING ELECTRICAL DISTRIBUTION (EXISTING YUKON ENERGY SERVICE)

The existing Yukon Energy service is a 2000A 600V service fed from a single pad mounted transformer. Yukon Energy is feeding the site with single 13.8kV underground cable running to a dual fed overhead line running north south just west of the property.

Currently a single pad mounted utility transformer (PMT) and a single service cable is not meeting the CSA Z32 requirements for redundancy and should be addressed in future phases and developments. (See Sketch 1)



Sketch 1

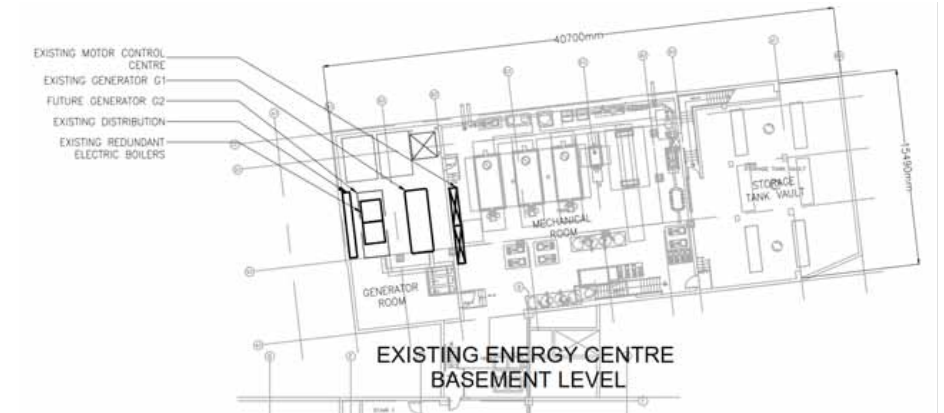
The main 2000A switch is feeding the main 600V 2400A main distribution board. The main distribution is feeding the generator’s transfer switch and the normal 1200A distribution board. Provision was made to feed the normal distribution board by a second generator.

A 600V distribution system is distribution power to local electrical rooms throughout the building and also to remote buildings like the Thomson Centre and the Ambulance building.

Existing Emergency Power System

The existing emergency power system consists off a single 800kW 600V diesel emergency generator and a single transfer switch with a single bypass switch. The generator is feeding a 1200A emergency distribution center. Provisions were made for a future second generator but were not implemented.

The Generator is also feeding directly the fire pump in the building. A 600V emergency distribution system is distribution power to local electrical rooms throughout the building and also to remote buildings like the Thomson Centre and the Ambulance building.



Sketch 2

The emergency generator’s fuel supply is fed from one of the tanks in the Storage Tank Vault. The fuel supply for the generator is more than 72 hours as required for post disaster facilities.

PHASING

Phase 1a

Phase 1a: provides accommodation in a permanent location for the MRI, at the west end of the existing atrium on Ground Level. Although temporarily separated from the remainder of the Diagnostic Imaging Department, the new MRI space will be contiguous with DI with completion of the first phase of DI expansion in phase 1c.

The existing Ambulance Station interferes with construction of phase 1b. A new Ambulance Station is therefore also included in Phase 1a, along with new space for the Data Centre, a portion of a new loading dock and a portion of a new logistics corridor on the north side of the existing 1997 building at Ground Level. The new logistics corridor is replicated on the 2nd Level, allowing access from a new IPU logistics centre, built above the new Ambulance Station, to the existing inpatient units (IPUs) on the 2nd Level of the 1997 building. The new IPU logistics centre provides additional support space for the existing IPUs.

The 2nd Level corridor will also serve as a patient transfer corridor at the completion of Phase 2a.

Site works and construction staging: the parking lot to the east of the old building should accommodate all construction staging. Additional site works can be deferred to Phase 1b.

Integration with future phases: if this phase proceeds prior to the start of construction of Phase 1b, consideration will need to be given to minimizing disruption to MRI operation from construction of Phase 1b. This may include partial excavation and construction of the Phase 1b foundations during Phase 1a. Consideration should also be given to construction of the public corridor on the south side of the MRI block that will link the atrium to the new East Wing.

The new logistics corridor must be designed to provide ceiling space above the Ground Level of the corridor to accommodate both supply and return air ducts serving the future Interventional Suite in Phase 2b. Ideally, the ducts would be built-in during construction of Phase 1a.

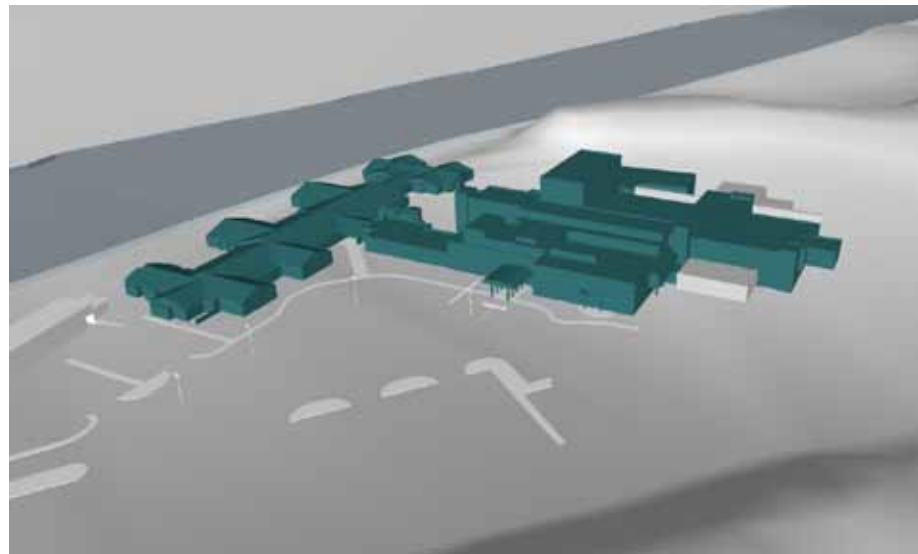
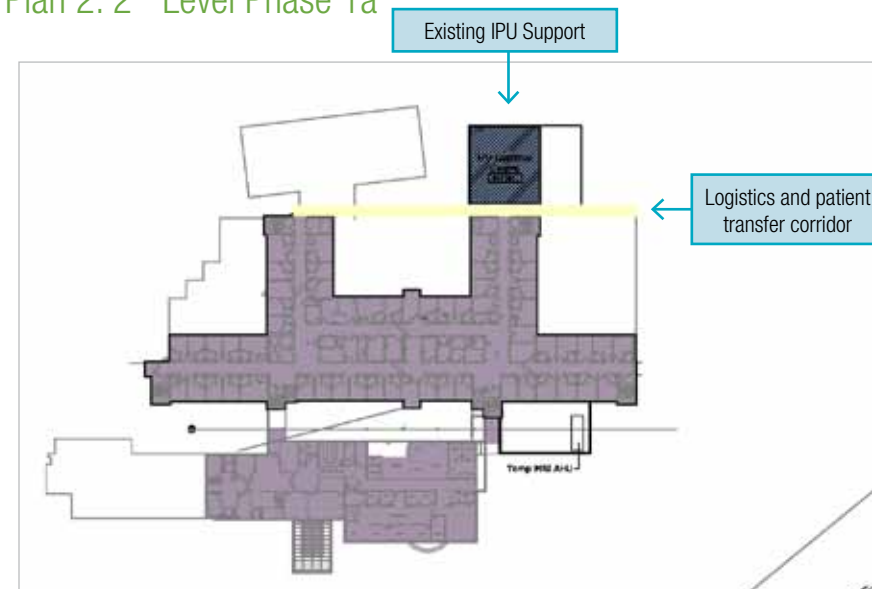


Figure 4.0 Phase 1a with addition of MRI, Data Centre, Loading Dock

Plan 1: Ground Level Phase 1a



Plan 2: 2nd Level Phase 1a



Phase 1a, if required separately from any other phase, accommodates the construction of a new MRI space independently from any other proposed additions. The new MRI space has been identified as a high priority. Also, Phase 1 a, if required, accommodates the construction of a new Ambulance Station independently from any other proposed additions. The new Ambulance Station and the relocation of this function allows for the demolition of the existing Ambulance Stations which in-turn allows for the construction of the larger Phase 1 addition.

To accommodate the proposed MRI addition, a new dedicated roof-top air handling unit (AHU) is proposed. This new AHU is intended to provide the air conditioning (AC) and ventilation/exhaust requirements for the MRI. Space heating, domestic water and fire suppression (sprinklers) requirements will be accommodated by extending the existing systems.

Similarly, to accommodate the proposed Ambulance Station addition, a new dedicated roof-top air handling unit (AHU) is proposed. This new AHU is intended to provide the air conditioning (AC) and ventilation/exhaust requirements for the Ambulance Station and living quarters. Space heating, domestic water and fire suppression (sprinklers) requirements will be accommodated by extending the existing systems.

See figures 1 and 2 below:

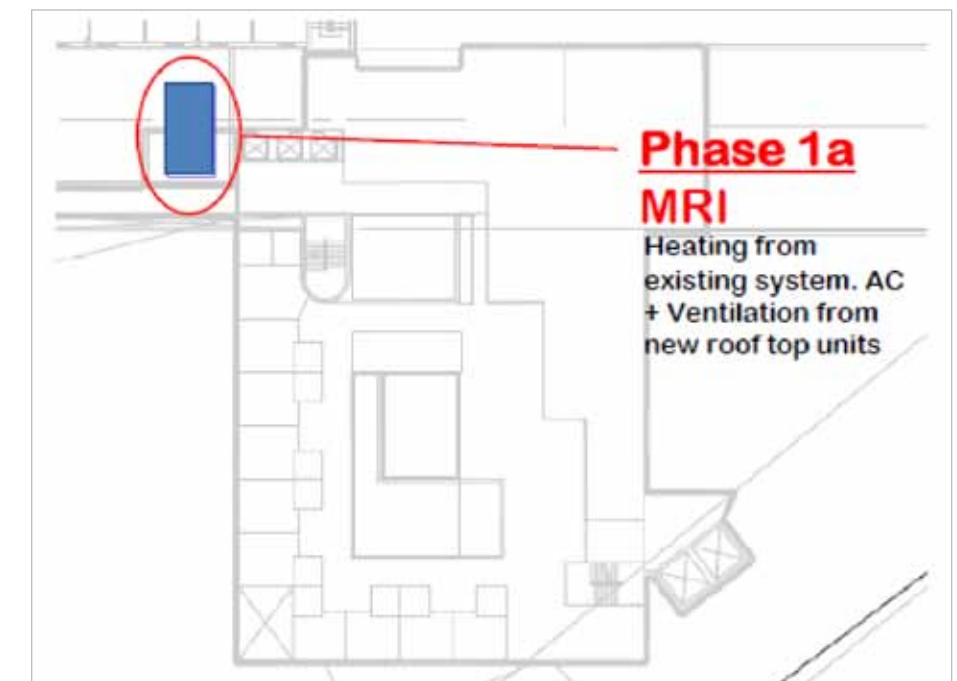


Figure 1 - MRI addition

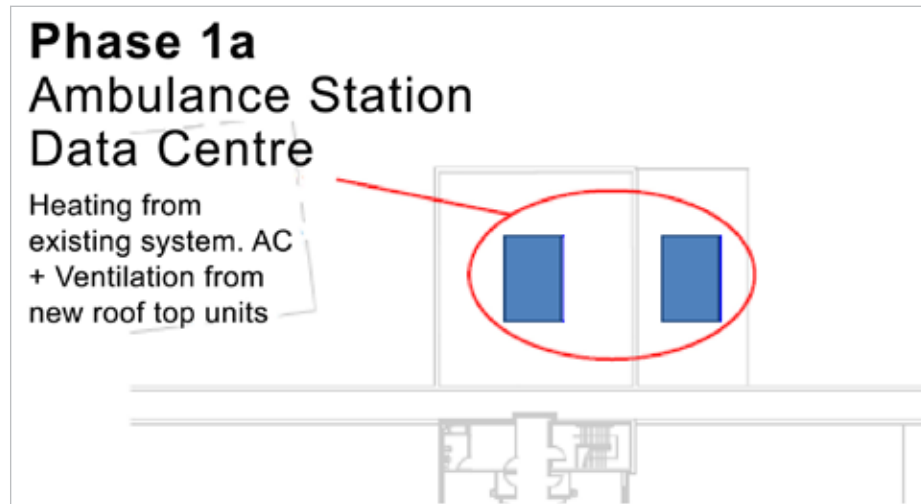
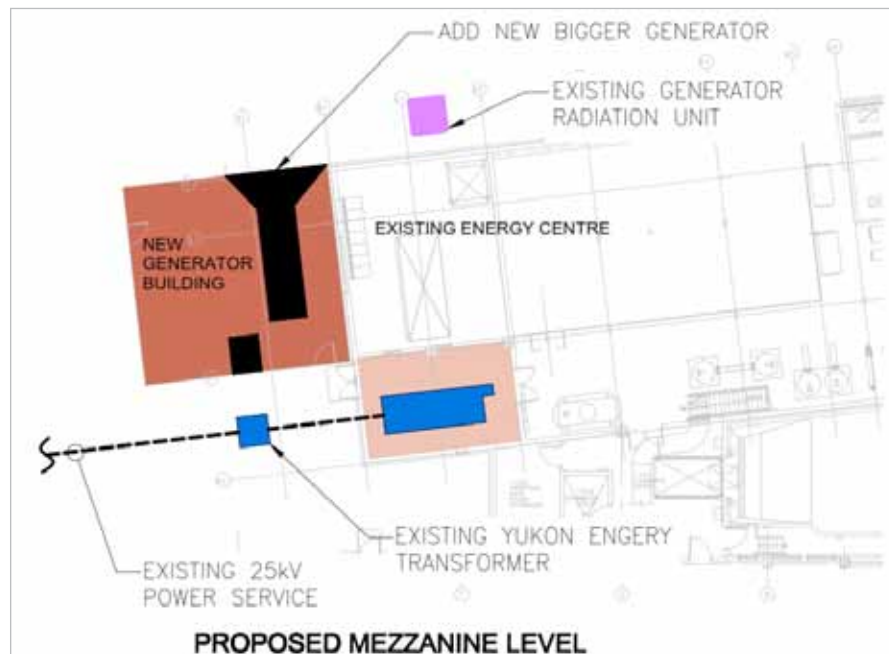


Figure 2 - Ambulance Bays addition

Adding additional electrical capacity will not be required in phase 1A. To address the emergency redundancy items that is not currently met as required by CSA Z32 we propose adding a second redundant generator to ensure patient and equipment safety.

Ultimately the total emergency power requirements for the facility will require two bigger redundant generators and therefore require a separate generator building adjacent to the existing main distribution. The new generator room will be sized to house two redundant generators. In this phase we will only add one larger generator that will be the main generator and the existing generator will act as the redundant generator for the facility (See Sketch 3).



Sketch 3

Phase 1b

Phase 1b: initiates construction of the new East Wing. It provides accommodation for a new ED with Trauma and ICU on Ground Level; a new Mental Health IPU, shelled space for expansion of the Mental Health IPU to the 2035 program, shelled space for a portion of the new Maternity IPU in Phase 2a, and a linking corridor from the preceding shelled space to the patient room access corridor within the existing IPUs in the 1997 Building, all on the 2nd Level; building services space on the 3rd Level; and building services space on the basement level. Phase 1b provides a public elevator core serving all of the new East Building and a patient transfer elevator core that will ultimately provide patient transfer from the ED to the Mental Health IPU in Phase 1b, to Maternity IPU in Phase 2a, to Medical IPUs in Phase 4 and to a possible relocated and expanded ICU in Phase 5.

Site works and construction staging: the existing public parking area to the south of the 1959 Building should be redeveloped in this phase to increase the amount of public parking, to bring parking closer to the existing Main Entrance, to provide dedicated ED parking and drop off, and to provide access for service vehicles and staff from north and east of the hospital. The expansion of parking south of the Thomson Centre must await demolition of Building #4. A section of retaining wall may be required between the new ambulance garage and the hill to allow construction of a two-lane roadway. The ambulance bay location shown is ideal from a medical operations perspective as it allows a single triage station to oversee both the walk-in entrance and the ambulance bays and entrance.

Integration with future phases: this phase is the linking element that will ultimately connect and integrate all of the new development on the site. A temporary corridor is required to provide a patient transfer and logistics link between Phase 1a and the 1997 building. This corridor will need to connect to the existing East / West corridor in the 1997 building where the latter meets the existing ambulance garage. It may not be possible to maintain drive-through access to the existing ambulance bay during or after construction of Phase 1b. The temporary corridor is to be built over a courtyard that will be completed in Phase 2a. As the courtyard is at basement level, excavation to basement level below the temporary corridor should be considered in this phase. Consideration should be given to retaining the temporary corridor through to completion of Phase 3b, as it may be useful during renovations to the existing atrium in that phase.

Phase 1b will also need to accommodate horizontal links at every level to phases 2b, 3b, and 5; and two levels of vertical expansion above the 3rd Level building services space. Consideration should be given to constructing both elevator cores to minimize disruption to elevator services during future vertical expansion in Phase 4.

In addition to providing a 'cushion' to reduce disruption to occupied space below during vertical expansion of the East Wing in Phase 4, the building services level, the 3rd Level, effectively sets the footprint for the Phase 4 IPUs to be constructed above it. For this reason, the plan of the Phase 4 IPUs should be included in the design of Phase 1b to design development level to confirm functionality and to minimize future disruption to clinical services, building services and to the building envelope.

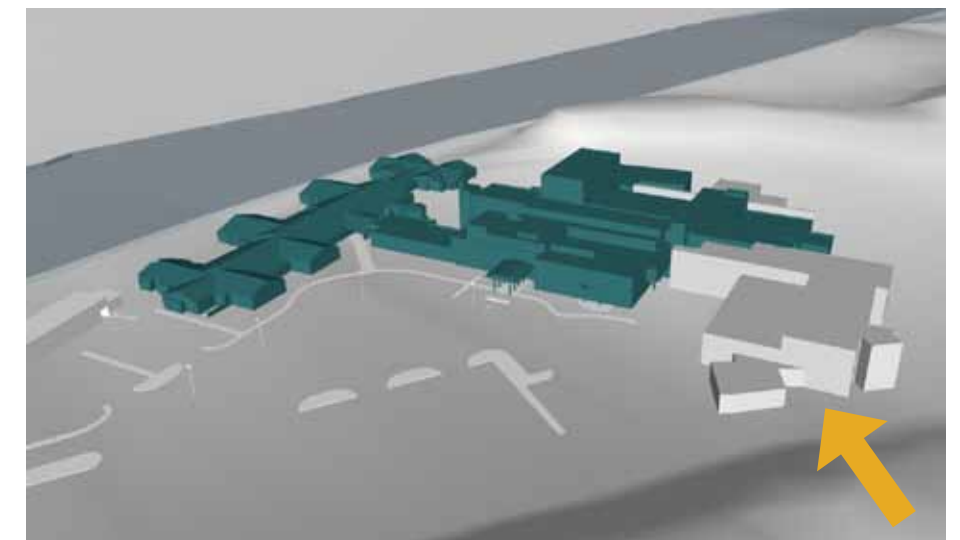


Figure 5.0 Phase 1b continuation with new build, 3D model

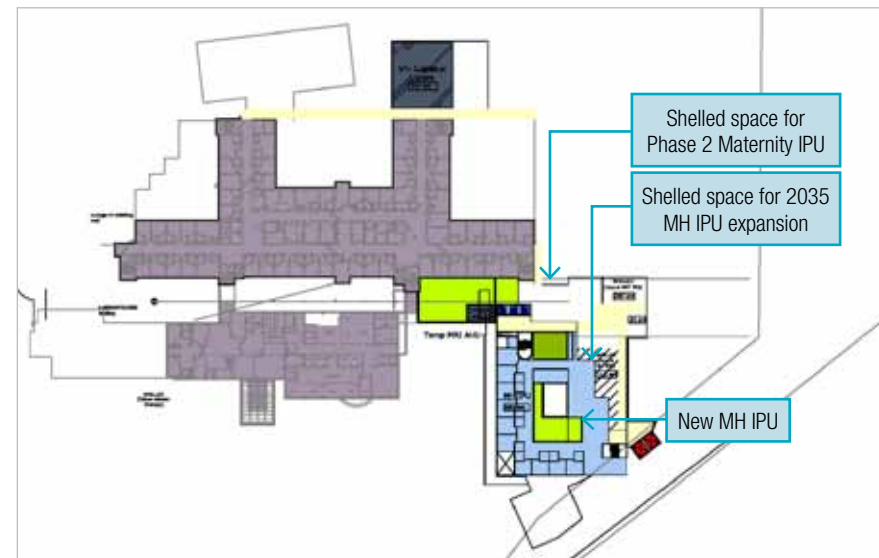
Plan 3: Ground Level Phase 1b



Plan 5: 3rd Level Phase 1b



Plan 4: 2nd Level Phase 1b



The Phase 1b development largely accommodates the construction of a new Emergency Department, located on the Ground Floor, plus the construction of a new Mental Health Unit, located on the Second Floor. This development will also include a Basement Floor, which will provide the space needs to accommodate mechanical and electrical source equipment, building services, intended to serve future phased developments plus inter-connection to the existing systems as a means to provide increased capacity plus improved redundancy.

As illustrated in figure 3 below, the required equipment is intended to be installed sequentially, as additional capacity is required to accommodate the future developments. The major pieces of equipment and services include:

1. New incoming water main for fire suppression and domestic supplies including water treatment, pressure regulating stations and pumping equipment. This new water main is intended to interconnect into the existing water main for redundancy
2. New medical Oxygen generation and storage. This generation is intended to be accomplished by means of new concentrators and related equipment. It is intended that this new generation be interconnected into the existing medical Oxygen supply for increased capacity and improved redundancy
3. New medical Air and Suction source equipment
4. New boilers, pumps, expansion tanks and domestic hot water generation and storage, including heat recovery equipment and fuel oil storage/ distribution

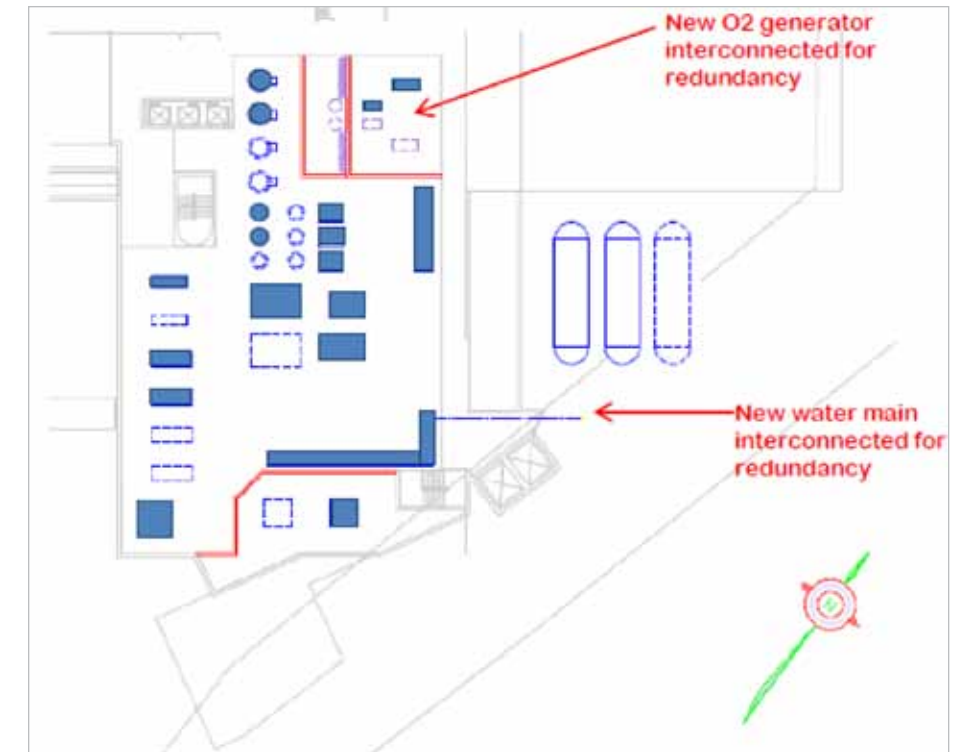
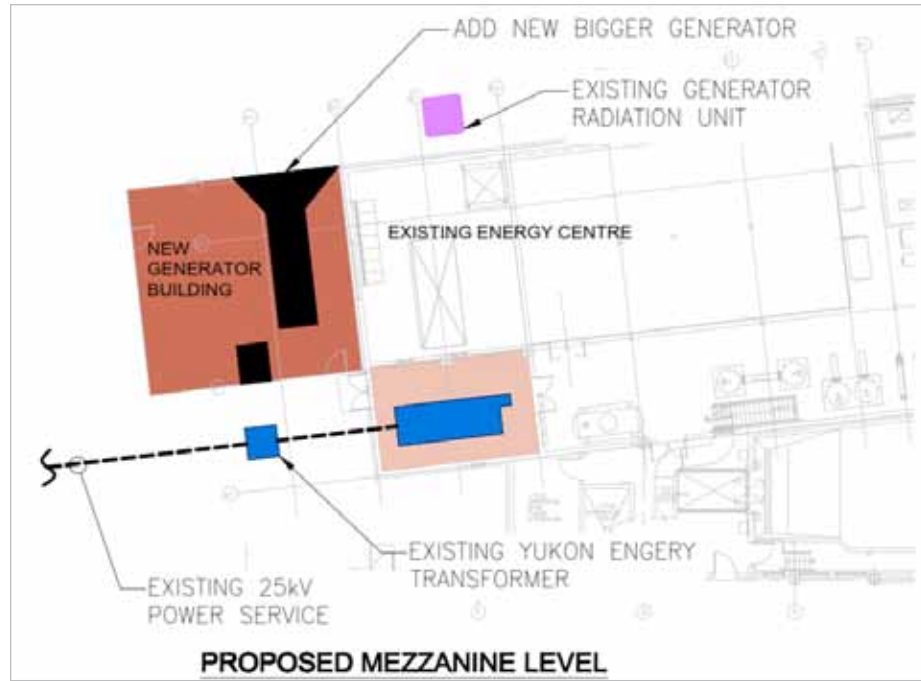


Figure 3 – Basement Level

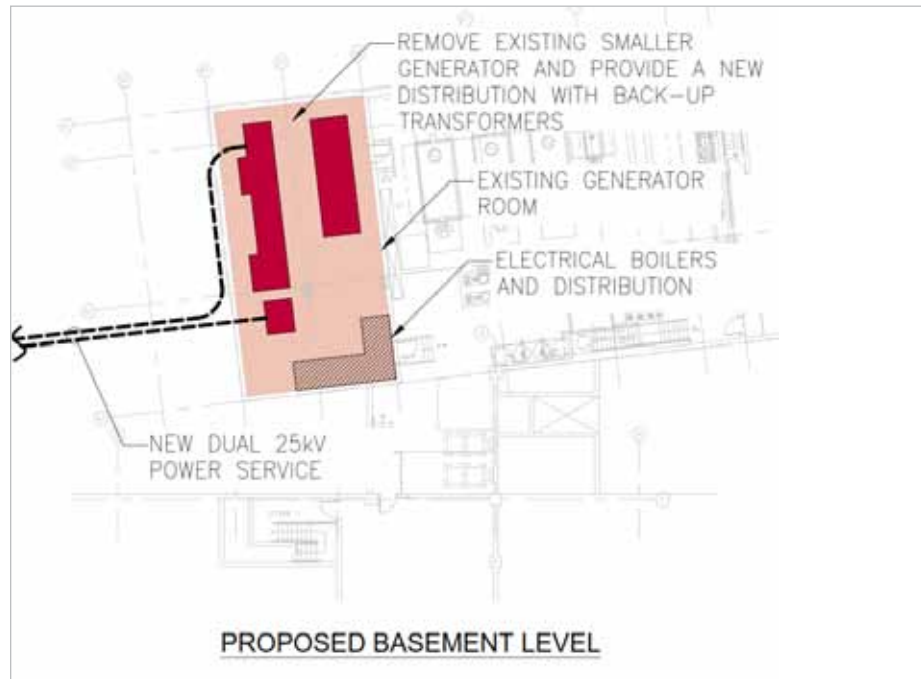
Space heating and domestic water and medical gasses for the Emergency department and Mental Health Unit will be provided from the building services equipment located in the Basement level. Air conditioning and ventilation/exhaust for the Emergency department and Mental Health Unit will be provided from new AHUs located on the roof (Level 3) of the Phase 1b development. See figure 4 illustrating the placement of equipment.

In Phase 1B additional normal and emergency power capacity is required. As required by CSA Z32 we proposed a new bigger Yukon Energy service with two redundant service cables and a new double ended unit substation with redundant main transformers.



Sketch 4

The intent is to move the existing generator temporarily to the new generator room or to upgrade it with a new generator and using the existing generator room in the basement for the new unit substation and main distribution (See Sketches 4 & 5).



Sketch 5

Phase 1c

Phase 1c: provides the first stage of Diagnostic Imaging (DI) expansion in renovated space currently occupied by the existing ED. Completion of this phase will integrate the new MRI with the remainder of DI. A new walk-in entrance to DI off of the atrium could be completed in this phase or deferred to Phase 2c.

Integration with future phases: further DI expansion will be provided in Phase 2c to the immediate east of this phase.

Plan 6: Ground Level Phase 1c



The Table 4.0 below illustrates various parts of Phase 1, showing new construction and renovation according to the year.

	Legend	New Construction	Renovation	Shelled
Phase 1	Time			
Phase 1a	2014	MRI, Data Centre, Existing IPU Support		
Phase 1b	2015	ED, MH IPU		
Phase 1c	2016		MI 1st Expansion	

Phase 2a

Phase 2a: completes the new loading dock from Phase 1a and provides accommodation for logistical services including Materials Management, Maintenance & Engineering, Laundry and Housekeeping, a new Sterile Processing Department, Bio-Med, Pharmacy, and On-Call rooms, and a new staff entrance from staff parking in the North East corner of the site, all on Ground level; a new Maternity Unit and building services space to serve the new Interventional Suite developed in Phase 2b on the 2nd Level; building services space on the 3rd Level (contiguous with building services space in Phase 1b); and Staff Support Facilities at Basement Level. A new patient transfer and logistics elevator core is provided serving all levels of the new East Wing as well as the 1997 Building. The elevators are double sided, allowing patient transfer from the west side doors on Ground Level and logistics access from the east side doors on Ground Level. Consideration should be given to the size and number of elevators provided in this core.

Site works and construction staging: construction of all or a portion of a new two or three level staff parkade should be considered in this phase as shown on the site plan in the NE corner of the site. Construction of the parkade would remove at grade hard surfaced parking, so consideration should be given to construction of the parkade in horizontally adjacent phases, beginning at the south end of the parkade footprint shown in the site plan.

Integration with future phases: Phase 2a will provide horizontal links at every level to phases 1a, and to the new logistics and patient transfer corridor provided in Phase 1a; and to two levels of vertical expansion above the 3rd Level building services space. Consideration should be given to constructing the elevator core to minimize disruption to elevator services during future vertical expansion in Phase 4.

Consideration should be given to the completion of schematic level planning of the Phase 2b interventional suite in this phase to ensure that it can be accommodated in the vacated logistical space within the 1997 building and that adequate space for building services is provided in the 2nd Level building services space.

Planning and design of the Phase 4 IPU should be reviewed in this phase, for the reasons cited in the Phase 1b description above.

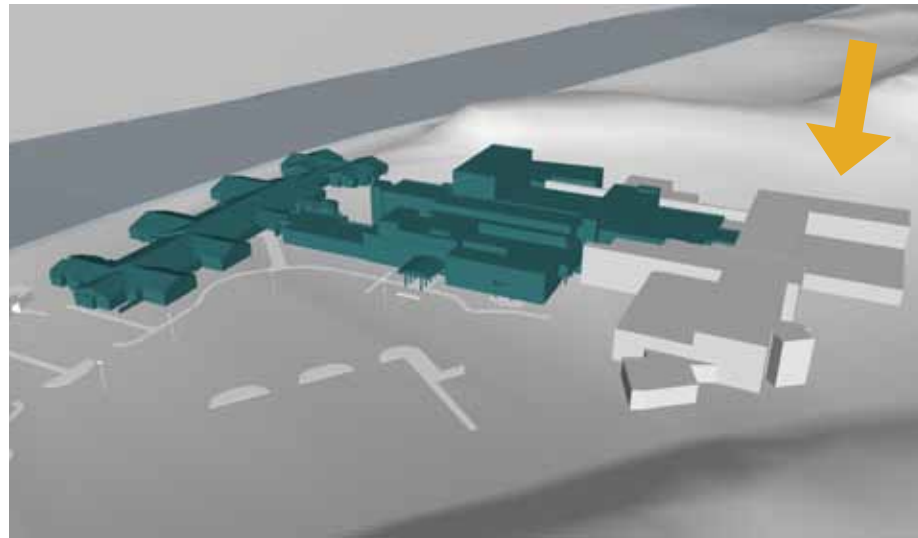
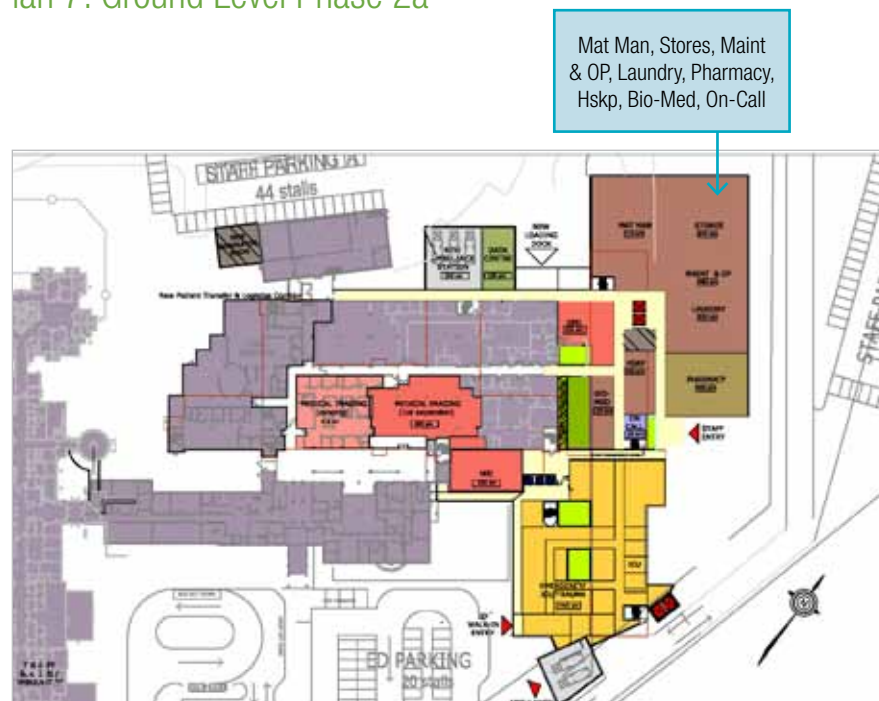
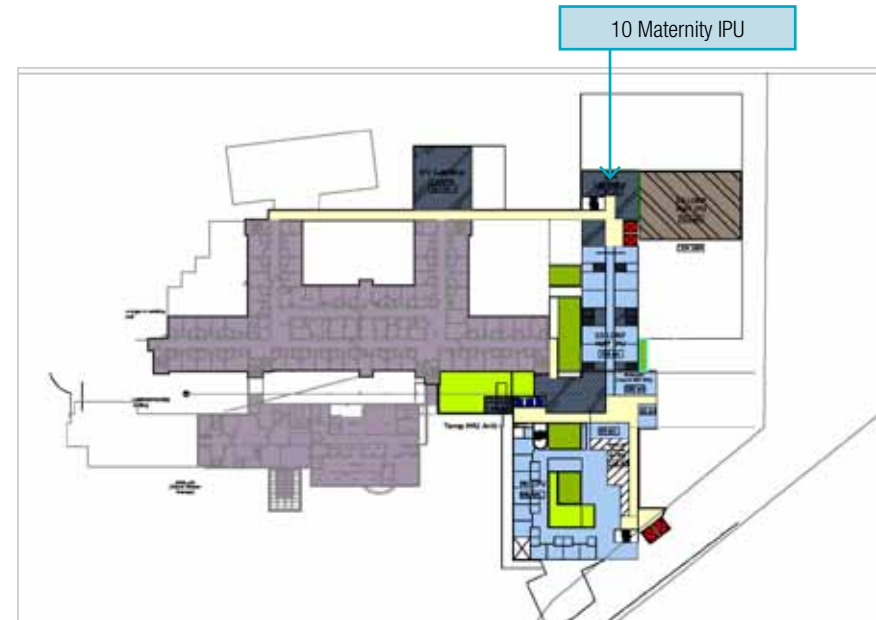


Figure 6.0 Rendering showing 3D model of Phase 2

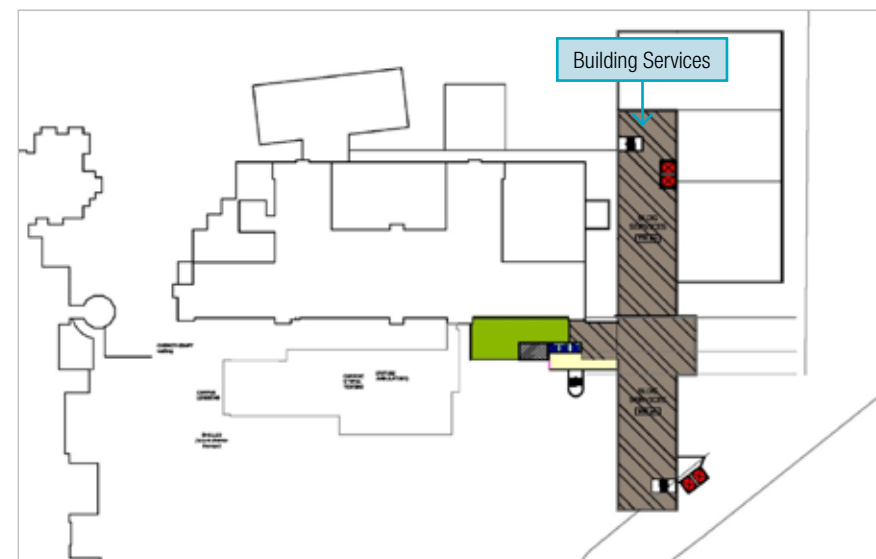
Plan 7: Ground Level Phase 2a



Plan 8: 2nd Level Phase 2a



Plan 9: 3rd Level Phase 2a

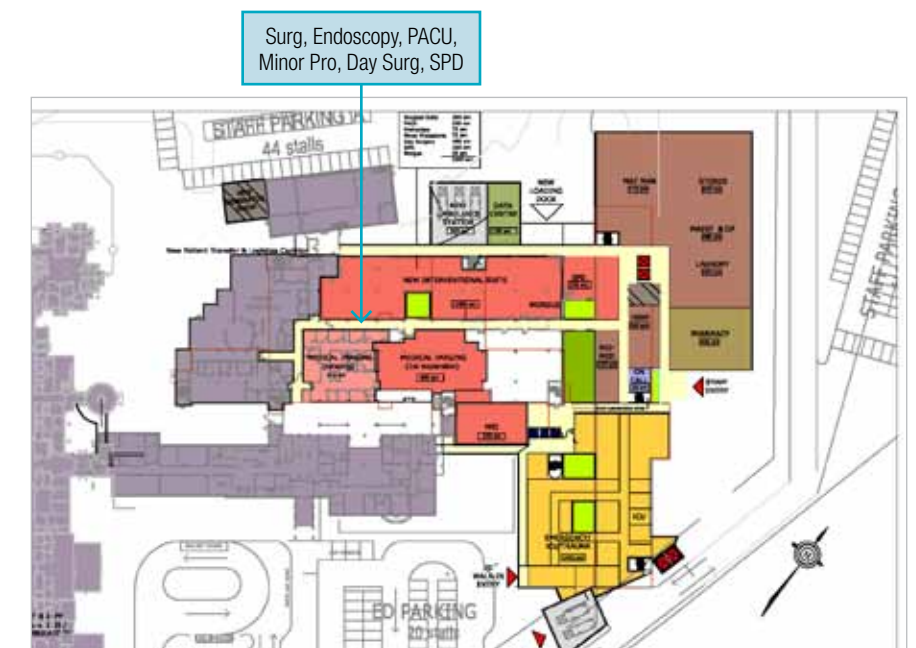


Phase 2b

Phase 2b: provides new accommodation in renovated space vacated by logistics services in Phase 2a for a new integrated Interventional Suite comprised of Surgery, Endoscopy, PACU, Minor Procedures, and Day Surgery. As the new Interventional Suite is entirely encapsulated in built space, consideration should be given to the provision of exterior courtyards as indicated on the plan for this phase. A strategically placed courtyard could provide daylight and nature view for patients and caregivers in PACU and other service areas.

Integration with future phases: Phase 2b is independent of future phases to the completion of Phase 5. Interventional Suite expansion beyond 2035 is anticipated as described in Future Opportunities below.

Plan 10: Ground Level Phase 2b



Phase 2c

Phase 2c: provides a second phase of DI expansion within space vacated by the existing PACU/Day Surgery and Surgery space at the completion of Phase 2b. If not constructed as part of Phase 1c, a new walk-in entrance to DI from the atrium will be constructed in this phase. At completion of this phase, the current DI space would be redundant according to the 2035 program. Integration with future phases: Phase 2c is independent of future phases to the completion of Phase 5.

Plan 11: Ground Level Phase 2c



The Table 5.0 below illustrates various parts of Phase 2, showing new construction and renovation according to the year.

	Legend	New Construction	Renovation	Shelled
Phase 1	2016			
Phase 1a	2014	MRI, Data Centre, Existing IPU Support		
Phase 1b	2015	ED, MH IPU		
Phase 1c	2016		MI 1st Expansion	
Phase 2	2021			
Phase 2a	2018	Logistics, Pharmacy, On-Call, Maternity, Staff Facilities		
Phase 2b	2020		Interventional Suite	
Phase 2c	2021		MI 2nd Expansion	

The Phase 2 development is required to accommodate new Logistics, Staff Facilities, Interventional Suites and Maternity Inpatient Rooms. This development will connect into the Phase 1 development and extend north.

Space heating and domestic water and medical gases for the Phase 2 development will be provided from the building services equipment located in the Basement level. Air conditioning and ventilation/exhaust for the Logistics, Staff Facilities and Maternity Inpatient Rooms will be provided from new AHUs located on the roof (Level 3) of the Phase 2 development. See figure 4 illustrating the placement of equipment.

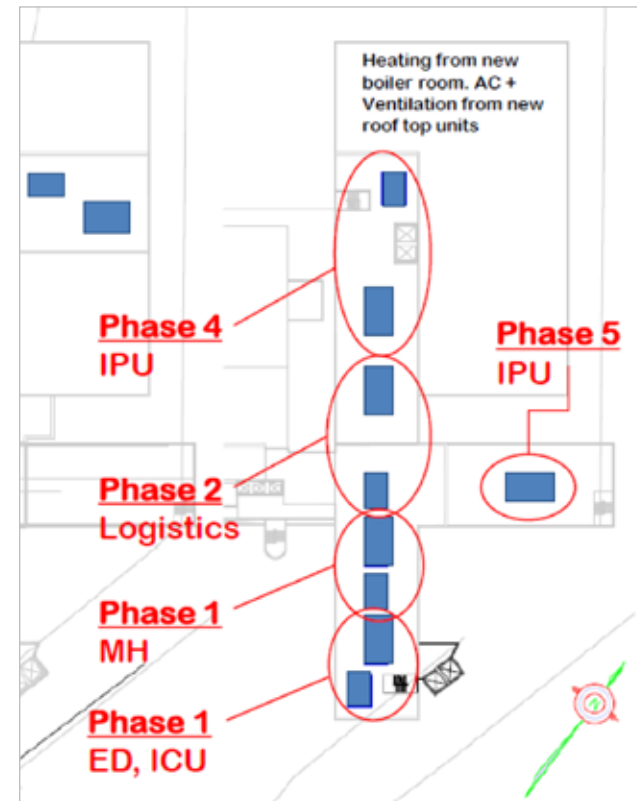


Figure 4 – Level 3, Building Services, for various phases

Phase 2 also includes the development of new Interventional (Surgical) Suites complete with associated departments including Sterile Processing (SPD) and Pre/Post Op. To a large degree the development of these spaces will involve a significant renovation of the existing hospital. The existing mechanical systems (HVAC, Plumbing, Medical Gas and Fire Suppression) will require modification to suit. Space heating and medical gasses will be provided from the building services equipment located in the Basement level. However, all re-developed Class 1 spaces (as defined by CSA) will require HVAC service from compliant AHUs and related systems. A new steam boiler is proposed to serve the redeveloped SPD.

CSA requires that all Class 1 spaces, for example Surgical Suites, have adequate provision for HVAC, including redundancy. To achieve the CSA requirements, new AHUs are proposed. These are proposed to be located on the roof of the Logistics Area (Phase 1b) development and extend to the Surgical Suites through a proposed two level corridor along the north side of the building.

See figure 5 below:



Figure 5 – CSA Class 1 compliant AHUs to serve the Interventional Suite

In order to improve energy efficiency and in a particular effort to reduce the building's energy usage density, Phase 2 affords an opportunity to add two electric boilers to replace the existing de-commissioned ones. During non-peak times these electric boilers can be used to augment the space heating capacity provided by the fuel fired boilers. These two electric boilers are proposed to be located within the existing Energy Centre as illustrated below, figure 6.



Figure 6 – Existing Energy Centre

It should be noted, the development of Phase 2 includes Level 3 dedicated to Building Services and systems (see figure 5). Level 3 is proposed to be a “buffer” between the clinical functions below and future developments of clinical functions above. This “buffer” level allows for the installation of building services equipment, serving floors below and above, and services required to support floors above with minimal interruption to patient care and medical process required for the operation(s) of the floors below.

Phase 3a

Phase 3a: provides new accommodation for Health Records to meet the 2035 program within the current DI space made redundant by the completion of Phase 2c. With the relocation of the current Pharmacy in Phase 2a, relocation of Health Records helps clear the way for demolition of the Old Building and construction of Phase 3b.

Integration with future phases: Additional functions in the 1959 Building will have to be relocated to allow its demolition. These include visiting Specialist Clinics, First Nations Health Program, and Admitting on Ground Level and Info Services, Administration on the 2nd Level. Together these existing functions are housed in approximately 2500 square meters of space in the 1959 Building. These functions could be temporarily housed in other locations within Whitehorse, including potentially within both levels of both Buildings#2 and #4 on the WGH site.

Three other options should be considered:

- Option A: Phase 1b could be constructed to 5 floors, providing approximately 2000 sm of space that could be used to house most of the functions requiring temporary accommodation. This would eliminate vertical expansion above Phase 1b.
- Option B: Phase 2b could be constructed to 5 floors with an adjacent vertical expansion to 5 floors built above Phase 1b at the same time. This option delays the decision about vertical expansion longer than Option A. This Option and Option C below could provide both temporary accommodation for functions in the Old Building and a new 24-bed Medical IPU if warranted by faster population growth or changes in service provision.
- Option C: Both Phase 1b and Phase 2a are constructed to 5 floors, potentially providing an additional 24 inpatient beds on Level 5 and space for temporary accommodation of the functions displaced from the 1959 Building on Level 4.

Movable partitions should be considered for use in any temporary accommodation strategy to minimize overall cost and waste going to landfill.

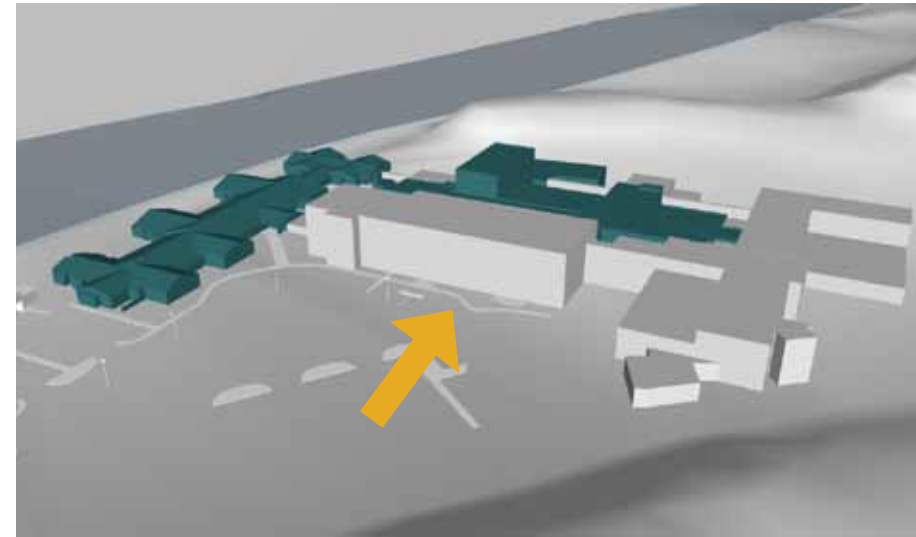
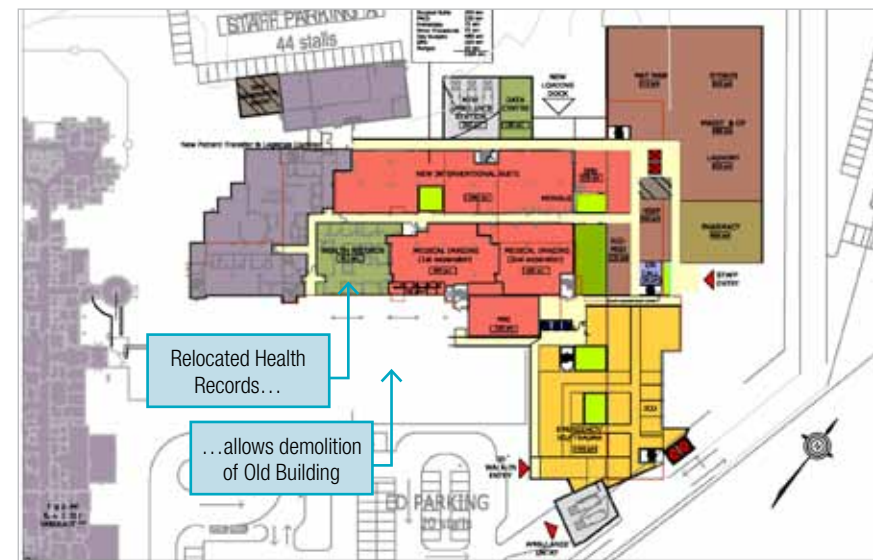
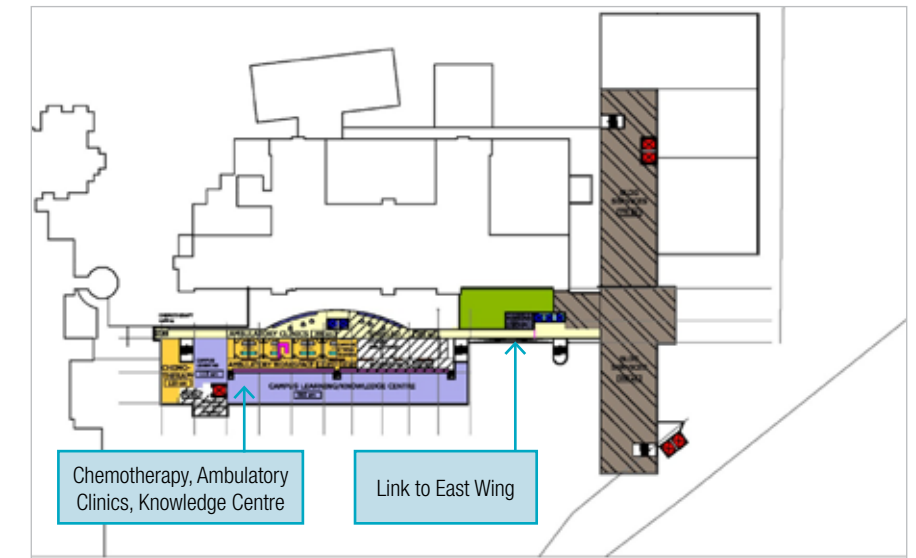


Figure 7.0 3D Rendering of Phase 3

Plan 12: Ground Level Phase 3a



Plan 13: 3rd Level Phase 3a

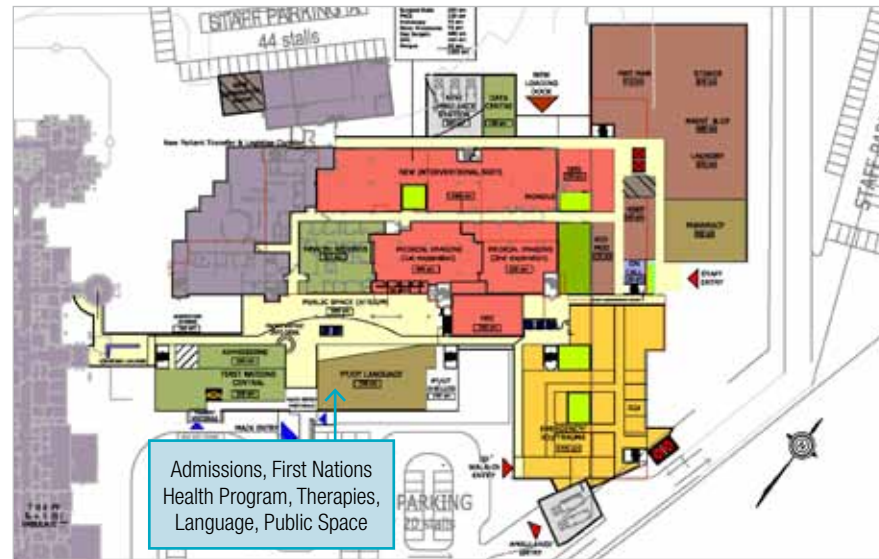


Phase 3b

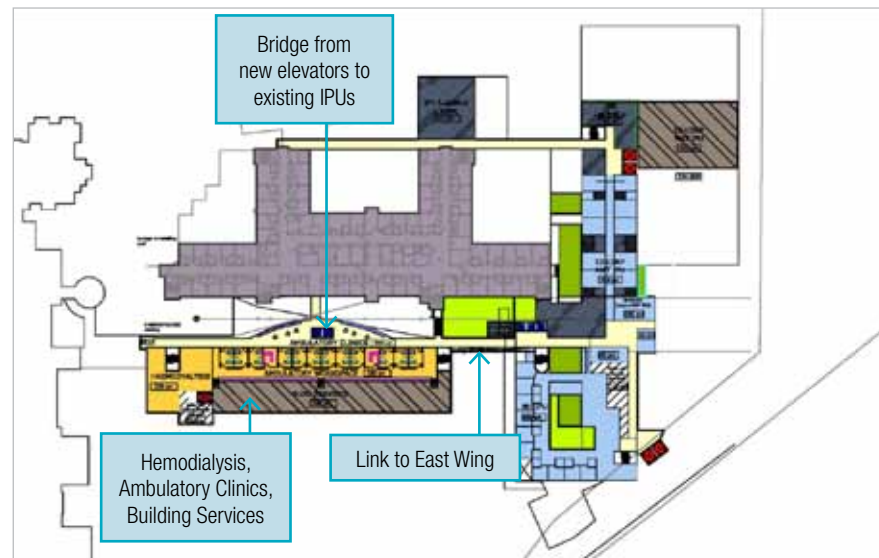
Phase 3b: provides a new South Wing to the hospital with accommodation for Admissions, First Nations Health Programs, Therapies, a new Main Entrance and expanded Public Space on Ground Level; Hemodialysis, Ambulatory Clinics and Building Services on the 2nd Level; and Chemotherapy, additional space for Ambulatory Clinics, and the Knowledge Centre on the 3rd Level; and Facility Administration, meeting space, and Information Systems on the 4th Level. The expanded public space provided in this phase provides a new front door for the Thomson Centre, the potential for some lounge space for Thomson Centre Residents with south exposure and a view of activity in and around the public parking area and a new link to the First Nations Healing Room, eliminating the need for visitors to enter and pass through the Thomson Centre to access the healing room. A new public elevator core is provided within the atrium to provide access to all levels of the new South Wing as well as access to the existing inpatient units on the 2nd Level of the 1997 Building. All levels of the new South Wing also connect via public corridor to the new East Wing.

Integration with future phases: if Phase 4 has not been completed ahead of this phase (see Options A-C for temporary accommodation of 1959 Building functions outlined in Phase 3a above), then construction of the links to Levels 4 and 5 of the East Wing will have to wait until completion of Phase 4.

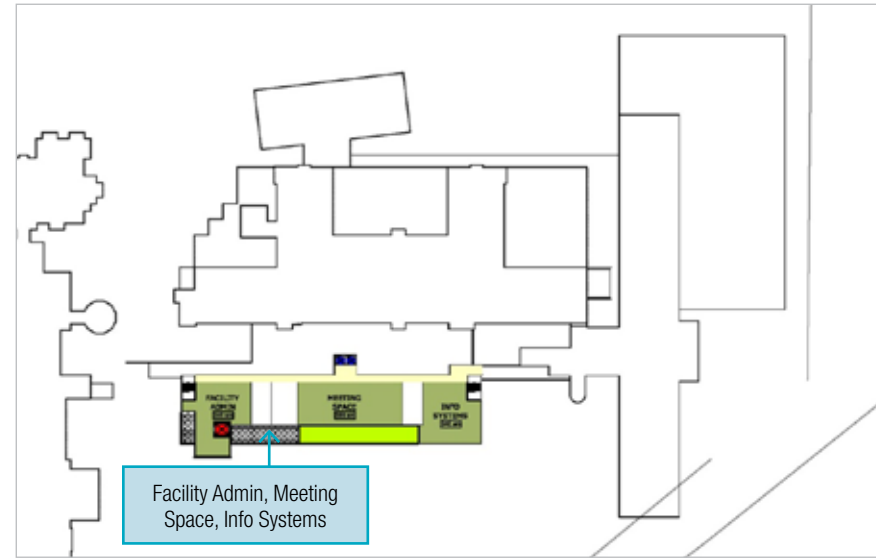
Plan 14: Ground Level Phase 3b



Plan 15: 2nd Level Phase 3b



Plan 16: 4th Level Phase 3b

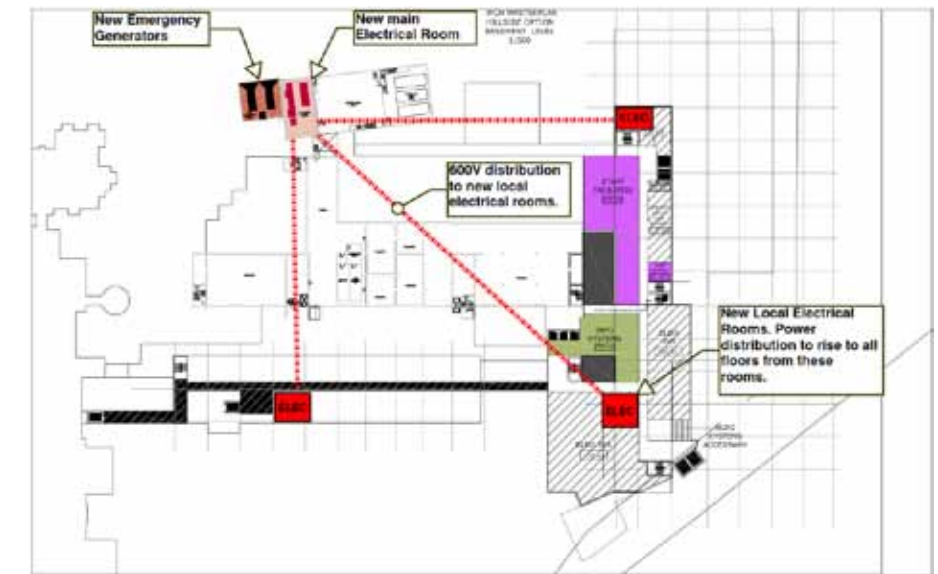


Plan 17: Basement Level Phase 3b



Ultimately new 600V normal and emergency distribute systems will distribute power to all the new proposed expansions to electrical rooms on the basement levels. (See Sketch 6)

The electrical & communication rooms will be stacked on all the floors above the basement electrical and communication rooms. Power and communication systems will be distributed from the local rooms on each floor to service the appropriate floor. (See Sketch 6)



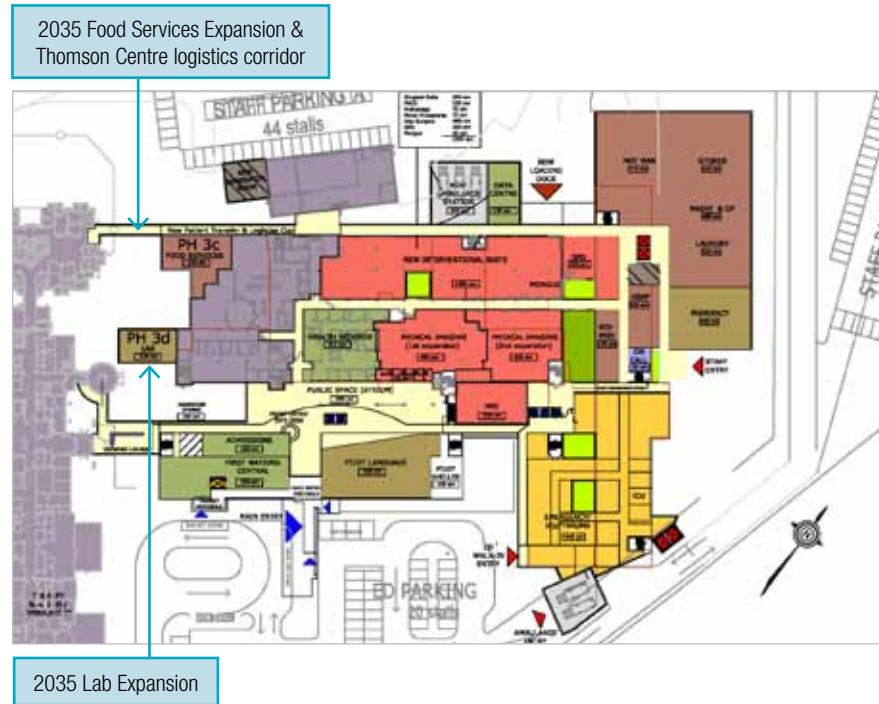
Sketch 6

Phase 3c

Phase 3c: provides Laboratory expansion space to meet the 2035 program requirement adjacent to the existing Laboratory.

Integration with future phases: this phase will have to proceed in conjunction with Phase 3b if Phase 3d is complete before the construction of Phase 3b.

Plan 18: Ground Level Phase 3 c-d



Phase 3d

Phase 3d: provides Food Services expansion space to meet the 2035 program requirement adjacent to the existing food services area and a logistics link to the Thomson Centre. Consideration should be given to advancing this phase, possibly to coincide with Phase 2a, as the enclosed corridor link to the Thomson Centre from the new Loading Dock and from Food Services will significantly improve the efficiency of all logistical services to the Thomson Centre.

Integration with future phases: the logistics corridor to the Thomson Centre constructed in this phase can also serve the Future Development that would be made possible by removal of the Thomson Centre, in which case it could also accommodate patient transfer to and from the Interventional Suite.

Table 6.0 below illustrates various parts of Phase 3, showing new construction and renovation according to the year.

	Legend	New Construction	Renovation	Shelled
Phase 1	Time			
Phase 1a	2014	MRI, Data Centre, Existing IPU Support		
Phase 1b	2015	ED, MH IPU		
Phase 1c	2016		MI 1st Expansion	
Phase 2	2021			
Phase 2a	2018	Logistics, Pharmacy, On-Call, Maternity, Staff Facilities		
Phase 2b	2020		Interventional Suite	
Phase 2c	2021		MI 2nd Expansion	
Phase 3	to 2025			
Phase 3a	2023		Health Records	
Phase 3b	2025	Public space, Admissions, First Nations, Therapies, Outpatient, Chemotherapy, Haemodialysis, Learning Centre, Facility Admin, Meeting Space, Info Systems		
Phase 3c	2024	Food services expansion, lab expansion		

Phase 3 involves the demolition of the original 1912 building and the development of a new 3 story building in its place. Primarily this new Phase 3 development will be Ambulatory Care and include functions related to Public Spaces, Laboratory Therapies, First Nations, Health Records and a Learning Centre.

Space heating and domestic water and medical gases for the Phase 3 development will be provided from the building services equipment located in the Basement level. Air conditioning and ventilation/exhaust will be provided from new AHUs located on the roof (Level 3) of the Phase 3 development. See Figure 7 illustrating the placement of equipment.

Ultimately new 600V normal and emergency distribution systems will distribute power to all the new proposed expansions to electrical rooms on the basement levels. (See Sketch 6)

The electrical and communication rooms will be stacked on all the floors above the basement electrical and communication rooms. Power and communication systems will be distributed from the local rooms on each floor to service the appropriate floor. (See Sketch 6)

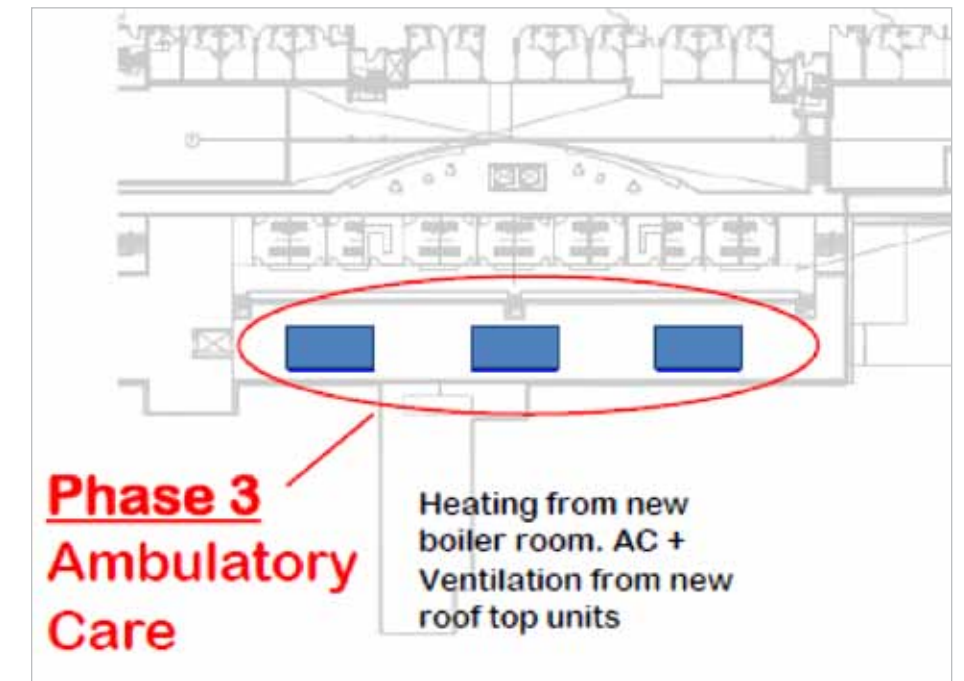
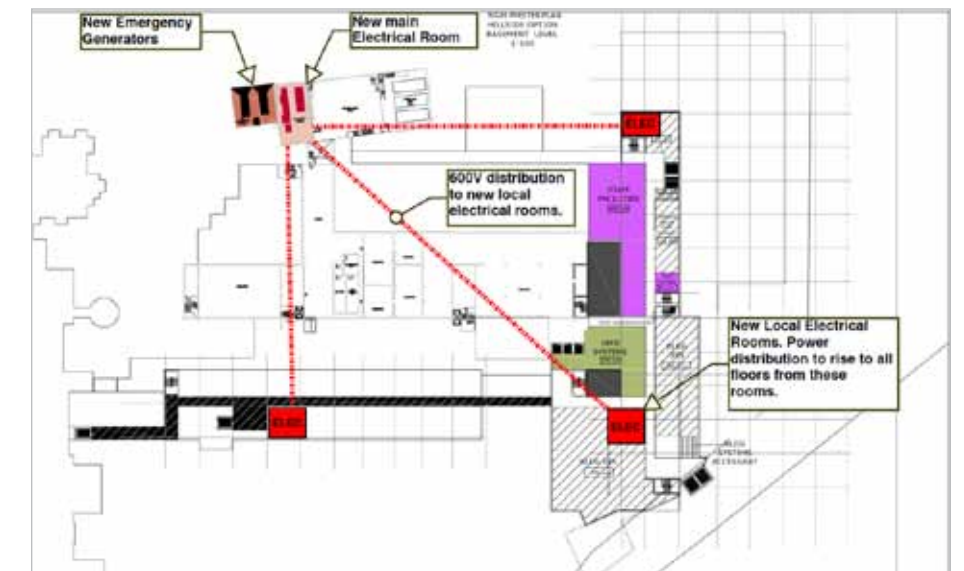


Figure 7 – Phase 3, Ambulatory Care



Sketch 6

Phase 4

Phase 4: provides space for a 24-bed Medical IPU on each of the 4th and 5th Levels above phases 1b and 2a with direct access from the ED. Fit out of only one level (preferably the 5th level to reduce disruption during fit out of the remaining level) is required to meet the 2035 program of 101 Med/Surg beds. A 24-bed inpatient unit is typically the lowest number of beds provided in new Med/Surg IPUs.

Consideration should be given to advancing this phase as hospitals typically require more Medical IPU beds than Surgical IPU beds and the IPUs in the new East Wing are ideally located relative to the ED with direct patient transfer elevator access. Advancing Phase 4 would also allow renovations to be made to the existing IPUs on the 2nd Level of the 1997 Building.

Integration with future phases: this phase will have to be designed to link to the 4th and 5th levels of Phase 5.

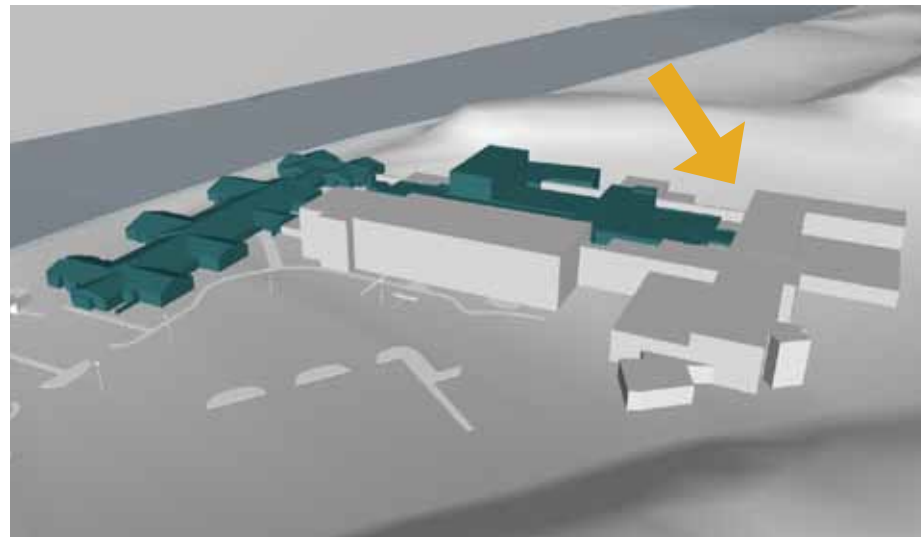


Figure 8.0 3D Rendering of Phase 4 showing IPUs

Plan 19: 4th Level Phase 4



Plan 20: 5th Level Phase 4



Table 7.0 below illustrates various parts of Phase 4, showing new construction and renovation according to the year.

	Legend	New Construction	Renovation	Shelled
Phase 1	Time			
Phase 1a	2014	MRI, Data Centre, Existing IPU Support		
Phase 1b	2015	ED, MH IPU		
Phase 1c	2016		MI 1st Expansion	
Phase 2	2021			
Phase 2a	2018	Logistics, Pharmacy, On-Call, Maternity, Staff Facilities		
Phase 2b	2020		Interventional Suite	
Phase 2c	2021		MI 2nd Expansion	
Phase 3	to 2025			
Phase 3a	2023		Health Records	
Phase 3b	2025	Public space, Admissions, First Nations, Therapies, Outpatient, Chemotherapy, Haemodialysis, Learning Centre, Facility Admin, Meeting Space, Info Systems		
Phase 3c	2024	Food Services expansion, L+ab expansion		
Phase 4	to 2035			
Phase 4	2034	24-bed IPU		24-bed IPU

Phase 4 makes provision for a vertical expansion, Levels 4 and 5 for Inpatient Units located above the Mental Health Unit and Maternity Inpatient Rooms (Phase 1b and Phase 2).

Space heating and domestic water and medical gasses for the Phase 4 development will be provided from the building services equipment located in the Basement level. Air conditioning and ventilation/exhaust will be provided from new AHUs located on the roof (Level 3) of the Phase 1b/2 developments. See figure 5 illustrating the placement of equipment.

Phase 5

Phase 5: provides expansion of Logistics functions constructed in Phase 2a at Ground Level; a possible 6-bed ICU at the 2nd Level (allowing expansion of the ED constructed in Phase 1b); building services on the 3rd Level (contiguous with building services space constructed on the 3rd Level of Phases 1b and 2a); and an additional 8 Medical IPU beds added to each of the Medical IPUs on the 4th and 5th Levels in Phase 4, bringing both units to 32-beds, considered the ideal size of a Med/Surg IPU for overall operational efficiency.

Consideration should be given to advancing this phase and Phase 4 as hospitals typically require more Medical IPU beds than Surgical IPU beds and the IPUs in the new East Wing are ideally located relative to the ED with direct patient transfer elevator access.

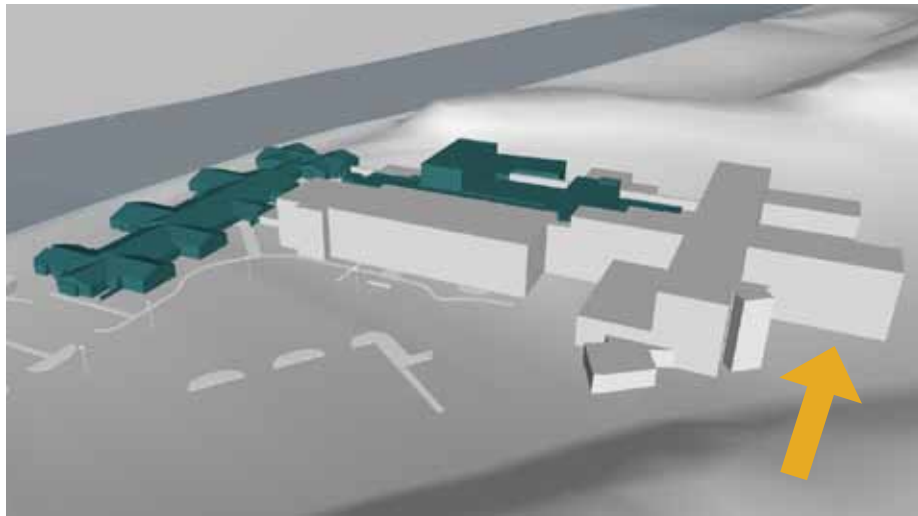
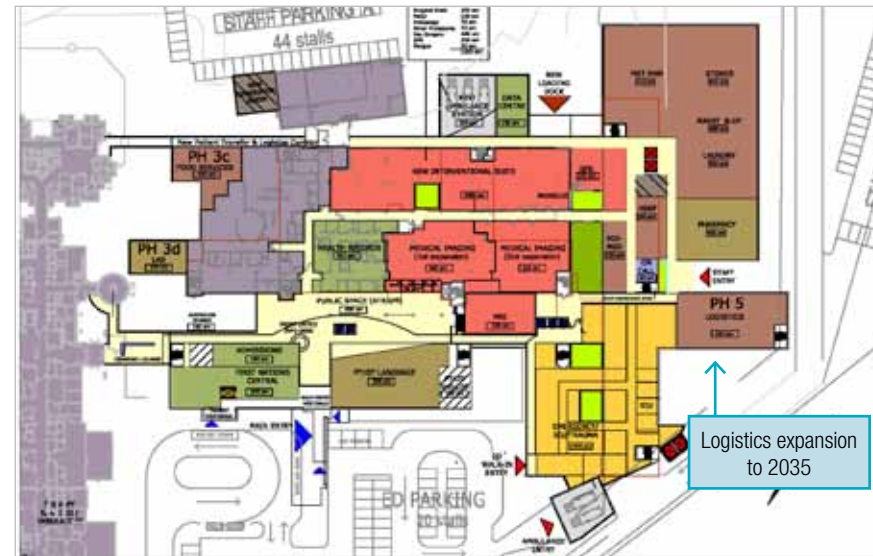
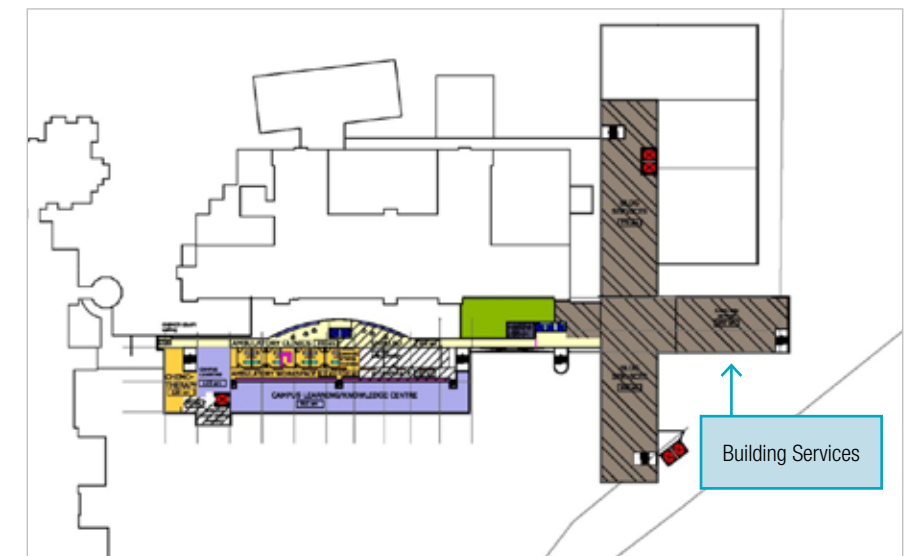


Figure 9.0 [Caption here](#)

Plan 21: Ground Level Phase 5



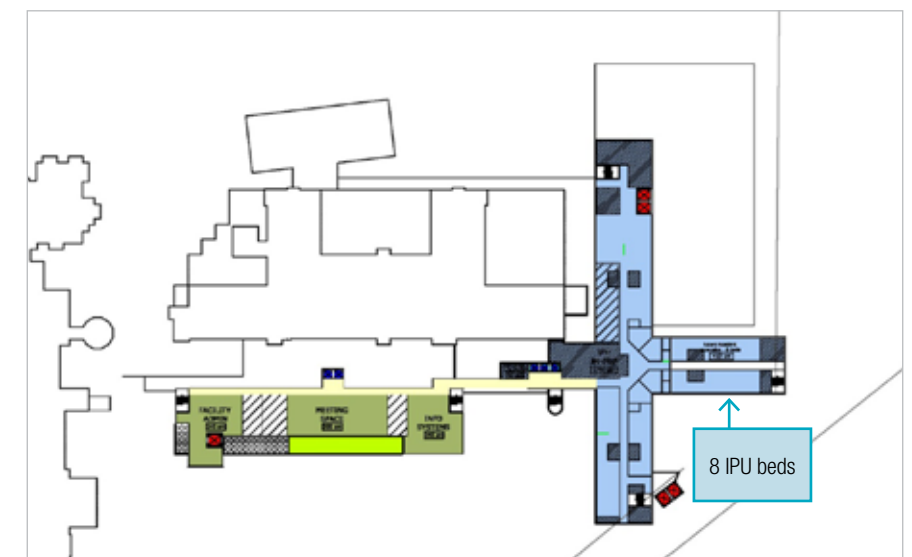
Plan 23: 3rd Level Phase 5



Plan 22: 2nd Level Phase 5



Plan 24: 4th Level Phase 5



Plan 25: 5th Level Phase 5



Table 8.0 below illustrates various parts of Phase 5, showing new construction and renovation according to the year.

	Legend	New Construction	Renovation	Shelled
	Time			
Phase 1	2016			
Phase 1a	2014	MRI, Data Centre, Existing IPU Support		
Phase 1b	2015	ED, MH IPU		
Phase 1c	2016		MI 1st Expansion	
Phase 2	2021			
Phase 2a	2018	Logistics, Pharmacy, On-Call, Maternity, Staff Facilities		
Phase 2b	2020		Interventional Suite	
Phase 2c	2021		MI 2nd Expansion	
Phase 3	to 2025			
Phase 3a	2023		Health Records	
Phase 3b	2025	Public space, Admissions, First Nations, Therapies, Outpatient, Chemotherapy, Haemodialysis, Learning Centre, Facility Admin, Meeting Space, Info Systems		
Phase 3c	2024	Food services expansion, lab expansion		
Phase 4	to 2035			
Phase 4	2034	24-bed IPU		24-bed IPU
Phase 5	Beyond			
Phase 5		Logistics expansion, 6-bed ICU, 24-beds added to Phase 4 IPUs		24-bed IPU constructed in Shelled Space from Phase 4

Phase 5 proposes to realize an expansion to Logistics, ICU and IPU.

Space heating and domestic water and medical gasses for the Phase 5 development will be provided by the building services equipment located in the Basement level. Air conditioning and ventilation/exhaust will be provided by new AHUs located on the roof (Level 3) of the Phase 1b/2 developments. See figure 5 illustrating the placement of equipment.

Future Opportunity

Future Opportunity: with removal of the Thomson Centre, a new West Wing allows for further development of acute care services on the WGH site to meet service delivery needs well beyond the 2035 program horizon. Although future development could take many forms and serve many functions, the following would increase service capacity and vastly enhance the relationship of public spaces, and a lucky number of IPUs within the hospital to view the Yukon River valley. WGH would then surely be considered among the most beautifully sited hospitals in the world.

New public facilities could be developed on Ground Level, including a new food services and cafeteria overlooking the river with long views up and down the valley, and new space for Health Records if in fact space for Health Records is required at all by that time. A healing garden could be developed in the South West corner of the expansion project adjacent to a second public entrance.

Relocation of Food Services and Health Records would provide space for expansion of the Diagnostic and Treatment functions established within the 1997 Building in earlier phases at Ground Level.

Additional 32-bed Surgical IPUs could be developed on the 2nd to 4th levels of the expansion project, either in one or two phases. These units would be very convenient to an expanded Interventional Suite. The IPUs could be accessed from an extension of the public corridor on the 2nd to 4th Levels of the new South Wing.

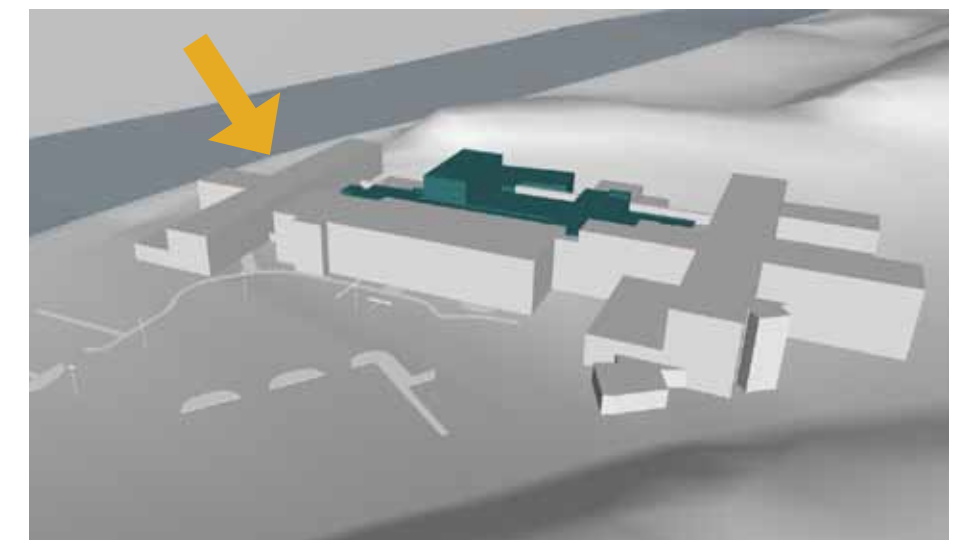


Figure 10.0 3D Rendering of Future Opportunities

Plan 26: Ground Level Phase 6



Civil/Site Utilities:

In order to accommodate the proposed phased developments, significant modification to the existing site's Civil infrastructure will be required. It is essential that these works be discussed and coordinated with City officials.

Significant modifications and additions will be required to:

1. The existing site storm drainage system (including possible addition of storage/retention and controlled flow/release)
2. The existing sanitary sewer system
3. The existing water main distribution system

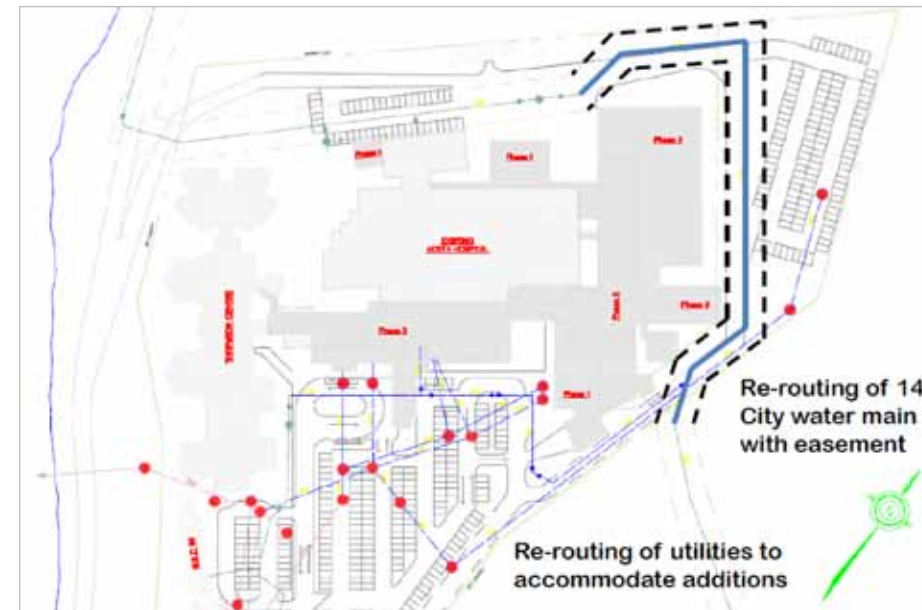
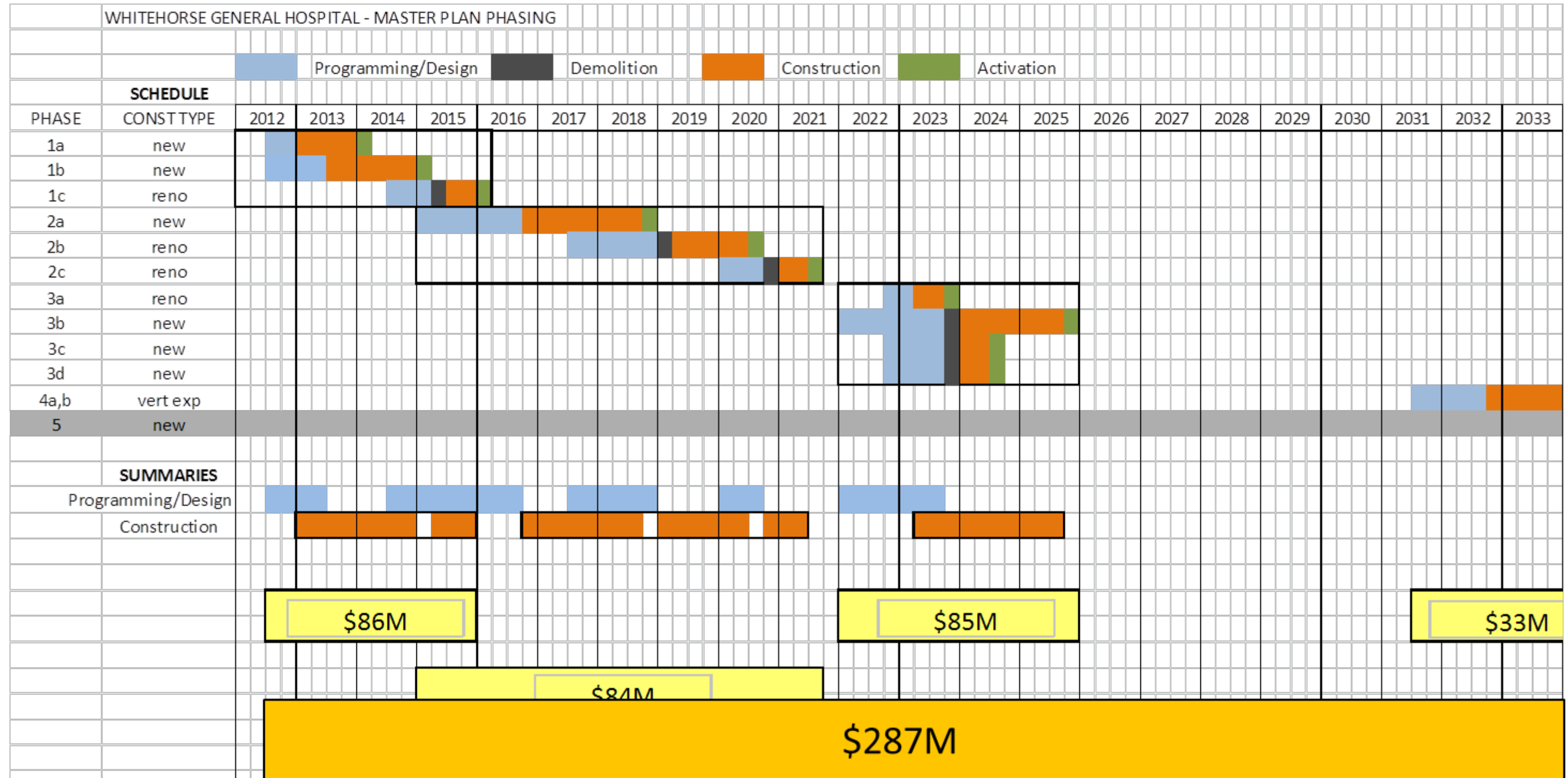


Figure 8 – Civil Site Utilities

Figure 8 above illustrates the requirement for modifications to the existing site's Civil infrastructure systems. It also illustrates the requirement to re-route an existing 14"Ø City water main around the proposed phased developments.

Schedule and Comparative Cost



GREENFIELD OPTION

Background

During the initial planing steps of the Strategic Facilities and Master Planning Project, there was an inherent assumption made that project focus on redevelopment of the current WGH Campus. Following the completion of Phase 1 and to ensure proper due diligence, the steering committee requested the completion of high level comparison of a Greenfield/New Building on new site option vs. Rebuild / redevelop on the current WGH Campus Site.

Rebuild & Greenfield Footprint

An all-new construction or 'Greenfield' option was developed to meet the 2025 Lean program, with the potential for future vertical expansion up to 146 beds. Although the potential maximum future bed number is well in excess of the 2035 requirement of 101 beds, no other expansion space is accommodated to meet the 2035 Lean program. The rebuild option does incorporate shelled spaces to accommodate expansion of several departments to avoid the need for multiple small additions and department relocations. A fully developed greenfield option would also likely benefit from a judicious use of shelled space to meet anticipated 2035 expansion.

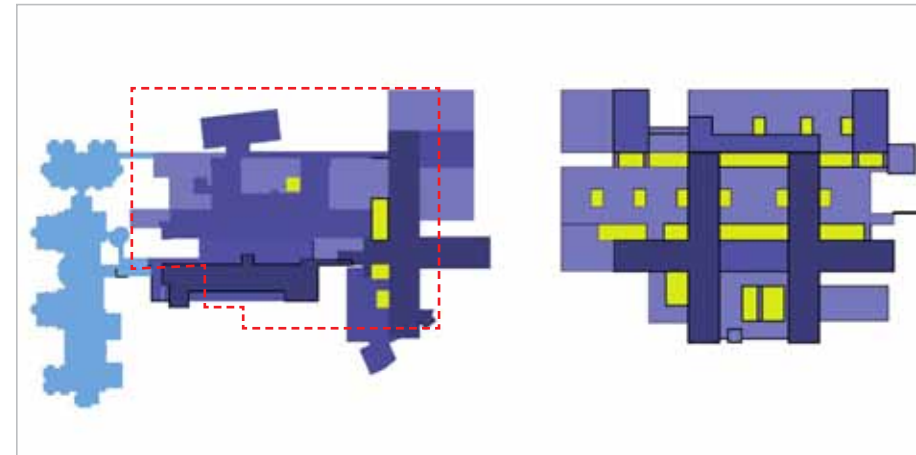
To retain full operation of the existing hospital throughout the construction, a Greenfield option could not be accommodated on the existing site. A new approximately 8 hectare site would be required to accommodate all surface parking for patients, visitors and staff. Two sites were identified close to downtown that could accommodate a greenfield option. Both are contaminated or 'brownfield' sites that would require remediation.

Like the rebuild option, the Greenfield option accommodates inpatient units above an extensive Diagnostics and Therapeutics (D&T) and public facilities floor at Level 1. All of the ambulatory clinics are located on the second level, along with the Maternity IPU and the Mental Health IPU. Both Maternity and Mental Health therefore would require frequent vertical transport of patients in duress, to and from surgery for maternity patients and from the ED for mental health patients. Locating both Maternity and Mental Health on the second level however, allows a more compact entry level with shorter patient and visitor travel and generates a smaller footprint, and therefore a smaller site requirement.

Further development of a Greenfield option would allow multiple departmental 'blocking and stacking' options to be explored.

The following diagram compares the footprint of the Rebuild and Greenfield options. The dashed red line superimposes the Greenfield option footprint on the existing hospital site, showing that the two options are very similar in horizontal extent.

Plan 27: Rebuild and Greenfield Footprint



Potential Future Sites – Whitehorse General Hospital

The two potential sites for a Greenfield hospital are shown on the photograph below. Both sites are owned by the Government of Yukon. The site on the Yukon River would be commonly referred to as the Whitehorse Grader Station Site. The site across the road is a YG compound containing various pre-engineered buildings most commonly associated with Yukon Supply Services Branch. As mentioned above, both are contaminated or 'brownfield' sites that would require remediation.

The following site diagram indicates surface parking for 750 vehicles on an 8 hectare Greenfield hospital site, 153 stalls more than the 597 surface stalls provided in the rebuild option at the completion of Phase 3b.

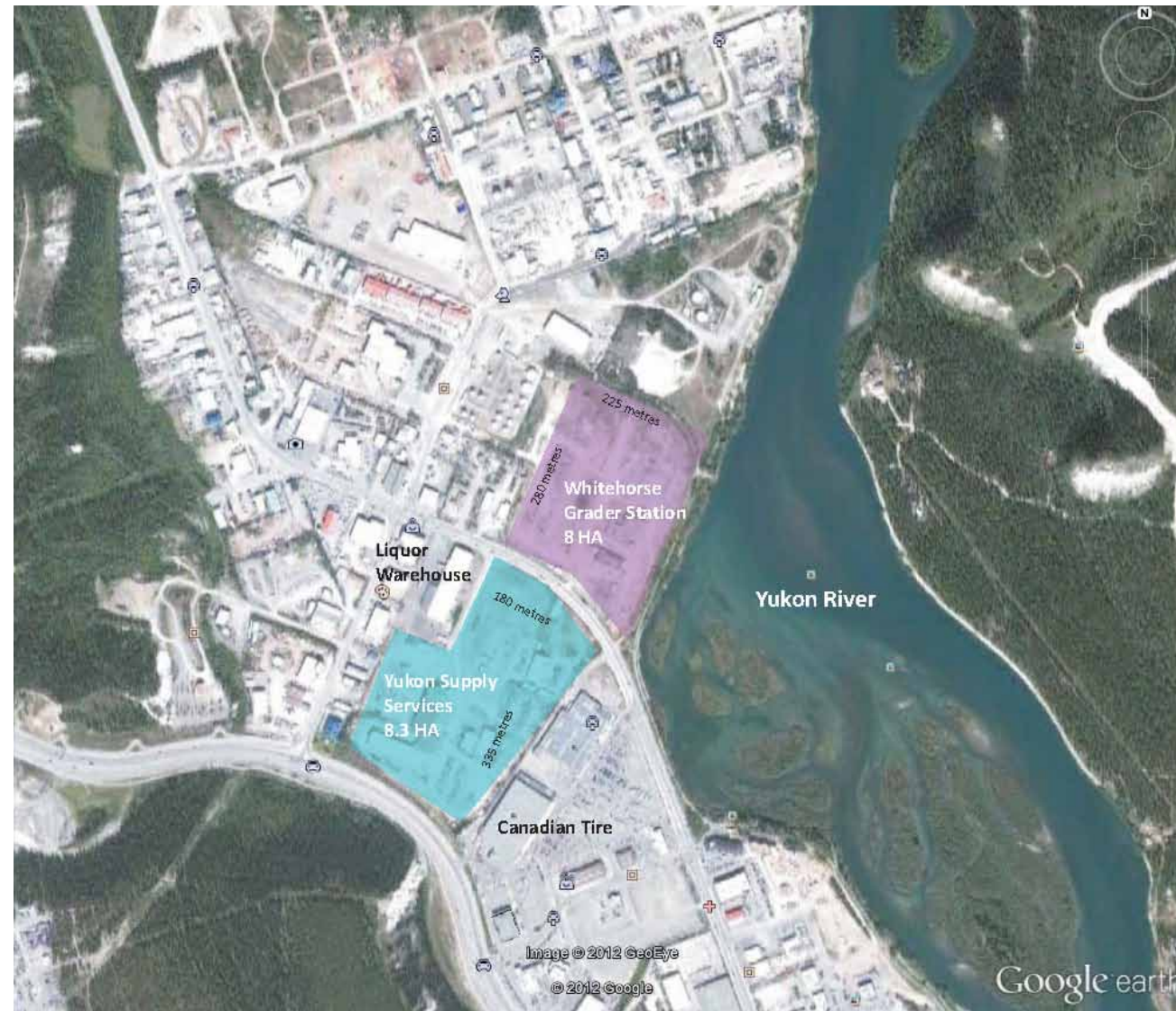
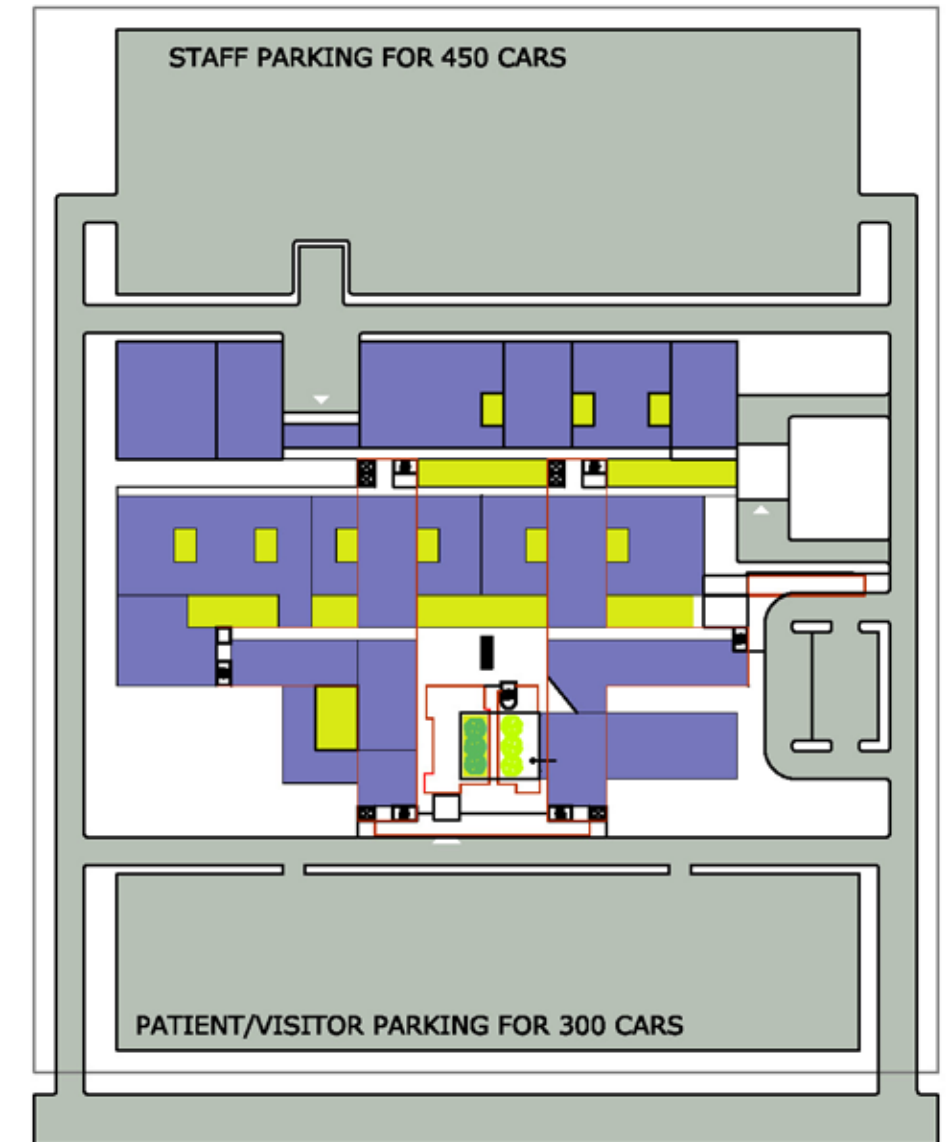


Figure 11.0 Possible Greenfield Site locations – future WGH

Plan 28: Greenfield Site Plan



The following floor plan diagrams describe the distribution of functions in the Greenfield option.

Level 1 is the at-grade entry level. The plan is organized in three bands: a public space, First Nations Health Program, and administrative band; a middle band for the Surgical Suite, Medical imaging and Emergency Services; and a Logistics and Building Services band. The Greenfield option would allow significantly more daylighting of the intensively used Diagnostics and Therapeutic type functions in the middle band, a distinct advantage over the rebuild option. Daylight and a garden space could also be introduced within the lobby volume, with the garden providing wind-sheltered outdoor dining space off of the cafeteria, as shown on the Level 1 Plan.

A single patient/visitor elevator core provides convenient access to all functions on the upper levels, contributing to ease of wayfinding. Two patient transfer cores provide access from the Surgery/procedures, Imaging and Emergency functions in the middle band of the plan. A patient transfer corridor allows access to and from the IPUs above to the 'back of house' of each of these important functions, providing very good separation of inpatient and outpatient flows. Outpatients have access to the 'front-of house' of each of Surgery, Medical Imaging, and Emergency functions directly from the lobby, again contributing to ease of wayfinding. A similar, but somewhat less complete separation of flows is achieved on the entry level in the Rebuild option.

Level 2 accommodates Maternity, Mental Health, and the Ambulatory Clinics. As in the Rebuild option, a Knowledge Centre is provided for staff behind the exam/consult rooms. In this case the Greenfield option might be less supportive of communication between care teams in the ambulatory clinics area, as the Rebuild option, with two levels of waiting/exam rooms/charting galleys with a single Knowledge Centre at a mid-level between them, is more compact.

Level 3 accommodates two 32-bed T-shaped X-hall inpatient units accessed directly from the patient/visitor elevator core. Patients enter each unit adjacent to the communication centre at the head of the 'T'. The communication centres have direct access to a shared inpatient Knowledge Centre paralleling but separate from the patient/visitor access corridor. The Knowledge Centre can provide a range of work spaces for clinicians, residents and students, as well as interview rooms with access from both the Knowledge Centre and the patient/visitor access corridor. The opportunity to provide all inpatient rooms to current standard, all within a unit layout that supports communication 'on the fly' between caregivers and a pace shared between units for communication and work is a distinct advantage of the Greenfield option. The new inpatient units in the rebuild option also adopt the X-hall T-shape, but the Knowledge Centre behind the communication centre serves only one unit. These are however, vertically aligned, allowing ease of clinician vertical movement and communication by a double-sided elevator.

Level 4 accommodates building service space and again could act as a cushion for future vertical expansion of the inpatient tower.

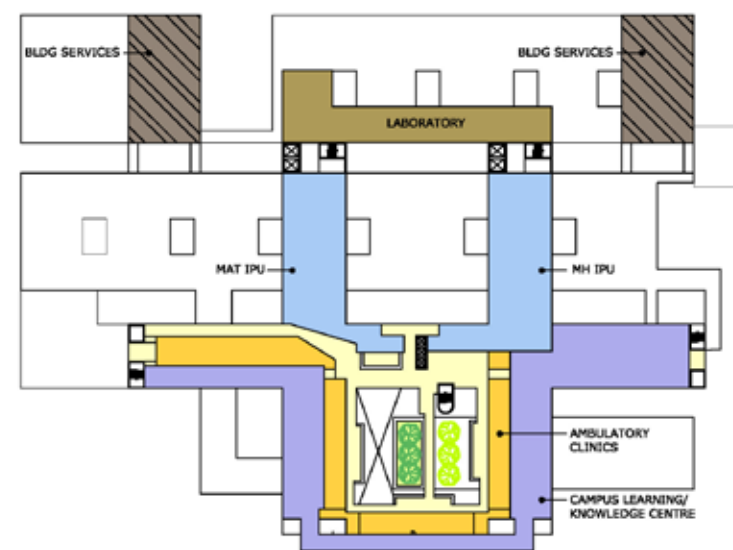
A below-grade Logistics Tunnels plan depicts an ideal configuration of logistics distribution for the hospital, with dedicated logistics elevators at the ends of each of the inpatient wings on Levels 2-5.

This layout would support the use of automatic guided vehicles (AGMs) for the distribution of meals, laundry and other materials. With a dedicated elevator serving each wing, logistics traffic would be evenly distributed, avoiding excess cart traffic in one wing and around the communication centre. A detailed care process model of logistics services would be required to determine the cost benefit of the system.

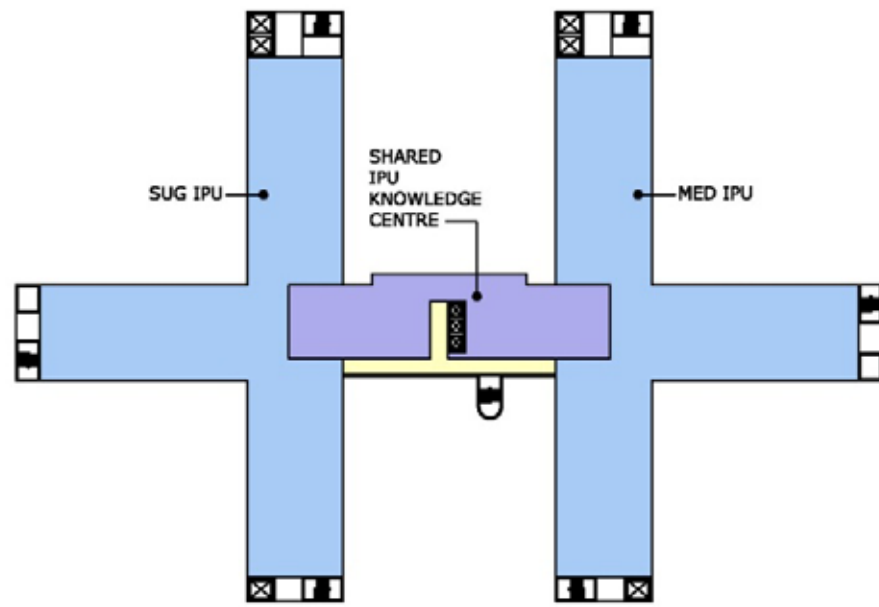
Plan 29: Greenfield Level 1



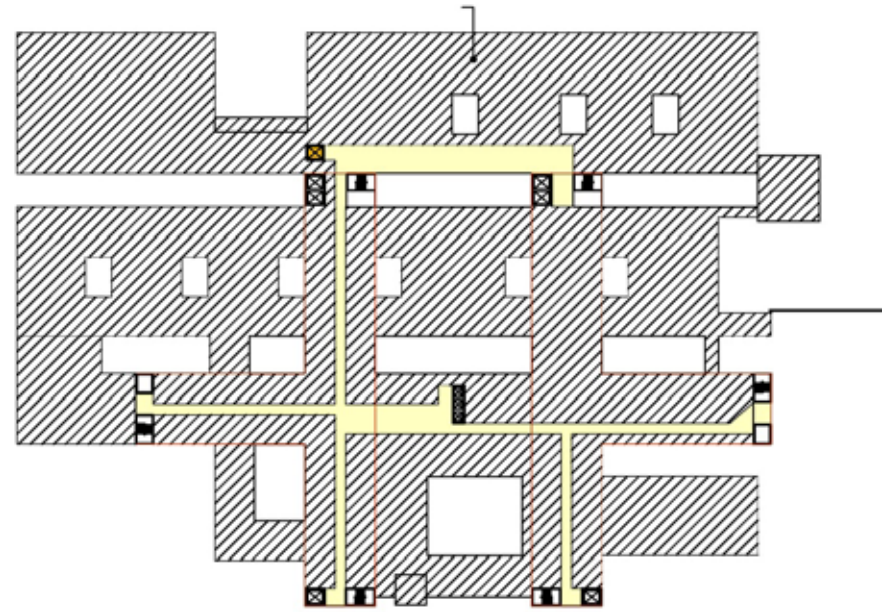
Plan 30: Greenfield Level 2



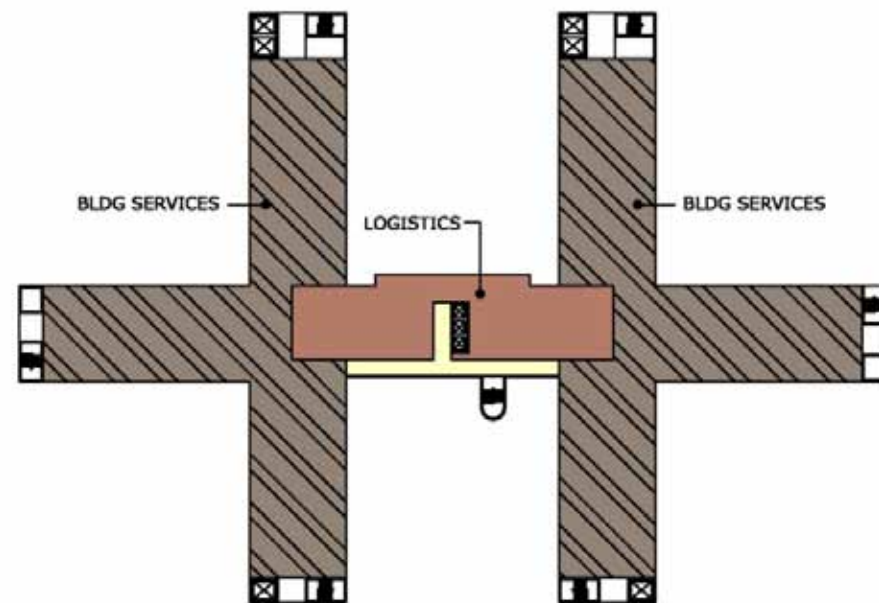
Plan 31: Greenfield Level 3



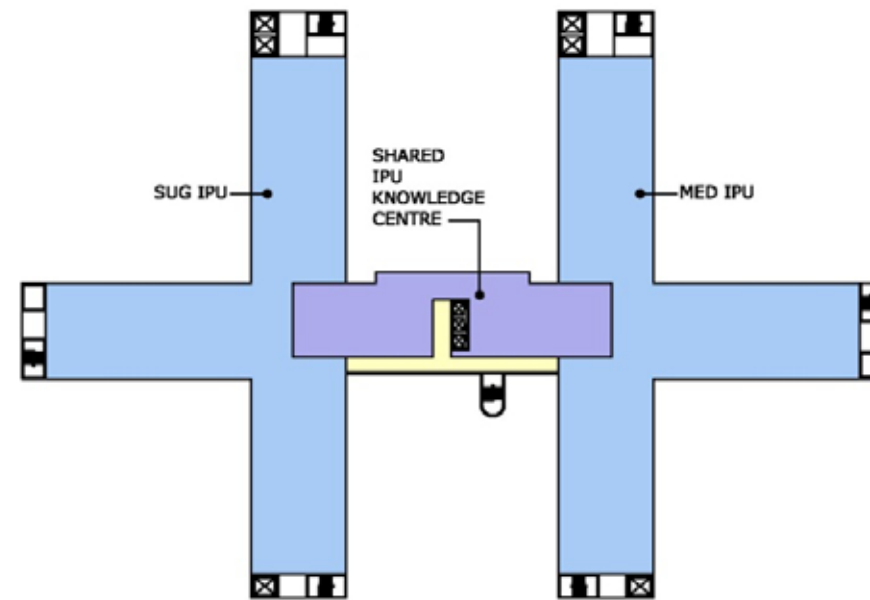
Plan 33: Greenfield Logistics Tunnel



Plan 32: Ground Level Phase 1a



Plan 34: Greenfield Future Level 5



Summary of Greenfield Option Operational Benefits

1. All IPUs and rooms are best practice
2. Knowledge Centre between IPU pairs
3. Improved separation of patient/visitor, patient transport and logistical flows
4. Overall compactness reduces global movement times somewhat
5. Easier wayfinding
6. Potential for significantly improved Indoor Environmental Quality (IEQ), particularly daylighting, in the D&T
7. Consolidated building systems with improved energy performance

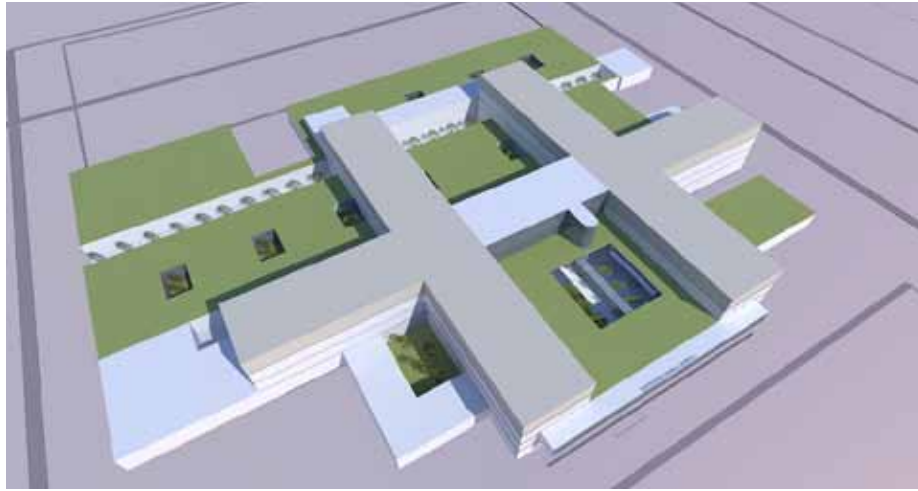


Figure 12.0 Frontview – 82 Beds



Figure 13.0 Frontview – 146 Beds



Figure 14.0 Rear view – 146 Beds

Greenfield Cost Estimate

Whitehorse General Hospital Strategic Facilities Plan
Program Estimate #3
April 2, 2012

PROJECT COST ESTIMATE (GREENFIELD SITE)

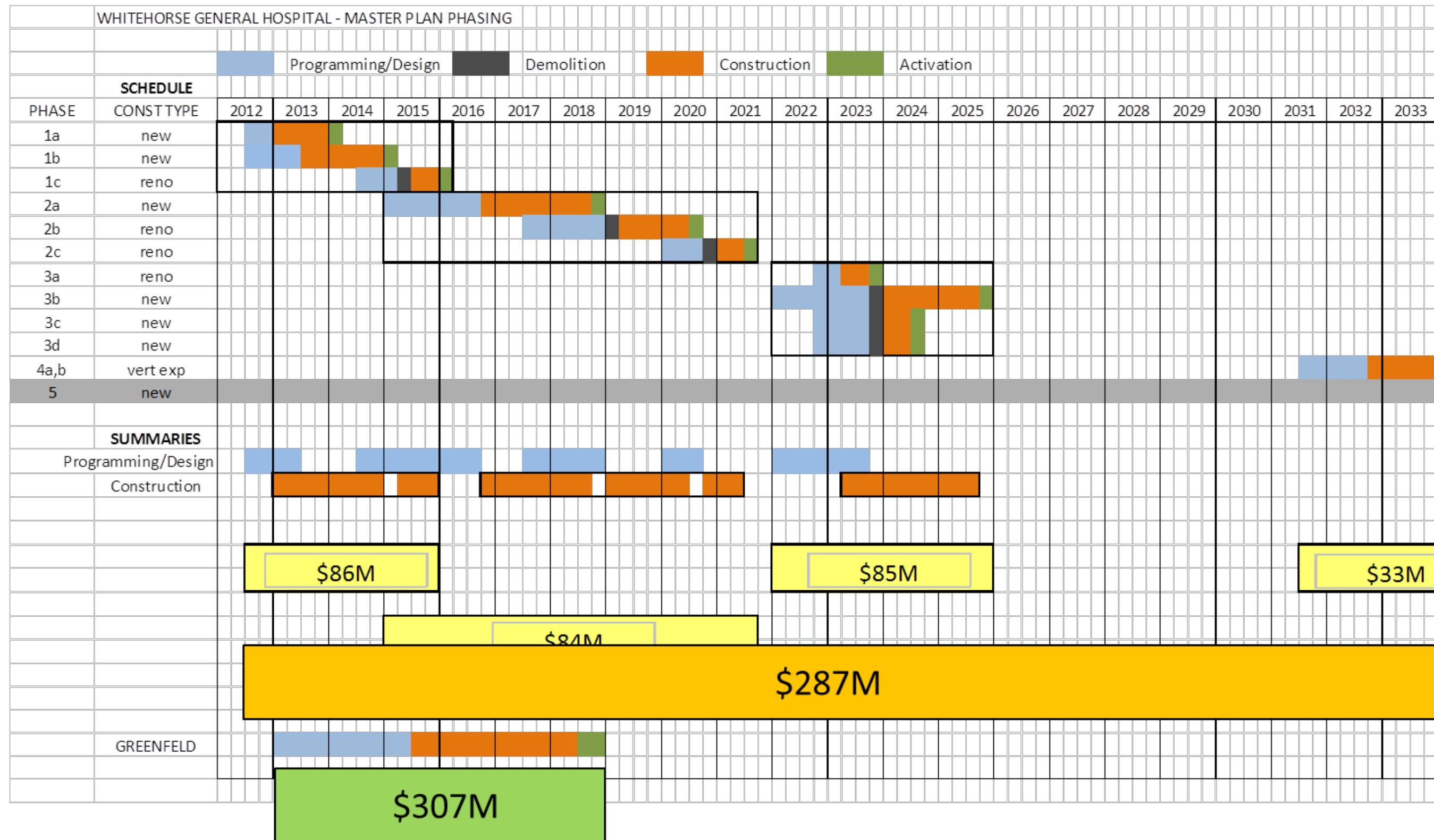
The estimated project costs may be summarized as follows:

Description	Year 2025	Year 2035
A. LAND COST	\$0	\$0
1 Land	\$0	\$0
2 Legal Fees	\$0	\$0
TOTAL PROJECT COST (March 2012 Dollars)	\$262,009,800	\$316,544,900
Gross Floor Area (New Build)	25,802 m ²	31,198 m ²
Net Building Cost \$/m ²	\$6,697/m ²	\$6,691/m ²
Net Construction Cost \$/m ²	\$7,030/m ²	\$7,025/m ²
Total Project Cost \$/m ²	\$10,155/m ²	\$10,146/m ²

Building Only

+ Land + Remediation (\$45M) = 307M

Schedule and Comparative Cost



Appendix A



APPENDIX A

Basic Lean Planning Concepts

The following information is general, descriptive information regarding the Lean methodology and principles which have been applied and used as a lens for creating this Master Program.

Lean Planning Principles & Strategies

The following five points outline the key principles required to successfully undertake Lean process improvement²:

1. Collaborate, really collaborate
2. Increase the relatedness of the participants
3. Develop a network of commitments
4. Optimize the whole, not the pieces
5. Tightly couple learning with action

These five principles drive Lean planning and enable it to focus on eliminating waste by integrating operational process improvement with the process of planning and designing the Whitehorse General Hospital master plan³.

There are eight wastes identified in Lean healthcare planning. They are as follows:

1. Overproduction
2. Waiting
3. Transportation
4. Complexity
5. Inventory
6. Motion
7. Underuse of staff
8. Defects

Overproduction

From the context of healthcare delivery, overproduction is evidenced by acceptance of poor utilization of spatial and human resources, time impacts from batch processing of requests and unnecessary replication of processes due to departmental fragmentation.

² Chambers, David (2009) Efficient Healthcare: Overcoming Broken Paradigms. Rice University, Houston
³ Black, John. R. (2008). The Toyota Way to Healthcare Excellence: Increase Efficiency and Improve Quality with Lean. Healthcare Administration Press.

Examples include:

- Lab holds tests to batch process them in the interest of minimizing cost per test; as a consequence of added time, patient stays are increased and overall costs are significantly higher
- Departments control elements of the registration and scheduling process, requiring patients to repeat these processes at each point in their journey

Measures that indicate overproduction or reduction of production include effective utilization rates, average length of stay (inpatient), and aggregated cycle times for completion of major milestone in the care plan.

Waiting

Waiting occurs throughout the patient care process. It occurs for the patient and it occurs for staff. Both wait for test results. Patients also wait at each check-in point for services to be initiated.

Measures for status and improvement include discreet queues and handoffs in the care pathway, time for completion of test requests (primarily imaging and lab), number of provider returns due to patient not available for indicated service, and patient wait times (aggregated to milestones).

Transportation

Transportation, simply put, is all the patient, staff, supplies and information movement required before a care pathway is completed. This is a high systemic issue in the current care delivery model.

Measures include total distance traveled (patients and staff) for each milestone in the care pathway; total discreet steps in the care pathway; distance and trip counts for access to supplies and medications.

Complexity

Complexity impacts healthcare delivery in two major ways:

1. Environments become cluttered with many discreet devices. These devices create visual complexity that, in its extreme, adds to the potential for errors and accidents, and at the least, adds time to ascertain “which button, dial or switch to use or respond to”.
2. The integration of clinical technologies into space also creates limits of what can be done in one space versus the other. These limits add to the waste of transportation discussed above. In fact, this assessment of waste is a very strong argument against traditional approaches based upon static concepts of function.

Measures include simplification of the human-technology interface (reduced

choices); reduced errors and accidents; reduced training requirements/quicker training certifications; reduced patient movement; and fewer patient treatment room types.

Inventory

Excess inventory includes redundant storage throughout typical healthcare facilities. Provider groups often rationalize that this is reasonable due to the ‘life-critical’ nature of their services. However, ‘just in time’ means exactly that. If essential supplies and medications are required for care, they are delivered just in time. A Kanban system, a ‘just in time’ system, of materials distribution has been implemented in some healthcare facility locations in the US and has proven to be very effective at decreasing excess inventory. This waste is multiplied due to multiple redundant care processes as noted above, each process supplied discreetly.

Measures include, total supplies required per adjusted patient discharge (a throughput metric), and supplies requiring replacement due to expired dates.

Motion

This waste deals with complex ergonomics and is a consequence of one of the complexity wastes described above. Complex motions require extensive training to avoid errors and accidents.

Measures for improving efficiency through reduction of complex motion are connected with incidents of staff injuries and patient accidents.

Under Use of Staff

Of all wastes, this waste is the most costly by far in the context of healthcare delivery. Resourcing the delivery of care with staff represents well over 60% of the costs for delivering care to patients. Increasing staffing efficiency is virtually not possible without changing patient and staff flow characteristics. But with changes to patient and staff flows, and the resulting dissolution of departments, the potential in this area is enormous. Every patient care location that duplicates processes adds human resource requirements.

Every unanticipated patient interaction adds human resources. Every similar clinical process separated by space adds human resources. The cumulative effect of these is a greater than 40% impact of waste on human resources.

In effect, departmental structures can never equal the sum of their parts when looking at the overall output of a service model, but multidisciplinary care teams configured to produce meaningful milestone outcomes in the care pathway, can surpass the sum of their parts.

Measures include discreet steps in patient flow for measured milestone

outcomes; distance traveled by patients and staff; aggregated cycle times; and ultimately, required full time equivalent staff per adjusted patient discharge.

Defects

Several major organizations have focused significant attention on patient safety issues and continue to press for a zero errors target. The most profound defects in the healthcare system are evidenced by accidental deaths, medical errors, patient falls, and hospital acquired infections.

Measures include those incidents indicated in the preceding paragraph.

Rational targets should include zero sentinel events (a sentinel event is defined as any unanticipated event in a healthcare setting resulting in death or serious physical or psychological injury to a patient or patients, not related to the natural course of the patient's illness), incidents of medical errors, patient falls, and readmissions due to errors or incompleteness of initial care provision. In the world of healthcare, errors hurt and even kill people. Our tolerance for them should be zero.

Appendix B



APPENDIX B
Costing Analysis



**WHITEHORSE
 GENERAL HOSPITAL**

Whitehorse, Yukon

March 28, 2012

Strategic Facilities Plan

Program Estimate #3

DRAFT

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1.0 INTRODUCTION

The estimate presented in this report is intended to provide a realistic assessment of the direct and indirect construction costs for the proposed redevelopment of the existing Whitehorse General Hospital located in Whitehorse, Yukon.

This estimate provides an order of magnitude estimate of the likely construction and project cost. The estimated costs contained in this report are based on the drawings and functional program area schedule prepared by Stantec. The information provided is not sufficiently detailed to allow for a fixed price contract to be solicited for the project at this stage. The estimate is to be utilized as a financial planning and modeling tool to assess the feasibility of the project. When the requirements of the project become more defined and are developed in later design documents, the estimate may vary from the costs summarized in this report.

In order to maintain the budget parameters established in this report, BTY strongly recommends that further cost estimates be prepared when the preliminary planning has been developed. We also recommend that estimates are prepared at the completion of major design stage milestones in order to track and monitor the budget.

2.0 PROJECT DESCRIPTION

The project involves the redevelopment of the existing Whitehorse General Hospital and includes additions and renovations. The preliminary schedule at the time this estimate was prepared indicate that the redevelopment will be constructed in four phases and span from year 2013 to 2024.

- Phase 1 – New MRI, Ambulance Station, Data Centre and East Building South Wing, and renovation of existing hospital Level 1 for Medical Imaging;
- Phase 2 – New East Building North Wing and renovation of existing hospital Level 1 for Interventional Suite;
- Phase 3 – New South Wing and renovation of existing hospital Level 1 for Health Records;
- Phase 4 – Add Level 4 and 5 to East Building

2.0 PROJECT DESCRIPTION (Cont'd)

The estimated costs for the new additions have assumed typical strip and pad footing with crawl space for frost protection. No piling foundation has been included.

Moderate renovation has been assumed for renovations to the existing hospital. It is assumed that the structural, mechanical and electrical systems of the existing building are generally in good condition. The primary scope of renovation is limited to the areas within the building envelope and includes:

- Reconfiguration of interior partitions
- Replacement of interior finishes
- Mechanical and electrical modifications to adapt the system to the new layout
- Replacement of plumbing fixtures
- Minor structural modifications if necessary
- Seismic upgrades (*if applicable*) are excluded

DRAFT

3.0 EXECUTIVE SUMMARY

The current estimated costs may be summarized as follows:

Description	Phase 1	Phase 2	Phase 3	Phase 4	Total
A. Land Cost	Excl.	Excl.	Excl.	Excl.	Excl.
B. Construction	61,802,800	60,099,000	61,767,900	23,822,300	207,492,000
C. Allowances	9,904,500	10,416,800	9,724,500	3,692,400	33,738,200
D. Professional Fees	8,088,700	7,954,200	8,064,200	3,103,600	27,210,700
E. Connection Fees & Permits	473,300	465,500	472,000	181,600	1,592,400
F. Management & Overhead	4,481,700	4,407,200	4,468,200	1,719,600	15,076,700
G. Project Contingency	652,200	641,300	650,200	250,200	2,193,900
H. Furnishings, Fittings & Equipment	Excl.	Excl.	Excl.	Excl.	Excl.
I. Goods & Services Taxes (5%)	4,270,100	4,199,200	4,257,400	1,638,500	14,365,200
Sub-Total Project Cost	\$89,673,300	\$88,183,200	\$89,404,400	\$34,408,200	\$301,669,100
J. Escalation Reserve	Excl.	Excl.	Excl.	Excl.	Excl.
Total Project Cost (March 2012 Dollars)	\$89,673,300	\$88,183,200	\$89,404,400	\$34,408,200	\$301,669,100

Please note where zero dollar values are stated, BTY has excluded these costs and the values should be carried in a separate budget (if applicable).

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4.0 AREAS

The gross floor areas of the project based on the information provided are:

PHASE 1

Location	Phase 1a		Phase 1b		Phase 1c		Total	
	Reno	New	Reno	New	Reno	New	Reno	New
Basement				1,555			0	1,555
Level 1		635		1,225	535		535	1,860
Level 2		265		985			0	1,250
Level 3				950			0	950
Building Gross Up Area		57		2,639			0	2,696
TOTAL BUILDING AREAS	0 m²	957 m²	0 m²	7,354 m²	535 m²	0 m²	535 m²	8,311 m²

PHASE 2

Location	Phase 2a		Phase 2b		Phase 2c		Total	
	Reno	New	Reno	New	Reno	New	Reno	New
Basement		770					0	770
Level 1		2,095	1,260		420		1,680	2,095
Level 2		705					0	705
Level 3		770					0	770
Building Gross Up Area		2,962					0	2,962
TOTAL BUILDING AREAS	0 m²	7,302 m²	1,260 m²	0 m²	420 m²	0 m²	1,680 m²	7,302 m²

PHASE 3

Location	Phase 3a		Phase 3b		Phase 3c		Total	
	Reno	New	Reno	New	Reno	New	Reno	New
Basement							0	0
Level 1	415			1,451		369	415	1,820
Level 2				1,710			0	1,710
Level 3				1,695			0	1,695
Level 4				1,089			0	1,089
Building Gross Up Area				1,900		131	0	2,031
TOTAL BUILDING AREAS	415 m²	0 m²	0 m²	7,845 m²	0 m²	500 m²	415 m²	8,345 m²

PHASE 4

Location	Phase 4		Total	
	Reno	New	Reno	New
Level 2		1,760	0	1,760
Level 3		1,760	0	1,760
Building Gross Up Area		616	0	616
TOTAL BUILDING AREAS	0 m²	4,136 m²	0 m²	4,136 m²

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5.0 PROJECT COST ESTIMATE

The estimated project costs may be summarized as follows:

Description	Phase 1			Phase 2			Phase 3			Phase 4			Total		
	Renovation	Addition	Sub-Total	Renovation	Addition	Sub-Total	Renovation	Addition	Sub-Total	Renovation	Addition	Sub-Total	Renovation	Addition	Total
A. LAND COST	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1 Land	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 Legal Fees	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B. CONSTRUCTION	\$2,955,500	\$58,847,300	\$61,802,800	\$10,013,000	\$50,086,000	\$60,099,000	\$1,368,200	\$60,399,700	\$61,767,900	\$0	\$23,822,300	\$23,822,300	\$14,336,700	\$193,155,300	\$207,492,000
1 New Build		49,872,100	49,872,100		39,387,100	39,387,100		48,219,300	48,219,300		20,879,400	20,879,400		158,357,900	158,357,900
2 Renovation	2,686,800		2,686,800	9,102,700		9,102,700	1,243,800		1,243,800	0			13,033,300	0	13,033,300
3 Aboveground Parkade (240 stalls)					4,000,000	4,000,000		4,000,000	4,000,000					8,000,000	8,000,000
4 Site Development (Allowance)															
- Retaining Wall (Allowance)					500,000	500,000								500,000	500,000
- Other Site Works (Allowance)		2,775,700	2,775,700		2,192,100	2,192,100		2,683,700	2,683,700		1,162,100	1,162,100		8,813,600	8,813,600
5 Demolition & Ancillary Works (Interfaces, etc.)		3,199,500	3,199,500		2,806,800	2,806,800		4,296,700	4,296,700		1,180,800	1,180,800		11,483,800	11,483,800
6 Phasing Premium on Renovations	268,700		268,700	910,300		910,300	124,400		124,400	0			1,303,400	0	1,303,400
7 Existing Energy Centre Upgrade		3,000,000	3,000,000		1,200,000	1,200,000		1,200,000	1,200,000		600,000	600,000		6,000,000	6,000,000
8 Off-Site Works (Excluded)															
9 Asbestos Removal (Excluded)															
C. ALLOWANCES	\$783,200	\$9,121,300	\$9,904,500	\$2,653,500	\$7,763,300	\$10,416,800	\$362,500	\$9,362,000	\$9,724,500	\$0	\$3,692,400	\$3,692,400	\$3,799,200	\$29,939,000	\$33,738,200
1 Design Contingency (Design & Program Changes)	443,300	5,884,700	6,328,000	1,502,000	5,008,800	6,510,800	205,200	6,040,000	6,245,200	0	2,382,200	2,382,200	2,150,500	19,315,500	21,466,000
2 Post Tender Change Order Contingency	339,900	3,236,600	3,576,500	1,151,500	2,754,700	3,906,200	157,300	3,322,000	3,479,300	0	1,310,200	1,310,200	1,648,700	10,623,500	12,272,200
D. PROFESSIONAL FEES	\$421,800	\$7,666,900	\$8,088,700	\$1,428,800	\$6,525,400	\$7,954,200	\$195,200	\$7,869,000	\$8,064,200	\$0	\$3,103,600	\$3,103,600	\$2,045,800	\$25,164,900	\$27,210,700
1 Programming	5,600	102,000	107,600	19,000	86,800	105,800	2,600	104,600	107,200	0	41,300	41,300	27,200	334,700	361,900
2 Architectural	210,500	3,826,600	4,037,100	713,100	3,256,900	3,970,000	97,400	3,927,600	4,025,000	0	1,549,100	1,549,100	1,021,000	12,560,200	13,581,200
3 Structural	37,400	679,700	717,100	126,700	578,500	705,200	17,300	697,600	714,900	0	275,100	275,100	181,400	2,230,900	2,412,300
4 Mechanical	74,800	1,359,400	1,434,200	253,300	1,157,000	1,410,300	34,600	1,395,200	1,429,800	0	550,300	550,300	362,700	4,461,900	4,824,600
5 Electrical	37,400	679,700	717,100	126,700	578,500	705,200	17,300	697,600	714,900	0	275,100	275,100	181,400	2,230,900	2,412,300
6 Cost Consultant	18,700	339,800	358,500	63,300	289,200	352,500	8,700	348,800	357,500	0	137,600	137,600	90,700	1,115,400	1,206,100
7 LEED Consultant (Excluded)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 Other Consultants and Disbursements	37,400	679,700	717,100	126,700	578,500	705,200	17,300	697,600	714,900	0	275,100	275,100	181,400	2,230,900	2,412,300
E. CONNECTION FEES & PERMITS	\$24,700	\$448,600	\$473,300	\$83,600	\$381,900	\$465,500	\$11,500	\$460,500	\$472,000	\$0	\$181,600	\$181,600	\$119,800	\$1,472,600	\$1,592,400
1 Development Cost Charges	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 Building Permits	24,700	448,600	473,300	83,600	381,900	465,500	11,500	460,500	472,000	0	181,600	181,600	119,800	1,472,600	1,592,400
F. MANAGEMENT & OVERHEAD	\$233,700	\$4,248,000	\$4,481,700	\$791,700	\$3,615,500	\$4,407,200	\$108,200	\$4,360,500	\$4,468,200	\$0	\$1,719,600	\$1,719,600	\$1,133,600	\$13,943,100	\$15,076,700
1 Project Management Fee	93,500	1,699,200	1,792,700	316,700	1,446,200	1,762,900	43,300	1,744,000	1,787,300	0	687,900	687,900	453,500	5,577,300	6,030,800
2 Owners Planning and Administrative Cost	46,700	849,600	896,300	158,300	723,100	881,400	21,600	872,000	893,600	0	343,900	343,900	226,600	2,788,600	3,015,200
3 Project Insurance	56,100	1,019,500	1,075,600	190,000	867,700	1,057,700	26,000	1,046,400	1,072,400	0	412,700	412,700	272,100	3,346,300	3,618,400
4 Project Commissioning, Move-In	37,400	679,700	717,100	126,700	578,500	705,200	17,300	697,600	714,900	0	275,100	275,100	181,400	2,230,900	2,412,300
G. PROJECT CONTINGENCY (5% of Items D to F)	\$34,000	\$618,200	\$652,200	\$115,200	\$526,100	\$641,300	\$15,700	\$634,500	\$650,200	\$0	\$250,200	\$250,200	\$164,900	\$2,029,000	\$2,193,900
SUB-TOTAL	\$4,452,900	\$80,950,300	\$85,403,200	\$15,085,800	\$68,898,200	\$83,984,000	\$2,061,300	\$83,085,700	\$85,147,000	\$0	\$32,769,700	\$32,769,700	\$21,600,000	\$265,703,900	\$287,303,900
H. FURNISHINGS, FITTINGS & EQUIPMENT (Excluded)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
SUB-TOTAL	\$4,452,900	\$80,950,300	\$85,403,200	\$15,085,800	\$68,898,200	\$83,984,000	\$2,061,300	\$83,085,700	\$85,147,000	\$0	\$32,769,700	\$32,769,700	\$21,600,000	\$265,703,900	\$287,303,900
I Goods and Services Tax (5%)	\$222,600	\$4,047,500	\$4,270,100	\$754,300	\$3,444,900	\$4,199,200	\$103,100	\$4,154,300	\$4,257,400	\$0	\$1,638,500	\$1,638,500	\$1,080,000	\$13,285,200	\$14,365,200
SUB-TOTAL PROJECT COST (March 2012 Dollars)	\$4,675,500	\$84,997,800	\$89,673,300	\$15,840,100	\$72,343,100	\$88,183,200	\$2,164,400	\$87,240,000	\$89,404,400	\$0	\$34,408,200	\$34,408,200	\$22,680,000	\$278,989,100	\$301,669,100
J ESCALATION (Excluded)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL PROJECT COST (March 2012 Dollars)	\$4,675,500	\$84,997,800	\$89,673,300	\$15,840,100	\$72,343,100	\$88,183,200	\$2,164,400	\$87,240,000	\$89,404,400	\$0	\$34,408,200	\$34,408,200	\$22,680,000	\$278,989,100	\$301,669,100
Gross Floor Area (New Build)		8,311 m ²	8,311 m ²		7,302 m ²	7,302 m ²		8,345 m ²	8,345 m ²		4,136 m ²	4,136 m ²		28,094 m ²	28,094 m ²
Gross Floor Area (Renovation)	535 m ²		535 m ²	1,680 m ²		1,680 m ²	415 m ²		415 m ²	0 m ²			2,630 m ²		2,630 m ²
Net Building Cost \$/m ²	\$5,022 /m ²	\$6,001 /m ²	\$5,942 /m ²	\$5,418 /m ²	\$5,394 /m ²	\$5,399 /m ²	\$2,997 /m ²	\$5,778 /m ²	\$5,646 /m ²		\$5,048 /m ²	\$5,048 /m ²	\$4,956 /m ²	\$5,637 /m ²	\$5,578 /m ²
Net Construction Cost \$/m ²	\$5,524 /m ²	\$7,081 /m ²	\$6,987 /m ²	\$5,960 /m ²	\$6,859 /m ²	\$6,691 /m ²	\$3,297 /m ²	\$7,238 /m ²	\$7,051 /m ²		\$5,760 /m ²	\$5,760 /m ²	\$5,451 /m ²	\$6,875 /m ²	\$6,753 /m ²
Total Project Cost \$/m ²	\$8,739 /m ²	\$10,227 /m ²	\$10,137 /m ²	\$9,429 /m ²	\$9,907 /m ²	\$9,818 /m ²	\$5,215 /m ²	\$10,454 /m ²	\$10,206 /m ²		\$8,319 /m ²	\$8,319 /m ²	\$8,624 /m ²	\$9,931 /m ²	\$9,819 /m ²

6.0 DEFINITIONS

The estimate for the project has been prepared and summarized in the following categories. The scope of work covered within each category is as follows:

A. Land Cost:

These costs include the acquisition of the site and associated fees, service obligations and property purchase tax.

B. Construction:

This category encompasses all direct and indirect construction costs including building(s), associated site development work and general contractor's general requirements and fee.

C. Allowances:

Allowances for cost increases as the design is developed and/or the work is carried out on site.

D. Professional Fees:

Within this section professional fees have been estimated for the primary design team consultants including: the architect, structural, mechanical & electrical engineers, and the cost consultant. Other specialist consultants and an allowance for disbursements are also included. Where available, all consultant fees have been calculated based on the current schedule of recommended charges published by the professional associations.

E. Municipal & Connection Fees:

This section includes an estimate for all project related fees and charges required by the City and other authorities having jurisdiction as part of the development. These costs include Development Cost Charges (DCC's), Building Permits, levies and associated legal and survey fees. These costs are based on current City formulas and schedules.

6.0 DEFINITIONS (Cont'd)

F. Management & Overhead:

The project management fee is charged by a company or individual providing project management services. The Owner's Planning and Administrative cost covers the owner's project-related management costs. Provisions are also included for project insurance, commissioning the facility prior to handover and move-in costs.

G. Project Contingency:

This allowance is provided as an owner's contingency to cover changes to non-construction items.

H. Furnishings, Fittings & Equipment:

The Furnishings, Fittings & Equipment estimate for the project has been compiled using a combination of BTY Group's own historical cost data and information specific to this project.

I. Goods and Services Tax:

The amount is adjusted to reflect rebates available to certain types of project.

J. Escalation

This is an allowance for increases in prices of inputs to the project, occurring after the date of the estimate, on the final cost of the project. This allowance is calculated based on BTY's projected annual escalation rates as stated in this report.

7.0 BUILDING COST SUMMARY

The estimated building construction costs are summarized as follows:

PHASE 1 - East Building South Wing

Component	Renovation			Addition			TOTAL		
	BGSM (m ²)	Unit Rate (\$/m ²)	Total (\$)	BGSM (m ²)	Unit Rate (\$/m ²)	Total (\$)	BGSM (m ²)	Unit Rate (\$/m ²)	Total (\$)
1 Phase 1a	0		0	900	6,843	6,158,100	900	6,842	6,158,100
2 Phase 1b	0		0	4,715	6,416	30,247,500	4,715	6,415	30,247,500
3 Phase 1c	535	5,023	2,686,800	0		0	535	5,022	2,686,800
4 Building Gross Area	0		0	2,696	4,995	13,466,500	2,696	4,995	13,466,500
Total Building Cost	535	5,023	2,686,800	8,311	6,001	49,872,100	8,846	5,942	52,558,900

PHASE 2 - East Building North Wing

Component	Renovation			Addition			TOTAL		
	BGSM (m ²)	Unit Rate (\$/m ²)	Total (\$)	BGSM (m ²)	Unit Rate (\$/m ²)	Total (\$)	BGSM (m ²)	Unit Rate (\$/m ²)	Total (\$)
1 Phase 2a	0		0	4,340	5,667	24,591,800	4,340	5,666	24,591,800
2 Phase 2b	1,260	5,551	6,993,500	0		0	1,260	5,550	6,993,500
3 Phase 2c	420	5,022	2,109,200	0		0	420	5,022	2,109,200
4 Building Gross Area	0		0	2,962	4,996	14,795,300	2,962	4,995	14,795,300
Total Building Cost	1,680	5,419	9,102,700	7,302	5,395	39,387,100	8,982	5,399	48,489,800

PHASE 3 - South Building

Component	Renovation			Addition			TOTAL		
	BGSM (m ²)	Unit Rate (\$/m ²)	Total (\$)	BGSM (m ²)	Unit Rate (\$/m ²)	Total (\$)	BGSM (m ²)	Unit Rate (\$/m ²)	Total (\$)
1 Phase 3a	415	2,998	1,243,800	0		0	415	2,997	1,243,800
2 Phase 3b	0		0	5,945	5,991	35,611,700	5,945	5,990	35,611,700
3 Phase 3c & d	0		0	369	6,675	2,462,800	369	6,674	2,462,800
4 Building Gross Area	0		0	2,031	4,995	10,144,800	2,031	4,995	10,144,800
Total Building Cost	415	2,998	1,243,800	8,345	5,779	48,219,300	8,760	5,646	49,463,100

PHASE 4 - East Building North & South Wings

Component	Renovation			Addition			TOTAL		
	BGSM (m ²)	Unit Rate (\$/m ²)	Total (\$)	BGSM (m ²)	Unit Rate (\$/m ²)	Total (\$)	BGSM (m ²)	Unit Rate (\$/m ²)	Total (\$)
1 Phase 4	0		0	3,520	5,058	17,802,400	3,520	5,058	17,802,400
2 Building Gross Area	0		0	616	4,996	3,077,000	616	4,995	3,077,000
Total Building Cost	0		0	4,136	5,049	20,879,400	4,136	5,048	20,879,400

8.0 EXCLUSIONS

The estimate specifically **excludes** the following:

- Land costs and associated legal fees
- Financing costs
- Temporary facilities for user groups during construction
- Removal of hazardous materials
- Unforeseen ground conditions and associated extras
- Piling foundation if required
- Furnishings, Fittings & Equipment
- Seismic upgrades and code upgrades to the existing building
- New addition or renovation to existing energy centre and loading dock
- Off-site works
- Relocation costs such as fitting out existing/new space for temporary use
- Phasing of works and accelerated schedule
- Environmental costs (if any)
- Costs associated with "LEED" certification
- Decanting & moving
- Erratic market conditions, such as lack of bidders, proprietary specifications
- Life cycle / maintenance costs
- Escalation past March 2012

9.0 TAXES

The estimate **includes** the Provincial Sales Tax (P.S.T.) where applicable. The estimate also **includes** the Goods & Services Tax (G.S.T.).

10.0 ESCALATION

No cost escalation allowance has been included in the estimate. BTY strongly recommends that the client establish a separate budget to cover the escalation cost from the date of this estimate to the mid-point of construction for the project. Our current projected escalation rates are shown below.

Current BTY Group Forecast	2012	2013	2014	2015 >
	4%	4%	4%	4%

11.0 PRICING

The estimate has been priced at current rates taking into account the size, location and nature of the project. The unit rates utilized are considered competitive for a project of this type, bid under a stipulated lump sum form of tender in an open market, with a minimum of five (5) bids, supported by the requisite number of sub-contractors.

The estimate allows for labour, material, equipment and other input costs at current rates and levels of productivity. It does not take into account extraordinary market conditions, where bidders may be few and may include in their tenders disproportionate contingencies and profit margins.

12.0 RISK MITIGATION

In order to maintain the budget parameters established in this report, and given the current volatile nature of the construction market place, BTY strongly recommends that further cost estimates are prepared at major design stage milestones to track and monitor the cost of the proposed design as it evolves. The major milestone estimates are typically carried out at the Program, Schematic Design, Design Development, 50% Working Drawings, 75% Working Drawings and 95% Working Drawings stages.

13.0 CONTINGENCIES

Design Allowance

Design contingency allowances of Ten Percent (10%) for New Construction and Fifteen Percent (15%) for Renovation have been included in the estimate to cover modifications to the program, drawings and specifications during the design development stages. This allowance should be re-considered as the design development proceeds with this contingency being ultimately reduced to zero at the tender stage.

Construction Allowance

Allowances of Five Percent (5%) for New Construction and Ten Percent (10%) for Renovation have been included in the estimate for changes occurring during construction period of the project. This amount may be expended during the construction phase if there are modifications to the drawings and specifications.

Project Contingency

An allowance of Five Percent (5%) of the soft costs has been included in the project cost plan to cover changes to non-construction items.

14.0 PROJECT COMPARABLES

Project	Bid Date	GFA m ²	GFA sf	Escalated Building \$	Current Unit Cost	
					\$/m ²	\$/sf
1 Abbotsford Hospital	Apr-04	75,324 m ²	810,781 sf	\$379,357,700	\$5,036/m ²	\$468/sf
2 Fort St John Hospital	Jan-09	23,817 m ²	256,364 sf	\$137,104,700	\$5,757/m ²	\$535/sf
3 Kelowna & Vernon Jubilee	Feb-08	50,772 m ²	546,505 sf	\$274,612,800	\$5,409/m ²	\$502/sf
4 Jim Pattison Outpatient Care and Surgery Centre	Aug-08	17,500 m ²	188,368 sf	\$101,524,500	\$5,801/m ²	\$539/sf
5 Peter Lougheed Centre	Jun-05	38,094 m ²	410,040 sf	\$188,154,700	\$4,939/m ²	\$459/sf
6 Alberta Children's Hospital	Jun-03	68,651 m ²	738,953 sf	\$367,017,300	\$5,346/m ²	\$497/sf
Average		45,693 m²	491,835 sf		\$5,281/m²	\$491/sf
Whitehorse General Hospital - New Addition Only		28,094 m²	302,401 sf	\$184,438,700	* \$6,565/m²	\$610/sf

Note: * Included building cost, site works and design allowance

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APPENDIX I

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Construction Cost Breakdown

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BUILDING COST BREAKDOWN

PHASE 1 - East Building South Wing

Component	Renovation			New Addition			TOTAL		
	SUBTOTAL			SUBTOTAL					
	CGSM	Unit Rate (\$/m2)	Total (\$)	CGSM	Unit Rate (\$/m2)	Total (\$)	CGSM	Unit Rate (\$/m2)	Total (\$)
A. Phase 1a									
Phase 1a - Level 1									
1				220.0	8,370	1,841,400	220.0	8,370	1,841,400
2				265.0	4,995	1,323,700	265.0	4,995	1,323,700
3				150.0	13,770	2,065,500	150.0	13,770	2,065,500
Phase 1a - Level 2									
4				265.0	3,500	927,500	265.0	3,500	927,500
Sub-Total				900.0	6,842	6,158,100	900.0	6,842	6,158,100
B. Phase 1b									
Phase 1b - Level 1									
1				1,105.0	9,315	10,293,100	1,105.0	9,315	10,293,100
2				120.0	8,640	1,036,800	120.0	8,640	1,036,800
3									
Phase 1b - Level 2									
4				705.0	7,695	5,425,000	705.0	7,695	5,425,000
5				280.0	3,500	980,000	280.0	3,500	980,000
Phase 1b - Level 3									
6				950.0	4,995	4,745,300	950.0	4,995	4,745,300
Phase 1b - Basement									
7									
8				1,365.0	4,995	6,818,200	1,365.0	4,995	6,818,200
9				85.0	4,995	424,600	85.0	4,995	424,600
10				105.0	4,995	524,500	105.0	4,995	524,500
Sub-Total				4,715.0	6,415	30,247,500	4,715.0	6,415	30,247,500
C. Phase 1c									
Phase 1c - Level 1									
1	535	5,022	2,686,800				535.0	5,022	2,686,800
Sub-Total				535	5,022	2,686,800	535.0	5,022	2,686,800
TOTAL CGSM				535	5,022	2,686,800	5,615.0	6,484	36,405,600
Building Gross Up Area									
Phase 1a - Level 1				40.0	4,995	199,800	40.0	4,995	199,800
Phase 1a - Level 2				17.0	4,994	84,900	17.0	4,994	84,900
Phase 1b - Level 1				1,022.0	4,995	5,104,900	1,022.0	4,995	5,104,900
Phase 1b - Level 2				758.0	4,995	3,786,200	758.0	4,995	3,786,200
Phase 1b - Level 3				353.0	4,995	1,763,200	353.0	4,995	1,763,200
Phase 1b - Basement				506.0	4,995	2,527,500	506.0	4,995	2,527,500
Sub-Total				2,696.0	4,995	13,466,500	2,696.0	4,995	13,466,500
TOTAL BUILDING COST (Phase 1)				535	5,022	\$2,686,800	8,311	6,001	\$49,872,100

BUILDING COST BREAKDOWN

PHASE 2 - East Building North Wing

Component	Renovation			New Addition			TOTAL					
	SUBTOTAL			SUBTOTAL								
	CGSM	Unit Rate (\$/m2)	Total (\$)	CGSM	Unit Rate (\$/m2)	Total (\$)	CGSM	Unit Rate (\$/m2)	Total (\$)			
A. Phase 2a												
Phase 2a - Level 1												
1						715.0	4,995	3,571,400	715.0	4,995	3,571,400	
2						480.0	4,995	2,397,600	480.0	4,995	2,397,600	
3						160.0	4,995	799,200	160.0	4,995	799,200	
4						320.0	4,995	1,598,400	320.0	4,995	1,598,400	
5						240.0	4,995	1,198,800	240.0	4,995	1,198,800	
6						130.0	6,345	824,900	130.0	6,345	824,900	
7						50.0	5,130	256,500	50.0	5,130	256,500	
8												
9												
Phase 2a - Level 2												
10						0.0		985,600	0.0		985,600	
11						490.0	7,020	3,439,800	490.0	7,020	3,439,800	
12						75.0	3,500	262,500	75.0	3,500	262,500	
13						140.0	6,615	926,100	140.0	6,615	926,100	
14						0.0		825,500	0.0		825,500	
Phase 2a - Level 3												
15						770.0	4,995	3,846,200	770.0	4,995	3,846,200	
Phase 2a - Basement												
16						480.0	4,995	2,397,600	480.0	4,995	2,397,600	
17						125.0	3,500	437,500	125.0	3,500	437,500	
18						165.0	4,995	824,200	165.0	4,995	824,200	
Sub-Total				4,340.0	5,666	24,591,800	4,340.0	5,666	24,591,800			
B. Phase 2b												
Phase 2b - Level 1												
1						1,030	5,994	6,173,800				
									1,030.0	5,994	6,173,800	
2						230	3,564	819,700				
									230.0	3,564	819,700	
Sub-Total				1,260	5,550	6,993,500			1,260.0	5,550	6,993,500	
C. Phase 2c												
Phase 2c - Level 1												
1						420	5,022	2,109,200				
									420.0	5,022	2,109,200	
Sub-Total				420	5,022	2,109,200			420.0	5,022	2,109,200	
TOTAL CGSM				1,680	5,418	9,102,700	4,340.0	5,666	24,591,800	6,020.0	5,597	33,694,500
Building Gross Up Area												
Phase 2a - Level 1							1,430.0	4,995	7,142,900	1,430.0	4,995	7,142,900
Phase 2a - Level 2							962.0	4,995	4,805,200	962.0	4,995	4,805,200
Phase 2a - Level 2 (Building Services - AHUs)							510.0	4,995	2,547,500	510.0	4,995	2,547,500
Phase 2a - Level 3							60.0	4,995	299,700	60.0	4,995	299,700
Sub-Total							2,962.0	4,995	14,795,300	2,962.0	4,995	14,795,300
TOTAL BUILDING COST (Phase 2)				1,680	5,418	\$9,102,700	7,302	5,394	\$39,387,100	8,982	5,399	\$48,489,800



BUILDING COST BREAKDOWN

PHASE 3 - South Building

Component	Renovation			New Addition			TOTAL		
	SUBTOTAL			SUBTOTAL					
	CGSM	Unit Rate (\$/m2)	Total (\$)	CGSM	Unit Rate (\$/m2)	Total (\$)	CGSM	Unit Rate (\$/m2)	Total (\$)
A. Phase 3a									
Phase 3a - Level 1									
1 Health Records (Reno of Current Medical Imaging)	415	2,997	1,243,800				415.0	2,997	1,243,800
Sub-Total	415	2,997	1,243,800				415.0	2,997	1,243,800
B. Phase 3b									
Phase 3b - Level 1									
1 First Nations Central			350.0	5,670	1,984,500	350.0	5,670	1,984,500	
2 Admissions			160.0	5,670	907,200	160.0	5,670	907,200	
3 Public Space			480.0	5,670	2,721,600	480.0	5,670	2,721,600	
4 PT/OT Language			320.0	5,670	1,814,400	320.0	5,670	1,814,400	
5 Admissions (Shelled)			41.0	3,500	143,500	41.0	3,500	143,500	
6 PT/OT Language (Shelled)			100.0	3,500	350,000	100.0	3,500	350,000	
Phase 3b - Level 2									
1 Haemodialysis			260.0	6,750	1,755,000	260.0	6,750	1,755,000	
2 Haemodialysis 2035 Expansion (Shelled)			60.0	3,500	210,000	60.0	3,500	210,000	
3 Ambulatory Clinics - 2/3 & Workspace			825.0	7,695	6,348,400	825.0	7,695	6,348,400	
4 Building Services - AHUs			565.0	4,995	2,822,200	565.0	4,995	2,822,200	
Phase 3b - Level 3									
1 Chemotherapy			120.0	6,075	729,000	120.0	6,075	729,000	
2 Chemotherapy 2035 Expansion (Shelled)			70.0	3,500	245,000	70.0	3,500	245,000	
3 Cardiac Stress Testing			50.0	6,075	303,800	50.0	6,075	303,800	
4 Ambulatory Clinics - 1/3 & Workspace			415.0	7,695	3,193,400	415.0	7,695	3,193,400	
5 Shelled Space			260.0	3,500	910,000	260.0	3,500	910,000	
6 Workspace			100.0	4,995	499,500	100.0	4,995	499,500	
7 Campus Learning/Knowledge Centre			680.0	5,940	4,039,200	680.0	5,940	4,039,200	
Phase 3b - Level 4									
1 Facility Administration			245.0	4,995	1,223,800	245.0	4,995	1,223,800	
2 Meeting Space			320.0	4,995	1,598,400	320.0	4,995	1,598,400	
2 Meeting Space			80.0	3,500	280,000	80.0	3,500	280,000	
3 Information Systems			240.0	11,745	2,818,800	240.0	11,745	2,818,800	
4 Facility Administration (Shelled)			62.0	3,500	217,000	62.0	3,500	217,000	
5 Meeting Space (Shelled)			80.0	3,500	280,000	80.0	3,500	280,000	
6 Information Systems (Shelled)			62.0	3,500	217,000	62.0	3,500	217,000	
Sub-Total	0	0	5,945.0	5,990	35,611,700	5,945.0	5,990	35,611,700	
Phase 3c - Level 1									
1 Laboratory			144.0	6,345	913,700	144.0	6,345	913,700	
2 Food Services			225.0	6,885	1,549,100	225.0	6,885	1,549,100	
Sub-Total	0	0	369.0	6,674	2,462,800	369.0	6,674	2,462,800	
TOTAL CGSM	415	2,997	1,243,800	6,314.0	6,030	38,074,500	6,729.0	5,843	39,318,300
Building Gross Up Area									
Phase 3b - Level 1			974.0	4,995	4,865,100	974.0	4,995	4,865,100	
Phase 3b - Level 2			290.0	4,995	1,448,600	290.0	4,995	1,448,600	
Phase 3b - Level 3			280.0	4,995	1,398,600	280.0	4,995	1,398,600	
Phase 3b - Level 4			356.0	4,995	1,778,200	356.0	4,995	1,778,200	
Phase 3c - Level 1			131.0	4,995	654,300	131.0	4,995	654,300	
Sub-Total			2,031.0	4,995	10,144,800	2,031.0	4,995	10,144,800	
TOTAL BUILDING COST (Phase 3)	415	2,997	\$1,243,800	8,345	5,778	\$48,219,300	8,760	5,646	\$49,463,100



BUILDING COST BREAKDOWN

PHASE 4 - East Building North & South Wings

Component	Renovation			New Addition			TOTAL		
	SUBTOTAL			SUBTOTAL					
	CGSM	Unit Rate (\$/m2)	Total (\$)	CGSM	Unit Rate (\$/m2)	Total (\$)	CGSM	Unit Rate (\$/m2)	Total (\$)
A. Phase 4									
Phase 4 - Level 4									
1 Med IPU 24-beds - 2035				1,760.0	6,615	11,642,400	1,760.0	6,615	11,642,400
Phase 4 - Level 5									
1 Med IPU 24-beds - 2035 (Shelled)				1,760.0	3,500	6,160,000	1,760.0	3,500	6,160,000
TOTAL CGSM				3,520.0	5,058	17,802,400	3,520.0	5,058	17,802,400
Building Gross Up Area									
Phase 4 - Level 4				308.0	4,995	1,538,500	308.0	4,995	1,538,500
Phase 4 - Level 5				308.0	4,995	1,538,500	308.0	4,995	1,538,500
Sub-Total				616.0	4,995	3,077,000	616.0	4,995	3,077,000
TOTAL BUILDING COST (Phase 4)				4,136	5,048	\$20,879,400	4,136	5,048	\$20,879,400

SITE WORKS

	Quantity	Unit	Unit Rate	Amount
On Site Development				
Site Clearance	47,225	m ²	4	189,000
Demolish hard paving, etc.	38,725	m ²	20	775,000
Asphalt Paving	27,971	m ²	68	1,902,000
Concrete paving	3,964	m ²	128	507,000
Concrete curb	2,752	m ²	47	129,000
Miscellaneous Stairs & Walkways	1	sum	100,000	100,000
Exterior Signage	1	sum	150,000	150,000
Site Furnishings	1	sum	100,000	100,000
Soft Landscaping	6,526	m ²	68	444,000
Mechanical Site Services (on site)	1	sum	1,650,000	1,650,000
Electrical Site Services (on site)	1	sum	1,000,000	1,000,000
Duplex receptacles for block heaters	268	no	1,750	468,000
Misc. Allowance	1	sum	250,000	250,000
Sub-total				7,664,000
General Requirements		10.00%		766,400
Fees		5.00%		383,200
TOTAL				\$8,813,600

Other Scope of Works

	Quantity	Unit	Unit Rate	Amount
PHASE 1				
Phase 1a				
Demolish existing ambulance station	500	m ²	108	54,000
Renovation for new loading dock adjacent Data Centre	1	sum	200,000	200,000
Temporary MRI AHU	1	sum	60,000	60,000
Interface between MRI and the existing hospital (29 m long)	160	m ²	1,350	215,300
Phase 1b - Level 1				
Interface between New South Wing and Phase 1a MRI, and existing hospital (41 m long)	226	m ²	1,350	304,400
Corridor to new Phase 1a MRI	48	m ²	4,995	237,300
Ditto interface (22 m long)	121	m ²	1,350	163,400
Temporary corridor (North) to existing hospital	50	m ²	1,350	67,500
Phase 1b - Level 2				
Re & re to Phase 1a MRI roof to accommodate Patient	40	m ²	270	10,800
Phase 1b - Level 3				
Phase 1b - Basement				
Cost premium for 5.8m floor height and basement construction	1,320	m ²	945	1,247,400
Phase 1c - Level 1 (Renovation)				
Sub-total				2,560,100
General Requirements		10%		256,000
Fees		5%		128,000
TOTAL				\$2,944,100



Other Scope of Works

	Quantity	Unit	Unit Rate	Amount
PHASE 2				
Phase 2a - Level 1				
Interface between New North Wing and the existing hospital (50 m long)	250	m ²	1,350	337,500
Interface between New North Wing and South Wing (22 m)	110	m ²	1,350	148,500
New Transfer Corridor	213	m ²	4,995	1,063,900
Phase 2a - Level 2				
Interface between New North Wing and South Wing (15 m)	54	m ²	1,350	72,900
Phase 2a - Level 3				
Phase 2a - Basement				
Interface between New North Wing and South Wing, and the existing hospital (48 m long)	221	m ²	1,350	298,100
Cost premium for basement construction	770	m ²	675	519,800
Phase 2b - Level 1 (Renovation)				
Phase 2c - Level 1 (Renovation)				
Sub-total				2,440,700
General Requirements		10%		244,100
Fees		5%		122,000
TOTAL				\$2,806,800



Other Scope of Works

	Quantity	Unit	Unit Rate	Amount
PHASE 3				
Phase 3a - Level 1 (Renovation)				
Phase 3b - Level 1				
Demolish existing hospital	5,181	m ²	108	560,000
Tunnel to connect South Wing to Thompson Centre	469	m ²	3,375	1,581,200
Interface at atrium (60 m long)	330	m ²	2,025	668,300
Interface with MRI	39	m ²	1,350	52,000
Phase 3b - Level 2				
Interface at atrium (60 m long)	270	m ²	2,025	546,800
Interface with new South Wing (3 m long)	14	m ²	1,350	18,200
Phase 3b - Level 3				
Interface with new South Wing (3 m long)	14	m ²	1,350	18,200
Phase 3c & d - Level 1				
Interface with existing hospital at West (48 m long)	216	m ²	1,350	291,600
Sub-total				3,736,300
General Requirements		10%		373,600
Fees		5%		186,800
TOTAL				\$4,296,700



Other Scope of Works

	Quantity	Unit	Unit Rate	Amount
PHASE 4				
Phase 4 - Level 4				
Interface with Level 3	2,068	m ²	300	620,400
Phase 4 - Level 5				
Sub-total				
General Requirements			10%	373,600
Fees			5%	186,800
TOTAL				\$1,180,800

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APPENDIX II - DOCUMENTATION

The following documentation was used as the basis for preparing this estimate:

Document	Description	Date
Drawings	Space Summary	March 28, 2012
	Ground Level Phase 1a	March 22, 2012
	2nd Level Phase 1a	March 22, 2012
	Basement Level Phase 1b	March 22, 2012
	Ground Level Phase 1b	March 22, 2012
	2nd Level Phase 1b	March 22, 2012
	3rd Level Phase 1b	March 22, 2012
	Ground Level Phase 1c	March 22, 2012
	Basement Level Phase 2a	March 22, 2012
	Ground Level Phase 2a	March 22, 2012
	2nd Level Phase 2a	March 22, 2012
	2nd Level Phase 2a - 2035	March 22, 2012
	3rd Level Phase 2a	March 22, 2012
	Ground Level Phase 2b	March 22, 2012
	Ground Level Phase 2c	March 22, 2012
	Ground Level Phase 3a	March 22, 2012
	Basement Level Phase 3b	March 22, 2012
	Ground Level Phase 3b	March 22, 2012
	2nd Level Phase 3b	March 22, 2012
	3rd Level Phase 3b	March 22, 2012
	Ground Level Phase 3c	March 22, 2012
	4th Level Phase 4	March 22, 2012
	Site Plan to Completion of Phase 4	March 22, 2012
	Storm Map (Sheet 3 of 20) Rev. 4	March 23, 2012
	Water and Sewer Map (Sheet 3 of 21) Rev.	March 23, 2012