Innovative Care Flexible Facilities
Part B Report, 31 May 2013

Prepared by William Nycum & Associates Limited and Smithgroup AEIP International Inc.
for Capital District Health Authority

Final Submission: 21 June 2013

Appendix A Updated: 25 June 2013

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Integrated Modular Furniture & Modular Medical Solutions Consultants:

Atlantic Business Interiors, with Nurture by Steelcase

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Introduction

Executive Summary

Government Announcement – The Centennial Building

In December 2011, The Nova Scotia Government announced that the Centennial Building, long fraught with building infrastructure problems, was slated for demolition. The announcement triggered a series of events to prepare for the replacement of the inpatient beds and OR services that presently occupy the Centennial Building.

Design Team

In Summer 2012, William Nycum & Associates Limited (Nycum) was retained as Prime Consultant to lead the project that would quantify and qualify the replacement of the Centennial beds and operating rooms with new spaces at the Halifax Infirmary and Dartmouth General sites. Nycum's team includes:

- **William Nycum & Associates Limited** (Halifax) Healthcare Architects
- **SmithGroup AEIP International Inc.** (Phoenix) Healthcare Architects
- **O'Neil Scriven & Associates** (Halifax) Mechanical & Electrical Engineers
- **Pinto Engineering** (Halifax) Structural Engineers
- **CBCL** (Halifax) Civil Engineers
- **Hanscomb** (Halifax) Construction Cost Estimators
- **Dr. John Blake** (Halifax) Industrial Engineer
- **Tripp Umbach** (Pittsburgh) Economists
- **ABI/Steelcase/Nurture** (Halifax / Grand Rapids) Equipment/Furniture
- **Burst!** (Halifax) Community Engagement Specialists

This team has had the great privilege to work with the complex, dynamic and committed team at CDHA throughout the project, culminating in this report. Together it has been quite a fast paced and exciting journey and one that we all feel has strived to reach for the best possible outcomes. A great deal of credit and thanks are owed to the CDHA team and various stakeholders for its contribution to this effort.

The Project Deliverables

There are three components (and corresponding reports) to this project: Part A, Part B, and Decision Support Resources. These component are described in the RFP for the project as follows:

Part A:

The initial stage of the CDHA Project requires preliminary program development planning, building conceptualization and the preparation of an outline scope of work so that budget range and computer visualization can be produced. In particular, the successful Proponent will be required to:

- *Develop detailed program and net floor area requirements in conjunction with a review of current and best practice models of inpatient, ICU, IMCU, and OR Suite layouts configuration and components as well as a review of issues such as single patient rooms and acuity adaptable (universal) design for rooms.*
- *Investigate access, circulation impacts from a development of existing site conditions including grading, municipal streets, pedestrian, vehicular/ parking, site services, site lines and solar impact issues which will help to inform the building concept development.*
- *Conduct a preliminary review of mechanical, electrical, structural and site civil issues as to how the additions infrastructure requirements would be impacted and potential future developments.*
- *Develop preliminary concepts from the programming, investigation and review of the previous stages. Block floor plans will be developed, alternative configurations will be investigated and compared to their advantages and disadvantages against a set developed criteria by Capital Health. A block 3D computer model will be prepared to illustrate the selected alternative, suitable to illustrate the building from various viewpoints.*
- *Develop a preliminary scope of work and outline specifications for the project(s).*
- *Prepare an element budget range (Class D) for the project(s) based upon the preliminary information collected and prepared.*
- *Class D Definition: Based on the scope of work above, this estimate is an indication (rough order of magnitude) of the final project cost.*
- *Prepare and submit a report highlighting the findings of Part A.*

The intent of Part A is to develop a preliminary program, review key issues impacting optional solutions, prepare alternative concepts, prepare a budget range for the project, and illustrate in block form, the additions massing in context. This information will assist the decision making process of Capital Health, support internal and external reviews by key stakeholders.

Part B:

The next stage of the CDHA Project expands or builds upon the work achieved in Part A. The successful Proponent will be required to:

Develop preliminary findings and solutions into a more detailed program and design; in particular, further investigation and review of best practices and evidence based design solutions for inpatient room and units, ICUs, ORs and supporting services.

Prepare a Master Program including a Functional Program.

- *Develop a preliminary equipment list.*
- *Review concept design alternatives and refine into a selected schematic design solution and outline specifications.*
- *Prepare Class "C" construction cost estimates and project schedules and review options for construction services.*
- *Class "C" Construction Definition: Based on the scope of work above, a Class "C" estimate is based on a full description of the preferred option, construction/ design experience and market conditions. Use professional estimator.*
- *Prepare a more refined 3D computer modeling of patient rooms, OR suites, buildings and site depicting various viewpoints.*

Decision Support Resources:

In consultation with the various stakeholders including the operating rooms, recovery, critical care, inpatient and support services, develop business cases to support decision-making strategies such as where particular services are best located. These business cases to be analyzed based on sound financial and quality based indicators such as patient safety, access and affordability.

- *Analysis of changes in operational costs as a result of revised health care delivery models or processes.*
- *Provision of analysis of economic impact of projects for the HRM area and the province.*

About the Content

This report contains design solutions, pros, and cons for each project component resulting from the refinement of work done on options presented in the *Part A Report*, dated 22 February 2013.

Given the nature of this project, the designs presented in this report are preliminary. The selected options from *Part A* evolved to incorporate the best elements from various previous options, tempered by new ideas and evolving requirements that emerged through consultation and discussion with stakeholders.

Due to the evolving nature of the Clinical Services Plan throughout the project (and upon preparation of this Report), different areas/departments within the scope of this project are presented to varying degrees of detail. The level of detail presented largely reflects the level to which the physical space can be reasonably designed given the clinical information available (i.e. which departments and services will be located in which building). Presenting more detailed layouts in the absence of a finalized Clinical Master Plan would create a false sense of resolution for all involved.

For the Halifax Infirmary (HI) addition, the floor layouts are more diagrammatic than those for the project components at Dartmouth General (DGH) – sufficient to represent the space required to support the preliminary Space Programs and illustrate the preferred/ suggested arrangement of key spaces relative to each other. Development of plans resolved at a room-by-room basis would be speculative, as the relationships between rooms is dependent on the function of the departments and relies on input from stakeholders of those specific departments. While the overall floor plans for HI represent a preliminary/concept level of detail, key rooms are developed to a much greater detail (including enlarged plans, 3D representations and detailed room data sheets) in order to capture the aspects of innovative and evidence-based design presented and discussed through the course of Part B. This detail, along with conceptual exterior elevations and 3D renderings, has allowed a "Class C" cost estimate to be developed to the level of accuracy expected at this stage of the project.

For the Dartmouth General Hospital (DGH) addition, the drawings were able to be developed to a more detailed level as a result of the limited number of variables at play at this site and the higher degree of resolution of the Clinical Services Plan with respect to DGH. The lower level of acuity of services offered at DGH precludes the potential for the many highly-specialized units and

spaces that may be required at the HI. The smaller size of the facility at DGH allowed the establishment of comprehensive Inpatient and Perioperative user groups, allowing stakeholder-specific input to be integrated into Schematic floor plans for the addition, the 5th floor inpatient fit-out and major impacted support services.

Stakeholder Involvement

This report summarizes activities and findings from Part B of the project, that have taken place between February 22, 2013, and May 31, 2013, as well as activities from Part A (November 2012 to February 2013). During this timeframe there have been many meetings, workshops, open houses, and presentations with Capital District Health Authority (CDHA) and Department of Health and Wellness (DHW) stakeholders, as well as the public. Each stakeholder has reviewed and provided feedback at presentations as well as in various written and verbal communications. This feedback has been compiled, evaluated and incorporated into the design where applicable to the scope of this project. Selected key issues and feedback are highlighted for each project component along with ways that this feedback has been incorporated into the layouts presented in this report.

Support Services Impacts

Much effort was involved in capturing the impacts to existing support services created by relocating services from the Centennial Building, to the degree possible given the current, evolving state of the Clinical Services Plan. These impacts are articulated in the Space Programs and in drawing/sketch format in this report. The costs associated with renovations or new construction required to satisfy the increased burden on these services have been captured in the Cost Estimates.

Given the current, evolving state of the Clinical Services Plan, some spaces (e.g. Diagnostic Imaging) are represented simply as blocks of space labeled for renovation, rather than developed in detail. The areas of these spaces were determined based on user feedback and metrics from other, similar, contemporary projects, but ultimate requirements will be determined by Clinical Services decisions. As the Clinical Services Plan is refined, the area of these spaces will need to be confirmed and further detailed design completed.

During the course of this work, it became evident that alterations or additions to certain areas outside the original scope of this project would need to be undertaken in order for the facility to function properly. A prime example of this is the new Main Entry and relocated ICU at Dartmouth General. While design of these items are outside the scope of this project, it is important to capture the costs of these elements in the overall project cost and Business Case. As such, they are represented diagrammatically on the drawings and the costs of these alterations and additions are captured in the Cost Estimates presented in this report.

Innovation in Hospital Design and Flexibility

The work represented in this report draws on the latest thinking in hospital design to inform the planning principles. Current and anticipated innovative developments, cutomizable for each site, are represented in detail later in the report. A primary component in this project is the concept of lifelong flexibility, in order to allow the hospital(s) to adapt to changing needs of the population, introduction of technology, and expansion and contraction of services over time. This aligns with the need for CDHA to have flexibility to manage its current and future needs. Many of the design solutions presented in this report embrace flexibility as a driving planning principle.

Cost

Class “C” Unit Rates cost estimates were prepared for each project area (HI Addition, DGH Addition and DGH 5th Floor Fit-out) by Hanscomb Limited. Class “D” estimates from Part A were updated and revised as the project progressed through Part B. The fundamental method of construction cost estimating for most aspects of the information shown in this report is cost per square foot, compiled using recent project cost data, assumed levels of complexity and discussions with construction contractors. Where possible, given the stage of the project, additional detail and other factors captured in the calculation of the underlying unit rates is provided in break-out tables.

Special attention should be paid when reviewing the costs shown, particularly when comparing to other projects. For example, construction costs and project costs are different: The former describes the costs associated with construction only and the latter describes the construction and associated costs (with the exception of costs, like internal staffing, not directly related to the project).

Renovation costs are based on two primary factors: the type of space being renovated, and the extent, or complexity, of renovation required for any given space. Renovation costs for different types of space are based on comparable cost data from other relevant and recent projects, while complexity of renovation required has been estimated by the design team, based on professional judgment and information provided by CDHA staff.

Detailed planning and design for the demolition of the Centennial Building is outside the scope of this project. Costing of the demolition work was requested by CDHA and provided in order to be factored into the Business Case. Costs of demolishing the Centennial Building alone (including capping and construction of new stairs, etc. to support the VG building) as well as the demolition of both Centennial and Victoria at the same time were provided. For the purpose of the Cost Estimate provided here, the latter cost has been included.

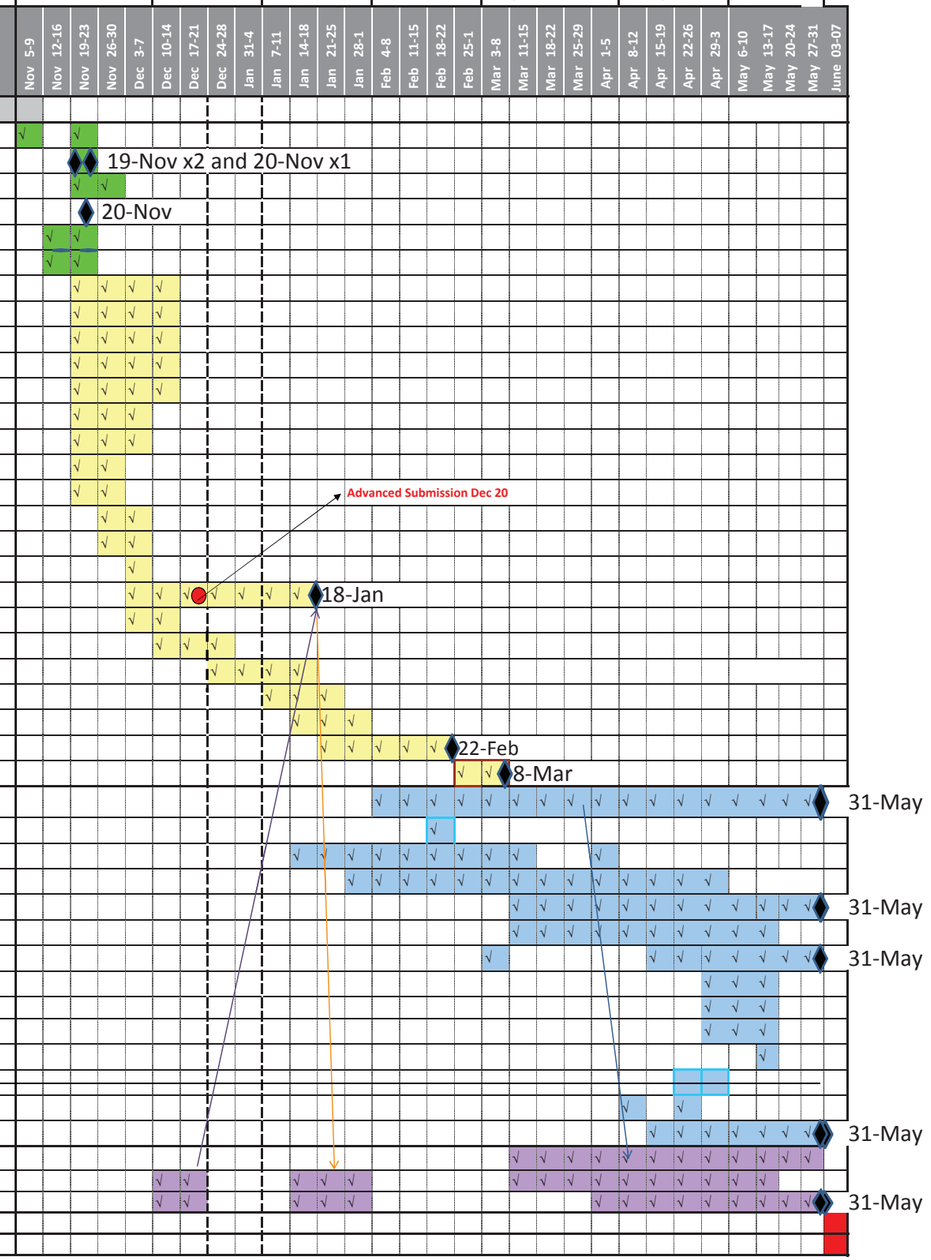
Project Timeline

The project timeline is shown on the following page with completed portions indicated, showing progress.

Update: 31 May, 2013

Months: 1 (Dec 2) | 2 (Jan 2) | 3 (Feb 2) | 4 (Mar 2) | 5 (Apr 2) | 6 (May 2) | 7 (June 2) | 8 (June 28)

	Innovative Care, Flexible Facilities Project 1 & Project 2	Involvement of Stakeholder/Provinicial Resource	Consultant Task or CH/Provincial Resource Event	Team Resource
	Sign Service Argeement	CH Project Leader		BN
	Start up and Visioning; Orientation and Roles	Stakeholders, Decision Makers	1 Session 3 hr	All Team Possible
	Workshop/Meeting to update and advance **(updated Nov 15, 2012)**	CDHA to identify (Renewal team, Leadership)	1hr+1hr+1hr	
	Delphi Stakeholder Sessions **(updated Nov 15, 2012)**	Stakeholders	1 hr sessions for each	BN,TL,NE,AB,ES,MP
	CDHA to provide requested project information to Design Team	Decision Makers - as noted at kick-off	Capital Health work	
	CDHA to engage communications team	Decision Makers - Communication Team	Capital Health work	
	Meet with Clinical Services Group, Steering Cte	CSP Group	3 meetings	BN, TL, NE
Part A Prelim Program, Building Concept, Outline Scope, Budget	**Develop Detailed Program and Net Floor Area Requirements**		Task	
	Exercise/User Session: Review Best Practice Models **(updated Nov 15, 2012)**	Designated Stakeholders	2 to 3 meetings	TBD
	Exercise/User Session: ICU, IMCU, OR **(updated Nov 15, 2012)**	Designated Stakeholders	2 to 3 meetings	TBD
	Exercise/User Session: Patient Rooms **(updated Nov 15, 2012)**	Designated Stakeholders	2 to 3 meetings	TBD
	High - Level Client Review **(added Nov 15, 2012)**	experts from team as identified	several meetings	TBD
	Investigate Site Conditions		Task	
	Access, Circulation, Grading, Streets, Pedestrian, Vehicle, Parking, Services, Sun, Daylight		Task	
	Preliminary Review of Building Infrastructure		Task	
	Site Civil	Engineering Services	1 or 2 meetings	
	Structural	Engineering Services	1 or 2 meetings	
	Mechanical and Electrical	Engineering Services	1 or 2 meetings	
	Clinical Services Data	CSP Group	Task	
	Develop Preliminary Concepts (Program)		Task	
	Block Floor Plans	Decision Makers, Stakeholder Reps	Task and Charette	
	Investigate Alternative Configurations	Decision Makers, Stakeholder Reps	Task and Charette	
	Block 3D model of Selected Alternative	Decision Makers, Stakeholder Reps	Task and Charette	
	Develop Preliminary Scope of Work and Outline Specification		Task	
	Prepare Elemental Budget Class D		Task	
	Prepare Report		Task	
	Capital Health Review and Approval	Decision Makers, Stakeholder Reps	Review Process	
Part B Build and Expand on Part A	**Develop Detailed Program and Design**		Task	
	Community Engagement #1 (Updated Nov 15, 2012)	Decision Makers, Designated Stakeholders	Community Session	
	Review of best practices & evidence based design (Inpatient, ICU, OR, Support Svcs)		Task and Charette	
	Prepare Master Program and Functional Program		Task	
	Develop Preliminary Equipment List	Designated Stakeholders	Task, 1 or 2 meetings	
	Refine selected Schematic Design Solution and Outline Specifications		Task	
	Prepare Class C Estimate		Task	
	Prepare 3D Computer Model(s)	Decision Makers, Stakeholder Reps	Task and Charette	
	Patient Rooms	Decision Makers, Stakeholder Reps	Task and Charette	
	OR Suites	Decision Makers, Stakeholder Reps	Task and Charette	
	Buildings and Site	Decision Makers, Stakeholder Reps	Task	
	~~**Community Engagement # 2 (Updated Nov 15, 2012)**~~	~~Decision Makers, Designated Stakeholders~~	~~Task and Presentation~~	
	Bi-weekly updates - alternate HI and DGH sites **(added Nov 15, 2012)**	open invitation	bi-weekly event	TBD
	Final Report		Task	
Decision Support	**Develop Business Cases in Consultation with skateholders**	Decision Makers, Stakeholder Reps	Task and Meetings	
	Analysis of changes in operational costs as a result of revised delivery processes		Task	
	Analysis of economic impact of projects for the HRM and province		Task	
	Capital Health Review and Submittal for Decision Process	Decision Makers, Stakeholder Reps	Review Process	
Project Schedule Contingency (Objective is to complete in 6 months, with 7th month as contingency)		Contingency	Contingency	



◆ = Major Milestones, refer to attached work plan for more details

List of Documents Received

1. CDHA Master Plan - Victoria Building
2. CDHA Master Plan - Centennial Building
3. CDHA - DGH Master Program and Plan
4. 1214 Bed-Service Map Nov 21
5. CH Master Planning Demand Projections Technical Appendix
6. Copy of District Amb Care Clinic Info Scan Global Summary SOC by Director Mar 29 12 MASTER
7. Length of Stay Report to August 2012 (values only) Nov 21 12.
8. Microsoft Word - CDHA programs services facilities profile - detailed Nov 20 12
9. Microsoft Word - Activity by Service Nov 21 12 – Snapshot
10. Microsoft Word - Bed Dashboard - VG Snapshot Nov 21 12
11. Microsoft Word - Bed Map - District - All Facilities -current capacity for CSP Services Alignment Discussion Nov 21 12
12. Microsoft Word - Capital District Profile Nov 21 12
13. Microsoft Word - Initial Dashboard View of Capital Health Bed Dashboard Nov 21 12
14. Microsoft Word - List of reports generated by Performance Excellence and Decision Support
15. Microsoft Word - P Bond- VP Acute Care - Surgical Service Slate Master Nov 21 12.
16. Microsoft Word - District Ambulatory Care Scan Summary Feb 22 12.
17. ICFF BLUE SKY THOUGHTS Dec 5
18. DGH and QEII Plan, Dec 4
19. OCCC Strategic priorities, Dec 4
20. Service Map- Halifax Infirmary 2012, Dec 5
21. Service Inventory - Dartmouth General – 2012, Dec 5
22. Service Map - Centennial Building 2012 Inventory, Dec 5
23. Innovative Care Flexible Facilities: Blue Sky Ideas, Dec 5
24. DGH Plan and QEII Bed Tower Full Platform, Dec 9
25. DGH Plan and QEII Bed Tower - Full Platform, Dec 13
26. Support Services Space Impact Survey for Innovative Care and Flexible Facilities Project – Phase I
27. Support Services Space Impact Assessment Survey Jan 31 1 - Food and Nutrition Services and Porter Services
28. Support Services Space Impact Assessment Survey Jan 31 13. Lab
29. Support Services Space Impact Assessment Survey Jan 31 13. Managed Services Feb 7.13
30. Support Services Space Impact Assessment Survey Jan 31 13. QEII SPD
31. Support Services Space Impact Assessment Survey Jan 31 13. Rehab and Social Work
32. Infrastructure renewal equipment Diagnostic - March 7th
33. Infrastructure Renewal Biomedical devices - March 7th
34. Building Infrastructure Overview - March 8th
35. 10Y projected Event Costs By Component - Centennial Building March 8th
36. 10Y projected Event Costs By Component - Victoria Building March 8th
37. Past 4Y Operational Cost to Centennial and Victoria - March 8th
38. Summery of Expenses at VG site - March 8th
39. VG Site Annual Utility (Heating, Electrical, Water) Costs per sq ft - March 8th
40. February Public Engagement Feedback Report - April 13th, 2013.
41. Conceptual Clinical Space Prototype Discussion Sessions April 9th and 10th, 2013 - Summary and Common Themes – April 17th, 2013.
42. Updated Cost/Sqft “estimates” for CH buildings along with same data for DGH and HI - April 30th, 2013.
43. Centennial Building - Condition Assessment / Preliminary Report – Brief, May 15th
44. Centennial Building - Facility Evaluation, May 15th
45. Centennial Summary, May 15th

Acknowledgements

The design team would like to acknowledge the participation and support of the following individuals and organizations:

Project Leadership Team

- Gail Blackmore, CDHA
- Cathy Brophy, CDHA
- Brian Butt, CDHA
- Susan Delaney,CDHA
- Denis Pellichero, DHW
- Piero Diliberatore, CDHA
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- Mike Meuse, CDHA
- Randi Monroe, CDHA
- Karen Mumford, CDHA
- Ward Patrick, CDHA
- Jane Pryor, CDHA
- Geoff Wilson, CDHA
- Robyn McIssac, CDHA
- Andrea Rose, CDHA
- Teresa Smith CDHA

Patient/Citizen Volunteers

[redacted] Exempt section 21(1)

Project Steering Committee

- Alan Harvey
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- Bill MacMaster
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- Florence Millard
- Cathering Gaulton
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- Dr. David Barnes
- Dr. Rick Gibson
- Dr. Todd Howlett
- Vickie Sullivan
- Heather Francis
- Shauna McMahon
- Brian Butt
- Lori-Anne Jones
- Theresa Mitchell

Stakeholders Consulted

- Dartmouth General Hospital Foundation
- QEII Foundation
- NS Department of Health and Wellness
- NS Department of Infrastructure Renewal
- QEII OR Executive
- QEII Clinical Services Planning
- Capital Health Leadershift Enabling Team (LET)
- DGH Clinical Affairs Group
- DGH OR Executive

Public Engagement

Two public consultations were held leading up to this report.

- February 18, 2013. Bethune Ballroom, Halifax
- February 20, 2013. NSCC Waterfront Campus Cafeteria, Dartmouth

Internal (staff) engagement

Open houses, presentations, workshops and user-group sessions were held at both the QEII and DGH sites which offered opportunity for information sharing and input from staff. Special thanks are extended to all who attended and provided valuable feedback.

Innovation and Best Practices

Many of the best practices and innovative ideas in healthcare are often both interrelated and supportive of multiple objectives. “Best Practice” is most frequently associated with clinical best practice in the form of proven protocols and treatments that achieve optimal patient outcomes for the lowest demand of resources and lowest costs. This is often referred to as evidence based care.

Similarly, in healthcare design there is a movement to create design solutions that can be demonstrated to achieve predictable outcomes, referred to as “Evidence Based Design.” The goal in creating healthcare environments is to create spaces and experiences that support the healing process either directly, by the effect the environment has on the patient, or indirectly by positively affecting those individuals that are supporting the patient.

Examples of best practice with this regard are discussed on the following pages and include:

- Private Patient Rooms
- Daylight and Views
- Team Rooms
- Patient Safety
- Situational Awareness
- Hand Washing
- Medications
- Task Lighting
- Radio Frequency Identification (RFID)
- Automation and Robotics
- Safety
- Flexibility and Change
- Operational Redesign
- Modular Solutions
- Patient Centered Care

Evidence Based Design is the creation of design solutions demonstrated to achieve predictable outcomes

Private Patient Room

There has been much debate among healthcare providers over recent years surrounding the subject of the private patient room and whether or not all patients should be housed in private rooms with private 'en-suite' bathrooms. This debate is well documented in the report titled 'The Use of Single Patient Rooms vs. Multiple Occupancy Rooms in Acute Care Environments' (2003) by Habib Chaudhury, Atiya Mahmood and Maria Calente at the Simon Fraser University. The current consensus is that all new hospitals should be constructed with 100% private rooms for all patients. This is now enshrined in the 'Guidelines for Design and Construction of Healthcare Facilities' (2010) published by the Facilities Guidelines Institute. The CSA Z8000 Standards follow suit, with section 4.5.3 reading in part: *"All inpatient bedrooms in Class A HCFs shall be single bedded unless the functional program demonstrates the necessity of a two-bed arrangement*." The justification for this requirement is also noted within the documents, as "*Single patient room occupancy has been shown to reduce the potential for transmission of organisms (and, therefore, to decrease the risk of infection), decrease medication errors and improve safety for both patient and health care providers overall."*

The private patient room model has been demonstrated to provide a superior healing environment by improving noise control, thereby allowing the patient to achieve improved rest and faster recovery. The private room can provide improved family amenities and, thus, indirectly improve the healing experience with increased opportunities for social interactions. The private room has also been shown to reduce the likelihood of nosocomial infections, further enhanced when hand washing sinks are located at the room entrance so patients and family can observe staff hand washing as they enter or leave the room. However, for certain specialties, including palliative care, the socialization provided by multi-patient rooms can be beneficial.

Private patient rooms also allow a more efficient use of rooms, as room assignment does not need to consider issues of roommate compatibility such as age or gender, or isolation for infection control.

That said, the debate continues with many healthcare providers challenging this recommendation on the basis of perceived benefits in staffing efficiency and costs.

The advantages of the private room model of care are:

- Improved patient and family satisfaction
  - Quieter and more restful experience
  - Improved patient and family comfort
  - Improved patient privacy
- Improved healing environment
- Improved patient safety
  - Reduced incidence of nosocomial infections
  - Reduced incidence of medication errors
- Improved patient and family security
- Improved staff satisfaction
- Improved operational costs (Babrow & Thomas, 2000)

The advantages of the multi-bed model of care are:

- Improved patient socialization
- Increased staff efficiency
- Perceived lower operational costs
- Reduced first time capital/construction costs.

Ulrich, R. S., Zimring, C., Zhu, X., DuBose, J., Seo, H.-B., Choi, Y.-S., et al. (2008). A Review of the Research Literature on Evidence-Based Healthcare Design (Part II). HERD, 21.

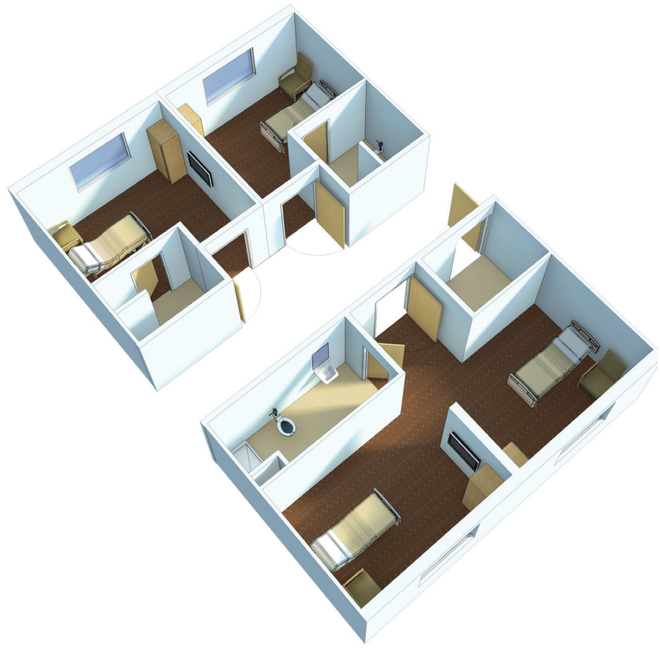
Calkins, Margaret P., & Biddle, Stacey, & Biesan, Orion (2012). Contribution of the Designed Environment to Fall Risk in Hospitals.

Kennedy, M. R. C. (2012). Sleep as a moderating value in healthcare design. Health Environments Research & Design Journal, 6(1), 123-143.12123.

O'Connor, M., O'Brien, A., Bloomer, M., Morphett, J., Peters, L., Hall, H., … Munro, I. (2012). The environment of inpatient healthcare delivery and its influence on the outcome of care. Health Environments Research & Design Journal, 6(1), 105-117.

Zimring, C., & Seo, H-B. (2012). Making acuity-adaptable units work: Lessons from the field. Health Environments Research & Design Journal, 5(3), 115-128

The patient rooms in Banner Ironwood provide large windows, oversized doors to the toilet rooms, a dedicated family area, and variable lighting levels. The also serves as a communications hub, allowing patients to order their meals or watch educational programs tailored to their needs. Selected rooms are equipped with the E-ICU system which allows remote specialists to consult over the television.



Left: flexible room layouts under consideration for renovations to the existing 5th Floor of the Dartmouth General include the option of converting double rooms into singles.

Patient Room Size and Organization

There are a variety of issues that relate to the appropriate size of the patient room and the justification for increasing this size beyond community averages. It is now common practice to carefully organize the room to provide dedicated areas for the three primary activities and users: the patient, the family and the care team (staff). By defining where each of these zones occur, and by organizing the room to optimize circulation between these zones, the room entrance and the bathroom, it is possible to maximize the value of exterior window views. This arrangement will preserve good visibility of the patient by the care team while providing sufficient space for efficient and effective care.

Each room must provide space for the first two users, the patient and care team, at a minimum. The amount of area dedicated to the family will vary depending upon expected patient acuity and cultural considerations.

Patient Space

The space needs for the patient area are defined by the patient bed and the area required around the bed. Included in this zone are the other room amenities including the bedside table, patient wardrobe/locker, television and a shelf for cards/flowers, etc.

Staff Space

Staff space needs vary, depending somewhat on the model of care. The amount of space allowed for the care team can determine the types of in-room procedures that might be performed, by determining the equipment and care team space that will be available. In teaching hospitals, the team area will need to include sufficient space to accommodate students accompanying the physician. A recent trend is the expansion of the care team to include a Pharmacist in the rounding team, which also increases the size of the team.

Family Accommodation

The space allowance for family is perhaps the largest variable within the overall room size. This can vary from a minimal area to accommodate a single chair, to a quite generous space for multiple family members. The inclusion of either a built-in or freestanding sofa can provide space to accommodate several people including children, or guests who may require bariatric seating options. The sofa can be also used by a family attendant to sleep/stay overnight with the patient. In some instances when the extended stays are anticipated, the family space can include sufficient space for a desk and chair for the attendant to work on a laptop computer or conduct personal business.

Location of Bathroom

The location of the bathroom is an important design issue and can affect the overall size of the patient bedroom. There are typically three alternates for the bathroom location in the private and semi-private room – Inboard, Outboard and Back-to-Back between pairs of rooms. Each option has different advantages.

- Inboard: The inboard bathroom results in adding circulation space to the overall room size to accommodate the passage from the room entrance door, past the bathroom to functional area of the bedroom.
- Outboard: The outboard bathroom results in a loss of area that might have been assigned to the family zone.
- Back-to-Back: The back-to-back bathroom optimizes the space availability for the three functional areas in the patient room. It can, however, result in increased corridor lengths and, thus, add to the overall space on the patient care unit.

Adaptability

The ability for a patient room to be adapted to other uses over time is referred to as room adaptability. The concept is typically coupled to the idea of creating a structural bay size that will accommodate a variety of room sizes to meet differing demands. For example, an acute care patient room may be required to become a critical care room at some point. The adaptation can be more easily accommodated if the room module is sized to meet the needs of both acute and critical care rooms.

- Universal Room: When applied to patient rooms, this term describes creating a room that can be used by either a critical or acute patient. While hospitals that have tried to implement a 100% universal room policy have found it to be prohibitively difficult to implement, acuity adaptable rooms that combine med-surg and progressive care into one unit can be beneficial. A common example of this room might be the Cardiac Care room. In this instance, the transition of the heart patient following surgery from being classified as a critical patient quickly progresses into an acute status. This room is required to meet the functional requirements of a critical care patient, with high level of monitoring and visibility from a nurse station, and the less demanding needs of an acute patient.

Patient Acuity

The degree of patient acuity is a major determinant of minimum room size. Typically, the higher acuity patient will require more space in the patient and staff areas to support additional equipment or supply needs.

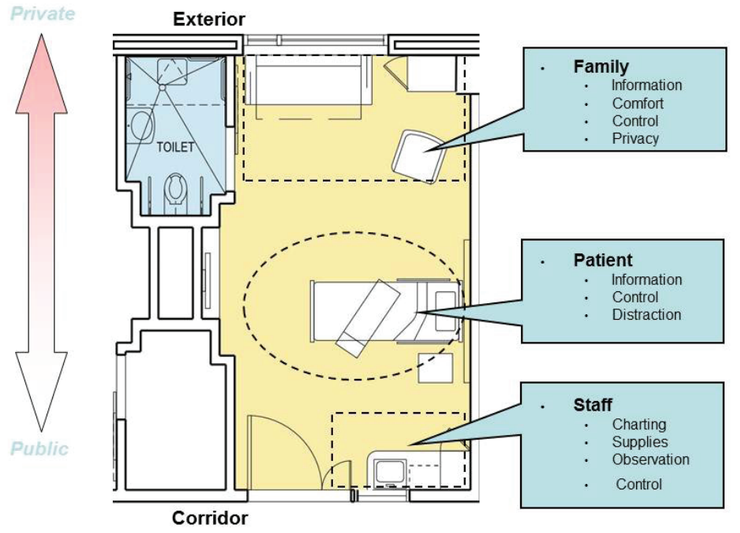
Special Needs

The special needs of the patient and/or their family attendants are an increasingly challenging issue to manage. This category includes disability of all sorts, including obesity. The incidence of obesity is increasing in North America, creating demands that this group is appropriately and respectfully accommodated. Larger people require more space to maneuver and may require wider clearances around objects. For example, both the patients and/or their attendants may use oversized wheelchairs. These patient rooms also require bathrooms that are appropriately sized to accommodate disabled patients and attendants using wheelchairs, patient lifts and care team support.

Specialty Care Model Needs

The patient room is typicaly a standard design which will accommodate most patient types. There are some patient types that require more specialized responses. These specialty groups would include, among others:

- Pediatrics and Maternity
- Chemical Dependency
- Mental Health
- Long Term Rehabilitation



Patient room zoning can affect room size. When more family space is required, the overall room size may need to increase. The size of the staff and patient zones will depend on the equipment expected to be used and the size of the care team.

It is now common practice to provide dedicated areas for the patient, the family, and the care team in patient rooms. The amount of area dedicated to family will vary depending on patient acuity and cultural considerations.

The adaptability of patient rooms is typically coupled with structural bay size to accommodate a variety of room sizes within one structural system.

Daylight and Views

It is demonstrable that patients who occupy sunny patient rooms and with attractive views from their beds typically heal faster in comparison to patients without this amenity. In these instances, this results in a lower average length of stay and higher utilization. It has also been demonstrated that similar results can be achieved using attractive landscape paintings, pictures or video images to augment a less-than-desirable bedroom window view. Attention to the quality and intensity of room lighting can compensate for direct sunlight into the space.

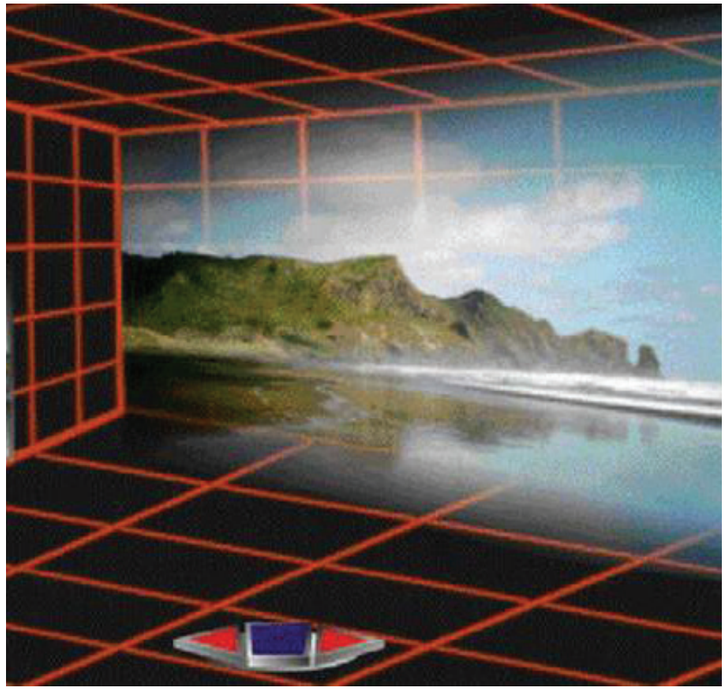
Herman Miller Healthcare. (2010). Patient Rooms: A Changing Scene of Healing. 7.

Vincent, E., & Battisto, D., & Grimes, L., & McCubbin, J. (2010). The Effects of Nature Images on Pain in a Simulated Hospital Patient Room. Health Environments Research & Design Journal,3(3), 42-55

Windows in the Emergency Department treatment rooms at Banner Page do more than provide natural light. Every room has a view of the garden. Carefully placed walls create private garden spaces, ensuring visual privacy for the patients, without compromising the views.

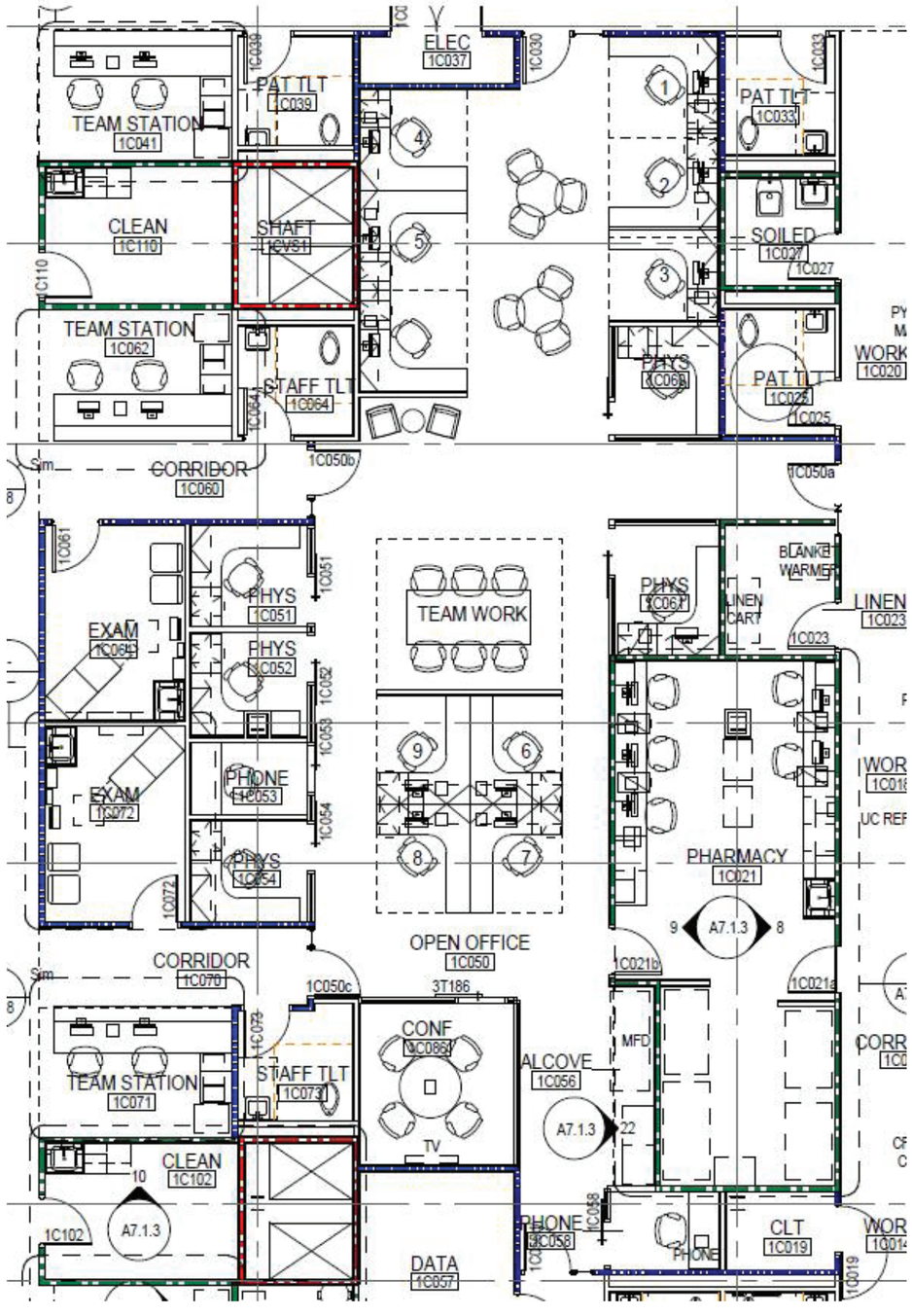
It is demonstrable that patients who occupy sunny patient rooms and with attractive views from their beds typically heal faster in comparison to patients without this amenity.

Views, paintings, photos of nature



Virtual reality - to create a personalized experience

Microsoft flat screen wallpaper under development



By designing care teams' working environments to encourage collaboration, quality and effectiveness of care can be improved.

Team Rooms

Creating a working environment for care teams that encourages easy, direct communication and collaboration has been shown to improve the quality and effectiveness of care. Every care pathway should be reviewed to determine when and where team collaboration spaces can be employed to optimize care and reduce the likelihood of errors and omissions. Collaboration spaces must be balanced by the incorporation of spaces that support quiet, focused work activities. The use of glass enclosed work cubes, telephone booths and mini conference spaces to separate noisier activities from those needing peace and quiet can help with this balance.

Almquist, J., & Kelly, C., & Bromberg, J., & Bryant, S., & Christianson, T., & Montori, V. (2009). Consultation room design and the clinical encounter: The space and interaction randomized trial. Health Environments Research and Design,3(1), 41-78

The team area at this cancer center in Ohio is designed to provide a balance of team and private workspace. Physician workstations are in cubicles with sliding glass doors, while other team members are at open workstations. Small private phone cubicles are provided to allow for privacy when needed. The team room is placed between clinics, allowing team members to move easily between them.

Best Practices: Critical Care Units

The ultimate goal of the design process is to create a healing environment that produces measurable improvements in the physical and psychological state of patients, staff and visitors.

Patient Room

Size

The patient room is the most important space for patient care in the critical care environment. The size and proportions of the room depend on a variety of needs including optimal bed orientation for visual supervision by clinical staff and optimal bed location for both normal and patient resuscitation modes. The room must be sized to accommodate the 'worst case' situation when there could be as many as 8-10 clinical staff with equipment and supplies, intent on preserving the patient's life.

Headwall vs. Booms

Headwall configurations are cost effective but can create problems in a "code" situation by forcing staff at the head of the bed to step around and over lines and tubes. Booms can allow more flexible room arrangements, adapting to changing patient requirements than headwalls. However, booms tend to require a higher first cost and can be frightening or confusing to patients.

Handedness

The value of same-handed rooms has been under debate in research on the matter. Early results seemed to indicate that same-handed rooms improved patient care and reduced errors, but subsequent research has called this into question. The research remains conflicted on this point, but suggests that consistent locations of items within the room, even if rooms are mirrored, is the most important design feature.

Environmental Awareness

Natural light and a view to the outdoors are especially important for the critical care patient. Patients and families should have the ability to control lighting and room temperature within established clinical requirements.

Toilets

Few critical care patients are capable of using the toilet unaided. Room design should provide privacy for patients using commode chairs. Swing-out or fold-down commodes, once common in ICUs, are no longer recommended as they create infection control issues.

Family Needs

In cases where the family will be accommodated in the patient room, family space must be created in addition to floor area provided for staff and equipment.

Unit Configuration

Patient Visibility

There is a link between poor visualization of patients by nursing staff and physicians and patient mortality. Depending on the overall size and configuration of the unit, the nurse station location and size will need to be considered. This may result in either a single central nurse station or some combination of central and decentralized nurse stations adjacent to each room.

Situational Awareness

Key to a smooth functioning critical care department is that the supervisory staff and physicians can maintain a clear situation awareness of all that is happening so that appropriate and timely intervention can be applied.

Family space

Family space outside of the patient room should also be considered to allow for family respite or for conferences between family and staff that should not include the patient.

Stress Management

A quiet place for staff can provide respite from what can be an emotionally and physically exhausting job.

Care Team

Collaboration and Communication

The quality of patient care has been shown to improve when delivered by a multidisciplinary team of clinical specialists. Space for this team must be available.

Teaching

Teaching hospitals will require additional space for students. Team rooms can allow for pre-rounding meeting space. Technology can allow in-room review of patient records by the entire team.

Support Spaces

Space for pharmacy, lab, and respiratory support must be considered in the design of any critical care unit. Imaging must also be considered with either proximity to the imaging department or space for portable imaging modalities within the unit.

Thompson, Dan R. MD, MA, FACP, FCCM et. al. "Guidelines for intensive care unit design" Critical Care Medicine, 2012 Vol. 40, No. 5

A combination of small charting stations at patient rooms, with centralized team work areas, allows staff to monitor patients closely when needed, while still providing space for whole teams to work together as needed.

Evidence-Based Design Assessment *(from "Hospital of the Future" Health Care Advisory Board, 2007)*

Design Element	Incremental Cost	Impact on Patient Outcomes	Financial Return	Notes
Private Patient Rooms	$$$	↑↑	↑	Baseline standard of care. More expensive but yields higher utilization rates.
Decentralized Nursing Stations	$$	↑	↔	Total decentralization can isolate staff. Hybrid model is preferred.
Same-Handed Room Design	$$	↔	↓	Standardized layout in mirrored rooms can achieve the same goals.
In-Room Family Space	$$	↑	↔	Family involvement improves patient outcomes and satisfaction.
In-Room Obesity Accommodations	$$	↔	↑	Lifts are a good investment to prevent injuries. Structural retrofit is expensive.
Universal Patient Rooms	$$$	↔	↓	Costly to build, difficult staffing challenges. May work in specialized applications
Natural Light Exposure	$	↑	↔	Outside windows for patient rooms are ideal.
Noise Reduction Measures	$	↑	↔	Patient stress levels lowered with noise control
Healing Gardens	$$	↔	↓	Perceived benefits not proven to outweigh costs
Additional Artwork	$	↔	↓	Can add comfort to public spaces but large investments are not justified.

Source: Berry L., "The Business Case for Better Buildings" Healthcare Financial Management, November 2004, Innovations Center interviews and analysis.

Operating Room Suites

Operating /Procedure Rooms

Interventional Platform: One of the most interesting developments in recent years is a reinvention of the organization and relationship between primary interventional procedures, such as interventional imaging and cardiology, and more conventional surgical procedures. The concept behind this is to restructure how all the supporting services and resources can be shared across the whole platform, resulting in improved patient outcome, improved overall efficiency and higher resource utilization. Additionally, the new integrated platform increases staff collaboration and integration of services. From the patient and family perspective, this new model simplifies the process of registration/ reception, pre-procedure preparation and post-procedure recovery and discharge.

Organization: There are several organizational models that can be applied to the operating room suite. The most commonly used incorporates the concept of a clean work core, surrounded by operating rooms, and a peripheral corridor for patient and staff access. The clean core acts as a staging area for all clean (sterile) supplies which ultimately move into operating rooms. The intent of this model is to create a one-way flow of clean materials into the operating room. Subsequently, all soiled items, including soiled case carts, are removed via the peripheral corridor. This model is typically used in conjunction with the 'case cart' system of instrument/ supply, where case carts are staged within the clean core. In smaller operating room suites, the clean work core is sometimes substituted by a sub-sterile room and shared multiple use corridors for delivery of case carts, patients and staff.

Operating Rooms: Historically, operating room suites were often organized to have different, dedicated, operating rooms for different types of procedure. This model resulted in reduced efficiency and flexibility as the workload for each specialty varied throughout the day and throughout the week. The advantage of this earlier model can be a smaller overall department size. The newer model now being applied is to standardize all the operating rooms at a size (700 to 900 square feet) that can easily accommodate any type of procedure. The adjacency of a 'flex-zone' of space that can be used in a variety of ways including specialized equipment storage, robotic storage and control rooms is coupled with the standardized room size. In some instances, depending on the anticipated volumes of specialized procedures, specific operating rooms may be dedicated to a particular specialty, while the remainder of the rooms are used flexibly. The advantage of this model is increased operating room utilization.

The increased application of imaging technology in the interventional environment is creating a new model of operating room frequently referred to as the Hybrid Operating Room. In this type of room CT/MRI equipment is incorporated into the operating room space. This can result in either a very large room where the patient is moved on the surgical table from the surgical area to the imaging area, or where the CT/MRI is located in an adjacent space on a gantry that allows the equipment to be moved into the operating room.

Induction Room: The induction room is modeled around the concept of improving operating room turn-around between cases. Again there are various interpretations of how this can be applied. In general, the patient is transferred from pre-op holding to the induction room where the patient in then sedated and prepped for transfer into the operating room as it becomes ready. This reduces the amount of time the patient is in the operating room resulting in increased room utilization.

Inpatient/Outpatient: The mix of inpatient and outpatient volumes has a significant impact on the overall operational efficiency and financial performance of the operating room suite. Generally it has been found that staff behaviour varies when working in these two models. Outpatient surgeries tend to be less complicated, shorter procedures with a higher throughput of patients. Consequently, staff response and materials supplies are geared to this higher pace of work. Conversely, the inpatient procedures tend to be longer and more complicated, resulting in slower and lower room utilization. Skillful management is required to optimize room and resource utilization when these two models are intermingled.

Preparing for Future trends:

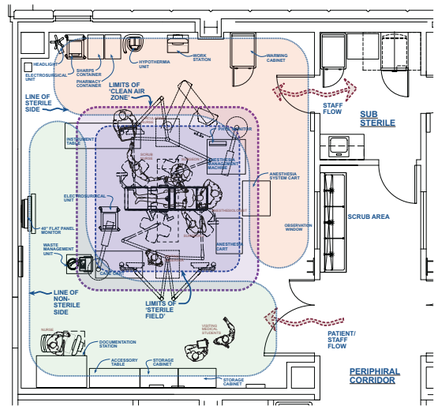
- An increase in non-invasive or minimally invasive procedures and increased use of imaging may drive larger room sizes.
- The increased use of robotics will drive the type and amount of space required.
- Hybrid ORs combine imaging and surgery.
- Inter-unit shell or soft space can allow easier changes to accommodate new technology or procedures. Perimeter layout of stairs, elevators, mechanical and electrical spaces allows for easier re-configuration.

Pre-Op and Recovery

- Private Rooms: Private rooms in prep and recovery improve patient privacy. Care team members can interview patients before a procedure or provide patient education after a procedure without fear of having private information overheard.
- Flex Zones: Arranging patient bays in "pods" allows a more flexible approach to patient bay assignment. Individual "pods" can change their function as needed
- Lighting individually controlled for each patient care area with three levels of lighting.
- Direct sight lines from nursing stations to patients.

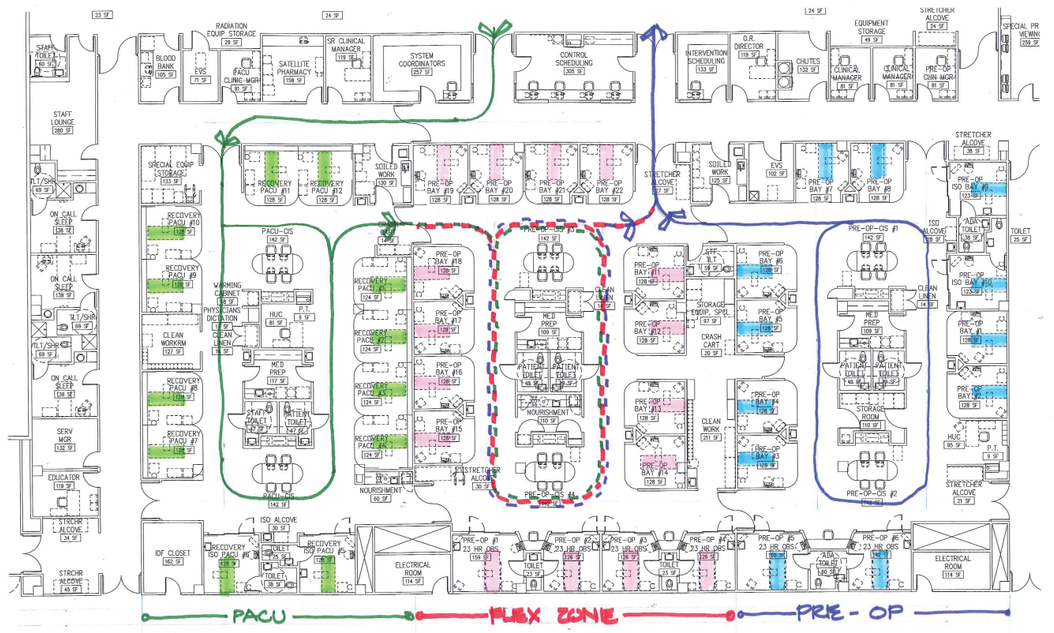
American Society of Anesthesiologists "Operating Room Design Manual," 2012.

The Health Advisory Board "Hospital of the Future" , 2007



Careful coordination of zoning and workflow patterns at the California Pacific Medical Center Operating Rooms ensure the integrity of the sterile field.

A reinvention of the organization and relationship between primary interventional procedures and conventional surgical procedures to restructure how supporting services and resources can be shared across the whole platform, can result in improved patient outcomes, overall efficiency and resource utilization



The flexible layout of the Pre-Op/PACU in the Banner Template Hospital allows more bays to be used for pre-op in the morning and more to be used for recovery at the end of the day.

Patient Safety

Patient Lifts:
It is clearly demonstrated that the use of patient lifts has significantly reduced incidences of patient and staff injuries. Optimally, these should be a permanent fixture in each patient room, supplemented with mobile lifts for use in other areas where, for example, patients are required to transfer from gurneys or wheelchairs to a procedure table.

Hand Rails:
The careful placement of handrails between the patient bedside and patient toilet has been shown to reduce the incidence of patient falls. When the patient toilet is located on the same side of the room as the patient headwall, the handrail can be continuous from the bed to the toilet door.

Lighting:
Inadequate lighting can contribute to errors and mistakes in key work spaces such as medication rooms, or at the patient bedside, when medications or treatments are administered.

Stress Reduction:
Creating a peaceful and calm healing experience contributes to patient and family well-being that can result in a reduced average length of stay. Many environmental factors can contribute to a stressful experience. These can include: unnecessary noise from multiple sources making rest and composure difficult, interruptions of sleep by staff undertaking duties, glaring bright or inappropriately located lighting and sharing of the bedroom with another disruptive patient or their family.

Non Slip Surfaces:
Infirm or elderly patients are more susceptible to falls as a result of slippery surfaces or tripping over items on the floor. Particular attention is required to lower the risks of slips when water can be easily/commonly spilled on the floor around sinks or toilets. Use of the appropriate materials to reduce the surface slipperiness is essential.

Vieira, E. R. (2008). Facing the Challenge of Patient Transfers: Using Ceiling Lifts in Healthcare Facilities. HERD, 4.

Pati, D., Harvey, T. E., Reyers, E., Evans, J., Waggener, L., Serrano, M., et al. (2009). A Multidimensional Framework for Assessing Patient Room Configurations. HERD, 3.

Mahmood, A., Chaudhury, H., & Gaumont, A. (2009). Environmental Issues Related to Medication Errors in Long-Term Care: Lessons From the Literature. HERD, 8-9.

Mahmood, A., & Chaudhury, H., & Valente, M. (2011). Nurses' perceptions of how physical environment affects medication errors in acute care settings. Applied Nursing Research, 24229-237

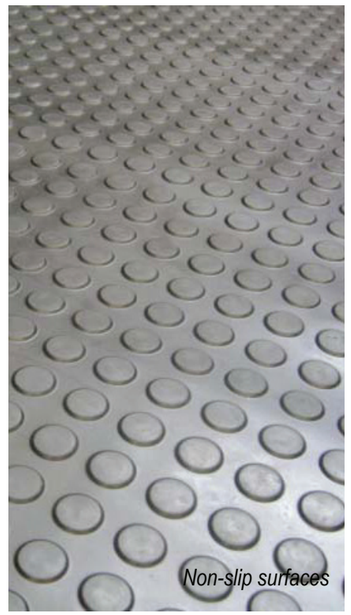
Patient rooms at Craig Hospital, a long-term rehabilitation facility in Denver, are designed with patient lift systems that allow patients to transfer from the bed to the toilet room via the lift. The system is in keeping with Craig Hospital's philosophy of empowering patients. The expectation is that the system will also reduce staff injuries.

Lighting

Stress reduction

Stress reduction

Stress reduction



Non-slip surfaces

Above and to the left: the nurse station in the Banner Page Emergency Department is located so that staff have a clear view into every treatment room. Patient beds are turned parallel to the corridor so the staff at the nursing station can see every patient's head.

Situational Awareness

Busy environments, such as the emergency department or critical care units, are examples of areas where creating spatial organization of key components can either add or detract from staff having a good sense of the overall situation. Centralized workstation/team rooms can provide an increased level of situational awareness when accompanied by good visibility across the space and ability to see what is going on with other staff or patients.

Sagha Zadeh, R., Shepley, M. M., & Waggener, L. T. (2012). Rethinking efficiency in acute care nursing units: Analyzing nursing unit layouts for improved spatial flow. Health Environments Research & Design Journal, 6(1), 39-65

Hua, Y., Becker, F., Wurmser, T., Bliss-Holtz, J., & Hedges, C. Effects of nursing unit spatial layout on nursing team communication patterns, quality of care, and patient safety. Health Environments Research & Design Journal, 6(1), 8-38

Centralized workstations and team rooms can provide increased levels of situational awareness in busy environments when accompanied by good visibility.

Hand Washing

One of the most effective protocols to reduce cross contamination between patients and improve staff safety is hand washing. It has been demonstrated that the location of sinks and hand sanitizers can have a significant impact on staff hand washing frequency. It has also been shown that when patients and/or the family members can observe if the staff wash their hands, they are more likely to do so and can be reminded to do so by the patient.

CSA Z8000-11 Section 4.5.1.4 on infection control requires “providing accessible hand hygiene sinks and waterless hand hygiene stations designed for caregiver and patient hand hygiene.”

The location of sinks and hand sanitizers can have a significant impact on staff hand washing frequency.

Ulrich, R. S., Zimring, C., Xuemei, Z., DuBose, J., Seo, H.-B., Choi, Y.-S., et al. (2008). A Review of the Research Literature on Evidence Based Healthcare Design (Part I). HERD, 8.

Bright accent colors are used at handwashing sinks in the Banner Ironwood Emergency Department. This draws attention to the sink and reinforces the importance of hand washing. The sink is placed at the entrance of the room to make handwashing before and after seeing the patient as convenient as possible.

Alcohol hand gel dispensers at doorways can improve hand hygiene.

Private quiet spaces to manage and handle medications reduce medical errors.

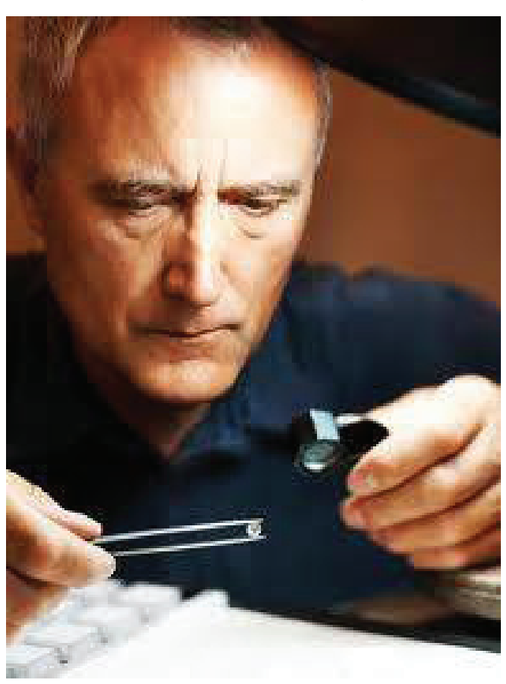
Right: modular storage and furniture systems allow this pharmacy to be configured for a smaller start-up phase and then reconfigured as the facility expands. Centralized workstations allow staff to communicate effectively and monitor the entire pharmacy.

Medications

Providing private quiet spaces for nursing staff to manage and handle patient medications has a direct impact on the reduction of medication errors by creating spaces that minimize the likelihood of interruptions or distractions. Creating a safe working environment is further enhanced by having adequate lighting levels to clearly read labeling.

Pharmacies are actively pursuing strategies that minimize errors in drug labeling and inappropriate placement of dangerous drugs in the medication storage areas. The use of technologies such as bar code identification systems to match prescription medications to the patient in the medication room and at the point of care are coupled with the safety issue of medications.

Mahmood, A., Chaudhury, H., & Gaumont, A. (2009). Environmental Issues Related to Medication Errors in Long-Term Care: Lessons From the Literature. HERD, 8-9.



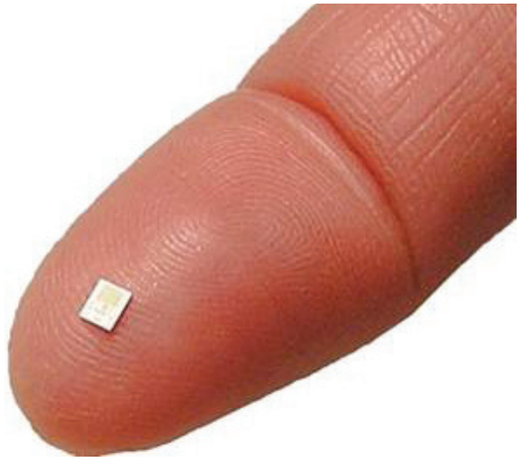
Task Lighting

Having adequate lighting in critical work areas is an essential component of creating a safe and effective work environment. With the average age of clinical staff increasing, these individuals are also subject to some loss of visual acuity, requiring higher lighting levels to be able to see clearly.

The ability to control lighting levels in the work environment can improve staff performance and accuracy.

Lighting solutions throughout the Banner Page ICU are tailored for each area. Patient rooms have at least three levels of lighting, for night lighting, for everyday situations and for examinations. Uplighting in corridors prevents patients having to stare into the lights as they are being transported. Careful placement of lights at nursing stations prevents glare in patient rooms.

Bar coding systems have allowed hospitals to better track medications all the way to the patient's bedside, reducing the likelihood of errors.



The "future hospital" will require RFID sensor systems to be widely distributed to develop simulation models, track item location and movement, and potentially track staff and patients.

Radio Frequency Identification (RFID)

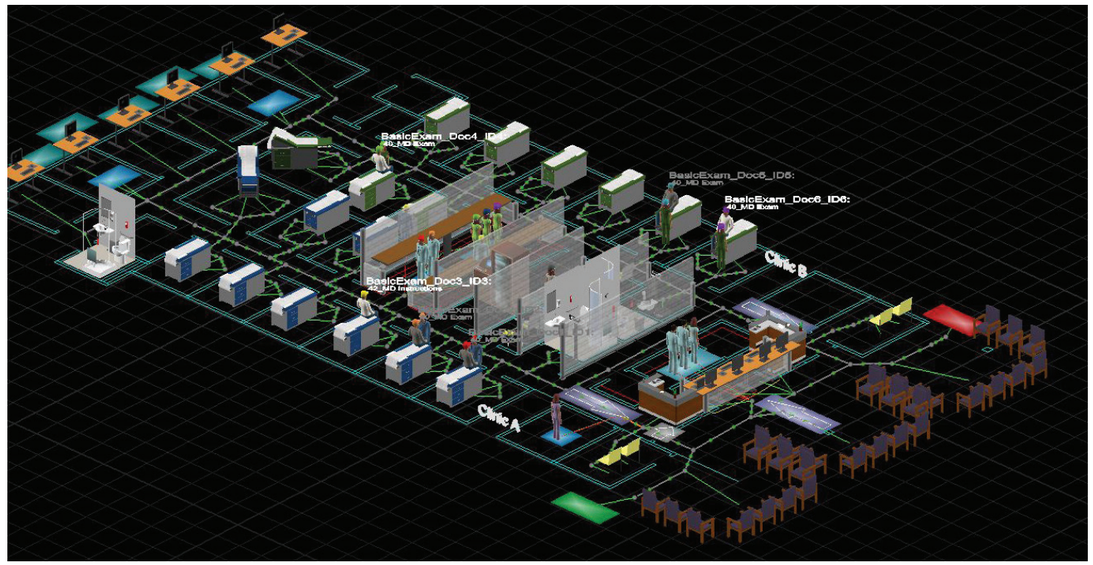
Managing supplies and items of equipment, coordinating these by location and use, is essential to optimize the use of those resources and minimize staff time taken to locate and acquire them.

RFID tagging of equipment allows any piece of equipment to be quickly located and prospective use reserved. RFID tags can increase security by alerting staff if a particular item is removed from its designated location, or taken out of the building, without authorization.

RFID tagging also allows Biomedical Engineering to actively manage the maintenance or repair of specific items to minimize loss of availability to line staff.

While controversial, RFID tracking is also possible for staff and patients, using the data produced to improve care delivery processes..

The future hospital will require RFID sensor systems to be widely distributed to track item location and movement.



Data collected through RFID tracking can be used to develop simulation models which allow the fine-tuning of the patient care process.

Automation and Robotics

Automation and robotics are strategies that are frequently employed to improve patient outcomes while lowering the cost of service.

Pneumatic Tube Systems:

By far the most cost effective automation system in support of delivery of smaller items (150 mm diameter) is the pneumatic tube system (PTS), especially when it can be planned and installed during initial construction. These systems can be point-to-point systems when a limited high security network is required, or widely distributed within and between buildings.

Transveyor Systems:

Similar to the PTS, a transveyor system can be extended to almost any part of the building through the interstitial space above the ceiling. This system is larger and slower than PTS, and runs on tracks both horizontally across floors and vertically between floors. It is space intensive and more expensive in comparison to the PTS, but larger items (about the size of a brief case) can be transported.

Processing Robots:

These technologies can be applied to achieve perfect and predictable performance outcomes. Processing robots can be used in the Pharmacy to package and label prescriptions, and in laboratories to undertake a wide variety of specimen analyses. It should be expected that the Laboratory or Pharmacy of the future will see an increased use of robotic systems to achieve faster turn-around times for analysis coupled with higher levels of accuracy.

Clinical Support Robots:

Robots, such as the DaVinci, are frequently used to assist surgeons to complete procedures with a higher level of competency and reduce patient complications resulting from surgery. We advocate all operating rooms be colocated with a “flex zone” of space to support multiple possible uses, including the storage of robotic equipment. The expectation within the industry is that the use of clinical support robots will eventually be pervasive, supporting direct patient care in almost every situation where care is to be provided.

Service/Support Robots:

The last category is robots that can be used for delivery of supplies or equipment. Already these types of robots are used by many healthcare systems to securely and reliably deliver medications from the Pharmacy to the department central staffing points. Also, types of robots are used for floor cleaning and room cleaning.

Operational costs represent by far the largest component of total health care costs and salaries and benefits are the largest part of operational costs. The use of automated technology and robotics is increasingly found to be a cost-effective investment

All operating rooms should be colocated with a “flex zone” of space to support multiple possible uses, including the storage of robotic equipment.

The use of clinical support robots will eventually be pervasive, supporting direct patient care in almost every situation where care is to be provided.

Pharmacy robotic systems are becoming more common in healthcare facilities. These systems bring new space planning and architectural design requirements to the pharmacy. Many require higher ceiling heights than might usually be available in a pharmacy and some have floor loading requirements that exceed the structural capacity of older existing buildings.

Processing robots

Clinical support robots

Service/support robots

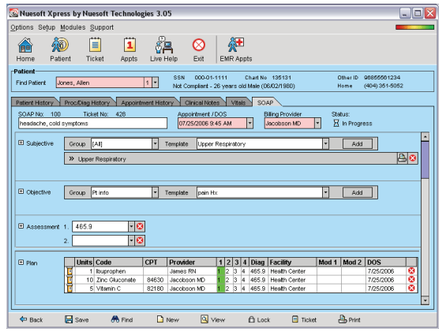
Safety

Patient safety is one of the most significant factors in the delivery of effective care to every patient, every time. While the statistical evidence for the numbers of reported medical errors is higher in the US than in Canada, there is still considerable room for continuous improvement. “30% of Canadian patients have reported that they have received the wrong medication, improper treatment or incorrect or delayed test results during the last two years (Commonwealth Fund).” *US Leads Way in Medical Errors: Study,* Susan Heavey, published November 3, 2005, by Reuters.

Factors that contribute to a safe environment of care and should be considered as part of the design process include the following:

1. Spaces to support team collaboration and communication
2. Electronic medical records
3. RFID and bar coding
4. Hand washing
5. Patient lifts
6. Handrails
7. Anti-microbial materials/surfaces
8. Improved patient visibility by staff (situational awareness)
9. Adequate lighting

There are many operational improvements, practices and protocols, such as the use of check lists, which can be applied to significantly improve patient safety.



Electronic medical record

RFID and barcoding

Hand washing

Patient lifts

Hospital handrails

Anti-microbial surfaces

Situational awareness

Adequate lighting

Anti-stick syringes

Flexibility and Change

One of the most important and valuable discussions to be had about the future design and development of any medical centre is to consider the impact of future change and identify strategies to be adopted to provide a flexible response to these concerns.

Operational Redesign:

Operational costs represent a proportionally higher level of total healthcare costs than capital improvement. In considering the purpose, intent and value of the healthcare delivery system, it is clear that it is the patient who ultimately determines if the care received was of value. Value is created when the care received relieved and, hopefully, cured the condition in the most expeditious and patient-sensitive manner.

One of the most significant movements underway in healthcare systems thinking is based on the redesign of how care can be provided by focusing on only doing those things that add value to the patient, as determined by the patient. The current terminology applied to these operational redesign systems includes 6 Sigma and 'The Toyota Way' or LEAN. These are tools that can be brought to discussions with all care providers, across all platforms, to assist departments in achieving better outcomes, improved efficiency and effectiveness, coupled with reduced costs and increased overall quality.

Modularity and Reconfiguration

Modular casework solutions and demountable partitions are strategies that can enhance healthcare environments in terms of flexibility, operations and maintenance, the ability to accommodate future changes, and reliability.

Flexibility:

By utilizing a system composed of modular elements that are designed to work together, individual components can be arranged and rearranged in a variety of manners – consider the multitude of outputs possible from a simple set of Lego™ pieces.

Operations & Maintenance:

Individual parts of modular systems are designed to be easy to switch out in the field without disrupting existing building infrastructure, minimizing disruption to patients and staff, and vastly decreasing the noise, infection risks, and dust associated with replacing traditional millwork and partition walls. This presents advantages at all levels of renovation, whether considering small alterations to accommodate new technologies or replacing a single damaged component of a system. The ability to replace only a single damaged component of an entire assembly allows for improved infection control and a significantly higher perception of cleanliness, quality and upkeep.

Future Changes:

In a traditional model of design and construction, millwork designs are decided at early phases, with construction detailing added just prior to tender. This can result in millwork that is out of date in terms of the technology or workflows it supports before it is even installed in the building. Modular systems allow millwork design decisions to change up to a matter of weeks prior to installation (and easier reconfiguration after installation as described above).

Demountable partitions are traditionally installed after installation of flooring and ceilings in non-acute healthcare settings. This allows future reconfiguration of spaces and relocation of walls without the expense, time, dust, and debris associated with renovations involving traditional framing. Even in acute care settings with cove-base flooring, modular wall and millwork systems treat the base as a sacrificial material, allowing the system to be moved and reconfigured while only needing to replace the base.

Reliability:

Prefabricated casework allows for a predictable quality of workmanship not readily achievable with custom millwork.

Modular systems specifically designed for healthcare are researched and tested in healthcare environments and are updated as best practices evolve. For example, completely wall-hung solutions and sloped tops allow for easier and faster cleaning, foot activated integral waste receptacles aid in infection control, and details like integrated pull-out charting surfaces make efficient use of limited space.

One of the most significant movements underway in healthcare systems thinking is to focus on only doing those things that add value to the patient, as determined by the patient.

Modular wall-mounted healthcare millwork

The entire check-in, waiting, scheduling and check-out procedure was rethought during the design of the Banner Health Template Outpatient Clinic. New technologies, including online registration, check-in kiosks and mobile computing were considered. While these are not yet implemented, spaces were designed to allow their eventual implementation. Centralized check-in spaces for all clinics were created and a shared waiting concourse allows patients of each clinic to overflow into other spaces if needed.

Patient Centred Care

Planetree Model

Perhaps the most comprehensive model for patient centred care is the Planetree Model, founded in 1978 by Angelica Theriott. It was a response to a model of care that was typically not patient centered but staff/hospital/system centric. The guiding principals are relevant to all healthcare facilities, not just those that choose to identify themselves with the Planetree model, specifically:

Human Interactions

Create cultures in which patients get "nurturing, compassionate, personalized care," provide support for the families of patients and for hospital employees.

Some hospitals use retreats to sensitize staff members.

Architectural & Interior Design Conducive to Health and Healing

Design healthcare spaces to "support patient dignity." Non-institutional designs and homelike atmospheres are encouraged, as is the elimination of "architectural barriers" thought to reduce patient control and privacy or interfere with family participation.

The Importance of the Nutritional and Nurturing Aspects of Food

Serve nutritional food, educate patients about cooking healthy food, add kitchens on patient floors for use by patients, their families and volunteers. In some hospitals, the smell of food being prepared, such as cookies baking, is considered aromatherapy.

Empowering Patients through Information and Education

Support patient education and participation in decisions about their treatment.

The Importance of Family, Friends and Social Support

Help families and friends support patients. Some hospitals have volunteers who provide emotional support to patients, including in the operating room, and families may be given unrestricted visiting hours, including the intensive care unit.

Spirituality: The Importance of Inner Resources

Make chapels, gardens and meditation rooms, where reflection and prayer are encouraged, available to patients.

The Importance of Human Touch

Provide services such as therapeutic full-body or chair massage for patients, families and staff.

Healing Arts: Nutrition for the Soul

Create "an atmosphere of serenity and playfulness," sometimes with music, storytellers, clowns, and funny movies.

Complimentary Therapies

Make "complimentary and alternative medical (CAM) therapy" available to patients, with programs in areas such as "heart disease reversal", meditation, therapeutic massage, therapeutic touch, Reiki, acupuncture, Tai Chi, and yoga.

Healthy Communities

Address health-care and wellness in the community served by the hospital by working with schools, senior centres, churches, and other community partners.

The CSA Z8000 guidelines recognize the importance of the environment of care, with section 4.2.2.1 stating: *The planning and design of the HCF shall support an environment of care that promotes safe and effective treatment while respecting the personal and social needs of the patient. Design decisions shall be based on available scientific evidence regarding patient outcomes and patient satisfaction.*

Below: If music or other alternative therapies are to be provided, spaces must be provided where they can occur.

Below: public spaces at the Maricopa Health Clinic are placed where they will have access to views and natural light.

Above: the waiting room at the Laser Spine Institute provides a comfortable, home-like setting.

Other Factors

Other factors that create a patient centric model of care include:

Patient and Family Amenities

These amenities can include the creation of family space in patient rooms and family kitchens to allow families to prepare food for themselves or the patient when appropriate. Family kitchens would allow a parent to prepare a favourite food for a child in hospital. Other amenities make it possible for family to stay for extended periods of time by providing workspaces or dedicated storage.

Value Based Care Model

It is the patients who define and determine if the care received is of value. Are they healed, are they cured? In a truly patient centered model of care, all processes and activities are focused on what is best for the patients. Any success in achieving this is determined by the patient. In this sense, the whole care process is organized around the needs and expectations of patients and their families to achieve the best possible outcome. All care is then delivered in a timely, efficient and effective manner, without mistakes or errors. In this model of care, all the operational structures of a given health care institution are organized around optimizing this process. From the perspective of the patients, anything that is done that does not add value to their healing or cure is irrelevant and unnecessary.

Choice and Control

A patient centered model of care is also about the environment of care, encouraging a sense of control and self-determination. If the needs of each patient are fully respected, then the environment and processes required adjust to the needs of that patient and family by offering choices. For example, patients with larger family social groups will likely require more space to accommodate the family at key points of care, such as the patient room.

Patient Privacy

Patient privacy is a key aspect of a patient centric model of care. This extends across all acuity levels and across multiple delivery platforms: from the emergency room to the patient bedroom. In this model of care, primary patient social interactions are with family and close friends, not necessarily with other patients. This premise would suggest that a majority of patient bedrooms are single-bed rooms with en-suite bathrooms.

Patient Dignity

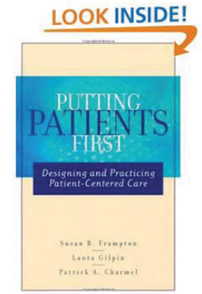
Preservation of a patient's dignity is essential in enhancing the patient's sense of self-control and self-determination. Thus, creating spaces that accommodate disabilities and independence of action without risk of injury, further enhancing the patient's sense of self-worth. Incorporation of handrails and patient lifts are examples of measures that might be taken in this regard.

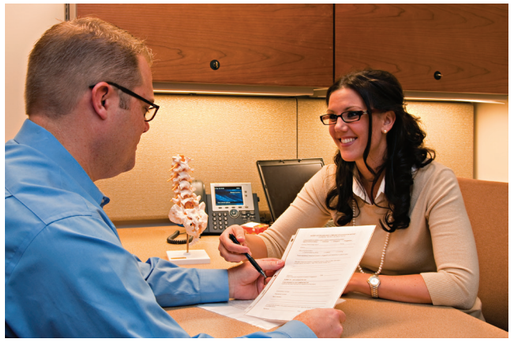
Ease of Wayfinding:

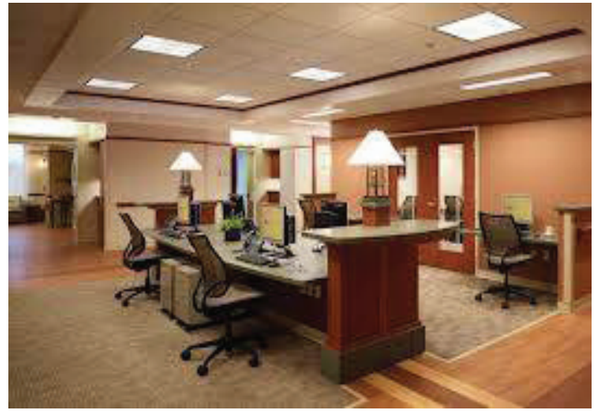
This extends to creating a healthcare experience that is easy to understand and navigate. Every patient is different and, as such, their needs will differ, but all patients are benefitted by achieving clarity of wayfinding.

It is the patient who defines if the care received is of value.

Whenever possible, corridors at Banner Ironwood end in windows. Aside from letting natural light into the units, this also contributes to ease of wayfinding. A consistent design language allows people in the building to better orient themselves.







Research

Translational research seeks to remove the barriers to multi-disciplinary collaboration, and facilitate the translation of findings from basic science to practical application. In healthcare, this has led to the development of translational medicine, a holistic research approach which seeks to move research from “bench to bedside”, bringing together laboratory research, clinical trials and actual patient applications.

Even with increasingly capable communications systems, there is still an advantage to physical proximity and colocation of the facilities that engage in basic and clinical research. An integrated research and teaching facility that colocates basic sciences discovery with clinical research, that may include population, health services, nursing and intervention foci, can target improved prevention strategies, treatment and outcomes for the patient.

As new technologies emerge, the need for a multi-disciplinary approach to biosciences will increase, as these technologies will have implications across broad categories of science. Technologies that will become increasingly important in the next 20-30 years include:

- Proteomics advances to Protein arrays and Cell Basis
- Pharmacogentics will lead to better understanding of what drugs do to the immune system
- Theoretical & computational applications for advanced modeling
- Nanotechnology will emerge in electromechanical, chemical, biological, physical
- Radio Pharmacy
- Genetics using MRI and optical imaging
- Virtual Lab microscopy, Electromicroscopy, Scanning probes, Virtual SEM
- Micro & Nano-based technologies, NMR Spectrometry
- Vascular implantation, gene therapy
- Crystallography for protein modeling

Space implications:

A translational research centre can have a significant impact on the communities it serves if planned strategically for growth. To actualize the promise of such a centre, there is a need for physical adjacencies, innovative facility solutions, and advanced communications technologies to augment collaboration and create synergy. Spaces that might be part of a translational research center could include:

- Office space for principle investigators, research faculty/post docs and support staff
- Core labs that provide support for multiple research teams; examples include:
  - Proteomics—lab space for PCRs and sequencing equipment
  - Genomics—sequencing equipment, bioinformatics’ workstations, computer systems
  - Imaging—NMR, SEM, TEM, confocal microscope, ultrasonic, and IVES system
  - Flow cytometry and cell counter equipment; dark room area.
- A vivarium to support research utilizing mice, rats, rabbits, pigs, monkeys and aquatics with appropriate isolation, containment and surgical facilities including biosafety level 2.
- Dry lab spaces; data analysis continues to grow in importance in medical research. High capacity computing and its associated infrastructure are becoming essential to a multidisciplinary research program.
- There is a growing understanding that preventive medicine and public health may prove more to be more effective approaches to some chronic diseases than radical interventions. Research space for these activities is critical to supporting a holistic approach to health research.
- Conference and lecture hall space can also play an important role, by providing a space for collaborative events with researchers outside of the facility.

There will also be space considerations within the clinical facility: researchers working within the facility may need office space during the times they are there, and may require interview or exam rooms where they can work with patients. In a teaching facility, the residents’ team rooms may be able to also support researchers.

Left: the Saint Jude Children’s Research Hospital Integrated Patient Care and Research Building combines three 18-bed nursing units, two laboratory floors, diagnostic imaging and radiation oncology to create a translational research center dedicated to the treatment of solid tumors and other childhood cancers.

Above: the University of Louisville Cardiovascular Innovation Institute houses a combination of wet/dry research labs, lab support space, a vivarium and research offices. Due to an increased emphasis on surgical research, additional surgical capabilities were also included

Sustainability

The CSA Z8000-11, Section 4.6.1, reads, in part:

"The HCF shall be planned and designed to promote sustainability in terms of the construction process, the finished building and the sustainable operation of the facility over time"

The standard further requires that projects comply with a *"recognized structured sustainability program"*. Examples of such programs include:

- *LEED*
- *Green Guide for Health Care*
- *The Building Owners and Managers Association of Canada's Building Environmental Standards Program (BOMA BESt)*
- *Green Globes (UK)*

The Canadian Green Building Council (CaGBC) offers a Canada-specific LEED program for New Construction projects called LEED Canada NC 2009. In addition, the CaGBC offers a Canada-specific LEED program called LEED-Canada-CI v1.0 for Commercial Interiors applicable to major renovations and some additions.

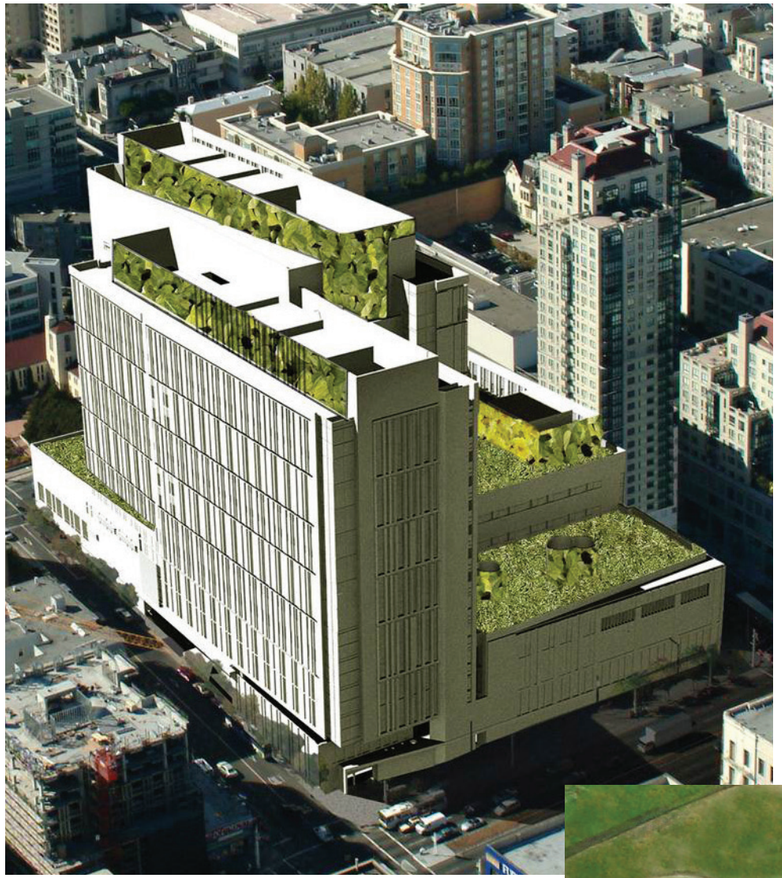
While both the HI and DGH project components represent additions to existing buildings, they differ in their ability to separate the existing building systems from the new systems. The LEED narrative sections for each project describe these limitations and the proposed path to follow for each project.

The Michigan State University Plant Sciences building uses a custom brick, designed to mimic the random coloration and texture of plant materials, an example of biomimicry and fractal patterning.

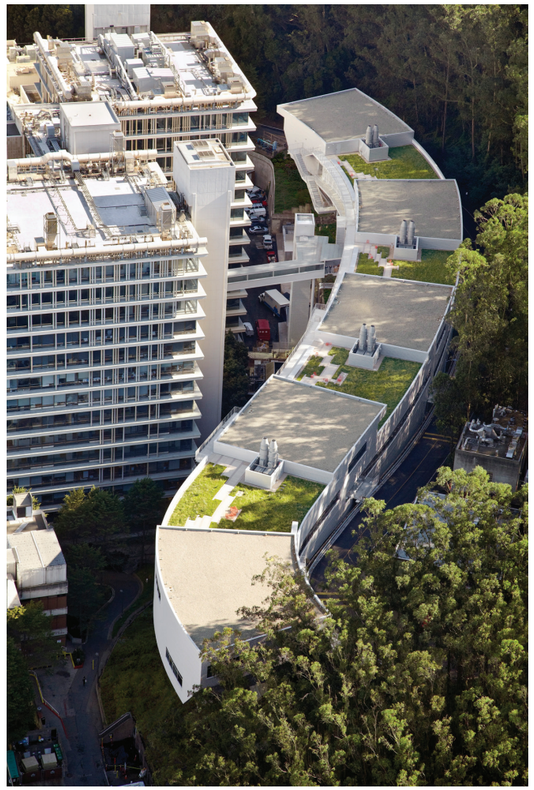
Chandler City Hall is a LEED Gold building which makes use of multiple sustainability strategies, including greywater reuse and underfloor ventilation. Non-toxic materials are used throughout for finishes and furniture.

First Solar is a LEED Gold building. Its most striking sustainability feature is the computer controlled exterior louvers used for sun control.

Green roofs extend the care environment, offer therapeutic opportunities, reduce stress, provide positive distractions, reduce and slow down the flow of stormwater to reduce civil infrastructure requirements, and absorb heat to reduce mechanical loads.



Above: California Pacific Medical Center in San Francisco incorporates green roofs whenever possible.



The UCSF Regenerative Medicine Research Facility makes use of green roofs as small courtyards.

Green Roofs and Roof Gardens

Green roofs have been integrated into the proposed design concepts where appropriate. While more expensive than conventional roofing, green roofs have significant benefits that may result in savings in the long term financial outlook for the facilities. Green roofs reduce and slow down the flow of stormwater, reducing the infrastructure needs associated with managing stormwater on-site. In addition, green roofs have been shown to absorb the heat that would normally contribute to increased mechanical loads in buildings, often creating paybacks through reduced energy needs.

Green roofs or roof gardens extend the care environment and offer therapeutic opportunities not found inside the confines of hospitals.

- They provide a place of refuge within the immediate environment, helping to reduce stress and enhance the healing process.
- Visual access to the roof garden provides patients with an opportunity to take their minds off the often difficult healing and coping process.

Below: the Library of Congress National Audio Visual Conservation Center has a 228,000 square foot garden roof ranging in depth from 6" to 48" of soil cover. The green roof keeps temperatures inside the archival storage facility stable for up to two weeks in the event of a long term power outage.

Water

Fresh water is a finite resource and while Canada is home to 6% of the world's 'renewable' fresh water, much of this water is located north, away from major population centers.

Water demands in Canada have increased by 25% over the last two decades and Canada is currently the second largest user of water per capita in the world. This water demand is second only to the US and is double that used by Europeans. As population increases, fresh water demands will continue to grow placing increased burden on already stressed resources and infrastructure.

Water conservation is paramount and, for a healthcare facility in particular, it demonstrates a commitment to the community, preserving available water and reducing the cost and ecological burdens associated with treatment, delivery and disposal. Conservation starts by reducing demand and the following represents a list of recommended strategies.

Recommended Strategies:

The simplest way to achieve significant savings is by utilizing low-flow fixtures such as:

- 1.5 gpm showers
- 0.5 gpm faucet aerators in breakroom sinks, patient sinks and public sinks
- 1.28 gpf toilets along with pint flush urinals.
- 1.6 gpm pre-rinse valves for dishwashing

Water used for sanitary purposes comprises over 40% of a hospital's total water use and the above strategies can save 42% of the water typically associated with their use.

These strategies can be combined with water efficient food service equipment to further reduce total water usage. Low-flow pre-rinse valves along with Energy-Star commercial combination ovens, steam cookers and dishwashers have significant impacts in annual water reduction.

The next largest user of water is Mechanical equipment which generally represent 23% of a hospital's total water use. Cooling tower water can be non-chemically treated to allow for usage of the blow-down water. This water can then be utilized for non-potable applications.

Other water conservation examples include using non-lubricated dry pumps for vacuum systems dedicated to liquid waste removal. These pumps do not require water to create a seal. They are typically half the horsepower of a liquid cooled pump and can be up to 50% more energy efficient, saving energy and eliminating water use.

Medical processes comprise about 14% of a hospital's total water use. Sustainable strategies include selecting air cooled medical air and compressor equipment or connecting these systems to a closed loop water cooling line. When these systems use once-through water cooling they can consume large volumes of water. For our application, a dedicated closed loop water line that is fed from a cooling tower would be the best option.

Non-medical equipment can require a significant amount of water as well. Ice machines are a perfect example where utilizing air cooled units over typical water cooled units can save over 250,000 gallons per year.

Beyond reducing demand, consideration should be made to finding alternate supplies. Systems that require a once-through water system are often good candidates for water capturing. These supplies, which include cooling-tower discharge and reverse-osmosis units, can be captured and reused for irrigation, cooling tower make-up water or for flushing toilets and urinals when appropriate.

An often overlooked resource is rainwater. Nova Scotia gets approximately 35" of rainfall which, if captured, could generate around 1,600 gallons of water per 1,000 square feet per year. This equates to approximately 1.2 million gallons (or more) on an annual basis and could be used for any of the uses noted above.

Canada is the second largest user of water, per capita, in the world.

Above: Visteon Village in Michigan utilizes the deep water of Grace Lake, a former sand and gravel quarry, to realize six benefits. The water 1) provides free winter process cooling, 2) improves summer chiller operation, 3) eliminates cooling towers (and associated fan power, noise and drift), 4) eliminates fire protection tanks, 5) provides sustainable site irrigation, and 6) allows the central plant to fit in within the design aesthetic of the Village. Energy modeling predicted that Visteon Village will spend 36% less on energy costs than that of a code compliant building, largely due to this energy conserving strategy.

Energy

Hospitals are the second largest energy intensive building type, representing a significant opportunity for operational savings and an opportunity to reduce the use of fossil fuels, a major contributor to pollution leading to significant health impacts. CSA Z8000-11 section 12.5.1.2 requires that electrical systems operate efficiently, and that alternative systems for energy generation be considered.

Operationally, as pointed out in "Targeting 100", a research project conducted at the University of Washington's Research Design Lab, the savings from energy efficiency can be significant if considered as part of the net operating income of the hospital: "*The savings accrued by the energy efficiency strategies are significant, especially if considered as part of the net operating income for the hospital. In a 4% operating environment, it takes $25 of gross revenue to generate $1 of net operating income. That is, $25 worth of services must be provided to yield $1 of profit, or net operating income. Energy savings can be viewed as an ongoing, high yield, low risk investment or revenue stream that does not require services to provide income to the bottom line of the hospital. In order to accrue $700,000-$850,000 of net operating income, (the savings achieved annually on energy bills) $18,000,000-$21,000,000 worth of services would have to be delivered annually.*"

Recommended Lighting Strategies:

Occupancy sensors reduce the total lighting loads often associated with unoccupied areas of a building. These sensors turn off the lights in unoccupied spaces. They can be used for the vast majority of support spaces.

Vacancy sensors differ from occupancy sensors in that they require someone to physically turn on a light when entering a space. After that, they work exactly like occupancy sensors in that when no activity is present in the space, the lights will be shut off. These are good to implement in private offices, conference rooms, and staff lounges.

Daylight sensors should be planned for all daylit spaces outside of patient and procedure rooms.

CSA Z8000-11 Section 12.5.2.2.3 requires adjustable lighting controls at nurse stations to accommodate different times of day and levels of activities. Task lighting is a very cost effective way to isolate those lighting needs to the individual versus having to turn on large expanses of area lights. This is also a credit under LEED which requires that each FTE have access to a Task Light.

LED technology has become an effective solution for most exterior lighting applications. It provides adequate lighting levels and saves considerable amounts of energy over conventional lighting options. We would recommend LED lighting in all exterior applications.

Wirelessly controlled and dimmable LED parking lot lighting reduces the load from parking lot fixtures and allows wireless control of individual fixtures, or group of fixtures, by a peer to peer signal. This allows lights to be dimmed for additional energy savings and/or the turning off of alternate lights after curfew to extend the lamp life of the fixtures.

Localized lighting controls could provide nurses and staff effective control of lighting from the nurse's stations or other central staff areas, controlling any room on the floor. A lighting control panel connected to the Building Management System (BMS) would allow remote operation of lighting controls.

A Building Management System (BMS) will increase the ability of facilities management to identify problems or inconsistencies in the monitored systems. We would recommend a comprehensive systems approach including meters and separate electrical panels to help facilitate the management, measurement and improvement of all electrical systems. Use of building scheduling will allow for a more precise energy control and will lead to noticeable operational savings.

Peak Demand Control can help prevent campus usage from exceeding specific demand loads, which can lead to substantial savings depending on the electrical rate structure. Monitoring electrical usage and implementing strategic load shedding strategies can prevent the exceeding of an established benchmark. Strategies include adjusting non-occupied or non-patient space temperatures by one degree or more, or dimming accent lighting that does not have an impact on code required lighting levels.

Hospitals are the second largest energy intensive building type... a significant opportunity for operational savings and an opportunity to reduce the use of fossil fuels.

Above: Daylighting of the Science & Technology Facility at the National Renewable Energy Laboratory (NREL) was achieved through the combination of building orientation, clerestory windows, clear and translucent glazing, light shelves, and highly reflective interior surfaces, as well as louvered overhangs and brise-soleil shading devices. The separation of both office and laboratory functions helped to maximize opportunities to apply this practice. Within the facility, 100% of the office lighting and 50% of the laboratory lighting between 10 am and 2 pm was accomplished through daylighting. When combined with high-efficiency electric illumination and integrated lighting controls, this resulted in a 48% reduction in energy required for lighting.

Mechanical Systems

The CSA Z8000-11 Standard, Section 12.4.10 requires that *"Environmentally sustainable strategies should be adopted in the design, construction, and operation of mechanical systems to attain high performance over the building lifetime."* Specific requirements include:

- *Effective and efficient systems that conserve energy and water resources;*
- *Comfortable and healthy indoor environment; and*
- *Minimum impact on the environment by means of emitting less pollutants and greenhouse gasses.*

A number of systematic strategies should be considered to increase the energy and operational efficiency of both the Halifax Infirmary and Dartmouth General projects.

Recommended Strategies

Heat Recovery Chillers: Chilled water is one of the main systems utilized in a hospital and producing it can be energy intensive. During the production of chilled water there is an opportunity to capture heat generated and reuse it for heating the domestic hot water system.

High Efficiency Chillers: New technologically advanced chillers will allow chilled water to be produced more efficiently. Magnetic bearing centrifugal chillers that are variable frequency driven have exceptional energy efficiency during full and part load operation. This allows the system to produce only the required amount of chilled water demanded, with no excess. Pairing the chillers with plate and frame heat exchangers will allow the system to produce chilled water when the outside wet bulb temperature is below a certain threshold without the use of the chillers.

Outside Air Economizers: There is evidence that increased use of outside air can result in shorter healing time for patients and increased productivity for staff. New systems being implemented can be supplied with an outside air economizer that uses the outside air to "free cool" the building. This strategy can utilize the cooler air temperatures in Nova Scotia to avoid or minimize the usage of chillers.

VAV Systems: Variable air volume (VAV) systems accurately follow a building's cooling and heating demands. This allows spaces to be supplied with more or less air depending upon the activities taking place in the space. System components include variable frequency drives and variable air volume boxes serving the spaces. The system also assures that rooms maintain code required minimum air changes.

Displacement Ventilation: Displacement ventilation is an air delivery method that uses the natural buoyancy effect to cool spaces. Using the fact that hot air rises, cool air is introduced inside the space, where it naturally pools at the floor. As heat is generated inside the room due to human activity or equipment, the heated air will rise up. This unidirectional airflow will help contaminants move in one direction and out of the space rather than being mixed inside the room, as they would be with traditional ventilation systems. Discharged air in a displacement ventilation system is warmer than the conventional mixed air system. This allows for increased economizer hours and lowered stress on the chilled water system, with a resulting increase in energy efficiency.

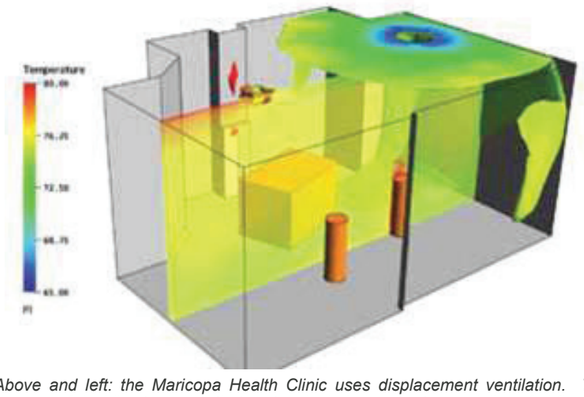
Chilled Beams: Chilled beams can be deployed in areas that do not have code required minimum air changes. This technology utilizes chilled water piped to individual spaces to provide cooling. Each space is provided with adequate fresh air based on occupancy level. This technology reduces the airside equipment sizing and airside delivery infrastructure.

Exhaust Air: Hospitals, by their nature, generate a noticeable amount of exhaust air that contains usable energy. Various recovery strategies can be employed to capture this energy. Air-to-air heat exchangers, a run around loop, or heat pipe will allow some of this energy to be captured without introducing exhaust air contaminants to the fresh air stream.

Solar: Solar heating systems such as solar duct, solar wall and solar panels should be investigated and incorporated into generating hot water and pre-heating outside air for campus use. These systems can capture the sun's energy regardless of the ambient temperature. The systems are comprised of vacuum sealed tubes that absorb solar energy with minimum heat transfer to the surroundings.

Building Management System: The building management system should have the capability of incorporating other systems such as electrical and plumbing to allow for scheduling and peak demand reduction strategies.

Solar duct heats ventilation air with a collector efficiency of up to 80%.



Above and left: the Maricopa Health Clinic uses displacement ventilation. The process of deciding to deploy that system included computer modeling of airflow, as well as real-world mock-ups to test the system in an actual space.

Indoor Environmental Quality

Healthcare environments have significant upstream and downstream impacts on environmental quality, affecting occupants, surrounding communities, and our global community.

According to the UN Strategic Approach to International Chemicals Management (SAICM):

"The healthcare sector is a major consumer of chemicals including those well documented to cause serious impacts on health and the environment. Thus, a sector whose mission it is to protect human health is contributing to the burden of disease. Chemicals in products used in healthcare affect human health throughout the life cycle of these products -- that is, during production, use and disposal. Vulnerable populations include patients, healthcare workers who experience exposure on a daily basis, factory workers who manufacture the products, workers in waste disposal facilities and people who live near manufacturing plants or waste disposal sites."

Many of these chemicals have been linked to serious illnesses such as learning disabilities, asthma, infertility, immunological disorders, Parkinson's disease, and cancer. The World Health Organization points out that in 2004, one in ten preventable deaths was caused by toxic substances. Healthcare facilities can help protect the health of occupants by addressing chemicals of concern and reducing opportunities for exposure by using safer alternatives and following a precautionary approach when selecting materials, finishes, and cleaning and sanitization products. It is critical to consider the make-up of products for specification for this project, and equally important to for lower maintenance requirements associated with these materials. Evaluation and proposal of materials such as flooring products, paints, and ceiling tiles would include educated considerations for the maintenance requirements, supporting higher indoor air quality and affecting the long term value of such selections.

Recommended Strategies:

Eliminating materials identified as allergens, mutagens, carcinogens and endocrine disrupters should be a priority. Careful consideration should be made to prioritize products, materials and finishes that minimize the potential exposure of patients and staff to these harsh chemicals.

Low Emitting Materials- adhesives/sealants – As a credit in LEED, and with the known availability of compliant products, this should be an easily implemented strategy. Following LEED Canada's NC-2009 guidelines when selecting adhesives and sealants will help to lower harmful VOC emissions that impact patient, worker and community health.

Low Emitting Materials- paints/coatings – Also a credit in LEED with many known compliant products available. Consideration should be given to taking this further and requiring only Zero VOC paints for all interior finishes and primer applications. There is a major shift in the marketplace to Zero VOC paint products and this should not be a major issue in terms of availability.

Low Emitting Materials- flooring systems - Another credit in LEED that limits VOC content of flooring adhesives to 50 g/L, requires all hard surface flooring to be Floorscore Certified and that all carpet and carpet cushion meet CRI's Green Label Plus program requirements.

Low Emitting Materials- Composite Wood and Agri-fiber products – This credit under the LEED system requires that all composite wood used on the project be urea formaldehyde free. This has also become a very common practice and should have wide availability in the marketplace.

PVC Reduction – PVC is ubiquitous in the construction world and can be found in a wide array of products including electrical wiring, flooring and other interior finishes, paints, coatings and even medical equipment and supplies. Every effort should be made to minimize the use of PVC in the project. PVC has major health implications during its manufacture and production, releasing dioxins in the environment. In addition, many PVC applications require the use of plasticizers known as phthalates which help keep the PVC pliable. Since Phthalates do not chemically bond to the PVC products, they off-gas continuously over the life of the product becoming airborne and easily ingested. These phthalates are known endocrine disrupting compounds and have increased impacts on children and patients with compromised immune systems. Alternatives such as rubber flooring in OR, ER or other D&T suites, or Linoleum in general public/patient areas should be considered.

Anti-Microbial Treatments

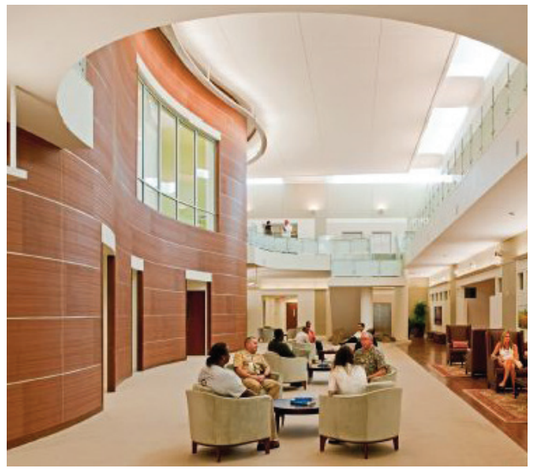
HAIs, or Hospital Acquired Illnesses, are the third leading cause of the death in the US. Recent studies have shown that Anti-microbial coatings on select surfaces in ICUs can reduce HAIs by as much a 40%. The natural anti-microbial aspects of copper can quickly and effectively kill 97%of bacteria and many viral and fungal pathogens. This is equal in effectiveness to 'terminal' cleaning, yet requires significantly less labour and fewer resources.

Recommended Strategies:

Purchase door hardware, including push plates and pulls, that incorporates the use of anti-microbial copper.

Prioritize products, materials and finishes that minimize the potential exposure of patients and staff to materials identified as allergens, mutagens, carcinogens and endocrine disrupters

PVC can be found in a wide array of products including electrical wiring, flooring and other interior finishes, paints, coatings, medical equipment, and medical supplies. It has major health implications during its manufacture and production and frequently requires the use of plasticizers to help keep the PVC pliable, and which off-gas endocrine disrupting compounds continuously over the life of the product, becoming airborne and easily ingested.



Above: the National Intrepid Center of Excellence in Washington, DC combines a carefully chosen palette of materials, with a variety of lighting strategies, to create a comfortable, soothing environment for veterans with traumatic brain injury.

Biophilic Design Elements

Biophilia is a term that describes our innate human attraction to nature, identifying our biological needs for connection with nature on physical, mental, and social levels. Biophilia draws direct connections between nature and our entire well-being.

Some of the most promising results of Biophilia on the physical body relate to the benefits people experience due to the calming nature of spaces that employ biophilic strategies. Biophilic designs have been found to help the body achieve its natural balance of homeostasis, as opposed to the "fight-or-flight" (sympathetic) stress related states. This balanced state (parasympathetic) provides our bodies less stress, and has been found to result in decreased stress, frustration, and irritability, and an increase in overall satisfaction. These design principles have been directly correlated to positive rates of recovery, healing and satisfaction, and for staff, reduced rates of illness, enhanced job performance (stress/fatigue) and increased rates of retention.

The wide variety of building occupants of healthcare facilities can all benefit from Biophilic design principles incorporated in a project such as this:

- patients, with their often vulnerable or compromised immune systems;
- family members needing comfort and support; and,
- staff, often working long and difficult hours with frequent stressful job demands.

The evidence of the benefits of Biophilic design leads us to conclusions that support the well being, comfort and higher satisfaction of all of these groups.

Recommended Strategies

Fractal Patterning - fractals are patterns in nature, well documented to positively affect human neural activity and the parasympathetic system leading to a restorative environment supporting human health and wellness.

Daylight - the quality of natural light (and of views) cannot be duplicated, replicated or mimicked in space. Priority should be given to provide natural light and views where at all possible.

Refuge/Prospect - Creating specific and thoughtful areas of shelter and refuge will help users in the space realize a greater sense of comfort. These areas should be balanced and supported with vast, expansive views from the area of refuge to take most advantage of the qualities associated with these spaces.

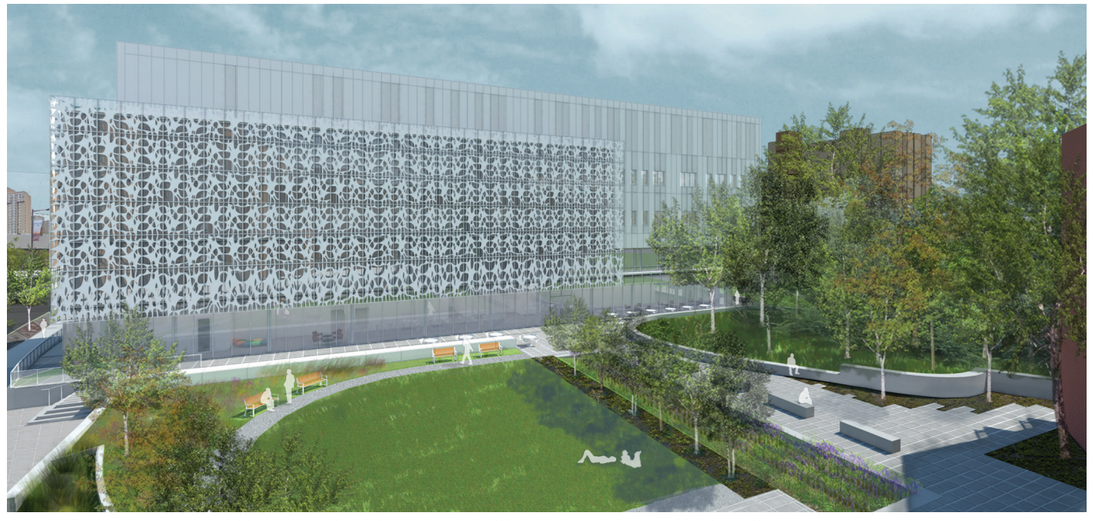
Age, Change and the Patina of Time - utilize items such as artwork, that show quality, richness and a departure from mechanical and more technical rigid forms in healthcare facilities, such as elements of copper that reflect patina and change over time.

Community and Staff Engagement - Biophilic design is also design that engages the surrounding community and can greatly assist in bringing greater meaning and positive public awareness to the project. The extension of the design process to include community, staff, patients and families' involvement not only serves the best interest of the project, but can enrich the service of the project and instill a sense of ownership, meaning and community engagement.

Left: Complexity and patterning can mimic the fractal patterning found in nature.

Utilize biophilic design strategies to improve patient rates of recovery, healing, and satisfaction, and to reduce staff rates of illness, while enhancing job performance and retention rates.

Above: The linear accelerator room at the Mt. Zion cancer center shows how biophilic elements can be incorporated in even the most high-technology spaces.



Above: The sun screen used at the University of Pennsylvania NBS building makes use of fractal patterning.

Preliminary LEED™ Narratives and Scorecards

Halifax Infirmary LEED™ Narrative

The Halifax Infirmary Addition is a new addition to the hospital that includes 20 operating rooms, and approximately 150 inpatient rooms, in a multi-story configuration. The new addition is targeting a minimum Silver level of certification through LEED-Canada™, administered by the Canada Green Building Council (CaGBC). Healthcare projects in Canada may choose between the USGBC's LEED for Healthcare™ program or another CaGBC program applicable to the project's scope.

Review of the project's scope reveals that it is a new addition to an existing facility and would typically pursue certification following a new construction approach. To qualify, projects are required to meet the CaGBC's Minimum Program Requirements (MPR). Here the project is required to be measured as a stand-alone structure, meaning that all mechanical/electrical/plumbing (MEP) systems utilized for the project must be metered individually from those of the existing facility. In addition, the MPR requires that a LEED™ boundary be identified that encompasses the entire scope of the project without gerrymandering. Since the proposed facility is built over the existing Emergency department, the only way to provide an accurate boundary would be to include the Emergency department wing in the proposed LEED™ boundary. Additional research is required to determine if the MEP systems for the existing ER wing can be individually metered and therefore included in the LEED™ scope. This report assumes they are able to be individually metered, suggesting the LEED-Canada-NC 2009™ is the most applicable certification path to follow. Should the ER wing be prohibitively complicated to meter and model, then the project may have to pursue certification under the LEED-Canada-CI™ version 1.0 for Commercial Interiors. This would change the LEED™ format significantly and would alter the findings in this report substantially.

Interior renovations to the existing hospital should follow the LEED™ requirements appropriate to their scope but will not be allowed to be included in the overall LEED™ scope of the certification unless the entire building is taken as a whole. Under that scenario, there is a high likelihood that the entire structure would not comply with the prerequisites of the LEED-Canada-NC 2009™ program.

LEED-Canada-NC 2009™ is a 100 point system that has 10 additional points available for innovation and regional priority. Projects achieve varying levels of certification based on the quantity of credits/points achieved. The following lists the number of points required for each level of certification:

Certified	*40-49 points*
Silver	*50-59 points*
Gold	*60-79 points*
Platinum	*80 points and above*

There are seven overarching categories within the LEED™ system: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, Innovation in Design, and Regional Priority. For purposes of this report, we will identify any required credits, called prerequisites, and major issues, concerns or strategic approaches that should be top of mind during the next phase of development for each of these categories.

Sustainable Sites

The Sustainable Sites Category has 26 possible points composed of one prerequisite and 14 credits. The prerequisite requires projects to implement Best Management Practices for controlling pollution during construction. The contractor is responsible for implementing the practices required to meet this credit's intent and there should be no issue in doing so. Since the Sustainable Sites and Energy and Atmosphere categories present the largest opportunities for points, special consideration should be paid to maximizing points that are cost effective and applicable to the project's needs and goals.

There appear to be 11 easily achievable points through immediate access to community resources and local transportation options. Stormwater management, as outlined by the Civil Consultant, will garner an additional point for quantity control, and if proper filtering and storage are introduced, could increase this to two points. High-reflectivity and emissivity roofing should be utilized such that 50% or more of the new roofing is helping to minimize local heat island impacts. Credits 1 (site selection) and 4.3 (low-emitting and fuel efficient vehicles) could be achieved. The remaining credits are either highly-unlikely to be achieved or cost prohibitive based on site constraints and/or existing conditions.

Water Efficiency

The Water Efficiency Category has 10 possible points composed of one prerequisite and three credits. The prerequisite requires projects to implement strategies that lead to a minimum interior potable water use reduction of 20%. This level of reduction is easily achieved through the use of high-efficiency water fixtures as outlined in the Part-A Report. The minimum goals for this project should be to achieve a 50% reduction in water use for landscape irrigation and a 30% reduction in interior water use. A 30% reduction would require a detailed evaluation of equipment and fixture requirements. Other strategies to consider would be the use of rainwater or greywater to reduce irrigation demands or potable water demands necessary for sewage conveyance. Both of these have large point implications and minor infrastructure investment.

Energy and Atmosphere

The Energy and Atmosphere Category has 35 possible points composed of three prerequisites and six credits. The prerequisites include commissioning of the building energy systems and assuring their alignment with the client's goals and expectations, the reduction of energy costs by a minimum of 10% over ASHRAE 90.1-2007 or 23% over MNECB (1997), and the elimination of harmful CFC-based refrigerants from the HVAC systems. Currently there are no plans for chillers to be shared between facilities but if that scenario presents itself, any CFC-based refrigerants in those existing plants must be phased out by 2015.

The largest opportunity to align long-term operational cost savings and increased LEED™ points is in the Optimize Energy Performance credit. Through advanced energy modeling, life-cycle analysis should be used to optimize energy conservation strategies and long-term cost savings. It is helpful to identify a maximum time frame within which strategies should provide a return-on-investment (ROI). Design strategies should be the first area of exploration as they provide the best opportunity to maximize the climatic response architecturally and minimize the system sizes in response. There are 19 points in this category, and if high levels of LEED™ certification are desired, maximizing points here will be important.

Enhanced Commissioning and Measurement and Verification credits under this Category should be pursued. Both will help ensure that systems installed in the facility are operating as they were intended and capable of achieving the energy reduction and cost savings projected during the design process.

Materials and Resources

The Materials and Resources Category has 35 possible points composed of one prerequisite and eight credits. The prerequisite requires that recycling facilities and infrastructure be integrated into the design solution. It requires projects to recycle cardboard, glass, plastic, metals, and paper. Location of these spaces should be coordinated with facilities and the design team to identify both approach and management strategies. Similar in impact is the reduction of construction waste. The minimum target for this project should be a 75% diversion rate of all unused construction related resources; this includes demolition of existing building structures and site materials.

The remaining credits in this category relate to material selection strategies that help reduce the addition's environmental impacts. The minimum level of achievement should be to use 10% recycled and regional content and for 50% of all wood purchased on the project to come from FSC certified forests. Where opportunities for material reuse are discovered, either through demolition or through investigation, integration of these materials into the design should be considered.

Indoor Environmental Quality

The Indoor Environmental Quality (IEQ) Category has 15 possible points composed of two prerequisites and 15 credits. The prerequisites require that the project's ventilation systems comply with Sections 4 through 7 of ASHRAE 62.1-2007 and that it be a smoke-free facility. Compliance with these prerequisites is not seen as an issue for the addition.

The balance of the IEQ Category is composed of credits that support the creation of a healthy indoor environment by reducing exposure to hazardous chemicals, providing basic levels of controllability to occupied spaces for lighting and mechanical needs, and providing access to daylight and views. Considerable attention should be paid to maximizing daylight opportunities and views in the design as these attributes contribute much to improving the healing process and reducing stress in both patients and staff. While it is difficult to fully achieve these credits, it should not limit the overall attempt to maximize the opportunities throughout. Controllability of systems is a critical issue that often gets overlooked in occupied spaces. Access to lighting controls and HVAC controls should be provided in every occupied space. These could pose some challenges since they are all-or-nothing credits.

Other credits relate directly to keeping chemicals out of the building. Specifying safer materials and finishes fosters a healthy healing environment, and the project should plan to minimize VOC's and formaldehyde from these products and consider evaluating material choices with more advanced chemicals of concern research in mind. Another strategy is to control the potential introduction of particulates through foot traffic into the facility. This can be achieved by incorporating recessed floor grates with integral drains within the proposed vestibules to allow for potential contaminants to be captured.

Innovation in Design

This category is meant to capture instances in the project where additional measures are taken to improve upon the performance of any LEED™ credit, known as exemplary performance, and to allow for further innovation by the design team. Typically, these innovations consist of educational opportunities, green cleaning practices/ policies, pest control and management, advanced waste diversion activities, community engagement, low-mercury lighting, and generation of case studies or other applied research. The innovation credits should be evaluated as a team in order to ensure proper integration in design, construction and operational phases of the project.

Regional Priority

The Regional Priority Credit has one credit called Durable Building and three optional points. The intent of the Durable Building credit is "to minimize materials use and construction waste over a building's life resulting from inappropriate material selection or premature failure of the building and its constituent components and assemblies." It requires developing a Building Durability Plan in compliance with CSA S478-95 (R2007) – Guideline of Durability in Buildings and utilizing a qualified building science professional to develop and deliver that plan. Consideration during detailed design phases will be required to further explore this opportunity.

The optional credits under this category should be discussed as a team as they apply to those LEED™ credits with regional benefits and must be requested as part of the LEED™ submittal. At this time, we should anticipate meeting at least one of these regional credits.

Halifax Infirmary LEED Scorecard

The following tables represent a summary of the LEED™ analysis for the HI addition project. It itemizes all the potential points within each category of the LEED-Canada-NC 2009™ program, along with preliminary determinations of achievability for this project.

This analysis will need to be revisited as design develops in each future design phase of the project, in order to reassess the overall LEED™ level and individual points achievable for the final construction.

LEED™ Status

The project is currently tracking at the SILVER certification level with the potential to achieve GOLD certification if all 'maybe' opportunities are capitalized on. This level will fluctuate as the project moves along but a minimum level of achievement should be identified as a team.

Halifax Infirmary

Y	?	N			
53	13	44	**Total Project Score**	Possible Points	110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 69 points Platinum 80 and above

Y	?	N			
20	3	3	**Sustainable Sites**	Possible Points	26
Y			Prereq 1	**Construction Activity Pollution Prevention**	
1			Credit 1	**Site Selection**	1
5			Credit 2	**Development Density and Community Connectivity**	3 or 5
	1		Credit 3.1	**Brownfield Redevelopment**	1
6			Credit 4.1	**Alternative Transportation**, Public Transportation Access	3 or 6
1			Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
3			Credit 4.3	**Alternative Transportation**, Low-Emitting and Fuel Efficient Vehicles	3
		2	Credit 4.4	**Alternative Transportation**, Parking Capacity	2
		1	Credit 5.1	**Site Development**, Protect or Restore Habitat	1
	1		Credit 5.2	**Site Development**, Maximize Open Space	1
1			Credit 6.1	**Stormwater Design**, Quantity Control	1
	1		Credit 6.2	**Stormwater Design**, Quality Control	1
1			Credit 7.1	**Heat Island Effect**, Non-Roof	1
1			Credit 7.2	**Heat Island Effect**, Roof	1
1			Credit 8	**Light Pollution Reduction**	1

Y	?	N			
4	1	5	**Water Efficiency**	Possible Points	10
Y			Prereq 1	**Water Use Reduction**, 20% Reduction	
2		2	Credit 1	**Water Efficient Landscaping**	2 or 4
		2	Credit 2	**Innovative Waste Water Technologies**	2
2	1	1	Credit 3	**Water Use Reduction**	2 to 4

Y	?	N			
10	2	23	**Energy & Atmosphere**	Possible Points	35
Y			Prereq 1	**Fundamental Building Systems Commissioning**	
Y			Prereq 2	**Minimum Energy Performance**	
Y			Prereq 3	**Fundamental Refrigerant Management**	
5		14	Credit 1	**Optimize Energy Performance**	1 to 19
		7	Credit 2	**On-Site Renewable Energy**	1 to 7
2			Credit 3	**Enhanced Commissioning**	2
	2		Credit 4	**Enhanced Refrigerant Management**	2
3			Credit 5	**Measurement and Verification**	3
		2	Credit 6	**Green Power**	2

Y	?	N			
5	0	9	**Materials & Resources**	Possible Points	14
Y			Prereq 1	**Storage & Collection of Recyclables**	
		3	Credit 1.2	**Building Reuse**, Maintain Existing Structural Elements	1 to 3
		1	Credit 1.3	**Building Reuse**, Maintain 50% of Existing Non-Structural Elements	1
2			Credit 2.1	**Construction Waste Management**, Divert 75%	1 to 2
		2	Credit 3.2	**Material Reuse**	1 to 2
1		1	Credit 4.1	**Recycled Content**	1 to 2
1		1	Credit 5.1	**Regional Materials**	1 to 2
		1	Credit 6	**Rapidly Renewable Materials**	1
1			Credit 7	**Certified Wood**	1

Continued on Next Page

10	1	4	Indoor Environmental Quality	Possible Points	15
Y	?	N			
Y			Prereq 1	**Minimum IAQ Performance**	
Y			Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	
1			Credit 1	**Outdoor Air Delivery Monitoring**	1
1			Credit 2	**Increased Ventilation**	1
1			Credit 3.1	**Construction IAQ Management Plan**, During Construction	1
1			Credit 3.2	**Construction IAQ Management Plan**, Before Occupancy	1
1			Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1
1			Credit 4.2	**Low-Emitting Materials**, Paints and Coatings	1
1			Credit 4.3	**Low-Emitting Materials**, Carpet	1
1			Credit 4.4	**Low-Emitting Materials**, Composite Wood and Laminate Adhesives	1
1			Credit 5	**Indoor Chemical & Pollutant Source Control**	1
	1		Credit 6.1	**Controllability of Systems**, Lighting	1
1			Credit 6.2	**Controllability of Systems**, Thermal Comfort	1
		1	Credit 7.1	**Thermal Comfort**, Design	1
		1	Credit 7.2	**Thermal Comfort**, Verification	1
		1	Credit 8.1	**Daylight & Views**, Daylight	1
		1	Credit 8.3	**Daylight & Views**, Views	1

3	3	0	Innovation & Design Process	Possible Points	6
Y	?	N			
1			Credit 1.1	**Innovation in Design**:	1
1			Credit 1.2	**Innovation in Design**:	1
	1		Credit 1.3	**Innovation in Design**:	1
	1		Credit 1.4	**Innovation in Design**:	1
	1		Credit 1.5	**Innovation in Design**:	1
1			Credit 2	**LEED™ Accredited Professional**	1

1	3	0	Regional Priority	Possible Points	4
Y	?	N			
	1		Credit 1	**Durable Building**	1
1			Credit 2	**Regional Priority**	1
	1		Credit 3	**Regional Priority**	1
	1		Credit 4	**Regional Priority**	1

Point Allocation

53	YES
13	POTENTIAL
44	NO

DGH Addition LEED™ Narrative

The Dartmouth Renovation & Addition project includes a new addition with 8 operating rooms, day surgery and recovery spaces as well as interstitial space for enhanced and consolidated Ambulatory Care services and a variety of interior renovated spaces within the existing hospital. The new addition is targeting a minimum LEED-Silver™ level of certification through LEED-Canada™, administered by the Canada Green Building Council (CaGBC). The CaGBC does not offer a program for certification specific to healthcare projects, but healthcare projects in Canada are able to choose between the USGBC's LEED for Healthcare™ program or a CaGBC program applicable to the project's scope.

This project is as addition to an existing facility and would typically pursue certification following a new construction approach. To qualify, projects are required to meet the CaGBC's Minimum Program Requirements (MPR). The MPR's for new construction require that the project be a complete structure in its entirety. Since this is an addition to an existing facility, under the same ownership and for the same purpose, it is not possible to look at this as new construction under LEED-Canada™. Under this circumstance, the LEED-Canada-CI™ v1.0 for Commercial Interiors is the most applicable certification path to follow.

Given that the scope of this project contains multiple renovation projects, LEED™ does not allow for non-contiguous portions to be considered in the same LEED™ boundary and would require separate certification. Special care should be taken to determine the most appropriate LEED™ boundary that encompasses as much contiguous space as reasonable and pursue one certification for this portion of the project.

Interior renovations of the existing hospital should follow the LEED™ requirements appropriate to their scope but will not be included in the overall LEED™ scope of the certification unless the entire building is taken as a whole. Under that scenario, there is a high likelihood that the entire structure would not comply with the prerequisites of the LEED-Canada-CI 1.0™ program.

LEED-Canada-CI 1.0™ is a 57 point system that includes five possible innovation points. Projects achieve varying levels of certification based on the quantity of credits/ points achieved. The following lists the number of points required for each level of certification:

Certified	*21-26 points*
Silver	*27-31 points*
Gold	*32-41 points*
Platinum	*42-57 points*

There are six overarching categories with the LEED™ system: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, and Innovation in Design. For purposes of this report, we will look at each category, identifying any required credits, called prerequisites, and any major issues, concerns or strategic approaches that should be top of mind during the next phase of development.

Sustainable Sites

The Sustainable Sites Category has seven possible points composed of no prerequisites and five credits. Two points appear to be easily achievable through immediate access to community resources and local transportation options. The remaining credits in this category are highly unlikely to be achieved without further considerations.

Water Efficiency

The Water Efficiency Category has two possible points composed of two credits (no prerequisites). Both credits are related to reduction in potable water use, and are separated into 20% reduction and 30% reduction. The minimum goal for this project should be to achieve a 20% reduction in interior water use. Strategies to consider would be the use of rainwater or greywater to reduce potable water demands necessary for sewage conveyance. A 20% reduction should be achievable. A 30% reduction could possibly be achieved, but would require a detailed evaluation of equipment and fixture requirements.

Energy and Atmosphere

The Energy and Atmosphere Category has 12 possible points composed of three prerequisites and seven credits. The prerequisites include commissioning of the building energy systems and assuring their alignment with project goals and expectations, compliance with ASHRAE 90.1-2004 for HVAC and lighting equipment, and the elimination of harmful CFC-based refrigerants

from the HVAC systems. Currently there are plans for new chillers in the addition but, if the existing chillers are utilized for the new addition, any CFC-based refrigerants in those existing plants must be phased out by 2015.

The largest opportunity to align long-term operational cost savings and increased LEED™ points is in the Optimize Energy Performance credit. Through advanced energy modeling, life-cycle analysis should be used to optimize energy conservation strategies and long-term cost savings. It is helpful to identify a maximum time frame within which strategies should provide a return-on-investment (ROI). Design strategies should be the first area of exploration as they provide the best opportunity to maximize the climatic response architecturally and minimize the system sizes in response.

The Enhanced Commissioning and Measurement and Verification credits under this Category should be pursued. Both will help ensure that systems installed in the facility are operating as they were intended and capable of achieving the energy reduction and cost savings projected during the design process.

Materials and Resources

The Materials and Resources Category has 14 possible points composed of one prerequisite and 14 credits. The prerequisite requires that recycling facilities and infrastructure be integrated into the design solution. It requires projects to recycle cardboard, glass, plastic, metals, and paper. Location of these spaces should be coordinated with facilities and the design team to identify both approach and management strategies. Similar in impact is the reduction of construction waste. The minimum target for this project should be a 75% diversion rate of all unused construction related resources; this includes demolition of existing building structures and site materials.

The remaining credits in this category relate to material selection strategies that help reduce the addition's environmental impacts. The minimum level of achievement should be to use 10% recycled and regional content and for 50% of all wood purchased on the project to come from FSC certified forests. Where opportunities for material reuse are discovered either through demolition or through investigation, integration of these materials into the design shall be considered.

Indoor Environmental Quality

The Indoor Environmental Quality (IEQ) Category has 17 possible points composed of two prerequisites and 17 credits. The prerequisites require that the project's ventilation systems comply with Sections 4 through 7 of ASHRAE 62.1-2004 and that it be a smoke-free facility. Compliance with these prerequisites is not seen as an issue for the addition.

The balance of the IEQ Category is composed of credits that support the creation of a healthy indoor environment by reducing exposure to hazardous chemicals, providing basic levels of controllability to occupied spaces for lighting and mechanical needs and providing access to daylight and views. Considerable attention should be paid to maximizing daylight opportunities and views in the design as these attributes contribute to improving the healing process and reducing stress in patients and staff. While it is difficult to fully achieve these credits, that should not limit the attempt to maximize opportunities throughout. Controllability of systems is a critical issue that often gets overlooked in occupied spaces, and access to lighting and HVAC controls should be provided in every occupied space. These credits could pose some challenges since they are all-or-nothing credits.

Other credits relate directly to keeping chemicals out of the building. Specifying safer materials and finishes fosters a healthy healing environment. The project should plan to minimize VOC's and eliminate formaldehyde from these products and consider evaluating material choices with more advanced chemicals of concern research in mind. Another strategy is to control the potential introduction of particulates through foot traffic into the facility. This can be achieved by incorporating recessed floor grates with integral drains within the proposed vestibules to allow for potential contaminants to be captured.

Innovation in Design

This category is meant to capture instances in the project where additional measures are taken to improve upon the performance of any LEED™ credit, known as exemplary performance, and to allow for further innovation by the design team. Typically these innovations consist of educational opportunities, green cleaning practices/ policies, advanced waste diversion activities, community engagement, low-mercury lighting, and generation of case studies or other applied research. The innovation credits should be evaluated as a team in order to ensure proper integration in design, construction and operational phases of the project.

DGH Addition LEED Scorecard

The following tables represent a summary of the LEED™ analysis for the Dartmouth General Hospital Addition project. The analysis itemizes potential points within each category of the LEED-Canada-CI™ v1.0 program, and suggests preliminary determinations of achievability for this project.

This analysis will need to be revisited as design develops in each future design phase of the project, in order to reassess the overall LEED™ level and individual points achievable for the final construction.

LEED™ Status

The project is currently tracking at the SILVER level with the potential to achieve GOLD certification if all 'maybe' opportunities are capitalized on. This level will fluctuate as the project moves along, but a minimum level of achievement should be identified as a team.

Dartmouth Hospital Addition/Renovation

28	11	18	**Total Project Score**	Possible Points	57

Certified 21 to 26 points **Silver** 27 to 31 points **Gold** 32 to 41 points **Platinum** 42 to 57 points

3 Y	0 ?	4 N	**Sustainable Sites**	Possible Points	7
0		3	Credit 1	**Site Selection,** Select a LEED Certified Building	3
		1/2	Option 1A	**Brownfield Redevelopment**	1/2
		1/2	Option 1B	**Stormwater Management**, Rate and Quantity	1/2
		1/2	Option 1C	**Stormwater Management**, Treatment	1/2
		1/2	Option 1D	**Heat Island Effect**, Non-Roof	1/2
		1/2	Option 1E	**Heat Island Effect**, Roof	1/2
		1/2	Option 1F	**Light Pollution Reduction**	1/2
		1/2	Option 1G	**Water Efficient Landscaping**, Reduce by 50%	1/2
		1/2	Option 1H	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1/2
		1/2	Option 1I	**Innovative Wastewater Technologies**	1/2
		1	Option 1J	**Water Use Reduction**, 20% or 30% Reduction	1/2 - 1
		1	Option 1K	**On-site Renewable Energy**	1/2 - 1
		3	Option 1L	**Other quantifiable Environmental Performance**	1/2 - 3
1			Credit 2	**Development Density & Community Connectivity**	1
1			Credit 3.1	**Alternative Transportation**, Public Transportation Access	1
1			Credit 3.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
		1	Credit 3.3	**Alternative Transportation**, Parking Availability	1

0 Y	2 ?	0 N	**Water Efficiency**	Possible Points	2
	1		Credit 1.1	**Water Use Reduction**, 20% Reduction	1
	1		Credit 1.2	**Water Use Reduction**, 30% Reduction	1

5 Y	3 ?	4 N	**Energy & Atmosphere**	Possible Points	12
Y			Prereq 1	**Fundamental Building Systems Commissioning**	
Y			Prereq 2	**Minimum Energy Performance**	
Y			Prereq 3	**CFC Reduction in HVAC&R Equipment**	
	1	2	Credit 1.1	**Optimize Energy Performance**, Lighting Power	3
	1		Credit 1.2	**Optimize Energy Performance**, Lighting Controls	1
2			Credit 1.3	**Optimize Energy Performance**, HVAC	2
	1	1	Credit 1.4	**Optimize Energy Performance**, Equipment and Appliances	2
1			Credit 2	**Enhanced Commissioning**	1
2			Credit 3	**Energy Use, Measurement & Payment Accountability**	2
		1	Credit 4	**Green Power**	1

7 Y	1 ?	6 N	**Materials & Resources**	Possible Points	14
Y			Prereq 1	**Storage & Collection of Recyclables**	
1			Credit 1.1	**Tenant Improvement**, Long-term Commitment	1
		1	Credit 1.2	**Building Reuse**, Maintain 40% of Interior Non-Structural Elements	1
		1	Credit 1.3	**Building Reuse**, Maintain 60% of Interior Non-Structural Elements	1
1			Credit 2.1	**Construction Waste Management**, Divert 50%	1
1			Credit 2.2	**Construction Waste Management**, Divert 75%	1
		1	Credit 3.1	**Resource Reuse**, Specify 5%	1
		1	Credit 3.2	**Resource Reuse**, Specify 10%	1
		1	Credit 3.3	**Resource Reuse**, 30% Furniture and Furnishings	1
1			Credit 4.1	**Recycled Content**, Specify 10% (pc + 1/2pi)	1
	1		Credit 4.2	**Recycled Content**, Specify 20% (pc + 1/2pi)	1
1			Credit 5.1	**Regional Materials**, 20% Manufactured Regionally	1
1			Credit 5.2	**Regional Materials**, 10% Extracted and Manufactured Regionally	1
		1	Credit 6	**Rapidly Renewable Materials**	1
1			Credit 7	**Certified Wood**	1

10 Y	3 ?	4 N	**Indoor Environmental Quality**	Possible Points	17
Y			Prereq 1	**Minimum IAQ Performance**	
Y			Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	
1			Credit 1	**Outdoor Air Delivery Monitoring**	1
1			Credit 2	**Increased Ventilation**	1
1			Credit 3.1	**Construction IAQ Management Plan**, During Construction	1
1			Credit 3.2	**Construction IAQ Management Plan**, Before Occupancy	1
1			Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1
1			Credit 4.2	**Low-Emitting Materials**, Paints and Coatings	1
1			Credit 4.3	**Low-Emitting Materials**, Carpet	1
1			Credit 4.4	**Low-Emitting Materials**, Composite Wood and Laminate Adhesives	1
		1	Credit 4.5	**Low-Emitting Materials**, Systems Furniture and Seating	1
1			Credit 5	**Indoor Chemical & Pollutant Source Control**	1
	1		Credit 6.1	**Controllability of Systems**, Lighting	1
1			Credit 6.2	**Controllability of Systems**, Temperature and Ventilation	1
		1	Credit 7.1	**Thermal Comfort**, Compliance	1
		1	Credit 7.2	**Thermal Comfort**, Monitoring	1
	1		Credit 8.1	**Daylight & Views**, Daylight 75% of Spaces	1
		1	Credit 8.2	**Daylight & Views**, Views for 90% of Spaces	1
	1		Credit 8.3	**Daylight & Views**, Views for 90% of Seated Spaces	1

3 Y	2 ?	0 N	**Innovation & Design Process**	Possible Points	5
1			Credit 1.1	**Innovation in Design**:	1
1			Credit 1.2	**Innovation in Design**:	1
	1		Credit 1.3	**Innovation in Design**:	1
	1		Credit 1.4	**Innovation in Design**:	1
1			Credit 2	**LEED™ Accredited Professional**	1

Point Allocation

28	YES
11	POTENTIAL
18	NO

Support Services Assumptions

Survey and Staff Comment Summary

In order to better determine the impact of the program expansions on the existing support services at each campus, support departments were asked to complete surveys in which they assessed the additional space and staff they would need to service the expanded programs. The results of the surveys and select email communications are organized and presented below.

Text in *Italics* represents follow-up communications and/or direction received from CDHA subsequent to receipt of the surveys. While many services may be impacted by the additional inpatient and surgical services being relocated from the Centennial building, some do not fall within the scope of this project. They are nonetheless recorded in this document for record purposes.

The results of the feedback received and the subsequent direction from CDHA has been incorporated into the work of this report. In some cases, this is manifested in space assignments in the Space Program documents. In others, it is captured in the programs and cost estimates for Renovations to Ancillary Spaces. In cases of large foreseen impacts, this is also seen in the drawings and sketches presented in this report.

Halifax Infirmary

The survey participants answered the following question:

What would be the space impact to your area if 150 in-patient beds and associated OR capacity was transitioned from the QEII Centennial Building to the QEII Halifax Infirmary Site

Inpatient Nursing Units:

Resident rooms: The Collective Agreement and Royal College Accreditation requirements state that on-call facilities be within reasonable proximity to the hospital area covered by the resident, so placing resident duty rooms in the new tower would be appropriate. *Revise nursing unit programs to show two resident duty rooms and one resident team room on each floor.*

Resident rooms: The number of resident duty rooms varies by unit. The formula of one duty room per service is not always accurate. There is also a need to accommodate clinical clerks who stay in-house during their rotations.

Second floor duty rooms: All of these rooms are currently assigned. There are no rooms for additional staff.

Resident rooms: There will be at least one resident on duty, and possibly a medical student for each clinical service.

Surgery:

Lockers: The single biggest complaint about the HI is that there are not enough lockers available to OR personnel. Residents alone will require 120+ lockers in close proximity to the scrub machines and the OR. *Revise the program for the new surgery locker room to include the additional lockers.*

Pathology and Laboratory Medicine:

Assumption: Pneumatic tube stations will be added to the additional floors for transporting specimens to the laboratory. Additional clinic activity will accompany the move of inpatient programs to the HI Tower. *Provide tube stations as needed within the new tower.*

Shared services: Additional space will be required for the dispatch of phlebotomists to inpatient care areas. Less space will be needed if space for collection carts is planned on the care areas. *Add point-of-care testing and phlebotomy storage space to nursing unit programs.*

Shared services: An increase in ambulatory clinics is expected (e.g. Pre-op, Dialysis, etc.) so there will be a need to expand outpatient blood collection facilities on the fourth floor. Ambulatory patients generate more than twice the number of lab tests than inpatients. *Provide blood draw space in pre-op.*

Shared services: Specimen accessioning and receiving areas on the sixth floor need to be expanded to accommodate second outlet of Pneumatic Tube Station, and additional staff moved from the VG site. (additional staff facilities including lockers will be required). *CDHA to provide clarification*.

Hematology and Chemistry: For Hematology, there would be little, if any, space impacts if 150 beds were relocated to the HI as long as the lab continues to function as a STAT satellite lab, the space remains on the sixth floor and some leaning occurs for better specimen flow. The new instrumentation will be capable of handling the additional workload and other associated demands. *No scope implications.*

Blood Transfusion Services: Testing from the additional beds at the HI site can be handled at the HI site with no testing equipment needs, as the majority of this testing is currently at the HI site.

Blood Transfusion Services: If BTS is centralized at the HI site (high end users such as the MDU at the HI site) the additional space would be needed for plasma freeze/thawers, blood fridges, and platelet agitators. *CDHA to provide clarification*.

Blood Transfusion Services: Blood Transfusion on the sixth floor of HI is also the provincial reference lab for Complex Transfusion cases in the province of NS, along with serving as the main transfusion lab for the district. *CDHA to provide clarification.*

[redacted]

Autopsy: Autopsies are performed on the first floor of Mackenzie. There is no autopsy suite at the HI. It is possible that the Autopsy suite is occasionally used for brain cutting and teaching by the neuropathologists. There is body holding space on the fourth floor refrigerated body holding space will be required at HI, possibly more space will be needed given the increase inpatient population planned for the HI site. There is no viewing room in HI. If viewing cannot be accommodated in a patient room, the body is moved to Mackenzie where there are appropriate viewing facilities. *Expand body holding only.*

Pathology: Currently pathology is located on the eleventh floor of the Centennial Building and will need to be relocated into the HI addition on the 5th level adjacent to the ORs. There is a frozen section lab at this location. Even if all VG OR's are relocated, frozen sections will still be performed in some of the VG procedure rooms. There may be a possibility that frozen sections in HI could be done on in the existing room on the sixth floor next to Central Accession. There are many issues to discuss regarding this service before a final decision can be made. There are currently ~50 frozen sections a year performed at HI and ~350 performed at VG. *CDHA to provide clarification.*

Diagnostic Imaging:

No survey returned. *DI Equipment inventory received.*

Additional information has been requested. The current modality count and projected demand models are needed before any evaluation can be made.

There is a film library on the third floor that stores old mammo files. This could be repurposed for additional imaging rooms if another place were found to store the files.

HI is now 100% electronic imaging

Modalities at HI include:

- 1 MRI (and 1 research MRI that is not part of standard patient care)
- 2 CTs for patient care (and 1 research CT)
- 4 Ultrasound rooms (all biopsies are done at VG, except a few for HI inpatients)
- 4 Nuc Med/Gamma Camera rooms.
- 1 stress test room
- 5 general imaging rooms, and 1 that is out of commission but could be used in the future.
- 2 fluoro units, of which 1 is at the end of its life.
- 2 echocardiogram rooms (not part of the DI program)
- 2 Angio rooms located in the HI OR suite.
- Also have DI equipment in the Cardiac Cath Lab.

Sterile Processing and Distribution (SPD):

Changes to the existing SPD are NOT within the scope of this project. Creation of a new SPD to support the new OR's is within the scope.

Currently occupy 10,478 sq ft. Based on a study completed in 2006 – 10,914 square feet were required to support the VG workload. This represents increase of 436 square feet; however, department was completely redesigned in this study.

Capital equipment required to support consolidation of VG workload was estimated at:

[redacted]

[redacted]

Pharmacy:

Relocation of VG Pharmacy staff will require the following spaces:

- One work space for 5 clinical pharmacists
- 7 offices for 4 clinical coordinators and 3 managers/ supervisors
- One work space for 2 DUE pharmacists
- One work space for 4 clinical trials technicians
- One work space for 3 IT pharmacy staff
- One work space for Anticoagulation pharmacist and student
- A conference room would be required (approximately 200ft²) to replace the one at the VG site which is in constant use

Pharmacy Redesign: Dispensing counter area needs to increase. Further medication storage space (approximately 1400 ft²) will be required adjacent to the Pharmacy to accommodate increased inventory. Future plans for Pharmacy will include robotics which would require higher ceilings and additional space. *An increase of the pharmacy size is within the scope of this project.*

Pyxsis units: To cover an additional 150 inpatient beds. Depending on the unit configuration, there would be a need for 3-4 units, requiring 35 square feet each. Cardinal Health recommends 15-18 patients maximum per unit. Large scientific fridge in each medication room.

Medication rooms: need to be sufficient to house both pieces of equipment. *Medication rooms are included in the new tower program.*

Inpatient Pharmacy Team member: Workspace at all inpatient areas for patient care related work (order entry or review). This is necessary to support a decentralized model of pharmacy work throughout the day. *There are seven offices shown on each nursing floor of the tower. The pharmacy workspace will be provided within this scope.*

Inpatient Pharmacy Team room: A centralized area for all clinical support leaders. *There will not be a dedicated pharmacy team room. The residents' team room will be available for all teams to use.*

OR Pharmacy Satellite: approximate dimension of 20x20, or a Pyxsis anesthesia system, with one station per OR (approximately 6 feet x 4 feet). *A satellite pharmacy will be included in the new surgery program.*

OR Pharmacy Satellite: The 5th floor satellite provides all wardstock and narcotic delivery to the HI OR and PACU's. All deliveries come to the 2nd floor dispensary (including those items ordered for the OR satellite). With more OR's the space will need to be doubled in this satellite. There is very minimal storage in the 2nd floor dispensary and no storage anywhere else at the HI/VMB sites so additional space will be required when VG beds move to HI. *The second floor kitchen space can be used to expand the pharmacy.*

New space for Centralized IV Admixture (CIVA), TPN and Chemotherapy preparation: Will be required at the HI site as this is all currently centralized at the VG site. Approximate space requirements for CIVA and TPN would be 3500 ft² (includes hood room and ante room). This area would require positive pressure and ISO Class 7 HEPA filtered air. Approximate space requirements for chemotherapy would be 500 ft² with the same air requirements as above and must also be externally vented. An adjacent scrub and gowning area with positive pressure and ISO Class 7 HEPA filtered air would be required needing approximately 200 ft². *The second floor kitchen space can be used to expand the pharmacy.*

If the oncology inpatient beds move to the HI and outpatient chemotherapy beds remain at the VG site, we would need to decide how we would handle this as it is a centralized service. We would definitely need space for a chemotherapy satellite and this would require ventilation to the outside. *The second floor kitchen space can be used to expand the pharmacy.*

Rehab Medicine:

Seven offices are provided on each nursing floor. Some of these may be used by Rehab. Each nursing floor has a 400 sf Rehab space programmed within it. One of these can be the gym, one can be the ADL space and one can be the additional sacred space.

General: Many staff are not dedicated to one particular unit, depending on the discipline they may cover: one or many.

General: PT and OT space can be shared for storage and rehab activities.

General: Overall, single rooms will be very helpful as it will help serve as a mini treatment space. Consideration to a few that are geared up as bariatric suites (accessibility of room and equipment) would be very helpful and needed in the future.

General: Families may be an important aspect of having care done in the future. Having cots or Murphy beds to enable rooming-in of family members may be helpful.

General: Technology in patients' rooms will be wonderful: automated light switches, access to computers, etc.

Teaching: We have many learners that we mentor for several weeks at a time. Consideration for where learners "hang their hats" is important.

Physiotherapy:

- Access to clear hallway for progression of mobility.
- Access to storage space for mobility aids.
- Small rehab area/gym to do transfer training, stairs practice, to do a variety of exercises with patient in preparation for discharge.

Occupational Therapy:

- Patient rooms that are accessible and set up similar to home enables OT's to better assess how patients may do on discharge.
- Space for equipment storage (splinting supplies,and equipment, wheelchair components, and tools)
- Space in patients' rooms for wheelchairs and mobility aides. Right now much of that is stored in the hall, where it adds to clutter, and is out of reach of the patient.

Social work: Access to area for patient/family meeting.

Spiritual care: In the new tower, consideration may need to be given to sacred spaces for patient, families and staff. In 10 years an increased immigrant population can be expected.

Psychology: Several of the services transferring from VG (transplant and oncology) have a psychology support component.

- Psychologists: require access to private and quiet confidential space for testing, assessment and counseling. They also have a lot of testing equipment and materials/charts/files and paper records (which will decrease over the next 10 years as electronic records expand)
- Clerical support: There will be a need for a centralized clerical support space.

Clinical Nutrition:

HI Food Distribution: 3 food service centres, approximately 244 square feet, centrally located on each of the three patient floors with appropriate electrical feeds. Food service centers are to be included in the nursing floor programs.

HI Food Distribution: Ensure a travel route for the tow motor to reach the service elevators. The tow motor will pull three traygens on each trip. Provide a connection at the second level, ithin the scope of this contract.

HI Food Distribution: Ensure time is available on the service elevator so that traygens can be delivered six times a day at peak meal times.

Clinical Nutrition: One office with 10 work stations (or three offices of 120 square feet for 3-4 Dieticians and 3 Diet Technicians and Dietetic Interns). The number of Dieticians will depend on whether there is an ICU. One office to be provided on each of three new nursing floors.

Retail Food: Retail Food Outlets at HI lose money every year. A business plan should be completed before any decisions are made regarding changes to Retail Food areas. The kitchen close to pharmacy will be removed so that pharmacy can expand. This is within the scope of this project. Location may be proposed for new retail food service.

Bio-Medical Engineering:

No survey returned.

Integrated Continuing Care:

No survey returned.

Primary Care:

No survey returned.

Public Health:

No survey returned.

Health Information Service:

No survey returned.

Electronic Records: Records will be electronic, current HI HIS space will be vacated and repurposed. *Vacated HIS space is available for repurposing within the scope of this project.*

Information Technology Services:

(Summary of email correspondence)

Communications closets: Communications closets are too small. Locations of new closets, regardless of service should be planned at perimeters whenever possible. *Communications closets built as part of this*

project will be sized as required. Existing closets will not be enlarged within the scope of this project.

Engineering:
No survey returned.

Housekeeping:
Additional space on each floor of the new tower for storage of housekeeping equipment, dispensing of chemicals, and storage of waste/recyclables. *Housekeeping closets within the new units are part of the program for his project.*

Refuse disposal storage room for compactor/autoclave on the bottom floor. *This is within the scope of this project. May be on Level 2 in proximity to link from existing HI.*

Garbage/recycling storage rooms from the second floor on up. *This is within the scope of this project.*

Equipment storage space with floor drain and electrical outlets. *This is within the scope of this project.*

[redacted]

Increased Waste disposal capacity is required for entire HI site. Regular waste compactor, cardboard and Recycling. Current system is at full capacity and is unable expand to accommodate volume associated with the creation of the new tower. A full review of waste management requirements is necessary. *CDHA to provide clarification.*

Closets: Closets are adequate, with the exception of communications closets. Locations of new closets, regardless of service should be planned at perimeters whenever possible. *Communications closets built as part of this project will be sized as required. Existing closets will NOT be enlarged within the scope of this project.*

Closets: Housekeeping closets large enough to accommodate carts in order to keep corridors free. *Housekeeping closets in new units to be sized as required. Existing closets will NOT be enlarged within the scope of this project.*

Maintenance:
No survey returned.

Staff areas: Small work areas for maintenance staff to be located in close proximity but not in new build. *AJL or VMB basement may be a consideration. This is not within the scope of this project.*

Parking:
No survey returned.

Security:
Documents completed by "Managed Services"

[redacted]

Other
Porter Services: Currently do not have adequate space to store equipment, which results in longer travel distances to get the required equipment, which can sometimes result in service delays. *Equipment alcoves should be provided as required within new units. There is adequate off-unit specialty bed storage space on campus. None will be required within the scope of this project.*

Conference spaces: During peak times there are not enough rooms. There are spaces within the VMB, but the issue there is that Veterans bump all other groups. Another large space similar to the HI Ballroom would be ideal. *There is a need for a classroom suite within the scope of this project.*

Linen Distribution: Extra space will be required for carts. *Linen alcoves are to be included within the scope of this project.*

Linen Distribution: All laundry is done at the central laundry at the NSH site and delivered to individual sites through the receiving bays. *CDHA to provide clarification as to linen delivery space.*

Gift Shop: The gift shop in the Level 1 lobby is more than adequate, and will likely be reduced in size and should be relocated near the Level 4 entrance in the existing retail space there. *This is not within the scope of this project.*

Gift Shop: The retail areas on Level 4 should remain, with a few additional in the new lobby area. This is not within the scope of this project.

Dartmouth General Hospital
Survey participants were asked to answer the following question:

What would be the space impact to your area if 50 in-patient beds and associated OR capacity was transitioned from the QEII Centennial Building to the DGH – (Ortho, General Surgery and Medicine Mix)?

Inpatient Nursing Units:
Resident rooms: The Collective Agreement and Royal College Accreditation requirements state that on-call facilities be within reasonable proximity to the hospital area covered by the resident. *Resident rooms are not an absolute requirement on the nursing floor for Dartmouth. While it would be ideal to have them, there is an understanding that the program must fit within the existing space.*

Portable equipment: Proper equipment storage space must be provided so that portable equipment is not stored in corridors.

Pathology and Laboratory Medicine:
The assumption is the pneumatic tube stations would be added to the additional floors for transporting specimens to the laboratory. *Tube stations will be added at the fifth floor and within the new surgery and recovery spaces.*

The present tube system in the lab will need to be reviewed. Additional space may be required to accommodate the influx of transport tubes to a single lab receiving port. *This is not within the scope of this project.*

There would be no additional space required except for additional outpatient blood collection if there is an increase in clinics in conjunction with inpatient programs (e.g. pre-admit, pre-op). *Show blood draw spaces within pre-op.*

The implementation of the Core Lab at Mackenzie will be completed by the time this project is in place, with subsequent referral of DGH ambulatory specimens to QEII for processing. *Information only – no scope implications.*

Current lab space is expected to support DGH Emergency patients and at least Stat and Urgent inpatients in the future. *Information only – no scope implications.*

Diagnostic Imaging:
No survey returned. *DI Equipment inventory received.*

Additional information has been requested. The current modality count and projected demand models are needed before any evaluation can be made.

Sterile Processing and Distribution (SPD):
SPD would require an additional 900 square feet to accommodate more processing equipment, staff movement and the storage of sterile OR equipment. *Mark the existing SPD space for high-cost renovation within the scope of this project. Some expansion to SPD may occur as the result of providing a vertical connection to the new OR suite.*

If the additional operating rooms were used for Ortho, an additional 100 square feet would be required. *See previous remarks.*

Pharmacy:
Requires Relocation: Pharmacy services should be closer to inpatient beds. It is currently in the basement and along a corridor where ambulatory clinics may be more appropriate. *Complete relocation of the pharmacy is not within the scope of this project. Expansion into the new space may be possible in at least one of the alternate plans.*

Relocated/Renovated Pharmacy size: Should be approximately 4,100 square feet. *The proposed size appears to be correct.*

Pyxsis units: To cover an additional 50 inpatient beds. Depending on the unit configuration, there would be a need for 3-4 units, requiring 100 square feet each. Cardinal Health recommends 15-18 patients maximum per unit. *The fifth floor program must fit into the available space. Every effort will be made to provide adequate med rooms, but some compromise may be required as the project moves into the next phase.*

Medication rooms: need to be sufficient to house both pieces of equipment.

Inpatient Pharmacy Team member: Workspace at all inpatient areas for patient care related work (order entry or review). This is necessary to support a decentralized model of pharmacy work throughout the day. *If a workspace can be created on the fifth floor without compromising required program space, it should be. Adding pharmacy workstations on the third and fourth floor nursing units are not within the scope of this project.*

Inpatient Pharmacy Team room: A centralized area for all clinical support leaders. *There will not be a dedicated pharmacy team room on the nursing unit. As layout options develop, there may be opportunities to incorporate this function into a multi-functional space.*

OR Pharmacy Satellite: approximate dimension of 20x20, or, a Pyxsis anesthesia system, with one station per OR (approximately 6 feet by 4 feet). *A satellite pharmacy will be included in the DGH surgery program.*

Rehab Medicine:
General: There is a concern that rehab space is shown as reduced or absorbed by other functions in one proposed plan. *This space will need to be relocated within the scope of this project in that case.*

General: Many staff are not dedicated to one particular unit. Depending on the discipline, they may cover one or many.

General: PT and OT space can be shared for storage and rehab activities.

General: Overall, single rooms will be very helpful as it will help serve as a mini treatment space. Consideration to a few that are geared up as bariatric suites (accessibility of room and equipment) would be very helpful and needed in the future.

General: Many PT and OT activities can be done in room with increased space, especially with an accessible washroom. Progressing endurance/distance with ambulation, practicing stairs and working on wheelchair mobility would require space on the unit (i.e., working in the hallways) so how the hallway is designed is important.

General: Technology in patients' rooms will be wonderful for our patients: automated light switches, access to computers, etc.

Teaching: We have many learners that we mentor for several weeks at a time- consideration for where learners "hang their hat" is important.

Physiotherapy: [redacted]

- Access to clear hallway for progression of mobility.
- Access to storage space for mobility aids.
- Small rehab area/gym to do transfer training, stairs practice, to do varied exercises with patient in preparation for discharge.

Physiotherapy: Ideally, providing patient care close to the patient room maximizes the use of resources.

Occupational Therapy:

- Space for equipment storage.
- Space for practice of ADL's

Social work: Access to area for patient/family meeting.

Spiritual care: Current space will be adequate.

Psychology: No services at DGH, based on service lines offered.

Clinical Nutrition:
Food Distribution: An additional 30 Square feet for two additional ovengens will be required for the main kitchen in the basement. Existing ovengens are at capacity. *This is within the scope of this project.*

Food Distribution: an additional 30 square feet added to the existing walk-in fridge area in the main kitchen. *This is within the scope of this project.*

Food Service: Space will be required to hold soiled supper carts overnight at DGH and NSH. *This is within the scope of this project.*

Clinical Nutrition: One office of 120 square feet for an additional Dietician and Diet Technician. *This is within the scope of this project.*

Kitchen: The kitchen space at DGH is used for the restaurants, and to store patient food trays, re-therm, and to store nourishments. *No work will be done to the cafeteria or restaurants within the scope of this project.*

Bio-Medical Engineering:
Currently an extra non-Dialysis tech is working in the Dialysis tech shop at DGH. The shop really needs extra space, especially if the Dialysis service will be growing. *This is not within the scope of this project.*

There is a general cry for more space at DGH. *This is not within the scope of this project.*

Bed Repair is not part of Bio Med. *This is not within the scope of this project.*

Integrated Continuing Care:
No survey returned.

Primary Care:
No survey returned.

Public Health:
No survey returned.

Health Information Service:
No survey returned.

Information Technology Services:
No survey returned.

Engineering:
No survey returned.

Housekeeping:
Additional space will be required on the 5th floor and in the OR for the storage of housekeeping equipment, dispensing of chemicals and storage waste. *Housekeeping closets on the fifth floor and ORs are within the scope of this project.*

Increased locker room capacity may be required for staff. *This is not within the scope of this project.*

[redacted]

Maintenance:
No survey returned.

Parking:
No survey returned. *Plan for a parking structure for approx. 175 cars over the existing grade-level parking. Should be designed to accommodate another two levels in the future.*

Security:
Some of the VG staff compliment would need to be transferred to DGH. *This is not within the scope of this project.*

Other :
Porter Services: Currently do not have adequate space to store equipment, which results in longer travel distances to get the required equipment, which can sometimes result in service delays. *Provide adequate equipment storage alcoves within the departments developed within the scope of this project, but do not provide dedicated porter storage space.*

Linen Distribution: Extra space will be required for carts. *Additional space may not be needed. More frequent deliveries may be a solution. CDHA to provide clarification.*

Linen Distribution: All laundry is done at the central laundry at the NSH site and delivered to individual sites through the receiving bays. *Additional space may not be needed. More frequent deliveries may be a solution. CDHA to provide clarification*

Other Sites
CDHA to review the following items and provide guidance to the design team moving forward.

Although the surveys specifically asked about the Dartmouth and Halifax Infirmary projects, some departments identified needs in other buildings that would arise as the result of the demolition of the Centennial Building. In general, these items lie outside the scope of this project. These Include:

Pathology and Laboratory Medicine:
Victoria General : Blood Transfusion is currently located on the Centennial 11th floor. Depending where the ambulatory care areas such as Medical Day Unit (Apheresis Unit), Renal Dialysis & Chemotherapy are located there will be a need for a BTS space at the Victoria General Site (Mackenzie Building) for at least the issuing of blood, along with some crossmatching to Ambulatory Care Units to ensure compliance with turn-around time requirements.

Victoria General: The HemoSafe on the Victoria General site could play a role in the VG site ambulatory care support.

[redacted]

Victoria General: VG Blood Collection Services is currently located on the second floor of the Centennial Building and supports VG Clinic patients, VG inpatients. Rehab A satellite clinic is located on 11V, and support CTRF, 10V and MDU.

Clinical Nutrition:
Victoria General: Supplies will still need to be delivered to the Victoria and Dickson buildings, so there will be a need for a loading bay. There will be a need for a walk-in fridge of 80 square feet to hold refrigerated supplies for the remaining clinics.

Veterans Memorial : Space to hold an additional nine traygens for the HI site in the Veterans Memorial Building refrigerator. This will require alternate refrigerator space for ward stock cages.

Sterile Processing and Distribution (SPD):
[redacted]

Pharmacy:
Victoria General: A new Chemotherapy preparation area will be required at the VG site adjacent to the ambulatory oncology treatment area. Approximate space requirements would be 3000 ft² (includes hood room and ante room). This area would require negative pressure, ISO Class 7 HEPA filtered air and must also be externally vented. An adjacent scrub and gowning area with positive pressure and ISO Class 7 HEPA filtered air would be required needing approximately 200 ft². Work space for 8 clinical staff would also be required.

Victoria General: Depending on the relocation of ambulatory clinics, space will be required for the High Cost Drug Program. This area would require an additional 700 ft² as well as large walk-in fridge space and must be accessible by the public.

NOTE: While not mentioned in any of the surveys, it is worth noting the cyclotron in the Centennial Building. The relocation of this space is currently not within the scope of this project.

Housekeeping:
Additional impacts related to demolition of Centennial Building include:
- Relocation of the Provincial Drug Distribution Program.
- Creation of alternative Shipping/Receiving docks.
- Soiled and clean linen plus OR linen
- Potential impact to the Retail Food production area (kitchen)

Materials:
Victoria General: Supplies will still need to be delivered to the Victoria and Dickson buildings, so there will be a need for a loading bay. There will be a need for a walk-in fridge of 80 square feet to hold refrigerated supplies for the remaining clinics.

Bulk supplies stored in Burnside Industrial Park warehouse: Storage capacity is assigned adjacent to loading docks at all sites. Central supply rooms are assigned in units for items used daily.

Loading Dock: A three bay loading dock exists in the AJL building. This may suffice with proper scheduling of planned deliveries, but there will be an increased demand on the existing HI site loading dock. *CDHA to provide direction, including area of any proposed renovation.*

Other:
Victoria General Conference spaces: Several groups (Oncology and others) use the larger rooms at VG for weekly rounds, including the Ballroom, VG auditorium, and B-44.

Volunteers: Volunteers are based in the Centennial main floor and the VMB main floor.

Space Programming, General
Space Programs have been prepared for both the Halifax Infirmary (HI) and Dartmouth General Hospital (DGH) sites. For ease of legibility, the DGH program is split into two documents – one for the new OR/ Ambulatory Services addition, and one for the 5th floor inpatient unit.

The process that was undertaken to develop these Space Programs is new, both to the design team and for other stakeholders. Typically, Space Programming would happen before preliminary design. In this case, programming happened in parallel with preliminary design as a dynamic process that included updating as layouts evolved.

Based on Department of Health and Wellness direction, these Space Programs used the relatively new CSA Z8000-11 Canadian Health Care Facilities document (released September 2011) as the basis for their starting points, in terms of spaces listed, selected functional requirements, and area requirements. The Space Programs were modified to reflect additional client/user input, clarifications of intent within the CSA document, design and healthcare innovations, staffing/resource constraints, and client direction.

Though some of the spaces included in the original program (as guided by the CSA document) were not included in the final design or final space program document, they did a) stimulate discussions around the needs/benefits of certain spaces; b) allow rapid program updating as alternate designs were considered and; c) assist in highlighting new/revised requirements and best practices contained in the CSA Z8000-11 document with which stakeholders may not yet be familiar.

Architectural Outline Specifications
Division 1 – General Requirements
Work Restrictions
Restricted work hours will be required due to locations adjacent to existing hospitals, and tie-ins to existing services so as to minimize or avoid disruption to existing services.

Sustainable Requirements
LEED Silver Certification for both additions

Infection Control during Construction and Renovation of Healthcare Facilities
Must be constructed in accordance with CSA Z317.13-12 Infection Control during Construction, Renovation and Maintenance of Health Care Facilities (or latest edition at time of construction).

For both the HI and DGH projects, the highest population risk group and highest level of work intensity (Population Risk Group 4, Construction Activity Type D and therefore Preventive Measures Level IV) will likely apply.

Both HI and DGH projects are identified as Category 3 projects (Existing Connected Location) under Clause 8.1.2 of CSA Z317.13-12.

Preventive Measures will be required both in the new building construction zones as well as the adjacent occupied hospital facilities at both HI and DGH. Measures in the existing adjacent buildings may include, but are not limited to:

1. Sealing windows
2. Relocation or additional filtration of existing air intakes
3. Enhanced air quality sampling and testing
4. Enhanced patient monitoring and testing
5. Enhanced inspection and maintenance regime on air handling equipment (e.g. filter changes)

Division 2 – Existing Conditions
Demolition
Selective demolition at both sites to accommodate new construction

DGH: Asbestos abatement in some existing areas being renovated.

Demolition of Centennial and Victoria Buildings.

Division 3 – Concrete
Structural Concrete
See Structural Engineering Commentary / Outline Specification for Halifax Infirmary.

Architectural Precast Concrete
Exterior cladding includes precast concrete panels at select areas (DGH).

Architectural Concrete Finishes
Architectural concrete finishes may be considered at exposed structural elements (columns, slabs, etc.).

Division 4 – Masonry
Exterior Masonry
Exterior cladding includes brick or other masonry finish in select areas (HI)

Interior Masonry
Concrete Masonry Unit (CMU) walls are appropriate in service areas

Non-loadbearing CMU wall construction should be considered around rooms with large equipment producing high levels of low-frequency sound (e.g. air handling rooms, pump rooms transformer rooms and generator rooms).

CMU walls may be considered at elevator shafts and stairwells.

CMU walls may be considered as part of fire rated construction where firewalls are required.

Division 5 – Metals
Structural Steel & Steel Decking
See Structural Engineering Commentary / Outline Specification for Dartmouth General Hospital.

Wind Load Bearing Structural Steel Framing
Shall be used in exterior wall assemblies where they are clad in metal panels.

Typical framing: 18-ga. 6” steel stud framing from slab to slab, at spacing to suit structural requirements.

Non-Structural Steel Framing
20-ga. steel stud framing at 16” O/C, typical for non-loadbearing partition walls. 3-5/8” typical. 6” stud size typical at plumbing fixtures and recessed panel locations.

In general, all partition walls are to extend from floor to underside of structure. In certain, limited cases (e.g.

administrative offices), the partitions may stop 6” above adjacent ceilings if those ceilings are gypsum board or AT4 type (see Ceiling Finishes).

Shaft wall construction shall be used at rated chases and shafts.

Sheet steel shall be used as reinforcing and backing for wall-hung specialties, equipment and millwork.

Metal Fabrications
Metal fabrications shall be used to provide required structural qualities for support of low walls (not full height).

Ceiling Lift Track Support/ Flexible Future Services Support System:

1. Provide prefabricated steel struts anchored to the underside of slabs every 4’-0” O/C in patient room areas. Orient struts parallel to anticipated bed direction.
2. Struts and anchors to support potential future load of 1200 lbs supported off min. three struts.
3. Struts to allow attachment of cross struts at intervals of max. 2” O.C. and allow attachment of threaded rod and rigid connections vertically.
4. Standard of Acceptance: Hilti Strut System or Hilti MI System.
5. All building services shall be suspended from Structure above, leaving a min. 4” clear at U/S of slab to allow future installation of cross struts anywhere along the length of primary struts.

Other ceiling- and wall-mounted equipment supports (OR / exam lights, booms, etc.) shall be supported with metal fabrications.

Metal fabrications shall be used to form angle lintels, trench frames and covers, bollards, etc., and provide lateral bracing where required.

Metal Stairs, Railings & Ladders
Shall be provided as required for access, meeting safety and other design requirements.

Roof Anchor System
1. Anchor points and cabling shall be provided on the roof for roof maintenance and inspection, window washing and equipment replacement.
2. Roof anchors shall be securely anchored directly to the structural roof slab (or steel in the absence of concrete slab).

Division 6 – Wood, Plastics and Composites
Rough Carpentry
Blocking and reinforcing, as required.

Finish Carpentry
Decorative wood trim and accents

Architectural Woodwork
Modular Casework
Modular healthcare casework should be considered in lieu of custom millwork. The benefits of modular healthcare casework include:

1. Standardized manufacturing increases consistency and predictability of the end product over traditional custom millwork.
2. Detailing can be easily tailored to healthcare and infection control (e.g. sloped tops for ease of cleaning).
3. Enables millwork design to be altered and approved later in the construction process than can typically be done for custom millwork. This supports more up-to-date millwork can help shorten construction timelines.
4. Modularity allows millwork components and parts to be easily replaced when damaged.
5. Simpler alterations and renovations in the future compared to traditional custom millwork.
6. Modular healthcare millwork is designed to be freestanding allowing mechanical and electrical connections to be run from side walls or ceilings.

Custom Millwork
1. Case bodies shall be constructed of melamine on (3/4” typ.) high-density particle core.
2. Doors and drawer fronts shall be high-pressure plastic laminate on ¾” high-density particle core, complete with 3mm PVC edge banding.
3. Countertops shall be high-pressure plastic laminate on high-density particle core with post-formed nosings and backsplashes, where required.
4. Window sills shall be high-pressure plastic laminate.
5. All architectural woodwork shall be constructed to AWMAC Custom Grade.

Plastic Laminate
1. High Pressure Laminate or Melamine may be used for semi-exposed and concealed casework.
2. High Pressure laminate countertops with post-formed nosings and backsplashes shall be used in non-patient care areas such as administrative offices.

Solid Surfaces
1. Solid surface countertops shall be used in patient-care and clinical support areas.
2. Colours and patterns should be chosen to facilitate the ability to see spills and equipment.

Division 7 – Thermal and Moisture Protection
Exterior Cladding/Wall Assemblies
Pre-formed metal cladding system, composite metal building panels, metal flashings and trims to suit envelop design.

Vapour Barriers
Exterior wall assemblies should include an inner layer of studwork and gypsum inboard of the insulation and vapour barrier so that service penetrations and subsequent renovations disrupt the vapour barrier integrity to the least extent possible.

Upgraded or redundant vapour barrier systems shall be provided where positively pressurized rooms and rooms with excessive humidity levels (e.g. shower rooms, central kitchens) are to be located on exterior walls.

Insulation
Sound Batt and Blanket Insulation
Soundbatts will be required in all partition walls with an STC value of 38 or higher. (see Division 9)

Sound blanket insulation shall be installed on top of ceiling above demountable partitions, if used, extending min. 3’-0” either side of the partition.

Thermal Batt insulation
1. Non-fibreglass insulation shall be used throughout.
2. Wherever possible, the use of batt insulation shall be avoided in favour of rigid and semi-rigid insulation products.

Foundation Waterproofing
Cold-applied rubberized waterproofing for below-grade application to suit foundation design.

Membrane Roofing
Fully-adhered modified bituminous roofing system to suit roof design.

Expansion Control
Accessories and materials as required to suit design requirements.

Division 8 – Openings
Doors and Frames
In general, doors to patient-accessed spaces will be heavy-duty particle-core birch or maple veneer, varnish grade. Doors into staff-only spaces will be heavy-duty particle-core mill-finish, paint grade doors.

1. Standard of Acceptance: Baillargeon 8500-series (fire-rated as required).

Openings into some spaces (e.g. counseling rooms, duty rooms) will be fitted with high-STC doors and will require positive latching lever sets and high-quality acoustic seals, including acoustic drop bottom seals.

1. Standard of Acceptance: Baillargeon SR-43.

Lead-lined doors may be required where high-intensity diagnostic equipment will be used.

Interior door frames shall be painted 16ga. hollow metal, continuously welded frames, fire rated as required.

Door frames in aluminum-framed demountable partitions shall be anodized aluminum knock-down type to match demountable partition system.

Exterior entrance doors will be anodized aluminum thermally-broken, insulated doors in thermally broken anodized aluminum frames.

1. Standard of acceptance: CR Laurence Series 650-T, 700-T or 750-T, High-Performance Thermal Entrance Doors with (optional) Foam Insulation.

Exterior exit-only doors in low-profile areas shall be painted insulated hollow metal doors in thermally broken hollow metal frames.

Door Sizes
Patient room and clinical room doors where persons may be transported in beds or stretchers shall be 3’-8” wide with a separate side leaf allowing a total width of 5’-0”.

In certain circumstances (not for patient room doors or ORs), a two-leaf configuration may be considered where a 3’-0” wide active leaf is paired with a 12” wide inactive leaf that can be opened to facilitate the passage of larger equipment when necessary. This configuration may be required in some circumstances to meet barrier-free accessibility while providing for the movement of large equipment.

No doors to be less than 3'-0" wide, unless it can be shown that the smaller width will not compromise future functionality.

All doors to be 7'-0" high.

Door Hardware

Door Hardware to be Healthcare Institutional Grade. Consideration should be given to hardware with antimicrobial properties.

Hinges:
Wide doors (3'-8" or wider): Continuous hinges or pivot hinges.

Standard size doors: three swing-clear butt hinges per leaf to prevent door thickness from restricting door opening.

Doors to bathrooms and treatment rooms where a higher potential for patient falls to occur shall be outswinging or be fitted with a hospital stop allowing the door to be swung outwards in emergency situations.

Latches/Locksets:
Patient Rooms: Roller latches, barrier-free compliant fixed handle

Typical: mortise locksets, barrier-free compliant lever handles

Electronic Door Hardware and Access Control

1. Electronic (Swipecard or keyfob) access hardware, centrally logged for :
    1. Pharmacy and Medication Prep spaces
    2. Laboratory spaces
    3. Staff Lounges
    4. Clean Utility Rooms
2. Electronic access hardware with delayed egress and remote release functionality should be assumed for egress doors in the following conditions:
    1. Restricted access areas (serving entire Pharmacy, Lab, etc. suite if part of the path of egress.
    2. Exit-only Stairwells
    3. Main cross-corridor doors into nursing units (to provide ability to lock-down in emergencies or for additional after-hours security.

Exterior Windows

Exterior windows shall be aluminum framed and thermally broken.Consideration should be given to the use of fiberglass windows for improved thermal performance.

Operable windows in public and patient areas should be awning style, with opening restricted to 8" maximum, and fitted with insect screens.

Window frame design should be easily cleanable without crevices that can trap dirt.

Glazed Aluminum Curtain Walls

Mullions (especially horizontal) should be minimized to improve cleanability.

Glazing

All exterior windows and curtain wall to have Low-E, argon-filled sealed double glazed units with tempered glass. Triple glazing should be considered for improved insulation value and acoustics. Special glazing design (including specialized films to control heat gain, glare, etc.) on a per-façade basis should in considered as design progresses to enhance the performance of the glazing given its orientation and position.

All glass (exterior and interior) shall be safety glass, wire glass, tempered or plastic with minimum breaking strain of 15 kg.

Interior glazing into Operating Rooms, and possibly other clinical areas, shall have integral blinds between glazing panes or be located above eye level to provide shared light, privacy, and infection control properties.

Leaded glass may be required in some areas where diagnostic imaging equipment is to be used.

Laminated or wired glazing shall be used if located in the perimeter of a Pharmacy and in medication dispensing units.

Window/Glazing Treatment

Window coverings: Most rooms with exterior windows will require some level of control of lighting or solar gain. Such control could take the form of the following:

1. Integrally designed sun shading: Exterior sun shading devices and louvers should be employed to control solar heat gain and glare, particularly on certain exposures. Interior light shelves should be considered to improve daylight penetration and improve light diffusion within the interior spaces. Infection control and ease of cleanability should be assessed for interior applications.
2. Diffusing Glazing Films adhered to the outside surface of the inside glass pane of exterior windows. This would be particularly appropriate where daylighting is desirable, privacy is always required and exterior views are not required (e.g. procedure rooms). Standard of Acceptance: 3M Fasara Milky White (SH2MAML), or approved equal.
3. User-controllable exposed window coverings (blinds/ curtains), including black-out versions. Fabrics must meet flammability and smoke development requirements of relevant codes and standards for healthcare facilities. The infection control concerns of exposed window coverings should be weighed against the benefits of a decreased institutional aesthetic and improved acoustic control.
4. Integral blinds installed within the sealed glazed units of exterior windows and interior glazing provides solar and privacy control while minimizing infection control concerns. These would be required for glazing in sterile environments (e.g. ORs) where privacy and/or solar control is required.

Division 9 – Finishes

New Partition Assemblies

Typical new partition walls shall be assumed to have a total of three layers of 5/8" Type-X gypsum wall board. Patient Room Walls: resilient channels on one side of the assembly, and sound batt insulation in cavity. As an alternate, patient room walls may be constructed with healthcare-grade modular prefabricated wall partitions, See Division 10.

Corridors shall be finished with abuse-resistant gypsum wall board, and moistureresistant gypsum board shall be used in all critical care areas.

Wet rooms (washrooms with showers/tubs; soiled utility rooms; janitor rooms; cart wash rooms, etc.) shall use paperless water resistant gypsum or cement board panels. Wet walls shall use paperless water resistant gypsum or cement board panels, min. 4'-0" either side from centre line of plumbing fixtures.

Fire Rated Assemblies shall be assumed to be constructed in accordance with ULC Tested Assembly W407. All new and existing penetrations shall be firestopped, as necessary, to achieve required FRR.

All partitions should be assumed to extend from floor to underside of structure above. For rated assemblies, the entire assembly must continue full height. For unrated and non-rated assemblies, at least one layer of drywall each side must extend full height.

The following STC values should be met at a minimum:

1. *Administrative offices* 40
2. *Patient interview/treatment/doctors' offices* 45
3. *Inpatient bedrooms* 45
4. *Inpatient bedroom to noisy public space* 55
5. *Quiet counseling rooms* 50
6. *Operating rooms* 50
7. *Meeting/seminar* 50
8. *Critical care* 50
9. *Mechanical rooms, kitchens, laundry* 55+

Wall Finishes

Painted gypsum board walls in corridors and open areas off public corridors (e.g. waiting rooms, resource room, alcoves) shall receive a Level 5 gypsum finish (i.e. skim coat).Painted gypsum walls in individual, enclosed rooms shall receive a Level 4 gypsum finish.

Where gypsum board is used, wall finishes, in general, shall be scrubbable, high-quality, low- or no-VOC latex paint finish.All painting shall be to a Level 5 paint finish (one coat of primer and two topcoats). All walls and ceilings (new and existing) are to be painted.

Walls in Operating Rooms shall receive water-proof, non-porous, heat-formable hygienic wall system from floor to ceiling with welded seams. Wall system to lap overtop of sheet flooring.

Standard of Acceptance: Altro Whiterock

Wall/Corner Protection

Acrylic (e.g. Acrovyn/Korogard) corner guards (on metal reinforced mounts) will be installed to all exposed outside corners unless other wall protection already exists.

Consideration may be given to applying impact resistant, non-porous wall protection (e.g. Koroguard, Acrovyn, decorative FRP, etc.) at the bottom portion of corridor walls below handrails.

Headwall protection should be considered for inpatient rooms and treatment rooms to protect walls from damage due to movement of beds, stretchers and equipment. This may take the form of plastic laminate panels, FRP or acrylic wall treatment, decorative durable "headboards", or pre-manufactured bed locator systems

Non-porous backsplashes shall be installed on vertical surfaces behind all hand hygiene sinks. Extent of such protection shall be generally from 10" above finished floor (AFF) to 4'-10" AFF, typically extending to any surfaces within 3'-0" of fixture centreline.

Metal corner and edge protection shall be considered for vulnerable surfaces of millwork and furniture to prevent damage.

Ceiling Finishes

Planned Ceiling Heights

1. Typical: 8'-6" AFF (min. 8'-0)
2. Patient Bedrooms: 9'-0" AFF
3. Operating Rooms: 13'-2" AFF
4. Storage Rooms, Washrooms, Bathrooms (8'-0" AFF, 7'-6" Min.)

Ceilings in washrooms, bathrooms, airborne isolation rooms and ante-rooms, burn units, Soiled Utility rooms and Janitor rooms shall be 5/8" water resistant gypsum board with high-quality, low- or no-VOC latex flat paint finish.

Ceiling Types

AT1: Corridors and Offices (single and two-person)
2'x2' square lay-in suspended acoustic ceiling tile, with integral anti-microbial treatment. Min. NRC: 0.50, Min. CAC: 35

1. Standard of Acceptance: Armstrong Dune

AT2: Exam Rooms, Patient Bedrooms, and non-surgical treatment rooms
2'x2' square lay-in suspended acoustic ceiling tile, with integral anti-microbial treatment. Min. NRC: 0.70, Min. CAC:35

1. Standard of Acceptance: Armstrong Ultima

AT3: Rooms in which sensitive conversations will take place, where enhanced levels of acoustic control are required, or where partition walls do not extend to underside of structure

2'x2' tegular edge suspended acoustic ceiling tile, with integral anti-microbial treatment. Min. NRC: 0.70, Min. CAC: 40

1. Standard of AcceptanceArmstrong Fine Fissured Beveled Tegular High Acoustics

AT4: *Minor Procedure Rooms*
2'x4' square lay-in suspended vinyl-coated suspended acoustic tile ceiling with integral anti-microbial treatment. Ceiling tiles in these areas must be gasketting and clipped-down.

Alternatively, these ceilings may be 5/8" water resistant gypsum board with high-quality, low- or no-VOC latex flat paint finish.

Operating Rooms
A prefabricated OR ceiling system is proposed that incorporates HVAC plenums for laminar flow OR ventilation, structural support for lights, booms, DI equipment and future additional services. This ceiling system would be complete with lighting, sprinklers, medical gases, rough-in conduit for electrical, data and A/V, air filtration and be finished with removable lay-in non-porous aluminum tiles.

1. Standard of Acceptance: CLEANSUITE system by Huntair.

Alternatively, these ceilings may be 5/8" water resistant gypsum board with high-quality, low- or no-VOC latex flat paint finish.

Floor Finishes

Flooring should be continuous under demountable partition walls.

Floor finishes in corridors shall be heterogeneous, patterned (e.g. wood grain, geometric, organaic, or linear pattern) welded resilient sheet flooring (vinyl or linoleum) with integral coved base

Floor finishes in inpatient rooms and treatment spaces, including washrooms without tubs and showers, shall be homogeneous non-directional (or minimally directional) welded resilient sheet flooring (vinyl or linoleum) with integral coved base. Flooring that includes acoustic and shock absorption characteristics should be considered, though these characteristics cannot significantly compromise the ease of movement of beds and mobility devices.

Floor finishes in Soiled Utility Rooms, Janitor Rooms, bathrooms with showers or tubs, CSPD, and food preparation areas shall be homogeneous non-directional welded resilient, non-slip sheet flooring (vinyl or linoleum) with integral coved base.

Flooring in Pharmacy and Laboratory spaces should have anti-fatigue characteristics. Anti-fatigue flooring is preferred over anti-fatigue mats for ease of cleaning.

Meeting Rooms, Offices, Duty Rooms and Waiting Areas shall be heterogeneous/patterned (e.g. wood grain, geometric, organic, or linear pattern) welded resilient sheet or tile flooring with rubber base.

Operating Rooms shall be slip-resistant welded resilient sheet flooring with integral coved base. Alternatively, poured epoxy flooring with integral cove base may be considered for enhanced durability and completely seamless characteristics.

Parking floors and mechanical/electrical service room floors shall be concrete with coloured hardener or epoxy paint with silica grit added for slip resistance.

Division 10 – Specialties (Built-in)

An allowance has been made for Toilet and Bath Accessories, Miscellaneous Specialties and Medical Specialties in the cost estimate included in this report.

Handrails and Bumper Rails

Handrails shall be installed continuously along corridors and within public spaces (lounges, waiting rooms, nourishment areas, etc.). In areas where people will not be walking, but which are continuous with these spaces (e.g. alcoves), hand rails may transition to bumper rails.

A low bumper rail should also be considered at the top of the wall base for added protection. If durable wall protection (e.g. FRP or vinyl sheet) is to be installed below the handrail, bumper rail at this location may be overkill.

Handrails should also be considered in select locations within inpatient rooms to facilitate safe independent movement from the bed location to the washroom. In this case, the handrail will also serve as wall protection in the room.

Characteristics:

1. Handrails shall be continuous, 6"-10" high, durable and terminate by either returning to the wall or with a tactile indicator to signal a termination for the visually impaired. Design should be free of gaps that may trap skin. Profile should meet barrier-free code and CSA requirements. Handrails shall be installed at barrier-free height throughout.
2. Polymeric materials with metal backer is suggested.
3. Wood handrails (completely sealed) may be considered for long-term durability and visual warmth, though infection control considerations may preclude this option, depending on jurisdiction.
4. Handrails (and in-wall support) in corridors and bariatric rooms shall be designed to support 453 kg., minimum.

Toilet and Bath Accessories

In further design development, the following items (amongst others) should be considered for inclusion:

- Grab Bars
- Robe Hook
- Coat Hook
- Toilet Paper Dispenser
- paper Towel Dispenser
- Soap Dispenser
- Hand Sanitizer Dispenser
    1. In addition to hand washing sinks, waterless hand rubs are recommended as the preferred method of hand hygiene unless hands are visibly soiled.
    2. Immediately adjacent to the entrance for exam rooms and any space where treatment, interventions or procedures are performed
    3. Adjacent to the bedside at the 'point of care' (where the patient, staff and interaction occur) to improve adherence to infection prevention and control principles
    4. In locations where personal protective equipment is donned or doffed
    5. High staff traffic areas to optimize compliance
    6. Additional areas based on workflow patterns
    7. Wall-mounted dispensers for hand lotion are also recommended to increase staff hand health and as a means to prevent skin breakdown.
- Baby Change Table
- Mirrors
- Wall-hung Shelf
- Shower Curtains
- Bedpan cabinet
- Sharps Containers
- Gloves Dispensers
- Mop Holders
- Toilet Partitions

Miscellaneous Specialties

In further design development, the following items (amongst others) should be considered for inclusion:

- Lockers
    1. Purse lockers on Inpatient Units near Nurse Stations
    2. Full-height or half-height lockers in OR locker/ change rooms (both staff and patient)
    3. Full-height lockers in new/renovated locker rooms on Level 200.
- Metal Storage Shelving for Clean utility rooms, Housekeeping Rooms and CSPD.
- Mobile Shelving for centralized storage rooms.
- Tackboards
- Whiteboards
- Magazine Racks
- Pamphlet Racks
- Televisions

- Projection Screens
- Projectors, ceiling and wall mounted.
- Smart Boards
- Coiling Counter Doors for secure lockup of registration areas and select other public spaces after hours.

Medical Specialties

In further design development, the following items (amongst others) should be considered for inclusion:

- Folding Charting Surface
- Vacuum slide bracket
- Specimen Pass-Through Cabinet
- Monitor Wall Brackets
- Surgical Ceiling Columns
- Morgue Body Holding Cooler
- Scope Cabinets
- OR Storage Cabinets
- Ice Machine
- Ceiling Mounted Surgical Lights
- Sterilizer (Electric)
- Sterilizer (Flash)
- Instrument WasherMessage Centre
  1. One in each inpatient room
  2. Wall-hung. To include whiteboard surface, clock, magnetic or clamping function for secure elevated display of notes/cards, and storage for pens/eraser.
  3. Standard of Acceptance: Message Centre by Peter Pepper Products.
- X-Ray Viewers (may not be required if fully-digital imaging, and digitization of back imagery as necessary).

Demountable Partitions

Walls of interior support cores (other than for shafts, and chases) in Inpatient Units shall be anodized aluminum framed demountable partition wall systems, complete with swing and/or surface-sliding doors. Standard of Acceptance: Steelcase Privacy Wall, or approved alternate.

As an alternate to traditional stud and drywall construction, patient room walls may be constructed with healthcare-grade modular prefabricated wall partitions, complete with pre-installed service rough-in.

1. Standard of acceptance:
   1. DIRTT Environmental Solutions;
   2. H Core Clinical Services Wall, by Modular Services Company

Cubicle Curtains

Standard health-care cubicle curtains, complete with mesh top portions, along with custom shape/length aluminum ceiling tracks (e.g. Silent Gliss system) as required to provide visual privacy for any locations where patients/clients may be undressed (one cubical curtain and track shall be supplied for each inpatient room). Fabrics shall all meet NFPA 701 flame spread requirements, and mesh shall comply with NFPA 701 and NFPA 13. Spares to be provided under the construction contract as appropriate.

1. Standard of Acceptance: Maharam Ruban fabric, by Kvadrat, complete with NFPA701/NFPA13-compliant mesh, Silent Gliss track system

Division 11 – Equipment

Patient Lift Track

One track per patient room (one bariatric track per bariatric patient room), installed across bed location.

Consideration should be given to gantry-style configuration in areas where increased flexibility may be required

Prefabricated Headwall Systems

If modular/demountable headwall systems are not used, consideration should be given to factory assembled modular, surface-mounted headwall units for patient rooms. Prefabricated modular systems provide the following benefits:

- Prewired and pre-piped for headwall services including, medical gases, power, data and IT.
- Raceways for future flexibility to add or change power and IT services
- Removable access panels for maintenance, servicing and alterations
- Integrated universal mounting rails for lighting, monitors, IT, IVs, small work surfaces, cord/quipment/tubing management, storage baskets, etc

Interactive Building Navigation

Consider incorporation of an interactive building navigation system: system and associated kiosks should integrate with elevator management system and interface with visitors' smartphones, tablets, and other mobile computing devices.

Division 12 – Furnishings

Furniture and Textiles

All furniture and textiles are to be Healthcare Institutional Grade and meet local and National Fire Code of Canada requirements. For Cubicle Curtain information, refer to Division 10 in the Architectural Outline Specifications.

Division 13 – Special Construction

N/A

Division 14 – Conveying Equipment

Elevators

Provision must be made for a dedicated firefighter's elevator and central alarm and control facilities (CACF) c/w monitor, control and communication devices. Traction type elevators should be used for all patient transfer, public, and service elevators.

Elevators to be integrated with building navigation systems and come complete with Elevator Management System. Interior of elevator cabs are to provide interactive interface with building navigation systems, providing information on services to passengers as floors are accessed, and supporting the real-time display of emergency, or other, events.

Halifax Infirmary Site

Minimum four 5,000Lb patient transfer elevators and two 2,500Lb passenger units. Integration of elevator management system with building security system to provide ability to lock, reserve, limit use of, and assign elevators as required. Integration of elevator management system to provide ability to designate a patient transfer elevator as a trauma car on an as-needed basis (via web interface or by pressing a hard button). Elevator management system is to coordinate with other elevators in the existing building (regardless of manufacturers).

Dartmouth General Site

Minimum one 5,000Lb patient transfer elevator reserved as a trauma car, two 5,000Lb patient transfer/passenger cars, and one to two 2,500Lb passenger units. Integration of elevator management system with building security system to provide ability to lock, reserve, limit use of, and assign elevators as required. Elevator management system is to coordinate with other elevators in the existing building (regardless of manufacturers).

1. Standard of acceptance: Otis Gen2

Elevator Management System

Patient Transfer Elevators shall be programmable to allow them to be available for public use when not transferring patients. All elevators shall be programmable to allow priorities to be managed simply and reducing the need for a dedicated trauma elevator. For example, if a patient is arriving by helicopter, staff presses a button, sending the first available patient transfer elevator to the roof level, as a trauma car, where it will wait until engaged by the arriving patient and staff, remaining in use as a trauma elevator until released from that task by authorized staff. Elevator Management System is to be operable via web-based applications and hard buttons for specific tasks (use as a trauma car)

1. Standard of acceptance: Otis EMS Panorama

Patient Transfer Elevators

All patient transfer elevators shall be sized for bariatric beds and have side opening doors.

If a new helipad will be provided on the roof of the HI bed tower, a trauma elevator extending from the rooftop helipad level to both the ORs on Level 5 and the Emergency Dept. on Level 3 shall be provided. This elevator shall be large enough to accommodate a fully equipped stretcher bed with associated accessories and a staff of six persons. The elevator shall be sized with minimum inside car dimensions of 1830 mm wide by 3350 mm deep and be provided with 1525 mm wide centre parting doors.

Public Elevators

Separate public and patient elevators are currently used at the HI and cause problems with regard to public using the patient elevators resulting in slower transfers and the need to post signage encouraging the exclusive use of larger elevators for patients. Separate public elevators should be avoided unless located away from those required for patient transfer. Consideration should be given to the cost/benefit analysis of sizing all elevators for patient transfer.

Service Elevators

At least one service elevator shall be provided for movement of food services supplies and/or other heavy loads (e.g. portable x-ray). At least one shall have a loading capacity to accommodate a single piece load of at least 2270 kg and single axle loading of 1135 kg. Access to non-public areas should be controlled via swipecards or keyswitches.

Dumbwaiters or Supplies Elevators

Separate elevators or dumbwaiters, physically separated and in separate shafts, shall be provided for transport of clean and soiled supplies between the CSPD and ORs.

These elevators shall be sized to carry at least three case carts 760 mm × 1220 mm at once.

Cost Estimating, General

Introduction

The Class 'C' Cost Estimates presented in this report represent an update to the Class 'D' (Master Plan) cost estimates presented in the Part A Report. The earlier estimates have been updated with more detail developed through the course of Part B. These Class 'C' Estimates are intended to provide an order of magnitude assessment of the total project costs associated with the proposed Development of the Capital District Health Authority's (CDHA) - Innovative Care Flexible Facilities at both the Halifax Infirmary site in Halifax, Nova Scotia and the Dartmouth General site in Dartmouth, Nova Scotia as outlined in the documentation prepared by William Nycum & Associates Limited with Smithgroup AEIP International, Inc.

Accordingly, these Class 'C' Estimates should only be considered within the full context of the above noted documentation.

Methodology

Generally, the areas of work projected by the Preliminary and Schematic Design documents are priced using parametric quantities and unit rates considered appropriate for a project of this scope and nature.

Costs reported in these estimates provide for all building construction and include related site development work, allowances for Hospital Furnishings & Equipment and Professional Fees & Expenses. Separate provision has also been made where appropriate for such things as building demolition, site clearance, etc.

Construction Phasing

Allowances have been made to cover premiums for phased construction essential for renovated areas and the fit-out of the DGH's 5th Floor where applicable. Please note that a phasing plan has not yet been developed.

Cost Considerations

All costs are estimated on the basis of competitive bids (a minimum of 6 general contractor bids and at least 3 to 4 subcontractor bids for each trade) being received in June 2013 from general contractors and all major subcontractors and suppliers based on a construction management form of contract. Pricing shown reflects probable costs obtainable in the Halifax Regional area on the effective date of this report and is therefore a determination of fair market value for the construction of the work and not a prediction of low bid.

Escalation has been allowed to the anticipated time to the mid-point of construction.

An allowance of 10% has been included to cover design and pricing unknowns. This allowance is not intended to cover any program space or quality modifications but rather to provide some flexibility for the designers and cost planners during the subsequent design stages.

An allowance of 5% has been made to cover construction (post contract) unknowns.

An allowance of 23.2% has been included to cover Project Ancillaries, commonly referred to as "soft costs". Soft costs are costs incurred in addition to the direct construction costs (Hard Cost). They are generally costs that are not directly related to the physical construction of a project. Some typical samples of Soft Costs include architectural & engineering fees, other consultant or specialty consultant fees, legal fees, permits, financing fees, advertising & marketing fees, assessment fees, etc

The unit rates in the preparation of these Class 'C' Estimates include labour and material, equipment, subcontractor's overheads and profits.

The following items have been specifically excluded from the Cost Estimates included in this report:

- owner's staff and management expenses
- land acquisition costs and expenses
- financing and/or fund raising expenses
- all costs associated with an Alternative Financing & Procurement (AFP) method of project delivery
- there is an allowance for FF&E and IT, but this does not include Specialized Equipment (ie: diagnostic imaging, CT scanners, etc.)

Ongoing Cost Control

Hanscomb has no control over the cost of labour and materials, the general contractor's or any subcontractor's method of determining prices, or competitive bidding and market conditions. This opinion of probable cost of construction is made on the basis of experience, qualifications and best judgment of the professional consultant familiar with the construction industry. Hanscomb cannot and does not guarantee that proposals, or actual construction costs will not vary from this or subsequent estimates.

Hanscomb recommends that the Owner and the design team carefully review these Class 'C' Estimate documents, including line item description, unit price clarifications, exclusions, inclusions and assumptions,

An allowance of 23.2% has been included to cover Project Ancillaries, commonly referred to as "soft costs". Soft costs are costs incurred in addition to the direct construction costs (Hard Cost). They are generally costs that are not directly related to the physical construction of a project. Some typical samples of Soft Costs include architectural & engineering fees, other consultant or specialty consultant fees, legal fees, permits, financing fees, advertising & marketing fees, assessment fees, etc

The unit rates in the preparation of these Class 'C' Estimates include labour and material, equipment, subcontractor's overheads and profits.

The following items have been specifically excluded from the Cost Estimates included in this report:

- owner's staff and management expenses
- land acquisition costs and expenses
- financing and/or fund raising expenses
- all costs associated with an Alternative Financing & Procurement (AFP) method of project delivery
- there is an allowance for FF&E and IT, but this does not include Specialized Equipment (ie: diagnostic imaging, CT scanners, etc.)

Equipment Costs

Typical healthcare Equipment and Furnishings are included at this stage as an allowance in the cost estimates provided. This (FF&E) allowance is expressed as a percentage of construction cost, based on recent metrics from projects of a similar type and scale. The FF&E allowance, however, does not include large service-dependent or highly-variable major equipment. This would include such items as major fixed diagnostic imaging equipment including MRIs, CT scanners, etc. In the absence of an advanced Clinical Services Plan, establishing what services will be offered where and deciding on service delivery models, it is not possible to establish a list of DI equipment that will be required for the new spaces. The DI equipment will need to be revisited in future design phases once the Clinical Services Plan is developed to a point where these assessments can be made.

In addition to DI equipment, equipment associated with radioisotope production serving Oncology is also not included, as the services associated with this equipment lies outside the scope of this project. The need to relocate, replace or supplement this equipment will also need to be assessed in subsequent design phases.

While accounted for in the FF&E allowance in the cost estimates, budget pricing has been obtained for select major equipment, based on discussions with CDHA personnel. This equipment (primarily related to CSPD, ORs and Pharmacy spaces) along with budget pricing, is included in the following table:

BUDGET PRICING FOR SELECT MAJOR EQUIPMENT:

Halifax Infirmary

Item	Vendor assumption for estimate	[redacted]	Notes
OR Booms/Integration Setup/Suction	Stryker		
OR Tables	(Pricing provided by Stryker)		
Anaesthesia Machines	Draeger Fabius (Pricing Provided by Stryker)		Pricing from Biomed Inventory is [redacted]. Should perhaps assume reuse/relocation of existing?
Unit Dose Medication Dispensers - inpatient	Pyxis MedStation ES		One per Med Prep Room
Unit Dose Medication Dispensers - ORs	Pyxis Anaesthesia Systems ES		One per OR
Flusher Disinfectors/Macerators	Arjo Typhoon / Vernacare		2 per unpatient unit + 1 for ICU + 2 for Surgical area. Vernacare cheaper up-front with added supply costs.
CSPD Equipment	Steris		
ICU Booms and Lights	Stryker		
			HST excluded

Dartmouth General Hospital

Item	Vendor assumption for estimate	Cost/unit	Qty	Extended Price	Notes
OR Booms/Integration Setup	Stryker	[redacted]			
OR Tables	(Pricing provided by Stryker)				
Anaesthesia Machines	Draeger Fabius				Pricing from Biomed Inventory is [redacted]. Should perhaps assume reuse/relocation of existing?
Unit Dose Medication Dispensers - Inpatient	Pyxis MedStation ES				One per Med Prep Room
Unit Dose Medication Dispensers - ORs	Pyxis Anaesthesia Systems ES				One per OR
Flusher Disinfectors/Macerators	Arjo Typhoon / Vernacare				2 per inpatient unit + 1 for surgical area. Vernacare cheaper up-front with added supply costs.
CSPD Equipment	Steris				
Pharmacy Safe	Pyxis C2				
					HST excluded

Summary of Gross Floor Areas
This table, titled "2.0 Gross Floor Area" summarizes the gross floor areas used in the preparation of the Class 'C' estimates contained in this report.

CAPITAL DISTRICT HEALTH AUTHORITY (CDHA)
INNOVATIVE CARE FLEXIBLE FACILITIES
HALIFAX & DARTMOUTH, NOVA SCOTIA

Hanscomb
JUNE 20, 2013

2.0 Gross Floor Area

GROSS FLOOR AREAS:

HALIFAX INFIRMARY	HALIFAX INFIRMARY - HYBRID CONCEPT (New Construction)	HALIFAX INFIRMARY - HYBRID CONCEPT (Renovated Areas)
	(SF)	(SF)
Level 1	64,919	7,900
Level 2	66,146	24,808
Level 3	31,117	10,262
Level 4	64,017	1,600
Level 5	98,839	1,000
Level 6	52,276	2,784
Level 7	52,276	384
Level 8	52,276	384
New Bridge Levels 6, 7 & 8	6,900	
TOTAL GFA (sf)	**488,766 SF**	**49,122**

DARTMOUTH GENERAL	DARTMOUTH GENERAL - CONCEPT OR's LEVEL 3	DARTMOUTH GENERAL - RENOVATED AREAS - OR's LEVEL 3	DARTMOUTH GENERAL - 5th FLOOR FIT-OUT
	(SF)	(SF)	(SF)
Level 1	19,666	9,775	
Level 2	20,687	22,075	
Level 3	34,010	275	
Level 4	6,757	5,273	
Level 5	1,257		26,843
Level 6 - New Penthouses			3,750
Level 7			
Level 8			
TOTAL GFA (sf)	**82,377 SF**	**37,398 SF**	**30,593 SF**

The above areas have been measured in accordance with the Canadian Institute of Quantity Surveyors' Method of Measurement of Buildings by Area and Volume.

Project Cost Summary

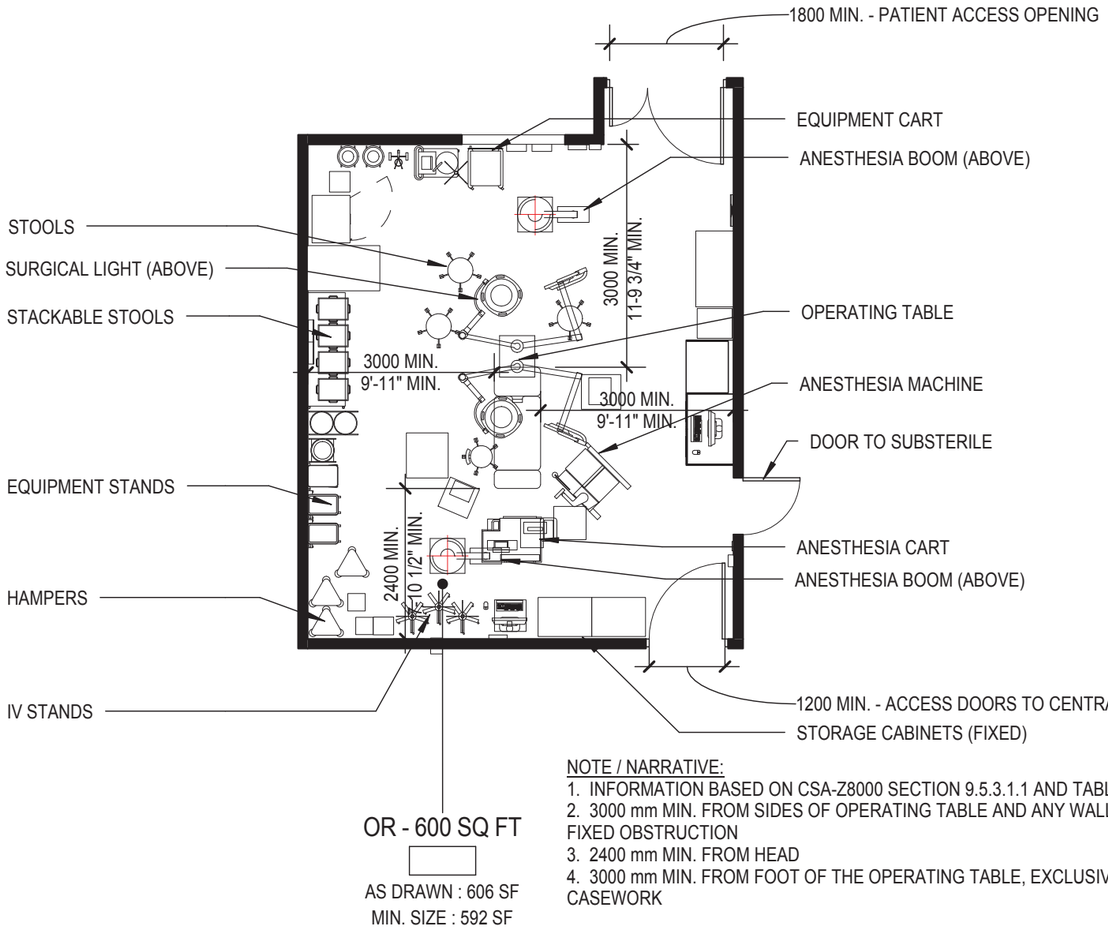
The table on this page summarizes the overall construction and project costs per site. Complete Cost Estimates for each site are presented within the approriate sub-sections of this report.

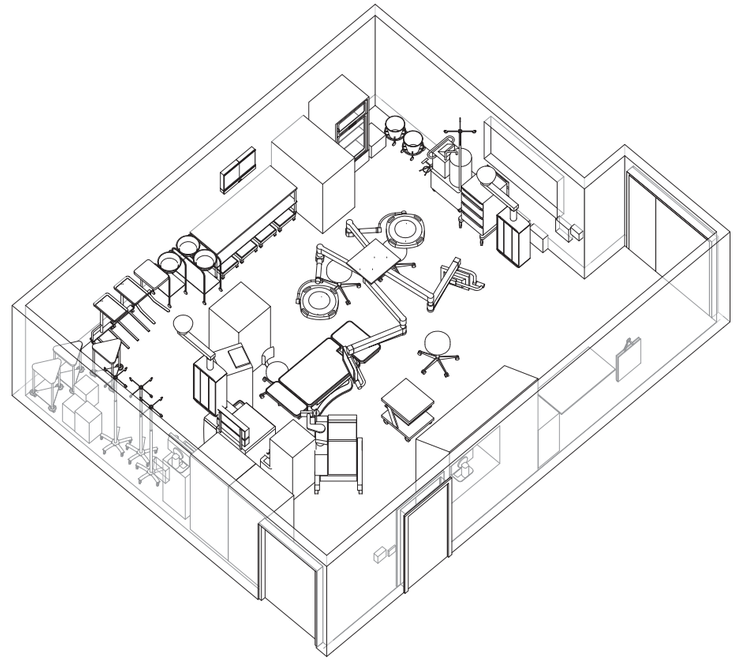
			Total
HALIFAX INFIRMARY - HYBRID CONCEPT			[redacted]
New Building Construction	488,766	SF	
Renovated Building Construction	49,122	SF	
Site Works	1	Sum	
Total Construction Cost	**537,888**	**SF**	
Additional Cost Items / Allowances	1	Sum	
Construction Contingency	1	Sum	
Ancillaries	1	Sum	
Healthcare Commissioning	1	Sum	
Moving Costs	1	Sum	
FF&E and IT	1	Sum	
Sub-total Project Cost Current $	**537,888**	**SF**	
Escalation to Mid-point of Construction			
Total Project Cost Escalated	**537,888**	**SF**	
DARTMOUTH GENERAL - CONCEPT OR's LEVEL 3			
New Building Construction	82,377	SF	
Renovated Building Construction	37,398	SF	
Site Works	1	Sum	
Total Construction Cost	**119,775**	**SF**	
Additional Cost Items / Allowances	1	Sum	
Construction Contingency	1	Sum	
Ancillaries	1	Sum	
Healthcare Commissioning	1	Sum	
Moving Costs	1	Sum	
FF&E and IT	1	Sum	
Sub-total Project Cost Current $	**119,775**	**SF**	
Escalation to Mid-point of Construction			
Total Project Cost Escalated	**119,775**	**SF**	
DARTMOUTH GENERAL - 5TH FLOOR FIT-OUT			
New Building Construction	3,750	SF	
Renovated Building Construction	26,843	SF	
Site Works	1	Sum	
Total Construction Cost	**30,593**	**SF**	
Additional Cost Items / Allowances	1	Sum	
Construction Contingency	1	Sum	
Ancillaries	1	Sum	
Healthcare Commissioning	1	Sum	
Moving Costs	1	Sum	
FF&E and IT	1	Sum	
Sub-total Project Cost Current $	**30,593**	**SF**	
Escalation to Mid-point of Construction			
Total Project Cost Escalated	**30,593**	**SF**	

Typical Rooms: Layouts and Data Sheets

The following pages contain Room Data Sheets, floor plans, and three dimensional views of typical major clinical spaces for all sites in this project. This information is based on the Canadian Healthcare Facilities Standard CSA Z8000-11, best practices, and user input.

Future design phases should review, revise, and update as the work progresses.





NOTE / NARRATIVE:
1. INFORMATION BASED ON CSA-Z8000 SECTION 9.5.3.1.1 AND TABLE 9.5, ITEM NO. 1
2. 3000 mm MIN. FROM SIDES OF OPERATING TABLE AND ANY WALL OR ANY OTHER FIXED OBSTRUCTION
3. 2400 mm MIN. FROM HEAD
4. 3000 mm MIN. FROM FOOT OF THE OPERATING TABLE, EXCLUSIVE OF FIXED CASEWORK

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
GENERAL OPERATING ROOM

nycum+ ASSOCIATES SMITHGROUP
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date : 04/30/13
Scale : 1/8" = 1'-0"
Drawn : Author

Drawing Number
A0.1

Department/Section: OPERATING ROOM SUITE
Number of Occupants:
Hours of Operation:

Direct Adjacency:
Indirect Adjacency:
Not Adjacent:

Program Space Name: GENERAL OPERATING ROOM
Program Space Number:
Program Space Type: 106

Program Space Area Excluding alcoves(NSF): 585 SF
Program Space Quantity: 4
Occupancy Type:

ROOM CRITERIA

Architectural:

Ceiling Height	11' - 6" / 3.5m
Room Construction:	0.00 CF
Room Finish Class:	
Floors:	Non-Slip Monolithic
Walls:	Smooth
Ceiling:	Monolithic
Doors (material, size, rating):	1800mm/6'-0"
Door Frames:	
Door Hardware:	
Door Special:	
Shielding Criteria:	X-Ray / Laser
Acoustic Criteria:	STC-50
Projection Screen:	
Fire Separation:	No
Exterior Window Treatment:	Yes
Way Finding:	No

Architectural Notes: Integral cove base, see keyed note 1, 2, 3, and 4.

Fireprotection/Safety/Security:

Fire Extinguisher:	Yes
Hazard Classification:	
Fire Suppression System:	Yes
Smoke Detection:	Yes
Eyewash:	No
Combo Eyewash/Shower:	No
Eyewash/Shower Drain:	No
Gas Leak Detection:	Yes
Key Locked:	No
Card Reader:	No
Biometrics:	No
Alarm:	Yes
Magnetic Locks:	No
Video Camera:	Yes
Motion Detection:	No
Request to Exit Button:	No

Fireprotection/Safety/Security Notes:

Audio Visual / Communications:

Intercom/Public Address:	No
Microphone / Loudspeaker:	Yes
Video Projector:	No
TV/Monitor/MATV:	Yes
Sound System:	Yes
Telephone:	Yes
Data:	Yes
Cable:	No
Equip. Monitoring Alarm:	Yes
Walk-up Shared PC:	Yes
Emergency Communication:	Yes
PACS Workstation:	Yes
Nurse Call:	

AV / Communications Notes: Patient Tracking (RFID) - Consider, Asset Tracking - Consider

SYSTEMS CRITERIA

Mechanical:

Temp. Set Range:	75dF +/-2dF
Humidity:	Yes
Pressurization:	
Air Changes:	4-8
Laminar Flow:	0
High/Low Ventilation:	0
Heat Load:	0
Exhaust:	
Fume Hood Type:	0
Bio-Safety Cabinet:	0
Point Exhaust:	No
Canopy Hood:	0
Pressure Monitoring:	No
Diffusers:	
Return:	
Cleanroom Class:	

Mechanical Notes: Add Thermostat

Plumbing/Gas:

Cold Water:	No
Hot Water:	No
Floor Sink:	No
Lab Sink:	No
Dedicated Handwash Sink:	No
Drain:	No
Steam:	No
Reagent Water:	Yes
RO Water:	No
Local Polisher:	No
Pure Water Quality:	No
Recessed Wall Connect:	No
Med Air:	Yes
Natural Gas:	No
Med Oxygen:	Yes
Vacuum:	Yes
Fitting Connections:	

Plumbing Notes: See keyed note 3, 5, and 6.

Electrical:

120V Normal Power:	Yes
120V Emergency Power:	Yes
120V Standby Power:	Yes
208V Normal Power:	Yes
208V Emergency Power:	Yes
208V Standby Power:	No
408V Power:	Yes
UPS Receptacles:	Equipment Supplied
Raceway:	Yes
Special Power:	As Required
Emergency Shut-Off:	No
Lighting Type:	
Fixture Type:	
Light Control:	Yes
Daylighting:	Yes w/ eff. shading controls
Special Lighting:	Surgical Lights

Electrical Notes: Add warning lights for Laser and X-Ray use

OTHER CRITERIA

Casework:

Standing Height Bench (36"):	Yes
Sitting Height Bench (30"):	No
Upper Cabinets:	Yes
Wall Shelves:	No
Reagent Shelves:	No
Adjustable Workstation:	Yes
Mobile Bench:	No
Movable Table:	No
Tall Cabinets:	Yes
Storage Cubbies:	No
Casework Material:	Stainless Steel
Countertop Material:	Solid Surface
Base Cabinet:	Yes
Chemical Storage:	No
Service Dist. Concepts:	

Casework Notes:

Equipment / Structural:

Vibration Sensitive:	Yes
Vibration Producing:	No
Heat Sensitive:	No
Heat Producing:	No
Light Sensitive:	No
Noise Producing:	No
Structural Support:	Yes - Booms and Light

Equipment Notes:

Structural:

Live Load:	
Dead Load:	
Structural Special:	
Vibration Criteria:	

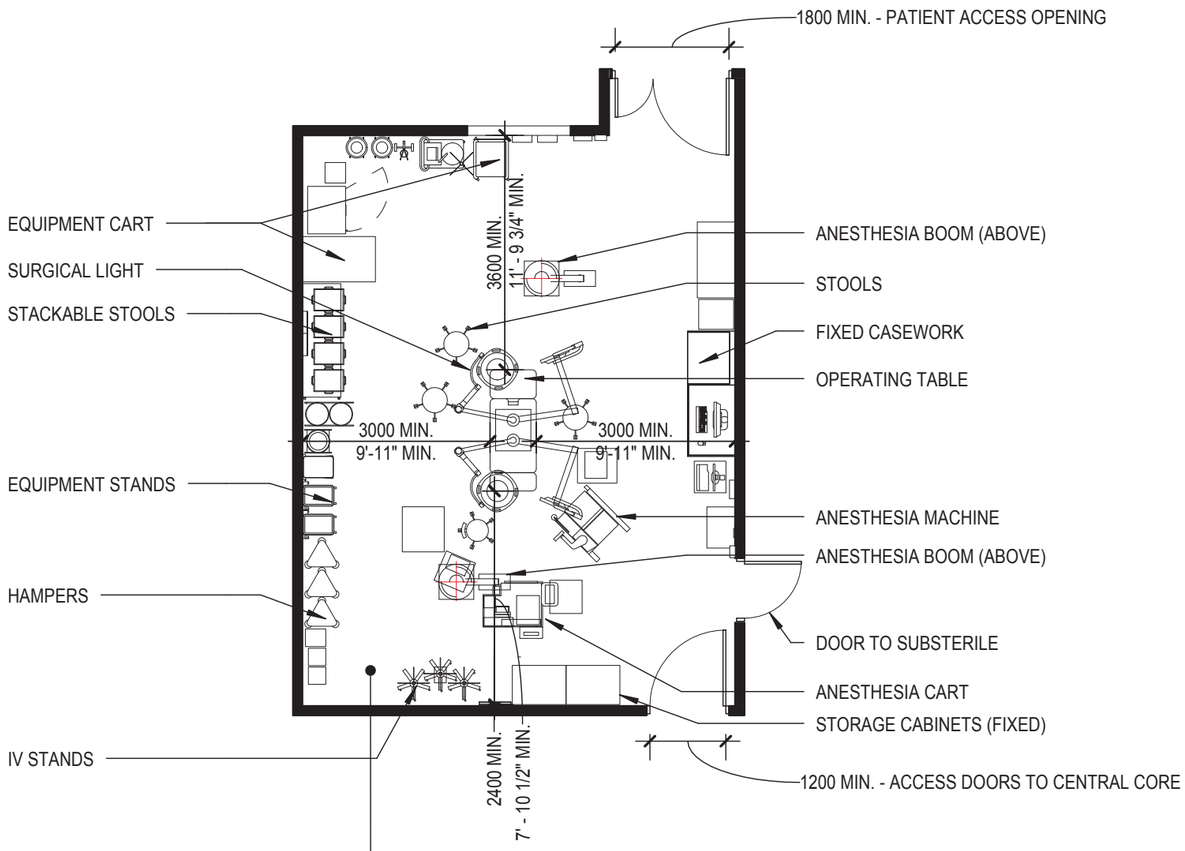
Structural Notes:

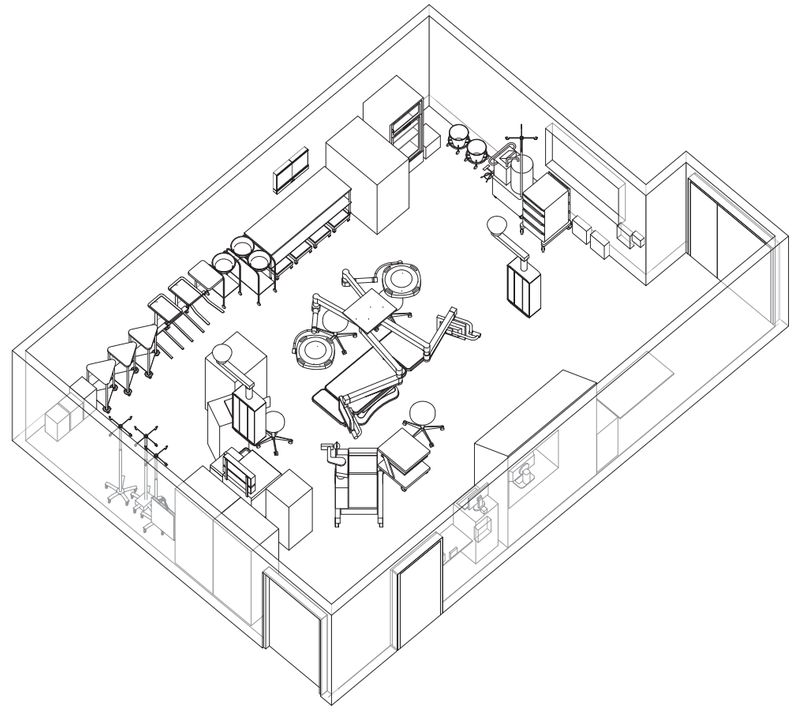
Keyed Notes

1. Perimeter walls, ceilings, and floors, including penetrations, shall be sealed.
2. Provisions should be made for a patient warming system.
3. Integration of ceiling-mounted articulating surgical and anaesthesia arms should be considered.
4. Central core access door - 1200mm/4'-0"
5. Anaesthetic medical gases shall be positioned so they are on the opposite side of the OR table from the patient entry door.
6. Add scavenging system.

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
GENERAL OPERATING ROOM DATA





NOTE / NARRATIVE:
1. INFORMATION BASED ON CSA-Z8000 SECTION 9.5.3.1.1 AND TABLE 9.5, ITEM NO. 2
2. 3000 mm MIN. FROM SIDES OF OPERATING TABLE AND ANY WALL OR ANY OTHER FIXED OBSTRUCTION
3. 2400 mm MIN. FROM HEAD
4. 3600 mm MIN. FROM FOOT OF THE OPERATING TABLE, EXCLUSIVE OF FIXED CASEWORK

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
SPECIAL OPERATING ROOM

nycum+ ASSOCIATES SMITHGROUP
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date : 04/30/13
Scale : 1/8" = 1'-0"
Drawn : Author

Drawing Number
A0.2

Department/Section: OPERATING ROOM SUITE
Number of Occupants:
Hours of Operation:

Direct Adjacency:
Indirect Adjacency:
Not Adjacent:

Program Space Name: SPECIAL OPERATING ROOM
Program Space Number: 104
Program Space Type: 106

Program Space Area Excluding alcoves(NSF): 686 SF
Program Space Quantity: 0
Occupancy Type:

ROOM CRITERIA

Architectural:

Ceiling Height	11' - 6" / 3.5m
Room Construction:	0.00 CF
Room Finish Class:	
Floors:	Non-Slip / Monolithic
Walls:	Smooth
Ceiling:	Monolithic
Doors (material, size, rating):	1800mm / 6'-0"
Door Frames:	
Door Hardware:	
Door Special:	
Shielding Criteria:	X-Ray / Laser
Acoustic Criteria:	STC - 50
Projection Screen:	No
Fire Separation:	No
Exterior Window Treatment:	Yes
Way Finding:	No

Architectural Notes: Integral cove base, see keyed note 1, 2, 3, and 4.

Fireprotection/Safety/Security:

Fire Extinguisher:	Yes
Hazard Classification:	
Fire Suppression System:	Yes
Smoke Detection:	Yes
Eyewash:	No
Combo Eyewash/Shower:	No
Eyewash/Shower Drain:	No
Gas Leak Detection:	Yes
Key Locked:	No
Card Reader:	No
Biometrics:	No
Alarm:	Yes
Magnetic Locks:	No
Video Camera:	Yes
Motion Detection:	No
Request to Exit Button:	No

Fireprotection/Safety/Security Notes:

Audio Visual / Communications:

Intercom/Public Address:	No
Microphone / Loudspeaker:	Yes
Video Projector:	No
TV/Monitor/MATV:	Yes
Sound System:	Yes
Telephone:	Yes
Data:	Yes
Cable:	No
Equip. Monitoring Alarm:	Yes
Walk-up Shared PC:	Yes
Emergency Communication:	Yes
PACS Workstation:	Yes
Nurse Call:	

AV / Communications Notes: Patient Tracking (RFID) - Consider, Asset Tracking - Consider

SYSTEMS CRITERIA

Mechanical:

Temp. Set Range:	75dF +/-2dF
Humidity:	Yes
Pressurization:	
Air Changes:	4-8
Laminar Flow:	0
High/Low Ventilation:	0
Heat Load:	0
Exhaust:	
Fume Hood Type:	0
Bio-Safety Cabinet:	0
Point Exhaust:	No
Canopy Hood:	0
Pressure Monitoring:	No
Diffusers:	
Return:	
Cleanroom Class:	

Mechanical Notes: Add Thermostat

Plumbing/Gas:

Cold Water:	No
Hot Water:	No
Floor Sink:	No
Lab Sink:	No
Dedicated Handwash Sink:	No
Drain:	No
Steam:	No
Reagent Water:	No
RO Water:	No
Local Polisher:	No
Pure Water Quality:	No
Recessed Wall Connect:	No
Med Air:	Yes
Natural Gas:	No
Med Oxygen:	Yes
Vacuum:	Yes
Fitting Connections:	

Plumbing Notes:

Electrical:

120V Normal Power:	Yes
120V Emergency Power:	Yes
120V Standby Power:	No
208V Normal Power:	Yes
208V Emergency Power:	Yes
208V Standby Power:	No
408V Power:	Yes
UPS Receptacles:	Equipment Supplied
Raceway:	Yes
Special Power:	As Required
Emergency Shut-Off:	No
Lighting Type:	
Fixture Type:	
Light Control:	Yes
Daylighting:	Yes - Effective Shading Cntrl
Special Lighting:	Surgical Lights

Electrical Notes: Add warning lights for Laser and X-Ray use

OTHER CRITERIA

Casework:

Standing Height Bench (36"):	Yes
Sitting Height Bench (30"):	No
Upper Cabinets:	Yes
Wall Shelves:	No
Reagent Shelves:	No
Adjustable Workstation:	Yes
Mobile Bench:	No
Movable Table:	No
Tall Cabinets:	Yes
Storage Cubbies:	No
Casework Material:	Stainless Steel
Countertop Material:	Solid Surface
Base Cabinet:	Yes
Chemical Storage:	No
Service Dist. Concepts:	

Casework Notes:

Equipment / Structural:

Vibration Sensitive:	Yes
Vibration Producing:	No
Heat Sensitive:	No
Heat Producing:	No
Light Sensitive:	No
Noise Producing:	No
Structural Support:	Yes - Booms and Light

Equipment Notes:

Structural:

Live Load:	
Dead Load:	
Structural Special:	
Vibration Criteria:	

Structural Notes:

Keyed Notes

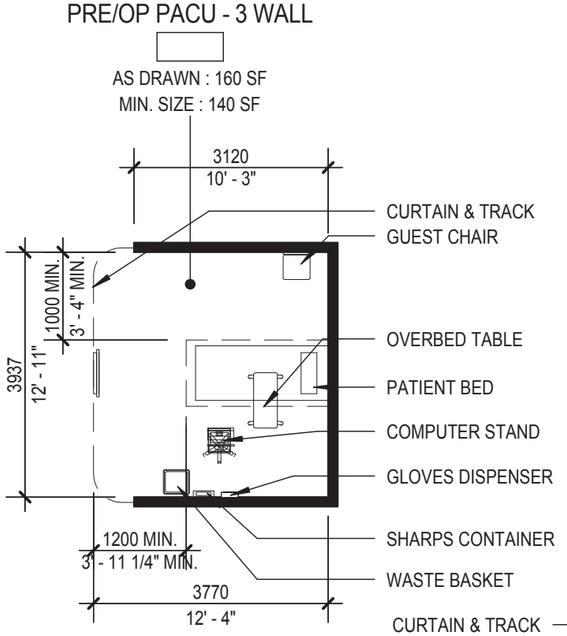
1. Perimeter walls, ceilings, and floors, including penetrations, shall be sealed.
2. Provisions should be made for a patient warming system.
3. Integration of ceiling-mounted articulating surgical and anaesthesia arms should be considered.
4. Central core access door - 1200mm/4'-0"
5. Anaesthetic medical gases shall be positioned so they are on the opposite side of the OR table from the patient entry door.
6. Add scavenging system.

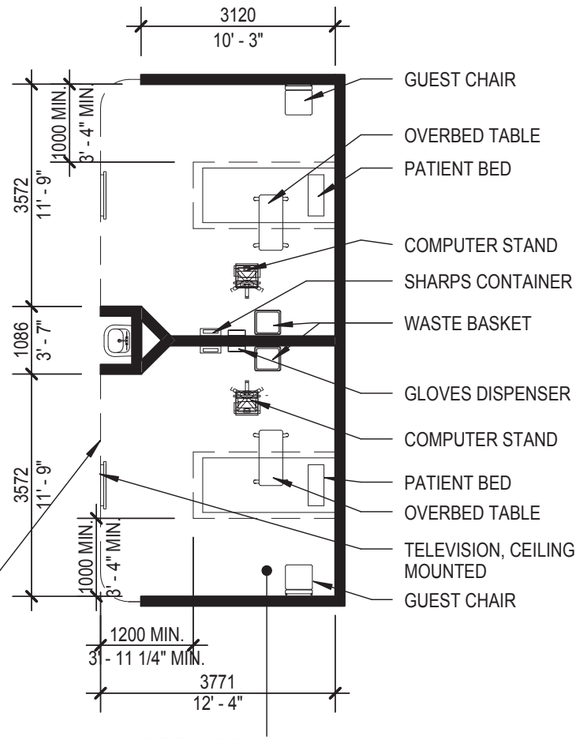
PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
SPECIAL OPERATING ROOM DATA

PRE/OP PACU - 3 WALL

AS DRAWN : 160 SF
MIN. SIZE : 140 SF

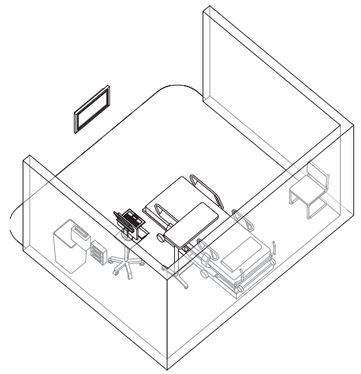


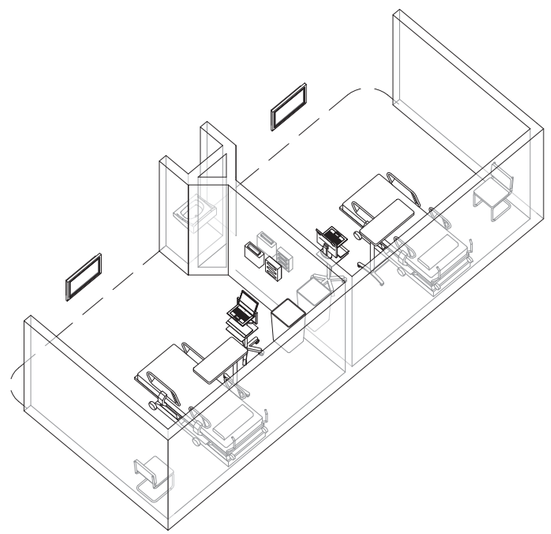


PRE/OP PACU - 3 WALL

AS DRAWN : 159 SF
MIN. SIZE : 140 SF

NOTE / NARRATIVE:
INFORMATION BASED ON CSA-Z8000 SECTION 9.5.3.2.2, TABLE 7.1, TABLE 9.5 (ITEM #8), TABLE 11.1 (ITEM #14)





PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
PREP/RECOVERY BAY - GURNEY
THREE WALLS

nycum+ ASSOCIATES SMITHGROUP
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date : 05/01/13
Scale : 1/8" = 1'-0"
Drawn : Author

Drawing Number
A0.3

Department/Section: OPERATING ROOM SUITE
Number of Occupants:
Hours of Operation:

Direct Adjacency:
Indirect Adjacency:
Not Adjacent:

Program Space Name: PREP/RECOVERY BAY
Program Space Number: 104
Program Space Type: THREE WALLS

Program Space Area Excluding alcoves(NSF): 334 SF
Program Space Quantity: 0
Occupancy Type:

ROOM CRITERIA

Architectural:

Ceiling Height	8' - 0" / 2.4m
Room Construction:	0.00 CF
Room Finish Class:	
Floors:	Non-Slip Seamless
Walls:	Smooth
Ceiling:	ACT
Doors (material, size, rating):	Min. 1050 mm / 3'-6"
Door Frames:	
Door Hardware:	
Door Special:	
Shielding Criteria:	None
Acoustic Criteria:	N/A
Projection Screen:	No
Fire Separation:	No
Exterior Window Treatment:	Privacy Curtain
Way Finding:	No

Architectural Notes:

Fireprotection/Safety/Security:

Fire Extinguisher:	No
Hazard Classification:	
Fire Suppression System:	Yes
Smoke Detection:	Yes
Eyewash:	No
Combo Eyewash/Shower:	No
Eyewash/Shower Drain:	No
Gas Leak Detection:	No
Key Locked:	No
Card Reader:	No
Biometrics:	No
Alarm:	No
Magnetic Locks:	No
Video Camera:	No
Motion Detection:	No
Request to Exit Button:	No

Fireprotection/Safety/Security Notes:

Audio Visual / Communications:

Intercom/Public Address:	Yes
Microphone / Loudspeaker:	No
Video Projector:	No
TV/Monitor/MATV:	Yes
Sound System:	Consider
Telephone:	No
Data:	Yes
Cable:	No
Equip. Monitoring Alarm:	No
Walk-up Shared PC:	Consider
Emergency Communication:	Yes
PACS Workstation:	
Nurse Call:	Yes

AV / Communications Notes:

SYSTEMS CRITERIA

Mechanical:

Temp. Set Range:	75dF +/-2dF
Humidity:	Yes
Pressurization:	
Air Changes:	4-8
Laminar Flow:	0
High/Low Ventilation:	0
Heat Load:	0
Exhaust:	
Fume Hood Type:	0
Bio-Safety Cabinet:	0
Point Exhaust:	No
Canopy Hood:	0
Pressure Monitoring:	No
Diffusers:	
Return:	
Cleanroom Class:	

Mechanical Notes:

Plumbing/Gas:

Cold Water:	Yes
Hot Water:	Yes
Floor Sink:	No
Lab Sink:	No
Dedicated Handwash Sink:	Yes
Drain:	No
Steam:	No
Reagent Water:	No
RO Water:	No
Local Polisher:	No
Pure Water Quality:	No
Recessed Wall Connect:	No
Med Air:	Yes
Natural Gas:	No
Med Oxygen:	Yes
Vacuum:	Yes
Fitting Connections:	

Plumbing Notes:

Electrical:

120V Normal Power:	Yes
120V Emergency Power:	Yes
120V Standby Power:	No
208V Normal Power:	Yes
208V Emergency Power:	Yes
208V Standby Power:	No
408V Power:	No
UPS Receptacles:	Equipment Supplied
Raceway:	Yes
Special Power:	As Required
Emergency Shut-Off:	No
Lighting Type:	
Fixture Type:	
Light Control:	Consider
Daylighting:	Yes, If possible
Special Lighting:	Exam Light

Electrical Notes:

OTHER CRITERIA

Casework:

Standing Height Bench (36"):	Advisory
Sitting Height Bench (30"):	No
Upper Cabinets:	Advisory
Wall Shelves:	No
Reagent Shelves:	No
Adjustable Workstation:	Advisory
Mobile Bench:	No
Movable Table:	No
Tall Cabinets:	Advisory
Storage Cubbies:	No
Casework Material:	Wood
Countertop Material:	Solid Surface
Base Cabinet:	Advisory
Chemical Storage:	No
Service Dist. Concepts:	

Casework Notes:

Equipment / Structural:

Vibration Sensitive:	No
Vibration Producing:	No
Heat Sensitive:	No
Heat Producing:	No
Light Sensitive:	No
Noise Producing:	No

Equipment Notes:

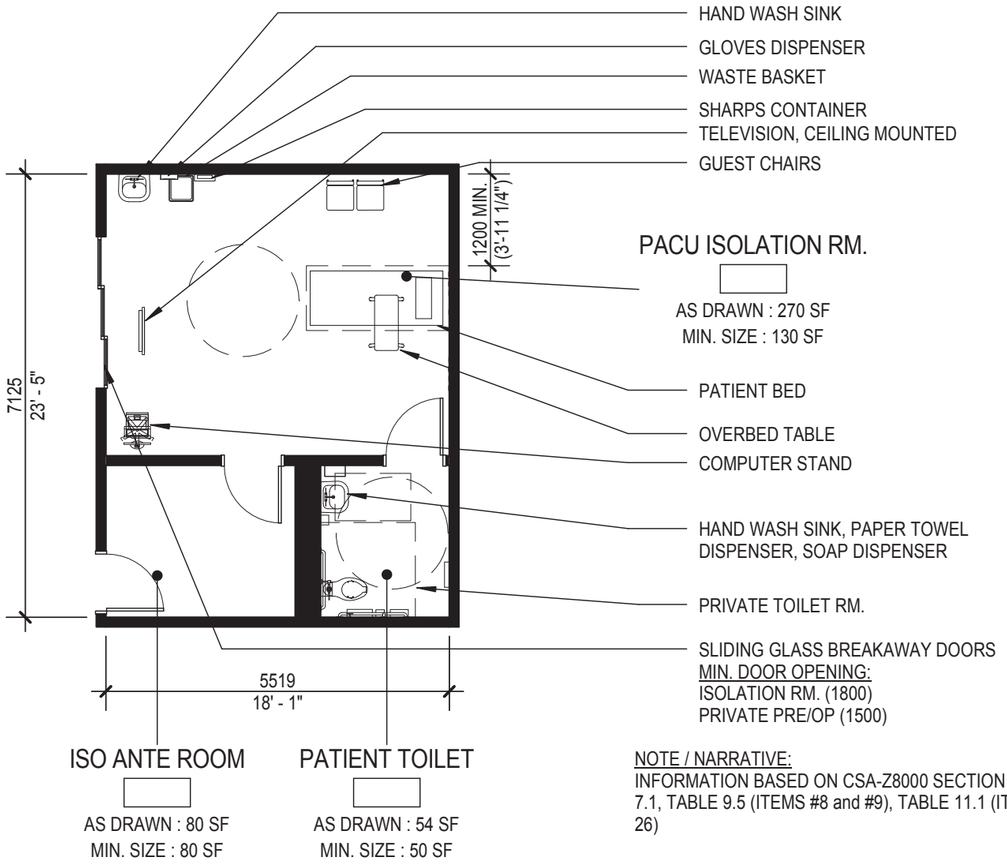
Structural:

Live Load:	
Dead Load:	
Structural Special:	
Vibration Criteria:	

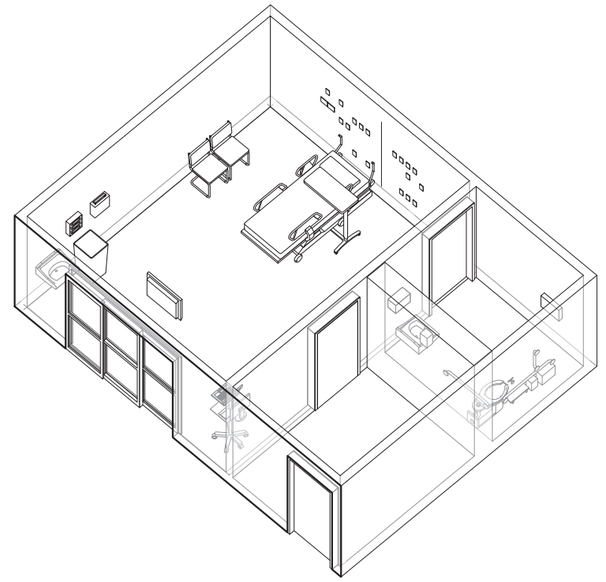
Structural Notes:

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
PREP/RECOVERY BAY - GURNEY
THREE WALLS DATA



NOTE / NARRATIVE:
INFORMATION BASED ON CSA-Z8000 SECTION 9.5.3.2, TABLE 7.1, TABLE 9.5 (ITEMS #8 and #9), TABLE 11.1 (ITEMS #24 and # 26)



PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
PREP/RECOVERY BAY - ISOLATION/PRIVATE

nycum+ ASSOCIATES SMITHGROUP
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date : 04/30/13
Scale : 1/8" = 1'-0"
Drawn : Author

Drawing Number
A0.4

Department/Section: OPERATING ROOM SUITE
Number of Occupants:
Hours of Operation:

Direct Adjacency:
Indirect Adjacency:
Not Adjacent:

Program Space Name: ISOLATION ROOM
Program Space Number: 104
Program Space Type: 106

Program Space Area Excluding alcoves(NSF): 253 SF
Program Space Quantity: 0
Occupancy Type:

ROOM CRITERIA

Architectural:

Ceiling Height	8' - 0" / 2.4m
Room Construction:	0.00 CF
Room Finish Class:	
Floors:	Non-Slip Seamless
Walls:	Smooth
Ceiling:	Monolithic
Doors (material, size, rating):	1800mm / 6'-0"
Door Frames:	
Door Hardware:	
Door Special:	
Shielding Criteria:	None
Acoustic Criteria:	N/A
Projection Screen:	No
Fire Separation:	No
Exterior Window Treatment:	Blinds between glass
Way Finding:	No

Architectural Notes: Integral cove base

Fireprotection/Safety/Security:

Fire Extinguisher:	No
Hazard Classification:	
Fire Suppression System:	Yes
Smoke Detection:	Yes
Eyewash:	No
Combo Eyewash/Shower:	No
Eyewash/Shower Drain:	No
Gas Leak Detection:	No
Key Locked:	No
Card Reader:	No
Biometrics:	No
Alarm:	No
Magnetic Locks:	No
Video Camera:	No
Motion Detection:	No
Request to Exit Button:	No

Fireprotection/Safety/Security Notes:

Audio Visual / Communications:

Intercom/Public Address:	Yes
Microphone / Loudspeaker:	Yes
Video Projector:	No
TV/Monitor/MATV:	Yes
Sound System:	Consider
Telephone:	No
Data:	Yes
Cable:	No
Equip. Monitoring Alarm:	No
Walk-up Shared PC:	Consider
Emergency Communication:	Yes
PACS Workstation:	
Nurse Call:	Yes

AV / Communications Notes:

SYSTEMS CRITERIA

Mechanical:

Temp. Set Range:	75dF +/-2dF
Humidity:	Yes
Pressurization:	
Air Changes:	4-8
Laminar Flow:	0
High/Low Ventilation:	0
Heat Load:	0
Exhaust:	
Fume Hood Type:	0
Bio-Safety Cabinet:	0
Point Exhaust:	No
Canopy Hood:	0
Pressure Monitoring:	No
Diffusers:	
Return:	
Cleanroom Class:	

Mechanical Notes:

Plumbing/Gas:

Cold Water:	Yes
Hot Water:	Yes
Floor Sink:	No
Lab Sink:	No
Dedicated Handwash Sink:	Yes
Drain:	No
Steam:	No
Reagent Water:	No
RO Water:	No
Local Polisher:	No
Pure Water Quality:	No
Recessed Wall Connect:	No
Med Air:	Yes
Natural Gas:	No
Med Oxygen:	Yes
Vacuum:	Yes
Fitting Connections:	

Plumbing Notes:

Electrical:

120V Normal Power:	Yes
120V Emergency Power:	Yes
120V Standby Power:	No
208V Normal Power:	Yes
208V Emergency Power:	Yes
208V Standby Power:	No
408V Power:	No
UPS Receptacles:	Equipment Supplied
Raceway:	Yes
Special Power:	As Required
Emergency Shut-Off:	No
Lighting Type:	
Fixture Type:	
Light Control:	Consider
Daylighting:	Yes, if possible
Special Lighting:	Exam Light

Electrical Notes:

OTHER CRITERIA

Casework:

Standing Height Bench (36"):	No
Sitting Height Bench (30"):	No
Upper Cabinets:	No
Wall Shelves:	No
Reagent Shelves:	No
Adjustable Workstation:	Advisory
Mobile Bench:	No
Movable Table:	No
Tall Cabinets:	No
Storage Cubbies:	No
Casework Material:	Wood
Countertop Material:	Solid Surface
Base Cabinet:	No
Chemical Storage:	No
Service Dist. Concepts:	

Casework Notes: Store Items in the Ante Room

Equipment / Structural:

Vibration Sensitive:	No
Vibration Producing:	No
Heat Sensitive:	No
Heat Producing:	No
Light Sensitive:	No
Noise Producing:	No

Equipment Notes:

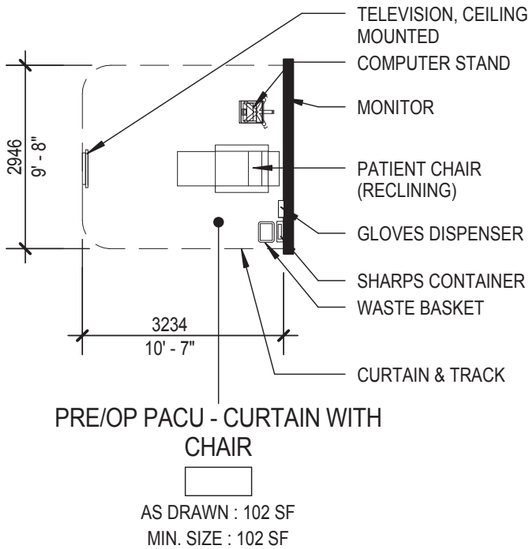
Structural:

Live Load:	
Dead Load:	
Structural Special:	
Vibration Criteria:	

Structural Notes:

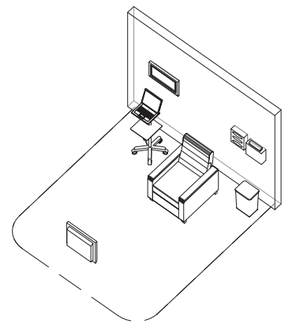
PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
PREP/RECOVERY BAY - ISOLATION/PRIVATE DATA



PRE/OP PACU - CURTAIN WITH CHAIR

AS DRAWN : 102 SF
MIN. SIZE : 102 SF



PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
PREP/RECOVERY BAY - CHAIR/CURTAINS

nycum+ ASSOCIATES SMITHGROUP
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date : 05/01/13
Scale : 1/8" = 1'-0"
Drawn : Author

Drawing Number
A0.5

Department/Section: ENDOSCOPY SUITE
Number of Occupants:
Hours of Operation:

Direct Adjacency:
Indirect Adjacency:
Not Adjacent:

Program Space Name: PREP/RECOVERY BAY
Program Space Number: 104
Program Space Type: CHAIR

Program Space Area Excluding alcoves(NSF): 103 SF
Program Space Quantity: 0
Occupancy Type:

ROOM CRITERIA

Architectural:

Ceiling Height	8' - 0" / 2.4m
Room Construction:	0.00 CF
Room Finish Class:	
Floors:	Non-Slip Seamless
Walls:	Smooth
Ceiling:	ACT
Doors (material, size, rating):	
Door Frames:	
Door Hardware:	
Door Special:	
Shielding Criteria:	None
Acoustic Criteria:	N/A
Projection Screen:	No
Fire Separation:	No
Exterior Window Treatment:	Privacy Curtain
Way Finding:	No

Architectural Notes:

Fireprotection/Safety/Security:

Fire Extinguisher:	No
Hazard Classification:	
Fire Suppression System:	Yes
Smoke Detection:	Yes
Eyewash:	No
Combo Eyewash/Shower:	No
Eyewash/Shower Drain:	No
Gas Leak Detection:	No
Key Locked:	No
Card Reader:	No
Biometrics:	No
Alarm:	No
Magnetic Locks:	No
Video Camera:	No
Motion Detection:	No
Request to Exit Button:	No

Fireprotection/Safety/Security Notes:

Audio Visual / Communications:

Intercom/Public Address:	Yes
Microphone / Loudspeaker:	No
Video Projector:	No
TV/Monitor/MATV:	Yes
Sound System:	Consider
Telephone:	No
Data:	Yes
Cable:	No
Equip. Monitoring Alarm:	No
Walk-up Shared PC:	Consider
Emergency Communication:	Yes
PACS Workstation:	
Nurse Call:	Yes

AV / Communications Notes:

SYSTEMS CRITERIA

Mechanical:

Temp. Set Range:	75dF +/-2dF
Humidity:	Yes
Pressurization:	
Air Changes:	4-8
Laminar Flow:	0
High/Low Ventilation:	0
Heat Load:	0
Exhaust:	
Fume Hood Type:	0
Bio-Safety Cabinet:	0
Point Exhaust:	No
Canopy Hood:	0
Pressure Monitoring:	No
Diffusers:	
Return:	
Cleanroom Class:	

Mechanical Notes:

Plumbing/Gas:

Cold Water:	Yes
Hot Water:	Yes
Floor Sink:	No
Lab Sink:	No
Dedicated Handwash Sink:	Yes
Drain:	No
Steam:	No
Reagent Water:	No
RO Water:	No
Local Polisher:	No
Pure Water Quality:	No
Recessed Wall Connect:	No
Med Air:	Yes
Natural Gas:	No
Med Oxygen:	Yes
Vacuum:	Yes
Fitting Connections:	

Plumbing Notes:

Electrical:

120V Normal Power:	No
120V Emergency Power:	Yes
120V Standby Power:	Yes
208V Normal Power:	Yes
208V Emergency Power:	Yes
208V Standby Power:	No
408V Power:	No
UPS Receptacles:	Equipment Supplied
Raceway:	Yes
Special Power:	As Required
Emergency Shut-Off:	No
Lighting Type:	
Fixture Type:	
Light Control:	Consider
Daylighting:	Yes if possible
Special Lighting:	Exam Light

Electrical Notes:

OTHER CRITERIA

Casework:

Standing Height Bench (36"):	No
Sitting Height Bench (30"):	No
Upper Cabinets:	No
Wall Shelves:	No
Reagent Shelves:	No
Adjustable Workstation:	Advisory
Mobile Bench:	No
Movable Table:	No
Tall Cabinets:	No
Storage Cubbies:	No
Casework Material:	Wood
Countertop Material:	Solid Surface
Base Cabinet:	No
Chemical Storage:	No
Service Dist. Concepts:	

Casework Notes:

Equipment / Structural:

Vibration Sensitive:	No
Vibration Producing:	No
Heat Sensitive:	No
Heat Producing:	No
Light Sensitive:	No
Noise Producing:	No

Equipment Notes:

Structural:

Live Load:	
Dead Load:	
Structural Special:	
Vibration Criteria:	

Structural Notes:

PRELIMINARY - NOT FOR CONSTRUCTION
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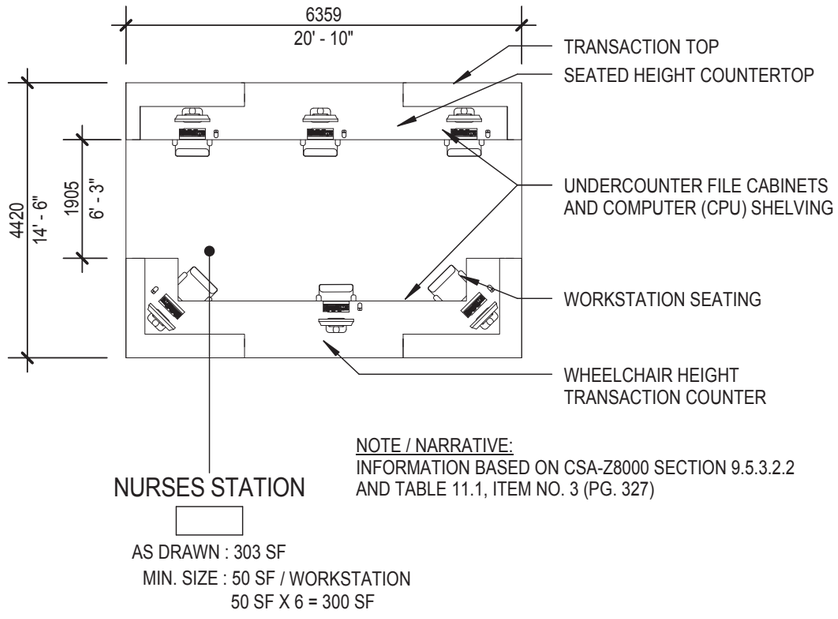
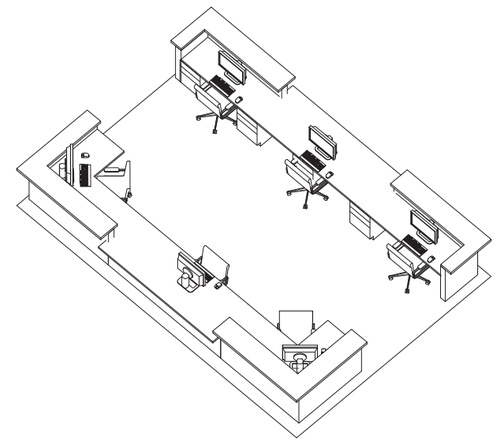
Drawing Title:
PREP/RECOVERY BAY - CHAIR/CURTAINS DATA



NOTE / NARRATIVE:
INFORMATION BASED ON CSA-Z8000 SECTION 9.5.3.2.2
AND TABLE 11.1, ITEM NO. 3 (PG. 327)

AS DRAWN : 303 SF
MIN. SIZE : 50 SF / WORKSTATION
50 SF X 6 = 300 SF



PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
NURSE STATION

nycum+ ASSOCIATES SMITHGROUP

WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date : 04/30/13
Scale : 1/8" = 1'-0"
Drawn : Author

Drawing Number
A0.6

Department/Section: PATIENT FLOOR
Number of Occupants:
Hours of Operation:

Direct Adjacency:
Indirect Adjacency:
Not Adjacent:

Program Space Name: CENTRAL STAFF STATION
Program Space Number: 104
Program Space Type: 106

Program Space Area Excluding alcoves(NSF): 299 SF
Program Space Quantity: 0
Occupancy Type:

ROOM CRITERIA

Architectural:

Ceiling Height	11' - 0" / 3.4m
Room Construction:	0.00 CF
Room Finish Class:	
Floors:	Non-Slip Seamless
Walls:	Smooth
Ceiling:	ACT
Doors (material, size, rating):	
Door Frames:	
Door Hardware:	
Door Special:	
Shielding Criteria:	
Acoustic Criteria:	Ceiling NRC of 0.55
Projection Screen:	
Fire Separation:	No
Exterior Window Treatment:	
Way Finding:	No

Architectural Notes: Consider additional sound-absorbing wall finishes

Fireprotection/Safety/Security:

Fire Extinguisher:	Yes
Hazard Classification:	
Fire Suppression System:	Yes
Smoke Detection:	Yes
Eyewash:	Yes
Combo Eyewash/Shower:	No
Eyewash/Shower Drain:	No
Gas Leak Detection:	Yes
Key Locked:	No
Card Reader:	No
Biometrics:	No
Alarm:	Yes
Magnetic Locks:	No
Video Camera:	Yes
Motion Detection:	No
Request to Exit Button:	No

Fireprotection/Safety/Security Notes:

Audio Visual / Communications:

Intercom/Public Address:	Yes
Microphone / Loudspeaker:	Yes
Video Projector:	No
TV/Monitor/MATV:	Yes
Sound System:	Consider
Telephone:	No
Data:	Yes
Cable:	No
Equip. Monitoring Alarm:	No
Walk-up Shared PC:	Yes
Emergency Communication:	Yes
PACS Workstation:	
Nurse Call:	Yes

AV / Communications Notes: Add pneumatic tube station

SYSTEMS CRITERIA

Mechanical:

Temp. Set Range:	75dF +/-2dF
Humidity:	Yes
Pressurization:	
Air Changes:	4-8
Laminar Flow:	0
High/Low Ventilation:	0
Heat Load:	0
Exhaust:	
Fume Hood Type:	0
Bio-Safety Cabinet:	0
Point Exhaust:	No
Canopy Hood:	0
Pressure Monitoring:	No
Diffusers:	
Return:	
Cleanroom Class:	

Mechanical Notes:

Plumbing/Gas:

Cold Water:	Yes
Hot Water:	Yes
Floor Sink:	No
Lab Sink:	No
Dedicated Handwash Sink:	Yes
Drain:	No
Steam:	No
Reagent Water:	No
RO Water:	No
Local Polisher:	No
Pure Water Quality:	No
Recessed Wall Connect:	No
Med Air:	No
Natural Gas:	No
Med Oxygen:	No
Vacuum:	No
Fitting Connections:	

Plumbing Notes: Med Gas Alarm should be located adjacent to Central Staff Station

Electrical:

120V Normal Power:	Yes
120V Emergency Power:	Yes
120V Standby Power:	No
208V Normal Power:	Yes
208V Emergency Power:	Yes
208V Standby Power:	No
408V Power:	No
UPS Receptacles:	Equipment Supplied
Raceway:	Yes
Special Power:	As Required
Emergency Shut-Off:	No
Lighting Type:	
Fixture Type:	
Light Control:	Yes, see note
Daylighting:	Consider
Special Lighting:	Task Lights

Electrical Notes: Light Control with Day, Evening, and Late Night Settings

OTHER CRITERIA

Casework:

Standing Height Bench (36"):	No
Sitting Height Bench (30"):	Yes
Upper Cabinets:	Yes
Wall Shelves:	No
Reagent Shelves:	No
Adjustable Workstation:	No - Advisory
Mobile Bench:	No
Movable Table:	No
Tall Cabinets:	Yes
Storage Cubbies:	No
Casework Material:	Wood
Countertop Material:	Solid Surface
Base Cabinet:	Yes
Chemical Storage:	No
Service Dist. Concepts:	

Casework Notes: See keyed notes 1 and 2

Equipment / Structural:

Vibration Sensitive:	No
Vibration Producing:	No
Heat Sensitive:	No
Heat Producing:	No
Light Sensitive:	No
Noise Producing:	No

Equipment Notes:

Structural:

Live Load:	
Dead Load:	
Structural Special:	
Vibration Criteria:	

Structural Notes:

Keyed Notes

1. Countertops deep enough to allow for computer/screen/keyboard and wide enough for keyboard and mouse.
2. Glass privacy screens to provide security and confidentiality but still alow shaft to view surroundings.

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

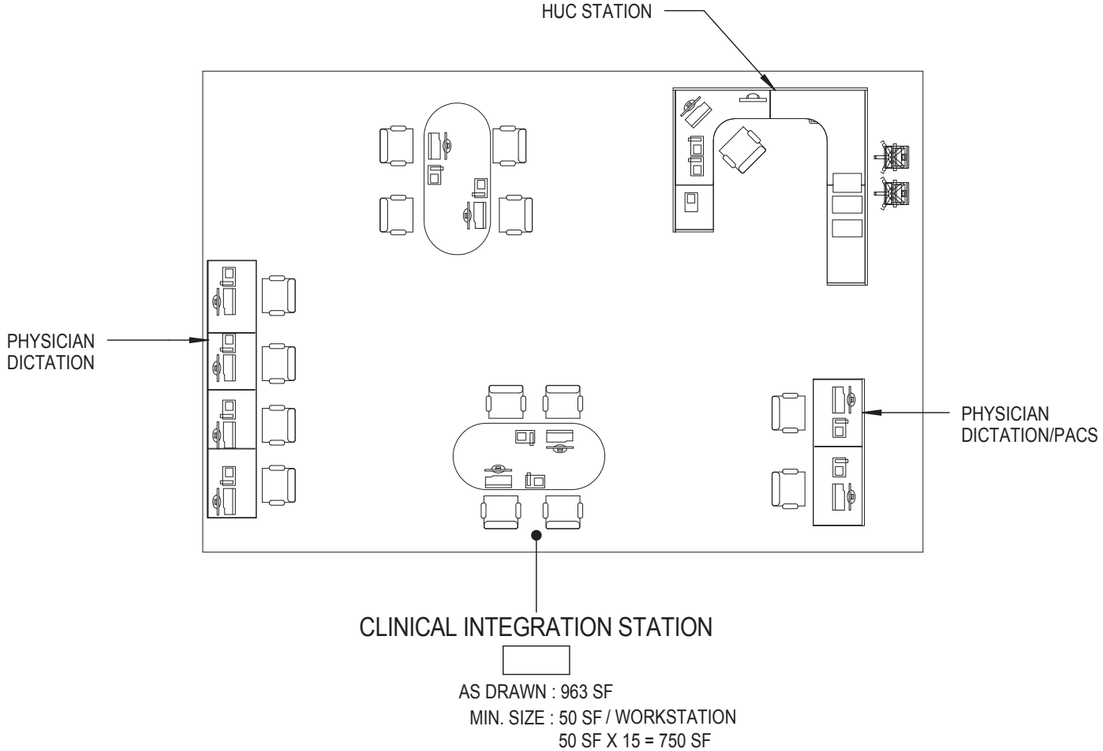
Drawing Title:
NURSE STATION DATA

nycum+ ASSOCIATES SMITHGROUP
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

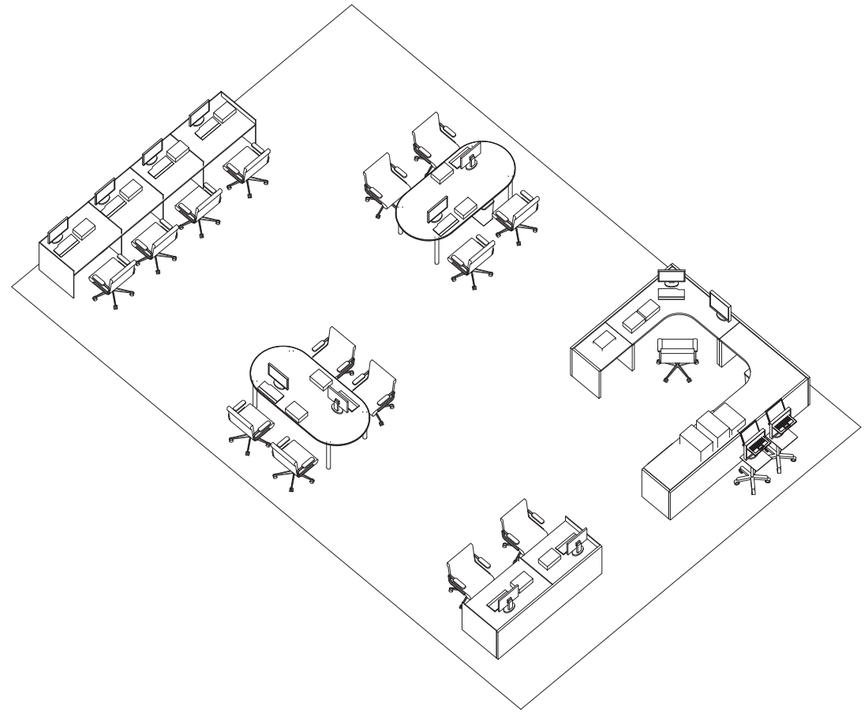
Project 1214:
Capital Health Innovative Care Flexible Facilities

Date : 05/01/13
Scale : 1/8" = 1'-0"
Drawn : Author

Drawing Number
A0.6A



AS DRAWN : 963 SF
MIN. SIZE : 50 SF / WORKSTATION
50 SF X 15 = 750 SF



PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
CLINICAL INTEGRATION STATION

nycum+ ASSOCIATES SMITHGROUP
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date : 05/02/13
Scale : 1/8" = 1'-0"
Drawn : Author

Drawing Number
A0.7

Department/Section: OR / PRE OP PACU ENDOSCOPY SUITEicency:
Number of Occupants: Indirect Adjacency:
Hours of Operation: Not Adjacent:

Program Space Name: CENTRAL STAFF STATION
Program Space Number: 104
Program Space Type: 106

Program Space Area Excluding alcoves(NSF): 963 SF
Program Space Quantity: 0
Occupancy Type:

ROOM CRITERIA

Architectural:

Ceiling Height	11' - 0" / 3.4m
Room Construction:	0.00 CF
Room Finish Class:	
Floors:	Non-Slip Seamless
Walls:	Smooth
Ceiling:	ACT
Doors (material, size, rating):	
Door Frames:	
Door Hardware:	
Door Special:	
Shielding Criteria:	
Acoustic Criteria:	Ceiling NRC of 0.55
Projection Screen:	
Fire Separation:	No
Exterior Window Treatment:	
Way Finding:	No

Architectural Notes: Consider additional sound-absorbing wall finishes

Fireprotection/Safety/Security:

Fire Extinguisher:	Yes
Hazard Classification:	
Fire Suppression System:	Yes
Smoke Detection:	Yes
Eyewash:	Yes
Combo Eyewash/Shower:	No
Eyewash/Shower Drain:	No
Gas Leak Detection:	Yes
Key Locked:	No
Card Reader:	No
Biometrics:	No
Alarm:	Yes
Magnetic Locks:	No
Video Camera:	Yes
Motion Detection:	No
Request to Exit Button:	No

Fireprotection/Safety/Security Notes:

Audio Visual / Communications:

Intercom/Public Address:	Yes
Microphone / Loudspeaker:	Yes
Video Projector:	No
TV/Monitor/MATV:	Yes
Sound System:	Consider
Telephone:	No
Data:	Yes
Cable:	No
Equip. Monitoring Alarm:	No
Walk-up Shared PC:	Yes
Emergency Communication:	Yes
PACS Workstation:	
Nurse Call:	Yes

AV / Communications Notes: Add Pneumatic tube station

SYSTEMS CRITERIA

Mechanical:

Temp. Set Range:	75dF +/-2dF
Humidity:	Yes
Pressurization:	
Air Changes:	4-8
Laminar Flow:	0
High/Low Ventilation:	0
Heat Load:	0
Exhaust:	
Fume Hood Type:	0
Bio-Safety Cabinet:	0
Point Exhaust:	No
Canopy Hood:	0
Pressure Monitoring:	No
Diffusers:	
Return:	
Cleanroom Class:	

Mechanical Notes:

Plumbing/Gas:

Cold Water:	Yes
Hot Water:	Yes
Floor Sink:	No
Lab Sink:	No
Dedicated Handwash Sink:	Yes
Drain:	No
Steam:	No
Reagent Water:	No
RO Water:	No
Local Polisher:	No
Pure Water Quality:	No
Recessed Wall Connect:	No
Med Air:	Yes
Natural Gas:	No
Med Oxygen:	No
Vacuum:	No
Fitting Connections:	

Plumbing Notes: Med gas alarm should be located adjacent to the central staff station

Electrical:

120V Normal Power:	Yes
120V Emergency Power:	Yes
120V Standby Power:	No
208V Normal Power:	Yes
208V Emergency Power:	Yes
208V Standby Power:	No
408V Power:	No
UPS Receptacles:	Equipment Supplied
Raceway:	Yes
Special Power:	As Required
Emergency Shut-Off:	No
Lighting Type:	
Fixture Type:	
Light Control:	Yes, see note
Daylighting:	Consider
Special Lighting:	Task Lights

Electrical Notes: Light Control with Day, Evening, and Late Night Settings

OTHER CRITERIA

Casework:

Standing Height Bench (36"):	No
Sitting Height Bench (30"):	Yes
Upper Cabinets:	Yes
Wall Shelves:	No
Reagent Shelves:	No
Adjustable Workstation:	No
Mobile Bench:	No
Movable Table:	No
Tall Cabinets:	Yes
Storage Cubbies:	No
Casework Material:	Wood
Countertop Material:	Solid Surface
Base Cabinet:	Yes
Chemical Storage:	No
Service Dist. Concepts:	

Casework Notes: See keyed notes 1 and 2

Equipment / Structural:

Vibration Sensitive:	No
Vibration Producing:	No
Heat Sensitive:	No
Heat Producing:	No
Light Sensitive:	No
Noise Producing:	No

Equipment Notes:

Structural:

Live Load:	
Dead Load:	
Structural Special:	
Vibration Criteria:	

Structural Notes:

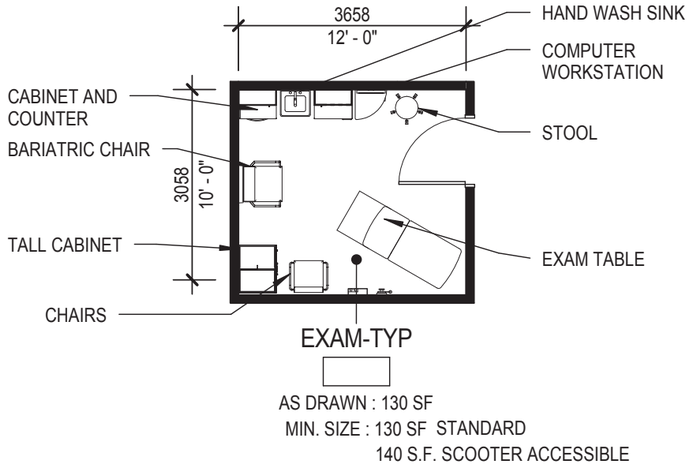
Keyed Notes

1. Countertops deep enough to allow for computer/screen/keyboard and wide enough for keyboard and mouse.

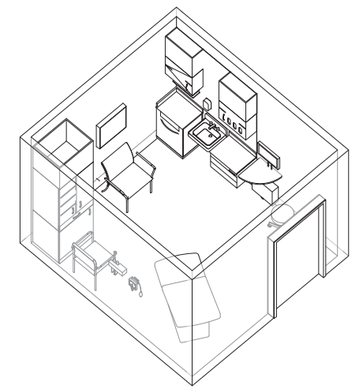
2. Glass privacy screens to provide security and confidentiality but still alow shaft to view surroundings.

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
CLINICAL INTEGRATION STATION DATA



AS DRAWN : 130 SF
MIN. SIZE : 130 SF STANDARD
140 S.F. SCOOTER ACCESSIBLE



PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
EXAM ROOM

nycum+ ASSOCIATES SMITHGROUP
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date : 05/02/13
Scale : 1/8" = 1'-0"
Drawn : Author

Drawing Number
A0.8

Department/Section: DAY SURGERY
Number of Occupants:
Hours of Operation:

Direct Adjacency:
Indirect Adjacency:
Not Adjacent:

Program Space Name: EXAM ROOM
Program Space Number: 104
Program Space Type: 106

Program Space Area Excluding alcoves(NSF): 122 SF
Program Space Quantity: 0
Occupancy Type:

ROOM CRITERIA

Architectural:

Ceiling Height	9' - 0" / 2.75m
Room Construction:	0.00 CF
Room Finish Class:	
Floors:	Seamless Rubber
Walls:	Gyp. Bd.
Ceiling:	ACT
Doors (material, size, rating):	Min 1050mm w/ 600mm leaf
Door Frames:	
Door Hardware:	
Door Special:	
Shielding Criteria:	None
Acoustic Criteria:	45-STC
Projection Screen:	
Fire Separation:	No
Exterior Window Treatment:	Privacy Curtain (2)
Way Finding:	No

Architectural Notes:

Fireprotection/Safety/Security:

Fire Extinguisher:	No
Hazard Classification:	
Fire Suppression System:	Yes
Smoke Detection:	Yes
Eyewash:	Yes
Combo Eyewash/Shower:	No
Eyewash/Shower Drain:	No
Gas Leak Detection:	No
Key Locked:	No
Card Reader:	No
Biometrics:	No
Alarm:	No
Magnetic Locks:	No
Video Camera:	No
Motion Detection:	No
Request to Exit Button:	No

Fireprotection/Safety/Security Notes:

Audio Visual / Communications:

Intercom/Public Address:	No
Microphone / Loudspeaker:	No
Video Projector:	No
TV/Monitor/MATV:	No
Sound System:	No
Telephone:	No
Data:	Yes
Cable:	No
Equip. Monitoring Alarm:	No
Walk-up Shared PC:	No
Emergency Communication:	Yes @ Day Surgery
PACS Workstation:	
Nurse Call:	Yes

AV / Communications Notes: Add Tele Health

SYSTEMS CRITERIA

Mechanical:

Temp. Set Range:	75dF +/-2dF
Humidity:	Yes
Pressurization:	
Air Changes:	4-8
Laminar Flow:	0
High/Low Ventilation:	0
Heat Load:	0
Exhaust:	
Fume Hood Type:	0
Bio-Safety Cabinet:	0
Point Exhaust:	No
Canopy Hood:	0
Pressure Monitoring:	No
Diffusers:	
Return:	
Cleanroom Class:	

Mechanical Notes:

Plumbing/Gas:

Cold Water:	Yes
Hot Water:	Yes
Floor Sink:	No
Lab Sink:	No
Dedicated Handwash Sink:	Yes
Drain:	No
Steam:	No
Reagent Water:	No
RO Water:	No
Local Polisher:	No
Pure Water Quality:	No
Recessed Wall Connect:	No
Med Air:	Yes
Natural Gas:	No
Med Oxygen:	Yes
Vacuum:	Yes
Fitting Connections:	

Plumbing Notes:

Electrical:

120V Normal Power:	Yes
120V Emergency Power:	No
120V Standby Power:	Yes
208V Normal Power:	Yes
208V Emergency Power:	No
208V Standby Power:	No
408V Power:	No
UPS Receptacles:	Equipment Supplied
Raceway:	Yes
Special Power:	As Required
Emergency Shut-Off:	No
Lighting Type:	
Fixture Type:	
Light Control:	Advisory
Daylighting:	No
Special Lighting:	Exam Light

Electrical Notes:

OTHER CRITERIA

Casework:

Standing Height Bench (36"):	Advisory
Sitting Height Bench (30"):	No
Upper Cabinets:	Advisory
Wall Shelves:	No
Reagent Shelves:	No
Adjustable Workstation:	Advisory
Mobile Bench:	No
Movable Table:	No
Tall Cabinets:	Advisory
Storage Cubbies:	No
Casework Material:	Wood
Countertop Material:	Solid Surface
Base Cabinet:	Advisory
Chemical Storage:	No
Service Dist. Concepts:	

Casework Notes:

Equipment / Structural:

Vibration Sensitive:	No
Vibration Producing:	No
Heat Sensitive:	No
Heat Producing:	No
Light Sensitive:	No
Noise Producing:	No

Equipment Notes:

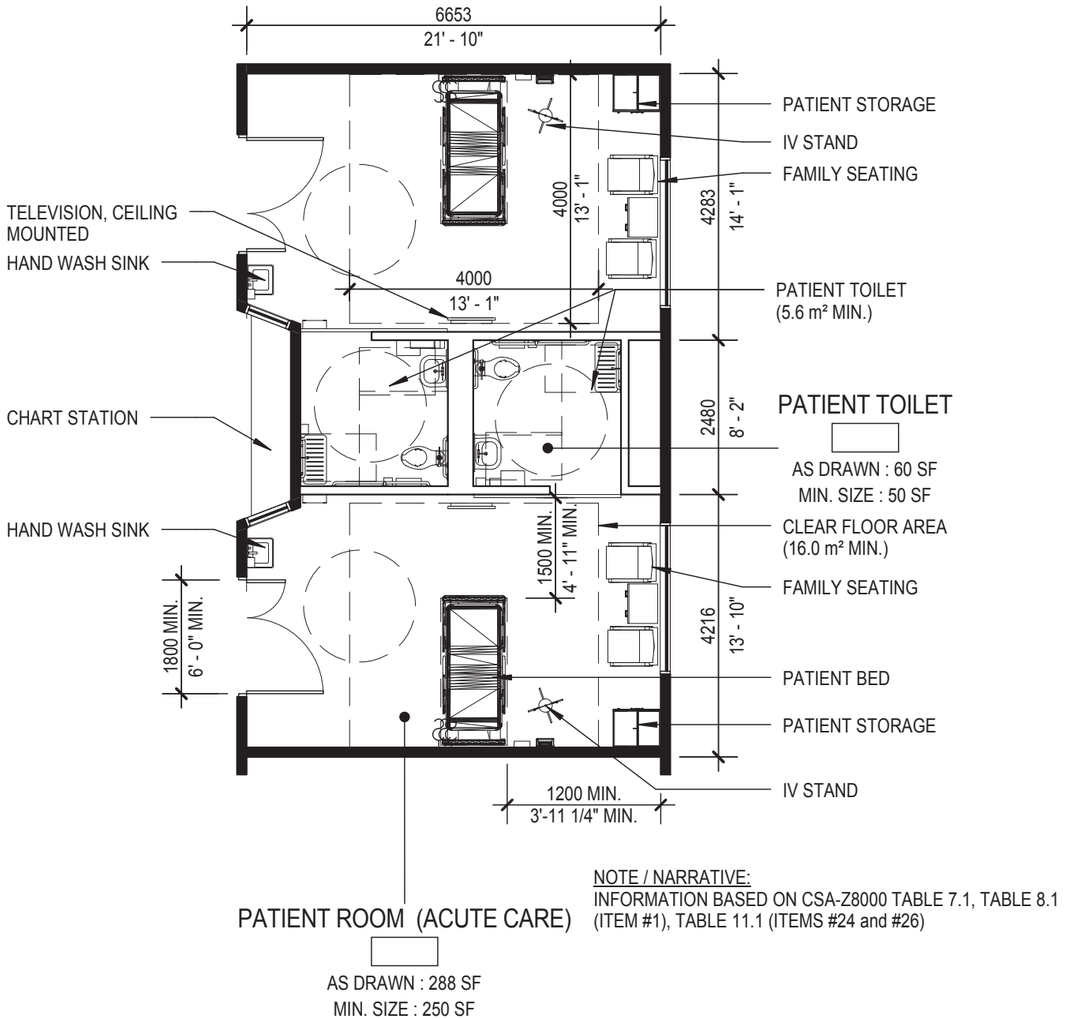
Structural:

Live Load:	
Dead Load:	
Structural Special:	
Vibration Criteria:	

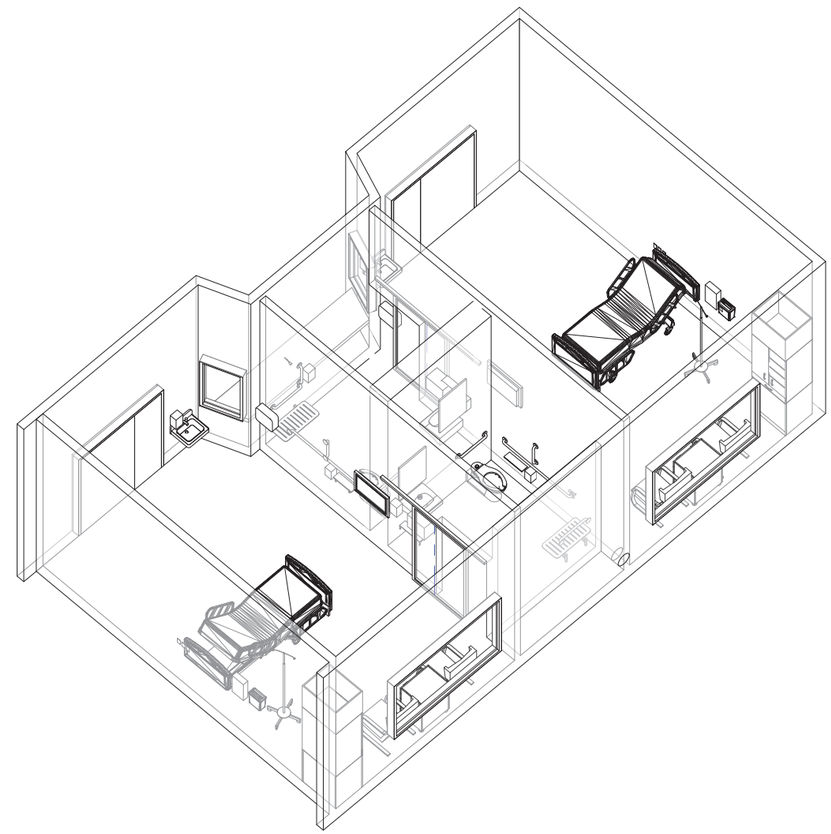
Structural Notes:

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
EXAM ROOM DATA



NOTE / NARRATIVE:
INFORMATION BASED ON CSA-Z8000 TABLE 7.1, TABLE 8.1 (ITEM #1), TABLE 11.1 (ITEMS #24 and #26)



PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
ACUTE CARE PATIENT ROOM - HI

nycum+ ASSOCIATES SMITHGROUP
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date : 05/01/13
Scale : 1/8" = 1'-0"
Drawn : Author

Drawing Number
A0.9

Department/Section: Medical/Surgical
Number of Occupants:
Hours of Operation:

Direct Adjacency:
Indirect Adjacency:
Not Adjacent:

Program Space Name: ACUTE CARE PATIENT ROOM
Program Space Number: 104
Program Space Type: 106

Program Space Area Excluding alcoves(NSF): 781 SF
Program Space Quantity: 0
Occupancy Type:

ROOM CRITERIA

Architectural:

Ceiling Height	9' - 0" / 2.75m MIN.
Room Construction:	0.00 CF
Room Finish Class:	
Floors:	Non-Slip Seamless
Walls:	Smooth
Ceiling:	ACT
Doors (material, size, rating):	1050mm w/ 475mm leaf
Door Frames:	
Door Hardware:	
Door Special:	
Shielding Criteria:	
Acoustic Criteria:	STC: 45
Projection Screen:	No
Fire Separation:	No
Exterior Window Treatment:	Cubicle Curtains / Drapes
Way Finding:	No

Architectural Notes: Integral cove base; See keyed notes 1, 2, 3

Fireprotection/Safety/Security:

Fire Extinguisher:	No
Hazard Classification:	
Fire Suppression System:	Yes
Smoke Detection:	Yes
Eyewash:	No
Combo Eyewash/Shower:	No
Eyewash/Shower Drain:	No
Gas Leak Detection:	No
Key Locked:	No
Card Reader:	No
Biometrics:	No
Alarm:	No
Magnetic Locks:	No
Video Camera:	No
Motion Detection:	No
Request to Exit Button:	No

Fireprotection/Safety/Security Notes:

Audio Visual / Communications:

Intercom/Public Address:	Yes
Microphone / Loudspeaker:	No
Video Projector:	No
TV/Monitor/MATV:	Yes
Sound System:	No
Telephone:	Yes
Data:	Yes
Cable:	Yes
Equip. Monitoring Alarm:	No
Walk-up Shared PC:	Yes
Emergency Communication:	Yes
PACS Workstation:	
Nurse Call:	Yes

AV / Communications Notes: See keyed notes 9

SYSTEMS CRITERIA

Mechanical:

Temp. Set Range:	75dF +/-2dF
Humidity:	Yes
Pressurization:	
Air Changes:	4-8
Laminar Flow:	0
High/Low Ventilation:	0
Heat Load:	0
Exhaust:	
Fume Hood Type:	0
Bio-Safety Cabinet:	0
Point Exhaust:	No
Canopy Hood:	0
Pressure Monitoring:	No
Diffusers:	
Return:	
Cleanroom Class:	

Mechanical Notes: Add Thermostat

Plumbing/Gas:

Cold Water:	Yes
Hot Water:	Yes
Floor Sink:	No
Lab Sink:	No
Dedicated Handwash Sink:	Yes
Drain:	No
Steam:	No
Reagent Water:	No
RO Water:	No
Local Polisher:	No
Pure Water Quality:	No
Recessed Wall Connect:	No
Med Air:	Yes
Natural Gas:	No
Med Oxygen:	Yes
Vacuum:	Yes
Fitting Connections:	

Plumbing Notes: Add dialysis connection if supports functional program

Electrical:

120V Normal Power:	Yes
120V Emergency Power:	Yes
120V Standby Power:	No
208V Normal Power:	Yes
208V Emergency Power:	Yes
208V Standby Power:	No
408V Power:	No
UPS Receptacles:	Equipment Supplied
Raceway:	No
Special Power:	As Required
Emergency Shut-Off:	No
Lighting Type:	
Fixture Type:	
Light Control:	Yes - Switched Seperately
Daylighting:	Yes
Special Lighting:	Bed Lights / Exam Light

Electrical Notes: See keyed notes 10 and 11

OTHER CRITERIA

Casework:

Standing Height Bench (36"):	Yes
Sitting Height Bench (30"):	No
Upper Cabinets:	No
Wall Shelves:	Yes - Flower Shelf
Reagent Shelves:	No
Adjustable Workstation:	No
Mobile Bench:	Yes
Movable Table:	No
Tall Cabinets:	No - Wardrobe
Storage Cubbies:	No
Casework Material:	Wood
Countertop Material:	Epoxy
Base Cabinet:	Yes
Chemical Storage:	No
Service Dist. Concepts:	

Casework Notes: See keyed notes 4, 5, 6, 7, 8

Equipment / Structural:

Vibration Sensitive:	No
Vibration Producing:	No
Heat Sensitive:	No
Heat Producing:	No
Light Sensitive:	No
Noise Producing:	No
Patient Lift Support	Yes

Equipment Notes: Provide Structural Framing for patient lift

Structural:

Live Load:	
Dead Load:	
Structural Special:	
Vibration Criteria:	

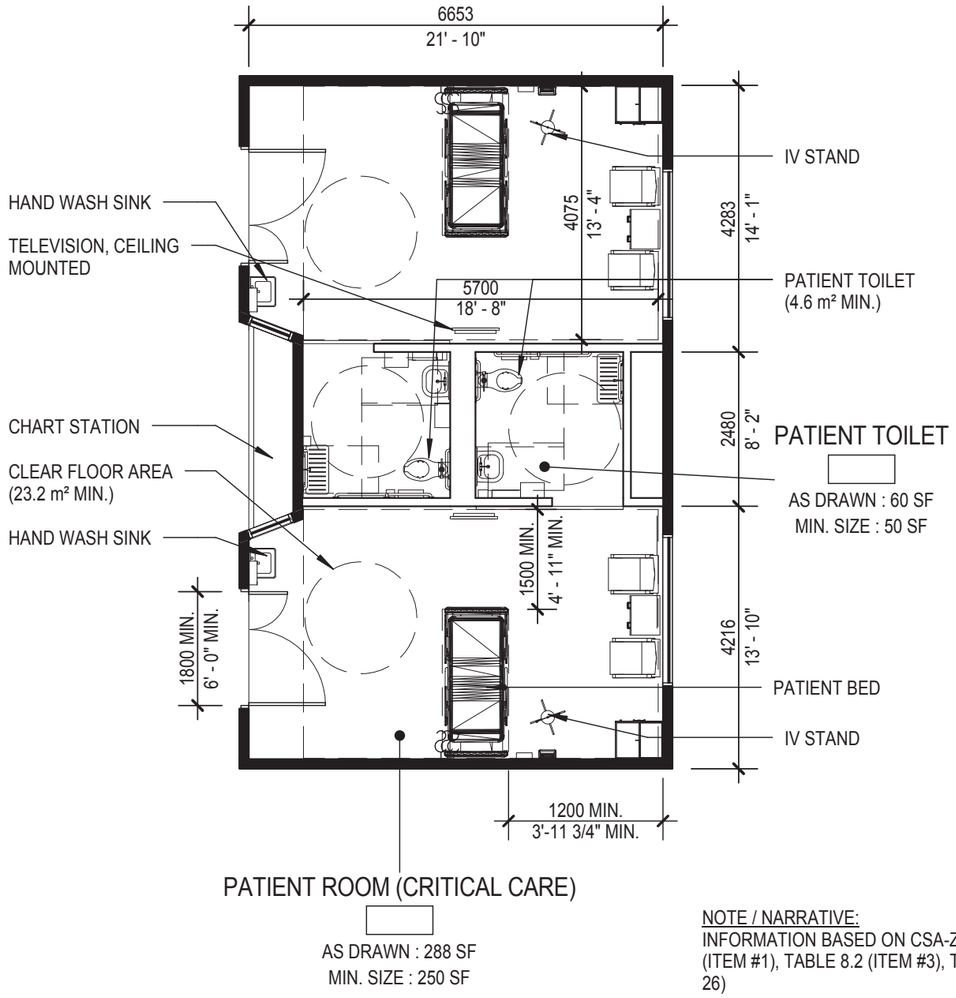
Structural Notes:

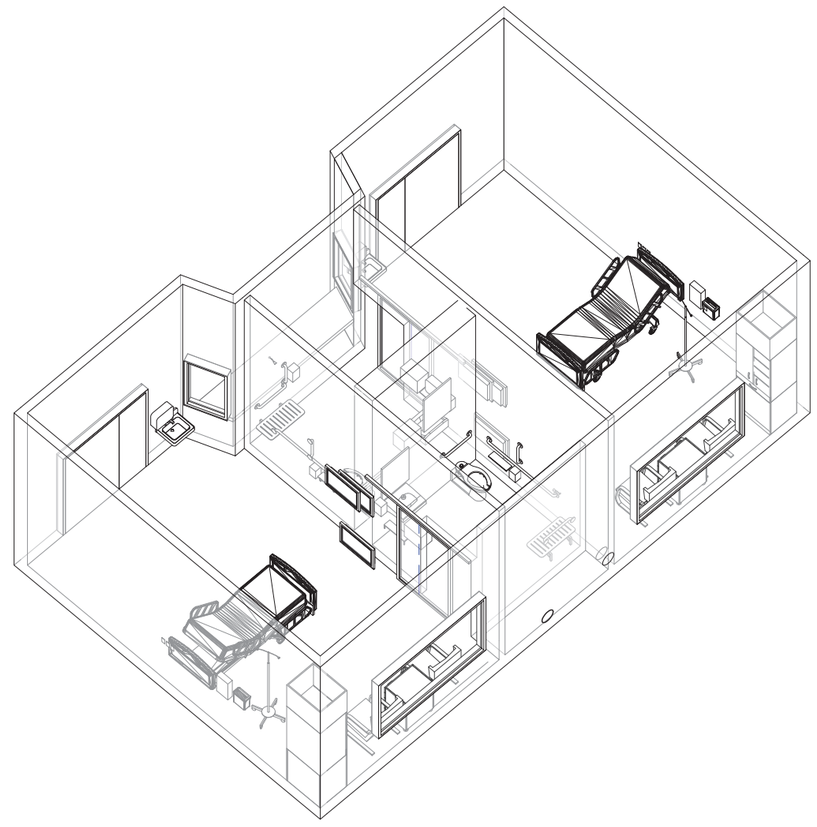
Keyed Notes

1. Flood resistant base / Integral cove base
2. Flooring shall have acoustic properties that reduces sound transmission and shock absorbtion sufficient to optimize staff comfort without hampering the movement of beds or equipment.
3. Add Patient lift and Wall protection at head wall.
4. Wardrobe shall be located on the family side of the room with the minimum dimension of 450mm x 600mm / 1'-6" x 2'-0".
5. There should be lockable storage for patients belongings.
6. Storage for a clean bed pan either in the patient washroom or discretely in the patient room.
7. A fold down surface for documentation charting should be provided on the staff side of the bed.
8. Supplies for use in patient room shall be conveniently located and secured against theft or tampering.
9. Accommodations for future wireless/multi-faced TV/communication/laptop, etc portable devices at the bedside should be incorporated.
10. Bed Lights shall be controlled by the patient.
11. There shall be a wall or ceiling mounted clock.

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
ACUTE CARE PATIENT ROOM - HI DATA





NOTE / NARRATIVE:
INFORMATION BASED ON CSA-Z8000 TABLE 7.1, TABLE 8.1 (ITEM #1), TABLE 8.2 (ITEM #3), TABLE 11.1 (ITEMS #24 and # 26)

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
CRITICAL CARE PATIENT ROOM - HI

nycum+ ASSOCIATES SMITHGROUP
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date : 05/01/13
Scale : 1/8" = 1'-0"
Drawn : Author

Drawing Number
A0.10

Department/Section:
Number of Occupants:
Hours of Operation:

Direct Adjacency:
Indirect Adjacency:
Not Adjacent:

Program Space Name: CRITICAL CARE PATIENT RM
Program Space Number: 104
Program Space Type: 106

Program Space Area Excluding alcoves(NSF): 518 SF
Program Space Quantity: 0
Occupancy Type:

ROOM CRITERIA

Architectural:

Ceiling Height	9' - 0" / 2.75m MIN.
Room Construction:	0.00 CF
Room Finish Class:	
Floors:	Non-Slip Seamless
Walls:	Smooth
Ceiling:	ACT
Doors (material, size, rating):	Min 1050mm w/475 leaf
Door Frames:	Aluminum
Door Hardware:	
Door Special:	
Shielding Criteria:	
Acoustic Criteria:	STC: 45
Projection Screen:	No
Fire Separation:	No
Exterior Window Treatment:	Cubicle Curtains / Drapes
Way Finding:	No

Architectural Notes: Integral cove base; See keyed notes 1, 2, 3

Fireprotection/Safety/Security:

Fire Extinguisher:	No
Hazard Classification:	
Fire Suppression System:	Yes
Smoke Detection:	Yes
Eyewash:	No
Combo Eyewash/Shower:	No
Eyewash/Shower Drain:	No
Gas Leak Detection:	No
Key Locked:	No
Card Reader:	No
Biometrics:	No
Alarm:	No
Magnetic Locks:	No
Video Camera:	No
Motion Detection:	No
Request to Exit Button:	No

Fireprotection/Safety/Security Notes:

Audio Visual / Communications:

Intercom/Public Address:	Yes
Microphone / Loudspeaker:	No
Video Projector:	No
TV/Monitor/MATV:	Yes
Sound System:	No
Telephone:	Yes
Data:	Yes
Cable:	Yes
Equip. Monitoring Alarm:	No
Walk-up Shared PC:	Yes
Emergency Communication:	Yes
PACS Workstation:	
Nurse Call:	Yes

AV / Communications Notes: See keyed notes 9

SYSTEMS CRITERIA

Mechanical:

Temp. Set Range:	75dF +/-2dF
Humidity:	Yes
Pressurization:	
Air Changes:	4-8
Laminar Flow:	0
High/Low Ventilation:	0
Heat Load:	0
Exhaust:	
Fume Hood Type:	0
Bio-Safety Cabinet:	0
Point Exhaust:	No
Canopy Hood:	0
Pressure Monitoring:	No
Diffusers:	
Return:	
Cleanroom Class:	

Mechanical Notes: Add Thermostat

Plumbing/Gas:

Cold Water:	Yes
Hot Water:	Yes
Floor Sink:	No
Lab Sink:	No
Dedicated Handwash Sink:	Yes
Drain:	No
Steam:	No
Reagent Water:	No
RO Water:	No
Local Polisher:	No
Pure Water Quality:	No
Recessed Wall Connect:	No
Med Air:	Yes
Natural Gas:	No
Med Oxygen:	Yes
Vacuum:	Yes
Fitting Connections:	

Plumbing Notes: Add dialysis connection if supports functional program

Electrical:

120V Normal Power:	Yes
120V Emergency Power:	Yes
120V Standby Power:	No
208V Normal Power:	Yes
208V Emergency Power:	Yes
208V Standby Power:	No
408V Power:	No
UPS Receptacles:	Equipment Supplied
Raceway:	Yes
Special Power:	As Required
Emergency Shut-Off:	No
Lighting Type:	
Fixture Type:	
Light Control:	Yes - Switched seperately
Daylighting:	Yes
Special Lighting:	Bed Lights / Exam Lights

Electrical Notes: See keyed notes 10 and 11

OTHER CRITERIA

Casework:

Standing Height Bench (36"):	No
Sitting Height Bench (30"):	Yes
Upper Cabinets:	Yes
Wall Shelves:	Yes - Flower Shelf
Reagent Shelves:	No
Adjustable Workstation:	Yes
Mobile Bench:	No
Movable Table:	No
Tall Cabinets:	Yes - Wardrobe
Storage Cubbies:	No
Casework Material:	Wood
Countertop Material:	Solid Surface
Base Cabinet:	Yes
Chemical Storage:	No
Service Dist. Concepts:	

Casework Notes: See keyed notes 4, 5, 6, 7, 8

Equipment / Structural:

Vibration Sensitive:	No
Vibration Producing:	No
Heat Sensitive:	No
Heat Producing:	No
Light Sensitive:	No
Noise Producing:	No
Patient Lift Support	Yes

Equipment Notes: Provide structural framing for patient lift

Structural:

Live Load:	
Dead Load:	
Structural Special:	
Vibration Criteria:	

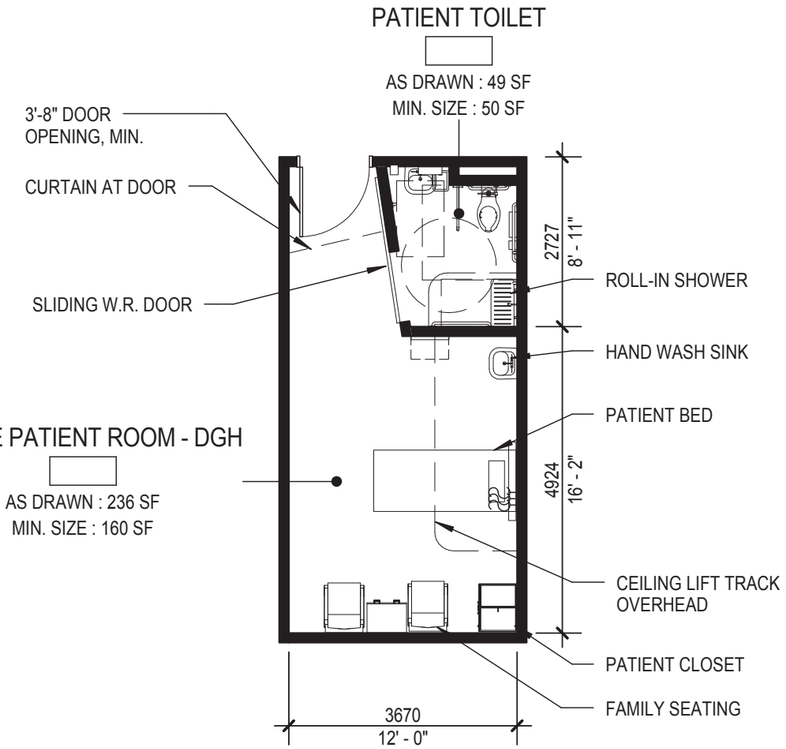
Structural Notes:

Keyed Notes

1. Flood resistant base / Integral cove base
2. Flooring shall have acoustic properties that reduces sound transmission and shock absorbtion sufficient to optimize staff comfort without hampering the movement of beds or equipment.
3. Add Patient lift and Wall protection at head wall.
4. Wardrobe shall be located on the family side of the room with the minimum dimension of 450mm x 600mm / 1'-6" x 2'-0".
5. There should be lockable storage for patients belongings.
6. Storage for a clean bed pan either in the patient washroom or discretely in the patient room.
7. A fold down surface for documentation charting should be provided on the staff side of the bed.
8. Supplies for use in patient room shall be conveniently located and secured against theft or tampering.
9. Accommodations for future wireless/multi-faced TV/communication/laptop, etc portable devices at the bedside should be incorporated.
10. Bed Lights shall be controlled by the patient.
11. There shall be a wall or ceiling mounted clock.

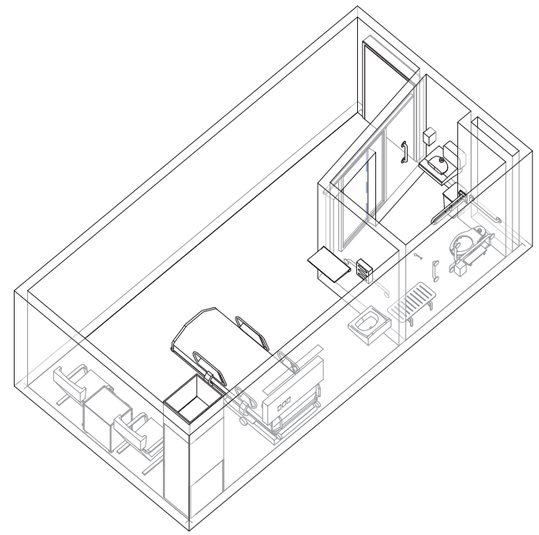
PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
CRITICAL CARE PATIENT ROOM - HI DATA



SINGLE PATIENT ROOM - DGH

AS DRAWN : 236 SF
MIN. SIZE : 160 SF



PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
SINGLE PATIENT ROOM - DGH

nycum+ ASSOCIATES SMITHGROUP
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date : 05/01/13
Scale : 1/8" = 1'-0"
Drawn : Author

Drawing Number
A0.11

Department/Section:
Number of Occupants:
Hours of Operation:

Direct Adjacency:
Indirect Adjacency:
Not Adjacent:

Program Space Name: SINGLE PATIENT ROOM
Program Space Number: 104
Program Space Type: DGH

Program Space Area Excluding alcoves(NSF): 298 SF
Program Space Quantity: 0
Occupancy Type:

ROOM CRITERIA

Architectural:

Ceiling Height	9' - 0" / 2.75m
Room Construction:	0.00 CF
Room Finish Class:	
Floors:	Non-Slip Seamless
Walls:	Smooth
Ceiling:	ACT
Doors (material, size, rating):	Min 1050mm w 475mm Leaf
Door Frames:	
Door Hardware:	
Door Special:	
Shielding Criteria:	
Acoustic Criteria:	STC: 45
Projection Screen:	No
Fire Separation:	No
Exterior Window Treatment:	Cubicle Curtains / Drapes
Way Finding:	Yes

Architectural Notes: Integral cove base; See keyed notes 1, 2, 3

Fireprotection/Safety/Security:

Fire Extinguisher:	No
Hazard Classification:	
Fire Suppression System:	Yes
Smoke Detection:	Yes
Eyewash:	No
Combo Eyewash/Shower:	No
Eyewash/Shower Drain:	No
Gas Leak Detection:	No
Key Locked:	No
Card Reader:	No
Biometrics:	No
Alarm:	No
Magnetic Locks:	No
Video Camera:	No
Motion Detection:	No
Request to Exit Button:	No

Fireprotection/Safety/Security Notes:

Audio Visual / Communications:

Intercom/Public Address:	Yes
Microphone / Loudspeaker:	No
Video Projector:	No
TV/Monitor/MATV:	Yes
Sound System:	No
Telephone:	Yes
Data:	Yes
Cable:	Yes
Equip. Monitoring Alarm:	Yes
Walk-up Shared PC:	Yes
Emergency Communication:	Yes
PACS Workstation:	
Nurse Call:	Yes

AV / Communications Notes: See keyed notes 9

SYSTEMS CRITERIA

Mechanical:

Temp. Set Range:	75dF +/-2dF
Humidity:	Yes
Pressurization:	
Air Changes:	4-8
Laminar Flow:	0
High/Low Ventilation:	0
Heat Load:	0
Exhaust:	
Fume Hood Type:	0
Bio-Safety Cabinet:	0
Point Exhaust:	No
Canopy Hood:	0
Pressure Monitoring:	No
Diffusers:	
Return:	
Cleanroom Class:	

Mechanical Notes: Add Thermostat

Plumbing/Gas:

Cold Water:	Yes
Hot Water:	Yes
Floor Sink:	No
Lab Sink:	No
Dedicated Handwash Sink:	Yes
Drain:	No
Steam:	No
Reagent Water:	No
RO Water:	No
Local Polisher:	No
Pure Water Quality:	No
Recessed Wall Connect:	No
Med Air:	Yes
Natural Gas:	No
Med Oxygen:	Yes
Vacuum:	Yes
Fitting Connections:	

Plumbing Notes:

Electrical:

120V Normal Power:	Yes
120V Emergency Power:	Yes
120V Standby Power:	No
208V Normal Power:	Yes
208V Emergency Power:	Yes
208V Standby Power:	No
408V Power:	No
UPS Receptacles:	Equipment Supplied
Raceway:	No
Special Power:	As Required
Emergency Shut-Off:	No
Lighting Type:	
Fixture Type:	
Light Control:	Yes Switched Seperately
Daylighting:	Yes
Special Lighting:	Bed Light/ Exam Light

Electrical Notes: See keyed notes 10 and 11

OTHER CRITERIA

Casework:

Standing Height Bench (36"):	No
Sitting Height Bench (30"):	No
Upper Cabinets:	Yes
Wall Shelves:	Yes - Flower Shelf
Reagent Shelves:	No
Adjustable Workstation:	Yes
Mobile Bench:	No
Movable Table:	No
Tall Cabinets:	Yes - Wardrobe
Storage Cubbies:	No
Casework Material:	Wood
Countertop Material:	Solid Surface
Base Cabinet:	Yes
Chemical Storage:	No
Service Dist. Concepts:	

Casework Notes: See keyed notes 4, 5, 6, 7, 8

Equipment / Structural:

Vibration Sensitive:	No
Vibration Producing:	No
Heat Sensitive:	No
Heat Producing:	No
Light Sensitive:	No
Noise Producing:	No
Patient Lift Support	Yes

Equipment Notes: Provide Structural Framing for patient lift

Structural:

Live Load:	
Dead Load:	
Structural Special:	
Vibration Criteria:	

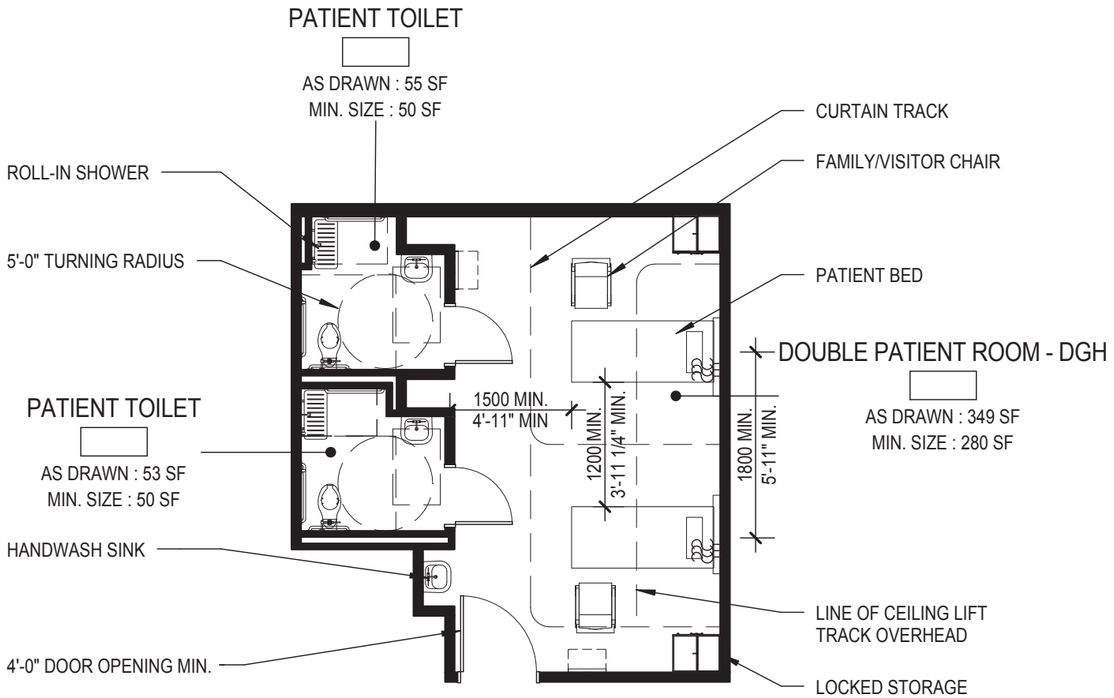
Structural Notes:

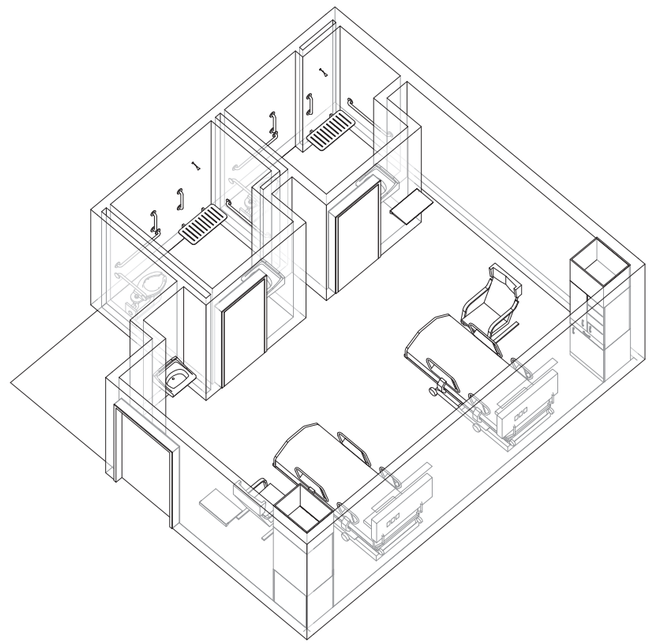
Keyed Notes

1. Flood resistant base / Integral cove base
2. Flooring shall have acoustic properties that reduces sound transmission and shock absorbtion sufficient to optimize staff comfort without hampering the movement of beds or equipment.
3. Add Patient lift and Wall protection at head wall.
4. Wardrobe shall be located on the family side of the room with the minimum dimension of 450mm x 600mm / 1'-6" x 2'-0".
5. There should be lockable storage for patients belongings.
6. Storage for a clean bed pan either in the patient washroom or discretely in the patient room.
7. A fold down surface for documentation charting should be provided on the staff side of the bed.
8. Supplies for use in patient room shall be conveniently located and secured against theft or tampering.
9. Accommodations for future wireless/multi-faced TV/communication/laptop, etc portable devices at the bedside should be incorporated.
10. Bed Lights shall be controlled by the patient.
11. There shall be a wall or ceiling mounted clock.

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
SINGLE PATIENT ROOM - DGH
MODEL DATA





PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
DOUBLE PATIENT ROOM - DGH MODEL

nycum+ ASSOCIATES SMITHGROUP
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date : 05/01/13
Scale : 1/8" = 1'-0"
Drawn : Author

Drawing Number
A0.12

Department/Section:
Number of Occupants:
Hours of Operation:

Direct Adjacency:
Indirect Adjacency:
Not Adjacent:

Program Space Name: DOUBLE PATIENT ROOM
Program Space Number: 104
Program Space Type: DGH

Program Space Area Excluding alcoves(NSF): 531 SF
Program Space Quantity: 0
Occupancy Type:

ROOM CRITERIA

Architectural:

Ceiling Height	9' - 0" / 2.75m
Room Construction:	0.00 CF
Room Finish Class:	
Floors:	Non-Slip Seamless
Walls:	Smooth
Ceiling:	ACT
Doors (material, size, rating):	Min 1050mm w/ 475mm leaf
Door Frames:	
Door Hardware:	
Door Special:	
Shielding Criteria:	
Acoustic Criteria:	STC: 45
Projection Screen:	No
Fire Separation:	No
Exterior Window Treatment:	Cubicle Curtains / Drapes
Way Finding:	Yes

Architectural Notes: Integral cove base; See keyed notes 1, 2, 3

Fireprotection/Safety/Security:

Fire Extinguisher:	No
Hazard Classification:	
Fire Suppression System:	Yes
Smoke Detection:	Yes
Eyewash:	No
Combo Eyewash/Shower:	No
Eyewash/Shower Drain:	No
Gas Leak Detection:	No
Key Locked:	No
Card Reader:	No
Biometrics:	No
Alarm:	No
Magnetic Locks:	No
Video Camera:	No
Motion Detection:	No
Request to Exit Button:	No

Fireprotection/Safety/Security Notes:

Audio Visual / Communications:

Intercom/Public Address:	No
Microphone / Loudspeaker:	No
Video Projector:	No
TV/Monitor/MATV:	No
Sound System:	No
Telephone:	No
Data:	Yes
Cable:	No
Equip. Monitoring Alarm:	No
Walk-up Shared PC:	No
Emergency Communication:	Yes
PACS Workstation:	
Nurse Call:	Yes

AV / Communications Notes: See keyed notes 9

SYSTEMS CRITERIA

Mechanical:

Temp. Set Range:	75dF +/-2dF
Humidity:	Yes
Pressurization:	
Air Changes:	4-8
Laminar Flow:	0
High/Low Ventilation:	0
Heat Load:	0
Exhaust:	
Fume Hood Type:	0
Bio-Safety Cabinet:	0
Point Exhaust:	No
Canopy Hood:	0
Pressure Monitoring:	No
Diffusers:	
Return:	
Cleanroom Class:	

Mechanical Notes: Add Thermostat

Plumbing/Gas:

Cold Water:	Yes
Hot Water:	Yes
Floor Sink:	No
Lab Sink:	No
Dedicated Handwash Sink:	Yes
Drain:	No
Steam:	No
Reagent Water:	No
RO Water:	No
Local Polisher:	No
Pure Water Quality:	No
Recessed Wall Connect:	No
Med Air:	Yes
Natural Gas:	No
Med Oxygen:	Yes
Vacuum:	Yes
Fitting Connections:	

Plumbing Notes:

Electrical:

120V Normal Power:	Yes
120V Emergency Power:	Yes
120V Standby Power:	No
208V Normal Power:	Yes
208V Emergency Power:	Yes
208V Standby Power:	No
408V Power:	No
UPS Receptacles:	Equipment Supplied
Raceway:	Yes
Special Power:	As Required
Emergency Shut-Off:	No
Lighting Type:	
Fixture Type:	
Light Control:	Yes - Switched Seperately
Daylighting:	Yes
Special Lighting:	Yes

Electrical Notes: See keyed notes 10 and 11

OTHER CRITERIA

Casework:

Standing Height Bench (36"):	No
Sitting Height Bench (30"):	No
Upper Cabinets:	Yes
Wall Shelves:	Yes - Flower Shelf
Reagent Shelves:	No
Adjustable Workstation:	Yes
Mobile Bench:	No
Movable Table:	No
Tall Cabinets:	Yes- Wardrobe
Storage Cubbies:	No
Casework Material:	Wood
Countertop Material:	Solid Surface
Base Cabinet:	Yes
Chemical Storage:	No
Service Dist. Concepts:	

Casework Notes: See keyed notes 4, 5, 6, 7, 8

Equipment / Structural:

Vibration Sensitive:	No
Vibration Producing:	No
Heat Sensitive:	No
Heat Producing:	No
Light Sensitive:	No
Noise Producing:	No
Patient Lift Support	Yes

Equipment Notes: Provide Structural Framing for patient lift

Structural:

Live Load:	
Dead Load:	
Structural Special:	
Vibration Criteria:	

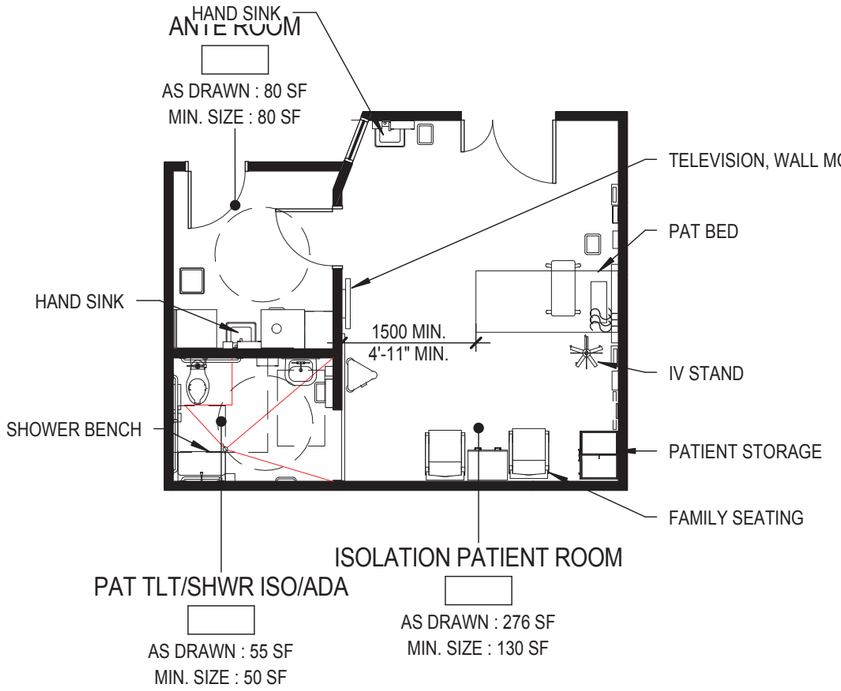
Structural Notes:

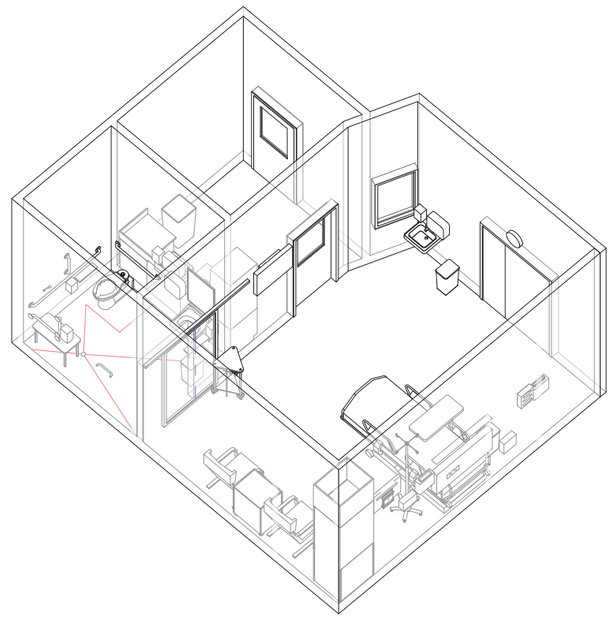
Keyed Notes

1. Flood resistant base / Integral cove base
2. Flooring shall have acoustic properties that reduces sound transmission and shock absorbtion sufficient to optimize staff comfort without hampering the movement of beds or equipment.
3. Add Patient lift and Wall protection at head wall.
4. Wardrobe shall be located on the family side of the room with the minimum dimension of 450mm x 600mm / 1'-6" x 2'-0".
5. There should be lockable storage for patients belongings.
6. Storage for a clean bed pan either in the patient washroom or discretely in the patient room.
7. A fold down surface for documentation charting should be provided on the staff side of the bed.
8. Supplies for use in patient room shall be conveniently located and secured against theft or tampering.
9. Accommodations for future wireless/multi-faced TV/communication/laptop, etc portable devices at the bedside should be incorporated.
10. Bed Lights shall be controlled by the patient.
11. There shall be a wall or ceiling mounted clock.

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
DOUBLE PATIENT ROOM - DGH
MODEL DATA





PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
ISOLATION PATIENT ROOM

nycum+ ASSOCIATES SMITHGROUP
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date : 05/01/13
Scale : 1/8" = 1'-0"
Drawn : Author

Drawing Number
A0.13

Department/Section: ENDOSCOPY SUITE
Number of Occupants:
Hours of Operation:

Direct Adjacency:
Indirect Adjacency:
Not Adjacent:

Program Space Name: ISOLATION PATIENT ROOM
Program Space Number: 104
Program Space Type: 106

Program Space Area Excluding alcoves(NSF): 278 SF
Program Space Quantity: 0
Occupancy Type:

ROOM CRITERIA

Architectural:

Ceiling Height	9' - 0" / 2.75m
Room Construction:	0.00 CF
Room Finish Class:	
Floors:	Non-Slip Seamless, Monolithic
Walls:	Smooth
Ceiling:	Monolithic
Doors (material, size, rating):	Min 1050mm w 475mm Leaf
Door Frames:	Aluminum
Door Hardware:	
Door Special:	
Shielding Criteria:	
Acoustic Criteria:	
Projection Screen:	
Fire Separation:	No
Exterior Window Treatment:	Cubicle Curtains / Drapes
Way Finding:	No

Architectural Notes: Integral cove base; See keyed notes 1, 2, 3, 4

Fireprotection/Safety/Security:

Fire Extinguisher:	No
Hazard Classification:	
Fire Suppression System:	Yes
Smoke Detection:	Yes
Eyewash:	Yes
Combo Eyewash/Shower:	No
Eyewash/Shower Drain:	No
Gas Leak Detection:	No
Key Locked:	No
Card Reader:	No
Biometrics:	No
Alarm:	No
Magnetic Locks:	No
Video Camera:	No
Motion Detection:	No
Request to Exit Button:	No

Fireprotection/Safety/Security Notes:

Audio Visual / Communications:

Intercom/Public Address:	Yes
Microphone / Loudspeaker:	No
Video Projector:	No
TV/Monitor/MATV:	Yes
Sound System:	No
Telephone:	Yes
Data:	Yes
Cable:	Yes
Equip. Monitoring Alarm:	Yes
Walk-up Shared PC:	Yes
Emergency Communication:	Yes
PACS Workstation:	
Nurse Call:	Yes

AV / Communications Notes: See keyed note 10

SYSTEMS CRITERIA

Mechanical:

Temp. Set Range:	75dF +/-2dF
Humidity:	Yes
Pressurization:	
Air Changes:	4-8
Laminar Flow:	0
High/Low Ventilation:	0
Heat Load:	0
Exhaust:	
Fume Hood Type:	0
Bio-Safety Cabinet:	0
Point Exhaust:	No
Canopy Hood:	0
Pressure Monitoring:	No
Diffusers:	
Return:	
Cleanroom Class:	

Mechanical Notes: Add Thermostat

Plumbing/Gas:

Cold Water:	Yes
Hot Water:	Yes
Floor Sink:	No
Lab Sink:	No
Dedicated Handwash Sink:	Yes
Drain:	No
Steam:	No
Reagent Water:	Yes
RO Water:	No
Local Polisher:	No
Pure Water Quality:	No
Recessed Wall Connect:	No
Med Air:	Yes
Natural Gas:	Yes
Med Oxygen:	Yes
Vacuum:	Yes
Fitting Connections:	

Plumbing Notes:

Electrical:

120V Normal Power:	Yes
120V Emergency Power:	Yes
120V Standby Power:	No
208V Normal Power:	Yes
208V Emergency Power:	Yes
208V Standby Power:	No
408V Power:	No
UPS Receptacles:	Equipment Supplied
Raceway:	No
Special Power:	As Required
Emergency Shut-Off:	No
Lighting Type:	
Fixture Type:	
Light Control:	Yes, Switched Seperately
Daylighting:	Yes
Special Lighting:	Bed Lights / Exam Lights

Electrical Notes: See keyed note 11 and 12

OTHER CRITERIA

Casework:

Standing Height Bench (36"):	No
Sitting Height Bench (30"):	No
Upper Cabinets:	Yes
Wall Shelves:	Yes
Reagent Shelves:	No
Adjustable Workstation:	Advisory
Mobile Bench:	No
Movable Table:	No
Tall Cabinets:	Yes
Storage Cubbies:	No
Casework Material:	Wood
Countertop Material:	Solid Surface
Base Cabinet:	Yes
Chemical Storage:	No
Service Dist. Concepts:	

Casework Notes: See keyed notes 5, 6, 7, 8, and 9

Equipment / Structural:

Vibration Sensitive:	No
Vibration Producing:	No
Heat Sensitive:	No
Heat Producing:	No
Light Sensitive:	No
Noise Producing:	No
Patient Lift Support	Yes

Equipment Notes: Provide structural framing for the patient lift.

Structural:

Live Load:	
Dead Load:	
Structural Special:	
Vibration Criteria:	

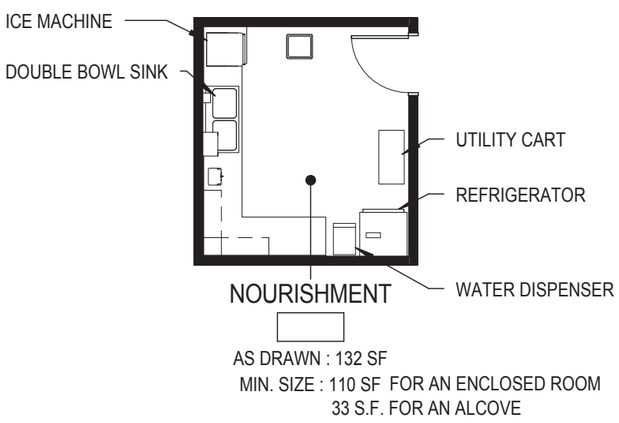
Structural Notes:

Keyed Notes

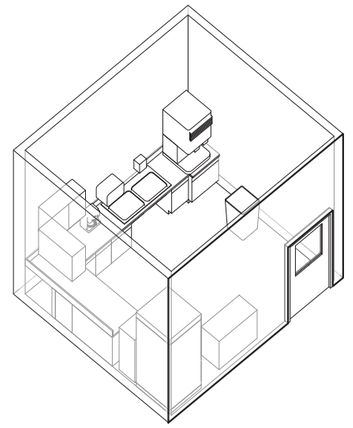
1. Flood resistant base / Integral cove base
2. Flooring shall have acoustic properties that reduces sound transmission and shock absorbtion sufficient to optimize staff comfort without hampering the movement of beds or equipment.
3. Add Patient lift and Wall protection at head wall.
4. Room walls, windows, penetration, and ceiling shall be sealed.
5. Wardrobe shall be located on the family side of the room with the minimum dimension of 450mm x 600mm / 1'-6" x 2'-0".
6. There should be lockable storage for patients belongings.
7. Storage for a clean bed pan either in the patient washroom or discretely in the patient room.
8. A fold down surface for documentation charting should be provided on the staff side of the bed.
9. Supplies for use in patient room shall be conveniently located and secured against theft or tampering.
10. Accommodations for future wireless/multi-faced TV/communication/laptop, etc portable devices at the bedside should be incorporated.
11. Bed Lights shall be controlled by the patient.
12. There shall be a wall or ceiling mounted clock.

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
ISOLATION PATIENT ROOM DATA



AS DRAWN : 132 SF
MIN. SIZE : 110 SF FOR AN ENCLOSED ROOM
33 S.F. FOR AN ALCOVE



PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
NOURISHMENT

nycum ASSOCIATES SMITHGROUP
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date : 05/02/13
Scale : 1/8" = 1'-0"
Drawn : Author

Drawing Number
A0.14

Department/Section: ENDOSCOPY SUITE
Number of Occupants:
Hours of Operation:

Direct Adjacency:
Indirect Adjacency:
Not Adjacent:

Program Space Name: NOURISHMENT
Program Space Number: 104
Program Space Type: DGH

Program Space Area Excluding alcoves(NSF): 132 SF
Program Space Quantity: 0
Occupancy Type:

ROOM CRITERIA

Architectural:

Ceiling Height	8' - 0" / 2.4m
Room Construction:	0.00 CF
Room Finish Class:	
Floors:	Non-Slip Seamless
Walls:	Smooth
Ceiling:	ACT - Cleanable
Doors (material, size, rating):	
Door Frames:	
Door Hardware:	
Door Special:	
Shielding Criteria:	No
Acoustic Criteria:	No
Projection Screen:	No
Fire Separation:	No
Exterior Window Treatment:	No
Way Finding:	No

Architectural Notes: Integral cove base; Light tight room

Fireprotection/Safety/Security:

Fire Extinguisher:	No
Hazard Classification:	
Fire Suppression System:	Yes
Smoke Detection:	Yes
Eyewash:	No
Combo Eyewash/Shower:	No
Eyewash/Shower Drain:	No
Gas Leak Detection:	No
Key Locked:	No
Card Reader:	No
Biometrics:	No
Alarm:	No
Magnetic Locks:	No
Video Camera:	No
Motion Detection:	No
Request to Exit Button:	No

Fireprotection/Safety/Security Notes:

Audio Visual / Communications:

Intercom/Public Address:	Yes
Microphone / Loudspeaker:	No
Video Projector:	No
TV/Monitor/MATV:	No
Sound System:	No
Telephone:	Yes
Data:	Yes
Cable:	No
Equip. Monitoring Alarm:	No
Walk-up Shared PC:	No
Emergency Communication:	No
PACS Workstation:	
Nurse Call:	Yes

AV / Communications Notes: Verify refrigerator temperature monitoring

SYSTEMS CRITERIA

Mechanical:

Temp. Set Range:	75dF +/-2dF
Humidity:	Yes
Pressurization:	
Air Changes:	4-8
Laminar Flow:	0
High/Low Ventilation:	0
Heat Load:	0
Exhaust:	
Fume Hood Type:	0
Bio-Safety Cabinet:	0
Point Exhaust:	No
Canopy Hood:	0
Pressure Monitoring:	No
Diffusers:	
Return:	
Cleanroom Class:	

Mechanical Notes:

Plumbing/Gas:

Cold Water:	Yes
Hot Water:	Yes
Floor Sink:	Yes
Lab Sink:	No
Dedicated Handwash Sink:	No
Drain:	No
Steam:	No
Reagent Water:	No
RO Water:	Yes
Local Polisher:	No
Pure Water Quality:	No
Recessed Wall Connect:	No
Med Air:	No
Natural Gas:	No
Med Oxygen:	No
Vacuum:	No
Fitting Connections:	

Plumbing Notes: See Keyed Notes 1, 2, 3, and 4.

Electrical:

120V Normal Power:	Yes
120V Emergency Power:	Yes
120V Standby Power:	No
208V Normal Power:	Yes
208V Emergency Power:	Yes
208V Standby Power:	No
408V Power:	No
UPS Receptacles:	Equipment Supplied
Raceway:	Yes
Special Power:	As Required
Emergency Shut-Off:	No
Lighting Type:	
Fixture Type:	
Light Control:	Yes
Daylighting:	No
Special Lighting:	Yes - Under Cabinet

Electrical Notes:

OTHER CRITERIA

Casework:

Standing Height Bench (36"):	No
Sitting Height Bench (30"):	No
Upper Cabinets:	Yes
Wall Shelves:	No
Reagent Shelves:	No
Adjustable Workstation:	No
Mobile Bench:	No
Movable Table:	No
Tall Cabinets:	No
Storage Cubbies:	No
Casework Material:	Wood
Countertop Material:	Solid Surface
Base Cabinet:	Yes
Chemical Storage:	No
Service Dist. Concepts:	

Casework Notes: Cabinets should be deep enough to fit Ice Machine on top

Equipment / Structural:

Vibration Sensitive:	No
Vibration Producing:	No
Heat Sensitive:	No
Heat Producing:	Yes - Refrigerator
Light Sensitive:	No
Noise Producing:	No

Equipment Notes:

Structural:

Live Load:	
Dead Load:	
Structural Special:	
Vibration Criteria:	

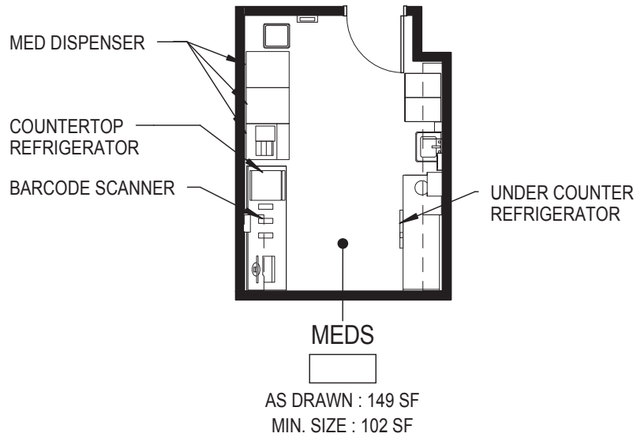
Structural Notes:

Keyed Notes

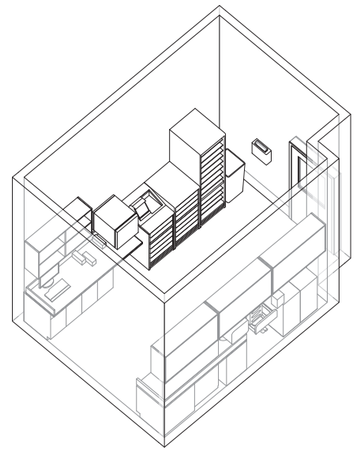
1. Add Double-Sink
2. Add Drinking Water Purifer
3. Add Ice Machine Connection
4. Add Coffee Machine

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
NOURISHMENT DATA



AS DRAWN : 149 SF
MIN. SIZE : 102 SF



PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
MEDICATION

nycum ASSOCIATES + SMITHGROUP
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date : 05/02/13
Scale : 1/8" = 1'-0"
Drawn : Author

Drawing Number
A0.15

Department/Section: CLINIC
Number of Occupants: 1
Hours of Operation: 8AM - 5PM

Direct Adjacency:
Indirect Adjacency:
Not Adjacent:

Program Space Name: EQUIPMENT STORAGE
Program Space Number:
Program Space Type: 106

Program Space Area Excluding alcoves(NSF): 152 SF
Program Space Quantity: 1
Occupancy Type: 1

ROOM CRITERIA

Architectural:

Ceiling Height	8' - 0" / 2.4m
Room Construction:	0.00 CF
Room Finish Class:	
Floors:	
Walls:	Non-Slip Seamless
Ceiling:	Smooth
Doors (material, size, rating):	
Door Frames:	
Door Hardware:	
Door Special:	
Shielding Criteria:	No
Acoustic Criteria:	50 STC - 45 NC
Projection Screen:	No
Fire Separation:	No
Exterior Window Treatment:	No
Way Finding:	Yes

Architectural Notes:

Fireprotection/Safety/Security:

Fire Extinguisher:	No
Hazard Classification:	
Fire Suppression System:	Yes SPRINKLER
Smoke Detection:	No
Eyewash:	No
Combo Eyewash/Shower:	No
Eyewash/Shower Drain:	No
Gas Leak Detection:	No
Key Locked:	Yes
Card Reader:	Yes
Biometrics:	No
Alarm:	No
Magnetic Locks:	No
Video Camera:	No
Motion Detection:	No
Request to Exit Button:	No

Fireprotection/Safety/Security Notes:

Audio Visual / Communications:

Intercom/Public Address:	Yes
Microphone / Loudspeaker:	No
Video Projector:	No
TV/Monitor/MATV:	No
Sound System:	No
Telephone:	Yes
Data:	Yes
Cable:	Yes
Equip. Monitoring Alarm:	Yes
Walk-up Shared PC:	No
Emergency Communication:	No
PACS Workstation:	
Nurse Call:	Yes

AV / Communications Notes:

SYSTEMS CRITERIA

Mechanical:

Temp. Set Range:	72-75 DEG F
Humidity:	No
Pressurization:	
Air Changes:	
Laminar Flow:	0
High/Low Ventilation:	0
Heat Load:	0
Exhaust:	
Fume Hood Type:	0
Bio-Safety Cabinet:	0
Point Exhaust:	No
Canopy Hood:	0
Pressure Monitoring:	No
Diffusers:	
Return:	YES
Cleanroom Class:	

Mechanical Notes:

Plumbing/Gas:

Cold Water:	Yes
Hot Water:	Yes
Floor Sink:	No
Lab Sink:	No
Dedicated Handwash Sink:	Yes
Drain:	No
Steam:	No
Reagent Water:	No
RO Water:	No
Local Polisher:	No
Pure Water Quality:	No
Recessed Wall Connect:	No
Med Air:	No
Natural Gas:	No
Med Oxygen:	No
Vacuum:	No
Fitting Connections:	

Plumbing Notes: Hand sink located away from Med Prep.
Add Sink

Electrical:

120V Normal Power:	Yes
120V Emergency Power:	Yes
120V Standby Power:	No
208V Normal Power:	Yes
208V Emergency Power:	Yes
208V Standby Power:	No
408V Power:	No
UPS Receptacles:	Equipment Supplied
Raceway:	No
Special Power:	As Required
Emergency Shut-Off:	No
Lighting Type:	Flourescent
Fixture Type:	Direct / Indirect
Light Control:	Occupancy Sensor
Daylighting:	No
Special Lighting:	Task

Electrical Notes:

OTHER CRITERIA

Casework:

Standing Height Bench (36"):	No
Sitting Height Bench (30"):	No
Upper Cabinets:	Yes
Wall Shelves:	No
Reagent Shelves:	No
Adjustable Workstation:	Yes
Mobile Bench:	No
Movable Table:	No
Tall Cabinets:	No
Storage Cubbies:	No
Casework Material:	Wood
Countertop Material:	Solid Surface
Base Cabinet:	Yes
Chemical Storage:	No
Service Dist. Concepts:	

Casework Notes: Computer Work Station located on the adjustable workstation

Equipment / Structural:

Vibration Sensitive:	No
Vibration Producing:	No
Heat Sensitive:	No
Heat Producing:	No
Light Sensitive:	No
Noise Producing:	No

Equipment Notes:

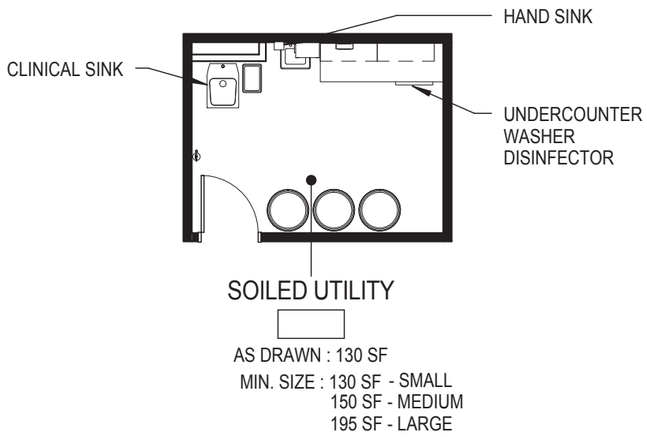
Structural:

Live Load:	
Dead Load:	
Structural Special:	
Vibration Criteria:	

Structural Notes:

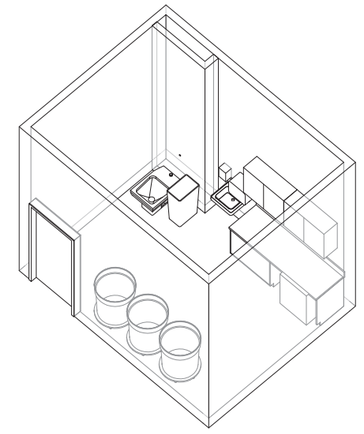
PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title: MEDICATION DATA



AS DRAWN : 130 SF

MIN. SIZE : 130 SF - SMALL
150 SF - MEDIUM
195 SF - LARGE



PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
SOILED WORK

Department/Section: OPERATING ROOM SUITE
Number of Occupants:
Hours of Operation:

Direct Adjacency:
Indirect Adjacency:
Not Adjacent:

Program Space Name: SOILED WORK
Program Space Number: 104
Program Space Type: 106

Program Space Area Excluding alcoves(N): S: 12m²(130sf)
Program Space Quantity: M: 14m²(150sf)
Occupancy Type: L: 18m²(195sf)

ROOM CRITERIA

Architectural:

Ceiling Height	11' - 0" / 3.4m
Room Construction:	0.00 CF
Room Finish Class:	
Floors:	Non-Slip Seamless, Impermeable
Walls:	Smooth
Ceiling:	
Doors (material, size, rating):	
Door Frames:	
Door Hardware:	
Door Special:	
Shielding Criteria:	No
Acoustic Criteria:	
Projection Screen:	No
Fire Separation:	No
Exterior Window Treatment:	No
Way Finding:	No

Architectural Notes: Integral cove base; Light tight room; Add Wall Protection

Fireprotection/Safety/Security:

Fire Extinguisher:	No
Hazard Classification:	
Fire Suppression System:	Yes
Smoke Detection:	Yes
Eyewash:	Yes
Combo Eyewash/Shower:	No
Eyewash/Shower Drain:	No
Gas Leak Detection:	No
Key Locked:	Yes
Card Reader:	Yes
Biometrics:	No
Alarm:	No
Magnetic Locks:	No
Video Camera:	No
Motion Detection:	No
Request to Exit Button:	No

Fireprotection/Safety/Security Notes:

Audio Visual / Communications:

Intercom/Public Address:	Yes
Microphone / Loudspeaker:	No
Video Projector:	No
TV/Monitor/MATV:	No
Sound System:	No
Telephone:	Yes
Data:	Yes - Equipment Scanning
Cable:	No
Equip. Monitoring Alarm:	No
Walk-up Shared PC:	No
Emergency Communication:	No
PACS Workstation:	
Nurse Call:	Yes

AV / Communications Notes:

SYSTEMS CRITERIA

Mechanical:

Temp. Set Range:	75dF +/-2dF
Humidity:	Yes
Pressurization:	
Air Changes:	4-8
Laminar Flow:	0
High/Low Ventilation:	0
Heat Load:	0
Exhaust:	
Fume Hood Type:	0
Bio-Safety Cabinet:	0
Point Exhaust:	No
Canopy Hood:	0
Pressure Monitoring:	No
Diffusers:	
Return:	
Cleanroom Class:	

Mechanical Notes:

Plumbing/Gas:

Cold Water:	Yes
Hot Water:	Yes
Floor Sink:	Yes
Lab Sink:	No
Dedicated Handwash Sink:	Yes
Drain:	No
Steam:	No
Reagent Water:	No
RO Water:	No
Local Polisher:	No
Pure Water Quality:	No
Recessed Wall Connect:	No
Med Air:	No
Natural Gas:	No
Med Oxygen:	No
Vacuum:	No
Fitting Connections:	

Plumbing Notes: Add Hopper Sink

Electrical:

120V Normal Power:	Yes
120V Emergency Power:	Yes
120V Standby Power:	No
208V Normal Power:	Yes
208V Emergency Power:	Yes
208V Standby Power:	No
408V Power:	No
UPS Receptacles:	Equipment Supplied
Raceway:	No
Special Power:	No
Emergency Shut-Off:	No
Lighting Type:	
Fixture Type:	
Light Control:	No
Daylighting:	No
Special Lighting:	No

Electrical Notes:

OTHER CRITERIA

Casework:

Standing Height Bench (36"):	No
Sitting Height Bench (30"):	No
Upper Cabinets:	No
Wall Shelves:	Yes
Reagent Shelves:	No
Adjustable Workstation:	No
Mobile Bench:	No
Movable Table:	No
Tall Cabinets:	No
Storage Cubbies:	No
Casework Material:	Stainless Steel
Countertop Material:	Stainless Steel
Base Cabinet:	Yes
Chemical Storage:	Yes
Service Dist. Concepts:	

Casework Notes:

Equipment / Structural:

Vibration Sensitive:	No
Vibration Producing:	No
Heat Sensitive:	No
Heat Producing:	No
Light Sensitive:	No
Noise Producing:	No

Equipment Notes:

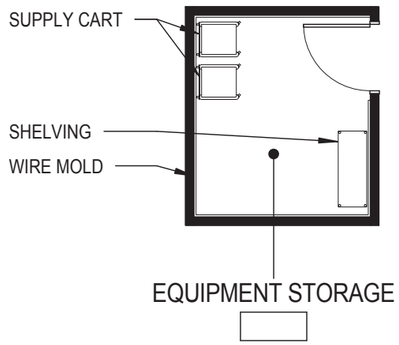
Structural:

Live Load:	
Dead Load:	
Structural Special:	
Vibration Criteria:	

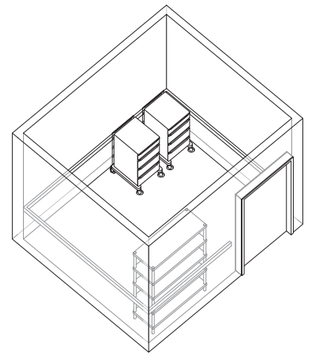
Structural Notes:

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title: SOILED WORK DATA



AS DRAWN : 100 SF
MIN. SIZE : VARIES



PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
EQUIPMENT STORAGE

nycum+ ASSOCIATES SMITHGROUP
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date : 05/02/13
Scale : 1/8" = 1'-0"
Drawn : Author

Drawing Number
A0.17

Department/Section: CLINIC
Number of Occupants: 1
Hours of Operation: 8AM - 5PM

Direct Adjacency:
Indirect Adjacency:
Not Adjacent:

Program Space Name: EQUIPMENT STORAGE
Program Space Number:
Program Space Type: 106

Program Space Area Excluding alcoves(NSF): 100 SF
Program Space Quantity: 1
Occupancy Type: 1

ROOM CRITERIA

Architectural:

Ceiling Height	11' - 0" / 3.4m
Room Construction:	0.00 CF
Room Finish Class:	
Floors:	Non-Slip Seamless
Walls:	Smooth
Ceiling:	ACT
Doors (material, size, rating):	1200mm (4'-0")
Door Frames:	
Door Hardware:	
Door Special:	
Shielding Criteria:	No
Acoustic Criteria:	50 STC - 45 NC
Projection Screen:	No
Fire Separation:	No
Exterior Window Treatment:	No
Way Finding:	Yes

Architectural Notes: Add Wall Protection

Fireprotection/Safety/Security:

Fire Extinguisher:	No
Hazard Classification:	
Fire Suppression System:	Yes SPRINKLER
Smoke Detection:	Yes
Eyewash:	No
Combo Eyewash/Shower:	No
Eyewash/Shower Drain:	No
Gas Leak Detection:	No
Key Locked:	Yes
Card Reader:	Yes
Biometrics:	No
Alarm:	No
Magnetic Locks:	No
Video Camera:	No
Motion Detection:	No
Request to Exit Button:	No

Fireprotection/Safety/Security Notes:

Audio Visual / Communications:

Intercom/Public Address:	Yes
Microphone / Loudspeaker:	No
Video Projector:	No
TV/Monitor/MATV:	Yes
Sound System:	No
Telephone:	Yes
Data:	Yes- Equipment Scanning
Cable:	No
Equip. Monitoring Alarm:	No
Walk-up Shared PC:	No
Emergency Communication:	No
PACS Workstation:	
Nurse Call:	Yes

AV / Communications Notes:

SYSTEMS CRITERIA

Mechanical:

Temp. Set Range:	72-75 DEG F
Humidity:	No
Pressurization:	
Air Changes:	
Laminar Flow:	0
High/Low Ventilation:	0
Heat Load:	0
Exhaust:	
Fume Hood Type:	0
Bio-Safety Cabinet:	0
Point Exhaust:	No
Canopy Hood:	0
Pressure Monitoring:	No
Diffusers:	
Return:	YES
Cleanroom Class:	

Mechanical Notes: EQ w/ Large battery charging reqs may require additional exhausting

Plumbing/Gas:

Cold Water:	No
Hot Water:	No
Floor Sink:	No
Lab Sink:	No
Dedicated Handwash Sink:	No
Drain:	No
Steam:	No
Reagent Water:	No
RO Water:	No
Local Polisher:	No
Pure Water Quality:	No
Recessed Wall Connect:	No
Med Air:	No
Natural Gas:	No
Med Oxygen:	No
Vacuum:	No
Fitting Connections:	

Plumbing Notes:

Electrical:

120V Normal Power:	Yes
120V Emergency Power:	Yes
120V Standby Power:	No
208V Normal Power:	Yes
208V Emergency Power:	Yes
208V Standby Power:	No
408V Power:	No
UPS Receptacles:	Equipment Supplied
Raceway:	Yes
Special Power:	As Required
Emergency Shut-Off:	No
Lighting Type:	Flourescent
Fixture Type:	Direct/ Indirect
Light Control:	Occupancy Sensor
Daylighting:	No
Special Lighting:	No

Electrical Notes: Multiple outlets or Powerstrips to recharge equipment

OTHER CRITERIA

Casework:

Standing Height Bench (36"):	No
Sitting Height Bench (30"):	No
Upper Cabinets:	No
Wall Shelves:	Yes - Adjustable
Reagent Shelves:	No
Adjustable Workstation:	No
Mobile Bench:	No
Movable Table:	No
Tall Cabinets:	No
Storage Cubbies:	No
Casework Material:	Wire Rack
Countertop Material:	N/A
Base Cabinet:	No
Chemical Storage:	No
Service Dist. Concepts:	

Casework Notes:

Equipment / Structural:

Vibration Sensitive:	No
Vibration Producing:	No
Heat Sensitive:	No
Heat Producing:	No
Light Sensitive:	No
Noise Producing:	No
Struct. Shelving Support	Yes

Equipment Notes:

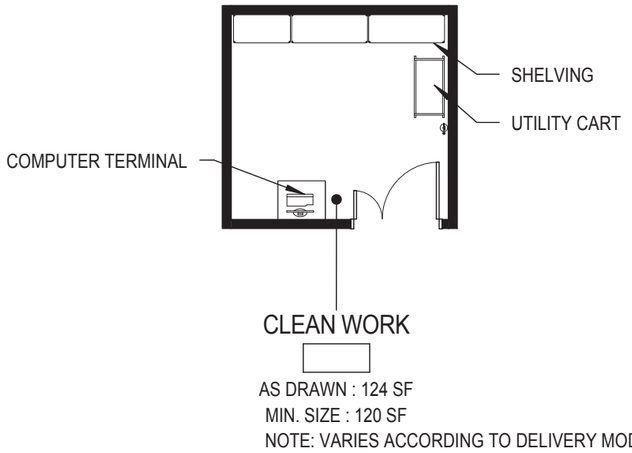
Structural:

Live Load:	
Dead Load:	
Structural Special:	
Vibration Criteria:	

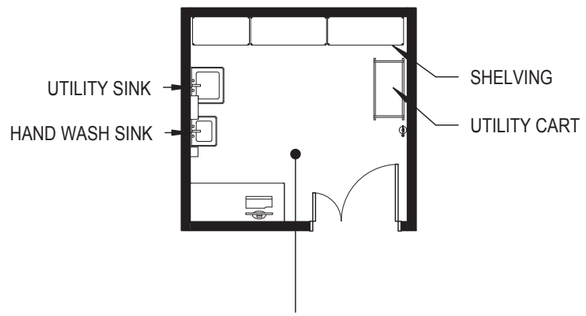
Structural Notes:

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

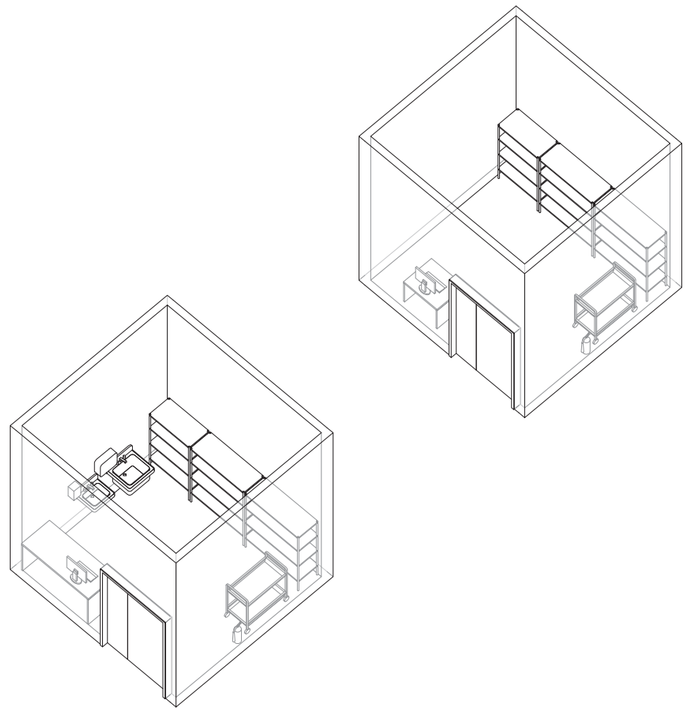
Drawing Title:
EQUIPMENT STORAGE DATA



AS DRAWN : 124 SF
MIN. SIZE : 120 SF
NOTE: VARIES ACCORDING TO DELIVERY MODEL



AS DRAWN : 124 SF
MIN. SIZE : 120 SF
NOTE: VARIES ACCORDING TO DELIVERY MODEL



PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
CLEAN WORK/UTILITY

nycum+ ASSOCIATES SMITHGROUP
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date : 05/02/13
Scale : 1/8" = 1'-0"
Drawn : Author

Drawing Number
A0.18

Department/Section: OPERATING ROOM SUITE
Number of Occupants:
Hours of Operation:

Direct Adjacency:
Indirect Adjacency:
Not Adjacent:

Program Space Name: CLEAN UTILITY
Program Space Number: 104
Program Space Type: 106

Program Space Area Excluding alcoves(NSF): 125 SF
Program Space Quantity: 0
Occupancy Type:

ROOM CRITERIA

Architectural:

Ceiling Height	11' - 0" / 3.4m
Room Construction:	0.00 CF
Room Finish Class:	
Floors:	Non-Slip Seamless, Impermeable
Walls:	Gyp. Bd.
Ceiling:	ACT
Doors (material, size, rating):	1200mm (4'-0")
Door Frames:	
Door Hardware:	
Door Special:	
Shielding Criteria:	No
Acoustic Criteria:	No
Projection Screen:	No
Fire Separation:	No
Exterior Window Treatment:	No
Way Finding:	No

Architectural Notes: Integral cove base; Flooring shall alow for rolling equipment with minimal resistance; add wall protection

Fireprotection/Safety/Security:

Fire Extinguisher:	No
Hazard Classification:	
Fire Suppression System:	Yes
Smoke Detection:	Yes
Eyewash:	No
Combo Eyewash/Shower:	No
Eyewash/Shower Drain:	No
Gas Leak Detection:	No
Key Locked:	Yes
Card Reader:	Yes
Biometrics:	No
Alarm:	No
Magnetic Locks:	No
Video Camera:	No
Motion Detection:	No
Request to Exit Button:	No

Fireprotection/Safety/Security Notes:

Audio Visual / Communications:

Intercom/Public Address:	No
Microphone / Loudspeaker:	No
Video Projector:	No
TV/Monitor/MATV:	No
Sound System:	No
Telephone:	No
Data:	Yes - Equipment Scanning
Cable:	No
Equip. Monitoring Alarm:	No
Walk-up Shared PC:	No
Emergency Communication:	No
PACS Workstation:	
Nurse Call:	Yes

AV / Communications Notes:

SYSTEMS CRITERIA

Mechanical:

Temp. Set Range:	75dF +/-2dF
Humidity:	Yes
Pressurization:	
Air Changes:	4-8
Laminar Flow:	0
High/Low Ventilation:	0
Heat Load:	0
Exhaust:	
Fume Hood Type:	0
Bio-Safety Cabinet:	0
Point Exhaust:	No
Canopy Hood:	0
Pressure Monitoring:	No
Diffusers:	
Return:	
Cleanroom Class:	

Mechanical Notes: See Keyed Note 1

Plumbing/Gas:

Cold Water:	No
Hot Water:	No
Floor Sink:	No
Lab Sink:	No
Dedicated Handwash Sink:	No
Drain:	No
Steam:	No
Reagent Water:	No
RO Water:	No
Local Polisher:	No
Pure Water Quality:	No
Recessed Wall Connect:	No
Med Air:	No
Natural Gas:	No
Med Oxygen:	No
Vacuum:	No
Fitting Connections:	

Plumbing Notes:

Electrical:

120V Normal Power:	Yes
120V Emergency Power:	No
120V Standby Power:	Yes
208V Normal Power:	Yes
208V Emergency Power:	No
208V Standby Power:	No
408V Power:	No
UPS Receptacles:	Equipment Supplied
Raceway:	Yes
Special Power:	No
Emergency Shut-Off:	No
Lighting Type:	
Fixture Type:	
Light Control:	
Daylighting:	No
Special Lighting:	No

Electrical Notes:

OTHER CRITERIA

Casework:

Standing Height Bench (36"):	No
Sitting Height Bench (30"):	No
Upper Cabinets:	No
Wall Shelves:	No
Reagent Shelves:	No
Adjustable Workstation:	No
Mobile Bench:	No
Movable Table:	No
Tall Cabinets:	No
Storage Cubbies:	No
Casework Material:	Wire Racks
Countertop Material:	
Base Cabinet:	No
Chemical Storage:	No
Service Dist. Concepts:	

Casework Notes: See Keyed Note 2, 3, and 4

Equipment / Structural:

Vibration Sensitive:	No
Vibration Producing:	No
Heat Sensitive:	No
Heat Producing:	No
Light Sensitive:	No
Noise Producing:	No
Struct. Shelving Support	Yes

Equipment Notes:

Structural:

Live Load:	
Dead Load:	
Structural Special:	
Vibration Criteria:	

Structural Notes:

Keyed Notes

1. Storage of equipment and supplies shall not be exposed to direct airflow from the HVAC system in accordance with CSA Z314.15 and CSA Z314.3
2. Items shall be stored on mobile shelving or in automated dispensing cabinets.
3. Linen shall be stored on mobile shelving.
4. Shelving for clean and sterile supplies shall be at least 230mm (9") off the floor; 450mm (1'-6") from the ceiling; and 50mm (2") from outside walls.

PRELIMINARY - NOT FOR CONSTRUCTION
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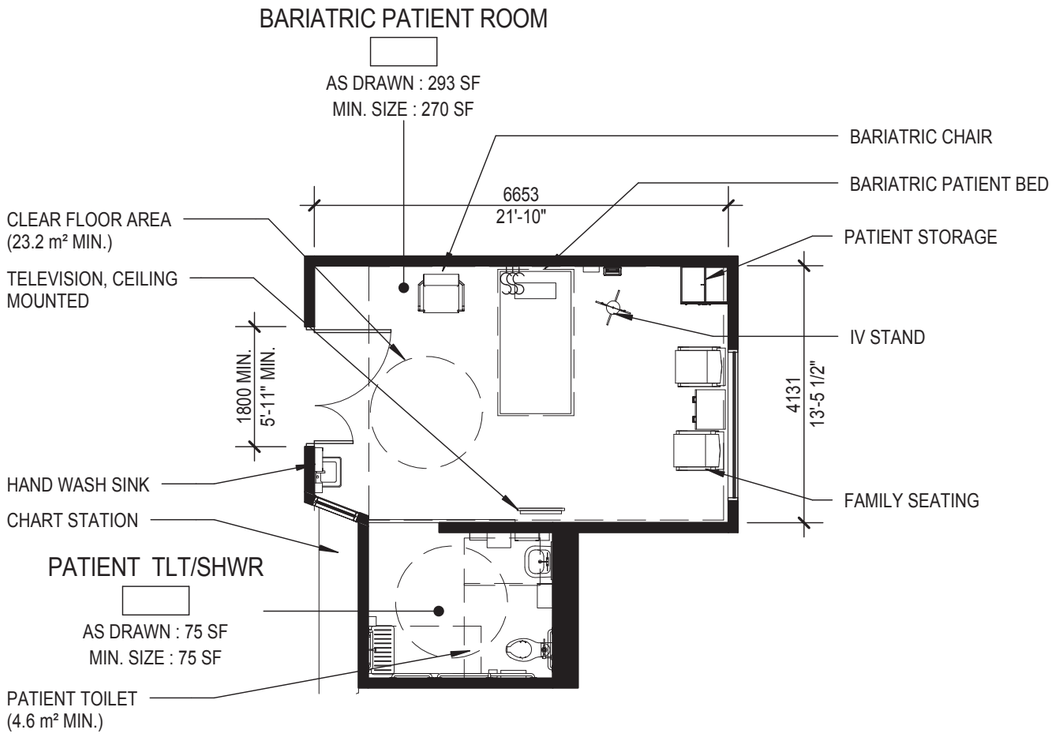
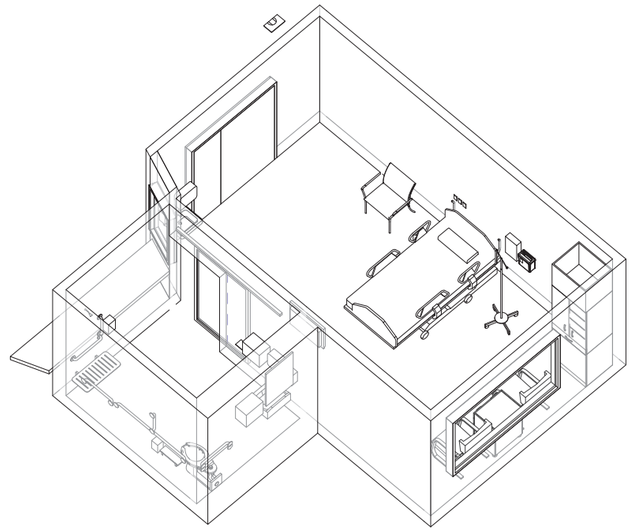
Drawing Title:
CLEAN WORK/UTILITY DATA





PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
BARIATRIC PATIENT ROOM

nycum+ ASSOCIATES SMITHGROUP
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date : 05/10/13
Scale : 1/8" = 1'-0"
Drawn : Author

Drawing Number
A0.19

Department/Section: PATIENT ROOMS
Number of Occupants:
Hours of Operation:

Direct Adjacency:
Indirect Adjacency:
Not Adjacent:

Program Space Name: BARIATRIC PATIENT ROOM
Program Space Number: 104
Program Space Type: 106

Program Space Area Excluding alcoves(NSF): 296 SF
Program Space Quantity: 0
Occupancy Type:

ROOM CRITERIA

Architectural:

Ceiling Height	9' - 0" / 2.75m
Room Construction:	0.00 CF
Room Finish Class:	
Floors:	Non-Slip Seamless
Walls:	Smooth
Ceiling:	ACT
Doors (material, size, rating):	Min 1500mm w 475mm Leaf
Door Frames:	
Door Hardware:	
Door Special:	
Shielding Criteria:	
Acoustic Criteria:	STC:45
Projection Screen:	No
Fire Separation:	No
Exterior Window Treatment:	Yes - Drapes
Way Finding:	Yes

Architectural Notes: Integral cove base; See keyed notes 1, 2, 3

Fireprotection/Safety/Security:

Fire Extinguisher:	No
Hazard Classification:	
Fire Suppression System:	Yes
Smoke Detection:	Yes
Eyewash:	No
Combo Eyewash/Shower:	No
Eyewash/Shower Drain:	No
Gas Leak Detection:	No
Key Locked:	No
Card Reader:	No
Biometrics:	No
Alarm:	No
Magnetic Locks:	No
Video Camera:	No
Motion Detection:	No
Request to Exit Button:	No

Fireprotection/Safety/Security Notes:

Audio Visual / Communications:

Intercom/Public Address:	Yes
Microphone / Loudspeaker:	No
Video Projector:	No
TV/Monitor/MATV:	Yes
Sound System:	No
Telephone:	Yes
Data:	Yes
Cable:	Yes
Equip. Monitoring Alarm:	Yes
Walk-up Shared PC:	Yes
Emergency Communication:	Yes
PACS Workstation:	
Nurse Call:	Yes

AV / Communications Notes: See keyed notes 9

SYSTEMS CRITERIA

Mechanical:

Temp. Set Range:	75dF +/-2dF
Humidity:	Yes
Pressurization:	
Air Changes:	4-8
Laminar Flow:	0
High/Low Ventilation:	0
Heat Load:	0
Exhaust:	
Fume Hood Type:	0
Bio-Safety Cabinet:	0
Point Exhaust:	No
Canopy Hood:	0
Pressure Monitoring:	No
Diffusers:	
Return:	
Cleanroom Class:	

Mechanical Notes: Add Thermostat

Plumbing/Gas:

Cold Water:	Yes
Hot Water:	Yes
Floor Sink:	No
Lab Sink:	No
Dedicated Handwash Sink:	Yes
Drain:	No
Steam:	No
Reagent Water:	No
RO Water:	No
Local Polisher:	No
Pure Water Quality:	No
Recessed Wall Connect:	No
Med Air:	Yes
Natural Gas:	No
Med Oxygen:	Yes
Vacuum:	Yes
Fitting Connections:	

Plumbing Notes: Add Dialysis connection

Electrical:

120V Normal Power:	Yes
120V Emergency Power:	Yes
120V Standby Power:	No
208V Normal Power:	Yes
208V Emergency Power:	Yes
208V Standby Power:	No
408V Power:	No
UPS Receptacles:	Equipment Supplied
Raceway:	Yes
Special Power:	As Required
Emergency Shut-Off:	No
Lighting Type:	
Fixture Type:	
Light Control:	Yes, Switched Seperately
Daylighting:	Yes
Special Lighting:	Bed Light / Exam Light / Fan

Electrical Notes: See keyed notes 10, 11, 12

OTHER CRITERIA

Casework:

Standing Height Bench (36"):	No
Sitting Height Bench (30"):	No
Upper Cabinets:	Yes
Wall Shelves:	Yes - Flower Shelf
Reagent Shelves:	No
Adjustable Workstation:	Yes
Mobile Bench:	No
Movable Table:	No
Tall Cabinets:	Yes - Wardrobe
Storage Cubbies:	No
Casework Material:	Wood
Countertop Material:	Solid Surface
Base Cabinet:	Yes
Chemical Storage:	No
Service Dist. Concepts:	

Casework Notes: See keyed notes 4, 5, 6, 7, 8

Equipment / Structural:

Vibration Sensitive:	No
Vibration Producing:	No
Heat Sensitive:	No
Heat Producing:	No
Light Sensitive:	No
Noise Producing:	No
Patient Lift Support	Yes

Equipment Notes: Provide Structural Framing for patient lift

Structural:

Live Load:	
Dead Load:	
Structural Special:	
Vibration Criteria:	

Structural Notes:

Keyed Notes

1. Flood resistant base / Integral cove base
2. Flooring shall have acoustic properties that reduces sound transmission and shock absorbtion sufficient to optimize staff comfort without hampering the movement of beds or equipment.
3. Add Patient lift and Wall protection at head wall.
4. Wardrobe shall be located on the family side of the room with the minimum dimension of 450mm x 600mm / 1'-6" x 2'-0".
5. There should be lockable storage for patients belongings.
6. Storage for a clean bed pan either in the patient washroom or discretely in the patient room.
7. A fold down surface for documentation charting should be provided on the staff side of the bed.
8. Supplies for use in patient room shall be conveniently located and secured against theft or tampering.
9. Accommodations for future wireless/multi-faced TV/communication/laptop, etc portable devices at the bedside should be incorporated.
10. Bed Lights shall be controlled by the patient.
11. There shall be a wall or ceiling mounted clock.
12. Fan shall be controlled by the patient.

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

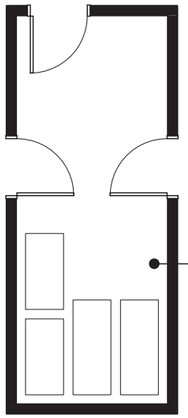
Drawing Title:
BARIATRIC PATIENT ROOM

nycum+ ASSOCIATES SMITHGROUP
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:
Capital Health Innovative Care Flexible Facilities

Date : 05/10/13
Scale : 1/8" = 1'-0"
Drawn : Author

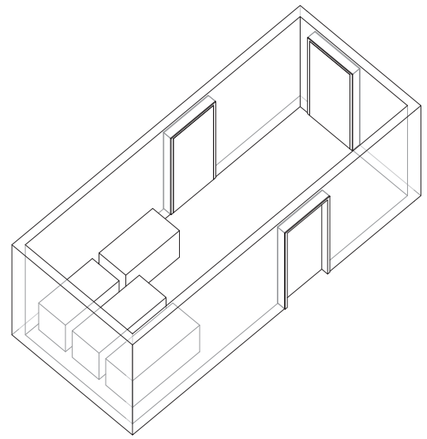
Drawing Number
A0.19A



SUB-STERILE

AS DRAWN : 164 SF

MIN. SIZE : 13 SF / CART



PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
SUB-STERILE

nycum+ ASSOCIATES SMITHGROUP
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date : 05/10/13
Scale : 1/8" = 1'-0"
Drawn : Author

Drawing Number
A0.20

Department/Section: OPERATING ROOM SUITE
Number of Occupants:
Hours of Operation:

Direct Adjacency:
Indirect Adjacency:
Not Adjacent:

Program Space Name: SUB-STERILE
Program Space Number: 104
Program Space Type: 106

Program Space Area Excluding alcoves(NSF): 164 SF
Program Space Quantity: 0
Occupancy Type:

ROOM CRITERIA

Architectural:

Ceiling Height	8' - 0" / 2.4m
Room Construction:	0.00 CF
Room Finish Class:	
Floors:	Non-Slip Seamless Monolithic
Walls:	Smooth
Ceiling:	Monolithic
Doors (material, size, rating):	1200mm (4'-0")
Door Frames:	
Door Hardware:	
Door Special:	
Shielding Criteria:	No
Acoustic Criteria:	No
Projection Screen:	No
Fire Separation:	No
Exterior Window Treatment:	No
Way Finding:	No

Architectural Notes: Integral cove base; Add Wall Protection

Fireprotection/Safety/Security:

Fire Extinguisher:	No
Hazard Classification:	
Fire Suppression System:	Yes
Smoke Detection:	Yes
Eyewash:	No
Combo Eyewash/Shower:	No
Eyewash/Shower Drain:	No
Gas Leak Detection:	No
Key Locked:	No
Card Reader:	No
Biometrics:	No
Alarm:	No
Magnetic Locks:	No
Video Camera:	No
Motion Detection:	No
Request to Exit Button:	No

Fireprotection/Safety/Security Notes:

Audio Visual / Communications:

Intercom/Public Address:	Yes
Microphone / Loudspeaker:	No
Video Projector:	No
TV/Monitor/MATV:	No
Sound System:	No
Telephone:	Yes
Data:	Yes - Equipment Scanning
Cable:	No
Equip. Monitoring Alarm:	No
Walk-up Shared PC:	No
Emergency Communication:	No
PACS Workstation:	
Nurse Call:	Yes

AV / Communications Notes:

SYSTEMS CRITERIA

Mechanical:

Temp. Set Range:	75dF +/-2dF
Humidity:	Yes
Pressurization:	
Air Changes:	4-8
Laminar Flow:	0
High/Low Ventilation:	0
Heat Load:	0
Exhaust:	
Fume Hood Type:	0
Bio-Safety Cabinet:	0
Point Exhaust:	No
Canopy Hood:	0
Pressure Monitoring:	No
Diffusers:	
Return:	
Cleanroom Class:	

Mechanical Notes:

Plumbing/Gas:

Cold Water:	No
Hot Water:	No
Floor Sink:	No
Lab Sink:	No
Dedicated Handwash Sink:	No
Drain:	No
Steam:	No
Reagent Water:	No
RO Water:	No
Local Polisher:	No
Pure Water Quality:	No
Recessed Wall Connect:	No
Med Air:	No
Natural Gas:	No
Med Oxygen:	No
Vacuum:	No
Fitting Connections:	

Plumbing Notes:

Electrical:

120V Normal Power:	Yes
120V Emergency Power:	Yes
120V Standby Power:	No
208V Normal Power:	Yes
208V Emergency Power:	Yes
208V Standby Power:	No
408V Power:	No
UPS Receptacles:	Equipment Supplied
Raceway:	No
Special Power:	No
Emergency Shut-Off:	No
Lighting Type:	
Fixture Type:	
Light Control:	
Daylighting:	No
Special Lighting:	No

Electrical Notes:

OTHER CRITERIA

Casework:

Standing Height Bench (36"):	No
Sitting Height Bench (30"):	No
Upper Cabinets:	No
Wall Shelves:	No
Reagent Shelves:	No
Adjustable Workstation:	No
Mobile Bench:	No
Movable Table:	No
Tall Cabinets:	No
Storage Cubbies:	No
Casework Material:	
Countertop Material:	
Base Cabinet:	No
Chemical Storage:	No
Service Dist. Concepts:	

Casework Notes:

Equipment / Structural:

Vibration Sensitive:	No
Vibration Producing:	No
Heat Sensitive:	No
Heat Producing:	No
Light Sensitive:	No
Noise Producing:	No

Equipment Notes:

Structural:

Live Load:	
Dead Load:	
Structural Special:	
Vibration Criteria:	

Structural Notes:

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
SUB-STERILE DATA

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Halifax Infirmary

Introduction

The Design Solution for the Halifax Infirmary (HI) Addition contains underground parking, 20 operating rooms, 150 inpatient beds, a 12-bed ICU along with related support and service spaces relocated from the Centennial Building at the Victoria General site.

Based on an assessment of Support Services requirements for the HI, additional existing spaces are shown as requiring renovations. These proposed Renovations to Ancillary Spaces may be the result of required enlargement or reorganization. In turn, some spaces may require relocation as a result of adjacent required modifications.

Summary

See the following page for a summary of the Halifax Infirmary Design Solution, including the pros and cons, proposed building areas and cost estimate information. The subsequent page provides space for client review notes.

Halifax Infirmary Addition		
Major Programmatic Requirements	• 20 ORs, with associated Pre-Op, Recovery, Support Services; Renovations required to connect new ORs with existing OR suites to remain within existing building. • 150-inpatient beds on 3 floors • 12-bed ICU relocated from Centennial Building • Enhanced and expanded support services required to serve the new inpatient floors and new OR capacity. • 2 levels of underground parking below addition along with potential expansion of existing Robie St. parkade to support new inpatient and OR services. • LEED Silver sustainable design target. • Vehicular connection from Bell Rd. to Emergency Dept. entrance.	
Options	**Hybrid Concept**	
Description	The Hybrid Concept draws positive elements from both the previous Bow and Courtyard Concepts. This concept was largely driven by the expressed requirement that inpatient floor interconnect with existing inpatient floors on Levels 6, 7 and 8, requiring a central connecting hub. The hybrid concept allows maximum flexibility in inpatient units, using a common footprint and room layout for the Med/Surg. Rooms and IMCU beds. This plan also reflects the stated target of units of 25 patients each for maximum staffing efficiency. This plan provides a fairly compact plan with efficient travel distances within the units, while allowing daylight into all patient rooms, family lounges and some support spaces. Each unit is organized around a central service/support core containing staff work areas, storage, utility rooms, and other unit support space while the patient bedrooms form a ring around the perimeter. Maximum flexibility can be achieved with the use of demountable partitions in the central core wherever possible for ease of future reconfiguration.	
Drawing References	A.00 through A.20 (dated 31 May 2013)	
Pros/Cons	**Pros**	**Cons**
	• Underground parking convenient to ED walk-in entry accessed off new Bell Rd. access road. • Direct interior connection between the existing building and the new food court on Level 3. • Food Court creates a public amenity with entrances possible from the adjacent street and park area. • The fourth floor provides interstitial space for the structural grid transition and HVAC equipment to serve the new floors above and below. • The two-storey drive under the building at the ED entrance allows for light and air to flow through, making for a more pleasant entry experience and providing sheltered drop-off, short-stay (Emerg.) parking and circulation. • ORs and PreOp/PACU are on the same floor as the existing ORs, to allow for staffing efficiency and clear patient access patterns. • Public/Retail spaces bridge the connection between new and existing buildings on Level 4, creating a unified feel to the complex and maximizing tenant/retail value. • No patient rooms look into other rooms – all have views. • Expansive Rooftop terrace on the 6th floor allows patient, family and staff secure access to the outdoors. • Inpatient Bridge provides lateral links on each floor. • Excellent passive solar potential due to large southern façade. • Flexible layout allows easy reconfiguration and redefinition of inpatient units on the floor. • The new CSPD is internally connected to the rest of the building, on the same floor as the existing CSPD. • Back elevator block provides convenient “back-of-house” vertical circulation between the new tower and the existing building, including Emerg., Diagnostic Imaging and Service spaces and VMB links on Level 2 (e.g. CSPD, Dietary, Housekeeping, etc.). • Floor plan allows Level 6 to be developed as a consolidated IMCU floor with convenient connections to the ORs and ICUs below and existing CCU on Level 6. • Research and Education space provided on the inpatient floors. • 12-bed ICU from Centennial accommodated on Level 5 (same floor as ORs and existing ICUs). • Symbiotic services located in close proximity to each other.	• Bridge Connection at Levels 6, 7 and 8 is very expensive, interferes with views from existing patient rooms to the Commons and eliminates a lounge on existing inpatient floors where it connects. • CSPD on Level 2 reduces quantity of underground parking possible on Level 2. • Large overhang of building above adds cost and impacts building heat loss (greater amount of envelope. • Potential Addition to existing Robie St. parkade is potentially awkward and expensive given limited number of additional spaces added.
Building Area (New Construction) BGSF	488,766 sq.ft. (Drawings)	
Program Area (Renovation/Ancillary) BGSF	49,122 sq.ft.	
Estimate of Probable Cost	[redacted]	

Space for Client Review Comments

Program Summary

The Halifax Infirmary (HI) Space Program included in this report represents the starting point (CSA Z8000-11 derived) condition with modifications and supplementary requirements as conveyed by CDHA and HI staff.

Program Components

Level 1:
- Underground parking under "new" footprint (beyond Emergency Department).
- Building Services

Level 2:
- Underground parking under "new" footprint (beyond Emergency Department).
- New CSPD services for new Level 5 ORs

Level 3:
- New Food Court replacing existing Level 2 kitchen and cafeteria.
- Vehicular connection for access to Emergency Department from Bell Road.
- At-grade lobby for new tower public elevator bank.
- Direct/convenient connection from Emergency Department to new patient elevators bank for transfer to new in-patient floors and to ORs on Level 5.

Level 4:
- Connection to existing HI Level 4
- Lobby space connecting to existing HI public/retail spaces near existing Robie St. entrance to HI
- Mechanical/Electrical spaces for new addition

Level 5:
- 20 ORs
- Associated Waiting, Pre-Op/Day Surgery, PACU/ Recovery
- OR Support Services
- 12-bed ICU

Level 6:
- 50 inpatient med/surg beds (design allows for development as consolidated IMCU floor)
- Bridge connection to existing HI

Level 7:
- 50 inpatient med/surg beds
- Bridge connection to existing HI

Level 8:
- 50 inpatient med/surg beds
- Bridge connection to existing HI

Roof:
- Mechanical/Electrical Penthouse
- New Helipad

HALIFAX INFIRMARY
BED TOWER EXPANSION: NEW CONSTRUCTION PROGRAM

Date: **May 31, 2013**
STATUS: **Part B Submittal**
Version 2

		NSF	CIRC	STRUCT	DGSF	DGSF Sub	FLOOR BGSF	Drawing BGSF Bow	Courtyard	Part B	
First Floor						55,275	63,566	48,475	44,916	63,944	ADDED PARKING & 2ND TUNNEL
	1st Floor Parking	50,250	0%	10%	55,275						
Second Floor						56,342	64,793	48,475	47,359	65,221	ADDED PARKING & 2ND TUNNEL
	2nd Floor Parking	34,500	0%	10%	37,950						
	2nd floor CSPD	15,200	10%	10%	18,392						
Third Floor						25,982	29,879	25,913	31,816	33,024	INCLUDES RAMP TO PARKING
	3rd Floor Food Court	9,472	15%	10%	11,982						
**	*Clinical/Facility Support*				*10,000*						
	Public Lobby				4,000						
Fourth Floor						54,200	62,330	60,601	61,808	59,266	
	4th Floor Interstitial MEP space	54,200	0%	0%	54,200						
Fifth Floor						84,272	96,913	89,050	88,815	93,025	INCLUDES 12 BED ICU
	Operating Room Suite	27,750	40%	10%	42,735						
	Recovery	9,993	40%	10%	15,389						
	Day Surgery	5,343	40%	10%	8,228						
***	Public Waiting / Lobby				3,562						
	ICU	9,323	40%	10%	14,357						
Sixth Floor						44,858	51,586	51,116	50,723	54,165	INCLUDES 2300 GSF BRIDGE
	6th Floor Nursing	28,453	40%	10%	43,818						
	Research/Education Space				1,040						
Seventh Floor						44,858	51,586	51,116	50,723	54,165	INCLUDES 2300 GSF BRIDGE
	7th Floor Nursing	28,453	40%	10%	43,818						
	Research/Education Space				1,040						
Eight Floor						44,858	51,586	51,116	50,723	54,165	INCLUDES 2300 GSF BRIDGE
	8th Floor Nursing	28,453	40%	10%	43,818						
	Research/Education Space				1,040						
SUBTOTAL: DGSF		301,390				410,644	472,240	425,862	426,883	476,975	
					BUILDING GROSSING FACTOR*	15%	61,597				
					TOTAL BUILDING GROSS SQ. FT.		472,240				

Note:

* *Building Grossing Factor includes: stairs, elevators, mechanical shafts, exterior wall and corridors not within specific departments*

** *Third Level Clinical/Facility Support includes education, research and support requirements as yet unidentified.*

*** *Public Waiting / Lobby to support all fifth floor functions*

Ancillary Renovated Spaces

In addition to space programming and preliminary designs for new construction components, there was considerable effort involved in capturing the impacts to existing support services. Some support services, where appropriate, are captured as new spaces within the new additions. Other existing support services and ancillary spaces will require renovations and expansions to meet the demands of the increased inpatient and surgical services being relocated from the Centennial building. These impacts are summarized in the following Renovation program and articulated in the design drawings. These ancillary renovations are not developed in detail in this report, but they are included in order to capture Master Plan level discussions and the cost impacts of the renovations required to satisfy the increased burden imposed by the relocated programs and services.

HALIFAX INFIRMARY	Hybrid Concept					
RENOVATION PROGRAM	Version 2					
	DGSF	Intensity of Reno	1 Low	2 Medium	3 High	4 Very High
LEVEL ONE						
Reassignment of office spaces	4,600	1	4,600	0	0	0
Reassignment of office spaces	2,000	1	2,000	0	0	0
Reassignment of office spaces	300	1	300	0	0	0
Reassignment of office spaces	1,000	1	1,000	0	0	0
LEVEL TWO						
Convert existing womens locker room to new corridor	1,400	2	0	1,400	0	0
New Corridor under existing construction	1,200	4	0	0	0	1,200
Convert Cafeteria and Servery toPharmacy	9,200	3	0	0	9,200	0
Convert Pharmacy to Womens Lockers	4,800	3	0	0	4,800	0
Expand Mens Lockers into Cardiac Offices	1,500	2	0	1,500	0	0
Retain/Modify/Expand Pharmacy Offices	3,400	1	3,400	0	0	0
Convert Offices to Body Holding	400	2	0	400	0	0
Expanded Medical Device Processing	1,693	3	0	0	1,693	0
Renovate for Sleep Rooms	1,215	2	0	1,215	0	0
LEVEL THREE						
Renovations above Level Two Connection	2,740	4	0	0	0	2,740
Expand Diagnostic Imaging into Film Holding & Waiting	6,500	3	0	0	6,500	0
Renovate Ambulance Bay for New Corridor under existing construction	1,022	4	0	0	0	1,022
LEVEL FOUR						
Renovate for Connection to New Addition	1,600	3	0	0	1,600	0
LEVEL FIVE						
Renovate Prep for Connection to New Addition	1,000	3	0	0	1,000	0
LEVEL SIX						
Renovate Food and Nutrition for Expanded Clinical Lab	2,000	3	0	0	2,000	0
Renovate Heart/ED for Expanded Clinical Lab	400	3	0	0	400	0
Renovate existing for New Bridge Connection	384	3	0	0	384	0
LEVEL SEVEN						
Renovate existing for New Bridge Connection	384	3	0	0	384	0
LEVEL EIGHT						
Renovate existing for New Bridge Connection	384	3	0	0	384	0
TOTALS	49,122		11,300	4,515	28,345	4,962

Design Solution: Hybrid Concept

Description

The Hybrid Concept for the HI addition incorporates elements from both the Courtyard and Bow concepts from the Part A report. The development of the Hybrid plan was driven largely by two key issues raised during Stakeholder Workshops held at the beginning of Part B. These included:

1. Stated benefits and requirement that all floors (including the three top inpatient floors) connect horizontally between the existing and new buildings.
2. Inpatient units of 25-beds were the best fit with CDHA staffing and care delivery models, and that changes to this were not foreseen within the timeframe of the addition being built.

These central issues were at odds with the 3-pod Courtyard plan - the preferred option at the completion of Part A. Both the division of the 50-bed floors into 25-bed units and the requirement for a central connection to the existing building on Levels 6, 7 and 8 require that the plan transform into a 2-winged plan with the connection point closer to the existing building in order to simplify and minimize circulation space and facilitate wayfinding.

This redesign allows for a fairly compact plan with efficient travel distances within the units, while allowing daylight into all patient rooms, lounges and some support spaces. The layout allows all patient rooms to have views without looking across at another face of the building.

Each 25-bed wing is organized around a central service/support core that will contain staff work areas along with storage, utility rooms, etc., while the patient bedrooms and other patient/family spaces form a ring around the perimeter.

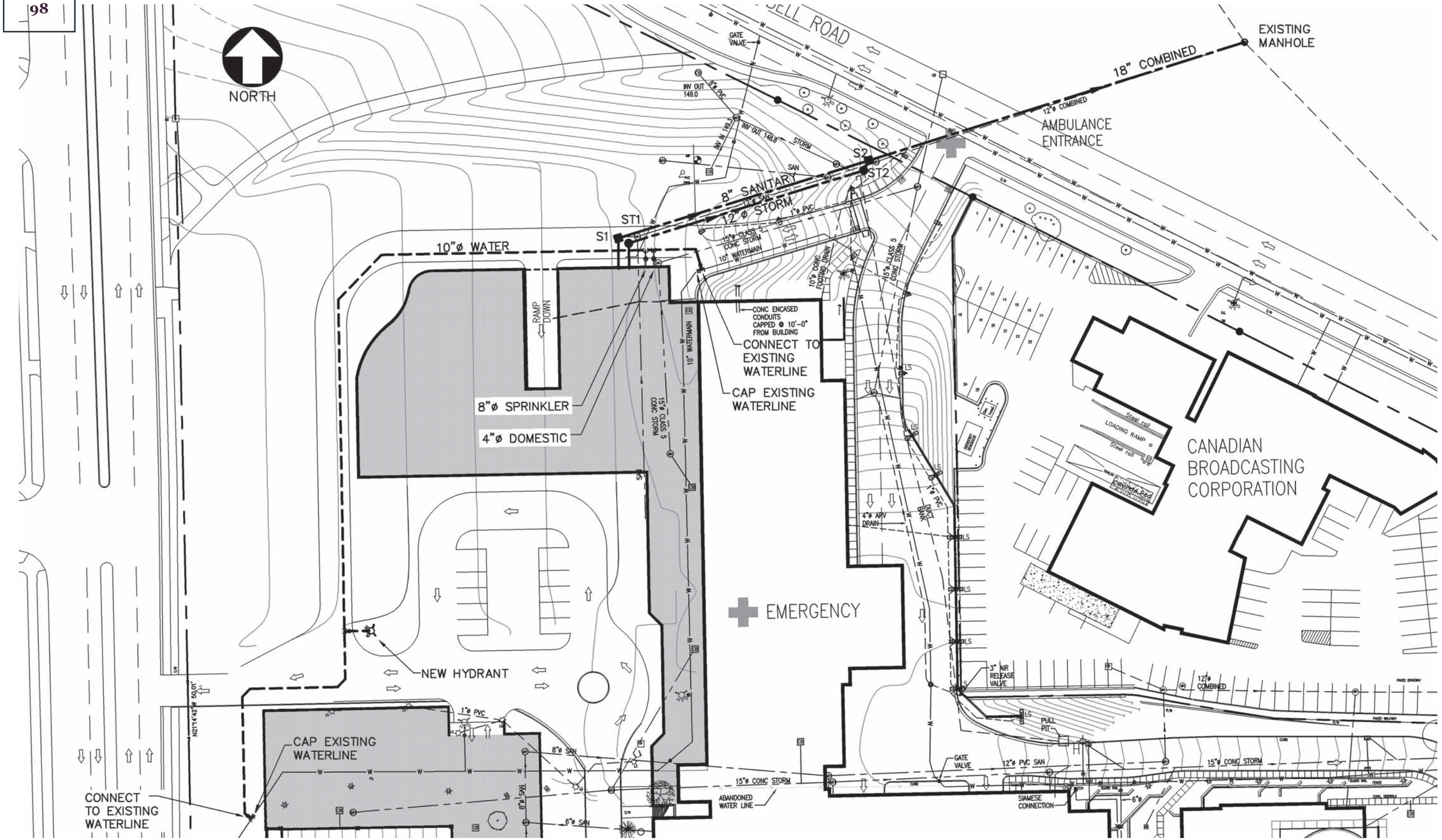
This racetrack design for the inpatient units along with the flexible, “modular” central core concept allows the Level 6 inpatient floor to be developed as a consolidated IMCU floor, and allows all inpatient floors to more easily accommodate as-yet undecided specialized units (e.g., burns, transplant, etc.). As the Clinical Services Plan is evolved further, this plan will much more easily accommodate the specialized spaces and functions required by specialized services.

This plan preserves much of the northern slope of the existing community gardens facing the Commons and allows the creation of an expansive green roof terrace over Level 5, creating both views and interest for patient rooms on the north and west facades. Other modifications realized in this plan in response to stakeholder input include:

1. The elevator core required to serve the bridge/link that connects the new and existing inpatient floors on levels 6, 7 and 8 provides convenient vertical transport for patient transfers between inpatient units as well as from the rooftop helipad to the ORs and ICUs on Level 5 and the Trauma room and Diagnostic Imaging Dept. on Level 3. This location helps separate patient transfer activities from the general public resulting in enhanced patient safety and privacy.
2. The access road from Bell Rd. now runs around the addition, rather than beneath, reconnecting the program space on Level 3 that had previously been isolated from the rest of the addition.
3. Relocation of new CSPD from Level 4 (Part A) to Level 2, with a new connecting service corridor.
4. Integration of 12-bed ICU from Centennial into the Level 5 floor plan, on the same floor as the ORs and other existing ICUs.
5. Closer proximity between of the public entrances and elevator lobbies on Level 4 of the new and existing buildings.

Drawings

See the site and floor plan drawings on the following pages illustrating the concept described for this site. The floor plans are followed by 3D drawings illustrating the massing of the hospital from a variety of angles.



PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Halifax Infirmary
Hybrid Concept
Site Servicing Concept

nycum+ ASSOCIATES SMITHGROUP Smithgroup AEIP International Inc.
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

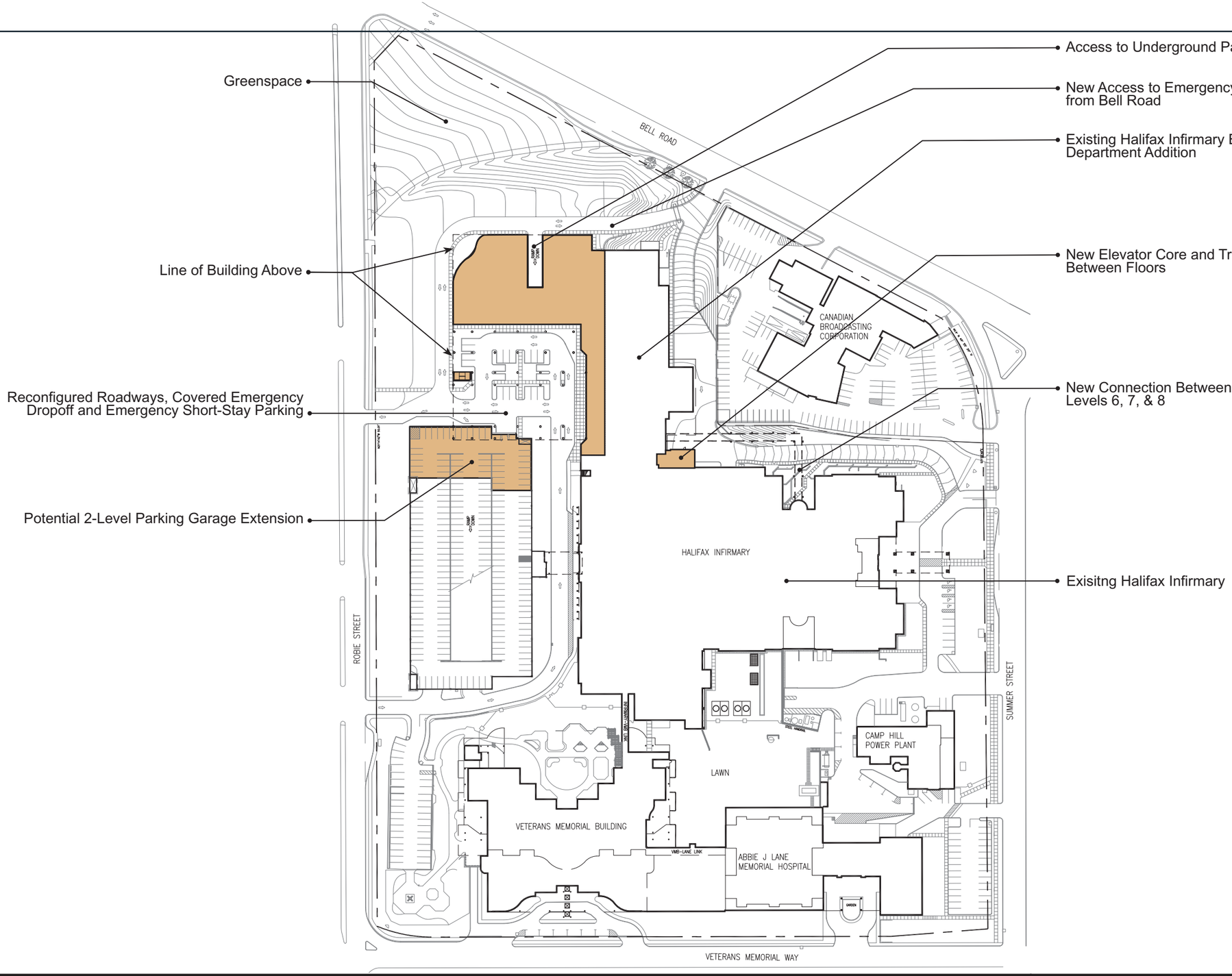
CBCL LIMITED
Consulting Engineers
ISO 9001 CERTIFIED

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date: 31 May 2013
Scale: 1" = 60'-0"
Drawn: BG

Drawing Number
A.C1



N

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Halifax Hybrid Concept - Site Plan

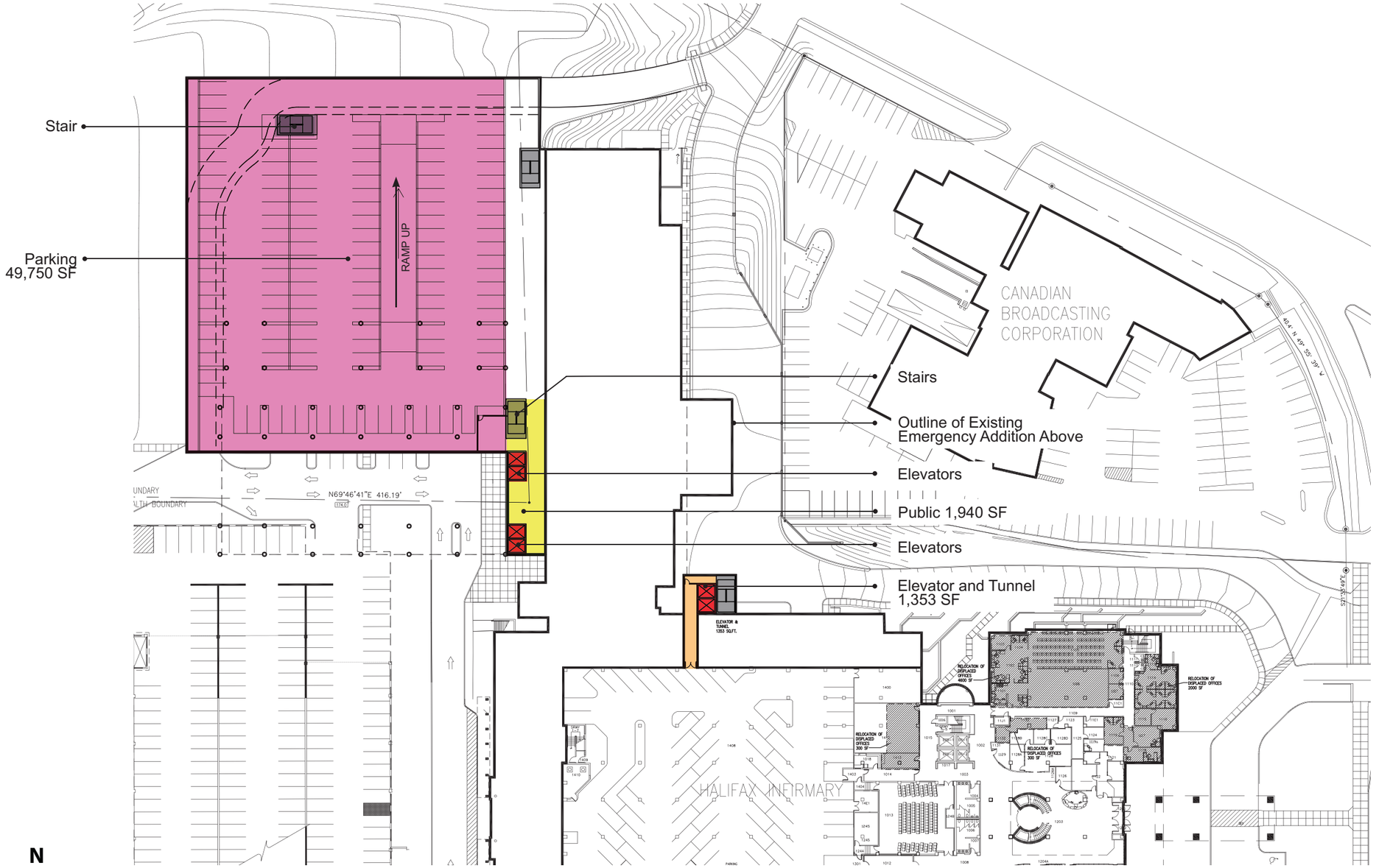
nycum+ ASSOCIATES SMITHGROUP Smithgroup AEIP International Inc.
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013
Scale: NTS
Drawn: SB

Drawing Number
A.00



LEGEND

- Public
- Ancillary/ Diagnostic Services
- Surgery Circulation
- Ambulatory Care
- Patient Room
- Patient Room Circulation
- Stairs
- Renovation
- General Services/ Support
- Parking
- Green Roof
- MEP
- Existing MEP
- Elevators
- CSPD

N

KEY PLAN

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Halifax Hybrid Concept - First Floor Plan - New

nycum+ ASSOCIATES SMITHGROUP Smithgroup AEIP International Inc.

WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

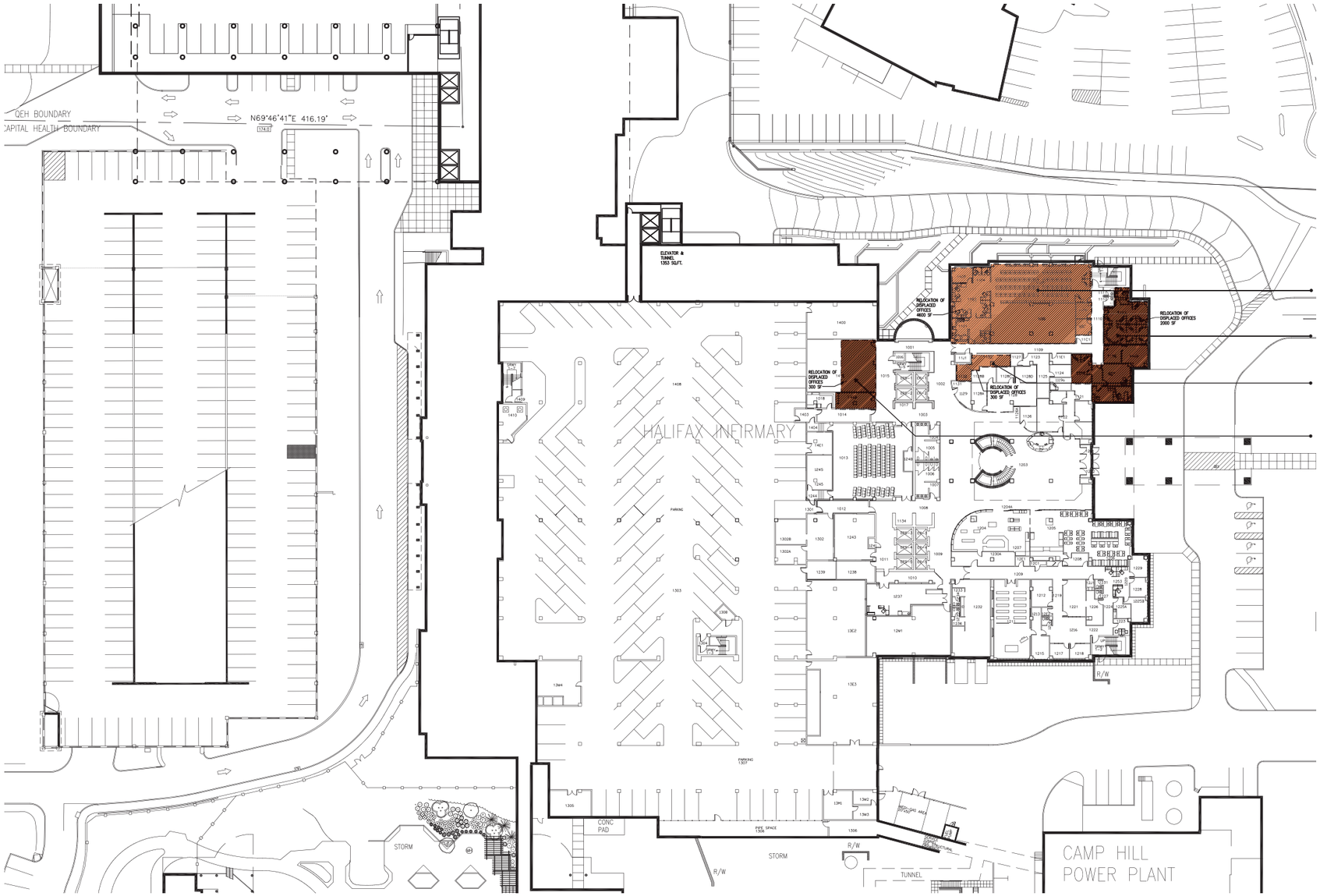
Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013

Scale: NTS

Drawn: SB

Drawing Number
A.01



LEGEND

- Public
- Ancillary/ Diagnostic Services
- Surgery Circulation
- Ambulatory Care
- Patient Room
- Patient Room Circulation
- Stairs
- Renovation
- General Services/ Support
- Parking
- Green Roof
- MEP
- Existing MEP
- Elevators
- CSPD

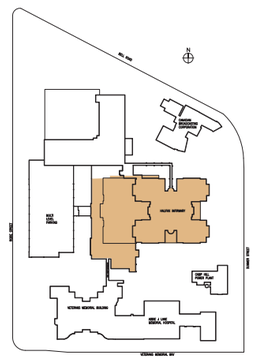
Relocation of Displaced Offices
4,600 SF

Relocation of Displaced Offices
2,000 SF

Relocation of Displaced Offices
300 SF

Relocation of Displaced Offices
1000 SF

N



KEY PLAN

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Halifax Hybrid Concept - First Floor Plan - Renovation

nycum+ ASSOCIATES SMITHGROUP Smithgroup AEIP International Inc.
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

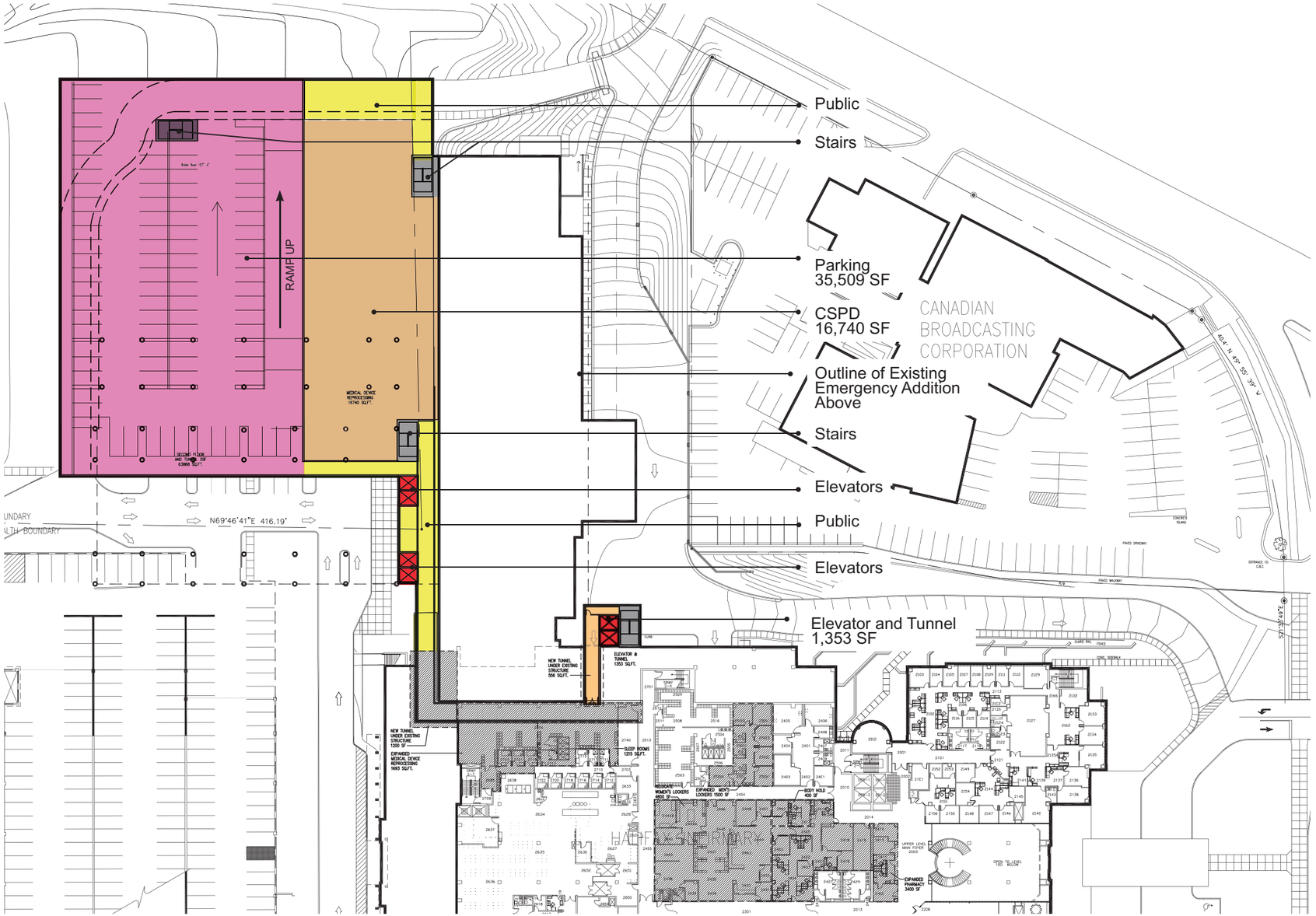
Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013

Scale: NTS

Drawn: SB

Drawing Number
A.02



LEGEND

- Public
- Ancillary/ Diagnostic Services
- Surgery Circulation
- Ambulatory Care
- Patient Room
- Patient Room Circulation
- Stairs
- Renovation
- General Services/ Support
- Parking
- Green Roof
- MEP
- Existing MEP
- Elevators
- CSPD

N

KEY PLAN

PRELIMINARY - NOT FOR CONSTRUCTION

The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Halifax Hybrid Concept - Second Floor Plan - New

Drawing Number
A.03

nycum+ ASSOCIATES SMITHGROUP Smithgroup AEIP International Inc.

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WITH SMITHGROUP AEIP INTERNATIONAL, INC.

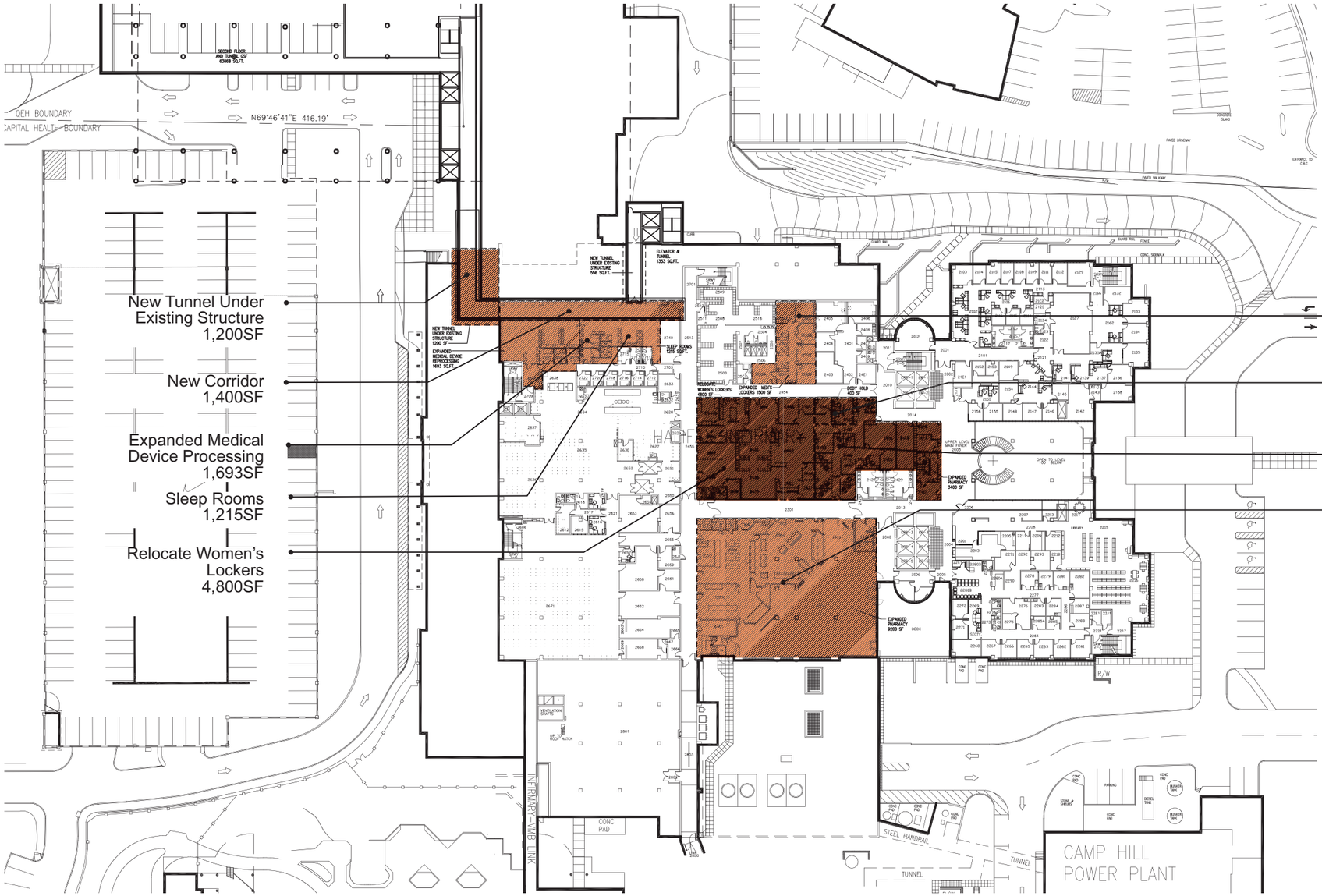
Project 1214:

Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013

Scale: NTS

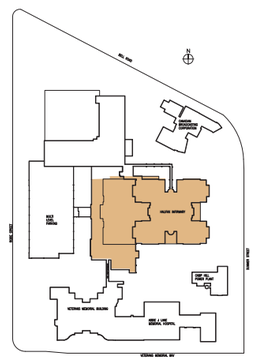
Drawn: SB



LEGEND

- Public
- Ancillary/ Diagnostic Services
- Surgery Circulation
- Ambulatory Care
- Patient Room
- Patient Room Circulation
- Stairs
- Renovation
- General Services/ Support
- Parking
- Green Roof
- MEP
- Existing MEP
- Elevators
- CSPD

N



KEY PLAN

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Halifax Hybrid Concept - Second Floor Plan - Renovation

nycum+ ASSOCIATES SMITHGROUP Smithgroup AEIP International Inc.

WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

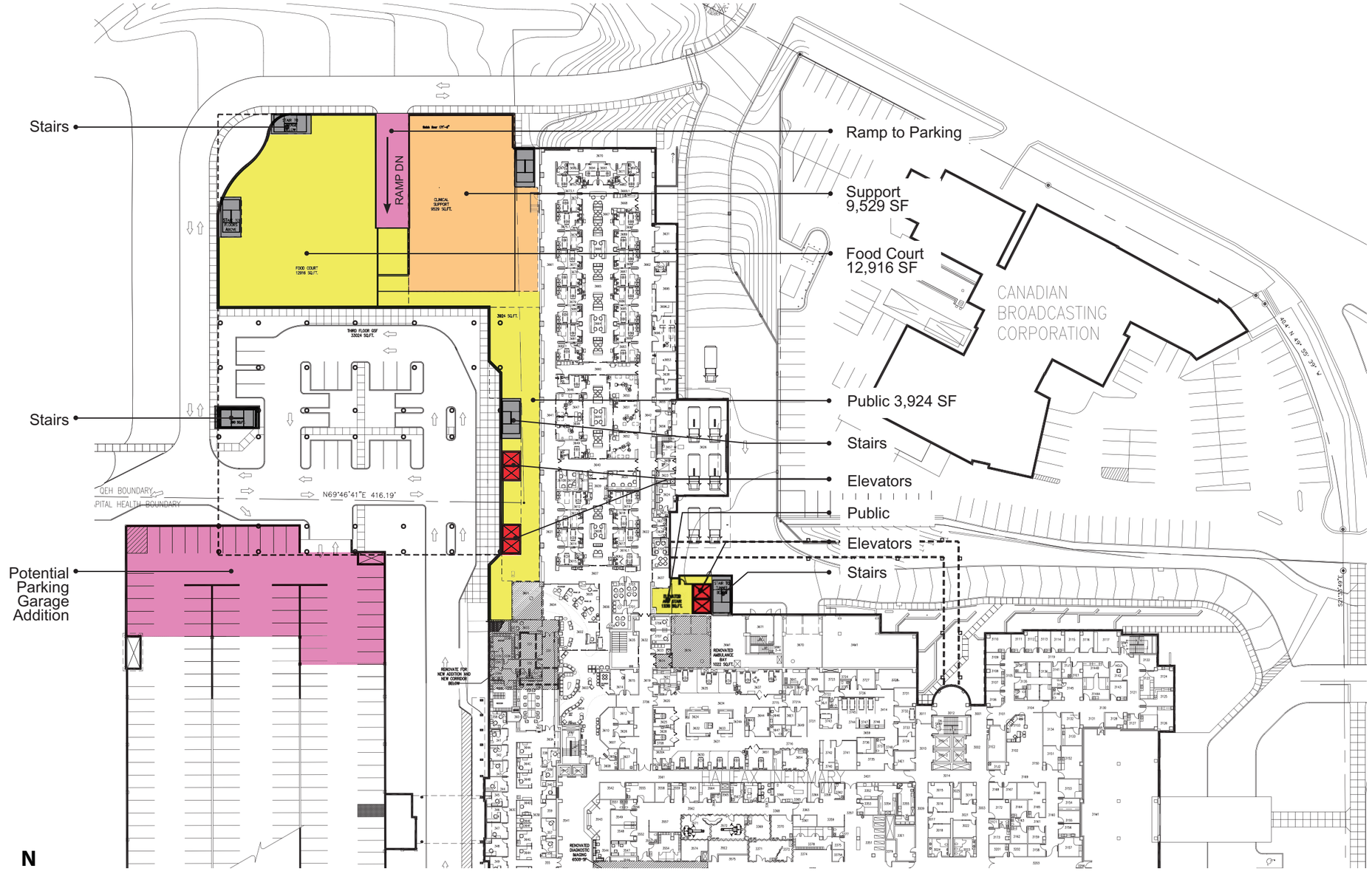
Capital Health Innovative Care Flexible Facilities

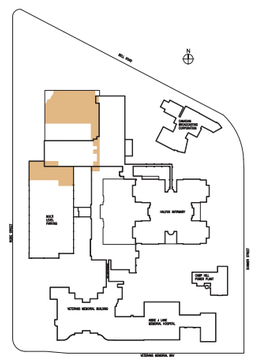
Date: May 31, 2013

Scale: NTS

Drawn: SB

Drawing Number
A.04





KEY PLAN

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Halifax Hybrid Concept - Third Floor Plan - New

nycum+ ASSOCIATES SMITHGROUP Smithgroup AEIP International Inc.

WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

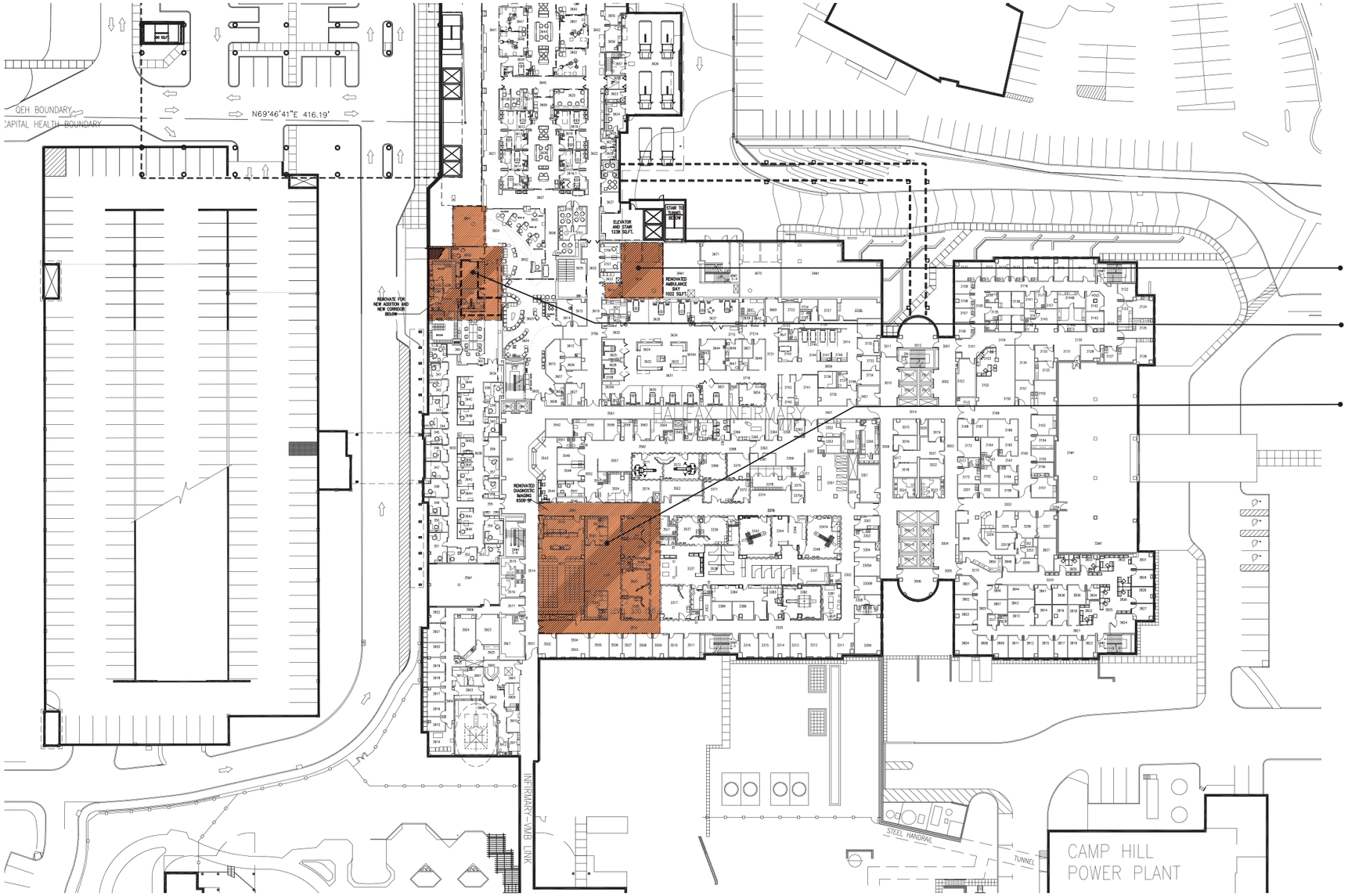
Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013

Scale: NTS

Drawn: SB

Drawing Number
A.05



LEGEND

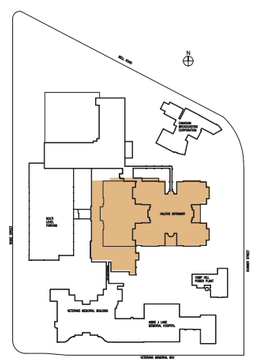
- Public
- Ancillary/ Diagnostic Services
- Surgery Circulation
- Ambulatory Care
- Patient Room
- Patient Room Circulation
- Stairs
- Renovation
- General Services/ Support
- Parking
- Green Roof
- MEP
- Existing MEP
- Elevators
- CSPD

Renovated Ambulance Bay
1,022SF

Renovate for New Addition and New Corridor Below
2,740SF

Renovated Diagnostic Imaging
6,500SF

N



KEY PLAN

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Halifax Hybrid Concept - Thrid Floor Plan - Renovation

nycum+ ASSOCIATES SMITHGROUP Smithgroup AEIP International Inc.

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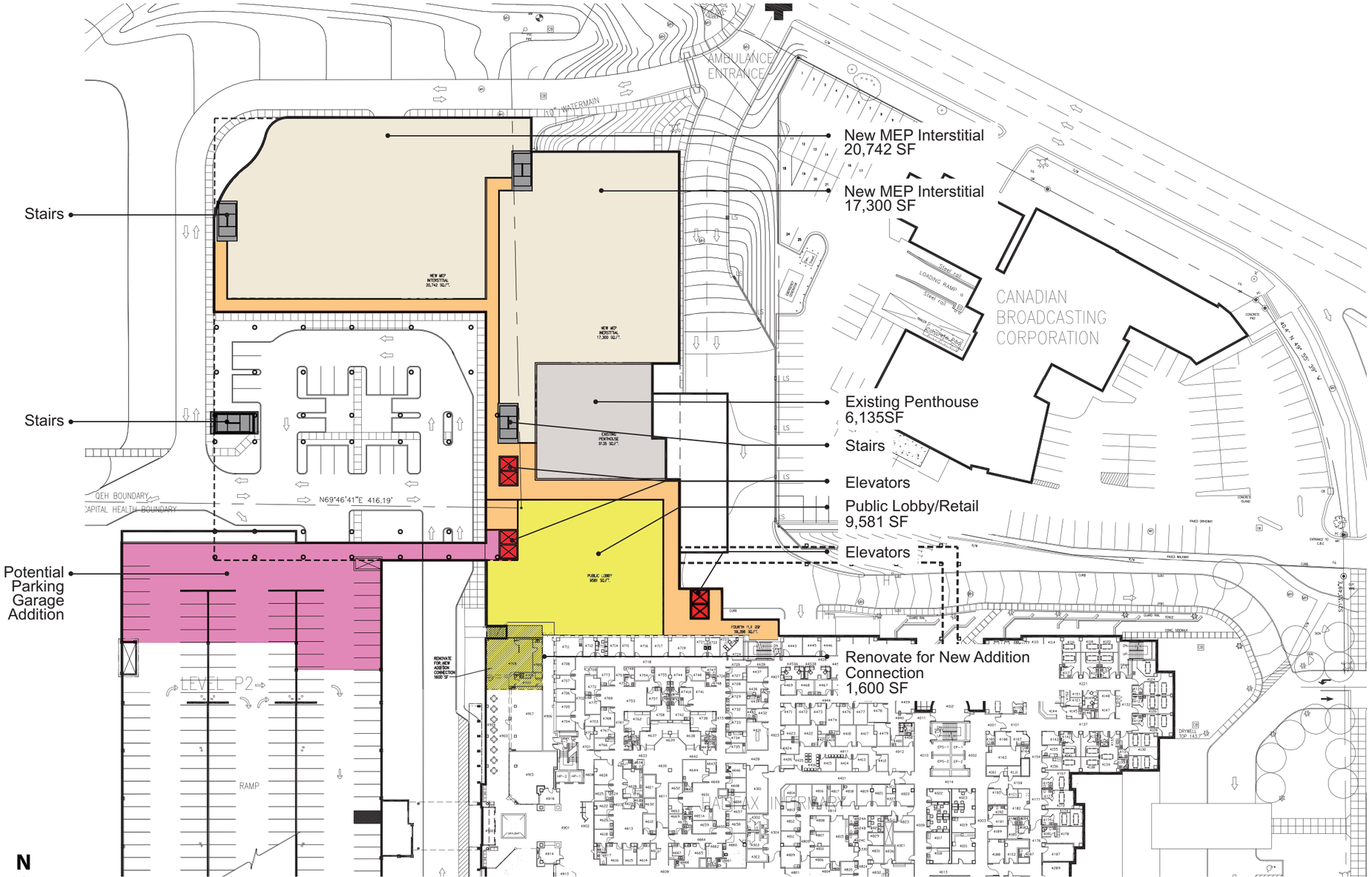
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

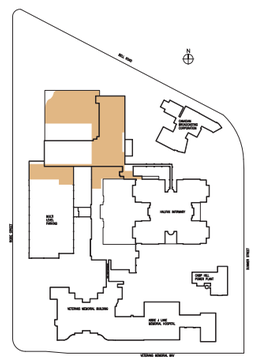
Date: May 31, 2013
Scale: NTS
Drawn: SB

Drawing Number
A.06



LEGEND

- Public
- Ancillary/ Diagnostic Services
- Surgery Circulation
- Ambulatory Care
- Patient Room
- Patient Room Circulation
- Stairs
- Renovation
- General Services/ Support
- Parking
- Green Roof
- MEP
- Existing MEP
- Elevators
- CSPD



KEY PLAN

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Halifax Hybrid Concept - Fourth Floor Plan - New

nycum+ ASSOCIATES SMITHGROUP Smithgroup AEIP International Inc.
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

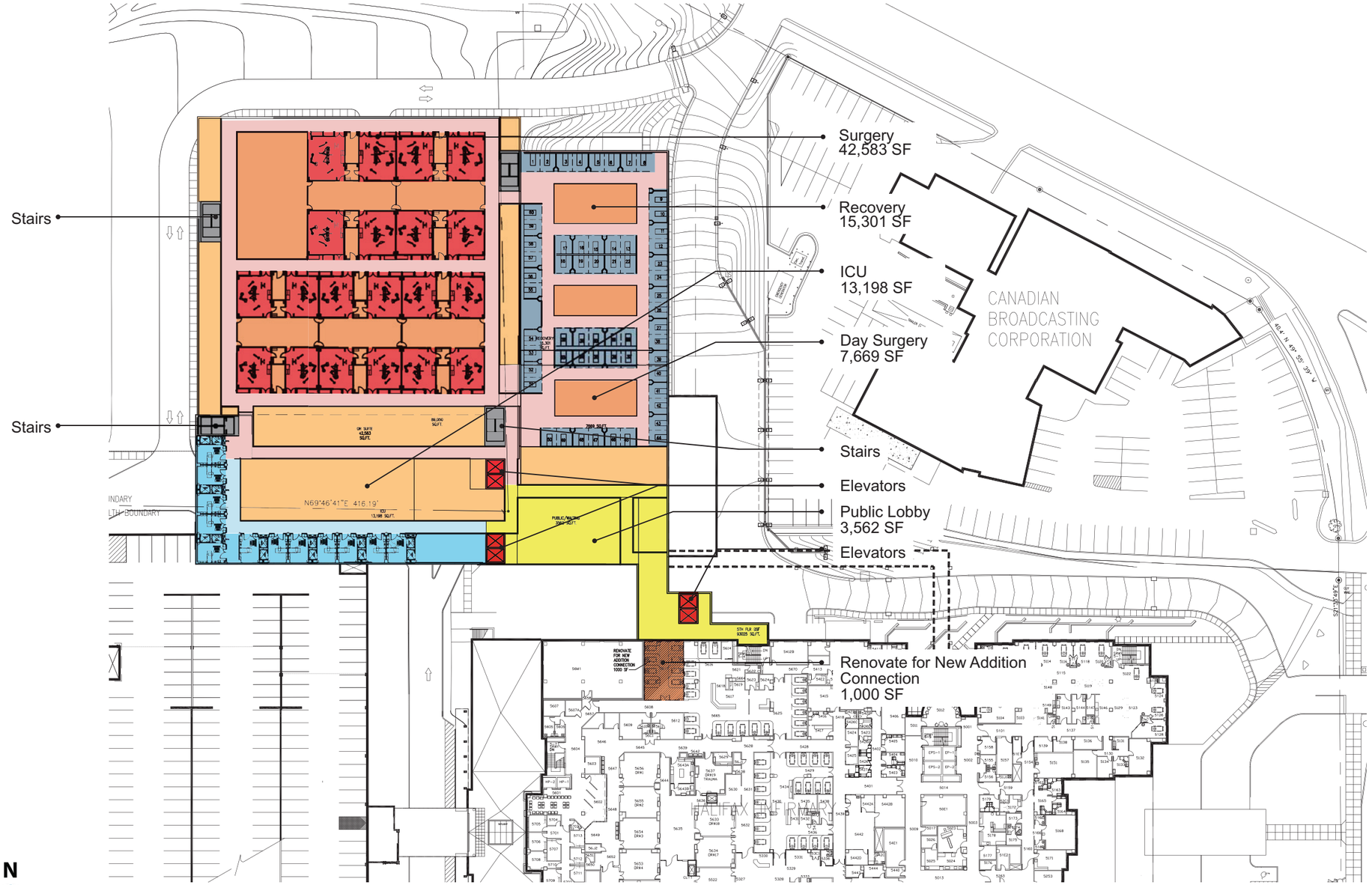
Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013

Scale: NTS

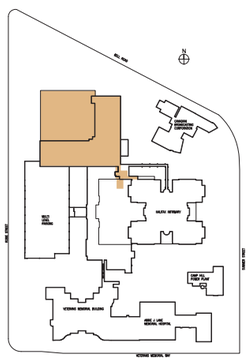
Drawn: SB

Drawing Number
A.07



LEGEND

- Public
- Ancillary/ Diagnostic Services
- Surgery Circulation
- Ambulatory Care
- Patient Room
- Patient Room Circulation
- Stairs
- Renovation
- General Services/ Support
- Parking
- Green Roof
- MEP
- Existing MEP
- Elevators
- CSPD



KEY PLAN

N

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Halifax Hybrid Concept - Fifth Floor Plan - New - OPTION 1

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Project 1214:

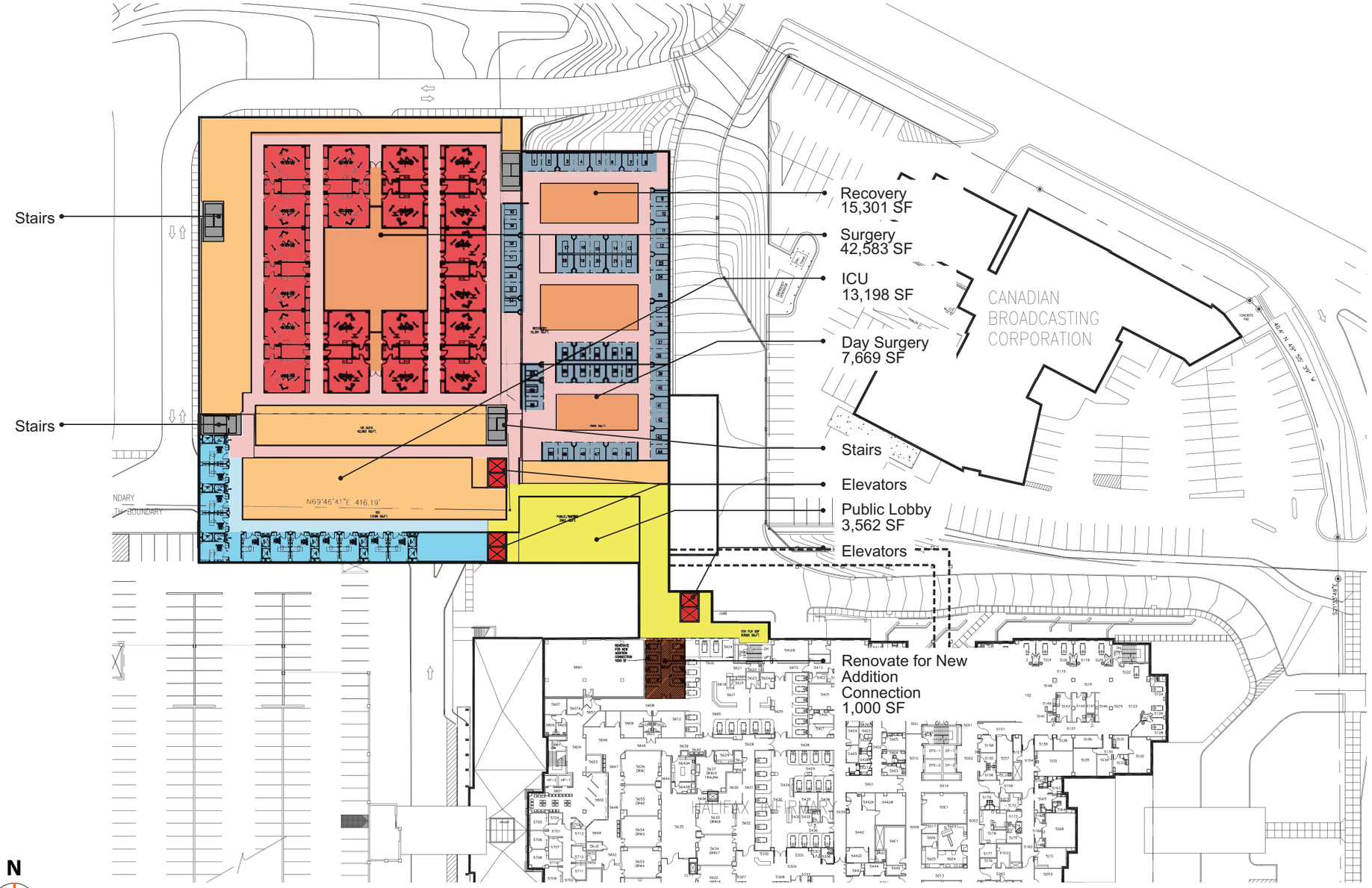
Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013

Scale: NTS

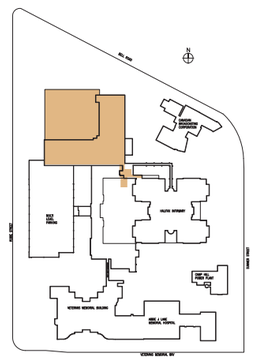
Drawn: SB

Drawing Number
A.08



LEGEND

- Public
- Ancillary/ Diagnostic Services
- Surgery Circulation
- Ambulatory Care
- Patient Room
- Patient Room Circulation
- Stairs
- Renovation
- General Services/ Support
- Parking
- Green Roof
- MEP
- Existing MEP
- Elevators
- CSPD



KEY PLAN

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Halifax Hybrid Concept -
Fifth Floor Plan - New - OPTION 2

Drawing Number
A.09

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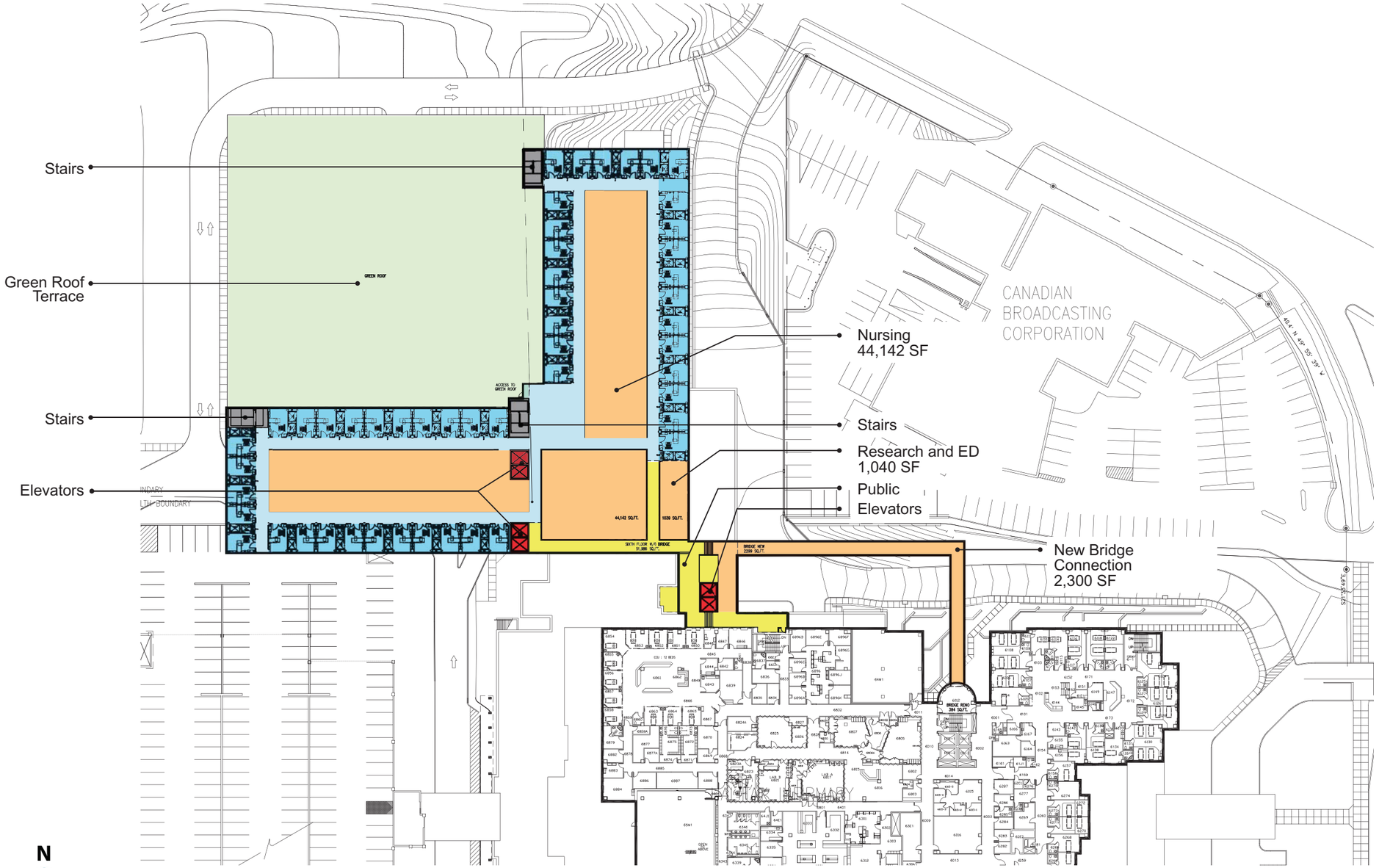
Project 1214:

Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013

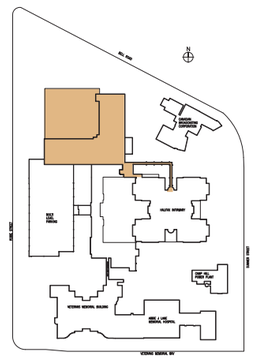
Scale: NTS

Drawn: SB



LEGEND

- Public
- Ancillary/ Diagnostic Services
- Surgery Circulation
- Ambulatory Care
- Patient Room
- Patient Room Circulation
- Stairs
- Renovation
- General Services/ Support
- Parking
- Green Roof
- MEP
- Existing MEP
- Elevators
- CSPD



KEY PLAN

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Halifax Hybrid Concept - Sixth Floor Plan - New

nycum+ ASSOCIATES SMITHGROUP Smithgroup AEIP International Inc.
WILLIAM NYCUM & ASSOCIATES LIMITED
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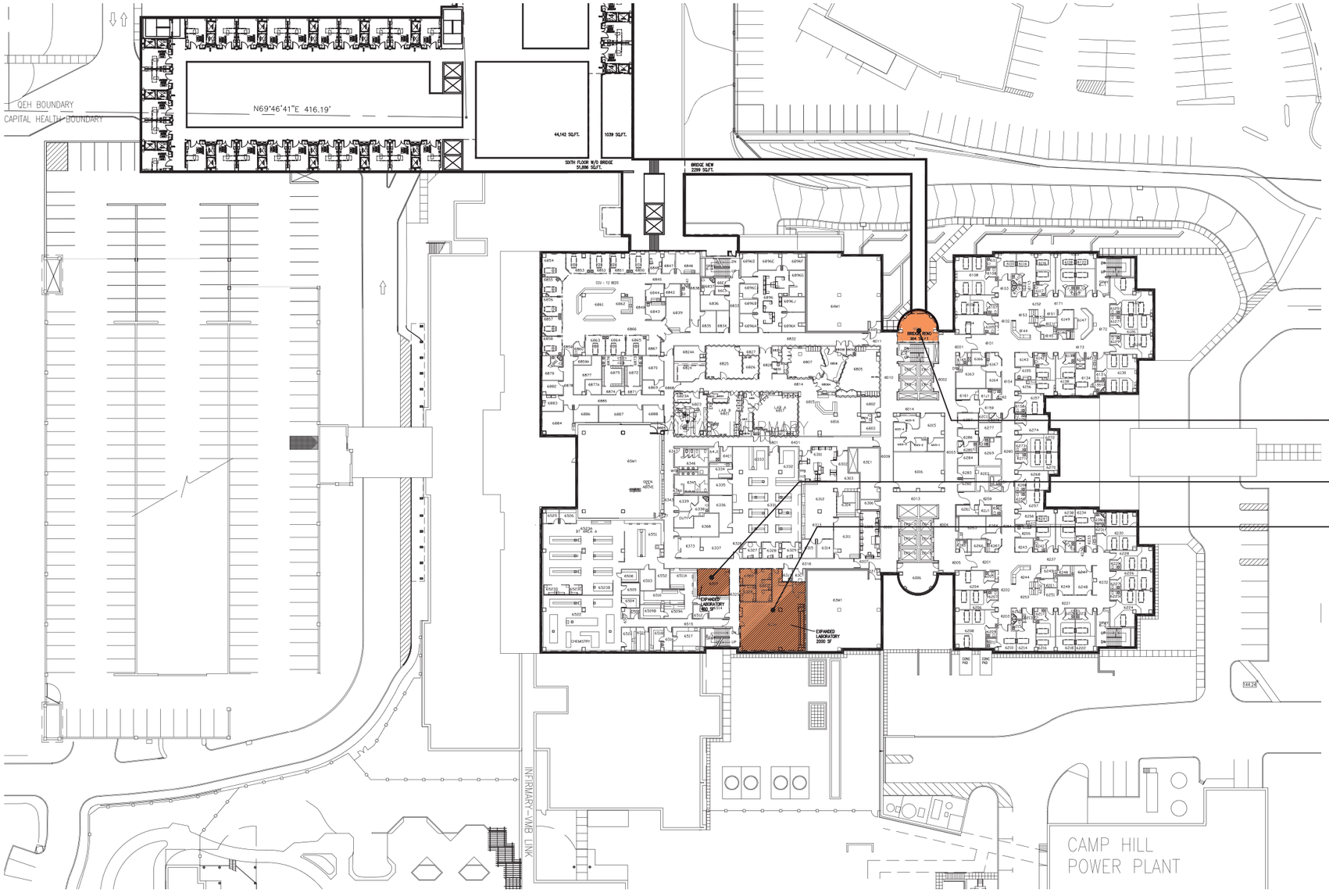
Project 1214:

Capital Health Innovative Care Flexible Facilities

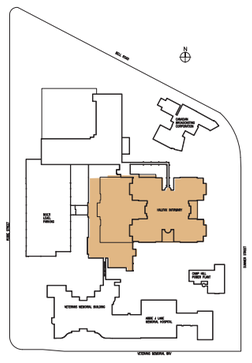
Date: May 31, 2013
Scale: NTS
Drawn: SB

Drawing Number
A.10



LEGEND

- Public
- Ancillary/ Diagnostic Services
- Surgery Circulation
- Ambulatory Care
- Patient Room
- Patient Room Circulation
- Stairs
- Renovation
- General Services/ Support
- Parking
- Green Roof
- MEP
- Existing MEP
- Elevators
- CSPD



KEY PLAN

N

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Halifax Hybrid Concept - Sixth Floor Plan - Renovation

nycum+ ASSOCIATES SMITHGROUP Smithgroup AEIP International Inc.
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Project 1214:

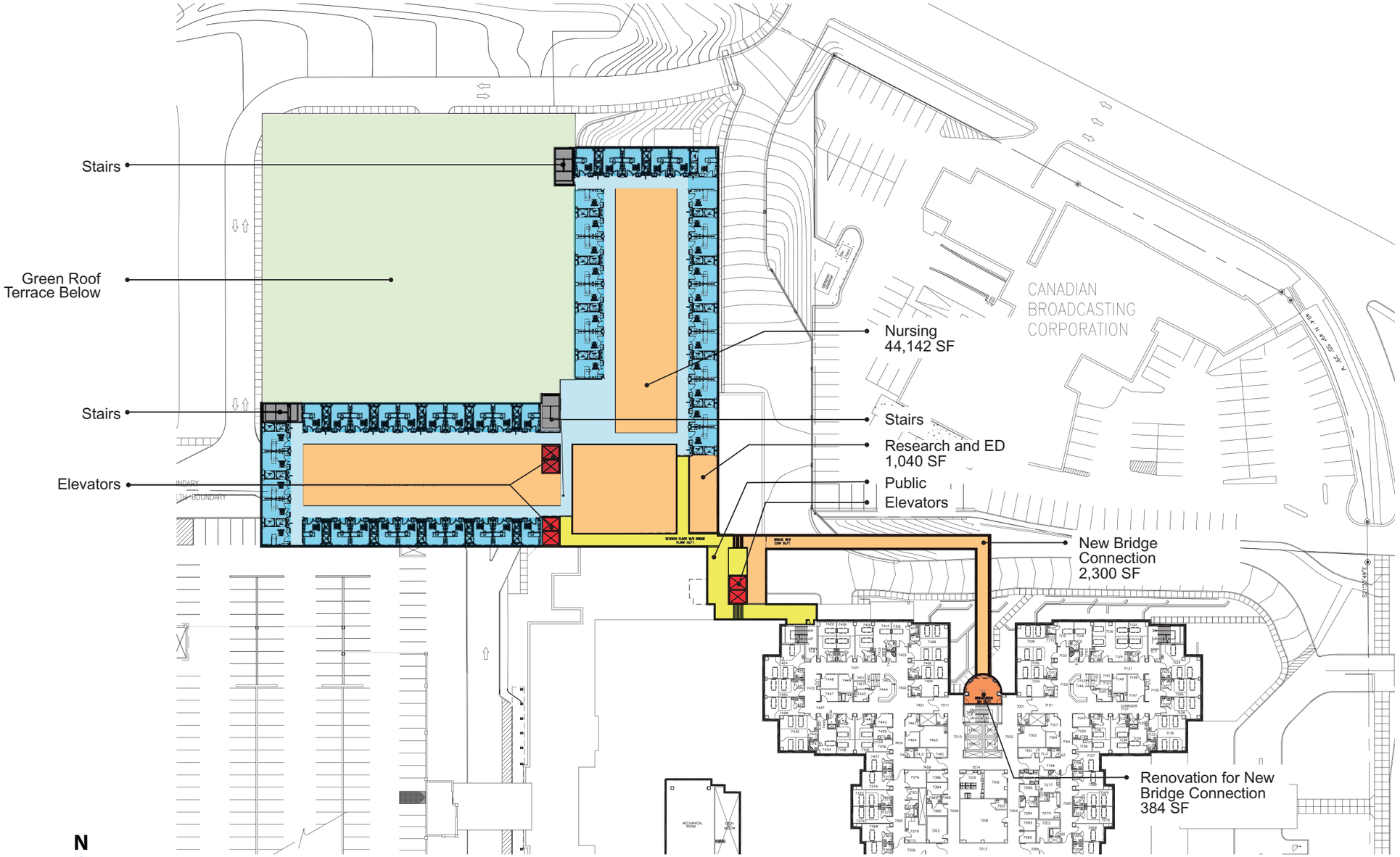
Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013

Scale: NTS

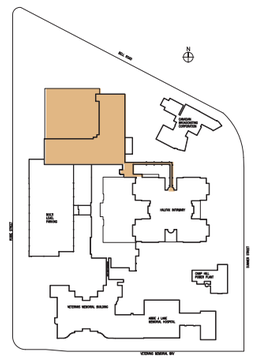
Drawn: SB

Drawing Number
A.11



LEGEND

- Public
- Ancillary/ Diagnostic Services
- Surgery Circulation
- Ambulatory Care
- Patient Room
- Patient Room Circulation
- Stairs
- Renovation
- General Services/ Support
- Parking
- Green Roof
- MEP
- Existing MEP
- Elevators
- CSPD



KEY PLAN

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Halifax Hybrid Concept - Seventh Floor Plan - New

nycum+ ASSOCIATES SMITHGROUP Smithgroup AEIP International Inc.
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WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

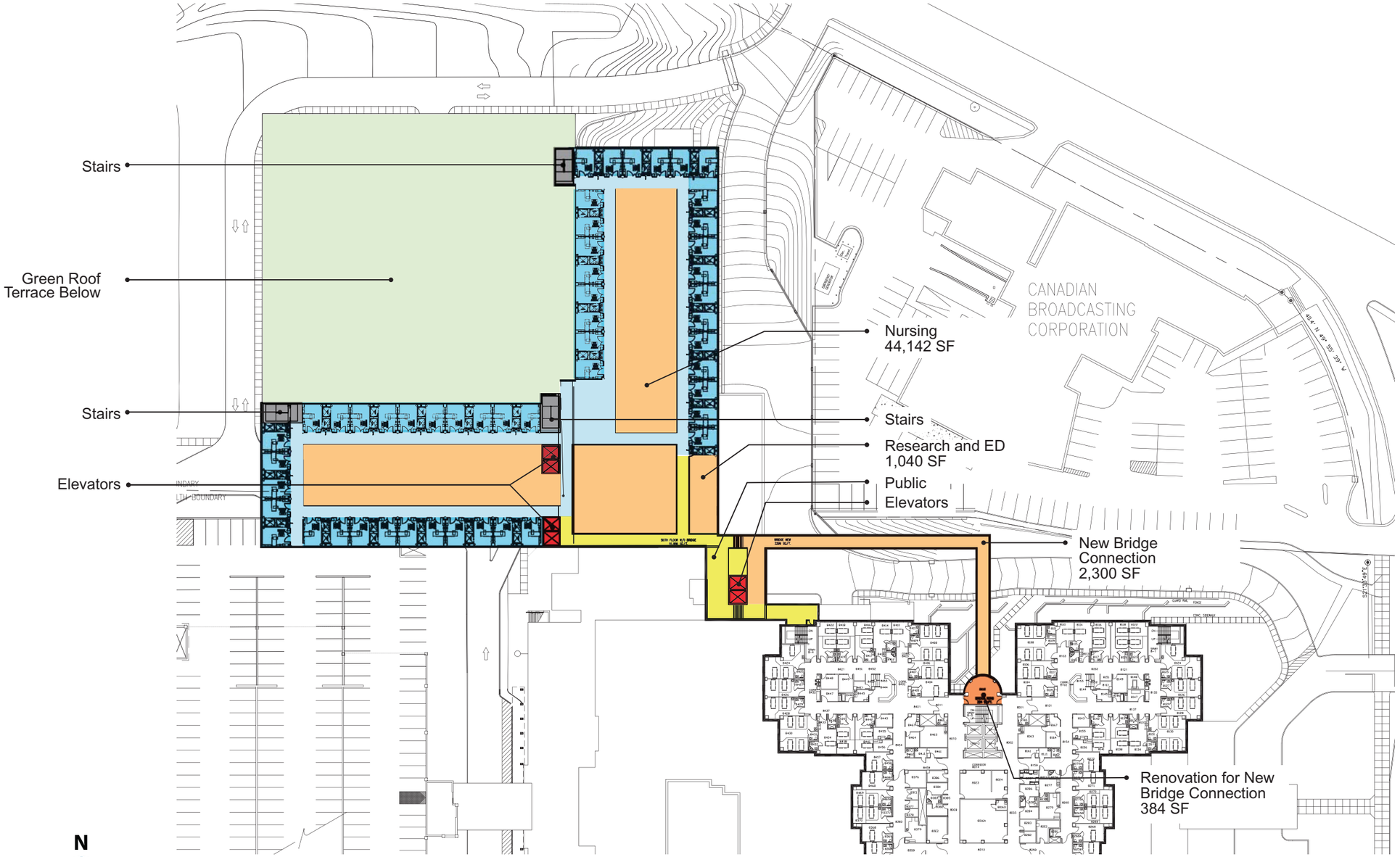
Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013

Scale: NTS

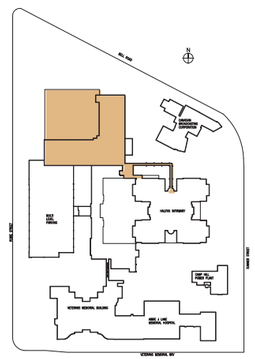
Drawn: SB

Drawing Number
A.12



LEGEND

- Public
- Ancillary/ Diagnostic Services
- Surgery Circulation
- Ambulatory Care
- Patient Room
- Patient Room Circulation
- Stairs
- Renovation
- General Services/ Support
- Parking
- Green Roof
- MEP
- Existing MEP
- Elevators
- CSPD



KEY PLAN

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Halifax Hybrid Concept - Eighth Floor Plan - New

nycum+ ASSOCIATES SMITHGROUP Smithgroup AEIP International Inc.
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013
Scale: NTS
Drawn: SB

Drawing Number
A.13

Southwest Aerial Perspective

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Halifax Hybrid Concept

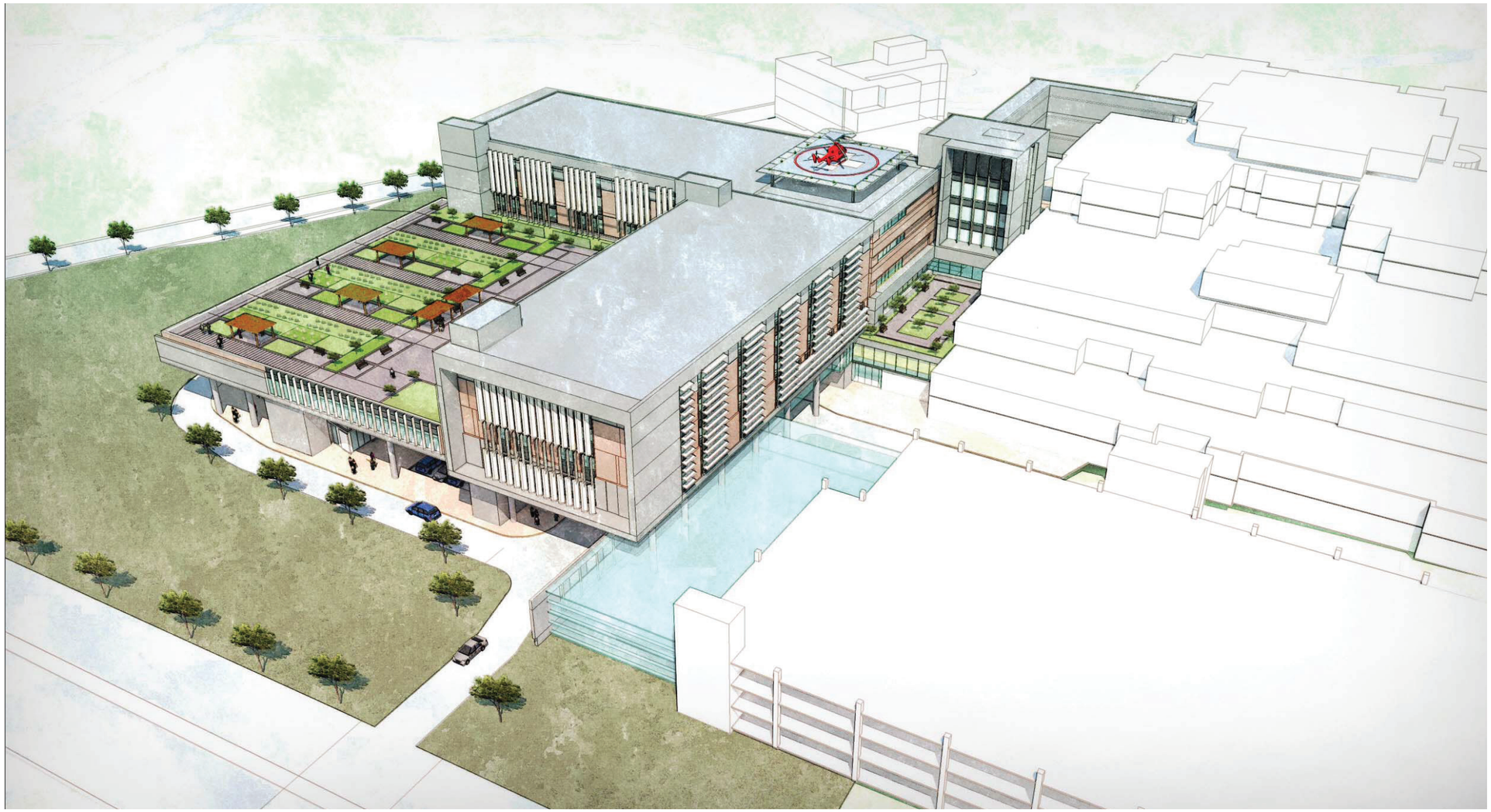
nycum+ ASSOCIATES SMITHGROUP Smithgroup AEIP International Inc.
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013
Scale: NTS
Drawn: VB

Drawing Number
A.14



Northeast Aerial Perspective

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Halifax Hybrid Concept

nycum+ ASSOCIATES SMITHGROUP Smithgroup AEIP International Inc.
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013
Scale: NTS
Drawn: VB

Drawing Number
A.15

West Street Perspective

Northeast Street Perspective

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Halifax Hybrid Concept

Drawing Number
A.16

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Project 1214:

Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013

Scale: NTS

Drawn: VB

Southeast Street Perspective

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Halifax Hybrid Concept

nycum+ ASSOCIATES SMITHGROUP Smithgroup AEIP International Inc.
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013
Scale: NTS
Drawn: VB

Drawing Number
A.17

Southeast Green Roof Perspective

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Halifax Hybrid Concept

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WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013
Scale: NTS
Drawn: VB

Drawing Number
A.18

South Elevation

North Elevation

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Halifax Hybrid Concept

nycum+ ASSOCIATES SMITHGROUP Smithgroup AEIP International Inc.
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013
Scale: NTS
Drawn: VB

Drawing Number
A.19

West Elevation

East Elevation

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Halifax Hybrid Concept

nycum+ ASSOCIATES SMITHGROUP Smithgroup AEIP International Inc.
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Project 1214:

Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013
Scale: NTS
Drawn: VB

Drawing Number
A.20

Discussion and Preliminary Outline Specification Information

Civil Engineering Commentary

Investigations and Existing Conditions

The location for the Halifax Infirmary expansion is the recently demolished Queen Elizabeth High School. This site is bounded by Robie Street to the west, Bell Road to the northeast, the existing Emergency to the east and the Multi-Level parking to the south. The land slopes gently from the west, easterly to the existing emergency. The finish surface is grass with portions presently being used as a vegetable gardening area. It is our understanding that the material below the surface will contain buried bricks and rubble debris from the demolition of the school. Sulphide-bearing slate bedrock may be encountered in areas below the old school basement and outside the school foundation perimeter.

Sanitary Service

An existing 8 inch sanitary service handles a portion of the sanitary flows from the existing Halifax Infirmary/ Emergency building. It is anticipated that most of the capacity of this 8 inch pipe is presently utilized. There is also an abandoned sanitary from the High School close to the new addition and draining towards Bell Road. This sewer is old and without doing a CCTV investigation, the structural integrity cannot be determined. Unless it can be proven that this sewer can be used, or there is access and adequate capacity in the 8 inch pipe servicing the existing hospital, sanitary servicing for the new addition will be via a lateral running towards Bell Road connecting to the combined city sewer which is located northeast of Bell Road. An observation manhole will be installed at the property line as part of Halifax Water requirements. Halifax Regional Municipality Municipal Design Guidelines and Halifax Water Design and Construction Specifications will be followed in the design of this system. The existing trunk sewer may require a capacity check to ensure there is sufficient spare capacity to accept the discharge from this addition.

Water Service

The new addition will require a new domestic and sprinkler service. The existing Hospital is serviced by a 10 inch “Campus” ring main. Existing domestic and sprinkler services come off this main. A similar approach will be taken with the new addition where a separate domestic and separate sprinkler will be taped off the ring main into the new mechanical room. The ring main will be extended around the new building and hydrants will also be added at strategic locations. A portion of the line will be abandoned and a hydrant(s) will be replaced or relocated. Halifax Water Design and Construction Specifications will be followed for the design of the additions.

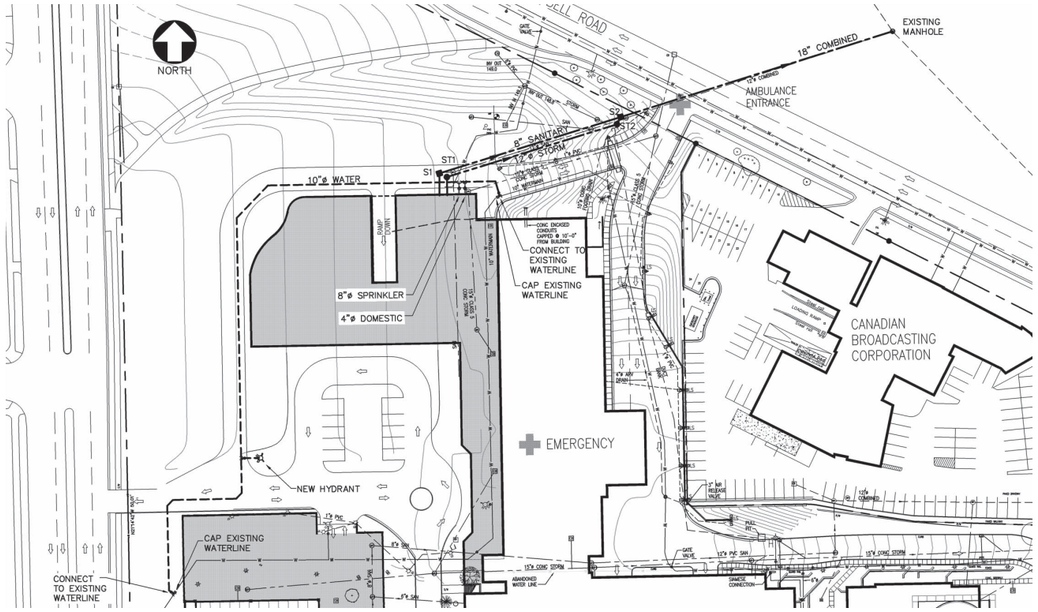
Storm Service

All developments within HRM are required to manage storm water within the development limits so that pre and post development flows are balanced. Use of roof storage along with other storage methods will be utilized to achieve this requirement before discharging to the public combined sewer northeast of Bell Road. The new structure will require under slab and perimeter drainage. This piped system will be directed to the public combined sewer as well.

Some of the existing catch basins may require removal to accommodate the expansion and new catch basins will be added. Halifax Regional Municipality Municipal Design Guidelines and Halifax Water Design and Construction Specifications will be incorporated with the design of the storm services.

Additional Site Consideration

This addition has been located primarily on a portion of the required excavation of the buried rubble and possible sulphide bearing rock. Should geotechnical investigations reveal the presence of sulphide bearing bedrock; this material will have to be dealt with according to the NSE “Sulphide-Bearing Materials Disposal Regulations”.



Above: Reduced size civil engineering site servicing concept plan for the Hybrid concept. See full-sized drawing, A.C1 elsewhere in this report.

Structural Engineering Commentary

The following represents the structural requirements for the design of this facility. It will form the basis for design, outlining the constraints from existing conditions and discussing the possibilities of structural options.

Building Code Structural Requirements and Related Design Options

The building design will need to meet the structural requirements of the 2010 National Building Code (NBCC) for Wind, Snow, Seismic, Live and Dead loads. The NBCC also lists hospitals as post disaster construction and the load factors for safety are increased for Wind, Snow and Seismic and, therefore, provide a structure that will not only survive a disaster, but also be able to provide care services after a disaster.

The NBCC provides a minimum loading for the following Live Loading:

- Main level, assembly areas and corridors – 4.8 kPa.
- Patient rooms – 1.9 kPa.
- Operating rooms and Laboratories – 3.6 kPa.
- Equipment and service rooms – 3.6 kPa.
- Minimum partition loading – 1.0 kPa.

To maximize flexibility, we recommend that all areas, except for main level, assembly areas and corridors (normally designed for 4.8 kPa), be designed for a minimum live load of 3.6 kPa and a partition load of 1 kPa, allowing patient rooms to better accommodate future renovations and use changes. This additional load will also account for any ceiling hung lifting systems being used in patient rooms. Mechanical rooms should be designed for 12 kPa, to allow for future concrete pads for mechanical equipment.

Although Halifax and Dartmouth have different snow loads, we recommend that the slightly higher snow load for Halifax be used for both locations, allowing for future changes to the requirements for snow loading in Dartmouth – this is anticipated to occur as codes are updated, given the proximity of Dartmouth to Halifax.

Future space requirements are often unknown, so we recommend designing the structure to accommodate additional one or two floors. This would support future expansion as long as it does not interfere with municipal and code requirements. Structural costs for the foundations, columns, and shear walls are relatively small compared to the costs of the floor structure.

Structural Options

Structural Steel

Structural steel buildings would require the application of additional products in order to achieve the required fire resistance rating of two hours for floors and columns. Over the course of a building's life, these products may be chipped off due to maintenance (hanging new mechanical ducts, ceilings, etc.) and other activities, compromising the fire rating. Structural steel buildings also have flanges that provide areas for dust and other pathogenic elements to build up on. The clear height to allow for interstitial space is often less for a steel structure than other systems

Recommendation

We suggest alternatives to structural steel buildings, such as concrete cast-in-place flat slab or waffle slab. The use of pre-stressed or post-tensioned construction gives larger spans but provides limited opportunity for renovations, and restricts the flexibility goals of this project: for example, holes that need to be cored for future plumbing or cut for mechanical openings would always have to avoid pre-stressed or the post-tensioned strands, or risk seriously compromising the structural integrity of the building if one is damaged. The loss or damage of one bar of reinforcing due to coring, or a couple of bars due to a small mechanical opening, will have negligible impact on the structural capabilities of a reinforced concrete building. We recommend additional capacity be included in the design of the structure for the buildings described in this report in order to accommodate these activities and enhance the flexibility of the chosen solution.

Most mechanical, electrical or architectural elements in a building can be modified in the future, but this is not the case for structural systems, as altering load paths and member resistances is expensive and impractical in most operational hospitals. Placing columns at larger spacing and minimizing shearwalls within usable floor area provides greater opportunity to alter the building when triggered by a change in use, without the potential restriction a tight column grid might introduce. We recommend the following structural options for different spans:

1. Spans up to 8 m: 204 mm reinforced concrete flat slab
2. Spans between 8 m to 9 m: reinforced slabs with drop panels, 250 mm slabs with 150 mm drop panels.
3. Spans between 9 m to 11 m: concrete waffle slabs.

We recommend that shearwalls (more economical) be located on outside walls, or a moment frame system (less economical) be used instead. Using the elevators and stairwell walls as shearwalls is a common strategy for shearwall location with minimal impact on a floor plan, bearing in mind that the walls of stairwells must extend full-height from the foundation level of a structure.

The existing building is a reinforced concrete structure with concrete walls, foundations, columns and structural slab. The building has been designed for additional floors and the foundation sizes have been sized as such. Reviewing the drawings, from our experience, it appears that little consideration has been given for lateral loads for the addition since, based on observation, the footing under the shear wall appears inadequate for the future expansion. Hence, the shear walls for the new addition beyond the footprint of the existing building will need to be designed to accommodate the lateral loads from the new and the old structures.

The structural option for this is concrete slab with moment frames and/or shear walls for lateral load capability. As mentioned earlier, the shear walls if used, will need to be at exterior walls where possible and full use of the stairwell and elevator walls be employed as shear walls.

Architectural Commentary

To optimize flexibility, much of the central service/ support cores could be defined and subdivided using demountable or modular wall systems, casework and workstations to allow for more rapid reconfiguration in the future, as needs and models of care change.

CDHA noted that their current staffing models support inpatient unit sizes that include between 20 and 25 beds.

The design concept incorporates horizontal circulation linkages at Level 3 (Emergency), Level 4 (Interstitial Mechanical & Robie St. Entrance) and Level 5 (ORs), as well as at existing Levels 6, 7 and 8 (Inpatient Units). These links connect directly to a new vertical circulation (elevator) core in the addition to facilitate transfer and simplify wayfinding. Double-sided elevators will be required to address Levels 6 and above, as new and existing floor slabs will not align at these levels, due to the higher floor-to-floor heights required for the new ORs.

CSA Z8000-11: Canadian Health Care Facilities forms the basis for Architectural outline specifications at a Preliminary Design stage.

Refer to the Architectural Outline Specifications in the Common Considerations section of this report.

Mechanical Engineering Commentary

Investigations and Existing Conditions

The existing sanitary and storm mains are not sized to handle the loads for the new addition. The existing domestic cold and hot system is not sized to accommodate the new expansion. A domestic water and sprinkler entrance will have to be provided to serve the new expansion.

It does not appear that the existing medical air and medical vacuum systems can accommodate the new addition. There may be some capacity available on the existing oxygen system to serve a portion of the new addition. A study will have to be undertaken to determine the current and future needs for this system.

The existing high pressure steam header will have to be modified in order to connect a new steam main for the new addition. According to Capital Health, the existing heating plant has sufficient capacity. Further analysis will have to be performed to determine the extent of capacity available, and if a supplemental heating system will have to be included within the new addition.

Neither the original chilled water plant nor the Emergency Wing chilled water system were sized to accommodate the proposed expansion.

Flexible Design Strategies:

To allow for flexibility and ease of maintenance it is a good practice to locate the plumbing and medical gas systems within the corridor walls and along permanent structural members. This strategy will allow for the plumbing and medical gas systems to be permanently located and not require to be relocated during renovations. Isolation valves should also be strategically located for both systems to allow for separation from the main hospital system to reduce impact to day-to-day operations during adjacent renovations.

Plumbing

Understanding that spaces within a hospital need to adapt as the needs of the community change, isolation valves should be placed at each plumbing fixture and strategically located within the water distribution network. Along with the valves, extra pipe tees should be provided within the waste and vent system. Both strategies will aid in reducing the impact to the operation of the hospital during future additions and renovations.

During renovations it's rarely observed that the permanent structural members are modified or removed which, in turn, makes adjacent locations good places to locate vertical plumbing piping. In general, piping and risers shall be located adjacent to sheer walls and panels to avoid or minimize disruption to clinical functions during renovation and even routine maintenance. Careful selection and detailing of the structural systems and connections should be undertaken, to allow vertical plumbing pipes and risers to run close to columns in order to minimize the area that must be worked around in future renovations.

Where planning for future growth and modifications is desired, the vent piping could be sized one nominal size larger than the code requirements. This will allow the vent piping to be routed horizontally as far as necessary within the ceiling to slab space during renovations.

Medical Gases

In order to increase flexibility for future growth and modification the medical gas zone valve boxes could be placed within the corridors. Typically in renovations the corridors are not modified as much, allowing the medical gas zone valves to be uninterrupted. In addition to corridor locations, locating medical gas zone valve boxes near department entrances allows for the isolation of each entire department.

The pipe sizing shall be based on most stringent patient room medical gas requirement such as pre-operation or recovery patient rooms. This will increase the size of the medical gas pipe mains to allow for adequate medical gasses in future modifications to higher acuity functions.

Dialysis

Dialysis boxes are readily used within different areas of hospitals – from outpatient clinics to critical care environments – and they have stringent requirements. There are two approaches that could be exploited for a dialysis system. One strategy would be to utilize a dedicated centralized Reverse Osmosis water loop to feed the dialysis boxes. The loop should be located above the dialysis boxes with a continuous loop routed towards the dialysis box to eliminate stagnation of water within the system. Valves should be placed strategically within the loop for future expansion and modification. To avoid bacteria growth the maximum length of pipe with stagnant water must not exceed 15cm (6inches). A point of use backflow preventer and shut-off valve at the connection point to dialysis equipment shall be used to avoid contaminating the main water loop. Piping material for the Reverse Osmosis system shall be non-metallic to avoid pipe degradation.

The other strategy is to utilize the house domestic softened water, piped to each dialysis box with point of use backflow preventer. This strategy will require the dialysis equipment to be provided with the necessary water treatment system on board. Because softened water is not as aggressive as the Reverse Osmosis system, piping material will not be a factor in this design. Future expansion could be achieved by connecting into the readily available domestic water network that is distributed throughout the floor to other plumbing fixtures in the hospital.

An assessment should be conducted in subsequent design phases to assess any areas of the addition for which provision should be made for dialysis plumbing to serve future services.

Anticipated Impacts

- New sanitary and storm mains will have to be provided to serve the new addition. A new domestic water and sprinkler entrance will have to be provided for the new building.
- New medical air and medical vacuum systems will have to be installed within the new mechanical level of the addition to serve the medical gas requirements of the new facility. The existing oxygen tanks appear to have capacity to serve a portion of the addition; further analysis is required to determine if there is adequate capacity for the entire expansion. According to the supplier, there is sufficient capacity in the nitrogen and nitrous oxide systems for an addition. Further discussions and analysis with the supplier will need to occur in order to determine if sufficient capacity is available in the existing systems to accommodate the entire proposed addition.
- The existing high pressure steam header located in Mechanical Room 2801 of the Infirmary will have to be modified in order to extend a new high pressure steam main through the Emergency Wing and over to the mechanical level of the expansion.
- A new chilled water cooling plant (chillers and cooling towers) will have to be provided to meet the cooling requirements of the addition.
- New air handling units will have to be provided in the new addition mechanical spaces to provide ventilation throughout the expansion.
- The outside air intake louver for the Emergency Wing air handling units is affected Currently the outside air intake louver is located on an exterior wall; however, the existing mechanical penthouse gets consumed within the footprint of the addition. The existing intake louver will have to be extended to an outside wall or to the roof.
- Water and air side economizer strategies will be employed to take advantage of outdoor air temperatures to reduce the cooling demand of the building.
- Heat recovery strategies could potentially be implemented to utilize the heat that is created during the production of chilled water. The captured heat could be utilized by the perimeter radiant panels or used to pre-heat the domestic hot water system.
- Investigation shall be performed on the existing central plant to replace any equipment that has reached its useful life with a more energy efficient system. A central plant optimization strategy could also be implemented to maximize the operating efficiency of the central plant.
- The new air handling system will be designed with built in redundancy to ensure continuous operation. This will include using fan array type air handling units along with a manifold duct system that will allow for a unit to be shut down without disrupting the operation of the spaces it serves.
- Plumbing fixtures will be of low flow type to ensure water efficiency. Some faucets could potentially utilize proximity sensors to operate. This technology will replace the infrared eye technology that typically gets damaged by cleaning operations and impacts the operation of the faucet.
- Solar hot water heating systems could potentially be utilized to help meet the heating demands of the hospital. This strategy will help reduce the non-renewable energy usage and increase overall building energy efficiency.
- To increase the diversity and redundancy of the campus chilled water system, the new chilled water system could potentially be connected to the existing system rather than act as a standalone system.
- Controls strategy will be set forth to operate all mechanical equipment at peak efficiency and monitor the required plumbing and electrical systems.

Relevant Mechanical Design Standards

1. CSA Z8000-11, Canadian Healthcare Facilities (to be applied as appropriate)
2. CAN/CSA Z317.1-09, Special Requirements for Plumbing Installations in Healthcare Facilities
3. CAN/CSA Z317.2-10, Special Requirements for Heating, Ventilation, and Air-Conditioning (HVAC) Systems in Healthcare Facilities
4. CAN/CSA Z317.13-12, Infection Control During Construction, Renovation, and Maintenance of Healthcare Facilities
5. CAN/CSA Z318.0-05 (R2010), Commissioning of Healthcare Facilities
6. CAN/CSA Z320-11, Building Commissioning
7. CAN/CSA Z7396.1-09, Medical Gas Pipeline Systems - Part 1: Pipelines for Medical Gases and Vacuum
8. CAN/CSA B139-09, Installation Code for Oil-Burning Equipment
9. CAN/CSA B149.1-10, Natural Gas and Propane Installation Code
10. National Building Code of Canada - 2010
11. National Plumbing Code of Canada - 2010
12. National Fire Code of Canada - 2010
13. National Energy Code of Canada for Buildings - 2011
14. NFPA 10, Standard for Portable Fire Extinguishers
15. NFPA 13, Standard for the Installation of Sprinkler Systems
16. NFPA 14, Standard for the Installation of Standpipe and Hose Systems
17. ASHRAE Standards and Handbooks

Electrical Engineering Commentary

Investigations and Existing Conditions

The design team has reviewed existing conditions with a focus on normal power, emergency power, telecommunications, fire alarm system, electronic access control, security, and the nurse call system.

Normal Power

The existing Halifax Infirmary electrical service lacks enough spare capacity to serve the proposed expansion. The design of the Emergency Department expansion in 2007 included provision for a new electrical service to accommodate the proposed expansion. A new pull pit and concrete encased duct bank were installed on the property; these will become part of the new high voltage underground service from an NSPI switching cubicle on Summer Street to a new pad- mounted transformer. New conduits were installed from an Emergency Department electrical room through the exterior wall; these will

become part of the new low voltage underground service from the pad-mounted transformer to a new service entrance switchboard in the electrical room.

A new transformer pad will be built and the high voltage and low voltage underground runs will be extended to it. A new concrete encased duct bank will be installed from the NSPI switching cubicle to the pull pit.

During the design phase the NSPI "Interruptible Rider to the Large Industrial Tariff" rate structure will be investigated with the infrastructure being planned. The possibility of installing a Bi-Fuel system on the generator sets being added will be investigated for adequate payback. The Bi-Fuel system allows the substitution of up to 70% natural gas for diesel fuel and allows more economical operation of the generator sets during NSPI's request to interrupt load. Mechanical equipment and non-critical loads will be run on the generator set(s) during requests to interrupt load. The minimum interruptible load to qualify for the NSPI plan is 2,000 kVA, selected mechanical and non-critical loads within the expansion will be fed from an optional standby automatic transfer switch.

Emergency Power

The three existing 1500 kW Halifax Infirmary standby diesel generators lack enough spare capacity to serve the proposed expansion. New generator(s) and bypass isolation automatic transfer switch(es) will be installed in the new expansion. As stated above the Bi-Fuel system for the generator sets will be investigated. The Bi-Fuel system also referred to as "natural gas fumigation of diesel generator sets" will be investigated with the authorities having jurisdiction to allow the natural gas to extend the run time of diesel fuel and allow less diesel fuel to be stored on site. Operating the generator sets during NSPI's request to interrupt load will fulfill generator set exercising requirements and will ensure the generators are exercised with enough load, thus eliminating the hassle of connecting generator load banks during exercising runs.

Telecommunications

A voice and data communications infrastructure was installed at the Halifax Infirmary in accordance with the standards that applied at the time of construction. The infrastructure is still standard compliant, but the cabling cannot support the high speed networks that have been developed in recent years. The original Category 5 cabling can support Fast Ethernet (100Mbps) but not Gigabit or 10 Gigabit Ethernet.

A new structured wiring system will be installed in the proposed expansion in accordance with the ANSI/TIA-1179-2010 Healthcare Facility Telecommunications Infrastructure Standard. Telecommunications Rooms will be installed on every floor. Backbone voice and data cables will interconnect these rooms; horizontal voice and data cables will be routed from these rooms to the work areas in the spaces they serve.

The Halifax Infirmary voice services are supplied from the Telephone Equipment Room in the sub-basement of the Abbie J. Lane Building. It lacks the spare capacity to serve the proposed expansion. A plan to serve the proposed expansion will be developed in consultation with Capital Health's Information Technology Department.

A new backbone data cable will connect the new data communications infrastructure to the existing Halifax Infirmary local area network.

During the design phase the possibility of implementing a Passive Optical Local Area Network, POL, will be investigated. Scale and reach are the two distinct advantages of using POL over traditional switched copper Local Area Networks, LAN's. Reach is accomplished through the use of single-mode fiber in the cabling plant as it allows a length of 20km as opposed to the 90m limitation of copper. Scale is accomplished by utilizing passive optical splitters. As a comparison a single mode fiber can be split into 32 fibers with each fiber terminating into a 4-port Fiber Optic Network Terminal, ONT, providing a total of 128 Ethernet ports. In contrast, a traditional copper LAN would require 128 home runs of copper to accomplish what POL provides with 33 total fibers. The scale and reach benefits allow the data and telecomm equipment footprint to be reduced and moved further away, thus reducing local telecommunication closet requirements and gaining valuable building space.

Fire Alarm

The existing Halifax Infirmary fire alarm system consists of a network of Simplex 4100 series control panels. Additional control panels will be installed in the proposed expansion and connected to the existing network.

Electronic Access Control

The facility has an IP-based card access system that permits staff with ID cards access to designated areas through secure doors. It consists of a server, database software, monitoring software, control panels, and peripheral devices. These peripheral devices include card readers, digital keypads, door contacts, motion sensors, alarm buttons, door strikes, and magnetic locks. The server and control panels are connected to the Capital Health LAN/WAN.

The access control system will be extended into the new expansion. New control panels will be installed and connected to the LAN, and new peripheral devices will be connected to the control panels.

Security

Existing security and CCTV surveillance systems are obsolete. New systems will be installed in the proposed expansion to meet Capital Health's requirements.

Nurse Call

Existing nurse call systems are obsolete and spare parts are no longer available. New systems will be installed in the proposed expansion to meet Capital Health's requirements.

Anticipated Impacts

N/A

Relevant Electrical Healthcare Design Standards

The following healthcare standards will be applied during the electrical design of this facility:

1. ANSI/IESNA RP-29-06 Lighting for Hospitals and Healthcare Facilities,
2. ANSI/TIA-1179-2010 Healthcare Facilities Telecommunications Infrastructure Standard,
3. CSA Z32-09 Electrical Safety and Essential Electrical Systems in Healthcare Facilities,
4. CSA Z317.5-98(R2007) Illumination Systems in Healthcare Facilities,
5. CSA Z8000-11 Canadian Healthcare Facilities (to be applied as appropriate)

Outstanding Issues

Geotechnical / Soils Investigations – the addition is located on the site of the former Queen Elizabeth High School, which reportedly may contain sulphide-bearing slate bedrock and debris from the demolition process. Investigations have not been undertaken to confirm site conditions; this should happen as soon as possible to determine the extent of any issues.

Willow Tree Traffic Circle - The concept of redeveloping the Willow Tree Intersection (Robie/Bell/Quinpool/ Cogswell) into a traffic circle is currently being studied by HRM. The current layout for the HI addition is unlikely to be impacted in any significant way by this work as the footprint is far removed from the intersection. The potential impacts to the HI addition should be revisited if/ when the city proceeds with this roadworks project and more specific information is made available.

Parking – ultimate requirements are unresolved at this time, and need to be evaluated upon the completion of the Clinical Services Plan. The design solution includes parking in the lower levels of the addition as well as a potential small expansion to the north end of the existing parking structure on Robie Street. A condition of the land transfer deal between the City and CDHA requiring that no surface parking occur on the transferred land limits the extent of expansion to the site's overall parking capacity. The final solution to parking may need to include facilitation of alternative modes of transportation, purchase/lease of adjacent property or off-site parking lots complete with a shuttle service.

Diagnostic Imaging: Equipment and Size of Spaces – the extent of new vs. existing/relocated equipment is not known at this time given the evolving nature of the Clinical Services Plan (CSP); budget and space requirements for this specialized equipment will need to be evaluated and resolved in subsequent design phases as the CSP is finalized.

Specialized Inpatient Rooms / Units – the requirement for highly specialized inpatient spaces such as Burn and Transplant units, and the resultant space and cost impact, needs to be confirmed. Additionally, certain specifics of the space program, e.g. number of bariatric rooms, etc. will need to be resolved upon evolution of the CSP. Once the CSP is finalized, the specific functional and space requirements of the program will require modifications - though it is unlikely that the overall floor area requirements will significantly change, given the flexible and standards-compliant nature of the current designs.

Specialized ORs – the requirement for highly specialized ORs (e.g. new cath labs, hybrid ORs), and the resultant space and cost impact, has yet to be confirmed. The programmatic and design implications of these decisions will need to be captured in subsequent design phases upon completion of the CSP.

OR Layout Options – two options are included in this report. One is based on the current industry standard; the other is included to address the some concerns raised by some surgical staff who are not happy with the existing OR arrangement at the HI. The feeling was that the racetrack layout leads to more difficulty in supervision and control and decreases staff interaction and collegiality. The second option represents an alternative layout that still preserves separation of sterile and soiled materials and processes while possibly helping address some of the concerns raised. As the number and nature of specialized ORs is determined - along with logical groupings and organization of these ORs, more options should be looked at.

Research/Education Spaces – the Space Programming and layouts include some space for Research and Education, reflecting the nature of the HI as a teaching hospital and acknowledging the emerging trend of research at the bedside. Specific requirements or functions are unresolved at this time, and will need to be evaluated in the context of the finalized Clinical Services Plan.

Food Services Area – the program reflects a cafeteria-style space, similar to what is being displaced for support services expansion on Level 2. After development of the program, direction was received from CDHA to provide a shelled space for future tenant fit-up. The cost estimates provided in this report reflect a retail "Food Court" style model where tenants would lease space and pay for fit-up. The original (cafeteria-based) space program is still included for reference in the event that the planned direction changes in subsequent phases of the project.

Space Program

The following Space Program applies to the Design Solution for the HI Addition.

For information, the Program Summary also includes the program areas from the Part A space programs as well as notes outlining major sources of variation from these earlier preliminary programs. The floor areas from the drawings are also listed here for ease of comparison.

Please also refer to the section of this report titled "Space Programming, General" for common criteria, methodology, assumptions and exclusions applicable to all Space Programs included in this report.

HALIFAX INFIRMARY
BED TOWER EXPANSION: NEW CONSTRUCTION PROGRAM

Date: **May 31, 2013**
STATUS: **Part B Submittal**
Version 2

		NSF	CIRC	STRUCT	DGSF	DGSF Sub	FLOOR BGSF	Drawing BGSF Bow	Courtyard	Part B	
First Floor						55,275	63,566	48,475	44,916	63,944	ADDED PARKING & 2ND TUNNEL
	1st Floor Parking	50,250	0%	10%	55,275						
Second Floor						56,342	64,793	48,475	47,359	65,221	ADDED PARKING & 2ND TUNNEL
	2nd Floor Parking	34,500	0%	10%	37,950						
	2nd floor CSPD	15,200	10%	10%	18,392						
Third Floor						25,982	29,879	25,913	31,816	33,024	INCLUDES RAMP TO PARKING
	3rd Floor Food Court	9,472	15%	10%	11,982						
**	*Clinical/Facility Support*				*10,000*						
	Public Lobby				4,000						
Fourth Floor						54,200	62,330	60,601	61,808	59,266	
	4th Floor Interstitial MEP space	54,200	0%	0%	54,200						
Fifth Floor						84,272	96,913	89,050	88,815	93,025	INCLUDES 12 BED ICU
	Operating Room Suite	27,750	40%	10%	42,735						
	Recovery	9,993	40%	10%	15,389						
	Day Surgery	5,343	40%	10%	8,228						
***	Public Waiting / Lobby				3,562						
	ICU	9,323	40%	10%	14,357						
Sixth Floor						44,858	51,586	51,116	50,723	54,165	INCLUDES 2300 GSF BRIDGE
	6th Floor Nursing	28,453	40%	10%	43,818						
	Research/Education Space				1,040						
Seventh Floor						44,858	51,586	51,116	50,723	54,165	INCLUDES 2300 GSF BRIDGE
	7th Floor Nursing	28,453	40%	10%	43,818						
	Research/Education Space				1,040						
Eight Floor						44,858	51,586	51,116	50,723	54,165	INCLUDES 2300 GSF BRIDGE
	8th Floor Nursing	28,453	40%	10%	43,818						
	Research/Education Space				1,040						
SUBTOTAL: DGSF		301,390				410,644	472,240	425,862	426,883	476,975	
					BUILDING GROSSING FACTOR*	15%	61,597				
					TOTAL BUILDING GROSS SQ. FT.		472,240				

Note:

* *Building Grossing Factor includes: stairs, elevators, mechanical shafts, exterior wall and corridors not within specific departments*
** *Third Level Clinical/Facility Support includes education, research and support requirements as yet unidentified.*
*** *Public Waiting / Lobby to support all fifth floor functions*

DRIVERS:

135	Parking spaces
135	**TOTAL**
409	**DGSF per Driver**

HALIFAX INFIRMARY

Department: **1st Floor Parking**

Date: May 31, 2013

STATUS: **Part B Submittal**

Version 2

NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m^2	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
					11							
1.00	*Parking*										48,050	
1.01	**Parking spaces**							**350**	**135**	**47,250**		
1.02	Elevator Lobby							800	1	800		
2.00	*Support*										2,200	
2.01	Storage/Mechanical							2,200	1	2,200		
	SUBTOTAL										50,250	
	Circulation Factor	*(Included in building circulation factor)*						0%		0		
	Structure Factor							10%		5,025		
	TOTAL PROGRAM DGSF REQUIRED:										**55,275**	

NOTES:

DRIVERS:

90	Parking spaces
90	**TOTAL**
422	**DGSF per Driver**

HALIFAX INFIRMARY

Department: **2nd Floor Parking**

Date: May 31, 2013

STATUS: **Part B Submittal**

Version 2

NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m^2	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
					11							
1.00	*Parking*										32,300	
1.01	**Parking spaces**							**350**	**90**	**31,500**		
1.02	Elevator Lobby							800	1	800		
2.00	*Support*										2,200	
2.01	Storage/Mechanical							2,200	1	2,200		
	SUBTOTAL										34,500	
	Circulation Factor (Includes speed ramp , elevators and stairs)							0%		0		
	Structure Factor							10%		3,450		
	TOTAL PROGRAM DGSF REQUIRED:										**37,950**	

NOTES:

DRIVERS:

HALIFAX INFIRMARY

Department: **2nd floor CSPD**

Date: May 31, 2013

STATUS: **Part B Submittal**

Version 2

	NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m^2	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
						11							
	1												
1.00	*2*	*Decontam*			247							2,770	
1.01		Soiled elevator							80	1	80		
1.02	**5**	Decontamination work area	10.1/1	10.2	130.00	1,399			1400	1	1,400		Waste bins, recycle bins, linen bins, hopper/flusher, desk, work table, PPE
1.03		Receiving and case cart holding		10.2	37.00	398			400	1	400		Triple sink, tables, sonic cleaners, equipment washers
1.04		Cart wash area	10.1/1	10.2	48.00	517			525	1	525		If carts are to be used
1.05		Equipment processing area		10.2	19.00	205			215	1	215		Consider a separate room for scope reprocessing
1.06		Chemical Storage	10.1/6	10.2	9.00	97			100	1	100		
1.07		Housekeeping		10.2	4.00	43			50	1	50		
2.00		*Prep/Pack and Sterilization*			498							5,365	
2.01		Work area		10.2	372.00	4,004			4,000	1	4,000		
2.02		Sterilizer service area		10.2	53.00	570			570	1	570		
2.03	**6**	Low temperature sterilizer area		10.2	30.00	323			325	1	325		
2.04		Personnel facilities		10.2	39.00	420			420	1	420		
2.05		Housekeeping		10.2	4.00	43			50	1	50		
3.00		*Storage and distribution*			572							6,235	
3.01	**3**	Clean elevator		10.2		0			80	1	80		
3.02		Case cart holding		10.2	74.00	797			800	1	800		
3.03		Sterile storage		10.2	325.00	3,498			3,500	1	3,500		
3.04		Clean equipment storage		10.2	56.00	603			600	1	600		
3.05		Reprocessing supply storage		10.2	21.00	226			225	1	225		
3.06		Dispatch		10.2	40.00	431			430	1	430		
3.07		Receiving and breakout rooms		10.2	56.00	603			600	1	600		
4.00		*Administration/Staff Support*										830	
4.01	**4**	Staff Locker		11.1/29	20.00	215			220	1	220		
4.02		Conference Room		10.2	19.00	205			210	1	210		
4.03		Staff Toilet/Shower			7.00	75			80	2	160		
4.04		Office- desk, small meeting area		11.1/34	11.00	118			120	2	240		
		SUBTOTAL										15,200	
		Circulation Factor								10%	1,520		
		Structure Factor								10%	1,672		
		TOTAL PROGRAM DGSF REQUIRED:								1.21		**18,392**	

DRIVERS:

HALIFAX INFIRMARY

Department: **2nd floor CSPD**

Date: May 31, 2013

STATUS: **Part B Submittal**

Version 2

NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m^2	CSA required SF	PROGRAM #ITEMS	PROGRAM NSF/ITEM	PROGRAM NSF /EA	PROGRAM QTY	PROGRAM NSF TOTAL	PROGRAM SUBTOTAL	REMARKS
					11							

NOTES:

1 **General** **10.7.1.1**
A centralized system provides service to multiple areas within an HCF or to HCF's located external to the MDRD
Decentralized systems can be located in areas such as:
(a) endoscopy units
(b) operating rooms and
(c) diagnostic imaging

2 **Functional Relationships** **10.7.2.2**
The decontamination receiving area shall be located at one entrance to the service. The dedicated (soiled) elevator for carrying contaminated devices from the OR and/or other HCF areas shall offload into this soiled receiving area

3 **Functional Relationships** **10.7.2.4**
The dedicated (clean) elevator MDRD, if provided, should be located in or near the sterile storage area.

4 **Functional Relationships** **10.7.2.5**
The staff locker room should be readily accessible to the MDRD

5 **Recommended size** **10.2**
Average sizes shown above based on the largest category - 75-88 procedures a day (with 20 OR's that equals 3.75 to 4.4 cases per OR per day)

6 Excludes ethylene oxide strelizers

DRIVERS:

200	Dining Room Seating
200	**TOTAL**
60	**DGSF per Driver**

HALIFAX INFIRMARY

Department: **3rd Floor Food Court**

Date: May 31, 2013

STATUS: **Part B Submittal**

Version 2

	NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m^2	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
						11							
1.00	***1,2***	*Dining*										5,600	
1.01		**Dining Room Seating**					**200**	**28**	**5,600**	**1**	**5,600**		
2.00		*Cafeteria Servery*										1,435	
2.01		Cafeteria, Cooking Area							450	1	450		
2.02		Serving Area, Soda/Ice Room							50	1	50		
2.03		Serving Area, Beverage Counter							150	1	150		
2.04		Serving Area, Salad/Sandwich Bar							250	1	250		
2.05		Serving Area, Deli Station							165	1	165		
2.06		Serving Area, Pizza Service							165	1	165		
2.07		Work Area, Cashier							60	3	180		
2.08		Alcove, Amenities Utensils, Condiments							25	1	25		
3.00		*Vending Area*										240	
3.01		Alcove, Vending Machines							20	6	120		
3.02		Alcove, Amenities, Counter / Trash							60	2	120		
4.00		*Cafeteria Prep*										750	
4.01		Strorage, Refrigerator, Walk-in							110	2	220		
4.02		Storage, Freezer, Walk-In							40	2	80		
4.03		Storage, Dry Food							150	1	150		
4.04		Storage, Paper Goods							150	1	150		
4.05		Work Area, Foor Prep, Salad							150	1	150		
5.00		*Dishwashing*										1,060	
5.01		Work Area, Soiled Tray Drop							60	4	240		
5.02		Work Area, Dishwasher, Automatic							200	1	200		
5.03		Storage, Trash Hold							60	4	240		
5.04		Alcove, Cart, Clean Dish Rack							15	12	180		
5.05		Alcove, Cart, Pots/Pans Rack							15	10	150		
5.06		EVS Closet							50	1	50		

DRIVERS:

200	Dining Room Seating
200	**TOTAL**
60	**DGSF per Driver**

HALIFAX INFIRMARY

Department: **3rd Floor Food Court**

Date: May 31, 2013

STATUS: **Part B Submittal**

Version 2

NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m^2	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
					11							
6.00	*Support*										387	
6.01	Office							100	1	100		
6.02	Workroom, Cash Count Room							75	1	75		
6.03	Lockers							2.5	20	50		
6.04	Staff Toilet							56	2	112		
6.05	EVS Closet							50	1	50		
6.06	Elevator Lobby									0		
	SUBTOTAL										9,472	
	Circulation Factor							15%		1,421		
	Structure Factor							10%		1,089		
	TOTAL PROGRAM DGSF REQUIRED:							1.27			**11,982**	

NOTES:

1 This program is for a cafeteria and vending space only. Patient food service will be provided from the VMB. Retherm and nourishment rooms are provided within the nursing unit programs

2 Subsequent to the program being prepared for a cafeteria, direction was received to cost this space as base-building only in anticipation of retail foodservice fitup. Program left as is for reference if strategy changes in future.

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DRIVERS:

HALIFAX INFIRMARY

Department: **4th Floor Interstitial MEP space**

Date: May 31, 2013

STATUS: **Part B Submittal**

Version 2

0 **TOTAL**

#DIV/0! **DGSF per Driver**

NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m^2	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
					11							
1.00	*Existing Mechanical Penthouse*										6,150	
1.01	Existing Mechanical Penthouse							6,150	1	6,150		
2.00	*Mechanical /Electrical / Plumbing / Data*										38,050	
2.01	MEP and Data space, Over existing ED							17,300	1	17,300		
2.02	MEP and Data space, Below Ors							20750	1	20,750		
4.00	*Public Space*										10,000	
4.08	Elevator Lobby/Reception							10,000	1	10,000		
	SUBTOTAL										54,200	
	Circulation Factor								0%	0		
	Structure Factor								0%	0		
	TOTAL PROGRAM DGSF REQUIRED:								1.00		**54,200**	

NOTES:

HALIFAX INFIRMARY

Department: **Operating Room Suite**

Date: May 31, 2013

STATUS: **Part B Submittal**

Version 2

DRIVERS:

12	General Operating Rooms
8	Special Operating Rooms
3,561	**DGSF per Driver OR Suite only**
15,389	DGSF , Recovery
2,906	**DGSF per Driver, OR and Recovery**

	NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m²	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
						11							
1.00		*Operating Rooms*										15,000	
1.01		**General Operating Rooms**	**9.5.3.1.1**	**9.5/1**	**55.00**	**592**			**600**	**12**	**7,200**		
1.02		**Special Operating Rooms**	**9.5.3.1.1**	**9.5/2**	**60.00**	**646**			**700**	**8**	**5,600**		
1.03		Scrub Stations	9.5.3.4.4	9.5/5	0.80	9			10	20	200		Two stations for each OR - may be shared between 2 PRs if adjacent to each entry
1.04		Substerile	9.5.3.4.8	11.1/46	1.20	13			100	10	1,000		May serve more than 1 OR. Warming cabinet, sterile supplies, sink (space is per cart)
1.05		Emergency (flash) sterilization	9.5.3.4.9						100	10	1,000		May serve more than 1 OR.
2.00		*Clinical Support Space*										8,050	
2.01		Control Station	9.5.3.4.2	9.5/13	4.60	50	6	50	300	1	300		Requirement is per workstation
2.02		Frozen section	9.5.3.3.2						200	1	200		Not required by CSA but may be included- Sized per HI staff survey
2.03		Medication station /Satellite pharmacy	9.5.3.4.5	11.1/32	9.50	102			200	1	200		Sized per HI staff survey
2.04		Dispensing style ice machine	9.5.3.4.6						30	2	60		
2.05		Patient holding	9.5.3.4.7						140	2	280		Req'd with 2 or more OR's. Under visual control of staff
2.06	**1**	Sterile Supply Storage	9.5.3.4.10(a)	9.5/10	varies				190	20	3,800		Separate from clean workroom
2.07		Clean Workroom	9.5.3.4.10						130	2	260		
2.08		Soiled workroom, small	9.5.3.4.11	11.1/40	12.00	129			130	2	260		Fume hood, clinical sink,
2.09		Anesthesia workroom	9.5.3.4.12						130	1	130		Work counter, fume hood, separate storage for clean and soiled
2.10		Blood storage	9.5.3.4.13						130	1	130		Per CAN/CSA-Z902
2.11		Specimen storage	9.5.3.4.14						50	1	50		
2.12		Equipment storage	9.5.3.4.15		4.65	50			50	12	600		Min. sf provided per OR
2.13		Reserve Medical Gas Storage	9.5.3.4.15								0		Enough to finish one day's procedures in accordance w/CSA Z305.12 - stored outside of suite
2.14		Housekeeping	9.5.3.4.16	11.1/21	7.00	75			80	2	160		
2.15		Trash Holding							80	1	80		Per HI staff survey
2.16		Physician/Image workstation		9.5/14	4.60	50	2	50	100	2	200		Requirement is per workstaion - 1220m desk at minimum, 1 per every 4 Ors
2.17		Imaging/Equipment alcove		9.5/15	4.60	50	2	50	100	2	200		
2.18		Satellite Respiratory		9.5/16	4.60	50	2	50	100	2	200		As required by functional program
2.19		Medical device reprocessing							600	1	600		Small area for specialized instruments CAN/CSA-Z317.2 & CAN/CSA-Z314.8
2.20		Staff Toilet							60	3	180		
2.21		Clean Elevator	12.2.6.4.3						80	1	80		
2.22		Dirty Elevator	12.2.6.4.3						80	1	80		

HALIFAX INFIRMARY

Department: **Operating Room Suite**

Date: May 31, 2013

STATUS: **Part B Submittal**

Version 2

DRIVERS:

12	General Operating Rooms
8	Special Operating Rooms
3,561	**DGSF per Driver OR Suite only**
15,389	DGSF , Recovery
2,906	**DGSF per Driver, OR and Recovery**

NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m^2	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
					11							
3.00	*Support spaces for staff*										4,700	
3.01	Offices, workstations	9.5.3.4.2								0		Per functional program
3.02	Office, desk, no meeting space		11.1/34	9.00	97					0		
3.03	Office, desk, two chairs		11.1/34	10.00	108					0		
3.04	Office, desk, small meeting area		11.1/34	11.00	118			4	120	480		
3.05	Office, desk, four-chair meeting space		11.1/34	14.00	151					0		
3.06	Dictation and report preparation	9.5.3.4.3				6	50	300	1	300		
3.07	Lounge	9.5.3.5.1	11.1/30	2.50	27	20	28	560	1	560		Convenient access to Stage One recovery
3.08	Lockers/Toilets/Showers	9.5.3.4.2	11.1/29	20.00	215			250	2	500		
3.09	Lockers, Full		11.1/5	0.70	8	100	8	800	2	1,600		Numbers per HI staff survey
3.10	Conference / Teaching /Library	9.5.3.5.3	11.1/7	15.00	161	10	28	280	2	560		
3.11	On-call offices	9.5.3.5.4	11.1/34	10.00	108			4	120	480		
3.12	Residents' Team Room							220	1	220		
4.00	*Non-Clinical Support*										0	
										0		
	SUBTOTAL										27,750	
	Circulation Factor								40%	11,100		
	Structure Factor								10%	3,885		
	TOTAL PROGRAM DGSF REQUIRED:								1.54		**42,735**	

NOTES:

1 Minimum storage:
- 2 case carts per OR
- Supplies
- Flash sterilizer
- anaesthetic supplies
- emergency carts
- blood fridge
- medication dispensing units

HALIFAX INFIRMARY

Department: **Recovery**

Date: May 31, 2013

STATUS: **Part B Submittal**

Version 2

DRIVERS:

30	Stage One Recovery, Partial Walls
2	Stage One Recovery, Isolation
8	Stage Two, Three walls/private
40	TOTAL RECOVERY BAYS
385	**DGSF per Driver**

	NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m²	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
						11							
1.00		*Stage One Recovery /PACU*	*9.5.3.2.2*									8,476	*At least one door to access surgical suite directly (9.5.3.2.2)*
1.01	1	**Stage One Recovery, Open**		9.5/6	9.50	102			110		0		Medical gas terminals per Annex F
1.02		**Stage One Recovery, Partial Walls**		9.5/7	11.00	118			130	30	3,900		Assumes 2 bariatric beds divided by curtain, walls on 1side, critical care clearances
1.03	2	**Stage One Recovery, Private**		**9.5/8**	**13.00**	**140**			**160**	**0**	**0**		**Assumes bariatric bed, critical care clearances**
1.04	3	**Stage One Recovery, Isolation**		**9.5/9**	**13.00**	**140**			**160**	**2**	**320**		**CAN/CSA-Z317.2 for pressure monitoring and alarm**
1.05	3	Isolation Anteroom		9.5/9	5.00	54			60	2	120		CAN/CSA-Z317.2 for HVAC and pressurization
1.06	3	Isolation, Prep alcove		11.1/15	2.00	22			25	2	50		
1.07		Isolation patient toilet							50	2	100		
1.08		Medication station	9.5.3.2.2 (a)(i)	11.1/32	9.50	102			120	2	240		
1.09		Waterless Hand Hygiene Stations	9.5.3.2.2 (a)(ii)	11.1/20	NA						0		
1.10		Nurse Station / Charting	9.5.3.2.2 (a)(iii)	11.1/3	4.60	50	4	50	200	4	800		
1.11		Soiled workroom, small		11.1/40	12.00	129			130	2	260		
1.12		Clinical Sink	9.5.3.2.2 (a)(iv)								0		
1.13		Provisions for Bedpan Cleaning	9.5.3.2.2 (a)(v)								0		
1.14		Storage for stretchers, supplies, equip	9.5.3.2.2 (a)(vi)						120	4	480		
1.15		PACS workstation	9.5.3.2.2 (a)(vii)				2	50	100	2	200		
1.16		Hand Hygiene sinks	9.5.3.2.2 (d)(ii)	11.1/19	1.00	11			12	8	96		1 sink per 4 patient bays
1.17		Staff toilet	9.5.3.2.2 (e)						60	3	180		
1.18		Isolation room (per ICRA)	9.5.3.2.2 (e/f)								0		Not required in stage one recovery
1.19		Crash cart							25	2	50		
1.20		Housekeeping		11.1/21	7.00	75			80	2	160		
2.00		*Stage Two Recovery*	*9.5.3.2.3*									1,897	*At least one door to access PACU suite directly: 9.5.3.2.3 (a)*
2.01		**Stage Two Recovery**	9.5.3.2.3c	9.5/11	7.50	81			90		0		Medical gas terminals per Annex F
2.02		**Stage Two Chair, Open/Curtained**		9.5/11	9.50	102			110		0		
2.03		**Stage Two Stretcher, Open/Curtianed**		9.5/11	11.00	118			120		0		
2.04	2	**Stage Two, Three walls/private**		**9.5/11**	**13.00**	**140**			**140**	**8**	**1,120**		
2.05		Medication Station	9.5.3.2.3 (d)(i)	11.1/32	9.50	102			120	1	120		
2.06		Waterless Hand Hygiene Station	9.5.3.2.3 (d)(ii)	11.1/20	NA						0		
2.07		Nurse Station with Charting	9.5.3.2.3 (d)(iii)	11.1/3	4.60	50	3	50	150	1	150		
2.08		Soiled Workroom, small		11.1/40	12.00	129			130	1	130		
2.09		Clinical Sink	9.5.3.2.3 (d)(iv)								0		
2.10		Provision for Bedpan Cleaning	9.5.3.2.3 (d)(v)								0		
2.11		Trash Hold							80	1	80		
2.12		Storage for Supplies and equipment	9.5.3.2.3 (d)(vi)						120	1	120		
2.13		Hand Hygiene Sinks	9.5.3.2.3 (e)	11.1/19	1.00	11			11	2	22		1 sink per 4 patient bays
2.14		Staff Toilet	9.5.3.2.3 (f)						60	1	60		
2.15		Patient Toilet	9.5.3.2.3 (g)	11.1/25	5.60	60			60	1	60		2 piece, bariatric
2.16		Isolation Room (per ICRA)	9.5.3.2.3 (h/i)								0		Not required in stage two recovery
2.17		Nourishment Alcove		11.1/33	3.00	32			35	1	35		

DRIVERS:

30	Stage One Recovery, Partial Walls
2	Stage One Recovery, Isolation
8	Stage Two, Three walls/private
40	TOTAL RECOVERY BAYS
385	**DGSF per Driver**

HALIFAX INFIRMARY

Department: **Recovery**

Date: May 31, 2013

STATUS: **Part B Submittal**

Version 2

NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m^2	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
					11							
3.00	*Non-Clinical Support*										660	
3.01	Break Room						1	220	1	220		
3.02	Team Rooms							220	2	440		
4.00	*Administration*										480	
4.01	Office, desk, no meeting space		11.1/34	9.00	97					0		
4.04	Office, desk, two chairs		11.1/34	10.00	108					0		
4.05	Office, desk, small meeting area		11.1/34	11.00	118			120	4	480		
4.06	Office, desk, four-chair meeting space		11.1/34	14.00	151					0		
	SUBTOTAL										9,993	
	Circulation Factor								40%	3,997		
	Structure Factor								10%	1,399		
	TOTAL PROGRAM DGSF REQUIRED:								1.54		**15,389**	

NOTES:

1 **Bed Clearances:** **7.5.2.5**

Inpatient beds:		0.0394		
Non transfer side (wall)	1000 mm	40 inches	3'- 4	
At foot of bed	1200 mm	48 inches	4'- 0	
between beds (in rms w/more than 1)	1200 mm	48 inches	4'- 0	
between centerlines	1800 mm	71 inches	5'- 11	
Critical Care Beds				
Non transfer side (wall)	1200 mm	48 inches	4'- 0	
At foot of bed	1500 mm	60 inches	5'- 0	
between beds (in rms w/more than 1)	1800 mm	71 inches	5'- 11	
between centerlines	2400 mm	95 inches	7'- 11	
Bed Size				
Width (normal) - 7.5, Note 2	1000 mm	40 inches	3'- 4	
Width (bariatric) - 7.5, Note 2	1200 mm	48 inches	4'- 0	
Length	2400 mm	95 inches	7'- 11	

Room Sizes

Length:	
Bed	71
Clearance	60
	131
	13'

2 **Patient treatment places** **4.5.4**

All patient treatment places, whether intended for inpatient or outpatient use, shall be single occupancy unless the functional program demonstrates the necessity of multi-patient arrangement.

Single occupancy means that patients have a spatial separation and a physical barrier between them sufficient to provide privacy, protection from the spread of infection and adequate area to support clinical funtions.

3 **Airborne Isolation Room** **7.5.5.1**

Class A HCF's shall provide at least one airborne isolation room (AIR) for each of the following services or areas:
(d) endoscopy

HALIFAX INFIRMARY

Department: **6th Floor Nursing**

Date: May 31, 2013

STATUS: **Part B Submittal**

Version 2

DRIVERS:

10	Inpatient bedroom
2	Inpatient bedroom, AIR
12	Total Inpatient Beds
1,196	**DGSF per Driver**

	NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m^2	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
						11							
1.00		*Patient Rooms*										*5,075*	
1.01	2	**Inpatient bedroom**	8.1.4	8.2/3	**23.20**	**250**			**250**	**10**	**2,500**		
1.02		Inpatient bedroom - vestibule	8.1.4	8.1/1	5.00	54			55	10	550		
1.03		Inpatient bedroom - supply alcove	8.1.4	8.1/1	1.40	15			15	10	150		
1.04		Inpatient bedroom - washroom	8.1.4	8.1/1	5.60	60			60	10	600		
1.05		PPE equipment alcove	8.2.3.3						5	10	50		Adjacent to each inpatient room entrance
1.06		**Inpatient bedroom, AIR**		**8.2/3**	**25.00**	**269**			**270**	**2**	**540**		
1.07		Inpatient bedroom, AIR, anteroom		8.2/3	7.50	81			80	2	160		
1.08		Inpatient bedroom, AIR, supply alcove		8.2/3	1.00	11			15	2	30		
1.09		Inpatient bedroom, AIR, washroom		8.2/3	5.60	60			60	2	120		Sized for three piece washroom
1.10		Dictation/Review Station		11.1/12	1.40	15			15	25	375		
2.00		*Clinical Support*										*2,484*	
2.01		Reception/control desk		8.2/1	4.60	50	2	50	100	1	100		
2.02		Staff Work Area (nursing station)		8.2/2	4.60	50	8	50	400	1	400		
2.03		Pneumatic Tube Station							25	1	25		Per HI staff survey
2.04		Point-of-care testing/Phlebotomy							120	1	120		Per HI staff survey
2.05		Family consult rooms	8.2.2.9	11.1/14	13.00	140			140	1	140		Scooter access
2.06		Crash Cart Alcove	8.2.2.10						25	1	25		
2.07		Equipment storage, small	8.2.3.6	11.1/9	12.00	129			130	1	130		
2.08		Medication		11.1/31	9.50	102			130	1	130		
2.09		Nourishment		11.1/33	10.00	108			100	1	100		
2.10		Food Service Center							244	1	244		Per HI staff survey
2.11		Clean Linen							35	1	35		
2.12		Clean Workroom		11.1/8	11.00	118			130	1	130		
2.13		Soiled Workroom		11.1/40	12.00	129			130	1	130		
2.14		Soiled Dietary Cart Storage							35	1	35		
2.15		Housekeeping		11.1/21	7.00	75			80	1	80		
2.16		Stretcher/Wheelchair storage							120	1	120		Per HI staff survey
2.17		Family lounge	8.2.2.8				10	28	280	1	280		
2.18		RT cleaning/testing	8.2.3.5						130	1	130		
2.19		RT storage	8.2.3.5						130	1	130		
2.20		Mobility Aid Storage							120	0	0		Per HI staff survey
2.21		Rehab Medicine treatment							400	0	0		Per HI staff survey

DRIVERS:

10	Inpatient bedroom
2	Inpatient bedroom, AIR
12	Total Inpatient Beds
1,196	**DGSF per Driver**

HALIFAX INFIRMARY

Department: **6th Floor Nursing**

Date: May 31, 2013

STATUS: **Part B Submittal**

Version 2

	NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m^2	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
						11							
3.00		*Staff Support*										1,324	
3.01	1	Conference room/teaching room	8.2.2.4						168	1	168		
3.02		Staff respite space	8.2.2.6						100	1	100		
3.03		Staff team room	8.2.2.6						168	1	168		
3.04		Staff toilet							60	1	60		
3.05		Staff lockers			20.00	215			220	1	220		
3.06		Offices							120	1	120		
3.07		Nutrition Office							120	0	0		Per HI staff survey
3.08		Pharmacy Office							120	1	120		Per HI staff survey
3.09		Rehab Medicine Office							140	0	0		Per HI staff survey
3.10		Residents' Team Room							168	1	168		
3.11		Residents' Duty Room							120	1	120		Per HI staff survey
3.12		Duty Room Toilet/Shower							80	1	80		Per HI staff survey
4.00		*Facilities Support*										*440*	
4.01		IDF/Telecomm							150	1	150		
4.02		Public Washroom							60	1	60		
4.03		Trash Hold							80	1	80		Per HI staff survey
4.04		Chute Room							150	1	150		Per HI staff survey
		Outdoor space											
		SUBTOTAL										9,323	
		Circulation Factor								40%	3,729		
		Structure Factor								10%	1,305		
		TOTAL PROGRAM DGSF REQUIRED:								1.54		**14,357**	

NOTES:

1 **Conference / teaching room** **8.2.2.4**

NOTE: A mock-up ICU set-up should be considered for research or teaching.

2 **Patient treatment places** **4.5.4**

All patient treatment places, whether intended for inpatient or outpatient use, shall be single occupancy unless the functional program demonstrates the necessity of multi-patient arrangement.

Single occupancy means that patients have a spatial separation and a physical barrier between them sufficient to provide privacy, protection from the spread of infection and adequate area to support clinical funtions.

HALIFAX INFIRMARY

Department: **Day Surgery**

Date: May 31, 2013

STATUS: **Part B Submittal**

Version 2

DRIVERS:

2	Examination, scooter access
8	Exam Treatment cubicle, closed, chair
8	Exam Treatment cubicle, closed, bed
18	**TOTAL DAY SURGERY PREP BAYS**
457	**DGSF per Driver**

	NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m²	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
						11							
1.00		*Arrival, Check in*	*9.5.3.6*									905	
1.01	**2,3**	Waiting	9.5.3.6				20	30	600	1	600		
1.02		Reception Desk					3	50	150	1	150		
1.03		Public Toilets							60	2	120		
1.04		Telephone							35	1	35		
2.00												3,908	
2.01		**Examination, standard**	**9.5.3.3.1**	**11.1/14**	**12.00**	**129**					**0**		
2.02		**Examination, scooter access**		**11.1/14**	**13.00**	**140**			**140**	**2**	**280**		
2.03											0		
2.04		Interview	9.5.3.3.1								0		
2.05		Preparation	9.5.3.3.1								0		
2.06		Exam Treatment cubicle, open, chair	9.5.3.6	11.1/14	7.50	81					0		
2.07		Exam Treatment cubicle, open, bed	9.5.3.6	11.1/14	9.50	102					0		
2.08	**1**	**Exam Treatment cubicle, closed, chair**	**9.5.3.6**	**11.1/14**	**8.40**	**90**			**90**	**8**	**720**		
2.09	**1**	**Exam Treatment cubicle, closed, bed**	**9.5.3.6**	**11.1/14**	**13.00**	**140**			**140**	**8**	**1,120**		
2.10		Lockers	9.5.3.6				20	8	160	1	160		
2.11		Patient Toilet	9.5.3.6	11.1/25	5.60	60			60	3	180		
2.12		Clothing change or gowning	9.5.3.6						60	3	180		If private holding rooms or cubicles are provided, changing rooms are not needed
2.13											0		
2.14		Testing	9.5.3.3.1						120	1	120		Per HI staff survey
2.15		Blood draw							80	2	160		
2.16		Vital Signs	9.5.3.3.1								0		
2.17		Scale alcove							35	2	70		
2.18											0		
2.19		Nurse Station / Control		11.1/3	4.60	50	4	50	200	1	200		
2.20		Hand Hygiene Sink		11.1/19	1.00	11			11	3	33		
2.21		Waterless Hand Hygiene Station		11.1/20	NA						130		
2.22		Medication Station							130	1	130		
2.23		Clean supplies							130	1	130		
2.24		Soiled Holding							130	1	130		
2.25		Trash Hold							80	1	80		Per HI staff survey
2.26		Linen							60	1	60		
2.27		Crash Cart							25	1	25		

HALIFAX INFIRMARY

Department: **Day Surgery**

Date: May 31, 2013

STATUS: **Part B Submittal**

Version 2

DRIVERS:

2	Examination, scooter access
8	Exam Treatment cubicle, closed, chair
8	Exam Treatment cubicle, closed, bed
18	**TOTAL DAY SURGERY PREP BAYS**
457	**DGSF per Driver**

	NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m^2	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
						11							
3.00												530	
3.01		Housekeeping		11.1/21	7.00	75			80	1	80		
3.02		Staff Toilet							60	1	60		
3.03		Offices							120	2	240		
3.04		Staff Break Room							150	1	150		
		SUBTOTAL										5,343	
		Circulation Factor								40%	2,137		
		Structure Factor								10%	748		
		TOTAL PROGRAM DGSF REQUIRED:								1.54		**8,228**	

NOTES:

1 **Patient treatment places** **4.5.4**
All patient treatment places, whether intended for inpatient or outpatient use, shall be single occupancy unless the functional program demonstrates the necessity of multi-patient arrangement.
Single occupancy means that patients have a spatial separation and a physical barrier between them sufficient to provide privacy, protection from the spread of infection and adequate area to support clinical funtions.

2 **Waiting area clearances** **7.5.2.7**
Waiting rooms and holding areas where multiple patients occupy the same room, shall comply with the following precautions and minimum distances for separation:
a: Unscreened patients - minimum of 1000mm or physical barrier (e.g., pod design)
b: screened patients -(i.e. symptoms have been assessed through triage or self-screening) distance between chairs may be less than 1000mm, depending on facility type, patient population and degree of risk
c: symptomatic patients (e.g., coughing) - mimimum distance of 2000 mm or physical barrier.

3 **Accommodations of bariatric persons** **7.8.8.1.2**
Door widths in lounges and waiting areas shall be a minimum of 1220mm wide.

DRIVERS:

48	Inpatient bedroom
2	Inpatient bedroom, AIR
50	Total Inpatient Beds
876	**DGSF per Driver**

HALIFAX INFIRMARY

Department: **6th Floor Nursing**

Date: May 31, 2013

STATUS: **Part B Submittal**

Version 2

	NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m^2	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
						11							
1.00		*Patient Rooms*										*19,705*	
1.01	2	**Inpatient bedroom**	8.1.4	8.2/3	**23.20**	**250**			**250**	**48**	**12,000**		
1.02		Inpatient bedroom - vestibule	8.1.4	8.1/1	5.00	54			55	48	2,640		
1.03		Inpatient bedroom - supply alcove	8.1.4	8.1/1	1.40	15			15	48	720		
1.04		Inpatient bedroom - washroom	8.1.4	8.1/1	5.60	60			60	48	2,880		
1.05		PPE equipment alcove	8.2.3.3						5	48	240		Adjacent to each inpatient room entrance
1.06		**Inpatient bedroom, AIR**		**8.2/3**	**25.00**	**269**			**270**	**2**	**540**		
1.07		Inpatient bedroom, AIR, anteroom		8.2/3	7.50	81			80	2	160		
1.08		Inpatient bedroom, AIR, supply alcove		8.2/3	1.00	11			15	2	30		
1.09		Inpatient bedroom, AIR, washroom		8.2/3	5.60	60			60	2	120		Sized for three piece washroom
1.10		Dictation/Review Station		11.1/12	1.40	15			15	25	375		
2.00		*Clinical Support*										*5,114*	
2.01		Reception/control desk		8.2/1	4.60	50	2	50	100	2	200		
2.02		Staff Work Area (nursing station)		8.2/2	4.60	50	8	50	400	2	800		
2.03		Pneumatic Tube Station							25	2	50		Per HI staff survey
2.04		Point-of-care testing/Phlebotomy							120	2	240		Per HI staff survey
2.05		Family consult rooms	8.2.2.9	11.1/14	13.00	140			140	2	280		Scooter access
2.06		Crash Cart Alcove	8.2.2.10						25	2	50		
2.07		Equipment storage, small	8.2.3.6	11.1/9	12.00	129			130	2	260		
2.08		Medication		11.1/31	9.50	102			130	2	260		
2.09		Nourishment		11.1/33	10.00	108			130	2	260		
2.10		Food Service Center							244	1	244		Per HI staff survey
2.11		Clean Linen							35	4	140		
2.12		Clean Workroom		11.1/8	11.00	118			130	2	260		
2.13		Soiled Workroom		11.1/40	12.00	129			130	2	260		
2.14		Soiled Dietary Cart Storage							35	2	70		
2.15		Housekeeping		11.1/21	7.00	75			80	2	160		
2.16		Stretcher/Wheelchair storage							120	2	240		Per HI staff survey
2.17		Family lounge	8.2.2.8				10	28	280	2	560		
2.18		RT cleaning/testing	8.2.3.5						130	1	130		
2.19		RT storage	8.2.3.5						130	1	130		
2.20		Mobility Aid Storage							120	1	120		Per HI staff survey
2.21		Rehab Medicine treatment							400	1	400		Per HI staff survey

DRIVERS:

48	Inpatient bedroom
2	Inpatient bedroom, AIR
50	Total Inpatient Beds
876	**DGSF per Driver**

HALIFAX INFIRMARY

Department: **6th Floor Nursing**

Date: May 31, 2013

STATUS: **Part B Submittal**

Version 2

	NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m^2	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
						11							
3.00		*Staff Support*										2,864	
3.01	**1**	Conference room/teaching room	8.2.2.4						168	1	168		
3.02		Staff respite space	8.2.2.6						100	2	200		
3.03		Staff team room	8.2.2.6						168	2	336		
3.04		Staff toilet							60	4	240		
3.05		Staff lockers			20.00	215			220	1	220		
3.06		Offices							120	4	480		
3.07		Nutrition Office							120	1	120		Per HI staff survey
3.08		Pharmacy Office							120	1	120		Per HI staff survey
3.09		Rehab Medicine Office							140	1	140		Per HI staff survey
3.10		Residents' Team Room							220	2	440		
3.11		Residents' Duty Room							120	2	240		Per HI staff survey
3.12		Duty Room Toilet/Shower							80	2	160		Per HI staff survey
4.00		*Facilities Support*										*770*	
4.01		IDF/Telecomm							150	2	300		
4.02		Public Washroom							60	4	240		
4.03		Trash Hold							80	1	80		Per HI staff survey
4.04		Chute Room							150	1	150		Per HI staff survey
		Outdoor space											
		SUBTOTAL										28,453	
		Circulation Factor								40%	11,381		
		Structure Factor								10%	3,983		
		TOTAL PROGRAM DGSF REQUIRED:								1.54		**43,818**	

NOTES:

1 Conference / teaching room **8.2.2.4**

NOTE: A mock-up ICU set-up should be considered for research or teaching.

2 Patient treatment places **4.5.4**

All patient treatment places, whether intended for inpatient or outpatient use, shall be single occupancy unless the functional program demonstrates the necessity of multi-patient arrangement.

Single occupancy means that patients have a spatial separation and a physical barrier between them sufficient to provide privacy, protection from the spread of infection and adequate area to support clinical funtions.

HALIFAX INFIRMARY

Department: **7th Floor Nursing**

Date: May 31, 2013

STATUS: **Part B Submittal**

Version 2

DRIVERS:

48	Inpatient bedroom
2	Inpatient bedroom, AIR
50	Total Inpatient beds
876	**DGSF per Driver**

	NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m^2	SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
						11							
1.00		*Patient Rooms*										*19,705*	
1.01		**Inpatient bedroom**	8.1.4	8.2/3	**23.20**	**250**			**250**	**48**	**12,000**		
1.02		Inpatient bedroom - vestibule	8.1.4	8.1/1	5.00	54			55	48	2,640		
1.03		Inpatient bedroom - supply alcove	8.1.4	8.1/1	1.40	15			15	48	720		
1.04		Inpatient bedroom - washroom	8.1.4	8.1/1	5.60	60			60	48	2,880		
1.05		PPE equipment alcove	8.2.3.3						5	48	240		Adjacent to each inpatient room entrance
1.06		**Inpatient bedroom, AIR**		**8.2/3**	**25.00**	**269**			**270**	**2**	**540**		
1.07		Inpatient bedroom, AIR, anteroom		8.2/3	7.50	81			80	2	160		
1.08		Inpatient bedroom, AIR, supply alcove		8.2/3	1.00	11			15	2	30		
1.09		Inpatient bedroom, AIR, washroom		8.2/3	5.60	60			60	2	120		Sized for three piece washroom
1.10		Dictation/Review Station		11.1/12	1.40	15			15	25	375		
2.00		*Clinical Support*										*5,114*	
2.01		Reception/control desk		8.2/1	4.60	50	2	50	100	2	200		
2.02		Staff Work Area (nursing station)		8.2/2	4.60	50	8	50	400	2	800		
2.03		Pneumatic Tube Station							25	2	50		Per HI staff survey
2.04		Point-of-care testing/Phlebotomy							120	2	240		Per HI staff survey
2.05		Family consult rooms	8.2.2.9	11.1/14	13.00	140			140	2	280		Scooter access
2.06		Crash Cart Alcove	8.2.2.10						25	2	50		
2.07		Equipment storage, small	8.2.3.6	11.1/9	12.00	129			130	2	260		
2.08		Medication		11.1/31	9.50	102			130	2	260		
2.09		Nourishment		11.1/33	10.00	108			130	2	260		
2.10		Food Service Center							244	1	244		Per HI staff survey
2.11		Clean Linen							35	4	140		
2.12		Clean Workroom		11.1/8	11.00	118			130	2	260		
2.13		Soiled Workroom		11.1/40	12.00	129			130	2	260		
2.14		Soiled Dietary Cart Storage							35	2	70		
2.15		Housekeeping		11.1/21	7.00	75			80	2	160		
2.16		Stretcher/Wheelchair storage							120	2	240		Per HI staff survey
2.17		Family lounge	8.2.2.8				10	28	280	2	560		
2.18		RT cleaning/testing	8.2.3.5						130	1	130		
2.19		RT storage	8.2.3.5						130	1	130		
2.20		Mobility Aid Storage							120	1	120		Per HI staff survey
2.21		Rehab Medicine treatment							400	1	400		Per HI staff survey

DRIVERS:

48	Inpatient bedroom
2	Inpatient bedroom, AIR
50	Total Inpatient beds
876	**DGSF per Driver**

HALIFAX INFIRMARY

Department: **7th Floor Nursing**

Date: May 31, 2013

STATUS: **Part B Submittal**

Version 2

	NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m²	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
						11							
3.00		*Staff Support*										2,864	
3.01	**1**	Conference room/teaching room	8.2.2.4						168	1	168		
3.02		Staff respite space	8.2.2.6						100	2	200		
3.03		Staff team room	8.2.2.6						168	2	336		
3.04		Staff toilet							60	4	240		
3.05		Staff lockers			20.00	215			220	1	220		
3.06		Offices							120	4	480		
3.07		Nutrition Office							120	1	120		Per HI staff survey
3.08		Pharmacy Office							120	1	120		Per HI staff survey
3.09		Rehab Medicine Office							140	1	140		Per HI staff survey
3.10		Residents' Team Room							220	2	440		
3.11		Residents' Duty Room							120	2	240		Per HI staff survey
3.12		Duty Room Toilet/Shower							80	2	160		Per HI staff survey
4.00		*Facilities Support*										*770*	
4.01		IDF/Telecomm							150	2	300		
4.02		Public Washroom							60	4	240		
4.03		Trash Hold							80	1	80		Per HI staff survey
4.04		Chute Room							150	1	150		Per HI staff survey
		Outdoor space											
		SUBTOTAL										28,453	
		Circulation Factor								40%	11,381		
		Structure Factor								10%	3,983		
		TOTAL PROGRAM DGSF REQUIRED:								1.54		**43,818**	

NOTES:

1 Conference / teaching room 8.2.2.4

NOTE: A mock-up ICU set-up should be considered for research or teaching.

2 Patient treatment places 4.5.4

All patient treatment places, whether intended for inpatient or outpatient use, shall be single occupancy unless the functional program demonstrates the necessity of multi-patient arrangement.

Single occupancy means that patients have a spatial separation and a physical barrier between them sufficient to provide privacy, protection from the spread of infection and adequate area to support clinical funtions.

DRIVERS:

48	Inpatient bedroom
2	Inpatient bedroom, AIR
50	Total Inpatient beds
876	**DGSF per Driver**

HALIFAX INFIRMARY

Department: **8th Floor Nursing**

Date: May 31, 2013

STATUS: **Part B Submittal**

Version 2

NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m^2	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
					11							
1.00	*Patient Rooms*										*19,705*	
1.01	**Inpatient bedroom**	8.1.4	8.2/3	**23.20**	**250**			**250**	**48**	**12,000**		
1.02	Inpatient bedroom - vestibule	8.1.4	8.1/1	5.00	54			55	48	2,640		
1.03	Inpatient bedroom - supply alcove	8.1.4	8.1/1	1.40	15			15	48	720		
1.04	Inpatient bedroom - washroom	8.1.4	8.1/1	5.60	60			60	48	2,880		
1.05	PPE equipment alcove	8.2.3.3						5	48	240		Adjacent to each inpatient room entrance
1.06	**Inpatient bedroom, AIR**		**8.2/3**	**25.00**	**269**			**270**	**2**	**540**		
1.07	Inpatient bedroom, AIR, anteroom		8.2/3	7.50	81			80	2	160		
1.08	Inpatient bedroom, AIR, supply alcove		8.2/3	1.00	11			15	2	30		
1.09	Inpatient bedroom, AIR, washroom		8.2/3	5.60	60			60	2	120		Sized for three piece washroom
1.10	Dictation/Review Station		11.1/12	1.40	15			15	25	375		
2.00	*Clinical Support*										*5,114*	
2.01	Reception/control desk		8.2/1	4.60	50	2	50	100	2	200		
2.02	Staff Work Area (nursing station)		8.2/2	4.60	50	8	50	400	2	800		
2.03	Pneumatic Tube Station							25	2	50		Per HI staff survey
2.04	Point-of-care testing/Phlebotomy							120	2	240		Per HI staff survey
2.05	Family consult rooms	8.2.2.9	11.1/14	13.00	140			140	2	280		Scooter access
2.06	Crash Cart Alcove	8.2.2.10						25	2	50		
2.07	Equipment storage, small	8.2.3.6	11.1/9	12.00	129			130	2	260		
2.08	Medication		11.1/31	9.50	102			130	2	260		
2.09	Nourishment		11.1/33	10.00	108			130	2	260		
2.10	Food Service Center							244	1	244		Per HI staff survey
2.11	Clean Linen							35	4	140		
2.12	Clean Workroom		11.1/8	11.00	118			130	2	260		
2.13	Soiled Workroom		11.1/40	12.00	129			130	2	260		
2.14	Soiled Dietary Cart Storage							35	2	70		
2.15	Housekeeping		11.1/21	7.00	75			80	2	160		
2.16	Stretcher/Wheelchair storage							120	2	240		Per HI staff survey
2.17	Family lounge	8.2.2.8				10	28	280	2	560		
2.18	RT cleaning/testing	8.2.3.5						130	1	130		
2.19	RT storage	8.2.3.5						130	1	130		
2.20	Mobility Aid Storage							120	1	120		Per HI staff survey
2.21	Rehab Medicine treatment							400	1	400		Per HI staff survey

DRIVERS:

48	Inpatient bedroom
2	Inpatient bedroom, AIR
50	Total Inpatient beds
876	**DGSF per Driver**

HALIFAX INFIRMARY

Department: **8th Floor Nursing**

Date: May 31, 2013

STATUS: **Part B Submittal**

Version 2

	NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m²	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
						11							
3.00		*Staff Support*										2,864	
3.01	1	Conference room/teaching room	8.2.2.4						168	1	168		
3.02		Staff respite space	8.2.2.6						100	2	200		
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3.04		Staff toilet							60	4	240		
3.05		Staff lockers			20.00	215			220	1	220		
3.06		Offices							120	4	480		
3.07		Nutrition Office							120	1	120		Per HI staff survey
3.08		Pharmacy Office							120	1	120		Per HI staff survey
3.09		Rehab Medicine Office							140	1	140		Per HI staff survey
3.10		Residents' Team Room							220	2	440		
3.11		Residents' Duty Room							120	2	240		Per HI staff survey
3.12		Duty Room Toilet/Shower							80	2	160		Per HI staff survey
4.00		*Facilities Support*										*770*	
4.01		IDF/Telecomm							150	2	300		
4.02		Public Washroom							60	4	240		
4.03		Trash Hold							80	1	80		Per HI staff survey
4.04		Chute Room							150	1	150		Per HI staff survey
		Outdoor space											
		SUBTOTAL										28,453	
		Circulation Factor								40%	11,381		
		Structure Factor								10%	3,983		
		TOTAL PROGRAM DGSF REQUIRED:								1.54		**43,818**	

NOTES:

1 **Conference / teaching room** **8.2.2.4**

NOTE: A mock-up ICU set-up should be considered for research or teaching.

2 **Patient treatment places** **4.5.4**

All patient treatment places, whether intended for inpatient or outpatient use, shall be single occupancy unless the functional program demonstrates the necessity of multi-patient arrangement.

Single occupancy means that patients have a spatial separation and a physical barrier between them sufficient to provide privacy, protection from the spread of infection and adequate area to support clinical funtions.

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CAPITAL DISTRICT HEALTH AUTHORITY (CDHA)
INNOVATIVE CARE FLEXIBLE FACILITIES
HALIFAX & DARTMOUTH, NOVA SCOTIA

JUNE 20, 2013

3.0 Project Cost Summary

HALIFAX INFIRMARY - HYBRID CONCEPT			Total Development
New Building Construction	488,766	SF	[redacted]
Renovated Building Construction	49,122	SF	
Site Works	1	Sum	
Total Construction Cost	**537,888**	**SF**	
Additional Cost Items / Allowances	1	Sum	
Construction Contingency	1	Sum	
Ancillaries	1	Sum	
Healthcare Commissioning	1	Sum	
Moving Costs	1	Sum	
FF&E and IT	1	Sum	
Sub-total Project Cost Current $	**537,888**	**SF**	
Escalation to Mid-point of Construction			
Total Project Cost Escalated	**537,888**	**SF**	

Cost Estimate

A Class "C" Unit Rate cost estimate was prepared for the Halifax Infirmary Hybrid Concept by Hanscomb Limited. *3.0 Project Cost Summary*, on this page, provides high-level information, with some line items shown with more detail in the tables on the following pages.

Many other factors are captured in the calculation of the underlying unit rates themselves.

Renovation costs are based on two primary factors: the type of space being renovated and the extent or complexity of renovation required to any given space. Renovation costs for different space types are based on comparable cost data from other relevant and recent projects, while complexity of renovation required has been estimated by the design team based on professional judgement and information provided by CDHA staff.

Please also refer to the section of this report titled "Cost Estimating, General" for common criteria, methodology, assumptions and exclusions applicable to all Cost Estimates for this project.

CAPITAL DISTRICT HEALTH AUTHORITY (CDHA)
INNOVATIVE CARE FLEXIBLE FACILITIES
HALIFAX & DARTMOUTH, NOVA SCOTIA

CAPITAL DISTRICT HEALTH AUTHORITY (CDHA)
HALIFAX INFIRMARY - HYBRID CONCEPT

Hanscomb
JUNE 20, 2013

A - 1

CAPITAL DISTRICT HEALTH AUTHORITY (CDHA) HALIFAX INFIRMARY - HYBRID CONCEPT	Type	Reno Level	May 2013 Drawing Areas (SF)	$/SF	Net Construction Cost	Asbestos Materials Abatement $15.00	Infectious Control Measures 1.0%	In Contract Equipment Allowance 5.0%	Design & Pricing Allowance 10.0%	Phasing for Renovated Work 3.0%	LEED Allowance 2.5%	Construction Management Fee 5.0%	Total Construction Cost	Construction Contingency 5.0%	Project Ancillaries 23.2%	Healthcare Commissioning 0.5%	Moving Allowance 4.00	FF& E and IT %	FF& E and IT Allowance	TOTAL CURRENT PROJECT COST	Potential Impact of Escalation @ 3% p.a. to Mid-point of Construction Const Mid-Point	Yrs	Escalation 3.0% per annum	PROJECT COST INCLUDING ESCALATION
FIRST FLOOR																								
Indoor Parking Garage	New		55,275 cgsf																					
Public Area	New		1,940 cgsf																					
Elevator & Tunnel Connection	New		1,353 cgsf																					
Building Gross	New		6,351 bgsf																					
Sub-total	**New**		**64,919 bgsf**																					
SECOND FLOOR																								
Indoor Parking Garage	New		37,950 cgsf																					
Central Sterile Processing Department (CSPD)	New		18,392 cgsf																					
Elevator & Tunnel Connection	New		1,353 cgsf																					
Building Gross	New		8,451 bgsf																					
Sub-total	**New**		**66,146 bgsf**																					
THIRD FLOOR																								
3rd Floor Food Court	Shell		11,982 cgsf																					
Clinical Facility Support	New		10,000 cgsf																					
Public Lobby	New		4,000 cgsf																					
Ramp to Parking	New		1,555 cgsf																					
Elevator & Public Connection	New		1,238 cgsf																					
Building Gross	New		2,342 bgsf																					
Sub-total	**New**		**31,117 bgsf**																					
FOURTH FLOOR																								
4th Floor MEP Interstitial Space	New		38,050 cgsf																					
New Public/Retail	Shell		10,000 cgsf																					
Penthouse - Existing	New		6,150 cgsf																					
Elevator & Public Connection	New		1,687 cgsf																					
Building Gross	New		8,130 bgsf																					
Sub-total	**New**		**64,017 bgsf**																					
FIFTH FLOOR																								
Operating Room Suite	New		42,735 cgsf																					
Surgical Prep/Recovery	New		15,389 cgsf																					
12-Bed ICU	New		14,357 cgsf																					
Day Surgery	New		8,228 cgsf																					
Surgery Public/Waiting	New		3,562 cgsf																					
Elevator & Public Connection	New		1,926 cgsf																					
Building Gross	New		12,642 bgsf																					
Sub-total	**New**		**98,839 bgsf**																					
SIXTH FLOOR																								
6th Floor Nursing - 50-Bed Inpatient Area	New		43,818 cgsf																					
Research Space (Dry & Wet Labs)	New		1,040 cgsf																					
Elevator & Public Connection	New		2,990 cgsf																					
Building Gross	New		4,428 bgsf																					
Sub-total	**New**		**52,276 bgsf**																					
SEVENTH FLOOR																								
7th Floor Nursing - 50-Bed Inpatient Area	New		43,818 cgsf																					
Research Space (Dry & Wet Labs)	New		1,040 cgsf																					
Elevator & Public Connection	New		2,990 cgsf																					
Building Gross	New		4,428 bgsf																					
Sub-total	**New**		**52,276 bgsf**																					
EIGHT FLOOR																								
8th Floor Nursing - 50-Bed Inpatient Area	New		43,818 cgsf																					
Research Space (Dry & Wet Labs)	New		1,040 cgsf																					
Elevator & Public Connection	New		2,990 cgsf																					
Building Gross	New		4,428 bgsf																					
Sub-total	**New**		**52,276 bgsf**																					
NEW BRIDGE CONNECTION																								
6th Floor	New		2,300 cgsf																					
7th Floor	New		2,300 cgsf																					
8th Floor	New		2,300 cgsf																					
Sub-total	**New**		**6,900 bgsf**																					
New Building Construction			**488,766 bgsf**																					
FIRST FLOOR																								
Reassignment/Relocation of Displaced Office Space	Reno	1	7,900 dgsf																					
SECOND FLOOR																								
Convert Extg Wms Locker Rm to New Corridor	Reno	2	1,400 dgsf																					
Renovation for Expanded CSPD	Reno	3	1,693 dgsf																					
New Corridor under Extg Construction	Reno	4	1,200 dgsf																					
Convert Cafeteria & Servery to Pharmacy	Reno	3	9,200 dgsf																					
Convert Pharmacy to Women's Lockers	Reno	3	4,800 dgsf																					
Expand Men's Lockers into Cardiac Offices	Reno	2	1,500 dgsf																					
Retain/Modify/Expand Pharmacy Offices	Reno	1	3,400 dgsf																					
Convert Offices to Body Holding	Reno	2	400 dgsf																					
Convert Lockers to Sleep Rooms	Reno	2	1,215 dgsf																					
THIRD FLOOR																								
Renovations above Level Two Connection	Reno	4	2,740 dgsf																					
Expand Diagnostic Imaging into Film Holding	Reno	3	6,500 dgsf																					
Renovated Ambulance Bay	Reno	4	1,022 dgsf																					
FOURTH FLOOR																								
Renovate for Connection to New Addition	Reno	3	1,600 dgsf																					
FIFTH FLOOR																								
Renovate Prep for Connection to New Addition	Reno	3	1,000 dgsf																					
SIXTH FLOOR																								
Renovate Food & Nutrition for Expanded Clinical Lab	Reno	3	2,000 dgsf																					
Renovate Heart/ED for Expanded Clinical Lab	Reno	3	400 dgsf																					
Renovate Existing for New Bridge Connection	Reno	3	384 dgsf																					
SEVENTH FLOOR																								
Renovate Existing for New Bridge Connection	Reno	3	384 dgsf																					
EIGHTH FLOOR																								

[redacted]

CAPITAL DISTRICT HEALTH AUTHORITY (CDHA)
INNOVATIVE CARE FLEXIBLE FACILITIES
HALIFAX & DARTMOUTH, NOVA SCOTIA

CAPITAL DISTRICT HEALTH AUTHORITY (CDHA)
HALIFAX INFIRMARY - HYBRID CONCEPT

Hanscomb
JUNE 20, 2013

A - 1

CAPITAL DISTRICT HEALTH AUTHORITY (CDHA) HALIFAX INFIRMARY - HYBRID CONCEPT	Type	Reno Level	May 2013 Drawing Areas (SF)	$/SF	Net Construction Cost	Asbestos Materials Abatement $15.00	Infectious Control Measures 1.0%	In Contract Equipment Allowance 5.0%	Design & Pricing Allowance 10.0%	Phasing for Renovated Work 3.0%	LEED Allowance 2.5%	Construction Management Fee 5.0%	Total Construction Cost	Construction Contingency 5.0%	Project Ancillaries 23.2%	Healthcare Commissioning 0.5%	Moving Allowance 4.00	FF& E and IT %	Allowance	TOTAL CURRENT PROJECT COST	Potential Impact of Escalation @ 3% p.a. to Mid-point of Construction Const Mid-Point	Yrs	Escalation 3.0% per annum	PROJECT COST INCLUDING ESCALATION
Renovate Existing for New Bridge Connection	Reno	3	384 dgsf																					
Renovated Building Construction			**49,122 dgsf**																					
Allowance for Site Works			**537,888 dgsf**																					
Site Work (See attached sheet for details)			1 Sum																					
Additional Cost Items / Allowances			**1 Sum**																					
Expansion to Existing Parking Structure - 2 Levels			25,230 bgsf																					
New 'Helipad' on roof of New Addition			1 Sum																					
Dismantle and Removal of Existing 'Helipad' - Allowance			1 Sum																					
New Pneumatic Tube System for New Addition - Tie into Existing			17 Stns																					
Demolition of Centennial & Victoria Bldgs			1 Sum																					
HALIFAX INFIRMARY - HYBRID CONCEPT			**537,888 bgsf**																					

[redacted]

File Name: HAL2724_-_CDHA_ICFF_Class_'C'_Estimate_(Jun_20_-2013)_V4.xlsOption HI CY
Print Date: 20/06/20134:44 PM

CAPITAL DISTRICT HEALTH AUTHORITY (CDHA)
INNOVATIVE CARE FLEXIBLE FACILITIES
HALIFAX & DARTMOUTH, NOVA SCOTIA

Hanscomb
JUNE 20, 2013

Project Cost Summary

BUILDING SHELL - HALIFAX INFIRMARY HYBRID CONCEPT:

Foundations		**488,766**	**SF**
1 Allowance for normal foundations		488,766	SF
Basement Excavation		**71,725**	**CY**
1 Allowance for bulk excavation for basement		71,725	CY
2 Allowance for backfill		17,931	CY
3 Extra over to excavate QEH demo rubble & sulphide bearing slate (See Site Work)		0	SF
Special Conditions		**1**	**Sum**
1 Allowance for dewatering		1	Sum
2 Premium for caissons (assume none required)		0	SF
3 Potential for artifacts (assume none in this area)		1	Sum
Lowest Floor Construction		**66,146**	**SF**
1 Concrete slab on grade		66,146	SF
2 Premium for underslab drainage		66,146	SF
Upper Floor Construction		**422,620**	**SF**
1 Suspended floors		401,904	SF
2 Existing roof space converted to new floor area c/w the removal of the existing roof finish and the repairs/modifications to the slab as maybe required		20,716	SF
3 Extra over for transfer slab over the parking levels		107,209	SF
4 Stairs		27	Flt
Roof Construction		**105,327**	**SF**
1 Roof structure		105,327	SF
Walls Below Grade		**20,805**	**SF**
1 Reinforced concrete basement walls		20,805	SF
Walls Above Grade		**142,759**	**SF**
1 Double Glazed Curtainwall (no spandrel)	45%	64,241	SF
2 Double Glazed Window	10%	14,276	SF
3 Brick cladding	31%	43,541	SF
4 Premium for sunshades, etc.		1	Sum
5 Louvers & metal panels	15%	20,700	SF
6 Architectural Features	100%	142,759	SF
Windows & Entrances		**22**	**No.**
1 Allowance for new doors, single leaf		11	Lvs
2 Allowance for new doors, double leaf		5	Pair
3 Allowance for overhead doors		1	No.
Roof Covering		**105,327**	**SF**
1 Roof covering system - 2 ply mod. Bit.		105,327	SF
2 Extra over for Green Roof / Terrace over Level 5		41,160	SF
3 Allowance for skylights - (assume none)		0	SF
Projections		**1**	**Sum**
1 Allowance for canopy		1	Sum
2 Soffit c/w insulation & finish - u/s Levels 4 & 5		31,622	SF
Elevators		**6**	**No.**
1 5,000lb Elevators (8 stop) - Passenger		2	No.
2 5,000lb Elevators (8 stop) - Patient		2	No.
3 5,000lb Elevators (8 stop) - Soiled & Clean		2	No.
SUB-TOTAL		**488,766**	**SF**
1 General Requirements		14%	
TOTAL		**488,766**	**SF**

CAPITAL DISTRICT HEALTH AUTHORITY (CDHA)
INNOVATIVE CARE FLEXIBLE FACILITIES
HALIFAX & DARTMOUTH, NOVA SCOTIA

Hanscomb
JUNE 20, 2013

Project Cost Summary

SITE - HALIFAX INFIRMARY HYBRID CONCEPT:

Site Development		**1**	**Sum**
1 Grub and prep site including removals		84,700	SF
2 Extra over to excavate QEH demo rubble & sulphide bearing slate (allow half of area)		23,680	SF
3 New asphalt paving to roadway off of Ambulance entrance at Bell Rd. and around addition to Exit road to Robie St.		10,672	SF
4 New asphalt paving area of drop off, turn-around, parking at Level 3 including exit road to Robie St.		20,615	SF
5 Concrete curbs		2,290	LF
6 New concrete walkways or surfaces		13,886	SF
7 Roofing membrane & cover over podium deck over parking levels		35,029	SF
8 Allowance for removals, repiars & reinstatements in the area with the new stair/elev tower at the new Bridge		1	Sum
9 Allowance for hard landscaping		1	Sum
10 Allowance for soft landscaping		1	Sum
11 Sod & topsoil to disturbed areas		1	Sum
12 Close off existing Exit to Robie St. and create a new Entrance/Exit from Robie St.		1	Sum
13 New Control gate at access road to entrance to the new parking garage		1	Sum
14 Allowance for miscellaneous site removals including asphalt, concrete, curbs, etc.		1	Allow
Site Mechanical		**1**	**Sum**
11 New 8" sanitary line from new addition to existing line at Bell Rd.		275	LF
12 New 10" domestic water & sprinkler line around new addition		745	LF
13 Allowance for new fire hydrants		3	No.
14 Storm drainage allowance		1	Allow
Site Electrical		**1**	**Sum**
15 Site electrical & site lighting allowance		1	Allow
16 Alliowance for a new Emergency Generator & associated work - 1500kw assumed		1	Allow
SUB-TOTAL		**1**	**Sum**
General Requirements		14%	
TOTAL		**488,766**	**SF**

Dartmouth General Hospital Addition

Introduction

The Dartmouth General Hospital addition contains eight operating rooms along with new day surgery, pre-op and recovery spaces, as well as interstitial space for enhanced and consolidated future Ambulatory Care services and related support and service spaces. Other internal renovations within the existing hospital are part of the planning.

These renovations include relocation of the existing ICU from the fourth floor to the existing Day Surgery area on Level 2 (which was originally designed to be an ICU) to improve patient flow and collocate complementary critical care services and provision for a new public entrance on the North side of the building, directly accessible from the north parking lot. New elevators are planned in the addition to provide for efficient transport of critical care and post-op patients between all floors of the hospital.

A new multi-level parkade is planned for the north parking lot to replace surface parking lost due to the addition and support new services relocated to Dartmouth General Hospital.

Summary

See the following page for a summary of highlights for the Dartmouth General Hospital addition, including the pros and cons, proposed building areas and cost estimate information.

Dartmouth General Hospital – Surgical Addition		
Major Programmatic Requirements	• 8 ORs, with associated Pre-Op, Recovery, Support Services; Renovations required to address existing Endoscopy suites to remain. • Enhanced and expanded support services required to serve the new inpatient floor and new OR capacity • New main entrance and canopy on North side of hospital to separate pedestrian and ambulatory and OR traffic from Emergency traffic patterns. • Relocation of ICU from Level 4 west to the current Day Surgery area on Level 2, adjacent to the Emergency Dept. (space was originally designed to be ICU) • Renovate existing ICU for typical med/surg Unit functionality. • New 175-car parking structure in North parking lot to replace existing parking displaced for new addition and as required to support new inpatient and OR services. Design to accommodate additional levels in future. • New (patient-transfer) elevator tower and links to connect new addition with all inpatient floors. • Rooftop green roof terrace space for exterior greenspace. • LEED Silver sustainable design target.	
Options	**Option D – ORs on Level 3**	
Description	• This option places all 8 ORs and associated Pre-Op, Recovery and Support spaces on Level 3 with a direct connection to the Level 3 inpatient floor. • Existing, newly renovated Endoscopy suites remain on Level 2 with dedicated Day Surgery, Pre-Op, Recovery and Support spaces. • Interstitial space for future Ambulatory services created on Level 2 with grade-level access from the North parking lot, convenient to new main entry. • Allows for expansion of existing Diagnostic Imaging space into the area vacated by existing ORs and Recovery. • New expanded CSPD on Level 1 directly beneath the new ORs, with dedicated clean and soiled elevators to Level 3. • Mechanical services and equipment housed partly on Level 1, allowing for a smaller penthouse on roof.	
Drawing References	D.00 through D.11 (dated 31 May 2013)	
Pros/Cons	**Pros**	**Cons**
	• Ambulatory services on main entrance level makes for easier wayfinding, natural lighting and security control. • Maximizes future Ambulatory space on a convenient grade-level floor. • Provides ample service, storage and clinical support space on Level 1. • Direct connection from ORs to inpatient units on Level 3. • Dedicated additional elevator to facilitate transfer between ORs, ED, DI and ICU. • MEP partly on Level 1 (reduced chances of leaks, noise and vibrations affecting ORs). • Fairly straightforward construction phasing with minimal impact to existing operations compared to other options considered. (Existing ORs become part of future Ambulatory shell space and can be used right up to opening of the new addition). • Relocated SPD allows for direct vertical connection to ORs, with ideal separation of clean and soiled materials. • New pharmacy location allows for better utilization of space and higher efficiency. • New service corridor allows for minimal cross traffic with public and patient circulation. • Provides room for Diagnostic Imaging to expand adjacent to their current location. • Separate Endo dept. collocated on the same level as Ambulatory Services (including planned outpatient Cysto. procedures). • ORs on top level provide more flexibility in floor layouts and do not constrain potential ceiling heights. • Allows development of additional clinical support services on Level 1 adjacent to existing Cafeteria and Dialysis.	• New Prep/Recovery Spaces built on existing roof (noise and disruption due to modifications to existing roof and penthouse alterations required). • Separates Endo and other surgical facilities. Functionally, this could be a benefit, as patient throughput and post-op mobility is quite different from other surgical facilities. • ORs are not on same floor as ED, DI and ICU. (Dedicated elevator helps address this). • Some redistribution of existing mechanical ductwork/louvers/etc. will need to be undertaken where the new construction on the existing roof abuts the existing mechanical penthouse on Level 3.
Building Area (New Construction) BGSF	82,377 sq.ft. (includes penthouse over ORs, elevator tower and links to all inpatient floors)	
Program Area (Renovation/Ancillary) BGSF	37,398 sq.ft.	
Estimate of Probable Cost	[redacted]	

Space for Client Review Comments

Program Summary

The Dartmouth General Hospital Addition (DGH) Space Program included in this report represents the starting point (CSAZ8000-11 derived) condition with modifications and supplementary requirements as conveyed by CDHA and DGH Staff.

DARTMOUTH GENERAL HOSPITAL — **OPERATING ROOMS, DAY SURGERY AND RECOVERY ON THIRD FLOOR, ENDO REMAINS ON SECOND**
SURGICAL EXPANSION SUMMARY — Version 4B

Date: **May 31, 2013**
STATUS: **Part B Submittal**

DEPARTMENTS	NSF	Grossing	DGSF	RENO	NEW	REMARKS
FIRST FLOOR						
Pharmacy Renovation	5,136	1.28	6,558	6,062	496	
Renovation at Elevator Core						
Medical Device Reprocessing	9,178	1.14	10,474		10,474	
Building Support / MEP					2994	
Building Support / MEP					309	
Storage/Unassigned					1246	
TOTAL, DGSF				6,062	15,519	
BUILDING GROSSING FACTOR					1.27	
TOTAL NEW CONSTRUCTION					**19,666**	
SECOND FLOOR						
Endoscopy & Surgery Waiting Reno	5,812	1.69	9,797	9,797		
Digital Imaging Expansion Shell				2,859		
Interstitial / Future Ambulatory Space					17,476	
TOTAL, DGSF				12,656	17,476	
BUILDING GROSSING FACTOR					1.18	
TOTAL NEW CONSTRUCTION					**20,687**	
THIRD FLOOR						
Renovation at Elevator Core				546		Requires the loss of one patient room for Corridor link and one room converted to other purpose.
Surgical Suite	12,435	1.50	18,592		18,592	
Day Surgery	2,999	1.64	4,929		4,929	
Recovery	4,345	1.55	6,719		6,719	
Elevator Core and Lobby					524	
TOTAL, DGSF				546	30,764	
BUILDING GROSSING FACTOR					1.11	
TOTAL NEW CONSTRUCTION					**34,010**	
FOURTH FLOOR						
Renovation at Elevator Core				250		Requires the loss of one patient room
Elevator Core and Lobby					832	Elevator Lobby and connection to existing - does not include elevators
TOTAL, DGSF				250	832	
BUILDING GROSSING FACTOR					1.51	
TOTAL NEW CONSTRUCTION					**1,257**	Includes elevators and exterior wall
FIFTH FLOOR						
Fifth floor inpatient shell build out				***		Fifth floor program documents provided in separate sheet
Elevator Core and Lobby					832	Elevator Lobby and connection to existing - does not include elevators
TOTAL, DGSF				***	832	
BUILDING GROSSING FACTOR					1.51	
TOTAL NEW CONSTRUCTION					**1,257**	Includes elevators and exterior wall

Note:

Building Circulation Factor includes: stairs, elevators, mechanical shafts, exterior wall and corridors not within specific departments.

Ancillary Renovated Spaces

In addition to space programming and preliminary design for new construction components, much effort was involved in capturing the impacts to existing support services. Some support services, where appropriate, are captured as new spaces within the new additions. Other existing support services and ancillary spaces require renovations and expansions to meet the demands of the increased inpatient and surgical services being relocated from the Centennial building. These impacts are summarized in the Renovation Program table on this page and illustrated in the design drawings. These ancillary renovations are not all developed in detail in this report, but they are included in order to capture Master Plan level discussions and the cost impacts of the renovations required to satisfy the increased burden imposed by the relocated programs and services.

DARTMOUTH GENERAL HOSPITAL — OPERATING ROOMS ON LEVEL 3
RENOVATION PROGRAM — Version 2

	DGSF	Intensity of Reno	1 Low	2 Medium	3 High	4 Very High
LEVEL ONE						
Renovate Old SPD for New Clinical Support	1,130	3	0	0	1,130	0
Renovate Old SPD for New Pharmacy	6,380	3	0	0	6,380	0
Create New Service Corridor	875	2	0	875	0	0
Renovate Old Pharmacy for Offices	920	2	0	920	0	0
Renovate Old Pharmacy for Culinary Offices	210	2	0	210	0	0
Renovate Culinary for Additional cold & cart storage	260	3	0	0	260	0
LEVEL TWO						
Renovate Day Surgery for ICU	5,250	3	0	0	5,250	0
Renovate Surgery/Endo for Endo	6,747	3	0	0	6,747	0
Renovate Surgery/Endo for DI	2,430	3	0	0	2,430	0
Renovate existing space for Surgery Waiting/Registration	2,600	2	0	2,600	0	0
Renovate Offices for new Main Entry	1,574	3	0	0	1,574	0
Renovate existing space for new Foundation/Chapel (2)	1,574	2	0	1,574	0	0
Renovate existing Corridor to New Corridor	1,900	1	1,900	0	0	0
LEVEL THREE						
Renovate Patient Room for New Access Corridor	275	3	0	0	275	0
LEVEL FOUR						
Renovate Patient Room for New Access Corridor	260	3	0	0	260	0
Renovate ICU to new inpatient unit	5,013	3	0	0	5,013	0
LEVEL FIVE						
Build Out Shell (1)	0	3	0	0	0	0
TOTAL	37,398		1,900	6,179	29,319	0

(1) Costed separately
(2) Exact location (including floor level) to be determined

Design Solution: ORs on Level 3

Description

This option places all 8 ORs and associated Pre-Op, Recovery and Support spaces on Level 3 with a direct connection to the Level 3 inpatient floor.

Existing, newly renovated, Endoscopy suites remain on Level 2 with renovations for dedicated Day Surgery, Pre-Op, Recovery and Support spaces.

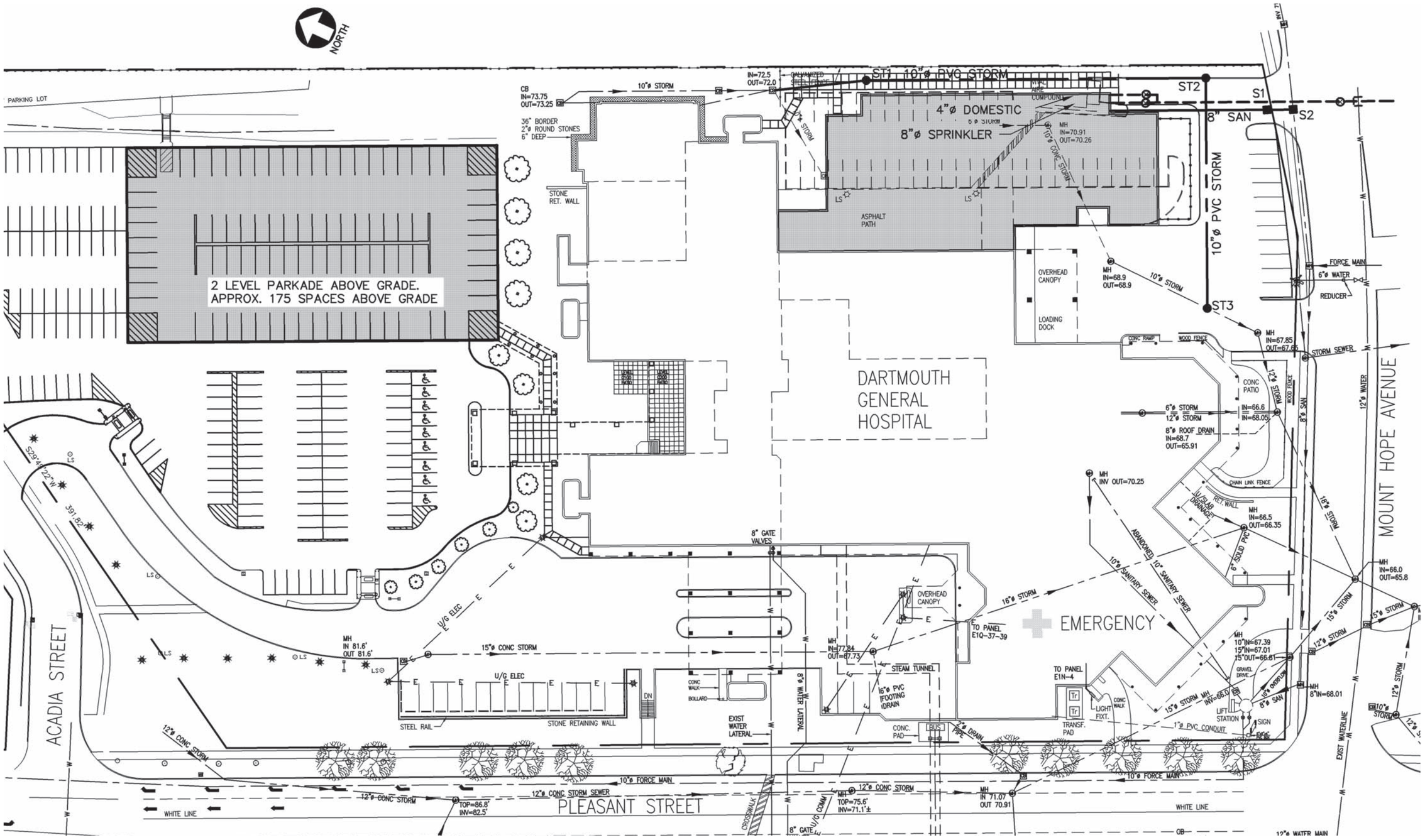
Interstitial space is created on Level 2 for new and consolidated Ambulatory Services with grade-level access from the North parking lot.

This option allows for additional clinic support, expanded Diagnostic Imaging or potential relocation of Pharmacy on Level 2 through renovation of the existing ORs for Pre-Op/Recovery.

Mechanical and electrical services/equipment are housed on Level 1 and in a rooftop penthouse over the ORs.

Drawings

See the plan drawings on the following pages illustrating the concept for the addition to Dartmouth General Hospital. The site plan and floor plans are followed by elevation rendering and 3D drawings illustrating the massing of the hospital from a variety of angles.



PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Dartmouth General
ORs on Level 3 Concept
Site Servicing Concept

nycum+ ASSOCIATES SMITHGROUP Smithgroup AEIP International Inc.
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

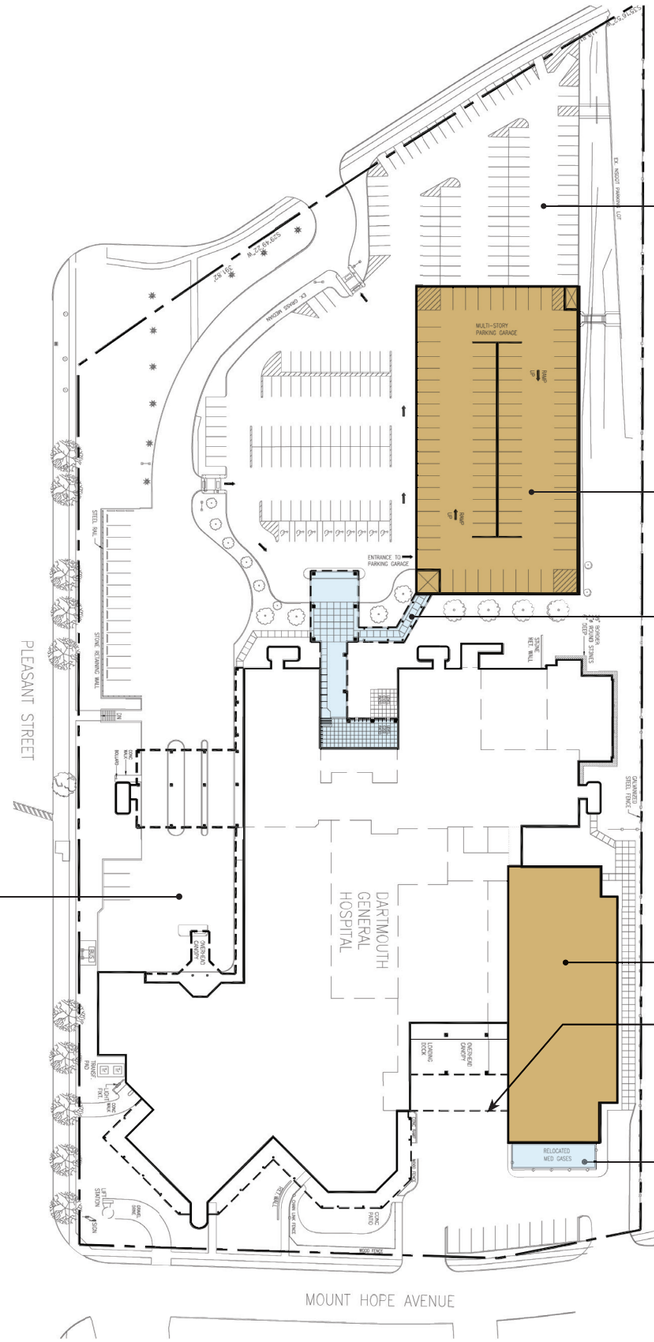
CBCL LIMITED
Consulting Engineers
ISO 9001 CERTIFIED

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date: 31 May 2013
Scale: 1" = 60'-0"
Drawn: BG

Drawing Number
D.C1



PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Dartmouth Concept OR 3
Site Plan

nycum+ ASSOCIATES SMITHGROUP Smithgroup AEIP International Inc.

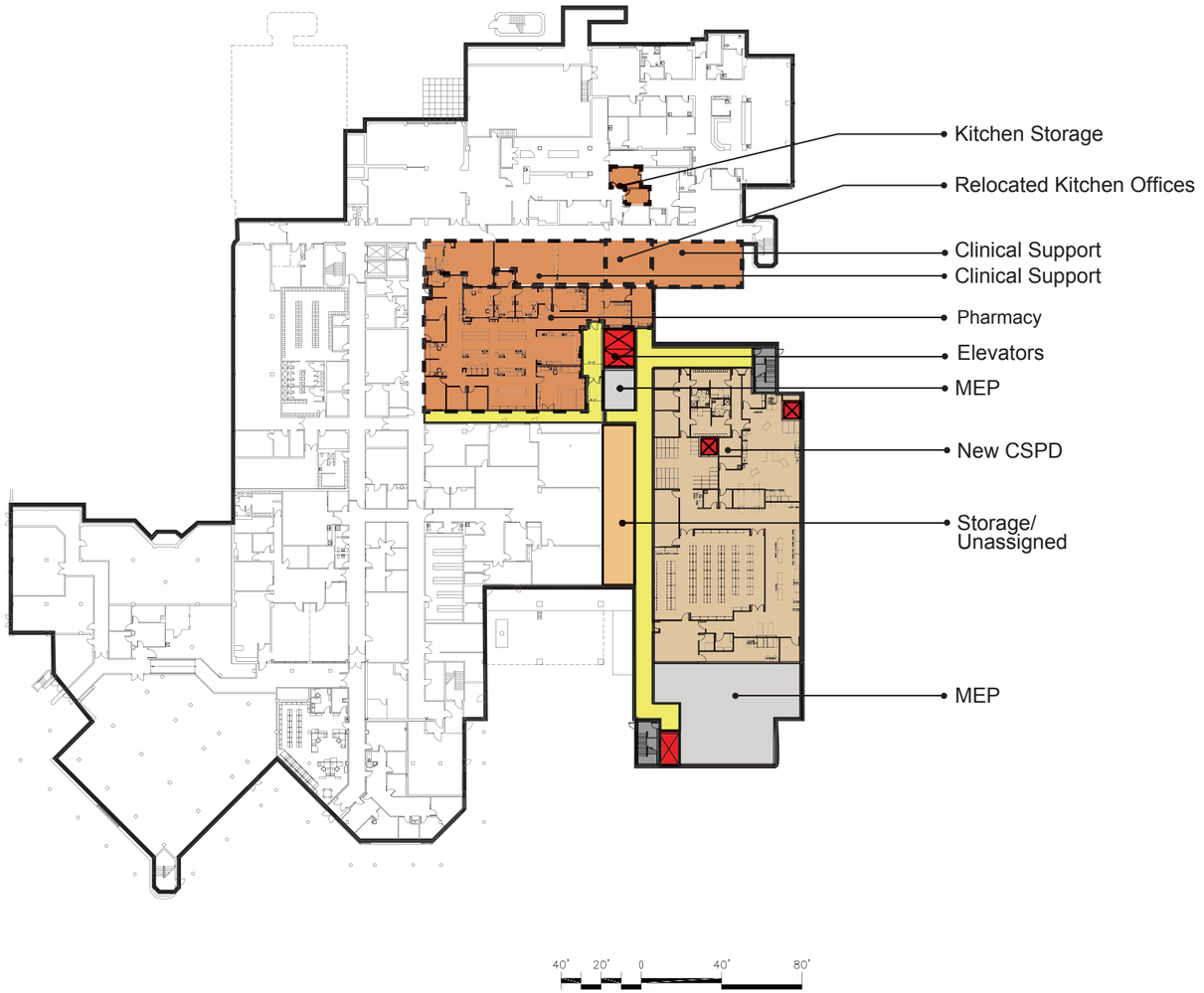
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

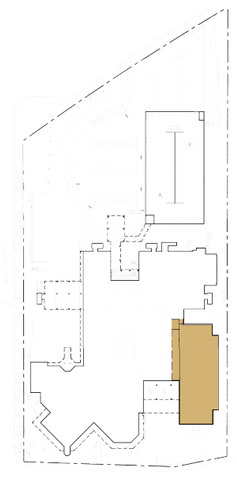
Date: May 31, 2013
Scale: NTS
Drawn:AB

Drawing Number
D.00



LEGEND

- Public
- Ancillary/ Diagnostic Services
- Surgery Circulation
- Ambulatory Care
- Patient Room
- Patient Room Circulation
- Stairs
- Renovation
- General Services/ Support
- Parking
- Green Roof
- MEP
- Existing MEP
- Elevators
- CSPD



KEY PLAN

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Dartmouth Concept OR 3
First Floor Plan

N

nycum+ ASSOCIATES SMITHGROUP Smithgroup AEIP International Inc.

WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

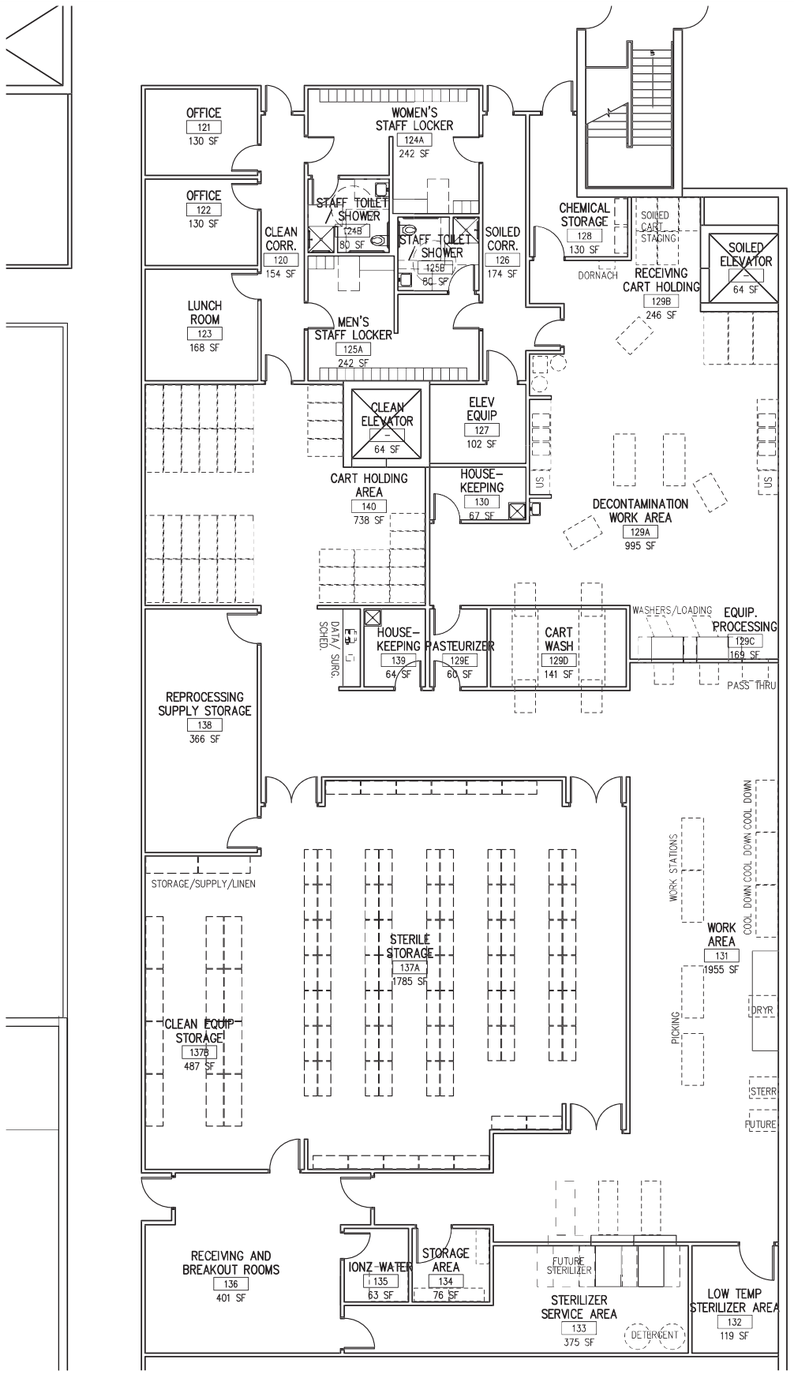
Capital Health Innovative Care Flexible Facilities

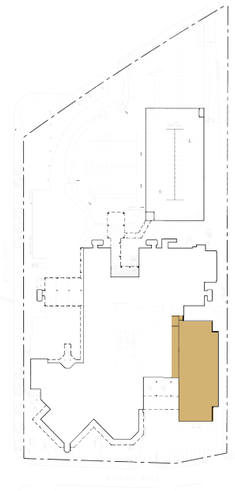
Date: May 31, 2013

Scale: NTS

Drawn: AB

Drawing Number
D.01





KEY PLAN

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Dartmouth Concept OR 3
Enlarged CSPD

nycum+ ASSOCIATES SMITHGROUP Smithgroup AEIP International Inc.
WILLIAM NYCUM & ASSOCIATES LIMITED
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Project 1214:

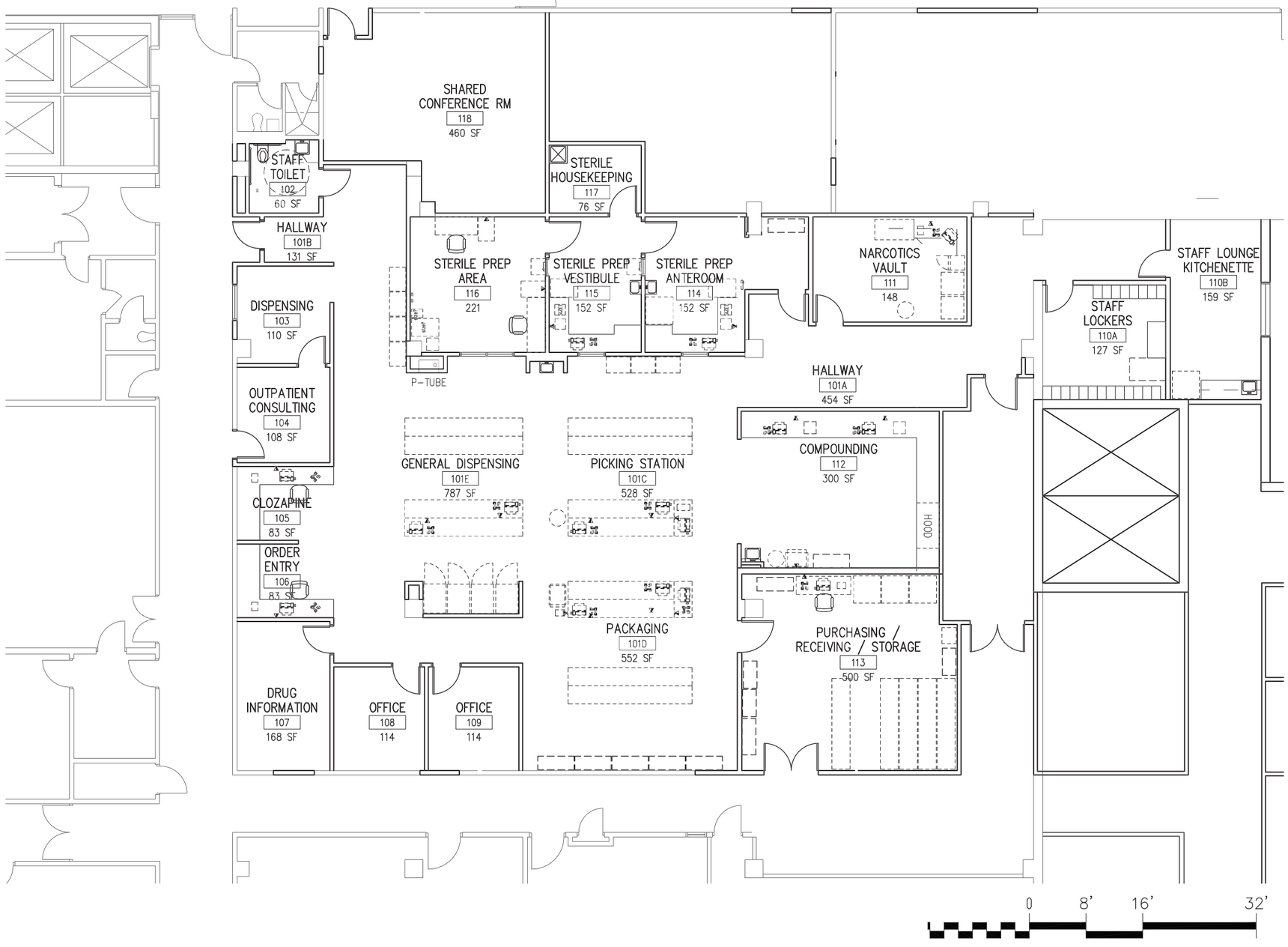
Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013

Scale: NTS

Drawn: AB

Drawing Number
D.02



KEY PLAN

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Dartmouth Concept OR 3
Enlarged Pharmacy

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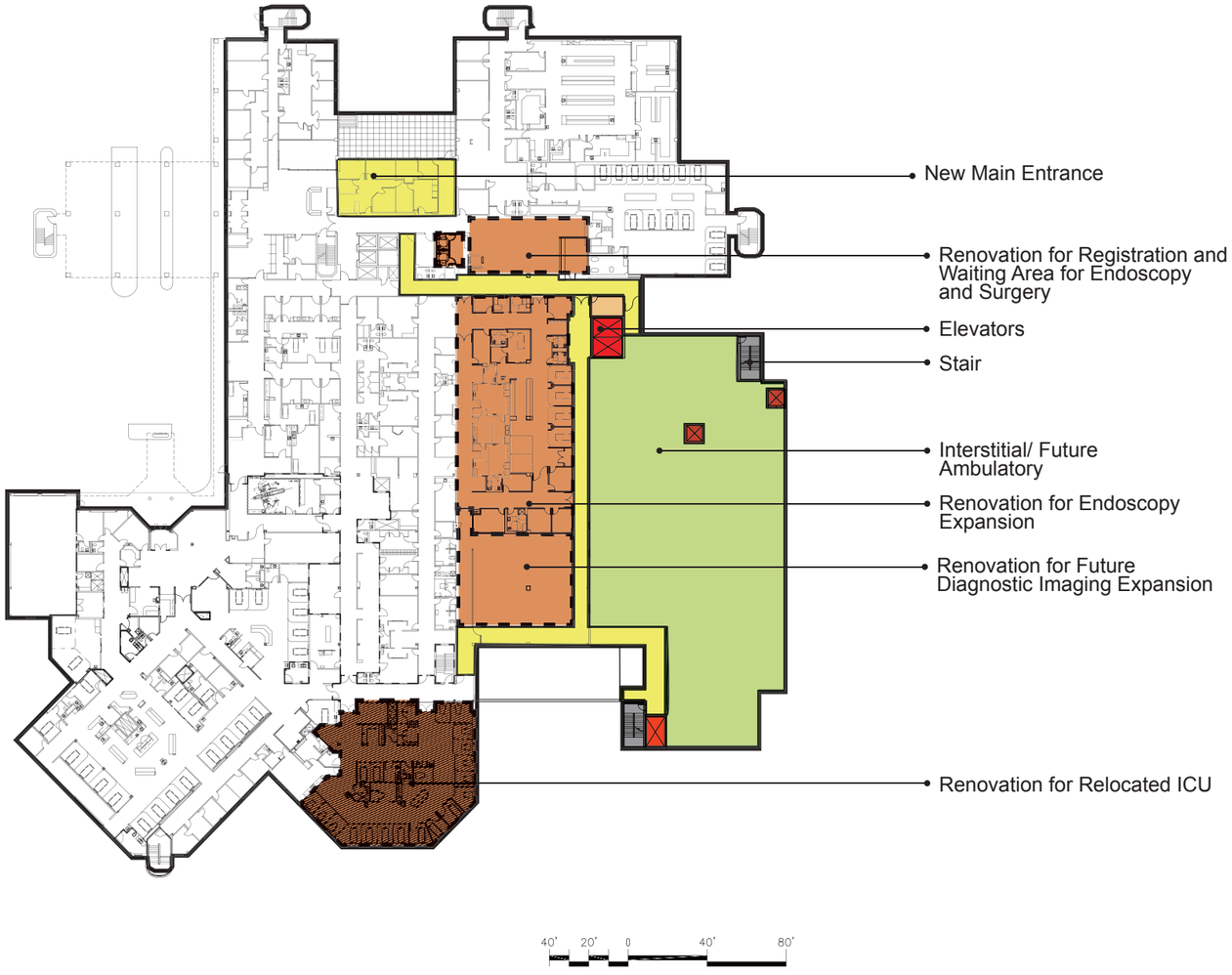
Project 1214:

Capital Health Innovative Care Flexible Facilities

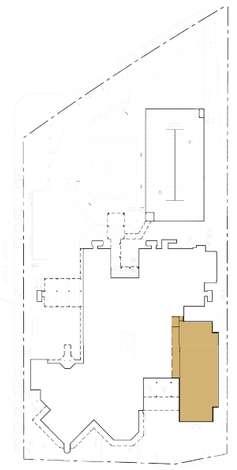
Date: May 31, 2013
Scale: NTS
Drawn: AB

Drawing Number
D.03



LEGEND

- Public
- Ancillary/ Diagnostic Services
- Surgery Circulation
- Ambulatory Care
- Patient Room
- Patient Room Circulation
- Stairs
- Renovation
- General Services/ Support
- Parking
- Green Roof
- MEP
- Existing MEP
- Elevators
- CSPD



KEY PLAN

PRELMINARY - NOT FOR CONSTRUCTION

The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Dartmouth Concept OR 3
Second Floor Plan

Drawing Number
D.04

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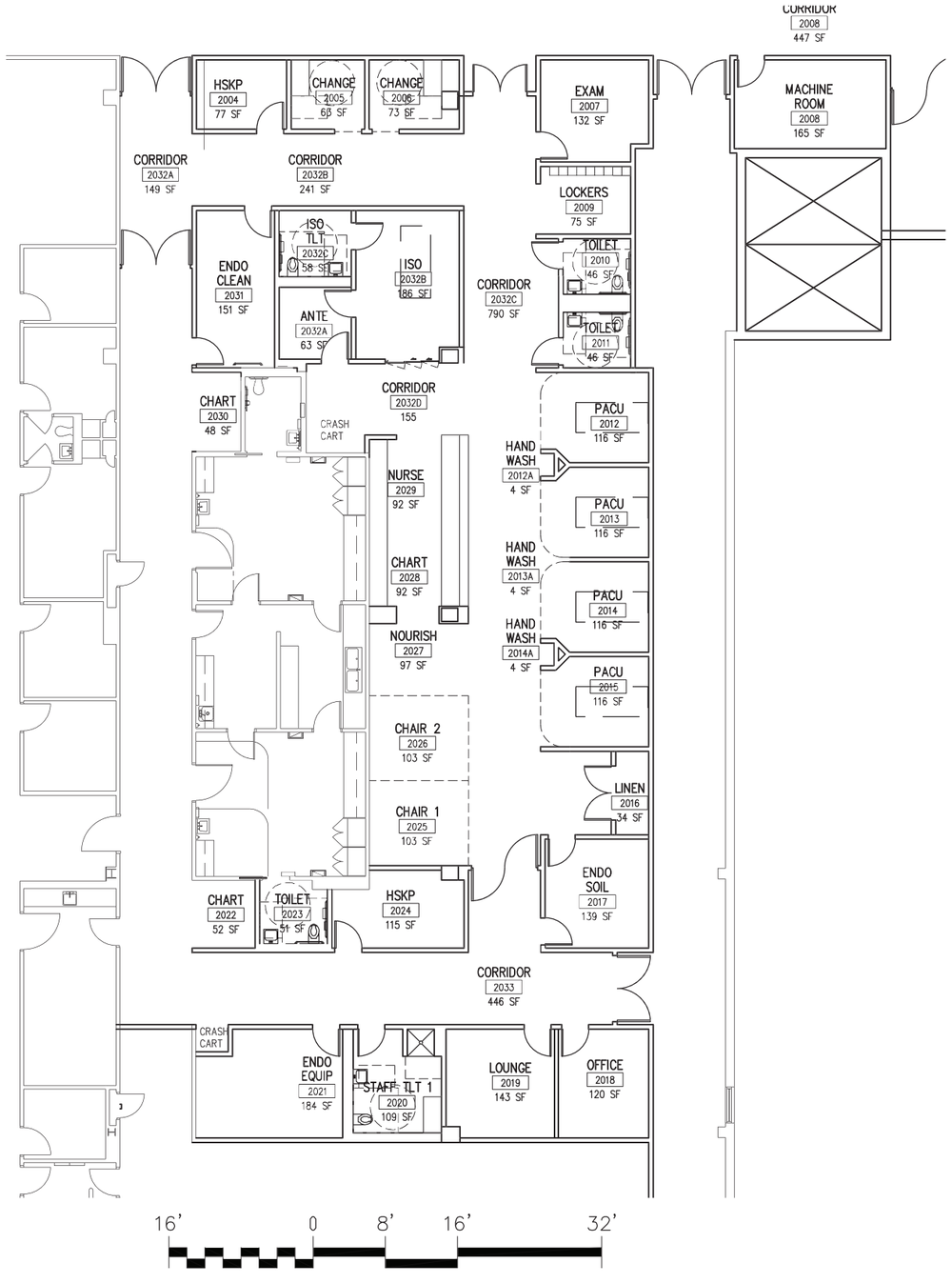
Project 1214:

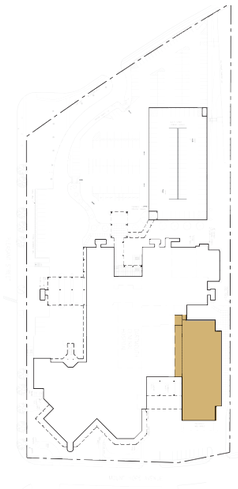
Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013

Scale: NTS

Drawn: AB





KEY PLAN

N

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Dartmouth Concept OR 3
Enlarged Endoscopy

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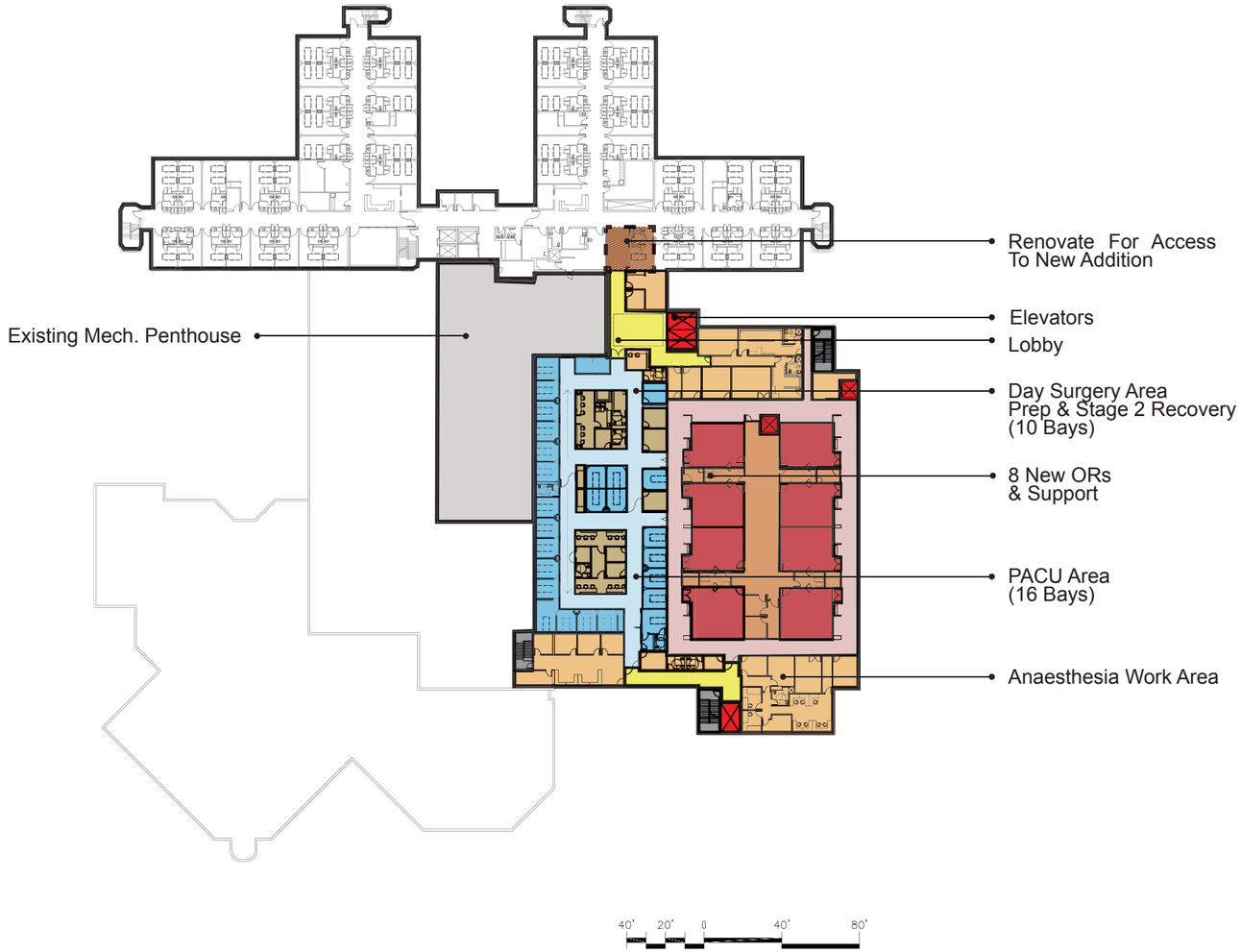
Project 1214:

Capital Health Innovative Care Flexible Facilities

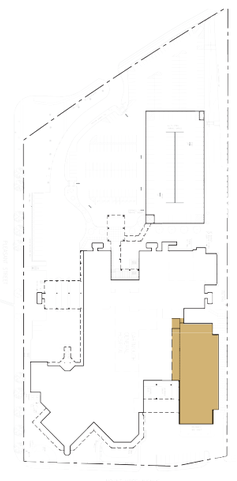
Date: May 31, 2013
Scale: NTS
Drawn: AB

Drawing Number
D.05



LEGEND

- Public
- Ancillary/ Diagnostic Services
- Surgery Circulation
- Ambulatory Care
- Patient Room
- Patient Room Circulation
- Stairs
- Renovation
- General Services/ Support
- Parking
- Green Roof
- MEP
- Existing MEP
- Elevators
- CSPD



KEY PLAN

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Dartmouth Concept OR 3
Third Floor Plan

Drawing Number
D.06

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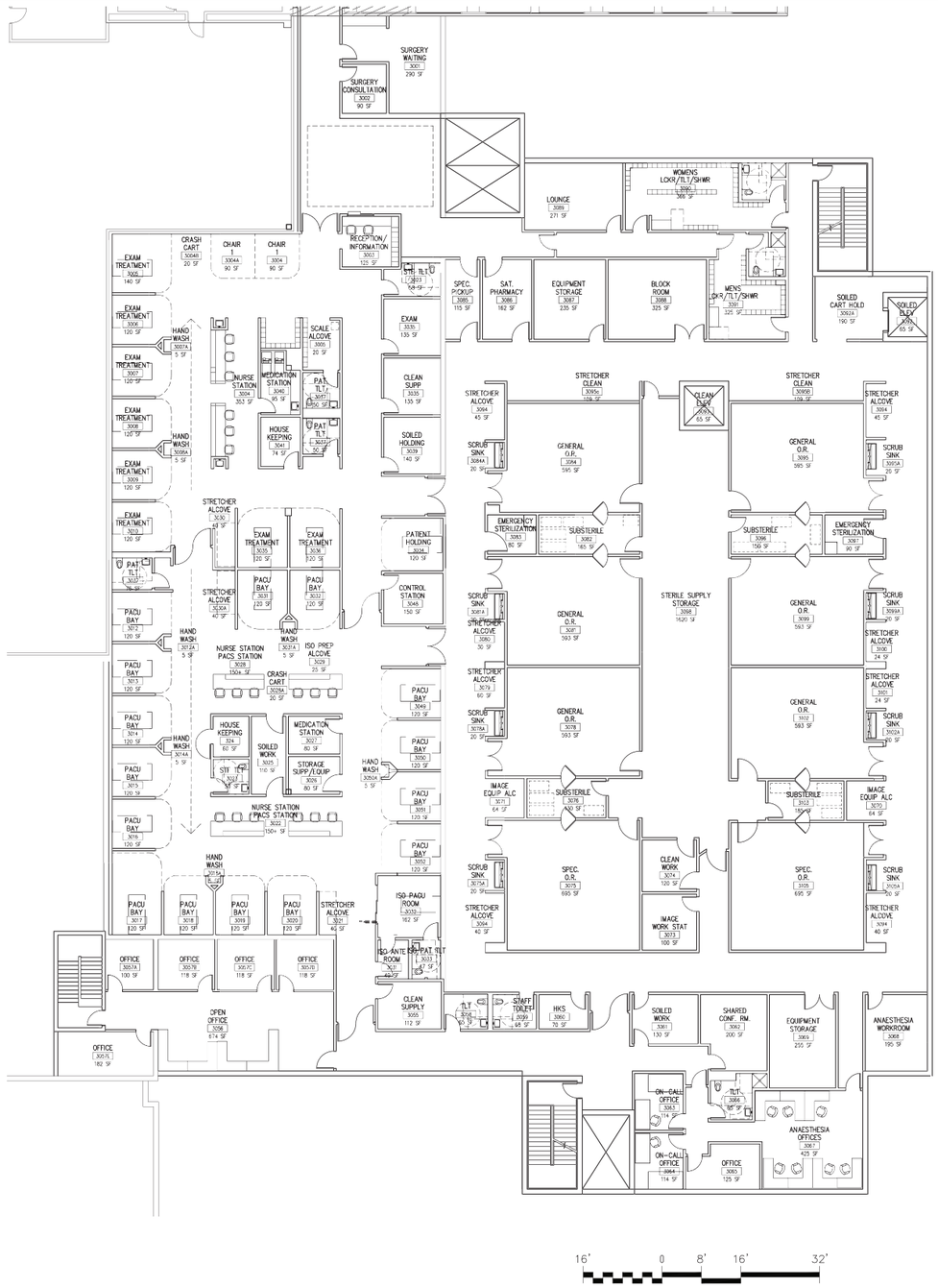
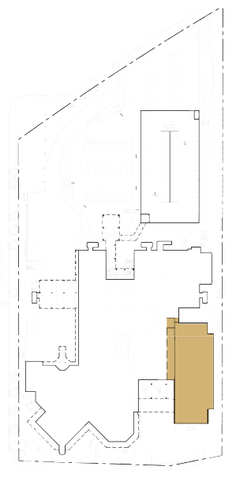
Project 1214:

Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013
Scale: NTS
Drawn: AB





KEY PLAN

N

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Dartmouth Concept OR 3
Enlarged ORs

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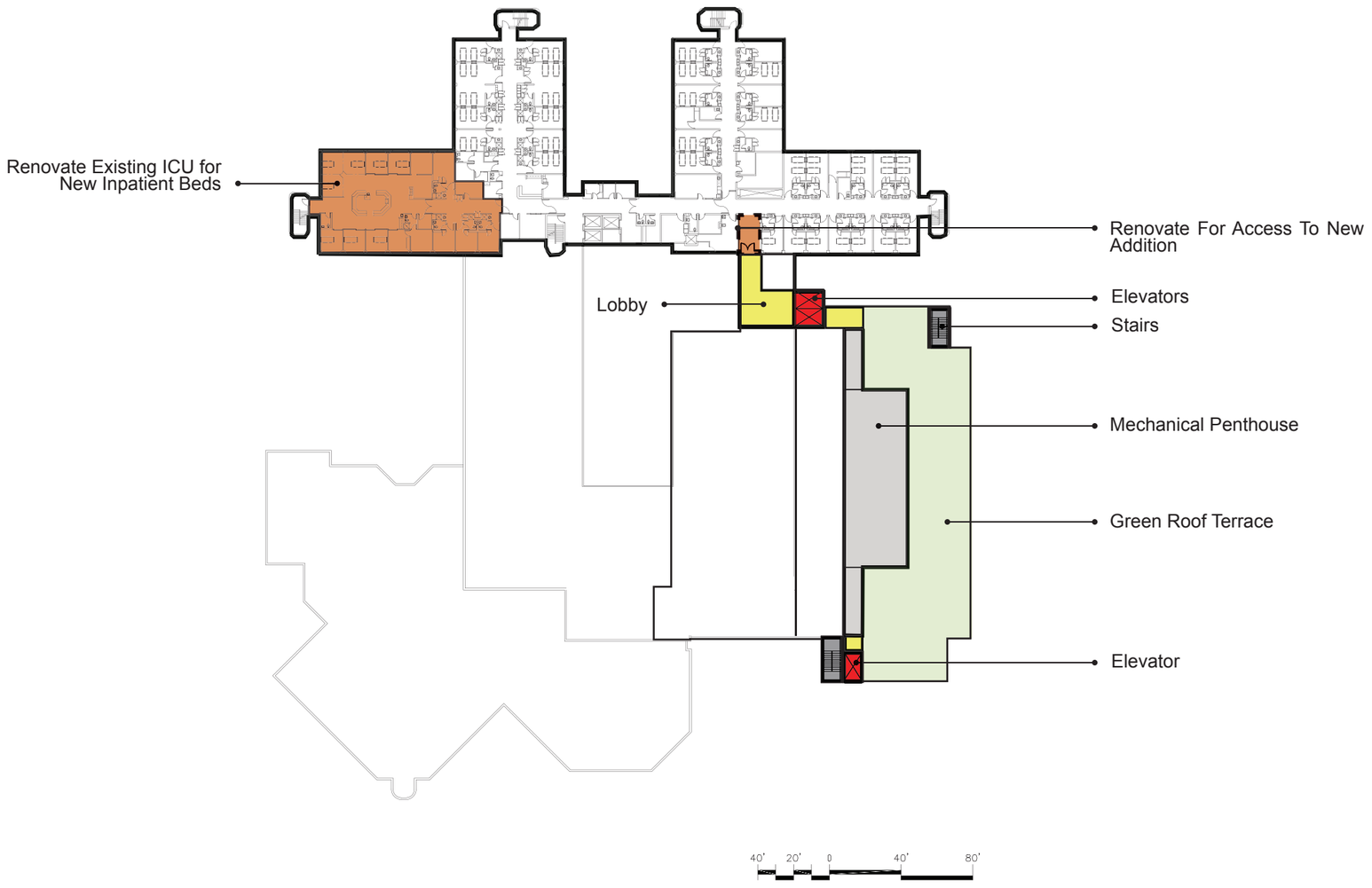
Project 1214:

Capital Health Innovative Care Flexible Facilities

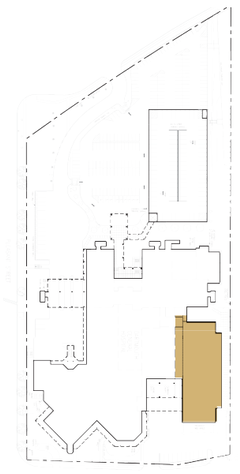
Date: May 31, 2013
Scale: NTS
Drawn: AB

Drawing Number
D.07



LEGEND

- Public
- Ancillary/ Diagnostic Services
- Surgery Circulation
- Ambulatory Care
- Patient Room
- Patient Room Circulation
- Stairs
- Renovation
- General Services/ Support
- Parking
- Green Roof
- MEP
- Existing MEP
- Elevators
- CSPD



KEY PLAN

PRELIMINARY - NOT FOR CONSTRUCTION

The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Dartmouth Concept OR 3
Fourth Floor Plan

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Project 1214:

Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013

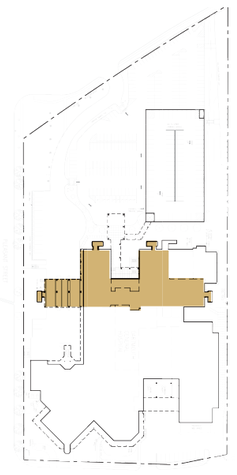
Scale: NTS

Drawn: AB

Drawing Number
D.08

LEGEND

- Public
- Ancillary/ Diagnostic Services
- Surgery Circulation
- Ambulatory Care
- Patient Room
- Patient Room Circulation
- Stairs
- Renovation
- General Services/ Support
- Parking
- Green Roof
- MEP
- Existing MEP
- Elevators
- CSPD



KEY PLAN

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Dartmouth Concept OR 3
Fifth Floor Plan

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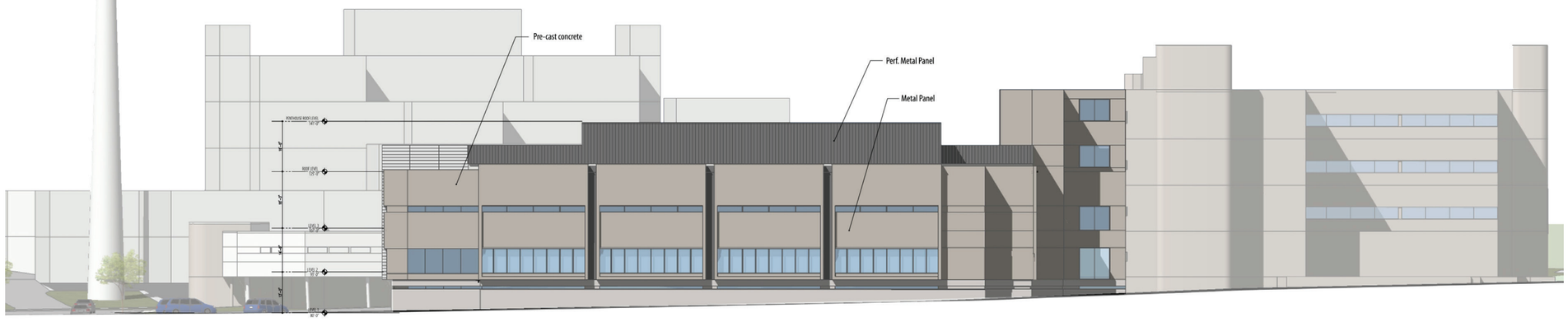
Project 1214:

Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013
Scale: NTS
Drawn: AB

Drawing Number
D.09

SOUTH ELEVATION



EAST ELEVATION

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Dartmouth Concept OR 3
Elevations

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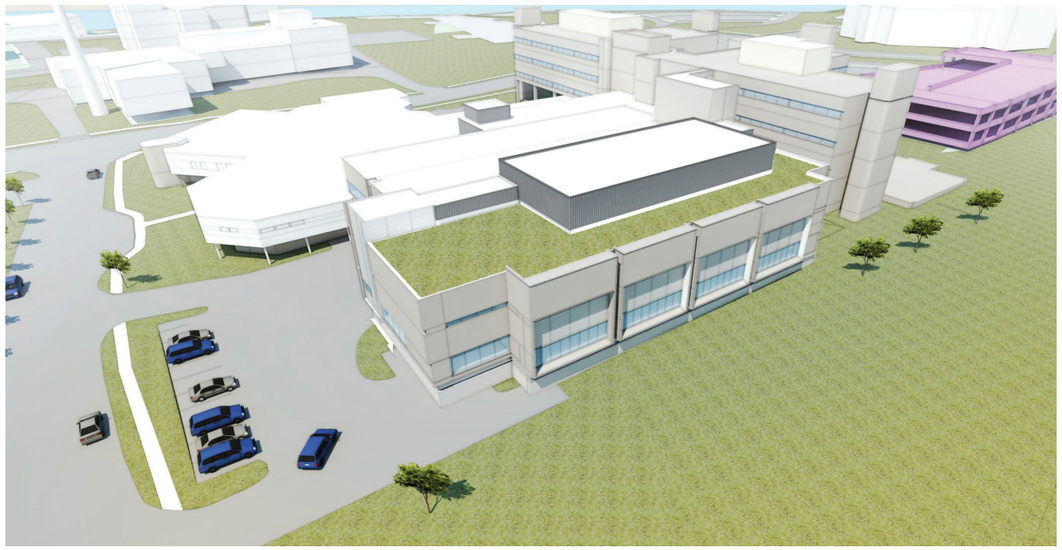
Project 1214:

Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013
Scale: NTS
Drawn: AB

Drawing Number
D.10

VIEW 3 - SOUTHEAST PERSPECTIVE



VIEW 1 - BIRDS-EYE PERSPECTIVE

VIEW 4 - SOUTH PERSPECTIVE AT LOADING DOCK

VIEW 2 - EAST FACADE PERSPECTIVE

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

Drawing Title:
Dartmouth Concept OR 3
Axonometrics

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Project 1214:

Capital Health Innovative Care Flexible Facilities

Date: May 31, 2013
Scale: NTS
Drawn: AB

Drawing Number
D.11

Discussion and Preliminary Outline Specification Information

Civil Engineering Commentary

The location of the Dartmouth General Addition is the existing parking lot area to the east of the Dartmouth General Hospital. The site is bounded by the dialysis section of the hospital to the north, hospital loading dock to the west, Mount Hope Avenue to the south and a parking lot for GMI Industries to the east. The land is generally flat. An existing storm drainage system consisting of catch basins and piping runs across the parking lot, handling runoff from the east side of the hospital site.

Investigations and Existing Conditions

Previous geotechnical work would indicate the area may contain rock in the form of sulphide-bearing slate.

Sanitary Service

The existing hospital is serviced by sanitary lines that gravitate to a pumping station at the corner of Pleasant Street and Mount Hope Avenue. The nearest main line sanitary sewer is the 8 inch sewer located on Mount Hope Avenue. This sewer services a portion of the industrial park behind the hospital. This Mount Hope sewer terminates at the pumping station. A capacity check of the 8 inch sanitary on Mount Hope will be required to determine if the expansion can be handled by this sewer or an upgrade in size will be required. The reserve pumping station capacity should also be determined and any upgrades identified. A new sanitary lateral would be directed to the Mount Hope main. An observation manhole will be installed at the property lines as part of Halifax Water requirements.

Halifax Regional Municipality Design Guidelines and Halifax Water Design and Construction Specifications will be used in the design of the new services. The proposed additions will require new domestic and sprinkler services. The site is adjacent to Mount Hope Avenue and there is a 12 inch water main in the street. The sprinkler and domestic services will connect to this line. Halifax Water Design and Construction Specification will be followed for the design of these services.

Storm Service

All development within HRM is required to manage storm water within the development limits so that pre and post development flows are balanced. This will be achieved through the use of roof storage along with other storage methods as required. The new structure will require under slab and perimeter drainage. The location of the addition will interrupt the existing hospital storm system located to the north and northeast. This means provision will be required to reroute the existing pipe network around the east side, south to Mount Hope and reconnecting to the original system.

Additional Site Considerations

Should geotechnical investigations reveal presence of sulphide bearing bedrock, this material will have to be dealt with according to the Nova Scotia Department of Environment regulations pertaining to handling and disposal of sulphide bearing materials which are outlined in the NSE “Sulphide Bearing Materials Disposal Regulations.”

Structural Engineering Commentary

The following represents the structural requirements for the design of the CHDA Innovative Care Flexible Facilities. It will form the basis for design and discussions outlining the constraints from existing conditions and discussing the possibilities of structural options.

Building Code Structural Requirements and Related Design Options

The building design will need to meet the structural requirements of the 2010 National Building Code (NBCC) for Wind, Snow, Seismic, Live and Dead loads. The NBCC also lists hospitals as post disaster construction and the load factors for safety are increased for Wind, Snow and Seismic and, therefore, provide a structure that will not only survive a disaster, but also be able to provide care services after a disaster.

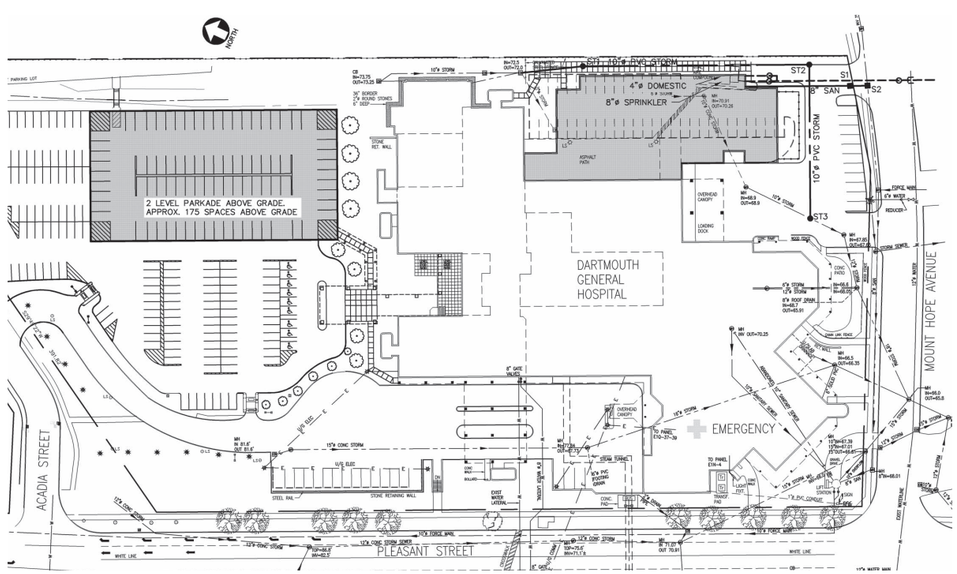
The NBCC provides a minimum loading for the following Live Loading:

- Main level, assembly areas and corridors – 4.8 kPa.
- Patient rooms – 1.9 kPa.
- Operating rooms and Laboratories – 3.6 kPa.
- Equipment and service rooms – 3.6 kPa.
- Minimum partition loading – 1.0 kPa.

To maximize flexibility, we recommend that all areas except for main level, assembly areas and

corridors (normally designed for 4.8 kPa.), be designed for a minimum live load of 3.6 kPa. and a partition load of 1 kPa allowing patient rooms to better accommodate future renovations. This additional load will also account for any ceiling hung lifting systems being used in patient rooms. Mechanical rooms should be designed for 12 kPa., which would allow for future concrete pads for mechanical equipment.

Although Halifax and Dartmouth have different snow loads, we would recommend that the slightly higher snow load for Halifax be used for both locations, allowing for future changes to the requirements for snow loading in Dartmouth – this is anticipated to occur as codes are updated given the proximity of Dartmouth to Halifax. Future space requirements are often unknown, so we recommend designing the structure to accommodate an additional one or two floor. This would support future expansion as long as it does not interfere with HRM and code requirements. Structural costs for the foundations, columns, and shear walls are relatively small compared to the costs of the floor structure.



Above: reduced size civil engineering site servicing concept plan. See full-sized drawing D.C1 elsewhere in this report.

Structural Options

Structural Steel

Structural steel buildings would require the application of additional products in order to achieve the required fire resistance rating of two hours for floors and columns. Over the course of a building’s life, these products may be chipped off due to maintenance (hanging new mechanical ducts, ceilings, etc.) and other activities, compromising the fire rating.

Structural steel buildings also have flanges that provide areas for dust and other pathogenic elements to build up on. The clear height to allow for interstitial space is often less for a steel structure than other systems

Recommendation

We suggest alternatives to structural steel buildings, such as concrete cast-in-place flat slab or waffle slab. The use of pre-stressed or post-tensioned construction gives larger spans but provides limited opportunity for renovations, and restricts the flexibility goals of this project: for example, holes that need to be cored for future plumbing or cut for mechanical openings would always have to avoid pre-stressed or the post-tensioned

strands, or risk seriously compromising the structural integrity of the building if one is damaged. The loss or damage of one bar of reinforcing due to coring, or a couple of bars due to a small mechanical opening, will have negligible impact on the structural capabilities of a reinforced concrete building. We recommend additional capacity be included in the design of the structure for the buildings described in this report in order to accommodate these activities and enhance the flexibility of the chosen solution.

Most mechanical, electrical or architectural elements in a building can be modified in the future, but this is not the case for structural systems, as altering load paths and member resistances is expensive and impractical in most operational hospitals. Placing columns at larger spacing and minimizing shearwalls within useable floor area provides greater opportunity to alter the building when triggered by a change in use, without the potential restriction a tight column grid might introduce. We recommend the following structural options for different spans:

i) Spans up to 8m: 204 mm reinforced flat slab.

ii) Spans between 8m and 9m: reinforced concrete slabs with drop panels, 250 mm slabs with 150 mm drop panels.

iii) Spans between 9m and 11m: waffle slab.

We recommend that shearwalls (more economical) be located on outside walls, or a moment frame system (less economical) be used instead. Using the elevators and stairwell walls as shearwalls is a common strategy for shearwall location with minimal impact on a floor plan, bearing in mind that the walls of stairwells must extend full-height from the foundation level of a structure.

Dartmouth General Hospital Addition:

The existing building construction is a structural steel building consisting of girder beams, columns, and beams used as joists. The proposed addition is adjacent to the existing building with new foundations and structure. The intent is to have access between the new and existing buildings and, therefore, the floor to floor heights must remain.

One area of overlap is the area between grids 10-14 and grids N-P. This is an existing roof area, which was designed for a snow shadow from the adjacent higher roof. The existing structure is composite steel deck (to be verified) with 4” total thickness but this is sloped to the outside (grid P) for drainage to a maximum of 4” (102 mm) below the high point. To be used as hospital space, the slope would need to be leveled with a self leveling concrete topping.

The existing structure has a maximum depth of 700 mm, composed of 102mm composite deck, on beams of 406mm and girder beams of up to 600mm. Depending upon the spans, we would recommend a concrete flat slab structure or waffle slab construction for the new addition.

Statement of Structural Design Work, Analysis and Design Checks

We have performed a set of analyses for the following tasks:

• To determine the capacity of the beams and girders in the overlap zone between the new addition and the existing building to resist the new loads from the concrete leveling of the sloped roof as well as the load arising from the one floor addition in this area (beams and girders between grids N-P and 10-14 at level 107’-0’’ (roof framing plan “Drawing S.224”).

• To check the foundations at the above mentioned location.

• To review two proposed locations for new mechanical rooms on the roof of the northern section of the building to serve the renovations of the fifth level for patient areas, between grids B-F and 3-7 and between grids N-Q and 3-7.

• To check the foundation for the columns at the mechanical room locations.

Analysis of Beams and Girders at Overlap Between Existing Building and Proposed Addition

Calculations were performed using a dead load of 4.60 kPa that includes the weight of the deck and the leveling concrete. This load also provides allowance for ceiling, mechanical, and partition loads. A live load of 3.60 kPa was used to perform the calculations. An additional floor (with unfilled steel composite deck roof) between grids N to P and 10 to 14 was considered in the calculations for the column and foundation loads. The roof of this addition was assumed to carry its own weight and a snow load of 2.11 kPa.

Results:

Beams and girders at this location can safely carry the loads arising from the new extension. The capacities of the columns at grids 11-P, 12-P, 13-P, and 14-P were checked and were found to be adequate to carry the loads arising from the new additions under the condition that the new concrete structure will not go higher than the unfilled steel composite deck described above.

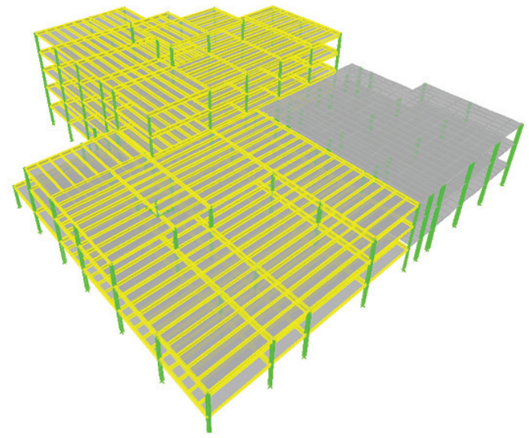


FIGURE 1: Structural model showing the proposed operating room addition and existing Dartmouth General Hospital used to analyze structural impacts at junction between existing and new (Grids M-S and 1-14).

This arrangement minimizes additional snow load drifting from the adjacent concrete structure. The footings under the previously mentioned columns were also checked and were found adequate to support the loads from the existing structure and the new addition. The soil bearing capacity should be verified by a certified geotechnical engineering firm.

Furthermore, the column in the middle of the hallway in the new architectural layout can be replaced by two additional columns (one on each side of the hallway). Additional analysis should be performed to check the moment and shear capacity of the surrounding beams.

An estimation of the size of the structural elements for the new concrete structure was also performed. For spans up to 9.6 m, 450 mm waffle slab (100 mm slab and 350 mm deep ribs) can be used. The rips are of 152 mm width and spaced at 900 mm. The solid parts of the slab above the columns are 3.65x3.65 m and a depth of 450 mm.

Architectural Commentary

Operating Rooms on Level 3

The design solution locates the ORs and associated Day Surgery/ Pre-Op, Recovery and Support spaces on Level 3, with a direct, lateral connection to the inpatient floor on Level 3. Locating the ORs on the top floor of the addition allows its entire floor area to have optimal floor-to-floor heights, and provides ultimate flexibility in locating program elements (ORs, support spaces, etc.).

This organization creates an interstitial space on Level 2 for future Ambulatory Services on the existing main Public Entrance level, to the South of the existing Rehab (PT/ OT) space. Existing OR space on Level 2 would be redeveloped around the existing newly-renovated Endo suites to create dedicated Waiting, Pre-Op, Recovery and Support spaces for Endo. Additional space in this area would allow some expansion of the adjacent Diagnostic Imaging department to support the new services being relocated to DGH.

This arrangement allows for relatively simple construction phasing, resulting in reasonably straight-forward requirements for Infection Control boundaries and Infrastructure (during Construction).

This solution requires some construction of occupied space on top of what is an existing roof. This may require some reinforcement of structure below to carry extra load, but would likely not be more than the required reinforcing to account for snow loading issues on this same roof caused by building a new adjacent structure.

Some redistribution of existing mechanical ductwork/ louvers/etc. will need to be undertaken where the new construction on the existing roof abuts the existing mechanical penthouse on Level 3.

An existing dumbwaiter shaft penetrates the roof over the existing OR space. This penthouse must be removed, and slab openings filled, as part of the work of this project.

Main Entrance:

Several references have been made to the dysfunctional nature of the existing Public/Main entrance to the hospital on Level 2. The main entrance to DGH is currently on the West side of the original inpatient tower. Access from the public parking lot on the North side of the building is via a narrow sidewalk between the building and drive to/from the Emergency Department drop-off.

Vehicular traffic for inpatient and visitor drop-off overlaps with traffic serving the Emergency Dept. and Ambulance

Bays. Development of a new main/public entrance to the hospital on the North side of the building has been included in the scope of this work in order to capture reasonable costs for such alterations. Pricing has included a new drive-under canopy for drop off, with covered walkways to the new North entrance and to the nearby new proposed parking structure.

Elevator Tower and Links:
New corridor links between the OR addition and the existing inpatient tower have been included in the scope of this work in order to provide adequately sized elevators for patient transfer at all levels. These links will require renovations to Inpatient Units on Levels 3 and 4 and will impact the new layout on Level 5 to accommodate the connection. The impact will lead to the loss of one inpatient bedroom on each floor where lateral connections are made.

Parking:
A new parking structure is included in the existing North parking lot. The structure has been sized for 175 cars above the grade-level parking. This is based on replacing the parking lost on the Southeast side of DGH and based on 2.2 cars per new inpatient bed and 4 cars per new OR being relocated from the VG. This size does not aim to address any parking shortages that may currently exist at the DGH. The parking structure should be designed to allow future addition of a minimum of another 2 levels of parking in order to address increased parking demands that would be imposed by future enhanced Ambulatory services.

ICU:
The planning and costing contained in this report includes relocation of the existing Intensive Care Unit from Level 4 West to the existing Day Surgery space on Level 2 adjacent to the Emergency and Diagnostic Imaging departments. CDHA has informed the design team that this space was originally designed to be an ICU, so renovation costs for this move should be less than they would be under other circumstances.

Additionally, the existing ICU space that will be vacated on Level 4 is shown and priced to be renovated into a new Med/Surg inpatient wing (possibly to be combined with the existing inpatient unit on 4 West).

CSA Z8000-11: Canadian Health Care Facilities forms the basis for Architectural Outline Specifications at a Preliminary Design stage. Refer to the Architectural Outline Specifications in the Common Considerations section of this document.

Mechanical Engineering Commentary
Investigations and Existing Conditions
• The existing sanitary and storm mains are not sized to handle the loads for the new addition. The existing domestic hot water heater does not have sufficient capacity to serve the domestic hot water demand for the expansion.

• The existing medical gas (medical air and oxygen) appear to have sufficient capacity to serve the gas requirements of the expanded building. Further investigation will be required to validate this assumption.

• The steam plant has sufficient capacity to serve the heating loads for the addition. There is no capacity in the chilled water cooling plants for the addition.

Flexible Design Strategies:
To allow for flexibility and ease of maintenance it is a good practice to locate the plumbing and medical gas systems within the corridor walls and along permanent structural members. This strategy will allow for the plumbing and medical gas systems to be permanently located and not require to be relocated during renovations. Isolation valves should also be strategically located for both systems to allow for separation from the main hospital system to reduce impact to day-to-day operations during adjacent renovations.

Plumbing
Understanding that spaces within a hospital need to adapt as the needs of the community change, isolation valves should be placed at each plumbing fixture and strategically located within the water distribution network. Along with the valves, extra pipe tees should be provided within the waste and vent system. Both strategies will aid in reducing the impact to the operation of the hospital during future additions and renovations.

for the Reverse Osmosis system shall be non-metallic to avoid pipe degradation.

The other strategy is to utilize the house domestic softened water, piped to each dialysis box with point of use backflow preventer. This strategy will require the dialysis equipment to be provided with the necessary water treatment system on board. Because softened water is not as aggressive as the Reverse Osmosis system, piping material will not be a factor in this design. Future expansion could be achieved by connecting into the readily available domestic water network that is distributed throughout the floor to other plumbing fixtures in the hospital.

During renovations it's rarely observed that the permanent structural members are modified or removed which, in turn, makes adjacent locations good places to locate vertical plumbing piping. In general, piping and risers shall be located adjacent to sheer walls and panels to avoid or minimize disruption to clinical functions during renovation and even routine maintenance. Careful selection and detailing of the structural systems and connections should be undertaken, to allow vertical plumbing pipes and risers to run close to columns in order to minimize the area that must be worked around in future renovations.

Where planning for future growth and modifications is desired, the vent piping could be sized one nominal size larger than the code requirements. This will allow the vent piping to be routed horizontally as far as necessary within the ceiling to slab space during renovations.

Medical Gases
In order to increase flexibility for future growth and modification the medical gas zone valve boxes could be placed within the corridors. Typically in renovations the corridors are not modified as much, allowing the medical gas zone valves to be uninterrupted. In addition to corridor locations, locating medical gas zone valve boxes near department entrances allows for the isolation of each entire department.

The pipe sizing shall be based on most stringent patient room medical gas requirement such as pre-operation or recovery patient rooms. This will increase the size of the medical gas pipe mains to allow for adequate medical gasses in future modifications to higher acuity functions.

Dialysis
Dialysis boxes are readily used within different areas of hospitals – from outpatient clinics to critical care environments – and they have stringent requirements. There are two approaches that could be exploited for a dialysis system. One strategy would be to utilize a dedicated centralized Reverse Osmosis water loop to feed the dialysis boxes. The loop should be located above the dialysis boxes with a continuous loop routed towards the dialysis box to eliminate stagnation of water within the system. Valves should be placed strategically within the loop for future expansion and modification. To avoid bacteria growth the maximum length of pipe with stagnant water must not exceed 15cm (6inches). A point of use backflow preventer and shut-off valve at the connection point to dialysis equipment shall be used to avoid contaminating the main water loop. Piping material

An assessment should be conducted in subsequent design phases to assess any areas of the addition for which provision should be made for dialysis plumbing to serve future services.

Anticipated Impacts:
• New sanitary and storm mains will have to be installed to serve the new OR addition. These mains will have to be extended to the municipal mains located under Mount Hope Avenue.

• The domestic cold water main will have to be extended from the entrance in Room 1506 to the new addition. New domestic hot water heaters will be added into the new mechanical room on Level 1 or a new rooftop penthouse.

• The existing oxygen tanks interfere with the new addition and will have to be relocated. The main oxygen line is located underground directly underneath the proposed addition; the main will have to be extended from a new location to the entrance point on Level 1.

• A high pressure steam main and condensate main will have to extend from the headers located in Mechanical Room 1506 to the mechanical room/penthouse of the new addition.

•A new chilled water cooling plant (chillers and cooling towers) will have to be provided to meet the cooling requirements of the addition.

• New air handling units will have to be provided in the new addition mechanical spaces to provide ventilation throughout the expansion.

• The existing sprinkler system will have to expand into the new addition.

• Water and air side economizer strategies will be employed to take advantage of outdoor air temperatures to reduce the cooling demand of the building.• Heat recovery strategies could potentially be implemented to utilize the heat that is created during the production of chilled water. The captured heat could be utilized by the perimeter radiant panels.

• Investigation shall be performed on the existing central plant to replace any equipment that has reached its useful life with a more energy efficient system. A central plant optimization strategy could also be implemented to maximize the operating efficiency of the central plant.

• The new air handling system will be designed with built in redundancy to ensure continuous operation. This will

include using fan array type air handling units along with a manifold duct system that will allow for a unit to be shut down without losing air to the spaces that it serves.

• All operating rooms will be designed with a flow tracking controls strategy. This will allow for the operating rooms to always be in a positive pressure, even during night setbacks.

• Plumbing fixtures will be of low flow type to ensure water efficiency. Some faucets could potentially utilize proximity sensors to operate. This technology will replace the infrared eye technology that typically gets damaged by cleaning operations and impacts the operation of the faucet.

Electrical Engineering Commentary

Investigations and Existing Conditions

The design team has reviewed existing conditions with a focus on normal power, emergency power, telecommunications, fire alarm system, electronic access control, security, and the nurse call system.

Normal Power

The electrical service for the Dartmouth General Hospital is supplied from the Nova Scotia Hospital; both sites are served by NSPI as one account. The large general rate is applied because the monthly demand load exceeds 2000 kVA. The Nova Scotia Hospital service runs at its full capacity in the summer months. An upgrade to the Nova Scotia Hospital electrical service is required to accommodate the Dartmouth General Hospital expansion. There are two possible means of upgrading this infrastructure.

The first option is to increase the size of the two 12kV-4kV pad-mounted transformers from 2500 kVA to 3750 kVA. The cost of increasing one of the transformers would be borne by NSPI due to the increase in revenue-generating load. The cost of replacing the second (redundant) transformer would be borne by the Dartmouth General Hospital. The secondary conductors from the pad-mounted transformers to the service entrance switchgear would have to be upgraded.

The second option is to add a third 12kV-4kV 2500 kVA pad-mounted transformer at the Nova Scotia Hospital, the cost of which would be borne by the Dartmouth General Hospital. Two of the transformers would operate in parallel and the third would serve as a spare. The installation of a third pad-mounted transformer would require a modification to the existing metering arrangement and a new switching cubicle. A new secondary service entrance would have to be installed, which would require the construction of a small building just to the south of the boiler plant or the installation of weatherproof switchgear.

Whichever approach is used to upgrade the Nova Scotia Hospital service, the existing Dartmouth General Hospital electrical service lacks enough spare capacity to serve the proposed expansion. The service is rated 2500-ampere, 600- volt, 3-phase, 4-wire. The service entrance switchboard has two main breakers that are key-interlocked so that only one can be closed at any given time. Each main breaker is supplied from a separate 4kV-347/600V 2000 kVA pad-mounted transformer for redundancy. Each pad-mounted transformer is supplied from a switching cubicle on the Nova Scotia Hospital site.

A new electrical service will be required to serve the expanded facility. This will include a new 4kV-347/600V 2000 kVA pad-mounted transformer, the cost of which will be borne by the Dartmouth General Hospital. Two of the three transformers will operate in parallel and the third will serve as a spare. They will supply a new service entrance switchboard. Space will have to be found to install the new service while the existing service remains operational. The existing service entrance switchboard will be sub-fed from the new service entrance switchboard after it is energized.

The normal power and emergency power feeds to the fire pump's automatic transfer switch do not comply with the Canadian Electrical Code. This should be corrected during the service entrance upgrade. For the normal power feed, a separate metered electrical service should be installed from the secondary of one of the pad-mounted transformers. The emergency power feed should be replaced with a feed that has a two hour fire rating.

Emergency Power

The existing 600 kW Dartmouth diesel standby generator lacks enough capacity to serve the proposed expansion. A second generator and associated paralleling switchgear will be required. There is enough space in the generator room to accommodate this.

Telecommunications

The Dartmouth General Hospital was constructed in 1975 and has undergone four expansion projects and countless renovations since. As a result, the voice and data communications infrastructure is nearly standard compliant in some parts of the facility and deficient in others. A new structured wiring system will be installed in the proposed expansion in accordance with the ANSI/TIA-1179-2010 Healthcare Facility Telecommunications Infrastructure Standard. Telecommunications Rooms will be installed. Horizontal voice and data cables will be routed from these rooms to the work areas in the spaces they serve.

A new backbone voice cable will connect the new voice communications infrastructure to the existing in the entrance facility. A new data backbone cable will connect the new data communications infrastructure to the existing local area network.

During the design phase the possibility of implementing a Passive Optical Local Area Network, POL, will be investigated. Scale and reach are the two distinct advantages of using POL over traditional switched copper Local Area Networks, LAN's. Reach is accomplished through the use of single-mode fiber in the cabling plant as it allows a length of 20km as opposed to the 90m limitation of copper. Scale is accomplished by utilizing passive optical splitters. As a comparison a single mode fiber can be split into 32 fibers with each fiber terminating into a 4-port Fiber Optic Network Terminal, ONT, providing a total of 128 Ethernet ports. In contrast, a traditional copper LAN would require 128 home runs of copper to accomplish what POL provides with 33 total fibers. The scale and reach benefits allow the data and telecomm equipment footprint to be reduced and moved further away, thus reducing local telecommunication closet requirements and gaining valuable building space.

Fire Alarm

The existing Dartmouth General Hospital fire alarm system consists of an Edwards EST3 control panel, alarm initiating devices, supervisory devices, audible/visible signal devices, and voice communication devices. The system will be extended into the proposed expansion.

Electronic Access Control

The facility has an IP-based card access system that permits staff with ID cards access to designated areas through secure doors. It consists of a server, database software, monitoring software, control panels, and peripheral devices. These peripheral devices include card readers, digital keypads, door contacts, motion sensors, alarm buttons, door strikes, and magnetic locks. The server and control panels are connected to the Capital Health LAN/WAN. The access control system will be extended into the new expansion. New control panels will be installed and connected to the LAN, and new peripheral devices will be connected to the control panels.

Security

Existing security and CCTV surveillance systems are obsolete. New systems will be installed in the proposed expansion to meet Capital Health's requirements.

Nurse Call

Existing nurse call systems are obsolete and spare parts are no longer available. New systems will be installed in the proposed expansion to meet Capital Health's requirements.

Anticipated Impacts

There will be some downtime while the existing Nova Scotia Hospital and Dartmouth General Hospital services are upgraded. Refer to the section on Normal Power for a brief description. The standby generator will provide emergency power to a limited portion of the loads during the downtime. The Contractor will schedule the work with NSPI to minimize the duration.

There will be some downtime while the existing diesel generator is disconnected from the existing automatic transfer switch and reconnected to the new paralleling switchgear. The Contractor will schedule the work to minimize the duration.

Electrical Healthcare Design Standards

The following healthcare standards will be applied during the electrical design of this facility:

1. ANSI/IESNA RP-29-06 Lighting for Hospitals and Healthcare Facilities,
2. ANSI/TIA-1179-2010 Healthcare Facilities Telecommunications Infrastructure Standard,
3. CSA Z32-09 Electrical Safety and Essential Electrical Systems in Healthcare Facilities,
4. CSA Z317.5-98(R2007) Illumination Systems in Healthcare Facilities,
5. CSA Z8000-11 Canadian Healthcare Facilities (to be applied as appropriate)

Outstanding Issues - DGH

Geotechnical / Soils Investigations – the addition is located on what is currently a surface parking area at the back of the Dartmouth General Hospital, which reportedly may contain sulphide-bearing slate bedrock. There is also anecdotal evidence that some soil contamination may be encountered at this site, related to a prior coal-fired plant at the NS Hospital site across Pleasant street. Investigations have not been undertaken to confirm site conditions; this should happen as soon as possible to determine the extent of any issues.

Parking – requirements are unresolved at this time, and need to be evaluated upon the completion of the Clinical Services Plan and determination of Ambulatory Care services to be provided at the site. The design solution includes a parking structure at the front of the building that replaces the surface parking that is being lost due to the expanded building footprint as well as the increased parking associated with the new inpatient beds and ORs. For future flexibility, it is proposed that this structure be designed to accommodating an additional two stories of parking if the needs increase in the future.

Elevator Lobby – the new elevator lobbies at Levels 4 and 5 require consultation with the Authorities Having Jurisdiction in order to determine whether a new stair will need to be added to address a possible requirement for a second egress. The current plans exclude a stair at the elevators, under the provision that the corridor link forms part of the elevator lobby. This is a matter of code interpretation and should be confirmed with the Office of the Fire Marshall in subsequent design phases.

Diagnostic Imaging: Equipment and Size of Spaces – the extent of new vs. existing/relocated equipment is not known at this time given the evolving nature of the Clinical Services Plan (CSP); budget and space requirements for this specialized equipment will need to be evaluated and resolved in subsequent design phases as the CSP is finalized.

Specialized ORs – the requirement for highly specialized ORs (e.g. new cath labs, hybrid ORs), and the resultant space and cost impact, has yet to be confirmed. The programmatic and design implications of these decisions will need to be captured in subsequent design phases upon completion of the CSP. While perhaps unlikely that the DGH site will require these OR types, the matter should be reviewed in subsequent design phases.

OR Patient Flow Analysis – as part if the work this project, the design team engaged the services of Dr. John Blake, an Industrial Engineer with a wealth of experience in Healthcare process modelling. Dr. Blake was tasked with analyzing the DGH 3rd floor OR Dept. layout in terms of patient flow, process efficiency and identification of bottlenecks. The relationship between the new registration/waiting area on Level 2, the small waiting area on Level 3 and the ORs on Level 3 was also analyzed. This analysis is based on some broad assumptions that will need to be revisited once it has been confirmed which surgical services will be delivered at DGH, as the specific procedure/case mix impacts relative procedure times and impact the overall model. A report, dated 23 May 2013, suggests some adjustment to the Level 3 Waiting Room and Pre-Op area may be required in subsequent design phases. While there is little room to extend the footprint of Level 3 beyond the current plans, it is broadly felt that these adjustments can be accommodated, if required. Dr. Blake's analysis and report are included as "Appendix A" to this report.

Pharmacy Location – there was considerable discussion over the appropriate and ideal location for the new central pharmacy at DGH during the course of the project. Pharmacy services are increasingly becoming decentralized in acute care settings, and it was felt strongly by Pharmacy staff that the new renovated pharmacy space should not be located on Level 1. Ultimately, the Pharmacy has been planned for Level 1 at this stage as a way to establish size and schematic layout requirements. Once the Clinical Services Plan is refined for DGH and the Ambulatory Services requirements on Level 2 are established, the ultimate location of the Pharmacy should be revisited.

Research/Education Spaces – the Space programming and floor plans for DGH do not provide specific research space. The increased size of the new ORs will facilitate some educational functions during procedures over the existing condition. In addition, the cost estimates for the ORs account for integration packages allowing procedures in the ORs to be remotely (and securely) viewed in other rooms in the hospital or connected to the Telehealth system for remote consultation and education. Additionally, select education/meeting spaces are planned for that may facilitate an increased teaching role at DGH.

Space Program - ORs on Level 3

The site area available for the addition at DGH is limited. The “first-cut” Space Programs for the addition options explored exceeded the area available for development, necessitating reductions and alterations to allow the addition to fit on the site. The Space Program presented in this report incorporates area reductions made in consultation with owner stakeholders – no reductions were made to OR room areas.

Please also refer to the section of this report titled “Space Programming, General” for common criteria, methodology, assumptions and exclusions applicable to all Space Programs included in this report.

DARTMOUTH GENERAL HOSPITAL — **OPERATING ROOMS, DAY SURGERY AND RECOVERY ON THIRD FLOOR, ENDO REMAINS ON SECOND**

SURGICAL EXPANSION SUMMARY — Version 4B

Date: **May 31, 2013**

STATUS: **Part B Submittal**

DEPARTMENTS	NSF	Grossing	DGSF	RENO	NEW	REMARKS
FIRST FLOOR						
Pharmacy Renovation	5,136	1.28	6,558	6,062	496	
Renovation at Elevator Core						
Medical Device Reprocessing	9,178	1.14	10,474		10,474	
Building Support / MEP					2994	
Building Support / MEP					309	
Storage/Unassigned					1246	
TOTAL, DGSF				6,062	15,519	
BUILDING GROSSING FACTOR					1.27	
TOTAL NEW CONSTRUCTION					**19,666**	
SECOND FLOOR						
Endoscopy & Surgery Waiting Reno	5,812	1.69	9,797	9,797		
Digital Imaging Expansion Shell				2,859		
Interstitial / Future Ambulatory Space					17,476	
TOTAL, DGSF				12,656	17,476	
BUILDING GROSSING FACTOR					1.18	
TOTAL NEW CONSTRUCTION					**20,687**	
THIRD FLOOR						
Renovation at Elevator Core				546		Requires the loss of one patient room for Corridor link and one room converted to other purpose.
Surgical Suite	12,435	1.50	18,592		18,592	
Day Surgery	2,999	1.64	4,929		4,929	
Recovery	4,345	1.55	6,719		6,719	
Elevator Core and Lobby					524	
TOTAL, DGSF				546	30,764	
BUILDING GROSSING FACTOR					1.11	
TOTAL NEW CONSTRUCTION					**34,010**	
FOURTH FLOOR						
Renovation at Elevator Core				250		Requires the loss of one patient room
Elevator Core and Lobby					832	Elevator Lobby and connection to existing - does not include elevators
TOTAL, DGSF				250	832	
BUILDING GROSSING FACTOR					1.51	
TOTAL NEW CONSTRUCTION					**1,257**	Includes elevators and exterior wall
FIFTH FLOOR						
Fifth floor inpatient shell build out				***		Fifth floor program documents provided in separate sheet
Elevator Core and Lobby					832	Elevator Lobby and connection to existing - does not include elevators
TOTAL, DGSF				***	832	
BUILDING GROSSING FACTOR					1.51	
TOTAL NEW CONSTRUCTION					**1,257**	Includes elevators and exterior wall

Note:

Building Circulation Factor includes: stairs, elevators, mechanical shafts, exterior wall and corridors not within specific departments.

DARTMOUTH GENERAL

Department: **PHARMACY**

Date: May 31, 2013

STATUS: **Part B Submittal**

Version 2

NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m^2	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
					11							
1.00											218	
1.01	Outpatient Consulting	9.11	9.11/1	11.0	118			108	1	108		
1.02	Satellite Pharmacy	9.11	9.11/2		0				0	0		Not within unit
1.03	Night Cupboard	9.11	9.11/15	10.0	108			110	0	0		Function provided by Pyxis on floors
1.04	Dispensing				0			110	1	110		Added per staff request. Inpatient and select mental health/addictions outpatients.
1.05	Clozapine workstation				0			83	1	83		Added per staff request
2.00											666	
2.01	Sterile Prep Vestibule	9.11	9.11/3	10.0	108			152	1	152		
2.02	Sterile Prep Anteroom	9.11	9.11/4	10.0	108			217	1	217		
2.03	Sterile Prep Area	9.11	9.11/5	30.0	323			221	1	221		
2.04	Sterile Housekeeping		11.1/21	7.0	75			76	1	76		
2.05	Chemotherapy Prep Anteroom	9.11	9.11/6	10.0	108			110	0	0		Chemo mixing not done on site
2.06	Chemotherapy Prep Room	9.11	9.11/7	10.0	108			110	0	0		Chemo mixing not done on site
3.00											3,052	
3.01	Narcotics Vault	9.11	9.11/8	10.0	108			196	1	196		
3.02	Picking Station	9.11	9.11/9	7.5	81	88	6	528	1	528		
3.03	Order Entry	9.11	9.11/10	4.6	50			87	1	87		
3.04	Packaging	9.11	9.11/11		0			493	1	493		
3.05	Compounding	9.11	9.11/12		0			375	1	375		
3.06	Purchasing / Receiving /Storage	9.11	9.11/13		0			500	1	500		
3.07	General Dispensing	9.11	9.11/14		0			705	1	705		
3.08	Drug Information Room	9.11	9.11/16	10.0	108			168	1	168		
4.00											1,117	
4.01	Offices		11.1/34	11.00	118			114	2	228		
4.02	Staff Toilet				0			60	1	60		
4.03	Staff Lounge		11.1/44		0			198	1	198		
4.04	Staff Lockers		11.1/43		0			171	1	171		
4.05	Shared Conference Room	9.5.3.5.3	11.1/7	42.5	457			460	1	460		Shared with other departments. Sized for 25 people.
	SUBTOTAL										5,136	
	Grossing Factor								1.28	1,422		
	TOTAL PROGRAM DGSF REQUIRED:										**6,558**	

DARTMOUTH GENERAL

Department: **CSPD**

Date: May 31, 2013

STATUS: **Part B Submittal**

Version 2

	NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m^2	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
						11							
1.00	**1,6 2**	*Decontam*			142.0							1,974	
1.01		Soiled elevator							64	1	64		
1.02		Elevator equipment							102	1	102		
1.03	**5**	Decontamination work area	10.1/1	10.2	87.0	936			995	1	995		Waste bins, recycle bins, linen bins, hopper/flusher, desk, work table, PPE
1.04		Receiving and case cart holding		10.2	14.0	151			246	1	246		Triple sink, tables, sonic cleaners, equipment washers. Area increased for cart count.
1.05		Cart wash area	10.1/1	10.2	13.0	140			141	1	141		If carts are to be used
1.06		Equipment processing area		10.2	15.0	161			169	1	169		Consider a separate room for scope reprocessing
1.07		Chemical Storage	10.1/6	10.2	9.0	97			130	1	130		
1.08		Pasteurizer							60	1	60		
1.09		Housekeeping		10.2	4.0	43			67	1	67		
2.00		*Prep/Pack and Sterilization*			220.0							2,533	
2.01		Work area		10.2	157.0	1690			1,955	1	1,955		
2.02		Sterilizer service area		10.2	39.0	420			375	1	375		
2.03		Ionized water equipment							63	1	63		
2.04		Sterilizer equipment storage							76	1	76		
2.05		Personnel facilities		10.2	20.0	215			200	0	0		DGH does not need
2.06		Housekeeping		10.2	4.0	43			64	1	64		
3.00		*Storage and distribution*			334.0							3,841	
3.01	**3**	Clean elevator		10.2					64	1	64		
3.02		Case cart holding		10.2	28.0	301			738	1	738		for 35- 40 carts, based on case load on Level 3
3.03		Sterile storage		10.2	186.0	2002			1,785	1	1,785		
3.04		Clean equipment storage		10.2	37.0	398			487	1	487		
3.05		Reprocessing supply storage		10.2	21.0	226			366	1	366		
3.06		Dispatch		10.2	25.0	269			270	0	0		DGH does not need
3.07		Receiving and breakout rooms		10.2	37.0	398			401	1	401		
4.00		*Administration/Staff Support*										830	
4.01	**4**	Staff Locker		11.1/29	20.0	215			242	1	242		
4.02		Staff lounge / lunch room		10.2	15.0	161			168	1	168		
4.03		Staff Toilet/Shower			7.0	75			80	2	160		
4.04		Office- desk, small meeting area		11.1/34	11.0	118			130	2	260		
		SUBTOTAL										9,178	
		Grossing Factor								1.14	1,296		
		TOTAL PROGRAM DGSF REQUIRED:										**10,474**	

NOTES:

1 **General** **10.7.1.1**
A centralized system provides service to multiple areas within an HCF or to HCF's located external to the MDRD
Decentralized systems can be located in areas such as:
(a) endoscopy units
(b) operating rooms and
(c) diagnostic imaging

2 **Functional Relationships** **10.7.2.2**
The decontamination receiving area shall be located at one entrance to the service. The dedicated (soiled) elevator for carrying contaminated devices from the OR and/or other HCF areas shall offload into this soiled receiving area

3 **Functional Relationships** **10.7.2.4**
The dedicated (clean) elevator MDRD, if provided, should be located in or near the sterile storage area.

4 **Functional Relationships** **10.7.2.5**
The staff locker room should be readily accessible to the MDRD

5 **Recommended size** **10.2**
Average sizes shown above based on the largest category - 75-88 procedures a day (with 20 OR's that equals 3.75 to 4.4 cases per OR per day)

6 Excludes ethylene oxide sterilizers

DARTMOUTH GENERAL HOSPITAL
Department: **Endoscopy and Shared Waiting**
Date: May 31, 2013
STATUS: **Part B Submittal**

OPERATING ROOMS, DAY SURGERY AND RECOVERY ON THIRD FLOOR, ENDO REMAINS ON SECOND
Version 4B

DRIVERS:

2	Procedure room
2	Recovery Bay, Private, Chair
4	Recovery Bay, Private, Bed
1	Stage One Recovery, Isolation
2	**TOTAL PROCEDURE ROOMS**
4,899	**DGSF per Driver**

	NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m^2	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
						11							
1.00	**1**	*Procedure suite*										1,657	
1.01		**Procedure room**		9.5/19	24.0	258			**300**	**2**	600		Retain existing rooms
1.02		Patient toilet		11.1/16	4.6	50			51	2	102		One existing, one new
1.03		Clean scope storage		9.5/27					123	1	123		Retain existing room between Endo Procedure rooms
1.04		Charting area		11.1/5	4.6	50			50	2	100		
1.05		Clean supply		11.1/7	11.0	118			151	1	151		Shared with Prep/Recovery
1.06		Equipment alcove		11.1/7	0.6	6			10	2	20		
1.07		Anesthesia support		11.1/38					130	0	0		Removed per staff request
1.08		Soiled utility		11.1/40	12.0	129			139	1	139		Shared with Prep/Recovery
1.09		Medical device reprocessing							130	1	130		Retain existing room between Endo Procedure rooms
1.10		Equipment storage	9.5.3.4.15		4.7	50			167	1	167		Space shared between two Procedure rooms and Pre/Post Op
1.12		Crash cart							10	1	10		
1.13		Housekeeping		11.1/21	7.0	75			115	1	115		
2.00		*Prep/Recovery Suite*										1,834	
2.01		**Recovery Bay, Private, Chair**		**11.1/14**	**8.4**	**90**			**103**	**2**	**206**		
2.02		**Recovery Bay, Private, Bed**		**11.1/14**	**13.0**	**140**			**116**	**4**	**464**		
2.03	**2**	**Stage One Recovery, Isolation**	7.5.5.1 (d)	**9.5/9**	**13.0**	**140**			**186**	**1**	**186**		
2.04		Isolation Anteroom		9.5/9	5.0	54			63	1	63		
2.05		Isolation, Prep alcove		11.1/15	2.0	22			20	1	20		
2.06		Isolation patient toilet		9.5/11	4.6	50			58	1	58		
2.07		Patient toilet	9.5.3.6	11.1/25	5.6	60			46	2	92		average of two - only one needs to be Barrier-Free.
2.08		Patient change rooms							68	2	136		average of two
2.09		Patient locker room							75	1	75		
2.10		Hand washing stations	9.5.3.2.3 (e)	11.1/19	1.0	11			11	4	44		
2.11		Exam room		11.1/14	12.0	129			132	1	132		
2.12		Nurse station		11.1/3	4.6	50	2	46	92	1	92		
2.13		Clean supply		11.1/7	11.0	118					0		Shared with Procedure Suite
2.14		Soiled utility		11.1/40	12.0	129					0		Shared with Procedure Suite
2.15		Medication station		11.1/32	9.5	102			110	0	0		Removed per staff request
2.16		Nourishment alcove		11.1/33	10.0	108			97	1	97		
2.17		Documentation/charting		11.1/5	4.6	50	2	46	92	1	92		
2.18		Housekeeping		11.1/21	7.0	75			77	1	77		
2.19		Linen		11.1/8					34	1	34		

	NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m^2	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
						11							
3.00		*Staff Support*										372	
3.01		Locker / lounge rooms		11.1/29	20.0	215			143	1	143		
3.02		Offices - one desk, two visitor chairs		11.1/34	10.0	108			120	1	120		
3.03		Staff toilet/shower			7.0	75			109	1	109		
4.00		*Shared Waiting and Reception*											Separate/Shared Space for all of Surgery and Endoscopy. Renovation Space on Level 2
4.01	**3,4**	Waiting Room		11.1/48					1,567	1	1,567		Size to be confirmed with Clinical Services Plan
4.02		Reception							240	1	240		Size to be confirmed with Clinical Services Plan
4.03		Public Toilets		11.1/48					48	2	96		Renovation of Existing Washrooms
4.04		Public Phone							12	1	12		
		SUBTOTAL										5,812	
		Grossing Factor								1.69	3,985		
		TOTAL PROGRAM DGSF REQUIRED:										**9,797**	

NOTES:

1 Endoscopy suites and work areas 9.1.2.6
Endoscopy services shall be designed so that the endoscopy suite is adjacent to a medical device reprocessing (MDR) area. Reprocessing areas shall be designed in accordance with CAN/CSA-Z314.8. The service shall be designed so that management of soiled scopes and storage for clean scopes and other equipment can be in accordance with CAN/CSA-Z314.8 and relevant infection prevention and control guidelines.

2 Airborne Isolation Room 7.5.5.1
Class A HCF's shall provide at least one airborne isolation room (AIR) for each of the following services or areas:
(d) endoscopy

3 Waiting area clearances 7.5.2.7
Waiting rooms and holding areas where multiple patients occupy the same room, shall comply with the following precautions and minimum distances for separation:
a: Unscreened patients - minimum of 1000mm or physical barrier (e.g., pod design)
b: screened patients -(i.e. symptoms have been assessed through triage or self-screening) distance between chairs may be less than 1000mm, depending on facility type, patient population, and degree of risk.
c: symptomatic patients (e.g., coughing) - minimum distance of 2000 mm or physical barrier.

4 Accommodations of bariatric persons 7.8.8.1.2
Door widths in lounges and waiting areas shall be a minimum of 1220mm wide.

DRIVERS:

0	Examination, scooter access
1	Examination, standard
2	Exam Treatment cubicle, open, chair
8	Exam Treatment cubicle, open, bed
11	**TOTAL DAY SURGERY BAYS**
448	**DGSF per Driver**

DARTMOUTH GENERAL HOSPITAL — **OPERATING ROOMS, DAY SURGERY AND RECOVERY ON THIRD FLOOR, ENDO REMAINS ON SECOND**

Department: **Day Surgery** — Version 4B

Date: May 31, 2013

STATUS: **Part B Submittal**

	NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m²	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
					11								
1.00		*Arrival, Check in*	*9.5.3.6*									504	
1.01	**2,3**	Waiting	9.5.3.6				9	33	297	1	297		Assumes that people have been prescreened on Level 2.
1.02		Reception Desk							117	1	117		Capacity for 2-3 booking clerks, ideally.
1.03		Consultation	9.5.2.1.2						90	1	90		Surgeon Consultation with Patients/Families.
2.00			*9.5.2.1.4*									2,363	At least one door to access PACU suite directly: 9.5.3.2.3 (a)
2.01		**Examination, standard**	**9.5.3.3.1**	**11.1/14**	**12.0**	**129**			**132**	**1**	**132**		Medical gas terminals per Annex F
2.02		**Examination, scooter access**		11.1/14	13.0	140			140	0	0		
2.04		Interview	9.5.3.3.1							0	0		Space shared with 1.03 Consultation
2.05		Preparation	9.5.3.3.1							0	0		Function accommodated in private Bays and Exam Room
2.06	**1**	**Exam Treatment cubicle, open, chair**	**9.5.3.6**	**11.1/14**	**7.5**	**81**			**81**	**2**	**162**		Medical gas terminals per Annex F
2.07		**Exam Treatment cubicle, open, bed**	**9.5.3.6**	**11.1/14**	**9.5**	**102**			**120**	**8**	**960**		Medical gas terminals per Annex F
2.08		Exam Treatment cubicle, closed, chair	9.5.3.6	11.1/14	8.4	90			120	0	0		
2.09		Exam Treatment cubicle, closed, bed	9.5.3.6	11.1/14	13.0	140			140	0	0		
2.11		Patient Holding	9.5.3.4.7						130	1	130		Surgical suite function
2.11		Patient Toilet	9.5.3.6	11.1/25	5.6	60			50	2	100		
2.12		Clothing change or gowning	9.5.3.6						60	0	0		If private holding rooms or cubicles are provided, changing rooms are not needed
2.13		Patient Lockers	9.5.2.1.3	11.1/29	0.4	4	25	4	100	1	100		Half-height lockers accounted for.
2.14		Testing	9.5.3.3.1							0	0		Blood draws done at bedside
2.16		Vital Signs	9.5.3.3.1							0	0		Vital signs taken at bedside
2.17		Scale alcove							20	1	20		
2.18		Nurse Station / Control	9.5.3.2.3 (d)(iii)	11.1/3	4.60	50	6	50	300	1	300		
2.19		Hand Hygiene sink	9.5.3.2.3 (e)	11.1/19	1.00	11			11	4	44		
2.20		Waterless Hand Hygiene Station	9.5.3.2.3 (d)(ii)	11.1/20	NA								No space allocation needed
2.21		Medication station	9.5.3.2.3 (d)(i)	11.1/32	9.50	102			91	1	91		
2.22		Clean supplies	9.5.3.2.3 (d)(vi)	11.1/7	11.00	118			132	1	132		
2.23		Soiled Holding	9.5.3.4.11	11.1/40	12.00	129			132	1	132		
2.24		Linen		11.1/8					35	0	0		Within clean supply
2.25		Stretcher Alcove		9.5/12(b)					40	1	40		
2.26		Emergency Cart							20	1	20		

NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m²	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
					11							
3.00											132	
3.01	Housekeeping		11.1/21	7.0	75			74	1	74		
3.02	Staff Toilet	9.5.3.2.3 (f)						58	1	58		
3.03	Offices							100	0	0		Shared office space with recovery
3.04	Conference/break							150	0	0		Shared conf room with recovery
	SUBTOTAL										2,999	
	Grossing Factor								1.64	1,930		
	TOTAL PROGRAM DGSF REQUIRED:										**4,929**	4499 GSF in unit, 430 GSF in waiting area

NOTES:

1 **Patient treatment places** **4.5.4**
All patient treatment places, whether intended for inpatient or outpatient use, shall be single occupancy unless the functional program demonstrates the necessity of multi-patient arrangement.
Single occupancy means that patients have a spatial separation and a physical barrier between them sufficient to provide privacy, protection from the spread of infection and adequate area to support clinical functions.

2 **Waiting area clearances** **7.5.2.7**
Waiting rooms and holding areas where multiple patients occupy the same room, shall comply with the following precautions and minimum distances for separation:
a: Unscreened patients - minimum of 1000mm or physical barrier (e.g., pod design)
b: screened patients -(i.e. symptoms have been assessed through triage or self-screening) distance between chairs may be less than 1000mm, depending on facility type, patient population, and degree of risk.
c: symptomatic patients (e.g., coughing) - minimum distance of 2000 mm or physical barrier.

3 **Accommodations of bariatric persons** **7.8.8.1.2**
Door widths in lounges and waiting areas shall be a minimum of 1220mm wide.

DRIVERS:

15	Stage One Recovery, Private
1	Stage One Recovery, Isolation
0	Stage Two Three walls/private
16	TOTAL RECOVERY BAYS
420	**DGSF per Driver**

DARTMOUTH GENERAL HOSPITAL
Department: **Recovery**
Date: May 31, 2013
STATUS: **Part B Submittal**

OPERATING ROOMS, DAY SURGERY AND RECOVERY ON THIRD FLOOR, ENDO REMAINS ON SECOND
Version 4B

	NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m^2	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
						11							
1.00		*Stage One Recovery /PACU*	*9.5.3.2.2*									3,134	*At least one door to access surgical suite directly (9.5.3.2.2)*
1.01	**1**	**Stage One Recovery, Open**		9.5/6	9.5	102			110		0		Medical gas terminals per Annex F
1.02		**Stage One Recovery, Partial Walls**		9.5/7	11.0	118			130		0		Assumes 2 bariatric beds divided by curtain, walls on 1side, critical care clearances
1.03	**2**	**Stage One Recovery, Private**		**9.5/8**	**13.0**	**140**			**120**	**15**	**1,800**		**Assumes REGULAR BED, INPATIENT clearances**
1.04	**3**	**Stage One Recovery, Isolation**	9.5.3.2.2 (e/f)	**9.5/9**	**13.0**	**140**			**160**	**1**	**160**		**CAN/CSA-Z317.2 for pressure monitoring and alarm**
1.05	**3**	Isolation Anteroom		9.5/9	5.0	54			50	1	50		CAN/CSA-Z317.2 for HVAC and pressurization
1.06	**3**	Isolation, Prep alcove		11.1/15	2.0	22			25	0	0		
1.07		Isolation patient toilet							47	1	47		
1.08		Medication station	9.5.3.2.2 (a)(i)	11.1/32	9.5	102			80	1	80		
1.09		Handwashing sinks							5	5	25		
1.10		Waterless Hand Hygiene Stations	9.5.3.2.2 (a)(ii)	11.1/20	NA						0		Mounted as needed, no specific spaces required
1.11		Nurse Station / Charting	9.5.3.2.2 (a)(iii)	11.1/3	4.6	50	4	50	200	2	400		
1.12		Soiled workroom, small		11.1/40	12.0	129			110	1	110		
1.13		Clinical Sink	9.5.3.2.2 (a)(iv)								0		Included in soiled workroom above
1.14		Provisions for Bedpan Cleaning	9.5.3.2.2 (a)(v)								0		Included in soiled workroom above
1.15		Storage	9.5.3.2.2 (a)(vi)						80	1	80		
1.17		Clean supply							112	1	112		
1.19		PACS workstation	9.5.3.2.2 (a)(vii)				2	50	100		0		
1.20		Staff toilet	9.5.3.2.2 (e)						50	1	50		
1.21		Crash cart							20	1	20		
1.22		Stretcher alcove							40	2	80		
1.23		Housekeeping		11.1/21	7.0	75			60	1	60		
1.24		Patient toilet	9.5.3.6	11.1/25	5.6	60			60	1	60		
2.00		*Stage Two Recovery*	*9.5.3.2.3*									0	*Stage Two Recovery function is described in "Day Surgery" section, per 9.5.2.1.4*
2.01		Stage Two Recovery	9.5.3.2.3c	9.5/11	7.5	81			90	0	0		Medical gas terminals per Annex F
2.02		Stage Two Chair, Open/Curtained		9.5/11	9.5	102			110	0	0		
2.03		Stage Two Stretcher, Open/Curtained		9.5/11	11.0	118			120	0	0		
2.04	2	Stage Two Three walls/private		9.5/11	13.0	140			140	0	0		
2.05		Medication station	9.5.3.2.3 (d)(i)	11.1/32	9.5	102				0	0		
2.06		Waterless Hand Hygiene Station	9.5.3.2.3 (d)(ii)	11.1/20	NA					0	0		
2.07		Nurse Station with Charting	9.5.3.2.3 (d)(iii)	11.1/3	4.6	50	3	50	150	0	0		
2.08		Soiled workroom, small		11.1/40	12.0	129			130	0	0		
2.09		Clinical Sink	9.5.3.2.3 (d)(iv)							0	0		
2.10		Provision for Bedpan Cleaning	9.5.3.2.3 (d)(v)							0	0		
2.11		Storage for Supplies and equipment	9.5.3.2.3 (d)(vi)						100	0	0		
2.12		Hand Hygiene Sinks	9.5.3.2.3 (e)	11.1/19	1.0	11			11	0	0		1 sink per 4 patient bays
2.13		Staff Toilet	9.5.3.2.3 (f)						60	0	0		
2.14		Patient Toilet	9.5.3.2.3 (g)	11.1/25	5.6	60			60	0	0		2 piece, bariatric

NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m²	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
					11							
2.15	Isolation room (per ICRA)	9.5.3.2.3 (h/i)								0		Not required in stage two recovery
2.16	Nourishment alcove		11.1/33	3.0	32			35	0	0		
3.00	*Non-Clinical Support*										0	
3.01	Small Staff Break Room	9.5.3.5.1	11.1/44				1	150	0	0		Shared with surgery, shown in surgery program
3.02	Conference Room		11.1/7	15	161		1	150	0	0		Shared with surgery, shown in surgery program
4.00	*Administration*										1,211	
4.01	Office, desk, no meeting space		11.1/34	9.00	97			116	4	464		Average of 4 rooms
4.04	Open Office, four workstations							573	1	573		
4.05	Office, desk, small meeting area		11.1/34	11.00	118			120	0	0		
4.06	Office, desk, 4 chair meeting space		11.1/34	14.00	151			174	1	174		
	SUBTOTAL										4,345	
	Grossing Factor								1.55	2,374		
	TOTAL PROGRAM DGSF REQUIRED:										**6,719**	

NOTES:

1 Bed Clearances: **7.5.2.5**

Room Sizes

Inpatient beds:		0.0394			Length:
Non transfer side (wall)	1000 mm	40 inches	3'- 4	Bed	71
At foot of bed	1200 mm	48 inches	4'- 0	Clearance	60
Between beds (in rms w/more than 1)	1200 mm	48 inches	4'- 0		131
Between centerlines	1800 mm	71 inches	5'- 11		13'
Critical Care Beds					
Non transfer side (wall)	1200 mm	48 inches	4'- 0		
At foot of bed	1500 mm	60 inches	5'- 0		
Between beds (in rms w/more than 1)	1800 mm	71 inches	5'- 11		
Between centerlines	2400 mm	95 inches	7'- 11		
Bed Size					
Width (normal) - 7.5, Note 2	1000 mm	40 inches	3'- 4		
Width (bariatric) - 7.5, Note 2	1200 mm	48 inches	4'- 0		
Length	2400 mm	95 inches	7'- 11		

2 Patient treatment places **4.5.4**

All patient treatment places, whether intended for inpatient or outpatient use, shall be single occupancy unless the functional program demonstrates the necessity of multi-patient arrangement.

Single occupancy means that patients have a spatial separation and a physical barrier between them sufficient to provide privacy, protection from the spread of infection and adequate area to support clinical functions.

3 Airborne Isolation Room **7.5.5.1**

Class A HCF's shall provide at least one airborne isolation room (AIR) for each of the following services or areas:
(d) endoscopy

DRIVERS:

6	General Operating Rooms
2	Special Operating Rooms
2,324	**DGSF per Driver OR Suite only**
11,648	DGSF , Recovery & Day Surgery
3,780	**DGSF per Driver, OR and Recovery**

DARTMOUTH GENERAL HOSPITAL — **OPERATING ROOMS, DAY SURGERY AND RECOVERY ON THIRD FLOOR, ENDO REMAINS ON SECOND**

Department: **Operating Room Suite** — Version 4B

Date: May 31, 2013

STATUS: **Part B Submittal**

	NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m²	CSA required SF	PROGRAM #ITEMS	PROGRAM NSF/ITEM	PROGRAM NSF /EA	PROGRAM QTY	PROGRAM NSF TOTAL	PROGRAM SUBTOTAL	REMARKS
						11							
1.00		*Operating Rooms*										5,850	
1.01		**General Operating Rooms**	**9.5.3.1.1**	**9.5/1**	**55.0**	**592**			**595**	**6**	**3,570**		
1.02		**Special Operating Rooms**	**9.5.3.1.1**	**9.5/2**	**60.0**	**646**			**695**	**2**	**1,390**		
1.03		Scrub Stations	9.5.3.4.4	9.5/5	0.8	9			20	8	160		Two stations for each OR - may be shared between 2 PRs if adjacent to each entry
1.04		Substerile	9.5.3.4.8	11.1/46	1.2	13			140	4	560		Average of 4 rooms
1.05		Emergency (flash) sterilization	9.5.3.4.9			0			85	2	170		May serve more than 1 OR. (average of 2 rooms)
2.00		*Clinical Support Space*										4,311	
2.01		Control Station	9.5.3.4.2	9.5/13	4.6	50			124	1	124		Requirement is per workstation
2.02		Frozen section	9.5.3.3.2						100	0	0		Not required but may be included
2.03		Medication station	9.5.3.4.5	11.1/32	9.5	102			0	0	0		Pyxis in each OR
2.04		Dispensing style ice machine	9.5.3.4.6						30	0	0		Removed per staff direction
2.05		Patient holding	9.5.3.4.7						120	0	0		Patient holding space in Day Surgery area
2.06	**1**	Sterile Supply Storage	9.5.3.4.10(a)	9.5/10	varies				195	8	1,560		CLEAN CORE: Separate from clean workroom
2.07		Clean Workroom	9.5.3.4.10						116	1	116		
2.08		Soiled workroom, small	9.5.3.4.11	11.1/40	12.0	129			134	1	134		Fume hood, clinical sink,
2.09		Pathology							130	0	0		Removed per staff direction
2.10		Blood storage	9.5.3.4.13						80	0	0		Removed per staff direction
2.11		Specimen storage	9.5.3.4.14						115	1	115		
2.12		Equipment storage	9.5.3.4.15		4.7	50			245	2	490		Min. sf provided per OR (average of two rooms)
2.13		Reserve Medical Gas Storage	9.5.3.4.15								0		Enough to finish one day's procedures in accordance w/CSA Z305.12 - stored outside of suite
2.14		Housekeeping	9.5.3.4.16	11.1/21	7.0	75			70	1	70		
2.15		Physician/Image workstation		9.5/14	4.6	50			125	1	125		Requirement is per workstation - 1220m desk at minimum, 1 per every 4 ORs
2.16		Imaging/Equipment alcove		9.5/15	4.6	50			64	2	128		
2.17		Satellite Respiratory		9.5/16	4.6	50	2	50	100	0	0		Removed per staff direction
2.18		Satellite Pharmacy	9.5.2.3.6	11.1/39					162	1	162		Augmented with Pyxis in each OR
2.19		Medical device reprocessing							400	0	0		Removed per staff direction
2.20		Staff Toilet							60	2	120		
2.21		Stretcher cleaning							109	2	218		Added per staff request
2.22		Block Room							325	1	325		Added per staff request
2.23		Soiled Cart Hold							176	1	176		Added per staff request
2.24		Clean Elevator	12.2.6.4.3						64	1	64		
2.25		Dirty Elevator	12.2.6.4.3						64	1	64		
2.26		Stretcher Alcove							40	8	320		

NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m²	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
					11							
3.00	*Support spaces for staff*										2,274	
3.01	Anesthesia Call Rooms	9.5.3.5.4	11.1/34	10.0	108			114	2	228		Added per staff request
3.02	Anesthesia Director							125	1	125		Added per staff request
3.03	Anesthesia Open workstation							426	1	426		Added per staff request
3.04	Anesthesia Toilet/Shower							65	1	65		Added per staff request
3.05	Anesthesia Workroom	9.5.3.4.12	11.1/38					195	1	195		Includes fume hood
3.06	Dictation and report preparation	9.5.3.4.3				2	50	100	0	0		Function served by Open Office space in Recovery, per staff request.
3.07	Lounge	9.5.3.5.1	11.1/30	2.5	27			271	1	271		Convenient access to Stage One recovery
3.08	Lockers/Toilets/Showers	9.5.3.4.2	11.1/29	20.0	215			384	2	768		Average of 2 rooms (men/women)
3.09	Lockers, Full		11.1/5	0.7	8		8	0	2			Area included in Locker room above
3.10	Conference / Teaching /Library	9.5.3.5.3	11.1/7	15.0	161	7	28	196	1	196		
4.00	*Non-Clinical Support*										0	
										0		
	SUBTOTAL										12,435	
	Grossing Factor								1.50	6,157		
	TOTAL PROGRAM DGSF REQUIRED:										**18,592**	

NOTES:

1 Minimum storage:
- 2 case carts per OR
- Supplies
- Flash sterilizer
- anaesthetic supplies
- emergency carts
- blood fridge
- medication dispensing units

CAPITAL DISTRICT HEALTH AUTHORITY (CDHA)
INNOVATIVE CARE FLEXIBLE FACILITIES
HALIFAX & DARTMOUTH, NOVA SCOTIA

JUNE 20, 2013

3.0 Project Cost Summary

			Total Development
DARTMOUTH GENERAL - CONCEPT OR's LEVEL 3			[redacted]
New Building Construction	82,377	SF	
Renovated Building Construction	37,398	SF	
Site Works	1	Sum	
Total Construction Cost	**119,775**	**SF**	
Additional Cost Items / Allowances	1	Sum	
Construction Contingency	1	Sum	
Ancillaries	1	Sum	
Healthcare Commissioning	1	Sum	
Moving Costs	1	Sum	
FF&E and IT	1	Sum	
Sub-total Project Cost Current $	**119,775**	**SF**	
Escalation to Mid-point of Construction			
Total Project Cost Escalated	**119,775**	**SF**	
DARTMOUTH GENERAL - 5TH FLOOR FIT-OUT			
New Building Construction	3,750	SF	
Renovated Building Construction	26,843	SF	
Site Works	1	Sum	
Total Construction Cost	**30,593**	**SF**	
Additional Cost Items / Allowances	1	Sum	
Construction Contingency	1	Sum	
Ancillaries	1	Sum	
Healthcare Commissioning	1	Sum	
Moving Costs	1	Sum	
FF&E and IT	1	Sum	
Sub-total Project Cost Current $	**30,593**	**SF**	
Escalation to Mid-point of Construction			
Total Project Cost Escalated	**30,593**	**SF**	

Cost Estimate - ORs on Level 3

A Class "C" Unit Rate cost estimate was prepared for the DGH Addition concept by Hanscomb Limited. *3.0 Project Cost Summary*, on this page, provides high-level information for both projects at the Dartmouth General Hospital Site, with some line items, particular to the Addition and related works, shown with more detail in the tables on subsequent pages.

Many other factors are captured in the calculation of the underlying unit rates themselves.

Renovation costs are based on two primary factors: the type of space being renovated and the extent or complexity of renovation required to any given space. Renovation costs for different space types are based on comparable cost data from other relevant and recent projects, while complexity of renovation required has been estimated by the design team based on professional judgement and information provided by CDHA staff.

Please also refer to the section of this report titled "Cost Estimating, General" for common criteria, methodology, assumptions and exclusions applicable to all Cost Estimates for this project.

CAPITAL DISTRICT HEALTH AUTHORITY (CDHA)
INNOVATIVE CARE FLEXIBLE FACILITIES
HALIFAX & DARTMOUTH, NOVA SCOTIA

CAPITAL DISTRICT HEALTH AUTHORITY (CDHA)
DARTMOUTH GENERAL - CONCEPT OR's LEVEL 3

Hanscomb
JUNE 20, 2013

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CAPITAL DISTRICT HEALTH AUTHORITY (CDHA) DARTMOUTH GENERAL - CONCEPT OR's LEVEL 3	Type	Reno Level	May 2013 Drawing Areas (SF)		$/SF	Net Construction Cost	Asbestos Materials Abatement $15.00	Infectious Control Measures 1.0%	In Contract Equipment Allowance 5.0%	Design & Pricing Allowance 10.0%	Phasing for Renovated Work 3.0%	LEED Allowance 2.5%	Construction Management Fee 5.0%	Total Construction Cost	Construction Contingency 5.0%	Project Ancillaries 23.2%	Healthcare Commissioning 0.5%	Moving Allowance 4.00	FF& E and IT %	FF& E and IT Allowance	TOTAL CURRENT PROJECT COST	Potential Impact of Escalation @ 3% p.a. to Mid-point of Construction: Const Mid-Point	Yrs	Escalation 3.0% per annum	PROJECT COST INCLUDING ESCALATION
FIRST FLOOR																									
Pharmacy	New		496	cgsf																					
Medical Device Reprocessing	New		10,474	cgsf																					
Building Support	New		2,994	cgsf																					
Shell Space	New		1,555	cgsf																					
Building Gross	New		4,147	bgsf																					
Sub-total	**New**		**19,666**	**bgsf**																					
SECOND FLOOR																									
Ambulatory Clinic Shell	New	Shell	20,687	cgsf																					
Sub-total	**New**		**20,687**	**bgsf**																					
THIRD FLOOR																									
Surgery Suite	New		18,592	cgsf																					
Recovery	New		6,719	cgsf																					
Day Surgery	New		4,929	cgsf																					
Elevator Core and Lobby	New		524	cgsf																					
Building Gross	New		3,246	bgsf																					
Sub-total	**New**		**34,010**	**bgsf**																					
FOURTH FLOOR																									
Elevator Core and Lobby	New		832	cgsf																					
New Mechanical Penthouse	New		5,500	cgsf																					
Building Gross	New		425	cgsf																					
Sub-total	**New**		**6,757**	**bgsf**																					
FIFTH FLOOR																									
Elevator Core and Lobby	New		1,257	cgsf																					
Sub-total	**New**		**1,257**	**bgsf**																					
New Building Construction			**82,377**	**bgsf**																					
FIRST FLOOR																									
Renovate Old SPD for New Clinical Support	Reno	3	1,130	dgsf																					
Renovate Old SPD for New Pharmacy	Reno	3	6,380	dgsf																					
Create New Service Corridor	Reno	2	875	dgsf																					
Renovate Old Pharmacy for Offices	Reno	2	920	dgsf																					
Renovate Old Pharmacy for Culinary Offices	Reno	2	210	dgsf																					
Renovate Culinary for Additional Cold & Cart Storage	Reno	3	260	dgsf																					
SECOND FLOOR																									
Renovate Day Surgery for ICU	Reno	3	5,250	dgsf																					
Renovate Surgery/Endo for Endo	Reno	3	6,747	dgsf																					
Renovate Surgery/Endo for DI	Reno	3	2,430	dgsf																					
Renovate Existing Space for Surgery Waiting/Reg.	Reno	2	2,600	dgsf																					
Renovate Offices for New Main Entry	Reno	3	1,574	dgsf																					
Renovate Existing Space for New Foundation/Chapel	Reno	2	1,574	dgsf																					
Renovate Existing Corridor to New Corridor	Reno	1	1,900	dgsf																					
THIRD FLOOR																									
Renovate Patient Room for New Access Corridor	Reno	3	275	dgsf																					
FOURTH FLOOR																									
Renovate Patient Room for New Access Corridor	Reno	3	260	dgsf																					
Renovate ICU to New Inpatient Unit	Reno	3	5,013	dgsf																					
FIFTH FLOOR																									
Part of 5th Floor Fit-Out Costs																									
Renovated Building Construction			**37,398**	**dgsf**																					
Allowance for Site Works			**119,775**	**dgsf**																					
Site Work (See attached sheet for details)			1	Sum																					
Additional Cost Items / Allowances			**1**	**Sum**																					
New Stand Alone Above Grade Parking Garage			87,924	bgsf																					
New Pneumatic Tube System for New Addition - Tie into Existing			8	Stns																					
DARTMOUTH GENERAL - CONCEPT OR's LEVEL 3			**119,775**	**bgsf**																					

CAPITAL DISTRICT HEALTH AUTHORITY (CDHA)
INNOVATIVE CARE FLEXIBLE FACILITIES
HALIFAX & DARTMOUTH, NOVA SCOTIA

Hanscomb
JUNE 20, 2013

Project Cost Summary Page B - 2

BUILDING SHELL - DARTMOUTH GENERAL CONCEPT OR's LEVEL 3:

Foundations			**82,377**	**SF**
1	Allowance for normal foundations		82,377	SF
Basement Excavation			**5,403**	**CY**
1	Allowance for excavation Level 1 half below grade		5,403	CY
2	Allowance for backfill		1,351	CY
3	Extra over to excavate sulphide bearing slate (1/2)		2,702	CY
Special Conditions			**1**	**Sum**
1	Allowance for dewatering		1	Sum
2	Premium for caissons (assume none required)		0	SF
3	Potential for artifacts (assume none in this area)		1	Sum
Lowest Floor Construction			**19,666**	**SF**
1	Concrete slab on grade		19,666	SF
2	Premium for underslab drainage		19,666	SF
Upper Floor Construction			**62,711**	**SF**
1	Suspended floors		49,388	SF
2	Existing roof space converted to new floor area		13,323	SF
	c/w the removal of the existing roof finish and the repairs/modifications to the slab as maybe required			
3	Stairs		8	Flt
Roof Construction			**34,010**	**SF**
1	Roof structure		34,010	SF
Walls Below Grade			**2,581**	**SF**
1	Reinforced concrete basement walls		2,581	SF
Walls Above Grade			**34,667**	**SF**
1	Double Glazed Curtainwall (no spandrel)	30%	8,726	SF
2	Double Glazed Window	10%	2,909	SF
3	Brick cladding	46%	13,234	SF
4	Premium for acoustic treatment	0%	0	SF
5	Louvers & metal panels	15%	4,218	SF
6	Metal siding to new penthouse		5,580	SF
7	Extra over for alterations at existing exterior walls where new additions adjoin		7,689	SF
8	Architectural Features	100%	29,087	SF
Windows & Entrances			**9**	**No.**
1	Allowance for new doors, single leaf		4	Lvs
2	Allowance for new doors, double leaf		2	Pair
3	Allowance for overhead doors		1	No.
Roof Covering			**34,010**	**SF**
1	Roof covering system - 2 ply mod. Bit.		34,010	SF
2	Extra over for Green Roof at Level 3 roof (partial area)		21,095	SF
Projections			**1**	**Sum**
1	Allowance for canopy/loading dock		1	Sum
2	Allowance for screen on roof		7,504	SF
Elevators			**6**	**No.**
1	Allowance for service elevator (3 stop)		2	No.
2	Allowance for passenger elevator (3 stop)		2	No.
3	Extra over to above for stops at levels 4 & 5		2	No.
SUB-TOTAL			**82,377**	**SF**
1	General Requirements		14%	
TOTAL			**82,377**	**SF**

[redacted]

File Name: HAL2724_-_CDHA_ICFF_Class_'C'_Estimate_(Jun_20,_2013)_V4.xlsShell 2 - DG OR3
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CAPITAL DISTRICT HEALTH AUTHORITY (CDHA)
INNOVATIVE CARE FLEXIBLE FACILITIES
HALIFAX & DARTMOUTH, NOVA SCOTIA

Hanscomb
JUNE 20, 2013

Project Cost Summary Page B - 3

SITE - DARTMOUTH GENERAL CONCEPT OR's LEVEL 3:

Site Development		**1**	**Sum**
1	Removal of existing asphalt paving at new addition	14,500	SF
2	Ditto above at new parking garage	30,000	SF
3	Miscellaneous removals and site clearing	1	Allow
4	Allowance for repairs to asphalt & realignment as/if necessary at lower parking & entrances off of Mount Hope Av.	1	Allow
5	Modifications to the line markings in the main parking lot	1	Allow
6	Site work associated with the relocated Main Entrance		
	- renovate/refinish the existing entry patio	1,324	SF
	- construct new cover walkway & bridge from parking lot drop off to entry	1,230	SF
	- new canopy over drop off lanes	1,942	SF
	- new covered walkway from drop off to new parking garage	744	SF
	- new asphalt paving	3,700	SF
	- new concrete sidewalks	1,636	SF
	- new concrete curbs	320	LF
	- realignment of existing parking lot in area of new drop off	1	Allow
7	Allowance for hard & soft landscaping including reinstatements to disturbed areas	1	Sum
8	Allowance to relocate the Vital Air tank farm including new pad and enclosure	1	Allow
Site Mechanical		**1**	**Sum**
9	New 8" sanitary line from new addition to existing line at Mount Hope Av.	140	LF
10	New 10" domestic water & sprinkler line around new addition from Mount Hope Av.	420	LF
11	Allowance for new fire hydrants	1	No.
12	Storm drainage modification allowance	1	Allow
Site Electrical		**1**	**Sum**
13	Site electrical & site lighting allowance	1	Allow
14	Alliowance for a new Emergency Generator & associated work - 400kw assumed	1	Allow
15	Upgrade electrical service from NSH and at DGH		
	- new transformer at each site (2no.)	1	Allow
	- allowance for 3 feeds including duct bank	165	LF
16	Upgrade power feeds to transfer switch to 2hr rated feeds		
	- 200A service entrance rated fusible disconnect switch, with a time delay, in main electrical room	1	No.
	- 7 jaw meter socket	1	No.
	- feeder from padmount transformer to switch	25	LF
	- feeder from switch to fire pump transfer switch	250	LF
	- feeder from emergency switchboard to fire pump transfer switch	250	LF
	- miscellaneous work	1	Allow
SUB-TOTAL		**1**	**Sum**
	General Requirements	14%	
TOTAL		**82,377**	**SF**

[redacted]

File Name: HAL2724_-_CDHA_ICFF_Class_'C'_Estimate_(Jun_20,_2013)_V4.xlsSite DG OR3
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Dartmouth General Hospital Level 5 Renovation

Introduction

Existing fifth floor shelled-in space at the Dartmouth General Hospital, constructed in 1987, is to be renovated as an inpatient floor supporting 40 to 46 beds relocated from the Centennial Building at the Victoria General Site in Halifax.

The design solution carefully considers the preferred model of care, private versus semi-private rooms, centralized versus decentralized staff and service spaces, etc.

Summary

See the following page for a summary of highlights for the Renovation of Level 5 at the Dartmouth General Hospital to support inpatient areas transferred from the Centennial Building, including the pros and cons, proposed building areas and cost estimate information.

Dartmouth General Hospital – 5th Floor Renovations		
Options	**Option H**	
Description	• 45 beds (27 private; 1 semi-private; 1 bariatric room; 2 Airborne Isolation Rooms; 7 acuity-adaptable rooms – used as 2-bed rooms) • 40 beds (37 private; 1 semi-private; 1 bariatric room; 2 Airborne Isolation Rooms – if 1/2-bed adaptable rooms built as shorter private rooms) • All 3-piece WRs	
Drawing References	H.03 (dated 31 May 2013)	
Pros/Cons	**Pros**	**Cons**
	• Majority of beds in single/private rooms • Private and 2-bed rooms all Z8000-compliant bedrooms, incl. 2-bed rooms, if justified. • 2-bed rooms (not CSA-compliant), allow more insurance income potential. • Acuity-adaptable rooms allow rooms to function well as 2-bed rooms (single washroom) in surge conditions, are bariatric-friendly due to slightly larger size and also provide long-term ability/flexibility to be used as step-down/IMCU beds if needs arise in the future. • Distributed nurse work areas/TCCs (shorter travel distances, facilitates bullet-rounds) • Team work/consult areas • True bariatric room could be built as another 2-bed room (separate washrooms) • Distributed clean supply storage • Family lounges on each wing • Reasonable ratio of Support & Service spaces to Bedrooms • Works mostly with existing structure and window openings • Large central Equipment storage room. • Decentralized Med rooms for Pyxis system (4 total) • Isolation rooms located close to unit entrances. • Essentially balanced bed count on each side of the floor.	• Mirrored room layouts (headwall layouts will not be identical room to room, washroom entry point inconsistent) • Washroom entry on footwall (increased potential for falls)
Building Area (New Construction) BGSF	3,750 sq.ft. (Rooftop Penthouses over Level 5) – Elevator Tower and Link (1,280 sq.ft.) on Level 5 priced as part of the DGH Addition	
Program Area (Renovation/Ancillary) BGSF	26,843 sq.ft. (area of existing 5th floor shell)	
Estimate of Probable Cost	[redacted]	

Space for Client Review Comments

Program Summary

The Dartmouth General Hospital (DGH) Fifth Floor Space Program included in this report represents the starting point (CSA Z8000-11 derived) condition with modifications and supplementary requirements as conveyed by CDHA and DGH staff.

As the DGH fifth floor fit-out project is an interior development of existing shelled-in space, there is a finite floor area available with no ability to increase the available space. The Building Gross Square Footage (BGSF) of this floor is 26,843 sq.ft.

Areas were eliminated from the space program included in the Part A Report through reductions made in conjunction with Stakeholders, as design decisions were made and a preferred scheme evolved. The Space Program was updated to reflect the final room/bed numbers and used as a tool to track deviations from CSA Z8000-11 document.

DARTMOUTH GENERAL HOSPITAL
LEVEL 5 INPATIENT RENOVATION

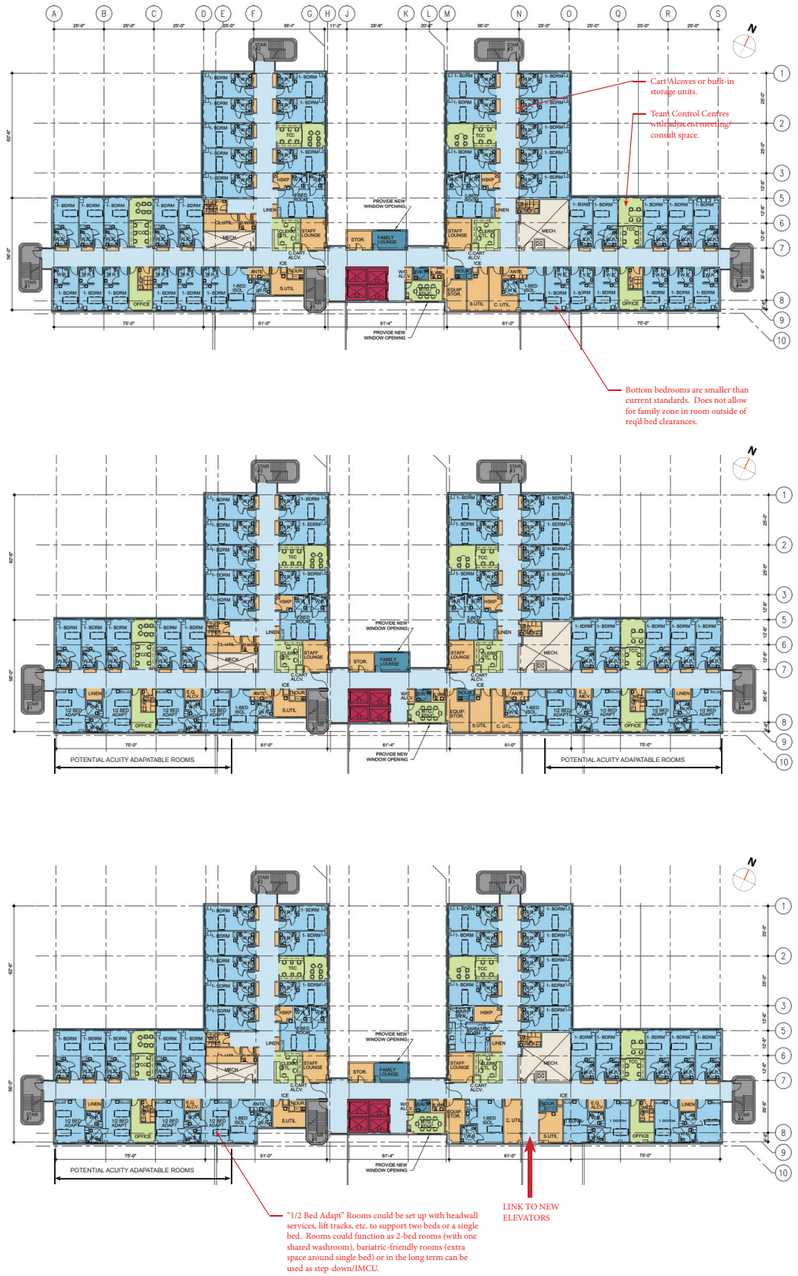
Date: **May 31, 2013**
STATUS: **Part B Submittal**

FIFTH FLOOR	NSF	CIRC	STRUCT	DGSF		REMARKS
Fifth Floor, New Inpatient Units	16,893	28%	9%	23,649		
SUBTOTAL	**16,893**			**23,649**	**SF**	
Building Grossing Factor (1)			13.5%	3,193		
Total Building Gross Square Footage				**26,842**	**SF**	
Square Footage Available				*26,843*	*SF*	*Represents existing 5th Floor Building Gross Square Footage*
New Elevator Tower and Link				**1,280**	**SF**	

Design Solution

From the options presented in the Part A report, many discussions ensued with stakeholders. Ultimately, a hybrid plan was arrived at that includes elements of these earlier plans.

Through the course of Part B, several iterations of the 5th floor inpatient floor plan were developed. Some of these layouts are presented on this page.



Above: Some plan iterations for the DGH 5th Floor Inpatient Unit presented throughout Part B.

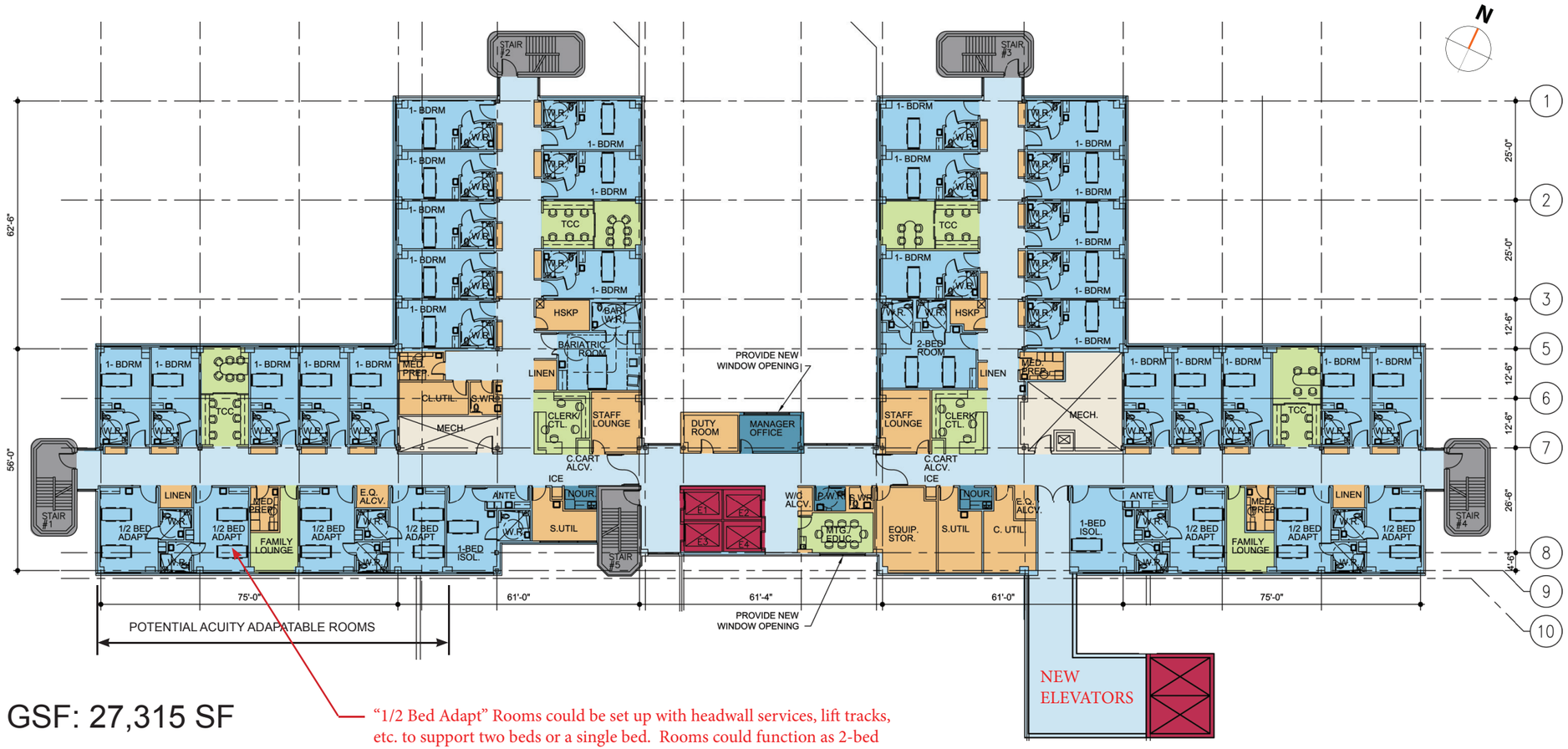
Description

1. Achieves a potential total of 45 beds with a variety of room-types - see plan.
2. Two Airborne Isolation Rooms, (AIRs) are included, complete with ante-room(s).
3. One centralized Clerk/Control centre per side
4. Distributed TCCs with public and private components.
5. Distributed supply and equipment alcoves/cabinetry along corridors.
6. Acuity Adaptable rooms function as larger single rooms that can function as 2-bed (surge) rooms, bariatric-friendly rooms (i.e. more manoeuvring space) or higher-acuity (e.g. IMCU) rooms in the future.

Note: Many discussions took place with respect to the need for a CSA-compliant bariatric room on the floor. Ultimately, it was felt that the frequency of need likely does not justify the creation of a room devoted to this purpose. It was, however, acknowledged that this direction might change in future phases. The plan continues to include a CSA-compliant bariatric room in order to visualize what the impact and layout would be if a bariatric room is to be accommodated. In subsequent design phases, this issue should be revisited and a final decision made.

Drawing

See the plan drawing on the following page, which illustrates the concept described above.



GSF: 27,315 SF

"1/2 Bed Adapt" Rooms could be set up with headwall services, lift tracks, etc. to support two beds or a single bed. Rooms could function as 2-bed rooms (with one shared washroom), bariatric-friendly rooms (extra space around single bed) or in the long term could be used as step-down/IMCU.

LEGEND

- Staff/Public Support Spaces
- Staff/Team Workspaces/Control points
- Horizontal Circulation
- Inpatient Rooms, incl. washrooms
- Shared Patient/Family Services
- Elevators
- Stairwells
- Mech/Elec Service Space

PRELIMINARY - NOT FOR CONSTRUCTION
The sizes and areas shown in these drawings are preliminary in nature and will change as the project is developed

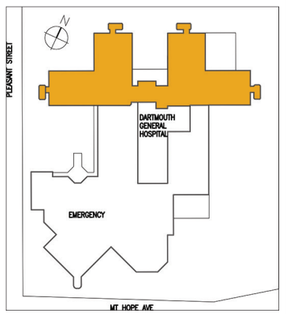
BED SUMMARY

45 Beds Total (23 on West Side; 22 on East Side) / 46 without bariatric room

- 29 Private/1-bed Rooms
- 1 Semi-Private/2-Bed Rooms (two washrooms, CSA-Z8000 compliant)
- 7 Semi-Private/2-Bed Rooms, acuity-adaptable (single washroom)
- 1 Bariatric Room with Bariatric W.R.
- 2 Airborne Isolation Rooms (included in 29-count)
- All 3-piece washrooms (with showers)
- Decentralized TCCs

OR

40 Beds Total (20 each side) - if used as ALL Compliant Rooms / 41 if no bariatric room



KEY PLAN

Drawing Title:
Dartmouth General Hospital
5th Floor Fit-Out - Option H, rev. 3

nycum+ ASSOCIATES SMITHGROUP Smithgroup AEIP International Inc.
WILLIAM NYCUM & ASSOCIATES LIMITED
WITH SMITHGROUP AEIP INTERNATIONAL, INC.

Project 1214:

Capital Health Innovative Care Flexible Facilities

Date: 07 May 2013
Scale: 1/32" = 1'-0"
Drawn: NAE

Drawing Number
H.03

Discussion and Preliminary Outline Specification Information

Structural Engineering Commentary

Structural analysis was undertaken to review the impact of new mechanical penthouses that will be added above each wing of Level 5 to accommodate new air handling units.

Dartmouth General Hospital: Level 5 Renovation

The existing building is is a structural steel construction consisting of girder beams, columns, and beams used as joists. New inpatient spaces within the renovated area on the fifth floor of the existing building will require additional Mechanical equipment – currently this is conceived of as a rooftop penthouse, and we have assessed two potential locations for a penthouse.

Statement of Structural Design Work, Analysis and Design Checks

We have performed the following analyses to:

- review two proposed locations for new mechanical rooms on the roof of the northern section of the building to serve the renovations of the fifth level for inpatient areas, between grids B-F and 3-7 and between grids N-Q and 3-7.
- check the foundation for the columns at the mechanical room locations.

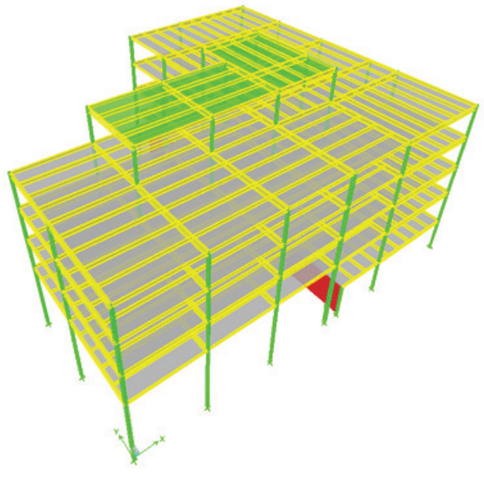


FIGURE 2: Structural model of Dartmouth General Hospital between gridlines A and G and 1 and 9, showing an option for locating a mechanical penthouse to service new inpatient spaces within the renovated fifth floor of the Dartmouth General Hospital.

Analysis of Proposed Mechanical Penthouse Between grids B- F and 3- 7

Several load combinations and values were used to take into account the current loads from the existing building and to anticipate the loads arising from the construction of the new mechanical rooms. Based on these calculations, the optimized loads were found to be as follows:

- Floor dead load of 3.4 kPa
- The roof of the mechanical room was assumed to be made of 1.5'' steel deck, joists, beams and columns with estimated total dead load of 1.2 kPa which includes roof membrane and insulation.
- Live load of 3.6 kPa in all floors except for the main floor where the live load was taken as 4.80 kPa.
- Live load for the mechanical room was limited to 4.8 kPa.
- Snow load was calculated as 2.11 kPa and loads due to snow drift were calculated to be 4.55 kPa.

Live load reduction factors were implemented per the National Building Code of Canada (NBCC). Service loads were calculated and compared to the service loads provided by the initial design that is shown in the design drawing, S-2.4, provided by CDHA. Factored loads were compared to the factored capacities of the columns cross sections. Finally, the footing capacities were checked.

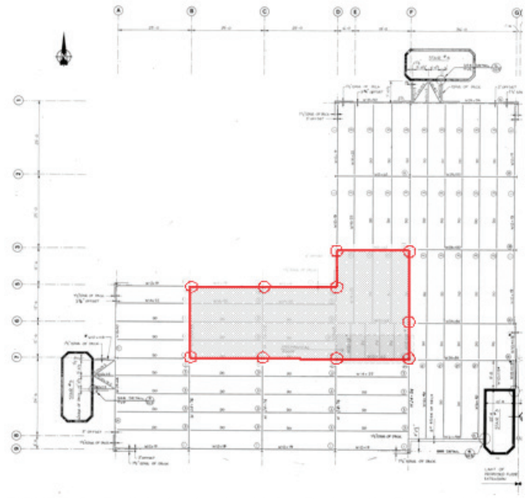


FIGURE 3: Partial structural grid for Dartmouth General Hospital. Shaded portion shows potential location for a mechanical penthouse and indicates columns analyzed.

Results:

Columns in in this zone appeared to be adequate for the applied loads under both service and ultimate conditions. Footings under these columns were also checked and found to be safe if the allowable bearing capacity of the soil is 245 kPa. A certified geotechnical engineering firm should confirm that the bearing capacity of the soil can reach this value. If this bearing capacity is not available for the soils, then the foundations will require reinforcing.

Analysis of Proposed Mechanical Penthouse Between grids N-Q and 3-7

The optimized loads used in assessing the first proposed mechanical penthouse location were directly applied to analysis of the second mechanical room.

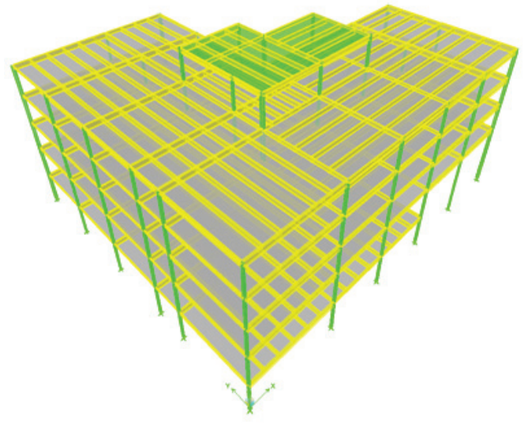


FIGURE 4: Structural model of Dartmouth General Hospital between gridlines M and S and 1 and 9, showing a second option for locating a mechanical penthouse to service new inpatient spaces within the renovated fifth floor of the Dartmouth General Hospital.

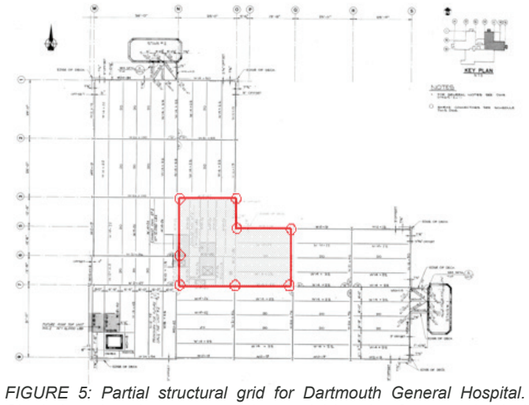


FIGURE 5: Partial structural grid for Dartmouth General Hospital. Shaded portion shows a second potential location for a mechanical penthouse and indicates columns analyzed.

Results:

It was found that the service load capacities for the columns located in this zone are considerably greater that the loads anticipated from the mechanical room addition; however the factored loads should also be checked against columns ultimate capacities.

Architectural Commentary

Constraints on available space on the 5th floor, existing conditions and significant bed count requirements do not allow achievement of the complete set of recommendations of CSA Z8000-11for new construction. Some deviations were made in the development of the designs for the 5th floor during Part B of the project. These deviations have been kept to a minimum in order to provide inpatient facilities that are as close to current “new construction” standards as possible. Further deviations will undoubtedly need to be considered in future design phases. It should be noted that CSA Z8000-11 acknowledges that some deviations may need to be made in renovation projects.

Existing Conditions

Shelled-in space on Level 5 is largely as it was originally constructed in 1987.

The only permanent interior partitions are those surrounding the elevator and stair shafts as well as concrete block walls around mechanical rooms on both the east and west wings. Additional temporary partitions have been erected to create storage spaces.

The existing original windows are in poor condition and show significant signs of leakage. They will need to be replaced, and in-filled as appropriate to accommodate a new floor plan layout.

The existing ballasted roof above the fifth floor (and likely the stair tower projections) will require replacement as part of this work. The existing fifth floor space shows significant signs of water leakage and daylight can be seen through/around some roof penetrations.

The existing concrete floor slabs are fairly rough with varying levels of damage. The floor slab on 5-east is the original roof slab from 1975, complete with projecting cast-in roof drains. The floor slab on 5-west was new when the space was shelled-in in 1987. Rectangular areas of concrete slab have been previously chipped out on 5-east, anticipating recessed shower pans. The expansion joints at the slab connections between the link portion of the building and both the east and west wings show signs of significant movement and some differential settlement. There is an estimated floor slab elevation difference of as much as 1” between the adjacent slabs and there is no finish expansion joint installed at the slab junctions. Significant amounts of slab preparation (grinding, leveling and core drilling) will be required to accommodate the work of this project and new continuous expansion joints will need to be installed at floor junctions.

There are significant numbers of roughed-in plumbing services on level 5 (vents, rain water leaders from above, supply lines, drains, toilet carriers, etc.). The extent of rough-in varies between the east and west sides of Level 5. See Mechanical site assessment for more detailed information. Significant work will be required to modify the existing plumbing running through the fifth floor. As some of this impacts the plumbing services on floors below, scheduling of this work will need to be done carefully and coordinated with operations on floors below.

Existing spray-applied fireproofing on the structural steel and roof deck above shows signs of physical and water damage. Selective remediation of the fireproofing will be required as part of the scope of this project.

The vapour barrier system and batt insulation on the interior face of the precast exterior wall panels has been damaged in several places and shows sign of water damage. Given the existing conditions and the required window replacements, the entirety of the existing insulation, drywall and vapour barrier system should be removed and replaced as part of the scope of this project.

The existing elevator core is comprised of four shafts, three of which were fitted with cars, doors and access originally. Renovations to add a fourth car, doors, etc. to the fourth existing shaft are presently underway. The shafts are undersized by current standards for patient transfer in acute care facilities.

Existing concrete block walls on Level 5 are unrestrained at the top of walls. This will need to be remedied with the installation of clip angles to connect the top of wall to the roof deck.

An existing dumbwaiter shaft extends through Level 5 to roof above. This dumbwaiter is no longer in use. We recommend investigating the removal of the hoist penthouse on the roof and shaft on at least Level 5 in order to maximize utility of the space.

Discussion:

Development of the 5th floor will require construction work to be undertaken on Level 4 below. The requirement for access/work on Level 4 (and the requisite infection control measures associated with this) will require that rooms, and likely whole wings (half-L), be shut down during certain stages of construction. At this point, it should be assumed that entire wings will need to be vacated during different stages of construction, as it is unlikely that this work could be done efficiently or cost effectively on a room-by-room basis.

As the ICU, which is currently on Level 4 West, is being relocated to the existing Day Surgery area on Level 2, this will provide a potential 9- to11-bed wing to act as a swing space while the 5th floor renovation proceeds through a number of phases of construction (likely four). This space would act as a temporary “empty chair” on Level 4 that would shift around under invasive construction on the floor above, minimizing impact to operations and providing simplified Infection Control and safety measures during construction. This functionality will require coordination of phasing of the 5th floor work with the addition, as the ICU can only move to Level 2 after Day Surgery is relocated.

This would initially suggest that construction of the OR Addition precede the 5th Floor renovations in order to allow some of this additional new space to be used as a buffer during subsequent renovations.

CSA Z8000-11: Canadian Health Care Facilities forms the basis for Architectural outline specifications at a Preliminary Design stage. Refer to the Architectural Outline Specifications in the Common Considerations section of this report.

Mechanical Engineering Commentary

Investigations and Existing Conditions

The entire 5th floor has been previously roughed-in (sanitary and plumbing vent piping) for patient washrooms. The water closet carriers and floor drains were installed on the west half of the 5th floor.

Domestic cold, hot, and recirculation piping extends into the 5th floor and was capped for future connection. However, the domestic cold water main is undersized for the quantity of flush valve water closets proposed for the new layout.

Medical gases were not extended to the 5th floor.

Suspended horizontal type unit heaters were installed in 1987 when the floor was constructed. Heating supply and return lines were piped to each of the heaters.

Chilled water supply and return piping was extended to the rooftop air handling unit that was added during the 1987 addition and 3" capped chilled water lines are located in the 5th floor. The capped chilled water lines could be utilized for the proposed renovations to the 5th floor; however, the existing absorption chillers are well past their useful life and need replacement in the immediate future.

A rooftop air handling unit (recirculation unit with minimum outside air) was installed in 1987 to provide ventilation and air conditioning to the west half of the 4th floor (which was added during the 1987 addition), as well as a portion of the west side of the 5th floor. However, the ducts serving the 5th floor were capped and never utilized, and the rooftop air handling unit is due for replacement.

The entire 5th floor is sprinklered throughout.

Flexible Design Strategies:

As this project is a fit-up of existing space, options are limited for strategies that can be taken to maximize long-term flexibility. That said, where possible, Flexible Mechanical Design strategies as outlined for the DGH Addition project should be implemented.

Anticipated Impacts

The existing roughed-in sanitary and plumbing vent piping do not match the two (2) proposed patient/washroom layouts. Current standards and user requirements preclude the ability to use all of the existing roughed-in plumbing in the locations they currently occupy. The sanitary and vent risers will more than likely have to be offset in order to conceal them within new wall partitions.

The piping offsets will require a large number of core drilled holes through the existing concrete slab. The existing floor penetrations will have to be filled. This work will impact the entire 4th floor below.

There is existing ventilation ductwork that runs both horizontally and vertically within the 5th floor layout. There are numerous ventilation duct risers that pass through the 5th floor that interconnect equipment located on the roof to areas located on the floors below. These duct risers are quite large and will have to remain in the new configuration.

Two (2) new mechanical penthouses should be constructed to house the new air handling units that will serve the 5th floor. One of the new air handling units will also serve the west side of the existing 4th floor since the existing rooftop air handling presently serving that area is due for replacement.

It is anticipated that the existing medical gas mains (medical air, vacuum, and oxygen) have sufficient capacity to service the patient areas of the proposed 5th floor.

The air handling units can be connected into the capped chilled water piping, however, the existing chillers need replacement.

Water and air side economizer strategies should be employed to take advantage of outdoor air temperatures to reduce the cooling demand of the building.

Heat recovery strategies could potentially be implemented to utilize the heat that is created during the production of chilled water. The captured heat could be utilized by the perimeter radiant panels or used to pre-heat the domestic hot water system.

Investigation shall be performed on the existing central plant to replace any equipment that has reached its useful life with a more energy efficient system. A central plant optimization strategy could also be implemented to maximize the operating efficiency of the central plant.

The new air handling system will be designed with built in redundancy to ensure continuous operation. This will include using fan array type air handling units along with a manifold duct system that will allow for a unit to be shut down without disrupting the operation of the spaces it serves.

Plumbing fixtures will be of low flow type to ensure water efficiency. Some faucets could potentially utilize proximity sensors to operate. This technology will replace the infrared eye technology that typically gets damaged by cleaning operations and impacts the operation of the faucet.

Solar hot water heating systems could potentially be utilized to help meet the heating demands of the hospital. This strategy will help reduce the non-renewable energy usage and increase overall building energy efficiency.

To increase the diversity and redundancy of the campus chilled water system, the new chilled water system could potentially be connected to the existing system rather than act as a standalone system.

A controls strategy will be set forth to operate all mechanical equipment at peak efficiency and monitor the required plumbing and electrical systems.

Electrical Engineering Commentary

Investigations and Existing Conditions

The design team has reviewed existing conditions with a focus on normal power, emergency power, telecommunications, fire alarm system, electronic access control, security, and the nurse call system.

Normal Power

The existing electrical service lacks enough capacity to serve the facility with the fifth floor fully occupied. Refer to the report on existing electrical conditions at the Dartmouth General Hospital for details.

There is currently no normal power distribution on the fifth floor. The normal power and emergency power equipment will share a new electrical room on this floor. The new normal power distribution equipment will include a 347/600V distribution panel, a 600-120/208V dry type transformer, a 120/208V distribution panel, and 120/208V branch circuit panels. The 347/600V distribution panel will be supplied from the service entrance switchboard or an existing distribution panel on the first floor.

Emergency Power:

The existing 600 kW standby diesel generator lacks enough capacity to serve the facility with the fifth floor fully occupied. Refer to the report on existing electrical conditions at the Dartmouth General Hospital for details.

There is currently no emergency power distribution on the fifth floor. The normal power and emergency power equipment will share a new electrical room on this floor. The new emergency power distribution equipment will include a 347/600V distribution panel, a 600-120/208V dry type transformer, a 120/208V distribution panel, and 120/208V branch circuit panels. The 347/600V distribution panel will be supplied from a distribution panel on the first floor.

Telecommunications:

There is currently no structured wiring system on the fifth floor. A new system will be installed in accordance with the ANSI/TIA-1179-2010 Healthcare Facility Telecommunications Infrastructure Standard. Horizontal voice and data cables will be routed from two Telecommunications Rooms to the work areas in the spaces they serve.

During the design phase the possibility of reducing the telecommunication room requirements utilizing a Passive Optical Local Area Network will be evaluated.

A new backbone voice cable will connect the new voice communications infrastructure to the existing in the entrance facility.

A new data backbone cable will connect the new data communications infrastructure to the existing local area network.

Fire Alarm:

The existing Dartmouth General Hospital fire alarm system consists of an Edwards EST3 control panel, alarm initiating devices, supervisory devices, audible/visible signal devices, and voice communication devices. There are currently enough fire alarm system devices on the fifth floor while it serves as a large storage space. Additional devices will be installed to suit the new patient care areas.

Electronic Access Control:

The facility has an IP-based card access system that permits staff with ID cards access to designated areas through secure doors. It consists of a server, database software, monitoring software, control panels, and peripheral devices. These peripheral devices include card readers, digital keypads, door contacts, motion sensors, alarm buttons, door strikes, and magnetic locks. The server and control panels are connected to the Capital Health LAN/WAN.

The access control system will be extended into the new expansion. New control panels will be installed and connected to

the LAN, and new peripheral devices will be connected to the control panels.

Security:

Existing security and CCTV surveillance systems are obsolete. New systems will be installed on the fifth floor to meet Capital Health's requirements.

Nurse Call:

Existing nurse call systems are obsolete and spare parts are no longer available. New systems will be installed on the fifth floor to meet Capital Health's requirements.

Anticipated Impacts

N/A

Electrical Healthcare Design Standards

The following healthcare standards will be applied during the electrical design of this facility:

1. ANSI/IESNA RP-29-06 Lighting for Hospitals and Healthcare Facilities
2. ANSI/TIA-1179-2010 Healthcare Facilities Telecommunications Infrastructure Standard
3. CSA Z32-09 Electrical Safety and Essential Electrical Systems in Healthcare Facilities
4. CSA Z317.5-98(R2007) Illumination Systems in Healthcare Facilities
5. CSA Z8000-11 Canadian Healthcare Facilities (to be applied as appropriate)
6. Outstanding Issues - DGH

Outstanding Issues

Inpatient Rooms – the requirement for Bariatric Inpatient Rooms (and associated Bathrooms), which are very specialized in terms of space and fittings, needs to be confirmed. Also, the discussion about Private versus Double Rooms should continue to ensure a conclusion that is satisfactory and acceptable to all stakeholders.

Decentralized/Corridor Storage – the plans for the 5th floor include decentralized storage along the corridor. This is in response to the "extra" width not required in the patient rooms, but also the decentralized nature of care delivery inherent in the inpatient unit layouts and current practice. The nature of this storage should be reviewed in detail in subsequent design phases. Consideration should be given to the tradeoff between flexibility of cart alcoves vs. the continuity of handrail made possible with built-in storage.

Space Program

The Dartmouth General Hospital (DGH) Fifth Floor preliminary Space Program included in the Part A report represented the ideal starting point (CSA Z8000-11 derived) condition for new construction. At that stage, it was noted that there was a significant discrepancy between the program area and actual floor area available and that this delta would need to be addressed through program changes or area reductions below CSA recommendations.

Through the course of Part B of the project, the program evolved along with client decisions regarding issues of single vs. semi-private rooms, bariatric rooms, logical staffing assumptions, ratios of soiled utility and medication prep rooms, etc. As design decisions were made and a preferred layout was developed, the Space Program was updated to reflect the room/bed numbers and then used to track deviation of room areas from the CSA recommendations.

The Space Program for the 5th floor included in this report falls generally within the recommendations of CSA Z8000 for Medical/Surgical inpatient units, with deviations made to reflect realities of the existing building. The CSA standard acknowledges deviations may be required for renovation projects.

Please also refer to the section of this report titled "Space Programming, General" for common criteria, methodology, assumptions and exclusions applicable to all Space Programs included in this report.

DARTMOUTH GENERAL HOSPITAL
LEVEL 5 INPATIENT RENOVATION

Date: **May 31, 2013**
STATUS: **Part B Submittal**

FIFTH FLOOR	NSF	CIRC	STRUCT	DGSF		REMARKS
Fifth Floor, New Inpatient Units	16,893	28%	9%	23,649		
SUBTOTAL	**16,893**				**23,649 SF**	
Building Grossing Factor (1)			13.5%	3,193		
Total Building Gross Square Footage					**26,842 SF**	
Square Footage Available					*26,843 SF*	*Represents existing 5th Floor Building Gross Square Footage*
New Elevator Tower and Link					**1,280 SF**	
New Rooftop Penthouses					**3,750 SF**	

Note:

(1) *Building Circulation Factor includes: stairs, elevators, mechanical shafts and exterior walls.*

nycum+ ASSOCIATES SMITHGROUP Smithgroup AEIP International Inc.

DRIVERS:

26	Inpatient bedroom, Std. Med/Surg
2	Inpatient bedroom, AIR
1	Inpatient 2- bed Room, Std. Med/Surg
7	Inpatient bedroom, 1/2 - Bed Adapt
1	Inpatient bedroom, Bariatric
37	Total Inpatient Bedrooms (Drivers)
639	**DGSF per Driver**

DARTMOUTH GENERAL HOSPITAL
Department: **Fifth Floor, New Inpatient Units**
Date: May 31, 2013
STATUS: **Part B Submittal**

Space ID	NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m²	CSA required SF	PROGRAM #ITEMS	PROGRAM NSF/ITEM	PROGRAM NSF /EA	PROGRAM QTY	PROGRAM NSF TOTAL	PROGRAM SUBTOTAL	REMARKS
					1	10.76							
1.00		*Patient Rooms*										*12,075*	
1.01		**Inpatient bedroom, Std. Med/Surg**	**8.1.4**	**11.1/24**	**15.00**	**161**			**165**	**26**	**4,290**		Area corresponds with bed area of room
1.02		Inpatient bedroom - vestibule	8.1.4	8.1/1	5.00	54			50	*26*	1,300		
1.03		Inpatient bedroom - supply alcove	8.1.4	8.1/1	1.40	15			15	*26*	390		
1.04		Inpatient bedroom - washroom	8.1.4	8.1/1	5.60	60			60	*26*	1,560		Sized for three piece washroom
1.05		PPE equipment alcove	8.2.3.3						5	*26*	130		Adjacent to each inpatient room entrance
1.06	3	**Inpatient bedroom, AIR**	**7.5.5**	**11.1/26**	**16.20**	**174**			**175**	**2**	**350**		AIR = Airborne Isolation Room; area corresponds with bed area of room
1.07		Inpatient bedroom, AIR, anteroom	7.5.5	11.1/26	7.50	81			65	*2*	130		
1.08		Inpatient bedroom, AIR, supply alcove	7.5.5	11.1/26	1.40	15			15	*2*	30		
1.09		Inpatient bedroom, AIR, washroom	7.5.5	11.1/26	7.50	81			60	*2*	120		Sized for three piece washroom
1.10		Inpatient bedroom, AIR, Family Zone	7.5.5	11.1/26	3.00	32			35	*2*	70		
1.11		Inpatient bedroom, AIR, Staff Zone	7.5.5	11.1/26	3.00	32			35	*2*	70		
1.12	4	**Inpatient 2- bed Room, Std. Med/Surg**	8.1.4	8.1/1	26.00	280			280	**1**	280		
1.13		Inpatient bedroom - washroom	8.1.4	8.1/1	5.60	60			60	*2*	120		In two-patient rooms, there shall be two washrooms per patient (CSA 7.5.2.3)
1.14		Inpatient bedroom - vestibule	8.1.4	8.1/1	7.00	75			75	*1*	75		
1.15		Inpatient bedroom - Staff Zone	8.1.4	8.1/1	3.00	32			35	*1*	35		
1.16		Inpatient bedroom - Family Zone	8.1.4	8.1/1	3.00	32			35	*1*	35		
1.17		Inpatient bedroom - supply alcove	8.1.4	8.1/1	1.40	15			15	*1*	15		
1.18	1	**Inpatient bedroom, 1/2 - Bed Adapt**	8.1.4	8.2/3	23.20	250			250	**7**	1,750		This room is sized based on Critical Care requirements.
1.19		Inpatient bedroom - vestibule	8.1.4	8.1/1	5.00	54			55	*7*	385		
1.20		Inpatient bedroom - supply alcove	8.1.4	8.2/3	1.40	15			15	*7*	105		
1.21		Inpatient bedroom - washroom	8.1.4	8.1/1	5.60	60			60	*7*	420		Sized for three piece washroom
1.22		Staff Charting Alcoves											Included in Room areas
1.23		PPE equipment alcove	8.2.3.3						5	*7*	35		Adjacent to each inpatient room entrance
1.24	5	**Inpatient bedroom, Bariatric**	7.5.5	8.2/4	25.00	269			270	**1**	270		
1.25		Inpatient bedroom - supply alcove	7.5.5	8.2/4	1.00	11			15	*1*	15		
1.26		Inpatient bedroom - bariatric washroom	7.5.5	8.2/4	7.00	75			60	*1*	60		
1.27		Inpatient bedroom - Family Zone	7.5.5	11.1/26	3.00	32			35	*0*	0		Included in Bedroom area
1.28		Inpatient bedroom - Staff Zone	7.5.5	11.1/26	3.00	32			35	*1*	35		
2.00		*Clinical Support*										*3,268*	
2.01		Reception/control desk		8.2/1	4.60	50	4	50	200	2	400		
2.02		Staff Work Area (TCC)		8.2/2; 11.1/3	4.60	50	3	50	150	4	600		Area represents the front portion of the TCCs. Back portion see item 3.03.
2.03		Charting Alcove, in Corridor		11.1/5	1.00	11			11	0	0		Omitted in favour of spaces attached to TCCs

Space ID	NOTE	SPACES/FUNCTIONS	CSA SECTION	CSA Table	CSA required m²	CSA required SF	PROGRAM #ITEMS	NSF/ITEM	NSF /EA	QTY	NSF TOTAL	SUBTOTAL	REMARKS
					1	10.76							
2.04		Family consult rooms	8.2.2.9	11.1/30	2.50	27	6	27	162	0	0		Omitted in favour of TCCs, Private rooms and Shared Mtg./Education Room.
2.05		Crash Cart Alcove	8.2.2.10						15	2	30		
2.06		Equipment storage	8.2.3.6						310	1	310		Shared for whole floor
2.07		Medication		11.1/32	9.50	102			80	4	320		Size based on existing Med. Rooms at DGH. On L5, these will serve fewer patients.
2.08		Nourishment		11.1/33	10.00	108			45	2	90		Area represents more of an alcove setup vs. a room.
2.09		Clean Linen Alcove		11.1/8					35	4	140		Average of 4 alcoves
2.10		Clean Supply/Utility		11.1/8	11.00	118			180	2	360		Average of 2 rooms
2.11		Soiled Utility/Holding		11.1/40	12.00	129			175	2	350		Average of 2 rooms. To accommodate two flushers and a hopper sink.
2.12		Wheelchair Alcove							20	1	20		
2.13		Housekeeping closet		11.1/21	7.00	75			80	2	160		Assumes major equipment is stored elsewhere. Min. one closet per 650 m2.
2.14		Housekeeping, service room		11.1/22	11.00	118			120	0	0		Assumes that large equipment will be stored in this room, off the unit.
2.15		Family lounge	8.2.2.8	11.1/30	2.50	27	7	27	189	2	378		Seating for 7 people.
2.16		RT cleaning/testing	8.2.3.5	11.1/38?					130	0	0		Deleted per Clinet request
2.17		RT storage	8.2.3.5						130	0	0		Deleted per Clinet request
2.18		Ice Machine Alcove		11.1/33	1.00	11			10	2	20		
2.19		Equipment Alcove	8.2.3.6						45	2	90		
3.00		*Staff Support*										1,380	
3.01	**2**	Conference room/teaching room	8.2.2.4	11.1/7					180	1	180		Seating for 8
3.02		Staff respite space	8.2.2.6	11.1/44					185	2	370		
3.03		Staff team room	8.2.2.6						160	4	640		One per TCC. Provides Resident and Private workspace, consult space, bullet-rounds
3.04		Staff toilet							35	2	70		Not Barrier-free. Barrier-free facilities provided in Public WR (4.02).
3.05		Staff lockers		11.1/29	20.00	215			215	0	0		Assumes purse lockers at Nurse Station. Coat lockers centralized for facility.
3.06		Unit Manager Office		11.1/34	11.00	118			120	1	120		
3.07		Hospitalist Duty Room							120	1	120		
4.00		*Facilities Support*										*50*	
4.01		IDF/Telecomm							150	0	0		Moved to existing Comm rooms on Level 4, per client direction.
4.02		Public Washroom	11.1/49		5	50			50	1	50		Size represents Barrier-Free 2-piece; close proximity to Family Lounge
		SUBTOTAL (sum of Net areas)										16,893	
		Circulation Factor								28%	4,764		Factor adjusted to reflect reality of existing building (circulation ratio known)
		Structure Factor								9%	1,992		Factor adjusted to reflect reality of existing building (most structure in Ext. walls)
		TOTAL PROGRAM DGSF REQUIRED:										**23,649**	

NOTES:

1 **Critical Care Rooms** **8.2**
NOTE: Areas represent an acuity-adaptable room (e.g. washroom area represents a 3-piece, which typically would not be in a Critical Care room.)

2 **Conference / teaching room** **8.2.2.4**
NOTE: A mock-up ICU set-up should be considered for research or teaching.

3 **AIR (Airborne Isolation Rooms)** **8.2.3.1.(c)**
NOTE: AIRs should be located close to patient entry and away from the main corridor and other patient cubicles to limit the travel distance into the main unit by immunosuppressed/infectious patients.

4 **Patient treatment places** **4.5.4**
All patient treatment places, whether intended for inpatient or outpatient use, shall be single occupancy unless the functional program demonstrates the necessity of multi-patient arrangement.
Single occupancy means that patients have a spatial separation and a physical barrier between them sufficient to provide privacy, protection from the spread of infection and adequate area to support clinical funtions.

5 **Bariatric Inpatient Rooms** **7.8.8**

Cost Estimate

A Class “C” Unit Rate cost estimate has been prepared for the DGH 5th Floor Fit-Out by Hanscomb Limited. Some line items are broken out into more detailed break-out tables following the summary page. Many other factors are captured in the calculation of the underlying unit rates themselves.

The 5th Floor Renovation Estimate includes two new rooftop service penthouses, replacement of the existing leaky roof membrane and windows, significant slab repairs and remediation of other known defects in the existing shell condition. These replacements are outlined in the Building Shell breakdown after the summary table.

Please also refer to the section of this report titled “Cost Estimating, General” for common criteria, methodology, assumptions and exclusions applicable to all Cost Estimates for this project.

CAPITAL DISTRICT HEALTH AUTHORITY (CDHA)
INNOVATIVE CARE FLEXIBLE FACILITIES
HALIFAX & DARTMOUTH, NOVA SCOTIA

CAPITAL DISTRICT HEALTH AUTHORITY (CDHA)
DARTMOUTH GENERAL - 5TH FLOOR FIT-OUT

Hanscomb
JUNE 20, 2013

C - 1

CAPITAL DISTRICT HEALTH AUTHORITY (CDHA) DARTMOUTH GENERAL - 5TH FLOOR FIT-OUT	Type	Reno Level	May 2013 Drawing Areas (SF)	$/SF	Net Construction Cost	Asbestos Materials Abatement $15.00	Infectious Control Measures 1.0%	In Contract Equipment Allowance 5.0%	Design & Pricing Allowance 10.0%	Phasing for Renovated Work 3.0%	LEED Allowance 2.5%	Construction Management Fee 5.0%	Total Construction Cost	Construction Contingency 5.0%	Project Ancillaries 23.2%	Healthcare Commissioning 0.5%	Moving Allowance 4.00	FF& E and IT %	FF& E and IT Allowance	TOTAL CURRENT PROJECT COST	Potential Impact of Escalation @ 3% p.a. to Mid-point of Construction: Const Mid-Point	Yrs	Escalation 3.0% per annum	PROJECT COST INCLUDING ESCALATION
New Mechanical Penthouses on 5th Floor Roof																								
East Penthouse	New		2,190 cgsf																					
West Penthouse	New		1,560 cgsf																					
Sub-total	**New**		**3,750 bgsf**																					
New Building Construction			**3,750 bgsf**																					
FIFTH FLOOR																								
New Inpatient Units	Fit-out		26,843 cgsf																					
Renovated Building Construction			**26,843 dgsf**																					
Allowance for Site Works			**30,593 dgsf**																					
Site Work (None Required)			1 Sum																					
Additional Cost Items / Allowances			**1 Sum**																					
			- bgsf																					
DARTMOUTH GENERAL - 5TH FLOOR FIT-OUT			**30,593 bgsf**																					

CAPITAL DISTRICT HEALTH AUTHORITY (CDHA)
INNOVATIVE CARE FLEXIBLE FACILITIES
HALIFAX & DARTMOUTH, NOVA SCOTIA

Hanscomb
JUNE 20, 2013

Project Cost Summary

BUILDING SHELL - DARTMOUTH GENERAL 5TH FLOOR FIT-OUT:

Foundations		**0**	**SF**
1	No Work	0	SF
Basement Excavation		**0**	**CY**
1	No Work	0	CY
Special Conditions		**1**	**Sum**
1	No Work	1	Sum
Lowest Floor Construction		**0**	**SF**
1	No Work	0	SF
Upper Floor Construction		**27,315**	**SF**
1	Repairs to existing slabs	27,315	SF
Roof Construction		**27,315**	**SF**
1	Partial renewal of existing sprayed applied fire-proofing to the roof steel & deck	27,315	SF
Walls Below Grade		**0**	**SF**
1	No Work	0	SF
Walls Above Grade		**12,604**	**SF**
1	Recaulk existing precast panel joints and provide new insulation, vapour barrier & studs with drywall on the inside face	12,604	SF
Windows & Entrances		**4,920**	**SF**
1	Replace existing windows with new dounle glazed, low E argon & tinted to match existing	4,920	SF
Roof Covering		**27,315**	**SF**
1	Replace existing roof covering system - 2 ply mod. bitumen, including removal of existing roof finish	27,315	SF
Projections		**1**	**Sum**
1	No Work	1	Sum
Elevators		**1**	**No.**
1	Installation of the 4th Elevator in the existing elevator shaft is presently underway and not part of this project		
2	Removal of existing unused dumbwaiter & shaft	1	Sum
SUB-TOTAL		**27,315**	**SF**
1	General Requirements	14%	
TOTAL		**27,315**	**SF**

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Appendix A

Dalhousie University
Department of Industrial Engineering

An Analysis of Patient Flow in the Proposed Surgical Suite at the Dartmouth General Hospital

23 May 2013

John T. Blake, PEng, PhD
Associate Professor
Department of Industrial Engineering
Dalhousie University

1. Background

To achieve the goal of becoming a world leading haven for people-centred health, healing, and learning, Capital Health has embarked upon a journey. The journey begins with innovative ideas and designs for two new planed patient care facilities. These are:

a) The transfer of 50 beds from the Halifax Infirmary and Victoria General Hospital (Centennial Building) to Dartmouth General Hospital. The anticipated changes resulting from the relocation of beds from the VGH site to the DGH site include the addition of up to 50 new inpatient beds on the currently vacant 5th floor of the DGH site; a new 3-storey tower to house eight new operating rooms and supporting facilities; space for future ambulatory clinics; and new support services.

b) The transfer of 150 beds from the Victoria General Hospital (Centennial Building) to a newly built complex at the Halifax Infirmary site. The new complex is anticipated to include a new 3-storey, 150 bed inpatient tower; 16 new operating rooms and support services; mechanical and support services.

The focus of this report is on planned changes at the Dartmouth General Site; specifically on the design and function of planed diagnostic and clinical services on Levels 2 and 3, which will house an expanded endoscopy suite and an updated surgical suite.

Several options for expansion and redevelopment of endoscopy and surgical services were mooted over the course of the design activity, which ran from the fall of 2012 through the spring of 2013. The design alternative that was eventually selected will see major redevelopment of both Levels 2 and 3. Highlights of the revisions, pertinent to the question of patient flow are listed below. See the appendices for a sketch of the proposed changes to Levels 2 and 3.

Level 2

- Realign the entrance of the hospital to the north end of the site to improve flow into the facility
- Relocation of existing surgical facilities to Level 3
- Expansion of Diagnostic Imaging on Level 2
- Redevelopment of the existing endoscopy facilities to support improved patient flow
- Creation of a shared registration and waiting space on Level 2 to support both endoscopy and same-day surgery patients

Level 3

- Relocation of the surgical suite into newly built space
- Expansion from 4 operating rooms to 8 operating rooms
- Relocation of pre/post op facilities to support the new surgical suite, consisting of 9 stretcher spaces for pre-op preparation and post-op recovery (phase II), 2 chair spaces for post-op recovery (phase II), and 16 stretcher spaces for post-op recovery (phase I)

- Addition of new patient transport elevators
- Addition of a waiting room on Level 3 to serve as an intermediate location for patients and families after leaving the general waiting area on Level 2 prior to entering their pre-operative phase

2. Problem Statement

Any change or expansion of physical space in a clinical setting implies impact for patient flow. Since the objective of the revisions to space at the DGH site is to support people centred care, it is important that the impact of facility redesign on patient flow be estimated prior to development. In the analysis which follows, model based reasoning is used to evaluate patient flow in the redesigned facility and to estimate patient volumes, wait times, and server utilization as a function of both the planed physical capacity and the operational policies for its use.

3. Methods

Two methods were used to evaluate patient flow and resource capacity: a deterministic calculation based on average cycle times and a simulation model to evaluate flow within an environment in which times at various stages of the patient care path may vary. The deterministic calculation of resource requirements was completed to estimate baseline resource requirements. The simulation methodology was employed to estimate the impact of redesigned space at the Dartmouth General Hospital site on patient flow and server utilization metrics. Simulation is an operations research method in which a system of interest is represented by a model, usually implemented as a computer program. The simulation model is validated against the system of interest and experiments are conducted on the model to infer how the system of interest might respond under similar assumptions. Simulation methods are typically employed when it is too costly, too dangerous, or simply impossible to experiment with the system of interest itself.

For the redesign of Levels 2 and 3 at the DGH site, a simulation model was built using special purpose software known as Rockwell *ARENA (Version 13.5)*. Architectural diagrams were used to identify resource capacity. A conceptual model of patient flow through the new facility was then developed from expert opinion. A simulation model was coded in ARENA. Data on operational aspects of patient flow (surgical volumes, case times, post-operative recovery times, etc.) were gathered and integrated into the computer model. The resulting representation of the new facility was then verified and validated against the assumptions used to build it. The validated model was then used to conduct experiments regarding patient flow.

3.1 Patient Flow

Patients are assumed to arrive to the system, entering at the common registration and waiting area on Level 2. The inflow of patients is comprised of two classes: endoscopy patients and surgical patients. Patients are assumed to arrive on a scheduled basis to the model – that is arriving patient entities are assumed to have been assigned a start time for their procedure and that they arrive with a randomly distributed lead time ahead of their procedure time. Endoscopy patients are assumed to arrive approximately 30 minutes early for their procedures (actual lead times are assumed to be Triangularly distributed (25, 30, 35) minutes); surgical patients are assumed to arrive approximately 120 minutes ahead of their scheduled OR time (actual lead times are assumed to be Triangularly distributes (90, 105, 180) minutes). Both endoscopy and surgical patients as well as their families are assumed to wait in the Level 2 wait room until such time as the patient is called to enter the pre-operative process. All patients are assumed to have between 1 and 2 family members attending them. There is no specific processing time assumed for the Level 2 wait.

Endoscopy Process Flow

The endoscopy suite is assumed to consist of two procedure rooms, two preoperative stretcher spaces, and four post-operative stretcher spaces. Patients are assumed to be called from the Level 2 wait room starting 1 hour before the start of the daily endoscopy schedule. Both endoscopy suites are assumed to operate between 08:00 and 11:30 and between 13:00 and 15:30. The presumed schedule suggests that 14 procedures will be scheduled in the morning session (i.e. 7 per room) and 10 in the afternoon session (5 per room). Once called into the endoscopy suite, patients exit the Level 2 wait room (their family members are also assumed to leave the L2 wait room as well) and occupy one of the two available pre-operative stretcher spaces. Patients are then prepared for their procedure (Triangular (15,30,30) minutes). When their scheduled suite becomes available, patients exit the pre-operative stretcher space and occupy one of the two endoscopy procedure rooms. Endoscopy procedures are assumed to last approximately 25 minutes (Triangular (20, 25, 30) minutes). After the procedure is complete, the patient is assumed to exit the endoscopy room and occupy one of the four post-operative recovery bays. The procedure room is assumed to require a cleaning time of between 5 and 10 minutes before the next patient can occupy it. Patients remain in recovery for approximately 45 minutes (Triangular (30, 45, 60) minutes). After completing their recovery, patients are assumed to give up control of their recovery bed and exit the system. The recovery bed itself is assumed to require a cleaning period of 5-10 minutes before another patient is able to occupy it.

Surgical Patient Flow

The surgical suite is assumed to consist of a total of 8 operating rooms, though only 7 are assumed to be scheduled at any given time. The surgical suite also contains 9 stretcher spaces that may be used by incoming patients or outgoing day surgery patients who have completed their phase I post-operative care. Two chairs are also available for use by outgoing day surgery patients who have completed their phase I post-operative care. There are, in addition, 16 post-anaesthesia care unit (PACU) beds that are available to treat patients who have just finished their surgical procedures and are in phase I of post-operative care.

Patients scheduled for a surgical procedure are assumed to be called from Level 2 to Level 3 in order of their start times, starting one hour before the start of the surgical day. Patients exit the Level 2 wait room and proceed with their accompanying family members to the Level 3 wait area. It is assumed that 1-2 family members attend each surgical patient and that a minimum of 5-10 minutes is required to transit from Level 2 through the Level 3 wait room. Patients (and their family members) remain in the

Level 3 wait room until such time as a pre-operative bed is available to accommodate the patient. Patients are assumed to exit the Level 3 wait in order of increasing surgical start times. Surgical patients may seize a pre-op/post op stretcher space (called exam/treatment rooms) or, if permitted, they may be housed in a post-operative bed for their pre-operative stay if it sufficiently early in the morning (we assume within the first two hours of the start of the surgical day or between 07:45 and 09:45). Pre-operative preparation for surgery is dependent on the class of surgery the patient is scheduled to have. We assume that patients may be assigned to one of 7 surgical types (though only 5 may be active after the expansion is complete) and that the time for surgical preparation is dependent on the patient's service.

Service	3-Letter Code	Assume Share of Total Surgical Time
Gynaecology	Gyn	0.15
Orthopaedics	Ort	0.11
Otolaryngology	ENT	0.28
Plastic Surgery	Pla	0.00
Urology	Uro	0.36
General Surgery	Gen	0.09
Oral Surgery	Ora	0.00

Table 1 – Assumed share of total surgical time at DGH by service after expansion and program re-alignment

Service	Minimum Time	Most Likely Time	Maximum Time	Calculated Average
Gyn	30	30	60	40.0
Ort	45	45	60	50.0
ENT	30	30	60	40.0
Pla	30	30	60	40.0
Uro	45	45	60	50.0
Gen	35	35	60	43.3
Ora	30	30	60	40.0

Table 2 – Preoperative preparation time by surgical service (in minutes)

Once prepared for surgery, patients wait, in order of scheduled start time, to access their assigned operating room. It is assumed that room assignments are fixed – even if another surgical room becomes available while waiting for surgery, patients do not switch room assignments. When their assigned room becomes available, patients enter and the surgical procedure begins. Surgical case times are assumed to be service specific.

Service	Minimum Time	Most Likely Time	Maximum Time	Calculated Average
Gyn	45	45	120	45.0
Ort	45	45	180	45.0
ENT	30	30	150	30.0
Pla	45	45	210	45.0
Uro	45	45	120	45.0
Gen	45	45	180	45.0
Ora	60	60	180	60.0

Table 3 – Surgical case times (in minutes)

Once surgery is complete, patients exit their assigned room and occupy one of the 16 available PACU beds. The operating room is assumed to require a cleaning period lasting between 15 and 20 minutes (Triangular ((15, 17.5, 20) minutes). Patients remain in the PACU bed for approximately 80 minutes (Triangular ((60, 60, 120) minutes). At the end of their phase I recovery, patients who will complete their recovery in an inpatient unit (assumed to be 30% of surgical volume) release their PACU bed and exit the system. Day surgery patients are assumed to have a slightly more complex flow. Approximately 15 minutes before a patient's assumed stay in a PACU bed, a call is made to bring his/her family members to the Level 3 wait area. The family waits there until the patient completes his/her phase I post-operative care and then are assumed to re-join the patient. The patient meanwhile occupies either one of the two post-operative chairs or one of the 9 available pre-operative stretcher spaces to complete the remainder of his/her post-operative care. This care (called PACU II) is assumed to require a period of time that may be service specific.

Service	Minimum Time	Most Likely Time	Maximum Time	Calculated Average
Gyn	60	60	90	70.0
Ort	30	30	60	40.0
ENT	30	30	120	60.0
Pla	30	30	60	40.0
Uro	30	30	60	40.0
Gen	30	30	60	40.0
Ora	30	30	60	40.0

Table 4 – PACU II recovery times by service (in minutes)

Once the phase II recovery time is complete, the patient is assumed to exit the system and thus leave the model.

3.2 Deterministic Analysis

The patient process is a special case of a flow shop – a production process that uses a fixed set of workstations and a pre-defined routing sequence. Flow process planning is based on a number of simple, deterministic formulas. We assume the flow line consists of series of stations each comprised of a set of workstations (i.e. one or more workstation may constitute a set) linked by a deterministic sequence. Each workstation has a cycle time, where the cycle time is defined as the time required to complete a defined task or list of tasks:

$$C_i = \sum_{j=1}^{n_i} t_{ij}$$

where C_i is the cycle time to complete a job at WS_i
n_i is the number of tasks to complete one job at WS_i
t_{ij} is the time to complete task j assigned to WS_i

We observe that the output or throughput of a workstation (in jobs / time) is the inverse of cycle time (time / job)

$$O_i = \frac{1}{C_i}$$

where O_i is the throughput of station i

In almost all flow process lines, the target throughput of the process is dictated by management fiat. In the case of the patient flow through the endoscopy and surgical suites at the DGH site, the target throughput is dictated by schedule (i.e. to complete 28 endoscopy cases and approximately 50 surgical cases per day).

Area	Number of Rooms	Average Case Time Including Turnover	Maximum Time / Room / Day	Target Throughput
Endoscopy	2	32.3 minutes	480 minutes	2*480/32.3 = 29.7
Surgical Suite	7	58.3 minutes	420 minutes	7*420/58.3 = 50.4

Table 5 - Calculations for target throughput

Thus, to meet the target cycle time the minimum number of workstations within a sequence step in the flow process is:

$$m_i = \left\lceil \frac{C_i}{C_{Target}} \right\rceil$$

where m_i is the minimum number of stations at step i

$\lceil n \rceil$ is the next largest integer to n

Using this simple equation, it is possible to estimate the minimum number of resources necessary to support the target throughput in both the surgical and endoscopy suites.

	Average Time	Min Resources
L2 Wait Time	30.0	6
Preop Prep	25.0	2
Scope Time	25.0	
Clean Room	7.3	2
Total Room	**32.3**	
Recovery	45.0	
Clean Recovery	7.5	
Total Recovery	52.5	4

Table 6 – Minimum resource requirements for endoscopy suite to support daily throughput of 28 cases over two case rooms

	Average Time	Min Resources
L2 Wait Time	105	42
Preop Prep	45.1	6
Case Time	40.8	
Clean Room	17.5	
Total Room	**58.3**	7
PACU I	80.0	10
PACU II (30% Inpatients)	50.2	5

Table 7 – Minimum resource requirements for the surgical suite to support daily throughput of 50 cases over seven rooms

3.3 Simulation Model

The resources calculated via the deterministic model are based on the assumption of constant processing times and thus exclude any buffer to accommodate process variability. Accordingly, to estimate the impact of resources under stochastic conditions, a simulation model was built. The simulation model is based on the conceptual process flow described in Section 3.1 and implemented in Rockwell Systems ARENA simulation language.

3.3.1 Verification

Once built, the simulation model was verified using a number of metrics to ensure the model faithfully represented the system as specified in the conceptual model. It can be calculated that, on average, endoscopy patients require 125.0 minutes in the system from entry to exit. A run of the simulation model was completed with a total of 30 runs and the average patient time in system was found to be 128.99 +/- 1.23 minutes. Based on a 95% prediction interval (123.1, 136.8) we note that the simulation produces output that is consistent with the expected average time in system for endoscopy patients. To confirm the veracity of the surgical patient flow, patient times in system were measured on an item by item basis for the five services expected to have surgical time after the expansion of the DGH surgical suite. Prediction intervals were generated from the simulation results and compared to expected values. In each case the simulation model was found to produce results that were consistent with the

expected average values. Accordingly, the simulation model is assumed to be an accurate representation of the surgical suite and patient flow at the Dartmouth General Hospital site after expansion. For illustrative purposes, the verification results for Gynaecology patients are presented below.

	Expected Value	Simulated Mean	PI Half Width	Lower Limit	Upper Limit
Preop	40	39.9	2.34	37.56	42.24
Case Time	45	45.3	9.30	36.00	54.60
PACU I	80	79.9	4.34	75.56	84.24
PACU II	70	70.0	2.06	67.94	72.06

Table 8 – Model results for time in process for Gynaecology patients, compared against expected values. The prediction interval (PI) half-width at a 95% certainty level is provided. The prediction interval shows the range of values that could, within statistical reason, be expected from the simulation. Note that the expected values are bracketed by the prediction interval.

3.3.2 Endoscopy Results

To test the impact of resource capacity on endoscopy patient flow, the simulation model was executed for a total of 30 replications of one day with differing resource levels. It was assumed that that the number of endoscopy procedure rooms is fixed at two; the number of inpatient spaces was varied from 2 to 4, while the number of post-procedure recovery (PACU) spaces was varied between 4 and 6. The total patient time in system was recorded as a proxy for system congestion. Results appear below:

		PACU Spaces		
		4	**5**	**6**
Pre-op Spaces	***2***	128.99	128.99	128.99
	3	124.25	124.26	124.26
	4	122.62	122.58	122.58

Table 9 – Simulation results showing endoscopy patient time in system versus resource levels

As can be seen from the table above, the model suggests only modest decreases in patient time in system with increasing resource availability. This implies that congestion in the system is modest even at baseline resource levels (2 pre-op spaces, 4 PACU spaces), from which it can be concluded that sufficient resources are present to support patient flow at a planned volume of 28 patients per day. The model also suggests that, should extra resources be added to the endoscopy suite, additional pre-op spaces provide more improvement to patient flow than do additional post-op spaces.

3.3.3 Surgical Suite Results

In a similar manner, the impact of resource levels on surgical patient flow was evaluated via the simulation model. The model was again run for 30 replications of one day, for varying levels of resource availability in the Level 3 wait room, pre-operative space, and post-operative recovery space. Initial runs of the model indicated the potential for patient congestion and accordingly the metric for evaluating resource impact was altered from patient time in system to operating room idle time, since it is assumed that a key indicator of surgical process efficiency is room utilization. The simulation was executed using the assumptions listed in Section 3.1. A total of seven rooms are assumed to be available each day and that the assignment of rooms to services is based on allocation outlined in Table 1. This allocation yields a daily scheduled patient volume of 45.4 +/- 0.76 (range 42 – 50) persons. When initially executed at assumed baseline resource levels (15 Level 3 wait spaces, 9 pre-op spaces, 16 PACU spaces, and 2 post-op (PACUII) chairs), the model indicated an average OR idle time of 26.82 minutes per room. This result suggested that patient flow may be constrained by resource limits. To test this hypothesis, the model was re-run, with resource levels increased to infinite levels; results showed that idle time dropped to approximately 1.6 minutes per room. Thus, it may be concluded that, at resources constrain patient flow at baseline levels.[1]

To determine how best to address resource constraints, the model was run for varying resource capacities in terms of Level 3 wait room, pre-operative space, and post-operative space. If additional space is added to the Level 3 wait room, OR idle time will decrease, particularly if Level 3 wait space is increased from 15 to 25; additions beyond 25 spaces provide little additional decrease in OR idle time.

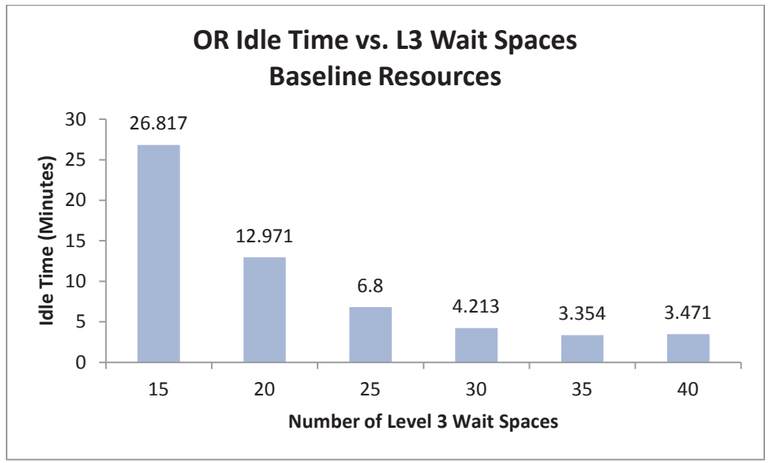

Figure 1 – Graph of operating room idle time (i.e. room ready, but no patient available) for increasing space in the Level 3 wait room

To determine the impact of additional pre-operative space on patient flow, the model was re-run for varying resources in the Level 3 wait under the assumption of one additional pre-operative space (i.e. an increase from 9 to 10 stretcher spaces. Note that pre-operative space is used by in-coming patients of all types and out-going day surgery patients). The model suggest that increasing pre-operative space will cause operating room idle time to decrease by approximately 35%, over baseline resource levels, regardless of the number of spaces that are available in the Level 3 wait room.

[1] Note: Subsequent iterations of the design have revised the Level 3 wait room to allow for a total of 30 spaces. F

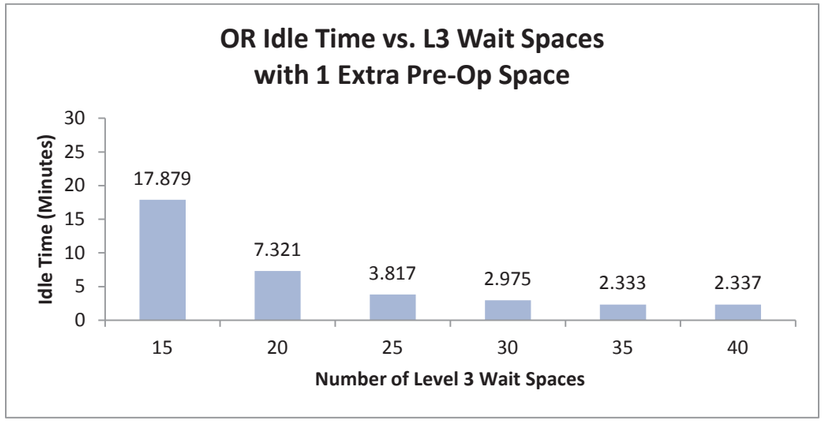

Figure 2 – Graph of operating room idle time for increasing space in the Level 3 wait room under the assumption of an additional pre-operative bed space. Note that idle time decreases by approximately 35% over all instances of Level 3 wait spaces.

To determine if operating room idle time was affected by post-operative spaces, the model was again re-run with varying resources in the Level 3 wait room under the assumption of an additional pre-op space (increase from 9 to 10) and an additional post-operative space (increase from 16 to 17). As can be seen from the figure below, the addition of an extra post-operative space did not significantly impact operating room idle time.

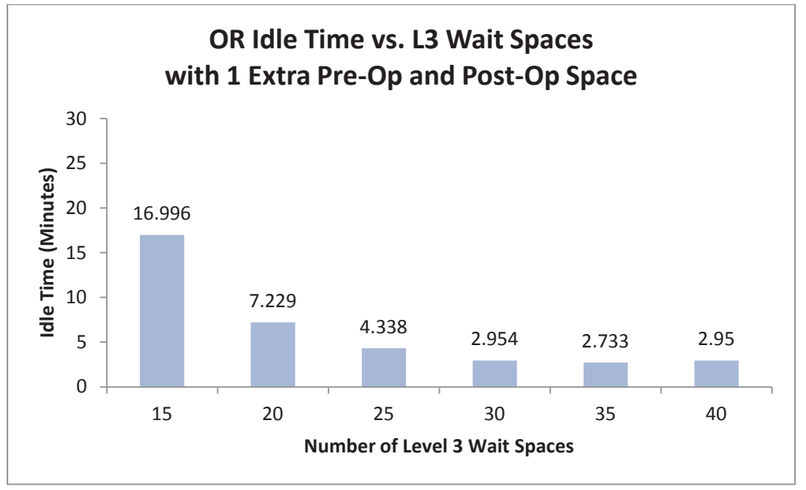

Figure 3 - Graph of operating room idle time for increasing space in the Level 3 wait room under the assumption of an additional pre-operative bed space and an additional post-operative bed space.

4. Conclusions

The results of the analysis suggest mixed results. As currently envisioned, resource levels will be sufficient to support 28 endoscopy cases per day without constraining patient flow. However, the model suggests that additional resources are required in the surgical suite to ensure a smooth patient flow. The model suggests that the Level 3 wait should have space to accommodate 20 to 25 individuals at a time. An addition pre-operative space would also decrease congestion and reduce OR idle time by approximately 35% regardless of the size of the Level 3 wait room.

Appendix: Schematic Layouts of Proposed Changes

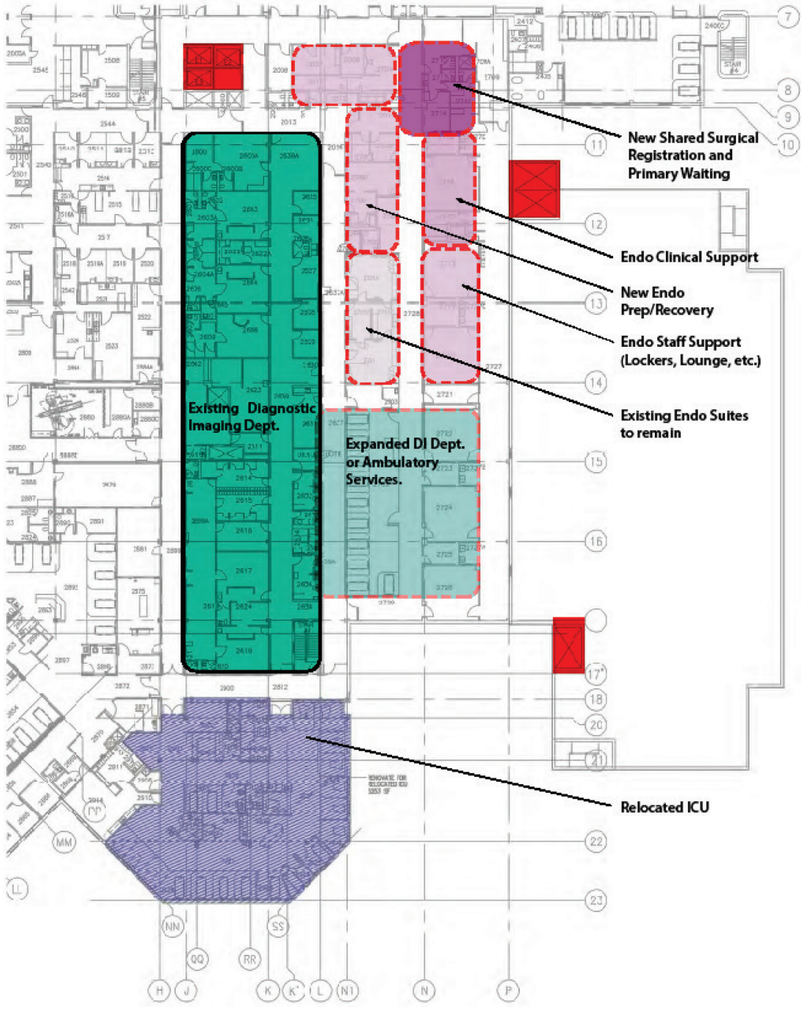

Figure 4 – Level 2

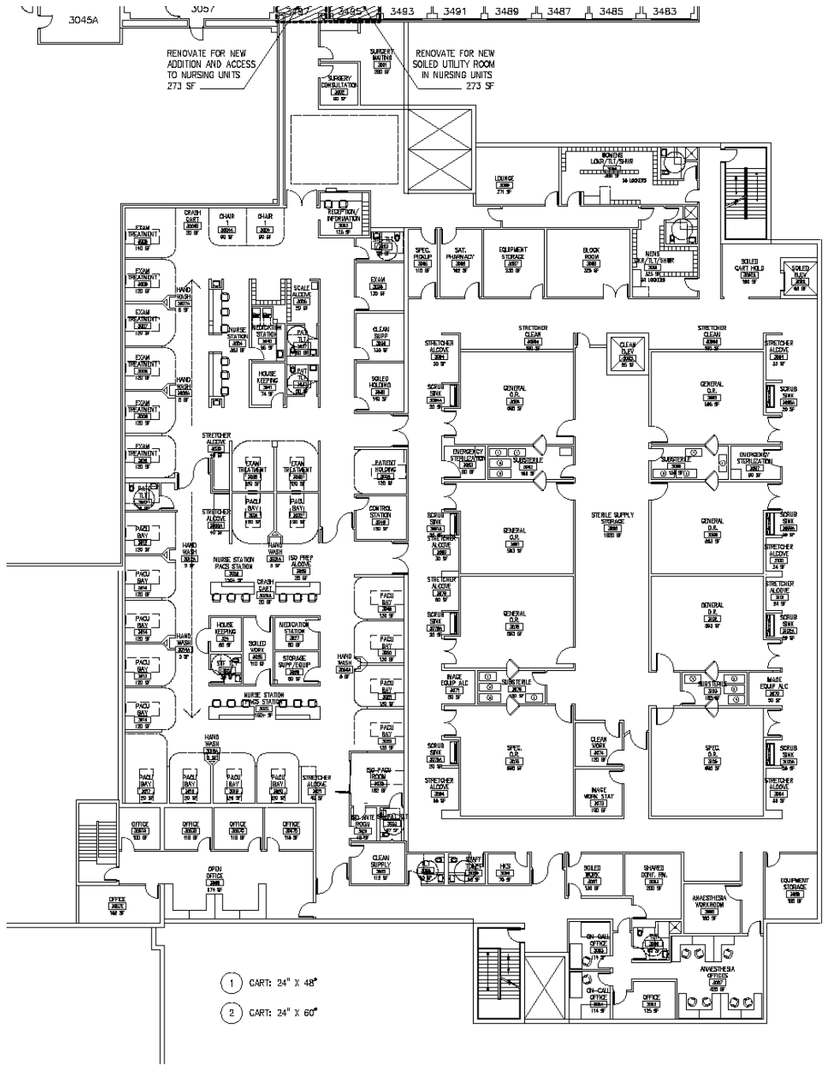

Figure 5 – Level 3