Appendix C – Building Capability Report
EC + DFO – Co-Location at FWI

For:
Environment Canada & Department of Oceans and Fisheries
Fresh Water Institute (FWI)
Winnipeg, Manitoba
Project No. R.075255

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Building Capability Report
Environment Canada and Department of Fisheries and Oceans
Co-Location to Freshwater Institute

January 16, 2017

FWI Institute
University of Manitoba, Winnipeg, MB

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1.1 Introduction

.1 Intent

.1 The intent of the Building and Site Capability Report is to investigate, analyze and assess how well the facility meets Client Departments' requirements, and make recommendations to suit.

.2 The findings in the Report were based upon a review of the 2013 Building Condition Report and site observations on:

- .1 January 26, 2016
- .2 July 4-5, 2016
- .3 August 31, 2016

.3 The Report includes some information from the 2013 Building Condition Report but does not include all information. For further information regarding the Freshwater Institute, the 2013 Building Condition Report should be reviewed.

.2 Freshwater Institute History

.1 The original Freshwater Institute (FWI) facility was designed in 1969 by GBR Architects and Engineers of Winnipeg. The original facility was completed in 1971/72 and comprised of the following major components:

- .1 Main Lab/office building comprised of: 2 storey Administration block with full basement, 4 storey Lab block with full basement, 3 storey service block with full basement and,
- .2 1 storey Workshop Building/Inspection Office Building (now referred to as Small Craft harbour Building) designed by GBR Architects and Engineers of Winnipeg.

.2 The (FWI) is located on the University of Manitoba campus, located in the south end of the city of Winnipeg. The Institute houses several programs of Fisheries and Oceans Canada (DFO). It is a national centre of expertise in aquatic biology and freshwater and marine fisheries. In conjunction with the Bayfield Institute in Burlington, Ontario, FWI serves as a focal point of scientific research in the DFO Central and Arctic Region and for fishery, fish habitat and oceans management programs.

.3 The Main Laboratory and Administration Building is a cast-in-place and precast concrete building with five floor levels and was built in 1972. The 21,725sm square meter building is laid out with the 3 level Administration block at the east end of the building and a 5 level Laboratory block in the center and the 3 level Service block at the west end of the building. The Basement level of the Lab/Administration block is mostly under grade, however windows do serve offices located on this level.

.3 Building Overview

.1 **Superstructure -** The reinforced concrete superstructure is robust and there are no apparent structural concerns. The building envelope is similarly robust, clad with precast

concrete panels. There are no concerns with the building envelope, however a study is recommended to confirm the condition of the panel anchors at the east and west elevations (anchors on the north and south elevations were replaced in the 1980's). The building envelope is similarly robust, clad with precast concrete panels. The building envelope consists of a cavity wall system of precast cladding on masonry or reinforced concrete wall backup. The interior face of the wall is clad with gypsum board on metal furring. The envelope features a large sloping copper roof/wall extending from the roof of the main entry to the roof parapet. Windows are fixed double glazed units in aluminum frames. Windows are primarily on the east and west exposures of the building. Approximately 33% of the wall area on these walls is windows.

.2 **Roof -** The built-up roof is only 16 years old but has had a history of leakage over the past 6 years. A roof report including a thermographic scan is recommended to determine the remaining service life of the roof. Replacement is required within a 2-7-year horizon. Replacement may be recommended within 2 years pending the recommendations of the roof report and if roof leakage persists.

.3 **Maintenance -** The building is in good condition and has benefited from a very good maintenance program. A MAXIMO computer program is used to support the preventive maintenance and track existing repairs or upgrades. In FY 2012/2013 the facility had PWGSC on site staff consisting of the following:

.1 1 Maintenance Supervisor,

.2 1 Plumber and,

.3 1 Maintenance Operator.

.4 **Finishes -** Original finishes in the Administration block are of good quality, including porcelain tile floor at main entry foyer and corridors, linear metal ceilings, precast concrete and oak wall finish. These finishes remain in average/good condition. Original finishes in the Lab block such as paint and vinyl floor tile, have a dated and/or worn appearance and are in fair condition only and due for replacement. Approximately 25% of the original labs have been renovated to accommodate office and storage functions. Finishes in these rooms have a range of finishes, from new carpet flooring to existing tile flooring. Existing stairs in the lab block require modifications to hand and guardrails to comply with current codes.

.4 Executive Summary

After review of the 2013 Building Condition Report and multiple on site reviews of the Architectural, Mechanical and Electrical areas and components, **the base building and site are capable** of meeting the needs of the Co-Location project with the exception of items identified below.

.1 In general, the building is robust and durable with ample base building areas, components and systems to support the project.

.2 As all areas affected by the new design and construction work will need to be compliant with Workplace 2.0, significant interior fit-ups will be required to complete the project. And, the building is capable of accommodating these fit-ups.

.3 The **base building areas and components** that will require upgrades to accommodate the Co-Location project are summarized below. The list is in order of priority in terms of financial impact.

.1 **Sprinklers** *(1.6.2)*

The entire Lab and Administration Blocks will need to be sprinklered to meet the current building code.

.2 **Parking** *(1.5.1)*

Confirm maximum allowed parking expansion area with UofM and Budget.

.3 **Roof** *(1.4.1)*

Although the roof is not part of the scope of the Co-Location project, it is beyond it's lifecycle with reports of leaking occurring. The roof covering should be replaced.

.4 **Main Entrance Lobby 2nd exit** *(1.3.2)*

A 2nd exit will need to be provided to meet the current building code.

.5 **Exit Stair guardrails** *(1.3.4)*

Upgrade all guardrails in all exit stairs to meet the current building code.

.6 **Washrooms** *(1.3.7)*

Reconfigure washrooms to meet barrier free requirements and to provide minimum numbers based upon current building code.

.7 **Barrier Free Upgrades** *(1.6.5)*

Upgrade Barrier Free deficiencies.

.8 **Finishes** *(1.4.8)*

Upgrade base building finishes including ceilings, walls, flooring and elevator cab interiors.

.9 **Lockers** *(1.3.8)*

Re-purpose existing locker areas for washroom space and/or new office space.

.10 **Building sign** *(1.5.3)*

Install new sign.

.5 Areas of Concern – Impact Assessment Summary

.1 The following chart is a summary of items that have been identified in this report as areas of concern regarding the base building areas, components and systems.

Area of concern	Impact Assessment		
	Space	Time	Budget
1.2 WP2.0 compliance	Non-compliance of the existing DFO office and lab space will impact current spatial arrangements. All re-located offices and labs into newly design and constructed space will be reduced significantly to meet WP2.0 standards	Phasing for newly constructed office and lab space will be crucial to ensure all re-located functions will be accommodated.	Newly constructed office and lab space will have significant cost implications for this project. However, over the years, the smaller and more efficient footprint of the office and lab area will provide long-term payback.
1.3.2/ 1.6.3 Main Entrance Lobby 2nd Exit	Upgrading the existing guardrails will have no impact on space.	Construction work can occur simultaneously with the Interior Fit-Up and will not affect the length of the overall construction schedule.	Construction will impact the overall construction budget and is identified in the cost estimate.
1.3.4/ 1.6.4 Lab Block Main Corridor Guardrails	Upgrading the exit handrails to meet current building codes will have minimal spatial impact.	Construction work can occur simultaneously with the Interior Fit-Up and will not affect the length of the overall construction schedule.	Construction will impact the overall construction budget and is identified in the cost estimate.
1.3.4 Lab Block Main Corridor Finishes	Construction work in this area will affect the daily operations for existing staff. Construction phasing will have to be addressed during the design phases of the project.	Construction work can occur simultaneously with the Interior Fit-Up and will not affect the length of the overall construction schedule.	Construction will impact the overall construction budget and is identified in the cost estimate.

Area of concern	Impact Assessment		
	Space	Time	Budget
1.3.4/ 1.6.5 Lab Block Main Corridor Elevator Cab	Construction work in this area will affect the daily operations for existing staff. Construction phasing will have to be addressed during the design phases of the project.	Construction work can occur simultaneously with the Interior Fit-Up and will have minimal impact on the length of the overall construction schedule.	Construction will impact the overall construction budget and is identified in the cost estimate.
1.3.7/ 1.6.1 Washrooms	Construction of washroom facility upgrades will have a direct impact on the space in the building and will need to be addressed in the future design phases.	Construction work can occur simultaneously with the Interior Fit-Up and will have minimal impact on the length of the overall construction schedule.	Construction will impact the overall construction budget and is identified in the cost estimate.
1.3.8 Lockers	Construction of Locker rooms re-purposing will have a direct impact on the space in the building and will need to be addressed in the future design phases.	Construction work can occur simultaneously with the Interior Fit-Up and will have minimal impact on the length of the overall construction schedule.	Construction will impact the overall construction budget and is identified in the cost estimate.
1.4.1 Roof	Although re-roofing will not impact the spaces in the building during construction, the impact of NOT re-roofing could have a major impact to all newly created and existing spaces if the roof continues to leak.	During construction, re-roofing should have minimal impact on the construction schedule as this work could be completed separately from the tenant fit-up portion.	Newly constructed roofing could have cost implications for this project if this project absorbs the scope. However, protecting the tenant fit-up with an adequate roof membrane could save costly repairs/ damages after the project is complete.

Area of concern	Impact Assessment		
	Space	Time	Budget
1.4.2/.3 Window/ Exterior Doors Envelope	Construction work of this component will have minimal impact on the daily operations. The work will have a large impact on the interior space by increasing the amount of interior area with access to daylight.	Construction work can occur simultaneously with the Interior Fit-Up and will have minimal impact on the length of the overall construction schedule	Construction will impact the overall construction budget and is identified in the cost estimate.
1.5.1 Parking	Parking area expansion will have a significant impact to the site's spatial arrangement.	Construction work can occur simultaneously with the Interior Fit-Up and will have minimal impact on the length of the overall construction schedule	Construction will impact the overall construction budget and is identified in the cost estimate.
1.5.3 Hard Landscape Replace Sign	Sign replacement will not have spatial impact.	No impact.	Construction will have minimal impact on the overall construction budget.
1.6.2 Sprinklers	Spaces in the building will be affected during construction of a new sprinkler system. After construction, space will not be affected.	During construction, adding a sprinkler system to the building will add time to the overall construction schedule.	Newly constructed sprinkler systems will add significant costs to the Co-location project.

1.2 Workplace 2.0 Compliance

The existing building is not Workplace 2.0 (WP2.0) compliant. The building has not undergone a major fit-up in many years and almost all office areas are non-compliant. The Co-location project is to comply with WP2.0 to the greatest extent possible. The base-building upgrades to accommodate the new interior office/ lab areas to meet WP2.0 will be minimal. Below is a series of tables illustrating where the existing building is non-compliant.

.1 Level 1

Block	Level	Element	Description	WP2.0 Compliant	WP2.0 Non Compliant
Admin	1	Walls	Wood Panelling		No
		Walls	Painted Gypsum Board	Yes	
		Floor	Carpet	Yes	
		Floor	Sheet Flooring	Yes	
		Ceilings	Acoustic Ceiling Tile	Yes	
		Doors	Wood panelled		No
		Hardware	Knob		No, require levers
		Window Coverings	None	Yes, add	
		WS Panels	Medium Performance	Yes	
		Office Space	Workstations		No, exceeds 4.5m²/ WS
		Office Space	Closed Offices		No, exceeds allocation
		Support Space			No, exceeds allocation
		Circulation Space			No, exceeds allocation

Block	Level	Element	Description	WP2.0 Compliant	WP2.0 Non Compliant
Lab	1	Walls	Painted Gypsum Board	Yes	
		Walls	Painted Concrete	Yes	
		Walls	Tile	Yes	
		Floor	Carpet	Yes	
		Floor	Sheet Flooring	Yes	
		Floor	Tile	Yes	
		Ceilings	Acoustic Ceiling Tile	Yes	
		Doors	Wood	Yes	
		Hardware	Knob		No, require levers
		Window Coverings	None	Yes, add	
		WS Panels	Medium Performance	Yes	
		Office Space	Workstations		No, exceeds 4.5m²/ WS
		Office Space	Closed Offices		No, exceeds allocation
		Support Space			No, exceeds allocation
		Circulation Space			No, exceeds allocation

.2 Level 2

Block	Level	Element	Description	WP2.0 Compliant	WP2.0 Non Compliant
Admin	2	Walls	Wood Panelling		No
		Walls	Painted Gypsum Board	Yes	
		Floor	Carpet	Yes	
		Floor	Sheet Flooring	Yes	
		Ceilings	Acoustic Ceiling Tile	Yes	
		Doors	Wood panelled		No
		Hardware	Knob		No, require levers
		Window Coverings	None	Yes, add	
		WS Panels	Medium Performance	Yes	
		Office Space	Workstations		No, exceeds 4.5m²/ WS
		Office Space	Closed Offices		No, exceeds allocation
		Support Space			No, exceeds allocation
		Circulation Space			No, exceeds allocation

Block	Level	Element	Description	WP2.0 Compliant	WP2.0 Non Compliant
Lab	2	Walls	Painted Gypsum Board	Yes	
		Walls	Painted Concrete	Yes	
		Walls	Tile	Yes	
		Floor	Carpet	Yes	
		Floor	Sheet Flooring	Yes	
		Floor	Tile	Yes	
		Ceilings	Acoustic Ceiling Tile	Yes	
		Doors	Wood	Yes	
		Hardware	Knob		No, require levers
		Window Coverings	None	Yes, add	
		WS Panels	Medium Performance	Yes	
		Office Space	Workstations		No, exceeds 4.5m²/ WS
		Office Space	Closed Offices		No, exceeds allocation
		Support Space			No, exceeds allocation
		Circulation Space			No, exceeds allocation

.3 Level 3

Block	Level	Element	Description	WP2.0 Compliant	WP2.0 Non Compliant
Admin	3	Walls	Wood Panelling		No
		Walls	Painted Gypsum Board	Yes	
		Floor	Carpet	Yes	
		Floor	Sheet Flooring	Yes	
		Ceilings	Acoustic Ceiling Tile	Yes	
		Doors	Wood panelled		No
		Hardware	Knob		No, require levers
		Window Coverings	None	Yes, add	
		WS Panels	N/A		
		Office Space	N/A		
		Office Space	N/A		
		Support Space	N/A		
		Circulation Space	N/A		

Block	Level	Element	Description	WP2.0 Compliant	WP2.0 Non Compliant
Lab	3	Walls	Painted Gypsum Board	Yes	
		Walls	Painted Concrete	Yes	
		Walls	Tile	Yes	
		Floor	Carpet	Yes	
		Floor	Sheet Flooring	Yes	
		Floor	Tile	Yes	
		Ceilings	Acoustic Ceiling Tile	Yes	
		Doors	Wood	Yes	
		Hardware	Knob		No, require levers
		Window Coverings	None	Yes, add	
		WS Panels	Medium Performance	Yes	
		Office Space	Workstations		No, exceeds 4.5m²/ WS
		Office Space	Closed Offices		No, exceeds allocation
		Support Space			No, exceeds allocation
		Circulation Space			No, exceeds allocation

.4 Level 4

Block	Level	Element	Description	WP2.0 Compliant	WP2.0 Non Compliant
Lab	4	Walls	Painted Gypsum Board	Yes	
		Walls	Painted Concrete	Yes	
		Walls	Tile	Yes	
		Floor	Carpet	Yes	
		Floor	Sheet Flooring	Yes	
		Floor	Tile	Yes	
		Ceilings	Acoustic Ceiling Tile	Yes	
		Doors	Wood	Yes	
		Hardware	Knob		No, require levers
		Window Coverings	None	Yes, add	
		WS Panels	Medium Performance	Yes	
		Office Space	Workstations		No, exceeds 4.5m²/ WS
		Office Space	Closed Offices		No, exceeds allocation
		Support Space			No, exceeds allocation
		Circulation Space			No, exceeds allocation

.5 Level 5

Block	Level	Element	Description	WP2.0 Compliant	WP2.0 Non Compliant
Lab	5	Walls	Painted Gypsum Board	Yes	
		Walls	Painted Concrete	Yes	
		Walls	Tile	Yes	
		Floor	Carpet	Yes	
		Floor	Sheet Flooring	Yes	
		Floor	Tile	Yes	
		Ceilings	Acoustic Ceiling Tile	Yes	
		Doors	Wood	Yes	
		Hardware	Knob		No, require levers
		Window Coverings	None	Yes, add	
		WS Panels	Medium Performance	Yes	
		Office Space	Workstations		No, exceeds 4.5m²/ WS
		Office Space	Closed Offices		No, exceeds allocation
		Support Space			No, exceeds allocation
		Circulation Space			No, exceeds allocation

1.3 Building Areas

The following existing base building areas were reviewed on site to determine if each area is sufficient to accommodate the Co-location project. The evaluation criteria was based on a functional assessment and technical observation of the area's ability to support EC and DFO operations. The September 2013 Building Condition Report was also reviewed to provide additional information in the evaluation of each area.

.1 Main Entrance

.1 The Main Entrance appears to be in good condition and can support the Co-Location project.

.2 Located on the east side of the building facing the University of Manitoba, access from the main public entrance appears to be in good condition. A barrier free ramp and power-assisted doors provide access to the main entrance lobby. Visitor parking including barrier free stalls are located on the east side of the building providing good access.

Figure 1 Barrier free main entrance. Architectural elements appear to be in good condition.

Figure 2 Aluminum entrance doors are dark bronze anodized and provide barrier free accessibility.

Recommendations – Main Entrance

- There is no architectural work required for this area to accommodate this project.
- The main entrance area is adequate to support the co-location project.

.2 Main Entrance Lobby

.1 The Main Entrance Lobby appears to be in good condition and can support the Co-Location project. However, egress from this area is an issue as discussed below.

.2 Located on the east side of the building, the main entrance lobby appears to be in good condition. Finishes are robust and in good condition. The lobby connects the 5 floors of the Lab and Block and 3 floors of the Admin Block. The Lab and Admin Blocks are secured from public access with controlled door access cards at each floor.

.3 An existing reception desk is located in the area that is currently staffed by a Commissionaire. In addition, an adequately sized mail room is located at the reception area and will provide a common mail receiving room for the Co-location project.

.4 The main concern with the Main Entrance Lobby is access to 2 exits. This will need to be addressed during design to ensure that occupants have access to exits. Potential solutions could include:

- .1 Providing a new exit on Level 2 that exits directly to the exterior into the south courtyard or the north courtyard. Windows above these exit areas will need to be considered to ensure protection of exit facilities.
- .2 Reconfigure the control doors from the main entrance lobby to provide access to exit stair #04. This would be typical on all floors.

Figure 3 Quarry tile and main building security desk.

.5 The table below is a summary of architectural action items for various elements as provided in the Sep 2013 Building Condition Report. Although all items should be addressed as recommended in the BCR, CKAID has reviewed which items are project specific and should be included in the scope of work for this Co-Location project – noted with a Yes. All other items are base building issues that should be addressed separately. CKAID has identified action items that will have a direct effect on this Co-Location project.

Element	Action	Year	Cost	Required for Co-Location Project
Fixed or Permanent Furnishing (Millwork)	Repair Main Reception Desk	2015	$2,495	No
Fixed or Permanent Furnishing (Millwork)	Replace Deficient Millwork	2023	$37,425	No

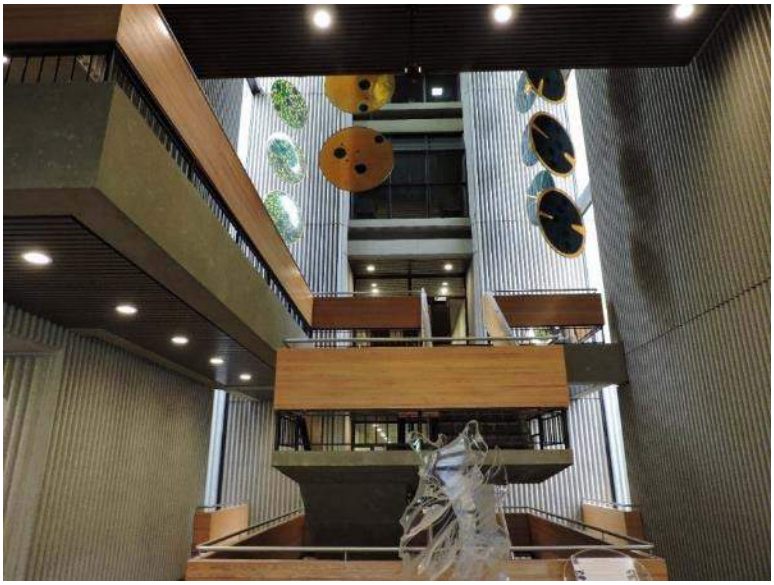

Figure 4 Figure 4 Entry lobby stair extends from 1st floor to 3rd floor.

Recommendations – Main Entrance Lobby

- Provide new exit on Level 2 that exits directly to the exterior OR reconfigure the control doors leading from the Main Entrance Lobby to the Main Elevator/ Stair Lobby.

.3 Seminar Rooms

.1 The Seminar Rooms appear to be in good condition and can support the Co-Location project.

.2 Located off the main lobby, a large and small seminar room are located in the main entrance lobby and should be sufficient for training, lectures, presentations, etc…

.3 The table below is a summary of architectural action items for various elements as provided in the Sep 2013 Building Condition Report. Although all items should be addressed as recommended in the BCR, CKAID has reviewed which items are project specific and should be included in the scope of work for this Co-Location project – noted with a Yes. All other items are base building issues that should be addressed separately. CKAID has identified action items that will have a direct effect on this Co-Location project.

Element	Action	Year	Cost	Required for Co-Location Project
Folding Partitions	Replace Folding Acoustic Partitions	2025	$73,045	No

Recommendations – Seminar Rooms

- There is no architectural work required at the seminar rooms to accommodate this project.
- The seminar rooms could be used as training rooms for EC and DFO.

.4 Lab Block Main Corridor

.1 The Lab Block Main Corridor appears to be in good condition and can support the Co-Location project. However, the guardrails in the exit stairs do not conform to current building code requirements and should be upgraded as discussed below.

.2 Located in the central part of the Lab Block, the floors are serviced by 2 elevators and 2 exit stairwells (Stair 2 and Stair 4).

Figure 5 Elevator Lobby in Lab Block is in good condition.

Figure 6 Figure 6 Stairs do not have code compliant guardrails.

.3 The table below is a summary of architectural action items for various elements as provided in the Sep 2013 Building Condition Report. Although all items should be addressed as recommended in the BCR, CKAID has reviewed which items are project specific and should be included in the scope of work for this Co-Location project – noted with a Yes. All other items are base building issues that should be addressed separately. CKAID has identified action items that will have a direct effect on this Co-Location project.

Element	Action	Year	Cost	Required for Co-Location Project
Interior Steel Stairs	Modify Stair Handrails & Guardrails	2015	$115,680	Yes

Recommendations – Lab Block Main Corridor

- The exits have guardrails that do not conform to current building code requirements – however, they most likely conformed to the code when the building was built. Upgrading the guardrails is recommended. This is typical for ALL stairs in the building.
- Upgrade the wall and floor finishes in the corridor to provide a uniform appearance and replace original materials that are at the end of there lifecycle
- Upgrade the elevator cabs to conform with current Barrier Free requirements

Figure 7 Elevators in Lab Block Main Corridor

.5 Service Entrance & Loading Area

.1 The Service Entrance & Loading Area appear to be in good condition and can support the Co-Location project.

.2 Located on the west side of the building, the loading area appears to be sufficient in size and functionality.

Figure 8 Loading area is sufficient in size and function. Overhead doors may require replacement in the future.

Figure 9 Loading area is sufficient in size and function. 2013 BCR report indicated a floor slab report is to be conducted.

.3 The table below is a summary of architectural action items for various elements as provided in the Sep 2013 Building Condition Report. Although all items should be addressed as recommended in the BCR, CKAID has reviewed which items are project specific and should be included in the scope of work for this Co-Location project – noted with a Yes. All other items are base building issues that should be addressed separately. CKAID has identified action items that will have a direct effect on this Co-Location project.

Element	Action	Year	Cost	Required for Co-Location Project
Loading Docks	Install New Access Ladder	2014	$2,559	No
Structural Slab - Concrete	Consultant Study - Loading Bay Slab	2014	$7,695	No

Figure 10 Service Entrance provides access to staff.

.4 Located on the west side of the building, the service entrance lobby appears to be in good condition. Finishes are robust and in good condition. The lobby provides access by DFO Officers to Fleet vehicles located in the parking areas on the south side. The lobby provides access to office staff.

.5 An existing reception desk is located in the area that is currently staffed by a Commissionaire. This desk monitors and controls access of people and material into the building.

Recommendations – Service Entrance & Loading Area

- There is no architectural work required for this area to accommodate this project.

.6 Service Shaft

.1 The Service Shaft appears to be in good condition and can support the Co-Location project.

.2 Located as a spine to the Lab Block, this vertical service shaft provides flexible access from the 1st to 5th floor. This shaft will provide ease of mechanical and electrical installations on all floors.

Figure 11 The central service shaft in the Lab Block from the 1st to 5th floors.

Recommendations – Service Shaft

- There is no architectural work required for this area to accommodate this project.

.7 Washrooms

.1 The Washrooms will need to be addressed by the Co-Location project as discussed below:

- .1 Minimum number for each sex
- .2 Minimum number barrier free

.2 Washroom facilities are provided throughout the Lab Block. Upgrading these facilities to include barrier free provisions is recommended as they do not meet current building code requirements. Finishes in the washrooms are durable and robust. However, they are dated and may need to be updated to achieve a uniform aesthetic on all floors to accommodate this project. Also, washrooms will need to be upgraded on each floor to accommodate current Barrier Free requirements.

.3 The Admin Block has limited washroom facilities. Based upon the final design, adding washrooms in this area is recommended.

Figure 12 Washrooms in the Admin & Lab Block require upgrades.

Figure 13 Washrooms on each Level require upgrades for barrier free compliance.

.4 The table below is a summary of architectural action items for various elements as provided in the Sep 2013 Building Condition Report. Although all items should be addressed as recommended in the BCR, CKAID has reviewed which items are project specific and should be included in the scope of work for this Co-Location project – noted with a Yes. All other items are base building issues that should be addressed separately. CKAID has identified action items that will have a direct effect on this Co-Location project.

Element	Action	Year	Cost	Required for Co-Location Project
Washroom Partitions	Refinish Toilet Partitions	2020	$13,510	As required.

.5 **Required Washrooms -** Based upon the National Building Code and occupant load calculations, the following washroom facilities are required. During design, this could be revised if a different occupant load is demonstrated.

3.1.17. Occupant Load

Business and personal services uses, offices @ 9.3m²/person. With the Co-location project, the occupancy load of the building will increase as many lab spaces will be converted into open office areas. During design, the actual occupant loads can be confirmed and could reduce occupant load per floor which may reduce the number of water closets and lavatories. For now, the chart below is based upon maximum occupant load per floor as per the National Building Code.

3.7.22. Water Closets & Lavatory Requirements

	Water Closets			**Lavatories**	
Level	**# persons**	**Male**	**Female**	**Male**	**Female**
1	195	6	6	3	3
2	220	7	7	4	4
3	228	7	7	4	4
4	151	6	6	3	3
5	151	6	6	3	3
Total	944				

.6 Level 1 Washrooms

Level 1		Existing							
		Water Closet				Lavatories			
Room		M	F	M/F	BF	M	F	M/F	BF
1-09	F		2				2		
1-12	M	2				2			
1-13	M	1				1			
1-40	BF				1				1
1-50	1stAid			1				1	
1-68	M	4				3			
1-89	M	3				2			
1-108	M	3				2			
1-111	W		2				2		
Sub-Total		13	4	1	1	10	4	1	1
19	**Total Water Closets**								
16	**Total Lavatories**								
Level 1 - Required									
		Water Closet				Lavatories			
		M	F	M/F	BF	M	F	M/F	BF
Required		6	6	0	2	2	2		2
Difference		7	-2	1	-1	8	2	1	-1

Recommendations – Level 1 Washrooms

- Add new Barrier Free Washroom backing on to 1-40; providing 1 male and 1 female for the floor.
- Convert male washroom into female washroom to ensure adequate facilities are provided for both sexes.
- Consider removing locker area on lab block west side and expand washrooms to accommodate requirements.

.7 Level 2 Washrooms

Level 2 - Existing									
		Water Closet				Lavatories			
Room		M	F	M/F	BF	M	F	M/F	BF
2-17	M/F			1				1	
2-18	M/F			1				1	
2-28	M/F			1				1	
2-40	BF				1				1
2-105	F		2				2		
2-109	M	4				3			
Sub-Total		4	2	3	1	3	2	3	1
10	**Total Water Closets**								
9	**Total Lavatories**								
Level 2 - Required									
Required		7	7	0	2	4	4	0	2
Difference		**-3**	**-5**	3	**-1**	**-1**	**-2**	3	**-1**

Recommendations – Level 2 Washrooms

- Add new Barrier Free Washroom backing on to 2-40; providing 1 male and 1 female for the floor.
- Consider removing locker area on lab block west side and expand washrooms to accommodate requirements.
- Designate Male/Female single washrooms to single sex.

.8 Level 3 Washrooms

Level 3									
		Water Closet				Lavatories			
Room		M	F	M/F	BF	M	F	M/F	BF
3-13	F		2				2		
3-16	M	4				3			
3-78	BF				1				1
Sub-Total		4	2	0	1	3	2	0	1
7	**Total Water Closets**								
6	**Total Lavatories**								
Level 3 - Required									
Required		7	7	0	2	4	4	0	2
Difference		-3	-5	0	-1	-1	-2	0	-1

Recommendations – Level 3 Washrooms

- Add new Barrier Free Washroom backing on to 3-78; providing 1 male and 1 female for the floor.
- Consider removing locker area on lab block west side and expand washrooms to accommodate requirements.

.9 Level 4 Washrooms

Level 4									
		Water Closet				Lavatories			
Room		M	F	M/F	BF	M	F	M/F	BF
4-07	F		2				2		
4-10	M/F	4				3			
4-76	M/F			1				1	
4-78	BF				1				1
Sub-Total		4	2		1	3	2		1
7	**Total Water Closets**								
6	**Total Lavatories**								
Level 4 - Required									
Required		6	6	0	2	3	3	0	2
Difference		-2	-4	0	-1	0	-1	0	-1

Recommendations – Level 4 Washrooms

- Add new Barrier Free Washroom backing on to 4-78; providing 1 male and 1 female for the floor.
- Consider removing locker area on lab block west side and expand washrooms to accommodate requirements.

.10 Level 5 Washrooms

Level 5									
		Water Closet				Lavatories			
Room		M	F	M/F	BF	M	F	M/F	BF
5-08	F		2				2		
5-10	M	4				3			
5-83				1				1	
5-85					1				1
Sub-Total		4	2		1	3	2		1
7	**Total Water Closets**								
6	**Total Lavatories**								
Level 5 - Required									
Required		6	6	0	2	3	3	0	2
Difference		-2	-4	0	-1	0	-1	0	-1

Recommendations – Level 5 Washrooms

- Add new Barrier Free Washroom backing on to 5-85; providing 1 male and 1 female for the floor.
- Consider removing locker area on lab block west side and expand washrooms to accommodate requirements.

Recommendations – All Washrooms

- Upgrade washroom finishes and fixtures.

.8 Locker Rooms

.1 The Locker Rooms are not required for the Co-Location project and can be re-purposed.

.2 The Lab Block has locker rooms on each floor. Currently, the existing washrooms do not provide adequate facilities for the project. Lockers are not a Workplace 2.0 compliant amenity in an office space. Where required, Lockers should be converted to Washrooms or other functional program space.

Figure 14 Existing Locker room.

Recommendations – Locker Rooms

- Review and confirm washroom requirements on each floor. Convert existing locker space into washroom space.

.9 Cafeteria

.1 The Cafeteria is not required for the Co-Location Project and should remain out of scope.

.2 Located on the 1st floor on the north east corner of the Admin block, a cafeteria provided food services to the building at one time. The cafeteria is currently not functioning. However, with increased occupancy levels in the building, the viability of a cafeteria re-opening is a possibility.

Figure 15 Existing cafeteria is currently not in use.

Figure 16 Existing cafeteria kitchen is currently not in use.

Recommendations - Cafeteria

- There is no architectural work required for this area to accommodate this project.

.10 Labs

.1 The Labs appear to be in good condition and can support the Co-Location project.

.2 Labs are located throughout the lab block. The existing labs are in good condition.

.3 As noted by DFO in a 2009 Space Utilization Report, many of the labs are under utilized and are not required.

.4 Through site observations, many labs were re-purposed into office space and storage areas.

.5 Assessments of lab use are being evaluated internally by DFO. Potential strategies for relocation and co-location of labs to meet DFO's needs is also being conducted internally.

Figure 17 Typical lab.

Figure 18 Typical lab converted into office space.

Figure 19 Typical under-utilized Lab.

Figure 20 Typical under-utilized Lab.

.6 The table below is a summary of architectural action items for various elements as provided in the Sep 2013 Building Condition Report. Although all items should be addressed as recommended in the BCR, CKAID has reviewed which items are project specific and should be included in the scope of work for this Co-Location project – noted with a Yes. All other items are base building issues that should be addressed separately. CKAID has identified action items that will have a direct effect on this Co-Location project.

Element	Action	Year	Cost	Required for Co-Location Project
Walk-in Freezer/Cold Storage	Replace Walk-in Freezers	2021	$266,560	As required.

Recommendations - Labs

- A significant number of labs will be demolished to accommodate office area, support area and special purpose space area requirements. Some labs will remain and will be used by other DFO departments.
- Some labs will remain to host DFO lab operations.

.11 Offices

.1 The Offices do not comply with WP2.0 and will be demolished in the Co-Location project.

.2 Offices are located on Levels 1 and 2 of the Admin Block.

.3 Offices are also located on Levels 1 to 5 at the perimeter of the Lab Block.

.4 Offices do not conform to Workplace 2.0.

Figure 21 Enclosed and Open Office Areas in the Admin Block.

Recommendations - Labs

- All existing office areas in the building will be affected by the co-location project.

.12 Level 1 Lab Block Storage

.1 The Level 1 Lab Block Storage appears to be in good condition and can support the Co-Location project.

.2 Located on Level 1, the lower level provides storage space for DFO and the building. Level 1 appears to be under-utilized space. Future space-utilization assessments are recommended to optimize the area.

.3 The table below is a summary of architectural action items for various elements as provided in the Sep 2013 Building Condition Report. Although all items should be addressed as recommended in the BCR, CKAID has reviewed which items are project specific and should be included in the scope of work for this Co-Location project – noted with a Yes. All other items are base building issues that should be addressed separately. CKAID has identified action items that will have a direct effect on this Co-Location project.

Element	Action	Year	Cost	Required for Co-Location Project
Plywood Partitions with Studs	Replace Plywood Partitions	2025	$18,840	No

Recommendations – Level 1 Lab Block Storage

- There is no architectural work required for this component to accommodate this project.

1.4 Building Components

The following existing base building components were reviewed on site to determine if each component is sufficient to accommodate the Co-location project. The evaluation criteria was based on a technical observation of the components ability to support EC and DFO operations. The September 2013 Building Condition Report was also reviewed to provide additional information in the evaluation of each component.

.1 Roof

.1 The Roof appears to be in poor condition and should be replaced. At this time, the roof covering is most likely not capable of supporting the Co-Location project due the risk of potential leaks and subsequent damage in the future.

.2 The existing roof on the Admin and Lab block is a 4 ply built-up roof that was installed in 1998.

Figure 22 BUR roofing.

.3 The table below is a summary of architectural action items for various elements as provided in the Sep 2013 Building Condition Report. Although all items should be addressed as recommended in the BCR, CKAID has reviewed which items are project specific and should be included in the scope of work for this Co-Location project – noted with a Yes. All other items are base building issues that should be addressed separately. CKAID has identified action items that will have a direct effect on this Co-Location project.

Element	Action	Year	Cost	Required for Co-Location Project
Built-up Roof, Tar & Gravel Roof	Replace BUR Roofing, Admin & Lab Block	2018	$1,294,800	Should be considered

Recommendations - Roof

- There is no architectural work required for this component to accommodate this project.

.2 Windows/ Exterior Doors

.1 The Windows/ Exterior Doors appear to be in good condition and can support the Co-Location project.

.2 Windows are fixed double glazed units in aluminum frames.

.3 Exterior doors are a dark bronze anodized, aluminum frame with tempered glazing.

.4 The table below is a summary of architectural action items for various elements as provided in the Sep 2013 Building Condition Report. Although all items should be addressed as recommended in the BCR, CKAID has reviewed which items are project specific and should be included in the scope of work for this Co-Location project – noted with a Yes. All other items are base building issues that should be addressed separately. CKAID has identified action items that will have a direct effect on this Co-Location project.

Element	Action	Year	Cost	Required for Co-Location Project
Exterior Overhead Door	Conduct Repairs - All Overhead Doors	2014	$13,788	No
Exterior Overhead Door	Replace All Overhead Door Assemblies	2020	$68,940	No
Aluminum Windows	Insulate Joints at Window Frames	2016	$5,245	No
Aluminum Windows	Replace Glazing Units	2022	$472,050	No
Exterior Door Hardware	Replace Worn Door Hardware	2016	$5,784	No

Recommendations – Windows/ Exterior Doors

- All new openings (Admin windows, 2nd floor exit) in the existing envelope will need to be assessed during design.

Figure 23 Existing Admin block - new windows may be provided on Level 3

.3 Envelope

.1 The exterior envelope of the building appears to be in good condition and can support the Co-Location project.

.2 The envelope is primarily characterized with 10mm precast concrete panels over an airspace, 50mm rigid insulation, air barrier and 200mm concrete (block).

.3 The envelope also features a large sloping copper roof/wall extending from the roof of the main entry to the roof parapet.

Figure 24 Exterior envelop - precast panels & sloped copper siding

.4 The table below is a summary of architectural action items for various elements as provided in the Sep 2013 Building Condition Report. Although all items should be addressed as recommended in the BCR, CKAID has reviewed which items are project specific and should be included in the scope of work for this Co-Location project – noted with a Yes. All other items are base building issues that should be addressed separately. CKAID has identified action items that will have a direct effect on this Co-Location project.

Element	Action	Year	Cost	Required for Co-Location Project
Exterior Wall - Precast Concrete Panels	Consultant Study - Assess Condition of Panel Anchors	2016	$23,443	No
Exterior Wall - Precast Concrete Panels	Replace Panel Joints & Patch Panels	2020	$41,370	No

Recommendations - Envelope

- All new openings (Admin windows, 2nd floor exit) in the existing envelope will need to be assessed during design.

.4 Ceilings

.1 The Ceilings of the building appears to be in good condition and can support the Co-Location project. A major portion of ceilings will need to be replaced to accommodate the project.

.2 A Linear Metal Ceiling system is located in the Lab Block Main Corridor and the Entrance Lobby – it is in good condition.

.3 Gypsum board ceilings are located on Level 1 of the Lab Block and washrooms; they are in good condition.

.4 Suspended Acoustic Panel Ceilings are located throughout the Admin and Blocks and are in good condition.

Figure 25 Typical ACT ceiling

Figure 26 Typical Metal Linear Ceiling in Main Corridor

Recommendations - Ceilings

- All Gypsum Board and Suspended Acoustic Panel Ceilings will need to be replaced where affected by the Co-Location project
- The existing Linear Metal Ceiling System should remain

.5 Partitions

.1 The Partitions of the building appear to be in good condition and can support the Co-Location project. A major portion of Partitions will need to be replaced to accommodate the project.

.2 Service rooms and service shaft partitions (including lab service core) are typically 200mm concrete block in good condition.

.3 The Main Corridor, Elevator Shaft, Stairwells and end walls of each Lab compartment are a 200mm concrete wall at following locations in good condition.

.4 At some Labs and all Offices Partitions are full height constructed with 2 layers 13mm gypsum board both sides 89mm steel stud with batt insulation and are in good condition.

Figure 27 Typical office corridor with GB partitions both sides

Recommendations - Partitions

- All Partitions will need to be replaced where affected by the Co-Location project

.6 Interior Doors

.1 The Interior Doors of the building appear to be in good condition and can support the Co-Location project. A major portion of Interior Doors will need to be replaced to accommodate the project.

.2 The Interior doors are a combination of wood and metal.

Figure 28 Typical Interior Door

.3 The table below is a summary of architectural action items for various elements as provided in the Sep 2013 Building Condition Report. Although all items should be addressed as recommended in the BCR, CKAID has reviewed which items are project specific and should be included in the scope of work for this Co-Location project – noted with a Yes. All other items are base building issues that should be addressed separately. CKAID has identified action items that will have a direct effect on this Co-Location project.

Element	Action	Year	Cost	Required for Co-Location Project
Wood Doors	Provide Missing Kick-plates	2014	$12,600	No
Wood Doors	Replace Wood Doors - 25 Doors	2022	$39,375	No
Metal Doors	Replace Metal Doors to Loading Area	2015	$4,936	No

.4 Interior door hardware consists of:

- .1 Card Access at Vestibule doors. While most other doors have typical lockset:
- .2 mortise lockset with rose trim and integral keying.

Recommendations – Interior Doors

- All Interior Doors will need to be replaced where affected by the Co-Location project.
- All Interior Door hardware will need to be reviewed and replaced where affected by the project. Door knobs will need to be replaced with levers where required.

.7 Floors

.1 The Floors of the building appear to be in good condition and can support the Co-Location project.

.2 In the Admin Block, the Floors are 225mm (9") concrete slab with 2.5mx 2.5m x 110mm deep drop panels

.3 In the Lab Block, the Floors are 150mm (6") concrete slab (on concrete beams at 600mm (2') o.c. at labs only) and 150mm (6") concrete slab at offices and corridors.

Figure 29 Typical floor with sheet flooring and carpet finish

.4 The table below is a summary of architectural action items for various elements as provided in the Sep 2013 Building Condition Report. Although all items should be addressed as recommended in the BCR, CKAID has reviewed which items are project specific and should be included in the scope of work for this Co-Location project – noted with a Yes. All other items are base building issues that should be addressed separately. CKAID has identified action items that will have a direct effect on this Co-Location project.

Element	Action	Year	Cost	Required for Co-Location Project
Slab above Grade - Concrete	Visually Monitor 2nd Floor Slab - Monthly	2013	$0	No

Recommendations - Floors

- There is no architectural work required for this component to accommodate this project.

.8 Finishes

.1 The Finishes in the building appear to be in good overall condition and can support the Co-Location project. However, many of the finishes are dated and should be upgraded to improve the appearance and long term durability of the project.

.2 Finishes - Walls

.1 Ceramic Wall and Floor Tile

.1 Location: All washrooms.

.2 2"x2" brown or white wall tile

.3 2"x2" brown floor tile

.4 Each washroom is estimated to have approximately 150m²

Figure 30 Typical ceramic tile in washrooms.

.2 Wall Paint

.1 Location: Throughout all areas of the Lab and Administration Block

Figure 31 Typical wall paint throughout the Lab and Admin Blocks.

.3 Wood Wall Finish

.1 Location: Walls and doors in the Admin Block office area on the 1st and 2nd Floors

.2 3" solid oak horizontal boards (tongue and groove).

Figure 32 Typical wood finish in the Admin Block.

.4 Concrete

.1 Location: Main Entrance Lobby: Level 1 to 5

.2 Original fluted concrete finishes flank the north and south walls of the Main Entrance Lobby

Figure 33 Fluted concrete finish in the Main Entrance Lobby.

.3 Finishes - Floors

.1 Carpeting

.1 Location: Throughout the Administration and Lab blocks:

.1 Administration Block:

.1 Level 1: Finance Area, Cafeteria

.2 Level 2: Office Area, seminar rooms

.3 Level 3: Library

.2 Lab Block:

.1 All lab offices and lab modules as follows:

.2 Level 1: 12 of 27 lab modules

.3 Level 2: 5 of 36 lab modules

.4 Level 3: 9 of 36 lab modules

.5 Level 4: 0 of 36 lab modules

.6 Level 5: 5 of 36 lab modules

.2 Sheet Vinyl Floor

.1 Locations:

.1 Level 1: none

.2 Level 2: 2 of 36 lab modules, corridors

.3 Level 3: 6 of 36 lab modules, corridors

.4 Level 4: 15 of 36 lab modules, corridors

.5 Level 5: none

.2 Original Sheet Vinyl flooring

Figure 34 Original Vinyl flooring throughout the Lab Block.

.3 Painted Concrete Floor

.1 Location: Service rooms/areas and storage rooms including:

.1 Water treatment addition

.2 Loading area

.3 Mechanical penthouse.

.4 Quarry Tile Floor

.1 Location: Quarry Administration Block as follows:

.1 Main Entry Lobby including stairs and landings at basement level, Main floor level and Second floor level. These floor areas are original construction.

.2 6"x6" brown tile

Figure 35 Quarry tile in the Main Entrance Lobby.

.5 Epoxy Floor

.1 Location:

.1 Lab block:

.1 Level 1: 2 of 27 lab modules

.2 Level 2: 9 of 36 lab modules

.3 Level 3: 0 of 36 lab modules

.4 Level 4: 0 of 36 lab modules

.5 Level 5: 0 of 36 lab modules

.6 Vinyl Floor Tile

.1 Location: Lab block:

.1 Level 1: 5 of 27 lab modules

.2 Level 2: 0 of 36 lab modules

.3 Level 3: 5 of 36 lab modules

.4 Level 4: 5 of 36 lab modules

.5 Level 5: 5 of 36 lab modules

.2 Original vinyl tile

.4 Finishes - Ceilings

.1 Gypsum Board Ceiling

.1 Location: Lab Block, on Level 1:

.1 Cafeteria ceiling (stipple finish)

.2 First Aid Room

.2 Suspended Acoustic Panel Ceiling

.1 Location:

.1 Administration block:

.1 Level 1: Finance Area

.2 Level 2: Office Area

.3 Level 3: Library

.2 Lab block: All lab offices and lab corridors (except main corridor).

.1 Service block: All offices on Level 1.

.2 All tiles are 2'x2' white mineral fibre supported by aluminum T-Bar. T-bar is prefinished white except at main floor executive office suite and Level 3 library - colour: black

Figure 36 Typical ACT throughout the Admin and Lab Blocks.

.3 Linear Metal Ceiling

.1 Location:

.1 Lab block: All floors - main corridor within lab block

.2 Administration Block: Main entrance lobby

.2 The ceiling utilizes 3" wide linear metal (dark bronze prefinished aluminum).

Figure 37 MLCS in Main Entrnace Lobby and Admin Block Main Corridor.

.5 The table below is a summary of architectural action items for various elements as provided in the Sep 2013 Building Condition Report. Although all items should be addressed as recommended in the BCR, CKAID has reviewed which items are project specific and should be included in the scope of work for this Co-Location project – noted with a Yes. All other items are base building issues that should be addressed separately. CKAID has identified action items that will have a direct effect on this Co-Location project.

Element	Action	Year	Cost	Required for Co-Location Project
Window Coverings - West Facing	Replace Window Coverings - West Elevation	2018	$13,050	Yes
Window Coverings - West Facing	Replace Window Coverings - Not West	2023	$26,100	Yes

Recommendations – Lab Block Main Corridor

- All finishes should be upgraded.

Recommendations – Washrooms

- All finishes should be upgraded.

Recommendations – Admin Block - Office Area

- As the majority of this area will be affected by construction, it is recommended to replace and upgrade all finishes

Recommendations – Lab Block - Lab/ Office Area

- As the majority of this area will be affected by construction, it is recommended to replace and upgrade all finishes

.6 All other areas of the building will not require upgrades to finishes unless construction work affects the area or a component in the area.

Figure 38 Level 3 Admin Block

1.5 Site Areas and Components

The following existing Site Areas and Components were reviewed on site to determine if each area and component are sufficient to accommodate the Co-location project. The evaluation criteria was based on a functional assessment and technical observation of the area's and component's ability to support EC and DFO operations. The September 2013 Building Condition Report was also reviewed to provide additional information in the evaluation of each area.

.1 Parking

.1 The Parking area and components appear to be in good condition and can support the Co-Location project.

.2 However, the parking area capacity will not be sufficient based upon current parking requirements. The parking area will need to be expanded to accommodate the maximum number of additional stalls that are required for the Co-Location project. Parking area expansion will be limited by approvals and agreements with the University of Manitoba. Expansion could also be limited by the project's budget.

.3 There are three paved main parking lots, all of which have paved asphalt and accommodate approximately 200 stalls.

.4 Components such as curbs, lights of the existing parking area appear to be adequate.

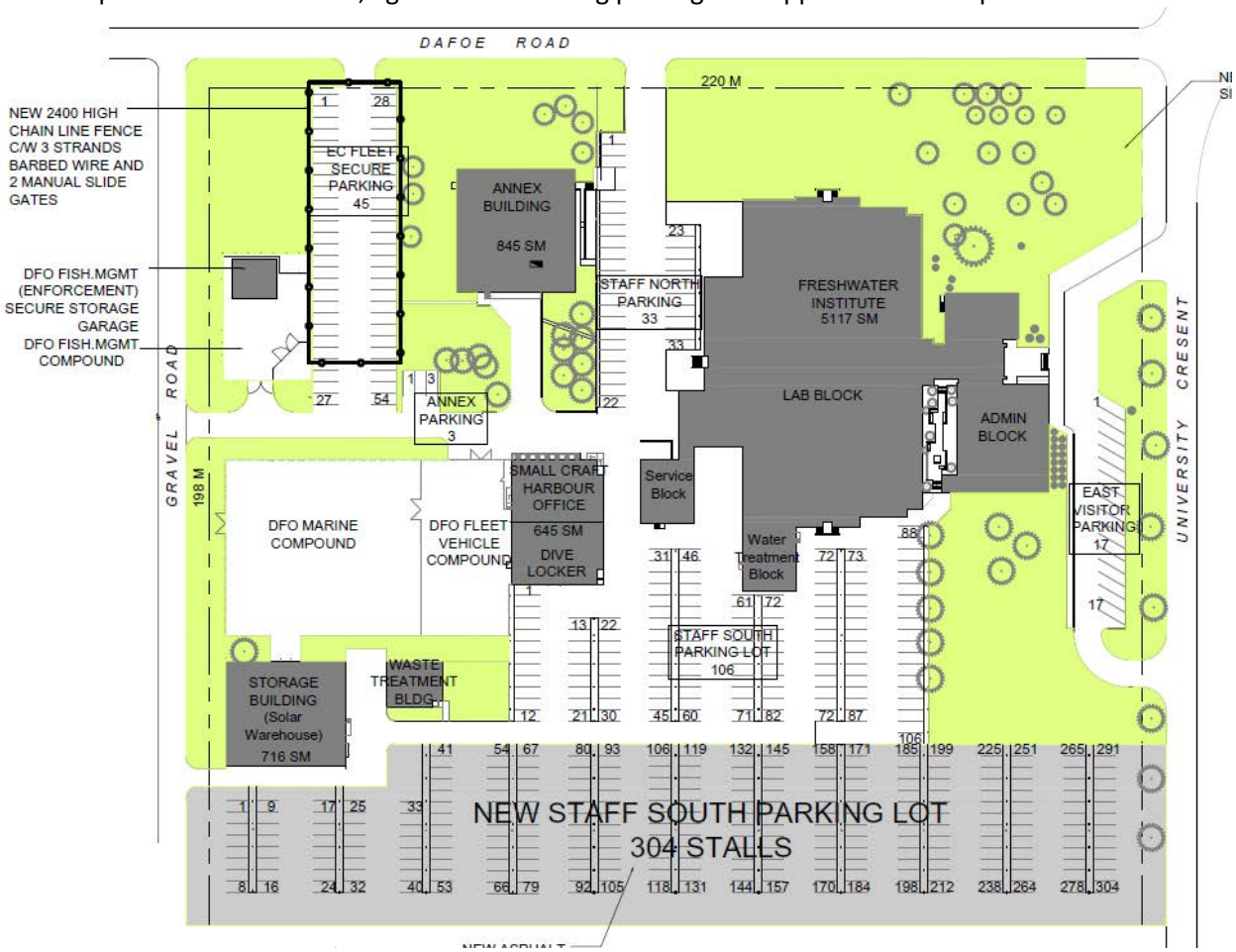

Figure 39 Parking areas at FWI.

Figure 40 North West overflow gravel parking area.

Figure 41 Staff south paved parking area.

.5 The table below is a summary of architectural action items for various elements as provided in the Sep 2013 Building Condition Report. Although all items should be addressed as recommended in the BCR, CKAID has reviewed which items are project specific and should be included in the scope of work for this Co-Location project – noted with a Yes. All other items are base building issues that should be addressed separately. CKAID has identified action items that will have a direct effect on this Co-Location project.

Element	Action	Year	Cost	Required for Co-Location Project
Paved Parking Lots	Reconstruct Parking Lots	2020	$1,219,500	No
Pavement Marking	Repaint Pavement Markings	2015	$13,063	No
Unpaved Parking Lots	Install New Pavement Structure	2020	$110,000	No

Recommendations – Parking

- New asphalt parking area in south area
- 304 stalls c/w electrical outlets
- Site lighting
- New access to Gravel Road and University Crescent
- New 2400 high chain link fence c/w 3 strands barbed wire and manual sliding gates for 45 Fleet vehicles

.2 Soft Landscape

.1 The Soft Landscape areas and components appear to be in good condition and can support the Co-Location project.

.2 Soft landscaping and natural landscape features are sufficient and in good condition. There are generous open grass areas surrounding the front of the Lab/Administration building. There is an adequate number of mature trees located in the open areas.

.3 The building features precast concrete planters at the main entry and planting beds at the east and south sides of the office block.

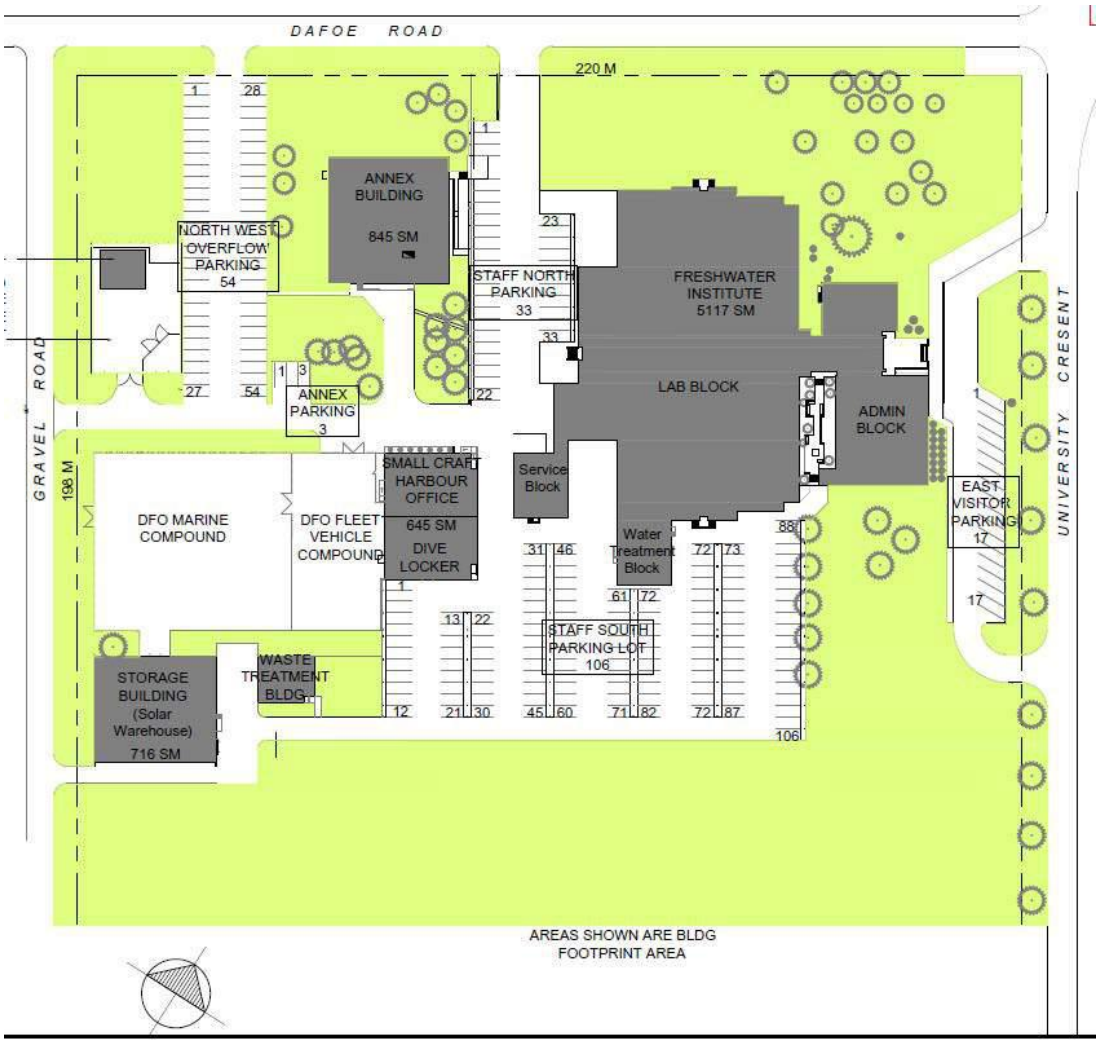

Figure 42 Areas in green represent soft landscaping.

Figure 43 Typical mature trees and open grass areas throughout.

Figure 44 Building sign will need to be updated.

Figure 45 Existing soft landscape - potential area for parking expansion.

Recommendations – Soft Landscape

- There is no architectural work required for this component to accommodate this project.

.3 Hard Landscape

.1 The Hard Landscape areas and components appear to be in average condition and can support the Co-Location project.

.2 The main entry plaza was reconstructed in 2008 with paving stones and concrete stairs and stainless steel handrails.

.3 The 2013 BCR identified many maintenance items that should be addressed to maintain the site. These items are listed below.

Figure 46 Sidewalks, curbs and roads are showing signs of deterioration and should be repaired.

Figure 47 Sidewalks, steps and handrails appear to be sufficient for the Co-Location project.

.4 The table below is a summary of architectural action items for various elements as provided in the Sep 2013 Building Condition Report. Although all items should be addressed as recommended in the BCR, CKAID has reviewed which items are project specific and should be included in the scope of work for this Co-Location project – noted with a Yes. All other items are base building issues that should be addressed separately. CKAID has identified action items that will have a direct effect on this Co-Location project.

Element	Action	Year	Cost	Required for Co-Location Project
Area Posts/Bollards	Repaint Bollards	2016	$3,414	No
Concrete Wall	Repaint Concrete Wall	2016	$3,740	No
Fence & Gates	Replace Fence Hardware & General Repairs	2018	$10,560	No
Flagpole	Replace Flagpole	2018	$4,334	No
Handrails and Railings-Site Related	Replace Exterior Handrails	2023	$9,525	No
Exterior Stairs	Replace Nosings & Concrete Repairs & upgrade handrails	2014	$19,286	No
Freestanding Signage	Replace Exterior Signage	2015	$6,056	Yes
Soft Landscaping	Soft Landscaping – Maintenance	2014	$78,000	No
Bituminous Walkway & Areaways	Install New Paving Stone Walkway	2015	$35,400	No
Concrete Curbing	Repair & Replace Damaged Curbing	2017	$15,840	No
Walkway Pavers & Areaways	Install New Concrete Sidewalk - Annex Bldg. - South	2015	$6,600	No

Recommendations – Hard Landscape

- Replace the freestanding building signage.

1.6 Preliminary Building Code Issues

.1 Occupant Load & Number of Washrooms

The following occupant load has been prepared to calculate the washroom requirements. These numbers will need to be re-calculated during the design phase to ensure actual occupant load is accounted for.

NBC 3.1.17. Occupant Load

Business and personal services uses, offices @ 9.3m²/person. With the Co-location project, the occupancy load of the building will increase as many lab spaces will be converted into open office areas. During design, the actual occupant loads can be confirmed and could reduce occupant load per floor which may reduce the number of water closets and lavatories. For now, the chart below is based upon maximum occupant load per floor as per the National Building Code.

	Admin Block		Lab Block SOUTH	Lab Block NORTH	Building TOTAL		# persons
Level	Area (m²)	#	Area (m²)	Area (m²)	Area (m²)	#	
1	445	48	795	565	1360	147	195
2	455	49	795	795	1590	171	220
3	525	57	795	795	1590	171	228
4	x	x	700	700	1400	151	151
5	x	x	700	700	1400	151	151
Total	1425	154	3785	3555	7340	790	944

NBC 3.7.22. Water Closets & Lavatory Requirements
3.8.2.3. Washrooms required to be barrier free.

Refer to Section 1.3 Building Areas for preliminary washroom requirements

Recommendations – Occupant Load

- Occupant Load should be re-confirmed to determine the number of Water Closets and Lavatories required for each floor.
- The number of water closets and lavatories should meet the current building code
- All barrier free washroom requirements should be provided

.2 Fire Protection - Sprinklers

NBC 3.2.2.80. Group F, Division 3, up to 6 Storeys, Sprinklered

- The building is sprinklered throughout
- It is not more than 6 storeys in building height
- It has a building area not more than 7200 m²
- The building is noncombustible
- Floor assemblies are fire separations with a fire resistance rating of 1 hr.
- Mezzanines shall have a fire-resistance rating not less than 1 hr, and
- Loadbearing walls, columns and arches shall have a fire-resistance rating not less than that required for the supported assembly

.1 In 2009, a Fire Protection Upgrade project was carried out to address outstanding deficiencies with respect to Fire Protection. The Upgrades were prioritized and selected in conjunction with HRSDC Fire Protection Engineering, based on the agreement with DFO Real Property Management that the main Lab building would be sprinklered in the near future. A sprinkler project was carried out to completion of construction documents only. The building remains unsprinklered.

Recommendations – Sprinklers

- The building will most likely need to be sprinklered because:
  - The change in the intensity of use of the building will increase – more occupants will be using the building
  - Many low-occupant-load Labs will be replaced with a higher density office areas
  - The existing building, while meeting the fire protection requirements of the building code at the time it was built, does not meet the current building codes.
  - The sprinkler system is the main fire protection system that has been identified in this building capability report that should be added.

.3 Main Lobby – 2 exits

NBC 3.4.2 Number and Location of Exits from Floor Areas

All floor areas are to provide 2 exits. After review on site, it appears the Main Entrance Lobby does not provide 2 exits.

Recommendations – Main Lobby – 2 exits

- During future design phases, ensure 2 exits are provided for the Main Entrance Lobby

.4 Guardrails in exit stairs

Guardrails in all exit stairs do not comply with the current building code and should be upgraded.

NBC3.4.6.6. Guards

Guardrail openings are not to exceed 100mm. Handrails should be upgraded to meet CSA B651 – 4.1.4 to have a circular section versus a rectangular section.

Recommendations – Guardrails

- Upgrade existing guardrails

.5 Barrier Free Interior Door hardware & Elevator Interiors

A variety of base building conditions exist that do not comply with the current CSA B651 (current edition) – Accessible design for the built environment. Below is a list of conditions that should be upgraded to comply. This intention of this report is not to provide an extensive accessibility audit, but rather to highlight some of the key concerns with the base building that should be addressed in future design stages.

Recommendations – Barrier Free

CSA B651 - 4.1.2.3 Warning indicators for stairs.

Warning indicator should be installed at all stairs.

CSA B651 – 4.1.3 Doors and doorways

Many existing doorways do not provide required manoeuvring areas for doors. Doorway widths should comply with current clear opening widths in doorways. In addition, lever handles should be provided at all doors on the barrier free path of travel.

CSA B651 – 4.1.1 Handrails

Handrails at stairs should be upgraded to have circular sections versus rectangular sections.

CSA B651 – 4.1.5 Stair Handrails

Handrails should be added to the outside edges of the stairs to provide adequate extensions at each landing and floor.

CSA B651 - 4.1.8.2 Areas of Refuge

Areas of Refuge should be reviewed with the AHJ to determine if they are required.

CSA B651 - 4.3 Washroom Facilities

Washroom upgrades are required on all floors to ensure barrier free requirements are met.

CSA B651/ NBC 3.3.1.13. Doors and Door hardware

Lever handles required as per CSA B651.

CSA B651 – Appendix E Elevator requirements

Provide tactile and illuminated controls, and mount at 1200 AFF maximum.

1.7 Sustainability

At this time, there are no specific sustainable design programs or targets that are to be met for the project. After review of the existing building and site, the existing building and site are capable of supporting current sustainability strategies for the Co-Location project. The following list of potential strategies has been provided for consideration in future design stages. Many of the strategies may not be supported by WP2.0 or Staff. For example, Shower Facilities are not a pre-approved functional use under WP2.0 and would therefore need to be added as a Special Purpose Space and require appropriate approvals. Another example, reducing the Parking Footprint would not be perceived as a positive strategy to Staff who typically rely on personal vehicles to commute to work and want a parking stall. Sustainability strategies are listed for consideration as follows:

.1 Bicycle Facilities - promote bicycling and transportation efficiency and reduce vehicle distance traveled.

.2 Shower Facilities - improve public health by encouraging utilitarian and recreational physical activity.

.3 Reduced Parking Footprint - minimize the environmental harms associated with parking facilities, including automobile dependence, land consumption, and rainwater runoff.

.4 Green Vehicles - reduce pollution by promoting alternatives to conventionally fueled automobiles.

.5 Indoor Water Use Reduction - reduce indoor water consumption.

.6 Construction and Demolition Waste Management Planning - reduce construction and demolition waste disposed of in landfills and incineration facilities by recovering, reusing, and recycling materials.

.7 Minimize Chemical Content in Furniture and Furnishings - enhance the environmental and human health performance attributes associated with freestanding furniture and medical furnishings.

.8 Enhanced Indoor Air Quality Strategies - promote occupants' comfort, well-being, and productivity by improving indoor air quality.

.9 Low-Emitting Materials - reduce concentrations of chemical contaminants that can damage air quality, human health, productivity, and the environment.

.10 Construction Indoor Air Quality Management Plan - promote the well-being of construction workers and building occupants by minimizing indoor air quality problems associated with construction and renovation.

.11 Indoor Air Quality Assessment - establish better quality indoor air in the building after construction and during occupancy.

.12 Interior Lighting - promote occupants' productivity, comfort, and well-being by providing high-quality lighting.

.13 Daylight - connect building occupants with the outdoors, reinforce circadian rhythms, and reduce the use of electrical lighting by introducing daylight into the space.

.14 Acoustic Performance - provide workspaces and amenity spaces that promote occupants' well-being, productivity, and communications through effective acoustic design.

2.1 Mechanical Introduction

.1 The purpose of this report is to provide the Client with a general assessment of the existing mechanical/electrical components and systems that would need replacement or greater scrutiny for the proposed Co-location project by giving a general idea of their age, condition and the capital investment required.

.2 The purpose of the report is not to provide an accurate inventory or condition of all equipment and material. This was not possible in the amount of time spent on site given the size of the building and all the devices it contains. As such, not all equipment, devices may have been accounted for.

.3 The preparation of this report included; general visual reviews of the interior and exterior conducted over a number of site visits; a review of the available documentation of previous construction projects; and discussions with the Maintenance Personnel.

.4 No detailed testing was performed in the preparation of this report. Further investigation or additional testing may change some of the conclusions and recommendations that are presented.

.5 This report was prepared exclusively for CKAID and their client PWGSC. The recommendations provided herein may not be used for any other purpose, or by any other parties, without written authorization of Tower Engineering Limited Partnership. The use of this report by third parties is done so at the risk and responsibility of those parties. The findings and recommendations of this report were prepared in accordance with generally accepted professional engineering principles and practice. No other warranty, expressed or implied, is given.

.6 Any use that a third party makes of this report, or any reliance on decisions made based on it, is the responsibility of such third parties. Tower Engineering accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

.7 Life span estimates where given are based on industry standards.

.8 The costs provided are class D estimates, are in current dollars and include the cost of installation for the mechanical and electrical components only as outlined. The respective costs do not reflect additional costs which may be associated with the work, such as, for electrical disconnections, reconnections, new power and panels, etc. that may be required and general construction requirements such as cutting and patching, new shafts, new rooms, etc..

2.2 MECHANICAL Components

Following the mandate of the BCR, the following existing base building components were reviewed on site to determine if they were sufficient to accommodate the Co-location project. The evaluation criteria was based on a technical observation of the components' ability to support EC and DFO operations. The September 2013 Building Condition Report was also reviewed to provide additional information in the evaluation of each component as they pertain to the fit-up of the proposed spaces.

.1 HVAC

.1 Fundamentally, the HVAC systems are in good condition and can support the Co-Location project.

.2 All areas of the proposed renovations are served by central air handling units located in the Mechanical Penthouse.

.3 Description: The building's HVAC system consists of large, central, dual duct air handling units located in the Mechanical Penthouse. These large units simultaneously supply heating and cooling air streams to the spaces within their respective areas through cold and hot air ducts that usually run parallel to each other. The air from these ducts is fed into blending/mixing boxes. There is one blending box per thermal zone though thermal zones may contain more than one room. Depending on the requirement of the thermostat in the zone, the damper inside the blending box will modulate allowing either more hot air or more cold air into the space. Each air stream is maintained at a constant temperature by having heat or cooling added to it at the air handler. Spaces around the perimeter of the building also have hydronic (hot water) heaters.

.4 Additional systems in the building include: laboratory exhaust and fume hood exhaust, storage room exhaust, change room exhaust and other miscellaneous systems. All exhaust fans are located in the Mechanical Penthouse.

.5 Included in the HVAC system are boilers, steam-to-hot water converters, pumps, chillers, cooler towers, controls compressors, and other equipment and material in the background necessary for the operation of whole system.

.6 The main central systems are very robust and were designed and built for a large laboratory which is much more demanding than the proposed renovations which consist primarily of office space. However, the ultimate replacement of these main systems is beyond the scope of this report. The September 2013 Building Condition Report is to be consulted for their condition and life expectancy. For this reason it is suggested that these systems would not be affected by the proposed renovations.

.7 The down side to point 6 is that the present systems are much less efficient that typical office systems due to the more demanding and exacting requirements that they were originally designed to fulfill. Ventilation rates are higher than necessary for typical office systems and the large central air handlers operate at much higher pressures moving large volumes of air. The demands and requirements of laboratory result in a causal sequence where the heating and cooling loads are greater, the equipment is larger and the operating costs are higher. Fine tuning the operation of the existing equipment would not reduce the operating costs of this building, if used as an office, in a significant way. A discussion and a plan from a broader perspective must be applied which is beyond the scope of this report.

.8 Therefore, the main items of immediate concern are those pieces of equipment in the proposed renovation area namely, the mixing boxes and any other actuating devices. These items should be replaced with new in any of the renovation options.

.9 Air supply devices such as grilles, registers and diffusers (GRDs) should be replaced to best accommodate the new architectural and interior design.

.10 All systems rendered redundant due to the repurposing of spaces should be removed, eg. laboratory exhaust fans, ductwork, piping, controls, etc.

.11 Insulation on heating and cooling piping fittings was observed that could possibly contain asbestos. This should be thoroughly assessed prior to any renovations.

Typical Blending Box

Typical Perimeter Wall Heating

.12 The table below is a summary of mechanical action items for various elements as provided in the Sep 2013 Building Condition Report. Although all items should be addressed as

recommended in the BCR, CKAID has reviewed which items are project specific and should be included in the scope of work for this Co-Location project – noted with a Yes. All other items are base building issues that should be addressed separately. CKAID has identified action items that will have a direct effect on this Co-Location project.

.13

Element	Action	Year	Cost	Required for Co-Location Project
Replace Blending Boxes	As required in the areas of renovation	2017	TBD	Yes
Replace GRDs	As required in the areas of renovation	2017	TBD	Yes
Asbestos Assessment		2017	TBD	Yes

Recommendations - HVAC

- Replace the mixing boxes, actuating devices and GRDs within the areas of renovation to accommodate the Co-Location project.
- Retain the services of Hazardous Materials Consultant to review the extent of asbestos and assess the removal.
- Removal of all systems rendered redundant due to the repurposing of spaces.

.2 PLUMBING

.1 Fundamentally, the Plumbing systems are in good condition and can support the Co-Location project.

.2 Description: The existing system generally consists of currently specified materials. Domestic cold water is supplied from the main campus source Basement Mechanical room. Domestic hot water is then generated locally by steam convertors. There are additional laboratory related plumbing systems present throughout including acid waste piping, dilution pit, and gas piping to laboratories.

.3 The cold and hot water distribution lines generally run in ceiling spaces and within the walls to serve the various plumbing fixtures. The water lines are in good condition.

.4 The sanitary lines that were observed were cast iron with the original hub and spigot fittings as well as more current mechanical fittings. The fittings appeared to be in good condition.

.5 Domestic cold and hot water piping distribution systems that were observed were copper. These systems typically have an expected service life of over 50 years and as such are expected to be incident free for some time.

.6 Laboratory waste piping was intact and appeared to be in good condition. No problems associated with this piping was reported.

.7 All water lines were observed to be insulated with pre-formed fiberglass. However, the insulation on the pipe fittings was suspect and could possibly contain asbestos. This should be thoroughly assessed prior to any renovations.

.8 The plumbing fixtures throughout the building are older but are in good working condition. The existing toilets are all wall hung, flush valve. The lavatory sinks are all wall hung. None of the fixtures incorporate water saving features.

Typical Toilet

Typical Urinals

.9 The washrooms would need to be reviewed by the architect for quantity, location and barrier free requirements.

.10 Some washrooms were observed to not contain floor drains.

.11 Safety fixtures such as eyewash stations are present and appeared to be in good condition.

.12 Gas piping to work stations is installed with the proper controls and indication. No problems associated with this piping were reported.

.13 The condition of the domestic water pump(s) and recirculation pump(s) that serve this building are beyond the scope of this report. The September 2013 Building Condition Report should be reviewed for their condition and life expectancy.

.14 The roof over the building is flat. Roof drainage is provided with roof drains and internal rain water leaders. The roof was not observed during the site review.

Typical Wall Hung Sink

Eyewash

.15 Refrigerated drinking fountains are provided at various locations in the building. These units appeared to be in good condition.

.16 The table below is a summary of mechanical action items for various elements as provided in the September 2013 Building Condition Report. Although all items should be addressed as recommended in the BCR, CKAID has reviewed which items are project specific and should be included in the scope of work for this Co-Location project – noted with a Yes. All other items are base building issues that should be addressed separately. CKAID has identified action items that will have a direct effect on this Co-Location project.

Element	Action	Year	Cost	Required for Co-Location Project
Replace Plumbing Fixtures	As required in the areas of renovation	2017	$1000/fixture	Yes
Asbestos Assessment		2017	TBD	Yes

Recommendations - PLUMBING

- Replace the existing sanitary fixtures to accommodate the Co-location project.

.3 FIRE PROTECTION

.1 The Fire Protection systems are deficient with respect to present day codes and would need further review before it could be concluded if they could support the Co-Location project.

.2 Description: The existing system only includes for sprinklers within the service cores at every floor. Fire hose cabinets are installed in the occupied areas.

.3 It is our understanding that in 2009, a Fire Protection Upgrade project was carried out to address outstanding deficiencies with respect to Fire Protection. The Upgrades were prioritized and selected in conjunction with HRSDC Fire Protection Engineering, based on the agreement with DFO Real Property Management that the main Lab building would be sprinklered in the near future. A sprinkler project was initiated and carried out to completion of construction documents only. At this time, the building remains unsprinklered.

.4 Fire department connections are present at the exterior of the building.

Typical Fire Hose Cabinet

Typical Fire Hose Cabinet

Recommendations – Sprinklers (excerpt from the BCR)

- The building will most likely need to be sprinklered because:
  - The change in the intensity of use of the building will increase – more occupants will be using the building
  - Many low-occupant-load Labs will be replaced with a higher density office areas.
  - The existing building, while meeting the fire protection requirements of the building code at the time it was built, does not meet the current building codes.
  - The sprinkler system is the main fire protection system that has been identified in this building capability report that should be added.

.4 CONTROLS

.1 Fundamentally, the Building Controls systems are in good condition and can support the Co-Location project.

.2 Description: The existing system is a combination of pneumatic, electric, and digital (DDC). The components include items such as AHU damper actuators, and HVAC space heating and cooling control valves and thermostats.

.3 The September 2013 Building Condition Report mentions that there are few problems associated with any of these components and advised that any problems be dealt with on a case by case basis as part of the Operations & Maintenance program. The report suggested a projected replacement date of 2018 that should be re-evaluated on the next BCR in 2017.

.4 For the DDC component of the control system, the 2013 Building Condition Report mentions that control is provided by a Honeywell XL5000 Control System which controls the building cooling and heating equipment, VAV boxes, and hot water valves. This includes all of the DDC panels in the Annex. The Head end resides in the main building. The BCR further notes that the DDC system is in average condition with most of the hardware having been updated in or around 2000 possibly as a result of Y2K. The system is well maintained via a Honeywell service contract, programming and graphical interface updates are on-going. The anticipated replacement date has been set at 2020 based on a 20 year expected life. Components for this system are readily available and service needs are met with the Honeywell office.

.5 Certainly devices that are critical to the DDC system's operation, and control of heating, cooling and ventilation must remain intact. Many controls have been rebuilt over the years as failures have occurred and this likely will continue until such a time parts become harder to come by.

Typical Pneumatic Thermostat

Typical Electronic Thermostat

Recommendations - CONTROLS

- As stated initially, the current Building Controls systems can support the Co-location project. New devices would be installed in all renovated areas and connected to the existing main systems.
- Ultimately, a long term strategy must be prepared for the building that will dictate the extent to which the Controls system will be replaced or upgraded. Simply replacing old components with new for systems that may be deemed redundant or superfluous, is not practical or recommended.

3.1 Electrical Introduction

.1 Intent

.1 The intent of the Building and Site Capability Report is to investigate, analyze and assess how well the facility meets Client Departments' requirements, and make recommendations to suit.

.2 The findings in the Report were based upon a review of the 2013 Building Condition Report and site observations on:

- .1 January 26, 2016
- .2 July 4-5, 2016
- .3 September 30, 2016

.3 The Report includes some information from the 2013 Building Condition Report but does not include all information. For further information regarding the Freshwater Institute, the 2013 Building Condition Report should be reviewed.

.2 Building Overview

.1 **Site Services -** The Lab Building is the centre point of the electrical services to the FWI site. All systems begin from here and none of the other 4 building (Annex, Small Craft, WTP or Storage Warehouse) have standalone services. The building built in 1972 has had few major changes to the electrical infrastructure. On the power side, the Main Secondary Switchgear was replaced in 2002, one of the banks of Power Factor Correction capacitors has been replaced and several smaller Square D panels were added to facilitate the installation of mechanical equipment. However, all the other equipment is original and now 44 years old and considered past its theoretical life expectancy.

.2 **Emergency Power -** The Generators are specifically vulnerable at this time because of their age, complexity, and function and safety necessity.

.3 **Lighting –** The lighting of the building is in critical condition in that the majority is dependent on the availability of obsolete T12 lamps.

.4 **Low Voltage Systems –** The low voltage systems, such as the telecommunications, fire alarm, and access/security have been upgraded and modified to maintain operation and are operating satisfactorily. The telecommunications does not seem to have an integral approach to infrastructure and is separated by telephone with category 3 cable and data with category 5 cable.

.5 **Electrical Distribution –** The electrical distribution, with preventative maintenance, could be extend life for 5 or maybe even 10 years but not without risk. At over 40 years, any system is vulnerable. Cleaning, re-torqueing and thermographic scanning of the electrical equipment would diminish the risk but not alleviate it.

3.2 Workplace 2.0 Compliance

The existing building is not Workplace 2.0 (WP2.0) compliant. The building has not undergone a major fit-up in many years and almost all office areas are non-compliant. The Co-location project is to comply with WP2.0 to the greatest extent possible. The base-building upgrades to accommodate the new interior office/ lab areas to meet WP2.0 will be minimal. Below is where the existing building is non-compliant.

.1 Telecommunication Infrastructure

.1 There are no Telecommunication Rooms (TR) provided on each floor as described in WP2.0 A4.

.2 There is an existing Equipment Room/Telecommunication room located on the 3rd floor serving the lab building. This room serve as Equipment room providing backbone cabling to wall mounted data racks.

.3 Several wall mounted data racks located in corridors on each level of the Lab Building provides the central distribution for data cables.

.2 Sound Masking

.1 There is no Sound masking system present in any area of the building. This system is a requirement of open area workspaces. Sound masking requirements will be addressed under the tenant's scope of work.

3.3 Building Areas

The following existing base building areas were reviewed on site to determine if each area is sufficient to accommodate the Co-location project. The evaluation criteria was based on a functional assessment and technical observation of the area's ability to support EC and DFO operations. The September 2013 Building Condition Report was also reviewed to provide additional information in the evaluation of each area.

.1 3rd Floor Server Room (Rm 3-06)

.1 The Server room appear to be in good condition and can support the Co-Location project. Although not in total conformance with WP2.0.

.2 The server room is located on the 3rd floor.

.3 The Server room has a dedicated cooling system, UPS and distribution panel and suppression system. There are several racks, approximately 6, many with spare space for additional equipment.

Figure 1 Dedicated cooling unit.

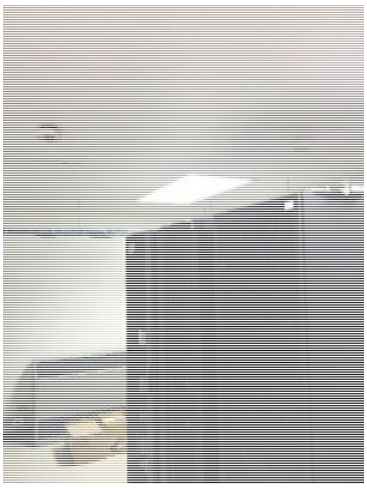

Figure 2 Typical IT racks and suppression head.

Figure 3 Server room suppression panel

Figure 4 UPS Panels.

Recommendations – 3rd Floor Server Room (Rm3-06)

- This room can continue to be a server or equipment or Telecommunication room as per WP2.0. It may also be able to be used for other purpose such as secure evidence/document storage, further review with RCMP documents would be required.
- It would be best to leave the systems in this room function and attempt to re-use or re-purpose the systems available.

3.4 Building Systems Components

The following existing base building components were reviewed on site to determine if each component is sufficient to accommodate the Co-location project. The evaluation criteria was based on a technical observation of the components ability to support EC and DFO operations. The September 2013 Building Condition Report was also reviewed to provide additional information in the evaluation of each component.

.1 Main Secondary Distribution

.1 The Main Secondary Distribution appears to be in good condition and can support the Co-Location project.

.2 The Main Secondary Distribution is located on the main floor of the Service Block of the FWI building. This equipment provides major circuit protection for power distribution for the site.

.3 The Main Secondary Distribution is 4000 amps, 600 volt, 3-phase, 3 wire, 50 KA interrupting capacity and is protected by a 4000 amp frame with a 3200 amp trip main breaker.

.4 The Main distribution was replaced in 2002. Maintenance replacement parts are still available.

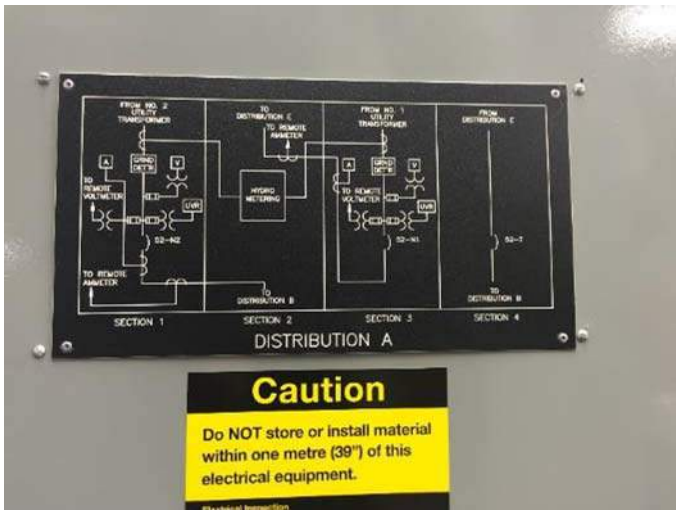

Figure 5 . Normal power distribution

Figure 6 Normal power distribution equipment.

Recommendations – Main Secondary Distribution

- There is no electrical work required for this component to accommodate this project.
- The main secondary distribution area is adequate to support the co-location project.

.2 Motor Control Centre (MCC)

.1 The MCCs all appear to be in fair condition and can support the Co-Location project.

.2 Located in the basement, main and penthouse of the FWI building. This equipment provide power and control to various apparatuses.

.3 The majority of the MCC equipment is rated 600 amps, 600 volt, 3-phase, 3 wire, 50 KA interrupting capacity. There is one MCC that is rated for 208 volts

.4 The MCC equipment were installed under the original contract in 1972, with a few sections added in 1994 and 2008. The MCC sections installed 1972 are past there expected life expectancy. The availability of parts may be of concern and the longer the units are kept in service the greater the risk.

.5 The table below is a summary of electrical action items for various elements as provided in the Sep 2013 Building Condition Report. Although all items should be addressed as recommended in the BCR, Tower Engineering has reviewed which items are project specific and should be included in the scope of work for this Co-Location project – noted with a Yes. All other items are base building issues that should be addressed separately. Tower Engineering has identified action items that will have a direct effect on this Co-Location project.

Element	Action	Year	Cost	Required for Co-Location Project
Motor Control Centre (MCC)	Replace 41 MCC section originally installed in 1972	2018	$1,263,522	No

Recommendations – Motor Control Centre

- No Electrical work required to for this system

.3 General Lighting

.1 The Lighting appear to be in fair to poor condition and can support the Co-Location project.

.2 Lighting is provided throughout the building and lighting levels appear to be good and meet IESNA recommended levels designated areas.

.3 Light fixture are mostly from 1972 installation with exception to of specific upgrade to and the process of upgrading from T12 lamps to T8 Lamps by retrofit. According to the 2013 BCR it is estimated that 60% of the fixtures remain to be upgraded.

.4 Note that the co-location project would account for some the of 60% original lighting fixture to be converted. The base building should consider replacing light fixture in were ceilings are being replaced and in public areas adjacent to the co-location renovated space.

.5 T12 lamps are no longer manufactured, making the obsolete. These light fixtures are beyond their life cycle and should be considered for replacement.

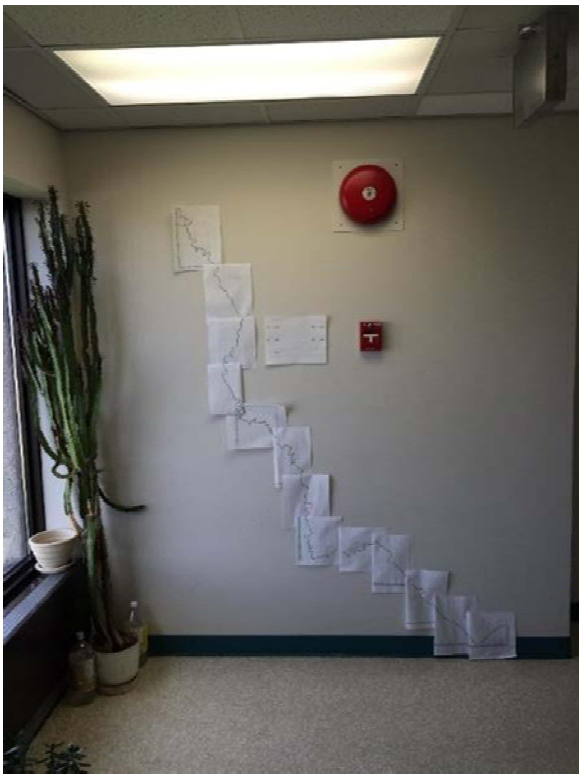

Figure 7 Lab Block corridor typical light fixture

Figure 8 Loading area lighting

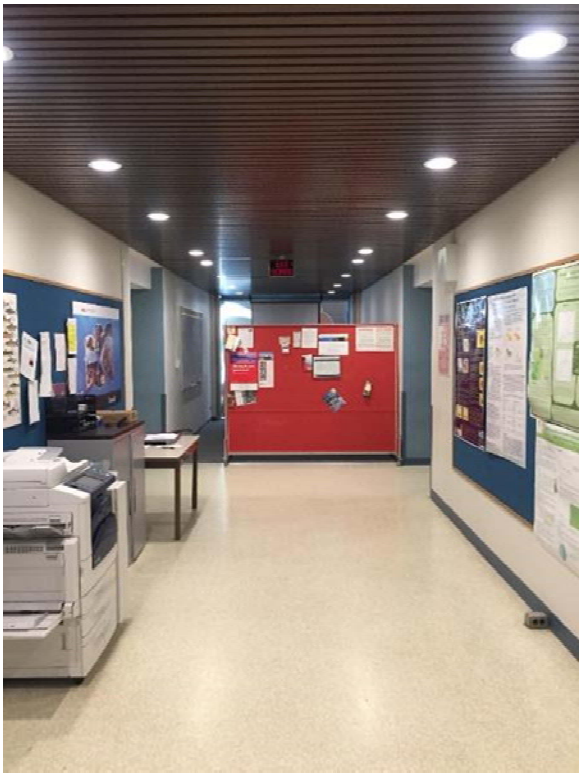

Figure 9 Main corridor lighting adjacent to co-location renovations

The table below is a summary of architectural action items for various elements as provided in the Sep 2013 Building Condition Report. Although all items should be addressed as recommended in the BCR, CKAID has reviewed which items are project specific and should be included in the scope of work for this Co-Location project – noted with a Yes. All other items are base building issues that should be addressed separately. CKAID has identified action items that will have a direct effect on this Co-Location project.

Element	Action	Year	Cost	Required for Co-Location Project
General lighting	Replace all original light fixture with obsolescent T12 or incandescent lamps.	2014	$1,692,386	No
	Replace general lighting due to obsolescent in public areas adjacent to co-location renovation	2014	$846,184	No

Recommendations – General Lighting

- Replace the remaining T12 and incandescent lighting fixture installed in the original 1972 installation (about 60% of the building lighting fixture). The T12 lamps are no longer produce.
- Replace all public space lighting with more energy efficient LED lighting.

.4 Exits Signs

.1 The exit signs appears to be in poor condition however, can support the Co-Location project.

.2 Exit signs are located throughout the FWI building.

.3 Most of the exit signs appear to be from the original 1972 installation however some exit signs have been upgraded over time. Some exit sign were observed not illuminated therefore not conforming to current code.

.4 Exit sign original to the building do not conform to current code.

.5 The table below is a summary of architectural action items for various elements as provided in the Sep 2013 Building Condition Report. Although all items should be addressed as recommended in the BCR, CKAID has reviewed which items are project specific and should be included in the scope of work for this Co-Location project – noted with a Yes. All other items are base building issues that should be addressed separately. CKAID has identified action items that will have a direct effect on this Co-Location project.

Element	Action	Year	Cost	Required for Co-Location Project
Exit signs	Replace existing exit signs with bilingual or international graphic symbol to conform to current code	2014	$98,215	Yes

Figure 10 Exit sign from original 1972 installation, not conforming to current code.

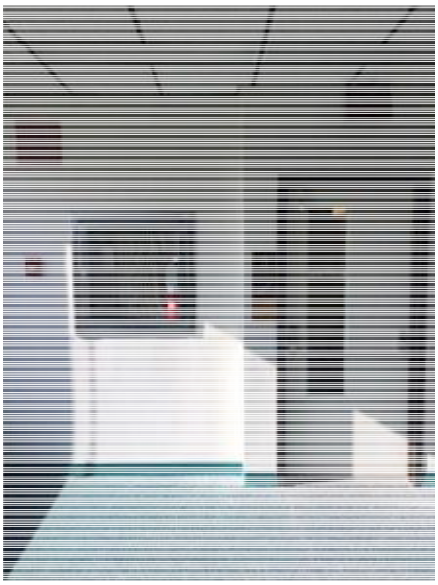

Figure 11 Exit sign not illuminated therefore not conforming to code

Figure 12 Exit sign upgraded from original installation.

Recommendations – Exit Sign

- Replace exit sign to conform to current code. Replace with bilingual or international graphic symbol.

.5 Fire Alarm System

.1 The Fire Alarm System appears to be in fair condition and can support the Co-Location project.

.2 The main fire alarm cabinet is located in the operator's office. The fire alarm system is a two stage addressable system, there is an annunciator at the rear entry security des and another at the spill response area, room 301-B. There are sub panels at the hazardous storage for the Inergen system suppression system. The main building gathers and alarms other building on the site including the Annex, Small Craft building, Water treatment Plant and Storage building.

.3 The Fire alarm appears to have been last upgraded in 1998, and is missing visual signal devices which does not conform to current MBC code, however it is noted in the BCR as a code requirements and noted as a requirement for this building. In addition the fire alarm system is nearing the end of life cycle and should be considered for replacement. At a minimum visual signals should be installed throughout the building.

Figure 13 Washrooms in the Admin & Lab Block require upgrades.

Figure 14 Washrooms on each Level require upgrades for barrier free compliance.

.4 The table below is a summary of architectural action items for various elements as provided in the Sep 2013 Building Condition Report. Although all items should be addressed as recommended in the BCR, Tower Engineering has reviewed which items are project specific and should be included in the scope of work for this Co-Location project – noted with a Yes. All other items are base building issues that should be addressed separately. Tower Engineering has identified action items that will have a direct effect on this Co-Location project.

Element	Action	Year	Cost	Required for Co-Location Project
Fire Alarm	Provide visual signal devices throughout the FWI building.	2014	$123,480	Yes
Fire Alarm	Upgrade Fire Alarm System	2018	$2,375,996	No

Recommendations – Fire Alarm System

- Add visual signal devices throughout the FWI facility
- Upgrade or replace fire alarm devices to new technology

.6 Emergency Power System

.1 The Emergency Power System appears to be in fair condition and can support the Co-Location project.

.2 The emergency generator is located on the main floor of the Service Block of the FWI Building. This equipment provides major emergency power distribution for the site. This system is use for life-safety system in the event of loss of power.

.3 The emergency generator system consists of two diesel generators connected to the essential switchboard through a synchronizing control panel. Each generators is rated for 800kWatts at 600 volts, 3-phase, 3 wire.

.4 The existing transfer switch system do not conform to current electrical code CEC 46-108 (5). Current code would require separate transfer switches for life-safety systems and non life-safety systems. However, the current configuration would be considered to be grandfathered.

.5 The generator are now 40 years old and maintenance may become more difficult and replacement part obsolete. In discussion with building maintenance, the system is fully functional and tested regularly.

Figure 15 Emergency generators

Figure 16 Synchronizing control panel

.6 The table below is a summary of architectural action items for various elements as provided in the Sep 2013 Building Condition Report. Although all items should be addressed as recommended in the BCR, Tower Engineering has reviewed which items are project specific and should be included in the scope of work for this Co-Location project – noted with a Yes. All other items are base building issues that should be addressed separately. Tower Engineering has identified action items that will have a direct effect on this Co-Location project.

Element	Action	Year	Cost	Required for Co-Location Project
Emergency Power system	Replace emergency and associated controls.	2018	$4,771,200	No

Recommendations – Emergency Power System

- The emergency generator system will need to be review further with the AHJ when replacement of the generator, synchronization and distribution system will be upgraded. The system as a whole would be considered grandfathered. The changes required to conform to current code would be extensive

.7 Communication

.1 The Communication system appears to be in fair condition and may support the Co-Location project. This system should be reviewed with SSC for type of system to be used for co-location renovation (VOIP, wireless, quantity of existing telephone pairs)

.2 The main telecommunication room (1-106) is located in the basement of the Administration Building. This is the location of the site terminations for the PBX system, and the carrier fiber cable.

.3 The telephone cable is category 3. Data cable is category 5.

.4 The data cable distribution wall mounted cabinets located in the corridors of the upper floor do not conform with WP2.0 and would not meet the requirements of the renovations.

.5 The system is basic and has little flexibility for future expansion. The system is functional and meet the current needs, however does not meet Tbits 6.9 and or EIA/TIA T568B standards.

Figure 17 Existing cafeteria is currently not in use.

Figure 18 Existing cafeteria is currently not in use.

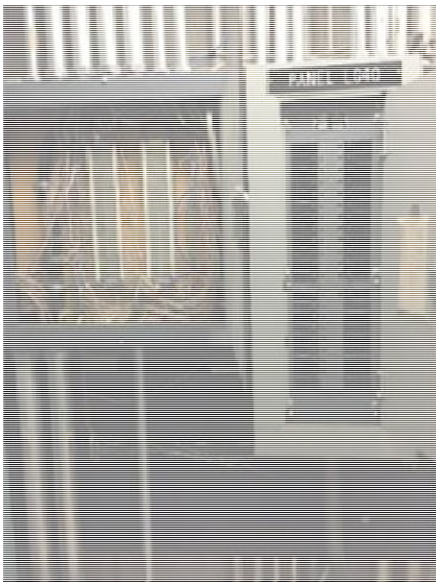

Figure 19 Existing cafeteria is currently not in use.

Figure 20 Existing cafeteria kitchen is currently not in use.

.6 The table below is a summary of architectural action items for various elements as provided in the Sep 2013 Building Condition Report. Although all items should be addressed as recommended in the BCR, Tower Engineering has reviewed which items are project specific and should be included in the scope of work for this Co-Location project – noted with a Yes. All other items are base building issues that should be addressed separately. Tower Engineering has identified action items that will have a direct effect on this Co-Location project.

Element	Action	Year	Cost	Required for Co-Location Project
Communication	Upgrade the telephone system to meet Tbits 6.9 and/or EIA/TIA T568B standards.	2020	$4,397,272	No

Recommendations - Communication

- This system should be reviewed with SSC for type of system to be used for co-location renovation (VOIP, wireless, quantity of existing telephone pairs) at time of renovation for which government initiative to be followed.
- Upgrade the system to meet government standard Tbits 6.9 and/orEIA/TIA T568B. The telecommunication system as existing is basic and has little flexibility or future expansion availability. The risk to the site of not upgrading is the operation function.

3.5 Preliminary Building Code Issues

.1 Life Safety – Fire Alarm

NBC 3.2.4.18. Alert and Alarm Signals

Amended by the Manitoba Building Code; in all building, visual signals devices shall be installed in addition to audible signal devices.

CAN/ULC-S524 5.2 Manual Stations

- Manual Stations shall be installed not less than 1200mm and not more than 1400mm above finished floor level measured from the centre of the manual station.

Recommendations – Signals and Manual Stations

- Visual Signals should be added to meet present day code, although the system is like likely grand-fathered, the renovation presents opportunity to meet code requirements, especially for life safety systems.
- Manual Station location and height should be confirmed and adjusted during Co-location renovations

.2 Life Safety – Emergency Power System

The emergency power systems is used to supply power to a variety of selected equipment during a loss of normal power (utility power) event. The selected equipment, although all important, vary from Life-safety system such as egress lighting and fire alarm systems for public protection to mechanical pumps and freezers for asset protection.

CEC 46-108(5)

Conductors between an emergency power supply and any electrical equipment that is not defined as a “life safety system” in accordance with this Section shall not enter a luminaire, raceway, box, or cabinet occupied by other conductors installed as described in Subrule (1), excepts where necessary in busway, splitter and other similar enclosures provided for the connection to the overcurrent device for an emergency power supply described in rule 46-108(1).

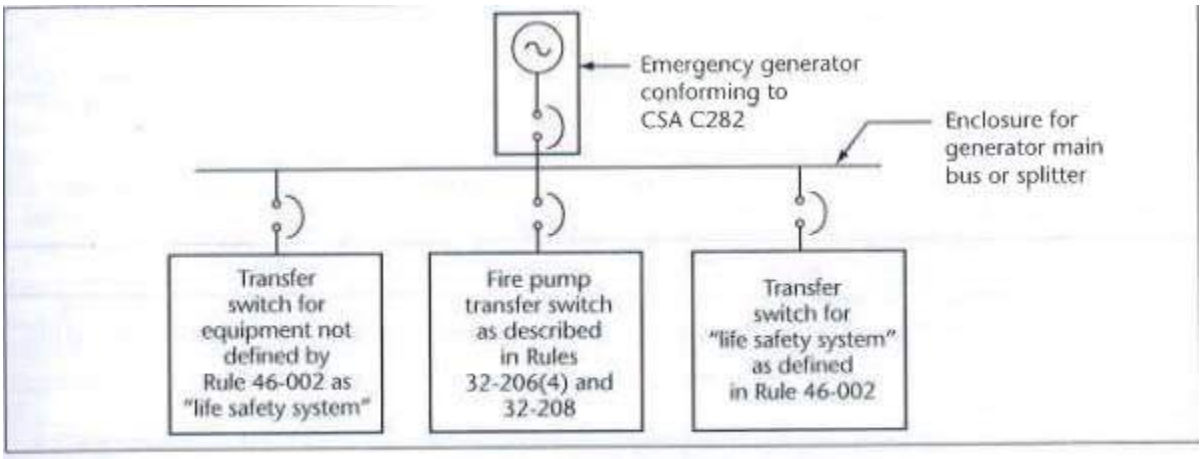

Figure 46-1
Emergency power supply

Figure 21

Recommendations – Emergency Power System

- This is just an information note indicating that the installation does not conform to current Canadian electrical code. The existing system installation would be considered grandfathered; however replacement of any system componence should be reviewed with the AJH prior proceeding with the upgrade.

.3 Life Safety – Emergency lighting

Some of the emergency lamps observed only had one lamp with does not conform to current code. This was mostly noted within the labs. There were other sparse locations throughout the facility with this infraction, however they were few.

CEC 46-106(1)

Emergency lights shall be arranged so that failure the failure of any one lamp will not leave in total darkness the area normally illuminated.

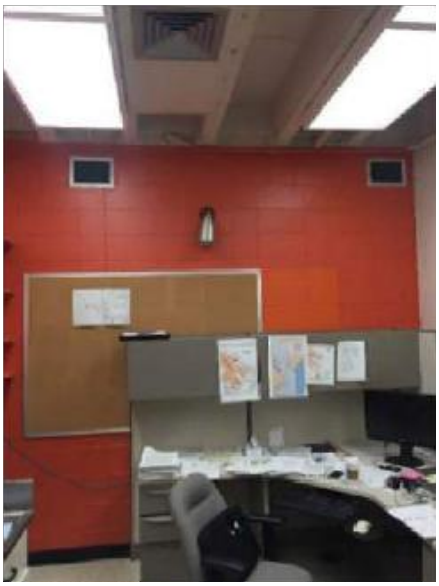

Figure 22 Lab area with single lamps emergency lighting head.

Recommendations – Emergency Lighting

- Replace single lamp emergency light fixtures with dual head lamp fixtures