Building Assessment & Master Plan

Ontario Museum of History & Art

City of Ontario CA | March 2019

Architectural
Resources Group

Client

The City of Ontario
Ontario Museum of History & Art
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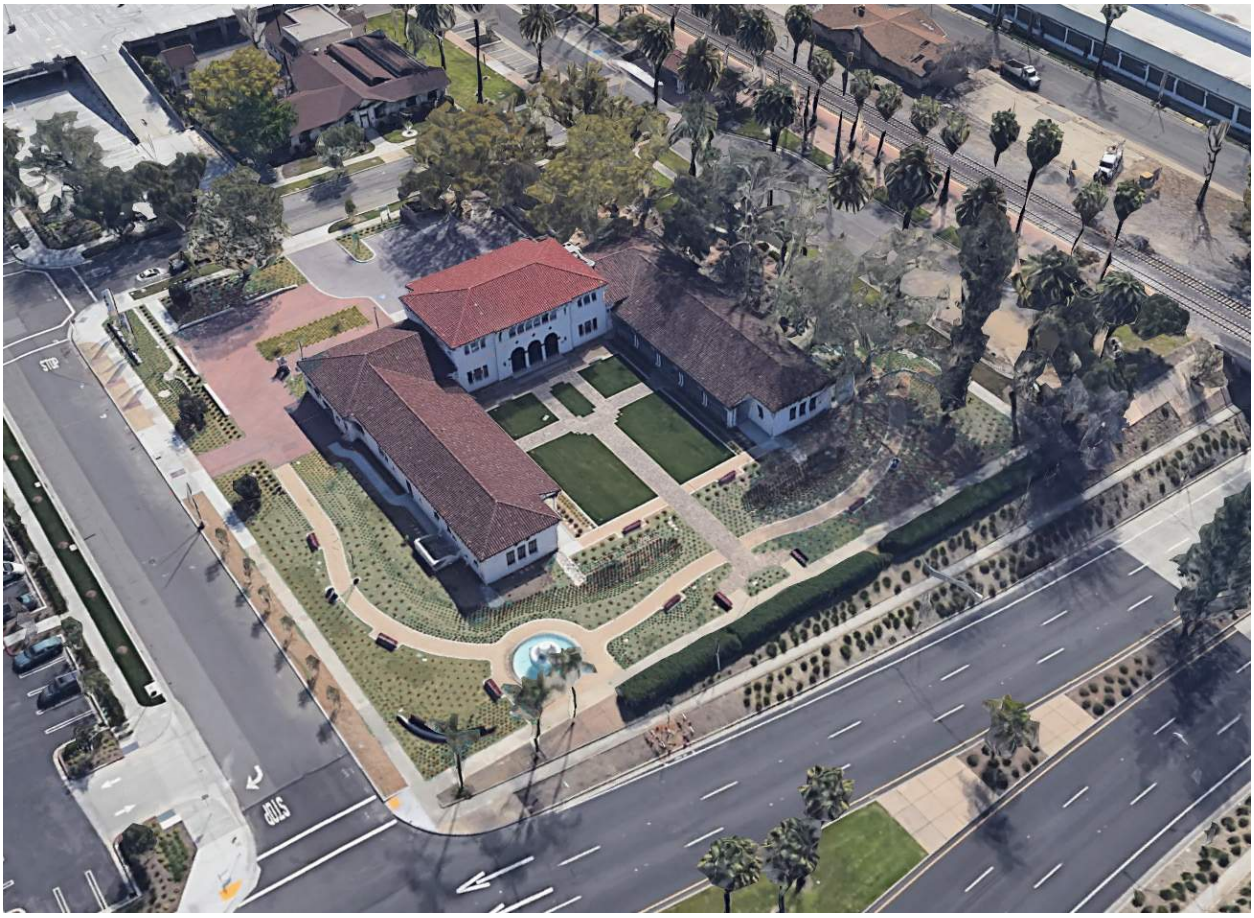
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Executive Summary

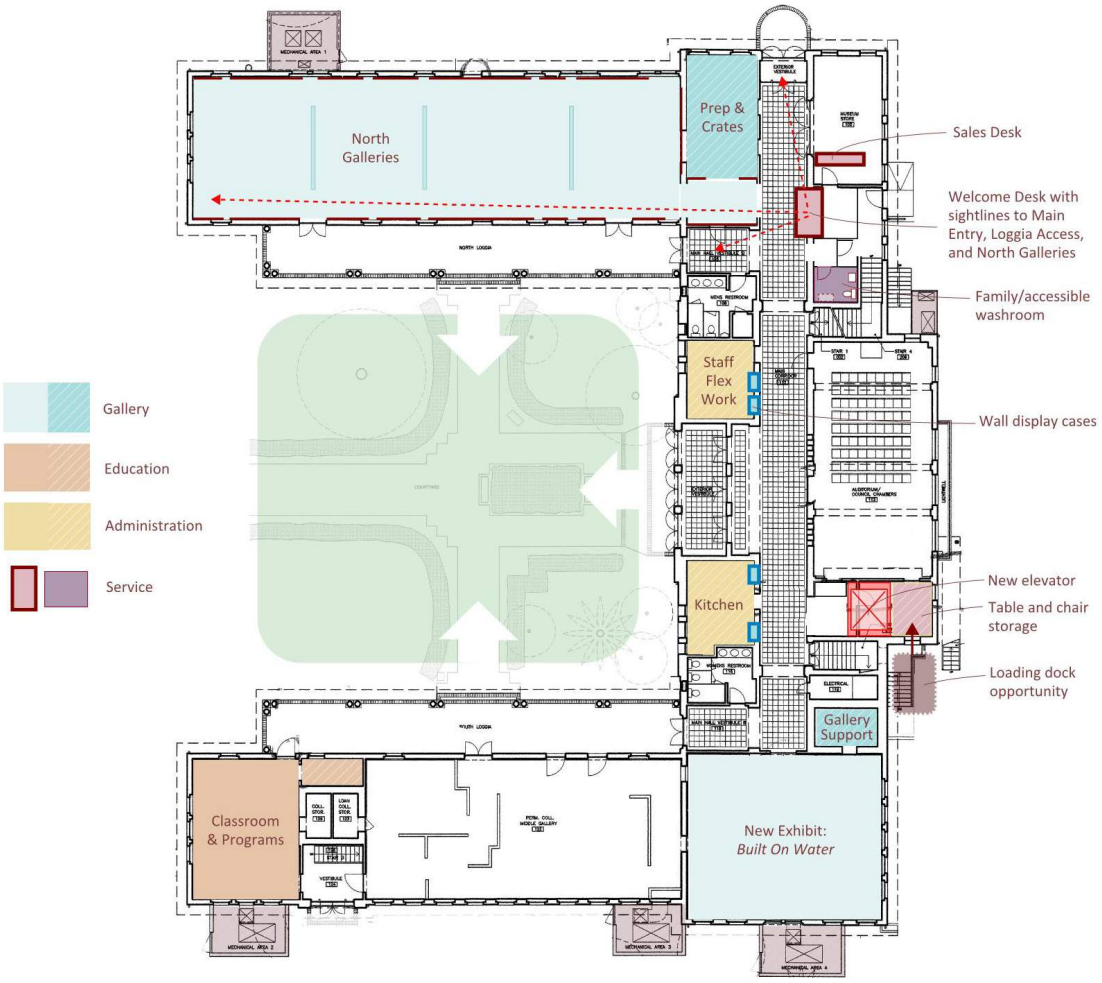
The Ontario Museum of History & Art (OMHA) is the custodian of Ontario's local history and an educational and cultural resource for its community. The museum's piecemeal adaptation of spaces in the 1937 City Hall over the past forty years has led to a less-than-optimal situation. In addition, upgrades for life safety, code, and curatorial standards are called for.

OMHA's primary goals in addressing these concerns are:

- Enhance the museum's value to its constituent communities
- Meet contemporary expectations for collections stewardship
- Obtain accreditation from the American Alliance of Museums

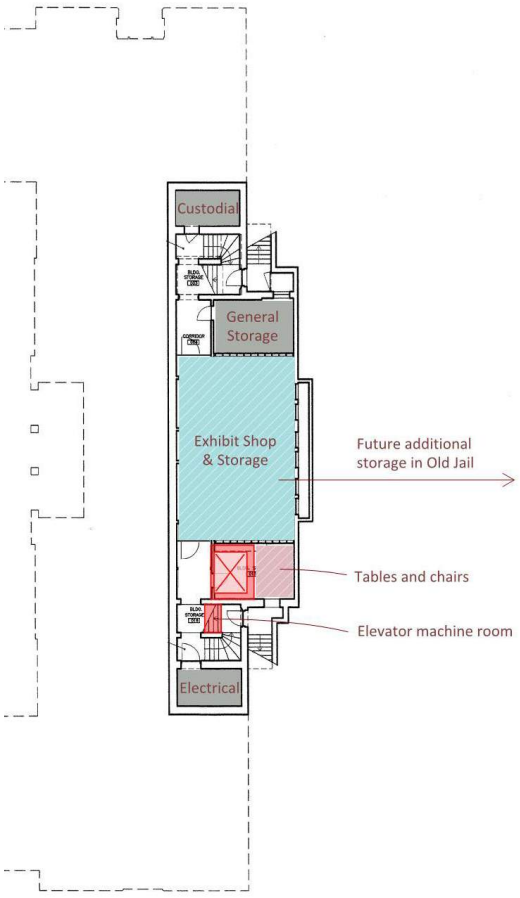
This report lays out current facilities conditions in Section 2 and, where appropriate, makes preliminary recommendations for remediation. These recommendations are then assessed for cost and potential work sequence. This analysis provides a framework for OMHA's decision making, both near- and long-term.

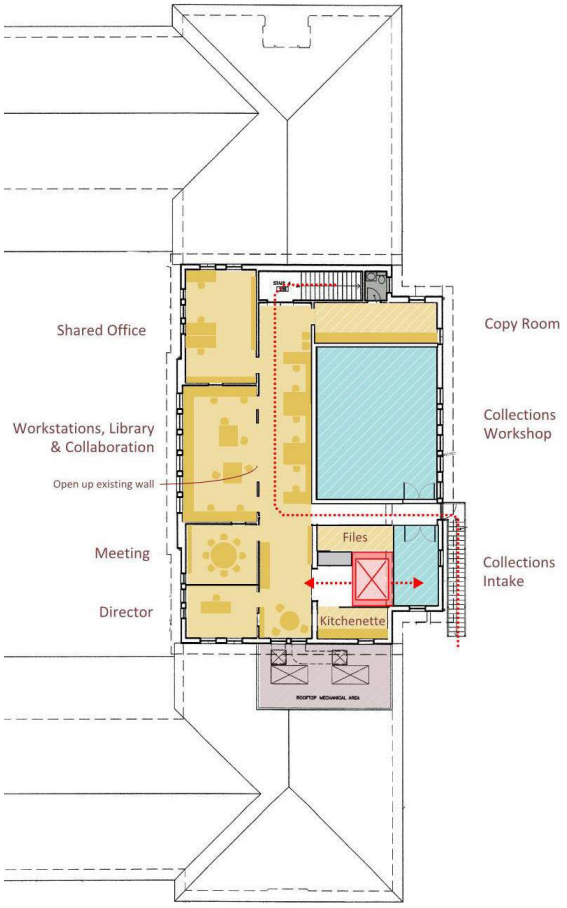
The core recommendations in Section 3 are for optimization of the museum's layout, shown in the plan diagrams on the next pages.



first floor

- Provide new Welcome Desk with direct oversight of Main Entry and potential Loggia and Courtyard access
- Relocate and improve North Galleries entrance
- Locate Exhibit Prep/Crate Storage near Main Entry loading,
- Reconfigure North Galleries to accommodate many different layouts
- Install new Elevator serving all floors
- Activate Main Hall with wall exhibit cases
- Make the Carlson Gallery a classroom/educational programs space
- Integrate the Garden Court into Museum programming
- Improve exterior screening of HVAC units





basement

- Enlarge and consolidate Exhibit Fabrication Shop and storage
- Create Elevator access

second floor

- Open up and rationalize Office areas
- Create Elevator access
- Provide direct access to exterior emergency stair
- Store collections off site and optimize Collections Intake and Workshop

Code and Accessibility

Section 4 assesses the Museum building's compliance with applicable codes and regulations, especially fire safety and barrier-free access.

Major considerations include:

- Installation of a sprinkler system. This is not code-required in the case of OMHA's existing building and will require the museum to make a decision that balances benefits against costs.
- Provision of accessible restroom facilities.
- Installation of an elevator serving all building floors.

Building Systems

Section 5 reviews the museum building's existing structural, mechanical, electrical, and plumbing systems and proposes upgrades as appropriate.

Particular attention is given to the mechanical systems (or HVAC: Heating Ventilation and Air Conditioning). Maintaining gallery environments at appropriate, consistent temperature and humidity levels is a critical part of collection stewardship and will be a major factor in obtaining American Alliance of Museums accreditation.

The museum's need for data and security systems is also addressed in this section.

Building Condition and Treatment

Section 6 details existing exterior conditions of the OMHA building, including deterioration and damage. Section 7 provides a corresponding rundown of recommended maintenance, repairs, and restoration measures.

Cost Projections

The overall project cost for the improvements recommended by this master plan has been estimated **$8,946,000.** This can be broken out into three general areas:

"Overall" — building-wide systems work	$2,083,800
"Area by Area" — focused interior upgrades	$5,819,400
"Exterior" — envelope maintenance and preservation	$1,042,800

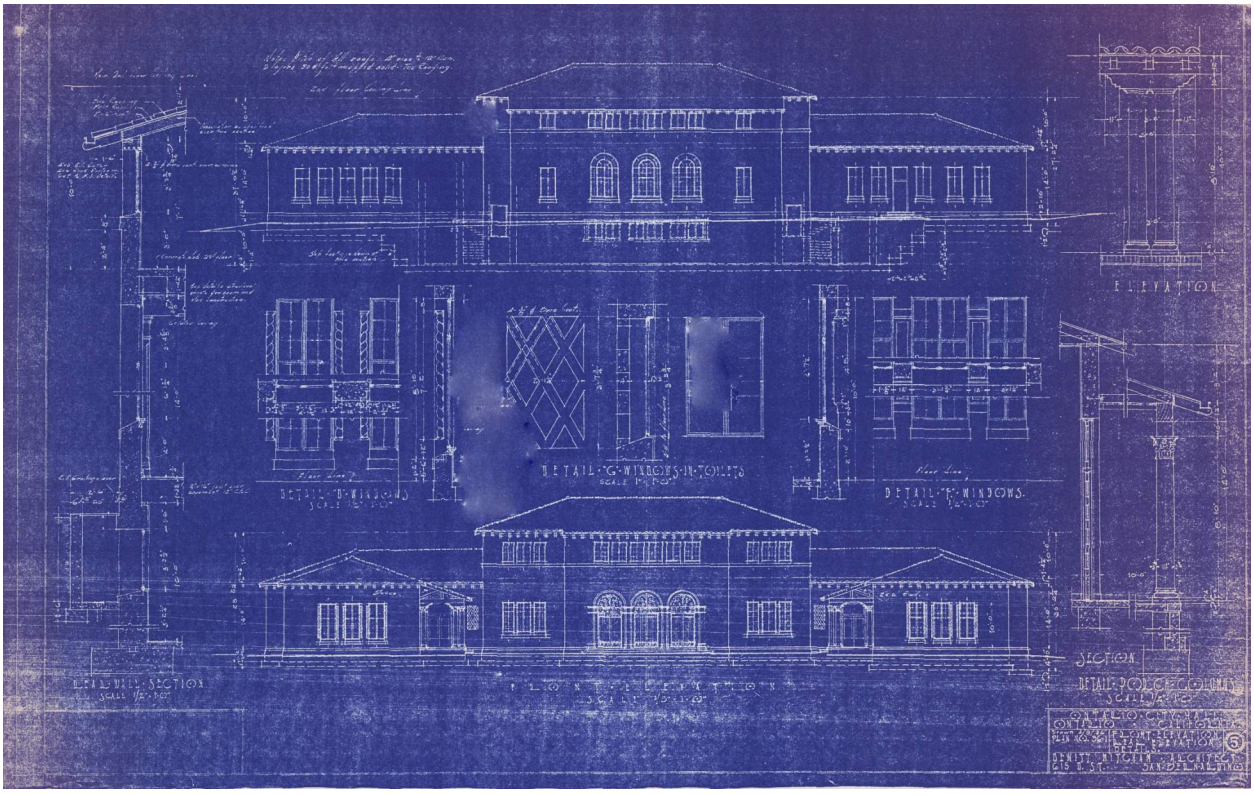
See Section 8 and Appendix C.1 for more detail on this estimate. Appendix C.2 provides a concept budget for the upcoming "Built On Water" exhibit.

The sequence in which work is done will depend on future availability of various kinds of funding. While the specifics here cannot be predicted, Section 9 provides an overview of phasing and implementation considerations that apply in most scenarios.

General Electric Hotpoint Flatiron
from OMHA collection

Part I

Introduction



1937 Construction Drawing

1.1 Project Overview

Architectural Resources Group, Inc. (ARG) has prepared this Building Assessment and Master Plan Report to guide facilities stewardship for the Ontario Museum of History & Art (OMHA or "the museum"). OMHA operates under the auspices of the City of Ontario, CA and this study was undertaken at the City's request.

OMHA was established in 1979 by the City of Ontario as "a public museum of natural and historical objects." Its permanent collections include historical artifacts, print archives, photographs, and regional artworks that document the history of Ontario and nearby communities. OMHA's identifies its institutional goals as follows (note: statements under review at time of report) :

> *Vision Statement*
>
> Ontario Museum of History & Art is a welcoming place that reflects pride in who we are, where we live and our legacy.
>
> *Mission Statement*
>
> Ontario Museum of History & Art enhances knowledge and understanding of our community through dynamic and vibrant experiences.

OMHA's physical facilities have been configured in a piecemeal fashion over the past forty years, resulting in a less-than-optimal arrangement that is now seen to detract from the museum's mission. In addition, the historic building housing the museum needs structural, MEP systems, and accessibility upgrades to bring it up to current life safety, code, and curatorial standards. OMHA's primary goals in addressing these concerns are:

- Enhance the museum's educational and cultural value for its constituents
- Meet contemporary expectations for collections stewardship
- Obtain accreditation from the American Alliance of Museums

This document lays out current facilities conditions and, where appropriate, makes preliminary recommendations for remediation. This analysis is meant to provide a framework for OMHA's decision making, both near- and long-term.

1.2 Existing Conditions Overview

Since is founding in 1979, OMHA has occupied a historic structure at 225 South Euclid Avenue that originally served as Ontario's City Hall. The building was designed by San Bernardino-area architect Dewitt Mitcham and constructed in 1937. It is U-shaped in plan, with cast-in-place concrete walls topped by hipped clay tile roofs. The design combines aspects of the Mission style (such as the low verandas framing an internal court) with the Mediterranean Revival (especially the paired Corinthian columns supporting the verandas). The building is a locally-designated historic landmark and has been determined eligible for the National Register of Historic Places. The adjacent landscape includes the city's rose garden; drought-tolerant and native species have recently been planted in other areas.

The Museum's ground floor is largely devoted to galleries for the permanent collections and temporary exhibits. Support areas on this level include a meeting room (the former Council Chambers), a gift shop, restrooms, offices, and miscellaneous spaces. The second floor houses museum offices, work spaces, and collections storage. While most collection items not on exhibit are stored on the second floor, some items are stored wherever room has been found in the building. A partial basement contains mechanical rooms, additional workspaces, and storage.

1.3 Scope

This document both assesses existing conditions and makes recommendations for remediation and improvement. The analysis is meant to provide a framework for decision making as OMHA moves forward over the next 20 years.

The scope of this report is:

- Assessment of current conditions and goals
- A long-term facilities strategy with specific recommendations by area
- Code and accessibility analysis
- Building systems review
- Building envelope assessment and treatment recommendations
- Cost projections
- Scheduling and implementation frameworks

1.4 Methodology

This document synthesizes previous reports, current site assessments, and proposals for the future that have been developed with input and insights from OMHA's staff and Board of Trustees.

ARG has reviewed the following background information in the preparation of this report:

> "Architectural Conservation Assessment", draft report dated December 1, 1993. Prepared by the Museum of History and Art, Ontario
>
> "Museum of History and Art, Ontario: Conservation Assessment", report dated March 4, 1994. Prepared by John Twiley, Conservation Scientist
>
> Museum of History and Art, Ontario", historic framework tech report dated November 3, 2003. Prepared by Chu + Gooding Architects
>
> "Strategic Outlook, Museum of History and Art, Ontario", reported dated December 17, 2004. Prepared by Chu + Gooding Architects
>
> "Conservation Consultation Report for the Museum of History and Art, Ontario," report dated February 2005. Prepared by the Western Region Field Service Office, Balboa Art Conservation Center

> "Sustaining Cultural Heritage Collections, Final Report", report dated August 2013. Prepared by ARG Conservation Services (ARG/CS)

The 2013 ARG/CS report cited above was prepared under a planning grant from the National Endowment for Humanities for Sustaining Cultural Heritage Collections to examine potential threats to the museum's collection. ARG found that OMHA suffered from inadequate space to inventory, house, and store collection items and from inadequate building systems and environmental controls. The report also identified significant code compliance issues:

- Non-compliant second floor emergency egress
- No fire suppression system
- Concerns regarding the loading capacity of the second floor

As a result of these and other discussions, ARG recommended that the museum take a more holistic approach to building assessment and a conceptual master plan. Key issues include:

- Programming and space usage
- Collections handling and storage
- Life safety, including egress and fire suppression
- Building envelope integrity (in particular windows and doors)
- Structural integrity
- Building systems capacity (mechanical, electrical, plumbing, lighting, and energy use)
- Accessibility

Members of ARG's architecture and conservation staff have made site visits to OMHA to record the building's features and their condition. The subconsultants made similar visits over the same period so that cross-referencing among different specialties could take place in the field when possible. The team examined the interior and exterior and used notes and photographs to record the findings. Along with the site visits, multiple meetings were held with the museum staff and key stakeholders to discuss the project.

ARG's conditions assessment and the findings of the subconsultants were compiled and analyzed by a cost estimator to inform the preliminary, phased cost estimate in this report.

1.5 Pending Projects

At the time of writing, the museum has a number of pending initiatives. As these are approved/ funded they should be coordinated with the recommendations within this report.

Pending Capital Improvement Projects (currently unfunded)

- Window film and blinds in north galleries
- Wi-fi / Wi-fi-based security/video system
- Signage and wayfinding graphics

Pending Facilities Maintenance Projects

- Seismic/egress remediation
- Exterior painting and wood trim
- LED lighting in south galleries
- Replacement/additional south wing sub-panel
- Collection relocation to rental storage
- Basement flood damage repair

Future Grant Objectives

- Outdoor educational program space

Opening of the Ontario City Hall, 1937
from OMHA collection

Part 2

Existing Use Analysis and Goals


EXISTING PROGRAMMING
Public (non-gallery)
Public Support
Education
Education Support
Gallery
Gallery Support
Administration
Admin Support
Collection Storage
Service

2.1 Overview

OMHA's current use of space is intensive and responds by necessity to the physical conditions inherited from the museum building's previous life as Ontario's City Hall.

The defining aspect of the building is its U-shaped plan. Although this configuration is generally considered a difficult one for museums, OMHA has evolved a workable arrangement where the wings contain galleries (one wing for permanent exhibits, one for changing shows) and the "bottom" of the U is a main hall with various non-gallery spaces opening off it. Offices and collections are located in a partial second floor; a small basement contains additional service spaces.

This arrangement is fortuitously suited to the building's structural layout: the wings have almost no interior bearing elements and most partitions have been removed to create gallery-sized spaces. The central part of the building has an unusual density of concrete bearing walls (a result of the jail originally located on the second floor) as well as the most historically important interior spaces, and has been maintained in its original configuration.

The building's U-shape creates an attractive courtyard that is visible from many of the interior spaces. Security and environmental control concerns have limited access from the museum to the courtyard, but the space is potentially a great asset for programs and environmental education.

2.2 Public Spaces

Public Entry

OMHA's main entrance is at the northeast corner of the building. Its location is clearly signaled to visitors by recent site landscaping, although the museum reports some visitors mistakenly walk around to the old City Hall's courtyard entrance. The museum's ground level is virtually at grade, and entry can be made fully accessible without a ramp or lift.

> Goals: The entry should be verified as fully accessible per applicable regulations. Push-plate door openers should be added if force required to open historic entry doors exceeds 5lb. An additional cue to draw

visitors to the correct entrance (such as a pole-mounted exhibit banner or outdoor sculpture) could be considered depending on the level of concern about visitor wayfinding.

Welcome Desk

OMHA does not have an admission charge. The welcome desk is a point to greet and inform visitors, as well as maintain security oversight of who enters and leaves the museum. The current desk has a provisional character and is poorly oriented to surveil the Main Hall and gallery entries.

Goals: Provide a substantial-looking welcome desk that encroaches on the Main Hall as little as possible but has clear sightlines to the main entrance and along the Hall in both directions. The desk should accommodate at least one computer, screened by a high panel, and should incorporate an accessible-height counter. Associated cabinetry should include space for materials and brochures. The area behind the desk should be easy to keep in order and could feature exhibit or informational graphics.

Museum Store

The Museum Store is located immediately inside the entry and is operated in partnership with the Museum Associates, a not-for-profit organization. The space is entered through a wide arched opening that can be secured with an ornamental grill; the grill's floorstop has presented an accessibility issue for some museum visitors. Typically, one city employee operates the store from a checkout counter with a computer station; this counter is poorly positioned for visual security. Most of the store's back stock is kept in the adjacent storage room, along with unrelated items. Back stock of posters is kept in the upstairs Copy Room as there is no other place to store it properly.

Goals: The Museum Store provides a complementary amenity for OMHA and can be upgraded to enhance its value. The checkout counter and desk should be reconfigured to allow oversight of the entire store area, particularly its entrance. The potential for a single person to staff both the Store and the museum entry should be explored. The floor transition at the entry must be adjusted to provide barrier-free access. The store needs a dedicated stock room; based on discussions with store staff, this should be approximately 30 square feet with proper shelving for all stock items. Exterior signage might be considered.

Council Chambers

The former Council Chambers is heavily used for functions ranging from school tour orientations to lectures to staff meetings. It has also become overflow storage, with tables and easels at the back of the room and several collections items in the front. The configuration of fixed seating and council table is not ideal for current uses, but is integral to the Council Chambers' original state (several seats have been removed to provide an accessible audience area). Further, the room is considered a defining historic resource for Ontario and any significant alterations require explicit permission from the City Council (City Resolution 9587).

Goals: The Council Chambers' historic integrity should be upheld. Maintenance work should be coordinated to return detail aspects (such as paint colors and window blinds) to their historical condition. All overflow items should be moved to appropriate storage elsewhere.

Upgrades to AV and/or presentation systems would enhance the room's functionality; specific system recommendations are outside the scope of this report.

Kitchen

The Kitchen serves as breakroom and lunch space for the museum staff, a space for volunteer lockers, and a prep area for Museum Associates events. Counter space is limited and unusually shallow, and all kitchen work is done on the table in the center of the room. The electrical panel feeding this room is overloaded and multiple appliances cannot be used at the same time. Storage space is not sufficient for Museum Associates event items (serving trays, plates, napkins, etc.).

Goals: The kitchen should be reconfigured to optimize counter and storage space. Electrical service should be upgraded to meet both daily and event loads. New cabinetry finishes should be durable enough for moderate institutional use. For accreditation purposes, OMHA should institute a protocol to keep kitchen and general waste areas totally separate from exhibit loading areas.

Washrooms

The existing public washrooms are entered from side corridors off the Main Hall and are fortuitously located so they can be used whether or not the galleries are open (e.g. for evening events in the Council Chambers). The washrooms themselves are functional but worn and somewhat cramped; the compartment doorswings in the women's room also conflict. There are currently no accessible/ barrier-free toilet rooms in the museum, either for public or staff.

Goals: The washrooms cannot be altered for full accessibility without entirely changing their layout and reducing their fixture count. A reasonable, accessible equivalent would be a new code-compliant single-user, gender-neutral toilet room. This facility should be located off the Main Hall, but preferably not open right onto it. It can also serve as a family restroom and baby-changing station.

See Sections 4.6 and 4.7 for analysis of required fixture counts and accessibility.

2.3 Exhibit Spaces

Permanent Collection Galleries

The Permanent Collection Galleries occupy the museum's south wing and are divided into two thematic local history exhibits: "Roadways" (southeast gallery) and "Gem of the Foothills" (south gallery). In both galleries, non-structural partitions have been built inboard of the exterior walls to block windows and increase display area. These partitions do not allow interior access to the windows for maintenance and repair. The ceilings are an open grid system that appears to be in reasonable repair and effectively masks the services above it, which are painted out black.

Goals: OMHA has received a three-year grant to change over the southeast gallery from "Roadways" to "Built on Water," an exhibit exploring local water use and conservation in historical perspective. During this process, perimeter partitions should be removed so windows can be repaired. Further, the new exhibit layout should maintain maintenance access to the windows. The museum also has a pending project for upgrading exhibit lighting in both the south and southeast galleries to LED

fixtures. While there are no current plans to change out the "Gem of the Foothills" exhibit, the museum intends to begin this process in the next few years. In both permanent collection galleries, OMHA plans to use a modular display system (to be determined) that can be reconfigured to stage future exhibits.

Detailed conditions above the grid system (duct integrity, dust accumulation, additional service elements) should be evaluated at the start of work on "Built on Water"

The building envelope should be upgraded in coordination with exhibit de-installation; see Section 6.4 Doors and Windows for scope. Doing window repair in phases, per gallery, is likely the most economically feasible option.

Typical grid ceiling in south galleries

Temporary Galleries

The four-room Temporary Galleries occupy the museum's north wing and host a broad range of both OMHA-curated and traveling exhibits. The galleries are entered through a conventional single door off the Main Hall that provides little sense of occasion. While the first gallery has a rectangular plan, subsequent rooms are laid out as interlocking shapes. This creates an effective labyrinth that problematizes both exhibit arrangement and security. An exhibit prep room located halfway through the galleries provides much needed workspace but further complicates the layout.

The gallery walls, including the exterior perimeter, incorporate a plywood backing for display attachments; their surface finish is trowel-textured plaster similar to the Main Hall, although not historical. The ceiling is 12x12 acoustical tile. Stridently-patterned carpet tile undercuts the galleries' role as a background for exhibits. Light and air infiltration from windows and doors is a major concern.

Goals: Upgrade Temporary Galleries to ASHRAE "Class B" environmental standards and applicable American Alliance of Museums standards for travelling exhibits (see Section 5.3). Rationalize gallery layout for display and security, and incorporate sufficient areas for prep work and crate storage.

New finishes should provide a neutral background appropriate for displaying art and cultural objects.

Refer to Section 6.4 Doors and Windows for additional upgrades to the windows. Refer to Section 2.4 Exhibit Prep and Support for related storage and prep issues.

Carlson Gallery

Located at the far west end of the south wing, The Carlson Gallery is used for small temporary shows of flatwork and moderately-sized objects. Between exhibits the space is used for educational programs; during the summer, it serves as a classroom for the spring children's program. A built-out enclosure on the south side of the room conceals ducting from the exterior AC unit and is used to store collections materials. A small room off the northeast corner is used for exhibit prep; it has a sink, but water service was cut off during installation of the courtyard landscaping and efforts to restore it have not yet succeeded. Along the east wall, a heavy door opens onto one of the old security vaults; this is concealed behind temporary partitions for safety reasons. Exterior windows and doors are covered by perimeter partitions similar to the rest of the south wing.

Goals: OMHA has no dedicated educational program space apart from the Council Chambers, which has limited functionality. The Carlson Gallery is the most reasonable candidate to fill this need, especially as its out-of-the-way location complicates its use as a gallery.

Reworking of the Carlson Gallery as a program space could be coordinated with removal of the room's perimeter partitions to access the historic windows. (This project should be coordinated with the recommendations in Section 6.4 Doors and Windows) Rehabilitation of the walls and windows could be treated as a "dry run" for similar work throughout the museum.

As part of the Carlson Gallery upgrades, the collections storage enclosure should be removed. This should be coordinated with replacement of the current HVAC unit with a VRV system that does not require a hard-ducted connection (see Section 5.3).

The prep space off the north east corner would be a useful adjunct to educational and arts programs. Unfortunately, water service to the sink in this room was disconnected during the Urban Greening Project for unknown reasons and attempts to restore it have not yet succeeded.

The Carlson identification should be maintained in any scenario.

2.4 Exhibit Prep and Support

As the Temporary Galleries frequently host traveling exhibits, loading and storage for crates (which must be kept within the galleries' environmental control zone) are a pressing concern. OMHA has no loading dock and shipments are accepted at the main entry; larger shipping crates cannot fit through the gallery door on the Main Hall and must be brought on an exterior route via the veranda. While a moderate number of crates can be accommodated in the prep room, in many cases OMHA has had to block off a portion of the galleries for crate storage.

Exhibit prep and prep storage is divided between the two gallery wings and a fabrication shop in the basement. Prep tools such as ladders, crate dolly, and paint are stored on the first floor; plexiglass, foam core, and work tables are located in the basement. There is no dedicated space for exhibit prep; at present, OMHA uses empty galleries between exhibitions or does work in public spaces, which is a safety concern.

Storage for pedestals and plexiglass cases is scattered across the basement and first floor,

as well as the offsite Jail Building. Most of the pedestals are located in the Jail, which has been an acceptable solution. Large plexi cases are stored in the first floor exhibit prep space because they are too fragile to be moved up and down stairs. Small cases are stored in the basement next to the exhibit shop area.

Goals: Crate storage and first floor exhibit prep areas should be consolidated in a space adjacent to the Temporary Galleries. When there is elevator access to the basement, storage and prep of large objects can be consolidated and moved there. This will require upgrading the basement HVAC system.

2.5 Education Spaces

School groups visiting the museum get a general orientation in the Council Chambers and are then divided into groups to visit the galleries, do an art project in the main corridor, or take a tour of the garden. During the visit, the Council Chambers is used to store backpacks and lunches. Education supplies are kept in the large multipurpose storage room, the main corridor, and some gallery spaces.

Many educational programs are staged in the Main Hall, but this has significant drawbacks. Tables and chairs must be frequently put up and taken down, and the potential to mount exhibits in the Hall is limited. Further, the acoustics are inappropriate and amplify noisy school group activities.

Goals: Educational activities should be accommodated in a dedicated area, freeing the Main Hall as a representational space and potential exhibit venue.

For long term planning, supplies and storage should be sorted and consolidated. Based on user group input, dedicated storage space could be consolidated into 100 square feet; the small cabinets within the galleries and art area should be retained for operational reasons.

2.6 Administration/Offices

The majority of administrative space is on the second floor, which accommodates offices for the Director and Collections Curator, a large room that serves as meeting space, work area and reference library, and a long 10'-wide hall with a desk for an administrative assistant, a station for the Museum Associates, and two floating stations for volunteers. There is a copy room and a very small toilet room accessed through the Collections Storage area.

The Exhibitions Curator and Education Director each have an office on the ground floor due to their frequent interaction with volunteers and exhibit preparers. Both these offices have a floating work station.

Goals: While the current amount of office space is sufficient for projected needs, it could be much more effectively arranged. The private offices on the second floor are each large enough to be divided in two if desired. The finishes and lighting should be improved and the toilet room must be accessible without passing through the Collections area.

Per OMHA, much of the material stored in the open office and conference room should be discarded or archived digitally or off-site. This decluttering would free up a significant amount of the second floor for better-organized storage and expanded work space. The separate copy room and office supply area should be consolidated.

Access to the exterior stair must be reconfigured so it does not pass through the Collections area or any other intervening room.

2.7 Collections Storage

Collections management is OMHA's most pressing operational priority. The museum does not have a complete inventory of its collections or space for proper intake of new items. A large portion of the collections are kept in unprocessed boxes that are difficult to access due to clutter. Storage space is extremely limited: the main collection room on the second floor provides only 1,300 square feet. Adding in the vault spaces, multipurpose storage room, and incidental storage areas, total on-site storage is estimated at 2,000 square feet. Some collection materials are stored nearby in the South Lemon Street jail building.

OMHA is currently working with a consultant, David Harvey, on planning how collections will be managed when a large portion of them are located off-site

Goals: Based on the user group meeting and guidance from the Sustaining Cultural Heritage Collection report, the current collection, when properly housed, will occupy approximately five times the current number of boxes, or roughly 10,000 square feet. An estimated additional 7,000 square feet may be needed within 10 years. These figures indicate that OMHA should plan for at least an eight-fold increase in storage area.

This space cannot reasonably be provided in the existing building and the museum is exploring offsite storage options. In the very near term, OMHA should secure approximately 3,000 square feet of interim offsite storage, with the goal of clearing out room for the staff to process and properly house the current collection while permanent off-site storage is investigated. This permanent space should be no less than 16,000 square feet and must provide proper humidity and temperature control, security, and shelving. It should also be within reasonable proximity to the museum for staff operations. Another immediate next step would be to get a collection needs assessment to help museum staff determine how to operate and manage the collection with a large portion of it being off-site.

As part of long term planning, approximately 170 square feet should be allocated for an isolation room, and approximately 300 square feet for a holding/processing room.

2.8 Non-Collections Storage

Museum Associates

In addition to event supplies in the kitchen, the Museum Associates keep large items such as pop-up tents and sandbags in the storage room by the staff stairs. They also have several large filing cabinets on the second floor containing their financial records.

Goals: The Museum Associates should review old files and discard or archive as much as possible. A dedicated space for event items should be provided either in the basement or the Jail Building.

Tables and Chairs

The museum has no dedicated furniture storage and furniture is scattered throughout the building, often in very visible public spaces. Furniture in hallways blocks egress paths.

Goals: Any furniture impeding required egress must be removed. Moving forward, furniture should have a dedicated storage space and none of it should be kept in public areas.

OMHA staff typically sets up for events, so furniture needs to be readily accessible and easily handled. The concept plan in Section 3 allocates an area within the building for furniture storage. If additional storage is needed, the nearby Jail Building is a potential location. Alternatively, part of the basement may be available for storage when the elevator is installed.

General Museum

OMHA's public relations materials and general museum items are stored in a cabinet in the staff entrance hallway. While the storage area provided is sufficient, the cabinet is impeding a required egress path.

Goals: This cabinet must be moved or modified to restore the egress path. An area for this material should be provided immediately adjacent to the welcome desk.

Jail Building

The Jail Building has no environmental control and is currently used only to store exhibit pedestals and collection items with minimal temperature and humidity requirements.

Goals: This building offers a practical solution for storing overflow furniture and larger Museum Associates items (tents, sandbags, etc.). Operational concerns should be explored with museum staff.

2.9 Stairs and Elevators

The main level of the museum building, which includes all public spaces, is essentially at grade and presents only minor accessibility issues. The original courtyard entrance and verandas have two shallow steps up, but these outdoor areas are not accessed from the museum's interior. The occupied basement is served by two interior stairs, which also connect at the half-level with egresses to exterior accessways; neither of these stairs has any fire separation from the ground level or basement.

The second floor is served by one interior stair, reached on the ground floor via a back-of-house corridor. This stair is separated from the floors it serves by doors/enclosures, but fire-rating of the existing construction has not been verified. A second means of egress is provided by an exterior escape stair on the east side of the building.

The building's vertical circulation does not meet current egress codes, especially as regards protection of stairs in fire-rated enclosures. Some non-compliant conditions may be allowed under California's Historic Building Code, especially in public areas. Careful consideration must be given to optimizing life safety measures, whatever configuration is allowed (see Section 4.5).

Goals: An elevator should be added to the building to make all levels accessible and facilitate movement of collections items and display elements.

2.10 Loading

The building does not have a loading dock or dedicated entry point for collections material or travelling exhibits.

Goals: A dedicated, secure entry point should be investigated. The most plausible location is discussed in Section 3.16, although reworking it as a loading dock is unlikely to be achievable in the near-term. For accreditation purposes, OMHA should institute a written protocol for handling and protecting all exhibit and collections material entering and leaving the building.

2.11 Landscape

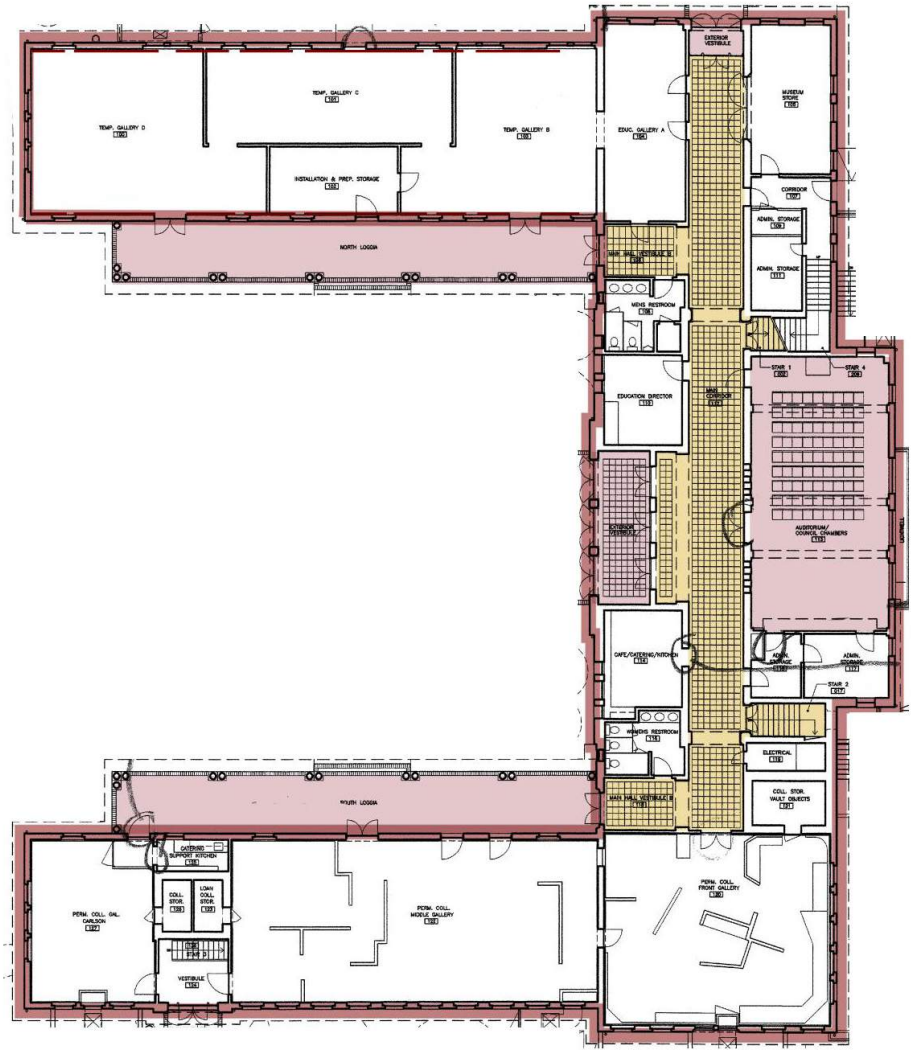
OMHA has recently completed a major relandscaping of its exterior areas, with emphasis on water conservation. While the museum has been approached about using the courtyard for private events, this has not been permitted since tents cannot be staked without risking damage to the new irrigation system. The City Rose Garden and the Nugent's Park Horseshoe Pitch are located on the same block, to the south and southeast respectively.

Goals: Increase connection between OMHA programming and landscape, possibly using courtyard and/or verandas for various programs. The dead end of Emporia Street to south may be considered for future site use, although that is beyond the scope of this report.

Shenzhen Port Medallion
from OMHA collection

Part 3

Space Optimization Recommendations



Building historic fabric priority

primary: preserve with minimum alteration

contributing: compatible adjustments for program needs only

3.1 Overview

The following proposals for space optimization are geared toward maximum positive impact without substantially changing the museum's physical organization (which already works well given the limits of the City Hall building's layout). Almost all program uses are left in their current locations, and improvements take the form of strategic upgrades and surgical interventions.

The proposed work can be understood as a series of discrete, independent projects as presented here, but with two caveats. First, the most effective sequencing of work should be carefully considered from both procedural and funding perspectives (see Section 9 for further discussion of implementation). Second, overall building systems such as electrical and fire safety are more suited to being addressed all at once, rather than space-by-space (see Section 5 for more on building systems).

All the proposals take into account the value of the old City Hall's historical fabric and are calibrated to avoid negative impacts on it. Fortuitously, the primary historical spaces are located in the central section of the building, while the gallery wing interiors have been extensively altered over the past decades and can thus be tailored more easily to OMHA's program needs. The diagram at left shows the location of primary and contributing historical fabric on the first floor. No historically sensitive interior spaces remain on the second or basement floors. See section 4.9 and Appendix D for more detailed information on preservation requirements.

Note: Section numbers following are keyed to locations on concept plans.

3.2 Welcome Desk

- Open wall for partially-inset Welcome Desk – minor impact on historic features; compatible result
- Desk and greeter should be clearly visible upon entry; maximize sightlines
- Durable materials, compatible with Main Hall finishes and historical features
- Incorporate ADA-height counter and raised area to shield computer screen
- Area behind desk with full-height cabinetry for Museum info and educational material

3.3 Museum Store

- New sales desk facing store and Museum entry
- Incorporate ADA-height counter and raised area to shield computer screen
- Potentially connected to entry desk
- New secure storage cabinetry in lieu of stock room

3.4 Family/Accessible Restroom

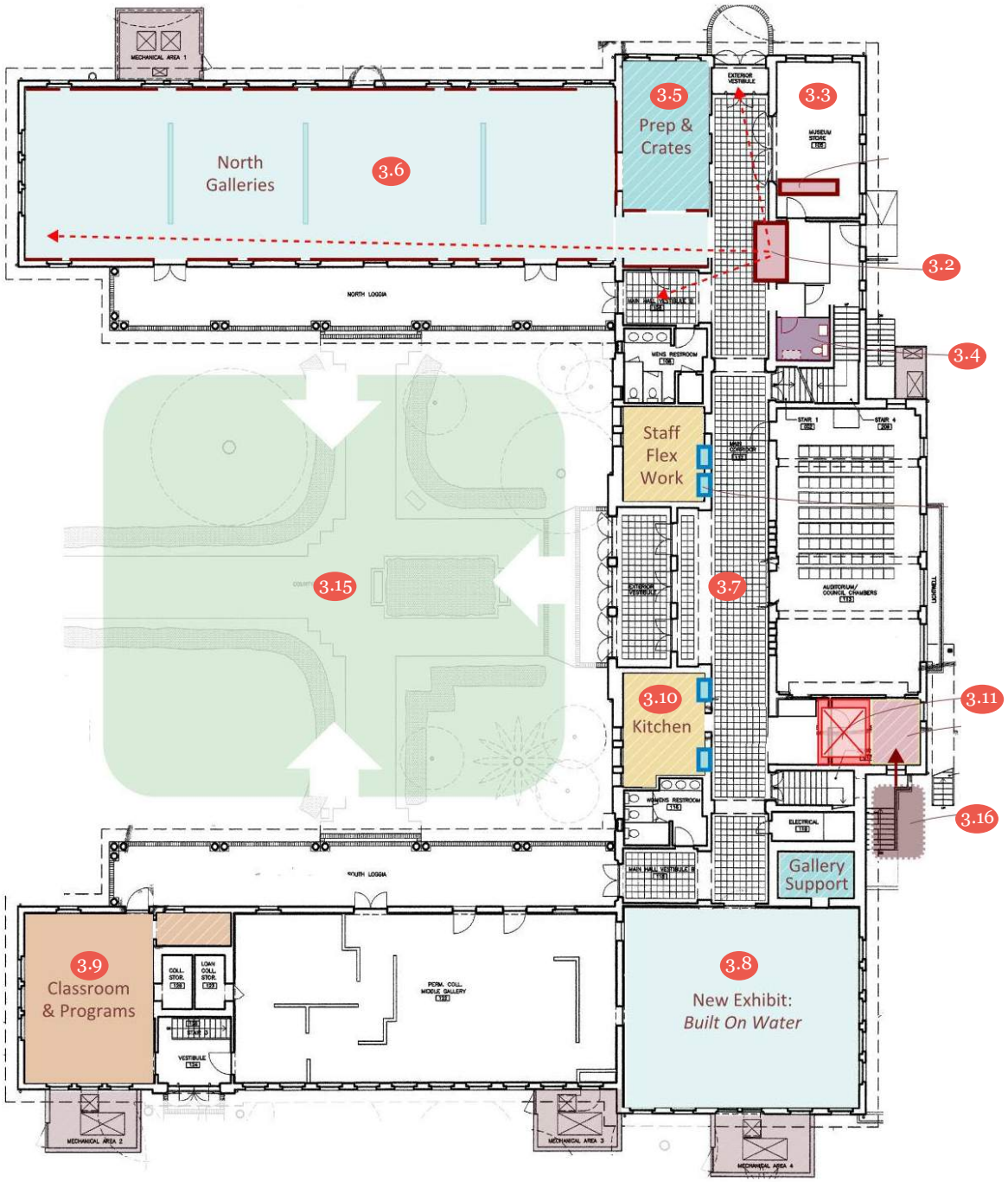
- Meet all applicable accessibility requirements
- Access from vestibule, not directly off Main Hall
- Provide changing table
- Note proximity of existing Men's Room plumbing and vent lines
- Will required ducted exhaust

3.5 Exhibit Loading/Prep Room

- Remake first room of north galleries as a prep room
- Immediate access from entry; coordinate pallet truck path clearance with new Welcome Desk footprint
- New double doors from gallery vestibule, retain single door at hall for secondary entry when room is full of crates
- In same climate control zone as north galleries
- Work counters and shelves at north end. Otherwise, movable tables to allow for storage of various amounts of crates
- Overflow work space in existing office off Main Hall

3.6 North Galleries

- Open up 6' entry from Main Hall and create vestibule for exhibit title and info graphics– minor impact on historic features; compatible result
- Glass doors between vestibule and galleries; direct sightline from welcome desk though galleries
- Remove all interior partitions west of concrete wall; keep perimeter wall partition buildout where practicable
- Build new full-height display walls perpendicular to axis of gallery; incorporate electrical outlets
- Fabricate 2-3 mobile exhibit walls
- Develop strategy for perimeter walls at windows and doors



First floor concept plan

- Remove carpet tile; concrete or wood floor; acoustics must be considered
- Remove acoustical tile, skimcoat ceiling, and paint
- New lighting: Overall grid of linear LEDs + track system; for budget savings, consider European approach of overall lighting with limited accents

3.7 Main Hall

- Retain historic features
- Remove clutter; keep historical seating
- Consider addressing acoustical issues with non-permanent, architecturally integrated sound-absorbent panels
- Incorporate exhibit displays
- Back-accessed cabinets along west side – requires demo through concrete wall and new lintels

3.8 Southeast Gallery

- Remove floor and wall carpeting
- Consider keeping gridded ceiling system
- Lay out new exhibits with greater visibility
- Develop strategy for perimeter walls at windows and doors
- See Appendix C.2 for "Built On Water" concept budget

3.9 Carlson Room

- Remove enclosure along south wall
- Reopen existing windows and restore damaged historical embrasures
- Easily maintainable floor and wall finishes
- Upgrade support room; possible pneumatic toilet
- Controlled access to the veranda for educational programs

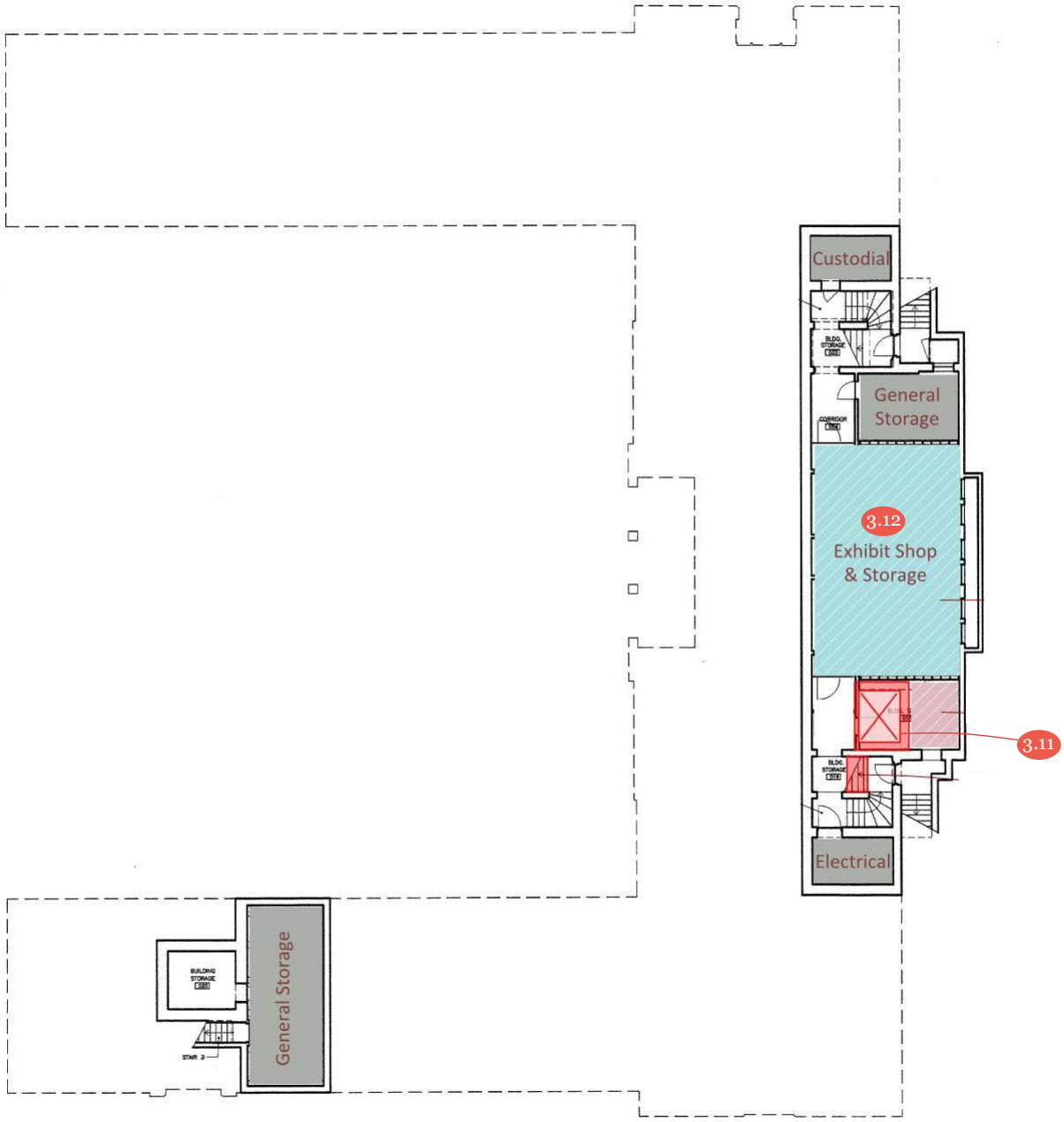
3.10 Kitchen

- Redesign for usability
- Add storage and counter space
- Change out room finishes and lighting as budget permits

3.11 Elevator

- Approximate 5'x8' cab size
- Double-sided – opens to furniture storage at basement and ground floor, collections holding at second floor
- For Museum Offices and basement access; not needed for general visitors
- Reorient adjacent duct riser, or eliminate altogether with VRV system
- Pop-up at roof level for overrun likely (Acceptable impact on historical features)
- Machine room and emergency power room in basement
- See also 3.16 Loading Dock

Space Optimization Recommendations



Basement concept plan

3.12 Basement

- Clear out central space (no bearing walls); remove disused service lines; work around any service lines to remain
- Lay out as a workshop
- Assess need for a spray booth; see Section 5.3 for required exhaust
- Consider educational access
- Dampproof exterior walls
- Assumed no collection material will be brought to basement level, as environmental control is not guaranteed this area

3.13 Offices

- Limited reconfiguration of second floor; note that many walls are 6" concrete due to original use as jail
- Open up existing library area to central hall by removing wall in original location of interior windows (not concrete); creates a sizeable work/collaboration area
- Divide SW room into Director's Office and Conference Room
- Remove walls at south end of central hall for elevator access
- Potential to use in-situ plumbing at south wall for a staff kitchenette
- Open up an unobstructed egress path to the exterior stair door
- Create a copy room along the north wall with access to the existing washroom
- Replace existing flooring with carpet tile
- Remove ACT, skimcoat ceilings, and paint
- Install energy-efficient lighting fixtures

3.14 Collections

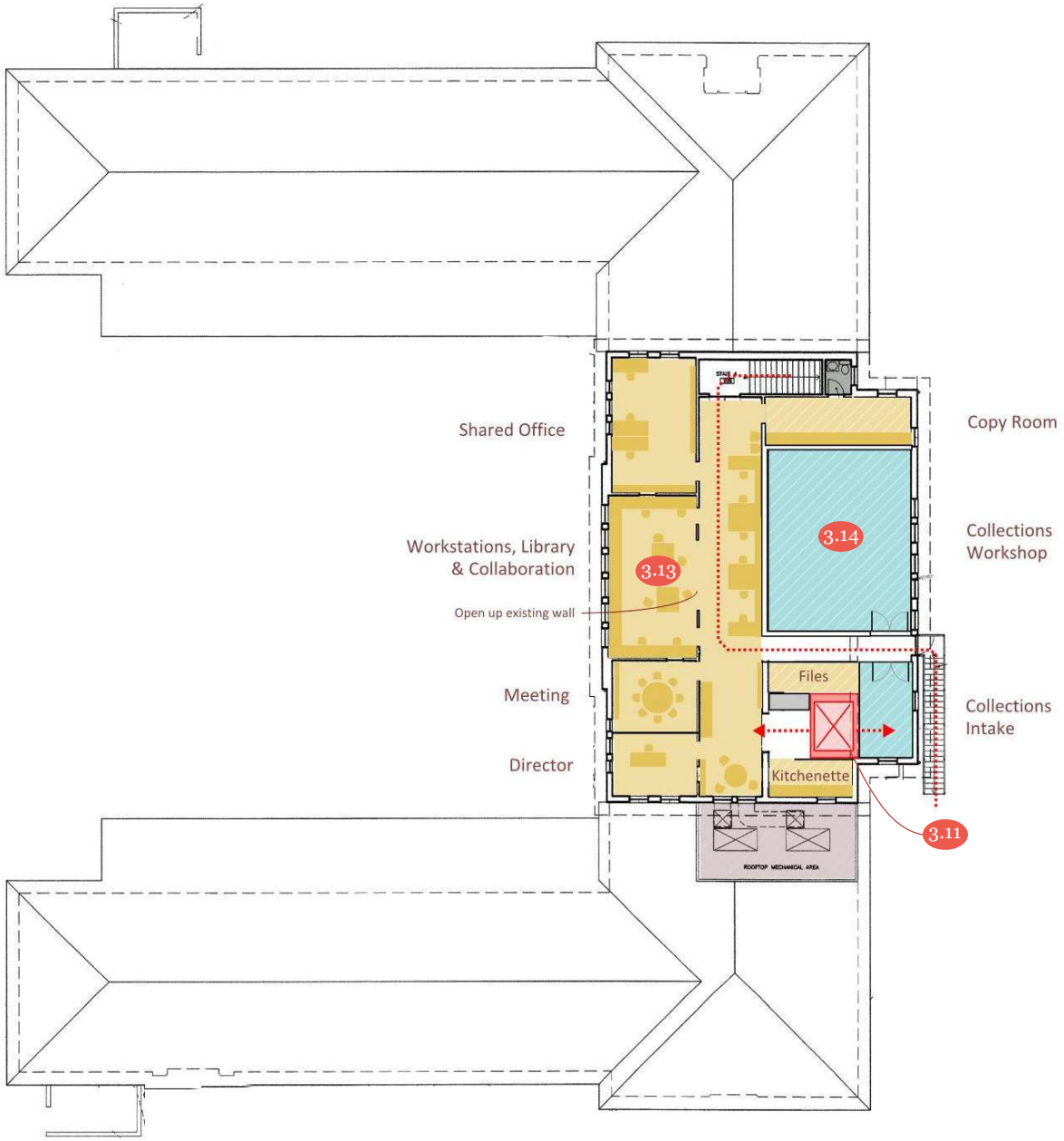
- Offsite storage allows collections space needs to be optimized for active and especially valuable items
- Receiving to secure room from rear door of elevator
- Assumed existing shelving will be reused

3.15 Connection to Courtyard

- Sightline from desk – potential to use door next to men's room
- Signature large scale sculpture?
- Use verandas for educational programming

3.16 Loading Dock

- Potential location along east side over south basement exit stair
- Accessible from parking lot
- Hold-open for double-sided elevator to bring shipments through – coordinate with accessibility requirements
- Elevator connection to collections receiving and basement workshop



Second floor concept plan

Derby Hat
from OMHA collection

Part 4

Code and Accessibility

4.1 Overview / Historical Building Code

See also Appendix B.6: Code Review Summary

Applicable building codes for OMHA as of March 2019 are:

- 2016 California Building Code (CBC), California Code of Regulations, Title 24
  - Part 2: 2016 California Building Code, vols. 1 and 2
  - Part 3: 2016 California Electrical Code (CElecC)
  - Part 4: 2016 California Mechanical Code (CMechC)
  - Part 5: 2016 California Plumbing Code (CPlumC)
  - Part 6: 2016 California Energy Code (CEngyC)
  - Part 8: 2016 California Historical Building Code (CHistC)
  - Part 9: 2016 California Fire Code (CFireC)
  - Part 10: 2016 California Existing Building Code (CExstC)
  - Part 11: 2016 California Green Building Standards Code (CalGreen)
- City of Ontario ordinances governing construction and site use

All code citations in this section are for the 2016 CBC and its component parts. Updated codes will almost certainly be adopted over the 20-year timeframe of this master plan. Currently applicable codes should be verified as work proceeds.

As a "Qualified Historical Building or Property" as defined by CA Health and Safety Code Section 18955, the former City Hall is subject to code as follows:

> All building alterations are to comply with the provisions of both the CHistC and the CBC except in cases where CBC compliance is not fully compatible with preservation of contributing historical features. In such cases, CHistC mandates that the approving agency accept solutions

that 1) provide a reasonable equivalent to CBC intent and 2) are compatible with CHistC (per CHistC 8-101.2).

CExstC may also be referenced for guidance where it provides more detailed direction than CHistC; however, specific requirements of the CExstC shall not be interpreted as overruling the CHistC's mandate to preserve historical features.

Note also CFireC Chapter 11: Construction Requirements for Existing Buildings, which directly addresses fire safety concerns.

Whenever the Historical Building Code is invoked to propose alternate solutions, there should be a clear narrative of the conflict with CBC requirements and the proposed equivalent measures.

4.2 Code-defined Occupancy

The current building uses as defined by CBC are as follows:

Basement

Group B - Exhibit Workshop

Group S-1 - Storage

Incidental - MEP and support rooms

First Floor

Group A-3 - Galleries & Council Chambers

Group M - Museum Store (<50 occupants)

Group B – Offices and support spaces

Group S-1 – Storage

Second Floor

Group B – Offices

Group S-1 – Collections Storage

Work proposed in this report is not anticipated to significantly change these categories.

4.3 Fire Life Safety: Construction

Occupancy Separations

The following occupancy separations (fire resistance rating in hours) are required per CBC Table 508.4:

Occupancy	*Separation*	
	Sprinklered	*Non-sprinklered*
A-3 to B*, M*, S-1	1	2
B to S-1	None	None

*The Group B and M occupancies on the first floor qualify as accessory occupancies to the primary A-3 occupancy and do not require a separation per CBC 508.2.3 since they do not take up more than 10% of the first floor building area.

A preliminary assessment indicates the following measures are required to achieve these separations:

- A continuous rated ceiling should be installed under the wood deck separating the basement and first floor.
- Storage adjacent to a gallery or public area that is not considered an accessory occupancy (if any) should be separated by rated partitions and/or ceilings.

Specific separation ratings will depend on whether a sprinkler system is installed; see Section 4.4 below. Note that CHistC does not necessarily obviate the requirement for occupancy separations but does permit fire rating reductions if an automatic sprinkler system is provided throughout the entire building.

While a rated separation is not required between the collections and office areas on the second floor, a 1 or 2 hour separation could be reasonably achieved by taking advantage of the existing concrete walls and floor. This would provide additional protection for collections material and is recommended for consideration.

Construction Type

Observed building conditions appear to be closest to the requirements of Construction Type IIIB as given in CBC Table 601. Elements of a Type IIIB building must have a fire resistance rating not less than the following:

Building Element	*Fire Rating Requirement*
Structural Frame	0
Bearing Walls	
Exterior	2
Interior	0
Nonbearing walls & partitions	
Exterior	0
Interior	0
Floor Construction	0
Roof Construction	0
Exit Stairs & Exit Passageways	1
Service and Elevator Shafts	1

The existing exterior walls, interior bearing walls, and the slab separating first and second floors are all cast-in-place reinforced concrete construction and, as such, are considered non-combustible. The existing exterior walls are expected to satisfy the provide 2-hour fire resistance requirement.

All interior partitions (nonbearing), roofs, and the ground floor deck directly over the basement are wood-framed. None of these elements are required to be fire resistant in Type IIIB construction. However, note required ratings between occupancies discussed above in this section.

Destructive testing would be required to determine if the enclosures of existing exit stairs and passageways provide continuous 1-hour fire resistance. However, per CHistC 8-402.2, upgrading a qualified historical building to 1-hour fire resistive construction and 1-hour fire resistive corridors shall not be required regardless of construction or occupancy when one of the following is provided:

a) An automatic sprinkler system throughout.

b) An approved life-safety evaluation.

c) Other alternative measures approved by the enforcing agency.

The elevator shaft enclosure is required to be 1 hour rated since it is new construction.

4.4 Fire Life Safety: Systems

Fire Alarm System

Per CHistC 8-409, every qualified historical building shall have a fire alarm system as required for the use or occupancy by the CBC, or an approved alternative. (Note also CFireC 1103.1.1 for fire protection plans in historical buildings) Alarm devices are extant in most areas of the museum building. The system functionality is not known and should be tested. Additional detection and alarm devices will likely be required. A complete assessment is beyond the scope of this report.

The fire alarm system is required for a Group A use by the CBC and for existing buildings by CFireC 1103.7. This system includes the following components:

- A manual alarm system (i.e. pull boxes at all required exits) that activates the occupant notification system.
- An emergency voice/alarm communications system (required due to Group A occupant load being greater than 1,000).
- Notification appliances consisting of speakers and strobes throughout the building.

The fire alarm system and egress routes should be tested regularly as required by code.

Sprinkler System

The museum building does not currently have a sprinkler system and installation of one is not required per CFireC Table 1103.1 / Section 1103.5. However, retrofitting the entire building with a system conforming to NFPA13R should be carefully considered, especially as it relates to protection of collections material.

(A system serving limited areas such as the offices and basement is also a possibility. Note, however, that most code-allowed reductions of fire ratings etc. require that the *entire* building be sprinklered.)

System installation would be relatively straightforward in areas with space above their architectural ceilings, such as the galleries. However, the most historically sensitive areas have little or no ceiling cavities, making sprinkler system components more difficult to integrate.

If a sprinkler system is installed, water service is readily available as evidenced by the three existing hydrants within 100-150' of the building footprint.

4.5 Egress

Any required egress doors that are not currently operational and any areas without sufficient egress signage should be remedied at the earliest opportunity.

First Floor as exists: All spaces either have required egress capacity or can be provided with it using existing doors.

Compliance measures:

- Provide appropriate door hardware for egress and security to eliminate the need to chain the doors together.
- Locked exterior doors that are not available for emergency egress must be clearly labeled "Not An Exit." These include the single door on north side of the temporary gallery and the three double doors to the courtyard from the main hallway.
- In the permanent galleries, exhibit partitions block views of exit signs from some areas. Adjust the location of the signs and/or add additional signs.

Second Floor as exists: Single interior egress, supplemented by exterior stair

Compliance measures:

- Upstairs path of travel through the collections storage is not unlocked during business hours and the door does not have proper panic hardware.
- Short term, provide proper panic hardware for egress and link it to the alarm system for collections security.
- Long term, provide a hallway so the path of egress is not through the collections storage.

Basement as exists: Two egresses, with connection to exterior areaways. Multiple instances of egress from occupied areas through intervening spaces. No rated separation from first floor, and none required per CFireC 1103.4.8.1.

Compliance measures:

- Reconfigure basement as one large space with exits at both ends.

Egress widths: Per CHistC 8-502.2, existing door opening and corridor widths of less than the dimensions required by the CBC shall be permitted where there is sufficient width and height for the occupants to pass through the opening or traverse the exit.

Existing Stairs: Per CHistC 8-502.3, existing stairs having risers and treads or width nonconforming to the CBC shall be permitted if determined by the enforcing agency to not constitute a distinct hazard. Handrails with nonconforming grip size or extensions are allowed if determined by the enforcing agency to not constitute a distinct hazard.

Exit signs: Locations must be confirmed based on egress plan and signage package.

4.6 Restroom Fixture Count

A preliminary evaluation was performed to assess restroom capacity. As the museum is an existing building and no changes in occupancy or type that would result in an increased occupant load are planned, conformance with current minimum facilities requirements may not be considered mandatory if the extent of work falls below certain thresholds (ref CPlumC Table 422.1 and Section 422.1.2; CHistC does not directly address fixture count requirements). Regardless, the museum should provide functionally sufficient facilities to the extent feasible. Museum staff has reported that there are backups at the restrooms, particularly the women's, when school groups are visiting.

A new building equivalent to OMHA would have the following plumbing occupant load and requirements:

Occupancy	*OLF**	*Area*	*Occupant Load*	
			male	*female*
Assembly	30 sf/oc	7,420	124	124
Business	200 sf/oc	3,805	10	10
Storage	5,000 sf/oc	1,890	1	1

* "Occupant Load Factor" per 2016 CPlumC Table A:
Exhibit rooms and similar: 30sf / occupant
Offices: 200sf / occupant
Storage: 5,000sf / occupant

Per CPlumC Table 422.1, the minimum required fixture count would be:

Occupancy	*WCs*		*Urinals*	*Lavatories*	
	m	*f*		*m*	*f*
Assembly	2	4	2	1	2
Business	1*		*n/a*	1	
Storage	*accessory to Business/Office use*				

*Per CPlumC 422.2 Exception (3)

This totals (8) fixtures for public/general use – (4) male and (4) female – and (1) fixture for office use. At present, the museum has (6) public fixtures -- (3) male and (3) female -- and (1) fixture for office use. The master plan includes a single-occupant accessible/family toilet room off the Main Hall, adding an additional, fully accessible fixture to make (7). If code officials determine that there must be (8) public fixtures, the most plausible option would be adding a public restroom in the basement.

Per CPlumC Table 422.1 a drinking fountain may be required on the ground floor, although the Kitchen's sink might be accepted as an alternative. A service sink is also required; the existing floor basin in the custodial closet (ground floor Men's Room) is likely to satisfy this requirement.

4.7 Accessibility

As a public cultural resource, OMHA should strive to make all new building work barrier-free. This effort is anticipated to be largely compatible with preservation of historic features. There appear to be few issues in the public areas; accessible routes must be confirmed in all new work, and all gallery installations should provide required clearances.

The museum's two pressing accessibility issues are restroom accommodation and accessible paths of travel to the basement and second floor. The existing restrooms are not fully accessible, and cannot be made so without extensive rearrangement and reduction of fixture count. In lieu of changes to the existing restrooms, CExstC 410.8.10 allows provision of one or more fully accessible single-occupant toilet rooms. These must be available to both public and staff, and located in an area no less convenient than the existing restrooms. See Section 3.4 for proposed measures to meet these parameters.

The museum building currently provides no accessible route to the basement or second floor. While a "limited-use, limited access" lift could be considered as a minimum accommodation, a full-scale elevator would have significant operational benefits for the museum and is strongly recommended. The proposed location for this elevator is shown in Section 3.11.

Other accessibility measures should be considered in the context of CHistC Chapter 8-6 – Accessibility and CExstC Section 410 – Accessibility for Existing Buildings. Note especially Section 410.6 and situational evaluation of "technically feasible" and "technically infeasible" measures.

4.8 Hazardous Materials

The extent of hazardous materials in the existing building has not been determined and a complete survey and report are needed. If hazardous materials are found, abatement must be finished before any work can proceed in the affected area.

Based on limited information from a previous report, the flooring mastic on the second floor contains asbestos. Flooring mastic on the interior stair to the second floor has been previously abated. OMHA believes the basement ductwork linings may contain asbestos.

The partial basement under the south wing has a strong moldy smell and staff have avoided going into this space. This almost certainly has a biological source, and options for cleaning and ongoing dehumidification should be investigated.

Paint sampling and lead testing is recommended.

4.9 Preservation Standards

The Old City Hall was one of the first buildings to be designated a Historic Landmark by the City of Ontario (in September 1993). Exterior work other than basic maintenance is subject to the City's Historic Preservation Ordinance (HPO), administered by the Advance Planning division of the Planning Department.

Planning staff, along with the Historic Preservation Sub-Committee and Historic Preservation

Commission, review all work affecting a designated property or district. Approval typically takes the form of a Certificate of Appropriateness. A Waiver to the Certificate of Appropriateness may be issued by the Planning Director if the proposed work is considered minor and does not adversely affect character-defining features.

In the case of the Old City Hall, all exteriors are subject to the HPO. In addition, any significant alterations to the former Council Chambers require explicit permission from the City Council (City Resolution 9587). The balance of the interiors are not subject to preservation requirements, but the intent of this master Plan is to retain original character-defining features wherever practicable, especially in public areas. Further, new work should be compatible with, but clearly distinguished from, historic fabric.

(See Appendix D for a matrix of planning approvals anticipated to be required for maintenance, rehabilitation, and new work at OMHA, by type.)

Given the building's status as a City Landmark, its importance to Ontario's history, and the large percentage of its historical fabric that remains intact, the Secretary of the Interior's Standards for Treatment of Historic Properties (SOI Standards) should be incorporated into all work, both exterior and interior. These standards lay out widely accepted best-practice guidelines for preservation and rehabilitation of historical properties in the United States. (Refer to ***nps.gov*** for latest version of SOI Standards at time of work.) In addition, the index of National Park Service Preservation Briefs should be consulted for publications offering specifically relevant guidance. (*nps.gov/tps/how-to-preserve/briefs.htm*)

The SOI Standards are generally not prescriptive; they will require thoughtful and appropriate interpretation in their application to specific situations. Note also that the SOI Standards do *not* mandate reconstruction of lost historic fabric. At OMHA, this means that redesign of the gallery and support spaces — already much altered from their historical condition — does not conflict with the Standards' intent.

4.10 Immediate Priorities

The following items should be addressed at once:

- Confirm egress door operation and signage are as required by code
- Test/verify fire alarm; remediate any non-compliant conditions
- Review accessibility, especially in, but not limited to, public areas. Remediate any issues to maximum feasible extent

Emergency Telephone Box
from OMHA collection

Part 5

Building Systems

5.1 Overview

Building systems at OMHA can be divided into four categories:

- Structure
- Services: Mechanical, Electrical, and Plumbing ("MEP")
- IT: Teledata and Security
- Life Safety: Fire Detection/Alarm and Sprinklers (discussed separately in Section 4.4)

Integrity of structure, services, and life safety systems is essential. At OMHA, the responsibility of collections stewardship puts added emphasis on the mechanical systems that regulate temperature and humidity (generally referred to as "HVAC," for "Heating, Ventilation, and Air Conditioning"). The museum currently functions with virtually no IT systems in place; adding them would significantly benefit institutional operations and programming.

Concerns about existing building systems performance have been raised in previous reports by ARG Conservation Services and others. Structural Focus was engaged to assess the anticipated seismic performance of the existing gravity load-bearing system and lateral force-resisting system. (See report by Structural Focus in Appendix B.) Hariton Engineering was engaged to assess the conditions of the current MEP systems (See report by Hariton Engineering in Appendix B.)

5.2 Structural

Gravity & Live Load

The 1937 City Hall is built of cast-in-place concrete and roofed with wood trusses spanning conventional distances. This structural system remains acceptable for most non-seismic loading conditions. However, the 2013 Sustaining Cultural Heritage Collections report cited a specific concern about the structural capacity of second floor at the Collections Storage area. Actual strengths of the second floor concrete deck were determined by materials testing, and live loads (including Collections Storage contents) were assessed as approximately 70 lb/sf. Calculations based on this

information indicate that the floor deck at the Collections Storage area has no excess loading capacity. At the time of review, no excessive deflection or cracking was observed at the floor deck or beams; variations in the existing floor level are likely irregularities of the original construction. While the current situation has not been deemed to present an immediate risk, if loading of this floor is increased the deck must be strengthened to the code-mandated live load capacity of 125 lb/sf. Conversely, if OMHA relocates much of the stored material offsite, loading will be reduced and no future action may be required. In any scenario, the museum should periodically assess the condition of the deck and avoid concentrated loads (such as equipment or heavy artifacts) on the second floor. Where such loads cannot be avoided, they should be positioned as close to a bearing wall as possible.

Seismic

As a mostly single-story building of monolithic construction, the old City Hall is not at an elevated risk of seismic damage. However, the roof must be connected to the structural walls more robustly to resist separation in a seismic event. The following measures are necessary:

- Provide out-of-plane anchorage at the top of the interior concrete walls on the second floor. Provide steel anchors, reinforcing dowels, or straps with positive attachment at the tops of these walls and attach to diaphragm as necessary to develop expected seismic forces.
- Supplement existing out-of-plane anchors at the lower roof. At the lower roof and the concrete walls at the two-story central wing (near grid line D and grid line I), provide additional anchors to reduce the load on the existing anchors.
- Strengthen the load transfer hardware at roof diaphragm to concrete shear walls. Provide additional anchor bolts to supplement the existing ledger connection between the lower roof and the concrete walls at the two-story central wing (near grid line D and grid line I).

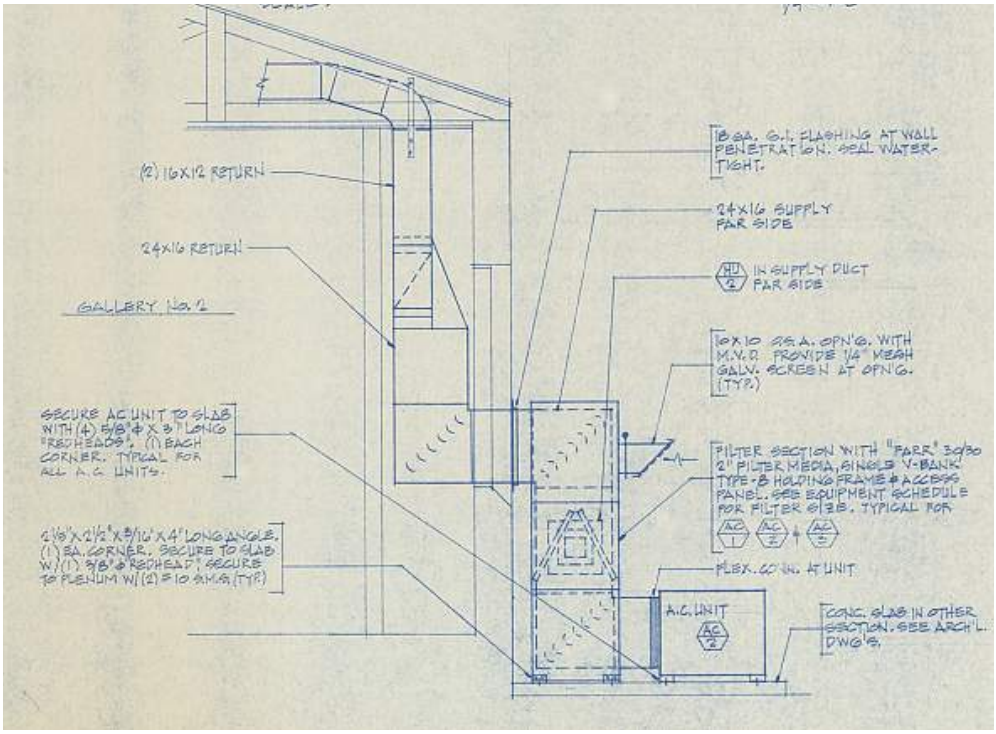
5.3 Mechanical

Collection Environment Standards

As a facility for care and preservation of cultural heritage items, the museum building must meet elevated standards for environmental control. The basic factors here are air temperature and relative humidity (rH), as maintained by the HVAC system. (The National Parks Service Museum Handbook, Chapter 4: Museum Collections Environment provides a comprehensive outline of relevant concerns here.)

The most widely referenced US framework for collections environment standards is Chapter 23 of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Handbook. ASHRAE defines two tiers of environmental control for galleries and collections areas: Class A is the strictest; Class B less so, but adequate for the range of exhibits and programs OMHA has engaged in to date. Class B sets targets for temperature and rH with an emphasis on maintaining stability of both within an acceptable range.

In addition to the ASHRAE targets, the American Alliance of Museums (AAM) may require specific environmental control measures for accreditation based on their assessment of OMHA facilities. These may not be significantly more onerous



Section detail of existing hard-ducted condition showing undesirable impact on window and interior space

than Class B parameters – and may even make allowances for the particular challenges of OMHA's historical building – but regardless it will be advantageous to get AAM's input as soon as practicable so it can be incorporated into systems planning.

Note that both north and south gallery wings are to be upgraded to meet the collections environment standards that are ultimately determined.

Maintaining separate climate zones for collections areas and non-collections uses is highly recommended.

Existing Conditions

Current HVAC systems are space by space, with exterior combination heating/cooling units serving individual zones of various sizes throughout the building. (For specific information on units, see pp.11-12 in the 2013 ARG/SC report, Appendix B.4)

Most exterior units are located in stuccoed masonry enclosures around the perimeter of the building that detract from its architectural coherency; units on the east side at both ground and rooftop levels are exposed to view.

In all cases, the exterior units are hard-ducted though altered window openings (see detail above)

and encroach on interior spaces before rising up to distribution level, typically above the ceiling.

There is no HVAC in the Main Hall, which can become uncomfortably hot for staff and visitors. While the Museum Store is served by the same system as the North Galleries, it can also become too warm as it is entirely open to the Main Hall. Window AC units serve the kitchen and office off the Main Hall.

Per the 2013 ARG/SC report (pp.12-13), OMHA's galleries and collections areas maintain Class B temperature levels year-round, but exceed both seasonal averages and max/mins for rH.

Recommendations

Given that OMHA's current HVAC units are operating beyond their lifespan and do not support the environmental requirements of gallery spaces, sequenced replacement of all existing units with more efficient and effective equipment is recommended.

A Variable Refrigerant Volume (VRV) system (also known Variable Refrigerant Flow, or VRF) would effectively address OMHA's HVAC issues. In a VRV system, exterior compressors with variable motor speed produce a calibrated flow of refrigerant that is distributed to interior spaces by small-diameter piping. This arrangement would eliminate the existing hard-ducted connections, allowing altered windows to be returned to their original configuration and getting rid of the clunky interior enclosures for connections to ceiling level distribution.

A pure VRV system is entirely ductless, with refrigerant pumped to each individual air handler. As OMHA already has ducting in place, the potential cost benefits of centralized air handling using existing distribution should be investigated.

In this scenario, the fans that are now provided in the exterior units would need to be replaced by new fans at the interior air handlers.

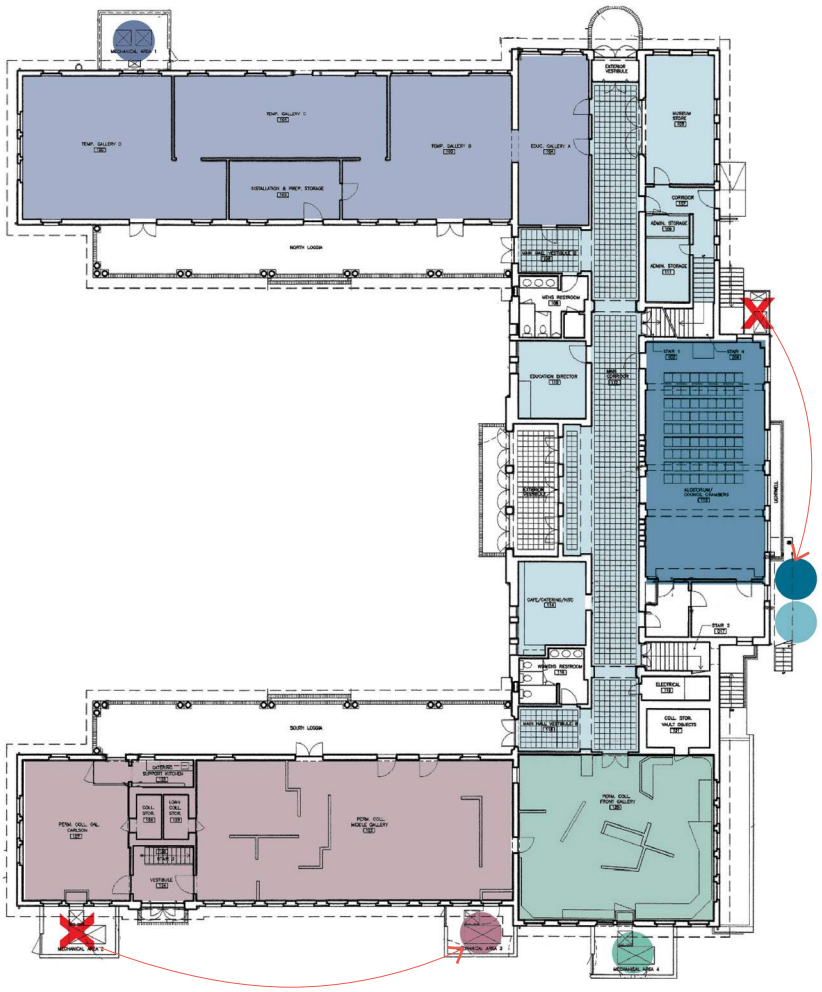
VRV systems have other features well-suited to OMHA's needs. By operating at varying speeds, VRV units work only at the needed rate allowing for substantial energy savings. Heat recovery allows individual indoor units to heat or cool as required, resulting in greater control of interior temperatures.

Most VRV systems have optional humidity control accessories; however, these accessories are typically designed for lower humidity levels than appropriate to gallery spaces. Their suitability to OMHA's needs should be assessed when specifying a system. A partially ducted arrangement could allow for humidification independent of the base VRV system if this proves to be advantageous.

VRV systems can be installed space by space, as the current HVAC arrangement, and are suited to incremental rehabilitation of the museum building. At the same time, they present opportunities for consolidating and minimizing the number of exterior units and their architecturally intrusive enclosures. For instance, the entire south wing could be served by one unit, with zoned loops.

Related recommendations are:

- Generate air balance report for the entire building's current HVAC configuration and adjust existing systems as indicated; update report as new systems are installed
- Follow National Air Filtration Association (NAFA) recommended best practice for recirculated and outside make-up air in collections areas
- Consider adding entry doors at North Galleries to maintain a stable environment



HVAC zoning concept

Circles indicate exterior units; colors match interior areas served.

- Test and verify system first in Built On Water gallery (green)
- Combine other south gallery HVAC and eliminate westernmost equipment enclosure (violet)
- Keep north galleries and prep room on one system (purple)
- Consolidate non-gallery HVAC and relocate unit under exterior stair (light blue)
- Relocate Council Chambers unit under exterior stair (dark blue)
- Single basement zone
- Separate office and collections area zones on second floor

- Replace all window AC units with architecturally integrated AC
- Provide HVAC service for Main Hall
- Add exhaust at basement workshop; if a spray booth is installed, it must have a separate, code-compliant exhaust
- Eliminate vertical duct near proposed elevator shaft

5.4 Electrical

OMHA's electrical system has been pieced together as the museum has incrementally taken over the City Hall building. While no immediate safety concerns have been observed, the electrical system should be assessed and rationalized, with all elements clearly labeled as to their service areas.

Service originates in the basement electrical room and branches to eight sub-panels throughout the building. This basic arrangement is to remain, with the distribution breakers clearly labeled to identify the sub-panels they serve. While the majority of the sub-panels are in acceptable condition, several are not in good repair and do not serve identifiable loads. In all cases, connected loads shall be confirmed and checked for potential overloading; load distributions shall be optimized. Sub-panels in unacceptable condition must be eliminated, with any connected loads transferred to viable existing or replacement subpanels.

All existing and new panels shall be mounted with required setback clearances. (Note especially the sub-panel in Education Storage 109)

Sub-panels serving the north galleries should be remounted in an appropriate location for museum operations when the north galleries are reconfigured.

Existing electrical service to the Kitchen off the Main Hall is not adequate for standard appliance loads and must be upgraded.

Overall load calculations should take the future impacts of upgraded mechanical systems, LED lighting, and the new elevator into account. Even though general load reduction is likely, service redistribution may be required and/or advantageous.

All new electrical outlets must meet code and accessibility requirements for height and spacing frequency. Existing outlets should be made compliant throughout the museum as work proceeds per area. GFI outlets should be provided in locations specified by code; note especially kitchen counters and plumbing fixture areas.

Outlets on gallery walls should be located to minimize their visual impact, preferably near corners or the ends of walls. For permanent installations, outlets should be coordinated with exhibit needs. Gallery floor outlets are likely to be cost-inefficient, as they would entail cutting conduit runs across the existing concrete slabs.

OMHA should evaluate needs for three-phase/ heavy-duty service in prep areas or workshops so appropriate outlets can be provided.

Occupancy sensors for lighting should be provided as required by CElecC in spaces as they are upgraded.

Egress lighting should be upgraded to meet current code for lumen levels and emergency service.

Per CFireC 604.1.4, 604.2.1, and 607.2, the new elevator will require a standby power system with a minimum two-hour load duration. (Note that 2016 CBC states, in contradiction, that the minimum duration is 90 minutes. Code reviewers typically—

although not invariably – apply the more stringent requirement.) This power system will require a dedicated space, likely in the basement.

5.5 Plumbing

Existing plumbing service is limited to the central, two-story zone of the building, with the exception of a convenience sink in the Carlson Gallery. The supply line to this sink was compromised during recent landscaping and has not yet been restored.

In the basement, the two long banks of connections for restrooms that no longer exist should be demolished and all lines cut back to their source. This work may require local demolition and reconstruction of the basement floor slab.

Proposed new/reinstated plumbing fixtures are located near or along existing supply and waste lines. These fixtures include the proposed kitchenette and accessible/family toilet room.

The absence of a basement under the wings makes new waste lines outside the central zone infeasible. One potential option for the wings is a pneumatic toilet. Assess any collections risks from plumbing lines.

5.6 Teledata

Currently, OMHA has telephone service but no dedicated data. Extension of in-ground data utilities to the museum's block is said to be pending, but installation is at least a year in the future, if not longer. For the present, the museum uses a connection to a nearby wi-fi hub for administrative business, but this is unreliable.

The museum hopes to follow current trends toward incorporating wireless access to digital content into exhibits, including the planned "Built On Water" gallery. Most of these measures will require an internet connection, and OMHA should vigorously pursue data service and advocate for utilities to be extended to its site.

5.7 Security

OMHA's gallery layouts restrict staff oversight and incidents of exhibit theft have been reported. The Museum is responding with increased personnel presence in the galleries and is investigating potential security systems.

Options fall into two categories: wireless and hard-wired. Wireless systems are typically less expensive, but have several drawbacks: they rely on uninterrupted wi-fi connections and are usually administered by providers who store data on their own servers (that is, beyond the client's direct control). Given OMHA's needs, a system of cameras and security devices hard-wired to a museum-controlled server is recommended. Basic components of a hard-wired system could be installed regardless of whether the museum has data service; however, remote notification and other offsite communications would be significantly limited.

Number of cameras is a cost point for any system. Sightlines should be considered when designing new exhibit layouts to the extent they are compatible with the display concept.

Vino Sano Grape Brick
from OMHA collection

Part 6

Building Conditions Assessment

Building Conditions Assessment

The following architectural conditions assessment primarily addresses distress conditions at the building envelope. Existing features have been grouped into the following categories: roofing and drainage, exterior walls and features, wood framing and trim, windows and doors, exterior stairs, exterior lighting, landscape features, and building systems.

Methodology

Sarah Devan, ARG architect and conservator, performed a visual survey of the property on February 11, 2018. The building exterior was surveyed from the grounds and habitable interior spaces were inspected. Existing conditions including observed distress were noted and documented with digital photographs.

Survey Limitations

The survey was visual only, and focused on the exterior building envelope. Observation of roofing and drainage systems was limited to areas that could be viewed from the ground and from available windows; no up close access was provided. Survey of existing structural framing was performed only as it relates to materials and finishes, not for soundness of either gravity load-bearing or lateral force-resisting aspects. Building systems (MEP, fire suppression, etc.) as such were not surveyed by ARG. Where available, information related to structural and building systems has been provided for reference.

6.1 Roofing and Drainage

The building roofs are hipped and covered with red clay straight mission (aka "barrel mission") tile. The roof structure is wood-framed with trusses and rafters. The rafter tails form an 18-inch wide overhang, with decorative ends and board decking exposed at the eaves (see "Wood Framing and Trim" section below for information). The rafters are notched to support the copper gutter, and there are painted sheet metal (likely also copper) downspouts and conductor heads.

In general, the clay tile roof appears to be in good condition overall; documentation indicates the building was reroofed ca. 2001. ARG noted localized areas of broken tile, with general soiling and debris accumulation overall. The condition of the underlayment and decking is unknown but is likely to be acceptable since the sheathing assembly was replaced as part of the 2001 project (with the exception of sheathing on the south wing roof, which dates from ca. 1982). Visible areas of the decking at the eaves appear in good condition. There may be localized areas of decay at previous leak locations, etc. Most drainage system elements are intact. The copper gutters appear to be in good condition, although in need of general maintenance and debris removal. The copper downspouts and conductor heads have been painted similar to the building. In some areas, ARG noted loose fittings, with drip stains where downspouts fit to gutters. We also noted an area where a downspout has been cut short, and a PVC end fitting installed; the PVC end was detached from the downspout.

A small concrete pad at the second floor level supports mechanical units. The pad is accessed from a window in the collections storage room and appears to be covered with a waterproof membrane or coating. The sloping tile roof is immediately adjacent, and reportedly there is a leak in this location. ARG noted broken tile and heavy accumulations of debris in this area. Sheet metal wall flashing set into a reglet at the concrete wall is visible, but other flashing or waterproofing cannot be observed. Tile and debris removal and further up-close inspection will be needed to confirm the condition of the underlayment and flashings in this area, and determine the leak location. Additional flashing and/or drainage may be required.

View from mechanical pad to clay tile roof at reported leak location. Note broken tile, heavy debris, and flashing.

View of clay tile roofing from second floor window; note debris accumulation.

Typical eave condition showing overhang, decorative rafter tails, and copper gutter.

Gutter-to-downspout connection; note drip stains at loose fitting.

Typical painted downspout and conductor head.

Roof mechanical pad seen from second floor window.

Replacement PVC extension disconnected from downspout at northwest corner of building.

6.2 Exterior Walls and Features

Concrete Walls

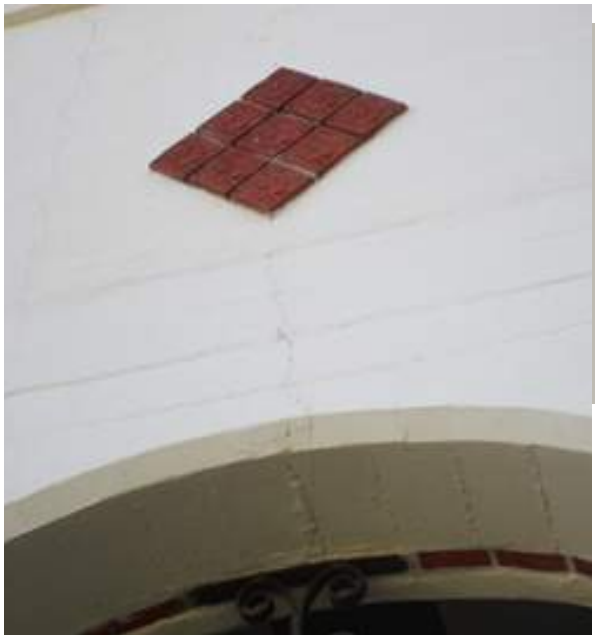
The exterior walls of the building are constructed of cast-in-place reinforced concrete. Horizontal form-board impressions are visible throughout; as well as localized ridges (resulting from gaps between form-boards) and honeycombing (small voids and air gaps from poor compaction). These are characteristic of the original construction and contribute to the building's historic appearance. Concrete surfaces are generally painted with an elastomeric paint coating. In some areas, such as the original main entrance, the walls are adorned with terra cotta tile. The tile features a molded floral design, and was most likely mass-produced (manufacturer unknown).

In general, the concrete walls are in good condition. Minor cracks (hairline to 1/16-inch wide) are present throughout. Wider cracks (greater than 1/16-inch) and spalls (material losses) occur in localized areas. The elastomeric coating is generally intact, but peeling in localized areas, particularly near the base of walls. Ferrous stains were also observed from surface runoff from adjacent metals. The tilework is generally in good condition, with some minor cracking of grout joints, paint splatter, and a few missing units.

Cracks in concrete at west elevation.

Peeled paint coating at base of wall, west elevation.

Spalled concrete at east elevation (south return).



Terra cotta tile details at east courtyard elevation. Note crack at concrete wall and arch below.

Typical terra cotta tile details flanking entrance bays at east courtyard elevation.

Missing tile between windows at east courtyard elevation.

Basement Walls

The museum has a partial basement at the central portion of the building. The basement is divided into various storage rooms and mechanical spaces, and can be accessed from both internal and external stairs. The walls are reinforced concrete and generally painted with an elastomeric coating or faced with plaster or other finish materials. The floors are concrete slab-on-grade. Most are bare concrete; some areas have vinyl floor tile which may contain asbestos (testing is needed to confirm). In other areas, such as the workroom, the tile has been removed. There are floor drains throughout the basement.

Historically, the basement has been prone to dampness and water infiltration and has not been used for collections storage or other uses requiring environmental control. ARG noted numerous areas of damaged interior finishes and staining consistent with water infiltration through the basement walls. The basement windows are heavily deteriorated and a likely source of some portion of the water infiltration. Most windows have been provisionally closed up with plywood. One window has been infilled with ductwork, with ill-fitting infill panels and poor sealant work. An active water leak has been reported in this location. The wall finishes below this window are heavily deteriorated.

Ductwork installed in basement window opening. Note plywood infill, sealant, and heavy deterioration of wall below.

Basement workroom; note vinyl tile has been removed from concrete floor slab.

Peeling paint and deteriorated wall finishes at basement storage room.

Typical floor drain at concrete floor slab in basement.

Deteriorated/damaged windows at basement. Windows covered with plywood at exterior.

6.3 Wood Framing and Trim

Exposed Rafters

The roof structure is wood trusses and rafters. At the eaves, the rafters extend as an 18-inch overhang with exposed decorative ends or "tails" and board decking. The rafter tails are notched to support the copper gutter. Surfaces treatment appears to be a combination of dark-stained wood (most likely original) and wood painted brown. For example, rafters at the courtyard verandas have been painted (see photos below).

In many locations throughout the building, the ends of the rafter tails are decayed (wood rot). The decay varies from minor splitting and checking to moderate loss (small voids) to heavy decay with large areas of loss. The heavy decay was noted primarily at building corners. ARG was unable to survey the rafter tails up-close to confirm the depth of decay. There may be additional areas of decay immediately below the gutter where the tails are notched.

Verandas

The north and south verandas at the courtyard elevations are framed with heavy wood timber. The shed roofs of the verandas also feature exposed rafter tails, similar to the rest of the building. Both the beams and rafter tails have been painted in these areas, but may have had a dark-stained finish originally. The verandas also have a board ceiling, which may or may not be the original condition.

The rafter tails at the verandas are generally in slightly better condition than those elsewhere, likely due to their protective paint coating. The heavy timber beams, on the other hand, are in poor condition, with numerous heavy checks and splits along their length. In some areas, the splits are very deep, almost entirely through the member, with some displacement or racking observed. Further inspection by a structural engineer is recommended.

Typical decayed ends of exposed rafters. (northeast corner shown)

Typical deep checking/splits at veranda wood beams. (south courtyard elevation shown)

6.4 Windows and Doors

Exterior Doors

Exterior doors around the building vary greatly in size and configuration. They are generally solid wood stile-and-rail doors with decorative inset panels or glass vision panels. Some have fixed wood sidelights and transoms. In general, the doors are in fair condition. All are operable, and have signs of wear from repeated use. Damage includes abraded or weathered stain finishes, surface gouges, minor splits, minor wood decay (particularly at the bottom of doors), and broken glazing. Surfaces are soiled throughout. Hardware is generally intact but there are concerns regarding locking of doors and fire egress (see Section 4.5).

Decorative Gates

Most building entrances have decorative iron gates. The gates are supported by iron frames which are anchored to the concrete walls and threshold slabs. In general, the gates are in good condition. ARG noted peeling paint and minor corrosion in localized areas, as well as some missing fasteners. The corrosion was particularly noted at the base where the frames are anchored into the concrete slab. The corrosion has resulted in cracking and damage of the concrete (see "Landscape Features, Building Entrances and Verandas" section below for more information).

Door and transom at east elevation.

Door, sidelights, and transom at north elevation.

Door and transom at north elevation.

Door, sidelights and arched transom at south elevation.

Gate at main entrance, north elevation.

Gate (1 of 2) at south elevation mechanical enclosure.

Three gates at west courtyard elevation.

Typical window requiring basic maintenance only.

Typical window at gallery blocked with interior partition; note insulation fill and back-painted glass.

Typical condition at windows requiring basic maintenance; note cracked glazing putty.

Typical condition at windows requiring more extensive repair; note corrosion of steel components.

Steel Windows

The original windows throughout the building are primarily steel paired-casement frames with clear single-pane glazing. Window sizes and configurations vary somewhat; in some cases fixed rectangular or arched sashes are added above operable casements. In many areas, particularly at gallery spaces, the windows have been modified to improve their performance and control daylighting. In the north gallery, the windows have interior venetian blinds; black foamcore sheets are sometimes been placed between the blinds and the windows for additional daylighting control. At the south galleries, windows have been completely blocked by interior partition walls, with most glass back-painted black and loose insulation placed up against the windows.

The windows vary greatly in observed condition and deterioration. Windows at offices, meeting rooms, corridors, etc. tend to be in relatively good condition, requiring limited remediation of peeling paint, cracked/deteriorated glazing putty, and a few broken panes. In other areas, windows are in worse condition, displaying corrosion of metal components, heavily deteriorated or missing glazing putty, and heavily weathered paint films. At windows that have been blocked by interior partitions, condensation build-up has contributed to deterioration and corrosion. Paint and UV-films on the interior side of glazing are deteriorated. Some windows have also been modified for air conditioning units and hard-ducted connections, with muntins cut and removed or relocated, changing the original sash configuration.

6.5 Exterior Stairs

At the east elevation, an emergency egress stair leads from the second floor down to the parking lot. The stair is comprised of painted steel components, with checker-plate treads and pipe handrails. The stair is supported by two steel tube columns with base plates anchored to concrete footings.

In general, the stair appears to be in good condition; however, some repairs are needed. The painted steel surfaces are weathered, with localized corrosion and peeling paint. Base plates and anchor bolts are similarly corroded. The pipe handrail at the base of the stair has been damaged, reportedly during recent construction activities.

Exit stair at east elevation; note second floor landing and column support.

View of steel stair; note damaged rail post.

View of steel stair; note damaged rail post.

Base plate at steel column support; note corrosion at anchor bolts.

Checker-plate steel stair tread; note surface corrosion and peeling paint.

6.6 Exterior Lighting

There are a number of existing bronze light fixtures around the building exterior that appear to be original. These are lantern-like wall sconces and pendant fixtures, both of which feature patterned amber-colored glass. The sconces are typically found in pairs to either side of building entrances. The ceiling pendants are typically found in the courtyard, in the north and south verandas and the original City Hall main entrance. In general, the fixtures are operational and in fair condition. Surfaces are heavily soiled throughout, with localized areas of paint splatter. Bronze surfaces are oxidized, with some bright green corrosion products observed. Copper alloy or brass finishes are tarnished. Some fixtures have missing components, including rounded clear lenses at the bottom and missing fasteners.

Typical bronze pendant fixture at courtyard veranda soffit.

Bronze sconce at exterior entrance, south elevation; note heavy soiling.

Bronze sconce at exterior entrance, east courtyard elevation; note missing lens at bottom, missing fasteners and localized corrosion products (green).

6.7 Landscape Features

Building Entrances and Verandas

Building entrance paving generally consists of concrete slab-on-grade with brick pavers used as borders or divider strips. At entrances with decorative iron gates, the gate frames or hardware are typically set directly into the concrete paving. The courtyard verandas have a raised cast-in-place concrete slab floor with brick edge detailing. At mid-point entrances to the verandas, there are steps also comprised of concrete and brick.

The concrete and brick paving elements are generally in fair condition. The veranda flooring was originally constructed with very few control joints and no expansion joints. As a result of thermal expansion/contraction and possible differential settlement or earth movement, there are numerous cracks throughout. The cracking is typical at both verandas, with cracks spanning the full width of the floors and occurring at somewhat regular intervals. Cracking and some spalling (concrete loss) was also observed adjacent to veranda entrance doors. The joints between brick and concrete are typically eroded, with the joint materials deteriorated. In some edge locations of the verandas, it appears that the brick units are pulling away from the concrete (minor displacement). Some previous repairs were also observed using cementitious repair materials and sealants. Veranda concrete surfaces have developed a nice aged patina. In general, concrete and brick surfaces are soiled, with localized stains and areas of efflorescence (salts deposition). At one entrance at the south veranda, there are remnants of a rubber doormat and adhesive residue.

At other building entrances, the concrete paving is cracked and spalled in localized areas. In some locations, such as the east courtyard entrance, the cracks have been previously repaired with cementitious repair materials; however, the repairs have failed in most areas. At entrances with decorative gates, the gate frames and hardware are typically corroded where in contact with concrete, resulting in ferrous staining, cracking and spalling of the concrete. Other ferrous staining was noted at areas where signage or other objects were placed on the concrete.

Detail view of damaged concrete.

Typical concrete spalling at entrance thresholds, north and south courtyard elevations.

Main Entrance Garden (Courtyard)

The courtyard space within the U-shaped building plan was originally the Main Entrance Garden for the Ontario City Hall. It contained various landscape features and walkways, for travel between the main entrance and verandas. Currently, the main entrance to the museum is located at the northeast corner of the north elevation, near the parking lot. The original courtyard entrance is no longer used except for special events, and the courtyard is generally under-utilized. Plant materials have also changed over time, including tree removal. The original flagstone walkways and benches remain.

The flagstone walkways consist of irregularly shaped and sized pieces of slate set in a random fashion into a concrete slab-on-grade medium. The slate varies in color, tending toward warm hues in a range of red, gray, and purple. In localized areas, diamond shapes are inscribed in the concrete and infilled with slate. At the east end of the courtyard there are two concrete benches with seat surfaces similar to the slate paving.

In general, the walkways are in fair condition. Control and expansion joints were not provided in most areas, and there are numerous cracks through both the slate pavers and the concrete bed. These are likely due to differential settlement and expansion/contraction. It is not known if the concrete walkway has steel reinforcement; the damage observed appears to be movement-related, rather than associated with corrosion of internal ferrous metal, suggesting that the walkways are unreinforced. At crack locations, there are numerous losses to stone. There are also previous repairs using various cementitious mortars and epoxies. In some areas, missing stone has been infilled with concrete, and locations near the western end appear to have been largely reset or otherwise modified: the materials look less aged, and the stone units are generally smaller than those on the east end.

The benches are generally in good condition. They were recently relocated as part of the courtyard landscaping project, and have been retained intact. There is some minor localized cracking at the concrete bench seat edges where they project beyond the support legs.

Cracking and spalling at slate paver walkway.

Courtyard bench. (Photo taken Feb. 2016, prior to relocation).

City Rose Garden

The City Rose Garden is located on the east side of the building. Early documentation indicates the garden contained thirty-three varieties of roses. The garden was established in 1939. It features a terraced flower beds, small concrete benches, and arbors for climbing roses. The walkways are red brick, set in a basket weave pattern with mortar. Some areas of walkway have concrete curbs, whereas others have brick edging. The setting bed materials are unknown at this time.

The brick paver walkways are generally in fair to poor condition. The terraced site is eroded, with differential settlement throughout. The walkway surfaces are generally uneven, with some areas lifted by invasive root systems and others depressed from settlement and soil erosion. The damage and displacement appears to be worse nearest the building; the lower terraced walkways are in somewhat better condition. In one area, tree roots have heavily damaged the walkway, and portions of brick are missing. Mortar joints between units are typically eroded and cracked. Some individual bricks are loose from the setting bed. Others are eroded and spalled at the face. Loose bricks have reportedly been used as projectiles to damage the museum building. At the end of one walkway adjacent to the building, there are the remains of a concrete bench; only the two support legs remain, the seat portion is no longer extant.

Damaged brick pavers at rose garden.

Walkway extension with missing brick pavers and tree root damage.

Uneven/deteriorated brick pavers and mortar joints.

Falcon by John E. Svenson
from OMHA collection

Part 7

Building Treatment Recommendations

Building Treatment Recommendations

The following are architectural repair and treatment recommendations for the conditions described in the previous section, “Building Conditions Assessment.” As in the previous section, recommendations are grouped into the following categories: Roofing and drainage, exterior walls and features, wood framing and trim, windows and doors, exterior stairs, exterior lighting, and landscape features.

7.1 Roofing and Drainage

- Clean leaves/debris from all roofs and gutters regularly.
- Inspect roofs for damage annually at minimum, and after heavy rainstorms or seismic events.
- Repair existing downspouts. Reattach loose components and re-solder open joints. Prep and paint as needed.
- Consider replacing non-matching PVC downspout end with new painted copper.
- Repair second floor mechanical pad and adjacent clay tile roof to address leak. Remove and salvage existing clay to expose underlayments and flashings. Amend waterproofing and flashing as required, then reinstall clay tile. A long-term solution may require drainage alterations (TBD).

7.2 Exterior Walls and Features

Concrete Walls

- Repair localized cracks. Inject cracks (min. 1/16-inch or wider) with an epoxy-based grout. Finish flush with surface, and touch-up paint coating. Monitor hairline cracks and repair if they widen.
- Patch localized concrete spalls. Remove loose material and debris down to sound concrete substrate. Patch loss area with a proprietary concrete patching compound (polymer-modified mortar) and finish to match surrounding surface, including tooling to resemble board-formed pattern as required. Touch-up paint coating to match existing.
- Touch-up paint coating at base of walls and other localized areas. Clean and prepare surfaces to remove loose/peeling paint coatings, and repaint to match existing.
- Clean and remove paint splatter at terra cotta tiles.
- Consider taking a mold of the existing tile, and having replica tile produced to replace the missing units.

Basement Walls

- Repair basement window at mechanical area to address active leak/water intrusion. Remove existing infill panel and poor sealant at window opening. Prep window masonry opening, and install new flexible flashing. Provide new painted sheet metal infill panel at exterior, with new flashing at ductwork penetration. Seal around ductwork penetration. Provide new painted plywood infill at interior, and seal around window opening. Repair existing concrete wall below window (see below).
- Test remaining vinyl floor tile for asbestos, and abate/remove as necessary.
- Replace basement-level windows, adding flexible flashing at concrete masonry openings.
- Remove all existing coatings and finishes at walls and floor slabs down to concrete. Inject all cracks or voids with polyurethane grout to prevent moisture intrusion.
- Ensure all floor drains are clean and operational. Maintain stored items raised on pallets or away from floor drains to ensure free flow of surface water to drains. If needed, provide sump pumps.
- Inspect/ensure there are no leaks or damage to building piping in or adjacent to basement

areas.

- Limit irrigation of plantings adjacent to basement walls. Replace sprinklers with a drip system, plant drought-tolerant native species, etc.

If basement level rooms continue to be used for their present functions or similar (mechanical rooms, basic storage and work spaces), perform the following minimum work:

- Following removal of all interior finishes, apply a waterproof coating or sealer to interior walls and floor slabs.

In the event that the basement level is used for any collections storage, we recommend the following more extensive measures:

- Excavate exterior of basement walls down to footings and install exterior waterproofing and a French drain system. Associated work would include removal and reinstallation of adjacent plantings, walkways, etc. This is a much more invasive and costly project, but necessary if collections-level climate control is desired in the basement.

7.3 Wood Framing and Trim

Exposed Rafters

- Repair/rebuild deteriorated ends of exposed rafter tails. Remove loose/decayed wood material with hand tools. Treat wood surfaces with a wood preservative/fungicide. Repair loss areas with a wood-compatible epoxy patching compound (Abatron WoodEpox or similar). Tool and finish surfaces of patch to match surrounding wood, and paint entire rafter tail to match existing.

Verandas

- Engage a structural engineer to inspect the wood beams at the verandas.
- Repair heavily split wood beams per structural engineer's recommendations. ARG assumes the repair will likely include installing iron straps at intervals along the beams length, and/or epoxy injection of deep splits/checking with a wood-compatible epoxy.

7.4 Windows and Doors

Exterior Doors

- Repair existing wood doors, sidelights and transoms, including the following:
- Clean and refinish exterior wood surfaces. Fill splits or gouges/losses with a wood-compatible filler. Renew wood stain where abraded or weathered, and apply a protective clear varnish.
- Replace cracked or otherwise damaged glazing.
- Replace glazing putty where required.
- Clean and refinish existing hardware to remain. Adjust to ensure proper operation.
- Upgrade hardware as required to meet egress and accessibility requirements.
- Provide new weatherstripping.

Decorative Gates

- Clean and prep metal surfaces to remove loose/peeling paint and corrosion.
- Treat areas where corrosion was removed with a rust reformer and rust-inhibitive primer.

- Repaint all surfaces with a high quality direct-to-metal paint coating (Tnemec or similar).
- Replace fasteners where missing.

Steel Windows

Basic Maintenance: For windows that are intact and to remain as-is (no upgrades), and have minimal to no corrosion of steel components, we recommend the following:

- Clean and prep metal surfaces to remove loose/peeling paint.
- Remove cracked/deteriorated glazing putty (full removal not required, only where loose)
- Replace cracked or otherwise damaged glazing.
- Reapply glazing putty where required.
- Repaint metal surfaces.
- Remove interior insulation.
- Remove old films, stray paint, etc. and clean glass. At areas where windows will be blocked by interior walls or partitions, glass can be painted black on interior side.
- Clean and adjust hardware; ensure proper operation.
- Provide new weatherstripping.
- Replace perimeter sealant at joint between window and wall.

Window Repairs: For more heavily corroded or damaged windows, we recommend the following, in addition to the above scope of work:

- Replace heavily corroded, damaged or missing individual steel components, such as muntins, with new to match.
- Correct modified individual steel components, such as muntins that were previously relocated for window air conditioning units, etc. Cut out and re-weld in original locations.

Window Upgrades: For windows at first floor gallery spaces and second floor collection spaces, where tighter temp/rH controls and daylighting requirements are desired, we recommend the following additional scope of work:

- Replace clear single glass with new clear laminated glass. Laminated glass performs better with solar and light transmittance, and offers higher levels of noise control and security/safety against breakage. This will also help with mitigation of sound/vibration from the adjacent rail line. Supply laminated glass with a low-e coating for better thermal performance.
- Provide clear, UV-absorbing film on glass panes to reduce amount of UV light transmitted.
- Provide interior roll-down fabric shades to limit visible light (light intensity) to exhibition spaces.

7.5 Exterior Stairs

Steel Exit Stair

- Clean and prep metal surfaces to remove loose/peeling paint and corrosion.
- Treat areas where corrosion was removed with a rust reformer and rust-inhibitive primer.
- Pay particular attention to base plates and fasteners at support columns. Replace corroded hex nuts as required.
- Cut out section of damaged handrail post, and replace with new. Grind all welds smooth.

- Repaint all surfaces of stair and railing with a high quality direct-to-metal paint coating (Tnemec or similar).

7.6 Exterior Lighting

- Clean metal and glass surfaces of existing sconces and pendant fixtures.
- Chemically passivate areas of active corrosion.
- Apply coat of protective wax or lacquer to bronze surfaces.
- Polish brass surfaces as required.
- Re-lamp and/or re-wire as needed. Replace any cloth-covered wire, etc. with new.
- Replace missing fasteners, lenses, and other components in kind.

7.7 Landscape Features

Building Entrances and Verandas

- Clean overall surfaces of concrete and brick paver trim to remove surface soiling.
- Clean to reduce/ visually minimize localized stains at concrete surfaces.
- Remove failed or deteriorated previous patch repairs.
- Epoxy-inject cracks at localized areas (min. 1/16 in. or wider). Finish flush with surface. Color and surface texture to match existing.
- Patch voids/losses in concrete at localized areas. Prep surfaces, and fill with polymer-modified repair mortar. Finish to match surrounding surface (color and texture).
- Replace damaged concrete flatwork adjacent to entrance bay at central west courtyard elevation.
- Repoint open or deteriorated joints at brick units.
- Consider replacing joint between brick units and concrete with new sealant joint (better expansion/contraction control, but requires cyclic maintenance).
- Where required, coordinate concrete repair work with treatment of decorative gates (see above).

Courtyard Paving

- Repair slate pavers at localized areas to correct tripping hazards and repair heavier damage or loss areas.
- Inject cracks in mortar setting bed with comparable color-matched mortar.
- Inject cracks in slate with epoxy-modified, color matched repair mortar (integrally pigmented, red to purple shades).
- Infill areas of slate loss with setting bed type mortar (similar to previous repairs).
- Consider sawcutting new control joints at regular intervals to limit/localize future cracking or damage. Locations to be selected by Architect in the field based on existing walkway layout and flagstone locations.

Rose Garden Paving

- Reset loose/ displaced brick pavers to correct tripping hazards and accessibility issues; repair heavier damage or loss areas.

- Remove units and mortar down to sub-grade. Clean off mortar residue from units, salvage and stack for reuse.
- Regrade and replace soil/sub-grade layers as required to provide level walkway (assumes new crushed stone or gravel base). Correct surface drainage as required.
- Consult arborist and where possible cut back tree roots.
- Reset salvaged brick pavers in new mortar setting bed and point joints flush.
- Replace missing units with new to match or with units salvaged from other abandoned areas, such as walkway extension to bench that is no longer extant.
- Remove remains of bench (two concrete supports). Salvage for future reuse.

Fruit Industries' Aristocrat Brandy, Guasti 1936
from OMHA collection

Part 8

Cost Projections

8.1 Overview

An outline cost projection for the scope described in the previous sections has been prepared by KPJ Consulting and is included in its entirety in Appendix C. This section distills the basic information in KPJ's report; please refer specifically to the full report for important framing information about the costing process and intent.

As the proposed work at OMHA breaks down for the most part into discrete projects, cost projections are presented *á la carte*, and in three categories:

"Overall": systems or efforts that are essentially building-wide, such as installing sprinklers or abating hazardous material.

"Area-by-Area": work that is confined to a specific area of the building, such as a gallery or workshop.

"Envelope": work that is primarily concerned with exterior building elements.

It is important to keep in mind that all cost estimates in this report are based on conceptual design; they provide a preliminary framework for general budgeting purposes only. Development of more detailed plans and specifications will be needed to further refine these estimates.

8.2 Funding

Securing funding will be a major part of realizing the goals described in this report. The proposed projects tend to be suited to one of three funding vectors:

Municipal budget: Maintenance, preservation, and capital projects such as MEP systems; back of house uses and code upgrades

Grants: Exhibits and educational spaces

Donations: Galleries and high-profile upgrades

8.3 Cost Adjustments

The cost projections prepared by KPJ are based on hard construction costs. In order to round out the budgeting picture, this section marks up KPJ's estimates to include soft costs such as:

Collection-related costs, such as insurance, interim relocation, etc.

Project management

A/E design fees

Legal and regulatory expenses

Based on recent similar projects, we have used a 50% markup estimate (x1.5) to arrive at a project budget.

8.4 "Overall" Scope Items

Building-wide systems upgrades

	Construction Estimate KPJ net	*Project Budget x1.5 net*
Hazardous material abatement	$298,500	$447,800
Sprinkler system	$380,900	$571,400
Fire alarm system	$303,000	$454,500
Security/video system	$163,600	$245,400
Telecommunications system	$208,300	$312,500
Seismic upgrades	$34,800	$52,200
Subtotal 1	$1,389,100	$2,083,800

8.5 "Area-by-Area" Scope Items

Interior improvements for specific areas

	Construction Estimate KPJ net	*Project Budget x1.5 gross*
Elevator	$556,600	$834,900
Local accessibility adjustments	$9,800	$14,700
Front desk/accessible washroom	$58,500	$87,800
Museum Store	$68,900	$103,400
North Gallery and prep room	$794,600	$1,146,900
Southeast Gallery – "Built on Water"	$294,800	$441,000
South Gallery – "Gem of the Foothills"	$413,000	$619,500
Carlson Gallery	$128,000	$192,000
Kitchen	$138,100	$207,200
Council Chamber/Hall HVAC	$534,600	$859,800
Offices	$460,700	$690,300
Washrooms	$146,500	$219,800
Main Hall and office	$98,800	$148,200
Basement	$208,000	$312,000
Subtotal 2	$3,879,600	$5,819,400

8.6 "Envelope" Scope Items

Exterior maintenance, repair, and preservation work

	Construction Estimate KPJ net	*Project Budget x1.5 gross*
Windows	$272,800	$409,200
Loggia restoration	$91,500	$137,300
Exterior doors	$49,300	$74,000
Exterior walls	$7,700	$11,600
Roofing	$20,400	$30,600
Steel exit stair	$40,300	$60,500
Sitework	$201,500	$302,300
Exterior historical fixtures	$2,000	$3,000
Basement waterproofing	$9,800	$14,700
Subtotal 3	$695,300	$1,042,800

8.7 Total Estimated Costs

The total estimated budget for all master plan work is:

$2,083,800 + $5,819,400 + $1,042,800 = **$8,946,000**

Uniform Coat, Chaffey High School Band
from OMHA collection

Part 9

Implementation

9.1 Overview

Much of the work proposed in this Master Plan can be implemented as a series of more or less independent projects. This allows for incremental phasing as funding becomes available, but also raises the question of what order these projects should be done in. The primary considerations are:

- Urgency of need
- Extent of benefit, especially versus cost
- Setting standard procedures (eg, rehabilitating one gallery as a roadmap for others)
- Keeping the museum open to the public as much as possible
- Minimizing area affected by a project and impact on adjacent spaces

In addition, the actual order of projects will depend heavily on funding availability. We recommend OMHA be proactive in seeking funding for work in a logical sequence.

9.2 Concept Budget Breakout

- Systems and Life Safety Improvements: ~$2 million
  - Sprinkler System (see Section 4.4 for code discussion)
  - Fire Alarm System
  - Seismic
  - Door Hardware/Egress
  - Hazardous Materials Abatement
  - Electrical
  - Telecom
  - Security/IT
- South Wing Galleries: ~$1.25 million

  (note that Southeast Gallery rehabilitation is already slated for "Built On Water")
- Central Wing / Accessibility: ~$3.5 million
- North Wing Galleries: ~$1.25 million
- Exterior Envelope Maintenance and Preservation: ~$1 million

9.3 Sequencing

The order in which work is done will depend heavily on available funding and evolving Museum priorities. However, given that some items are best scheduled earlier or later in the process, a potential sequence of projects is diagrammed to the right to guide further thinking. This diagram synthesizes input from the Museum's Board and staff into a logical progression of work.

Initial priorities are the “Built On Water” gallery (already in development), building systems and life safety, and basic accessibility. The decision whether or not to install a sprinkler system is of particular importance since it will have the greatest impact on OMHA's operations and public access to galleries (see Section 9.4). Combined work at the Museum's entry on an accessible restroom and welcome desk has been included in initial priorities for two reasons: the Museum is sorely lacking barrier-free toilet facilities for visitors and staff, and a new welcome desk would provide a significant impression of change for the better at a relatively small cost.

Work following the initial priorities can be roughly divided into gallery and operational upgrades. Discussions with the Museum indicate that OMHA hopes to focus primarily on gallery upgrades to further its public mission. At the same time the Museum should keep in mind the importance of operational improvements, including addition of an elevator, as a backbone for public spaces and programs.

Exterior maintenance and preservation work is not shown in the diagram since it is largely independent from interior projects and can funded over time by the Museum’s annual facilities budget (augmented, if necessary, by additional funding). The exceptions are exterior windows and doors, which will require coordination with interior work.

The costs cited in the diagram are rough figures for assessing magnitude only. Refer to the estimates in Appendix C for more comprehensive information.

Initial Priorities

Southeast Gallery "Built On Water" (~$400K)

- Develop and verify general strategies for HVAC, lighting, and non-exhibit fitout, as well as window refurbishment and maintenance access

Building-wide Systems and Life Safety (~$2M)

- Sprinkler System (~$570K)
- Fire Alarm System (~$450K)
- Seismic (~$50K)
- Door Hardware/Egress (~$25K)
- Hazardous Materials Abatement (~$450K)
- Electrical (~$50K)
- Telecom (~$300K)
- Security/IT (~$250K)

Accessible/Family Restroom and Welcome Desk (~$90K)

- Critical for public accessibility

Gallery Upgrades

North Gallery (~$1.25M)

- Includes exhibit prep room

Carlson Gallery (~$190K)

- Independent of other work, except HVAC

"Gem of the Foothills" Gallery (~$600K)

- Coordinate with Carlson HVAC

Main Hall (~$150K)

- Wall display cases

Museum Store (~$100K)

Operational Upgrades

Elevator, Basement, and Offices (~$2.25M)

- Do as single, comprehensive project
- Use Carlson Gallery as temp office
- Investigate how construction area could be accessed directly from outside

Kitchen and Misc Ground Floor (~$800K)

- Independent of other work, except HVAC

Loading Dock (TBD)

- Long-term goal

9.4 Access Coordination

OMHA intends to remain open to the public as much as possible throughout this work. However, some projects affect not just their own area but also access to other spaces. Specific concerns for each project are:

Southeast Gallery

The museum wishes to maintain access to its core "Gem of the Foothills" exhibit over the 2-3 year period that the southeast gallery is closed for reinstallation. This requires a temporary enclosure either on the south veranda or through the southeast gallery. The first option is implausible; ARG has suggested partitioning off a corridor along the edge of the southeast gallery to an existing, unused door opening onto "Gem of the Foothills." Note that this is a preliminary concept and may require relocation of exhibits.

Building-wide Systems

System installations vary greatly in their potential impact on museum operations. A sprinkler system (if pursued) would have the most wide-ranging effect, requiring gallery closures and temporarily shifting exhibit elements away from work areas. Multiple holes would need to be drilled in interior concrete walls for new piping; any proposed layout should minimize this. Electrical, telecommunications, and security systems are essentially wiring and will have less impact. However, ARG recommends coordination with new work wherever possible to avoid surface-mounted conduit and inappropriate device locations. Seismic and hazardous materials work is anticipated to affect limited, mostly non-public areas.

Elevator, Basement, and Offices

This is an issue for OMHA operations, but has limited impact on public access. Construction noise and dust issues will need to be addressed, including temporary shielding where the basement stairs open on the Main Hall.

North Gallery

The north gallery can easily be closed off during renovation work, allowing the rest of museum to remain open.

Museum Entrance Area

If not carefully planned, work at the entry could seriously limit public access. Elements such as the desk and other casework should be designed to be fabricated offsite for efficient installation. Potentially, much of the new layout could be completed before breaking through the wall into the Main Hall.

Carlson Gallery

Due to its location, the Carlson Gallery can be closed for renovation with minimal impact on the rest of the museum. This should be coordinated with educational program schedules.

Work affecting very limited areas, such as the Kitchen upgrade and Main Hall display cases, can take place at any point, but must be coordinated with museum operations.

Appendix A

Programming Documents

Appendix B

Reports

B.1 Draft Structural Evaluation

B.2 Seismic Evaluation

B.3 Material Testing Report (Concrete and Steel)

B.4 ARG Conservation Services Report

B.5 MEP Condition Assessment Report

B.6 Code Review Summary

Appendix C

Cost Projection

C.1 Cost Plan Report

C.2 “Built On Water” Concept Budget

Appendix D

Historic Preservation

D.1 Preservation Approvals Matrix

Preservation Approvals Matrix

As detailed in Section 4.9, work on OMHA's building is subject to Ontario's Historic Preservation Ordinance (HPO), as administered by the Advance Planning division of the City's Planning Department.

Approval of work typically takes the form of a Certificate of Appropriateness. A Waiver to the Certificate of Appropriateness may be issued by the Planning Director if the proposed work is considered minor and does not adversely affect character-defining features.

The following matrix of anticipated approvals per work type is based on input from Ontario's Planning Department. It is advisory, not definitive: requirements for work other than regular cleaning and maintenance should be confirmed with the Planning Department on a case-by-case basis.

Roofing and Drainage	
Regular inspection and cleaning	No review required
Repair existing downspouts	No review required
Remediate second floor mechanical pad	Administrative approval required
Exterior Walls and Features	
Remediate localized concrete cracks and spalls	Administrative approval required
Touch-up painting	No review required
Replicate and replace historic tiles	Administrative approval required
Remediate and waterproof basement walls	No review required
Repair or replace basement windows	Administrative approval required
Basic steel window upkeep	No review required
Steel window frame repairs and reconstruction	Administrative approval required
Glazing upgrades (laminated, UV film, etc.)	Administrative approval required
Windows and Doors	
Maintain wood doors	No review required
Refinish and repair wood doors	No review required
Upgrade door hardware for egress/accessibility	Administrative approval required
Conserve and repaint metal gates	No review required
Repair or replace basement windows	Administrative approval required
Basic steel window upkeep	No review required
Steel window frame repairs and reconstruction	Administrative approval required
Glazing upgrades (laminated, UV film, etc.)	Administrative approval required

Wood Framing and Trim

Repair/rebuild rafter tails	Administrative approval required
Remediate wood structural beams at veranda	Administrative approval required

Steel Exit Stairs

General maintenance	No review required
Repairs	No review required

Exterior Lighting

Conservation of historical fixtures	Administrative approval required
Relamp/rewire fixtures	Administrative approval required

Landscape Features

Clean concrete and brick surfaces	No review required
Repoint brick paving	Administrative approval required
Remediate cracks and losses in pavement	Administrative approval required
Repairs to slate paving in courtyard	Administrative approval required

Interiors

General maintenance and cleaning	No review required
Painting	No review required if same color
Replacement of non-historic interior finishes *(for instance, carpet, bathroom tile, acoustical ceilings)*	No review required
Work requiring selective opening and patching *(for instance, installation of sprinkler system or electrical wiring)*	No review required
Alterations in areas without contributing historic fabric *(gallery wings, office, basement)*	No review required
Alterations in areas with contributing historic fabric *(front desk, main hall)*	Administrative approval or Certificate of Appropriateness required
Work with any impact on Council Chambers	Administrative approval or Certificate of Appropriateness required
Conservation of historical fixtures and fittings	Administrative approval required

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