CITY OF NELSON

The Corporation of the City of Nelson

Suite 101, 310 Ward Street, Nelson British Columbia V1L 5S4

Office of the Finance and Purchasing Manager

March 11, 2019

2019-P-02
Coke and Gas Works Exterior Revitalization
ADDENDUM #1

This Addendum shall be read in conjunction with and be considered part of the Contract Documents. Its intent is to describe additions, deletions and/or clarifications to the original drawings, specifications and/or previously issued addenda. The contents here-in shall be reflected in the Contractors Tender Price and no consideration will be given to requests for extras due to any bidder not being familiar with the contents of this Addendum.

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1. **Closing date extension**
   The closing date has been extended to March 28, 2019 @ 2:30pm.

2. **Clarification**
   Q1 Will there be a water source available on-site?
   A1 There is an exterior hose bib available. The Owner will ensure this is functioning prior to project start.

   Q2 Will there be washroom facilities available or is contractor to supply porta-potties?
   A2 The main floor washroom including one toilet will be available for Contractor use.

   Q3 What is the liability for future cracking if only conducting partial repairs?
   A3 The Contractor will be responsible for the performance of their work only. Cracking associated with mortar shrinkage is the responsibility of the Contractor. Cracking associated with building movement is not the responsibility of the Contractor.

   Q4 Overhead power lines and incoming electrical service to building?
   A4 The Owner will arrange for protection or temporary relocation of existing infrastructure with Nelson Hydro. The Contractor shall provide provision for temporary power during construction for any necessary lighting and the operation of power tools during this period.

   Q5 Work-site fencing?
   A5 The Owner will supply temporary fencing for containment of the neighbour's property (veterinary clinic) only. See attached map (610 Railway Ortho) for details.
   The Owner will install fencing from the existing termination at the boiler shack to the building after removal of the boiler shack by the Contractor. The Contractor is to notify the Owner of the schedule.

Q6 Can attic be cleaned prior to construction?
A6 Yes, the Owner will have the attic tidied and rodent droppings removed prior to the start of construction.

Q7 Can the envelope report conducted by JDA be released?
A7 Yes, the report is attached to this addendum. Please direct any questions arising from this document to the Owner.

Q8 Storm window clarification, drawing callouts do not match site conditions.
A8 A consistent renewal of the storm windows is desired, choosing the preferred split storm windows as the most appropriate for this building. Currently there are two typical storm windows – full pane and split pane. The drawing set accurately reflects this.

Q9 Can the consultant supply an area amount of required repointing to simplify bid process?
A9 Yes, the expected area of minimum repair is 220 ft^2 plus miscellaneous cracks as detailed.

Q10 Will the Owner consider a full repoint of the building?
A10 The Owner will consider additional repointing work or a full repoint of the building, which will depend on a number of factors, including but not limited to:

1. if the extra work (partial increase in scope or full repointing of the building) is deemed necessary by JDA , building consultant, to maintain the integrity and prolong the life of the building exterior and is in the best interest of the Owner to complete during this contract;
2. the cost of completing the extra repointing work; and,
3. subject to budget approval.

Any additional repointing work will require the Owner's approval before commencement and will be added to the contract by change order as per Sections 2.6 and 2.7 of the RFP documents.

The value of the extra repointing work shall be based on unit pricing on a square foot basis and is to include labour and materials.

Proponents should clearly identify the repointing unit pricing as a separate line item from the all-inclusive contract price and breakdown of hourly rates, expenses, per diems and other fees.

Q11 What gauge for metal roofing?
A11 26 gauge minimum.

Q12 What is the desired metal roof profile?
A12 Corrugated.

Q13 Is the intent to completely demo planters and rebuild?
A13 No, replace "Rebuild" callout on DWG R300 to "Restore." To be addressed on the IFC set.

Q14 Window interior trims to be linseed oil refinish or paint?
A14 This is a Contractor decision. Please detail your approach in your RFP submission. Linseed oil is preferred, but not at extensive additional cost.

Q15 At front entrance door it states two things, repair door jamb and new front door, which one is it?

A15 Both are required.

3. Additions – to be addressed in the IFC set

a) **Chimney**

The Contractor shall repoint the chimney; this is included in base price for minimum repointing work, as specified in Q9.

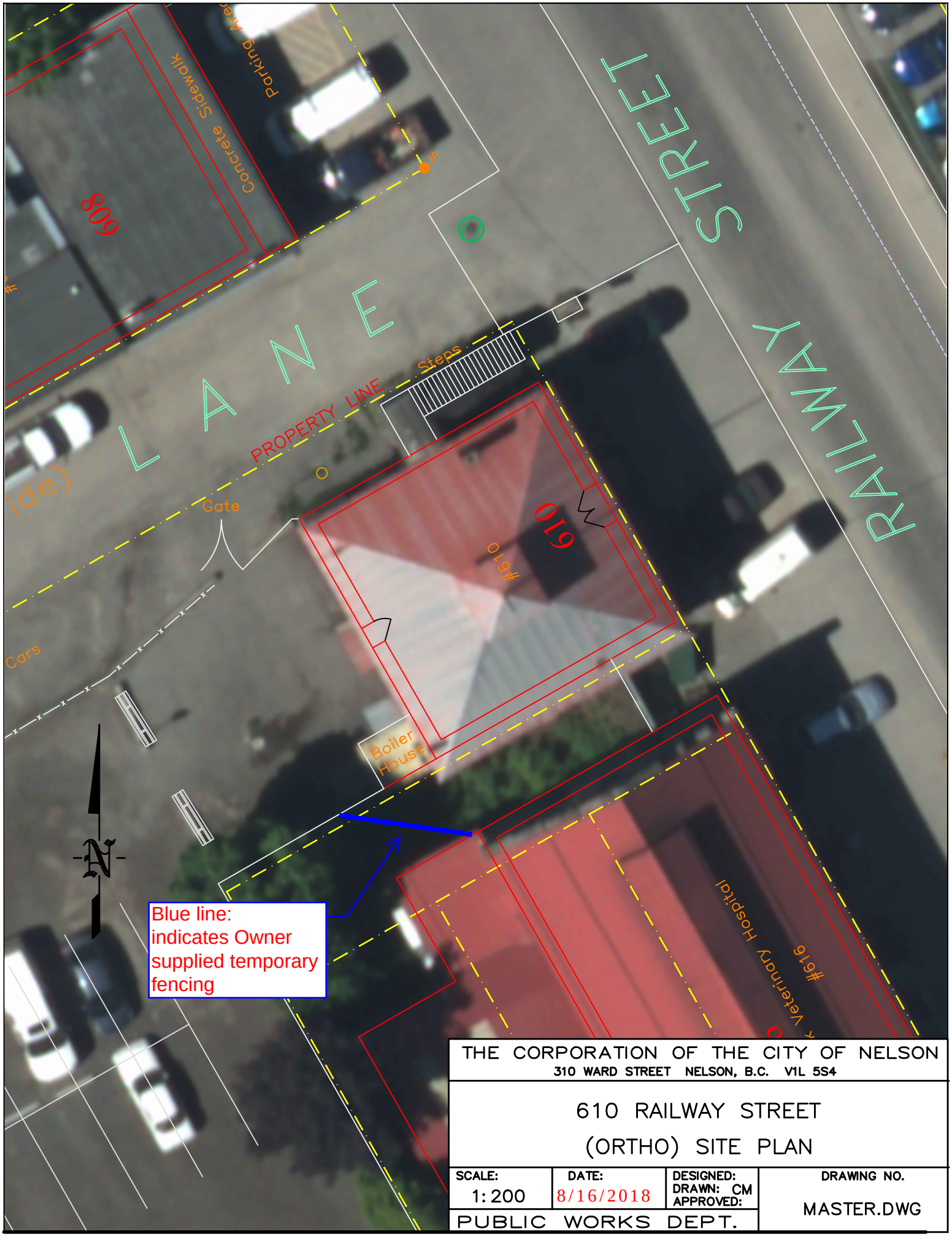
b) **Electrical mast on NE corner of roof**

The Contractor shall coordinate with the service provider for communications removal. The Contractor shall remove the mast.

If you have any question or concerns, please contact me by email srorick@nelson.ca.

Suzanne Rorick

Suzanne Rorick
Finance & Purchasing Manager, CPA,CMA



THE CORPORATION OF THE CITY OF NELSON
310 WARD STREET NELSON, B.C. V1L 5S4

610 RAILWAY STREET
(ORTHO) SITE PLAN

SCALE:	DATE:	DESIGNED:	DRAWING NO.
1: 200	8/16/2018	DRAWN: CM APPROVED:	MASTER.DWG
PUBLIC WORKS DEPT.			

John Dam & Associates
Building Conservation Engineering

Nelson Coke and Gas Works

CONDITION ASSESSMENT

Prepared for:

The Corporation of the City of Nelson
Suite 101 – 310 Ward Street
Nelson, British Columbia
V1L 5S4

Prepared by:

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2884 Gorge View Drive
Victoria, British Columbia
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November 7th, 2017
1051.001

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1.0 Introduction

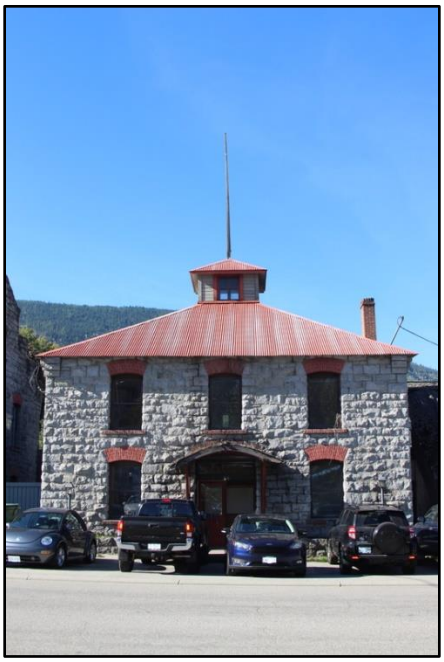
At the request of the Corporation of the City of Nelson (the Client), John Dam & Associates (JDA) has completed a condition assessment of the Coke and Gas Works building at 610 Railway Street, Nelson, BC. The purpose of this assessment was to review the currently vacant building, focusing on the building envelope and structural assemblies, and provide a summary report on the condition of the various assemblies and associated renewals recommendations. A visit to the site was completed in the fall season to review the building, gathering a general overview on the buildings' condition while noting particular areas of deterioration and unsympathetic alterations. The assessment and associated recommendations have been summarized this report.

2.0 Terms of Reference

JDA was the successful proponent for the contract opportunity to complete a condition assessment of the Nelson Coke and Gas Works building (in tandem with the Touchstones Nelson building) for the Client.

The scope of work undertaken to complete this assessment included:

- previewing current photographs and reports, to gain a better understanding of the building assemblies
- completing a visual review of the building envelope and structural assemblies with the intent of identifying general and particular assembly conditions and the potential for repairs / renewals
- considering the known problem areas as revealed by the Client
- preparing a written report summarizing observations and providing associated recommendations
- discussing the findings of the report, and associated recommendations, with the Client



Photograph 1 – The north-east or front elevation of the Nelson Coke and Gas Works building.

Documents made available for the preview included current photographs of the building provided by the Client and a heritage register report of the building sourced online.

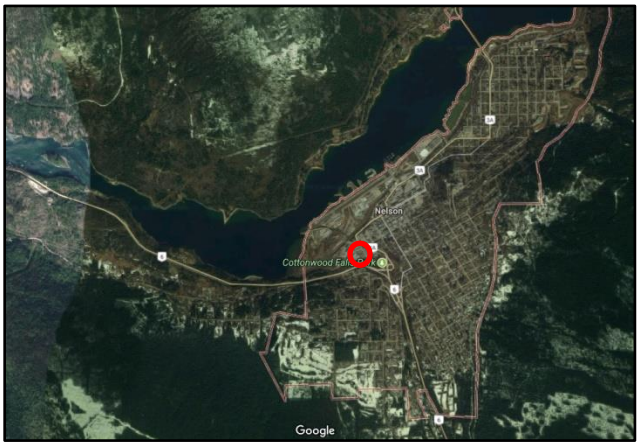
JDA was on site from September 25 – 27, 2017 to meet with the Client and complete the visual review.

3.0 Building History

Designed and engineered by L.L. Merrifield and David Morris, the Coke and Gas Works buildings originally comprised three structures constructed by the Nelson Coke and Gas Works Corporation in 1900. Built on the flatlands to the south-west of the downtown core, the location was selected for its proximity to Cottonwood Creek and the nearby railway lines. The buildings were made of indigenous materials including red clay brick, granite and timber, relating them to many of the fine buildings comprising the downtown core. With the arrival of natural gas in 1957, the buildings ceased to be of functional use. In the late 1970's, while two of the buildings (the Retort and Purifying buildings) underwent adaptive renewal for alternative occupancies, the former Administration building underwent a complete renovation of the exterior and ground floor interior. The Coke and Gas Works buildings became the first buildings to be voluntarily designated heritage structures in the City of Nelson. Today the Administration building, now singularly identified as the Coke and Gas Works building, sits vacant.

4.0 Site Description

The Coke and Gas Works building is located adjacent to Cottonwood Creek on the flat lands 600m south-east of the west arm of Kootenay Lake. Only the local airport and industrial rail lands separate it from the west arm of the lake. To the south, the city rises up into the Selkirk Mountains. The building is exposed to a temperature range between -10 and 40 °C, with an average annual rainfall of 680mm, annual snowfall of 175mm, and an average of 150 days of precipitation each year. Within this setting, the building experiences significant wet weather and extreme temperature ranges and the associated impact that this climate has on the durability and performance of the building envelope.



Photograph 2 – The City of Nelson and the location of the Coke and Gas Works buildings (courtesy Google Maps).

5.0 Building Description

Characterized by the granite walls and red clay brick detailing while remaining in its original 'Railyards' setting, the Coke and Gas Works building is a valued example of the industrial heritage of the City of Nelson. All four elevations reflect what was once symmetrically identical facades with three windows over a door flanked by two windows; the front elevation having a double door beneath a curved canopy. A stylishly sympathetic stairway up the side of the building, a later addition, has become a character defining element of the building in its own right.

A metal clad, hipped roof is capped with a wood cupola from which extends a timber spire. The cupola is itself protected with a sheet metal roof. Through the north-west roof, a single clay brick chimney rises.

The granite walls are punctuated with hung sash windows framed by clay brick arches at the head, and parged, clay brick sills. At grade, each elevation has a door in the middle of the wall while the north-west elevation has an added door at the upper level.

Photograph 3 – The Coke and Gas Works Administration building.

The building assemblies, including the roof, walls and windows are understood to be substantially original excepting the sheet metal on the roof and a few modifications that have taken place to accommodate a change of use with the building over the years.

For its' important contribution towards the historic character of Nelson and in particular the Railyards district, the Coke and Gas Works building was identified as the first official heritage building of the city.

6.0 Building Assessment

The assessment of the building was primarily visual in nature. The following sections are a summary of the observations with recommendations for renewal work provided where appropriate.

6.1 Roof Assemblies

The symmetrical, hipped roof assembly comprises corrugated metal on shiplap planks on a heavy timber structure. Set at the peak of this roof is a wood framed and clad cupola, itself protected with a symmetrical, hipped, corrugated metal roof assembly. Each side of the cupola is punctuated with a single glazed, two over two lite fixed window. Projecting from the heavy timber roof structure through the cupola is a timber spire that appears to have served as a flag pole in the past. A clay brick chimney projects out through the north-west roof. The outer edge of the corrugated metal roof cladding simply extends over and away from the granite walls, approximately 300mm, without secondary structural support excepting corbels at the corners. Typical for this region, due to the damage incurred with snow shedding, the main and cupola roof perimeters do not have gutters to control moisture runoff.

Photograph 4 – The south-west roof with heavily faded, corrugated metal cladding. Note the bent eaves adjacent to the boiler exhaust pipe.

The roof assemblies appeared to be in fair condition with no observed signs of serious deterioration or damage excepting the bent eaves due to snow accumulation against the boiler stack and beneath the chimney where there is reduced structural integrity of the corrugated sheet (Photos C-3 and G-2). The protective coating on the corrugated metal cladding was observed to be fading, especially on the south elevations, but there were no signs of corrosion.

The wood frame cupola is showing signs of extensive weather exposure with fading and peeling paint on the wood cladding and deteriorating wood trim. This deterioration has also set in on the window frames (Photo C-2).

The unfinished timber spire is showing signs of weather exposure with the formation of cracks and fraying grain. A cord was observed to be attached to the top and bottom of the spire.

From the attic space, the heavy timber roof structure was observed to be set on the granite walls. Eight rafters extend up to a single point (Photo C-9), one each from the corners and one each from the centre of the walls. These rafters are each supported by central braces (Photo C-11) which all come together to a single inverted point beneath the rafter point. These points are then tied together with a heavy steel rod forming the primary roof structure (Photograph 5). On these rafters are set purlins which in turn support the sloped shiplap planks beneath the corrugated metal roof (Photo C-10). Set on the upper end of the rafters is the cupola wall structure with a lighter timber base plate and wall studs supporting a light framed roof assembly, all beneath

shiplap planks (Photos C-5 & C-6). The main ceiling is moderately insulated with blown cellulose insulation (Photo C-11).

Photograph 5 – The heavy timber roof structure with horizontal purlins and shiplap planks. Note the central steel tie rod.

The timber structure and shiplap planks appeared to be in good condition excepting the signs of moisture staining where water is making its way through the assembly. This is particularly evident at the base of the cupola where there is a significant gap between the base plate and the main roof assembly (Photo C-7). Further evidence of moisture ingress is revealed with staining patterns on the insulation showing water dripping from the edges of the shiplap planks (Photo C-15). The venting of the attic space appeared to be adequate with vents set in the upper walls above the ceiling structure (Photo D-10) and the unintentional gaps in the cupola. Aside from observing the sound appearance of the timber structure, a structural analysis was not completed to determine if the roof would be able to meet current building code load requirements.

Based on the observations, the roof assembly appears to be performing as expected for a historic building with no signs of major performance compromise or deterioration. If it is intended that the building be adaptively-renewed, it is recommended that the assembly be reviewed and modified to improve durability and performance. This would include the renewal of the corrugated metal cladding that is reaching the end of its expected service life and sealing the gaps beneath the cupola walls where moisture ingress and uncontrolled air flow is occurring. The sealing of these gaps will require the intentional placement of vents to retain the necessary ventilation of the attic space. The cupola cladding, wood frame windows and trim should all be restored, addressing the deteriorated wood elements where necessary. It is also recommended that the insulation of the roof be brought up to current code standards and that a structural review of the heavy timber roof be completed to ensure it meets current code requirements and provides a safe cover over the building. The timber spire can be addressed as deemed appropriate for its potential future function; left as it is if it is to simply remain a spire, or restored and adequately anchored if it is to support a flag.

Table 1 – Roof Assembly Recommendations	
A	Renew the corrugated metal cladding and address the moisture, air, and vapour barriers while providing for intentional ventilation of the attic space.
B	Restore the wood cladding, trim and windows of the cupola.
C	Increase the thickness (and performance) of the ceiling insulation.
D	Complete a structural review of the heavy timber trusses.

6.2 Wall Assemblies

The wall assemblies are constructed of solid, hand dressed granite producing a rough face surface. The cementitious mortar joints typically have a 'penny-rolled' profile to accentuate a straight joint (Photo D-23 & Photograph 6). Window detailing is completed with red, clay brick arches and sills; the sills being surfaced with a cementitious mortar. Granite corbels extend out from the upper wall corners to support the corrugated metal roof. To the interior, the walls are finished with painted drywall and in some rooms, natural wood wainscoting along the base of wall.

In general, the walls were observed to be in good condition with no signs of material deterioration and / or moisture ingress excepting the severely spalled parging on the clay brick window sills (Photo D-6 & Photograph 6). However, building movement has resulted in a number of cracks on all elevations, some of noteworthy concern.

Photograph 6 – Granite block wall beneath a clay brick window sill with failed parging.

The largest cracks were observed on the south-east elevation where a 25mm vertical gap has opened up between the upper and lower windows. This gap reduces in width nearer both the roof and grade (Photos D-18 – D-20). Further, it does not manifest itself on the interior finishes which are understood to have been in place for over 35 years (Photo D-25). A number of smaller cracks extending down to grade were observed closer to the east corner of the wall. The upper central window of this elevation was replaced with two contemporary windows requiring a portion of the granite wall to be in-filled. The mortar joints of this area were not properly tooled resulting in a rough finish (Photo D-22). Above the new windows, a concrete lintel was poured and concrete blocks were used to infill the void in the wall, rather than the original granite blocks and clay brick arch (Photo E-8).

On the south-west elevation, minor cracking and surface staining comprise the extent of observed deterioration (Photos D-15 & D-16). Efflourescence was noted on the undersurface of the doorway arch, indicating elevated moisture migrating through the clay brick masonry (Photo G-17). A number of granite blocks were also observed to be exhibiting iron oxide staining, likely a natural occurrence associated with inclusions rather than an indication of material failure (Photo D-17).

The north-west and north-east elevations, exhibited many of the symptoms observed on the south-west elevation including stained granite, minor cracking including cracking arches, and spalled window sill parging. With the addition of the stairs to the upper level of the north-west elevation, the upper central window was converted to a door. Evidence of the original window sill remains with a clay brick embedded in the base of one door jamb while the opposite jamb base

was never infilled. Additional staining was observed on either side of the front canopy from moisture running off the canopy roof and down the wall.

No signs of staining, or otherwise noteworthy wall deterioration, were observed on the interior finishes.

Reflecting on the extent of cracking occurring on all elevations, it must be noted that most cracking is vertical, with many of the cracks relating to the nearly unavoidable arch cracking. Another significant factor is that the age and dynamic nature of the cracks are unknown, including the significant crack on the south-east elevation.

It is recommended that the mortar joints be repointed where necessary, including the infilling of all cracks, and those cracks that are deemed to be significant be monitored for recurrence and if necessary, rate and direction of motion. Only then can a proper course of action be determined to alleviate building movement. The window sill parging should also be restored with an appropriate mortar that resists the ingress of moisture into the clay brick window sills. If possible, the historic character of the building should be restored with the reinstatement of the original upper central window and the surrounding granite block walls and clay brick detailing on the south-east elevation. Understanding that the south-west stair has become a character defining feature, the upper level door should simply be refinished and the jamb base filled with a granite block (the embedded clay brick being a characteristic feature that can be retained). Any minor wall staining can be cleaned to improve building aesthetics.

All work on the wall assemblies should only be completed by qualified craftspeople having experience with and an understanding on how to conserve historic building materials.

Table 2 – Wall Assembly Recommendations	
E	Repoint the deteriorated mortar joints and cracks and install crack monitors on the more significant cracks.
F	Renew the window sill parging.
G	Restore the upper, south-east elevation wall (and window).
H	Infill the base of jamb at the upper level door.
I	Remove staining from the granite and clay brick surface.

6.3 Window & Door Assemblies

Excepting the noted contemporary windows on the south-east elevation, the exterior windows are all understood to be the original, wood frame, single glazed, single lite, hung sash assemblies. A lower level window on the north-west elevation is set with opaque glass for interior privacy (Photograph 7). The two contemporary windows share a similar, albeit makeshift, hung sash

profile with opaque, privacy glass (Photo E-8). A number of windows are protected on the exterior with wood frame, single glazed, storm windows, either single or double lite.

The solid wood doors offer a variety of styles from the single lite multi-panel front doors (Photo E-10) to the multi panel side doors sharing the same panel profile as the front door (Photo E-11). It is understood that these three doors are all original though the south-east door was partially boarded over obscuring the upper half of the door and transom lite (Photo E-14). While the multi-lite, multi-panel, upper level door is known to be contemporary (Photo E-15), the single lite, single panel back door is believed to be so too (Photo E-12). All of the doors excepting the upper level door have overhead transom windows.

Photograph 7 – A lower level, hung sash window with opaque glass.

The windows and doors all appeared to be in fair condition with those on the south-west elevation showing more extensive weathering of the wood frames and finishes, especially at the sills where exposure is the highest (Photos E-5 & E-13). None of the windows were observed to be damaged, though two were altered to accommodate the passage of mechanical equipment (Photos E-6 & E-7). From the interior, it was noted that the window sash were typically missing their sash cords while a lower level window was observed to have been treated with spray foam around the perimeter, likely to improve the thermal performance of the window by reducing air infiltration (Photo E-9). The south-west door was most extensively deteriorated at the base, likely a combination of solar and moisture exposure and potential snow accumulation. The condition of the upper portion and transom of the south-east door is unknown.

Based on the observations, it is recommended that all of the windows and doors be renewed with the frames being repaired where necessary and all of them being refinished with protective coatings. For historic accuracy, it is recommended that the upper, central, south-east window be reinstated along with the restoration of the granite walls. The south-west door could be restored to match the front or side doors. As part of the contemporary stair addition, the north-west, upper level door should simply be renewed. As an enhanced measure, it is recommended that the functionality of the hung sash windows be restored with the cords and weights reinstated. The operable sash should also incorporate air seals as necessary to maintain the air tightness of the window, while the window frame perimeters should be sealed where necessary, to ensure air flow between the window and wall is minimized. Understanding the mechanical equipment along the south-west elevation is likely to be removed, it is recommended that those windows altered to accommodate the air ducts and vents be restored. The historic appearance of the building would also benefit with a unified storm window profile, selecting either single or double lite frames and making them removable during the warmer times of the year.

All work on the window and door assemblies should only be completed by qualified craftspeople having experience with and an understanding on how to conserve historic building materials.

Table 3 – Window & Door Assembly Recommendations	
J	Renew all windows and doors, repairing damaged elements and applying a new protective coating. Reinstate the operability of the hung sash, restoring sash cords and weights and where necessary, operable and perimeter seals.
K	Restore the upper, central, south-east hung sash window.
L	Reinstate a multi-panel, south west door.
M	Restore those windows altered to accommodate mechanical equipment.
N	Install a single style, wood frame storm window over all windows.

6.4 Foundation Assembles

The foundation of the building consists of a rubble stone wall supporting the hand-dressed walls above (Photo F-1). The lower level wood frame floor is also supported by the perimeter foundation wall and two intermediate stone walls, extending the length of the crawlspace plan (Photo F-2). A stone pier supports the clay brick chimney (Photo F-3). The lower level floor was confirmed to be a contemporary assembly utilizing nominally dimensioned and pressure treated lumber (Photo F-2 & F-4), while the floor of the crawlspace was finished with a concrete mud-slab (Photo F-5). A crawlspace vent at the lower floor joist level was observed from the exterior (Photo F-6).

In general, the foundation structure was observed to be in good condition. No cracks were noted in the foundation walls to suggest adverse building movement. Particular attention was given to explore the south corner beneath the large wall crack and no related cracking was observed. It is not known when the mud-slab was installed, though it is possible it may have occurred at the time the lower floor was rebuilt. It may also be possible that renewal works were completed on the foundation walls at the same time.

Photograph 8 – Perimeter and intermediate, stone foundation walls with the lower level floor overhead.

Considering the general condition of the crawlspace with no observed moisture ingress, wall cracking or typical deterioration, no recommendations beyond maintaining adequate ventilation are made at this time.

6.5 Exterior Attachments

A number of attachments to the building can be noted around the exterior including the original front canopy, a back canopy, the north-west staircase and the mechanical shed on the south-west elevation.

The exterior, character defining stair was constructed in the late 70's to accommodate the desired change of use of the building and provide exterior access to the upper level. The wood frame stair case is set on a granite stone base with a wood frame roof providing overhead protection. The curved profile framing of the roof incorporates detailed and complex joinery (Photos G-4 & G-5). Fish-scale, cedar shingles set on wood battens clad the roof.

Photograph 9 – The roof structure, guardrail and steps of the exterior stairs.

In general, the wood frame staircase was observed to be in fair condition, though plywood walls limited the review of the base. A gap between the upper landing and the stone base suggests the base has, or is, tilting away from the building. This has been addressed with the addition of a second ledger to support the landing (Photo G-9). A number of timber joints in the roof framing are starting to open up indicating movement or shrinkage of the structure (Photos G-7 & G-8). The cedar shingles have also reached the end of their expected service life with a number of them severely deteriorated, especially over the upper landing (Photo G-6). A structural review of the staircase was not completed to determine if it conforms to current code load requirements for the stair, roof or guardrail assemblies.

It is recommended that the wood frame structure be renewed with all the joints tightened up and any deteriorated elements replaced. The support of the upper landing should be upgraded to ensure a safe landing and then monitored to determine if the stone base is still moving or not. The cedar shingle roof should also be renewed with new fish-scale, cedar shingles, maintaining the characteristic appearance of the curved roof. A fresh coat of paint would enhance the appearance of the stairs and provide additional protection to the wood framing. If the stair is to be utilized as a primary access point for the second level, and subsequently a fire escape route, a review of its structural integrity is recommended.

The wood frame canopies on both the front and back elevations are supported on heavy timber frames on which curved rafters are set. The front canopy appears original with laminated, decorative brackets bracing 3½ x 5½ posts and beams set on their weak axis. Four, 2x8 rafters support the fish-scale, cedar shingle roof while a 1x3 T&G ceiling covered the soffit. It could not be determined if the roof structure was affixed to the building at the rafter level. The back canopy was constructed in a more contemporary style with 3½ x 5½ posts and beams set on their strong axis, reinforced with simple, straight braces bolted to them at each end. The rafters were spliced with plywood with the back rafter mechanically affixed to the clay brick arch. Metal post brackets supported the posts off of grade while a corrugated metal roof provided the overhead protection.

Photographs 10 & 11 – The original front and contemporary back canopies.

Both canopies appeared to be in fair condition with the front canopy, likely due to age, showing signs of more advanced deterioration. The front posts are set directly on grade and as such are decaying at the base. This has resulted in a vertical displacement of the left post and damage to the supported beam. The right side post is split, potentially compromising its structural integrity. Past plant growth and bird nests were observed in the roof assembly which was also noted to be draining against the building. The outer roof battens were also starting to deteriorate with the protective shingles having exceeded their expected service. The back canopy, although lacking the historic character of the front canopy, appeared sound with only the right post having twisted and starting to crack.

It is recommended that both canopies be renewed, addressing the damaged posts by replacing them if necessary. The front canopy requires a new shingle roof and repairs made to the deteriorated rafters and battens. The back canopy does not require any restorative work at this time though the twisted post should be monitored. If desired, the back canopy could be reconstructed with a design and materials that better match the front canopy including the utilization of a cedar shingle roof. Both canopies should have flashing installed where they come in contact with the building, diverting moisture runoff away from the building walls. Both canopies would also benefit with the renewal of the protective coating of paint.

The mechanical shed on the on south-west elevation is constructed of concrete block with a sheet metal roof. A steel exhaust pipe extends up from the roof, passing by the eaves of the main roof. An air-conditioning unit is supported off the side of the shed with air ducts passing through an original window into the building. Along the south-east side of the shed, a large crack has formed between the concrete block wall and the stone wall of the building showing that the two structures are moving apart.

It is understood that there have been discussions to remove this shed and the associated mechanical equipment. This course of action would greatly enhance the appearance of the south-west elevation and allow for the restoration of the original windows.

Table 4 – Exterior Attachments Recommendations	
O	Renew the wood frame stair structure, addressing all loose joints and the displaced upper landing, and applying a protective coating.
P	Replace the cedar shingle roof with new cedar shingles cut in the same design
Q	Complete a structural design review of the staircase assembly
R	Renew the front canopy, repairing the post and deteriorated battens, and replacing the cedar shingles. Add flashing where the canopy interfaces with the masonry wall.
S	Rebuild the back canopy utilizing a historically sympathetic design and materials.
T	Remove the concrete block mechanical shed and associated mechanical equipment.

7.0 Renewal Recommendations Summary

The building assemblies of the Nelson Coke and Gas Works building are, in general, performing well given the age and history of the building. The most significant deterioration and urgent recommendation is to repoint and fill the deteriorated mortar and masonry cracks. In addition, the window and door assemblies should be restored before further deterioration of the wood elements sets in, necessitating more costly repairs.

The recommendations summarized in Table 5 would address current areas of material / assembly deterioration and deficiencies that are compromising the appearance, performance, durability and/or safety of the building. A number of recommendations have also been provided to address the historical integrity of the building and would be completed at the discretion of the Client.

Table 5 – Recommended Renewals

	Task	**Priority**
A	Renew the corrugated metal cladding and address the moisture, air, and vapour barriers while providing for intentional ventilation of the attic space.	Medium
B	Restore the wood cladding, trim and windows of the cupola.	High
C	Increase the thickness (and performance) of the ceiling insulation.	Medium
D	Complete a structural review of the heavy timber trusses.	Medium
E	Repoint the deteriorated mortar joints and cracks and install crack monitors on the more significant cracks.	High
F	Renew the window sill parging.	High
G	Restore the upper, south-east elevation wall (and window).	Medium
H	Infill the base of jamb at the upper level door.	Low
I	Remove staining from the granite and clay brick surface.	Low
J	Renew all windows and doors, repairing damaged elements and applying a new protective coating. Reinstate the operability of the hung sash, restoring sash cords and weights and where necessary, operable and perimeter seals.	High
K	Restore the upper, central, south-east hung sash window.	Medium

L	Reinstate a multi-panel, south west door.	Low
M	Restore those windows altered to accommodate mechanical equipment.	Medium
N	Install a single style, wood frame storm window over all windows.	Low
O	Renew the wood frame stair structure, addressing all loose joints and the displaced upper landing, and applying a protective coating.	High
P	Replace the cedar shingle roof with new cedar shingles cut in the same design	High
Q	Complete a structural design review of the staircase assembly	Medium
R	Renew the front canopy, repairing the post and deteriorated battens, and replacing the cedar shingles. Add flashing where the canopy interfaces with the masonry wall.	High
S	Rebuild the back canopy utilizing a historically sympathetic design and materials.	Low
T	Remove the concrete block mechanical shed and associated mechanical equipment.	Low

Priority ratings have been included to provide guidance towards developing an appropriate scope of work based on the desired performance of the building envelope, the retention/restoration of the buildings historic character and the intended use of the building. These ratings are based on current building and operating conditions and would have to be reassessed should either of these factors change. The performance of the assemblies and associated durability of the building would be significantly enhanced once the items of this table are fully addressed.

8.0 Conclusion

Considering its' age, history of use, and current level of maintenance, the Nelson Coke and Gas Works building is in fair to good condition. Recommendations for renewal work have been provided for all of the assemblies with the priority of attention given to addressing the deteriorated mortar and masonry cracks and restoring the wood frame windows and doors. Other recommendations have been provided to improve the building envelope performance and gain assurance of structural integrity. Lacking historical evidence makes restoration recommendations difficult. A number of alterations that have been recommended appear plausible but cannot be ascertained as historically correct. It is advised that on the completion of renewal works, a diligent level of maintenance be upheld to best assure the ongoing performance and durability of this heritage building.

9.0 Disclaimers

This report identifies the current condition of the building at the time of its review by JDA and has been prepared in accordance with generally accepted engineering practices. No warranties, either impressed or implied, are made as to the professional services provided under the terms of the scope of work included in this report.

The findings presented in this report are based upon the visual observation of the site and structure while the recommendations are based upon the observations and generally accepted building restoration and conservation practice. These findings and recommendations cannot extend to portions of the building that were not or could not be reviewed.

The intent of this report is to assess the current condition of the building. A structural analysis of the building and/or the various assemblies was not completed and no claims to the structural integrity of the building under vertical or lateral load conditions can be implied from this report.

It must be recognized that the act of performing a condition assessment cannot ensure that all and every condition of the building, its materials, assemblies and systems be expected to be identified and that some conditions may go undetected. As a professional organization, JDA endeavours to provide an assessment that is thorough and an associated condition report that the client can base its maintenance and renewals budget on for the near future. Those conditions that remained hidden during the review may arise at a future time necessitating an adjustment to the findings, recommendations and opinions of probable costs presented in the report.

JDA does not provide services normally performed by other consultants including the identification of mould, fungus, mildew, asbestos, or other pollutants and contaminants. Our policy has the industry standard exclusions relating to these substances. The Client agrees that JDA shall have no liability for any cause of action relating to them.

This report was prepared for the Corporation of the City of Nelson. It is not for the use or benefit of, nor may it be relied upon, by any person or entity without written permission of JDA and the Client. It is recommended that the report be renewed on a minimum 5 year cycle to retain its relevancy.

It is trusted that the information in this report satisfies your expectations and requirements. Please do not hesitate to contact us should you have any questions or comments pertaining to this report and its associated recommendations.

Sincerely,

John Dam, Principal
Building Conservation Engineer
B.A.Sc., M.Sc., P.Eng., CAHP, LEED AP

APPENDIX A – GLOSSARY

Appendix A - Glossary

The following glossary is intended to assist with the understanding of technical terms used in this report that may be unclear or unknown.

Air Barrier: A material/component that controls the flow of air through an assembly, limiting the potential for heat loss and condensation.

Alligatoring: A condition of paint or aged asphalt brought about by the loss of volatile oils and oxidation due to exposure to solar radiation. Ultimately the result of the limited tolerance of such paint or asphalt to thermal expansion or contraction, a pattern of cracks is produced resembling an alligator hide.

Assembly: a grouping of components and materials which when organized together form a product that, in the case of a building, functions to prevent the unwanted transfer of environmental conditions.

Building Envelope: A collection of assemblies that contain an enclosed space, providing separation between the conditioned and unconditioned environments. The basic assemblies of the building envelope control the movement of air, moisture and heat.

Building Paper: Organic sheet material saturated with asphalt to create a moisture resistant barrier.

Cladding: A component of the building envelope that protects the building from its exposure to weather, primarily controlling the infiltration of moisture.

Control Joint: A joint in a material component/assembly directing the location where movement occurs in the component/assembly. This movement may occur due to thermal or moisture related expansion or shrinkage.

Delamination: The separation of a material into layers. In the case of masonry material, this is typically manifested by the separation of the outer, exposed layer from the main body of the material.

Face-Seal: A building envelope assembly that depends on the outer surface to control the infiltration of moisture and air from the unconditioned environment providing no allowance for the failure of the control in the system.

Flashing: sheet material, typically metal, used to control to movement of moisture over or behind the cladding of the building envelope.

Hygrothermal: Pertaining to the movement of heat and moisture.

Lite: A piece or pane of glass.

Membrane: A layer of material that serves as a barrier between two environments. It can be designed to be selectively permeable to specific particles.

Modified Bitumen: A product created by adding polymers to asphalt to improve its flexibility, flatten its temperature susceptibility curve (i.e. more flexible at lower temperatures, more stable at higher temperatures) and provide greater toughness.

Mortice: An opening cut in a member to receive the projected end of an adjoining member, often used to connect the stiles and rails of a window sash. The opening can be stubbed or cut through, closed at the bottom or open.

Mullion: A horizontal or vertical member that supports and/or separates panel items such as glass panes.

Pilaster: An architectural element providing the appearance of a supporting column, articulating an extent of wall but remaining ornamental in function.

Purlin: A horizontal structural member spanning between beams or trusses to support a roof deck.

Rafter: A sloping roof member that supports the roof covering and extends from the eaves to the ridge or the apex of the roof. A common rafter is one which runs square with the wall plate and extends to the apex. A hip rafter extends from the outside angle of the wall plate towards the apex of the roof while a valley rafter extends from the inside angle of the wall plate towards the apex of the roof.

Re-point: To renew the pointing or the external part of the mortar joint in a masonry wall.

Riven: To divide into pieces.

Sash: The window frame, including mullions if used, to receive a pane(s) of glass.

Scupper: An opening through a building wall allowing for the movement of moisture off of a horizontal roof surface.

Service Life: The period of time in which a material can be expected to perform its function without undue or unforeseen maintenance or renewal.

Soffit: The underside of a horizontal surface, typically referring to the area beneath the roof eaves or a balcony.

Spall: The detachment of a delaminated component from its base material

Tenon: A projection of a member, typically reduced in size, to fit into the opening of adjoining member. Often used to connect the styles and rails of a window sash. A tenon can be stubbed or through.

Truss

- **Scissor:** A truss with which the bottom chord members cross each other, connecting to the angled top chords at a point intermediate on the top chords' length, creating an appearance similar to an opened pair of scissors. Scissors trusses are used almost entirely to support a pitched roof, where a sloping or raised ceiling surface is desired.

Wainscotting: A term originally applied to high quality riven oak boards but now referencing wall coverings constructed from rigid or semi-rigid components; traditionally interlocking wood, but could be of other materials. In previous times it may have served the function of increasing interior comfort though now it is often more decorative in purpose.

Window:

- **Awning:** An operable sash with a hinge(s) along its top edge allowing the bottom to swing out.
- **Casement:** An operable sash with a hinge(s) along one side allowing the opposing side to swing out.
- **Fixed:** A sash that is fixed in place.
- **Hopper:** An operable sash with a hinge(s) along the bottom edge allowing the top to swing in.
- **Hung -Single:** An operable sash that slides up and down within the window frame. Typically the lower of two sash. The sash can be weighted or sprung to ease operation.
- **Hung-Double:** Operable sash within a window where both upper and lower sash can slide up and down within the window frame. The upper sash can have horns on the stiles to prevent dropping below the lower sash. The sash can both be weighted or sprung to ease operation.
- **Slider:** A sash that slides open to one side within a window frame

APPENDIX B – MATERIAL DETERIORATION

Appendix B – Material Deterioration

Building materials all succumb to inevitable deterioration over time, exacerbated by exposure to inclement conditions including prevailing moisture, solar radiation, organic growth and pest infestation. The Nelson Coke and Gas Works building, constructed of traditional building materials and in close proximity to open water and a challenging environment, has been and remains vulnerable to a full variety of these deterioration mechanisms. These mechanisms are briefly described for reference to existing and/or potential conditions that may occur.

Deterioration of Wood

Wood and water are generally compatible with wood being able to effectively absorb and release moisture in equilibrium with its surrounding micro-climate. However, if the exposure to and absorption of moisture are disproportionate over the wood member or the wetting period outpaces the corresponding drying period, problems can set in.

Wood dimensionally adjusts in relation to absorbed moisture levels – as it dries it will shrink and as it is wetted it will expand. This dimensional variance is impacted by the material properties of wood and its' relative exposure. Dimension change of significance is typically associated to both radial and tangential directions relative to the grain pattern, both of which can lead to cracking of the wood member. This cracking can be worse if the wetting pattern is predominantly on a single surface where only a portion of the member is undergoing dimensional stress. Once cracking is initiated, an increased area of wood is exposed to moisture and the protective barrier of wood is breached with moisture being able to pass through the open crack.

The moisture content of wood also has a direct impact on the initiation and sustaining of organic growth. Wood is considered 'dry' with up to 19% moisture content by weight. Under these circumstances, the wood is 'safe' from sustaining organic growth. At 28% moisture content, the wood fibres can be considered fully saturated and dimensional 'growth' will have reached its maximum. Sustained moisture at these levels will result in the onset of organic decay. Once decay has started, the moisture content can then drop to just 19% and still sustain organic decay.

It is important that dry, clean wood does not reach the fibre saturation point in wood construction, but if it does, the wood must be brought below 19% to stave off progressive decay. Even at this point though the organic decay processes may have been established and the wood remains vulnerable to moisture exposure unless the area is repaired and the details addressing the source of moisture exposure have been addressed.

Though cracking of wood members is a mechanism of deterioration, the primary durability hazard with wood is bio-deterioration. Wood in buildings is a food source for a variety of fungi and insects, both having the ability to destroy the cellular structure of wood and correspondingly reduces its' strength and structural ability upon which the building relies. The process of bio-decay follows a series of events initiated with fungal/insect colonization and concluding with cellular consumption and fibre

disconnectivity. Fungi spores and insects can be around much of the year – a part of the natural environment. Once in contact with wood, they can utilize it as a food source but only under favourable moisture and temperature conditions. For much of the year, the North American west coast provides a favourable temperature leaving the only control being the source of moisture.

The sources of moisture include:

- rain water through direct exposure or through leaking drainage systems
- high humidity levels
- retained construction moisture either from the material itself or adjacent materials

Moisture can also be transported in and around wood through:

- liquid flow (bulk moisture transport)
- capillarity flow through the structure of wood
- air movement or vapour pressure differential transporting humidity

Liquid movement and capillarity flow are the most important sources for wood saturation and subsequent triggers for decay in buildings. The focus for moisture control is therefore typically in shedding rainwater and preventing exposure and absorption of ground water.

To effectively combat moisture exposure it is good to consider durability, defection, drainage, and drying.

- Durability is primarily considered at the onset of construction but must also be given attention during conservation. Good quality materials simply perform better and last longer than their poor quality counterparts.
- Deflection must be understood during the design phase though lapses in this consideration must be addressed during any conservation work. If the building does not deflect rain water well, consideration for redesign or the acceptance of continued maintenance must be given.
- Drainage is as simple as directing away all water that impacts the building. Do not let the building or its surrounding environment 'store' water.
- Drying is very important but often overlooked when building comfort is addressed. Air flow and heating contribute significantly to removing moisture by picking it up and transporting it away. If either mechanism is altered in a building, the corresponding positive effects they provided may no longer be present.

Protection of buildings from moisture is an important design criterion if proper, durable construction and restoration is to be assured. The capabilities of wood must be well understood and then articulated in the design, construction and restoration efforts.

Deterioration of Masonry

Masonry as a building material is generally resistant against deterioration and with modest maintenance has a reputation of being highly durable, in many cases maintaining its durability over the course of centuries. With proper attention given to the masonry assembly, it is generally accepted that the mortar joints will require the most, if not the only, attention during its' lifespan.

Mass masonry construction has been utilized for millennia with good results. The material is typically readily available, economical and strong. As a building envelope component it either sheds water as with granite and glazed terra cotta or it absorbs water as with exposed brick. Either process does not result in deterioration though absorption can enable the migration of internal minerals within the material or result in deleterious freeze-thaw conditions. Mineral migration can lead to expansive cryptoffllorescence or efflorescence either just beneath or on the drying surface respectively. This is often more of an aesthetic issue than a reduction of material integrity. Freeze-thaw conditions leading to significant deterioration occurs in those climates where the temperature hovers back and forth over the freezing temperature of water allowing moisture to enter the wall and then freeze before the cycle repeats itself. As water freezes in the masonry wall, it expands, compressing and cracking the masonry structure. As this cycle progresses, cracks begin to form, allowing in increasing amounts of water and the subsequent acceleration of the deterioration process.

Typically, if moisture is absorbed into the wall, it is effectively dissipated with the drying of the wall surface. Complications arise when this dynamic is compromised by utilizing incorrectly selected repointing materials and/or covering the drying surface with a material that may provide improved appearance or thermal properties without considering moisture transport. The impact on the masonry wall in both cases is increased moisture retention as the evaporation rate is reduced, which in turn can result in free-thaw deterioration discussed above or the facilitation of organic growth.

Incorrect repointing materials typically include the use of Portland cement in the mortar mix. Applying this material over the masonry joint will seal the joint and prevent it from drying – an important mechanism in masonry construction. The wall will now be forced to dry through the now relatively softer masonry units or remain wet for longer periods of time. This can lead to the degradation of the original softer mortar in behind the newly applied repointing mortar leading to it losing its' binding properties – in effect turn to sand. If the masonry units themselves are porous, they may suffer from becoming the 'new' migratory path for moisture movement resulting in delamination and spalling of the masonry at the face of the wall. Both compromise the structural integrity of the wall and over time may result in structural failure of the assembly and possibly building.

Another common misunderstanding with historic masonry walls in buildings the covering of the interior drying surface with a moisture impermeable material like many types of insulation. In an effort to improve the thermal performance of a historic building, spray applied or rigid board insulation are applied against the interior surface of the masonry resulting in a wall that remains cold and wet through the inclement seasons often leading to significantly increased rates of deterioration. Thermal performance of historic masonry walls can be achieved but the process must be carefully considered to prevent the unnecessary deterioration of the wall assembly.

A properly built and maintained masonry wall can last for many generations. This simply requires an understanding of the dynamic mechanism of the wall under adverse conditions and how to prevent associated deterioration. Of highest priority, the mortar joints should be carefully considered for material selection and application to maximize the expected service life of the wall assembly.

APPENDIX C – ROOF ASSEMBLIES

Appendix C - Roof Assemblies

General observations were made of the condition of the roof assemblies as viewed from both the exterior and interior. The roof is a heavy timber truss structure that is currently protected with corrugated metal on shiplap planks.

A visual summary of the roof assembly review with associated comments is presented in the following pages.

Table C – Roof Assembly Observations	
The north corner of the building showing the wood spire above the cupola, the red, corrugated metal roof, the clay brick chimney and the wood frame stairs to the upper floor.	 Photo C-1
The wood frame cupola with 2 over 2 lite, wood frame windows and wood siding beneath the protective corrugated metal roof. The wood spire projects from within the cupola through the roof assembly.	 Photo C-2

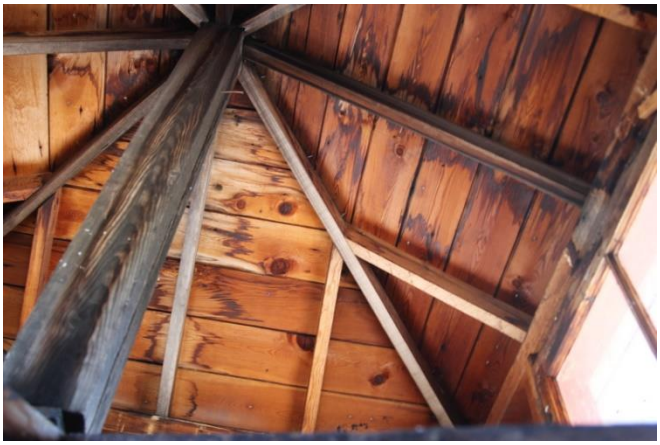
Table C – Roof Assembly Observations	
The unsupported eaves of the corrugated metal roof having bent beneath previous snow load accumulations.	 Photo C-3
The 2x4 and shiplap plank roof structure of the cupola supported by a central post that extends out as the wood spire.	 Photo C-4
The 2x4 and shiplap plank cupola roof structure showing minor water staining.	 Photo C-5

Table C – Roof Assembly Observations	
The shiplap plank and 2x4 wall structure of the cupola.	 Photo C-6
The baseplate of the cupola wall structure supported over the central opening of the main roof. Note the gap between the baseplate and the corrugated, metal roof.	 Photo C-7
The heavy timber rafters of the main roof structure supporting the central post that extends through the cupola roof structure. Note the heavy steel plate between the post and the rafter ends.	 Photo C-8

Table C – Roof Assembly Observations	
The eight, heavy timber roof rafters of the main roof coming together to a single point.	 Photo C-9
The heavy timber purlins supporting the shiplap roof planks while being supported by the heavy timber rafters.	 Photo C-10
A support brace for the heavy timber roof rafters. Note the vertical metal tie rod supporting the bottom chord of the truss.	 Photo C-11

Table C – Roof Assembly Observations	
A close-up view of the connection detail for the support brace and the tie rod.	 Photo C-12
A metal bracket connecting the base of the heavy timber roof rafter to the heavy timber bottom chord.	 Photo C-13
The roof perimeter detail showing the roof structure supported by the stone masonry wall and the ceiling structure set in on a support shoulder constructed into the wall.	 Photo C-14

Table C – Roof Assembly Observations	
Tell-tale stain lines showing that water leaks through the main roof along the edges of the shiplap planks. The deterioration appeared to be limited to staining with no ceiling deterioration observed.	 Photo C-15

APPENDIX D – WALL ASSEMBLIES

Appendix D - Wall Assemblies

General observations were made with regard to the condition of the wall assemblies as viewed from both the exterior and interior. The stone masonry walls with clay brick arches are finished to the interior with wood framing and drywall. Vertical tongue and grove boards finish portions of the upstairs wall while more traditional paneling finishes the downstairs lobby and office areas.

A visual summary of the wall assembly review with associated comments is presented in the following pages.

Table D – Wall Assembly Observations	
The front elevation showing the granite walls with clay brick trim.	 Photo D-1
A typical window detail with the clay brick arch at the head and clay bricks protected with cementitious parging at the sill.	 Photo D-2

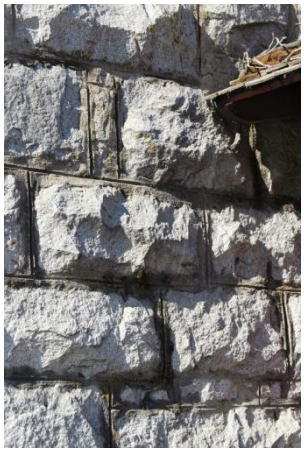
Table D – Wall Assembly Observations	
Staining on the granite masonry to the left of the front entrance canopy revealing moisture runoff against the wall. Note the penny-rolled mortar joint profile.	 Photo D-3
A crack in the clay brick arch over the front door indicating movement in the arch.	 Photo D-4
Staining on the granite wall to the right of the front entrance canopy.	 Photo D-5

Table D – Wall Assembly Observations	
A typical clay brick window sill with delaminating, cementitious parging on the surface.	 Photo D-6
A wood wedge set in the mortar joint - sometimes used to level the masonry unit during placement or sometimes utilized to receive fasteners in the more joint.	 Photo D-7
A crack in the granite wall between the clay brick sill and arch.	 Photo D-8

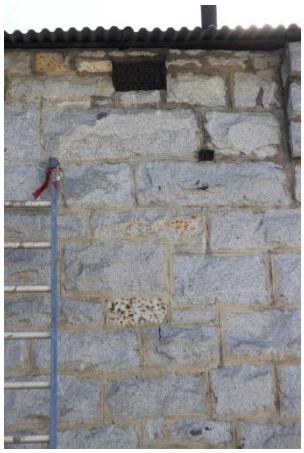
Table D – Wall Assembly Observations	
A crack in the granite masonry passing through the penny rolled joints near the base of wall.	 Photo D-9
Poorly matched and applied cementitious mortar. Note the upper wall vent into the attic space.	 Photo D-10
Cracked clay brick arch above the upper level doorway.	 Photo D-11

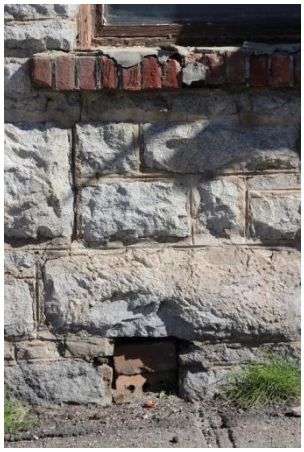
Table D – Wall Assembly Observations	
A crack in an upper level window arch.	 Photo D-12
Cracked mortar joints in the granite masonry wall.	 Photo D-13
Cracked mortar and delaminated cementitious parging. Note the blocked vent to the crawlspace.	 Photo D-14

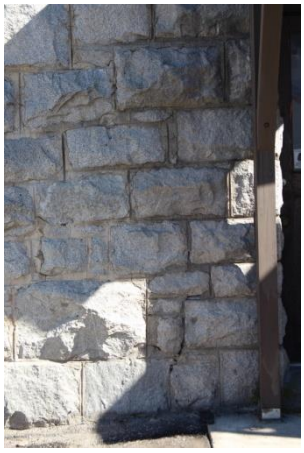
Table D – Wall Assembly Observations	
Poorly applied and cracked masonry mortar.	 Photo D-15
Poorly applied and cracked masonry mortar with shrinkage cracks.	 Photo D-16
Corroding iron inclusions in the granite stone.	 Photo D-17

Table D – Wall Assembly Observations	
A large crack through an upper window arch.	 Photo D-18
A significant crack between a window sill and an arch immediately below.	 Photo D-19
Minor cracking through the grade level sill beneath the significant crack suggesting differential wall movement.	 Photo D-20

Table D – Wall Assembly Observations	
Infilled granite masonry revealing the original window area.	 Photo D-21
Unfinished masonry joints in granite infill.	 Photo D-22
Cracked mortar joints in granite masonry. Note the penny rolled mortar profile.	 Photo D-23

Table D – Wall Assembly Observations	
Typical interior finishes – upper level.	 Photo D-24
Wood wainscoting finish on some of the upper level walls. This particular section is immediately behind the significant wall crack (see Photo D-19)	 Photo D-25
Panel wainscoting in the lower level lobby area.	 Photo D-26

APPENDIX E – WINDOW & DOOR ASSEMBLIES

Appendix E - Window & Door Assemblies

General observations were made with regard to the condition of the window and door assemblies as viewed from both the exterior and interior. The windows of the building are all typically hung sash assemblies with one smaller unit on the north-west elevation and a pair of contemporary assemblies on the opposite elevation. The upper cupola has a fixed assembly in each wall with 2 over 2 lites. A variety of wood doors, some with glazing in the door and others with transom lites over, provide egress to the building.

A visual summary of the window and door assembly review with associated comments is presented in the following pages.

Table E – Window & Door Assembly Observations	
Typical window & door distribution on each elevation. The north-west elevation has modified the upper, centre window to become a door opening while the opposite elevation has modified the upper, central window to become a set of double, contemporary window assemblies.	 Photo E-1
A typical single lite over single lite, wood frame, hung sash window assembly. A number of assemblies have exterior storm windows.	 Photo E-2

Table E – Window & Door Assembly Observations	
A smaller hung sash window on the north-west elevation.	 Photo E-3
Fixed, two lite over two lite wood frame windows in each side of the cupola.	 Photo E-4
Deterioration of a wood window frame – south-west elevation.	 Photo E-5

Table E – Window & Door Assembly Observations	
A window modified to accommodate the passage of mechanical ducting into the building – south-west elevation.	 Photo E-6
Modification of a window pane to allow for passive venting – south-east elevation.	 Photo E-7
Contemporary windows replacing an original hung sash window to accommodate interior modifications – south-east elevation.	 Photo E-8

Table E – Window & Door Assembly Observations	
Spray foam insulation around the window perimeter to improve the air tightness of the frame.	 Photo E-9
Main entrance doors with a single lite over a 4 panel, solid wood door. A double lite transom over the doors allows for additional light into the lobby.	 Photo E-10
A solid wood side door with 10 panels similar in style to the main doors but without the glazing. Note the transom lite over.	 Photo E-11

Table E – Window & Door Assembly Observations	
A double panel glass lite over wood back door. It is likely this is not an original door. Note the transom lite over.	 Photo E-12
Deterioration at the base of a door – south-west elevation.	 Photo E-13
A partially boarded over 10 panel door similar to the door on the opposite side elevation.	 Photo E-14

Table E – Window & Door Assembly Observations	
A contemporary door providing access to the upper level with 9 lites over 3 vertical panels.	 Photo E-15

APPENDIX F – FOUNDATION ASSEMBLIES

Appendix F - Foundation Assemblies

General observations were made with regard to the condition of the foundation assemblies as viewed from the crawlspace. Rubble stone foundation walls support the exterior building walls while interior granite stem walls provides intermediate support for the lower level timber floor. The crawlspace grade is finished with a contemporary mudslab. A single vent opening to the exterior was observed on the south-west elevation. A paved surface has been placed around the perimeter excepting a side elevation where weeds have been allowed to grow on natural grade.

A visual summary of the foundation assembly review with associated comments is presented in the following pages.

Table F – Foundation Assembly Observations	
Mortared, rubble stone was used for the exterior foundation walls.	 Photo F-1
Intermediate, stone, stem walls support the lower level floor structure.	 Photo F-2

Table F – Foundation Assembly Observations	
A stone pier supports the clay brick chimney.	 Photo F-3
Contemporary joists and pressure treated sill plates comprise the lower level floor structure affirming the original lower level floor was entirely replaced.	 Photo F-4
A concrete mudslab finishes the grade in the crawlspace controlling moisture and associated deterioration.	 Photo F-5

Table F – Foundation Assembly Observations	
A partially blocked vent at grade connecting the crawlspace to the exterior.	 Photo F-6

APPENDIX G – EXTERIOR ATTACHMENTS

Appendix G - Exterior Attachments

General observations were made with regard to the condition of the exterior attachments including the stairs, canopies and mechanical shed. The main entrance canopy appears original to the building while the back canopy appears to be a contemporary copy of the original. It is known that the side stairs were added almost 80 years after original construction to facilitate exterior access to the upper level. The construction of their wood frame structure reflects the design of the original, front canopy. A concrete block structure on the south-west elevation contains mechanical equipment for the building.

A visual summary of the exterior attachments review with associated comments is presented in the following pages.

Table G – Exterior Attachment Observations	
The exterior stairs with the stone base and wood frame structure. A curved, cedar shingle roof protects the wood framing and steps.	 Photo G-1
A side view of the exterior stairs.	 Photo G-2

Table G – Exterior Attachment Observations	
A back view of the exterior stairs showing the spacing from the building and the upper landing.	 Photo G-3
A wood frame joint of the stair roof canopy structure.	 Photo G-4
The wood frame canopy over the stair.	 Photo G-5

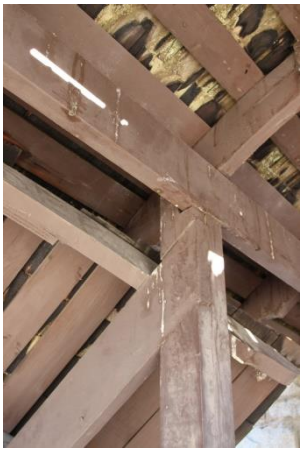
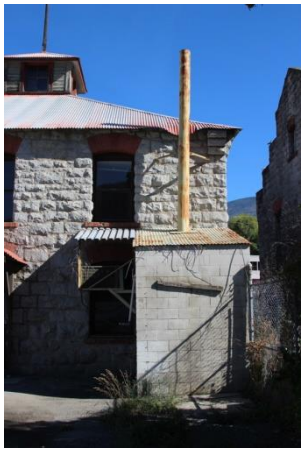
Table G – Exterior Attachment Observations	
The canopy roof over the upper level landing showing deteriorated cedar shingles.	 Photo G-6
A joint in the upper wood frame structure starting to warp out of position.	 Photo G-7
A complex framing joint in the upper stair canopy structure.	 Photo G-8

Table G – Exterior Attachment Observations	
The upper level landing with a supporting ledger beneath showing the stone base is receding away from the building, reducing the integrity of the landing structure.	 Photo G-9
The original front entrance canopy with curved rafters and a wood soffit.	 Photo G-10
The painted support brackets of the front entrance canopy. Note the organic growth on the cedar shingle roof.	 Photo G-11

Table G – Exterior Attachment Observations	
The canopy support post separating from the support beam.	 Photo G-12
The deteriorating edge of the front canopy roof.	 Photo G-13
A split post supporting the front canopy.	 Photo G-14

Table G – Exterior Attachment Observations	
A deteriorating post base causing the separation between the post and upper beam.	 Photo G-15
The back door canopy with a corrugated metal roof.	 Photo G-16
The spliced rafters of the back canopy supporting a corrugated metal roof. Note the efflourescence on the masonry arch.	 Photo G-17

Table G – Exterior Attachment Observations	
The contemporary brace and beam with a bolted connection on the back canopy. Note the beam is poorly protected by the roof assembly.	 Photo G-18
A twisted and split support post.	 Photo G-19
The support posts of the back canopy are set on framing brackets.	 Photo G-20

Table G – Exterior Attachment Observations	
A concrete block shed containing a mechanical boiler. Note the air conditioning unit to the side with the airducts passing through the window and the boiler exhaust pipe that has contributed to the damaged upper roof.	 Photo G-21
A gap between the concrete block structure and the original building suggesting the shed is rotating away from the building.	 Photo G-22