CIVE 4601 – Assignment 4 – April 12, 2019

Monastery of the Visitation of Holy Mary

378 Leighton Terrace

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1.0 Introduction

1.1 Characterization of Building

The Elms, being part of the Soeurs de la Visitation Monastery, is a large property located on the south side of Richmond road in the Westboro neighborhood. The Monastery of the Visitation of Holy Mary is formally designated under Part IV of the Ontario Heritage Act [10]. As of 2012, the designation has included the Monastery and the property grounds. The building is made up of both the original late-19th century farmhouse villa, or The Elms, and early-20th century Monastic Addition [11]. On the 5.2- acre lot, the designated portions that encompass the monastery include the immediate landscaping, a treed pathway, and some perimeter landscaping. This building and its grounds present a unique, historical story that is very important to the people of the Westboro neighbourhood, the City of Ottawa, and the province of Ontario.

The original structure, The Elms, has been home to many prominent figures in Ottawa's history. The first resident, George Eaton, was one of the emerging elites who purchased the extravagant home designed by architect Sydney Fripp on the six-acre lot [12]. James Skead, a senator and industrialist, and the Holland family, who introduced many new communications technologies to Ottawa, and took residence there. The Monastery, added by the Sisters of the Visitation of Holy Mary in 1910, was attached to their long-standing history since 1610 in France and provided religious service to the community for many years [11]. The monastery's isolation was achieved mostly through their significant setback from Richmond road and Byron Avenue. [13] By 1947 the monastery was considered a significant landmark for the Catholic community and hosted a Roman Catholic conference called the Marian Congress.[13] In 2010 the number of Nun's occupying the building had reduced to 8 and became unsustainable for the order. That same year the Sisters sold the property to Ashcroft Homes. [14] The monastery has remained vacant since 2010, and the developer has been in consultation with the community to determine the best use for the structure.

The key attributes that embody the site are based on their historic uses. The Elms' house is an excellent example of a Gothic Revival House. It's character defining elements include steeply pitched roof with narrow gable roofed dormers, large bay windows with wooden pointed arch details; decorative barge board; tall chimneys; stone quoins and voussoirs; pinwheel plan around a central staircase; and the rubble core stone masonry construction.[13]

In contrast the Heritage attributes that make the building an excellent example of a monastery is the tall two story stone construction with regularly spaced windows. The inward-facing plan with a central courtyard that is enclosed on four sides with a patterned flower bed. A high hipped metal-clad gable roof, with triangular dormers. And the chapel with its pointed arch windows, vaulted ceilings, and bellcote. [13]

1.2 Nara Grid Values Assessment

Dimensions and Aspects	Historic	Artistic	Social	Scientific
Form and Design	Features an excellent 1860's Gothic Revival House design that was popular in the 19th century for the Elite. The addition features an early 20th century monastery based on medieval European monasteries and convents.	Features a Gothic Revival Home built in the 1860's based on a pinwheel design. It includes decorative elements such as decorative barge board and perpendicular windows. The second half of the building is typical monastery design that is an inward facing plan with wings arranged around a central cloister enclosed on four sides. The Chapel has vaulted ceilings and pointed arches with simple gothic features.	Large pinwheel gothic revival house private residence. The pinwheel design was purposed for everyday living. The addition of the monastery was built for the Soeurs de la Visitation, and is a rare example of an enclosed monastery with a picturesque setting for meditative contemplation.	The design of the Elms' house based on the pinwheel is to maximize available light within the space. The addition of the monastery provided ample daylight and an enclosed private space.
Materials and Substance	The Elms house consist of traditional materials in the form of local stone, and traditional wood shake shingle and decorative wood bargeboard. The addition uses local stone as well and uses a tin roofing material.	The use of local stone and decorative bargeboard of the house are in keeping with the style of gothic revival. The materials of the monastery are not very ornate, rather the materials	The richness in the stone materials, decorative bargeboard, and perpendicular windows of the Elms house were used to display status in the community. The materials used in the monastery share similarities to those of Christian monasteries and convents and are symbolic of monasticism.	The materials used are mass masonry stone walls with a rubble core. The stone walls provide thermal massing and are designed manage moisture and complex loads.
Use and Functions	The Elms' house was used as a private house from 1865-1910. It was sold to Soeurs de la	The Elms house which was built was built for domestic purposes. Its	A large step back is provided for separation from the general population.	The use of a Vaulted chapel provides acoustics for sermons, music, and prayer.

	Visitation who added an addition and used the monastery and house as a convent until 2010 where it has been unoccupied since.	pinwheel design reflects that. The use and function of the building as a monastery can most readily be seen in the vaulting.	The central courtyard along with the with landscaping was built to shelter and provide privacy for the Sisters of the Visitation of the Holy Mary.	
Tradition, Techniques, and Workmanship	Historic masonry techniques using rubble core stone masonry as load bearing walls. The interior assembly also utilized a traditional lathe and plaster finish.	The techniques used in decorating were in a Gothic Revival design and can be seen in the intricate barge board ad perpendicular windows.	Similar techniques in construction were used to build other local residences in the area. Other high-profile homes around the 1860's was built using rubble core stone masonry, and decorative wood elements.	The design of the monastery sheltered the roof line of the original Elms' house. This preserved the original wood shake shingles on the roof of the Elm House.
Location and Setting	The location has been in 114 Richmond Rd. The location was once rural but has become more Urbanized.	The building gives the area a sense of character. It is one of the last stone buildings in the area and provides a sense of place to the surrounding urban environment.	The inner court yard, setback, and large property all played a role in provided a secluded space for spiritual worship.	Evidence of how a property can be designed to be secluded while in the city given enough space.
Spirit and Feeling	The stone masonry, and size of the building gives a sense there is a history of the area that dates back to the 19th century.	The craftsmanship of the stone masonry and barge board are a point of beauty when contrasted to the modern development surrounding it.	The Monastery of the Visitation of the Holy Mary was important to the Roman catholic history of the area.	

1.3 Chronology

The Elms house was built in 1864-1865 by Ottawa architect Sidney Bowless Fripp for hardware merchant James Dyke. The home was later occupied by George Eaton, James Skead, and Allison Hilson Holland. In 1910, the sister of the Visitation of Holy Mary came to Canada and purchased the property. The Monastery addition was completed in 1912 by builders Poirier & Sons with the addition of three wings to the Elms. In 2009, the sisters sold the property to Ashcroft homes. In 2015, a new mixed-use development was built in front of the Monastery. There are future development plans for the site behind the Monastery to join a mixed-use building to the historic building.

2.0 Methodology

The scope of this project was to provide a condition assessment of the deterioration of the Monastery of the Visitation of the Holy Mary. This assessment included the building exterior, the interior three floors and the roof. The site was very large, so this assessment focused primarily on the conditions of the Elm's house the northern section of the building.
The first phase of this project involved obtaining background information on the site. This included, date of construction, the original architect, the dates of any additions or renovations that were completed. This information was obtained through on-line research and conversations with the site custodian Robert Betts. The second phase of the project was having all members examining a specific part of the building and performing an analysis them. Through these analyses other conditions and deteriorations were found and future remediations were determined. The third phase of this project involved a photogrammetric model being created of the exterior to outline the exterior conditions. The data for all these phases was collected in 4 different site visits through the months of February and March.

2.1 Equipment, standards, references and online tools used in assessment

The equipment used to produce this report and past reports were DSLR camera to take high definition photographs. The reference standards that were used for this paper were; The Heritage Conservation Directories "Glossary of Building Exterior Conditions", Canada's Historic Places "The Standards and Guidelines for the Conservation of Historic Places"… Additionally the "Monument Diagnosis and Conservation System" is an online tool that was used to reference the diagnosis and conditions of the Monastery. Computer programs that were also used in the creation of this report include autodesk AutoCAD, a drafting software that helped create the drawings featured in this report. Adobe Photoshop was used for editing the photographs that were used in all the reports. ArcGIS ArcMaps was used in creating the site plan and site map of the monastery.

2.2 Assess Limitation

The monastery was vacant and closed off for future construction, but the building was relatively accessible. There was a fence surrounding the perimeter that was open to the team. The chapel on the interior was the only section that was inaccessible because of significant structural damage. All site visits were performed when there was significant ice and snow that was on the ground that is visible some of the attached photos. There was a new construction very close to the monastery restricting the distance from the façade that a photo could be taken. Some of the features of the building were documented due to these limitations, including the roof and the chapel.

2.3 Health and Safety Conditions

The site is currently a construction zone stating that one must wear full personal protection equipment (PPE). This building is significantly deteriorating with some structural damage done to the interior increasing the safety risks. There was a specific section of the interior that were completely off limits due to the safety concerns. The low temperatures in February and March, significant snow build up and significant rain created significant ice on the paths, creating a walking hazard. These hazards were addressed by using caution while walking around the building as well as avoiding the areas of the monastery with the most significant structural damage.

3.0 Condition Assessment

3.1 Site Condition

The following section summaries site condition surrounding the Monastery of the Visitation of Holy Mary that may pose threats in the future lifespan of the heritage building. Topics such as the location of property and its surrounding neighborhood, soil type, and groundwater elevation are discussed.

3.1.1 Observations

The Site that Monastery of the Visitation of Holy Mary resides on is located directly southwest of the intersection of Richmond Road and Leighton Terrace, within the Westboro neighborhood of Ottawa.

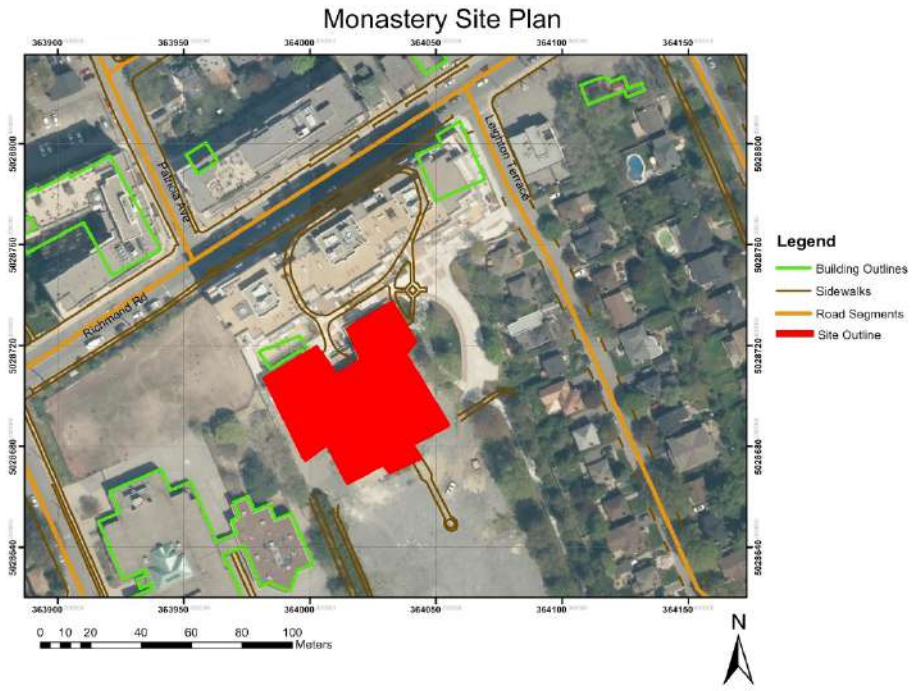

Figure 3.1.1: Monastery Site map [1]

Two buildings currently exist on this site, including 88-111 Richmond Road (the first phase of the Q West development by Ashcroft Homes) at the north boundary of the site and the Soeurs de la Visitation Monastery directly south of the new building. The southern half of the site remains largely vacant.

Adjacent to the site to the east and southeast are residential neighborhoods consisting of 2-3 story residences and to the west is the Hilton Avenue Public School. The site is surrounded by trees on three sides.

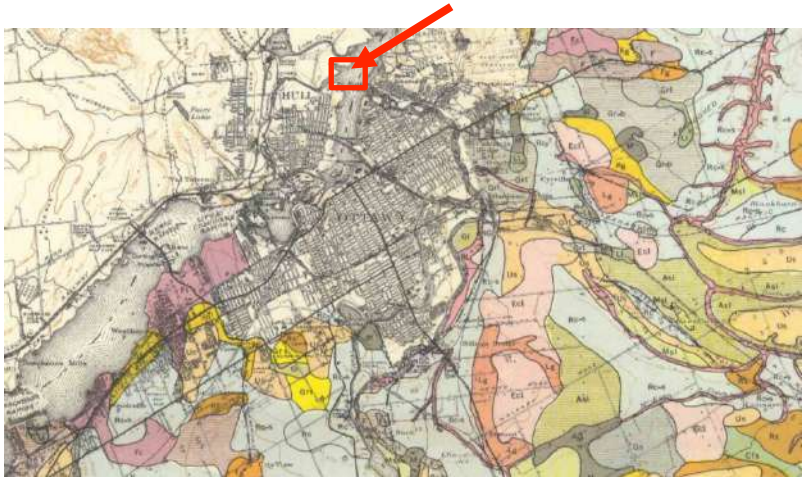

Figure 3.1.2: Westboro soil map [3]

Based on the soil survey map of Ottawa done in March 1944 by the Geologic Survey of Canada, much of the Westboro area in which the site is sitting on has a soil composition of thin surficial layers of organic soil, followed by glacial till, and then bedrock. [2] Thus, initial assumption regarding Leda Clay being the main soil component is no longer valid.
The groundwater level underneath the monastery is measured to be 4 meters from the surface. Since no accurate information at the exact location was found, depths of wells in the surrounding neighborhood were gathered, and the average was used.

3.1.2 Analysis

Site conditions mentioned above are contributors to some of the pathological issues we have seen in the building. The Monastery of the Visitation of Holy Mary sits on a soil composed of glacial till, a very hard and compact soil containing boulders, gravel, sand, silt, and clay particles [4]. With the right percentage of moisture content, the strength of the soil can support the foundation of the Monastery for an extensive amount of time.
However, drawbacks from sitting on glacial till occur when the moisture content is below the required level. As mentioned in the last section, the average groundwater level in the area is 4 meters deep, a level that is too high to excavate the new Ashcroft Home's condo. Thus, to prevent water from penetrating through during construction, dewatering method is applied.

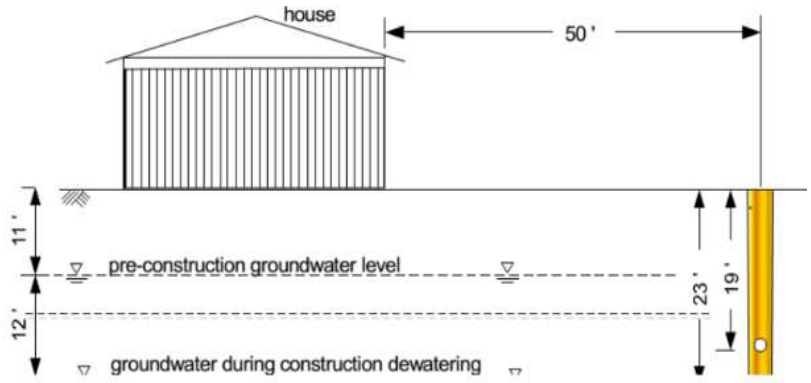

Figure 3.1.3: Dewatering Technique [5]

It is a practice to lower the groundwater level to facilitate the excavation work and construct the foundation in dry soil [5]. However, doing so lowers the moisture content in the surrounding soil as well.

Glacial till contains particles such as boulders, sand, and gravel with various sizes. When a load is applied on top, compaction movement pushes different particles around until it reaches equilibrium. With moisture presented, the friction created by the movement of particles can be smoothened, creating a better load carrying capacity.

On the contrary, when the moisture content is lowered, friction created by movements can disintegrate the bigger boulders into smaller gravels, thus reducing load carrying capacity of the soil. With vibration created from construction, the disintegration process underneath the monastery has been happening at a faster pace, causing ground settlements in the areas with the most severe soil deterioration.

Another pathological issue induced by site condition originated from increasing wind load on the building envelope. In general, a high-rise establishment increases wind speed on its surrounding environment based on the downdraught and Venturi effect [6]. When air hits a tall building, with nowhere to go, it is pushed up, down and around the sides (downdraught). On top of that, wind around the sides can be accelerated even more due to a channeling effect (Venturi effect) from air squeezing through two closely placed structures, which in turns create a larger wind load on the windward, leeward, and sides of the adjacent structure. With a larger wind load, potential damages to the building envelope such as windows and doors could occur in the future.

Figure 3.1.4: Wind Effect on Monastery

3.1.3 Treatment Options and Recommendations

The treatment options in terms of mitigating risks from its surrounding site can be categorized into two stages with first of the two focusing on consolidating the foundation. To stabilize the foundation, strengthening the remaining non-damaged glacial till layer could be accomplished by redirecting groundwater to the Monastery level, to achieve required moisture content within the soil.

For damaged soil areas, since its resistance is permanently damaged due to the disintegration of larger particles inside, a spread footing foundation can be added. With such foundation, loads from the monastery can be spread over a larger area to reduce stresses in the soil.
Damages on building envelope from increasing wind load can be mediated from regular maintenance and monitoring works. Defects on windows and roof tiles a need to be replaced following the standard and guidelines for the Conservation of Historic Places in Canada. And any restoration works done on the building needs to respect its original appearance and historical values.

3.2 Building Exterior Conditions

This section describes building envelope conditions of the Monastery of the Visitation of Holy Mary, followed by an analysis of possible causes and recommended treatments that could be applied in the future. All terminology used in this section is based on the "Glossary of Building Exterior Conditions" by Heritage Conservation Services [7]. All figures referenced in this section are in Appendix A. Due to the scale of this project; only the Elms and the North wall are considered.

3.2.1 Wall Assembly

The Monastery of the Visitation of Holy Mary is constructed with a rubble-filled stone masonry wall; an assembly consists of a rubble-infill core and two stone masonry layers. The composition of the exterior stone layer is different between the Elms and the rest. The Elms has a sandstone layer where the rest of the Monastery consists of limestone.

3.2.1.1 Observations

Due to limited access to the site, only the North-West and West facades of the Elms were examined. Upon examination, the overall sandstone layers appeared to be in good condition. In terms of moisture related issues, staining areas were observed on both facades near windowsills, and places where ice accumulates during the winter. Ferric staining was also seen in areas that are in direct contact with the metal fire escape. (See Figure E1-E3)

A vertical crack was seen on the west façade, originating from the sill of first-floor window to the lintel on top of the basement window, following a path along what seemed to be a non-original addition to the Elms. Smaller cracks in mortar joints were also observed on both facades near window lintels. (See Figure E4-E6)

Furthermore, North façade of the Monastery was also observed, and appeared to be in a poor condition. Similar to the Elms, moisture staining was observed near windowsills and snow accumulated areas. Ferric Staining was also seen on limestone around a metal embedment near a second-floor window to the left. (See Figure E7-E8)

To the right of north façade, severe deteriorations were observed. Detached fragments of limestone units were seen at the bottom of an exposed door opening, and displacement and bulging of the exterior stone layers were seen on the far-right corner of the façade. Furthermore, cracking in masonry units and mortar joints were also observed, with the most severe one being a crack near a window lintel on top of the bulging wall. (See Figure E9-E14)
Due to snow accumulation at the foundation, any condition assessments on the building below the snow layers were not examined.

3.2.1.2 Analysis

For the Elms, moisture staining on its sandstone layer has resulted from excessive humidity. In this case, humidity is accumulated in two places; the first being in contact with melting snow and another near the windowsills. The logic behind melting-snow induced staining is straightforward. Water from the melting snow infiltrates into dense masonry pores and trapped, causing damping in the area. On the other hand, Moisture staining near the windowsills is caused by condensation. Without the use of airtight seals, warmer indoor air is in direct contact with colder window glass, creating condensation reactions, which turns air into water. Excessive water is then run off and penetrates the limestone sill and surrounding areas.

The vertical crack seen on the west façade of the Elms are caused by improper past interventions. When the Elms was first constructed, window shown in Figure 3.2.1 was designed to be an entrance. During the construction of the Monastery addition, the entrance was replaced with windows and the voids were filled with limestone. However, the Elms were constructed using sandstones, which have a different shrinkage rate than limestone. Thus, cracks were formed along the interaction plane between the two materials.

Figure 3.2.1: The Elms West Façade

For the more severely deteriorated north façade, ferric staining was caused by the oxidation of steel on limestone. In this case, it is the oxidation of fire escape that is embedded in the masonry units. Detached masonry units near the door were removed intentionally due to excessive spalling, and a weakening lintel causes the crack on top of the bulging wall to form due to its inability to resistance loads.

A weakened rubble-core causes the bulging of the limestone wall on the right side of North façade. When cracks occur on top of the wall, moisture gets into the assembly and deteriorate the lime mortar that binds the core. With core weakened, more loads are transferred into the limestone layers, causing the bulging movement of the wall.

3.2.1.3 Treatment options and Recommendations

Treatment option for the Elms would be rehabilitation. Recommended repairs include installation of windows with air-tight seals to prevent further moisture staining on the sandstone units, repointing the open and cracked mortar joints, and repairing the cracked masonry units.
For north façade of the Monastery, treatment option for the bulging wall would be dependent on structural performance evaluation carried out by a structural engineer. If the wall is determined to be stable, rehabilitation would be the recommended option. With the use of wall ties to restrain further bulging, the load carrying capacity can be restored by applying grout to the core material. However, if the wall is bulging to the extent that replacement of the wall is needed, restoration works on the entire wall would be recommended.

Due to the nature of rubble-filled stone masonry walls, in order to reduce future degradation, regular maintenance and repairs on surface cracks to prevent moisture penetration is recommended.

3.2.3 Roofing

The original roof on the Elms house differs from that of the monastery addition. Wooden shingles still cover the Elms today, but the old roof no longer has a function as a new roof made of tin shingles was installed in 1910 when the Monastery addition was built. The wooden roof can be seen from the attic.

3.2.3.1 Observations

Tinplate roofing covers both the Elms and the Monastery, the condition of the roof can be observed on the exterior, using photography to get a closer look in more detail. Figure E15 shows a detail where flashing was used to join the masonry wall corner to the roof in order to shed water away from the stone to prevent moisture damage. A similar detail can be seen around the chimney, flashing is installed around the bottom of the sides of the chimneystack to shed the water away from the stone.

In some areas, usually along the edge of the roof, the tin has begun to rust (E17). This is due to the moisture accumulation on the roof; overtime oxygen reacts with the moisture and metal to create rust. If left untreated, rust can further deteriorate the tin shingles to cause holes in the roof leading to performance issues in the building envelope.

Since it was winter, ice damming was prevalent in most areas along the roof (22). The ice damming is a product of heat loss from the building causing the melting of snow and then the cold temperatures freezing the melted snow into ice along the edge of the roof.

The roof is supported with a timber A-frame that be seen within the attic of the building (E19). In the attic there were some buckets placed along the edges to collect any leaking moisture, which indicates some performance issues in the roofing system (E21).

3.2.3.2 Analysis

The leakage in the attic provides evidence that there is deterioration in the roof shingles. This could either be caused by the rusted tin or through seams failing, allowing moisture to penetrate through. When the moisture travels through to the attic, it poses a risk to the structural timber frame since added moisture can lead to deterioration of the wooden members. The roofing structure was designed so that water sheds outward from the building so it is important that the roof is fully repaired to prevent any further leakage.

3.2.3.3 Treatment Options and Recommendations

Treatment recommendations for the roof include replacement of any damaged tin shingles. In some cases, the seams between the shingles can be repaired to prevent moisture penetration. It is

important to understand the materials that are used before implementing any repairs. The substitute materials used for repairs must be physically compatible with the existing materials. To prevent the severity of ice damming from occurring, insulation should be added in some areas of the attic while also controlling ventilation in the space. This may be difficult since the building relies on natural ventilation and heat loss through the attic, so another prevention option could be to maintain the roof in the winter by removing the ice.

3.2.4 Windows

3.2.4.1 Observations

The building contains wooden framed windows that are mainly in good condition. Some of the windows act as a character-defining element to the historic building, especially the large bay windows as seen in E27. Different types of glass types were seen, such as the Georgian wire glass, figure E26, or the frosted glazing, figure E25.

3.2.4.2 Analysis

The reason the windows are in such good condition is because of the preventative acts that have been taking through the implementation of exterior storm windows. Storm windows are beneficial for historic wooden framed windows as they protect them from the outdoor elements while also reducing the risk of moisture and air infiltration. Storm windows can also be removed in the summer season, so it does not take away from the building's character. Although the storm windows fit in with the architectural significance of the building through its red painted exterior to match the red bargeboard trim.

From the basement, the window looking out into the courtyard has snow built up against the glass (E24). It is important to evaluate the condition of the window once the snow melts away to observe if there has been any moisture damage to the wood. When wood is exposed to moisture for long periods of time it can be susceptible to wood rot or warping.

3.2.4.3 Treatment Options and Recommendations

Since the wooden windows are in relatively good condition there is no replacement or major intervention required. The main recommendation is to continue proper maintenance and follow through with minor repairs when needed. It is important to continue to make sure that water is shed away from the windows to prevent any moisture damage to occur. Another minor repair would be to repaint the interior frames in some areas where the paint is starting to chip off.

3.3 Building Interior Conditions

The Elms' interior has a characteristic irregular layout and floor plan. It is stone masonry building with a timber-framed structure. There is extensive use of plaster for the finishing of the walls and ceiling. The basement foundation is a continuation of the stone while load bearing walls are of the red clay brick variety. Our observations, analysis, and treatment options and recommendations for each are as follows

3.3.1 Timber Frame

3.3.1.1 Observations

The timber framing is concealed in the occupied floors, but it is exposed in the basement and attic spaces. We observed a structural beam that is supporting the second floor near the stairs that has almost completely pulled away from the wall, which can be seen in figure I1. There was no physical movement despite seeming visually unstable. The roof structure and exposed floor beams in the basement look structural sound with little to no major deterioration.

3.3.1.2 Analysis

It seems to have been compromised during the excavation and blasting that occurred during the construction of the condos on Richmond Road. This blasting affected the soil and Leda clay around the site, the stone foundation, and potentially shook the structure. These separations and cracks are cause by shifting and the subsequent stress.

3.3.1.3 Treatment Options and Recommendations

To ensure the safety, monitoring of the structural members is necessary to ensure no further shifting occurs. The shifting could render the structure unfit for occupancy. This could be done adding a simple plaster rod or a measurable crack monitor to a frame connection to show movement. In the future it would be wise to support the member that has shifted and separated to prevent further damage with future development or work on the site.

3.3.2 Walls

3.3.2.1 Observations

The wall assembly above grade is a lath and plaster construction. Below grade, the load bearing walls are brick. Some areas of the walls have stripped areas where sections were most likely removed to reveal the subsurface conditions of the stone as seen in figure I2. Most of the walls are in poor

shape with many cracks and separation at the corners as seen in figure I3. The basement brick wall can be seen to have an intentional alteration seen in figure I4.

3.3.2.2 Analysis

The cracking damage is due to the movement and deterioration of the timber frame construction. The absence of wall sections is due to the purposeful removal to inspect other envelope features.

3.3.2.3 Treatment Options and Recommendations

The treatment for the walls would be to assess the interventions needed for the structural timber members and repair accordingly. If the timber frame remains, the lath and plaster could be renovated and repaired. However, if the frame requires adjustment or replacement, the out-dated lath and plaster construction may need modernization to stud and drywall assembly.

3.3.3 Stone Foundation and Brick

3.3.3.1 Observations

The stone foundation and brick in the basement seem to be damaged. Most of the reinforcement and stabilization in the basement was for supporting the foundation under the exterior wall as seen in figure I5. There were many cracks and some missing stones along with efflorescence seen in figure I6.

3.3.3.2 Analysis

The lack of reinforcement during the construction of the adjacent condos influenced the cracks and removal of certain sections of the foundation. Unfortunately, the basement is wet and with exposure to the outdoor environment there will be increased moisture. This will cause water to become trapped in the foundation and thus some deterioration could have resulted from freezing and expansion of the trapped water.

3.3.3.3 Treatment Options and Recommendations

This can be treated by implementing more permanent reinforcement to the stone foundations and by replacing and repairing gaps and cracks in the foundation. The efflorescence can be cleaned and prevented by reducing the amount of moisture in the basement through dehumidification.

3.3.4 Finishes

3.3.4.1 Observations

The finishes in the Elms do not actually contribute to the heritage of the building but are worth noting, as they are indicators of pathological problems that the building faces. The paint is bubbling and peeling in many places near the ceiling as well as on some wall areas, as seen if figure I7. The floor tiles are heavily discoloured, decoupled from the floor, and are cracked and deformed as seen is figure I8. The wooden features such as entrances, trim, and decoration are in good shape however some crown moulding is cracked with the walls.

3.3.4.2 Analysis

The paint stripping and floor tiles deformation and discolouration indicate heavy moisture damage. The moisture comes from leaking pipes or from leaks in the roof that infiltrate through the envelope.

3.3.4.3 Treatment Options and Recommendations

This can be treated by removal and renovation of the floor tiles, wall paint, and ceilings. This can be done in any style however the compatibility with existing building materials should be considered. The wood features should be preserved and removed gently due to their quality and uniqueness. Their repair or replacement should maintain likeness as much as possible.

4.0 Planning and Initiatives

4.1 Sustainability

The proposed project of the site would have the South-half of the building demolished for new buildings / development. This approach to developing projects that require demolition and new builds are considered far less environmentally sustainable than projects that are retrofitted to suit new needs. By keeping existing buildings, there is less need of new materials that have high-embodied energy. The North-half of the building is seeing a retrofit, which can be considered an environmentally sustainable method of development.

The new building will be a nine-story mid-rise apartment building. It will not be trying to obtain any environmental sustainability ratings such as LEED or One Planet and is going to be constructed of concrete and steel [8]. The new building attachment will also feature a façade composed mostly of glass, an energy intensive material due to high heat loss (high U-Value).

The transformation this building could be considered sustainable in a social and economic sense compared to an environmental sense. The fact that the developer is keeping most heritage valuable sections of the building is important in preserving the local history of the area and holds great social benefit. The new uses of the building and the developments around it are meant to bring economic growth for the area; another important factor for sustainable development.

4.2 Accessibility

Some of the new changes to be implemented include improving accessibility for persons with disabilities [8]. This is done by including ramps to the back courtyard and to the new proposed front courtyard. A ramp will also be included to the front entrance of the original Elms house that will be converted to a restaurant.

4.3 Adaptive Reuse

As previously mentioned, about half of the building will be demolished and a new multi-storey mixed-use building will be attached to the monastery. The original Elms house on the Northeast corner of the monastery will be converted into a restaurant as well as the chapel on the Northwest corner [9]. The hall between the two corners will act as lockers and storage for the restaurants. The other side of the hall is going to be restored back to a courtyard with the same landscape design originally in place. Currently it is overgrown. The South hallway and the West wing will be demolished to make room for a mixed-use building and access to a parking lot [8]. The East wing of the building that was originally living space for nuns will be retrofitted to dwellings for residents.

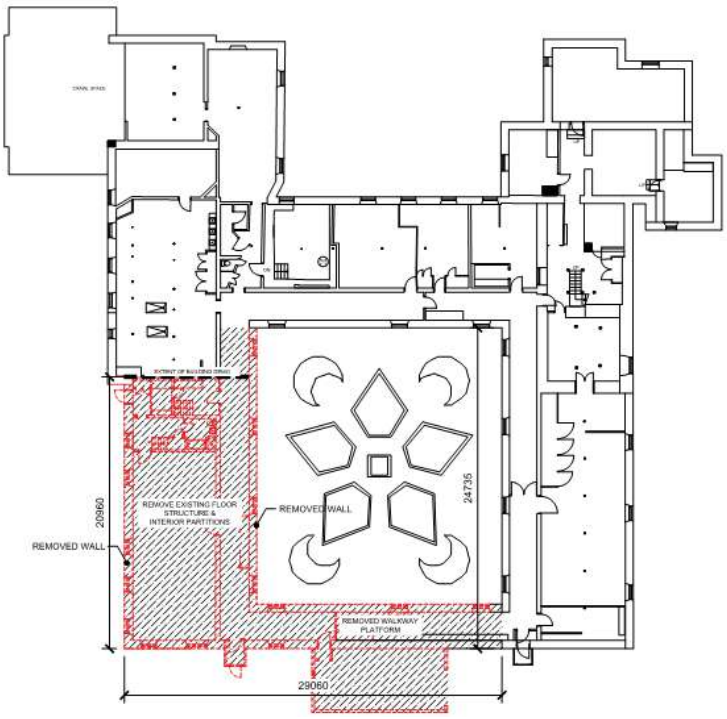

Figure 4.1: Portion of Monastery Being Demolished [8]

4.4 Preventative Maintenance Plan

Location	Material or Assembly	Maintenance Action	Timeline
Building Enevelope	Roof and Water Shedding Details		
	Metal Roofing	Replace the roof. Clean the roof from ferric staining.	Every 80-100 years. When necessary.
	Wood Shake Shingles	Roof is covered by the addition. Inspect regularly to ensure no leaks in the primary Roof are damaging the wood shake shingles.	Monthly
	Water- Shedding Details and seals.	Design and implement water shedding details.	As soon as possible. Inspect and replace every 5 years
	Wooden Fascia	Repair where possible. Replace in Kind where necessary. Strip and Repaint	Repair or replace ASAP. Strip and Repaint every 5 years.
	Masonry		
	Elms House Stone	Use Ground Penetrating Radar to test for Voids. Consolidate with Mortar Injection where necessary. Repair and Replace in kind cracked and spalling stones. Replace detached fragments in kind. Remove and Clean Soiling. Rake and repoint damaged mortar joints.	Analyze the wall as soon as possible for voids, repairs, and replacements. Once stabilised and consolidated provide routine maintenance of raking and repointing every 20-40 years based on an analysis on stone type.
	Monastery and Chapel Stone	Use Ground Penetrating Radar to test for Voids. Consolidate with Mortar Injection where necessary. If necessary, disassemble wall and rebuild. Repair and Replace in kind cracked and spalling stones. Replace detached fragments in kind. Remove and Clean Soiling. Rake and repoint damaged mortar joints.	Analyze the wall as soon as possible for voids, repairs, and replacements. Once stabilised and consolidated provide routine maintenance of raking and repointing every 20-40 years based on an analysis on stone type.
	Windows		
	Hanging Windows	Replace broken glass. Repair or replace in kind decayed windows.	As soon as possible and when necessary. As soon as possible and

		Repaint Window Frames where paint is peeling. Replace sealants around window frames.	when necessary Every 10-15 years. Every 5-10 years.
	Wooden Doors	Repair or Replace in kind. Replace Seal around door frame. Clean door frame from debris and excess de-icing salts.	As soon as possible and when necessary. Every 5-10 years. Weekly
	Other		
	Porch	Restore porch form. Repaint Fascia and Wood Columns	As soon as possible. Every 10-15 years.
	Railings	Install railings. Repaint.	As soon as possible. Every 10-15 years
	Sealants	Remove and Replace	Every 5-10 years
	Decorative Barge Board	Repair or Replace in kind. Repaint where paint is peeling.	As soon as possible and where necessary. Every 5-10 years
Interior	Walls		
	Load Bearing Walls	Stabilise and Consolidate Walls based on recommendations by a Structural Engineer. Repair and paint. Monitor Walls for Cracking	As soon as possible. Whenever Necessary. Ongoing.
	Partition Walls	Repair, or replace. Repaint.	When Necessary
	Floors		
	Hardwood Floor	Repair, and refinish. Replace in kind.	When necessary
	Vinyl Floor Tiles	Replace with original material used on floor. Monitor Sagging	As soon as possible. On going.
	Other		
	Wood Framing	Check wood frame structure for deterioration. Repair and replace in kind.	As soon as possible.
	Trim Finishes	Repair and Replace in kind. Repaint.	When necessary.
	Ceiling	Repair and repaint. Monitor Sagging and deformations.	As soon as possible, when necessary. Ongoing.

5.0 Conclusion

The Monastery of the Visitation of Holy Mary is a key part of the historical context of Westboro. From its transformation from the Elms house to the Monastery addition, its architectural, historical, aesthetic and spiritual values are carried out through the heritage building that remains. It is critical that the building undergoes the proper interventions in order to rehabilitate and treat the pathological conditions that were listed in this document in order to prolong the significance of the site.

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Appendix A - Photos

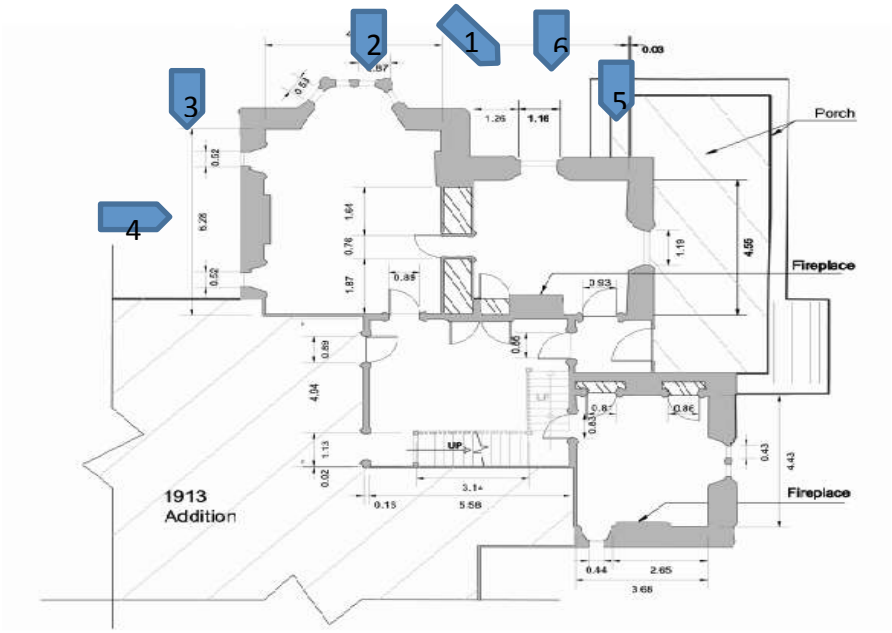
Site Condition

C1: View facing entrance to site. Monastery of the Visitation of Holy Mary. Renee. Carleton University. 11-04-2019

C2: View facing North-East façade. Monastery of the Visitation of Holy Mary. Tom. Carleton University. 11-04-2019

C3: View facing South-West façade. Monastery of the Visitation of Holy Mary. Renee. Carleton University. 11-04-2019

Exterior Condition - Elms



E1: Moisture Staining Elms. Monastery of the Visitation of Holy Mary. Tom. Carleton University. 11-04-2019

E2: Moisture Staining Elms. Monastery of the Visitation of Holy Mary. Tom. Carleton University. 11-04-2019

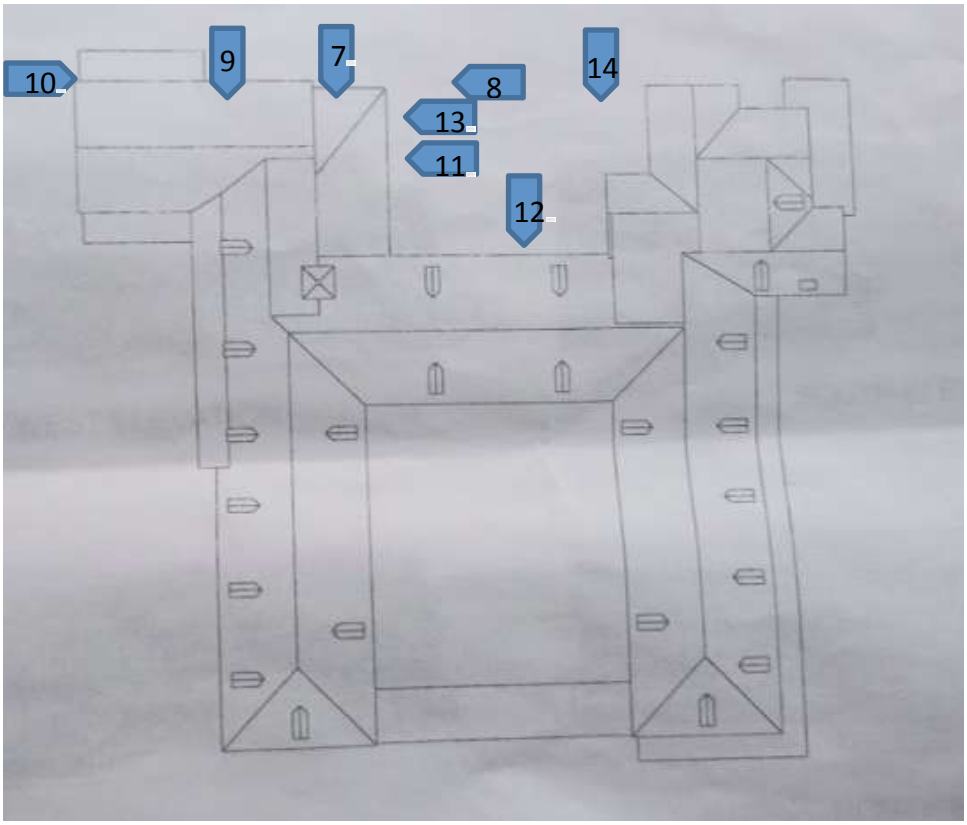
E3: Ferric Staining. Monastery of the Visitation of Holy Mary. Tom. Carleton University. 11-04-2019

E4: Vertical Crack. Monastery of the Visitation of Holy Mary. Tom. Carleton University. 11-04-2019

E5: Crack at Lintel. Monastery of the Visitation of Holy Mary. Tom. Carleton University. 11-04-2019

E6: Crack at Lintel. Monastery of the Visitation of Holy Mary. Tom. Carleton University. 11-04-2019

Exterior Condition - Monastery



E7: Moisture Staining North Wall. Monastery of the Visitation of Holy Mary. Renee. Carleton University. 11-04-2019

E8: Moisture Staining North Wall. Monastery of the Visitation of Holy Mary. Renee. Carleton University. 11-04-2019

E9: Detached Fragment. Monastery of the Visitation of Holy Mary. Renee. Carleton University. 11-04-2019

E10: Detached Fragment. Monastery of the Visitation of Holy Mary. Renee. Carleton University. 11-04-2019

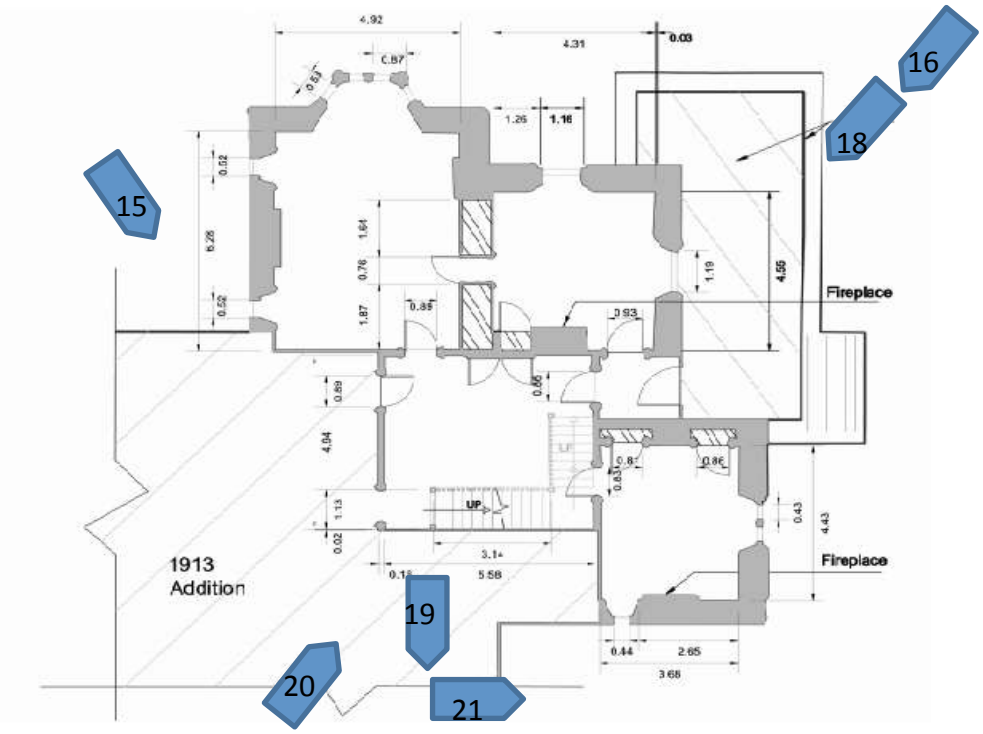
E11: Masonry Displacement. Monastery of the Visitation of Holy Mary. Renee. Carleton University. 11-04-2019

E12: Masonry Cracks. Monastery of the Visitation of Holy Mary. Renee. Carleton University. 11-04-2019

E13: Bulging Wall. Monastery of the Visitation of Holy Mary. Jason. Carleton University. 11-04-2019

E14: Cracks near lintel. Monastery of the Visitation of Holy Mary. Jason. Carleton University. 11-04-2019

Exterior Condition – Roofing and Windows



E15: Flashing between roof and masonry. Monastery of the Visitation of Holy Mary. Tom. Carleton University. 11-04-2019

E16: Flashing on side of chimney stack. Monastery of the Visitation of Holy Mary. Tom. Carleton University. 11-04-2019

E17: Rusting on tin roof. Monastery of the Visitation of Holy Mary. Tom. Carleton University. 11-04-2019

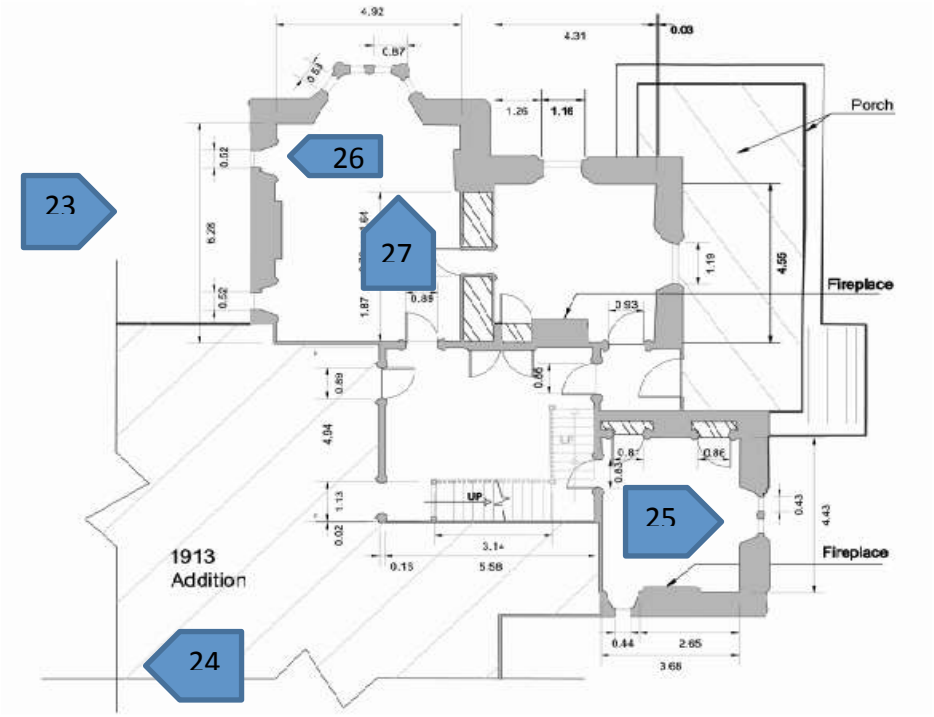
E18: Ice damming. Monastery of the Visitation of Holy Mary. Tom. Carleton University. 11-04-2019

E19: Roof frame in attic. Monastery of the Visitation of Holy Mary. Renée. Carleton University. 11-04-2019

E20: Old wooden shingle roof. Monastery of the Visitation of Holy Mary. Renée. Carleton University. 11-04-2019

E21: Bucket for roof leakage. Monastery of the Visitation of Holy Mary. Renée. Carleton University. 11-04-2019

E22: Ice damming. Monastery of the Visitation of Holy Mary. Renée. Carleton University. 11-04-2019



E23: Exterior storm windows. Monastery of the Visitation of Holy Mary. Tom. Carleton University. 11-04-2019

E24: Basement window snow build up. Monastery of the Visitation of Holy Mary. Tom. Carleton University. 11-04-2019

E25: Frosted window. Monastery of the Visitation of Holy Mary. Connor. Carleton University. 11-04-2019

E26: Georgian Wire Glass. Monastery of the Visitation of Holy Mary. Renée. Carleton University. 11-04-2019

E27: Wooden windows in good condition. Monastery of the Visitation of Holy Mary. Jason. Carleton University. 11-04-2019

E28: Bay windows. Monastery of the Visitation of Holy Mary. Renée. Carleton University. 11-04-2019

Interior Condition

I1: Second Floor Beam Separation. Monastery of the Visitation of Holy Mary. Connor. Carleton University. 11-04-2019

I2: Lath and Plaster Removed. Monastery of the Visitation of Holy Mary. Jason. Carleton University. 11-04-2019

I3: Wall corner separation. Monastery of the Visitation of Holy Mary. Jason. Carleton University. 11-04-2019

I4: Brick Load Bearing Wall Alteration. Monastery of the Visitation of Holy Mary. Jason. Carleton University. 11-04-2019

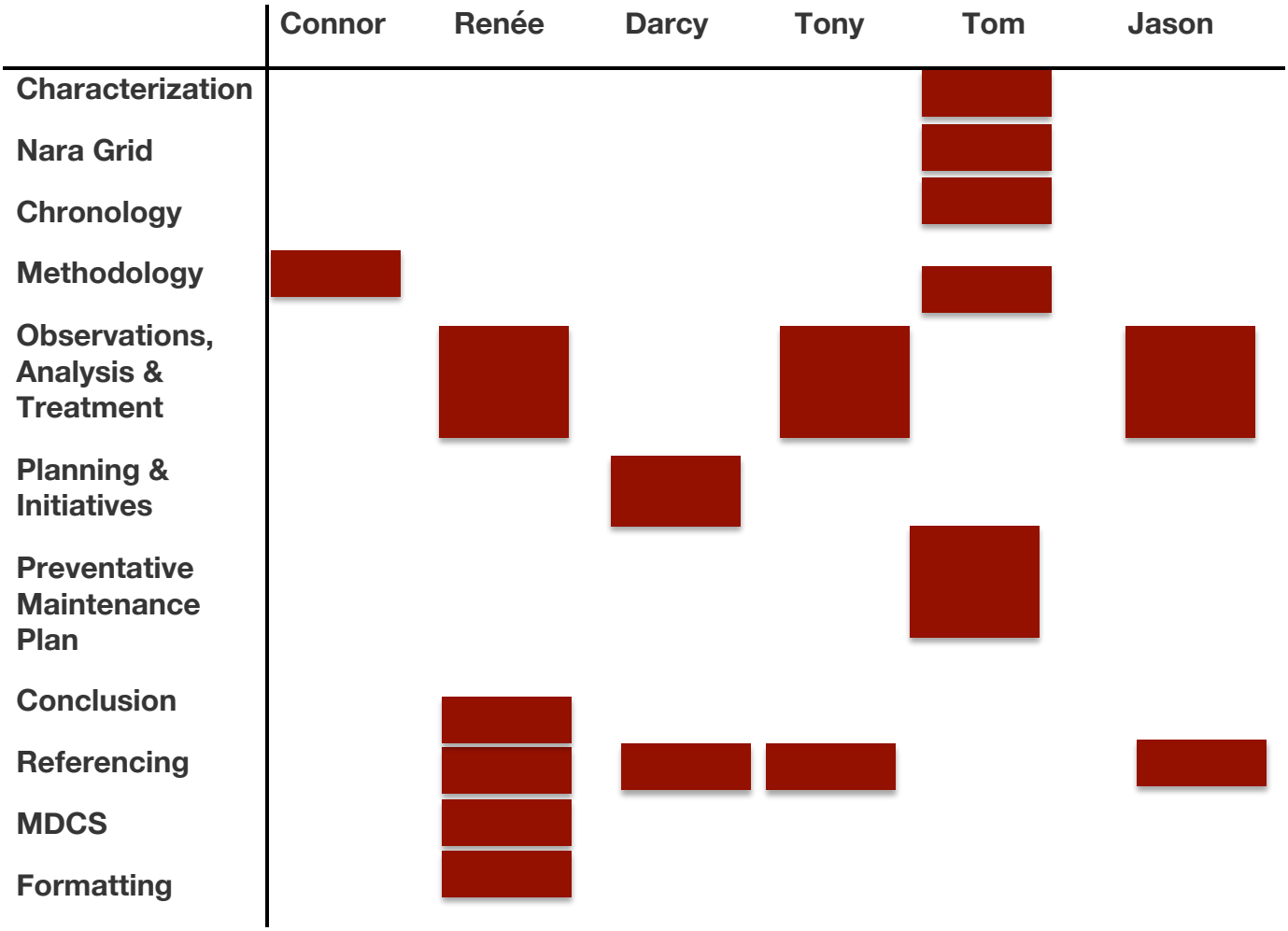
I5: Reinforcement of Stone Foundation. Monastery of the Visitation of Holy Mary. Jason. Carleton University. 11-04-2019

I6: Stone Foundation Cracks and Efflorescence. Monastery of the Visitation of Holy Mary. Jason. Carleton University. 11-04-2019

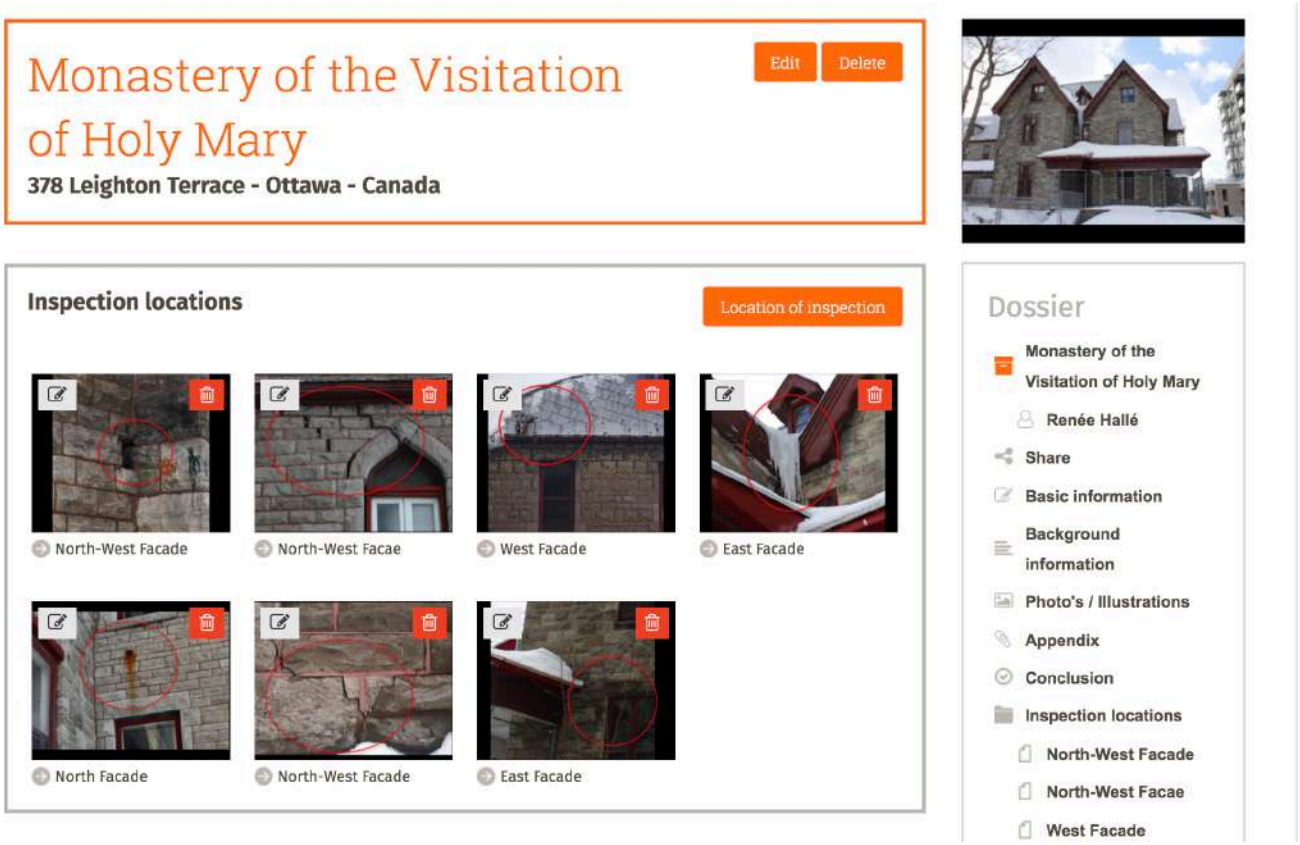
I7: Paint Peeling. Monastery of the Visitation of Holy Mary. Renée. Carleton University. 11-04-2019

I8: Floor Tile Deterioration. Monastery of the Visitation of Holy Mary. Renée. Carleton University. 11-04-2019

Appendix B – Group Task Delegation



Monument Diagnosis and Conservation Systems



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