

**ANNUNCIATION OF THE LORD PARISH**  
**Report on Roofing and Structural Repairs**

**Prepared by: Parish Finance Council**

**November 2017**

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## **SECTION 1: Introduction**

Over the past several years, substantive monies and effort have been expended on the roofs and structural repairs. During the years 2015, 2016 and 2017, an amount of \$213,000 was spent<sup>1</sup>.

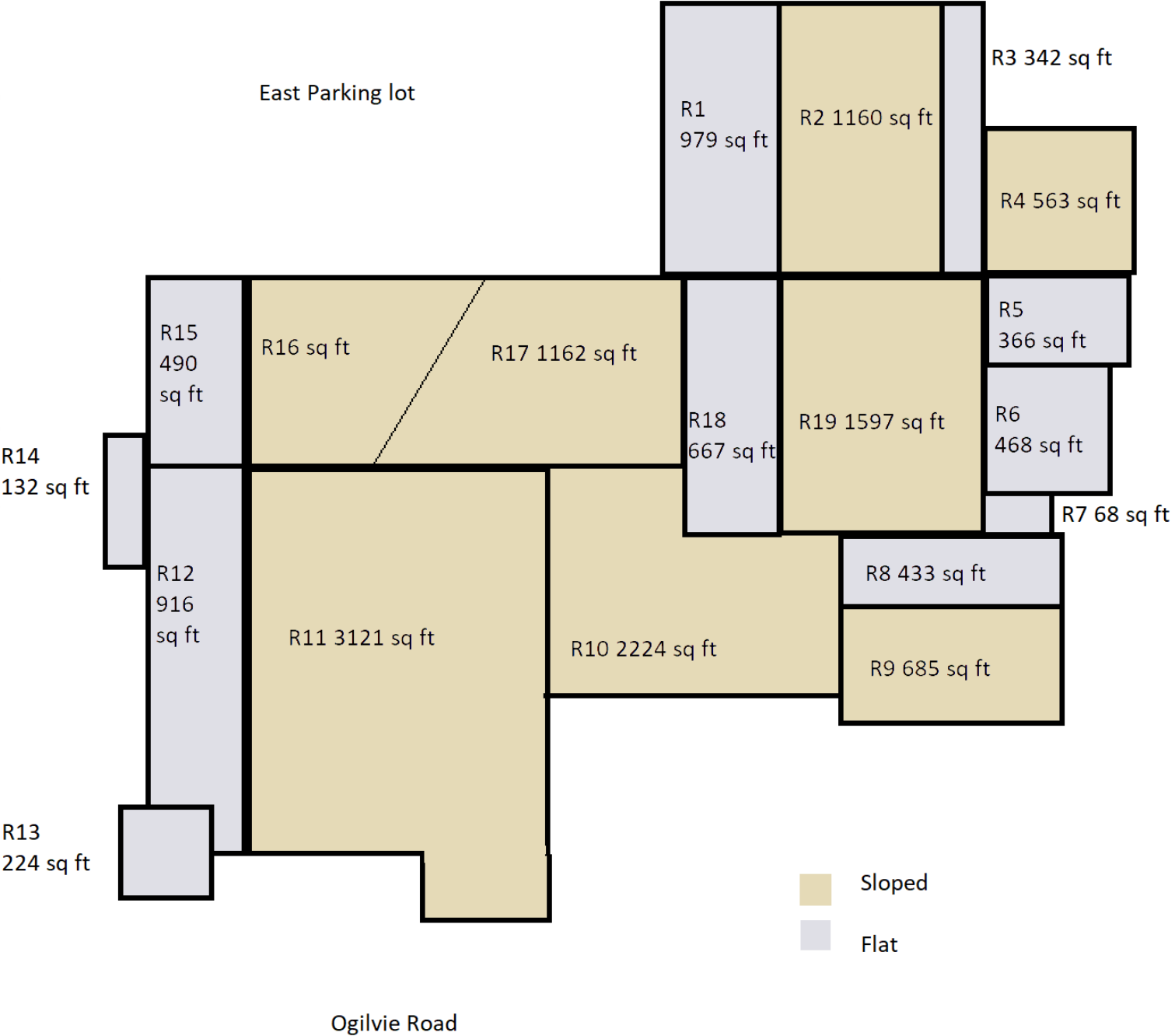
This Report provides information under the following headings:

- The Roofs – Birds Eye View Schematic
- The Roofs – Detailed Listing
- Roofing and Structural Repair Costs 2015-2017
- Appendix A: History and Analysis of the Roof and Structural Repair Project
- Appendix B: Detailed Roof listing with comments

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<sup>1</sup> AOLP – Report on Roof Cost Analysis from January 2011 to August 2017. An additional amount of \$50,748 was spent on the roof between 2011 and 2013.

**SECTION 2: Birds Eye View Schematic**



### SECTION 3: Roofs - Detailed Listing

<u>Roof #</u>	<u>Description</u>	<u>Flat (F) Sloped (S)</u>	<u>Area<sup>2</sup> Ft<sup>2</sup></u>	<u>Year Repaired<sup>3</sup></u>	<u>Anticipated Year of Next Repair</u>
R1	Hall Washrooms	F	979	Scheduled for 2018	2018
R2	New Hall	S	1160	1998	2018 for parapet repair  Estimated cost of \$2,000  2021
R3	New Hall	F	342	2000	2021
R4	New Kitchen	S	563	2016	2036
R5	New Kitchen	F	366	2016	2036
R6	Garage	F	468	2016	2036
R7	Breakfast Nook	F	68	2016	2036
R8	Rectory	F	433	2000	2021
R9	Rectory	S	685	2016	2036
R10	Offices	S	2224	Scheduled for 2018	2018
R11	Church	S	3121	2011/12	2027
R12	Church	F	916	2000	2021
R13	Tower	F	224	2000	2021
R14	Confessional	F	132	2016	2036
R15	Annex	F	490	2016	2036
R16	Annex	S	934	2016	2036
R17	Library	S	1162	2016	2036
R18	Upper Room	F	667	2016	2036
R19	Old Hall	S	1597	2016	2036

**Total Area in Ft<sup>2</sup>**

**16,531 ft<sup>2</sup>**

<sup>2</sup> Measurements are taken from the Schematic in Section 2.

<sup>3</sup> For work done prior to 2016, year completed is taken from the 2001 Keller Report which cites that the sloped roofs (excluding the roof over the new hall) were repaired in 1998 and the flat roofs (excluding the roof over the new hall) were repaired in 2000. With the exception of R11 which was replaced in 2011/12.

## SECTION 4: Roofing and Structural Repair Costs 2015-2017<sup>4</sup>

<u>Category</u>		<u>Costs</u>
A. Roofing		\$138,000
B. Structural Repairs:		
I. East Entrance	\$25,000	
II. Parapets, Insulation & Other	<u>\$38,000</u>	\$63,000
C. Architectural Design and Project Management		\$12,000
<b>TOTAL</b>		<b>\$213,000</b>

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<sup>4</sup> All construction completed in 2016 and 2017.

## **Appendix A**

### **History and Analysis of the Repair Project**

#### **ROOFING SYSTEM - DESCRIPTION**

Annunciation of the Lord Parish (ALoP) Campus was built in 1984 and includes the church building and attached hall (built in 1992), offices and a rectory. The roofing is comprised of asphalt shingles on sloped roofs and 4-ply built-up roofing on flat roofs. There are 19 roofs in total, 5,085 ft<sup>2</sup> of flat roofs and 11,446 ft<sup>2</sup> of sloping roofs for a total roof area of 16,531 ft<sup>2</sup>.<sup>5</sup> The roofing system also includes metal parapet structures, which are addressed in more detail below.

The roofing system on the parish facilities is considered to be a complex design in comparison to most typical roofs which consist of only two sloping roofs and no parapets. The complexity of the design lends itself to higher than normal costs for repair and maintenance for a variety of reasons: flat roofs are more costly to repair and replace; having 19 different roofs contributes to higher than normal costs for flashing as the multiple seams that are created must be sealed; and, parapet structures are known to cause many problems and be costly to maintain and repair.

#### **BACKGROUND**

##### **Flat Roofs (5,085ft<sup>2</sup>)**

According to the Keller Engineering Report, commissioned by the Parish in 2001<sup>6</sup>, the roofing on the original flat roofs was replaced in 2000. The Report notes that this work included replacement of defective flashing to address previous leakage problems. The flat roof over the hall, (built in 1992), was not replaced since it was still in good condition. The Keller report recommended a complete re-roofing of the flat roofs in 2022 at a projected cost of \$125,000.

##### **Sloped Roofs (11,446 ft<sup>2</sup>)**

The Keller Report also states that the original roofing on the sloped roofs was replaced in 1998 and at the time of the Report in 2000, remained in good condition. This work had included the installation of ice and water shield under the entire roof area. Again, the sloped roof on the church hall (built in 1992), was not replaced as it was still in satisfactory condition. The Keller Report recommended a complete re-roofing of the sloped roofs in 2015, and every 20 years thereafter at a projected cost of \$45,000. It is of interest to note the considerable difference in

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<sup>5</sup> Measurements are taken from the Schematic in Section 2.

<sup>6</sup> Reserve Fund Study, Keller Engineering & Associates Inc., Ottawa, Ontario, September 17, 2001. The objectives of the Keller Study were: 1) to establish a plan for major repairs and replacement work; and 2) to recommend reserve fund contributions or funding levels.

the estimated cost for the sloped roof area as compared to the flat roof area. Even though the latter is significantly smaller in size, it is estimated to cost almost three times as much to replace.<sup>7</sup>

### **Costs 1998-2000**

The combined cost of replacing both the sloped and flat roofs in 1998 and 2000 respectively (which did not include the roofs over the hall) is reported to be \$90,000, according to verbal reports of parishioners who were at the Parish during those years. It should be noted that while these repair projects did include the installation of an ice and water shield, they did not include repairs to the parapet structures.

### **Parapets**

In addition to the complex design of 19 different roofs, some flat and some sloping, the roofing system also includes many parapet structures. Parapets are low protective walls installed along the edge of a roof (typically a flat roof), historically to slow the spread of fire. More recently, modern flat-roofed construction includes these walls primarily to protect the edge of roof assemblies from wind damage and, as a matter of safety, to prevent people from accidentally falling off the roof or accumulated debris from falling off and possibly injuring people below. Parapets are known to cause many problems, particularly related to inefficient water drainage. This can lead to exterior staining and potentially, to structural damage. The parapets on the parish buildings had not been included in the previous roof repair projects in 1998 and 2000. Most had not been repaired since their original installation in 1984 and as a result, many were rusted and twisted and contributing to the overall poor performance of the roof.<sup>8</sup>

### **CURRENT CONTEXT**

In early 2014, David Angelo, member of Parish Finance Council, was asked to take the lead on the roof repair project. A visual inspection of the roof was conducted and revealed serious issues, including: three roofs that showed significant deterioration (unsafe to even walk on) and issues with the parapets that were suspected of contributing to problems with water damage and the heavy staining on the exterior brick throughout the building. In discussions at Parish Finance Council, it was decided to further investigate these roof issues and to identify proposed solutions.

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<sup>7</sup> Current estimates are indicating a cost of four times greater for flat versus sloped roof replacement.

<sup>8</sup> The AoLP Roof Cost Analysis Report, August 2017 indicates that \$14,198 was spent in August 2012 for parapet repairs and installation of eaves trough in the front and back of the church.



## **PROJECT TIMELINE**

April, 2014: the engineering firm of Morrison-Hershfield was engaged to develop a proposal for a solution to repair the problems with the roof, including the parapets. The proposal was deemed to lack sufficient detail and with the approval of Parish Finance Council, Andre Simmons, Architect was hired instead to conduct an investigation and to oversee the planning and later, the implementation, of the roof repairs.

May 2014: three contractors were invited to bid on the investigative work; however, only two expressed interest (Godfrey Roofing and Sanderson Roofing).

November 2014: despite persistent follow up, quotes were only received in November 2014. Godfrey Roofing was selected to undertake the investigative work; however, given the impending winter, the work was postponed to the spring of 2015.

June 2015: Godfrey further delayed the start of the work until June 2015.

June 2015: the investigative work was performed by Godfrey Roofing under the direction of Mr. Simmons who documented the work with numerous photographs, including the interior of the parapet walls. From the investigation, it was concluded that the church structure was not significantly compromised by the ailing parapets; however, it did reveal that improvements to the roof performance could be significantly increased by improving the ventilation and properly insulating and protecting the parapet structures. Following the results of the investigation, Mr. Simmons developed solutions for the roof issues, including technical drawings.

July 2015: Mr. Angelo began contacting contractors to bid on the proposed work with the intent that a project proposal would be developed and submitted to the Diocesan College of Consultants for approval. Bids were solicited for both a simple re-shingling project and for the more robust scope of work that included improvements to the roof ventilation and the parapet structures. Getting quotes for the work proved to be difficult as few companies seemed interested, even in the simple re-shingling let alone the more robust solution. While five companies were invited to bid, only two expressed interest in bidding on the full solution; however, despite persistent follow-up, no bids were received until October 2015 when only one company (Godfrey Roofing) finally submitted a bid.

October, 2015: during the period that no bids were coming in for the more robust solution, Parish Finance Council had decided to proceed with the simple re-shingling project and had invited Geerts Roofing to provide a quote. Once we received the quote from Godfrey Roofing for the more robust solution, Geerts Roofing was also asked to provide a quote for the full roofing solution. Having then received two competitive bids, the decision was made to once again proceed with the full roofing solution. Since the quotation from Geerts Roofing was lower than the one received from Godfrey Roofing and given the previous delays and lack of responsiveness from Godfrey Roofing, the Parish decided to award the work for the full roofing solution to Geerts Roofing.

A proposal was developed and submitted to Msgr. Beach for Diocesan approval with an estimated total cost of \$160,000<sup>9</sup>.

November 4, 2015: Approval to proceed was received from Msgr. Beach.

November 18, 2015: Construction start

July 18, 2017: Construction end

### **SCOPE OF WORK**

The expanded scope of work for the roof repair project went beyond simple re-shingling to include repairs to the parapets, improved ventilation and insulation and was expected to provide multiple benefits:

1. Longer shingle life as a result of proper ventilation
2. Less ice damming as a result of proper ventilation
3. Money saved on electricity since heating cables would no longer be required
4. Eliminate water infiltration into parapet walls through improved protection

Top quality materials were used, including Dow Corning shingles on the sloped roofs. These materials have an estimated life expectancy of 20 years<sup>10</sup>.

### **Parapets**

Significant repairs and/or reconstruction of the parapets was done on 6 of the roofs completed in 2016-17. These repairs were necessary because the parapets were poorly constructed, missing insulation or absent entirely. Issues with the poor performing parapets was causing rainwater to flow over the side onto the brick resulting in significant staining and/or cracking in the brick from repetitive freeze-thaw cycles.

### **Entrances**

Both of the entrances to the church have significant problems with water and ice as a result of issues with the roofs. In both cases, a large roof ends over each entrance leading to problems with water and ice. The east entrance in particular had significant issues with ice build-up in the winter that had caused cracking in the brick. Upon investigation, water damage was

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<sup>9</sup> Refer to Appendix B for a copy of the submission to Msgr. Beach

<sup>10</sup> Similar shingles might last longer on a residential home; however, because the roofs on the church facilities are not ventilated, they reach higher temperatures which advances the aging process. All south facing roofs have this same issue due to the original construction and the complex design of the roofing system.

discovered. Wet insulation was replaced, the brickwork was repaired and a new canopy was built to ensure that this problem would not reoccur in future years (\$25,000).

### **Insulation**

Throughout the project, many instances of missing insulation were discovered. Although the roofs met the building code during the time of construction, they are far below today's standards. Insulation voids were filled with Styrofoam spray and new insulation was added where it was missing.

### **Ventilation**

An air space was added to the repair of the Annex roof (\$14,000) with the expectation that it will prolong the shingle life. If the improvement is significant, other south facing roofs could be modified upon the next shingle replacement.

## **SUMMARY**

### **A. Roofing Costs (since 2011)**

In the summer of 2017, Fr. Yves requested that a report be prepared to identify all of the costs associated with the recent roof repair project. A Roof Cost Analysis Report was completed (August 29, 2017) that documented all known roof expenditures since 2011. The report is summarized in the table below:

<b><u>COST</u></b>	<b><u>DESCRIPTION</u></b>
\$50,748	Spent between 2011-2013. Included: minor parapet repairs and installation of eave trough in the front and back of the church; roof repair to the east slope roof; 15 ft. of roof repair on the west side over the office and the installation of cables.
\$170,215	Paid to Geerts Roofing
\$22,440	Redesign and construction of the new east entrance and canopy
\$5,378	Paid to Direct Seal Contractors to replace R9, sloped roof over the rectory
\$6,000	Paid to Andre Simmons, Architect to lead the investigative study on the parapet issues.
\$6,080	Paid to Andre Simons, Architect for architectural drawings and site supervision during construction.
\$1,113	Paid to Godfrey Roofing for investigation and emergency repair May 12, 2015
\$1,578	Roof investigation with Architect July 8, 2015
\$243	Paid to Dan Can for cable repairs January 16, 2017
\$263,795	<b>TOTAL (including HST/GST)</b>

## B. Work completed and remaining

Year Completed	Roofs (19 total)		Total ft <sup>2</sup>	% of Total Roof Area
	<u>Sloped (8/19)</u>	<u>Flat (11/19)</u>		
2011/12	R11		3,121	19%
2016-2017	R4,R9,R16,R17, R19	R5,R6,R7,R14,R15,R18	7,132	43%
<b>Sub-total</b>	<b>8062ft<sup>2</sup></b>	<b>2,191ft<sup>t</sup></b>	<b>10,253</b>	<b>62%</b>
1998/2000 TBD	R2, R10	R1,R3,R8,R12,R13	6,278	38%

## NEXT STEPS

The following roofs will need to be replaced before 2027:

Roof #	Description	Flat (F) Sloped (S)	Area Ft <sup>2</sup>	Year Last Repaired	Estimate
R1	Hall/Washrooms	F	979	2000	\$23,000
R2	New Hall	S	1160	1998	\$6100 *
R3	New Hall	F	342	2000	\$6200
R8	Rectory	F	433	2000	\$7800
R10	Offices	S	2224	1998	\$9,000
R11	Church	S	3121	2000	\$18500 *
R12	Church	F	916	2000	\$16500
R13	Tower	F	224	2000	\$4100

\* Includes parapet repairs

**Appendix B**  
**Detailed roof listing with comments**

<u>Roof #</u>	<u>Description</u>	<u>Flat (F)</u> <u>Sloped (S)</u>	<u>Area<sup>11</sup></u> <u>Ft<sup>2</sup></u>	<u>Year Repaired<sup>12</sup></u>	<u>Comments</u>
R1	Hall Washrooms	F	979	Scheduled for 2018	Roof was inspected in 2017 and re-roofing recommended
R2	New Hall	S	1160	1998	Because this roof is north-facing, shingle life is significantly increased. Roof was inspected in 2017 and will not have to be done in 2018, but re-shingling is not far off. This section will require parapet refurbish at \$80/ft. adding approx. \$2000 to the job.
R3	New Hall	F	342	2000	When the sloped roof (R2 above) is done, this roof may have a few years of life left, but it may be more economical to have both roofs done since the cost of hauling material, clean-up, and disposal of old material can be a shared cost.
R4	New Kitchen	S	563	2016	2 ½ inches of blue styro-foam insulation added to this roof. Core samples were drilled in all roofs before work began to determine the amount of insulation. Although our roofs met the building code at the time of construction, they are far below today's standards. The parapet along this roof was also so poorly constructed, that rainwater was being directed over the side and onto the brickwork. This not only causes staining, but caused the bricks to crack due to being wet on milder winter days and then freezing when the cold returns. Regarding the shingles, our roofs were re-done with the best possible materials, so this roof may get 20yrs. Its lifetime will not match that of a house because our roofs are non-venting and this particular roof has a southern exposure
R5	New Kitchen	F	366	2016	Insulation added to this roof. Winter photos showed a disturbing lack of snow cover on the roofs in this area. For all of the flat roofs which we had done in 2016, they should generally last approximately 20 yrs.
R6	Garage	F	468	2016	The interface between this flat roof and the sloped roof above it had numerous insulation voids. All such areas were filled with spray foam. Insulation and vapour barrier voids not only cause an increase in our heating bill, but the condensation associated with these trouble areas causes significant water damage.
R7	Breakfast Nook	F	68	2016	Insulation was inadequate in this area, with large voids existing. Six inches of spray foam added
R8	Rectory	F	433	2000	The flat roofs will be inspected in 2018. It is likely this roof will have to be done in 2021

<sup>11</sup> Measurements are taken from the Schematic in Section 2

<sup>12</sup> For work done prior to 2016, year completed is taken from the 2001 Keller Report which cites that the sloped roofs (excluding the roof over the new hall) were repaired in 1998 and the flat roofs (excluding the roof over the new hall) were repaired in 2000.

R9	Rectory	S	685	2016	Again, poor parapet construction was causing water to drain onto the brickwork. The extreme staining caused by this deficiency in the parapet is still evident at the south-west corner of the rectory. The parapet tops were rebuilt and recapped when the roof shingling was done.
R10	Offices	S	2224	Scheduled for 2018	
R11	Church	S	3121	2010	This roof may go to 2027, but it does have a southern exposure and the shingles used were not the quality of today's <i>Architectural</i> style shingle. When this roof is done, the parapets should be re-capped
R12	Church	F	916	2000	This roof will be inspected for life expectancy in 2018
R13	Tower	F	224	2000	This roof will be inspected for life expectancy in 2018
R14	Confessional	F	132	2016	This flat roof only sees the mid-day sun and may not require replacement until 2040
R15	Annex	F	490	2016	Insulation added to this rooftop to reduce heat loss. Likely will require replacement in 2037
R16	Annex	S	934	2016	Parapet reformed and recapped to prevent water from draining over the parapet edge and onto the brickwork. Insulation inside the parapet had come away from the church wall, thus leaving passages for cold air to pass. Insulation was repaired, and new insulation added where required. Airspace added to this rooftop to prolong shingle life. If the improvement is significant, other south-facing roofs can be modified upon next shingle replacement. Replacement should not be required until 2036 or later
R17	Library	S	1162	2016	A large parapet was added to this roof over top of the east entrance to control roof drainage and prevent water from saturating the area. A significant problem with both main entrances at Annunciation is that large roofs end at each entrance. This is very unusual and causes winter problems. The east entrance formed a "glacier" each winter and repetitive freeze-thaw cycles caused the brickwork to crack in this area, which then lead to the insulation becoming wet. The wet insulation was removed, new insulation sprayed, and the brickwork repaired. This phase of the project involved an architect who produced the drawings and oversaw construction, an engineer for structural work who also provided tradesmen, a sheet metal tradesman, a metal fabrication company to produce the custom siding, a welding company to fabricate the custom support post, a mason to repair the brickwork, and an insulation company
R18	Upper Meeting Room	F	667	2016	Insulation added to this rooftop. Also, the small parapet separating the flat roof from the sloped roof did not have tinned valleys running down the sloped roof from the drain ports (see the main church roof for an example of these tin valleys under each <i>scupper</i> ). This lead to excessive wear of shingles below each scupper. To resolve this issue, the small parapet between the sloped roof and flat roof was removed so that water draining from the flat roof would do so evenly over a large surface, thus avoiding shingle wear in certain areas. The removal of the parapet was much cheaper then installing tin valleys down the sloped roof under each scupper.

R19 Old Hall

S

1597

2016

Parapet canter (inward slope) repaired and new metal cap installed. This parapet top was so poorly constructed that rainwater drained towards the adjacent wall. The entire length of this parapet was nearly void of insulation. The vapour barrier had come detached along its entire length. A “shelf” was constructed inside the parapet to hold the new six inches of spray foam insulation that was added.

**Total Area in Ft<sup>2</sup>**  
**16531 ft<sup>2</sup>**

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