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Cork Institute of Technology

ARCHITECTURAL TECHNOLGY

Conservation 2

Historic building material and technology

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Semester 2

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Introduction:

For the purpose of this survey I will only be looking at the east and north wing of the Quad. When completing the detailed survey I must ensure that the original character of the Quad building is protected while the needs of modern intervention is realised. All students have been given a new use for the building. In my case the new use for the Quad building will be offices. In carrying out this report I must evaluate the significance of the Quad building methodology in the context of the proposed office strategy. I must also evaluate the adaptability of the Quad building for its proposed office strategy.

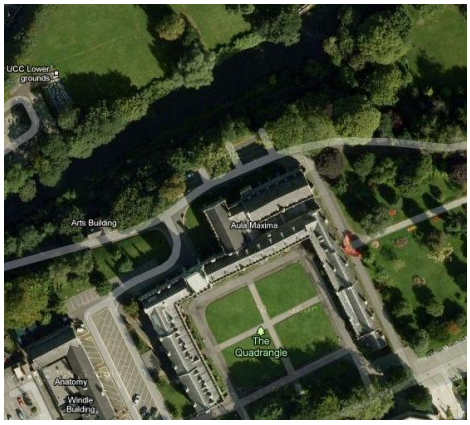
In order to fully understand the historic nature and importance of the Quad building I must look deep into the conservation records. I will investigate manuscripts, collections, printed source materials and trace details. These will allow me to obtain information in relation to the original construction, historical modifications and the ownership. When considering any altercations or additions to the existing building careful consideration must be given to the historic structure and appearance of the building ,and the conservation of it. Careful consideration must be given to the extension in terms of its location and the effect it will have on the existing structure. In order to carry out this project I will be breaking the report up into a number of sections. These sections are as follows:

1. History of the building and proposed new use.
2. Survey of existing features and materials indicating level of decay where appropriate
3. Proposed programme of remediation to include established preservation methods and techniques to ensure minimum intervention and damage.
4. Areas of special interest to show details where intervention is necessary and best practice is recommended.
5. Conclusion and recommendations
6. References and Bibliography

Chapter One.

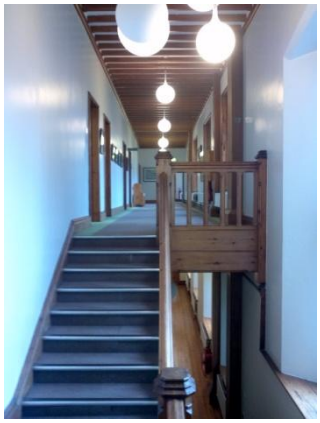
History of the building:

UCC was first established in 1845. The main Quad building was designed by the architectural partnership of Thomas Deane and Benjamin Woodward, of the Deane and Woodward practice. The Quad is seen as a Tudor Gothic design and it consists of vaulted windows, pointed arches, aluminium windows , stone mullions between windows, solid oak doors, slated roof with lead strapping and oak cable windows up on the roof. These are some of the features that make the building Tudor Gothic. The Building was built on an escarpment, outcrop of Rock, which was located on a hill. This hill and the Quad building is located parallel to a section of the river Lee. This can be clearly seen from the aerial photograph below.



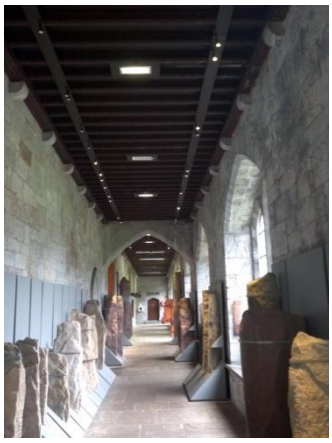
(Fig 1.1- Aerial photograph of Quad and surrounding area)

The main structural material is limestone. This limestone was quarried on site and was taken from the area where the Boole Library is currently situated. Another building material which is used quite regularly is oak which was sourced from the south. The east wing currently facilitates the president's office along with administrative offices.



(Fig1.2- East wing)

The north wing houses UCC's unique collection of Ogham stones. They date back as far as mid fifth and late seventh centauries. The North wing also hosts the Visitors centre, shop and various administrative offices.



(Fig 1.3- North Wing)

The final part of the Quad I am looking at is The Aula Maxima. It was originally used as the venue for many formal events such as, honorary conferring, recitals, concerts and banquets. To this day it still serves the same purpose The stained window on the East wall commemorates George Boole. He was the first professor of mathematics at UCC and his findings in Algebra became the foundation of modern computer science. The window on the North wall is known as the professors window and is in memory of Robert Harkness, who was the professor of Geology in 1853.

(Fig 1.4- Aula Maxima)

Proposed new use:

The proposed new use that I have been given for the Quad building is offices. The Quad building already consists of a large amount of office spaces. However I must turn it into a modern office space whilst not interfering with the historic nature of the building. I have to try provide minimal intervention whilst making the building into a modern and comfortable office space for its occupants. I will look at the necessary altercations and problems with the current building in the following chapters. The most historic and important part of the Quad building is undoubtedly the Aula Maxima. It still contains most of its original features including the hardwood flooring and stained glazing. I plan on turning the Aula Maxima into a Canteen/ Communal area. This will lead to severe wear and tear of the area. Therefore some form of intervention must take place. There are certain levels of decay in areas throughout the Quad These would have to be repaired and modified in order to bring the building up to modern day standards. When carrying out these repair works I must be careful not to affect the historic nature of the building. Any repair works must be identifiable from the original structure in order for it to be true conservation.

There will be an extension located underground out the back of the North wing which will come up underneath the building. This is a major form of intervention and will be looked at in the following chapters.

Chapter Two.

Survey of existing features and materials:

The main building material used through the Quad is limestone. The Walls are 750mm thick. There was no such thing as insulation when the Quad was built and therefore they insulated there buildings through mass by making the walls thicker. Another major building material is solid oak which is used throughout the Quad. I will use a stepped approach in looking at the building and will use images to show the areas of interest throughout the building. I will start by looking at the foundations and working my way up to the roof, looking at the doors and windows on the way up. I will then move inside the building and begin to look at the structure and the materials used. These materials and others are now going to be looked at in the following images.

External:

(Fig 2.1- External wall)

Here we see the solid Limestone wall meeting the concrete ground. As you can see from the photo the wall is very well kept as is the limestone mortar holding it together. Other things to note from this photo are the more modern plastic PVC gutters which have replaced some of the old cast iron gutters. The gutters are the same colour as the original ones but are constructed of a different material and are therefore identifiable from the originals.

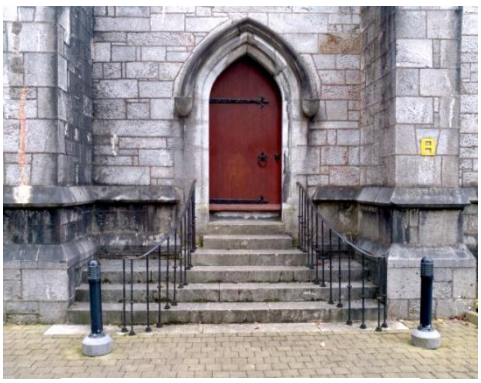
The solid Limestone wall is meeting the concrete ground. There is some form of vent incorporated in this case. This vent is constructed of oak timber and is most likely used to ventilate the basement .It has not been properly maintained or conserved. The paint is peeling off in places and there appears to be pieces of timber missing.

(Fig 2.2- External vent)

(Fig 2.3- External wall)

Directly beneath the window is a solid limestone cill and beneath that again in the centre of the wall is a gap which is used to ventilate the area around the window. There is also a limestone plinth located in the image which slopes out from the wall. Beneath this plinth there is a cast iron vent. This vent is used to ventilate the floor area internally. The vent is in poor condition and in need of repair.

This is a ground floor entrance to the Auala Maxima. There is a limestone frame wrapping around the solid oak door which has been varnished. It also has a design piece running along the head of the door. The ironmongery on the door consists of cast iron that is painted black. There are solid limestone steps leading up to the door. From the picture it can be seen that there are little bits of staining around the place but other than that all other materials in this image are well maintained.



(Fig 2.4- External door)

(Fig 2.5- External wall)

This is an external image of the east wing. In this image we can see a number of buttresses running up along the building vertically. These buttresses are constructed of solid limestone and their purpose is to solidify the building and make it more rigid. Ivy growth can also be seen running along the face. This growth has accumulated over the years. This has however become a feature of the building and at this time is not causing any risk to the structural

This is the East wall of the Aula Maxima. There is a large stained glass window covering most of the elevation. The window has been divided up using stone mullions. Nearly all of the windows throughout the Quad are vaulted in some way. The windows of the Aula Maxima are in good condition and do not need to be repaired or replaced.

(Fig 2.6- Aula Maxima)

(Fig 2.7- External windows)

These windows located throughout the rest of the Quad building. They are again divided up using stone mullions. The glass has been divided up using aluminium strips. In recent times there has been an incorporation of opening sashes in the windows throughout the Quad. They were installed to ventilate the building and consist of an aluminium frame. There is fenestration in the windows throughout the building.

The building is constructed using a hipped roof. The roof is constructed using slate and lead strapping. There are various chimneys running up along the East wing. As you can see they are quite long and run above the roof top. They are again like the walls constructed of limestone and as cam be seen from the photo, they have withstood the test of time. The roof has been re-slated and is currently in perfect condition.

(Fig 2.8- East wing)

(Fig 2.9- External Image)

There are cable windows coming out of the roof. These cable windows are constructed of oak as is the frame for the glass. There is also a parapet rising up above the bottom of the roof.

Internal:

Most of the plaster throughout the Quad is very well maintained. However there are certain areas where damage is clearly visible. An example of this is shown in the image adjacent. This is not causing any structural damage but is a building defect and most be remedied properly paying close attention to detail and keeping conservation in mind at all times

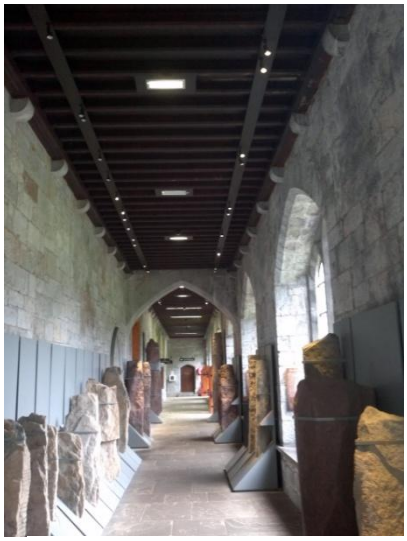
(Fig 2.10- Internal plaster)

(Fig 2.11- Internal stairs)

The stairs are constructed of stone and are the original stairs that were installed in the building. The stairs are quite worn in the middle, where they are being used the most. These are protected stairs and cannot simply be replaced. There are a number of these stairs located throughout the building

Mixture of old and new. It starts off as an original stone stairs and then changes to a timber frame stairs covered in carpet on the landing. They conserved as much of the stairs as possible before they had to modernise it and make the building function properly in relation to its requirements. It may not look aesthetically pleasing but this form of modernization allows us to identify what's new and what's original in the Quad building

(Fig 2.12- Internal stairs)



(Fig 2.13- North wing)

This is the north wing corridor. The Oghman stones are lined up either side of the corridor. The floor surface is constructed of stone paving slabs which are there since the original build. The ceiling consists of solid oak beams running in both directions. These beams are supported by the walls and by the stone pieces coming out of the wall just below the roof. The vaulted arches are again seen internally and this gives way to the Tudor Gothic design.

This is a Macintosh heater. They were used quite often in older buildings to heat large spaces. It may have been installed a few years after the original construction but it is still around a long time. In my opinion any alterations or changes to this radiator must be given careful consideration in relation to conservation issues.

(Fig 2.14- Macintosh heater)

(Fig 2.15- East wing)

This is an internal image of the east wing. The pine floorboards have been very well maintained as have the oak window boards. The stairs banister is also original and has been very well kept. The stairs itself has been modified and fitted with carpet.

The Aula Maxima still contains the original oak flooring from 1849 and the timber book shelves running alongside either wall of the Hall. One of the most impressive parts of this area in my opinion is the roof. It is again constructed of oak. All of the pieces come together to form various vaults and arches and they give you a feeling of extravagance and openness. This area has been extremely well kept and conserved.

(Fig 2.16- Aula Maxima)

Chapter Three.

Programme of remediation:

There are a number of areas in the Quad that need to be looked at in terms of preservation and repair. Externally the Quad is in very good condition however there are a few issues that must be dealt with. There are several areas of staining around the building.

(Fig 3.1- External staining)

Above is an example of the kind of staining that can be seen. To fix this you would simply clean the facade of the building. There are many different techniques available. Some are more expensive than others however they can prove more effective and less harmful to the building's facade. An example of harmful treatment would be sand blasting. However this system erodes away the facade and therefore is damaging it. A harmless way of cleaning the facade would be laser treatment. This method is much more expensive but is very effective. Therefore the laser technique is the best option as it will cause the least damage to the original structure.

Another issue that must be dealt with is the fenestration of the windows. I believe that in order for this building to become a modern and sustainable office building the windows will have to change. The windows in the Aula Maxima are in good condition and will not require any altercations. However throughout the rest of the building there are serious issues that must be dealt with.

(Fig 3.2- Cracked glazing)

There are several areas of cracked glazing around the building and most of the other glazing is providing insufficient insulation. To solve this problem I would suggest the installation of double glazed vacuum glazing. This glazing is 7mm in thickness and will give the same appearance as the single glazing as well as fitting into the original framing. It will also greatly improve the overall thermal performance of the building. It is produced by a German company called 'Grenzebach'. All windows will be sealed using clear sealant in or to stop any drafts from entering the building. Some of the frames are rusted and eroded beyond repair and therefore they must be replaced. The replacement frames will look similar to the original but not the very same and therefore will be identifiable as replacements. This may seem as an extreme form of intervention but it is necessary in order to improve the buildings thermal performance and bring it up to some form of modern standards. The windows could be replaced with a like for like single pane of glazing but this would not provide sufficient thermal insulation and therefore the vacuum glazing is the best option.

Damaged internal plaster is another issue that must be dealt with. There are areas throughout the building were damaged plaster is providing quite an eye sore.

(Fig 3.3- Internal Plaster)

In order to repair this plaster correctly a specialist conservation contractor must be brought in. They will carefully knock away all the plaster which has been damaged beyond repair and replace it with a similar breathable form of lime plaster. This plaster will again be identifiable form the original plaster.

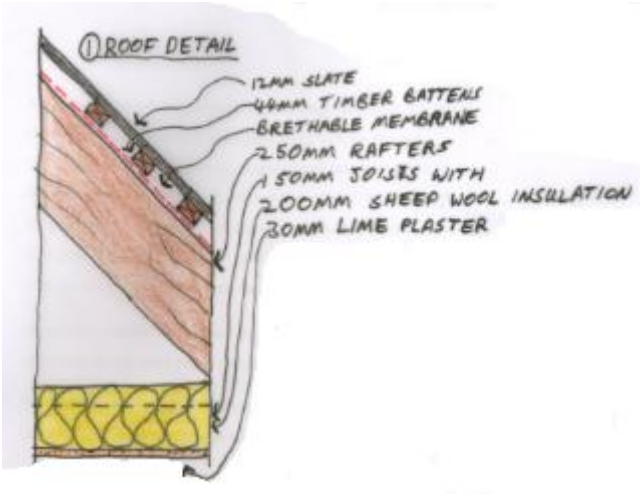
The internal stone steps are another area which must be dealt with. They are very worn in some areas and can become very dangerous when wet.

(Fig 3.4- Stone stairs)

As these are a highly protected part of the building they cannot simply be replaced. there are a number of solutions. Firstly the steps could be taken out, turned around and put back

into place. This would leave them with straight level and safe edges. Another method would be to simply fit the steps with grips to give people more grip when walking on the steps. The second method is the cheapest, quickest and easiest form of intervention. It will also greatly improve the safety of the steps.

Finally the roof is another are which must be looked at. There is currently no insulation in the roof and this is providing a massive cold bridge for the entire building. To solve this problem a breathable form of insulation will be installed between the rafters above in the roof.



(Fig 3.6- Roof Sketch)

Chapter Four.

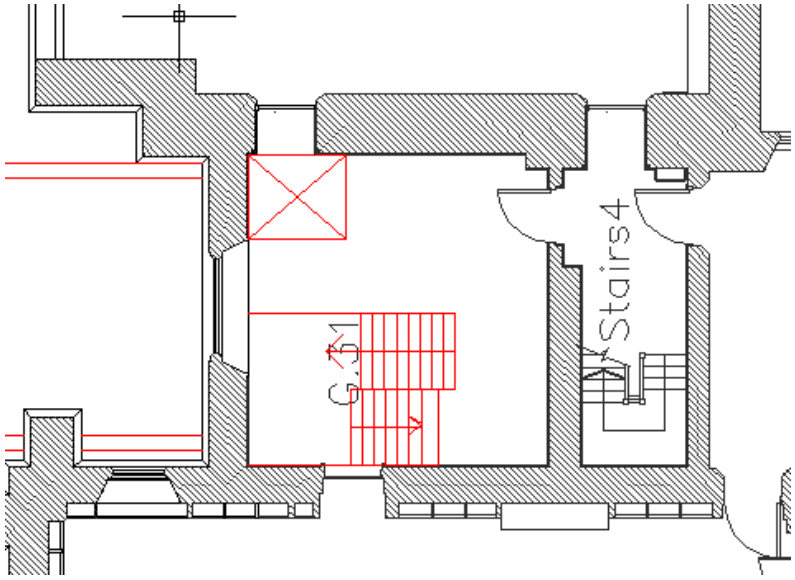
Areas of special interest:

There are many areas of special interest throughout the Quad building. The first area I am going to look at is the Aula Maxima. For the purpose of the new use I will be turning the Aula Maxima into a canteen/recreation area. In order to do this I had to come up with a strategy to protect the floor from excessive ware and tare. I have done this by covering it in cork paving slabs.

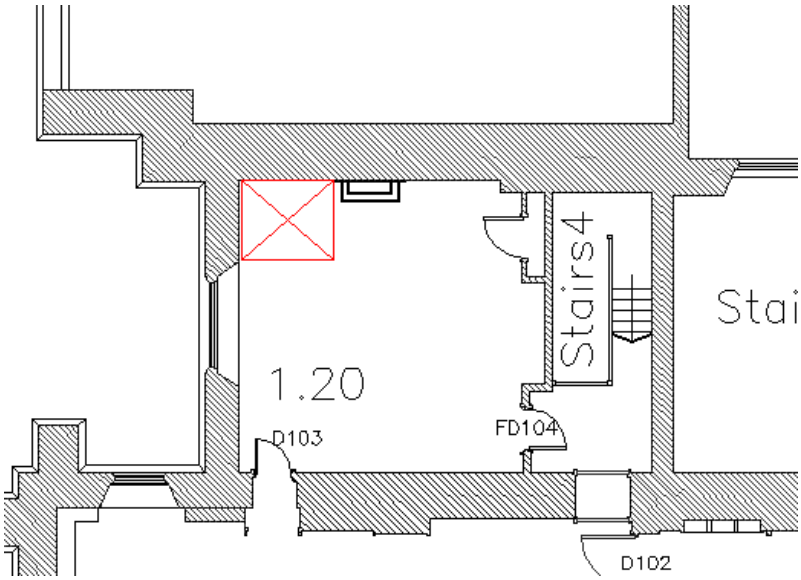
(Fig 4.1- Cork Flooring)

These slabs can be easily installed and removed. They are also breathable and renewable. They will protect the original floor whilst allowing it to breath and it is completely reversible.

Another area of special interest is the installation of an elevator. An elevator must be installed in order to make the upper floors of the building more accessible to people with disabilities. I have chosen a location within the building that will allow access to the ground floor, first floor and new extension which will be located beneath ground level. The lift will make the building much more accessible and will help it become more of a modern office building.



(Fig 4.2- Ground floor lift)

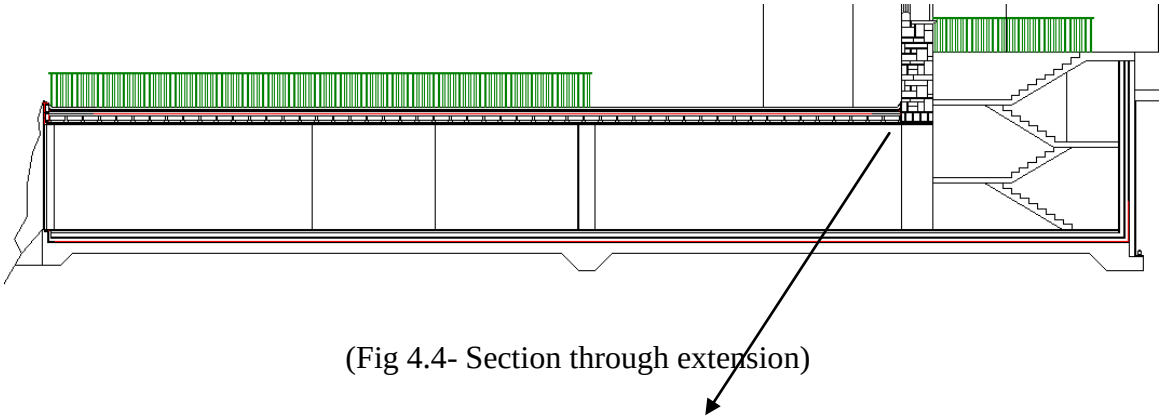


(Fig 4.3- Second floor lift)

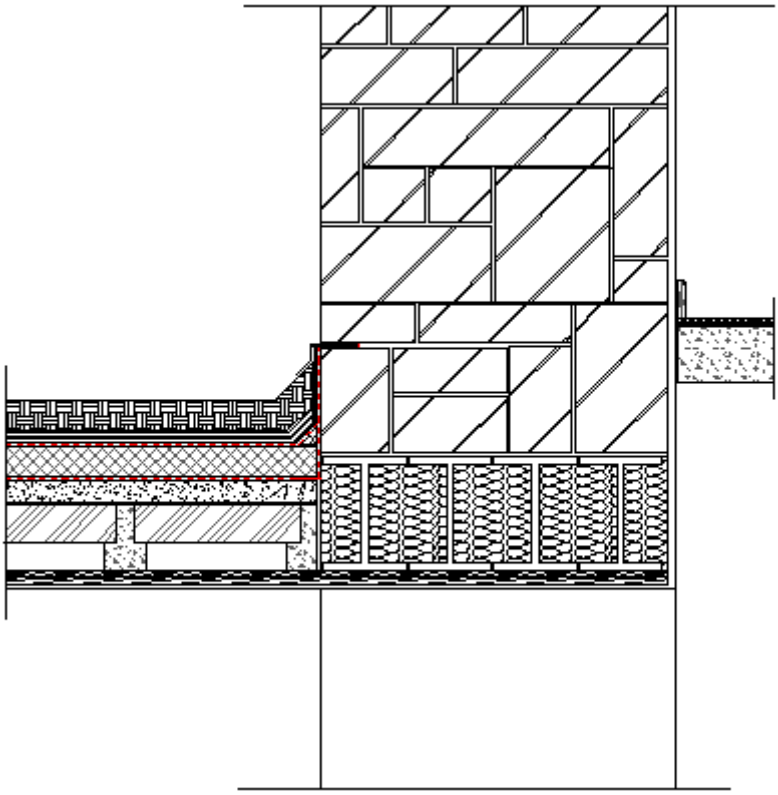
The lift will not only be used to transport people but will also allow the transportation of heavy materials from floor to floor.

The area of most special interest is the cutting away of the section of a foundation to allow the extension to come in underneath the original building. This is a major form of intervention and has been given careful consideration. I choose to go underneath the Quad mainly because I did not want the extension to have an effect on the appearance of the Quad. The Quad is the most historic building on the campus and I felt it would be a

crime to attach the extension onto the building and therefore I choose to go beneath the ground and hide it from the eye. The extension will be attached as seen below.



(Fig 4.4- Section through extension)



(Fig 4.5- Detail of the extension meeting the Quad. See appendix for more extension details)

As this is a major form of intervention it would be essential that specialists be brought in to prop up and secure The existing wall in order to allow the above detail to be carried out. The work must be carried out with the greatest of care, in order to avoid any damage or cracks to the original building. All works must be carried out by specialists with expertise in the area of conservation.

Chapter Five.

Conclusions and Recommendations:

I have concluded that overall the Quad is in very good condition. It requires different levels of intervention at different points throughout but overall it has been well kept. There are several small issues, such as the problems with the stairs and the plaster. There are also larger issues such as the installation of a lift. These are all issues that must be fixed in order to make the Quad building into a suitable office for all of its occupants. When the problems in the above chapters have been fixed then the building will be of an acceptable standard. Some of the work may seem a bit extreme but they are necessary. Sometimes minimalist intervention is not possible and extreme steps must be taken. An example of this is the cutting away of the foundations to allow access from the extension into the Quad. In conclusion all of the works mentioned in the above chapters will modernise and improve the performance of the Quad whilst conserving and preserving as much of the original appearance of the building as possible.

The necessary recommendations for the repair of the building have been laid out in the above chapters. These steps must be followed in order for the building to be brought up to modern day standards. I recommend that the work be carried out with careful consideration been given to the conservation issues. All work is to be carried out by specialist contractors who have been specially trained in the field of conservation.

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Other:

Paul Prendergast- UCC buildings officer

Appendix.

Extension drawings: