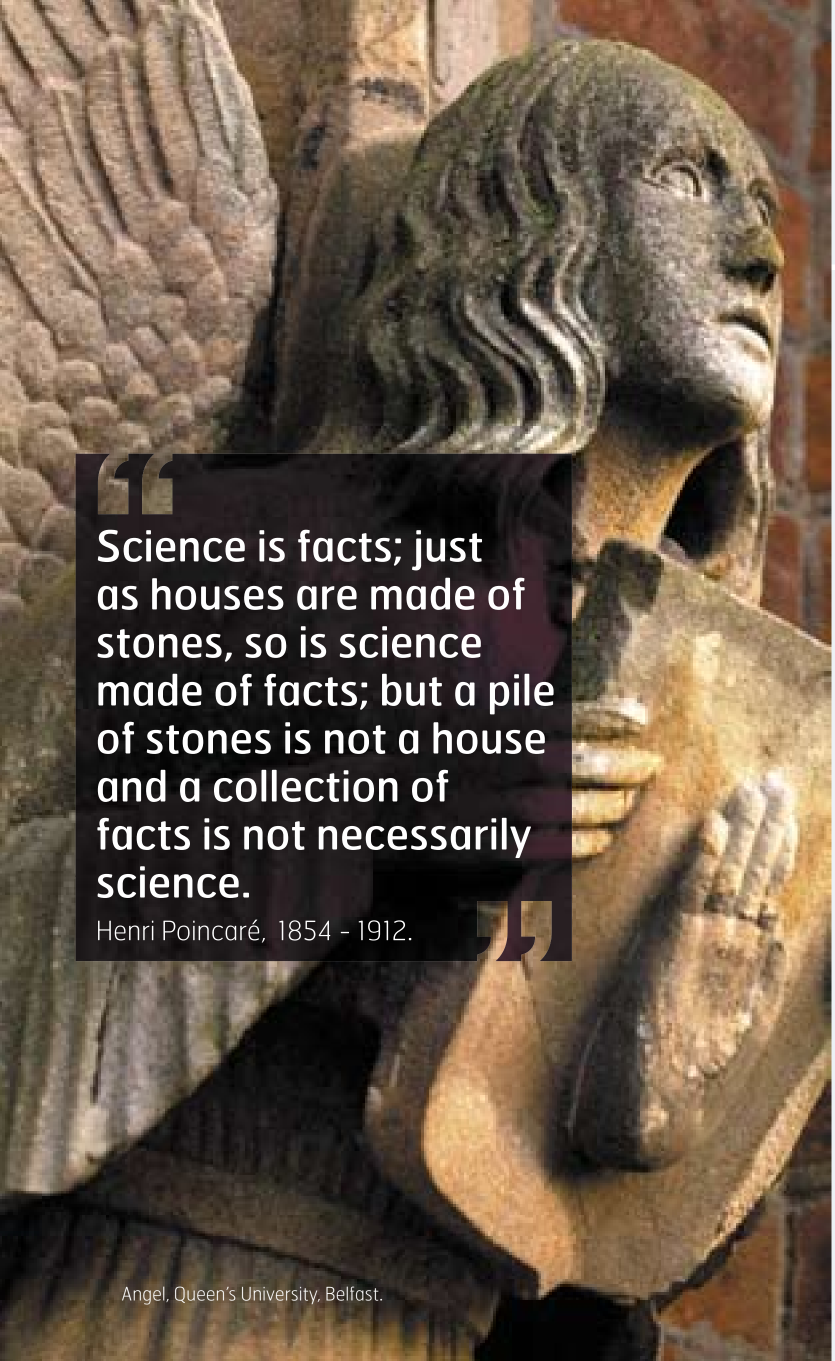
Patricia A. Warke

Recording Stone Decay



> Science is facts; just as houses are made of stones, so is science made of facts; but a pile of stones is not a house and a collection of facts is not necessarily science.
>
> Henri Poincaré, 1854 - 1912.

Angel, Queen's University, Belfast.

There are many types of stone built structures ranging from the historically and archaeologically prestigious to those that are less culturally significant. The former are typically of great international importance whilst the latter may be considered valuable in a more local context. However, regardless of their individual merits, together these different structures imbue our city and townscapes with character and bear witness to the cultural and stylistic mores of previous generations.

The internationally important buildings such as the great medieval cathedrals and the wealth of archaeological structures found in countries around the Mediterranean coastline have provided the focus for development of detailed and descriptive schemes for recording stone decay at a block by block and within individual block, level of detail. Because of the degree of detail required, these schemes are costly to apply in terms of both time and manpower and require a high level of expertise. Such schemes are undoubtedly essential components in the development of conservation programmes for internationally significant heritage structures but are definitely not appropriate for the assessment of less esteemed buildings.

Unfortunately, because the focus in assessment scheme development has been on high value structures, buildings at the other end of the significance scale have tended to be treated in a decidedly more *ad hoc* fashion. Instead of the formal detailed and standardised assessment schemes, financial and manpower constraints often result in the initial condition assessment of stonework being reliant on the expertise of the appointed contractor. This non-standardised *ad hoc* approach has several disadvantages:

- The quality of expertise depends on training and often this has been gained at the expense of mistakes on other buildings;
- There tends to be a lack of a common descriptive terminology with each contractor employing descriptive language for weathering features and stone condition that only they fully understand;
- Underpinning the above is the lack of a common assessment method that can result in the absence of long-term records of a building against which to compare other buildings and the success or failure of conservation treatments or intervention measures.

Given the above comments, it is obvious that a clear need exists for development of a recognised standard method for assessing the condition of stonework. A method that is relatively simple and rapid to use but sufficiently robust to accommodate different levels of operator expertise. Such a scheme is needed to help safeguard the future of an ever-dwindling stock of comparatively unremarkable historic buildings that nonetheless possess collective significance because they imbue urban landscapes with 'character' and 'identity'. Such a scheme could be used in several ways:

- For a general stock assessment of all historic buildings in a particular urban area by local or national government bodies as a means of creating a database for prioritising and targeting spending on conservation programmes;
- By individual building owners or those with a 'duty of care' for historic buildings to provide an initial assessment of building condition and as a first-step in identifying problems and the need for intervention;
- By contractors involved in the planning and provision of conservation services whereby the use of such a scheme in initial assessment would provide the first stage of conservation programme planning and would also provide a base-line record of condition before intervention against which the future condition of the structure could be assessed and the relative success or failure of intervention strategies evaluated.

Staging System Approach to Condition Assessment of Stonework

Many disciplines have developed condition assessment schemes but there are few that can match the flexibility and rigour of the Staging System developed by medical clinicians to aid in the assessment of, and treatment planning for cancer patients. This is an internationally recognised and applied scheme that provides a shorthand notation for describing the extent of a tumour based on unambiguous categories related to its size, type, degree of local involvement and spread to distant parts of the body.

At first glance the relevance of adapting such a scheme for condition assessment of building stone may seem somewhat tenuous but there are many areas of similarity particularly with regard to predicting the extent of intervention required and providing a forecast of 'life expectancy'. The ethos underlying the medical Staging System approach is concerned with producing a relatively rapid measure of the condition of the system as a whole based on assessment of the condition of smaller elements within the system and an understanding of the links between them. In addition, the Staging System approach possesses the following attributes, which are clearly applicable to any stonework evaluation strategy:

- The scheme provides a common assessment method that can be applied to any type of building or monument;
- It uses a relatively simple descriptive terminology that facilitates comparisons between assessments done by different personnel at different times;
- It facilitates the formulation of a meaningful record of condition before and after treatment;
- It allows the success or failure of specific treatments to be evaluated;
- The scheme also enables a forecast of outcome to be made with an in-built option to place emphasis on supportive rather than curative treatments.

This latter point is significant for two reasons. First, as a natural response to ageing and long-term exposure stone can

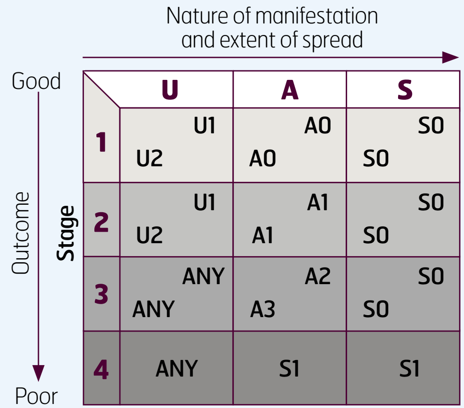


Figure 1
UAS Staging System grid showing the links between the extent and spread of stone deterioration and the condition stage which in turn gives an indication of the degree of intervention required and an assessment of potential outcome if no remedial treatment is undertaken. (Key to abbreviations in Table 1)

undergo varying levels of change in structural and mineralogical characteristics. Such changes are to be expected and may pose no immediate threat to the integrity of the structure, with only minimal, targeted intervention and on-going monitoring being the best management option. Second, if deterioration is severe and widespread, the historical or architectural value of the building may not justify the economics of full-scale restoration with effort being more realistically aimed at supportive intervention to keep the building structurally safe but not necessarily resulting in an extension of the 'life expectancy' of the stonework.

Stage Assessment Method

The Staging System comprises three categories that describe in general terms the extent of deterioration of stonework (**Figure 1**):

- **Unit (U)** - this refers to the condition of individual stone blocks;
- **Area (A)** - this category provides a measure of the involvement of adjoining blocks;
- **Spread (S)** - this refers to the extent of visible deterioration across an individual façade.

Each of these **U, A** and **S** categories are sub-divided into different sub-categories **(Table 1)** based on a relative measure of the extent of visible deterioration. When these sub-category values are combined they enable one of the four condition stages to be assigned to the building façade **(Figure 1)**. The higher the numerical value of the stage identified, the worse the condition of the façade in question and the greater the extent of remedial intervention required **(Table 2)**. As previously outlined, in the staging system approach there is in-built recognition that once stage 4 has been reached there is the option, if funds are limited, to shift emphasis from curative to supportive treatment

Table 1 **Unit, Area and Spread sub-category divisions**

Category	Sub-Category	Description
UNIT	U0	No deterioration detectable
	U1	Surface alteration with minimal evidence of surface breakdown detected affecting only parts of individual blocks
	U2	Well-developed surface alteration and/or obvious surface breakdown involving whole blocks
	U3	Well-established surface breakdown with loss of original stone surfaces affecting up to 10% of the façade
AREA	A0	No involvement of surrounding blocks detectable
	A1	Positive involvement of surrounding/connecting blocks
	A2	Positive involvement of surrounding/connecting blocks affecting between 10–20% of the façade
	A3	Extensive localised involvement of connecting blocks and beyond affecting 20–40% of the façade
SPREAD	S0	Deterioration is restricted to specific sections of the façade
	S1	Positive deterioration affecting distant unconnected portions of the façade involving more than 50% of the total surface area

Table 2 **Summary guidelines for each condition stage**

STAGE	Extent of intervention required
1	A façade in this condition would require only localised remedial treatment concentrating on individual stone blocks. A staging classification of 1 may also indicate that no active intervention is required with only periodic reassessment of the façade advised.
2	Section specific remedial action would be required in this case but the extent of intervention should be relatively limited because of the lack of distant involvement within the façade boundaries.
3	Significant intervention will be required with up to 50% of the total façade surface showing evidence of deterioration. Although the extent of deterioration is severe, appropriate conservation treatment should prolong the life expectancy of the structure.
4	Serious deterioration affecting more than 50% of the total façade surface with stone decay detected on unconnected, distant portions of the façade. On a stage 4 category of façade, considerable intervention will be required to restore the stonework. If the structure is of limited historic and/or architectural merit then consideration should be given to the provision of palliative rather than restorative treatment.

strategies especially if the cost of intervention outweighs the architectural and historic value of the structure.

A recording sheet should be completed for each façade and the predominant stage value for all facades used as an overall condition assessment for the building as a whole. The reliability of the stage assignment can be increased through the collection of stone samples for laboratory analysis. The more samples collected and the greater the variety of analyses employed will increase the certainty of the final stage assignment (**Table 3**).

For example, the presence of obvious surface deterioration of stonework can lead to assumptions regarding the cause of the decay and the depth of stonework affected which may not be accurate and lead to selection of inappropriate intervention treatment. This was clearly demonstrated on a building constructed of clay-rich sandstone that was

Table 3 **Summary of analytical techniques and sampling strategy for different certainty levels**

Certainty Factors	List of Potential Analytical Techniques	Extent of Stone Sampling
C1	Visual assessment only	None
C2	Visual assessment, Ion Chromatography, Atomic Absorption Spectroscopy, X-ray Diffraction	Sampling limited to surface material from blocks showing evidence of deterioration
C3	Visual assessment, Ion Chromatography, Atomic Absorption Spectroscopy, X-ray Diffraction, Thin-sectioning, Scanning Electron Microscopy, coring of stonework	Widespread sampling of stone surface and subsurface material from across the whole façade from both intact stone and stone exhibiting evidence of surface deterioration

showing extensive evidence of surface breakdown through flaking, scaling and granular disintegration. The initial intention was to dress the stone blocks back by some 25mm to remove the outer decayed material but subsequent analysis of stone cores showed that the salts that were driving this surface breakdown were present in high concentrations deep within the sandstone blocks. Consequently, removing the outer 25mm of stone would have provided only a short-term answer with flaking and scaling becoming re-established within a few months as deep salt deposits were activated. This analytical interpretation of laboratory data was substantiated by a test panel of dressed-back stone on the building. Analysis of stone samples can also help avoid the unnecessary replacement of stone that, apart from some superficial deterioration, is in reasonably good condition.

The stage assignment procedure is outlined in the following sequence of steps, the key components of which are outlined on the site recording sheets (**Figures 2a and 2b**).

Figure 2a **Building Record Sheet**

Building Name	
Address	
Townland	
Architect	
Building Function	
Date of Construction	
Historic Building Record	
Listing	
Grid Reference (IG)	
Date of Survey	
Exterior Description and Notes Photograph of Building	
Stone Types	
Primary	
Secondary	
Other	
Construction Type	
Sample Codes	
Location of Samples	

Example of building record sheet.

Figure 2b **Façade Condition Assessment Form**

FAÇADE DESCRIPTIONS	**Name of Building:** **Grid Reference:**	**Pointing (L or C)* %**	**Mortar Repair %**	**Stone Replacement Type %**	**Clean/Treatment**	**Fracturing**	**Stone Decay**	**Soiling Biological or Pollution**	**RW** Goods**	**Stage & UAS Scores**
NORTH										
EAST										
SOUTH										
WEST										
	RESULTS **[Certainty Factor:]**									**STAGE ?**

* L= Lime; C= Cement; ** RW= Rain water goods (these were assessed as being in either Good, OK or Poor Condition).

The Assessment Process

Step 1

Complete background questions for the building including date of assessment, location (including grid reference) and name of building. Also required in this section is a general description of the building with some indication of the building's age, the architect (if known) and any other relevant information such as, any record of previous conservation treatment and when this took place. It is useful to accompany this section with a general photographic record of the main architectural features and structural components and possibly some image of the immediate environs such as proximity to roads, other buildings etc. In this section stone types used in construction should be identified and a note made of any samples taken.

Step 2

Note the aspect of the first façade to be assessed (e.g. whether it is north-facing, south-facing etc). Select a section of the façade that is roughly representative of the condition of the rest of the façade. The size of the section selected should be in proportion to the total size of the façade in question. If there appear to be complex patterns of deterioration across the façade and it is not possible to select a representative section, then the whole façade will need to be assessed. Make a note of any previous conservation interventions (if known) and/or any obvious repairs to the façade (e.g. insertion of replacement stone blocks, application of cement render repairs etc.). If any repairs are obvious then a photographic record should be made of these.

Step 3

Record the main stone type used in construction and any secondary stone types used for architectural detailing such as string-courses, corbelling, quoins etc. In some cases it may not be possible to identify the stone type and in such instances, it is recommended that with permission from the building owner, a surface or drilled core sample of stone should be taken for specialist identification. Another important part of this step in the process is the identification and recording of any factors that may predispose stone to deterioration. Examples of common predisposing factors are:

- Poorly maintained rainwater goods that allow water to flow over the stone surface thus encouraging biological growth, surface staining, potential degradation of mortars and deep moisture penetration of stonework. Poorly maintained rainwater goods tend to have localised effects on a building and can facilitate biological activity (**Figure 3**).
- Inappropriate pointing or mortar replacement with hard cement mortar can have a particularly widespread adverse impact on 'soft' stones such as sandstone as it prevents the natural expansion of stone associated with heating or wetting. This constraint typically results in flaking and scaling around the edges of blocks (**Figure 4**). The presence of 'hard' mortar in association with deterioration of stone is a good indication that the mortar may need to be replaced. However, it is important to note that not all stone types are adversely affected by 'hard' mortars.

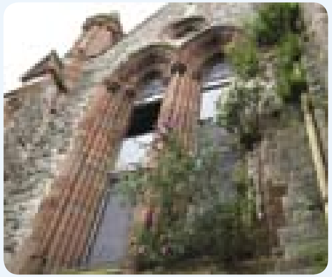


Figure 3

Figure 4

Figure 5

Figure 6

Step 4

Carry out the visual assessment of stone condition within the selected section of the façade. The criteria used in visual

Figure 7a

Figure 7b

Figure 8

Figure 9

assessment are quite limited and generalised with a reliance on assessing whether they are present or absent and if present, to what extent through an estimation of the percentage area of the façade affected. The criteria included on the recording sheet are:

- Evidence of obvious surface stone decay through scaling, flaking and granular disintegration (ie; whether there is loose material on block surfaces that can be easily dislodged) (**Figure 5**);
- Presence and extent of biological colonisation (e.g. algae, lichens, moss etc.) – if individual plant forms are not visible a general surface 'greening' of stone indicates the presence of algae (**Figure 6**);
- Presence and extent of surface staining and/or soiling. Soiling may be widespread affecting most of the façade (**Figure 7a**) or may be related to some more localised factor where, for example, sections of the façade are sheltered from direct rainwash (**Figure 7b**);
- Presence of any other signs of stone alteration or deterioration such as fracture development (**Figure 8**). Such features may be associated with failure of an individual stone block due to corrosion of metalwork or may indicate more serious structural problems.

Table 4 **Example of stage assignment where individual building facades display different stage characteristics**

Façade Description	**UAS Notations**	**Stage Classification**
North-facing	U1, A2, S0	3
East-facing	U2, A2, S0	3
South-facing	U3, S1	4
West-facing	U1, A3, S0	3
Overall Stage Assigned		**3**

Step 5
On the basis of the visual assessment a sub-category from each of the main **U, A** and **S** categories should be assigned to the façade in question. For example, a sandstone façade showing evidence of surface deterioration of individual blocks and some entire blocks with deterioration affecting some adjoining blocks but no extensive involvement of the whole façade will fall into the U2, A1 and S0 sub-categories. When checked on the staging assessment grid these notations give the façade in question a Stage 2 classification with a certainty factor of C1 because the stage assignment was based solely on a visual assessment.

Step 6
The above sequence should be repeated for each façade with the predominant stage value being used to represent the condition of the building as a whole (**Table 4**). In Table 4, if two facades had been classified as being Stage 3 and the other two as Stage 4 then an overall Stage 4 classification should be assigned to the building. It is unusual to encounter a building where there is a significant disparity between the condition of different facades but it can happen where, for example one façade has been protected from exposure to atmospheric pollution by the presence of

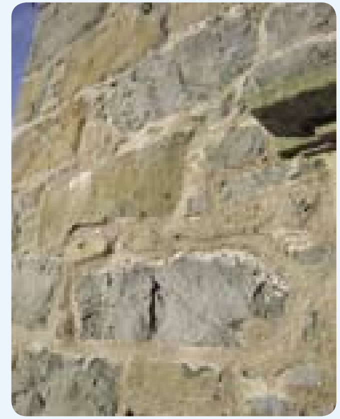
another building (**Figure 9**). If the sheltering building is subsequently demolished the newly exposed façade will present a very different appearance and condition to the rest of the structure. In such cases the predominant higher stage value should be recorded as being representative of the building as a whole. Some differences between the condition of separate facades is to be expected and may be related to aspect with the 'weather' side of the building often showing more evidence of deterioration.

Assignment of the correct 'Stage' is extremely important because the cost and risks associated with remedial intervention are only justified if the treatment does more good than harm.
For example, under-staging a building can result in the urgency of intervention being under-emphasized with the programme of works being too conservative resulting in a slowing of deterioration but no long-term 'cure'. Conversely, over-staging can result in intervention being too radical with unnecessary work being done that not only increases costs but may contribute to the destabilisation of previously stable stonework. If an assessment is borderline between two stages then the higher value stage should automatically be assigned.

Stage Classification Examples

As an aid to stage classification, examples of buildings in the four different stage categories, are shown in the following section.

Billy Parish Church. A Gothic style chapel built in 1815.



Basalt blocks, showing no evidence of deterioration.

Stage 1 Classification

Example: Billy Parish Church, County Antrim.

A façade in this condition should require only localised remedial treatment concentrating on individual stone blocks. A staging classification of 1 may also indicate that no immediate intervention is required with only periodic reassessment of the façade being advised.

Building Record Sheet	
Building Name	Billy Parish Church
Address	1 Cabragh Road, Glebe, Bushmills, BT57 8UH
Townland	Glebe
Architect	Not known
Building Function	Church
Date of Construction	1815
Historic Building Record	HB05/07/001
Listing	B+
Grid Reference (IG)	295829 438235
Date of Survey	11/01/06
Exterior Description and Notes 	Gothic style chapel fronted by a 3 stage square tower with battlements, corner pinnacles and arched windows with hood moulds. Pitched slate roof. Later addition of apse style chancel in 1890. Yellow sandstone used on original window dressing with red sandstone of courses. The building was recently cleaned, repointed with lime mortar and fitted with new rain water goods.
Stone Types	
Primary	Basalt
Secondary	Ballycastle Sandstone
Other	English Carboniferous Sandstone
Construction Type	Rough coursed rubble
Sample Codes	AM/C/BILLY1
Location of Samples	Window Surround

Façade Condition Assessment Form

FAÇADE DESCRIPTIONS

	Name of Building: Billy Parish Church **Grid Reference:** 2955829 438235	Pointing (L or C)* %	Mortar Repair %	Stone Replacement Type %	Clean/Treatment	Fracturing	Stone Decay	Soiling Biological or Pollution	RW** Goods	Stage & UAS Scores
NORTH	**Soiling**: limited **Decay**: basalt in good order. Sandstone: courses eroded, weathering and flaking under window	100 L	0-2	0	yes	0	2-10	0-2	Good	1 **U**2 **A**0 **S**0
EAST	**Soiling**: limited, mainly sandstone dressing- green patches of biological growth **Decay**: basalt in good order. Sandstone: surface granular disintegration under door archway. Heavy flaking under window arches, occasional flaking under courses	100 L	0-2	0	yes	0	2-10	2-10	Good	1 **U**2 **A**0 **S**0
SOUTH	**Soiling**: limited, mainly chancel Sandstone and courses **Decay**: basalt in good order. Sandstone: surface granular disintegration on window. Replacement corner stone of lower course and door entrance	100 L	0-2	0-2	yes	0	2-10	2-10	Good	1 **U**2 **A**0 **S**0
WEST	**Tower Soiling**: clean, patches of bio on pinnacles **Decay**: basalt in good order. Sandstone: surface weathering and granular disintegration, older blocks weathered. Replacement blocks on courses & window	100 L	0-2	0-2	yes	0	0-2	0-2	Good	1 **U**2 **A**0 **S**0
	RESULTS **Certainty Factor: C2**	100 L	0-2	0-2	yes	0	2-10	2-10	Good	STAGE 1

* L= Lime; C= Cement; ** RW= Rain water goods (these were assessed as being in either Good, OK or Poor Condition).

Stormont Castle, a Scottish Baronial style castle built in 1830.

Stage 2 Classification

Example: Stormont Castle, Belfast.

Section specific remedial action would be required in this case but the extent of intervention should be relatively limited because of the lack of distant involvement within the façade boundaries.

Deterioration of block corners.

Building Record Sheet	
Building Name	Stormont Castle
Address	Stormont Estate, Upper Newtownards Road, Belfast
Townland	Ballymiscaw
Architect	Thomas Turner (LA); Stone Contractor
	(Resoration): McConnell and Sons
Building Function	Offices/Administrative
Date of Construction	1830, enlarged 1858, works: 1920's, recently: 2001
Historic Building Record	HB26/13/014
Listing	B+
Grid Reference (IG)	340292 374768
Date of Survey	18/07/07
Exterior Description and Notes 	Scottish Baronial style castle. The main face is 3 storeys and 8 bays wide. The centre of the main face has a 2 storey canted bay window with remaining windows with square-topped sashes and suspended turrets at either end of the façade. There is a tall tower at the East end with a large door surround, topped with a balustrade.
Stone Types	
Primary	Scrabo Sandstone (Ballyalton)
Secondary	Stanton Moor Replacement
Other	
Construction Type	Uncoarsed rock-faced
Sample Codes	
Location of Samples	

FAÇADE DESCRIPTIONS

Façade Condition Assessment Form		Pointing (L or C)* %	Mortar Repair %	Stone Replacement Type %	Clean/Treatment	Fracturing	Stone Decay	Soiling Biological or Pollution	RW** Goods	Stage & UAS Scores
	Name of Building: Stormont Castle **Grid Reference:** 340292 374768									
NORTH	**Modern Extension (not assessed)**									
EAST	**Soiling**: mild black soiling across face, green biological growth in sheltered areas. **Decay**: mostly mortar damage, flaking and scaling around edges, some pitting, whole block faces.	100 C?	0-2	0-2	yes	0-2	30-50	>50	OK	2 **U**2 **A**1 **S**0
SOUTH	**Soiling**: mild black soiling across face, white and yellow lichen on lower string-course **Decay**: mortar damage causing flaking and scaling, whole block faces, occasional pitting and differential weathering	100 c?	0-2	0-2	yes	0-2	30-50	10-30	OK	2 **U**2 **A**1 **S**0
WEST	**Soiling**: mild black soiling across face, heavier and green biological growth on string-course and detail **Sandstone??**: same as above??	100 C?	0-2	0-2	yes	0-2	30-50	10-30	OK	2 **U**2 **A**1 **S**0
	RESULTS **Certainty Factor: C1**	100 C?	0-2	0-2	yes	0-2	30-50	10-30	OK	STAGE 2

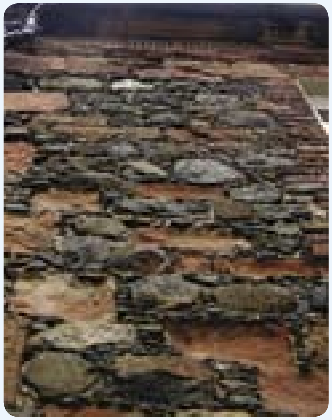
* L= Lime; C= Cement; ** RW= Rain water goods (these were assessed as being in either Good, OK or Poor Condition).

Late 18th Century, Georgian style house.

Stage 3 Classification

Example: Moira, County Down

Significant intervention will be required on facades with this stage classification with up to 50% of the total façade surface showing evidence of significant deterioration. Although the extent of deterioration is severe, appropriate conservation treatment should prolong the life expectancy of the structure.



Picture caption

Building Record Sheet

Building Name	Main Street, Moira
Address	Moira, County Down
Townland	Carnalbanagh East
Architect	Not Known
Building Function	Private House
Date of Construction	c. 1770 - 1835
Historic Building Record	HB19/22/011
Listing	B1
Grid Reference (IG)	315143 360717
Date of Survey	23/03/06
Exterior Description and Notes 	Georgian style, 2 storey building with basement. Sash windows on ground and first floor with brick dressings and painted cills?. The central doorway is pedimented with attached columns and painted fan-light. Pitched slate roof. Fluted band course under cornice. Rear of the building is partially rendered. Rubble build with galleting, sandstone quoins and banding.
Stone Types	
Primary	Basalt/Greywackle mix
Secondary	Local red Triassic Sandstone
Other	Granite
Construction Type	Rough coursed rubble
Sample Codes	
Location of Samples	

Façade Condition Assessment Form

FAÇADE DESCRIPTIONS	**Name of Building:** Main Street, Moira **Grid Reference:** 315143 360717	Pointing (L or C)* %	Mortar Repair %	Stone Replacement Type %	Clean/Treatment	Fracturing	Stone Decay	Soiling Biological or Pollution	RW** Goods	Stage & UAS Scores
NORTH	**Soiling**: white lichen and green biological growth on plinth and some other blocks. Moss on plinth **Decay**: fewer sandstone blocks, mainly just quoins. Sandstone quoins: very bad, heavy scaling. Main stone fine, just fault-line fractures. Part rendered (40%) order. Sandstone: courses eroded, weathering and flaking under window.	100 c	0-2	0	No	0-2	0-2	2-10	OK	2 **U**2 **A**1 **S**0
EAST	**Rendered (not assessed)**									
SOUTH	**Soiling**: ivy in centre of façade, little or no biological growth **Decay**: Sandstone quoins and head stones over basement windows in very bad condition, severe scaling and major surface loss, mortar damage, 1 head badly fractured. Greywacke/ basalt OK. Sandstone blocks in wall very bad, scaling and hollowed out in places. Some strap pointing at west end.	100 C	0-2	0	No	0-2	2-10	2-10	OK	3 **U**3 **A**2 **S**0
WEST	**Rendered (not assessed)**									
	RESULTS **Certainty Factor: C1**	100 C	0-2	0	No	0-2	2-10	2-10	OK	STAGE 3

* L= Lime; C= Cement; ** RW= Rain water goods (these were assessed as being in either Good, OK or Poor Condition).

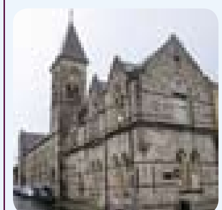
Larne Town Hall.

Stage 4 Classification

Example: Larne Townhall, County Antrim

Serious deterioration affecting more than 50% of the total façade surface with stone decay detected on unconnected, distant portions of the façade. On a stage 4 category of façade, considerable intervention will be required to restore the stonework. If the structure is of limited historic and/or architectural merit then consideration may be given to the provision of supportive rather than restorative treatment.

Widespread surface deterioration of stonework with loss of architectural detail.

Building Record Sheet	
Building Name	Larne Town Hall
Address	Upper Cross Street, Larne, BT40 1SZ
Townland	Town Parks
Architect	Alexander Tate, Samuel P. Close.
Building Function	Town Hall
Date of Construction	1868
Historic Building Record	HB06/12/002
Listing	B+
Grid Reference (IG)	340039 402601
Date of Survey	23/08/05
Exterior Description and Notes 	Italianate style Town Hall (2 storey, 11 bays) with a central square tower and clock. Pitched slate roof with gabled upper windows. Main stone type is Scrabo Sandstone with string-course detailing in red sandstone and slate columns on windows and at the entrance.
Stone Types	
Primary	Scrabo Sandstone
Secondary	Slate Columns
Other	
Construction Type	Random coarsed, rock-faced
Sample Codes	AM/B/TH1, AM/B/TH2, AM/B/TH3
Location of Samples	

Façade Condition Assessment Form

Name of Building: Larne Town Hall

Grid Reference: 340039 402601

FAÇADE DESCRIPTIONS

Façade	Description	Pointing (L or C)* %	Mortar Repair %	Stone Replacement Type %	Clean/Treatment	Fracturing	Stone Decay	Soiling Biological or Pollution	RW** Goods	Stage & UAS Scores
NORTH	**Soiling**: Some vegetation at roof level, some biological growth **Decay**: Scaling and flaking across face. Loss of some faces of stone	100 C	0-2	0	No	0	>50	10-30	OK	4 **U**3 **A**2 **S**1
EAST	**Adjoining Building (not assessed)**									
SOUTH	**Soiling**: Heavy in corners, sills, and lower face **Decay**: Heavy scaling and flaking across face. Cracks in slate columns	100 C	0-2	0	No	0-2	>50	30-50	OK	4 **U**3 **A**2 **S**1
WEST	**Soiling**: Biological growth on sills, courses, and tower, gables heavy. Some vegetation growth on gables and corner, slates clean. **Decay**: Heavy scaling, flaking of majority of exposed stone faces. Heavy loss of detail on door carving. Scaling on string courses. Loss of face occasionally Open joints. Broken slate columns in door	100 C	0-2	0	No	0-2	>50	30-50	OK	4 **U**3 **A**2 **S**1
	RESULTS Certainty Factor: C?	100 C	0-2	0	No	0-2	>50	30-50	OK	STAGE 4

* L= Lime; C= Cement; ** RW= Rain water goods (these were assessed as being in either Good, OK or Poor Condition).

Summary Comments

Identification of the extent and nature of stone decay on a building is an essential first-step in the development of an appropriate conservation strategy. Even when conservation work is not envisaged, a condition assessment is important because it creates a base-line record of building condition against which to monitor the future progress of the building and to provide early warning of the need for any future remedial action.

In the care of buildings it is important to recognise that change is a natural characteristic of stone and that most building stone will show some evidence of change following construction - change that reflects a natural and expected adjustment to its new conditions of exposure. Such changes may affect colour or texture and are generally benign occurring relatively gradually over many decades. However, there is a big difference between the expected and relatively benign gradual changes associated with the natural ageing of a building and, change that heralds the onset of more serious deterioration. For example, the nature and rate of stone decay may change in response to a variety of actions such as overly aggressive stone cleaning, poor maintenance of rainwater goods, use of inappropriate re-pointing material, fire damage, increased atmospheric pollution, or a change in groundwater conditions.

However, it is also important to recognise that the rate of deterioration may also increase in response to the crossing of an internal stone durability threshold associated solely with the ageing process. For example, human beings experience a natural physical weakening as they grow older manifest in a reduction in the quality of such factors as eyesight, hearing and general mobility. The rate of this physical deterioration may be greatly accelerated by the development of some malignant disease process but this is not always the case with rapid decline and eventual death resulting from the natural effects of 'old age' where system components just wear out. Similarly, building stone has a finite 'life-span' and even with the best management possible in the least aggressive environmental setting it will gradually deteriorate to a point where the stone is so badly weakened that it needs to be replaced or the building demolished!

The importance of having a formal record of the building condition cannot be too greatly emphasized, as only with such a record is it possible to evaluate long-term stone response and identify sections 'at risk' on a building from accelerated deterioration with all the associated implications of this for the rest of the structure. The staging system approach is a first-step in formulating a standardised method of building stone condition assessment that is relatively rapid and straightforward to use. Aside from its value as a preliminary assessment tool for building owners, the main value of this scheme lies in its use in the creation of a base-line assessment of historic building stock within a town, city or region. Such inventories are essential in targeting the ever-diminishing funds available for conservation and for establishing a database of structures, the condition of which may not have been formally recorded or monitored.