

**Negotiating Repair and Authenticity in the Conservation of
Ornamental Architectural Stone: Managing Decay and Past
Interventions on the Façades of Rosslyn Chapel and Mission San
José**

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Abbreviations

FPC	Ford, Powell & Carson Architects & Planners
ICOMOS	International Council on Monuments and Sites
NBSC	Nicolas Boyes Stone Conservation
RCAHMS	Royal Commission for the Ancient and Historic Monuments of Scotland

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Introduction

This dissertation aims to determine how material and historical authenticity are balanced with artistic unity and aesthetic legibility in the conservation of ornamental architectural stone through an analysis of the current conservation of exterior carved stonework at the 15th century Rosslyn Chapel in Roslin, Scotland and the 18th century Church of Mission San José in San Antonio, Texas.

At first glance, Rosslyn Chapel (Figure 0.1) and Mission San José (Figure 0.2) appear to have little in common, stylistically, historically or culturally, apart from their use as historic places of Christian worship. Rosslyn Chapel was founded in Scotland in the 15th century and built for a powerful patron in an elaborate Gothic style. Mission San José was constructed some three centuries later in the northern-most outpost of New Spain in what is today south Texas in a simplified form of the ornate Spanish Baroque style. However, despite their stylistic, cultural and historical differences, both are significant architecturally for their intricate ornamental stonework and both have played an important role in the artistic and cultural psyche of their respective regions. Additionally, both buildings have undergone considerable alteration and decay over their lifetimes, including periods of disuse and material loss, as well as 19th and 20th century restoration programs that introduced a significant amount of plastic repairs and other modern interventions. Therefore, Rosslyn Chapel and Mission San José provide useful case studies for the examination of the practical and philosophical issues that surround the conservation of ornamental architectural stone on building façades.

This research aims to establish how decay, damage and material loss in the ornamental stonework at Rosslyn Chapel and Mission San José are treated in their respective conservation programs and how those treatments are guided by philosophies of authenticity and legibility. Through a comparison of the decay issues and treatment programs at each site, this research seeks to understand how the nature of the ornament and its relationship to the building as a whole does or does not shape the way those philosophies are put into practice.

Chapter 1 provides a theoretical background to the research by presenting an overview of the concepts of material authenticity and aesthetic legibility as they relate to the conservation of ornamental architectural stone. A brief summary of historical debates on authenticity and legibility in conservation is presented along with a review of several precedents showing the variety of ways in which these concepts have been applied to the conservation of ornamental stonework in the past.

The conservation program for Rosslyn Chapel, the first case study, is presented in Chapter 2. The history of the exterior stone ornament of Rosslyn is discussed with particular attention paid to how it has been treated in the past and the importance of the ornament for the significance of the building. The current conservation program is then outlined with a discussion of the main decay issues affecting the ornamental stonework and the adopted treatment approaches. Chapter 3 presents the second case study, the Church of Mission San José, with a similar presentation of the history and significance of the ornamental stonework and its past treatment, followed by a discussion of the current conservation program.

The main analysis of the two case studies is presented in Chapter 4 with a comparison of the conservation programs at each site, specifically looking at potential reasons for differences in the two conservation programs and how those differences may reflect discrepancies in philosophical approaches to the conservation of ornamental stonework. Specifically, the analysis attempts to determine how a desire to maintain material authenticity versus an artistic unity of the original design influences the treatment programs at each site.

Methodology

This study was carried out through an analysis of secondary literature, archival research, a desktop review of the conservation documents for each case study, multiple site visits to the case study buildings, as well as interviews with the architects and stone conservators involved. While considerable information was available for this research on both case studies, more information on the conservation work at San José was available at the time, as this author has been involved in the ongoing conservation program at San José as an employee of Ford, Powell & Carson Architects & Planners in San Antonio, Texas.

Both Rosslyn Chapel and Mission San José are currently undergoing multi-phased conservation programs on their interior and exterior fabric. However, for the purpose of this dissertation, an assessment of the conservation programs has been limited to the conservation of the external ornamental stonework at each site.

Chapter 1

Stone Conservation: Theory, Historical Debates and Precedents

1.1 Theoretical Background

The conservation of building stone has a long history. Stone is a very complex building material and if used, treated or maintained inappropriately, can have serious decay issues as a result of those poor practices [Ashurst and Dimes, 1998, p. 1; Curran, 2010, p.178]. While our understanding of the various decay mechanisms and material properties of building stone has greatly expanded in the last few decades, especially with the growth in interdisciplinary research between practicing conservators, geologists and physical scientists, the philosophical and ethical underpinnings of stone conservation are often not fully taken into account in practice [Doehne and Price 2010; Forster 2010a]. According to Jokilehto [1999, p.304] there is frequently “a gap between theoretical intent and practical execution.” Much of the current research on stone conservation focuses on the more physical aspects of stone decay and treatment, often relying on laboratory tests and isolated field studies. The ethics of stone conservation, especially issues of authenticity and aesthetic integrity, can be seen as disconnected from its more practical and scientific aspects.

Ornamental architectural stone occupies a unique position in the building fabric. As ornament, it is often not part of a building’s structural integrity, but nor is it pure sculpture that can be treated as separate from the structure’s composition. It is an artistic and design element but is still an integral part of the building’s fabric, particularly for monuments in which the decorative stone program forms a key aspect

of its artistic and cultural significance, like many historic churches. Therefore, how ornamental stonework is conserved and the ethics that guide those conservation approaches is of critical importance for the continued value of any monument for which the ornamental stonework forms a key aspect of its significance.

What, then, are the ethics and principles that underpin the conservation of ornamental architectural stone? Policy and guidelines do exist that aim to provide clear philosophical foundations for conservation practice, from the various international conservation charters to national, state or institutional policy documents. Many of these policy documents, for example Historic Scotland's Technical Advice Notes and the US National Park Service's Technical Briefs, exist to help guide practitioners and outline basic best practices by highlighting appropriate and inappropriate maintenance and repair techniques on various types of buildings and building materials. However, these guidelines are often, by necessity, very broad in scope and don't necessarily address specific ethical foundations relating to the repair and treatment of decayed or damaged ornamental architectural stone.

The ethical concepts that are touched on in most conservation literature are the ideas of authenticity and integrity [Bell 1997; Forster 2010a]. While many attempts have been made to broadly define what these terms mean relative to historic buildings, they are nonetheless difficult to ascribe with absolute meaning. Bell [1997, p.27] defines authenticity as being "true in substance, as really proceeding from its reputed source or author" and integrity as "material wholeness, soundness and uncorrupted character." But does authenticity rely simply in the material fabric, or does it also depend upon the coherency of the original design? Does authenticity change over

time, since the values we assign to specific buildings often change over time? Bell [1997, p. 29] argues that authenticity of some elements of an historic building are more readily defined, such as age, but when various characteristics of the building throughout its history are combined “the question of authenticity becomes less answerable.” For instance, when do later interventions, even if they are copies of an original feature, acquire their own authenticity with “genuine symbolic or emotional value...built up over time” [Bell, 1997, p.29]?

There are numerous theoretical texts on the issues of authenticity and integrity in architectural conservation, from the 19th century anti-restoration tracts of William Morris in England, to the 1960s writings by Cesare Brandi in Italy, to more recent discussions of cultural heritage and diversity in the *Nara Document on Authenticity* [ICOMOS 1994]. Yet as Bell [1997] and Matero [2007] have suggested, the issue of authenticity is still a controversial and much debated topic that is increasingly taking into account a notion of layered history. In assessing the conservation strategies for ornamental architectural stone in historic churches, debates about material and historical authenticity and aesthetic legibility seem natural. How past and current concepts of authenticity are applied to the conservation of ornamental architectural stone depends upon a variety of factors, including but not limited to, the age of the building, the type of stone, the degree of decay, legal protection and guidelines, as well as the cultural significance of the ornament and the impact of past interventions on the material performance and artistic unity of the stonework. How these factors affect a conservation program ultimately depends on the professionals involved in the decision making process. Additionally, the ethical concepts that underlie conservation

of ornamental stonework can, like other areas of conservation, sometimes come into conflict [Forster, 2010a, p.92].

One of the main accepted philosophies of conservation, as outlined in the Venice Charter [ICOMOS 1964], is a “respect for original material”. However, when intervention is needed, a policy of minimal intervention has become standard in conservation literature and guidance. Yet the question remains of how to address past mistakes and inappropriate repairs? This is an especially pertinent question for many historic churches where much of the stone decay has been exacerbated by inappropriate past repairs from the 19th and 20th centuries, especially the use of abrasive or chemical cleaning and the widespread use of cement patches, renders and mortars. Removing these repairs is often necessary because there is severe damage to the physical fabric [Forsyth, 2008, p.2]. However, reversing or “correcting” past interventions also highlights, and may come into conflict with, issues of material and historical authenticity.

The replacement of decayed stone in historic buildings is an accepted practice when the decayed stone compromises the structural stability or protective and weatherproofing ability of the structure. Current conservation ethics, however, firmly look down upon stone replacement for purely aesthetic reasons [Curran et al. 2010; Coulson 2007; Historic Scotland 2005; Ashurst and Dimes 1998]. Can it ever be argued, however, that legibility of the overall decorative scheme outweighs an adherence to strict material authenticity? For historic churches in particular, does the continued religious function create a need for a more flexible approach to ideas of material and historical authenticity? On historic church façades, especially those of

the more highly decorative styles, like Rosslyn Chapel and Mission San José, the ornamental stone and sculptural program can also serve a didactic function. The carved stone and sculpture sends a religious message, often illustrating Biblical stories or themes. Therefore, maintaining the legibility of the original design is critical to maintaining the cultural significance of the monument. Thus, when it comes to the replacement of stone ornament, the conservator is presented with a potentially murky ethical dilemma between respect for the original material and its change over time on one hand and maintaining the artistic unity and legibility of the design on the other. When the ornamental stone straddles the line between pure ornament and functional element, forming an integral part of the building's meaning and cultural significance, what parameters permit its repair and or replacement?

Forster [2010a, p.105] states that these kinds of ethical concepts need to be thought through before conservation treatments are considered or implemented, and that while “definitions of the ethics can be achieved, their application is open to various interpretations.” While a review of the various theories and guiding principles of material conservation available in architectural conservation literature, charters and guidelines helps to establish the common philosophical issues and principles involved in stone conservation, it is the assumption of this dissertation that an in-depth examination of on-going conservation programs on buildings of recognized artistic and cultural significance can help to provide a more meaningful understanding of the common problems and variety of solutions inherent in the conservation of ornamental architectural stonework.

1.2 Historical Debates and Precedents

The various ways in which material authenticity and artistic integrity are balanced in practice can be seen in the range of approaches taken to the conservation of ornamental stonework. While the history of architectural conservation and the development of modern theories and practices is beyond the scope of this dissertation, a brief overview of historic debates on authenticity and legibility and how they have been applied to the conservation of significant stone ornament in the past is useful background for understanding both the concepts that guide the current conservation programs at Rosslyn Chapel and Mission San José, as well as for understanding the past interventions and repairs at each building within an historical framework.

The modern idea of architectural conservation has its roots in the emergence of the concept of cultural heritage in Renaissance Italy. The Renaissance notion of a work of art having value as both an aesthetic object and an historical and cultural document was debated by artists and humanists starting in the 16th century and coincided with a burgeoning fashion for the collection and restoration of ancient sculptures [Jokilehto, 1999, p.16]. Renaissance sculptors were often commissioned to restore ancient statues by reinstating lost elements, such as arms, legs and heads, in order to restore the artistic unity of the artwork, or what Jokilehto [1999, p.25] calls “aesthetic reintegration on the basis of a probable idea of the original form” (Figure 1.1). Some, however, did admire the original work more in its broken state and preferred to leave notable antiquities untouched, avoiding conjectural restoration (Figure 1.2) [Jokilehto, 1999, p.24].

The concept of heritage as it related to art and the built environment continued to develop from Renaissance ideas into the Enlightenment. The 18th century saw the beginnings of attempts to define concepts important to the protection of historic buildings in particular, including an appreciation of the ‘patina’ of old age in architecture and the Romantic notion of a picturesque ruin [Jokilehto, 1999, p.17]. By the beginning of the 19th century, modern concepts of works of art and historic monuments as being “worthy of conservation as an expression of a particular culture and a reflection of national identity” had become a fundamental part of western culture [Jokilehto, 1999, p.17].

19th Century Restoration Debates – Stylistic Unity versus Honest Repair

Modern theories of authenticity and integrity as they relate to the conservation of historic buildings have their foundations in 19th century debates on restoration, often represented through the opposing ideas of the French architect Eugène-Emmanuel Viollet-le-Duc (1814-1879) and the English critic and theorist John Ruskin (1819-1900) [Matero 2006]. Both men saw authenticity in architecture as being embodied in the form and fabric of a building and were concerned with a proper understanding of a building’s history. However, Viollet-le-Duc viewed restoration as a “rational process of information recovery” that aimed for stylistic unity [Matero, 2006, p. 80], while Ruskin [2005, p.353] believed that restoration meant the “most total destruction a building can suffer... a destruction accompanied with false description of the thing destroyed.”

Viollet-le-Duc was responsible for restoration works to many of France’s most notable buildings, including the Cathedral of Notre-Dame in Paris. In his 1854

Dictionnaire Raisonné, Viollet-le-Duc wrote that restoration meant “to re-establish it in a finished state, which may in fact never have actually existed at any given time” [Matero, 2006, p.80]. Thus, at Notre-Dame, he restored statuary and carved stonework damaged or lost during the revolution by adding new figures in a supposedly 13th century style based on fragments found on the site (Figure 1.3) [Jokilehto, 1999, p.147]. Viollet-le-Duc’s theories and projects were widely respected at the time and had an immense influence not only on restoration practices and policies within France, but also on those of other European countries, including Britain. He was more concerned with creating an “architectural unity” and aesthetic and structural consistency with the original design than ensuring the “authenticity” of the original fabric and its change over time [Jokilehto, 1999, p.154; Bell, 1997, p. 3].

For Ruskin, however, the argument against restoration was in a perceived falsification. In his 1849 architectural treatise *The Seven Lamps of Architecture* Ruskin stated that the “marks of [age]” upon historic buildings made them worthy of appreciation. Thus, historical and aesthetic values of ‘patina’ and material truthfulness were valued over the original appearance [Matero, 2006, p.79]. Here Ruskin combines the 18th century picturesque aesthetic with a concern for material fabric, arguing for honest interventions that protected the “authentic character” of a building [Matero, 2007, p. 53]. Ruskin’s ideas were quickly adopted into an anti-restoration movement, which culminated in the foundation of the Society for the Protection of Ancient Buildings (SPAB) in 1877 under the leadership of William Morris. SPAB advocated for “protection” in the place of “restoration,” calling for minimal interference by focusing on preventing further decay through daily maintenance and resisting “all tampering with either the fabric or ornament of the building as it stands”

[SPAB Manifesto quoted in Miele, 1996, p. 52-55]. Where intervention is needed it must be “conservative repair” done honestly, clearly differentiating new from original [Jokilehto, 1999, p.185].

The SPAB mantra of honest repair and clear differentiation of old and new influenced many subsequent leaders in the conservation movement, including Camillo Boito (1836-1914) in Italy. Boito viewed all later interventions and additions to historic buildings as legitimate historic documents and recommended a policy of minimal restoration in which any alterations should be clearly differentiated through the use of “different material, a date, or simplified geometrical forms” [Jokilehto, 1999, p.201-202]. The restoration of the Arch of Titus in Rome from 1817-23, while occurring several decades before SPAB or Boito, is a good representation of this concept of honest repair (Figure 1.4). Here, the architects systematically dismantled and rebuilt the unstable monument, incorporating the original carved marble stonework with new travertine blocks left undecorated, so as “not to mislead the visitor” [Jokilehto, 1999, p.84].

The 20th Century – Argan, Brandi and Artistic Restoration

The concepts of conservation introduced by Morris, Boito and others in the late 19th century had a great influence on 20th century theories, and the destruction and damage to cultural property wrought by the two world wars led to several attempts to reach international agreement on the treatment of historic buildings through the creation of international conservation charters, such as the Athens Charter in 1931 and the Venice Charter in 1964.

Post-war conservation-restoration theories were greatly impacted by the ideas of two influential Italian art historians, Giulio Carlo Argan (1909-94) and Cesare Brandi (1906-88). Argan, who was responsible for the creation of the Central Institute of Restoration in Rome in 1939, for which Brandi was the first director [Jokilehto, 1999, p.223], saw restoration as not simply reintegrating loss, but as a means of “rediscovery of a work of art in its material consistency” through one of two methods: conservative restoration and artistic restoration. The first is what is more generally thought of as conservation, focusing on the consolidation of the material and prevention of decay, while the later is based on the “historical-critical evaluation” of the building as a work of art and aims to “re-establish the aesthetic qualities of the object if disturbed or obscured” by damage, loss, decay or even poor repairs and restorations [Jokilehto, 1999, p.224-5]. However, the idealised stylistic restorations of the 19th century were firmly rejected.

The importance of artistic unity was especially pertinent to conservation after World War II, in which so many historic buildings were destroyed or damaged. One such example is the church of San Lorenzo fuori le mura in Rome, which was severely damaged in the war and extensively rebuilt [Jokilehto, 1999, p.225-6]. The damaged portico was restored by completing missing structural and decorative elements of the cornice in plain marble to distinguish from the original elements (Figure 1.4). Here, while still respecting the original material and differentiating new from old, the integrity of the carved stonework is restored without attempting to recreate the carved elements that were lost.

Brandi presented a modern theory of restoration in which every building should be seen as a unique work of art in which the whole architectural and artistic concept of the building must guide any restoration or conservation program [Jokilehto, 1999, p.231-2]. Brandi [1963 quoted in Jokilehto, 1999, p.233] broadly defined restoration as having two principles. In the first, he rejected the idea that restoration could ever recreate the original state of a building because “only the material form of the work of art is restored.” Secondly, he stated that restoration “must aim to reestablish the potential unity of the work of art, as long as this is possible without producing an artistic or historical forgery and without erasing every trace of the passage of time left on the work of art.” Thus both respect for the original material form and the aesthetic integrity of the building receive equal significance [Matero, 2007, p.53].

Balancing the desire for maintaining artistic unity in an ornamental stonework façade with the practical issues of decay or damage to the original stone fabric, however, can require various degrees of intervention, particularly when that original stone is severely damaged or has been lost. In more extreme circumstances when the stonework is particularly at risk if left *in situ*, it is generally seen as appropriate to remove the threatened or damaged stonework to an indoor environment, such as a museum, for conservation and instate a replica in its place [Jokilehto, 1999, p.296]. This approach has been used for the Romanesque frieze at Lincoln Cathedral in England (Figure 1.6) and for several sculptures on the west front of Reims Cathedral in France (Figure 1.7). While the manner of the decay or loss and the materials used for the replicas varies at each of these sites, they all show a similarity in that maintaining or reinstating the overall unity of the ornamental stonework design plays a fundamental role in the aim of the conservation programs. At both of these sites, the

original carved stonework carries such a high degree of significance that its removal to shelter was thought preferable to keeping the stonework *in situ*. However, the significance of the stonework for the artistic unity of the original setting is such that replacement of the originals with a replica is the favored restoration method.

At Reims Cathedral, the fact that some of the sculptures of the west portals were damaged during WWI has led to debates about how much of the damaged stonework should be reinstated. According to the cathedral's website [Decrock 2008a], the current conservation work on the western façade aims to create “a less ruiniform aspect, more worthy of the grandeur intended by its designers, but at the same time respecting, as closely as possible, its history.” Thus, a difficult balance must be struck between reinstating the artistic unity and “conserving the memory of certain scars.” However, major sculptural figures that were damaged in the war but are also seen as of vital significance for the iconography of the stonework on the façade, such as the Queen of Sheba figure, have been removed and replicated with a copy based on a cast made of the figure in the 19th century, with the justification that to do otherwise “would be detrimental to the appearance and the understanding of the ensemble” (Figures 1.8 and 1.9) [Decrock 2008b]. The conservation approach, in this case, is to value both the original stonework as an historic object by removing it to a protected environment, while at the same time reinstating the unity of the sculptural program on the façade in order to ensure legibility of the original design.

Reims is an unusual case, in that so much of the stonework was highly documented through photographs and casts in the 19th century before it was damaged in the war. When no documentation exists for the original appearance of ornamental stonework

that is to be replaced, a more artistic approach to replacement stone is sometimes taken. Approaches vary from creating an original design while following historical precedents or styles, such as some of the replacements carvings in the Romanesque frieze at Lincoln Cathedral (Figure 1.6) [Lincoln Cathedral 2011], to more extreme modern installations as seen at the 12th century choir of the Church of St. Jean-Baptist in Bourbourg, France (Figure 1.10) [Architecture Today 2009]. In these cases, the new work is seen as adding a new cultural significance to the building through the creation of a new artistic element, while at the same time reinstating the decorative and artistic legibility or wholeness of the ornamental program.

As this brief overview demonstrates, the approaches to the conservation and restoration of ornamental stonework have varied greatly in the past. How the ornamental stonework contributes to the artistic and historical significance of the building, how the stonework has been treated in the past, and the current condition of the stonework are all important factors that help shape the conservation and restoration strategies for each building, as will be seen in an analysis of the current conservation programs for Rosslyn Chapel and Mission San José.

Chapter Two

First Case Study – Exterior Stone Ornament at Rosslyn Chapel

2.1 Introduction to Rosslyn Chapel

Rosslyn Chapel, formally known as the Collegiate Church of St Matthew, is one of the most important late medieval monuments in Scotland and sits just outside the village of Roslin in Midlothian, some seven miles south of Edinburgh [Maggi 2008]. The chapel was founded in 1446 by William Sinclair, third Earl of Orkney, and was constructed with local grey, buff, yellow and red sandstones. Planned as a grand church with choir, nave and transepts, construction ceased after the building of the choir, most likely after the Earl's death in 1484, resulting in the current modest-sized, aisled, rectangular plan chapel (Figure 2.1) [McWilliam, 1978, p.409].

As little is known about the design and construction of the building, speculation abounds as to the source or inspiration for the design and all of its ornamental carvings. While some art historians have suggested a Portuguese or Spanish influence because of the sumptuousness of the carvings, most interpretations point to France as the ultimate source of inspiration for the style of the chapel, especially the more flamboyant exterior treatment of late gothic French churches that William Sinclair very well may have seen on his travels to France in the 1430s [Fawcett, 2011, p.269]. Whatever the model or models for the chapel, the masons at Rosslyn gave the building such a rich degree of carved detail, both internally and externally, that makes it unique among Scottish medieval architecture [Fawcett, 2011, p.270].

On the exterior, the volume is divided into bays by projecting buttresses decorated with canopied niches that terminate in highly ornamented square pinnacles and pyramidal crocketed finials which in turn are connected to another series of pinnacles at the level of the clerestory by decorative flying buttresses (Figure 2.2 and 2.3). Both the north and south façades are characterized by entrance porches with an arched canopy spanning the buttresses on either side that is decorated with two large, projecting gargoyles, and a segmental triangular window above (Figure 2.4). Two-light, pointed-arch windows with various tracery designs, niched jambs and a profusion of foliate carvings punctuate the walls at ground level with a sill course and a heavy base-course below (Figure 2.5). At the upper level, the clerestory windows are less ornate, having no tracery or niches, but do have hood-moulds enriched with stylized floral carvings that continue as stringcourses between the windows. A large two-light window with 19th century tracery fills the east end of the clerestory level. The west end of the chapel shows the remains of what would have been the east end of the transept walls, had the church been completed as originally planned by William Sinclair. Various carved elements are still in place, including corbels for the retables, parts of the altars, aumbries and piscinas, as well as carved shafts with elaborate foliate capitals around the blocked archways (Figure 2.6). A two-storey, narrow addition of 1880 by Andrew Kerr stands somewhat awkwardly in the centre of the western façade and forms a small baptistery, vestry and organ loft [The Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS), 1929, p.99].

While Rosslyn Chapel is most famous for the sumptuous and abundant carvings on its interior surfaces, the exterior of the chapel also reveals a wealth of carved detail. The

majority of the ornament is concentrated at the windows, buttresses and pinnacles, as well as the two exterior doors (Figures 2.3 – 2.5). Various stylized foliate and floral patterns, or paterae, run along the wall-heads, windows and buttresses, while the arches of the flying buttresses are decorated with a carved dogtooth pattern. The niches along the buttresses have various degrees of ornamentation. The pinnacles and finials are richly treated, with a mixture of foliate, floral and geometric carvings (Figure 2.4). The cornice of the high wall-head is decorated with carved shields displaying the engrailed cross of the St Clair family, interspersed with grotesque heads that project as gargoyles above the flying buttresses (Figure 2.7), and on the north side, with carved letters that tell us “William Lord Sinclair Fundit Yis College Ye Zeir of God 145-” [RCAHMS, 1929, p.100]. In addition to the grotesque heads on the upper cornice, and the large projecting gargoyles at the north and south porches, various other small fantastic and bizarre figures can be found on the exterior.

Abstracted animal and human figures, angels playing musical instruments, green men, and hands holding foliage appear on the entrance porches, window moulds, jambs and on the buttresses in the ground and upper levels (Figure 2.8).

Much of the external carving at Rosslyn Chapel is well above eye-level, and it is only when one is at the level of the clerestory and close to the pinnacles and other carved surfaces that the true extent of how much detail and work went into ornamenting the exterior of the chapel is apparent. Today, much of the deep, three-dimensional quality of the carving, particularly around the top of the pinnacles, is difficult to discern from the ground, particularly with the black crusts that have enveloped much of the sandstone. However, the wealth of ornamentation is striking and even after centuries of deterioration, the level of carved detail is still impressive.

2.2 Conservation History

Rosslyn Chapel, like many churches of its period, suffered from vandalism and neglect following the Reformation. In 1592, the altars of the chapel were demolished and worship discontinued. However, the main structure of the church remained stable. Nothing else is known about the chapel's history until the 1730s and 40s, when General James St. Clair hired the architect and carpenter John Baxter the elder to install glazing at the windows and add a sloping roof over the side aisles, which partially obscured the clerestory windows [Maggi, 2008, p.7].

19th Century Restorations

In 1837 the third Earl of Rosslyn set out to extensively restore the then-ruinous chapel. The earl first focused his attention on the building's exterior, hiring the architect William Burn, who carried out repairs through the mid-1840s [Maggi, 2008, p.89]. The project aimed at arresting the decay of the building and included the removal of the eighteenth-century sloping roof over the aisles and the refitting of the doors and windows, including the opening of the large east window, which had been partially built up, and removing the vegetation growing along the walls (Figure 2.9) [Maggi, 2008, p.90; Turnbull, 2007, p.75]. According to an 1836 letter held in the National Archives of Scotland [GD 164/1013], the Earl requested that Burn provide proposals for re-roofing the chapel and repairing one of the pinnacles. Unfortunately, it is not clear if the repair of the pinnacle was carried out and what, if any, stone repair was completed elsewhere on the exterior.

Burn's work at Rosslyn was not met with universal approval. The chapel had been open to the elements for many years, and its ruinous, lichen and moss covered interior

and exterior had become a romantic icon in the Scottish landscape, beloved by many as a picturesque monument “beautifully tinted with all the variegated blotches and incrustated vegetation can bestow” (Figure 2.10) [Maggi, 2008, p.90]. The most outspoken critic of Burn and the restoration was the artist David Roberts, who had sketched and painted many images of the chapel (Figure 2.11). Roberts believed the proposed repairs would destroy the peculiar “combination of light and shade” and the “solemnity of the place” [Quoted in Maggi, 2008, p.93]. Roberts was not simply worried about the building losing its picturesque quality; he firmly believed that the vegetation was helping to preserve the stonework and by drying up the vegetation on the interior with increased airflow and proper glazing, Burn would cause a more rapid decay of the carved stone [Maggi, 2008, p.93]. While Robert’s view does not align with modern conservation practices, it is important to note that his was not an uncommonly held opinion. William Burn’s repair program was, after all, happening as the great restoration debates of the 19th century were beginning. Roberts and the “wild nature lover” faction were in direct opposition to Lord Rosslyn, Burn and the “building lovers” who, with a growing archaeological interest in medieval architecture, wanted to see the chapel protected from further decay [Maggi, 2008, p.100].

In 1860, Burn’s former partner David Bryce took over the restoration campaign at Rosslyn and focused his efforts on the interior in order to bring the chapel back into use as a place of worship [Turnbull, 2007, p.79; Maggi, 2008, p.7]. The historical records make it unclear precisely what work Bryce carried out, although it is known that he added a coal-fired heating system, had some of the interior stonework re-carved or replaced, such as the base of the apprentice pillar, cleaned the stonework of

biological growth with an acid solution, added new altars in the lady chapel, and modified the stairway to the crypt [Maggi, 2008, p.118]. Comparisons of depictions of the chapel both before and after Bryce's work show a new crispness and definition to some of the carved elements, suggesting his re-tooling and replacement of some of the pieces (Figures 2.12-2.13) [Maggi, 2008, p.120]. On the exterior, Bryce replaced the worn stonework at the south porch, including the base and shafts of the columns around the archway, as a photographic comparison shows (Figures 2.14-2.15) [Maggi, 2008, p.123]. Any other repairs to the exterior by Bryce are unclear, as there is little documentation. What we do know, however, is that Lord Rosslyn was in full support of replacing decayed stone where Bryce felt it necessary. In a published response to criticism of the project, the Earl argued that the work was in full respect of the original fabric, and that no original carved stone "has been or will be removed, except to be replaced with an exact *fac simile*" where necessary [Quoted in Maggi, 2008, 126]. Bryce's project, like Burn's before, caused much debate about restoration, and about the relative harm or good that the work was doing for the chapel's fabric. Numerous anonymous letters appeared in various national newspapers, arguing both for and against the restoration work. Some critics still saw the restoration as a destruction of the chapel's picturesque quality, but others also accused Bryce of attempting to make the chapel look new, destroying its originality by replacing some of the carvings with "lifeless copies" [Maggi, 2008, p.129].

Between 1953 and 1957, the Ancient Monuments Branch of the Ministry of Works (later Historic Scotland) oversaw a series of repairs on the chapel that had a significant impact on the fabric of the building. The project included a renewal of the asphalt roof, which had been installed in 1915, internal stonework "cleaning and

preservation,” which included the use of a lime-wash and stone-hardening chemical consolidant on all the interior stonework, and repairs and “preservation treatment” to the external walls and ornament that included significant amounts of cement mortar re-pointing [Turnbull, 2007, p.88; Nicolas Boyes Stone Conservation (NBSC) 2005]. According to Nicolas Boyes [Interview, 16 June 2011], the current stone conservator working on the chapel, the ministry’s approach was “almost right,” in that they were attempting to address the leaking roof, the biological growth covering the chapel ceiling and the decaying stonework and open mortar joints. However, they were working with “the wrong materials,” namely the asphalt roof that trapped moisture and the use of an impermeable lime-wash and cement coating on internal stone surfaces and cement mortars on the exterior joints, that have now led to significant decay issues. In 1997, the decision was made to place a large, temporary metal canopy over the chapel in order to allow the moisture-laden building to dry out and a conservation plan for the chapel to be instated (Figure 2.16) [Turnbull, 2007, p.90].

2.3 Current Conservation Program

The current exterior conservation program at Rosslyn Chapel began in 2009 and is anticipated to reach completion in early 2013. This is the first substantial conservation program for the exterior of the building [Boyes, Interview, 16 June 2011] and is being carried out by Nicolas Boyes Stone Conservation of Edinburgh with project architects Page & Park Architects of Glasgow. The treatment program is based on a Conservation Assessment Report completed in 2005, which was produced following a detailed survey of the fabric conducted over four weeks in February and March 2005. The decay issues and treatment approaches discussed below are summarized from the 2005 report, unless otherwise noted. The survey divided the exterior walls of the

chapel into numbered bays and references below to specific sections of the stonework on the chapel's façades will follow this labeling system (Figure 2.17).

Decay Issues

The main decay mechanisms affecting the exterior ornamental stonework on Rosslyn Chapel are three of the most common types of decay mechanism seen on historic stone buildings – water infiltration, heavy soiling and inappropriate past repairs, namely the use of cement pointing. Weathering relating to water ingress is to be expected on a building such as Rosslyn, especially because of the nature of the naturally porous and soft sandstone, as well as the many areas of carved stonework that are exposed to the elements. However, with the loss of original mortar in many of the construction joints, water has been able to saturate the stone over a long period of time, accelerating the rate of decay. Loss of mortar in the joints has also led to serious instability of some of the stone elements, especially the highly carved buttress finials. One of the major threats to the carved stonework is the dark environmental pollution soiling and crusts that obscure much of the carved surfaces and are causing significant preferential erosion (Figure 2.18). Additionally, inappropriate past repairs, chiefly the use of Ordinary Portland cement (OPC) mortar has also resulted in an accelerated rate of decay in much of the carved stonework (Figures 2.19-2.20). The main decay mechanisms identified by the 2005 report are summarized in Table 1 and are described in greater detail in Appendix A.

The north and south façades show varying weathering and decay patterns mostly due to the fact that the south façade receives most of the prevailing weather, as well as the most dramatic thermal changes throughout the year. The more severe weathering of

ornamental detail is visible along this façade. However, the north façade, because it is more sheltered and receives less direct sun, has more biological growth and dark pollution crusts [N. Boyes, Interview, 16 June 2011].

Table 1. Rosslyn Chapel Exterior Stonework Decay Mechanisms and Treatments

Decay Issue	Treatment
OPC Pointing Mortar	Remove 100% and re-point with compatible lime mortar
Open Construction Joints	Clean open joints and re-point with compatible lime mortar
Environmental Pollution Soiling	De-soil with wet treatment and Phoenix Conservation Laser system
Disaggregation	Consolidate with Paraloid B72 acrylic resin in acetone
Delamination	Consolidate with Paraloid B72 acrylic resin in acetone
Contour Scaling	Consolidate with Paraloid B72 acrylic resin in acetone
Cracks	Consolidate with Paraloid B72 acrylic resin in acetone; Larger voids to be filled with acrylic resin based repair mortar
Oxide Jacking of Ferrous Elements	Remove ferrous element and replace with stainless steel element set in a thixotropic polyester resin
Insecure Fragments	Reconstruct and secure with stainless steel dowels set in a thixotropic polyester resin
Structurally Insecure Finials	Lift and re-bed in compatible lime mortar
Biological Growth	Remove with wet treatment
Bat/Bird Guano	Remove with wet treatment
Woody Vegetation	Remove all plant and root material

Treatment Plan

The aim of the conservation treatment is to halt the decay of the exterior stonework as much as possible by addressing the insecure stonework, the inappropriate OPC mortar repairs, water infiltration and the damaging environmental pollution soiling on the

stonework. The treatment plan was divided into two basic stages – prioritised work to be completed first, followed by more general conservation treatments to the stonework to be completed in a bay-by-bay schedule [N. Boyes and M. Mitchell, Interview, 16 June 2011]. The prioritised work on the exterior stonework included securing all insecure or loose fragments with stainless steel dowels set in small amounts of resin and securing the structurally insecure buttress finials. This involved systematically lifting or deconstructing each finial and then re-bedding the stone with a compatible lime mortar as many of the construction joints were almost completely devoid of mortar (Figures 2.21 – 2.22). Damaging ferrous dog cramps within the stonework were also removed and replaced with non-ferrous (stainless steel) cramps where necessary and any adjacent stonework damaged by the ferrous elements was consolidated (Figure 2.23).

While a significant amount of structural intervention was needed for the insecure fragments, particularly the south façade finials, it is important to note that no missing ornament or details are being replaced or re-instated with new stone [Boyes, Interview, 16 June 2011]. Any voids that exist between re-attached and stabilized fragments are to be filled with a lime based repair mortar designed specifically to be sympathetic with the adjacent stonework. The main concern is in preventing moisture ingress into voids between stone elements and surfaces. The emphasis of the work is on “preserving the existing stone carvings, not replacing them” [Rosslyn Chapel: A Treasure in Stone 2010]. However, there are a few instances in which new stonework has or will be used, although only for structural reasons. According to the 2005 report, where there is significant loss of stone as a result of oxide jacking of the ferrous elements, and any fractured or fallen stone cannot be reinstated, the decayed stone

will be cut back to a sound substrate and the original profile of the stone reinstated by inserting a matching carved indent of replacement stone. The most significant use of replacement stone, however is the large section of damaged and structurally insecure stone tracery in the east window that has been replaced with new stone carved by a stonemason on site at Rosslyn to match the historic tracery, which itself dates from a 19th century repair (Figures 2.24 – 2.25) [Rosslyn Chapel: A Treasure in Stone 2010].

The current phased approach of the conservation work involves treating each individual stone block or element in a bay-by-bay approach. This allows a very careful and in-depth stone-by-stone analysis and treatment (Figure 2.26). As of a 16 June 2011 site visit, the conservators had completed treatments to the pinnacles and buttress between bay N5 and N6 on the north façade (Figure 2.35) and were in the process of treating the pinnacles and buttress of bay S5 and S6 on the south façade (Figures 2.27 – 2.28).

One of the main obstacles in the conservation treatment was how to handle the heavy soiling on the carved stone. Due to the harmful effects of chemical and abrasive stonecleaning on many Scottish buildings in the past, Historic Scotland now has a policy that strongly discourages cleaning of stone [Maxwell 2005]. Stone should never be cleaned or “de-soiled” for purely aesthetic reasons. It must be proved that de-soiling is necessary on structural and fabric stability grounds [N. Boyes, Interview, 16 June 2011].

In the case of Rosslyn’s exterior carved stonework, the dark pollution crusts are a major contributor to preferential erosion of the soft sandstone. Therefore, de-soiling

of the stonework in this case has been permitted. The de-soiling process involves a careful wet treatment to desalinate the stonework and soften the biological growth for removal with a steam cleaning process [N. Boyes, Interview, 16 June 2011]. The dark pollution crusts are then carefully removed using a Phoenix Conservation Laser System (Figure 2.29 – 2.31). This method has become an accepted treatment for cleaning environmental soiling, especially for delicate surfaces such as stone sculpture and carved ornament, and is much preferred over other methods like abrasive and chemical treatments because it is less invasive, more easily controlled and targeted and produces little to no waste [Doehne and Price, 2010, p. 31]. After the de-soiling, any underlying stone that is found to be disaggregated or friable will then be consolidated with the resin techniques described below.

All of the harmful OPC pointing mortar is being removed from the stone surfaces and construction joints and re-pointed with a lime mortar (Figure 2.32 – 2.33).

Appropriate mortars are mixed on site to match the color and texture of the adjacent stonework, and their composition is based on mortar analysis of the existing historic bedding and pointing mortars [N. Boyes, Interview, 16 June 2011]. For small areas (2mm or less) of active disaggregation, delamination and scaling, or for small cracks and fissures in the stonework, an acrylic resin solution will be used to consolidate the stonework (Figure 2.34). For areas of larger voids (wider than 2mm), the stone will be consolidated with an acrylic resin based repair mortar. The repair mortars are designed to be sympathetic to each specific area of damaged stone, in terms of color, texture and durability. It is important that the repair mortar is less durable than the adjacent stonework and acts as a “renewable sacrificial element in order to protect the vulnerable host stone against the effects of preferential weathering” [NBSC 2005].

While this is a labor-intensive process, precision in matching the repair mortar to each individual section of stonework will ensure the greatest possible compatibility between the stone and the mortar repair.

Natural weathering, preferential erosion, loss of bedding and pointing mortars and the use of OPC mortar repairs in the past have all contributed to a loss of carved detail on the exterior of Rosslyn Chapel. However, the treatment plan is a conservative one and only involves stabilizing the exterior stonework and not reinstating any lost or heavily decayed ornament. The goal is to preserve the stonework with as little visible intervention as possible, and at the end of the project, the stonework should not look visibly renewed [M. Mitchell, Telephone Interview, 10 June 2011]. While, it is clear that the removal of the pollution crusts will somewhat change the appearance of the stonework by removing the dark staining and making the carved detail more perceptible from the ground (Figure 2.35), the weathered appearance of the stonework will remain in place.

Chapter 3

Second Case Study: Carved Façade of Mission San José

3.1 Introduction to Mission San José

Mission San José y San Miguel de Aguayo, commonly known as Mission San José, is the largest of the five former Spanish Colonial mission compounds in San Antonio, Texas. Franciscan missionaries established the missions in the 18th century as part of a chain of settlements that dotted the northernmost borders of New Spain (Figure 3.1) [Quirarte 2002; Fisher 1998].¹ The present large, single-aisled, Baroque-style church of Mission San José was built of locally quarried, soft, buff-colored limestone and was constructed between 1768 and 1782 by a variety of master masons from central New Spain (Mexico) (Figure 3.2 and 3.3) [Quirarte, 2002, p.65; Ivey, Thurber and Escobedo 1990].²

The façade of Mission San José is one of the most significant features of any of the Texas missions because of the intricate level of detail and relief in its carved limestone, which rivals many of its contemporary churches in more populous regions of New Spain [Quirarte, 2002, p.72]. The double-height façade frames the entrance doors to the church and contains a wealth of carved floral and vegetal ornament intertwined with cherub figures, as well as six larger sculptures of various saints (Figure 3.4). The façade is visually divided in half by a large projecting cornice that forms a shallow balcony just below the central oval window. On the upper level of the façade are three large sculptures, with St. Joseph, the mission's patron saint, above the window flanked by angels, and St. Francis of Assisi to the right of the window and St. Dominic to the left. On the lower level, sculptures of St. Anne and St. Joachim flank

the entrance door, while above the door carved in relief is a figure of the Virgin of Guadalupe with several cherubs at her feet.

The stylistic character of the carvings is consistent with the prevailing Baroque style in New Spain (Mexico) in the mid 1700s, with its turned-down spirals, scalloped shell patterns, flowing vegetal forms, niche pilasters and pendants [Ford, Powell & Carson (FPC), 2003, p.24]. In addition to the nearly freestanding sculptures of saints, the relief at San José is often carved in a three-dimensional manner, with some of the floral elements and cherub figures projecting outwards (Figure 3.5). This level of detail and deep carving is made possible by the soft, fine-grained nature of the limestone, which was taken from a small quarry within the grounds of Mission Concepción, just a few miles north of San José [Myjer 2010]. Additionally, the exterior limestone rubble walls of San José that surround the central carved façade were originally covered in a thick lime render that was whitewashed and decorated with an intricate polychrome pattern of geometric and floral motifs, adding a further decorative element to the exterior (Figure 3.6) [Quirarte, 2002, p.86].³

Both during and after San José's construction, many contemporary visitors to the region noted the church for its outstanding beauty and architectural ornament. In the 1780s, Fr. Juan Agustín Morfi remarked on the great cost of the building "because of the sculptures and ornaments with which it was heavily decorated" that gave "much majesty to the building" [Quoted in Quirarte, 2002, p.72-3]. The complexity and quality of such work is all the more significant considering that this was a colonial mission church in a distant region with little to no skilled labor available locally [Quirarte, 2002, p.73].

3.2 Conservation History

The fabric of Mission San José was threatened relatively quickly after its completion [Fisher, 1998, p.3]. While much of the mission complex fell into disuse after it was secularized in 1824, the church itself continued to be used by the local population as their community church until the 1840s [Fisher, 1998, p.13].⁴ Yet by mid-century the building suffered from a combination of human neglect and vandalism (Figure 3.7). From 1841 to 1850, the building was used to quarter US cavalry soldiers, who reportedly used the sculptures of the façade for target practice on several occasions, damaging some of the carved elements [Quirarte, 2002, p.75]. While accounts and written descriptions of the building from this time highlight its derelict state, many were still greatly impressed by the building and saw the “surpassing workmanship” of the carved façade as one of the “best pieces of ancient architecture in this country,” despite it being constructed less than a century before [Quirarte, 2002, p.76-9]. Although still owned by the local Catholic diocese and reoccupied for religious use in 1859, the church continued to deteriorate. In 1868 the north wall of the church partially collapsed and by 1874 the dome had fallen in, forcing religious services to be relocated to the sacristy (Figure 3.8) [FPC, 2003, p.4-5].

Despite these collapses, the central carved façade remained standing throughout this era of neglect and became one of the area’s top tourist attractions. However, the destructive habits of treasure seekers, who regularly stole pieces of limestone from the walls to sell to passing tourists, further undermined the building’s structural integrity and resulted in significant damage to the statuary and relief of the façade [FPC, 2003, p.25]. By the end of the century, several statues were missing arms and heads, or in

the case of the St. Anne figure the entire upper half of the sculpture, while structural cracks are also visible (Figure 3.9). The remaining statuary/relief carving had begun to lose its crisp edges and take on a noticeably dark appearance from environmental soiling.

The first serious efforts at protecting and restoring San José came in the early 20th century. Fearful for the future of the city's Spanish Colonial structures as urban expansion rapidly encroached and encouraged by a growing awareness of their historical and architectural significance, as well as the burgeoning popularity of the Spanish Colonial Revival and Mission Revival styles in the United States, local interest groups and Catholic Church officials began to restore Mission San José and the other San Antonio missions [Fisher 1998]. In 1917 temporary bracing was provided for the western elevation to prevent further deterioration of the cracking in the façade [Quirarte, 2002, p.82] (Figure 3.10). Over the next twenty years, some small restoration projects were carried out by the Catholic diocese, including a few attempts at re-pointing parts of the façade in cement mortar [FPC, 2003, p.5]. In the 1930s work was undertaken to completely restore the building, following a serious collapse in 1928 that destroyed most of the bell tower [FPC, 2003, p.7]. Between 1928 and 1937, under the auspices of the Works Progress Administration, the San Antonio Conservation Society and the Catholic Archdiocese, the church's north wall, dome, and bell tower were reconstructed, giving the carved façade greater stability (Figure 3.11) [Quirarte, 2002, p.84; FPC, 2003, p.7].⁵

1948-9 Façade Restoration

In 1948, a local sculptor, Ernest Lenarduzzi, was hired by the Archdiocese to undertake the first substantial restoration of the carved stonework on the façade (Figure 3.12 and 3.13) [Quirarte, 2002, p.84; FPC, 2003, p.26]. According to the contract for the work, Lenarduzzi's approach to the project was to recreate elements that had been lost or damaged, specifically the larger figural sculptures, with a mixture of new stone and cement mortars and patches [Myjer 2010; FPC, 2003, p.27]. However, he made it clear that he would “not remove or destroy any of the stone or sculpted work” that was original [Quoted in Myjer 2010]. While some replacement carvings were based on photographs and documentation of the missing originals, such as the upper portion of the St. Anne figure, other elements were replaced with less careful attention to the originals, such as the floral element to the left of St. Joseph (Figure 3.16). Some elements that had been lost over time, including much of the floral elements on the lower portion of the façade were not replaced, although it is unclear why these were left untouched. While costs may have played a role, it may also be that Lenarduzzi did not consider these elements as critical to the overall legibility of the carved façade or that the decayed appearance of these more peripheral carved elements were valued as representing the age of the building. Myjer [2010] argues that Lenarduzzi's restoration was an attempt to “restore the imagery and meaning” of the sculptural program of the façade by reinstating major gaps in the original design and that it achieved a “respectable balance between recreating missing elements and acceptance of the effects that time had on the original stonework” [Myjer 2010].

In the 1980s, the statuary had begun to show evidence of new deterioration. A large

crack had developed along the southern edge of the carved façade requiring grouting and the left arm of the St. Joachim statue detached. A stabilization program was put in place in 1986 to address the needs of the façade, including re-pointing of various joints and mortar patches on the carved stone, as well as a system of routine and preventative maintenance [FPC, 2003, p.27]. In 2003, a comprehensive conditions assessment of the church was carried out, which reported that the carved façade was in need of a series of critical repairs.

3.3 Current Conservation Program

The conservation of San José's carved façade began in 2009 and has undergone two phases of a planned three-phase program that is expected to reach completion in the spring of 2012.⁶ The work is being carried out by Building and Monuments Conservation of Arlington, Massachusetts, led by stone conservator Ivan Myjer, and is being overseen by project architects Ford, Powell & Carson Architects & Planners of San Antonio. It is based on two detailed surveys carried out in February and April 2009 that resulted in a comprehensive treatment plan developed in January 2010 (Figure 3.14). The decay issues and conservation and restoration treatments described below are based on those outlined in Myjer's January 2010 Conditions Assessment Report, unless otherwise indicated.

Decay Issues

The initial survey of the façade revealed a variety of decay issues affecting the elaborate carved stonework, some of which required immediate attention, including serious structural cracks along the head of the statue of St. Francis that posed a

potential falling hazard. The decay mechanisms identified by the survey are summarized in Table 2 and described in more detail in Appendix B.

Table 2: San José Façade Decay Mechanisms and Treatments

Decay Issue	Treatment	Treatment Phase
Water Infiltration	Improve water shedding at top cornice and drainage at ground level; re-point open joints and other areas of ingress	All
Biological Growth	Clean with water and biocide	Phase I
OPC Pointing and Repair Mortars	Remove and re-point	Phase I & II
Open and Failing Mortar Joints	Re-point with lime mortar	Phase I & II
Stone Loss	Re-instate with stone indent	Phase II & III
Structurally Insecure or Loose Stone	Stabilize with stainless steel pins and grout	Emergency Stabilization & Phase I
Cracked Units of Stone	Consolidant / Injection grouts / Lime mortar	Phase I & II
Delamination	Consolidants and pinning	Phase II & III
Exfoliation, Flaking and Salt Crystallization Damage	Consolidant; Poulticing (de-salinization)	Phase II & III
Staining Relating to Rising Damp	Improve water shedding and drainage	Phase III
Contour Scaling	Consolidant / Injection grouts	Phase II & III
Inappropriate Past Replacement Carvings	Recarve or replace to better match historic profiles	Phase II & III

Like Rosslyn Chapel, the main decay mechanisms at San José are caused by water infiltration and preferential erosion due to inappropriate past repairs in OPC pointing mortar. However, San José also has several areas of ornament that were executed in cement and were created to infill missing original carved stone detail during the 1949 restoration (Figure 3.15). Additionally, there are a few areas of replacement stone carvings from 1949, including sections of the figural sculptures and floral motifs, that are considered by the project team to be out of character with the original carvings

and therefore detracting from the original artistic integrity of the sculptural program (Figure 3.16). While the hard, cement mortar patches need to be removed because they are causing accelerated decay to the adjacent limestone, areas of perceived inappropriate replacement stone carvings are a more difficult problem to solve. However, it is clear that many of these decay issues and past interventions, including missing sections of carved stonework and elements of the sculptures, failing previous repairs, dark cement patches, large areas of dark staining/biological growth, and replacement carvings from the 1949 repair do create visible interruptions to the coherency of the façade.

Water infiltration is responsible for a number of decay mechanisms, as falling damp from periods of heavy rain and insufficient water shedding details has led to increased weathering of the limestone. The areas where moisture tends to remain longer, particularly beneath projecting details, are significantly more decayed than areas that are able to properly dry out after heavy rainfall due in part to the swelling of inherent clays in the limestone that can cause structural cracks and failures in the stone (see Appendix B) (Figure 3.17). Water also enters the stonework through open construction joints and is often trapped in the stone because of the impermeable cement mortars. The lower portion of the façade is affected by both falling damp and rising damp, due to inadequate drainage at the base of the façade. The wetting and drying cycles associated with rising damp, however, are responsible for the concentration of salts just below the surface of the stone in the lower few feet of the façade (Myjer, personal communication, 13 July 2011). Therefore, the conservation program seeks to reduce the amount of water that is able to enter the stonework,

through improved drainage and water shedding, as well as infilling open construction joints and removing hard, impermeable OPC mortars.

Another significant cause of water infiltration is the loss of the painted lime render that originally covered the façade walls on either side of the central carved portion. Significant traces of this render remained on the walls in the twentieth century, but during the various repair schemes of the 1930s and 40s, the decision was made not to re-instate it, and since then all but a few minor traces of the render have washed away (Figure 3.18 and 3.19). The render played a vital role in protecting the porous, soft limestone and the joints between the carved central portal and the flanking ashlar and rubble walls by acting as a sacrificial and renewable coating. Without this protective render, water that saturates the ashlar and rubble walls is able to flow laterally into the sections of carved, ornamental stonework.

Treatment Plan

The treatment for the façade follows two basic lines of approach – conservation treatment and restoration. Myjer [2010] defined the conservation treatment scope as “those steps necessary to stabilize and preserve the original stonework,” while the restoration scope are “those steps that help preserve the intent and meaning of the design.” Thus, ensuring the continued survival of the stone material through halting decay and reversing damaging earlier repairs is an essential part of preserving the significance of the façade’s design.

One of the initial steps of the conservation treatment carried out in Phase I was the removal of dark biological growth covering much of the carved detail on the façade

with a diluted biowash (Figure 3.20). While the biological growth was obscuring the detail of the carved ornament, it was also potentially obscuring the severity of the damage and decay on the stonework. In addition to allowing the decay issues of the stonework to be better assessed, cleaning the façade has had a noticeable aesthetic benefit and makes the carved ornament of the façade more legible for visitors.

Stabilization of loose or structurally insecure elements was another initial treatment step in the conservation program. A crack running along the head of the St Francis figure was considered to be the most immediate problem and an emergency stabilization was carried out on the figure in April 2009 using a temporary wire restraint and a small amount of acrylic resin (Figure 3.21) [FPC 2009]. During Phase I, two stainless steel cramps were installed to secure the cracked upper south volute (Figure 3.22) and the torso of St. Francis was stabilized with a lateral stainless steel tie-back (Figure 3.23). Additionally, two small areas of projecting carved ornament that had become cracked and unstable were secured with stainless steel pins (Figure 3.24). In Phase II, the head of St. Francis and the upper south volute were taken down and more permanently re-secured with internal stainless steel pins (Figure 3.25).

Before the conservation began, areas of the façade that constituted surviving original carvings, 1949 replacement carvings, original lime mortar and later cement-based pointing and patching mortars were identified (Figure 3.26). Once these elements were clearly identified on each zone of the façade, a treatment plan for each section was determined. According to Myjer [2010], in order to “stabilize and preserve all remaining areas of original stone as well as some select areas of the 1949 restoration” they must remove “those components of the prior restoration projects that have failed

and/or are detrimental to the original stone.” The primary damaging component of the prior restorations is the hard, impermeable pointing mortars. During Phase II, all OPC pointing mortar was removed from the upper façade and all open construction joints were re-pointed with a feebly hydraulic lime mortar that closely matches the existing original mortar (Figure 3.16 and 3.31). The same treatment will be used in Phase III for the lower portions of the façade (I. Myjer, personal communication, 13 July 2011).

Additionally, the areas of hard cement patching mortar on various elements of the carved stonework were removed and replaced with a more compatible material. For smaller or shallow patches, a compatible lime mortar patch was instated (Figure 3.27). However, for larger voids, a stone indent was installed using a compatible soft Texas limestone (Figure 3.28). Some areas of failed cement patching in more significant carved elements, such as the skull held by the figure of St. Francis, were also replaced with stone indents (Figure 3.29).⁷ These indents were installed and grouted with lime mortar and are therefore completely reversible. The lime mortar and replacement stone were selected based on mortar and stone analysis carried out in 2009.

A number of locations where the original stone was either delaminating in thin layers or scaling were injected with an acrylic resin and capped with a resin-based lime mortar to fill the void and provide some adhesion between the substrate and the separating layer of stone [FPC 2010]. Smaller cracks on projecting elements were filled with the acrylic resin based lime patching mortar. Some areas of delamination and larger cracks were also stabilized with the use of stainless steel pins set in a reversible epoxy.

Minimizing water infiltration and saturation of the carved limestone is another important step in the conservation program. During Phase III, the failed cement wash at the top of the upper cornice of the façade is to be removed and the water shedding feature improved with either a new wash or flashing that will direct most of the rainwater back to the roof, to where it can be directed through the rainwater goods. The goal is to ensure the detail is not visible from the ground so as to not detract from the original appearance of the façade. The drainage at the base of the façade will also be improved, through coordination with the project architect, to avoid any standing water that can contribute to rising damp in the lower sections of the façade.

The most significant way in which the façade can be protected from water infiltration, however, is through reinstating the lime render that originally protected the porous limestone walls. While the render is arguably a necessary preventative conservation treatment that can help ensure the long term preservation of the carved façade as well as the porous rubble masonry walls, reinstating the render to the whole of the west wall would dramatically change the appearance of the building by covering the yellowish, rubble limestone walls with a smooth, lighter finish. Currently, a decision on the extent that the render will be reinstated has yet to be made. However, it is probable, pending approval from the Texas Historical Commission, that the render will be reinstated immediately either side of the carved façade to a minimum width of ten feet. Reinstating the lime render will inevitably change the appearance of the façade, but it will more importantly ensure adequate protection of the carved stonework and help to reinstate an original feature of the façade.

The other major aspect of the treatment program at San José is carrying out restoration steps that address elements that are perceived to interrupt and detract from the artistic integrity and aesthetic coherency of the façade, specifically several of the stone replacement carvings from the 1949 restoration as well as the iron balcony rail installed in the 1930s.⁸ The restoration goals include re-carving of elements that are considered out of proportion or stylistically incompatible with the adjacent original work. However, it is important to note that the treatment does not propose to reinstate any lost original carvings that were not repaired in the 1949 restoration or have been lost since. These include some of the areas of projecting carved detail, like at the base of the oval window, as well as all the majority of the lower sections of the façade (Figure 3.30). Thus, the only carvings to be reworked or replaced with new stone date to 1949 and not the original construction.

The 1949 replacement floral and vegetal elements at the cornice above the St. Joseph figure and a floral element just below were considered by the conservator and architects to be out of proportion and stylistically inconsistent with the original adjacent profiles, as well as being crudely and roughly executed (Figure 3.16). Similarly, the head of the St. Joseph figure is considered out of scale with the original body. In order to address these inconsistencies, in Phase II, the cornice blocks were re-carved *in situ* to better match the adjacent original cornice elements, as removing them to the workshop posed too many structural concerns. The floral element below was removed and replaced with a new limestone carving to better match the existing original on the other side of the St. Joseph figure (Figure 3.31). The head of St. Joseph will be removed and replaced with a more in-proportion carving during Phase III. Some of the 1948 replacement carvings, however, are being retained, including

the upper portion of St. Anne as well as the head and proper right arm of St. Joachim and several smaller floral elements. It is only those elements considered a “visual distraction from the beauty of the original carvings and the integrity of the original design” [Myjer 2010] that are considered appropriate to replace.

As this summary of the conservation and restoration program for Mission San José shows, the treatment approach is one that takes into account a need for both material conservation of the decayed and damaged stonework as well as the need to ensure the continued unity and coherency of the artistic composition of the figural and sculptural program of the façade. However, in order to preserve the artistic integrity of the façade design, decay issues and inappropriate replacement carvings from the 1949 restoration had to be addressed, resulting in a noticeable change in the appearance of the façade, especially with the removal of dark cement patches and biological growth.

Chapter 4

Analysis of Case Studies

4.1 Comparison of the Conservation Programs

A comparison of the decay issues and treatment approaches between Rosslyn Chapel and Mission San José reveals many similarities in the conservation programs. The intricate carved ornamental stonework at each site is suffering from comparable decay issues caused by natural weathering, water infiltration, heavy soiling and the past use of cement repair mortars. The main goal of the conservation programs at both buildings is to halt these decay mechanisms as much as possible. Conservators and architects at both sites carried out multi-phased surveys of the fabric that resulted in stone-by-stone analysis and treatment plans. Ensuring the stability of each carved stone element is seen as integral to protecting the overall performance of the exterior stonework.

The sandstone used at Rosslyn Chapel and the limestone used at San José are both naturally soft and porous materials. While these characteristics have allowed the stone to be carved to a high level of detail, this also means that they are more susceptible to weathering and loss of detail from water infiltration and freeze/thaw cycles.⁹

Therefore, one of the most critical treatments for protecting the delicate carvings of both buildings is ensuring that all open construction joints and voids are filled with either a soft, compatible lime mortar or resin-based lime mortar that will help to prevent water from infiltrating the stonework. While the loss of original mortar over time has contributed to many of these problems, it is primarily the use of cement

based mortar repairs during the mid-20th century that has caused accelerated rates of decay in the ornamental stonework at both case studies.

Rosslyn Chapel and Mission San José are also both being treated for biological growth and staining that is obscuring the detail of the carved stonework. The main argument for removing the soiling at each site is centered on the material performance of the stone and the need to better assess its condition. Heavy soiling can often obscure not only carved detail and therefore have a negative impact on the aesthetics of the stonework, but can also obscure the degree of decay in the underlying stonework [Andrew, 1994, p.25, 30]. However, the aesthetic issue is also an important consideration in de-soiling carved stonework because it can dramatically change the appearance of the building, as is apparent in the result of cleaning biological growth from the light colored limestone on San José (Figure 3.20).

There are several notable differences in the decay issues for the ornamental stonework at the two case studies that are also reflected in the treatment approaches. Differences in location, climate, stone type, style and degree of ornamentation and, perhaps most basically, the age of the buildings all play a significant role in not only the decay mechanisms but also how the stone is conserved.

At Rosslyn Chapel, one of the main causes for concern is the heavy environmental pollution soiling that has caused the formation of hard, impermeable crusts on the stone surfaces, which in turn has caused severe preferential erosion of many carved stone elements. Thus de-soiling the stone surfaces and carefully removing the dark crusts using a labor-intensive laser system is a considerable part of the conservation program. The carved limestone at San José, however, has not suffered as much

damage due to environmental pollution soiling and the vast majority of the dark staining on the stonework is from heavy biological growth from algae and bacteria [Myjer 2010].¹⁰ In contrast to Rosslyn, the main source of preferential erosion at San José is the heavy use of cement based mortar repairs from the 20th century restorations.

The impact of past repairs is an important factor in the current decay issues at both sites. However, when comparing the degree of stone replacement and the importance of aesthetic considerations in the current conservation programs of each site, it is evident that the scope of those past repairs and restorations have also influenced the way in which the ornamental stonework is being treated. There is a greater focus on aesthetics and visual coherence in the Mission San José project that is reflected in the amount of stone replacement and re-carving of the 1949 elements that is being carried out. This replacement or reworking of the past restoration elements, however, is itself seen as following on the intent of the 1949 restoration [Myjer 2010]. That project was undertaken in order to restore the imagery and meaning of the façade that had been lost through neglect, decay and vandalism in the 19th century. However, the professionals working on the project had the stated goal of not removing anything that was original from the façade, but rather “supplementing” the remaining original elements with new work “so that the iconography and meaning of the original design would once again be legible” [Myjer 2010].

While from today’s conservation viewpoint some of the materials and craftsmanship of the 1949 restoration are seen as objectionable, as Myjer [2010] has stated, “it would take a particular type of purist to object to the intent of the 1949 restoration.”

The professionals involved at the time understood the importance of the artistic coherence of the sculptural program of the façade to the building's cultural significance. The current work at San José is actually very dependent on the 1949 restoration. While it is clear that from a material fabric viewpoint the earlier restoration was harmful to the façade because of the heavy use of cement mortars, the aesthetic intentions of the restoration to reinstate the original unity and legibility of the narrative aspects of the sculptural element have been adopted for the current work. However, unlike the earlier restoration, the current work does not seek to reinstate any original 18th century missing details that have been lost since the 1949. Therefore, a respect for the passage of time and the authenticity of the original fabric is also a guiding principle of the conservation.

Another important restoration decision at San José that involves consideration of aesthetics just as much as replacing the 1949 failed repairs revolves around whether or not to reinstate the lime render that originally covered the walls flanking the central carved façade. Reapplying this protective render is a necessary preventative conservation treatment that can help ensure the long-term preservation of the carved façade as well as the porous rubble masonry walls [Myjer 2010]. The lime render was part of the original design of the building because the masons knew that the porous limestone rubble walls needed a protective finish to keep water out of the stonework. However, when the church was abandoned in the 19th century the render was not maintained and in the 20th century, restoration programs did not include reinstating it. In the current conservation work, to reinstate the render to the whole of the west wall would change the appearance of the building significantly. However, because it would have a greater visual impact, it is likely that a compromise will be created that would

entail reinstating the render only in the area immediately surrounding the carved façade.

The decision to recreate any of the documented original polychrome paint on the reinstated render presents another conservation and interpretation challenge. Most of the lime render and polychrome pattern had disappeared from the walls by the early 20th century, but in the 1920s the local artist Ernst Schuchard recorded the remaining colors and patterns (Figure 3.6). His depiction was used as a model for a small section of painted render that was recreated on the southern elevation of the bell tower during restoration work on the church in 1949 (Figure 4.1) [Quirarte, 2002, p.86]. Therefore the precedent exists to recreate some of the polychrome design. However, it could be argued that the extant recreated section of render and polychrome design on the bell tower is sufficient for providing visitors with an idea of what the façade walls may have looked like originally.

Aesthetic considerations also help guide the conservation approach at Rosslyn Chapel, but to a much different degree than at San José. While the decay seen on the ornamental stonework at Rosslyn Chapel has been affected by the past use of cement mortars, the amount of disintegration, delamination and other types of loss of detail are also related to the age of the structure. The nature of the soft sandstone means that a loss of carved detail over time is to be expected. At Mission San José, which was built some 300 years after Rosslyn Chapel, the soft limestone has also suffered from natural weathering and loss of detail. However, it can be argued that San José has been more adversely affected by past interventions. This difference is reflected in the conservation programs in that at Rosslyn Chapel, with very few exceptions, no

attempt is being made to recreate lost details, while at San José more in-depth restoration is being undertaken. The clear ‘patina’ of age on the exterior carved stonework is still an important part of the aesthetic image of Rosslyn Chapel, just as it was to many 19th century viewers. Therefore, where carved detail is missing, it is being accepted as part of the natural weathering of the building and authentic to its age (Figure 4.2) [Boyes, Interview, 16 June 2011]. The intention of the conservation is not to make the stonework look new in any way, although the removal of the black crusts has the added benefit of revealing the carved details of the stonework more fully [Boyes, Interview, 16 June 2011]. At San José, the age of the façade is also respected in the conservation program in that no original stonework that is currently missing from the façade is being recreated. However, the repairs and replacement stonework instated in the 1949 restoration are being reworked, not in an attempt to make them look new, but in order to restore the façade to an appearance more in keeping with its original, 18th century design. However, the reworking or replacement of the earlier replacement carvings, the removal of the dark cement mortars and the dark biological staining have meant a greater aesthetic transformation at San José than at Rosslyn Chapel [see figures 3.20 and 2.35].

This conservation versus restoration discrepancy between the two case studies is also in part related to differences in the type and scale of the ornamental stonework at each building. Rosslyn Chapel’s exterior stone ornament is more evenly distributed across the entire exterior and therefore covers a more extensive area of stonework, while at San José it is concentrated in one central area. Rosslyn’s exterior ornament is more straightforwardly decorative, with the majority of ornament being vegetal, floral and geometric patterns with various stylized figures. While the façade of San José is also

characterized by floral and vegetal elements, the sculptural program of saints that are specifically connected with the church and its founders, for instance the church's patron saint, St. Joseph, and the founder of the Franciscan order, St. Francis, gives the façade a more strongly narrative aspect that reflects the religious nature of the building. Thus, legibility of the original design, it can be argued, is more important at San José, justifying a greater amount of restoration.

It is interesting to note that the two most considerable previous restoration programs on the ornamental stonework at Rosslyn Chapel (Bryce 1861) and San José (1948/9) coincided with the rededication of the churches as modern places of worship. These are both churches where the elaborate carvings help to not only beautify the building, but also serve as a physical symbol of the faith of those worshipping within its walls. It was when the churches were being reoccupied for religious use that the ornamental stonework was heavily restored in an attempt to bring the buildings back from semi-ruinous condition. This involved reinstated missing details with replacement stone on the interior of Rosslyn Chapel and on the carved façade of Mission San José. For San José especially, the legibility of the carved façade, with its various images of saints, was seen an integral to transmitting the religious meaning and didactic element of the design. As a "living" building that is still serving its community and religious purpose, reinstating the artistic unity of the façade's religious message was privileged in the restoration program. This philosophy is still guiding the conservation work at San José.

4.2 The Influence of Authenticity and Legibility on the Conservation Programs

The conservation programs for the ornamental architectural stone at Rosslyn Chapel and San José both reveal a desire to maintain both material authenticity and artistic unity of the carved stonework. However, there is a clear difference in how these are weighted at each site that is related to the differences in the type and degree of ornament of the two buildings, as well as differences in the extant and impact of past interventions on the material.

The ornamental architectural stonework at both Rosslyn Chapel and Mission San José is a significant part of what make these buildings such unique artistic works of architecture. Therefore, the preservation of the ornamental stonework is something that should and has taken precedence in the conservation programs at each site.

Respect for the original material and a careful and detailed effort to preserve as much of the original ornamental stonework as possible is the most responsible and defensible conservation practice, as an analysis of the respective conservation programs has shown, because the conservation treatments help to ensure the continued survival of the artistic unity of the ornament. However, when the artistic legibility of the façade is threatened by loss or inappropriate past repairs, it is reasonable that effort be made to retain or re-instate that legibility.

In the case of Rosslyn Chapel, that means removing harmful pollution soiling that has not only caused preferential erosion of the sandstone, but has obscured the details of the intricate exterior carvings for many years. De-soiling in this case has nothing to do with making the building appear new or “renewed,” but rather it means slowing decay

and allowing the artistic quality of the original detailed carvings to be better appreciated by the visitor. At San José, keeping within the goals of the previous restorations that sought to more fully reinstate the aesthetic legibility of the carved façade means not only removing detrimental cement mortars, but also reinstating the lime render in order to preserve the delicate carvings for the future, and reworking replacement stone from the previous restoration.

Authenticity is not something that can be applied universally with a single definition for every historic building or artistic work. In the end, it is the requirements of each building that define what is or is not authentic to it. Material and artistic authenticity can sometimes come into conflict, and when they do, the overall integrity of the building must be used to help determine the best possible conservation approach. It must be determined what makes the building culturally significant – the “material truth” of the original stonework or the artistic coherency of the original design.

Jokilehto [1999, p.298-99] argues that there is a danger in placing too much emphasis on integrity based on material wholeness, which “may stress the trend to reintegration, stylistic restoration, or reconstruction.” But if the completeness of the original design of the ornamental stonework is what makes the building a culturally and artistically significant monument, as is particularly the case for the façade of San José, it can be argued that reconstruction to some degree is necessary to re-establish, in the words of Brandi [Quoted in Jokilehto, 1999, p.233], the “potential unity of the work of art.”

Conclusion

Ornamental architectural stonework plays a significant role in the cultural, artistic and historical value of both Rosslyn Chapel and Mission San José. The material fabric has clear historical, aesthetic and spiritual values that help to inform the conservation approach. The past restoration and conservation methods used at the two sites play a significant role in how the buildings are conserved today. The aesthetic goals that guide each conservation program are also greatly influenced by the importance of the carved stonework for the artistic and cultural significance of the building.

The current conservation programs at each site seek to halt decay, correct harmful past interventions, and ensure the continued survival of the ornamental stone programs. The approaches to treating the decayed stonework at Rosslyn Chapel and San José are guided by the need to maintain the material authenticity of the original stonework as well as a desire to maintain the aesthetic legibility of the original design for which the stonework plays such an important role. However, as has been seen in a comparison of the two conservation programs, the work at San José is more heavily influenced by a theory of artistic unity and a belief that the completeness of the original design is vital for understanding and appreciating the intent and meaning of that design. The conservators at Rosslyn Chapel are less concerned with the aesthetic legibility of the exterior carved stonework than the conservators of Mission San José because for Rosslyn, the completeness of the details of the original design is not seen as integral for understanding the monument and its significance. Rather it is the overall integrity of the stonework that is important, not the legibility of each carved element. However, this discrepancy between the two approaches is not due to a basic

difference in conservation philosophy between the two groups of professionals, but rather the differences in the nature of the ornamental stonework and the importance of the design legibility for the overall significance of the building.

Endnotes

1. The San Antonio Spanish Colonial Missions are the largest grouping of colonial mission compounds in the United States. From north to south, they are Mission San Antonio de Valero (now known as the Alamo), Mission Nuestra Señora de la Purísima Concepción de Acuña, Mission San José y San Miguel de Aguayo, Mission San Juan Capistrano, and Mission San Francisco de la Espada.

2. Joseph Palafox was hired as the master mason for the completion of the Missions San Antonio de Valero church, just north of San José, in 1759, but may have also been responsible for the initial design of San José's church just prior to his departure from San Antonio in 1765. Estevan de Losoya replaced Palafox as master mason and was responsible for the initial phase of construction at San José until his death in 1767. The next master mason was Antonio Salazar, who is generally credited with the final design and execution of the church. He changed Palafox's original design, cutting the length of the nave, removing the transepts and adding the sacristy, and finally completing the church in 1782. However, popular legend holds that the detailed stone carvings of the central façade and the sacristy's 'Rose Window' are the work of a master carpenter named Pedro Huizar. While most historians see Salazar as the most likely designer and executor of the carvings, some believe it entirely possible that the legend is mainly accurate, and that Huizar was a skilled sculpture as well as carpenter, since it was not uncommon at the time for a master carpenter to also be a proficient in stone carving [Ivey, Thurber and Escobedo, 1990, p.69-98]

3. While most of the lime render and polychrome pattern had disappeared from the walls by the early 20th century, in the 1920s the local artist Ernst Schuchard recorded the remaining colors and patterns. His depiction was used as a model for a small section of painted render that was recreated on the southern section of the southwest bell tower wall during restoration work on the church in 1948-9 [Quirarte, 2002, p.86]. Thus, the façade that we see today is much more simple and monochromatic than what the original builders and artists intended and lacks an important protective coating for the porous limestone walls.

4. As constructed, San José and the other missions were only intended to serve as mission complexes for as long as it took to convert the local Native Americans to Catholicism and turn them into settled farmers and loyal Spanish citizens – supposedly around ten years. In 1794, the Texas missions began the process of secularization, through which mission land was sold off to local families and control of the churches and chapels were transferred to the local Catholic parish at San Fernando. By 1824, this process was complete, and the Franciscan missionaries left the area [Fisher, 1998, p.3,13].

5. Due to conflicts arising from the principal of the separation of church and state in the United States, the Catholic Diocese eventually became the party primarily

responsible for the repair and maintenance of the church building at San Jose, while the ground and other mission buildings became property of the State of Texas. In 1978, the San José grounds, along with those of the other San Antonio missions, excluding the Alamo, became the San Antonio Missions National Historic Park, owned by the federal government.

6. The approach to the conservation work on the façade was to divide the project into multiple phases that could accommodate the stone conservation team's schedule (as they have to relocate to San Antonio for weeks or months at a time), the weather, and the client's ongoing fundraising efforts. The work was divided into four stages – Emergency Stabilization of Cracked Stone Units in April 2009, Phase I Stabilization and Cleaning in November 2009, Phase II Upper Façade Conservation and Restoration in October 2010 – March 2011, and Phase III Lower Façade Conservation and Restoration planned for October 2011– April 2012.

7. There are considerably more areas of cement patching on the lower façade that will require re-patching with the lime mortar, including areas of carved ornament. For example, the shell motif above the Virgin Mary relief figure in Zone M was created out of brick fill and cement mortar in 1949 and is now failing. The treatment plan for Phase III includes reinstating this central detail in a new carved limestone indent in lime mortar. However, there is no documentation for the original design of this particular area of ornament, so the treatment plan is to create a new shell motif “based on clues provided by the ornament in other sections of the façade” [Myjer, personal communication, 13 July 2011].

8. During the 1930s restoration of San José a wrought iron balcony railing was installed to serve members of the church's choir who used to stand on the balcony during festival occasions. This practice no longer occurs, for health and safety reasons, thus the balcony railing is not necessary. More importantly, it was never part of the original design. Therefore, during Phase II the railing was removed in an effort to help reinstate the original appearance (Figure 3.21).

9. This limestone used at Mission San José is a highly porous, soft, fine-grained limestone that contains a high-level of natural clays that expand when the stone is moisture saturated [Myjer 2010]. Therefore, when water infiltrates the stone, this swelling of natural clays puts pressure on the stone, and can, when saturated for a prolonged period, create enough pressure to crack the stone. Additionally, the porous nature of the limestone means that water can more easily saturate the stone, leading not only to the clay swelling, but also other forms of deterioration, such as salt crystallization and freeze-thaw damage. The relatively dry and warm climate that San Jose is exposed to is, in fact, what has allowed the continued existence of the elaborate stone carvings. According to the stone analysis report, had San Jose been constructed further north, it is probable that “the fine details of the [carved stone] would have been long ago destroyed by freeze-thaw cycles” [Myjer 2010]. Therefore, because of the presence of potentially damaging expansive clays in the limestone, one of the main long-term goals in treating the façade is to prevent moisture from

saturating the stone through ensuring the use of lime mortar at the construction joints and at various voids in the carvings, as well as improving water shedding and drainage around the façade.

10. There is some evidence that a limited amount of sulfate encrustations may play a role in the decay of some of the carved elements at San José. A stone analysis conducted in 2009 of eight different samples from various areas of the façade identified a slightly high concentration of acid-soluble sulfates (or gypsum) in the stone sample taken from just below the balcony, an area that remains damp longer in comparison to other areas of the façade. The presence of gypsum is most likely caused by the reaction of the limestone with acid rain. However, because a negligible amount of sulfates were found in the other stone samples, which displayed an equal level of scaling and cracking as the sulfate-laden sample, it was determined that salt distress is not an important cause of decay in the stonework [Myjer 2010].



Figure 0.1 Rosslyn Chapel, Roslin, Scotland



Figure 0.2 The Church of Mission San Jose, San Antonio, Texas



Figure 1.1 An example of an ancient sculpture restored in the 17th century with new head and arms. *Torchbearer*, Ludovisi Collection, National Museum of Rome.



Figure 1.2 *Belvedere Torso of Hercules*, which remained unrestored during the Renaissance.



Figure 1.3 West Front of the Cathedral of Notre-Dame, Paris with restored stonework by Viollet-le-Duc from the mid-19th century.



Figure 1.4 Arch of Titus, Rome, restored 1817-23. The new travertine elements were left plain in contrast to the original carved marble elements.



Figure 1.5 Detail of exterior portico of San Lorenzo fuori le mura, Rome, showing simple, undecorated stone indents into cornice where original sections were lost from damaged sustained in WWII.



Figure 1.6 Detail of Romanesque frieze at Lincoln Cathedral before restoration (top), showing decayed original stonework, and after restoration (bottom), showing replacement stonework inserted on facade. The original stone frieze was removed for conservation and installed in a permanent exhibit inside the cathedral to protect the stonework from further decay. Where documentation did not exist for lost original details, the stonemasons created original designs that were in-keeping with the extant original carvings.



Figure 1.7 Reims Cathedral, France in 2004 during restoration and conservation work on the south portal.



Figure 1.8 Reims Cathedral. Detail of the damaged original Queen of Sheba figure at the central portal of the facade before removal and replacement with a replica.



Figure 1.9 Reims Cathedral. Detail of the replica Queen of Sheba figure installed in 2007 at the central portal.



Figure 1.10 Restored 12th century choir of the church of St. Jean-Baptiste in Bourbourg, France. The choir was heavily damaged during WWII and was restored in 1999. The church commissioned modern sculptures for the niches along the interior of the choir that would have originally held carved stonework. In 2008, artist Anthony Caro installed modern steel and terracotta sculptures in the niches.

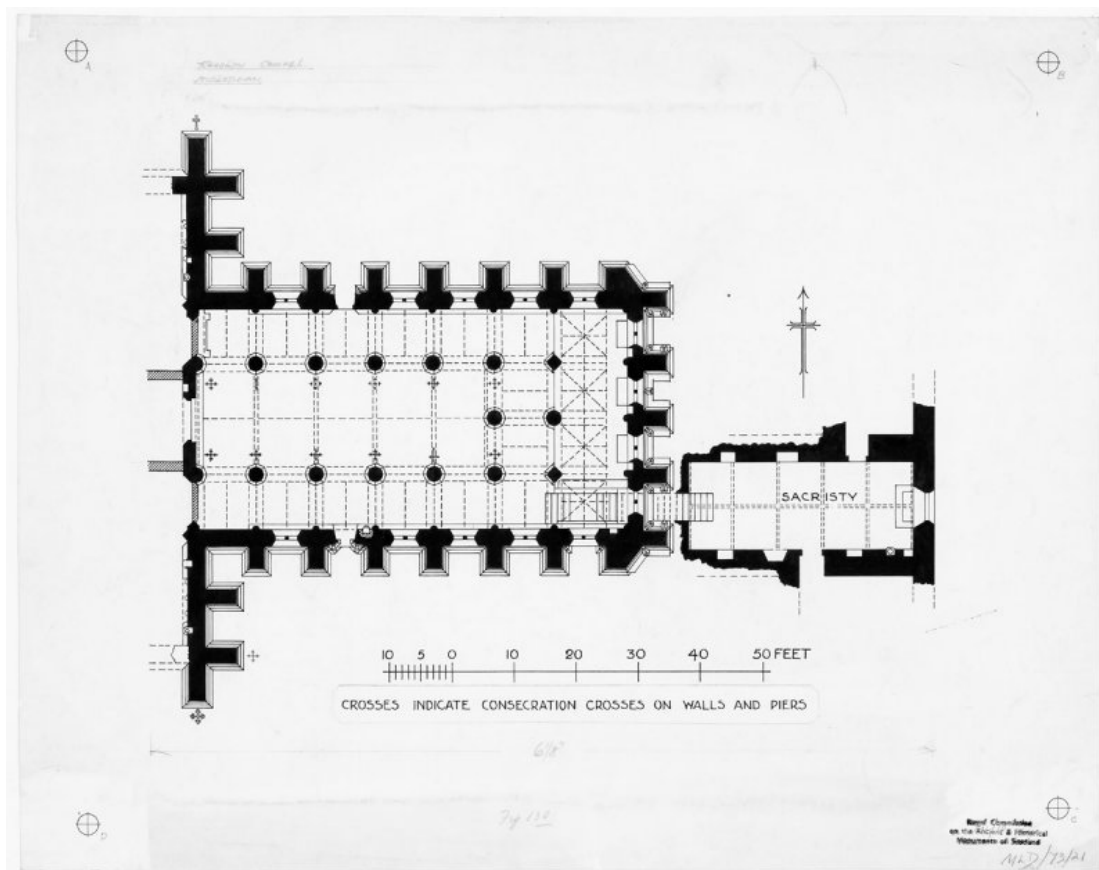


Figure 2.1 Plan of Rosslyn Chapel, c.1920



Figure 2.2 Rosslyn Chapel, south facade, c.1920



Figure 2.3 Rosslyn Chapel, south facade. October 2010.

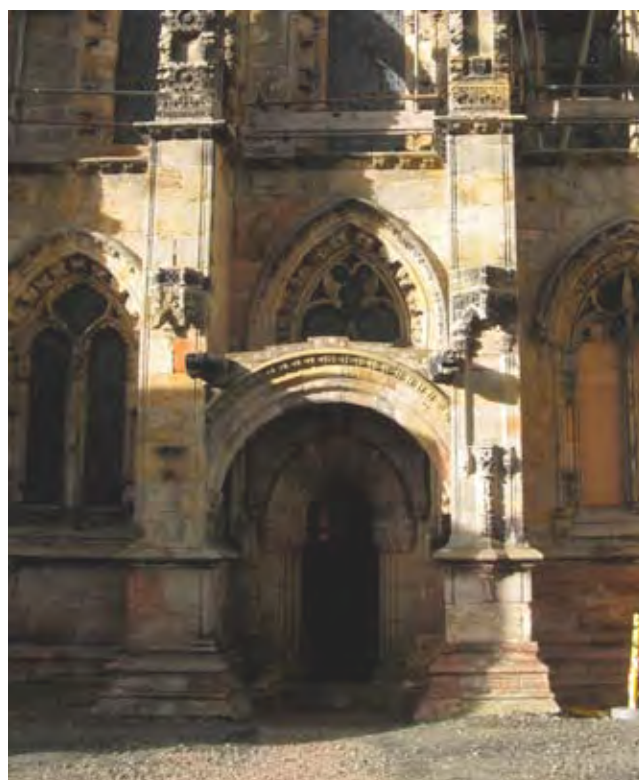


Figure 2.4 North entrance porch (left) and south entrance porch (right) at Rosslyn Chapel. October 2010.



Figure 2.5 Rosslyn Chapel ground level window, bay N7, north facade, showing typical carved ornament around windows. June 2011.



Figure 2.6 View of Rosslyn Chapel from southwest, showing transept walls and 1880 Kerr addition.



Figure 2.7 Detail of wall head showing grotesque above flying buttress.



Figure 2.8 Detail of carved figure on buttress to the west of the south porch.



Figure 2.9 Great east window c.1843-8 before the current tracery was installed photographed by David Octavius Hill and Robert Adamson. Scottish National Portrait Gallery.



Figure 2.10 John Adam Houston, *Sir Walter Scott in Rosslyn Chapel*. Watercolor, 1854. Private Collection.



Figure 2.11 David Roberts, *The south porch of Rosslyn Chapel*. Oil on Canvas, 1845. Blackburn Museum and Art Gallery.



Figure 2.12 Interior of Rosslyn Chapel prior to Bryce restoration. William Donaldson Clark. *The Apprentice Pillar from the south aisle*. Albumen print, 1860. Scottish National Portrait Gallery.



Figure 2.13 Interior of Rosslyn Chapel, showing apprentice pillar, after Bryce restoration. c. 1885.



Figure 2.14 South porch of Rosslyn Chapel in 1856. Photograph by Roger Fenton. Victoria & Albert Museum.



Figure 2.15 View of south porch c. 1956. Note new stone at threshold and door surround from Bryce restoration.



Figure 2.16 Rosslyn Chapel covered by temporary roof. December 2009.

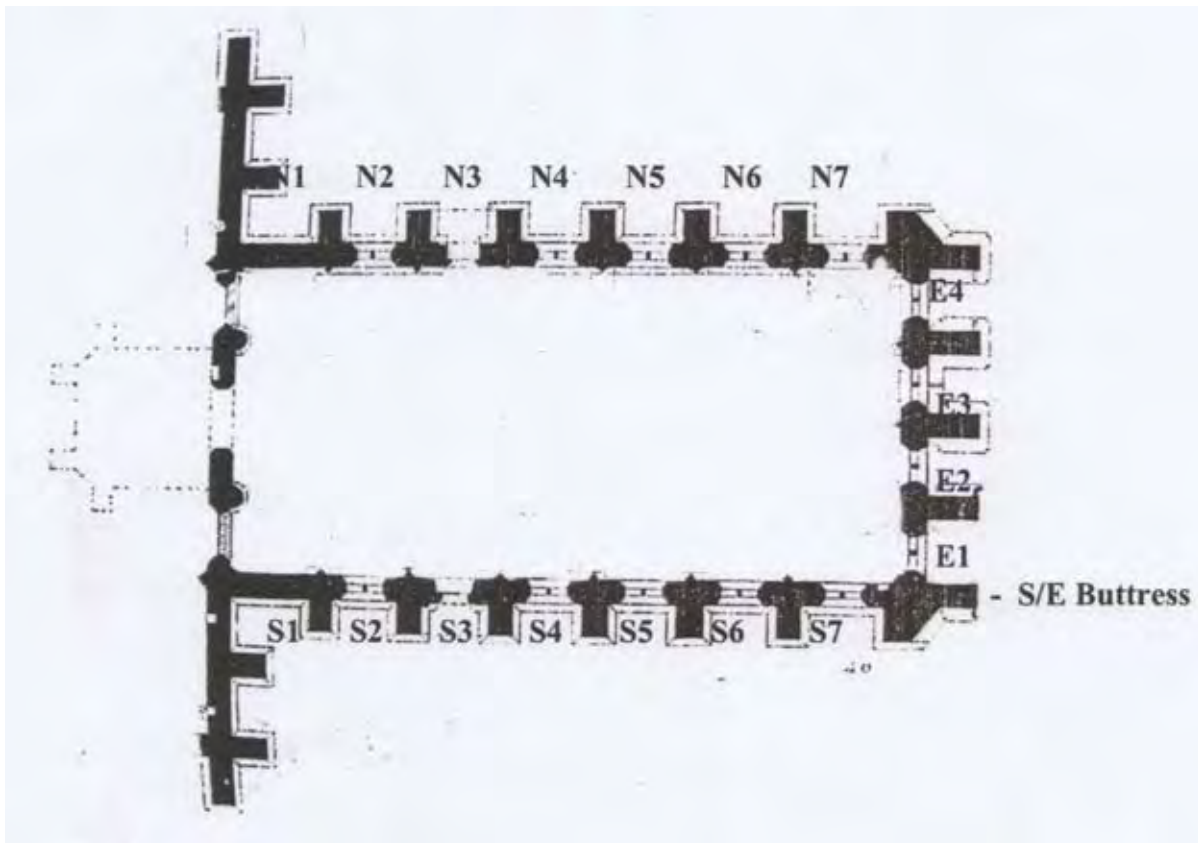


Figure 2.17 Numerical Identification system for exterior bays at Rosslyn Chapel



Figure 2.18 Examples of preferential erosion on carved elements caused by adjacent dark pollution crusts.





Figure 2.19 Examples of cement mortar that is causing preferential erosion of the adjacent stone surfaces.



Figure 2.20 Detail of cement mortar on red sandstone surface that has caused significant preferential erosion of the stone.



Figure 2.21 Deconstruction of N5 left side pinnacle during stabilization work in 2010 in order to properly re-bed and secure pinnacle.



Figure 2.22 Detail of construction joint at buttress pinnacle showing loss of bedding mortar that has caused the stonework to become structurally unstable.



Figure 2.23 Damage to stonework at carved base course caused by oxide jacking of ferrous dog cramp.



Figure 2.24 Great east window at Rosslyn Chapel in 2010 prior to replacement of section of tracery.



Figure 2.25 Detail of failed 19th century section of tracery from great east window (left) and detail of replacement stone during carving (right).

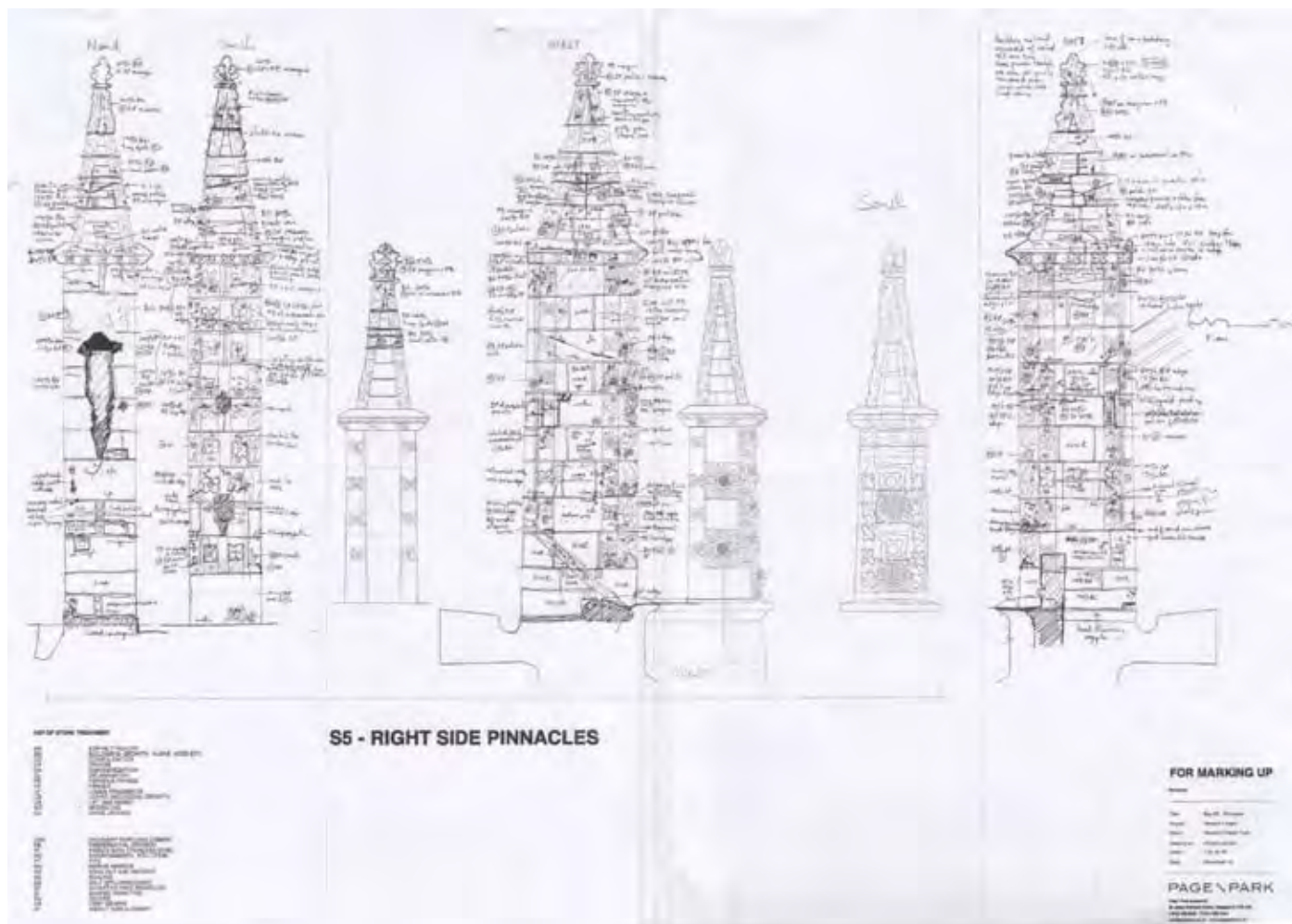


Figure 2.26 Bay S5 pinnacles decay mechanism and treatment mark-up drawing, 2010. Each stone and carved element has been carefully inspected and scheduled for treatment.



Figure 2.27 Pinnacles between bays S5-S6 before conservation treatment in 2010.



Figure 2.28 Pinnacles and buttress between bay S5-S6 during conservation treatment in June 2011.



Figure 2.29 Flying buttress at bay S5 being de-soiled with laser system June 2011.



Figure 2.30 Pinnacle at bay S5 before treatment showing areas of pollution crust and soiling.



Figure 2.31 Pinnacle at bay S5 after de-soiling and laser treatment and re-pointing of mortar joints, June 2011.



Figure 2.32 OPC mortar being removed from construction joints with hand tools. 2010.



Figure 2.33 Pinnacle at bay S5 after re-pointing and before laser de-soiling treatment. June 2011.



Figure 2.34 Crack along carved element on S5 pinnacle after being consolidated with acrylic resin. June 2011.



Figure 2.35 North facade with de-soiled and laser treated pinnacles at left and untreated pinnacles at right. July 2011.

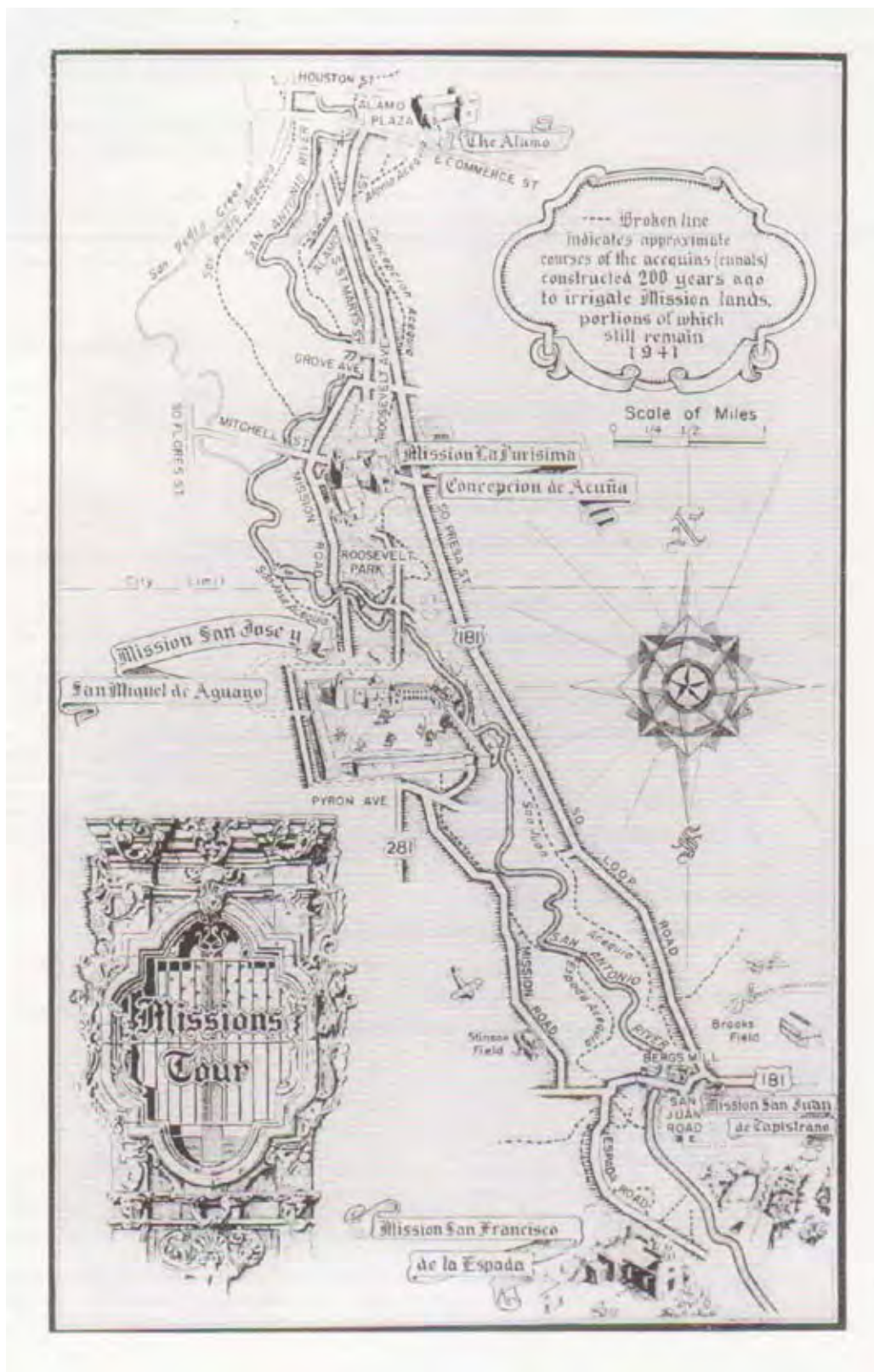


Figure 3.1 1941 Works Progress Administration map showing the five San Antonio missions.

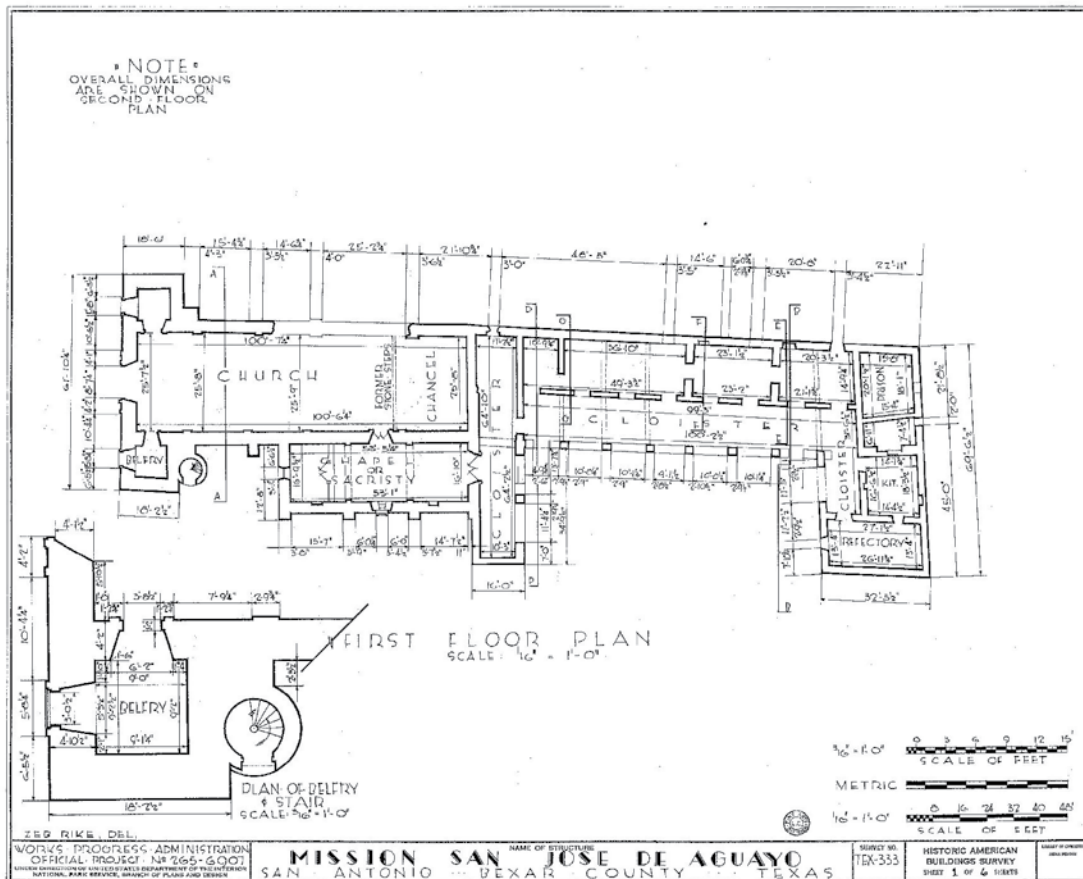


Figure 3.2 Plan of Mission San José.



Figure 3.3 Front (west) elevation of the church of Mission San José, showing the central carved façade. July 2011.



Figure 3.4 Mission San José Church - detail of carved façade. July 2011.



Figure 3.5 Mission San José Church - detail of floral elements and cherub figure above double doors. 2009.



Figure 3.6 Painted reconstruction of the facade of San Jose by Ernst Schuchard, 1932, showing details of the original limewash and painted designs.

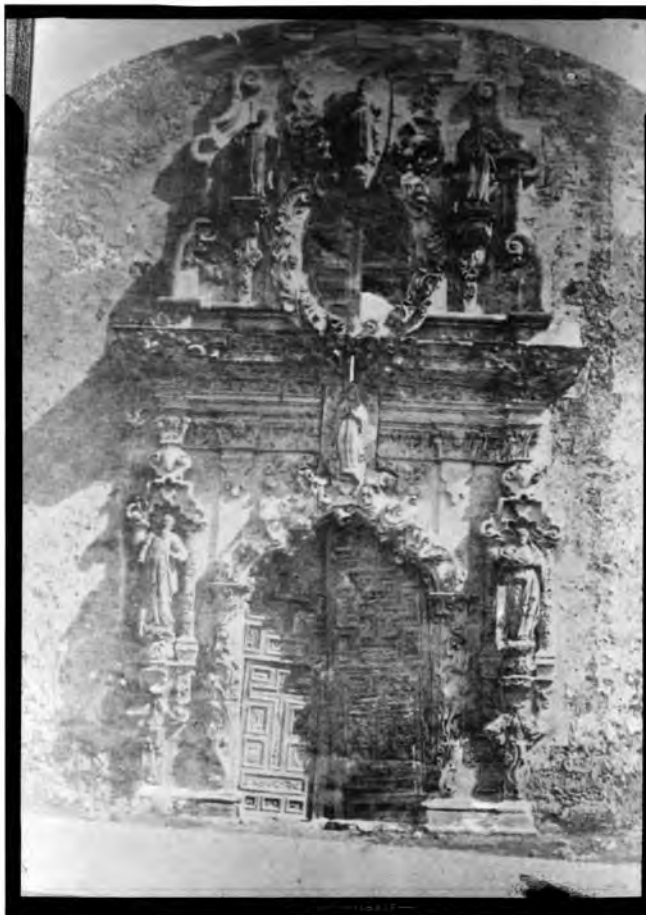


Figure 3.7 San Jose facade before 1890. All of the large figural sculptures are still for the most part intact.



Figure 3.8 San Jose following collapse of dome, roof and north wall, c.1880.



Figure 3.9 San Jose facade c.1890, showing loss of several sculptural elements and carved relief, as well as heavy dark staining on the stonework.



Figure 3.10 San Jose facade in 1917, showing bracing timbers supporting the facade wall.



Figure 3.11 San Jose facade in 1936 following WPA restoration work.



Figure 3.12 Sculptor E. Lenarduzzi preparing the figure of St. Anne for restoration, March 1948.



Figure 3.13 San Jose facade in 1983.



Figure 3.14 San Jose facade in 2009 following Phase I, showing zone map overlay. The facade was divided into zones A-Z for the 2010 treatment plan.



Figure 3.15 Detail of angel figure in zone G, showing cement patch of lost carved element adjacent to angel's proper right arm. February 2009.



Figure 3.16 Detail of facade above window, showing inappropriate 1949 replacement carvings at left and central sections of cornice with original sections at right, as well as the 1949 replacement head of the central figure of St. Joseph. Note construction joints cleared of OPC mortar and awaiting new lime mortar. November 2010.



Figure 3.17 Detail of Zone C showing areas of cement mortar repairs and areas of heavy scaling, delamination and biological growth below the cornice, where stone tends to remain damp after periods of heavy rain. February 2009.



Figure 3.18 Detail of window to north of carved central facade showing traces of lime render below cornice that originally covered the entire west elevation on either side of the central carved facade.



Figure 3.19 Exposed rubble limestone wall adjacent to central carved facade that originally would have been covered in a protective lime render but is now vulnerable to water infiltration.



Figure 3.20 San Jose facade before (left) cleaning and conservation in 2009 and after (right) Phase II completion in July 2011.



Figure 3.21 Head of St. Francis following emergency stabilization in 2009, showing wire restraints.



Figure 3.22 Cracked volute in zone H stabilized in Phase I with stainless steel cramps.



Figure 3.23 Stainless steel lateral tie-back installed to secure St Francis figure during Phase I in 2009.



Figure 3.24 Pinning of detached drop pendant in zone C during Phase I in 2009.



Figure 3.25 St. Francis and upper south volute following permanent stabilization efforts during Phase II. July 2011.



Figure 3.26 Detail of St. Joseph and St. Francis figures, showing areas of original stone, 1949 replacement stone and cement patches and mortars.

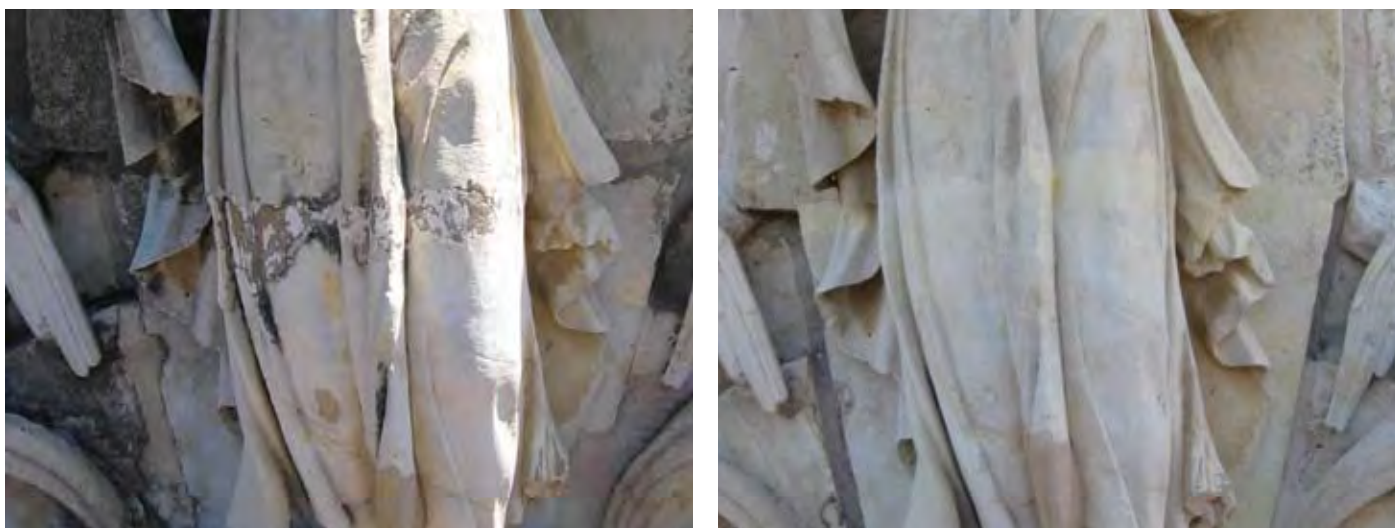


Figure 3.27 20th century cement patch across robe of St. Joseph (left) in 2009 and removal and replacement with compatible tinted lime mortar patch during Phase II in 2011 (right).

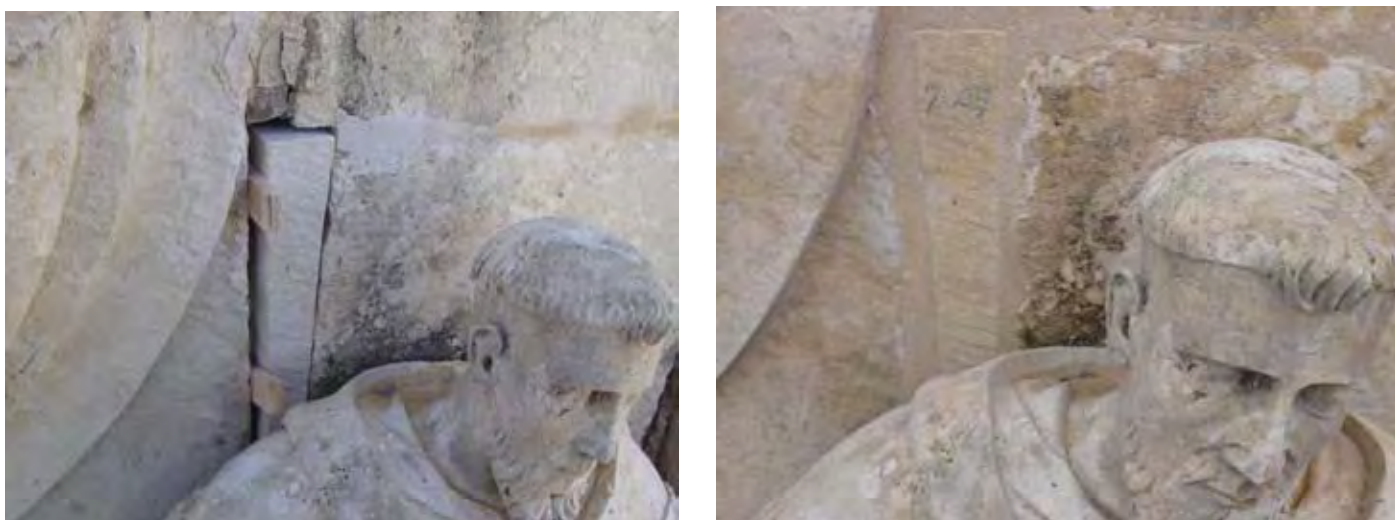


Figure 3.28 Stone indent being installed in 2009 into large void in construction joint that had been patched in the early 20th century with cement (left) and the completed indent repair showing year of installation on stone surface to differentiation it from the original adjacent stone (right).



Figure 3.29 Replacement skull at St. Francis figure executed in cement in 1949 (left) before restoration in 2009 and after restoration (right) in 2011 with new carved stone indent secured to original stone behind with pins and grout.



Figure 3.30 Detail of area below St. Joachim figure in Zone W, showing area of missing original carved stonework beneath pedestal. February 2009.



Figure 3.31 Upper portion of facade showing recarved 1949 cornice blocks and new limestone floral element to left of St. Joseph that replaced the inappropriate 1949 carving. Note how this new floral element is more consistent with the style and proportion of the existing original floral element to the right of St. Joseph. March 2011.



Figure 4.1 Recreated render and polychrome design at the south elevation of the bell tower instated during the 1949 restoration.



Figure 4.2 Severly weathered carved stonework on the south facade of Rosslyn Chapel. According to Boyes [Interview, 16 June 2011], the stonework will be stabilized with lime mortar at the open joints in order to prevent water ingress, however, no replacement of the carved stonework will be carried out as the stone is currently considered structurally stable.

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