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Authenticity and Change: A Framework for Examining Post-Earthquake Outcomes for the Christ Church Cathedral in Aotearoa New Zealand

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ABSTRACT

The Canterbury earthquake sequence (2010–2011) resulted in damage to historic unreinforced masonry cathedral and church precincts in Christchurch, Aotearoa New Zealand, where significant schemes of post-earthquake remediation have taken place. Public and church communities, government authorities, and conservation experts constitute decision-making stakeholders who are often, but not always, collectively motivated to retain historic architectural characteristics and religious traditions. International theories for conserving authenticity offer specialist guidance; however, there is a critical gap between institutional discourse and actual heritage outcomes shaped by the local decision-making. Using archival materials, local history records, and conservation planning documentation, we explore the construction of the city's Anglican cathedral, known as Christ Church Cathedral, and post-earthquake proposals and interventions from the 19th century to the present day. The novelty of this study lies in investigating tensions between heritage values, material conservation, community engagement, and financial constraints, as demonstrated by the production of post-earthquake design responses, ranging from ruination and preservation through to reconstruction and complete redesign, presented using a thematic assessment framework. Analysing the site's history of construction and conservation reveals a multidimensional authenticity, evolving from a focus on retaining materiality to a greater acceptance of change to heritage sites, consistent with global and local trends.

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Authenticity; Cathedral; Christchurch; church; cultural heritage conservation; earthquakes; retrofit; SDG11: sustainable cities and communities; unreinforced masonry

1. Introduction

Cultural heritage sites face threats from multiple natural and human-induced hazards, and global conflicts (ICOMOS and ICCROM 2023; Tandon 2018). Fire, flood, earthquake, climate change, and conflict all threaten the existence of significant heritage buildings and sites (Fatorić and Seekamp 2017; IBRAM, ICOM Brazil, & ICCROM 2019; ICOMOS Climate Change and Cultural Heritage Working Group 2019). The joint report produced by the International Council for Monuments and Sites (ICOMOS) and the International Centre for the Study of the Preservation and Restoration of Historic Property (ICCROM) highlights the urgency of post-trauma recovery and reconstruction for cultural heritage sites across the world (Kealy et al. 2020). The conservation of churches destroyed in war, such as the Coventry Cathedral, through to the restored Notre-Dame Cathedral Paris following a destructive fire in 2019, has captured international interest and sentiment to safeguard the core religious and architectural experiences that these buildings offer to religious and secular communities alike (Bandarin 2020; Djabarouti 2022; Praticò et al. 2020; Schoenefeldt 2023). While this discourse offers prominent global perspectives for addressing damaged historic cathedrals and churches, it is important to also examine the extent to which recommended conservation practices are followed in more peripheral contexts, where local decision-making is influenced by multiple additional factors.

This study focuses on one such building, the Anglican Christ Church Cathedral in Christchurch, Aotearoa New Zealand, a Gothic Revival building designed by the English architect Sir George Gilbert Scott, built between 1864 and 1881, with the transepts and chancel added in 1904 (Figure 1). Churches proliferated in 19th-century Aotearoa New Zealand. McKay (2015) highlights the country's relatively high concentration of Gothic Revival timber churches as compared with the global context. Christ Church Cathedral

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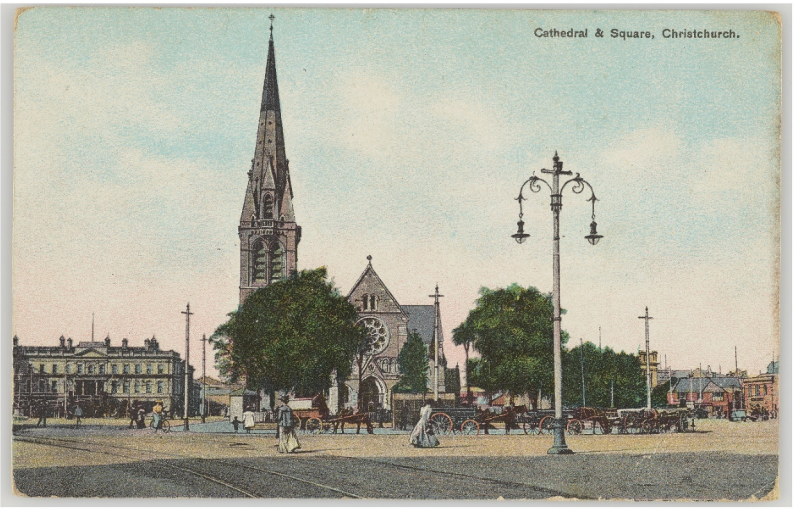

Figure 1. Cathedral Square as seen from northwest (1900–1910), Cathedral & Square, Christchurch, 1900–1910, Christchurch, maker unknown. Gift of Patricia M. Mitchell, 1989. Te Papa Tongarewa (PS.000777).

differed in having an unreinforced stone masonry construction.

After the earthquakes, the future of the earthquake-damaged Christ Church Cathedral attracted much attention and speculation. Many people thought that reinstatement of the original design, which would necessarily involve a high degree of reconstruction using new fabric, was the only option, given the building's high degree of significance. But other proposals were forthcoming, ranging from leaving the remains as a ruin, through to preservation of the old fabric in combination with new wall and roof treatment, as well as demolition and replacement with a new design.

This paper explores issues of authenticity in the wide-ranging proposals put forward for the building after the disaster, while also acknowledging the broad architectural and cultural significance of historic churches. Considering heritage values, material conservation, community engagement, and financial constraints, it asks, how do the post-earthquake proposals and outcomes for the Christ Church Cathedral align with, or deviate from, established international principles for retaining authenticity in heritage conservation?

Archival photographs, local history monographs, contemporary conservation planning documents, newspaper reports, architectural drawings, and territorial authority geospatial maps were used to establish a history of the original construction and subsequent additions and conservation interventions, supported by site visits undertaken in 2011, 2015, 2021, 2024, and 2025. These sources were used to construct a timeline of structural, material, and aesthetic interventions, and discern stakeholder attitudes towards post-earthquake conservation decisions (Figure 2). International conservation charters and theories were employed to evaluate the gap and tensions that exist between best practice recommendations for the conservation of authenticity and local interpretations and priorities for the post-earthquake Cathedral. The paper shows that conservation outcomes are strongly influenced by local stakeholders and public perception of heritage value and authenticity.

2. Christ Church Cathedral and the ever-present earthquake threat

The enduring national heritage significance ascribed to the Christ Church Cathedral starts with its prominent location within the historic and current spatial layout of Christchurch, at the centre of four urban squares, two named in honor of martyred English bishops and hence reflecting colonial and religious considerations (McKay 2015) (Figure 3). The city was conceived by John Robert Godley as a model Church of England settlement, originally named Canterbury and later renamed to reference Christ Church at the University of Oxford (Encyclopaedia Britannica 2024; Lochhead 1976, 1999, 2012, 2023). The central square was named Cathedral Square in 1851 and a prominent site within it was assigned for the Cathedral building in 1858.

Christ Church Cathedral is an example of English Gothic Revival architecture. It has a comparatively narrow nave with side aisles, transept, and a semi-circular apse, a dominant verticality, buttresses, contrasting local grey stone walls and intricate limestone dressings, and a west-facing entrance and porch (Lovell-Smith 2001). The buttresses are responsible for transferring lateral stresses from the roof, and stone columns allow the

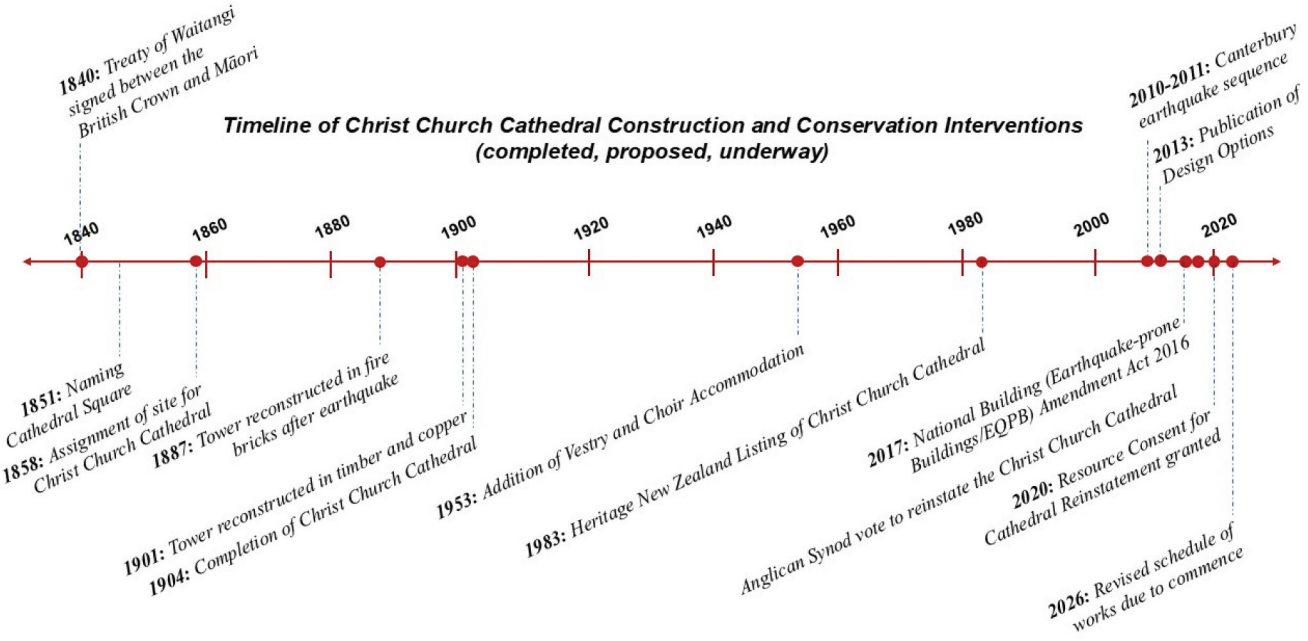

Figure 2. Timeline of Christ Church Cathedral construction and conservation interventions (completed, proposed, underway). Produced by Stacy Vallis.

transfer of vertical forces to the ground. Later additions include the vestry and choir accommodation (1953) and Visitor's Centre (1992–1995) (ICOMOS New Zealand 2015).

Early deliberations by settlers and stakeholders including the original Anglican Cathedral Commission reveal concerns that are consistent with today's post-earthquake conservation priorities, relating to structural stability and architectural character (ICOMOS New Zealand 2015; Lovell-Smith 2001). Significantly, early debates centred on the proposed construction of the building in timber instead of stone masonry as a response to perceived earthquake risk from the time of design through to completion in 1904 (Lovell-Smith 2001; Skinner 2010). The architect Sir George Gilbert Scott proposed an innovative, experimental timber Gothic cathedral with exterior stone masonry walls as a solution to earthquake risk but this proposal never came to fruition (Skinner 2010). Instead, Bishop Harper promoted a masonry building, and the design iteration of 1862 presented an internal timber frame with stone facing. The Cathedral Commission continued to advocate for a masonry building, supported by limited local supplies of timber. In particular, the timber spire proposed by Scott was replaced with a masonry spire designed by the local architect Benjamin Mountfort together with balconies, pinnacles, and additional ornamental features. Cyril Mountfort, the son of Benjamin Mountfort, was responsible for overseeing the construction of the Cathedral including the chancel, transepts, and apse (Lovell-Smith 2001). Earthquakes in 1881 loosened the Cathedral's stonework, and the upper parts of the tower were reconstructed after an earthquake in 1887. The tower was replaced with firebricks instead of the original stone masonry. An earthquake in 1901 caused further damage to the spire and required full reconstruction using the original design executed in timber and copper (Lovell-Smith 2001), which remained intact until the Canterbury earthquake sequence of 2010–2011 when the tower fully collapsed (Figure 4).

During the earthquake sequence, damage to the Cathedral was incremental. It survived the first major earthquake of September 2010 with superficial damage and was reopened to the public a few weeks later. Further damage occurred during the Boxing Day aftershock that same year. The building was closed and emergency stabilisation efforts to secure the primary façade and Rose Window included the use of a temporary brace made from disused steel lighting towers sourced from a sports stadium (Barrie, Anderson, and Goodenough 2014). Despite these works, subsequent aftershocks in June and December 2011 led to increasing instability and eventual collapse of much of the prominent west elevation, facing towards the main city square (Figure 5).

While the current study is primarily concerned with the post-2011 proposals for the Cathedral site, other research since the earthquake sequence has explored the vulnerabilities of historic churches more generally,

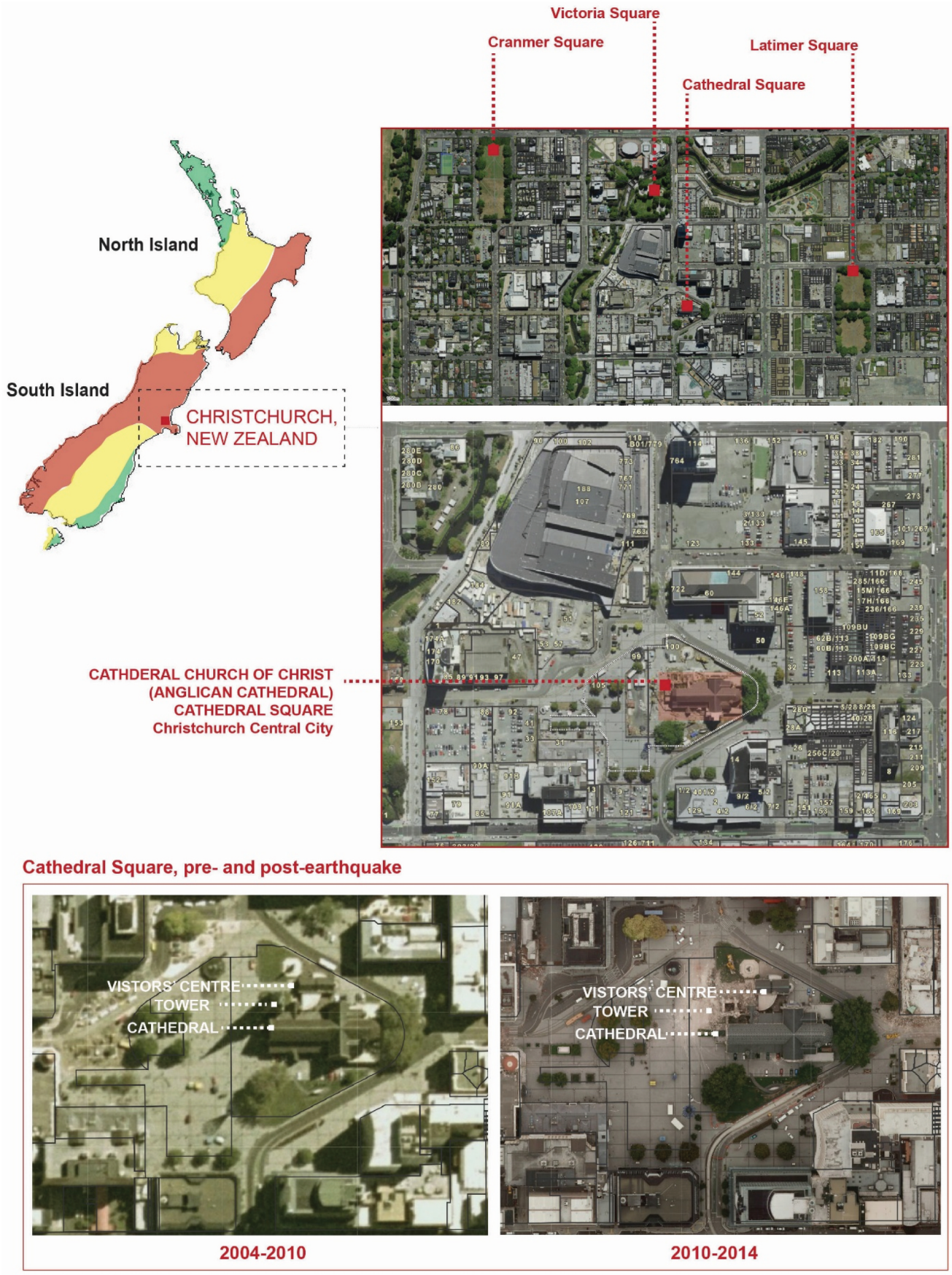

Figure 3. Location of the extant Christ Church Cathedral in the central city, with national earthquake risk zones shaded (red, yellow, green indicating high, medium, low risk) adapted from Ministry of Business, Innovation & Employment ('Seismic risk areas as defined in the Building Act 2004') and Canterbury maps viewer. Produced by Stacy Vallis.

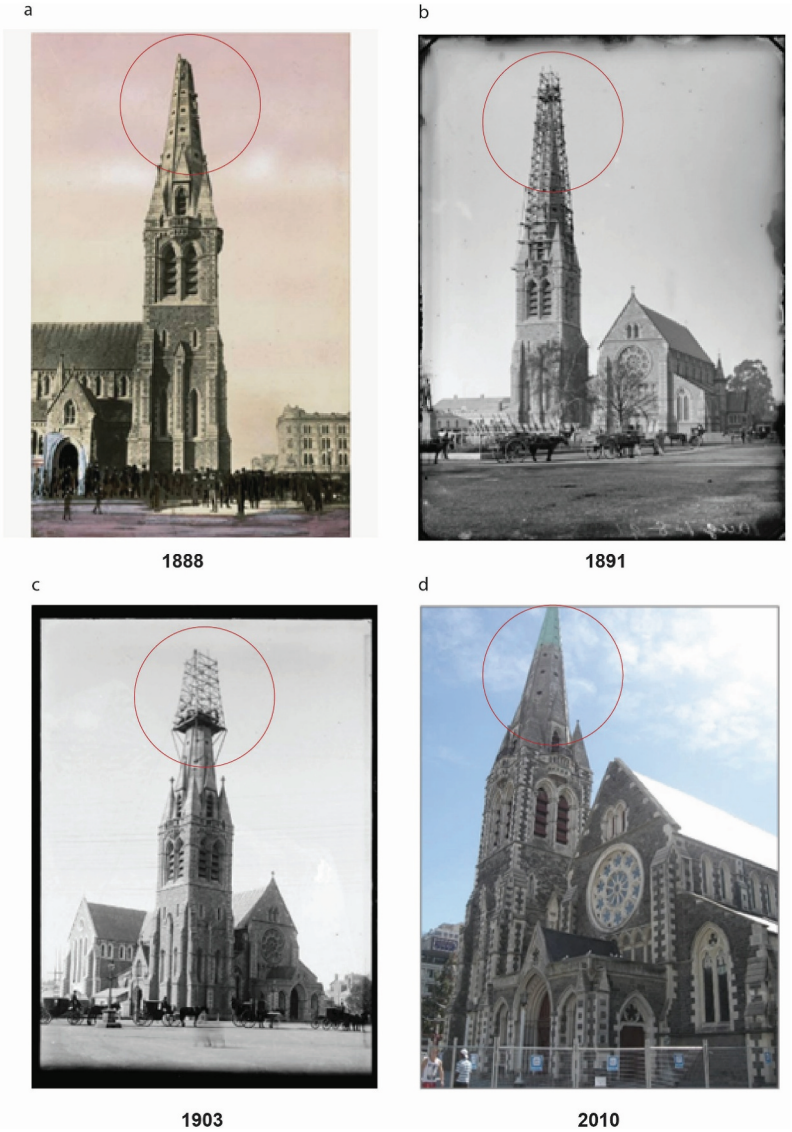

Figure 4. Christ Church Cathedral: material deliberations in rebuilding the spire. (a) 1888, Creator unknown: photograph of crowd outside Christ Church Cathedral with earthquake damage to spire, Christchurch. Original photographic prints and postcards from the File Print Collection, Box 19. Ref: PAColl-7985–72. Alexander Turnbull Library, Wellington, New Zealand. /records/22720273. (b) 1891, strengthening with masonry firebricks and view of the Cathedral Church steeple under repair from prior earthquake damage, with John Robert Godley statue and horse drawn wagons and coaches in foreground, with Warner's hotel beyond, Cathedral Square, Christchurch. Maclay, Adam Henry Pearson, 1873–1955: negatives. Ref: 1/2-163954-G. Alexander Turnbull Library, Wellington, New Zealand. /records/30111762. (c) Christ Church Cathedral, Christchurch, with spire being rebuilt. Ref: 1/2-018021-G. Alexander Turnbull Library, Wellington, New Zealand. /records/22614520. (d) Christ Church Cathedral, 2010, pre-2011 earthquake. Photograph by Stacy Vallis.

including the intersecting challenges of improving public safety while also retaining vulnerable cultural heritage fabric. Following the Canterbury earthquake sequence, Ingham and Griffith (2011) concluded that damage to Christchurch's stone masonry buildings and churches was attributable to low-quality construction materials, combined with irregular bond patterns and insufficient securing of walls and diaphragms that contribute to poorer seismic performance than clay brick masonry buildings. Irregular architectural plans, in addition to the interactions between structural elements at the wall intersections of the primary church building and adjacent components such as annexes also contribute to seismic vulnerability (Ingham and Griffith 2011). The presence of architectural elements including domes, vaults, chapels, bell towers, and presbyteries increased the vulnerability to earthquake damage (Dizhur et al. 2011; Leite, Lourenco, and Ingham 2013; Senaldi, Magenes, and Ingham 2015). A national inventory compiled in 2016 contained approximately 297

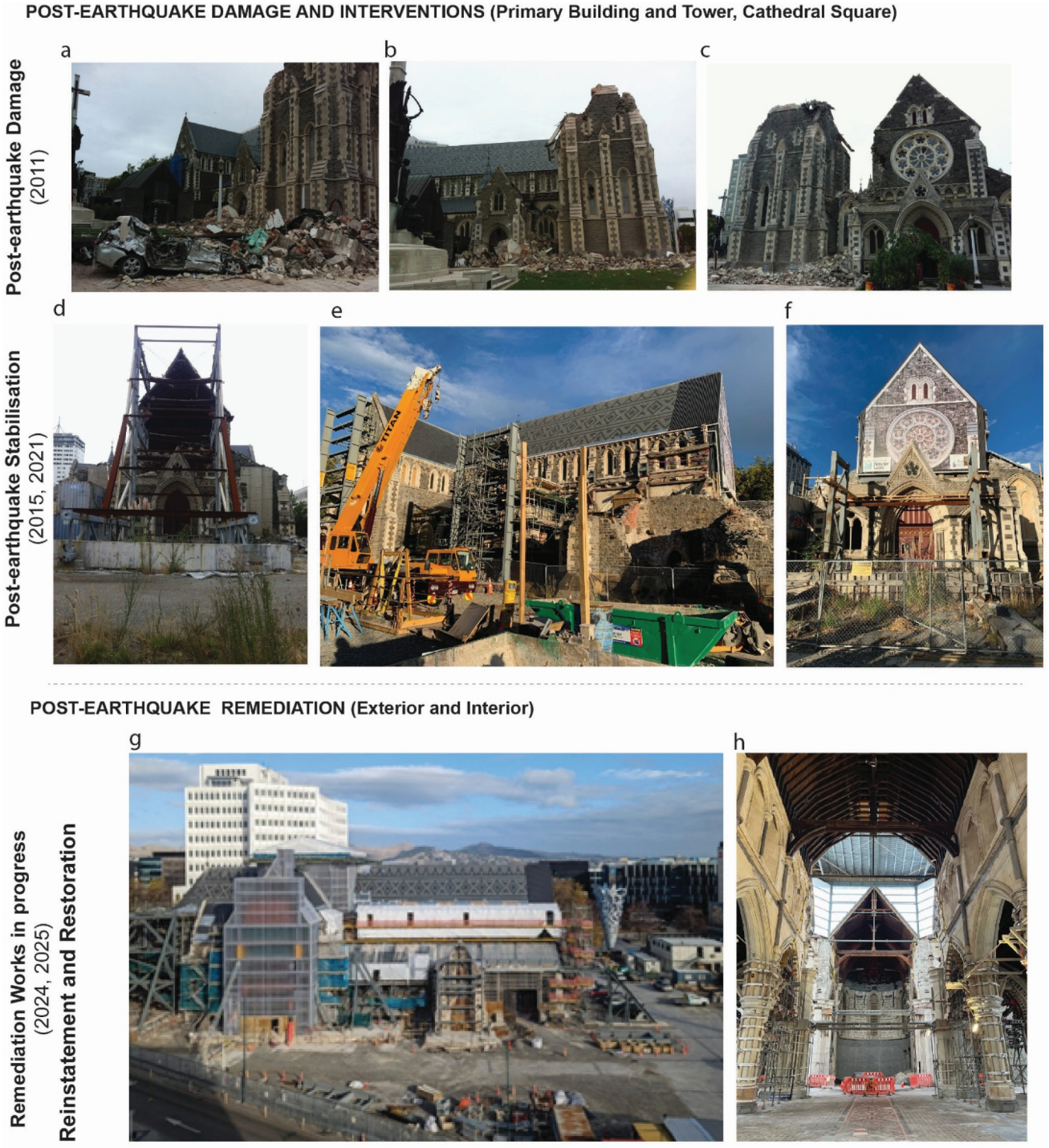

Figure 5. Post-earthquake damage, interventions, and remediation, Christ Church Cathedral. (a) Post-earthquake damage, seen from Cathedral Square, 2011. Photograph by Jason Ingham. (b) Post-earthquake damage to Cathedral tower, 2011, seen from Cathedral Square. Photograph by Jason Ingham. (c) Post-earthquake collapse of Cathedral tower and damage to primary façade 2011, seen from Cathedral Square. Photograph by Jason Ingham. (d) Emergency stabilisation for primary façade, 2015. Photograph by Jason Ingham. (e) Stabilisation works underway, 2021. Photograph by Jason Ingham. (f) Post-earthquake securing for primary façade, 2021. Photograph by Jason Ingham. (g) Post-earthquake external remediation works, 2024. Photograph by Stacy Vallis. (h) Post-earthquake internal remediation works, 2025. Photograph by Julia Gatley.

extant unreinforced masonry churches located across the country's South Island, where it was found that high ratios of wall height-to-thickness and length-to-thickness contributed to greater structural vulnerability, along with degraded construction materials and inadequate building maintenance (Marotta et al. 2015).

Further fieldwork between 2016–2018 focused on churches within the Anglican diocese of the Waikato and Taranaki regions in the North Island (Abeling et al. 2018; Galvez et al. 2017) that had both unreinforced masonry and timber churches. Decision Support Systems (DSSs) were subsequently developed and trialled to enhance risk assessment and, in turn, increased resilience (Giovinazzi et al. 2018).

The national Building (Earthquake-prone Buildings) Amendment Act 2016 was introduced on 1 July 2017, mandating local authorities to carry out assessments to identify earthquake-prone buildings, while building owners were required to complete any required works within designated timeframes (Ministry of Business Innovation & Employment 2026). Since then, major legislative changes announced in September 2025 aim to transition the management of earthquake-prone buildings back to a more proportionate, risk-based approach. These changes are designed to ensure more focus is placed on buildings that represent greater life-safety risks and facilitating more affordable seismic strengthening when the risk is lower (Ministry of Business Innovation & Employment 2025).

3. Theoretical Framework

Much has been written in conservation theory and guidance documents about the concept of authenticity (Araoz 2013; Feilden 2003; Jokilehto 2006; Orbaşlı 2015; Philippot et al. 1996; Stovel 2008). Acknowledging the relationships between critical life-safety structural engineering considerations and conservation interventions for damaged historic unreinforced masonry buildings, the following sections examine how the applications of relevant conservation principles collectively contribute to the conservation of authenticity in post-disaster scenarios (Borri and Corradi 2018; Borri et al. 2019). Lessons can be gleaned from global events, particularly from the Italian context where responses to the L'Aquila earthquake (2009), Emilia earthquake (2012), and Central Italy earthquake (2016) underscore the importance of multidisciplinary collaboration between structural engineers and conservation professional stakeholders to develop appropriate interventions that do not undermine the characteristic tangible and intangible heritage values of a given site (Borri and Corradi 2018). The ICOMOS International Scientific Committee on the Analysis and Restoration of Structures of Architectural Heritage (ISCARSAH) Principles and Guidelines on the Analysis, Conservation and Structural Restoration of Architectural Heritage, informed by the Venice Charter (1964), Nara Document (1994), and the International Organization for Standardization's International Standard 13822:2010 Bases for Design of Structures — Assessment of Existing Structures (ISO 13822 2010), emphasise the conservation of inherent tangible values (e.g., materials, structure, location, and setting) and intangible values (e.g., conservation traditions and techniques, use and function) (Borri et al. 2019; Napolitano et al. 2025; Roca 2021). Reversibility and minimal intervention are cited as core strategies to avoid unnecessarily invasive retrofitting approaches, based on safety and durability needs of a given site (Borri et al. 2019; Roca 2021). Not only does an approach based on minimal intervention support the conservation of authenticity, but excessive structural interventions can result in potentially unpredictable seismic behaviour, and these interventions can prove difficult to remove or remediate (Roca 2021). Maintaining the integrity of the structural characteristics and behaviour is important and contributes to the conservation of authenticity for the wider cultural heritage significance of a given site (Roca 2021). At a finer grain, Roca et al. propose the use of intervention criteria including compatibility, durability, non-invasiveness, and removability (encompassing re-treatability, controllability, and sustainability) to assess potential impacts on heritage values. Acknowledging the interrelationships between these principles, Roca (2021) stresses that the authenticity of a given site can be achieved through conserving both tangible and intangible values.

The following discussion traces the amalgamation of these concepts within the overarching definitions of authenticity and evolution through key charters from the early 20th century onwards. Table S1 presents direct excerpts from key charters containing references to authenticity, respect for surviving fabric, truthfulness and/or avoiding conjecture that contribute to the conceptualisation of authenticity as a heritage value whose potential loss requires careful evaluation and minimisation. To this end, the third column of Table S1 is provided to collate relevant intervention principles (e.g., compatibility, reversibility, minimal intervention) and the corresponding operational criteria for undertaking assessment of potential impacts and loss of authenticity (e.g., processes of reconstruction, restorations, anastylosis).

Table S1 captures a chronological review of key philosophical developments presented by international conservation charters and guidelines. Implications for post-disaster interventions are found in the Athens Charter (ICOMOS) and the Carta del Restauro Italiana

(1931), highlighting the concept of *anastylosis*, while the Venice Charter (1964) also discusses these processes during reconstruction and reinstatement with reference to historic monuments. While lay definitions of anastylosis describe the process as "the restoration of a ruined monument or building by reassembling fallen parts and, when necessary, incorporating new materials", Feilden acknowledges ambiguity in the concept despite common use of the process when treating post-earthquake buildings and sites (Collins English Dictionary 2025; Feilden 2003). Challenges arise in conveying the history of earthquake damage and subsequent repairs or reconstruction that may depend on the legibility of these interventions to viewers. For example, the term *lacuna* or *lacunae* refers to the "missing parts of objects" and can be understood as the "figure" and "background" concepts from Gestalt psychology and natural human perception (Philippot et al. 1996). Scholars connect the process of anastylosis to the concept of truthfulness and authenticity, achieving 'unity of the whole', through the treatment of lacuna/lacunae. Hence, Philippot suggests that restoration schemes should enable the reversal of lacunae from figure to background to reduce visual impact. In other words, material or structural interventions may be designed to be identifiable by viewers from close proximity, while being invisible to viewers from a distance. Brandi supports this approach, noting that the "unity of the whole" in architecture is important for ensuring a cohesive overall message or understanding by viewers (Brandi et al. 1996). Nevertheless, Philippot also acknowledges the unavoidable changes within masonry buildings, due to variation to the original masonry course rhythm and craftsmanship during anastylosis (Philippot et al. 1996). Therefore, for anastylosis to take place, extant masonry fabric is needed along with care taken in the treatment of lacunae through reassembly of surviving fragments (Feilden 2003).

Greater recognition of the need to consider and conserve authenticity of a broader range of heritage typologies in promoting an integrated approach to conservation, and the role of context, use, and function, emerges through the Norms of Quito (1967), Amsterdam Declaration/European Charter of the Architectural Heritage (1975) and the Declaration of San Antonio (1996) (Committee of Ministers of the Council of Europe 1975; Conti 2014; ICOMOS National Committees of the Americas 1996). A growing acknowledgement of change to historic buildings and sites is also evident through the Burra Charter (1999, 2013) and further crystallised within the Charter of Cracow (2000) and Zimbabwe Charter (2003), where the conservation of authenticity is linked to the conservation of heritage values within a specific cultural context (Australia ICOMOS 2025a, 2025b; Charter of Cracow 2000; ICOMOS 2003). Meanwhile, reconstruction without conjecture is emphasised by the Riga Charter (2000), stressing that interventions should be legible from existing historic building fabric, reversible, and should primarily support conservation and presentation of the site, where replication should only be adopted in exceptional cases (ICCROM/Latvian National Commission for UNESCO/State Inspection for Heritage Protection of Latvia 2000a). Amongst these developments, the Nara Document (1994) and Nara +20 (2014) were instrumental in promulgating key principles, particularly the role of cultural heritage context and diversity in the interpretation of authenticity (Agency for Cultural Affairs Government of Japan Nara Prefecture and Nara City 2014; ICOMOS 1994).

Locally, the ICOMOS New Zealand Charter 2010 defines authenticity as "the credibility or truthfulness of the surviving evidence and knowledge" with reference to architectural characteristics including building form, construction technology and craftsmanship, location and surroundings, setting, use, and sense of place, and is in keeping with the global shifts (Australia ICOMOS 2025a; ICCROM/Latvian National Commission for UNESCO/State Inspection for Heritage Protection of Latvia 2000b; ICOMOS 2003; ICOMOS New Zealand Charter for the Conservation of Places of Cultural Heritage Value 2010). The ICOMOS New Zealand Charter relates these principles to four types of intervention, namely, preservation (meaning stabilisation, maintenance, repair), restoration (meaning reassembly, reinstatement, or removal of old fabric), reconstruction (using new fabric to resemble the old), and adaptation. Because post-disaster interventions often involve combinations of restoration, reconstruction, and adaptation, the ICOMOS New Zealand Charter also advises against excessive or conjectural reconstruction (ICOMOS New Zealand Charter for the Conservation of Places of Cultural Heritage Value 2010).

The charters and principles discussed in the preceding paragraphs collectively recommend the conservation of authenticity for current and future generations by showcasing a building's history including change. Key shifts are highlighted, especially noting the latter 20th-century recognition of intangible as well as tangible values, and acknowledging the national view of 'place' as central to contemporary conservation decision-making in Aotearoa New Zealand (Ahmad 2006). Based on close reading across these guidelines, discussions concerning the conservation of authenticity and truthfulness within post-earthquake contexts should address the principles of integrity, minimal

intervention, reversibility, and compatibility in relation to the broad tangible and intangible values of a given building or site.

3.1. Assessment Framework: conservation of authenticity for earthquake-damaged churches

These core principles discussed in Table S1 are collated as an Assessment Framework of implications for the conservation of authenticity for earthquake-damaged churches in Table 1, informed by conservation discourse, charters, and decision-making guidelines for sites at risk from natural hazards and climate change, including resources published by the National Park Service and ISCARSAH (Aguilar 2016; Napolitano et al. 2025; Palazzi et al. 2023). The Assessment Framework presented in Table 1 provides 'Technical Intervention Principles' and corresponding 'Operational Criteria' to guide assessment of potential impacts and loss of authenticity arising from proposed interventions. The Technical Intervention Principles of 'Minimal Intervention' and 'Compatibility' are informed by the conceptualisation of authenticity identified in Table S1, whereby 'Operational Criteria' incorporate a series of prompts for undertaking a qualitative assessment based on 'Non-invasiveness', 'Reversibility', 'Physical Compatibility', 'Truthfulness and Avoiding Conjecture', and 'Use (current and ongoing)'. Incorporation of 'Non-Invasiveness' and 'Reversibility' within the principle of 'Minimal Intervention' is based on the extent to which proposed interventions entail invasion of the original fabric and the feasibility for potentially reversing these interventions to address potential impacts and losses of authenticity, while the inclusion of 'Physical Compatibility', 'Truthfulness and Avoiding Conjecture', and 'Use (current and ongoing)' within the principle of 'Compatibility' is informed by the integration of contemporary interventions within existing fabric as well as the interpretive, educational, social, and economic implications for current and future users that bear potential impacts and losses for authenticity (i.e., through examining the scope of compatibility of materiality and structure, aesthetics, and proposed new uses). 'Non-Technical Assessment Criteria: Governance and Participation' refers to integrated conservation approaches that involve local authorities, specialists, and citizen participation in the decision-making process (Agency for Cultural Affairs (Government of Japan) Nara Prefecture and Nara City 2014; Australia ICOMOS 2025b; Committee of Ministers of the Council of Europe 1975; ICCROM/Latvian National Commission for UNESCO/State Inspection for Heritage Protection of Latvia 2000b; ICOMOS National Committees of the Americas, 1996 ; ICOMOS New Zealand Charter for the Conservation of Places of Cultural Heritage Value 2010; ICOMOS 1931; ICOMOS 1994). Acknowledging the integral role of stakeholder participation and multidisciplinary input within the conservation decision-making process outlined by charters including the Riga Charter and Amsterdam Declaration, the Assessment Framework also offers an opportunity to canvas and incorporate these perspectives.

Together, the Framework offers a pipeline for comparing implications for the conservation of authenticity presented by divergent post-earthquake proposals for

Table 1. Assessment Framework template for post-earthquake interventions to historic churches.

Intervention Principles	Score Range	Operational criteria to evaluate potential impact and loss of tangible and intangible heritage values
Technical Intervention Principles and Operational Criteria		
Minimal Intervention	−3 to +3	**Non-Invasiveness**: What degree of invasiveness to the historic building fabric does the proposed intervention entail?
	−3 to +3	**Reversibility**: Removability, Retreatability, Sustainability Is it possible to remove and replace the adopted measures, with a limited and repairable deterioration to the original construction? Are future interventions feasible? What is the durability of the adopted measures? Do the adopted measures use sustainable materials and technologies that have a low environmental impact? Also refers to the potential of restoring to a fully intact previous state, where 'removability' is advised as more achievable.
Compatibility	−3 to +3	**Physical Compatibility**: What is the extent of new material introduced to replace material that has been lost? What is the physical and mechanical compatibility with the original material and techniques? *Note: Analysis of chemical, rheological, and thermal compatibility is outside the scope of this study.*
	−3 to +3	**Truthfulness and Avoiding Conjecture**: What is the extent of reassembly using existing materials, and reinstatement to return existing materials to its former position? Are repairs using matching or similar materials and are the repairs distinguishable by conservation professionals?
	−3 to +3	**Use (current and ongoing)**: Are the proposed uses respectful?
Non-Technical Assessment Criteria: Governance and Participation		
Stakeholder Considerations	−3 to +3	**Financial Constraints**: What are the financial considerations required for the adopted measures?
	−3 to +3	**Engineering and Life-Safety Requirements**: How do the adopted measures satisfy engineering and life-safety requirements for regulatory compliance?
	−3 to +3	**Public Support**: What is the level of acceptance of the adopted measures by public stakeholders and decision-makers?

earthquake-damaged historic churches in a structured and transparent manner during the initial stages of the consultation and decision-making processes. Based on the scoring rubric and implementation process proposed by Napolitano et al. (2025) to highlight and analyse the advantages and potential trade-offs that commonly arise between different stakeholder parties, each intervention can be evaluated using a bipolar, Likert-style integer scale. Numeric scoring is allocated using the proposed scale, where the score range falls between '−3' (indicating 'Most Significant Adverse Impact') and '+3' (indicating 'Most Significant Positive Impact') to elucidate potential impact on heritage values, where a score of '0' indicates 'Neutral/No Discernible Impact'. An outcome of 'Not Applicable' is also scored as '0' and needs to be recorded as such in the template. Instead of serving as a fixed checklist, the proposed framework is intended to provide a transparent strategy for evaluating potential impacts and losses for the conservation of authenticity for earthquake-damaged historic churches. As outlined in Napolitano et al. (2025), the Framework developed in this paper can serve as a rapid assessment tool to support collaborative and structured dialogue during project initiation and can be employed iteratively during subsequent project stages as more detailed data becomes available. Intended end users include conservation practitioners, local government and community representatives, and building industry professionals. The Framework requires users to individually populate the Table 1 template anonymously, allowing each party to allocate scores and justifications relating to proposed conservation interventions. A neutral facilitator gathers this data, aggregates the scores and rationales, and circulates a summary where the stakeholder parties may reconsider their preceding assessments. This process may be repeated to clarify needs, priorities, and potential challenges required to reach consensus in the decision-making process. In the following sections of this paper, the Framework is used to assess the complex considerations presented by four design responses for the Anglican Christ Church Cathedral as a case study.

4. The post-quake course of events

Repairing, rebuilding or replacing Christ Church Cathedral constituted a significant decision-making dilemma for the local community in Christchurch. The local Bishop and others within the Anglican Synod initially wanted to demolish the old building, but among the public there was strong support for retention and repair from the outset. As demonstrated by Table 2, several legal battles took place, including a Supreme Court ruling that supported the Diocese's preference.

Extensive damage rendered the old Cathedral unsafe to use, and a temporary building was erected to meet the immediate needs of the parish. Designed by the renowned Japanese architect Shigeru Ban, the Transitional Cathedral was built using 98 cardboard tubes, timber, and polycarbonate. It was the first non-commercial construction following the 2010–2011 earthquake sequence (Crook 2025), and came to represent the city's resilience as the fate of the Christ Church Cathedral remained hotly contested by decision-makers and advocates.

Three options for the site were publicised in 2013: 1) to rebuild the Cathedral to its earlier appearance, combining repair, the reinstatement of old fabric, and reconstruction using new fabric to resemble the old; 2) to build a traditional-looking building in timber; and 3) to build a completely new building, to a contemporary design (Herald Online 2013). The idea of leaving the Cathedral in ruins as a memorial surrounded by a reflecting pool and building a new Cathedral on another site was also raised during this time (McDonald 2017; Stewart 2013). Local architects speculated on the development of the site as a preserved archaeological ruin that would contribute to national heritage tourism, education, and science, in a similar way to prominent heritage sites globally. At that time, the option of repairing, reinstating, and reconstructing the Cathedral was expected to take between 6 and 22 years, with a cost of between NZ$104 million and NZ $221 million, while the traditional timber building was projected to take between 5 and 22 years to build and cost between NZ$85 million and NZ$181 million, and the contemporary building, between NZ$56 million and NZ$74 million and between 4 and 9 years.

Following legal proceedings and negotiations, along with further earthquakes in 2016, a Working Group report eventually recommended the reinstatement and reconstruction option, with insurance payouts and local and central government support to cover half of the projected cost, and the remainder to be raised over 3 to 5 years (David Williams 2024). In August 2017, the Anglican Synod floated the option of gifting the Cathedral to the government for its management (Gates 2017a). Nothing came of this, however, as in September 2017, the Church finally voted in favour of the repair, reinstatement, and reconstruction option.

Reinstatement and reconstruction in the original architectural style and materials constituted a substantial undertaking. It would mean ongoing use as a place of worship, albeit with a flexible seating arrangement introduced to enable additional uses by

Table 2. Table of planning documentation and media reports used to discern stakeholder attitudes towards conservation outcomes for the earthquake-damaged Christ Church Cathedral.

Document Type	Source and Title	Year Published	Conservation Recommendation
Heritage Recognition	Heritage New Zealand Pouhere Taonga; Cathedral Church of Christ (Anglican); 100 Cathedral Square, Christchurch 'Highly Significant' listed Heritage Item in the Christchurch City District Plan	1983	Recognition and documentation of heritage significance (Christchurch City Council 2025; ICOMOS New Zealand 2015; Lovell-Smith 2001)
Conservation Documentation	Salmond Architects – *Christchurch Cathedral; Conservation Plan*	2006	Documentation of heritage significance (Salmond Architects 2006)
Local Government Reports	Regenerate Christchurch – *Whiti-Reia Cathedral Square; Our Long Term Vision*	2018	Plan for the regeneration of the Cathedral Square precinct (Regenerate Christchurch 2018)
Stakeholder Documentation	Christ Church Cathedral Working Group (established in 2016 by the Government and Church Property Trustees)	2021	Reinstatement of damaged Cathedral (Christ Church Cathedral Working Group 2016)
	Webpage – *Christ Church Cathedral Reinstatement Project*	2025	Rebuilding existing damaged Cathedral (Christ Church Cathedral Reinstatement Project & Timeline 2025)
Media reports	Gates, Charlie. *Emotional service for Christ Church Cathedral*, stuff.co.nz	2011	Proposed deconsecration and partial demolition to make safe while options are considered (Gates 2011)
	Christ Church Cathedral to be pulled down, stuff.co.nz	2012	Proposed demolition and community heritage advocacy efforts underway to save it (The Press 2012)
	Design options for Christchurch Cathedral revealed, Radio New Zealand; *Christchurch Cathedral demolition given green light*, New Zealand Herald	2013	APNZ (2013); Radio New Zealand (2013)
	Gates, Charlie. *Cathedral decision will kick-start millions of dollars in donations – campaigner*, stuff.co.nz	2017	Seeking funding support (Gates 2017b)
	Christ Church Cathedral rebuild could be mothballed as cost blows out to $248 million, Radio New Zealand	2024	Radio New Zealand (2024a)
	Williams, David. *How Christchurch got sucked into an eye-wateringly expensive cathedral rebuild*, Newsroom	2024	David Williams (2024)
	Christ Church Cathedral restoration over, for now, Radio New Zealand	2024	Restoration works halted (Radio New Zealand 2024b)
	Christ Church Cathedral could reopen in five years in cheaper restoration plan, Radio New Zealand	2025	Phased works and reopening (Radio New Zealand 2025)

different groups. The developed design of October 2020 included ancillary buildings to ensure the creation of a 'Cathedral Quarter' precinct (Christ Church Cathedral Reinstatement Project 2025b). The Cathedral's Reinstatement Resource Consent was granted for works to begin in December 2020.

The initial seismic remediation works included global stabilisation of the external steel frames required for transferring loads within the main building structure, reducing the risk of collapse, and providing access and support for subsequent strengthening measures. Local stabilisation strategies addressed the secondary support systems, while the final stage of stabilisation enabled access to the building's interior to allow decontamination, temporary weather protection, and the salvaging of heritage items. Between March 2023 and December 2024, around 40% of the superstructure strengthening was completed (Christchurch Cathedral Reinstatement Project 2026). Strengthening of the existing walls involved the introduction of reinforced concrete into the existing stone rubble, along with grouting and structural pinning, while walls that had sustained excessive damage would require reconstruction using new fabric and contemporary construction techniques. A new foundation system featuring base isolation was proposed, along with underfloor reticulation of services, including heating to ensure thermal comfort. The remains of the original Cathedral tower were identified for dismantlement and reconstruction in their original position, to resemble the original design, albeit with base isolation, reinforced walls, and a steel steeple to meet seismic design standards. The rebuilt tower was planned to have a functioning belfry and viewing platform.

In April 2024, with the stabilisation work complete and strengthening partially complete, those leading the project revealed that the projected cost had escalated to NZ$248 million, presenting a funding shortfall of NZ$114 million, along with an anticipated completion date of 2031 (Christ Church Cathedral Reinstatement Project 2025a; Radio New Zealand 2024a). The building was mothballed. In September 2025, the Christ Church Cathedral Reinstatement Ltd, a registered charity responsible for the Cathedral reinstatement, then proposed a phased approach to completing the project, thus significantly reducing the funding shortfall, due to begin in 2026 (Radio New Zealand 2025). At the time of writing, broad public discussion regarding the funding shortfall, as well as national priorities and identity, continues to take place, encapsulated by the earthquake-damaged Cathedral (Roberts 2026; Sargent 2026).

5. Implementation of the Assessment Framework

Four scenarios of post-earthquake architectural design and conservation intervention are employed to demonstrate an application of the Assessment Framework, using existing published resources. The design solutions proposed for the earthquake-damaged Christ Church Cathedral site reveal a spectrum of interpretations and understandings of local and national cultural heritage. Exploring the proposed responses in light of conservation theory reveals both shared and conflicting attitudes among stakeholders including owners, building industry practitioners and conservation experts (e.g., architects, engineers, trades practitioners), local authorities, and communities. Such tensions commonly arise between material preservation, engineering life-safety provisions, and evolving attitudes towards authenticity in post-disaster scenarios. Accordingly, implementation of the Framework generates an assessment report to evaluate implications and potential losses of authenticity based on a series of structured evaluation criteria intended to guide discussion and decision-making.

5.1. Transitional Cathedral

Acknowledging that the Transitional Cathedral was a new building some distance away from the earthquake-damaged Cathedral (Table 3), with no direct physical impact on the original earthquake damaged Cathedral, the score of '0' ('not applicable') was allocated for the degree of invasiveness. Shigeru Ban's design referred to the old Cathedral building. It was given 700 seats to match the capacity of the old, while the gabled primary façade incorporates an 'A-frame' structure and coloured glass triangles later named the Trinity Window, referencing the original Rose Window (Barrie, Anderson, and Goodenough 2014). These considerations are reflected in a score of '+2' allocated for 'Physical Compatibility' and 'Truthfulness and Avoiding Conjecture'. A 900-mm-deep concrete raft foundation necessitated by the New Zealand Building Code and the risk of soil liquefaction from future earthquakes gave the building stability but negated the possibility of relocation to another site (Barrie, Anderson, and Goodenough 2014). This intervention and choice of building materials being environmentally low impact cardboard components with an expected life span of 50 years is given a score of '0' ('Neutral') in relation to 'Reversibility'. Conservation of historic building fabric was not a consideration, but the continuity of religious practices was, and the Transitional Cathedral provided a temporary space for ongoing worship and community

Table 3. Assessment Framework for post-earthquake intervention: Transitional Cathedral.

Intervention Principles	Score Range	Operational criteria to evaluate potential impact and loss of tangible and intangible heritage values
Technical Intervention Principles and Operational Criteria		
Minimal Intervention	0	**Non-Invasiveness**: Not applicable.
	0	**Reversibility**: Removability, Retreatability, Sustainability Neutral; No direct interventions to the original Anglican Cathedral building or site. Transitional Cathedral offers an interim space for religious worship. Transitional Cathedral remains in use approximately 15 years following the Canterbury earthquake sequence.
Compatibility	+2	**Physical Compatibility** No direct intervention to the original Anglican Cathedral. Transitional Cathedral design inspired by form and uses of original building.
	+2	**Truthfulness and Avoiding Conjecture** No direct intervention to the original Anglican Cathedral. Transitional Cathedral design inspired by form and uses of original building.
	+3	**Use (current and ongoing)**: Interim space to facilitate continuity of religious worship and community activities; Remains in use at the time of this study.
Non-Technical Assessment Criteria: Governance and Participation		
Stakeholder Considerations	−3 to +3	**Financial Constraints**: Various uncertainties sourcing the appropriate funding; Some pro bono work.
	+3	**Engineering and Life-Safety Requirements**: Innovative design solution combined reference to historic architectural characteristics; Use temporary building materials.
	+3	**Public Support**: Despite challenges during design development, the project received support and remains in use.

uses while the fate of the historic Cathedral was debated. Despite the ephemeral nature of the Transitional Cathedral, it remains in use some 15 years following the Canterbury earthquakes. In this respect, a score of '+3' is allocated. The complex nature of the 'Non-Technical Assessment Criteria' relating to governance and participation is evident through the range of scores captured in Table 3. For example, significant uncertainty relating to financial considerations, noting challenges in securing project funding and pro bono work, is demonstrated by the score range of '−3 to +3', whereas the project's innovative nature and strong public support are each reflected by a score of '+3'.

5.2. Reinstatement and reconstruction of the earthquake-damaged Cathedral

Architectural renders of the reinstatement and reconstruction project indicate a finished building matching the old Cathedral in appearance, despite the introduction of multiple seismic retrofit works undertaken for meeting life-safety standards (Hudson 2013) and the introduction of much new building fabric. Such projects involve a high degree of intervention (Table 4) and challenge the notion of minimal intervention and compatibility for authentic conservation, reflected by the allocated score of '−3' for 'Non-Invasiveness'. For example, engineering discussions revealed the challenges with the retention of existing foundations where feasible, as retention reduces demolition and maintains gravity load pathways for the superstructure whilst the new foundation elements are installed (Schwass 2023). Due to uncertainties arising from insufficient reinforcement and the varying nature of the historic construction, the existing foundations were otherwise treated as voids within the raft foundation. A score of '0', 'Neutral's is provided for 'Reversibility' based on the scope of available public documentation.

The reinstatement, reconstruction, and strengthening of the tower are to be based on an overall goal to utilise existing material where possible, which serves conservation ends focused on achieving compatibility with the extant remains and urban setting within Cathedral Square while also reducing expenditure on new materials, resulting in a score of +2' for 'Physical Compatibility'. To reduce the risk of conjecture, the available project documentation also states that any temporary deconstruction required during the rebuilding will be preceded by cataloguing and storage of existing material for reuse, demonstrated by a score of '+2' in relation to 'Truthfulness and Avoiding Conjecture', while the historic building fabric will be protected from further damage by stabilisation and weatherproofing provisions (Christ Church Cathedral Reinstatement Project & Timeline, 2025).

While the structural interventions will inherently improve the integrity and seismic performance of the building, the design decisions result from entwined conservation and structural engineering priorities. In doing so, these works present numerous opportunities for authentically conveying the timeline of earthquake damage and subsequent intervention through the expression of lacunae, anastylosis, and the presentation of patina. For example, Cathedral 'Quarter' will

include two new buildings, the Visitor Centre and the Cathedral Centre. They will host a café, gathering spaces, and offices (Christchurch City Council 2020). Glass and timber will be used in both buildings to enhance visual connectivity from these spaces to Cathedral Square and to avoid visual interference between the new buildings and the reinstated and reconstructed Cathedral. New vestry buildings that are intended to replace the 1960s predecessors demolished to facilitate repair of the Cathedral apse will have a similar material palette and roof forms to the original earthquake-damaged building, offering a degree of compatibility. Subtle modifications in use are proposed for the new vestries, whereby the north vestry is proposed to function as a library and choir rehearsal space, as well as serving other community and educational purposes, while the south vestry will be used by the Cathedral personnel before religious services.

In contrast, the remains of the damaged tower and western porch will be demolished and both will be reconstructed in their original positions. Proposed structural strengthening interventions for the tower use a similar masonry material palette and aim for a high degree of visual compatibility with the reinstated and reconstructed Cathedral building. From an urban perspective, the proposed works seek to address a number of tangible and intangible heritage values associated with the building and prominent central city site, through physical attributes, as well as patterns of circulation and, significantly, the continuing and increased range of uses that acknowledge the intergenerational role of the Anglican Cathedral in the heart of central Christchurch resulting in an allocated score of '+3' for 'Use (current and ongoing)'.

Acknowledging the substantial debate and uncertainty within the local community that preceded these interventions, combined legislative and financial support has contributed to the completed and ongoing remediation works, demonstrated by the range of scores allocated in the 'Non-Technical Assessment Criteria: Governance and Participation' in Table 4. Three legislative mechanisms that have enabled this process, the Christ Church Cathedral Reinstatement Act 2017, the subsequent Order in Council to streamline the consenting process, and the following Resource Consent granted in 2020 to progress works on site together reflect the role of central government in the national debates on the future of the Cathedral, debates that also included the Anglican Church, the community, and heritage advocates (Empowering Regulations; Christ Church Cathedral Rebuild 2025).

5.3. Replacement in timber

The second option for the Christ Church Cathedral site, comprising the demolition of the remains of the earthquake-damaged Cathedral building and replacement, on the same site, with a reinterpretation of the original Gothic Revival forms and volume in timber (Herald Online 2013), is not without precedent in New Zealand. As mentioned, this country has a long tradition of building churches in timber, with numerous significant Gothic Revival timber churches from the 19th

Table 4. Assessment Framework for post-earthquake intervention: reinstatement and reconstruction.

Intervention Principles	Score Range	Operational criteria to evaluate potential impact and loss of tangible and intangible heritage values
Technical Intervention Principles and Operational Criteria		
Minimal Intervention	−3	**Non-Invasiveness**: Highly invasive to undertake stabilisation, reinstatement, reconstruction, rebuilding.
	0	**Reversibility**: Removability, Retreatability, Sustainability Neutral; Based on publicly available documentation, is unclear; Implemented measures intended for long-term performance.
Compatibility	+2	**Physical Compatibility** Key architectural elements will be reconstructed in the original position. Substantial seismic retrofit interventions integrated within the surviving structure to enhance structural performance.
	+2	**Truthfulness and Avoiding Conjecture** Reconstruction and construction of new ancillary buildings will use a similar material palette to the original building, and original materials used where feasible. Based on publicly available documentation, some legibility between original fabric and new buildings; Unclear what extent of reconstructed elements will be easily legible.
	+3	**Use (current and ongoing)**: Strong continuity of use for religious worship, with supporting functions.
Non-Technical Assessment Criteria: Governance and Participation		
Stakeholder Considerations	−3 to +3	**Financial Constraints**: Significant financial considerations and challenges encountered since the original design proposals.
	+3	**Engineering and Life-Safety Requirements**: Engineering requirements and life-safety at the forefront of conservation decision-making.
	−3 to +3	**Public Support**: Public support and criticism relating to project timeline and cost.

century. They have been known to perform comparatively well in major earthquakes. Furthermore, timber was Sir George Gilbert Scott's original material of choice for the Cathedral. Published renders showed the proposed design with an intricate vaulted ceiling, expressed in timber, along with a hollow timber spire (Hudson 2013).

The historic building, however, has stood in stone since first built and replacement in timber would have had a major impact on the character and experience of the place, from its visual appearance through to its historical references, atmosphere, acoustics, and patterns of circulation within the space. It would have resulted in significant loss of historic building fabric, even as there would have been some continuity of architectural form, and the original building's scale and ordering of religious spaces would have served as a reference for the new replacement ("Three Design Options Revealed" 2013) (Table 5). Given that none, or almost none, of the original building would have been retained, despite the design taking inspiration from the country's architectural heritage meaning a locally familiar architectural form, and one with a demonstrated track record of surviving earthquakes, such substantial changes would have resulted in significant impacts and losses of authenticity; hence these considerations are reflected by a score of '−3' across the intervention principle of 'Minimum Intervention' and corresponding operational criteria of 'Non-Invasivenss' and 'Reversibility'. Nevertheless, there is a degree of continuity of use of the Cathedral Square site by the Anglican Church evident in the publicly available documentation, and this is displayed through the score range of '+1 to +3' relating to 'Use'. The distinction from the original building is reflected in the scores allocated across the principle of 'Compatibility' and the corresponding operational criteria of 'Physical Compatibility' and 'Truthfulness and Avoiding Conjecture' where further consideration of aesthetic value and structural performance of reinterpreting the Gothic Revival building using timber construction would be necessary. The uncertainties relating to the 'Non-Technical Assessment Criteria: Governance and Participation' are captured by the range of scores allocated for 'Financial Constraints' ('−2 to +3'), 'Engineering and Life-Safety Requirements' ('0 to +2'), and 'Public Support' ('−3 to +3').

5.4. Contemporary Cathedral design

The third option for the Cathedral site, comprising the demolition of the remains and replacement, on the same site, with a contemporary design, would have satisfied stakeholders such as the Anglican community in Christchurch who initially prioritised their desire for a safe new building, located in Cathedral Square, and completed within a reasonable length of time, so they

Table 5. Assessment Framework for post-earthquake intervention: replacement in timber.

Intervention Principles	Score Range	Operational criteria to evaluate potential impact and loss of tangible and intangible heritage values
Technical Intervention Principles and Operational Criteria		
Minimal Intervention	−3	**Non-Invasiveness**: Proposed timber Cathedral would entail demolishing remains of original building and rebuilding a new Cathedral on the same site.
	−3	**Reversibility**: Removability, Retreatability, Sustainability Based on the publicly available information, the proposed Cathedral would represent an irreversible intervention in demolishing and replacing the original building; Use of timber offers opportunities for sustainable timber building technologies.
Compatibility	−3	**Physical Compatibility** Acknowledging the demolition of extant remains and rebuilding in timber implies a significant adverse impact for physical compatibility between the new building and original building.
	−2 to +2	**Truthfulness and Avoiding Conjecture** Reinterpreting Gothic Revival architectural characteristics and rebuilding features in the former positions, and using contemporary timber building technology requires consideration of aesthetic characteristics and structural performance.
	+1 to +3	**Use (current and ongoing)**: Public documentation demonstrates a worship space and a continuity of use.
Non-Technical Assessment Criteria: Governance and Participation		
Stakeholder Considerations	−2 to +3	**Financial Constraints**: Based on the publicly available documentation, potential financial constraints are unclear, noting early estimate as the medium cost option between most expensive and least expensive.
	0 to +2	**Engineering and Life-Safety Requirements**: Based on the publicly available documentation, engineering and life-safety requirements unclear; Building a new Cathedral using timber construction and current seismic engineering standards implies a positive impact for life-safety provisions and amenity.
	−3 to +3	**Public Support**: Based on the publicly available documentation, potential public advocacy and support unclear, noting the decision to proceed with reinstating the original building instead of rebuilding.

could resume their religious and communal activities on site.

While a consciously contemporary design would have provided the most dramatic contrast to the original earthquake-damaged building, published renders from 2013, produced by a local architecture practice, again seem to evoke the aspects of the old Cathedral building, including its massing and tower (Hudson 2013). They showed curved, highly sculptural forms that can be seen to reference the verticality of Gothic Revival architecture, a futuristic tower form enclosing a spiral staircase, and stained-glass elements to create a dramatic luminosity (Hudson 2013). Published renders also showcased a central nave and altar, with seating intended for religious services in a similar manner to the original building. While the renders did not specify the intended building materials, they clearly showed the intention to employ natural light, subtly channelled through the roof form and a monumental stained-glass window located behind the altar.

Again, there would have been considerable impact and loss of authenticity, given that none, or almost none, of the original building would have been retained, demonstrated by scores of '−3' for 'Non-Invasiveness' and 'Reversibility' Table 6). A distinctly new building with some degree of compatibility referencing the original Anglican Cathedral is apparent in the visual characteristics of the design proposal in available public renders, resulting in scores of '−2' in relation to 'Physical Compatibility' and '+3' in relation to 'Truthfulness and Avoiding Conjecture', along with continuity of use of the site where a score of '+1 to +3' is allocated. Similar to previous scenarios, uncertainty arises through consideration of 'Non-Technical Assessment Criteria' where engineering and life-safety requirements are potentially indicated as bearing significant positive impacts due to the use of contemporary construction technologies; the financial constraints and public support is unclear and offers scope for potential adverse and positive impacts.

A summary of results is presented in Table 7. Based on the scoring and implementation of the Assessment Framework, a series of observations can be made. All interventions apart from the Transitional Cathedral demonstrate potential impacts and losses of authenticity due to the substantial scope of works required for seismic retrofitting the earthquake-damaged building or building anew (i.e., replacement in timber or the contemporary design). The degree of reversibility differs across the options of 'reinstatement and reconstruction' and constructing a new building, noting that reversibility to the previous state is impossible for a new building. In comparison, the scores allocated across the intervention principle of 'Compatibility' and corresponding Operational Criteria, clearly indicate a shared interest to reference the original Christ Church Cathedral, in relation to functioning as a worship space. All intervention design scenarios also display engagement with

Table 6. Assessment Framework for post-earthquake intervention: contemporary design.

Intervention Principles	Score Range	Operational criteria to evaluate potential impact and loss of tangible and intangible heritage values
Technical Intervention Principles and Operational Criteria		
Minimal Intervention	−3	**Non-Invasiveness**: Proposed contemporary design would entail demolishing the earthquake-damaged remains of the original building and rebuilding.
	−3	**Reversibility**: Removability, Retreatability, Sustainability Based on the publicly available information, proposed contemporary design for a new Cathedral represents an irreversible intervention in demolishing and replacing the original building; Use of contemporary building materials would offer opportunities for sustainable building technologies.
Compatibility	−2	**Physical Compatibility** Based on publicly available documentation, contemporary design for a new Cathedral does not intend to use any existing materials from the original building; Features such as the contemporary stained-glass window and architectural form including a new tower evoke characteristics of the original building.
	+3	**Truthfulness and Avoiding Conjecture** Based on publicly available documentation, contemporary design for a new Cathedral features a distinctly new building and materiality that is immediately legible to viewers.
	+1 to +3	**Use (current and ongoing)**: Public documentation demonstrates a worship space and a continuity of use referencing the original building and site.
Non-Technical Assessment Criteria: Governance and Participation		
Stakeholder Considerations	−1 to +2	**Financial Constraints**: Based on the publicly available documentation, potential financial constraints are unclear though cited to be the least expensive option.
	0 to +2	**Engineering and Life-Safety Requirements**: Based on the publicly available documentation, engineering and life-safety requirements are unclear; Building a new Cathedral using contemporary construction technologies and seismic engineering standards implies a positive impact for life-safety provisions and amenity.
	−3 to +3	**Public Support**: Based on the publicly available documentation, potential public advocacy and support is unclear.

Table 7. Summary of results for four design proposals for Christ Church Cathedral.

Intervention Principles	Transitional Cathedral	Reinstatement and Reconstruction	Replacement in Timber	Contemporary Design
Technical Intervention Principles and Operational Criteria				
Minimal Intervention				
'Non-invasiveness'	0	−3	−3	−3
'Reversibility'	0	0	−3	−3
Compatibility				
Physical Compatibility	+2	+2	−3	−2
Truthfulness and Avoiding Conjecture	+2	+2	−2 to +2	+3
Use (current and ongoing)	+3	+3	+1 to +3	+1 to +3
Non-Technical Assessment Criteria: Governance and Participation				
Stakeholder Considerations				
Financial Constraints	−3 to +3	−3 to +3	−2 to +3	−1 to +2
Engineering and Life-Safety Requirements	+3	+3	0 to +2	0 to +2
Public Support	+3	+3	−3 to +3	−3 to +3

'Truthfulness and Avoiding Conjecture', arising from the distinctive publicised solutions that range from a temporary building, reinstatement and reconstruction, a replacement building in timber, and a fully contemporary design. The legibility of original and new building fabric in the reinstated and reconstructed building, and the reinterpretation of Gothic Revival architectural and structural characteristics using timber construction technology, also embody uncertainty and require greater stakeholder discussion and debate during decision-making. Lastly, upon reflection of the 'Non-Technical Assessment Criteria', the role of current engineering and life-safety requirements offers potential for positive impact for the building users. However, there is greater variation in the scores allocated for stakeholder considerations relating to 'Financial Constraints' and 'Public Support'. Whereas the options for constructing a replacement building in timber or for a fully contemporary design present less expensive works, based on available documentation, the scope for public acceptance is highly variable given the significant departure from the original building. A current limitation includes the initial restricted demonstration of the Assessment Framework to assess potential impacts and losses of authenticity across the design proposals for the Christ Church Cathedral, informed by public documentation and discourse. Future research would examine broader applications of the Framework, for example, using a series of pilot stakeholder workshops to investigate applicability, user experience, and inform the refinement of the Framework for use in complex conservation decision-making settings.

6. Conclusion

By investigating the range of design proposals and developments relating to the future of the earthquake-damaged Anglican Christ Church Cathedral in Christchurch in this study, we question the limits of international heritage theories relating to the conservation of authenticity and the management of change within a post-earthquake environment, while also recognising the central, yet often excluded role of local community, and public perception of heritage value in determining conservation outcomes. In this study, the conservation of authenticity in a post-earthquake scenario shifted beyond purely material or technical considerations, to be driven by real-world considerations relating to community use and interpretation, life-safety requirements, and financial constraints.

The research utilised archival materials, architectural documentation and other documents to generate a timeline of intervention with the Cathedral's building fabric to interpret the nuanced application of international theories within a post-disaster national context, elucidated through the development of a thematic Assessment Framework. This process revealed the significant role of various groups and stakeholders in the decision-making process and consequently demonstrated a range of attitudes towards the conservation of authenticity and management of change for cultural heritage in Aotearoa New Zealand.

Key findings from this study are as follows. First, post-earthquake interventions may entail combined conservation processes from stabilisation to reconstruction where authenticity is negotiated with reference to conservation principles as well as engineering requirements, financial constraints, and public support. While conservation discourse cites the challenges associated with the reconstruction of damaged buildings and sites, communities may support this process especially within post-disaster scenarios. Second, despite aiming for minimal intervention to the original building, post-earthquake remediation can involve a substantial scope of works and works in which reversibility is unlikely. Communities may desire a final design outcome that is

visually close to the original building, leading to structural interventions that are highly concealed and invasive to the original building fabric, while the addition of new buildings and facilities is likely more legible to users. Moreover, public interpretation of the terms 'reinstatement' and 'restoration' can vary from institutional definitions, especially considering the substantial degree of works proposed and undertaken. Third, intangible cultural heritage values form a recurring priority across all three post-earthquake design proposals, including replacement in timber and for a completely new contemporary building. Ensuring a future for the Anglican Church on the Cathedral Square site was the only constant across the various proposals. The reinstatement of the original use and the addition of facilities to house contemporary uses will ensure continuity of use for the site. This contributes to the authenticity of the setting and encompasses both tangible and intangible attributes that define the site's significance for the religious congregation and public at large. In this way, the design of temporary premises such as the Transitional Cathedral draws from these heritage characteristics to help provide a meaningful spatial experience for communities in the years following a major earthquake where there is restricted or no access to public facilities.

Despite the challenges presented by evolving financial constraints and project timeframes since the earthquake sequence in 2010–2011, various stakeholder groups have supported the reinstatement and reconstruction of the earthquake-damaged building as it progresses with a revised and phased approach to completing the schedule of works from 2026 onwards. Contemporary heritage conservation principles go hand in hand with the practicalities of real-world conservation management of historic buildings and sites facing post-earthquake scenarios today.

Public interpretation and support for these interventions is also indicative of community memory and identity associated with their buildings and urban spaces, especially noting the post-colonial, religious context of this case study. Nineteenth-century design proposals display the opinions of the community and religious leaders to root European architectural and religious traditions in Aotearoa, New Zealand. Early earthquakes demanded architectural adaptation to the risks posed by the local environment; however, a desire to retain connection to European building traditions familiar to the colonial populace determined the design response. More recently, the Church communities and key stakeholders (the Anglican Diocese, Christchurch City Council, central government, philanthropic donors, and respective religious congregations and public communities) have again supported significant interventions to retain the surviving historic building fabric using options that include reinstatement, reconstruction, and demolition, albeit to generate earthquake-resilient and meaningful contemporary facilities to serve the needs of current and future congregations, public communities, and visitors.

While these observations are informed by the national conversations and outcomes that have taken place in New Zealand so far, investigating the application of international conservation discourse within significant post-disaster scenarios highlights the role of contextual concerns that supports a dynamic landscape of contemporary heritage management practices. Change driven by the risks posed by natural and human-induced hazards is inevitable within our unique cultural heritage sites and these phenomena initiate opportunities to proactively consider the conservation processes that govern our decision-making.

Author contributions

CRediT: **Stacy Vallis:** Conceptualization, Formal analysis, Investigation, Methodology, Visualization, Writing – original draft, Writing – review & editing; **Jason Ingham:** Conceptualization, Investigation, Methodology, Supervision, Visualization, Writing – original draft, Writing – review & editing; **Julia Gatley:** Conceptualization, Investigation, Methodology, Supervision, Visualization, Writing – review & editing.

Disclosure statement

Stacy Vallis is currently the President of the National Committee of the International Council for Monuments and Sites (ICOMOS) Aotearoa New Zealand, but this study does not represent the views of ICOMOS Aotearoa New Zealand.

The authors report generative AI was not used in their research or preparation of this manuscript.

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