

COMPLETION OF THE BELL TOWER AND SPIRE, THE CATHEDRAL CHURCH OF SAINT SAVIOUR, GOULBURN, NEW SOUTH WALES, AUSTRALIA

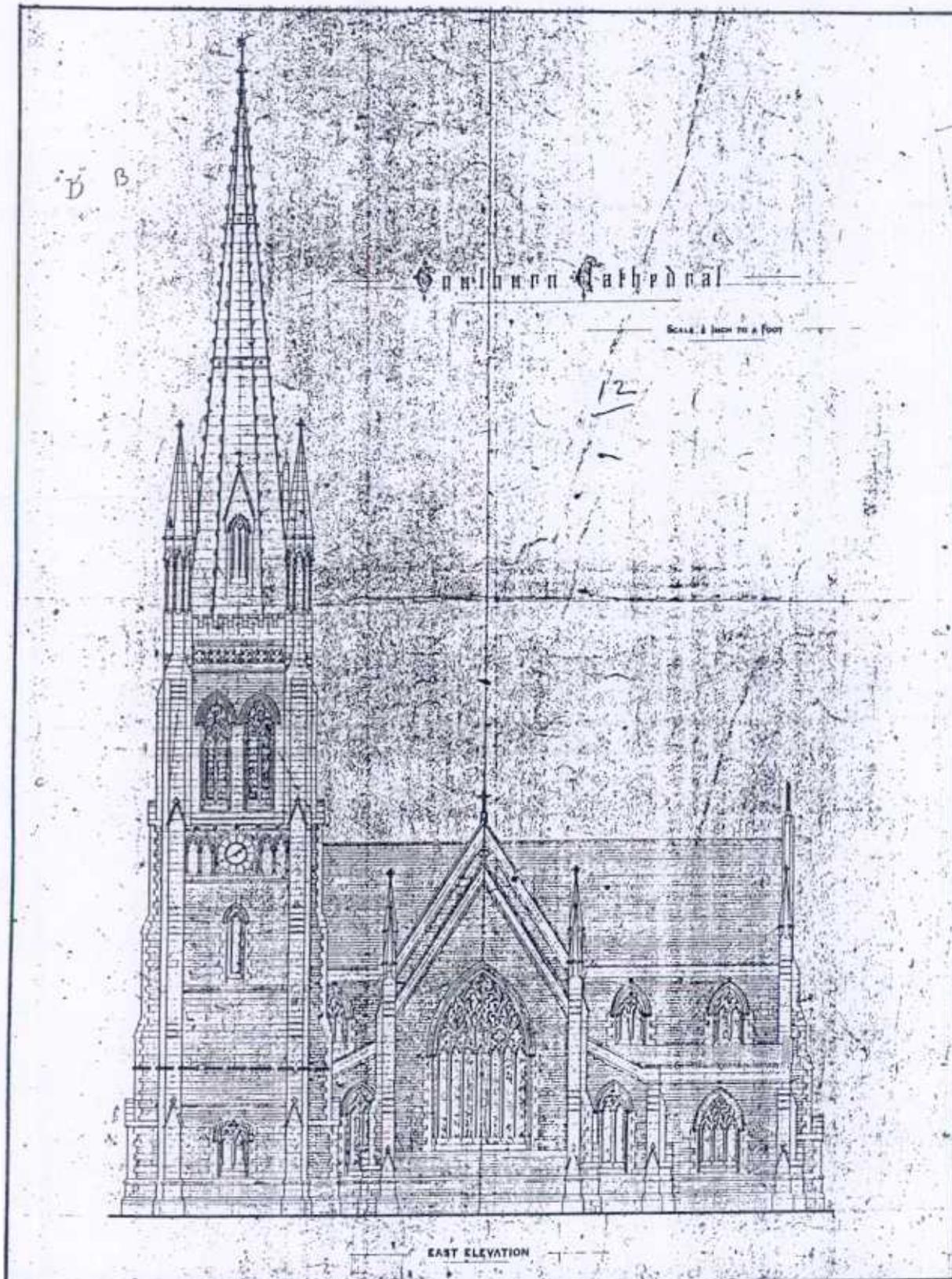
HISTORICAL BACKGROUND

The township of Goulburn was established on the Wollondilly River in the early 1830s. The site of the original township was some 200 kilometres from the coast and from the earliest settlement in the Colony of New South Wales at Sydney. Not two years after the town plan had been established for Goulburn, a decision was taken by the Colonial Government to relocate the township away from its river bound site to a flat plain some two kilometres to the west.

A new Georgian town plan was prepared for new Goulburn and within this plan, classically disposed around a central square, were allotments for market, church, prison, and court house use. The 'site for ecclesiastical purposes' was placed on a slight rise overlooking the township in a prominent position. In 1840 a simple brick church to the designs of a Sydney architect/designer, James Hume, was erected on the site. This Church of Saint Saviour was in the manner of English parish churches with a bold square western tower, and a simple axiality complimenting the Georgian town plan. By the early 1860s when the Diocese of Sydney could not functionally minister to the Goulburn area, it was decided that a new Anglican Diocese of Goulburn should be created. Accordingly, Bishop Mesac Thomas was consecrated in 1861, and the need for a cathedral church came to be considered.

It was not until 1871, however, that cathedral plans came to be actively considered. Three years later, on 15 January 1874, the foundation stone of the Cathedral Church was laid. The Cathedral Church of Saint Saviour was designed by the then noted Colonial ecclesiastical architect, Edmund Thomas Blacket. Blacket had already had some involvement with the Church site at Goulburn. In 1843 he had designed a pulpit for James Hume's original brick church which was approved by Bishop Broughton and then installed. Since Blacket's cathedral was to take ten years to construct, Blacket was also asked to design a smaller pro Cathedral cum Parish Sunday School. This building was completed in 1874, and still stands within the Cathedral precinct, to the west of the Cathedral.

The Blacket Cathedral was one of the architect's greatest works. It was really the only cathedral he designed unencumbered by distance, financial stringency, and unsympathetic clients. It was a favourite building, and Blacket spent much of the last nine years of his life working on it. Blacket gave to the Cathedral a crucifix that he had carved in his youth; a controversial gift which the authorities hid away for many years. The Cathedral is unmistakably a Blacket church, on a grand scale, with nave, aisles, transepts, chancel, porches, and tower. It has large and elaborate stone traceried windows and an impressive interior with a heavily carved hammer beam roof, clustered columns and foliage capitals, elaborately moulded arcades and chancel arch, and a striking use of figurative roundels in the nave, transepts, and chancel. The tower and spire, however, were never completed. The Cathedral cost 20,000 pounds at the time of its completion in 1884.



The original Edmund Thomas Blacket drawing for the Cathedral East Elevation 1876. Note that the dotted line indicates the height to which the Tower was originally completed.

Many attempts were made subsequent to Blacket's death in 1883 and the completion of the Cathedral proper one year later, to complete the Cathedral's tower and spire, but all these attempts were to no avail. In 1909, Edmund's son Cyril prepared documents for the completion of the tower and spire, and a commemorative stone was even laid within the tower base to signal recommencement of the tower building. But nothing more was done. In the 1920s, a Melbourne architect Louis R. Williams, was asked to advise the Diocese on the state of the tower footings. He reported that "...as a result of my examination of the structure and [Blacket] drawings, I can assure you that the present tower stump and footings are of ample strength to bear the proposed superstructure." Still no further work was undertaken.

Some ten years later, Williams and a Sydney architect, Sir Charles Rosenthal, produced a joint scheme for the new Cathedral tower and spire. Again, however, no work issued from all this activity. Perhaps this inactivity resulted from particularly pessimistic analyses of the tower foundations to carry the weight of the building. The stringencies imposed by World War II also dampened enthusiasm, and restricted available monies. It was not then until 1984, and the introduction of the Australian Bicentennial commemorative program, that funds became available for the completion of the tower and spire. A grant of \$1,000,000 was announced in that year by the Premier of New South Wales, and the Diocese of Canberra and Goulburn agreed to provide additional funds. Our practice was approached by the Diocese to assist in the preparation of architectural documents and in the construction management of the project.

THE TOWER SPIRE PROJECT

A series of tasks were early identified as critical to the project's success. The first task was, of course, the undertaking of a thorough geotechnical examination of the existing tower founding material. This investigation showed quite clearly that the existing footings to the tower were not adequate to carry the load of the intended tower and spire. Nine metre bore holes were drilled through the existing foundations and a footing/soil profile was established. This soil profile showed that beneath the sandstone and lime concrete footings was a 1.5 to 2.0 metre band of sandy clay and weathered sandstone, which was judged inadequate to carry the tower loads, particularly under the stress of wind and seismic loading.

As a result of this study, engineering documentation was prepared for the underpinning of the existing tower. This work involved the excavation of the interior of the tower base to a depth of 8.5 metres. For this excavation, 'drives' were taken out diagonally under each buttress for a length of four metres. These drives were then excavated clean and a reinforced concrete structure poured into the 'drive'. The drive was then sealed and an adjacent area excavated. This process was continued until the tower walls were underpinned. This underpinning work was made more complex by the requirement to preserve intact the grave of Bishop Chalmers, directly to the east of the tower wall. At the completion of underpinning, the tower core was filled with mass concrete. During the excavation preparatory to the underpinning work, considerable ground water was also encountered at the Cathedral sub-floor level. This ground water had followed the underlying rock strata and pooled at the

Cathedral east end and tower walls. Drainage of this sub-floor water is part of the associated Cathedral conservation project.

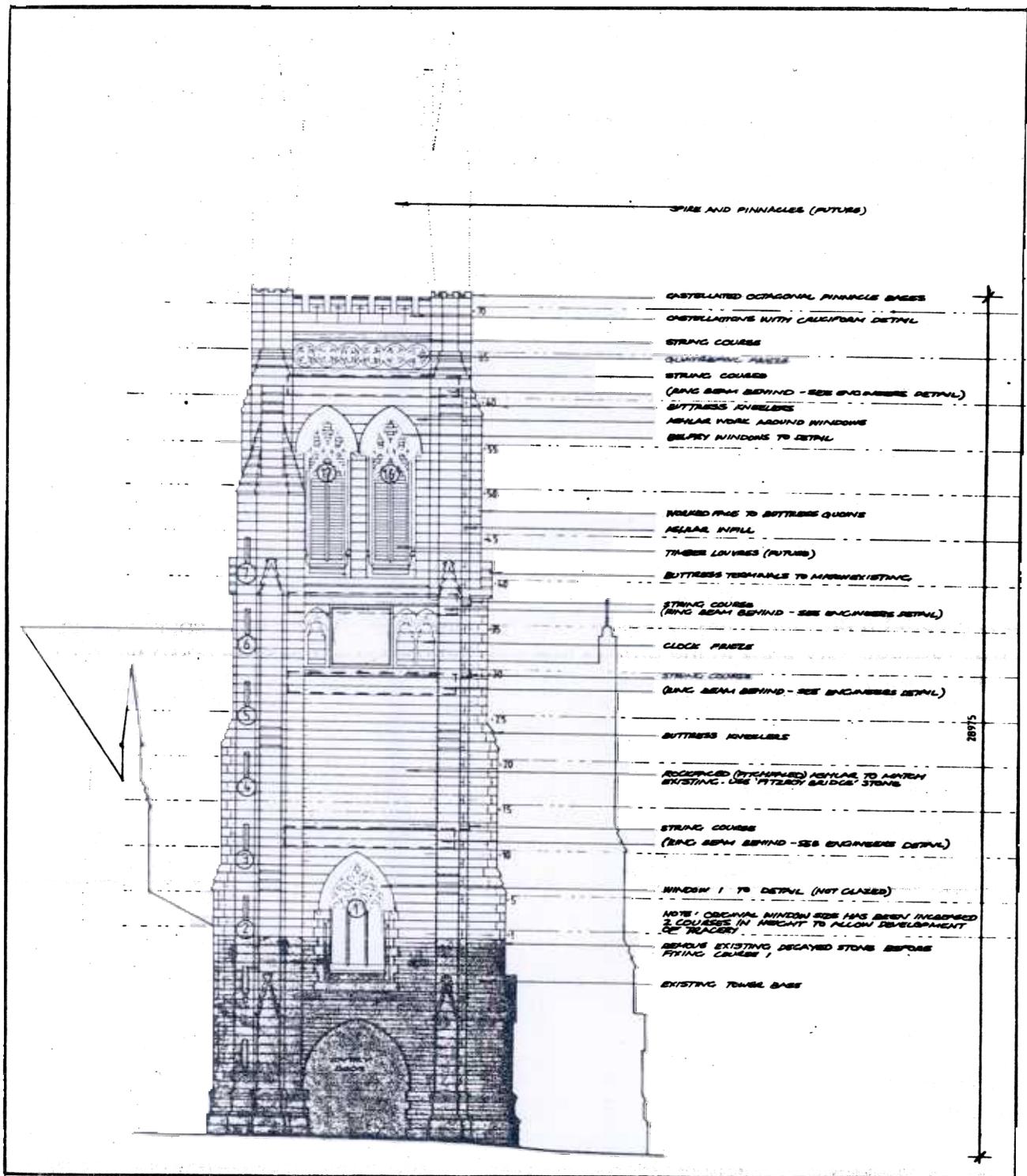
A second task faced by the project team was the preparation of adequate 'base' drawings for the tower project, and for the related conservation project that was to proceed simultaneously with the tower. Fortunately, we were aided in this work by the Australian Survey Office, who undertook the photogrammetrical survey of the entire Cathedral. Base plans had also to be produced of every stone course within the proposed building, to allow an early understanding of stone sizes and quantities.

A third task was the investigation of suitable stone types and sources for the proposed building. We were fortunate in having been left the demolished remains of a local stone bridge, the Fitzroy Bridge, which once spanned the Wollondilly River, just east of Goulburn. This stone, though plentiful in quantity and though from the same quarry source, was not adequate in quantity or dimension to fulfil the requirements for the proposed tower and spire. So we set upon a search for the original quarry. We eventually found it, just east of a little town called Marulan, some thirty kilometres east of Goulburn. The quarry, which had not been disturbed for almost a hundred years, was a wonderful archaeological site, but hardly suited to the extraction of stone in the quantities required by the project. The costs of re-opening this quarry were outside the resources of the project. Other sources were investigated and eventually an operational quarry north of Sydney was selected for the supply of stone to the project. This quarry, Central Coast Quarries, had the ability to provide the quantities of stone work required, and the capacity to produce profiled stone. The 'Fitzroy Bridge' stone was used for the 'rock faced' body work, being appropriately sized for that use. As soon as the project commenced, other sources were also made known to us, particularly another source of [original] Marulan stone left unused at another Goulburn church.

The final task of this first, investigative phase was for the consultant team to visit other bell towers and spires within Australia. Only one other 'completion' project of similar size and philosophical intent has been completed in Australia, That project, at Bendigo in Victoria, was visited by the consultant team, and considerable data was exchanged with that project's architects.

On 1 August, 1986, the stonemasons commenced work at the Goulburn site. The team had been assembled from Goulburn and environs, which had a rich and continuing tradition of stonemasonry work. The project manager and a specialist setter-out draughtsman were brought out from England to assist the project, as no similar expertise existed within Australia.

Initially, the stonemasons were engaged in preparing the 'Fitzroy Bridge' stone for the rock faced work. Concurrent with this masonry work, the setter-out draughtsman commenced the preparation of stone 'shop drawings' for use by the masons. Working from our 1:100 scale plans and elevations, the draughtsman prepared drawings scheduling every stone within the building. Full size drawings were then prepared of architectural elements such as windows, string course, profiles, and friezes. From these full size drawings profiles for all stones were prepared, and



Architectural drawing for the new Tower, Peter Freeman & Partners Pty Ltd, 1986.

isometric drawings for each 'special' stone were made available to the stonemasons. With the profile and isometric shop drawings, the masons prepared the worked stone for the project.

Parallel with this activity, engineering drawings were prepared for the concrete structure within the tower. This structure was required to stabilise the tower upper structure and support the thirteen bell bell-peal to be hung on the tower. Considerable work was done on the likely loadings imposed by the large bell peal and the concrete internal frame adopted as a result.

Building work on the tower proper commenced in February 1987. The first work was to remove the existing Church of Saint Saviour tenor bell, the existing (temporary) roof, and the weathered render to the top of the wall. During this work, the 1909 commemoration stone was discovered. It has always been a tenet of the consultant's work on the project that their building would resemble Edmund Blacket's original design as closely as possible. In accordance with this principal, it was decided very early that the tower/spire would be a mass masonry structure, with the concrete substructure introduced only as demanded by seismic and bell ringing loads. The mass structure employed was of face sandstone with 'through' stones as required, with a mass brickwork backing making up the rest of the wall. This dry press brickwork was to be laid integrally with the stonework in garden bond.

The work of completing Edmund Blacket's tower is now at course 18 level [as at May 1987], about a quarter of the extent of the completed tower which is 72 courses high. It was realised very early in the project that the completion of the spire could not be included within the present project's completion target date of May 1988 for reasons of financial and time constraints. The tower, however, will be substantially complete by that date, a fitting tribute to Australia's most prominent ecclesiastical architect, and to Australia's first inland city, Goulburn. It will also be a fitting contribution to the Bicentennial of European settlement in Australia.

The work of the consultant team in this project has been assisted and supported by the Australian Bicentennial Authority [NSW Council], the Anglican Diocese of Canberra & Goulburn, the consultant stonemason team, and the people and Parish of Saint Saviours, Goulburn.

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COMPLETION OF THE BELL TOWER AND SPIRE, THE CATHEDRAL CHURCH OF SAINT SAVIOUR, GOULBURN, NEW SOUTH WALES, AUSTRALIA

HISTORICAL BACKGROUND

The Cathedral Church of Saint Saviour was commenced in 1874 after the establishment of Goulburn as the See of the Anglican Diocese of Goulburn. The Cathedral Church was designed by Edmund Thomas Blacket, at that time the Colony's foremost ecclesiastical architect.

On completion and consecration of the Cathedral proper in 1884, one year after Blacket's untimely death, the tower had only been completed to a level just over the tower entrance doorway. The tower has remained a stump for another one hundred years, despite numerous attempts in that period to complete Blacket's beautiful tower and spire.

THE TOWER/SPIRE PROJECT

In 1984, the Premier of New South Wales announced the grant of \$1,000,000 for the completion of Blacket's tower and spire, as an Australian Bicentennial Project. One requirement of the grant was that the Project be completed by Australia's Bicentennial of European settlement, 1988. The initial phase of the project involved a thorough geotechnical investigation of the existing tower foundations, a search for the original Cathedral stone source and for appropriate stone supply sources for the Cathedral building, and for a comprehensive tour of similar Cathedral bell towers within Australia. As a result of the geotechnical investigations, it was decided to undertake the underpinning of the Tower stump. The original stone quarry was located near a village north east of Goulburn. This quarry, although a remarkable 19th century archaeological site, would have proved economically impossible as a stone source. Appropriate stone was located at a quarry north of Sydney and quarrying of stone for the Cathedral was commenced.

Underpinning of the Tower was undertaken by excavating the core of footing and founding material within the tower, and then by excavating drives in all directions from the centre of the Tower. This work was completed, the Tower was back filled, and building work commenced. Building was preceded by preparatory carving of stonework for the Tower. This stonework was either rock faced ashlar stone, or dressed buttress, quoin, and window stone. The Project was fortunate to have some stone from a demolished Goulburn bridge already available at the site, and this stone was carved first.

In February 1987 building work on the Tower commenced. In preparing for the new work, a 1909 commemorative stone was uncovered - a remnant of the many previous unsuccessful campaigns to complete the Tower. The construction method for the Tower follows, as closely as possible, the Blacket specification for his Tower. The work of completing the Tower and Spire has been the work of many people, and is a fitting contribution to Australia's Bicentennial celebration of European settlement in 1988.

Peter Freeman, Peter Freeman & Partners Pty Ltd, Canberra, Australia

ACHEVEMENT DU CLOCHER ET DE LA FLECHE, CATHEDRALE DU SAINT-SAUVEUR, GOULBURN, NOUVELLES GALLES DU SUD, AUSTRALIE

HISTORIQUE

La Cathedrale du Saint Sauveur a ete commencee en 1874, apres l'etablissement de Goulburn comme Siege du Diocese anglican de Goulburn. Les plans de la cathedrale ont ete dressees par Edmund Thomas Blacket, a l'epoque le tout meilleur architecte ecclesiastique de la Colonie.

Lorsque la Cathedrale proprement dite fut achevee et consacree, en 1884, soit un apres apres la mort prematuree de Blacket, le clocher n'avait ete construit que jusqu'a une hauteur juste superieure au niveau du portail d'entree. Le Clocher est reste en son etat de troncon pendant cent ans, en depit des nombreuses tentatives effectuees dans cette periode pour achever la merveille concue par Blacket.

LE PROJET CLOCHER/FLECHE

En 1984, le Premier Ministre des Nouvelles Galles du Sud annonca l'octroi d'une allocation d'un million de dollars pour l'achevement du clocher et de la fleche de Blacket, dans le cadre du Programme de Celebration du Bicentenaire de l'Australie. Une des conditions attachees a l'octroi de cette allocation etait que le Projet devait etre termine pour le Bicentenaire de l'arrivee des Europeens en Australie, en 1988. La phase initiale du Projet comprit une investigation geotechnique tres pousee sur les fondations existantes du clocher, une recherche de la region d'origine de la pierre utilisee pour la construction de la Cathedrale originale et des sources d'approvisionnement de cette pierre, et une visite d'etude des clochers de cathedrales semblables existant en Australie. Le resultat de l'investigation geotechnique a conduit a decider l'etayage du troncon du clocher.

La carriere originale a ete localisee pres d'un village au nord-est de Goulburn. Cette carriere, quand bien meme elle presente toutes les caracteristiques d'un site archeologique du XIXe siecle, s'est revelee non-viable economiquement en tant que source d'approvisionnement en pierre. Une pierre appropriee a ete trouvee dans une carriere du nord de Sydney, et l'extraction de la pierre pour la Cathedrale a commence.

L'etayage du clocher a ete entrepris par l'excavation du coeur des materiaux de fondation a l'interieur du clocher, et ensuite par le creusement de tranches dans toutes les directions a partir du centre du clocher. Ces travaux finis, le clocher a ete renforce, et les travaux de construction ont commence. Les travaux de construction ont ete precedes par la sculpture des pierres pour le clocher. Ces pierres etaient soit de la pierre "de gros oeuvre" a facade rugueuse, soit des pierres taillees de contre-boutant, d'angle ou de chambranle. Des pierres provenant de la demolition d'un pont de Goulburn se sont trouvees tres heureusement disponibles sur le site meme du projet, et ce sont ces pierres qui ont ete taillees en premier.

En fevrier 1987, les travaux de construction sur le clocher ont commence. Au cours de la preparation pour les nouveaux travaux, une pierre commemorative de 1909 a ete decouverte, symbole des nombreuses tentatives effectuees auparavant pour achever le clocher. La methode de construction du clocher suit, d'aussi pres que possible, les specifications de Blacket. Les travaux d'achevement du Clocher et de la Fleche ont ete l'oeuvre de nombreuses personnes, et sont une contribution parfaite aux celebrations de l'arrivees des Europeens en Australie en 1988.

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