The Birth
of the
Cyclone Testing Station

Personal Recollections

George Walker

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In The Beginning

In 1958 the North Queensland town of Bowen was hit by its first cyclone in 76 years. It caused major damage. A young Sydney architect, Kevin Macks, had just joined an architectural practice in Townsville and became involved in some of the reconstruction. He settled in Townsville and subsequently formed his own architectural company practicing throughout North Queensland. He never forgot the destruction he had observed in Bowen and was determined that the lessons he had learned then about cyclone resistant building practice should become an integral part of construction in cyclone prone North Queensland.

In 1960 following representations from a body of citizens in Townsville calling themselves the Townsville University Society the Queensland Government established the University College of Townsville as a provincial campus of the University of Queensland. It enrolled its first students at the beginning of 1961 including a group of first year engineering students in its Department of Engineering headed by a young hydraulic engineer, Kevin Stark, who had been working on the construction of the Tineroo Dam on the Atherton Tablelands. The initial intention was to provide first and second year courses before transferring the successful students to Brisbane to complete their courses, but Kevin Stark successfully argued that with help from local professionals and visits from Engineering staff at the University of Queensland the full 4 year Civil Engineering course could be provided in Townsville. In 1962 he engaged a young structural engineer, Baden Best, who had been a colleague on the Tineroo Dam, to be responsible for the development of the structural engineering component. In 1963 he engaged Kevin Macks to take the 3rd year course in building construction and architecture.

In 1964 a relatively young civil engineering academic from the University of Melbourne, Hugh Trollope, a Welshman by birth and still in his 30's who had established the science of geomechanics in Australia, became the first Professor at the University College of Townsville with his appointment as the foundation Professor of Civil Engineering. He was a visionary who believed that the fledgling engineering department could become a major centre of civil engineering research in Australia, with a particular focus on issues relevant to North Queensland, and was determined to see his vision become a reality.

It was this somewhat random combination of events that laid the foundation for the establishment of the James Cook Cyclone Structural Testing Station more than a decade later.

It didn't take long for Hugh Trollope and Kevin Macks to become acquainted. Although an engineer, Hugh Trollope had a strong interest in the relationship between structure and form of buildings. Although an architect, Kevin Macks had a strong interest in the structural engineering behaviour of buildings. Together they were to produce the marriage of ideas from which the Cyclone Testing Station was born.

In 1970 the University College of Townsville gained its independence as the James Cook University of North Queensland, and in this capacity provided the home for its birth.

A Developing Relationship

The University College of Townsville was initially established on a temporary campus adjacent to the Pimlico High School. For its permanent campus the Townsville City Council made a grant to it of over 600 acres at the foot of Mount Stuart in the proposed suburb of Douglas, on which over a period of time permanent buildings were established for the different Departments. The design of the first stage of the Engineering Building was commissioned in 1967 with Kevin Macks as the principal architect. In addition to lecture rooms, offices and small laboratories, this phase included two major laboratories, a hydraulics laboratory and a structures laboratory.

It was a time when structural engineering research was synonymous with testing large structural components and assemblies, and Hugh Trollope was determined that his Department would have the proper facilities to do this. The funding for the building was insufficient for what he wanted so he approached the Queensland Government Co-ordinator General, Charles Barton, arguing successfully that there was a need for a facility in North Queensland to test full scale bridge beams. In this he had the support of a local consulting engineer, John McIntyre. John McIntyre had come to Queensland from New Zealand as a young civil engineer shortly after graduating from the University College of Canterbury in Christchurch, New Zealand, following studies that had been interrupted by service in the 2nd World War. By the mid 1960's he was well established as the head of North Queensland's largest local firm of consulting engineers, and was a person of considerable influence within both the engineering profession and the community. Not many bridge beams were tested, but the resulting strong floor facility was to prove invaluable for the testing of building components and sub-assemblies on which the Cyclone Testing Station was to be based.

A seemingly unrelated event at this time was the appointment of a new staff member. In addition to pioneering the teaching of soil mechanics in Australia, Hugh Trollope played a pioneering role in extending the scope of it to include rock mechanics to produce the discipline known today as geomechanics. His first ambition after arriving in Townsville was to make his new Department the leading centre of rock mechanics research in Australia, recognising its importance in relation to mining activities in northern Australia, and Mount Isa in particular. To get it started he brought with him from Melbourne a young graduate student, Ted Brown, encouraged staff with relevant expertise to join in his endeavour, and in seeking new staff sought staff who may be able to contribute. He had persuaded Baden Best to specialise in the newly developing field of stress analysis known as the finite element method and apply it to the analysis of the behaviour of jointed rock, so when seeking an additional structural engineering academic, he included dynamics in the prescription, with a view to getting someone who may be persuaded to undertake research on the dynamic aspects of rock mechanics. It attracted a young New Zealand engineer working in the United Kingdom in the nuclear power industry who had a PhD in earthquake engineering. The new staff member was George Walker. He never got interested in rock mechanics, but in due course the appointment was also to prove significant in the establishment of the Cyclone Testing Station.

A Miscarriage

By January 1970 Hugh Trollope had achieved his first ambition of establishing a major centre for rock mechanics research in Townsville and was looking for further fields of research in which his Department could excel. Nature answered in the form of Cyclone Ada which hit the Whitsunday Islands that month. His response was immediate. Hiring a plane he inspected the damage taking with him George Walker to look at the structural aspects of the damage and Bill Bodley, another staff member, to look at the flood damage, together with Mick Lamont, the University photographer. Dropping Bill off in Proserpine they flew over the Whitsunday Islands and observed the extensive damage, following which a ground inspection of the damage at Airlie Beach was made. (This flight had a worrying moment for Hugh Trollope. Mick Lamont had had the door removed so he could lean out with only his seatbelt restraining him and take his photographs. Anxious to get the best shots he continually urged the pilot to fly slower, until Hugh Trollope observing the stall light flashing on urged the pilot in no uncertain terms to ignore him!) .

Before he landed back in Townsville Hugh Trollope had decided here was the next big opportunity to do something unique. As he explained to George Walker, just as the 1960's had been the decade of earthquake engineering research, of which George was a product, so would the 1970's be the decade of wind engineering research. Townsville could provide the lead in the study of cyclone resistant housing and other low rise buildings, in contrast to the studies of wind loading on larger buildings which had already begun at the Universities of Sydney and Melbourne. He suggested to George Walker that he become the leader of this research.

George Walker was appalled at the thought. Not only did he know nothing about wind engineering, but there did not seem to be a problem requiring research. Roof cladding that peeled off because it was inadequately fastened, roofs that came off concrete block buildings because the cavities containing the tie down rods were filled with cement bags, and houses that disintegrated because they were just nailed together, were all problems that could be easily solved by the application of existing engineering knowledge. What was there to research? Furthermore discussions with Townsville builders indicated that in their opinion the damage had highlighted a problem unique to the Whitsunday Islands. A similar event in Townsville would have much less effect.

It needs to be understood that at this time most houses and small low rise buildings were outside the scope of structural engineering except for some particular components like prefabricated roof trusses which were just coming on to the market. Houses were built to prescriptive rules developed by trial and error over time, rules which in Australia were largely embodied in what was known as the 'Blue Book' published by the Commonwealth Bank which described the minimum standards of construction for new houses for which the bank would make a loan. There were special requirements in cyclone areas, mainly regarding the number of cyclone bolts tying the top plate down to the underfloor system - but with few requirements about where they should be located!. Furthermore at this time in Queensland building regulations were the sole preserve of each local Council. Many Councils based their regulations for houses on the 'Blue Book' but interpretations and levels of enforcement varied greatly.

When suggestions were made that there were lessons to be learned from Cyclone Ada, the house building industry in Townsville reacted negatively, saying the problem was with the local building regulations and their enforcement in the Whitsunday Islands. To George Walker it did not seem to be the sort of problem whose solution would enhance his standing among his structural engineering academic peers, and he turned down Hugh Trollope's request. (He did however inspect his own house and finding the roofing largely unsecured around the edges installed a system of external brackets which directly tied down the edge of the roof to the walls, his first foray into cyclone resistant building. They can still be seen on the house which is located at 18 Cordelia Avenue, Cranbrook. Overbattens were subsequently added after he saw their value in Cyclone Tracy and Cyclone Joan.)

Meanwhile Kevin Macks saw Cyclone Ada as a repeat of what had happened in Bowen, and further evidence of the need for proper attention to tie down details. Although having little success in getting the local building industry in general to take him seriously he made sure those buildings for which he was responsible were well designed to resist cyclonic forces. About this time Monier Colourtile Pty Ltd established a concrete tile factory in Townsville to capitalise on the increasing popularity of this form of roof construction. They were keen for local architects to use them. When the company approached Kevin Macks he expressed concern about their behaviour in strong winds. They assured him that the weight of them, in combination with the way they locked together and the system of tying them using a continuous piece of wire linked around the battens, would keep them in place. He was not convinced and George Walker was organised to test them at the University. It was the first 'cyclone test' at the University. It was decided to test them by making up a panel and tipping it upside down and then loading it with sand up to the calculated design load times the factor of safety – this being still the age of working stress design, and before fatigue effects had been thought of. The test was a disaster with the panel falling to pieces when it was turned upside down due to the whole system acting as a mechanism under the self weight of the tiles alone which was much less than the minimum failure load. Only by nailing the top (ridge) and bottom (eaves) tiles was it possible to undertake a test. It didn't have much influence on the way Monier fixed their tiles but Kevin Macks continued to recommend against their use by his clients, but if they really wanted them he insisted on the eaves row and ridge row being nailed to the battens!

So for both Hugh Trollope and Kevin Macks, despite their own best efforts, Cyclone Ada was an opportunity missed. They both had a vision, but they had failed to communicate it to others, and the ideas they had formulated in their minds were still-born. But the vision remained.

A Second Opportunity

Less than two years after Cyclone Ada, on Christmas Eve, 1971, the citizens of Townsville sheltered in their homes as the city was pounded by Cyclone Althea. For most of the citizens it was their first direct experience of a cyclone. When the winds died down, if their own home had not been seriously damaged, then they had only to look down the street and see other homes that had been. No respecter of class, some of the most expensive new homes in the most desirable areas around Castle Hill were among the most damaged, while most of the new small low cost Defence houses were among the least damaged. Nor was the damage just restricted to houses, with many larger buildings also suffering significant damage including

many of the new university buildings. In intensity it was similar to Cyclone Ada, and the level of damage was just as great. It put paid well and truly to the argument that Townsville building standards were better than those in the Whitsunday Islands.

Cyclone Althea demonstrated that there was a fundamental problem with house building construction in cyclone prone areas of Queensland. Most of the community were unprepared for it and it came as a great surprise. The damage generated the largest insurance loss from a single event in Australia up to that time. The impact on Townsville in particular and Queensland in general was great.

Two people were not surprised and they were ready to respond to it. Hugh Trollope responded by getting the Vice-Chancellor, Ken Back, to offer the services of the University to the Queensland Government for an investigation of the damage to determine the reasons for it and to make recommendations on changes in construction to overcome the current shortcomings. Kevin Macks responded by organising the local building industry to tackle the inspection and repair of buildings in a coordinated manner using his experience from the Bowen cyclones 14 years earlier.

The Queensland Government, through its Coordinator General who was still Charles Barton, readily accepted the University's offer and made a grant to facilitate the study. Hugh Trollope quickly assembled a number of key people from the community including Kevin Macks and John McIntyre, together with some university colleagues, to form an advisory panel and organise a scientific investigation of the cyclone and its impact in respect of both wind and surge effects. George Walker was made responsible for the report on the wind effects and Kevin Stark accepted responsibility for the report on storm surge effects. The reports not only reported on the effects that had occurred but attempted to identify the mechanics of behaviour causing these effects and presented engineering methods for solving the problems that had arisen.

The report on the effect on buildings was published in March 1972. It included a report on the wind characteristics including an analysis of maximum wind speeds based on the then novel approach of using road signs and hoardings as 'windicators' for estimating maximum wind speeds, a detailed description and analysis of the building damage, and a comprehensive chapter on the design of common housing systems, including recommended changes in detailing, to improve their performance under cyclonic wind loads. In general the severity of the damage was attributed to inadequate design rather than poor workmanship, and the principal mode of failure was identified as uplift resulting in either loss of roof sheeting or loss of the roof structure, with failure of windows and doors contributing to this through the increased internal pressures. It was recommended that research and testing of roof sheeting and fixing methods should be initiated as a matter of urgency, with research on the structural behaviour of timber framed houses and wind tunnel research on wind loads on housing being undertaken on a longer term basis. The need for education of the building industry on sound cyclone resistant building standards was also emphasised. Although it didn't foresee the establishment of a special unit to achieve these recommendations, the report and its outcomes played a major role in creating the environment from which the Cyclone Testing Station evolved.

One of the first outcomes of the report was a Vacation School on Design for Tropical Cyclones held at the University in August 1972 which was primarily designed to educate the building industry in particular and the community in general on the lessons to be learned from

Cyclone Althea. Among those who attended this were two engineers from the Commonwealth Department of Housing and Construction in Darwin who were responsible for the design of most of the houses being built in Darwin at that time, and who then rigorously implemented what they had learned on their return to Darwin. Subsequently through another quirk of nature this was to be of great significance for the founding of the Cyclone Testing Station.

For the University the major direct outcome was the establishment of cyclone related research within the University, particularly in engineering but in other disciplines as well. Involvement in the investigations following Althea had changed George Walker's mind, and from that time onward until he left the University in 1989 the structural behaviour of houses under cyclonic winds dominated his research activities. Hugh Trollope was also keen to have a combination of structural and wind tunnel based research and this led to the appointment of John Holmes and the construction of the University's wind tunnel, which in turn led to the University becoming a leader in wind tunnel studies on low rise buildings and particularly houses. Meanwhile Kevin Stark led the development of storm surge studies which have underpinned much of the current management to the storm surge risk in Australia – as well as providing the initial research training for the current Vice Chancellor of Swinburne University, Ian Young.

The other major outcome of the Cyclone Althea report, picking up the recommendation regarding education, was the establishment of the Townsville based Cyclone Building Research Committee. This was the result of an initiative by Kevin Macks, and its members were local representatives of the Royal Australian Institute of Architects, the Australian Institute of Building and the Institution of Engineers Australia. This group dedicated itself to educating the building industry at the work face level in the principles and details of cyclone resistant design, making use of the University staff for the principles but using their own professional members for imparting the more practical aspects of construction details which they had developed and proven to be workable. More than anyone else this group established Townsville as the leading area for the development of practical cyclone resistant details of construction and their implementation into normal house building. In due time several members of this group were also to have a strong involvement with the Cyclone Testing Station.

There was another significant outcome from Cyclone Althea in relation to the performance of roof tiles, which did not perform very well. The concerns expressed by Kevin Macks, and highlighted by the tests undertaken before the cyclone, were shown to be real. The General Manager of Monier Colourtile Pty Ltd, Theo Wilkinson, responded by conducting an investigation, in collaboration with the University, to develop a new system of fixing which would make them more wind resistant. The result was the Monier tile clip which when tested was shown to be capable of resisting the design uplift pressures including the specified factor of safety. The relationship developed with Theo Wilkinson during this project was to prove very significant, as he was to be one of the three key people, along with Hugh Trollope and Kevin Macks, who were primarily responsible for the Cyclone Testing Station getting off the ground.

During the ensuing couple of years after Cyclone Althea the University established links with a number of wind engineering researchers whose advice and support was invaluable, including Barry Vickery then at Sydney University, Bill Melbourne at Monash University, Joe Minor at Texas Tech University and Keith Eaton at the Building Research Establishment

(BRE) in the UK One of the major projects being undertaken at BRE involved full scale measurements of wind loads on an experimental house in a new housing estate in Aylesbury along with complementary wind tunnel studies. In September 1974 George Walker departed for a year's sabbatical leave to work with Keith Eaton on this project which was seen as a good way of quickly acquiring state of art knowledge of wind engineering in respect of houses. About the same time John Holmes was engaged to strengthen the wind engineering research group with his first task being to design and construct the wind tunnel.

By December 1974 Hugh Trollope and Kevin Macks could both feel very satisfied with the way things were going, with programmes in place that augured well for the future development of the University and Townsville as leaders in the research, development, education and implementation of cyclone resistant methods of housing construction. Neither would have had any idea how quick this development would be.

The Defining Event

On Christmas Day 1974 Cyclone Tracy hit Darwin causing the greatest destruction of any sudden onset disaster in Australia's history. For those involved with the wind engineering research programme at James Cook University as well as many others life would never be the same again.

Hugh Trollope's first response was to contact the Acting Prime Minister, Jim Cairns and offer the University's services for investigating the damage utilising the experience gained in investigating Cyclone Althea. His second response was to look for somebody to go to Darwin. George Walker would have been the obvious person but he was in England. Other staff were approached but his approaches were turned down. In desperation he sent a telegram to George Walker saying 'Can you get to Darwin? Please ring. Trollope'. At the time George Walker was away visiting friends in the Midlands and found the telegram under his door on his return 2 or 3 days later. On New Year's Eve he boarded a plane for Australia - eventually getting to Darwin on January 2nd following an aborted flight from Brisbane to Darwin when the Hercules on which he was aboard was forced to divert to its base at Richmond in New South Wales because of engine failure.

In Darwin he was briefed by Charles Bubb, who at the time was Assistant Chief Structural Engineer for the then Commonwealth Department of Housing and Construction. Charles had led the initial investigation of damage with a team of hastily assembled wind engineering experts and academic and professional engineers and architects. Subsequently George Walker was commissioned by Norm Sneath, the Chief Structural Engineer of the Commonwealth Department of Housing and Construction, to lead the detailed investigation of the damage, including co-ordination of the inputs from a range of other experts and professionals. The output was a 3 volume report, Volume 1 being the main report written by George Walker, and Volumes 2 and 3 containing the detailed reports of all the other investigators who contributed to the study – including one by two experts from the CSRIO Division of Building Research, Bob Leicester and Greg Reardon.

Cyclone Tracy was not just a repeat of what had happened in Cyclone Althea with the same lessons to be learned in another locality. Much of the most damaged housing in Darwin had been designed based on the lessons learned from Cyclone Althea. The roof cladding had been

tested to loads similar to those which would have been experienced in Tracy and the tie down systems had been well designed – so well none of them actually failed. What Tracy did was highlight problems that had not been exposed in Althea, particularly the importance of racking strength and of fatigue loading in the vicinity of the fasteners of the recently introduced high tensile steel roof cladding – which had replaced the thicker mild steel roof cladding used up to the time of Cyclone Althea. It was clear that applying a piecemeal approach by just fixing problems that been exposed, which had been the traditional approach to housing design for extreme events, was flawed. The major recommendation arising from the investigation was that houses in cyclone prone regions should be subjected to the same level of structural design for wind as was applied to the design of larger buildings.

At the time this was a revolutionary recommendation and there were many in the building industry who believed it was impractical. The systems used for housing were different than those used in larger buildings with which structural engineers were familiar. The basic technical knowledge of the behaviour of these systems that was required for analytical design did not exist in many cases and the only recourse was to testing, and in many cases the test methods did not exist. Through the influence of its senior engineering public servants such as Norm Sneath, the Commonwealth Government delayed all reconstruction until the necessary research and testing had been undertaken. Had it not had the strong support of these engineers in the Commonwealth Department of Housing and Construction the recommendation may never have been implemented – in which case it is likely there would have been no Cyclone Testing Station, for it was the demand for testing created by this recommendation that led to the creation of the Station.

There was another significant failure in Cyclone Tracy which did not get much mention in the report because it was a very minor contributor to the overall damage, but was to be of major significance in the birth of the Cyclone Testing Station. Monier Colourtile had opened a concrete tile factory in Darwin shortly before Cyclone Tracy. Only a few houses had been built using the tiles, fixed with the new tile clips developed in association with James Cook University. The new tile clips proved to be no match for Cyclone Tracy, to the dismay of both Theo Wilkinson and George Walker, who had been involved in their development. (It was also big surprise to Theo Wilkinson as he had been initially informed by his local staff that they had performed well, sending him photographs demonstrating this – photographs which had been judiciously taken from an appropriate angle that made it look as if they had performed well!) George Walker investigated them closely, and discovered that most of the clips had become dislodged from the tiles as a result of the vibration of the tiles due to the same fluctuating wind pressures that had caused fatigue failure of the metal roof cladding. Theo Wilkinson responded immediately by suspending the production of the tile clips and initiating the development of a modified clip which could not be dislodged by vibration. To test the new clip Monier developed a unique tile testing machine capable of testing a small panel of tiled roofing under the fatigue loading regime recommended in the Commonwealth Government's report on Cyclone Tracy – a machine that in modified form was subsequently to be used for many years by the Cyclone Testing Station for fatigue testing of roof cladding systems.

Conception

Even prior to Cyclone Tracy the recommendations arising from Cyclone Althea had led to an increasing demand for the University's structural testing facilities that was placing significant demands on the academic staff. Hugh Trollope recognised that after Cyclone Tracy these demands were likely to increase much more, and he did not want to be in a position of having to turn such testing away. Theo Wilkinson was already working with the University on the modification of his tile clip, and was himself becoming a fervent believer in the need for such facilities to service the needs of an industry with a background of low involvement in technical activities. They discussed the problem together and with Kevin Macks and John McIntyre, leading to a documented proposal by Hugh Trollope. In it he wrote:

'It is a feature of academic employment that priority must be given to the teaching and research function; this must always be the case. It is widely recognised that because of these limitations academic staff members are frequently unable to meet demanding time schedules which are needed in industry. This frequently means that a lot of valuable resources are under utilised, and it has been recognised that this could be the situation at this university.

To supplement the existing situation it has been proposed that a structural testing unit should be established with financial support from interested industrial organisations. In the first instance only a modest unit comprising a research engineer with a technical assistant has been contemplated. The annual cost of such a unit is estimated to be $30,000 which allows approximately $6,000 to $8,000 for maintenance and equipment, the remainder being taken up in salaries and associated costs. The proposal is that this unit would work closely with the academic staff already engaged in this area, who would of course be available on an advisory basis, but that the unit would concentrate on carrying out specific programmes and develop testing methods according to the needs of industry at large. This does not mean that it is seen in the early stages as purely an ad hoc testing authority which would only carry out tests according to appropriate specifications of individual companies but it would concentrate on the development of appropriate test methods to meet the new situation that has arisen. In particular the aim should be to assist in investigations aimed at reducing building costs as well as ensuring adequate safety.'

However it was not to be just a testing unit. It would also undertake relevant research and development. He wrote:

'At any stage it is difficult to put down a hard and fast development programme in a situation where developments are continually occurring. However it is possible to identify three main areas which appear to need specific attention. These are –

(a) The design of structural systems to resist uplift

(b) Repeated load effects on roof cladding

(c) Racking resistance of wall and roof systems, particularly under repeated loads.'

Addressing the issue of funding Hugh Trollope further wrote:

'If this is to be financially supported by industry, then in order to be successful, it must gain the confidence of industry in a relatively short time. The proposal that has been put forward and so actively pursued by Mr. Theo Wilkinson of Monier Colourtile Pty. Ltd. to raise $100,000 will in effect provide, in today's inflationary situation, for about three years operation. The scale of the operation is also seen as a minimal one. To ensure that adequate account is taken of industrial factors and needs it has been suggested that the operation of the unit should be overseen by a management committee and a possible composition of this committee has been suggested as follows:-

1.	*Private industry*	*2 members*
2.	*Royal Australian Institute of Architects*	*1 member*
3.	*The Institution of Engineers Australia*	*1 member*
4.	*Local Government*	*1 member*
5	*James Cook University*	*2 members*

The function of this committee would be in effect to act as a "Board of Directors" who would look at the overall policy and programme of the unit but would not be concerned with day to day operations.'

It is an amazing document for its clarity of vision, the use of plain English to convey great ideas, and its lack of the waffle and exaggeration of benefits that is a feature of many research proposals. If there was a date at which the Cyclone Testing Station was conceived it was 7 May 1975 with the documentation of this proposal. Over thirty years on the Station still exhibits the ideas embodied in it. However it was to be another two and a half years before the proposal became a reality.

Gestation

The proposal was endorsed in principle by the Vice-Chancellor, Ken Back. Hugh Trollope, Theo Wilkinson, Kevin Macks and John McIntyre, together developed a plan for getting industry support. In the process they gave the unit a name. Formally it was to be known as the James Cook University Cyclone Structural Testing Station but informally, from the beginning, it was known by the shortened name which remains to this day, the Cyclone Testing Station. The first major milestone was to hold a public meeting with representatives of the building industry, associated professions and local government to explain the proposal and seek a firm commitment to it. This was to be preceded by individual lobbying of key individuals. Theo Wilkinson accepted the responsibility for leading this effort.

Theo Wilkinson was a busy man. His first priority was to develop the modified tile clips and get them into production for use in the reconstruction of Darwin as well as other cyclone areas. In December 1975 he wrote to Hugh Trollope:

'The preliminary meetings from various members of industry and Government Departments to do with the establishment of the James Cook Structural Cyclone Testing Station (sic) have

not been called for some time. This is mainly my fault and for this I must apologise to you. To get this project moving I am notifying all concerned that a meeting will be called for 2.30 p.m. Thursday, 22nd January, 1976. The meeting will be convened at the Queensland Master Builders Association Rooms, 417 Wickham Terrace, Brisbane.

This meeting should have the following objects:-

(1) Establish a steering and finance committee to temporarily handle the affairs of this project until it is established.

(2) Approve a prospectus for mailing to industry describing the Cyclone Testing Station and also including the appropriate information for fund raising for the project.

(3) Arrange a schedule for the steering and finance committee to meet formally on a monthly basis until the James Cook Structural Cyclone Station (sic) is properly launched with the final establishment of a permanent organisation with its associated committees.'

The proposal was well received by the subsequent meeting and commitments were made that ensured the process for establishing the Station would continue.

A major consequence which arose from this meeting was the formation of the James Cook Cyclone Structural Testing Station Interim Management Committee to be responsible for raising funds, preparing a Constitution, and getting it up and running. Theo Wilkinson was the Chairman, and Kevin Macks the Deputy Chairman and the representative of the Royal Australian Institute of Architects. Other members were Hugh Trollope representing the University; John McIntyre representing the Institution Of Engineers Australia; Brian Addison of Planet Homes, Townsville, representing the Master Builders Association; Sto Ariotti, a Townsville consulting engineer, representing the Housing Industry Association; Nigel Daniels, the Townsville City Architect, representing the Queensland Local Government Association; John Emmerig from CSR representing the major building product manufacturers along with Theo Wilkinson; Ron Horton, a Townsville builder representing the Queensland Master Builders Association; Bob Leicester representing the CSIRO Division of Building Research; Norm Lonn representing the State Works Department, Queensland; Doug Morton, the Assistant Commissioner for Main Roads in North Queensland, representing the Queensland Housing Commission; Paul Smith, representing the Queensland Department of Government; with Geoff Addison, the Bursar for the University, being the Secretary. Although not formally a member, George Walker attended meetings by invitation to provide expert advice on issues relating to wind engineering research.

In many committees of this size there are a few movers and shakers, with the majority being content to listen and provide comment and support when appropriate. That could not be said about this committee. Every member became an enthusiastic contributor. While the ideas had been the product of just a few minds, it was the combined enthusiasm and energy of all these individuals that hammered the ideas into a practical entity that would attract the support of the building industry. The establishment of the Station and its subsequent success owes much to each of them.

One of the first actions of the Interim Management Committee was to form three sub-committees to look at the different needs which were to be addressed by the proposed Cyclone Testing Station. These were:

(1) A building products industry technical sub-committee chaired by John Emmerig which looked at the areas of research and development in relation to the wind resistant design of building products that were considered to be the greatest priority.

(2) A builders and local government technical sub-committee chaired by Norm Lonn which looked at the type of information which builders and building inspectors needed to ensure more cyclone resistant house construction.

(3) A promotion and education technical sub-committee chaired by Theo Wilkinson which looked at ways of publicly promoting the Cyclone Testing Station and improvements in cyclone resistant building standards in the general community.

Although chaired by members of the Interim Management Committee, the membership of these sub-committees was largely made up of representatives of companies and organisations that were not on it, thus considerably increasing the number of supporters working for the establishment of the Station.

Because at this stage no formal organisation had been formed and money was being raised two trustees were appointed to be responsible for the funds collected. They were the Honourable Fred Campbell, Minister for Industrial Development in the Queensland Government, and Professor Ken Back, the Vice-Chancellor of the James Cook University of North Queensland.

Meanwhile during this period within the Civil Engineering Department there was a flurry of research work and commercial testing activities arising from Cyclone Tracy being undertaken which was to provide a base for the Cyclone Testing Station when it was established. John Holmes got the wind tunnel up and running and commenced his extensive research on wind loads on houses. George Walker was focussed on the racking strength of houses, modifying a testing rig he had constructed after Cyclone Althea to test wall systems in uplift to enable it to also test wall systems in racking, as well as in combined racking and uplift. From his appointment in 1962 Baden Best had assumed responsibility for the provision of testing services of structural components and subsystems within the Department using the testing machines and the facilities of the heavy structures laboratory including the strong floor. Two significant additions to this equipment after Cyclone Tracy were a missile impact testing rig constructed to provide testing of window systems to the Darwin missile test, and a tile testing rig donated by Monier Colourtile Pty Ltd, which was an exact copy of the rig they had developed for testing their modified tile clip after Cyclone Tracy. It was the availability of all this equipment that enabled the Interim Committee to focus primarily on the staffing costs in budgeting for the establishment of the Cyclone Testing Station. From the beginning the Cyclone Testing Station was envisaged as a joint venture of the university and industry with the university providing its facilities and the expertise of its academic staff members, and industry providing the funds required to support the staff of the Cyclone Testing Station for its specific testing, research and educational work. Without this synergy the establishment of the Cyclone Testing Station would have been a much more difficult task.

The Birth

By mid 1977 with approximately $60,000 having been raised or promised the Interim Management Committee decided it was in a position to appoint an engineer and technical assistant as envisaged in the original proposal. The engineering position was advertised nationally and a good response was received. Two candidates stood out from the rest. Both had been very involved in the investigation of damage following Cyclone Tracy as Commonwealth public servants involved in building research and both were highly regarded. Although having different personalities there was little to choose between them with each having different strengths. It would have been great to employ both, but the funds didn't allow that. Indeed there were only sufficient funds to guarantee two years employment so it required a considerable act of faith to take on the position. By a narrow decision Greg Reardon was appointed.

Hugh Trollope was fond of saying many decisions are 51%:49% at the time but having made them they must become 100%. So it was with the appointment of Greg Reardon. Once appointed the Interim Management Committee gave him their 100 percent support and he didn't let them down. He went on to develop the Cyclone Testing Station in a way that reflected his own style and personality. Had the appointment gone the other way it would probably have been equally successful, but some of its characteristics may have been different.

Greg Reardon took up his appointment on 1 November 1977. Keith Abercrombie, a former coach builder in the Queensland Railways, and later a draughtsman in a consulting engineering firm, began a few weeks earlier, filling in the interim time until Greg took up his position as a temporary technical officer in the Civil Engineering Department.

When Greg Reardon was appointed he had no title. He was appointed to be a research engineer in charge of the Cyclone Testing Station. Nor did Hugh Trollope have any particular position in the Station, except that Greg Reardon reported to him on a day to day basis, with Hugh Trollope performing this role on behalf of the Interim Management Committee. It was not until a meeting of the Interim Management Committee on 8 September 1978 that the situation was formalised with Hugh Trollope being appointed as Director of the Station and Greg Reardon being appointed as Technical Director reporting to the Director.

The James Cook University Cyclone Structural Testing Station is generally regarded as having come into existence on 1 November 1977, as this is the date it commenced operations. However it was to be another two years before everything was properly formalised. Prior to Greg Reardon being appointed the Interim Management Committee had been considering a draft Trust Deed under which the Cyclone Testing Station could operate. At the first meeting after Greg was appointed on 23 November 1977 Geoff Addison indicated that the University had problems with the nature of the proposed Trust Deed and that as a result he was preparing a new form of agreement. This was discussed at considerable length at subsequent meetings eventually becoming the Constitution. On 10 May 1979 the Council of James Cook University of North Queensland formally approved the establishment of the James Cook University Cyclone Structural Testing Station within its Department of Civil and Systems Engineering, based on the Constitution that had been submitted by the Interim Management Committee.

The final meeting of the Interim Management Committee was effectively held on 13 July 1979. At this meeting Theo Wilkinson tendered his resignation as a consequence of health problems. It was received with great regret. The next meeting is also described in the minutes as being of the Interim Management Committee but in effect it was now the Management Committee specified in the Constitution with a number of new members as required by it. Kevin Macks was the Acting Chairman, a position in which he was subsequently confirmed. In all respects the Cyclone Testing Station was now fully established and under way.

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