

FIVE YEARS OF RETAILING IN A FABRIC STRUCTURE

Peter Worsp

Partner: Sunhill Garden Centre

I am grateful that I have been asked to speak on one of the less complex topics at this conference. I see that this afternoon Ross McDonald will address you on "Theory of Curvature and Loading for Membrane Structures" - a topic that sounds impressive and daunting. My topic this morning is "Five Years of Retailing in a Fabric Structure". In this case the topic covers 5 years of retailing as a garden centre in a fabric structure. While this is not as high-powered a topic as Curvature and Loading it is an important one for those who design and fabricate these structures: the end-user of the structure, such as a retailer, must be happy with the end result of the curvature and loading theory, to justify the work in the first place. This may sound like an undermining of Ross McDonald and his topic - this is certainly not intentional.

I find it easier to get my tongue around the term "fabric structure" rather than "Tensile Membrane Structure", particularly when explaining the nature of the building to first-time viewers. While "fabric structure" conjures up visions of something made of calico the term "Tensile Membrane Structure" sounds like something from a biology textbook.

When Mike Ure of Structurflex first asked me to speak on this topic he suggested that I be perfectly frank and cover both the good points and the bad. In fact his words were "the pain and the pleasure of a fabric structure". As with any good relationship - and our modern world is heavily into "relationships" - there is pain and pleasure in varying amounts at varying times. So it was in our relationship with this structure.

In 1986 my partner and I were fortunate enough to find what we considered a brilliant site for a new garden centre. The site was on a main highway used by 30,000 commuters daily, it was on a prominent corner and it was in the middle of a good catchment area of middle to upper income earners - an important aspect when attracting discretionary spending.

Given the advantages of the site we had the following requirements for the garden centre building:

1. It had to be innovative and eye-catching to passing traffic
2. It had to provide high natural light inside
3. It had to have minimum internal supporting structures to give a clear unobstructed sales area and finally and most importantly
4. It had to create the right atmosphere and "feel" for customers.

2.

As I said earlier this talk is about both the pain and the pleasure in using this type of building. Our pleasure in the initial stages of planning was considerable. We looked at a large number of photographs of fabric structures from several countries including, of course, those of the Munich Games structures. We were convinced by the photographs, particularly those taken inside the buildings, that we could achieve the look and the feel we wanted for a garden centre. The photographs gave one the feeling of being inside something that was a cross between a marquee and a hot air balloon: it was an exciting feeling and it was different.

We entered the project with an enthusiasm that we had found an ideal type of building that would be quite different from anything else around. Luckily or unluckily we also had a fair amount of naivety - rather like married couples about to have their first baby - if one knew what was ahead the project would never get off the ground.

Our initial enthusiasm was soon tempered by a short sharp dose of pain. At this point I have to say that Structurflex were extremely professional and consistent throughout the project. Their brief was to design, or have designed, the roof itself and to be responsible for its fabrication and erection. The rest of the design and construction was put in the hands of an architectural firm. As you can see from the photographs, apart from the roof itself, there was a considerable amount of construction involving the 13 tension-bearing concrete buttresses, the free-standing external walls, internal partitioning, etc.

It was in these areas that the costs grew like Topsy. The initial estimate of \$300,000 for the building and carpark went first to \$500,000 and then to \$850,000. While the first figure of \$300,000 was very acceptable the last was extremely painful. To give Structurflex full credit their initial figure of \$80,000, + design fees, for the roof itself never varied. At this stage we felt we were too far down the track with town planning to scrap the concept and waste precious time starting afresh. Coupled with this was the fact that these were pre-Crash days and anything was possible.

The pain continued during the construction period: delays in town planning approval meant that construction was carried out in the winter. Excavation for concrete buttresses and trenching for essential services do not marry happily with Auckland's winter rain. I mention here that the buttresses are rather like icebergs: what one sees above the surface is only a small part of the total mass. And of course this was all totally unknown territory for the construction firm.

It was a welcome relief to have a dose of considerable pleasure when the roof itself was erected. The process was quick and uncomplicated and as soon as we stepped in under the canopy and saw the light and the effect we knew it had the right feel.

The gardeners amongst you will know that the garden centre trade is geared around the spring, when the warmer weather brings out man's primitive urge to hoe and dig and plant. The construction process had been slower than anticipated. As August arrived there was mounting pressure to complete the work in time for an early September opening. This was achieved under considerable duress for all involved. However, the final result on opening day was all that we'd hoped it would be and the public reaction to the building was extremely positive.

Since the painful birth process we have had five years of a purpose-built and highly attractive structure, ideally suited to a garden centre operation.

During that five years we have had time to evaluate all the good points and bad points that have contributed to the pain and pleasure of our relationship with the structure. I will now give you all these points because I consider them particularly relevant to those who design and build fabric structures, given that the ultimate success, or failure, lies in the satisfaction of the user of the structure.

Firstly the positive points of this type of building, remembering that this assessment is given from the point of view of one type of retailer only, that of a garden centre operation.

1. The atmosphere created by the structure is ideal: it has a marquee-type feel about it giving an indoor-outdoor environment. I suggest there are several other types of retailing that could use a similar structure to great advantage: restaurants, boating equipment retailers, markets, ski-equipment retailers for example.
2. There is a high natural light inside: in our case this was important for maintaining quality of indoor plants.
3. The high domes allow for good air circulation (which in our case was important for plants). This also allows for considerably cooler temperatures in summer than in a conventional building of the same size. Many garden centre buildings are based on a glasshouse type structure which can become overly warm in summer. In our case the two main peaks have large extractor fans set under the domes to improve air movement in summer.

4.

4. The building has a high profile both in sheer physical terms and in the minds of the local population. Within a very short time everyone in the area knew about the new garden centre on the Pakuranga Highway. I believe, in fact, it was soon known amongst the local population as "the big tent".
5. Cleaning and maintenance is very straight-forward and inexpensive. Each year we spend \$1,800 having the exterior of the roof itself cleaned by a contractor using a pressure washer to take off the year's accumulated grime.
6. Although there was some difficulty in obtaining planning permission to operate a garden centre on the site the building permit itself was reasonably straightforward, given the unusual nature of the building. In fact I think the local Council rather welcomed a new type of structure for the area, once they had come to grips with ensuring it conformed with standard building codes.
7. The roof is both easy to replace and relatively inexpensive. The complex curves and stress loadings on the woven PVC material necessitated that the design was done in Brisbane by McWilliams & Partners. Isn't it reassuring that in some areas we still have to turn to our Australian neighbours for help?

The original computerised design has been retained, I trust, and can be used again to fabricate a new roof. This allows for the old one to be disconnected from the tension-bearing buttresses and lifted off and a new one installed should the necessity arise.

As I said at the beginning there has been some pain along the way and there are some negative aspects to this type of building: some of these aspects may well apply to our project only.

1. The first of these would be the cost. At the outset of the project it was envisaged that this would be a relatively low cost building, considering the amount of covered retail space obtained. This was not the case and I think a number of factors contributed to this:

It was the first time a fabric structure of this size had been built and the costs of the supporting structures such as the buttresses were an unknown quantity. I'm sure these costs have been pared down considerably since the construction in 1987.

5.

It was also the first time the construction company had undertaken work of this nature and once again it was uncharted territory for them. Being a "one off" fabrication of the roof there were some problems with wrinkling in the fabric just below the high domes. These wrinkles were emphasised by the extreme smoothness of the rest of the roof: the PVC fabric itself and the high tension of the structure gave an extremely smooth overall appearance.

2. Some parts of the roof have been problem areas for dirt: seams in the less-steep areas have not been as self-cleaning as those in the steeper areas. The accumulation of dirt in those seams has proved difficult to dislodge even with a pressure washer.

To seal off the gap between the fixed free-standing walls and the flexible roof was something of a challenge. It was necessary to seal this gap off both for security and to stop the wind whistling through into the shop itself. In the early days, before it was sealed, papers were lifted off the office desks and thrown to the floor - not conducive to systematic filing. While this flexible "skirt" has proved effective in sealing the gap it has accumulated dirt quite badly and is not easy to clean being 5 metres off the ground in places.

3. Vandalism and hooliganism were problems in the early days. The buttresses gave easy access onto the roof from the carpark. The shiny slippery slopes of the roof acted like a magnet to the local lads who saw it as a type of sub-tropical mini-skifield. After one particularly extreme skier cut a hole in the fabric one night we installed an electric fence along the edge of the roof and suddenly there was one less playground in the area.
4. While the large high space inside is nice and airy for nine months of the year it is virtually impossible to heat effectively for the other three months and can be too cold for comfort.
5. Because the building is used as a garden centre very little internal partitioning is required. In situations where this was a requirement the height of the roof would make partitioning difficult to achieve effectively.
6. The "temporary tent" mentality. Once the construction was complete and the garden centre operating we entertained the possibility of selling the land and buildings and continuing to operate the garden centre on a lease-back basis. Interest by commercial investors was nearly always qualified by their hesitation to invest in

6.

a building that didn't fit into the normal categories. How long was it supposed to last? Would it stand up to storms? Could it be used for any purpose other than a garden centre? Wasn't it just a glorified tent? I feel careful consideration should be given to this re-sale aspect when a building of this type is being contemplated. However, the final result has been most satisfactory. The garden centre, including both the business and land and buildings has been sold to another operator. In fact today is settlement day and hopefully, even as we speak, money is changing hands.

In summary I would say that some of the problem areas of fabric structure construction may well have been overcome since we built in 1987 and that for certain types of retail where high natural light, and an indoor/outdoor atmosphere are required, tensile membrane structures are an excellent solution.



SUNHILL GARDEN WORLD TENSION MEMBRANE STRUCTURE

Auckland, New Zealand
Completion Date: October 1987

MSAA/LSAA Conf Proceedings

