

Inside or outside?

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Over the last year or so – in fact since the Olympics in London – we have all had more than enough opportunity to see sporting stadiums. The last batch to get mass scrutiny were the Brazilian variety for the World Cup (poor old Brazil), and now the Commonwealth Games in Glasgow, and the next batch (next year) will be the Rugby World Cup in England/Wales. Twickenham...Wembley... Old Trafford...Millennium...Olympic etc. Wherever they are, stadiums pose really interesting design challenges, especially if you want them to open and close.

I know it might be glaringly obvious, but it was only in the recent splurge of stadium exposure that I have noticed an interesting phenomenon. They are either beautiful venues on the inside – or wonderful buildings on the outside. But (subject to correction of course) almost never are they both. Let me take a couple of examples to illustrate my point.

The Aviva stadium, on the site of the old Lansdowne Road ground in Dublin, is the home of Irish rugby and a real stronghold for them. In the 6 Nations tournament earlier this year none of the visiting teams got any joy from Ireland.



As you approach it, the Aviva really does look a terrific building. Sinuous and organic it sits in the heart of Dublin like some recently birthed pod from outer space. But viewed from the inside it's a different world altogether. To

support that wonderful flowing roof there is a mass of steelwork that looks as though it was the product of a convention of demented scaffolders. It is anything but elegant and sinuous and graceful. Rather, it is adjectives like *crude* and *functional* that spring to mind.

So how about a football example? Let's say Manchester United and the world famous Old Trafford stadium.



In this example, the view from the terraces is awesome. It's completely uninterrupted and provides all round perfect views of the pitch from the three banks of massed red seating. The roof over the seating (though not over the pitch of course) just hangs there without any visible means of support. No pillars or scaffolding extravaganza here. Just clean sweeping vision lines in every direction. But take a look outside and – just as with the Aviva (but in reverse) – it's a very different story. The mad scaffolders are back in force. It might be clever to hang the roof like that from cantilever structures hooked over retaining walls, but it doesn't make for a pretty building. Grotesque maybe. And Twickenham stadium is just the same; fantastic sight lines all round on the inside and an ugly concrete and steel mess on the outside.

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I know that to some degree this is a matter of taste. Like the difference between the two bridges over the Firth of Forth at Edinburgh. The Victorian railway bridge with all its interwoven structural steelwork stands there like a gigantic mechanical dinosaur...an elegant sculpture of power and purpose. At any moment it looks as though it might awake from its slumbers and wander off into the hills. By contrast, the 1960s suspension road bridge alongside it has elegance and simplicity. Each will have its enthusiasts and its detractors. But my point is not really about taste. It's about how these stadiums seem to have such a glaringly one-sided design.

I think that the Aviva works really well on the outside and not on the inside. The inside is compromised to achieve the outside. But Old Trafford works well on the inside and not on the outside. The outside is compromised to achieve the inside. In both cases they seem to be designed with one set of priorities on the inside and a different set on the outside. And I suspect that these two sets of priorities are in competition with each other, and the winner in that competition decides whether it's the inside or the outside that takes priority. More than that, I suspect that the planning authorities in the city concerned may well have their fingers in this particular pie.

This is purely speculation on my part, but I have had reason to mix it occasionally with planning authorities and I know how tricky it can be. I can imagine that the local planning department would have a view about the appearance of the ground within its surrounding city context...and perhaps they would be less concerned about how it looks once inside the building. That is the concern of those who choose to go in and play rugby – or support their team. So the outside is – to an extent a public matter, while the inside is more of a members matter. Another way of looking at it is that the outside appearance forces itself on the local residents and the city more generally, whereas the internal space bears only upon those who choose to go in and participate. So it is easy to see how different rules might apply and I can imagine the architects of the Aviva conducting a whole series of negotiations between the Dublin city authorities and the Irish rugby authorities. For what it's worth I think the Dublin city authorities won the debate over the Aviva stadium and the Man Utd football authorities (and the England Rugby authorities) won the debate over Old Trafford (and Twickenham).

While I was speculating about this matter, I was reminded of my experience of building structures with my boys many years ago. Sunday mornings, for some years was LEGO time, and we built all kinds of outlandish things: from city-

scapes and monsters to cable cars swinging across the room (once technical LEGO power was added to the buckets of bits). It was great fun and, I am convinced, was also good learning for my boys, but it was occasionally borne in upon me that we were building things that were very different from those that I had built as a child. Because I was brought up on Meccano. Buildings are easy in LEGO, because the bricks lend themselves to simple compression structures. But if you apply tension forces to LEGO it pulls apart. Cranes however require these tension forces and if you have Meccano it lends itself to them. But apply a compression force to your Meccano structure and you have to work out how to avoid it buckling. I think there might be a research grant lurking here somewhere. Looking at the buildings created by architects brought up on LEGO, compared to the buildings created by those brought up on Meccano. I wonder what they use is schools of architecture? Both I hope.

Anyhow, I had more or less reconciled myself to the idea that stadiums are one-sided affairs, inside or outside. Either they are beautiful for those enjoying the game or for the city dwellers in the surrounding streets. Either the roof sections are held up from underneath by some combination of posts and steel lintels/braces, or they are hung from above on some version of cantilever frame on a load bearing wall. And then, whilst watching one of the football world cup matches in Brazil, I was astonished to see a stadium that broke the rules. It really is worth a look.



Not only does the Arena das Dunas offer clear uninterrupted sight-lines for the fans, but it also presents a really interesting and elegant appearance from the outside. Designed by architect Christopher Lee, the stadium roof has 20 petal-like structures that resemble the moving sand dunes that are famous in that area of Brazil. The success of the design lies in redefining the notion of how the roof should work. Instead of being a thin skin supported from above or from beneath, the roof 'petals' of the Arena das

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Dunas have depth in themselves and that depth is used to generate a support structure from *within* the roof section itself. It doesn't need any external support from above or below. The petals are apparently made of steel trusses, coated with aluminium tiles on the outside and with a PVC pre-stressed membrane in the inside. But however the structure works it strikes me as an absolute revelation in stadium design. If you are interested in reading a bit more about it – see below.

www.designbuild-network.com/projects/arena-das-dunas-natal/

When Walter Gropius established the Bauhaus in Weimar in the 1920s, he left the study of architecture to the final years, when students had already received a thorough grounding in design disciplines. He believed for a number of reasons that architecture was the ultimate expression of the designer's art, and not least because their efforts live with us and define our civic spaces for such an extended period. Good architecture enriches us all for a long time. Bad architecture is a serious and enduring blight on the landscape.

When the stakes are so high, we have a responsibility to engage with the built environment. Architecture projects should feature in the curriculum far more commonly than they currently do. If you are interested, RIBA and the Institution of Civil Engineers may help and as an example, have a look at the Open City programme.

open-city.org.uk/education/schools/secondary.html

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