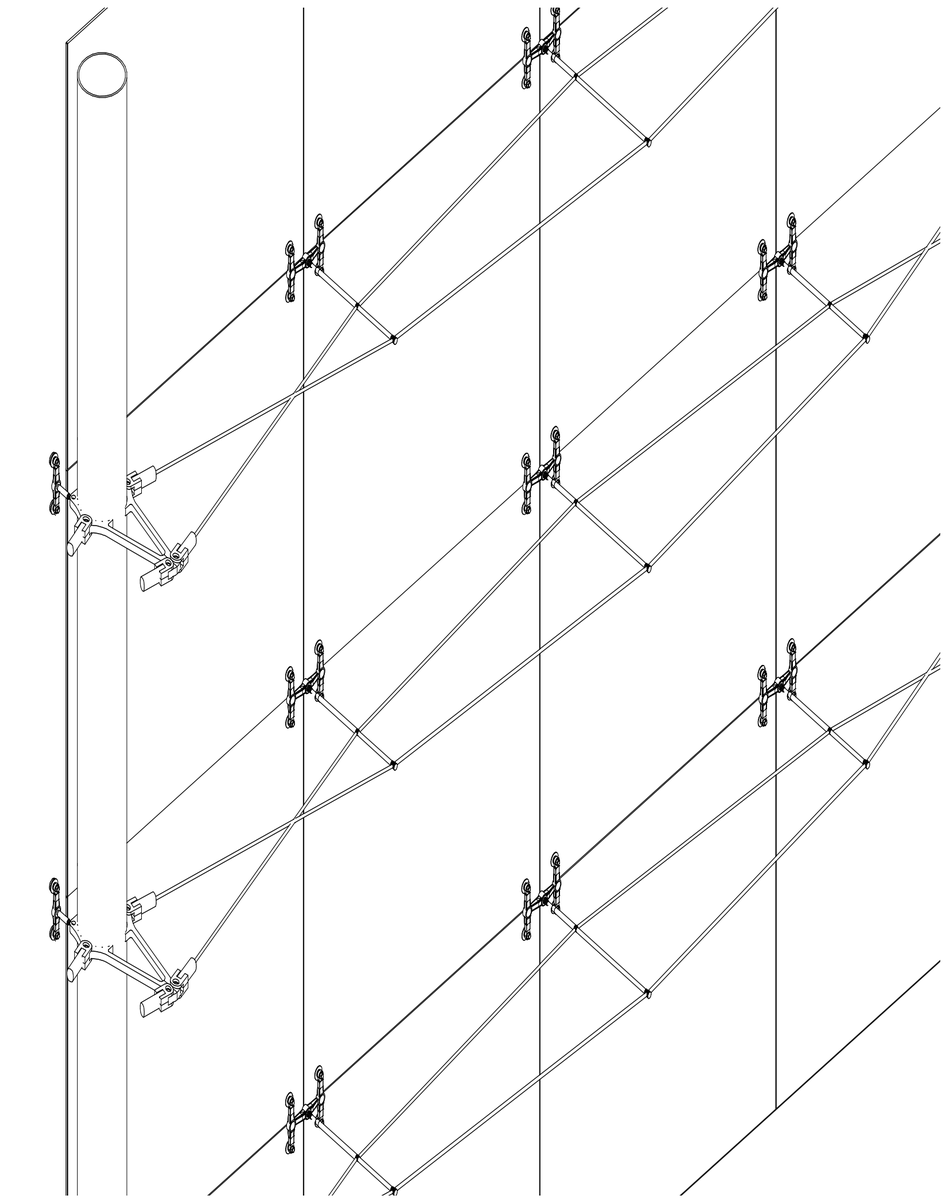
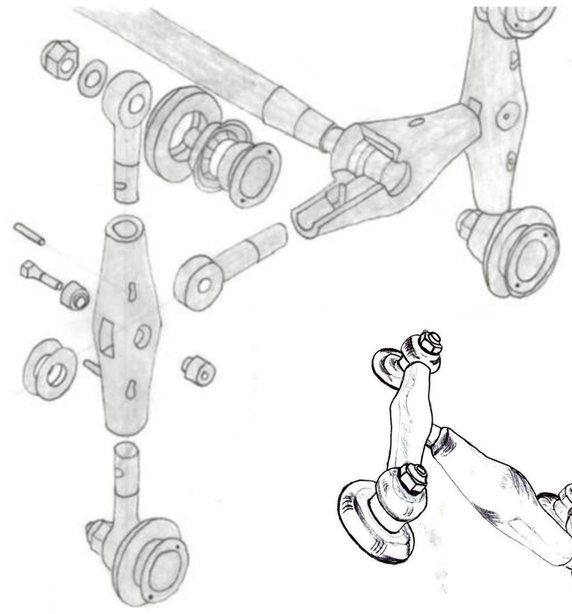
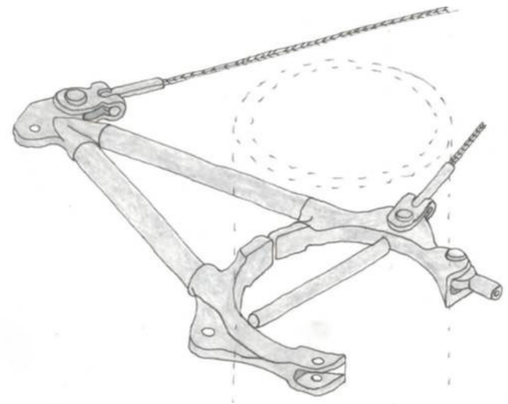


View of Les Serres Glazing System

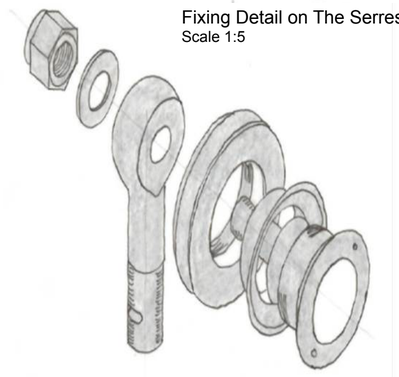


Exploded View of Spider Fixing

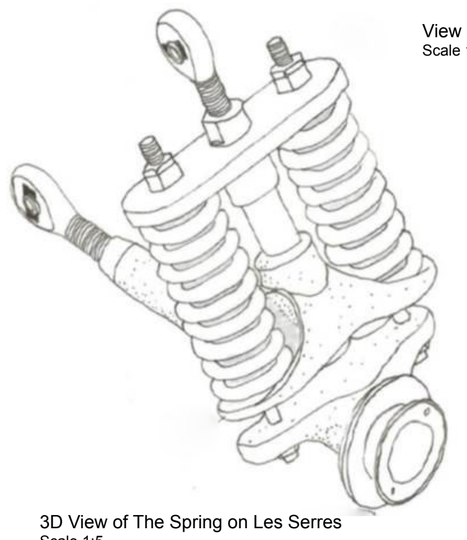
View of Spider Fixing On The Serres System
Scale 1:5



Fixing Detail on The Serres System
Scale 1:5



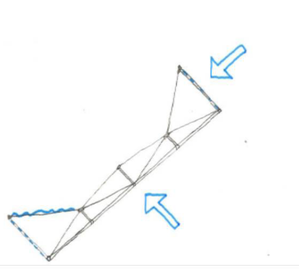
Exploded View Of Fixing



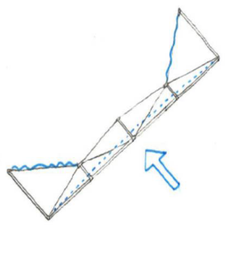
3D View of The Spring on Les Serres
Scale 1:5

Cite Des Science et L'Industrie is situated in the La Villette area in the greater Paris region. La Villette first mentioned in 1198 was the facility used as abattoirs (Slaughter houses) opened in 1867 by Baron Haussmann, Prefect of the Seine department. The last abattoir closed in 1974 and in 6 years' time Adrien Fainsilber won the competition for his design of the new science museum. Peter Rice later drafted in by Fainsilber designed and constructed the bioclimatic glass boxes to the front of the façade including the H fixings and the compression and tensioning systems the first ever of its kind.

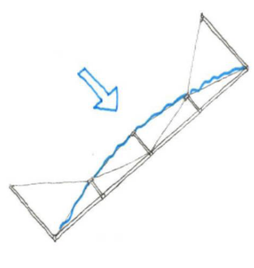
The Les Serres articulated bolt suspension system with cable support arrangements was used in the Cite de science et de l'industrie to create transparency and link the museum with its surroundings, Parc La Villette. The glass façade system is a structural and load bearing system which must be capable of supporting loads. One of the main design factors that had to be taken into account was wind loads being exerted on the façade. The cable trusses are primarily use to take any horizontal loads off the glass, if the glass was to be subjected to horizontal loads it would break. When under extreme loads the cable trusses can undergo a deflection of up to 40mm. The articulated bolts are used in the glass to allow for movement preventing any damage to the glass. The bolts are counter sunk and revolve around a pivoting ball at one end. The glass suspension system consists of 16 sheets of glass each 2 X 2 meters which are hung from above using chains and spring systems. This allows for movement within the structure and allows each vertical line of glass find its own central point as to not have and vertical loads on the glass sheets.



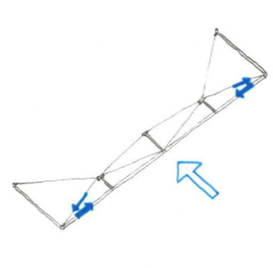
Front and side wind loading causing tension in side tubes of Les Serrres and compression in cables



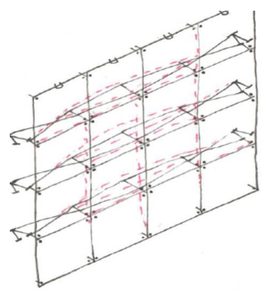
Front wind loading causing deflection in glass tensioning cable trusses.



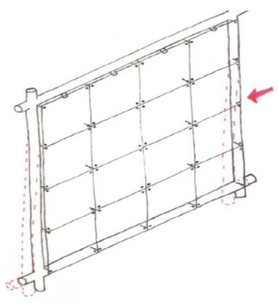
Wind loading from behind Les Serres putting back cables into compression.



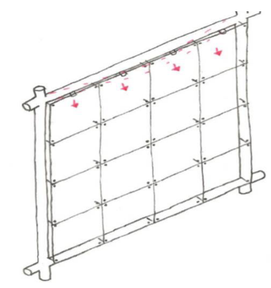
Front wind loading transfering horizontal loads to corner connection components and onto vertical tubes.



Loads transferring along cable trussses



Side wind loads cause deformation on main frame up to 40mm.



Self weight of glass hung from spring components allowing vertical panes of glass to find centre of gravity in a single line.

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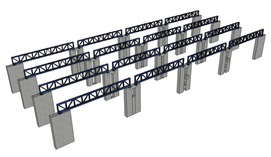
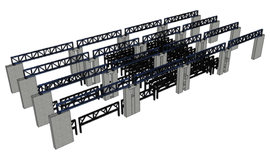
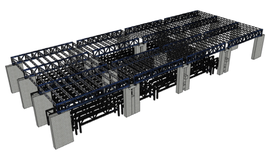
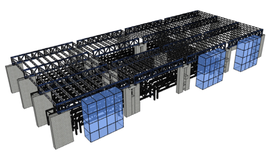
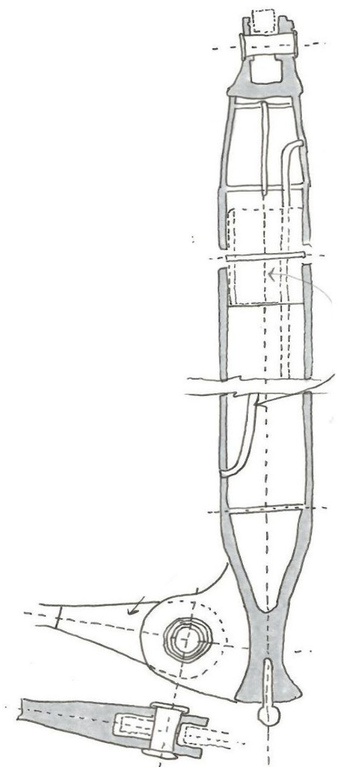


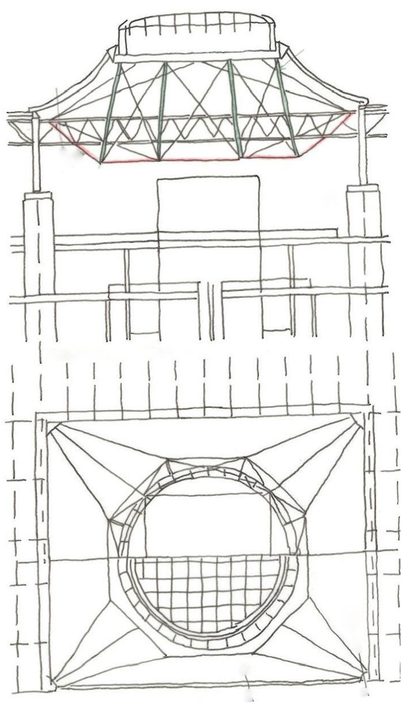




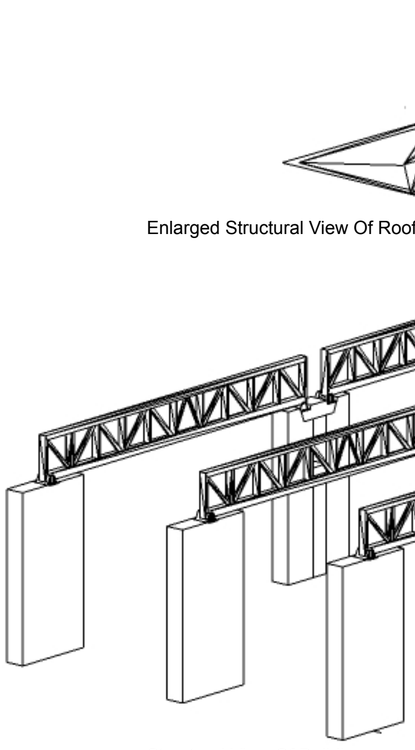




Suspension Column
Scale 1:5

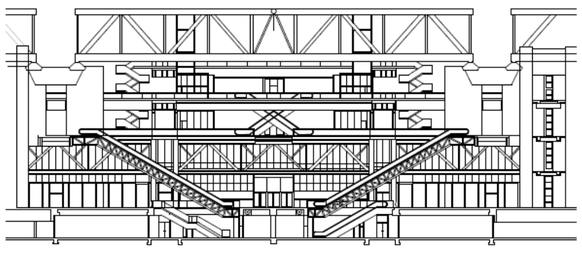


Structural Roof Plan And Section

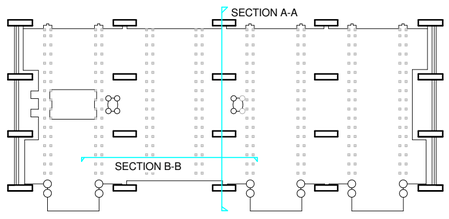


Enlarged Structural View Of Roof

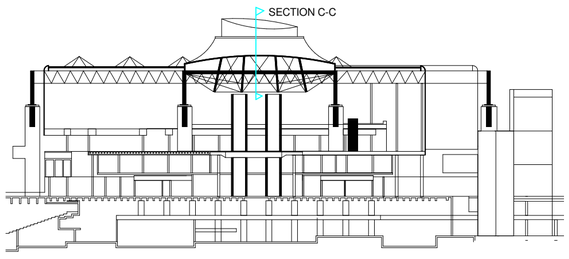
Structural View Of Building



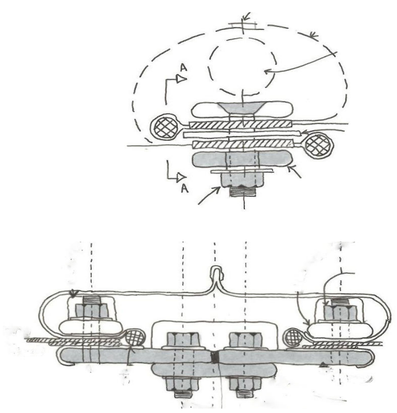
Long Section Through Building
Scale 1:1000



Structural Floor Plan
Scale 1:1000



Cross Section Through Building
Scale 1:1000



Fabric PTFE Connections
Scale 1:5

CONNECTION & COLLABORATION: LESSONS FROM PETER RICE

3rd & 4th YEAR ARCHITECTURAL TECHNOLOGY 2013

Students: Milo Bashford, Gerard Bennett, Ross Boyce, Patrick Brady, Robert A Burns, Robert G Burns, Sean Casey, Andrew Cleary, Carl Corcoran, Anna Cullen, Chris Daly, Adam Darby, Bernard Deay, Mark Denneny, Vincent Doherty, Mark Doyle, Dean Farrell, Ciaran Ford, Shane Hall, Ross Harrell, Ben Harrison, Colin Hemon, Adam Henderson, Fatma Hinawy, Darren Hoey, David Holland, Brian Kennedy, Akvile Klapatauskaite, Davitt Lamon, Brian Lee, Peter Lemasney, Ciaran Lennon, Brendan Linnane, Sarah Mac Loughlin, James Maguire, Peter Mahon, Brian Malone, Michael Malone, Jason Mc Elroy, Kevin Mc Feely, Karl Mc Garry, Pauric Mc Gill, Marcus Mc Guire, Joe Mc Nally, Kevin McNulty, Bryan Menton, Darragh Moore, Stephen Morris, Niall Murphy, Owen O'Flaherty, Ruairi O'Neill, John O'Sullivan, Daryl Phelan, Martin Philip, Ian Plunkett, Robert Quinn, Stephen Ralph, David Reilly, Jonathan Rogers, Anita Salako, Andrei Triffo, Aiga Veltensone, David Veltom, John Wolfe-Flanagan, Dominika Zubiak. **Staff:** Cormac Allen, Eric Bates, Noel Brady, Máirtín D'Alton, Pierce Fahy, Rory Greenan, Orna Hanly, John Lauder, Tim O'Leary, Jim Roche, Sima Rouholamin, David Wright. **Collaborators:** Gerard Crowley, Peter Flynn, Declan McGonagle, Sean Ó Laoire.

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