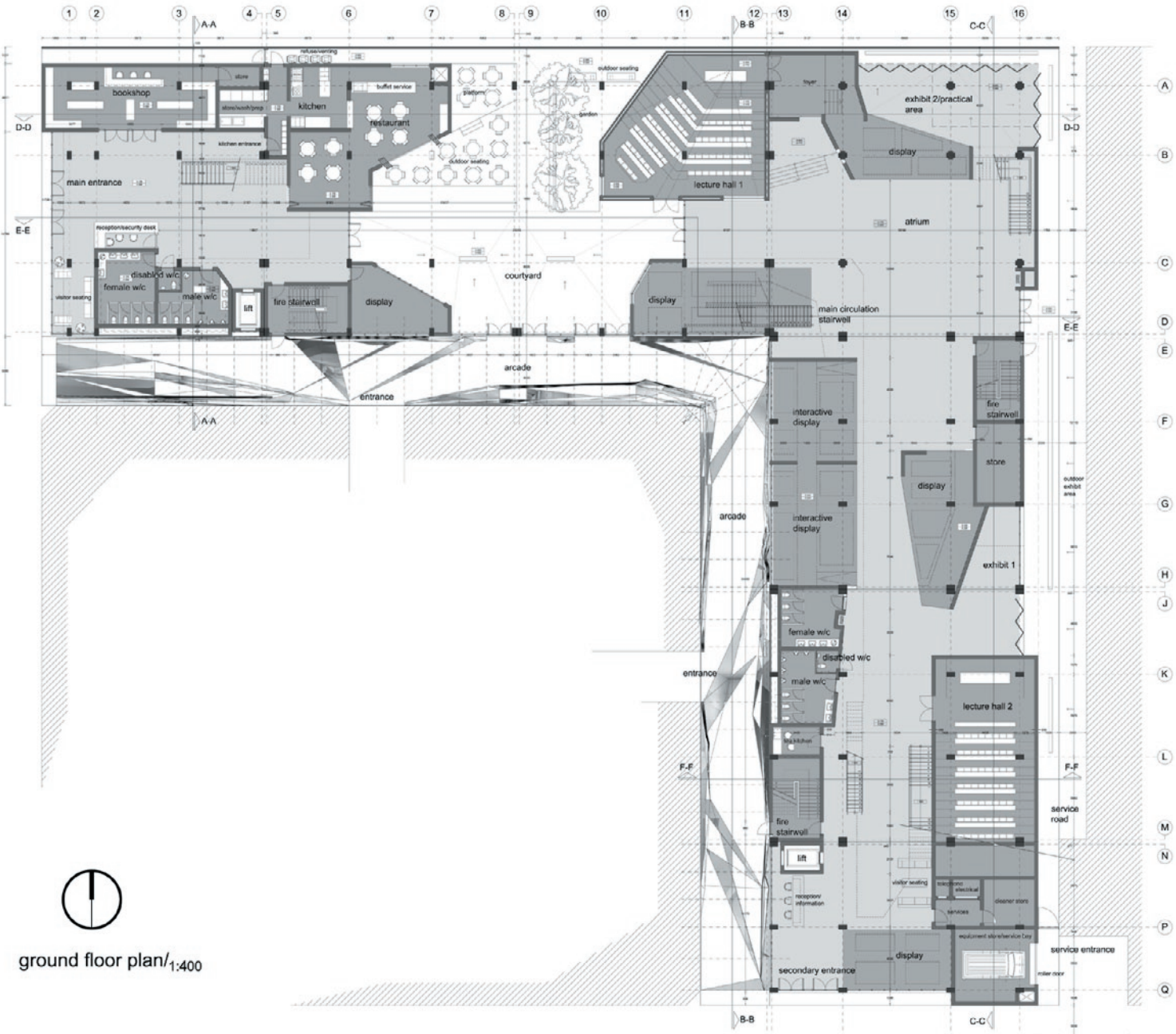
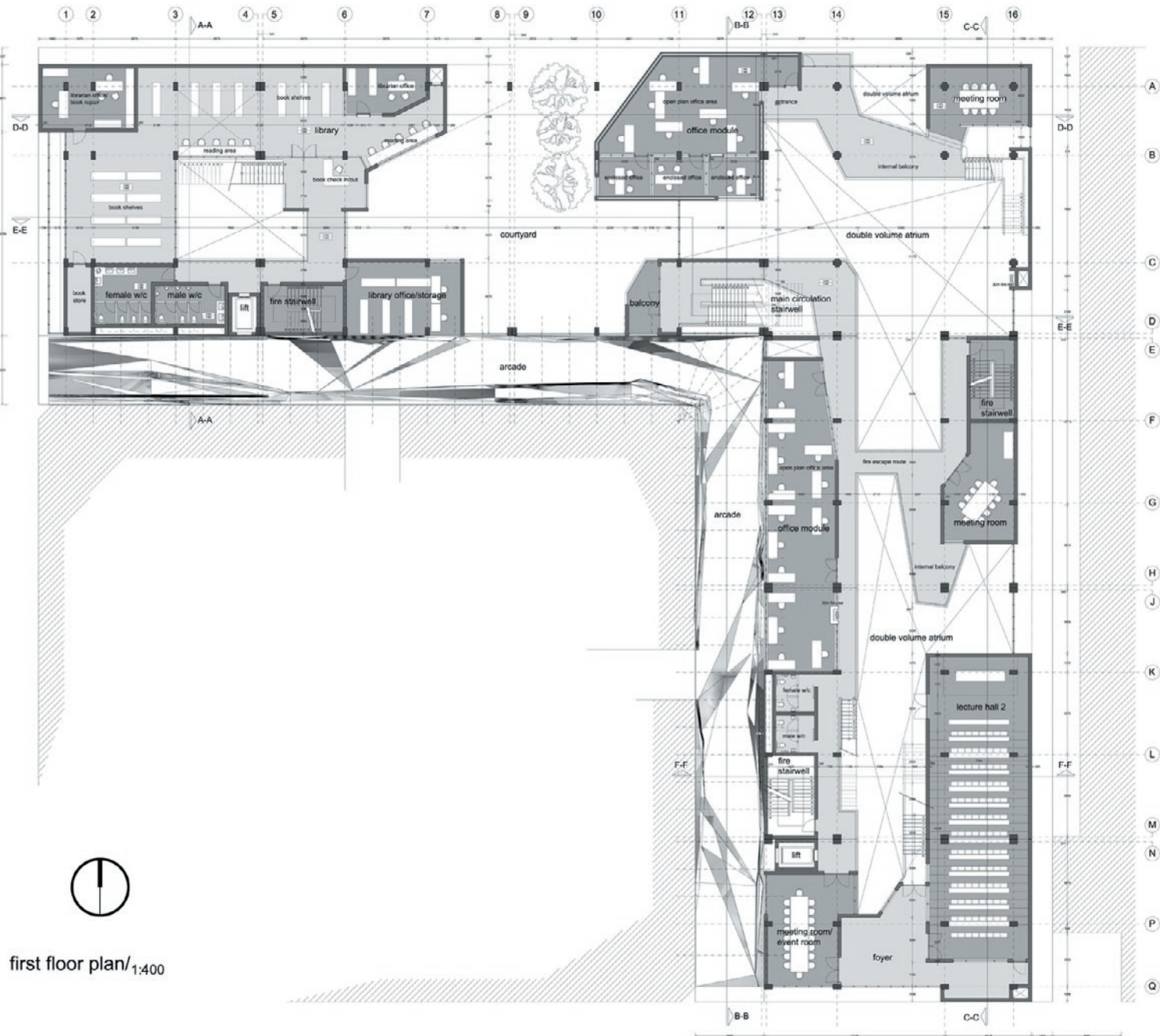


technical

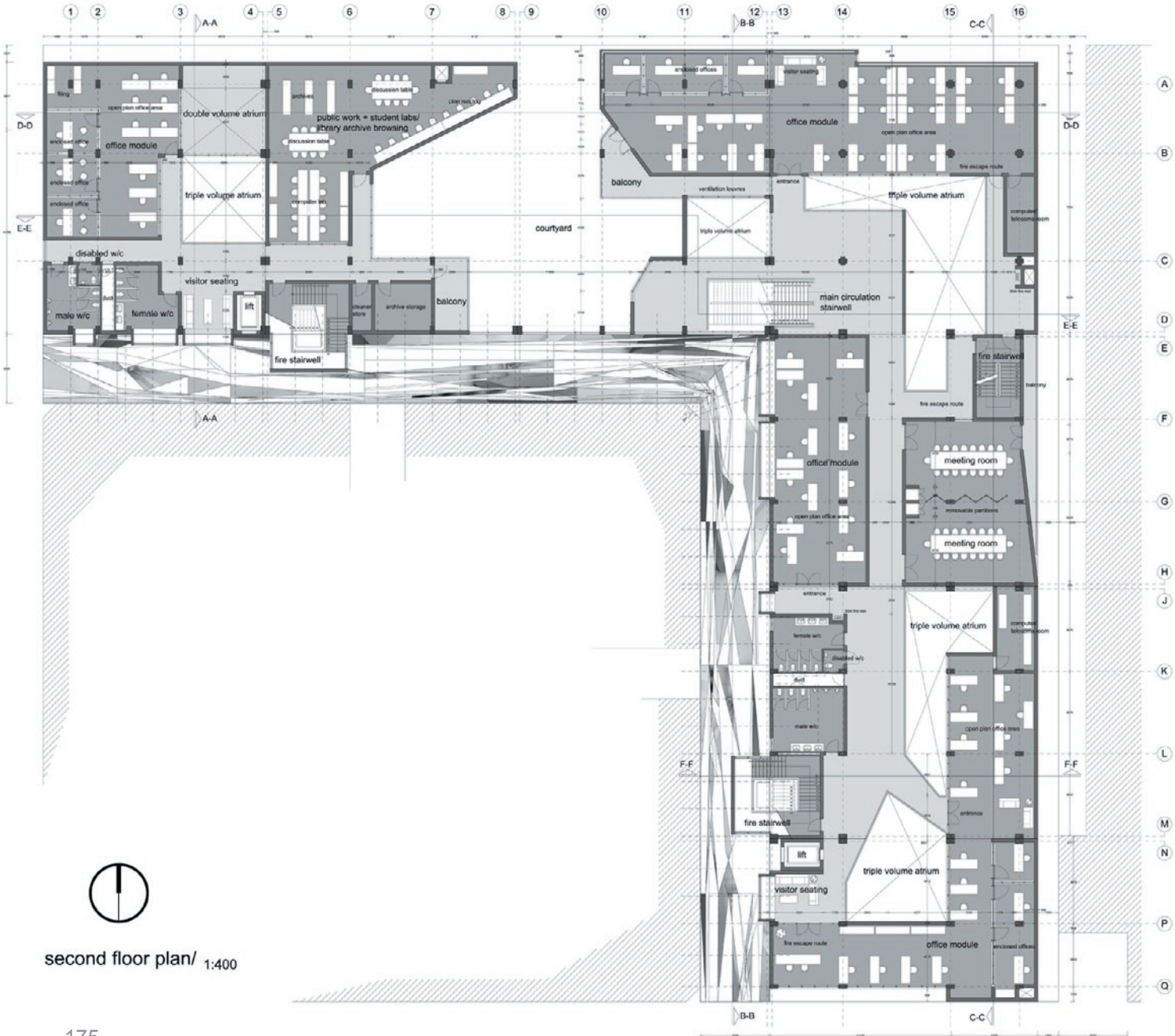
- 01 site plan
- 02 ground floor plan
- 03 first floor plan
- 04 second floor plan
- 05 third floor plan
- 06 roof plan
- 07 sections
- 08 elevations
- 09 sunscreen details
- 10 arcade details
- 11 arcade development
- 12 structural renders



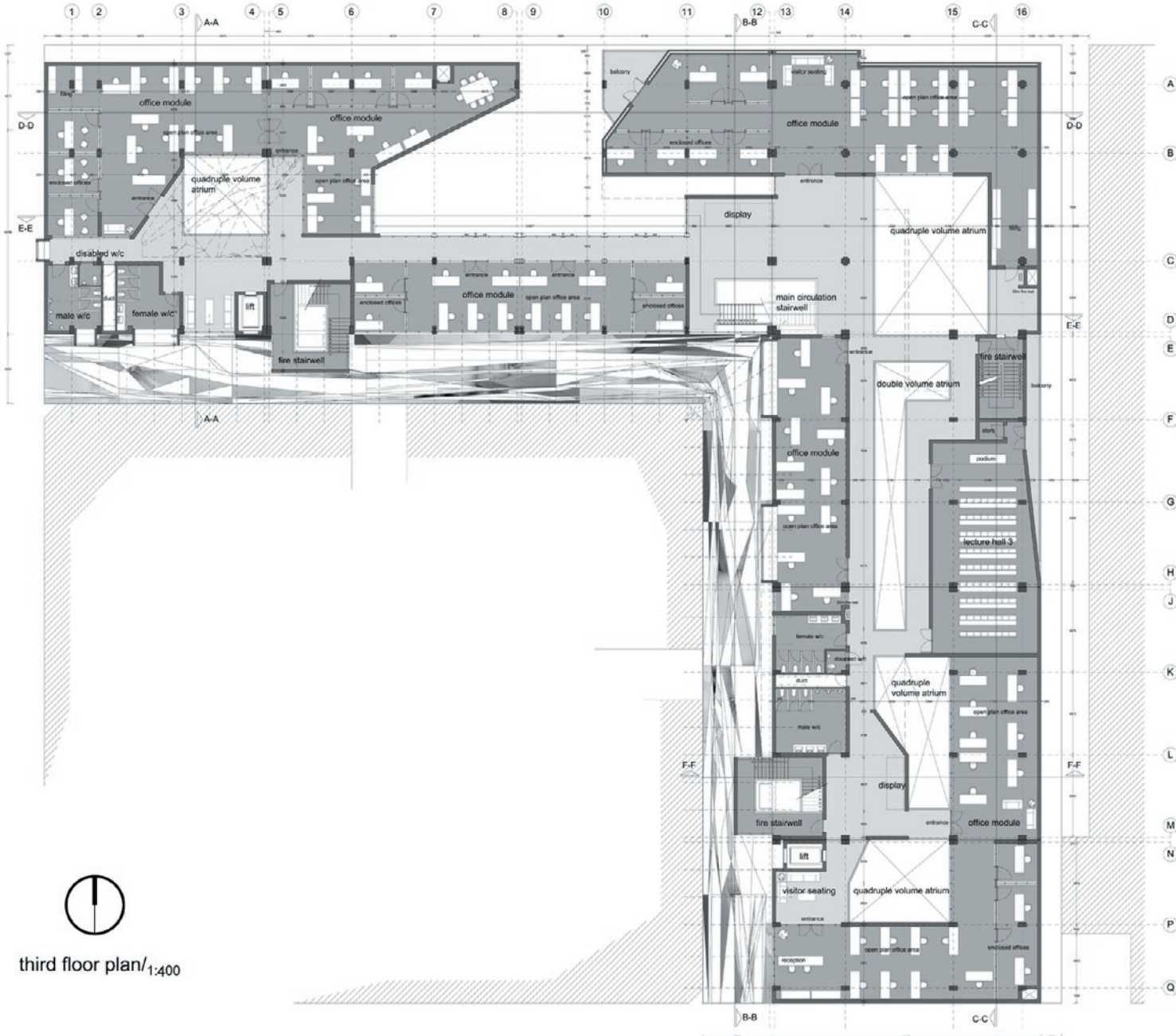
ground floor plan/1:400



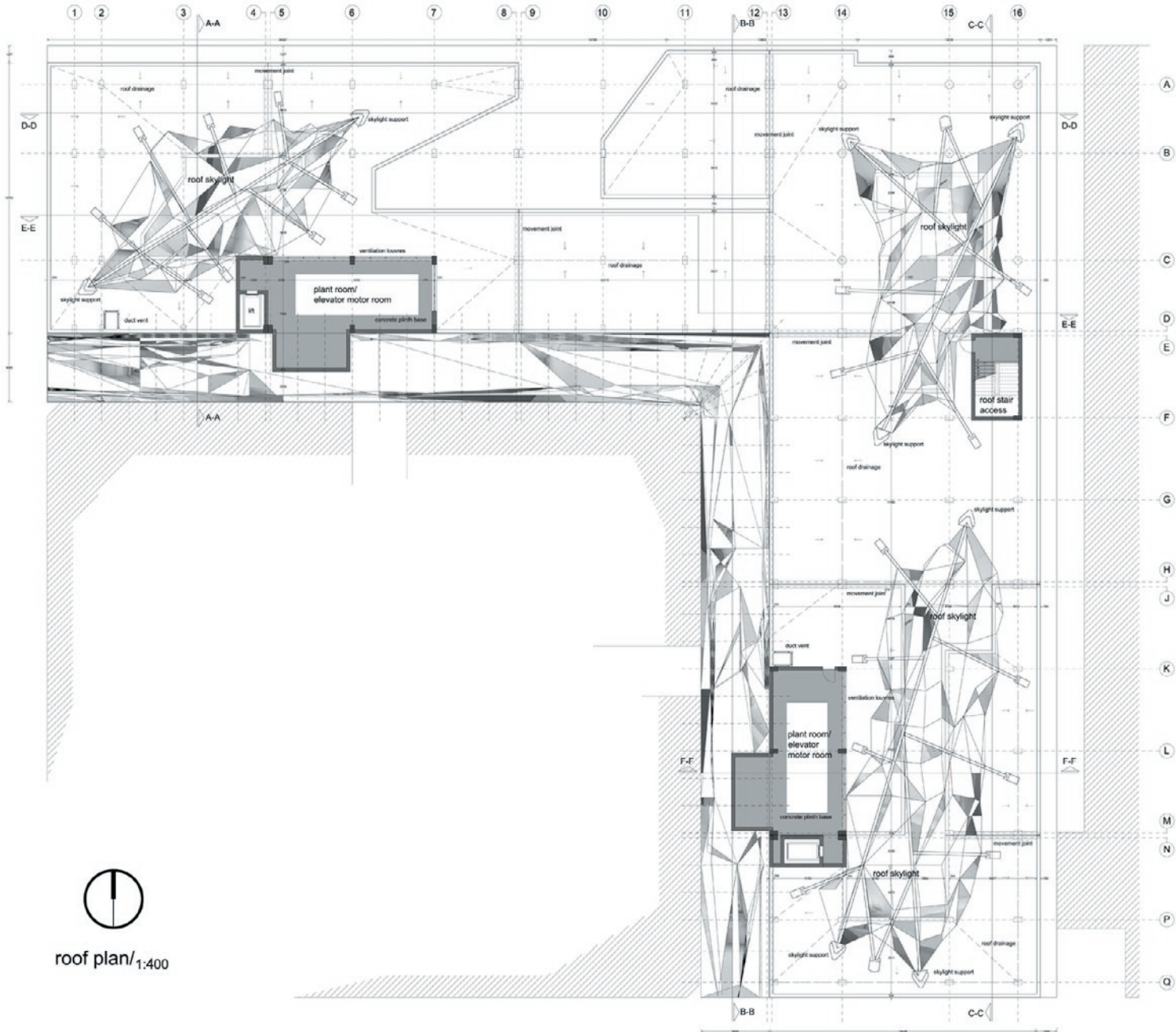
first floor plan/1:400



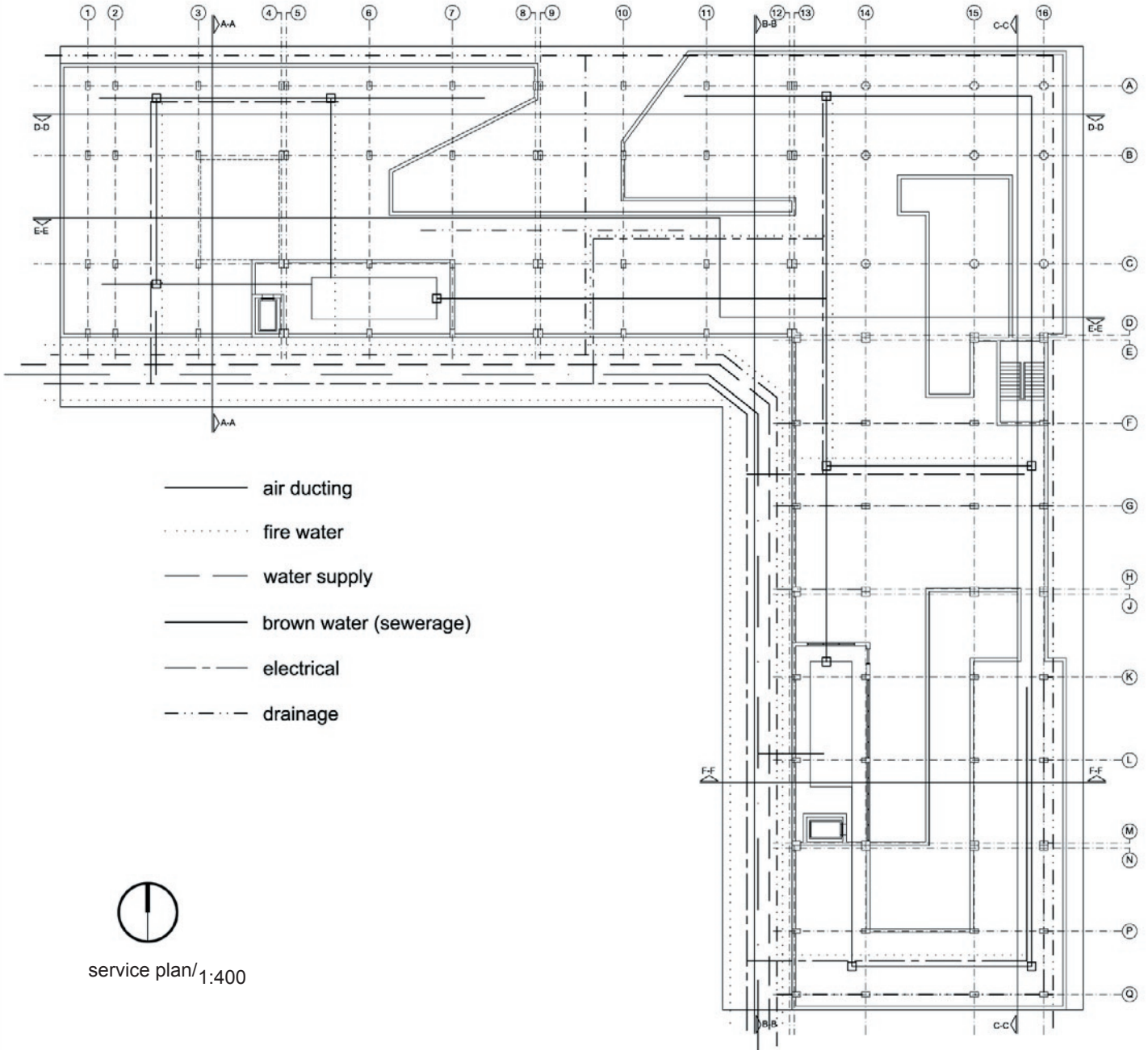
second floor plan/ 1:400

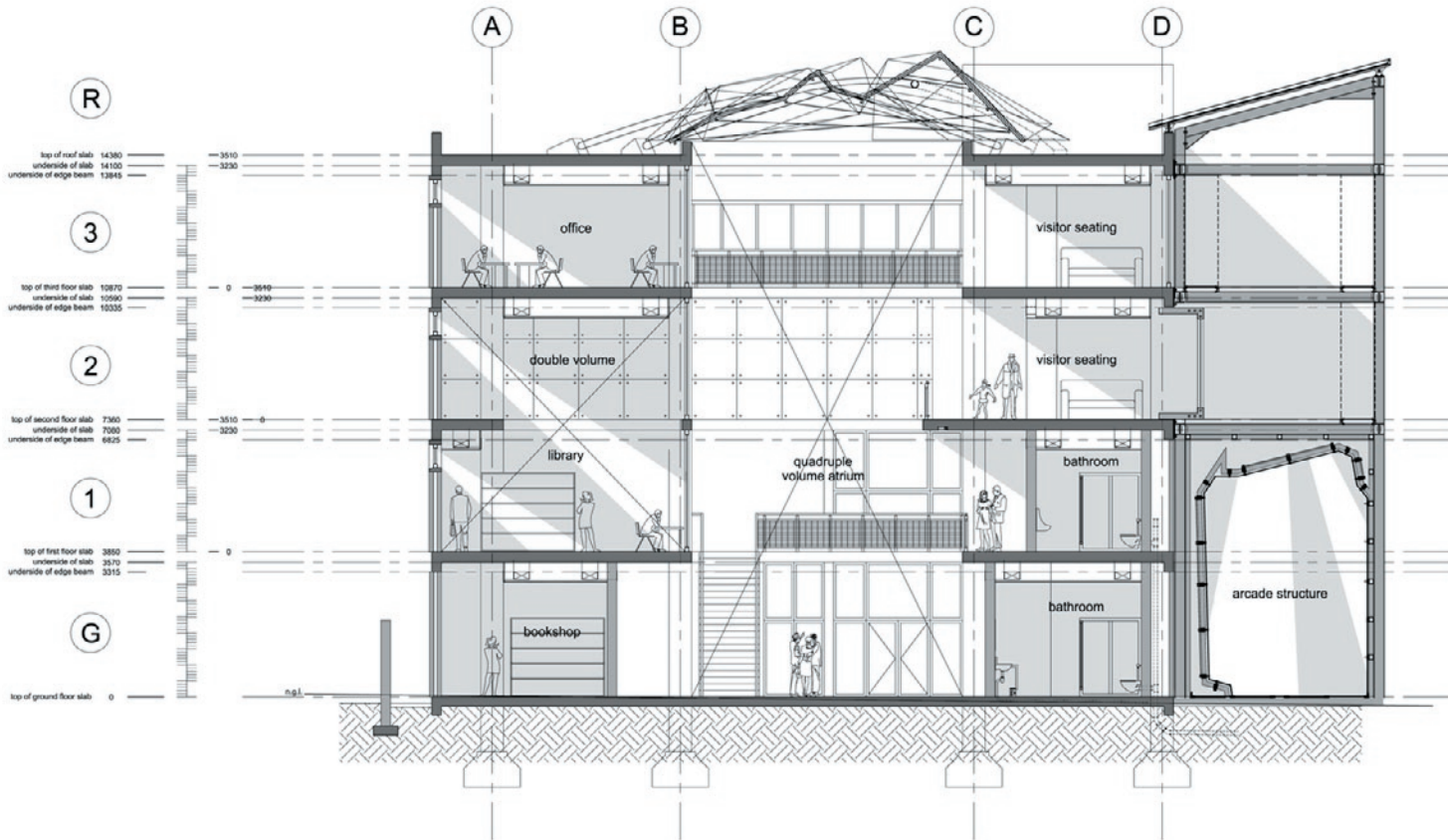


third floor plan/1:400

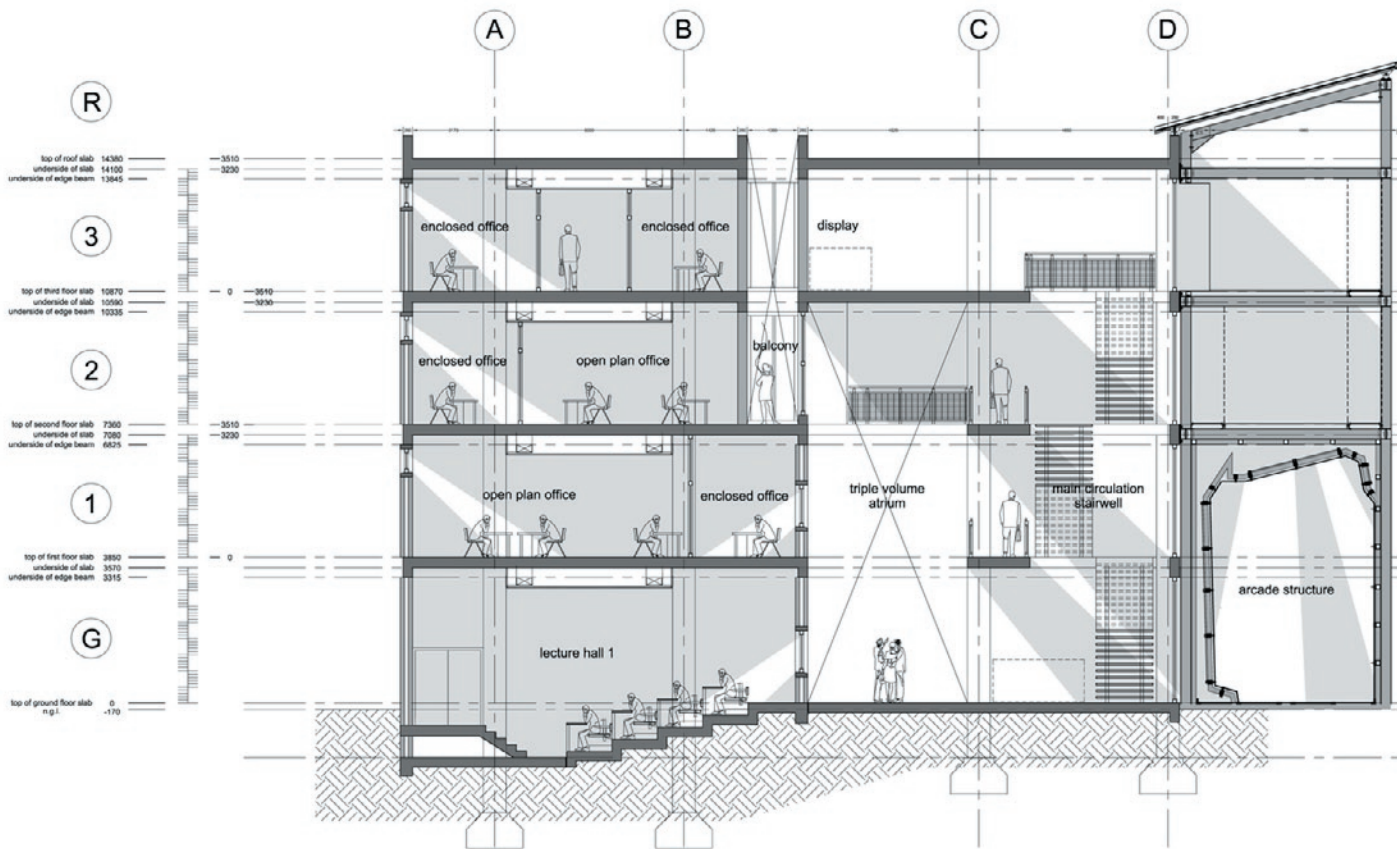


roof plan/1:400

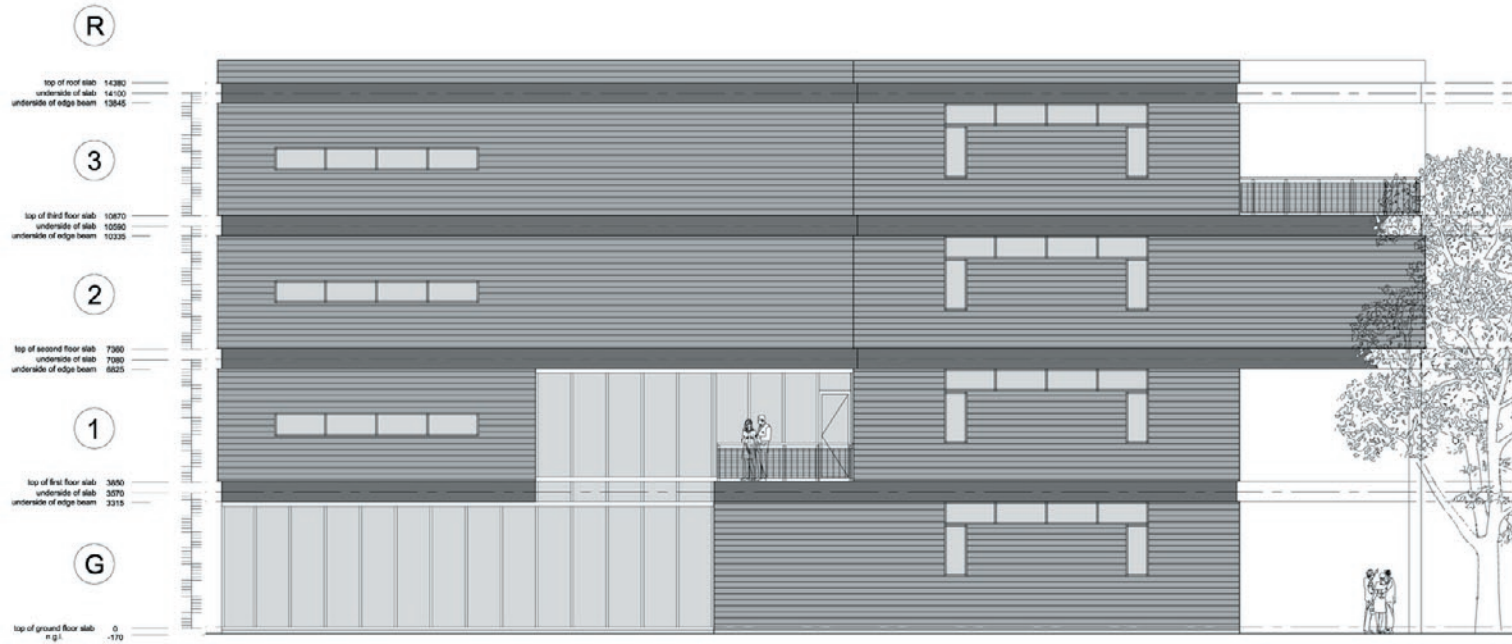




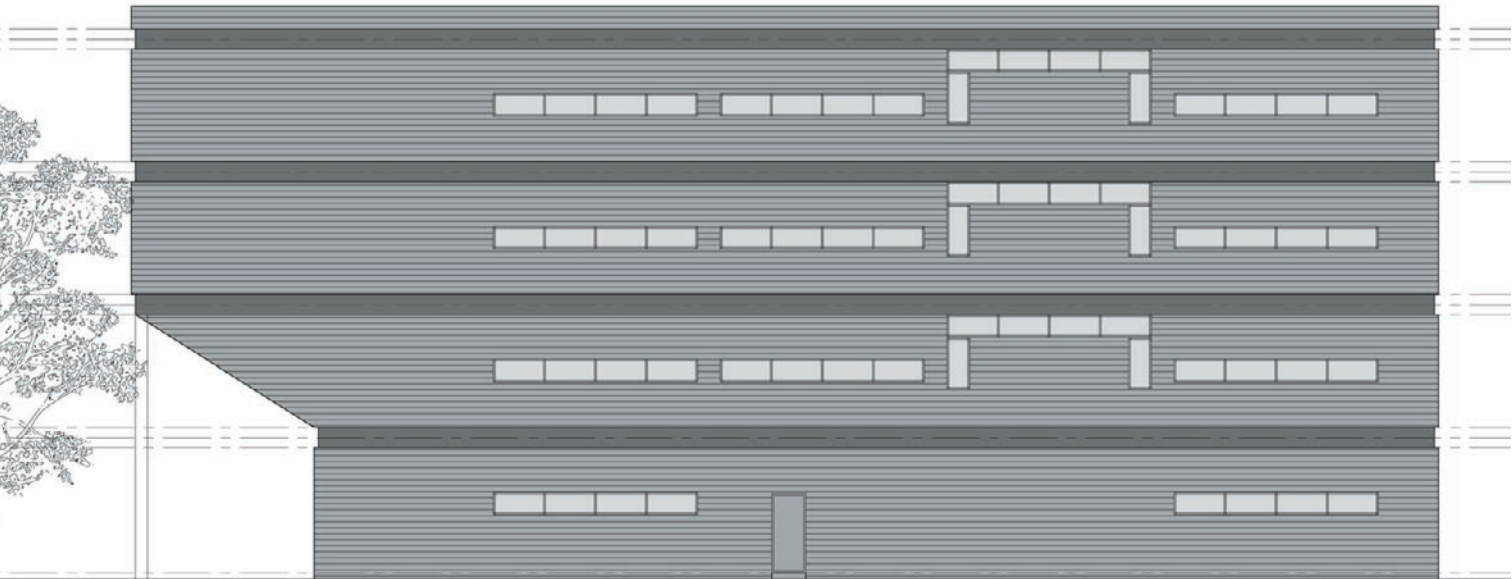
section A-A/ 1:200



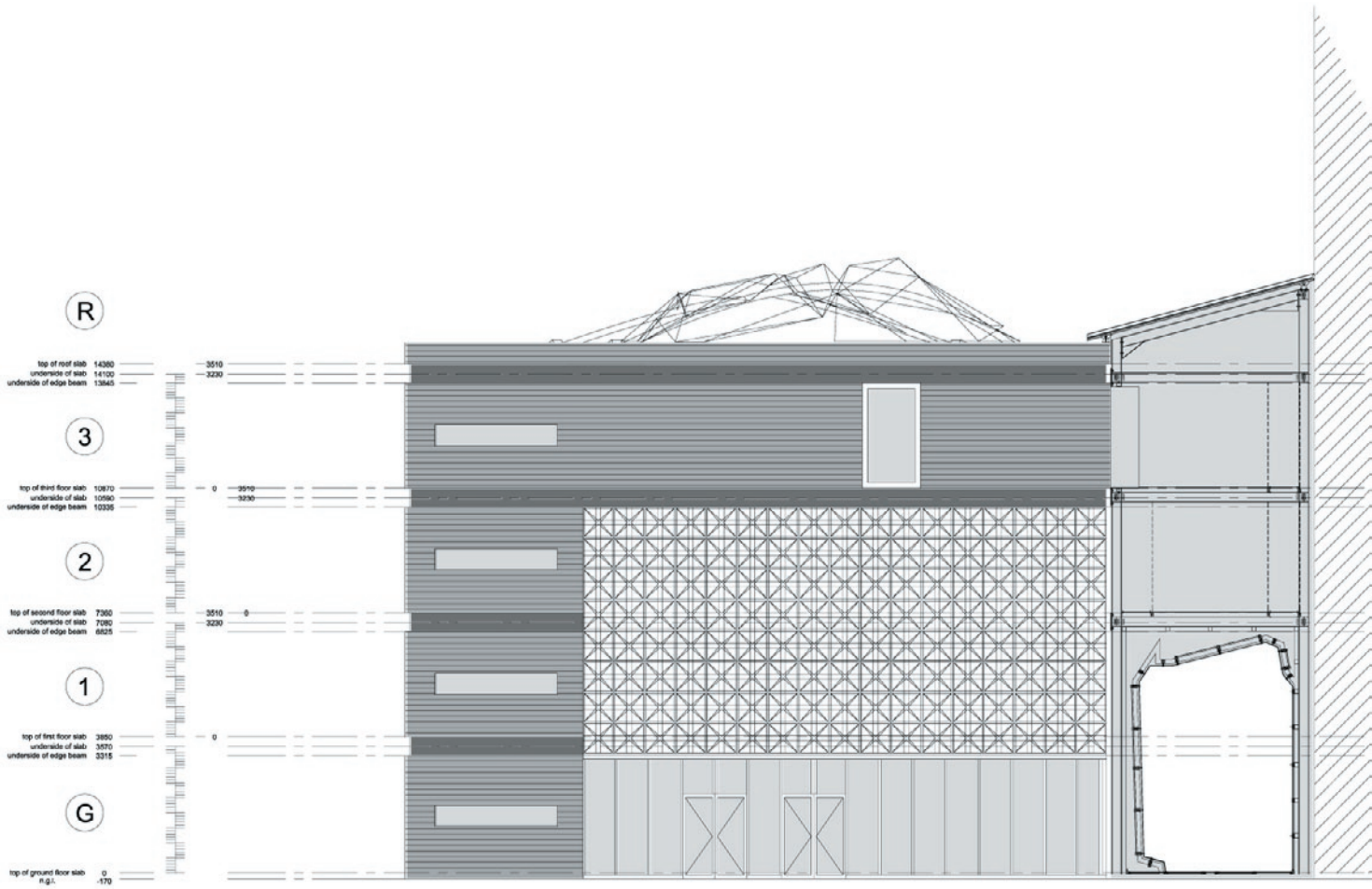
section B-B/ 1:200



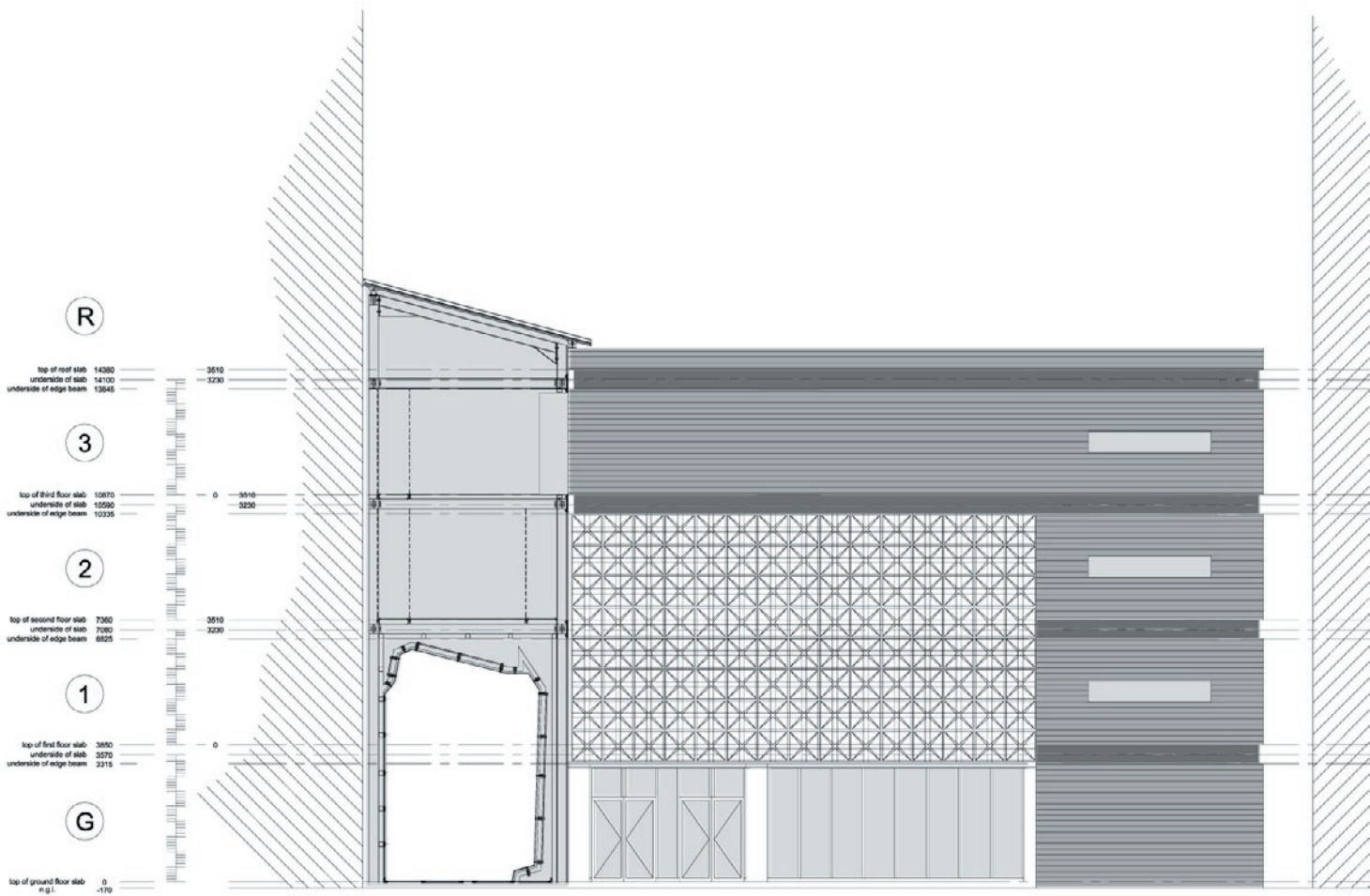
C.U.B.E. north elevation/ 1:20



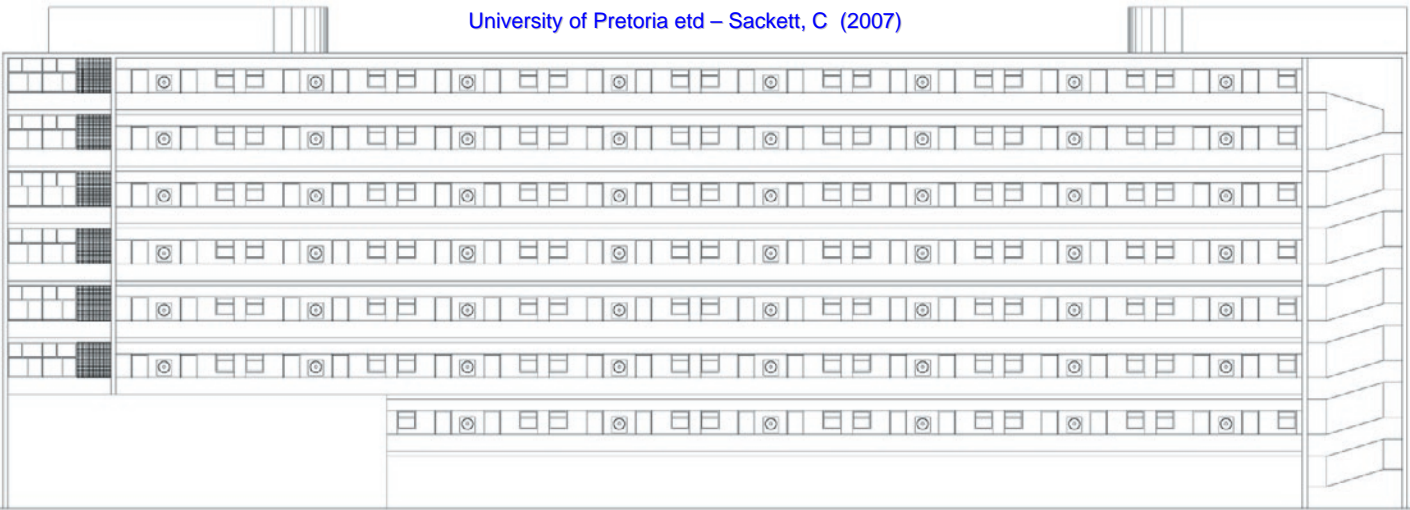
0



C.U.B.E. west elevation/ 1:100



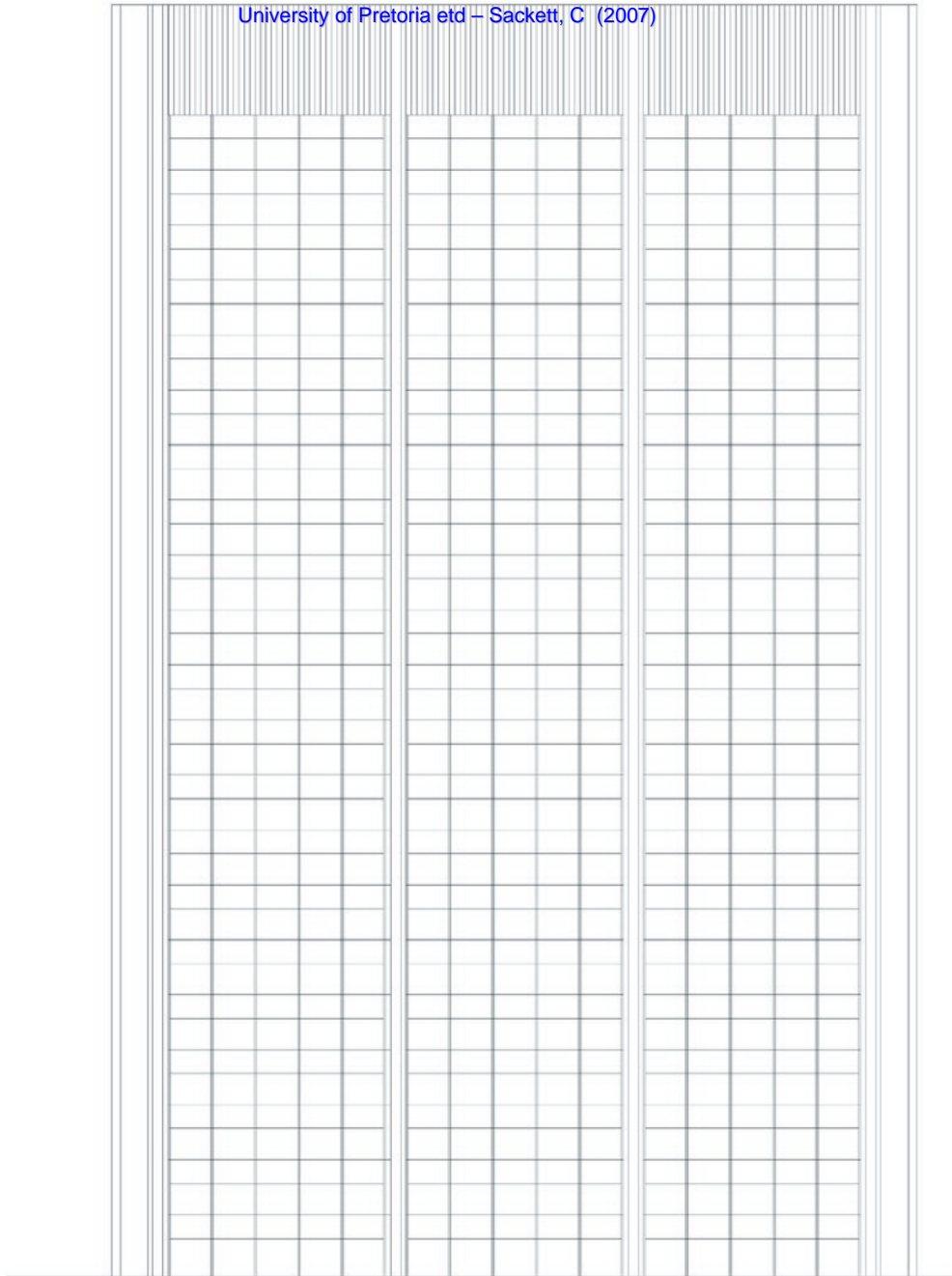
C.U.B.E. south elevation/ 1:100



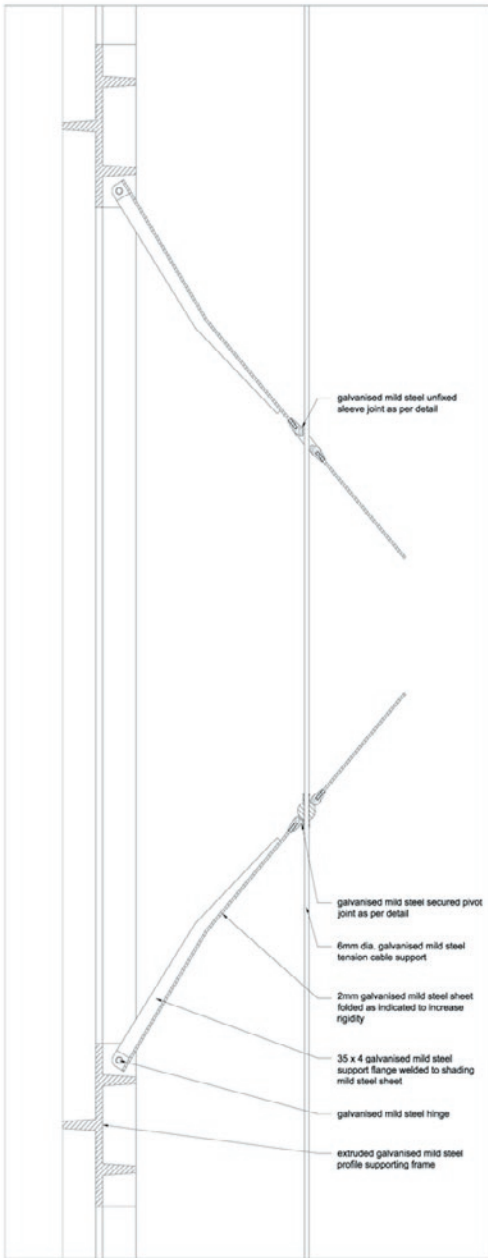
woltemadegebou south elevation/ 1:200



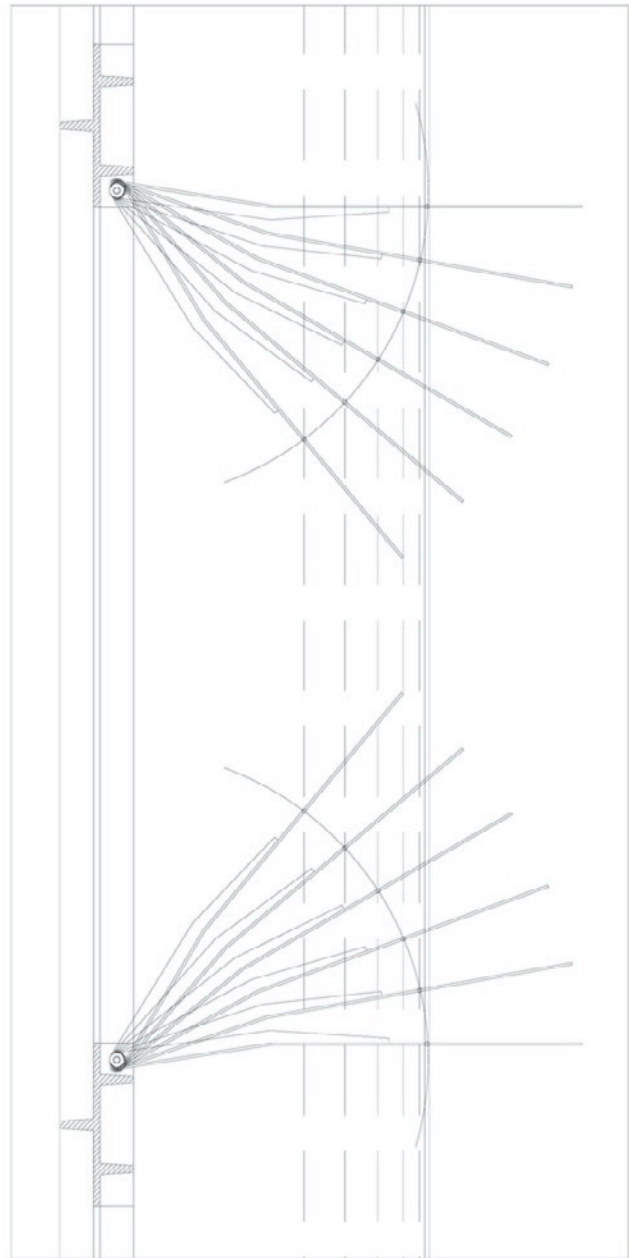
pretoria news building west elevation/ 1:200



VWL sentrum building north + east elevation/ 1:200

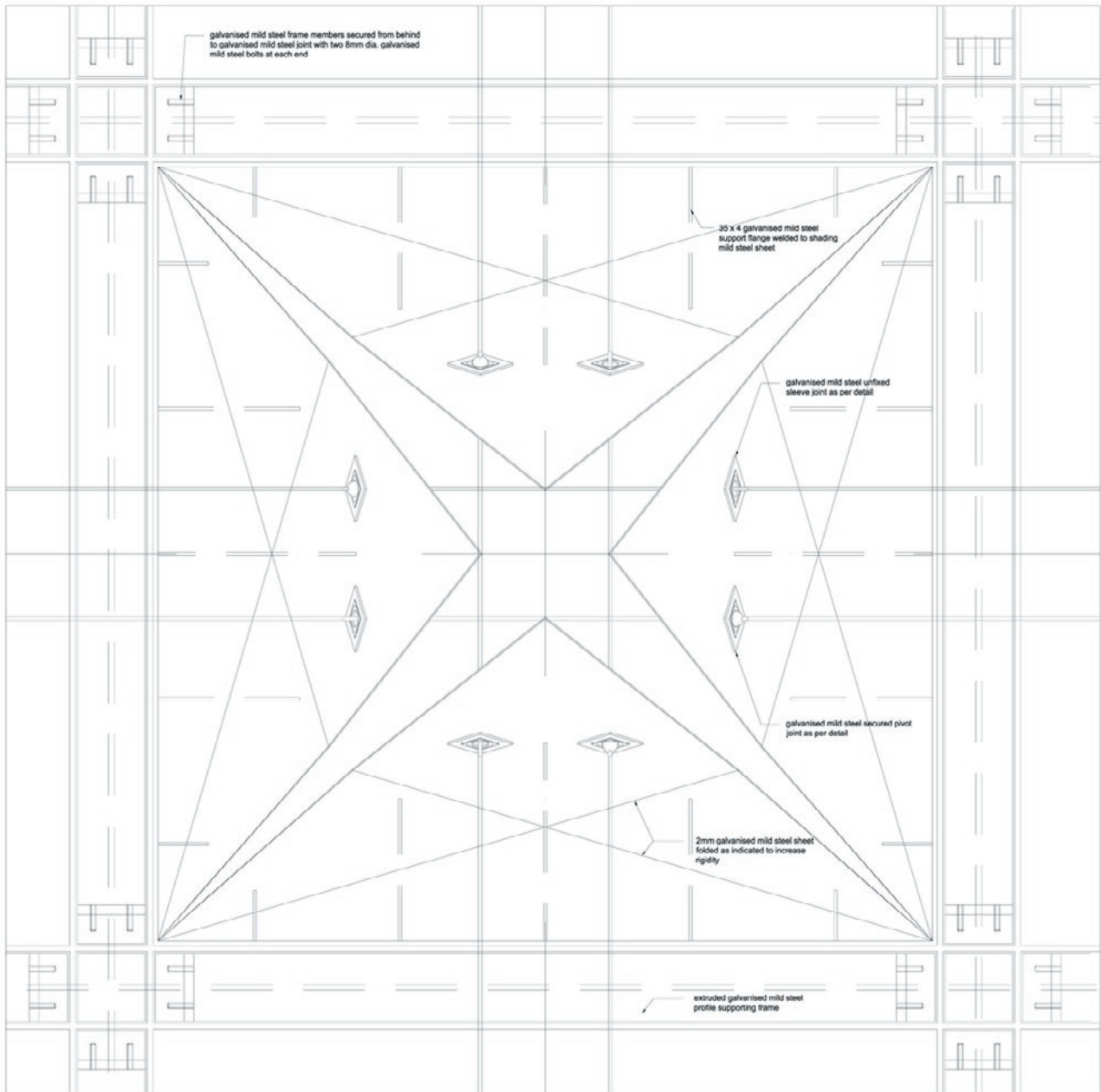


single unit in closed position/ 1:2

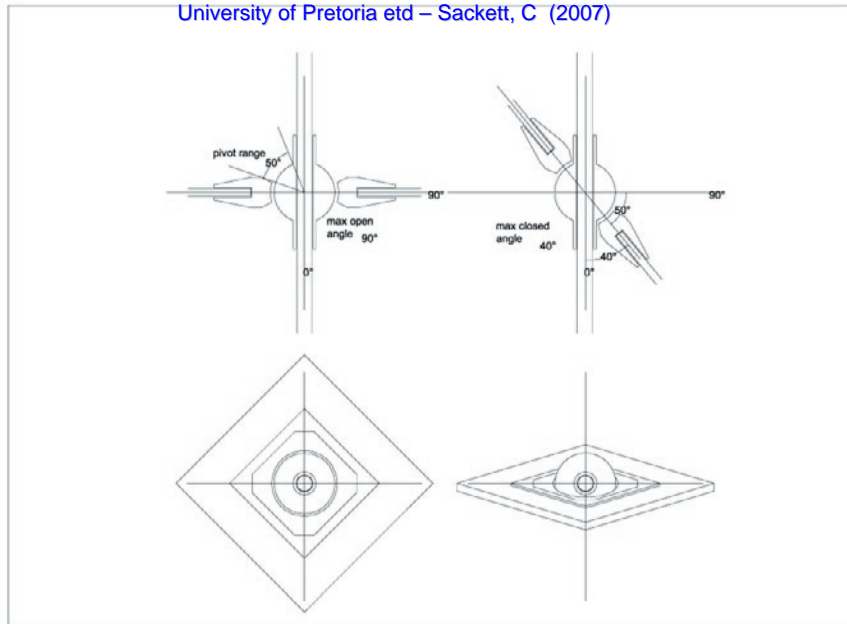


single unit in open position/ 1:2

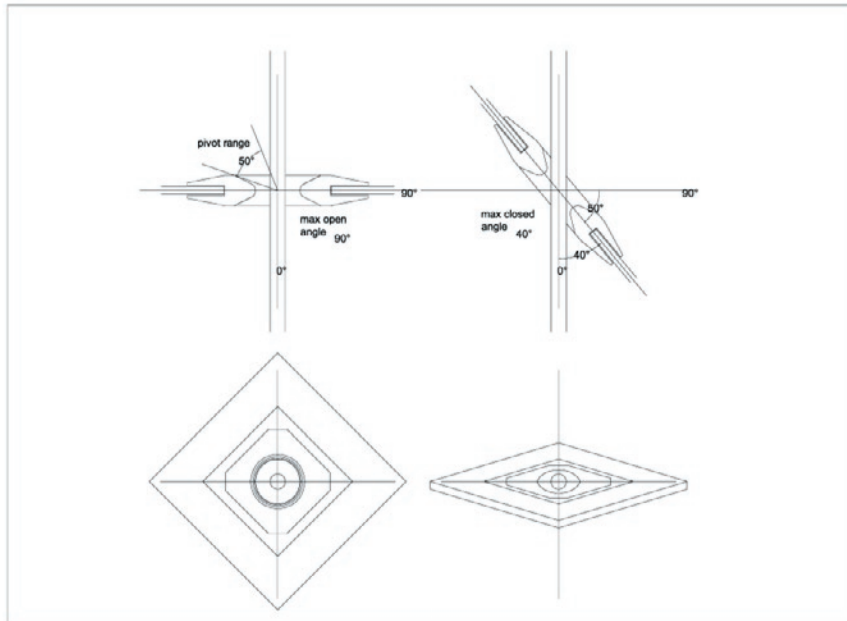




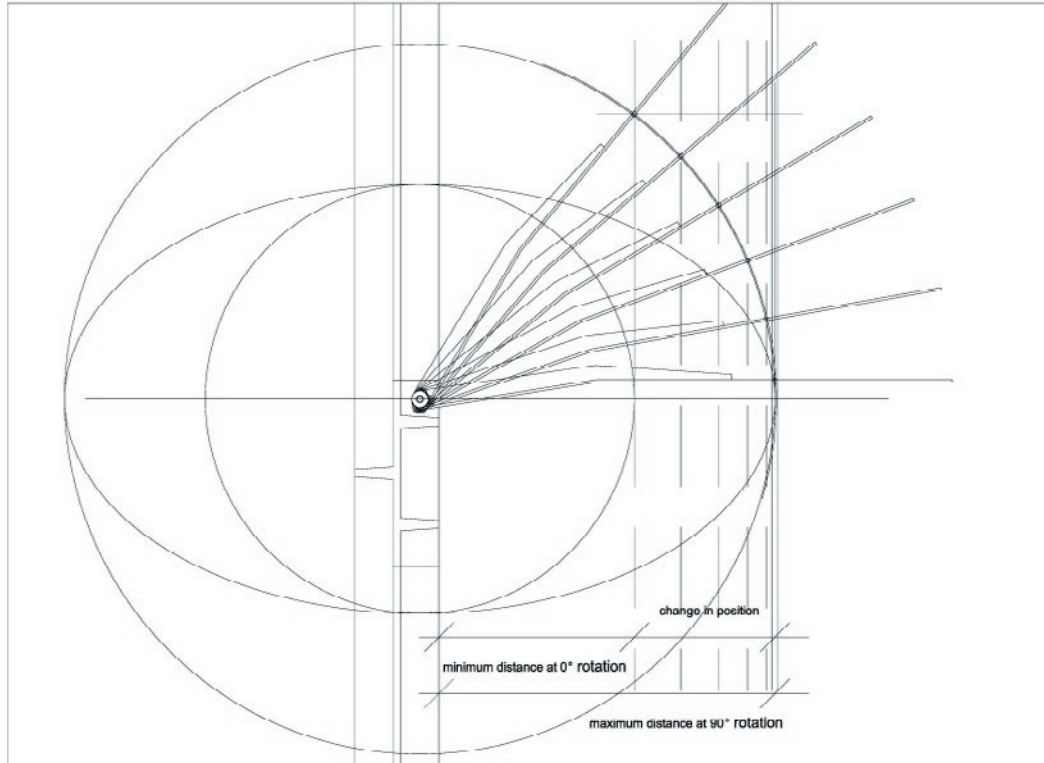
single unit elevation/ 1:2



secured pivot joint/ 1:1



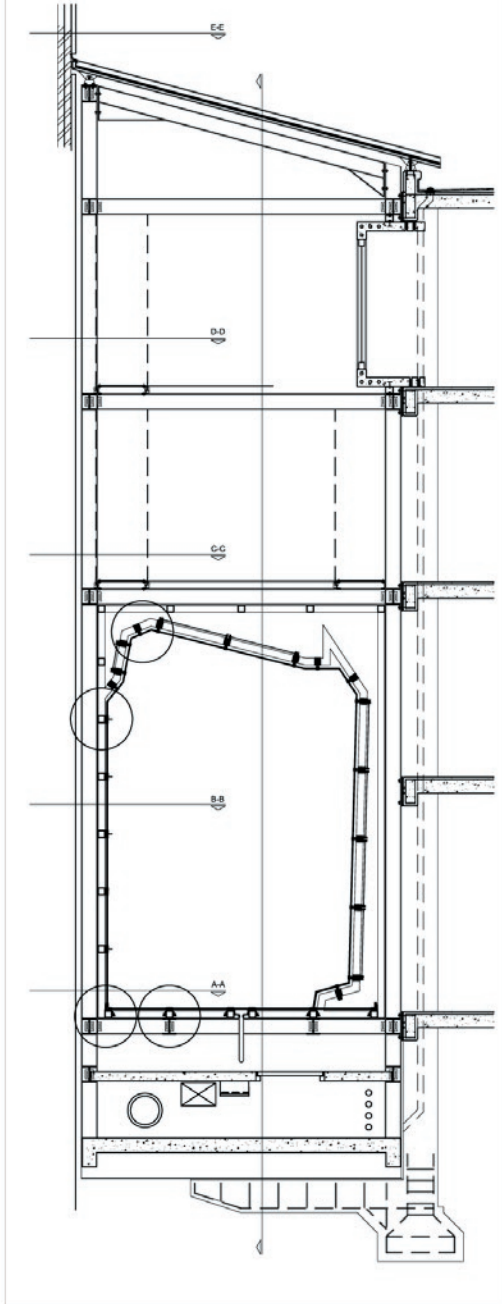
unfixed sleeve joint/ 1:1



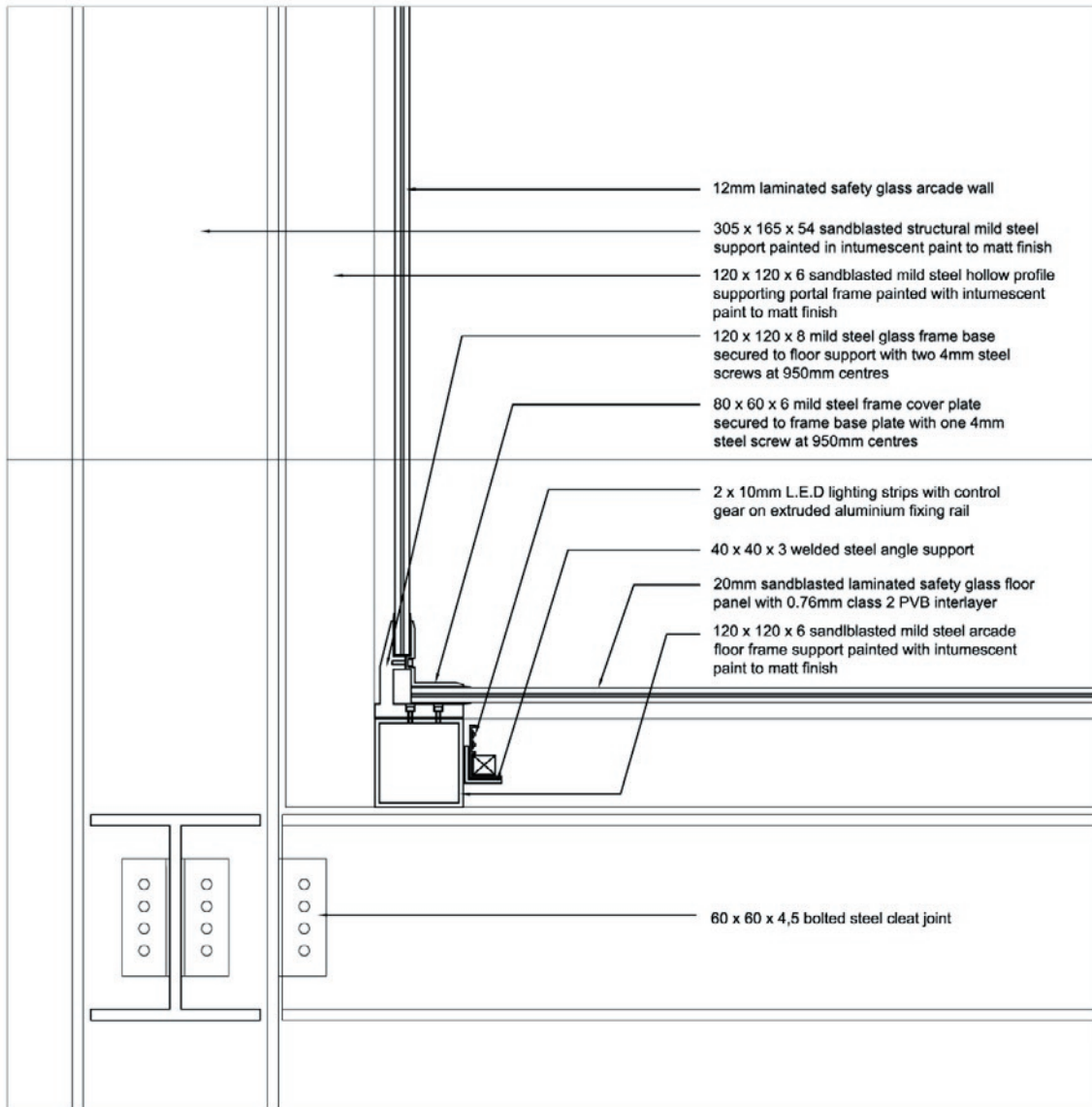
cable movement analysis/

due to the circular movement arc of the metal panels, the tensile cables will move forward and back in position as the panels open and close. this can lead to operating problems should this movement not be designed for. however with the use of a simple elliptical rotation element this problem can be solved.

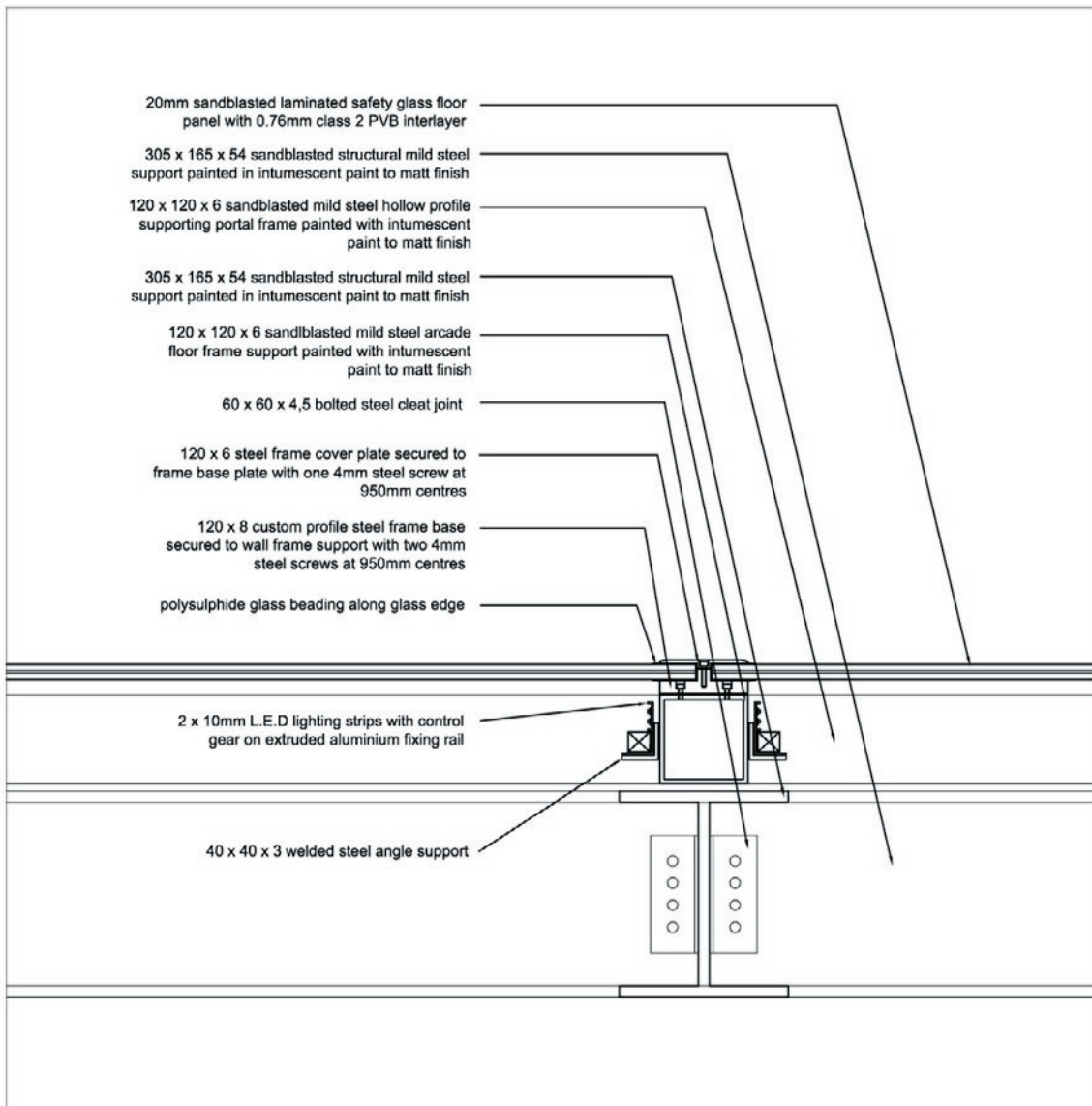
since the panel movement centres about the hinge, so too will the position of the cable. but since the rotation of a circular element will not induce horizontal position change, an elliptical element must be designed according to the ratio of position change about the hinge.



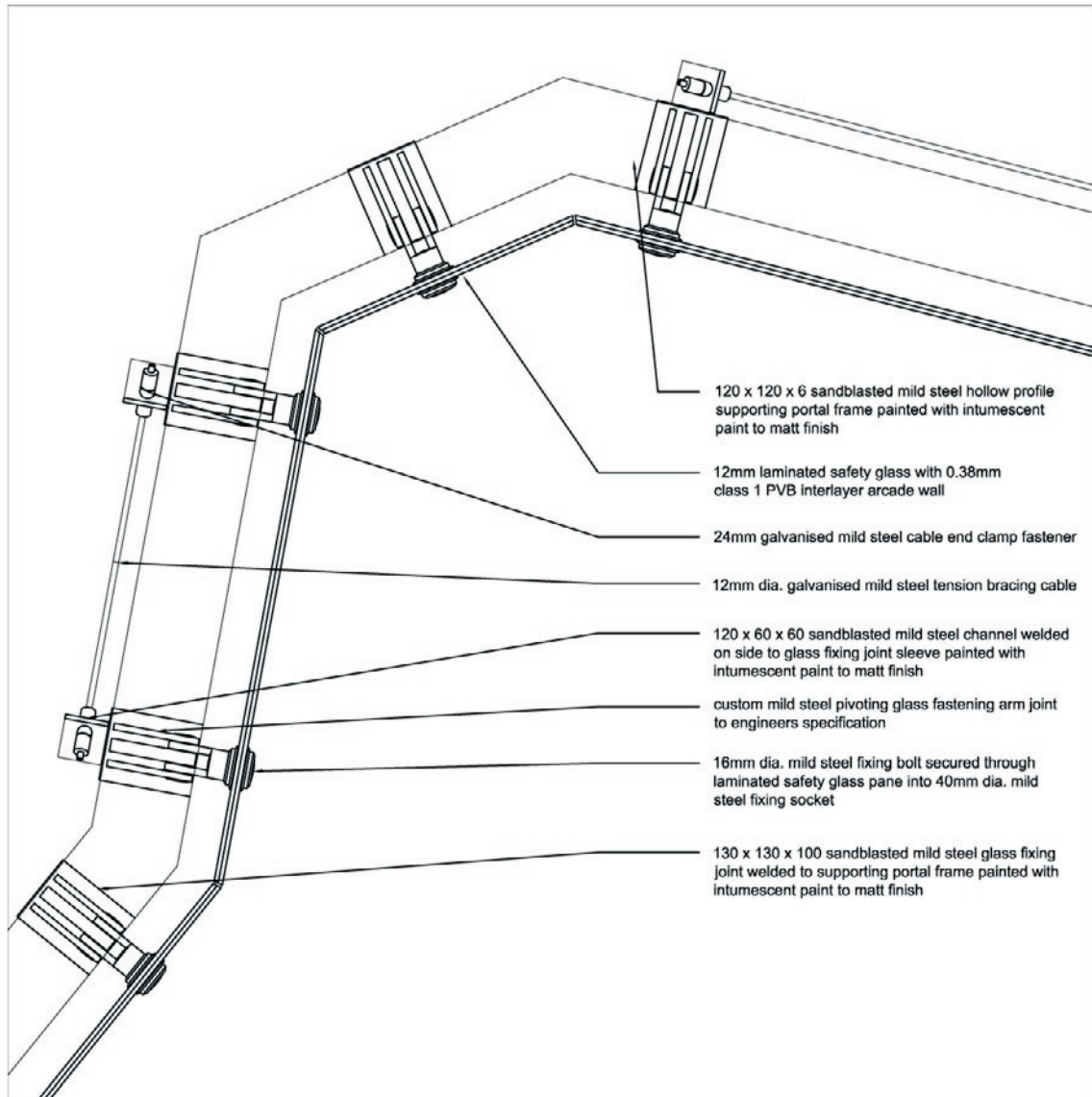
arcade section/ 1:100



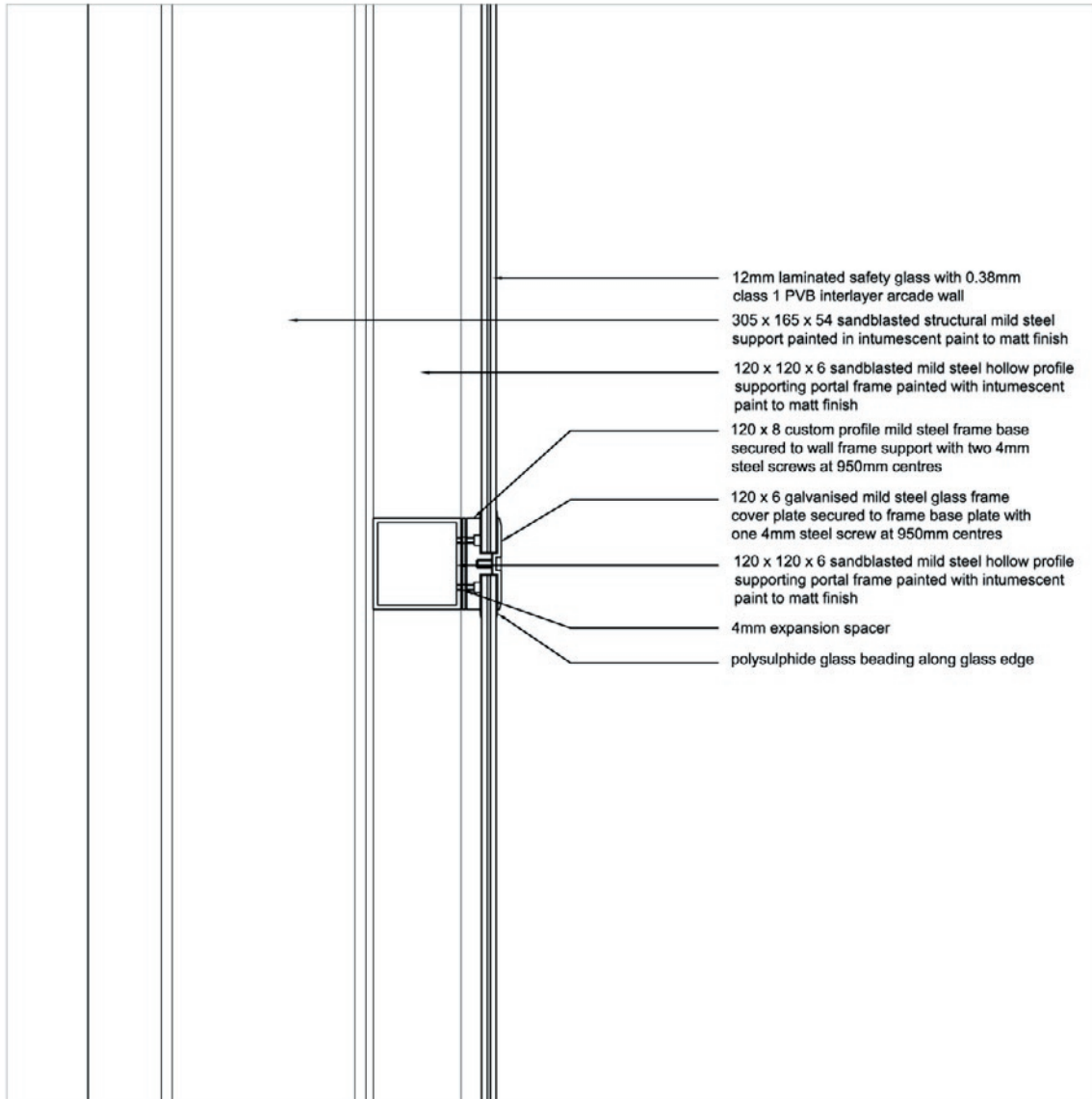
arcade glass floor and wall joint/ 1:10



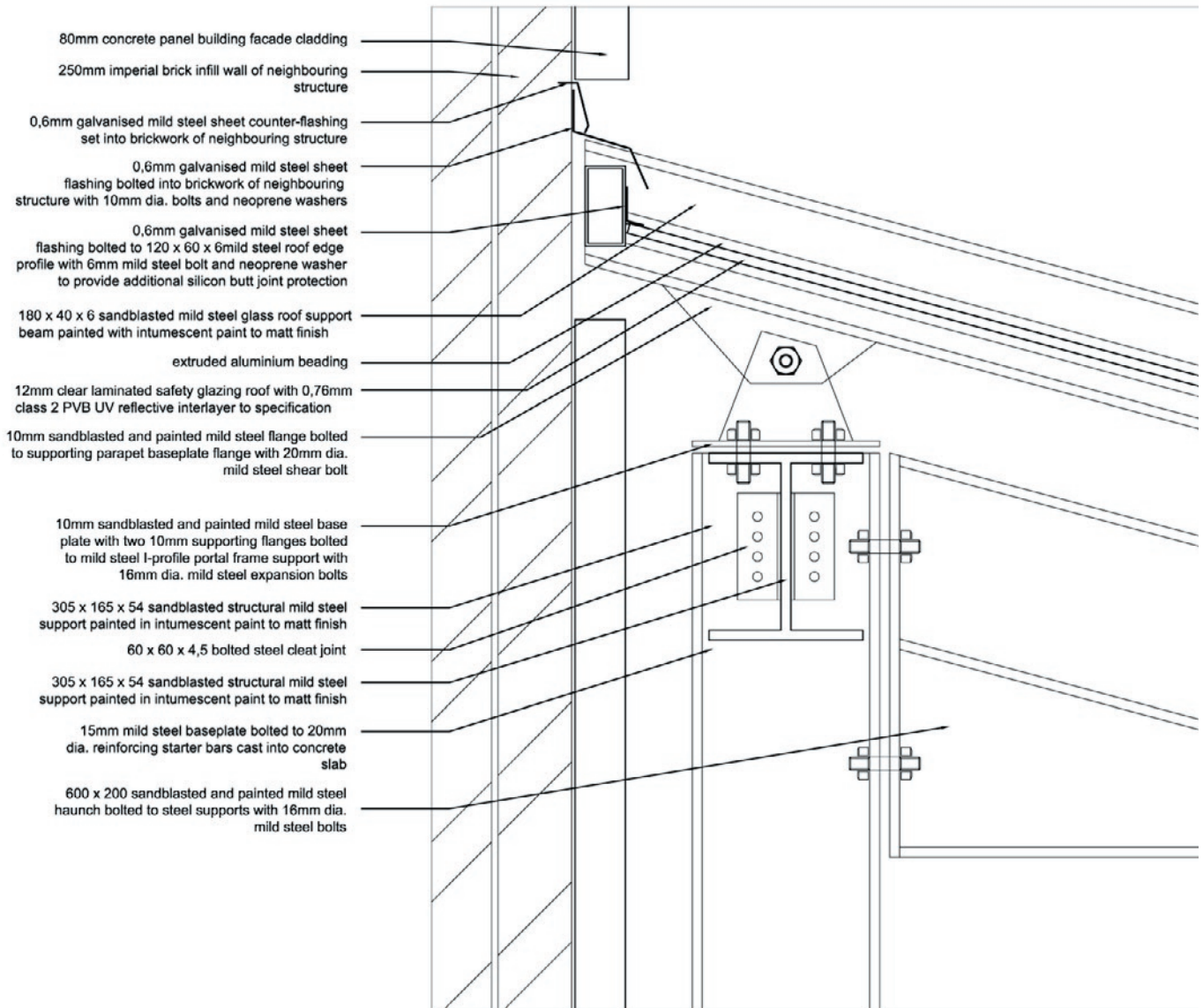
arcade glass floor frame detail/ 1:10



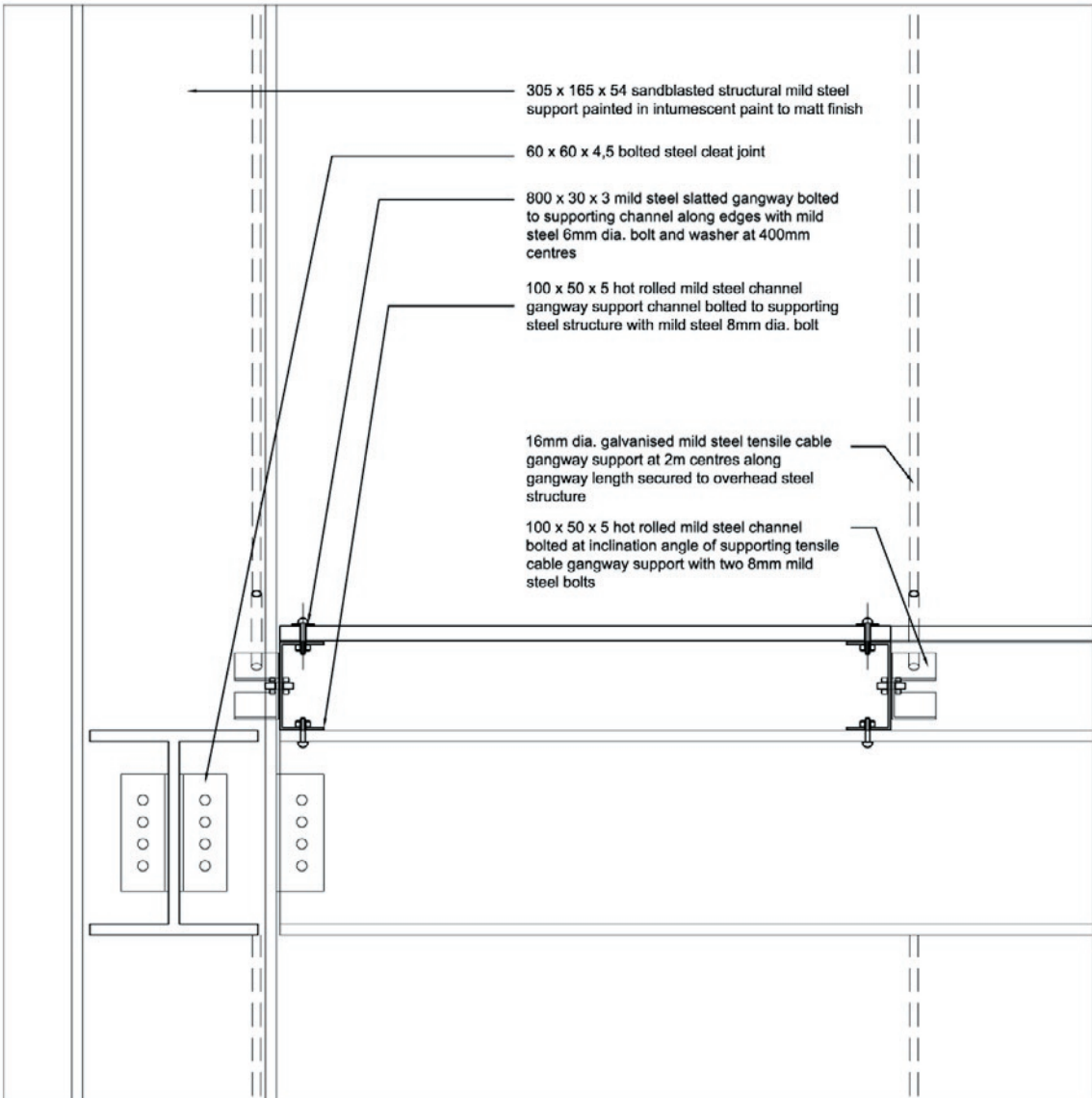
arcade steel portal joints/ 1:10



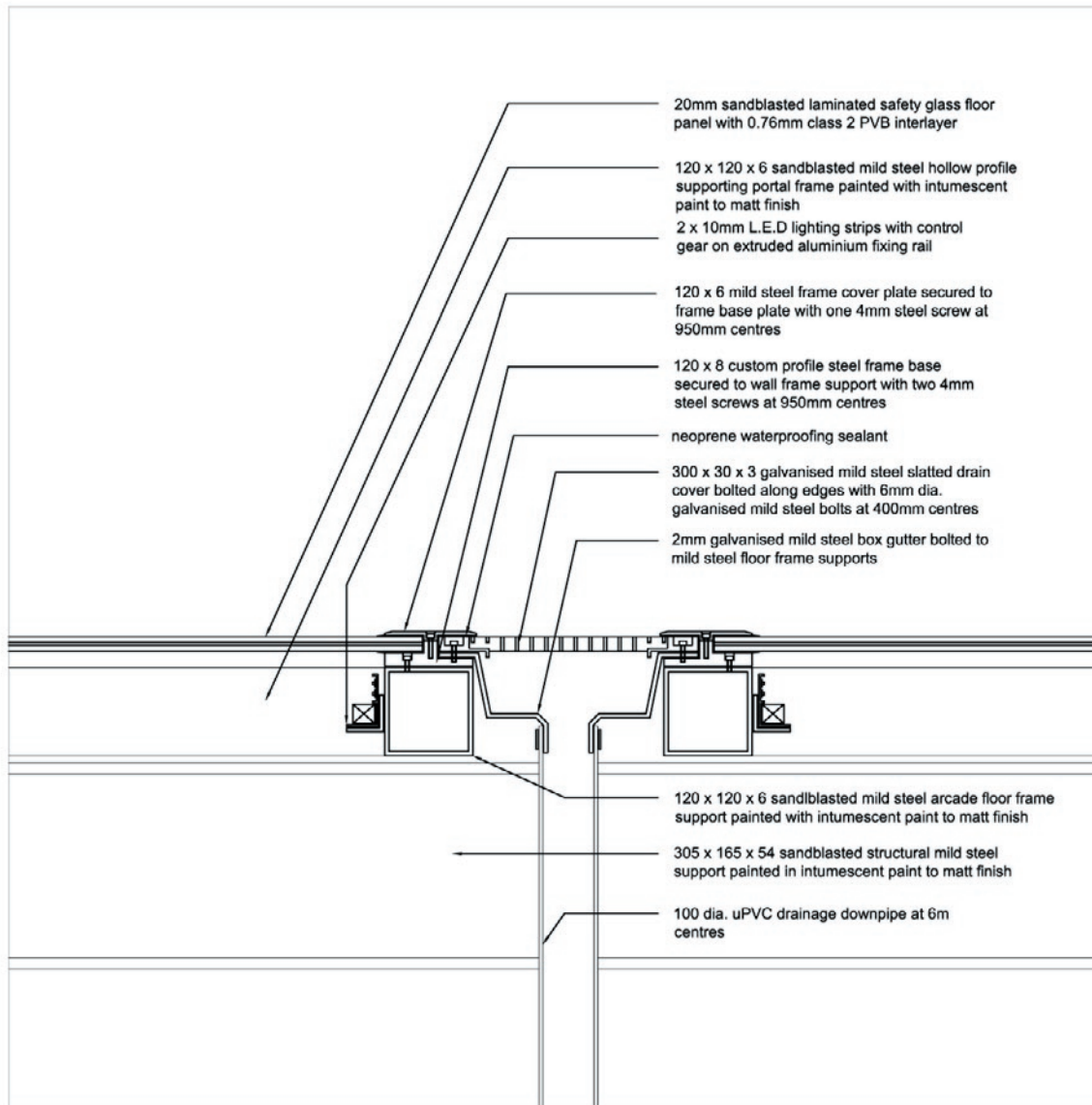
arcade glass wall frame detail/ 1:10



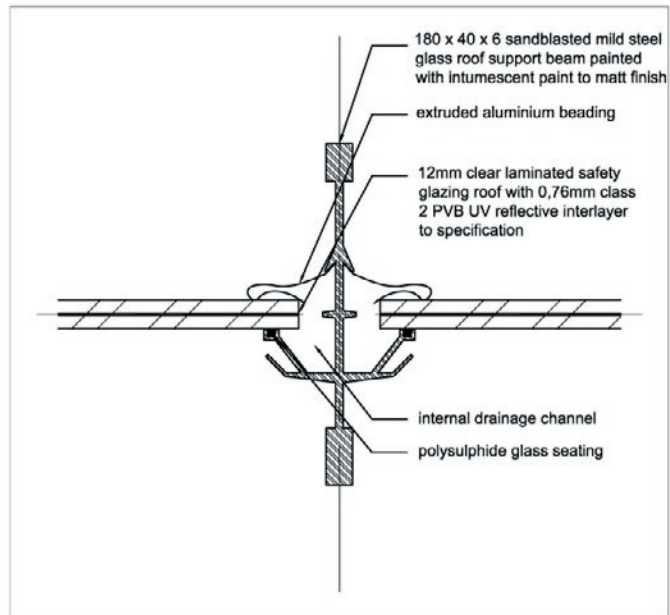
glass arcade roof apex detail/ 1:10



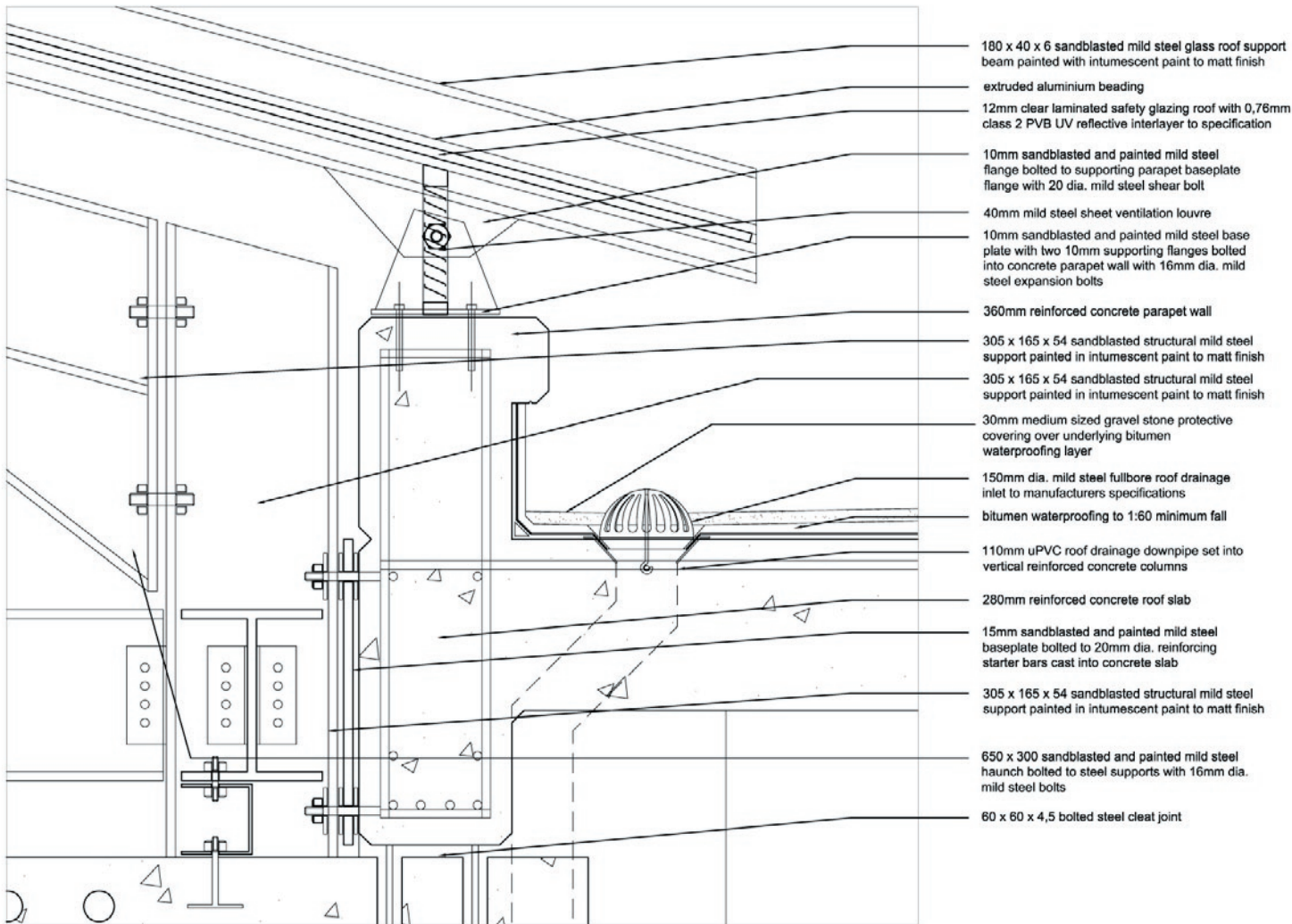
internal arcade gangplank detail/ 1:10



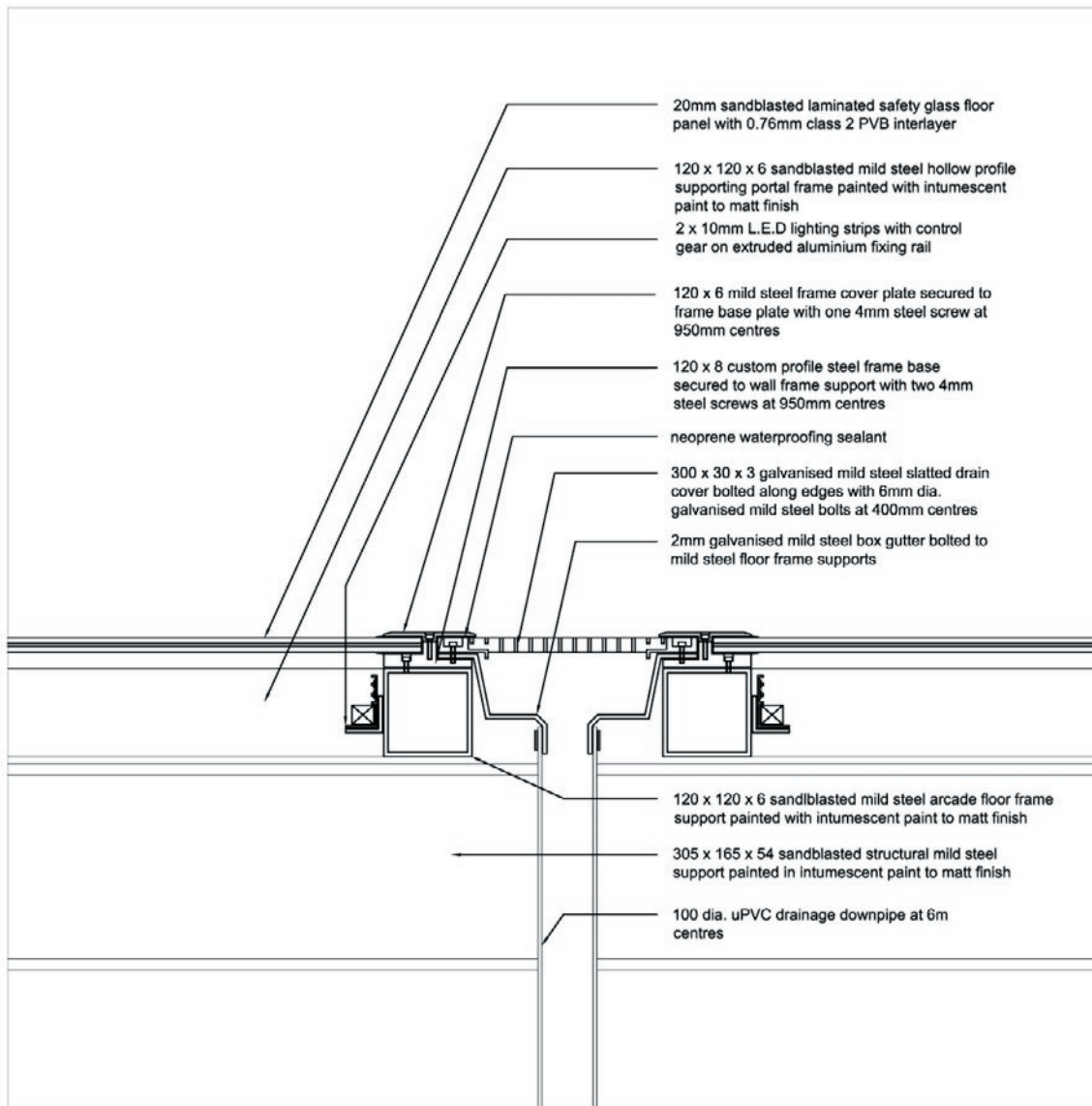
arcade floor drain detail/ 1:10



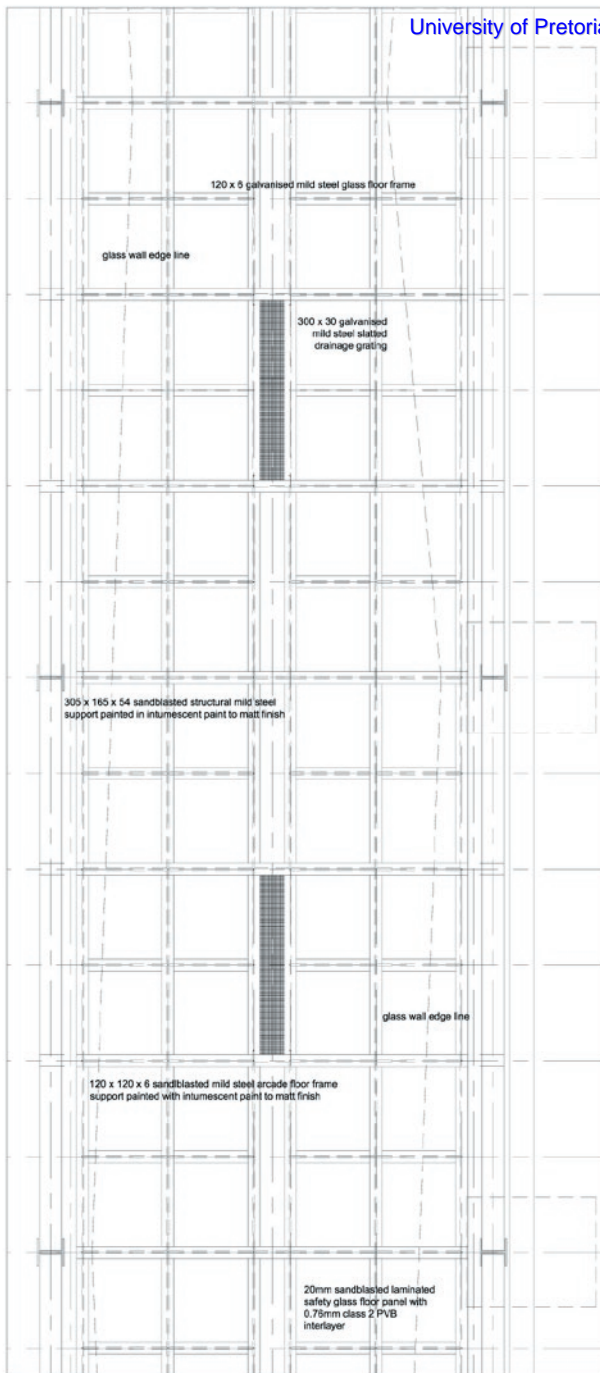
glass roof support detail F-F/ 1:4



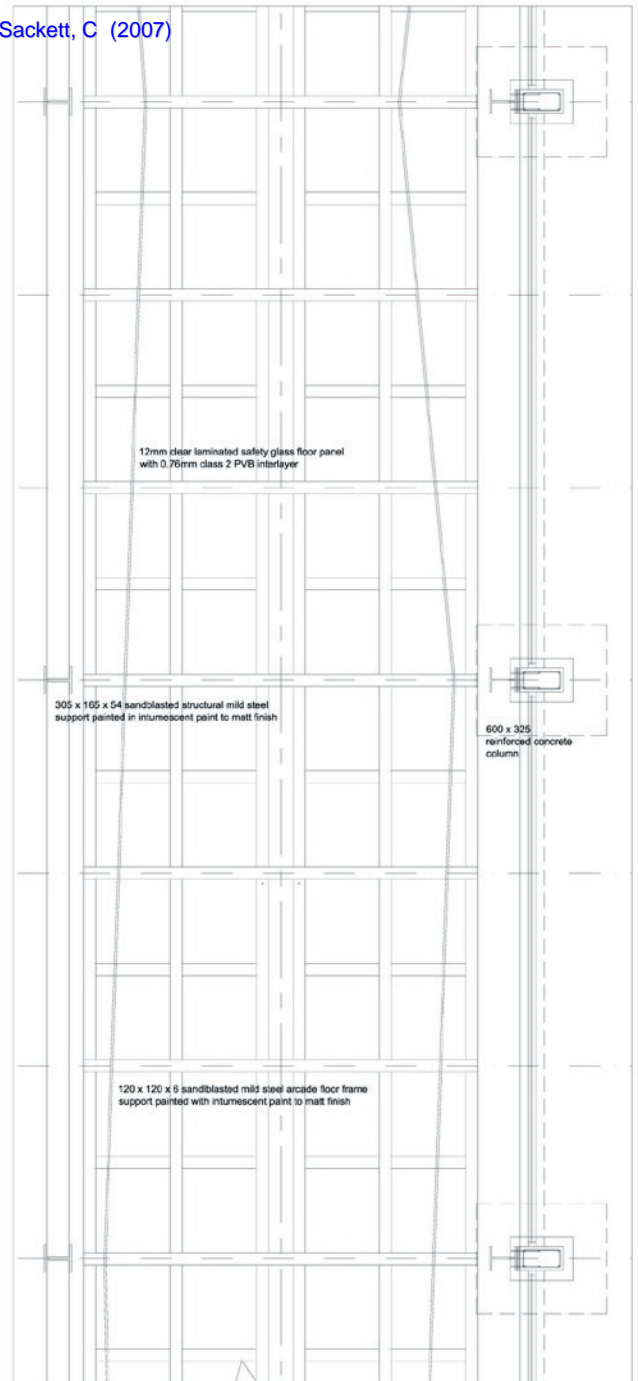
glass arcade roof edge detail/ 1:10



arcade floor drain detail/ 1:10



plan A-A/1:100



plan B-B/1:100

T E C H N I C A L D E V E L O P M E N T

Technical focus for this project was placed upon the arcade and the structural design which required various alterations and changes to arrive at the final solution.

01_SEGMENTED FRAME

Initial investigations into the construction of the supporting portal frames required a method of construction which allowed for the unique profile of each portal whilst adhering to some form of standardisation for ease of fabrication and assemblage by workers.

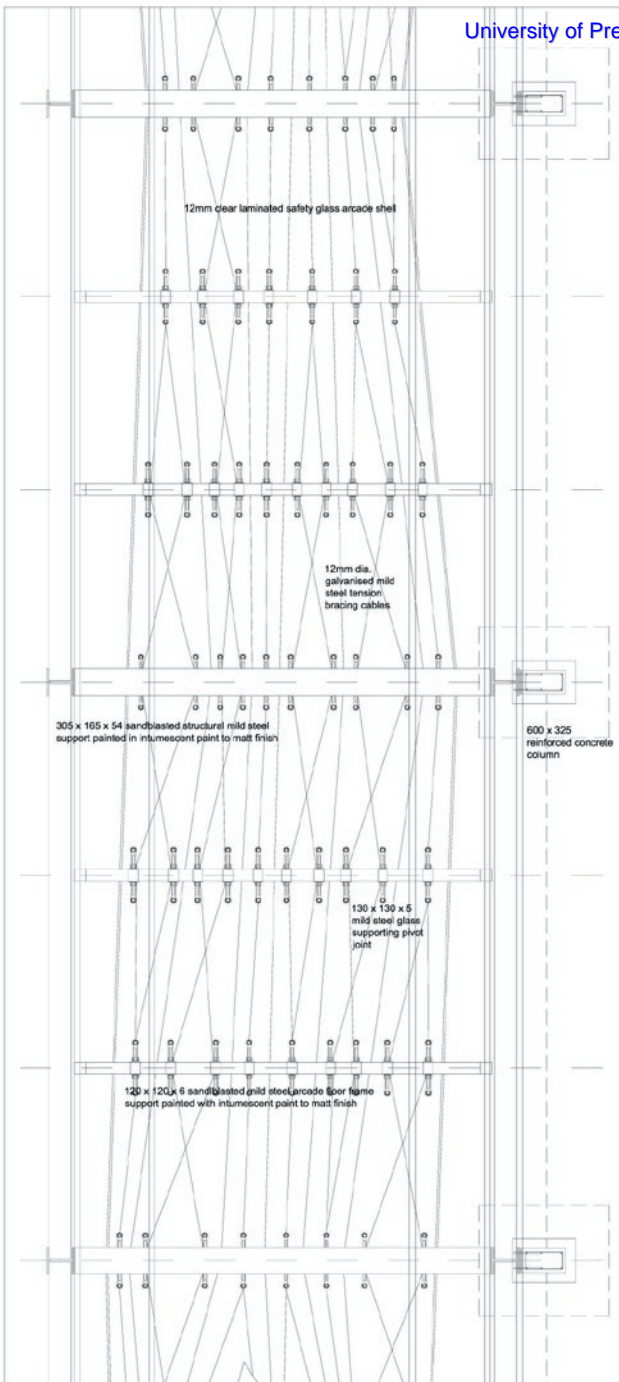
A square outer frame which housed the various arcade profiles became the starting point for a solution. The inner unique profile would be constructed from segments joined together with flange 'fingers' and bolted together to allow the individual segments to be orientated according to design prior to fixing.

The problem of lateral support between portal frames which differ in profile was solved through the development of a pivotable joint which secured into the joints of the unique portal profile. In a similar fashion to the main joints but with the ability to allow 3-dimensional adjustment through rotation of the pivotable joint and the rotation of the flanges securing the lateral supports, the problem of 3-dimensional fluctuations between portal profiles was solved.

02_PREFABRICATED FRAME

Concerns with structural strength however prompted the redesign of each of the unique arcade portals. In order to achieve greater strength the decision was taken to have each portal fabricated into profile from a single mild steel hollow.

The incorporation of the lateral pivoting joints could



then be bolted at the necessary points around the frame to give the required lateral support. Lateral support members between the portal frames would be similar hollow steel profiles in compression connected at each end with the bi-pivoting joints.

03_FIXED JOINT

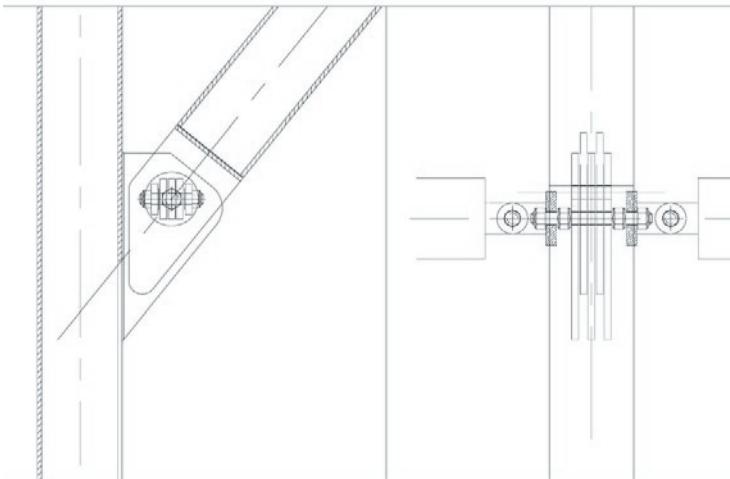
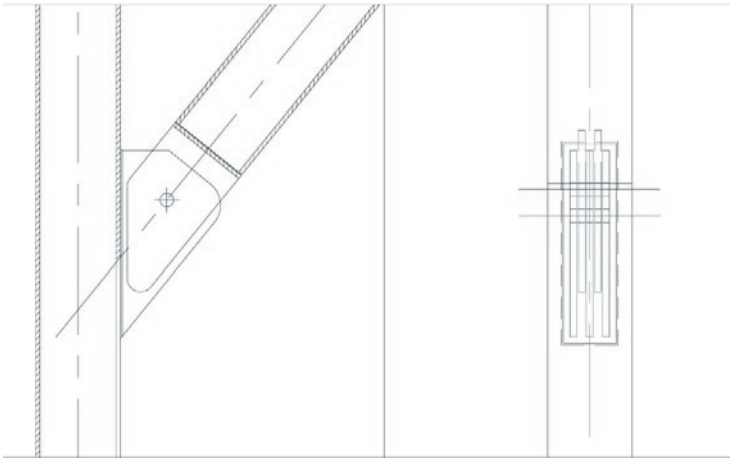
Focus however shifted then into the manner in which the glass would be fixed and supported by the structure. Due to the density of glass and the required thicknesses, large weights are required to be supported. Utilising the designed pivoting joint system generated concerns of the ability of the portal frames to support this large weight due to the large shear stresses that would be placed on the bolts in each joint.

Thus a solution was sought that incorporated the manner of fixing the glass as well as enhancing structural integrity. The third stage solution was a mild steel channel sleeve which slides over the portal support and attaches to the glass on the inside of the frame. In this manner the added weight of the glasswork would place further compression on the portal frame and due to its enclosed nature, would increase its rigidity and integrity.

04_PIVOT JOINT

Final design of this technical aspect required attention be paid to the design of the arcade. In particular its fluctuating surface which requires the ability of the joint to adapt to various angles of the glass panes. However with the triangular sleeve joints previously mentioned there was no allowance for adjustability of the joint arm to secure onto glass panes that were supported at an angle.

The final solution thus sees the incorporation of a shear bolt into the structure of the arm support which will allow movement of the arm to orientate itself with any angle the glass pane may require.



segmented frame joint/ 1:10

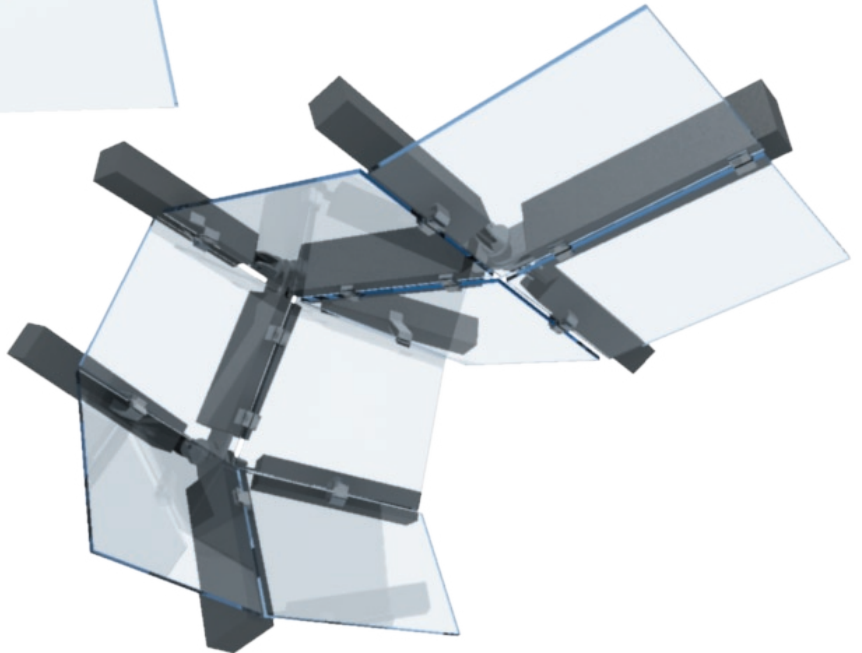
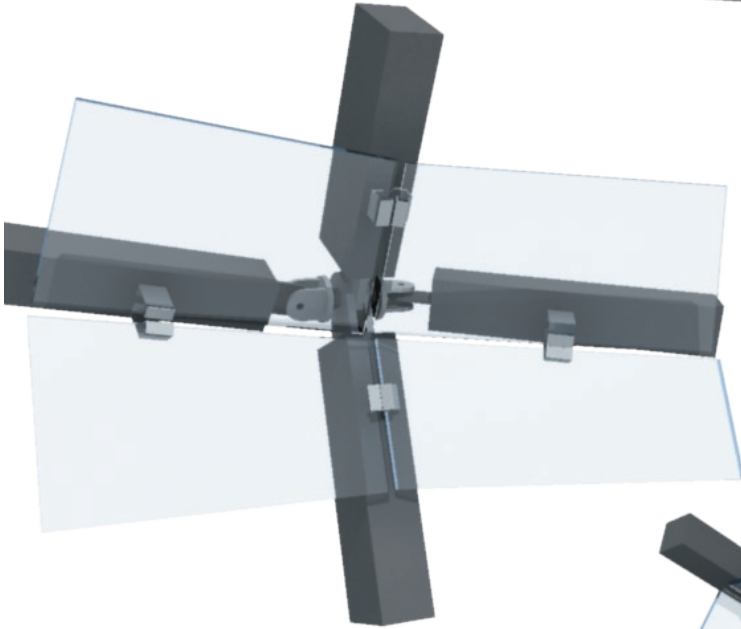
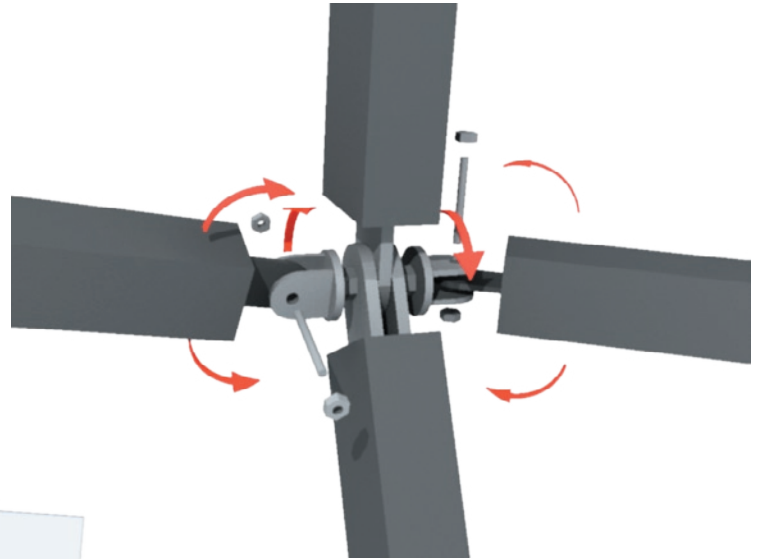
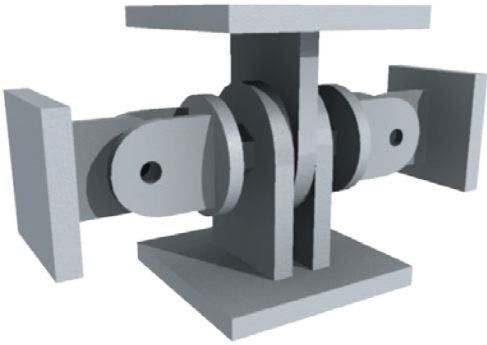


Fig.12_01.Portal frame joint (top left)

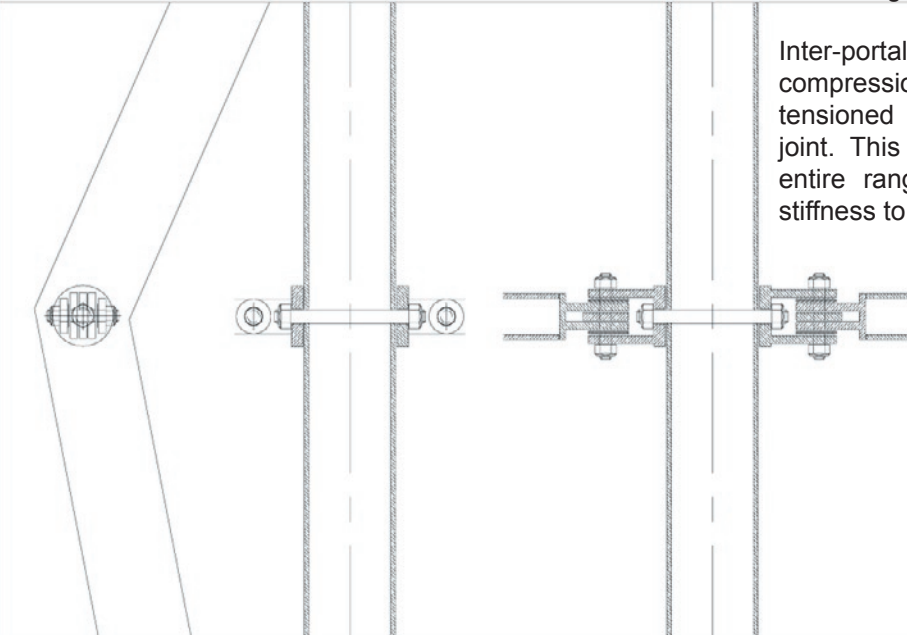
Fig.12_02.Movement analysis (top right)

Fig.12_03.Glass pane assembly (above)

Fig.12_04.Portal frame assembly (right)

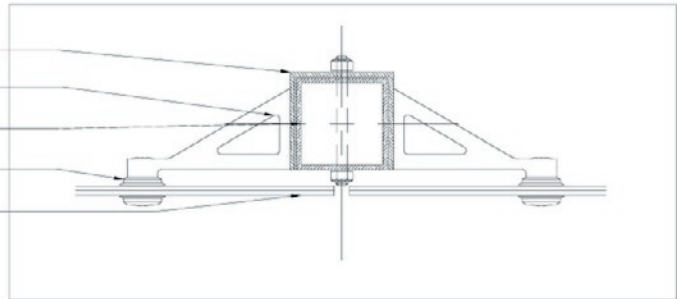
Under the weight of the glass the tendency would be for the arm to sag inwards, placing it in tension, pulling the sleeve around the portal frame inwards and placing the frame into further compression, enhancing structural stiffness.

Inter-portal bracing was also replaces from compression members between the frames to tensioned cables which secure to the glass fixture joint. This tension establishes rigidity through the entire range of portal frames and added lateral stiffness to individual portal frames.

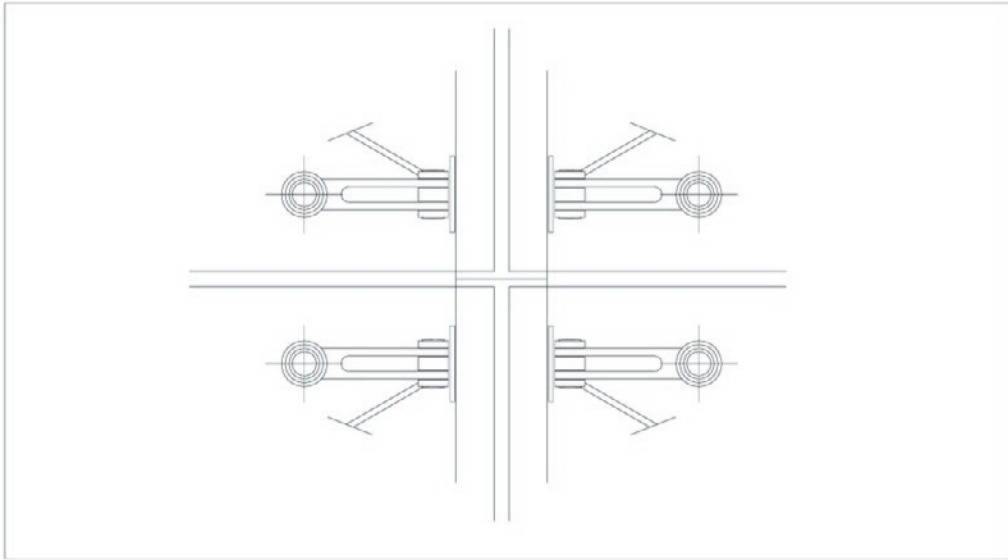


prefabricated frame joint/ 1:10

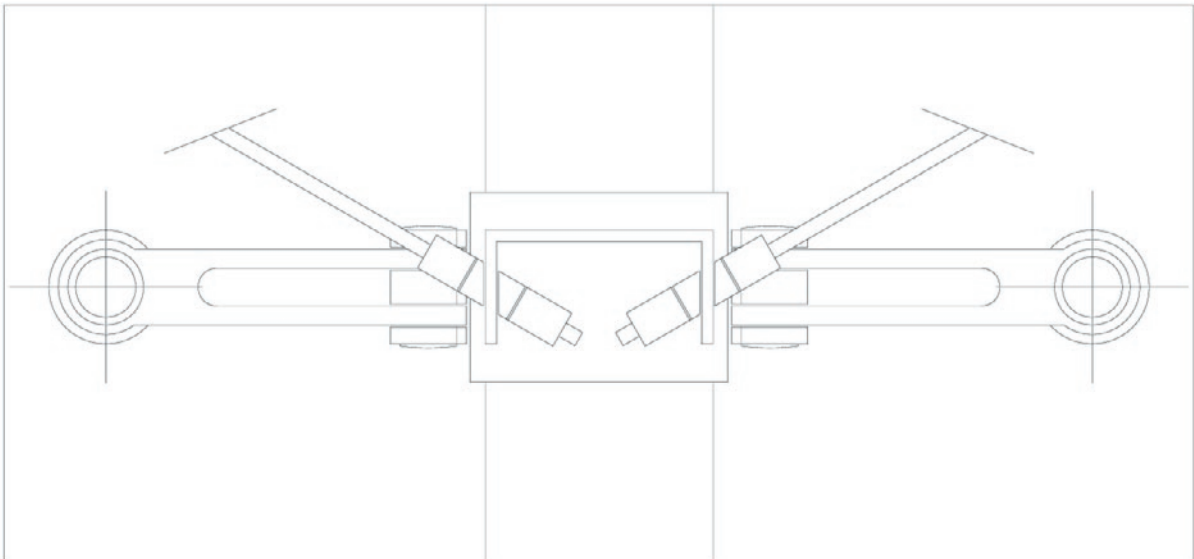
- 130 x 130 x 6 mild steel channel sleeve
- prefabricated mild steel triangular glass pane supporting arm
- 120 x 120 x 6 mild steel portal frame support
- drilled and bolted glass pane clamp with neoprene footings
- 12mm clear laminated safety glass



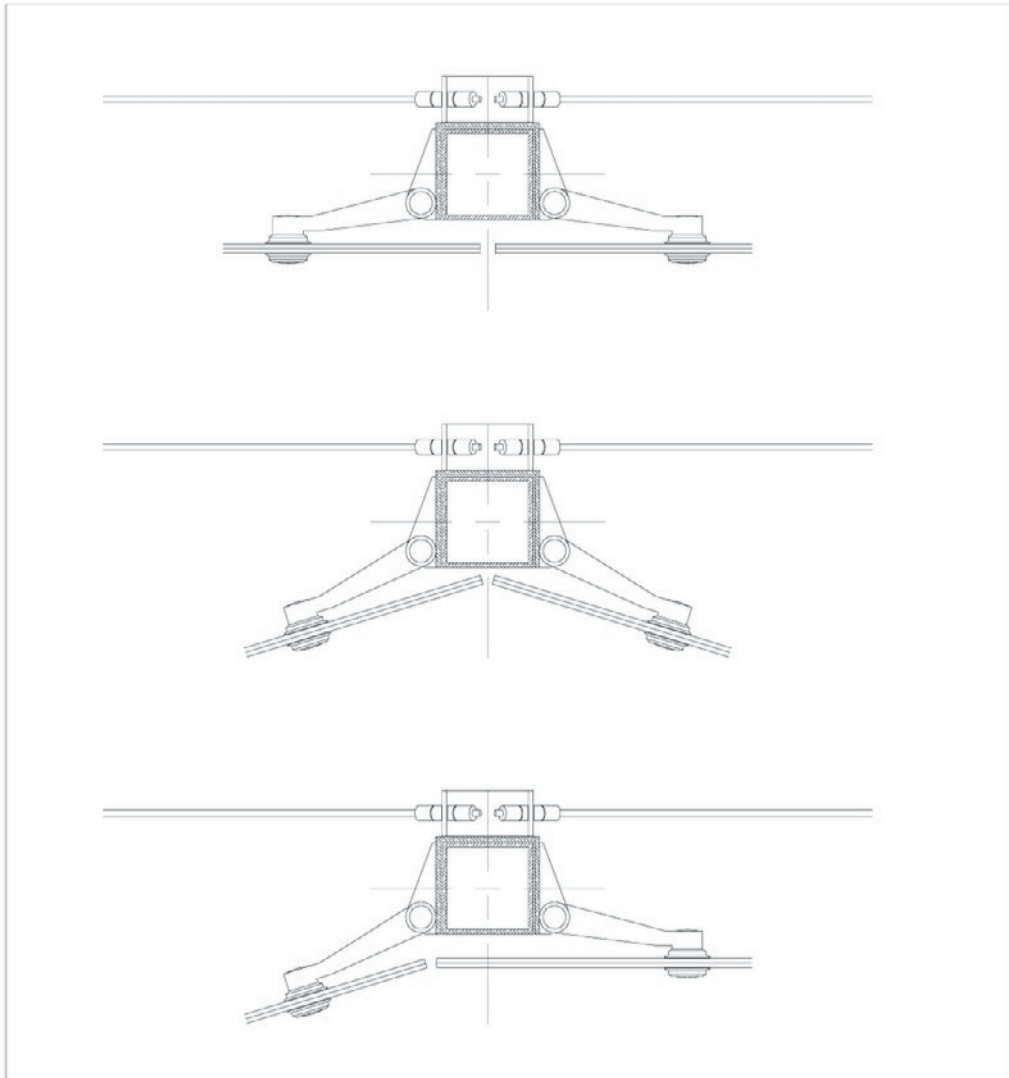
fixed joint section/ 1:10



internal elevation of pivot joint/ 1:10



external elevation of pivot joint/ 1:4



possible pivot joint sections/ 1:10

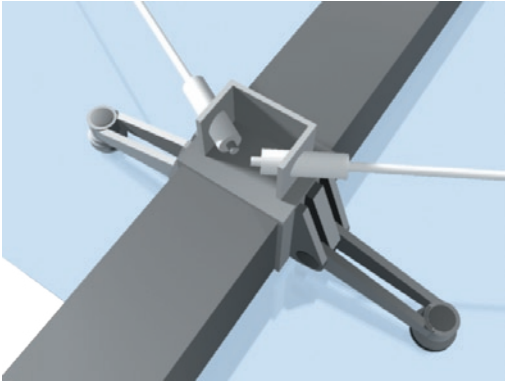


Fig.12_05.Joint detail model

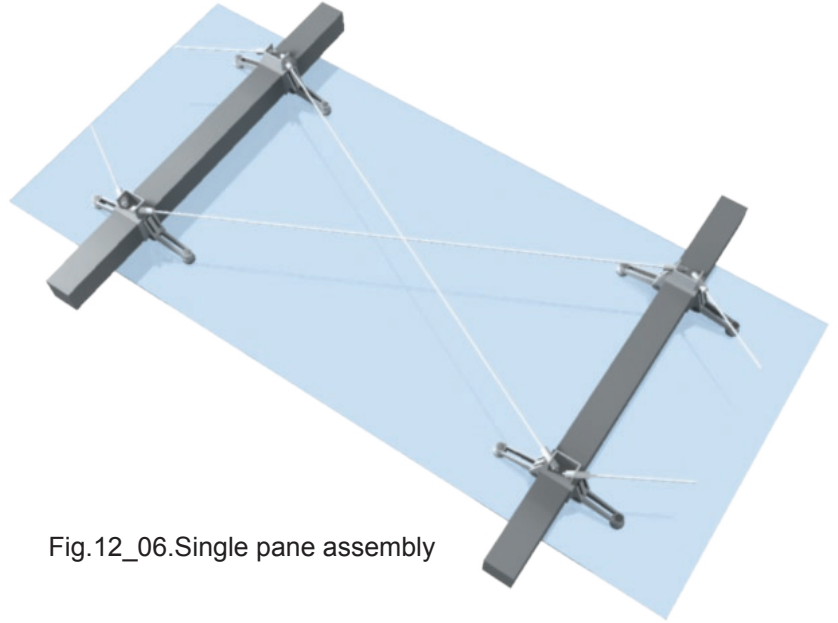


Fig.12_06.Single pane assembly

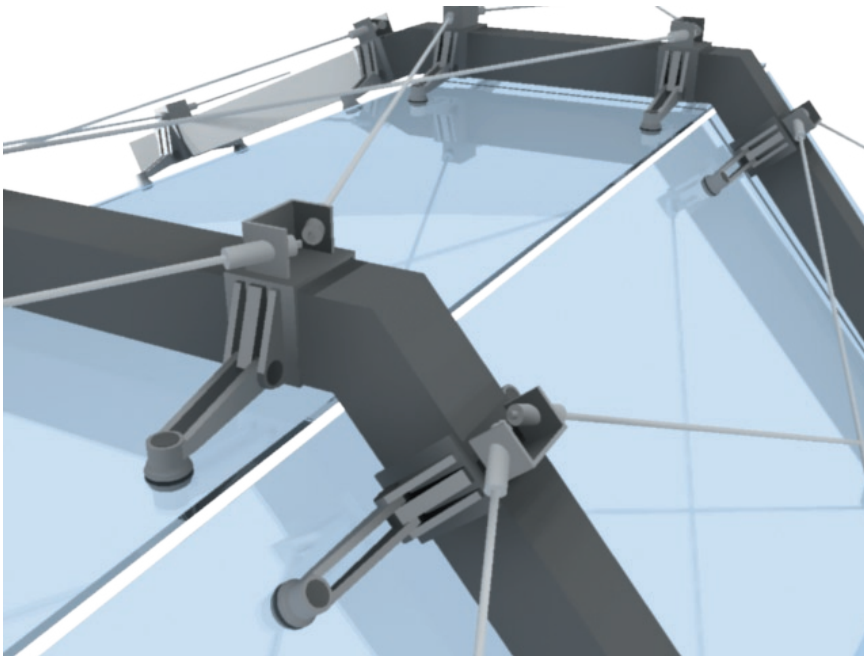


Fig.12_07.Portal detail assembly

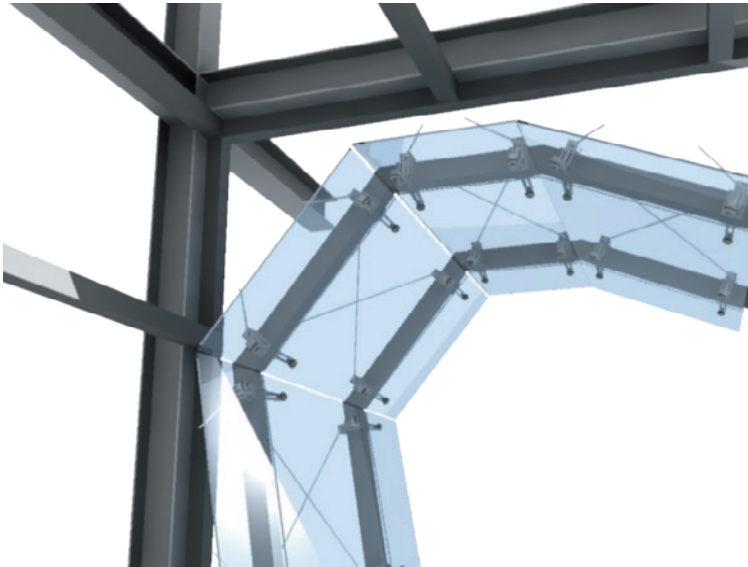


Fig.12_08.Detail Arcade construction

Fig.12_09.Arcade load analysis

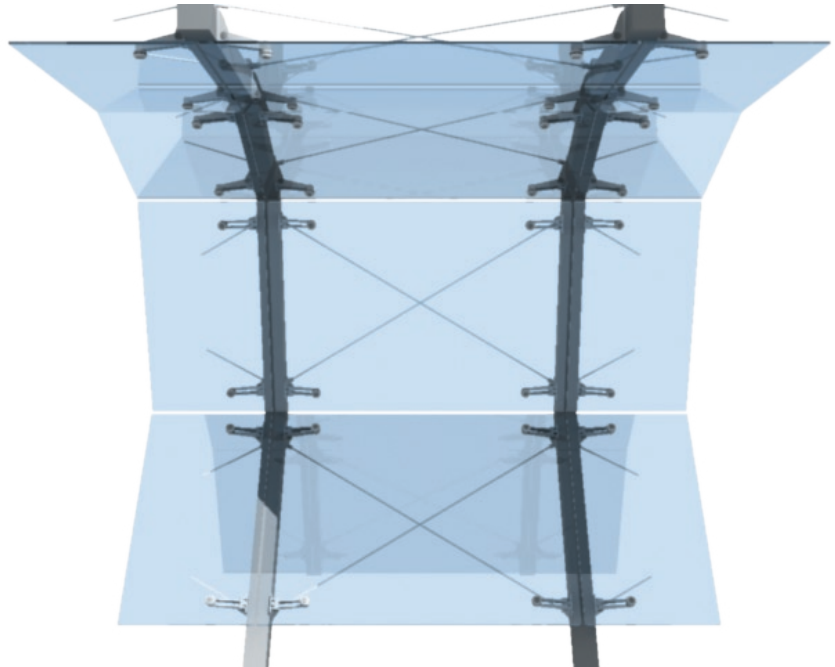
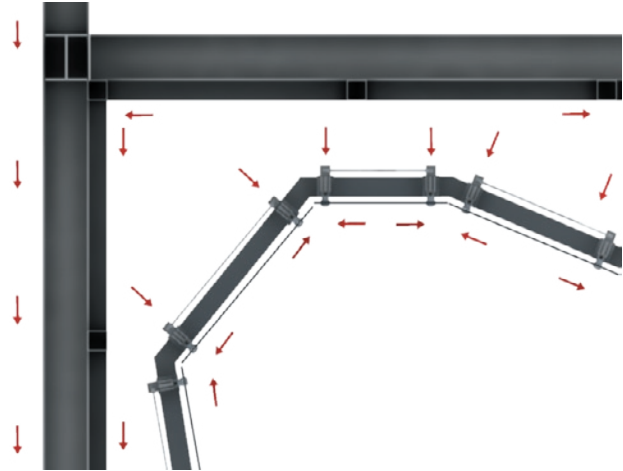
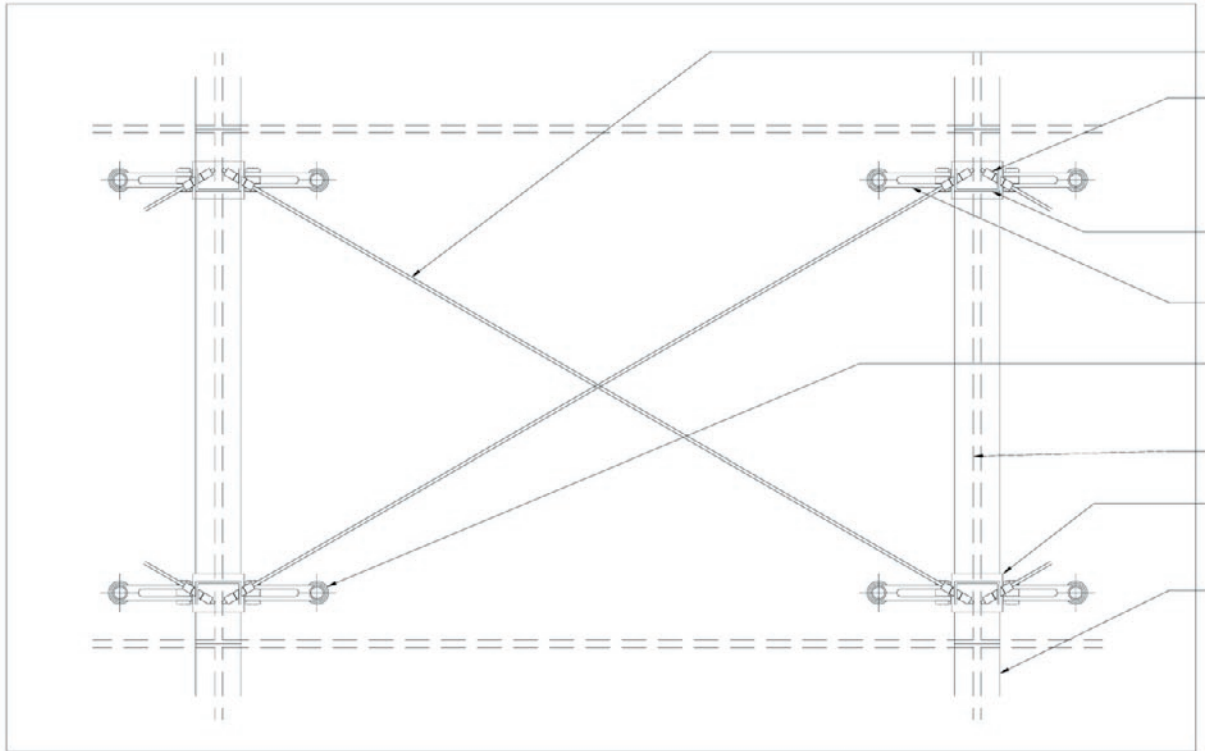
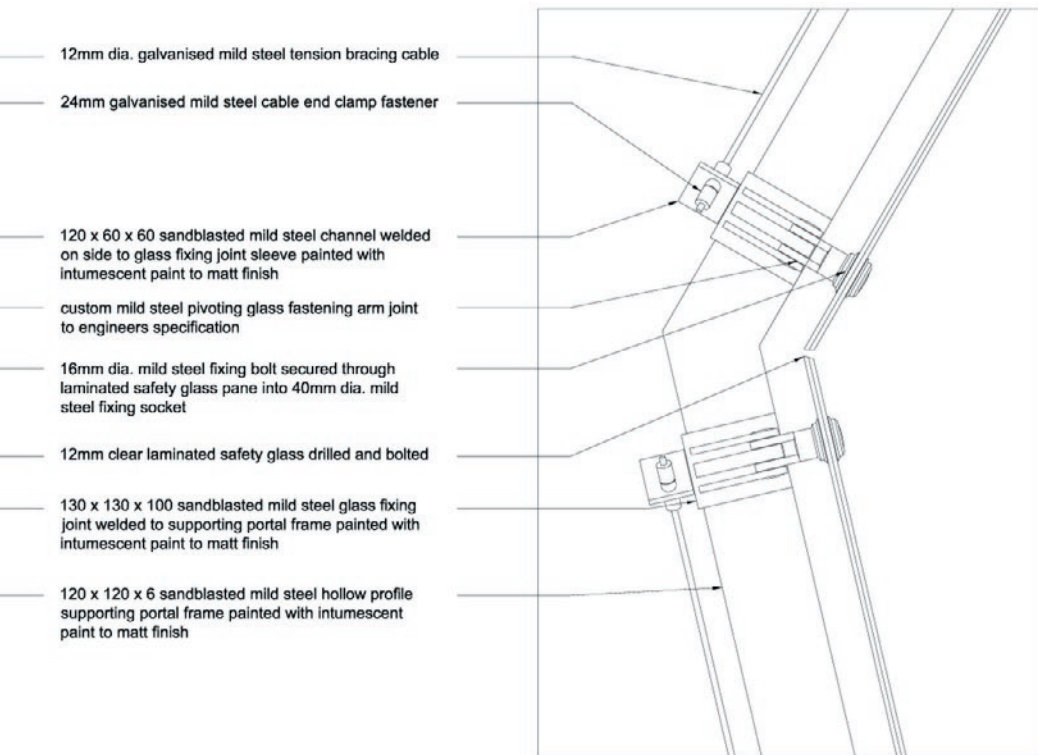


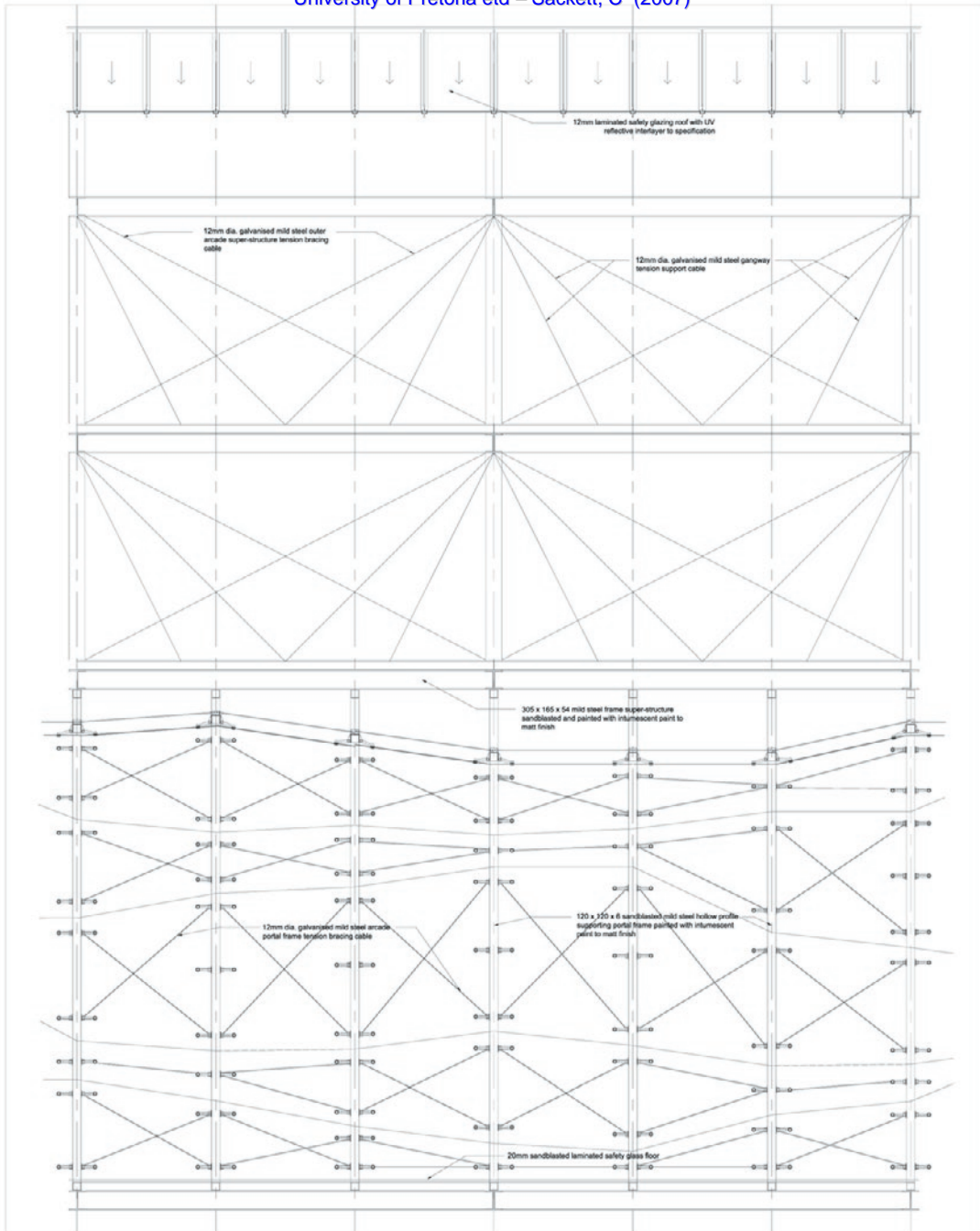
Fig.12_10.Multi-pane assembly



single pane assembly/ 1:20



side profile/ 1:10



longitudinal arcade section + internal elevation/ 1:100

C O N C L U S I O N

Our cities remain in a state of constant flux, influenced through cultural, political, social and economic forces. The ability of the city to act as a social centre and serve it's people is in turn altered through the constant changes in these forces.

In order that the city remain the social nexus which belied its establishment in the first place, the people of the city must actively participate in its evolution. Without the involvement of the public as the ultimate end user, the potential for the city to become an un-responsive and disused environment is greatly increased.

This project has thus attempted to reconnect the people with their city by fostering an interest in the development occurring within it. By establishing a centralised location from where the people can peruse and discuss the ideas for the city, see development plans and put forward comment, the future of the city is shared between all.

The focus throughout this design project has dealt with pragmatic responses to real world problems and scenarios. Specific focus has been placed on the translation of a theoretical and factual base into a physical design, the development of which must, in the author's opinion, remain as transparent, logical and readable as possible.

The relationship between the people and their city does however ultimately remain the responsibility of the people. Hopefully the future development of a project similar in nature to this dissertation design will become reality and provide the ideal location for the development of this relationship.