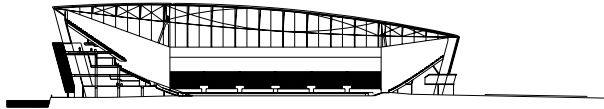
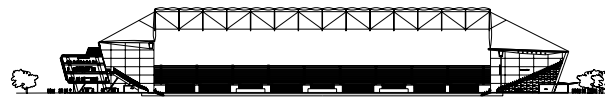




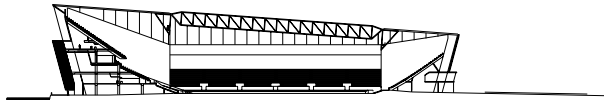
Figure 2-20



Short Section - Fully Enclosed Roof Option



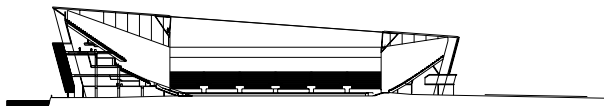
Long Section - Fully Enclosed Roof Option



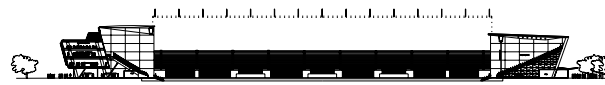
Short Section - Retractable Roof Option



Long Section - Retractable Roof Option



Short Section - Open Roof Option



Long Section - Open Roof Option



Braga Stadium – open roof type



Wimbledon – retractable roof

Figure 2-21



Scottish Castle



Scottish Parliament – Detail 1



Scottish Parliament – Detail 2



Scottish Parliament – Detail 3

Figure 2-22

### 2.3.8 Masterplan Concept Design

Carisbrook Stadium is a well known landmark within the city of Dunedin and the international rugby world. The ground's nickname "House of Pain" is a mark of respect to the hard fought battles that have been fought on the hallowed turf. Carisbrook Stadium provides a physical backdrop to an intense physical experience and celebration of what the community holds as very special. However the existing site has fallen behind in the chase for top flight rugby games through the current lack of facilities and amenities.

The new stadium design addresses not only these failings, but endeavours to achieve two unique goals, being a full integration with the University of Otago and the first fixed roof over the playing field and the spectator seating to protect from the inclement winter weather. It is important that the new stadium enhances and nurtures the "House of Pain" mythology, and it is with this in mind that the building of an angled, sharp and uncompromising shape has been proposed. The angled roof also adds to the feeling of enclosure within the stadium, as discussed later. The material pallet, though not finalised will compliment this robust aesthetic.

The site is located at the South eastern end of the University precinct in North-East Dunedin and is well positioned for the University to take advantage of the proximity of the site to locate one of their buildings on the site. The University facilities are proposed to be integrated in such a way as to provide the enclosure for the West stand and also connect to the South Stand so that the University can potentially utilise the lounges at level 03 for seminar rooms and the corporate suites at level 04 for classrooms (see sections 2.3.5 and 2.3.6). These uses and how they will best be operated has yet to be finalised and would form part of further investigation at concept stage.

The design team was requested to investigate a number of roof studies for the development to build on the vision for a fully enclosed stadium established by the CST. These studies outlined in this report include the following options (refer Figure 2-21):

- A fully enclosed stadium with a roof over the spectator accommodation and field of play.
- A retractable roofed stadium with the retractable roof located over the field of play.
- A traditional roofed stadium with the roof restricted to provide coverage to 100% of the seats and standing accommodation.

During the investigation of the above options it was realised that the best opportunity to develop a fully enclosed stadium within the budgetary constraints was to investigate the possibility to design a fully enclosed stadium with a natural grass playing field. This will be unique, not only in New Zealand but also in the world of stadium design, clearly placing Dunedin on the map in terms of unique venues and iconic landmarks.

Recent technology and the development of modern materials have allowed a realistic opportunity to investigate this option, an option that to date has only been done with artificial turfed stadia or more recently with stadia incorporating relocatable grass field trays. ETFE was the preferred material as it allows the majority of UV through for



Figure 2-23. Level 2 South Stand – Internal Concourse View

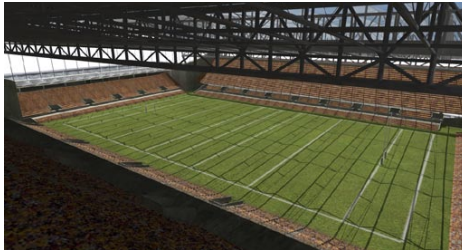


Figure 2-24. Spectator Bowl – view looking toward North Stand



Figure 2-25. Spectator Bowl – view looking toward West Stand



Figure 2-26. Spectator Bowl – view looking toward East Stand

optimum turf growth (see section 2.3.11), is clear or translucent, is self supporting and light.

The roof is proposed to be supported by bowstring trusses (discussed in detail in section 2.3.9) that span the entire width of the stadium, with a clear height above the field of play of approximately 25m to the bottom cord, which is the equivalent of an 8 storey building. Whilst neither soccer (FIFA) or Rugby Union (IRB and NZRU) give guidance in relation to the clear height over a field of play for a fully enclosed stadium, research into retractable and fully enclosed stadia for soccer, AFL, Grid Iron and Tennis has been undertaken (see Section 2.3.13 for Benchmark table). The clear height identified in the masterplan concept will need to be assessed further during the concept stage of the project.

#### South Stand (Figure 2-30)

The South stand is the main and fully serviced stand. It is approximately 37m high and accommodates the team facilities, main production kitchen, stores, staff and groundsman facilities and plant at level 01. The two 500 person members lounges (or one 1,000 members lounge), media and coaches' boxes at level 03 are served by their own finishing kitchens and washrooms. The 18no. 16-24 person corporate suites, 48 person Hirers suite and the 120 person Founders Club are located on level 04 are also serviced by their own finishing kitchens and washrooms.

As mentioned above the roof sweeps down towards the northern stand which it is envisaged will provide greater intimacy with the action on the field and sense of theatre (refer Figure 2-24). The South stand is serviced by a service road that runs parallel to the Leith River, between Anzac Avenue and the proposed relocated SH 88. This route will also be where the coaches arrive to drop the players off at the team entrance. VIPs can also be dropped off at the door of the VIP lobby.

The South stand offers views from the function rooms back towards the city and across the Dunedin Harbour towards the Otago Peninsula. The mass and bulk of the stand will be visible from the city centre, acting as a beacon for the spectators walking to the stadium as well as forming a new iconic structure for the city and University.

The corporate and function room facilities are designed as 'flex' spaces with the ability to be adjusted to suit a number of non-event day uses either for the University or as Dunedin's premier convention and meeting centre. The two 500 person dining rooms (or one 1,000 person) are envisaged to be capable of hosting non- event day dinners, functions, cocktail parties, presentations as well as being able to be configured into meeting rooms / class rooms capable of accommodating up to 1,000 people.

The suites located on level 04 are designed to be converted into breakout meeting rooms or seminar rooms for up to 20 people. These rooms have direct access to the main function rooms located on level 03 allowing them to form part of the suite of facilities to meet the Meeting and Convention industry requirements. Additional investigations will need to be carried out in the next stage to investigate further possible use of these suites as potential hotel rooms and boardrooms to serve local businesses.

#### North Stand (Figure 2-31)

The North stand is designed as an efficient single tier structure with access to the seating bowl from the ground floor concourse. The tier is designed to facilitate air movement across the field of play through the use of low level grilles and high level louvers located above the seating tier. The cost effective structure provides seating for 7,880 patrons and is approximately 24m high.

The single tier seating bowl allows the future development of commercial spaces as described above to be located above the ground floor concourse. The envisaged commercial uses for these spaces include ORFU Administration and Marketing offices, ORFU Team Management Offices, Academy of Sport facilities, Private Sports Medicine and Physio Therapy Suites, Sports related marketing and public relation offices and other sports / entertainment commercial office requirements.

The seating tier is serviced from the ground level concourse with permanent toilets and a combination of permanent and temporary bars and food and beverage concessions. The temporary food and beverage concessions are located on hard standing serviced concrete slabs located along the external perimeter of the concourse. The design of the concourse enclosure will allow mobile food vans and hawkers to be able to open on the public concourse on major event days.

The roof sweeps up to the southern stand, which is intended to increase the sense of drama and majesty. The low roof over the North stand and the extent of the transparent ETFE cladding allows the maximum solar penetration into the field thus minimising the shadow cast of the proposed structure (refer Figure 2-25).

#### East Stand (Figure 2-33)

The East stand is designed as a unique flexible space that allows a number of opportunities. The 4 rows of permanent seats are located in front of a lateral aisle that links the South stand to the North stand. The lateral aisles forms the track for a 13m high retractable wall that encloses the flexible space to the East. The stand is approximately 16m high.

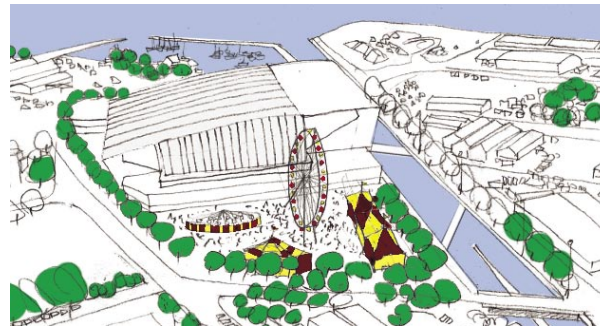
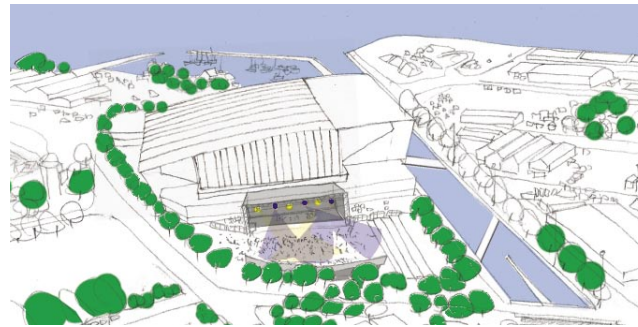
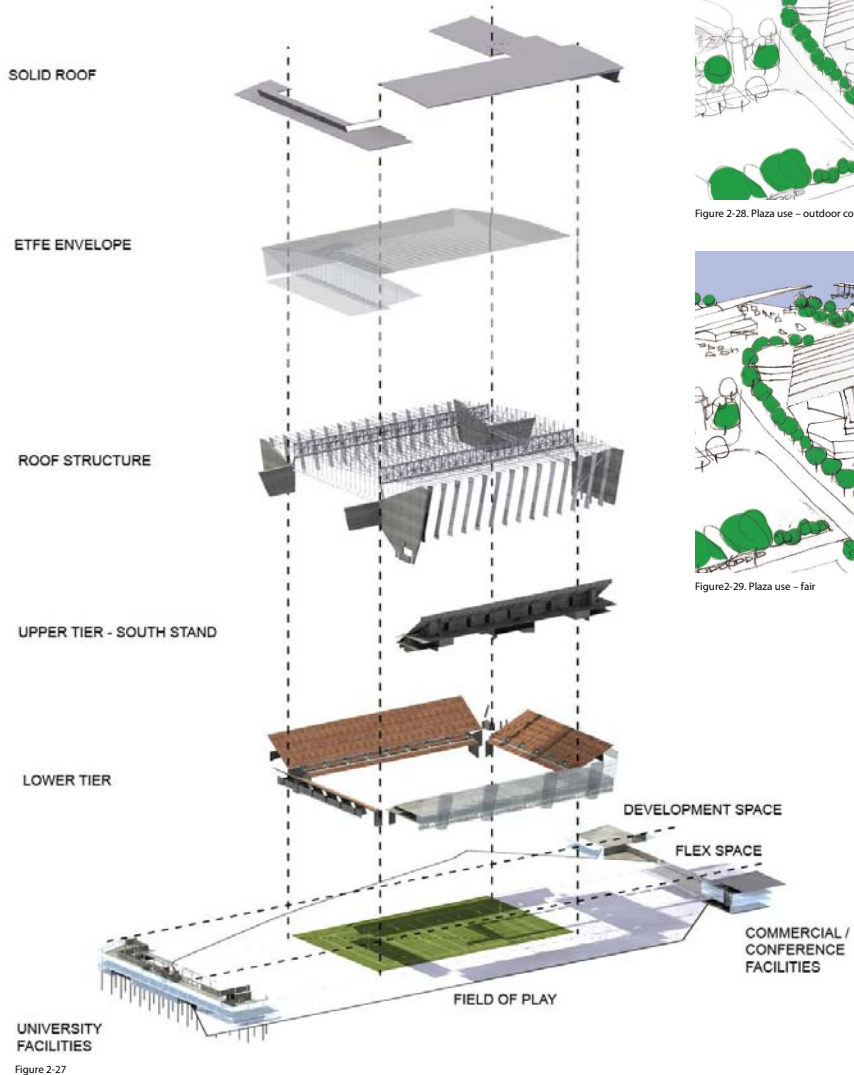
When required this wall is retracted into the North and South blade walls framing the stand allowing 5,000 temporary seats to be installed on the floor of the flexible space.

The stand also accommodates the required washroom facilities for the stand use and also turnstile entrances. A concourse would be constructed under the relocatable seating to the rear of the flexible space on major event days.

The height of the stand is governed by the requirements of flexible space for gym height and the maximum practical height for a folding wall. The folding wall, when closed has the advantage of becoming a background to graphics for the home team or sponsor (refer Figure 2-26).

This unique design feature of the retractable wall allows additional flexibility to the stadium. The space can potentially be used as an exhibition hall as well as the gym use identified. This use could help support the potential convention and exhibition centre non event day usage of the stadium when combined with the facilities described in the South stand.

Additional design enhancements could in future be installed into the East stand including the installation of retractable seats. These seats would replace the



temporary seats and would allow further flexibility to the space. The retractable seats could be configured into seating around the basketball and other indoor sports courts or to create a lecture theatre for up to 4,000 patrons.

The East stand is also designed to accommodate a stage for concerts and major entertainment events. The stage would be located on the floor under the eastern roof minimising the seat kills typically associated with stadium concerts.

#### West Stand (Figure 2-32)

The West stand is also approximately 16m high and is proposed to be “The University Stand” or the New Terraces. The stands design inspiration has been to develop a low cost student area within the ground allowing the atmosphere of the terraces to be developed and enhanced into a new unique experience. The stand accommodates a single standing tier, with the required washroom facilities for the stand use located on the ground floor concourse.

The main entry to the stadium is located in the West stand addressing the proposed Quadrangle. The rear of the stand is designed to accommodate the University building.

The plaza (Quadrangle) is bounded by Anzac Avenue and Ravensbourne Road and is envisaged to be the main focal point of the new development, as entrance for both Stadium and University. The plaza is considered an opportunity for all year round activity including craft fairs, exhibitions, visiting shows etc. The design of the plaza also allows the development of an ‘overlay’ approach to be adopted for major events. The process of overlay would see the additional requirements of major events such as Rugby World Cup and Lions Tests being required both inside and outside the stadium. The plaza is envisaged to form a live site during such events where the activity of the stadium can engage with the city. During such major events it is envisaged that the plaza would be used as a centre for a live stage hosting community acts supporting the stadium event as well as a major video screen to allow people outside the stadium to partake in the activities going on inside (refer Figure 2-28 & 2-29).

The seating bowl is proposed to be naturally ventilated using a number of methods including:

- Louvres at high level.
- Open grill fencing at ground level.

This will need to be researched further in the next stage of the project.

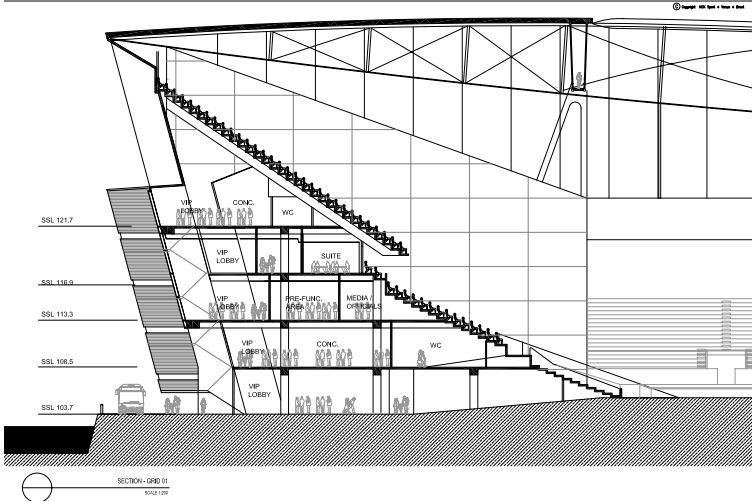


Figure 2-30. South Stand Section

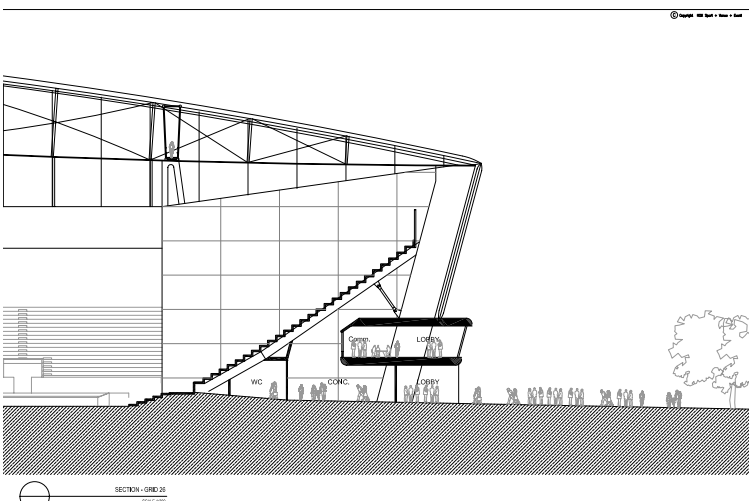


Figure 2-31. North Stand Section

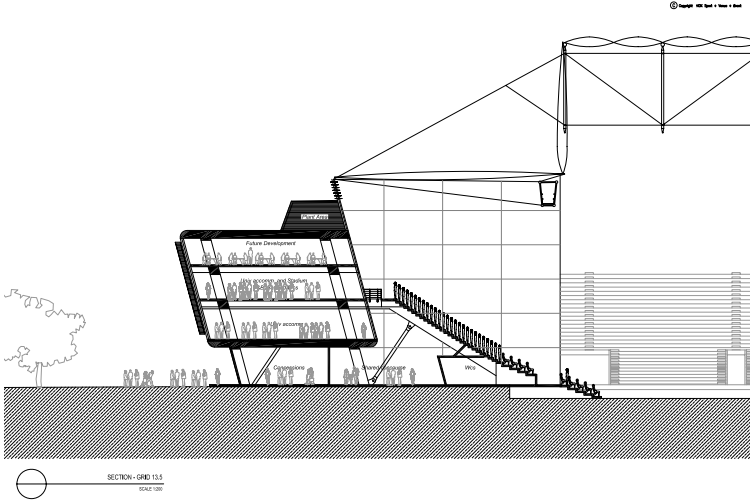


Figure 2-32. West Stand Section

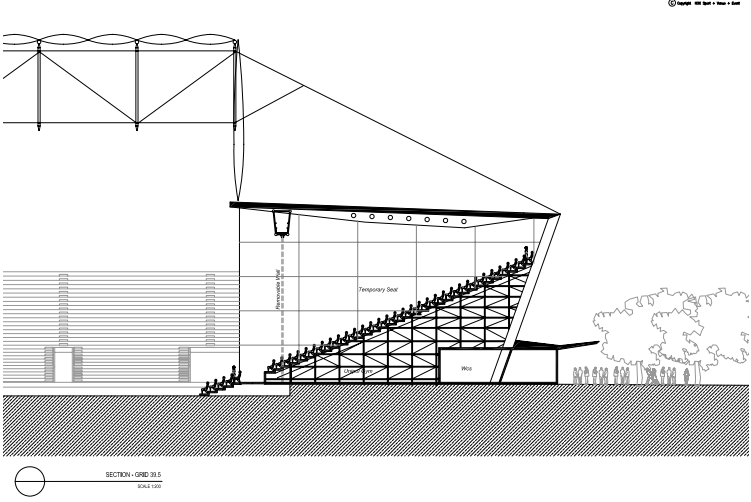
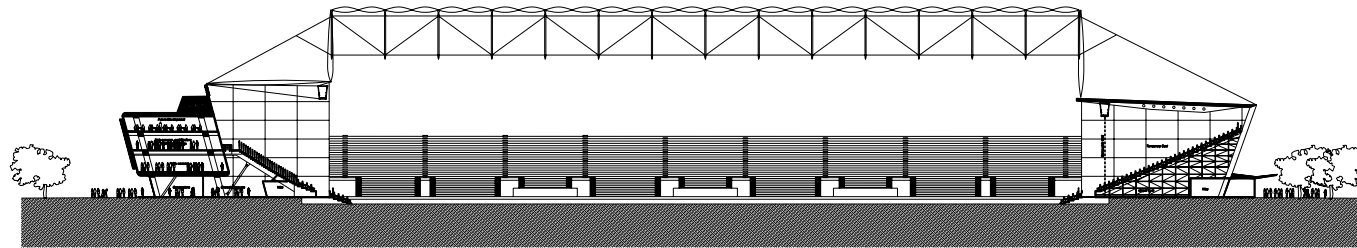
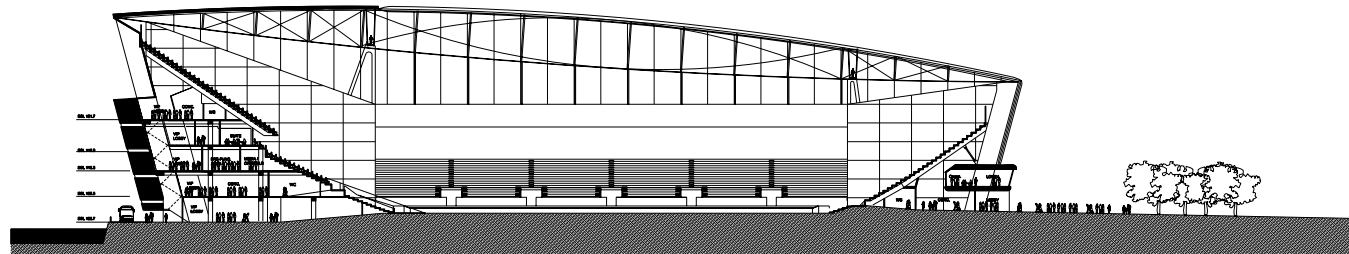


Figure 2-33. East Stand Section



**SECTION B**  
GRID 13.5 - GRID 39.5



**SECTION A**  
GRID 01 - GRID 26



Figure 2-34: Full Sections

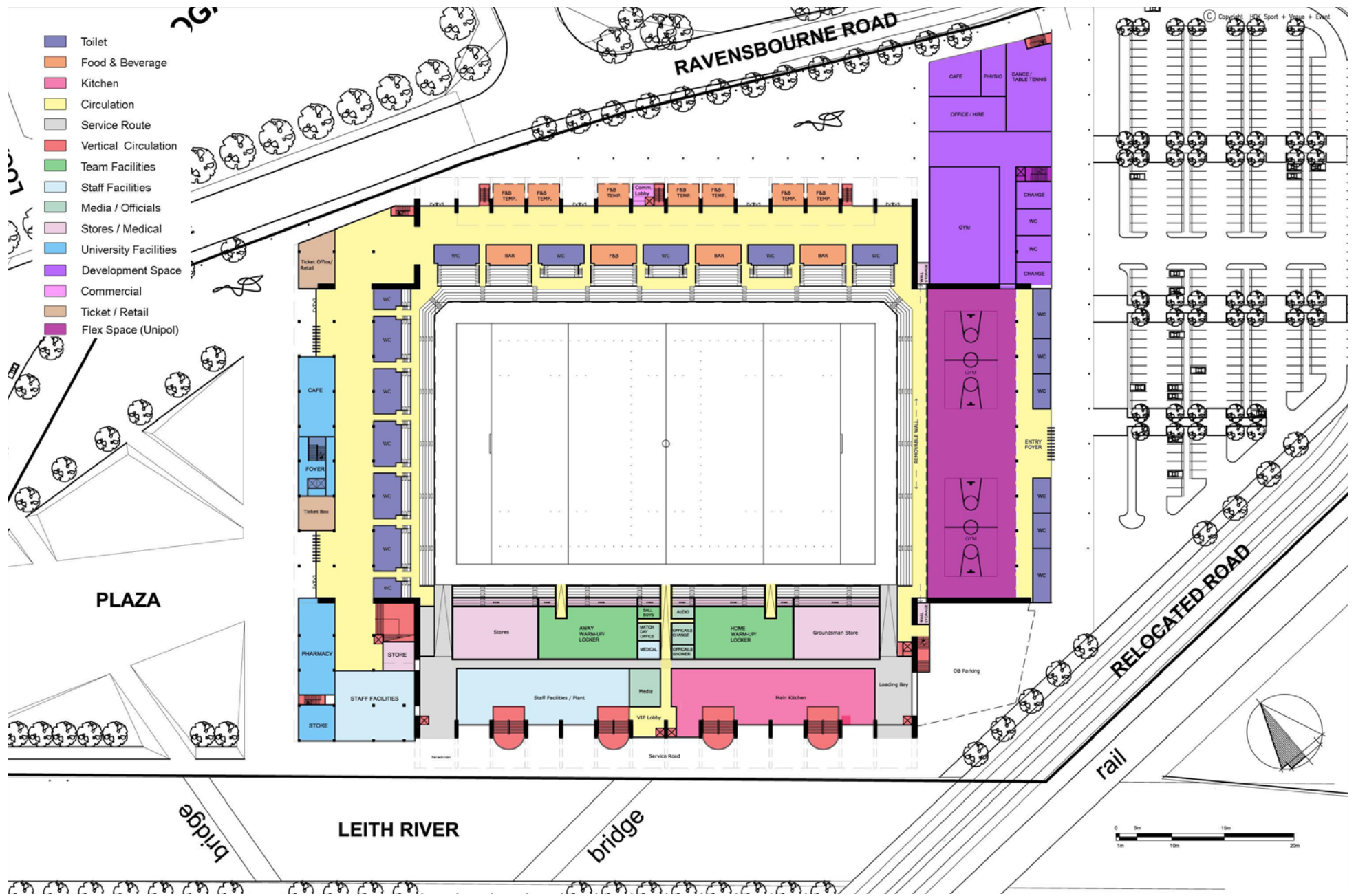


Figure 2-35. Option 1 – Level 01 Plan

- Toilet
- Food & Beverage
- Circulation
- Vertical Circulation
- Members
- University Facilities
- Development Space
- Commercial

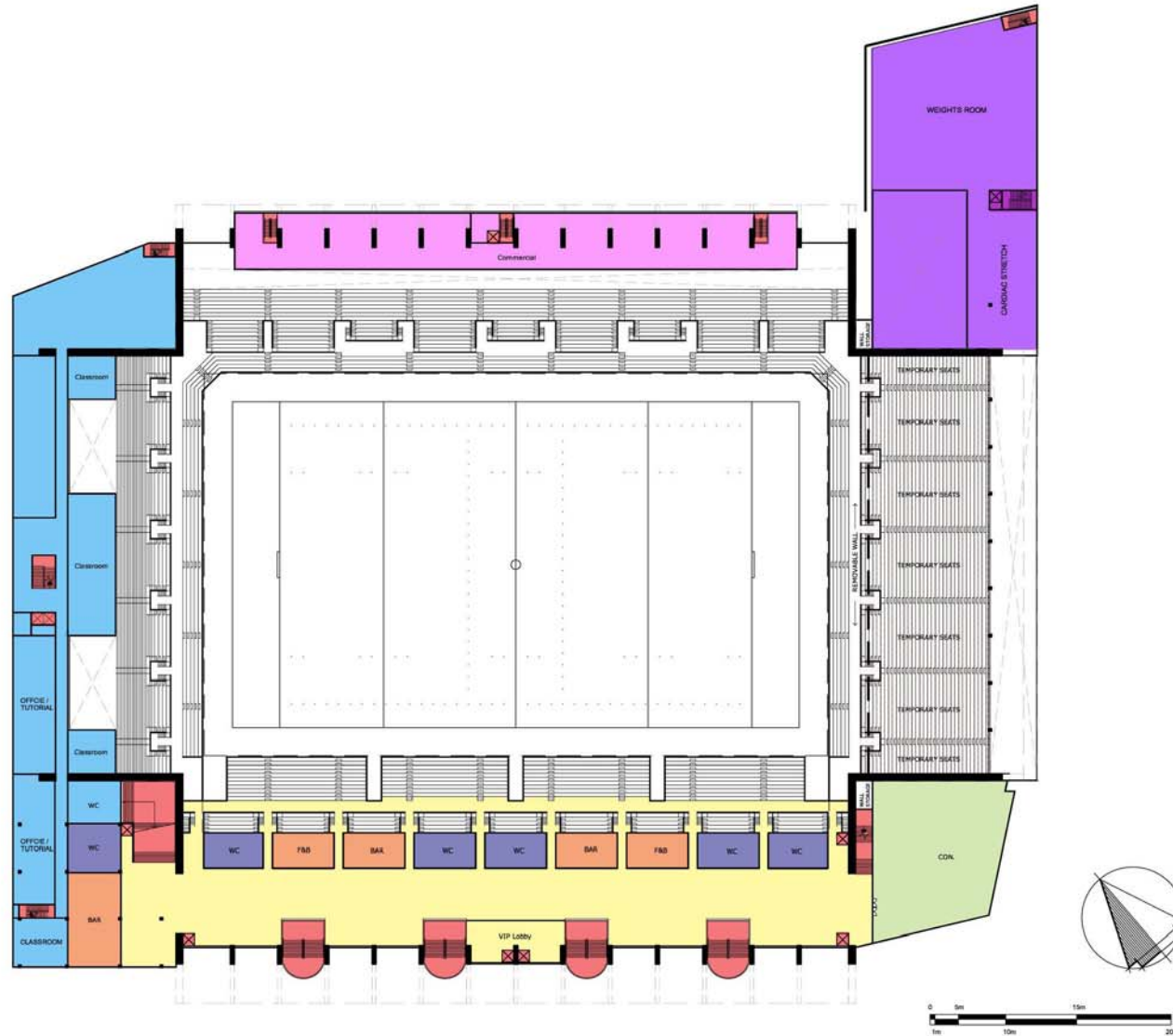


Figure 2-36. Option 1 – Level 02 Plan

- WC
- F&B
- Kitchen
- Circulation
- Vertical Circulation
- Media / Officials
- Members
- University Facilities

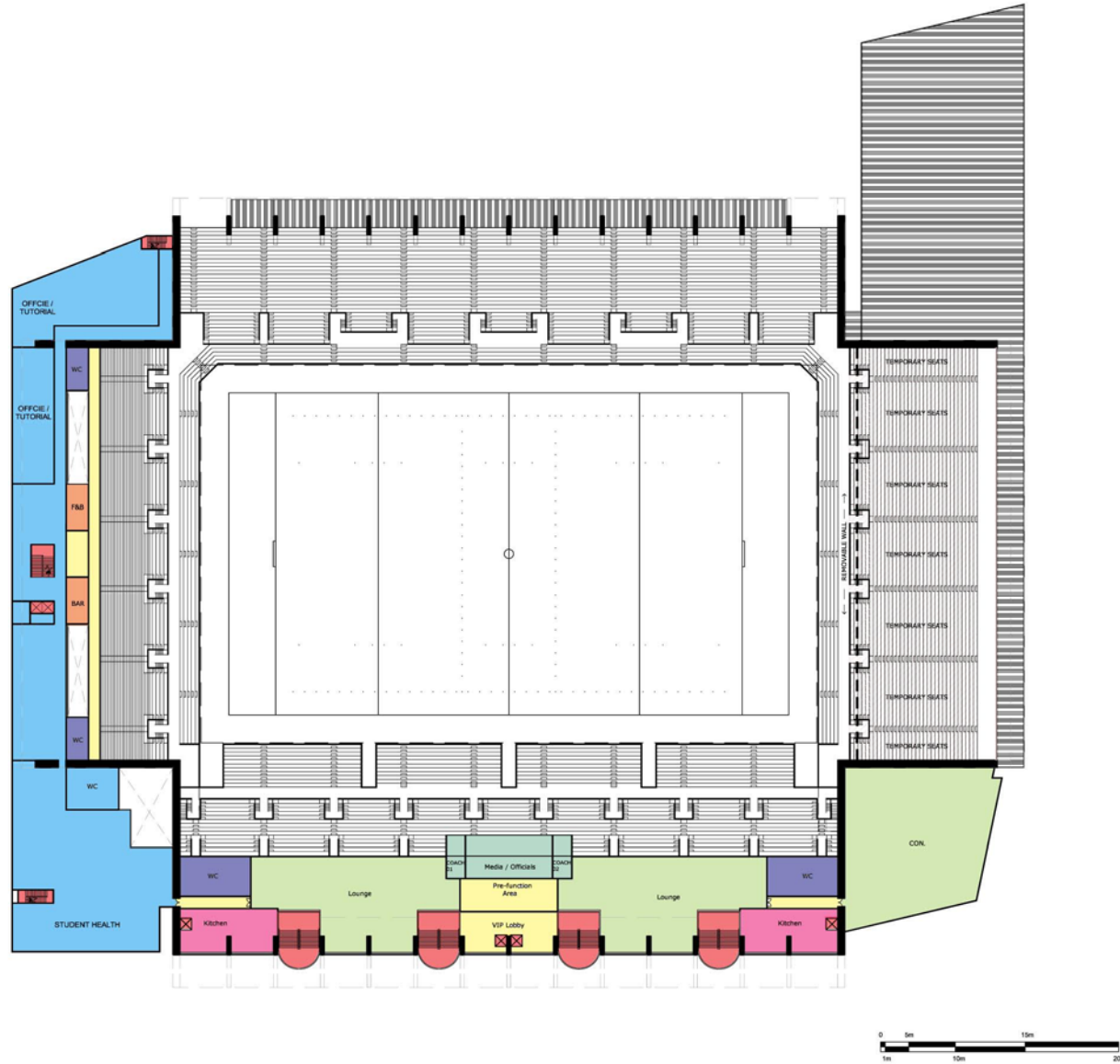


Figure 2-37. Option 1 – Level 03 Plan

- WC
- Kitchen
- Circulation
- Vertical Circulation
- Members
- University Facilities

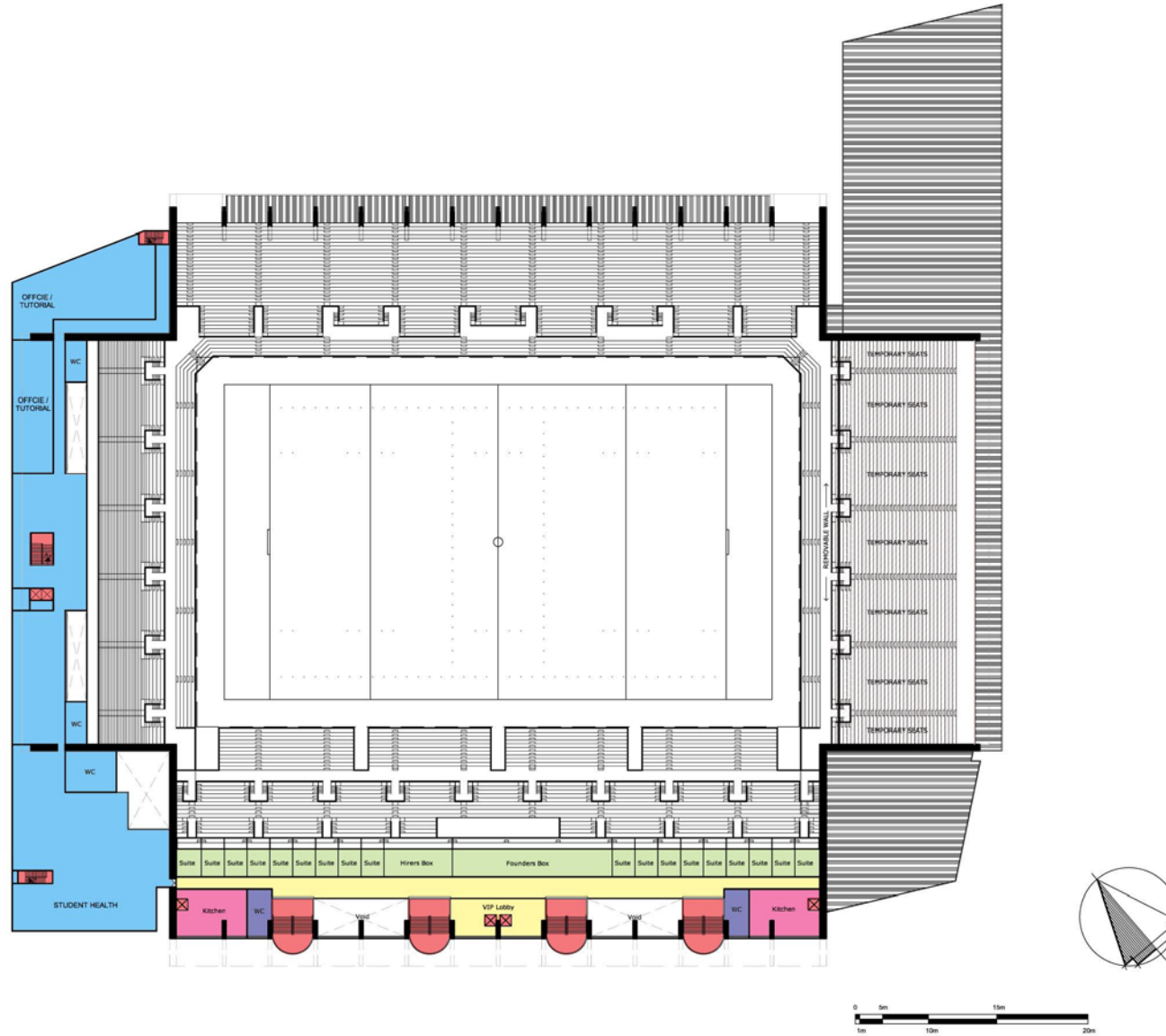


Figure 2-38. Option 1 – Level 04 Plan

- WC
- F&B
- Circulation
- University Facilities
- Vertical Circulation

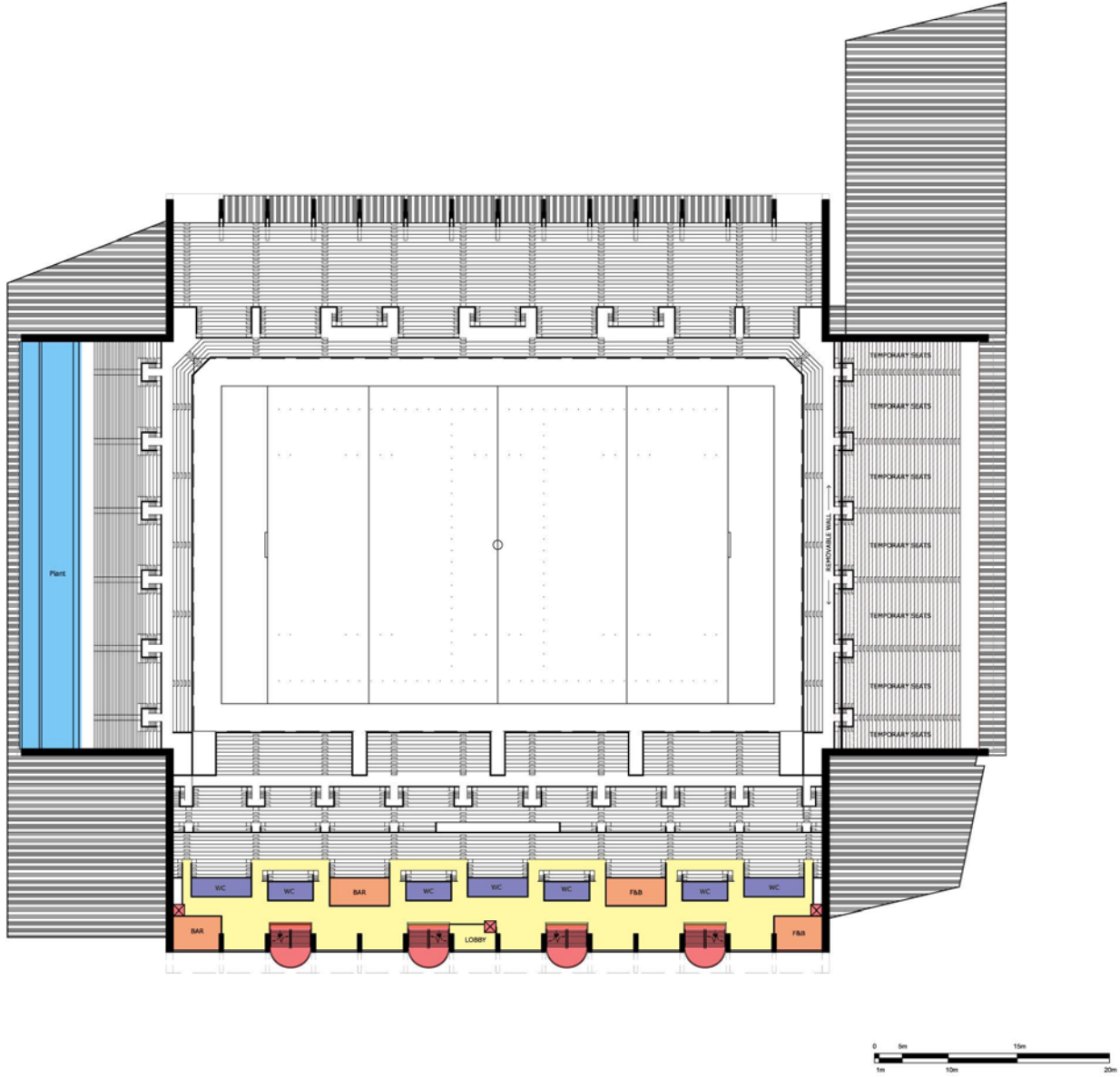


Figure 2-39. Option 1 – Level 05 Plan

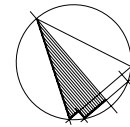
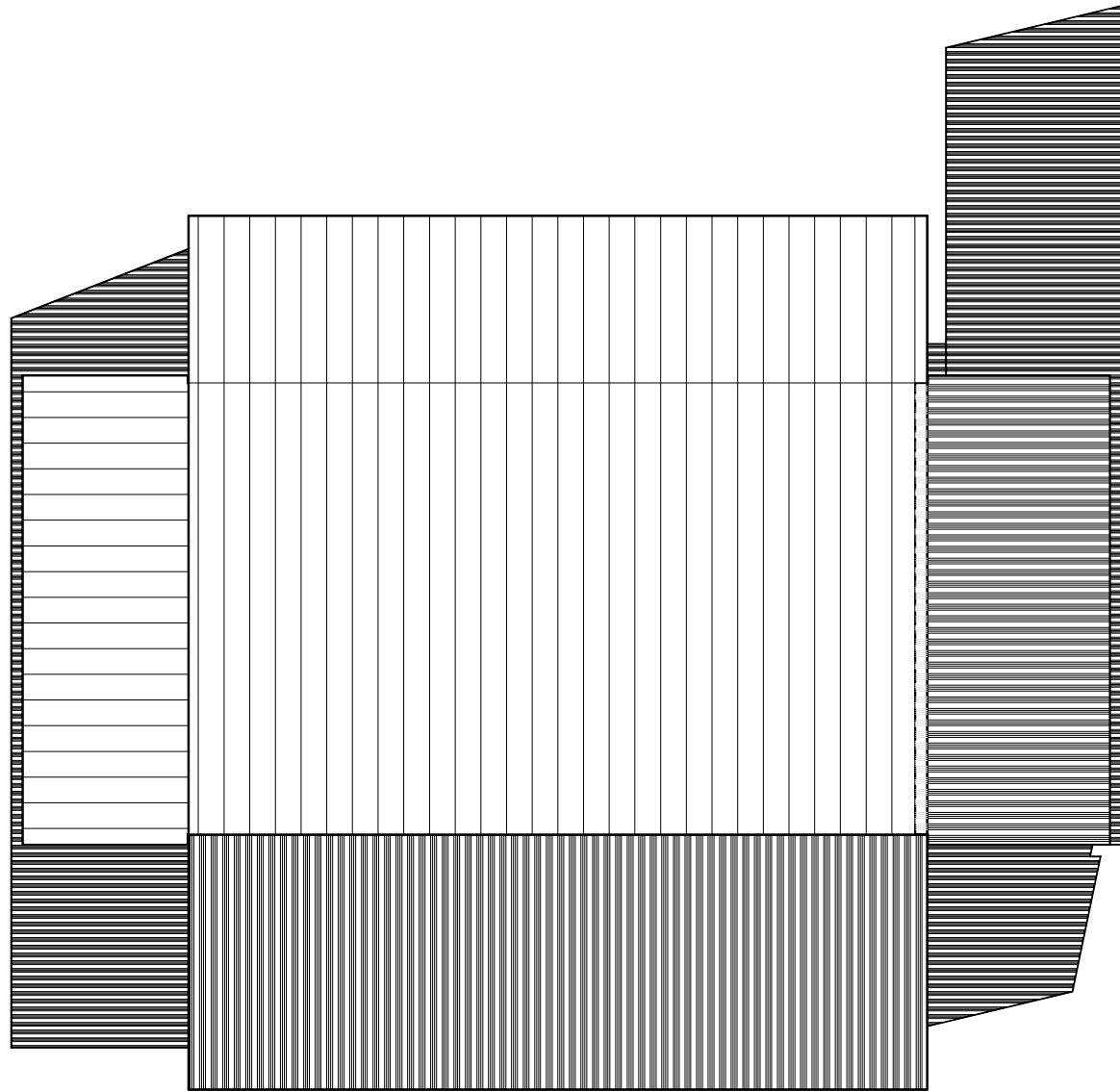


Figure 2-40. Option 1 – Roof Plan