Figure 6-1

6.0 Option 2c Complete Redevelopment of the Entire Site with Awatea Street Design Solution

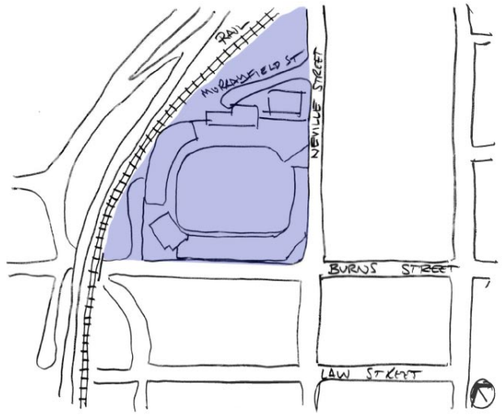


Figure 6-2. Site Plan

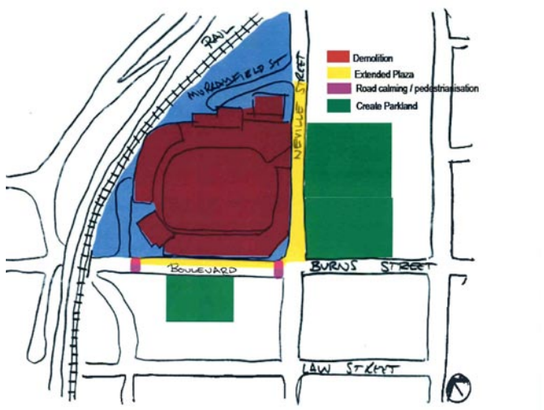


Figure 6-3. Site Plan – Demolition and Pedestrianisation

6.1 Facilty Design

6.1.1 Masterplan

A real opportunity exists to establish a unique precinct within the city of Dunedin as a destination in it's own right. The Stadium precinct needs to be defined and increased to allow for the Awatea street site proposal to fit at the existing Carisbrook site. Air rights and the pedestrianisation of Burns Street, Neville Street and Murrayfield Street would allow the available footprint of the Stadium to be increased for pedestrians and patrons. It is also proposed that the area east of Neville street be turned into a parkland area, extended north to align with the Murrayfield turning and include car parking. The substation should be relocated as should the electric cables to the North West of the site. A VIP drop off, VIP parking and team coach turn should replace the substation. This will also provide the opportunity to open the site visually. The clearing of the ORFU properties opposite the Stadium on Burns Street and the incorporation of further adjacent blocks of land could also allow for the establishment of a park zone in front of the Stadium, which will help to mitigate the impacts of the Stadium on the surrounding neighbourhood (Figure 6-3).

The cricket oval is to be removed in order to improve the proximity for the spectators to the action on the rectangular pitch and thus increase the atmosphere.

Height of the Stadium is an important consideration and it has directed some of the design decisions set out in section 6.1.5, especially relating to orientation of the site so that the taller main stand is to the NE of the site and the lower stand is to the SW of the site, thus reducing the impact of shadows on the adjacent residences.

6.1.2 Layout and Orientation

The new Stadium and field of play is proposed to be orientated as the existing Stadium.

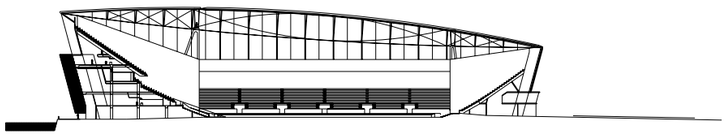
6.1.3 Stadium Uses

West Stand	Spectator facilities for events (sport or concerts)
North Stand	Spectator and team facilities for events (sport or concerts)
	Potential use of the members' lounges and private boxes by the conference/commercial facility as seminar rooms and break out spaces.
East Stand	Temporary and Permanent spectator facilities for events (sport or concerts)
	Potential exhibition space
South Stand	Spectator facilities for events (sport or concerts).

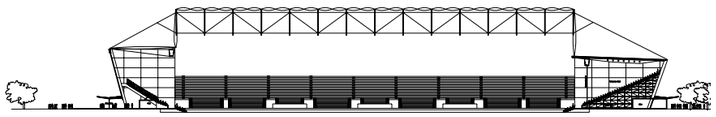
Refer to Section 2.3.5 for possible uses of the Stadium (excluding the University integration).

6.1.4 Facility Services

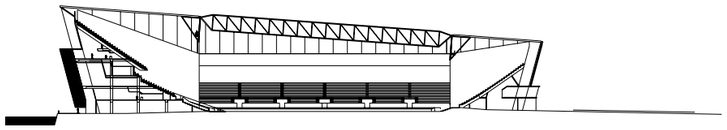
Facilities to NZRU and ORFU recommendations and to align with modern stadia standards (refer to Section 2.3.2).



Short Section - Fully Enclosed Roof Option

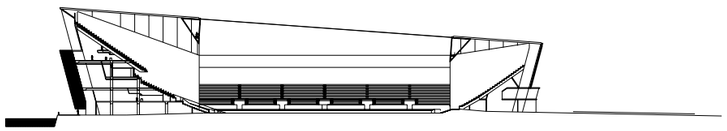


Long Section - Fully Enclosed Roof Option

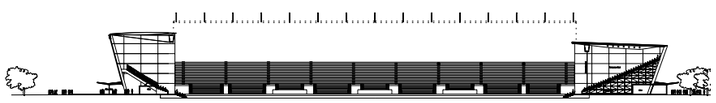


Short Section - Retractable Roof Option

Long Section - Retractable Roof Option



Short Section - Open Roof Option



Long Section - Open Roof Option

Braga Stadium – open roof type

Wimbledon – retractable roof

Figure 6-4. Roof Types

6.1.5 Design

Carisbrook Stadium is a well know 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 played out 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 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 consultants were instructed to look into designing a fixed roof over the Stadium to cover both the seating and the field of play. This will be unique, not only in New Zealand but also in the world of Stadium design. ETFE was the preferred material as it allows the majority of UV through for optimum turf growth (see section 6.1.7), is clear or translucent, is self supporting and light. It is important to understand that, although natural ventilation is being considered for the seating bowl and turf, further development of this principle is required during the next stage of the project.

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. Having researched the relevant codes for direction on minimum heights of structures above the field of play it would appear that there are no guidelines in place. This height will need to assessed and tested further during the next stage of the project.

The alternative roof option that the consultants were asked to investigate were:

- An "open roof", where the pitch is left exposed, but all the stands are enclosed. It is envisaged that the roof type between the South and North stands will follow the precedent of Braga Stadium in Italy, being cables strung from A frame structures on either side of the pitch, with the roof over the stands supported by the cables. The East and West stands follow the same principle in both roof options, as they are independent from the main north south roof. This alternative roof type needs further investigation if pursued in the next stages of the project development.

The Stadium is divided into 4 distinctly separate stands with their own personalities. Each stand is bookended by monolithic buttress walls to enhance the rugged nature of this new 'House of Pain'.

The North stand is a fully serviced stand and accommodates two tiers of spectator seating. 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 members lounges (approximately 500 persons each), media and coaches' boxes at level 03, served by their own kitchens and washrooms. On level 04 there are 18

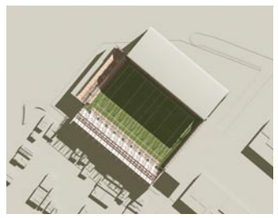
(16-24 person) corporate suites, the Hirers suite (approximately 48 persons) and the Founders Club (approximately 120 persons) which are serviced by their own finishing kitchens and washrooms. The North stand is serviced by Murrayfield Street. This route will also be where the coaches arrive to drop the players off at the team entrance and where VIPs can also be dropped off at the door of the VIP lobby.

The South stand accommodates a single tier of spectator seating, with future commercial spaces at level 02. It is approximately 24m high.

The West stand is approximately 16m high and is proposed to accommodate a single standing tier, which has a capacity for approximately 5,000 people. Food and beverage and washroom facilities are envisaged to be temporary.

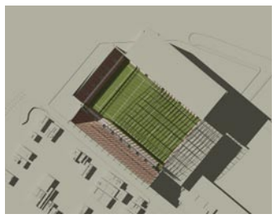
The East stand (or Neville Street Stand) is also approximately 16m high and is proposed to accommodate a temporary single seating tier, with the required washroom facilities for the stand use. It also has turnstile entrances off Neville Street.

Preliminary sun path studies have been undertaken (see Figure 6-5) to assess the impact of the Stadium height on the adjacent residences. Further analysis will be required in the next stage of the project.

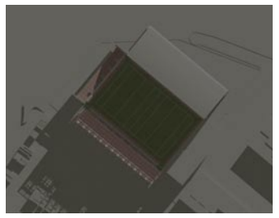


Shadow Diagram – March 9am

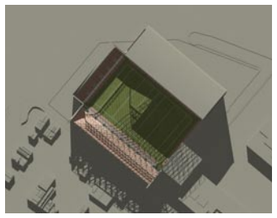
Shadow Diagram – March 12noon



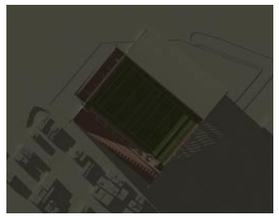
Shadow Diagram – March 3pm



Shadow Diagram – June 9am



Shadow Diagram – June 12noon



Shadow Diagram – June 3pm

Figure 6-5. Sun Path Study

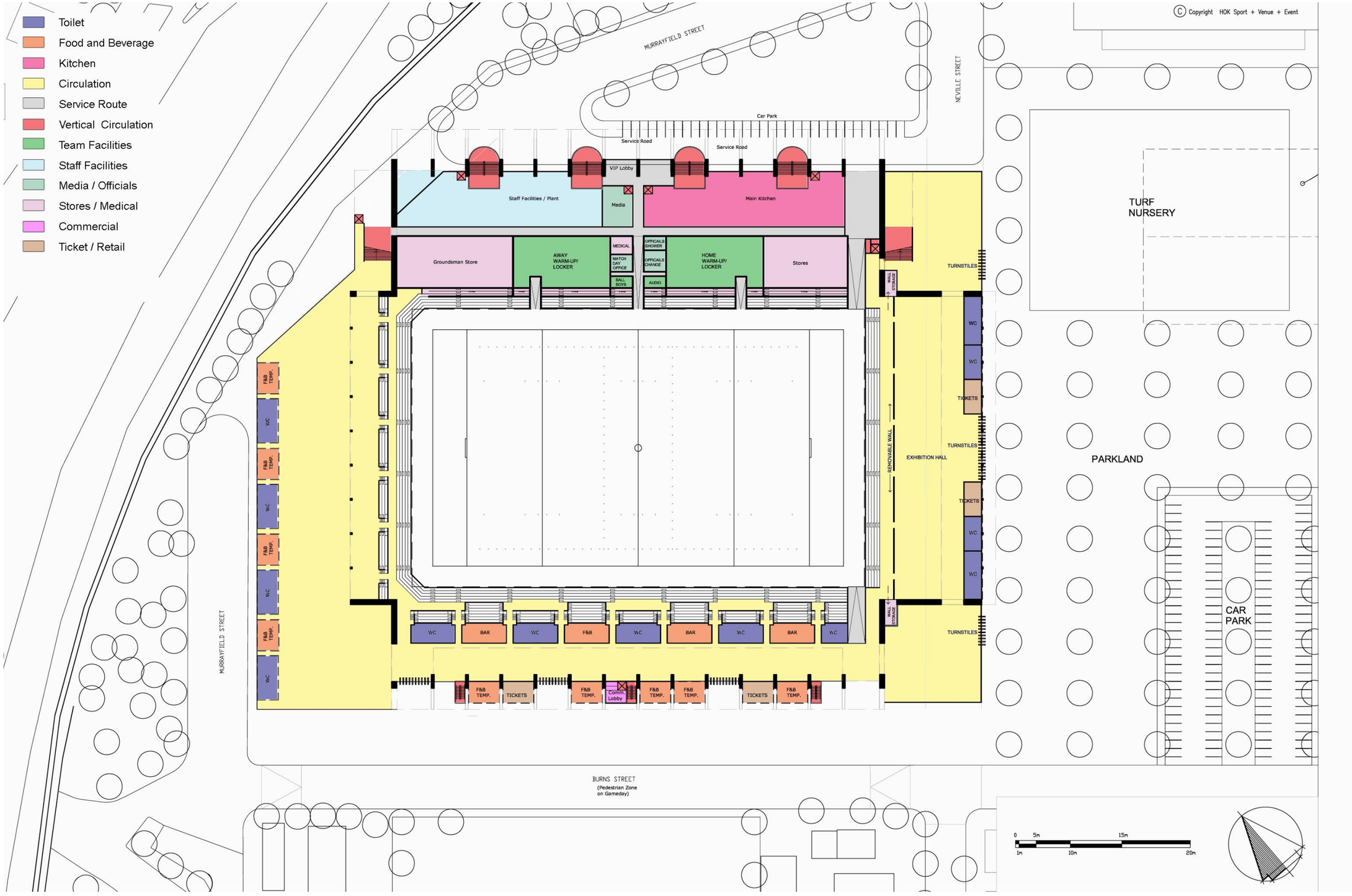
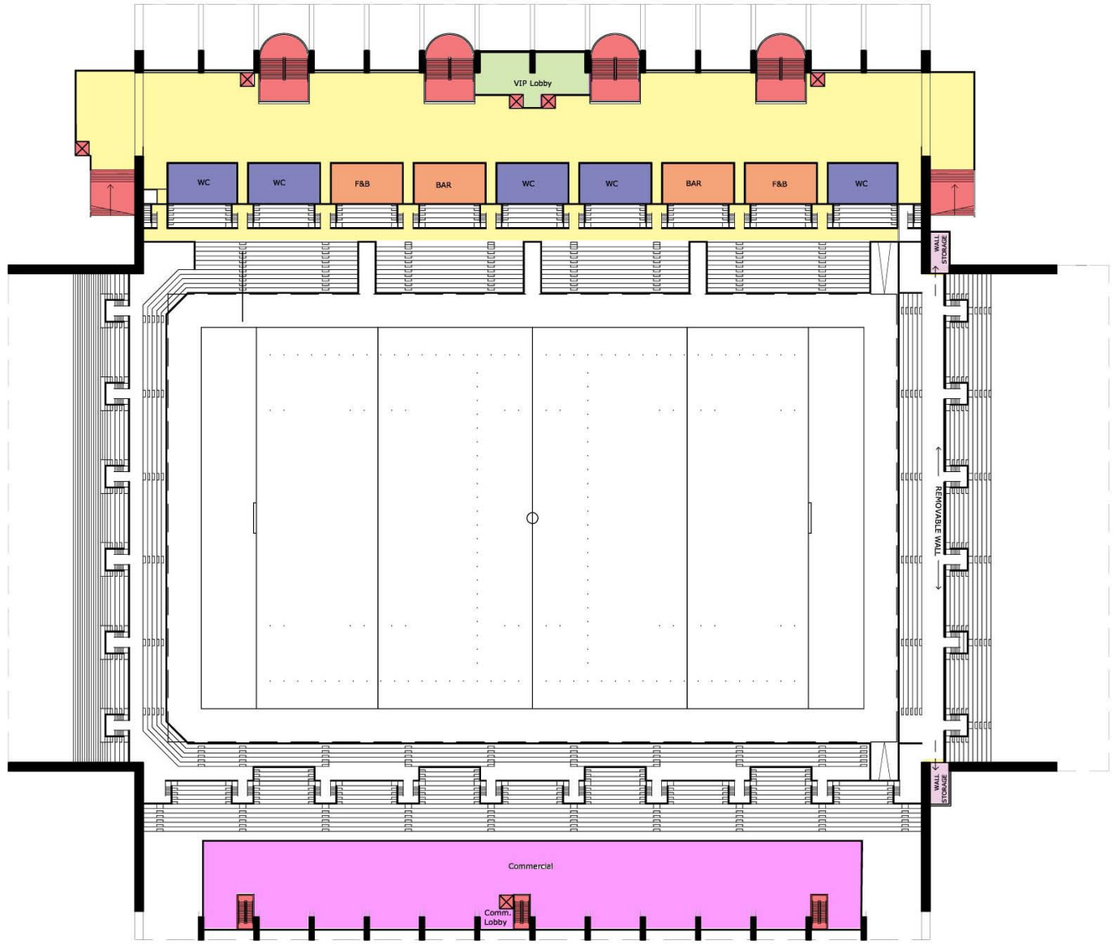


Figure 6-6. Option 2c – Level 01 Plan

- Toilet
- Food and Beverage
- Circulation
- Vertical Circulation
- Staff Facilities
- Stores / Medical
- Members
- Commercial



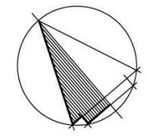
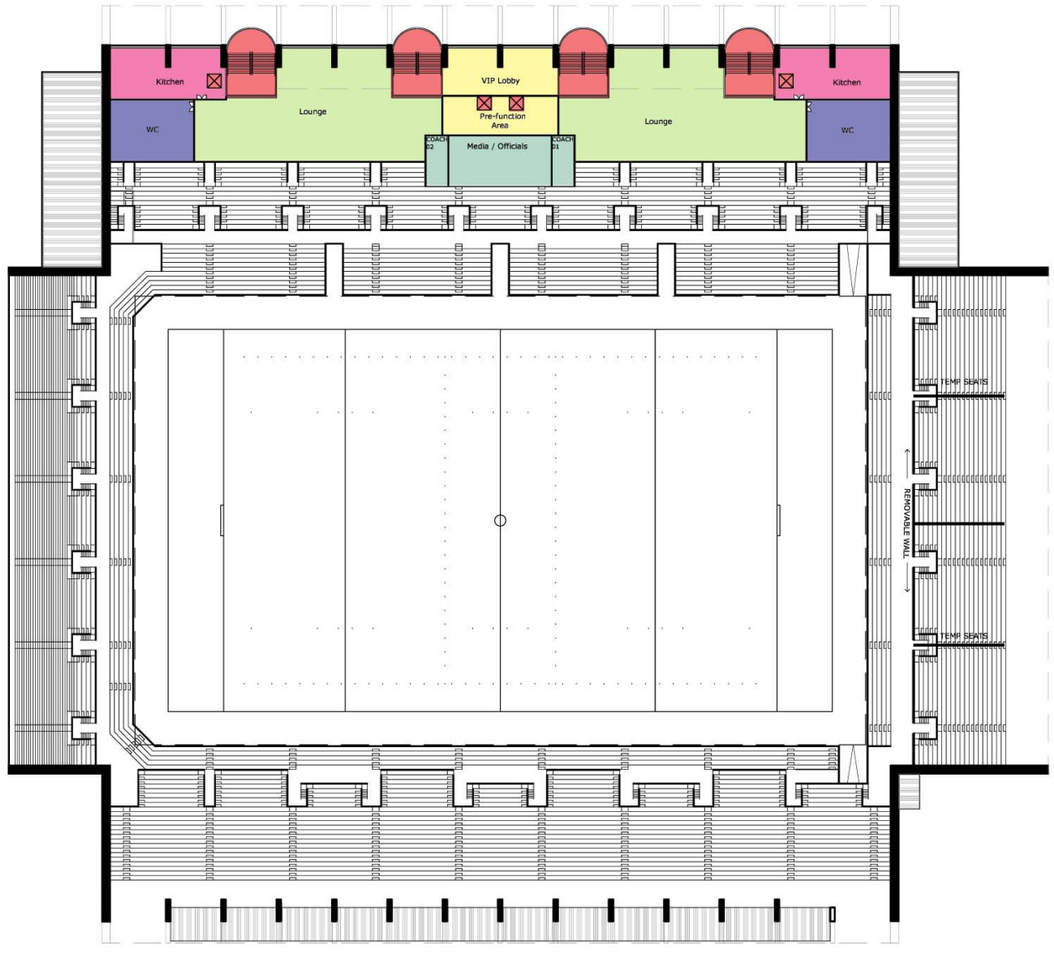
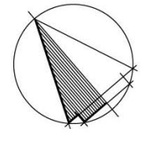


Figure 6-7. Option 2c – Level 02 Plan

- Toilet
- Kitchen
- Circulation
- Vertical Circulation
- Media / Officials
- Members





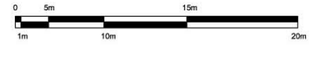


Figure 6-8. Option 2c – Level 03 Plan

- Toilet
- Kitchen
- Circulation
- Vertical Circulation
- Corporate Suites

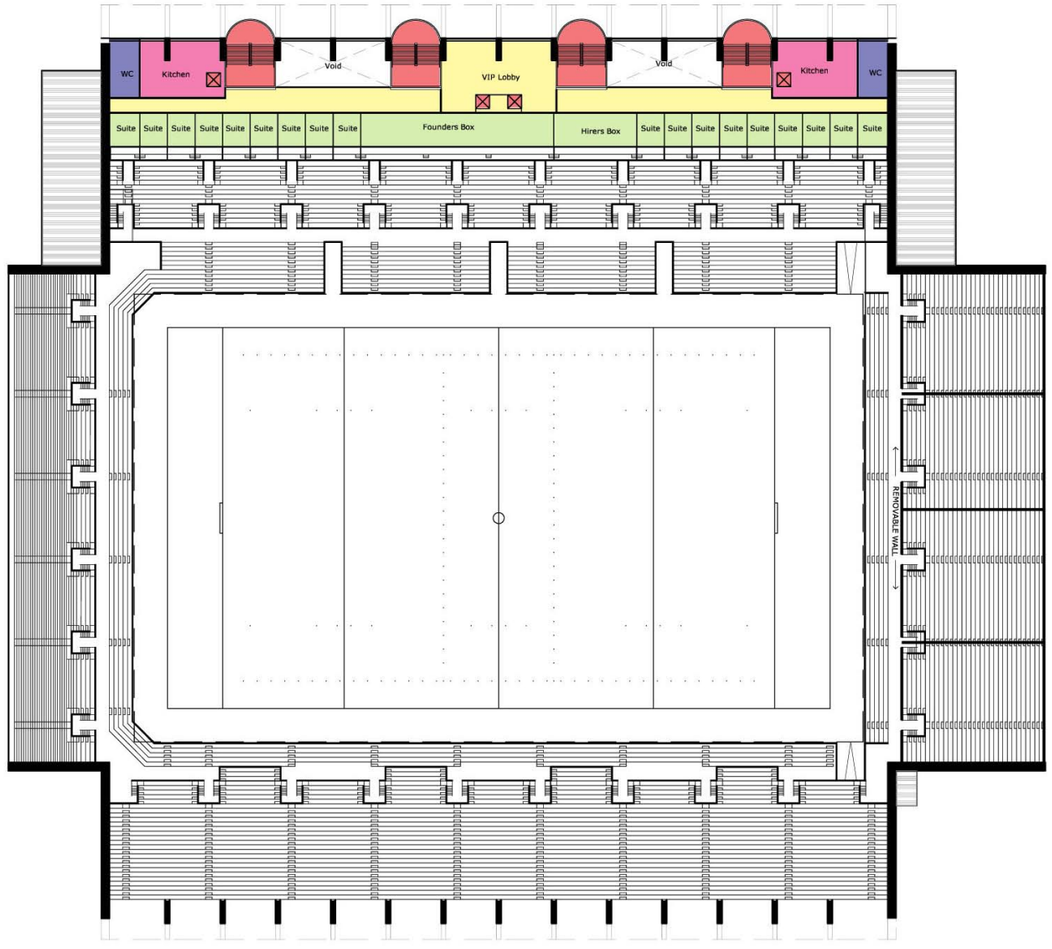


figure 6-9. Option 2c – Level 04 Plan

- Toilet
- Food and Beverage
- Circulation
- Vertical Circulation
- Members

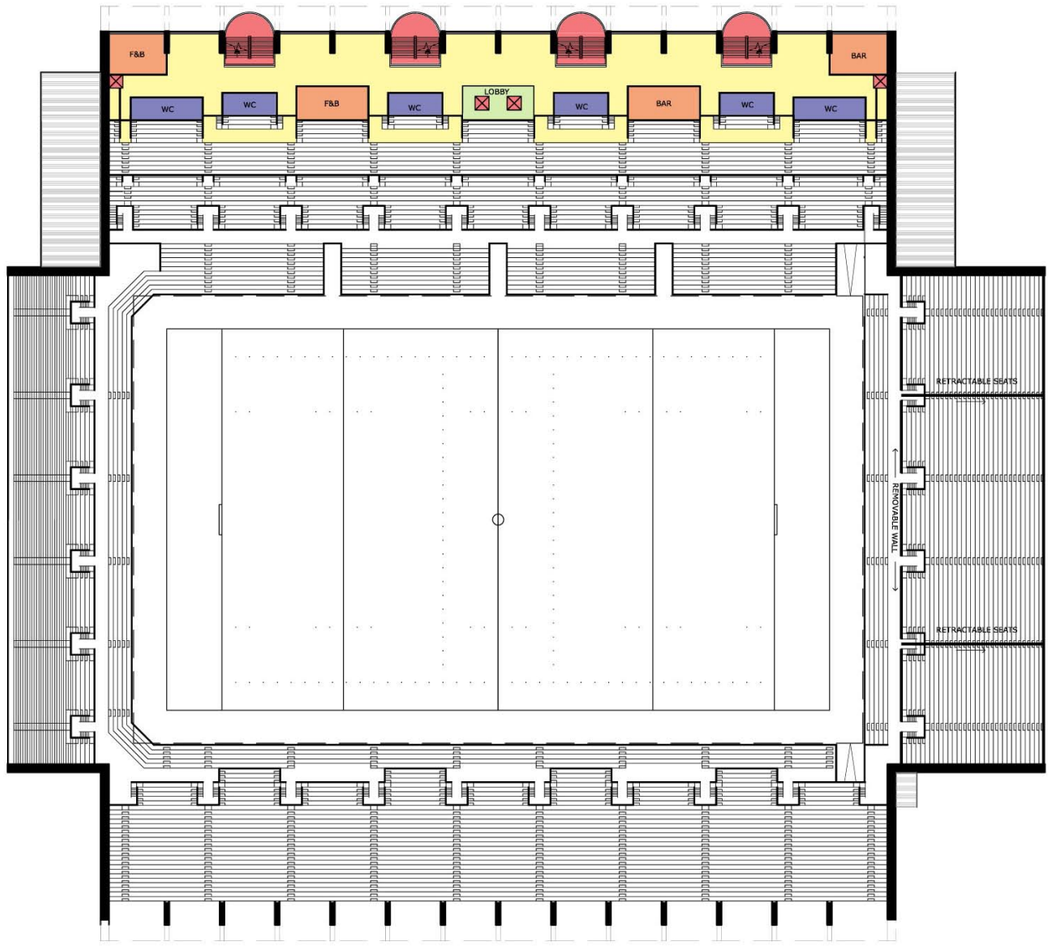


Figure 6-10. Option 2c – Level 05 Plan

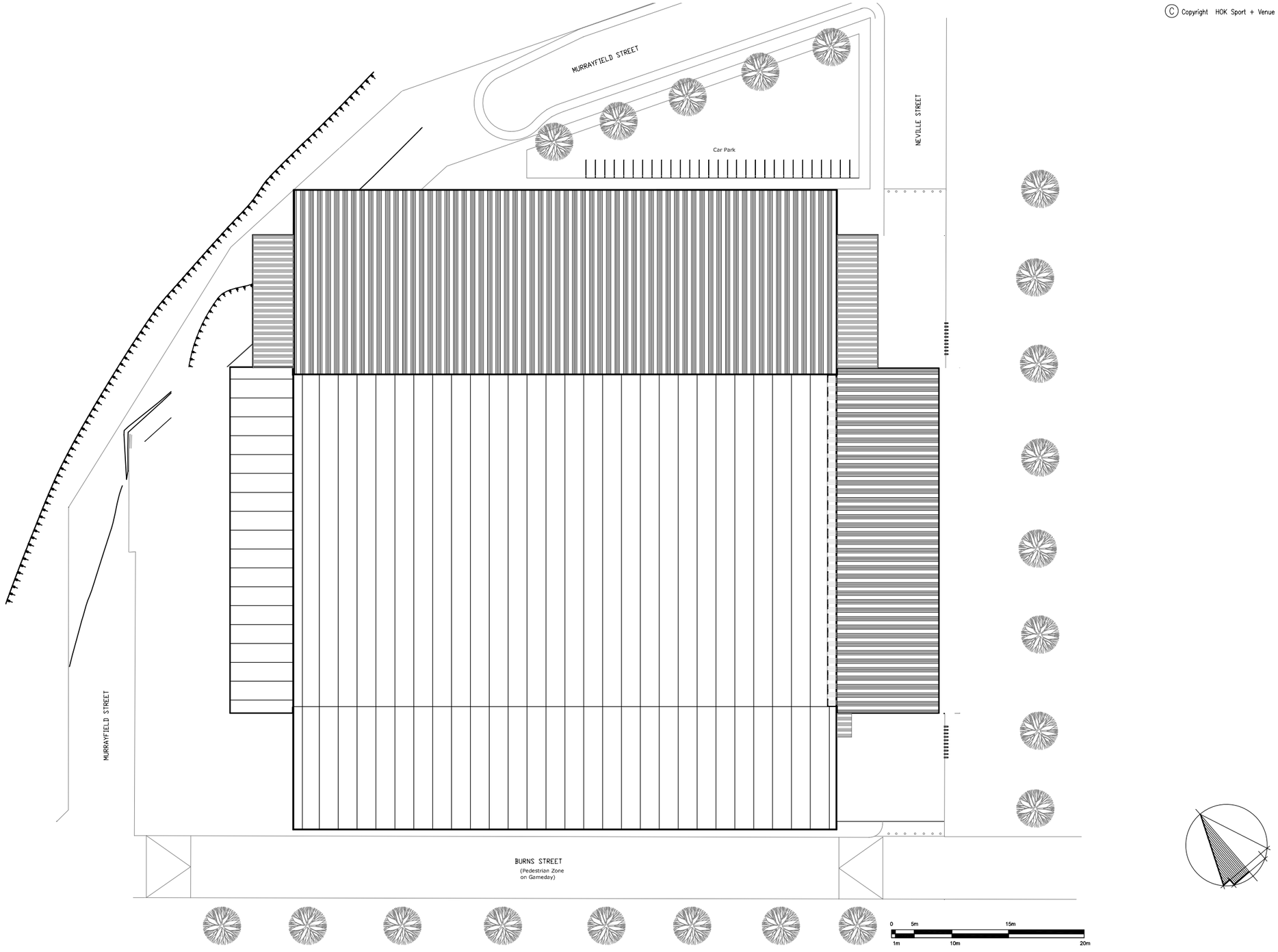


Figure 6-11. Option 2c – Roof Plan

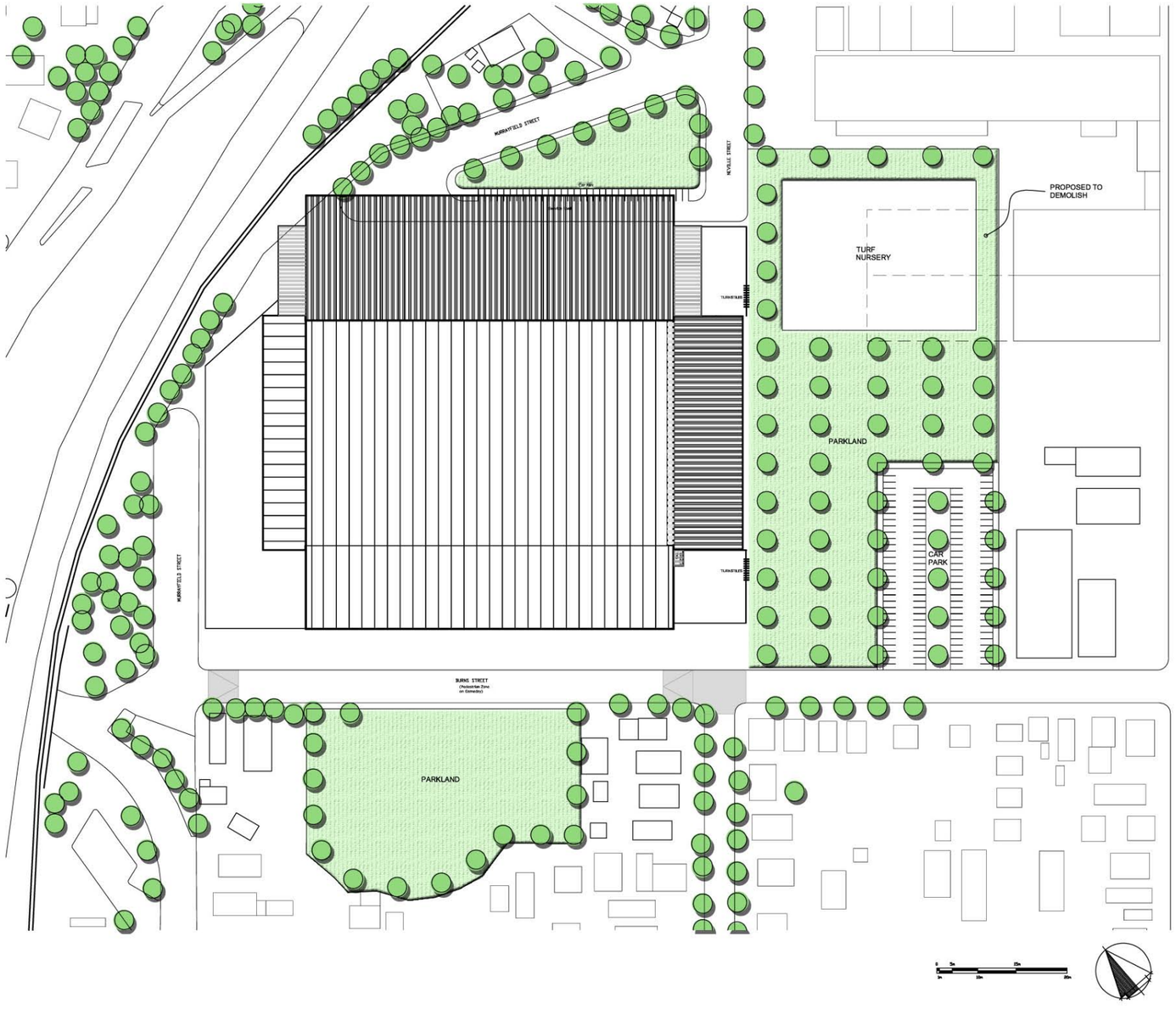


Figure 6-12. Option 2c – Site Plan

6.1.6 Structure

As this option is a transposition of the Awatea Street Fixed Roof option to the existing site the structural description is generally the same as given in sections 2.3.9 and 2.3.10. Two differences occur:

- The geotechnical conditions are likely to be more favourable leading to reduced piling costs
- There will not be a University involvement which will significantly modify the East and West stand approach (E & W names as per Awatea Street site orientation).

The East and West stands are still required to close off the end walls of the Stadium against wind loads and also to receive the lateral restraint cables of the roof system. At this point it is assumed that both stands will be as the Awatea Street site East stand.

6.1.7 Turf

Refer to Option 1. Potentially the reclaimed area to the East of the Stadium could be turned into a nursery for turf development.

6.1.8 Benchmarking

Suncorp Stadium, Brisbane

Telstra Dome, Melbourne

Westpac Stadium, Wellington

Landsdowne Road, Dublin

Skilled Park, Gold Coast

Benchmark Comparisons

Space Type	Suncorp Stadium Brisbane	Telstra Dome Melbourne	Skilled Park Gold Coast	Lansdowne Road Stadium Dublin	Galpharm Stadium Huddersfield	Waikato Hamilton Park	Westpac Stadium Wellingtion	The New Stadium Dunedin
Sports / Events	Rugby Union, Rugby League, Soccer	AFL, Cricket (ODI), Rugby Union, Rugby League, Soccer, Concerts, Motor Cross	Rugby Union, Rugby League, Soccer, Concerts	Soccer, Rugby, Concerts	Soccer/ rugby	Rugby	Rugby Union, Cricket	Rugby Union
Construction Cost	$224,000,000	NZ $327,750,000	NZ $138,000,000	265,000,000 euro	28,000,000 GBP	TBC	NZ $ 121,000,000	TBC
Capacity	52,854	49,709 Rugby 52,209 AFL	25,465	50,746	26,000	27,500 including 20,000 seats (10,000 under cover)	34,500	30,000 including approx. 25,000 seats and 5000 standing under cover
Number of Tiers	3	3	1 with small corp suite tier on West side.	3	2 and 1	2 and 1	1	2 in the South Stand and 1 in North, East and West Stands
Building Area (sqm)	92,072	107,154	25,750	TBC	24,200		26,970	28,835 (excl. Bowl)
Building Footprint (sqm)	42,450	48,350	15,500	TBC				26,800
Site Area (hectares)	7.42	7.21	4.8					
Field Format	Rectangular	Variable (oval / rectangular)	Rectangular	Rectangular	Rectangular	Rectangular	Oval	Rectangular
Field Size	144m x 90m	170m x 140m	138 x 83m					
Retractable Roof	No	Yes	No	No	No	No	No	
Fixed Roof								Yes
Roof Coverage	88%	92 - 100%	80%	TBC	100%	40%	65%	100% with fixed roof over stands and field of play 90% with roof over stands only
Spectator Group								
General Admission:	39,274	38,204	22,643	39,200			31,900	24,544
Club Seating:	4,948	4,554	980				2,600	
Code Seating:	4,964	8,249	n/a	10,000				
Corporate Seating:	2,800	991	1,360	850				
Wheelchair Positions	260	244	178	230			172	75
Companion Seats	260	232	178				172	75
EAS	260	244	0	230				
Press	52	97	36	236				
Players / Officials / Team	36	99	44					
Total	52,854	52,914	25,465	50,746	26,000		34,500	30,000
Seating Standards								
General Admission	*500mm chair x 800mm tread (lower tier)* *500mm chair x 825mm tread (upper tier)*	*480mm chair x 800mm tread*	*500mm chair x 850mm tread*	*500mm chair x 800mm tread*			*480mm chair*	*500 chair x 825 tread*
Club Seating	*560mm chair x 850mm tread*	*500mm chair x 800mm tread*	*550mm x 900mm tread*	*550mm chair x 850 tread*				*550mm x 850 mm tread*
Code Seating	*500mm chair x 800mm tread*							
Corporate	*560mm chair x 950mm tread*	*500mm chair x 900mm tread*	*550mm x 900mm tread*	*550mm chair x 850mm tread*			*550mm chair*	*550 chair x 900 tread*
Written Press			*550mm x 900mm tread*				*500m chair*	*500m chair*
Broadcast Commentators								
Roof Coverage	Roof Coverage: 82%	Roof Coverage: 98-100%	79%					
Corporate Facilities								
Suites	26 x 12-seat suites 18 x 14-seat suites 28 x 20-seat suites 1 x 80-seat hirers suite	34 x 12-seat suites 29 x 16-seat suites 4 x 20-seat suites	*18 x 12 seat suites* *6 x 18 seat suites* *3 x 18 or 1 x 54 seat seat hirers suite*	12 - 50 person suites	26 x suites 16 x executive suites			18 x 16 capacity suites 1 x 48 capacity hirer's suite 1 X 120 capacity Founders Club
Total	73	67	67	35				20
Open Carrel Boxes	41 x 10-seat boxes 60 x 10-seat boxes	no boxes	*62 x 10 seat boxes* 18 x 8 seat boxes *20 x 12 seat boxes* *100*					
Total	101	0						
Hospitality / Dining	1 x 1,000 seat banquet hall 2 x 500 seat restaurants 2 x 250 seat restaurants 2 x 144 seat terraces 2 x 80 seat end goal clubs	6 x 500 seat facilities 2 x 1,000 seat facilities 1 x 1,500 seat facility	*1 x 500 seat Function Room*	1 x 400 seat restaurant 1 x 650 seat restaurant				
Total Dining Spaces	2,948	6,500	*500*	1,050	650	628	1,400	1,000
Bars / Lounges			*North West Member Bar - 400 standing* *Function Room 2(no fit-out) 750 standing*					
Toilets								
Standards Used	FSADC	FSADC	FSADC/BCA	FSADC	FSADC		FSADC	FSADC
Club/ Corp.	60:40 male-to-female ratios	60:40 male-to-female ratios	60:40 male-to-female ratios		60:40 male to female ratio 70:30 male to female ratio		50:50 male-to-female ratios	Corporate/Members - 50:60 ratio of women to men Public - 40:70 ratio of women to men
Male								
Urinals							1:25 ratio	
WC's							0-400 1 per 100p, 400+ 1 per 250p	
WHB's							1 per wc, 1 per 5 urinals	
Female								
WC's							0-200 1 per 50p, 200+ 1 per 100p	
WHB's							1 per 2 wc	
PWD								
General Public	70:30 male-to-female ratios	70:30 male-to-female ratios	70:30 male-to-female ratios				70:30 male-to-female ratios	
Male								
Female								
PWD							1 per 10 wheelchair spaces	
Guest Services								
First Aid	First Aid - *1 at 50 sqm + 2 at 20*	First Aid - *4 at 10 sqm*	First Aid - *2 at 15sqm*					
Customer Service Counter	Customer Service - *4 at 20 sqm*	Customer Service - *8 at 15 sqm*	0				one counter 'serving' space per 10,000 spectators	one counter 'serving' space per 10,000 spectators
Creche / Kids	Creche/Kids Play - *1 at 50 sqm*	Creche/Kids Play - *no*	Creche/Kids Play - *1 at 50 sqm*					
Mothering Stations	Mothering Stations - *2 at 6.25 sqm*	Mothering Stations -*no*	Mothering Stations -*3 at 6.25 sqm*				1 TAB	
TAB / Betting	Gaming Facilities - *2 at 30 sqm*	Gaming Facilities - *2 at 30 sqm*	0					
Merchandising	ATM machines - *2 at 5 sqm*	ATM machines - *4 at 5 sqm*	ATM machines - *2*			1 x 70 sqm		1 permanent shop
	Sports Store - *1 at 185 sqm*	Main Store	Sports Store - *2 at 20 sqm*					
	5 sales counters		2 sales counters					
Food Stands							5 permanent merchandising	
	Sales Counters - *12 at 15 sqm*	Sales Counters						
Food Concessions	7.5 m / 1,000 spectators	5.0 m / 1,000 spectators	Sales Counters - *16*	8.0m / 1,000 spectators			12.5m/ 2500 spectators	approx. 5m/1000 spectators
Bars	7.5 m / 2,000 spectators	5.0 m / 2,000 spectators	5.0 m / 1,000 spectators	4.5m / 1,000 spectators (GA)			6.0m per 2500 spectators	approx. 4m/1000 spectators
			5.0 m / 1,000 spectators	9m / 1,000 spectators (Members)				
Kitchen	Kitchen/Commissary: *2,040 sqm*	Kitchen/Commissary: *2,352 sqm*						
Main Kitchen / Commissary	2,040sqm	2,352sqm	Kitchen/Commissary: *2,040 sqm*					690 sqm
Finishing Kitchens			550sqm					
Suite Kitchens						250 sqm		650 sqm
In-suite servery								
Team Facilities								
Home Lockers	1 at 400 sqm	1 at 477 sqm	1 at 350 sqm(incl. warm-up, wet areas)					
Visitor Locker	1 at 400 sqm	1 at 385 sqm	1 at 350 sqm(incl. warm-up, wet areas)					
Aux. Lockers	2 at 170 sqm	2 at 195 sqm	2 at 175 sqm					
Miscellaneous	Referee - *2 at 55 sqm*	Referee - *2 at 55 sqm*	Referee - 1 at 60 sqm					
Lockers	Star Dressing - *1 at 55 sqm*	Star Dressing - *1 at 60 sqm*	Star Dressing - 1 at 18 sqm					
	Ballboys - *1 at 55 sqm*	Ballboys - *1 at 28 sqm*	Ballboys - 1 at 20 sqm					
	Cheerleader - *1 at 55 sqm*	Band - *1 at 60 sqm*	Cheerleader - 1 at 150 sqm					
	Doping Control - *1 at 100 sqm*	Doping Control - *1 at 60 sqm*	Band Room - 1 at 32sqm					
Ticket Office	Ticket Windows - 20	Ticket Windows - 50	Doping Control - 1 at 25 sqm					
	Administrative Offices - *150 sqm*	Administrative Offices -	Ticket Windows - 20					
			Administrative Offices - 180 sqm			Ticket Windows - 10 Administrative Offices - 354 sqm		Ticket Windows - approx. 11 Administrative Offices - approx. 180 sqm

6.2 Planning and Consultation

In respect of land use planning requirements, there are two mechanisms available to the Carisbrook Stadium Trust to facilitate the DCC's approval for the construction of a new Stadium on the existing Carisbrook site. The options available are:

- Resource Consent
- Plan Change

As this option will not include the intergration of the University, it is assumed a Resource Consent will be suitable for the redevelopment of the Carisbrook site. Further discussion with the DCC will be required during the next stage of the project to confirm this approach and develop a consultation strategy.

Consultation is required under the Resource Management Act to enable the identification and clarification of issues early in the process, and provides the opportunity to resolve issues prior to any more formal consultation occurring.

Initial pre-application consultation has already been undertaken with Council staff in the feasibility stages of the proposal to determine the most appropriate means of authorising the Stadium development. To ensure that the processing of the Resource Consent continues smoothly, and that the Council is favourably disposed to the adoption of the Resource Consent itself, it is essential that this dialogue continues.

Other consultation considered appropriate prior to the lodgement of the request for a Resource Consent should include meetings with a number of parties who will have individual and specific concerns in the process, and a broader round of consultation with the general public.

It is recommended that targeted consultation meetings are held with Aurora Energy Limited, Transit New Zealand, Toll Holdings Limited, On-Track, Kai Tahu, and the Otago Regional Council. It may be appropriate to consult with DCC Community and Recreation Planning and DCC Transportation Planning during this round of consultation. Each of these organisations is likely to have discrete concerns that are of a technical nature, and which are of little relevance to a number of other parties. As such, it is appropriate that these parties have the opportunity to provide independent feedback on the proposal at an early stage.

It is recommended that the more general round of consultation that is undertaken includes the owners and/or occupiers of properties that surround the site, including those properties in Burns, Neville, and Murrayfield Streets.

It would also be beneficial for the parties to be able to take information on the proposed Stadium away, and it is therefore recommended that an A4 brochure is prepared. This would enable individuals to give further consideration to the proposal, and provide them with a contact point should they wish to provide further feedback subsequent to the meeting.

The provisions of the Resource Consent, and its supporting documents, should reflect the feedback obtained during this consultation. Taking such an approach may reduce the number of submissions received during the more formal consultation process, which in turn reduces hearing time, deliberations required, and may alleviate some of the concerns of parties that are likely to take the matter to the Environment Court.

6.3 Programme

Programme Overview

Redevelopment of the existing Carisbrook site can be achieved by the Rugby World Cup in 2011.

The programme for this option is based on similar principles to option 1a development of the Awatea Street site. Similar challanges and programme risk is applicable to this option. For completeness of this section these factors are repeated below:

Significant challenges exist which will need to be overcome to ensure that this date is achievable. Overcoming these challenges will require strong and proactive collaboration by the key project partners: CST, DCC, ORC and ORFU.

The dominant constraint in the programme is the late sign-off by the ORC of their involvement and contribution to the development, this is currently forecast for July 2008. This delayed sign-off increases the period of uncertainty carried by the early project funders, being principally DCC. The programme is based on DCC providing the necessary funding to maintain progress on the development. This is the role undertaken by Wellington City Council (WCC) with their multipurpose Stadium, where the WCC provided working capital of $15M in 1996, two years ahead of construction commencement, in order to enable the development to be progressed and the challenges overcome

Option 2c and 2d has a construction period of 26 and 24 months respectively. Each of these options assume the Stadium will be closed for the duration of the construction period. An alternative option could be considered during the next stage to determine the feasibility of staging this option to allow Carisbrook to remain partially operational.

Master Programme

Included in the appendices is the detailed master programme for the proposed redevelopment of the Carisbrook Site. For ease of reference the following Milestone dates have been extracted from this programme:

Submit Masterplan Feasibility to Project Stakeholders	February 2007
ORC and DCC begin consultation process	February 2007
Concept Design	March 2007- July 2007
DCC Commitment to Project	July 2007
Submit Resource Consent	July 2007
Continue Developed and Detailed Design	July 2007- July 2008
Resolution for Consent	November 2007
Construction Procurement	March 2008
ORC Commitment to Project	July 2008
Private Sector funding achieves threshold	July 2008
Construction Cost accepted	July 2008
Commence Construction on site	October 2008
Construction Practical Completion	February 2011
Stadium Trials Complete and Stadium Ready for RWC	March 2011

Understanding the Programme Risks and Assumptions

In preparing this programme, detailed discussions with the ORC and DCC were required to fully understand their consultation processes. In order to achieve completion of this Stadium prior to the 2011 Rugby World Cup, it has been necessary to make some key assumptions namely;

Funding Commitments

This option assumes that funding will be made available for the proposed upgrade. Further discussion with ORC and DCC will be required to determine the level of funding that will be made available for this option

DCC commitment to the project

Similarly, CST will need to progress the concept design to enable the Resource Consent to be submitted prior to DCC providing their commitment to the project. Non-recourse working capital will need to be provided to enable this to happen on the period between March and July 2007.

ORC commitment to the project

It is assumed ORC's commitment to this project will not be known until July 2008. This is a major risk to the project as this milestone falls on the programme critical path. Any movement on this date will affect the completion date for this project. ORC's commitment impacts on funding certainty for the project. Without this ORC commitment, CST is unable to commit working capital for placement of building works contracts. This places great risk on CST during the period of March 2007 through to July 2008 to obtain working capital to progress the developed design and procurement.

The Programme assumes CST will continue the design process through this March to July 2007 period, enabling the Resource Consent to proceed. Effectively this means the funding provided during this period will be non-recourse until such time as ORC commits to the project. Confirmation of the building contract(s) will therefore need to take place on confirmation of ORC's commitment.

Resource Consents

A Resource Consent will be required for this option. The complete demolition of the Carisbrook site and construction of new facilities will be a significant Resource Consent in this location. While the existing Carisbrook site has existing use rights, the scale of redevelopment will alter the intensity and character of the existing Stadium. It has been assumed that a Resource Consent for this option will be obtained within the statutory periods indicated in the programme. To fit within the permitted activities of the Industrial Zone, unlike the Awatea Street options, this site would be redeveloped without the integration of the University and Commercial space. Further consultation

and discussion with DCC during the next stage of the project will be required to confirm this apporach

Design Period

The design period has been based on similar durations to that discussed under option 2a. There remains a minor amount of flexibility in these durations and the design does not fall on the critical path of teh programme. If the assumed ORC commitment date were to be brought forward the the design periods would be adjusted to reflect a revised programme.

Construction Period

Based on the information available, the construction period has been estimated to be 26 months. This period assumes CST place an enabling works package to complete necessary demolitions and site works to provide adequate access into and around the site. An off site pre-fabrication contract will also be placed to accelerate construction on site. During the next stage of the project, the construction periods will be tested with local contractors when further detailed information is available

Stadium Trials

Following Practical Completion a period of 6 weeks has been identified to perform Stadium trials and identify any aspects that may require minor modification to ensure a successful running of a full capacity event.

Ommision of the Roof

As with option 1a, an alternative to option 2c is to omit the roof to the Stadium pitch. A detailed Master Programme for this option 2d has been included in the appendices. In principle all durations remain the same as the pre-construction activities all remain unaltered. A Resource Consent will still be required for option 2d

Based on the information available the construction period is estimated to be reduced by approximately two months, resulting in a practical completion date of November 2011. This assumption will be tested in further detail during the next stage of the project to fully understand the effects on the structure and construction methodology.

The programme risks for this option are the same as above.

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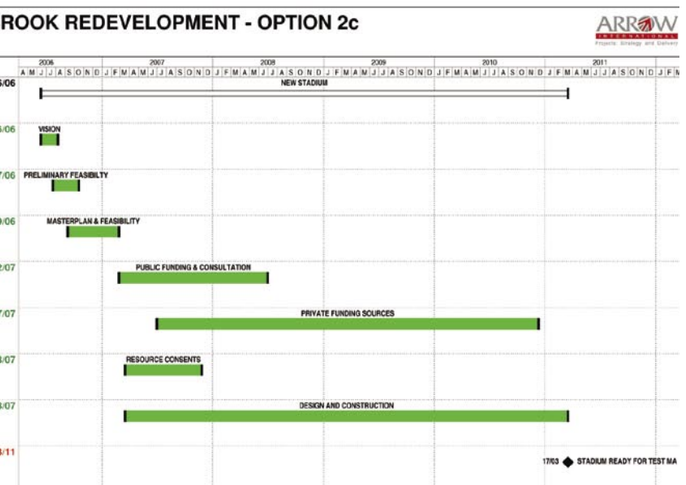
CLIENT: Carisbrook Stadium Trust
PROJECT: Carisbrook Stadium Development

CARISBROOK REDEVELOPMENT - OPTION 2c

ID	Task Name	Duration	Start
1	1 NEW STADIUM	1155 days	Wed 14/06/06
2	1.1 VISION	41 days	Wed 14/06/06
14	1.2 PRELIMINARY FEASIBILTY	62 days	Mon 24/07/06
56	1.3 MASTERPLAN & FEASIBILITY	108 days	Mon 11/09/06
76	1.4 PUBLIC FUNDING & CONSULTATION	324 days	Mon 26/02/07
95	1.5 PRIVATE FUNDING SOURCES	841 days	Mon 02/07/07
99	1.6 RESOURCE CONSENTS	176 days	Mon 19/03/07
113	1.7 DESIGN AND CONSTRUCTION	970 days	Mon 19/03/07
126	1.8 STADIUM READY FOR TEST MATCHES	0 days	Thu 17/03/11



6.4 What are the Key Challenges?

The key challenges for options 2c and 2d are similar to those identified for options 1a and 1b. Any development of this scale has key challenges to overcome at this stage of the project. The primary development challenges for options 1c and 1d have been identified and are summarised below:

Key Challenge	Issues	Comments/ Mitigation	Risk Level (H, M, L)
1.Development Costs			
a. Land			NA
b. Ground Conditions	The ground conditions are adversely different to the desktop information currently available.	Although a desktop study on the ground conditions has not been prepared for this option, it is assumed, as there are existing substantial structures on this site, the existing ground conditions will not impose and constraints likely to affect the proposed redevelopment of Carisbrook. Further work during the next stage of the project will be required to test this assumption and ground bearing capacities	M
c. Construction	Construction costs escalate due to unforeseen circumstances.	At present there is a large variance in the professional quantity surveyor estimates. The benchmark information available indicates that the construction costs are achievable within the allowance indicated in this report. Robust Project and Cost Management systems are to be adopted to manage the cost development on the project.	M
d. Roof	The development of the roof structure increases the construction values of the project.	The project team has been working closely with Vector Foiltec to develop a workable solution for the roof system. Vector Foiltec have provided preliminary cost advice which has been assessed and included within the current cost plan.	M

Key Challenge	Issues	Comments/ Mitigation	Risk Level (H, M, L)
2. Time			
a. Working Capital	CST cannot secure the working capital to progress the design in line with the proposed programme.	CST are to continue discussions and negotiations with the project funding partners to secure this working capital to avoid delays to the project.	H
b. Planning	Not obtaining the required planning notification to progress the development.	The project team are to adopt a rigid consultation strategy to minimise the threat of objections and delay to the planning process. As this site sits closely to a residential zone, there is a greater risk that there will be objections to the Resource Consent application resulting in delays to the programme. Further consultation with the DCC will be required to determine if the Resource Consent process is suitable for this option.	H
c. ORC Consultation	The period in which ORC require for their consultation process provides great uncertainty and risk of the viability of the project and financial risk to other funding partners.	CST to continue discussion with ORC to try and obtain earlier commitment to the project	H
d. Construction Period	Delays to the construction programme resulting in missing the RWC 2011deadline.	The construction period allowed for option 2c and 2d is 26 and 24 months respectively. To expedite construction on site an advanced enabling works and offsite fabrication contract will have to be let. The construction programme will be assessed in greater detail during the next stage of the project as the design evolves with local contractors and suppliers. To achieve these construction periods an innovative procurement process will have to be adopted	H
e. Plan Change			NA
f. Land			NA

Key Challenge	Issues	Comments/ Mitigation	Risk Level (H, M, L)
3. Funding			
a. DCC	The level of funding required from DCC is $65M for options 2c and 2d	If this funding is reduced then CST will be required to source the shortfall from alternative sources. CST to continue discussion and negotiations with DCC	H
b. ORC	The level of funding required from ORC is $30M for options 2c and 2d	If this funding is reduced then CST will be required to source the shortfall from alternative sources. CST to continue discussion and negotiations with ORC	H
c. Other	The level of funding required from other sources is $49.5M for option 2c and $36.05 for option 2d	Horwath HTL have assessed this level of funding in the financial feasibility report. This is considered by HHTL to be an optimistic funding scenario. Evidence from the Westapac Stadium in Wellington has indicated that funding sources trend upwards once developments of this nature have commitment and support.	H
4. Partners			
a. University			NA
b. NZRU	Obtaining commitment from NZRU to provide test match rugby for the Stadium.	NZRU have expressed support for the CST options and consderation is presently being given as to how test matches might be rescheduled.This is subject to a commitment for the project proceeding which the funding and development partners must assist CST with	L
c. ORFU	Inability to agree terms and conditions for the agreement between CST and ORFU	Initial discussions are very positive. ORFU recognise that some form of agreement must be entered into and this will be progressed as soon as possible	L
d. Government	Inability to secure any funding commitment from central government	Nothing has been allowed within the funding scenarios for central government funding, based on the governments stance on improvements to stadia for the RWC 2011. Local government representatives and CST are to lobby local MP's and parliament	L

Key Challenge	Issues	Comments/ Mitigation	Risk Level (H, M, L)
5. Operational			
a. Multi-use and Events	The number and type of events that are projected within the operational feasibility are not realised	The assumptions made within the operational feasibilities can be considered of a relatively conservative nature	L
b. Community Support	Lack of support from the community for a redevelopment of the Carisbrook site	Keep the community informed and updated on the issues associated with the project	L

Construction Risks

The items marked with a * can be considered both a risk and an opportunity

ID	Risk	Impact	Action
1	Site contamination - ground	Low	Investigations during next phase.
2	Site contamination – existing buildings	Moderate	Test for asbestos, PCBs etc.
3	Soil conditions – insufficient load bearing capacity	Low	Bore log investigations
4	Site flooding	Low	Investigations during next phase.
5*	Dunedin construction market conditions	High	Discussions with local main contractors to identify capacity. Possible early contractor involvement.
6*	Availability of materials	High	Mixed materials where appropriate to mitigate potential demand pressures. Investigate pre-ordering possibilities.
7	ETFE material availability, cost and performance criteria.	High	Obtain written quotes and commitments.
8*	Availability of labour. Skilled labour for specialist structure, roof & cladding	High	Discussions with local contractors re design specifics.
9*	Programme – compressed construction period	Moderate	Construction programme reviewed with local main contractors when appropriate.
10	Programme – inflationary pressures	High	Avoid delay to project timescale. Allow sufficient Escalation Contingency
11	Escalation in costs	High	Allow sufficient Escalation Contingency. Monitor escalation during design period.
12	Programme delays (consent issues etc.)	Moderate	Manage consent process. Monitor programme.
13	Resource Consent / re-designation issues	Low	Manage consent process.
14	Pitch roof – services design issues	Moderate	Further investigation into ventilation and fire hazard issues.
15*	Pitch roof – option selection	High	Select option ASAP.
16*	Pitch roof – Contractor experience	High	Commence discussions with Contractors with respect to constructability
17	Surrounding infrastructure upgrade requirements	Moderate	Review traffic management reports.
18	Realignment of State Highway 88. Costing, timing and effects on site planning.	N/A	N/A
19*	Land costs	N/A	N/A
20	Existing land occupiers lease exit / relocation costs	N/A	N/A
21*	Design development / scope creep	Moderate	Allow sufficient design development Contingency in budgets. Provide further design information ASAP.
22*	Funding allocation and confirmation	Moderate	Identify sources. Obtain commitments.
23	Structural upgrade of existing stands	N/A	N/A
24	Services upgrade of existing stands.	N/A	N/A
25	Site accessibility – for construction	Moderate	Review sequencing of construction works. Review traffic management. Avoid requirement for out of hours work.
26	Requirement for staged construction	High	Review any possible requirements ASAP (cost plan does not allow)
27	Under-grounding of power cables	High	Seek advice from local power authority. Identify cost options.
28	Disruption to existing users & reduction in revenue	High	Manage.

6.5 Development Costs

Introduction

The estimates for Options 2c and 2d are an extrapolation of the estimates for Option 1a and 1b. In a similar manner to these options the estimate has been developed by comparing three estimate approaches, a base estimate from Davis Langdon, a check estimate from Rawlinsons (pro rated from their Option 1a estimate) and a benchmark review.

Davis Langdon's estimate is included in the appendices. The benchmark data is as shown in Section 2.9.

Estimate

a) Estimate

Element	Value
Stands	$132,020,000
Siteworks	$7,615,000
Escalation Contingency	$13,870,000
Construction Contingency	$15,350,000
Consultant Fees	$19,420,000
Sub Total	$190,775,000
Fixed Roof	$46,555,000
Trust Costs	$2,600,000
TOTAL excl. GST	$237,430,000

b) Pro-rata with Rawlinsons estimate

Element	Value
Stands	$135,000,000
Fixed Roof	$46,555,000
Trust Costs	$2,600,000
TOTAL excl. GST	$184,155,000

c) Benchmark Analyses

Element		Value
Stands	30,218 at $4,000/seat	$120,872,000
Fixed Roof		$46,555,000
Trust Costs		$2,600,000
TOTAL excl. GST		$170,027,000

Analysis

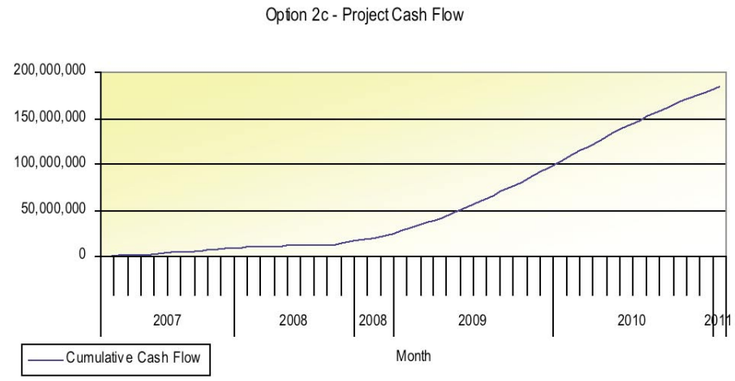
The comments made in comparing the estimates in the 'Analysis' part of Section 2.9 apply to these options.

Summary

An appropriate estimate for Option 2c is $184,155,000 and $131,050,000 for Option 2d.

6.6 Development Cashflow

The graph below indicates a cumulative cash flow for Option 2c. The graph assumes that DCC makes a positive commitment to put this option forward to public consultation.



A monthly project cashflow is included in the appendices. The cashflow has been developed using a normal construction industry S curve.

The period March 2007 to May 2008 allows for Resource Consent, concept design and developed design. Construction starts in October 2008, which sees the cashflow accelerate.

Option 2d

Option 2d is comparatively similar to the expenditure profile of this option albeit at a lower construction value. A detailed monthly cashflow for option 2d is included in the appendices for information.

Working Capital

As with option 2a and 2b, there are two critical periods for provision of working capital. The first is the period March 2007 to July 2007. CST believes that additional design needs to be undertaken over this period to enable DCC to make a more confident decision on July 2007, along with receiving public feedback on the option. In addition the work will allow a prompt submission of resource consent documents should DCC determine that this option is to be progressed. The likely expenditure over this period is $800,000.

The second critical period is from July 2007 to July 2008. The latter date being the assumed date that ORC will make a final decision on its involvement in the development.

The likely expenditure over this period is $11,000,000. This will cover the bulk of design, the Resource Consent process and Trust activities associated with obtaining funding.

Funding of this working capital needs to be discussed between DCC, ORC and the Community Trust of Otago. There are various precedents with other stadia for how similar parties have split this risk capital.