

## 2 Design Considerations

### 2.1 Site Treatment

#### 2.1.1 Skyline

The skyline is primary importance. It is clearly seen from State highway 1, South Bay Parade and from multiple viewpoints on the sea. The skyline is currently a mix of landform broken by taller exotic trees. The proposal looks to remove most of the exotic trees over time, leaving only native planting on the side-slopes of the peninsula. Any building design should carefully address its impact on this landform. The building should be low, gently curved, and without sharp protrusions. Ideally it should be dug into the slope, to allow for a useable interior space without significantly breaking the skyline. Because the building will generally be viewed with the sun behind it (to the north), the overall form will be clearly visible as a silhouette. A low curving form will match the landform of the peninsula.

#### 2.1.2 Cut (Enclosure, Wind, and Views).

The main area of the hot pools will be cut another metre into the slope. The three main points to consider for this site specific hot pool design are:

A) Wind. The site needs to be free from wind. No matter what the temperature, the chilling effects of wind are magnified on wet skin.

B) Enclosure. While sitting for up to an hour in the same space, it is important that a sense of space and enclosure is created. This is our ideal oasis remember, and it should feel like it is nestled into the slope creating a feeling of security rather than hanging off the side of a hill.

C) Views. The hot pools have been oriented to take advantage of the best views, which are actually towards the coastline. This also applies to the hydroslide, which should have clear perspex sections when the slide is oriented towards the sea. This is not just any hydroslide!

#### 2.1.3 Protection of side-slope

While the exotic trees are to be removed over time, the existing native vegetation will be retained and enhanced. The access to overflow parking in the racecourse, and the setting out of the hydroslide need to remove as little vegetation as possible. The hydroslide should be of muted colours or transparent.

#### 2.1.4 Masterplan Layout

This layout diagram shows the overall strategy of the site. While stage 1 is created, stage 2 can be planted in preparation for further development, which will be then set in amongst semi-mature trees.

# ANALYSIS STRATEGY

## 1. SKYLINE

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## 2. CUT (ENCLOSURE, WIND, VIEWS)

The main area of the hotpools will be cut another metre into the slope. The three main points to consider for this site specific hotpool design are:

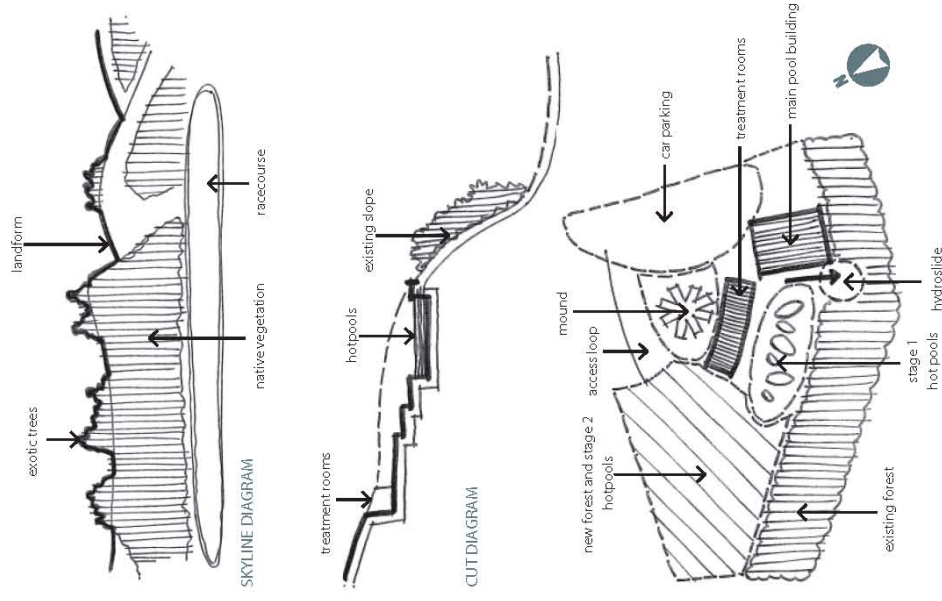
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## 3. PROTECTION OF SIDE-SLOPE

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## 4. MASTERPLAN LAYOUT

This layout diagram shows the overall strategy of the site. While stage 1 is created, stage 2 can be planted in preparation for further development, which will be then set in amongst semi-mature trees.



**Boffa Miskell**

## 2.2 Design issues

Given the functional and environmental challenges posed by pool design, together with the significant risks associated with underperformance, it is not surprising that many of the main design issues concern the mitigation of operational risks. However, before detailed performance is considered, some big-picture issues need to be addressed.

## 2.3 Ancillary spaces

The arrangement of support spaces has a considerable impact on ease of use and the long-term cost-effectiveness of the pool. In addition to optimising area allocations, there are operational and safety issues to be considered, which may create challenges on a highly constrained site:

- Changing areas should ideally be adjacent to the shallow end of the pool
- Spaces for covers and so on need to be immediately adjacent to the pool tank
- Adequate space must be provided for the storage of equipment
- Plant rooms must be provided for filtration plant, movable floor control gear and other systems.

## 2.4 Building services solutions

Building services installations in pools deal with large heating and ventilating loads in a highly corrosive atmosphere. Selection of the systems can have a significant impact on the base build design, operating costs and the management regime. Three areas to consider are:

**2.4.1** Design of the system to manage pollutants Pool environments are highly corrosive and the ventilation and extract system can be used to contain the zone of polluted air above the water surface, taking extract air through "dry ducts" incorporated into the pool overflow system.

This system also reduces the metal work in the pool hall by removing the need for high-level extract ductwork.

**2.4.2** Requirements for builders' work Dry duct systems have extensive requirements for builders' work that will increase the capital cost of the pool. However, the ducts can also be used as services distribution routes, which may lead to savings in capital and maintenance costs associated with the building services installation. More conventional systems that use high-level extract will require dedicated service routings around the pool tank.

## 2.5 Building performance issues

Pool design involves a number of technical challenges and the consequences of defects can be more severe than for many other public buildings. However, there are many successful projects from which lessons have been learned and a risk-adverse approach to design is likely to be in the best interests of the client. Areas to focus on include:

### 2.5.1 Control of condensation

Condensation and corrosion are inherent problems in swimming pool design, where control of condensation has become more challenging as pool temperatures have risen in line with user expectations. To avoid condensation, air temperature must be kept 1°C above the water temperature. Air in swimming pools is also very humid, so if there are failures in either insulation or the vapour barrier, the consequences can be severe. Design measures include using stable insulation, use of low conductivity materials such as glulam timber in the pool hall and the design of the heating and ventilating system to direct warm, dry air over the internal surface of the facade to minimise condensation. Use of pool covers outside of opening hours also helps to control both evaporation and condensation and lowers water heating bills.

### 2.5.2 Leakage from pool tank and surround

Leaks can come from failures in the casting of the concrete tank shell or from applied waterproof coatings. The pool tank itself should be tested for integrity before backfilling operations and so on.

### 2.5.3 Glare and pool hall safety

Natural light is an important feature in pool design - to provide contact with the outside world and visual interest for swimmers and to reduce lighting costs. Most natural lighting can be provided from high-level roof lights and presents only a limited risk of glare. Side lighting, an increasingly popular design feature, can create glare and unwanted reflection, which can result in risks to users, such as not being able to distinguish the pool edge. The risk can be addressed by considering the extent of glazing, its orientation and control of contrast.

## 2.6 Operating costs

Key issues in controlling operating costs include:

- 2.6.1 The selection of the filtration system until recently, ozone was the market leader. Because of high water turnover rates, ozone-based systems are widely believed to provide the highest quality water. However, they need larger plant rooms and have the highest operating costs, partly because of the need to generate ozone on site. UV systems are also highly rated, because they need very low levels of chlorine, cause little swimmer discomfort.
- 2.6.2 The design of surfaces and selection of easy clean materials. An effective cleaning regime is important in pools, not only to maintain good appearances but for health and safety reasons. Careful selection of non-slip tiles and the specification of falls that balance public safety and effective cleaning are important.
- 2.6.3 Avoidance of high maintenance materials. These include exposed architectural concrete, porous masonry and ceramics, structural glass and certain grades of stainless steel.

## 2.7 Safety and security of users

Key safety issues include:

- 2.7.1 Providing clear sight lines for supervisory staff in the pool hall
- 2.7.2 Avoidance of circulation pinch points, level changes and trip and catch hazards in all public areas
- 2.7.3 Adequate provision for safe storage of equipment and teaching aids.

Personal security concerns users more and more so the design of changing areas and glazing has to take into account the prevention of antisocial behaviour. New risks - and public awareness of these risks are always emerging and pool design must respond to these.

## 2.8 Co-ordination of filtration and equipment specialists

A high degree of co-ordination between systems is needed, and many specialists operate in strategic alliances.

- 2.8.1 Drafting of performance standards
- 2.8.2 Pool performance standards are open to a degree of interpretation so it is important to draft the specification to cover a full range of operational circumstances. This needs to address:
- 2.8.3 Overall system capacity
- 2.8.4 Performance at different rates of throughput
- 2.8.5 System resilience and back-up capacity.

## 2.9 Design and Build Recommendation

**CPM recommends the pre selection of a list of filtration, pool equipment and HAVC subcontractors by the client before the selected Design Engineers proceed to drawing design phase. This will result in a high level of design build input, which will reduce the need of expensive design changes and more expensive variation claims made throughout the life of the contract against the client due to unsuitable design.**

## 2.10 Area Specs

Kaikoura Pool Complex			
CONCEPT INDICATIVE AREA SCHEDULE			
Main Pool Complex Curved Roof			
ACTIVITY AREA	FACILITY COMPONENTS	FEATURES	AREA SCHEDULES
Indoor Aquatic Ground Floor	Main Public Pool 25m Pool with 8 lanes (2.5m wide lanes).  Water depth 1.4m to 2.1m	Pool	25
		Wet Deck – 0.5m around pool edge Concourse	0.5 54
			20 Pool 92 Wet Deck 1.5 Concourse 1.617 Concourse 1.8 Concourse 2.5 Concourse
		Volume	27
		1.4 1.75	2.1 1.75
			Volume m3= 875
			<b>Main Pool Area</b>
			<b>747.803</b>
	Admin/Office		4.5
	Life Guard Station		9.2
	Store Room		4.1
		Concourse	8.4
		Concourse	2.8
		Concourse	2.9
		Concourse	17.5
		Concourse	4.5
		Concourse	2.3
		Concourse	6.9
		Main Stairs	3.9
		Lift	2.4
			6.9
			2.2
			2.5
			28.5
		Seating	71.25
			199.84
			31.5
			37.72
			21.84
			50.75
			10.35
			15.87
			9.75
			16.56
			5.5
			167
			no pacs =
			5.22
			32
			2.5
			6
			7
			42
			Pool
			47 lm
			Pool Shaped
			2.3
			7
			Concourse
			8.2
			1.6
			Concourse
			0
			Concourse
			0
			shaped
			0
			seating
			60
			Volume
			0
			0.3
			Volume m3=
			6
			0.15
			Volume
			0.3
			1.2
			Volume m3=
			118
			0.75
			Sub Total Covered Pool Floor Area
			1396.118
			Young Pool Area
			377.22
			42
			157



**Kaikoura Pool Complex**  
**CONCEPT INDICATIVE AREA SCHEDULE**

**Main Pool Complex Entrance 1st Floor**

ACTIVITY AREA	FACILITY COMPONENTS	FEATURES	AREA SCHEDULES	TOTAL AREA (m2)
Front of House Areas 1st Floor	Entrance Reception  Café café Gym/Other Circulation Stairs Lift Gym Changing in stand alone structure	Reception  Deck		40 80  143 64 176 31.6  21 7 50
<b>Total Estimated First Floor Public Service Floor Covered</b>				<b>612.6</b>

**Kaikoura Pool Complex**  
**CONCEPT INDICATIVE AREA SCHEDULE**

**Pools**

		Water Temp 26C to 27C	1.4	2.1	Volume m3=	875
Toddlers pool Water depth 0m to 0.300m Beach entry Keep separate water		Water depth 0.0 to 0.3	6	7	Pool	42
		Water Temp 26C to 27C	0.1	0.3	Volume m3=	8.4
Leisure Area (young) Water sprays and leisure water features including slides etc Water depth 300 to 1.2m		Water depth 0.3 to 1.2	47 lm		Pool	157
		Water Temp 26C to 27C	0.3	1.2	Volume m3=	125.6
<b>Areas Indoor Pools</b>						
Total m2= 199						
Volume m3= 1009						

*Water Temp 26C to 27C*

*Water Temp 33C to 42C*

**Outdoor Hot Pools**

Hot Pools	Deck Pool Deck Pool Pool A Pool B Pool C Pool D Pool E Pool F	Water depth .900 average Water Temp 33C to 42C	26 28 63 70 69 53 42 105	M2	32 22 79 81 84 53 38 101	Volume m3= Volume m3= Volume m3= Volume m3= Volume m3= Volume m3= Volume m3= Volume m3=	28.8 19.8 71.1 72.9 75.6 47.7 34.2 90.9
		Water depth .900 average	no pacs =				456
		Water Temp 33C to 42C	0.9 average				Volume
<b>Areas Outdoor Pools</b>							
Total m2= 490							
Total Litres 441,000							
Volume m3= 441							