

## 4.0 Materials Outline Specification

### Siteworks

- Roading/Parking Areas: Asphalt
- Kerbing: Precast Concrete
- Pedestrian Areas/Courtyards: Coloured concrete pavers and exposed aggregate
- Fixed Seating: Selected hardwood, on galvanized steel brackets

### Building Exterior

- Roofing: Kingspan panel
- Barges & Fascias: `Colorsteel`
- Box Gutters: 2 ply Membrane on Kingspan to falls, with proprietary sump and snow boards over
- Downpipes: Painted galvanized steel pipe where exposed, pvc where concealed
- Main buildings exterior walls : Kingspan panel AWP with matching flashings
- Roof gable end: Kingspan Wave with matching flashing
- Roof soffits: Painted flush jointed 9mm villa board
- Sun screen: Dark stained H3.1 treated dress finished timber slats (75x50) secured to hot dipped galvanised steel support
- Exposed steel work: 200 micron spray metallic aluminium with acrylic sealer)
- Windows & Doors: Powdercoated aluminium commercial grade (Flush glaze system)
- Glazing: Double glazed, exterior glass `Evergreen`, internal glass clear
- Deck Handrail – frameless glass system handrail
- Deck floor – Non-slip ceramic tiles

### Building Interior

#### Level 1 Floors (all concrete construction with coverings as below)

- Wind Lobby: `Advance Startread II` matting
- Lobby : large format ceramic tiles
- Main Lobby Stairs : Terrazzo
- Main Concourse: - polished patterned/cut concrete.
- Pool Concourse/Learners /Playpen/Sauna/Steamroom : Nuplex Traxite
- Staffroom/ Reception/ office : Direct stick Commercial grade carpet tile
- Pool Staffroom change area : Nuplex Traxite
- Café servery: 300X300 non slip tile
- Café kitchen and Food servery areas: 2mmVinyl
- Café Seating : Carpet tiles
- Wet Change rooms, Meet Control : Nuplex Traxite
- Dry Change Rooms and Public Toilets: 2mm Vinyl
- Pool hall Stairs/Landings: Precast concrete, Nuplex Traxite non-slip finish, drains to landings
- Other stairs and Landings: Precast concrete
- M&E, F&T Plantrooms/Stores/cleaners: Steel trowel concrete slab to falls, clear sealed with 150mm concrete nib
- All showers : Non-slip tiles to showers
- Medical Centre – Carpet tiles and 2mm Vinyl
- Sports hall: Main Floors – Tarkett Omnisports Pro.
- Sports hall: Drop in Tournament Floor: FeildTurf Tarkett – Indoor Multiflex M Beech – interlocking panels to International netball size.

#### Level 1 Walls

- Structural Walls/Columns (Public Areas): Precast concrete, no finish
- Structural Walls/Columns (Plantrooms/Stores): Precast concrete, no finish
- Solid partition Change rooms office: H3.2 treated timber frame on 150mm concrete nib with painted flush jointed 9mm Villaboard (ceiling height) and unfinished precast concrete wall
- Solid Partitions : Precast concrete, blockwork & H3 treated timber frame on 150mm concrete nibs with 9mm Villaboard linings, paint finish

- Plantroom Partitions: H3 treated timber framed walls, on 150mm concrete nibs, Villaboard with pvc jointers, no finish
- Pool Shower : wall tiles on Villaboard backing
- Café kitchen wall: Hardiglaze with PVC jointer. ( splash back and wash area to operator fittout)
- Glazed Partitions: Powdercoated aluminium commercial grade
- Glazing: Single glazed, clear glass
- Cubicles partition : Proprietary compact laminate partitions and doors with SCP hardware
- Structural Steelwork: 200 micron spray metallic aluminium with acrylic sealer
- Main hall: 18mm plywood, p9olyurethaned to 3.6m, painted gib board above

### **Level 2 Walls**

- Structural Walls/Column: Precast concrete panels/columns, no finish
- Solid Partitions: Precast concrete & H3 treated timber framed, on 150mm concrete nibs, 9mm Villaboard linings to all wet areas, and 13mm gib to remaining areas, Level 4 stopping and paint finish
- Glazed Partitions: Powdercoated aluminium commercial grade
- Meeting room Operable partitions: Proprietary operable partition min STC 45
- Glazing: Single glazed, laminated glass clear
- Stair & Landing Balustrades: Cantilevered frameless clear glass
- Structural Steelwork: 200 micron spray metallic aluminium with acrylic sealer

### **Level 1 Ceilings**

- Entry Lobby and Reception: Selected concealed suspended ceiling
- Atrium Lobby: 13mm Gib, level 4 stopping and paint finish
- Pool Spaces: `Ecophon` acoustic panels prefinished on H3 timber ceiling battens on ventilated cavity, H3 LVL timber purlins
- Pool Hall Main Beams: Line with Kingspan panel
- Pool Bleachers: 9mm Villaboard flush jointed , paint finish
- Plantrooms, Stores: Villaboard with pvc jointers, no finish
- Main hall: Ecophon` acoustic panels prefinished on metal suspended grid with hold down clips.
- Main hall beams: 200 micron spray metallic aluminium with acrylic sealer

### **Miscellaneous**

- Bleachers: GRC on H3 timber framing, paint finish
- Pools: `Myrtha` supply & install complete
- Beach/Pool Surrounds between Drains: Non-slip ceramic tiles
- Hydrosides: Proprietary seamless fibreglass tubes, paint finish, on steel tube structure with zinc & aluminium spray corrosion protection
- Pool Fixed Seating: Selected hardwood, clear finish, on galvanized steel brackets
- Trim: Anodised aluminium
- Lift: Glass lift (Machine room-less lift system)
- Powder coated aluminium frame to all internal doors
- Main hall seating: Propriety Galv Steel sectional removable seating with Polyprop seats. (seating for 3000)
- Court markings: Coloured taped markings for Netball, Basketball, Badminton and Volleyball.
- Toilet Suites: medium range porcelain with integral flush system and plastic seats.
- Shower Suites: fixed rose with mixers.
- Security System: Card access system to key arras.
- Monitored Fire Alarms and Smoke detectors

## **5.0 Geotechnical and Foundations**

No subsoil investigation has yet been carried out on the site.

The site is on the bank of the Ashburton River and can reasonably be inferred to be a typical Canterbury Plains river terrace composed of greywacke based alluvial silts, sands and gravels. Such soils typically provide reliable medium strength bearing which is generally reasonably consistent. No special foundations are expected to be required with cantilever sockets integral with flat pads being required for the main columns and simple flat pads elsewhere.

The soils are expected to be free draining with a very low risk of a perched water table and high ground water is not expected. Flood levels will need to be determined during the developed design stage of the project to ensure that the lowest part of any pool is well above any possible flood or ground water level. This is necessary to preclude any gross loss of heat energy to the ground water.

## **6.0 Structures**

The main frames to both the Aquatic Centre and the Events Centre/Sports Hall are presumed to be comprised of

- Pairs of cantilever precast concrete columns supporting pairs of deep horizontal steel lattice trusses laced together after erection to form very stable box section trusses
- Steel UB section secondary portal frames supported by the cross trusses with steel purlins in the Events Centre and LVL (treated timber) purlins in the Aquatic Centre
- The upper level floors are precast flooring units supported on reinforced concrete frames.
- The balance of the structural framing is conventional steel UB sections and steel purlins
- The cantilever columns and rigid panel roofing provide the necessary bracing resistance in the Aquatic Centre and conventional roof bracing will be installed through the rest of the structure.

Durability of the Aquatic Centre Frames is provided by ensuring all steelwork is in the delivery air stream and therefore only in contact with dry warm air with no contaminants from the pool. Any steel exposed to the pool environment will either be coated with 200 microns of sprayed metallic aluminium sealed with acrylic or be T316 stainless steel. All timber products in the Aquatic Centre will be treated H3 and all fasteners either stainless steel (bolts) or hot dip galvanised (nails).

## **7.0 Pool Construction**

The use of Myrtha technology is recommended for the pool tanks. This technology comprises bolted together modular buttressed stainless steel wall panels with vinyl bonded to the water face and concrete floors over-lain with vinyl sheeting. All vinyl to vinyl contacts are then jointed by thermo-welding or liquid PVC giving tanks guaranteed to be water-tight for 10 years. Heavy duty purpose-made swimming pool tiles are used around all top surfaces to give a first class finish. The initial cost of these pools is higher than a tiled concrete pool but they are virtually maintenance free in comparison and can accommodate small movements that would fracture a concrete pool. Padding can be placed under the floor vinyl in the toddlers' and learners' pools and will be greatly appreciated by swimmers and coaches working in the pools.

The spa pool can also be constructed of Myrtha components to obtain the advantages of water-tightness and simple construction but with a tiled concrete floor slab overlying the vinyl to avoid the risks of it stretching in the hot water.

Myrtha pools typically have significantly less embodied energy and create less CO2 emissions in their manufacture than equivalent concrete tiled pools.

## **8.0 Water Quality**

The use of diatomaceous earth filtration is recommended as opposed to sand or other media. DE has the ability to filter out the oocysts of cryptosporidium and giardia which sand does not. Pressure DE is preferred to Vacuum DE because of its considerably lower operating costs and for its simpler operation which does not require the same level of staff skill.

UV is recommended for the main disinfection. This process is carried out by passing all the recycled water through a chamber surrounded by fluorescent tubes emitting ultra-violet light. The UV light kills bacteria and other organisms very efficiently, particularly in water with high clarity as is provided by DE filtration. UV has an added advantage in that it breaks down chloramines and tri-chloro-methanes which are the compounds that cause tiredness, asthma symptoms, eye irritation and the distinctive "chlorine" smell associated with indoor pools. Large leisure pools in the UK using UV have been able to run with very much reduced chlorine residuals in their pools which is an added advantage in operating cost and internal conditions. UV plant is more reliable and effective than ozone gas which has to be carefully handled due to its lethal nature. To provide the necessary chlorine residual the use of sodium hypochlorite with pH correction by gas CO<sub>2</sub> is proposed. The use of on-site generated 1% solution of sodium hypochlorite as an alternative to the commercial product should be considered at the developed design stage for both long term economy and improved chemistry reasons.

## 9.0 Heating and Ventilation

The most economic and energy efficient method of heating indoor pools is by use of heat pumps coupled with run-around coils recovering both sensible and latent heat from the exhaust air stream and returning this to the incoming air. This method allows a full fresh air system thus eliminating the build up of chemicals in the pool environment and avoiding stagnant air. Boost heat is likely to be most economically provided by use of LPG though this should be further investigated at the developed design stage to take account of likely tariffs.

The pool hall must be well insulated and isolated from the rest of the buildings by a complete vapour barrier envelope to avoid deterioration through condensation. This will be achieved by the use of prefabricated steel faced PIR (poly-iso-cyanurate) core panels to the roof and a combination of these and extruded polystyrene with glued T&G joints to the walls. All insulation will be concealed in accordance with the fire code.

The concept presumes ventilation of the pool hall via ducts formed by the encasement to the rectangular trusses with outlets both direct to the pool hall and also via the ceiling plenums. Ventilation rates will be automatically controlled in the pool hall to maintain temperature and humidity at optimum levels. Tempered fresh air will be ducted to all other areas to maintain comfortable temperatures and provide the necessary ventilation.

## 10.0 Fire Safety

In accordance with normal practice an alternative solution will be proposed for the Aquatic Centre. This solution results in the elimination of sprinklers and/or detectors that would normally be required on the following grounds:

- There is very low fire load as most construction is non-combustible or has a predictable and slow charring rate
- The pools must be supervised at all times when they are open
- The life guards will give the alarm if a fire breaks out and it can be shown that the occupants would all have vacated the building before alarms triggered by detectors could have activated
- Detectors have a very short life in the corrosive environment of a swimming pool
- It is virtually impossible to service detectors above swimming pools because of the difficulty in obtaining access.

The size and occupancy of the sports hall will almost certainly dictate the use of sprinklers in that area. In order to have a partially sprinklered building it will therefore be necessary to divide the two major portions by fire-rated construction into two separate fire cells. This has been taken into account in the planning.

Large numbers of egress doors are required, especially in the sports hall which can accommodate 3,000 people for a large event.

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