

**King's Cross Central Limited Partnership : King's Cross Bathing Pond - Operations and Management Manual**



### **Artistic Concept :**

The project is the fourth of 4 under the curated RELAY Public Arts Programme at King's Cross and is a concept by Ooze Architects (Eva Pfannes and Sylvain Hartenberg) and the artist Marjetica Potrc.

• **“Of Soil and water’: King’s Cross Pond Club** is a temporary project located at the heart of the King’s Cross Central development. The project creates an enclave for public use in the private land under construction. People who enter the site must agree to certain ‘house rules’.

• **The King’s Cross Pond Club** will be a place to swim and relax in a secluded atmosphere only a 10 minute walk from the King’s Cross station. The water for the swimming pool is purified through a natural process using wetland plants.

• **Key ideas:** – Swimming in a natural water-treatment environment - The nature of public spaces in London. – A living laboratory – Balance between interaction and observation by users – A body of land and water that tests the balance between oneself and nature

The King’s Cross Bathing Pond is a temporary (24 month) artistic installation within the Kings’ Cross Central Development. General admission to the enclave can occur during manned operating hours, with dedicated swimming during daylight hours: this will be facilitated via a ticketing system. The pool will be manned – by lifeguards, dedicated security and ‘hosts’ – and will be maintained via a daily, fortnightly and annual monitoring regime. The King’s Cross Central Limited Partnership are the Commissioners of the piece under the Relay Programme – part of the site S106 obligations regards delivery of public art. Carillion are the core contractors overseeing the build, who are in turn sub-contracting with a full team, including a dedicated water management specialist, Kingcombe Aquacare, who are experienced in delivering new swimming pools and ponds via the water engineers.

**Themes** – opening up development site; environment and sustainability; new amenity and public realm; swimming in natural waters; ‘an oasis within a desert’

### **Natural Pool operations across Europe and the technology involved :**

This will be the UK’s first public man-made swimming pond. Yet precedent is set throughout the EU with over 900 public swimming ponds belonging to hotels, communities and campgrounds in (mainly) Germany, Austria and Italy - some pools in Germany host up to 5000 guests each day.

Biological water purification must fulfil stringent hygiene requirements. The pool design follows rigorous German / Austrian regulations. There is no equivalent in the UK (as there is no public man-made Swimming Ponds) but follows these regulations via ‘The performance of Public Swimming Ponds – an overview of Hygiene in Pools with Biological Water Purification’, compiled by the International Organisation for Natural Bathing Waters’. Clear, clean water is the naturally occurring state in ponds and lakes if the body of water is large and deep enough. Swimming ponds are purposely built to emulate this state.

A conventional swimming pool uses chemicals to kill micro-organisms in the water. This isn't necessary in a natural pool where the cleaning work is carried out by micro-organisms which exist together in equilibrium. This is the basic principle of a swimming pond - to use the natural purifying properties of plants and micro-organisms to sustain clean, clear and healthy water.

So, the natural pond is a purpose built swimming pool that keeps clean by using natural processes. It is completely free of chemicals, instead it relies on water plants and nutrient mineralisation to keep the water clean. Water quality is distinguished by two main factors, limnology and hygiene.

Limnology – The natural water cycle of the pond involves various processes and forms a natural chain that includes phytoplankton (algae) and zooplankton (small organisms that feed on algae). The density of these fluctuates with temperature, light and the availability of nutrient in the water column. Consequently the 'living' pond has natural rhythms where cloudy water can be controlled naturally.

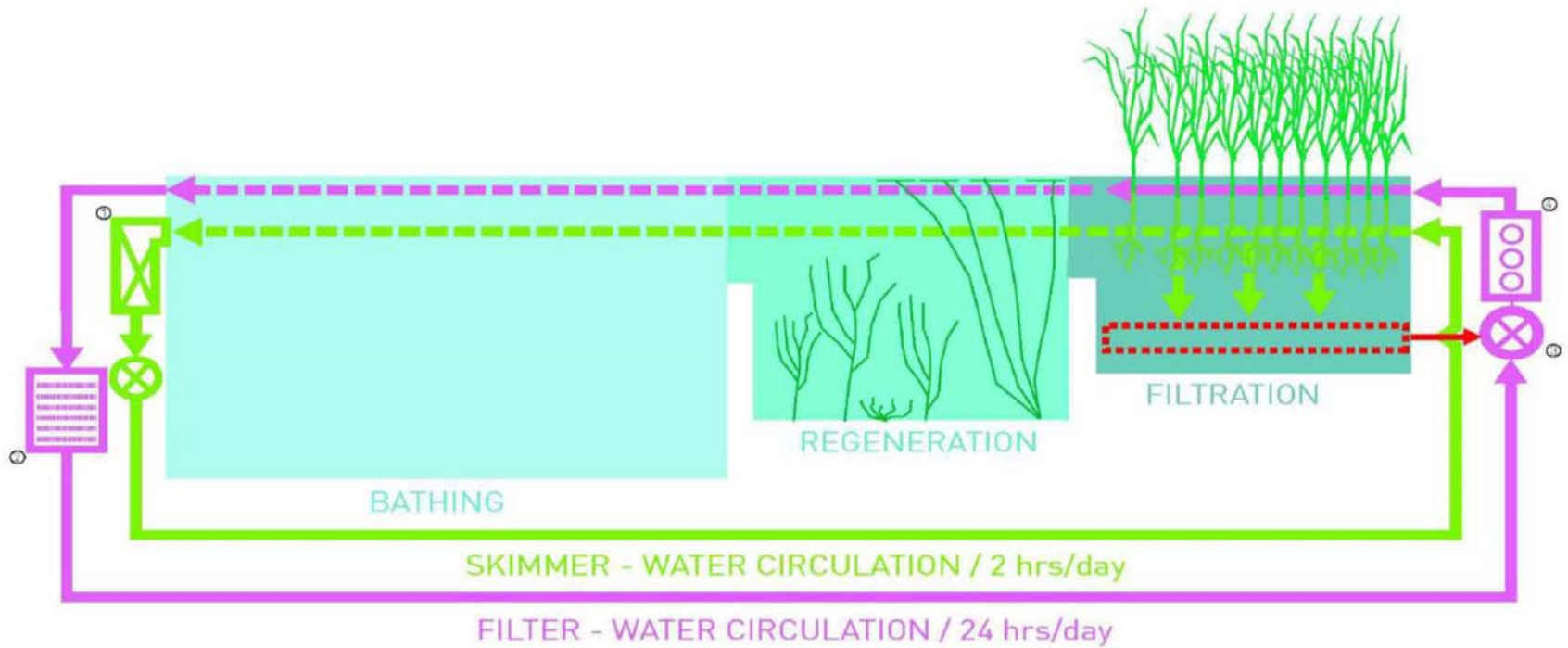
Water plants control free nutrient within the water column. As submerged plants grow they absorb nutrient and turn it into plant mass, this helps to reduce the frequency of algae. They further improve water quality by adding oxygen to the water during daylight hours.

Hygiene – The Biotop pool consists of a fine gravel substrate area planted with reed type species. Essential mineralising bacteria colonise the surface area of the substrate. A slow draw down process through the filter bed allows the bacteria to mineralise organic substances in the water column. The plant filter also helps to filter out particulate impurities from the system. As most bacteria obtain nourishment from organic substances their number is kept to a minimum by controlling the nutrient loading within the pool. The water body is kept free as far as possible from external influences (dirty water, animal waste etc) that may cause imbalances of water quality and potential contamination.

#### **How the pool will work :**

The pool system has a series of surface skimmers and external pumps, which circulate the water at specific rates. These are operated by a timer system to ensure that water is recycled in the designed manner. Water loss through evaporation and splash is automatically replenished from the mains water supply. This water can often have a very high phosphorous content. In this instance the pool system can be augmented with phosphate binding modules to help reduce the excessive loading on the natural system. The number and size of these filters is specified following a water test analysis taken at design stage.

An image follows that highlights the 24 hr working of the system and the various aspects of filtration and water flow.



skimmer



biofilter



pump



phosphate absorber

### **Operations and Maintenance of the Pool (including addressing wildfowl/vermin) :**

Operation - Daily function of the natural pool pump, filtration and water top up elements will be automated via a control panel with timer function. No intervention should be required unless carrying out specific maintenance tasks.

Maintenance – The pool has a degree of self-cleansing but the measures listed below are essential for good water quality and long term function. Nutrients enter the water via atmospheric measures and swimmers

The water requires a simple test each morning – a visual test as to the water clarity and for any foreign substance that may have entered the water overnight, which will be removed. In addition, a check is required that the pumps and filters that continue to circulate the water and cleanse as it passes through are running as they should do:

#### *Daily:*

1. Remove and empty the skimmer baskets, taking all material away from the pool.
2. Remove any obvious floating material or items from the pool floor using a long handled pool net.
3. Visual check of pump/filtration equipment for damage.

#### *Fortnightly:*

1. Backwash all of the 'Phostec' filters in the filter line.
2. Check the biofilter units and clean the top two layers if they start to get clogged (normally every 3months).
3. Manually fill the pool from the mains supply as required, to replenish water loss through evaporation, evapotranspiration and splash
4. Vacuum the base of the swimming area to remove accumulated detritus. Send the cloudy water to a designated surface water drain.
5. Perform a water test to check the quality in line with the German FLL guidelines. The frequency may reduce to 3 weekly or monthly, following a period of 'bedding in'.

#### *Annually:*

1. Cut back and remove excess or dead/decaying plant material. Take away from the pond and compost.
2. Electrical safety check by a qualified electrician.
3. Periodic deterrence of wildfowl using a qualified falconer and erection of a net over the pool to exclude water fowl during periods of fallow use.

*In addition:*

1. Setting and regular checking of rodent control measures.
2. Daily litter pick to remove food and rubbish from the surrounding land (to include changing litter bin liners)

### **Tickets and payment :**

General admission to the enclave is possible during dedicated staffed hours. Access to the pond to swim\* will be during specified hours and via ticket only. These will be available online (with a dedicated page added to [www.kingscross.co.uk](http://www.kingscross.co.uk)) or at the King's Cross Visitor Centre. A small amount of tickets will be available on the gate on the day (clear communications will be set out at the site entrance outlining how many tickets are available and when/if these are sold out). The amount available may well fluctuate with conditions – the weather; the popularity of the pool; how long people stay etc.

The swimming sessions will be programmed to incorporate access for different users i.e early mornings for Open Water enthusiasts; family sessions mid afternoon; free sessions for site residents and tenants after work etc. Swimmers will swap their tickets for a Natural Pool wristband. Different colours may be used to indicate different sessions.

Prices are yet to be set but are likely to be pegged to the cost of an adult swim within the new leisure facilities at Camden's B3 Civic Centre building on site.

*\*There may be periods where the pool is not in use (say, during shift changes or busy periods) where the site may be accessed by dedicated site tours i.e regular sitewide tours as led by the staff of the Visitors Centre, whereby the public can visit the pool and surrounds to see the art installation but not to swim. Indeed, we have agreed with Ooze that the pool may be closed for swimming one or two days a week to allow for maintenance, increasing potential numbers on other days and allowing people who may not choose to swim to visit.*

### **Access and Egress, Signage :**

Access will be via pedestrian walkway from Tapper Walk, circa 250metres. This will be a dedicated access point, signposted from Granary Square and York Way. The walkway will be tarmacked for open access to all. At one end will be details of the pool including ticket availability and some background.

The main entrance will have a dedicated entrance booth, to be manned daily by site 'hosts'. They will exchange tickets for wristbands, explain the basics of the site and swimming and encourage the public to read the 'House Rules' and other information boards.

Movement around the plot and pond will be via a tarmacked walkway and ramp. Access up to the pool will be via two means; one set of steps opposite the shower area and a compressed ramp to the 'pool edge. There is an embedded ledge deck within the shallower swimming area for ease of access.

The pool itself will have three set of ladders for access and one shallow deck entrance for paddling / play. Ground mounted depth marker plates will display water depth in key areas.

**Emergency procedures :**

The first point of contact for any issues relating to the swimming pond will be the lifeguard personnel (please see RLSS for guidance on specified numbers). Emergency evacuation will be announced by one of the lifeguards.

Exits will be clearly marked. The primary point of egress will be the main pedestrian route, back to the main public realm of King's Cross. This route back to Tapper Walk will also count as the primary gathering point in case of emergency.

Emergency vehicles can access the plot. Whilst they will not be able to drive onto the site itself, they will be able to reverse into the south east corner of the plot, which is fully tarmacked. Staff will also be able to access via the pedestrian entrance on Tapper Walk.

The pool system itself can deal with small fluctuations in water quality as it has a certain amount of buffer capacity. However bathing water quality can be affected by the presence of faecal matter, normally the result of a 'nappy explosion' or similar incident. If faecal contamination is suspected, the lifeguards the offending matter is removed as soon as possible and the pool left to 'clear'. During this period no bathers should use the pool. A water test will confirm the bacterial count (particularly E. coli) and dictate when swimming can continue again. Normally over 90% of E. coli contamination will die off within 1-3 days after contamination. Generally the procedures will follow PWTAG faecal contamination guidelines. After day one of a 'solid' incident, the pool water will be tested and a result given within two days. After day three of a 'loose' incident the same testing procedure will be employed.

Should there ever be a need to 'purge' the pool of water, water can be removed via the main sewer system, given there are no chemicals involved in delivery and running of the pond.

All emergency procedures will be outlined as part of the core 'House Rules' that all persons that access the site will be directed to read.

**Set up (i.e changing rooms, toilets, showers) :**

Dedicated toilets will provide 3 female, 1 disabled and 2 male cubicles.

There will be changing rooms, one with wider access for wheelchairs / families with pushchairs.

Showering before entering the pool is an important part of the balance of the system. All ticketholders will be informed of this before and dedicated showers near to the pool access points will be available.

**Special users : Children, Elderly, Disabled, Wheelchair users.**

Access to the plot is open to all. The pedestrian access point will be wide enough to accommodate all users. On entering the site, any user with special needs will be flagged by staff at the entrance booth.

Requirements for the above users are being addressed through the Planning and Building Control application process but include :

- A dedicated compliant ramp (with landing) to access the pool side
- Wide changing rooms to accommodate frames, chairs or buggies.
- Availability of a dedicated 'water chair'
- An inbuilt 'deck' with in the shallow end that will allow for a small slope to access a higher 'safe' level of water access and young and family play.
- Grab rail in the showers

**Staffing :**

The pool will be overseen by qualified lifeguards at all times (guidance for which will be set by the RLSS). In addition, KCES security services will also have a permanent dedicated presence on site. Additionally, the site will dedicated 'hosts' who will man the entrance booth, deal with ticketing and flagging the site information which users must read. Staff working in all positions on the enclave should have the minimum training standards (to be determined by RLSS). They can also assist with the needs of special users.

**Hours of operation :**

General Admission 7:45 am – dusk- daily. Access to swimming available 5-6 days a week during daylight hours.

Winter – to be reviewed in line with demand and maintenance / staffing availability. It will not be outside the hours outlined above however

**Capacity :**

The pool can accommodate circa 150 people daily safely. As aforementioned, this will be addressed via a dedicated ticketing system, 'sessions' to deal with capacity at one time and a monitoring system. The RLSS guidelines also set out the number of people that can safely use the pool at one time....

**Other :**

There will be no amplified music. Noise assessment is that it will be considerably less than that from the existing construction site.



There will be no lighting, as hours of operation during summer align with daylight hours.  
 There will be no food preparation at the site. Thus no vans or kiosks.  
 Vehicular movement within the plot is not permitted (or viable)

**Risk Assessment :**

Type of risk	Likelihood / RAG status	How addressed
<b>LIVE</b>		
Cost over-runs	High	VE exercise underway. Costs re s106 confirmed with Camden.
Thames Water Sewer interface.	Low	KCCLP to consult directly
<b>Water related :</b>		
Sickness or health issues arising from water quality / nutrients	Low	Maintenance and monitoring - daily visual checks on the water quality and the running of all pumps and filters. Fortnightly tests on the water quality and nutrients level. Other more stringent maintenance as required
Animals attracted to the water affecting the water quality	Medium	Construction to help limit access by anything on foot. Vigilance by staff during daily sessions. Use of nets at night.
Human 'accidents' affecting the water quality	Medium	Clearly, there lifeguards will be briefed to be alert to such a scenario arising and will ask customers to leave the water immediately to deal with the offending item. Thereafter,  All customers will be asked to read the information about how the natural system works before entering the pool and signposting to toilets will be made very clear.
Technology failure	Low	Will be fully tested prior to opening and then checked daily as part of maintenance operations
<b>People related :</b>		

Risk of drowning	Medium	Qualified lifeguards to be on duty, poolside, whenever swimming is permitted. Working on rotation (20 minute shifts to maintain concentration) Despite the 'recreation of nature' depth measures will be used and clearly displayed, alongside lifebuoys. Lifeguards will be pro-active regards vulnerable users in areas.
Risk of accidents	Medium	All customers will effectively sign up to a set of 'house rules' – which they will be reminded of and asked to read again on entering.
Overcrowding	Low	A ticket entry system will be in place at all times there is swimming on the site. The pool has a daily capacity but will always be significantly less i.e tickets will be sold for morning swims, lunch swims, afternoon's children's sessions etc – and numbers split against the same.
Security – theft and break-ins	Low	There will be secure, padlocked lockers available for all. We are working with KCES now to ensure there can be security support whenever the site is open.
<b>Other :</b>		
Landscape maintenance	Low	A degree of change in a new landscape is to be expected. We will ensure lawns and plants are kept maintained and at an acceptable height. Wear and tear will be addressed by contractors as the project develops. Any areas of concern will be barriered and marked out of bounds.
The weather	High	Excessive heat will see advice and support given re the sun's affects and crowd control via the ticketing system. Excessive rain may see the pool close on occasion – as an assessment by the lifeguards. Run off water will go into a drainage

		system but the wetness pool areas will, again, be assessed by the duty lifeguards.
Structural failure / flood	Low	The structure is being constructed by professional water landscape engineers, with calculations from Arup. The facility will be assessed by LBC Building Control before opening and signed off thereafter. As above, any excess water will be addressed via fitted drainage (into the core sewer, as there are no chemicals).
Pricing strategy	Low	We will ensure that the facility is accessible as possible by pegging the prices to that of the new Camden leisure facility. After a period of bedding in, some free sessions for local residents will take place early mornings and late afternoons

**Organisations and stakeholders consulted or contracted to date:**

King's Cross Central Limited Partnership – Commissioners

Michael Pinsky and Stephanie Delcroix - Curators

Ooze (Eva Pfannes and Sylvain Hartenberg) and Marjetica Potrc – Artist collective

Biotop Austria – pool designers

Carillion – core site contractor

Kingcombe Aquacare – specialist bathing pond construction team & engineers

Hoare Lea – site utilities and services

Peter Brett Associates – infrastructure

JLT – site insurance brokers

Arup – soil contamination

Arup – water load structural engineering

Willerbys – planting and landscape specialists

Global Generation – on site sustainability charity

London Borough of Camden – Building Control

London Borough of Camden – Town Planning

London Borough of Camden – Arts and Tourism

International Organisation for Natural Bathing Waters (UK) – overall advice and guidance

Thames Water