



Guidelines to Pool Hall Construction

Solutions for:

- Humidity control
- Pool water heating
- Ventilation
- Air cooling
- Recovering energy
- Air heating

Guidelines for pool hall construction

The following few pages list some of the more common issues that should be considered when planning for an anticipated swimming pool complex.

Long before construction, feasibility and costing are usually the 'key' factors in influencing details of a building project.

Below is a concise list of general design factors that often contribute to these 'key' factors.

Practical construction factors

- Site access & storage
- Drainage & service routes
- Telecommunication / cable lines
- Ground water level
- Landscaping
- Site exposure / orientation
- Illumination / natural lighting
- Proposed fuel supplies / access
- Vehicle access & parking
- Implications on existing building(s)

Building concept factors

- Shower / changing facilities
- Provision of toilets
- Stairs / elevators
- Facilities for less able (access, hoists etc.)
- Fire escape routes (emergency access / first aid facilities)
- Spectators / viewing area (possible servery / dining area)
- Lighting levels
- Water features (slides, flumes etc.)
- Balance tank location
- Adjacent health / fitness suite (also spa / sauna)
- Distribution ductwork runs.

Although this is by no means an extensive list of contributory factors, it hopefully presents some helpful guidelines when planning for a swimming pool complex.

Regarding Building regulations and planning approval, it is recommended that Project representatives contact the relevant local Authorities to establish precise requirements.

With respect to actual construction materials used for the pool hall, the following is a list of important considerations.

For guideline purposes, materials referred primarily relate to those associated with the internal pool hall environment and energy conservation.

Structural members

Due to the very high levels of moisture within such an internal environment, it is of utmost importance that all affects are considered to ensure that structural members are sufficiently designed and / or protected. Exposed structural steelwork may need a high specification for both preparation and primer coat to endure such a corrosive atmosphere.

Exposed structural timber is designed according to assumed moisture content. It is therefore important to ensure both specifier and designer take necessary measures to address this. Fixings also need to be considered carefully, i.e., materials used and / or adequate protection (not forgetting affects of electrolytic reactions.)

Good advice is, if in doubt, consult the manufacturers / suppliers.

Block work walling will have a tendency to absorb moisture if not treated with a preventative coating. This could have design implications, especially relevant if the wall forms a structural support.

Depending on shapes and dimensions, movement joints may be required within the structure to control or eliminate cracking.

Having briefly considered implications on structural members, a crucial issue, which should not be overlooked, is the selection of materials for the building fabric.

Listed below are common, but important construction factors affecting the vulnerability and durability of the pool hall itself.

To avoid needless deterioration, care should be taken when specifying both materials selected and construction methods.

The following are for guideline purposes only; the onus and ultimate responsibility for the building specification must lie with those overseeing the project.

Insulation and Air Gaps

The swimming pool hall is generally heated to a higher temperature than that of other habitable areas. Therefore, a high standard of thermal insulation throughout is justified in order to minimise heat losses as demanded by the current Building Regulation standards.

Insulation located between inner and outer leaf of an external cavity wall should ideally be ventilated; and consideration given to moisture drainage (weep holes etc.).

The building should be well sealed to prevent infiltration of external air. Gaps (around doors and windows etc.) should be sealed to minimise both localised condensation and pool hall heat losses.

Interior finishes

Materials selected for pool hall finishes are critical. They will be continually exposed to higher levels of moisture content than in other interior applications. During instances of equipment breakdown or power cuts, the interior fabric may be exposed to saturated air and must, therefore, be able to resist these circumstances without deteriorating.

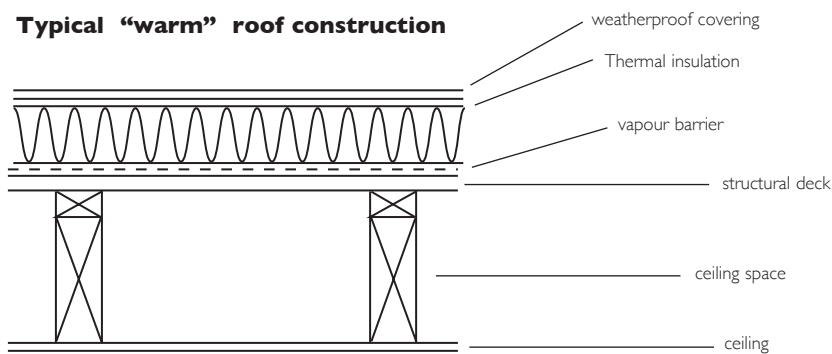
As a rule, materials used for the interior finishes should be of the same specification as those used for exterior use. Plasterboard and Artex finish are unsuitable due to their hygroscopic nature, whereas waterproof render, tiling and treated timber are far more suitable finishes.

If it is proposed to finish internal surfaces with paint or special coating, it is advised that the product manufacturer be consulted before hand.

NOTE: Timber must be conditioned to the pool hall environment and allowances should be made for movement when fitted. (Refer to TRADA for expert advice.)

Vapour barrier

Even when a high degree of insulation is used in the structure, interstitial condensation can occur, with the ceiling/roof structure normally being the most vulnerable. The warm pool hall air has a higher moisture content than the normally cooler outside air. This creates a vapour pressure difference and causes the pool hall air to exert some considerable force in it's attempt to equalise with the outside air. If the water vapour is allowed to permeate the structure, it will reach an area below it's dew point temperature and condense. To prevent this occurring in the roof structure, an internal vapour check barrier fitted on the warm side of the insulation restricts water vapour seepage.



Thermal insulation material placed immediately beneath the weatherproof covering and on top of the roof deck and any vapour barrier. Deck and cavity thus maintained at warm temperatures during the winter. Condensation risk can be reduced considerably by correct selection and installation of a vapour check barrier.

It is recommended that a proprietary vapour barrier should be used. The installation procedure must ensure that the barrier is complete and secure. Light fittings or fixtures fitted in the ceiling, which might normally penetrate such a barrier, are not advisable. All tradesmen (electrical, plumbing, etc.) who fit services through the barrier must be overseen to ensure the vapour barrier remains fully effective.

Propriety high performance ceiling systems are available which double-up as both decorative ceiling and vapour barrier alike, usually suspended beneath Roof/floor zone above.

If water vapour does manage to pass through the vapour barrier into the cooler area above, it will condense into droplets. This will moisten the insulation and reduce its performance. To avoid accumulation of these water vapour droplets it is essential that this area is adequately ventilated.

The Building Regulations demand that all types of roof construction incorporating such a roof void / cavity be ventilated at a specified rate.

Cold bridging

Although the structure may be well insulated, there may be areas where structural members such as lintels, support beams, etc. create a direct bridge from outside to inside known as a 'cold bridge'. A 'cold bridge' will expose a cold internal surface to the pool hall air and result in condensation. In the building design this can be averted with the proper use of insulation and a vapour check.

Roof lights

Roof lights are areas that are prone to condensation as it is not always possible to create a warm air curtain onto the internal surfaces. They can cause 'dead air' pockets and create difficulties ensuring that the vapour check barrier remains complete. If roof lights are essential to the design, it is strongly recommended that they are triple skin.

Floor drainage channel

A saturated pool surround can contribute as much moisture to the pool hall atmosphere as the pool itself. A drainage channel installed in the pool surround with correct falls will ensure that the surface water drains away as quickly as possible.

Single and double skin enclosures

Many types of translucent enclosures are available for housing a pool and protecting it from the external elements.

Typically they are available in three main types:

- Inflatable air dome
- Telescopic enclosure
- Conservatory style building

These normally provide a structure that can be easily installed at a relatively low capital cost. If the proposed enclosure is to house an existing (outdoor) pool, consideration needs to be given regarding:

- The strength / capacity of existing structure(s) affected by the enclosure
- Local Authority planning constraints
- Building regulation requirements (if applicable)

From experience, there are a few issues often overlooked when considering the selection of this type of enclosure.

Firstly, if the pool is to be used during winter conditions, space-heating requirements will usually be high due to the poor insulation values.

The enclosure is unlikely to be completely free from condensation due to practical constraints of effectively distributing warm drier air internally.

Diligent use of a floating cover and sufficient air heating are strongly recommended.

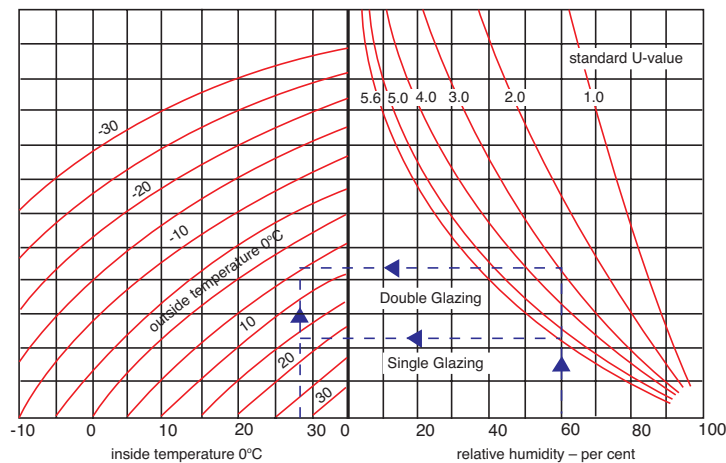
Secondly, solar gain can present problems during the summer periods. Although a proportion of natural heat gain assists with space heating, high solar gain can often result in overheating of the pool hall air. Ventilation / cooling will then be necessary to maintain the ideal comfort levels.

For a permanent enclosure of this kind (e.g. conservatory style) solar reflecting treatment to the panels and / or proprietary blinds should be considered to reduce solar heat gains if concerned.

Glazing

There is a temptation when designing the pool hall structure to include large areas of external glazing. If the pool is to be used throughout the winter, this should ideally be avoided, not only to prevent excessive heat loss, but also to help reduce the risk of higher condensation levels associated with such glass.

Affects of solar gain during summer months also need reiterating.



Condensation Prediction Chart For Normal Site Exposure

Condensation on glazing

Internal surfaces of glazing within any pool hall structure are normally the areas most prone to condensation. The 'Condensation Prediction Chart' below shows that double-glazing will experience condensation when the outside ambient air temperature falls below 5°C centigrade. (Condition: Hall Air 28°C; 60% RH. Site Exposure Normal.)

In order to ensure absolute minimal condensation occurs it is necessary to warm the internal glass surface to a temperature above that of the dew point. This can be achieved by simply distributing a supply of warm dry air directly onto the glazing.

To make the most effective use of the warm air curtain, the following points should be noted: -

- All glazing exposed to the pool hall air should consist of double or ideally, triple glazed sealed units and NOT secondary glazing added to single glazing.
- The glazing frames should be constructed from hard wood, aluminium, UPVC or metal and must have a thermal break in order to reduce the risk of condensation forming on the frames.
- In contrast to normal building practice, the glazing should ideally be flush with the inside surface of the walls to gain the best warm air curtain effect from the supply air.
- The use of Georgian style glazing should be discouraged as the cross members of the frame can restrict warm air distribution to all the glass surfaces.
- Sliding patio doors should be air tight, as cold air entering through any gaps in the seal is often the cause of localised condensation.

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