Club Facilities

The information contained in this document has been produced by the Facilities Subcommittee of the Leinster Branch Tennis Ireland with the intention to assist affiliated tennis clubs in designing, installing, operating and maintaining tennis club facilities, including courts, lights, etc. It is considered that the provision of proper facilities is vital, because no matter how talented the player, if the courts are not right, they cannot hope to perform to their true potential.

The initial work concentrated on gathering information by way of a survey on facilities from a sample of Leinster clubs and we thank those clubs who completed the survey.

Much of the information is based on British Tennis web site and we wish to acknowledge their assistance in providing the basic information, which has been tailored for Irish conditions.

While every effort has been made to try and ensure the information provided is as accurate as possible, Tennis Ireland cannot be held responsible for the use of the information provided below.

The information provided has been organized under the following headings:-

- Site Selection
- Size/Marking
- Drainage
- Slope
- Evenness
- Subsurface
- Surface
- Testing/Commissioning
- Selecting Contractors
- Workmen/Equipment
- Supervising Contractors
- Typical Price
- Guarantees
- Fencing
- Wind breaks
- Maintenance
- Safety
- Mix of Surfaces
- Pavilions/clubhouses
- Planning Permission
1. Site Selection

Typical Site Layout –
Glasnevin Tennis Club Dublin – 8 courts, Orientation (North-South)

1.1 Dimensions

Obviously the site chosen must permit the minimum court dimensions to be met i.e. Principal Playing Area (The area bounded by the outside of the court lines)

Length 23.77m (78’ 0”)
Width 10.97m (36’ 0”)
Length of net (doubles) 12.8m (42’ 0”)
Width of play lines (white) excluding base line 5cm (2”)

Base Line 5-10cm(4”)

1.2 Other dimensions

<table>
<thead>
<tr>
<th>Recommended Size</th>
<th>Min Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Runback (i.e. clear depth behind (18’00”) baselines, at each end)</td>
<td>6.40m (21’ 0”) 5.49m</td>
</tr>
<tr>
<td>Side-run (i.e. clear width beside each (10’0”) side)</td>
<td>3.66m (12’ 0”) 3.05m</td>
</tr>
<tr>
<td>Side-run between courts not separately (12’0”) enclosed</td>
<td>4.27m (14’ 0”) 3.66m</td>
</tr>
</tbody>
</table>
1.3 Design

The design of the scheme should be visually pleasing and create an environment that will be attractive to users of all ages and abilities. It should be fit for its intended purpose and made attractive by the considered use of landscaping materials, textures and colours in suitable combinations.

1.4 Court Layout and Orientation

Courts should be positioned with the centre-line of the courts running in a generally north/south orientation, although conditions may prevent this arrangement. This is to avoid problems of serving into the sun during the summer months. Courts should not preferably exceed three in a row. Consideration should be given for access to each court, without interrupting play on adjoining courts. If adjacent to an indoor centre, the outdoor courts should have access to the ancillary accommodation of the centre. The court layout should preferably ensure a view of all outdoor courts from reception in order to control their use, allow viewing from the social areas and have some visual relationship with any indoor courts.

1.5 Paths and Lighting

Paths must be provided to all court access doors and to allow movement around the site. Paths must have a suitable camber to shed water and be constructed from a suitable low slip material. Paths should be at least 1.5 m wide, where space permits, for sports wheelchair access.

1.6 Site Selection

If starting with a completely new tennis facility, of course many problems can be solved by careful selection of site to maximise the benefits with respect to items like :-

- Cost
- Orientation
- Maintenance
- Lighting and light spill
· Impact on neighbours

· Planning permission

· Possibility of expansion, if required in the future, etc

· Parking on site if required

· Ground should be reasonably level, preferably on the same plane or higher than adjacent land, to allow drainage away from the courts
· The site should be sheltered from prevailing winds, away from traffic noise and other distractions, and devoid of shadows cast by buildings or trees
· A dark, solid background is desirable. Light backgrounds, such as white buildings, or moving backgrounds, such as people or traffic, should be avoided at the ends of the court. Landscaping or windscreens can be used to screen out inappropriate backgrounds.

· Subsoil stability and drainage conditions are important to tennis court construction. Many sites may not require extensive site investigation. In some cases, shallow hand dug test pits, auger borings or backhoe excavation can reveal conditions which may cause potential problems. The presence of certain conditions, however, mandates more careful site investigation. These include: 1) peat or organic soils 2) uncontrolled fill materials or waste materials 3) expansive soils and 4) high ground water 5) solid rock which may have drainage impacts
2. Size & Marking

The court markings define the playing area of the surface and provide consistency with the Rules of Tennis and between courts.

2.1 Apparatus

Test apparatus consists of:

1. Distance-measuring device, calibrated to ± 0.05%, such as a laser distance meter or a steel tape.

2.2 Calibration of apparatus

Check the distance-measuring accuracy of the apparatus against a known standard prior to testing.

2.3 Test procedure

1. Using the calibrated device, measure each of the distances listed in table (refer also to figure). Follow the same procedure on both sides of the net to complete the court.
2. Repeat the measurements in reverse order. Check any measurement for which the discrepancy between the two values exceeds half of the applicable tolerance.

2.4 Calculation of results

Calculate the mean of the two values measured for each distance. The criterion values are listed in table. The tolerance for each test value (measured distance) corresponds to 0.1% of the distance measured, with a minimum tolerance of 5 mm.

2.5 Recommendations
Refer to table:

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Description</th>
<th>Criterion (m)</th>
<th>Tolerance(mm)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xa, Xb</td>
<td>Middle of net to singles sidelines</td>
<td>4.115</td>
<td>5</td>
<td>4.110-4.120</td>
</tr>
<tr>
<td>Xn</td>
<td>Middle of net to singles sticks</td>
<td>5.029</td>
<td>5</td>
<td>5.024-5.034</td>
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<tr>
<td>XA, XB</td>
<td>Middle of net to doubles sidelines</td>
<td>5.486</td>
<td>5</td>
<td>5.481-5.491</td>
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<tr>
<td>XN</td>
<td>Middle of net to net posts</td>
<td>6.401</td>
<td>6</td>
<td>6.395-6.407</td>
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<tr>
<td>AC, BD</td>
<td>Half court diagonal (doubles)</td>
<td>16.177</td>
<td>16</td>
<td>16.161-16.193</td>
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<tr>
<td>AD, XJ, BC</td>
<td>Net to baseline</td>
<td>11.887</td>
<td>12</td>
<td>11.875-11.899</td>
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<tr>
<td>DC</td>
<td>Distance between doubles sidelines</td>
<td>10.973</td>
<td>11</td>
<td>10.962-10.984</td>
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<tr>
<td>Dd, Cc</td>
<td>Doubles sidelines to singles sidelines</td>
<td>1.372</td>
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<td>1.367-1.377</td>
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<tr>
<td>dJ</td>
<td>Singles sideline to centre mark</td>
<td>4.115</td>
<td>5</td>
<td>4.110-4.120</td>
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<tr>
<td>aG, XH, bF</td>
<td>Net to serviceline</td>
<td>6.401</td>
<td>6</td>
<td>6.395-6.407</td>
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<tr>
<td>HG, HF</td>
<td>Centre serviceline to singles sidelines</td>
<td>4.115</td>
<td>5</td>
<td>4.110-4.120</td>
</tr>
<tr>
<td>ac, bd</td>
<td>Half court diagonal (singles)</td>
<td>14.458</td>
<td>14</td>
<td>14.444-14.472</td>
</tr>
</tbody>
</table>

Table. Recommended tolerances for dimensions of a tennis court.

Notes:
a. N and n are measured from the centre of the net posts/singles sticks.
b. In cases where the position of X cannot be located precisely, for instance due to anchoring of the centre strap, use a reference point midway across the centre serviceline.
c. All other measurements should be made to the outside edge of lines.
d. Movement of grass during the application of court markings shall be taken into account when assessing the results.
Figure Plan view of half-court
3. Slope and Drainage

Ideally, a tennis court should be a flat surface lying in a single horizontal plane. However in Ireland due to the prevalence of rain it should be sloped to assist in the run off of rain. Where the court is sloped for drainage the single plane of the surface should always be maintained.

The gradient for non-porous courts shall be min. 1:120 and max 1:100. Porous courts should be laid to a maximum gradient of 1:120 and a minimum of 1:200. Porous court may be laid flat if a gradient is incorporated in the subsurface. Where a porous surface or subsurface is being used great care should be exercised to ensure the porosity or ability to drain is maintained. In the case of a new surface the contractor should be requested to demonstrate the porosity and in the case of old subsurfaces the surface should be cleaned (hosed clean with water to try and open the surface and make it more porous. The surface drainage ability can be tested simply by pouring water onto the surface. If the surface is porous and the drainage is working then the water should disappear in 1-2 minutes. Some contractors will offer to drill holes in a subsurface but this will only give a marginal improvement and really does not solve poor drainage.

The slope should be oriented to minimise its effect on play. Thus, where a court must be sloped for drainage, a slope from side-to-side is preferred (see figure).

The slope is determined by measuring the ratio of change in elevation to horizontal distance.

![Preferred orientation of slope (side-to-side), if necessary](image)
Apparatus

Test apparatus consists of:

- A distance-measuring device, calibrated to ± 0.05%, such as a laser distance meter or a steel tape.
- A surveyor’s level with a measuring staff. This may be either a laser level, which sweeps out a horizontal plane with a beam of visible or infrared light, or an optical level, where the plane is defined by the horizontal axis of the instrument.

A surveyor’s level may be checked using the standard ‘two-peg’ method, which gives an absolute measurement of the accuracy of the level. If the two-peg test reveals any error, the level must be serviced or repaired, as necessary.
4. Evenness (ITF CS 02/02)

The court surface should be free from any imperfection that causes an inconsistent ball bounce, allows the collection of water, or significantly increases the risk of injury to players. The standard achievable is dependent on the materials and equipment used to construct the court, and the quality of workmanship. Undulations are measured relative to a rigid straight edge placed on the surface.

Apparatus

Test apparatus consists of:

- 3 m straight edge, made from box-section aluminium or equivalent.
- Wedge approximately 25 mm wide and 200 mm long, with marked height increments of 1 mm.
- Two supports for the straight edge, of equal height.

Calibration of apparatus

Devices used for evenness measurements should be calibrated annually. Surveying-quality straight edges in serviceable condition are deemed appropriate. Check for any damage to the straight edge and wedge prior to testing.

Test procedure

1. Lay the straight edge on the surface.
2. Drag the straight edge across the surface parallel to the net, looking for deviations that warrant measurement. Perform sufficient passes to inspect the Total Playing Area (TPA) of the court (see figure 4).
3. For hollows, measure the maximum deviation from the underside of the straight edge using the graduated wedge (see figure 5). Ensure that the straight edge is resting on the court surface either side of the hollow.
4. For isolated bumps or ridges, suspend the straight edge above the peak of the hump using supports at either side (see figure 5). Measure the minimum deviation from the underside of the straight edge using the wedge and subtract this value from the height of the supports. This gives the height of the bump.
5. Repeat steps (1) to (4) moving the straight edge at right angles to the net.
Note: Beware of damaging the surface and/or straight edge when dragging the apparatus over the court.
5. Subsurface

The foundations or subsurface for tennis courts have a considerable bearing on the overall performance of the court. Great care has to exercised to ensure that when the final playing surface is installed that it is laid on a suitable subsurface – if the subsurface is wrong then the playing surface will never be right and this can lead to a lot of maintenance/remedial action with obvious disruption to play and costs/compensation claims. So it is fundamental that the subsurface is properly specified and installed with respect to drainage, slope and evenness.

A porous asphalt tennis court surface or subsurface is made up of several layers of aggregate, often limestone, bound together with bitumen. Finer grades of aggregate are used closer to the top surface. The foundation provides support for the layers of porous asphalt and allows water to drain away from the surface of the court. If water is held in the sub-surface frost can cause the court to heave. Loosely packed stones will provide better drainage, but reduced stability.

Porous asphalt courts are typically laid by hand. Hot bituminous asphalt is raked between steel bars and then rolled to compact the aggregate. The steel bars are set using dual-plane, laser levels for accuracy. If there is a sufficiently stable formation or depth of foundation, laser-automated machines can be employed to lay the asphalt. The asphalt must be rolled immediately to compact the aggregate before the bitumen cools. Therefore, thicker layers, which take longer to cool, can be used to give higher densities. The wearing course (top layer) uses the finest grade of aggregate to achieve a dense, uniform surface.

For courts, which use asphalt as the playing surface during the opening season of play, hot weather may soften the bitumen and aggregate can be ‘plucked’ out of the wearing course. It is important that the court is not used under these conditions. Three weeks after laying, the bitumen has dried and hardened and the court can be painted. Pre-spraying the court with a polyurethane (PU) or acrylic (PMMA) binder extends the life of the surface and reduces stone plucking. PU or PMMA are also used within the paint. The colour coating is applied in at least two passes in opposite directions. Please note that it is very important that where the subsurface is found to be uneven, it should not be levelled/patched using a different material than that of the subsurface - this may lead to different drainage patterns or to different bounces of the ball in different parts of the court.

Where asphalt is being used for the surface or subsurface great care should be exercised in selecting the contractor to carry out the works. They should be experienced in carrying out this work - this is further covered in the section on Contractors below. Note that contractors who are experienced in laying car parks may not have the necessary experience for laying tennis courts, as the grades of asphalt are totally different due to their different loading and drainage requirements.
5.1 Sand filled grass carpet or asphalt court
5.2 Typical Construction Photos

The foundation layer, consisting of angular pieces of limestone.

Hand laying bituminous asphalt

Rolling the wearing course

Clockwise from top left: Wearing course, wearing course (as rolled), and base course
6. Surface

6.1 Introduction

There are many different types of surface available today including

- Concrete
- Acrylic
- Rubber
- Grass
- Clay
- Artificial Grass over asphalt

Most of the above have been installed in Ireland over the last 10 years with the preference being for artificial Grass over asphalt as detailed below.

All of these surfaces have considerably different playing characteristics and it is important for a club to know what they want and why they want it. The ITF Court Pace Classification Programme has been developed to assist purchasers of tennis surface products to determine the type and speed of surface most suited to their requirements. The ITF classifies surfaces into five categories according to court pace:

- Category 1 (slow)
- Category 2 (medium-slow)
- Category 3 (medium)
- Category 4 (medium-fast)
- Category 5 (fast)

The ITF Court Pace Rating (CPR) measures the effect of ball-surface interaction. This concept includes: friction, which primarily determines the reduction in the horizontal
component of post-impact ball velocity; and vertical restitution, which determines the time between successive bounces.

Further information on the test procedure for measuring court pace is described in the ITF Guide to Test Methods for Tennis Court Surfaces, test method ITF CS 01/02.

A surface product included on the list of ITF Classified Court Surfaces is classified purely on the basis of its court pace rating. The chart below list the CPR ratings used

Calculation of CPR

Any manufacturer, contractor or facility owner may apply for classification and inclusion on the ITF list. The ITF reserves the right to refuse an application for classification of a surface that it deems is not suitable for the game of tennis.

All ITF Classified tennis surface products are valid for 3 years, whilst the classifications of individual courts tested on-site are valid for 1 year.

Note: ITF Classification is not a mandatory requirement of the court surface selection process for any ITF tournaments and classification does not constitute any form of ITF Approval.

In January 2008, the Davis Cup by BNP Paribas and Fed Cup by BNP Paribas regulations
were amended to require the pace of courts to be used in these competitions, excluding grass and clay surfaces, to have a measured ITF Court Pace Rating between twenty-four (24) and fifty (50) inclusive. The rule applies to World Group and Zonal Group I tournaments only.

The descriptions in the ITF table below can be cross-referenced with the classified court surfaces to identify the generic court surface type associated with each product in the list. The descriptions relate only to court construction, and not to performance characteristics.

**ITF Classification - Surfaces**

<table>
<thead>
<tr>
<th>Surface Code</th>
<th>Type Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Acrylic¹  Textured, pigmented, resin-bound coating.</td>
</tr>
<tr>
<td>B</td>
<td>Artificial clay² Synthetic surface with the appearance of clay.</td>
</tr>
<tr>
<td>C</td>
<td>Artificial grass³ Synthetic surface with the appearance of natural grass.</td>
</tr>
<tr>
<td>D</td>
<td>Asphalt³     Bitumen-bound aggregate.</td>
</tr>
<tr>
<td>E</td>
<td>Carpet       Textile or polymeric material supplied in rolls or sheets of finished product.</td>
</tr>
<tr>
<td>F</td>
<td>Clay⁴        Unbound mineral aggregate.</td>
</tr>
<tr>
<td>G</td>
<td>Concrete⁵    Cement-bound aggregate.</td>
</tr>
<tr>
<td>H</td>
<td>Grass        Natural grass grown from seed.</td>
</tr>
<tr>
<td>J</td>
<td>Other        E.g. modular systems (tiles), wood, canvas.</td>
</tr>
</tbody>
</table>

Notes:
- All surfaces may be porous or non-porous, with the exception of ‘Clay’ and ‘Grass’, which are always porous.
- ¹ Normally forms only the uppermost few millimetres of a court.
- ² “Appearance” relates only to the form of the uppermost surface material and not other characteristics (e.g. colour).
- ³ Used only when the material itself forms the playing surface. When used as a base for other surfaces (e.g. acrylic), reference will be made only to the playing surface.
- ⁴ This term denotes a class of surface that is constructed from naturally-derived materials, and includes a fine gritty material as the uppermost (playing) layer, e.g. fast-dry.

Note: ITF Classification does not imply any form of ITF approval or endorsement.

<table>
<thead>
<tr>
<th>CATEGORY 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of surface product</td>
</tr>
<tr>
<td>120 Tennis Clay</td>
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<tr>
<td>Bross Clay (clay-dressed)</td>
</tr>
<tr>
<td>Bross G-Clay (sand-dressed)</td>
</tr>
<tr>
<td>FieldTurf Tarkett Melbourne</td>
</tr>
<tr>
<td>Laykold Cushion Plus System</td>
</tr>
<tr>
<td>Name of surface product</td>
</tr>
<tr>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>Rebound Ace HSA Club “S”</td>
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<tr>
<td>Rebound Ace Pro International “S”</td>
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<tr>
<td>RoyalClay Pro (clay-dressed)</td>
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<tr>
<td>Sit-In Sport Cepiemme Red Brick 15</td>
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<tr>
<td>(clay-dressed)</td>
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<tr>
<td>Sportflex</td>
</tr>
<tr>
<td>Sportfloor Clay (clay-dressed)</td>
</tr>
<tr>
<td>Tennis Force</td>
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<tr>
<td>CATEGORY 2</td>
</tr>
<tr>
<td>Name of surface product</td>
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<tr>
<td>12 TS Match Point</td>
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<tr>
<td>AllSport</td>
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<tr>
<td>ASI – Court Tournament XP Pro</td>
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<tr>
<td>DecoColor</td>
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<tr>
<td>Decoflex Universal TX 9mm</td>
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<td>FieldTurf Tarkett Basic XT-20</td>
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<tr>
<td>Grand Clay 12 (sand-dressed)</td>
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<td>MondoTurf NSF 66 15</td>
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<td>RuKortPro</td>
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<tr>
<td>Surface Evolution</td>
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<tr>
<td>T.E.A.M. Sports Masters SL</td>
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<tr>
<td>TigerTurf Advantage</td>
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<td>Tournament LSR 12</td>
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<tr>
<td>CATEGORY 3</td>
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<tr>
<td>Name of surface product</td>
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<tr>
<td>AC Hi-Court</td>
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<td>AC Play Cushion System</td>
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<td>Bross Slide (Indoor Court)</td>
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<td>Champward CA-101</td>
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<td>Champward CA-102</td>
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<tr>
<td>Champward CW-301</td>
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<td>Chaoda Tennis Court</td>
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<tr>
<td>Classic Clay (sand-dressed)</td>
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<td>DecoTurf</td>
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<td>Edel Elite Soft</td>
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<tr>
<td>Greenset Grand Prix Cushion</td>
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<td>Greenset Trophy</td>
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<td>Laykold Colorcoat System</td>
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<td>NewGrass Red Clay 12mm (sand-dressed)</td>
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<td>NewGrass T6 20</td>
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<tr>
<td>Novacrylic Combination System 2</td>
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<tr>
<td>PlayPave</td>
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<tr>
<td>Plexicushion Prestige</td>
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<tr>
<td>Pro Vantage</td>
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<tr>
<td>Rebound Ace Pro International “MF”</td>
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<td>Rebound Ace Synpave</td>
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<td>RuKortRTT</td>
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<td>Sit-In Sport Smash 10</td>
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<td>Supersoft Doppio</td>
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<td>T.E.A.M. Sports Grand Prix</td>
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<td>Taraflex Tennis ATP</td>
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<tr>
<td>Tiger Cushion</td>
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<td>TigerPave</td>
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<td>TigerTurf Rally (sand-dressed)</td>
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<td>Truflex MultiSport</td>
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**CATEGORY 4**

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<th>Surface</th>
<th>Code</th>
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<td>Advantage II</td>
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<td>23.02.09</td>
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<td>Apron Acrylic System</td>
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<td>Classic Turf System</td>
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<td>Courtsol Pro</td>
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<td>FieldTurf Tarkett Olympus</td>
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<td>Greenset Confort</td>
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<td>Pavitex Tennis RK</td>
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**CATEGORY 5**

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The above would seem to give a bewildering choice of court types, but the choice for a club in Ireland will primarily be based on the factors below:-

- Cost
- Longevity, if carefully specified and installed
- Suitability for weather conditions i.e. can be played on all year round and will be available for play shortly after rain
- Reasonable maintenance programme
- Suitability for all grades of players
- Aesthetic appeal

Generally speaking Artificial Grass over asphalt (medium pace) Code C and D Category 3 has become the surface of choice for tennis clubs in Ireland

It should however be recognised that Artificial Grass over asphalt have limitations in use for high level play and is not used, in general, on the international circuit. This is due to Federer, Murray, Nadal. What do the world’s top three players have in common? At least two things:

- Each spent much of his formative years as a player being coached, practicing and competing on the world’s slowest surface – clay courts.
Each has been able to translate the skills learnt on the slowest surface into success on the world’s fastest surface – grass. Specifically the manicured grass of the All England Club, London SW19. At Wimbledon Federer has reigned for the last seven years with the exception of Nadal’s 2008 triumph. Meanwhile Murray reached the semifinals this year, and is frequently touted as a future champion.

Why does developing ones game on slow courts set the seed for future success on a variety of surfaces? The key fact is that slow courts force a player to fully develop all aspects of his or her game. There are four areas in tennis that must be mastered in order to become a complete player, and the speed of the surface that you learn the game on effects each of them:

TECHNIQUE: Because the rallies on slow courts tend to last longer, players develop sound technique that allows them to be consistent. Consistency is the fundamental building block of winning tennis.

TACTICS: Because it is harder to hit a winning shot on slow courts, players are forced to learn how to ‘construct’ a point. They become expert at moving the opponent around, finding and hitting to a weakness, and knowing when to be patient and when to go for broke.

PHYSICAL: Longer points mean more physical exertion, so players who develop their game on slow courts tend to be fitter than their ‘fast court’ counterparts.

MENTAL: Long points ‘pressurize’ a player mentally, so they learn to cope well with the psychological challenges of match play on any surface. Who wants to lose a point that has gone on for 20 shots? The more time and effort invested in a point, the more a player wants to win it. Slow courts make for more ‘pressure points’, so pressure points become not such a big deal.

Lets focus on club tennis. What are the benefits of installing slower courts at your club? A recent survey by Tennis Australia found that one of the main factors causing people to drop out of tennis was that “the game is too difficult”. The ITF’s Play and Stay campaign (which introduced smaller courts and slower balls for less skilled players), has helped enormously with this stumbling block. The final piece of the jigsaw here in Ireland is for clubs to think in terms of laying the type of courts that give players more time to get to the ball and play their shot. This will lead to longer rallies, which equates to more success, more fun and more motivation to continue playing.

Clay courts may not be ideal for the Irish climate, due to the fact that crushed house brick absorbs a lot of water and takes quite a while to dry out (members of the marvellous Tipperary LTC may beg to differ!). But there are other types of tennis court on the market that are well suited to our climate, and provide the sort of slow to medium paced bounce that gives players of all ages a little more time to respond to their opponents shot. If your club is considering resurfacing some or all of the courts put some thought into
whether you should change to a slower surface, then put some research into which type of slower court would work best at your club

6.2 Artificial Grass
The different types of artificial grass are considered below.

6.2. Long pile

Until the early 1990’s the large majority of synthetic grass tennis surfaces installed for outdoor use in the UK were sand-filled tufted carpets with pile heights traditionally in the range of 18 to 23mm and with densities of between 20,000 and 30,000 tufts per square metre.

These early forms of synthetic grass relied upon a particulate or granular fill to be introduced into the carpet to support the pile and to form a major part of the playing surface. The fill material, usually sand, had a number of advantages; it allowed the ball bounce characteristics to be varied; it helped to support the pile of the carpet, therefore enabling the quality of the playing surface to be more consistent over a longer period of time; it assisted the drainage of the surface; and it reduced the overall costs of an installation.

6.2.2 Medium pile

It was the sand, however, that was identified as the cause of some of the surface’s playing deficiencies - particularly an inconsistent and low bounce. This encouraged manufacturers during the early 1990s to develop shorter, denser carpets; initially 15mm in height with approximately 40,000 tufts per square metre – commonly referred to as medium pile today. These surfaces proved to be popular at many clubs for two main reasons; a slightly higher, more consistent ball bounce.

6.2.3 Short pile

The success of the medium pile carpets led some manufacturers to continue the trend towards even shorter carpets. An increasing number of short pile carpets are now on the market. These typically have 10mm pile heights and pile densities of between 45,000 and 65,000 or more tufts per square metre. The carpets are still sand-filled, but inevitably require less sand than other products. The shorter pile height generally also allows the pile to be stiffer, offering more resistance to a ball as it strikes the surface, resulting in a slower surface pace.

Synthetic grass carpets are generally of a higher standard now than they were during the early 1990s. Better polymers have been developed to produce harder-wearing and longer-lasting fibres, and more attention has been paid to the choice of sand used, following the early problems of compaction and drainage. Being a permeable surface, synthetic grass
can be played on in most weather conditions, and can be used for twelve months of the year. Short pile carpets should only be installed above 6mm diameter open grade surface

6.3 What is it made of?

A synthetic grass court is basically a tufted synthetic carpet laid on a base usually constructed from porous macadam. Correct installation of the base is critical if the court is to perform satisfactorily for the duration of its life, and the specification used should be tailored to the individual site. The carpet is loose laid in pieces, and seamed, either by sticking or gluing to a backing tape. (it is very important to ensure that the backing tape and glue is suitable for Irish environmental conditions with respect to rain and temperature)

6.4 Minimum design requirements

Sand filled grass carpet

Carpets are produced in a range of widths, usually between 4.0m or 5.0m. The greater the carpet width, the lower the number of seams required in the court, which reduces the risk of premature failure of the surface – this is important because seams may wear faster than other areas of the carpet, as sand filling may not be as good in that area, or the seam area may not be as even.

The playing lines are nearly always permanently inlaid, and can either be incorporated into the carpet during manufacture, or cut and glued into the surface once it has been laid. The overall layout of the carpet sections should be carefully designed, especially when lines are to be introduced during manufacture, to ensure that the finished surface is acceptable both aesthetically, and in terms of its performance. Surfaces are increasingly being laid in kits, rather like jigsaw puzzles, which reduces the installation time required.

6.5 Sand infill

Once the carpet has been installed, dry weather conditions are required to fill the surface with sand. The choice of sand itself is vital if the court is to perform well. Many of the earlier surfaces experienced over-compaction and pollution of the sand, which led to drainage problems and inconsistent bounces, and so these days larger rounded sand particles are usually preferred. Typically, installers will recommend filling the carpet with sand to within 2 or 3mm of the top of the pile, but in practice this can be seen to vary considerably. Different players may also have their own preferences for the level of sand maintained, according to the playing characteristics and the visual appearance required.
During the first few months of a court's life, the sand will compact to some degree, and should be topped up as necessary. It is important that not too much of the pile should be exposed, as otherwise it will flatten and can then be very difficult, if not impossible, to raise. This can cause excessive wear and tear of the fibre, and reduce the life of the carpet. Correct on-going maintenance is also vital to keep the surface in optimum condition (see How do I look after it- 6.8 below?)

6.6 How does it perform for the player?

Since the mid-1980s there has been significant growth in both the range and installation of synthetic grass surfaces in clubs, with most new courts being synthetic grass. The surface has proved to be popular with many club players, mainly due to its shock absorbing qualities, ability to allow play in “all weathers” and the surface’s aesthetic appeal. However, the variation in speed and playing performance of, particularly long and medium pile, synthetic grasses (such as ball bounce), means that the surfaces are less well-suited for higher standards of play or coaching. It is, therefore, increasingly difficult to generalise about the characteristics of synthetic grass as a single type of surface, and it is very important that anyone choosing a synthetic grass court play tests all products under consideration.

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<td>Speed of court: Medium slow to very fast, according to type of product age &amp; condition</td>
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<td>Height of ball bounce: Medium to low</td>
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<td>Trueness of bounce: Variable depending on carpet design</td>
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<tr>
<td>Ball Spin</td>
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<tr>
<td>Topspin: Little</td>
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<tr>
<td>Slice: Yes</td>
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<tr>
<td>Player-surface</td>
</tr>
<tr>
<td>Footing: Generally firm footing, but can have partial slide depending on type of product and condition.</td>
</tr>
<tr>
<td>Traction: Mainly non-slip but can be variable and slippery when dry or badly maintained</td>
</tr>
<tr>
<td>Shock Absorption: Most sand-filled products have reasonable shock absorption qualities</td>
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6.7 Player Testing

It can be a difficult task to compare the quality and performance of the many different products currently available on the market. Prospective purchasers must rely largely on their own inspection and play testing of different courts, although this can also be difficult when comparing examples of surfaces of varying age and condition. Buyers should be particularly careful when play-testing older, well-worn installations of artificial
surfaces, as the performance of courts can change significantly from when they were new.

Most court contractors act as agents for different manufacturers’ products, and it is important to ensure that surfaces inspected are the same as those offered, as products may vary whilst still having the same trade name. An increasing number of manufacturers are now having their products assessed using test procedures adopted by the International Tennis Federation. Whilst not attempting to replace player evaluations this data does allow potential purchasers to make desktop comparisons of products to shortlist for further consideration.

6.8 How do I look after it?

The maintenance procedures are designed to ensure:

- The playing surface is kept scrupulously clean, to preserve its playing characteristics.
- That the pile remains supported to prevent flattening leading to inconsistency in ball rebound, foot friction and poor drainage.
- That the free drainage of surface water is maintained throughout the life of the court.
- That the tennis court should look attractive and well kept at all times.

See section 15 On Maintenance
7. Testing and Commissioning

It is very difficult to properly test courts when they are complete, but obviously the following tests should be carried out

- Dimensional tests to 2
- Slope/Drainage tests to 5
- Bounce tests - to ensure that bounce is even throughout court and that there are no spots of uneven bouncing
- Player testing

It should be borne in mind that new artificial turf courts may take a few months or even a year to bed in and may require application/removal of sand to ensure that they are playing correctly.
8. Contractors

Whether you are building a tennis court for residential use, for a private club, for a resort facility or for a public project, the decisions you make should not be taken lightly. The investment in a court is substantial. However, a well-constructed court, properly maintained, can provide years of playing enjoyment. To get the most out of your investment, be a smart consumer.

Choosing the right contractor is vital in determining the ultimate success of your tennis facility. A knowledgeable and experienced contractor can help you, the owner, make the right decisions resulting in a quality project. Tennis court construction is a highly specialised field within the construction industry. It is vital that the contractor you choose be familiar with the current marketplace, as well as with the type of surface you intend to install. There is no list of approved tennis court contractors in Ireland and, as a result, you should carefully select the contractor for your work. – this cannot be stressed strongly enough.

Do your homework before you begin construction. The reward will be the right court at the right price. Having defined your needs you will now need to develop a Specification (how work is to be done and to what standards- based on sections 1-6#) and a Scope of Work (what has to be done and in what time – how many courts). At this stage you will need to have a budget price in mind (what you can afford to pay for the selected contractor’s work and for any supervision you will need to pay for during the works). Before inviting prospective Tenderers’ to bid it is useful to form a shortlist of those companies that seem qualified to bid. There are two steps in forming this shortlist.

The first one is to locate such specialists by consulting tennis clubs, municipal facilities and schools, as well as individuals, who have recently completed tennis court projects. Ask

- Whether or not they would recommend their contractor
- Was the job completed on time?
- Did it meet the owner's expectations?
• Were there any hidden costs?
• Was the contractor able to solve any problems which arose during construction?
• If there have been any post-construction problems, was the contractor responsive in taking care of them?
• How does the court look?
• How does it play?
• What is the surface wearing with time?

Once you have the names of a few builder prospects, then complete the second prequalification step by discussing with each prospective Tenderer

• How many years has the company been in business?
• If it is a relatively new company, what is the work experience of its principals?
• How many courts have they built?
• Were they responsible for the complete project, just for surfacing, just for site work? Look for individuals or for a company with specific knowledge and experience in tennis court construction.
• Does the company have experience in the type of project you contemplate?
• Has it built residential courts or club projects, hard courts or soft?
• Look for a company with experience in projects similar in size and scope to yours.
• Ask for references and for a complete list of recent projects. If a significant project is omitted from the list of references, there may be a reason for that omission. Call references and ask questions. Determine as much information as you can about a prospective contractor's knowledge, experience, workmanship, ability to meet schedules, financial responsibility/accountability and after sales service. If possible, visit completed projects and talk to owners.
• Get references from design professionals, subcontractors, bankers and bonding companies.
• Ask about a contractor's insurance; have there been any major accidents or claims against the builder?
• Ask about awards and recognition. Has the contractor won any awards for his work? Is he certified or accredited by any trade organization?
• Check on lawsuits. If the contractor has been or is currently involved in litigation, find out the details
• Ask to meet the individuals who will be involved with your project, particularly the job superintendent- this is of considerable importance as the final quality of the installed courts is very dependent on the supervision/quality/experience of the installation crew that comes on site to do the job. Does the contractor/superintendent seem knowledgeable about size requirements, orientation and slope of tennis courts? Does he understand grading, drainage, site preparation and base materials? Is he familiar with different tennis court surfaces? Can he make recommendations regarding specific court surfaces for your needs? Is he familiar with amenities and accessories including fencing, lighting, nets, net
posts and windscreens? What is his current workload; can he realistically handle your project within a reasonable time frame?

- Consider communication. You want a contractor who listens to you and responds to your needs. You want someone with whom you feel comfortable, someone with whom you can establish rapport. You want a contractor who will build the facility you want, not one who will build his standard court and move on. You want a contractor in whom you have confidence. Don't underestimate the value of a good working relationship.

Having completed steps one and two above, now select the companies to be invited to bid and issue them with the Enquiry indicating the dates for submitting bids and when bids will be opened. Clarifications issued before the closing date should be issued to all prospective bidders. The bids, once opened, should then be evaluated under the following criteria:-

- Ensure that the bids, including products to be used and methods of construction, are equivalent to your Specifications and Scope of Work
- What is included and what is not included in the contract price?
- How important are the deviations and how much will it cost to remove them
- Who contractor or owner is responsible for such items as permits, site preparation, electric power, taxes, insurance, removal and replacement of trees and shrubbery? Such items, while essential to the project, may or may not be included in the bid; whether or not they are included can significantly affect the contract price and the overall project cost. Even if construction materials and methods are identical and items included in the contract are consistent, look beyond price when comparing proposals.
- Compare proposed construction schedules, progress payments, and most importantly, guarantees and warranties. Be sure that you understand what is included in any guarantee materials, workmanship or both and for how long.
- Rank the proposals and then attempt to negotiate a contract with your first choice builder. While price is not the only consideration, if the bid of your preferred contractor seems high, try to negotiate a lower price or additional services into the package to make the higher bid more attractive.

Once you have chosen a contractor, confirm your agreement in writing. The contract documents, signed by both owner and contractor, should be as specific as possible and should include, where appropriate, an agreement, conditions of the contract, drawings and specifications defining the scope of work including labour, materials, equipment and transportation to produce the project and any agreements/clarification made after the bid was opened and before award. Consider appropriate bonding, which may depend upon the size of the project. You may ask for a bid bond, a performance bond and/or a payment bond.

Also, you may want to ask for a current certificate of insurance as proof that your chosen contractor has adequate insurance coverage.

In general, if the Scope of Work requires two contractors to be on site- e.g. one to do civil works and one to supply and lay an artificial turf surface then we consider that this should
be organised by having a main contractor and a sub contractor. This means that one contractor is responsible for the overall installation and, in the event of later problems with the court, the owner has only to contact the main contractor. It is usually better that the supplier and layer of the artificial turf be the main contractor, as the subsurface must be prepared to their specification.
9. Workmen and Equipment

All workmen and equipment shall be clearly identified and they shall not be brought on site or removed without the written approval, of the owner, which shall not be unreasonably withheld. This is to avoid any unnecessary disruption of work.

It is vital that the gang doing the installation are experienced in installing the type of court selected.

Of course where additional courts are being added or old courts renewed then provision will have to be made for access of materials and equipment to carry out the work. This may involve the carriage of several tonnes across courts and this has the potential to do considerable damage if routing and timing is not properly planned.

All work with respect to Safety, Health and Welfare must be carried out in accordance with Irish Labour Laws and Recommendations
10. Supervision

It may be desirable to employ a consultant to assist in planning, building or renovating a court facility. Depending on the scope of the project, employing the services of an expert can actually help control job costs by better translating the needs of the owner into proper direction for construction, and by helping to avoid costly mistakes. A professional architect, engineer or landscape architect, or a knowledgeable contractor, trained and experienced in tennis court construction, will help you identify your needs and refine the information to the specific requirements of your site. A consultant can assist you in determining the scope of work to be included in the job, in planning the facility, in determining a realistic budget for the project, in evaluating and comparing bids, in overseeing the work in progress and in solving any problems which occur during construction.

In employing professional assistance, however, it is important to consider the experience of your consultant. Tennis court construction is a highly specialised field which is undergoing constant change. It is important to employ an individual or firm with extensive current experience in the field of tennis court construction.

Another way to find a qualified professional is by contacting colleagues who have recently completed similar projects and asking for a recommendation. In any case, when you contact a prospective design consultant, be sure to ask questions about the firm's experience in tennis court design. Ask about completed projects and past clients. Contact references and visit completed projects. Ask for proposals and compare them carefully. Be sure you understand what is and what is not included in the proposed contract. Finally, once you choose a professional consultant, carefully negotiate fees and services and be sure to secure a signed letter of agreement or contract which clarifies all aspects of your arrangement.

It may be that the owner/club has in house expertise, which has the technical competence to complete the above work. It is very important that there is only one person supervising the Contractor and that it is not supervision by Committee- the latter leads to considerable confusion with respect to who is giving instructions and almost certainly leads to delays and additional costs which can be considerable.
11. Typical Price

This is difficult subject and it is really how long is a piece of string. It depends on many factors including

- The number of contractors who can do the work; obviously the more contractors the more competition there is
- The state of the market; if there are lots of courts being installed in Ireland then prices may be high as the contractors have lots of work
- The recession – in a recession contractors tend to price more keenly as labour and raw materials drop in price
- The number of courts being installed; the contractor’s mobilisation/demobilisation (i.e. bringing labour and equipment on and off site) cost for one court will be higher than say for four courts – in the latter case he can spread this cost over the four courts
- Whether the contractor is part using the installation for advertising/marketing purposes in that he hopes to get additional business at this installation or at a nearby facility.

The price per court for artificial turf courts installed before 2009 was approximately €15,000

In 2009 17 artificial turf courts were installed in Glasnevin, Clontarf, Malahide and Glenalbyn and the average price is approximately €18,000

All of the above prices exclude the asphalt sub-surface, which was already installed. The subsurface is estimated to cost approximately €8,000 -€10,000 per court.

So on the basis of the above the projected price for 2010 is

- €18,000 for artificial turf per court
- € 10,000 for asphalt sub-surface

Where a number of courts are being installed.
If only one court is being installed then an overall price of €35,000 - €40,000 might be expected. Of course very careful attention has to be paid to the type and quality of surface being installed and the quality of the workmanship. You get what you pay for or at least, if it's properly specified, a good contractor and surface selected and the installation properly specified then you should get what you pay for. If any one of these is not done correctly, then you may not get what you think you are paying for.
12. Guarantees

When a contractor completes a new installation or indeed completes a refurbishment (e.g. reduces compaction of sand on an artificial turf court) he should supply a guarantee for the work completed. The guarantees should clearly specify what is covered, for how long it's covered and what the remedial action will be.

In Ireland we have been informed by clubs that Guarantees tend to be 5-7 years duration for new courts or surfaces and 1-2 years for refurbishment.

If the Contractor is relatively new it may be necessary for him to provide a bond to cover the Guarantee.
13. Fencing

It is suggested that all courts are to be fenced in green or black chain link fencing to BS1722 Part 13.

Angle section fence posts 50mm x 50mm are commonly adopted, however a 60mm diameter tubular or rolled hollow section, plastic coated coloured black or green post is preferred.

**Careful attention should be paid to fixings, to ensure that there are no sharp edges that would cause injury to either players or spectators.**

The base of the fencing should be constructed so that the tennis balls cannot get underneath the fencing and the edge of the court construction. This can take the form of a horizontal bracing bar.

Generally the fencing should be 2.75m high, however, lowered sections should be considered for viewing. The fencing should then be 2.75m behind the base line and return two bays full height, the second of which should slope down to height of 1.2m above the court surface for the remainder of the side elevations. Where it can be achieved fencing dividing multiple court enclosures should be min.1.2m high with one bay from the surround fencing brought into the court at full height.

The gate provision should allow for maintenance access for court surface and floodlighting.

If windbreaks are going to be attached to the fencing it is important that the fence posts and their foundations are designed for the winds expected otherwise the fence will
The typical cost of fence including post, foundations etc, is €xxx per linear metre for vvvv fencing
14. Windbreaks

Wind screening maybe provided either in the form of landscaped earth mounds, planting or porous windbreak screens mounted on the court fencing. The design of the fencing must take due consideration of the additional wind loads applied by the windbreaks with additional or strengthened supports whether or not windbreaks are included in the scheme. Windbreaks should not be left up all year.

Windbreaks based on planting usually provide the most effective and are also the most visually accepted. However they have to be carefully planned as they require maintenance in the growing season and during the autumn when they shed leaves.
15. Maintenance

Court investment is high and it is essential that the courts are properly maintained in order to ensure that

- The playing surface is kept scrupulously clean, to preserve its playing characteristics.
- That the pile remains supported to prevent flattening leading to inconsistency in ball rebound, foot friction and poor drainage.
- That the free drainage of surface water is maintained throughout the life of the court.
- That the tennis court should look attractive and well kept at all times.

These objectives are achieved by:

- Regularly sweeping leaves and other detritus from the surface.
- Regularly brushing to freshen the fibre surface, counteracting any slight sand drift or compaction and tendency to form an impervious skin on the sand surface that might impair drainage.
- Applying prophylactic treatments of moss killer and/or algaecide.

15.1 Keeping the surface clean

Leaves, tree flowers, pine needles, and other detritus should not be allowed to remain on the surface for any length of time. If this happens they rapidly decay forming a drainage-inhibiting skin within the surface, and providing a growing medium for algae and moss. A wide soft broom or a rubber-tined rake is ideal for removing vegetable matter and other rubbish. Better still a mechanical leaf sweeper or garden vacuum cleaner will greatly speed-up the operation. The equipment should be well maintained and carefully operated to avoid contamination of or physical damage to the surface. Both sweepers and vacuum cleaners may tend to remove rather too much sand during the first few months of the life of the surface, but thereafter should cease to be a problem. Some disturbance of the surface of the sand may be a positive benefit

15.2 Brushing

Brushing the surface is a crucial operation if premature loss of pile and deterioration in drainage is to be prevented. Apart from freshening the look of the surface (rather like a lawn mower making stripes on a lawn), the purpose of regular and fairly vigorous
brushing is to prevent the formation of a compacted and impervious skin on the top of the sand layer which will inhibit drainage and encourage moss and algae.

Or other similar maintenance machinery – mechanised or otherwise – it is very important that refuse/debris is removed from the surface and not brushed into it. If the debris is brushed into the surface it will clog the surface, compact, cause poor drainage and lead to moss growth.

15.3 Brushing Machinery

Brushing by hand is basically ineffective and hard work. A selection of mechanical brushing machines is now available which will speed up and lighten the operation and these are recommended at tennis venues where there are several courts. The machines vary in the vigour with which they treat the surface – some methods, namely rotary brushing, are rather fierce and only recommended for use by experienced operatives and where heavy remedial brushing is indicated. Combined brush and vacuum machines must be used with even greater care because sand brushed and sucked from the surface may be very difficult to replace especially when the court is wet. The use of a small mechanical tractor with weighted drag brush is strongly recommended for the best long-term performance. The installer’s advice should always be sought when considering the use of any but the lightest machines.

15.4 Synthetic grass court maintenance tractor & brushes

The recommended frequency of brushing must depend on the amount of use the court receives and whether its location is open and clean. Once a week is a recommended norm but it may be advisable to brush more often if the court is heavily used, shaded or subject to ‘pollutions’. Similarly a little used court, in a domestic garden for instance, will come to no harm if the intervals between brushings are longer, provided the location is open and clean. It cannot be overemphasised that to neglect the brushing of this kind of court may have serious long-term consequences even if, in the shorter term, the court does not appear to suffer. Brushing need be neither time-consuming nor onerous but its benefits are profound. To omit the process may result in a court ceasing to drain at half-life or sooner. An un-brushed court will look scruffy and be susceptible to moss infestation.
15.5 Moss and Algae

In certain situations and in some seasons algae or moss can become established on the court surface. Since prevention is very much more effective than cure, it is important to treat the court with a good proprietary moss killer and algaecide at least once a year. Moss is not usually found on that part of the surface that is heavily used, and it may not be essential to treat these areas although it is still a wise precaution to do so. Particular attention should however be paid to those perimeter and other areas that are not heavily used, especially if they are shaded by walls or buildings or overhung by trees. Any good proprietary product is satisfactory provided it is not oil-based. The manufacturers instructions should be closely followed. Some installers can supply specially formulated moss killers. Where moss has become established, repeated applications of moss killer may be needed until the moss can be brushed and cleared away. In the case of very severe infestation, the installer should be consulted. High pressure cleaning equipment is now available but its use is a skilled process. It should be emphasised that moss is only a serious problem if it is allowed to become established. An annual prophylactic application of moss-killer is an easy way of preventing this. Regular brushing and use of the court renders moss an even less likely problem.

15.6 The First Month or Two

Immediately after construction there is an initial working-in period during which the final playing surface is created. Initially the court surface will be left rather sandy but full penetration of the sand infill into the pile and its subsequent compaction into a uniform playing surface occurs naturally with normal processes, especially rainfall and initial play. This usually takes 1 to 2 months.

During construction every effort is made to ensure even distribution of sand over the whole court. Experience, however, shows that increasing the frequency of brushing in the early weeks of use is beneficial in creating the final playing surface. If areas are found which are short of sand it should be possible to brush surplus sand into them from adjacent areas, provided this is done within the first few weeks. If the under-sanded areas are extensive or do not respond to this treatment, the installer should be called in immediately.

15.7 Play Lines

Your court will normally be supplied with permanently in-laid playing lines. However, if additional lines are required for special events, these can be painted onto the surface using water based paints. Chalk lines can be applied but these tend to leave a lasting powder spread in the area of the line. Permanent lines require no special attention.
15.8 Stain Removal

Most stains can easily be removed with a solution of hot (NOT BOILING) water and a household detergent e.g. washing up liquid. The removal of chewing gum can be simplified by using ice cubes to harden the gum.

15.9 Weeds

No matter how much care is taken, weeds may occasionally appear on the surface usually as a result of wind blown seeds. Small numbers of weeds can be removed by hand without damaging the surface. Localised areas of weed seedling infestation can be treated with domestic weed-killers without causing damage to the surface of your court. Oil based weed-killers should not be used.

15.10 Snow and Ice

Snow and ice are not harmful and can be permitted to melt through. If it is important to remove the snow to enable play to start sooner than would otherwise be the case, brushes or wooden scrapers may be used. Metal shovels or scrapers may damage the surface and should not be permitted. Rock salt and chemical de-icing agents should not be used. Provided that the foothold is adequate the court may be played on when frozen, but heavy use is to be discouraged because the fibre is relatively brittle at low temperatures. Of course Safety becomes a major consideration if playing under snow and ice and players are actively discouraged form playing in such conditions. If heavy rain falls immediately after a very cold spell, the court may become flooded for a few hours. This is because the sand beneath is still frozen. Do not worry; the ice will soon melt and the surface will then drain normally.

15.11 Footwear and General Court Care

Make sure that suitable footwear is used i.e. tennis shoes or plimsolls. It is strongly recommended that your court is a “NO SMOKING” area. A dropped cigarette will melt the fibres down to the surface leaving an unsightly mark. Chewing gum should be banned too. It is also recommended that food and alcohol be prohibited from the court area.
15.12 Maintenance Schedule

15.12.1 Daily – at the end of the day’s play

- Make sure the gate is shut
- Clean debris from court

15.12.2 Weekly

- Brush court to re-distribute sand
- Clear leaves and rubbish etc. from the court
- Deal with any new weeds, moss or algae

15.12.3 Monthly

- Check sand levels

15.12.4 Periodically – at least every six months

- Check for moss and algae growth, food-stains, shoe-marks etc., and remedy as appropriate
- Apply grease to the winding gear

15.12.5 Annually

- Treat court with moss-killer/algaecide
- Call in installer if any aspect is causing significant concern

Note:

These are minimum recommendations. Cleaning, brushing and court inspection can always be done more frequently. Common sense and careful observation should prevail. If any serious doubt exists about the effectiveness of the maintenance regime or the condition of the court(s), call in the installer immediately. It is better to be safe than sorry. Great care should be exercised if sand compaction is being dealt with or seams have lifted. If the compaction is not properly treated the seams can be disturbed (blasting with high pressure water). If seams have to be treated make sure that it is done professionally and the proper adhesive (suitable for Irish conditions) is used.
FAQs

Does it need much maintenance?

It is essential to keep the sand evenly distributed and free from dirt and debris. Effective brushing should be carried out at least once a week using a mechanical method. Brushing by hand is ineffective, hard work and does not penetrate deep enough into the pile. Contractors offer maintenance packages but these tend to encourage clubs to neglect maintaining the courts themselves.

Our courts are not draining properly, what is the cause?

Bad drainage is usually a sign that an ageing court has a build up of moss, dirt and debris contaminating the sand infill and causing it to compact. Compaction effectively blocks water from permeating through the carpet and results in ponding. If the problem is severe the contaminated infill can be replaced with new sand. There are two methods using either high power water pressure or compressed air. Vacuuming using compressed air is the most effective because the surface remains dry, allowing immediate and complete resanding. The water pressure method needs to be carried out in two stages. Once the sand is removed the carpet must be allowed to dry out before the new sand is installed. If the carpet is wet the sand will not flow evenly into the carpet pile. There is also the risk of some contamination being washed to the bottom of the carpet and causing a problem in the future. Great care should be exercised, when using water pressure, not to break the seal which bonds adjacent bits of carpet together; this can lead to carpet lifting, additional wear on the seams and finally the need for complete carpet replacement. Both of these methods are available through contractors but they are expensive and the choice of companies offering the dry version is limited. The only effective way of avoiding contamination is to follow the recommended maintenance guidelines.

When is the best time to brush the courts?
The courts should be brushed when they are dry.

Method of replacement

The synthetic grass carpet is removed in its entirety and replaced with a new surface and new sand infill. In order to ensure adequate drainage for the life of the new synthetic grass carpet the macadam base of the court may need to be pierced and back filled before resurfacing. With medium and particularly short pile carpets there is a possibility of the pierced holes causing small depressions in the playing surface. This can distort the bounce of the ball after it has made contact and is therefore unacceptable. To ensure the holes do not become a problem it is strongly recommended that the pierced macadam surface is overlaid with a new macadam layer. Overlaying also has the advantage of ensuring the surface regularity of the macadam base for the carpet is to the highest possible standards – giving the best possible ball consistency. A new layer of macadam with raised kerbs will cost approximately €6000 per court excluding VAT.
16. Safety

Safety and Health are major issues and all clubs should be fully in accordance with Irish and EU Laws and legislation with respect to safety and health. In general clubs should have a Safety Policy Statement and Safety Plan that all employees and Contractors will be requested to comply with. Contractors will also be requested to produce an additional Safety Plan/ Method Statement clearly identifying the risks for their work on site and how they will mitigate those risks.
17. Floodlighting

Facilities providing floodlit tennis have an enormous advantage over those without lighting, attracting coaches, more players, extending playing time and increasing revenue from court fees during the winter months. Between November and April when daylight is shorter and indoor provision is not available illuminating outdoor courts adds 35% more playing time.
The floodlights are to be designed to meet LTA guidelines for illumination and to ensure that routine maintenance such as changing of bulbs, can be accomplished simply. The floodlight columns should preferably not be positioned inside court enclosures. The electrical installation should conform to the ETCI regulations current at the date of installation. Controls should enable individual courts to be illuminated and controlled from a central point.

If show courts are to be included in the facilities, their special requirements must be taken into consideration in the floodlighting scheme design installation.

Where floodlights are not to be provided then the installation of the necessary ducting etc., should be considered to enable floodlights to be fitted at a later date. Consideration should be given to the layout of the ducting to enable central columns between courts to be accommodated.

17.2 Facility Hours per annum

Outdoor non floodlit court (allowance of 35% for bad weather) 2500

Outdoor Floodlit court (allowance of 35% for bad weather) 3500

When considering installing or replacing floodlighting it is easy to become perplexed by all the special terminology; Illumination levels (measured in lux), evenness of light distribution, the number of lumens per watt generated by a particular type of lamp.

But these elements are important contributors to a successful scheme and the context in which the system is placed can have a profound impact on its overall effectiveness. Clubs are strongly advised to look at and play under as many different working systems as they can and listen to the experiences of others who already have floodlighting.

Above all else, be aware that you are buying illumination, not just columns and lights.

The first issues to consider when planning a floodlighting scheme are:

- How much light do I need?
- How much will it cost?
- Do I need planning permission?
- Do we have enough power?
- What design will best suit our club & the local environment?
Floodlighting is highly subjective. The main difficulty facing any club wishing to install a lighting system is the balancing of a number of conflicting constraints governing its design. Some of these constraints are imposed by external bodies such as a local planning authority or electricity suppliers.

The best design solutions will be a balance between available power, cost, and ease of maintenance, system management, and, player preference / perception.

17.3 Definitions

Illumination The process of lighting an object or surface

Luminaire Combination of the light fitting and the lamps[s] e.g. box /projector with lamp inside

Uniformity The evenness of the distribution of light over the court surface. The uniformity of light is as important as the level of illumination, and therefore light should be spread evenly over the whole area, including behind the baselines, outside the sidelines, and above the court

Lux Unit of measurement of illumination falling on the surface of the court. One Lux equals one lumen per square metre.

Light spillage

Two forms:

- **horizontal** illuminance - measured at ground level
- **vertical** light trespass – impact on the face of vertical surfaces – e.g. neighbouring windows

Glare:

Glare is not simply too much light. It affects both players, spectators and the surrounding environment and is highly subjective. There are two types;

- **Disability glare** impairs vision without necessarily causing discomfort.
- **Discomfort glare** causes discomfort without necessarily impairing vision.

It is related to the brightness of sources of illumination viz. the lamps, in the observer’s field of view and other factors such as the brightness of the background e.g. night sky,
against which they can be seen and the position of the observer. These factors working
together give rise to the sensation of discomfort glare.

Discomfort and disability glare are minimised by the correct selection, siting and aiming
of the floodlighting, relative to the observers position.

In general the application of floodlights incorporating asymmetric reflectors at low
aiming angles will contribute significantly to the control of glare. For further advice see
ILE Guidance Notes on the Reduction of Light Pollution.

17.4 How much light do I need?

LTA standard levels of illumination

- **Principal Playing Area (PPA)**: The area within the court lines
- **Total Playing Area (TPA)**: The court area comprising the PPA plus 4.5m of each
  runback and 2.5m of each side run

**Uniformity Factor:**

Minimum/average lighting level

**Maintained Illuminance:**

The specified standard within the prescribed areas. This will be the value attained when
degradation in performance, from the initial value, has occurred and the lamps are then
considered to be at the end of their performance life. (Typical value 2/3000 hours).

The following illumination levels for artificial lighting within the prescribed areas must
be matched to the different environments measured at the playing surface. The standards
are to be applied on a court-by-court basis. The court lighting is measured at the playing
surface irrespective of the switching arrangements.

<table>
<thead>
<tr>
<th>Standard</th>
<th>Maintained Average Illumination on PPA</th>
<th>Maintained Average Illumination on TPA</th>
<th>Uniformity within PPA Emin/Eav</th>
<th>Uniformity within TPA Emin/Eav</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended</td>
<td>500 Lux</td>
<td>400 Lux</td>
<td>0.7</td>
<td>0.6</td>
</tr>
<tr>
<td>Minimum</td>
<td>400 Lux</td>
<td>300 Lux</td>
<td>0.7</td>
<td>0.6</td>
</tr>
</tbody>
</table>
NB. Emin = lowest recorded value within the prescribed area. Eav = Arithmetic average of all readings within the prescribed area.

When preparing the performance specification, the required uniformity must be identified. Greater uniformity will generally be achieved by systems using taller columns and/or a larger number of light sources.

17.5 How much will it cost?

The overall feasibility of a floodlighting project will depend upon the standard required, the initial cost of the system, the hourly running costs and the cost of maintenance and eventual replacement. All these factors should therefore be given careful consideration, particularly as a more costly installation could also mean a more efficient (and therefore less expensive) system overall.

Individual court £10,000
Block of 2 courts £16,000
Block of 3 courts £25,000

These are guideline costs and do not take account of any site specific issues particularly the provision of underground ducting or new power supplies.

17.6 Do I need planning permission?

Planning permission is usually necessary because the installation will normally involve the erection of some sort of floodlighting columns and some changes in the use of the club grounds. The installation comprises an engineering application and therefore only a full planning application can be made. This requires drawings showing the location of the columns, their design and appearance, a datasheet, manufacturers leaflet for the luminaires and switchgear cabinets.

17.6.1 How do I apply?

Firstly, a club should obtain the appropriate planning application form from the local planning authority. Each Planning Authority (County Council) will have an overall policy and plan for its particular area and it is usually a good idea to seek advice from the appropriate planning officer before submitting a completed application.

It will be necessary to draw up a site plan of the proposed scheme, together with a data pack to illustrate the column layout, the predicted performance and associated spillage,
light trespass, sky glow and glare. The majority of the specialist floodlighting contractors are fully familiar with the requirements of the planning authorities, and have historically provided the data packs. It is recommended that any scheme be developed in accordance with the “Guidance Notes for the Reduction of Light Pollution” as published by the Institute of Lighting Engineers.

The planning officer will then decide on the merits of the application.

**17.6.2 How long will it take?**

Most authorities work on a regular cycle of meetings and so it is likely that an answer will be given within eight to twelve weeks of submission, depending on how busy the Planning Office is. However, before a decision the planning officers may contact the club for clarification, or advise the club in its own interests to change certain details in the application. Such action inevitably means deferment of the eventual decision. One of three answers can be expected:

1. **Granted Outright**: This gives permission to carry on with the development straightaway. The club has five years within which to put the permission into effect, or three years to submit detailed plans for approval if the permission is in outline only. It should be noted that all applications are subject to conditions even if it is only a time limit condition.

2. **Granted Subject to Conditions**: The conditions will regulate certain aspects of the development, such as the height of the structure supporting the lamps, the intensity of the light, the hours of play and the use of car parking, service roads and highways.

3. **Outright Refusal**: The council must give full reasons if an application is refused or conditions imposed.

Applicants who are aggrieved by a refusal, or disagree with the conditions, can appeal to an Bord Pleanala. Objectors who are aggrieved by a grant of permission or disagree with the conditions, can also appeal to an Bord Pleanala.

In obtaining planning permission, clubs have found that the most sensitive factors are:

- the number and height of the lighting columns
- the physical appearance of the fitting
- Initial and maintained illuminance
- Sky Glow – ‘halo’ effect over the playing area
- Glare – Impact of high intensity light source against a dark background
- the “spillage” of light from the playing area to surrounding residential development, highways and service roads
- vertical light trespass onto the face of adjoining windows
• the times of operation (often restricted to before 10.00 or 11.00 pm each evening, depending on location and neighbours)
• the extra usage of the club created by the installation of floodlighting and the associated activity relative to its neighbours

17.7 Do we have enough power?

One of the major issues involved in the design of a new floodlighting system is whether or not the existing power supply is adequate. There are a number of demands on the power supply to the site e.g. the clubhouse. The total of all existing loads will need to be checked to verify any spare capacity for the new floodlighting installation. Advice can be sought from either a design consultant, electrical contractor or installer of the system. A club with up to 2 courts may be able to utilise the existing “domestic” single phase supply for additional floodlighting. At sites with more than two floodlit courts the ESB will usually require a “commercial” three-phase power supply to be installed to ensure they can match the overall demands of all consumers by balancing the loads on the supply. Provision of the correct power supply, to a location adjacent to the courts will be the responsibility of the Club / Organisation.

To ensure the power supply required is correctly quantified the following information must be established at the earliest possible date in the project development.

• Confirmation of the supply voltage and frequency required for the electrical supply.
• The power factor of the proposed lighting
• Total load for the complete facility (Kva rating)

17.7.1 How will the power supply be installed?

If a new supply is needed it may be installed into an existing building, or into an Intake Enclosure, local to the court block. Please note that during the project development it may prove more economic for the power supply to be terminated at an Intake Point at the site boundary, instead of local to the court block. This will minimise the work to be done and hence contain the cost by utilising the services of either a local contractor or the floodlighting contractor. They will complete the feed cable installation from the intake point. This arrangement is commonly used if there are other facilities being installed, on other parts of the site which may also require electric power now or at a future date. [E.g. floodlighting for outdoor courts, or clubhouse etc.] In this case, at the Intake Point a Main Isolator and a ‘switchboard’ or ‘switchfuse’ will be needed. The function of this equipment is to control and protect the feed cables to the various locations.

The cables are called ‘sub-mains’. When any sub-main serves an area that includes floodlighting it is critical that this cable is designed to ensure that the volt drop on it does not exceed 1.5% of the supply voltage. Any local contractor instructed to carry out the
provision of the intake equipment and / or the sub main cable[s] needs to be briefed accordingly and advised that the “Zs” value must not exceed 0.3 ohms. The sub-main will be terminated at the isolator of a Power Distribution Unit (PDU), inside a building or within a Feeder Pillar local to the court block. The supply voltage will be measured when the building and / or the floodlighting only is operating under full load. Failure to follow this guidance, in respect of sub main design, can lead to an unacceptable loss of performance from the floodlighting and an ineffective lighting system.

17.8 Layouts/Fittings

When considering a suitable lighting scheme for a particular site the basic design criteria is to:

- Meet the LTA minimum standards of maintained average illuminance within the prescribed areas of each court, the Principal Play and Total Play Areas. (PPA & TPA). (see below).
- Maximise the uniformity on the prescribed areas of each court, the Principal Play and Total Play Areas. (PPA & TPA).
- Provide high quality colour rendition with minimum glare, sky glow and spillage.
- Minimise the height and quantity of floodlighting columns
- Minimise the effect on the environment
- Minimise light spill which may inconvenience neighbours.
- Provide a lighting installation dedicated to tennis
- Provide a cost effective solution

It is critical that the design clearly identifies the prescribed areas to be illuminated and the uniformity, and addresses the problem of illuminating the side of the ball that the player looks at in preparing a stroke whether it be driven low over the net or falling from a high lob. Thus the ideal is to simulate daylight where the light is diffuse, i.e. it appears to come from everywhere. Similarly it is important that the player does not perceive a multitude of “suns in the sky” when serving or going for overheads. Noticeable variation in illumination levels makes the ball appear to speed up or slow down, and distorts a player’s judgement.

Conventional tennis court lighting systems consist of a number of floodlights mounted on several columns located at various points around the courts. Generally, the minimum column height is 6m, the maximum not normally exceeding 10m, and there are different types of lamps and light fitting each with its own characteristics. The type of system is predominantly dictated by local issues; residents, houses, the environment, residential or open field and by the planning authority.
17.8.1 Open site or sports field

For those sites with few residential houses, but some local natural screening the most commonly applied solution is the application of four 10m high columns, per court, arranged in a corner lit configuration, with four projector fittings per court inclined at low aiming angles. This arrangement minimises the number of columns and glare for neighbours and is attractive to the planning authorities. This solution minimises glare to players and maximises uniformity, significantly better than the LTA minimum requirements.

N.B. If the site does not have any local natural screening then care must be taken to avoid the floodlighting and/or the columns being too obtrusive. In these cases alternative design concepts may be more suitable and expert advice should be sought in choosing the most appropriate design.

17.8.2 Contentious area with environmental/planning issues

Planning authorities are less likely to accept columns at 10m in residential areas. Reducing the height of the columns from 10m to 8m can, with correct fitting selection, be considered. It will result in higher levels of illuminance but lower, poorer uniformity. The projectors are aimed a little higher, but this must not be allowed to cause an unacceptable amount of glare to players and neighbours. The improvement in light fitting design from 2005 has made this a practical alternative to the 10m high column scheme.

Another solution to these more contentious sites is the application of six low level columns [6m to 8m high] per court, fitted with a minimum of six lower powered luminaires per court. This will produce the correct uniformity, minimise glare and control spillage. Although more columns and luminaires are required with this scheme, the impact in daylight is reduced by the lower column height – another key factor in planning terms. When planning approval can be achieved for the use of 8m high columns, the uniformity is equal to that of the 10m high corner lit scheme described previously.

Developing the floodlighting system will also involve matching the environment to the appropriate LTA standard and selecting the appropriate type of lamp.

17.8.3 Column layouts & fittings

Careful planning in the location of columns and the luminaire heights is essential to lighting design. Ideally lights should be as high as possible in order to maximise uniformity, but due to other factors all lighting systems are a compromise to some degree.

Of course there must be reasonable access to the columns for maintenance /replacement of lamps, as necessary. Where access is a problem, consideration should be given to use of ‘hinged’ poles where the upper section can be lowered to the ground when required. These poles are, of course, more expensive, but ensure easier access to the lamps.
When courts are lit individually, the minimum height for floodlighting columns is 6m, the maximum not normally exceeding 10m. Alternatively courts can be lit as a block of three and a cost effective solution is to apply four 10m columns.

Most layouts involve lighting the courts from the corners or in a corner and side lit configuration.

Where the site conditions and/or court spacing allows, the side lit layout should be used. Lighting from the side of the court will result in minimum glare.

Where appropriate, adjoining courts can share columns to support the light fittings.

The relative merits of the alternative **column layouts** are detailed below:

### 17.8.4.1 Side Lit Scheme

Side lit layout - typically up to 8m with ‘Box’ fittings
Two courts controlled as ONE block and lit from the SIDES only

---

**Advantages**

a) Less glare within the court area
b) Less glare outside intended area
c) Good control of light spillage
d) With columns 8m high and above – high levels of uniformity
e) Multi court lighting in blocks of two and three courts is possible
**Disadvantages**

a) Difficulties experienced where two or more courts are to be illuminated individually, unless a minimum of 7m is available to safely locate columns between courts at the baseline.
b) Usually a minimum of three columns is required each side of each court, hence not as cost effective as other solutions when lighting courts individually.

**17.8.4.2 Corner Lit Scheme**

Corner lit layout - typically 10m with ‘Projector’ fitting (Min. column height 8m). Two courts lit & controlled INDIVIDUALLY from the CORNERS of each court.

If there are only two courts moving the corner columns to the side of each court will reduce any glare further

**Advantages**

a) Least number of columns to achieve LTA recommended standards.
b) High level of illumination on surface of ball approaching player
c) High standards of uniformity
d) More suitable for three or more courts, where individual court switching is required and limited room is available between courts
e) Cost effective solution

**Disadvantages**

a) Potential for excessive glare. Careful selection of aiming angles required.
b) Column height may be considered obtrusive in daylight
c) Column locations usually required outside the fence area.
17.8.4.3 Corner and Side Lit Scheme

Corner and side lit – typically from 6m with ‘Box’ fittings. Two courts controlled INDIVIDUALLY from the corners and sides.

Advantages
a) Uses lowest column heights that can be applied to meet LTA minimum standards
b) Facilitates the application of ‘box type’ fittings – perceived by most planning authorities as more suitable for contentious site locations.
c) More suitable for two or more courts, where limited room is available between courts
d) Good control of glare, sky glow and spillage

Disadvantages
a) Large number of columns required to achieve minimum standards
b) Larger number of fittings than the equivalent corner lit scheme
c) More costly to install

The use of corner lighting systems is not recommended where national or international levels of play are involved.

Typically the lamp control gear is housed at the base of the floodlighting columns inside the columns themselves. The mains protection (MCBs) and control switchgear is usually located either within the tennis facility premises or within a purpose-built weatherproof cabinet local to the court block. This is called a feeder pillar.
17.8.5 Fitting Selection

Fitting selection is closely related to the column layout as illustrated below:

Comparison of fittings

<table>
<thead>
<tr>
<th></th>
<th>Box Fittings</th>
<th>Projector Fittings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Height</strong></td>
<td>Typically applied up to 8m</td>
<td>Typically applied from 8m upwards</td>
</tr>
<tr>
<td><strong>Cost</strong></td>
<td>Approx 5% higher capital cost than equivalent corner lit scheme</td>
<td>Cost effective solution</td>
</tr>
<tr>
<td><strong>Position</strong></td>
<td>Side or Corner and side</td>
<td>Side or Corner</td>
</tr>
<tr>
<td><strong>Planning</strong></td>
<td>Greater No. of fittings</td>
<td>Height of columns has an impact on the environment in daylight, but is offset by the need for fewer columns and fittings</td>
</tr>
<tr>
<td><strong>Performance</strong></td>
<td>LTA minimum Six [6] 1Kw fittings per court</td>
<td>LTA recommended Four 2kW fittings per court</td>
</tr>
<tr>
<td></td>
<td>LTA recommended Eight(8) 1kW fittings per court</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LTA minimum uniformity at 6m</td>
<td>Best uniformity</td>
</tr>
<tr>
<td></td>
<td>Best uniformity at 8m</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low glare</td>
<td>Glare control subject to careful fitting selection and aiming angles</td>
</tr>
<tr>
<td></td>
<td>Very close control of spillage</td>
<td>Good spillage and sky glow control</td>
</tr>
<tr>
<td></td>
<td>Good sky glow control</td>
<td></td>
</tr>
</tbody>
</table>
17.8.6 Light sources / lamps

For conventional systems there are essentially two different types of light source, incandescent and high pressure discharge lamps. Incandescent are now rarely used. There are two principal types of high pressure discharge lamps which give out a markedly different colour light:-

- Metal Halide [MH]
- High pressure sodium [Son].

Metal halide lamps emit a brilliant white light whereas high pressure sodium lighting has a pale yellow tinge. The latter should not be confused with low pressure sodium roadway lighting

The colour of the court surface can also significantly affect the performance of the floodlighting. Different colours absorb and reflect different amounts of light depending on its own colour content. White light contains a high proportion of all colours and therefore reflects equally well from any coloured surface, while yellow light contains a high proportion of yellow and reflects best from a yellow surface. When playing tennis under floodlights the reflected light is used just as much as the light directly radiated from the lamps and so lamps should be accordingly selected. The reflected light is normally the only source of light for underlighting a falling ball. Also the ambience created by playing in white light is usually better than with sodium lighting which tends to make some colours, such as red, look dull and dingy.

Before selecting either Metal Halide or Sodium lamps it is recommended that the club/developer visit other clubs/courts, which have installed floodlights and compare each type of lamp. This is very important because outside the cost and maintenance aspects the question is whether a white type light (Metal Halide) or a yellow light (Sodium) would be preferable to the players.

It should be noted that to achieve LTA lux levels additional lamps may be required with Metal Halide when compared with Sodium. However as Metal Halide is a whiter light when compared with Sodium and thus with Metal Halide there is a greater perception of light. So in practice, fewer lamps are required with Metal Halide to give adequate lighting.
Irrespective of which lamp is selected it is very important that the level of light over the court (front to back and side to side) is relatively even - a maximum variation of 20% is recommended.

17.8.6.1 Metal Halide Lamp

Advantages

a) Efficient lamp
b) Low power required to achieve LTA standards
c) Low running cost
d) Approx. €0.9/hr at LTA minimum standard i.e. 6 x 1kW fittings
e) Approx. €1.2 /hr at LTA recommended standard i.e. 8x1kW fittings
f) Very good colour rendition
g) Lamp performance life typically 2/3000 hours under normal switching intervals as applied to tennis lighting usage.

Disadvantages

a) High replacement cost.
b) Takes time to reach full output, approx 10 to 15 minutes
c) Lamps that have just been turned off [e.g. end of token period] require a ‘cool down’ period before being switched on again. Typical overall time is 10-15 minutes.

These values are based on the unit cost of electricity at domestic rates.

17.8.6.2 Sodium Lighting
Advantages
a) Very efficient lamp
b) Lower power required to achieve LTA standards
c) Lower running cost than metal halide values depend on final scheme design e.g. min standards can be achieved from 10m columns at approx. €0.5/hr
d) Lamp performance life typically 4/5000 hours under normal switching intervals as applied to tennis lighting usage.
e) Low replacement cost, approx. half that of metal halide

Disadvantages
a) Poor colour rendition when compared to metal halide
b) Takes time to reach full output, approx 10 to 15 mins
c) Lamps that have just been turned off (e.g. end of token period) require a ‘cool down’ period before being switched on again. Typically this is 15 minutes.

17.9 Maintenance

17.9.1 When should lamps be replaced?

The average life of a lamp is different for each type- the output of metal halide lamps decreases at a slower rate than sodium lamps. It should also be borne in mind that lamps deteriorate in their effectiveness from the moment they are first switched on and ideally they should be replaced at the end of their performance life which is usually well before they finally fail. The temptation is to wait for a lamp to fail before it is replaced. Equally the manufacturer does not usually guarantee the life of a lamp and so the club can be unlucky and lose one long before its average life expectancy. **But in order to maintain uniformity of lighting, lamps should be replaced as a complete set per court.**
17.9.2 How do I maintain the floodlights?

Maintenance of the lighting system is one of the most important issues to consider when choosing equipment. Apart from replacing lamps, the lens and reflector of each fitting have to be kept clean and the aiming of the fitting may need to be adjusted at any time. When a system is installed, according to its design, each lamp should be aimed to direct light to a particular area of a particular court. After a long period, the aim may become distorted by vibration or high winds. Also, because luminaires are designed to produce beams using highly polished reflectors as in car headlamps, it is important to keep the interior moisture-free to minimise corrosion. Most floodlights have a sealed glass lens which may be opened to wipe clean the reflector and replace the lamp. A regular check of illumination levels and the resulting uniformity should be included in the maintenance procedures.

17.9.2.1 Minor Service:

- Periodic inspection to keep the face of the light fitting (luminaire) lens clean
- All equipment, exposed to the elements, should be checked to ensure the integrity of the weather sealing
- An inspection to ensure the tightness of ALL electrical connections

17.9.2.2 Interim Service:

- All work listed under the ‘minor service’ schedule plus a test to monitor the degradation in performance of the lamps and hence the overall lighting installation. This test would be identical to those carried out prior to handover and would thus be on a court-by-court basis.

17.9.2.3 Major Service:

- Re-lamping of each court where it has been previously established that performance has dropped from the original installation level (initial value) to the ‘maintained level’ – specified in the original design. N.B LTA standards are set at the ‘maintained level’.
- All work listed under the ‘minor service’ section should also be carried out, together with a fully documented test.
- Health and safety requirements should be taken into account when servicing floodlighting. Adequate protection of the court surface must be considered with the use of a high level maintenance vehicle or working platform.

17.9.2.4 Typical Maintenance Costs

On a metal halide scheme of four courts the budget should include allowance for the following

- Minor service €1000 - Annually
· Interim Service €1200 - After two years of operation from previous re-lamping
· Major Service €2,000 per court - As dictated by the results of the Interim service, approx. every 4/5 years.

17. 10 What allowance should be made for lifecycle costs?

To maintain acceptable floodlighting standards it is necessary to replace items such as columns, luminaires etc. over time. This will, in general be due to:

· deterioration from wear and tear in normal use
· the fairly harsh environment in which most of the equipment is operating
· misuse or lack of full maintenance, or a combination of the above

It is considered essential to budget for this need and to create a sinking fund related to the initial capital purchase. Each floodlighting scheme is unique and site specific. To calculate an accurate sinking fund for a particular site the capital cost of component elements is needed. Based over a large number of schemes we know that €4.00 is the current (2010) average charge for using floodlights on a single court per hour. The table below gives an indication of the minimum working life that you could expect from each element over a 20 year lifecycle.

**Elements that need replacing / Minimum Life Expectancy**

**Protection and control systems** Allow 5-10 years.

**Fittings** (The replacement of the complete light fitting(s) at the top of the columns i.e. luminaires) Allow 10 years

**Light columns** – 20 years

**Cables** (Replacement at end of their overall life). Allow 20 years.

17.11 How do I control my lighting?

The most common methods of control are by coin, token or card meters. Specialist sports floodlighting contractors will normally be able to offer meters to operate the system. It should be checked that:

· The meters can be overridden by a key so that when the club is running a match or tournament the referee or players are not continually feeding them
· The charge per hour may be simply adjusted by the club management so that prices can be adjusted as costs increase;
The meters are robust and may be placed in a relatively secure part of the clubhouse, preferably out of view from outside. (Coin operated machines are a great attraction to passing vandals!)

With high pressure metal halide lamps it is important to note that if the lights go out then they will need to be left typically 10/15 minutes before they can be switched back on. Devices are available on most modern meters that give a visual warning several minutes before the lights are about to go out so that players are not disrupted and lamp life is protected. It is possible to track the lamp maintenance intervals by installing a counter to record the ‘burning hours’ of each court.

If the courts are switched individually a separate meter is required for each court; if they are switched as a group only one meter is required per group. Separate metering is of course more flexible and may be more economic, as when courts are not in use they are not floodlit.

To ensure safety when leaving the courts exit lighting should be considered. This is usually achieved by retaining one of the court floodlights for an overrun period at the end of the pre-paid time or just prior to the curfew time imposed by the planning authority. To ensure safe access to and from the court block, courtesy lighting or security lighting should also be considered.

17.12 What are the procurement methods?

It is critical to have a Scope of Works document for a project preferably prepared with professional help. This is a multi-page document which sets out the requirements for the floodlighting, the performance and installation standards to be applied, and the supporting documentation to be provided. This document is known as the Enquiry Document.

Contractors would be appointed on a design and build basis, whereby the contractor is responsible for the detailed design, supply installation and testing of the scheme to meet the performance criteria set out in the Scope of Works document.

When choosing contractors, clubs should approach reputable specialists in sports lighting. It is always useful to check the reputation of firms at other floodlit tennis facilities, particularly where the systems are at least two or three years old. There are other electrical contractors that will offer floodlighting, but whilst they may appear relatively cheap, their proposals need careful analysis to ensure all aspects of the installation have been included otherwise they may not provide the best value for money. Similarly, “do-it-yourself” installations carried out by clubs might also be false economy, if the desired performance level of lighting and electrical safety is not achieved. When selecting a contracting company the following points should be considered:
• Does the firm manufacture its own products?
• Does the firm offer a full design service, backed by appropriate Professional Indemnity cover?
• Do the products conform with the appropriate Irish and European standards?
• What guarantees are available?
• Does the company carry out its own installation, and is this always done in accordance with the mandatory electrical wiring regulations?
• Does the firm carry full Contractor’s Erection All Risks and Public Liability Insurance
• What after sales service is available, and at what cost?
• Are spare parts readily available?
• Details of experience and staff proposed to complete the works
• Experience with the products proposed

Clubs should seek quotations and/or design proposals from at least three firms, and it is important to ask contractors to provide full specifications and replies to the above bullet points with their quotes.

17.13 How do I develop the scheme?

When developing a scheme for external court floodlighting you will need to present your requirements in a logical order to enable either the Design Consultant or, more commonly, the Design and Build contractor to present proposals and submit quotations for your scheme. The information and actions needed to create Enquiry Documents which sets out your requirements are:

a) A site/location plan (including numbering of courts) to support the planning application and later to inform the contractors when quotations are being sought. It should show the position of the court block and its relationship to adjacent properties, roads, etc.

b) The areas to be illuminated must be identified using the established terms:
   Principal Playing Area
   Total Playing Area

c) The level of illumination in each prescribed area is to be established at the required average value, with a finite uniformity ratio attached to the figure.

d) Consideration must be given to glare control and to “overspill” of the lighting and the extent to which this can be accepted.

e) The different types of lighting system available must be related to the overall requirements and matched to the performance standards required and cost plans.
f) The location and availability of a suitable power source must be identified, together with the associated protection equipment.

g) The requirements for manual and time clock controls must be identified.

h) The routing and type of cables and cable ducts are to be identified.

i) The operating, maintenance and life cycle costs will need to be quantified to form part of the overall business plan.

j) Consultation with Local Authority Planning Officers and, in some instances, with ESB will be required.

**17.14 Frequently Answered Questions**

**Do I need planning approval?**

Yes. For all new installations and where the light source, column height or layout is changed from that already in place. If courtesy lighting is to be installed this will also usually need approval, together with any remote control boxes or power distribution feeder/service pillars.

**What is a planning agreement?**

The formal document which confirms a local authority’s agreement to your development. It may contain “conditions” that will apply to your particular project e.g. curfew time, colour of columns.

**Who prepares the location and site plan drawings?**

On larger schemes the Project Architect, Engineer or Surveyor. On smaller ‘Design and Build’ schemes a Club member can produce the required information using ordnance survey maps, on payment of the required fee, for the location plans at the scales dictated by the Planning Authorities. Dimensioned drawings of the court block[s] are needed to show the overall size of the block, the spaces between the play lines and the depth of back runs and the width of the side runs.

**What is a data pack?**

Data packs are produced to varying standards by most lighting contractors. Basically they contain all the design details of the lighting scheme showing light distribution (predictions of horizontal illuminance on the court surface), light spillage around the perimeter of the courts based on the fittings selected by the designer. These elements are shown mostly in the form of computer printouts – graphical tables and drawings. They
clearly show the cut off points and reduction in overspill that specified fittings can
achieve. Datapacks are particularly important in environmentally sensitive areas and
useful tools for planning authorities to evaluate your scheme.

What are Cable Ducts & Drawpits?

Cable Ducts are heavy duty plastic tubes which usually run underneath the court surface
to contain the power cables serving the various floodlighting columns. Drawpits are
“manholes” strategically placed on or around the court block. Together the cable ducts
and drawpits form a containment system to facilitate the initial installation and or future
replacement of the power cables serving each of the columns. If power cable routes can
be buried close to the perimeter of the court block in soft ground the ducting provision
can be minimised.

What provision needs to be made for ducting and drawpits?

When building new courts the aim of any court contractor should be;

· To minimise the amount of ducting and drawpits whilst achieving the required
containment system defined above.
· To ensure any future re-cabling can be achieved without disturbing the courts
surfaces or adjacent ‘hard’ areas.
· If installed ‘in advance’ of the floodlighting it should include column sleeves set
out to match the lighting design if already approved by planning.

Ducting provision is categorised as follows;

Full- where ducting is needed to every column and would usually apply where there is no
soft ground around the perimeter of the court block.

Partial- can be applied where only some of the cables have to be run in ducting under the
court surface.

Minimal- where none of the cables pass under the court surface but may need similar
containment under hard standings e.g. patios or pathways.

Why should I change the lamp before it fails?

The performance of the light deteriorates to a level at which it cannot achieve the original
performance standard. Lamps need to be changed as a complete set per court in order to
ensure that uniformity (evenness of light distribution) is maintained.

Does the LTA support the application of sodium lighting?

Yes because in certain circumstances the lower power required by sodium systems may
enable an LTA compliant scheme to be accommodated on the existing power supply.
Modern high pressure sodium lighting can provide very acceptable lighting conditions when the impact of lower maintenance and running costs is set against the higher colour rendition achieved by metal halide.

We are keeping the columns and just changing the light fittings, do we need planning permission?

In these circumstances you are likely to need approval for a change of fitting, particularly if you are changing the type of lamp e.g. sodium to metal halide and/or the performance standard. However, there are other technical and commercial issues to address. The new fittings may be of a greater weight than the original and therefore impose a bigger load on existing columns. They may also require larger lamp control gear, which is unlikely to fit inside the existing columns. Commercially, contractors may be reluctant to supply and fit new lamp fittings on to old columns as there could be a conflict of responsibilities in the event of column failure.

Who installs the power supply?
ESB will provide a new, or replacement, power supply. However, you must check their quote very carefully as it will contain exclusions which will need to be covered by a local contractor for the groundworks, and an electrical contractor to prepare for the connections.

Who installs the Electricity meter?
ESB

Who will connect the meter to your electrical equipment?
This work should be entrusted to a local ETCI (RECI) approved electrical contractor who will work in conjunction with ESB.

Further Information:
ILE. (2000). Guidance Notes for the Reduction of Light Pollution. The Institute of Lighting Engineers. Tel: 01788 576492
Website:
www.ile.co.uk
www.LTA.org.uk
www.reci.ie
18. Clubhouse and Pavilion

- Introduction
- Standards
- Statutory Approvals
- Disabled Users’ Policy
- Contract
- Design
- Location
- Internal Planning
- Security
- Future Expansion

- Maintenance

- References

18.1 Introduction

This information should not be considered to be a complete building brief in itself but the basis from which a full project brief, design and specification can be evolved.

18.2 Standards

All construction projects should conform to the requirements of all relevant current building legislation, including Irish Standards and Codes of Practice. Statutory Approvals Building Regulation and Planning Approvals should be obtained (if appropriate).

It should be noted that the Construction Regulation 2007 (CDM Regulations) will apply to all but a few minor projects.

18.3 Statutory Approvals

Before any building commences all Statutory Approvals, planning permissions, etc must be obtained
18.4 Disabled Users Policy

All new tennis facilities and extensions or refurbishment works to existing facilities should meet or exceed the standards required by law as set out in the current Building Regulations.

The technical, financial and sports development aspects of all projects applying for LTA loans or grants are vetted, and access for all disabled users (with particular attention to the extra width of sports wheelchairs) is considered as part of this process. When designing any tennis facility, whether indoor, outdoor or both, always consider the following for all potential users:

- Designated accessible parking.
- Access from car park to front door.
- Access through front door and to all main areas internally and externally.
- High level bolts on double leaves that cannot be reached.
- Entrance matting impeding movement.
- Height of entrance counters/reception desks.
- Door widths that are too narrow. Sports chairs range up to a 1200mm wheelbase.
- Strength of door closers.
- Corridor widths that do not allow passing of sports wheelchairs.
- Steps and thresholds into showers that obstruct movement and use.
- Lack of suitable shower seats or shower chairs.
- Electrical sockets/switches, taps, handles, etc. are positioned too high to be reached.
- Mirrors that are too high and cannot be used.
- Use of colours that are inappropriate for anyone who has a sight impairment.
- Ramp gradients that are steep or have no landing areas.
- Steps generally.
- Capacity of lifts.
- Fire escape for large groups of people on viewing balconies, in meeting rooms, etc.
- Unnecessary restrictions on the use of some tennis court surfaces.
- Choice of lift to social/viewing areas.
- Viewing - height of balustrades

18.5 Contract

All projects should use a recognised standard form of building contract e.g RIAI Standard Form of Contract, which are suitable for dealing with a range of projects values and types.
18.6 Environmental Policy

The LTA embraces environmental issues in the design of tennis facilities. The following areas should be considered:

• use of materials obtained from renewable sources  
• measures to minimise dependence on finite fossil fuels, emissions and operating costs and improve energy efficiency.

18.7 Design

The design of any scheme should create a facility with warmth of character and environment that will be attractive to users of all ages and abilities. It should be fit for its intended purpose and made attractive by the considered use of landscaping materials, textures and colours in suitable combinations.

Pavilions are a highly specialised type of building and it is advisable to obtain specialist assistance with the design of facilities from an architect, surveyor or engineer. While most of the difficulties relate to the layout, specification and detail of the interior, the exterior too can present some serious problems for designers. Most clubhouses are quite prominent, set in either a fairly flat landscape of tennis courts or within confined residential areas. At the same time, they tend to be somewhat isolated and susceptible to vandalism. The ideal building is therefore both resistant to vandals but aesthetically pleasing.

Consideration should therefore be given to the use of hardwearing, long life, low maintenance materials. You may also wish to consider local architectural styles and local materials.

18.8 Location

An assessment will need to be made of the factors affecting the location of a clubhouse development. These include:-

• The shape and contours of the available land and the likelihood of gaining planning approval.

• Location of service supplies i.e. mains electricity, sewers, water supplies and access roads. Long stretches of pipework or cable will affect the cost and hence the viability of a project.

• Aspect - this will influence the location of viewing areas, social areas, access doors,
etc. Viewing areas, for instance, should be designed and located so that the glare from the setting sun does not destroy the view. Of course in developing the site attention must be paid to court orientation. Courts should be positioned with the centre-line of the courts running in a generally north/south orientation, although site conditions may prevent this arrangement. This is to avoid problems of serving into the sun during the summer months

• Access to all areas for routine maintenance should be considered.

• The potential hazard of large overhanging trees and their root systems or preserved trees should be considered.

• Proximity to walls or trees that could give vandals access to the roof or second floor must be taken into account.

• The potential for future expansion of the facility including the construction of indoor courts.

• Access to outdoor tennis courts - avoid a long walk and keep well illuminated.

• Access for all users.

• Proximity of adjacent properties

• Car parking - avoid a long walk and keep well illuminated.

18.9 Internal Planning

The intended use of the building will have a significant effect upon the required facilities. The main uses found within tennis clubhouses are as follows:-

• Lobby Area - with provision for booking courts, etc. Special arrangements and door sizes will be required to allow disabled users full access to the facilities including front entrance, changing rooms, etc.

• Changing Facilities (including the provision of showers and toilets) - The number of courts that the pavilion is intended to serve will determine the size of changing provisions. If the building is to be used by both males and females, this will affect the position of changing room doors, number of toilets and showers etc. For example, doors into changing rooms and toilets should be arranged to deny views into interiors, modesty walls/screens or two sets of doors may be necessary. An adjoining door between changing rooms is a useful means of expanding provision for a single sex if special events are to be held. If both adults and children will use the building, the shower controls will have to be mounted at a height that can be reached comfortably by adults and children alike. Child protection issues must also be taken into account in the design.
• **Kitchen** - with external access and a store area. It is important to meet the Health and Safety and environmental Health requirements when this type of facility is specified. The kitchen store will need to be accessible for deliveries.

• **Social Area/Bar** - Before considering the addition of a social area/bar, you should consider whether the area will be used throughout the week or only at weekends. A social area will add to the initial building costs and its long-term running costs, consider whether it is really desirable. The bar store will need to be accessible for deliveries if a bar is to be included.

• **Office Accommodation** - with suitable power supplies for modern equipment.

• **Fitness Area** – with suitable space and power supplies to cater for numbers

• **Viewing Areas** - an external terrace or balcony.- safety aspects are a serious consideration here

Typical layout including men’s and ladies’ changing facilities, showers, toilets, kitchen and bar/social area, etc -

Typical recent development costs
**Glasnevin Tennis Club**

Single storey building  
Membership 400  
6 showers men/6 showers women  
Male/female changing rooms  
Kitchen  
Bar approx  
Bar store  
Total covered area $25 \times 17 = 400$ sq m  
Cost (fully fitted) 2004  
€650,000

**Clontarf Tennis Club**

Two storey building  
Membership 1000  
6 showers men/6 showers women  
Male/female changing rooms  
Kitchen  
Bar approx  
Bar store  
Balcony  
Total covered area  
Cost (fully fitted) 2005

**Malahide Tennis Club**

Single storey building  
Membership 400  
6 showers men/6 showers women  
Male/female changing rooms  
Kitchen  
Bar approx  
Bar store  
Total covered area  
Cost (fully fitted) 2005

Note: the above costs may be taken as indicative only and the costs for your project will depend on:-

- The Scope of Work, Specification, Conditions of Contract and Programme
- The location of your facility and availability of builders
· The degree of competitiveness in the market – during the Celtic Tiger years there were a lot of civil work projects and so, in general, prices were not so competitive. Now that there has been a reduction in this activity prices should be more competitive.

18.10 Security

Most pavilions are located on relatively isolated sites and are potential targets for vandals or intruders. Consider security measures such as alarms, secure windows, etc. Contact the local Crime Prevention Officer at the design stage and seek his or her advice on security. Include low level lighting to pathways to allow safe egress from the clubhouse.

18.11 Future Expansion

Unless the constraints of the site mean that future expansion is extremely unlikely, always consider the possibility that extra changing rooms or committee rooms may be needed in the future. Think ahead, say 15 years, to what type of facility the club may need. Identify ways in which the pavilion could be extended, for example, developing the area around the end of a corridor.

18.12 Maintenance

It is essential that all facilities are fully maintained from a safety, health and visual appeal point of view and that all local laws and regulations are complied with. Amongst the items to be considered are:

- Cleaning of all toilets, showers, wash hand basins, sinks, etc on a daily basis
- Ensuring all drainage is working properly and, if not, ensuring it is repaired/cleaned out as soon as possible
- Removal of all refuse from the premises on a daily basis
- Safe storage of food stuffs – if food can be served it is vital that proper hygiene standards are maintained – daily
- Control and disposal of out-of-date stock – daily
- Cleaning of all floors, walls, doors, bars, etc as required – probably daily
- Maintenance of all electrical equipment, cables, gas boilers, plumbing, etc as required.
- Ensuring that all proper standards are maintained with respect to items like Legionnaires disease, swine flu and other contagious diseases, where appropriate
- Generally maintaining decor of building including painting/decorating both inside and outside, as required

Reference

www.riai.ie
19. Indoor Courts

INTRODUCTION

Nobody will argue with the statement that it rains quite a lot in Ireland! Some sports can carry on regardless of rainfall during play. Tennis is not one of those sports. Tennis balls are very efficient at absorbing water, making then heavier than they should be. In the wet the bounce of the ball is significantly altered, and it becomes harder to grip the racquet effectively. A windy day also makes tennis more difficult and less enjoyable to play. More difficult and less enjoyable adds up to decreased motivation to go to the tennis club and get involved. The ultimate issues are member recruitment and retention.

Coaching is a key activity at all forward-looking clubs. Effective coaching depends on reasonable conditions for the players. It is very difficult for players to concentrate on instructions and make changes to their game if their main concern is how cold and wet they are feeling. Ireland lags well behind other European nations in terms of number of inhabitants per indoor court:

The Case for Indoors Courts may be summarised as follows:

- Play all year round and for longer each day (see figures below).
- Increased levels of participation (comfortable conditions will attract new players).
- Ability to offer wide range of programmes to members on a year round basis.

- Major advantages for the `performance` side of the sport (under ideal conditions players improve quicker).

- Increased revenue opportunities for clubs (e.g. charging hourly fees for indoor play).

- Ability to attract better, more highly qualified and full time coaches (the best coaches will gravitate to the clubs with the best facilities).

In simple terms, it is possible to play the game for almost 1,800 hours more per year on an indoor court versus an outdoor floodlit court. A club with three indoor courts will gain over 5,000 hours of playing time each year:

<table>
<thead>
<tr>
<th>Month</th>
<th>Outdoor Floodlit Court</th>
<th>Indoor Courts</th>
</tr>
</thead>
<tbody>
<tr>
<td>November</td>
<td>272</td>
<td>420</td>
</tr>
<tr>
<td>December</td>
<td>282</td>
<td>434</td>
</tr>
<tr>
<td>January</td>
<td>282</td>
<td>434</td>
</tr>
<tr>
<td>February</td>
<td>255</td>
<td>392</td>
</tr>
<tr>
<td>March</td>
<td>282</td>
<td>434</td>
</tr>
<tr>
<td>April</td>
<td>273</td>
<td>420</td>
</tr>
<tr>
<td><strong>6 Month Total</strong></td>
<td><strong>1646</strong></td>
<td><strong>2534</strong></td>
</tr>
<tr>
<td>May</td>
<td>282</td>
<td>434</td>
</tr>
<tr>
<td>June</td>
<td>273</td>
<td>420</td>
</tr>
<tr>
<td>July</td>
<td>282</td>
<td>434</td>
</tr>
<tr>
<td>August</td>
<td>282</td>
<td>434</td>
</tr>
<tr>
<td>September</td>
<td>273</td>
<td>420</td>
</tr>
<tr>
<td>October</td>
<td>282</td>
<td>434</td>
</tr>
<tr>
<td><strong>6 Month Total</strong></td>
<td><strong>1674</strong></td>
<td><strong>2576</strong></td>
</tr>
<tr>
<td><strong>Yearly Total</strong></td>
<td><strong>3320</strong></td>
<td><strong>5110</strong></td>
</tr>
</tbody>
</table>

**PLANNING AN INDOOR FACILITY – INITIAL CONSIDERATIONS.**

1. Is there sufficient space surrounding the playing surface to allow for the construction of indoor facilities? The amount of space necessary varies depending on the type of structure planned.
2. What type of building is most suitable, given the budget, planning restrictions etc? There are three main types of structure available – air supported structures, framed fabric structures and `traditional’ structures – i.e. block/steel/wood buildings.

3. Who will be the Project Manager and who will assist in the form a Development Committee? Are there people with the necessary expertise in the Club, or should an outside consultant be brought in?

4. Are the necessary funds immediately available, or does fundraising need to take place – club activities, bank loans?

5. Is it planned to cover existing courts, or is it a `green field’ site? If green field, what type of court surface should be put in place? Covering courts allows for surfaces to be used that would not be practical in an outdoor environment in Ireland – e.g. non-porous cement. If covering existing courts, how will this effect current floodlighting structures?

6. Forward planning to ensure that there is sufficient and comfortable access and ease of use for disabled users.

7. Who will take care of ongoing maintenance and security of the new structure? Can this be done on a voluntary basis, or will it be necessary to employ staff?

**AIR SUPPORTED STRUCTURES.**

Airhalls are made from a light transmitting fabric. The fabric is inflated and supported by a mechanical air blower.
• With some systems it is possible to heat the air if desired.

• Existing floodlights can sometimes be utilized, with the light shining through the fabric from outside.

• One advantage of airhalls is that they can be taken down in the summer months, and stored on site until autumn. This allows `the best of both worlds` and may also make it easier to obtain planning permission.

• Thorough maintenance is required in order to patch any slight tears that may appear.

• Automatic back up systems are necessary, so that in the event of a power failure the `tent` does not deflate.

• Single, double and triple skinned airhalls are available. While single skinned halls can be lit from outside, double and triple skinned varieties generally require the lighting source to be inside the bubble. Single skinned halls tend to generate condensation, but this problem does not occur with double or triple skinned halls. The middle layer in a triple skin hall is an insulation layer to help regulate temperature.

DIMENSIONS

The profile of air-supported structures can vary. To achieve recommended minimum height clearances the following dimensions are required:

Run-back 7.0m (23’0”)
Side-run 5.0m (16’5”)
Total length 37.8m (124’0”)
Total width for two enclosed courts 36.3m (118’10”)
Total width for three enclosed courts 51.5m (168’10”)
Total width for four enclosed courts 66.7m (218’10”)

Allow for a further 2m on each end of the total lengths and widths to allow for the ring beam, perimeter fencing, drainage and where applicable on single skin airhalls, the lighting columns.

FANS OR AIR BLOWERS

Enough fans of sufficient capacity should be provided to ensure that the Airhall Designer’s
specified inflation pressure (Design Inflation Pressure) can be reliably provided, even under storm conditions. The fans should be configured to comply with the following requirements:

- There should be a minimum of two fans. These may be configured as one main and one standby fan, one main and one supplementary fan (which operates only at higher pressure levels), or both fans may operate together.

- The fans may be linked, but each fan should be capable of operating independently in case of failure of the other fan.

- If the fan is configured as a standby or supplementary fan it should start automatically if the main fan fails.

- Each fan should be capable on its own of supplying enough air to maintain the airhall at a pressure of at least 60% of the Design Inflation Pressure.

All fans should be capable of operating from either the main or the reserve power supply. The inflation system including the fans should be robust, designed and rated for continuous running, and easily maintainable.

**FOUNDATIONS**

The perimeter foundation should be arranged to resist the maximum uplift and horizontal forces imposed upon it, taking into account the deflections of the membrane and the changes in profile which occur under extreme loads.

The foundation arrangement should make allowance for:

- The drainage requirements of the court playing surfaces (when the airhall is not in place) and the runoff from the airhall (when the airhall is in place). Drainage may need to be incorporated within or to pass through the foundation.

- Routes for electrical and mechanical services associated with the airhall systems. Ducts and electrical trunking including those cast into foundations should be waterproof and of robust external construction quality.

- The need for perimeter security fencing, maintenance access and, in the case of airstructures using transparent membranes, external floodlighting.

In the case of a concrete ring beam:
• Any concrete upstand above finished ground level should be constructed to a high standard with clean shuttered sides and chamfered corners and edges in order to achieve an attractive and durable finish.

• The top surface of the perimeter foundation should be flat, level and smooth, with a small outward crossfall to prevent ponding of rainwater.

• Reinforcement should be provided within the concrete foundation to at least the level required to control cracking.

• Consideration should be given to ensure continuity of shear strength at construction joints and expansion joints.

• The back-fill material should be properly compacted in layers on both sides of the ground beam.

In the case of ground anchors:

Component materials should be chosen with due consideration given to the design life of the airhall and the aggressiveness of the soil conditions. All anchors should be installed according to the manufacturer’s instructions and by a manufacturer approved installer.
FENCING

The perimeter of the air-structure, including the inflation units, should be protected by a tall and robust security fence at least 2.75m high and/or some other system designed to deter vandals from gaining access to the structure and inflicting any damage. Sufficient space must be provided between the structure and the fence to facilitate maintenance access.

OPTIONAL EXTRAS

The following features are highly desirable additions to an airhall scheme, and could be included in the scheme if desired.

Control System Options for the Inflation Systems
Remote Operation
A facility to remotely monitor the control system and make adjustments including pressure and temperature settings (e.g. via a telephone or computer).

Emergency Door Ajar Status
A facility to instantaneously detect an open door and make corresponding adjustments to the control system to compensate for the pressure loss.

Remote Monitoring
A facility to remotely monitor pressure, wind and temperature gauge readings.

Alarm Options
Remote Monitoring - a facility to monitor the alarm status remotely (e.g. via a telephone or computer).

Ground anchors in place.

Snow Detection Automatic Detection
A facility to automatically detect snowfall and to trigger the system to operate at the Design Inflation Pressure (and temperature if heating is provided), without the need for manual intervention. Automatic snowfall detection should be via instruments mounted in an exposed position, but protected from strong winds and accidental interference, on top of nearby buildings or structures where snow can accumulate.

Door Options Emergency Doors
Wherever possible, pressure balanced rather than butt-hinged emergency doors should be used, with self-closers strong enough to close the door against the action of the internal pressure.

Security Options Alarms and CCTV

Consideration should be given to the installation of automatic alarm and/or video surveillance security systems around the airhall.

Storage

For seasonal airhalls, if a suitable storage facility does not already exist a suitable facility needs to be provided. The storage facility should permit the airhall to be stored and retrieved easily and provide a secure, dry and pest free environment.

Heating Option

Consideration should be given to fitting heating unit(s). The heating unit if fitted should be compatible with and incorporated into the inflation system. The control of temperature should be fully automatic.

• Air temperature should be maintained at a minimum of 8 degrees C. when the ambient temperature is -4 degrees C.

• The control system should include a master timeclock to switch the heating on and off to match usage patterns.

• During unoccupied periods a frost protection system can be used to maintain a minimum temperature of 2 C.

• Any temperature sensors within the air hall should to be fitted with wire guards to protect the devices.
FRAMED FABRIC STRUCTURES.

Framed Fabric Structures consist of a lightweight metal framework over which a light transmitting fabric membrane is stretched. Modular design permits selection of sizes to cover a number of courts. No inflation systems are required and the sides can be left open if desired.

DIMENSIONS
To achieve recommended minimum height clearances the following dimensions are required:
Run-back: 6.4m
Side-run: 3.66m
Total length: 36.58m
Total width for two enclosed courts: 33.53m
Total width for three enclosed courts: 48.77m
Total width for four enclosed courts: 64.01m
Space between courts: 4.27m
Allow for a further 2m on each end of the total lengths and widths to allow for the foundations, perimeter fencing and drainage.
DESIGN STANDARDS

Structural Frame
Structural frames should be sufficiently stiff and well braced to ensure that their deflection does not result in excessive stress concentrations in the membrane panels. Durable padded protection should be provided to exposed columns and rigid bracings to a minimum height of 2m above floor level.

Bracing Cables
Cables and their end terminals should be stainless or galvanised steel, carefully designed, detailed and installed to avoid any undue chaffing or damage to adjacent membrane material.

Frame Splices and Connections
Frame splices and connections should be designed and detailed to prevent any sharp edges, corners or protrusions from bearing onto the membrane material, and to avoid local membrane stress concentrations.

Membrane Panels
All membrane panels should be tensioned and shaped in such a way as to ensure stability under wind loading and to avoid flapping or chaffing. Where membrane materials are expected to creep and stretch over time, re-tensioning of the membrane panels should be possible. All membrane panels should also be tensioned and orientated to shed water and to avoid ponding occurring during and after rainfall.

Membrane Attachment System

The attachment system should be detailed to prevent membrane damage occurring. Membrane attachment and tensioning devices should be designed to evenly distribute the tensioning force into the membrane material. The following requirements should be met:

• Punched bolt holes in steel or aluminium components shall be ground smooth where they attach to or come into contact with the membrane.

• Steel or aluminium sections should be properly aligned without any steps or sharp protruding edges.

• Holes in membranes, for example to permit bolts to pass through, should be punched with an appropriate circular punch, to ensure a smooth circular profile avoiding scores, sharp corners or overcuts.
• Where the membrane is directly tensioned by rope or cable, corrosion proof eyelets should be used to reinforce the holes.

• All attachment components should be sufficiently stiff to ensure that their deflection does not result in uneven stress distribution in the membrane material.

Panel and Structure Openings

In cases where it is intended to remove membrane panels or part of the structure during the summer months, the attachment system, any holding down bolts, or anchorage to the foundation should be designed such that there are no elements remaining (e.g. upstanding bolts or angles) which could present a trip hazard to players or spectators. All membrane materials should be stored in a secure, rodent-free, dry environment during the summer months.

Doors and Emergency Exits

Provision for disabled users should be made either through the main door or via an adjacent emergency exit. All doors, including emergency exits, should be fitted with clear viewing panels to permit safe entry and exit.

Foundations

The foundations should be arranged to resist the loads imposed upon them including uplift and horizontal forces.

The foundation arrangement should make allowance for:

• The drainage requirements of the court playing surfaces (i.e. when removable membrane panels are not in place) and the runoff from the framed-fabric structure.

Drainage may need to be incorporated within or to pass through the foundation.

• Routes for electrical and mechanical services associated with the framed-fabric structure heating and lighting systems. Ducts and electrical trunking including those cast into foundations should be waterproof and of robust external construction quality.

• The need for perimeter security fencing and maintenance access.
In the case of concrete ring beams, pads or pile caps:
• Any concrete upstand above finished ground level should be constructed to a high standard with clean shuttered sides and chamfered corners and edges in order to achieve an attractive and durable finish.
• The top surface of the foundation should be flat, level and smooth, with a small outward crossfall to prevent ponding of rainwater.

• The back-fill material should be properly compacted in layers on both sides of the foundation.

In the case of foundations incorporating ground anchors:
• Ground anchors component materials should be chosen with due consideration given to the design life of the framed-fabric structure and the aggressiveness of the soil conditions.

• All anchors should be installed according to the manufacturer’s instructions and by a manufacturer approved installer.

Fencing

The perimeter of the frame-fabric structure should be protected by a tall robust security fence at least 3m high and/or some other system designed to deter vandals from gaining access to the structure and inflicting any damage. Sufficient space must be provided between the structure and the fence to facilitate maintenance access.

TRADITIONAL STRUCTURES

In using the heading above, we refer to a permanent structure made of traditional materials using traditional construction techniques. This commonly takes the form of a steel or timber portal frame spanning the full length of the court (including run-backs) clad in a material to
suit local conditions e.g. metal cladding, brickwork or timber boarding.

**DIMENSIONS**

Minimum Runback (ie clear depth behind baselines, at each end): 6.40m (21’ 0”)
Minimum Side-run (ie clear width beside each side): 3.66m (12’ 0”)
Minimum Side-run between courts not separately enclosed: 4.27m (14’ 0”)
Unobstructed height at netline: 9.00m (29’ 6”) min
Unobstructed height at base line: 5.75m (18’ 11”) min
Unobstructed height at rear of run-back: 4.00m (13’ 1”) min
Total length: 36.57m (120’ 0”)
Width for one enclosed court: 18.29m (60’ 0”)
Width for two enclosed courts: 33.53m (110’ 0”)
Width for three enclosed courts: 48.77m (160’ 0”)
Width for four enclosed courts: 64.01m (210’ 0”)

**DESIGN STANDARDS**

Positioning

- The indoor hall should be positioned so that it does not overshadow any outdoor courts.
- The physical relationships between spaces within the building should be considered. These may include café/bar areas, reception area, offices, storage etc.

Maintenance

In addition to satisfying the fundamental requirements of function, safety, elegance and economy, the design should minimise future maintenance needs and running costs.

Viewing Areas

- A viewing area within the tennis hall, behind the baseline of indoor courts with easy access for disabled and family users.
- Views from social area to indoor/outdoor courts positioned so as to avoid distracting players.
- An access lift or ramp should be provided to raised viewing areas.

Accessibility

- Parent and child bays or a drop off point system should be included in any scheme in
addition to statutory minimum requirements.

- Accessibility for users and coaching/tennis development staff.

- Accessibility from car park to main entrance for all users.

- Each internal and external court should be easily accessible without disturbing users on adjacent courts e.g. by the use of separate access doors for each court.

- Revenue collection facilities should be easily accessible to social/entrance spaces.

Playing Surface

The playing surface should lie in a single level horizontal plain with no gradient. The maximum permitted tolerance in the level of the finished playing surface is a 6mm gap under a 3m straight edge.

Colour Schemes

- Walls should be flat and continuous with a minimum of obstructions or protrusions and be of a single light matt colour other than brilliant white.

- Ceilings and secondary steelwork should be coloured with the same single matt finish to give a continuous effect.

Internal Fittings

- Single colour backdrop drapes should be provided to the walls behind the baseline of the tennis courts. These should span from ground level to eaves level or to a minimum of 2m to the underside of viewing gallery handrails.

- Netting should be used above the curtains to ceiling level. Suitable colours for drapes and netting include dark green and dark blue.

- Adequate durable protection should be provided to any protrusions eg. steel columns, to a minimum height of 2m above floor level and should be coloured to match the canvas drapes. The steelwork above this protection should be coloured to match the canvas drapes up to their maximum height to give a level backdrop. Alternatively, the lower portion of the structure may be positioned so that it does not project into the hall and is continuous with the wall surface.

- Court divider netting should be provided, positioned between courts with the ability to
be withdrawn if required.

- Good clear signage internally and externally combined with a considered use of colour and texture.
20. Planning

20.1 Introduction

The planning system plays an important role in modern society by helping to manage development whilst protecting the environment in our towns, cities and countryside. It is not necessary to have detailed knowledge to make a planning application although at some point you will probably need professional help from a planning consultant, an architect, a surveyor and perhaps even a lawyer.

20.2 When is Planning Permission Required?

Although there are minor developments that are exempted from the requirement to obtain planning permission, it is almost inevitable that a club will require planning permission for new development whether it is additional tennis courts, floodlighting or an extension to the clubhouse. An application for permission is made to the Planning Authority (PA) for the area in which the proposed development is situated. This will be the County Council, City Council or Urban District Council as the case may be. It is advisable to consult the relevant PA before making the application to identify potential problems in advance. It will save time and money. Such a meeting can be formal under Section 247 of the Planning Act and be recorded or it can be informal. The consultation will identify whether there are any elements of the proposal which are likely to be contrary to the Development Plan (or other Plans) for the area or that may arouse opposition from local residents or other interest groups. Never under-estimate the effectiveness of local opposition in blocking development proposals and always consider the best course of action to communicate your ideas locally.

20.3 Types of Application

There are two basic types of application, one for outline permission and one for ‘full’ permission. Outline permission is unlikely to be applicable or of relevance in the case of development associated with a tennis club so that ‘full permission’ will be required.

20.4 Application and Fees

The PA can provide the necessary forms and the method of calculating charges for the application. These together with details of what must be included in the application will normally be available at the offices of the PA or by downloading from the PA’s website. You will also have to factor in the cost of placing a public notice in a newspaper circulating in your area as well as the erection of Site Notice(s).
20.5 Considering an Application

The PA will initially assess the application to determine whether or not it is valid. This can be a surprisingly tricky area. In some local authorities up to 40% of applications are believed to fail the validation process at the first attempt. On validation the proposed development will then be examined against the provisions of the Development Plan (and other Plans) for the area.

The Development Plan is the planning blueprint regulating development in any given area. It will provide for and regulate future development. It contains planning objectives and planning policies. The PA can tell you which policies and objectives apply to your proposal. The key issue will be whether the development is compatible with the zoning of the area but many other considerations will apply. Typical considerations would include traffic generation and parking, impact on local residential amenities including noise, floodlighting, opening hours, visual appearance etc.

There may also be a Local Area Plan that covers the site of your proposal. It will normally contain additional detail on how the area should be developed. Other Plans such as Action Area Plans or Framework Plans may also be of relevance.

The application will be circulated to relevant departments such as Roads Engineering and a planning assistant will then prepare a report recommending whether permission should be granted or not having considered the provisions of the Development Plan/Local Area Plans etc. He or she will also consider submissions made by interested persons. Such submissions must be made within 5 weeks of the date of lodgement of the application and these submissions can often consist of objections on various grounds.

(If you are considering large-scale development in the future it may be worth making a submission to the PA when they are reviewing the Development Plan to request them to facilitate your proposals).

20.6 Timescale

The PA has a statutory 8-week period to process an application from lodgement although in more complex cases this could take longer as additional information is frequently requested. If such information is requested the applicant will normally have up to six months to reply and the PA then has 4 weeks to complete its assessment. A Planning Permission normally has a 5-year lifetime.
20.7 Decision to Grant Permission/Refusal

The PA will decide to either grant permission or refuse permission. A decision to grant will normally contain conditions. A typical one for floodlighting would set restrictions on the hours of operation. Conditions requiring contributions to the PA are also frequently included. The ‘final’ grant of permission will be issued only at the expiry of the appeal period (provided no appeal is lodged), which is 4 weeks after the date of the Authority’s decision. If the PA refuses permission they will give their reasons in writing. If you are unhappy about the reasons for refusal (or the conditions imposed), you can appeal to an Bord Pleanala within 4 weeks of the date of the PA’s notice of decision. The Board has a statutory objective of deciding on appeals within a four-month period however currently appeals are averaging 6 months. A fee is payable to An Bord Pleanala for appeals. Details are available on their website.

Third party appeals are frequent and these can only be lodged by persons who have earlier made submissions to the PA during the aforementioned 5-week period. The third parties also have a 4-week period within which to appeal. You will be afforded an opportunity by the Board to comment on these third party appeals.

20.8 Summary Checklist

1. Consult the Local Planning Authority
   · To determine the cost of an application
   · To identify potential problems about the proposals.
   · To consult the relevant Development Plan.
   · To identify whether there are any relevant Supplementary Planning Documents such as Local Area Plans, Area Action Plans, Framework Plans etc.

2. Communicate your ideas about the Proposal
   · To the Planning Authority.
   · To Club Members, etc.
   · To local residents and interest groups
   · To local public representatives

3. Obtain and complete the relevant application documentation and enclose the drawings and other information required as well as copies of the Newspaper and Site Notice(s) and the necessary fee.

4. Allow time in your overall project development programme for the planning process to take place.
References / Further Reading

Each PA has an area on its website devoted to making and following Planning Applications and there is a lot of useful information on the whole planning process on these sites. An Bord Pleanala too has a website that contains much useful information.

Other Codes

Do not forget that your proposal must comply with the Building Regulations and that a Fire Safety Certificate may well be required depending on the nature of the development.