Handball Court Specifications

(4-Wall Courts)

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Contents:

Section 1. Introduction

This court specification document outlines the recommended standards for a 4-Wall Handball Court (often referred to as a 40x20 Court).

It has been produced by GAA Handball, who acknowledge the assistance of industry experts, manufacturers and suppliers in the production of this guidance document.

Purpose:

The purpose of this document is to:

- Ensure comparability of recommended standards for all GAA Handball Courts.
- To act as a guidance document for Clubs to present to Architects, Surveyors, Builders, etc. involved in court construction and renovations.
- To ensure future builds are constructed to the highest standards, suitable for hosting National and International events.

Build Types:

1. New stand-alone complexes.
2. Extension/renovation of stand-alone complexes
3. Extension/renovation of facilities within larger complexes.

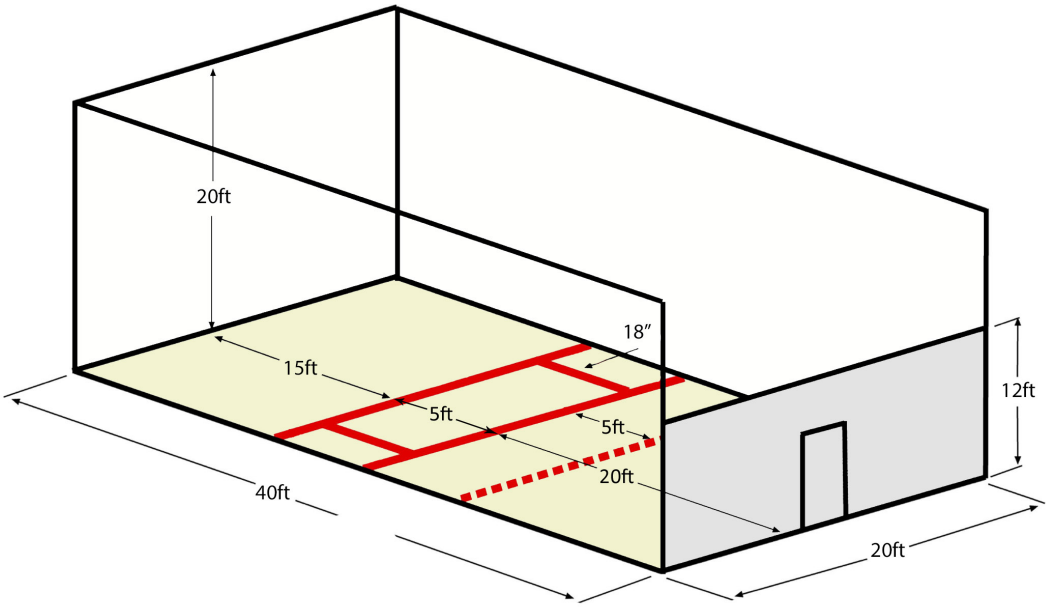
The principles outlined, and the recommendations/guidelines presented, hold good for all three types, but are especially relevant to Type 1 where there is a single opportunity to get it right first time.

It is not the intention of this document to pinpoint specific material and methods for court construction. Instead, it is a recommendation for performance to define basic characteristics of Handball courts.

Section 2. Court Configuration

2.1 General Court Configuration

The general configuration of the court is shown below.



2.2 Spectators

Spectator areas to be located at the rear of the court, behind the glass back wall. Spectator areas may also be located behind any glass sidewall.

The spectator seating area should, where possible, comply with regulations. Provision should also be made for disabled access and seating. Arrangements should be constructed to reflect this.

The colouring of the spectator area should be considered so as to not negatively affect a player's vision of the ball during play; if that player is facing the glass back or sidewall whilst executing a shot.

2.3 Match Officials

Space provided for a referee who shall be in a position to view the whole court, and communicate to the players.

Referee positions are recommended to be either:

- Middle and centre of the spectator area behind the glass wall.
- Elevated to either the right or left sidewall, at the top of the glass back wall looking down onto the court.

2.3 Camera Facilities

To assist with the quality of camera coverage (filmed and photographed), the below considerations should be acknowledged:

- Leave adequate space between the glass back wall and first spectator seating for cameras and cameramen.
- Camera panels may be positioned flush on the front wall, but must have similar rebound & colour characteristics of the surrounding court area. A suitably durable material (e.g. toughened glass), that has a low risk of breakage, and that will withstand the high impact of the ball should be used.

2.4 Access to Courts

In order to minimize cold air entering the court area, one should try and have ingress and egress from the main playing area/spectator area from the rear of the complex, and not the side wall as is the case in most existing courts. This also prevents distraction to players during rallies.

2.5 Dressing Rooms

Dressing rooms should be located as far away from the playing area as possible. There should also be an isolation door to prevent moisture entering the playing area whilst showers are in use.

Section 3. Court Dimensions

3.1 Court Dimensions

The dimensions of the 4-Wall court are:

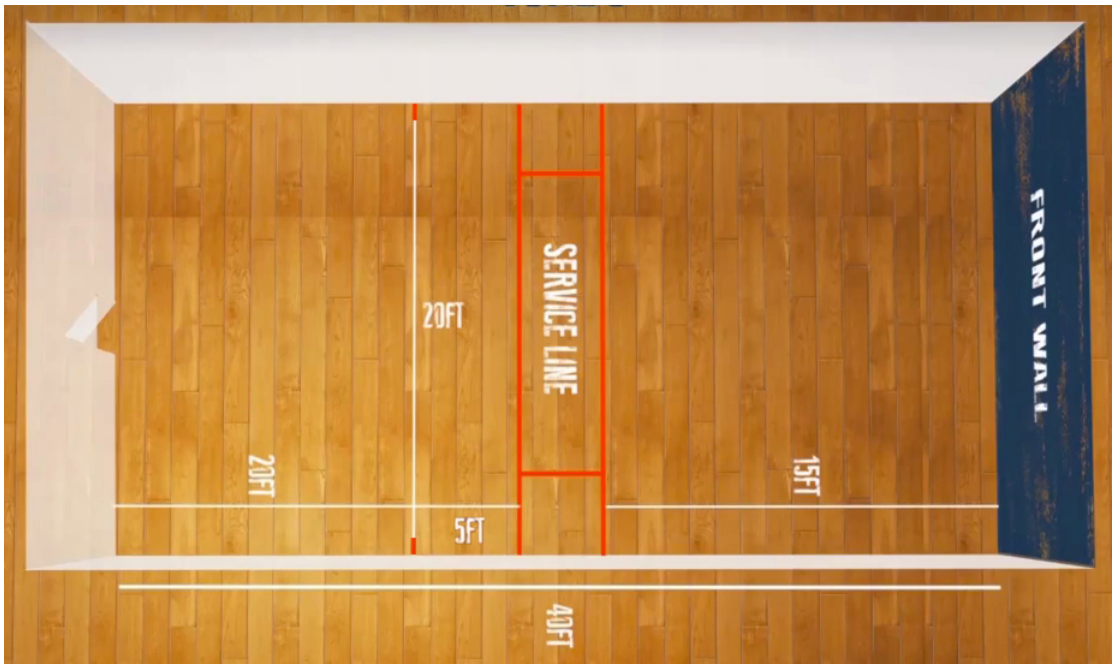
Front Wall	20ft wide, 20ft high.
Floor	20ft wide, 40ft long.
Back Wall	A full glass back wall is recommended for spectator purposes, with minimum height of 12ft.

It is important to note that the above dimensions are to the internal finished wall playing surfaces and allowance must be made within the building structure for the thickness of plaster.

3.2 Court Markings

Handball courts shall be divided and marked on the floors with 2-inch wide lines. Anti-slip paint should be used. Recommended colours are white or red.

The lines shall be marked as follows:



I. **Short line.** The short line is parallel to the front and back walls. Its outside edge (edge closest to back wall) is 20 feet from the front wall in the 40x20 court.
II. **Service line.** The service line is parallel to the short line and its outside edge is 5 feet in front of the outside edge (edge closest to front wall) of the short line.

III. **Service zone.** The service zone is the area between the outer edges of the short and service lines.
IV. **Service boxes.** A service box is located at each end of the service zone by lines which have outside measurements of 18 inches from, and parallel to, each side wall.
V. **Receiver's restraining lines.** Five feet back of the outside edge of the short line, lines should be marked on the floor extending at least 6 inches from the side wall. These lines, parallel to the short line, may also be marked as a broken line extending from side-wall to side wall.

Section 4. The Floor

4.1 Concrete Base

The concrete base must be absolutely level before installing the timber flooring. A self-leveling compound can be used.

4.2 Floor Insulation

Floor insulation should be factored in between the concrete underlay and timber court floor.

4.3 Timber Court Floor

i. Damp Proof Membrane and a batten framework should sit on top of the concrete underlay to provide a platform for the Court Floor to be installed.

ii. The wood being used must be acclimatized to the environment it is being laid in for at least 3-4 weeks prior.

iii. Both sides of the wood flooring is recommended to be sealed, not just the playing surface. Leave expansion gaps at regular intervals between floor boards.

iv. The timber used for the court flooring is required to have a hard, smooth surface (e.g. Maple) with firm footing. It should have a consistent degree of resilience, with the bounce and pace of the ball being even in all areas of the court.

v. When viewed from vertically above the line of flight of the ball, the linear path of the ball shall not be affected when it bounces on the floor.

vi. Floor colouring should have a natural wood finish, or light in colour to ensure as visible an appearance of the ball during play as possible.

vii. If untreated flooring is used, it should be sanded and varnished with a non-slip sports varnish. Painting the floor markings (See 3.2) on in between varnish coats should result in less wearing off.

viii. The floor shall be kept clean of all rubber, dust particles and other depositions, which may reduce its slip resistance.

4.4 Floor Ventilation

Air vents should be placed under the court floor to aid airflow and prevent rot of the timber over time. A gap of at least 6mm between the Floor and the Wall all round will also assist the air circulation.

Section 5. Court Walls

5.1 Wall Strength

Walls must be capable of withstanding all potential stresses put on them by balls and players, and shall not suffer any damage as a result of such impacts. There must be a consistent rebound of the ball in all areas of the court.

5.2 Wall Insulation

It is critically important that external walls are well insulated to retain heat in the court and reduce risk of moisture on the internal walls. Pumping insulation into the wall cavity, or installing ridged insulation can provide this.

5.3 Wall Plaster

All playing walls should have a smooth, hard finish.

It is important to allow for 25mm plaster finish on the inside walls when building the court to ensure the internal dimensions of the alley are accurate upon completion. Two coat rendering process; scratch coat and a final coat, steel trowelled to a smooth finish.

- **Option A:** Sand cement plaster finish. Adding lime to the sand & cement when mixing helps absorb moisture in the walls and reduce the chance of condensation. Painted with a sealing/primer coat and two coats of emulsion paint (see 5.5).

- **Option B:** ArmourCoat plaster. A polished plaster finish. Note this option cannot be painted.

5.4 Ceiling

Ceiling should be with Plywood (or similar material). All areas of the ceiling should have a consistent rebound.

5.5 Paint

The Court Walls and Ceiling should be painted with good quality Vinyl Matt (Berger, Dulux or Equivalent) or Weathershield emulsion paint. White is the preferred colour, but light shades of other colours are acceptable. Consideration should be taken in respect of visibility of the ball during play when selecting a colour other than white.

The above recommendations will eliminate most of the condensation problems that exist in Irish Courts but you should also install a heating system in the Court, Balcony and the Dressing Rooms to achieve absolute atmospheric control.

5.6 Wall Branding

Logos or branding may be applied to court walls via paint/decals, but must be located high enough on the walls as to not distract play. Design and colouring of any branding should not negatively affect vision of players during play.

5.7 Glass Walls

Toughened glass walls are recommended for the back wall of the playing court to enable greater spectator viewing. Glass walls must meet all guidelines on safety requirements.

Glass back walls should reach a minimum of 12ft.

Doors on a glass back wall should be located in the centre of the wall, and any fixings should be flush with the playing area as to not affect play.

In the instances where a glass wall is used for the side or front wall of the playing area, then it is recommended for the walls to be treated as to enhance both player ball visibility and spectator viewing by providing a form of ‘one way vision’.

Section 6: Lighting

6.1 Court Lighting

Artificial Fluorescent or LED lighting should be used to light the court area.

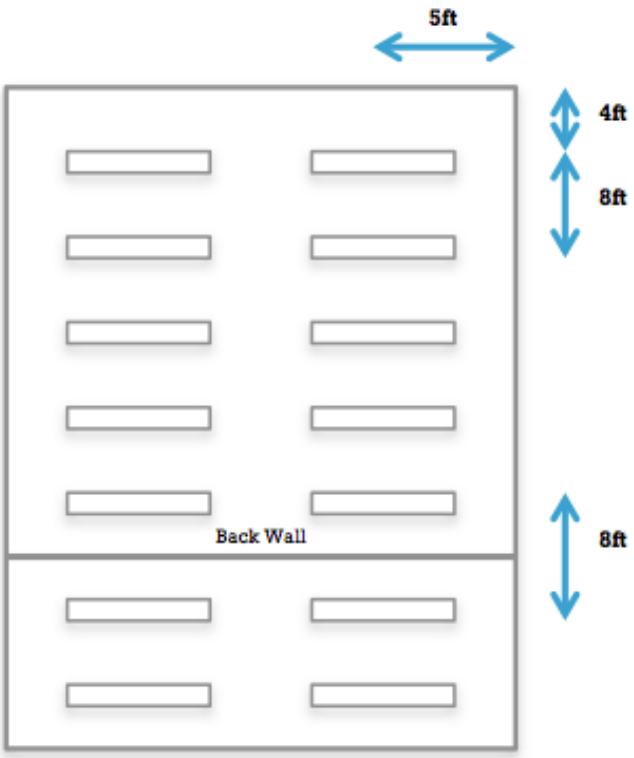
- Recommended standard for LED installation 500-750 lux

Lighting should be placed in lighting boxes and recessed flush into the ceiling. Lighting boxes should be covered with clear Polycarbonate sheets (or similar material, e.g. Perspex). These lighting covers should be a minimum of 10mm thick, and have small air holes drilled into them for heat dissipation. The ball rebound off lighting covers should be similar to the main ceiling material.

6.2 Court Lighting Layout

The lighting should be evenly distributed across all areas of the court and shadow free. It is recommended to use the same lighting in at least the first row of lighting behind the glass back wall, as what is used within the court area. See sample layout below.

All fixtures must be installed flush, have a playable surface, and similar rebound to other areas of the court.



Section 7: Heating & Ventilation

It is critically important that court walls and floor are insulated, heated and ventilated sufficiently to ensure they remain free from condensation during play. This becomes even more critical when an adjacent spectator area is in high usage. The desired outcome of a build is to create a highly insulated building envelope, with an appropriate heating and ventilation system which can be left on all the time with automatic control.

7.1 Ventilation / Air Vents

The inclusion of several air vents under the floor of courts will contribute greatly to lack of airflow, and hence condensation problems. Vents going outside however are not recommended as this may create a cold surface for condensation to develop.

7.2 Extractor Fans

If there is no provision for changing the air on the premises this will add to the condensation problems, especially when a number of spectators are present. Court would require Four Air Changes per Hour for proper Humidity control.

An Extractor Fan should be fitted at the rear of the Court, either on the sidewall at a high level, or on the ceiling. This fan should be controlled manually from an accessible position and automatically through a humidistat.

The preference would be a Hand/Auto Switch to allow manual operation at high speed when a crowd is present, and be left on automatic control at low speed through a Humidistat at all other times. This will change the air constantly and extract the moisture away from the court.

An Extractor Fan should also be located in dressing rooms to alleviate the issue of condensation caused by people showering etc.

7.3 Facility Heating

If you have access to a heating circuit from the main premises, then a circuit from this unit should be used for your heating requirements. Alternatively you may have to install an oil, gas or electrical heating system. Whatever system you decide on should not have a naked flame burning in the court area. Example Oil or Gas Burner heating water for radiators or an Electrical Heating system with fans to distribute the heat.

In order to achieve an energy efficient building whilst minimizing condensation problems, one could adopt the following:

- Good Thermal Insulation
- Adequate heating requirements such as a condensing oil burner with heating zones. A heating programmer would be beneficial to allow

user control over heating of court, etc.

- Installation of solar panels to heat water.

7.5 Court Area Heating

Two Mark Air Radiators with quiet fans giving a throw of 12 feet at each side of the court as indicated on drawing. The fans on these heaters to be controlled by a thermostat located high in the court as indicated, set at 10 Degrees Centigrade. This setting is adequate to keep the walls warm and is not too hot for players. It is important to note that the heating system for the court area should be run automatically each day. Suggested control program 10 - 11am, and 5 - 9pm daily.

7.6 Condensation Control

In order to control any variable, it is important to understand what determines the variable.

- Atmospheric air always contains a percentage of water vapour.
- The amount of moisture present depends on the humidity and air temperature.
- When air cools, it will reach a point at which it is saturated with moisture. This is known as the Dew Point.
- If the air cools further, it cannot retain all the moisture and the surplus is expelled as droplets of condensation.
- This will settle on cold walls or glass.
- The actual amount of water that can be retained by air depends almost entirely on Temperature.

The chart below shows the relative dew points at various temperatures

Temperature(°Celsius)	0°	5°	10°	15°	20°	25°	30°
Grams/Metre3	4.98	6.86	9.51	13.04	17.69	23.76	31.64

As can be seen from the above chart, the moisture carrying capacity of air is very much dependent on the air temperature. If the court was kept at 10°C it can hold twice as much moisture as it would at 0°C. If the balcony area was heated to 15°C it can hold three times the moisture compared to 0°C. If the walls are kept warm, condensation will not deposit on them.

The effectiveness of De-Humidifiers is limited as they try to dry the air and not regulate the temperature, hence, if the temperature is 0°C. the dry cold air will soon reach it's dew point and condensation on the walls and floor will occur.