Specialist Greenhouse Environments Case Study

Turnbull & Scott provide heating solutions for many specialist environments, including for plants and wildlife, to ensure that optimum temperatures are achieved as required for each setting.

Whether it be for residential or commercial use such as large greenhouses or botanical gardens, zoos, museums or churches, Turnbull & Scott offer highly effective Finned Tube heating systems that provide a large surface area for the transfer of heat to the circulating air.

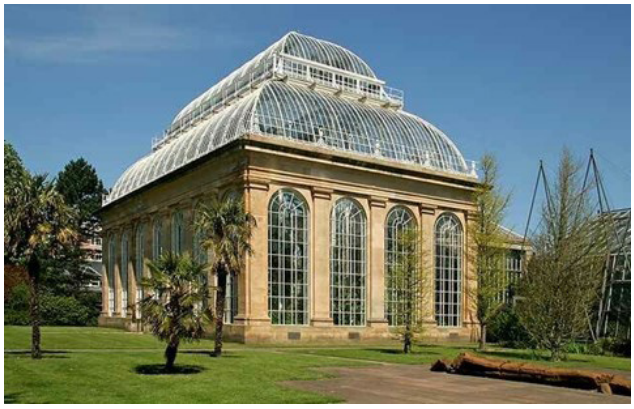
Turnbull & Scott can manufacture Finned Tube in straight lengths or, for specific projects, can produce curved Finned Tube that follows a curved wall or glass panel. Spiral, or helically wound, Finned Tube is produced by winding a specific width of metal strip around the length of a metal tube with pre-determined gaps between the spirals. This creates a series of 'fins' which extend the surface of the tube through which hot water circulates, providing a much larger surface area for the circulating air to pick up heat energy and carry it around the building by means of natural convection. With natural convection the heat is carried throughout the space via natural air currents and not forced along with the aid of a fan.

The stimulation of plant growth in botantical environments is a precise and delicate process. The heating system must deliver a consistent ambient temperature as required by specific species. A Finned Tube heating system excels with such exacting requirements.

The Turnbull and Scott team welcome enquiries to discuss individual projects to ensure customers have the most appropriate Finned Tube solution for their needs, whatever the environment.

Royal Botanic Gardens, Edinburgh

The Royal Botanic Gardens (RBGE) has revealed its vision for Edinburgh Biomes, an ambitious new project to protect its unique and globally important plant collection. Once completed, Edinburgh Biomes hopes to secure the Garden's work for future generations and create an amazing new visitor experience for the public. To help achieve their vision, the RBGE required a highly reliable and efficient heating system that could withstand the test of time whilst providing the optimal environment temperature to promote the growth and development of plant life. Turnbull & Scott have an established history in supplying heating solutions to the RBGE.



Our solution:

- With the overall project concept being around building for the future, it was essential that a sturdy heating system was in place. A galvanised finned tube heating solution was chosen to meet the exacting requirements, which is a robust solution that lasts a significant amount of time.
- Natural convection heating is preferred in this environment over forced convection due to the fragile nature of the plants.
- To deliver the required heat, the project required a variety of tube lengths with three different tube diameters: 50mm nominal bore (NB), 65mm NB and 80mm NB . All tubes were fitted with 25mm steel fins with a 10mm fin pitch separating each fin. They were finished with a hot dipped galvanized coating to prevent corrosion. Overall, over 270m of tube length was required for this project.
- To optimise space in the greenhouses, this solution included a combination of using wall attached wall-bracketed Finned Tube and trench encased Finned Tube in areas where space was limited.

Fernery, Thatched Cottage

Turnbull & Scott was approached to provide an innovative and robust heating solution for a fernery. As suggested by the name, a fernery is place that facilitates the growth of ferns. With all plant growth, there is a need to keep the ambient temperature consistent with requirements. This is where finned tube is at its best.

Our solution:

- A particular finned tube which was 32mm NB tube with 25mm fin at 10mm pitch. Giving an output per metre of 373W based on 80 degrees flow, 60 degrees return, and 20 degrees ambient.
- As a result of wash down - a recurring theme with this project – and a humid environment, Turnbull & Scott provided this system with a hot dip galvanised finish.
- Hot dip galvanised provides the necessary coating to stop the rusting of the mild steel tube. This is tried and tested in several volatile environments including poultry sheds.

Chester Zoo

Chester Zoo decided to start exploring their heating options for its spectacular new “Islands” attraction. The Zoo required a heating system for a new tropical environment that would maintain the atmosphere in the exotic animals’ habitat at 45°C and 90% humidity - to which they are accustomed to.

A key requirement was that the solution needed to blend in with the overall structure already in place. This included sections with ‘curved’ walls.

Our solution:

- A custom designed ‘curved’ spiral wound Finned Tube low pressure hot water (LPHW) heating system was manufactured.
- A particular challenge for this project was the need to curve the Finned Tube to mirror the shape of the building walls. Manufacture of curved Finned Tube however is a Turnbull & Scott speciality.
- The carbon steel Finned Tube was galvanised to resist corrosion and facilitate the special cleaning requirements of dealing with ‘jungle’ debris and powder coated to facilitate the Jungle aesthetic.

For more information and to discuss your project, please contact us on 01450 372053 or visit ww.turnbull-scott.co.uk