

# Royal Opera House

## Thurrock Ground Source Heat Pump

### At a glance

#### *Location*

Purfleet, Thurrock

#### *Tags*

Ground source heat  
pump upgrade  
Solar film

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**The Royal Opera House has recently refurbished and updated the ground source heat pump at the Bob and Tamar Manoukian Production Workshop in Thurrock.**

Our workshops are purpose-built to create the vast sets and scenery you see on the Main Stage. The ground source heat pump was originally installed in 2012 to provide sustainable heating to the workshops: water is circulated through 16 loops of pipework that run through boreholes drilled into the ground below the workshop. The cool water entering the system is warmed by the surrounding rock and provides heating to the building. However, it was found that during the extreme temperatures of summer, a system with cooling, as well as heating was required.

Rather than replacing the ground source heat pumps completely, we upgraded the existing system. By replacing the heat pumps with more efficient units that have reversing valves, the system can now provide cooling as well as heating. This more sustainable system saves around 25 tonnes of carbon dioxide in comparison with a conventional heating and cooling system, that's the same amount as would normally be produced by 25 domestic gas boilers.

We took the opportunity whilst undertaking work on the Thurrock buildings, to install solar film. This is a thin layer of film that is added to windows that reduces solar gain during the summer; reducing the amount of heat from direct sunlight means that cooling systems can be more effective. We found this is a relatively low financial investment resulting in greater staff comfort without restricting sunlight to our workshop spaces.