



REDUCING ENERGY COSTS

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# Ground Source Energy EXPO 2015

## Commercial GSHP installation

Matthew Evans – Technical Director TGE Group



# From Design to Installation

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Delivering the project as designed

- Size doesn't matter!



- Critical for all the information contained within the design to be fully delivered to the installation contractor/company



# From design to installation

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Some common mistakes, omissions and misunderstandings

- Value engineering which can lead to inferior installation practice, products or both
- Installation engineers unfamiliar with GSHP
- Commissioning valves should not only being installed but fully understood
- Effective air elimination and dirt separation devices in the heating and ground circuits
- Correct system flushing and treatment
- System not commissioned correctly
- Thermal response test not performed correctly or at all
- Borehole caps not clearly identified and protected
- Electrical demands not fully understood
- Recording of underground services
- BMS integration



# What can go wrong



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- Open loop filter system incorrectly installed
- Bore holes not drilled deep enough
- Poor ground contact – poor grout or backfill practice
- Building demands are not met
- Poor performance



# Managing the project

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- The heat pump is part of every element of the build and early involvement is essential
- Changes in design will happen and need to be communicated and discussed
- Experienced project manager is recommended



# The Installation

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1. Health & Safety
2. Internal Installation
3. External installation
4. Commissioning
5. Handover





# Health & Safety



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- Construction Phase Plan
- CDM for direct contract
- RAMS
- Trained personnel and sub contractors
- Civil works
- Refrigeration handling



Health & Safety Executive







# Internal installation



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- Buffer tanks – Heating and cooling configuration
- Anti vibration mats & couplings for heat pumps and circulation pumps
- Spill tanks or expansion tanks & pressurisation units
- Pipe and valve insulation – condensation
- Pipe types and fixing methods
- System flushing
- Refrigeration – Is a room detector required



# External installation



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PE pipe specification and connection method

- Colour
- Thickness
- Quality
- Bore hole loops
- Connection method







# External installation

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Trenching methods



# External Installation

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## Drilling

- Choose a drilling contractor with care
- Drilling can be a messy business





# External Installation

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## Manifold Chambers

- Should be one piece or in a sealed chamber where possible

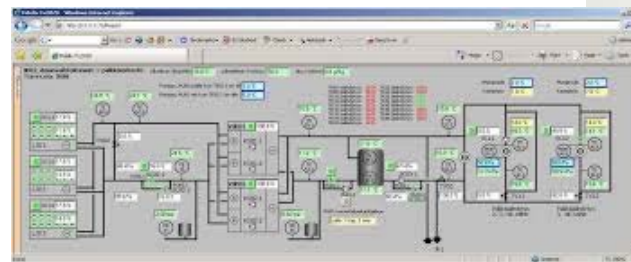


# Commissioning



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- Pre-commission, commission and post commission
- System flushing and purging heating and ground side pipework
- Biocide treatment
- System flow rate setting
- BMS and remote communication
- Testing and sign off





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**Thank you**

