



7543.3.1  
7543.3.1 - Plot 45  
Acorn Property Group  
RAJ2WO

# Design Standard Notes

- GENERAL
1. The Services provided by Bosch are a suggested heating design specification. It is strictly the responsibility of the Client to check the designs prior to installation on site to ensure their needs are satisfied.
  2. It is the responsibility of the installer to comply with current statutory regulations, British Standards, CIBSE Guides, Codes of Practice and the manufacturers installation instructions.
  3. Installation of gas fired boilers must comply with the requirements of BS 6798.
  4. Installation of oil fired boilers must comply with the requirements of BS 5410 and OFTEC technical literature books 1, 2, 3 & 4.
  5. Installation of low carbon technologies should comply with relevant MCS Standards .
  6. Installation of low carbon technologies should comply with minimum standards set by the building warranty provider.
  7. The design and layouts provided remain the property of Bosch Thermotechnology Ltd. They are provided in good faith and must not be reproduced or supplied to any third party without prior written permission.

- HEATING
1. The system has been designed with reference to the parameters given in BS EN 12831, BS EN 12828, BS EN 14336, relevant regional building regulations and supporting guidance.
  2. Heat losses have been calculated using Client agreed U-values. The external temperature is selected at 99.6% of the Meteonorm data set (2000-2019) at Client agreed location. Room temperatures and natural air change rates are set according to the CIBSE domestic heating design guide for new dwellings (unless otherwise specified and agreed). Ventilation air change rates have been increased in rooms where open flues or fireplaces are shown (it is assumed that throat restrictors are installed as default).
  3. Radiator systems have been designed with an operating temperature of 50°C flow temperature or the lowest feasible temperature that will meet the heating needs of the dwelling, as agreed with the Client.
  4. For heating systems operated intermittently, a maximum of 20% heating capacity has been added to radiator outputs as recommended in the CIBSE Domestic Heating Design Guide.
  5. All pipe work has been designed in Hep2O to BS7291 unless otherwise indicated. Pipe sizes have been selected with a maximum pressure loss of 350 Pa/m (in accordance with CIBSE guidance) and with fluid velocity limited to 1.5 m/s. Any deviation from indicated pipe routes should be considered carefully to ensure impact on system performance is minimised.
  6. 15mm flow and return pipe work unless otherwise indicated.
  7. Thermostatic Radiator Valves (TRV's) & Lock Shield Valves (LSV's) to all radiators except those in room/s containing a room thermostat.
  8. Top and bottom opposite ends radiator configuration is recommended.
  9. When specifying an underfloor heating system a bifilar configuration is recommended.
  10. An automatic bypass providing a 3-metre circuit must be fitted for systems using a fixed speed pump with two-port motorised valves installed. A system with a modulating pump may not require a system bypass.
  11. For zoned or intermittently heated spaces, in-built product frost protection may be insufficient to protect parts of the system exposed to low external temperatures e.g. pipe work in unheated roof spaces, voids, garages etc. In this scenario, additional third party frost protection should be installed
  12. An additional expansion vessel may be required. In the case of underfloor heating, assumptions regarding the water volume shall be made where underfloor heating designs are not provided by the Client.
  13. Underfloor heating with an integrated pump pack and hydraulic separation should be used.

- PLUMBING
1. The system has been designed with reference to the parameters given in BS 8558, BS EN 806 and the building warranty provider's technical standards where requested or appropriate.
  2. Balanced cold connections – In order to minimise pressure differences between the hot and cold connections on mixer shower units etc. it may be preferable to provide balanced cold water supplies. For advice with regard to systems incorporating unvented Green Storage cylinders, please refer to Technical Bulletin TB0067\*. Similarly, the distance between the cold mains entry and supply for combination boilers should be kept to as short a distance as practical.
  3. Combination isolation and flow restrictor valves must be installed on all services to sanitary ware with particular emphasis to the bath and shower to ensure balanced supplies and adequate simultaneous performance.
  4. All pipe work has been designed in Hep2O to BS7291 unless otherwise indicated. Pipe sizes have been calculated with reference to BS 806 with fluid velocity limited to 4 m/s. Any deviation from indicated pipe routes should be considered carefully to ensure impact on system performance is minimised.
  5. 15mm hot and cold pipe work unless otherwise indicated.
  6. Dead legs – In order to balance energy efficiency and comfort during a hot water demand, it may be necessary to limit the amount of cold water drawn off through pipe work before hot water is available. Where domestic Hot Water Secondary - Recirculation (HWS-R) is specified, all pipe work must be copper (Refer to TB 0050\* for more information regarding Hot Water Secondary – Recirculation). HWS-R is not applicable for hot water systems supplied by a combination boiler - trace heating should therefore be considered as an alternative when required.
  7. Boosted mains cold water supplies can be achieved through the use of an accumulator.

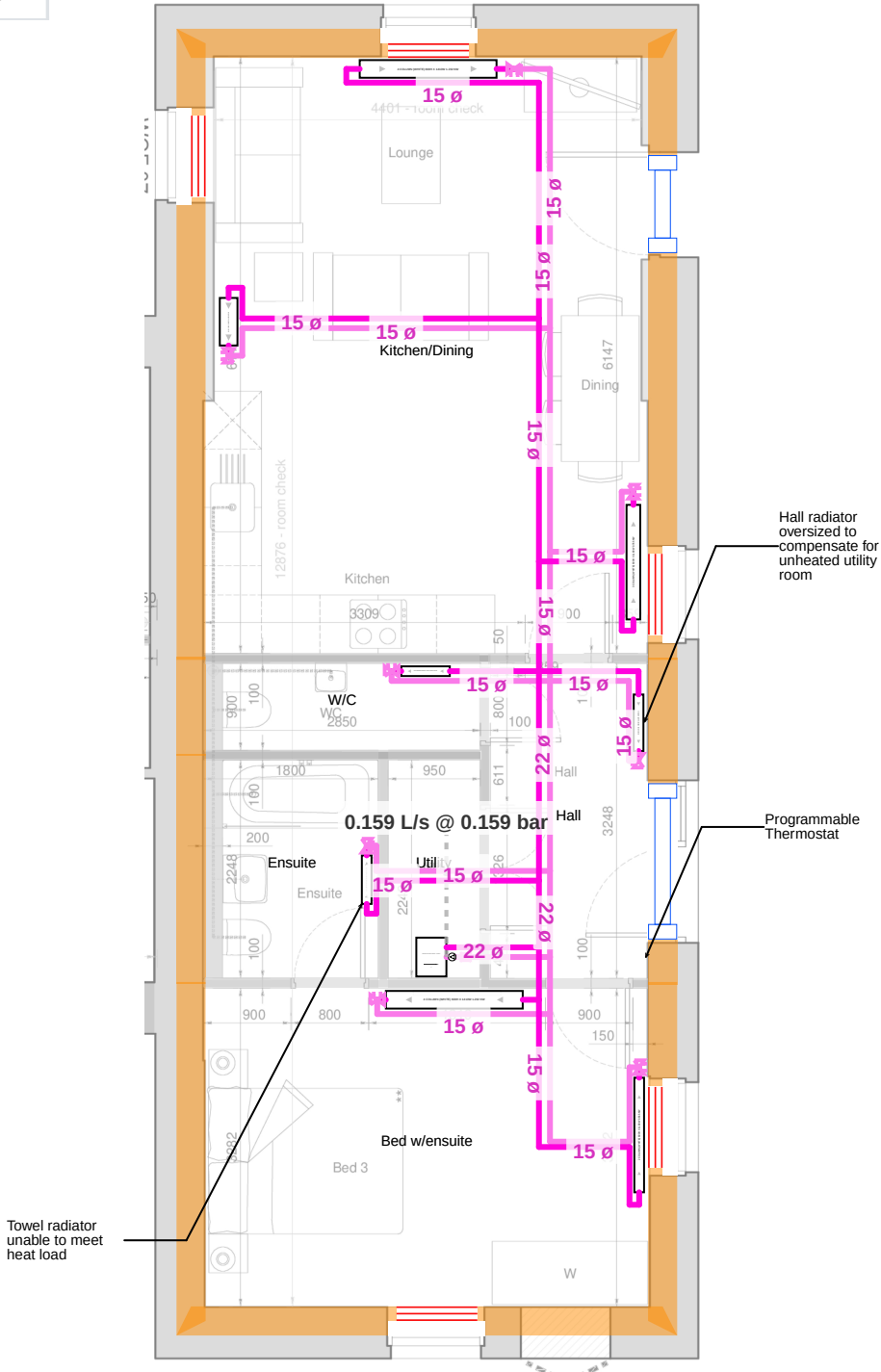
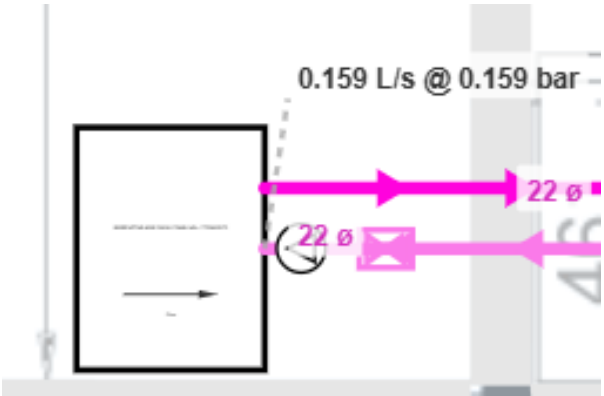
\*Please note: Technical Bulletins can be downloaded from the Worcester website ( [HYPERLINK "http://www.worcester-bosch.co.uk"](http://www.worcester-bosch.co.uk) www.worcester-bosch.co.uk)



## 7543.3.1 - Plot 45 - Bill of Materials

| CODE          | ITEM DESCRIPTION                                                                                                               | UNIT | QTY PER PLOT |
|---------------|--------------------------------------------------------------------------------------------------------------------------------|------|--------------|
| 7733600373    | Worcester Greenstar 4000 30kW Combi NG                                                                                         | No   | 1            |
| 7733600236    | Worcester Greenstar System Filter 22mm                                                                                         | No   | 1            |
| 3rd party     | Third party programmable room thermostat - Customer specified                                                                  | No   | 1            |
| 3rd Party     | 4L Expansion Vessel                                                                                                            | No   | 1            |
| <b>102</b>    | <b>WATER SUPPLY</b>                                                                                                            |      |              |
| <b>102.2</b>  | <b>Copper</b>                                                                                                                  |      |              |
| <b>102.2</b>  | <b>Pipework</b>                                                                                                                |      |              |
| 102.2.5       | 15mm diameter BSEN1057 COPPER pipe                                                                                             | m    | 48.32        |
| 102.2.8       | 22mm diameter BSEN1057 COPPER pipe                                                                                             | m    | 10.11        |
| <b>102.2</b>  | <b>Tees (Side x Side x Centre)</b>                                                                                             |      |              |
| 102.2.57      | 15mm x 15mm x 15mm copper Tee                                                                                                  | No   | 6.00         |
| 102.2.57      | 15mm x 22mm x 22mm copper Tee                                                                                                  | No   | 2.00         |
| 102.2.57      | 22mm x 22mm x 15mm copper Tee                                                                                                  | No   | 2.00         |
| <b>102.2</b>  | <b>Elbows</b>                                                                                                                  |      |              |
| 102.2.61      | 15mm copper Elbow                                                                                                              | No   | 31.00        |
| <b>102.7</b>  | <b>Polybutylene</b>                                                                                                            |      |              |
| <b>102.7</b>  | <b>Pipework</b>                                                                                                                |      |              |
| 102.7.3       | 15mm diameter GENERIC POLYBUTYLENE pipe                                                                                        | m    | 17.14        |
| 102.7.6       | 22mm diameter GENERIC POLYBUTYLENE pipe                                                                                        | m    | 13.17        |
| <b>102.7</b>  | <b>Tees (Side x Side x Centre)</b>                                                                                             |      |              |
| 102.7.35      | 15mm x 15mm x 15mm polybutylene Tee                                                                                            | No   | 1.00         |
| 102.7.35      | 22mm x 15mm x 22mm polybutylene Tee                                                                                            | No   | 2.00         |
| 102.7.35      | 22mm x 22mm x 15mm polybutylene Tee                                                                                            | No   | 3.00         |
| 102.7.35      | 22mm x 22mm x 22mm polybutylene Tee                                                                                            | No   | 1.00         |
| <b>102.7</b>  | <b>Elbows</b>                                                                                                                  |      |              |
| 102.7.37      | 15mm polybutylene Elbow                                                                                                        | No   | 4.00         |
| 102.7.40      | 22mm polybutylene Elbow                                                                                                        | No   | 4.00         |
|               | <b>RADIATORS</b>                                                                                                               |      |              |
| <b>102.54</b> | <b>Heat Emitter</b>                                                                                                            |      |              |
| 193016        | 0.861kW Towelrad Windsor Type 2 Column (White) (Windsor Column Radiator) Radiator - H1800.000mm x W582.000mm                   | No   | 1.00         |
| 193005        | 0.555kW Towelrad Windsor Type 2 Column (White) (Windsor Column Radiator) Radiator - H600.000mm x W1180.000mm                   | No   | 1.00         |
| 140033        | 0.274kW Towelrad Pisa Type Pisa Chrome Straight (Towelrad - Pisa Chrome Straight - 140033) Radiator - H1800.000mm x W500.000mm | No   | 1.00         |
| 140017        | 0.216kW Towelrad Pisa Type Pisa Chrome Straight (Towelrad - Pisa Chrome Straight - 140017) Radiator - H1200.000mm x W500.000mm | No   | 1.00         |
| 193014        | 1.232kW Towelrad Windsor Type 4 Column (White) (Windsor Column Radiator) Radiator - H600.000mm x W1410.000mm                   | No   | 2.00         |
| 193005        | 0.765kW Towelrad Windsor Type 3 Column (White) (Windsor Column Radiator) Radiator - H600.000mm x W1180.000mm                   | No   | 1.00         |
| 193006        | 1.148kW Towelrad Windsor Type 4 Column (White) (Windsor Column Radiator) Radiator - H1800.000mm x W490.000mm                   | No   | 1.00         |

| Name                                     | Dimensions     | Design Rating | 50°C dT Rating | Room           | Room Heat Loss |
|------------------------------------------|----------------|---------------|----------------|----------------|----------------|
| Windsor Column Radiator                  | 1800mm x 582mm | 0.861kW       | 1.548kW        | Hall           | 742.271W       |
| Windsor Column Radiator                  | 600mm x 1180mm | 0.555kW       | 1.100kW        | Bed w/ensuite  | 1701.803W      |
| Towelrad - Pisa Chrome Straight - 140033 | 1800mm x 500mm | 0.274kW       | 0.572kW        | Ensuite        | 417.970W       |
| Towelrad - Pisa Chrome Straight - 140017 | 1200mm x 500mm | 0.216kW       | 0.375kW        | W/C            | 185.975W       |
| Windsor Column Radiator                  | 600mm x 1410mm | 1.232kW       | 2.457kW        | Kitchen/Dining | 3117.535W      |
| Windsor Column Radiator                  | 600mm x 1180mm | 0.765kW       | 1.523kW        | Kitchen/Dining | 3117.535W      |
| Windsor Column Radiator                  | 600mm x 1410mm | 1.232kW       | 2.457kW        | Bed w/ensuite  | 1701.803W      |
| Windsor Column Radiator                  | 1800mm x 490mm | 1.148kW       | 2.343kW        | Kitchen/Dining | 3117.535W      |



HEATING LAYOUT - NOTES

- 1) Please refer to 'Design Standard Notes' sheet attached for details of standard design parameters.
- 2) The pipework layout and equipment specified are based on the information supplied by the client and the Worcester 'Design Option Report' agreed at the start of the project.
- 3) Wherever possible radiators, indoor units, outdoor units, cylinders, programmers and room thermostats are located as suggested or indicated on architectural drawings provided.
- 4) Where third party controls are specified, it is assumed that these will be Class IV for ErP system labels.
- 5) Use of electric element within towel rails would be an advantage for summer use.

Flow Systems

- Return
- Flow
- Zone 1
- Zone 2
- Zone 3
- Zone 4



CLIENT:  
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Ground

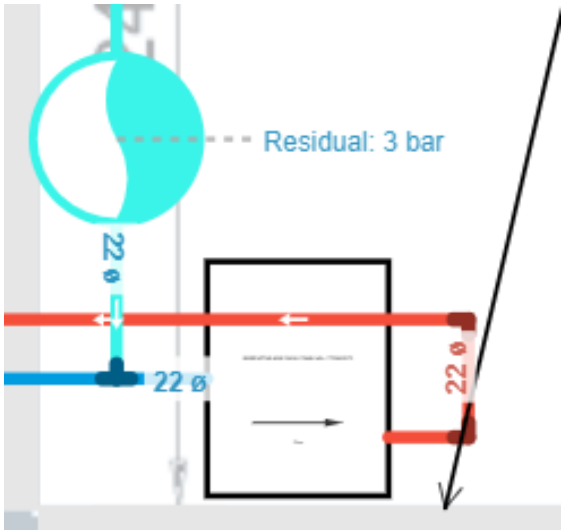
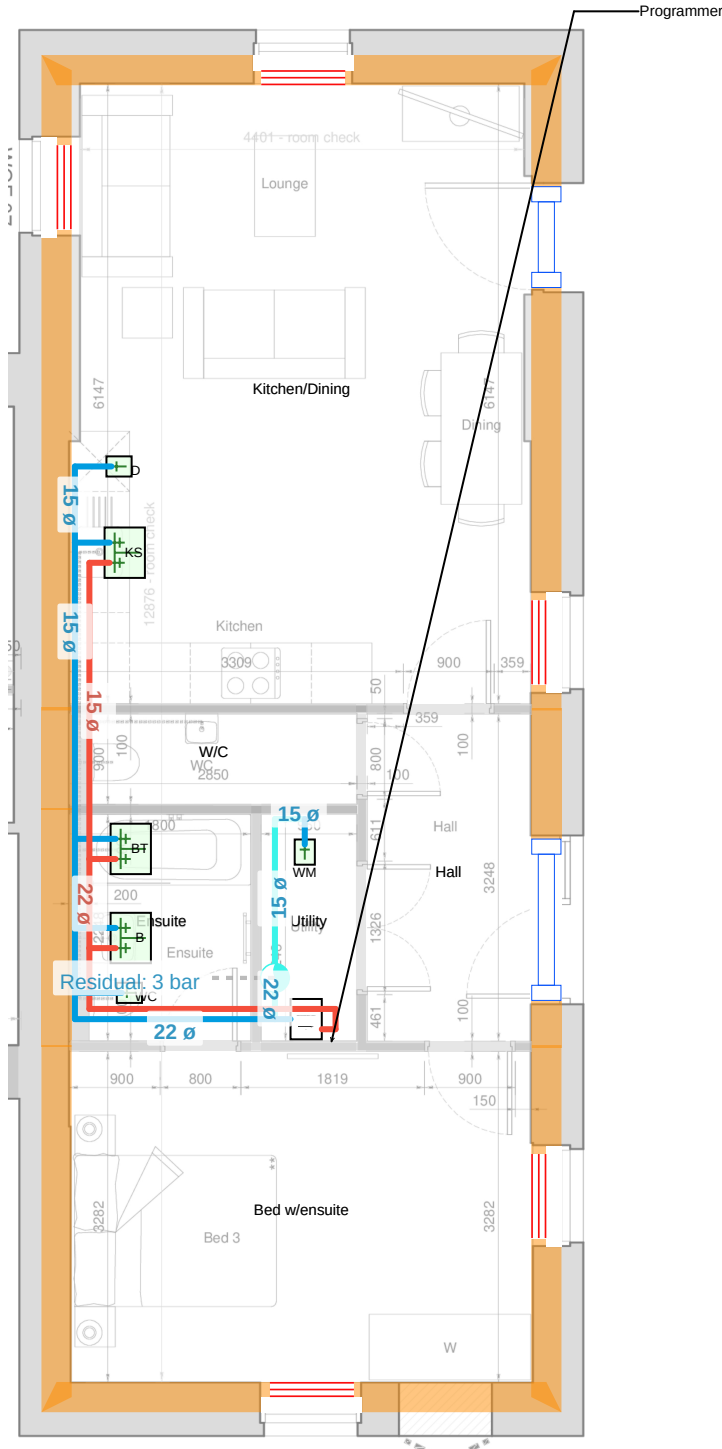
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Design Parameters  
External Temperature: - 3.4°C  
Flow/Return Temperature: 55°C/45°C  
Designed in Copper

Plumbing Fixtures:  
22mm to Bath outlets  
15mm to all others  
Designed in Plastic

Designed using  h2x



PLUMBING LAYOUT - NOTES

- 1) Please refer to 'Design Standard Notes' sheet attached for details of standard design parameters.
- 2) The pipework layout and equipment specified are based on the information supplied by the client and the Worcester 'Design Option Report' agreed at the start of the project.
- 3) Hot & Cold water outlets are located as indicated on the architectural drawings provided.
- 4) Where the available mains cold water pressure is lower than that required, a boosted supply system will be necessary to ensure performance is maintained. For more information see Plumbing note IX on Design Standard Notes page.

Flow Systems

- Cold Water 
- Hot Water 
- Warm Water 
- Cold Balance Feed 



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