



|                         |                                                                                         |
|-------------------------|-----------------------------------------------------------------------------------------|
| JOB TITLE               | Our Town Hall Project                                                                   |
| JOB NUMBER              | 256650                                                                                  |
| MADE BY                 | SC/CH                                                                                   |
| CHECKED BY              | JC/CH                                                                                   |
| DATE                    | 07/10/2019                                                                              |
| Description of schedule | CHW & LTHW Equipment Schedule                                                           |
| Document Reference      | OTH-ARU-TH-ZZ-SCH-B-0011                                                                |
| Filename                | J:\250000\256650 Town Hall\4 Internal Project Data\4-07 Schedules & Data Sheets\4-07-04 |

|           |                  |     |
|-----------|------------------|-----|
| REVISIONS | Current Revision | P04 |
|-----------|------------------|-----|

| Rev. | Date     | Made by | Checked | Description                                             |
|------|----------|---------|---------|---------------------------------------------------------|
| P01  | 06/09/19 | SC      | JC      |                                                         |
| P02  | 20/09/19 | CH      | CH      | Heating schedules added                                 |
| P03  | 27/09/19 | SC      | CH      | Trace heating schedule added                            |
| P04  | 07/10/19 | SC      | CH      | Underfloor heating schedule updated and appendix added. |

**Document Review**  
Lendlease document received on:  

1. Accepted

2. Accepted with comments

3. Rejected

Lendlease Checked by Jia Wen Lee  
Date 25/11/2019

Accepted documents are considered to conform to the design intent, but does not mean acceptance of dimensions, details, size or weights, nor does it relieve the designer from responsibilities for errors, omissions and/or compliance with obligations and/or responsibilities of the contract.

|                                                             |                       |         |                                    |                    |            |
|-------------------------------------------------------------|-----------------------|---------|------------------------------------|--------------------|------------|
| <div>ARUP</div> <div>OUR TOWN HALL</div> <div>PROJECT</div> |                       | Job No. |                                    | Rev.               |            |
|                                                             |                       | 256650  |                                    | Work Stage 4 Issue | P04        |
|                                                             |                       |         |                                    |                    |            |
| Job Title                                                   | Our Town Hall Project |         | Doc. Ref. OTH-ARU-TH-ZZ-SPE-B-0011 |                    |            |
| Schedule                                                    | VRF Indoor Units      |         | Made by SC/CH                      | Date 07/10/2019    | Chd. JC/CH |

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type             | VRV Split Air Conditioning Units (heat pumps)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Location         | See Schedules                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Description      | <p>Air conditioning units comprising indoor fan coil unit and external condenser units</p> <p>Multiple indoor units connected in series to external condenser units</p> <p>3 pipe system connected to Manifolds - Branch Control boxes (BC) at each floor level. 2 pipe Connections from BC box to each FCU</p> <p>A specialist manufacturer/installer to carry out the complete VRF installation including all indoor/outdoor units, controls system, local controllers, refrigerant pipework, insulation, condensate pipework, controls and power cabling and necessary containment. All installations shall comply with the requirements of the specifications and drawings</p> <p>All condensate pipework shall be installed to the nearest above ground drainage stack where it will discharge to drain via a 54mm dia deep seal trap. A gravity system shall be utilised.</p>                                                                                                                                                                                                                                                                                                                                        |
| Indoor unit      | Floor mounted chassis 'ducted' fan coil type or Wall mounted in plant rooms (Refer to the schedules)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Outdoor Units    | <p>Standard outdoor condenser units</p> <p>Multiple VRF system outdoor condensers 3 pipe system</p> <p>The VRV system will have the ability to sustain refrigerant piping lengths of up to 165m with a level difference of 50m between indoor units</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Accessories      | <p>External isolator</p> <p>Condensate pump (Pumps required where gravity drain is not possible)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Refrigerant      | R410a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Performance Data | All Indoor units shall be selected to provide the specified duty operating on Medium Fan Speed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Controls Data    | <p>The VRF system shall be controlled by stand alone room controllers supplied by the manufacturer.</p> <p>On/Off selection</p> <p>Set Point adjustment (Range 16-32 degrees C) Fan speed adjustment</p> <p>Heat/cool/auto changeover mode selection Frost protection set point</p> <p>Timer settings</p> <p>Holiday period settings</p> <p>Priority settings for restriction of local access for start/stop, heat/cool mode and set point adjustment range limitation</p> <p>Reset ability for malfunction codes and filter maintenance warnings</p> <p>The VRF system control shall interface with the BMS system via Bacnet gateway.</p> <p>The BACnet gateway will enable the VRV system to communicate with up to 256 indoor units (via DAM411B51, 128 as standard) to a BACnet compatible BMS.</p> <p>This system will allow communication of up to 29 control and monitoring points per indoor control group</p> <p>The BACnet gateway will allow energy monitoring via optional PPD software (DAM412B51) Additional kW/h meters would be required</p> <p>Return air temperature sensors shall be provided by remote temperature sensors located on the boxing-in, final setting out of which by the Architect.</p> |
| Manufacturer     | Daikin, Mitsubishi or equal and approved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| System           | Daikin VRV IV R410A series ( Inverter Heat Recovery)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Notes                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------|
| This datasheet should be read in conjunction with all other datasheets, drawings and documentation.                        |
| Refer to Mechanical Particular specification and BMS and Automatic Controls specification for the design criteria.         |
| All units to be complete with anti vibration mounts as necessary to comply with the vibration and acoustic specifications. |
| The units shall be suited to the external environment and mounted on a steel frame to protect anti vibration mounts.       |

|                                                             |                       |         |  |                    |  |           |       |                          |            |      |       |
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|                                                             |                       | 256650  |  | Work Stage 4 Issue |  | P04       |       |                          |            |      |       |
|                                                             |                       |         |  |                    |  |           |       |                          |            |      |       |
| Job Title                                                   | Our Town Hall Project |         |  |                    |  | Doc. Ref. |       | OTH-ARU-TH-ZZ-SPE-B-0011 |            |      |       |
| Schedule                                                    | VRF Indoor Units      |         |  |                    |  | Made by   | SC/CH | Date                     | 07/10/2019 | Chd. | JC/CH |

| Unit Reference  | Serving | Outdoor Unit Ref   | Type          | Total Cooling Capacity (kW) | Sensible Cooling Capacity (kW) | Total Heating Capacity (kW) | Maximum Airflow (m3/min) | Power Supply (V/Ph/Hz) | Minimum Circuit Amps (A) | Sound Pressure dB(A) | Ventilation Outlets          | Dimensions (mm) |        |       |
|-----------------|---------|--------------------|---------------|-----------------------------|--------------------------------|-----------------------------|--------------------------|------------------------|--------------------------|----------------------|------------------------------|-----------------|--------|-------|
|                 |         |                    |               |                             |                                |                             |                          |                        |                          |                      |                              | Width           | Height | Depth |
| 01-009/FCU/001  | 01-009  | CB Deck/VRO/001..3 | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| 01-009/FCU/002  | 01-009  | CB Deck/VRO/001..3 | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| 01-011/FCU/001  | 01-011  | CB Deck/VRO/001..3 | Floor Mounted | 5.0                         | 3.9                            | 7.7                         | 275                      | 230/1/50               | 0.6                      | 35                   | Ducted connection on the top | 1190            | 720    | 200   |
| 01-012/FCU/001  | 01-012  | CB Deck/VRO/001..3 | Floor Mounted | 2.5                         | 1.9                            | 3.9                         | 133                      | 230/1/50               | 0.4                      | 35                   | Ducted connection on the top | 790             | 720    | 200   |
| 01-012/FCU/002  | 01-012  | CB Deck/VRO/001..3 | Floor Mounted | 2.5                         | 1.9                            | 3.9                         | 133                      | 230/1/50               | 0.4                      | 35                   | Ducted connection on the top | 790             | 720    | 200   |
| 01-013/FCU/001  | 01-013  | CB Deck/VRO/001..3 | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| 01-014/FCU/001  | 01-014  | CB Deck/VRO/001..3 | Floor Mounted | 5.0                         | 3.9                            | 7.7                         | 275                      | 230/1/50               | 0.6                      | 35                   | Ducted connection on the top | 1190            | 720    | 200   |
| 01-019/FCU/001  | 01-019  | CB Deck/VRO/001..3 | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 30                   | Ducted connection on the top | 990             | 720    | 200   |
| 01-019/FCU/002  | 01-019  | CB Deck/VRO/001..3 | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 30                   | Ducted connection on the top | 990             | 720    | 200   |
| 01-019/FCU/003  | 01-019  | CB Deck/VRO/001..3 | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 30                   | Ducted connection on the top | 990             | 720    | 200   |
| 01-019/FCU/004  | 01-019  | CB Deck/VRO/001..3 | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 30                   | Ducted connection on the top | 990             | 720    | 200   |
| 01-020/FCU/001  | 01-020  | CB Deck/VRO/001..3 | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| 01-020/FCU/002  | 01-020  | CB Deck/VRO/001..3 | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| 02-002/FCU/001  | 02-002  | 06-C03/VRO/003..5  | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| 02-002/FCU/002  | 02-002  | 06-C03/VRO/003..5  | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| 02-002/FCU/003  | 02-002  | 06-C03/VRO/003..5  | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| 02-003/FCU/001  | 02-003  | 06-C03/VRO/003..5  | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| 02-003/FCU/002  | 02-003  | 06-C03/VRO/003..5  | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| 02-003/FCU/003  | 02-003  | 06-C03/VRO/003..5  | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| 02-004/FCU/001  | 02-004  | 06-C03/VRO/003..5  | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| 02-004/FCU/002  | 02-004  | 06-C03/VRO/003..5  | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| 02-005a/FCU/001 | 02-005a | 06-C03/VRO/003..5  | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| 02-006/FCU/001  | 02-006  | 06-C03/VRO/003..5  | Floor Mounted | 5.0                         | 3.9                            | 7.7                         | 275                      | 230/1/50               | 0.6                      | 40                   | Ducted connection on the top | 1190            | 720    | 200   |
| 02-007/FCU/001  | 02-007  | 06-C03/VRO/003..5  | Floor Mounted | 5.0                         | 3.9                            | 7.7                         | 275                      | 230/1/50               | 0.6                      | 40                   | Ducted connection on the top | 1190            | 720    | 200   |
| 02-010/FCU/001  | 02-010  | 06-C03/VRO/003..5  | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 40                   | Ducted connection on the top | 990             | 720    | 200   |
| 02-010/FCU/002  | 02-010  | 06-C03/VRO/003..5  | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 40                   | Ducted connection on the top | 990             | 720    | 200   |
| 02-011/FCU/001  | 02-011  | 06-C03/VRO/003..5  | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| 02-012/FCU/001  | 02-012  | 06-C03/VRO/003..5  | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 40                   | Ducted connection on the top | 990             | 720    | 200   |

|                                                             |                       |         |  |                    |  |           |       |                          |            |      |       |
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|                                                             |                       | 256650  |  | Work Stage 4 Issue |  | P04       |       |                          |            |      |       |
|                                                             |                       |         |  |                    |  |           |       |                          |            |      |       |
| Job Title                                                   | Our Town Hall Project |         |  |                    |  | Doc. Ref. |       | OTH-ARU-TH-ZZ-SPE-B-0011 |            |      |       |
| Schedule                                                    | VRF Indoor Units      |         |  |                    |  | Made by   | SC/CH | Date                     | 07/10/2019 | Chd. | JC/CH |

| Unit Reference | Serving | Outdoor Unit Ref  | Type          | Total Cooling Capacity (kW) | Sensible Cooling Capacity (kW) | Total Heating Capacity (kW) | Maximum Airflow (m3/min) | Power Supply (V/Ph/Hz) | Minimum Circuit Amps (A) | Sound Pressure dB(A) | Ventilation Outlets          | Dimensions (mm) |        |       |
|----------------|---------|-------------------|---------------|-----------------------------|--------------------------------|-----------------------------|--------------------------|------------------------|--------------------------|----------------------|------------------------------|-----------------|--------|-------|
|                |         |                   |               |                             |                                |                             |                          |                        |                          |                      |                              | Width           | Height | Depth |
| 02-012/FCU/002 | 02-012  | 06-C03/VRO/003..5 | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 40                   | Ducted connection on the top | 990             | 720    | 200   |
| 02-012/FCU/003 | 02-012  | 06-C03/VRO/003..5 | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 40                   | Ducted connection on the top | 990             | 720    | 200   |
| 02-012/FCU/004 | 02-012  | 06-C03/VRO/003..5 | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 40                   | Ducted connection on the top | 990             | 720    | 200   |
| 02-014/FCU/001 | 02-014  | 06-C03/VRO/003..5 | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 40                   | Ducted connection on the top | 990             | 720    | 200   |
| 02-014/FCU/002 | 02-014  | 06-C03/VRO/003..5 | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 40                   | Ducted connection on the top | 990             | 720    | 200   |
| 03-001/FCU/001 | 03-001  | 05-C01/VRO/001..3 | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 25                   | Ducted connection on the top | 990             | 720    | 200   |
| 03-001/FCU/002 | 03-001  | 05-C01/VRO/001..3 | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 25                   | Ducted connection on the top | 990             | 720    | 200   |
| 03-001/FCU/003 | 03-001  | 05-C01/VRO/001..3 | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 25                   | Ducted connection on the top | 990             | 720    | 200   |
| 03-001/FCU/004 | 03-001  | 05-C01/VRO/001..3 | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 25                   | Ducted connection on the top | 990             | 720    | 200   |
| 03-001/FCU/005 | 03-001  | 05-C01/VRO/001..3 | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 25                   | Ducted connection on the top | 990             | 720    | 200   |
| 03-007/FCU/001 | 03-007  | 05-C01/VRO/001..3 | Floor Mounted | 1.9                         | 1.7                            | 3.1                         | 133                      | 230/1/50               | 0.4                      | 40                   | Ducted connection on the top | 790             | 720    | 200   |
| 03-007/FCU/002 | 03-007  | 05-C01/VRO/001..3 | Floor Mounted | 1.9                         | 1.7                            | 3.1                         | 133                      | 230/1/50               | 0.4                      | 40                   | Ducted connection on the top | 790             | 720    | 200   |
| 03-008/FCU/001 | 03-008  | 05-C01/VRO/001..3 | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 40                   | Ducted connection on the top | 990             | 720    | 200   |
| 03-010/FCU/001 | 03-010  | 05-C01/VRO/001..3 | Floor Mounted | 1.9                         | 1.7                            | 3.1                         | 133                      | 230/1/50               | 0.4                      | 40                   | Ducted connection on the top | 790             | 720    | 200   |
| 03-011/FCU/001 | 03-011  | 05-C01/VRO/001..3 | Floor Mounted | 2.5                         | 1.9                            | 3.9                         | 133                      | 230/1/50               | 0.4                      | 40                   | Ducted connection on the top | 790             | 720    | 200   |
| 03-013/FCU/001 | 03-013  | 05-C01/VRO/001..3 | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 40                   | Ducted connection on the top | 990             | 720    | 200   |
| 03-013/FCU/002 | 03-013  | 05-C01/VRO/001..3 | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 40                   | Ducted connection on the top | 990             | 720    | 200   |
| 03-013/FCU/003 | 03-013  | 05-C01/VRO/001..3 | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 40                   | Ducted connection on the top | 990             | 720    | 200   |
| 03-013/FCU/004 | 03-013  | 05-C01/VRO/001..3 | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 40                   | Ducted connection on the top | 990             | 720    | 200   |
| 04-020/FCU/001 | 04-020  | 06-C03/VRO/001..3 | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| 04-020/FCU/002 | 04-020  | 06-C03/VRO/001..3 | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| 04-023/FCU/001 | 04-023  | 06-C03/VRO/001..3 | Floor Mounted | 5.0                         | 3.9                            | 7.7                         | 275                      | 230/1/50               | 0.6                      | 40                   | Ducted connection on the top | 1190            | 720    | 200   |
| 04-024/FCU/001 | 04-024  | 06-C03/VRO/001..3 | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 25                   | Ducted connection on the top | 990             | 720    | 200   |
| 04-024/FCU/002 | 04-024  | 06-C03/VRO/001..3 | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 25                   | Ducted connection on the top | 990             | 720    | 200   |
| 04-024/FCU/003 | 04-024  | 06-C03/VRO/001..3 | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 25                   | Ducted connection on the top | 990             | 720    | 200   |
| 04-024/FCU/004 | 04-024  | 06-C03/VRO/001..3 | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 25                   | Ducted connection on the top | 990             | 720    | 200   |
| 04-024/FCU/005 | 04-024  | 06-C03/VRO/001..3 | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 25                   | Ducted connection on the top | 990             | 720    | 200   |
| 05-001/FCU/001 | 05-001  | 05-C01/VRO/001..3 | Floor Mounted | 5.0                         | 3.9                            | 7.7                         | 275                      | 230/1/50               | 0.6                      | 35                   | Ducted connection on the top | 1190            | 720    | 200   |

|                                                             |  |  |  |  |  |  |  |                                                       |                    |              |  |
|-------------------------------------------------------------|--|--|--|--|--|--|--|-------------------------------------------------------|--------------------|--------------|--|
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|                                                             |  |  |  |  |  |  |  | 256650                                                | Work Stage 4 Issue | P04          |  |
|                                                             |  |  |  |  |  |  |  |                                                       |                    |              |  |
| Job Title      Our Town Hall Project                        |  |  |  |  |  |  |  | Doc. Ref.                    OTH-ARU-TH-ZZ-SPE-B-0011 |                    |              |  |
| Schedule        VRF Indoor Units                            |  |  |  |  |  |  |  | Made by    SC/CH                                      | Date   07/10/2019  | Chd.   JC/CH |  |

| Unit Reference | Serving | Outdoor Unit Ref    | Type          | Total Cooling Capacity (kW) | Sensible Cooling Capacity (kW) | Total Heating Capacity (kW) | Maximum Airflow (m3/min) | Power Supply (V/Ph/Hz) | Minimum Circuit Amps (A) | Sound Pressure dB(A) | Ventilation Outlets          | Dimensions (mm) |        |       |
|----------------|---------|---------------------|---------------|-----------------------------|--------------------------------|-----------------------------|--------------------------|------------------------|--------------------------|----------------------|------------------------------|-----------------|--------|-------|
|                |         |                     |               |                             |                                |                             |                          |                        |                          |                      |                              | Width           | Height | Depth |
| 05-001/FCU/002 | 05-001  | 05-C01/VRO/001..3   | Floor Mounted | 5.0                         | 3.9                            | 7.7                         | 275                      | 230/1/50               | 0.6                      | 35                   | Ducted connection on the top | 1190            | 720    | 200   |
| 05-001/FCU/003 | 05-001  | 05-C01/VRO/001..3   | Floor Mounted | 5.0                         | 3.9                            | 7.7                         | 275                      | 230/1/50               | 0.6                      | 35                   | Ducted connection on the top | 1190            | 720    | 200   |
| 05-001/FCU/004 | 05-001  | 05-C01/VRO/001..3   | Floor Mounted | 5.0                         | 3.9                            | 7.7                         | 275                      | 230/1/50               | 0.6                      | 35                   | Ducted connection on the top | 1190            | 720    | 200   |
| GF-020/FCU/001 | GF-020  | CB Deck/VRO/004..6  | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 40                   | Ducted connection on the top | 990             | 720    | 200   |
| GF-020/FCU/002 | GF-020  | CB Deck/VRO/004..6  | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 40                   | Ducted connection on the top | 990             | 720    | 200   |
| GF-021/FCU/001 | GF-021  | CB Deck/VRO/004..6  | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| GF-021/FCU/002 | GF-021  | CB Deck/VRO/004..6  | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| GF-022/FCU/001 | GF-022  | CB Deck/VRO/004..6  | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| GF-022/FCU/002 | GF-022  | CB Deck/VRO/004..6  | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| GF-023/FCU/001 | GF-023  | CB Deck/VRO/004..6  | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| GF-023/FCU/002 | GF-023  | CB Deck/VRO/004..6  | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| GF-025/FCU/001 | GF-025  | CB Deck/VRO/004..6  | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| GF-025/FCU/002 | GF-025  | CB Deck/VRO/004..6  | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| GF-026/FCU/001 | GF-026  | CB Deck/VRO/004..6  | Floor Mounted | 3.6                         | 3.0                            | 6.3                         | 208                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| GF-026/FCU/002 | GF-026  | CB Deck/VRO/004..6  | Floor Mounted | 3.6                         | 3.0                            | 6.3                         | 208                      | 230/1/50               | 0.5                      | 35                   | Ducted connection on the top | 990             | 720    | 200   |
| GF-027/FCU/001 | GF-027  | CB Deck/VRO/004..6  | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 30                   | Ducted connection on the top | 990             | 720    | 200   |
| GF-027/FCU/002 | GF-027  | CB Deck/VRO/004..6  | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 30                   | Ducted connection on the top | 990             | 720    | 200   |
| GF-027/FCU/003 | GF-027  | CB Deck/VRO/004..6  | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 30                   | Ducted connection on the top | 990             | 720    | 200   |
| GF-027/FCU/004 | GF-027  | CB Deck/VRO/004..6  | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 30                   | Ducted connection on the top | 990             | 720    | 200   |
| GF-033/FCU/001 | GF-033  | CB Deck/VRO/012..13 | Floor Mounted | 5.0                         | 3.9                            | 7.7                         | 275                      | 230/1/50               | 0.6                      | 45                   | Ducted connection on the top | 1190            | 720    | 200   |
| GF-033/FCU/002 | GF-033  | CB Deck/VRO/012..13 | Floor Mounted | 5.0                         | 3.9                            | 7.7                         | 275                      | 230/1/50               | 0.6                      | 45                   | Ducted connection on the top | 1190            | 720    | 200   |
| GF-033/FCU/003 | GF-033  | CB Deck/VRO/012..13 | Floor Mounted | 5.0                         | 3.9                            | 7.7                         | 275                      | 230/1/50               | 0.6                      | 45                   | Ducted connection on the top | 1190            | 720    | 200   |
| GF-033/FCU/004 | GF-033  | CB Deck/VRO/012..13 | Floor Mounted | 5.0                         | 3.9                            | 7.7                         | 275                      | 230/1/50               | 0.6                      | 45                   | Ducted connection on the top | 1190            | 720    | 200   |
| GF-033/FCU/005 | GF-033  | CB Deck/VRO/012..13 | Floor Mounted | 5.0                         | 3.9                            | 7.7                         | 275                      | 230/1/50               | 0.6                      | 45                   | Ducted connection on the top | 1190            | 720    | 200   |
| GF-038/FCU/001 | GF-038  | CB Deck/VRO/010..11 | Floor Mounted | 5.0                         | 3.9                            | 7.7                         | 275                      | 230/1/50               | 0.6                      | 45                   | Ducted connection on the top | 1190            | 720    | 200   |
| GF-038/FCU/002 | GF-038  | CB Deck/VRO/010..11 | Floor Mounted | 5.0                         | 3.9                            | 7.7                         | 275                      | 230/1/50               | 0.6                      | 45                   | Ducted connection on the top | 1190            | 720    | 200   |
| GF-039/FCU/001 | GF-039  | CB Deck/VRO/010..11 | Floor Mounted | 1.9                         | 1.7                            | 3.1                         | 133                      | 230/1/50               | 0.4                      | 45                   | Ducted connection on the top | 790             | 720    | 200   |
| GF-040/FCU/001 | GF-040  | CB Deck/VRO/010..11 | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 45                   | Ducted connection on the top | 990             | 720    | 200   |

|           |                       |               |  |           |                    |                          |            |            |
|-----------|-----------------------|---------------|--|-----------|--------------------|--------------------------|------------|------------|
| ARUP      |                       | OUR TOWN HALL |  | Job No.   |                    | Rev.                     |            |            |
|           |                       |               |  | 256650    | Work Stage 4 Issue | P04                      |            |            |
|           |                       |               |  |           |                    |                          |            |            |
| PROJECT   |                       |               |  |           |                    |                          |            |            |
| Job Title | Our Town Hall Project |               |  | Doc. Ref. |                    | OTH-ARU-TH-ZZ-SPE-B-0011 |            |            |
| Schedule  | VRF Indoor Units      |               |  | Made by   | SC/CH              | Date                     | 07/10/2019 | Chd. JC/CH |

| Unit Reference  | Serving | Outdoor Unit Ref    | Type          | Total Cooling Capacity (kW) | Sensible Cooling Capacity (kW) | Total Heating Capacity (kW) | Maximum Airflow (m3/min) | Power Supply (V/Ph/Hz) | Minimum Circuit Amps (A) | Sound Pressure dB(A) | Ventilation Outlets          | Dimensions (mm) |        |       |
|-----------------|---------|---------------------|---------------|-----------------------------|--------------------------------|-----------------------------|--------------------------|------------------------|--------------------------|----------------------|------------------------------|-----------------|--------|-------|
|                 |         |                     |               |                             |                                |                             |                          |                        |                          |                      |                              | Width           | Height | Depth |
| GF-040/FCU/002  | GF-040  | CB Deck/VRO/010..11 | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 45                   | Ducted connection on the top | 990             | 720    | 200   |
| GF-040/FCU/003  | GF-040  | CB Deck/VRO/010..11 | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 45                   | Ducted connection on the top | 990             | 720    | 200   |
| GF-041/FCU/001  | GF-041  | CB Deck/VRO/010..11 | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 45                   | Ducted connection on the top | 990             | 720    | 200   |
| GF-041/FCU/002  | GF-041  | CB Deck/VRO/010..11 | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 45                   | Ducted connection on the top | 990             | 720    | 200   |
| GF-041/FCU/003  | GF-041  | CB Deck/VRO/010..11 | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 45                   | Ducted connection on the top | 990             | 720    | 200   |
| GF-042/FCU/001  | GF-042  | CB Deck/VRO/010..11 | Floor Mounted | 2.5                         | 1.9                            | 3.9                         | 133                      | 230/1/50               | 0.4                      | 45                   | Ducted connection on the top | 790             | 720    | 200   |
| GF-043/FCU/001  | GF-043  | CB Deck/VRO/010..11 | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 45                   | Ducted connection on the top | 990             | 720    | 200   |
| LG-006/FCU/001  | LG-006  | 07-S16/VRO/001..2   | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 70                   | Ducted connection on the top | 990             | 720    | 200   |
| LG-008/FCU/001  | LG-008  | 07-S16/VRO/001..2   | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 45                   | Ducted connection on the top | 990             | 720    | 200   |
| LG-009/FCU/001  | LG-009  | 07-S16/VRO/001..2   | Floor Mounted | 3.9                         | 3.1                            | 6.1                         | 208                      | 230/1/50               | 0.5                      | 40                   | Ducted connection on the top | 990             | 720    | 200   |
| LG-010/FCU/001  | LG-010  | 07-S16/VRO/001..2   | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 40                   | Ducted connection on the top | 990             | 720    | 200   |
| LG-011/FCU/001  | LG-011  | 07-S16/VRO/001..2   | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 40                   | Ducted connection on the top | 990             | 720    | 200   |
| LG-046/FCU/001  | LG-046  | CB Deck/VRO/010..11 | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 40                   | Ducted connection on the top | 990             | 720    | 200   |
| LG-046/FCU/002  | LG-046  | CB Deck/VRO/010..11 | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 40                   | Ducted connection on the top | 990             | 720    | 200   |
| LG-046/FCU/003  | LG-046  | CB Deck/VRO/010..11 | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 40                   | Ducted connection on the top | 990             | 720    | 200   |
| LG-046/FCU/004  | LG-046  | CB Deck/VRO/010..11 | Floor Mounted | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 40                   | Ducted connection on the top | 990             | 720    | 200   |
| LG-015/FCU/001  | LG-015  | AS Moat/VRO/001..3  | Wall Mounted  | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/50               | 0.5                      | 70                   |                              | 990             | 720    | 200   |
| LG-015/FCU/002  | LG-015  | AS Moat/VRO/001..3  | Wall Mounted  | 3.1                         | 2.6                            | 4.8                         | 175                      | 230/1/51               | 0.5                      | 70                   |                              | 990             | 720    | 200   |
| LG-019/FCU/001  | LG-019  | AS Moat/VRO/001..3  | Wall Mounted  | 5.0                         | 3.9                            | 7.7                         | 275                      | 230/1/52               | 0.6                      | 70                   |                              | 1190            | 720    | 200   |
| LG-019/FCU/002  | LG-019  | AS Moat/VRO/001..3  | Wall Mounted  | 5.0                         | 3.9                            | 7.7                         | 275                      | 230/1/53               | 0.6                      | 70                   |                              | 1190            | 720    | 200   |
| LG-019/FCU/003  | LG-019  | AS Moat/VRO/001..3  | Wall Mounted  | 5.0                         | 3.9                            | 7.7                         | 275                      | 230/1/54               | 0.6                      | 70                   |                              | 1190            | 720    | 200   |
| LG-019/FCU/004  | LG-019  | AS Moat/VRO/001..3  | Wall Mounted  | 5.0                         | 3.9                            | 7.7                         | 275                      | 230/1/55               | 0.6                      | 70                   |                              | 1190            | 720    | 200   |
| LG-026/FCU/001  | LG-026  | AS Moat/VRO/001..3  | Wall Mounted  | 5.0                         | 3.9                            | 7.7                         | 275                      | 230/1/56               | 0.6                      | 70                   |                              | 1190            | 720    | 200   |
| LG-026/FCU/002  | LG-026  | AS Moat/VRO/001..3  | Wall Mounted  | 5.0                         | 3.9                            | 7.7                         | 275                      | 230/1/57               | 0.6                      | 70                   |                              | 1190            | 720    | 200   |
| LG-026/FCU/003  | LG-026  | AS Moat/VRO/001..3  | Wall Mounted  | 5.0                         | 3.9                            | 7.7                         | 275                      | 230/1/63               | 0.6                      | 70                   |                              | 1190            | 720    | 200   |
| LG-028a/FCU/001 | LG-028a | AS Moat/VRO/001..3  | Wall Mounted  | 3.9                         | 3.1                            | 6.3                         | 208                      | 230/1/58               | 0.5                      | 70                   |                              | 990             | 720    | 200   |
| LG-028a/FCU/002 | LG-028a | AS Moat/VRO/001..3  | Wall Mounted  | 3.9                         | 3.1                            | 6.3                         | 208                      | 230/1/59               | 0.5                      | 70                   |                              | 990             | 720    | 200   |
| LG-028a/FCU/003 | LG-028a | AS Moat/VRO/001..3  | Wall Mounted  | 3.9                         | 3.1                            | 6.3                         | 208                      | 230/1/60               | 0.5                      | 70                   |                              | 990             | 720    | 200   |

|                                                             |                       |         |  |                    |  |           |       |                          |            |      |       |
|-------------------------------------------------------------|-----------------------|---------|--|--------------------|--|-----------|-------|--------------------------|------------|------|-------|
| <div>ARUP</div> <div>OUR TOWN HALL</div> <div>PROJECT</div> |                       | Job No. |  |                    |  | Rev.      |       |                          |            |      |       |
|                                                             |                       | 256650  |  | Work Stage 4 Issue |  | P04       |       |                          |            |      |       |
|                                                             |                       |         |  |                    |  |           |       |                          |            |      |       |
| Job Title                                                   | Our Town Hall Project |         |  |                    |  | Doc. Ref. |       | OTH-ARU-TH-ZZ-SPE-B-0011 |            |      |       |
| Schedule                                                    | VRF Indoor Units      |         |  |                    |  | Made by   | SC/CH | Date                     | 07/10/2019 | Chd. | JC/CH |

| Unit Reference  | Serving | Outdoor Unit Ref   | Type         | Total Cooling Capacity (kW) | Sensible Cooling Capacity (kW) | Total Heating Capacity (kW) | Maximum Airflow (m3/min) | Power Supply (V/Ph/Hz) | Minimum Circuit Amps (A) | Sound Pressure dB(A) | Ventilation Outlets | Dimensions (mm) |        |       |
|-----------------|---------|--------------------|--------------|-----------------------------|--------------------------------|-----------------------------|--------------------------|------------------------|--------------------------|----------------------|---------------------|-----------------|--------|-------|
|                 |         |                    |              |                             |                                |                             |                          |                        |                          |                      |                     | Width           | Height | Depth |
| LG-028d/FCU/001 | LG-028d | AS Moat/VRO/001..3 | Wall Mounted | 3.1                         | 2.6                            | 5.0                         | 175                      | 230/1/61               | 0.5                      | 70                   |                     | 990             | 720    | 200   |
| LG-028d/FCU/002 | LG-028d | AS Moat/VRO/001..3 | Wall Mounted | 3.1                         | 2.6                            | 5.0                         | 175                      | 230/1/62               | 0.5                      | 70                   |                     | 990             | 720    | 200   |
| LG-043c/FCU/001 | LG-043c | 07-S16/VRO/003..4  | Wall Mounted | 4.9                         | 4.0                            | 7.7                         | 305                      | 230/1/75               | 0.7                      | 40                   |                     | 1050            | 290    | 269   |
| LG-043c/FCU/002 | LG-043c | 07-S16/VRO/003..4  | Wall Mounted | 4.9                         | 4.0                            | 7.7                         | 305                      | 230/1/76               | 0.7                      | 40                   |                     | 1050            | 290    | 269   |
| LG-043c/FCU/003 | LG-043c | 07-S16/VRO/003..4  | Wall Mounted | 4.9                         | 4.0                            | 7.7                         | 305                      | 230/1/77               | 0.7                      | 40                   |                     | 1050            | 290    | 269   |
| LG-043c/FCU/004 | LG-043c | 07-S16/VRO/003..4  | Wall Mounted | 4.9                         | 4.0                            | 7.7                         | 305                      | 230/1/78               | 0.7                      | 40                   |                     | 1050            | 290    | 269   |
| LG-043c/FCU/005 | LG-043c | 07-S16/VRO/003..4  | Wall Mounted | 4.9                         | 4.0                            | 7.7                         | 305                      | 230/1/79               | 0.7                      | 40                   |                     | 1050            | 290    | 269   |
| LG-043c/FCU/006 | LG-043c | 07-S16/VRO/003..4  | Wall Mounted | 4.9                         | 4.0                            | 7.7                         | 305                      | 230/1/80               | 0.7                      | 40                   |                     | 1050            | 290    | 269   |

|                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------|
| Notes                                                                                                                      |
| This datasheet should be read in conjunction with all other datasheets, drawings and documentation.                        |
| Refer to Mechanical Particular specification for the design criteria.                                                      |
| All units to be complete with anti vibration mounts as necessary to comply with the vibration and acoustic specifications. |
| The units shall be suited to the external environment and mounted on a steel frame to protect anti vibration mounts.       |

|                                                  |                       |         |  |                    |                                                |
|--------------------------------------------------|-----------------------|---------|--|--------------------|------------------------------------------------|
| <div>ARUP</div> <div>OUR TOWN HALL PROJECT</div> |                       | Job No. |  | Rev.               |                                                |
|                                                  |                       | 256650  |  | Work Stage 4 Issue | P04                                            |
|                                                  |                       |         |  |                    |                                                |
| Job Title                                        | Our Town Hall Project |         |  |                    | Doc. Ref. OTH-ARU-TH-ZZ-SPE-B-0011             |
| Schedule                                         | VRF Outdoor Units     |         |  |                    | Made by SC/CH    Date 07/10/2019    Chd. JC/CH |

| Reference           | Serving                 | Location              | No Units | Total Cooling Capacity (kW) | Total Heating Capcacity (kW) | MCA (A)              | Sound Pressure dB(A)       | Dimensions WXHxD (mm)                                             |
|---------------------|-------------------------|-----------------------|----------|-----------------------------|------------------------------|----------------------|----------------------------|-------------------------------------------------------------------|
| 05-C01/VRO/001..3   | Level 3 Albert Sq       | Refer to the drawings | 3        | 50.4                        | 77.9                         | 27.0<br>24.0<br>16.1 | Refer to the Acoustic Spec | 1,240 x 1,685 x 765<br>930 x 1,685 x 765<br>930 x 1,685 x 765     |
| 06-C03/VRO/001..2   | Level 4 Coroner's Court | Refer to the drawings | 2        | 31                          | 46.1                         | 24.0<br>16.1         | Refer to the Acoustic Spec | 930 x 1,685 x 765<br>930 x 1,685 x 765                            |
| 06-C03/VRO/003..5   | Level 2 Princess St     | Refer to the drawings | 3        | 50.8                        | 103.3                        | 31.0<br>31.0<br>27.0 | Refer to the Acoustic Spec | 1,240 x 1,685 x 765<br>1,240 x 1,685 x 765<br>1,240 x 1,685 x 765 |
| 07-S16/VRO/001..2   | Heritage Storage        | Refer to the drawings | 1        | 5                           | 23.7                         | 22                   | Refer to the Acoustic Spec | 930 x 1,685 x 765                                                 |
| 07-S16/VRO/003..4   | LG Control Room         | Refer to the drawings | 1        | 28.5                        | 26.8                         | 24                   | Refer to the Acoustic Spec | 930 x 1,685 x 765                                                 |
| AS Moat/VRO/001..3  | LG Plant Rooms          | Refer to the drawings | 3        | 62.4                        | 71.2                         | 22.0<br>22.0<br>22.0 | Refer to the Acoustic Spec | 930 x 1,685 x 765<br>930 x 1,685 x 765<br>930 x 1,685 x 765       |
| CB Deck/VRO/001..3  | Level 1 Princess St     | Refer to the drawings | 3        | 25                          | 71                           | 22.0<br>22.0<br>22.0 | Refer to the Acoustic Spec | 930 x 1,685 x 765<br>930 x 1,685 x 765<br>930 x 1,685 x 765       |
| CB Deck/VRO/004..6  | GF Princess St          | Refer to the drawings | 3        | 30.9                        | 87                           | 35.0<br>24.0<br>16.1 | Refer to the Acoustic Spec | 1,240 x 1,685 x 765<br>930 x 1,685 x 765<br>930 x 1,685 x 765     |
| CB Deck/VRO/010..11 | GF Visitor Centre       | Refer to the drawings | 3        | 31.4                        | 61.6                         | 22.0<br>16.1<br>16.1 | Refer to the Acoustic Spec | 930 x 1,685 x 765<br>930 x 1,685 x 765<br>930 x 1,685 x 765       |
| CB Deck/VRO/012..13 | GF Reception Rooms      | Refer to the drawings | 2        | 17.1                        | 39                           | 16.1<br>16.1         | Refer to the Acoustic Spec | 930 x 1,685 x 765<br>930 x 1,685 x 765                            |

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| Notes                                                                                                                      |
| This datasheet should be read in conjunction with all other datasheets, drawings and documentation.                        |
| Refer to Mechanical Particular specification for the design criteria.                                                      |
| All units to be complete with anti vibration mounts as necessary to comply with the vibration and acoustic specifications. |
| The units shall be suited to the external environment and mounted on a steel frame to protect anti vibration mounts.       |

|                                                             |                       |         |  |                    |                                                |
|-------------------------------------------------------------|-----------------------|---------|--|--------------------|------------------------------------------------|
| <div>ARUP</div> <div>OUR TOWN HALL</div> <div>PROJECT</div> |                       | Job No. |  | Rev.               |                                                |
|                                                             |                       | 256650  |  | Work Stage 4 Issue | P04                                            |
|                                                             |                       |         |  |                    |                                                |
| Job Title                                                   | Our Town Hall Project |         |  |                    | Doc. Ref. OTH-ARU-TH-ZZ-SPE-B-0011             |
| Schedule                                                    | DX Split Indoor Units |         |  |                    | Made by SC/CH    Date 07/10/2019    Chd. JC/CH |

| Unit Reference | Serving | Outdoor Unit Ref | Type          | Total Cooling Capacity (kW) | Sensible Cooling Capacity (kW) | Total Heating Capacity (kW) | Maximum Airflow H/L (m3/sec) | Power Supply (V/Ph/Hz) | Minimum Circuit Amps (A) | Sound Pressure NR | Ventilation Outlets          | Dimensions (mm) |        |       |
|----------------|---------|------------------|---------------|-----------------------------|--------------------------------|-----------------------------|------------------------------|------------------------|--------------------------|-------------------|------------------------------|-----------------|--------|-------|
|                |         |                  |               |                             |                                |                             |                              |                        |                          |                   |                              | Width           | Height | Depth |
| GF-027c/DXI/1  | GF-027c | PS Moat/DXO/001  | Floor Mounted | 3.3                         | 2.3                            | 4.0                         | 0.145/0.122                  | 230/1/50               | Fed from condenser       | 45                | Ducted connection on the top | 620*750*200     |        |       |
| 01-030/DXI/1   | 01-030  | 05-C01/DXO/001   | Wall Mounted  | 7.8                         | 5.3                            | 7.5                         | 0.3/0.233                    | 230/1/50               | Fed from condenser       | 45                |                              | 290*1050*238    |        |       |
| 02-023/DXI/1   | 02-023  | LS Moat/DXO/001  | Wall Mounted  | 7.8                         | 5.3                            | 7.5                         | 0.3/0.233                    | 230/1/50               | Fed from condenser       | 45                |                              | 290*1050*238    |        |       |
| 02-023/DXI/2   | 02-023  | LS Moat/DXO/002  | Wall Mounted  | 7.8                         | 5.3                            | 7.5                         | 0.3/0.233                    | 230/1/64               | Fed from condenser       | 45                |                              | 290*1050*238    |        |       |
| 02-023/DXI/3   | 02-023  | LS Moat/DXO/003  | Wall Mounted  | 7.8                         | 5.3                            | 7.5                         | 0.3/0.233                    | 230/1/65               | Fed from condenser       | 45                |                              | 290*1050*238    |        |       |
| 02-023/DXI/4   | 02-023  | LS Moat/DXO/004  | Wall Mounted  | 7.8                         | 5.3                            | 7.5                         | 0.3/0.233                    | 230/1/66               | Fed from condenser       | 45                |                              | 290*1050*238    |        |       |
| 02-023/DXI/4   | 02-023  | LS Moat/DXO/004  | Wall Mounted  | 7.8                         | 5.3                            | 7.5                         | 0.3/0.233                    | 230/1/66               | Fed from condenser       | 45                |                              | 290*1050*238    |        |       |
| GF-041a/DXI/1  | GF-041a | CB Deck/DXO/001  | Wall Mounted  | 4.9                         | 3.7                            | 5.8                         | 0.267/0.225                  | 230/1/50               | Fed from condenser       | 45                |                              | 620*1150*200    |        |       |
| GF-041a/DXI/1  | GF-041a | CB Deck/DXO/002  | Floor Mounted | 4.9                         | 3.7                            | 5.8                         | 0.267/0.225                  | 230/1/67               | Fed from condenser       | 45                | Ducted connection on the top | 620*1150*200    |        |       |
| GF-008b/DXI/1  | GF-008b | AS Moat/DXO/003  | Floor Mounted | 3.42                        | 2.56                           | 4.0                         | 0.21/0.107                   | 230/1/68               | Fed from condenser       | 45                | Ducted connection on the top | 294*811*272     |        |       |
| GF-009/DXI/1   | GF-009  | AS Moat/DXO/001  | Wall Mounted  | 5.86                        | 4.11                           | 7.0                         | 0.266/0.225                  | 230/1/69               | Fed from condenser       | 45                |                              | 620*1150*200    |        |       |
| GF-010/DXI/1   | GF-010  | AS Moat/DXO/002  | Wall Mounted  | 4.89                        | 3.66                           | 5.8                         | 0.267/0.225                  | 230/1/70               | Fed from condenser       | 45                |                              | 620*1150*200    |        |       |
| GF-010/DXI/2   | GF-010  | AS Moat/DXO/002  | Wall Mounted  | 4.89                        | 3.66                           | 5.8                         | 0.267/0.225                  | 230/1/70               | Fed from condenser       | 45                |                              | 620*1150*200    |        |       |
| LG-042/DXI/1   | LG-042  | LS Moat/DXO/007  | Wall Mounted  | 7.76                        | 5.32                           | 7.5                         | 0.3/0.233                    | 230/1/71               | Fed from condenser       | 45                |                              | 290*1050*238    |        |       |
| LG-042/DXI/2   | LG-042  | LS Moat/DXO/008  | Wall Mounted  | 7.76                        | 5.32                           | 7.5                         | 0.3/0.233                    | 230/1/72               | Fed from condenser       | 45                |                              | 290*1050*238    |        |       |
| 01-028b/DXI/1  | 01-028b | LS Moat/DXO/010  | Wall Mounted  | 3.42                        | 2.56                           | 4.0                         | 0.21/0.107                   | 230/1/74               | Fed from condenser       | 45                |                              | 294*811*272     |        |       |
| 01-C01h/DXI/1  | 01-C01h | 07-S16/DXO/001   | Wall Mounted  | 7.76                        | 5.32                           | 7.5                         | 0.3/0.233                    | 230/1/81               | Fed from condenser       | 45                |                              | 290*1050*238    |        |       |

Notes

This datasheet should be read in conjunction with all other datasheets, drawings and documentation.

Refer to Mechanical Particular specification for the design criteria.

All units to be complete with anti vibration mounts as necessary to comply with the vibration and acoustic specifications.

The units shall be suited to the external environment and mounted on a steel frame to protect anti vibration mounts.

|                                                  |                       |         |                    |       |                            |
|--------------------------------------------------|-----------------------|---------|--------------------|-------|----------------------------|
| <div>ARUP</div> <div>OUR TOWN HALL PROJECT</div> |                       | Job No. |                    | Rev.  |                            |
|                                                  |                       | 256650  | Work Stage 4 Issue | P04   |                            |
|                                                  |                       |         |                    |       |                            |
| Job Title                                        | Our Town Hall Project |         | Doc. Ref.          |       | OTH-ARU-TH-ZZ-SPE-B-0011   |
| Schedule                                         | DX Units              |         | Made by            | SC/CH | Date 07/10/2019 Chd. JC/CH |

| Reference       | Serving | Location              | Total Cooling Capacity (kW) | Sensible Cooling Capacity (kW) | Total Heating Capcacity (kW) | Fuse Rating (A) | Sound Pressure dB(A) | Dimensions W×H×D (mm) |
|-----------------|---------|-----------------------|-----------------------------|--------------------------------|------------------------------|-----------------|----------------------|-----------------------|
| PS Moat/DXO/001 | GF-027c | Refer to the drawings | 3.32                        | 2.26                           | 4                            | 16              | 48/-                 | 820*1050*480          |
| CB Deck/DXO/001 | GF-041a | Refer to the drawings | 4.89                        | 3.66                           | 5.8                          | 16              | 47/44                | 1430*940*320          |
| 05-C01/DXO/001  | 01-030  | Refer to the drawings | 7.76                        | 5.32                           | 7.5                          | 20              | 46/42                | 990*940*320           |
| LS Moat/DXO/001 | 02-023  | Refer to the drawings | 7.76                        | 5.32                           | 7.5                          | 16              | 51/44                | 1430*940*320          |
| LS Moat/DXO/002 | 02-023  | Refer to the drawings | 7.76                        | 5.32                           | 7.5                          | 16              | 51/44                | 1430*940*320          |
| LS Moat/DXO/003 | 02-023  | Refer to the drawings | 7.76                        | 5.32                           | 7.5                          | 16              | 51/44                | 1430*940*320          |
| LS Moat/DXO/004 | 02-023  | Refer to the drawings | 7.76                        | 5.32                           | 7.5                          | 16              | 51/44                | 1430*940*320          |
| CB Deck/DXO/002 | GF-041a | Refer to the drawings | 4.89                        | 3.66                           | 5.8                          | 16              | 47/44                | 1430*940*320          |
| AS Moat/DXO/003 | GF-008b | Refer to the drawings | 3.42                        | 2.56                           | 4                            | 16              | 48/-                 | 820*1050*480          |
| AS Moat/DXO/01  | GF-009  | Refer to the drawings | 5.86                        | 4.11                           | 7                            | 16              | 50/-                 | 820*1050*480          |
| AS Moat/DXO/002 | GF-010  | Refer to the drawings | 4.89                        | 3.66                           | 5.8                          | 16              | 47/44                | 1430*940*320          |
| LS Moat/DXO/007 | LG-042  | Refer to the drawings | 7.76                        | 5.32                           | 7.5                          | 20              | 46/42                | 990*940*320           |
| LS Moat/DXO/008 | LG-042  | Refer to the drawings | 7.76                        | 5.32                           | 7.5                          | 20              | 46/42                | 990*940*320           |
| LS Moat/DXO/010 | 01-028b | Refer to the drawings | 3.42                        | 2.56                           | 4                            | 16              | 48/-                 | 820*1050*480          |
| 07-S16/DXO/001  | 01-C01h | Refer to the drawings | 7.76                        | 5.32                           | 7.5                          | 20              | 46/42                | 990*940*320           |
| 05-C01/DXO/001  | AHU-05  | Refer to the drawings | 7.76                        | 5.32                           | 7.5                          | 16              | 51/44                | 1430*940*320          |

|                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------|
| Notes                                                                                                                      |
| This datasheet should be read in conjunction with all other datasheets, drawings and documentation.                        |
| Refer to Mechanical Particular specification for the design criteria.                                                      |
| All units to be complete with anti vibration mounts as necessary to comply with the vibration and acoustic specifications. |
| The units shall be suited to the external environment and mounted on a steel frame to protect anti vibration mounts.       |

|                                                             |                       |         |                    |           |                          |
|-------------------------------------------------------------|-----------------------|---------|--------------------|-----------|--------------------------|
| <div>ARUP</div> <div>OUR TOWN HALL</div> <div>PROJECT</div> |                       | Job No. |                    | Rev.      |                          |
|                                                             |                       | 256650  | Work Stage 4 Issue | P04       |                          |
| Job Title                                                   | Our Town Hall Project |         |                    | Doc. Ref. | OTH-ARU-TH-ZZ-SPE-B-0011 |
| Schedule                                                    | Air Cooled Chiller    |         |                    | Made by   | SC/CH                    |
|                                                             |                       | Date    | 07/10/2019         | Chd.      | JC/CH                    |

| General            |  |                               |
|--------------------|--|-------------------------------|
| Unit Reference(s)  |  | ACC/01                        |
| Location           |  | Central Block Roof Plant Deck |
| Quantity           |  | 1                             |
| System Description |  | Air Cooled Chiller            |

| Performance Data                                |      |                                                                                       |
|-------------------------------------------------|------|---------------------------------------------------------------------------------------|
| Chiller Type & Configuration                    |      | Air cooled, low noise, dual refrigerant circuit chiller is complete with EC plug fans |
| Required Capacity                               | kW   | 170                                                                                   |
| Minimum Energy Efficiency Ratio (EER)           |      | 3                                                                                     |
| Minimum Seasonal Energy Efficiency Ratio (SEER) |      | 4.50                                                                                  |
| Refrigerant                                     |      | R32                                                                                   |
| Leaving Fluid Temperature                       | °C   | 6                                                                                     |
| Entering Fluid Temperature                      | °C   | 12                                                                                    |
| Fluid Flow Rate                                 | kg/s | 6.70                                                                                  |
| Fluid Pressure Drop Through Evaporator          | kPa  | 20.00                                                                                 |
| Antifreeze Type and Concentration               | %    | 0.00                                                                                  |
| External Ambient Summer Temperature             |      | 35°C db and 22°C wb                                                                   |
| Integrated Hydronic Module Required             |      | No                                                                                    |
| Required External Static Pressure               | KPa  |                                                                                       |

| Electrical Data          |        |          |
|--------------------------|--------|----------|
| Maximum Running Current  | A      | 106      |
| Maximum Starting Current | A      | 242      |
| Supply Details           | V/ø/Hz | 400/3/50 |

| Noise Data (Sound Power Level) |     |    |
|--------------------------------|-----|----|
| A-weighted sound power         | dBA | 80 |

| Physical Data                |      |                |
|------------------------------|------|----------------|
| Unit Length / Width / Height | mm   | 2554/2200/2672 |
| Unit Weight                  | Kg   | 1842           |
| Unit Connection sizes        | Ø mm | 80             |

|                                                             |  |                       |                    |                          |            |
|-------------------------------------------------------------|--|-----------------------|--------------------|--------------------------|------------|
| <div>ARUP</div> <div>OUR TOWN HALL</div> <div>PROJECT</div> |  | Job No.               |                    | Rev.                     |            |
|                                                             |  | 256650                | Work Stage 4 Issue | P04                      |            |
| Job Title                                                   |  | Our Town Hall Project |                    | Doc. Ref.                |            |
| Schedule                                                    |  | Air Cooled Chiller    |                    | OTH-ARU-TH-ZZ-SPE-B-0011 |            |
|                                                             |  | Made by               | SC/CH              | Date                     | 07/10/2019 |
|                                                             |  | Chd.                  | JC/CH              |                          |            |

| Controls & BMS                       |      |     |
|--------------------------------------|------|-----|
| Unit Enable / Disable                |      | Yes |
| Unit Status / Failure                |      | Yes |
| Compressor run VFC                   | Each | Yes |
| Compressor fault VFC                 | Each | Yes |
| Hours run                            |      | Yes |
| Low pressure trip VFC                |      | Yes |
| High pressure trip VFC               |      | Yes |
| % Loading                            |      | Yes |
| Instantenous power                   |      | Yes |
| Total power                          |      | Yes |
| Flow temperature                     |      | Yes |
| Return temperature                   |      | Yes |
| Flow & Return Set-point Control      |      | Yes |
| Packaged chiller controller          |      | Yes |
|                                      |      |     |
| Accessories & Additional Information |      |     |

This datasheet should be read in conjunction with all other datasheets, drawings and documentation.

Refer to Mechanical Particular specification for the design criteria.

All units to be complete with anti vibration mounts as necessary to comply with the vibration and acoustic specifications.

Chiller selection based on Airedale. Alternative selections shall be equal and approved.

The unit selection shall comply with the acoustic specifications.

The Chillers shall be suited to the external environment and mounted on a steel frame to protect anti vibration mounts.

Field power connection, control interlock terminals, and unit control system should be centrally located in an electric panel (IP64). Power and starting controls should be separate from safety and operating controls in different compartments of the same panel weatherproof isolator.

Control Panel shall incorporate Microprocessor Controls and necessary interface for integration into the BMS System for remote monitoring, and to manage and display a minimum of the following on/off, setpoint of water temperatures, capacity control, alarm codes, operational status and failure.

Compressor shall each include Bipolar Electric Motor with Star Delta starting, solenoid valves for capacity control, electronic protection against high temperature with centralised manual reset, oil separator, oil level indication and sight glass, mechanical operating time counter.

Condenser Fans shall be selected to achieve low noise level and maximum efficiency with option available for dividing operation into cycles. Falls shall have integral inverter control and shall come c/w top and bottom fan guards.

The Construction of the Chiller shall consist of anti-corrosion steel profiles, painted with epoxy paint. External panels shall be made of Stainless Steel with Acrylic painting.

The unit shall have refrigerant circuits completely independent of each other with one compressor per circuit.

The Refrigeration circuits shall each be provided with integral strainer, drier, steel bodied electronic expansion valve, bellows sealed stop valve, sight glass, gas line check valve, gas line safety valve, compressor high and low pressure switches, compressor safety valve, dual safety valve and protection control.

The Chiller to be complete with a water flow switch.

The Chillers shall be connected strictly in accordance with the manufacturer’s recommendations and include propriety flexible connections, air purge plug & drain valve.

A final acoustic performance / environmental noise report shall be provided on completion of the Chiller installation and commissioning period.

All chillers shall be provided to meet ErP directive requirements for comfort cooling chillers.

|                                                             |                       |         |  |                                    |                            |
|-------------------------------------------------------------|-----------------------|---------|--|------------------------------------|----------------------------|
| <div>ARUP</div> <div>OUR TOWN HALL</div> <div>PROJECT</div> |                       | Job No. |  | Rev.                               |                            |
|                                                             |                       | 256650  |  | Work Stage 4 Issue                 | P04                        |
|                                                             |                       |         |  |                                    |                            |
| Job Title                                                   | Our Town Hall Project |         |  | Doc. Ref. OTH-ARU-TH-ZZ-SPE-B-0011 |                            |
| Schedule                                                    | CHW Pumps             |         |  | Made by SC/CH                      | Date 07/10/2019 Chd. JC/CH |

| General            |  |                        |                        |
|--------------------|--|------------------------|------------------------|
| Unit Reference(s)  |  | CHW/P/01-02            | CHW/P/03-04            |
| Location           |  | Level 4 CHW Plant Room | Level 4 CHW Plant Room |
| Quantity           |  | 2                      | 2                      |
| System Description |  | CHW Primary Pumps      | CHW Secondary Pumps    |

| Performance Data                            |      |                                              |                                              |
|---------------------------------------------|------|----------------------------------------------|----------------------------------------------|
| Pump Type                                   |      | Single-stage, centrifugal, in-line           | Single-stage, centrifugal, in-line           |
| Pump Configuration                          |      | Single-head                                  | Single-head                                  |
| Capacity Control                            |      | Integral frequency inverter c/w integrated F | Integral frequency inverter c/w integrated F |
| Flow Rate                                   | kg/s | 6.7                                          | 6.1                                          |
| Required Static Pressure @ Design Flow Rate | kPa  | 150                                          | 250                                          |
| System Cooling Flow & Return Temperatures   | °C   | 6/12                                         | 6/12                                         |

| Electrical Data        |        |          |          |
|------------------------|--------|----------|----------|
| Maximum Absorbed Power | kW     | 1.4      | 2.12     |
| Motor Size             | kW     | 2.2      | 3        |
| Supply Details         | V/ø/Hz | 415/3/50 | 415/3/50 |

| Physical Data                       |    |                         |                         |
|-------------------------------------|----|-------------------------|-------------------------|
| Unit Length / Width / Height        | mm | 300/461/300             | 300/461/300             |
| Unit Weight                         | Kg | 43.5                    | 43.5                    |
| Pipe Connection Size (Inlet/Outlet) | mm | 40/40                   | 40/40                   |
| Housing & Impeller Construction     |    | Manufacturer to confirm | Manufacturer to confirm |

| Controls & BMS                           |  |     |
|------------------------------------------|--|-----|
| Unit Enable / Disable                    |  | Yes |
| Unit Status / Failure                    |  | Yes |
| Set-Point Control                        |  | Yes |
| Speed feedback                           |  | Yes |
| Frequency (Hz)                           |  | Yes |
| Instantaneous Power Consumption (kW)     |  | Yes |
| Total Power Consumption (kW)             |  | Yes |
| Overload Trip                            |  | Yes |
| Manual Override Active (Local Operation) |  | Yes |

Accessories & Additional Information

This datasheet should be read in conjunction with all other datasheets, drawings and documentation.

Refer to Mechanical Particular specification for the design criteria.

Pump selection based on Armstrong. Alternative selections shall be equal and approved.

The pump shall be supplied, installed and commissioned in strict accordance with the manufacturers recommendations and the Contract Specification.

Pumps shall be self-balancing type. If not possible, where floor mounted, pumps shall be provided with suitable anti-vibration mountings on a steel frame.

Breakout noise levels from the pumps shall be such that they do not exceed the required NR levels for the plantroom and adjacent spaces.

Pumps to be provided with integral inverter drives, which shall incorporate integrated overload and temperature protection. A control panel shall allow the setting of the required set point and the MIN & MAX operating range.

|                                                             |                                         |         |  |                                    |                            |
|-------------------------------------------------------------|-----------------------------------------|---------|--|------------------------------------|----------------------------|
| <div>ARUP</div> <div>OUR TOWN HALL</div> <div>PROJECT</div> |                                         | Job No. |  | Rev.                               |                            |
|                                                             |                                         | 256650  |  | Work Stage 4 Issue                 | P04                        |
|                                                             |                                         |         |  |                                    |                            |
| Job Title                                                   | Our Town Hall Project                   |         |  | Doc. Ref. OTH-ARU-TH-ZZ-SPE-B-0011 |                            |
| Schedule                                                    | Pressurisation Units & Expansion Vessel |         |  | Made by SC/CH                      | Date 07/10/2019 Chd. JC/CH |

| General            |  |                        |  |
|--------------------|--|------------------------|--|
| Unit Reference(s)  |  | CHW-PU-01              |  |
| Location           |  | Level 4 CHW Plant Room |  |
| Quantity           |  | 1                      |  |
| System Description |  | Chilled Water System   |  |

| Performance Data                         |        |                                                                                                                                                     |
|------------------------------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| System Configuration                     |        | Packaged microprocessor controlled fixed gas pressurisation unit and system vacuum degasser, comprising pumps, control panel and backflow preventer |
| Pump Configuration                       |        | Twin                                                                                                                                                |
| Cooling Sytem Flow & Return Temperatures | °C     | 6/12                                                                                                                                                |
| Estimated System Water Content           | Litres | 1,530                                                                                                                                               |
| Expansion Vessel Size                    | Litres | 150                                                                                                                                                 |
| Manufacturers Maximum Acceptance Factor  |        | 0.45                                                                                                                                                |
| Static Height above Vessel               | m      | 5                                                                                                                                                   |
| Final System Design Pressure             | Bar    | 4.5                                                                                                                                                 |
| Safety Valve Opening Pressure            | Bar    | 5.0                                                                                                                                                 |
| High Pressure Alarm/Reset                | Bar    | 4.7                                                                                                                                                 |
| Low Pressure Alarm/Reset                 | Bar    | 1.0                                                                                                                                                 |

| Electrical Data        |  |        |          |  |  |
|------------------------|--|--------|----------|--|--|
| Maximum Absorbed Power |  | kW     | 0.800    |  |  |
| Supply Details         |  | V/ø/Hz | 230/1/50 |  |  |

| Physical Data                |    |              |
|------------------------------|----|--------------|
| Unit Length / Width / Height | mm | 673/360/1020 |
| Unit Weight                  | Kg | 64           |
| CWS Pipe Connection Size     |    | G3/4"        |
| System Connections (F&R)     |    | G3/4"        |

| Controls & BMS   |  |                                                                 |  |  |  |
|------------------|--|-----------------------------------------------------------------|--|--|--|
| Common Fault     |  | Yes - (LP, HP, Water Low, System Leak, Pump 1&2 Fault, Service) |  |  |  |
| System Interlock |  | Yes                                                             |  |  |  |

Accessories & Additional Information

This datasheet should be read in conjunction with all other datasheets, drawings and documentation.

Refer to Mechanical Particular specification for the design criteria.

Combined pressurisation and vacuum degasser unit selection based on Spirotech. Alternative selections shall be equal and approved.

The unit shall be supplied, installed and commissioned in strict accordance with the manufacturers recommendations and the Contract Specification

Breakout noise levels from the unit shall be such that they do not exceed the required NR levels for the plantroom and adjacent spaces.

Separate high and low pressure switches shall be provided by the manufacturer to be installed by the mechanical services sub-contractor, and hard-wired interlock with the appropriate system plant by the BMS/controls specialist.

Control of the unit shall be via a pressure transducer to maintain the system pressure at the set-point level. All conditions of the unit, fault conditions and user adjustment shall be displayed/controlled via unit mounted control panel and LCD display .

Expansion vessel(s) to be provided as part of package. Manufacturer to recalculate vessel size based on final system water content.

|                                                             |  |                       |  |                          |  |
|-------------------------------------------------------------|--|-----------------------|--|--------------------------|--|
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|                                                             |  | 256650                |  | Work Stage 4 Issue       |  |
|                                                             |  |                       |  | P04                      |  |
| Job Title                                                   |  | Our Town Hall Project |  | Doc. Ref.                |  |
| Schedule                                                    |  | Buffer Vessel         |  | OTH-ARU-TH-ZZ-SPE-B-0011 |  |
|                                                             |  | Made by               |  | Date                     |  |
|                                                             |  | SC/CH                 |  | 07/10/2019               |  |
|                                                             |  | Chd.                  |  | JC/CH                    |  |

| General            |  |                        |  |  |  |
|--------------------|--|------------------------|--|--|--|
| Unit Reference(s)  |  | BFR-01                 |  |  |  |
| Location           |  | Level 4 CHW Plant Room |  |  |  |
| Quantity           |  | 1                      |  |  |  |
| System Description |  | Chilled Water System   |  |  |  |

| Performance Data                  |  |     |        |  |  |
|-----------------------------------|--|-----|--------|--|--|
| Maximum System Operating Pressure |  | Bar | 10 Bar |  |  |
| Temperatures Entering Leaving     |  | °C  | 5/12   |  |  |

6/12

| Physical Data                       |  |        |          |  |  |
|-------------------------------------|--|--------|----------|--|--|
| Unit Dia / Height                   |  | mm     | 600/1805 |  |  |
| Unit Weight (Dry)                   |  | Kg     | 120      |  |  |
| Capacity                            |  | Litres | 425      |  |  |
| Flow & Return Connection Sizes (x4) |  | mm     | 80       |  |  |
| Drain Connection Size               |  | mm     | 25       |  |  |

| Accessories & Additional Information                                                                                                                                                           |  |  |  |  |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|
| This datasheet should be read in conjunction with all other datasheets, drawings and documentation.                                                                                            |  |  |  |  |  |
| Refer to Mechanical Particular specification for the design criteria.                                                                                                                          |  |  |  |  |  |
| Buffer Vessel selection based on HRS. Alternative selections shall be equal and approved.                                                                                                      |  |  |  |  |  |
| The buffer vessel shall be supplied, installed and commissioned in strict accordance with the manufacturers recommendations.                                                                   |  |  |  |  |  |
| Vessel selection is based on vertical models.                                                                                                                                                  |  |  |  |  |  |
| Vertical vessels shall be mounted on fabricated steel frame or a skirt with base plates, welded to the shell to manufacturer's details.                                                        |  |  |  |  |  |
| Flanged or screwed connections shall be provided for; Inlet and outlet pipes, thermometer, pressure gauge, contents gauge, safety valve mounting, drain connection with valve and access hole. |  |  |  |  |  |
| Buffer vessels shall be provided with insulation, the performance of which shall comply with BS 5422.                                                                                          |  |  |  |  |  |

|                 |                                             |         |  |                    |                                                |
|-----------------|---------------------------------------------|---------|--|--------------------|------------------------------------------------|
| <div>ARUP</div> | <div>OUR TOWN HALL</div> <div>PROJECT</div> | Job No. |  | Rev.               |                                                |
|                 |                                             | 256650  |  | Work Stage 4 Issue | P04                                            |
|                 |                                             |         |  |                    |                                                |
| Job Title       | Our Town Hall Project                       |         |  |                    | Doc. Ref. OTH-ARU-TH-ZZ-SPE-B-0011             |
| Schedule        | CHW Water Treatment Unit                    |         |  |                    | Made by SC/CH    Date 07/10/2019    Chd. JC/CH |

| Performance Data              |        | AD/LG/01                                                                  |  |
|-------------------------------|--------|---------------------------------------------------------------------------|--|
| System                        |        | CHW                                                                       |  |
| Location                      |        | Rooftop Heating Plantroom                                                 |  |
| Description                   |        | ENWA Matic. Combined Filtration, Automated Dosing, Dirt and Air Separator |  |
| Flow/Return Temperature       | (°C)   | 6/12                                                                      |  |
| System Flow Rate              | (kg/s) | 6.1                                                                       |  |
| Estimated System Volume       | (l)    | 1530                                                                      |  |
| System Pressure for selection | (bar)  | 10                                                                        |  |

| Connection Sizes                        |      |                                      |
|-----------------------------------------|------|--------------------------------------|
| Intel/Outlet Size Ø                     | (mm) | 22                                   |
| Main Cols Water/Drain Connection Size Ø | (mm) | 22                                   |
| Connection description to main systems  |      | Connected with pump from & to header |
| Pumps                                   |      | Integral to unit                     |

| Dimensional Data |    |          |
|------------------|----|----------|
| Overall Width    | mm | 597      |
| Overall Depth    | mm | 477      |
| Overall Height   | mm | 1440.000 |
| Overall Weight   | kg | 60       |

| Controls & BMS        |     |  |
|-----------------------|-----|--|
| Unit Enable / Disable | Yes |  |
| Unit Status / Failure | Yes |  |
| Auto restart          | Yes |  |

Accessories & Additional Information

This datasheet should be read in conjunction with all other datasheets, drawings and documentation.

Refer to Mechanical Particular specification for the design criteria.

Side stream filtration unit selection based on ENWA. Alternative selections shall be equal and approved.

The drain valve shall be fitted at the base for dirt removal while the system remains operational.

Units to be with integral controlled and volt free contact provided by the Contractor.

The automatic air release system shall have a solid polypropylene float and tamper proof air release valve.





|           |  |                       |  |                   |  |                          |      |             |            |
|-----------|--|-----------------------|--|-------------------|--|--------------------------|------|-------------|------------|
| ARUP      |  | OUR TOWN HALL PROJECT |  | Job No.<br>256650 |  | Work Stage 4 Issue       |      | Rev.<br>P04 |            |
|           |  |                       |  |                   |  |                          |      |             |            |
| Job Title |  | Our Town Hall Project |  | Doc. Ref.         |  | OTH-ARU-TH-ZZ-SCH-B-0011 |      |             |            |
| Schedule  |  | LTHW Pumps            |  | Made by           |  | SC/CH                    | Date | 07/10/2019  | Chd. JC/CH |

| General                                                                                                                                                                                                                          |        |                                                          |                                                          |                                                          |                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------|
| Unit Reference(s)                                                                                                                                                                                                                |        | LG-001/PUP/001<br>LG-001/PUP/003<br>LG-001/PUP/005       | LG-001/PUP/008<br>LG-001/PUP/009                         | LG-001/PUP/010<br>LG-001/PUP/011                         | LG-001/PUP/002,<br>LG-001/PUP/004,<br>LG-001/PUP/006,<br>LG-001/PUP/007 |
| Location                                                                                                                                                                                                                         |        | Lower Ground LTHW Plant Room                             | Lower Ground LTHW Plant Room                             | Lower Ground LTHW Plant Room                             | Lower Ground LTHW Plant Room                                            |
| Quantity                                                                                                                                                                                                                         |        | 3                                                        | 2                                                        | 2                                                        | 4                                                                       |
| System Description                                                                                                                                                                                                               |        | LTHW Primary Pumps                                       | Secondary LTHW CT flow (AHUs)                            | Secondary LTHW VT flow (RADs)                            | Secondary LTHW flow (DHWs)                                              |
| Performance Data                                                                                                                                                                                                                 |        |                                                          |                                                          |                                                          |                                                                         |
| Pump Type                                                                                                                                                                                                                        |        | Single-stage, centrifugal, in-line                       | Single-stage, centrifugal, in-line                       | Single-stage, centrifugal, in-line                       | Single-stage, centrifugal, in-line                                      |
| Pump Configuration                                                                                                                                                                                                               |        | Single-head                                              | Single-head                                              | Single-head                                              | Single-head                                                             |
| Capacity Control                                                                                                                                                                                                                 |        | Integral frequency inverter c/w integrated PI controller | Integral frequency inverter c/w integrated PI controller | Integral frequency inverter c/w integrated PI controller | Integral frequency inverter c/w integrated PI controller                |
| Flow Rate                                                                                                                                                                                                                        | kg/s   | 18.16 (sized at 50% load each)                           | 5.04                                                     | 25.6                                                     | 2.38                                                                    |
| Required Static Pressure @ Design Flow Rate                                                                                                                                                                                      | kPa    | 150                                                      | 250                                                      | 300                                                      | 200                                                                     |
| System Flow & Return Temperatures                                                                                                                                                                                                | °C     | 80/60                                                    | 80/60                                                    | 80/60                                                    | 80/60                                                                   |
| Electrical Data                                                                                                                                                                                                                  |        |                                                          |                                                          |                                                          |                                                                         |
| Maximum Absorbed Power                                                                                                                                                                                                           | kW     | 3.33                                                     | 1.94                                                     | 11.37                                                    | 1.03                                                                    |
| Motor Size                                                                                                                                                                                                                       | kW     | 4                                                        | 3                                                        | 15                                                       | 1.5                                                                     |
| Supply Details                                                                                                                                                                                                                   | V/ø/Hz | 400/3/50                                                 | 400/3/50                                                 | 400/3/50                                                 | 400/3/50                                                                |
| Physical Data                                                                                                                                                                                                                    |        |                                                          |                                                          |                                                          |                                                                         |
| Unit Length / Width / Height                                                                                                                                                                                                     | mm     | 442/314/590                                              | 299/301/552                                              | 559/553/1092                                             | 362/407/691                                                             |
| Unit Weight                                                                                                                                                                                                                      | Kg     | 30.69                                                    | 43.5                                                     | 246.3                                                    | 135.6                                                                   |
| Pipe Connection Size (Inlet/Outlet)                                                                                                                                                                                              | mm     | 80/80                                                    | 40/40                                                    | 80/80                                                    | 40/40                                                                   |
| Housing & Impeller Construction                                                                                                                                                                                                  |        | Manufacturer to confirm                                  | Manufacturer to confirm                                  | Manufacturer to confirm                                  | Manufacturer to confirm                                                 |
| Controls & BMS                                                                                                                                                                                                                   |        |                                                          |                                                          |                                                          |                                                                         |
| Unit Enable / Disable                                                                                                                                                                                                            |        |                                                          |                                                          | Yes                                                      |                                                                         |
| Unit Status / Failure                                                                                                                                                                                                            |        |                                                          |                                                          | Yes                                                      |                                                                         |
| Set-Point Control                                                                                                                                                                                                                |        |                                                          |                                                          | Yes                                                      |                                                                         |
| Speed feedback                                                                                                                                                                                                                   |        |                                                          |                                                          | Yes                                                      |                                                                         |
| Frequency (Hz)                                                                                                                                                                                                                   |        |                                                          |                                                          | Yes                                                      |                                                                         |
| Instantaneous Power Consumption (kW)                                                                                                                                                                                             |        |                                                          |                                                          | Yes                                                      |                                                                         |
| Total Power Consumption (kW)                                                                                                                                                                                                     |        |                                                          |                                                          | Yes                                                      |                                                                         |
| Overload Trip                                                                                                                                                                                                                    |        |                                                          |                                                          | Yes                                                      |                                                                         |
| Manual Override Active (Local Operation)                                                                                                                                                                                         |        |                                                          |                                                          | Yes                                                      |                                                                         |
| Accessories & Additional Information                                                                                                                                                                                             |        |                                                          |                                                          |                                                          |                                                                         |
| This datasheet should be read in conjunction with all other datasheets, drawings and documentation.                                                                                                                              |        |                                                          |                                                          |                                                          |                                                                         |
| Refer to Mechanical Particular specification for the design criteria.                                                                                                                                                            |        |                                                          |                                                          |                                                          |                                                                         |
| Pump selections based on Armstrong. Alternative selections shall be equal and approved.                                                                                                                                          |        |                                                          |                                                          |                                                          |                                                                         |
| The pump shall be supplied, installed and commissioned in strict accordance with the manufacturers recommendations and the Contract Specification.                                                                               |        |                                                          |                                                          |                                                          |                                                                         |
| Pumps shall be self-balancing type. If not possible, where floor mounted, pumps shall be provided with suitable anti-vibration mountings on a steel frame.                                                                       |        |                                                          |                                                          |                                                          |                                                                         |
| Breakout noise levels from the pumps shall be such that they do not exceed the required NR levels for the plantroom and adjacent spaces.                                                                                         |        |                                                          |                                                          |                                                          |                                                                         |
| Pumps to be provided with integral inverter drives, which shall incorporate integrated overload and temperature protection. A control panel shall allow the setting of the required set point and the MIN & MAX operating range. |        |                                                          |                                                          |                                                          |                                                                         |

|                                                             |                                         |         |  |                                    |                            |
|-------------------------------------------------------------|-----------------------------------------|---------|--|------------------------------------|----------------------------|
| <div>ARUP</div> <div>OUR TOWN HALL</div> <div>PROJECT</div> |                                         | Job No. |  | Rev.                               |                            |
|                                                             |                                         | 256650  |  | Work Stage 4 Issue                 | P04                        |
|                                                             |                                         |         |  |                                    |                            |
| Job Title                                                   | Our Town Hall Project                   |         |  | Doc. Ref. OTH-ARU-TH-ZZ-SCH-B-0011 |                            |
| Schedule                                                    | Pressurisation Units & Expansion Vessel |         |  | Made by SC/CH                      | Date 07/10/2019 Chd. JC/CH |

| General            |  |                              |
|--------------------|--|------------------------------|
| Unit Reference(s)  |  | LG-001/PRU/001               |
| Location           |  | Lower Ground LTHW Plant Room |
| Quantity           |  | 1                            |
| System Description |  | LTHW System                  |

| Performance Data                         |        |                                                                                                                                                     |
|------------------------------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| System Configuration                     |        | Packaged microprocessor controlled fixed gas pressurisation unit and system vacuum degasser, comprising pumps, control panel and backflow preventer |
| Pump Configuration                       |        | Twin                                                                                                                                                |
| Cooling Sytem Flow & Return Temperatures | °C     | 80/60                                                                                                                                               |
| Estimated System Water Content           | Litres | 36,000                                                                                                                                              |
| Expansion Vessel Size                    | Litres | 4 x 1500<br>(Ref: LG-040-VES-001, LG-040-VES-002, LG-040-VES-003, LG-040-VES-004)                                                                   |
| Manufacturers Maximum Acceptance Factor  |        | 0.45                                                                                                                                                |
| Static Height above Vessel               | m      | 35                                                                                                                                                  |
| Final System Design Pressure             | Bar    | 4.5                                                                                                                                                 |
| Safety Valve Opening Pressure            | Bar    | 6.7                                                                                                                                                 |
| High Pressure Alarm/Reset                | Bar    | 6.4                                                                                                                                                 |
| Low Pressure Alarm/Reset                 | Bar    | 1.0                                                                                                                                                 |

| Electrical Data        |        |          |
|------------------------|--------|----------|
| Maximum Absorbed Power | kW     | 0.800    |
| Supply Details         | V/ø/Hz | 230/1/50 |

| Physical Data                |    |              |
|------------------------------|----|--------------|
| Unit Length / Width / Height | mm | 673/360/1020 |
| Unit Dry Weight              | Kg | 64           |
| CWS Pipe Connection Size     |    | G3/4"        |
| System Connections (F&R)     |    | G3/4"        |

| Controls & BMS   |  |                                                                 |
|------------------|--|-----------------------------------------------------------------|
| Common Fault     |  | Yes - (LP, HP, Water Low, System Leak, Pump 1&2 Fault, Service) |
| System Interlock |  | Yes                                                             |

Accessories & Additional Information

This datasheet should be read in conjunction with all other datasheets, drawings and documentation.

Refer to Mechanical Particular specification for the design criteria.

Combined pressurisation and vacuum degasser unit selection based on Spirotech. Alternative selections shall be equal and approved.

The unit shall be supplied, installed and commissioned in strict accordance with the manufacturers recommendations and the Contract Specification

Breakout noise levels from the unit shall be such that they do not exceed the required NR levels for the plantroom and adjacent spaces.

Separate high and low pressure switches shall be provided by the manufacturer to be installed by the mechanical services sub-contractor, and hard-wired interlock with the appropriate system plant by the BMS/controls specialist.

Control of the unit shall be via a pressure transducer to maintain the system pressure at the set-point level. All conditions of the unit, fault conditions and user adjustment shall be displayed/controlled via unit mounted control panel and LCD display .

Expansion vessel(s) to be provided as part of package. Manufacturer to recalculate vessel size based on final system water content.

|           |                           |               |  |           |                          |      |            |      |    |
|-----------|---------------------------|---------------|--|-----------|--------------------------|------|------------|------|----|
| ARUP      |                           | OUR TOWN HALL |  | Job No.   |                          | Rev. |            |      |    |
|           |                           |               |  | 256650    | Work Stage 4 Issue       | P04  |            |      |    |
|           |                           |               |  | PROJECT   |                          |      |            |      |    |
| Job Title | Our Town Hall Project     |               |  | Doc. Ref. | OTH-ARU-TH-ZZ-SCH-B-0011 |      |            |      |    |
| Schedule  | LTHW Water Treatment Unit |               |  | Made by   | CH                       | Date | 07/10/2019 | Chd. | CH |

| Performance Data              |        |                                                                           |
|-------------------------------|--------|---------------------------------------------------------------------------|
| Unit Reference(s)             |        | LG-001/FLT/001                                                            |
| System                        |        | LTHW                                                                      |
| Location                      |        | Lower Ground Heating Plantroom                                            |
| Description                   |        | ENWA Matic. Combined Filtration, Automated Dosing, Dirt and Air Separator |
| Flow/Return Temperature       | (°C)   | 80/60                                                                     |
| System Flow Rate              | (kg/s) | 35.78                                                                     |
| Estimated System Volume       | (l)    | 36000                                                                     |
| System Pressure for selection | (bar)  | 10                                                                        |

| Connection Sizes                        |      |                                      |
|-----------------------------------------|------|--------------------------------------|
| Intel/Outlet Size Ø                     | (mm) | 25                                   |
| Main Cols Water/Drain Connection Size Ø | (mm) | 25                                   |
| Connection description to main systems  |      | Connected with pump from & to header |
| Pumps                                   |      | Integral to unit                     |

| Dimensional Data   |    |      |
|--------------------|----|------|
| Overall Width      | mm | 697  |
| Overall Depth      | mm | 577  |
| Overall Height     | mm | 2054 |
| Overall Dry Weight | kg | 79   |

| Controls & BMS        |     |  |
|-----------------------|-----|--|
| Unit Enable / Disable | Yes |  |
| Unit Status / Failure | Yes |  |
| Auto restart          | Yes |  |

| Accessories & Additional Information                                                                        |
|-------------------------------------------------------------------------------------------------------------|
| This datasheet should be read in conjunction with all other datasheets, drawings and documentation.         |
| Refer to Mechanical Particular specification for the design criteria.                                       |
| Side stream filtration unit selection based on ENWA. Alternative selections shall be equal and approved.    |
| The drain valve shall be fitted at the base for dirt removal while the system remains operational.          |
| Units to be with integral controlled and volt free contact provided by the Contractor.                      |
| The automatic air release system shall have a solid polypropylene float and tamper proof air release valve. |

ARUP

OUR TOWN HALL PROJECT

Job No.  
256650

Rev.  
Work Stage 4 Issue  
P04

Job Title  
Our Town Hall Project

Doc. Ref.  
OTH-ARU-TH-ZZ-SCH-B-0011

Schedule  
Door Air Curtains

Made by  
CH

Date  
07/10/2019

Chd.  
CH

| Reference                          | Floor Level  | Location                       | Type                | Manufact Ref.    | Quantity | Heating Output (kW) | Room Temp (°C) | LTHW Flow rate (l/s) | Maximum Coil Pressure Drop (kPa) | Dimensions (mm) |        |       | Mounting Height (m) | Max Noise Level (dBA)                | Electrical Supply | max Electrical Power / Current (kW/A) |
|------------------------------------|--------------|--------------------------------|---------------------|------------------|----------|---------------------|----------------|----------------------|----------------------------------|-----------------|--------|-------|---------------------|--------------------------------------|-------------------|---------------------------------------|
|                                    |              |                                |                     |                  |          |                     |                |                      |                                  | Width           | Height | Depth |                     |                                      |                   |                                       |
| GF-C01a/DAC/001<br>GF-C01a/DAC/002 | Ground Floor | Lloyd Street Entrance Lobby    | Above Internal door | Windbox Recessed | 2        | 14.2                | 19             | 0.170                | 5                                | 1550            | 770    | 310   | 3                   | Refer to the acoustics specification | 230/1/50          | 0.64 / 2.85                           |
| GF-C01g/DAC/001<br>GF-C01g/DAC/002 | Ground Floor | Albert Square Entrance Lobby   | Above Internal door | Windbox Recessed | 2        | 14.2                | 19             | 0.170                | 5                                | 1550            | 770    | 310   | 3                   | Refer to the acoustics specification | 230/1/50          | 0.64 / 2.85                           |
| GF-C02a/DAC/001<br>GF-C02a/DAC/002 | Ground Floor | Princess Street Entrance Lobby | Above Internal door | Windbox Recessed | 2        | 14.2                | 19             | 0.170                | 5                                | 1550            | 770    | 310   | 3                   | Refer to the acoustics specification | 230/1/50          | 0.64 / 2.85                           |
| GF-C03a/DAC/001<br>GF-C03a/DAC/002 | Ground Floor | Cooper Street Entrance Lobby   | Above Internal door | Windbox Recessed | 2        | 14.2                | 19             | 0.170                | 5                                | 1550            | 770    | 310   | 3                   | Refer to the acoustics specification | 230/1/50          | 0.64 / 2.85                           |

| Accessories & Additional Information                                                                                                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------|
| This datasheet should be read in conjunction with all other datasheets, drawings and documentation.                                              |
| All door air curtains to be provided with removable filters.                                                                                     |
| Door air curtain selections based on JS Air Curtains. Alternative selections shall be equal and approved.                                        |
| LTHW flow and return temperatures are 80°C and 60°C, respectively.                                                                               |
| Dimensions of door air curtains to be selected to suit final details of entrance doors. Architect to confirm final details for concealing units. |
| Door air curtains to be tested to 10 bar pressure                                                                                                |
| Units to be provided with VFCs for enable and common fault monitoring by the BMS                                                                 |

|                                                             |  |                       |  |                                    |                                            |
|-------------------------------------------------------------|--|-----------------------|--|------------------------------------|--------------------------------------------|
| <div>ARUP</div> <div>OUR TOWN HALL</div> <div>PROJECT</div> |  | Job No.               |  | Rev.                               |                                            |
|                                                             |  | 256650                |  | Work Stage 4 Issue P04             |                                            |
|                                                             |  |                       |  |                                    |                                            |
| Job Title                                                   |  | Our Town Hall Project |  | Doc. Ref. OTH-ARU-TH-ZZ-SCH-B-0011 |                                            |
| Schedule                                                    |  | Underfloor Heating    |  | Made by                            | SC/CH      Date 07/10/2019      Chd. JC/CH |

| General Data                       |      | 01-033/UFH/001       | 01-033/UFH/002       | 01-033/UFH/003       | 01-033/UFH/004       | Notes                                                                |
|------------------------------------|------|----------------------|----------------------|----------------------|----------------------|----------------------------------------------------------------------|
| System                             |      | LTHW                 | LTHW                 | LTHW                 | LTHW                 |                                                                      |
| Quantity                           |      | 1                    | 1                    | 1                    | 1                    |                                                                      |
| Location                           |      | Great Hall Wall Void | Great Hall Wall Void | Great Hall Wall Void | Great Hall Wall Void |                                                                      |
| Serving                            |      | Great Hall           |                      |                      |                      |                                                                      |
| Performance Data for Each          |      |                      |                      |                      |                      | Notes                                                                |
| General Design Surface Temperature | °C   | ≤27                  | ≤27                  | ≤27                  | ≤27                  | To be confirmed with the architect for the existing wooden flooring. |
| Room Air Temperature               | °C   | 21.0                 | 21.0                 | 21.0                 | 21.0                 |                                                                      |
| Zone Area                          | m²   | 107                  | 107                  | 107                  | 107                  |                                                                      |
| Net Design Heating Capacity        | W/m² | 78.0                 | 78.0                 | 78.0                 | 78.0                 |                                                                      |
| Net Design Heating Capacity        | kW   | 8.300                | 8.300                | 8.300                | 8.300                |                                                                      |
| LTHW F&R Temps to Manifold         | °C   | 80 / 60              | 80 / 60              | 80 / 60              | 80 / 60              |                                                                      |
| LTHW Flow Rate to Manifold         | kg/s | 0.20                 | 0.20                 | 0.20                 | 0.20                 |                                                                      |
| Maximum Pressure Drop of Manifold  | kPa  | 30                   | 30                   | 30                   | 30                   |                                                                      |
| Pipe Spacing                       | mm   | 200                  | 200                  | 200                  | 200                  |                                                                      |
| Number of Circuits                 |      | 6                    | 6                    | 6                    | 6                    |                                                                      |
| Maximum working pressure           | bar  | 3                    | 3                    | 3                    | 3                    |                                                                      |
| Testing pressure                   | bar  | 6                    | 6                    | 6                    | 6                    |                                                                      |

|                                          |              |                                            |              |
|------------------------------------------|--------------|--------------------------------------------|--------------|
| <b>Accessories</b>                       |              |                                            |              |
| Distribution Manifold Isolating Valves   | <div>✓</div> | Distribution Manifold Cabinets             | <div>✓</div> |
| Distribution Manifold Temperature Gauges | <div>✓</div> | Integral Temperature Controls              | <div>✓</div> |
| Circuit Return Temperature Gauges        | <div>✓</div> | High Flow Temperature Limit Control        | <div>✓</div> |
| Distribution Manifold Air Vents          | <div>✓</div> | 3-port mixing valve                        | <div>✓</div> |
| Distribution Manifold Drain Cocks        | <div>✓</div> | Circulating pump                           | <div>✓</div> |
| Programmable Room Thermostats            | <div>✓</div> | Zone control valves/actuators              | <div>✓</div> |
| <b>Testing</b>                           |              | <b>Samples</b>                             |              |
| Performance Type Tests                   | <div>✓</div> | Pipe                                       | <div>✓</div> |
| Works Performance Tests                  | <div></div>  | Manifold and Fittings                      | <div>✓</div> |
| Site OEM Pressure Performance Tests      | <div>✓</div> |                                            |              |
| BBA Certificate/CE Mark                  | <div>✓</div> |                                            |              |
| <b>Specialist Contractor Particulars</b> |              |                                            |              |
| System Detailed Design & Calculations    | <div></div>  | System Pressure Testing                    | <div>✓</div> |
| Automatic Controls Design                | <div></div>  | System Performance Testing                 | <div></div>  |
| System Installation                      | <div>✓</div> | Record Drawings                            | <div>✓</div> |
| Supply and Fit Heated Floor Insulation   | <div>✓</div> | Site Supervision                           | <div>✓</div> |
| Supply and Lay Screed                    | <div></div>  | Design, Material & Installation warranties | <div>✓</div> |
| Integrated Construction Programme        | <div>✓</div> |                                            |              |

|                                                                                                                                                               |                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| <b>Additional Information</b>                                                                                                                                 |                                              |
| This datasheet shall be read in conjunction with all other datasheets, drawings and specifications.                                                           |                                              |
| Refer to Mechanical Particular specification for the design criteria.                                                                                         |                                              |
| Underfloor heating selections based on Myson - Refer to the Quotation GHD31794 attached for the details. Alternative selections shall be equal and approved.  |                                              |
| Comply with BS EN 1264 Floor Heating Systems and components:                                                                                                  |                                              |
|                                                                                                                                                               | -Part 1 Definitions and symbols.             |
|                                                                                                                                                               | -Part 2 Determination of the thermal output. |
|                                                                                                                                                               | -Part 3 Dimensioning.                        |
|                                                                                                                                                               | -Part 4 Installation.                        |
| The Contractor shall install each pipe as a continous length without buried connections                                                                       |                                              |
| Thermal insulation shall be as specified by the architect and to be confirmed with the underfloor heating manufacturer                                        |                                              |
| The underfloor heating construction shall be suitable for static and dynamic floor loadings including Manchester City Council's MEWPs.                        |                                              |
| UFHMs to be supplied with Radio Frequency (Wireless) room thermostats to control the heat output of the individual actuators of the underfloor heating loops. |                                              |
| UFH final fixing details shall be confirmed with the architect following the removal of the existing floor boards.                                            |                                              |



|                         |                                      |  |                   |              |                                      |                    |             |           |  |
|-------------------------|--------------------------------------|--|-------------------|--------------|--------------------------------------|--------------------|-------------|-----------|--|
| ARUP                    | OUR TOWN HALL                        |  | Job No.<br>256650 |              | Work Stage 4 Issue                   |                    | Rev.<br>P04 |           |  |
|                         | PROJECT                              |  |                   |              |                                      |                    |             |           |  |
|                         | Job Title      Our Town Hall Project |  |                   |              | Doc. Ref.   OTH-ARU-TH-ZZ-SCH-B-0011 |                    |             |           |  |
| Schedule      Radiators |                                      |  |                   | Made by   CH |                                      | Date    07/10/2019 |             | Chd.   CH |  |

| Equipment Reference | Room Reference | Manufacturer* | Emitter Output (W) | Flow Rate (kg/s) | Overall Dims (mm) |     |      | Type* | Notes                                                       |
|---------------------|----------------|---------------|--------------------|------------------|-------------------|-----|------|-------|-------------------------------------------------------------|
|                     |                |               |                    |                  | H                 | W   |      |       |                                                             |
| 01-015/RAD/001      | 01-015         | Zehnder       | 2372               | 0.028            | 709               | 92  | 1400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 01-015/RAD/002      | 01-015         | Zehnder       | 1254               | 0.015            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 01-016/RAD/001      | 01-016         | Zehnder       | 2710               | 0.032            | 709               | 92  | 1400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 01-023/RAD/001      | 01-023         | Zehnder       | 3575               | 0.043            | 709               | 92  | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 01-029/RAD/001      | 01-029         | Zehnder       | 3097               | 0.023            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 01-029/RAD/002      | 01-029         | Zehnder       | 3097               | 0.027            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 01-031/RAD/001      | 01-031         | Zehnder       | 1672               | 0.020            | 709               | 92  | 1000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 01-032/RAD/001      | 01-032         | Zehnder       | 1436               | 0.017            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 01-032/RAD/002      | 01-032         | Zehnder       | 1077               | 0.013            | 709               | 92  | 600  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 02-013/RAD/001      | 02-013         | Zehnder       | 4259               | 0.051            | 709               | 92  | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 02-013/RAD/002      | 02-013         | Zehnder       | 4259               | 0.051            | 709               | 92  | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 02-029/RAD/001      | 02-029         | Zehnder       | 1461               | 0.017            | 2200              | 100 | 444  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 02-029/RAD/002      | 02-029         | Zehnder       | 2191               | 0.026            | 2200              | 100 | 666  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 02-029/RAD/003      | 02-029         | Zehnder       | 2191               | 0.026            | 2200              | 100 | 666  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 02-030/RAD/001      | 02-030         | Zehnder       | 2191               | 0.026            | 2200              | 100 | 666  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 02-030/RAD/002      | 02-030         | Zehnder       | 2191               | 0.026            | 2200              | 100 | 666  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 02-030/RAD/003      | 02-030         | Zehnder       | 2191               | 0.026            | 2200              | 100 | 666  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 03-003/RAD/001      | 03-003         | Zehnder       | 1693               | 0.020            | 2200              | 100 | 592  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 03-004/RAD/001      | 03-004         | Zehnder       | 1948               | 0.023            | 2200              | 100 | 592  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 03-012/RAD/001      | 03-012         | Zehnder       | 4543               | 0.054            | 709               | 92  | 2400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 03-012/RAD/002      | 03-012         | Zehnder       | 2650               | 0.032            | 709               | 92  | 1400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 03-016/RAD/001      | 03-016         | Zehnder       | 1426               | 0.017            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 03-016/RAD/002      | 03-016         | Zehnder       | 1426               | 0.017            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 03-016/RAD/003      | 03-016         | Zehnder       | 1426               | 0.017            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 03-019/RAD/001      | 03-019         | Zehnder       | 1741               | 0.021            | 709               | 92  | 2000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 03-019/RAD/002      | 03-019         | Zehnder       | 1741               | 0.021            | 709               | 92  | 2000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 03-021/RAD/001      | 03-021         | Zehnder       | 3622               | 0.043            | 709               | 92  | 2400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 03-021/RAD/002      | 03-021         | Zehnder       | 3622               | 0.043            | 709               | 92  | 2400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 03-022/RAD/001      | 03-022         | Zehnder       | 5782               | 0.069            | 709               | 92  | 3000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 03-025/RAD/001      | 03-025         | Zehnder       | 1185               | 0.014            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 03-025/RAD/002      | 03-025         | Zehnder       | 1067               | 0.013            | 2200              | 100 | 666  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 03-027/RAD/001      | 03-027         | Zehnder       | 2393               | 0.029            | 709               | 92  | 1400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 03-C01/RAD/001      | 03-C01         | Zehnder       | 2615               | 0.031            | 709               | 92  | 1400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 04-005/RAD/001      | 04-005         | Zehnder       | 3702               | 0.044            | 425               | 92  | 2600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 04-006/RAD/001      | 04-006         | Zehnder       | 2688               | 0.032            | 709               | 92  | 2600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 04-007/RAD/001      | 04-007         | Zehnder       | 3279               | 0.039            | 709               | 92  | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 04-009/RAD/001      | 04-009         | Zehnder       | 974                | 0.012            | 2200              | 100 | 592  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 04-009/RAD/002      | 04-009         | Zehnder       | 974                | 0.012            | 2200              | 100 | 592  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 04-009/RAD/003      | 04-009         | Zehnder       | 487                | 0.006            | 2200              | 100 | 296  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 04-016/RAD/001      | 04-016         | Zehnder       | 3183               | 0.038            | 709               | 92  | 3000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 04-016/RAD/002      | 04-016         | Zehnder       | 3183               | 0.038            | 425               | 92  | 3000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 04-016/RAD/003      | 04-016         | Zehnder       | 2759               | 0.033            | 425               | 92  | 2600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 04-016/RAD/004      | 04-016         | Zehnder       | 1061               | 0.013            | 425               | 92  | 1000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 04-016/RAD/005      | 04-016         | Zehnder       | 3183               | 0.038            | 709               | 92  | 3000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 04-016/RAD/006      | 04-016         | Zehnder       | 424                | 0.005            | 425               | 92  | 400  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 04-016/RAD/007      | 04-016         | Zehnder       | 424                | 0.005            | 425               | 92  | 400  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 04-017/RAD/001      | 04-017         | Zehnder       | 4272               | 0.051            | 425               | 92  | 3000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 04-017/RAD/002      | 04-017         | Zehnder       | 3987               | 0.048            | 425               | 92  | 2800 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 04-018/RAD/001      | 04-018         | Zehnder       | 3133               | 0.037            | 425               | 92  | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 04-018/RAD/002      | 04-018         | Zehnder       | 3133               | 0.037            | 425               | 92  | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 04-029/RAD/001      | 04-029         | Zehnder       | 3391               | 0.041            | 709               | 92  | 1800 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 04-029/RAD/002      | 04-029         | Zehnder       | 3391               | 0.041            | 709               | 92  | 1800 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-002/RAD/001      | 05-002         | Zehnder       | 1893               | 0.023            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-002/RAD/002      | 05-002         | Zehnder       | 1893               | 0.023            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-002/RAD/003      | 05-002         | Zehnder       | 1893               | 0.023            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-003/RAD/001      | 05-003         | Zehnder       | 5031               | 0.060            | 709               | 92  | 2600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-003/RAD/002      | 05-003         | Zehnder       | 1432               | 0.017            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-004/RAD/001      | 05-004         | Zehnder       | 8658               | 0.104            | 425               | 92  | 2600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-004/RAD/002      | 05-004         | Zehnder       | 5822               | 0.070            | 425               | 92  | 2400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-004/RAD/003      | 05-004         | Zehnder       | 5822               | 0.070            | 425               | 92  | 2400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-004/RAD/004      | 05-004         | Zehnder       | 3396               | 0.041            | 425               | 92  | 1400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-004/RAD/005      | 05-004         | Zehnder       | 3396               | 0.041            | 425               | 92  | 1400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-004/RAD/006      | 05-004         | Zehnder       | 1795               | 0.021            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-004/RAD/007      | 05-004         | Zehnder       | 1795               | 0.021            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-004/RAD/008      | 05-004         | Zehnder       | 1795               | 0.021            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-004/RAD/009      | 05-004         | Zehnder       | 1795               | 0.021            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |

|                         |                                      |  |                   |              |                                      |                    |             |           |  |
|-------------------------|--------------------------------------|--|-------------------|--------------|--------------------------------------|--------------------|-------------|-----------|--|
| ARUP                    | OUR TOWN HALL                        |  | Job No.<br>256650 |              | Work Stage 4 Issue                   |                    | Rev.<br>P04 |           |  |
|                         | PROJECT                              |  |                   |              |                                      |                    |             |           |  |
|                         | Job Title      Our Town Hall Project |  |                   |              | Doc. Ref.   OTH-ARU-TH-ZZ-SCH-B-0011 |                    |             |           |  |
| Schedule      Radiators |                                      |  |                   | Made by   CH |                                      | Date    07/10/2019 |             | Chd.   CH |  |

| Equipment Reference | Room Reference | Manufacturer* | Emitter Output (W) | Flow Rate (kg/s) | Overall Dims (mm) |     |      | Type* | Notes                                                       |
|---------------------|----------------|---------------|--------------------|------------------|-------------------|-----|------|-------|-------------------------------------------------------------|
|                     |                |               |                    |                  | H                 | W   |      |       |                                                             |
| 05-004/RAD/010      | 05-004         | Zehnder       | 1795               | 0.021            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-004/RAD/011      | 05-004         | Zehnder       | 1795               | 0.021            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-005/RAD/001      | 05-005         | Zehnder       | 1964               | 0.023            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-005/RAD/002      | 05-005         | Zehnder       | 1964               | 0.023            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-005/RAD/003      | 05-005         | Zehnder       | 1964               | 0.023            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-005/RAD/004      | 05-005         | Zehnder       | 1964               | 0.023            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-005/RAD/005      | 05-005         | Zehnder       | 1635               | 0.020            | 2200              | 100 | 666  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-005/RAD/006      | 05-005         | Zehnder       | 1453               | 0.017            | 2200              | 100 | 592  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-005/RAD/007      | 05-005         | Zehnder       | 1635               | 0.020            | 2200              | 100 | 666  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-005/RAD/008      | 05-005         | Zehnder       | 1453               | 0.017            | 2200              | 100 | 592  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-006/RAD/001      | 05-006         | Zehnder       | 4444               | 0.053            | 709               | 92  | 2000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-006/RAD/002      | 05-006         | Zehnder       | 4444               | 0.053            | 709               | 92  | 2000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-006/RAD/003      | 05-006         | Zehnder       | 6666               | 0.080            | 709               | 92  | 3000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-006/RAD/004      | 05-006         | Zehnder       | 6666               | 0.080            | 709               | 92  | 3000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-006/RAD/005      | 05-006         | Zehnder       | 1644               | 0.020            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-006/RAD/006      | 05-006         | Zehnder       | 1644               | 0.020            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-006/RAD/007      | 05-006         | Zehnder       | 1644               | 0.020            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-006/RAD/008      | 05-006         | Zehnder       | 1644               | 0.020            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-007/RAD/001      | 05-007         | Zehnder       | 2022               | 0.024            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-007/RAD/002      | 05-007         | Zehnder       | 2022               | 0.024            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-007/RAD/003      | 05-007         | Zehnder       | 2022               | 0.024            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-007/RAD/004      | 05-007         | Zehnder       | 2022               | 0.024            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-007/RAD/005      | 05-007         | Zehnder       | 1683               | 0.020            | 2200              | 100 | 666  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-007/RAD/006      | 05-007         | Zehnder       | 1496               | 0.018            | 2200              | 100 | 592  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-007/RAD/007      | 05-007         | Zehnder       | 1683               | 0.020            | 2200              | 100 | 666  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-007/RAD/008      | 05-007         | Zehnder       | 1496               | 0.018            | 2200              | 100 | 592  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-008/RAD/001      | 05-008         | Zehnder       | 3627               | 0.043            | 425               | 92  | 1800 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-008/RAD/002      | 05-008         | Zehnder       | 4434               | 0.053            | 425               | 92  | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-008/RAD/003      | 05-008         | Zehnder       | 3627               | 0.043            | 425               | 92  | 1800 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-008/RAD/004      | 05-008         | Zehnder       | 5643               | 0.067            | 425               | 92  | 2800 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-008/RAD/005      | 05-008         | Zehnder       | 2821               | 0.034            | 425               | 92  | 1400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-008/RAD/006      | 05-008         | Zehnder       | 2821               | 0.034            | 425               | 92  | 1400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-008/RAD/007      | 05-008         | Zehnder       | 895                | 0.011            | 2200              | 100 | 444  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-008/RAD/008      | 05-008         | Zehnder       | 895                | 0.011            | 2200              | 100 | 444  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-009/RAD/001      | 05-009         | Zehnder       | 2492               | 0.030            | 709               | 92  | 1000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-009/RAD/002      | 05-009         | Zehnder       | 2492               | 0.030            | 709               | 92  | 1000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-009/RAD/003      | 05-009         | Zehnder       | 2492               | 0.030            | 709               | 92  | 1000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-009/RAD/004      | 05-009         | Zehnder       | 1660               | 0.020            | 2200              | 100 | 666  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-009/RAD/005      | 05-009         | Zehnder       | 1475               | 0.018            | 2200              | 100 | 592  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-009/RAD/006      | 05-009         | Zehnder       | 1660               | 0.020            | 2200              | 100 | 666  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-009/RAD/007      | 05-009         | Zehnder       | 1475               | 0.018            | 2200              | 100 | 592  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-010/RAD/001      | 05-010         | Zehnder       | 3090               | 0.037            | 425               | 92  | 1400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-010/RAD/002      | 05-010         | Zehnder       | 3973               | 0.048            | 425               | 92  | 1800 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-010/RAD/003      | 05-010         | Zehnder       | 3090               | 0.037            | 425               | 92  | 1400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-010/RAD/004      | 05-010         | Zehnder       | 1470               | 0.018            | 2200              | 100 | 666  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-010/RAD/005      | 05-010         | Zehnder       | 1470               | 0.018            | 2200              | 100 | 666  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-010/RAD/006      | 05-010         | Zehnder       | 1470               | 0.018            | 2200              | 100 | 666  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 05-011/RAD/001      | 05-011         | Zehnder       | 4262               | 0.051            | 425               | 92  | 3000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-011/RAD/002      | 05-011         | Zehnder       | 4262               | 0.051            | 425               | 92  | 3000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-011/RAD/003      | 05-011         | Zehnder       | 3126               | 0.037            | 425               | 92  | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-012/RAD/001      | 05-012         | Zehnder       | 3418               | 0.041            | 425               | 92  | 2400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-012/RAD/002      | 05-012         | Zehnder       | 4349               | 0.052            | 425               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-012/RAD/003      | 05-012         | Zehnder       | 3418               | 0.041            | 425               | 92  | 2400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 05-012/RAD/004      | 05-012         | Zehnder       | 4349               | 0.052            | 425               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-001/RAD/001      | 06-001         | Zehnder       | 3098               | 0.037            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-001/RAD/002      | 06-001         | Zehnder       | 3098               | 0.037            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-001/RAD/003      | 06-001         | Zehnder       | 4618               | 0.055            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-001/RAD/004      | 06-001         | Zehnder       | 4618               | 0.055            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-003/RAD/001      | 06-003         | Zehnder       | 3098               | 0.037            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-003/RAD/002      | 06-003         | Zehnder       | 3820               | 0.046            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-003/RAD/003      | 06-003         | Zehnder       | 2710               | 0.032            | 709               | 92  | 1400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-003/RAD/004      | 06-003         | Zehnder       | 774                | 0.009            | 709               | 92  | 400  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-004/RAD/001      | 06-004         | Zehnder       | 3026               | 0.036            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-004/RAD/002      | 06-004         | Zehnder       | 5673               | 0.068            | 709               | 92  | 3000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-005/RAD/001      | 06-005         | Zehnder       | 3872               | 0.046            | 709               | 92  | 2000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-005/RAD/002      | 06-005         | Zehnder       | 3485               | 0.042            | 709               | 92  | 1800 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |

|                         |                                      |  |                   |  |                    |              |                                      |                    |           |
|-------------------------|--------------------------------------|--|-------------------|--|--------------------|--------------|--------------------------------------|--------------------|-----------|
| ARUP                    | OUR TOWN HALL                        |  | Job No.<br>256650 |  | Work Stage 4 Issue |              | Rev.<br>P04                          |                    |           |
|                         | PROJECT                              |  |                   |  |                    |              |                                      |                    |           |
|                         | Job Title      Our Town Hall Project |  |                   |  |                    |              | Doc. Ref.   OTH-ARU-TH-ZZ-SCH-B-0011 |                    |           |
| Schedule      Radiators |                                      |  |                   |  |                    | Made by   CH |                                      | Date    07/10/2019 | Chd.   CH |

| Equipment Reference | Room Reference | Manufacturer* | Emitter Output (W) | Flow Rate (kg/s) | Overall Dims (mm) |     |      | Type* | Notes                                                       |
|---------------------|----------------|---------------|--------------------|------------------|-------------------|-----|------|-------|-------------------------------------------------------------|
|                     |                |               |                    |                  | H                 | W   |      |       |                                                             |
| 06-006/RAD/001      | 06-006         | Zehnder       | 2710               | 0.032            | 709               | 92  | 1400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-006/RAD/002      | 06-006         | Zehnder       | 2710               | 0.032            | 709               | 92  | 1400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-007/RAD/001      | 06-007         | Zehnder       | 3331               | 0.040            | 709               | 92  | 2000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-007/RAD/002      | 06-007         | Zehnder       | 2332               | 0.028            | 709               | 92  | 1400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-008/RAD/001      | 06-008         | Zehnder       | 2435               | 0.029            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 06-009/RAD/001      | 06-009         | Zehnder       | 4055               | 0.048            | 709               | 92  | 2400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-009/RAD/002      | 06-009         | Zehnder       | 1389               | 0.017            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 06-009/RAD/003      | 06-009         | Zehnder       | 1389               | 0.017            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 06-009/RAD/004      | 06-009         | Zehnder       | 1389               | 0.017            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |
| 06-010/RAD/001      | 06-010         | Zehnder       | 1121               | 0.013            | 709               | 92  | 600  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-010/RAD/002      | 06-010         | Zehnder       | 4767               | 0.057            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-010/RAD/003      | 06-010         | Zehnder       | 4110               | 0.049            | 709               | 92  | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-010/RAD/004      | 06-010         | Zehnder       | 4110               | 0.049            | 709               | 92  | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-011/RAD/001      | 06-011         | Zehnder       | 3860               | 0.046            | 709               | 92  | 2000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-011/RAD/002      | 06-011         | Zehnder       | 1544               | 0.018            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-011/RAD/003      | 06-011         | Zehnder       | 4246               | 0.051            | 709               | 92  | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-012/RAD/001      | 06-012         | Zehnder       | 3403               | 0.041            | 709               | 92  | 1800 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-012/RAD/002      | 06-012         | Zehnder       | 3403               | 0.041            | 709               | 92  | 1800 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-012/RAD/003      | 06-012         | Zehnder       | 1891               | 0.023            | 709               | 92  | 1000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-013/RAD/001      | 06-013         | Zehnder       | 5808               | 0.069            | 709               | 92  | 3000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-015/RAD/001      | 06-015         | Zehnder       | 5808               | 0.069            | 709               | 92  | 3000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-015/RAD/002      | 06-015         | Zehnder       | 2323               | 0.028            | 709               | 92  | 1200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-016/RAD/001      | 06-016         | Zehnder       | 1424               | 0.017            | 425               | 92  | 1000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-017/RAD/001      | 06-017         | Zehnder       | 2710               | 0.032            | 709               | 92  | 1400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-017/RAD/002      | 06-017         | Zehnder       | 5016               | 0.060            | 709               | 92  | 2600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-018/RAD/001      | 06-018         | Zehnder       | 5808               | 0.069            | 709               | 92  | 3000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-018/RAD/002      | 06-018         | Zehnder       | 3082               | 0.037            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-019/RAD/001      | 06-019         | Zehnder       | 5421               | 0.065            | 709               | 92  | 2800 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-019/RAD/002      | 06-019         | Zehnder       | 5421               | 0.065            | 709               | 92  | 1200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-019/RAD/003      | 06-019         | Zehnder       | 3053               | 0.037            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-019/RAD/004      | 06-019         | Zehnder       | 3053               | 0.037            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-020/RAD/001      | 06-020         | Zehnder       | 4646               | 0.056            | 709               | 92  | 2400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-020/RAD/002      | 06-020         | Zehnder       | 4646               | 0.056            | 709               | 92  | 2400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-020/RAD/004      | 06-020         | Zehnder       | 3872               | 0.046            | 709               | 92  | 2000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-020/RAD/005      | 06-020         | Zehnder       | 3872               | 0.046            | 709               | 92  | 2000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-021/RAD/001      | 06-021         | Zehnder       | 5034               | 0.060            | 709               | 92  | 2600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-021/RAD/002      | 06-021         | Zehnder       | 5034               | 0.060            | 709               | 92  | 2600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-021/RAD/003      | 06-021         | Zehnder       | 3098               | 0.037            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-021/RAD/004      | 06-021         | Zehnder       | 3098               | 0.037            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-022/RAD/001      | 06-022         | Zehnder       | 5034               | 0.060            | 709               | 92  | 2600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-022/RAD/002      | 06-022         | Zehnder       | 5034               | 0.060            | 709               | 92  | 2600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-022/RAD/003      | 06-022         | Zehnder       | 1936               | 0.023            | 709               | 92  | 1000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-C02/RAD/001      | 06-C02         | Zehnder       | 3098               | 0.037            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 06-C02/RAD/001      | 06-C02         | Zehnder       | 3089               | 0.037            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-001/RAD/001      | 07-001         | Zehnder       | 5720               | 0.068            | 709               | 92  | 3000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-001/RAD/002      | 07-001         | Zehnder       | 5720               | 0.068            | 709               | 92  | 3000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-001/RAD/003      | 07-001         | Zehnder       | 5720               | 0.068            | 709               | 92  | 3000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-001/RAD/004      | 07-001         | Zehnder       | 5720               | 0.068            | 709               | 92  | 3000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-001/RAD/005      | 07-001         | Zehnder       | 1525               | 0.018            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-002/RAD/001      | 07-002         | Zehnder       | 2059               | 0.025            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-003/RAD/001      | 07-003         | Zehnder       | 2060               | 0.025            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-004/RAD/001      | 07-004         | Zehnder       | 3072               | 0.037            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-004/RAD/002      | 07-004         | Zehnder       | 3072               | 0.037            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-005/RAD/001      | 07-005         | Zehnder       | 4242               | 0.051            | 709               | 92  | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-005/RAD/002      | 07-005         | Zehnder       | 4627               | 0.055            | 709               | 92  | 2400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-006/RAD/001      | 07-006         | Zehnder       | 1424               | 0.017            | 425               | 92  | 1000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-007/RAD/001      | 07-007         | Zehnder       | 3889               | 0.047            | 709               | 92  | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-008/RAD/001      | 07-008         | Zehnder       | 4191               | 0.050            | 709               | 92  | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-009/RAD/001      | 07-009         | Zehnder       | 5808               | 0.069            | 709               | 92  | 3000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-009/RAD/002      | 07-009         | Zehnder       | 2323               | 0.028            | 709               | 92  | 1200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-009/RAD/003      | 07-009         | Zehnder       | 3872               | 0.046            | 709               | 92  | 2000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-009/RAD/004      | 07-009         | Zehnder       | 4646               | 0.056            | 709               | 92  | 2400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-010/RAD/001      | 07-010         | Zehnder       | 1506               | 0.018            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-010/RAD/002      | 07-010         | Zehnder       | 3389               | 0.041            | 709               | 92  | 1800 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-011/RAD/001      | 07-011         | Zehnder       | 4224               | 0.051            | 709               | 92  | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-011/RAD/002      | 07-011         | Zehnder       | 3072               | 0.037            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |

|                         |                                      |  |                   |  |                    |              |                                      |                    |           |
|-------------------------|--------------------------------------|--|-------------------|--|--------------------|--------------|--------------------------------------|--------------------|-----------|
| ARUP                    | OUR TOWN HALL                        |  | Job No.<br>256650 |  | Work Stage 4 Issue |              | Rev.<br>P04                          |                    |           |
|                         | PROJECT                              |  |                   |  |                    |              |                                      |                    |           |
|                         | Job Title      Our Town Hall Project |  |                   |  |                    |              | Doc. Ref.   OTH-ARU-TH-ZZ-SCH-B-0011 |                    |           |
| Schedule      Radiators |                                      |  |                   |  |                    | Made by   CH |                                      | Date    07/10/2019 | Chd.   CH |

| Equipment Reference | Room Reference | Manufacturer* | Emitter Output (W) | Flow Rate (kg/s) | Overall Dims (mm) |     |      | Type* | Notes                                                       |
|---------------------|----------------|---------------|--------------------|------------------|-------------------|-----|------|-------|-------------------------------------------------------------|
|                     |                |               |                    |                  | H                 | W   |      |       |                                                             |
| 07-012/RAD/001      | 07-012         | Zehnder       | 5732               | 0.069            | 709               | 92  | 3000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-013/RAD/001      | 07-013         | Zehnder       | 1609               | 0.019            | 709               | 92  | 1000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-015/RAD/001      | 07-015         | Zehnder       | 1536               | 0.018            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| 07-016/RAD/001      | 07-016         | Zehnder       | 3373               | 0.040            | 709               | 92  | 1800 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| GF-012/RAD/001      | GF-012         | Zehnder       | 3843               | 0.046            | 709               | 92  | 2000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| GF-014/RAD/001      | GF-014         | Zehnder       | 2934               | 0.035            | 709               | 92  | 1200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| GF-014/RAD/002      | GF-014         | Zehnder       | 1086               | 0.013            | 2200              | 100 | 444  | Roda  | Vertically mounted on wall, BBOE Connections                |
| GF-014/RAD/003      | GF-014         | Zehnder       | 1086               | 0.013            | 2200              | 100 | 444  | Roda  | Vertically mounted on wall, BBOE Connections                |
| GF-017/RAD/001      | GF-017         | Zehnder       | 2831               | 0.034            | 709               | 92  | 1800 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| GF-019/RAD/001      | GF-019         | Zehnder       | 5034               | 0.060            | 709               | 92  | 2600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| GF-024/RAD/001      | GF-024         | Zehnder       | 2278               | 0.027            | 425               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| GF-030/RAD/001      | GF-030         | Zehnder       | 3923               | 0.047            | 709               | 92  | 2800 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| GF-035/RAD/001      | GF-035         | Zehnder       | 926                | 0.011            | 2200              | 100 | 296  | Roda  | Vertically mounted on wall, BBOE Connections                |
| GF-036/RAD/001      | GF-036         | Zehnder       | 608                | 0.007            | 2200              | 100 | 296  | Roda  | Vertically mounted on wall, BBOE Connections                |
| GF-037/RAD/001      | GF-037         | Zehnder       | 2435               | 0.029            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |
| GF-047/RAD/001      | GF-047         | Zehnder       | 1371               | 0.016            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| GF-048/RAD/001      | GF-048         | Zehnder       | 4272               | 0.051            | 425               | 92  | 3000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| GF-049/RAD/001      | GF-049         | Zehnder       | 5421               | 0.065            | 709               | 92  | 2800 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| GF-C01/RAD/001      | GF-C01         | Zehnder       | 2710               | 0.032            | 709               | 92  | 1400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| GF-C02/RAD/001      | GF-C02         | Zehnder       | 3912               | 0.047            | 709               | 92  | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-004/RAD/001      | LG-004         | Zehnder       | 2066               | 0.025            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |
| LG-004/RAD/002      | LG-004         | Zehnder       | 2066               | 0.025            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |
| LG-004/RAD/003      | LG-004         | Zehnder       | 2435               | 0.029            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |
| LG-004/RAD/004      | LG-004         | Zehnder       | 1033               | 0.012            | 2200              | 100 | 370  | Roda  | Vertically mounted on wall, BBOE Connections                |
| LG-004/RAD/005      | LG-004         | Zehnder       | 1217               | 0.015            | 2200              | 100 | 370  | Roda  | Vertically mounted on wall, BBOE Connections                |
| LG-005/RAD/001      | LG-005         | Zehnder       | 1473               | 0.018            | 2200              | 100 | 666  | Roda  | Vertically mounted on wall, BBOE Connections                |
| LG-006/RAD/001      | LG-006         | Zehnder       | 2506               | 0.030            | 425               | 92  | 1800 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-006/RAD/001      | LG-006         | Zehnder       | 1697               | 0.020            | 425               | 92  | 1200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-006/RAD/002      | LG-006         | Zehnder       | 2506               | 0.030            | 425               | 92  | 1800 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-006/RAD/002      | LG-006         | Zehnder       | 1697               | 0.020            | 425               | 92  | 1200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-007/RAD/001      | LG-007         | Zehnder       | 3872               | 0.046            | 709               | 92  | 2000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-012/RAD/001      | LG-012         | Zehnder       | 3281               | 0.039            | 425               | 92  | 2600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-012/RAD/002      | LG-012         | Zehnder       | 3281               | 0.039            | 425               | 92  | 2600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-012/RAD/003      | LG-012         | Zehnder       | 3029               | 0.036            | 425               | 92  | 2400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-012/RAD/004      | LG-012         | Zehnder       | 3029               | 0.036            | 425               | 92  | 2400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-014/RAD/001      | LG-014         | Zehnder       | 2546               | 0.030            | 709               | 92  | 1400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-020/RAD/001      | LG-020         | Zehnder       | 1936               | 0.023            | 709               | 92  | 1000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-020/RAD/002      | LG-020         | Zehnder       | 1936               | 0.023            | 709               | 92  | 1000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-021/RAD/001      | LG-021         | Zehnder       | 2542               | 0.030            | 425               | 92  | 2400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-024/RAD/001      | LG-024         | Zehnder       | 1061               | 0.013            | 709               | 92  | 600  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-024/RAD/002      | LG-024         | Zehnder       | 1061               | 0.013            | 709               | 92  | 600  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-025/RAD/001      | LG-025         | Zehnder       | 3782               | 0.045            | 709               | 92  | 2000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-025/RAD/002      | LG-025         | Zehnder       | 1513               | 0.018            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-026/RAD/001      | LG-026         | Zehnder       | 2311               | 0.000            | 709               | 92  | 2000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-026/RAD/002      | LG-026         | Zehnder       | 924                | 0.011            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-028/RAD/001      | LG-028         | Zehnder       | 2325               | 0.000            | 709               | 92  | 1400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-028/RAD/001      | LG-028         | Zehnder       | 434                | 0.005            | 709               | 92  | 400  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-028/RAD/001      | LG-028         | Zehnder       | 851                | 0.010            | 709               | 92  | 600  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-028/RAD/002      | LG-028         | Zehnder       | 1328               | 0.016            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-030/RAD/001      | LG-030         | Zehnder       | 3196               | 0.038            | 709               | 92  | 1800 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-030/RAD/002      | LG-030         | Zehnder       | 3196               | 0.038            | 709               | 92  | 1800 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-031/RAD/001      | LG-031         | Zehnder       | 3872               | 0.046            | 709               | 92  | 2000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-032/RAD/001      | LG-032         | Zehnder       | 4507               | 0.054            | 709               | 92  | 2400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-032/RAD/002      | LG-032         | Zehnder       | 4507               | 0.054            | 709               | 92  | 2400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-033/RAD/001      | LG-033         | Zehnder       | 4983               | 0.060            | 709               | 92  | 2600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-034/RAD/001      | LG-034         | Zehnder       | 5482               | 0.066            | 709               | 92  | 3000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-036/RAD/001      | LG-036         | Zehnder       | 3285               | 0.039            | 425               | 92  | 2400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-036/RAD/001      | LG-036         | Zehnder       | 1162               | 0.014            | 709               | 92  | 600  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-036/RAD/002      | LG-036         | Zehnder       | 3285               | 0.039            | 425               | 92  | 2400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-036/RAD/003      | LG-036         | Zehnder       | 2190               | 0.026            | 425               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-037/RAD/001      | LG-037         | Zehnder       | 2781               | 0.033            | 425               | 92  | 2000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-037/RAD/002      | LG-037         | Zehnder       | 2781               | 0.033            | 425               | 92  | 2000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-037/RAD/003      | LG-037         | Zehnder       | 2224               | 0.027            | 425               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-037/RAD/004      | LG-037         | Zehnder       | 2224               | 0.027            | 425               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-038/RAD/001      | LG-038         | Zehnder       | 3418               | 0.041            | 425               | 92  | 2400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-038/RAD/001      | LG-038         | Zehnder       | 2323               | 0.028            | 709               | 92  | 1200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |

|                         |                                      |  |                   |  |                    |              |                                      |                                   |  |
|-------------------------|--------------------------------------|--|-------------------|--|--------------------|--------------|--------------------------------------|-----------------------------------|--|
| ARUP                    | OUR TOWN HALL                        |  | Job No.<br>256650 |  | Work Stage 4 Issue |              | Rev.<br>P04                          |                                   |  |
|                         | PROJECT                              |  |                   |  |                    |              |                                      |                                   |  |
|                         | Job Title      Our Town Hall Project |  |                   |  |                    |              | Doc. Ref.   OTH-ARU-TH-ZZ-SCH-B-0011 |                                   |  |
| Schedule      Radiators |                                      |  |                   |  |                    | Made by   CH |                                      | Date    07/10/2019      Chd.   CH |  |

| Equipment Reference | Room Reference | Manufacturer* | Emitter Output (W) | Flow Rate (kg/s) | Overall Dims (mm) |     |      | Type* | Notes                                                       |
|---------------------|----------------|---------------|--------------------|------------------|-------------------|-----|------|-------|-------------------------------------------------------------|
|                     |                |               |                    |                  | H                 | W   |      |       |                                                             |
| LG-038/RAD/002      | LG-038         | Zehnder       | 3133               | 0.037            | 425               | 92  | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-038/RAD/003      | LG-038         | Zehnder       | 3133               | 0.037            | 425               | 92  | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-038/RAD/003      | LG-038         | Zehnder       | 2323               | 0.028            | 709               | 92  | 1200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-038/RAD/004      | LG-038         | Zehnder       | 2278               | 0.027            | 425               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-040/RAD/001      | LG-040         | Zehnder       | 1386               | 0.017            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-043/RAD/001      | LG-043         | Zehnder       | 4259               | 0.051            | 709               | 92  | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-046/RAD/001      | LG-046         | Zehnder       | 437                | 0.005            | 2200              | 100 | 444  | Roda  | Vertically mounted on wall, BBOE Connections                |
| LG-046/RAD/001      | LG-046         | Zehnder       | 1673               | 0.020            | 709               | 92  | 1000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-046/RAD/001      | LG-046         | Zehnder       | 2125               | 0.025            | 2200              | 100 | 740  | Roda  | Vertically mounted on wall, BBOE Connections                |
| LG-046/RAD/001      | LG-046         | Zehnder       | 1793               | 0.021            | 2200              | 100 | 592  | Roda  | Vertically mounted on wall, BBOE Connections                |
| LG-046/RAD/002      | LG-046         | Zehnder       | 1793               | 0.021            | 2200              | 100 | 592  | Roda  | Vertically mounted on wall, BBOE Connections                |
| LG-046/RAD/002      | LG-046         | Zehnder       | 437                | 0.005            | 2200              | 100 | 444  | Roda  | Vertically mounted on wall, BBOE Connections                |
| LG-047/RAD/001      | LG-047         | Zehnder       | 1341               | 0.016            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-047/RAD/002      | LG-047         | Zehnder       | 820                | 0.010            | 709               | 92  | 400  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-047/RAD/003      | LG-047         | Zehnder       | 820                | 0.010            | 709               | 92  | 400  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-047/RAD/004      | LG-047         | Zehnder       | 820                | 0.010            | 709               | 92  | 400  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-048/RAD/001      | LG-048         | Zehnder       | 1337               | 0.016            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-049/RAD/001      | LG-049         | Zehnder       | 1338               | 0.016            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-050/RAD/001      | LG-050         | Zehnder       | 1348               | 0.016            | 709               | 92  | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-051/RAD/001      | LG-051         | Zehnder       | 1897               | 0.023            | 709               | 92  | 1000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-054/RAD/001      | LG-054         | Zehnder       | 4259               | 0.051            | 709               | 92  | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-054/RAD/002      | LG-054         | Zehnder       | 3485               | 0.042            | 709               | 92  | 1800 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-054/RAD/003      | LG-054         | Zehnder       | 4259               | 0.051            | 709               | 92  | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-057/RAD/001      | LG-057         | Zehnder       | 1936               | 0.023            | 709               | 92  | 1000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C01/RAD/001      | LG-C01         | Zehnder       | 2710               | 0.032            | 709               | 92  | 1400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C01/RAD/001      | LG-C01         | Zehnder       | 5781               | 0.069            | 709               | 92  | 3000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C01/RAD/001      | LG-C01         | Zehnder       | 4259               | 0.051            | 709               | 92  | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C01/RAD/001      | LG-C01         | Zehnder       | 2047               | 0.024            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C01/RAD/002      | LG-C01         | Zehnder       | 5781               | 0.069            | 709               | 92  | 3000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C01/RAD/002      | LG-C01         | Zehnder       | 4259               | 0.051            | 709               | 92  | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C01/RAD/002      | LG-C01         | Zehnder       | 2710               | 0.032            | 709               | 92  | 1400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C01/RAD/003      | LG-C01         | Zehnder       | 5781               | 0.069            | 709               | 92  | 3000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C01/RAD/004      | LG-C01         | Zehnder       | 3469               | 0.041            | 709               | 92  | 1800 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C01/RAD/005      | LG-C01         | Zehnder       | 3469               | 0.041            | 709               | 92  | 1800 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C01/RAD/006      | LG-C01         | Zehnder       | 3469               | 0.041            | 709               | 92  | 1800 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C01/RAD/007      | LG-C01         | Zehnder       | 2313               | 0.028            | 709               | 92  | 1200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C02/RAD/001      | LG-C02         | Zehnder       | 3098               | 0.037            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C02/RAD/002      | LG-C02         | Zehnder       | 3098               | 0.037            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C02/RAD/003      | LG-C02         | Zehnder       | 3098               | 0.037            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C02/RAD/004      | LG-C02         | Zehnder       | 3098               | 0.037            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C02/RAD/005      | LG-C02         | Zehnder       | 3098               | 0.037            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C02/RAD/006      | LG-C02         | Zehnder       | 3098               | 0.037            | 709               | 92  | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C03/RAD/001      | LG-C03         | Zehnder       | 4316               | 0.052            | 709               | 92  | 2600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C03/RAD/002      | LG-C03         | Zehnder       | 3984               | 0.048            | 709               | 92  | 2400 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C04/RAD/001      | LG-C04         | Zehnder       | 1936               | 0.023            | 709               | 92  | 1000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C04/RAD/001      | LG-C04         | Zehnder       | 4196               | 0.050            | 709               | 92  | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C04/RAD/002      | LG-C04         | Zehnder       | 1936               | 0.023            | 709               | 92  | 1000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C04/RAD/002      | LG-C04         | Zehnder       | 2289               | 0.027            | 709               | 92  | 1200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |

ARUP

OUR TOWN HALL PROJECT

Job No.  
256650

Work Stage 4 Issue

Rev.  
P04

Job Title  
Our Town Hall Project

Doc. Ref. OTH-ARU-TH-ZZ-SCH-B-0011

Schedule  
Radiators

Made by CHDate 07/10/2019Chd. CH

| Equipment Reference | Room Reference | Manufacturer* | Emitter Output (W) | Flow Rate (kg/s) | Overall Dims (mm) |    |      | Type* | Notes                                                       |
|---------------------|----------------|---------------|--------------------|------------------|-------------------|----|------|-------|-------------------------------------------------------------|
|                     |                |               |                    |                  | H                 | W  | L    |       |                                                             |
| LG-C04/RAD/003      | LG-C04         | Zehnder       | 1936               | 0.023            | 709               | 92 | 1000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C04/RAD/004      | LG-C04         | Zehnder       | 1936               | 0.023            | 709               | 92 | 1000 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C05/RAD/001      | LG-C05         | Zehnder       | 1337               | 0.016            | 709               | 92 | 800  | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C05/RAD/001      | LG-C05         | Zehnder       | 2062               | 0.025            | 709               | 92 | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C05/RAD/001      | LG-C05         | Zehnder       | 3037               | 0.036            | 709               | 92 | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C05/RAD/001      | LG-C05         | Zehnder       | 3040               | 0.036            | 709               | 92 | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C05/RAD/002      | LG-C05         | Zehnder       | 3037               | 0.036            | 709               | 92 | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C05/RAD/002      | LG-C05         | Zehnder       | 2062               | 0.025            | 709               | 92 | 2200 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
| LG-C05/RAD/003      | LG-C05         | Zehnder       | 3037               | 0.036            | 709               | 92 | 1600 | Nova  | Horizontally mounted on face of boxing in, BBOE Connections |
|                     |                |               |                    |                  |                   |    |      |       |                                                             |

Accessories & Additional Information

This datasheet shall be read in conjunction with all other datasheets, drawings and specifications.

Refer to Mechanical Particular specification for the design criteria.

Radiator selections based on Zehnder. Alternative selections shall be equal and approved.

Valves shall be rated to close against the full duty pump head.

LTHW flow and return temperatures are 80°C and 60°C, respectively.

All radiators to be provided complete with manufacturers floor/wall mountings as described.

All radiators to be tested to 10 bar pressure

Radiators to be BMS controlled via pressure independent control valves. Refer to BMS and Automatic Controls specification for the details.

Factory finished to RAL colour to be agreed with architect.



|                                                          |                                                                                                              |                                    |    |                        |            |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------|----|------------------------|------------|
| <div>ARUP</div> <div>Job Title</div> <div>Schedule</div> | <div>OUR TOWN HALL</div> <div>PROJECT</div> <div>Our Town Hall Project</div> <div>Finned Tube Emitters</div> | Job No.                            |    | Rev.                   |            |
|                                                          |                                                                                                              | 256650                             |    | Work Stage 4 Issue P04 |            |
|                                                          |                                                                                                              | Doc. Ref. OTH-ARU-TH-ZZ-SCH-B-0011 |    |                        |            |
|                                                          |                                                                                                              | Made by                            | CH | Date                   | 07/10/2019 |

| Equipment Reference | Room Reference | Manufacturer* | Emitter Output (W) | Flow Rate (kg/s) | Overall Dims (mm) |     |      | Type                 | Notes                                      |
|---------------------|----------------|---------------|--------------------|------------------|-------------------|-----|------|----------------------|--------------------------------------------|
|                     |                |               |                    |                  | H                 | W   | L    |                      |                                            |
| 01-028/FIN/001      | 01-028         | Zehnder       | 1112               | 0.040            | 240               | 150 | 900  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 01-028/FIN/002      | 01-028         | Zehnder       | 1112               | 0.013            | 240               | 150 | 900  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 01-028/FIN/003      | 01-028         | Zehnder       | 1112               | 0.013            | 240               | 150 | 900  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 01-028/FIN/004      | 01-028         | Zehnder       | 741                | 0.009            | 240               | 150 | 600  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 01-028/FIN/005      | 01-028         | Zehnder       | 741                | 0.009            | 240               | 150 | 600  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 01-028/FIN/006      | 01-028         | Zehnder       | 741                | 0.009            | 240               | 150 | 600  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 01-028/FIN/007      | 01-028         | Zehnder       | 741                | 0.035            | 240               | 150 | 600  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 01-033/FIN/003      | 01-033         | Zehnder       | 3317               | 0.040            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 01-033/FIN/004      | 01-033         | Zehnder       | 3317               | 0.040            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 01-033/FIN/005      | 01-033         | Zehnder       | 3317               | 0.040            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 01-033/FIN/006      | 01-033         | Zehnder       | 3317               | 0.040            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 01-033/FIN/007      | 01-033         | Zehnder       | 3317               | 0.040            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 01-033/FIN/008      | 01-033         | Zehnder       | 3317               | 0.040            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 01-033/FIN/009      | 01-033         | Zehnder       | 3317               | 0.040            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 01-033/FIN/010      | 01-033         | Zehnder       | 3317               | 0.040            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 02-008/FIN/001      | 02-008         | Zehnder       | 2653               | 0.032            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 02-015/FIN/001      | 02-015         | Zehnder       | 1865               | 0.022            | 240               | 150 | 900  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 02-015/FIN/002      | 02-015         | Zehnder       | 2487               | 0.030            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 02-015/FIN/003      | 02-015         | Zehnder       | 2487               | 0.059            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 02-017/FIN/001      | 02-017         | Zehnder       | 2653               | 0.032            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 02-017/FIN/002      | 02-017         | Zehnder       | 2653               | 0.063            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 02-018/FIN/001      | 02-018         | Zehnder       | 3117               | 0.037            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 02-018/FIN/002      | 02-018         | Zehnder       | 2494               | 0.030            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 02-018/FIN/003      | 02-018         | Zehnder       | 3117               | 0.104            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 02-019/FIN/001      | 02-019         | Zehnder       | 2096               | 0.025            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 02-020/FIN/001      | 02-020         | Zehnder       | 3317               | 0.040            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 02-020/FIN/002      | 02-020         | Zehnder       | 3317               | 0.040            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 02-020/FIN/003      | 02-020         | Zehnder       | 3317               | 0.119            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 02-021/FIN/001      | 02-021         | Zehnder       | 3059               | 0.059            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 02-021/FIN/002      | 02-021         | Zehnder       | 3059               | 0.037            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 02-021/FIN/003      | 02-021         | Zehnder       | 1835               | 0.022            | 240               | 150 | 900  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 02-021/FIN/004      | 02-021         | Zehnder       | 1835               | 0.059            | 240               | 150 | 900  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 02-022/FIN/001      | 02-022         | Zehnder       | 3528               | 0.042            | 240               | 150 | 1800 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 02-022/FIN/002      | 02-022         | Zehnder       | 3528               | 0.084            | 240               | 150 | 1800 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 02-022/FIN/003      | 02-022         | Zehnder       | 3528               | 0.042            | 240               | 150 | 1800 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 02-022/FIN/004      | 02-022         | Zehnder       | 3528               | 0.042            | 240               | 150 | 1800 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 03-015/FIN/001      | 03-015         | Zehnder       | 2653               | 0.087            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 03-015/FIN/002      | 03-015         | Zehnder       | 2653               | 0.032            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 03-015/FIN/003      | 03-015         | Zehnder       | 1990               | 0.024            | 240               | 150 | 900  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-001/FIN/001      | 04-001         | Zehnder       | 2560               | 0.031            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-001/FIN/002      | 04-001         | Zehnder       | 2560               | 0.061            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-002/FIN/001      | 04-002         | Zehnder       | 2176               | 0.026            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-002/FIN/001      | 04-002         | Zehnder       | 1739               | 0.021            | 240               | 150 | 900  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-003/FIN/001      | 04-003         | Zehnder       | 2456               | 0.029            | 240               | 150 | 1800 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-003/FIN/001      | 04-003         | Zehnder       | 2427               | 0.029            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-004/FIN/001      | 04-004         | Zehnder       | 2079               | 0.025            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-004/FIN/001      | 04-004         | Zehnder       | 2049               | 0.025            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-008/FIN/001      | 04-008         | Zehnder       | 3168               | 0.076            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-008-/FIN/002     | 04-008         | Zehnder       | 3168               | 0.038            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-010/FIN/001      | 04-010         | Zehnder       | 2280               | 0.027            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-010/FIN/001      | 04-010         | Zehnder       | 1616               | 0.019            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-011/FIN/001      | 04-011         | Zehnder       | 2169               | 0.026            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-011/FIN/001      | 04-011         | Zehnder       | 2258               | 0.027            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-012/FIN/001      | 04-012         | Zehnder       | 1679               | 0.020            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-012-/FIN/001     | 04-012         | Zehnder       | 2179               | 0.026            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-019/FIN/001      | 04-019         | Zehnder       | 3146               | 0.038            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-019/FIN/001      | 04-019         | Zehnder       | 2521               | 0.030            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-019/FIN/002      | 04-019         | Zehnder       | 1887               | 0.023            | 240               | 150 | 900  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-019/FIN/003      | 04-019         | Zehnder       | 3146               | 0.075            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-019a/FIN/002     | 04-019         | Zehnder       | 2521               | 0.060            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-021/FIN/001      | 04-021         | Zehnder       | 3958               | 0.095            | 240               | 150 | 1800 | Lateo Finned Emitter | Same end connections. Vertical Orientation |

ARUP

OUR TOWN HALL

PROJECT

Job Title

Our Town Hall Project

Schedule

Finned Tube Emitters

Job No.

256650

Rev.

Work Stage 4 Issue

P04

Doc. Ref.

OTH-ARU-TH-ZZ-SCH-B-0011

Made by

CH

Date

07/10/2019

Chd.

CH

| Equipment Reference | Room Reference | Manufacturer* | Emitter Output (W) | Flow Rate (kg/s) | Overall Dims (mm) |     |      | Type                 | Notes                                      |
|---------------------|----------------|---------------|--------------------|------------------|-------------------|-----|------|----------------------|--------------------------------------------|
|                     |                |               |                    |                  | H                 | W   | L    |                      |                                            |
| 04-021/FIN/002      | 04-021         | Zehnder       | 3958               | 0.047            | 240               | 150 | 1800 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-022/FIN/001      | 04-022         | Zehnder       | 3948               | 0.047            | 240               | 150 | 1800 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-022/FIN/002      | 04-022         | Zehnder       | 3948               | 0.094            | 240               | 150 | 1800 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-025/FIN/001      | 04-025         | Zehnder       | 2490               | 0.030            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 04-025/FIN/002      | 04-025         | Zehnder       | 2490               | 0.060            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 06-002/FIN/001      | 06-002         | Zehnder       | 3925               | 0.047            | 240               | 150 | 1800 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 06-002/FIN/002      | 06-002         | Zehnder       | 2616               | 0.031            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 06-002/FIN/003      | 06-002         | Zehnder       | 1962               | 0.023            | 240               | 150 | 900  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 06-C04/FIN/001      | 06-C04         | Zehnder       | 3613               | 0.086            | 240               | 150 | 1800 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 06-C04/FIN/002      | 06-C04         | Zehnder       | 3011               | 0.036            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| 06-C04/FIN/003      | 06-C04         | Zehnder       | 3613               | 0.043            | 240               | 150 | 1800 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-001/FIN/001      | GF-001         | Zehnder       | 2455               | 0.029            | 240               | 150 | 1800 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-001/FIN/002      | GF-001         | Zehnder       | 818                | 0.083            | 240               | 150 | 600  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-001/FIN/003      | GF-001         | Zehnder       | 1637               | 0.020            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-001/FIN/004      | GF-001         | Zehnder       | 818                | 0.010            | 240               | 150 | 600  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-001/FIN/005      | GF-001         | Zehnder       | 1228               | 0.015            | 240               | 150 | 900  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-001/FIN/006      | GF-001         | Zehnder       | 409                | 0.005            | 240               | 150 | 300  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-001/FIN/007      | GF-001         | Zehnder       | 1228               | 0.015            | 240               | 150 | 900  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-001/FIN/008      | GF-001         | Zehnder       | 1228               | 0.015            | 240               | 150 | 900  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-001/FIN/009      | GF-001         | Zehnder       | 1228               | 0.015            | 240               | 150 | 900  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-001/FIN/010      | GF-001         | Zehnder       | 409                | 0.005            | 240               | 150 | 300  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-001/FIN/011      | GF-001         | Zehnder       | 1637               | 0.073            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-003/FIN/001      | GF-003         | Zehnder       | 2486               | 0.054            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-003/FIN/002      | GF-003         | Zehnder       | 1989               | 0.024            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-007/FIN/001      | GF-007         | Zehnder       | 3181               | 0.038            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-007/FIN/002      | GF-007         | Zehnder       | 3181               | 0.114            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-007/FIN/003      | GF-007         | Zehnder       | 3181               | 0.038            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-008/FIN/001      | GF-008         | Zehnder       | 2448               | 0.029            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-008/FIN/002      | GF-008         | Zehnder       | 2448               | 0.117            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-008/FIN/003      | GF-008         | Zehnder       | 2937               | 0.035            | 240               | 150 | 1800 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-008/FIN/004      | GF-008         | Zehnder       | 1958               | 0.023            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-008/FIN/005      | GF-008         | Zehnder       | 1469               | 0.018            | 240               | 150 | 900  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-008/FIN/006      | GF-008         | Zehnder       | 1469               | 0.018            | 240               | 150 | 900  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-008/FIN/007      | GF-008         | Zehnder       | 1958               | 0.023            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-008/FIN/008      | GF-008         | Zehnder       | 1469               | 0.018            | 240               | 150 | 900  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-008/FIN/009      | GF-008         | Zehnder       | 979                | 0.012            | 240               | 150 | 600  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-008/FIN/010      | GF-008         | Zehnder       | 1469               | 0.018            | 240               | 150 | 900  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-028/FIN/001      | GF-028         | Zehnder       | 3979               | 0.048            | 240               | 150 | 1800 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-028/FIN/002      | GF-028         | Zehnder       | 3979               | 0.048            | 240               | 150 | 1800 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-029/FIN/001      | GF-029         | Zehnder       | 1883               | 0.023            | 240               | 150 | 900  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-029/FIN/001      | GF-029         | Zehnder       | 3138               | 0.038            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-029/FIN/002      | GF-029         | Zehnder       | 3138               | 0.038            | 240               | 150 | 1500 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-029/FIN/002      | GF-029         | Zehnder       | 628                | 0.008            | 240               | 150 | 300  | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| GF-029/FIN/003      | GF-029         | Zehnder       | 628                | 0.105            | 240               | 150 | 300  | Lateo Finned Emitter | Same end connections. Vertical Orientation |

|                                                             |                                    |                       |      |            |      |
|-------------------------------------------------------------|------------------------------------|-----------------------|------|------------|------|
| <div>ARUP</div> <div>OUR TOWN HALL</div> <div>PROJECT</div> | Job No.                            |                       | Rev. |            |      |
|                                                             | 256650                             | Work Stage 4 Issue    | P04  |            |      |
|                                                             | Doc. Ref. OTH-ARU-TH-ZZ-SCH-B-0011 |                       |      |            |      |
|                                                             | Made by                            | CH                    | Date | 07/10/2019 | Chd. |
| Job Title                                                   |                                    | Our Town Hall Project |      |            |      |
| Schedule                                                    |                                    | Finned Tube Emitters  |      |            |      |

| Equipment Reference | Room Reference | Manufacturer* | Emitter Output (W) | Flow Rate (kg/s) | Overall Dims (mm) |     |      | Type                 | Notes                                      |
|---------------------|----------------|---------------|--------------------|------------------|-------------------|-----|------|----------------------|--------------------------------------------|
|                     |                |               |                    |                  | H                 | W   | L    |                      |                                            |
| GF-031/FIN/001      | GF-031         | Zehnder       | 3980               | 0.048            | 240               | 150 | 1800 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| LG-005/FIN/001      | LG-005         | Zehnder       | 2653               | 0.032            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |
| LG-005/FIN/002      | LG-005         | Zehnder       | 2653               | 0.032            | 240               | 150 | 1200 | Lateo Finned Emitter | Same end connections. Vertical Orientation |

Accessories & Additional Information

This datasheet shall be read in conjunction with all other datasheets, drawings and specifications.

Refer to Mechanical Particular specification for the design criteria.

Finned tube selections based on Zehnder. Alternative selections shall be equal and approved.

Valves shall be rated to close against the full duty pump head.

LTHW flow and return temperatures are 80°C and 60°C, respectively.

All finned tubes to be provided complete with manufacturers floor/wall mountings as described.

All finned tubes to be tested to 10 bar pressure

Finned tubes to be BMS controlled via pressure independent control valves. Refer to BMS and Automatic Controls specification for the details.

Factory finished to RAL colour to be agreed with architect.







|                                                             |                       |           |                          |      |            |      |    |
|-------------------------------------------------------------|-----------------------|-----------|--------------------------|------|------------|------|----|
| <div>ARUP</div> <div>OUR TOWN HALL</div> <div>PROJECT</div> |                       | Job No.   |                          | Rev. |            |      |    |
|                                                             |                       | 256650    | Work Stage 4 Issue       | P04  |            |      |    |
|                                                             |                       |           |                          |      |            |      |    |
| Job Title                                                   | Our Town Hall Project | Doc. Ref. | OTH-ARU-TH-ZZ-SCH-B-0011 |      |            |      |    |
| Schedule                                                    | LTHW 2 Port PIVCs     | Made by   | CH                       | Date | 07/10/2019 | Chd. | CH |

| Valve ref       | Floor Level | Serving | Flow Rate (kg/s) | Line size (mm) | Notes |  |  |  |  |  |
|-----------------|-------------|---------|------------------|----------------|-------|--|--|--|--|--|
| LG-057/PCV/001  | LG          | LG-057  | 0.195            | 20ø-20ø        |       |  |  |  |  |  |
| LG-046a/PCV/001 | LG          | LG-046a | 0.025            | 15ø-15ø        |       |  |  |  |  |  |
| LG-046b/PCV/002 | LG          | LG-046b | 0.021            | 15ø-15ø        |       |  |  |  |  |  |
| LG-046/PCV/002  | LG          | LG-046  | 0.021            | 15ø-15ø        |       |  |  |  |  |  |
| LG-046e/PCV/001 | LG          | LG-046e | 0.005            | 15ø-15ø        |       |  |  |  |  |  |
| LG-046e/PCV/002 | LG          | LG-046e | 0.005            | 15ø-15ø        |       |  |  |  |  |  |
| LG-005/PCV/001  | LG          | LG-005  | 0.018            | 15ø-15ø        |       |  |  |  |  |  |
| LG-004/PCV/005  | LG          | LG-004  | 0.012            | 15ø-15ø        |       |  |  |  |  |  |
| LG-004/PCV/004  | LG          | LG-004  | 0.025            | 15ø-15ø        |       |  |  |  |  |  |
| LG-004/PCV/003  | LG          | LG-004  | 0.025            | 15ø-15ø        |       |  |  |  |  |  |
| LG-004/PCV/001  | LG          | LG-004  | 0.015            | 15ø-15ø        |       |  |  |  |  |  |
| LG-004/PCV/002  | LG          | LG-004  | 0.029            | 15ø-15ø        |       |  |  |  |  |  |
| 01-022/PCV/001  | 01          | 01-022  | 0.053            | 15ø-15ø        |       |  |  |  |  |  |
| 01-021/PCV/002  | 01          | 01-021  | 0.044            | 15ø-15ø        |       |  |  |  |  |  |
| 01-022/PCV/002  | 01          | 01-022  | 0.033            | 15ø-15ø        |       |  |  |  |  |  |
| 01-008/PCV/001  | 01          | 01-008  | 0.008            | 15ø-15ø        |       |  |  |  |  |  |
| 01-010/PCV/001  | 01          | 01-010  | 0.076            | 15ø-15ø        |       |  |  |  |  |  |
| 01-016/PCV/001  | 01          | 01-016  | 0.032            | 15ø-15ø        |       |  |  |  |  |  |
| 01-023/PCV/001  | 01          | 01-023  | 0.043            | 15ø-15ø        |       |  |  |  |  |  |
| 01-029/PCV/001  | 01          | 01-029  | 0.045            | 15ø-15ø        |       |  |  |  |  |  |
| 01-029/PCV/002  | 01          | 01-029  | 0.027            | 15ø-15ø        |       |  |  |  |  |  |
| 01-R15/PCV/001  | 01          | 01-R15  | 0.508            | 50ø-50ø        |       |  |  |  |  |  |
| 02-R29/PCV/001  | 02          | 02-R29  | 0.492            | 32ø-32ø        |       |  |  |  |  |  |
| 01-018/PCV/001  | 01          | 01-018  | 0.089            | 15ø-15ø        |       |  |  |  |  |  |
| 01-017/PCV/001  | 01          | 01-017  | 0.094            | 15ø-15ø        |       |  |  |  |  |  |
| 01-026/PCV/002  | 01          | 01-026  | 0.056            | 15ø-15ø        |       |  |  |  |  |  |
| 01-028/PCV/001  | 01          | 01-028  | 0.035            | 15ø-15ø        |       |  |  |  |  |  |
| 01-028/PCV/002  | 01          | 01-028  | 0.040            | 15ø-15ø        |       |  |  |  |  |  |
| 01-027/PCV/001  | 01          | 01-027  | 0.072            | 15ø-15ø        |       |  |  |  |  |  |
| 01-001/PCV/006  | 01          | 01-001  | 0.017            | 15ø-15ø        |       |  |  |  |  |  |
| 01-001/PCV/007  | 01          | 01-001  | 0.034            | 15ø-15ø        |       |  |  |  |  |  |
| 01-001/PCV/005  | 01          | 01-001  | 0.017            | 15ø-15ø        |       |  |  |  |  |  |
| 01-003/PCV/006  | 01          | 01-003  | 0.024            | 15ø-15ø        |       |  |  |  |  |  |
| 01-001/PCV/004  | 01          | 01-001  | 0.017            | 15ø-15ø        |       |  |  |  |  |  |
| 01-001/PCV/003  | 01          | 01-001  | 0.017            | 15ø-15ø        |       |  |  |  |  |  |
| 01-001/PCV/002  | 01          | 01-001  | 0.017            | 15ø-15ø        |       |  |  |  |  |  |
| 01-001/PCV/001  | 01          | 01-001  | 0.068            | 15ø-15ø        |       |  |  |  |  |  |
| 01-003/PCV/005  | 01          | 01-003  | 0.048            | 15ø-15ø        |       |  |  |  |  |  |
| 01-003/PCV/004  | 01          | 01-003  | 0.024            | 15ø-15ø        |       |  |  |  |  |  |
| 01-003/PCV/003  | 01          | 01-003  | 0.071            | 15ø-15ø        |       |  |  |  |  |  |
| 01-001/PCV/011  | 01          | 01-001  | 0.057            | 15ø-15ø        |       |  |  |  |  |  |
| 01-001/PCV/010  | 01          | 01-001  | 0.057            | 15ø-15ø        |       |  |  |  |  |  |
| 01-001/PCV/009  | 01          | 01-001  | 0.057            | 15ø-15ø        |       |  |  |  |  |  |
| 01-001/PCV/008  | 01          | 01-001  | 0.057            | 15ø-15ø        |       |  |  |  |  |  |
| GF-004/PCV/001  | GF          | GF-004  | 0.079            | 15ø-15ø        |       |  |  |  |  |  |
| GF-004/PCV/002  | GF          | GF-004  | 0.079            | 15ø-15ø        |       |  |  |  |  |  |
| GF-004/PCV/003  | GF          | GF-004  | 0.079            | 15ø-15ø        |       |  |  |  |  |  |
| 01-004/PCV/001  | 01          | 01-004  | 0.079            | 15ø-15ø        |       |  |  |  |  |  |
| 01-004/PCV/002  | 01          | 01-004  | 0.079            | 15ø-15ø        |       |  |  |  |  |  |
| 01-004/PCV/003  | 01          | 01-004  | 0.024            | 15ø-15ø        |       |  |  |  |  |  |
| 01-004/PCV/004  | 01          | 01-004  | 0.024            | 15ø-15ø        |       |  |  |  |  |  |
| 01-003/PCV/001  | 01          | 01-003  | 0.024            | 15ø-15ø        |       |  |  |  |  |  |
| 01-003/PCV/002  | 01          | 01-003  | 0.024            | 15ø-15ø        |       |  |  |  |  |  |
| 01-004/PCV/005  | 01          | 01-004  | 0.024            | 15ø-15ø        |       |  |  |  |  |  |
| 01-004/PCV/006  | 01          | 01-004  | 0.024            | 15ø-15ø        |       |  |  |  |  |  |
| 01-005/PCV/001  | 01          | 01-005  | 0.026            | 15ø-15ø        |       |  |  |  |  |  |
| 01-005/PCV/002  | 01          | 01-005  | 0.024            | 15ø-15ø        |       |  |  |  |  |  |
| 01-005/PCV/003  | 01          | 01-005  | 0.079            | 15ø-15ø        |       |  |  |  |  |  |
| 01-005/PCV/008  | 01          | 01-005  | 0.079            | 15ø-15ø        |       |  |  |  |  |  |
| 01-005/PCV/013  | 01          | 01-005  | 0.079            | 15ø-15ø        |       |  |  |  |  |  |
| 01-005/PCV/004  | 01          | 01-005  | 0.024            | 15ø-15ø        |       |  |  |  |  |  |
| 01-005/PCV/009  | 01          | 01-005  | 0.024            | 15ø-15ø        |       |  |  |  |  |  |
| 01-005/PCV/010  | 01          | 01-005  | 0.024            | 15ø-15ø        |       |  |  |  |  |  |
| 01-006/PCV/009  | 01          | 01-006  | 0.026            | 15ø-15ø        |       |  |  |  |  |  |
| 01-006/PCV/008  | 01          | 01-006  | 0.079            | 15ø-15ø        |       |  |  |  |  |  |
| 01-006/PCV/007  | 01          | 01-006  | 0.079            | 15ø-15ø        |       |  |  |  |  |  |
| 01-006/PCV/007  | 01          | 01-006  | 0.079            | 15ø-15ø        |       |  |  |  |  |  |
| 01-006/PCV/006  | 01          | 01-006  | 0.079            | 15ø-15ø        |       |  |  |  |  |  |
| 01-005/PCV/005  | 01          | 01-005  | 0.048            | 15ø-15ø        |       |  |  |  |  |  |
| 01-005/PCV/006  | 01          | 01-005  | 0.024            | 15ø-15ø        |       |  |  |  |  |  |
| 01-006/PCV/002  | 01          | 01-006  | 0.048            | 15ø-15ø        |       |  |  |  |  |  |
| 01-006/PCV/003  | 01          | 01-006  | 0.048            | 15ø-15ø        |       |  |  |  |  |  |
| 01-006/PCV/004  | 01          | 01-006  | 0.048            | 15ø-15ø        |       |  |  |  |  |  |
| 01-006/PCV/005  | 01          | 01-006  | 0.048            | 15ø-15ø        |       |  |  |  |  |  |
| 01-028/PCV/003  | 01          | 01-028  | 0.089            | 15ø-15ø        |       |  |  |  |  |  |
| 01-027/PCV/002  | 01          | 01-027  | 0.111            | 15ø-15ø        |       |  |  |  |  |  |
| 01-026/PCV/001  | 01          | 01-026  | 0.125            | 15ø-15ø        |       |  |  |  |  |  |

ARUP

OUR TOWN HALL

PROJECT

Job Title

Our Town Hall Project

Schedule

LTHW 2 Port PIVCs

Job No.

256650

Rev.

P04

Work Stage 4 Issue

Doc. Ref.

OTH-ARU-TH-ZZ-SCH-B-0011

Made by

CH

Date

07/10/2019

Chd.

CH

| Valve ref       | Floor Level | Serving | Flow Rate (kg/s) | Line size (mm) | Notes |  |  |  |  |  |
|-----------------|-------------|---------|------------------|----------------|-------|--|--|--|--|--|
| 01-033/PCV/002  | 01          | 01-033  | 0.040            | 15ø-15ø        |       |  |  |  |  |  |
| 01-033/PCV/003  | 01          | 01-033  | 0.040            | 15ø-15ø        |       |  |  |  |  |  |
| 01-033/PCV/004  | 01          | 01-033  | 0.040            | 15ø-15ø        |       |  |  |  |  |  |
| 01-033/PCV/005  | 01          | 01-033  | 0.040            | 15ø-15ø        |       |  |  |  |  |  |
| 01-033/PCV/006  | 01          | 01-033  | 0.040            | 15ø-15ø        |       |  |  |  |  |  |
| 01-031/PCV/001  | 01          | 01-031  | 0.020            | 15ø-15ø        |       |  |  |  |  |  |
| 01-032/PCV/001  | 01          | 01-032  | 0.017            | 15ø-15ø        |       |  |  |  |  |  |
| 01-032/PCV/002  | 01          | 01-032  | 0.013            | 15ø-15ø        |       |  |  |  |  |  |
| 01-033/PCV/007  | 01          | 01-033  | 0.040            | 15ø-15ø        |       |  |  |  |  |  |
| 01-033/PCV/008  | 01          | 01-033  | 0.040            | 15ø-15ø        |       |  |  |  |  |  |
| 01-033/PCV/009  | 01          | 01-033  | 0.040            | 15ø-15ø        |       |  |  |  |  |  |
| 005---/PCV/009  | 00          | 005---/ | 0.032            | 15ø-15ø        |       |  |  |  |  |  |
| 005---/PCV/007  | 00          | 005---/ | 0.032            | 15ø-15ø        |       |  |  |  |  |  |
| 005---/PCV/011  | 00          | 005---/ | 0.032            | 15ø-15ø        |       |  |  |  |  |  |
| 01-005/PCV/012  | 01          | 01-005  | 0.032            | 15ø-15ø        |       |  |  |  |  |  |
| 003---/PCV/007  | 00          | 003---/ | 0.108            | 15ø-15ø        |       |  |  |  |  |  |
| 003---/PCV/008  | 00          | 003---/ | 0.108            | 15ø-15ø        |       |  |  |  |  |  |
| 01-007/PCV/002  | 01          | 01-007  | 0.022            | 15ø-15ø        |       |  |  |  |  |  |
| 01-007/PCV/001  | 01          | 01-007  | 0.030            | 15ø-15ø        |       |  |  |  |  |  |
| 01-002/PCV/003  | 01          | 01-002  | 0.024            | 15ø-15ø        |       |  |  |  |  |  |
| 01-002/PCV/004  | 01          | 01-002  | 0.024            | 15ø-15ø        |       |  |  |  |  |  |
| 01-002/PCV/001  | 01          | 01-002  | 0.024            | 15ø-15ø        |       |  |  |  |  |  |
| 01-002/PCV/002  | 01          | 01-002  | 0.024            | 15ø-15ø        |       |  |  |  |  |  |
| 01-006/PCV/001  | 01          | 01-006  | 0.215            | 20ø-20ø        |       |  |  |  |  |  |
| 02-008/PCV/001  | 02          | 02-008  | 0.041            | 15ø-15ø        |       |  |  |  |  |  |
| 02-015/PCV/001  | 02          | 02-015  | 0.041            | 15ø-15ø        |       |  |  |  |  |  |
| 02-015/PCV/002  | 02          | 02-015  | 0.041            | 15ø-15ø        |       |  |  |  |  |  |
| 02-017/PCV/001  | 02          | 02-017  | 0.064            | 15ø-15ø        |       |  |  |  |  |  |
| 02-021/PCV/001  | 02          | 02-021  | 0.059            | 15ø-15ø        |       |  |  |  |  |  |
| 02-013/PCV/001  | 02          | 02-013  | 0.051            | 15ø-15ø        |       |  |  |  |  |  |
| 03-027/PCV/001  | 03          | 03-027  | 0.029            | 15ø-15ø        |       |  |  |  |  |  |
| 02-022/PCV/001  | 02          | 02-022  | 0.042            | 15ø-15ø        |       |  |  |  |  |  |
| 02-022/PCV/002  | 02          | 02-022  | 0.084            | 15ø-15ø        |       |  |  |  |  |  |
| 02-021/PCV/002  | 02          | 02-021  | 0.059            | 15ø-15ø        |       |  |  |  |  |  |
| 02-020/PCV/001  | 02          | 02-020  | 0.119            | 15ø-15ø        |       |  |  |  |  |  |
| 02-018/PCV/001  | 02          | 02-018  | 0.104            | 15ø-15ø        |       |  |  |  |  |  |
| 02-013/PCV/002  | 02          | 02-013  | 0.051            | 15ø-15ø        |       |  |  |  |  |  |
| 02-030/PCV/001  | 02          | 02-030  | 0.026            | 15ø-15ø        |       |  |  |  |  |  |
| 02-030/PCV/002  | 02          | 02-030  | 0.026            | 15ø-15ø        |       |  |  |  |  |  |
| 02-030/PCV/003  | 02          | 02-030  | 0.026            | 15ø-15ø        |       |  |  |  |  |  |
| 02-029/PCV/001  | 02          | 02-029  | 0.026            | 15ø-15ø        |       |  |  |  |  |  |
| 02-029/PCV/002  | 02          | 02-029  | 0.017            | 15ø-15ø        |       |  |  |  |  |  |
| 02-029/PCV/003  | 02          | 02-029  | 0.026            | 15ø-15ø        |       |  |  |  |  |  |
| 02-019/PCV/001  | 02          | 02-019  | 0.025            | 15ø-15ø        |       |  |  |  |  |  |
| 04-R15/PCV/001  | 04          | 04-R15  | 0.000            | 40ø-40ø        |       |  |  |  |  |  |
| 03-C01h/PCV/001 | 03          | 03-C01h | 0.031            | 15ø-15ø        |       |  |  |  |  |  |
| 03-025/PCV/001  | 03          | 03-025  | 0.014            | 15ø-15ø        |       |  |  |  |  |  |
| 03-025/PCV/002  | 03          | 03-025  | 0.013            | 15ø-15ø        |       |  |  |  |  |  |
| 03-022/PCV/001  | 03          | 03-022  | 0.069            | 15ø-15ø        |       |  |  |  |  |  |
| 03-021/PCV/001  | 03          | 03-021  | 0.043            | 15ø-15ø        |       |  |  |  |  |  |
| 03-021/PCV/002  | 03          | 03-021  | 0.043            | 15ø-15ø        |       |  |  |  |  |  |
| 03-019/PCV/002  | 03          | 03-019  | 0.021            | 15ø-15ø        |       |  |  |  |  |  |
| 03-019/PCV/001  | 03          | 03-019  | 0.021            | 15ø-15ø        |       |  |  |  |  |  |
| 03-015/PCV/001  | 03          | 03-015  | 0.087            | 15ø-15ø        |       |  |  |  |  |  |
| 03-016/PCV/001  | 03          | 03-016  | 0.017            | 15ø-15ø        |       |  |  |  |  |  |
| 03-016/PCV/002  | 03          | 03-016  | 0.017            | 15ø-15ø        |       |  |  |  |  |  |
| 03-016/PCV/003  | 03          | 03-016  | 0.017            | 15ø-15ø        |       |  |  |  |  |  |
| 03-012/PCV/001  | 03          | 03-012  | 0.032            | 15ø-15ø        |       |  |  |  |  |  |
| 03-012/PCV/002  | 03          | 03-012  | 0.054            | 15ø-15ø        |       |  |  |  |  |  |
| 03-003/PCV/001  | 03          | 03-003  | 0.020            | 15ø-15ø        |       |  |  |  |  |  |
| 04-021/PCV/001  | 04          | 04-021  | 0.095            | 15ø-15ø        |       |  |  |  |  |  |
| 04-019a/PCV/001 | 04          | 04-019a | 0.060            | 15ø-15ø        |       |  |  |  |  |  |
| 04-019/PCV/001  | 04          | 04-019  | 0.075            | 15ø-15ø        |       |  |  |  |  |  |
| 04-019/PCV/002  | 04          | 04-019  | 0.023            | 15ø-15ø        |       |  |  |  |  |  |
| 04-001/PCV/001  | 04          | 04-001  | 0.061            | 15ø-15ø        |       |  |  |  |  |  |
| 04-002/PCV/001  | 04          | 04-002  | 0.026            | 15ø-15ø        |       |  |  |  |  |  |
| 04-003/PCV/001  | 04          | 04-003  | 0.029            | 15ø-15ø        |       |  |  |  |  |  |
| 04-002a/PCV/001 | 04          | 04-002a | 0.021            | 15ø-15ø        |       |  |  |  |  |  |
| 04-003a/PCV/001 | 04          | 04-003a | 0.029            | 15ø-15ø        |       |  |  |  |  |  |
| 04-004/PCV/001  | 04          | 04-004  | 0.025            | 15ø-15ø        |       |  |  |  |  |  |
| 04-004a/PCV/001 | 04          | 04-004a | 0.025            | 15ø-15ø        |       |  |  |  |  |  |
| 04-008/PCV/001  | 04          | 04-008  | 0.076            | 15ø-15ø        |       |  |  |  |  |  |
| 04-005/PCV/001  | 04          | 04-005  | 0.044            | 15ø-15ø        |       |  |  |  |  |  |
| 04-006/PCV/001  | 04          | 04-006  | 0.032            | 15ø-15ø        |       |  |  |  |  |  |
| 04-007/PCV/001  | 04          | 04-007  | 0.039            | 15ø-15ø        |       |  |  |  |  |  |
| 04-009/PCV/001  | 04          | 04-009  | 0.006            | 15ø-15ø        |       |  |  |  |  |  |
| 04-009/PCV/002  | 04          | 04-009  | 0.012            | 15ø-15ø        |       |  |  |  |  |  |

|                                      |                       |                                         |                    |            |  |
|--------------------------------------|-----------------------|-----------------------------------------|--------------------|------------|--|
| <div>ARUP</div>                      | OUR TOWN HALL PROJECT | Job No.                                 |                    | Rev.       |  |
|                                      |                       | 256650                                  | Work Stage 4 Issue | P04        |  |
|                                      |                       |                                         |                    |            |  |
| Job Title      Our Town Hall Project |                       | Doc. Ref.      OTH-ARU-TH-ZZ-SCH-B-0011 |                    |            |  |
| Schedule      LTHW 2 Port PIVCs      |                       | Made by    CH                           | Date    07/10/2019 | Chd.    CH |  |

| Valve ref       | Floor Level | Serving | Flow Rate (kg/s) | Line size (mm) | Notes |  |  |  |  |  |
|-----------------|-------------|---------|------------------|----------------|-------|--|--|--|--|--|
| 04-009/PCV/003  | 04          | 04-009  | 0.012            | 15ø-15ø        |       |  |  |  |  |  |
| 04-029/PCV/001  | 04          | 04-029  | 0.041            | 15ø-15ø        |       |  |  |  |  |  |
| 04-029/PCV/002  | 04          | 04-029  | 0.041            | 15ø-15ø        |       |  |  |  |  |  |
| 04-016/PCV/001  | 04          | 04-016  | 0.013            | 15ø-15ø        |       |  |  |  |  |  |
| 04-016/PCV/002  | 04          | 04-016  | 0.033            | 15ø-15ø        |       |  |  |  |  |  |
| 04-016/PCV/003  | 04          | 04-016  | 0.038            | 15ø-15ø        |       |  |  |  |  |  |
| 04-016/PCV/004  | 04          | 04-016  | 0.038            | 15ø-15ø        |       |  |  |  |  |  |
| 04-016/PCV/005  | 04          | 04-016  | 0.038            | 15ø-15ø        |       |  |  |  |  |  |
| 04-016/PCV/006  | 04          | 04-016  | 0.005            | 15ø-15ø        |       |  |  |  |  |  |
| 04-016/PCV/007  | 04          | 04-016  | 0.005            | 15ø-15ø        |       |  |  |  |  |  |
| 04-016/PCV/008  | 04          | 04-016  | 0.051            | 15ø-15ø        |       |  |  |  |  |  |
| 04-017/PCV/001  | 04          | 04-017  | 0.048            | 15ø-15ø        |       |  |  |  |  |  |
| 04-018/PCV/001  | 04          | 04-018  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| 04-018/PCV/002  | 04          | 04-018  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| 05-007/PCV/001  | 05          | 05-007  | 0.024            | 15ø-15ø        |       |  |  |  |  |  |
| 05-007/PCV/002  | 05          | 05-007  | 0.024            | 15ø-15ø        |       |  |  |  |  |  |
| 05-007/PCV/003  | 05          | 05-007  | 0.024            | 15ø-15ø        |       |  |  |  |  |  |
| 04-012a/PCV/001 | 04          | 04-012a | 0.020            | 15ø-15ø        |       |  |  |  |  |  |
| 04-012/PCV/001  | 04          | 04-012  | 0.026            | 15ø-15ø        |       |  |  |  |  |  |
| 04-011a/PCV/001 | 04          | 04-011a | 0.026            | 15ø-15ø        |       |  |  |  |  |  |
| 04-011/PCV/001  | 04          | 04-011  | 0.027            | 15ø-15ø        |       |  |  |  |  |  |
| 04-010a/PCV/001 | 04          | 04-010a | 0.019            | 15ø-15ø        |       |  |  |  |  |  |
| 04-010/PCV/001  | 04          | 04-010  | 0.027            | 15ø-15ø        |       |  |  |  |  |  |
| 04-025/PCV/001  | 04          | 04-025  | 0.060            | 15ø-15ø        |       |  |  |  |  |  |
| 05-007/PCV/008  | 05          | 05-007  | 0.024            | 15ø-15ø        |       |  |  |  |  |  |
| 03-024/PCV/001  | 03          | 03-024  | 0.094            | 15ø-15ø        |       |  |  |  |  |  |
| 03-020/PCV/001  | 03          | 03-020  | 0.060            | 15ø-15ø        |       |  |  |  |  |  |
| 03-019/PCV/003  | 03          | 03-019  | 0.042            | 15ø-15ø        |       |  |  |  |  |  |
| 03-018/PCV/001  | 03          | 03-018  | 0.055            | 15ø-15ø        |       |  |  |  |  |  |
| 03-021/PCV/003  | 03          | 03-021  | 0.090            | 15ø-15ø        |       |  |  |  |  |  |
| 03-022/PCV/002  | 03          | 03-022  | 0.069            | 15ø-15ø        |       |  |  |  |  |  |
| 03-C01/PCV/005  | 03          | 03-C01  | 0.057            | 15ø-15ø        |       |  |  |  |  |  |
| 03-C01/PCV/004  | 03          | 03-C01  | 0.057            | 15ø-15ø        |       |  |  |  |  |  |
| 03-C01/PCV/003  | 03          | 03-C01  | 0.057            | 15ø-15ø        |       |  |  |  |  |  |
| 03-C01/PCV/002  | 03          | 03-C01  | 0.057            | 15ø-15ø        |       |  |  |  |  |  |
| 03-C01/PCV/001  | 03          | 03-C01  | 0.057            | 15ø-15ø        |       |  |  |  |  |  |
| 03-004/PCV/001  | 03          | 03-004  | 0.023            | 15ø-15ø        |       |  |  |  |  |  |
| 04-022/PCV/001  | 04          | 04-022  | 0.094            | 15ø-15ø        |       |  |  |  |  |  |
| 06-019/PCV/001  | 06          | 06-019  | 0.000            | 40ø-40ø        |       |  |  |  |  |  |
| 05-005/PCV/001  | 05          | 05-005  | 0.023            | 15ø-15ø        |       |  |  |  |  |  |
| 05-005/PCV/002  | 05          | 05-005  | 0.023            | 15ø-15ø        |       |  |  |  |  |  |
| 05-005/PCV/003  | 05          | 05-005  | 0.023            | 15ø-15ø        |       |  |  |  |  |  |
| 05-005/PCV/004  | 05          | 05-005  | 0.023            | 15ø-15ø        |       |  |  |  |  |  |
| 05-009/PCV/007  | 05          | 05-009  | 0.030            | 15ø-15ø        |       |  |  |  |  |  |
| 05-009/PCV/005  | 05          | 05-009  | 0.030            | 15ø-15ø        |       |  |  |  |  |  |
| 05-002a/PCV/001 | 05          | 05-002a | 0.023            | 15ø-15ø        |       |  |  |  |  |  |
| 05-002a/PCV/002 | 05          | 05-002a | 0.023            | 15ø-15ø        |       |  |  |  |  |  |
| 05-002a/PCV/003 | 05          | 05-002a | 0.023            | 15ø-15ø        |       |  |  |  |  |  |
| 05-003/PCV/001  | 05          | 05-003  | 0.017            | 15ø-15ø        |       |  |  |  |  |  |
| 05-004/PCV/001  | 05          | 05-004  | 0.104            | 15ø-15ø        |       |  |  |  |  |  |
| 05-004/PCV/002  | 05          | 05-004  | 0.070            | 15ø-15ø        |       |  |  |  |  |  |
| 05-011/PCV/001  | 05          | 05-011  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| 05-011/PCV/002  | 05          | 05-011  | 0.051            | 15ø-15ø        |       |  |  |  |  |  |
| 05-011/PCV/003  | 05          | 05-011  | 0.051            | 15ø-15ø        |       |  |  |  |  |  |
| 05-012/PCV/001  | 05          | 05-012  | 0.041            | 15ø-15ø        |       |  |  |  |  |  |
| 05-012/PCV/002  | 05          | 05-012  | 0.041            | 15ø-15ø        |       |  |  |  |  |  |
| 05-003/PCV/002  | 05          | 05-003  | 0.060            | 15ø-15ø        |       |  |  |  |  |  |
| 05-004/PCV/003  | 05          | 05-004  | 0.041            | 15ø-15ø        |       |  |  |  |  |  |
| 05-004/PCV/004  | 05          | 05-004  | 0.041            | 15ø-15ø        |       |  |  |  |  |  |
| 05-008/PCV/002  | 05          | 05-008  | 0.034            | 15ø-15ø        |       |  |  |  |  |  |
| 05-008/PCV/004  | 05          | 05-008  | 0.034            | 15ø-15ø        |       |  |  |  |  |  |
| 05-004/PCV/005  | 05          | 05-004  | 0.070            | 15ø-15ø        |       |  |  |  |  |  |
| 05-008/PCV/001  | 05          | 05-008  | 0.043            | 15ø-15ø        |       |  |  |  |  |  |
| 05-008/PCV/003  | 05          | 05-008  | 0.043            | 15ø-15ø        |       |  |  |  |  |  |
| 05-008/PCV/005  | 05          | 05-008  | 0.053            | 15ø-15ø        |       |  |  |  |  |  |
| 05-008/PCV/006  | 05          | 05-008  | 0.067            | 15ø-15ø        |       |  |  |  |  |  |
| 05-010/PCV/001  | 05          | 05-010  | 0.052            | 15ø-15ø        |       |  |  |  |  |  |
| 05-010/PCV/003  | 05          | 05-010  | 0.048            | 15ø-15ø        |       |  |  |  |  |  |
| 05-010/PCV/002  | 05          | 05-010  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| 05-010/PCV/004  | 05          | 05-010  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| 05-010/PCV/005  | 05          | 05-010  | 0.052            | 15ø-15ø        |       |  |  |  |  |  |
| 05-008/PCV/008  | 05          | 05-008  | 0.011            | 15ø-15ø        |       |  |  |  |  |  |
| 05-008/PCV/007  | 05          | 05-008  | 0.011            | 15ø-15ø        |       |  |  |  |  |  |
| 05-010/PCV/008  | 05          | 05-010  | 0.018            | 15ø-15ø        |       |  |  |  |  |  |
| 05-010/PCV/007  | 05          | 05-010  | 0.018            | 15ø-15ø        |       |  |  |  |  |  |
| 05-010/PCV/006  | 05          | 05-010  | 0.018            | 15ø-15ø        |       |  |  |  |  |  |
| 05-005/PCV/005  | 05          | 05-005  | 0.020            | 15ø-15ø        |       |  |  |  |  |  |

|                                                  |  |                       |                    |           |    |                          |            |      |    |
|--------------------------------------------------|--|-----------------------|--------------------|-----------|----|--------------------------|------------|------|----|
| <div>ARUP</div> <div>OUR TOWN HALL PROJECT</div> |  | Job No.               |                    | Rev.      |    |                          |            |      |    |
|                                                  |  | 256650                | Work Stage 4 Issue | P04       |    |                          |            |      |    |
|                                                  |  |                       |                    |           |    |                          |            |      |    |
| Job Title                                        |  | Our Town Hall Project |                    | Doc. Ref. |    | OTH-ARU-TH-ZZ-SCH-B-0011 |            |      |    |
| Schedule                                         |  | LTHW 2 Port PIVCs     |                    | Made by   | CH | Date                     | 07/10/2019 | Chd. | CH |

| Valve ref       | Floor Level | Serving | Flow Rate (kg/s) | Line size (mm) | Notes |  |  |  |  |  |
|-----------------|-------------|---------|------------------|----------------|-------|--|--|--|--|--|
| 05-005/PCV/006  | 05          | 05-005  | 0.017            | 15ø-15ø        |       |  |  |  |  |  |
| 05-005/PCV/007  | 05          | 05-005  | 0.020            | 15ø-15ø        |       |  |  |  |  |  |
| 05-005/PCV/008  | 05          | 05-005  | 0.017            | 15ø-15ø        |       |  |  |  |  |  |
| 05-007/PCV/004  | 05          | 05-007  | 0.020            | 15ø-15ø        |       |  |  |  |  |  |
| 05-007/PCV/005  | 05          | 05-007  | 0.018            | 15ø-15ø        |       |  |  |  |  |  |
| 05-007/PCV/006  | 05          | 05-007  | 0.020            | 15ø-15ø        |       |  |  |  |  |  |
| 05-007/PCV/007  | 05          | 05-007  | 0.018            | 15ø-15ø        |       |  |  |  |  |  |
| 05-009/PCV/001  | 05          | 05-009  | 0.020            | 15ø-15ø        |       |  |  |  |  |  |
| 05-009/PCV/002  | 05          | 05-009  | 0.018            | 15ø-15ø        |       |  |  |  |  |  |
| 05-009/PCV/003  | 05          | 05-009  | 0.020            | 15ø-15ø        |       |  |  |  |  |  |
| 05-009/PCV/004  | 05          | 05-009  | 0.018            | 15ø-15ø        |       |  |  |  |  |  |
| 05-006/PCV/003  | 05          | 05-006  | 0.020            | 15ø-15ø        |       |  |  |  |  |  |
| 05-006/PCV/004  | 05          | 05-006  | 0.020            | 15ø-15ø        |       |  |  |  |  |  |
| 05-006/PCV/002  | 05          | 05-006  | 0.020            | 15ø-15ø        |       |  |  |  |  |  |
| 05-006/PCV/001  | 05          | 05-006  | 0.020            | 15ø-15ø        |       |  |  |  |  |  |
| 05-004/PCV/006  | 05          | 05-004  | 0.021            | 15ø-15ø        |       |  |  |  |  |  |
| 05-004/PCV/007  | 05          | 05-004  | 0.021            | 15ø-15ø        |       |  |  |  |  |  |
| 05-004/PCV/008  | 05          | 05-004  | 0.021            | 15ø-15ø        |       |  |  |  |  |  |
| 05-004/PCV/009  | 05          | 05-004  | 0.021            | 15ø-15ø        |       |  |  |  |  |  |
| 05-004/PCV/010  | 05          | 05-004  | 0.021            | 15ø-15ø        |       |  |  |  |  |  |
| 05-004/PCV/011  | 05          | 05-004  | 0.021            | 15ø-15ø        |       |  |  |  |  |  |
| ---PCV/PCV/018  | --          | ---PCV  | 0.000            | 40ø-40ø        |       |  |  |  |  |  |
| ---PCV/PCV/019  | --          | ---PCV  | 0.000            | 40ø-40ø        |       |  |  |  |  |  |
| 05-006/PCV/007  | 05          | 05-006  | 0.053            | 15ø-15ø        |       |  |  |  |  |  |
| 05-006/PCV/008  | 05          | 05-006  | 0.080            | 15ø-15ø        |       |  |  |  |  |  |
| 05-006/PCV/006  | 05          | 05-006  | 0.080            | 15ø-15ø        |       |  |  |  |  |  |
| 05-006/PCV/005  | 05          | 05-006  | 0.053            | 15ø-15ø        |       |  |  |  |  |  |
| 05-C01/PCV/008  | 05          | 05-C01  | 0.057            | 15ø-15ø        |       |  |  |  |  |  |
| 05-C01/PCV/007  | 05          | 05-C01  | 0.057            | 15ø-15ø        |       |  |  |  |  |  |
| 05-C01/PCV/006  | 05          | 05-C01  | 0.057            | 15ø-15ø        |       |  |  |  |  |  |
| 05-C01/PCV/005  | 05          | 05-C01  | 0.057            | 15ø-15ø        |       |  |  |  |  |  |
| 05-C01/PCV/004  | 05          | 05-C01  | 0.057            | 15ø-15ø        |       |  |  |  |  |  |
| 05-C01/PCV/003  | 05          | 05-C01  | 0.057            | 15ø-15ø        |       |  |  |  |  |  |
| 05-C01/PCV/002  | 05          | 05-C01  | 0.057            | 15ø-15ø        |       |  |  |  |  |  |
| 05-C01/PCV/001  | 05          | 05-C01  | 0.057            | 15ø-15ø        |       |  |  |  |  |  |
| 05-009/PCV/006  | 05          | 05-009  | 0.030            | 15ø-15ø        |       |  |  |  |  |  |
| 06-001/PCV/001  | 06          | 06-001  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| 06-001/PCV/002  | 06          | 06-001  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| 06-003/PCV/001  | 06          | 06-003  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| 06-003/PCV/002  | 06          | 06-003  | 0.032            | 15ø-15ø        |       |  |  |  |  |  |
| 06-004/PCV/001  | 06          | 06-004  | 0.046            | 15ø-15ø        |       |  |  |  |  |  |
| 06-004/PCV/002  | 06          | 06-004  | 0.036            | 15ø-15ø        |       |  |  |  |  |  |
| 06-005/PCV/001  | 06          | 06-005  | 0.046            | 15ø-15ø        |       |  |  |  |  |  |
| 06-005/PCV/002  | 06          | 06-005  | 0.042            | 15ø-15ø        |       |  |  |  |  |  |
| 06-007/PCV/001  | 06          | 06-007  | 0.040            | 15ø-15ø        |       |  |  |  |  |  |
| 06-007/PCV/002  | 06          | 06-007  | 0.028            | 15ø-15ø        |       |  |  |  |  |  |
| 06-010/PCV/001  | 06          | 06-010  | 0.013            | 15ø-15ø        |       |  |  |  |  |  |
| 06-010/PCV/002  | 06          | 06-010  | 0.048            | 15ø-15ø        |       |  |  |  |  |  |
| 06-003/PCV/003  | 06          | 06-003  | 0.009            | 15ø-15ø        |       |  |  |  |  |  |
| 06-017/PCV/002  | 06          | 06-017  | 0.060            | 15ø-15ø        |       |  |  |  |  |  |
| 06-018/PCV/002  | 06          | 06-018  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| 06-019/PCV/005  | 06          | 06-019  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| 06-019/PCV/004  | 06          | 06-019  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| 06-004/PCV/003  | 06          | 06-004  | 0.068            | 15ø-15ø        |       |  |  |  |  |  |
| 06-C02b/PCV/001 | 06          | 06-C02b | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| 06-001/PCV/003  | 06          | 06-001  | 0.055            | 15ø-15ø        |       |  |  |  |  |  |
| 06-001/PCV/004  | 06          | 06-001  | 0.055            | 15ø-15ø        |       |  |  |  |  |  |
| 06-010/PCV/003  | 06          | 06-010  | 0.049            | 15ø-15ø        |       |  |  |  |  |  |
| 06-010/PCV/004  | 06          | 06-010  | 0.049            | 15ø-15ø        |       |  |  |  |  |  |
| 06-011/PCV/003  | 06          | 06-011  | 0.051            | 15ø-15ø        |       |  |  |  |  |  |
| 06-012/PCV/003  | 06          | 06-012  | 0.023            | 15ø-15ø        |       |  |  |  |  |  |
| 06-C02e/PCV/001 | 06          | 06-C02e | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| 06-009/PCV/001  | 06          | 06-009  | 0.017            | 15ø-15ø        |       |  |  |  |  |  |
| 06-009/PCV/002  | 06          | 06-009  | 0.017            | 15ø-15ø        |       |  |  |  |  |  |
| 06-009/PCV/003  | 06          | 06-009  | 0.017            | 15ø-15ø        |       |  |  |  |  |  |
| 06-C04b/PCV/001 | 06          | 06-C04b | 0.043            | 15ø-15ø        |       |  |  |  |  |  |
| 06-C04b/PCV/002 | 06          | 06-C04b | 0.086            | 15ø-15ø        |       |  |  |  |  |  |
| 06-022/PCV/001  | 06          | 06-022  | 0.023            | 15ø-15ø        |       |  |  |  |  |  |
| 06-022/PCV/002  | 06          | 06-022  | 0.060            | 15ø-15ø        |       |  |  |  |  |  |
| 06-022/PCV/003  | 06          | 06-022  | 0.060            | 15ø-15ø        |       |  |  |  |  |  |
| 06-021/PCV/001  | 06          | 06-021  | 0.060            | 15ø-15ø        |       |  |  |  |  |  |
| 06-021/PCV/002  | 06          | 06-021  | 0.060            | 15ø-15ø        |       |  |  |  |  |  |
| 06-020/PCV/001  | 06          | 06-020  | 0.056            | 15ø-15ø        |       |  |  |  |  |  |
| 06-020/PCV/002  | 06          | 06-020  | 0.056            | 15ø-15ø        |       |  |  |  |  |  |
| 06-019/PCV/002  | 06          | 06-019  | 0.065            | 15ø-15ø        |       |  |  |  |  |  |
| 06-019/PCV/003  | 06          | 06-019  | 0.065            | 15ø-15ø        |       |  |  |  |  |  |
| 06-018/PCV/001  | 06          | 06-018  | 0.069            | 15ø-15ø        |       |  |  |  |  |  |

|                                                  |                       |           |                          |      |            |      |    |
|--------------------------------------------------|-----------------------|-----------|--------------------------|------|------------|------|----|
| <div>ARUP</div> <div>OUR TOWN HALL PROJECT</div> |                       | Job No.   |                          | Rev. |            |      |    |
|                                                  |                       | 256650    | Work Stage 4 Issue       | P04  |            |      |    |
|                                                  |                       |           |                          |      |            |      |    |
| Job Title                                        | Our Town Hall Project | Doc. Ref. | OTH-ARU-TH-ZZ-SCH-B-0011 |      |            |      |    |
| Schedule                                         | LTHW 2 Port PIVCs     | Made by   | CH                       | Date | 07/10/2019 | Chd. | CH |

| Valve ref       | Floor Level | Serving | Flow Rate (kg/s) | Line size (mm) | Notes |  |  |  |  |  |
|-----------------|-------------|---------|------------------|----------------|-------|--|--|--|--|--|
| 06-017/PCV/001  | 06          | 06-017  | 0.032            | 15ø-15ø        |       |  |  |  |  |  |
| 06-016b/PCV/001 | 06          | 06-016b | 0.017            | 15ø-15ø        |       |  |  |  |  |  |
| 06-015/PCV/001  | 06          | 06-015  | 0.069            | 15ø-15ø        |       |  |  |  |  |  |
| 06-015/PCV/002  | 06          | 06-015  | 0.028            | 15ø-15ø        |       |  |  |  |  |  |
| 06-011/PCV/001  | 06          | 06-011  | 0.057            | 15ø-15ø        |       |  |  |  |  |  |
| 06-011/PCV/002  | 06          | 06-011  | 0.046            | 15ø-15ø        |       |  |  |  |  |  |
| 06-011/PCV/003  | 06          | 06-011  | 0.018            | 15ø-15ø        |       |  |  |  |  |  |
| 06-012/PCV/001  | 06          | 06-012  | 0.041            | 15ø-15ø        |       |  |  |  |  |  |
| 06-012/PCV/002  | 06          | 06-012  | 0.041            | 15ø-15ø        |       |  |  |  |  |  |
| 06-013/PCV/001  | 06          | 06-013  | 0.069            | 15ø-15ø        |       |  |  |  |  |  |
| 06-008/PCV/001  | 06          | 06-008  | 0.029            | 15ø-15ø        |       |  |  |  |  |  |
| 06-020/PCV/004  | 06          | 06-020  | 0.046            | 15ø-15ø        |       |  |  |  |  |  |
| 06-020/PCV/003  | 06          | 06-020  | 0.046            | 15ø-15ø        |       |  |  |  |  |  |
| 06-021/PCV/004  | 06          | 06-021  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| 06-021/PCV/003  | 06          | 06-021  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| LG-053/PCV/002  | LG          | LG-053  | 0.000            | 50ø-50ø        |       |  |  |  |  |  |
| LG-053/PCV/002  | LG          | LG-053  | 0.000            | 50ø-50ø        |       |  |  |  |  |  |
| 06-002/PCV/003  | 06          | 06-002  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| 06-002/PCV/002  | 06          | 06-002  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| 002---/PCV/001  | 00          | 002---/ | 0.009            | 15ø-15ø        |       |  |  |  |  |  |
| 06-006/PCV/001  | 06          | 06-006  | 0.032            | 15ø-15ø        |       |  |  |  |  |  |
| 06-006/PCV/002  | 06          | 06-006  | 0.032            | 15ø-15ø        |       |  |  |  |  |  |
| ---PCV/PCV/010  | --          | ---PCV  | 0.000            | 40ø-40ø        |       |  |  |  |  |  |
| 07-S16/PCV/001  | 07          | 07-S16  | 25.503           | 32ø-32ø        |       |  |  |  |  |  |
| 07-011/PCV/001  | 07          | 07-011  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| 07-007/PCV/001  | 07          | 07-007  | 0.017            | 15ø-15ø        |       |  |  |  |  |  |
| 07-005/PCV/001  | 07          | 07-005  | 0.051            | 15ø-15ø        |       |  |  |  |  |  |
| 07-004/PCV/002  | 07          | 07-004  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| 07-001/PCV/004  | 07          | 07-001  | 0.068            | 15ø-15ø        |       |  |  |  |  |  |
| 07-011/PCV/002  | 07          | 07-011  | 0.051            | 15ø-15ø        |       |  |  |  |  |  |
| 07-016/PCV/001  | 07          | 07-016  | 0.040            | 15ø-15ø        |       |  |  |  |  |  |
| 07-009/PCV/001  | 07          | 07-009  | 0.046            | 15ø-15ø        |       |  |  |  |  |  |
| 07-009/PCV/002  | 07          | 07-009  | 0.056            | 15ø-15ø        |       |  |  |  |  |  |
| 07-009/PCV/003  | 07          | 07-009  | 0.028            | 15ø-15ø        |       |  |  |  |  |  |
| 07-009/PCV/004  | 07          | 07-009  | 0.069            | 15ø-15ø        |       |  |  |  |  |  |
| 07-010/PCV/001  | 07          | 07-010  | 0.041            | 15ø-15ø        |       |  |  |  |  |  |
| 07-010/PCV/002  | 07          | 07-010  | 0.018            | 15ø-15ø        |       |  |  |  |  |  |
| 07-007/PCV/002  | 07          | 07-007  | 0.047            | 15ø-15ø        |       |  |  |  |  |  |
| 07-008/PCV/001  | 07          | 07-008  | 0.050            | 15ø-15ø        |       |  |  |  |  |  |
| 07-015/PCV/001  | 07          | 07-015  | 0.018            | 15ø-15ø        |       |  |  |  |  |  |
| 07-013/PCV/001  | 07          | 07-013  | 0.019            | 15ø-15ø        |       |  |  |  |  |  |
| 07-012/PCV/001  | 07          | 07-012  | 0.069            | 15ø-15ø        |       |  |  |  |  |  |
| 07-005/PCV/002  | 07          | 07-005  | 0.055            | 15ø-15ø        |       |  |  |  |  |  |
| 07-004/PCV/001  | 07          | 07-004  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| 07-003/PCV/001  | 07          | 07-003  | 0.025            | 15ø-15ø        |       |  |  |  |  |  |
| 07-002/PCV/001  | 07          | 07-002  | 0.025            | 15ø-15ø        |       |  |  |  |  |  |
| 07-001/PCV/005  | 07          | 07-001  | 0.068            | 15ø-15ø        |       |  |  |  |  |  |
| 07-001/PCV/002  | 07          | 07-001  | 0.068            | 15ø-15ø        |       |  |  |  |  |  |
| 07-001/PCV/001  | 07          | 07-001  | 0.068            | 15ø-15ø        |       |  |  |  |  |  |
| 07-001/PCV/003  | 07          | 07-001  | 0.018            | 15ø-15ø        |       |  |  |  |  |  |
| ---PCV/PCV/024  | --          | ---PCV  | 0.115            | 20ø-20ø        |       |  |  |  |  |  |
| ---PCV/PCV/025  | --          | ---PCV  | 0.115            | 20ø-20ø        |       |  |  |  |  |  |
| ---PCV/PCV/026  | --          | ---PCV  | 0.115            | 20ø-20ø        |       |  |  |  |  |  |
| GF-029/PCV/001  | GF          | GF-029  | 0.000            | 15ø-15ø        |       |  |  |  |  |  |
| GF-029/PCV/002  | GF          | GF-029  | 0.000            | 15ø-15ø        |       |  |  |  |  |  |
| GF-028/PCV/001  | GF          | GF-028  | 0.000            | 15ø-15ø        |       |  |  |  |  |  |
| GF-028/PCV/002  | GF          | GF-028  | 0.000            | 15ø-15ø        |       |  |  |  |  |  |
| GF-031/PCV/001  | GF          | GF-031  | 0.000            | 15ø-15ø        |       |  |  |  |  |  |
| GF-001/PCV/001  | GF          | GF-001  | 0.052            | 15ø-15ø        |       |  |  |  |  |  |
| GF-001/PCV/002  | GF          | GF-001  | 0.073            | 15ø-15ø        |       |  |  |  |  |  |
| GF-003/PCV/001  | GF          | GF-003  | 0.000            | 15ø-15ø        |       |  |  |  |  |  |
| GF-008/PCV/001  | GF          | GF-008  | 0.000            | 15ø-15ø        |       |  |  |  |  |  |
| GF-007/PCV/001  | GF          | GF-007  | 0.000            | 15ø-15ø        |       |  |  |  |  |  |
| GF-008/PCV/002  | GF          | GF-008  | 0.000            | 15ø-15ø        |       |  |  |  |  |  |
| ---PCV/PCV/004  | --          | ---PCV  | 0.813            | 40ø-40ø        |       |  |  |  |  |  |
| 01-R29/PCV/001  | 01          | 01-R29  | 0.490            | 32ø-32ø        |       |  |  |  |  |  |
| ---PCV/PCV/017  | --          | ---PCV  | 0.000            | 50ø-50ø        |       |  |  |  |  |  |
| GF-037/PCV/001  | GF          | GF-037  | 0.029            | 15ø-15ø        |       |  |  |  |  |  |
| GF-036/PCV/001  | GF          | GF-036  | 0.007            | 15ø-15ø        |       |  |  |  |  |  |
| GF-049/PCV/001  | GF          | GF-049  | 0.065            | 15ø-15ø        |       |  |  |  |  |  |
| GF-048/PCV/001  | GF          | GF-048  | 0.051            | 15ø-15ø        |       |  |  |  |  |  |
| GF-047/PCV/001  | GF          | GF-047  | 0.016            | 15ø-15ø        |       |  |  |  |  |  |
| GF-C02h/PCV/001 | GF          | GF-C02h | 0.047            | 15ø-15ø        |       |  |  |  |  |  |
| GF-030/PCV/001  | GF          | GF-030  | 0.047            | 15ø-15ø        |       |  |  |  |  |  |
| GF-C01k/PCV/001 | GF          | GF-C01k | 0.032            | 15ø-15ø        |       |  |  |  |  |  |
| GF-024/PCV/001  | GF          | GF-024  | 0.027            | 15ø-15ø        |       |  |  |  |  |  |
| GF-012/PCV/001  | GF          | GF-012  | 0.046            | 15ø-15ø        |       |  |  |  |  |  |

|                                                             |                       |           |                          |      |            |      |    |
|-------------------------------------------------------------|-----------------------|-----------|--------------------------|------|------------|------|----|
| <div>ARUP</div> <div>OUR TOWN HALL</div> <div>PROJECT</div> |                       | Job No.   |                          | Rev. |            |      |    |
|                                                             |                       | 256650    | Work Stage 4 Issue       | P04  |            |      |    |
|                                                             |                       |           |                          |      |            |      |    |
| Job Title                                                   | Our Town Hall Project | Doc. Ref. | OTH-ARU-TH-ZZ-SCH-B-0011 |      |            |      |    |
| Schedule                                                    | LTHW 2 Port PIVCs     | Made by   | CH                       | Date | 07/10/2019 | Chd. | CH |

| Valve ref       | Floor Level | Serving | Flow Rate (kg/s) | Line size (mm) | Notes |  |  |  |  |  |
|-----------------|-------------|---------|------------------|----------------|-------|--|--|--|--|--|
| GF-014/PCV/001  | GF          | GF-014  | 0.035            | 15ø-15ø        |       |  |  |  |  |  |
| GF-017/PCV/001  | GF          | GF-017  | 0.034            | 15ø-15ø        |       |  |  |  |  |  |
| GF-019/PCV/001  | GF          | GF-019  | 0.060            | 15ø-15ø        |       |  |  |  |  |  |
| GF-004/PCV/001  | GF          | GF-004  | 0.170            | 15ø-15ø        |       |  |  |  |  |  |
| GF-004/PCV/002  | GF          | GF-004  | 0.094            | 15ø-15ø        |       |  |  |  |  |  |
| GF-002/PCV/001  | GF          | GF-002  | 0.090            | 15ø-15ø        |       |  |  |  |  |  |
| GF-C01f/PCV/001 | GF          | GF-C01f | 0.087            | 32ø-32ø        |       |  |  |  |  |  |
| GF-S11/PCV/001  | GF          | GF-S11  | 0.338            | 32ø-32ø        |       |  |  |  |  |  |
| GF-C01g/PCV/001 | GF          | GF-C01g | 0.338            | 32ø-32ø        |       |  |  |  |  |  |
| GF-C02a/PCV/001 | GF          | GF-C02a | 0.339            | 32ø-32ø        |       |  |  |  |  |  |
| GF-C03a/PCV/001 | GF          | GF-C03a | 0.338            | 32ø-32ø        |       |  |  |  |  |  |
| LG-S11/PCV/001  | LG          | LG-S11  | 0.419            | 32ø-32ø        |       |  |  |  |  |  |
| GF-S06/PCV/001  | GF          | GF-S06  | 0.419            | 32ø-32ø        |       |  |  |  |  |  |
| GF-S09/PCV/001  | GF          | GF-S09  | 0.419            | 32ø-32ø        |       |  |  |  |  |  |
| 01-021/PCV/001  | 01          | 01-021  | 0.044            | 15ø-15ø        |       |  |  |  |  |  |
| ---PCV/PCV/002  | --          | ---PCV  | 0.537            | 32ø-32ø        |       |  |  |  |  |  |
| ---PCV/PCV/003  | --          | ---PCV  | 0.488            | 32ø-32ø        |       |  |  |  |  |  |
| 07-R01/PCV/001  | 07          | 07-R01  | 0.565            | 32ø-32ø        |       |  |  |  |  |  |
| ---PCV/PCV/005  | --          | ---PCV  | 0.819            | 40ø-40ø        |       |  |  |  |  |  |
| LG-053/PCV/001  | LG          | LG-053  | 0.040            | 15ø-15ø        |       |  |  |  |  |  |
| LG-053/PCV/002  | LG          | LG-053  | 0.145            | 20ø-20ø        |       |  |  |  |  |  |
| LG-C04b/PCV/001 | LG          | LG-C04b | 0.050            | 15ø-15ø        |       |  |  |  |  |  |
| LG-033/PCV/001  | LG          | LG-033  | 0.060            | 15ø-15ø        |       |  |  |  |  |  |
| LG-032/PCV/001  | LG          | LG-032  | 0.054            | 15ø-15ø        |       |  |  |  |  |  |
| LG-032/PCV/002  | LG          | LG-032  | 0.054            | 15ø-15ø        |       |  |  |  |  |  |
| LG-030/PCV/001  | LG          | LG-030  | 0.038            | 15ø-15ø        |       |  |  |  |  |  |
| LG-030/PCV/002  | LG          | LG-030  | 0.038            | 15ø-15ø        |       |  |  |  |  |  |
| LG-028/PCV/001  | LG          | LG-028  | 0.016            | 15ø-15ø        |       |  |  |  |  |  |
| LG-047/PCV/001  | LG          | LG-047  | 0.016            | 15ø-15ø        |       |  |  |  |  |  |
| LG-048/PCV/001  | LG          | LG-048  | 0.016            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C05c/PCV/001 | LG          | LG-C05c | 0.016            | 15ø-15ø        |       |  |  |  |  |  |
| LG-050/PCV/001  | LG          | LG-050  | 0.016            | 15ø-15ø        |       |  |  |  |  |  |
| LG-051/PCV/001  | LG          | LG-051  | 0.023            | 15ø-15ø        |       |  |  |  |  |  |
| LG-049/PCV/001  | LG          | LG-049  | 0.016            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C05a/PCV/001 | LG          | LG-C05a | 0.036            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C05a/PCV/002 | LG          | LG-C05a | 0.036            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C05a/PCV/003 | LG          | LG-C05a | 0.036            | 15ø-15ø        |       |  |  |  |  |  |
| LG-054/PCV/001  | LG          | LG-054  | 0.051            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C05g/PCV/001 | LG          | LG-C05g | 0.036            | 15ø-15ø        |       |  |  |  |  |  |
| LG-028f/PCV/001 | LG          | LG-028f | 0.010            | 15ø-15ø        |       |  |  |  |  |  |
| LG-046d/PCV/001 | LG          | LG-046d | 0.020            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C05/PCV/001  | LG          | LG-C05  | 0.025            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C05/PCV/002  | LG          | LG-C05  | 0.025            | 15ø-15ø        |       |  |  |  |  |  |
| LG-028g/PCV/001 | LG          | LG-028g | 0.005            | 15ø-15ø        |       |  |  |  |  |  |
| LG-054/PCV/002  | LG          | LG-054  | 0.042            | 15ø-15ø        |       |  |  |  |  |  |
| LG-054/PCV/003  | LG          | LG-054  | 0.051            | 15ø-15ø        |       |  |  |  |  |  |
| LG-028/PCV/002  | LG          | LG-028  | 0.028            | 15ø-15ø        |       |  |  |  |  |  |
| LG-057/PCV/002  | LG          | LG-057  | 0.023            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C04/PCV/001  | LG          | LG-C04  | 0.023            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C04/PCV/002  | LG          | LG-C04  | 0.023            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C04/PCV/003  | LG          | LG-C04  | 0.023            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C04/PCV/004  | LG          | LG-C04  | 0.023            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C04b/PCV/002 | LG          | LG-C04b | 0.027            | 15ø-15ø        |       |  |  |  |  |  |
| LG-034/PCV/001  | LG          | LG-034  | 0.066            | 15ø-15ø        |       |  |  |  |  |  |
| LG-036a/PCV/001 | LG          | LG-036a | 0.014            | 15ø-15ø        |       |  |  |  |  |  |
| LG-036/PCV/001  | LG          | LG-036  | 0.039            | 15ø-15ø        |       |  |  |  |  |  |
| LG-036/PCV/002  | LG          | LG-036  | 0.039            | 15ø-15ø        |       |  |  |  |  |  |
| LG-037/PCV/001  | LG          | LG-037  | 0.027            | 15ø-15ø        |       |  |  |  |  |  |
| LG-037/PCV/002  | LG          | LG-037  | 0.027            | 15ø-15ø        |       |  |  |  |  |  |
| LG-036/PCV/003  | LG          | LG-036  | 0.026            | 15ø-15ø        |       |  |  |  |  |  |
| LG-037/PCV/003  | LG          | LG-037  | 0.033            | 15ø-15ø        |       |  |  |  |  |  |
| LG-037/PCV/004  | LG          | LG-037  | 0.033            | 15ø-15ø        |       |  |  |  |  |  |
| LG-038/PCV/001  | LG          | LG-038  | 0.041            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C03/PCV/001  | LG          | LG-C03  | 0.052            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C03/PCV/002  | LG          | LG-C03  | 0.052            | 15ø-15ø        |       |  |  |  |  |  |
| LG-026a/PCV/001 | LG          | LG-026a | 0.011            | 15ø-15ø        |       |  |  |  |  |  |
| LG-026a/PCV/002 | LG          | LG-026a | 0.000            | 15ø-15ø        |       |  |  |  |  |  |
| LG-038/PCV/002  | LG          | LG-038  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| LG-038/PCV/003  | LG          | LG-038  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| LG-038/PCV/004  | LG          | LG-038  | 0.027            | 15ø-15ø        |       |  |  |  |  |  |
| LG-025/PCV/001  | LG          | LG-025  | 0.045            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C02/PCV/001  | LG          | LG-C02  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C02/PCV/002  | LG          | LG-C02  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C02/PCV/003  | LG          | LG-C02  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C02/PCV/004  | LG          | LG-C02  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C02/PCV/005  | LG          | LG-C02  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C02/PCV/006  | LG          | LG-C02  | 0.037            | 15ø-15ø        |       |  |  |  |  |  |

|                                                             |                       |         |                    |                          |      |            |      |    |
|-------------------------------------------------------------|-----------------------|---------|--------------------|--------------------------|------|------------|------|----|
| <div>ARUP</div> <div>OUR TOWN HALL</div> <div>PROJECT</div> |                       | Job No. |                    | Rev.                     |      |            |      |    |
|                                                             |                       | 256650  | Work Stage 4 Issue | P04                      |      |            |      |    |
|                                                             |                       |         |                    |                          |      |            |      |    |
| Job Title                                                   | Our Town Hall Project |         | Doc. Ref.          | OTH-ARU-TH-ZZ-SCH-B-0011 |      |            |      |    |
| Schedule                                                    | LTHW 2 Port PIVCs     |         | Made by            | CH                       | Date | 07/10/2019 | Chd. | CH |

| Valve ref       | Floor Level | Serving | Flow Rate (kg/s) | Line size (mm) | Notes |  |  |  |  |  |
|-----------------|-------------|---------|------------------|----------------|-------|--|--|--|--|--|
| LG-C01e/PCV/001 | LG          | LG-C01e | 0.051            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C01e/PCV/002 | LG          | LG-C01e | 0.051            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C01g/PCV/001 | LG          | LG-C01g | 0.032            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C01g/PCV/002 | LG          | LG-C01g | 0.032            | 15ø-15ø        |       |  |  |  |  |  |
| LG-038b/PCV/001 | LG          | LG-038b | 0.028            | 15ø-15ø        |       |  |  |  |  |  |
| LG-020/PCV/001  | LG          | LG-020  | 0.023            | 15ø-15ø        |       |  |  |  |  |  |
| LG-020/PCV/002  | LG          | LG-020  | 0.023            | 15ø-15ø        |       |  |  |  |  |  |
| LG-038b/PCV/002 | LG          | LG-038b | 0.028            | 15ø-15ø        |       |  |  |  |  |  |
| LG-040/PCV/001  | LG          | LG-040  | 0.017            | 15ø-15ø        |       |  |  |  |  |  |
| LG-006a/PCV/001 | LG          | LG-006a | 0.030            | 15ø-15ø        |       |  |  |  |  |  |
| LG-006a/PCV/002 | LG          | LG-006a | 0.030            | 15ø-15ø        |       |  |  |  |  |  |
| LG-021/PCV/001  | LG          | LG-021  | 0.030            | 15ø-15ø        |       |  |  |  |  |  |
| LG-006b/PCV/001 | LG          | LG-006b | 0.020            | 15ø-15ø        |       |  |  |  |  |  |
| LG-006b/PCV/002 | LG          | LG-006b | 0.020            | 15ø-15ø        |       |  |  |  |  |  |
| LG-005/PCV/002  | LG          | LG-005  | 0.032            | 15ø-15ø        |       |  |  |  |  |  |
| LG-024a/PCV/001 | LG          | LG-024a | 0.013            | 15ø-15ø        |       |  |  |  |  |  |
| LG-024a/PCV/002 | LG          | LG-024a | 0.013            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C01/PCV/001  | LG          | LG-C01  | 0.069            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C01/PCV/002  | LG          | LG-C01  | 0.041            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C01/PCV/003  | LG          | LG-C01  | 0.041            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C01/PCV/004  | LG          | LG-C01  | 0.041            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C01/PCV/007  | LG          | LG-C01  | 0.069            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C01/PCV/009  | LG          | LG-C01  | 0.028            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C01/PCV/010  | LG          | LG-C01  | 0.069            | 15ø-15ø        |       |  |  |  |  |  |
| LG-007/PCV/001  | LG          | LG-007  | 0.046            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C01/PCV/005  | LG          | LG-C01  | 0.010            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C01/PCV/006  | LG          | LG-C01  | 0.010            | 15ø-15ø        |       |  |  |  |  |  |
| LG-C01/PCV/008  | LG          | LG-C01  | 0.010            | 15ø-15ø        |       |  |  |  |  |  |
| LG-043/PCV/001  | LG          | LG-043  | 0.051            | 15ø-15ø        |       |  |  |  |  |  |
| LG-025/PCV/002  | LG          | LG-025  | 0.018            | 15ø-15ø        |       |  |  |  |  |  |
| LG-S07/PCV/001  | LG          | LG-S07  | 0.419            | 32ø-32ø        |       |  |  |  |  |  |
| LG-S01/PCV/001  | LG          | LG-S01  | 0.419            | 32ø-32ø        |       |  |  |  |  |  |
| LG-S04/PCV/001  | LG          | LG-S04  | 0.419            | 32ø-32ø        |       |  |  |  |  |  |
| LG-S10/PCV/001  | LG          | LG-S10  | 0.419            | 32ø-32ø        |       |  |  |  |  |  |
| LG-S05/PCV/001  | LG          | LG-S05  | 0.419            | 32ø-32ø        |       |  |  |  |  |  |

| Accessories & Additional Information                                                                |
|-----------------------------------------------------------------------------------------------------|
| This datasheet should be read in conjunction with all other datasheets, drawings and documentation. |
| Refer to Mechanical Particular specification for the design criteria.                               |
| Final valve settings and pressure drop TBC by manufacturer                                          |

|                                                             |         |  |                    |                                                                                       |
|-------------------------------------------------------------|---------|--|--------------------|---------------------------------------------------------------------------------------|
| <div>ARUP</div> <div>OUR TOWN HALL</div> <div>PROJECT</div> | Job No. |  | Rev.               |                                                                                       |
|                                                             | 256650  |  | Work Stage 4 Issue | P04                                                                                   |
|                                                             |         |  |                    |                                                                                       |
| Job Title      Our Town Hall Project                        |         |  |                    | Doc. Ref.      OTH-ARU-TH-ZZ-SCH-B-0011                                               |
| Schedule      LTHW 3 Port Motorised Control Valves          |         |  |                    | Made by    CH                      Date    07/10/2019                      Chd.    CH |

| Valve ref      | Floor Level | Serving          | Flow Rate (kg/s) | Line size (mm) | Pressure Drop | Valve Setting | Notes                                                                          |
|----------------|-------------|------------------|------------------|----------------|---------------|---------------|--------------------------------------------------------------------------------|
| LG-001/PCV/001 | LG          | VT Return        | 25.600           | 150            | TBC           | TBC           |                                                                                |
| LG-053/PCV/001 | LG          | AHU 01 LTHW Coil | 0.041            | 15             | TBC           | TBC           |                                                                                |
| 01-033/PCV/001 | 01          | UFHM 01          | 0.200            | 20             | TBC           | TBC           | 3 Port Valve to be supplied by UFH manufacturer as a complete controls package |
| 01-033/PCV/002 | 01          | UFHM 02          | 0.200            | 20             | TBC           | TBC           | 3 Port Valve to be supplied by UFH manufacturer as a complete controls package |
| 01-033/PCV/003 | 01          | UFHM 03          | 0.200            | 20             | TBC           | TBC           | 3 Port Valve to be supplied by UFH manufacturer as a complete controls package |
| 01-033/PCV/004 | 01          | UFHM 04          | 0.200            | 20             | TBC           | TBC           | 3 Port Valve to be supplied by UFH manufacturer as a complete controls package |
| 06-XXX/PCV/001 | 06          | AHU04 Frost Coil | 1.050            | 40             | TBC           | TBC           | Catering AHU                                                                   |

Accessories & Additional Information

This datasheet should be read in conjunction with all other datasheets, drawings and documentation.

Refer to Mechanical Particular specification for the design criteria.

Final valve settings and pressure drop TBC by manufacturer

|                                                             |                       |         |           |                    |                          |
|-------------------------------------------------------------|-----------------------|---------|-----------|--------------------|--------------------------|
| <div>ARUP</div> <div>OUR TOWN HALL</div> <div>PROJECT</div> |                       | Job No. |           | Rev.               |                          |
|                                                             |                       | 256650  |           | Work Stage 4 Issue | P04                      |
|                                                             |                       |         |           |                    |                          |
| Job Title                                                   | Our Town Hall Project |         | Doc. Ref. |                    | OTH-ARU-TH-ZZ-SCH-B-0011 |
| Schedule                                                    | Commissioning Sets    |         | Made by   | CH                 | Date 07/10/2019 Chd. CH  |

| Valve ref      | Floor Level | Serving | Flow Rate (kg/s) | Line size (mm) | Notes |
|----------------|-------------|---------|------------------|----------------|-------|
| 01-C02/CSV/001 | 01          | 01-C02  | 0.051            | 15ø-15ø        |       |
| 01-C02/CSV/002 | 01          | 01-C02  | 0.051            | 15ø-15ø        |       |
| 01-C02/CSV/003 | 01          | 01-C02  | 0.051            | 15ø-15ø        |       |
| 01-C02/CSV/004 | 01          | 01-C02  | 0.051            | 15ø-15ø        |       |
| 01-C02/CSV/005 | 01          | 01-C02  | 0.051            | 15ø-15ø        |       |
| 01-C02/CSV/006 | 01          | 01-C02  | 0.051            | 15ø-15ø        |       |
| 01-C02/CSV/007 | 01          | 01-C02  | 0.051            | 15ø-15ø        |       |
| 01-C02/CSV/008 | 01          | 01-C02  | 0.051            | 15ø-15ø        |       |
| 01-C02/CSV/009 | 01          | 01-C02  | 0.051            | 15ø-15ø        |       |
| 01-C02/CSV/010 | 01          | 01-C02  | 0.051            | 15ø-15ø        |       |
| GF-C04/CSV/001 | GF          | GF-C04  | 0.049            | 15ø-15ø        |       |
| GF-C04/CSV/002 | GF          | GF-C04  | 0.049            | 15ø-15ø        |       |
| GF-C04/CSV/003 | GF          | GF-C04  | 0.049            | 15ø-15ø        |       |
| GF-C04/CSV/004 | GF          | GF-C04  | 0.049            | 15ø-15ø        |       |
| GF-C04/CSV/005 | GF          | GF-C04  | 0.049            | 15ø-15ø        |       |
| GF-C04/CSV/006 | GF          | GF-C04  | 0.049            | 15ø-15ø        |       |
| GF-C04/CSV/007 | GF          | GF-C04  | 0.049            | 15ø-15ø        |       |
| GF-C04/CSV/008 | GF          | GF-C04  | 0.049            | 15ø-15ø        |       |
| GF-C04/CSV/009 | GF          | GF-C04  | 0.049            | 15ø-15ø        |       |
| GF-C04/CSV/010 | GF          | GF-C04  | 0.049            | 15ø-15ø        |       |
| 01-C04/CSV/001 | 01          | 01-C04  | 0.051            | 15ø-15ø        |       |
| 01-C04/CSV/002 | 01          | 01-C04  | 0.051            | 15ø-15ø        |       |
| 01-C04/CSV/003 | 01          | 01-C04  | 0.051            | 15ø-15ø        |       |
| 01-C04/CSV/004 | 01          | 01-C04  | 0.051            | 15ø-15ø        |       |
| 01-C04/CSV/005 | 01          | 01-C04  | 0.051            | 15ø-15ø        |       |
| 01-C04/CSV/006 | 01          | 01-C04  | 0.051            | 15ø-15ø        |       |
| 01-C04/CSV/007 | 01          | 01-C04  | 0.051            | 15ø-15ø        |       |
| 01-C04/CSV/008 | 01          | 01-C04  | 0.051            | 15ø-15ø        |       |
| 02-C02/CSV/001 | 02          | 02-C02  | 0.054            | 15ø-15ø        |       |
| 02-C02/CSV/002 | 02          | 02-C02  | 0.054            | 15ø-15ø        |       |
| 02-C02/CSV/003 | 02          | 02-C02  | 0.054            | 15ø-15ø        |       |
| 02-C02/CSV/004 | 02          | 02-C02  | 0.054            | 15ø-15ø        |       |
| 02-C02/CSV/005 | 02          | 02-C02  | 0.054            | 15ø-15ø        |       |
| 02-C02/CSV/006 | 02          | 02-C02  | 0.054            | 15ø-15ø        |       |
| 02-C02/CSV/007 | 02          | 02-C02  | 0.054            | 15ø-15ø        |       |
| 02-C02/CSV/008 | 02          | 02-C02  | 0.054            | 15ø-15ø        |       |
| 02-C02/CSV/009 | 02          | 02-C02  | 0.054            | 15ø-15ø        |       |
| 01-C04/CSV/009 | 01          | 01-C04  | 0.051            | 15ø-15ø        |       |
| 01-C04/CSV/010 | 01          | 01-C04  | 0.029            | 15ø-15ø        |       |
| 04-C04/CSV/001 | 04          | 04-C04  | 0.057            | 15ø-15ø        |       |
| 04-C04/CSV/002 | 04          | 04-C04  | 0.057            | 15ø-15ø        |       |
| 04-C04/CSV/003 | 04          | 04-C04  | 0.057            | 15ø-15ø        |       |
| 04-C04/CSV/004 | 04          | 04-C04  | 0.057            | 15ø-15ø        |       |
| 04-C04/CSV/005 | 04          | 04-C04  | 0.057            | 15ø-15ø        |       |
| 04-C04/CSV/006 | 04          | 04-C04  | 0.057            | 15ø-15ø        |       |
| 04-C04/CSV/007 | 04          | 04-C04  | 0.057            | 15ø-15ø        |       |
| 04-C04/CSV/008 | 04          | 04-C04  | 0.057            | 15ø-15ø        |       |
| 04-C04/CSV/009 | 04          | 04-C04  | 0.057            | 15ø-15ø        |       |
| 04-C04/CSV/001 | 04          | 04-C04  | 0.028            | 15ø-15ø        |       |
| 04-C02/CSV/001 | 04          | 04-C02  | 0.057            | 15ø-15ø        |       |
| 04-C02/CSV/002 | 04          | 04-C02  | 0.057            | 15ø-15ø        |       |
| 04-C02/CSV/003 | 04          | 04-C02  | 0.057            | 15ø-15ø        |       |
| 04-C02/CSV/004 | 04          | 04-C02  | 0.057            | 15ø-15ø        |       |
| 04-C02/CSV/005 | 04          | 04-C02  | 0.057            | 15ø-15ø        |       |
| 04-C02/CSV/006 | 04          | 04-C02  | 0.057            | 15ø-15ø        |       |
| 04-C02/CSV/007 | 04          | 04-C02  | 0.057            | 15ø-15ø        |       |
| 04-C02/CSV/008 | 04          | 04-C02  | 0.057            | 15ø-15ø        |       |
| 04-C02/CSV/009 | 04          | 04-C02  | 0.057            | 15ø-15ø        |       |
| 04-C02/CSV/010 | 04          | 04-C02  | 0.057            | 15ø-15ø        |       |
| 03-024/CSV/001 | 03          | 03-024  | 0.094            | 15ø-15ø        |       |
| LG-038/CSV/001 | LG          | LG-038  | 0.052            | 15ø-15ø        |       |
| LG-058/CSV/001 | LG          | LG-058  | 0.052            | 15ø-15ø        |       |
| LG-038/CSV/001 | LG          | LG-038  | 0.052            | 15ø-15ø        |       |
| GF-C04/CSV/011 | GF          | GF-C04  | 0.052            | 15ø-15ø        |       |
| GF-C04/CSV/012 | GF          | GF-C04  | 0.052            | 15ø-15ø        |       |
| GF-C04/CSV/013 | GF          | GF-C04  | 0.052            | 15ø-15ø        |       |
| GF-C04/CSV/014 | GF          | GF-C04  | 0.052            | 15ø-15ø        |       |
| GF-C04/CSV/015 | GF          | GF-C04  | 0.052            | 15ø-15ø        |       |
| LG-039/CSV/001 | LG          | LG-039  | 0.052            | 15ø-15ø        |       |
| LG-C01/CSV/001 | LG          | LG-C01  | 0.052            | 15ø-15ø        |       |
| LG-C02/CSV/001 | LG          | LG-C02  | 0.051            | 15ø-15ø        |       |
| GF-C02/CSV/001 | GF          | GF-C02  | 0.051            | 15ø-15ø        |       |
| LG-C02/CSV/002 | LG          | LG-C02  | 0.051            | 15ø-15ø        |       |
| LG-C02/CSV/003 | LG          | LG-C02  | 0.051            | 15ø-15ø        |       |
| LG-C02/CSV/004 | LG          | LG-C02  | 0.051            | 15ø-15ø        |       |
| LG-C02/CSV/005 | LG          | LG-C02  | 0.051            | 15ø-15ø        |       |
| LG-C02/CSV/006 | LG          | LG-C02  | 0.051            | 15ø-15ø        |       |

|                                                  |                       |           |                          |      |            |      |    |
|--------------------------------------------------|-----------------------|-----------|--------------------------|------|------------|------|----|
| <div>ARUP</div> <div>OUR TOWN HALL PROJECT</div> |                       | Job No.   |                          | Rev. |            |      |    |
|                                                  |                       | 256650    | Work Stage 4 Issue       |      | P04        |      |    |
|                                                  |                       |           |                          |      |            |      |    |
| Job Title                                        | Our Town Hall Project | Doc. Ref. | OTH-ARU-TH-ZZ-SCH-B-0011 |      |            |      |    |
| Schedule                                         | Commissioning Sets    | Made by   | CH                       | Date | 07/10/2019 | Chd. | CH |

| Valve ref      | Floor Level | Serving | Flow Rate (kg/s) | Line size (mm) | Notes |
|----------------|-------------|---------|------------------|----------------|-------|
| LG-C02/CSV/007 | LG          | LG-C02  | 0.051            | 15ø-15ø        |       |
| GF-C02/CSV/002 | GF          | GF-C02  | 0.051            | 15ø-15ø        |       |
| LG-C02/CSV/001 | LG          | LG-C02  | 0.051            | 15ø-15ø        |       |
| LG-043/CSV/001 | LG          | LG-043  | 0.014            | 15ø-15ø        |       |
| LG-043/CSV/001 | LG          | LG-043  | 0.014            | 15ø-15ø        |       |
| GF-C01/CSV/001 | GF          | GF-C01  | 0.014            | 15ø-15ø        |       |
| LG-043/CSV/002 | LG          | LG-043  | 0.014            | 15ø-15ø        |       |
| LG-043/CSV/003 | LG          | LG-043  | 0.014            | 15ø-15ø        |       |
| GF-C01/CSV/002 | GF          | GF-C01  | 0.014            | 15ø-15ø        |       |

Accessories & Additional Information

This datasheet should be read in conjunction with all other datasheets, drawings and documentation.

Refer to Mechanical Particular specification for the design criteria.

|                                                             |                                   |         |                    |                          |
|-------------------------------------------------------------|-----------------------------------|---------|--------------------|--------------------------|
| <div>ARUP</div> <div>OUR TOWN HALL</div> <div>PROJECT</div> |                                   | Job No. | Rev.               |                          |
|                                                             |                                   | 256650  | Work Stage 4 Issue | P04                      |
|                                                             |                                   |         |                    |                          |
| Job Title                                                   | Our Town Hall Project             |         | Doc. Ref.          | OTH-ARU-TH-ZZ-SCH-B-0011 |
| Schedule                                                    | Electric Frost Protection Heaters |         | Made by            | CH                       |
|                                                             |                                   | Date    | 07/10/2019         | Chd. CH                  |

| Equipment Reference | Location | Manufacturer | Selection Output (W) | Room Temp (°C) | Overall Dims (mm) |     | Type                | Power Supply (V/PH/Hz) | Notes |
|---------------------|----------|--------------|----------------------|----------------|-------------------|-----|---------------------|------------------------|-------|
|                     |          |              |                      |                | H                 | W   |                     |                        |       |
| LG-009a/HTR-001     | LG-09    | Dimplex      | 1000                 | 10             | 437               | 382 | Coldwatcher MPH1000 | 230/1/50               |       |
| LG-009a/HTR-002     | LG-09    | Dimplex      | 1000                 | 10             | 437               | 382 | Coldwatcher MPH1000 | 230/1/50               |       |
| LG-009a/HTR-003     | LG-09    | Dimplex      | 1000                 | 10             | 437               | 382 | Coldwatcher MPH1000 | 230/1/50               |       |
| LG-009a/HTR-004     | LG-09    | Dimplex      | 500                  | 10             | 330               | 255 | Coldwatcher MPH500  | 230/1/50               |       |
| LG-008a/HTR-001     | LG-08    | Dimplex      | 1000                 | 10             | 437               | 382 | Coldwatcher MPH1000 | 230/1/50               |       |
| LG-008a/HTR-002     | LG-08    | Dimplex      | 1000                 | 10             | 437               | 382 | Coldwatcher MPH1000 | 230/1/50               |       |
| LG-008a/HTR-003     | LG-08    | Dimplex      | 500                  | 10             | 330               | 255 | Coldwatcher MPH500  | 230/1/50               |       |
| LG-010a/HTR-001     | LG-10a   | Dimplex      | 1000                 | 10             | 437               | 382 | Coldwatcher MPH1000 | 230/1/50               |       |
| LG-010a/HTR-002     | LG-10a   | Dimplex      | 1000                 | 10             | 437               | 382 | Coldwatcher MPH1000 | 230/1/50               |       |
| LG-011a/HTR-001     | LG-11a   | Dimplex      | 1000                 | 10             | 437               | 382 | Coldwatcher MPH1000 | 230/1/50               |       |
| LG-011a/HTR-002     | LG-11a   | Dimplex      | 1000                 | 10             | 437               | 382 | Coldwatcher MPH1000 | 230/1/50               |       |
| LG-011a/HTR-003     | LG-11a   | Dimplex      | 500                  | 10             | 330               | 255 | Coldwatcher MPH500  | 230/1/50               |       |
| LG-014/HTR-001      | LG-14    | Dimplex      | 1000                 | 19             | 437               | 382 | Coldwatcher MPH1000 | 230/1/50               |       |
| LG-014/HTR-002      | LG-14    | Dimplex      | 1000                 | 19             | 437               | 382 | Coldwatcher MPH1000 | 230/1/50               |       |
| LG-014/HTR-003      | LG-14    | Dimplex      | 500                  | 19             | 330               | 255 | Coldwatcher MPH500  | 230/1/50               |       |
| 06-014/HTR-001      | 06-014   | Dimplex      | 1000                 | 21             | 437               | 382 | Coldwatcher MPH1000 | 230/1/50               |       |
| 06-014/HTR-002      | 06-014   | Dimplex      | 1000                 | 21             | 437               | 382 | Coldwatcher MPH1000 | 230/1/50               |       |
| 06-014/HTR-003      | 06-014   | Dimplex      | 1000                 | 21             | 437               | 382 | Coldwatcher MPH1000 | 230/1/50               |       |
| 06-014/HTR-004      | 06-014   | Dimplex      | 1000                 | 21             | 437               | 382 | Coldwatcher MPH1000 | 230/1/50               |       |
| 06-014/HTR-005      | 06-014   | Dimplex      | 1000                 | 21             | 437               | 382 | Coldwatcher MPH1000 | 230/1/50               |       |
| 06-014/HTR-006      | 06-014   | Dimplex      | 1000                 | 21             | 437               | 382 | Coldwatcher MPH1000 | 230/1/50               |       |
| 06-014/HTR-007      | 06-014   | Dimplex      | 500                  | 21             | 330               | 255 | Coldwatcher MPH500  | 230/1/50               |       |

Accessories & Additional Information

This datasheet shall be read in conjunction with all other datasheets, drawings and specifications.

The Electric heaters shall be supplied and installed in strict accordance with the manufacturers recommendations and the Contract Specification.

Valves shall be rated to close against the full duty pump head.

Each unit shall be provided with a 7-day time clock control, c/w frost protection setting.

|                                                             |                       |                    |      |           |                          |                      |
|-------------------------------------------------------------|-----------------------|--------------------|------|-----------|--------------------------|----------------------|
| <div>ARUP</div> <div>OUR TOWN HALL</div> <div>PROJECT</div> | Job No.               |                    | Rev. |           |                          |                      |
|                                                             | 256650                | Work Stage 4 Issue |      | P04       |                          |                      |
|                                                             |                       |                    |      |           |                          |                      |
| Job Title                                                   | Our Town Hall Project |                    |      | Doc. Ref. | OTH-ARU-TH-ZZ-SCH-B-0011 |                      |
| Schedule                                                    | Heat Meters           |                    |      | Made by   | CH                       | Date07/10/2019Chd.CH |

| Equipment Reference                  | Location | Manufacturer | Flow Rate (l/s) | Water Temp F&R (°C) | Line Size (mm) | Digital Output | Type                                         | Notes                      |
|--------------------------------------|----------|--------------|-----------------|---------------------|----------------|----------------|----------------------------------------------|----------------------------|
| LG-001/HMR-001                       | LG-001   | DMS          | 25.6            | 80/60               | 150            | M-Bus/digital  | Fluid oscillator flow meter and temp sensors | VT Circuit Return          |
| LG-001/HMR-002                       | LG-001   | DMS          | 5.04            | 80/60               | 80             | M-Bus/digital  | Fluid oscillator flow meter and temp sensors | CT Circuit Return          |
| LG-001/HMR-003                       | LG-001   | DMS          | 2.38            | 80/60               | 65             | M-Bus/digital  | Fluid oscillator flow meter and temp sensors | DHW Primary Circuit Return |
| LG-001/HMR-004                       | LG-001   | DMS          | 2.38            | 80/60               | 300            | M-Bus/digital  | Fluid oscillator flow meter and temp sensors | LTHW Header                |
| 04-028/HMR/001                       | 04-029   | DMS          | 8.92            | 6/12                | 80             | M-Bus/digital  | Fluid oscillator flow meter and temp sensors | CHW Secondary Return       |
|                                      |          |              |                 |                     |                |                |                                              |                            |
| Accessories & Additional Information |          |              |                 |                     |                |                |                                              |                            |

This datasheet should be read in conjunction with all other datasheets, drawings and documentation.

All heat meters shall conform with BS EN 1434:2006

For complete integration with BMS system

Heat Meters to be manufactured by DMS Ltd or equivalent

Heat meters to be fluid oscillator flow meter and temp sensors type

|           |                       |           |                          |      |                    |
|-----------|-----------------------|-----------|--------------------------|------|--------------------|
| ARUP      | OUR TOWN HALL         | Job No.   | Rev.                     |      |                    |
|           |                       | 256650    | Work Stage 4 Issue       | P04  |                    |
|           |                       | PROJECT   |                          |      |                    |
| Job Title | Our Town Hall Project | Doc. Ref. | OTH-ARU-TH-ZZ-SCH-B-0011 |      |                    |
| Schedule  | Trace Heating         | Made by   | SC                       | Date | 07/10/2019 Chd. CH |

| General Data                                                                                                                                             |        |                      | Comments                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------|------------------------------------------------------------------|
| Location                                                                                                                                                 |        | Refer to drawings    |                                                                  |
| System Served                                                                                                                                            |        | Refer to drawings    |                                                                  |
| Type                                                                                                                                                     |        | Self Regulating      |                                                                  |
| Performance Data                                                                                                                                         |        |                      |                                                                  |
| Minimum Ambient Temperatur                                                                                                                               | °C     | -10                  |                                                                  |
| Pipe Temperature Maintained                                                                                                                              | °C     | 5                    |                                                                  |
| Maximum Pipe Temperature                                                                                                                                 | °C     | 25                   |                                                                  |
| Max Permissible Temperature                                                                                                                              | °C     | 65                   |                                                                  |
| Pipe Material                                                                                                                                            |        | Mild Steel           |                                                                  |
| Power Output @ 5                                                                                                                                         | W/m    | 10                   |                                                                  |
| Type of Output Control                                                                                                                                   |        | Self Regulating      |                                                                  |
| Maximum Cable Length                                                                                                                                     | m      | 150                  |                                                                  |
| Number of Circuits                                                                                                                                       |        | 1 per each system    |                                                                  |
| Electrical Data                                                                                                                                          |        |                      |                                                                  |
| Circuit Breaker Rating                                                                                                                                   | A      | 10                   |                                                                  |
| IP Rating                                                                                                                                                |        | IP 65                |                                                                  |
| Power Source                                                                                                                                             |        | Local DB             |                                                                  |
| Electrical Supply                                                                                                                                        | V/Ø/Hz | 240/1/50             |                                                                  |
| Construction Data                                                                                                                                        |        |                      |                                                                  |
| Fixing Method                                                                                                                                            |        | Direct to pipe       | Fixing shall be in accordance with manufacturers recommendations |
| Options                                                                                                                                                  |        |                      |                                                                  |
| Ambient Temperature Thermostat                                                                                                                           |        | ✓                    |                                                                  |
| Pipe Sensing Thermostat                                                                                                                                  |        | ✓                    |                                                                  |
| Power Connections                                                                                                                                        |        | ✓                    |                                                                  |
| Fixing and Connecting Accessories                                                                                                                        |        | ✓                    |                                                                  |
| Warning Labels                                                                                                                                           |        | ✓                    |                                                                  |
| Manufacturers                                                                                                                                            |        |                      |                                                                  |
| Model Reference                                                                                                                                          |        | FS-A-2X              |                                                                  |
| Preferred                                                                                                                                                |        | Tyco Thermal Control |                                                                  |
| Alternative                                                                                                                                              |        |                      |                                                                  |
| Additional Information                                                                                                                                   |        |                      |                                                                  |
| This datasheet shall be read in conjunction with all other datasheets, drawings and specifications.                                                      |        |                      |                                                                  |
| Refer to BMS & Mechanical Particular specification for the design criteria.                                                                              |        |                      |                                                                  |
| The Contractor shall install each pipe as a continous length without buried connections                                                                  |        |                      |                                                                  |
| Each trace heating circuit shall be protected by a miniature circuit breaker and residual current device rated at 30mA with a trip sensitivity of 100mS. |        |                      |                                                                  |
| Warning labels shall be provided at a spacing of not greater than 5m apart.                                                                              |        |                      |                                                                  |
| All special tools required for the operation, maintenance and repair of the equipment shall be identified and included in the Tender.                    |        |                      |                                                                  |

|                                                             |                                 |         |           |                    |                          |
|-------------------------------------------------------------|---------------------------------|---------|-----------|--------------------|--------------------------|
| <div>ARUP</div> <div>OUR TOWN HALL</div> <div>PROJECT</div> |                                 | Job No. |           | Rev.               |                          |
|                                                             |                                 | 256650  |           | Work Stage 4 Issue |                          |
|                                                             |                                 |         |           | P04                |                          |
| Job Title                                                   | Our Town Hall Project           |         | Doc. Ref. |                    | OTH-ARU-TH-ZZ-SCH-B-0011 |
| Schedule                                                    | Appendix - A Underfloor Heating |         | Made by   | SC                 | Date07/10/2019Chd.CH     |

## FLOORTEC Underfloor Heating Quotation

### 

Osman Serhat Cengen  
Arup  
6th Floor  
3 Piccadilly Place  
Manchester  
M1 3BN

**Quotation Reference:**  
**GHD31794**

**Quotation Date:**  
**October 5, 2019**

**Project Managed By:**  
**Dan Groves**  
**UFH Sales & Technical**

Contact Telephone  
01616029408

### Quotation Details

|                            |                                      |
|----------------------------|--------------------------------------|
| <b>Property Reference:</b> | Great Hall - Manchester City Council |
| <b>Customer Name:</b>      |                                      |
| <b>Contact Telephone:</b>  |                                      |

|                                |                |  |  |
|--------------------------------|----------------|--|--|
| <b>Proposed Fixing Method:</b> |                |  |  |
| Ground                         | Plated - 400mm |  |  |
|                                |                |  |  |
|                                |                |  |  |

### Comments

### Contents

|        |                                                      |
|--------|------------------------------------------------------|
| Page 2 | Underfloor Heating Summaries                         |
| Page 3 | Underfloor Heating Zoning Details                    |
| Page 4 | Pricing                                              |
| Page 5 | Criteria used for Quotation                          |
| Page 6 | Terms and Conditions, Delivery and Product Warranty. |

**Quotation Prepared by:**  
**Callum Connolly**

**Underfloor Heating Summaries**

**Fixing Method Summaries [m<sup>2</sup>]:**

|                        |  |
|------------------------|--|
| 25mm Tacker Insulation |  |
| 50mm Tacker Insulation |  |
| Naked Preformed Plate  |  |
| Microboard             |  |

|                      |  |
|----------------------|--|
| Tackernail 3D Short  |  |
| Tackernail 3D Medium |  |
| Tackernail 3D Long   |  |

|                      |            |
|----------------------|------------|
| Mesh                 |            |
| Cliprail             |            |
| Plated - 400mm       | <b>462</b> |
| Plated - 600mm       |            |
| Floating - 30mm      |            |
| Floating - 40mm      |            |
| Floating - 50mm      |            |
| 11mm Preformed Plate |            |

**Total heated floor area [m<sup>2</sup>]:**

**462** m<sup>2</sup>

**Maximum Heat Outputs:**

Suggested heat load for dwellings constructed to The Building Regulations,  
Approved Document L1A, 2006:

25,410 Watts

Maximum floor heat output:

32,340 Watts

**Manifold Data:**

|            | Ports    |
|------------|----------|
| Manifold 1 | <b>6</b> |
| Manifold 2 | <b>6</b> |
| Manifold 3 | <b>6</b> |
| Manifold 4 | <b>6</b> |
| Manifold 5 |          |

|             | Ports |
|-------------|-------|
| Manifold 6  |       |
| Manifold 7  |       |
| Manifold 8  |       |
| Manifold 9  |       |
| Manifold 10 |       |

**Proposed Pipework:**

Total pipework to be supplied

16mm MLP  
3000 metres

# FLOORTEC Underfloor Heating Quotation

| Zoning Details |            |               |         |       |              |
|----------------|------------|---------------|---------|-------|--------------|
| Manifold Ref   | Room Name  | Pipe Diameter | Area m2 | Loops | Pipe Spacing |
| Manifold 1, 2  | Great Hall | 16mm MLP      | 462     | 24    | 200          |
| 3 & 4          |            |               |         |       |              |

**Control Options**

**Option 1 - Digital 24 V Room Thermostats**

Quantity **£23,666.27**

|                                             |    |
|---------------------------------------------|----|
| Number of 24V Actuators                     | 24 |
| Number of 24V Wiring Centres                | 4  |
| Number of A-Rated Pump Packs                | 4  |
| Number of MRTE Digital 24V Room Thermostats | 1  |
| Number of MEP1C Programmers                 | 4  |

List Price exc. VAT



**Option 2 - Programmable Room Thermostats**

**£23,347.64**

|                                 |    |
|---------------------------------|----|
| Number of 24V Actuators         | 24 |
| Number of 24V Wiring Centres    | 4  |
| Number of A-Rated Pump Packs    | 4  |
| Number of MPRT Room Thermostats | 1  |

List Price exc. VAT



**Option 3 - Programmable RF Room Thermostats**

**£23,371.17**

|                                    |    |
|------------------------------------|----|
| Number of 24V Actuators            | 24 |
| Number of 24V Wiring Centres       | 4  |
| Number of A-Rated Pump Packs       | 4  |
| Number of MPRT RF Room Thermostats | 1  |

List Price exc. VAT



**Option 4 - Touch Screen Thermostats**

**£23,284.80**

|                                                  |    |
|--------------------------------------------------|----|
| Number of 230V Actuators                         | 24 |
| Number of 230V Wiring Centres                    | 4  |
| Number of A-Rated Pump Packs                     | 4  |
| Number of Touch Screen Thermostats               | 1  |
| Number of Touch Screen Remote Sensor Thermostats |    |

List Price exc. VAT



**Option 5 - Touch2 WiFi Thermostats**

**£23,501.44**

|                                     |    |
|-------------------------------------|----|
| Number of 230V Actuators            | 24 |
| Number of 230V Wiring Centres       | 4  |
| Number of A-Rated Pump Packs        | 4  |
| Number of Touch2 WiFi Thermostats   |    |
| Number of Touch2 WiFi + Hub         | 1  |
| Number of Touch2 WiFi Floor Sensors |    |
| Number of Touch2 Thimble Sensors    |    |

List Price exc. VAT



## FLOORTEC Underfloor Heating Quotation

### Criteria Used for Quotation Purposes

All Myson FLOORTEC Quotations are based on the requirements of the current Building Regulations which call for minimum levels of thermal insulation in a building and full room by room temperature control with a boiler interlock device.

Where insulation is included in a quotation, the insulation is designed to be used as a fixing system only. It may however be used to supplement proprietary insulation so the overall effect meets the requirements of the Building Regulations

U Values used in the preparation of this quotation are (W/m<sup>2</sup>K):

|              |      |               |      |                  |                                          |  |
|--------------|------|---------------|------|------------------|------------------------------------------|--|
| Roof         | 0.16 | Exposed Floor | 0.18 | Windows          | 1.6                                      |  |
| Exposed Wall | 0.2  | Party Wall    | 0.2  | Air Permeability | 10m <sup>3</sup> /hm <sup>2</sup> at50Pa |  |

### British Standards & Recommended Codes of Practice

The UFH system must be designed and installed in accordance with the requirements of BSEN1264 Parts 1, 2, 3, 4, 5. The CIBSE Guide "Underfloor Heating: Design & Installation (Domestic Building Services Panel) 2012" should also be followed.

### Screed / Floor Coverings

Any screed must be installed in accordance with BS8204. Screed Curing: Allow any sand/cement screed a minimum of 21 days, and anhydrite screeds require a minimum of 7 days prior to applying heat.

When the screed is fully cured and dry, limit the UFH flow temperature to 35C for 24 hours, then raise the flow temperature by 3C each day until the design flow temperature is reached.

Floor coverings can limit the performance of your UFH system. Typical Tog ratings of popular floor coverings are: Thick carpet 1.5; Standard Carpet 1.0; Vinyl 0.75; Ceramic Tiles 0.20

Some floor coverings, such as vinyl, are sensitive to floor surface temperatures. Consult your flooring supplier for specific advice.

Dan Groves

GHD31794

**Terms and Conditions**

The prices quoted are **LIST PRICES** and are exclusive of Value Added Tax. This quotation is valid for 3 months from the date detailed on page 1 unless a price increase has been notified. Myson FLOORTEC only supply products through major builders merchants, and the price quoted includes delivery to your merchant. Myson FLOORTEC do not install or commission underfloor heating systems, or supply any equipment other than that stated in this quotation. Pipe decoilers and Tackers may be hired or purchased if required; please contact Myson FLOORTEC for details.

Where remote sensing thermostats are required, Myson FLOORTEC can supply upon special request. Please contact Myson FLOORTEC for details.

**Delivery**

We shall normally deliver the underfloor heating components, via the appropriate plumbing merchant, within 3-5 working days of receiving the order.

**Quality**

Myson FLOORTEC underfloor heating pipework conforms to DIN 4726 and BS 7291-1:2001. It is a high density cross linked polyethylene pipe with an integral oxygen barrier. BS7291-1:2001 requires a minimum operational life of 50 years

Myson FLOORTEC Underfloor Heating offer a 10 year complete system warranty on all our bespoke systems. For more information call 0845 4023434.

**Contact Details**

Should you have any queries, please contact the Myson FLOORTEC Team on 0845 4023434 with the Myson FLOORTEC Quotation Number on Page 1

DENSE AREA'S OF UNDERFLOOR HEATING  
PIPEWORK TO BE INSULATED

THE DRAWINGS AND SUBMISSIONS HAVE BEEN BASED UPON INFORMATION SUPPLIED BY THE CUSTOMER. ANY DISCREPANCIES DUE TO THE LACK OF SUPPLIED INFORMATION OR QUALITY OF PLANS, MYSON FLOORTEC WILL NOT BE RESPONSIBLE FOR ANY ERRORS, OMISSIONS OR INADEQUATE PERFORMANCE OF THE SYSTEM.

THESE DRAWINGS ARE INTENDED FOR  
INSTALLATION PURPOSES ONLY AND THUS  
PIPEWORK MAY ALTER FROM THAT SHOWN.  
DETAILS OF ANY ALTERATION DURING  
INSTALLATION SHOULD BE NOTIFIED TO  
MYSON FLOORTEC FOR AS FITTED  
DRAWINGS TO BE PRODUCED.

THIS DRAWING IS CONFIDENTIAL AND IS THE  
COPYRIGHT PROPERTY OF MYSON  
FLOORTEC LTD. IT MUST NOT BE DISCLOSED  
LOANED OR COPIED WITHOUT WRITTEN  
PERMISSION.

THE CLIENT MUST CHECK ALL DRAWINGS TO ENSURE THAT ALL DESIGNS MEET THEIR SPECIFIED REQUIREMENTS.

PIPEWORK PASSING THROUGH WALL TO BE SLEEVED.

AIR CHANGES IN ROOMS SHOWING CLASS 1  
FLUES ALLOWED 4 AIR CHANGES PER HOUR  
ALUMINIUM DIFFUSION PLATES 1M IN

LENGTH AND CUT TO SIZE WHERE NECESSARY. WITH 100MM SPACING BETWEEN PLATES AND 300MM SPACING FROM WALL TO END OF PLATES

RETTIG (UK) LTD RECOMMEND THE USE OF  
'ADEY MC10+' CENTRAL HEATING BIOCIDES TO  
PREVENT THE FORMATION OF BACTERIAL

PREVENT THE FORMATION OF BACTERIAL  
CONTAMINANTS, ALGAE AND  
MICRO-ORGANISMS WHICH MAY OCCUR IN  
LOW TEMPERATURE HEATING SYSTEMS.

**PRESSURE TESTING.**  
A PRESSURE TEST OF A MINIMUM 3 BAR AND

A MAXIMUM OF 6 BAR MUST BE APPLIED TO ALL THE UNDERFLOOR HEATING PIPEWORK PRIOR TO AND DURING FLOOR FIXING.

**SCREEN CURING.**  
A MINIMUM OF 21 DAYS SHOULD BE  
ALLOWED FOR THE SCREEN TO FULLY CURE

BEFORE THE HEATING SYSTEM IS COMMISSIONED. ( 7 DAYS FOR ANHYDRITE) AT THIS TIME THE UNDERFLOOR HEATING FLOW TEMPERATURE SHOULD BE LIMITED TO 30OC AND THEN INCREASED BY 3OC PER DAY UNTIL DESIGN TEMPERATURE IS REACHED.

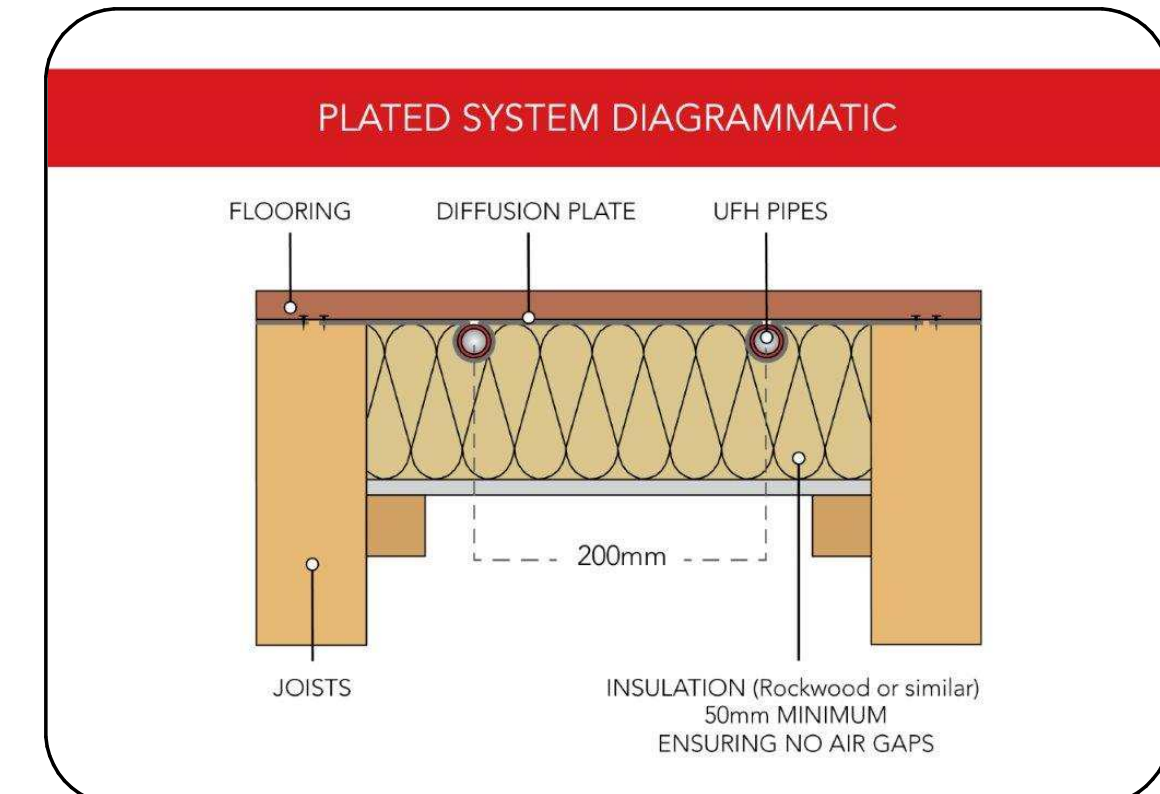
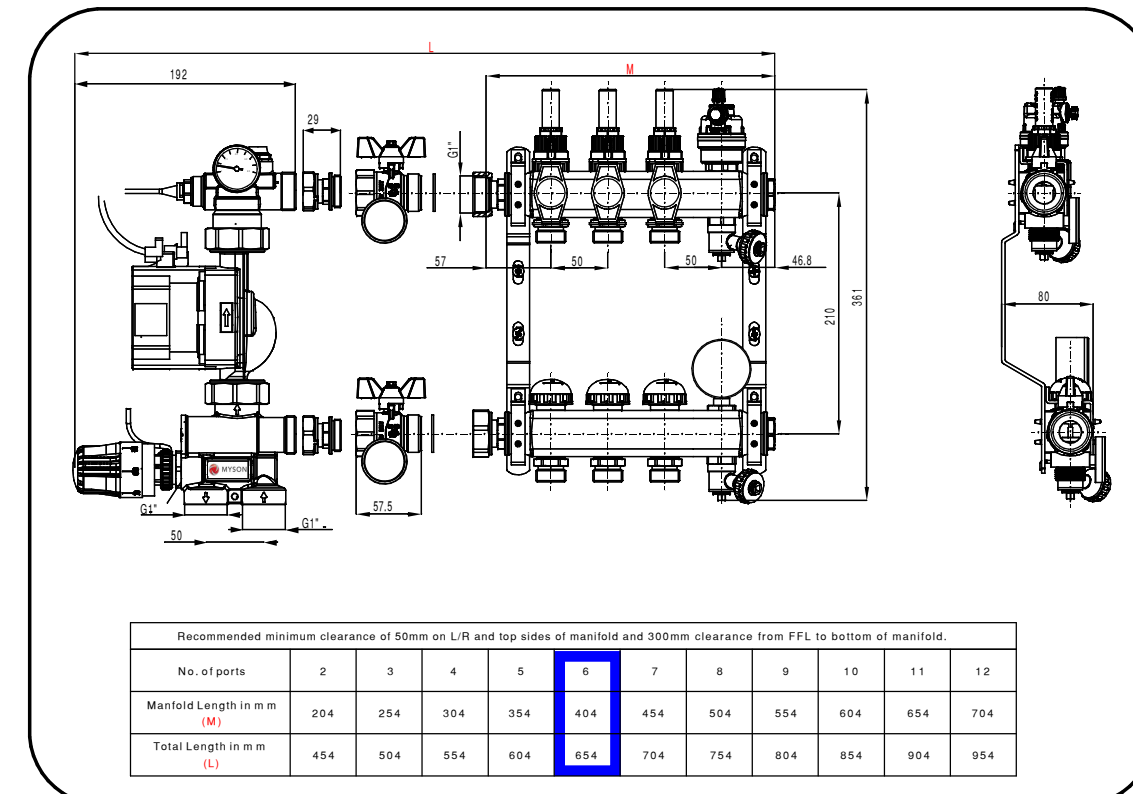
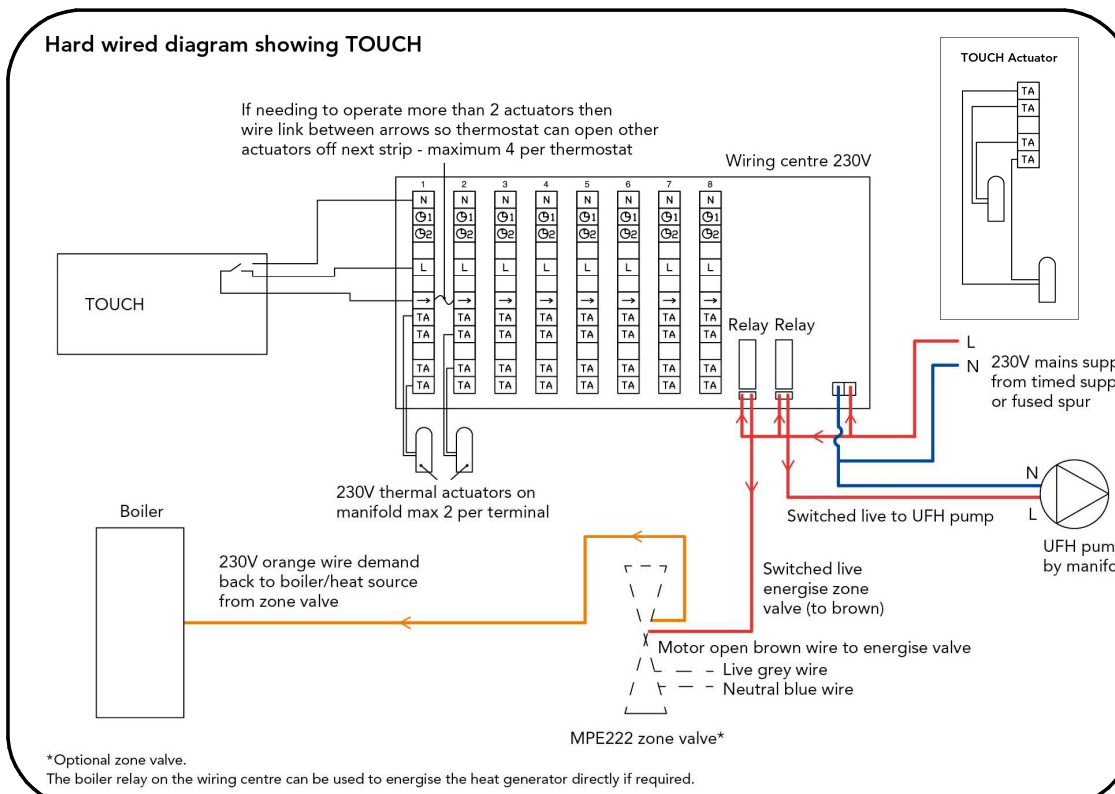
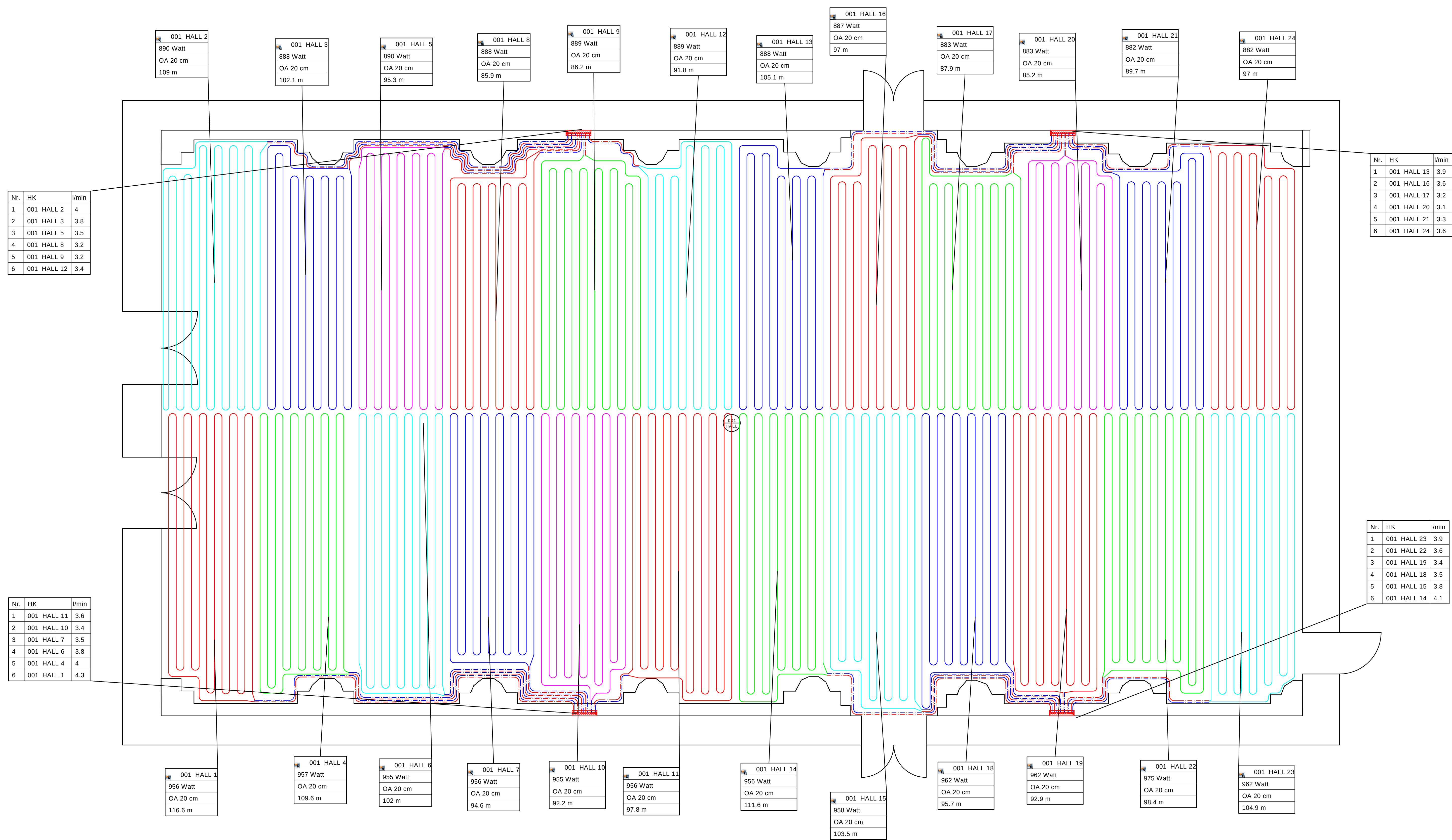
THE FLOOR SCREED MUST COMPLY WITH THE REQUIREMENTS OF BRITISH STANDARD 8204-1:2000. PARTICULAR ATTENTION MUST BE GIVEN TO SCREED THICKNESS, BAY SIZES AND EXPANSION JOINTS.

**FLOOR COVERINGS.**  
CERAMIC TILES OR VINYL FLOOR

COVERINGS SHOULD NOT BE LAID UNTIL THE  
SCREED HAS BEEN FULLY DRIED. SEE NOTE  
ABOVE. THE HEATING SHOULD BE TURNED  
OFF ONE DAY PRIOR TO LAYING THESE  
FLOOR COVERINGS. TO AVOID  
RE-ABSORPTION OF MOISTURE THE  
FLOORING SHOULD BE LAID NO MORE THAN  
THREE DAYS AFTER THE HEATING HAS BEEN  
TURNED OFF.

WHERE A TIMBER FLOOR IS TO BE FITTED, THE FLOOR MUST NOT BE LAID UNTIL THE SCREED HAS FULLY CURED AND THE HEATING SYSTEM HAS BEEN RUNNING FOR A MINIMUM OF 1 WEEK. THE SCREED MOISTURE CONTENT SHOULD THEN BE CHECKED TO BE WITHIN THE ACCEPTABLE LIMITS AS GIVEN BY THE FLOORING MANUFACTURERS. FAILURE TO CARRY OUT THESE INSTRUCTIONS COULD RESULT IN DAMAGE TO THE PIPEWORK. READ AND UNDERSTAND THE TIMBER MANUFACTURERS' INSTRUCTION MUST PREVAIL FOR ALL TIMBER FLOOR FINISHES.

**AMBIENT AIR TEMPERATURES.**  
THE UNDERFLOOR PIPEWORK SHOULD NOT BE LAID WITH AMBIENT AIR TEMPERATURES BELOW 0 DEG C. SCREEDS SHOULD NOT BE LAID WITH AMBIENT AIR TEMPERATURES BELOW 5DEG C.



26°C Surface

[illegible]