HARLEY HADDOW

HMG Security Control Room

Mechanical and Public Heath Services Specification

P01

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Ss_25_60_30_40
Individual services penetrations fire-stopping systems

Systems

Ss_25_60_30_40 Individual services penetrations fire-stopping systems

1. Description: Any service passing through a fire compartment
2. System performance: Ss_25_60_30/210 Design of fire stopping system; and Ss_25_60_30/230 Durability.
3. System manufacturer: Submit proposals .
4. Penetration seal: Pr_30_31_76_41 Intumescent foam fillers.
5. Execution: Ss_25_60_30/610 Fire stopping systems workmanship generally and 30-85-30/612 Installing fire stopping system to individual services penetrations.
6. System completion: Ss_25_60_30/810 Cleaning after installation of fire stopping systems and Ss_25_60_30/820 Inspection of fire stopping systems.

System performance

Ss_25_60_30/210 Design of fire stopping system

1. Detailed design
    1.1. Requirements: Complete the design of the fire stopping system.
    1.2. Details: To be completed in accordance with the architect/fire consultants fire strategy
    1.3. Submittals: Detailed design drawings, technical information, calculations and manufacturers' literature.
    1.4. Timing:
    1.5. Format:

Ss_25_60_30/230 Durability

1. Effective design life: 25 years.

Products

Pr_30_31_76_41 Intumescent foam fillers

1. Description:
2. Manufacturer: Rockwool Ltd.
3. Product reference: Linear and Trapezoidal Firestops.
4. Material: Manufacturer's standard .
5. Type: Submit proposals .
6. Profile: Submit proposals .
7. Thickness: Submit proposals .
8. Width: Submit proposals .
9. Colour: Natural.
10. Execution: Pr_30_31_76/610 Suitability of joints for sealant application and Pr_30_31_76/620 Joint preparation for sealant application.

Execution

30-85-30/612 Installing fire stopping system to individual services penetrations

1. Size of penetration seal: To match wall thickness.

Pr_30_31_76/610 Suitability of joints for sealant application

1. Joint dimensions: Within limits specified for the sealant.
2. Substrate quality: Surfaces regular, undamaged and stable.
3. Joints not fit to receive sealant: Submit proposals for rectification.

Pr_30_31_76/620 Joint preparation for sealant application

1. Surfaces to which sealant must adhere: Remove temporary coatings, tapes, loosely adhering material, dust, oil, grease, surface water and contaminants that may affect bond.
2. Cleaning: Use materials and methods recommended by sealant manufacturer.
3. Vulnerable surfaces adjacent to joints: Mask and Do not stain or smear with primer or sealant.

Ss_25_60_30/610 Fire stopping systems workmanship generally

1. Preparation: Remove loose dust and combustible materials.
2. Openings and gaps: Seal between building elements and services, to provide effective resistance to fire and the passage of smoke. Allow for capping sealants where required. Finish flush with surrounds.
3. Adjacent surfaces: Prevent overrun of filler, sealant or mortar on to finished surfaces.

System completion

Ss_25_60_30/810 Cleaning after installation of fire stopping systems

1. Masking tapes: Remove.
2. Cleaning: Clean off splashes and droppings. Wipe down finishes.

Ss_25_60_30/820 Inspection of fire stopping systems

1. Notice for inspection (minimum): 5 working days.

Ω End of System

Ss_50_30_04_97
Above-ground internal stack wastewater drainage systems

Systems

Ss_50_30_04_97 Above-ground internal stack wastewater drainage systems

1. Description: Internal soil & waste drainage shall be a combined soil & vent gravity drainage system.

   The contractor shall design, coordinate, procure, install, set to work and commission a complete above ground foul drainage system.

   The above ground internal drainage shall connect to the existing internal SVP and shall be vented to atmosphere at roof level where necessary. Off sets and lateral lengths of the drainage stacks shall be installed with an acoustic lined material.

   Each appliance shall be supplied with a trapped connection which shall be of the ventilating anti syphon type. All sanitary appliance drainage traps/shower gully's are specified by interior designer. All pipework shall be concealed with maintenance/rodding access as per the requirements of BS EN 12056-2:2000.

   All penetrations through slabs or fire compartments shall be provided with a fire collar round the drain pipe at the same rating as the fire compartment wall.

   All drains to be sleeved at penetrations and shall be entirely sealed with acoustic sealant. Where drains rise through roofs the drain pipe shall be flashed to the roof to the Architects requirements and a roof cowl shall be provided.

   Access points, AAVs and rodding eyes shall be provided as required on the drain system to allow full access and rodding of the drains. All SVPs shall have an access point at the base of the drain and at top to allow full rodding of the SVP and associated below ground drain.

   All drains shall fall at the required rate and shall be supported with resilient hangers and supports to prevent noise transfer.

   Trap serving sinks in kitchens where noted shall be supplied with dishwasher/washing machine connection points suitable for connection flexible hoses

   The drains shall be fully pressure tested and inspected to the requirements of Building Control.

   The drainage system shall be fully compliant with the requirements for BS EN 12056-2:2000

   All drains shall be connected to the underground drainage.
2. System performance:
3. System manufacturer: Submit proposals .
4. Floor drainage
   - 4.1. Preparation to existing floors:
   - 4.2. Floor channels and gullies: Pr_65_52_24_31 Floor gullies.
   - 4.3. Covers and gratings: Pr_65_52_24_30 Floor gully covers and gratings.
   - 4.4. Fixing:
     - 4.4.1. Bedding: Concrete.
     - 4.4.2. Backfill: Concrete.
     - 4.4.3. Securing: Stainless steel screws.

5. Sanitary pipework
    5.1. Small diameter branch discharge pipework
        5.1.1. Accessories for fixing: Stainless steel screws.
        5.1.2. Traps: Pr_65_52_25_75 Sanitary appliance traps.
        5.1.3. Pipelines and fittings: Pr_65_52_03_87 Unplasticized polyvinyl chloride (PVC-U) drainage pipes and fittings type A.
        5.1.4. Accessories for jointing: Solvent welding cement.
        5.1.5. Supports: Pr_20_85_09_01 Above-ground drainage pipe brackets type A.
        5.1.6. Fixings:
    5.2. Large diameter branch discharge pipework
        5.2.1. Accessories for fixing: Stainless steel screws.
        5.2.2. Pipelines and fittings: Pr_65_52_03_87 Unplasticized polyvinyl chloride (PVC-U) drainage pipes and fittings type B.
        5.2.3. Accessories for jointing: Solvent welding cement.
        5.2.4. Supports: Pr_20_85_09_01 Above-ground drainage pipe brackets type A.
        5.2.5. Fixings:
        5.2.6. Insulation:
    5.3. Discharge stack pipework
        5.3.1. Accessories for fixing: Stainless steel screws.
        5.3.2. Pipelines and fittings: Pr_65_52_03_87 Unplasticized polyvinyl chloride (PVC-U) drainage pipes and fittings type A.
        5.3.3. Accessories for jointing: Solvent welding cement.
        5.3.4. Supports: Pr_20_85_09_01 Above-ground drainage pipe brackets type B.
        5.3.5. Fixings:
        5.3.6. Insulation:
6. Overflow pipework
    6.1. Pipelines and fittings: 90-10-20/332 Copper above ground wastewater branch discharge pipelines.
    6.2. Accessories for jointing: Soldered
    6.3. Supports: Pr_20_85_09_01 Above-ground drainage pipe brackets type C.
    6.4. Accessories for fixing: Stainless steel screws.
    6.5. Fixings:
7. Pipework identification: Pr_40_10_57_78 Self-adhesive colour pipe bands and 90-90-55/480 Mechanical plant and equipment identification labels generally type C.
8. Fire-stopping
    8.1. Floor penetrations: Intumescent collars and Pr_65_52_61_63 Pipe sleeves type A.
    8.2. Wall penetrations: Intumescent collars and Pr_65_52_61_63 Pipe sleeves type B.
9. System accessories: Access fittings;
   Pr_65_54_24_02 Air admittance valves;
   Pr_65_52_61_23 Discharge and ventilating stack terminations;
   and Pr_65_52_61_50 Masking plates.
10. Execution: Ss_50_30_04/610 Installing above-ground wastewater drainage systems;
    Ss_50_30_04/612 Applying above-ground wastewater drainage internal pipework identification;
    Ss_50_30_04/614 Installing above-ground wastewater drainage discharge branch pipework;
    Ss_50_30_04/616 Installing above-ground wastewater drainage discharge stack pipework generally;
    Ss_50_30_04/620 Electrical continuity of above-ground wastewater drainage pipework;

and Ss_50_30_04/622 Access to above-ground wastewater drainage systems for testing and maintenance.

11. System completion: Ss_50_30_04/810 Testing above-ground wastewater drainage systems

Products

90-10-20/332 Copper above ground wastewater branch discharge pipelines

1. Manufacturer: Yorkshire Copper
2. Standard: To BS EN 1057.
3. Grade: Half hard, R250 (up to and Including 42mm) and R290(>42mm).
4. Jointing type: Capillary fittings.
5. Dimensions:
   5.1. Outside diameter (nominal): As noted on teh mechanical drawings
   5.2. Wall thickness (nominal):
6. Finish: Chrome-plated to BS EN ISO 1456 for all exposed pipework and Plain for all concealed pipework.

90-90-55/480 Mechanical plant and equipment identification labels generally type C

1. Manufacturer:
2. Material: Face engraved rigid plastic laminate.
3. Label size: Manufacturer's standard .
4. Colour:
   4.1. Background: White.
   4.2. Lettering: Black.
5. Typography:
   5.1. Font: Helvetica medium.
   5.2. Size: Manufacturer's standard .
6. Information to be included: Equipment name;
   Equipment reference number;
   and Service.
7. Execution: Pr_40_10_57/611 Installing mechanical plant and equipment identification type A.

Pr_20_85_09_01 Above-ground drainage pipe brackets type A

1. Description:
2. Manufacturer: Contractor's choice .
3. Pipe location: Internal.
4. Arrangement: Horizontal and Vertical.
5. Form: Anchor and guide brackets for low gradient internal pipes;
   Hanging rail system;
   Pipe clips;
   and Stand off pipe clips.
6. Material: Brass;
   Copper;
   HDPE;
   Plastics;
   and Steel.
7. Finish: To match pipelines.

8. Fasteners: Coach screws.

Pr_20_85_09_01 Above-ground drainage pipe brackets type B

1. Description:
2. Manufacturer:
3. Pipe location:
4. Arrangement:
5. Form:
6. Material:
7. Finish:
8. Fasteners:

Pr_20_85_09_01 Above-ground drainage pipe brackets type C

1. Description:
2. Manufacturer:
3. Pipe location:
4. Arrangement:
5. Form:
6. Material:
7. Finish:
8. Fasteners:

Pr_40_10_57_78 Self-adhesive colour pipe bands

1. Description:
2. Manufacturer: Submit proposals .
3. Standards: To BS 1710.
4. Identification type: Adhesive colour bands.
5. Execution: Pr_40_10_57/660 Installing identification on pipework.

Pr_65_52_03_87 Unplasticized polyvinyl chloride (PVC-U) drainage pipes and fittings type A

1. Description:
2. Manufacturer: Marley Plumbing & Drainage or equal
3. Product reference: PVCu condensate drain system
4. Standard:
5. Joint type: Solvent weld.
6. Nominal size: 35mm
7. Colour: White.
8. Brackets: Marley Pipe Support System.
9. Fixings: Nut and bolt.
10. Accessories:
11. Third-party product certification:
12. Nominal sizes:
13. Colour:
14. Integral accessories:

15. Execution:

Pr_65_52_03_87 Unplasticized polyvinyl chloride (PVC-U) drainage pipes and fittings type B

1. Description:
2. Manufacturer: Marley Plumbing & Drainage or equal
3. Product reference: PVCu Soil and Vent System.
4. Standard:
5. Joint type: Solvent weld.
6. Nominal size: 82 mm & 110 mm.
7. Colour: White.
8. Brackets: Marley Pipe Support System.
9. Fixings: Nut and bolt.
10. Accessories: Durgo Air Admittance Valves;
    Vent Terminals;
    and WC Connectors.
11. Third-party product certification:
12. Nominal sizes:
13. Colour:
14. Integral accessories:
15. Execution:

Pr_65_52_24_30 Floor gully covers and gratings

1. Description:
2. Manufacturer: Contractors Choice - Refer to Mechanical Schedules & Interior Designer Specification for details
3. Cover type: Gratings.
4. Form: Flat.
5. Loading: Heavy wheeled traffic.
6. Material: Stainless steel.
7. Outlet: Type and direction to suit pipelines.
8. Integral accessories:
9. Execution: Pr_65_52_24/620 Installing gullies.

Pr_65_52_24_31 Floor gullies

1. Description:
2. Manufacturer: Contractors Choice - Refer to Mechanical Schedules & Interior Designer Specification for details
3. Floor finish: Stainless Steel
4. Standard:
5. Body
    5.1. Configuration: Manufacturer's standard .
    5.2. Material: Stainless steel.
6. Cover or grating
    6.1. Cover or grating type:
    6.2. Material:

6.3. Finish:

7. Outlet: Type and direction to suit pipelines.
8. Load class (minimum):
9. Integral accessories: Strainer.
10. Execution: Pr_65_52_24/620 Installing gullies.

Pr_65_52_25_75 Sanitary appliance traps

1. Description:
2. Manufacturer: Pipe system manufacturers standard
3. Product reference: Refer to Drainage Drawings.
4. Standard: To BS EN 274-1, BS EN 274-2 and BS EN 274-3.
5. Third party product certification: BSI Kitemark certified.
6. Trap: Anti-siphon bottle trap;
   Shower trap;
   Tubular P trap;
   and Tubular S trap.
7. Jointing: Compression joint.
8. Material: Manufacturer's standard .
9. Colour: As branch discharge pipework.
10. Size: As branch discharge pipework.
11. Depth of water seal (minimum): Manufacturer's standard .
12. Integral accessories: Manufacturer's standard .

Pr_65_52_61_23 Discharge and ventilating stack terminations

1. Description:
2. Manufacturer: Submit proposals .
3. Arrangement: Perforated cover or cage that does not restrict airflow.
4. Material: Plastics, as discharge stack.

Pr_65_52_61_50 Masking plates

1. Description:
2. Manufacturer: Contractor's choice .
3. Material
   3.1. All pipes except chromium plated copper: Plastic.
   3.2. Chromium plated copper pipes: Chromium plated.
4. Format: Split.

Pr_65_52_61_63 Pipe sleeves type A

1. Description:
2. Manufacturer: Contractor's choice .
3. Product reference: FloPlast Intumescent Wrap Ref: FW110.

Pr_65_52_61_63 Pipe sleeves type B

1. Description:
2. Manufacturer:
3. Material:

4. Form:

Pr_65_54_24_02 Air admittance valves

1. Description:
2. Manufacturer: Contractor's choice .
3. Product reference:
4. Standard: To BS EN 12380.
5. Third-party certification: BBA Agrément certificate and BSI Kitemark certified.
6. Material: PVC-U.
7. Size: As noted on Drainage Drawings
8. Jointing: Solvent weld.
9. Minimum airflow rate: To BS EN 12056-2.
10. Execution:

Execution

Pr_40_10_57/611 Installing mechanical plant and equipment identification type A

1. Fixing: Fix with adhesive to equipment.
2. Position: On equipment.

Pr_40_10_57/660 Installing identification on pipework

1. Application of basic identification colour: Coloured bands as BS 1710 clause 3.3 and Over the whole length of the pipe.
2. Safety colour identification: On or next to the colour bands.
3. Information: Colour bands as BS 1710 appendix D.
4. Direction of flow: Indication arrow and the word FLOW or the letter F and Indication arrow and the word RETURN or the letter R.

Pr_65_52_24/620 Installing gullies

1. Alignment: Grating flush with finished floor.
2. Bedding
   2.1. Bedding: Concrete.
   2.2. Material:
   2.3. Thickness (minimum):
3. Surround
   3.1. Material:
   3.2. Width (minimum):
   3.3. Depth:

Ss_50_30_04/610 Installing above-ground wastewater drainage systems

1. Standards: To BS EN 12056-2 and BS EN 12056-5.
2. Collection and distribution of wastewater
   2.1. General: Quick, quiet and complete; self-cleansing in normal use, without blockage, crossflow, backfall, leakage, odours, noise nuisance or risk to health.
   2.2. Pressure fluctuations in pipework (maximum): ±38 mm water gauge.

2.3. Water seal retained in traps (minimum): 25 mm.

3. Pipelines: Plumb and/ or true to line.
   3.1. Routes
      3.1.1. Routes generally: The shortest practical, with as few bends as possible.
      3.1.2. Routes not shown on drawings: Submit proposals .
   3.2. Jointing: Joint with materials, fittings and techniques intended for the purpose and that will make effective and durable connections.
4. Allowance for thermal and building movement: Provide and maintain clearance as fixing and jointing proceeds.
5. Concealed or inaccessible surfaces: Decorate before starting work specified in clauses from this section.
6. Electrolytic corrosion: Avoid contact between dissimilar metals where corrosion may occur.
7. Protection
   7.1. Purpose made temporary caps: Fit to prevent ingress of debris.
   7.2. Access covers, cleaning eyes and blanking plates: Fit as the work proceeds.

Ss_50_30_04/612 Applying above-ground wastewater drainage internal pipework identification

1. Standard: To BS 1710.
2. Method: Integral lettering on pipe wall, self-adhesive bands or identification clips.
3. Form
   3.1. Wastewater system without recycling
      3.1.1. Definition: All wastewater from sanitary appliances and sinks.
      3.1.2. Direction of flow: White arrow on black background.
      3.1.3. Wording: White lettering 'FOUL DRAINAGE' on a black background.
   3.2. Blackwater in system with recycling
      3.2.1. Definition: Containing faecal matter or urine.
      3.2.2. Direction of flow: White arrow on black background.
      3.2.3. Wording: White lettering 'FOUL DRAINAGE' on a black background.
   3.3. Greywater in system with recycling
      3.3.1. Definition: As defined in BS EN 12056-1, clause 3.1.
      3.3.2. Direction of flow: Black arrow on light grey background.
      3.3.3. Wording: Black lettering 'GREYWATER' on a light grey background.

Ss_50_30_04/614 Installing above-ground wastewater drainage discharge branch pipework

1. Pipework
   1.1. Alignment: Fix securely plumb and/ or true to line.
   1.2. Branches and low gradient sections: Fix with uniform and adequate falls to drain efficiently.
   1.3. Socketed pipes and fittings: Fix with sockets facing upstream.
   1.4. Additional supports: Provide as necessary to support junctions and changes in direction.
2. Wall and floor penetrations
   2.1. Isolating pipework: Isolate pipework from structure, e.g. with pipe sleeves.
   2.2. Masking plates: Fix at penetrations if visible in the finished work.

Ss_50_30_04/616 Installing above-ground wastewater drainage discharge stack pipework generally

1. Pipework
    1.1. Alignment: Fix securely plumb and true to line.
    1.2. Externally socketed pipes and fittings: Fix with sockets facing upstream.
    1.3. Vertical pipes: Provide a loadbearing support not less than every storey level. Locate at or close below socket collar or coupling. Tighten fixings as work proceeds so that every storey is self-supporting.
    1.4. Additional supports: Provide as necessary to support junctions and changes in direction.
2. Wall and floor penetrations
    2.1. Isolating pipework: Isolate pipework from structure, e.g. with pipe sleeves.
    2.2. Masking plates: Fix at penetrations if visible in the finished work.
3. Expansion joint sockets: Fix rigidly to the building.
4. Fixings: Allow the pipe to slide.

Ss_50_30_04/620 Electrical continuity of above-ground wastewater drainage pipework

1. Joints in metal pipes with flexible couplings: Make with clips (or suitable standard pipe couplings) supplied for earth bonding by pipework manufacturer to ensure electrical continuity.

Ss_50_30_04/622 Access to above-ground wastewater drainage systems for testing and maintenance

1. General: Install pipework with adequate clearance to permit testing, cleaning and maintenance, including painting where necessary.
2. Access fittings and rodding eyes: Position to avoid obstruction.

System completion

Ss_50_30_04/810 Testing above-ground wastewater drainage systems

1. Dates for testing
    1.1. Notice: Required.
    1.2. Period of notice (minimum):
2. Preparation
    2.1. Pipework: Securely fixed and free from obstruction and debris.
    2.2. Traps: Fill with clean water.
3. Testing
    3.1. Water for testing: Supply clean water, assistance and apparatus.
    3.2. Smoke for testing: Do not use.
4. Records of tests: Submit.

Ω End of System

Ss_55_70_38_15
Cold water supply systems

Systems

Ss_55_70_38_15 Cold water supply systems

1. Description:

   The contractor shall design, coordinate, procure, install, set to work and commission a complete mains water pipework installation serving all sanitary outlets.

   The incoming mains water supply(s) shall be investigated and validated prior to the installation works.

   The existing mains water supplies serving the SCR shall be suitably disconnected and isolated during the initial strip out works ensuring that redundant pipework and dead-legs are removed.

   The new mains water connections shall connect to the existing supplies as indicated in the water services layouts.

   Pipework connections to sanitary fittings and equipment shall be fitted with ¼ turn ball valves. Water supplies to the WC shall be fitted with a combined service valve and flow restrictor as manufactured by Arrow Valves or equal and approved to limit water flow rates.

   The system shall be installed to be self-venting with automatic air vents at all high points and drain cocks at all low points to facilitate drain down.

   The Local Authority shall be given due notice to inspect the works at 2nd fix to ensure compliance with the water regulations.

   The water system shall be installed in accordance with BS 6700 Specification for design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages, the CIBSE Public Health Engineering Guide G and the local water authority byelaws.

   The domestic cold water distribution pipework shall be copper, with fittings entirely suitable for potable water supply. The pipework shall be insulated in accordance with BS 5422, BS 5970 and BS EN ISO 12241.
2. System performance: Ss_55_70_38/220 Cold water supply.
3. Pipelines
   3.1. Above ground: Pr_65_52_63_17 Copper pipelines Type A.
4. Valves
   4.1. Backflow prevention devices:
   4.2. Isolating valves: Pr_65_54_95_06 Ball valves type B.
   4.3. Check valves: Pr_65_54_95_14 Copper alloy check valves type B.
   4.4. Regulating valves:

   Arrow Valves AFL service valve with automatic flow limiting cartridge:

   Showers shall be limited to 6l/s min.

   Wash Hand Basin (0.13l/s) White AFLC13
   Sink (0.17l/s) Blue AFLC17
   Washing Machine/Dish Washer (0.2l/s) Red AFLC20

4.5. Accessories: Pr_65_54_95_94 Verifiable backflow prevention devices type B.

5. Fire-stopping: Individual services penetrations fire-stopping system.
6. Thermal insulation
   6.1. Pipelines: Pr_80_77_76_54 Mineral wool pipe section insulation.
   6.2. Tanks: Pr_80_77_76_53 Mineral wool duct slab insulation type C.
7. Vibration isolation: Pr_80_77_94_30 Flexible vibration isolation hoses type A.
8. Accessories: Pr_80_77_27_15 Channel supports type C.
9. Plant and equipment identification: Pr_40_10_57_78 Self-adhesive colour pipe bands type A.
10. Execution: Ss_55_70_38/620 Installing hot and cold water systems generally Type A;
    Ss_55_70_38/660 Flushing hot and cold water systems Type A;
    Ss_55_70_38/670 Disinfection of hot and cold water systems Type A;
    Ss_55_70_38/650 Hydraulic pressure testing of hot and cold water supply systems Type A;
    and Ss_55_70_38/610 Removing hot and cold water systems Type A.
11. System completion: Ss_55_70_38/810 Commissioning of hot and cold water supply systems Type A;
    Ss_55_70_38/820 Inspection and test records Type A;
    Ss_55_70_38/830 Demonstrations Type A;
    Ss_55_70_38/840 Documentation;
    Ss_55_70_38/850 Water quality tests;
    Ss_55_70_38/860 Spares Type A;
    and Ss_55_70_38/880 Maintenance Type A.

System performance

Ss_55_70_38/220 Cold water supply

1. Type of system: Existing

Products

90-10-65/320 Copper pipeline jointing materials Type A

1. Standards:
   1.1. Lead free solder for capillary fittings: To BS EN ISO 9453.

90-10-65/450 Pipeline supports Type A

1. Manufacturer: Contractor's choice .
2. Arrangement: Manufacturer's standard .
3. Material: Brass and Steel.
4. Execution: Pr_20_29_14/620 Installing pipeline supports Type A.

Pr_40_10_57_78 Self-adhesive colour pipe bands type A

1. Description:
2. Standards: To BS 1710.
3. Identification type: Adhesive colour bands.
4. Execution: Pr_40_10_57/660 Installing identification on pipework type A.

Pr_65_52_63_17 Copper pipelines Type A

1. Description:
2. General requirements: 90-10-65/320 Copper pipeline jointing materials Type A and Pr_65_52_63_18 Copper pipeline fittings Type A.
3. Standard: To BS EN 1057.
4. Grade: R250.
5. Finish: Manufacturer's standard .
6. Options: 90-10-65/450 Pipeline supports Type A.
7. Execution: Installing copper pipelines.

Pr_65_52_63_18 Copper pipeline fittings Type A

1. Description:
2. Standards
    2.1. Capillary: To BS EN 1254-1, solder ring and To BS EN 1254-1, end feed.

Pr_65_54_95_06 Ball valves type B

1. General requirements: Connections for accessories .
2. Description:
3. Manufacturer: Oventrop.
4. Material: Manufacturer's standard .
5. Connections: Compression.
6. Finish: Manufacturer's standard .
7. Execution: Pr_65_54_95/610 Installation of valves generally type A.

Pr_65_54_95_14 Copper alloy check valves type B

1. General requirements: Connections for accessories .
2. Description:
3. Standard: To BS 5154.
4. Third-party certification:
5. Lift type
    5.1. Design: Disk.
    5.2. Body pattern: Straight.
6. Swing type:
7. Material: Copper alloy.
8. Connections: Compression.
9. Operation: Manufacturer's standard .
10. Execution: Pr_65_54_95/610 Installation of valves generally type A.

Pr_65_54_95_94 Verifiable backflow prevention devices type B

1. General requirements: Connections for accessories .
2. Description:
3. Standard:
    3.1. Anti-pollution check valves: To BS EN 13959.
    3.2. Hose union: To BS EN 14454.
    3.3. In-line anti-vacuum valves: To BS EN 14451.

4. Third-party certification:
5. Material: Copper alloy.
6. Denomination:
7. Connections: Compression.
8. Acoustic group:
9. Execution: Pr_65_54_95/610 Installation of valves generally type A.

Pr_80_77_27_15 Channel supports type C

1. Description:
2. Support type: Proprietary support channels and fixings.
3. Third party certification:
4. Channels
    4.1. Load capacity:
    4.2. Format:
    4.3. Dimensions:
    4.4. Type:
    4.5. Material:
    4.6. Finish:
    4.7. Accessories:

Pr_80_77_76_34 Glass wool cloth insulation protection

1. Description:
2. Manufacturer:
3. Material:
4. Colour:
5. Execution:

Pr_80_77_76_53 Mineral wool duct slab insulation type C

1. Description:
2. Manufacturer: Rockwool Ltd.
3. Standard: To BS 3958-5.
4. Recycled content: 50% (minimum) to BS EN ISO 14021.
5. Thermal conductivity: 0.032 W/m·K at 0°C.
   0.034 W/m·K at 10°C.
   0.037 W/m·K at 50°C.
   0.040 W/m·K at 75°C.
   0.044 W/m·K at 100°C.
6. Finish: Aluminium foil faced.
7. Insulation thickness (minimum): To BS 5422.
8. Protection: Pr_80_77_76_34 Glass wool cloth insulation protection
9. Items to be insulated:

Pr_80_77_76_54 Mineral wool pipe section insulation

1. Description:
2. Manufacturer: Rockwool Ltd.
3. Product reference: Rockwool Rocklap H&V Pipe Sections.

4. Reaction to fire classification:
5. Vapour barrier
    5.1. Material:
    5.2. Vapour permeability:
6. Protection:
7. Execution: Pr_80_77_76/625 Installing foil faced mineral wool insulation on pipelines.

Pr_80_77_94_30 Flexible vibration isolation hoses type A

1. General requirements: Mountings generally .
2. Description:
3. Flexible hoses type: Stainless steel braided.
4. Execution: Pr_80_77_94/620 Installation of flexible hoses and rubber bellows Type A.

Execution

Pr_20_29_14/620 Installing pipeline supports Type A

1. Position
    1.1. In plant rooms: One piece strap, sling rod, washer and nuts.
    1.2. Distribution corridors and risers: All pipework outwith plantrooms to be exposed and mounted on cable trays.
    1.3. Surface mountings: Split ring, spacer nipple and backplate.

Pr_40_10_57/660 Installing identification on pipework type A

1. Application of basic identification colour: Coloured bands as BS 1710 clause 3.3 and Over the whole length of the pipe.
2. Safety colour identification: On or next to the colour bands.
3. Information: Abbreviation of name;
   Chemical symbol for gases;
   Colour bands as BS 1710 appendix D;
   and Refrigerant number.
4. Direction of flow: Indication arrow and the word FLOW or the letter F and Indication arrow and the word RETURN or the letter R.

Pr_65_54_95/610 Installation of valves generally type A

1. Installation: In accordance with BS 6683.
2. Position: As detailed on mechanical drawings and schematics
3. Isolation and regulation valves: Provide at equipment and on sub-circuits.
4. Access: Locate valves so they can be readily operated and maintained. Locate next to equipment which is to be isolated.
5. Connection to pipework: Fit with joints that suit the pipe material.

Pr_80_77_76/610 Installing insulation and protection products generally Type A

1. Standard: In accordance with BS 5970.
2. Timing: Insulate after installed system has been fully tested and joints proved sound.
3. Insulation: Do not enclose adjacent units together.
4. Clearance: Maintain between pipes.

5. Finish: Neatly finish joints, corners, edges and overlaps.

Pr_80_77_76/625 Installing foil faced mineral wool insulation on pipelines

1. General requirements: Pr_80_77_76/610 Installing insulation and protection products generally Type A .
2. Joints: Close butt; seal with 50 mm wide class 0 foil tape on both longitudinal and circumferential joints.
3. At fittings: Mitre. Secure with tape.
4. Vapour seal: Tape exposed insulation membrane. Seal vapour barrier at pipe support with class 0 foil tape.

Pr_80_77_94/620 Installation of flexible hoses and rubber bellows Type A

1. Position: Close to the source of vibration.

Ss_55_70_38/610 Removing hot and cold water systems Type A

1. Scope: Entire existing systems in a phased manor as indicated on the mechanical drawings. Stripout to include all items of plant, cisterns, distribution pipework, insulation / protection, pipework hangers / supports, controls and electrical wiring associated with the systems. Any damage to the building or finishes to be rectified once stripout is complete.

Ss_55_70_38/620 Installing hot and cold water systems generally Type A

1. Standard: To BS 8558 and BS EN 806-4.
2. Performance: Free from leaks and the audible effects of expansion, vibration and water hammer.
3. Fixing of equipment, components and accessories: Fix securely, parallel or perpendicular to the structure of the building.
4. Preparation: Immediately before installing tanks and cisterns on a floor or platform, clear the surface completely of debris and projections.
5. Corrosion resistance: In locations where moisture is present or may occur, avoid contact between dissimilar metals by use of suitable washers, gaskets, and the like.

Ss_55_70_38/650 Hydraulic pressure testing of hot and cold water supply systems Type A

1. Standard: To BS 8558 and BS EN 806-4.
2. Notice (minimum): 1 week.
3. Pressure: 680 kPa.
4. Duration of test: 1 h.

Ss_55_70_38/660 Flushing hot and cold water systems Type A

1. Standard: To BS EN 806-4.
2. Water analysis: Analyse water samples before treatment.
3. Preliminary checks: Thoroughly inspect pipework. Complete pressure tests before cleaning or chemical treatment.
4. Waste products : Neutralize, and dispose of to drain. Preferably direct to manhole.

Ss_55_70_38/670 Disinfection of hot and cold water systems Type A

1. Standard: To BS EN 806-4.
2. Samples for analysis: Provide after disinfection and flushing.

System completion

Ss_55_70_38/810 Commissioning of hot and cold water supply systems Type A

1. Pre-commissioning: In accordance with BSRIA 2/89.3 and CIBSE Commissioning Code W.
2. Commissioning: In accordance with BS EN 806-4, BSRIA 2/89.3 and CIBSE Commissioning Code W.
3. Notice (minimum): One week.
4. Equipment: Check and adjust operation of equipment, controls and safety devices.
5. Outlets: Check operation of outlets for satisfactory rate of flow and temperature.

Ss_55_70_38/820 Inspection and test records Type A

1. Reports:
2. Construction phase reports: System design is commissionable;
   Post-installation;
   System cleanliness;
   and System commissionable.
3. Records for water systems: In accordance with BSRIA 2/89.3.
4. Record sheets
   - 4.1. Submission: On completion.
   - 4.2. Number of copies: Three.

Ss_55_70_38/830 Demonstrations Type A

1. Running of plant
   - 1.1. Operation: Run, maintain and supervise the installations under normal working conditions.
   - 1.2. Duration: Two weeks.
2. Instruction: Instruct and demonstrate the purpose, function and operation of the installations.

Ss_55_70_38/840 Documentation

1. Operating and maintenance instructions
   - 1.1. Scope: Submit for the system giving optimum settings for controls.
   - 1.2. Product information: Include product description, date of purchase, performance characteristics, application (suitability for use), method of operation and control, and cleaning and maintenance requirements.
   - 1.3. Format: Paper copy.
   - 1.4. Number of copies: Two.
2. Record drawings
   - 2.1. Content: Location and arrangement of plant in plant rooms;
     Location, size and route of hot and cold water services;
     Location, route and depth of underground services;
     Location and identification of regulating, isolation and control valves;
     and Location of outlets.
   - 2.2. Format: A1 paper print and Electronic.
   - 2.3. Number of copies: Two.
3. Submittal date: At handover.
4. Wholesome water consumption notice: Submit within five days.

Ss_55_70_38/850 Water quality tests

1. Standard: To BS EN 806-4.
2. Samples
    2.1. Sample points: Main supply to site;
    2.2. Samples for analysis: Submit samples for bacteriological analysis.
3. Water temperature: Record at each sampling point at the time of taking the sample.
4. Test results
    4.1. Record: Details of all analyses.
    4.2. Submit: On completion.
    4.3. Number of copies: One.

Ss_55_70_38/860 Spares Type A

1. Pipeline ancillaries
    1.1. Keys: Two of each type.
    1.2. Hose unions: Two of each type.
2. Pumps:
3. Belts and pulleys: Two of each type.

Ss_55_70_38/880 Maintenance Type A

1. Servicing and maintenance: Undertake for 12 months after completion.

Ω End of System

Ss_55_70_38_20
Direct hot water storage supply systems

Systems

Ss_55_70_38_20 Direct hot water storage supply systems

1. Description: The contractor shall design, coordinate, procure, install, set to work and commission a complete domestic hot water system providing hot water to all hot water outlets.

   The SCR shall be provided with a direct electric unvented water cylinder with single phase immersion heaters, the water heater shall be installed with integral expansion vessel and supplied with the manufacturer's temperature controls and temperature/pressure relief valve.

   The domestic hot water systems shall be installed in accordance with BS 6700 Specification for design, installation, testing and maintenance of services supplying water for domestic use within, buildings and their curtilages, the CIBSE Public Health Engineering Guide G and the local water authority byelaws.

   The hot water supplies to all sanitary appliances shall be fitted with thermostatic mixing valves for a safe water delivery temperature of 43°C. The only exception shall be the Kitchen and cleaners outlets which shall have full temperature hot water.

   DHW to shower heads shall be kept to a max of 6l/min via flow limiting valves.

   The pipework shall be labelled in accordance with BS 1710.

   All items of sanitary ware shall be fitted with combined isolation/flow regulator valves as manufactured by Arrow Valves or equal and approved.

   The system shall be installed to be self-venting. Drain cocks shall be provided at all low points to facilitate drain down.

   The Local Authority shall be given due notice to inspect the works at 2nd fix to ensure compliance with the water regulations.

   Any services penetrating fire barriers shall be suitably fire treated/rated. Branch valves accessible through hatches shall be fitted for maintenance.

   The domestic hot water distribution pipework shall be copper, with fittings entirely suitable for potable water supply. The pipework shall be insulated in accordance with BS 5422, BS 5970 and BS EN ISO 12241.

2. Electric immersion heater: Immersion heaters
3. System: Unvented.
4. Capacity: 50lt
5. Pipelines: Pr_65_52_63_17 Copper pipelines Type B
6. Pipeline accessories
   - 6.1. Expansion devices: Pr_65_67_28_46 Lateral expansion compensators Type B
   - 6.2. Gauges: Pr_65_52_34_66 Pressure gauges Type B
   - 6.3. Accessories: Pr_65_52_61_91 Tundishes Type B
   - 6.4. Pipeline supports:
7. Valves
   - 7.1. Isolating valves: Pr_65_54_95_06 Ball valves type C

7.2. Check valves: Pr_65_54_95_14 Copper alloy check valves type C

7.3. Regulating valves: Pr_65_54_95_26 Double regulating valves Type B; Pr_65_54_95_30 Flow-measuring valves Type B

7.4. Draining devices: Pr_65_54_95_27 Draining taps Type B

8. Fire-stopping: Individual services penetrations fire-stopping system. Pipe collar fire-stopping system.
9. Thermal insulation

9.1. Pipelines: Pr_80_77_76_54 Mineral wool pipe section insulation Type A

10. Vibration isolation:
11. Accessories: Electrical resistance trace heating system.
12. Plant and equipment identification: Pr_40_10_57_78 Self-adhesive colour pipe bands type C
13. Execution: Ss_55_70_38/620 Installing hot and cold water systems generally Type B
14. System completion: Ss_55_70_38/810 Commissioning of hot and cold water supply systems Type B

Products

90-10-65/320 Copper pipeline jointing materials Type B

1. Standards:

1.1. Lead free solder for capillary fittings: To BS EN ISO 9453.

90-10-65/450 Pipeline supports Type B

1. Manufacturer: Contractor's choice .
2. Arrangement: Manufacturer's standard .
3. Material: Brass and Steel.
4. Execution: Pr_20_29_14/620 Installing pipeline supports Type B.

Pr_40_10_57_78 Self-adhesive colour pipe bands type C

1. Description:
2. Manufacturer:
3. Standards: To BS 1710.
4. Identification type:
5. Execution:

Pr_65_52_34_66 Pressure gauges Type B

1. Description:
2. Manufacturer: Contractor's choice .
3. Standard: To BS EN 837-1.
4. Diameter: 50 mm.
5. Scale subdivisions: 20 kPa (0.2 bar) for a maximum scale value of 1000 kPa (10 bar).
6. Material: Stainless steel.
7. Connections: Manufacturer's standard .
8. Execution: Pr_65_52_34/630 Installing pressure gauges Type B.

Pr_65_52_61_91 Tundishes Type B

1. Description:

2. Manufacturer: Contractor's choice .
3. Material: Mild steel sheet, hot dip galvanized.
4. Connections: Diameter to suit drain line.

Pr_65_52_63_17 Copper pipelines Type B

1. Description:
2. General requirements: 90-10-65/320 Copper pipeline jointing materials Type B and Pr_65_52_63_18 Copper pipeline fittings Type B.
3. Standard: To BS EN 1057.
4. Grade: R250.
5. Finish: Manufacturer's standard .
6. Options: 90-10-65/450 Pipeline supports Type B.
7. Execution: Installing copper pipelines.

Pr_65_52_63_18 Copper pipeline fittings Type B

1. Description:
2. Standards
   2.1. Capillary: To BS EN 1254-1, solder ring and To BS EN 1254-1, end feed.

Pr_65_54_93_87 Test points type C

1. Description:
2. Third-party certification:
3. Arrangement: Self sealing.
4. Material: Brass.
5. Connections: 6 mm (¼ inch) standard length.

Pr_65_54_95_06 Ball valves type C

1. General requirements: Connections for accessories .
2. Description:
3. Manufacturer: Contractor's choice .
4. Material: Brass copper alloy and Bronze.
5. Connections: Compression.
6. Finish: Chrome plated (Where exposed) and Natural (where concealed).
7. Execution: Pr_65_54_95/610 Installation of valves generally type C and Valve tests.

Pr_65_54_95_14 Copper alloy check valves type C

1. General requirements: Connections for accessories .
2. Description:
3. Manufacturer: Contractor's choice .
4. Standard: To BS 5154.
5. Third-party certification:
6. Lift type
   6.1. Design: Piston.
   6.2. Body pattern: Straight.
7. Swing type:

8. Series: Manufacturer's standard .
9. Material: Copper alloy.
10. Connections: Capillary and Compression.
11. Operation: Manufacturer's standard .
12. Execution: Pr_65_54_95/610 Installation of valves generally type C and Valve tests.

Pr_65_54_95_26 Double regulating valves Type B

1. Description:
2. Manufacturer: Oventrop
3. Standard: To BS 7350.
4. Arrangement: Globe.
5. Material: Steel.
6. Connections: Flanged and Threaded.
7. Accessories: Drain plug facility and Independent means for positive isolation on pressure tapping point.
8. Execution: Pr_65_54_95/610 Installation of valves generally type C;
   and Pr_65_54_95/620 Installation of double regulating valves Type B.

Pr_65_54_95_27 Draining taps Type B

1. General requirements: Connections for accessories .
2. Description:
3. Manufacturer: Contractor's choice .
4. Standard: To BS 2879.
5. Size:
6. Arrangement: 1.
7. Material: Bronze.
8. Connections: Threaded.
9. Accessories: Lever pattern key and Spare hose union.
10. Execution: Pr_65_54_95/610 Installation of valves generally type C and Valve tests.

Pr_65_54_95_30 Flow-measuring valves Type B

1. Description:
2. General requirements: Pr_65_54_93_87 Test points type C
3. Manufacturer: Oventrop
4. Standard: To BS 7350.
5. Arrangement: 3.
6. Material: Cast iron and Steel.
7. Connections: Flanged and Threaded.
8. Accessories: Drain plug facility;
   Position indicator;
   and Independent means for positive isolation on pressure tapping point.
9. Execution: Pr_65_54_95/610 Installation of valves generally type C;

   and Pr_65_54_95/630 Installation of flow measurement devices Type B.

Pr_65_67_28_46 Lateral expansion compensators Type B

1. Description:
2. Manufacturer: Heating Appliances & Services Ltd (HASL)
3. Product reference: Expansion Compensators to be contractor designed with HASL
4. Execution: Pr_65_67_28/620 Installing expansion compensators Type B.

Pr_80_77_76_54 Mineral wool pipe section insulation Type A

1. Description:
2. Manufacturer:
3. Standard:
4. Recycled content:
5. Thermal conductivity: 0.032 W/m·K at 0°C.
6. Finish:
7. Reaction to fire classification:
8. Insulation thickness (minimum): To BS 5422.
9. Vapour barrier
   9.1. Material:
   9.2. Vapour permeability: To BS 5422, clause 5.6.
10. Protection:
11. Accessories:
12. Execution:

Execution

Pr_20_29_14/620 Installing pipeline supports Type B

1. Position
   1.1. In plant rooms: One piece strap, sling rod, washer and nuts.
   1.2. Distribution corridors and risers: All pipework outwith plantrooms to be exposed and mounted on cable trays.
   1.3. Surface mountings: Split ring, spacer nipple and backplate.

Pr_65_52_34/630 Installing pressure gauges Type B

1. Position: Downstream of outlet check valve and upstream of outlet stop valve on pump supply.

Pr_65_54_95/610 Installation of valves generally type C

1. Installation: In accordance with BS 6683.
2. Position: As detailed on mechanical drawings and schematics
3. Isolation and regulation valves: Provide at equipment and on sub-circuits.
4. Access: Locate valves so they can be readily operated and maintained. Locate next to equipment which is to be isolated.
5. Connection to pipework: Fit with joints that suit the pipe material.

Pr_65_54_95/610 Installation of valves generally type D

1. Installation: In accordance with BS 6683.
2. Isolation and regulation valves: Provide at equipment and on sub-circuits.

3. Access: Locate valves so they can be readily operated and maintained. Locate next to equipment which is to be isolated.
4. Connection to pipework: Fit with joints that suit the pipe material.

Pr_65_54_95/620 Installation of double regulating valves Type B

1. General requirements: Pr_65_54_95/610 Installation of valves generally type D .

Pr_65_54_95/630 Installation of flow measurement devices Type B

1. General requirements: Pr_65_54_95/610 Installation of valves generally type D .
2. Position: Provide straight length of pipe upstream and downstream.

Pr_65_67_28/620 Installing expansion compensators Type B

1. Position: Contractor Design.
2. Anchors and guides: Locate to contain movement and resist maximum imposed loads.

Ss_55_70_38/620 Installing hot and cold water systems generally Type B

1. Standard: To BS 8558 and BS EN 806-4.
2. Performance: Free from leaks and the audible effects of expansion, vibration and water hammer.
3. Fixing of equipment, components and accessories: Fix securely, parallel or perpendicular to the structure of the building.
4. Preparation: Immediately before installing tanks and cisterns on a floor or platform, clear the surface completely of debris and projections.
5. Corrosion resistance: In locations where moisture is present or may occur, avoid contact between dissimilar metals by use of suitable washers, gaskets, and the like.

System completion

Ss_55_70_38/810 Commissioning of hot and cold water supply systems Type B

1. Pre-commissioning: In accordance with BSRIA BG 2/2010 and CIBSE Commissioning Code W.
2. Commissioning: In accordance with BS EN 806-4, BSRIA BG 2/2010 and CIBSE Commissioning Code W.
3. Notice (minimum):
4. Equipment: Check and adjust operation of equipment, controls and safety devices.
5. Outlets: Check operation of outlets for satisfactory rate of flow and temperature.

Ω End of System

Ss_60_40_37_48
Low-temperature hot water heating systems

Systems

Ss_60_40_37_48 Low-temperature hot water heating systems

1. Description: The contractor shall design, coordinate, procure, install, set to work and commission the required works to the heating system.

   The heating circuits from the basement plantroom shall be isolated and drained down prior to the amendments to the LTHW pipework and the installation of the new radiators.

   The LTHW heating system shall be installed in mild steel and copper pipes as per the existing and shall be fully insulated.

   The contractor shall ensure that the pipework serving any radiators that are to be removed is disconnected back to the main pipework runs to avoid deadlegs.

   The radiator type is subject to the architects approval, all radiators shall be selected to fit into the space available by the Contractor.

   Where existing pipework that is to be reused is discovered to be corroded to excess, it will be brought to the attention of the Consulting Engineers

   Any existing radiators shall be flushed prior to reuse.

   All radiators shall be provided with TRVs, radiators.

   All pipework shall be sleeved through walls and fire compartments and shall be appropriately sealed to prevent fire and noise transfer.

   The LTHW heating pipework shall be installed to provide offsets to allow natural expansion an avoid the requirement for expansion bellows etc.

   The LTHW heating system shall be commissioned by a reputable and reliable commissioning engineer.

   The heating system shall be fully flushed and filled with water treatment recommendations. The heating system water shall be sampled and tested by the water treatment manufacturer. The water treatment manufacturer shall certificate the level of water treatment in the system.

   The exsisting electric overdoor heater serving the entrance lobby is to be removed and replaced with a new low noise unit.

2. System performance: Ss_60_40_37/210 Design of heating systems.
3. Arrangement: Variable flow circuits.
4. Distribution:
5. Heat source: Heat pumps.
6. Burner
   6.1. Arrangement:
   6.2. Type:
7. Fuel: Electricity.
8. Feed and expansion: Pr_65_53_86_68 Pressurization units.

9. Pumps: Refer to Mechanical Schedules
10. Water treatment plant
    10.1. Equipment: 90-15-95/350 Dosing pots.
    10.2. Chemicals: Pr_60_55_96_15 Corrosion inhibitor chemicals.
11. Pipelines: Pr_65_52_63_82 Steel pipelines.
12. Pipeline ancillaries
    12.1. Venting devices: Pr_65_54_93_05 Automatic air vents.
    12.2. Expansion devices: Pr_65_52_28_05 Axial expansion compensators and Pr_65_52_28_46 Lateral expansion compensators.
    12.3. De-aerators: Degaser integral to pressurisation unit
    12.4. Separators: Pr_65_55_76_22 Dirt separators.
    12.5. Gauges: Pr_65_52_34_66 Pressure gauges and Pr_65_52_34_88 Temperature gauges.
    12.6. Accessories: Pr_65_52_61_50 Masking plates Type A;
    Pr_65_52_61_63 Pipe sleeves type C;
    Pr_65_52_61_91 Tundishes;
    and 90-10-60/400 Pipeline strainers.
    12.7. Pipeline supports:
13. Fire stopping:
14. Valves
    14.1. Isolating valves: Pr_65_54_95_06 Ball valves.
    14.2. Check valves: Pr_65_54_95_14 Copper alloy check valves.
    14.3. Regulating valves: Pr_65_54_95_26 Double regulating valves and Pr_65_54_95_30 Flow-measuring valves.
    14.4. Balancing valves:
    14.5. Mixing valves:
    14.6. Radiator valves: Pr_65_54_95_70 Radiator valves and Pr_65_54_95_89 Thermostatic radiator valves.
    14.7. Draining devices: Pr_65_54_95_27 Draining taps.
    14.8. Accessories: Pr_65_54_93_87 Test points type B and Pr_65_54_95_75 Safety valves.
15. Thermal insulation: Pr_80_77_76_62 Phenolic foam insulation.
16. Vibration isolation: Pr_80_77_94_40 Inertia bases;
    Pr_80_77_94_42 Isolation hangers type A;
    Pr_80_77_94_74 Rubber bellows;
    and Pr_80_77_94_30 Flexible vibration isolation hoses.
17. Heat emitters: Pr_70_60_36_73 Radiators
18. Controls: As per the controls specification
19. System accessories: Pr_80_77_27_15 Channel supports type A.
20. Plant and equipment identification: Pr_40_10_57_78 Self-adhesive colour pipe bands type D;
    90-90-55/480 Mechanical plant and equipment identification labels generally type A;
    90-90-55/490 Valve charts and schematics generally type B;
    and 90-90-55/495 Valve identification labels generally type B.
21. Execution: Ss_60_40_37/620 Installing water based heating systems;
    Ss_60_40_37/650 Filling and pressure testing of water based heating systems;
    and Ss_60_40_37/660 Flushing and pre-commission cleaning of heating systems.
22. System completion: Ss_60_40_37/810 Commissioning water heating systems;
    Ss_60_40_37/840 Performance testing;
    Ss_60_40_37/845 Demonstrations;
    and Ss_60_40_37/880 Servicing and maintenance.

System performance

Ss_60_40_37/210 Design of heating systems

1. Design: Complete the design of the heating systems.

Products

90-10-60/400 Pipeline strainers

1. Manufacturer: Contractor's choice .
2. Integral accessories: Plugged connections for drain, air vent and differential pressure monitoring.
3. Execution: Pr_65_57_96/650 Installing strainers.

90-10-65/425 Steel pipeline jointing materials

1. Manufacturer: Contractor's choice .
2. Standards:
    2.1. Jointing compound: To BS 6956-5.
    2.2. PTFE tape: To BS EN 751-3.
    2.3. Flange jointing rings: To BS EN 1514-4.
    2.4. Elastomeric gaskets: To BS EN 681-1.
    2.5. Welding rods:
        2.5.1. Gas welding: To BS EN 12536.
        2.5.2. Arc welding: To BS EN ISO 636.

90-10-65/450 Pipeline supports

1. Manufacturer: Contractor's choice .
2. Arrangement: Manufacturer's standard .
3. Material: Brass and Steel.
4. Execution: Pr_20_29_14/620 Installing pipeline supports.

90-10-90/305 Connections for accessories type A

1. Capillary: To BS EN 1254-1.
2. Compression for copper tubes: To BS EN 1254-2.
3. Compression for plastics pipes: To BS EN 1254-3.
4. Flanged for cast iron: To BS EN 1092-2.
5. Flanged for copper alloy: To BS EN 1092-3.
6. Threaded:
    6.1. Where pressure-tight joints are made on the threads: To BS 21 or BS EN 10226-1.
    6.2. Where pressure-tight joints are not made on the threads: To BS EN ISO 228-1.

90-15-95/350 Dosing pots

1. Manufacturer: Submit proposals .
2. Standard: To PD 5500.
3. Material: Mild steel.
4. Working pressure (maximum): 10 bar.
5. Execution: Pr_60_55_97/610 Installing dosing equipment.

90-90-55/480 Mechanical plant and equipment identification labels generally type A

1. Colour:
2. Typography:
3. Execution: Pr_40_10_57/611 Installing mechanical plant and equipment identification type C.

90-90-55/490 Valve charts and schematics generally type B

1. Material: Paper print, glazed frame.
2. Information to be included: Location and identification of pipework regulating, isolating and control valves.
3. Execution: Pr_40_10_57/620 Installing valve charts and schematics type B.

90-90-55/495 Valve identification labels generally type B

1. Material: Face engraved rigid plastic laminate.
2. Label size:
3. Colour:
   3.1. Background: White.
   3.2. Lettering: Black.
4. Typography:
   4.1. Font: Helvetica medium.
   4.2. Size: Manufacturer's standard .
5. Information: Purpose and reference number.
6. Execution: Pr_40_10_57/630 Installing valve identification labels.

90-90-95/310 Mountings generally

1. Criteria: Ensure that vibration generated by the engineering services is not transmitted to pipework, ductwork, the building and supporting structure.
2. Overload capacity (minimum): 50%.
3. Colour code: Identify for load and deflection rating.
4. Marking: Label with load capacity.

Pr_40_10_57_78 Self-adhesive colour pipe bands type D

1. Description:
2. Manufacturer: Submit proposals .
3. Standards: To BS 1710.
4. Identification type: Adhesive colour bands.
5. Execution: Pr_40_10_57/660 Installing identification on pipework type B.

Pr_60_55_96_15 Corrosion inhibitor chemicals

1. Description:
2. Manufacturer: Submit proposals .
3. Chemicals: Submit proposals .
4. Corrosion inhibitors:

Pr_65_52_28_05 Axial expansion compensators

1. Description:

2. Manufacturer: Contractor's choice .
3. Product reference: Expansion Compensators to be contractor designed
4. Standards: In accordance with BS 6129-1 and to BS ISO 15348.
5. Material
6. Execution: Pr_65_52_28/620 Installing expansion compensators.

Pr_65_52_28_46 Lateral expansion compensators

1. Description:
2. Manufacturer: Contractor's choice .
3. Product reference: Expansion Compensators to be contractor designed
4. Standards: In accordance with BS 6129-1 and to BS ISO 15348.
5. Connections: Flanged.
6. Execution: Pr_65_52_28/620 Installing expansion compensators.

Pr_65_52_34_66 Pressure gauges

1. Description:
2. Manufacturer: Contractor's choice .
3. Standard: To BS EN 837-1.
4. Diameter: 150mm
5. Scale subdivisions: 20 kPa (0.2 bar) for a maximum scale value of 1000 kPa (10 bar).
6. Material: Stainless steel.
7. Connections: Manufacturer's standard .
8. Execution: Pr_65_52_34/630 Installing pressure gauges.

Pr_65_52_34_88 Temperature gauges

1. Description:
2. Manufacturer: Contractor's choice .
3. Standard: To BS EN 13190.
4. Format: Vapour pressure.
5. Diameter: 150
6. Case: Brass.
7. Connections: Straight stem.
8. Integral accessories: 100 mm immersion length pocket.

Pr_65_52_61_50 Masking plates Type A

1. Description:
2. Manufacturer: Contractor's choice .
3. Material
   3.1. All pipes except chromium plated copper: Plastic.
   3.2. Chromium plated copper pipes: Chromium plated.
4. Format: Split.

Pr_65_52_61_63 Pipe sleeves type C

1. Description:
2. Manufacturer: Contractor's choice .

3. Product reference: FloPlast Intumescent Wrap Ref: FW110.

Pr_65_52_61_91 Tundishes

1. Description:
2. Manufacturer: Contractor's choice .
3. Material: Mild steel sheet, hot dip galvanized.
4. Connections: Diameter to suit drain line.

Pr_65_52_63_82 Steel pipelines

1. Description:
2. General requirements: 90-10-65/425 Steel pipeline jointing materials and Pr_65_52_63_83 Steel pipeline fittings.
3. Standard
   3.1. Up to 150mm: To BS EN 10255, medium weight.
4. Options: 90-10-65/450 Pipeline supports.
5. Execution: Pr_65_52_63/700 Installing buried pipelines;
   Pr_65_52_63/705 Protection of buried pipelines;
   Pr_65_52_63/680 Installing steel pipelines;
   and Pr_65_52_63/685 Welding steel pipelines.

Pr_65_52_63_83 Steel pipeline fittings

1. Description:
2. Manufacturer: Contractor's choice .
3. Standards
   3.1. Malleable: To BS 143 and 1256.
   3.2. Flanged: To BS EN 1092-1.
   3.3. Welded: To BS EN 10253-1 and BS EN 10253-2.
   3.4. Wrought: To BS EN 10241.
   3.5. Press fit fittings:
   3.6. Mechanical couplings: Contractor's choice .

Pr_65_53_86_68 Pressurization units

1. Description:
2. Manufacturer: Contractor's choice .
3. Product reference: Wilo Comfort P230-WM
4. Standards
   4.1. General: To BS EN 13831.
   4.2. Domestic heating and hot water supply: In accordance with BS 7074-1.
   4.3. Low and medium temperature hot water heating: In accordance with BS 7074-2.
   4.4. Chilled water and condenser water: In accordance with BS 7074-3.
5. Format: Fully automatic pre-wired packaged unit on common base plate.
6. Execution: Pr_65_53_86/630 Installing pressurization units.

Pr_65_54_93_05 Automatic air vents

1. Description:
2. Manufacturer: Contractor's choice .

3. Arrangement: Vertical inlet with integral lockshield isolating valve.
4. Material: Gunmetal.
5. Connections: Threaded.

Pr_65_54_93_87 Test points type B

1. Description:
2. Manufacturer: Contractor's choice .
3. Third-party certification:
4. Arrangement: Self sealing.
5. Material: Brass.
6. Connections: 6 mm (¼ inch) standard length.

Pr_65_54_95_06 Ball valves

1. General requirements: 90-10-90/305 Connections for accessories type A .
2. Description:
3. Manufacturer: Contractor's choice .
4. Material: Brass copper alloy and Bronze.
5. Connections: Compression.
6. Finish: Chrome plated (Where exposed) and Natural (where concealed).
7. Execution: Pr_65_54_95/610 Installation of valves generally and 90-10-90/670 Valve tests.

Pr_65_54_95_14 Copper alloy check valves

1. General requirements: 90-10-90/305 Connections for accessories type A .
2. Description:
3. Manufacturer: Contractor's choice .
4. Standard: To BS 5154.
5. Third-party certification:
6. Lift type
    6.1. Design: Piston.
    6.2. Body pattern: Straight.
7. Swing type:
8. Series: Manufacturer's standard .
9. Material: Copper alloy.
10. Connections: Capillary and Compression.
11. Operation: Manufacturer's standard .
12. Execution: Pr_65_54_95/610 Installation of valves generally and 90-10-90/670 Valve tests.

Pr_65_54_95_26 Double regulating valves

1. General requirements: Pr_65_54_93_87 Test points type B and 90-10-90/305 Connections for accessories type A.
2. Description:
3. Manufacturer: Contractor's choice .
4. Standard: To BS 7350.
5. Arrangement: Globe.
6. Material: Steel.

7. Connections: Flanged and Threaded.
8. Accessories: Drain plug facility and Independent means for positive isolation on pressure tapping point.
9. Execution: Pr_65_54_95/610 Installation of valves generally;
   90-10-90/670 Valve tests;
   and Pr_65_54_95/620 Installation of double regulating valves.

Pr_65_54_95_27 Draining taps

1. General requirements: 90-10-90/305 Connections for accessories type A .
2. Description:
3. Manufacturer: Contractor's choice .
4. Standard: To BS 2879.
5. Size:
6. Arrangement: 1.
7. Material: Bronze.
8. Connections: Threaded.
9. Accessories: Lever pattern key and Spare hose union.
10. Execution: Pr_65_54_95/610 Installation of valves generally and 90-10-90/670 Valve tests.

Pr_65_54_95_30 Flow-measuring valves

1. Description:
2. General requirements: Pr_65_54_93_87 Test points type B and 90-10-90/305 Connections for accessories type A.
3. Manufacturer: Contractor's choice .
4. Standard: To BS 7350.
5. Arrangement: 3.
6. Material: Cast iron and Steel.
7. Connections: Flanged and Threaded.
8. Accessories: Drain plug facility;
   Position indicator;
   and Independent means for positive isolation on pressure tapping point.
9. Execution: Pr_65_54_95/610 Installation of valves generally;
   90-10-90/670 Valve tests;
   and Pr_65_54_95/630 Installation of flow measurement devices.

Pr_65_54_95_70 Radiator valves

1. General requirements: 90-10-90/305 Connections for accessories type A .
2. Description:
3. Manufacturer: Contractor's choice .
4. Standard: To BS 2767.
5. Arrangement: Straight pattern.
6. Material: Brass copper alloy and Bronze.
7. Connections: Compression and Threaded.
8. Finish: Chrome plated.
9. Options: Lockshield.
10. Execution: Pr_65_54_95/610 Installation of valves generally and 90-10-90/670 Valve tests.

Pr_65_54_95_75 Safety valves

1. General requirements: 90-10-90/305 Connections for accessories type A .
2. Description:
3. Manufacturer: Contractor's choice .
4. Product reference: Contractor's choice .
5. Standard: To BS EN ISO 4126-1.
6. Lift type:
7. Accessories:
8. Execution: Pr_65_54_95/610 Installation of valves generally and Pr_65_54_95/660 Installation of discharge connections.

Pr_65_54_95_89 Thermostatic radiator valves

1. General requirements: 90-10-90/305 Connections for accessories type A .
2. Description:
3. Manufacturer: Oventrop
4. Standard: To BS 7478 and BS EN 215.
5. Arrangement: Integral sensor and Presetting.
6. Pattern: Straight.
7. Connections: Compression fitting and cone seated union and Internal pipe thread and cone seated union.
8. Execution: Pr_65_54_95/610 Installation of valves generally;
   90-10-90/670 Valve tests;
   and Pr_65_54_95/640 Installation of thermostatic radiator valves.

Pr_65_55_76_22 Dirt separators

1. Description:
2. Manufacturer: Contractor's choice .
3. Product reference: Spirovent Bronze DN50 Dirt Separator
4. Arrangement: Vertical mild steel housing with internal reservoir, sludge pipe, perforation plate and automatic air release mechanism..
5. Material: Carbon steel.

Pr_70_60_36_73 Radiators

1. Description:
2. Manufacturer: Submit proposals .
3. Product reference: Refer to Mechanical Drawings
4. Standards: To BS EN 442-1, BS EN 442-2 and BS EN 442-3.
5. Third party certification: To RADMAC scheme.
6. Duty:
7. Finish:
8. Execution: Pr_70_60_36/611 Installing heat emitters generally.

Pr_80_77_27_15 Channel supports type A

1. Description:
2. Manufacturer: Submit proposals . Contractor Design.
3. Support type: Submit proposals .

4. Third party certification:
5. Channels
    5.1. Load capacity:
    5.2. Format:
    5.3. Dimensions:
    5.4. Type:
    5.5. Material:
    5.6. Finish:
    5.7. Accessories:

Pr_80_77_76_62 Phenolic foam insulation

1. Description:
2. Manufacturer: Contractor's choice .
3. Product reference: Glasswool & ULTIMATE faced sections
4. Standard: To BS EN 13166.
5. Thermal conductivity: 0.018 W/m·K at 0°C.
   0.018 W/m·K at 10°C.
   0.023 W/m·K at 50°C.
   0.025 W/m·K at 75°C.
6. Fire performance:
7. Vapour barrier
    7.1. Material:
    7.2. Vapour permeability:
8. Protection:
9. Execution: Pr_80_77_76/640 Installing phenolic foam insulation on pipelines and Pr_80_77_76/755 Installing at non-loadbearing pipelines supports.

Pr_80_77_94_30 Flexible vibration isolation hoses

1. General requirements: 90-90-95/310 Mountings generally .
2. Description:
3. Manufacturer: Contractor's choice .
4. Connections
5. Execution: Pr_80_77_94/620 Installation of flexible hoses and rubber bellows.

Pr_80_77_94_40 Inertia bases

1. General requirements: 90-90-95/310 Mountings generally .
2. Description:
3. Manufacturer: Manufacturers proprietry inertia base
4. Inertia bases type: Manufacturer's standard .
5. Material: Welded steel channel perimeter frame.
6. Size:
7. Static load range:
8. Dynamic load range:
9. Execution: Pr_80_77_94/610 Cast in situ bases.

Pr_80_77_94_42 Isolation hangers type A

1. General requirements: 90-90-95/310 Mountings generally .
2. Description:
3. Manufacturer: Contractor's choice .
4. Isolation hangers type: Spring and neoprene rubber.
5. Colour code: Manufacturer's standard .

Pr_80_77_94_74 Rubber bellows

1. General requirements: 90-90-95/310 Mountings generally .
2. Description:
3. Manufacturer: Contractor's choice .
4. Execution: Pr_80_77_94/620 Installation of flexible hoses and rubber bellows.

Execution

90-10-90/670 Valve tests

1. Standard: To BS EN 12266-1.

Pr_20_29_14/620 Installing pipeline supports

1. Position
   1.1. In plant rooms: One piece strap, sling rod, washer and nuts.
   1.2. Distribution corridors and risers: All pipework outwith plantrooms to be exposed and mounted on cable trays.
   1.3. Surface mountings: Split ring, spacer nipple and backplate.

Pr_40_10_57/611 Installing mechanical plant and equipment identification type C

1. Fixing: Fix with adhesive to equipment.
2. Position: On equipment.

Pr_40_10_57/620 Installing valve charts and schematics type B

1. Fixing: Plug and screw to wall.
2. Position: Boiler house;
   Calorifier room;
   and Plant room.

Pr_40_10_57/630 Installing valve identification labels

1. Fixing: Secure with metal chain.

Pr_40_10_57/660 Installing identification on pipework type B

1. Application of basic identification colour: Coloured bands as BS 1710 clause 3.3 and Over the whole length of the pipe.
2. Safety colour identification: On or next to the colour bands.
3. Information: Colour bands as BS 1710 appendix D.
4. Direction of flow: Indication arrow and the word FLOW or the letter F and Indication arrow and the word RETURN or the letter R.

Pr_60_55_97/610 Installing dosing equipment

1. Position: Install where there is a high differential pressure between flow and return pipeline.
2. Drain point: Provide adjacent to the unit.
3. Fixing: Securely to a wall using mounting bracket.

Pr_65_52_28/620 Installing expansion compensators

1. Position: Contractor Design.
2. Anchors and guides: Locate to contain movement and resist maximum imposed loads.

Pr_65_52_34/630 Installing pressure gauges

1. Position: Downstream of outlet check valve and upstream of outlet stop valve on pump supply.

Pr_65_52_63/610 Pipelines installation generally

1. Standard: HVCA TR/20/4 and HVCA TR/20/5.
2. Dissimilar metals: Prevent electrolytic corrosion.

Pr_65_52_63/615 Installing pipeline fittings

1. Bushes: Use only at radiators.
2. Fabricated junctions and fittings: Same material as the main pipeline.
3. Demountable joints: Regularly spaced along pipeline runs and at items of equipment.

Pr_65_52_63/680 Installing steel pipelines

1. General requirements: Pr_65_52_63/690 Spacing of pipelines ;
   Pr_65_52_63/615 Installing pipeline fittings;
   Pr_65_52_63/610 Pipelines installation generally;
   and Pr_65_52_63/710 General inspection and testing.
2. Permanently concealed joints: Welded.
3. Accessible joints: Screwed, up to and including 50 mm and Welded and flanged, 65 mm and over.
4. Expansion loops:
5. Anchor
   5.1. Method:
   5.2. Pipe restraints:

Pr_65_52_63/685 Welding steel pipelines

1. Standard: In accordance with HVCA TR/5.
2. Welder identification: Mark each weld to identify operative and Use weld mapping.
3. Non-destructive examination: Visual examination, to BS EN ISO 17637.
4. Completed welds: Wire brush and protect from corrosion.

Pr_65_52_63/690 Spacing of pipelines

1. Minimum clearance between insulated pipelines and
   1.1. Wall finish: 25 mm.
   1.2. Ceiling finish or soffit: 100 mm.
   1.3. Floor: 150 mm.
   1.4. Electrical services: 150 mm.
   1.5. Adjacent services: 100 mm.

1.6. Uninsulated pipeline: 75 mm.
1.7. Another insulated pipeline: 25 mm.

2. Minimum clearance between uninsulated pipelines and
2.1. Wall finish: 25 mm.
2.2. Ceiling finish or soffit: 100 mm.
2.3. Floor: 150 mm.
2.4. Electrical services: 150 mm.
2.5. Adjacent services: 150 mm.
2.6. Another uninsulated pipeline: 25 mm.

Pr_65_52_63/700 Installing buried pipelines

1. Depth of cover: 750 mm.
2. Set out: Lay in straight lines.
3. Concealment: Do not lay under surfaced footpaths or drives.
4. Trench excavations: Carefully prepare to a firm even base. Remove sharp objects and replace with pea gravel to give 100 mm (minimum) cover above and below the pipe.
5. Installation: Thoroughly clean lengths of pipe internally before laying. Temporarily cap until jointing takes place. After laying and jointing keep leading end capped.
6. Thrust blocks: Install at changes of direction and blank ends.
7. Backfilling: Excavated material free from large stones and sharp objects. Leave joints exposed until after pipeline pressure test. Lay and compact in 300 mm maximum layers. Do not use heavy compactors before backfill is 600 mm deep.

Pr_65_52_63/705 Protection of buried pipelines

1. Earth cover (minimum)
1.1. Water pipework: 900 mm, 1200 mm maximum.
1.2. Fuel oil and gas: 500 mm.
1.3. Under roadways: 900 mm.
2. Protection: Apply an anticorrosive, non- cracking, non-hardening, waterproof sealing tape.
3. Application: After cleaning pipework wrap two layers contrawise spirally around the pipe, with 50% minimum overlap.
4. Marker tape: Not required.

Pr_65_52_63/710 General inspection and testing

1. Inspection of joints
2. Safety precautions: In accordance with HSE GS 4.

Pr_65_53_86/630 Installing pressurization units

1. Standards:
2. Location of expansion vessel: In the system return pipeline close to the heat source or chilled water unit.

Pr_65_54_95/610 Installation of valves generally

1. Installation: In accordance with BS 6683.
2. Position: As detailed on mechanical drawings and schematics
3. Isolation and regulation valves: Provide at equipment and on sub-circuits.

4. Access: Locate valves so they can be readily operated and maintained. Locate next to equipment which is to be isolated.
5. Connection to pipework: Fit with joints that suit the pipe material.

Pr_65_54_95/620 Installation of double regulating valves

1. General requirements:
2. Position: Provide 10 diameters of straight pipe upstream of valve and 5 diameters downstream.

Pr_65_54_95/630 Installation of flow measurement devices

1. General requirements:
2. Position: Provide straight length of pipe upstream and downstream.
3. Straight length:

Pr_65_54_95/640 Installation of thermostatic radiator valves

1. General requirements:
2. Position: In areas which represent the space temperature, e.g. not behind curtains or enclosed in heating or radiator panels.

Pr_65_54_95/660 Installation of discharge connections

1. General requirements:
2. Safety and relief valves: Terminate at a safe discharge point.
3. Vent cocks: Terminate 150 mm above floor level.
4. Air bottles: Terminate with air cock or needle valve in a convenient position.
5. Automatic air vents: Terminate over a suitable gully or drain line in a visible location.

Pr_65_57_96/650 Installing strainers

1. Angle type: Install with strainer cap at the bottom. Inlet at the top or side.
2. Y-type: Install in direction of flow with the pocket in the horizontal plane.

Pr_70_60_36/611 Installing heat emitters generally

1. Fixing: Secure and parallel or perpendicular to the structure of the building.
2. Stud walls: Fix to studs and/ or noggings.

Pr_80_77_76/610 Installing insulation and protection products generally Type B

1. Standard: In accordance with BS 5970.
2. Timing: Insulate after installed system has been fully tested and joints proved sound.
3. Insulation: Do not enclose adjacent units together.
4. Clearance: Maintain between pipes.
5. Finish: Neatly finish joints, corners, edges and overlaps.

Pr_80_77_76/640 Installing phenolic foam insulation on pipelines

1. General requirements: Pr_80_77_76/610 Installing insulation and protection products generally Type B .
2. Joints: Close butt, seal with 50 mm wide class 0 tape on both longitudinal and circumferential joints.
3. At fittings: Mitre. Secure with tape.

4. Vapour seal: Tape exposed insulation membrane. Seal vapour barrier at pipe support with class 0 tape.

Pr_80_77_76/755 Installing at non-loadbearing pipelines supports

1. Insulation: Carry through pipe support.

Pr_80_77_94/610 Cast in situ bases

1. Supported equipment: Arrange equipment on base to distribute load evenly.

Pr_80_77_94/620 Installation of flexible hoses and rubber bellows

1. Position: Close to the source of vibration.

Ss_60_40_37/620 Installing water based heating systems

1. Standard: To BS EN 1264-4 or BS EN 14336.

Ss_60_40_37/650 Filling and pressure testing of water based heating systems

1. Testing: In accordance with HVCA TR/6 and In accordance with BS EN 14336, Appendix B.
2. Notice (minimum): 48 h.
3. Pressure: 680 kPa.
4. Inspection and witnessing:
5. Duration of test: 2 h.

Ss_60_40_37/660 Flushing and pre-commission cleaning of heating systems

1. Preliminary checks: Thoroughly inspect pipework. Complete pressure tests before cleaning.
2. Flushing: In accordance with BG 29/2012.
3. Cleaning: In accordance with BSRIA BG 29/2012 and BSRIA BG 50/2013.
4. Waste products: Neutralize, and dispose of to drain. Preferably direct to manhole.

System completion

Ss_60_40_37/810 Commissioning water heating systems

1. Pre-commissioning: In accordance with BSRIA 2/89.3 and Commissioning Code: Water distribution systems.
2. Commissioning: In accordance with BSRIA AG 2/89.3 and Commissioning Code: Water distribution systems.
3. Seasonal commissioning:
4. Variable flow systems: In accordance with CIBSE KS09 Commissioning variable flow pipework systems.
5. Notice (minimum): 48 h.

Ss_60_40_37/840 Performance testing

1. General: Demonstrate the performance of the installations.
2. Guaranteed efficiency: Tolerances defined in this specification.
3. Environmental tests: Carry out environmental testing. If necessary, use artificial loads to simulate operating conditions.
4. Recorders
    4.1. Type: Supply and maintain portable seven day space temperature and relative humidity recorders, complete with charts.

4.2. Number: Four.

4.3. Duration of loan: One week.

5. Reports: Submit on completion.

Ss_60_40_37/845 Demonstrations

1. Running of plant

1.1. Operation: Run, maintain and supervise the installations under normal working conditions.

1.2. Duration: One week.

2. Instruction: Instruct and demonstrate the purpose, function and operation of the installations.

Ss_60_40_37/880 Servicing and maintenance

1. Requirement: Undertake for 12 months after completion.

Ω End of System

Ss_60_60_70_94
Variable refrigerant flow systems

Systems

Ss_60_60_70_94 Variable refrigerant flow systems

1. Description: The contractor shall design, coordinate, procure, install, set to work and commission a complete a mutli split DX air conditioning system serving the SCR and the lower ground staff area.

   The system shall be fully designed (including pipework sizes and exact routes), installed, tested and commissioned by a specialist refrigeration contractor.

   The system shall operate in master/slave arrangement with the SCR fan coil unit prioritising the system operation in either heating or cooling mode.

   The FCUs shall be controlled via manufactures standard local controls.

   The contractor shall provide suitable condensate drains for both the FCUs and external condenser unit.

   The contractor shall provide a cost for connecting the system to the site BMS for fault monitoring for the client to confirm if this is required.

   Locations of indoor and external plant are indicative only and shall be confirmed by the architect prior to installation.

   The interconnecting refrigerant pipework between external condenser and the indoor units shall be designed by the installation contractor. The routes shown on the contract drawings are indicative only. The refrigerant pipework shall be installed, tested, charged with refrigerant and commissioned by a refrigerant specialist to the manufacturer's design requirements and BS EN 378 which covers the safety and environmental aspects of the design, construction and installation of refrigeration systems.
   All refrigerant pipework materials will be of copper and conform to BS EN 12735-1 with degreased copper/end brazed fittings manufactured to ASME B16-22-2012.
2. System performance: Ss_60_60_70/210 Design of variable refrigerant flow systems
3. System manufacturer: Daikin
4. System: Two pipe cooling and heating.
5. Pipelines: Pr_65_52_63_20 Copper refrigerant pipelines
6. Controls: Manufacturers Standard
7. Execution: Ss_60_60_70/620 Installing variable refrigerant flow systems generally; Ss_60_60_70/610 Removing variable refrigerant flow systems
8. System completion: Ss_60_60_70/810 Commissioning of refrigerating systems

System performance

Ss_60_60_70/210 Design of variable refrigerant flow systems

1. Design: Complete the design of the variable refrigerant flow system.
2. Requirement: Submit proposals including detailed design drawings, technical information, calculations and manufacturers' literature.

Products

Pr_65_52_63_20 Copper refrigerant pipelines

1. Standard: To BS EN 378-2.
2. Pipelines: To BS EN 12735-1.
3. Execution: Pr_65_52_63/665 Installing refrigerant pipework

Execution

Pr_65_52_63/665 Installing refrigerant pipework

1. General requirements:
2. Standards: To BS EN 378-3 and BS EN 378-4.
3. Refrigerant lines:

Ss_60_60_70/610 Removing variable refrigerant flow systems

1. Scope: The contract shall de-gas and and safely remove the existing dx unit serving the staff area including all associated pipework FCU controls and external condenser prior to the installation of the new unit

Ss_60_60_70/620 Installing variable refrigerant flow systems generally

1. Standards: To BS EN 378-3 and BS EN 378-4.
2. Fixing of equipment, components and accessories: Fix securely on purpose-made bases or supports.
3. External units: Protect from high winds. Prevent snow, leaves and debris from blocking air flow.
4. Access: Provide for inspection and servicing of heat pumps and ancillary equipment.
5. Refrigerant lines: Short and straight.
6. Location of outdoor units: Away from windows and adjacent buildings.

System completion

Ss_60_60_70/810 Commissioning of refrigerating systems

1. Pre-commissioning: In accordance with CIBSE Commissioning Code R.
2. Commissioning: In accordance with CIBSE Commissioning Code R. Ss_65_40_33/820 Performance testing; Ss_65_40_33/830 Inspection and test records; Ss_65_80_45/850 Documentation
3. Notice (minimum):

Ss_65_40_33/820 Performance testing

Shared by: Ss_65_40_33_51 Mechanical supply ventilation systems

1. General: Demonstrate the performance of the installations.
2. Guaranteed efficiency: Tolerances defined in this specification.
3. Environmental tests: Carry out environmental testing. If necessary, use artificial loads to simulate operating conditions.
4. Reports: Submit on completion.

Ss_65_40_33/830 Inspection and test records

Shared by: Ss_65_40_33_51 Mechanical supply ventilation systems

1. Reports:
2. Construction phase reports: System design is commissionable;
   Post-installation;
   System cleanliness;
   and System commissionable.
3. Records for air systems: In accordance with BSRIABG 49/2015.
4. Record sheets
   4.1. Submission: On completion.
   4.2. Number of copies: Three.

Ss_65_80_45/850 Documentation

1. Operating and maintenance instructions
   1.1. Scope: Submit for the system as a whole giving optimum settings for controls.
   1.2. Product information: Include product description, date of purchase, performance characteristics, application (suitability for use), method of operation and control, and cleaning and maintenance requirements.
   1.3. Format: Paper Copy
   1.4. Number of copies: 2
2. Record drawings
   2.1. Content:

   Location and identification of pipework regulating, isolation and control valves;
   and Location of outlets. Location and arrangement of plant in plant rooms.
   2.2. Format: A1 paper print. Electronic.
   2.3. Number of copies: 2
3. Submittal date: At handover.

Ω End of System

Ss_65_40_33_51
Mechanical supply ventilation systems

Systems

Ss_65_40_33_51 Mechanical supply ventilation systems

1. Description: The contractor shall design, coordinate, procure, install, set to work and commission a complete heat recovery ventilation system serving the SCR.

   The contractor shall provide a dedicated heat recovery unit (MVHR) with integrated controls to provide a mechanical ventilation to the SCR including the adjacent staff areas and WC . The MVHR unit shall be equipped with EC-Motor fans, counterflow heat exchanger, attenuators and electric heater .

   The MVHR is to be installed within a roof/loft void with suitable access to underside of the unit.

   The unit shall be provided with the manufacturers standard controls

   All ductwork shall be galvanised sheet metal.

   The contractor shall provide extract and air intake louvres in the location of the existing large louvre in the kitchen area which is to be removed, appropriate BWIC will be required to fill areas of the louvre not required. Ductwork shall connect to the louvres via suitable plenums.

   Extract and Supply grilles shall be approved by the architect prior to installation.

   All supply and extract ductwork shall be suitably insulated.

   Flexible ductwork shall not exceed 500mm in length.

   All ductwork shall have cleaning access.

   All excess duct sealant and paint etc. must be cleaned off. All commissioning holes must be resealed using duct coloured sealant.

   All equipment shall be installed to the manufacturer's recommendations.

   The contractor provide suitable fire stopping to all ductwork crossing fire compartments.

   Testing and Commissioning shall be carried out in accordance with BS.7258 Part 1. All test and commissioning results shall be witnessed by the Services Engineer and the Client's Representative, and copies of the results signed where applicable.
2. Location of plant: As shown on Mechancial Services drawings.
3. Route of distribution: As shown on Mechancial Services drawings.
4. Air-handling units: Pr_60_65_03_86 Supply air handling units.
5. Air ductwork and accessories
   5.1. Ductwork: Pr_65_65_25_14 Circular sheet metal ductwork and fittings and Pr_65_65_25_72 Rectangular sheet metal ductwork and fittings.
   5.2. Accessories: Pr_65_65_23_20 Duct access panels; Pr_65_65_24_29 Fire and smoke dampers; and Pr_65_65_25_32 Flexible ductwork.
6. Fire-stopping:
7. Thermal insulation on supply air ductwork: Pr_80_77_76_53 Mineral wool duct slab insulation.
8. Thermal insulation on Extract Ductwork: Mineral wool slabs insulation.

9. Vibration isolation mountings: Pr_80_77_94_42 Isolation hangers type B.
10. Reheat batteries: Pr_60_65_37_47 Low temperature hot water heating coils.
11. Room supply air terminal devices: Pr_70_65_04_02 Air diffusers; and Pr_70_65_04_03 Air grilles.
12. Accessories: Pr_80_77_27_15 Channel supports type B.
13. Identification of ductwork and equipment: 90-90-55/480 Mechanical plant and equipment identification labels type D and 90-90-55/420 Identifying ductwork.
14. Testing: Pr_65_65_25/785 Air leakage testing of medium-pressure ductwork and Pr_65_65_25/790 Air leakage testing of plant items.
15. Execution: Ss_65_40_33/630 Installing ductwork on air-handling units.
16. System completion: Ss_65_40_33/810 Commissioning of air distribution systems; Ss_65_40_33/820 Performance testing; Ss_65_40_33/830 Inspection and test records; Ss_65_40_33/840 Demonstrations; Ss_65_40_33/850 Documentation for ventilation systems; Ss_65_40_33/860 Spares and consumables; and Ss_65_40_33/870 Maintenance.

Products

90-90-55/420 Identifying ductwork

1. Standard: To BESA DW/144
2. Identification type: Self-adhesive plastics or transfers.
3. Execution: Pr_40_10_57/650 Installing ductwork identification.

90-90-55/480 Mechanical plant and equipment identification labels type D

1. Material: Face engraved rigid plastic laminate.
2. Label size: Manufacturer's standard .
3. Colour:
   3.1. Background: White.
   3.2. Lettering: Black.
4. Typography:
   4.1. Font: Helvetica medium
   4.2. Size: Manufacturer's standard .
5. Information to be included: Equipment name; Equipment reference number; and Service.
6. Execution: Pr_40_10_57/611 Installing mechanical plant and equipment identification type B.

Pr_60_65_03_86 Supply air handling units

1. Description:
2. Manufacturer: Systemair
3. Standard: To BS EN 13053.
4. Duty
   4.1. Air volume: Refer to Equipment Schedules for details
5. Casing construction
   5.1. Standard: To BS EN 1886.
   5.2. Details: Submit shop drawings and details of dimensions and weight.

5.3. Leakage class of casing:

5.4. Filter bypass leakage:

6. Access

6.1. General: Provide access openings and covers complete, including opening devices.

6.2. Seal: To prevent excessive air leakage.

6.3. Seal durability: For normal maintenance operations over at least 10 years.

6.4. Access clear width (minimum): 400 mm.

7. Execution: Pr_60_65_03/610 Installing air-handling units;
Pr_60_65_03/615 Access;
Pr_60_65_03/645 Installing fans;
Pr_60_65_03/650 Services connections;
Pr_60_65_03/655 Isolation of air-handling units;
Pr_60_65_03/660 Support for air-handling units;
Pr_60_65_03/680 Air leakage testing;
and Pr_60_65_03/685 Testing.

Pr_60_65_37_47 Low temperature hot water heating coils

1. Description:
2. Manufacturer: S&P Coil Products Ltd, as supplied by Heating Appliances & Spares Limited (HASL). Or equal and approved
3. Standards: To BS 5141-2 and BS EN 1216.
4. Duty

4.1. Air volume: Refer to Equipment schedules for duties

5. Hot water flow temperature: 80°C
6. Hot water return temperature: 70°C
7. Thermal expansion: Allow for movement.
8. Execution: Pr_60_65_37/610 Installing heating and cooling coils generally.

Pr_65_65_23_20 Duct access panels

1. Description:
2. Manufacturer: Contractor's choice .
3. Material: Preinsulated and to match ductwork

Pr_65_65_24_29 Fire and smoke dampers

1. Description:
2. Manufacturer: ActionAir Fire Dampers to sut fire strategy.
3. Standard

3.1. Fire dampers: To BS EN 15650.

3.2. Test: To BS EN 1366-2.

3.3. Classification: To BS EN 13501-3.

3.4. Aerodynamic performance: To BS EN 1751 and BS EN ISO 5135.

4. Arrangement: Folding curtain blades in air stream.
5. Material: Stainless steel.
6. Fusible links

6.1. Fusing temperature: 72°C.

6.2. Spare fusible links: yes

7. Execution: Pr_65_65_24/725 Installing fire and smoke control dampers and Pr_65_65_24/750 Access to dampers for resetting and maintenance.

Pr_65_65_25_14 Circular sheet metal ductwork and fittings

1. Description:
2. Manufacturer:
3. Standards: To BESADW/144, BS EN 1506 and BS EN 12237.
4. Classification: Class A.
5. Material: Zinc coated steel to BS EN 10346 grade DX51D+Z140.
6. Construction: Spirally wound.
7. Regulating dampers
   7.1. Standard: As BESADW/144.
   7.2. Operation: Manual.
   7.3. Material: To match ductwork.
8. Access openings
   8.1. Purpose: Inspection;
   Cleaning;
   and Maintenance.
9. Execution: Pr_65_65_25/610 Air ductwork generally;
   Pr_65_65_25/640 Installing sheet metal ductwork;
   Pr_65_65_25/670 Ductwork support for vapour seal continuity;
   Pr_65_65_25/700 Test holes in ductwork;
   Pr_65_65_25/740 Installing control equipment and instruments in metal ductwork;
   Pr_65_65_25/785 Air leakage testing of medium-pressure ductwork;
   and Pr_65_65_25/790 Air leakage testing of plant items.

Pr_65_65_25_32 Flexible ductwork

1. Description:
2. Manufacturer: Contractor's choice .
3. Standard: To BESADW/144.
4. Material: Aluminium and polyester laminate encapsulating high tensile steel wire helix.

Pr_65_65_25_72 Rectangular sheet metal ductwork and fittings

1. Description:
2. Manufacturer:
3. Standards: To BESADW/144, BS EN 1505 and BS EN 1507.
4. Classification: Class A.
5. Material: Zinc coated steel
6. Regulating dampers
   6.1. Standard: To BESADW/144.
   6.2. Operation: Manual.
   6.3. Material: To match ductwork.
7. Access openings
   7.1. Purpose: Inspection;
   Cleaning;
   and Maintenance.
   7.2. Sizes: To BESA DW/144and to BS EN 12097.

8. Execution: Pr_65_65_25/610 Air ductwork generally;
   Pr_65_65_25/640 Installing sheet metal ductwork;
   Pr_65_65_25/670 Ductwork support for vapour seal continuity;
   Pr_65_65_25/700 Test holes in ductwork;
   Pr_65_65_25/740 Installing control equipment and instruments in metal ductwork;
   Pr_65_65_25/785 Air leakage testing of medium-pressure ductwork;
   and Pr_65_65_25/790 Air leakage testing of plant items.

Pr_70_65_04_02 Air diffusers

1. Description:
2. Standards
   2.1. Mixed flow applications: To BS EN 12238.
   2.2. Sound power levels: To BS EN ISO 5135.
3. Application: Extract and Supply.
4. Duty
   4.1. Air volume: Refer to Equipment Schedules for details.
5. Position: Ceiling.
6. Finish: To be agreed with Architect prior to ordering.
7. Execution: Pr_70_65_04/620 Installing circular and rectangular diffusers and Pr_70_65_04/690 Support of air terminal units in ceiling grids.

Pr_70_65_04_03 Air grilles

1. Description:
2. Standards
   2.1. Mixed flow applications: To BS EN 12238.
   2.2. Displacement flow applications: To BS EN 12239.
   2.3. Sound power levels: To BS EN ISO 5135.
3. Application: Extract.
4. Duty
   4.1. Air volume: Refer to Equipment Schedules for details.
5. Position: Ceiling.
6. Finish: To be agreed with Architect prior to ordering.
7. Execution: Pr_70_65_04/690 Support of air terminal units in ceiling grids.

Pr_80_77_27_15 Channel supports type B

1. Description:
2. Support type: Proprietary support channels and fixings.
3. Third party certification:
4. Channels
   4.1. Load capacity:
   4.2. Format:
   4.3. Dimensions:
   4.4. Type:
   4.5. Material:
   4.6. Finish:
   4.7. Accessories:

Pr_80_77_76_53 Mineral wool duct slab insulation

1. Description:
2. Manufacturer: Saint-Gobain Isover
3. Product reference: Isover CLIMCOVER Roll Alu1 Strong
4. Thickness: 40 mm.
5. Fire performance:
6. Execution: Pr_80_77_76/660 Installing foil-faced mineral wool insulation on ductwork.

Pr_80_77_94_42 Isolation hangers type B

1. General requirements: Mountings generally .
2. Description:
3. Manufacturer: Contractor's choice .
4. Isolation hangers type: Spring and neoprene rubber.
5. Colour code: Manufacturer's standard .

Execution

Pr_40_10_57/611 Installing mechanical plant and equipment identification type B

1. Fixing: Fix with adhesive to equipment.
2. Position: On equipment.

Pr_40_10_57/650 Installing ductwork identification

1. Standard: In accordance with BESADW/144.
2. Position: Locate where visible.
3. Direction of flow: Equilateral triangle, 150 mm length of side, with one apex pointing in the direction of flow.
4. Information: Space served by the duct and associated plant.

Pr_60_65_03/610 Installing air-handling units

1. Standard:
2. Component assembly
   2.1. Sealing: Provide gaskets between air handling unit sections to prevent air leakage from casing.
   2.2. Site-drilling : Not permitted.

Pr_60_65_03/615 Access

1. Access space: Position air-handling units to allow space for maintenance and access.

Pr_60_65_03/645 Installing fans

1. Blow through units: Arrange section to allow uniform velocity profile downstream.
2. Accessories: Flexible connection between fan discharge and casing spigot.

Pr_60_65_03/650 Services connections

1. Entry points: Seal around electrical cable and pipeline entry points to prevent air leakage.
2. Flexible cables: Provide between fan motor and local isolator.

Pr_60_65_03/655 Isolation of air-handling units

1. Electrical connections: Provide means of isolating air-handling units electrically.
2. Pipe connections: Provide means of isolating pipelines to air-handling units.
3. Steam: Provide means of isolating steam to humidifier when access door is opened.

Pr_60_65_03/660 Support for air-handling units

1. Method: Builder's work base.

Pr_60_65_03/680 Air leakage testing

1. Testing: In accordance with HEVACGuide to air handling unit leakage testing.

Pr_60_65_03/685 Testing

1. Test location: Factory.
2. Tests: Component air pressure drops;
   Component water pressure drops;
   Fan and motor speeds;
   Fan running to check rotation and vibration;
   Fan flow rate and developed pressure, using simulated system resistance;
   Functional test on electrical equipment;
   Motor starting and running currents;
   Power consumption;
   Sound power level;
   and Vibration measurements.
3. Test results: Submit on completion.

Pr_60_65_37/610 Installing heating and cooling coils generally

1. Equipment, controls and instruments positioned next to heating coils: Protect from thermal radiation.
2. Fixings:

Pr_65_65_24/725 Installing fire and smoke control dampers

1. Standard: In accordance with ASFP Volume 1: EN fire dampers. (Grey book). 2nd edition and In accordance with HVCA DW/145.

Pr_65_65_24/750 Access to dampers for resetting and maintenance

1. Position: Provide access to damper mechanisms on fire dampers; smoke dampers; combined smoke and fire dampers, and volume control dampers through access doors, suspended ceilings, etc. Where more than one fire damper is installed in a frame provide access to all fire dampers.
2. Fire links: Provide access for replacement.

Pr_65_65_25/610 Air ductwork generally

1. Cut edges on ductwork, flanges and supports: Smooth and burr-free.

Pr_65_65_25/640 Installing sheet metal ductwork

1. Standard: To BESADW/144.
2. Hangers and supports: Install in accordance with BSRIA BG 10/2010 and Strength requirements to BS EN 12236.
3. Installing flexible joint connections: Fit on fan inlets and outlets;
   Fit at building expansion joints;
   and Install fully stretched to minimize pressure drop.

Pr_65_65_25/670 Ductwork support for vapour seal continuity

1. Method of support: Ensure vapour seal is maintained throughout.

Pr_65_65_25/700 Test holes in ductwork

1. Position: In accordance with CIBSECommissioning Code Series A and BESADW/144.

Pr_65_65_25/740 Installing control equipment and instruments in metal ductwork

1. General: Fit sensors, damper motors and other control equipment.
2. Connections: Connect control equipment and instruments.

Pr_65_65_25/785 Air leakage testing of medium-pressure ductwork

1. Standard: To BESADW/144 and BESADW/143.
2. Extent: Random testing of 10% maximum of the ductwork system.
   Carry out tests as work proceeds before thermal insulation is installed.
   Where a test fails, select two further sections for testing.
   Carry out remedial work where tests fail.
3. Test pressure: To BESADW/144, Table 22.
4. Documentation: Air leakage test sheet.
5. Report
   5.1. Format: Electronic and Paper copy.
   5.2. Submit: At handover.
   5.3. Number of copies: 2.

Pr_65_65_25/790 Air leakage testing of plant items

1. Standard: To BESADW/144.
2. Procedure: Include in-line plant with certificate of conformity for pressure class and air leakage classification for system under test.
3. Report
   3.1. Format: Electronic and Paper copy.
   3.2. Submit: At handover.
   3.3. Number of copies: 2.

Pr_70_65_04/610 Installing air terminal devices

1. General: Do not distort air terminal devices. Fix securely.
2. Air leakage: Prevent. Seal joints with self adhesive foam strip or equivalent.
3. Appearance: Finish visible edge joints neatly. Do not leave sharp edges and protruding screws.
4. Operation: Fit so that moving parts operate correctly and removable cores can be taken out and replaced.
5. High level and ceiling applications: On removable cores, provide safety wires with quick release ends.

Pr_70_65_04/620 Installing circular and rectangular diffusers

1. General requirements: Pr_70_65_04/610 Installing air terminal devices .
2. Method: Hidden screw;
   Rear support angles;
   Rear suspension bracket;

Spring edge clip;
and Suspension bolts and brackets.

Pr_70_65_04/690 Support of air terminal units in ceiling grids

1. Standard: To BESADW/144.
2. Position: Agree final position of air terminals before installation.

Pr_80_77_76/610 Installing insulation and protection products generally

1. Standard: In accordance with BS 5970.
2. Timing: Insulate after installed system has been fully tested and joints proved sound.
3. Insulation: Do not enclose adjacent units together.
4. Clearance: Maintain between pipes.
5. Finish: Neatly finish joints, corners, edges and overlaps.

Pr_80_77_76/660 Installing foil-faced mineral wool insulation on ductwork

1. General requirements: Pr_80_77_76/610 Installing insulation and protection products generally .
2. Fixing to underside of ducting: Self adhesive stick pins. Further support with 0.7–1.0 x 50 mm mesh galvanized wire netting.
3. Seals: Seal with 100 mm wide class 0 foil tape.

Ss_65_40_33/630 Installing ductwork on air-handling units

1. Air discharge: Connect ductwork to allow air to straighten as it leaves the air-handling unit.

System completion

Ss_65_40_33/810 Commissioning of air distribution systems

1. Pre-commissioning: In accordance with BSRIABG 49/2015 and CIBSECommissioning code A.
2. Commissioning: In accordance with BSRIABG 49/2015 and CIBSECommissioning code A.
3. Notice (minimum): 48 h.

See Ss_65_40_33/820 Performance testing in Ss_60_60_70_94 Variable refrigerant flow systems

See Ss_65_40_33/830 Inspection and test records in Ss_60_60_70_94 Variable refrigerant flow systems

Ss_65_40_33/840 Demonstrations

1. Running of plant
   1.1. Operation: Run, maintain and supervise the installations under normal working conditions.
2. Instruction: Instruct and demonstrate the purpose, function and operation of the installations.

Ss_65_40_33/850 Documentation for ventilation systems

1. Operating and maintenance instructions
   1.1. Scope: Submit for the system as a whole giving optimum settings for controls.
   1.2. Product information: Include product description, date of purchase, performance characteristics, application (suitability for use), method of operation and control, and cleaning and maintenance requirements.
   1.3. Format: Paper copy.
   1.4. Number of copies: Two.
2. Record drawings

2.1. Content: Location and arrangement of plant in plant rooms;
Location, size and route of ductwork;
Location and identification of regulating dampers and fire dampers;
and Location of outlets.

2.2. Format: A1 paper print and Electronic.

2.3. Number of copies: Two.

3. Submittal date: At handover.

Ss_65_40_33/860 Spares and consumables

1. Filters

1.1. Filter media: Supply two sets of filters, the first for use before commissioning and the second for final commissioning.

2. Detectors: Supply two of each type.

3. Air terminal device keys: Supply a set for adjusting each size and type of grille and diffuser.

Ss_65_40_33/870 Maintenance

1. Servicing and maintenance: Undertake for 12 months after completion.

Ω End of System

HARLEY HADDOW

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