

SIM Power Hall, Package 4 Works – M&E Summary for Listed Building Consent

M&E Strategy – Main Plant Room Extension

As part of the Package 4 works the main plant area of the Powerhall is to be extended to accommodate new steam system plant equipment that serves the Historic Working Machines. This includes a new condensate tank, spray condenser, pumps and filters as well as steam distribution pipework.

Several options for the location of this new equipment were originally explored with the project team to assess the viability from a cost, maintenance and building heritage point of view. These options included in the vicinity of the Lancashire Boiler and adjacent to the south of the existing plant area, on a new structural floor.

Following coordination, it was agreed with the project team that the most integrated option was to have a new structural platform that extends from the south plant area across the full width. The new steam equipment is to sit in the west most section of this new deck as indicated on the J6960-MXF-P4-00-DR-M-10102 mechanical layout (Appendix A1).

A balustrade prevents public access to the plant room however there is a clear visual connection to the steam equipment in this location. The structural frame allows the steam pipework to drop to low level in the void below which then distributes into the east section of the new platform to serve the Historic Working Machines. The extent of the platform in plan avoids the need for any penetrations through existing walls. Electrical containment also utilises this route between the plant room and east platform.

In addition to this, the new platform to the south of the plant room means the services will fix into the platform structure or floor only so none of the new building services will fix into existing wall structures in this area. The platform also conceals new low level pipework from the GSHP system to reduce the amount of trenching required to the east platform to serve the heating emitters.

This contrasts with the Lancashire Boiler option as shown below.

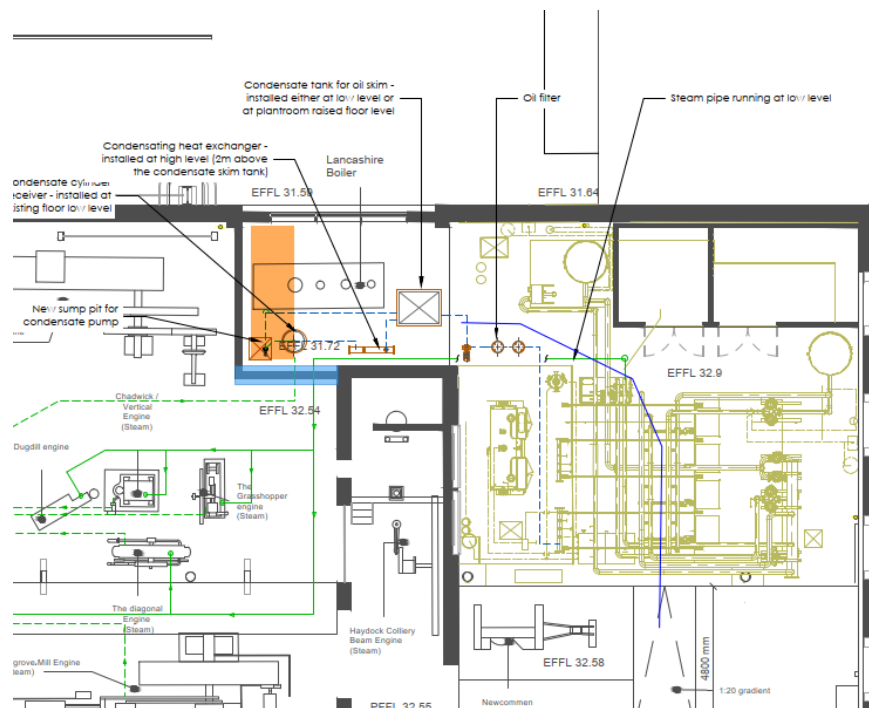


Figure 1 – Lancashire Boiler Steam Equipment Option

This option which would require significant building service openings for the pipework and containment through the existing brick wall (highlighted in blue) that is directly south of the Lancashire Boiler. This was one of the key reasons why this option was discounted.

M&E Strategy – South West Plant Room

An existing plant area which housed the incoming gas meter and redundant electrical infrastructure is to be demolished and reinstated to a similar configuration to the previous condition. A store and cleaners store are being linked onto the side of this as detailed in the architect's information. The proposed plant room walls and partitions are to be re-built in blockwork to suit the new MEP requirements.

The gas meter room in the corner of the Power Hall becomes slightly narrower while there is an adjacent plant room of similar size to the existing which mainly houses new electrical equipment including panel board, local zone distribution board and static inverter unit for high level emergency lighting.

In this plant room there also is a vertical ventilation heating unit. This unit is ducted inside the plant room with a ductwork plenum at high level on the inner face that has connects onto jet nozzles. These nozzles appear on the outer face of the new blockwork wall and push heated air into this area of the Power Hall. This keeps as much of the required MEP services in this area within a distinct, invisible plant space to the main Power Hall area. This is illustrated on MF drawing J6960-MXF-P4-00-DR-M-20101 (Appendix A2).

General Services Distribution

As part of the Package 4 works new mechanical and electrical services will be required to distribute around large areas of the Power Hall. This is to meet the heating, exhibition, Historic Working Machine and key operational requirements of the building.

In summary the key building services systems and equipment include:

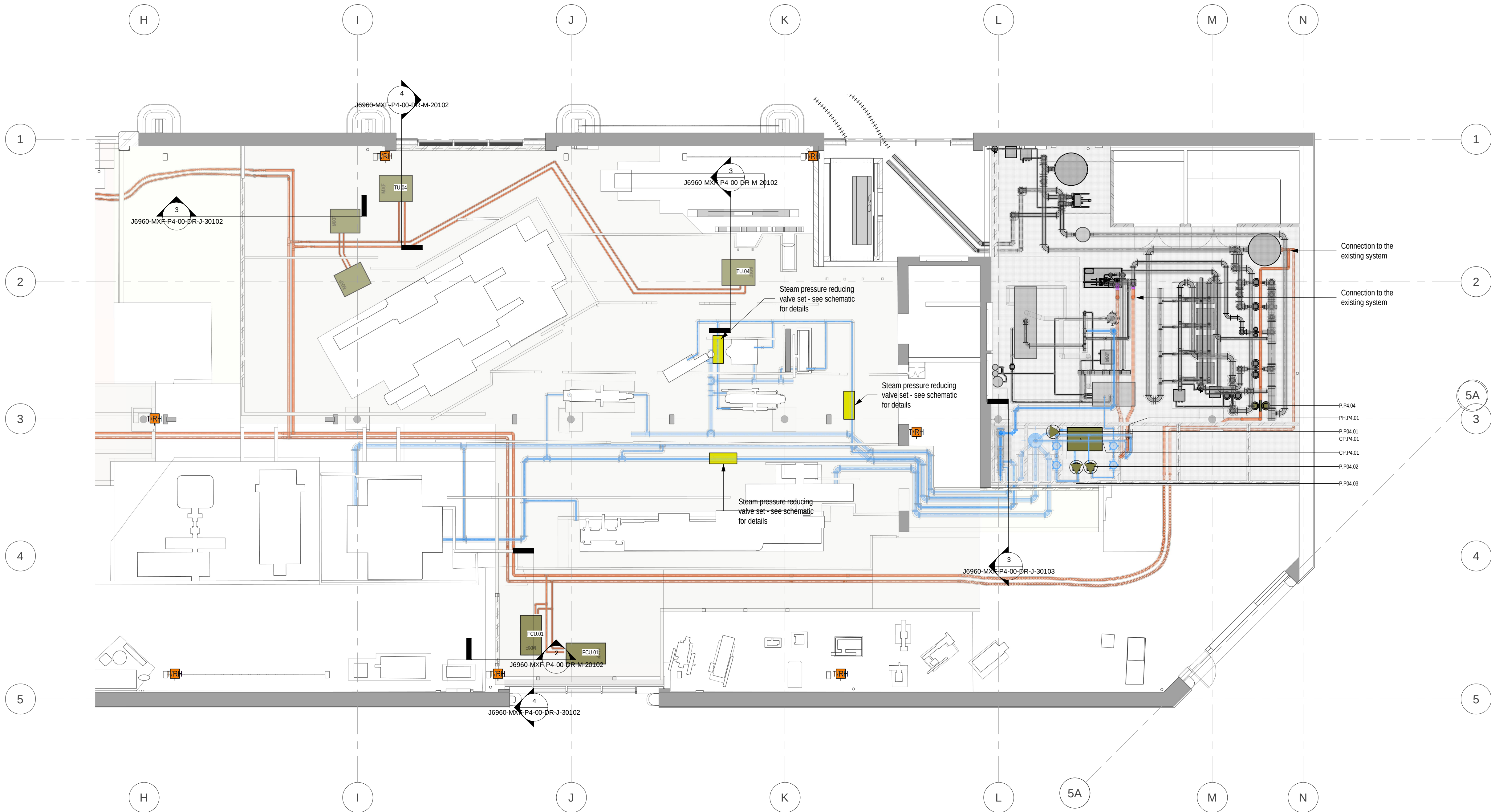
- Piped services
- LTHW heating pipework for terminal ventilation units and fan coil units to heat the Power Hall.
- Steam pipework distribution network to serve Historic Working Machines.
- Specific power supplies to steam and electrically driven Historic Working Machines for power and control as applicable.
- Socket and data provision for exhibition and operational functionality with associated containment.
- Emergency illuminated exit signage.
- Elements of the ancillary electrical systems including public address, access control, security alarm and CCTV.
- Completion of building fire alarm system.

To keep these distributed building services as discreet as possible they are to be run in the void below the platforms. This has been coordinated with the structure to allow passing of services through supporting walls and columns and allow low level crossing of services.

Where new systems must be installed away from the platform or wall mounted containment is being avoided new trench routes are proposed. These have been kept to a minimum, trying to utilise existing voids or discreet low level floor mounted routes instead and are indicated on MF drawings J6960-MXF-P4-00-DR-J-20101 and J6960-MXF-P4-00-DR-J-20102 (Appendix A3).

Some equipment installed on the perimeter walls will instead utilise the existing new high level horizontal containment and vertical containment drops where possible. Where new vertical containment is required containment drops will be kept to a minimum and coordinated in elevation to minimise the visual impact.

Appendix A1 - J6960-MXF-P4-00-DR-M-10102



NOTES

1. This drawing is to be read in conjunction with all other Max Fordham LLP drawings, Schedules and specifications.
2. Do not scale from this drawing. Setting out by others
3. This drawing should be printed in colour.
4. This drawing is developed at Stage 3 LoD for information and costing purposes.

KEY

- Chilled Water Flow (CHW F)
- Chilled Water Return (CHW R)
- Low Temperature Hot Water Flow (LTHW F)
- Low Temperature Hot Water Return (LTHW R)
- Steam flow
- Steam return
- Ground water flow
- Ground water return
- Domestic cold water supply
- Drain
- Services high level
- Services low level
- Builderswork
- Combined temperature/Relative humidity space sensor

500 - Space Heating and Cooling - Powerhall Right Section

1 : 100

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client
SIM
job no.
J6960
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IS
scale at A1
1 : 100
status code and description
S2 - for information

project name
Powerhall & decarbonisation

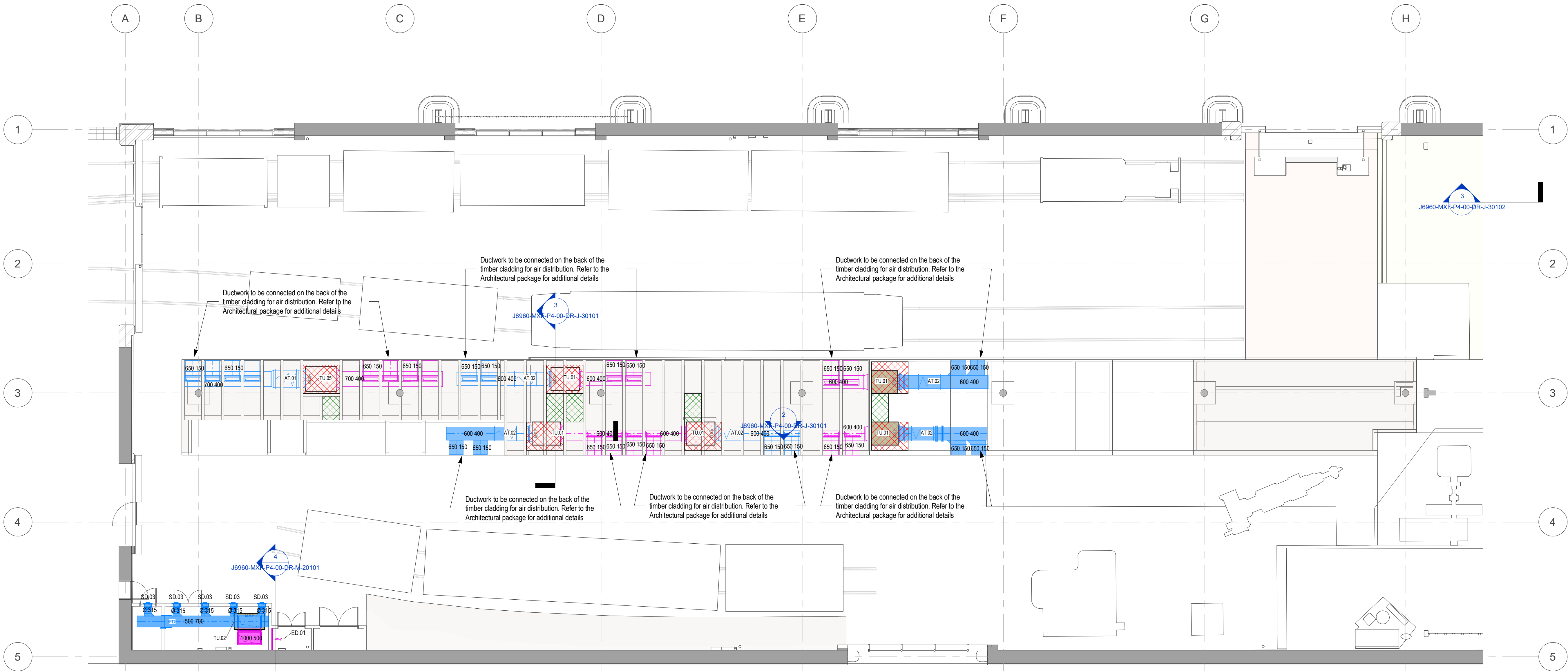
issue date
28/04/23
revision
P1
classification
Ss_60_40_00_00

drawing title
Power Hall WP4
heating system layout
Right side

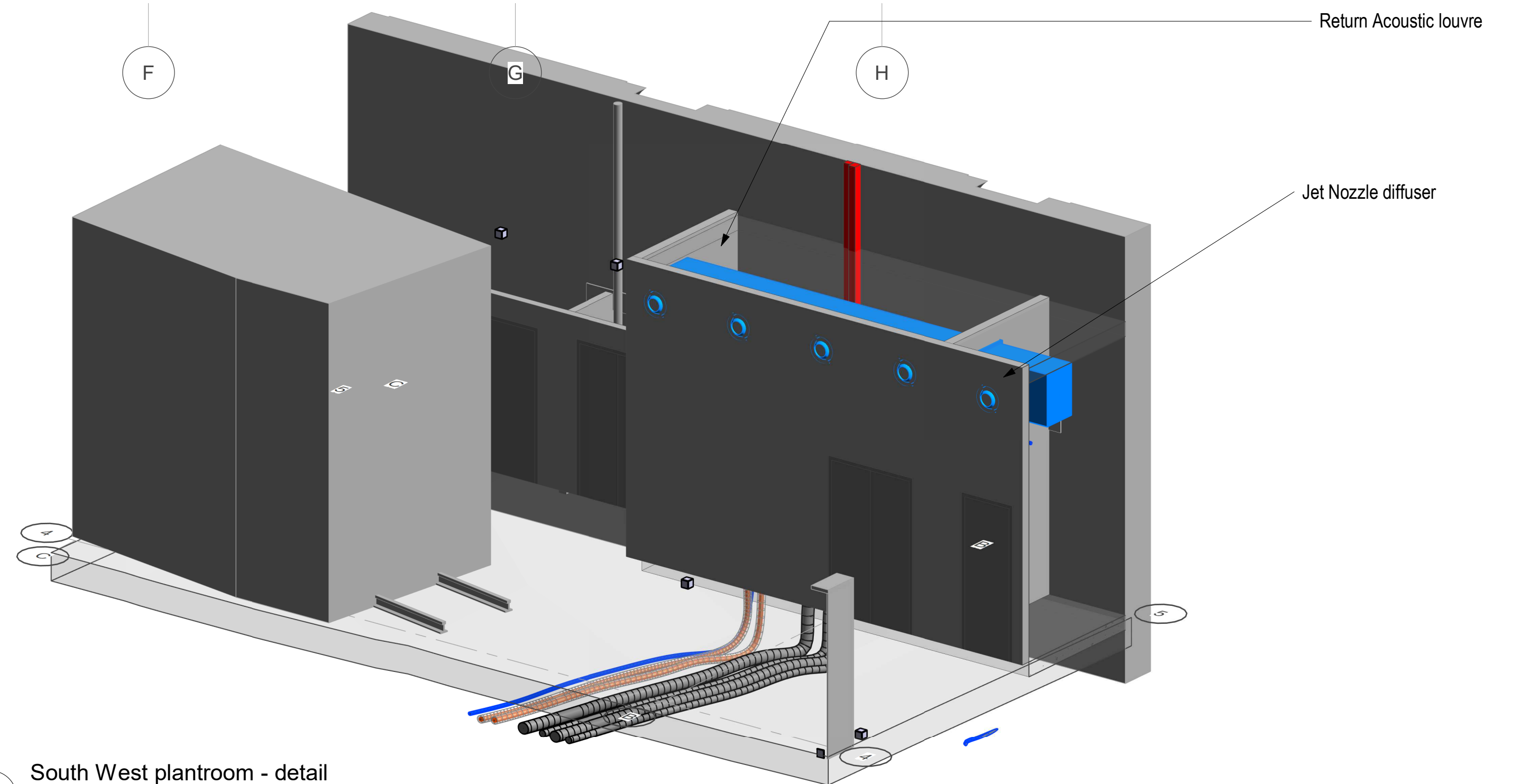
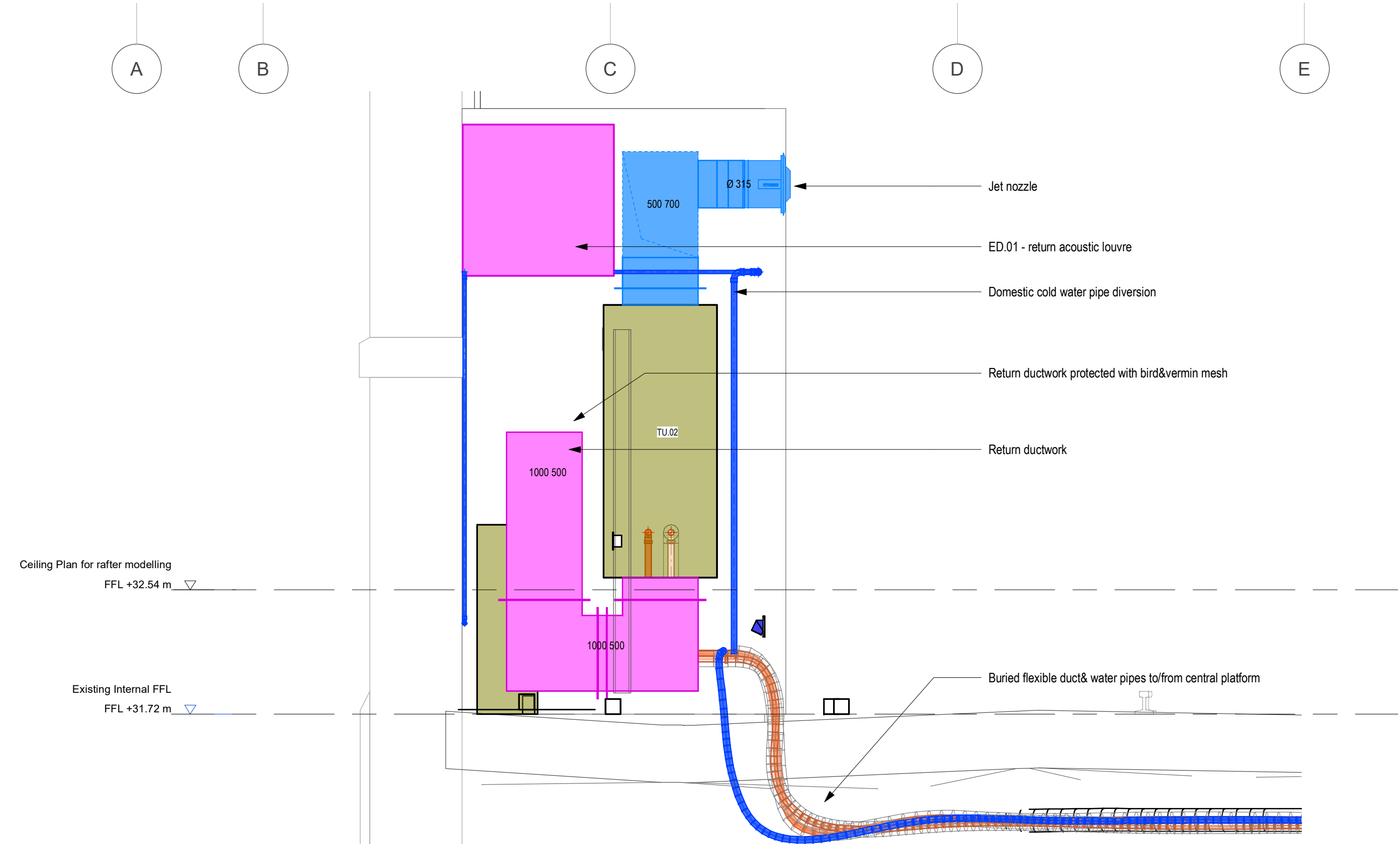
project code orig. volume level type role number
J6960 - MXF - P4 - 00 - DR - M - 10102

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Appendix A2 - J6960-MXF-P4-00-DR-M-20101



- NOTES**
- To read in Conjunction with other MF documents and relevant documents from the other Design Team disciplines
 - Do not scale from this drawing
 - Contractor to allow for all expansions and contractions of duct work to air component connections.
 - All duct work that routes across fire compartment to be provided with fire dampers
 - Size and dimension are indicative and designed at STAGE 3 LoD - To be confirmed during the next design stage
- KEY**
- Intake
 - Supply
 - Extract
 - Exhaust
 - Smoke Extract
 - Flue
 - Access zone for plant replacement
 - Access zone for regular maintenance
 - F/A From above
 - T/B To below
 - AT Attenuator
 - SD.x Supply diffuser
 - ED.x Extract Diffuser
 - FCU.x Fan coil unit
 - TU.x Terminal unit
 - FD Fire damper
 - MD Motorized damper
 - BD Balancing damper



3 South West plantroom - detail

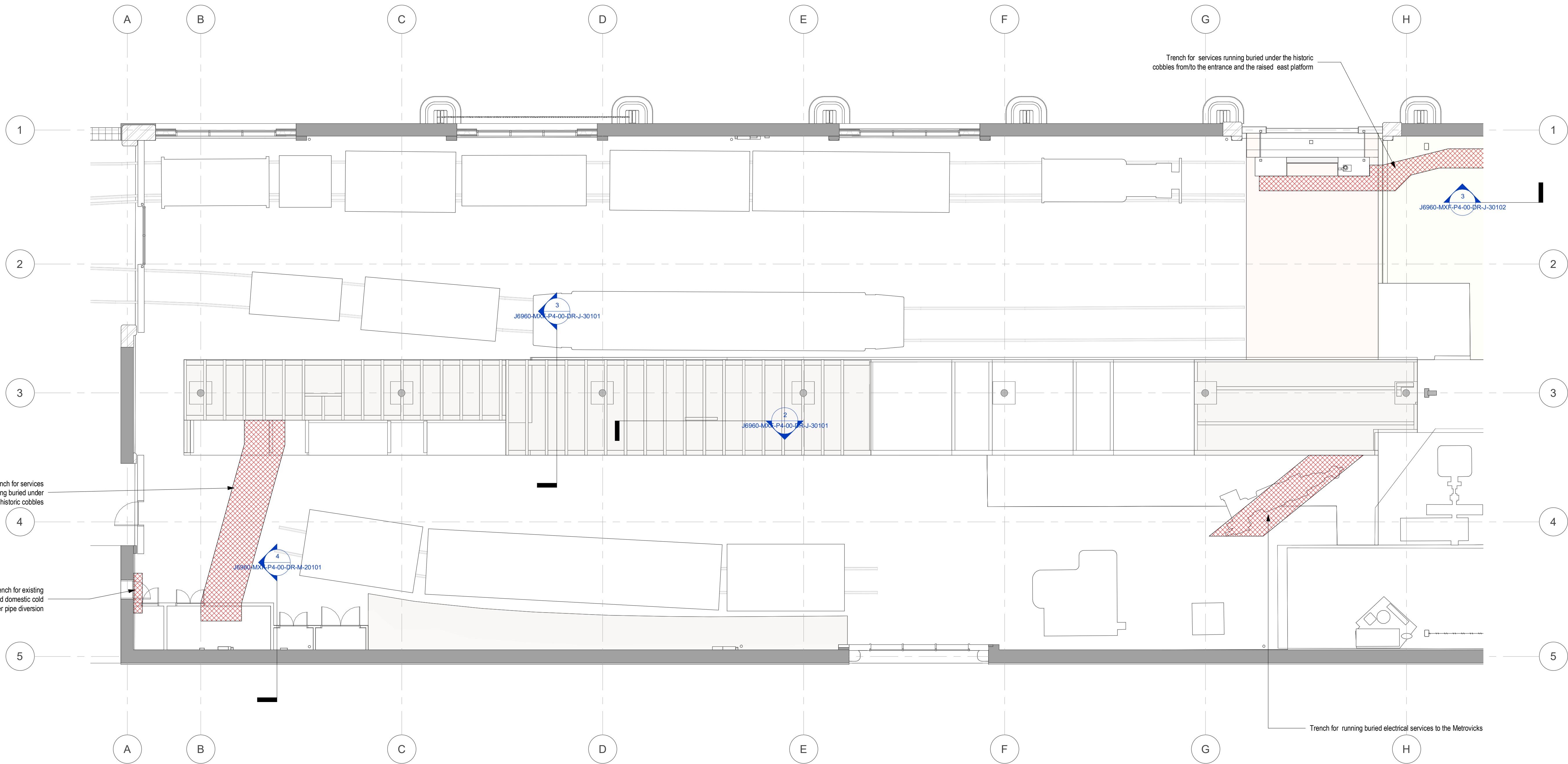
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project name
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issue date
28/04/23
revision
P1
classification
Ss_65_40_00_00

drawing title
**Power Hall WP4
Ventilation layout
Left side**
project code orig. volume level type role number
J6960 - MXF - P4 - 00 - DR - M - 20101

Appendix A3 - J6960-MXF-P4-00-DR-J-20101 and J6960-MXF-P4-00-DR-J-20102



- NOTES**
1. Drawing is to be read in conjunction with all relevant MFLP drawings, schematics and specifications.
 2. The architect's and structural engineer's information is to be considered in tandem with this drawing
 3. All trenches and penetrations are to be agreed with the Architect and the structural engineer. Refer to structural engineer's information for limitations on locations and sizes of openings in the structure
 4. Drawing is indicative of main distribution penetrations only - final penetration quantities, locations, sizes and secondary distribution penetrations are to be designed and agreed by the contractor based on final design and subcontractor installation drawings
 5. Floor and ceiling of plantrooms, risers, and switchrooms to be thoroughly cleaned and painted with two coats of clear dust sealant prior to services installation
 6. Walls of plantrooms, risers, switchrooms and risers to be painted with two coats of white emulsion prior to services installation
 7. M&E contractor is responsible for preparing builders work drawings based on their services installation drawings
 8. M&E contractor is responsible for setting out of all builders work penetrations
 9. The following items in the entire building are to be electrically bonded in accordance with BS 7430 and BS 7671 to main earth terminal by M&E contractor: metal access ladders, access staircases, flooring in risers, plant step-overs, ductwork, metal pipework, metal ceilings, metal floors
 10. All doors to risers are to have fire rating of riser shaft. Refer to architects drawings for details
 11. M&E contractor is responsible for detailing all secondary steelwork support structures associated with the M&E services
 12. M&E contractor is responsible for detailing and setting out builders work plinths for plant

KEY

 BUILDERSWORK - Floor trench

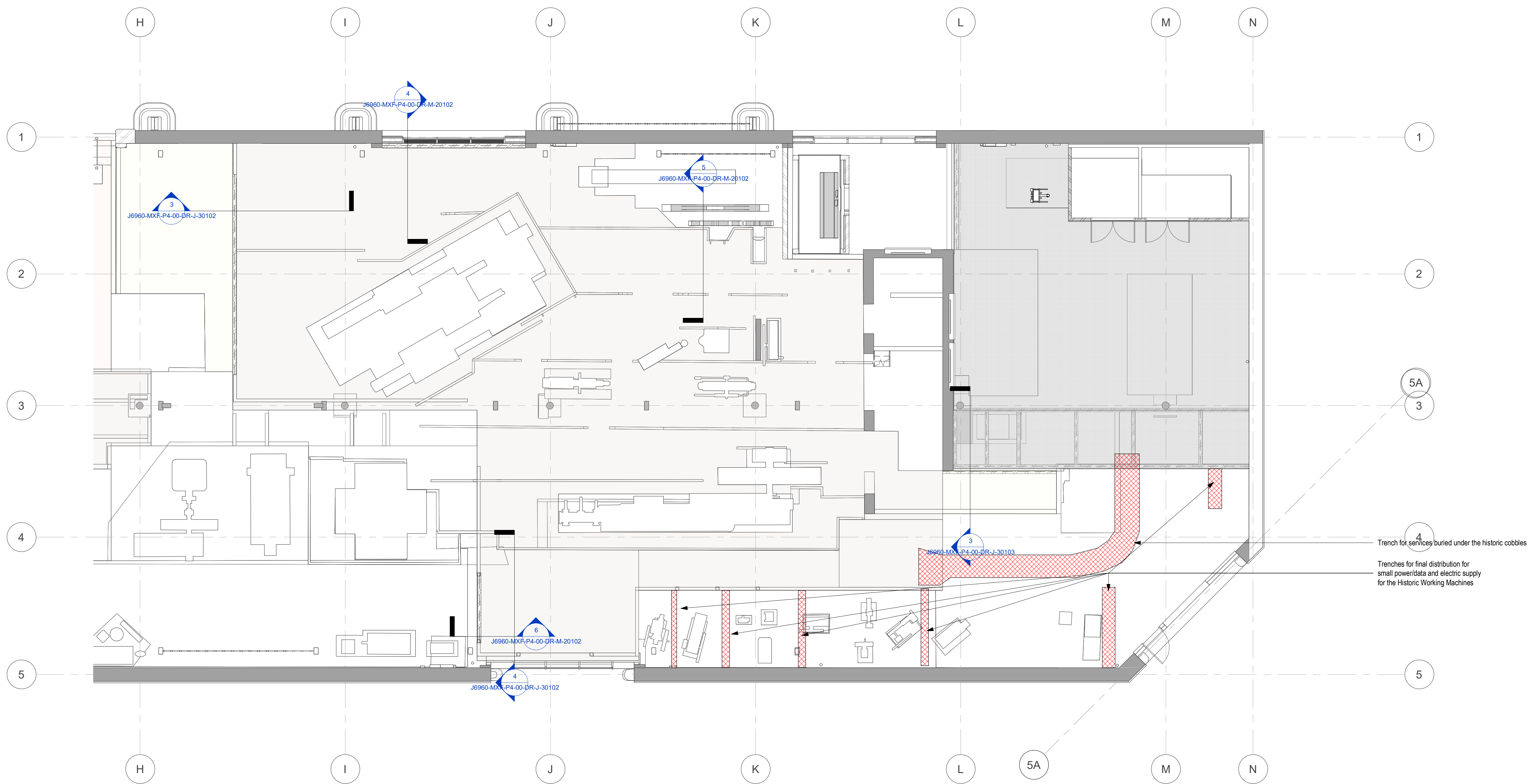
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issue date
28/04/23
revision
P1
classification
Ss_40_40_10_00

drawing title
**Power Hall WP4
Builder's work in connection
Left side**
project code orig. volume level type role number
J6960 - MXF - P4 - 00 - DR - J - 20101



- NOTES**
- Drawing is to be read in conjunction with all relevant MFLP drawings, schematics and specifications.
 - The architect's and structural engineer's information is to be considered in tandem with this drawing.
 - All trenches and penetrations are to be agreed with the Architect and the structural engineer. Refer to structural engineer's information for limitations on locations and sizes of openings in the structure.
 - Drawing is indicative of main distribution penetrations only - final penetration quantities, locations, sizes and secondary distribution penetrations are to be designed and agreed by the contractor based on final design and subcontractor installation drawings.
 - Floor and ceiling of plantrooms, risers, and switchrooms to be thoroughly cleaned and painted with two coats of clear dust sealant prior to services installation.
 - Walls of plantrooms, risers, switchrooms and risers to be painted with two coats of white emulsion prior to services installation.
 - M&E contractor is responsible for preparing builders work drawings based on their services installation drawings.
 - M&E contractor is responsible for setting out of all builders work penetrations.
 - The following items in the entire building are to be electrically bonded in accordance with bs 7430 and bs 7571 to main earth terminal by M&E contractor: metal access ladders, access staircases, flooring in risers, plant step-overs, ductwork, metal pipework, metal ceilings, metal floors.
 - All doors to risers are to have fire rating of riser shaft. Refer to architects drawings for details.
 - M&E contractor is responsible for detailing all secondary steelwork support structures associated with the M&E services.
 - M&E contractor is responsible for detailing and setting out builders work plinths for plant.

KEY

BUILDERSWORK - Floor trench

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project name
Powerhall & decarbonisation

issue date
28/04/23

revision
P1

classification
Ss_40_40_10_00

drawing title
**Power Hall WP4
Builder's work in connection
Right side**

project code	orig.	volume	level	type	role	number
J6960	-	MXF	-	P4	-	00 - DR - J - 20102