

HOME Arches: Mechanical Servicing

TO	Design Team	FROM	WSP
DATE	12 October 2021	CONFIDENTIALITY	Restricted
SUBJECT	FOR COMMENT: HVAC strategy for Home Arches		

VENTILATION STRATEGY

ALL ARCHES

Arch 3 does not have the pod in which plant items can be placed on the roof of, therefore, plant is located at high level in the arch. The MVHR is located centrally as to minimise impact on the space. **This servicing option can be common across all arches**

Fresh air intake is via louvre of free area approx. 0.17m^2 (example louvre is $1000 \times 350\text{mm}$ at 50% free area)

A heater battery on the supply air duct will pre heat the air (when required) up to a suitable temperature before expelling into the space. The supply duct will follow the arch shape to keep as high as possible (see section 5). The supply grilles would be on-duct grilles to minimise the visual impact of the HVAC system.

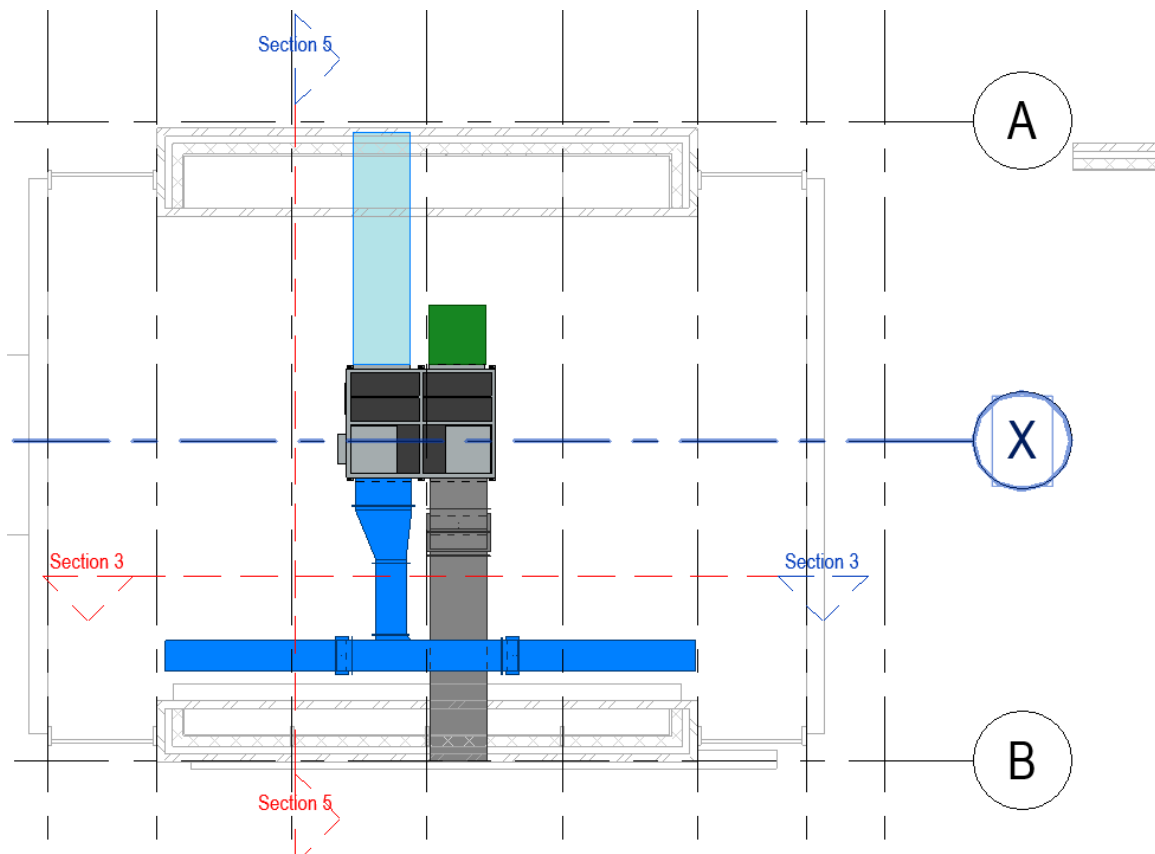


Figure 1: Arch 3 High Level

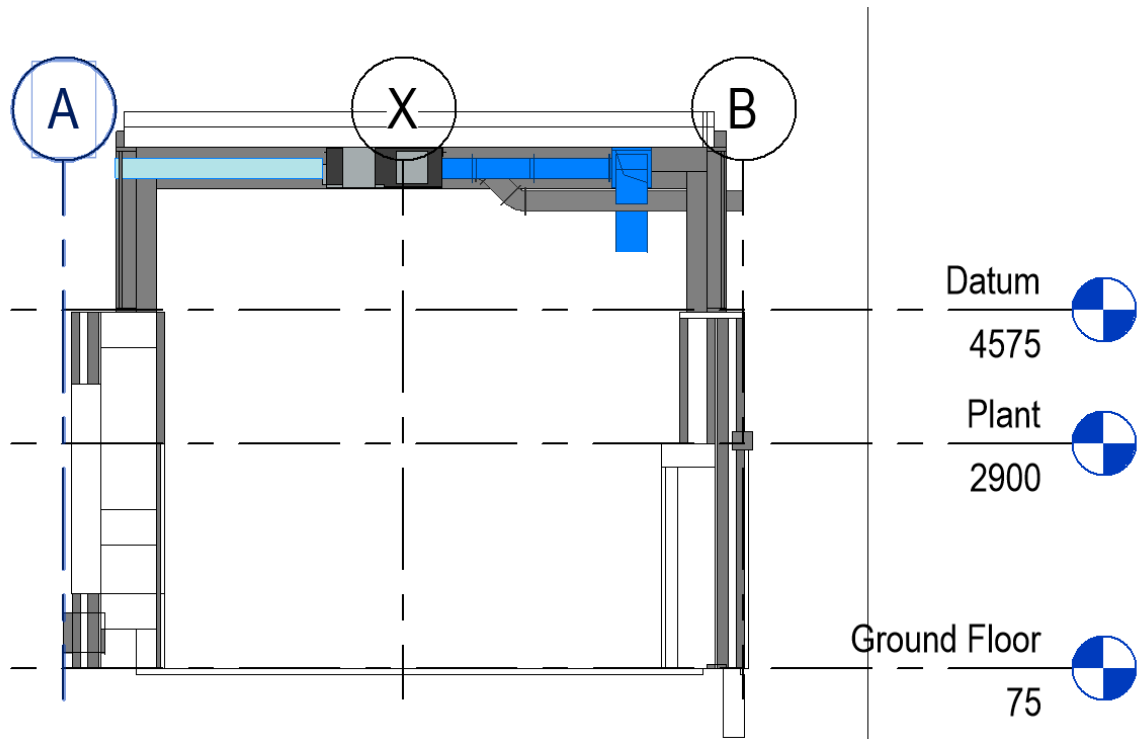


Figure 2: Section 5

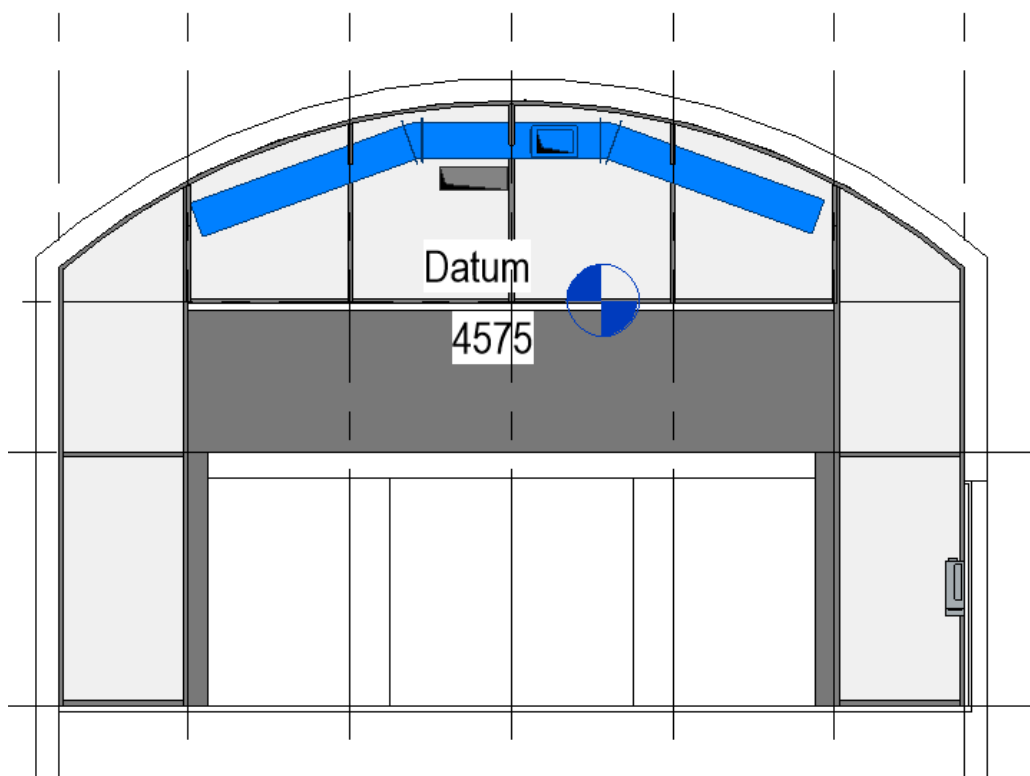


Figure 3: Section 3

ARCH 1 & 2

Arch 1 and 2 have a pod space of which the roof can be utilised for plant. This can drastically reduce the plant at high level.

The methodology of servicing the space is the same, a heater battery on the supply duct heats the fresh air intake to a comfortable temperature before expelling into the space.

The louvres required are the same as previously stated - free area approx. 0.17m^2 (example louver is $1000 \times 350\text{mm}$ at 50% free area)

Extract is through a bell mouth located in the wall between pod and the arch.(free are of 0.17m^2)

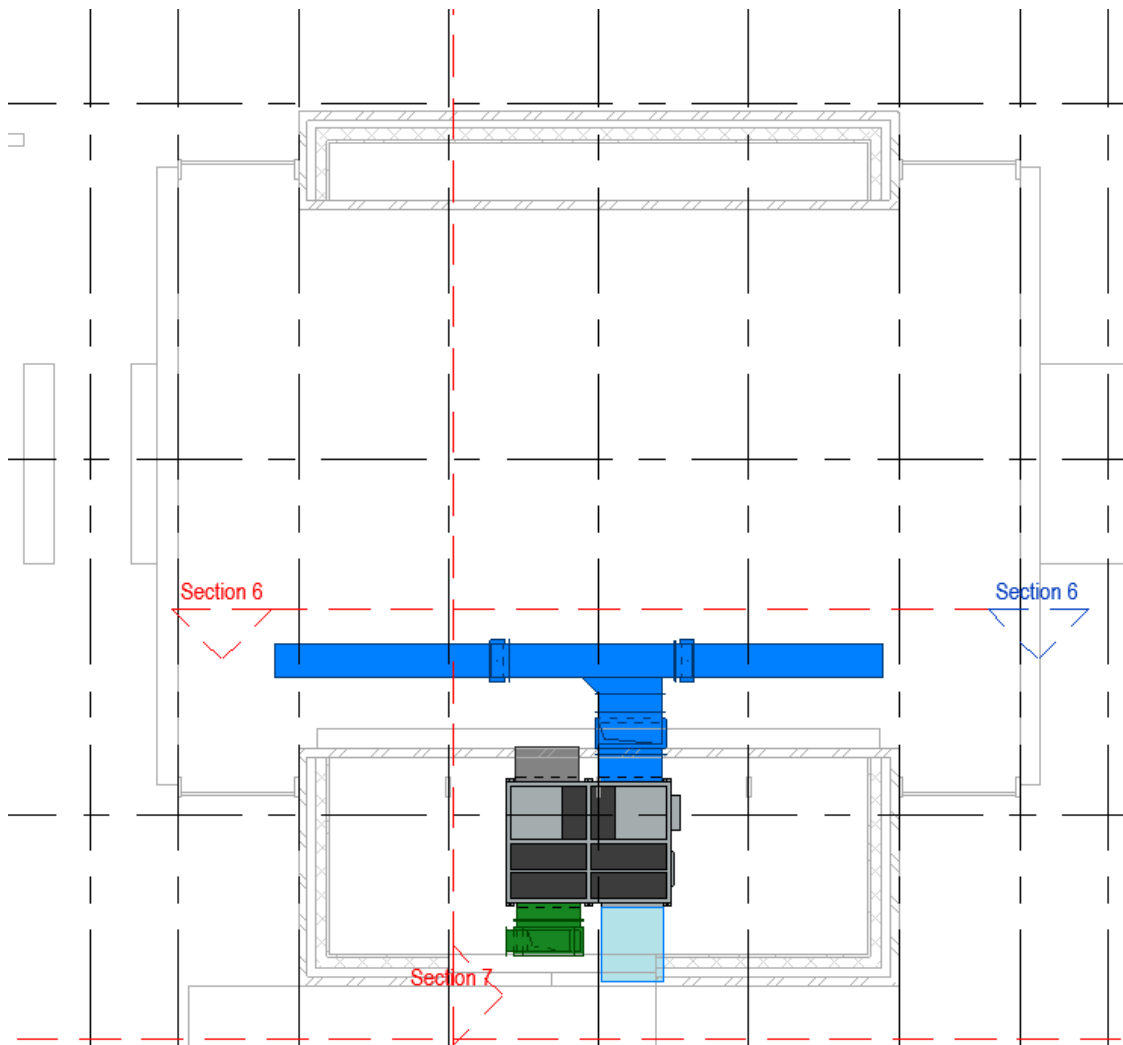


Figure 4: Arch 1 services. Plant space on top of pod and ductwork up to high level

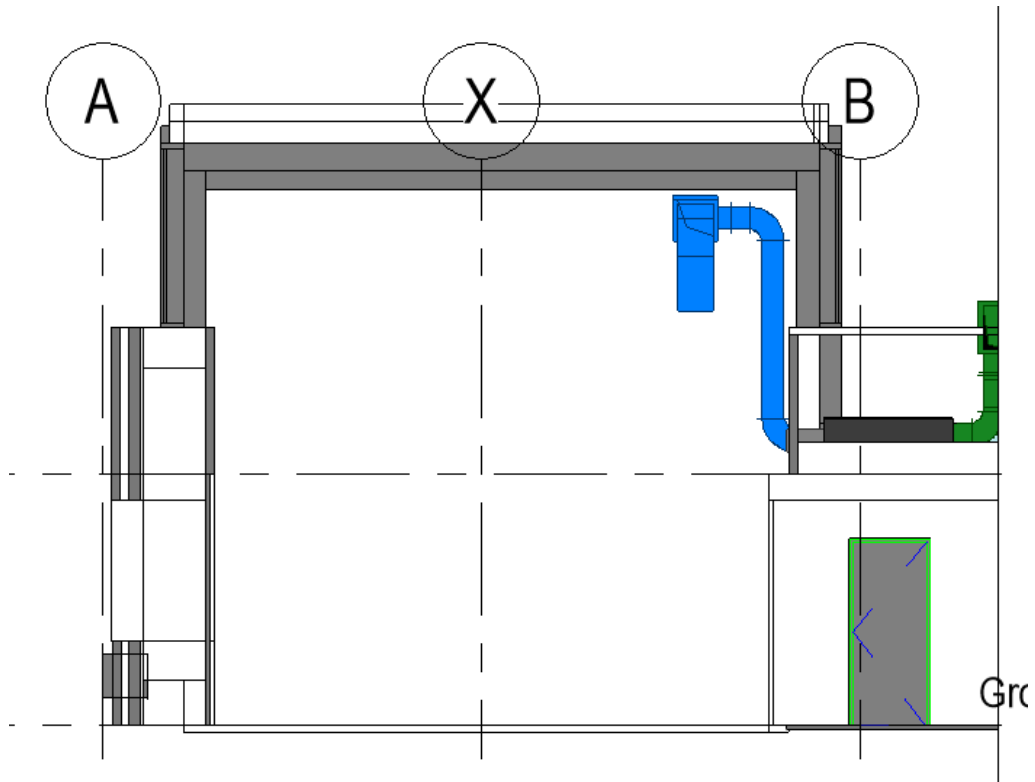


Figure 5: Section 7

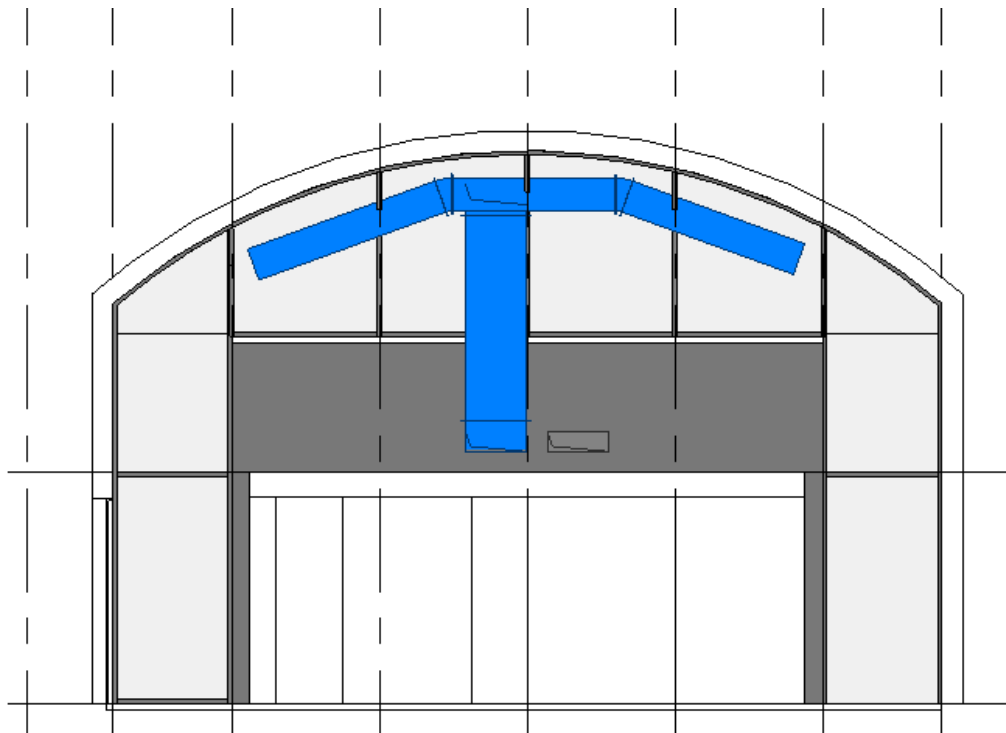


Figure 6: Section 6

MVHR UNIT SPACE REQUIREMENTS

Typically, MVHR unit is 500mm deep and can be pushed as high up against the ceiling as possible (no space is required above). The nature of the arch shape means that a space will be present above the unit, therefore it is recommended to lower the MVHR unit by 250-300mm to allow for cleaning of any dust in this space.

The MVHR does not need clear void space below for any airflow requirements, but it will need full access periodically for maintenance and cleaning. Therefore, items can be located directly underneath the MVHR but they must be removable. If any false ceiling is proposed, this must have adequate access panels.

HEATING AND COOLING

When the outside air is colder than the room set point, the supply air will be pre-heated by an electric heater battery before being expelled into the space.

The space will then be heated or cooled via recirculation fan coil units situated in the wall build up. A low-level grille into the void will allow air from the space to be drawn in, then raised or lowered to temperature by the FCU and then this conditioned air will be supplied to the space through high level grilles (detail tbc by JMA)

The FCU have been highlighted below in the following indicative locations – two per arch. As the air is supplied from one side of the arch, it is good practice to have the circulation units on the other side of the arch to introduce good air flow around each space.





HATCHED AREA 600X600MM
DETAILS THE ACCESS AREA
REQUIRED TO COMPLETE
REGULAR CLEANING AND
MAINTENANCE.

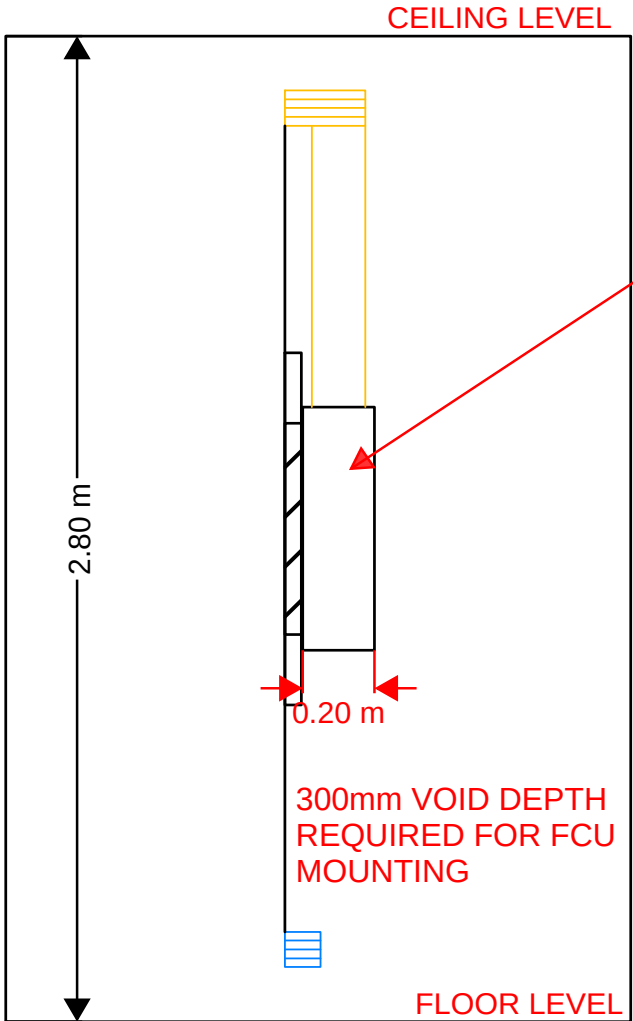
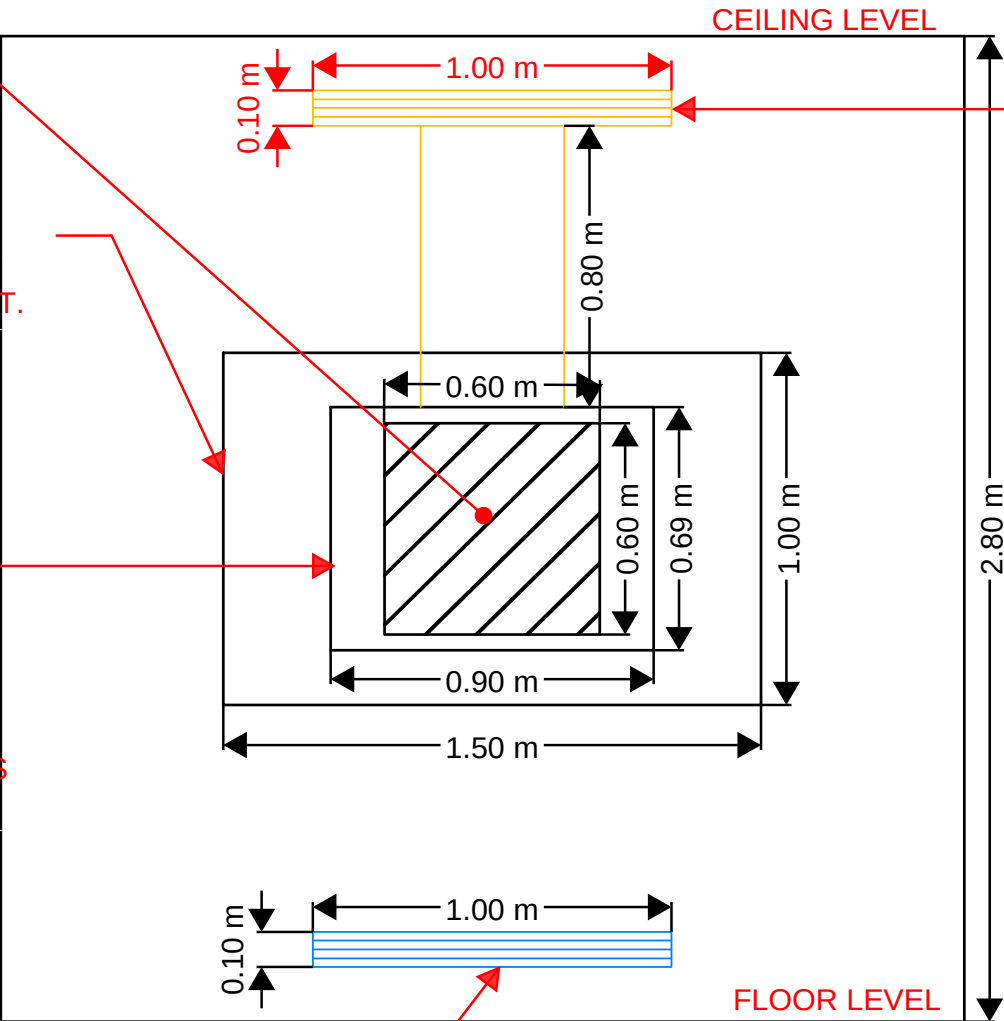
SUPPLY GRILLE 1000X100MM
AT HIGH LEVEL PROVIDING
COOL AIR TO THE SPACE.
DUCTED TO UNIT BY 800MM
LENGTH OF DUCTWORK

COOLING UNIT DEPTH OF
200MM TO BE CONCEALED
WITHIN WALL CAVITY

OUTER AREA 1500X1000MM
DETAILS THE ACCESS AREA
REQUIRED TO BE
DESTRUCTED IN THE EVENT
OF FULL UNIT REPLACEMENT.

COOLING UNIT DIMENSIONS
900X690MM

INTAKE GRILLE 1000X100MM
AT LOW LEVEL DRAWING IN
AIR FROM THE SPACE. CAN BE
DUCTED DUCTED TO UNIT BY
800MM LENGTH OF
DUCTWORK OR UTILISE AN AIR
PLENUM BELOW UNIT.



NOTE: THE 2.8m FLOOR TO CEILING
HEIGHT IS A TYPICAL MEASUREMENT
AND IS NOT REFLECTIVE OF THIS
SCHEME