BOND BRYAN

FILE NOTE

Project Name	Barnsley Levelling Up Fund 2
File Ref	BALU-BBA-XX-XX-FN-A-0015-S2-P03
Description	NAVE Level 02 Plant Well Proposal Notes
Date	2024-02-23
BB Project No	23048

NAVE Level 02 Plant Well Proposal Notes

Key items/reasoning for the proposed strategy to create a new plant well at Level 02 of the NAVE to locate a central Air Handling Unit (AHU) for the building.

1.0 Acoustic & Ventilation Requirements

1.1 The Barnsley Youth Choir (BYC) have set ambitious targets to create world-class singing spaces in the NAVE, which will attract singers and other musicians from across the Northern region, the UK, and the world to come and sing in the building. This is in line with their vision document/project proposal and has been the top priority for the project from the outset.

1.2 The Design Team have been developing proposals, testing, interrogating requirements and progressing with multiple iterations of the design to understand how these world-class singing spaces might be achieved in practice.

1.3 Stringent acoustic targets have been set for the spaces to ensure they can meet the brief that has been set, including suitably controlled noise break-in from outside as far as practically possible, as well as minimal noise from any plant/other building services within the spaces (e.g. lighting). This requires larger than typical duct sizes to minimise the velocity of air moving through ducts and achieve a corresponding reduction in plant noise within internal spaces.

1.4 High levels of occupancy proposed by the client require good levels of ventilation to ensure an adequate supply of fresh air. This requires large central plant and duct sizes.

2.0 Design Development

2.1 At RIBA Stage 2, the Design Team explored a mixed mode, natural ventilation strategy. This strategy was determined inadequate to meet the Acoustic requirements, and a fully mechanically ventilated strategy was adopted at the start of RIBA Stage 3.

2.2 A central plant solution for all spaces within the building would require duct sizes equal to or in excess of 1500mm x 1500mm, which are too large to be accommodated within the building. The required size of the AHU would also be too large to fit in the designated plant room space. It would not be possible to accommodate this plant within the existing building due to the internal space required by the BYC to fulfil the proposed schedule of accommodation.

2.3 A central plant solution with a smaller AHU serving only the highly acoustically sensitive spaces, and localised Mechanical Ventilation with Heat Recovery (MVHR) or Direct Mechanical Extract Ventilation (DMEV) to less sensitive spaces was proposed to be accommodated within the plant room space available. However, duct routes from the external store/plant building are not practicable for the following reasons:

- 2.3.1 Duct sizes would still be approximately 1000mm x 1000mm to achieve the required ventilation supply flow rates required.
- 2.3.2 50% diversity on the proposed occupancies would be required to minimise the plant sizes to those stated above (duct size and size of AHU to fit within the plant room space).
- 2.3.3 Duct routes proposed from the external building would clash with the existing garages and with the proposed main entrance.
- 2.3.4 Ducts would be overly lengthy with multiple junctions resulting from changes in direction, introducing high levels of friction into the system, and requiring plant sizes to be increased to overcome the resulting level of resistance.
- 2.3.5 Ducts would be highly visible externally, resulting in an unsightly appearance and harming the visual amenity of the historic building.

3.0 Proposal

3.1 Design Team's investigations into the history of building adaptations brought to light a relatively recent adaptation (1982/83) to the existing roof over the Northwest corner of the building, originally the roof above the Magistrate's Retiring Room. This space originally had a section of flat roof, which was later extended into a pitched roof to meet the existing gable end of the principal courtroom space. (See historic planning application B\82\1687\BA drawings for details).

3.2 It is our view that this historic condition provides some justification, albeit limited, for exploring proposals to reintroduce an area of flat roof in this location. The proposed area is larger than the 'roof well' that would have been present historically, however, the Design Team note the acknowledgement of the limited visibility of this part of the building that is highlighted in the details of the historic permission.

3.3 The Design Team propose to remove the entire section of pitched roof in the area shown on the plans to create a new plant well with a lightweight screen to conceal the plant from street level. This would provide a sqm area commensurate with the proposed plant room space currently proposed in the new external building. This space could accommodate the AHU required.

3.4 The plant well would be screened, and the air handling unit and associated ductwork would be only partially visible externally, improving the amenity of any proposals to introduce plant to the building, which, as noted above, are necessary for building viability.

3.5 Duct routes would be much more efficient, reducing services penetrations and duct routes within the building, ensuring plant sizes are minimised as far as possible and improving the overall efficiency of the ventilation system.

3.6 The size of the proposed external store/plant room building could be reduced as a result of the space created at roof level, omitting the second storey currently proposed for the new outbuilding, and replacing it with a lightweight screen to match the one proposed at roof level and ensure any remaining requirements for plant in this location are minimised. The Team hope this would be viewed favourably by planning & conservation officers.

3.7 The removal of windcatcher louvres associated with the now discounted natural ventilation strategy may be viewed positively by planning & conservation officers, as well as requiring less extensive alterations or structural strengthening to the main pitched areas of the existing roof.

3.8 Routing ductwork only through key, sensitive spaces, rather than siting localised plant in these spaces, means that acoustic requirements can be achieved in principle, and will help to ensure that the BYC is able to create world-class singing spaces in line with their vision for the building.

3.9 The proposed strategy involves a lower level of programme risk, since mechanical plant will be able to be installed prior to the completion of the new external store/plant room building.