

7.0 SERVICES STRATEGY

7.1 SERVICES CONDITION SURVEY

Qoda, specialist MEP and Sustainability Engineers, have been appointed to develop the Mechanical and Electrical Strategy for the redevelopment of the Grand Pavilion. Aligned with the project's sustainability ambitions, the redevelopment looks to remove all reliance on fossil fuels in lieu of electric Air Handling Units (AHU), Air Source Heat Pumps (ASHP) and Mechanical Ventilation and Heat Recovery (MVHR) units.

For the full condition survey and MEP Strategy Drawings, refer to appendices.

Mechanical & Electrical Condition Survey

From a thorough services condition survey, Qoda recommend the wholesale replacement and upgrade of the existing MEP services within the building, identifying that many services are exceeding their CIBSE recommended economic life.

Qoda have graded the condition of each individual service to allow for a holistic understanding of particular elements and what could feasibly be retained or re-used if required. The general conclusion of the condition grading is that the majority of services are classed as poor, where the element is operational but major repair or replacement will be needed in the short-term future. The items suitable for potential re-use comprise more recent local installations such as electric hot water heaters, some AC equipment and local ventilation units. It is however identified that in the major redevelopment, these systems would benefit from the efficiencies associated with linking them to central systems.

Porthcawl Grand Pavilion

Mechanical & Electrical Services Condition Survey Report

2561.R1

VENTILATION STRATEGY LEGEND

- AREA OUTSIDE OF FIRST PHASE OF WORKS AND NOT SERVICES IN THIS PROPOSAL
- MECHANICAL VENTILATION VIA DEDICATED AHU COMPLETE WITH HEATING, COOLING AND HEAT RECOVERY
- EXTRACT ONLY VENTILATION. MAKE UP AIR BY UNDERCUT DOORS OR TRANSFER GRILLES
- NATURAL VENTILATION BY OPERABLE WINDOWS AND DOORS. OCCUPANCY TO BE CONFIRMED
- HIGH LEVEL MVHR UNITS DUCTED TO THE FACADE TO BE PROVIDED
- SEPARATE SUPPLY AND EXTRACT VENTILATION

0.8 X 0.8 FRESH AIR DUCT RISES FROM BELOW TO RUN BELOW BALCONY AND TO SUPPLY BALCONY THROUGH DIFFUSERS INTEGRATED INTO STEPPED SEATING ABOVE.

MINIMUM 500mm SERVICES VOID REQUIRED

0.15m² FREE AREA

0.15m² FREE AREA

0.15m² FREE AREA

0.2m² FREE AREA

0.15m² FREE AREA

WET HEATING SYSTEM SERVED BY ASHP TO BE REPLACED WITH DUCTED CONCEALED REFRIGERANT FAN COIL UNITS

EXTRACT DUCTWORK RISES TO ABOVE 1.5m x 1.5m

LOW LEVEL SUPPLY BELOW DUCT AND HIGH LEVEL EXTRACT AS EXISTING

2.0 X 0.8m FRESH AIR DUCT FROM ABOVE

1 X 1.5m FRESH AIR DUCT DROPS TO BELOW AND RISES TO HIGH LEVEL PLUS 0.5 X 1m MECHANICAL RISER

0.8 X 0.8m EXTRACT FROM ABOVE TO HIGH LEVEL 0.8m x 0.8m SUPPLY FROM HIGH LEVEL TO BELOW FLOOR

HEATING & COOLING BY DUCTED CONCEALED REFRIGERANT FAN COIL UNITS

APPROXIMATE OCCUPANCY = 650 PEOPLE

FRESH AIR DUCT RUN BELOW BALCONY AND TO SUPPLY BALCONY THROUGH DIFFUSERS INTEGRATED INTO STEPPED SEATING ABOVE.

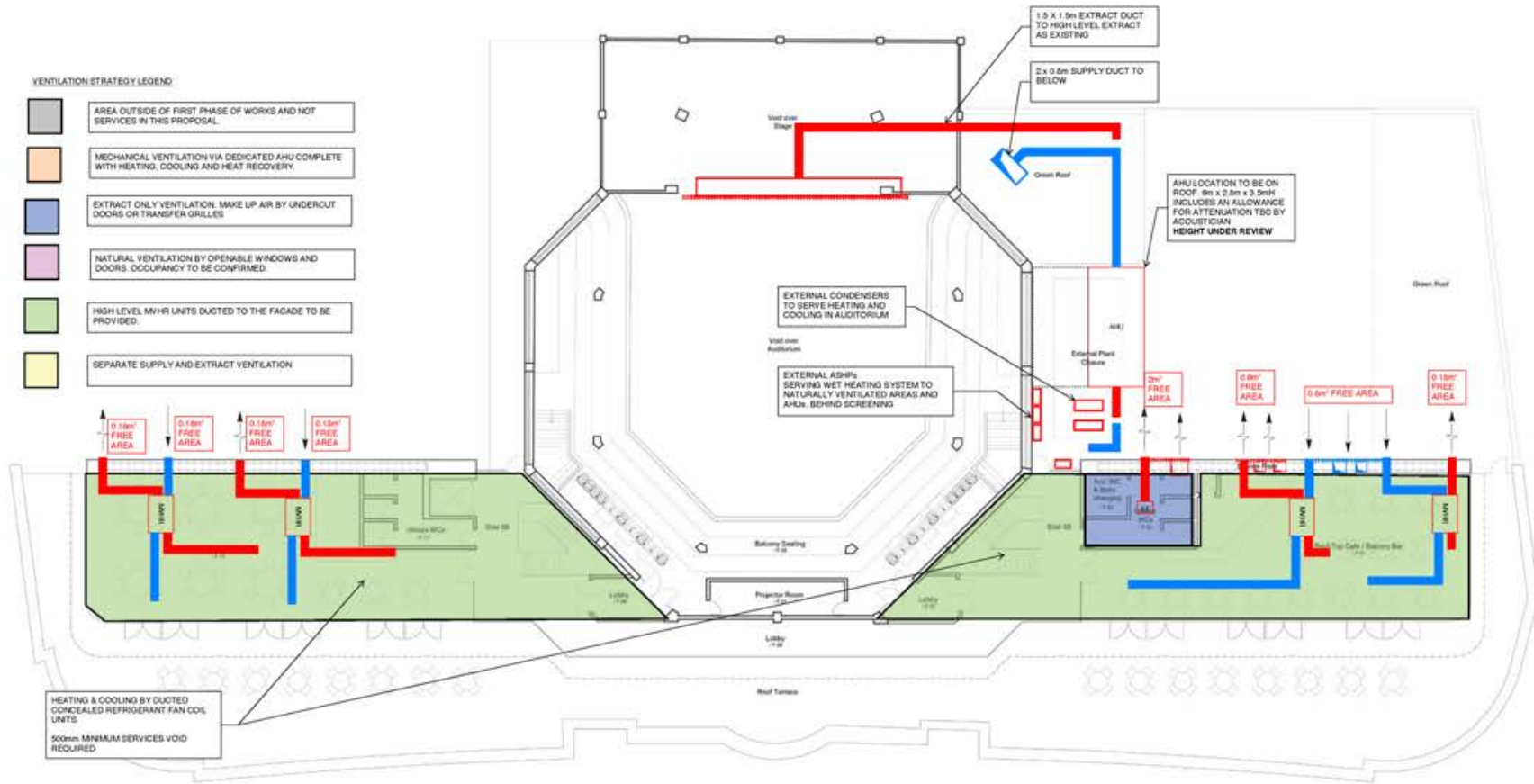
HEATING & COOLING BY DUCTED CONCEALED REFRIGERANT FAN COIL UNITS. MINIMUM 500mm SERVICES VOID REQUIRED.

NOTES
- FCU's AND ASSOCIATED SECONDARY DUCTWORK IS NOT SHOWN
- RADIATORS AND LTHW / REFRIGERANT PIPEWORK NOT SHOWN

Proposed - GA Ground Floor
2001 1:100

VENTILATION STRATEGY LEGEND

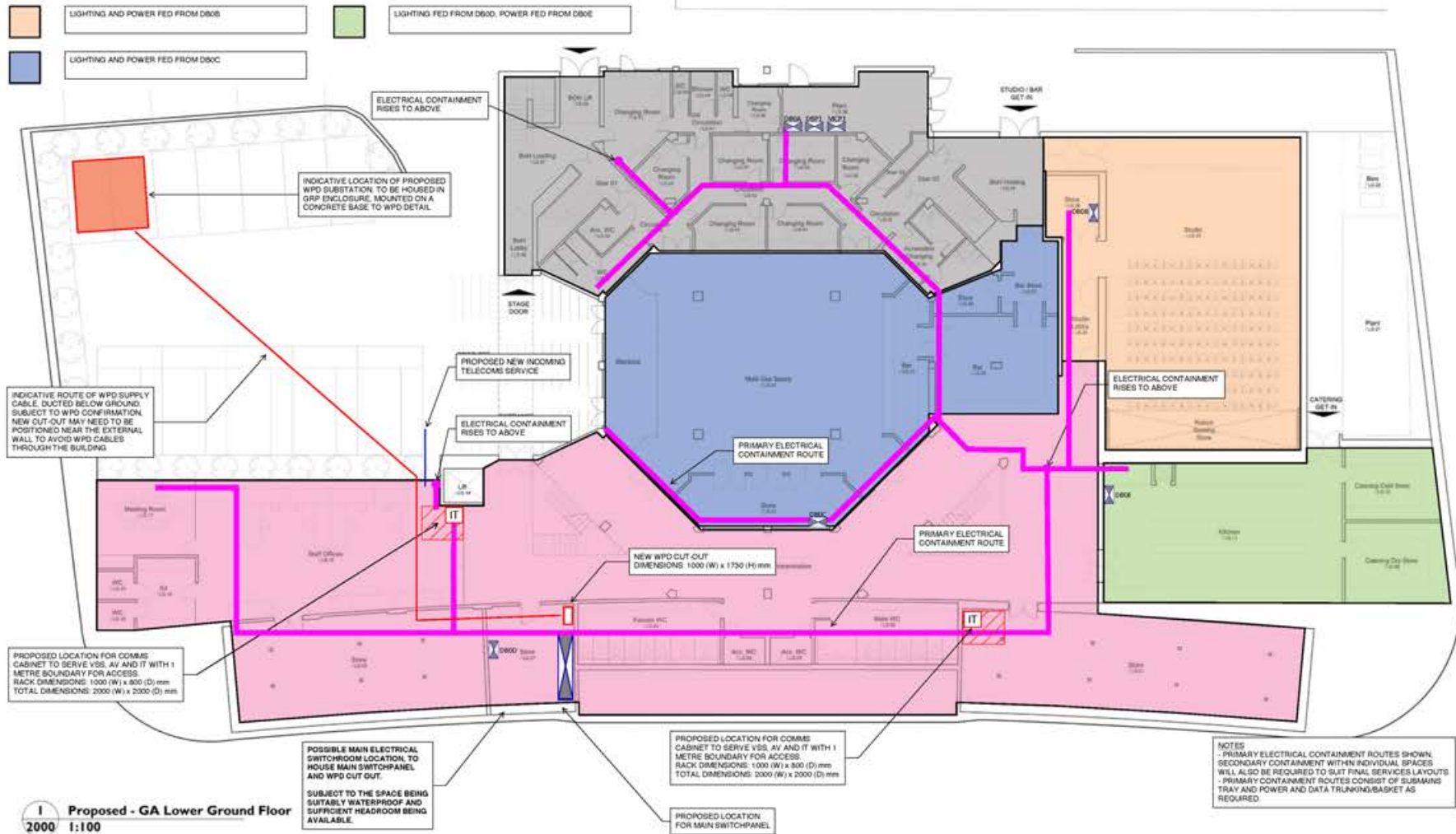
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- NATURAL VENTILATION BY OPENABLE WINDOWS AND DOORS. OCCUPANCY TO BE CONFIRMED
- HIGH LEVEL MVHR UNITS DUCTED TO THE FACADE TO BE PROVIDED.
- SEPARATE SUPPLY AND EXTRACT VENTILATION



2002 Proposed - GA First Floor
1:100

NOTES
 - FURN AND ASSOCIATED SECONDARY DUCTWORK IS NOT SHOWN
 - RADIATORS AND LTHW / REFRIGERANT PIPEWORK NOT SHOWN

7.3 ELECTRICAL STRATEGY DRAWINGS



Notes: 13/05/2022 17:24:53
 Drawings are based on survey data and may not accurately represent what is physically present.

PORHCRAWL GRAND PAVILION
 31/05/22

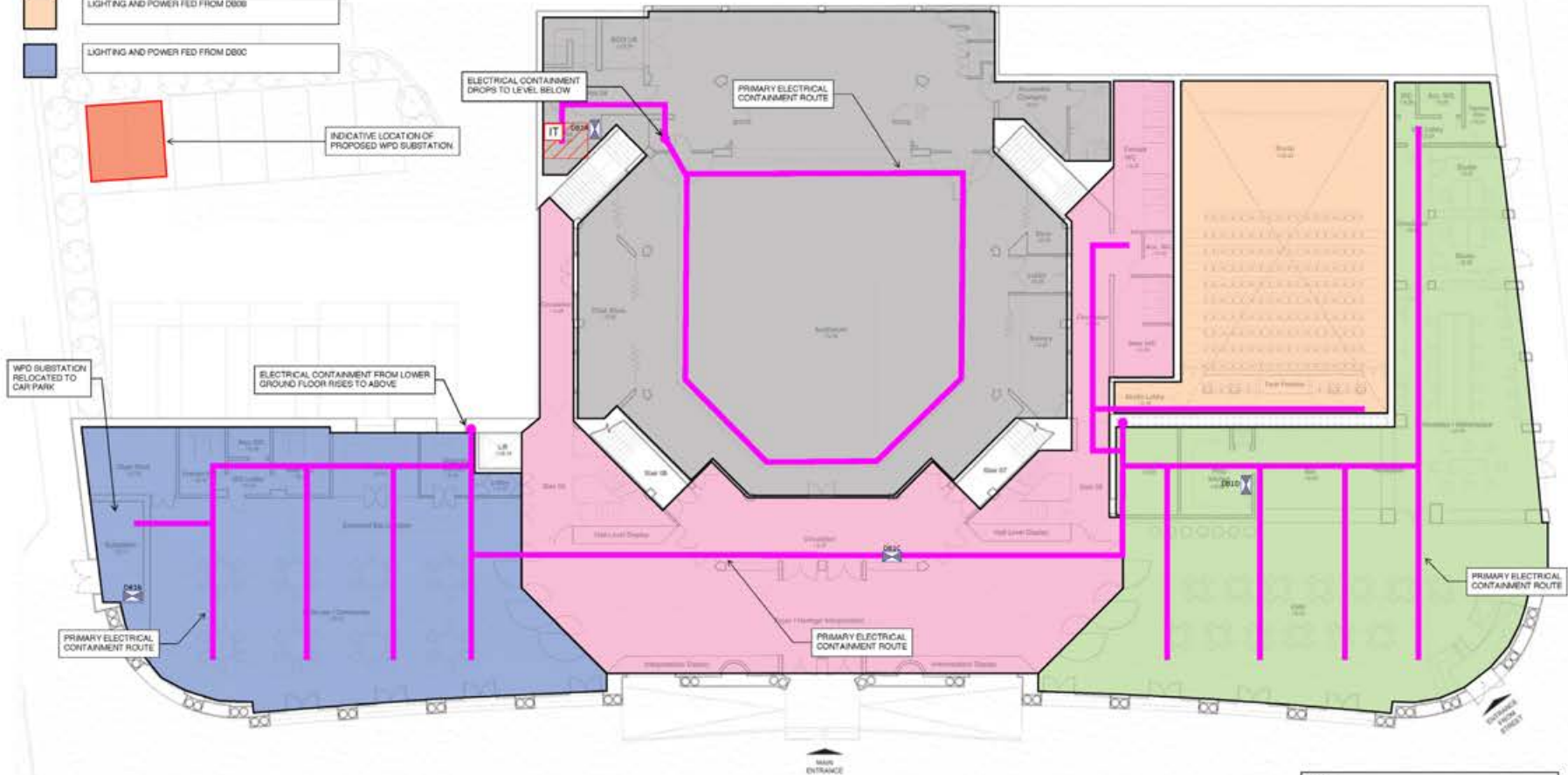
CLIENT: AWEN Cultural Trust
 PROJECT: Porthcawl Grand Pavilion
 239541

SCALE: A1/L 1:100
 LAST REVISION: 07/04/22
 DRAWN BY: GC
 CHECKED BY: RH



DISTRIBUTION STRATEGY LEGEND

	LIGHTING AND POWER FED FROM DB0A		LIGHTING AND POWER FED FROM DB0D		LIGHTING FED FROM DB0D, POWER FED FROM DB0E
	LIGHTING AND POWER FED FROM DB0B				
	LIGHTING AND POWER FED FROM DB0C				

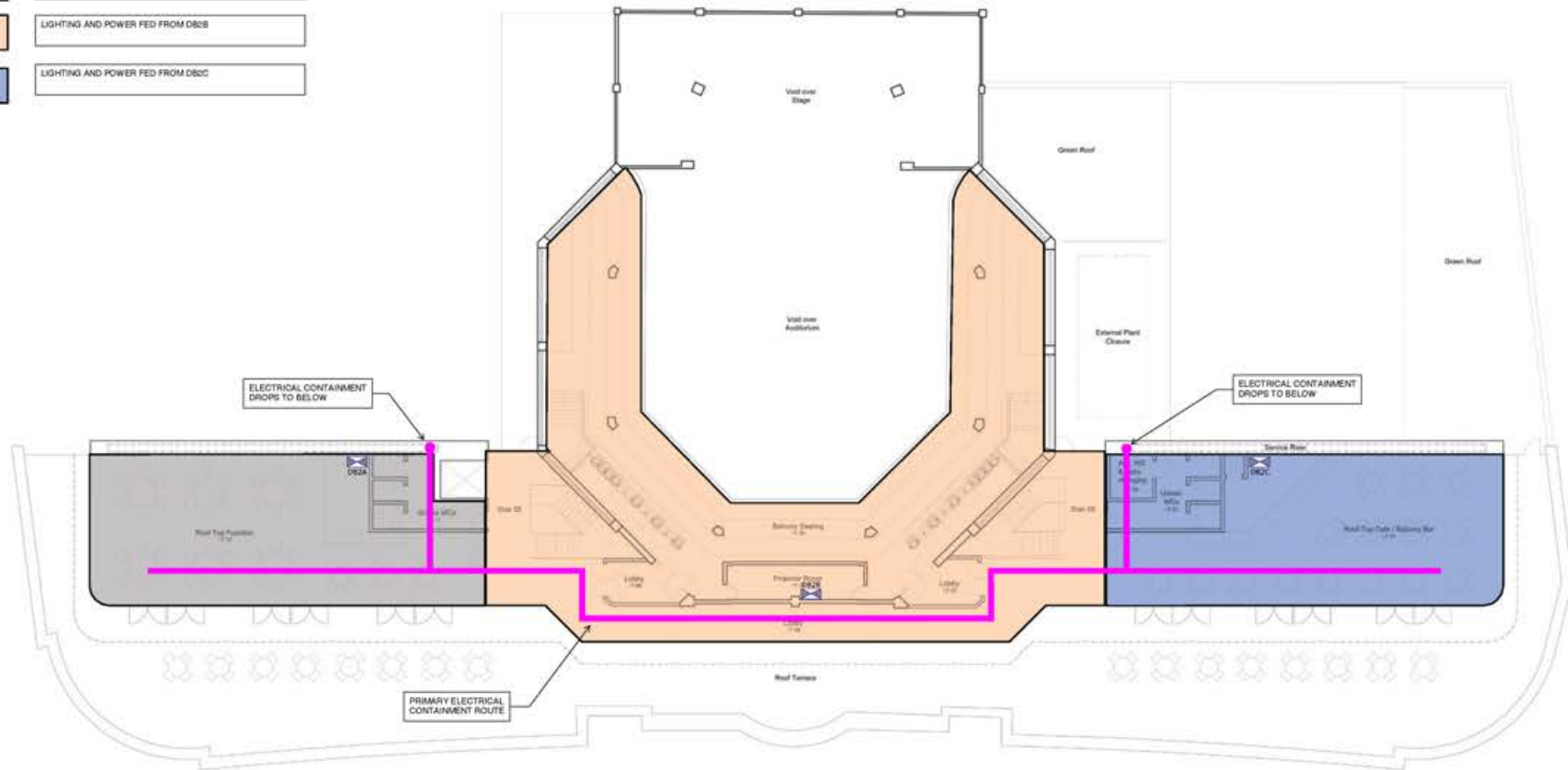


1 Proposed - GA Ground Floor
2001 1:100

NOTES
 - PRIMARY ELECTRICAL CONTAINMENT ROUTES SHOWN
 - SECONDARY CONTAINMENT WITHIN INDIVIDUAL SPACES
 WILL ALSO BE REQUIRED TO SUIT FINAL SERVICES LAYOUTS
 - PRIMARY CONTAINMENT ROUTES CONSIST OF SUBMINS
 TRAY AND POWER AND DATA TRUNKING/BASKET AS
 REQUIRED.

DISTRIBUTION STRATEGY LEGEND

	LIGHTING AND POWER FED FROM DBCA
	LIGHTING AND POWER FED FROM DBCB
	LIGHTING AND POWER FED FROM DBCD



NOTES
 - PRIMARY ELECTRICAL CONTAINMENT ROUTES SHOWN.
 - SECONDARY CONTAINMENT WITHIN INDIVIDUAL SPACES WILL ALSO BE REQUIRED TO SUIT FINAL SERVICES LAYOUTS.
 - PRIMARY CONTAINMENT ROUTES CONSIST OF SUBMINS TRAY AND POWER AND DATA TRUNKING/BASKET AS REQUIRED.

7.4 SUSTAINABILITY & ENERGY

The proposal enables the continued use of a Listed building, within an urban site and, as such, incorporates inherent qualities of social and environmental sustainability. During the global climate and fuel crisis however, upgrading the performance of existing and listed buildings to reduce their operational carbon demand is hugely important and, ethically, is the correct approach. The commitment to work toward a low or zero carbon redevelopment is, by way of the inevitable shortage of fossil fuels, how we will secure the sustainable and affordable future operation of the Grand Pavilion.

Responding to this, Awen Cultural Trust and Bridgend County Borough Council have commissioned a sustainability appraisal and AECB Retrofit analysis by Qoda. The appraisal sets out the benefits of a fabric-first approach, where the existing fabric of the Grand Pavilion is thermally upgraded to improve the performance in line with the AECB Retrofit Standard.

Such fabric upgrades include:

- An insulated over-roof to the existing concrete dome with 150mm PIR insulation to achieve 0.14W/m²K U-Value, addressing the condensation issues and improving thermal performance
- High-quality triple glazing units to new extensions to achieve <0.85 W/m²K U-Value
- Internal wall insulation to the currently uninsulated reinforced concrete walls to achieve 0.15W/m²K U-Value
- Secondary glazing to existing windows to 1.80W/m²K U-Value
- The specification of efficient new construction with U-Values based on calculations

With these fabric first upgrades undertaken, the energy required to heat and cool the building would be significantly reduced, with the provision of renewable technologies such as PV arrays and Air Source Heat Pumps becoming far more efficient in offsetting the building's operational energy demand.

QODA

Grand Pavilion, Porthcawl

Sustainability – EnerPHit approach and Low zero carbon feasibility

2561/R2

The proposal will comply with all national, regulatory standards but, with local and national ambitions to achieve net-zero carbon by 2030, the project is committed to achieving greater standards including BREEAM Excellent and the AECB Retrofit Standard.

Following consultation, the proposal adopts a low consumption approach that includes:

- The removal of all fossil-fuel burning services in lieu of electric and renewable Air Handling Units, Air Source Heat Pumps and a Photovoltaic array.
- A 'fabric-first' approach to thermally upgrading the existing building, where deemed appropriate against the building's character and heritage.
- A specified passenger lift with regenerative technology that recycles energy for immediate use in the building
- Natural ventilation wherever possible, with those areas requiring assisted ventilation due to their function, equipped with air-handling units incorporating heat recovery devices, such as heat exchangers or thermal wheels. These areas will be CO₂ controlled to ensure that only the required amount of air is supplied to the space

- Low-energy LED lighting, with automatic lighting controls, and daylight dimming and, within all WCs and stores, PIRs with absence detection
- Advanced metering to enable close monitoring of energy consumption and flow-rates
- Reduced water usage by the specification of low-flow sanitary fittings and appliances
- The re-use and retention of materials wherever possible
- Cement Replacement; to reduce the embodied energy of the concrete elements high levels of cement replacement are proposed. For structural concrete a 50:50 OPC / GGBS mix to be used. Research from the Concrete Centre suggests that at 50% cement replacement the embodied carbon of the concrete is reduced by approximately 1/3 compared to an equivalent mix made in entirely with OPC.
- Steelwork

To facilitate the easy reuse of the steelwork in the building the sections could be hard stamped with their serial size and the mill certificates and included in the health and safety file. Site bolted connections will also be used, with welding avoided wherever possible.

The environmental impact of the steelwork could be reduced if water based corrosion protection is specified as this virtually eliminates the Volatile Organic Content (VOC) of the coating. Discussions will be required with the Contractor's supply chain.