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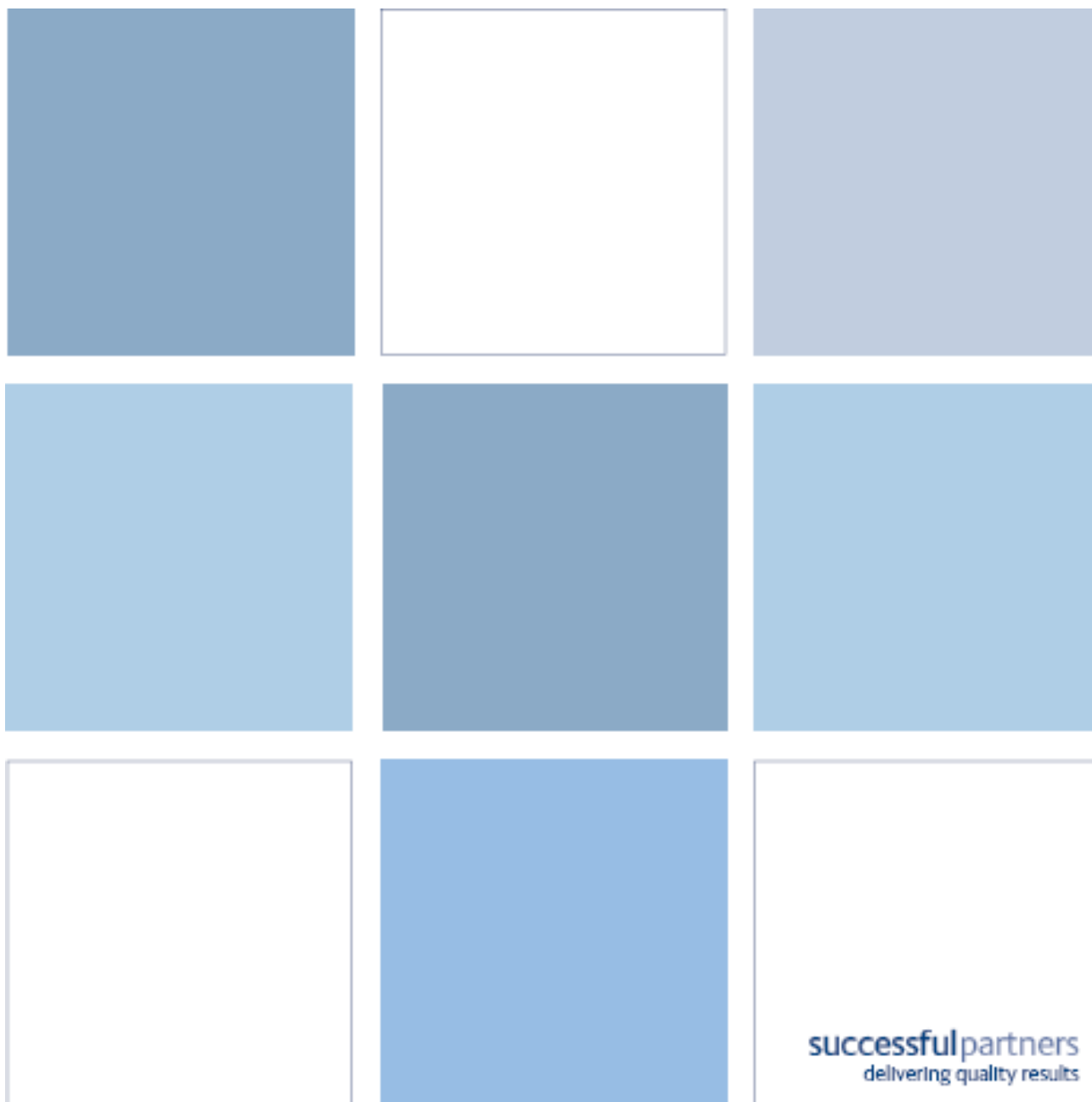
Royal Liverpool Broadgreen University Hospital Trust

Liverpool Life Sciences Innovation Centre

Infrastructure Proposals & Utilities Statement

to serve the new Life Sciences Innovation Centre

Issue 1



Quality Management

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1.0 Introduction

The following document describes the preliminary proposals to serve the Life Sciences Innovation Centre building with Electrical Incoming Service, Heating & Domestic Hot Water, Mains Gas, Mains Water and Chilled Water Services.

The production of this document is to provide sufficient information for the Planning Application (New Liverpool Innovation Centre, Phase 1 only – Phase 2 represents a future expansion to the LBIC, of which a separate planning application will be required).

The Mechanical & Electrical loadings calculated for this document are provisional and will require updating and revision as further design is carried out.

The loadings are calculated on the following basis:-

Phase 1	-	7,000m ²
Future Phase 2	-	7,000m ² - Not part of the Planning Application

The loadings will therefore be denoted as:

x kW for Phase 1

(x kW) for Phase 1 & 2

2.0 General

Initially it was thought that there were three main options.

- a. Provide independent feeds from the Statutory Authorities for all services to provide a stand alone facility.
- b. Provide metered Electrical Power and Heat medium from the central Combined Heat and Power generators (CHP) located in the Central Energy Centre with other services direct from the Statutory Authorities to provide a separately metered facility but within the Hospital campus overall Energy Strategy.
- c. A combination of hybrid of a. and b.

On further investigation it has become apparent that Option b. would in all likelihood be the preferred option due to the following:-

- (i) Initial investigations into providing a separate incoming Electrical Supply have confirmed that Scottish Power's policy is to not provide two separate supplies to sites of this nature. Although under certain circumstances you can contest this and a case can be made to overcome this policy, it would carry the risk that this would not be allowed and would have cost and programme consequences.
- (ii) The provision of the Electrical Supply from the CHP unit gives long term cost benefits to the Hospital due to economies of scale.
- (iii) The use of the central CHP unit to provide the Electrical Load gives Carbon Reduction benefits.

- (iv) The budget costs can be more easily firmed up due to not having the risk of Scottish Power infrastructure charges.
- (v) As the main site infrastructure is being upgraded (11kV Ring Main) the inclusion of the Life Science building on this infrastructure would improve the resilience to the building.

With all the above taken into consideration the proposal is to take the Electrical Supply from the Central CHP system. Therefore this lends itself to providing the heating and DHWS from the central plant again due to economies of scale and Carbon Reduction consideration.

3.0 Electrical Incoming Services

It is proposed that the new supply is initially taken from the 6.6kV supply from the existing Central CHP unit to a new sub station serving the Life Sciences building. (See Sketch No. M6644/SK1).

The substation provided under this project shall have double wound transformers to enable the supply to be changed over to the proposed 11kV ring main due to be installed under the PFI project.

The building and supply would be metered.

The preliminary loading requirement are as follows:-

Phase 1	7,000m ²	= 1025 kW
Phase 1 & 2	14,000m ²	= (2045 kW)
Phase 2 - Not part of this Planning Application		

It is recommended that the physical size of the sub-station for the full load provision is catered for under this phase i.e. (2045 kW) to enable any future expansion to be carried out without major infrastructure works but the temporary cable could be sized to supply only the first phase (1025 kW) as the total phase 1 and 2 supply would be taken of the new 11 KV ring main at a later date. Only the HV transformer and switchgear for the first phase would be supplied under this phase.

4.0 Heating & Domestic Hot Water

Whilst it would be possible to provide the heating and DHW from independent gas fired plant it is considered that the most cost effective and carbon efficient method would be to utilise the waste heat from the central CHP unit.

It is therefore proposed that a new temporary metered steam main is taken from the existing CHP energy centre running in front of the existing Hospital in an accessible duct or fixed to the perimeter wall (see Sketch No. M6644/SK1) to serve new Heating and Domestic Hot Water calorifiers in the plantroom within the Life Science building.

The preliminary loading requirements are as follows:-

Phase 1	7,000m ²	= 1433 kW
Phase 1 & 2	14,000m ²	= (2865 kW)
Phase 2 - Not part of this Planning Application		

It is recommended only the load for phase 1 is provided from this interim main as the final service for both phase 1 and 2 should be taken from the supply serving the reconfigured site covered by the PFI contract.

This would enable any future expansion to be carried out without major infrastructure works.

5.0 Mains Gas

Due to the heating provision being provided by the CHP the gas provision is limited to any cooking facilities and laboratory use.

In discussion with End Users it has become apparent that the use of gas within the laboratories is virtually non existent.

With this in mind we would propose that a new relatively small metered gas supply is provided from the mains in Prescott Street. (See Sketch No. M6644/SK1).

It is also proposed that this element is considered in more detail during the design process as it is possible that this service could be dispensed with as a mains supply.

6.0 Mains Water

It is proposed that a new metered water supply is provided from the mains in Prescott Street serving a new bulk storage tank and booster set in the Life Science Building. (See Sketch No. M6644/SK1).

The cold water storage requirements have been calculated following discussions with end users.

Phase 1	Range 150 Occupants 300 Occupants	6,000 litres 12,000 litres
Phase 2	Not Required (Tank and booster provided in expansion space)	
Phase 2 - Not part of this Planning Application		

It is proposed to provide 2 No. 6,000 litre tanks at this stage. This would enable one tank to be used initially until the building becomes fully used, then the second tank could be brought into use hence balancing security of supply with minimum storage (maximum turn around).

7.0 Chilled Water

It is proposed that new packaged chiller plant is provided and located on the roof of the new Life Sciences Building.

The preliminary chiller capacity requirements are as follows:

Phase 1	7,000m ²	= 875 kW
Phase 1 & 2	7,000m ²	= (1750 kW)
Phase 2 - Not part of this Planning Application		

It is recommended that the chiller plant for Phase 1 only i.e. 875 kW is provided in this phase as a separate packaged chiller could be provided on the roof of any further expansion.

(Note: The full spatial electrical requirements for Phase 1 and 2 would be catered for within the sub-station but not the transformer/switchgear).

APPENDIX A – SKETCH NO. M6644/SK1

