Liverpool Health & Academic Precinct

MSCP Infrastructure Management Plan – Electrical & ICT

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Health Infrastructure

Client Reference

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Contents

Executive Summary

The Liverpool Health and Academic Precinct development is a large-scale project with an approximate floor area of 60,000m2 for Stage 1 and 2, this will require a substantial amount of additional car park spaces. A new MSCP is proposed to accommodate these additional spaces due east of the existing P2 Multi Deck Car park. This new Car park will consume additional electrical load and will require a new power supply from the existing hospital owned Central Energy Plant. As part of the Multi Storey Carpark project a new/ extended high voltage (HV) cable will be installed to a new kiosk substation (transformer), this will be owned and operated by the hospital and does not require any easements or certification from the power supply authorities.

The new kiosk substation supplying the new MSCP shall be fed from the existing Central Energy Plant (CEP). Prior to the construction of the MSCP the existing Ron Dunbier Building is to be demolished. The Ron Dunbier Building power supply (from the CEP) shall be reused to provide the new MSCP Kiosk substation (this will however require the replacement of the existing HV cable due to its current condition. We are not adding more power merely transferring the existing load from Ron Dunbier to the new MSCP.

A new Main Switch Board room shall be established inside the new MSCP and will reticulate all low voltage supplies throughout the building. The supply from the CEP is already backed up by high voltage generators, therefore no new generator/s are required for the new MSCP.

The telecommunications infrastructure shall consist of a new ICT backbone cabling from the existing hospitals Campus Distributor into the new MSCP Building Distributor via new in ground conduits and the existing services tunnel.

All Electrical and ICT infrastructure for the new MSCP shall be derived from the existing hospital site with no external infrastructure required outside the property boundary. No consultation is required from any external authorities such as Telstra or Endeavour Energy for the new MSCP development.

1. Electrical – Infrastructure

1.1 MSCP Construction

The existing Central Energy Plant (CEP) which is located on the Eastern Campus contains a large HV infrastructure which supplies a large portion of the Liverpool Hospital site. The CEP is owned and operated by the Hospital as they are an HV customers and own, maintain and operate all the HV network on the site excluding the HV meter/ isolation points.

As part of the Multi storey car park works a new 1000kVA kiosk substation shall be installed external to the car park to provide all LV power to the building. Prior to the new MSCP the existing Ron Dunbier building shall be demolished. The existing supply to the Ron Dunbier building shall be reused to supply the new 1000kVA transformer for the MSCP. The HV cabling shall be replaced and connected to the existing HV switches inside the CEP and terminated into the new Hospital owned 1000kVA kiosk transformer.

The new transformer will connect directly into a dedicated Main LV Switchboard for the required LV distribution around the MSCP. The LV main switchboard shall be located in its own dedicated main switch room on ground floor.

The two existing HV standby diesel generators are located in the CEP. The HV supply to the new 1000kVA transformer is already supplied from both EE grid supply and generator back up, therefore no additional generators are required for the MSCP. The new MSCP MSB shall have a generator signal to a contactor/MCCB bus tie to disconnect all non-essential circuits in the event the generator is in operation due to mains failure.

As this supply will be provided from the existing HV network on site which is hospital owned there is no requirement to coordinate, discuss or gain an approval this with the supply authorities EE. Therefore, no consultation has been undertaken with the supply authority for the MSCP scope.

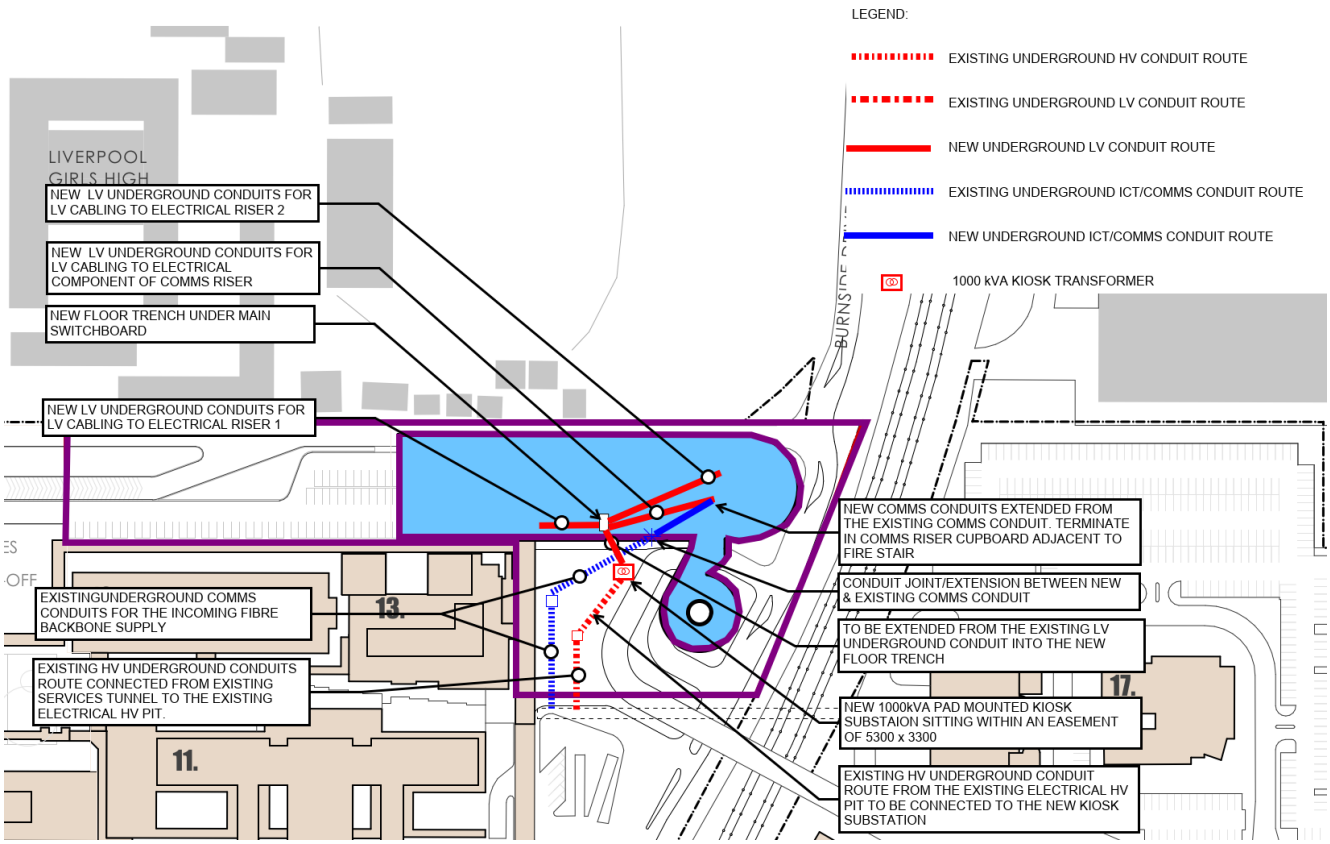

Fig 1 Site Power layout

1.2 Single Line Diagram for the MSCP

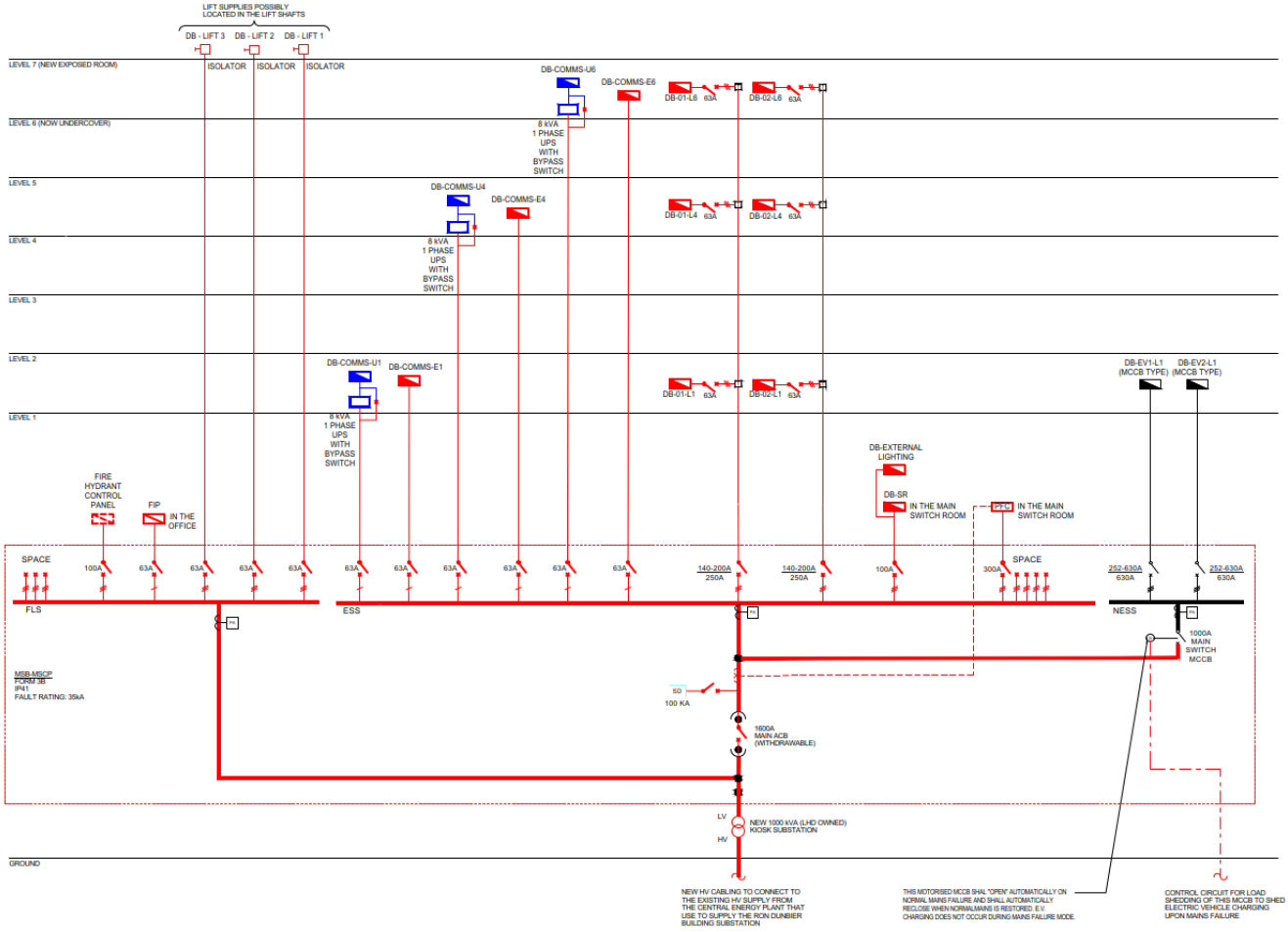

Fig 2 LV single line diagram

2. Electrical – Telecommunications Reticulation/Infrastructure

2.1 MSCP Construction

The MSCP construction does not require any new incoming cable connections from the telecommunications service providers (Telstra, Optus, E-Health, NBN) as this will be connected to the hospital ICT backbone and terminated in the existing Alex Grimson building. This shall be a temporary connection until Stage 1 and 2 are completed and the car park can then be connected to the Campus Distributor No.1 installed in the Eastern CSB building and the Campus Distributor No.2 installed in Stage 2 ISB.

There shall be 3x Communications rooms in the new MSCP. This will comprise of two Floor Distributors (one on Level 4 and the second on level 6). There will be one combined Building and Floor Distributor on level 1 of the MSCP. Each Floor Distributor will connect directly back to the Building Distributors with multicore single mode fibre optic cables. It is essential that all Floor Distributors are located so that any ICT technical outlet in the workspace shall be no more than 90m cable length from the patch panel (in the Floor Distributor). It is also essential that the Building Distributors and the Floor Distributors are not located next to a lift shaft and/or an electrical cupboard, electrical riser, electrical switch room or substation.

With regard to the reduced copper backbone network, each Floor Distributor in the MSCP will connect back directly to the Building Distributor only with single mode fibre optical cables, and a copper backbone cat 3 cable shall connect from Alex Grimson to the combined building and floor distributor only.

Please note that the copper backbone network does not have a redundant pathways but is a single radial network stemming from the Alex Grimson (as a temporary connection) and in the future will be connected to the Campus Distributor No 2 (located in Stage 2).

The size of all fibre optic and copper backbone cabling is currently in the process of being finalised.

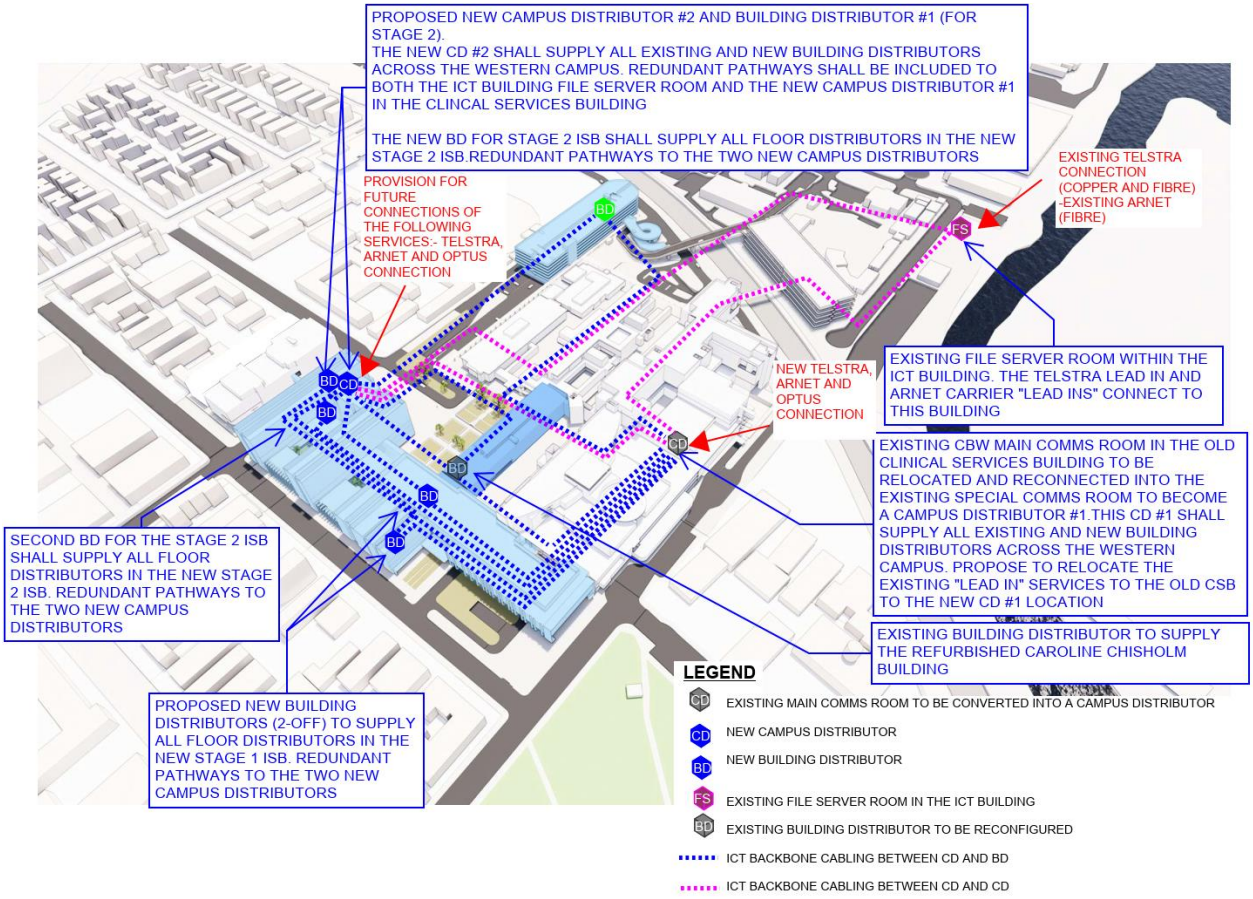

Fig 3 Site ICT layout

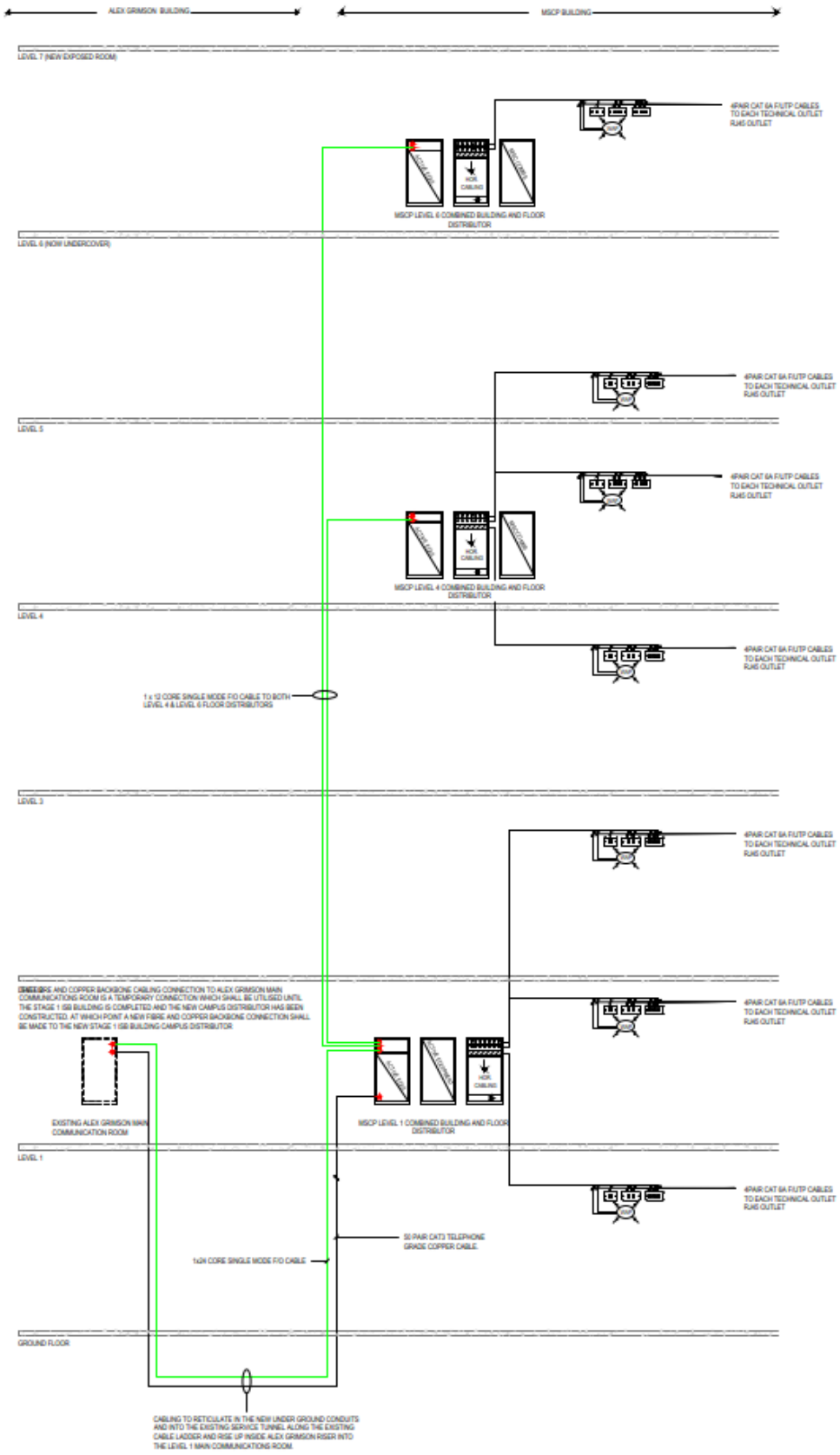

Fig 4 MSCP ICT Schematic

2.2 Horizontal Structured Cabling (MSCP)

The Structured cabling shall be carried out using 4 pair F/UTP Cat 6A cable to support 10 GBit/sec and a frequency of at least 500 MHz. Cables shall terminate in Cat 6A shielded RJ 45 outlet jacks forming the technical outlet at the workstation.

The maximum fixed cable length to each technical outlet from the Floor Distributor patch panel shall be 90m.

All components of the structural cabling (cable, outlets, patching, etc.) shall be Cat 6A to provide an integrated complying Class Ea system

2.3 Wireless LAN (MSCP)

Wireless local area networks (WLAN) shall be provided to comply with IEEE 802.11 a, b, g, n and ac to all levels of both MSCP to provide wireless access to data, voice, video services, RTLS (real time location system - tracking) and wireless duress. The system shall be designed for sufficient signal strength and coverage to locate equipment and/or personnel with an accuracy of 10 m radius. Within this scope of work and during the construction process, a building survey will be carried out to determine the exact location of access points required to ensure seamless coverage for the whole building.

F/UTP cabling shall be utilised via a radial topology from the floor distributor to the ceiling WAPs. Two 4 pair Cat 6A F/UTP cables shall be installed to each WAP. Power to these access points shall be provided via PoE (Power over Ethernet). A WAP density allowance of one per 350m2 of total floor space shall be provided and shall be located to ensure that Access point locations include the complete perimeter of each floor to enable compliant “triangulation” of signals from the WAPs. A survey shall be carried out when the building construction of each stage is nearing completion and when all the ceiling services (hydraulic, mechanical, fire and electrical) have been installed, but before the ceiling tiles are installed. The results from the survey may require that in certain locations within the building that a higher density of WAPs is required to achieve the required Wi Fi coverage.

Access points shall be located to give sufficient coverage with total seamless overlap from one access point to another. The designed system shall provide the user to walk/travel anywhere within the new MSCP, including lift lobbies, lift cars, fire stairs and plant rooms without access being denied or the service/signal failing.