3. The Proposal

3.1 Design Proposals

Cheetah Ward AHU and Chiller

The proposed external AHU is to be located to the east of the Level 4 terrace, adjacent to the VCB ‘blip’ west elevation.

Existing window and door openings in the VCB west elevation will be carefully removed and infilled with lightweight SFS construction to provide 60 minutes fire protection. This will be finished in the same composite panel as is proposed to the hospital facing elevations of the GOSHCCC scheme.

An existing window opening in the South elevation of VCB will be carefully removed, along with solid cill construction below. A new double door set will be installed to provide access to the terrace and plant during the GOSHCCC construction period.

A double set of doors from the proposed corridor Link 4C in the GOSHCCC proposals will provide dedicated terrace/AHU access in the future condition.

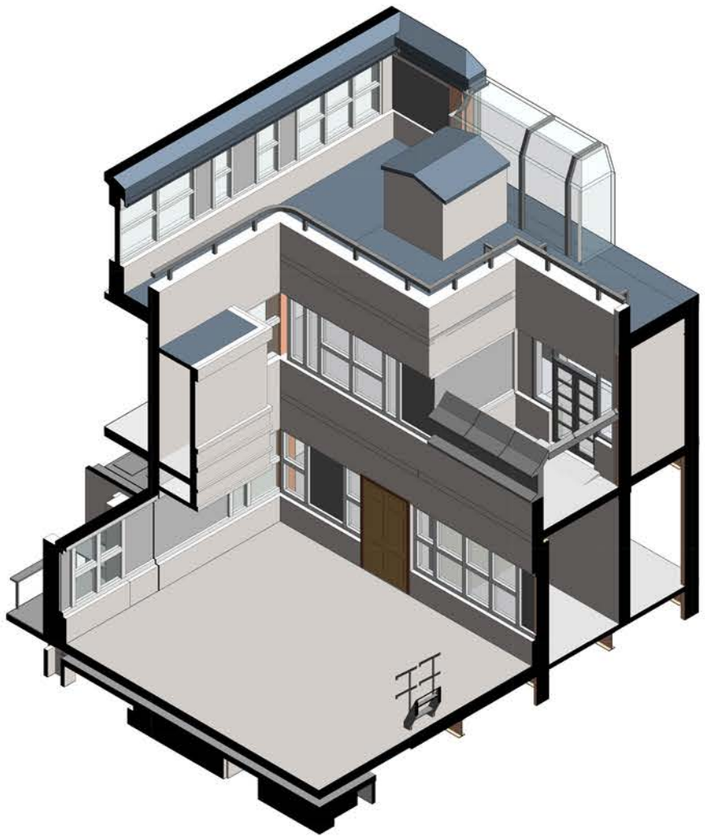
A new chilled water connection will be derived from the sitewide system and routed to the Level 4 terrace to serve the replacement AHU. This mitigates the requirement to install a new replacement chiller unit and therefore reduces the physical impact of the proposal. The pipework will extend from the new AHU to serve the Cheetah Ward and main reception areas on Level 2.

Distinct ductwork routes from the AHU to the Cheetah Ward are proposed during the site construction phase and final proposed state to ensure a discreet long term solution that will be concealed within the proposed building. The proposed intake and exhaust ducts are also proposed to be interchanged between construction and final proposal phases to protect the intake from construction activity.

1. *External AHU on Level 4 terrace*
2. *Air intake*
3. *Feature Air exhaust*

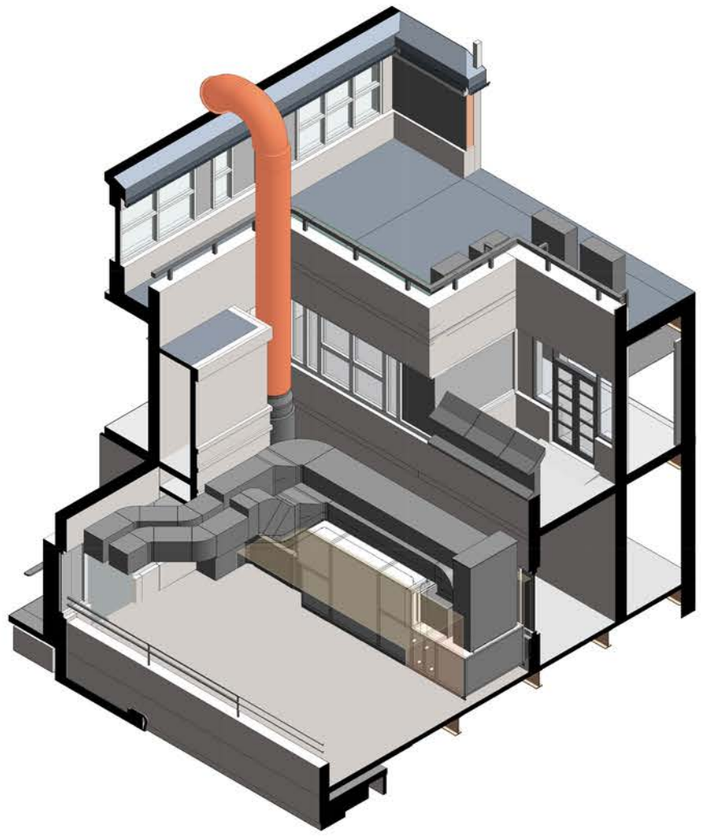
Cheetah Ward Services relcoation overview - The proposal

Cheetah Ward - External Plant reprovision



As Existing

The existing terrace is accessible from a door in the west elevation of the VCB ‘Blip’. A ladder provides access to the elevated Frontage Building terrace to the south where the existing external plant is located.



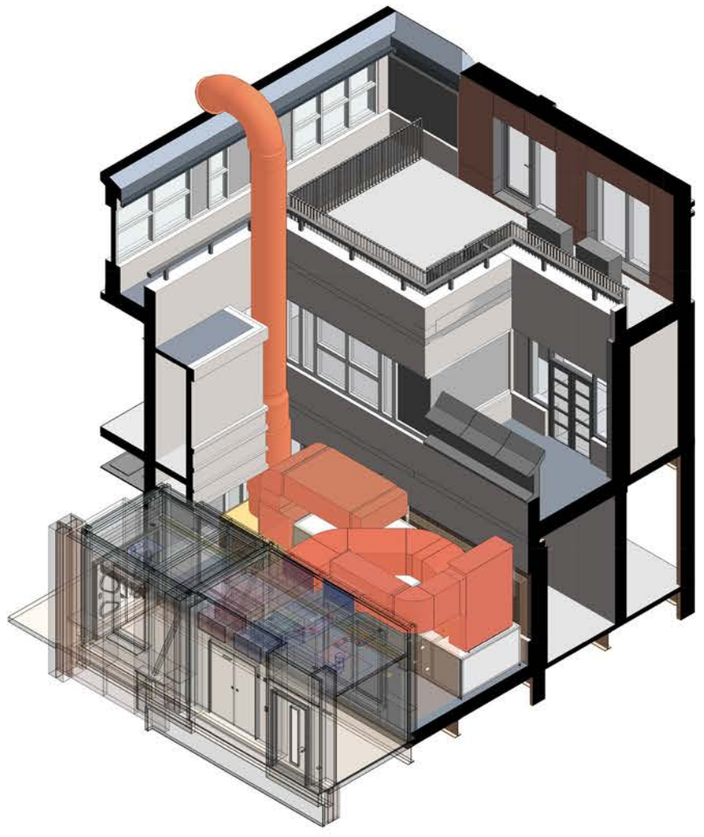
Site Mobilisation

The proposals take the opportunity to renew the terrace roof build up with a new warm roof construction above the strucutral slab. Existing pavers will be saved for re-use over the new roof system.

The existing windows and door to the VCB will be carefully removed and infilled with lightweight wall construction, finished in the same composite panel that is proposed to be used on the hospital facing elevations of the GOSHCCC. This will be arranged in 300mm wide panels to correspond with existing VCB ribbon window infill finishes.

An existing window to the VCB south elevation will be removed together with its solid cill construction and a new external doorset will be installed to proide access to the terrace during the construction of the CCC.

An external Air Handling unit will be positioned adjacent to the VCB west elevation with temporary ductowrk routes installed to reach the Cheetah Ward at VCB Level 2. A feature coloured duct taken to high level will provide air intake during construction.

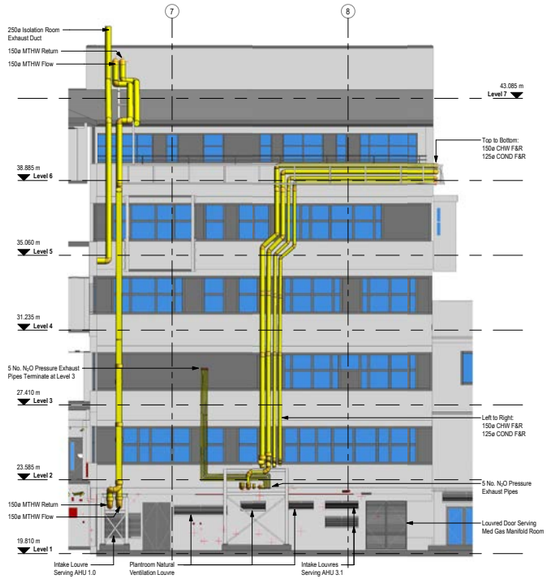


As Proposed

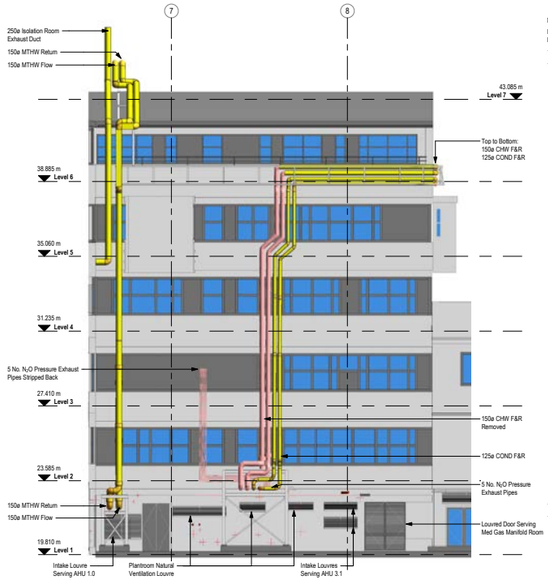
The GOSHCCC construction will develop around the terrace, including the Corridor link 4C to the west portion of the terrace. Double doors will provide access to the external terrace from this link connection and its ceiling zone will provide a dedicated concealed route for the permanent ductowrk route to the Cheetah Ward.

Air intake and exhaust ductowrk will be changed over so that the feature duct at high level becomes the exhaust.

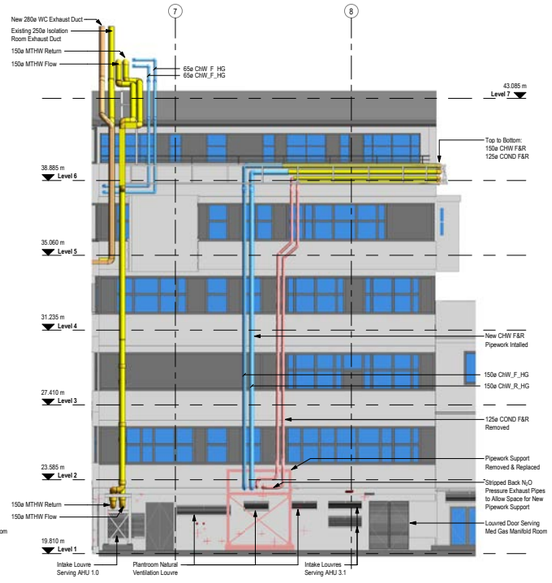
Variety Club Building - Externally mounted services reconfiguration



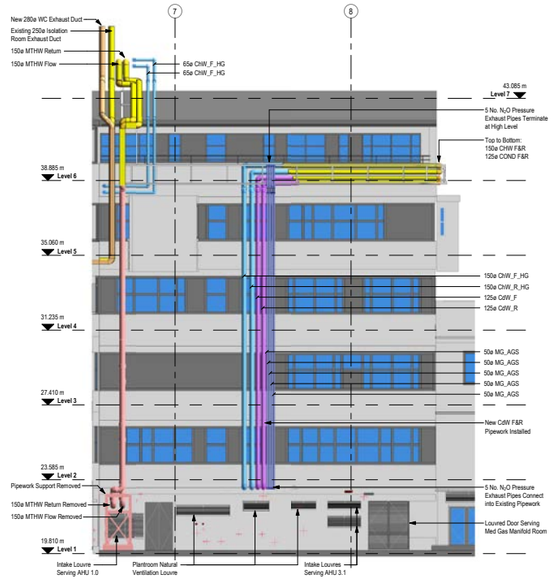
1 Section - Existing
1 : 100



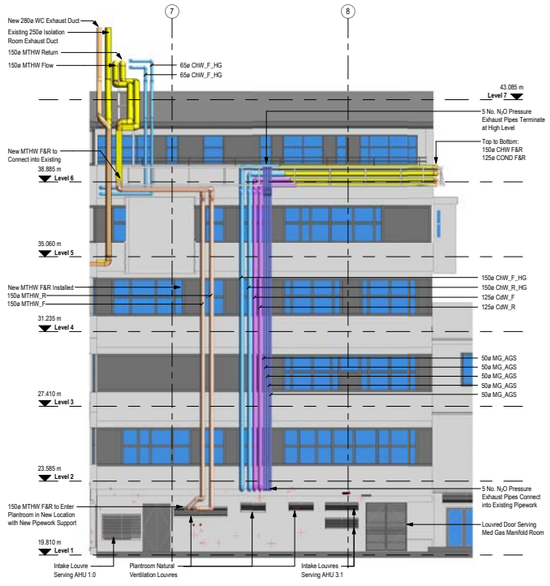
2 Section - Advanced Works Phase 1
1 : 100



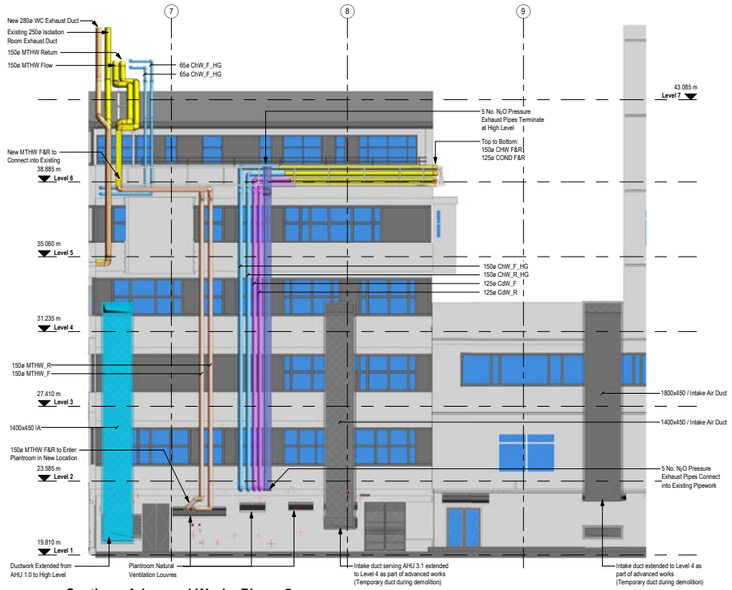
3 Section - Advanced Works Phase 2
1 : 100



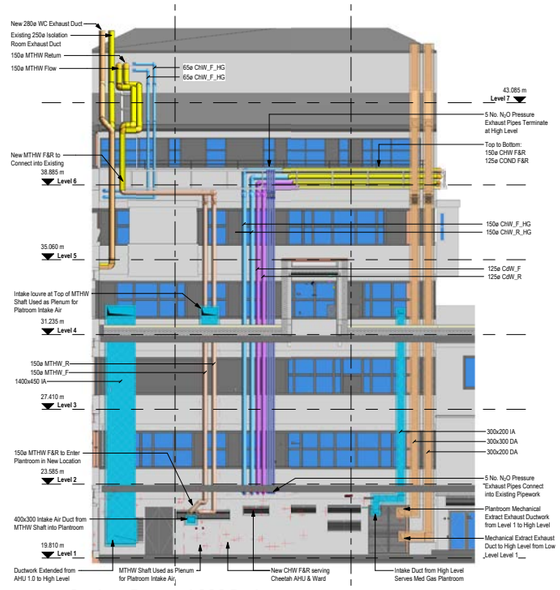
4 Section - Advanced Works Phase 3
1 : 100



5 Section - Advanced Works Phase 4
1 : 100



6 Section - Advanced Works Phase 5
1 : 100



7 Section - Proposed CCC Design
1 : 100

LEGEND

VCB External Services Distribution

The drawings on this page illustrate the proposed sequencing of change to enable a transition from the existing to the proposed conditions for site mobilisation and the final proposals. The phasing is designed to minimse impact on the continuity of existing services provision as far possible. Phase 5 represents the proposed ‘Site Mobilisation’ condition.

The following pages illustrate site mobilisation proposals (a temporary condition) and the GOSHCCC proposals that will follow.

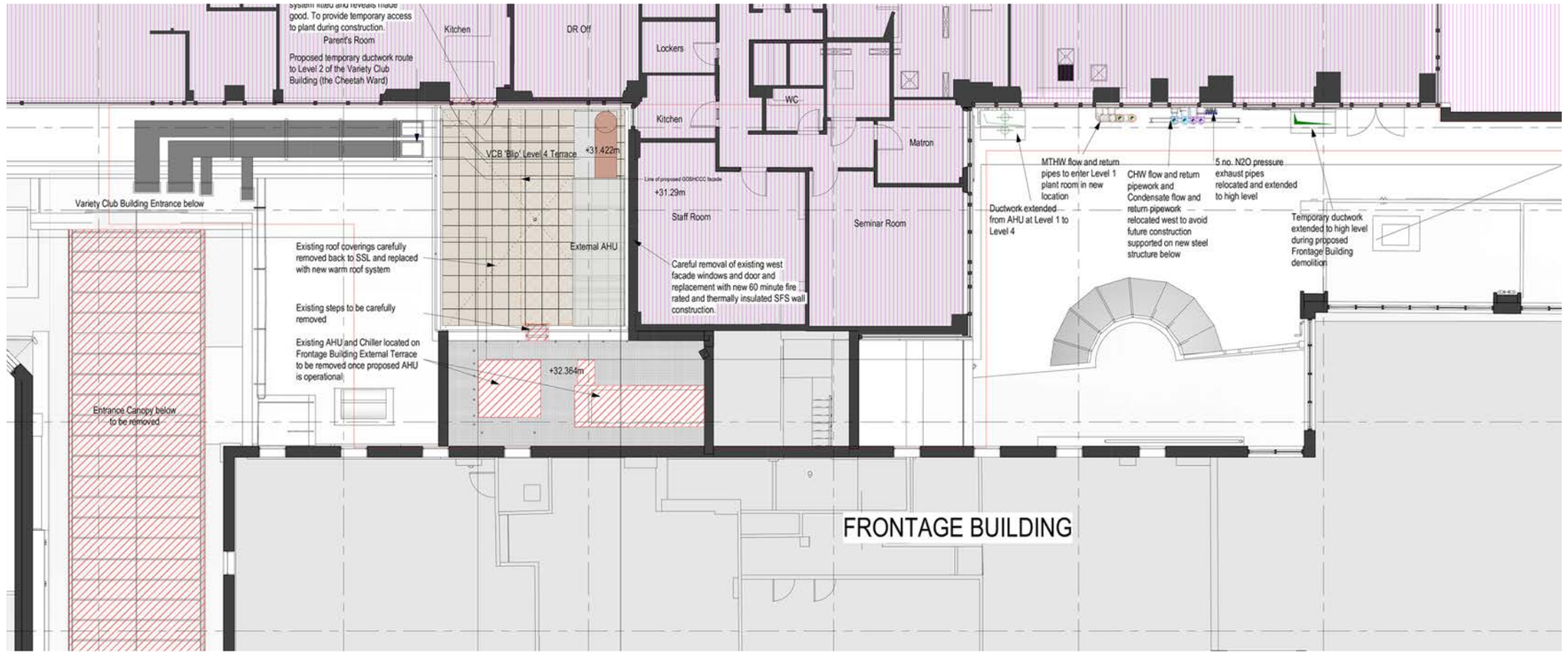
Level 4 (AHU Terrace Level)

The Level 4 proposals in the site mobilisation phase include:

- The removal of existing floor coverings back to structural slab level. Existing pavers to be set aside for re-use. Cleaning and making good of the existing slab and installation of a new warm roof construction. Reinstatement of the existing paver finish.
- Careful removal of existing windows and a door from the VCB 'blip' existing west elevation and replacement with SFS external wall build up.
- Careful removal of an existing window and cill construction from the VCB south elevation and installation of a double doorset to provide terrace access during construction.
- Installation of an externally graded Air Handling Unit (AHU) and implementation of temporary ductwork routes between the AHU and the ceiling void of VCB Level 2 adjacent to the current Main Entrance. Air intake and exhaust ductwork provided to the north of the AHU inclusive of a feature duct taken to high level above the Level 6 accommodation of the VCB.
- Existing AHU and Chiller on Frontage terrace to be removed once new plant activated, enabling deconstruction of the Frontage Building
- Existing externally mounted services reconfigured and redirected to east of the 'blip' (refer to interface 11).

The GOSHCCC Level 4 proposals include:

- Removal of roof finshes within the footprint of the proposed GOSHCCC Link 4C.
- General implementation of GOSHCCC construction including the provision of double access doors to the terrace.
- Installation of a dedicated and concealed ductwork route between the AHU and the Cheetah Ward within Level 2 of the VCB. Removal of temporary ductwork once installed.



Site Mobilisation

Proposal

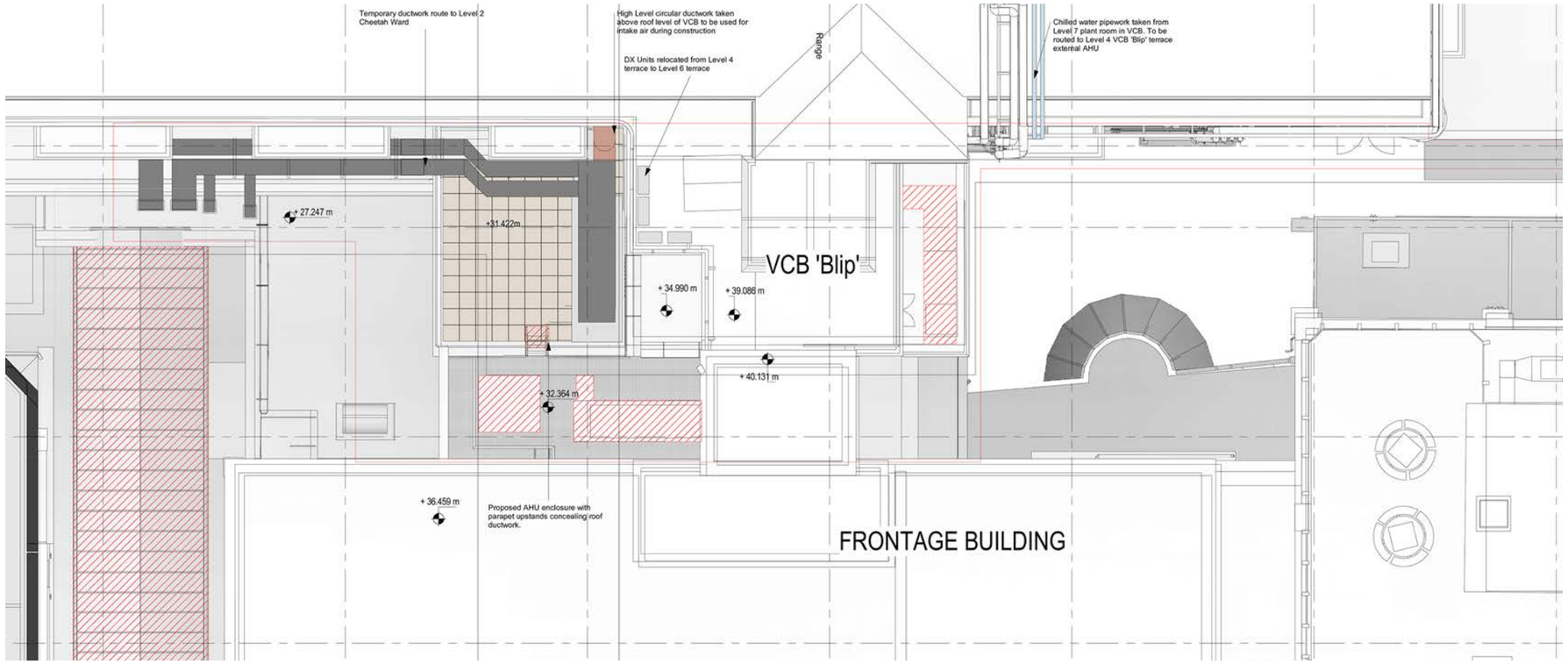
Roof Level (Level 7)

The Level 7 proposals in the site mobilisation phase include:

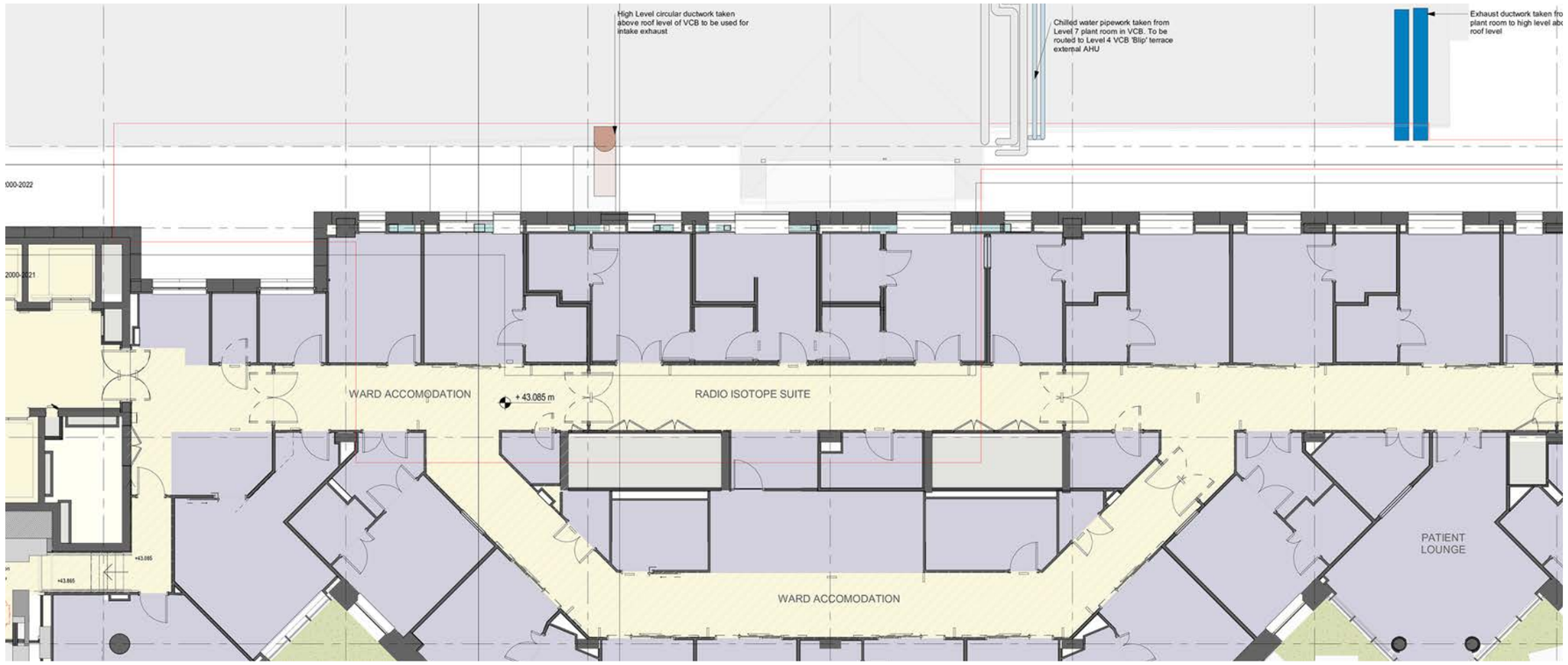
- Relocation of external DX units from Level 4 to Level 6 terrace. Visual and potential acoustic screening to existing bedroom windows to be considered based upon selection.
- Routing of feature duct to high level adjacent to VCB
- Chilled water connections to serve cheetah ward AHU and main reception area to be derived from existing main distribution pipework in level 7 plantroom

The GOSHCCC proposals include:

- General implementation of GOSHCCC construction including new railings to Level 6 terrace areas.



Site Mobilisation



Proposal

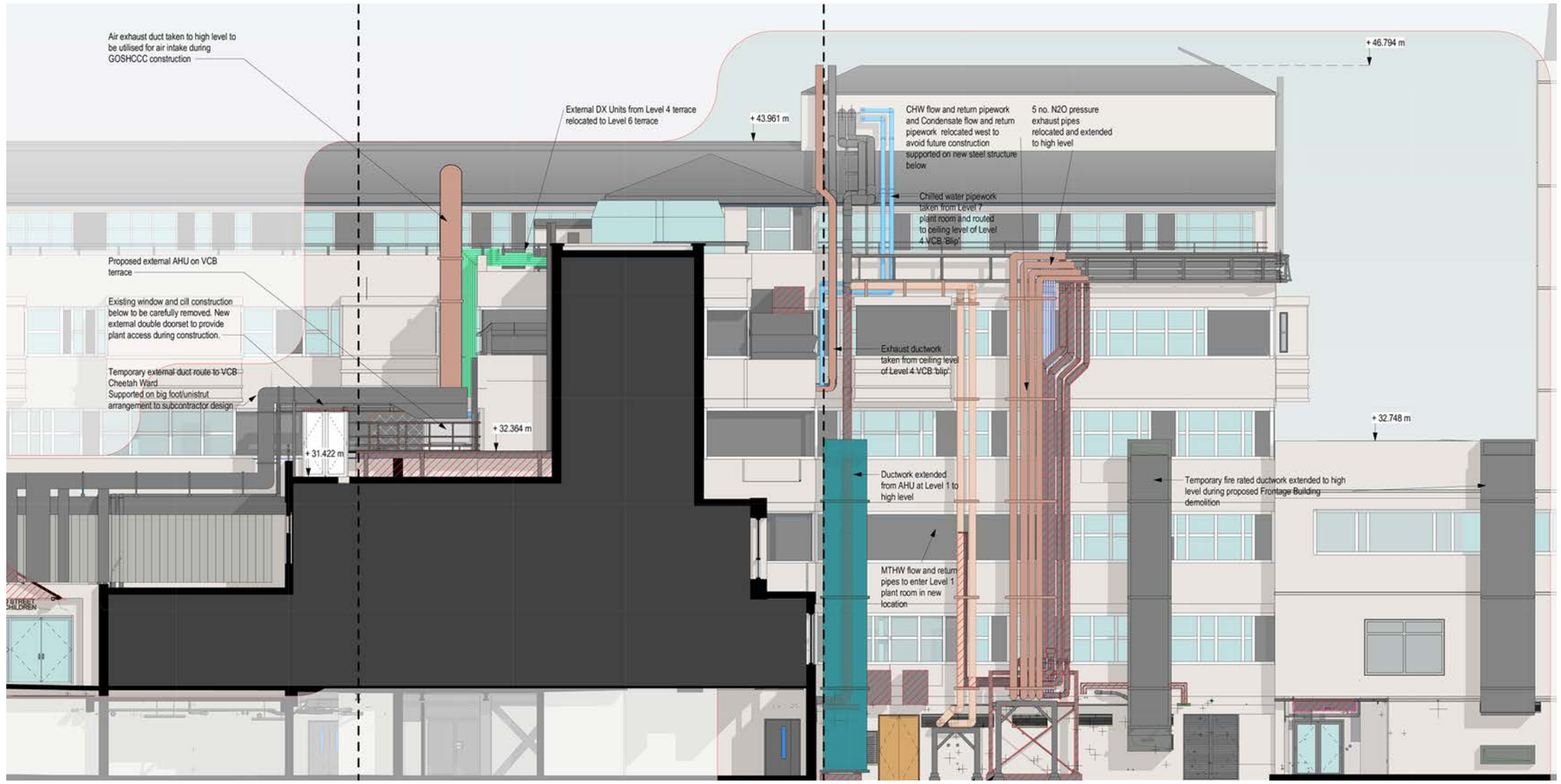
North facing section (south elevation)

The South Elevation proposals in the site mobilisation phase include:

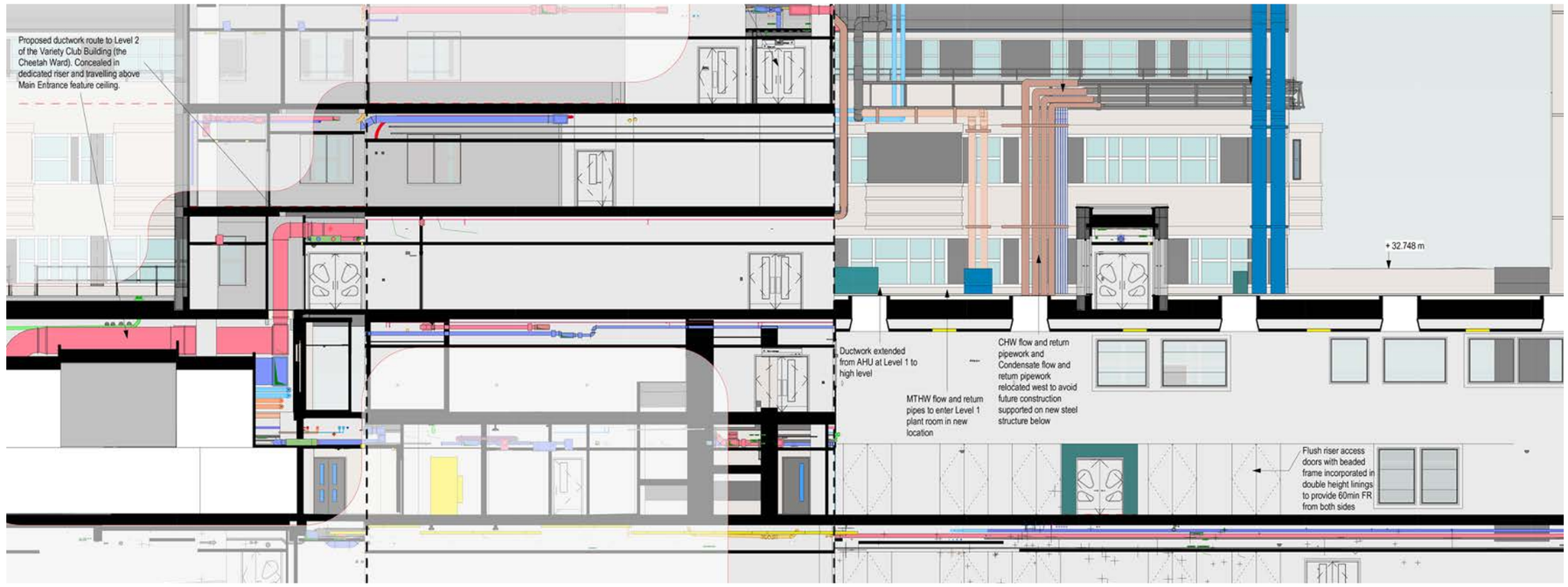
- The creation of a temporary access door within the south elevation of the VCB.
- Installation of external AHU to east of Level 4 terrace
- Temporary ductwork route established to enter the VCB L2 ceiling from above. TO be supported on big feet and uni strut system to subcontractor design.
- Relocation of DX units to Level 6 terrace.
- Routing of feature ductwork to high level adjacent to VCB to provide air intake during the construction phase

The GOSHCCC South Elevation proposals include:

- Implementation of the GOSHCCC construction including the construction of Link 4C.
- Removal of the temporary access door from VCB once weathertight.
- Installation of dedicated ductowrk route to VCB Cheetah Ward through dedicated riser within GOSHCCC proposals. Removal of temporary external ductwork post changeover.



Site Mobilisation



Proposal

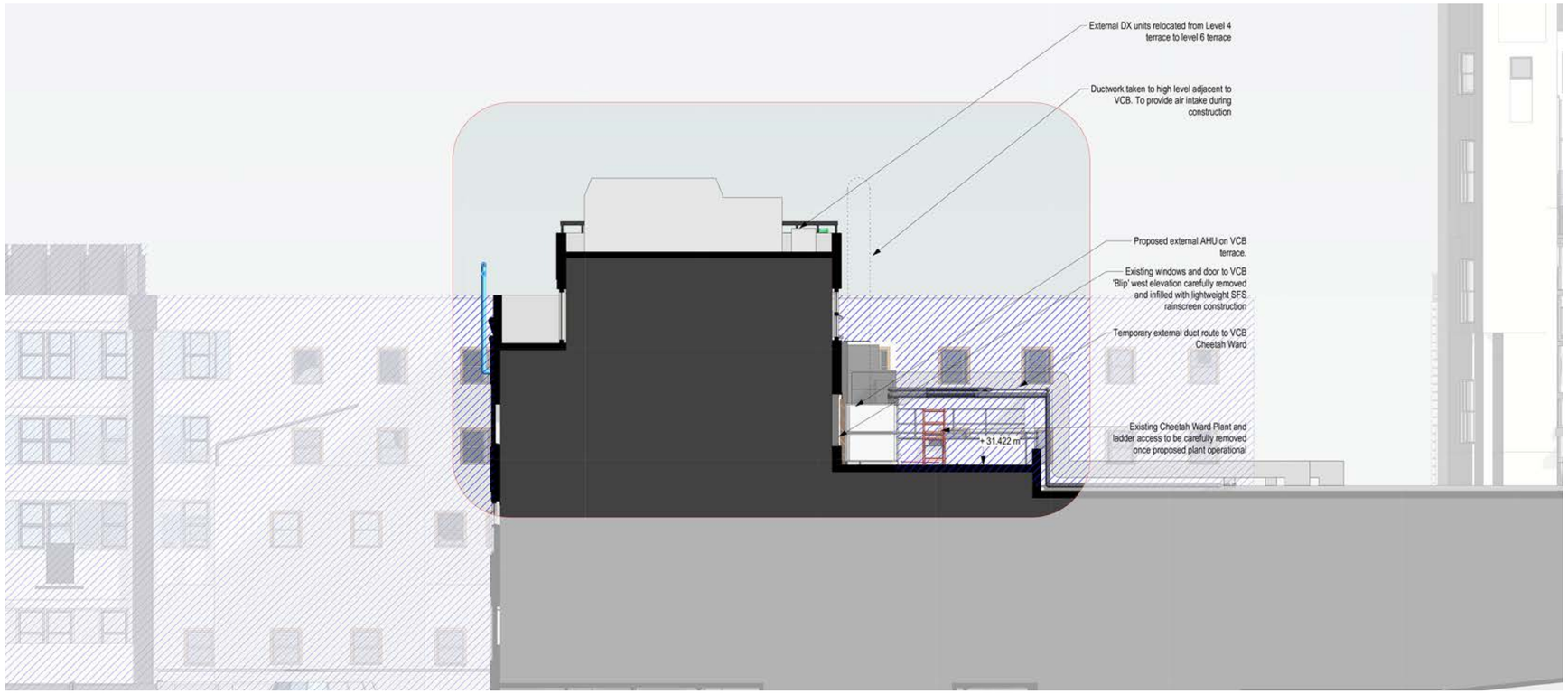
South facing section (north elevation)

The North Elevation proposals in the site mobilisation phase include:

- Replacement of terrace roof build up with new warm roof construction. Existing paver finish to be re-used.
- Removal of existing windows and door to the VCB west elevation and infill with lightweight SFS construction to provide 60 minutes fire protection.
- Installation of external AHU adjacent to the VCB ‘Blip’
- Temporary ductwork route established to west, entering VCB L2 ceiling from above.
- Relocation of DX units to Level 6 terrace.
- Removal of steel deck, AHU and Chiller once new plant is operational

The GOSHCCC North Elevation proposals include:

- Installation of dedicated internal ductwork route and removal of temporary ductwork.
- General construction of the GOSHCCC around the enclosure including provision of double access doors to the external terrace area.



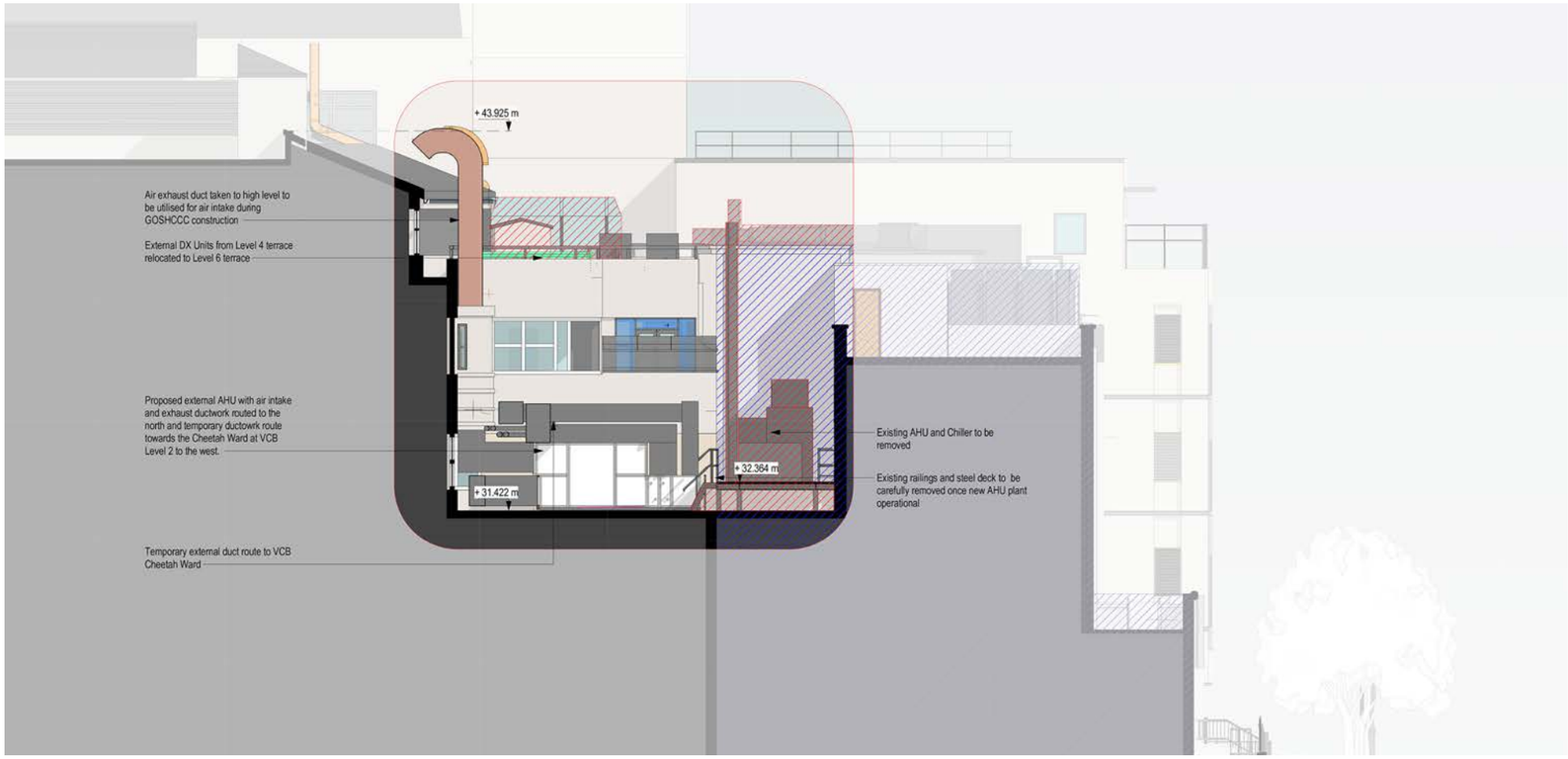
Site Mobilisation

Proposal

East facing section (west elevation)

The West Elevation proposals in the site mobilisation phase include:

- Replacement of terrace roof build up with new warm roof construction. Existing paver finish to be re-used.
- Removal of existing windows and door to the VCB west elevation and infill with lightweight SFS construction to provide 60 minutes fire protection.
- Installation of external AHU adjacent to the VCB ‘Blip’
- Relocation of DX units to Level 6 terrace.
- Removal of steel deck, AHU and Chiller once new plant is operational



Site Mobilisation

The GOSHCCC West Elevation proposals include:

- Installation of dedicated internal ductwork route and removal of temporary ductwork.
- General construction of the GOSHCCC around the enclosure including provision of double access doors to the external terrace area.
- Change over of air intake and exhaust so that the exhaust utilises the feature ductwork that is taken to high level.

Proposal

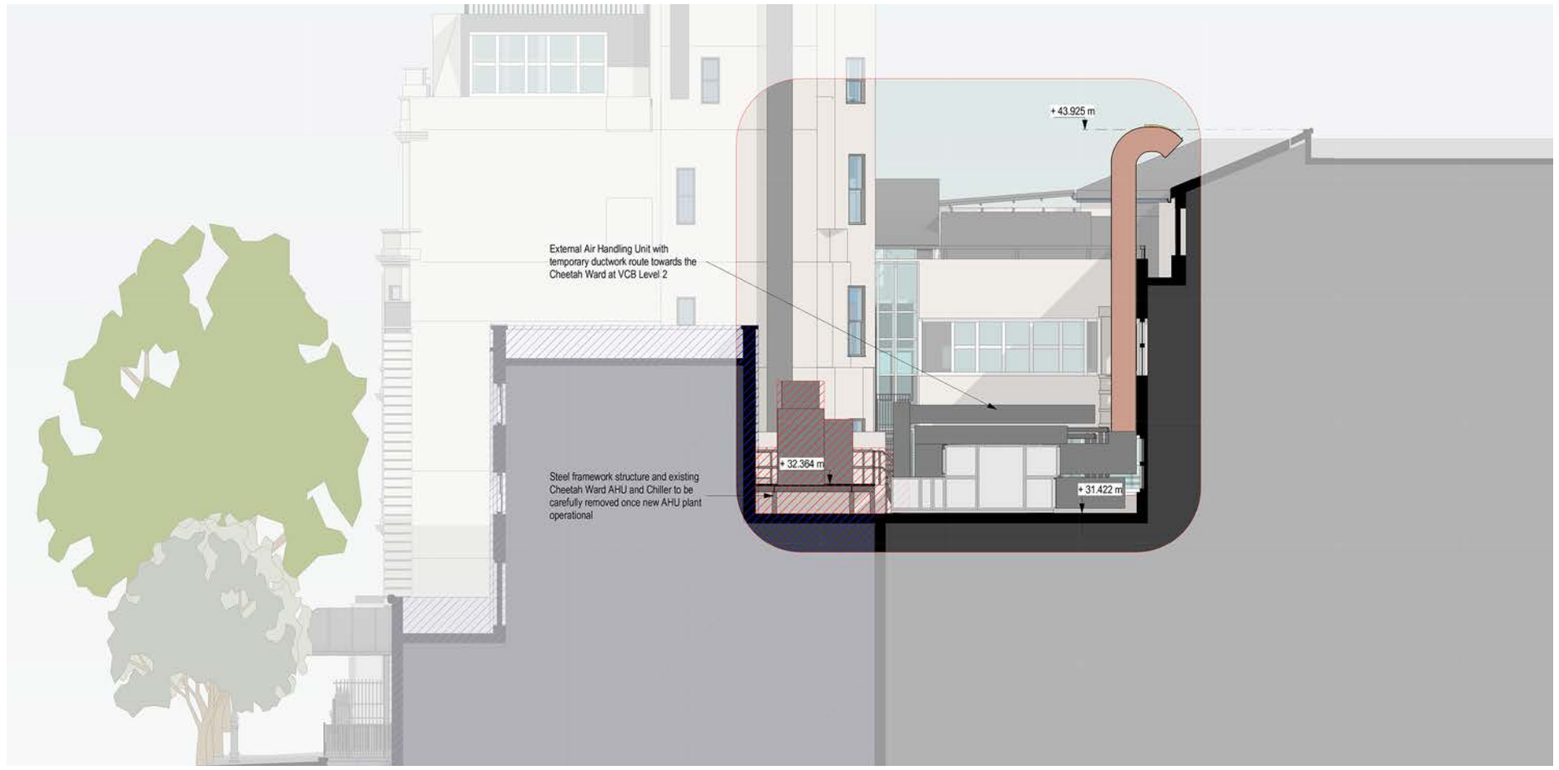
West facing section (east elevation)

The East Elevation proposals in the site mobilisation phase include:

- Replacement of terrace roof build up with new warm roof construction. Existing paver finish to be re-used.
- Removal of existing windows and door to the VCB west elevation and infill with lightweight SFS construction to provide 60 minutes fire protection.
- Installation of external AHU adjacent to the VCB 'Blip'
- Temporary ductwork route established to west, entering VCB L2 ceiling from above.
- Relocation of DX units to Level 6 terrace.
- Removal of steel deck, AHU and Chiller once new plant is operational

The GOSHCCC East Elevation proposals include:

- General construction of the GOSHCCC around the enclosure including provision of double access doors to the external terrace area.
- Change over of air intake and exhaust so that the exhaust utilises the feature ductwork that is taken to high level.



Site Mobilisation

Proposal

Building fabric - Scope

Modification and upgrades are proposed to the building fabric of the terrace and surrounding elevations prior to installation of the external Air Handling Unit.

Terrace floor Finishes upgrade

It is proposed to carefully remove the existing roof terrace coverings back to the structural slab level and to implement a new warm roof covering. Existing concrete pavers will be saved for re-use. Proposals to renew the roof coverings are based on the fact that once the AHU is in situ it will become difficult to carry out such a refurbishment and it is unclear how close to the end of its life the existing asphalt finish is.

VCB 'Blip' West elevation

The proposed AHU will be located adjacent to the west elevation of the VCB 'Blip'. Its scale is such that all of the existing windows and doors from the existing staff room will become redundant. It is therefore proposed that they are removed and infilled with new lightweight construction.

It is proposed that an SFS infill construction is employed. A proposed fibre cement composite panel, the same proposed for the GOSHCCC hospital facing elevations, will provide the finish in 300mm wide panels to match the existing format of the VCB elevations.

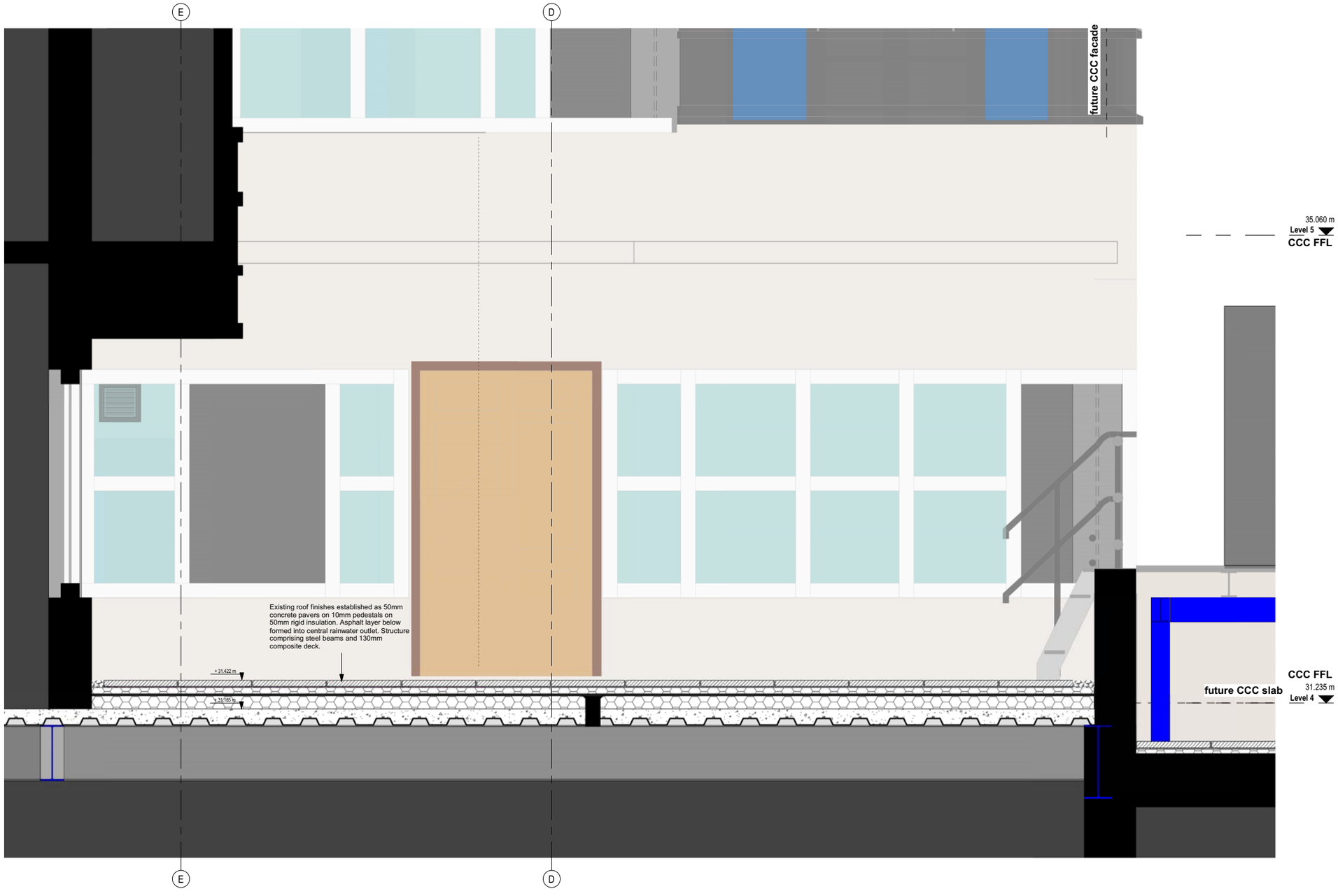
VCB South elevation

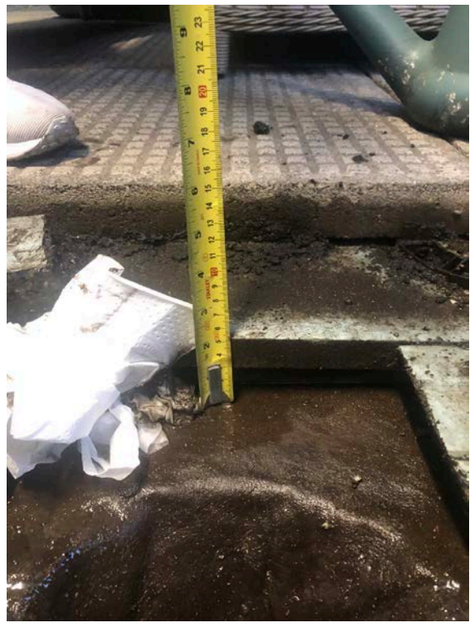
To ensure ongoing access to the terrace and plant during construction, an existing window to the north of the terrace belonging to an existing kitchen area has been identified for removal, along with the solid cill construction below it in order to provide a double doorset. It is noted that this doorset will need to be removed to enable the GOSHCCC internal door connection as the levels will alter once internalised.

1. *Re-used concrete pavers on pedestals over new warm roof build up*
2. *Composite rainscreen cladding panel finish to lightweight solid infill construction*
3. *Brick finish to infill up to cill levle of removed door opening*

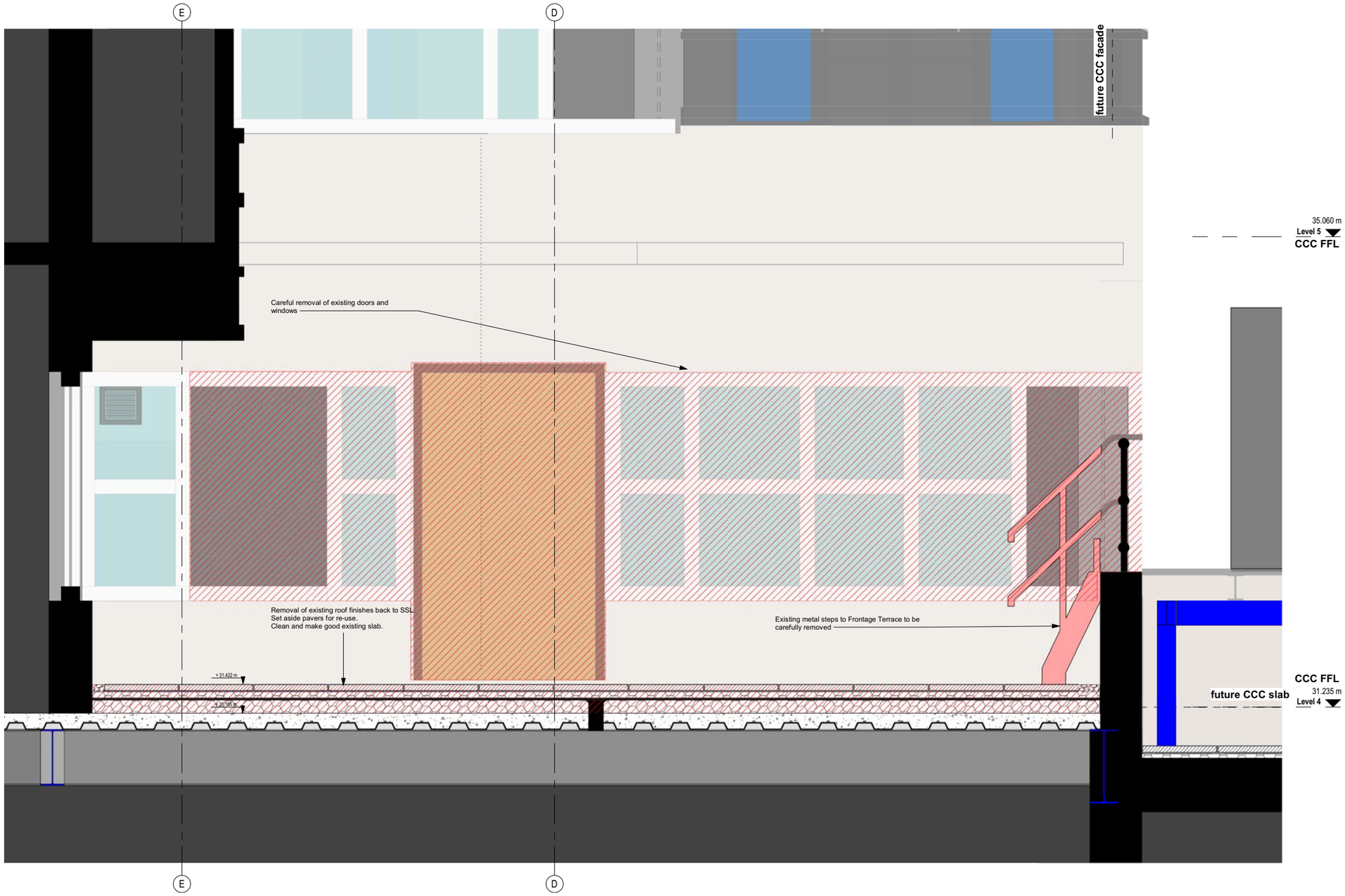
As Existing

- *The existing terrace roof coverings comprise 50mm concrete pavers on 10mm pedestals on 50mm rigid insulation. An asphalt roof covering below falls towards a centrally located rainwater outlet. The roof structure of steel beams supporting 130mm composite deck.*





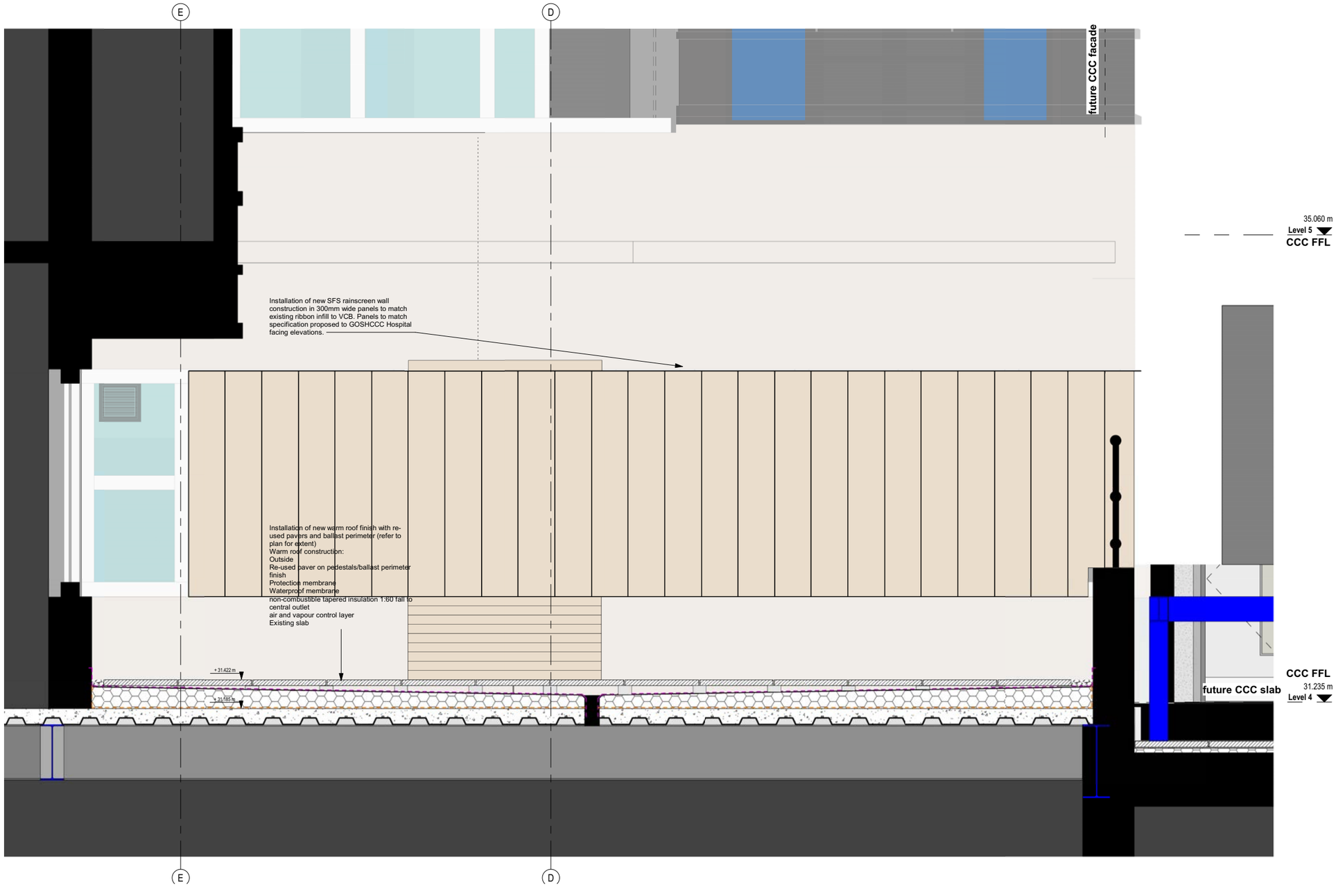
Section through terrace illustrating the VCB 'Blip' west elevation AS EXISTING



Section through terrace illustrating the VCB 'Blip' west elevation PROPOSED FABRIC REMOVAL

Fabric Removal

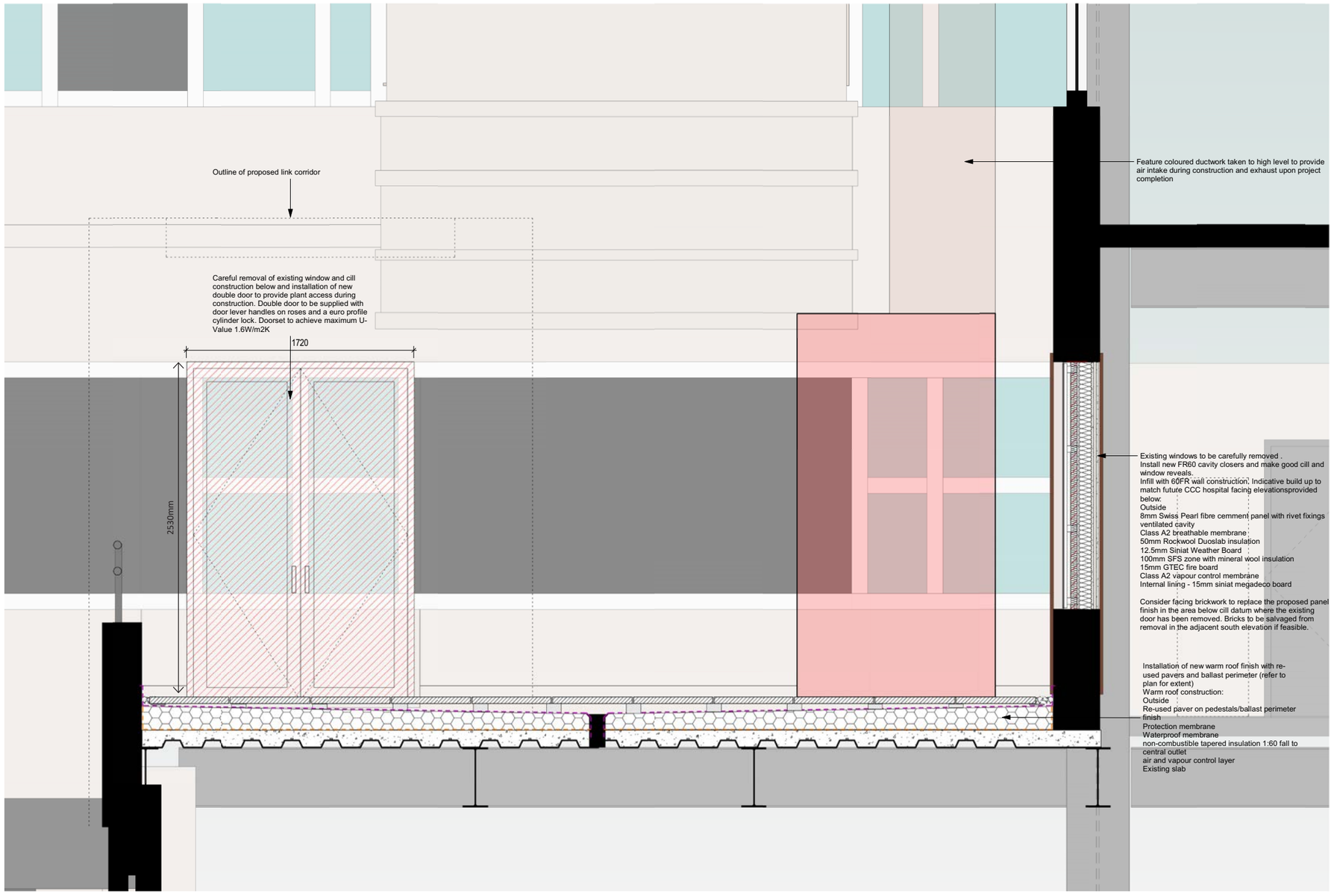
- *Removal of all roof coverings down to structural slab level. Set aside terrace pavers for re-use.*
- *Carefully remove existing windows and door from VCB west elevation.*
- *Remove metal steps to Frontage terrace once access to the existing Cheetah Ward plant is no longer required.*



Section through terrace illustrating the VCB 'Blip' west elevation FABRIC PROPOSALS

Fabric Proposals

- *Install a new warm roof system comprising vapour and air control layer, non combusitble tapered insulation falling to existing central rainwater outlet, a waterproof membrane, protection membrane, pedestals, and reinstate the existing concrete pavers.*
- *Install new FR60 infill wall construction where windows and doors have been removed. Lightweight SFS rainscreen construction utilising the same composite panel finish proposed to the hospital facing elevations of the GOSHCCC. Format to mimic solid ribbon infill panels of the VCB building (300mm wide panels).*



Section through terrace illustrating the VCB south elevation FABRIC PROPOSALS

Fabric Removal / Proposals

- *Carefully remove existing kitchen window and solid construction below cill in VCB south elevation*

- *Install new double doorset with eurocyclinder lock and lever handles. Door to achieve max 1.6w/m2k U-Value.*

- *Infill wall construction comprising from outside:*

1) 8mm swisspearl composite cladding panel recessed to align with adjacent ribbon infill construction
2) ventilation/framing cavity
3) Class A2 breathable membrane
4) 50mm Rockwool Duoslab insulation
5) 12.5mm Siniat Weather Board
6) 100mm SFS zone with mineral wool insulation
7) 15mm GTEX fire board
8) Class A2 vapour control membrane
9) Internal lining system - 15mm Siniat megadeco board

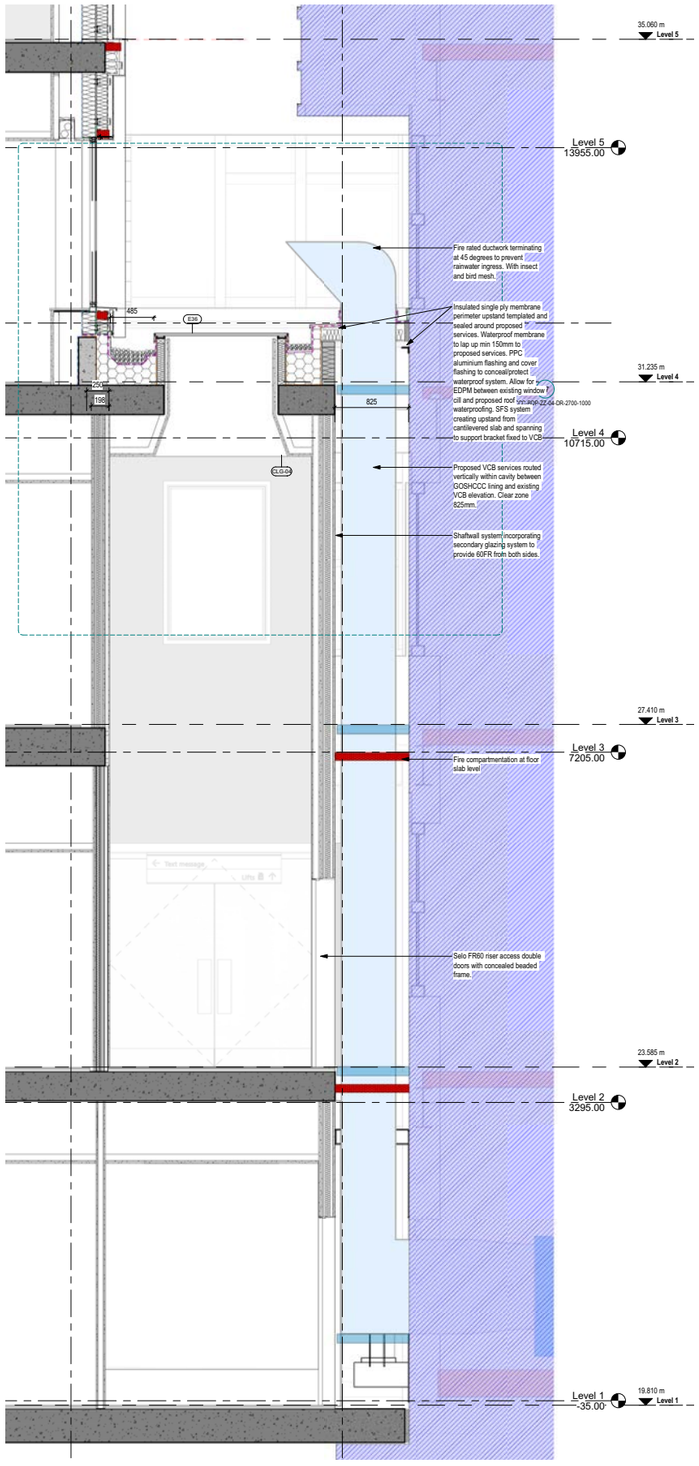
- *Removed brickwork from the new opening in the south elevation to be salvaged where feasible for reinstatement below cill level of the door removed from the west elevation.*

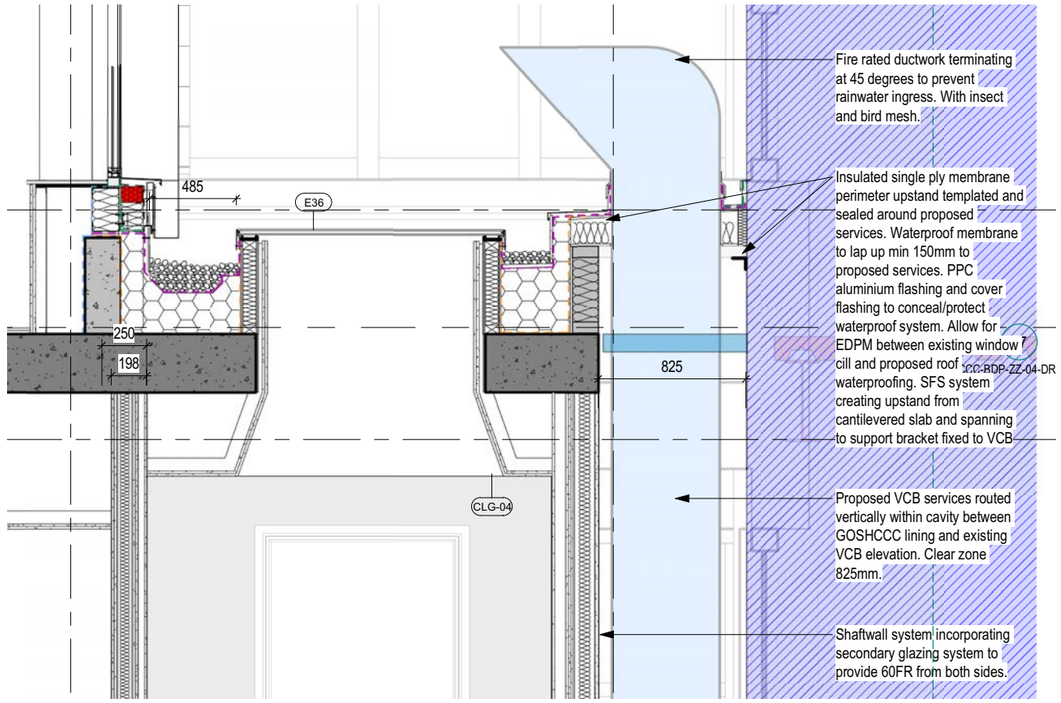
External services integrated approach

The south elevation of the VCB is set further north than its neighbour, the PICB. This creates a natural cavity between the proposed GOSHCCC and VCB which is intended to be utilised to route the identified external services between Levels 1 and 4, at which point the proposals return to an external condition.

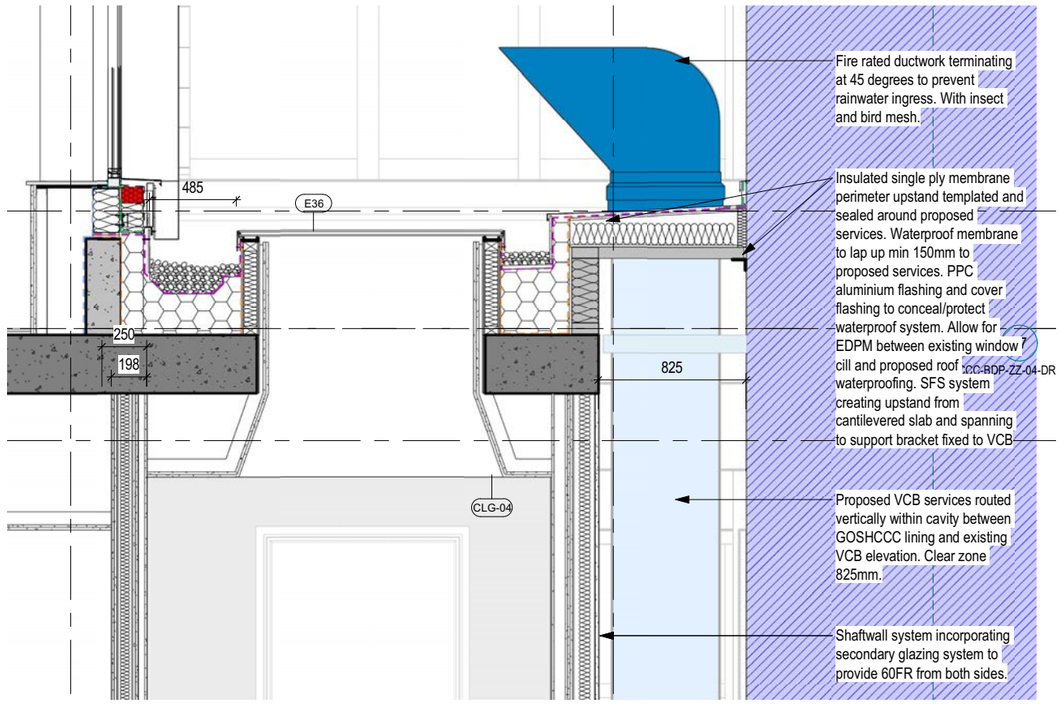
The proposed shaftwall system providing the north edge to proposed GOSHCCC spaces and Levels 1, 2 and 3 will provide 60 minutes fire protection from both sides and also incorporate discreet maintenance access doors at Levels 1 and 2, aligned with the proposed services routes behind. Services above this level can be accessed from the GOSHCCC Level 4 flat roof space or as we understand to be the current strategy, via abseil from the VCB's Level 6 terraces.

Air intake ducts are proposed to be set above the Level 4 flat roof, consistent with the air intake strategy for the GOSHCCC building. Ductwork along with other pipework will penetrate a consistent upstand flashing detail that encloses the top of the services cavity.





Section through ductwork/services penetration



Section through perimeter upstand flashing

3.2 Engineering Proposals
AHU Reprovision

Description of works

Demolition of the existing Frontage Building on Great Ormond Street is required to prepare the site for the new GOSHCCC building. Decommissioning and removal of the building services as part of this demolition is mostly straight forward as they serve the Frontage Building. However, there is an external AHU and Chiller unit that provides ventilation and cooling to accommodation within the retained VCB Main Reception and Cheetah Ward on Level 2 which is to be reprovided.

The proposed location for the AHU is identified on the enclosed drawings, on the existing Level 4 terrace of the projecting VCB 'Blip'. A new chilled water connection will be derived from the sitewide system to replace the existing chiller.

The new plant, as specified in the appended schedules, shall be installed and commissioned prior to the demolition of the Frontage Building.

Ventilation

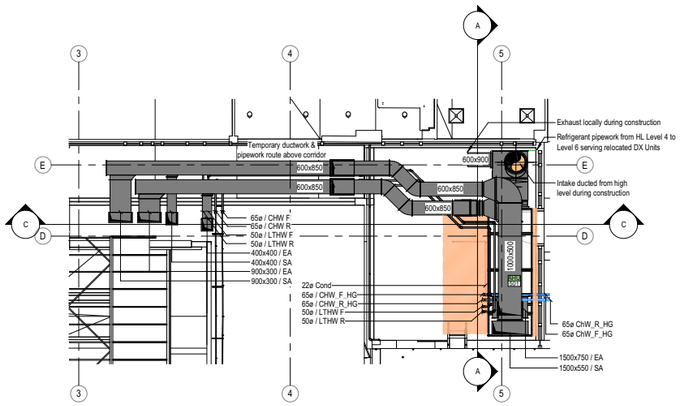
Existing Installation

The existing Cheetah Ward AHU is located on a steel plant deck on an external area of flat at level 4 of the Frontage building. In the existing configuration, ductwork is routed via a riser which extends from level 4 to the Cheetah Ward Waiting Area at Level 2.

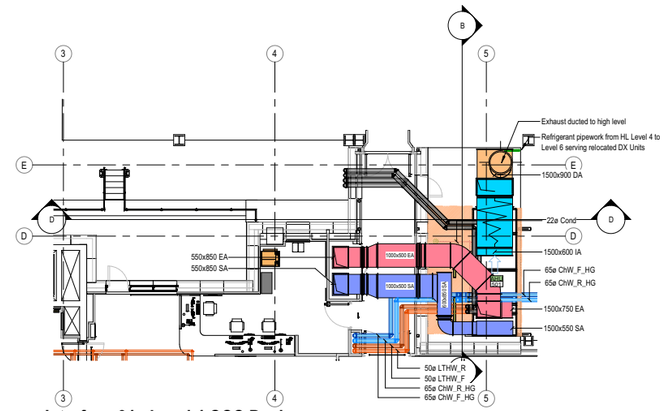
The ductwork then serves three main areas in VCB: The Waiting Area B2037, Cheetah Ward OPD and the Main Reception Area.

Proposed Works

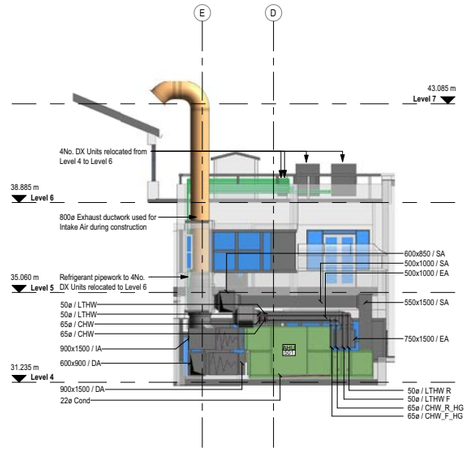
An area of flat roof on Level 4 of the VCB building has been identified as the location for the new Cheetah Ward AHU.



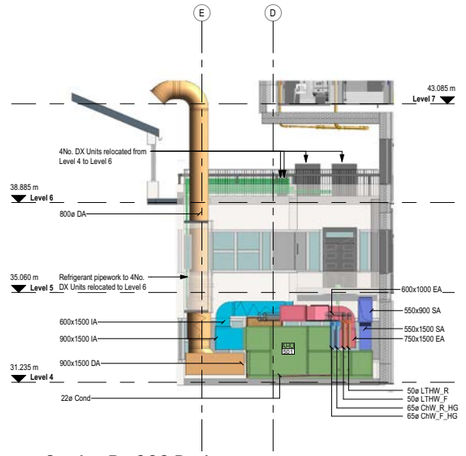
2 **Interface 64 - Level 4 Advanced Works**
1 : 100



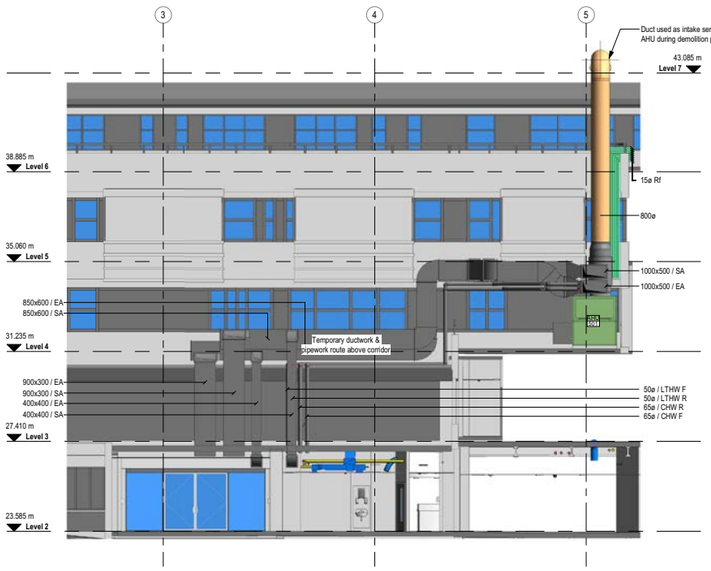
3 **Interface 64 - Level 4 CCC Design**
1 : 100



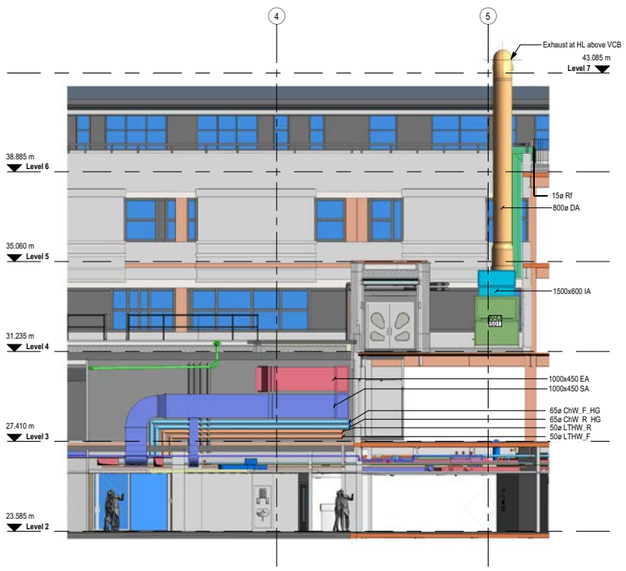
A **Section A - Advanced Works**
1 : 100



B **Section B - CCC Design**
1 : 100



C **Section C - Advcanced Works (South Elevation)**
1 : 100



D **Section D - CCC Design (South Elevation)**
1 : 100

A new externally rated AHU is to be provided as detailed in the appended schedule.

The works are to be split into two phases as follows:

1. Temporary condition

The final ductwork route between the new Cheetah Ward AHU and the Level 2 main entrance is within the CCC via a new dedicated riser. It is, therefore, necessary provide a temporary route which does not clash with the construction of the CCC. This route is provided in the enclosed drawings, with ductwork fixed to the existing building fabric.

To accommodate the new ductwork route, a penetration will need to be formed in the roof of the shell space in Consultation Room B2124. The penetration will need to be large enough to provide clearance such that the remaining building fabric can be demolished without damaging the temporary ductwork.

2. Final Condition

The final ductwork route between the new Cheetah Ward AHU and the Level 2 main entrance is within the CCC. As such, it does not form part of the mobilisation works but is included here for information. The ductwork will extend from the AHU plantroom on level 4, through the ceiling void of the level 4 link bridge, down a new dedicated riser, and will then be concealed behind a new ceiling.

Heating

Existing Installation

LTHW serving the existing AHU frost and re-heat coils emanates from a branch taken from the main distribution at Level 2. This pipework also serves the Level 2 Main Reception area and warm air curtains. An indicative route for the pipework is shown on the enclosed drawings, based on the commissioning information received from the Trust.

Proposed Works

Diversion of the LTHW pipework is required to serve the new Cheetah Ward AHU and to relocate the distribution from Waiting Area B2037 area as this area is inside the demolition zone. The proposed temporary and permanent pipework routes are show on the enclosed drawings along with indicative connection locations which will need to be confirmed by site survey once the services are exposed.

Cooling

Existing Installation

The existing chiller is located on the same steel plant deck as the Cheetah ward AHU on an external area of flat at level 4 of the Frontage building. In the existing configuration, The chilled water serves a cooling coil in the existing Cheetah ward AHU then the circuit extends via a riser from level 4 to the Cheetah Ward Waiting Area B2037.

From this point the chilled water circuit distributes through The Level 2 ceiling void to serve individual fan coil units located in the main reception area, including office spaces and IT Hub B2011

An indicative route for the pipework is shown on the enclosed drawings, based on the commissioning information received from the Trust.

Proposed Works

A new chilled water connection will be derived from the sitewide system and routed to the Level 4 terrace to serve the replacement AHU. From here the pipework will extend to serve the Cheetah Ward and main reception areas on Level 2.

The location for connecting into the sitewide chilled water system has been agreed as the Level 7 East Plantroom in VCB.

From the Level 7 plantroom, chilled water will be circulated to the new AHU located on the Level 4 terrace. The pipework route will then extend to the main reception area.

A new route is required for the CHW circuit between the level 4 terrace and the main reception area as a section of the existing route is inside the demolition zone.

The proposed temporary and permanent pipework routes are show on the enclosed drawings along with indicative connection locations which will need to be confirmed by site survey once the services ate exposed.

External chilled water pipework shall be provided with electrical trace heating for winter frost protection. Generally, the trace heating systems shall comprise self-regulating heating cable, fixing tapes, power distribution boxes, pipe mounting brackets, temperature sensors, warning labels and control units as required for a fully functioning system.

Works are to be carried out to the chilled water distribution pipework and terminals in the main reception area as shown on the enclosed level 2 drawings. A number of FCUs are to be stripped out as they sit within the demise of the demolition zone and on FCU is to be relocated to serve a lobby area.

The overall cooling demand will decrease due to the works.

On completion of the works the existing primary commissioning valves shall be adjusted to allow for the demand due to the works and maintain the original measured flow rates to the balance of the areas on the system.

Existing DX condensers

There are 4no condensers located on the level 4 staff terrace, connected to indoor units serving level 4. As this space becomes partially enclosed by the development of the CCC (implementation of Link 4C reducing the external terrace area), these are proposed to be relocated to the level 6 terrace to ensure adequate airflow. The Trust will engage the incumbent installation / maintenance company to relocate the condensers to the positions shown on the drawings.

Acoustic Considerations

Component	Parameter	Frequency, Hz							
		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
AHU Exhaust (in interim arrangement)	Minimum Insertion Loss, dB	8	12	23	46	55	43	27	20
	Maximum regenerated	51	49	43	43	41	36	26	17
	sound power level, dB								
AHU Intake (in interim arrangement)	Minimum Insertion Loss, dB	11	18	32	54	52	36	22	16
	Maximum regenerated sound power level, dB*	57	55	49	49	47	42	33	23

The proposed Air Handling Unit (AHU) will incorporate noise mitigation measures to ensure any impact on existing hospital ward facades and the new proposed CCC is minimised.

An initial assessment has been undertaken to establish noise mitigation measures required, based AHU product selections as provided by the MEP team. Advice is based on the 'AHS AIR HTM 2.0' model AHU.

The AHU itself is to be enclosed at Level 04 and so noise break-out is expected to be controlled by the enclosure build-up. Attenuators are required to be installed for the intake and exhaust connections to atmosphere, such that the below noise limits are met at terminal source:

- AHU Intake: 60 dB(A) SWL, or 49 dB(A) SPL at 1m [under free-field conditions];
- AHU Exhaust: 55 dB(A) SWL, or 44 dB(A) SPL at 1m [under free-field conditions].

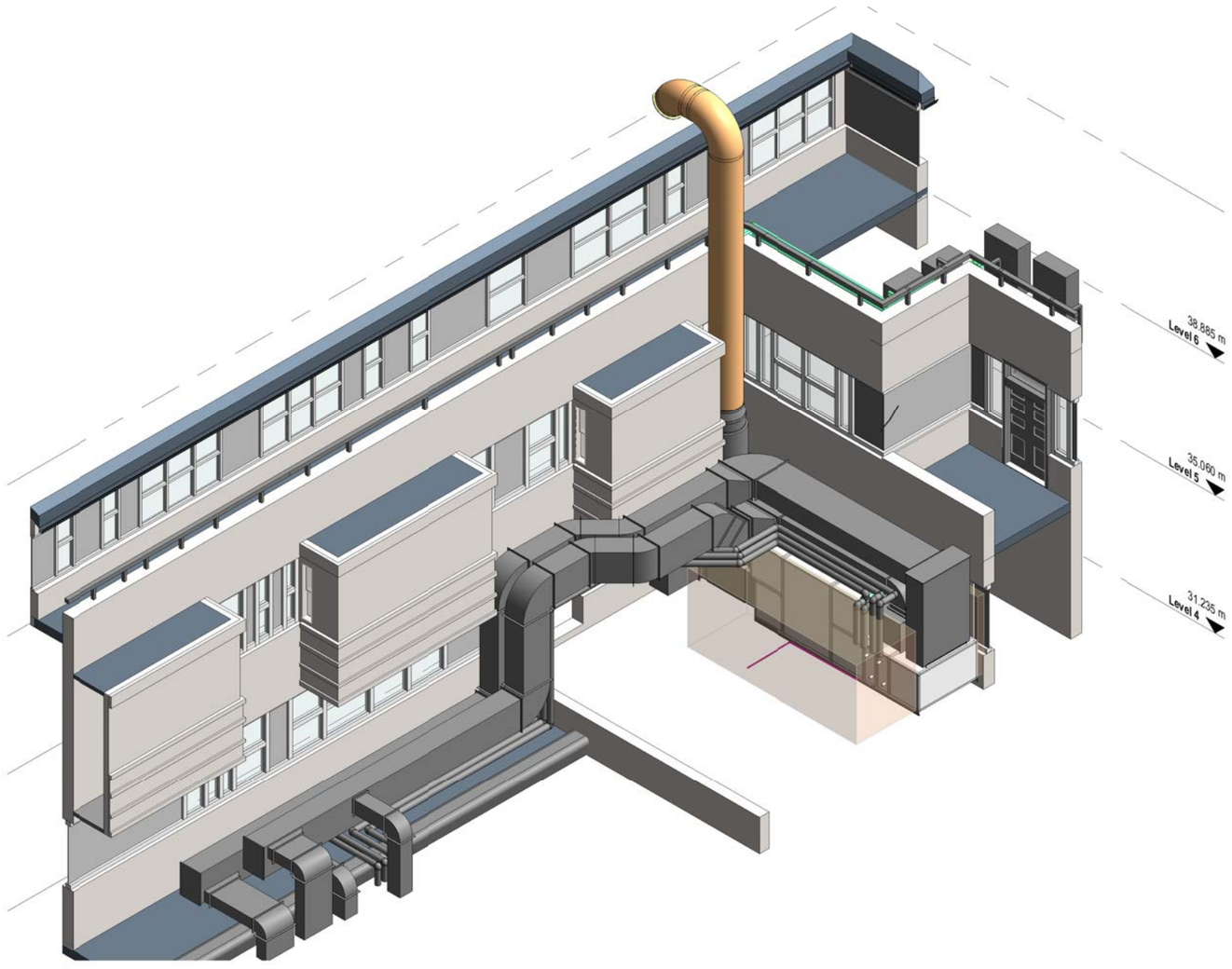
Following implementation of the mitigation measures described in this section, noise levels incident on the existing hospital and new CCC are expected to be compliant with criteria limits. All advice within this section is from an acoustics perspective only.

*Attenuator required to be located as close to the AHU source as possible.

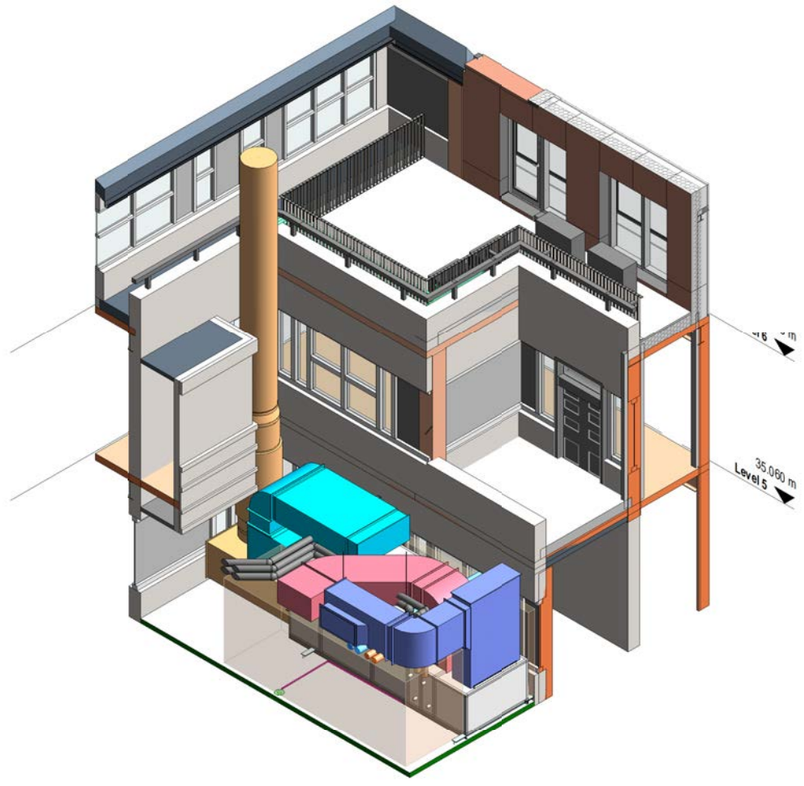
Based on the proposed arrangements, the performance noted will be suitable (note that final attenuator selections would be the responsibility of the contractor) The attenuators would be suitable for the final arrangement after the intake/exhausts are swapped, such that the exhaust attenuator requirements in the table above become the intake requirements in the final arrangement (and vice versa).

Further requirements are below:

- Attenuators are required to be located as close to the AHU source as possible, in particular for the intake (interim arrangement) attenuator, which requires a length of ductwork and bend after the attenuator to meet the requirements
- Requirements are based on the current proposed ductwork arrangements, and would require review following any changes



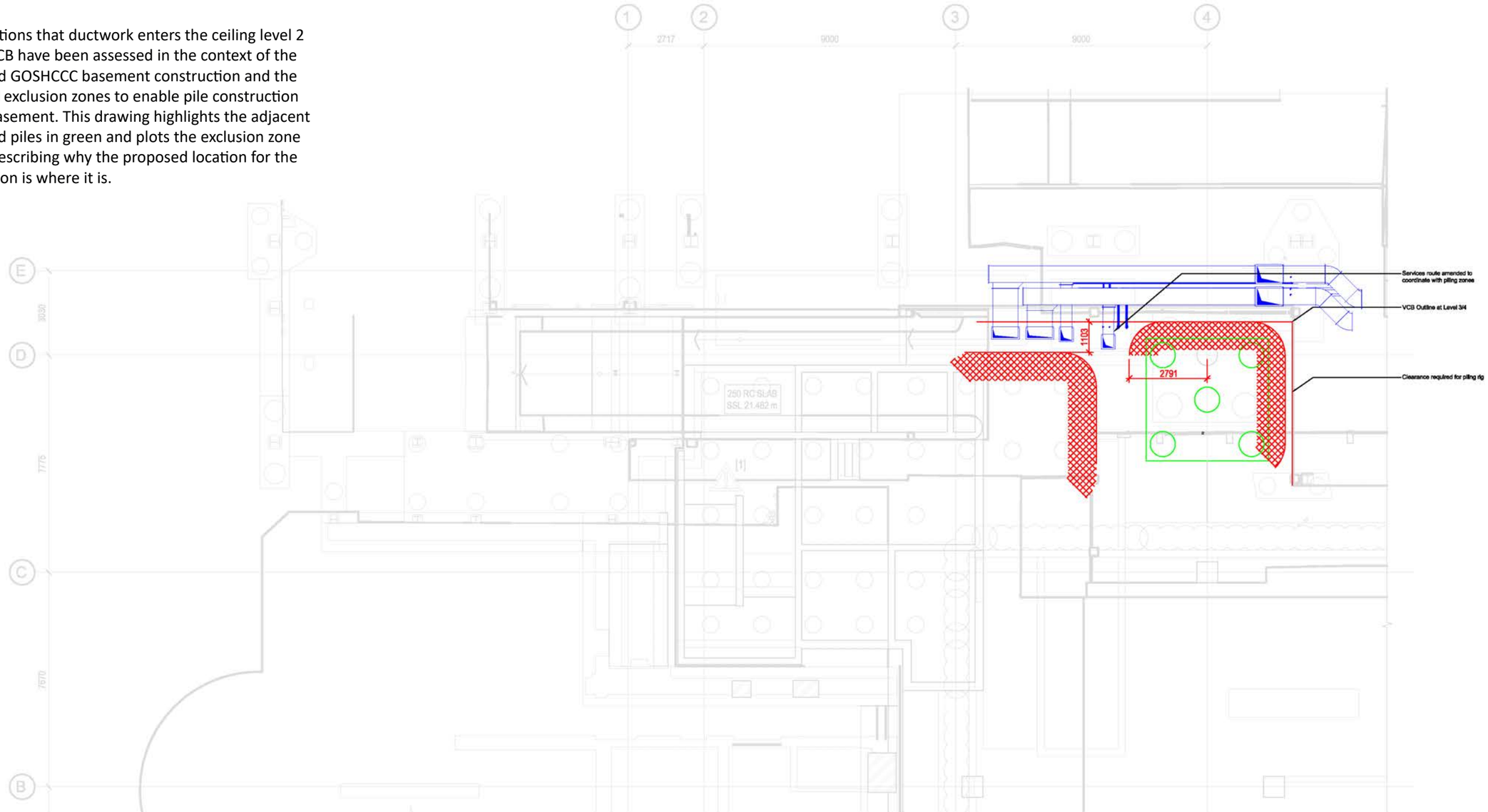
Site Mobilisation proposal



GOSHCCC Proposal

Connection to the Cheetah Ward

The locations that ductwork enters the ceiling level 2 of the VCB have been assessed in the context of the proposed GOSHCCC basement construction and the required exclusion zones to enable pile construction of the basement. This drawing highlights the adjacent proposed piles in green and plots the exclusion zone in red, describing why the proposed location for the connection is where it is.



INTERFACE 64 - LEVEL 1

1 : 100

Level 2 VCB - Strip-out Drawing

- HOARDING AT SITE POSSESSION
- HOARDING DURING CONSTRUCTION PHASE
- DEMOLITION/ SERVICES TO BE REMOVED
- ASSUMED EXISTING LTHW F&R ROUTE TO BE CONFIRED ON SITE
- LTHW F&R PIPEWORK TO BE REMOVED
- NEW LTHW F&R TO SERVE LEVEL 4 AHU
- ASSUMED EXISTING CHW F&R ROUTE TO BE CONFIRED ON SITE
- CHW F&R PIPEWORK TO BE REMOVED
- NEW CHW F&R FROM MRI PLANTROOM
- PROPOSED CONNECTION LOCATION TO EXISTING SERVICES

VENTILATION LAYOUT TAKEN FROM DRAWING B2-MEC (21/05/2018)

PROPOSED CONNECTION LOCATION TO EXISTING DUCTWORK

LTHW F&R ROUTE FROM EXISTING PLANT TO BE CONFIRMED BY SURVEY

SUPERSEDED LAYOUT. SHELL SPACE SERVICES TO BE REMOVED FOR NEW DUCT ROUTE FROM LEVEL 4 AHU

SLAB BREAKTHROUGH ZONES FOR NEW DUCTWORK & PIPEWORK

NEW LTHW & CHW ROUTE TO LEVEL 4

SHELL SPACE

AREA BEING INSTALLED AS PART OF SECOND PHASE

SUPPLY & EXTRACT DUCTWORK RISES TO AHU AT LEVEL 4. PLANT ARE SEE DRAWING 6485/0313/M03

RISER ASSUMED TO BE CHW & LTHW F&R ROUTE TO LEVEL 4 AHU & CHILLER TO BE CONFIRMED BY TRUST

RECORD DRAWING

6485/0313/M01 RD

VENTILATION LAYOUT LEVEL 2

Level 2 VCB - Connection into existing services

- HOARDING AT SITE POSSESSION
- HOARDING DURING CONSTRUCTION PHASE
- DEMOLITION/ SERVICES TO BE REMOVED
- ASSUMED EXISTING LTHW F&R ROUTE TO BE CONFIRED ON SITE
- LTHW F&R PIPEWORK TO BE REMOVED
- NEW LTHW F&R TO SERVE LEVEL 4 AHU
- ASSUMED EXISTING CHW F&R ROUTE TO BE CONFIRED ON SITE
- CHW F&R PIPEWORK TO BE REMOVED
- NEW CHW F&R FROM MRI PLANTROOM
- PROPOSED CONNECTION LOCATION TO EXISTING SERVICES

VENTILATION LAYOUT TAKEN FROM DRAWING B2-MEC (21/05/2018)

PROPOSED CONNECTION LOCATION TO EXISTING DUCTWORK

RELOCATE EXISTING FCU 04 OR FCU 05 TO SERVE LOBBY

LTHW F&R ROUTE FROM EXISTING PLANT TO BE CONFIRMED BY SURVEY

SUPERSEDED LAYOUT. SHELL SPACE SERVICES TO BE REMOVED FOR NEW DUCT ROUTE FROM LEVEL 4 AHU

SLAB BREAKTHROUGH ZONES FOR NEW DUCTWORK & PIPEWORK

NEW LTHW & CHW ROUTE TO LEVEL 4

SHELL SPACE

AREA BEING INSTALLED AS PART OF SECOND PHASE

SUPPLY & EXTRACT DUCTWORK RISES TO AHU AT LEVEL 4. PLANT ARE SEE DRAWING 6485/0313/M03

RISER ASSUMED TO BE CHW & LTHW F&R ROUTE TO LEVEL 4 AHU & CHILLER TO BE CONFIRMED BY TRUST

RECORD DRAWING

6485/0313/M01 RD

VENTILATION LAYOUT LEVEL 2

Engineering Proposals -
VCB Externally mounted services

MTHW Diversion (11)

Description of works

The proximity of the proposed CCC building to the existing VCB façade will result in limited space to accommodate the services which are currently located on the façade of VCB. These include a combination of primary MTHW & CHW pipework, fresh air intakes and passive louvres. Each of these require careful treatment in both the temporary state, during demolition and construction, and once the construction is complete. The phasing drawing included with this pack demonstrates the order in which the works should be completed.

MTHW Pipework Diversion

In its current arrangement, the MTHW pipework protrudes so far from the VCB façade that it would encroach into the north atrium if no diversion works were carried out. Similarly, the structural support frame for the pipework would clash with the proposed building line.

The proposal is to relocate the pipework as indicated on the enclosed phasing drawing. This location has been chosen as most of the new pipework can be installed whilst the existing pipework remains live. The final connections can then be made in the shortest time possible, thus limiting the duration of service interruption. This location has also been chosen as it has minimal impact on views out from the existing windows.

To avoid heat build-up, it is important that no sections of the MTHW pipework are concealed in unventilated voids in the final arrangement. A riser will be formed, independent from the VCB building fabric, accessed from CCC, which allows air to pass over the pipework dissipating heat. This will be achieved using mechanical ventilation. We propose to ventilate the riser and the VCB plantroom by drawing air through the MTHW pipework riser via fans located in the plantroom. A separate discharge, ducted to outside, will exhaust vitiated air from the plantroom.

This system will replace the current arrangement which provides ventilation to the plantroom via passive louvres. Motorised fire and smoke dampers will be provided where the intake and exhaust ducts penetrate the plantroom façade.

CHW & Condensate Pipework Diversion

In its current arrangement, the CHW & Condensate pipework protrudes so far from the VCB façade that it would encroach into the north atrium if no diversion works were carried out. Similarly, the structural support frame for the pipework would clash with the proposed building line.

The proposal is to relocate the pipework as indicated on the enclosed phasing drawing. This location has been chosen as most of the new pipework can be installed whilst the existing pipework remains live. The final connections can then be made in the shortest time possible, thus limiting the duration of service interruption. This location has also been chosen as it has minimal impact on views out from the existing windows.

The existing electrical trace heating which provides winter frost protection for the external pipework shall be stripped out and replaced, making use of the existing power supplies . Generally, the trace heating systems shall comprise self-regulating heating cable, fixing tapes, power distribution boxes, pipe mounting brackets, temperature sensors, warning labels and control units as required for a fully functioning system.

MTHW & CHW Materials

Pipeline Specification					
Tube				Fittings	
Size Range	Material	Material Grade	Standard	Type	Standard
65-150	Black Mild Steel	Heavy	BS EN 10255	Welded / Flanged	Butt Welding to BS EN 10253-2 Flanges to BS10/BS EN 10253-1/ BS EN 1092-1

Insulation				
Type	Standard	Finish	Thickness	Notes
Mineral Fibre Pipe Insulation	BS5422: 2009 & BS5970: 2012	Low emissivity (0.05) Al Foil Faced	BS5422:2009 Table 15 t=125.0	Proprietary valve jackets on all valves, pipeline components and flanges

Fresh air intakes

A series of louvres are located along the façade of the VCB & PICB Buildings at Level 1, providing fresh air intakes and exhaust air discharge routes for air handling plant located in the Level 1 plantrooms B1103 and B1101.

It will be necessary to provide ductwork routes from the existing intake locations to high level to avoid drawing dust and other contaminants into the existing ventilation systems during the demolition phase. In the case of AHU 1.0, this could potentially form the permanent arrangement, provided that the ductwork is adequately protected during the demolition and construction phases. For AHU 3.1 and AHU 22, the arrangement will be temporary as the intention is for the ductwork to be diverted back through the PICB building to an existing lightwell in the permanent condition.

Fire rated ductwork is proposed to mitigate the requirement for motorised dampers and complex interfaces with the existing Hospital fire management systems.

The discharge louvres will remain their existing configuration during demolition works.

AHU 1.0

AHU 1.0 is located in the Level 1 Plantroom B1103. The existing intake louvre shall be removed, and the intake ductwork extended to high level as show on the enclosed phasing drawing. The phasing drawing shows the ductwork terminating at level 4, however, the final height at which this duct terminates is to be agreed with the Trust based on the predicted generation of dust and contaminants during demolition. The duct shall terminate at a minimum 45o angle to prevent the ingress of rain.

AHU 3.1

AHU 3.1 is located in the Level 1 Plantroom B1103. The existing intake louvre shall be removed, and the intake ductwork extended to high level as show on the enclosed phasing drawing. The phasing drawing shows the ductwork terminating at level 4, however, the final height at which this duct terminates is to be agreed with the Trust based on the predicted generation of dust and contaminants during demolition. The duct shall terminate at a minimum 45o angle to prevent the ingress of rain.

AHU 22

AHU 22 is located in the Level 1 Plantroom B1101. For the duration of demolition, the existing intake louvre shall be removed, and the intake ductwork extended to high level as show on the enclosed phasing drawing. The phasing drawing shows the ductwork terminating at level 4, however, the final height at which this duct terminates is to be agreed with the Trust based on the predicted generation of dust and contaminants during demolition. The duct shall terminate at a minimum 45o angle to prevent the ingress of rain.

During the construction works, this ductwork will be removed. It its final configuration, the air intake for AHU 22 is to be diverted through the roof of plantroom B1101 to an existing lightwell.

Passive louvres

Treatment of the passive louvres is excluded from interface 11. In the temporary condition, the contractor shall make arrangements to mitigate the ingress of dust to plantroom B1103 and NO2 manifold room B1042. The future ductwork serving NO2 manifold room B1042 is show indicatively for coordination purposes, however, final arrangement is subject to further design.

It has been noted that there is a preference to use fire rated ductwork to mitigate the use of motorised dampers which would require major upgrade of the existing hospital fire and BMS systems. Fire rated ductwork to be suitably protected during construction. All ductwork to terminate with a 45 degree angle to prevent rainwater ingress and to include insect/bird screen. Unused sections of louvres to be blocked off by fire rated barrier.