

**NHS Forth Valley Modular
Wards NTC Construction
Key Stage Assurance Review**

CONST KSAR Report

V1.0

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Document Overview

Key Stage Assurance Review Report | Construction Stage

Prepared for:

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NHS Scotland Assure – Assurance Service

Document Control Sheet

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Version	Date	Name & Organisation	Role	Signature
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1. Executive Summary

As a result of the Construction Stage Key Stage Assurance Review (KSAR) and based on the information presented to NHS Scotland Assure (NHS SA), we are unable to support the project at this time.

NHS SA have concerns that should the key themes identified within the KSAR not be addressed in a timely, safe and satisfactory manner, this could lead to delays to the programme or potentially compromise the safety of the patients and staff. Of significance, is the lack of assurance provided to demonstrate that NHS Forth Valley (FV) have addressed the concerns raised during the KSAR undertaken at Full Business Case (FBC). These include (but are not limited to) a lack of documented risk assessments to inform design solutions, non-compliances with guidance, a lack of consideration for access and maintenance to services and a lack of detail within the fire strategy. NHS FV have engaged in a transparent manner throughout the KSAR and have provided a commitment to further develop their action plans as the project moves towards the commissioning phase.

The evidence provided by NHS FV, does not provide assurance that there are appropriate governance processes in place, particularly with respect to; reviewing and approving design information, technical submittals and derogations, and the processes for managing the change control process. Whilst the NHS FV project team have produced a design tracker to record the findings from consultation with various stakeholders, there is a lack of supporting evidence around the response to their comments and a number of these items on the tracker remain open. Furthermore, the design information provided was predominantly noted as *'Preliminary'* status, therefore it is unclear if the design information has been reviewed and approved for use during Construction. There is no evidence of a document management system in place to provide visibility to all parties for managing, reviewing and approving design and construction documentation.

Whilst NHS Forth Valley were able to demonstrate an element of quality monitoring via site inspection reports, it was unclear how the respective parties implementing quality monitoring (e.g. modular build contractor, external supervisors) were co-ordinating observations or tracking resolution/closure of any quality matters raised. There is also no reference to the integration of key stakeholders, such as Infection, Prevention and Control (IPC) within this process. During the site visit undertaken as part of the KSAR review, an issue with water ingress to the building was identified. This had resulted in damage and mould growth on internal walls. This issue was unresolved as the KSAR process concluded. This should be addressed as a matter of urgency, with remedial works agreed with NHS FV and their key stakeholders, including the IPC team.

From the evidence submitted by NHS FV, there is no assurance that appropriate plans are in place for the Testing and Commissioning process. There is no evidence of a process in place for undertaking pre-commissioning checks in line with relevant Scottish Health Technical Memorandum (SHTM) guidance and it is unclear who will witness and sign-off on behalf of the board. The Commissioning Programme provided, does not include reference to pre-commissioning checks, and does not

define the date that commissioning activities will commence. There is also no detail on the commissioning process within the overall project programme, therefore it is unclear if sufficient time has been allocated to the process. Given the nature of the contractual relationships, there was a disconnect between the ancillary works packages and the main Modular Ward NTC works.

From a fire safety perspective, NHS Scotland Assure note that there was no assurance as to how NHS FV were monitoring the implementation of the fire strategy on site. There are also concerns in relation to the fire stopping proposals, with no evidence of an agreed design between the relevant parties, therefore no assurance that the fire stopping systems are being installed to the correct standard.

NHS Scotland Assure therefore recommend that NHS FV address the following key themes as a matter of urgency:

- Ensure all recommendations from the FBC KSAR have been reviewed and addressed, with supporting evidence recorded.
- Develop and implement a consolidated action plan, combining any residual items from the FBC KSAR report and the Construction KSAR report.
- Ensure that all contractors and subcontractor competency checks have been reviewed and signed off by NHS FV. Ensure that the processes for training and mentoring operatives with no previous healthcare experience is reviewed and implemented.
- Review the status of MEP design packages noted as '*Preliminary*' to ensure that these have been approved for use in the Construction stage. Ensure documented approvals from key stakeholders, including IPC.
- Ensure that the design information provided is in line with the requirements of RIBA Stage 4 and 5. It was noted through the course of the review that there is a lack of overarching MEP design specification, to cover workmanship clauses etc. This
- Ensure that access and maintenance strategies have been developed and that these are reviewed and approved by relevant NHS FV stakeholders.
- Ensure that the process for undertaking quality inspections is documented, including roles and responsibilities for all parties involved. This should include the process for recording, resolving and closing out defects.
- Ensure that Designer's Commissioning Briefs are developed and reviewed in line with the requirements of SHTM 03-01 Part A (2014) and SHTM 04-01 Part A (2014).
- Ensure that the testing commissioning programmes are developed to incorporate pre-commissioning stages and to include sufficient detail of commissioning activities, to ensure that there is adequate time allowed for the commissioning process in the overall programme.

- Consider the use of an independent commissioning manager to manage and oversee the commissioning process.
- Ensure that pre-commissioning checks are carried out prior to commissioning and ensure that pre-commissioning check sheets are completed in line with the requirements of relevant SHTM guidance. Ensure the process for carrying out pre-commissioning check and details of the parties responsible for undertaking and witnessing the checks is documented.
- Review the duty holder matrix and ensure that it is updated to reflect the required contributing roles beyond Handover, to consider roles of Authorised and Competent Persons, duty holders, IPC roles etc.

1.1 Summary of Findings

The findings of this report have been collated based on information provided by NHS Forth Valley (NHS FV). The following table outlines the status of key findings as derived from the KSAR and identified within the NHS SA Recommended Action Plan issued to NHS FV under separate cover:

Review	No. of Issues per category				
	1	2	3	4	5
Project Governance and General Arrangements	2	9	5	2	0
Water and Internal Plumbing / Drainage Systems	0	3	7	0	0
Ventilation	0	2	7	1	0
Electrical	0	0	4	0	0
Medical Gases	0	2	5	1	0
Fire	0	1	10	4	1
Infection Prevention & Control Built Environment	0	3	2	1	0

The following categories were used in relation to the findings:

Category	Definition
1	Significant – Concerns requiring immediate attention, no adherence with guidance
2	Major – Absence of key controls, major deviations from guidance
3	Moderate – Not all control procedures working effectively, elements of noncompliance with guidance
4	Minor – Minor control procedures lacking, or improvement identified based on emerging practice
5	Observation and improvement activity

1.2 Project Overview

NHS FV is seeking to develop a sustainable model for the provision of orthopaedic surgery for the residents of Forth Valley and reduce overall waiting times for this service. Good progress has been made since 2019, using the NTC theatres, interim beds and expanded day/23 hour surgery spaces to provide additional orthopaedic capacity to Forth Valley patients. Despite the covid pandemic, Forth Valley has made progress with developing a sustainable orthopaedic service and the Board's planned care performance is amongst the best in Scotland. At present there is limited capacity to provide all the services required locally and a heavy reliance upon sending patients to the Golden Jubilee National Hospital (GJNH) for treatment and elective surgery. As we worked with Scottish Government in 2019/20 to develop the operating model for the National Treatment Centre, we were advised that around half of the capacity would be allocated to other NHS Boards to support increased demand for orthopaedic joint surgery, and the other half for Forth Valley, to meet our local increased demand for orthopaedic surgery, and to allow FV to repatriate patients from the Golden Jubilee, enabling the capacity freed up at GJNH to be allocated to other Boards.

NHS FV has identified the ability to repatriate orthopaedics services back from GJNH through the provision of a 30-bed elective care ward which aligns with the wider Scottish Pathway Standards of care. The project also falls under the wider Scottish Government Elective Care / National Treatment Centre Programme (NTC) of Works. Unfortunately, the impact of the pandemic in some Board areas has meant that their waiting times for orthopaedic joint surgery are in excess of 2 years, and significantly higher than those in Forth Valley where good progress has been made to reduce waiting times and numbers waiting. As a result, the Scottish Government has advised NHS Forth Valley that 100% of the NTC FV capacity in the first instance will be offered to other NHS Boards i.e. those with the longest waiting times. Additional capacity in the NTC will not be made available to Forth Valley until waiting times across Scotland are equalised.

A schedule of accommodation has been prepared by NHS FV and forms part of the Variation Enquiry approval process with the SPV. The schedule identifies the requirement for thirty single bed patient bedrooms with associated en-suite and showering facilities (100%) along with the standard support accommodation for staff and patients, including staff bases, waiting rooms, offices, domestics, kitchen and waste disposal etc. The single storey accommodation is wrapped round a central courtyard space, with patient rooms externally facing giving access to natural light.

2. Review Methodology

2.1 Overview of NHS Scotland Assure & The KSAR Process

Good management and effective control of projects is an essential element to the successful delivery and maintenance of healthcare facilities across NHS Scotland estates.

The NHS Scotland Assure - Assurance Service was launched on the 1st June 2021 following a letter issued by Scottish Government to Health Board Chief Executives, Directors of Finance, Nursing Directors and Directors of Estates. This letter outlined the purpose of NHS Scotland Assure, with an overarching aim to deliver a co-ordinated approach to the improvement of risk management in new builds and refurbishment projects across NHS Scotland. The new service will underpin a transformation in the approach to minimising risk in our healthcare buildings and environments, protecting patients from the risk of infection and supporting better outcomes for patients in Scotland.

From the 1st June 2021, all NHS Board projects that require review and approval from the NHS Capital Investment Group (CIG), will need to engage with NHS Scotland Assure to undertake key stage assurance reviews (KSARs). Approval from the CIG will only follow once the KSAR has been satisfactorily completed. The KSARs have been designed to provide assurance to the Scottish Government that guidance has been followed. The Scottish Government may also commission NHS Scotland Assure to undertake reviews on other healthcare-built environment projects. This does not change accountability for the projects; NHS Boards remain accountable for their delivery. NHS Scotland Assure will be accountable for the services it provides that support delivery of the projects.

NHS Scotland Assure will also work closely with Health Boards to identify where a KSAR may be required for projects under their Delegated Authority, utilising a triage system to assess risk and complexity of projects.

The KSARs will assess if Health Boards Project Management teams (inclusive of clinicians, appointed construction consultants, and contractors) are briefed and following best practice procedures in the provision of facilities. We will review if projects are compliant in all aspects of safety, if specific engineering systems are designed, installed and commissioned, and for ongoing safety maintenance including Infection Prevention and Control (IPC).

The KSAR focuses on key topics, specifically – IPC, water, ventilation, electrical, plumbing, medical gases installations and fire. This ensures they are designed, installed and functioning from initial commissioning of a new facility and throughout its lifetime. Health Boards are required to have appropriate governance in place at all stages of the construction procurement journey.

The purpose of the KSAR at Construction is to ensure that there are adequate governance arrangements in place across the project that maintains the standards required across various disciplines such as IPCT, Electrical, Ventilation, Water & Drainage and Medical Gas systems throughout the construction period.

Whilst the KSAR focusses on actions to improve the end product, it is not intended to detract from the merits of a development that will add significant benefit for the healthcare of the population served, and which has many exemplary elements. Rather, it is a reflection of the complexity of healthcare construction projects and the stage of development at which it was reviewed. Some conflicts and changes are to be expected as complex projects develop and project teams have in place mechanisms to identify and address these. This report adds a layer of scrutiny and assurance to that process to address the above requirement from government.

2.2 KSAR Process

The Construction KSAR for NHS Forth Valley on the NTC Modular Wards took place between 17th October 2022 and 16th January 2023

2.2.1 To inform the findings of the KSAR, the Health Board were issued with key documents outlining the assurance question set and expected level of evidence and supporting documents in accordance with relevant legislation and guidance. This included the Construction KSAR Workbook and Construction Deliverables list.

2.2.2 The KSAR report includes an overview of the main findings of the review, with a further itemised list of detailed observations included within the appendices of the report. The detailed observations are recorded in an action plan that should be adopted by the Health Board following the review and subsequently monitored by them to ensure appropriate actions are completed in a timeous manner.

2.3 Application of Standards & Legislation

2.3.1 Health Facilities Scotland (HFS) currently provides a range of advisory and delivery services across a wide variety of topics from a portfolio which covers the built estate, engineering and environment and facilities management. With some exceptions these services are largely advisory in nature, identifying best practice and developing national guidance and standards.

2.3.2 Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) Scotland currently provides advice and guidance on all aspects of infection protection and control nationally in Scotland, inclusive of expert advice and guidance on the topic of Healthcare Associated Infections (HAI) and antimicrobial resistance. It maintains and continues to develop a practice guide (National Infection Prevention and Control Manual – NIPCM) as well as a HAI Compendium of all extant guidance and policy appropriate for use in NHS Scotland. Like HFS, these services are largely advisory in nature, identifying best practice and developing national guidance and standards. The

NHS Scotland NIPCM was first published on 13 January 2012 as mandatory guidance, by the Chief Nursing Officer (CNO (2012)1), and updated by a second edition on 17 May 2012 (CNO(2012)01-update). The NIPCM provides guidance for all those involved in care provision and should be adopted for infection, prevention and control practices and procedures. The NIPCM is mandatory policy for NHS Scotland.

The authority of guidance produced by National Services Scotland (NSS) and other national organisations e.g. Healthcare Improvement Scotland is best described by the definitions outlined below (SHTM 00 – Best practice guidelines for healthcare engineering):

Regulations are law, approved by Parliament. These are usually made under the Health and Safety at Work etc Act following proposals from the Health & Safety Commission. Regulations identify certain risks and set out specific actions which must be taken.

Approved Codes of Practice give advice on how to comply with the law by offering practical examples of best practice. If employers follow the advice, they will be doing enough to comply with the law.

Approved Codes of Practice have a special legal status. If employers are prosecuted for a breach of health and safety law, and it is proved that they did not follow the relevant provisions of an Approved Code of Practice, they will need to show that they have complied with the law in some other way, or a court will find them at fault.

Standards (British or European), institutional guides and industry best practice play a large part in how things should be done. They have no direct legal status (unless specified by Regulations). However, should there be an accident; the applied safety practices at the place of work would be examined against existing British or European Standards. It would be difficult to argue in favour of an organisation where safety was not to the described level.

Guidance is issued in some cases to indicate the best way to comply with Regulations, but the guidance has no legal enforcement status.

2.3.3 Whilst guidance is deemed not compulsory by the Health and Safety Executive (HSE), where compliance with guidance is specified in a contract, as is the case here, it becomes a contractual requirement. Therefore, any permitted deviation from it would be expected to follow a formal process with input from all relevant parties, with clarity around how the outcome was reached, including risk assessments where appropriate and sign off by all those authorised to approve it.

2.4 Project Technical Outline Summary

2.4.1 Water and Internal Drainage Systems

The modular wards will be served via a boosted cold water metered supply from the existing Forth Valley Royal Hospital (FVRH) Boosted Cold Water network. The modular wards will not contain any raw cold water storage tanks, emergency water supplies, water filtration plant, filtered cold water storage tanks nor any cold-water booster pumps. Domestic hot water to serve the various appliances within the modular wards will be generated by a dedicated plate heat exchanger and associated storage vessels.

The above ground drainage system has been designed to serve all sanitaryware appliances and condensate drain requirements from the hub room cooling systems and the AHU drain pans. The above ground drainage system utilises air admittance valves to ventilate stacks.

2.4.2 Ventilation

The ventilation strategy for the modular wards is a combination of mechanical supply and extract and a separate dirty extract. The mechanical supply and extract ventilation air is provided via a single air handling unit (AHU) located within the ground floor plant room. The AHU incorporates filtration devices, LTHW heating, heat recovery devices and a direct expansion (DX) cooling coil. Duct mounted attenuators are included within the appropriate ductwork distribution.

Ductwork for supply, extract and dirty extract air is located within the ceiling voids. The Dirty Extract system serves all Toilets, Showers and Dirty Exhaust areas via a twin fan assembly incorporating a run around heat recovery coil. The dirty extract fan is in the ground floor plant room near the AHU. Supply make-up air to rooms with clean / dirty extract air provisions is via door transfer grilles/ducts from adjacent areas.

Low Temperature Hot Water (LTHW) from the existing NHS FVRH network will supply the modular wards. Constant Temperature (CT) LTHW is provided from the existing NHS FV LTHW network to serve the new AHU frost coils and reheat batteries, 2 No. plate heat exchanger storage vessels are to serve the new LTHW distribution pumps P1 and P2. Pumps P1 and P2 distribute constant temperature (CT) LTHW through the facility to serve ceiling mounted radiant panels.

Dedicated cooling is provided to the Hub Room only via a single wall mounted direct expansion (DX) cooling unit. The DX unit is linked to an external condensing unit via refrigerant pipework located in the ceiling void. There was no evidence to suggest that the noise impact from the DX system has been considered to either the existing or new wards.

2.4.3 Electrical

The LV distribution electrical power services includes both essential and non-essential power services taken from the existing FVRH power infrastructure, with changeover

switches in position at each of the Distribution Boards (DB), except for the server DB. The current design allows for a new Main Switch Board (MSB) and DB's (plus associated internal switchgear), sub main cabling and containment throughout the modular wards.

Small power sockets will be installed throughout the modular wards. Final circuits will be supplied from DBs' Outgoing circuits will be protected by either a miniature circuit breaker (MCB) (lighting circuit) or residual current circuit breaker with overcurrent protection RCBO (small power circuit), depending on the equipment requiring protection. Mechanical power supplies are provided through DBs serving the air handling unit, external condenser and mechanical control panel.

Internal and external LED light fittings are specified and linked on a digital control system. Lighting occupancy detection is specified to all toilets, stores and escape routes for energy efficiency. A standalone emergency lighting system (with integral battery packs) plus exit signs is specified.

Electrical sub-metering is provided at the main LV switchboard, as part of the main Hospital infrastructure, as well as both the essential and non-essential switchboards within the new modular ward.

A nurse call system has been specified to include bedhead call points, reset buttons and indicator panels. Alert and annunciation are provided by tone units and lamp indicators located throughout the new modular ward.

2.4.4 Medical Gases

The Medical Gas Pipeline Systems (MGPS) are limited to Oxygen and Medical Vacuum systems only. The Oxygen and Medical Vacuum supplies to the new modular ward will be extended from the existing Hospital systems. Oxygen and Medical Vacuum terminal units have been evidenced within the Treatment Rooms and each bedroom.

3.0 KSAR Review Summary

The following narrative relates directly to the Construction KSAR workbook and the evidence indicated therein. The comments associated with the points are because of the evidence presented by the Board and their advisors during the review process.

3.1 Project Governance and General Arrangements

3.1.1 Project Governance and General Arrangements KSAR Observations

Workbook Ref No.	Areas to probe	Evidence expected
1.1	Has suitable plans and documentation been put in place for the project to manage and monitor Quality Management and Assurance?	Project Quality Plan Inspection and Test Plans Inspection and Test Schedule/Register

NHS Scotland Assure Observations:

NHS FV have presented a project quality plan (PQP) prepared by the Modular Build Contractor, which relates exclusively to the construction of the modular building and their obligations only. There is no quality documentation which identifies the required input from the health board or other key stakeholders, such as subcontractors, etc. It was noted during the KSAR undertaken at FBC stage that there was no overarching Project Execution Plan (PEP), to document the governance processes in place to deliver the project, no further evidence to demonstrate the development of a PEP was provided by NHS FV.

The evidence presented does not provide assurance that the health board has considered their responsibilities with respect to the requirements for quality management and assurance throughout the project. There is no reference to integration of key stakeholders, such as Infection, Prevention and Control (IPC) or the health board's Technical Advisor Team and their approach to recording quality issues.

Inspection and test plans have been provided for the Mechanical, Electrical and Public Health (MEP) subcontractors, which remain blank and do not provide a record of reviews carried out on the design and specification prior to the testing and construction & commissioning phase. Inspection and test plans have also been provided for the SPV's enabling works contract from their MEP subcontractor, which appear to be more advanced, with pre-design checks in place and cross references to design drawings and details prepared by the SPV's MEP Consultant.

Given the two differing workstreams, there is no overarching Inspection and Test Plan (ITP) schedule or register that connects both workstreams together or coordinates the activities and dependencies. There is a risk to the project that any dependencies

between the workstreams are not recorded which may impact on the overall programme. If left unresolved there could be a significant operational risk within the existing hospital systems and the Modular Wards NTC.

Documents referenced are:

EC Project Delivery Tool

Governance Structure – EC Organogram

‘SPV’s Enabling Works MEP contractor’ Doc No. ITP-E-01

‘SPV’s Enabling Works MEP contractor’ Doc No. ITP-M-01

Various RAMS in the SPV’s Enabling Works MEP contractor RAMS Folder

Various ITPs & IPQCS in the ITPs & IPQCS Folder

MEP subcontractor ITP C2659 = Forth Valley-Quality Plan Rev 3 21.09.22

Electrical Subcontractor ITP – Forth Valley Issue 1

Workbook Ref No.	Areas to probe	Evidence expected
1.2	Has suitable arrangements been implemented on the project for document control processes for Quality Assurance and Management?	<p>Process for ensuring latest drawings approved and used.</p> <p>Processes for ensuring latest specification and details approved and used.</p> <p>Approach to management of non-conformances.</p> <p>Approach to change management control.</p> <p>Document management recording and structure.</p>

NHS Scotland Assure Observations:

As noted in question 1.1, the PQP does not reflect the requirements of NHS FV and their governance of the project, rather it reflects the requirements of the Modular Build Contractor.

The information provided does not provide assurance that the process for reviewing and approving design information for use during Construction has been fully considered by the health board. NHS FV have submitted a design tracker, which records the feedback from key stakeholders, however, there is a lack of supporting evidence around the responses to the comments and a number of items on the tracker remain open.

As noted in NHS FV’s action plan from the FBC KSAR, there was a lack of assurance associated with the level of design information provided during the previous KSAR. This includes the lack of a comprehensive RIBA Stage 4 design package (drawings,

schedules and specifications). Whilst evidence of updated technical submittals was provided in response to these points, based on the level of detail presented, it is not clear if a full review of the design has been undertaken against the requirements of SHTM guidance, therefore, there remains a risk that aspects of the design are not in compliance with guidance.

No evidence has been submitted to provide assurance that NHS FV have established the requirements for document management and control. From discussions at the KSAR technical workshops and the weekly progress meetings, the Modular Build Contractor holds a document issue register for recording the current drawings and specifications for the Modular Build works package. This does not extend to briefing or other relevant documentation. A live version is not available in an open format for the wider project team to view, therefore there is a significant risk as to site operations reflecting the agreed documentation at any given time.

NHS FV have not provided assurance that document change and non-conformance controls are being documented and following a prescribed process. NHS FV have provided a change control tracker, however, the document owner, its current status and the process around establishing change and approvals is not clearly defined. The tracker confirms details of the instructed changes which are often coupled with a confirmation email. These emails lack any clarity on the reason for change, the impact of change and ownership of the change process.

Documents referenced are:

Quality Plan Rev 3 21.09.22

NHS FV – Change Control Tracker 04.07.22

Various emails relating to changes

Contractors Report 28 June 22

Contractors Report July

Elective Care_design tracker- v36 080822 DW

Various NTC TORs in the supplementary KSAR Upload File

Governance Structure – EC Organogram v9

Workbook Ref No.	Areas to probe	Evidence expected
1.3	How has the Health Board approached Quality Assurance on the project to ensure processes and procedures are being adhered?	Evidence of regular Quality Assurance audits / reports undertaken on the project.

NHS Scotland Assure Observations:

NHS FV have appointed a lead advisor team to provide project management and technical support to the health board. Examples of documentation which record the quality inspections undertaken by MEP and Civil and Structural supervisors have been provided. There is, however, only a single report from the Mechanical and

Electrical Supervisor during the factory inspection of the modular units. No further evidence was provided of ongoing MEP quality inspections. There is no evidence to provide assurance that the qualifications and suitable experience of the MEP supervisors has been reviewed by the health board.

The PQP refers to the use of the ‘SnagR’ system to record in-progress inspections by the Modular Build Contractor. It is not clear from the PQP if the quality observations recorded by the health board and their representatives are also recorded on this system and there is no further detail provided within the PQP on the process for actioning and closing out quality issues raised by any parties involved in the process.

During the site visit, an issue was raised in relation to water ingress internal to the modular building, which had caused damage to the internal fabric of the modular building. There is a lack of assurance that this issue has been fully resolved during the period of the KSAR. This should be addressed as a matter of urgency, with remedial works agreed with NHS FV.

Documents referenced are:

NHS FV Modular Ward Site Inspection Report 20220714 (Civils)

NHS FV Modular Ward Site Inspection Report 20220811 (Civils)

NHS FV Elective Ward_Modular Build Contractor Factory_Site Inspection Report_2220802_Final.V1

NHS FV Elective Ward_Modular Build Contractor Factory_Site_20220802_Final.V1

Workbook Ref No.	Areas to probe	Evidence expected
1.4	How does the Health Board assure itself that Testing, and Commissioning of services and systems have / are being developed and put in place to meet the project needs?	<p>Evidence of Testing and Commissioning monitoring / witness of tests.</p> <p>Evidence of Testing and Commissioning review of results.</p> <p>Evidence of Testing and Commissioning acceptance of results.</p> <p>Testing and Commissioning programme.</p> <p>Plans have / are being developed for collating information and documents.</p> <p>Have additional checks (external parties) been carried out to review the Contractors T&C's proposed plans.</p>

NHS Scotland Assure Observations:

No pre-commissioning checks or testing and commissioning activities had commenced during the KSAR review period. From the evidence submitted, there is

no assurance that appropriate plans are in place for the testing and commissioning of MEP systems within the facility. The Commissioning Programme developed by the MEP subcontractor, is limited in detail, does not include reference to pre-commissioning checks, and does not define the date that commissioning activities will commence. There is also no detail on the commissioning process within the overall project programme, therefore it is unclear if sufficient time has been allocated to the process and how this is coordinated with other site activities. There was no evidence submitted to define the scope of testing and commissioning requirements. Designer's Commissioning Briefs have not been provided by NHS FV as part of their KSAR response; these are a requirement of SHTM 03-01 Part A and SHTM 04-01 Part A.

There was no detail provided on the roles and responsibilities of key stakeholders involved in the commissioning process, including requirements for the witnessing of testing and commissioning activities. No independent commissioning manager has been appointed to oversee and manage the testing and commissioning process. The evidence submitted also gave no assurance of the intention to undertake pre-commissioning checks.

NHS FV have provided testing and commissioning plans for the ancillary NTC enabling works within the existing hospital being completed by the SPV; a commissioning statement provided by the MEP Design Consultant and an Inspection and Test Plan developed by the MEP subcontractor. There is no assurance that the ancillary enabling works and the Modular Wards NTC works are aligned.

There is no defined link between the Contractors delivering the ancillary works and the Modular Wards NTC and this is reflected in the lack of coordinated programme for the works and in the Inspection and Test Plans.

There is a significant risk that if these interdependencies between projects are not appropriately defined or managed, they could impact on key operating parameters of the facility and the resilience of the hospital as a whole. During the project weekly touchdown meetings, it was verbally confirmed that the same commissioning contractor was being appointed on both projects to carry out testing and commissioning activities, however, there is no independent testing and commissioning manager to oversee and manage the works.

Documents referenced are:

Forth Valley Commissioning Statement 26th October 2021

CT2659 – Forth Valley – ITPS

C2659 Commissioning Programme Revision A 29-09-21

EC Contract Prgm Rev 04 25.07.22

-M&E LFBVH Programme Draft (Ancillary Works)

26.05.22 – Action Log (Water Safety Group)

Workbook Ref No.	Areas to probe	Evidence expected
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1.5	How does the Health Board assure itself that the management of defects have / are being developed and put in place to meet the project needs?	<p>Systems and process for recording and management defects.</p> <p>Process for the rectification and close out of defects prior to handover.</p> <p>Plans have / are being developed for collating information and documents.</p>
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NHS Scotland Assure Observations:

As noted in question 1.1, the PQP does not reflect the requirements of NHS FV and their governance of the project, rather it reflects the requirements of the Modular Build Contractor.

The PQP refers to the use of the ‘SnagR’ and ‘I-Auditor’ software for in-process inspections by the Modular Build Contractor. Access to the system is described as being from the Modular Build Contractor site team only, therefore it is not clear how quality issues and defects identified by the health board or their advisors are being recorded and actioned. The PQP provides no detail on the process for recording, actioning and closing out quality issues, and the roles and responsibilities of key stakeholders in the process.

There has been no information presented that provides any assurance that the health board have considered defect management and how they intend to manage and resolve quality issues and defects prior to handover.

Documents referenced are:

Quality Plan Rev 3 21.09.22

Workbook Ref No.	Areas to probe	Evidence expected
1.6	How does the Health Board assure itself that the management of the Handover process have / are being developed and put in place to meet the project needs?	<p>Soft Landings process</p> <p>Plans have / are being developed for collating as installed information and documents.</p>

NHS Scotland Assure Observations:

NHS FV have provided a number of documents to outline the Soft Landings delivery process with roles and responsibilities. A Soft Landings representative has been identified by the Board. The Soft Landings champion has prepared a number of the documents and there are minutes provided of discussions on the subject at the NTC Project Group meetings. A Clinical Commissioning Master Plan has also been provided detailing the tasks required for the clinical commissioning process, related

to equipping, resource and familiarisation of the facility, however, the dates within this programme do not appear to align with the overall project programme.

A Soft Landings delivery plan has been provided which notes a series of activities relative to the project milestones, such as OBC/FBC, etc. Whilst the project stages are noted as being well developed at FBC, some items remain open and the activities around Construction, and Handover yet to start. Given the programme duration ensuring that the Soft Landings activities are identified and allocated is crucial.

Whilst the expectations of the O&M documentation were defined within the Soft Landings documentation, no evidence of the agreed structure or draft O&M templates have been provided.

Documents referenced are:

CLINICAL COMMISSIONING MASTER PLAN V03 120822

EC Contract Prgm Rev 04 25.07.22

25.08.22 NTC Project Group – Rolling Action Log

22-07JUL20FVRH EC Risk Register

2019-08-05 Soft Landings -Delivery Plan

Soft Landings -Delivery Plan Stage 5

Workbook Ref No.	Areas to probe	Evidence expected
1.7	How does the Health Board assure itself that the works are following the procedures as laid out in HAISCRIBE?	<p>Evidence that the Contractor in charge of the works has read, understood and signed the HAISCRIBE.</p> <p>Evidence that Infection Control have carried out interim site inspections at points where setting out of the rooms are underway to pick up implications of any Contractor's onsite adjustments.</p> <p>For works inside of or adjacent to healthcare spaces which are in use, evidence that a task specific HAISCRIBE has been produced and that compliance is monitored by the Board.</p>

NHS Scotland Assure Observations:

NHS FV have provided a number of documents relating to the HAISCRIBE elements of the project. There is evidence that the SHFN30 HAISCRIBE document has been completed for Stage 1, albeit not executed, and also that Stage 2 has been started, however with a number of elements on the MEP section are still to be actioned.

NHS SA observed that there were outstanding actions on the HAISCRIBE stages previously completed. It was also noted that there was no record of any IPC quality inspections.

NHS FV submitted a HAISCRIBE (SHFN 30) document in September 2022 in which Stage 1 is recorded as having been completed retrospectively by the review team, comprising representatives from the health board, project management, the SPV's hard FM provider, the health board's hard FM provider, HCP and the Modular Build Contractor. Stage 1 is not signed off or dated. Specialist infection prevention and control (IPC) input is not recorded on the Stage 1 HAISCRIBE but SHFN 30 Stages 1 and 2 are noted as having been reviewed at the HAISCRIBE workshop of 28.07.21 at which members of the IPC team (IPCT) are listed as present. Actions raised in Stage 1 as needing to be addressed, specifically the breakthrough into the existing hospital, are not noted in the HAISCRIBE workshop action notes provided at this stage, the latest of which is dated 23.09.21.

The Stage 2 section of the document is dated 20.05.21 and includes clinical and IPC representation alongside other health board and contractor representatives. Potential problems are identified, but not necessarily followed through to resolution, e.g. Section 2.f lists 'Actions to be addressed' including a communications plan pre-construction for staff and service users and issues potentially arising from the location of the plant room that are not mentioned further in the HAI-SCRIBE document or included in the workshop action notes dated 23.09.21.

Following discussion with NHS Forth Valley at the KSAR weekly meetings and the IPC Workshop, further documents were provided, including updated and signed off versions of the Stage 1 and Stage 2 HAI-SCRIBE; a completed, separate, Stage 3 HAI-SCRIBE document dated 27.05.22; and a reviewed and updated version of this document dated 04.10.22. These documents suggest that the Board has adopted a more structured approach to the HAI-SCRIBE process than was evident in Stage 1 and 2. NHS Forth Valley should continue with regular HAI-SCRIBE review of Stage 3, and also review Stages 1 and 2 to ensure that any issues identified at those stages have been satisfactorily resolved.

In discussion with NHS Forth Valley at the IPC Workshop, NHS Scotland Assure was informed that a separate, task-specific, HAI-SCRIBE would be completed imminently for the breakthrough into the main hospital. No documentation for this has been provided. This should be carried out at the earliest opportunity and, alongside the HAI-SCRIBE process for the modular build, reviewed regularly until the work is completed.

No evidence was provided of site inspections by the IPCT.

Documents referenced are:

SHFN 30 Part B: HAI-SCRIBE Implementation strategy

SHFN30 NHS FV NTC v4

EC-Hai Scribe workshop Action Note 280721-v0.1

EC-Hai Scribe workshop Action Note 230921-v0.1

SHFN30 NHS FV NTC DJC v7 051121

Modular Ward HAI SCRIBE Stage 3 May 2022

Workbook Ref No.	Areas to probe	Evidence expected
1.8	How does the Health Board continue to assure itself that the clinical needs of the facility are clearly understood by each section of the client organisation?	Updated description of each department of the facility review process evidenced. All specifications are being related back to the Portfolio Document (PD). An updated and live Derogation document.

NHS Scotland Assure Observations:

There is evidence of a review of derogations by clinical staff within the derogation schedule provided, derogations are also noted as an item for consideration in the minutes and action log of the National Treatment Centre Infection Control Workshops and minutes of Project Board meetings. The derogation schedule provided lacks technical detail or evidence of mitigation measures to be employed to maintain an equivalent level of safety and / or technical performance to that outlined in the respective guidance.

The Project Board is chaired by the Interim Director of Nursing and includes other clinical representatives. The HAISCRIBE review team also now includes appropriate clinical representation. The Board have submitted copies of Project Board meeting minutes dated 25 February 2022, 28 March 2022 and 25 July 2022 to demonstrate that the derogation register has been discussed at each meeting. There remains a single derogation to be agreed, in relation to SHTM 03-01 and the requirement for extract ductwork to be insulated.

Section 7.2 of the minute dated 25 February states "...that the Derogation register (revision 6) had been issued to the group. All of the derogations that are outstanding have been on the register for a period of time and the majority of these, have no impact or acceptable". "The only one that will not be accepted is which is currently going through a technical checking process which remains to be concluded".

Section 6 of the minute dated 28 March 2022, generally reflects the same message as section 7.2 of the minute dated 25 February.

Section 6 of the minute dated 25 July 2022 does not indicate which version of the derogation schedule is under review by the Board, however the minute does record that the one open derogation is relating to the extract ductwork insulation.

Documents referenced are:

SHPN 04-01 Part A

Forth Valley Derogation Schedule Rev 7 250722

Modular Ward HAI SCRIBE Stage 3 Review 04102022
 27.07.22 DRAFT NTC Project Board Minutes of MeetingLC
 25.02.22.Minutes of Meeting APPROVED
 26.04.22.Minutes of Meeting DRAFT
 26.05.22 Action Log

Workbook Ref No.	Areas to probe	Evidence expected
1.9	Are the Principal Designers regularly carrying out site inspections and providing reports to the Board and Principal Contractor?	<p>Regular (fortnightly) reports being provided to the clients' project management team, certifying installation is being provided in accordance with the CD.</p> <p>Regular comment on each of the installing contractors' quality safety plan and work delivered.</p> <p>If the Principal Designer is not employed to carry out site inspections, evidence that the Board has alternative, adequate means of design / construction quality control in place.</p>

NHS Scotland Assure Observations:

NHS FV have provided a number of documents including the Construction Phase Plan prepared by the Modular Build Contractor, confirming that they are also acting as the Principal Designer for the project. There is no evidence of any site inspections from the Principal Designers for the modular ward, or for the ancillary works being carried out within the existing hospital. Therefore, there is no assurance that regular site inspections are being undertaken by the Principal Designers. There is no evidence of an independent CDM advisor being appointed to undertake audits or inspections on behalf of NHS FV.

The Construction Phase Plan confirms that *“Our monitoring procedures will include regular inspections by the responsible person, where necessary this will be complimented by Tier 2 site audits from the HSE Team and potential third party audits where appropriate.”* 2 No. Health, Safety and Environmental Audit Report Forms have been provided, which include a number of Health & Safety criterion. These have not been completed by the Responsible Person as noted in the construction phase plan.

The Construction Phase Plan for the ancillary works is provided, which notes a further responsible person. There is no overarching Construction Phase Plan to consider both aspects and further to a review of the Construction Phase Plans, there is no reference to either separate project on each plan, which suggests that there may be unknown risks that exist between each project.

Documents referenced are:

1B.12.PD Signed Acceptance.v0

CPP FV Hospital – (25.05.22)

220801_SI_PORT002_Forth Valley Hospital_Larbert_TE

220915_SI_PORT002_Forth Valley Hospital_Larbert_TE

D9.8 CDM Construction Phase Plan(FES Group – Ancillary Works)

Workbook Ref No.	Areas to probe	Evidence expected
1.10	The Health Boards approach on the procurement journey with evidence of the plans on how the Board will provide assurance, particularly emphasis on the critical system identified earlier.	<p>Evidence on how this requirement is being managed and how it fits with the project governance arrangements</p> <p>Plans to identify any gaps in the procurement approach that may require to be addressed.</p> <p>Evidence on how Infection Prevention and Control are involved with the procurement approach to future plans for project.</p> <p>Evidence that the Health Boards selected procurement route has gone through the Board's Governance channels.</p>

NHS Scotland Assure Observations:

Planned engagement with the IPCT is noted in the procurement document provided, and notes of NTC Project Group Infection Control Workshops, which demonstrate ongoing engagement with the IPCT and consideration of relevant issues. The Area Infection Control Manager is listed as a member of the NTC Equipment Workshop.

Documents referenced are:

1.12D.2.Procurement JF221119.v1

25.02.22.Minutes of Meeting APPROVED

26.04.22.Minutes of Meeting DRAFT

26.05.22 Action Log

NTC Equipment Workshop TOR.v1

Workbook Ref No.	Areas to probe	Evidence expected
1.11	Evaluation of the Health Boards commissioning plan.	Evidence that the Health Board has recorded plans that are comprehensive and adequate to address the needs of

		<p>the project and that they are fully resourced.</p> <p>Evidence that the Board has had all pre-commissioning checks audited and approved by an independent organisation.</p>
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NHS Scotland Assure Observations:

As described in the response to KSAR question 1.4, no assurance has been provided that the preparation of commissioning documentation is being suitably developed, complete with specific processes and managed by an independent commissioning manager.

At the time of the KSAR, construction works were ongoing and pre-commissioning checks were still to be undertaken. There is insufficient evidence to provide assurance that the health board and the Modular Build Contractor are engaged in generating the required information for testing and commissioning, appointing independent third parties and assigning actions.

Documents referenced are:

- Forth Valley NTC Component Placement 15-03-2022*
- Forth Valley Commissioning Statement 26th October 2021*
- CT2659 – Forth Valley – ITPS*
- M&E LFBVH Programme Draft (Ancillary Works)*
- 26.05.22 – Action Log (Water Safety Group)*

Workbook Ref No.	Areas to probe	Evidence expected
1.12	Evaluation of the Health Boards duty holder matrix.	<p>Evidence that the Health Board have a fully recorded matrix of the required roles and responsibilities and have a clear governance structure that is fully resourced together with plans in place for the implementation.</p> <p>Evidence that Health Boards have appropriate number of competent, qualified staff to carry out specific duties throughout the life cycle of the project e.g., IPC, Engineers, Estates staff etc. The number of competent, qualified staff will depend on the type and size of the Build Project.</p>

NHS Scotland Assure Observations:

NHS FV have submitted a comprehensive roles and responsibilities matrix for the project and these clearly define the responsibilities of each role and identifies the

responsible person(s). The table includes the Area Infection Control Manager, Infection Control Lead, Soft Landings Champion, Authorising Engineers, Clerk of Works and Estates representatives.

Whilst this provides assurance that there are roles in place to lead and/or support the project up to Handover, no detail has been provided on the resource required to manage the facility in use. There are no details of the number or roles required for operational roles such as Authorised Persons (APs), Competent Persons (CPs), IPC etc. required in the ongoing management of the facility.

Documents referenced are:

Governance Structure-EC Organogram v8

3.1.2 Project Governance and General Arrangements: Further Observations

No additional observations were recorded.

3.2 Water and Internal Plumbing / Drainage Systems

3.2.1 Water and Internal Plumbing / Drainage Systems: KSAR Observations

4 Workbook Ref No.	Areas to probe	Evidence expected
2.1	How does the Health Board assure itself that all plumbers are trained to understand the needs (including special requirements) for the installation of water and plumbing/drainage systems in the healthcare environment?	<p>Evidence of a vetted list of site plumbers which confirms qualifications and healthcare experience.</p> <p>Evidence that the site induction with respect to working on water and plumbing/drainage services has been developed, implemented and agreed with the Board.</p> <p>Where anyone does not have previous healthcare experience, evidence should be provided of the relevant onsite training which was provided to them before they commence work on site.</p> <p>Evidence that all contractors and sub-contractor competency checks have been completed and signed off.</p>

NHS Scotland Assure Observations:

The Modular Build Contractor has submitted subcontractor details, however, the information does not provide assurance with respect to the operatives competency to work on the plumbing/drainage systems. No evidence has been submitted which confirms that all contractors and subcontractor competency checks have been reviewed and signed off by NHS Forth Valley.

The information submitted includes a company profile and training certificates associated with each of the three identified employees. There is no evidence to confirm if any of the individuals have any previous healthcare experience and it is not clear if this is being reviewed by the Modular Build Contractor, or their subcontractors. There is no evidence of a defined process in place for delivering training or mentoring to those with no healthcare experience.

The Modular Build Contractor has not submitted any evidence relating to the site induction process. There is no evidence to suggest that a site induction process with respect to working on the water and plumbing/drainage services has been developed, implemented and agreed with the Board.

The MEP subcontractor verbally confirmed at the Plumbing and Domestic Water Services Workshop, that no additional on-site training will be required other than

toolbox talks, to reinforce the message about maintaining a state of cleanliness within the domestic water pipeline installations, removal of contaminated pipework and the requirements for joint testing (SHTM 04-01 Part A. Clauses 16.3 and 16.4.), however, it is not clear the basis for this assessment or if the health board has assessed the requirement for further training.

The Modular Build Contractor verbally confirmed at the Plumbing and Domestic Water Services Workshop that prior to the induction process, the MEP subcontractor prepared and submitted a Risk Assessment and Method Statement (RAMS) which would have been used during the induction process. The RAMS document has not been submitted as part of the KSAR evidence. No evidence was submitted to indicate if the Board has commented on the RAMS document.

Documents referenced are:

MEP subcontractor Company Profile

MEP subcontractor (Mechanical) Certificates

Pipework Joint testing performance specification

Workbook Ref No.	Areas to probe	Evidence expected
2.2	How does the Health Board assure itself that the plumbing contracting company have the relevant experience to direct and manage their staff on the site for a healthcare environment?	<p>Evidence of similar, previous healthcare projects by the contractor.</p> <p>Evidence of site management structure.</p> <p>Evidence of HAI and SHPN 30 training.</p>

NHS Scotland Assure Observations:

The Modular Build Contractor has submitted a company profile identifying the MEP subcontractor’s previous healthcare experience and company management structure. The company profile identifies various healthcare facilities where the MEP subcontractor have been involved, however, it does not clearly define details of the works completed, nor whether any of the individuals working on this project were involved in any of the examples provided.

The company management structure submitted identifies the primary management structure of the company. It does not clearly define the site management structure, nor the site-based individuals including the roles and responsibilities of these individuals.

No evidence has been submitted which demonstrates that HAI and SHPN 30 training has been provided to the MEP subcontractor’s personnel. It was confirmed at the Plumbing and Domestic Water Services Workshop held on Monday 14th November 2022 that the MEP subcontractor personnel do not require HAI scribe and SHPN 30 training, however, the basis of this assessment is not clear and there is no evidence that this has been discussed with NHS FV or their IPC team.

Documents referenced are:
 MEP Subcontractor Company Profile

Workbook Ref No.	Areas to probe	Evidence expected
2.3	How does the Health Board ensure that the water and plumbing / drainage systems are being installed to the correct standard and reflect the agreed design?	Written and photographic, monthly evidence for the progress of work produced by a body which is independent of the contractor and which confirms compliance of the works to date.

NHS Scotland Assure Observations:

Whilst NHS Forth Valley were able to demonstrate an element of quality monitoring via site inspection reports, it was unclear how the respective parties implementing quality monitoring (e.g. modular build contractor, external supervisors) were co-ordinating observations or tracking resolution/closure of any quality matters raised. There is also no reference to the integration of key stakeholders, such as Infection, Prevention and Control (IPC) within this process.

It was verbally confirmed that the NHS FV Technical Advisor team will act independently of the Modular Build Contractor and will be undertaking regular inspections of the works. The Board has submitted a copy of NHS FV Technical Advisor team’s Site Inspection record dated 2nd August 2022. The report submitted is a record of an inspection undertaken at the Modular Build Contractor factory ahead of the units being transported to the temporary storage facility in Grangemouth. The report predates the above ground drainage installation start date, however, the report does cover the domestic water services installations. It is noted that the report is silent with reference to the installations being installed to the correct standard and being reflective of the agreed design. The Site Inspection record does however include several photographs of the installation progress

The Board should ensure that all subsequent monthly NHS FV Technical Advisor Team reports include written and photographic evidence of progress including commentary and photographic evidence of the installations being installed to the correct standard and agreed design.

It was verbally confirmed at the Plumbing and Domestic Water Services Workshop, that in addition to the NHS FV Technical Advisor team monthly report, the Modular Build Contractor would be preparing monthly reports (including photographs) of the progress of the works in site. It was confirmed that MEP subcontractor would also prepare a specific Plumbing and Domestic Water Services progress report for inclusion within the relevant MEP sections of the Modular Build Contractor’s monthly report. However, no evidence was provided to define these processes or to provide assurance that the processes are being followed.

It was also verbally confirmed that both the SPV and SPV'S MEP Consultant would also be undertaking periodic inspections of the installations; however the quantity and frequency of inspections was not confirmed.

Documents referenced are:

NHS FV Elective Ward_Modular Build Contractor Factory_Site Inspection Report_220802_Final.V1

Workbook Ref No.	Areas to probe	Evidence expected
2.4	How does the Health Board ensure that precautions are taken throughout the works to avoid open pipe ends for a period beyond the time needed to make a joint on that pipe end?	Photographic and written evidence for the progress of work produced by a body which is independent of the contractor (on a monthly basis).

NHS Scotland Assure Observations:

As identified in the response to Question 2.3, the Board has employed a Technical Advisor Team to act independently of the Modular Build Contractor and undertake periodic inspections of the works. It was verbally confirmed that the NHS FV Technical Advisor Team will prepare and issue a monthly report on the progress of the works.

The Board has submitted a copy of NHS FV Technical Advisor Team's Site Inspection record dated 2nd August 2022. This clearly identifies several instances where temporary capping/bagging of the installed pipework was missing, and that capping/bagging of stored materials had been removed or damaged. It is not clear from the report as to what remedial works have been undertaken by the Modular Build Contractor to rectify the identified non-compliance.

It was evident from the site inspection on Monday 7th November 2022, that the first fix water services pipework installation had commenced. It was noted by NHS SA during the visit that any installed pipework open ends had been capped with proprietary plastic plugs.

Documents referenced are:

NHS FV Elective Ward_Modular Build Contractor Factory_Site Inspection Report_220802_Final.V1

Workbook Ref No.	Areas to probe	Evidence expected
2.5	How does the Health Board ensure that water services are installed in a fashion which will provide ease of access for future maintenance?	Evidence that the contractor has presented their co-ordination drawings (BIM model) to the Board. Evidence that the contractor has presented their co-ordination drawings

		<p>(BIM model) to the design consultant and that they have agreed them for construction.</p> <p>Evidence that the contractor has presented each of the main service runs plus plant rooms to the Board's FM team.</p> <p>Evidence that the plant access strategy is being adhered too.</p>
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NHS Scotland Assure Observations:

The documents submitted by NHS FV do provide assurance that the domestic water services will be installed in a fashion which will provide ease of access for future maintenance.

The *'Revit Model Coordination Report'* provided states that there is no requirement for any level of Building Information Modelling (BIM) for this project. It is unclear from the evidence provided as to what this statement is based upon, nor if NHS FV have considered the requirements to comply with Scottish Government policy with respect to BIM for new projects commencing for procurement procedures from April 2017, nor if the Scottish Government BIM grading tool has been used to support this assessment.

The MEP subcontractor has, however, developed a BIM model incorporating the MEP services using Revit software. Extracts from the BIM model are included in the *'Revit Model Coordination Report'*. The report contains 5 no. screen shots indicating sections at various points through the building which only provide a snapshot of the services coordination in these areas. From the sections reviewed, the corridor ceiling void is congested and access around and within the voids could be problematic in some areas. This information was presented during the previous FBC KSAR review and does not appear to have been updated to address the concerns raised and to demonstrate the level of coordination expected at the Construction stage. The limited examples provided do not provide assurance that the services will be installed in a fashion which will provide ease of access for future maintenance.

There is no evidence that the MEP design consultants have reviewed and approved the *'Revit Model Coordination Report'* and the associated BIM model. There is also no evidence that the BIM model or coordination drawings have been presented for review to the health board or the SPV and their Hard FM Contractor, who will be responsible for maintenance of the facility on completion.

It was evident from the KSAR site inspection on Monday 7th November 2022, that the first fix domestic water services pipework installation had commenced. The Modular Build Contractor has utilised offsite manufacturing techniques in the form of Prefabricated Service Units (PSUs). These units have been constructed off site and the primary MEPH distribution installations have been installed within the main circulation routes. The PSUs include the mains service distribution routes for

ductwork, domestic water, chilled and heating pipework etc. From the inspection, it was noted that the domestic water services pipework was being installed on the underside of the prefabricated service modules. Whilst this may assist with access, a full review of the level of access for the domestic water services was not possible, given the level of detail of the documentation provided for review.

It was verbally confirmed at the Plumbing and Domestic Water Services Workshop that the SPV (FM contractor) had reviewed the drawings and were content with the access in ceiling voids and plant rooms, The health board noted that the coordinated drawings and plant access strategy has been agreed. However, there is no evidence provided to support the above statements and to define the process undertaken.

Documents referenced are:

C2659-MEP subcontractor-M1-00-DR-X-5810_1 Revision 4

C2659-MEP subcontractor-M1-00-DR-X-5802 Rev C1

Revit Model Coordination Report, OPP1180824 PTK-A1-RP-A-003 Rev P01

Workbook Ref No.	Areas to probe	Evidence expected
2.6	How does the Health Board ensure that water and plumbing / drainage services are installed in a fashion which will retain space for minor additions and modifications to services in the future?	<p>Evidence that the contractor has presented their co-ordination drawings (BIM model), with space for future flexibility identified, to the Board.</p> <p>Evidence that the design consultant has considered and agreed with the Board, space for future flexibility in the service installations.</p> <p>Evidence that the contractor has presented their co-ordination drawings (BIM model), with space for future flexibility identified, to the design consultant and that they have agreed them for construction.</p> <p>Evidence that the contractor has presented each of the main service runs plus plant rooms to the Board's FM team, to highlight space for future flexibility.</p> <p>Evidence that the Health Board has agreed a strategy (percentage) for spare capacity and a documented allowance to be incorporated into the design.</p>

		Are plant/tank rooms, IPS sections, horizontal distribution runs and risers appropriately sized for the equipment being installed and facilitate safe adequate maintenance?
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NHS Scotland Assure Observations:

As described in the response to KSAR Question 2.5, the Modular Build Contractor has stated that there is no requirement under the contract to apply specific BIM protocols. However, the MEP subcontractor has modelled the MEP systems using Revit software.

As described in the response to KSAR Question 2.5, the '*Revit Model Coordination Report*' does not appear to have been updated since the FBC KSAR process. As the report does not include a clash detection report or identify any zones for future flexibility, it is not possible to assess if access to space for minor additions and modifications to the water services / drainage installation in the future has been adequately demonstrated.

There is no evidence to suggest that the Modular Build Contractor has presented their coordination drawings indicating future flexibility zones to the health board. In addition, there is no evidence which would confirm that the MEP Consultant has considered and agreed space for future flexibility within the domestic water installation.

The Modular Build Contractor has not submitted any evidence to confirm if any spare capacity has been incorporated into the design. It is noted from the FBC KSAR review that the Board's Construction Requirements for the building infrastructure for the existing facility was to have 25% spare capacity (for all services) at the time of design. There is no evidence to suggest that the spare capacity allowances have been incorporated within the current design proposals for the elective ward building.

Documents referenced are:

- C2659-MEP subcontractor-M1-00-DR-X-5810_1 Revision 4
- C2659-MEP subcontractor-M1-00-DR-X-5810_2 Revision 2
- C2659-MEP subcontractor-M1-00-DR-X-5802 Rev C1
- C2659-MEP subcontractor-M1-00-DR-X-5803 Rev C1
- C2659-MEP subcontractor-M1-00-DR-X-5804 Rev C2
- Revit Model Coordination Report, OPP1180824 PTK-A1-RP-A-003 Rev P01
- Explanation text document

Workbook Ref No.	Areas to probe	Evidence expected
2.7	How does the Health Board assure itself that all plumbers materials are stored on site in an environment which protects them from	Written, monthly evidence for the progress of work produced by a body which is independent of the contractor and which confirms inspection of the site storage of materials.

	deterioration and from the entry of contaminants into the parts of the component which will be in contact with the water?	Photographic evidence of the site storage of materials produced by a body which is independent of the contractor (on a monthly basis).
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NHS Scotland Assure Observations:

As identified in the response to Question 2.3, the Board has employed a Technical Advisor team to act independently of the Modular Build Contractor and to undertake periodic inspections of the works. The reports provided were in relation to the factory inspection of the modular units. No further evidence was provided of ongoing MEP quality inspections. It was verbally confirmed that future inspections would review the locations of stored materials and the protection afforded to the systems to prevent the ingress of any contaminants.

It was evident from the KSAR site inspection on 14th October and 7th November 2022, that the first fix water services pipework installation had commenced. Pipework installed at high level was capped with proprietary end caps. Pipework being stored internally within the facility was stored on wooden pallets to ensure that the pipework is not in contact with the ground floor slab and that the pipework has been provided with proprietary end caps to prevent the ingress of dirt /debris.

It was confirmed at the Plumbing and Domestic Water Services Workshop held on Monday 14th November 2022 that all domestic pipework and pipework fittings will be stored on site in a dry, secured area, i.e. within a container. The pipework will be stored horizontally on purpose designed pipe racks to ensure that the pipework was clear of the floor. The stored pipework will also be capped and sealed with polythene. However, at the time of the KSAR this storage facility was not available to view.

Documents referenced are:

NHS FV Elective Ward_Modular Build Contractor Factory_Site Inspection Report_220802_Final.V1

Workbook Ref No.	Areas to probe	Evidence expected
2.8	How does the Health Board assure itself that all pre-commissioning inspections are completed and recorded before commissioning can commence?	<p>Evidence that adequate pre-commissioning check sheets (SHTM 04-01 Part A) have been completed and signed off.</p> <p>Evidence that the Health Board has had all pre-commissioning checks audited and approved by an independent organisation.</p>

NHS Scotland Assure Observations:

The board has submitted the MEP subcontractor's '*Original Commissioning Programme*'. Limited detail is provided within the programme and no reference to pre-commissioning checks within the documentation provided. The testing and commissioning activities defined within the programme, do not reflect the full extent of activities required to demonstrate compliance with SHTM 04-01. The commissioning period is noted as 23 days, however, given the lack of detail provided, there is a risk that adequate time for commissioning is not considered within the overall programme.

At the time of the KSAR, the domestic water and drainage installations were at the 1st fix stage, and there was no evidence that completion of any pre-commissioning check sheets included in line with '*SHTM 04-01*', '*BS EN12056*' or '*CIBSE Commissioning Code W*' had commenced. The MEP subcontractor has submitted a series of '*In Process Quality Check Sheets*' (IPQCS). A sheet has been prepared to record the flushing of all water systems and the above ground drainage stack tests. The IPQCS check sheets do not provide a record of pre-commissioning checks completed on either the domestic water services, or above ground drainage systems. There is no evidence to provide assurance that the process for undertaking pre-commissioning checks in line with SHTM 04-01 has been considered.

An M&E Commissioning Statement has been provided, developed by the Modular Build Contractor's MEP Consultant, dated October 2021. Whilst this document references test samples from the existing systems and the testing, flushing and disinfection process, it is not a Designer's Commissioning Brief as it does not reflect the level of detail as described within SHTM 04-01 Parts A and C. This document has also not been updated further to the previous FBC Stage KSAR submission.

The Modular Build Contractor has submitted a copy of the MEP Subcontractor's Inspection and Test Plan. This document identifies the standards and acceptance criteria for the above ground drainage and domestic water services installations; however, the document refers to the manufacturer's instructions as being the standard for inspection and testing and does not refer to required standards such as the appropriate British Standards, CIBSE Code W and the requirements of SHTM 04-01 for domestic water services or BS EN 12056 for above ground drainage.

The MEP subcontractor has also submitted a copy of the HVAC commissioning plan. This document does not have a reference date. The document contains sections relating to the flushing, chlorination, balancing, sampling of the domestic water systems. It is not clear if this document has been submitted to the Boards or SPV Water Authorising Engineer for review or comment.

It was verbally confirmed at the Plumbing and Domestic Water Services Workshop, that the Water Management Plan has been circulated within the Modular Build Contracting team, however it is unclear if this has been submitted to the Board.

The Board should ensure that all of the various parties roles and responsibilities are agreed and clearly defined with the final Inspection Testing and Completion Plan.

Documents referenced are:

NHS FV MEP Performance Specification, Revision E, September 21
Forth Valley M&E Commissioning Statement dated 26 October 2021 revision A
Inspection and Test Plan, Revision A, dated 10 June 2022
MEP subcontractor In Process Quality Check Sheets
Original Commissioning Programme
HVAC Commissioning Plan

Workbook Ref No.	Areas to probe	Evidence expected
2.9	How does the Health Board assure itself that all variations which may be required to water and plumbing and drainage systems after tender are investigated and agreed by all parties before they are instigated?	Evidence that the each variation / derogation has a detailed technical analysis and has been referred to the Board and agreed with their water management group, clinical, Estates, infection control and FM teams.

NHS Scotland Assure Observations:

The Derogation Schedule provided does not include any derogations associated with the water services or above ground drainage installations.

The health board have also submitted a copy of the NHS FV 'Change Control Tracker'. This document identifies 2 No. change control items associated with the water and drainage installations. There is evidence in the form of emails from NHS FV stakeholders and the Authorising Engineers (Water), to suggest that the Board and the Water Safety Group have been kept informed of changes.

The health board verbally confirmed during the Plumbing and Domestic Water Services Workshop held on Monday 14th November 2022 that no further derogations have been sought to date and that any derogations that have been accepted, e.g. the use of AAVs within patient bedded areas have been confirmed by the clinical team via their representation within the infection control team and at project board.

Documents referenced are:

Project board meeting minutes dated 25 February 2022, 28 March 2022 and 25 July 2022.
Derogation Schedule Nr 7. dated 25 July 2022
NHS FV Change Control Tracker dated 04.07.22

3.2.2 Water and Internal Plumbing / Drainage Systems: Further Observations

In addition to the points raised via the KSAR workbook above, we also include the following observations as a result of the review, all of which relate to the evidence presented during the appraisal.

3.2.2.1	N/A
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3.3 Ventilation

3.3.1 Ventilation: KSAR Observations

Workbook Ref No.	Areas to probe	Evidence expected
3.1	How does the Health Board assure itself that all duct and plant installers are trained to understand the needs (including special requirements) for the installation of ventilation systems in the healthcare environment?	<p>Evidence of a vetted list of duct and plant installers which confirms qualifications and healthcare experience.</p> <p>Evidence that the site induction with respect to working on ducts and plant services has been developed, implemented and agreed with the Board.</p> <p>Evidence that all contractors and sub-contractor competency checks have been completed and signed off.</p>
<p>NHS Scotland Assure Observations:</p> <p>The observations noted in response to KSAR Question 2.1 apply to this question with respect to ventilation.</p> <p>The Modular Build Contractor has submitted subcontractor details. The information submitted includes a company profile and various certificates associated with each of the two identified employees. The information submitted indicates that only one of the operatives has a recognised ventilation installation qualification. There is no evidence to confirm if any of the individuals have any previous healthcare experience.</p> <p>At the KSAR Ventilation Workshop held on Tuesday 15th November 2022, the Modular Build Contractor verbally confirmed that prior to the induction process, MEP Subcontractor had prepared and submitted a Risk Assessment and Method Statement (RAMS) for their works, this statement would have been used during the induction process, however it was confirmed by the NHS FV Technical Advisor team that the Ventilation RAMS document has not been received by the Board. The RAMS document was not submitted as part of the KSAR process.</p> <p>Documents referenced are: MEP Subcontractor Company Profile MEP Subcontractor (Mechanical) Certificates</p>		

Workbook Ref No.	Areas to probe	Evidence expected
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3.2	How does the Health Board assure itself that the ventilation contracting company and their plant installers have the relevant experience to direct and manage their staff on the site for a healthcare environment?	<p>Evidence of similar, previous healthcare projects by the contractor.</p> <p>Evidence of site management structure.</p>
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NHS Scotland Assure Observations:

The observations noted in response to KSAR Question 2.2 apply to this question with respect to ventilation.

Documents referenced are:

MEP subcontractor Company Profile
MEP subcontractor (Mechanical) Certificates

Workbook Ref No.	Areas to probe	Evidence expected
3.3	How does the Health Board ensure that the ventilation systems are being installed to the correct standard and reflect the agreed design?	Written, monthly evidence for the progress of work (including photographs) produced by a body which is independent of the contractor and which confirms compliance of the works to date.

NHS Scotland Assure Observations:

The observations noted in response to KSAR Question 2.3 apply to this question with respect to ventilation.

The Modular Build Contractor have also submitted a copy of the Quality Plan, which confirms that ‘*Quality Control Checklist Sheets*’ (IPQCS) will be utilised on the Mechanical and Electrical systems. The Inspection Test Plan provided includes a copy of the following IPQCS relevant to ventilation:

- IPQCS ME014 – Ductwork Installations
- IPQCS ME020 – Fire Damper Drop Tests
- IPQCS ME039 – Ventilation Test Witnessing

The IPQCS provided, however, are blank. It was confirmed at the Ventilation Workshop held on Tuesday 15th November, that the IPQCS checklists submitted are for the sole purpose of demonstrating the checks that were undertaken during the manufacturing process. The Modular Build Contractor confirmed that these checklists will not be used on site, therefore it is not clear what process will be used for

monitoring that the ventilation systems will be installed in line with the design by the Modular Build Contractor or their subcontractors.

Documents referenced are:

NHS FV Elective Ward_Modular Build Contractor Factory_Site Inspection Report_220802_Final.V1

Modular Build Contractor Quality Management Plan

Project Construction Meeting Minutes

Workbook Ref No.	Areas to probe	Evidence expected
3.4	How does the Health Board ensure that precautions are taken throughout the works to avoid open duct or plant ends for a period beyond the time needed to make a joint on that duct / plant end?	Photographic and written evidence for the progress of work produced by a body which is independent of the Contractor (on a monthly basis).

NHS Scotland Assure Observations:

As identified in the response to Question 2.3, the Board has employed an NHS FV Technical Advisor Team.

The Board has submitted a copy of NHS FV Technical Advisor Team’s Site Inspection record dated 2nd August 2022. Included within this report is a section which clearly identifies several instances where temporary capping/bagging of the installed ductwork was missing and that stored materials had had their capping/bagging either removed or damaged. It is not clear from the report as to what remedial works have been undertaken by the Modular Build Contractor to rectify the identified non-compliance.

It was evident from the KSAR site inspection on Monday 7th November 2022, that the first fix ventilation installation had commenced. It was noted by NHSSA that in three instances ductwork had been installed without any capping or bags covering the ends of the ductwork. It was also noted by NHS SA that the ductwork and automatic fire smoke dampers are being stored within the building in unsecured areas. The ductwork and dampers are being stored on wooden pallets. The stored ductwork and dampers were sealed with polythene.

The Board should ensure that the Contractor includes a section within the updated Ventilation Installation RAMS document which confirms the process for cleaning/replacement of any section of ductwork that becomes contaminated.

Documents referenced are:

Workbook Ref No.	Areas to probe	Evidence expected
3.5	How does the Health Board ensure that ventilation services are installed in a fashion which will provide ease of access for future maintenance?	<p>Evidence that the Contractor has presented their co-ordination drawings (BIM model) to the Board.</p> <p>Evidence that the Contractor has presented their co-ordination drawings (BIM model) to the Design Consultant and that they have agreed them for construction.</p> <p>Evidence that the Contractor has presented each of the main service runs plus plant rooms to the Board's FM team. Safe and adequate access has been provided.</p>

NHS Scotland Assure Observations:

The observations noted in response to KSAR Question 2.5 apply to this question with respect to ventilation. The concerns raised at the time of the FBC review in relation to access provision for the ventilation systems have not been addressed within the evidence provided.

The Modular Build Contractor has submitted a coordinated plantroom layout with plant access / maintenance zones indicated for the main plant and Air Handling Units (AHUs), however, a number of concerns have been identified with the provision of safe access. There is no evidence to confirm if this drawing has been reviewed by the relevant NHS FV stakeholders, to agree that access is appropriate for future maintenance.

- The drawing indicates that there is an AHU located at high level within the plant room. It is not clear if there is sufficient space for safe access around the AHU, to allow for inspection, maintenance, repair or replacement of components in line with *SHTM 03-01 Part A 2014 Clause 3.57*.
- There are also concerns about the proximity of the AHU to adjacent plant, and the facility to access sections of ductwork and dampers.
- It is noted that the fresh air intake duct is located on the roof of the plantroom, it is unclear from the information submitted as to how this intake duct will be accessed and maintained.
- It is shown on the plant room drawing that the clean air extract louvre (Reference EL01) is located close to the floor level of the plantroom. *SHTM 03-01 Part A (2014 edition) clause 3.65* advises that where intakes are sited at or near ground level, the area around them should be paved or concreted to prevent soil or vegetation being drawn in. They should also be caged or located

within a compound to prevent rubbish being left in the vicinity. There is no evidence to suggest that that these precautions have been included within the design proposals.

During the site visit undertaken by the KSAR team on Monday 7th November 2022, no access was made available to the plant room area to review the provision of access to plant. During the visit it was observed that the first fix of the ventilation ductwork installation had commenced, with ventilation ductwork located above the piped and electrical services. The space available to form branch connections to the main ducts is limited, as is the space for access to components such as volume control dampers and fire dampers.

The process for the coordination of MEP services has not been clearly demonstrated through the evidence provided. The review and sign off of the access and maintenance strategy by the health board and other stakeholders has not been evidenced through the KSAR.

The SPV's FM contractor confirmed at the ventilation workshop that they have reviewed the drawings and are content with the access to the ductwork within ceiling voids and to plant items located in plant rooms, however, no evidence of any comments made, or the process undertaken has been submitted.

Documents referenced are:

Construction Issue Ventilation layout drawings

Coordinated plantroom layout - C2659-'MEP-Subcontractor'-M1-00-DR-X-5810_1 Modular Build Contractor Quality Management Plan

BIM Revit Coordination report - OPP1180824 PTK-A1-RP-A-003 Rev P01

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Modular Build Contractor Quality Management Plan

Workbook Ref No.	Areas to probe	Evidence expected
3.6	How does the Health Board ensure that ventilation services are installed in a fashion which will retain space for minor additions and modifications to services in the future?	<p>Evidence that the contractor has presented their co-ordination drawings (BIM model), with space for future flexibility identified, to the Board.</p> <p>Evidence that the design consultant has considered and agreed with the Board, space for future flexibility in the service installations.</p> <p>Evidence that the contractor has presented their co-ordination drawings</p>

		<p>(BIM model), with space for future flexibility identified, to the design consultant and that they have agreed them for construction.</p> <p>Evidence that the contractor has presented each of the main service runs plus plant rooms to the Board's Estates team and / or, to highlight space for future flexibility.</p> <p>Evidence that the ventilation solution has been agreed with clinical and IPC colleagues.</p> <p>Evidence that the Board has agreed a strategy (percentage) for spare capacity and a documented allowance to be incorporated into the design.</p> <p>Are plant rooms, horizontal distribution runs and risers appropriately sized for the equipment being installed and facilitate safe adequate maintenance?</p>
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NHS Scotland Assure Observations:

The observations noted in response to KSAR Question 2.6 apply to this question with respect to ventilation.

There is no evidence submitted to identify if the Modular Build Contractor has presented their coordination drawings indicating the future flexibility/ minor amendment zones to the Board. In addition, there is no evidence which would confirm that the Design Consultant has considered and agreed space for future flexibility within the ductwork installations.

It should be noted that at the time of the FBC review, detailed design calculations had not been provided therefore it was not possible to confirm if the design solutions included any spare capacity or if compliance with SHTM 03-01 Part A Table 4 is achieved.

Documents referenced are:

C2659-MEP Subcontractor-M1-00-DR-X-5810_1 Revision 3

C2659-MEP Subcontractor-M1-00-DR-X-5810_2 Revision 3

NHS FV Environmental Matrix 3 Feb 2022

NHS FV MEP Performance Specification, Revision E, September 21

Workbook Ref No.	Areas to probe	Evidence expected
3.7	How does the Health Board assure itself that all ventilation materials are stored on site in an environment which protects them from deterioration and from the entry of contaminants into the parts of the component which will be in contact with the air flow?	<p>Written and photographic, monthly evidence for the progress of work produced by a body which is independent of the contractor and which confirms inspection of the site storage of materials.</p> <p>Photographic evidence of the site storage of materials produced by a body which is independent of the contractor (on a monthly basis).</p>
<p>NHS Scotland Assure Observations:</p> <p>As identified in the response to Question 2.3, the Board has employed an NHS FV Technical Advisor Team who submit inspection reports. As described in the response to Question 3.4, the NHS FV Technical Advisor Team’s site inspection report has been provided as an example, which identifies where temporary capping/bagging of the installed ducting was missing and that stored materials had had their capping/bagging either removed or damaged.</p> <p>Further examples of photographs taken on site by the NHS FV Technical Advisor Team have been provided, however, no associated inspection report have been provided. It is not clear if NHS FV undertake a review of the photographs and whether these are recorded on file.</p> <p>It is noted that the NHS FV Performance Specification Rev E identifies that ductwork shall be manufactured, delivered, installed and protected to prevent the ingress of dust/dirt and cleaned if required in accordance with TR/19 PDI level 2 for general ductwork TR/19 PDI level 3 for clinical areas ductwork. SHTM 03-01 Part A requires ductwork to be cleaned to “advanced level” as defined in the 2005 edition of TR19. There is no evidence to confirm that the ductwork is installed in line with these requirements, or that this standard is being considered in the ongoing monitoring of the works. The health board should ensure that this standard is monitored and maintained throughout the duration of the works.</p> <p>The Board should ensure that all future reports include a section in relation to the storage of the ventilation ductwork and associated ancillaries, including photographs of materials storage locations.</p> <p>Documents referenced are: <i>NHS FV Elective Ward_Modular Build Contractor Factory_Site Inspection Report_220802_Final.V1</i></p>		

Workbook Ref No.	Areas to probe	Evidence expected
3.8	How does the Health Board assure itself that all pre-commissioning inspections are completed and recorded before commissioning can commence?	<p>Evidence that adequate pre-commissioning check sheets (CIBSE, BSRIA) have been completed and signed off.</p> <p>Evidence that the Board has had all pre-commissioning checks audited and approved by an independent organisation.</p>

NHS Scotland Assure Observations:

The observations noted in response to KSAR Question 2.6 apply to this question with respect to the commissioning of the ventilation system.

At the time of the KSAR, the ductwork installations were at the 1st fix stage, and there was no evidence provided to demonstrate the pre-commissioning check sheets included within SHTM 03-01 or CIBSE Commissioning Code A had been completed at this time.

An M&E Commissioning Statement has been provided, developed by the Modular Build Contractor's MEP Consultant, dated October 2021. This document does not refer to the pre commissioning and final commissioning checks identified within SHTM 03-01 Part A Chapter 8.0. It is not a Designer's Commissioning Brief as it does not reflect the level of detail as described within SHTM 03-01 Part A. This document has also not been updated further to the previous FBC stage KSAR submission.

The Inspection and Test Plan submitted describes the standards and acceptance criteria for the ventilation systems as being the Modular Build Contractor's MEP Consultant's MEP Performance Specification. NHS FV have submitted a copy of the Performance Specification. Whilst this refers to the CIBSE Commissioning Codes, it does not refer to the pre-commissioning and commissioning requirements indicated within SHTM 03-01 Part A. The standards used should be the requirements of SHTM 03-01, appropriate British Standard and CIBSE Commissioning Code A.

It was confirmed at the Ventilation Workshop held on Tuesday 15th November 2022 that the MEP subcontractor will undertake all of the required pre-commissioning checks for the ventilation system and NHS FV Technical Advisor Team will confirm that these checks have been completed on behalf of the Board. NHS FV confirmed that all pre-commissioning validation and final validation will be undertaken by the Board. There is, however, no supporting evidence submitted which confirms the above statements

The Board should ensure that all of the testing and pre-commissioning forms include those associated with Air Handling Unit (AHU) and air distribution pre-commissioning checklists, fan performance test sheets, air balance (terminals) test sheets, duct travers record sheets and finally the inspection and test forms for the Fire and Smoke Dampers.

Documents referenced are:

NHS FV MEP Performance Specification, Revision E, 24 September 21

Inspection and Test Plan, Revision A, dated 10 June 2022

Forth Valley M&E Commissioning Statement dated 26 October 2021 revision A

Workbook Ref No.	Areas to probe	Evidence expected
3.9	How does the Health Board assure itself that all variations which may be required to ventilation systems after tender are investigated and agreed by all parties before they are instigated?	Evidence that the each variation / derogation has a detailed technical analysis and has been referred to the Board and agreed with their clinical, Estates, infection control and FM teams.

NHS Scotland Assure Observations:

NHS FV have submitted a copy of the NHS FV 'Change Control Tracker'. As noted in the response to KSAR question 1.2, there is no evidence of the process in place to manage variations to the design post-tender, other than the tracker provided.

The tracker identifies 2 no. changes associated with the insulation of the extract ductwork and the change of filter grade within the Air Handling Unit (AHU). No further detail is provided within the Change Control Tracker. There is evidence in the form of emails from the Modular Build Contractor, NHS FV Technical Advisor Team, SPV and NHS FV that they were aware of the AHU filter grade changes. There is no evidence to confirm that the Authorising Engineer (Ventilation) or the Ventilation Safety Group have been kept informed of changes.

Derogation schedule Revision 7 includes 1 no. derogation associated with requirement to insulate extract ductwork. The derogation schedule details the discussions that took place to discuss the derogation. The outcome of the discussions resulted in the derogation being rejected and an instruction issued for the Modular Build Contractor to insulate the extract ductwork.

It was confirmed at the Ventilation Workshop held on Tuesday 15th November 2022 that that no further derogations have been sought to date and that should any further derogations be raised that these will go through the current derogation review process.

Documents referenced are:

Project board meeting minutes dated 25 February 2022, 28 March 2022 and 25 July 2022.

Derogation Schedule Nr 7 dated 25 July 2022

NHS FV Change Control Tracker dated 04.07.22

3.3.2 Ventilation: Further Observations

In addition to the points raised via the KSAR workbook above, we also include the following observations as a result of the review, all of which relate to the evidence presented during the appraisal.

3.3.2.1	N/A
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3.4 Electrical

3.4.1 Electrical: KSAR Observations

Workbook Ref No.	Areas to probe	Evidence expected
4.1	How does the Health Board assure itself that all electricians are trained to understand the needs (including special requirements) for the installation of electrical systems in the healthcare environment?	<p>Evidence of a vetted list of site electricians which confirms qualifications and healthcare experience.</p> <p>Evidence that the site induction with respect to working on electrical services has been developed, implemented and agreed with the Board.</p> <p>Evidence that all contractors and sub-contractor competency checks have been completed and signed off.</p>
<p>NHS Scotland Assure Observations:</p> <p>The Modular Build Contractor has submitted subcontractor details in the form of individual certificates and a company profile, however, there is no assurance provided. No evidence has been submitted which confirms that all contractor and sub-contractor competency checks have been completed and signed off, this is despite the electrical installation works having commenced on site.</p> <p>For the three individuals listed, the certificates include Construction Skills Certification Scheme (CSCS) cards, basic disclosures, thermography certificate, inspection and testing, solar photovoltaics and level 3 certificate for the requirements of electrical installations. There is no evidence to confirm if any of the individuals have any previous healthcare environment experience. No evidence has been submitted to identify the site management structure.</p> <p>The Modular Build Contractor has not submitted any evidence relating to the site induction process. There is no evidence to suggest that a site induction process with respect to working on the electrical systems has been developed, implemented and agreed with the Board.</p> <p>Documents referenced are: <i>Electrical subcontractor Company Profile</i> <i>Electrical subcontractor (Electrical) Certificates</i></p>		

Workbook Ref No.	Areas to probe	Evidence expected
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4.2	How does the Health Board assure itself that the electrical contracting company have the relevant experience to direct and manage their staff on the site for a healthcare environment?	<p>Evidence of similar, previous healthcare projects by the contractor.</p> <p>Evidence of site management structure.</p> <p>Electricians completed approved current BS 7671 training course.</p> <p>Evidence that commissioning contractors have completed relevant test and commissioning courses.</p> <p>Evidence of trained operatives (AP and CP) to SHTM 06-02.</p>
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NHS Scotland Assure Observations:

The Modular Build Contractor provided a company profile identifying the electrical subcontractor’s previous healthcare experience and company management structure. The company profile identifies various healthcare facilities where they have been involved with the installation of electrical services.

The company management structure submitted identifies the primary management structure of the company. It also clearly defines the general site management structure, but not the specific site operatives for the Modular Build Ward’s NTC project.

Documents referenced are:

Electrical subcontractor Company Profile
Electrical subcontractor (Electrical) Certificates

Workbook Ref No.	Areas to probe	Evidence expected
4.3	How does the Health Board ensure that the electrical systems are being installed to the correct standard and reflect the agreed design?	<p>Written, monthly evidence for the progress of work produced by a body which is independent of the contractor and which confirms compliance of the works to date.</p> <p>Photographic and written evidence for the progress of work produced by a body which is independent of the contractor (on a monthly basis).</p>

NHS Scotland Assure Observations:

Whilst there have been a number of documents provided, there is no assurance currently that there are regular quality assurance inspections being undertaken which confirms compliance of the works to date.

During the NHSSA team’s inspection of the facility on Monday 7th November, it was evident that the electrical installation had commenced on site. NHS FV have confirmed that the NHS FV Technical Advisor Team will act independently of the Modular Build Contractor and will be undertaking regular inspections of the works.

The Board has submitted a copy of NHS FV Technical Advisor Team Site Inspection record dated 2nd August 2022 this provides a record of an inspection undertaken at the Modular Build Contractor factory ahead of the units being transported to the temporary storage facility in Grangemouth. The report is silent with reference to the installations being installed to the correct standard and being reflective of the agreed design. The Site Inspection record does, however, include several photographs of the installation progress.

The Board should ensure that all subsequent monthly NHS FV Technical Advisor Team reports include written and photographic evidence of progress including commentary and photographic evidence of the installations being installed to the correct standard and agreed design.

The Modular Build Contractor have also submitted a copy of the Quality Plan, this document confirms that Quality Control checklists will be utilised on the Mechanical and Electrical systems. The In-Process Quality check sheet provided does not specifically mention electrical installations, however it does refer to M&E installations.

Documents referenced are:

- NHS FV Elective Ward_Modular Build Contractor Factory_Site Inspection Report_220802_Final.V1*
- Portakabin Quality Management Plan*
- Project Construction Meeting Minutes*

Workbook Ref No.	Areas to probe	Evidence expected
4.4	How does the Health Board ensure that electrical services are installed in a fashion which will provide ease of access for future maintenance?	<p>Evidence that the contractor has presented their co-ordination drawings (BIM model) to the Health Board.</p> <p>Evidence that the contractor has presented their co-ordination drawings (BIM model) to the design consultant and that they have agreed them for construction.</p> <p>Evidence that the contractor has presented each of the main service runs plus plant rooms to the Health Board's FM team.</p>

NHS Scotland Assure Observations:

The observations noted in response to KSAR Question 2.5 apply to this question with respect to the ease of access to the electrical system. The documents submitted by NHS FV do not offer any assurance that the electrical services have been installed in a fashion which will provide ease of access for future maintenance.

A technical submission has been submitted within the evidence pack. Within this pack, there are electrical drawings provided, which are the same drawings provided during the FBC interim review process. These drawings are noted as 'Preliminary Issue', It is unclear if these have been approved for use in the Construction stage.

Documents referenced are:

OPP1180824 PTK-A1-RP-A-003(P01) Revit Model Co-ordination Report (1)
FORTH VALLEY TECH SUB FULL

Workbook Ref No.	Areas to probe	Evidence expected
4.5	How does the Health Board ensure that electrical services are installed in a fashion which will retain space for minor additions and modifications to services in the future?	<p>Evidence that the contractor has presented their co-ordination drawings (BIM model), with space for future flexibility identified, to the Health Board.</p> <p>Evidence that the design consultant has considered and agreed with the Health Board, space for future flexibility in the service installations.</p> <p>Evidence that the contractor has presented their co-ordination drawings (BIM model), with space for future flexibility identified, to the design consultant and that they have agreed them for construction.</p> <p>Evidence that the contractor has presented each of the main service runs plus plant rooms to the Health Board's FM team, to highlight space for future flexibility.</p> <p>Evidence that the Health Board has agreed a strategy (percentage) for spare capacity and a documented</p>

		<p>allowance to be incorporated into the design.</p> <p>Are sub stations, switch rooms, distribution board cupboards, horizontal distribution runs and risers appropriately sized for the equipment being installed and facilitate safe, adequate maintenance?</p>
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NHS Scotland Assure Observations:

The design information identifies that the primary containment routes are located within the corridor ceiling voids. As described in the response to KSAR Question 2.5, the corridor ceiling void appears congested and access to containment systems is not clearly demonstrated. As the Electrical subcontractor has not submitted any design calculations, it is not possible to be assured that the design proposals include sufficient capacity to facilitate minor additions within the containment in the future.

The 'Revit Model Coordination Report' provided, as described in the response to KSAR Question 2.5, does not identify any space for future flexibility for the electrical services, nor does it identify the electrical zones and crossovers. This information was presented at FBC stage and does not appear to have been updated.

The Electrical Technical Submission ('Tech Sub') drawings includes electrical system layouts and associated schematic, plant room layout drawings and an MEP Section noted within the drawings. The section provides limited detail and does not provide assurance that the electrical services have been fully coordinated with the other MEP services. The ceiling voids above the main circulation corridors, whilst coordinated, do not appear to indicate any zones for future flexibility.

The plant room layout submitted does not provide sufficient electrical detail to establish if any space for future flexibility has been included.

The Tech Sub drawings include electrical containment systems, which identify the main runs for electrical services. The corridors form the main runs and use a 700mm wide cable basket, sub divided into 300mm LV, 200mm data, 100mm fire alarm and 100mm Security and Nurse Call. The requirements of SHTM 06-01A clause 11.20 still requires to be satisfied.

Documents referenced are:

OPP1180824 PTK-A1-RP-A-003(P01) Revit Model Co-ordination Report (1)
 FORTH VALLEY TECH SUB FULL

Workbook Ref No.	Areas to probe	Evidence expected
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4.6	How does the Health Board assure itself that all electrical materials are stored on site in an environment which protects them from deterioration and from the entry of contaminants into the operational parts of the component?	<p>Written, monthly and photographic evidence for the progress of work produced by a body which is independent of the contractor and which confirms inspection of the site storage of materials.</p> <p>Photographic evidence of the site storage of materials produced by a body which is independent of the contractor (on a monthly basis).</p>
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NHS Scotland Assure Observations:

The Board has submitted a copy of the Clerk of Work (CoW)'s Site Inspection Record. The report records any general observations noted at the time of inspection, priority issues to be addressed, health and safety issues observed and progress photos.

There is evidence to suggest that the CoW is recording the storage of materials on site, where the electrical report notes a final distribution board assembly lying on the floor of the plantroom without any cover or protection.

Documents referenced are:

NHS FV Elective Ward_Modular Build Contractor Factory_Site Inspection Report_220802_Final.V1
Portakabin Quality Management Plan
Project Construction Meeting Minutes

Workbook Ref No.	Areas to probe	Evidence expected
4.7	How does the Health Board assure itself that all pre-commissioning inspections are completed and recorded before commissioning can commence?	<p>Evidence that adequate pre-commissioning check sheets (e.g. SHTM 06-01 Part A, , BS7671, etc.) have been completed and signed off.</p> <p>Evidence that the Health Board has had all pre-commissioning checks audited and approved by an independent organisation.</p>

NHS Scotland Assure Observations:

The observations noted in response to KSAR Question 2.8 apply to this question with respect to the commissioning of the electrical systems.

The Electrical subcontractor has prepared a first issue Inspection and Test Plan, dated 09.06.2022. This document makes no reference to any pre-commissioning checks undertaken, nor any pre commissioning checks in line with the requirements of SHTM 06-02 or BS 7671:2018.

Documents referenced are:

Forth Valley Commissioning Statement 26th October 2021

CT2659 – Forth Valley – ITPS

‘Electrical Subcontractor’ ITP – Forth Valley Issue 1

Workbook Ref No.	Areas to probe	Evidence expected
4.8	How does the Health Board assure itself that all variations which may be required to electrical systems after tender are investigated and agreed by all parties before they are instigated?	Evidence that the each variation / derogation has a detailed technical analysis and has been referred to the Health Board and agreed with their clinical, Estates, infection control and FM teams.

As described in the response to KSAR Question 1.3, no evidence has been provided to describe the change control processes in place to manage post-tender variations. It is noted from the information provided that there is currently an electrical change to include for an additional 2No. double sockets, however this appears to be instructed in an email opposed to via a formal change control mechanism.

From review of the documentation provided for the Construction Stage KSAR by NHS FV, there are no electrical services elements within the derogations schedule. Observations identified through the course of the FBC Stage KSAR, found that elements of the electrical design proposals were potentially not in line with SHTM 06-01 and/or BS 7671. No further evidence has been provided to provide assurance that these items have been resolved, or been reviewed as derogations/departures.

Documents referenced are:

Forth Valley Derogation Schedule Rev 7 250722

Quality Plan Rev 3 21.09.22

NHS FV – Change Control Tracker 04.07.22

Various emails relating to changes

Contractors Report 28 June 22

Contractors Report July

Elective Care_design tracker- v36 080822 DW

Various NTC TORs in the supplementary KSAR Upload File

Governance Structure – EC Organogram v9

3.4.2 Electrical: Further Observations

In addition to the points raised via the KSAR workbook above, we also include the following observations as a result of the review, all of which relate to the evidence presented during the appraisal.

3.4.2.1	There are unresolved items from the FBC KSAR review which have not been cleared. The health board should consider reviewing these and closing the issues out before the project construction works conclude.
3.4.2.2	There have been no designer's risk assessments for the electrical services provided, to inform the SPV FM team as to any residual risks that will be required to form part of future maintenance strategies.

3.5 Medical Gases

3.5.1 Medical Gases: KSAR Observations

Workbook Ref No.	Areas to probe	Evidence expected
5.1	How does the Health Board assure itself that all medical gas installers are trained to understand the needs (including special requirements) for the installation of medical gas systems in the relevant healthcare environment?	<p>Evidence of a vetted list of site medical gas installers which confirms qualifications and healthcare experience.</p> <p>Evidence that the site induction with respect to working on medical gas services has been developed, implemented and agreed with the Board.</p> <p>Evidence that all contractors and sub-contractor competency checks have been completed and signed off.</p>

NHS Scotland Assure Observations:

NHS FV have submitted details of the Medical Gas Pipeline Systems (MGPS) subcontractor. The submittal confirms that the MGPS subcontractor have been appointed to design and install the MGPS within the new facility. The information submitted includes a company overview document, two HTM 02-01 Competent Person certificates for each of the two operatives and a divisional organisation chart detailing the management structure of the company. There is no evidence provided of the competence of those undertaking the detailed design of the systems.

The Competent Person certificates confirm that the identified site operatives have successfully completed the '*HTM 02:01 Competent Persons Installation (MGPS) course*' and are valid until February 2025. The training records submitted do not confirm the extent of previous healthcare experience.

No evidence has been submitted which confirms that all contractors and subcontractor competency checks have been completed and signed off by the health board. It was verbally confirmed by the health board during the MGPS Workshop held on Thursday 10th November 2022, that the contractor competency checks were still being reviewed by the Authorising Engineer (AE (MGPS)).

The Modular Build Contractor has not submitted any evidence relating to the site induction process. There is no evidence to suggest that a site induction process, with respect to working on MGPS has been developed, implemented and agreed with the health board. It was confirmed at the MGPS Workshop held on Thursday 10th November 2022, that the site induction process would focus on health and safety, however, the MGPS subcontractor confirmed that they would be undertaking their own internal induction process with site operatives to cover the aspects of SHTM 02-01,

including the appropriate storage provisions for MGPS pipework, fittings and valves, however, no evidence has been provided to support this statement.

A Risk Assessment and Method Statement (RAMS) has not been submitted as part of the KSAR evidence for the MGPS. No evidence was submitted to indicate if the health board has reviewed or commented on the RAMS document.

Documents referenced are:

MGPS Subcontractor Overview Brochure

HTM 02:01 Competent Persons Installation (MGPS) certificates of training

MGPS Subcontractor Division Organisational Chart

Workbook Ref No.	Areas to probe	Evidence expected
5.2	How does the Health Board assure itself that the medical gas contracting company have the relevant experience to direct and manage their staff on the site for the relevant healthcare environment?	<p>Evidence of similar, previous healthcare projects by the contractor.</p> <p>Evidence of site management structure.</p> <p>AP and CP training to SHTM 02-01 for operatives.</p>

NHS Scotland Assure Observations:

NHS FV have submitted subcontractor details. The information submitted includes a company overview document and a divisional organisation chart detailing the management structure of the company. The divisional organisation chart submitted is a generic document which identifies the UK installation team rather than the site-based management structure and the individuals/positions of the responsible individuals.

NHS FV have not submitted any evidence which indicates if an Authorised Person will be deployed on the project. It was confirmed at the MGPS Workshop held on Thursday 10th November 2022, that the MGPS subcontractor will have an AP who will be responsible for the day-to-day management of the MGPS installations and will be based on site, however, no details were provided for review.

Documents referenced are:

MGPS Subcontractor Overview Brochure

HTM 02:01 Competent Persons Installation (MGPS) certificates of training

MGPS Subcontractor Division Organisational Chart

Workbook Ref No.	Areas to probe	Evidence expected
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5.3	How does the Health Board ensure that the medical gas systems are being installed to the correct standard and reflect the agreed design?	Written and photographic, monthly evidence for the progress of work produced by a body which is independent of the contractor and which confirms compliance of the works to date.
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NHS Scotland Assure Observations:

NHS FV have provided the MGPS subcontractor drawings and calculations. The drawings are noted as being 'Preliminary' and it is not clear if the drawings provided have been reviewed and approved for use during Construction. It is noted on the Design Tracker, that the SPV's MEP Consultant have provided comments and the drawings have been updated. There is no evidence within the Design Tracker to confirm if the health board and other key stakeholders, including the AE(MGPS) have reviewed the drawings.

As described in the response to KSAR Question 1.3, NHS FV have employed a Technical Advisor Team to undertake quality inspections, who will act independently of the Modular Build Contractor. At the time of the KSAR submission, and during the NHS SA team's inspection of the facility on Monday 7th November, the MGPS installation had not started on site, therefore, no examples of the MGPS being reviewed as part of the inspections on site were provided.

As described in the response to KSAR Question 1.1, there is no documented evidence on the health board's approach to quality monitoring, or the remit of the technical advisors and other stakeholders required to monitor the medical gas systems to ensure they reflect the agreed design, therefore no assurance has been provided. There is no evidence to confirm if a Contract Supervising Office (CSO) has been appointed for the MGPS, to carry out the activities outlined in SHTM 02-01 Part A.

Documents referenced are:

NHS FV Elective Ward_Modular Build Contractor Factory_Site Inspection Report_220802_Final.V1

Elective Care_design tracker-v36 080822 DW

MGPS Subcontractor drawings:

ACBL21-0033-01 Elective Ward Med Gas Layout Rev 3

ACBL21-0033-02

ACBL21-0033-03

PD_02_A

PD_02_A1

PD_VAC_A

PD_VAC_A1

Workbook Ref No.	Areas to probe	Evidence expected
5.4	How does the Health Board ensure that precautions are taken throughout the works	Photographic and written evidence for the progress of work produced by a

	to avoid open pipe ends for a period beyond the time needed to make a joint on that pipe end?	body which is independent of the contractor (on a monthly basis).
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NHS Scotland Assure Observations:

As identified in the response to Question 5.3, NHS FV have employed a Technical Advisor Team to undertake quality inspections, who will act independently of the Modular Build Contractor. At the time of the KSAR submission, and during the NHS SA team's inspection of the facility on Monday 7th November, the MGPS installation had not started on site, therefore, no examples of the MGPS being reviewed as part of the inspections on site were provided.

It was confirmed at the MGPS Workshop held on Thursday 10th November 2022, that the Authorised Person (AP) for MGPS from the SPV's Hard FM Provider will not be responsible for undertaking any inspection of the installations during the construction phase of the works.

Documents referenced are:

NHS FV Elective Ward_Modular Build Contractor Factory_Site Inspection Report_220802_Final.V1

Workbook Ref No.	Areas to probe	Evidence expected
5.5	How does the Health Board ensure that medical gas services are installed in a fashion which will provide ease of access for future maintenance?	<p>Evidence that the contractor has presented their co-ordination drawings (BIM model) to the Board.</p> <p>Evidence that the contractor has presented their co-ordination drawings (BIM model) to the design consultant and that they have agreed them for construction.</p> <p>Evidence that the contractor has presented each of the main service runs plus plant rooms to the Health Board's FM team.</p>

NHS Scotland Assure Observations:

The observations noted in response to KSAR Question 2.5 apply to this question with respect to medical gas systems. It is understood that the MGPS do not form part of the prefabricated service modules, however, it is not clear how the pipework has been coordinated with the modules and the associated MEP services.

There is no evidence to confirm that the MGPS installation design has been reviewed by the relevant stakeholders and agreed with NHS FV. There is no evidence that an

Access and Maintenance Strategy document has been developed which covers all aspects of access and maintenance of the MGPS installations, or that Modular Build Contractor has presented the BIM model to the health board, or other relevant stakeholders for review.

The Board have not submitted any evidence which ensures that medical gas services are installed in a fashion which will provide ease of access for future maintenance

Documents referenced are:

Revit Model Coordination Report, OPP1180824 PTK-A1-RP-A-003 Rev P01

Workbook Ref No.	Areas to probe	Evidence expected
5.6	How does the Health Board ensure that medical gas services are installed in a fashion which will retain space for minor additions and modifications to services in the future?	<p>Evidence that the contractor has presented their co-ordination drawings (BIM model), with space for future flexibility identified, to the Health Board.</p> <p>Evidence that the design consultant has considered and agreed with the Board, space for future flexibility in the service installations.</p> <p>Evidence that the contractor has presented their co-ordination drawings (BIM model), with space for future flexibility identified, to the design consultant and that they have agreed them for construction.</p> <p>Evidence that the contractor has presented each of the main service runs plus plant rooms to the Health Board's FM team, to highlight space for future flexibility.</p>

NHS Scotland Assure Observations:

The observations noted in response to KSAR Question 2.6 apply to this question with respect to medical gas pipeline systems.

NHS FV have submitted medical gas drawings developed by the MEP subcontractor and further detailed design drawings and calculations developed by the MGPS subcontractor. The calculations provided confirm that there is no allowance for spare capacity within the oxygen supply pipework or the medical vacuum installation.

As described in the response to KSAR Question 2.5, from the BIM coordination report provided, the corridor ceiling void appears congested and access around and within

the voids could be problematic in some areas. A supporting file note confirms that there is “*limited space for future amendment*” for the MGPS.

There is no evidence submitted to confirm or otherwise, that the Modular Build Contractor has presented their coordination drawings indicating the future flexibility/ minor amendment zones to the Board. In addition, there is no evidence presented which would confirm that the Design Consultant has considered and agreed space for future flexibility within the MGPS installation.

The Modular Build Contractor confirmed during the MGPS workshop on Thursday 10th November 2022 that the MGPS Subcontractor have designed the facility as a basic ward and that no future flexibility has been built in nor any spare capacity included to facilitate minor additions in the future. It was also confirmed that the SPV / SPV’S MEP Consultant has confirmed that the existing Oxygen system has sufficient capacity to cater for the current oxygen loads, as advised by MGPS Subcontractor. If there was an increase in demand on the medical gas installation, then the existing infrastructure capacity will need to be reviewed again by SPV/SPV’S MEP Consultant.

Documents referenced are:

MEP Subcontractor:

C2659-AQC-M1-00-DR-E-6702 Medical Gas Void Layout

C2659-AQC-M1-00-DR-M-5401_1 P2 – Med Gas – Main Block

C2659-AQC-M1-00-DR-M-5402_1 P2 – Med Gas – Link

‘Explanation’ text document.

MGPS Subcontractor drawings:

ACBL21-0033-01 Elective Ward Med Gas Layout Rev 3

ACBL21-0033-02

ACBL21-0033-03

PD_O2_A

PD_O2_A1

PD_VAC_A

PD_VAC_A1

Workbook Ref No.	Areas to probe	Evidence expected
5.7	How does the Health Board assure itself that all medical gas materials are stored on site in an environment which protects them from deterioration and from the entry of contaminants into the parts of the component which will be in contact with the gas?	Written, monthly evidence for the progress of work produced by a body which is independent of the contractor and which confirms inspection of the site storage of materials. Photographic evidence of the site storage of materials produced by a body which is independent of the contractor (on a monthly basis).

NHS Scotland Assure Observations:

As identified in the response to Question 5.3, the health board has employed an NHS FV Technical Advisor Team to act independently of the Modular Build Contractor and will be undertaking periodic inspections of the works. The NHS FV Technical Advisor Team verbally confirmed that these inspections would review the locations of stored materials and the protection afforded to the systems to prevent the ingress of any contaminants.

The example of NHS FV Technical Advisor Team's Site Inspection record provided, is dated 2nd August 2022, and predates the MGPS installation start date. At the time of the KSAR submission, and during the NHS SA team's inspection of the facility on Monday 7th November, the MGPS installation had not started on site, therefore, no examples of the MGPS being reviewed as part of the inspections on site were provided.

Whilst the Modular Build Contractor verbally confirmed during the MGSP workshop on Thursday 10th November 2022 that all MGPS pipework will be stored on site in a dry, secured area, i.e. within a container. The pipework will be stored horizontally on purpose designed pipe racks to ensure that the pipework was clear of the floor. The stored pipework will also capped and sealed with polythene. However, no evidence was available to review during the KSAR and the process for storage of pipework and equipment was not documented within the evidence provided.

Documents referenced are:

NHS FV Elective Ward_Modular Build Contractor Factory_Site Inspection Report_220802_Final.V1

Workbook Ref No.	Areas to probe	Evidence expected
5.8	How does the Health Board assure itself that all pre-commissioning inspections are completed and recorded before commissioning can commence?	Evidence that adequate pre-commissioning check sheets (e.g. SHTM 02-01 Part A) have been completed and signed off. Evidence that the Health Board has had all pre-commissioning checks audited and approved by an independent organisation.

NHS Scotland Assure Observations:

The observations noted in response to KSAR Question 1.4 and 2.8 apply to this question with respect to medical gas pipeline systems.

At the time of the KSAR the MGPS had not commenced on site, therefore, there was no evidence of any pre-commissioning tests being undertaken. However, no evidence has been provided to confirm the health board will assure itself that all pre-

commissioning inspections are completed and recorded before commissioning commences.

The MEP Subcontractor's *'Inspection and Test Plan'* provided does not include any reference to medical gas pipeline systems, or the associated requirements for testing and commissioning in line with the requirements of SHTM 02-01 Part A Chapter 15 and Appendix A. The MEP Consultant's *'Commissioning Statement for the Mechanical and Electrical Services'*, dated October 2021 is identified as "*Prelim Issue*". This is the same document that was reviewed during the FBS KSAR process. This document does not refer to the testing and commissioning requirements in line with SHTM 02-01 Part A Chapter 15.

Documents referenced are:

MEP Subcontractor's Inspection and Test Plan Revision A dated 10 June 2022
MEP Design Consultant's Commissioning Statement for the Mechanical and Electrical Services, Revision A dated 26 October 2021.

Workbook Ref No.	Areas to probe	Evidence expected
5.9	How does the Health Board assure itself that all variations which may be required to medical gas systems after tender are investigated and agreed by all parties before they are instigated?	Evidence that the each variation / derogation has a detailed technical analysis and has been referred to the Board and agreed with their medical gas management group, clinical, Estates, infection control and FM teams.

NHS Scotland Assure Observations:

As noted in the response to KSAR question 1.2, other than the tracker, there is no evidence of the process in place to manage variations to the design post-tender. No changes are noted on the Change Control Tracker provided with respect to the MGPS installation.

NHS FV have submitted the *'Derogations Schedule'*. This refers to a derogation in relation to the removal of Medical Air for the facility. The schedule confirms that the derogation was reviewed at the Infection Control workshop on 23/9/2021 and approved at the Project Board meeting on 4 October 2021. The schedule notes the stakeholders involved, however, does not provide any supporting evidence in terms of notes of the discussion, or evidence of sign off from the individuals involved.

The health board confirmed during the MGPS workshop on Thursday 10th November 2022 that no further derogations have been sought to date and that any derogations that have been accepted e.g. removal of medical Air, has been confirmed by the clinical team via their representation within the infection control team and at project board.

Documents referenced are:

Project board meeting minutes dated 25 February 2022, 28 March 2022 and 25 July 2022.

Derogation Schedule Nr 7 dated 25 July 2022.

Change Cntrl Tracker 04.07.22

3.5.2 Medical Gases: Further Observations

3.5.2.1	N/A
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3.6 Fire

3.6.1 Fire: KSAR Observations

Workbook Ref No.	Areas to probe	Evidence expected
6.1	How does the Health Board assure itself that all fire stopping specialists are trained to understand the needs (including special requirements) for the installation of fire stopping systems in the healthcare environment?	<p>Evidence of a vetted list of site fire stopping specialists which confirms qualifications and healthcare experience.</p> <p>Evidence that the site induction with respect to working on fire stopping services has been developed, implemented and agreed with Board.</p> <p>Evidence that all contractors and sub-contractor competency checks have been completed and signed off.</p>
<p>NHS Scotland Assure Observations:</p> <p>NHS Forth Valley have provided a number of documents in relation to the fire stopping subcontractor. NHS Scotland Assure have identified concerns in relation to the documentation which are discussed below and conclude that this provides no assurance that the fire stopping specialists are fully trained to understand the needs for installation within healthcare environments.</p> <p>NHS Forth Valley has included within its evidence, subcontractor qualifications related to general construction activities. Evidence of fire stopping qualifications for individuals were not provided. A Fire Accreditation Scheme (FIRAS) certificate, valid until September 2023 was provided for the company. This document noted that the subcontractor complies with the certification scheme for “<i>Application of passive fire resisting products using intumescent coating, Boards, Penetrating Sealing Systems and Cavity Barriers.</i>” In addition to the above document, a certificate of membership for the Association of Specialist Fire Protection was provided, in which they are noted as a Contractor Member, however, the certificate expired on 21st November 2022.</p> <p>Within the documentation provided, no list of vetted site fire stopping specialists was provided nor details of how the fire stopping subcontractor was chosen and on what merit. In addition to this, no evidence of site inductions with respect to fire stopping was provided to NHS Scotland Assure.</p> <p>Whilst the above limited evidence was provided regarding qualifications of the fire stopping specialists, no evidence was provided to demonstrate the contractor or subcontractor have had competency checks reviewed and signed off by the health board.</p> <p>Documents referenced are: <i>FIRAS ‘Fire Stopping Consultant’ Issue 6</i></p>		

'Fire Stopping Consultant' – ASFP Membership

Workbook Ref No.	Areas to probe	Evidence expected
6.2	How does the Health Board assure itself that the fire stopping contracting company have the relevant experience to direct and manage their staff on the site for a healthcare environment?	Evidence of similar, previous healthcare projects by the contractor. Evidence of site management structure.
<p>NHS Scotland Assure Observations: NHS Forth Valley have provided documentation in relation to the fire stopping subcontractor. Within the documentation provided a short list of previous healthcare projects was provided. This list did not however, provide further details as to the similarity of those projects with NHS Forth Valley Modular Wards NTC, it also does not clearly define details of the works completed, nor whether any of the individuals working on this project were involved in any of the examples provided.</p> <p>The documentation provided did, however, show evidence of the management structure of the chosen specialist's team.</p> <p>Documents referenced are: <i>'Fire Stopping Consultant' Fire Protection Management Structure 2022 incl H&S</i> <i>NHS KSAR – Construction Review (spreadsheet)</i></p>		

Workbook Ref No.	Areas to probe	Evidence expected
6.3	How does the Health Board ensure that the fire stopping systems are being installed to the correct standard and reflect the agreed design?	Written, monthly evidence for the progress of work produced by a body which is independent of the contractor and which confirms compliance of the works to date.
<p>NHS Scotland Assure Observations: NHS Forth Valley have provided a number of documents in relation to fire stopping. NHS Scotland Assure have reviewed the documentation and have concerns in relation to the assurance of the installation of the fire stopping. NHS Scotland Assure note that there are gaps in the information provided in relation to the correct standards and lack of agreed designs of the fire stopping.</p> <p>It was confirmed on site on 7th November 2022 by the MEP sub-contractor that fire stopping would be commencing in December 2022.</p>		

Evidence provided includes a series of builder's work drawings, identifying holes in walls and a colour coded approach to signify pipework (light green), ductwork (blue), cable containment (dark green) or smoke dampers (red). The drawings are not clear on whether all the holes require fire stopping, as when compared to the fire strategy drawing, holes were noted between rooms where no fire rating of the walls was indicated.

Included within the documentation from NHS Forth Valley is an image 'PNG' file indicating examples of standard fire stopping details. These examples are not specific to NHS Forth Valley Modular Wards NTC and are lacking in detail with respect to the intended fire stopping for this project. No further evidence was provided as to the fire stopping methodology/design, the intended products to be used, their suitability, compliance and compatibility. There is no evidence of an agreed design between the relevant parties, therefore there is no assurance that the fire stopping systems are being installed to the correct standard.

Further documentation provided included various '*In Process Quality Check Sheets*'. These were noted as belonging to the Modular Build Contractor and therefore not considered independent. No evidence was provided of the intended independent quality assurance checks and reporting of the fire stopping.

Documents referenced are:

C2659-'MEP subcontractor'-M1-00-DR-X-5901_5 C4 – Ground Floor – Main Block – Holes in Internal Walls

C2659-'MEP subcontractor'-M1-00-DR-X-5901_6 C4 – Link – Main Block – Holes in Internal Walls

Fire Stopping Detail (png file)

IPQCS ME008 – Above Ceiling Checks

IPQCS ME010 – Suspended Ceiling Checks

IPQCS ME20 – Fire Damper Drop Test

IPQCS ME21 – Fire Stopping

IPQCS ME32 – Fire System Install

OPP1180824 PTK-A1-00-DR-A-1401 (C02) – Ground Floor Fire Strategy

221109_R00_NHS Assure Forth Valley Modular Wards_Site Report_CIC

Fire Workshop 15th November 2022

Workbook Ref No.	Areas to probe	Evidence expected
6.4	How does the Health Board ensure that precautions are taken throughout the works to avoid openings in fire barriers to occupied spaces during the works?	Written and photographic evidence for the progress of work produced by a body which is independent of the contractor (on a monthly basis).

NHS Scotland Assure Observations:

NHS FV have provided documentation on the ancillary works which includes a breakthrough into the existing hospital. Documentation provided includes drawings of existing external door details from 2008 with overmarks by the SPV and a detailed report from the Modular Build Contractor. This report provides a scope of works and intended methodologies for this part of the construction, highlighting that precautions have been considered by the Modular Build Contractor.

Documents referenced are:

OPP1180824 MBC-A1-RP-A-006 (P02) – Existing Hospital Breakthrough SoW

OPP1180824 MBC-A1-00-DR-A-1003 (C02) – Ground Floor Plan

OPP1180824 MBC-A1-00-DR-A-1211 (P02) – Ext Wall Break Through Concept – Lift

OPP1180824 MBC-A1-00-DR-A-1212 (P01) – Ext Wall Break Through Concept – Doorway

OPP1180824 MBC-A1-ZZ-SK-A-011 (P02) – Existing Building Aperture Break Through

KEP-A(32)X-0-001

KEP-A(32)X-0-002

KEP-A(32)X-0-003

KEP-G(25)E-X-103

Workbook Ref No.	Areas to probe	Evidence expected
6.5	How does the Health Board ensure that fire stopping systems are installed on ventilation, electrical, plumbing and drainage services where they penetrate fire barriers?	Photographic and written evidence for the progress of work produced by a body which is independent of the contractor (on a monthly basis).

NHS Scotland Assure Observations:

NHS Forth Valley have provided a number of documents relating to the design of the ventilation and public health installations throughout NHS Forth Valley Modular Wards NTC. NHS Scotland Assure have reviewed the provided information and have a number of concerns, detailed below.

Within the provided documentation were the drawings referred to in the response to Question 6.3 above, indicating holes in walls. But as detailed above, the drawings do not provide clear evidence of the intended fire stopping and highlight holes in walls that are not fire rated.

The latest revision of the ventilation drawings dated 2nd September 2022 provide an update stating, “*Fire protection detail added*”. However, this is the ‘PNG’ file referred to in 6.3 above, which has been added to the drawings. As detailed in 6.3 above,

there is insufficient detail of the intended fire stopping proposals, which are not specific to the project. The remainder of the drawing does not appear to provide any corresponding annotations as to the required fire stopping for the ventilation penetrations.

The latest revision of the above ground drainage drawing provides an update to include the intumescent collar details. There are no further details of product information, describing only that a “*hinged collar with intumescent lining*” will be provided.

Other drawings that indicate service penetrations through fire rated walls show no indication of the required fire stopping detail.

Whilst documentation provided included various ‘*In Process Quality Check Sheets*’. These were noted as belonging to the Modular Build Contractor and therefore not independent. No evidence was provided of the intended independent quality assurance checks and reporting of the fire stopping.

Documents referenced are:

C2659-AQC-M1-00-DR-E-6101_1 C02 Containment Layout – Sheet 1 of 2
C2659-AQC-M1-00-DR-E-6101_2 Containment Layout – Sheet 2 of 2
C2659-AQC-M1-00-DR-E-6201_1 C02 Small Power and Data Layout – Sheet 1 of 2
C2659-AQC-M1-00-DR-E-6201_2 Small Power and Data Layout – Sheet 2 of 2
C2659-AQC-M1-00-DR-E-6701_1 C02 Fire Alarm Layout – Sheet 1 of 2
C2659-AQC-M1-00-DR-E-6701_2 C02 Fire Alarm Layout – Sheet 2 of 2
C2659-AQC-M1-00-DR-E-6704_1 Nurse Layout – Sheet 1 of 2
C2659-AQC-M1-00-DR-E-6704_2 Nurse Layout – Sheet 2 of 2
C2659-AQC-M1-00-DR-M-5401_1 P2 Med Gas Main Block
C2659-AQC-M1-00-DR-M-5401_2 P2 Med Gas Link
C2659-AQC-M1-00-DR-M-5601_1 C5 Heating Main Block
C2659-AQC-M1-00-DR-M-5601_2 C5 Heating Link
C2659-AQC-M1-00-DR-M-5701_1 C7 Ventilation Main Block
C2659-AQC-M1-00-DR-M-5701_2 C7 Ventilation Link
C2659-AQC-M1-00-DR-P-5201_1 C3 Above Ground Drainage – Main Block
C2659-AQC-M1-00-DR-P-5201_2 C3 Above Ground Drainage – Link
C2659-AQC-M1-00-DR-P-5301_1 C4 Domestic – Main Block
C2659-AQC-M1-00-DR-P-5301_2 C4 Domestic – Link
C2659-AQC-M1-00-DR-X-5901_5 C4 – Ground Floor – Main Block – Holes in Internal Walls
C2659-AQC-M1-00-DR-X-5901_6 C4 – Link – Main Block – Holes in Internal Walls
Fire Stopping Detail (png file)
IPQCS ME008 – Above Ceiling Checks
IPQCS ME010 – Suspended Ceiling Checks
IPQCS ME20 – Fire Damper Drop Test
IPQCS ME21 – Fire Stopping
IPQCS ME32 – Fire System Install
Weekly Meeting 1st November 2022

Workbook Ref No.	Areas to probe	Evidence expected
6.6	How does the Health Board ensure that fire stopping is installed in electrical containment (trunking / tray systems) systems where they penetrate fire barriers?	Photographic and written evidence for the progress of work produced by a body which is independent of the contractor (on a monthly basis).
<p>NHS Scotland Assure Observations: The observations noted in response to KSAR Question 6.5 apply to this question with respect to electrical containment.</p> <p>Documents referenced are: <i>Those documents referenced in 6.5 are applicable for 6.6</i></p>		

Workbook Ref No.	Areas to probe	Evidence expected
6.7	How does the Health Board assure itself that all fire stopping materials are stored on site in an environment which protects them from deterioration?	Written, monthly evidence for the progress of work produced by a body which is independent of the contractor and which confirms inspection of the site storage of materials. Photographic evidence of the site storage of materials produced by a body which is independent of the contractor (on a monthly basis).
<p>NHS Scotland Assure Observations:</p> <p>No evidence has been provided to confirm the intended storage facilities for fire stopping materials on site, only a statement to confirm that further details will be included in the method statement from the Fire Stopping Specialist, therefore, no assurance has been provided that the fire stopping materials will be stored on site in an environment which protects them from deterioration.</p> <p>As noted in 6.3 above, fire stopping had not begun on site at the time the Board provided documentation therefore no photographic evidence of stored items was possible as no fire stopping material were on site.</p> <p>On the day of the site visit, 7th November 2022, the MEP subcontractor confirmed that a shipping container was due to arrive on site that week and will be used for storage of fire stopping materials and all other fire safety related materials. It was later verbally confirmed that this container has now arrived and placed on site.</p> <p>Documents referenced are: <i>Explanation Document</i></p>		

Workbook Ref No.	Areas to probe	Evidence expected
6.8	How does the Health Board assure itself that all fire detection and alarm systems are installed in the correct locations and are easily maintained?	Written evidence for the progress of work produced by a body which is independent of the contractor (on a monthly basis). Demonstration by the contractor that any detectors which are above 3m from floor level or in ceiling voids, to the Board's FM team, have suitable access for maintenance.

NHS Scotland Assure Observations:

From the documentation provided, no details have been provided in reference to the access and maintenance strategy for the fire detection and alarm system.

The documentation provided includes an Inspection and Test Plan from the electrical subcontractor. The document is a check sheet for various activities, including the fire detection and alarm system. The check sheet details those parties who require to sign off the fire detection and alarm which includes the electrical subcontractor, the MEP subcontractor, the Client and any other relevant parties. Prior to ceiling installation, the fire detection and alarm system should be acceptable to all parties.

Documents referenced are:

'Electrical subcontractor' ITP – Forth Valley Issue 1

Workbook Ref No.	Areas to probe	Evidence expected
6.9	How does the Health Board assure itself that all variations which may be required to fire stopping systems after tender are investigated and agreed by all parties before they are instigated?	Evidence that the each variation has been referred to the Health Board and agreed with their clinical, engineering, infection control and FM teams.

NHS Scotland Assure Observations:

No evidence was presented to NHS Scotland Assure in response to KSAR Question 6.9 and therefore there is no assurance provided that there is a process in place to manage variations to the fire stopping systems after tender.

Documents referenced are:

None

Workbook Ref No.	Areas to probe	Evidence expected
6.10	How does the Health Board assure itself that all fire dampers and fire/smoke dampers can be accessed for inspection, resetting and maintenance?	<p>Evidence that the contractor has presented their co-ordination drawings (BIM model) to the Health Board.</p> <p>Evidence that the contractor has presented their co-ordination drawings (BIM model) to the design consultant and that they have agreed them for construction.</p> <p>Evidence that the contractor has presented each of the fire dampers and smoke / fire dampers to the Health Board's FM team.</p>

NHS Scotland Assure Observations:

NHS Forth Valley have provided a number of documents in relation to the question posed in 6.10.

Ventilation drawings provided by the health board indicate the locations of dampers and the drawings are marked as Construction Status. The drawings indicate access doors within the ductwork for maintenance and testing. As noted in response to KSAR Question 2.5 and 3.5, however, there are concerns regarding the level of coordination that has been undertaken to date on the MEP services. The evidence provided indicates that ceiling voids are congested in some areas, therefore, it has not been fully demonstrated that the access to fire dampers has been fully coordinated with the MEP services.

Whilst there are detailed drawings showing the access to the dampers for maintenance, no evidence was provided to demonstrate that the Board had been presented with the drawings for review and are clear on the access and whether this has been approved by the Board. It was verbally confirmed in the Fire Workshop on 15th November 2022 that the Board have reviewed the fire damper installation and that this review is ongoing throughout the construction process. It was confirmed on site on 7th November 2022 by the MEP subcontractor that all dampers are remotely resettable from a main panel.

The documentation provided includes an Inspection and Test Plan from the MEP subcontractor. The document is a check sheet for various activities, with ventilation noted as one of them. The check sheet report details those parties who require to sign off the ventilation system which includes the MEP subcontractor, the ventilation subcontractor, the Client and any other relevant parties. Whilst these checks are in place, there is no note of a check on damper locations and access as part of this process.

Documents referenced are:

AQC TIP C2659 – Forth Valley

C2659-AQC-M1-00-DR-M-5701_1 C7 Ventilation Main Block

C2659-AQC-M1-00-DR-M-5701_2 C7 Ventilation Link

Fire Workshop 15th November 2022

Workbook Ref No.	Areas to probe	Evidence expected
6.11	How does the Health Board assure itself that any fire rated ductwork is correctly installed?	Evidence that the system is certificated and that the installation follows the installation details which were used for the certification. Written confirmation from the design consultant.

NHS Scotland Assure Observations:

This item is not applicable as there is no fire rated ductwork within the design.

Documents referenced are:

N/A

Workbook Ref No.	Areas to probe	Evidence expected
6.12	How does the Health Board assure itself that any smoke control and / or clearance systems are fit for purpose?	Evidence that the smoke system has been designed by an accredited Fire Engineer. Evidence that Building Control have accepted the solution. Confirmation from the Building Services Design Consultant that the operating sequence for the smoke system has been agreed and integrated into the control of other building systems.

NHS Scotland Assure Observations:

This item is not applicable as there are no smoke control or smoke clearance systems within the design.

Documents referenced are:

N/A

Workbook Ref No.	Areas to probe	Evidence expected
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6.13	How does the Health Board assure itself that all pre-commissioning inspections are completed and recorded before commissioning can commence?	Evidence that the Health Board has had all pre - commissioning checks audited and approved by an independent organisation.
<p>NHS Scotland Assure Observations: NHS Forth Valley provided documentation with regards to the pre-commissioning. An Inspection and Test Plan from the MEP sub-contractor has been provided with reference to fire stopping, however, the document lacks detail in any pre-commissioning checks.</p> <p>Elsewhere within the information provided for other KSAR questions, a master commissioning plan has been provided. This document provides further details of the pre-commissioning plan. However, there is no evidence that this has been approved by an independent organisation. It has been later discussed that the Board Technical Advisor team are reviewing all commissioning related information on behalf of the NHS Forth Valley.</p> <p>Documents referenced are: C2659 – Forth Valley – ITPS (Fire Stopping) AQC Master Commissioning Programme R3 – 06.10.22</p>		

3.6.2 Fire: Further Observations

In addition to the points raised via the KSAR workbook above, we also include the following observations as a result of the review, all of which relate to the evidence presented during the appraisal.

3.6.2.1	<p>It was noted in the fire workshop on 15th November 2022 that the fire strategy is at Revision 6. However, this version has not been provided to the NHS Scotland Assure team. During this workshop it was noted by the Modular Build Contractor that this version of the fire strategy has not been widely distributed and the updates include comments from Building Standards.</p> <p>There is no evidence that the fire strategy has been reviewed by the Board.</p>
3.6.2.2	<p>The previous KSAR (FBC KSAR) has some points that remain outstanding, these are detailed below and require further development and discussion with Board:</p> <ol style="list-style-type: none"> 1. No Evidence of competency checks on the Fire Engineering consultant designers:

- a. Board response: *“Design by Portakabin, no fire engineering consultant designer employed. NHS FV Fire Officer has involved in all meetings & provide input”.*
 - b. NHS Scotland Assure Update: *“No further information provided to demonstrate the competency of Portakabin with regards to fire engineering”.*
2. Scottish Fire & Rescue Service (SFRS) access to modular facility to be provided:
 - a. Board response: *“PTK have submitted Stage 1 BC application, Stage 2 BC in progress and will be submitted as required Initial contact has been made with SFRS and Fire strategy information to be issued (see email)”.*
 - b. NHS Scotland Assure Update: *“It is noted that the Board have confirmed via an email that contact has been made with SFRS and the fire strategy submitted to them. However, this is noted as amber in the RAG status as NHS Scotland Assure have not seen this evidence”.*
3. There is no evidence to show the fire resistance of the ‘bedroom’ half leaf doors. There is no detail to indicate that these will have self-closing devices fitted:
 - a. Board response: *“PTK have submitted Stage 1 BC application, Stage 2 BC in progress and will be submitted as required Initial contact has been made with SFRS and Fire strategy information to be issued (see email)”.*
 - b. NHS Scotland Assure Update: *“Response provided does not align with the observation made. No evidence provided to detail discussions had with NHS FV and the design team in relation to the appropriateness of fire doors.”*
4. SHTM ‘Firecode’ recommends ‘free swing arm’ self-closing devices on bedroom doors. The type of self-closing device has not been identified within the fire strategy:
 - a. Board Response: *“PTK - SM to confirm”*
 - b. NHS Scotland Assure Update *“No further information provided at FBC close out”*
 - c. NHS Scotland Assure Additional Update: *“During the workshop on 15th November, it was confirmed that the Board have explicitly requested free swing closers. However, the item is yet to be closed as there is no conclusion as to them being provided.”*
5. No fire alarm cause and effect provided:
 - a. Board Response: *“FH -Will be provided by specialist contractor ADT - dedicated to the building.”*
 - b. NHS Scotland Assure Update: *“No further information provided at FBC close out”*
 - c. NHS Scotland Assure Additional Update: *“During the workshop on 15th November, it was confirmed that the*

MEP sub-contractor has a detailed cause and effect (revision 5) which is with the MODULAR BUILD CONTRACTOR for approval. NHS Scotland Assure have not been provided with this document.”

6. The Electrical technical submittal notes a requirement for the system to integrate into the wider hospital fire alarm network, which requires to be upgraded before the modular extension works can be completed. It has not been made clear how NHS FV propose to interlink the two alarms. NHS FV confirmed that they are currently upgrading the existing hospital alarm, currently unfinished work:
 - a. Board Response: *“Undertaken by FH via Serco as part of interface works.”*
 - b. NHS Scotland Assure Update: *“No further information provided at FBC close out.”*
 - c. NHS Scotland Assure Additional Update: *“During the workshop on 15th November, it was confirmed by the MEP sub-contractor that the linking of the system will be completed as the older panels within the existing hospital have now been upgraded to support the newer system in the Modular Wards NTC.”*
7. There is no evidence to show fire protection at the junction of floors and compartment/sub compartment walls. Evidence should be provided to show fire protection at the junction of floors and compartment/sub compartment walls:
 - a. Board Response: *“PTK - SM to confirm.”*
 - b. NHS Scotland Assure Update: *“No further information provided at FBC close out. It is known that discussions with Building Control are ongoing at this time.”*
 - c. NHS Scotland Assure Further Update: *“During the workshop on 15th November 2022, the MODULAR BUILD CONTRACTOR confirmed that an assessment had been undertaken by a specialist which was approved by Building Control. The review team have not been provided with this additional information”*
8. Hazard Rooms (Hoist 080, Linen 095) are not enclosed by fire resistance. There is no evidence of a risk assessment for the bed hoist / linen stores opening to the corridor:
 - a. Board Response: *“Please see OPP1180824 PTK-A1-00DR-A-1401 (P05) - Ground Floor Fire Strategy. Trolley store now enclosed with double FD30s doors. Linen store noted as for storage of linen in suitable fire rated trolleys - Risk assessment to be provided by NHS FV.”*
 - b. NHS Scotland Assure Update: *“No further information provided at FBC close out.”*

	<p>c. NHS Scotland Assure Further Update: <i>“During the workshop on 15th November 2022, NHS Forth Valley confirmed that the assessment had not been provided as yet as further details of fire rated storage was to be obtained.”</i></p> <p>9. The Mechanical Specification requests that access is provided in the ductwork to one side of the fire damper:</p> <p>a. Board Response: <i>“NHS FV should ensure that the damper can be inspected from both sides and have adequate access for maintenance.”</i></p> <p>b. NHS Scotland Assure Update: <i>“No evidence has been provided to demonstrate accessibility or that discussions have been had with NHS FV in relation to dampers. The project is known not to use BIM so it is not clear how access has been demonstrated once all services are installed.”</i></p> <p>c. NHS Scotland Assure Further Update: <i>“During the workshop on 15th November 2022, the MEP sub-contractor and the Board Technical Advisor Team confirmed that access is provided to both sides. However, these would be reviewed once all services were installed.”</i></p>
3.6.2.3	There is no evidence of Board specific fire safety site inductions.
3.6.2.4	<p>During the workshop on 15th November 2022, the Modular Build Contractor noted that they are monitoring the strategy implementation alongside the partition sub-contractor. In addition to this, the Board Technical Advisor Team noted that they attend site weekly and report on all aspects and issue weekly reports to the Board of their findings.</p> <p>It should be noted that NHS Scotland Assure was not provided with any written evidence of the above.</p>
3.6.2.5	It is noted that the location in which the Modular Wards NTC is positioned, fire and rescue service access is by way of the current access. This is also addressed within the version of the report that was provided to NHS Scotland Assure (noting that it is not the most recent version).
3.6.2.6	During the site visit on 7th November 2022, it was noted that some plasterboard sheets appeared damaged by way of cracking. This has been noted within the NHS Scotland Assure (fire specific) Site Report, raised at the workshop on 15 th November 2022. During a weekly meeting on 29 th November 2022, the Modular Build Contractor confirmed that all damaged boards would be replaced.
3.6.2.7	During the site visit on 7th November 2022, it was noted that there was water ingress on site and plasterboard damaged as a result. The plasterboard has blackened. This has been noted within the NHS Scotland Assure (fire specific) Site Report, raised at the workshop on

	15 th November 2022. During a weekly meeting on 29 th November 2022, the Modular Build Contractor confirmed that all damaged boards would be replaced.
3.6.2.8	During the site visit on 7th November 2022, it was noted that not all plasterboard on the corridor walls (30 min fire resistant walls) had been completed as services were still required to be complete. However, some plasterboard panels had been cut to accommodate these works. Where the boards are cut and then repaired can often degrade the fire resistance of the board itself. This has been noted within the NHS Scotland Assure (fire specific) Site Report, raised at the workshop on 15 th November 2022. During a weekly meeting on 29 th November 2022, the Modular Build Contractor confirmed that all damaged boards would be replaced.
3.6.2.9	During the site visit on 7th November 2022, it was noted that some builder's works are still to be completed on site, however it was noted that cable trays are already in place in some of these unfinished apertures. This has been noted within the NHS Scotland Assure (fire specific) Site Report and raised at the workshop on 15 th November 2022. At the workshop, the Modular Build Contractor confirmed they would review this on site and rectify where needed.
3.6.2.10	During the site visit on 7th November 2022, it was noted that 'Pink foam' was witnessed in use on site between the frames of the modules and appears to be used as a filler material. The areas viewed on site were located on 30 minutes fire resistance walls. This has been noted within the NHS Scotland Assure (fire specific) Site Report and raised at the workshop on 15 th November 2022. At the workshop, the Modular Build Contractor confirmed they would review the use of the pink foam to confirm it's appropriate.
3.6.2.11	During the site visit on 7th November, 2022, it was noted that the fire rated walls stop at the ceiling and do not continue to the roof. This has been noted within the NHS Scotland Assure (fire specific) Site Report and raised at the workshop on 15 th November 2022. At the workshop, the Modular Build Contractor provided greater detail on the design, confirming the fire resistance continues above the ceiling in the void.

3.7 Infection Prevention & Control Built Environment

3.7.1 Infection Prevention & Control Built Environment: KSAR Observations

Workbook Ref No.	Areas to probe	Evidence expected
7.1	<p>How does the Health Board demonstrate that there is an effective infection prevention and control management structure in place?</p> <p>How does the Health Board demonstrate leadership and commitment to infection prevention and control to ensure a culture of continuous quality improvement throughout the organisation and that there is an effective IPC structure in place?</p>	<p>The Health Board provides evidence that there is an IPC Management Structure with the necessary expertise and leadership skills to support the organisation:</p> <p>The Health Board provides evidence that there is an IPC Management Team with the necessary expertise and leadership skills to support the project. The board are compliant with content of HDL (2008) role of the ICM / CNO 22.12.16.</p> <p>Executive board reports or minutes. Risk registers or equivalent, Minutes from operational and governance groups, (and action points). Structure of infection prevention and control team (IPCT) and qualifications held, previous experience supporting new build projects.</p> <p>Evidence IPC and clinical teams have been involved with any derogation through the build process and are satisfied this will not impact on patient safety, evidence could be through meeting minutes, risk assessments, risk registers relating to IPC with evidence of escalation through the agreed NHS board governance process.</p> <p>Evidence the Executive Board Member assigned to lead on IPCT has been kept informed of IPC risks identified and associated with the project this can be demonstrated by the board.</p> <p>Evidence IPCT advice has been followed, such as IPCT walk round audits during the construction process.</p>

		<p>Evidence that fixtures fitting and equipment have not been incorporated into the project that would represent an identified IPC risk.</p> <p>Evidence that all contractors and sub-contractor competency checks have been completed and signed off.</p>
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NHS Scotland Assure Observations:

No documentary evidence was provided relating to the Board’s wider IPC management structure or expertise. A verbal account was provided during the IPC KSAR workshop, where it was also noted that sufficient IPC resource had been made available to the project, despite service pressures on the IPC team due to the COVID-19 pandemic. NHS Forth Valley should ensure that the IPC team continues to have sufficient resource available to be able to provide any input necessary to the project.

The Interim Director of Nursing is the executive board member responsible for IPC and chairs both the Board’s Infection Prevention and Control Committee (IPCC) and the Project Board. The review team was given verbal assurance that the project is a standing item on the IPCC agenda.

IPC Team engagement is demonstrated in notes of the NTC Project Group Infection Control Workshops and the associated Action Log. As noted in paragraph 1.8, derogations are noted as an item for consideration in these workshops

Competency information was provided for a number of personnel and subcontractors and included little, if any, information relating to infection prevention and control. NHS Forth Valley should ensure that there is a process in place to provide assurance of contractor and subcontractor competency in this area.

Documents referenced are:

- 22-11-17 NHSFV NTC Modular Ward CON IPC Action Decision Sheet d0.01*
- 25.02.22.Minutes of Meeting APPROVED*
- 26.04.22.Minutes of Meeting DRAFT*
- 26.05.22 Action Log*
- 27.07.22 DRAFT NTC Project Board Minutes of Meeting LC*
- Employee Competencies 2017*
- EPD Healthcare Competency Scotland*
- Subcontractor competency Matrix*

Workbook Ref No.	Areas to probe	Evidence expected
7.2	How does the Health Board demonstrate implementation of evidence based infection prevention and control measures during the design process?	<p>The Health Board provides evidence: The board can demonstrate the current version of the National Infection Prevention and Control Manual has been adopted by the organisation and all staff are aware of how and where to access this and it is being referred to during the construction process.</p> <p>IPC risks (actual or perceived) risks identified during the work programme or through the KSAR evidence review are provided.</p> <p>Evidence of walk rounds during the construction process and these are being fed back to clinical staff and the executive team to provide assurance that the requirements of the CD are being adhered with.</p>
<p>NHS Scotland Assure Observations:</p> <p>Although it is clear from discussion with the Board's IPC team that the requirements of the NIPCM are being considered during the construction process, no documentary evidence of this was provided. The health board should ensure that the project team are familiar with the NIPCM and that it is being taken into consideration in all areas.</p> <p>No walk rounds of the site by IPCT members have yet taken place; NHSSA was informed at the IPC Workshop that site visits will be arranged. These should be scheduled for the earliest opportunity.</p> <p>Documents referenced are: N/A</p>		

Workbook Ref No.	Areas to probe	Evidence expected
7.3	How does the Health Board assure itself that the contractors have a proper understanding of the infection prevention and control procedures required by the CD and that the contractors work is being rigorously managed in this respect?	<p>The Health Board evidences that: All relevant staff within the contractors' organisation are provided with clear guidance on roles and responsibilities in relation to infection prevention and control.</p> <p>The contractors' organisation provides an education programme that meets the need of staff which includes mandatory induction, training and updates on HAI guidance, policies and procedures.</p>
<p>NHS Scotland Assure Observations:</p> <p>The evidence submitted by NHS Forth Valley for this item is the Modular Build Contractor's Preliminary Pre-Contract Services Award (PCSA) issue quality plan, which notes that the IPCT will be consulted as part of the process of ongoing design reviews and in-process inspections, and lists HAI-SCRIBE within its management controls. It does not explicitly address the potential risks to future patients from, for example, contaminated water or ventilation systems. NHS Forth Valley should ensure that contractors and subcontractors are aware of these risks and of their roles in minimising them.</p> <p>Documents referenced are: <i>Quality Plan PCSA Phase 12.08.21</i></p>		

Workbook Ref No.	Areas to probe	Evidence expected
7.4	How does the Health Board assure itself that equipment meets the required IPC standards?	The IPC Team are involved and IPC advice followed in all procurement decisions for new equipment prior to purchase. IPCT are satisfied that all equipment purchased can be decontaminated safely in line with National Guidance and manufacturer's instructions.
<p>NHS Scotland Assure Observations:</p> <p>IPC Team involvement in the procurement of equipment is evidenced by IPC engagement with the NTC Equipment Workshop.</p> <p>Documents referenced are: <i>UPDATED 05.05.22 – Rolling Action Log</i> <i>05.05.22DRAFT Minute Equipment Workshop</i></p>		

3.7.2 Infection Prevention & Control Built Environment: Further Observations

In addition to the points raised via the KSAR workbook above, we also include the following observations as a result of the review, all of which relate to the evidence presented during the appraisal.

3.7.2.1

During a site visit the NHSSA review team observed substantial water ingress to the building. This has apparently resulted in water damage and mould on internal walls in multiple sites throughout the building. NHSSA understands that all affected plasterboard is to be replaced; NHS Forth Valley should ensure that the IPCT is engaged throughout this process and their advice followed.

4. Appendices

Appendix 1: Glossary

Please refer to NHS Scotland Assure – Assurance Service Master Glossary document available to download from [NHS National Services Scotland website](#)

