

**NHS Grampian
The ANCHOR Centre
Key Stage Assurance Review**

**Construction
KSAR Report**

Table of Contents

Table of Contents	2
Document Overview	3
1. Executive Summary	5
1.1 Summary of Findings	8
1.2 Project Overview	9
2. Review Methodology	10
2.1 Overview of NHS Scotland Assure & The KSAR Process	10
2.2 KSAR Process	11
2.3 Application of Standards & Legislation	11
2.4 Project Technical Outline Summary	13
3. KSAR Review Summary	14
3.1 Project Governance and General Arrangements	14
3.2 Water and Internal Plumbing / Drainage Systems	28
3.3 Ventilation	37
3.4 Electrical	46
3.5 Medical Gases	54
3.6 Fire	62
3.7 Infection Prevention & Control Built Environment	74
4. Appendices	80
Appendix 1: Glossary	80



Document Overview

Key Stage Assurance Review Report | Construction Stage

Prepared for:

NHS Grampian – The ANCHOR Centre

Prepared by:

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Document Control Sheet

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1. Executive Summary

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

Whilst NHS Grampian have demonstrated assurance on a number of elements during the KSAR process, given the time remaining to construction completion, we 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 significant concern is the lack of assurance demonstrating stakeholder interaction and sign-off of developed strategies, particularly with respect to the Infection Prevention & Control (IPC) team approvals / comments.

The evidence provided by NHS Grampian, does not provide assurance that engagement between the NHS Grampian project team and their IPC colleagues has been consistent throughout the project. Furthermore, the NHS Grampian IPC team raised a number of their own concerns during the KSAR process, including items related to the developed ventilation and domestic water services design strategies and the potential impact on IPC strategies.

The review undertaken at Full Business Case (FBC) by Health Facilities Scotland under the Interim Review Service (IRS), identified multiple concerns in relation to the development of the ventilation strategy that, from the evidence presented, do not appear to have been addressed. These include (but are not limited to) inconsistencies between project documents in relation to air change rates/pressure cascades, potential non-compliances with SHTM 03-01 and stakeholder input to and approval of developed solutions.

The IRS FBC report also highlighted concerns in relation to the development of project derogations, including lack of demonstrable evidence to indicate stakeholder review and approval, assessment of risks or mitigation measures to be implemented. The current derogations schedule (as submitted by NHS Grampian) is still lacking detail in relation to these points and does not appear to capture the concerns raised by NHS Grampian's own IPC team.

In the absence of any consolidated action plan tracker, it was not always apparent as to how NHS Grampian have closed out the residual actions from the IRS review. NHS Grampian have noted a commitment to demonstrate close out of any outstanding items in conjunction with the findings identified through this KSAR and have advised verbally that they have a tracker to monitor the IRS actions that was not submitted as part of their KSAR response.

From a fire safety perspective, NHS Scotland Assure note that there was no assurance as to how NHS Grampian were monitoring the implementation of the fire strategy on site. There was an inference that this was being done via the NEC Supervisor inspections, however this aspect is not specifically noted within any of the NEC Supervisor reports.

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

- Review developed mechanical, electrical and plumbing strategies with the NHS Grampian IPC team, including ventilation strategies. Ensure that documented approvals are in place from all key stakeholders.
- Ensure that the derogation schedule is fully updated to include an appropriate level of technical detail, inclusive of supporting risk assessments and proposed mitigation measures. Ensure technical and clinical stakeholder review and approval of derogations is documented and that any derogations accepted provide an equivalent (or better) level of safety/performance than if the relevant guidance been complied with in full.
- Ensure that the processes for training and mentoring operatives with no previous healthcare experience is reviewed and implemented.
- Ensure that the testing commissioning programmes are reviewed by the PSCP and their subcontractors, to ensure that there is adequate time allowed for the commissioning process and the programmes are in alignment.
- Review the duty holder matrix and ensure that it is updated to reflect the required contributing roles beyond Authorised and Competent Persons, for example duty holders, IPC roles etc.
- Ensure that all CDP and specialist elements have been coordinated within the project Building Information Modelling (BIM) model and reviewed by relevant NHS Grampian stakeholders.
- Ensure that access and maintenance strategies have been developed for CDPs and specialist elements and that these are reviewed by relevant NHS Grampian stakeholders.
- Ensure that drip trays under heater batteries are incorporated in line with the requirements of SHTM 03-01 Part A (2014).
- Ensure that a Designer's Commissioning Brief is developed and reviewed in line with the requirements of SHTM 04-01 Part A (2014).
- Review the impact on the wider site to facilitate the connection from the existing site-wide electrical infrastructure to the ANCHOR facility, including whether there will be any break in supply that may impact other areas of the Forresterhill site. Ensure that the PSCP provides recorded evidence of infrastructure connection action plan, including phasing, notifications, stakeholder engagement and Safe System of Work. All information should be documented and signed off by NHS Grampian prior to works commencing.

- Review the status of electrical schedules noted as preliminary to ensure that these have been approved for use in the Construction stage.
- Ensure all recommendations from the IRS FBC have been reviewed and addressed, with supporting evidence recorded.
- Develop and implement a consolidated action plan, combining any residual items from the IRS FBC report and the Construction KSAR report.

1.1 Summary of Findings

The findings of this report have been collated based on information provided by NHS Grampian. 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 Grampian under separate cover:

Review	No. of Issues per category				
	1	2	3	4	5
Project Governance and General Arrangements	1	8	5	3	0
Water and Internal Plumbing / Drainage Systems	1	1	2	0	1
Ventilation	1	3	3	1	0
Electrical	0	3	2	1	0
Medical Gases	0	1	1	1	0
Fire	0	0	3	6	0
Infection Prevention & Control Built Environment	0	0	4	2	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

The ANCHOR Centre is located within the Foresterhill Site in Aberdeen and will be co-located with the Radiotherapy Centre opened in 2013. Once the new facility is commissioned, both will operate as a single ambulatory centre for the patients of Grampian and the North of Scotland. The new centre will provide out-patient and day-patient investigation and treatment services for patients with cancer and for patients with blood and bone marrow disorders, including non-cancerous conditions as well as cancers. The centre will also include an aseptic pharmacy and research and teaching facilities. The ANCHOR Centre and Radiotherapy Centre are connected on two levels.

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 Grampian's ANCHOR Centre took place between 29th August 2022 and 24th 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

NHS Grampian have appointed a Principal Supply Chain Partner (PSCP) to undertake the design, construction and delivery of the ANCHOR Centre.

The project has a reliance on the existing sitewide NHS Grampian infrastructure for key items, such as electricity, mains water services, medium temperature hot water and medical gas infrastructure.

An outline summary of the primary mechanical, public health and electrical systems installed on the project are as follows:

- Mains water services are derived from the wider site infrastructure, with two supplies from independent sources. Within the facility, water storage is provided with mains and boosted cold water distributed across the facility. Cold water is stored before distributing throughout the facility as boosted cold water on a flow and return loop.
- The domestic hot water services are provided by semi-storage calorifiers via plate heat exchangers served by low temperature hot water services.
- New medical gas infrastructure is provided via an extension from the existing site infrastructure including the existing 2no. Oxygen Vacuum Insulated Evaporator (VIE) plant, providing two potential sources of supply. Oxygen, Entonox, medical and surgical air pipework is distributed throughout the facility.
- Ventilation plant is provided within the facility to accommodate the specific medical and occupational needs of the facility. Air Handling Units (AHU) are located within the rooftop plantroom with ductwork distribution systems throughout. The aseptic suite is supplied with dedicated ventilation plant.
- Drainage is provided throughout the facility using a mixture of central downpipes and horizontal service pipes, which serve the required outlets before entering the site wide drainage infrastructure.
- Electrical services emanate from the existing site wide infrastructure High Voltage (HV) network which supplies a new ring main unit which in turn serves a new transformer and main switchboard.
- Medical IT (electrical) and Uninterruptable Power Supply (UPS) systems are provided within the facility.
- Fire detection and alarm systems are provided to maintain the L1 system category across the facility and integrate with the fire engineering solution across the facility.
- Offsite manufacturing processes have been utilised which include pipework and containment systems. No ductwork or medical gases have been included on these prefabricated modules.

3. 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
<p>NHS Scotland Assure Observations:</p> <p>NHS Grampian have provided a number of documents that demonstrate the processes they have in place for monitoring and managing quality, however, NHS Grampian have not provided assurance in relation to the frequency and process for formally reviewing/updating the Project Quality Plans (PQPs) and how the engagement/approval of the NHS Grampian IPC team or other stakeholders is managed.</p> <p>The health board provided evidence of Project Quality Plans (PQPs) developed by the Principal Supply Chain Partner (PSCP) and the Mechanical, Electrical and Public Health (MEPH) subcontractor which includes an overview of various processes including;</p> <ol style="list-style-type: none"> 1. Document control and management of records 2. Planning and control of construction 3. Competence and training 4. Inspection, testing and verification 5. Non-conformance procedures 6. Use of BIM 360 field for recording construction quality observations/defects <p>The PQP issued as part of the KSAR response was noted as being in draft and dated 11th March 2022. There was no evidence provided as to how often the PSCP was reviewing the content during Construction to make sure it was current, or how the board/PSCP was monitoring the implementation of the document.</p>		

NHS Grampian have provided evidence that inspection and test plans are being developed, with regular reviews being undertaken. At the time of the KSAR, the last formal update of the documentation was dated 31st July 2022.

The PQP confirms that the inspection and test plans (ITPs) will be summarised by work element. All inspections and tests will be complete by competent persons, with suitable records being complete. Whilst a register of ITPs was provided indicating the status of each, no examples of ITPs were provided for review.

The MEPH subcontractor PQP provides detail on the requirements for testing and commissioning specifically, citing regulations and commissioning guides. The document details visual inspection protocols and interfaces with the 'BIM360 Field' quality management system for recording quality observations and other relevant supporting information. There is also reference and links to testing and pre-commissioning sheets. The document also cites specific quality control procedures which include all relevant systems on the project. This document also provides an overview of the quality procedures associated with the offsite manufacturing of services.

NHS Grampian did not provide assurance of IPC input into the quality monitoring processes. Concerns were raised by the health boards own IPC team around the sign-off and approval of design solutions currently being implemented on site, for example, in relation to the ventilation strategy within the chair treatment area. Given the progress on site, this represents a risk that installed solutions are not currently approved by all stakeholders. Further details on specific concerns with respect to the ventilation can be found in section 3.3 of this report.

Documents referenced are:

PQP Baird ANCHOR Project Main Works Draft P01 (002+DM+GD comments)

Page 38&42 NHSGAS-GRA-XX-XX-RP-W-01300

NGB ANCHOR Mech ITP Register No. 17 – 29.7.22

ANCHOR Centre Complete Criteria Update Aug_22

ANCHOR SOR 013090822- NDT

ANCHOR MEP CVF Tracker 310722

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:

NHS Grampian have provided assurance that they have processes in place for monitoring Quality Assurance, but as noted in KSAR Question 1.1, concerns are noted with respect to the process and frequency for reviewing and updating the PQP document during Construction and how the health board are monitoring its implementation.

Documents referenced are:

*PQP Baird ANCHOR Project Main Works Draft P01 (002+DM+GD comments)
Page 38&42 NHSGAS-GRA-XX-XX-RP-W-01300
Change Request Form Tracker*

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 Grampian have provided a number of documents demonstrating that there are regular quality assurance audits and reports being undertaken on the project by the health board. However, as noted within KSAR question 1.1, NHS Scotland Assure have concerns over the IPC approvals process, with several concerns identified by the health boards own IPC team yet to be addressed. There was also no evidence

presented as to how the IPC team have been engaged to undertake site quality audits or inspections

There are a number of individuals responsible for undertaking quality inspections and reporting. These include the NEC Supervisors, NHS Grampian Clerk of Works and the independent commissioning manager.

The project is managed by the Project Director, with support from an external Project Manager. The health board have appointed internal staff in the roles of Technical Supervisor and NEC3 Supervisor, which gives the Board a technical review of the works on the day of inspection and reports are prepared which are shared with all stakeholders.

Examples of NEC Supervisor reports were provided as part of the KSAR response. Whilst there is a nominated NEC 3 Supervisor in place, the documentation indicates that this is a building fabric supervisor. There is no supporting detail to describe how the MEP Technical Supervisors would interface with the NEC 3 Supervisor. At the time of the KSAR it was also noted that the role of the MEP Technical Supervisor was vacant, following a change in local staffing, with no documented mitigation measures in place – NHS Grampian advised verbally that they are currently engaging with a 3rd party “as and when” required to supplement their own internal resource, but given the importance of this role, NHS Scotland Assure would recommend that this risk is fully assessed and documented.

From the sample reports provided, there is no assurance that the NEC Supervisor has been inspecting the materials storage compound and containers, nor whether the individuals now undertaking the inspections are competent/qualified to provide a multi-disciplinary technical overview.

Further to the health board’s representatives inspecting and reporting on quality, the independent commissioning managers are monitoring the MEP readiness for inspecting and testing through their role as independent testing and commissioning managers. This is reported through Site Observation Reports and the commissioning tracker provided for review.

Documents referenced are:

Various documents within folder 1.03 and 1.3 of the KSAR submission.

NEC ANCHOR Supervisor Report 13.05.22 (NHS Grampian)

NEC ANCHOR Supervisor Report 10.06.22 (NHS Grampian)

QL1132NHS GRAMPIAN (B) NEC4 ANCHOR Rep No.32 WE 03.04.22

QL1132NHS GRAMPIAN (B) NEC4 ANCHOR Rep No.43 WE 26.06.22

QL1132NHS GRAMPIAN (B) NEC4 ANCHOR Rep No.47 WE 31.07.22

QL1132NHS GRAMPIAN (B) NEC4 ANCHOR Rep No.50 WE 21.08.22

MEP Progress Report 13-6-22

ANCHOR SOR 013090822- NDT

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:

NHS Grampian have provided documentation associated with the testing and commissioning programme, including the process for the collation of documents (once testing and commissioning results are available) and confirmation that an independent testing and commissioning manager has been appointed. It is noted however that there is a disconnect between the PSCP's testing and commissioning programme and the MEP contractor's programme, where the PSCP's programme is 6 weeks shorter than that of the MEP subcontractor. This may represent a risk to the success and adequacy of the commissioning of the MEP systems if not addressed. It is of vital importance to the success of the project that the MEP commissioning is not compromised by reducing the period required.

The PSCP has engaged with an independent commissioning manager to coordinate and govern the testing and commissioning process in line with the requirements set out in the PQP. The independent commissioning manager has prepared a commissioning plan which provides details of the systems to be commissioned, a high-level summary of key activities and the roles and responsibilities for each party, including NHS Grampian, for each RIBA stage from Stage 3 (pre-construction) up to Stage 6 (handover).

The independent commissioning manager has also prepared a tracker document, submitted for review, which goes into more specific detail for each system and identifies the specific commissioning certificates, witnessing requirements and demonstrations to be undertaken and offers a further defined progress evaluation.

Due to the contractual arrangement of the appointment of the independent commissioning manager by the PSCP, this does not represent a truly independent

organisation and as such NHS Grampian monitor the implementation of this role and ensure that no conflict of interest arises.

Documents referenced are:

The ANCHOR Centre Commissioning Plan, August 2022

220311 – NHSGAS-GRA-XX-XX-RP-W-24400 – Main Works Commissioning - Rev 19

220413 – NGB Rev G – TAC Commissioning Extract

MEP- Inspection, testing and commissioning sign off schedule

Workbook Ref No.	Areas to probe	Evidence expected
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>

NHS Scotland Assure Observations:

The Project Quality Plan (PQP) provided by NHS Grampian outlines an approach for raising defects. The approach evidenced by NHS Grampian indicates that any quality issues are generally raised as an observation first and if not addressed are subsequently upgraded to a defect. No assurance was provided by NHS Grampian as to the threshold for upgrading the observations to defects.

The PQP notes that “*observations are identified and recorded on the BIM360 software and defects are raised as necessary and followed up formally under contract by the Board using the CAT toolkit.*” Once addressed, these items are noted as cleared on the Asite and BIM360 software. There is no defined process to determine what constitutes “*as necessary*” nor how these will be formally recorded under the contract.

All observations and defects are collated and retained on the BIM360 central data environment. During the KSAR this was demonstrated by the PSCP.

Documents referenced are:

NHS Grampian- Baird ANCHOR PEP Stage 4 20-06-22

To demonstrate the management of defects

NHSGAS-GRA-XX-XX-RP-W-01300 1.5

BIM360 Observations.JPG

Defects Asite.JPG

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?	Soft Landings process Plans have / are being developed for collating as installed information and documents.
<p>NHS Scotland Assure Observations:</p> <p>A number of documents have been provided that outlines the Soft Landings delivery process with roles and responsibilities, which provides assurance at this stage of the project that the management of the handover process is being considered and developed by NHS Grampian. This includes the identification of a Soft Landings Champion, who has prepared a number of supporting documents and chaired a number of meetings related to the Soft Landings process. A Soft Landings “delivery action plan” has also been created and will be a work in progress throughout the remainder of the project.</p> <p>The NHS Grampian KSAR Review Summary Evidence document confirms that all digital information will be transferred to NHS Grampian from the PSCP in a digital format. The actual handover process is yet to be agreed and is not defined in the PQP.</p> <p>Documents referenced are: 1.6 Soft Landings Approach 1.6 Delivery Action Plan (Draft)v2 19.08.22 NHS Grampian KSAR Review Summary Evidence (1.6), 26.08.22</p>		

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 Grampian provided evidence of a revised Stage 3 Construction HAISCRIBE and a supporting HAISCRIBE risk matrix to detail the risk profile of the identified risks. From the documents provided, it was evident that the initial Stage 1 HAISCRIBE undertaken in 2015 was completed without input from IPC which does not follow the principles of HAISCRIBE. Whilst it is understood based on confirmation by NHS Grampian, that there was IPC input to the Stage 1-3 HAISCRIBE (undertaken in 2018) and the HAISCRIBE for the enabling works (2018), the role of the individuals involved in the process are not identified within the documentation. The most recent version of the HAISCRIBE Stage 3, provided as part of the KSAR response, was dated December 2020, which was carried out in conjunction with the health boards IPC team. Whilst evidence was provided to demonstrate that further reviews of the risk matrix have been undertaken, there is no evidence to provide assurance that the HAISCRIBE document has been reviewed or updated. This may lead to risks not being identified or recorded in accordance with the recommended processes outlined in Scottish Health Facilities Note (SHFN) 30.

There is no evidence of any regular site inspections being undertaken by the NHS Grampian IPC team throughout the construction period, nor was there any evidence of how the NHS Grampian IPC team were monitoring the works in accordance with the HAISCRIBE and the associated risk matrix.

Whilst the PSCP provided a contractor endorsement certificate example to demonstrate they have integrated the requirements of the HAISCRIBE into their induction processes, there was no evidence to support what is covered in the induction or how the level of understanding of PSCP and subcontractor teams is monitored.

NHS Grampian provided examples of specific task HAISCRIBE documentation for interfaces with the existing building. The examples provided did not contain signatures of the key stakeholders relevant to the process.

Documents referenced are:

Baird ANCHOR HAI SCRIBE contractor endorsement certificate
HAI-SCRIBE ANCHOR Centre Stage 3 - 9th December 2020
Baird and ANCHOR HAI Scribe Risk Matrix no 15 June 2022
Radiotherapy enabling works HAI SCRIBE
Review of actions from HAI Scribe
3-8b Minor Project HAI pack Rev 4 – ANCHOR RADIO THERAPY ALTERATIONS

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:

NHS Grampian provided evidence of the clinical briefing information which was developed in 2016. Evidence of initial stakeholder engagement was also provided. There was no evidence provided as to whether the briefing information has been reviewed since 2016. The evidence presented showed inconsistent engagement with IPC stakeholders, as the health board's IPC stakeholders themselves have raised a number of concerns through the KSAR process that do not appear to have been addressed by the project team.

There are a number of documents relating to derogations provided within the NHS Grampian KSAR evidence pack. Evidence of a tracker document has been provided, but no details of the supporting processes were provided. There is a lack of supporting evidence to provide assurance that derogations have been adequately developed, collated, associated risks and mitigations understood and ultimately addressed with appropriate consultation and sign off. There is therefore no assurance that derogations are being appropriately managed.

Documents referenced are:

The ANCHOR Centre Service Modelling Paper March 2016
Final ANCHOR Clinical Brief – July 2016
Copy of NHSGAS-GRA-XX-XX-RP-W-11300_P13
NHSGAS-GRA-XX-XX-RP-W-1150-ANCHOR Architectural Derogations_P09

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 Grampian have provided a number of documents from the Principal Designer and CDM Advisor confirming that regular site inspecting and reporting is being undertaken.

The Principal Designer for the project has been confirmed as the PSCP, who also acts as Principal Contractor.

The Board have also engaged the services of an external organisation to fulfil the role of CDM Advisor and to be responsible for regular site inspections and audits, with evidence of these inspections/audits provided as part of the NHS Grampian KSAR response.

Documents referenced are:

AECOM NHS Grampian_Core Team Report_12.05.22

AECOM NHS Grampian_Core Team Report_13.07.22

AECOM NHS Grampian_Core Team Report_15.06.22

CDM Contract Reviews 1-5

NHS GRAMPIAN Bard & ANCHOR – Audits March 2021, August 2021, November 2021 & June 2022

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:

NHS Grampian appointed the PSCP in 2017 via the Framework Scotland 2 standard processes. With respect to the procurement journey, the PSCP has subsequently appointed a number of MEPH subcontractors. Further narrative on the selection of MEPH subcontractors is included in the respective technical sections of this report. No details have been provided on the experience of the independent commissioning manager, or the commissioning contractor or how their competency has been assessed by the PSCP or the health board.

Further procurement and allocation of equipping packages is also ongoing on the project, with evidence of these processes provided as part of the KSAR.

The NHS Grampian evidence provided indicates that IPC were to be involved in meetings relevant to equipment procurement, but no evidence of their involvement was provided. NHS Scotland Assure note that this further highlights the lack of documented IPC engagement on the project. There is a risk, therefore, that equipping strategies may not align with project IPC strategies and the NIPCM.

Documents referenced are:

- 1.10 Evidence Overview Procurement*
- 1.10c Evidence_IPCT*
- Baird ANCHOR HAI SCRIBE contractor endorsement certificate*
- ANCHOR Construction phase Stage 3 HAI Scribe*
- Baird and ANCHOR HAI Scribe Risk Matrix no 15 June 2022*
- Radiotherapy enabling works HAI SCRIBE*
- Review of actions from HAI Scribe*
- 3-8b Minor Project HAI pack Rev 4 – ANCHOR RADIOTHERAPY ALTERATIONS*

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

NHS Scotland Assure Observations:

As noted in KSAR question 1.4, NHS Grampian evidenced that processes were in place for the commissioning of MEPH systems through the PQP and other supporting documents. At the time of the KSAR, construction works were ongoing and pre-commissioning checks had yet to be fully concluded, however evidence of the ongoing processes was provided as part of the KSAR response.

The project PQP refers to an independent commissioning manager being appointed by the PSCP who will oversee the works. Due to the contractual arrangement of the appointment, this does not represent a truly independent organisation and as such NHS Grampian monitor the implementation of this role and ensure that no conflict of interest arises.

Documents referenced are:

- The ANCHOR Centre Commissioning Plan, August 2022*
- 220311 – NHS GRAMPIANAS-GRA-XX-XX-RP-W-24400 – Main Works Commissioning - Rev 19*
- 220413 – NGB Rev G – TAC Commissioning Extract*
- MEP- Inspection, testing and commissioning sign off schedule*
- ANCHOR Functional Commissioning Phase Gantt Chart v1.0 Jan 2020weeks*
- Team Structure June 2022*

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 Grampian provided evidence of a duty holder matrix for the facility, however this document did not identify all key stakeholders involved in the project governance structure. The document primarily identifies NHS Grampian's Authorised and Competent persons for MEPH and other services. The reporting structure is directly to the Designated Person. There is no defined reference to IPC roles within the matrix.

The Authorising Engineers associated with the relevant MEPH systems are not named and the health board's fire representative is missing.

The '1.12b2 2 Stage 4 Resource Arrangements_021121_v5 and 1.12b3 2 Stage 4 Resource Arrangements_0230522_v3' documents note a particular risk as "NHS Grampian IP&C capacity to implement lessons learnt from other public sector projects."

This is a clear indicator that a risk of capacity around IPC resource was acknowledged. There was no definitive mitigation for this specific risk identified within the KSAR response.

Documents referenced are:

Team Structure June 2022

1.12b2 2 Stage 4 Resource Arrangements_021121_v5

1.12b3 2 Stage 4 Resource Arrangements_0230522_v3

3.1.2 Project Governance and General Arrangements: 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.

3.1.2.1

There is no evidence that the specialist design package associated with the aseptic suite has been reviewed by NHS Grampian. NHS Grampian should ensure that a fully documented review of the specialist design package is in place.

No evidence has been provided to provide assurance that an access and maintenance strategy for the aseptic suite has been developed, reviewed and agreed with key stakeholders from NHS Grampian.

3.2 Water and Internal Plumbing / Drainage Systems

3.2.1 Water and Internal Plumbing / Drainage Systems: KSAR Observations

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:

NHS Grampian have provided evidence relating to the training and competency of named individuals, including a master training matrix, which offer a level of assurance that plumbers are suitably trained. Whilst there is a volume of information present, the summary matrix clearly states that a number of operatives have no previous healthcare experience. The PSCP advised verbally that the site operational procedures involve a process for those with no direct healthcare experience to work alongside experienced healthcare operatives, however no documented evidence of this process was provided.

The MEPH Subcontractor has submitted to the PSCP individual training certificates for each of the 25 individuals with responsibilities to deliver the plumbing and water services installations. The training matrix provided, however, clearly shows that very few of the individuals responsible for installation of the water services on site are confirmed as having previous healthcare experience.

It is clear from the evidence submitted that a site induction process has been developed and implemented by the PSCP in relation to the internal plumbing / drainage systems. It was explained by NHS Grampian and PSCP representatives that the development of the KSAR induction training process was agreed during

workshops between both prior to roll out of the documentation which would ensure technical site operatives were aware of the requirements of working on the ANCHOR project.

No evidence has been submitted which confirms that all contractors and subcontractor competency checks have been completed and signed off by NHS Grampian.

Documents referenced are:

*Various documents within folder 4.01
KSAR Document Transmittal Record
KSAR Training Matrix - master*

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 SHFN 30 training.</p>

NHS Scotland Assure Observations:

NHS Grampian provided evidence identifying the plumbing contractor’s previous healthcare experience and site management structure. The documentation provided lists a number of projects, but does not explicitly state whether plumbing works formed part of the particular project. It is therefore unclear as to what extent the health board and PSCP have probed the experience and competency of the plumbing contractor to undertake the works on the ANCHOR Centre. As noted in KSAR question 2.1, the KSAR has also identified a number of site operatives with no healthcare experience.

Evidence of a site management structure was provided as part of the KSAR response which identifies individuals allocated to roles and their responsibilities including the Senior Project Manager, Technical Manager, and QC Manager and how these roles link back to PSCP from various specialist subcontractors.

An SHFN30 Part B contractor endorsement certificate was provided as described in section 1.7. No detail was provided regarding the HAISCRIBE education provided/undertaken or the roles or responsibilities required for the project with respect to HAISCRIBE.

No evidence has been submitted which demonstrates that HAI Scribe and SHFN 30 training has been provided to the onsite personnel, with the exception of the PSCP Pre-Construction Director. No detail of the content of the training was provided in relation to HAI and HAISCRIBE.

Documents referenced are:

'MEPH subcontractor' and Subcontractors Training Matrix
Drainage Organogram 10.03.22
Domestic Water Management Organogram 10.04.22
Baird Anchor HAI Scribe contractor endorsement certificate
'MEPH subcontractor' Projects Undertaken

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:

NHS Grampian has submitted a number of NEC Supervisor's Site Inspection Reports, MEP progress reports, which cover the fabric and MEP installations. These offer assurance that regular inspections are being carried out to ensure the water and plumbing/drainage systems are being installed to the correct standard and design. At the time of the KSAR it was also noted that the role of the MEP Technical Supervisor was vacant, following a change in local staffing, with no documented mitigation measures in place.

The reports record any general observations noted at the time of inspection, priority issues to be addressed, health and safety issues observed and progress photos. Also provided is a document titled '2022 09 12 G001 Assure Contents List'. This list details the existence of 89 records, for example, MEP Progress Report 13-6-22, NEC3 ANCHOR Supervisor Report, 14.03.22 CoW Report ANCHOR, 'CDM Advisor' NHS Grampian Core Team Report. There was no evidence provided for review to demonstrate that observations had been closed off timeously.

A file note provided by NHS Grampian confirms that their technical staff, Technical Supervisors and Clerk of Works will be appointed to oversee the PSCP commissioning process and undertake site inspections. The team are also supported by external companies to assist in undertaking site inspections and reporting on quality observations.

Documents referenced are:

2022 09 12 G001 Assure Contents List

MEP Progress Report 12-5-22 & 18-7-22

NEC 3 ANCHOR Supervisor Report – 11-02-22 (NHS Grampian)

NEC 3 ANCHOR Supervisor Report – 11-03-22 (NHS Grampian)

NEC 3 ANCHOR Supervisor Report – 14-04-22 (NHS Grampian)

NEC 3 ANCHOR Supervisor Report – 13-05-22 (NHS Grampian)

NEC 3 ANCHOR Supervisor Report – 10-06-22 (NHS Grampian)

NEC 3 ANCHOR Supervisor Report-15.07.22 (NHS Grampian)

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).
<p>NHS Scotland Assure Observations:</p> <p>NHS Grampian have provided evidence of NEC Supervisor Site Inspection Reports and noted that as part of this process, the NEC Supervisor would be monitoring the pipework installation. The NEC Supervisor reports do not highlight any significant concerns with respect to open-ended pipework, nor were any significant observations made in this respect during the NHS Scotland Assure site visit. However, it is noted that there is no MEP Technical Supervisor at the time of writing, to assist in monitoring the installation process.</p> <p>As noted previously in this report, there is no evidence to demonstrate that the NEC Supervisor site inspections also cover the material storage compounds/containers within the site.</p> <p>It was also confirmed during the Plumbing and Domestic Water Services KSAR Workshop held on Friday 25th October 2022 that the MEPH subcontractor are monitoring the plumbing and domestic water services installation and producing monthly site progress reports which include photographic evidence of progress. Photographs were evidenced through the PSCP monthly progress reports and the use of the Multivista system.</p> <p>The reports from the NEC Supervisor and MEPH subcontractor are stored on a digital platform, with access available to project team members, including NHS Grampian.</p> <p>Documents referenced are:</p> <p><i>NHS Grampian KSAR Review Summary Evidence (2.4)</i> <i>NEC 3 SUPERVISOR SITE OBSERVATION REPORT – 10.06.22</i> <i>NEC 3 SUPERVISOR SITE OBSERVATION REPORT – 13.05.22</i></p>		

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?	<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.</p> <p>Evidence that the plant access strategy is being adhered to.</p>

NHS Scotland Assure Observations:

NHS Grampian provided evidence of developed access and maintenance information, including drawings and schedules. The evidence also demonstrated engagement between the PSCP and NHS Grampian Estates teams, including BIM “fly through” sessions to review key areas.

The PSCP has provided a recording of a meeting held between PSCP and NHS Grampian technical representatives dated 28.07.2022. This meeting involved a fly-through of the coordinated BIM model and was led by representatives from MEPH Subcontractor and PSCP, where five key examples of critical services such as lighting, fire dampers, ventilation services, water services and internal drainage were reviewed, in addition to clear access being reviewed along main corridor distribution runs. NHS Grampian’s technical representation was observed to be engaged with the meeting activities as well as referencing previous BIM Model fly-throughs where previous coordination elements had been discussed.

The PSCP has also provided numerous examples of meeting minutes ‘N101H-NOR-XX-XX-MN-A-43401’, dated from 04.01.22 – 27.07.22 within which various discussions surrounding BIM coordination have been evidenced. However, there appears to have been no attendance at these meetings by MEPH designers. Only the structural designers were present alongside PSCP, MEPH subcontractor and architectural team, as documented within the minutes. It was confirmed at the weekly KSAR progress meeting on 08.11.22 that the MEPH subcontractor was responsible for the coordination and design elements after RIBA stage 4a.

NHS Grampian have also provided a plant access and maintenance strategy documented dated 13.05.22. However, it is understood at the time of the KSAR this document is still to be reviewed and approved by NHS Grampian. The plant access and maintenance strategy provided for review excludes a number of key CDP elements, including the aseptic suite. It is not clear if the access and maintenance

strategy for CDP elements have been developed and reviewed by key stakeholders within NHS Grampian.

Documents referenced are:

N101H-NOR-XX-XX-MN-A-43401 versions 15-20

NHS GRAMPIAN B&A - NGB Baird and ANCHOR Model fly through-20220728_130906-Meeting Recording.mp4

N101H-MML-ZZ-ZZ-RP-M-2001

N101H-MML-ZZ-ZZ-PF-M-50100

N101H-MML-ZZ-ZZ-RF-M-50100

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> <p>Are plant/tank rooms, IPS sections, horizontal distribution runs and risers appropriately sized for the equipment being installed and facilitate safe adequate maintenance?</p>

NHS Scotland Assure Observations:

Within the evidence provided as part of the KSAR response, NHS Grampian have not identified a strategy or requirement for any spare capacity in the installation. The PSCP also provided a cover note which states “*there is no requirement within the BCRs sections 6.12 relating to space for future flexibility relating to drainage.*”

Similarly, a cover note was provided stating “*there is no requirement within BCR sections 8.6.1, 8.6.2, 8.6.6 that suggests there is a requirement for future flexibility of the internal water services*”.

There is evidence of the PSCP carrying out BIM model fly through meetings with NHS Technical representation present dated 28.07.22, however there is no evidence to suggest that the PSCP has presented coordination drawings indicating any specific future flexibility zones to NHS Grampian.

The MEPH subcontractor and PSCP have provided recorded meeting evidence demonstrating the main access runs to NHS Grampian as part of the design coordination and that the domestic water pipework distribution systems have generally been installed above cable basket. The PSCP in this model fly-through meeting confirmed that access to valves on pipework within the corridor ceilings void could be achieved through the 500mm zone allowed in the corridor voids.

The PSCP has utilised offsite manufacturing techniques in the form of Prefabricated Service Modules (PSMs). These modules have been constructed off site and installed within the main circulation routes in the building.

Documents referenced are:

N101H-NOR-XX-XX-MN-A-43401 versions 15-20

NHS GRAMPIAN B&A - NGB Baird and ANCHOR Model fly through-20220728_130906-Meeting Recording.mp4

N101H-MML-ZZ-ZZ-RP-M-2001

N101H-MML-ZZ-ZZ-PF-M-50100

N101H-MML-ZZ-ZZ-RF-M-50100

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 deterioration and from the entry of contaminants into the parts of the component which will be in contact with the water?	<p>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.</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>

NHS Scotland Assure Observations:

As noted previously within this report, NHS Grampian have appointed an NEC Supervisor to undertake regular site inspections and prepare reports. There is no evidence to demonstrate that as part of the site inspections that materials storage containers have been inspected. The report samples provided appear to only cover local materials storage within the site itself. As noted above, at the time of the KSAR it was also noted that the role of the MEP Technical Supervisor was vacant, following a change in local staffing, with no documented mitigation measures in place.

Documents referenced are:

NEC 3 ANCHOR Supervisor Report – 11-02-22 (NHS Grampian)

NEC 3 ANCHOR Supervisor Report – 11-03-22 (NHS Grampian)

NEC 3 ANCHOR Supervisor Report – 14-04-22 (NHS Grampian)

NEC 3 ANCHOR Supervisor Report – 13-05-22 (NHS Grampian)

NEC 3 ANCHOR Supervisor Report – 10-06-22 (NHS Grampian)

NEC 3 ANCHOR Supervisor Report-15.07.22 (NHS Grampian)

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:

As noted within KSAR question 1.4 NHS Grampian and the PSCP have provided evidence of plans for undertaking pre-commissioning activities. This evidence extends to cover domestic water services and drainage.

At the time of writing, as the domestic water pipework is still being installed the 'pre commissioning checks' are ongoing.

An independent testing and commissioning manager is in place and is responsible for pre-commissioning checks as part of their independent commissioning role under the PSCP. An '*MEP - Inspection, Testing & Commissioning Review & Sign Off Schedule*' (or CVF Tracker as indicated in the documents provided) has been provided which details the minimum inspection, testing and commissioning and pre-commissioning

requirements for the MEPH systems Installed. Detailed within are appropriate standards such as 'BS EN 12056 – 2' for gravity drainage systems as well as 'SHTM 04-01' relating to water safety for healthcare premises. There is no evidence provided to demonstrate this methodology has been reviewed and signed off by the board.

Documents referenced are:
ANCHOR MEP CVF tracker 310722

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:

NHS Grampian have provided documentation relating to change management and the processes in place to document, approve and sign off variations. Whilst there is a defined process in place, this process does not capture all key stakeholder input, particularly with respect to the health board's IPC team. There is a lack of evidence with respect to the derogations process, and a lack of documented review/approval, assessment of risks and mitigations by key stakeholders.

Documents referenced are:
NHS Grampian KSAR Review Summary Evidence (2.9).docx
NHSGAS -GRA-XX-XX-RP-W-11300_P13

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.

3.1.2.2	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 subcontractor competency checks have been completed and signed off.</p>
<p>NHS Scotland Assure Observations:</p> <p>The observations noted in response to question 2.1 apply to this question with respect to ventilation.</p> <p>The MEPH Subcontractor has submitted to the PSCP individual training certificates for each of the 17 individuals with responsibilities to deliver the ventilation installations. The training matrix provided, however, clearly shows that only one of the operatives responsible for installation of the ventilation systems for the specialist ductwork contractor is confirmed as having previous healthcare experience.</p> <p>Documents referenced are: <i>Various documents within folder 3.01</i> <i>KSAR Training Matrix – Master</i> <i>KSAR Transmittal - 3.1 Training of Ventilation Installers in Healthcare Environment</i></p>		

Workbook Ref No.	Areas to probe	Evidence expected
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>

NHS Scotland Assure Observations:

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

NHS Grampian have submitted evidence which demonstrates the specialist ductwork contractor’s previous healthcare experience across Scotland since the 1990’s, ranging from small works packages to large multi-million pound contracts. As stated in 3.1, the training matrix shows that only a single individual within the site team responsible for this particular project is noted as having previous healthcare experience. It is therefore unclear as to what extent the health board and PSCP have probed the experience and competency of the specialist ductwork contractor to undertake the works on the ANCHOR Centre.

Ventilation and air quality site management organograms have been provided which provide an overview of the site personnel structure including management. It was noted that the organograms provided differentiate between the ANCHOR and Baird Family Hospital projects, however, there appear to be discrepancies between staff allocated to the ANCHOR project on the project specific organograms and the overarching organogram.

The PSCP has provided a copy of the ductwork installers accreditations relating to ventilation installation.

Documents referenced are:

- ‘Specialist ductwork contractor’, Healthcare Contract Experience – Past projects Specialist ductwork contractor Accreditations.jpg*
- KSAR Ventilation Induction(Ductwork) Issue No.4*
- Air Quality Management Organogram 03.02.22*
- Ventilation Management Organogram 10.03.22*

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.
<p>NHS Scotland Assure Observations:</p> <p>The observations noted in response to question 2.3 apply to this question with respect to ventilation.</p> <p>Documents referenced are: 2022 09 12 G001 Assure Contents List MEP Progress Report 12-5-22 & 18-7-22 NEC 3 ANCHOR Supervisor Report – 11-02-22 (NHS Grampian) NEC 3 ANCHOR Supervisor Report – 11-03-22 (NHS Grampian) NEC 3 ANCHOR Supervisor Report – 14-04-22 (NHS Grampian) NEC 3 ANCHOR Supervisor Report – 13-05-22 (NHS Grampian) NEC 3 ANCHOR Supervisor Report – 10-06-22 (NHS Grampian) NEC 3 ANCHOR Supervisor Report-15.07.22 (NHS Grampian)</p>		

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).
<p>NHS Scotland Assure Observations:</p> <p>The observations noted in response to question 2.4 apply to this question with respect to ventilation.</p> <p>NHS Grampian have provided evidence of NEC Supervisor Site Inspection Reports and noted that as part of this process and that the NEC Supervisor would be monitoring the ductwork installation. The NEC supervisor reports highlight instances where open duct / plant ends have been identified on site, however, there were not</p>		

any significant observations made in this respect during the NHS Scotland Assure visit.

Documents referenced are:

NHS Grampian KSAR Review Summary Evidence (3.4)

2022 09 12 G001 Assure Contents List

MEP Progress Report 12-5-22 & 18-7-22

NEC 3 ANCHOR Supervisor Report – 11-02-22 (NHS Grampian)

NEC 3 ANCHOR Supervisor Report – 11-03-22 (NHS Grampian)

NEC 3 ANCHOR Supervisor Report – 14-04-22 (NHS Grampian)

NEC 3 ANCHOR Supervisor Report – 13-05-22 (NHS Grampian)

NEC 3 ANCHOR Supervisor Report – 10-06-22 (NHS Grampian)

NEC 3 ANCHOR Supervisor Report-15.07.22 (NHS Grampian)

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:

As presented in question 2.5, the same findings apply for ventilation as they did for water and drainage systems.

NHS Grampian have presented access and maintenance details in drawing and report format, for review through the KSAR. Engagement has also been demonstrated between the PSCP and NHS Grampian Estates teams through evidence of meeting minutes and BIM fly-through sessions.

The plant access and maintenance strategy provided for review excludes a number of key CDP elements, including the aseptic suite and smoke ventilation systems. It is

not clear if the access and maintenance strategies for CDP elements have been developed and reviewed by key stakeholders within NHS Grampian.

Documents referenced are:

N101H-NOR-XX-XX-MN-A-43401 versions 15-20

NHS Grampian B&A - NGB Baird and ANCHOR Model fly through-20220728_130906-Meeting Recording.mp4

N101H-MML-ZZ-ZZ-RP-M-2001

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 (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</p>

		the equipment being installed and facilitate safe adequate maintenance?
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NHS Scotland Assure Observations:

Within the evidence provided as part of the KSAR response, NHS Grampian have not demonstrated how space has been retained to allow for minor modifications and additions to the ventilation installation. The PSCP has provided a cover note which states “*BCR’s 8.6.8 Mechanical Ventilation, Air Conditioning and comfort Cooling. 8.12 Heating, ventilation zoning shall be configured to promote flexibility in order to enable re-modelling and re-planning to be undertaken at a future date*”. There is, however, no evidence to demonstrate that a strategy for incorporating space for future flexibility has been developed or incorporated into the design.

There is evidence of the PSCP carrying out BIM model fly through meetings with NHS Technical representation dated 28.07.22, however there is no evidence to suggest that the PSCP has presented coordination drawings indicating any future flexibility zones to NHS Grampian.

No calculations were provided for review and spare capacity was not defined within the technical submissions for plant provided for review. The PSCP verbally advised there is no spare capacity on AHUs other than design margin of 10% on flow rate and 21% on pressure and advised there is no defined space allocated in ceiling voids for future expansion.

There was no evidence provided for review to provide assurance that the ventilation strategies for each space had been reviewed and agreed with clinical and IPC colleagues within NHS Grampian. The local IPC team have raised a number of concerns in relation to HAI risks for the project, including the concerns around the ventilation proposals for the first-floor chair treatment area, which at the time of the KSAR are still to be resolved.

Documents referenced are:

- PSCP email to the Board, dated 07 March 2022 14:04*
- Overview of Plant Capacity and Spatial Provisions – March 2022*
- N101H-NOR-XX-XX-MN-A-43401 versions 15-20*
- NHS GRAMPIAN B&A - NGB Baird and ANCHOR Model fly through-20220728_130906-Meeting Recording.mp4*
- N101H-MML-ZZ-ZZ-RP-M-2001*
- N101H-MML-ZZ-ZZ-PF-M-50100*
- N101H-MML-ZZ-ZZ-RF-M-50100*

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>

NHS Scotland Assure Observations:

As noted within KSAR question 3.4 NHS Grampian have appointed an NEC Supervisor to undertake regular site inspections and prepare reports.

There is evidence to suggest that the NEC Supervisor is recording the storage of materials on site as the inspection records makes reference to ductwork end protection being used, and that there are some examples of where ductwork fittings are not protected. Photographic evidence is uploaded to BIM360 by both PSCP operatives, the NEC supervisor and observations recorded for action by the PSCP. Photographs are also recorded via the Multivista platform.

It was confirmed by the MEPH subcontractor during the KSAR Ventilation Workshop that they have been instructed to work to PDI Level 3 in line with *BESA TR 19 'Guide to Good Practice, Internal Cleanliness of Ductwork Systems'*, however, there was no specific reference to the ongoing monitoring of TR 19 requirements within the evidence provided.

Documents referenced are:

- NEC 3 ANCHOR Supervisor Report – 11-02-22 (NHS Grampian)*
- NEC 3 ANCHOR Supervisor Report – 11-03-22 (NHS Grampian)*
- NEC 3 ANCHOR Supervisor Report – 14-04-22 (NHS Grampian)*
- NEC 3 ANCHOR Supervisor Report – 13-05-22 (NHS Grampian)*
- NEC 3 ANCHOR Supervisor Report – 10-06-22 (NHS Grampian)*
- NEC 3 ANCHOR Supervisor Report-15.07.22 (NHS Grampian)*

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>
<p>As noted within KSAR question 1.4 NHS Grampian and the PSCP have provided evidence of plans for undertaking pre-commissioning activities. This evidence extends to cover ventilation systems.</p> <p>At the time of writing, as the ventilation system is still being installed the 'pre commissioning checks' are ongoing.</p> <p>An independent testing and commissioning manager is in place and is responsible for pre-commissioning checks as part of their independent commissioning role under the PSCP. An '<i>MEP - Inspection, Testing & Commissioning Review & Sign Off Schedule</i>' (or CVF Tracker as indicated in the documents provided) has been provided which details the minimum inspection, testing and commissioning and pre-commissioning requirements for the MEPH systems installed. There is no evidence to demonstrate that this methodology has been reviewed and signed off by the health board.</p> <p>Documents referenced are: ANCHOR MEP CVF tracker 310722</p>		

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.
<p>NHS Scotland Assure Observations:</p> <p>NHS Grampian have provided documentation relating to change management and the processes in place to document, approve and sign off variations. Whilst there is a defined process in place, this process does not capture all key stakeholder input, particularly with respect to the health board's IPC team. There is a lack of evidence</p>		

with respect to the derogations process, and a lack of documented review/approval, assessment of risks and mitigations by key stakeholders.

As an example, the derogations tracker document provided for review, notes that in the open plan chair treatment area, the number of air changes per hour (ACH) has been reduced from 10 ACH to 6 ACH, however, there is a lack of detail provided within the tracker to allow a full review of the technical approach taken to be undertaken as part of the KSAR. There is no associated supporting information to provide assurance that this strategy had been risk assessed with associated mitigations put in place. There is no detail provided as to the extent to which the derogation has been reviewed with key stakeholders, including the IPC team.

The derogation tracker also describes a 'non-standard approach' to the design of the air change rates and pressure regimes associated with the pentamidine room, however, no further supporting information has been provided to allow a full review of the technical approach taken to be undertaken as part of the KSAR.

Documents referenced are:

NHS Grampian KSAR Review Summary Evidence (3.9).docx

Derogation Tracker - NHSGAS-GRA-XX-XX-RP-W-11300_P13

3.3.1 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	In line with BSRIA BG 29-2011 ' <i>Pre-commission Cleaning of Pipework</i> ', test points are required around components such as strainers and pressure independent control valves (PICV) to ensure that blockages can be identified. It is not clear from the information provided for review whether test points are incorporated.
3.3.2.2	Drip trays under heater batteries are not specified within the project documentation. SHTM 03-01 Part A Clause 9.84. recommends these are provided. It is not clear from the information provided for review whether drip trays are incorporated. NHS Grampian IPC and Estates colleagues may also have comment on this element.
3.3.2.3	90° bends are indicated on ductwork drawings. These should be reviewed in accordance with SHTM 03-01 Part A, Clause 9.144 and DW144. It is recommended that long radius bends, large radius main branches with not more than 45° angle sub-branches and long-taper transformations should be used in accordance with noted guidance.

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 subcontractor competency checks have been completed and signed off.</p>
<p>NHS Scotland Assure Observations:</p> <p>The observations noted in response to question 2.1 apply to this question with respect to the electrical installation.</p> <p>Whilst NHS Grampian have provided evidence relating to the training and competency of named individuals, the documentation clearly states that a number of operatives have no previous healthcare experience. The PSCP advised verbally that the site operational procedures involve a process for those with no direct healthcare experience to work alongside experienced operatives, however, no documented evidence of this process was provided.</p> <p>No evidence has been submitted which confirms that all contractors and subcontractor competency checks have been completed and signed off by NHS Grampian.</p> <p>Documents referenced are: <i>Various documents within folder 4.01</i> <i>KSAR Training Matrix – Master</i> <i>KSAR Transmittal - 3.1 Training of Electrical Installers in Healthcare Environment</i></p>		

Workbook Ref No.	Areas to probe	Evidence expected
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>

NHS Scotland Assure Observations:

NHS Grampian has submitted evidence which demonstrates the MEP Subcontractor’s previous healthcare experience across Scotland ranging from small works packages to large multi-million pound contracts. It has not been made clear whether the site team responsible for this particular project have suitable healthcare experience or worked on these projects.

No evidence has been provided for review during the KSAR to demonstrate that site operatives have the required knowledge and experience of SHTM 06-01 and SHTM 06-02.

A Curriculum Vitae (CV) has been provided for the commissioning engineer, noting relevant experience, however, no healthcare experience is noted. A standard brochure is provided for the commissioning engineering company together with certification noting corporate registration with the Commissioning Specialists Association.

Documents referenced are:

‘PSCP’, Healthcare Contract Experience – Past projects

‘MEPH subcontractor’ KSAR training Matrix

KSAR electrical Induction document

XXXX Commissioning Engineers CV

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?	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. 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:</p> <p>The observations noted in response to question 2.3 apply to this question with respect to the electrical installation.</p> <p><i>Documents referenced are:</i> MEP Commissioning Manager ANCHOR SOR reports numbers 001-011 inclusive 'PSCP' SOR summary tracker dated 26th July 2022</p>		

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?	Evidence that the contractor has presented their co-ordination drawings (BIM model) to the Health Board. Evidence that the contractor has presented their co-ordination drawings (BIM model) to the design consultant and that they have agreed them for construction. 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:</p> <p>NHS Grampian have presented access and maintenance details in drawing and report format for review. Engagement has been demonstrated between the PSCP and Estates teams through evidence of meeting minutes and BIM fly-through sessions.</p> <p>As presented in question 2.5, the same findings apply for electrical systems as they did for water and drainage systems.</p>		

Documents referenced are:

PSCP/Architect' BIM coordination Minutes Version 15 – 20 inclusive

'MEPH subcontractor' Baird and ANCHOR model fly through meeting recording.

NHS Grampian Statement dated 26.08.2022

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 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>

NHS Scotland Assure Observations:

NHS Grampian have provided a file note setting out the requirement for spare capacity within the electrical design, however, the evidence provided does not clearly identify

that spare capacity has been maintained within the electrical installation. It is not clear if this requirement has been monitored through the design or construction stages.

There is evidence of the PSCP carrying out BIM model fly through meetings with NHS Technical representation present dates 28.07.22, however there is no evidence to suggest that the PSCP has presented coordination drawings indicating any future flexibility zones to NHS Grampian.

The PSCP has provided a “*health & safety risk assessment and plant access and maintenance strategy document*”, dated May 2022. This document has been produced by the MEP consultant and the PSCP confirmed this is a live working document (with tracked changes evidence within the document). At the time of the KSAR the document had not been approved by the health board therefore no assurance has been provided.

Documents referenced are:

BIM coordination Minutes Version 15 – 20 inclusive

health & safety risk assessment and plant access and maintenance strategy document”, dated May 2022

‘MEPH subcontractor’ Baird and ANCHOR model fly through meeting recording.

File note titled “To demonstrate electrical services are installed in a fashion which will retain space for minor additions and modifications to services in the future” – document is not dated

Workbook Ref No.	Areas to probe	Evidence expected
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?	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. 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:

NHS Grampian has submitted a number of NEC Supervisor’s Site Inspection Reports, which provide assurance that regular quality inspections are being carried out and reports prepared. It is noted that whilst these reports included the storage of materials onsite, they did not appear to inspect the stores.

A written statement has been provided by NHS Grampian to confirm that no specific checks were carried out on the storage of electrical materials within the early stages of the project, however a review of storage of electrical materials is now included

within the NHS Grampian Clerk of Works reports. No evidence of this reporting has been provided as part of the KSAR submission.

The statement notes that photos are recorded on BIM360 and via the Multivista system, however, no evidence was provided for review. It should be highlighted that during the site visit on 7th October 2022 that the BIM model was presented, and evidence was provided showing that record photos are stored within the BIM 360 system.

Documents referenced are:

NHS Grampian Health board assurance around storage of electrical installation materials statement – dated 26.08.2022

NEC 3 ANCHOR Supervisor Report – 11-02-22 (NHS Grampian)

NEC 3 ANCHOR Supervisor Report – 11-03-22 (NHS Grampian)

NEC 3 ANCHOR Supervisor Report – 14-04-22 (NHS Grampian)

NEC 3 ANCHOR Supervisor Report – 13-05-22 (NHS Grampian)

NEC 3 ANCHOR Supervisor Report – 10-06-22 (NHS Grampian)

NEC 3 ANCHOR Supervisor Report-15.07.22 (NHS Grampian)

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:

As noted within KSAR question 1.4 NHS Grampian and the PSCP have provided evidence of plans for undertaking pre-commissioning activities. This evidence extends to cover electrical systems.

At the time of writing, as the electrical system is still being installed the ‘pre commissioning checks’ are continuously ongoing.

An independent testing and commissioning manager is in place and is responsible for pre-commissioning checks as part of their independent commissioning role under the PSCP. An ‘MEP - Inspection, Testing & Commissioning Review & Sign Off Schedule’ (or CVF Tracker as indicated in the documents provided) has been provided which details the minimum Inspection, testing and commissioning and pre-commissioning

requirements for the MEPH systems Installed. There is no evidence provided to demonstrate that this methodology has been reviewed and signed off by the board.

Documents referenced are:

ANCHOR MEP CVF tracker 310722

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.

The observations noted in response to question 2.9 apply to this question with respect to electrical services.

There is a single derogation noted relative to the electrical services and SHTM 06-01. This relates to reduced fuel storage and has been accepted further to a contingency management plan review by NHS Grampian, however, supporting evidence associated with the derogation has not been provided for review through the KSAR.

Documents referenced are:

Asite Protocol information – dated 04.08.22

Asite Protocol Appendix A User Roles information – dated 04.08.22

Asite Protocol Appendix B Folder Structure information – dated 04.08.22

Asite Protocol Appendix C Naming Convention Documents information – dated 04.08.22

Asite Protocol Appendix D Naming Convention Drawings information – dated 04.08.22

Asite Protocol Appendix E Naming Conventions Models information – dated 04.08.22

Asite Protocol Appendix F Naming Convention File Number information – dated 04.08.22

NHSG Health Board Assurance around Variations to Electrical Systems After Tender statement – dated 26.08.22

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	SHTM 06-01 clause 14.35 states “it is best practice to use metallic trunking and/or conduit”. During the site visit of 7th October 2022, plastic conduit was visible adjacent to flexible metallic containment systems. It is unclear from the evidence provided whether the plastic conduit will afford sufficient protection to prevent penetration of the cabling by nails, screws etc. in accordance with BS 7671 18th Edition amendment 2 Regulation 522.6.1 through 522.6.204.
2.4.2.2	The incoming electrical supply is derived from the existing site wide high voltage infrastructure. From the evidence provided it is not clear how NHS Grampian have considered the potential impacts on the wider site to facilitate the connection to the ANCHOR facility, including whether there will be any break in supply that may impact other areas of the Forresterhill site. There was also no evidence of a Safe System of Work being in place to undertake the tie-in works, for example task specific Risk and Method Statements, Permits, etc.
3.4.2.3	In several instances the electrical schedules provided are noted as preliminary and not construction status. It is unclear if these have been approved for use in the Construction stage.
3.4.2.4	There is no evidence that a test link for the generator earth matrix to disconnect and test is incorporated. This is a residual observation from the Interim Assurance Service review, with no further evidence provided as to how this has been considered by NHS Grampian.

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>
<p>NHS Scotland Assure Observations:</p> <p>NHS Grampian has provided evidence relating to the training and competency of named individuals, including a skills matrix for Medical Gas Pipeline Systems (MGPS) with respect to SHTM 02-01 and British Compressed Gases Association (BCGA) training requirements, which provides assurance that the training records are being reviewed and recorded by the Medical Gas Pipeline Systems (MGPS) subcontractor.</p> <p>The training matrix confirms the APs / CPs, the skill level for each operative, for each of the key technical elements of the medical gas system and associated training certification for AP / CP in line with SHTM 02-01.</p> <p>It is noted that the '<i>KSAR Training Matrix-master</i>' provided by the MEP subcontractor identifies a number of trades however the MGPS subcontractor operatives are not included.</p> <p>A specific medical gas site induction has been developed and the presentation document has been provided.</p> <p>There is no formal record of the sign off of these operatives, therefore it is unclear as to what extent the health board have probed the experience and competency of the MGPS subcontractor.</p> <p>Documents referenced are: <i>Various documents within folder 5.01 of the Construction KSAR Submission QA document reference Q6/1 (issue 17) Installation / Maintenance Engineer Skill Matrix.</i> <i>HTM 02:01 Competent Persons Refresher (MGPS) certificates of training</i> <i>Pearson SRF BTEC Level 4 in Medical Gas Systems to HTM02:01 (Competent Person)</i></p>		

Medical gas subcontractor Appointment of Competent Person (MGPS) letters

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 Grampian has submitted evidence identifying the MGPS subcontractor's previous healthcare experience. These offer assurance that the MGPS subcontractor has the relevant experience required to deliver this project. The medical gas subcontractor has submitted a list of previous healthcare experience which includes facilities operated by number of other health boards in Scotland.

The organogram of the site management structure is, however, a generic document which only identifies the position of the MGPS subcontractor relative to the MEP subcontractor as a single responsible person and does not include specific site-based resource or QA interfaces within the MGPS subcontractor.

As noted in 5.2 individual operatives are listed within the MGPS skills matrix and their role as AP / CP is confirmed. Further certification for AP / CP training to SHTM 02-01 and appointments letters have been provided for review.

Documents referenced are:

QA document reference Q6/1 (issue 17) Installation / Maintenance Engineer Skill Matrix.

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

Pearson SRF BTEC Level 4 in Medical Gas Systems to HTM02:01 (Competent Person)

Medical gas sub contractor Appointment of Competent Person (MGPS) letters

Workbook Ref No.	Areas to probe	Evidence expected
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.
<p>NHS Scotland Assure Observations:</p> <p>A file note provided by NHS Grampian confirms that a Contract Supervising Officer (CSO) will be appointed to oversee the PSCP process and that the NHS Grampian Technical Supervisors and Clerk of Works will undertake site inspections, along with the independent commissioning manager and record any concerns through the BIM 360 recording process. It also notes that the appointed NHS Grampian Authorising Engineer (AE) will review and oversee relevant designs and installation checks. There has been no evidence submitted to provide assurance that the AE has reviewed the design.</p> <p>Documents referenced are: 2022 09 12 G001 Assure Contents List MEP Progress Report 12-5-22 & 18-7-22 NEC ANCHOR Supervisor Report – 11-02-22 (NHS Grampian) NHS Grampian KSAR Review Summary Evidence (5.3)</p>		

Workbook Ref No.	Areas to probe	Evidence expected
5.4	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).
<p>NHS Scotland Assure Observations:</p> <p>NHS Grampian has submitted a number of NEC Supervisor's Site Inspection Reports, which cover the fabric and MEP installations. At the time of the KSAR information being submitted it is understood that the MGPS installation had not started on site, therefore, no examples of the MGPS being reviewed as part of the NEC inspections on site were provided.</p> <p>Refer to question 5.3 above for details of the monitoring process.</p>		

A statement is provided that confirms the process includes checks undertaken by the Independent Commissioning Manager and any concerns noted in their Site Observations Report, examples of these were provided for review.

Documents referenced are:

2022 09 12 G001 Assure Contents List

MEP Progress Report 12-5-22 & 18-7-22

NEX ANCHOR Supervisor Report – 11-02-22 (NHS Grampian)

NHS Grampian KSAR Review Summary Evidence (5.3)

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:

NHS Grampian have provided documents relating to the coordination process and BIM review process (as described in question 2.3), however, within the examples provided for review there was no evidence to confirm that the medical gas design, which is a contractor designed portion (CDP), had been incorporated into the project BIM model.

Provided within folder '3.6, document N101H-MML-ZZ-ZZ-RP-M-2001', which is 'The ANCHOR Centre Mechanical Electrical and Public Health & Safety Risk Assessment and Plant Access & Maintenance Strategy, dated 13.05.22'. This document details the plant access and maintenance strategy for various MEP services, however no specific detail is provided in relation to access and maintenance strategy for the MGPS. The document also references access and maintenance drawings which have not been provided.

Documents referenced are:

N101H-NOR-XX-XX-MN-A-43401 versions 15-20

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:

As noted in question 5.5 above, whilst details of the coordination process have been provided for review, from the evidence provided for review, there is no assurance that the MGPS design has been coordinated within the BIM model.

Within the evidence provided as part of the KSAR response, NHS Grampian have not evidenced how space has been retained to allow for minor modifications and additions to the MGPS installation. The PSCP has provided a cover note which states “BCR’s 8.12 Medical gas zoning shall be configured to promote flexibility in order to enable re-modelling and re-planning to be undertaken at a future date”. There is, however, no evidence to demonstrate that a strategy for incorporating space for future flexibility has been developed or incorporated into the design.

There is no evidence that the health board has agreed a strategy for incorporating spare capacity into the design.

Documents referenced are:

N101H-NOR-XX-XX-MN-A-43401 versions 15-20

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?	<p>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.</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>NHS Grampian have submitted a number of NEC Supervisor’s Site Inspection Reports, which provides assurance that regular quality inspections are being carried out and reports prepared.</p> <p>A written statement has been provided by NHS Grampian to confirm that no specific checks were carried out on the storage of MGPS materials within the early stages of the project, however a review of storage of materials is now included within the NHS Grampian Clerk of Works reports.</p> <p>The statement also notes that photos are recorded on BIM360 and via the Multivista system. Whilst no evidence of photographs was submitted, during the site visit on 7th October 2022 the BIM model was presented, along with examples of the photos recorded within the BIM 360 system.</p> <p>Whilst the PSCP verbally confirmed that the manifold room is to be utilised for site storage of specialist medical gas materials and equipment to provide dry secure storage, no evidence was provided to confirm this.</p> <p>Documents referenced are: <i>NHS Grampian KSAR Review Summary Evidence (5.7).docx</i> <i>N101H-NOR-XX-XX-MN-A-43401 versions 15-20</i> <i>NHS Grampian B&A - NGB Baird and ANCHOR Model fly through-20220728_130906-Meeting Recording.mp4</i></p>		

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?	<p>Evidence that adequate pre-commissioning check sheets (e.g. SHTM 02-01 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>
<p>NHS Scotland Assure Observations:</p> <p>NHS Grampian have provided assurance that the independent testing and commissioning manager has a process in place to ensure that pre-commissioning inspections are completed and recorded before commissioning commences. NHS Grampian have provided documentation that itemises pre-commissioning activities in line with SHTM 02-01, in advance of testing and commissioning commencing.</p> <p>The independent testing and commissioning manager is responsible for monitoring the pre-commissioning checks as part of their independent commissioning role under the PSCP. An “MEP - Inspection, Testing & Commissioning Review & Sign Off Schedule” (or CSV Tracker as indicated in the documents provided) has been provided which details the minimum inspection, testing and commissioning requirements for the MEPH systems installed, and for which ITP's must be produced and agreed.</p> <p>Documents referenced are: ANCHOR MEP CVF tracker 310722</p>		

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.
<p>NHS Scotland Assure Observations:</p> <p>NHS Grampian have provided documentation relating to change management and the processes in place to document, approve and sign off variations. Whilst there is a defined process in place, this process does not capture all key stakeholder input,</p>		

particularly with respect to the health board's IPC team. There is a lack of evidence with respect to the derogations process, and a lack of documented review/approval, assessment of risks and mitigations by key stakeholders.

The detailed derogation schedule ('*NHS Grampian as-GRA-XX-XX-RP-W-11300_revision P13*) under reference MEP 08, notes a reduction in the number of gas outlets. The document includes a reference to workshops that have been held between the health board, PSCP, design team and clinical leads to discuss and agree amendments to the original briefing information and SHTM documentation, however this supporting information has not been provided for review.

The above-mentioned derogation schedule indicates that the clinical team have been involved during development of the 1:50's drawing review process regarding medical gas outlets and risk assessments were to be signed off by clinical team members, however, no supporting evidence was provided for review.

Documents referenced are:

NHS Grampian as-GRA-XX-XX-RP-W-11300_Draft (5) MGPS technical submission Revision

377965 2019-02-18 NHS Grampian BA- Medical Gas table 11 Derogation Schedule_Ver3

Copy of NHS GRAMPIANAS-GRA-XX-XX-RP-W-11300_P13

File Note – NHS Grampian KSAR Review Summary Evidence (5.9).docx

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 subcontractor competency checks have been completed and signed off.</p>
<p>NHS Scotland Assure Observations:</p> <p>NHS Grampian have provided a series of documents for review in relation to the fire stopping subcontractor to provide assurance that they have relevant experience within the healthcare environment.</p> <p>The documentation provided for review, shows evidence of competency checks being carried out of the chosen fire stopping specialist. Evidence of the chosen specialist's healthcare experience was also provided which listed previous healthcare projects where their services were provided.</p> <p>Included in this list of healthcare projects were individual's initials of who worked on each project, as well as dates of works, providing clarity on their specific experience, and demonstrating recent experience.</p> <p>The chosen fire stopping specialist documentation included each individual staff members Fire Accreditation Scheme (FIRAS) membership number and a training matrix highlighting each individual's training in relevant aspects of fire stopping.</p> <p>Further documentation provided shows evidence of specific fire stopping inductions discussing relevant topics which have been signed off by operatives. It is understood through the process of the weekly meetings that NHS Grampian have agreed the inductions.</p> <p>Documents referenced are: <i>A&B Training Matrix</i> <i>Anchor and Baird Quality Induction Sign Off</i> <i>Quality Induction Presentation</i> <i>Hospital Experience Spreadsheet</i></p>		

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.

NHS Scotland Assure Observations:

NHS Grampian have provided a series of documents for review in relation to the fire stopping subcontractor. NHS Scotland Assure have reviewed the documents and have no concerns.

Documentation provided shows evidence of the chosen specialist's healthcare experience listing previous healthcare projects where their services were provided.

Included in this list of healthcare projects were individual's initials of who worked on each project, as well as dates of works, providing clarity on their specific experience, and demonstrating recent experience.

Documentation provided shows evidence of the management structure of the chosen specialist's team on and off site.

Documents referenced are:

Hospital Experience Spreadsheet
Organogram – Anchor and Baird

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.

NHS Scotland Assure Observations:

NHS Grampian have provided a series of documents for review in relation to the fire stopping subcontractor. NHS Scotland Assure have reviewed the documents and have no concerns.

The documentation provided includes evidence of the specialist fire stopping subcontractor's quality control process. The NHS SA review team attended site on 6th October 2022 and met with the fire stopping subcontractor who provided a clear overview of the fire stopping process including quality assurance and how this is monitored and reported. Evidence provided on that day demonstrated that the reporting is included within the overall project quality assurance in BIM 360 Field.

Documentation provided includes evidence that under the PSCP, an independent commissioning role is in place with an MEP subcontractor. This further explains that regular commissioning meetings take place with NHS Grampian technical staff.

Documentation provided includes evidence that NHS Grampian have engaged with two specialist subcontractors to assist with site inspection and reporting duties.

Through the above channels, evidence has demonstrated that should issues arise, these are fed back into the BIM 360 Field system.

During the site visit the NHS SA review team witnessed completed areas of fire stopping. All areas witnessed had been labelled by the fire stopping subcontractor and generally appeared to be installed well.

Documents referenced are:

Anchor One Trace 010622 – 310722

BC19 – BIM 360 – BW-00-0021 W (other examples also provided)

NEC 3 Anchor Supervisor Report – 10.06.22 xxxxxx xxxxxxxx NHS Grampian (other examples also provided)

BC19 Quality Meeting – Agenda & Minutes (other examples also provided)

NHS Scotland Assure Site Visit Report – 221011_R00_NHS Assure Anchor_Site Report_CIC

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 Grampian have provided a file note and additional documentation in relation to 6.4. NHS Scotland Assure have reviewed the documentation and have no concerns.

A file note has been provided that states *“Prior to any works being undertaken adjacent to occupied spaces NHSG technical staff discuss requirements with PSCP*

to allow a clear plan of work to be identified. This includes any necessary temporary fire stopping or creation of fire barriers during works. Details are submitted by the PSCP for review by NHSG technical representatives via A-Site once the methodology has been agreed and commented upon or approved. During construction of any temporary works with fire safety implications NHSG technical representatives will undertake site inspections to ensure works are being completed in line with agreed standards. Any concerns are noted via the BIM 360 Field process as observations and remain open until satisfactorily closed out by NHSG on receipt of relevant evidence being provided.”

Documentation provided includes evidence of regular reports of fire stopping. The fire stopping contractor report and monitor all fire stopping within the building. Their reports detail all products used, photographic evidence as well as labelling and annotations detailing a unique name for each location. This is all available via the BIM 360 process which can be accessed by all parties.

Documents referenced are:

NHS Grampian KSAR Review Summary Evidence (6.4)

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 Grampian have provided a series of documents for review in relation to the fire stopping. NHS Scotland Assure have reviewed the documents and have no concerns.

Documentation provided includes evidence of the specialist fire stopping subcontractor’s quality control process. This process whilst digital, can also produce hard copies of reports. Example reports of the quality assurance process were provided within the documentation. In addition, this documentation included reviews by NHS Grampian documenting inspections and reporting back to the PSCP.

Documentation provided includes evidence of regular reports of fire stopping. The fire stopping contractor report and monitor all fire stopping within the building. Their reports detail all products used, photographic evidence as well as labelling and annotations detailing a unique name for each location. This is all available via the BIM 360 process which can be accessed by all parties.

The NHS SA review team attended site on 6th October 2022 and met with the fire stopping subcontractor, who provided a clear overview of the fire stopping quality assurance process and how this is monitored and reported. Evidence provided on that day demonstrated that the reporting is included within the overall project quality assurance in BIM 360 Field. It was demonstrated to the NHS SA review team how the BIM 360 Field is accessed by all members of the project team including NHS Grampian.

Documents referenced are:

Anchor One Trace 010622 – 310722

BC19 – BIM 360 – BW-00-0021 W (other examples also provided)

NEC 3 Anchor Supervisor Report – 10.06.22 xxxxxx xxxxxxxx NHS Grampian (other examples also provided)

BC19 Quality Meeting – Agenda & Minutes (other examples also provided)

NHS Scotland Assure Site Visit Report – 221011_R00_NHS Assure Anchor_Site Report_CIC

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).

NHS Scotland Assure Observations:

NHS Grampian have provided a series of documents for review in relation to the fire stopping. NHS Scotland Assure have reviewed the documents and have no concerns.

Documentation provided includes evidence of the specialist fire stopping subcontractor’s quality control process. This process whilst digital, can also produce hard copies of reports. Example reports of the quality assurance process were provided within the documentation. In addition, this documentation included reviews by NHS Grampian documenting inspections and reporting back to the PSCP.

Documentation provided includes evidence of regular reports of fire stopping. The fire stopping contractor report and monitor all fire stopping within the building. Their reports detail all products used, photographic evidence as well as labelling and annotations detailing a unique name for each location. This is all available via the BIM 360 process which is accessed by all parties.

The NHS SA review team attended site on 6th October 2022 and met with the fire stopping subcontractor, who provided a clear overview of the fire stopping quality assurance process and how this is monitored and reported. Evidence provided on that day demonstrated that the reporting is included within the overall project quality assurance in BIM 360 Field. It was demonstrated to the NHS SA review team how

the BIM 360 Field is accessed by all members of the project team including NHS Grampian.

Documents referenced are:

Anchor One Trace 010622 – 310722

BC19 – BIM 360 – BW-00-0021 W (other examples also provided)

NEC 3 Anchor Supervisor Report – 10.06.22 xxxxxx xxxxxxxx NHS Grampian (other examples also provided)

BC19 Quality Meeting – Agenda & Minutes (other examples also provided)

NHS Scotland Assure Site Visit Report – 221011_R00_NHS Assure Anchor_Site Report_CIC

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).

NHS Scotland Assure Observations:

No written evidence was provided detailing the storage of fire stopping materials on site. However, during the site visit on 6th October by the NHS SA review team, the storage was viewed first hand and had no concerns.

Storage is located across several areas. Cement and mortar products used for fire stopping are stored on the roof deck within the large plant room. All other fire stopping materials are located in unused rooms inside the building or within a storage container located on site. All materials were located protected from the environment / adverse weather.

Documents referenced are:

NHS Scotland Assure Site Visit Report – 221011_R00_NHS Assure Anchor_Site Report_CIC

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	Written evidence for the progress of work produced by a body which is independent of the contractor (on a monthly basis).

	the correct locations and are easily maintained?	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.
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NHS Scotland Assure Observations:

NHS Grampian have provided a file note review in relation to 6.8. NHS Scotland Assure have reviewed the document and note that whilst no anecdotal evidence was provided during meetings in relation to access to detectors above 3m, no written strategy was provided for review.

The file note provided states the following *“Regular reviews of the BIM model take place involving NHSG technical representatives and PSCP and designer representatives to ensure access is available for maintenance. These include Plant Room reviews and reviews of main room and corridor locations, including in service voids. There are no specific reviews with the FM team and reliance is placed on NHSG technical representatives to ensure maintenance access is provided to key elements of the electrical system design.”*

No written evidence was provided detailing the process to which access to any detectors above 3m. However, from meetings held with the PSCP throughout the KSAR process, it was confirmed that there is detection provided at heights above 3m which will be subject to an access and maintenance strategy. The MEP subcontractor has verbally advised that they are responsible for completing this. Whilst no document was available for review at the time, at the Fire Workshop dated 27th October 2022, the MEP subcontractor confirmed the document will take into account the access to the fire detection and any associated access equipment required.

Documents referenced are:

Fire Workshop 27/10/22

NHS Grampian KSAR Review Summary Evidence (6.8)

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.
<p>NHS Scotland Assure Observations:</p> <p>NHS Grampian have provided documentation in relation to procedures in the event of any variances. NHS Scotland Assure have reviewed the documentation and note no concerns.</p>		

Documentation provided includes evidence of Asite protocols. The file note presented states *“Any variations to fire stopping after tender are dealt with through ASite and the issue of design information which is reviewed by NHSG technical representatives and either commented upon, rejected or approved.”*

The evidence provided notes that the PSCP utilise Asite as their common data environment to manage the project information. Evidence shows that this is the methodology by which any design information is uploaded using Workflows to allow all parties to review. This includes any variations.

Documents referenced are:

NHS Grampian KSAR Review Summary Evidence (6.9)

NHSG-GRA-XX-XX-PO-W-01100 Asite Protocol

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 Grampian have provided a file note and additional documentation in relation to 6.10. NHS Scotland Assure have reviewed the document and have no concerns.

A file note provided states “Bi-monthly BIM meetings are held involving NHSG and the PSCP team to review the BIM model and any clash detection reports. Weekly BIM meetings take place involving NHSG and the design team to review services installations and to ensure there is sufficient space for maintenance.

At the earlier stage of the project consultation took place with the NHSG Maintenance Team to review design principles and to agree the Maintenance access strategy. Access and Maintenance Strategy meetings are held to review the developing design to ensure maintenance access will be available and these are attended by NHSG, PSCP (including Principal Designer) and NHSG appointed CDM Advisor.”

Documentation provided includes evidence of BIM Coordination Meetings taken place with the PSCP team discussing fire, fire/smoke dampers access.

At meetings through the process, the PSCP confirmed that at 14 dampers to date (27th September 2022) had been through a joint review process including NHS Grampian. The PSCP confirmed that this process is to continue for all dampers.

Documents referenced are:

Weekly meeting 27/09/22

NHS Grampian KSAR Review Summary Evidence (6.10)

N101H-NOR-XX-XX-MN-A-43401_Ver15-20

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:

No written evidence was provided in relation to the accreditation of the fire rated ductwork installer. This item was specifically discussed at the Fire Workshop dated 27th October 2022. The PSCP confirmed that the fire rated ductwork is being installed by a FIRAS accredited installer, who will certify the installation and provide a conformity certificate to the PSCP.

The PSCP notes that as present they have uploaded the FIRAS accreditation to BIM 360.

Documents referenced are:

Fire Workshop 27/10/22

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:

NHS Grampian have provided a file note and additional documentation in relation to 6.12. NHS Scotland Assure have reviewed the document and have made the following observation that no cause-and-effect details were provided for review.

A file note provided states “*Design of systems by accredited fire engineer and Building Control sign off design and completed installation at relevant times. PSCP to provide evidence from design consultant that operating sequence has been agreed and integrated with other systems as appropriate. NHSG technical staff also undertake reviews of designs to assure themselves that appropriate arrangements are in place.*”

Documentation provided includes a recent fire strategy report by the incumbent fire engineer, dated July 2022 with a detailed smoke control performance specification for the atrium and confirmation from Aberdeen City Council providing a warrant for ‘Stage 3: Fire Strategy’.

Additional documentation provided is a statement from the building services design consultant that the operation of the smoke control system is integrated into the cause and effect. No written evidence of the cause-and-effect provided.

Documents referenced are:

*NHS Grampian KSAR Review Summary Evidence (6.12)
Stage 3 Fire Anchor Approval
N101H-MML-XX-XX-RP-Y-02001_P17*

Workbook Ref No.	Areas to probe	Evidence expected
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.

NHS Scotland Assure Observations:

NHS Grampian have provided documentation in relation to 6.13. NHS Scotland Assure have reviewed and have no concerns.

Documentation provided includes evidence of a project commissioning tracker ‘MEP Inspection, Testing and Commissioning Review and Sign Off Schedule’ from the Independent Commissioning manager.

Documents referenced are:

Anchor MEP CVF Tracker 310722

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	It was noted that the latest fire strategy provided is P17 dated July 2022 noted as being updated for Construction.
3.6.2.2	<p>Whilst no previous KSAR was undertaken for ANCHOR, the NDAP and IRS processes were followed. The following items were outstanding at the NDAP stage and raised by NHS National Fire Officer at the Fire Workshop with answers provided by the PSCP at the time and via the updated fire strategy:</p> <ol style="list-style-type: none"> 1. Smoke Detection – False Alarm Reduction <p>The P17 fire strategy report provides clarity that multi-criterion point detectors will be used.</p> <ol style="list-style-type: none"> 2. Extended travel distances within the chair treatment areas <p>The P17 fire strategy report provides an analysis addressing the extended travel distances. This report is submitted via the Asite workflow process for review by all parties.</p> <ol style="list-style-type: none"> 3. Fire Hydrants <p>The P17 fire strategy reports notes that additional hydrants are provided in line with recommendations.</p>
3.6.2.3	Whilst there is no evidence of Board specific fire safety site inductions, documentation provided provides evidence of specific inductions with the fire stopping subcontractor and the PSCP.
3.6.2.4	<p>The NHS Scotland Assure review team visited site on 6th October. Site visit did not highlight any areas of concern in relation to implementing the fire strategy on site.</p> <p>However, no written evidence provided demonstrating how the PSCP are ensuring the fire strategy is being implemented correctly on site and how this is continually monitored.</p>
3.6.2.5	As construction is ongoing, suitable access for fire and rescue service for the completed building could not be established. The P17 fire strategy details the design of this access in line with Firecode which has been through the design process.
3.6.2.6	During the site visit, fire rated ductwork had some minor damage in the form of small chips around the edges and flanges. This was noted within the site report and noted the PSCP for review to ensure not adverse effect on the fire performance of ductwork.

3.6.2.7	During the site visit, the NHS Scotland Assure review team viewed a store which was marked as a 30-minute fire hazard room on the fire strategy drawings. It was noted that there was steelwork penetrating the fire rated construction in various locations. Where some steelwork appeared to have a fire stopped detail applied, other steelwork was viewed to have none. The PSCP was notified. They advised this will be reviewed in detail with their team.
3.6.2.8	During the site visit, noted that some fire collars appeared to be fitted leaving significant gaps to the pipework. It was later confirmed (same day) verbally that this is intentional and testing for this product used in this manner was provided, reviewed by the PSCP team and subsequently agreed for use.
3.6.2.9	During the site visit it was noted that an area on the lower ground floor was different to that shown on the provided fire strategy plans. The drawings provided presented an open plan area on the lower ground floor. However, when on site, partitions were in place. Upon review with the PSCP on site with the most recent general arrangement drawings, it was noted that there was no impact on the fire strategy. The PSCP was notified.

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 subcontractor competency checks have been completed and signed off.</p>
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NHS Scotland Assure Observations:

NHS Grampian have provided information regarding the structure of the IPC team and the IPC governance structure. The Governance structure provided, highlights the IPC governance structure, reporting to the NHS Grampian board and the HAI executive lead. No minutes of board clinical governance meetings were provided, but an agenda and an IPC structure diagram was available for review.

IPCT resource requirements for the project and how the service is integrated into the project team has also been highlighted as a concern through discussions during the KSAR weekly meetings, which NHS Scotland Assure acknowledge has been challenging due to the pandemic response and staffing levels. It is noted from the evidence provided in the PEP, that IPC is not included as part of the project team or board by NHS Grampian and that engagement is sought with IPCT when the project team identify a need for IPC input. This has resulted in IPC engagement across the project not being consistent and has resulted in a number of design issues being escalated at construction stage through the KSAR review.

There is no evidence of IPC input to, review of or sign off of any main project risks or derogations for the project to date.

From the revised HAISCRIBE stage 3 (Dec 2020) and the enabling works HAISCRIBE provided, IPCT were involved in the assessment of HAI risks associated with the projects and any mitigations required. Minutes of meetings have been provided between IPC and the project team when specific questions or issues have been raised, however, there is no evidence of consistent IPC support to the project where advice would support development of the facility.

Evidence was provided for the competency and previous experience of the project board team and for contractors and subcontractors. Whilst detail of the qualifications and experience of the IPC team was provided, the information was anonymised, therefore we are unable to determine how this relates to the current IPC resource supporting the project.

Documents referenced are:

IPCT Reporting Structure – Folder 7 – IPC – 7.1

Agenda NHSG Clinical Governance Committee 12/08/22 – Folder 7 – IPC – 7.1

IPCN IPC Qualifications v3 anonymised – Folder 7 – IPC – 7.1

29a 110 Aug 2022 - - NHSGAS-GRA-XX-XX-RP-W-08100-Stage 4-NHSG Risks Folder 29 – Deliverables

1.12a.2 Project Team Structure May 2022 – WTE – Folder 1 Governance

Project Board - The Baird Family Hospital & The ANCHOR Centre FBC – Folder 1 - Governance

7.1 Demonstration of Effective Infection Prevention and Control Structure – Folder 7 – IPC

Schedule of Engineering Derogations - NHSGAS-GRA-XX-XX-RP-W-11300 – clarification info 11 Oct Final upload

HAI Risk Matrix – Folder 28 – Construction HAISCRIBE

HAISCRIBE Stage 3 – 9/12/2020 – Folder 28 – Construction HAISCRIBE

NHSG BFH TAG Report 12/08/22 – Fortnightly design management meeting – Folder 8.01 – Deliverables

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>

NHS Scotland Assure Observations:

Evidence was provided by NHS Grampian regarding the promotion of the National Infection Control Manual (NIPCM) across the organisation. The NIPCM has been implemented in NHS Grampian since 2012, however, the lack of engagement of the IPC team with the ANCHOR project does not provide assurance that the NIPCM and IPC expertise has influenced the design and operational use of the facility. The local IPC team have raised a number of HAI risks for the project, and to date there has been no resolution to reassure the IPC team that these risks have been addressed or agreed by the IPC team. One of their main concerns being the proposed design of the first-floor chair treatment area and the associated ventilation proposals.

No evidence was provided by NHS Grampian regarding site walk rounds by the IPC team during the construction phase. At the time of the KSAR review, no walk rounds are reported to have taken place which may result in HAI risks going unidentified during construction.

HAI project risks have been captured on the main project risk register, derogations schedule and the HAI Risk Matrix. IPC involvement is only noted within the HAI Risk matrix which was developed following the last HAISCRIBE review (December 2020). From the evidence provided for review, there appears to have been no review of HAISCRIBE since, therefore there is no assurance that any additional HAI risks which may have been identified through construction have been captured within the risk matrix, or mitigated by the project team. There is no evidence of IPC input to, review of or sign off of any main project risks or derogations.

Documents referenced are:

7.1 Demonstration of Effective Infection Prevention and Control Structure – Folder 7 – IPC

Daily Brief – 1 August 2022 – Ref NIPCM – Folder 7 – IPC – 7.02

IPC Updates – SNMLC – 050822 v3.1 – Folder 7 – IPC – 7.02

29a 110 Aug 2022 - - NHSGAS-GRA-XX-XX-RP-W-08100-Stage 4-NHSG Risks Folder 29 – Deliverables

Schedule of Engineering Derogations - NHSGAS-GRA-XX-XX-RP-W-11300 - clarification info 11 Oct Final upload

HAI Risk Matrix – Folder 28 – Construction HAISCRIBE

HAISCRIBE Stage 3 – 9/12/2020 – Folder 28 – Construction HAISCRIBE

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>

NHS Scotland Assure Observations:

Evidence was submitted providing sign off of onsite training for contractors and subcontractors however no detail of the content of the training was provided and specifically in relation to HAI and HAISCRIBE. A certificate of endorsement was provided by the PSCP however no detail was provided regarding the HAI SCRIBE education provided/undertaken or their roles or responsibilities required for the project.

Good IPC practice was observed on site during the ANCHOR site visit indicating HAISCRIBE and IPC measures were being followed.

Documents referenced are:

Baird and Anchor HAISCRIBE Contractor Endorsement Certificate – Folder 7 – IPC – 7.01

Subcontractor Selection Criteria L12 – Folder 3 – Board competency checks

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.

NHS Scotland Assure Observations:

Evidence was provided to demonstrate the equipping for the ANCHOR centre has been developed using a service level agreement (SLA) with Health Facilities Scotland (HFS) national equipping team. It was verbally confirmed that an equipping group has been established which is attended by NHS Grampian and HFS representatives. IPC will be included in the membership to ensure IPC standards are met, however, no documentation to support this has been provided.

Documents referenced are:

SLA P076 NHSG Baird and ANCHOR v6 – Signed – Folder 30 – Deliverables

Minute – Equipment group 07/06/22 – Folder 30 – Deliverables

Minute Monthly Equipment Meeting with PSCP 01/07/22

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	The supporting evidence statement regarding IPC engagement (Folder 7.1) provided by NHS Grampian project team did not communicate fully the roles and responsibilities of the IPC team and reporting requirements. The document was produced by a member of the project team using the information provided by the IPCT. In future it may be more appropriate for
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	the IPC team to either provide a response for the IPC elements of the KSAR review or work collaboratively with the project team.
3.7.2.2	IPCT structure and governance structure provided. Provision on the IPC annual work programme would have helped show how IPC is resourced into project.
3.7.2.3	IPCT have not had opportunity to review detailed design drawings for the facility and time is restricted by the time remaining for construction. Priority should be given to ensure IPC team have time to review plans for areas which are critical for patient care.

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](#)

