

Key Stage Assurance Review Workbook

Construction

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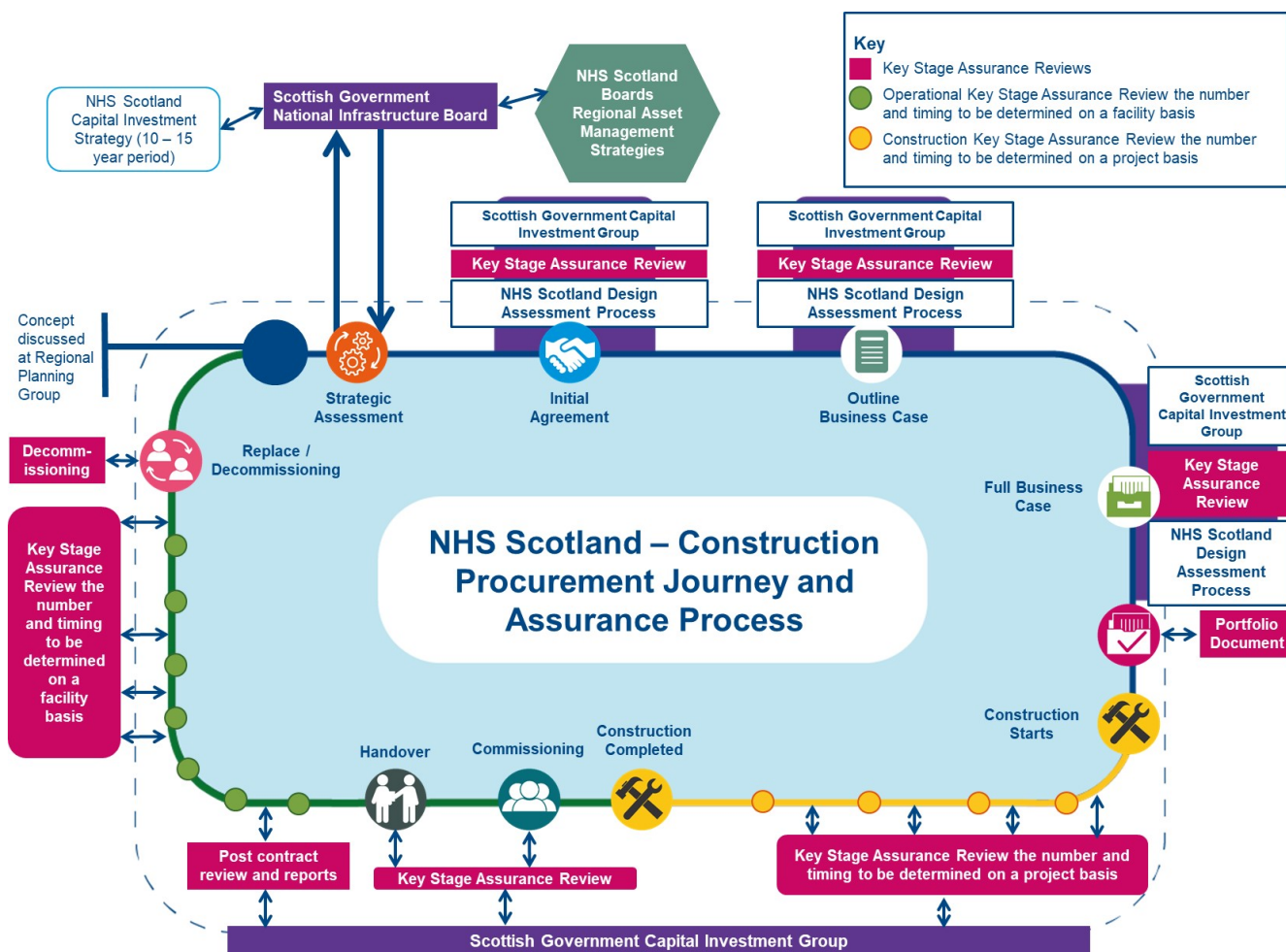
1. About this workbook

This workbook supports the Construction Key Stage Assurance Review (KSAR), delivered by the NHS Scotland Assure Assurance service.

Further information about the NHS Scotland Assure Assurance service and KSAR process is provided in section 2.

Figure 1. shows how the Construction stage in the procurement and construction journey commences following the Full Business Case. The timing and frequency of KSARs during this stage will vary dependent upon the facility. Specific workbooks have been developed for the other stages within this journey.

Figure 1: Construction Procurement Journey



KSARs are of a process ensuring facilities and the teams using them are able to deliver the standards required to provide the best and safest outcomes for patients, staff and visitors in the built environment.

KSARs deliver an independent peer review. NSS staff outside the project use their experience and expertise to examine the progress and likelihood of successful delivery, with a particular emphasis on the safety of the patients, staff and visitors using the facility.

It is vital to receive feedback on the following elements of health facilities - Infection Prevention and Control (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 KSAR workbook provides a transparent, structured framework for all clinical specialisms, facilities and operational management professionals to assess and manage a health care build or refurbishment. Allowing facilities to align with current standards as the assurance reviews are taking place, as well as aligning changes for patient cohort.

Using this workbook

The review investigates at various points during the Build / Construction Stage of the construction of the facility. The timing and number of Build / Construction Reviews will be determined during the design process and by agreement of the NHS Assessment Team and the Client Board.

The workbook is predominantly intended to be used by NHS Scotland Assure KSAR review teams, Health Boards are encouraged to use its content to support their own projects.

This workbook is predominantly intended to be used by NHS Scotland Assure KSAR review teams, Health Boards are encouraged to use its content to support their own projects. It provides guidance on the review structure and areas of investigation to be addressed by the review team and should be regarded as indicative and not prescriptive.

The review team will consider whether any emerging findings require additional topics to be addressed. If so, evidence relating to these areas, regarding the safety of the patients, staff and visitors should be provided.



2. Key Stage Assurance Review

Introduction to NHS Scotland Assure – Assurance Service

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

The initial delivery of the NHS Scotland Assure - Assurance Service will focus upon new builds and major refurbishments in the acute estate, submitted to the Scottish Government Capital Investment Group (CIG). In addition, a number of projects identified as being complex, primarily due to the needs of patients utilising the facilities, will be reviewed by this service. Whilst not an exhaustive list, these projects will cover oncology, maternity, theatre and critical care units, no matter of their financial value.

The NHS Scotland Assure - Assurance Service will deliver KSARs, designed to provide independent assurance to Scottish Government Health and Social Care Directorates (SGHSCD's).

It 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 IPC.

The KSAR process is applicable regardless of procurement route chosen



The KSAR Process

The KSAR process examines projects at key points in their lifecycle. It does not remove any legal or contractual obligations from the NHS Health Board, their designers or contractors. It provides assurance to progress successfully to the next review point and the process will be mandated for projects requiring CIG approval. KSARs focus on the assessment of the delivery approach, and will work with the Health Board's project team to ensure there is comprehensive understanding of the patient cohorts utilising the facility. KSARs also ensure relevant guidance is fully implemented and any technical derogations have been fully reasoned, transparently

discussed, the implications understood, recorded and signed off by the Health Board and their advisors.

With a focus on construction elements where previous reviews have demonstrated potential patient safety concerns, KSARs will concentrate on water; ventilation, electrical, plumbing, medical gases installations, fire, and associated IPC guidance. If further issues are raised with the review team, they will fully incorporate those issues into the reporting process.

Value of the KSAR Process

Key Stage Assurance Reviews (KSARs) deliver an independent peer review. NSS staff outside the Health Board's project use their experience and expertise to examine the progress and likelihood of successful delivery, with a particular emphasis on the safety of the patients, staff and visitors using the facility. KSARs provide an external perspective and provide a challenge to the robustness of the Health Board's brief, plans and processes.

This includes work delivered by construction consultants, employed either directly or through construction contractors, and the work being delivered by the primary contractor, their sub-contractors and specialist suppliers.

The KSAR provides an independent report and action plan, which is shared with the Health Board to ensure:

- Appropriate skills and experience are deployed on the project by the Health Board, consultants, primary contractor and all sub-contractors.
- The clinicians and wider stakeholders covered by the project fully understand the project status, aims and the issues involved.
- Appropriate management structures put in place to ensure appropriate infection prevention and control measures are designed into the project to reduce the risk of transmission of infectious agent.
- There is assurance the project can progress to the next stage of development or implementation with particular emphasis on the safety of the patients, staff and visitors utilising the facility.
- Provision of advice and guidance to programme and project teams by fellow Practitioners.

The KSAR report and the Health Board's response and action plan is submitted to CIG along with a recommendation from the NHS Scotland Assure - Assurance Service regarding the projects' progression to the next stage of the construction procurement journey.



KSAR as part of the overall assurance framework

Each NHS Health Board will be fully responsible for the delivery of all projects, and its own internal process and resources for carrying out internal reviews and audits of its activities. The KSAR is seen as a complementary independent review, and not as a replacement for the responsibilities of the Health Board.

NHS Health Boards should have in place an effective framework to provide a suitable level of assurance for their programmes and projects. Health Boards are encouraged and expected to ensure adequate and timely coordination and sharing of information, including plans, between the various internal reviews and functions.

The KSAR process is not a substitute for a rigorous governance framework in the Board to manage key processes including business planning, investment appraisal, business case management, risk management and service and contract management.

The KSAR Process relationship with NHS Scotland Design Assessment Process (NDAP)

The Scottish Government's ambition for NHS Scotland's estate and the need for well-designed healthcare environments is articulated in the Policy on Design Quality for NHS Scotland. Good design in the built environment encompasses a wide range of inter-related factors such as, sustainability, engineering, architecture, fire safety, energy, environment, decontamination, space utilisation, landscaping, security, technology, lighting, access for visitors and mobility impaired persons.

The NDAP process is overseen by Health Facilities Scotland and Architecture and Design Scotland and holistically considers all of the above. It sets the principles for the resolution of potential conflicts of statutory or mandatory compliance to ensure the specific facility provides; the best balance of the technical requirements, meets clinical needs and fulfils the conceptual aims of the policy on Design Quality. The NDAP process begins at the initial agreement stage of a project and provides advice through to the Full Business Case. There is no change to either SCIM or NDAP processes.



The Scottish Government is progressing policy to improve the safety of the healthcare environment in relation to the built environment risk. The Assurance Service delivered through NHS Scotland Assure is a response to this policy and the KSARs are integral to the compliance work. The aspiration is not to duplicate any of the work included in the NDAP process, but to provide assurance regarding the critical components highlighted throughout this workbook.

Integral to the KSARs will be a review of the balance between sustainability issues and patient safety.

The NDAP, working with Health Boards, will set the principles of the design solution, whereas the KSAR will provide a detailed technical review of the specifics of the design solution. Where possible the two reviews will be aligned to avoid duplication of work. For example, in instances where the NDAP has reviewed detail at a technical level, this will be used by the KSAR team rather than being separately requested and reviewed.

Sustainability

The review will provide assurance that the proposals for the project provide an effective balance in terms of patient, staff and visitors safety, whilst meeting required sustainability outcomes and complying with the guidance standards.



Construction KSAR

KSAR reviews are designed to provide independent assessment to Scottish Government Health and Social Care Directorates (SGHSCD's) so that:

- The construction phase is fully defined, and effectively utilises national guidance and construction techniques required to deliver a building which comply with relevant national guidelines and meet the needs of patients who will be using the facility.
- The construction and commissioning teams are skilled in the necessary construction methods and understand the required outcomes.
- The facility complies with:
 - NHS Scotland current guidance; e.g. NHS Scotland policy letters
 - Scottish Health Planning Notes (SHPN)
 - Scottish Health Facilities Notes (SHFN)
 - Scottish Health Technical Memoranda (SHTM)
 - Scottish Fire Practice Notes (SFPN)
 - Health Building Notes (HBN)
 - Health Technical Memoranda (HTM)
 - Health Facilities Notes (HFN)
 - UK construction industry bodies best practice or design guidance publications e.g. HSE, CIBSE, BRE, IHEEM, IET, BRE, BSRIA, sustainability, dementia and equality.
 - Incident Reporting and Investigation Centre (IRIC) Alerts
 - Relevant British Standards
 - Fire Safety

Also, including but not limited to:

- Other Statutory requirements: Planning permission; Building Regulations compliance; Equality Act compliance; Health and Safety Executive (HSE) compliance; Construction (Design and Management) Regulations compliance. Fire Scotland Act
- Other mandatory NHS Scotland requirements – use of:
- Activity Data Base (ADB);
- Achieving Excellence Design Evaluation Tool;
- BREEAM Healthcare or equivalent (BRE environmental & sustainability tools);
- Scottish Government BIM Policy (SPPN 1/2017; implementation of building information modelling within construction projects: March 2017).
- The implementation of NHS Scotland Soft Landings (SL) guidance.
- Confirm that there are plans in place for risk management, issue management and that these plans are being shared with suppliers and delivery partners.

- Evaluation of actions taken to implement recommendations made in earlier assessment of deliverability.
- There are plans in place for the requirements of the NHS Scotland National Infection Prevention and Control Manual for Scotland to be incorporated into the development in a manner to allow the staff allocated to the role to deliver the services to the patients.
- There are plans in place for risk management, issue management and these plans are being shared with suppliers and delivery partners.
- Action taken to implement recommendations made in earlier assessment of deliverability.

At this stage in the facility lifecycle the review will be site based. The review teams will consist of experienced operational estates professionals and experienced Infection Prevention Control clinicians. This team will work with the Health Board's project team, inclusive of their clinicians and their appointed consultants and contractor. Each review will result in a report being prepared for the Programme Director at the Health Board and a copy of the report will be provided to the Scottish Government Capital Investment Group.

The appendix is provided indicates the typical question set for Construction the review Team use as the basis of evidence finding for the KSAR. The review team amend this as necessary depending on the project and areas of particular interest. The Health Board, their designers and contractors should be aware this is the information expected and the design should effectively be completed at Construction at the time of the KSAR to ensure the accuracy of the report.



3. Assessment of Delivery Approach

General approach to the Governance of Quality on the Project

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?	<ul style="list-style-type: none">• Project Quality Plan.• Inspection and Test Plans.• Inspection and Test Schedule / Register.
1.2	Has suitable arrangements been implemented on the project for document control processes for Quality Assurance and Management?	<ul style="list-style-type: none">• Process for ensuring latest drawings approved and used.• Processes for ensuring latest specification and details approved and used.• Approach to management of non-conformances.• Approach to change management control.• Document management recording and structure.
1.3	How has the Health Board approached Quality Assurance on the project to ensure processes and procedures are being adhered?	<ul style="list-style-type: none">• Evidence of regular Quality Assurance audits / reports undertaken on the project.
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?	<ul style="list-style-type: none">• Evidence of Testing and Commissioning monitoring / witness of tests.• Evidence of Testing and Commissioning review of results.• Evidence of Testing and Commissioning acceptance of results.• Testing and Commissioning programme.• Plans have / are being developed for collating information and documents.• Have additional checks (external parties) been carried out to review the Contractors T&C's proposed plans.
1.5	How does the Health Board assure itself that the management of defects have / are being developed and put in	<ul style="list-style-type: none">• Systems and process for recording and management defects.• Process for the rectification and close out of defects prior to handover.• Plans have / are being developed for collating information and documents.

No.	Areas to probe	Evidence expected
	place to meet the project needs?	
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?	<ul style="list-style-type: none"> • Soft Landings process. • Plans have / are being developed for collating as installed information and documents.
1.7	How does the Health Board assure itself that the works are following the procedures as laid out in HAISCRIBE?	<ul style="list-style-type: none"> • Evidence that the Contractor in charge of the works has read, understood and signed the HAISCRIBE. • 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. • 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.
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?	<ul style="list-style-type: none"> • 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.
1.9	Are the Principal Designers regularly carrying out site inspections and providing reports to the Board and Principal Contractor?	<ul style="list-style-type: none"> • Regular (fortnightly) reports being provided to the clients' project management team, certifying installation is being provided in accordance with the CD. • Regular comment on each of the installing contractors' quality safety plan and work delivered. • 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.



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.	<ul style="list-style-type: none"> • Evidence on how this requirement is being managed and how it fits with the project governance arrangements • Plans to identify any gaps in the procurement approach that may require to be addressed. • Evidence on how Infection Prevention and Control are involved with the procurement approach to future plans for project. • Evidence that the Health Boards selected procurement route has gone through the Board's Governance channels.
1.11	Evaluation of the Health Boards commissioning plan.	<ul style="list-style-type: none"> • 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. • Evidence that the Board has had all pre-commissioning checks audited and approved by an independent organisation.
1.12	Evaluation of the Health Boards duty holder matrix.	<ul style="list-style-type: none"> • 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. • 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.



Water and Plumbing / Drainage Systems

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?	<ul style="list-style-type: none">• Evidence of a vetted list of site plumbers which confirms qualifications and healthcare experience.• Evidence that the site induction with respect to working on water and plumbing/drainage services has been developed, implemented and agreed with the Board.• 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.• Evidence that all contractors and sub-contractor competency checks have been completed and signed off.
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?	<ul style="list-style-type: none">• Evidence of similar, previous healthcare projects by the contractor.• Evidence of site management structure.• Evidence of HAI and SHPN 30 training.
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?	<ul style="list-style-type: none">• 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.
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?	<ul style="list-style-type: none">• Photographic and written evidence for the progress of work produced by a body which is independent of the contractor (on a monthly basis).
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?	<ul style="list-style-type: none">• Evidence that the contractor has presented their co-ordination drawings (BIM model) to the Board.• Evidence that the contractor has presented their co-ordination drawings (BIM model) to

No.	Areas to probe	Evidence expected
		<p>the design consultant and that they have agreed them for construction.</p> <ul style="list-style-type: none"> • Evidence that the contractor has presented each of the main service runs plus plant rooms to the Board's FM team. • Evidence that the plant access strategy is being adhered to.
<p>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>		<ul style="list-style-type: none"> • Evidence that the contractor has presented their co-ordination drawings (BIM model), with space for future flexibility identified, to the Board. • Evidence that the design consultant has considered and agreed with the Board, space for future flexibility in the service installations. • 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. • 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. • Evidence that the Health Board has agreed a strategy (percentage) for spare capacity and a documented allowance to be incorporated into the design. • Are plant/tank rooms, IPS sections, horizontal distribution runs and risers appropriately sized for the equipment being installed and facilitate safe adequate maintenance?
<p>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>		<ul style="list-style-type: none"> • Written, monthly evidence for the progress of work produced by a body which is independent of the contractor and which confirms inspection of the site storage of materials. • Photographic evidence of the site storage of materials produced by a body which is independent of the contractor (on a monthly basis).
<p>2.8 How does the Health Board assure itself that all pre-commissioning</p>		<ul style="list-style-type: none"> • Evidence that adequate pre-commissioning check sheets (SHTM 04-01

No.	Areas to probe	Evidence expected
	inspections are completed and recorded before commissioning can commence?	Part A) have been completed and signed off. <ul style="list-style-type: none"> • Evidence that the Health Board has had all pre-commissioning checks audited and approved by an independent organisation.
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.



Ventilation

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?	<ul style="list-style-type: none">• Evidence of a vetted list of duct and plant installers which confirms qualifications and healthcare experience.• Evidence that the site induction with respect to working on ducts and plant services has been developed, implemented and agreed with the Board.• Evidence that all contractors and sub-contractor competency checks have been completed and signed off.
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?	<ul style="list-style-type: none">• Evidence of similar, previous healthcare projects by the contractor.• Evidence of site management structure.
3.3	How does the Health Board ensure that the ventilation systems are being installed to the correct standard and reflect the agreed design?	<ul style="list-style-type: none">• 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.
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?	<ul style="list-style-type: none">• Photographic and written evidence for the progress of work produced by a body which is independent of the Contractor (on a monthly basis).
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?	<ul style="list-style-type: none">• Evidence that the Contractor has presented their co-ordination drawings (BIM model) to the Board.• Evidence that the Contractor has presented their co-ordination drawings (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 Board's FM team.

No.	Areas to probe	Evidence expected
		<ul style="list-style-type: none"> • Safe and adequate access has been provided.
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?	<ul style="list-style-type: none"> • Evidence that the contractor has presented their co-ordination drawings (BIM model), with space for future flexibility identified, to the Board. • Evidence that the design consultant has considered and agreed with the Board, space for future flexibility in the service installations. • 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. • 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. • Evidence that the ventilation solution has been agreed with clinical and IPC colleagues. • Evidence that the Board has agreed a strategy (percentage) for spare capacity and a documented allowance to be incorporated into the design. • Are plant rooms, horizontal distribution runs and risers appropriately sized for the equipment being installed and facilitate safe adequate maintenance?
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?	<ul style="list-style-type: none"> • 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. • Photographic evidence of the site storage of materials produced by a body which is independent of the contractor (on a monthly basis).
3.8	How does the Health Board assure itself that all pre-commissioning inspections are completed and	<ul style="list-style-type: none"> • Evidence that adequate pre-commissioning check sheets (CIBSE, BSRIA) have been completed and signed off.



No.	Areas to probe	Evidence expected
	recorded before commissioning can commence?	<ul style="list-style-type: none"> • Evidence that the Board has had all pre-commissioning checks audited and approved by an independent organisation.
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?	<ul style="list-style-type: none"> • 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.

Electrical

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?	<ul style="list-style-type: none">• Evidence of a vetted list of site electricians which confirms qualifications and healthcare experience.• Evidence that the site induction with respect to working on electrical services has been developed, implemented and agreed with the Board.• Evidence that all contractors and sub-contractor competency checks have been completed and signed off.
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?	<ul style="list-style-type: none">• Evidence of similar, previous healthcare projects by the contractor.• Evidence of site management structure.• Electricians completed approved current BS 7671 training course.• Evidence that commissioning contractors have completed relevant test and commissioning courses.• Evidence of trained operatives (AP and CP) to SHTM 06-02.
4.3	How does the Health Board ensure that the electrical systems are being installed to the correct standard and reflect the agreed design?	<ul style="list-style-type: none">• 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).
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?	<ul style="list-style-type: none">• 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.
4.5	How does the Health Board ensure that electrical services are installed in a	<ul style="list-style-type: none">• Evidence that the contractor has presented their co-ordination drawings

No.	Areas to probe	Evidence expected
	<p>fashion which will retain space for minor additions and modifications to services in the future?</p>	<p>(BIM model), with space for future flexibility identified, to the Health Board.</p> <ul style="list-style-type: none"> • Evidence that the design consultant has considered and agreed with the Health Board, space for future flexibility in the service installations. • 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. • 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. • Evidence that the Health Board has agreed a strategy (percentage) for spare capacity and a documented allowance to be incorporated into the design. • 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?
4.6	<p>How does the Health Board assure itself that all electrical materials are stored on site in an environment which protects them from deterioration and from the entry of contaminants into the operational parts of the component?</p>	<ul style="list-style-type: none"> • 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).
4.7	<p>How does the Health Board assure itself that all pre-commissioning inspections are completed and recorded before commissioning can commence?</p>	<ul style="list-style-type: none"> • Evidence that adequate pre-commissioning check sheets (e.g. SHTM 06-01 Part A, , BS7671, etc.) have been completed and signed off. • Evidence that the Health Board has had all pre-commissioning checks audited and approved by an independent organisation.
4.8	<p>How does the Health Board assure itself that all</p>	<ul style="list-style-type: none"> • Evidence that the each variation / derogation has a detailed technical

No.	Areas to probe	Evidence expected
	variations which may be required to electrical systems after tender are investigated and agreed by all parties before they are instigated?	analysis and has been referred to the Health Board and agreed with their clinical, Estates, infection control and FM teams.



Medical Gases

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?	<ul style="list-style-type: none">• Evidence of a vetted list of site medical gas installers which confirms qualifications and healthcare experience.• Evidence that the site induction with respect to working on medical gas services has been developed, implemented and agreed with the Board.• Evidence that all contractors and sub-contractor competency checks have been completed and signed off.
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?	<ul style="list-style-type: none">• Evidence of similar, previous healthcare projects by the contractor.• Evidence of site management structure.• AP and CP training to SHTM 02-01 for operatives.
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?	<ul style="list-style-type: none">• 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.
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?	<ul style="list-style-type: none">• Photographic and written evidence for the progress of work produced by a body which is independent of the contractor (on a monthly basis).
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?	<ul style="list-style-type: none">• Evidence that the contractor has presented their co-ordination drawings (BIM model) to the Board.• Evidence that the contractor has presented their co-ordination drawings (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.

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?	<ul style="list-style-type: none"> • Evidence that the contractor has presented their co-ordination drawings (BIM model), with space for future flexibility identified, to the Health Board. • Evidence that the design consultant has considered and agreed with the Board, space for future flexibility in the service installations. • 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. • 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.
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?	<ul style="list-style-type: none"> • 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).
5.8	How does the Health Board assure itself that all pre-commissioning inspections are completed and recorded before commissioning can commence?	<ul style="list-style-type: none"> • Evidence that adequate pre-commissioning check sheets (e.g. SHTM 02-01 Part A) have been completed and signed off. • Evidence that the Health Board has had all pre-commissioning checks audited and approved by an independent organisation.
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?	<ul style="list-style-type: none"> • 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.



Fire

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?	<ul style="list-style-type: none">• Evidence of a vetted list of site fire stopping specialists which confirms qualifications and healthcare experience.• Evidence that the site induction with respect to working on fire stopping services has been developed, implemented and agreed with Board.• Evidence that all contractors and sub-contractor competency checks have been completed and signed off.
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?	<ul style="list-style-type: none">• Evidence of similar, previous healthcare projects by the contractor.• Evidence of site management structure.
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?	<ul style="list-style-type: none">• 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.
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?	<ul style="list-style-type: none">• Written and photographic evidence for the progress of work produced by a body which is independent of the contractor (on a monthly basis).
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?	<ul style="list-style-type: none">• Photographic and written evidence for the progress of work produced by a body which is independent of the contractor (on a monthly basis).
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?	<ul style="list-style-type: none">• Photographic and written evidence for the progress of work produced by a body which is independent of the contractor (on a monthly basis).

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?	<ul style="list-style-type: none"> • 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).
6.8	How does the Health Board assure itself that all fire detection and alarm systems are installed in the correct locations and are easily maintained?	<ul style="list-style-type: none"> • Written evidence for the progress of work produced by a body which is independent of the contractor (on a monthly basis). • Demonstration by the contractor that any detectors which are above 3m from floor level or in ceiling voids, to the Board's FM team, have suitable access for maintenance.
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?	<ul style="list-style-type: none"> • Evidence that the each variation has been referred to the Health Board and agreed with their clinical, engineering, infection control and FM teams.
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?	<ul style="list-style-type: none"> • 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 fire dampers and smoke / fire dampers to the Health Board's FM team.
6.11	How does the Health Board assure itself that any fire rated ductwork is correctly installed?	<ul style="list-style-type: none"> • 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.



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?	<ul style="list-style-type: none"> • 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.
6.13	How does the Health Board assure itself that all pre-commissioning inspections are completed and recorded before commissioning can commence?	<ul style="list-style-type: none"> • Evidence that the Health Board has had all pre-commissioning checks audited and approved by an independent organisation.

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? 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> <ul style="list-style-type: none"> • 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. • 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. • 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. • 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. • Evidence IPCT advice has been followed, such as IPCT walk round audits during the construction process. • Evidence that fixtures fitting and equipment have not been incorporated into the project that would represent an identified IPC risk. • Evidence that all contractors and sub-contractor competency checks have been completed and signed off.
7.2	<p>How does the Health Board demonstrate implementation of evidence based infection prevention and control</p>	<p>The Health Board provides evidence:</p> <ul style="list-style-type: none"> • 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

No.**Areas to probe****Evidence expected**

measures during the construction process?

and it is being referred to during the construction process.

- IPC risks (actual or perceived) risks identified during the work programme or through the KSAR evidence review are provided.
- 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.

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?

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.
- 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.

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.
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4. References

KSAR Master Glossary

Available to download from NHS National Services Scotland website.

5. Bibliography

**Scottish Property Advisory Group – Building Design and Construction:
Report on Construction Quality Matters**

John Donnelly, Chair BDAC

Dated: December 2020

