

TECHNICAL ASSURANCE

Assurance Gates Implementation Procedure

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Revision Changes:

Revision	Status / Description of Changes
2.0	Revised to include texts on the management of Gates Conditions Tracker & include ref G.
3.0	New Section 5.5 on Wrap Up presentation meeting added New Section 5.9 on issue of Gate Pass Certificate and Associated Documentation added. Section 6.2, Systemwide Conditions and Gate Reports amended Reference to Certificate of Integration added (Ref H)
4.0	Revision of content: 5. -Header text amended. 5.4 -Sub-header text amended. 5.4.1 -Text amended. 5.4.3 -Text amended. 5.7.1 -Text amended. 5.8 -Sub-header text amended. 5.8.4 -Lines from Revision 3.0 deleted and text added. 5.8.6 -Line from Revision 3.0 deleted. 5.8.7 -Text amended. 5.9.5 -Lines from Revision 3.0 deleted and text added. 6.1.6 -Line from Revision 3.0 deleted. 6.2.1 -Text amended. 6.2.2 -Lines from Revision 3.0 deleted and text added. 6.3 -Paragraph added. Appendix -Process Flow of Assurance Gates – Replaced with revised Visio diagram.
5.0	4.2.7 - text amended. 4.2.7 – text added 5.4 - Amended to include Systemwide Mini Gates 5.10.1 - Inclusion of Code 4 'fit for information' in eB Appendix - E Systemwide Mini Gate Submission Template added.

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1 Purpose

- 1.1.1 The purpose of this procedure is to detail the implementation of the Engineering Design Assurance Gates Procedure (Ref 1) and the Systemwide Design Gate Review Procedure (Ref 2).
- 1.1.2 The Gate Procedures are used to provide progressive assurance during the design stage that the objectives of the programmed will be achieved and that the programmed can progress successfully to the next stage.
- 1.1.3 Guidance on maintenance of the assurance case post Gate 3 is given in Post IFC (Issued for Construction Changes Guidance Note) Ref 3, and Post IFC (Issued for Construction) Changes Internal Crossrail Guidance Note Systemwide (Ref 4).

2 Scope

- 2.1.1 This procedure applies to all work packages within the Crossrail Central section of the Crossrail Project. It does not cover those projects undertaken by the other bodies (LU and NR) under their own project management systems as part of the Crossrail programme.

3 Gates Conditions

3.1 Status, Shafts and Portals

Gate Stages – Civils Design / M&E Systems Design / Architectural Design

- 3.1.1 **Gate 1 (GRIP 3 / RIBA D)** – Termed a **Final Scheme Design**. Production of a single option selected for development. The details will be in outline only but will define the character, limit and form of construction.
- 3.1.2 **Gate 2 (GRIP 4 / RIBA E)** – At this stage the design has progressed to an *intermediate* position (progress check at 60% complete). This Gate is a check point at about the mid-point between Gate 1 and the final design. At the outset of a project the target deliverables at Gate 2 shall be clearly defined so that it will provide an interim way point to confirm progress.
- 3.1.3 **Gate 3 (GRIP 5 / RIBA F)** - At this stage the design is complete and ready to be **issued for construction**. Design details will be finalised and fully integrated with other interfacing works. Installation (e.g. reinforcement schedule, supplier design for architectural products) will be produced post gate.
- 3.1.4 Gate Stages – Systemwide Design
Design Gate stages as described within the Systemwide Works Information are: **Gate 1**: Design at 30% completion coinciding with issue of the Design Statement; **Gate 2**: Design at 60% completion stage coinciding with the release of IFC drawings; **Gate 3**: A final review when design is 90% complete.

3.1.5 Gate Comparison

The following table provides a comparison between the gates described above and the equivalent RIBA and GRIP stages:

Table: Gate Comparison-RIBA, NR, and LU Processes

Crossrail Gate	RIBA Stage	GRIP Stage	LU Stage	% completion	Description
Gate 1	C or D	3	2 (Conceptual Design Statement)	20% Design	Final Scheme design
Gate 2	E	4	3 Ref Clause 3.15- 1-538	60% Design	Development of single option
Gate 3	F	5	Compliance Submission Ref Clause 3.17- 1-538	100% Design	Detailed design; tender documents and production information

Definitions Table

Subject	Definition
CRL	Crossrail Limited
Designer	FDC (see below) or D&B Contractor
D&B	Design & Build
DLR	Docklands Light Railway
EM	Engineering Manager
FDC	Framework Design Consultant (Designer)
IFC	Issued For Construction
LU	London Underground
NR	Network Rail
PE	Project Engineer
PMC	Project Manager's Communication
RfL	Rail for London

4 Responsibilities of the Gates Coordinator

4.1 General

- 4.1.1 The Gates Coordinator will manage Gate Review Meetings for the Station, Shaft and Portal Contracts (SSP), and will issue Gates Review Reports (Ref A) and Gate Pass Certificates (Ref B).
- 4.1.2 For Stations, Shafts and Portals contracts the Gates Coordinator will receive through the Gates and Assurance Inbox Mini Gate Submissions (Ref D) and Gate Impact Reviews (Ref C) from the Engineering Manager (EM), and in conjunction with the Head of Technical Assurance, will manage the review, acceptance and issue of Gate Pass Certificates relating to the above submissions and Reviews
- 4.1.3 For Systemwide Gate Reviews the Gates Coordinator will liaise with the relevant Head of Discipline conducting the undertaking of the Design Gate Reviews as described elsewhere, and will issue a Gate Pass Certificate when the Review is satisfactorily concluded all correspondence will be through the Gates and Assurance Inbox.

4.2 The Gates Coordinator is responsible for the maintaining the following:

- 4.2.1 The Assurance Master Summary Tracker captures the status of all gates, mini Gates and Gate Impact Reviews undertaken as being either passed, passed with conditions or re-submission required.
- 4.2.2 If a conditional pass is given the Tracker will record the number of conditions, date for closure and date closed.
- 4.2.3 Planned Gates and Mini Gates are also recorded on the Tracker and updated each period using the dates provided by CRL Planning Team in the Planning which is the single source of truth for CRL Engineering Assurance Gates planning.
- 4.2.4 Booking of rooms and sending of invites for Gate Reviews meetings in accordance with the standard invitee list and including any specialists requested by the Contractor.
- 4.2.5 A working copy of the above Tracker is held in T Drive and is accessible to the Assurance Team and all Crossrail users via eB on a read only basis.
- 4.2.6 At each Period end, new refreshed dates are issued through the Planning Portal. These dates are recorded on the Assurance Gates Summary Tracker by the Gates Coordinator as Planned Gates (highlighted in yellow) – final gate dates will be confirmed by Engineering Managers a minimum of two weeks before the gate.
- 4.2.7 The Gates Coordinator will instruct issue of the Assurance Summary Master Tracker via email to CRL Document Control for issue to RfL and LU IMs as per list held each week. The Conditions Tracker shall be reviewed and open conditions only added to the Assurance Master Summary Tracker prior to issue.
- 4.2.8 The Gates Coordinator will request CRL Document Control to approve the Assurance Summary Master Tracker to allow a new revision to be created in eB.

4.3 Gates Evidence Coordinators and Delivery Design Manager Responsibilities

- 4.3.1 A Gates Conditions Tracker is maintained in addition to the Assurance Master Summary Tracker, containing the detailed conditions, dates for closure and progress of close out.
- 4.3.2 A working copy of the Tracker is held T Drive and is accessible to the Assurance Team and all Crossrail users via eB on a read only basis.
- 4.3.3 The Gates Evidence Coordinators are responsible for recording all conditions on the Tracker.

- 4.3.4 The Evidence Coordinators will liaise with Engineering Manager(s) (EM)s / Project Manager (PM) regarding closure of the gate conditions, check evidence submitted and record closure of the conditions on the Tracker each week or as they occur.
- 4.3.5 If the due date of any condition is passed it will be turned red.
- 4.3.6 The Delivery Design Integration Manager will transfer from the Gates Condition Tracker to the Critical Issues Tracker on a weekly basis.
- 4.3.7 Gates Evidence Coordinators will attend the 'By Exception Construction Prior to Gate Acceptance for Station, Shafts and Portals' (Ref 4) review meeting. They will receive the By Exception Gate Risk Assessment Form (Ref F) when completed. Each By Exception Gate Risk Form will be recorded in the Gates Condition Tracker noting which future Gate will close out and incorporate the assurance.
- 4.3.8 Request to Proceed to IFC with Partial Gate Scope process is available to contractors provided they can demonstrate that none of the open Gate Conditions described in the Gate Review Report impact on the design drawings proposed to be progressed to IFC. The Request to Proceed to IFC with Partial Gate Scope Form (Ref G) will be prepared by the contractor prior to submission to CRL for Acceptance. Completed Request to Proceed to IFC with Partial Gate Scope forms will be recorded in the Gates Condition Tracker ensuring that Conditions relating to the Partial Gate Scope are Closed Out in accordance with the Evidence of Acceptance. Gates Evidence Coordinators will review the evidence submissions and manage the Conditions Close Out prior to IFC.

5 Gate Review Meeting and Mini Gates Implementation – Design and Build Contractors for Stations, Shafts and Portals

5.1 Confirmation of Gate Date

- 5.1.1 Engineering Manager (EM) / Project Engineer (PE) is responsible for confirming the gate date at least three weeks prior to the planned programme date.
- 5.1.2 The EM/PE will confirm the date is as per programme (priority for Wednesday each week where possible).
- 5.1.3 The EM/PE is responsible for closing out all conditions relating to the gate and creating/maintaining a Gates Conditions Tracker for the contract.

5.2 Gate Review Meeting and Mini-Gate Implementation FDCs and SSP Design and Build Contractors

- 5.2.1 The Gates Coordinator will issue the CARE data evidence report as held on SharePoint and eB in conjunction with gate invitation to the EM/PE/PM to show the status of documentation at Code 1 and Code 4 in eB and will set up a folder in T/Drive to store the submitted assurance evidence. The link to the T/Drive will be included in the invitation. List of invitees are:

- Gates Chair
- Discipline Lead Civils
- Discipline Lead Architecture
- Discipline Lead MEP
- Lead Fire Engineer
- Head of S&C
- Interface Manager
- Head of ESM
- Requirements Engineer

5.3 Mini Gate Invitees as per below:

- Gates Chair
- Applicable Panel Members i.e. if MEP Lead Engineer or Head of Civils, plus
- Engineering Manager
- Assistant Engineering Manager
- Design Manager
- Project Director (if required)

5.4 Systemwide Mini Gates

A Mini Gate Submission with relevant Heads of Discipline for Systemwide i.e. Civils, MEP, OHLE, Power etc sign off will be made via Gates & Assurance Inbox with accompanying Design Review Release signed by PM and Gate specific RIR

- Gates Evidence Coordinator to create folder on T drive and store submission
- If all relevant signatures complete proceed to Gate Pass Certificate
- Gates Chair to sign off submission and certificate

5.5 Post Issued for Construction (IFC) (Gate Impact Reports) – The Gates Coordinator Responsibilities:

5.5.1 A Gate Impact Report with supporting evidence such as CAT II or III Check Certificates and relevant Drawings shall be submitted by the Engineering Manager via the Gates and Assurance Team Inbox.

5.5.2 The Gates Coordinator will then log the report on the Assurance Master Summary Tracker and then print with supporting evidence and pass to the relevant signatories for review and sign off.

5.5.3 Once the Report is signed as satisfactory, and any Conditions issued as a result of the review have been satisfied and agreed by the relevant discipline lead, a Gate Pass Certificate will be prepared and issued.

5.6 Wrap Up Presentation Meeting

5.6.1 The procedure for setting up a Wrap Up Presentation meeting shall be as described in 5.2 above. The Wrap Up Presentation document shall be given an Eb No, and together with the Certificate of Integration (Ref G) completed by the Contractor placed in the T/Drive prior to the meeting.

5.7 Gate Readiness Reviews

5.7.1 Engineering Managers are responsible for carrying out Gate Readiness reviews a minimum of one week before the Gate.

5.7.2 Immediately after the review the Engineering Manager will confirm to the Gates Coordinator that a Gate Risk Assessment with eB reference has been shared with RfL/LU Leads has been produced and added to the T/Drive.

5.7.3 The Design Gate Review Presentation shall be issued by Contractor and made available to the panel at least 5 days prior to the Gate Review.

5.7.4 The evidence provided in the presentation will have full CRL eB document numbering including revision to allow for future retrieval.

5.7.5 **Note:** It is not acceptable to provide only electronic links (without documents numbers) to the documents within the Gate submission.

5.7.6 All documents electronically linked to the presentation shall have eB references.

5.8 Gate Review Meeting

5.8.1 The Gate Coordinator will electronically incorporate the List of Conditions into Gates Review Report, and complete a draft of Report in eB.

5.9 Issue of Gate Conditions Report – Stations, Shafts and Portals Only

5.9.1 The Gates Coordinator will issue a draft report to EM / PE / Contractor and Consultant Design Lead and Gates Chair within 5 days. (Electronic word copy or eB link).

5.9.2 Attach attendee signature list to word copy and get a signed report by Author / Check by Panel Member / Approved by Gates Chair.

5.9.3 Scan signed report and save PDF to T drive. Upload PDF to eB.

5.9.4 Gates Coordinator to email CRL Document Control Team to issue Gate Condition Report within 10 days of the Gate Review to the following:

- Engineering Manager
- Project Engineer
- Contract Project Manager and Design Lead
- Respective Infrastructure Manager - Rail for London (RfL)
- London Underground (LU) - Mined Stations only.

5.9.5 File hardcopies of reports etc. in Gates Folders under Contract Number.

5.9.6 Update Gate Review Summary Tracker in Gate Management on eB.

5.9.7 When Conditions have been addressed, Contractor / EM / PE to send closeout evidence by email or put into T/Drive folder set up by Gates Coordinator.

5.10 Issue of Gate Pass Certificate and Associated Documentation

5.10.1 Gates Evidence Coordinator to review evidence with Gates Chair/Discipline Leaders and when satisfied that the conditions are addressed, the Gates Coordinator shall produce a Gate Pass Certificate and ensure this is Code 4 'Fit for Information' in eB. This shall be issued formally via eB and filed with evidence in the Contract T Drive folder.

5.10.2 Create document number in eB for Gate Certificate.

5.10.3 Gates Chair or Deputy (Heads of Engineering Head of Stations or Chief Engineer) sign certificate as accredited signatories for IMs

5.10.4 Scan certificate and evidence, save to eB and T drive.

5.10.5 Gates Coordinator to email CRL Document Control Team to issue the following documents within 5 days of confirmation of condition close out:

- Gate Pass Certificate with documentation as appropriate
- Gate Presentation Report/Gate Impact Report/Mini-Gate Submission
- Accepted Request to Proceed with Partial Gate Pass Certificate

These documents to be issued to:

- Engineering Manager
- Project Engineer
- Contract Project Manager and Design Lead
- All to Rail for London (RfL)
- London Underground (LU) - Mined Stations only. The e-mail shall be archived in the T/Drive

6 Gates Implementation – Systemwide Design Contractor

6.1 Gates Implementation

- 6.1.1 The Gates Coordinator shall liaise with the Head of Discipline for the relevant Gate.
- 6.1.2 Confirm Gate date as per Gate Programme.
- 6.1.3 Contractor's PM/EM/PE issues the invite to the CRL Systemwide PM, to forward to Assurance Gates Inbox for the Gates Coordinator to issue to all parties.
- 6.1.4 Gates Coordinator set up T/Drive Folder and include hyperlink in meeting invite.
- 6.1.5 Design Gate Review Report and Presentation issued by Contractor and made available to at least 5 days prior to the Gate Review by uploading to the T/Drive.
- 6.1.6 The Contractor will issue an updated Design Gate Review Report to include all Conditions and Observations made at the Gate.

6.2 Systemwide Conditions and Gate Reports

- 6.2.1 The Gates Evidence Coordinator will receive The Design Gate Review Reports from the relevant Head of Discipline/Engineering Manager and will record the evidence required to allow any conditions to be closed.
- 6.2.2 When all Conditions have been closed to the satisfaction of the Head(s) of Discipline, and the evidence provided in an updated Report, a Gate Pass Certificate will be signed by Head of Technical Assurance and issued by the Gates Coordinator who will email CRL Document Control Team to issue the following documents within 5 days of confirmation of condition close out:
- Gate Pass Certificate
 - Gate Impact Report/Mini-Gate Submission
 - Accepted Request to Proceed with Partial Gate Pass Certificate

These documents to be issued to:

- Engineering Manager
 - Project Engineer
 - Contract Project Manager and Design Lead
- 6.2.3 The Gates Coordinator will update the Assurance Master Summary Tracker, and Assurance Evidence Coordinators will update the Gates Conditions Tracker.

6.3 Wrap Up Presentation Meeting

- 6.3.1 Wrap Up Presentation Meeting shall be as described in 6.1 above. The Wrap Up Presentation document shall be given an eB number, and together with the Certificate of Integration (Ref H) completed by the Contractor and placed in the T/Drive prior to the Meeting.

7 Reference Documents

Ref:	Document Title	Document Number:
1.	Engineering Design Assurance Gates Procedure	CRL1-XRL-O7-GPD-CR001-50015
2.	Systemwide Design Gate Review Procedure	CRL1-XRL-O7-GPD-CR001-50012
3.	Post IFC (Issued for Construction Changes Crossrail Internal Guidance Note	CRL1-XRL-O7-GUI-CR001-50001
4	Systemwide Post IFC (Issued for Construction) Changes Internal Crossrail Internal Guidance Note	CRL1-XRL-O7-GUI-CR001-50008
5.	By Exception Construction Prior to Gate Acceptance for Station, Shafts and Portals	CRL1-XRL-O7-GPD-CR001-50023

8 Standard Forms / Templates

Ref:	Document Title	Document Number:
A	Gate Review Report Template	CRL1-XRL-O7-ZTM-CR001-50007
B	Gate Pass Certificate	CRL1-XRL-O7-ZTM-CR001-50008
C	Gate Impact Report Template	CRL1-XRL-O7-ZTM-CR001-50009
D	Mini Gate Submission Template	CRL1-XRL-O7-ZTM-CR001-50010
E	Systemwide Mini Gate Submission Template	CRL1-XRL-O7-ZTM-CR001-50022
F	Gates Conditions Tracker	CRL1-XRL-O-LLG-CRG02-50005
G	By Exception Gate Risk Assessment Form	CRL1-XRL-O7-ZFM-CR001-50003
H	Request to Proceed to IFC with Partial Gate Scope	CRL1-XRL-O7-ZFM-CR001-50004
I	Contract Design Integration Certificate	CRL1-XRL-O-CER-CR001-50028

9 Appendices

Table 1

Table showing Outputs and Actioners for Station, Shaft and Portals Design and Build Gates; Mini Gates, Gate Impact Reviews and Systemwide Gate Review

Gate Type	Presentation	Meeting (Attendees)	Report	Certificate
Design & Build Gate Review G1 / G2 / G3	Presentation (By Contractor)	Gate Review carried out (Full Panel / EM / Contractor / 3 rd Parties)	Gate Report prepared by Gates Co-ordinator (Signed by CRL)	Gates Pass Certificate Prepared by Gates Co-ordinator Signed by Gates Chair
Mini Gate Review	Presentation / Mini Gate Template (By Contractor)	Mini Gate Review carried out (Discipline Panel / EM / Contractor)	Mini Gate Template Completed by Contractor (Signed by Contractor & CRL Discipline Lead and Head of Technical Assurance) Report Prepared by Gates Co-ordinator (Signed by CRL)	Gates Pass Certificate Prepared by Gates Co-ordinator Signed by Gates Chair
Gate Impact Review (GIR) - Post Gate 3	GIR Template (By Contractor)	GIR Mtg (Gate Chair and CRL Discipline, EM / Contractor, Gates Co-ordinator)	GIR Template Completed by Contractor (Signed by Contractor), CRL Discipline Lead(s) and Heads of Technical Assurance Append Evidence for Conditions to GIR in eB and issue with Certificate	Gates Pass Certificate Prepared by Gates Co-ordinator Signed by Gates Chair

Table 2

Table showing Outputs and Actioners for: Systemwide Design and Build Gates Process.

Systemwide Gate	RIBA Stage	GRIP Stage	LU Stage	% completion	Description
Gate 1 Gate dates managed by Gates Co-ordinator Contractor presents to PM and Gates Chair	C or D	3	2 (Conceptual Design Statement)	30% Design PM submits report to Gates Co-ordinator PM issues Systemwide Design Gate Review Release to Gates Co-ordinator PM supplies evidence of conditions (if applicable)	Final Scheme design Gate Pass Certificate Signed by Gates Chair Gate Co-ordinator issues Certificate
Gate 2 Gate dates managed by Gates Co-ordinator Contractor presents to PM and Gates Chair	E	4	3 Ref Clause 3.15- 1-538	60% Design PM submits report to Gates Co-ordinator PM issues Systemwide Design Gate Review Release to Gates Co-ordinator PM supplies evidence of conditions (if applicable)	Development of single option Gate Pass Certificate Signed by Gates Chair Gate Co-ordinator issues Certificate
Gate 3 Gate dates managed by Gates Co-ordinator Contractor presents to PM and Gates Chair	F	5	Compliance Submission Ref Clause 3.17- 1-538	100% Design PM submits report to Gates Co-ordinator PM issues Systemwide Design Gate Review Release to Gates Co-ordinator PM supplies evidence of conditions (if applicable) and issues Systemwide Gate Declaration Certificate	Detailed design; tender documents and production information Gate Pass Certificate Signed by Gates Chair Gate Co-ordinator issues Certificate via eB

Process Flow of Assurance Gates

