

OPERATIONAL INSTRUCTION REF. OI/IPMG.2018.03

DESIGN REVIEW OF INFRASTRUCTURE WORKS

1. Authority

- 1.1. This Operational Instruction (OI) is promulgated by the Director of the Infrastructure and Project Management Group (IPMG), on the basis of a delegation of authority from the Deputy-Executive Director, under the authority of the Executive Director, under OD.EO.2017.02 on Management of UNOPS Partners and Resulting Agreements.

2. Purpose

- 2.1. In line with the goal to enhance UNOPS performance in the delivery of infrastructure, the purpose of this OI is to outline the mandatory review requirements for the design of UNOPS Infrastructure Works, in order to mitigate organizational risk, and to ensure consistent infrastructure design quality, minimum standards of safety, and functionality of UNOPS infrastructure for partners and beneficiaries.

3. Effective Date

- 3.1. This OI shall become effective on **immediately**.

4. Consequential Changes

- 4.1. The following Administrative Instructions (AI) shall be abolished as of the effective date of this OI:
- AI/IPMG/2016/01, Design Review and Compliance with UNOPS Design Planning Manuals.

[signature redacted]

Nicholas O'Regan
Director, Infrastructure and Project
Management Group

OPERATIONAL INSTRUCTION REF. OI.IPMG.2018.03**DESIGN REVIEW OF INFRASTRUCTURE WORKS****Table of Contents**

1. Introduction.....	3
2. Definition:	3
3. Design Review Requirements.....	4
4. Designs for works not covered by UNOPS design planning manuals.....	5
5. Design responsibility and liability	5
6. Design Review process	6
7. Infrastructure Design - Special Cases	9
8. Non-Compliance	9
9. Cost of Design Review	9
10. Establishing a preferred process for review	10
11. Authoritative Interpretation:	10
Annex 1: Cost of Design Review.....	11
Annex 2: Establishing a preferred process of review	13

1. Introduction

- 1.1. The purpose of this OI is to outline the mandatory Design Review requirements for UNOPS Infrastructure Works (Design Review). With a mandate as a central resource for infrastructure planning, design and implementation within the United Nations, the Design Review process is imperative to help ensure quality, mitigate risk, and meet the expectations of our partners.
- 1.2. The UNOPS design planning manuals (the Design Planning Manual for Buildings and the Design Planning Manual for Transport Infrastructure) provide further guidance and supporting documents to this OI. Refer to the Process and Quality Management System (PQMS) for additional details, as the Design Review processes are progressively transferred into it.

2. Definition:

- 2.1. For the purpose of this OI, the following terms shall have the meaning provided herewith:

Design Development

- 2.2. Design Development refers to any Works Design that are works-in-progress, and that which have not yet met all requirements of the respective Design Review checklist. The checklist is available on IPMG intranet site.

Design Review

- 2.3. Design Review is an internal assurance process for Infrastructure Works Designs that mitigates organizational and life/safety risks by ensuring design compliance with established codes and standards as cited in the Engagement Agreement or the Project Initiation Documentation (PID), UNOPS Design Planning Manuals and associated Design Review checklists and is carried out by respective reviewer as outlined.

Infrastructure Works

- 2.4. Infrastructure Works refer to activities related to buildings; highways, streets, roads, and bridges; mass transit; airports and airways; water supply, treatment, distribution, etc. and water resources; wastewater management; solid-waste treatment and disposal; electric power generation, transmission and distribution; telecommunications; hazardous waste management and other services and assets that together form a unified system needed for the functioning of society.

Projects of Special Significance

- 2.5. Projects of Special Significance is defined as Infrastructure Works projects that are not covered by existing UNOPS design planning manuals and which may require different considerations. Such projects are identified, and appropriate measures for risk assessment and Design Review shall be determined, on an individualized basis according to Section 4 of this OI.

Works Design

- 2.6. A Works Design is defined as the drawings, technical specifications, bills of quantities (BOQs), preliminary technical investigations (geotechnical, topographic, hydrologic,

traffic, etc.), supporting technical calculations, and basis of design reports that describe the specific physical composition and methodology for constructing the particular Infrastructure Works project.

3. Design Review Requirements

Application of Design Review requirements

- 3.1. To ensure that all UNOPS Infrastructure Works meet the minimum requirements stated within the applicable UNOPS design planning manuals and other project related codes and standards cited in the Engagement Agreement and/or PID, all Works Designs used for projects delivered by UNOPS, whether prepared by UNOPS or a third party, for example, a donor/partner, a design consultant/company, a contractor (the Designer), shall be reviewed for compliance before the Infrastructure Works can be procured and subsequently constructed. A Certificate of Design Review Compliance (see below) shall be issued upon satisfactory review and completion of the design prior to Infrastructure Works implementation.

Designs prepared by UNOPS personnel

- 3.2. For all Works Designs prepared by UNOPS personnel, the Project Manager shall ensure that the Designer and design team members are competent to provide the required design services. Where the Project Manager is not a technical personnel, IPMG can provide support in identifying the expertise required and/or assessing the qualifications of potential Designers.

Designs prepared by third parties

- 3.3. If a Works Design is to be prepared by an external Designer, the Project Manager shall specify in the solicitation and contract documents that the applicable UNOPS design planning manual shall be followed and complied with and that Design Review shall be required. Before procuring design services, the procurement practitioner assisting the Project Manager with the tendering of the design services shall ensure that reference to the applicable UNOPS design planning manual is included in such requirements, and that the manual is issued with the tender documents for the design.

Design Review under Design and Build contract modality

- 3.4. In the case of UNOPS FIDIC based Design and Build Works Contracts, the design for the project of Infrastructure Works does not yet exist, and it is the objective of the procurement process to engage a contractor that shall provide both the design and construction of the whole project. The contractor is therefore expected to provide the design of the Infrastructure Works (the Contractor Design) and later carry out the Infrastructure Works construction. The Design Review process shall be in compliance with section 6.9 of this OI.
- 3.5. Due to the complexity of the Design and Build approach, if procurement of Design and Build services is being considered by the Project Manager, guidance should be sought from the Head of Engagement Assurance, IPMG.
- 3.6. It is mandatory to obtain a prior approval from the Head of Engagement Assurance, IPMG, before preparing an RFP for Design and Build services and its corresponding contract (see OI on Works Contracts).

Design Review and UNOPS procurement activities

- 3.7. In cases where UNOPS executes a procurement process on behalf of a partner and the construction contract agreement is not signed by UNOPS but is entered into by the partner and the contractor, UNOPS Design Review shall not be required.
- 3.8. However, if UNOPS' role and associated responsibilities and liabilities goes beyond simply procuring the contractor as defined in the Engagement Agreement (e.g. UNOPS is to supervise the Infrastructure Works under the contract between the client and the contractor), after the procurement stage, Design Review shall be required.

Design Review requirements for existing engagements

- 3.9. Any new Infrastructure Works added to existing engagements that were not planned, designed and approved as part of the existing Engagement Agreement prior to the effective date of this OI shall be subject to Design Review.

Design variations

- 3.10. Requests for structural or significant design changes (as defined in the applicable design planning manual) during project implementation must be referred to the Designer for consideration. Any such changes shall be subject to Design Review.

Exemptions from Design Review

- 3.11. Minor installations and other Infrastructure Works that do not have implications for the functional integrity of infrastructure may be exempted from Design Review. Exemptions can only be issued by the IPMG Design Review Manager, and/or, the IPMG Head of Engagement Assurance or his/her OIC for this purpose.. Exemptions shall only be issued once the scope of Infrastructure Works, and additional supporting documentation, have been reviewed and confirmed.

4. Designs for works not covered by UNOPS design planning manuals

- 4.1. All Infrastructure Works that are not identified in existing UNOPS design planning manuals (such as, but not limited to, Projects of Special Significance, as defined in section 2.5 of this OI), shall be referred to IPMG for a preliminary technical review. The decision whether or not to review the design for such Infrastructure Works shall be taken through discussion and agreement between the IPMG Design Review Manager, IPMG Head of Engagement Assurance and the respective Regional Director.
- 4.2. Referral to IPMG shall be made as soon as possible and prior to implementing any Infrastructure Works, including at the engagement review stage (as defined in OI.IPMG.2018.01: Project Management) following preliminary technical assessment by the engagement reviewer.

5. Design responsibility and liability

- 5.1. Responsibility and liability for the design shall be clearly identified in the Engagement Agreement and any specific design contract documentation, including applicable references to liability in cases of designs being prepared by third parties.

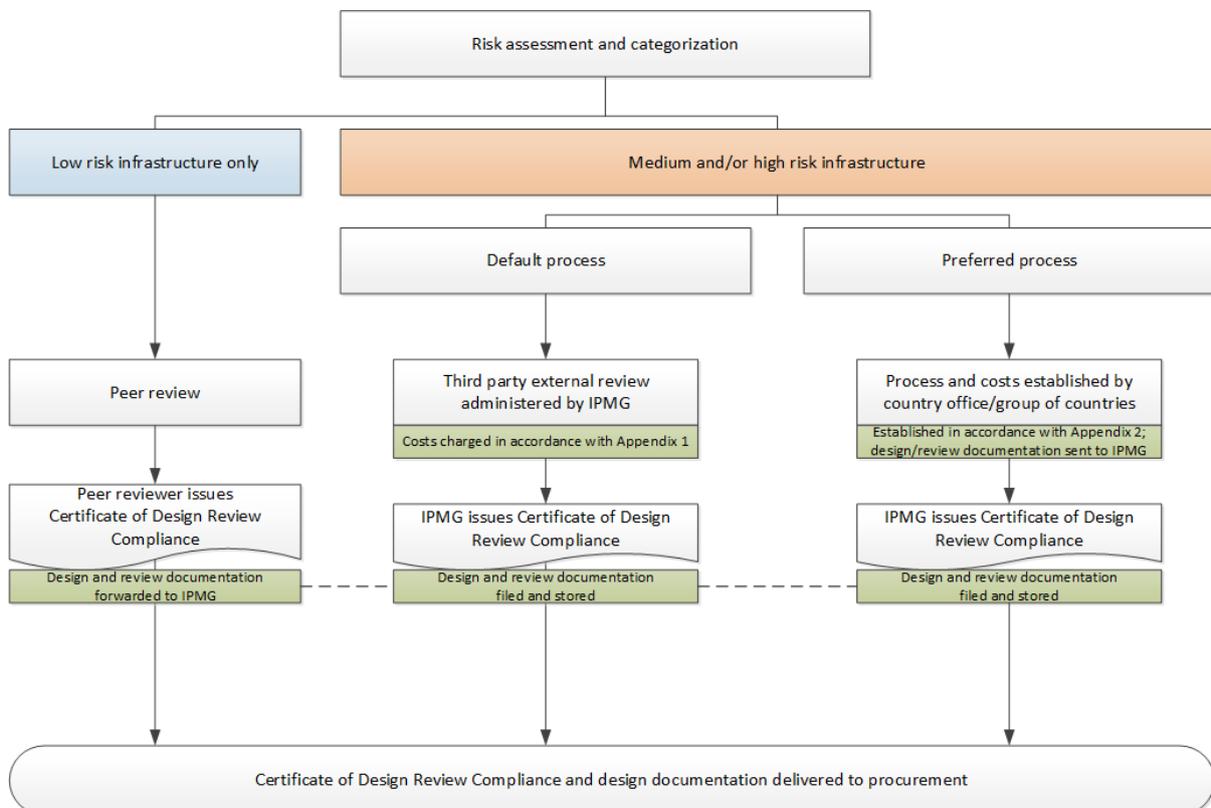
- 5.2. UNOPS shall only accept design liability where a design has been produced internally on behalf of UNOPS by UNOPS personnel (as defined in OD.PCG.2017.01 on Human Resources, Ethics and Culture) in accordance with the applicable design planning manual, or where the Engagement Agreement and any specific design contract documentation accepts this liability. In cases, where UNOPS is responsible and liable for the design under an agreement between UNOPS and its partner, but UNOPS outsources the preparation of such design, liability for the design shall be passed on to the external Designer in the agreement between UNOPS and the Designer.
- 5.3. For designs provided by a third party (e.g. a donor, a consultant), design liability shall rest with that third party. UNOPS shall not accept design liability unless specifically approved by the Engagement Authority, following consultation with the Integrated Practice Advice and Support (IPAS) and/or Legal Group (LG). In this regard, UNOPS shall not make changes to any such design either prior to, or during the construction phase, other than to the extent identified in the applicable design planning manual (see also section 4.5).
- 5.4. In order to accept any design liability (for example, in situations where UNOPS directly amends an existing design prepared by a third party) from a third party, approval shall be provided by the Engagement Authority, as a pre-requisite to approval of the design and issuance of the Certificate of Design Review Compliance (as per section 3 of this OI).
- 5.5. The Design Reviewer's liability shall be limited to evaluating the compliance of the design against the minimum requirements set out in the applicable design planning manual and shall not include any liability for the design itself, which shall remain with the original designer.

6. Design Review process

Principles of Design Review

- 6.1. All infrastructure designs shall be reviewed to ensure that minimum life safety requirements as defined in the Design planning Manuals are incorporated within the Works Design.
- 6.2. All infrastructure designs shall be reviewed to ensure that minimum sustainability and resilience attributes in the requirements defined in the Design planning Manuals are included within the completed Infrastructure Works to ensure that the impact upon the environment and contribution to development is positive in nature.
- 6.3. Designs shall not be reviewed by individuals where a conflict of interest exists. For example, a designer shall not approve and sign off their own work.
- 6.4. Designs prematurely submitted (still in Design Development) for review shall be returned by IPMG to the issuing party with directions for resolution. Further guidance and advice should be sought from IPAS Infrastructure and Project Management unit.
- 6.5. The Project Manager shall ensure that appropriate resources and time allowance are identified within the project plan for Design Development and Design Review. Any shortfalls should be highlighted as an issue and escalated within the project governance structure.

- 6.6. All design and review documentation, including the final version of the design package, shall be submitted to design.review@unops.org, and stored in a central design library at UNOPS Headquarters.
- 6.7. The required level of Design Review (i.e. for low, medium or high-risk Infrastructure Works) shall be initially assessed by the Project Manager in accordance with the design risk assessment methodology as defined in the applicable design planning manual. The risk evaluation will dictate either peer or independent, third party review. Design risk evaluation shall not determine a design to be exempt from Design Review. Exemptions from Design Review shall be determined according to section 2.
- 6.8. Upon completion of the Design Review process, and where confirmed that the proposed design meets the minimum requirements of the applicable design planning manual, the reviewer shall issue a Certificate of Design Review Compliance. For low-risk infrastructure, the peer reviewer shall issue the certificate. For medium and high-risk infrastructure, IPMG shall issue the certificate.
- 6.9. The procurement of construction for Infrastructure Works and services can commence only after the Certificate of Design Review Compliance has been issued. In cases where the Design and Build implementation modality is intended be used (in accordance with the OI on Works Contracts), the Certificate of Design Review Compliance shall only be issued where the Employer Requirements (as defined within the UNOPS Design Build Contract) have been reviewed and accepted by the Head of Engagement Assurance, IPMG.



Design Review of low risk works

- 6.10. For low-risk Infrastructure Works, the Project Manager shall submit the Works Design to one of the following qualified technical resources with the required competency in the specific discipline areas for review:
- i. Design consultant: For local markets with sufficient national design capacity (to be agreed in consultation with the Head of Engagement Assurance, IPMG and the respective Regional Director), low risk designs can be reviewed by a local design consultant;
 - ii. Regional Long Term Agreement (LTA) holder: Regions can establish LTA agreements with regional consultancies to carry out reviews of low risk designs, in consultation with Head of Engagement Assurance, IPMG;
 - iii. UNOPS offices with capacity: Low risk designs can be referred to another UNOPS office with specialized technical resources to carry out peer reviews. The office providing the service can define the cost of review, if any; or,
 - iv. Existing network of peer reviewers: Low risk designs can be referred to UNOPS personnel with specialized technical resources to carry out peer reviews. The office with the delegated resource can define the cost of review. A peer reviewer is a UNOPS personnel member with the requisite technical knowledge of the disciplines they are reviewing and professional experience to conduct the review, who has been certified by IPMG to act as a peer reviewer and who has not been involved in the development of the design to be reviewed.
 - v. To be certified as a peer reviewer under section c) and d) above, UNOPS personnel shall submit a copy of their Curriculum Vitae to IPMG, and complete the mandatory IPMG training exercise for the relevant infrastructure type. The Design Review Manager, IPMG, shall be responsible to maintain the directory of approved peer reviewers, and may determine when any training updates shall be required.
- 6.11. Low risk reviews shall occur only after the Design Review Manager, IPMG, has confirmed the risk assessment of the Infrastructure Works and the design documentation has progressed to a sufficient stage of development
- 6.12. IPMG may undertake spot-checks of peer review outputs and the associated design package to ensure mitigation of design risk.
- 6.13. After receipt of all revised design and peer review documentation, a design that has been approved by a peer reviewer shall receive from IPMG a unique identifying number, specific to the Infrastructure Works. This number is to be entered on the Certificate of Design Review Compliance and signed by the peer reviewer.

Design Review of medium and high risk works

- 6.14. For medium and high-risk Infrastructure Works, as determined in accordance with the risk assessment methodology of the applicable design planning manual, the Project Manager shall submit the design of such infrastructure to IPMG for independent third party review.
- 6.15. Upon confirmation that the proposed design meets the minimum requirements of the applicable design planning manual, a Certificate of Design Review Compliance shall be signed and issued by the Design Review Manager or Head of Engagement Assurance, IPMG or his/her OIC for this purpose.

7. Infrastructure Design - Special Cases

- 7.1. **Rehabilitation works:** Renovation works and repetitive works present special technical issues for risk mitigation and maintenance of minimum standards for safety and functionality. Renovation works, particularly in cases of infrastructure repurposing, shall be evaluated as Projects of Special Significance to ensure continued structural and fire safety, operational safety and protection of life.
- 7.2. **Multiple works with repetitive design:** Repetitive design works, including low value Infrastructure Works, shall be categorized as medium risk infrastructure due to the potential risk for repeating a design error many times over. The intended use of similar facilities located in multiple sites may well entail substantially different site-related factors that may affect the standard design.

8. Non-Compliance

- 8.1. For medium and high-risk Infrastructure Works, designs with minor non-compliances from the minimum requirements that do not affect the life safety and functionality of the Infrastructure Works can be accepted at the discretion of the Head of Engagement Assurance, or Design Review Manager, IPMG.
- 8.2. If the Head of Engagement Assurance, or Design Review Manager, IPMG, determines that the proposed design entails substantial non-compliance from the minimum requirements or non-compliance that affect the life safety and functionality of the Infrastructure Works, he/she must refer the issue for a consensus resolution to the respective Country/Hub Director, the Regional Director, and the Director of IPMG.
- 8.3. In the event of a disagreement on the technical sufficiency of a design, such disagreement shall be escalated to the Executive Office for decision.
- 8.4. Project documentation may be requested at any time to verify mandatory compliance with the Design Review requirement as specified in this OI.

9. Cost of Design Review

- 9.1. The costs of Design Review are a direct project cost to be recovered from project budgets. Designs submitted for Design Review that are in various stages of the Design Development phase shall incur higher Design Review costs and longer Design Review time, as opposed to designs submitted in the Design Review phase requiring minor corrections and technical adjustments. See Annex 1 of this OI for additional costing details.
- 9.2. Designs for low risk infrastructure may be reviewed by qualified peer reviewers as per section 5 above. Subject to agreement between the provider and recipient of peer review, an office may charge a fee for the peer review service, perform the review pro bono or on a reciprocal basis. There are no Design Review costs administered by IPMG.
- 9.3. Designs for medium and high risk infrastructure shall be charged in accordance with Annex 1 to this OI, unless a preferred process has been established.
- 9.4. Specific high profile, extremely complex projects, or projects that include Infrastructure Works with a total construction value of more than USD 5,000,000, as well as multiple site, renovation, or repetitive works may be priced on an individual basis. Estimated costs for these reviews shall be determined by IPMG during early stages of project

development. It is incumbent upon the Project Developer/Project Manager to seek guidance on this matter.

10. Establishing a preferred process for review

10.1. Offices with sufficient Design Review capacity may establish an alternate process for Design Review that is administered and funded locally. The process for establishing a preferred process is laid out in the Annex 2 of this OI.

11. Authoritative Interpretation:

11.1. Authoritative interpretation of this OI and the applicable design planning manuals, may be made by the Director of IPMG, or other personnel as authorized by the Director of IPMG, in order to provide clarification on the applicability or interpretation of the requirements stated herein.

Annex 1: Cost of Design Review

Given the varying complexity of infrastructure and the time required for a thorough review of design documentation, a sliding scale of charges is applied to the review of low, medium and high risk infrastructure.

The tables below provide a range of costs to guide the Project Manager during the planning process. The identified costs are based on the estimated number of hours needed to carry out the Design Review assessment, including any further assessments of revisions. Note that these figures are provided are to be used for preliminary budget guidance only; the actual costs will equal expenses incurred.

Peer reviews of low risk infrastructure

Designs for low risk infrastructure are to be reviewed by certified peer reviewers. There are no associated IPMG costs.

Note: There are no peer review resources within IPMG and peer reviewers need to be mobilized from individual offices. The specific costing arrangement is up to agreement between the offices. Offices may agree to review each other's designs as a professional courtesy, on a reciprocal basis, or charge for the service. To ensure that the project manager will have an available peer reviewer when the design documentation is ready, it is crucial to have these discussions as early as possible and identify a resource well in advance of the need to use it. Attempts to find a resource shortly before the ITB/RFP is to be issued will cause delays to the project.

Third party reviews of medium and high risk infrastructure

Unless a preferred process of review has been established for the country office, designs for medium and high risk infrastructure are to be submitted to IPMG for a review by an independent third party.

Projects shall be charged for Design Review according to the costs incurred. The total cost shall be based on the number of infrastructure elements assessed, their risk category, and the number of revisions in the course of the review process.

Specific high profile, extremely complex projects, projects that include Infrastructure Works with a total construction value of more than USD5,000,000, as well as multiple site, renovation, or repetitive works may be treated on an individual basis. Costs for these reviews shall be determined by IPMG during risk assessment of the design.

Project Managers must plan for the cost and time implications of review. Please note that the initial risk assessment may be altered based on additional information or changes to the risk profile of the infrastructure during the development of the design.

Note: The biggest driver of costs is the quality of design documentation submitted—the fewer revisions and requests for more information, the faster and cheaper the review process will be. Project managers should refer to the applicable design planning manual for guidance on the documentation that should be submitted at various points in the project.

The below tables are provided as preliminary budget guidance. The actual cost of review will equal expenses incurred.

Table 1: Budget guidance for Design Reviews (buildings)

Buildings	Low risk	Medium risk	High risk
Up to \$1m (per building)	<i>To be agreed with office providing review resource</i>	\$4,000	\$10,000
\$1-3m (per building)	<i>To be agreed with office providing review resource</i>	\$6,000	\$15,000
Above \$3m (per building)	High risk	High risk	\$20,000

Table 2: Budget guidance for Design Reviews (transport infrastructure)

Transport infrastructure	Low risk	Medium risk	High risk
		<i>The italicized amounts refer to total construction cost</i>	
Roads (per design)	<i>To be agreed with office providing review resource</i>	< \$1,000,000, \$5,000	< \$1,000,000, \$10,000
		> \$1,000,000, \$5,000 + 0.25% of total construction cost < \$5,000,000	> \$1,000,000, \$10,000 + 0.4% of total construction cost < \$5,000,000
Bridges (per design)	<i>To be agreed with office providing review resource</i>	< \$1,000,000, \$10,000	< \$1,000,000, \$15,000
		> \$1,000,000, \$10,000 + 0.6% of total construction cost < \$5,000,000	> \$1,000,000, \$15,000 + 0.7% of total construction cost < \$5,000,000
Tunnels (per design)	<i>To be agreed with office providing review resource</i>	< \$1,000,000, \$10,000	< \$1,000,000, \$15,000
		> \$1,000,000, \$10,000 + 0.6% of total construction cost < \$5,000,000	> \$1,000,000, \$15,000 + 0.7% of total construction cost < \$5,000,000
Ports (per design)	N/A	Priced on one-off basis	Priced on one-off basis
Airstrips (per design)	<i>To be agreed with office providing review resource</i>	< \$1,000,000, \$5,000	< \$1,000,000, \$10,000
		> \$1,000,000, \$5,000 + 0.25% of total construction cost < \$5,000,000	> \$1,000,000, \$10,000 + 0.4% of total construction cost < \$5,000,000
Railways (per design)	N/A	Priced on one-off basis	Priced on one-off basis

Annex 2: Establishing a preferred process of review

Offices with sufficient Design Review capacity may establish an alternate process of Design Review that is administered locally and eliminates the cost of reviews administered by IPMG. A preferred process does not exempt an office from compliance with the applicable design planning manual; it provides the opportunity for an office to control the Design Review process instead of administering it via IPMG. IPMG will continue to provide support in an oversight function and can provide senior technical experts for specialized tasks.

The method for establishing a preferred process is as follows:

- i. A Regional Director initiates the set-up of a preferred process by making a request to the Head of Engagement Assurance, IPMG.
- ii. This initiates a maturity assessment of the Design Review capacity and practice in the relevant country or countries.
- iii. In order to qualify for a preferred process for review, a country office or group of offices must demonstrate either: 1. the existence of robust national controls over review processes for the quality of design documentation¹, or 2. the following:
 - a. Existence or establishment of a panel of technical experts able, qualified and available to independently review medium and high risk designs. Members of the panel cannot review designs that were developed with their involvement.
 - b. Training of the panel members on the contents of the applicable design planning manual.
 - c. Agreement to submit design and review documentation to IPMG, together with review checklists, for issue of the Certificate of Design Review Compliance.
- iv. Upon meeting the necessary criteria for Design Review capacity and practice, a review process may be approved by the Head of Engagement Assurance, IPMG. This notification shall be issued to the Regional Director, Country Director, and other relevant personnel.
- v. To verify compliance with the review requirement and to ensure that the preferred process is sufficient for the management of design risk, IPMG may request design and review documentation at any time.

¹ These national controls must be clearly identified and mapped. Proof is to be provided that the controls exceed or are equivalent to all aspects identified in the applicable design planning manual to enable approval of the preferred process.