

APPENDIX D GUIDANCE NOTES ON SPECIFYING THE DESIGN CHECKING PROCEDURES

1.0 Preamble

The Employer's Requirements shall stipulate the requirements for design checking. If stated in the Employer's Requirements the Contractor shall appoint a Design Checker, independent of the Contractor and his designer. Alternatively, if the Employer's Requirements do not require a Contractor to appoint a Design Checker, the design check shall be carried out by the Supervising Officer (or his representative) as part of the consent procedure. The extent of the design check shall be specified in the Employer's Requirements. The obligations for the Contractor or Design Checker(s) to seek approvals from Government Departments/Offices prior to any certification by the Design Checker(s) shall be stated in the Employer's Requirements. The procedures for dealing with proposed changes to checked drawings shall also be stipulated (see Clause 62 of the D&B GCC).

The flow charts at **Figures D1** and **D2**, outline the normal design checking procedures where a Design Checker is appointed by the Contractor and include procedures where Statutory Authorities and/or Government departments are required to check particular aspects of the design. The general principles are applicable to any design and build project. The flow chart at **Figure D3** outlines a streamlined approval process where previously approved detailed design drawings are resubmitted to incorporate minor changes. If there is no Contractor appointed Design Checker under the Contract, the Supervising Officer shall carry out his own design check prior to giving his consent.

Where checking or approvals by Statutory Authorities/Government departments are required for the permanent Works, the concerned Authorities and departments should be listed and relevant scope specified. Previous agreements or rejections should also be specified.

2.0 Design Checking Procedures

2.1. Objective

The basic objective of the design checking procedures is to encourage the progressive processes of submissions, discussion and endorsements to avoid delays to the project.

Specimen design checking clauses for the Employer's Requirements are shown at **Annex D1**.

The design checking procedures normally comprise two main stages :-

- Approval in Principle (AIP).
- Detailed Design Approval (DDA).

Employer's Requirements shall include time limits for the design checking. It is important to establish time frames for the overall processes of submission through checking and giving consent. Time limits set for approval of various packages and stages should be commensurate with the requirements of the programme and the quantity of information to be checked. Generally AIP stages require a shorter approval time than DDA stages.

Proforma check certificates to be used by the Contractor for seeking design approval i.e. AIP and DDA are at **Annexes D2/1 and D2/4** respectively.

The nature of the project would dictate whether two-stage design checking should be adopted and the extent of checking overall. Some aspects of the design of the project may only require AIP whilst other aspects of the design may require both AIP and DDA. The Employer's Requirements should state which aspects of the design require one or two-stage design checking. Normally, one-stage Design Checking Procedures should follow DDA submission procedures.

2.2. Project Design Plan

The Contractor shall be required to submit a Project Design Plan after award of the Contract. The purpose of the document is to show how the Contractor intends to implement the Design Checking Procedures. The Contractor's Project Design Plan should address the following matters:-

- (a) Identification of various design stages and trade packages.
- (b) Organisation chart of the Contractor's design team with allocation of responsibilities for design packages and interfaces.
- (c) Document flow chart and approval plan, including statutory submissions.
- (d) Design changes management procedure.
- (e) Design and submission programme, in line with the construction programme.
- (f) Proposed title block layout and document numbering system.
- (g) Proposed standard forms.

The Project Design Plan shall be reviewed with the Contractor and approved prior to the start of the bulk of the design checking process.

2.3. Approval in Principle

Figure D1 indicates the sequence for AIP submissions where an independent Design Checker is appointed by the Contractor. Time

allowed for certain activities shall be stipulated in the Employer's Requirements. If there is no Contractor appointed Design Checker, time should be allowed in the activity for the Supervising Officer to give his consent for his design check.

Normally, before commencing the detailed design of any element of the Works the Contractor shall seek the AIP from the Supervising Officer. The specific purpose of AIP is to check that all aspects of the Works, including Temporary Works which could affect the integrity or performance of the structure, stated in the Employer's Requirements, are identified and have been taken into account before detailed design and construction commence. The requirements for the independent checking of Temporary Works is contained in prevailing DEVB TCW. The sanctioned AIP document serves as a yardstick for subsequent approval of the detailed design.

AIP submission shall include :-

- (a) General arrangement drawings.
- (b) List of design codes.
- (c) List of design parameters.
- (d) Description of analysis methods to be used.
- (e) Aspects requiring further clarification in the Employer's Requirements.
- (f) Evidence of consultation with the relevant Statutory Authorities/Government departments (other than the Works Department).

In considering the Contractor's AIP submission the Supervising Officer must be satisfied that, where required the design has been independently checked and return the document endorsed according to one of the following categories :-

- (a) Consent to proceed to detailed design.
- (b) Consent as above but with conditions.
- (c) Consent not granted for reasons to be listed.

The design checking procedures should specify the time limit under which the Supervising Officer should give his reply.

Once having received AIP for a design package or for the whole of the Works, the Contractor shall not vary any of the design criteria used in the AIP submission without seeking the consent of the Supervising Officer. A revised AIP document must be submitted if the Contractor wishes to vary the design criteria used in the AIP. Procedures for this have to be specified in the Employer's Requirements, (See D&B GCC Clause 62).

The AIP submission must contain the proposed methods of design analysis. Computer programmes must be based on established design

principles and evidence must be provided that such programmes have been validated and calibrated. If any part of the design is to be done by in-house computer programmes developed by the Contractor these shall be verified also but by an alternative independent method.

2.4. Detailed Design Approval

Figure D2 indicates the sequence for DDA submissions i.e. checking of detailed design drawings and calculations where an independent Design Checker is appointed by the Contractor. Time allowed for certain activities shall be stipulated in the Employer's Requirements. If there is no Contractor appointed Design Checker, time should be allowed in the activity for the Supervising Officer to give his consent for his design check.

The scope of the design check shall be to :-

- (a) Ensure compliance of the design with the terms and conditions of the Contract.
- (b) Ensure compliance with any relevant AIP documents.
- (c) Ensure that any computer programmes used have been properly validated, calibrated or verified as appropriate.
- (d) Check input data to computer programmes and carry out a separate check of critical elements using the output data.
- (e) Carry out an analytically separate design check of critical elements without reference to the calculations if hand calculations are submitted.
- (f) Review in detail the general arrangement and other drawings and to ensure that the design is accurately translated to the drawings.
- (g) Assessment in detail of any required Temporary Works proposals as listed in the Employer's Requirements and influence of construction methods and sequence on design of the permanent works and safety of the permanent Works and of adjacent property.

In considering the Contractor's detailed design submission the Supervising Officer should return the document sanctioned according to one of the following categories :-

- (a) Consent for construction to proceed.
- (b) Consent as above subject to certain conditions.
- (c) Consent not granted due to reasons to be listed.

The Design Checking Procedures shall specify the time limits under which the Supervising Officer shall make his reply.

2.5. Design changes

Previously approved DDA documents resubmitted to incorporate minor changes resulting from corrections of errors or Variations may be allowed to follow a streamlined approval process. However, where the Supervising Officer considers that the changes are not minor then the General Condition of Contract for Design and Build Clause 62 would require the approval process to be repeated.

The corresponding flow chart is at **Figure D3**.

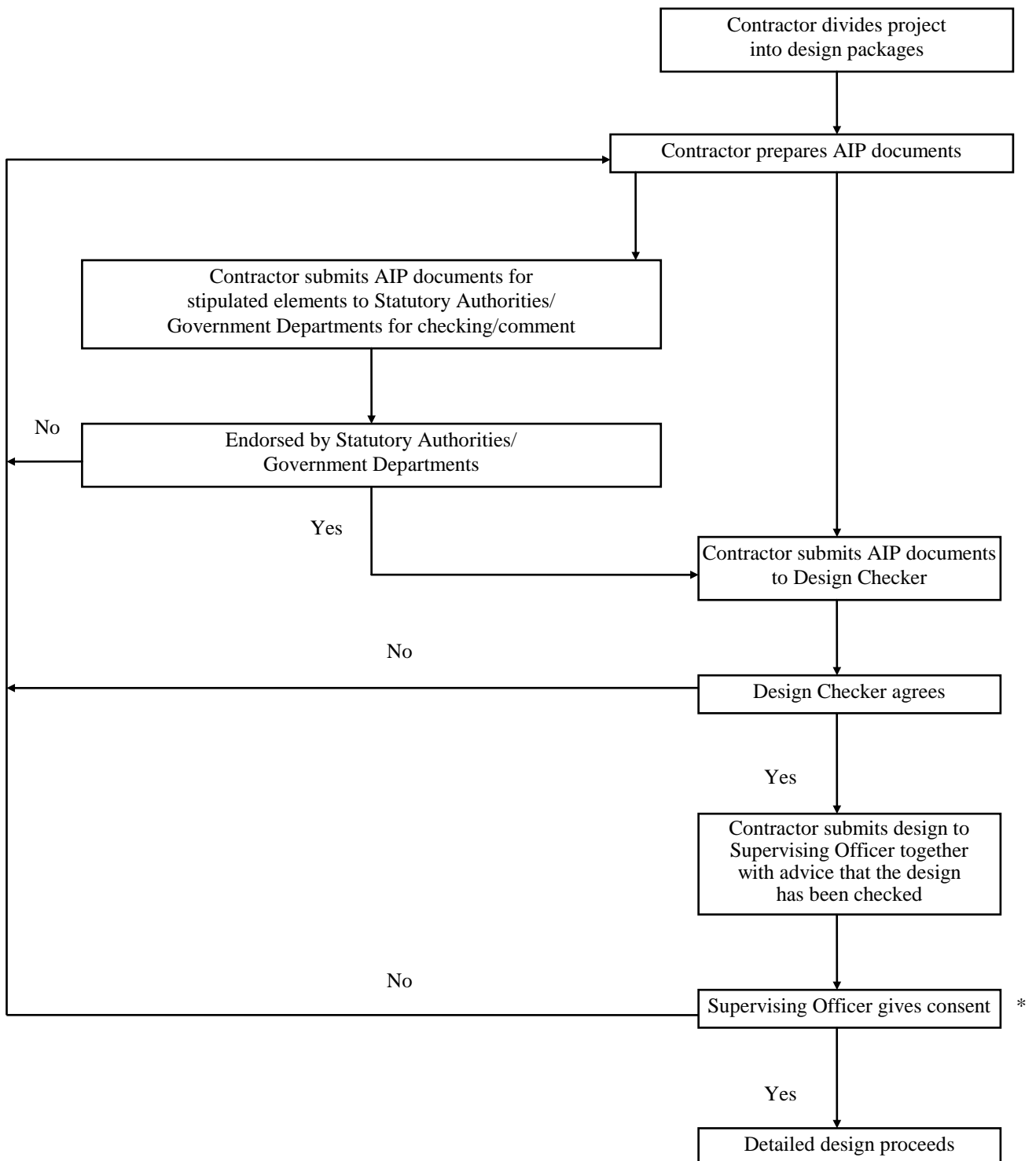
The scope permitted to be modified should be agreed with the Contractor at the outset of the Contract.

2.6. Shop drawings and co-ordination drawings

In addition to AIP and DDA documents generally prepared by the Contractor's designer, the Contractor usually prepares shop drawings and co-ordination drawings reflecting the fabrication or installation details of the permanent Works. Such documents, as long as they do not deviate from the approved design, generally do not require the formal approval of the Design Checker, if appointed, or the Supervising Officer. The documents should be vetted by the Contractor's designer as complying with the approved design and submitted for information to the Design Checker, if appointed, and/or to the Supervising Officer.

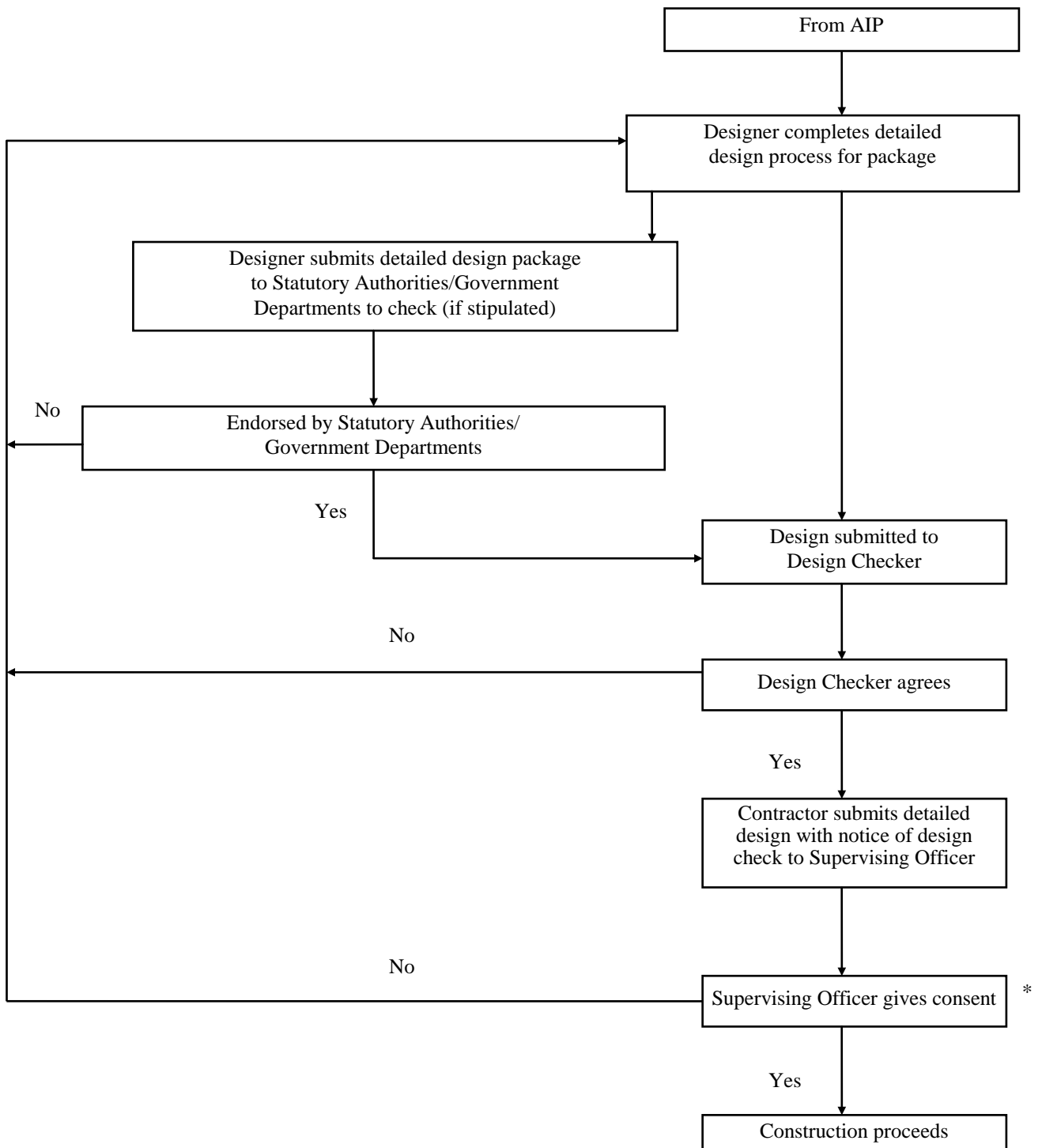
FIGURE D1

APPROVAL IN PRINCIPLE (AIP) DESIGN CHECKING PROCEDURES



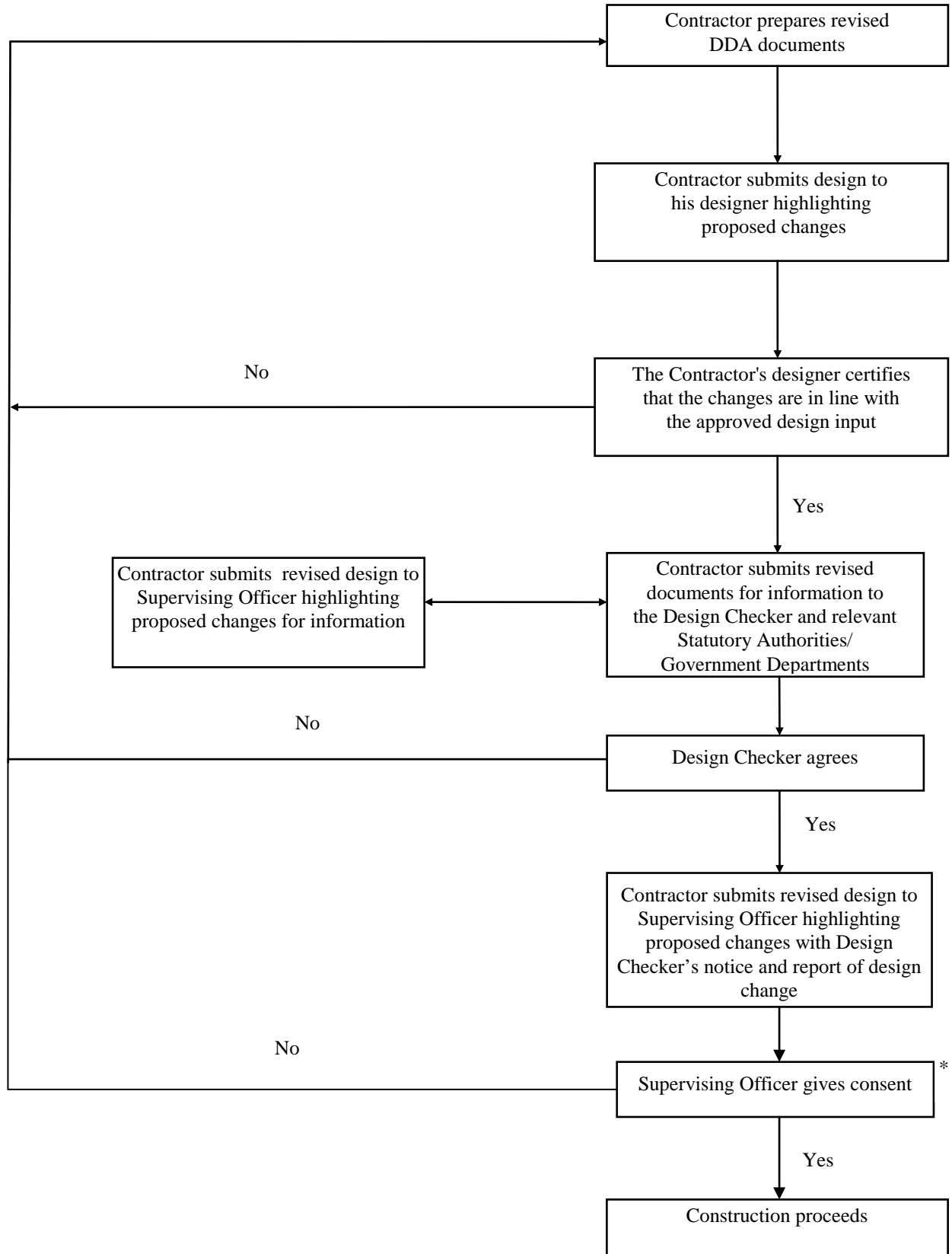
* Time limit for giving consent should be stipulated for this process.
See introduction to Appendix D

FIGURE D2 DETAILED DESIGN APPROVAL (DDA) DESIGN CHECKING PROCEDURES



* Time limit for giving consent should be stipulated for this process.
See introduction to Appendix D

FIGURE D3 AMENDED DOCUMENTS - DETAILED DESIGN APPROVAL (DDA) DESIGN CHECKING PROCEDURES



* Time limit for giving consent should be stipulated for this process.
See introduction to Appendix D

SPECIMEN DESIGN CHECKING CLAUSES FOR THE EMPLOYER'S REQUIREMENTS

The following sample clauses shall be amended to suit the requirements of the particular project. Paragraph numbers follow those of Appendix C - Preparation of Employer's Requirements.

“9.1. Objective

9.1.1 The objective of the Design Checking Procedures set-out hereafter is to encourage the progressive processes of submissions, discussion and endorsements to avoid delays to the project. The Design Checking Procedures shall comprise a two-stage approval process :-

- Approval in Principle (AIP)
- Detailed Design Approval (DDA)

The Contractor shall prepare and submit for the approval of the Supervising Officer a Project Design Plan to show how he shall implement the two-stage approval process.

[State here the Employer's Requirements for design stages and packages, programme, numbering, scale of drawings, level of detail, etc. for both AIP and DDA submissions.]

9.1.2 Definitions

The following expressions shall have the meaning assigned to them except when the context otherwise requires:-

“Approval in Principle” means the consent given by the Supervising Officer in respect of the Contractor's design submitted for Approval in Principle after the endorsement of appropriate government departments and statutory authorities and, when required, the submission of a Check Certificate by the Design Checker as being in conformity with the Employer's Requirements.

“Check Certificate” for design approval means a certificate for Approval in Principle or for Detailed Design Approval as the case may be, in the form specified in Appendix [*] to the Employer's Requirements, issued by the Design Checker certifying that the Contractor's design has been independently checked and complies in all respects with the terms and conditions of the Contract.

“Certified Working Drawing” means a drawing, Plant and equipment schedule and/or document prepared by the Contractor's designer and endorsed as being checked and approved by the Design Checker.

“Detailed Design Approval” means the consent given by the Supervising Officer in respect of the Contractor's design submitted for Detailed Design Approval after the endorsement of appropriate government departments and statutory authorities and when required, the submission of a Check Certificate by the Design Checker as being in conformity with the Employer's Requirements.

“Project Design Plan” means the document to be submitted by the Contractor in accordance with the Employer's Requirements showing how the Contractor intends to implement the Design Checking Procedures.

9.1.3 The Contractor shall within [] days of the acceptance of the Contractor's Tender submit for the Supervising Officer's approval the Contractor's Project Design Plan. The Supervising Officer shall within 14 days of receipt of the Project Design Plan submitted pursuant to this sub-clause, notify the Contractor in writing :-

- (a) that the Project Design Plan is approved; or
- (b) that the Project Design Plan is rejected, in which case reasons for such rejection shall be given; or
- (c) that further information is required to clarify or substantiate the Project Design Plan or to satisfy the Supervising Officer as to its reasonableness.

* **The standard forms shown in Appendix D, Annexes D2/1 and D2/4 shall be used.**

Provided that if none of the above actions is taken within the said period of 14 days, the Supervising Officer shall be deemed to have approved the Project Design Plan submitted.

- 9.1.4 The Contractor shall within 7 days of receiving notification under Sub-clause 9.1.3(c) or within such further period as the Supervising Officer may allow in writing, provide the further information requested failing which the Project Design Plan shall be deemed to have been rejected. The Supervising Officer shall within 7 days of receipt of such further information approve or reject the Project Design Plan in accordance with Sub-clause 9.1.3.
- 9.1.5 In the event of the Project Design Plan being rejected under sub-clause 9.1.3(b) or deemed to have been rejected under sub-clause 9.1.4, the Contractor shall within 7 days thereafter submit a revised Project Design Plan taking account of the reasons given for the rejection or incorporating the further information requested by the Supervising Officer, as the case may be.
- 9.1.6 (a) The Contractor may at any time following approval of the Project Design Plan submit to the Supervising Officer an amended or varied version thereof.
- (b) The Contractor shall review the Project Design Plan in the event that :-
 - (i) the Supervising Officer grants an extension of time in accordance with Clause 50 of the General Conditions of Contract; or
 - (ii) the Supervising Officer instructs a Variation under Clause 60 of the General Conditions of Contract; or
 - (iii) the Contractor considers for any reason that there is or may be a significant deviation between the actual or anticipated progress of the Works and the Project Design Plan; or
 - (iv) the Supervising Officer requests the Contractor in writing to reflect or incorporate any other matter in the Project Design Plan.

Provided that the Contractor shall within 14 days of such event either submit an amended or varied Project Design Plan to the Supervising Officer for approval under Sub-clause 9.1.3 or inform the Supervising Officer in writing of the reasons why the Contractor considers that such a submission is inappropriate.

- 9.1.7 Should it appear to the Supervising Officer at any time that there is or may be a significant deviation between the actual or anticipated progress of the Works and the Project Design Plan, the Supervising Officer shall be entitled by written instruction to require the Contractor to produce a revised version showing such modifications to the Project Design Plan as may be necessary to ensure or to be consistent with substantial completion of the Works or Section of the Works by the time or times for the completion of the Works or Section thereof. The Contractor shall submit such revised Project Design Plan within 14 days of the Supervising Officer's instruction or within such other time as the Supervising Officer shall allow in writing.
- 9.1.8 (a) Unless and until an amended version is approved by the Supervising Officer in accordance with under Sub-clause 9.1.3, the Project Design Plan previously approved by the Supervising Officer shall remain as the Project Design Plan for all purposes of the Contract.

- (b) Approval by the Supervising Officer of the Project Design Plan in accordance with Sub-clause 9.1.3 shall not relieve the Contractor of any of his duties or responsibilities under the Contract nor bind or create any obligation or liability on the part of the Employer nor, in any event that a Works Programme indicates that a Key Date has not or will not be met, constitutes any form of acknowledgement that the Contractor is or may be entitled to any extension of time in relation to such Key Date.

9.1.9 The Contractor shall submit to the Supervising Officer by the end of each calendar month a monthly progress report which shall, amongst other things, highlight actual or potential departures from the Project Design Plan and state the measures which the Contractor proposes to take in order to make good or reduce any delays.

9.2. Approval in Principle

9.2.1 Subject to the Supervising Officer's approval of the Project Design Plan, the Contractor shall proceed with his design and prepare and submit the same in accordance with the Project Design Plan to the Supervising Officer for Approval in Principle. The Supervising Officer shall, either give his approval in writing or refuse to give such approval and notify the Contractor in writing of his refusal giving particulars within the time (or times) and in such manner as stated in Sub-clause 9.2.2 hereafter.

The Contractor shall submit to the Supervising Officer in accordance with the Project Design Plan :-

- (a) two certified copies of the Contractor's design; and
- (b) the relevant Check Certificate(s) (if any).

9.2.2 The Supervising Officer shall within [] days of receipt of the Contractor's design, part or parts thereof submitted in accordance with the Project Design Plan, notify the Contractor in writing :-

- (a) that the Approval in Principle is granted; or
- (b) that Approval in Principle is not given in which case reasons for not granting approval shall be given; or
- (c) that further information is required to be submitted, in which case the information required shall be stated.

Provided that if none of the above actions is taken within the said period of [] days, the Supervising Officer's Approval in Principle shall be deemed to have been given.

9.2.3 The Contractor shall within 7 days of receiving notification under Sub-clause 9.2.2(c) or within such further period as the Supervising Officer may allow in writing, provide the further information requested failing which Approval in Principle shall be deemed to have been not granted. The Supervising Officer shall within 7 days of receipt of such further information grant or not grant Approval in Principle in accordance with Sub-clause 9.2.2.

9.2.4 In the event of Approval in Principle not being granted under Sub-clause 9.2.2(b) or deemed to have been not granted under Sub-clause 9.2.3, the Contractor shall within 7 days thereafter resubmit his design, part or parts thereof taking account of the reasons given for the rejection or incorporating the further information requested by the Supervising Officer, as the case may be.

9.3. Detailed Design Approval

9.3.1 Upon Approval in Principle being given by the Supervising Officer, the Contractor shall proceed with the detail of the Contractor's design and submit the same in accordance with the Project Design Plan to the Supervising Officer for Detailed Design Approval.

The Supervising Officer shall, either give his approval in writing or refuse to give such approval and notify the Contractor in writing of his refusal giving particulars within the time (or times) and in such manner as stated in Sub-clause 9.3.2 hereafter. The Contractor shall submit to the Supervising Officer in accordance with the Project Design Plan :-

- (a) two copies of the Certified Working Drawings; and
- (b) the relevant Check Certificate(s) (if any).

9.3.2 The Supervising Officer shall within [] days of receipt of the detail of the Contractor's design, part or parts thereof submitted in accordance with the Project Design Plan, notify the Contractor in writing :-

- (a) that the Detailed Design Approval is given; or
- (b) that Detailed Design Approval is not given, in which case reasons for not granting approval shall be given; or
- (c) that further information is required to be submitted, in which case the information to be submitted shall be stated.

Provided that if none of the above actions is taken within the said period of [] days, the Supervising Officer's Detailed Design Approval shall be deemed to have been given.

9.3.3 The Contractor shall within 7 days of receiving notification under Sub-clause 9.3.2(c) or within such further period as the Supervising Officer may allow in writing, provide the further information requested failing which Detailed Design Approval shall be deemed to have been rejected. The Supervising Officer shall within 7 days of receipt of such further information grant or not grant Detailed Design Approval in accordance with Sub-clause 9.3.2.

9.3.4 In the event of Detailed Design Approval being not granted under Sub-clause 9.3.3 or deemed to have been not granted under Sub-clause 9.3.3, the Contractor shall within 7 days thereafter resubmit his detailed design, part or parts thereof taking account of the reasons given for the rejection or incorporating the further information requested by the Supervising Officer, as the case may be.

9.3.5 If at any time it becomes apparent to the Contractor that an amendment to the Contractor's design is required for the proper completion of that part of the Works involved in such design, then he shall :-

- (a) immediately advise the Supervising Officer of the proposed amendment,
- (b) resubmit drawings, Plant and equipment schedules and/or documents to the Supervising Officer in accordance with Sub-clause 9.3.2 hereof, provided that the finished appearance of the Works shall remain substantially unaltered.”.

The Government of the Hong Kong Special Administrative Region

Contract No. _____

Title : _____

To : The Supervising Officer pursuant to Clause [] of the Employer's Requirements.

Check Certificate for Approval In Principle

(NOTE : Form of Certificate to be used by the Contractor for seeking Approval In Principle from the Supervising Officer. To be included in the Employer's Requirements.)

1. This Check Certificate refers to submission No. _____ which comprises

(a) Works covered by this Certificate
(nature and description of the submission)

in respect of :
(description of Works to which the submission refers)

(b) The contents of this submission are scheduled in Schedule A below and are attached to this Check Certificate.

2. I/We certify that

***Designer's certification**

(a) the design of the Works, as illustrated and described in the documents scheduled in Schedule A below, complies with the Contract requirements including without limitation the Employer's Requirements and the Contractor's Proposals.

(b) an in-house check has been undertaken and completed to confirm the completeness, adequacy and validity of the design of the Works as illustrated and described in documents scheduled in Schedule A below, and

(c) all necessary and required approvals relating to the design of the Works, as illustrated and described in the documents scheduled in Schedule A below, have been obtained and copies of such approvals are annexed at Schedule B below.

Signed : _____
for _____

(name of designer)
(name)
(position/designation)
(date)

3. I/We certify that

Contractor's certification

(a) the above Check Certificate is issued by the designer on the basis that it has exercised all the skill and care to be expected of a professionally qualified and competent designer experienced in work of similar nature and scope as the Works in the performance of its duties relating to the preparation, review, checking and certification of design of the Works.

(b) I/We endorse the content of the above Check Certificate.

Signed :	_____	(name of Contractor)
for	_____	(name)
	_____	(position/designation)
	_____	(date)

4. I/We certify that

Design Checker's certification

(a) I/We certify that the design has been independently checked using all reasonable skill and care and that I/we am/are satisfied that the design checked complies in all respects with the terms and conditions of the Contract.

(b) I/We am/are satisfied that the detailed design of
(Name of structure or works)

_____ can commence.

I/We further certify that I am/we are satisfied that the checking of the above design is completed.

Signed :	_____	(name of Design Checker)
for	_____	(name)
	_____	(position/designation)
	_____	(date)

* Where the Contractor is the designer the Contractor shall complete both the declaration for the Contractor and for the designer.

Schedule A

Submission No. _____ comprises the following

Documents : *(Title, reference number and revision)*

Drawings : *(Title, drawing number and revision)*

Others : _____

Schedule B

Approvals from: *(List of Government Departments or Statutory Authorities)*

(Contractor to bind and attach all documents, drawings and copies of necessary and required approvals associated with this Check Certificate)

The Government of the Hong Kong Special Administrative Region

Contract No. _____

Title : _____

To : The Supervising Officer pursuant to Clause [] of the Employer's Requirements.

Check Certificate for Detailed Design Approval

(NOTE : Form of Certificate to be used by the Contractor for seeking Detailed Design Approval from the Supervising Officer. To be included in the Employer's Requirements.)

1. This Check Certificate refers to submission No. _____ which comprises

(a) Works covered by this Certificate
(nature and description of the submission)

in respect of :
(description of Works to which the submission refers)

(b) Contents of this submission are scheduled in Schedule A below and are attached to this Check Certificate.

(c) This submission is made in accordance with the provisions stated in Clause [] of the Employer's Requirements.

(and with special reference to

[any Variation]

_____)*

**(delete if not required)*

2. I/We certify that

*Designer's certification

(a) the design of the Works, as illustrated and described in the documents scheduled in Schedule A below, complies with the Contract requirements including without limitation, the Employer's Requirements, the Contractor's Proposals, the submission no(s). _____ for which an Approval in Principle that has been issued together with any conditions and comments pertaining thereto.

(b) an in-house check has been undertaken and completed to confirm the completeness, adequacy and validity of the design of the Works as illustrated and described in documents scheduled in Schedule A below, and

(c) all necessary and required approvals relating to the design of the Works, as illustrated and described in the documents scheduled in Schedule A below, have been obtained and copies of such approvals are annexed at Schedule B below.

Signed : _____
 for _____ (name of designer)
 _____ (name)
 _____ (position/designation)
 _____ (date)

3. I/We certify that

Contractor's certification

(a) the above Check Certificate is issued by the designer on the basis that it has exercised all the skill and care to be expected of a professionally qualified and competent designer experienced in work of similar nature and scope as the Works in the performance of its duties relating to the preparation, review, checking and certification of design of the Works.

(b) I/We endorse the content of the above Check Certificate.

Signed : _____
 for _____ (name of Contractor)
 _____ (name)
 _____ (position/designation)
 _____ (date)

4. I/We certify that

Design Checker's certification

(a) I/We certify that the design has been independently checked using all reasonable skill and care that that I/we am/are satisfied that the design checked complies in all respects with the terms and conditions of the Contract.

(b) I/We am/are satisfied that the construction of

 (Name of structure or works) can commence.

(c) I/We further certify that I am/we are satisfied that the checking of the Contractor's design is completed.

Signed : _____
 for _____ (name of Design Checker)
 _____ (name)
 _____ (position/designation)
 _____ (date)

* Where the Contractor is the designer the Contractor shall complete both the declaration for the Contractor and for the designer.

Schedule A

Submission No. _____ comprises the following

Documents: *(Title, reference number and revision)*

Drawings : *(Title, drawing number and revision)*

Others : _____

Schedule B

Approvals from : *(List of Government Departments or Statutory Authorities)*

(Contractor to bind and attach all documents, drawings and copies of necessary and required approvals associated with this Check Certificate)