

Structural Design Information

To facilitate processing of structural submissions, plans and calculations should be clearly presented and organised as outlined below.

Structural Plans

2. Structural plans should be properly indexed and each drawing should bear a drawing title and drawing number.
3. The first drawing of the set should contain general notes and material specification on:
 - (a) design codes and standards;
 - (b) concrete materials, including cement, aggregates, pulverised fuel ash and ground granulated blast furnace slag;
 - (c) reinforcement and other structural materials;
 - (d) grade and characteristic strength of structural materials;
 - (e) concrete covers, corrosion protections and fire resistance requirements; and
 - (f) other particulars of method of construction, workmanship and testing.
4. The submitted drawings should cover floor plans, sections and elevations to show the layout, dimensions, levels and identification numbers of all structural frames and members.
5. Notes on design imposed loads (including allowance for partitions, screeds, dynamic effects and the like) should be given on the corresponding floor plans. Where there are different design imposed loads for different parts of the floor, the variations should be illustrated diagrammatically.
6. For alteration and addition proposals, reinforcement details of the structural members in the existing building affected by the proposed works should be shown on the plans. These reinforcement details should be extracted from the approved plans of the affected structural members.

General Building Plans

7. The information on design imposed loads specified in paragraph 5 above should also be shown on the general building plans.

Structural Calculations

8. Structural calculations should be grouped into two parts, each to be properly indexed. The first part (Part I structural calculations) should contain essential information on the structural design of the building as specified in paragraph 9 below, and is to be retained in the Buildings Department (BD) for record. The second part (Part II structural calculations) should contain relevant details of analysis and design calculations of the structural elements as outlined in paragraph 10 below.

9. Part I structural calculations should contain the following:

- (a) a synopsis of the structural design giving –
 - (i) a general description of the foundation and structural system and the basic anatomy of stability by which the applied loads are transferred to the ground; and
 - (ii) design method, assumptions, codes of practice used and limitations of stresses and deformation;
- (b) essential information on the computerised calculations, including –
 - (i) the name, version, developer's name/identification, BD reference number and validity period of the computer program used;
 - (ii) the scope of application of the program which is accepted by BD and a list of the limitations in application;
 - (iii) assumptions made and justifications on parameters used in the computer model, e.g. material properties and boundary conditions;
 - (iv) input data with computer-generated graphics or hand sketch showing the framing and layout of the structure, nodes and elements, joint fixity, etc.;
 - (v) summary of salient output results, e.g. the design envelopes of moment, shear and displacement of the most critical cases for design and compatibility check of the applied forces against the output overall reactions; and
 - (vi) interpretation and application of the computer output in the design;

/(c) ...

- (c) essential information on the design to resist wind load, including –
 - (i) a general description of the wind-resisting system and mathematical modelling;
 - (ii) diagrams illustrating the location and identification of all structural frames and members in the wind-resisting system;
 - (iii) a summary of sectional properties of wind-resisting elements;
 - (iv) a summary of wind loads applied to the building and the distribution of the wind forces on individual frames at each floor level;
 - (iv) principal reactions (moments, shear forces and axial forces) in the wind-resisting elements; and
 - (vi) a summary of equilibrium check on applied lateral forces and calculated reactions of vertical structural members at foundation and other critical levels where there is a major change in structural configuration;
- (d) essential information on the design to resist dead and imposed loads, including –
 - (i) the design data on dead and imposed loads (including allowance for partitions, screeds, dynamic effects and the like); and
 - (ii) a summary of principal reactions (moments, shear forces and axial forces) in the vertical structural members at foundation and all floor levels;
- (e) details of the design of major transfer members; and
- (f) details of the design of cantilevered canopies, balconies and major structural appendages.

10. Part II structural calculations usually involves presentation of detailed analysis and design of individual structural elements computed by BD's pre-accepted programs in bulk volume of computer printout. Part II structural calculations will be returned to the authorized person (AP)/registered structural engineer (RSE) after processing of the structural submission.

Pre-submission Enquiry and Conference

11. If the structural submission involves the use of any new structural theories, materials or structural forms, sophisticated designs or unconventional construction methods, the AP/RSE/registered geotechnical engineer (RGE) are advised to consult BD through the pre-submission enquiry and conference mechanism specified in Practice Note

/for ...

for AP, RSE and RGE ADM-19 at early stage of the design. If the pre-submission enquiry has not been made prior to the formal submission of structural plans, the structural proposals and principles involved will be considered in parallel. In such case, one set of additional plans and relevant supporting documents is required to be submitted for the Technical Services Unit of BD to examine the structural proposals and principles involved.

12. To facilitate referral of plans to other concerned government departments, a checklist on the documents and the number of sets of plans and design documents required to be included in the structural submission is given in Appendix A. AP/RSE are requested to include the completed and signed checklist in the submission of structural plans.

Paperless Submission of Documents

13. To promote green environment and facilitate effective preparation and processing of structural submissions and the associated structural documents, BD encourages paperless submission of Part II structural calculations and such types of structural documents in Appendix B in CD/DVD format as an alternative to the conventional paper format. In this connection, the CD/DVD should be in the form of a non-rewriteable CD-ROM in ISO 9660 format (i.e. CD format) or non-rewriteable DVD-ROM in ISO/IEC 13346:1995 format (i.e. DVD format) with the project information, i.e. BD reference number, submission title, name of RSE/RGE and disc number, printed on the cover. The RSE/RGE should sign on the cover of each CD/DVD submitted and the electronic files contained in it should:

- (a) be in the Adobe Portable Document Format (PDF), and each separate page of the documents should not be larger than A3 size;
- (b) have a clear index listing the content and purpose of each document file in the CD/DVD;
- (c) support searching of text contained in the document; and
- (d) have resolution not less than 300 dpi for any image contained in the document.

14. Once the CD/DVD is submitted, it is not replaceable and will not be returned. Any supplementary design calculations and/or other information in Part II structural calculations as well as supplementary structural documents should be presented in the same format and submitted in a supplementary CD/DVD for BD's retention.

(YU Tak-cheung)
Building Authority

Ref. : BD GP/BREG/A/12 (Pt.II)

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Checklist on Documents included in Structural Submissions

PART 1 - GENERAL INFORMATION

BD Ref. No.: _____ Address of Site: _____ Lot No.: _____

Authorized Person: _____ Registered Structural Engineer: _____

Type of Submission (Please tick as appropriate):

- First Submission Resubmission upon Disapproval Major Revision/Amendment

Type of Works (Please tick as appropriate):

- New Building Alteration & Addition

Foundation

- Ground Investigation Driven Pile Small Diameter Bored Pile (not exceeding 750mm)
 Large Diameter Bored Pile (over 750mm) Barrette Spread Footing Raft
 Others _____

Earth-retaining, Excavation and Lateral Support Works

- Retaining Wall Sheet Piling Piled Wall Diaphragm Wall Lateral Support Detail
 Other Shoring System _____

Underground Structure

- Basement Pile Cap Others _____

Superstructure

- Main Structure Curtain/Glass Wall Cladding Signboard
 Others _____

PART 2 - DOCUMENTS SUBMITTED (Please tick as appropriate)

| | Yes | N/A |
|--|-----|-----|
| Plans (2 signed sets for approval) | | |
| Design calculations (Part I, No. of Vol.____) | | |
| (Part II, No. of Vol.____/ CD / DVD ROM) | | |
| Ground/site investigation report (2 sets) | | |
| Appraisal report on adjacent buildings | | |
| Geotechnical report | | |
| Form BA 4 (Appointment of AP/RSE/RGE) | | |
| Form BA 5 (Application for approval) | | |
| Form BA 6 (Stability certificate) | | |
| Form BA 16 (Application for exemption/modification) | | |
| Payment is required when fees are charged according to the total number of plans submitted | | |
| Others (Please specify): | | |

PART 3 - ADDITIONAL PLANS AND DESIGN DOCUMENTS FOR REFERRAL

| Does the proposal involve or affect the following? | Yes | No | |
|---|-----|----|--|
| Area Number 1, 2 or 4 of the Scheduled Areas | | | Geotechnical Engineering Office (1 set of plans and 1 set of documents) |
| Area Number 3 of the Scheduled Areas or Railway Protection Areas | | | (a) Mass Transit Railway Corporation Limited; and (b) Railway Division, Highways Department (2 sets of plans) |
| Area Number 5 of the Scheduled Areas | | | (a) Geotechnical Engineering Office; and (b) Drainage Services Department (2 sets of plans and 1 set of documents) |
| Designated Area of Northshore Lantau | | | Geotechnical Engineering Office (1 set of plans and 1 set of documents) |
| Slopes, retaining structures, deep excavation, disused tunnel | | | Geotechnical Engineering Office (1 set of plans and 1 set of documents) |
| Culvert, nullah, stream course | | | (a) Geotechnical Engineering Office; (b) Drainage Services Department; and (c) Highways Department (3 sets of plans) |
| Proposed railway routes | | | Railway Development Office, Highways Department (1 set of plans) |
| Chek Lap Kok Airport | | | Civil Aviation Department (1 set of plans) |
| Structures to be erected in, over, under or upon a street | | | (a) Lands Department; and (b) Highways Department (2 sets of plans) |
| Highway structures | | | Highways Department (1 set of plans and 1 set of documents) |
| Sea walls, adjacent to sea front | | | Port Works Division, Civil Engineering and Development Department (1 set of plans and 1 set of documents) |
| Reclamation, piers | | | (a) Marine Department; and (b) Port Works Division, Civil Engineering and Development Department (2 sets of plans and 2 sets of documents) |
| Public drainage | | | Drainage Services Department (1 set of plans) |
| Water mains | | | Water Supplies Department (1 set of plans) |
| Monument, proposed monument, graded building, proposed graded building or site having archaeological interest | | | Antiquities and Monuments Office (1 set of plans) |
| Use of any new structural theories, materials or systems, sophisticated designs and unconventional construction methods | | | Technical Services Unit, Buildings Department (1 set of plans and 1 set of documents) |
| A total of _____ set(s) of additional plans and _____ set(s) of documents for referral | | | |

Remark : This checklist is not meant to be exhaustive and more information may be required for individual structural submission.

Date : _____

Signature : _____

Full name of AP/RSE : _____

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Paperless Submission of Structural Documents

The structural documents listed below may be submitted in CD/DVD format, save for the statement signed by the RSE or RGE, as appropriate, confirming compliance with the relevant acceptance criteria/standards/supervision requirements, etc. should still be submitted in hard copy:

- (a) Material documents and testing reports for concrete, steel reinforcement, prestressing steel, grouting, structural steel, welding, stainless steel, aluminum, anchor bolt, steel T bolt, structural sealant, mechanical/elastomeric bearing, mechanical coupler, heat strengthened/tempered glass, stainless steel spider and glass reinforced polyester;
- (b) Quality assurance documents such as quality assurance proposal, quality assurance scheme, quality supervision plan/scheme and quality assurance certificate;
- (c) Quality supervision reports and audit reports;
- (d) Ground investigation reports and laboratory testing reports;
- (e) Method statements/proposals for testing and construction works;
- (f) Initial readings of monitoring stations and subsequent monitoring readings during the course of works; and
- (g) Site/works management documents such as public relations plans and debris disposal and management system proposal.

(7/2021)