

Control of Blasting

Blasting in private building works is subject to control under the Buildings Ordinance (Cap 123) and Dangerous Goods Ordinance (Cap 295).

Buildings Ordinance

2. Authorized persons/registered structural engineers/registered geotechnical engineers (APs/RSEs/RGEs) responsible for any building works or street works involving blasting should ensure that any blasting carried out will not adversely affect services, slopes, retaining walls, buildings and structures through ground vibrations or other effects. In the design and execution of blasting works, the APs/RSEs/RGEs should also ensure that adequate and necessary preventive, protective and precautionary measures are provided to prevent the works from causing injury to workers and the public, significant disruption to traffic, undue vibration and movement to existing structures and services, or undue nuisance to the public.

3. The geotechnical assessment submitted at the general building plan stage should identify if there is a need to carry out blasting for rock excavation and discuss its feasibility. If blasting is to be carried out as part of the site formation, excavation or foundation works, a blasting assessment prepared by a competent person and signed by the responsible RGE and/or RSE as appropriate should be submitted together with the relevant site formation, excavation and lateral support, or foundation plans. Such competent person should have at least 4 years of relevant experience in design and supervision of blasting works. The required contents of a blasting assessment are specified in Appendix A and the following should be indicated on the plans :

- (a) proposed areas of blasting;
- (b) geology, ground and groundwater conditions;
- (c) locations of sensitive receivers [see item (a) of Appendix A];
- (d) details of control criteria;
- (e) instrumentation and monitoring details;
- (f) specific precautionary measures such as road closure, evacuation plan, restricted hours of blasting, etc;
- (g) requirements for submission of regular reports and other related documents; and
- (h) a note stating that the plan should be read in conjunction with the blasting assessment.

If the need for blasting is identified after the general building plan stage, the same requirements as aforesaid for the preparation of a blasting assessment and its submission, together with any relevant revised plans, are applicable.

4. The curricula vitae of the competent person who prepared the blasting assessment should be included in the submission. Generally, supervision by such competent person will be required to verify the assumptions in the blasting assessment during construction relating to blasting.

Supervision Requirements for Blasting Works

5. The paragraphs below set out the supervision requirements that may be imposed under section 17 of the Buildings Ordinance (BO) as conditions for qualified supervision of blasting works. This is in addition to the site supervision required under the Technical Memorandum for Supervision Plans 2005 and relevant provisions of the BO.

6. For the supervision of the blasting works, a competent supervisor independent of the registered contractor should be appointed to assist the technically competent person grade T5 (TCP T5) in the RGE/RSE's stream in the supervision of the blasting works. This competent supervisor should have at least 4 years of relevant experience in design and supervision of blasting works. Where necessary, the Building Authority (BA) may impose a higher qualification/experience requirement taking into account the scale and complexity of the proposed blasting works and the risk involved. The competent person described in para. 3 above who meets the above necessary qualification/experience requirement can also be the competent supervisor for assisting the TCP 5 in the supervision of the blasting works. As an alternative to having a competent supervisor, if a person holds the qualification and experience of both the TCP T5 and the competent supervisor, he can take up the overall supervision of blasting works by himself. The curricula vitae of the proposed supervision personnel should be submitted to the BA for acceptance prior to commencement of the blasting works.

7. The RGE/RSE should include particular items related to the blasting works in the check lists of Specific Tasks for the TCPs, as required in the Code of Practice for Site Supervision 2005. Typical items related to blasting works are listed in Appendix B.

Demolition Works

8. Blasting normally would not be adopted in the demolition of private building works due to its wide implications on the surroundings which, in general, are of high density developments. In the exceptional circumstances where explosives are to be used in demolition works, a blasting assessment, prepared by a competent person who should have at least 4 years of relevant experience in the design and supervision of blasting works and signed by the responsible RSE and RGE as appropriate, should be submitted with the relevant demolition plans. The requirements given in the Code of Practice for

/Demolition

Demolition of Buildings issued by the Buildings Department should be followed. In the consideration for the protection of properties and the inhabitants that may be affected by the proposed blasting, and in conducting the blasting assessment to examine the effects on structures to be demolished and its surroundings as mentioned in the Code, the relevant items specified in Appendix A should be covered.

Dangerous Goods Ordinance

9. Dangerous Goods (General) Regulation 46 stipulates that no person shall carry out any blasting without the permission of the Authority, i.e. the Commissioner of Mines who is the Director of Civil Engineering and Development. Where blasting is required, the registered contractor has to apply for a blasting permit from the Commissioner of Mines, who may impose conditions requiring the registered contractor to take effective preventive, protective and precautionary measures against the adverse effects of blasting, e.g. flyrock, vibrations and air-overpressure, to adopt suitable blasting designs and techniques, to comply with the control criteria, and to undertake the monitoring shown in the approved plans.

Railway Structures and Operations

10. Guidelines for assessing the effects of blasting on the structures and operations of the Mass Transit Railway Corporation Limited and the Kowloon-Canton Railway Corporation are given in Practice Notes for Authorized Persons and Registered Structural Engineers 77 and 279 respectively. The "General Specification for Civil Engineering Works (Hong Kong Government)" also specifies technical standards on blasting. This document is available for purchase from either the Publications Sales Section of the Information Services Department or the online Government Bookstore at <http://bookstore.esdlife.com>.



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Contents of a Blasting Assessment

- (a) Site plans clearly indicating the proposed areas of blasting and locations of all sensitive receivers including streets, structures, foundations, railways, public utilities, water mains, drains, sewers, gas mains and other services, geotechnical features such as slopes, retaining walls, boulders, tunnels, caverns, etc. that may be damaged or destabilized by the proposed blasting works.
- (b) A report containing the results of a study, including on the topography, geology, ground, groundwater and surface water conditions, and the physical site constraints, sensitive receivers and site history.
- (c) A report containing examination of the conditions of the sensitive receivers on and adjacent to the site.
- (d) A report containing an assessment of the effects of blasting works to demonstrate that the proposed blasting would not cause any injury to persons or damage to property and sensitive receivers.
- (e) Proposals of preventive measures to be carried out on sensitive receivers, if considered necessary.
- (f) A list of the action limits to be specified for the implementation of blasting works, including blasting vibration limits and air-overpressure limits, etc. to ensure that the blasting works to be carried out would not cause any injury to persons, damage to sensitive receivers, significant disruption to traffic or undue nuisance to the public. The limits proposed should take into account the existing conditions of all sensitive receivers. The source of the limits and documentary evidence of consultation and agreement, where appropriate, with the key stakeholders (e.g. owners or maintenance agents) of the sensitive receivers should be provided.
- (g) An outline of the blast design to demonstrate that the blasting works could be safely carried out and the proposed limits and any other constraints could be satisfied.
- (h) A document setting out the safety management system to be employed, and the working procedures and sequences, where appropriate, for all blasting works.
- (i) Particulars of site inspections, surveys and monitoring to be carried out to check and measure the effects of blasting, including plans showing the locations of the monitoring stations, the performance criteria and the action limits.
- (j) Proposals of protective and precautionary measures to be taken, including any evacuation and closure of public areas (such as roads and other facilities) and warnings needed to protect sensitive receivers and safety of the public and workers.

- (k) Proposals of the arrangement for delivery of explosives to the site to demonstrate the practicability of completing the blasting works and the rock excavation needed within the construction period.
- (l) If an on-site explosive store is considered necessary, a report containing an assessment of its feasibility and proposed arrangement.

**Typical Items Related to Blasting Works for
the Check List of Specific Tasks for the RSE/RGE's TCPs**

Specific Tasks for TCP T5 (with the support of the competent supervisor)

- (a) Carry out checking of the registered contractor's blasting method statement.
- (b) Check (including both document and site checks) and satisfy, for each blast, that the registered contractor's blast design and precautionary measures comply with the plans approved by the Building Authority and the blasting permit requirements.
- (c) Verify on site that the ground conditions and geology are as stated or assumed in the blasting assessment, and that the provisions in the method statement and the preventive, protective and precautionary measures are adequate for the conditions as encountered on site.
- (d) Ensure that the preventive measures, if required, have been properly carried out prior to commencement of the blasting works.
- (e) Ensure that protective and precautionary measures have been properly executed prior to each blast.
- (f) Regularly monitor the conditions of all sensitive receivers and carry out reviews before and after each blast.
- (g) Prepare regular reports with records of the condition of the site, sensitive receivers, adjacent grounds, structures and services etc. after each phase of blasting operation and completion of related works.

Specific Tasks for TCP T3

- (a) Inspect the construction of preventive works, if required, for the sensitive receivers.
- (b) Inspect the provision and installation of all necessary protective and precautionary measures prior to each blast, in accordance with the blast design.
- (c) Monitor the site operations and working methods to ensure that they meet the safety requirements set out in the blasting permit.
- (d) Inspect the conditions of all sensitive receivers before and after each blast.
- (e) Carry out and ensure the quality of monitoring for the sensitive receivers before and during blasting.