

Guidance Note On How to Apply for a Blasting Permit



**Mines Division
Civil Engineering and Development Department**

1. Introduction

- 1.1 Under Regulation 46 of the Dangerous Goods (General) Regulations, no person shall carry out any blasting without the permission of the Commissioner of Mines. This note provides guidance to Contractors on making application for a Blasting Permit to carry out blasting. For private projects, a pre-contract Blasting Assessment Report (BAR) submitted by the Registered Geotechnical Engineer should have been agreed by the Buildings Department as part of the site formation plans approval. For public projects, the project proponent should have obtained GEO's agreement to the pre-contract BAR at the planning and design stages.
- 1.2 The purpose of the pre-contract BAR is to identify all sensitive receivers, assess any adverse effects and risks arising from the transport, storage and use of explosives for blasting; and to demonstrate the feasibility of carrying out the blasting works in a practical, safe and acceptable manner. As it is essentially a feasibility study at the project planning and design stage before award of contract, the assumptions adopted in the BAR are not binding on the Contractor, who can propose alternatives. However, it needs to be appreciated that for private projects, this may require resubmission to the Buildings Department to obtain approval of amendments to the site formation plans, and time needs to be allowed for this statutory process. Buildings Department will consult the Mines Division on the proposed amendments within the statutory period. For public projects, the proposed amendments should be discussed directly with the Mines Division.

2. Application for a 'Licence to Possess Category 1 Dangerous Goods' and a 'Permit to Use Category 1 Dangerous Goods'

- 2.1 When the contract is awarded, the Contractor shall apply for a 'Licence to Possess Category 1 Dangerous Goods' for the possession of explosives for immediate use at a blast site, and a 'Permit to Use Category 1 Dangerous Goods' for preparing, loading and firing of explosive charges. The 'Licence to Possess Category 1 Dangerous Goods' and 'Permit to Use Category 1 Dangerous Goods' are together referred to as a Blasting Permit.

2.2 Submission of Applications

To apply for a Blasting Permit, the Contractor should submit an application to the Commissioner of Mines with the following documents:

- (a) a covering letter enclosing a duly completed application form No. MIN/EXP/F.1CR which can be downloaded from <http://www.cedd.gov.hk/eng/forms/index.htm>;
- (b) an updated BAR (known as the Contractor's BAR) to re-visit and confirm or amend the assumptions and recommendations in the pre-contract BAR. The contents of the

Contractor's BAR could be the same as the pre-contract BAR if the site conditions, assumptions and recommendations are confirmed unchanged, or may be amended if required. Please refer to Annex 1 for the contents of a BAR;

- (c) a Method Statement (MS) checked by the Site Supervisory Staff. Annex 2 provides typical contents of a MS;
- (d) six copies of the following site plan of scale 1:500 or 1:1000 showing :
 - i. the intended boundary for the Licence to Possess Category 1 Dangerous Goods, which should normally cover all areas, including all possible accesses to blasting areas within the site boundary;
 - ii. the intended boundary of blasting areas for the Permit to Use Category 1 Dangerous Goods, marked with coordinates together with notes on any restrictions and conditions regarding the blasting proposal;
 - iii. 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. within a plan radius of 150m for tunnel/shaft blasting or 300m for open-cast;
 - iv. the intended boundary of blasting areas shall be confined to such areas requiring blasting and exclude any Dangerous Goods stores, site offices, etc.
- (e) one set of relevant specifications and parts of contract drawings (for government projects) or relevant plans approved by Buildings Department (for private projects) showing any restrictions and conditions on blasting.

2.3 Processing of Application

Mines Division will respond normally within 28 days upon the receipt of a submission from the Contractor or within 25 days upon the receipt of the subsequent submission of any missing/supplementary information. Upon the acceptance of the MS and site check to verify that the information and documents submitted are correct and acceptable, Mines Division will provide the pre-licensing requirements to the Contractor for follow-up action. The agreed MS will form part of the conditions for the issue of the Blasting Permit. General pre-licensing requirements will include, but will not be limited to, items listed in Annex 3.

2.4 Issue of Permit

Upon satisfactory completion of the works and compliance with Mines Division's pre-licensing requirements, a Blasting Permit (normally valid for one year) will be issued to the Contractor within 3 working days upon payment of the prescribed licence and permit fees.

2.5 Renewal of Permit

Any application for renewal of a Blasting Permit shall reach the Mines Division not less than 28 days before the expiry date. The Contractor shall provide an updated MS to review the site conditions, the manner of working, precautionary and protective measures to protect the existing sensitive receivers and also new sensitive receivers, if any, during blasting.

**Mines Division
November 2007**

General guidance is provided in this Note. Site-specific requirements may be imposed by the Commissioner of Mines according to the site conditions and characteristics. Feedback or enquiries on this document can be directed to the Chief Geotechnical Engineer/Mines of the Geotechnical Engineering Office, Civil Engineering and Development Department at 25/F, 410 Kwun Tong Road, Kwun Tong, Kowloon, Hong Kong.

Telephone: (852) 2716 8666 Facsimile: (852) 2714 0193 E-mail: mines@cedd.gov.hk

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 destabilised by the proposed blasting works.
- (b) A report containing the results of a study, including the site 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 for sensitive receivers, if considered necessary.
- (f) A list of the alert and cease works 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 shall 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 shall 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 methods to be employed, working procedures and sequences for all blasting works, and the safety management system.
- (i) Particulars of the 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 alert and cease works 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 the sensitive receivers and the 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.

Contents of a Method Statement

1. Brief description of the project (including blasting period, amount of rock excavation, works programme, no. of blast per day/week, time of blast, etc.).
2. Outline Design of Blasting Works
 - a. Open-cast blasting
 - i. Table showing General Blasting Parameters (ranges of values, where applicable) in Production Blasting and Pre-split Blasting, which include:

1. Bench Height	2. Hole Diameter	3. Stemming
4. Sub-drill	5. Drill Hole Depth	6. Burden x Spacing
7. Inclination	8. No. of rows	9. Cartridged/Bulk Explosive Charge per Hole
10. Use of Detonating Cord	11. Excavation Volume per Shot	12. Powder Factor
13. Others (e.g. Secondary blasting ¹)		

- ii. Cross-sections showing the charging details of blast holes for production and pre-split blasting.

- b. Tunnel blasting
 - i. Table showing combination of General Blasting Parameters (ranges of values, where applicable) in tunnel blasting (shafts, caverns and subsurface etc.), includes:

1. Face Area	2. Hole Diameter	3. Stemming
4. Drillhole Spacing	5. Drill Hole Depth	6. Drill Hole Inclination
7. Cartridged/Bulk Explosive Charge per Hole	8. Expected Pull	9. Excavation Volume per Shot
10. Powder Factor	11. Use of Detonating Cord	12. Others

3. Typical Daily Blast Design
4. Estimation of Blast Effects
 - a. Blasting induced vibration. A charge weight per delay table based on the allowable PPVs proposed for the nearby sensitive receivers.
 - b. Blasting induced air overpressure. An air overpressure target of 120dB(L) should be adopted initially for blasting adjacent to sensitive receivers with inhabitants (e.g. residential building, school, hospital, church, etc.) to avoid causing any human discomfort, alarm or damage to hearing. This may subsequently be adjusted upwards or downwards in response to outcome and human reaction.
 - c. Evacuation zone. The zone to be evacuated to protect people against the possible ejection of flyrock, taking into account of the difference in elevation between the blast area and sensitive receivers.
5. Anticipated Maximum Daily Consumption of Explosives types and Quantities

¹ Secondary blasting should be carried out with extreme caution and tailor-made blast design and particular protective and precautionary measures should be provided.

6. Sequence of blasting works
7. Non-Blast zone
Defining the Non-Blast Zone to avoid causing any unacceptable adverse effects on the stability of adjoining temporary/permanent slopes and/or sensitive receivers as a result of blasting.
8. Protective Measures
 - a. Drawings showing typical details of protective measures² against flyrock. Example:
 - (i) Vertical screens;
 - (ii) Blasting cages;
 - (iii) Blast door³, etc.
 - b. Arrangement and layout of protective measures to demonstrate the blasting proposal is safe and feasible.
9. Precautionary Measures
 - a. A plan showing the evacuation zone⁴ and sentry points.
 - b. For any evacuation zone encroaching onto any public road/area outside the site boundary, temporary closure/evacuation shall only be carried out with the prior agreement from HKP and other government departments concerned. It is the Permittee's responsibility to obtain such agreement in a timely manner before carrying out the blast. If no prior agreement could be obtained, Permittee is required to provide suitable protective measures (e.g. vertical screens, blasting cages, etc. at the blast locations) to protect the affected public area/road located outside the site boundary.
 - c. Evacuation procedures for the Contractor, Sub-contractors and the Site Supervisory Staff.
10. Safe Handling of Explosives
 - a. Cordon-off line to prevent unauthorised entry to the blasting areas during handling of explosives.
 - b. Maximum. no. of personnel permitted at blasting areas.
 - c. Location of handing over the explosives to shotfirer.
 - d. Contractor's own transport of explosives within the site.
11. Inspection and Monitoring plan
 - a. Locations and details of vibration and air overpressure monitoring stations.
 - b. Monitoring Action Levels.
 - c. Requirements for inspection of sensitive receivers before and after each blast.
12. Contractor Organization and Responsibility
 - a. Contractor's drilling and blasting crew organization chart.
A flow chart details the various steps, working procedures, cross-checking and responsible persons for all blasting related activities.
 - b. The roles, duties and responsibilities of all these Contractor personnel mentioned in the above flow chart.

² Blasting cages and vertical screens may need to be provided at blast locations when appropriate to protect against flyrock affecting adjacent sensitive receivers and members of the public.

³ A blast door should be provided at each tunnel entrance to protect against ejection of flyrock and to reduce air overpressure during blasting. Sufficient air vents should be formed at areas between the frame and arch ribs to release air pressure effectively, and the door should be covered with some acoustic materials to mitigate air overpressure.

⁴ A mobile robust blast shelter for the shotfirer should be provided if he chooses to remain in the evacuation zone during the blast.

- c. Channels of communication between the Contractor and the Site Supervisory Staff.
 - d. An emergency contact list.
13. Contingency plan for the following scenarios, but not limited to :
- a. Loaded blastholes not being able to discharge within the same day.
 - b. Thunderstorm or lightning.
 - c. Rainstorm.
 - d. Typhoon.
 - e. Misfire.

Typical Pre-licensing Requirements

1. General Requirements
 - a. Establishment of vibration monitoring stations on site.
 - b. Erection of warning signboards at major accesses to prevent unauthorised vehicles or personnel entering the evacuation zone after the commencement of warning signals prior to the blasting.
 - c. Provision of sufficient numbers of wooden boxes for storing electric detonators on the journey to the blasting area(s). The wooden boxes shall be painted in red with words "Danger-Detonators" "危險-雷管" painted in white letters/characters of not less than 40mm in height on four sides and the top.
 - d. Completion and return to Mines Division the 'Authorised signature for placing and ordering for an explosives delivery' form.
 - e. A visit by the Contractor to the Mines Division office together with the proposed shotfirer(s) for an interview to discuss the delay firing techniques and other safety conditions required for the site, during which the Contractor should bring to Mines Division office for test and registration the firing equipment and circuit testing equipment to be used for initiation of blast.
 - f. Arrangement with the appointed explosives supplier(s) to give briefing(s) to the blasting crew to enhance their awareness on the method of safe handling and use of explosives (i.e. cartridges, bulk emulsion explosives, detonating cords and initiation system) to be used for blasting, and submission of the training attendance records.

2. Open-cast Blasting
 - a. Erection of boundary markers at all control points to identify the blasting area requiring different protective measures, design blasthole diameter, etc. These markers shall be made of steel poles of not less than 60mm in diameter anchored in concrete and projected not less than 1.5m above ground.
 - b. Vegetation and overburden has to be stripped to form a level platform so that the height and other details of rock face to be blasted and the distances from any sensitive receivers (i.e. adjacent properties, structures, utilities and installations) to be protected can be measured and shown on plan. Prior stripping of overburden may be waived if protective measures are not required for the blast.
 - c. Sufficient protective measures (eg. roof-over meshes, vertical screens and protective cages, etc.) and quantities of gunny sacks, mesh covers and filled sandbags, if proposed, required for the daily blasts are available on site.
 - d. Provision of a specially constructed mobile robust blast shelter for the shotfirer if he chooses to remain in the evacuation zone during the blast.
 - e. Provision of a portable lightning detector to monitor the approach of thunderstorms.

3. Tunnel Blasting
 - a. Construction of a blast door and/or blast screen¹.
 - b. Provision of a stray current detector.

¹ A typical blast screen normally consists of wire mesh and conveyor belt, or equivalent.