
Drilling and Blasting Course: Blast Design Review, Vibration Limits and Safe Firing

23 – 27 August 2027
Tokyo





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Programme Summary

Drilling and blasting oversight is the subject of this one-week training course for project directors, site managers and contract managers, ending in a blasting control plan for one site. Leaders who commission blasting must judge designs, limits and contractor claims. The programme moves from blast design review to vibration and overpressure limits, flyrock and exclusion zones, monitoring and neighbour communication, then contractor control and incident response, using construction cases. Mars Training Centre UK delivers this programme on drilling and blasting to mixed-organisation cohorts.

The Business Case

Blasting is a small share of site activity but a large share of its dispute and safety risk. Complaints and claims usually trace back to a weak design review, an unagreed vibration limit or unchecked monitoring. A shared review method lets leaders challenge a design, set limits with evidence and hold the contractor to a written plan. Each term is recorded so that decisions can be traced.

- Neighbour Complaints and Claims: Fall as limits are agreed, monitored and communicated before the first blast.
- Safety Exposure: Falls as flyrock risk and exclusion zones are assessed for each blast type.
- Programme Stability: Improves as blasting stoppages are anticipated and handled through set response steps.

Principles and Evidence Base

- Vibration Limit Setting Principles: Match limits to structure type and vibration frequency, applied in Session 2.
- Scaled-Distance Prediction: Estimates ground vibration from charge and distance, applied in Sessions 2 and 3.
- Flyrock and Exclusion Zone Risk Assessment: Sets the area kept clear for each blast, applied in Session 3.
- Explosives Control Plan Principles: Cover storage, transport, misfires and records, applied in Sessions 4 and 5.



Intended Participants

- Project directors who commission excavation and rock removal and carry the risk of the blasting programme.
- Site managers who receive blast designs, approve firing arrangements and answer to neighbours.
- Contract managers who write blasting requirements into subcontracts and assess compliance.
- Health, safety and environment leads who review exclusion zones, monitoring and incident reports.

Typical sectors include civil construction, quarrying, property development and rail works.

Learning Outcomes

1. Participants will be able to evaluate a blast design for drill pattern, charge and timing choices against the site constraints.
2. Participants will be able to justify vibration and overpressure limits for the structures near a site.
3. Participants will be able to assess flyrock risk and define an exclusion zone for a planned blast.
4. Participants will be able to construct a monitoring and neighbour communication plan for a blasting programme.
5. Participants will be able to prioritise contract controls that hold a blasting contractor to the agreed limits.
6. Participants will be able to diagnose the cause of a misfire, complaint or limit exceedance and set the response.

Programme Structure

Day 1: Drilling and Blasting Design Review

What should a project leader check in a blast design before approving it?

- Blasting Programme Scope Sheet
- Drill Pattern and Burden Review
- Charge and Initiation Timing Check
- Geology and Rock Condition Summary
- Blast Design Approval Checklist

Day 2: Vibration and Overpressure Limits

How are limits set and predicted for the structures and people near a blast?

- Neighbouring Structure Survey Record
- Vibration Limit Setting Table
- Scaled-Distance Prediction Chart
- Air Overpressure Assessment Sheet
- Limit Agreement Note



Day 3: Flyrock, Exclusion Zones and Safe Firing

What keeps people and property clear at the moment of firing?

- Flyrock Risk Assessment Matrix
- Exclusion Zone Plan
- Warning and Clearance Procedure
- Misfire Response Procedure
- Firing Authorisation Record

Day 4: Monitoring, Neighbours and Contractor Control

How is each blast checked afterwards, and how is the contractor held to the plan?

- Monitoring Station Layout
- Blast Record and Trend Log
- Neighbour Communication Plan
- Subcontract Blasting Requirements Table
- Explosives Control Plan Review

Day 5: Blasting Control Plan for One Site

Do the design, limit, safety and contract records support one controlled blasting programme?

- Applying the Session 1 Blast Design Approval Checklist
- Testing the Session 2 Limit Agreement Note
- Reviewing the Session 3 Exclusion Zone Plan
- Checking the Session 4 Explosives Control Plan Review
- Completing the Blasting Control Plan

Methodology

The programme uses a structured exercise method built on a shared case of a rock excavation near occupied buildings. Participants review prepared blast designs and monitoring records, find weaknesses, then adapt each tool to a site of their own.

- Suggested activity: Reviewing a blast design and listing the questions to put to the contractor.
- Suggested activity: Setting a vibration limit for three neighbouring structures and predicting the result.
- Suggested activity: Handling a limit exceedance with a neighbour on the telephone in a role play.



Capstone Output

Each participant completes a blasting control plan for one site. It holds a design approval checklist, a limit agreement, an exclusion zone plan, a monitoring and communication plan and a set of contract requirements. The plan is used at work to brief the contractor, brief neighbours and review each blast against agreed limits.

Frequently Asked Questions

Is drilling and blasting training suitable for managers without an explosives background?

Yes. Drilling and blasting is taught from the viewpoint of the person who commissions and oversees the work, assuming construction or contract experience but no shotfiring or explosives qualification.

Which principles does drilling and blasting training rest on?

Drilling and blasting training rests on vibration limit setting, scaled-distance prediction, flyrock and exclusion zone risk assessment and explosives control plan principles, and participants apply the limits of the authority governing their site.

How is the plan from drilling and blasting training used at work?

You use the blasting control plan to brief the contractor and neighbours, review each blast against agreed limits and keep a record for disputes.

How does drilling and blasting differ from excavation and earthworks training?

Drilling and blasting centres on designing, limiting and controlling explosive rock breaking, while excavation and earthworks training covers machine selection, haulage and ground stability.