

**Mass Transit Railway Protection
Railways Ordinance
Mass Transit Railway (Land Resumption and Related Provisions) Ordinance
Buildings Ordinance Scheduled Area No. 3**

To safeguard the safety and stability of Mass Transit Railway (MTR) structures, a "protection boundary" for the MTR has been drawn and a set of building/engineering guidelines produced. The areas within the protection boundary are commonly known as the railway protection areas. These areas are designated as Scheduled Area No. 3 in the Fifth Schedule to the Buildings Ordinance. The MTR railway protection areas in Schedule Area No. 3 are: -

- (a) the areas delineated on the plans numbered MTR/G/1 to 3, MTR/RP/1 to 22, MTR/RP/25 to 27, MTR/RP/30 to 46, MTR/RP/50 to 55, MTR/RP/60 to 66 and MTR/RP/101 to 170 dated 29 June 1998 signed by the Secretary for Planning, Environment and Lands and deposited in the Land Registry; and
- (b) the areas delineated on the plans numbered MTR/G/4, MTR/RP/23 Rev. A, MTR/RP/24 Rev. A, MTR/RP/28 Rev. A, MTR/RP/29 Rev. A, MTR/RP/56 Rev. A, MTR/RP/57 Rev. A, MTR/RP/58 Rev. A, MTR/RP/59 Rev. A and MTR/RP/202 to 223 dated 29 May 2002 signed by the Secretary for Planning and Lands and deposited in the Land Registry.

Copies of these plans are available for inspection in the Buildings Department (BD) and the Mass Transit Railway Corporation Limited (MTRCL).

2. As a general guide, the protection boundary is about 30 m outside the outer surface of the MTR structures but it encompasses the whole of any lot where any part lies within the 30 m distance. At MTR stations, the area enclosed by the boundary is more extensive. Information on the "alignment of the railway as constructed" may be obtained direct from the MTRCL. Some information is also held by BD.

3. The guidelines at Appendix A apply to all building works (including ground investigation works and underground drainage works) to be carried out in Scheduled Area No. 3 and any new railway protection areas to be included in the scheduled area. Ground investigation works and underground drainage works in these areas are subject to additional control as stated in paragraph 9 below.

/Building

Building Works

4. Plans submitted to BD for proposed building works within the protection boundary are circulated to the MTRCL for their comment under the centralized processing arrangements. Railways Ordinance section 27 or Mass Transit Railway (Land Resumption and Related Provisions) Ordinance section 15 will be invoked to require the incorporation of any necessary measures to protect the MTR.
5. Authorized persons (APs), registered structural engineers (RSEs) and registered geotechnical engineers (RGEs) are required to monitor any movement and vibration on the MTR structures when required by the MTRCL. Upon request by the MTRCL, APs, RSEs and RGEs should submit a copy of the monitoring records to them. APs, RSEs and RGEs are required to inform the MTRCL direct of the commencement of any building works within the protection boundary to enable them to plan an appropriate monitoring programme. If any adverse situation becomes apparent, the MTRCL will alert the interested parties.
6. Any other necessary monitoring within the building site (e.g. monitoring of piezometric change) will be carried out by the AP/RSE/RGE of the site, who should maintain regular contact with the MTRCL and keep each other informed of the monitoring records as necessary.
7. The Director of Buildings may in writing, under the provisions of Mass Transit Railway (Land Resumption and Related Provisions) Ordinance section 12, authorize an employee of the MTRCL to enter any building site within the protection boundary for the purpose of monitoring construction. Alternatively, the Secretary for Environment, Transport and Works may issue such notice under the provisions of Railways Ordinance section 24.

Building Opening adjacent to a Mass Transit Railway Vent Shaft

8. There are certain restraints on the design of and making alteration to properties in close proximity to a MTR vent shaft to minimise the possibility of contamination by fire or smoke. In this connection, APs and RSEs are advised that any opening such as an openable or fixed window, doorway, building ventilation system intake or exhaust and the like in any building shall be located not closer than 5 m to the opening of any MTR vent shaft, irrespective of whether such vent shaft is free-standing or is accommodated in a building. This distance may be reduced to 2.5 m, if the exhaust air from the MTR vent shaft is directed away from and is not likely to affect the opening by natural convection.

Ground Investigation Works and Underground Drainage Works

9. Ground investigation works within Scheduled Area No. 3 require prior approval and consent. Plans prescribed under Building (Administration) Regulation 8(1)(f) should be submitted and the proposals should follow the guidelines at Appendix A. Application for concurrent processing of approval and consent in respect

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of ground investigation works should follow PNAP 225. Underground drainage works in Scheduled Area No. 3 are also subject to the full provisions of the Buildings Ordinance.



(H W CHEUNG)
Building Authority

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Index under : Mass Transit Railway Protection
Scheduled Area No. 3

**Technical Notes for Guidance in Assessing
the Effects of Civil Engineering Construction/Building Development
on Mass Transit Railway Structures and Operations**

A. General

All proposals for new building and engineering works including utilities within the limits of the railway protection areas as shown in the MTR Protection plans shall be subject to special scrutiny of the Government prior to giving approval to any plans and consent for commencing construction works. Every proposal shall be assessed individually on its impact on existing railway and related structures including all plants and fixtures necessary for the safe operation of the railway and subject to satisfactory compliance with the following technical requirements.

B. Underground Railway Structures

1. Site Formation/Foundation Works

Where site formation or foundation works or excavation for basements etc. are proposed above or adjacent to MTR underground structures including cooling water mains, the effects of such works shall not exceed the following limits: -

- (a) The vertical or horizontal pressure change on any underground structure due to the above works, including filling, dewatering etc. and due to additional loads transmitted from foundations (including loads arising during construction), shall not exceed 20 kPa.
- (b) Differential movement resulting from the works shall not produce final distortion in any MTR structure including the plinth or track in excess of 1 in 1 000 in any plane or a total movement in any MTR structure including the plinth or track exceeding 20 mm in any plane.
- (c) The peak particle velocities induced to any railway structure resulting from blasting (where permitted) and from driving or withdrawing of piles or any similar operation which can induce prolonged vibration shall not exceed 25 mm/sec and 15 mm/sec respectively, when measured with a vibrograph.

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- (d) No pile, foundation, borehole, well, soil nail, horizontal drain, rock bolt/dowel or other geotechnical installation shall be driven or constructed within a distance of 3 m from any point of the underground railway structures.
- (e) Any part of an anchor, if allowed, shall be more than 3 m away from any part of a MTR structure/installation, and the centroid of the fixed length of the anchor shall be more than twice the fixed length away from any MTR structure/installation.

2. Ground Investigation Works

Ground investigation proposals should point out: -

- (a) Details of the exploration and locations of the proposed exploration holes, trial pits, trenches, field testing or instrumentations relative to the MTR structures whether inside or outside the lot;
- (b) Proposed depth of boreholes, pits or trenches;
- (c) A method statement for sinking boreholes, excavating trial pits and trenches including back-filling, conducting field testing or installing instrumentation;
- (d) A method statement for checking verticality of boreholes within a distance of 10 m on plan of any point of the underground railway structure, should boreholes be sunk to a depth of 3 m from the highest point of the MTR structures; and
- (e) A method statement for controlling depth of ground hole sinking within a distance of 3 m on plan of any point of the underground railway structures.

Each proposal will also be judged against the following technical guidelines: -

- (i) The vertical and horizontal pressure change on any MTR structure due to ground investigation works including field testing such as plate loading test, pressuremeter test, packer test or any operation shall not exceed 20 kPa;
- (ii) The peak particle velocities induced to any MTR structure resulting from artificial shocks generated either by the detonation of explosives or a mechanical blow at ground surface or at depth within a hole shall not exceed 25 mm/sec;

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- (iii) The peak particle velocities induced to any MTR structure resulting from percussion drilling, hammer drilling or any other site operation which can induce prolonged vibration, shall not exceed 15 mm/sec; and
- (iv) No boreholes, trial pits or trenches shall be sunk or excavated within a distance of 3 m from any point of the MTR structures.

3. Utility Trenches

Utility trenches which require excavation within the railway protection areas shall not be carried out without the approval of the Government in consultation with the MTRCL.

4. Marine Works

Any reclamation, dredging, laying of pipes, dropping of anchors, or other engineering works to be carried out within the railway protection areas shall be submitted to the Government for approval in consultation with the MTRCL.

C. Overhead Railway Structures and Surface Section

1. Scaffolding, Advertising Signs, Projections

Erection of scaffolding, working platforms, advertising signs or any projections at a level above the MTR tracks shall not be allowed within a distance of 6 m on plan of any point of the MTR tracks, without the consent of the Government. When such works are permitted to be carried out within the 6 m limit, effective measures to protect the railway structures shall be provided. According to individual circumstances it may be necessary for such works to be conducted outside MTR hours of operation. All protective works shall be subjected to the special approval of Government.

2. Overhead Structures

The requirements of paragraphs B.1(b), B.1(c), B.1(d) and B.1(e) should also apply to overhead structures.

3. Utility Works

- (a) When cables and pipes, etc are to cross above or below MTR overhead structures, the Utility Undertaking shall submit to the Government details of the cables, pipes and the method of construction and seek special approval before work can commence. When cables and pipes, etc are to pass over the railway, the provision of paragraph C.1 shall apply.

/(b)

- (b) When utility works are to be carried out across the MTR tracks at ground surface level, approval from the MTRCL has to be sought.

**4. Operation of Stationary Lifting Appliance
(tower crane, hoist, piling/drilling rigs)**

- (a) When such an appliance is erected adjacent to MTR tracks and/or above ground structures/installations, effective measures to protect the MTR structures shall be provided. According to individual circumstances it may be necessary for such works to be conducted outside MTR hours of operation. All protective works shall be subject to special Government approval. In addition the Government may impose conditions on the operation and positioning of the appliance if in its opinion such operation and positioning may endanger the safe operation of the MTR.
- (b) The arc in which the jib of lifting appliance swings shall not encroach within 6 m of the MTR tracks and above ground structures/installations on plan except with special Government approval.

5. Mobile Lifting Appliance

Where a mobile lifting appliance (e.g. crane, excavator) operates within 6 m on plan of MTR structures and any part of the appliance is higher than the MTR track level, the provisions of paragraph C.4 shall apply.

6. Maintenance of Road Lamp Standards

When road lighting tower maintenance vehicles are to be used to service road lamp standards adjacent to MTR tracks, the working equipment shall not be positioned closer to the MTR tracks than the nearest part of the road lamp standard where the height of the lamp standard is greater than the height of the tracks. If the working equipment is to be operated at a level higher than 1 m above MTR tracks and closer than 6 m from the MTR tracks, provisions as in paragraph C.1 shall also apply.

7. Fire Services Department/Police Force Vehicles

The operation of Fire Services/Police vehicles adjacent to the MTR tracks or vent shafts under emergency situations shall be in accordance with the emergency procedure agreed between MTRCL and the respective organization.

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8. Storage of Materials

- (a) No materials, containers, etc. shall be stored within 6 m on plan of the MTR tracks and vent shaft openings except with the special Government approval.
- (b) No dangerous goods or other inflammable materials shall be stored within 6 m on plan of MTR structures except with the special Government approval.

9. Demolition Works

Where demolition and removal works for any structure which includes scaffolding, advertising signs, container offices and buildings are proposed above or adjacent to MTR above ground structures, such as entrances, vent shafts, distribution substations, traction substations, plant rooms, overhead railway structures and surface track sections, effective measures to protect the railway structures shall be provided. Demolition works proposal with the protective measures shall be submitted to BD for approval and consent prior to commencing work.

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PNRC 14

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