

**Railway Protection
Railways Ordinance**

**Mass Transit Railway (Land Resumption and Related Provisions) Ordinance
Area Number 3 of the Scheduled Areas in Schedule 5, Buildings Ordinance, Cap 123**

As a result of the merger of the Mass Transit Railway Corporation and Kowloon-Canton Railway Corporation (KCRC) on 2 December 2007, the MTR Corporation Limited (MTRCL) becomes the operator of all the railway lines in the territory. The existing railways in operation comprise the following lines –

Tsuen Wan Line, Kwun Tong Line, Island Line, Tseung Kwan O Line, Tung Chung Line, Airport Express, Disneyland Resort Line, East Rail Line, West Rail Line, Ma On Shan Line and Light Rail.

2. To safeguard the safety and stability of the railway structures, railway protection areas have been delineated and shown on relevant plans and a set of building/engineering guidelines produced. Copies of the plans showing the railway protection areas are available for inspection in the MTRCL. They can also be viewed and downloaded from the web site of MTRCL (http://www.mtr.com.hk/engtxt/railway/protection_boundary_map.html).
3. As a general guide, the boundary of the railway protection areas is about 30 m outside the outer surface of the railway structures or the railway fence/wall, or from the nearest rail if there is no railway fence/wall, but it encompasses the whole of any lot where any part thereof lies within the 30 m distance. At the railway stations, the area enclosed by the boundary is more extensive.
4. The railway protection areas of some of the railway lines are designated as Area Number 3 of the scheduled areas in Schedule 5 to the Buildings Ordinance. Such protection areas are delineated and shown edged black on the plans as listed out in the Schedule, which will be updated from time to time as and when necessary. Copies of these plans have been deposited in the Land Registry and are available for inspection in the Buildings Department (BD), either by attending the Building Information Centre in person or by visiting BD's website (<http://www.bd.gov.hk/english/ScheduledAreas.html>) as detailed in PNAP APP-39.
5. The guidelines at Appendix A apply to all building works (including ground investigation works and underground drainage works) to be carried out in the railway protection areas. Ground investigation works and underground drainage works in Area Number 3 of the scheduled areas are subject to additional control as stated in paragraph 11 below.

Building Works

6. The MTRCL will monitor settlement and vibration on railway structures where necessary. In the event that any adverse situation becomes apparent the MTRCL will alert the interested parties, and a copy of such monitoring records prepared by the MTRCL may be made available to registered contractors.

7. Any other necessary monitoring within the building site (e.g. monitoring of piezometric change) will be carried out by the registered contractor of the site under the instruction of the authorized person. The registered contractor should maintain regular contact with the MTRCL and keep each other informed of the monitoring records as necessary.

8. The Director of Buildings may in writing, under the provisions of section 12 of the Mass Transit Railway (Land Resumption and Related Provisions) Ordinance, Cap 276, authorize an employee of the MTRCL to enter any building site within the railway protection areas for the purpose of monitoring construction. Alternatively, the Secretary for Transport and Housing may issue such notice under the provisions of section 24 of the Railways Ordinance, Cap 519.

Building Opening adjacent to a Railway Vent Shaft

9. There are certain restraints on the design of and making alteration to properties in close proximity to a railway vent shaft to minimise the possibility of contamination by fire or smoke. In this connection, registered contractors 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 railway 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 railway vent shaft is directed away from and is not likely to affect the opening by natural convection.

Ground Investigation Works and Underground Drainage Works

10. The practice of monitoring building works being carried out above railway structures has proved very effective and a number of potentially dangerous ground investigation operations have been identified. Particularly dangerous are ground investigation works where carelessness may result in the drill bit breaking through an underground railway tunnel with the possibility of striking a train.

11. Ground investigation works within Area Number 3 of the scheduled areas require prior approval and consent from the Building Authority. Plans prescribed under Building (Administration) Regulation 8(1)(I) should be submitted and the proposals should follow the guidelines at Appendix A. Application for concurrent processing of approval and consent in respect of ground investigation works should follow PNAP ADM-16. Underground drainage works in any building to be carried out in Area Number 3 of the scheduled areas are not exempted from application for approval and consent to commence works and are subject to the full provisions of the Buildings Ordinance.

12. Proposals for ground investigation works or underground drainage works in or for any existing buildings to be carried out within railway protection areas other than those designated as Area Number 3 of the scheduled areas should be forwarded to the MTRCL for comment prior to commencement of the proposed works.

Guidelines for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers

13. A similar practice note is issued to Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers.

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Building Authority

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

A. General

All proposals for new building and engineering works including utilities works within the limits of the railway protection areas shall be subject to special scrutiny of the Government prior to giving approval to any plans and/or consent for commencing construction works. Every proposal shall be assessed individually on its impact on existing railway and related structures/installations 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 works etc. are proposed above, beneath or adjacent to railway underground structures/installations including cooling water mains system, the effects of such works shall not exceed the following limits: -

- (a) The vertical or horizontal pressure change on any underground structures/installations due to the works, including filling, ground improvement, dewatering, field testing (such as plate loading test, pressure-meter test and packer test) etc. and due to addition or reduction of loads transmitted from foundations (including any loads arising during construction), shall not exceed 20 kPa.
- (b) Differential movement resulting from the works shall not produce distortion in any railway structures/installations including the plinth or track in excess of 1 in 1 000 in any plane or a total movement in any railway structures/installations including the plinth or track exceeding 20 mm in any plane.
- (c) The induced level difference between rails of a track in perpendicular plane resulting from the works shall not exceed 5 mm.
- (d) The peak particle velocities induced to any railway structures 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.

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

2. Ground Investigation Works

Ground investigation proposals should include the followings: -

- (a) Details of the exploration and locations of the proposed exploration holes, trial pits, trenches, field testing or instrumentations relative to any railway structures whether inside or outside the lot;
- (b) Proposed depth of boreholes/drillholes, pits or trenches;
- (c) A method statement for sinking boreholes/drillholes, excavating trial pits and trenches including back-filling, conducting field testing or installing instrumentation;
- (d) A method statement for checking verticality of boreholes/drillholes located within a distance of 10 m on plan of any point of the underground railway structure, should boreholes/drillholes be sunk to a depth of 3 m from the highest point of the railway structures; and
- (e) A method statement for controlling depth of boreholes/drillholes 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 technical guidelines as specified in paragraph B.1 above.

3. Utility Works

Utility trenches/pits 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.

5. Sinking of Wells

Sinking of wells within railway protection areas is building works subject to the control of the Buildings Ordinance including section 14(1) thereof. Before the carrying out of the works, the approval of plans and consent for the commencement of such works should be obtained from the Building Authority.

C. Overhead Railway Structures

1. Scaffolding, Advertising Signs, Projections

Erection of scaffolding, working platforms, advertising signs or any projections at a level above the railway tracks shall not be allowed within a distance of 6 m on plan of any point of the railway 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 the railway operation hours. All protective works shall be subject to the special approval of Government.

2. Overhead Structures

The requirements of paragraph B.1(b) to B.1(f) should also apply to overhead structures.

3. Utility Works

When cables, ducts and pipes, etc are to cross above or below railway overhead structures, the Utility Undertaking shall submit to the Government details of the cables, ducts, pipes and the method of construction and seek special approval before work can commence. When cables, ducts and pipes, etc are to pass over the railway, the provisions of paragraphs B.1, C.1 and D shall apply.

D. At-grade Railway Structures

1. When utility works are to be carried out across the at-grade railway tracks, agreement from the MTRCL has to be sought.
2. Unless prior special agreement has been obtained, piling works will not be permitted within 3 m on plan from the railway fence or wall along the railway premises, or 7 m on plan from the centreline of the nearest track when there is no railway fence or wall.
3. Vibration measured on the overhead power line mast, or signalling and telecommunication furniture of railway shall not exceed the peak particle velocity of 10 mm/sec and the vibration amplitudes shall not exceed 80 μm .

4. The requirements of paragraphs B.1, B.2, B.3 and C.1 shall also apply to the at-grade railway structures and tracks.

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

1. When such an appliance is erected adjacent to railway tracks and/or above ground structures/installations, 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 the railway operation hours. All protective works shall be subject to special Government approval. 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 railway.
2. The arc in which the jib of lifting appliance swings shall not encroach within 6 m of the railway tracks and above ground structures/installations on plan except with special Government approval.

F. Mobile Lifting Appliance

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

G. Maintenance of Road Lamp Standards

When road lighting tower maintenance vehicles are to be used to service road lamp standards adjacent to railway tracks, the working equipment shall not be positioned closer to the railway 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 railway tracks and closer than 6 m from the railway tracks, provisions as in paragraph C.1, E and F shall also apply.

H. Fire Services Department/Police Force Vehicles

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

I. Storage of Materials

1. No materials, containers, huts etc. shall be stored within 6 m on plan of the railway structures/tracks and vent shaft openings except with the special Government approval.

2. No dangerous goods or other inflammable materials shall be stored within 6 m on plan of railway structures/tracks except with special Government approval.

J. 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 above-ground railway structures, such as entrances, vent shafts, power distribution substations, traction substations, plant rooms, overhead railway structures and at-grade railway tracks, 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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