

**Peraturan-Peraturan Keretapi (Zon Perlindungan Keretapi) 1998; (Versi Bahasa
Inggeris)**

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Regulation 1: Citation and commencement.

(1) These Regulations may be cited as the Railways (Railway Protection Zone) Regulations 1998 and shall come into operation on 22 October 1998.

(2) These Regulations shall not apply to railways operated by the Keretapi Tanah Melayu Berhad.

Regulation 2: Interpretation.

In these Regulations, unless the context otherwise requires-

"above-ground structure" means any development works, of any structure in whatever manner, above the surface of the ground, as described in Drawings D and E in the First Schedule;

"at-grade structure" means any section of the railways with tracks at ground level or on any embankment, or on an in-cutting as described in Drawing F in the First Schedule;

"Commissioner" means the Commissioner of the City of Kuala Lumpur appointed under section 3 of the Federal Capital Act 1960[Act 190];

"development" means the carrying out of any building, engineering, mining, industrial, or other similar operation in, on, over, or under land, and includes any change in the use of any land or building or any part thereof, or the subdivision or amalgamation of lands;

"development order" means a development order issued by the Commissioner under the Federal Territory (Planning) Act 1982[Act 267];

"local authority" shall have the meaning assigned to it under the Local Government Act 1976[Act 171];

"local planning authority" shall have the meaning assigned to it under the Town and Country Planning Act 1976[Act 172];

"planning permission" means a planning permission issued by the local planning authority under the Town and Country Planning Act 1976;

"portal structure" or "transition structure" means any guideway structure that occurs between an underground structure and above-ground structure or at-grade structure as described in Drawing C in the First Schedule;

"railway protection zone" means the railway protection zone designated by the Directed General pursuant to regulation 3;

"railway structure" includes the above-ground structure, the at-grade structure, the underground structure and the portal structure;

"restricted activities" means the activities described in the Third Schedule which could pose safety hazards on the railway structure and the operation of the railway;

"restricted activities standards" means the safety standards for restricted activities prescribed by the Director General in the Third Schedule;

"safety standards" means such safety standards prescribed by the Director General in the Second Schedule;

"underground structure" means any development works of any structure in whatever manner, below the surface of the ground as described in Drawings A and B in the First Schedule.

Regulation 3: Designation of railway protection zone.

The Director General shall designate an area in the railway premises as a railway protection zone, as described in Drawings A to F in the First Schedule.

Regulation 4: Issuance of development order or planning permission after consultation with Director General.

(1) The Commissioner or any local planning authority should consult with the Director General before issuing a development order or planning permission regarding any development in the railway protection zone.

(2) If the consultation in subregulation (1) is not carried out, such failure shall not impede in whatsoever manner the Commissioner or any local planning authority from issuing such development order or planning permission.

Regulation 5: Permission for restricted activity after consultation with Director General.

(1) A local planning authority should consult with the Director General before allowing any restricted activity to be carried out in the railway protection zone.

(2) If the consultation in subregulation (1) is not carried out, such failure shall not impede in whatsoever manner the local planning authority from allowing any restricted activity to be carried out.

Regulation 6: Matter to be taken into cognisance before issuance of development order or planning permission or permission for restricted activity.

The Director General shall ensure that the Commissioner or the local planning authority, as the case may be, prior to the issuance of the development order or the planning permission, and the local authority, prior to allowing a restricted activity to be carried out, in the railway protection zone take cognisance of-

- (a) the railway protection zone;
- (b) all maps and drawings provided by the railway company;
- (c) any possible effect on the safety of the railway structure or the operation of the railway as a result of the development or the carrying out of the restricted activities; and
- (d) the safety standards and the restricted activities standards.

Regulation 7: Compliance by Director General.

For the purposes of regulation 6, the Director General shall-

- (a) at all times provide the Commissioner of the local planning authority with the safety standards; and
- (b) cause the railway company to prepare and provide the Director General such maps and drawings indicating the sites and positions of the railway structures.

Regulation 8: Director General may recommend for suspension or cessation of development.

Subject to any laws for the time being in force pertaining to the suspension or cessation of development, the Director General may make such necessary recommendation to the Commissioner of the local planning authority or such relevant authority, for the suspension or cessation of the development of the carrying out of the restricted activities, or to take any appropriate measure, upon the Director General being satisfied that-

- (a) the safety of any person using the railway is or has been or may be affected; and
- (b) the safety of the railway structure or the operation of the railway is or has been or may be affected,

as a result of the said development or the carrying out of the restricted activities.

SECOND SCHEDULE (Regulation 3)
SAFETY STANDARDS

1. Underground and portal structures

(1) Drawings A, B and C in the First Schedule define the first and second reserve around underground and portal structures as indicated in the drawings. The following restrictions shall apply in each reserve, and are equally applicable to the construction activities below the tunnel alignment and portal:

(a) the pressure on the underground structures shall not be increased due to filling or dewatering or form additional loads transmitted by foundations (including loads arising during construction) without prior approval of the Director General;

(b) where dewatering works or pumping from any trench, excavation, caison, pile or well is more than 5 metres deep, precautions such as reasonable cut-off under excavations are to be taken and suitable instrumentation installed to monitor pore pressure changes and ground settlement both close to the works and to the nearest railway structure. Dewatering/pumping plans shall demonstrate the effect of drawdown to the stability of the tunnel or underground structure;

(c) where excavations, trenches, caissons, piles or wells are less than 5 metres below the ground surface, pumping of water from them may be allowed by the Director General;

(d) where tunnel construction is permitted, precautions must be taken to avoid water flow into railway tunnels at the face, or through the temporary or permanent linings. Suitable instrumentations shall be installed. Tunnelling involving use of compressed air shall be restricted, with specified plans and methods subject to the Director General's prior approval;

(e) where basements are more than 5 metres below ground surface, they shall be made as watertight as possible. The base slab and walls shall be designed to withstand full hydrostatic pressure, and pressure relief in the form of weep-holes or under-drains is not allowed;

(f) differential movement resulting from the works shall not produce final distortion in the track or its plinth in excess of 3 millimetres in 6 metres (1:2000) in any plane or a total movement in the railway structure or tracks exceeding 15 millimetres in any plane;

(g) the piezometric pressure in compressible soils shall not be reduced by more than 10 kilopascal. Where the total depth of compressible soil is less than 15 metres and the railway structure is supported below the compressible soils, then this requirement may be waived by the Director General;

(h) the peak particle velocities at any railway structure resulting from blasting or form driving or with-drawing of piles or any operation which can induce prolonged vibration which shall not exceed 15 millimetres per second; and

(i) demolition of existing structures shall be controlled to encure no shock or vibration damage to the underground structures.

(2) The following restrictions shall apply in the first reserve:

- (a) no sheetpiles, piles, foundations, boreholes or wells shall be driven within this zone;
- (b) no excavation greater in depth than 3 metres or within 3 metres vertically of the railway structure shall be permitted. No dredging greater than 1.5 metres shall be undertaken in the river where the tunnel alignment is under the river;
- (c) no blasting shall be permitted; and
- (d) horizontal tie-backs and ground anchors extending into the first reserve shall be designed such that no part of an anchor is closer than 3 metres to any underground or transition structure. The centroid of the fixed length of the anchor should be more than twice the fixed length away from any underground or transition structure. Tie-backs and anchors shall not be subject to testing which results in collapse and/or failure in the soil structure surrounding it.

(3) The following restrictions shall apply in the second reserve:

(a) pile foundations may generally be constructed in the second reserve subject to the following requirements:

- (i) the clear distance between the outside of the pile and the outside of the underground or transition structure is greater than 3 metres or 5 pile diameters whichever is the greater;
 - (ii) the piles are designed so that they are debonded within the zone of influence of the underground structure and develop all of their load either in shear or end bearing from soil located below the zone of influence of the structure;
 - (iii) piles shall generally be constructed by auger or reverse circulation drilling techniques and the stability of the ground ensured by the use of casings and/or drilling muds as may be appropriate;
 - (iv) the use of percussively driven concrete piles, sheetpiles, steel H-Piles or timber piles, or the use of rock chopping chisels are not acceptable within 10 metres of the structure; and
 - (v) the use of vibratory method of installing sheetpiles, H-piles or casings is prohibited;
- (b) site investigation bore holes may generally be drilled in this zone subject to verification of the exact location of the underground structure on site. All such boreholes shall be carefully and completely grouted to their full depth with a bentonite/cement grout on completion;
- (c) basement excavations and foundations are generally acceptable subject to the requirements of paragraphs I(l)(a) to (i); and
- (d) no blasting shall be permitted.

(4) Site investigation reports and data shall be copied to the Director General for reference.

(5) Details of any proposed pressure grouting method of soil improvement (jet grouting, injection grouting, grouting freezing, lime or cement stabilization, etc.) shall be submitted to the Director General for approval, and each shall be considered on a case-by-case basis.

2. Above-ground structures

(1) Drawing D in the First Schedule defines acceptable limits on excavations and ground surcharge adjacent to pile caps supporting above-ground structures. The following requirements shall apply:

- (a) excavation above pile caps is acceptable;
- (b) no excavation shall extend below a line drawn at a gradient of 1:1 from the top surface of the pile cap structure as shown in Drawing D in the First Schedule;
- (c) no surcharge on the earth surface shall extend above a line drawn at a gradient of 1:1 from a point on ground surface located at the intersection of the ground surface with a line extended from the maximum depth of foundation pile on 1:1 gradient outwards;
- (d) where the depth of compressible soil, as defined in paragraph 1(l)(g) exceeds 15 metres, then the piezometric pressure at 5 metres depth adjacent to the pile cap shall not be lowered by more than 1 metre;
- (e) no building shall be constructed within 6 metres of any above-ground structure measured from the outer edge of the above-ground structure unless it conforms to the following:
 - (i) development shall not exceed one storey;
 - (ii) development shall have no basement;
 - (iii) the development shall be of non-combustible construction and shall have a fire-resistance rating for its elements of structure of not less than 2 hours;
 - (iv) at least 1 metre clearance (shown 'x' on Drawing E in the First Schedule) from top of the development's roof to underside of the above-ground structures beam shall be maintained. No projection above the surface of this roof shall be allowed. Development roofs shall be constructed such that above-ground structures access holes are inaccessible from them;
 - (v) all structures shall be kept at least 0.5 metre clear from the edge of the pilecaps or 2 metres clear from the edge of the bearings whichever is the more restrictive (shown 'y' and 'z' respectively on Drawing E in the First Schedule);
 - (vi) activities carried out shall be of low fire risk;
 - (vii) no use of piped gas and/or bottled gas shall be allowed;
 - (viii) no development is allowed to be built around or to enclose any above-ground structures column. All sections of above-ground structures shall be kept accessible to maintenance and vehicles;
 - (ix) the development shall be protected by approved automatic sprinkler system, if so required by the Director General;
 - (x) surface and roof run off from the development shall not interfere with the existing above-ground structures drainage system. The applicant shall bear all costs and expenses incurred in the diversion and reinstatements of the drains; and
 - (xi) exposed lightning conductor running along the surface of the above-ground structures column shall be protected.

(2) For the purpose of this regulation, the Director General may allow a modification to this regulation provided that the applicant justifies, at the Director General satisfaction:

(a) that all measures and dispositions are taken for preserving the level of the original water table if any, for avoiding any lateral displacements in the surrounding soil strata as well as its bearing and shearing capacities; and

(b) that all measures and dispositions are taken for preserving the existent bearing and friction capacities of adjacent foundations, and for avoiding any movement of existing adjacent structures in any plane.

3. At-grade structures

(1) Drawing F in the First Schedule defines the limits of the first and second reserve that exist around the at-grade structures.

(2) Paragraphs I(l)(b) to (h) shall apply to engineering works in each reserve.

(3) Generally no engineering work of any kind will be allowed in the first reserve.

(4) Piled foundations will generally be permitted in the second reserve subject to regulation 6.

(5) Site investigation boreholes may be drilled in the second reserve subject to regulation 6.

(6) No trench or other excavation more than 2 metres deep shall be allowed without prior written permission of the Director General.

(7) No surcharge exceeding 40 kilopascal shall be allowed without prior written permission of the Director General.

(8) No surcharge resulting in an increase in ground pressure exceeding 15 kilopascal shall be permitted.

(9) The use of high displacement driven piles including timber piles and precast concrete piles shall not be permitted.

(10) The use of water in the drilling of bored piles or site investigation boreholes shall not be permitted.

(11) Site investigation boreholes must be backfilled with cement/bentonite grout. Drains and water pipes shall be designed to avoid raising the groundwater level in the second reserve.

(12) The installation of recharge walls or soak-aways shall not be permitted.

4. Building developments adjacent to vents/vent shafts

To minimize the possibility of contamination of the railway station by fire or smoke, no building opening within the development shall be located closer than 5 metres to any vent or vent shafts irrespective of whether it is free standing or is accommodated in the development. This distance may be reduced to 2.5 metres provided that the intake air to the vent or vent shafts is directed away from the building opening and the Director General is satisfied that discharge from the opening is not likely to be drawn by natural convection into the railway station.

THIRD SCHEDULE (Regulation 2)
RESTRICTED ACTIVITIES

1. Restricted activities structures

(1) The following are defined as restricted activities:

- (a) the erection of scaffolding, maintenance towers, hoardings, fencing, gantries, signs, lighting posts and similar structures where any part of that structure is within 6 metres on plan of above-ground, at-grade, portal structure, or ventilation shafts;
- (b) the operation or movement of cranes, whether fixed or mobile, hoists, ladders, drilling and piling equipment, excavators and any other mechanical equipment or vehicles where any part of the said equipment or vehicle at any stage of its works is within 6m on plan of an aboveground, at-grade, or portal structure. The term "movement" in this paragraph does not include the passage of the equipment or vehicles along a public roadway. The operation of any equipment or vehicles of the fire service shall be excluded;
- (c) the movement of any vehicle or trailer exceeding 5.3 metres in height within 6 metres on plan of an above-ground, or at-grade structure, unless minimum/maximum clearances are posted otherwise;
- (d) the storage of materials, either loose, in pallet, or in containers within 6 metres on plan of an above-ground, portal or at-grade structure;
- (e) the storage of Class I flammable and Class II Class III combustible liquids as defined under the NFPA code of practice and the storage of related pipework within 30 metres on plan of any above ground, atgrade or underground structure;
- (f) the storage of explosive materials within 30 metres on plan of any sructure above or below ground or within 30 metres of any railway property; and
- (g) the planting of trees within 6 metres on plan of an above-ground, atgrade or portal structure or within the first reserve of underground structures.

(2) The standard restricted activity to be complied for the restricted activity stated in paragraph 1(1)(a):

- (a) any part of the scaffolding that extends above the level of track shall be at least 3 metres clear on plan of the above-ground. or at-grade structure;
- (b) the scaffolding shall be so designed and positioned so that it is not possible for persons to climb onto any above-ground or at-grade structure;

- (c) the scaffolding, etc, is sufficiently robust and maintained to a satisfactory, standard so as to prevent collapse onto, obstruction of or danger to the railway structures;
- (d) where deemed necessary by the Director General additional protection measures shall be provided to the railway, at the applicant's expense;
- (e) the scaffolding etc shall not interface with the free flow of air into or out of ventilation shafts, ducts or grilles.

(3) The standard restricted activity to be complied for the restricted activity stated in paragraph I(I)(b):

- (a) the jib of any lifting appliance or any other moving or stationery part of the mechanical equipment including its handled load shall not encroach within 3 metres on plan from the edge of the nearest aboveground or at-grade structure unless the equipment restricted to work beneath the above-ground structures;
- (b) where deemed necessary by the Director General effective measures of protection to the above-ground or at-grade structures;
- (c) the equipment and, where appropriate its foundation has been certified satisfactory for operation within the preceding two weeks prior to the application to the Local Authority.

(4) If the standard restricted activity in paragraph 1(3)(a) is not complied with, the Director General may consider giving permission for the use of the equipment only during the period when trains are not running.

(5) The standard restricted activity to be complied for the restricted activity stated in paragraph I(I)(d):

- (a) storage is not closer than 2 metres from any above-ground, at-grade, or portal structure;
- (b) storage does not impose a load on the railway structure in excess of 15 kilopascal;
- (c) storage is not higher than 4 metres or such that a person may be able to climb onto the above-ground or at-grade structures from the stored materials;
- (d) material stored is of low combustibility.

(6) The standard restricted activity to be complied for the restricted activity stated in paragraph I(I)(e):

- (a) storage is not closer than 7.6 metres from the outer wall of the underground structure;
- (b) storage tanks containing Class I flammable liquids and Class II combustible liquids shall be installed underground in a cast-in-place reinforced concrete vault large enough to hold and retain the entire contents of the tanks. The storage tank shall be completely encompassed by not less than 600 millimetres thick of white-washed sand;
- (c) vaults, tanks and piping shall be protected from corrosion and have approved cathodic protection;
- (d) the tank and all related piping shall conform to the provisions of NFPA 30 and the licensing requirements of the Local Authority;

(e) storage of Class II combustible liquids may be located above ground. The storage tank shall be placed within a masonry or welded steel, oil-tight vault, of adequate capacity to contain the contents of the tank. Masonry vaults shall be at least 150 millimetres thick and steel vaults shall be made of not less than 18 gauge metal;

(f) dispensing pumps for Class II flammable liquids and Class II combustible liquids shall not be located less than 7.6 metres from the face of such pump to the nearest side of any ventilation shafts opening or station entrance;

(g) the surface around the dispensing area whether with or without dispensing pumps shall be graded in a manner to direct any possible spills into a drain that flows away from the underground structures.

2. Planting of trees

(1) No trees with full grown heights of more than 7 metres shall be planted within 4 metres from the edge of any above-ground or at-grade structure.

(2) Whenever required by the Director General, trees planted near to aboveground or at-grade structures shall be pruned by applicant such that the outer extremity of the canopy of the tree shall not encroach within 2 metres of the edge of the above-ground or at-grade structures.

Made 3 October 1998.

[JK/LRT/0.604/5 Jld. 2(19); PN. (PU2) 514.]

ISA BIN KASSIM,

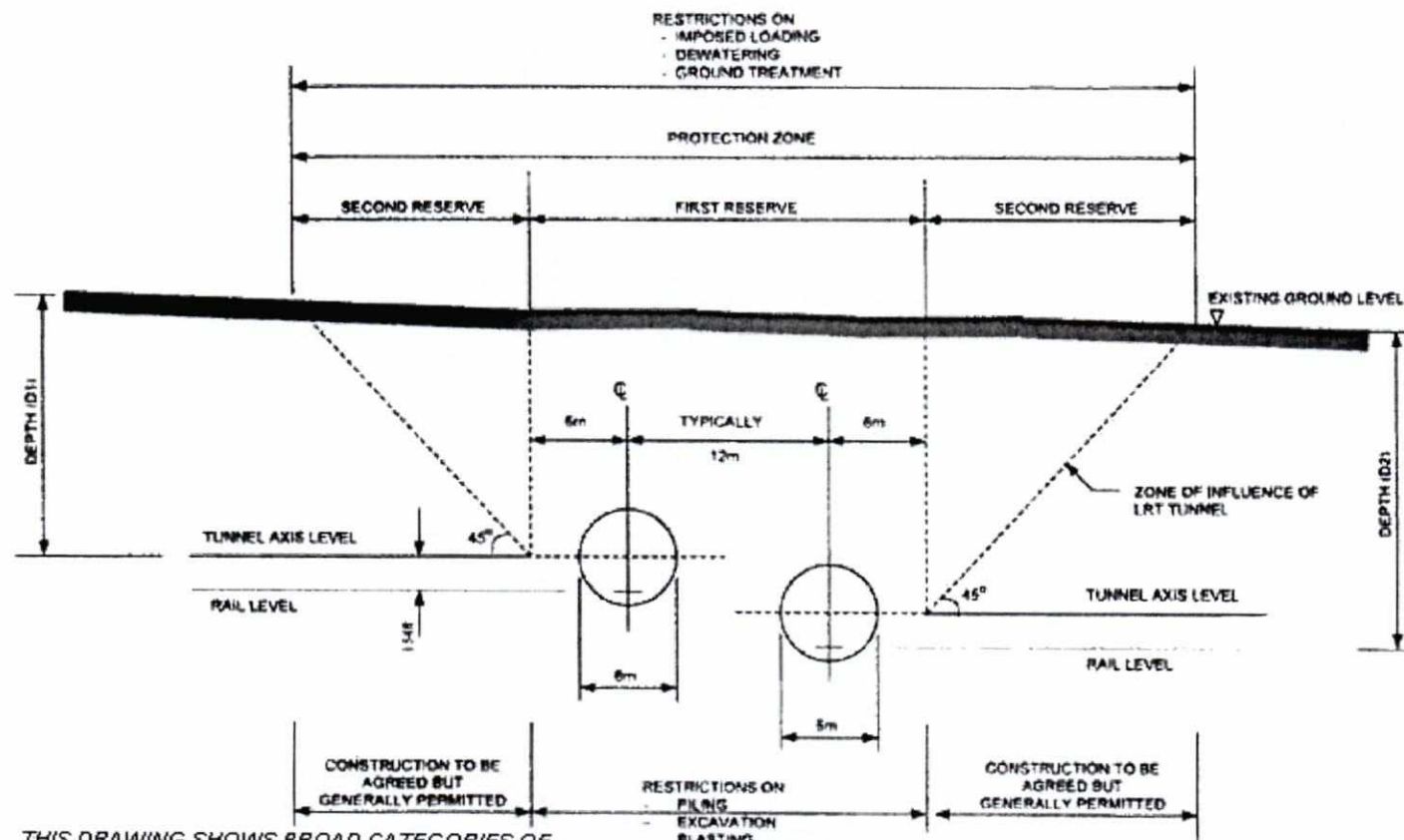
Director General of Railways

Approved 7 October 1998.

DATO' SERI DR. LING LIONG SIK,

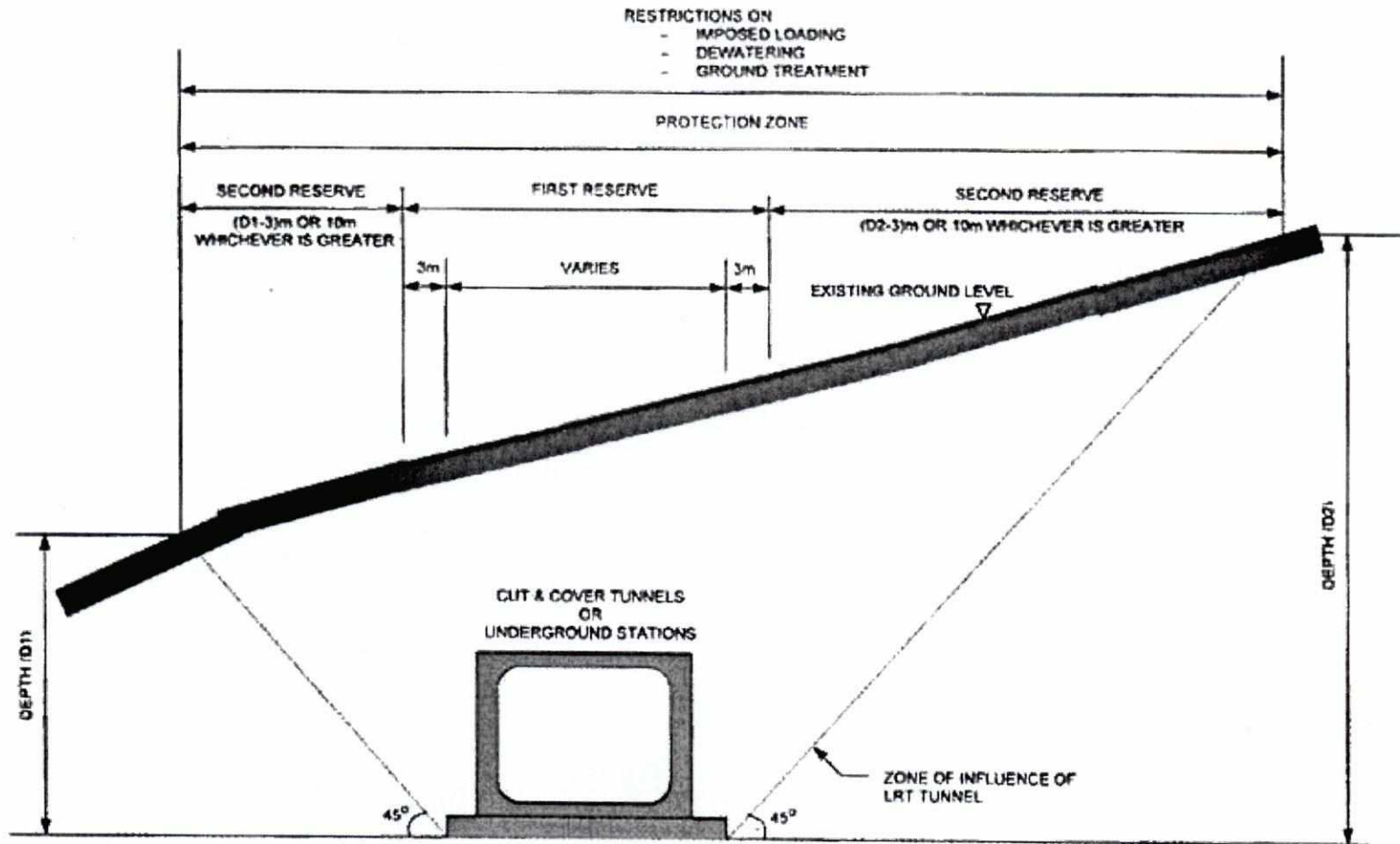
Minister of Transport

**FIRST SCHEDULE (Regulation 3) - Drawing A
BORED TUNNELS**



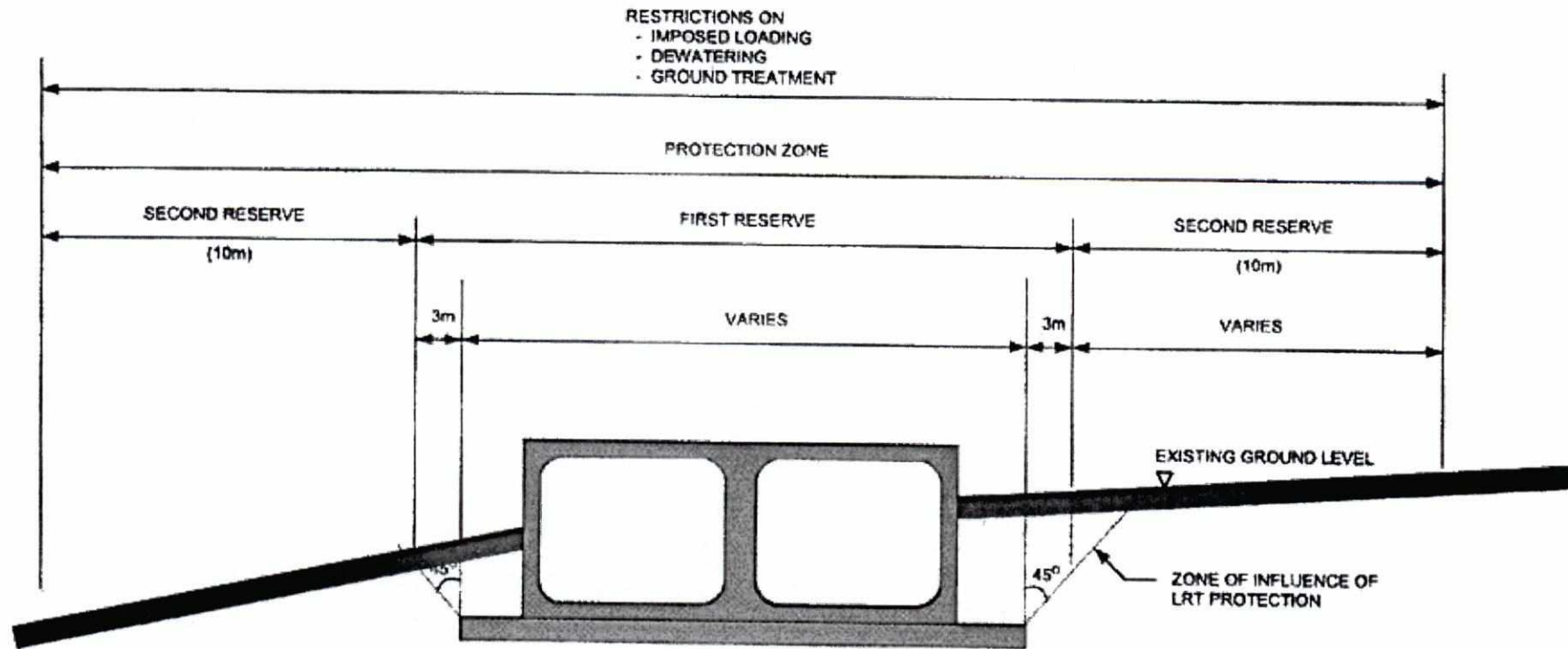
THIS DRAWING SHOWS BROAD CATEGORIES OF RESTRICTIONS NEEDED TO PROTECT THE LRT STRUCTURES REFER TO THE REGULATIONS FOR DETAILS

**FIRST SCHEDULE (Regulation 3) - Drawing B
UNDERGROUND STRUCTURES**



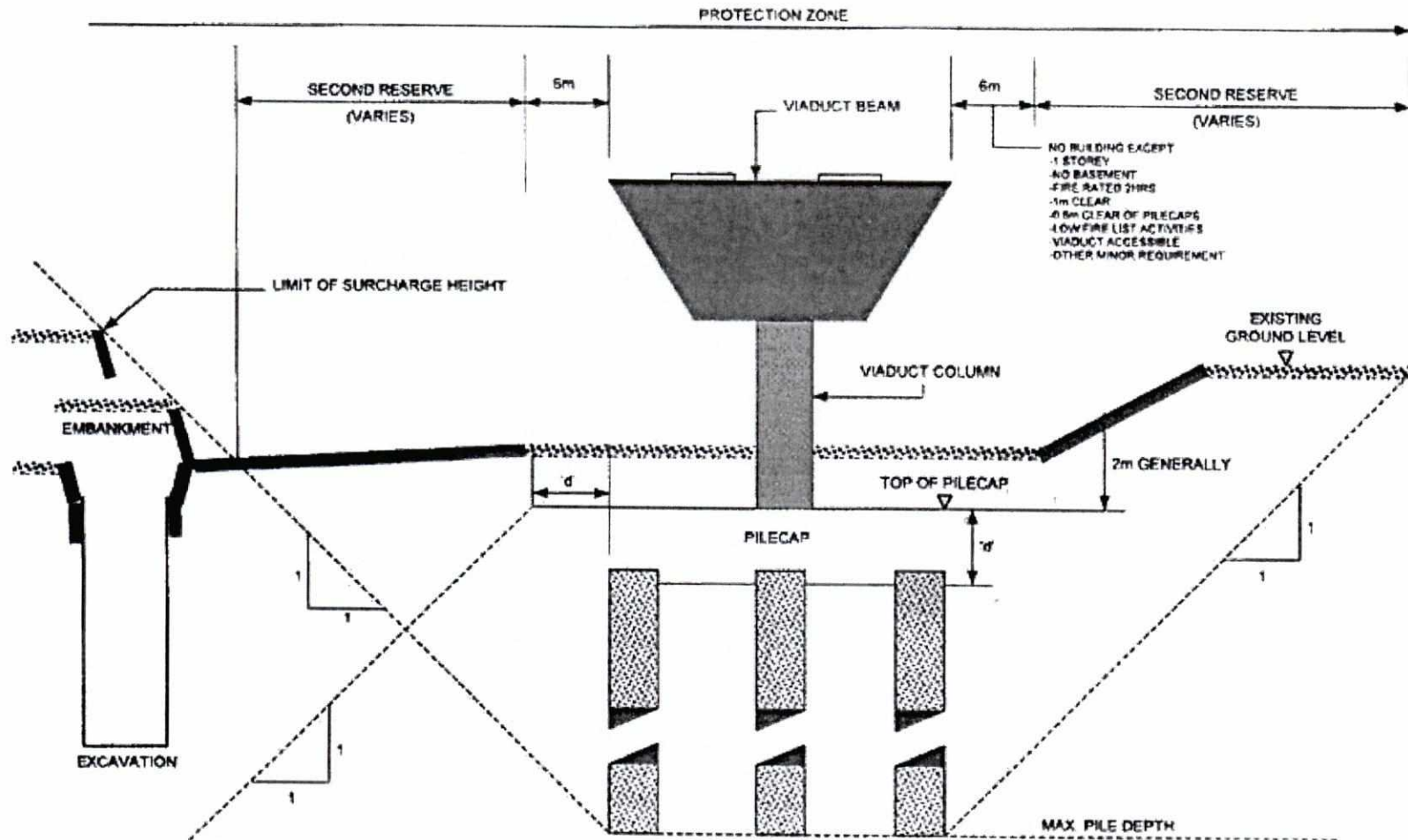
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FIRST SCHEDULE (Regulation 3) - Drawing C
TRANSITION STRUCTURES



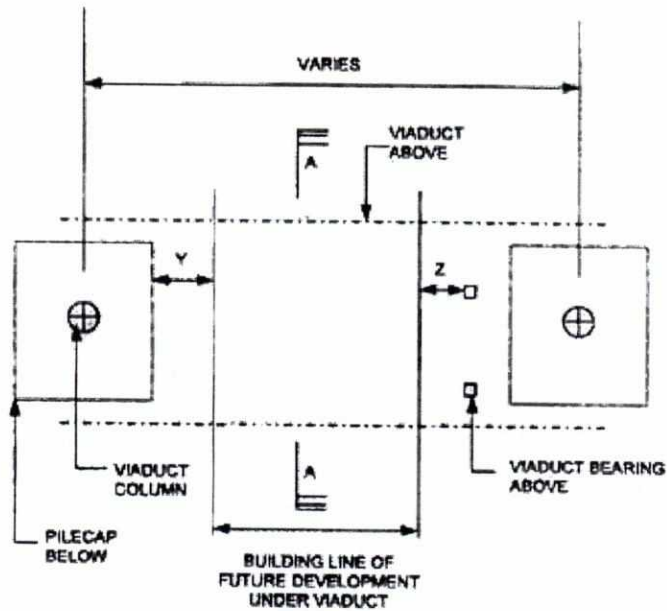
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**FIRST SCHEDULE (Regulation 3) - Drawing D
ABOVEGROUND STRUCTURES**



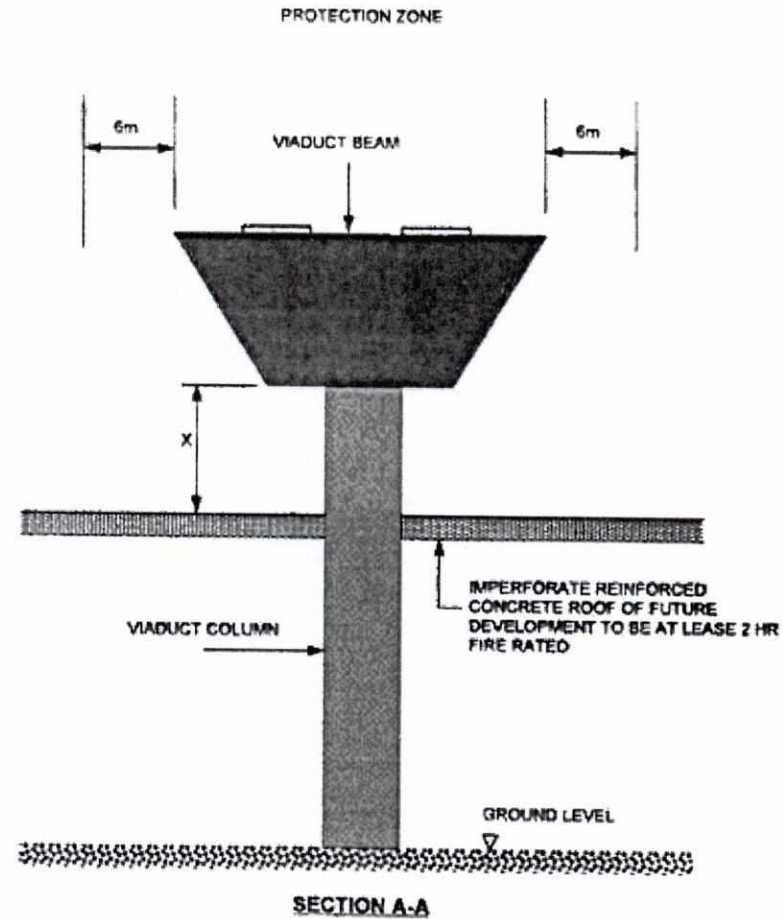
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**FIRST SCHEDULE (Regulation 3) - Drawing E
ABOVE GROUND STRUCTURES**



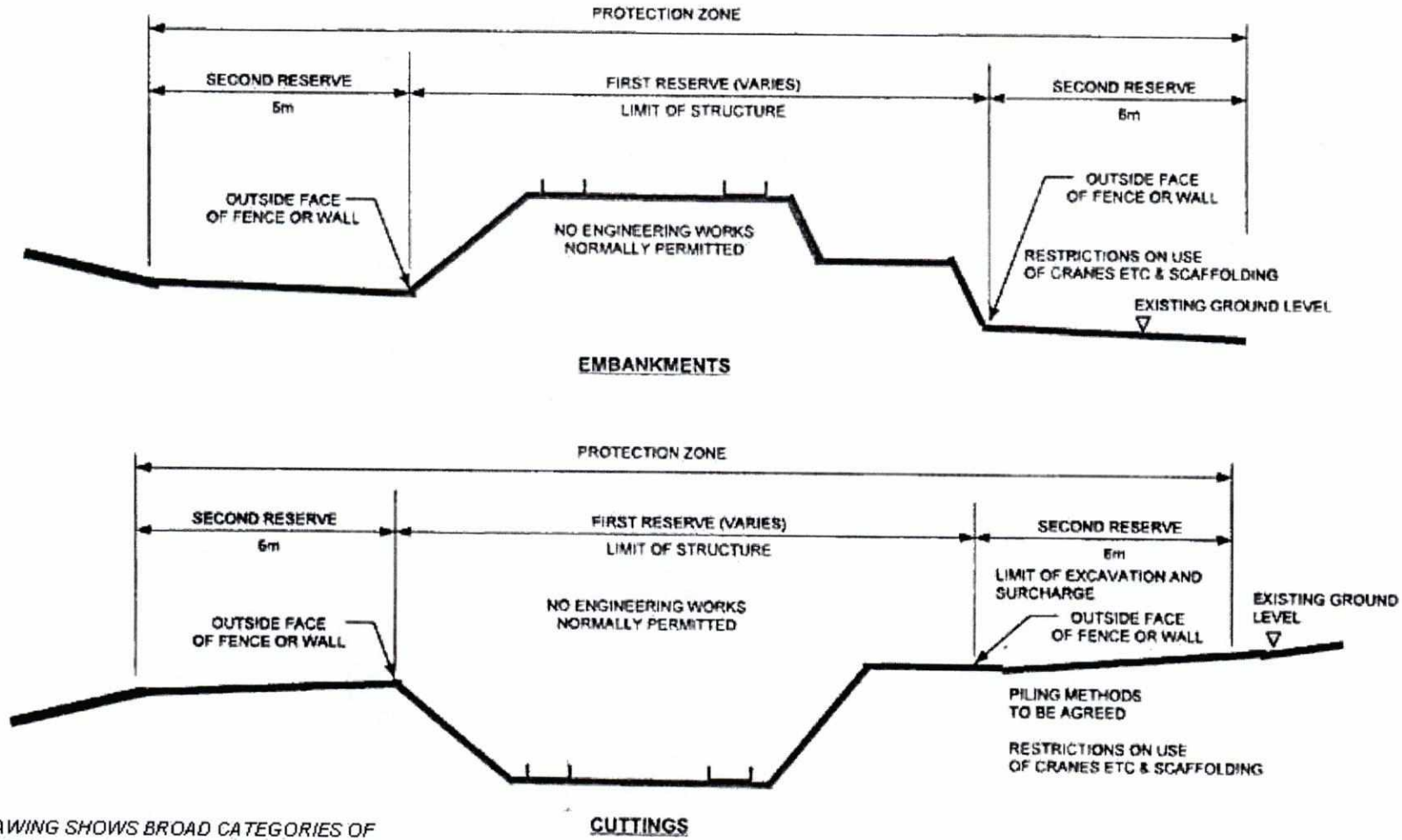
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SECTION A-A

**FIRST SCHEDULE (Regulation 3) - Drawing F
AT GRADE SECTIONS**



THIS DRAWING SHOWS BROAD CATEGORIES OF RESTRICTIONS NEEDED TO PROTECT THE LRT STRUCTURES REFER TO THE REGULATIONS FOR DETAILS