

TECHNICAL GUIDELINES ON THE PROVISION OF RISING MAINS FOR BUILDING UNDER CONSTRUCTION

1. The responsibility of the main contractor of the project is to actively work closely with the PE to ensure that all requirements for the provision of rising mains in the building are complied with and allowed for in the construction stage
2. An inspection checklist has been designed for the provision of rising mains in buildings under construction (see Annex A). The major items in the checklist are elaborated as follows:
 - a. **Provision of dry & wet risers**
 - (i) All rising mains (dry & wet) shall be made operational for all storeys (except the uppermost 3 storeys) as soon as the uppermost completed storey reaches 24m. This is because the uppermost 3 storeys are likely to be struted with props and scaffoldings for the purpose of gaining structural strength. Moreover, some of the staircases may not have been provided yet, hence no access available to the upper storeys.
 - (ii) Dry & wet rising mains shall be installed progressively as the building gains height, in order to provide fire-fighting capabilities to all stages of construction. All outlets, landing valves, inlets, water tanks and pumps, where required shall be provided and made readily operational.
 - b. **Provision of normal lift/ passenger hoist**
 - (i) A normal lift is preferred for the purpose of fire-fighting. However, we are fully aware that this is not possible at the construction stage. As a ready-made alternative, the passenger hoist (usually installed on site) can then be made available for use by firefighters.
 - c. **Provision of electrical supply**
 - (i) A generator set may be used for fire-fighting if the permanent power supply is not available prior to the completion of the building. In a fire situation, an experienced worker should be made available to operate the generator set immediately.

d. **Provision of fire engine accessway**

- (i) It is difficult to provide fire engine accessway during construction stage as the entire site is invariably cluttered with all kind of activities and items such as electrical services, water pipes, excavation works and all kinds of equipment. Space for fire engine accessway may not even be available or, otherwise very limited .
- (ii) However, in spite of the site constraints, adequate fire engine accessway shall be provided where practicable, for the purpose of conducting fire-fighting operations.
- (iii) Where there is no fire engine accessway provided at site, the main contractor should install more portable fire extinguishers at every floor, which would facilitate first-aid fire fighting by construction workers. This would at least help to control any fire that may occur before the arrival of the fire engine. Nevertheless, it is important that good housekeeping is observed.

e. **Provision of adequate pressure & flow**

- (i) It is important to note that for the rising mains to be effective, it must be hydraulically tested and a pressure-release valve installed at the highest point of the riser stack. In the case of wet riser system, a break tank of only 11.5 cubic metre is required to provide for close-range fire-fighting for at least 5 minutes and the continuous flow of water supply can subsequently be drawn from the public fire hydrant. The main contractor should also bear in mind that the break tank must be installed before the building reaches 60 meters mark.
- (ii) For the testing of flow rate for wet riser system (residential & non-residential buildings), the topmost landing valve should be tested (under pump/gravity feed) with a flow rate of at least 27 L/s. This minimum flow rate required for residential buildings will also be applicable to non-residential buildings (commercial building), as the fire hazard in both types of buildings are similar while under construction.

**INSPECTION CHECKLIST FOR RISING MAINS IN BUILDING
UNDER CONSTRUCTION**

S/No	Description	Yes	If no, remedy action/comments
PART A			
1	Dry rising mains shall be installed progressively during the course of construction as per approved plan and made operational for all storeys except the uppermost 3 storeys, for building exceeding 8 storeys or habitable height of 24m.		
2	Wet rising mains shall be installed progressively during the course of construction as per approved plan and made operational for all storeys except the uppermost 3 storeys, for building exceeding 18 storeys or habitable height of 60m. The following shall be provided: a. Break tank with minimum water capacity of 11.5 cubic metre; and b. Fire pumps which are operational and supplied with emergency power supply.		
3	Provision of breeching inlets (2-way / 4-way)* provided as per approved plan. The following shall be complied with: a. Breeching inlets made operational and housed in protective enclosure; and b. Labelled and numbered accordingly.		
4.	Riser stacks labelled and numbered accordingly: a. Earthing to be provided; and b. Air relief valve provided.		
5.	Landing valves provided with blank caps and are strapped and padlocked in closed position.		
6.	Dry rising mains are hydrostatically tested to constant pressure of 13.8 bars for at least 2 hours.		

7.	Flow rate and pressure of wet rising mains are to comply with the following: a. Flow rate of topmost 3 landing valves is not less than 27 l/s; b. Static pressure at landing valves is less than 8 bars; and c. Running pressure is between 2 bars and 5.5 bars.		
8	Lift/passenger hoist ready for firefighters' use shall be provided for building exceeding 8 storeys or habitable height of 24m.		
9	Generator set or adequate PUB power supply shall be provided for emergency lighting and fire-fighting purpose.		
10	Provision of adequate fire engine accessway (where practicable) for fire-fighting purpose.		
11	Adequate portable fire extinguishers to be provided on each floor. Fire extinguisher of 13A rating for every 500sq.m.		

Date inspected: _____ by _____ Signature _____

*Delete as appropriate

ANNEX A

S/No	Description	Yes	If no, remedy action/comments	
PART B : CHECKLIST FOR THE TESTING OF RISING MAINS				
BREECHING INLET		In - Order	Not In - Order	Remarks
1	Inlet housed in protective enclosure			
2	Rigidly support			
3	Labeled " dry/wet Riser Inlet " and numbered accordingly			
4	Clear of obstruction			
RISER				
5	Air relief valve provided			
6	Labeled & numbered accordingly			
7	Earthing provided			
LANDING VALVE				
8	Blank cap provided			
9	Strapped and padlock in closed position			
10	Clear of obstruction			
TESTING OF PRESSURE/FLOW				
11	<u>Dry rising mains</u> a. Pressure constant at 300 psi (20.7 bar) for 30 mins. b. Regularly tested			
12	<u>Wet rising mains</u> a. Static pressure shall not be less than 8 bar b. Topmost landing valve Fully opened (under pump/gravity feed) with flow rate at 27 L/S c. Provide break tank with Minimum water capacity of 11.5m			

Date inspected: _____ by _____ Signature _____

Revised on 1 March 2002