

Riverview City Integrated Township Project

RISK ASSESSMENT

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| STEP 1: DEFINE THE PROJECTS/TASKS |
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a) *What we shall be using is:*

- plant/equipment
- portable electrical equipment
- pressure vessels/boilers
- hazardous substances
- scaffolding
- ladders
- lifts/hoists/cranes/rigging/load-shifting machinery

b) *What our project/task will involve*

- using tools/equipment with moving part(s)
- using tools/equipment that vibrate
- electrical wiring
- welding
- hazardous waste
- excavation / trenches (>1.5m)
- working around electrical installations
- working at a height (>3m)
- working in isolation.
- working in a confined space
- manual handling
- repetitive or awkward movements
- lifting or moving awkward or heavy objects

c) *What our project is not likely to involve:*

- working with x-rays ,or lasers
- working near traffic
- asbestos removal
- heavy demolition work
- Poor ventilation/air quality
- A poorly designed work area for the project/task

d) *What may be the possible situation involving the following?*

- Noise
- Dust/fumes/vapours/gases
- Hot temperatures
- Risk of fire/explosion
- Slippery surfaces/tripping hazards

During Construction Phase:

| 3: ASSESS THE RISK | | | | | |
|----------------------------------|----------------------|------------------------|------------------------|-----------------------|----------------------------|
| | Air Pollution | Water Pollution | Noise Pollution | Soil Pollution | Occupational Hazard |
| A. Material Handling: | | | | | |
| Cement | +M | - | - | +M | +M |
| Steel | - | - | + | - | +M |
| Sand | - | - | - | - | - |
| Stone | - | - | - | - | +L |
| Wood | - | - | -- | - | - |
| Glass | - | - | - | - | +M |
| Hardware | - | - | - | - | - |
| Colour | - | +H | - | +M | - |
| B. Construction Machinery | | | | | |
| Rotary Driller | +L | - | +L | - | +L |
| Mixers | +M | - | +M | +L | +M |
| Excavator | +L | - | +L | - | +H |
| Material Lift | - | - | +L | - | +H |

Risk Factor:

- +** : **Positive**
- : **Negative**
- L** : **Low**
- M** : **Medium**
- H** : **High**

4: CONTROL THE RISK

For any projects/tasks that present a high or extreme risk, a Safe Work Method Statement must be completed.

a) *Note how you will control the risk following the priorities listed to the right. This may include controls like redesigning the workplace, using guards or barriers, ventilation, using lifting equipment or personal safety equipment.*

1. Eliminate the hazard
2. Keep the hazard and people apart
3. Change work methods
4. Use personal protection

b) Note any specific risk assessments required for high-risk hazards. Check whether any hazards noted in step 2 require further assessment or action

hazardous substance risk assessment confined spaces risk assessment
 test and tag electrical equipment sound level test

c) Note Permits/Licenses/Registration required

Demolition work Friable asbestos removal
 Electrical wiring Ionizing radiation sources
 Pressure vessels registers for chemicals, Personal protective Equipment, training, ladders, lifting gear

d) Note certificates of competency/licenses for operators

Scaffolding Pesticide application
 Rigging Crane operation
 Load shifting machinery operation Hoist operation

e) Note emergency systems required

first aid kit Fire control
 extended first aid kit remote communication mechanism
 emergency stop button others
 additional emergency procedures

DISASTER MANAGEMENT PLAN

Disaster is a threat to Environment and Society. Disaster Management Plan (DMP) deals with the preparations to reduce the impacts of Natural and Man-made disasters. Recent rise in the incidence of disasters has alerted us regarding the need of pre-planned DMP which will aim at providing effective and timely relief during disaster through organized manner.

Emergency prevention through good design, operation, maintenance and inspection are essential to reduce the probability of occurrence and also making the occupiers aware of what to do in case of any emergency. The overall objective of a disaster management plan is to make use of the combined resources created or available at the site and/or off-site services to achieve the following:

- Prevent Disasters
- Minimize the effects of the accident on people and property;
- Initiate the rescue and medical treatment of casualties;
- Safeguard other people
- Evacuate people to safe areas with care
- Inform and collaborate with statutory local and state authorities;
- Provide credible information to news media;
- Bring the incident under control;
- Preserve relevant records and equipment for the subsequent enquiry into the cause and circumstances of the emergency;
- Investigate and take steps to prevent recurrence of similar incidents.

DMP follows the Basic structure as shown in Figure 6.1

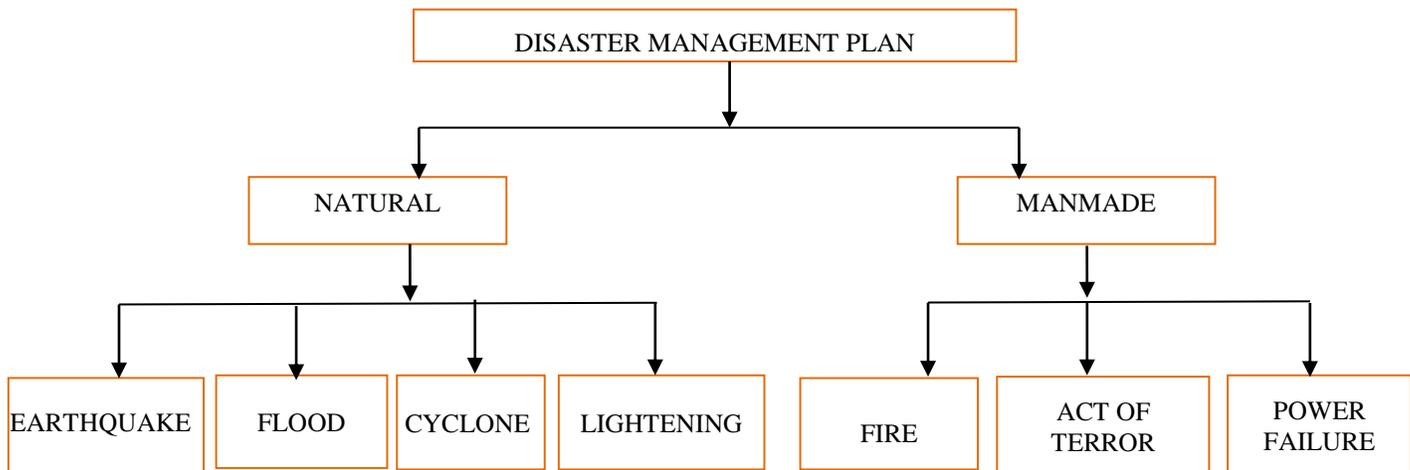


Fig. 1: Basic Structure of DMP

Natural Disaster

A. Earthquake:

Seismic Environment & Precautions

As per the Seismic Zoning Map of India, Pune region falls under Seismic Zone-III. The structural design shall be certified as per IS code 456-2000 Plain & reinforced concrete – code of practice IS 1893 – 2002, criteria for earthquake resistant design of structures.

B. Floods:

Particularly in this district, due to nearness of water bodies chances are to get flooded by accumulation of water from heavy rainfall. Following precautions would be taken by the proponent to manage flood disasters:

- a. Storm water system would be checked and cleaned periodically.
- b. Mapping the areas within or leading in or out of the building that will be water logged, flooded or isolated due to the flood. The areas will be marked after completion and before occupation of the project (as final ground levels etc. will be available after completion).
- c. Basements are not provided in this project.
- d. Dewatering pumps shall be installed at vulnerable locations.

C. Cyclones:

Cyclones are caused by atmospheric disturbances around a low-pressure area distinguished by swift and often destructive air circulation. They are usually accompanied by violent storms and bad weather.

There is no history of any cyclone in this area. However in such an instance the occupants should be advised to stay in the shelter in tightly secured windows and doors. The glass of windows etc. should be covered with paper/cardboards to avoid glass breaking due to flying objects outside.

D. Lightning:

Lightning is an atmospheric electrostatic discharge accompanied by thunder which typically occurs during thunderstorms and sometimes during volcanic eruptions or dust storms. It often leads to physical damage to the building and occupants. It can also lead to short circuits, failure of power supply and fire.

Lightning arrestor systems shall be provided for buildings in this project to abate the impact of lightning hazard.

Man-Made Disaster

A. Fire:

Fire could take place through various means; one of them is through electrical fire. Hence, all the electrical works and material of the building would adhere to the standards. Regular maintenance and audit of the electrical systems would be carried out by external auditors.

Fire alarm would be installed. The functioning of these fire alarms would be checked periodically by security manager. A report of the same would be submitted to safety manager. The same report must be submitted to PP for necessary action. The occupants/residents of the proposed buildings would undergo mock fire drills. These mock drills would be conducted by qualified staff (e.g. fire brigade). Fire extinguishers would be placed in every floor. All occupants/residents would be given training on how to use these fire extinguishers. Fire extinguisher equipment would be evaluated periodically to ensure that it is in working conditions by security manager. If any faulty equipment is observed then it would be repaired or replaced by Society. Proper evacuation plan would be chalked out for the building. The map for the evacuation plan would be provided to all the occupants.

As a township, this project has provision of its own Fire station within the premises, supported by Fire Tenders and trained staff.

Firefighting measures:

For Residential Buildings:-

Hydrant System

- Overhead Storage of 10000 / 20000 litres to required building.(As per Fire NOC / NBC / Maharashtra Fire Act)
- 1 No. of Booster pump for Fire.
- 1 No. of Wet-riser.
- Single Headed Hydrants shall be provided at each Landing Level.
- The System shall be fully charged.
- Automatic sprinkler system in each building having height 45mtr & above

For Commercial Building:-

Hydrant System

- Underground Storage of 50,000 liters for each building (As per Fire NOC / NBC / Maharashtra Fire Act)
- Single zone is proposed for all buildings.
- 1 No. of Electrical driven Multi-stage, Single-outlet Fire Pump & 1 No. Main diesel engine driven.
- 1 No. of Multi-stage, Single-outlet Jockey Pump and same head as above for common Fire Pump room
- 1 No. of Booster pump for Fire on the terrace.
- 1 No. of Wet-risers.
- Double Headed Hydrants shall be provided at each Landing Level.
- The System shall be fully charged.
- Overhead storage of 10,000 / 20,000 liters to required buildings. (As per Fire NOC / Fire Act)

Fire Alarm System

- Main Conventional Analogue Fire Alarm Panel
- Conventional Control Zone Module
- Conventional Monitor Module
- Conventional Manual Call Point
- Fault Isolator Module
- Cabling
- Repeater Fire Panels at strategic locations
- **Fire Appurtenances**
- Fire Extinguishers
- Fire Buckets
- **Sprinkler System**
- Single zone is proposed for all buildings.
- Sprinkler Pump will be provided.

a. Response Sequence during Fire:

i. Person noticing the fire should attempt to isolate and extinguish the fire with the available equipment and Inform or arrange to inform the security regarding the:

- Location of the fire
- Material of burning
- Extent of fire
- Callers name and number

“A proper code of communication shall be maintained wherein the caller makes sure that the message has been conveyed to the right person”.

ii. Security or the coordinators will

- Respond to the scene of the incident.
- Arrange to send the necessary firefighting equipment to the scene of the incident.
- Extinguish the fire with the available equipment.
- Ensure closure of gates immediately to regulate traffic in such a way that free movement of outside assistance like fire tenders, ambulance etc is available.
- Security will cordon off the area and local city fire fighting staff should be notified for further assistance.
- All the occupants will need to stop their operations/ work, switch off lights, fans, machines etc. All persons should assemble to refuge or designated area for fire and hazardous situation.

iii. Reporting and Follow up System

- All cases of fire occurrence, no matter how small, must be reported promptly to the Security for further action to avoid such incident.
- Fire extinguishing equipment once used, should not be returned to its location without it is being recharged/ certified fit by the security.
- All fire extinguishers after use should be laid horizontally to indicate that they have been exhausted.

b. Refuge Area :

The Refuge Area will have the following resources available:

- i. Copies of the Disaster Management Plan.
- ii. Layout Plan of the complex.
- iii. Information regarding Safety Equipment, Fire Fighting material.
- iv. A list of important telephone numbers like those of neighboring police station, Fire Brigade, Hospitals etc.
- v. First - Aid Kit.
- vi. Communication equipment - Internal and External telephones and other communication equipment.
- vii. A separate evacuation plan shall be adopted for evacuation of patients in the hospital

In addition to many of the above measures an attempt will be made to add any site specific steps and manpower based instruction. Instruction should be in multiple languages including “Marathi and Hindi”. The communication equipment will be checked periodically to ensure that they are functional.

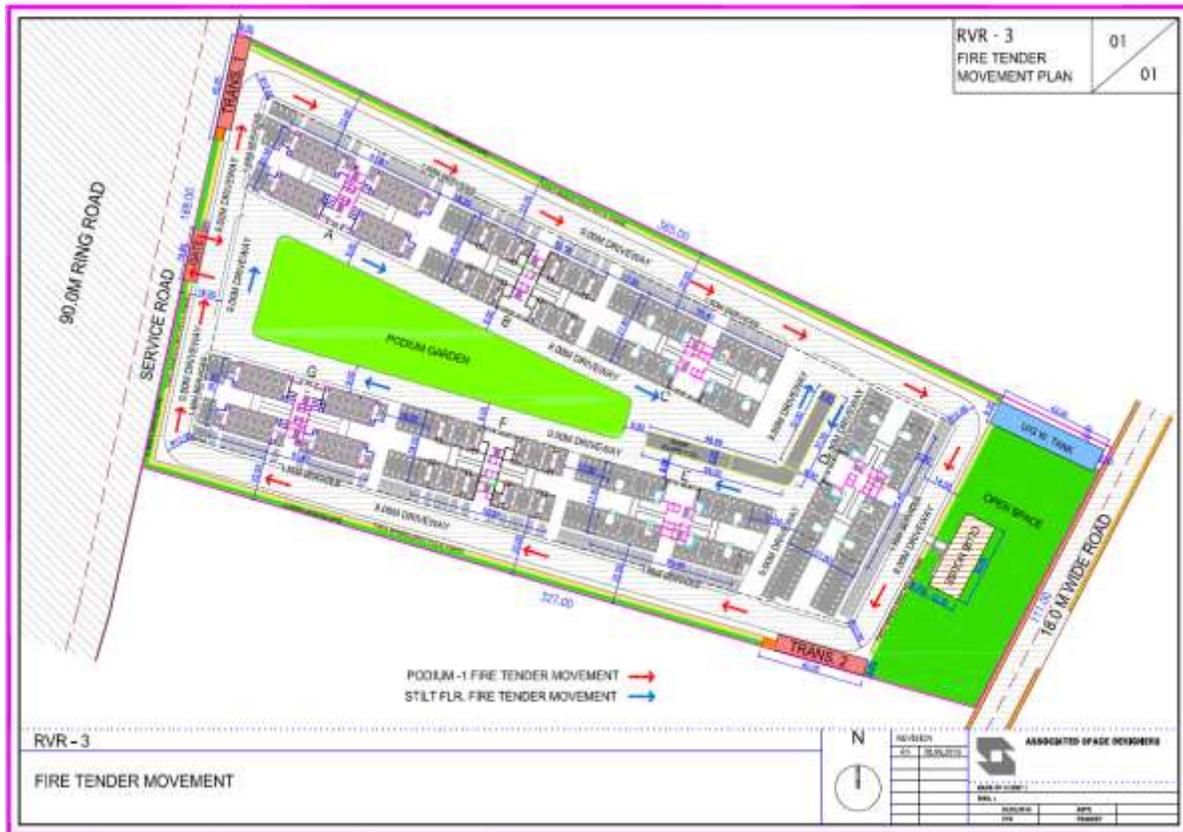


Fig. 2: Typical Fire Engine Movement Layout

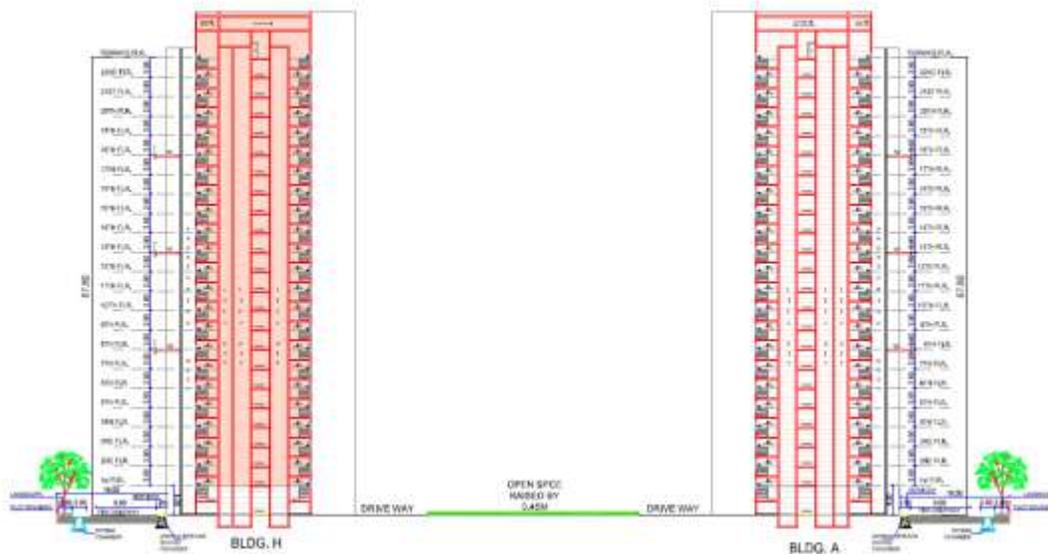


Fig. 3: Fire Tender Movement showing road section

B. Act of terror:

After completion of this project even if each building shall have its own security services, precautions should also be taken at individual level

C. POWER FAILURE:

Power failure is a short- or long-term loss of the electric power to an area. Failure of electrical power to a building will have a serious impact on its operations, particularly if the failure occurs during normal operating hours when the building is fully occupied.

a. Causes of Power Failure:

There are many causes of power failures in an electricity network which are caused by either of the following faults:

- i. Manmade / Technical Fault
 - Faults at power stations,
 - Damage to electric transmission lines, substations or other parts of the distribution system,
 - Short circuit,
 - Overloading of electricity mains.
 - Collision of person or object with utility poles or power transformers,
 - Human error in operating equipment within the building or outside (such as at the utility company supplying the power), or malicious tampering.
- ii. Natural Events.

Natural events include storms, floods, and earthquakes, lightning.

b. Types of Power Failure:

Power failures are categorized into three different phenomena, relating to the duration and effect of the failures:

- i. A transient fault is a momentary (a few seconds) loss of power typically caused by a temporary fault on a power line. Power is automatically restored once the fault is cleared.
- ii. A brownout or sag is a drop in voltage in an electrical power supply.

- iii. A blackout refers to the total loss of power to an area and is the most severe form of power outage that can occur.

c. Effects of Power Failure:

- i. Loss of visibility
- ii. Safety is at risk.
- iii. Stoppage of elevators.
- iv. Computer memory loss and equipment damage.
 - v. Stoppage of working of Fire fighting system.
- vi. Stoppage of working of building utilities like water pumps, Sewage treatment plants etc.
- vii. Loss of comfort.

i. Mitigation plan:

Buildings have emergency and standby power systems to provide safety and comfort to building occupants during interruptions in their normal power supply.

ii. Diesel Generators

DG sets will be installed to provide emergency power to all common services in case of power supply failure. All the common services ie. Utilities, lighting in common areas and Lifts will be considered to provide emergency power supply. When power supply failure is sensed, the DG sets will start automatically and feed to the services connected. The recommended 126 DG sets shall be provided.

iii. Provision of Independent electrical circuits for critical equipment as per Norms

Also as per specific requirement of Firefighting department the Electric supply for Fire pumps, booster pumps, sprinkler pumps will be on independent circuit.

iv. Uninterruptible power supply (UPS)

Uninterruptible power supply, also uninterruptible power source, UPS or battery/flywheel backup is an electrical apparatus that provides emergency power to a load when the input power source, typically the utility mains, fails. A UPS differs from an auxiliary or emergency power system or standby generator in that it will provide instantaneous or near-instantaneous protection from input.

Even if DG sets are provided as power backup a UPS is typically used to protect computers, data centers, telecommunication equipment or other electrical equipment where an unexpected power disruption could cause injuries, fatalities, serious business disruption or data loss.

Offsite Disaster Management Plan

Safeguard Requirements for Natural and Manmade Disasters:

List of nearest clinics and hospitals shall be maintained for medical emergency as also any other eventuality. The table below will be ready and will be distributed to all members within the building and later for off-site plan to neighborhood. These information need to be updated every six months before safety drills. The information thus updated should also be shared with occupants.

Off-site plan addresses all issues which can have impact out-site of the site. Off-site Emergency Plan has many components which need to be in place for effective plan