

# Barricade Installation for Working Near the Running Track of Indian Railways

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**Abstract:** *The paper focuses on establishing safe work practices near running Indian Railway tracks by detailing specific barricade installation methods.*

*It discusses the protocol for preparing work sites, emphasizing the need for detailed planning, proper training, and the use of temporary barricades to maintain track safety during work operations.*

*This paper outlines essential pre-work measures:*

*Contractors must provide requisite training and ensure adherence to safety norms while working near both running tracks and overhead equipment (OHE).*

*Detailed planning is required before any work begins, which includes safety measures to protect both the infrastructure and the workers.*

*During the execution phase:*

*The paper stresses strict compliance with “permit to work” systems, minimizing the infringement of moving dimensions of the railway, and ensuring that work does not encroach on critical safety clearances.*

*Measures such as deploying patrolmen, maintaining proper demarcations, and usage of safety signals like red flags are highlighted to protect both personnel and railway operations.*

*Additional safety considerations include:*

*Traffic block procedures before beginning work that may physically infringe on the defined movement dimensions of the track.*

*Specific guidelines for working near OHE areas and performing electrical work safely, including adherence to Indian Electricity Rules and the use of appropriate insulating and protective gear.*

*This paper provides comprehensive standards for hard barricading:*

*It requires that work conducted near the track center must follow special protocols, such as power block protection and the erection of safety fencing to prevent accidental encroachments.*

*Night operations mandate additional lighting and secure fencing to ensure safe working conditions.*

*This paper has practical implications:*

*It serves as a guide for railway contractors and engineers by setting out explicit precautions, which are essential in ensuring that work near running tracks is conducted with minimal risk to both personnel and the continuity of railway operations.*

*Emphasis is placed on coordination, adherence to documented safety procedures, and active monitoring during both the planning and operational stages.*

**Keywords:** Barricading, Safety, Tracks, Schedule of dimensions, Indian Railway, IR, Traffic Block, Lookout, Overhead Equipment (OHE)



## **I. INTRODUCTION**

The primary focus of Indian Railways is 'Safety', which cannot be disregarded. Engaging in work close to the tracks poses risks; any breach of the moving dimensions may result in train accidents, causing substantial harm to both human lives and the machinery utilized. Therefore, it is important to enforce all safety precautions as detailed in the instructions, which should be strictly followed during work on or near the tracks. This paper is expected to serve as a valuable resource for the technical staff of Contractors who are involved in the construction and maintenance operations of Indian Railway tracks.

It has been observed that proper safety measures should be implemented to safeguard both personnel and machinery during work adjacent to the track. The nature of the work along the track includes track renewals, gauge conversions, doublings, and bridge reconstruction, among others. These activities, primarily performed by contractors' personnel and machinery, present safety challenges, and any infringement of moving dimensions could lead to train accidents. It is essential for every individual associated with the track to be safety-oriented and to avoid shortcut methods during the execution of various track works. This paper summarizes the precautionary measures while working on Indian Railway tracks.

Where the schedule of dimensions (SOD) of Indian railways (IR) for the running tracks is likely to be infringed by the contractor, the following safety measures shall be ensured,

### **Measures before the start of the work**

- Contractor to provide necessary training to their supervisors and staff and shall ensure that they are known of the safety norms to be followed for working in the premises of IR and in the vicinity of running tracks and electrified territories.
- Inform the Engineer / Employer about:
- Name and address of the contractor's supplier/subcontractor assigned to execute the work.
- Name of the vehicle drivers/equipment operators identified for the work
- Location, duration and timings during which the SOD of IR is to be infringed.
- Provide the Engineer / Employer with:
- Copy of detailed planning of work, including protection of IR track and safety measures proposed (duly approved by the Engineer)
- Copy of the competency certificate of the contractor's supervisor in charge of the work (to be issued by the Engineer)
- Demarcate the working area at the site in consultation with the Engineer / Employer
- Barricade / temporary fencing along the stretch of the concentration of the work area along the IR track, as consented by the Engineer.
- Provide adequate watch, flagman, lighting, etc., including signage boards.

### **Measures during the Execution of work**

- It shall be ensured that no workmen and staff are working on the line/tracksides unless a proper 'permit to work' is issued for those lines by the Indian Railways and the Engineer.
- It shall be ensured that the moving dimensions of IR shall not be infringed. In case of track crossing, the work is required; the same shall not be carried out without permission from the Engineer and IR. Safety of all the existing fixed structures in the vicinity of the site shall also be ensured.
- No vehicles shall be operated within 6m of the center of the IR track without the specific approval from the Engineer / Employer. Individual vehicle/construction equipment shall not be left unattended. No vehicle shall ply from sunset to sunrise and during the period when the visibility is impaired, except in case of emergency and with the consent of the Engineer.



- Where the construction vehicles are required to ply along the existing running tracks of IR, the contractor shall deploy adequate patrolmen to prevent the tendency of the vehicle drivers to come close to the tracks and infringe.
- All the drivers of the road vehicles/machines plying near the running tracks of IR shall be provided with a red flag / red lamp so that in the event of any obstruction, they can stop the incoming train.
- It shall be ensured that the line of demarcation shall not be infringed by the road vehicles/construction equipment.
- It shall be ensured that the eligible and competent staff shall be employed for the work and they must wear identity card while working near running tracks of IR.
- For working during night, sufficient illumination shall be provided for the entire work area for the safety of the workmen and the public.
- Temporary Engineering signals as required shall be provided.
- Existing engineering indicator boards shall be lit as per the Permanent Way Manual (PWM) of Indian Railways.
- Lookout man with red and green flags/hand signals and whistle shall be deployed wherever required.
- No part of the stacked material should infringe the moving dimensions of IR. Material shall be stacked to such a height that it does not lead to infringement of SOD in case of accidental toll off.
- Any temporary arrangement shall not infringe with the moving dimensions of IR.
- Where the work is planned to be done within 3.5m from the centre of the IR tracks, it shall require a traffic block, and all the necessary safety precautions shall be ensured as per the Permanent Way Manual of Indian Railways.
- A first aid kit shall be readily available at the site.
- In case any cable/ utility is found while working, the contractor shall inform the Engineer immediately. In case a large number of cables /utilities are found during excavation, the work shall be carried out in the presence of a representative from the concerned owning agency of the utility/cable.
- It shall be ensured that the existing emergency sockets of IR are not damaged.

#### **Additional Measures Required during Traffic Block**

- Any work that infringes the moving dimensions of IR shall be started only after a traffic block has been imposed and the IR track is protected.
- All the work intended to be completed during the traffic block shall be completed within the duration of the traffic block, and the duration of the traffic block shall not be exceeded.
- The traffic block shall be considered as cleared of the moving dimensions, and the IR track is left with proper track geometry so that IR trains can run safely.

#### **Safety Measures while working in the OHE Area**

- While working near the OHE area, the safety guidelines as specified in para 20301, 20327, 20334, 20335, 20529, 20612, 20614, 20714, 20825, 20833, 21206, and 21207 of Volume II, Part 1 of the AC Traction Manual of Indian Railway shall be followed.
- No electric work close to the live OHE shall be carried out without a power block and specific approval from the Engineer / Employer.
- A minimum distance of 2m shall be maintained between live OHE wire and any body part of the workmen or tools or metallic support, etc.
- No electric connection shall be tapped from OHE.



### **Safety Requirements for Electrical Works**

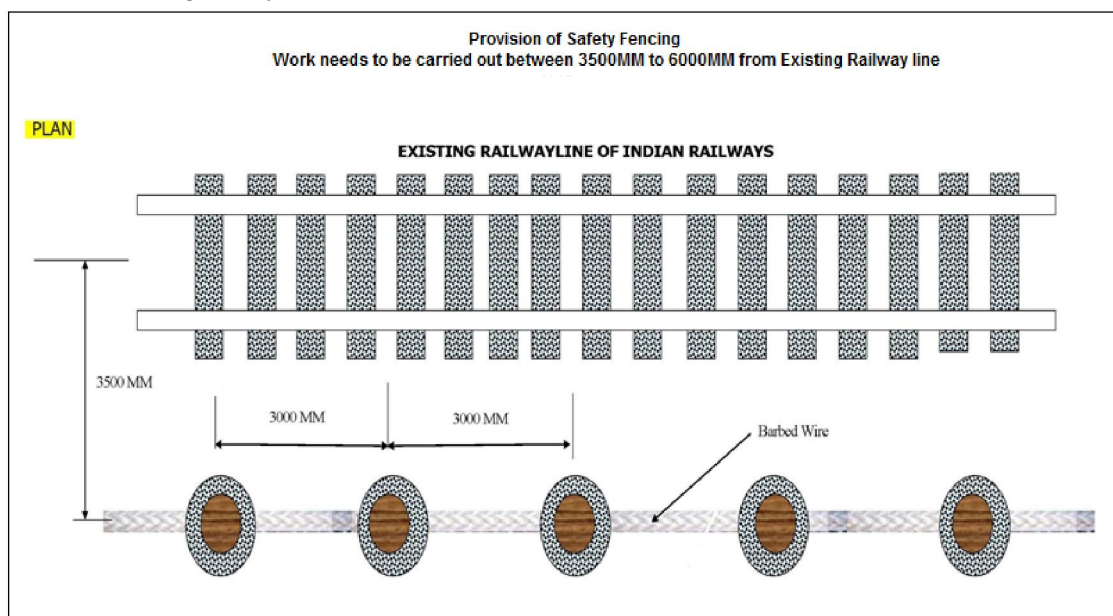
- The Indian Electricity Rules 1956, as amended up to date, shall be followed. The detailed instructions on safety procedures given in BIS and Indian Electricity Rules, the respective State Electricity Authorities regulations with up-to-date amendments, shall be applicable.
- The LT/HT distribution diagram of sub-stations shall be prominently displayed. The substation premises, main switch rooms, and Distribution Board enclosure shall be kept clean whenever works are carried out either inside or outside.
- No inflammable materials shall be stored in places other than the rooms specially constructed for this purpose under the provisions of the Indian Explosive Act.
- Rubber insulating mats of suitable size and thickness should be provided in front of the switch boards of sub-stations or any other control equipment of medium voltage and above.
- Protective and safety equipment such as rubber gauntlets or gloves, earthing rods, linemen's belt, portable artificial respiration apparatus, safety goggles, etc., shall be provided as per the requirements of the work.
- A necessary number of caution boards, such as Man Working on Line, Don't Switch On, shall be readily available in the vicinity of the electrical installation.
- Standard first aid boxes containing materials as prescribed by the St. John's Ambulance Brigade or the Indian Red Cross shall be made available.
- A chart displaying methods of giving artificial respiration to a recipient of electrical shock (One in English and another one is in the regional language) shall be prominently displayed at appropriate places.
- No work shall be undertaken on live installations, or on installations which could be energized, unless another person is present to immediately isolate the electric supply in case of any accident and to render First Aid, if necessary.
- No work on live L.T. Bus Bar or pedestal switch board in the sub stations should be handled by a person below the rank of a licensed wireman, and such work should preferably be done in the presence of a qualified engineer.
- When working on or near live installations, suitable insulated tools should be used, and special care should be taken to see that those tools accidentally do not drop on live terminals, causing shock or a dead short.
- The electrical switch controls in distribution boards shall be marked to indicate the areas being controlled by them.
- Before starting any work on the existing installation, it shall be ensured that the electric supply to that portion is cut off. Precautions, like displaying Man at Work caution boards on the controlling switches and removing fuse carriers from these switches, shall be taken against accidental operation. Caution boards shall be kept by the person working on the installation.
- All electrical panels and switch gear shall conform to the relevant IEC standard.
- All external enclosures shall have a degree of protection not less than IP-54.
- All equipment/ system shall conform to the relevant IEC Standard on Electromagnetic compatibility (EMC)
- Cable routes of all the newly laid cables by the contractor shall be identified with electronic or concrete markers.

### **Hard barricading requirement:**

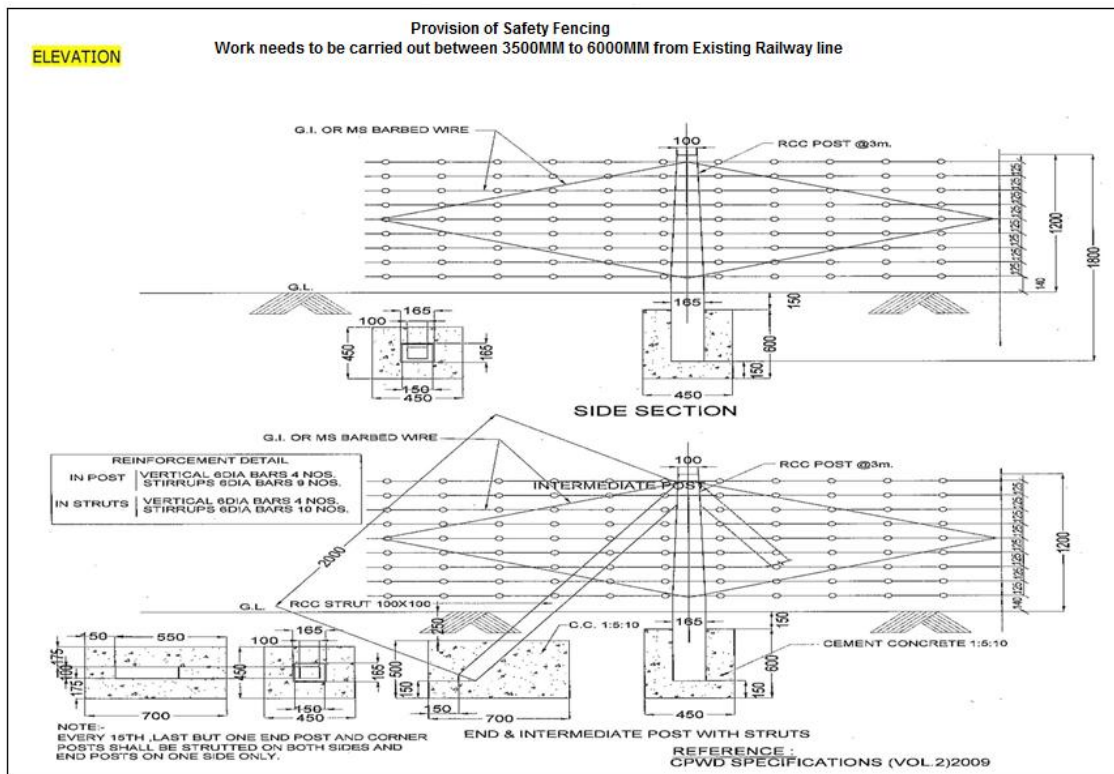
- Whenever work is to be executed near a running Indian Railway track then the following safety measures would be adopted.
- Works which is executed within 3.5m from the center line of the existing Indian Railway track will be executed under a power block from the relevant railway authority.
- For works to be executed beyond 6 m from the center line of the existing Indian Railway track, it will be ensured that no vehicle/construction equipment infringes the demarcation line marked at 6 m from the center of the existing railway track.



- Any material unloaded along the track will be kept clear of moving dimensions and stacked at a minimum of 3.5 m from the track center of the running track.
- Movement of vehicles/working of machinery will not be permitted during the night. In case night working is to be adopted, proper fencing at 3.5 m from the track center of the running track will be erected to ensure that no infringement of the moving dimension takes place. Suitable lighting arrangements will also be done.
- Works which is executed within 3.5m from the centre line of the existing Indian Railway track should be executed under block protection and with a permit to work from the concerned railway authority & Engineer.
- For works to be executed between 3.5 m to 6 m from the centre line of the existing Indian Railway track, work is to be executed after the erection of safety fencing as per the approved plan. (as drawing on the next page)
- For works to be executed beyond 6 m from the centre line of the existing Indian Railway track, it must be ensured that no vehicle/construction equipment infringes the demarcation line marked at 6 m from the centre of the existing railway track.







Overall, the conclusions drawn from the paper stress the need for stringent planning, a clear chain of command, and robust safety procedures when working near active railway lines. These guidelines not only aim to protect human lives but also preserve track integrity and ensure seamless train operations.

## REFERENCES

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- [2]. Safety Precautions at Worksite adjacent to track – Indian Railways

