MINISTRY OF RAILWAYS

(Railway Board)

NOTIFICATION

New Delhi, 21st July, 2000

The Railways Opening for Public Carriage of Passengers Rules, 2000.

G.S.R. 625(E).—In exercise of the powers conferred by sections 28, 29 and 198 of the Railways Act, 1989 (24 of 1989), the Central Government hereby makes the following rules, namely:—

CHAPTER I

PRELIMINARY

1. **Short title, commencement and application** -(1) These rules may be called the Railways (Opening for Public Carriage of Passengers) Rules,2000.

(2) They shall come into force on the date of their publication in the Official Gazette.

(3) They shall apply to Government railways and also to non-government railways.

2. **Definitions** - In these rules, unless the context otherwise requires, –

(a) "Act" means the Railways Act, 1989 (24 of 1989);

(b) "Bridge Engineer" means the Chief Engineer, the Deputy Chief Engineer (bridges) or any other engineer responsible for the construction and design of bridges ;

(c) "Commissioner" means the Chief Commissioner of Railway Safety or

a Commissioner of Railway Safety appointed under section 5;

(d) "carriage" means the carriage of passengers or goods by a railway administration;

(e) "Form" means a form appended to these rules;

(f) "General Manager" means,—

(i) in case of a Government railway, the General Manager of a Zonal Railway appointed under section 4 and includes the Chief Administrative Officer, the Chief Project Manager or any other officer, not below the rank of Under Secretary to the Government of India, who is the Head of the Department and to whom the powers of the General Manager have been delegated by general or special order under section 28; and

(ii) in the case of a non-Government railway, the person who is the Chief Executive of that railway, by whatever name called and such other officer of that railway to whom the powers of the Chief Executive have been delegated;

(g) "General Rules " means the Indian Railways (Open Lines) General Rules,1976, as amended by the Indian Railways (Open Lines) General Amendment Rules, 1991 ;

(h) "Government railway " means a railway owned by the Central Government ;

(i) " Inspection Report "means the inspection report of the Commissioner given under rule 18 ;

(j) "level crossing" means an inter-section of a road with lines of rails at the same level ;

(k) " non-Government railway "means a railway other than a Government railway ;

(l) "passenger" means a person travelling with a valid pass or ticket;

(m) "railway" means a railway, or any portion of a railway, for the public carriage of passengers or goods, and includes -

(1) all lands within the fences or other boundary marks indicating the limits of the land appurtenant to a railway ;

(2) all lines of rails, sidings, yards, branches used for the purposes of, or in connection with, a railway and includes bridges over which lines of rails passes;

(3) all electric traction equipment, power supply and distribution installations used for the purposes of, or in connection with, a railway;

(4) all rolling stock, stations, offices, warehouses, wharves, workshops, manufactories, fixed plant and machinery, roads and streets, running rooms, rest houses, institutes, hospitals, waterworks and water supply installations, staff dwellings and any other works constructed for the purpose of, or in connection with, railway;

(5) all vehicles which are used on any road for the purposes of traffic of a railway and owned, hired or worked by a railway; and

(6) all ferries, ships, boats and rafts which are used on any canal, river, lake or other navigable inland waters for the purposes of the traffic of railway and owned, hired or worked by a railway administration, but does not include -

(A) a tramway wholly within a municipal area; and

(B) lines of rails built in any exhibition ground, fair park, or any other place solely for the purpose of recreation ;

Explanation. - For the purpose of these rules, "railway" shall include newly built railway lines, either as extension of an existing railway, or as double

or multiple lines alongside an existing one, conversion of railway from one gauge to another, restoration of abandoned lines, the use of electric motive power or change of traction from Direct Current(DC) to Alternate Current(AC) on an existing line;

(n) "railway administration", in relation to –

(a) a Government railway, means the General Manager of a Zonal Railway; and

(b) a non-Government railway, means the person who is the owner or lessee of the railway or the person working the railway under an agreement and includes the Chief Executive of that railway by whatever name called;

(o) " railway servant " means any person employed by the Central Government or by any railway administration in connection with the service of any railway ;

(p) "rolling stock" includes locomotives, lenders, carriages, wagons, rail-cars, containers, trucks, trolleys and vehicles of all kinds moving on rails;

(q) "section", means a section of the Act ;

(r) "Schedule" means a Schedule annexed to these rules ;

(s) "traffic" includes rolling stock of every description as well as passengers and goods;

(t) "Zonal Railway" means a Zonal railway constituted under section 3 and in the case of a non-Government railway such division or section of that railway as the Central Government may, in consultation with that railway, notify ;

(u) all other words and expressions used in these rules, but not defined shall have the same meanings, respectively assigned to them in the Act and in the Indian Railways(Open Lines) General Rules,1976.

CHAPTER II

PREPARATION FOR OPENING OF RAILWAYS

1. **Reference to the Commissioner** - (1) Every railway administration shall ensure that the railway line or a portion thereof to be opened for public carriage of passengers is complete in all respects as per the Indian Railways Standard Codes and Manuals of Practice and for such opening all the administrative formalities are complete and that the working of the railway is regulated by the Indian Railways(Open Lines) General Rules,1976. – or any other General Rule as app. by the C. Govt & notified in the Gaz. of India

2. The Chief Executive of the railway administration of a non-Government railway, before making a reference to the Commissioner under sub-rule(3) for inspection of any railway, shall obtain a clearance from the Central Government that the railway which is sought to be opened has been constructed and maintained by that administration in accordance with the Indian Railways Standard Codes and Manuals of Practice and the working of the railway is governed by the Indian Railways(Open Lines) General Rules,1976.

3. Where the General Manager of a Zonal Railway, or the Chief Executive of a non-Government railway is of the opinion that any railway or part thereof is required to be opened for public carriage of passengers, he shall refer the matter to the Commissioner for inspection and report on the safety of that railway.

4. **Supply of certain documents to Commissioner** -(1) The General Manager of a Zonal Railway or the Chief Executive of the non-Government railway shall furnish all the relevant documents to the Commissioner while making reference to the Commissioner for inspection under rule 3 from the following list of documents, namely :-

— 14 —

(a) Tabulated details;

(b) Index Plan and Section of railway;

(c) Drawings of works;

(d) List of questions and answers;

(e) Certificates;

(f) List of infringements of Maximum and Minimum Dimensions;

(g) Working orders to be enforced at each station; and

(h) Administrative note giving the salient features of the project.

(2) The documents referred to in sub-rule (1) shall indicate the distances from the same *"fixed point"*, in kilometres and decimals up to two digits and the *fixed point* shall be clearly defined in a *Note* and on the Plan and Section sheets of the work documents.

(3) The *datum* adopted shall be "Mean Sea Level" as fixed by the Survey of India and all heights shall be mentioned with reference to the *datum* in meters and decimals up to two digits.

5. **Contents of documents to be supplied** - The documents referred to in rule 4 shall contain the details as specified below:-

(1) Tabulated details which shall consist of important characteristics of the railway or a portion of railway to be opened for public carriage of passengers and in particular include -

(a) Curve abstract as specified in Form I;

(b) Gradient abstract as specified in Form II;

(c) Bridge abstract as specified in Form III;

(d) Important bridges – particulars of waterway and construction as specified in Form IV;

(e) Ballast and Permanent Way as specified in Form V;

(f) Stations and station sites as specified in Form VI;

(g) Station accommodation as specified in Form VII;

(h) Station machinery as specified in Form VIII;

(i) Level crossing abstract as specified in Form IX;

(j) Brief particulars of traction installations as specified in Form X;

(k) Power supply installation abstract as specified in Form XI;

(l) Traction maintenance depot abstract as specified in Form XII;

(m) Restricted Over Head Equipment clearances abstract as specified in Form XIII; and

(n) Electrical crossing over railway track abstract as specified in Form XIV.

(2) Index Plan and Section sheet shall be prepared as laid down in paragraphs 443 to 451 of the Indian Railways Code for the Engineering Department as reproduced in Schedule.

(a) Completion drawings of bridges, with drawings showing each type of girders used and giving the loading standard for which each is designed, and (if called for by the Commissioner), details of the calculations of their strength;

(b) Completion drawings of tunnels, if any;

(c) Diagrammatic plans of station yards showing the gradients, the layout of tracks and particulars of turn out, block working and of any signals and interlocking installed;

(d) Implantation of diagrams of Over Head Equipment masts, if applicable.

(3) List of Questions and Answers shall be prepared in terms of questions enlisted in Form XV.

(4) Certificates of works shall comprise -

(a) Certificate in Form XVI containing the comments on the following

matters, namely :-

(i) maximum and minimum dimensions;

(ii) strength of bridges;

(iii) number of engines on one span ;

(iv) brake and communications;

(v) accommodation in coaches to cater for different categories of passengers ;

(vi) system of working;

(vii) electric traction equipment (only if applicable); and

(viii) types of rolling stock proposed along with list of restrictions.

(5) List of infringements of maximum and minimum dimensions shall be prepared in Form XVII and shall show the gauge of the railway and items infringed and shall contain full explanation for the infringement and the reference to the authority under which the infringement is permitted or allowed.

(6) Working orders to be enforced at each station on the railway to be opened shall be prepared in accordance with the rules provided in Chapter V of the General Rules and shall specify any special conditions that are required to be met with.

(7) Where it involves introduction of electric traction on the railway line the working orders shall include traction working rules.

CHAPTER III

DUTIES OF THE GENERAL MANAGER

6. **Deviation from or infringement of Standard Codes and Manuals of Practice to be notified** - (1) The General Manager shall ensure that the railway proposed to be opened is operationally fit in every respect before inspection.

(2) The General Manager shall, while making the reference under rule 3, bring to the notice of the Commissioner any deviation in design, material and construction of the works, rolling stocks or appliances of the railway, instances in which Maximum and Minimum Dimensions have not been observed, or the bridges, tunnels are not capable of carrying the prescribed or standard load without exceeding the stress specified in the Indian Railways Standard Codes and Manuals of Practice.

7. **General Manager to make special arrangements** - (1) The General Manager shall make such arrangements as are necessary to facilitate the inspection by the Commissioner, of the railway, which is to be opened.

(2) The General Manager shall be responsible to make such special arrangements as the Commissioner may require for inspection and testing of bridges and tunnels on the railway, which is to be opened.

8. **Supply of information to Commissioner** - The General Manager shall supply all the information and give all the assistance in his power to the Commissioner and supply or provide all instruments and apparatus required for making measurements, testing of bridges and electrical and other installations.

9. **Dismantling of any work on request by Commissioner** - (1) The General Manager shall, on receipt of a request made by the Commissioner, make arrangements to dismantle any structure on the railway to be opened, with a view to make complete examination of the details or workmanship of the structure, as quickly and completely as possible.

(2) The Commissioner, while requesting the dismantling of the structure, shall be responsible to see that such dismantling does not arfect the utility or strength of the structure, unless total dismantling is necessary for its proper inspection.

10. **General Manager to accompany Commissioner at inspection** - (1) The General Manager shall accompany the Commissioner throughout the inspection.

(2) If, for any unavoidable reason it is not possible for the General Manager to accompany the Commissioner, then, an officer not below the rank of Under Secretary to the Government of India authorised by general or special order of the Central Government issued under section 28, shall accompany the Commissioner and shall be present during the entire period of inspection.

(3) During the inspection of each portion or division of the railway, the engineer or officer who is or was in immediate charge of that portion or division of the railway during its construction may also be present.

(4) An officer not below the rank of Assistant Engineer shall be made responsible for making arrangements for testing bridges on the railway line.

CHAPTER IV

DUTIES OF THE COMMISSIONER

11. **Commissioner to make full and complete examination** - (1) On receiving a reference under rule 3 from the General Manager of any railway for inspection of a railway to be opened for public carriage of passengers, the Commissioner shall, with a view to determine whether it is fit to be so opened, enquire into all matters which appears to him relevant for the safety of public carriage of passengers and goods, on that railway.

(2). The Commissioner shall satisfy himself that -

(a) the Indian Railways(Open Lines) General Rules,1976 have been applied to the railway or portion of a railway proposed to be opened;

(b) the maximum and minimum dimensions have been observed;

(c) the works, structures, rolling stocks and appliances belonging to, or working on, the railway are designed properly or constructed in such manner so as to guard the system against accident and failure.

12. **Provisions for handling traffic at stations** -The Commissioner shall satisfy himself that at every station on a railway proposed to be opened -

(a) adequate provisions have been made for handling of traffic of passengers and goods; and

(b) arrangements have been made for easy access by road.

13. **Accommodation works** - Where the accommodation works made under section 16 are to be inspected, the Commissioner shall ensure that such works are sufficient and suitable for the purpose for which they are provided or constructed.

14. **Inspection of light railways** - The Commissioner shall, while

inspecting any light railway to be opened for public carriage of passengers, take into consideration -

(a) speed limits which are specified with reference to narrow gauge of the line and the kind of traffic proposed to be handled;

(b) standard of convenience of the passengers keeping in view the condition in which the light railway shall be operated,

and shall lay down the speed limits to be observed and the kind of traffic the light railway may be allowed to handle.

15. **List of questions and answers** - (1) The Commissioner shall take into consideration the answers provided by the General Manager to the questions listed in the list of questions and answers submitted in relation to them under sub-rule (4) of rule 5 and satisfy himself that the points enumerated therein have been duly observed by the concerned railway administration.

(2) The Commissioner may, if he considers it necessary, modify the requirements specified in answers in accordance with the circumstances of each case.

16. **Inspection of railway bridges** - (1) The Commissioner shall satisfy himself that the railway bridges and other elevated structures on the railway proposed to be opened for public carriage of passengers are designed and constructed as to the loads specification specified in the IRS Bridges Rules, 1964 and that the loads specification and stress limits are not exceeded.

(2) The Commissioner shall be responsible to see that under no circumstances the stresses specified in the Standard Codes of Practice for bridges are exceeded, unless the Central Government, by general or

special order, specify different stresses or loads specification, for the reasons recorded therein, in a specific case.

(3) Where the Commissioner is satisfied that first class standards are not required in the cases such as temporary bridges, railway worked at low speed or with small axle loads, he may recommend departure from the IRS Bridge Rules, 1964 and the Standard Codes of Practice on such conditions as he may deem fit, provided that the Commissioner shall forward with his report the calculations showing that the opening of such bridges, railways or axle loads will not be dangerous to the public carriage of passengers and the railway servants.

(4) Where any particular bridge is not up to the standards mentioned in sub-rules (1) to (3), the Commissioner shall submit the design of the bridge along with the standard of loading to the Central Government along with his recommendations as to whether the bridge may be brought in use and if so, under what conditions.

17. **Procedure for inspection of bridges** - (1) The Commissioner shall examine at least one bridge of each different pattern or type and satisfy himself about the adequacy with reference to safety of -

(a) the general design of the bridge;

(b) designs of different parts or portions of the bridge;

(c) the construction and erection of the whole structure of the bridge;

(d) girder spans and their bedding at all four supports; and

(e) type and design of bearings in regard to pre-stressed bridges.

(2) Where the Commissioner feels that it is necessary for the purpose of inspection and to see whether any riveting has been properly and efficiently executed, he may order the cutting out any rivets and may also order the dismantling of any part of the structure of the bridge for more detailed examination.

(3) If the Commissioner considers it necessary, in addition to the certificate of a Bridge Engineer employed for the purpose, he can call for the Load Deflection Test under the loads for which the bridge is designed and where this is not possible under the heaviest loads available.

(4) (a) When making Card Deflection Test, the test cards are to be placed at right angles to the centre line of the track, in order to record oscillation and the recording pencil point should be as fine as possible.

(b) When central deflection is measured, allowance shall be made for the deflection, if any, of the abutments.

(5) In order to record the static deflection, the test shall be carried out at dead slow speed and at the maximum permissible speed of the section and the speed shall be carefully measured by stopwatch or by some automatic means.

(6) The actual deflection cards shall be submitted to the Commissioner together with a statement of deflections and oscillations in Form XVIII.

(7) The deflection of the girder shall be worked out theoretically and shall be shown in column 12 of Form XVIII to enable a comparison being made with the observed deflection.

(8) In addition to the Card Deflection Test, the Commissioner may, at his discretion, require Stress Recorder Test to be carried out on any plate or open web girders of clear spans exceeding 30 metres.

(9) (a) Stress Recorder Test shall be carried out with a stress recorder of approved type.

(b)Tests loads and speeds shall be as specified for card Deflection Tests.

(c)Tests shall be taken, on the chords or flanges at mid span and on such web and floor members as the Commissioner shall specify.

(d) If a sufficient number of instruments are available, these tests shall be made simultaneously.

(10) The stress recorder diagrams together with calculations showing how the maximum stress under the design load with full impact (including dead load stresses) is deduced from the measured stress shall be submitted to the Commissioner who shall, before sanctioning the opening of the bridge, satisfy himself that the stresses in the girders will not exceed those specified in the IRS Steel Bridge Code, 1962.

(11) If the Commissioner is satisfied that the girder has been properly designed for the work it is intended to perform, then, the open web and plate girders are not required to be tested.

(12) New plate girders of standard designs need not be tested if those girders were inspected at the time of their manufacture by the Research, Design and Standards Organisation or any other inspecting agency and a certificate of satisfactory erection including the seating of the bearings and field riveting has been given.

(13) The Commissioner may decide that the second hand plate girders are not required to be tested if he is satisfied that -

(i) the girder is strong enough for the work it is intended to perform; and

(ii) the responsible officer of the concerned railway has certified that the condition of the material and workmanship are such that the use of the girder for the specified loading shall not involve stresses in excess of those permitted in the IRS Steel Bridge Code,1962, provided that this sub-rule shall not apply to welded girders.

(14) The Commissioner may have tests of any number of spans made and may have a span tested any number of times and at any speeds as he considers desirable, up to the maximum permissible speed of the Section.

(15) Card Deflection Test shall be carried out for each welded girder including second hand girders, and results of such tests, together with the cards, shall be supplied to the Commissioner.

(16) The Commissioner shall examine as many welded girders as possible and shall also have Card Deflection Test of any welded girder carried out in his presence.

(17) The Commissioner shall be supplied with a certificate from the engineer (not below the Junior Administrative Grade) responsible for design and construction of the bridge to the effect that welds have been designed in accordance with the IRS Code for Mild Steel Bridges carrying rail,1972 and executed to the satisfaction of the said engineer.

(18) If radiographic examination of the welds is specified in the drawing or procedure sheet or is required to be done in accordance with the provisions of the IRS Code for Mild Steel Bridges carrying rail,1972, the results of such examination shall be annexed to the certificate.

CHAPTER V

THE INSPECTION REPORT

18. **Contents of Inspection Report** - (1) The Inspection Report of the Commissioner shall specify that -

(a) he has made a careful inspection of the railway and the rolling stock that may be used thereon;

(b) the moving and fixed dimensions as laid down have not been infringed;

(c) the structure of lines of rails, strength of bridges, general structural character of the works and the size of, and maximum gross load upon the axles of any rolling stock, comply with the requirements laid down; and

(d) in his opinion, the railway can be opened for the public carriage of passengers without any danger to the public using it.

(2) The Inspection Report shall be clear and concise and shall deal with all matters which are required to be considered, particularly whether the railway line is designed for standard loading and the instances of deviation or infringement of Maximum and Minimum Dimensions.

19. **Documents accompanying Inspection Report** - The following documents shall accompany the Inspection Report, namely :-

(i) Index Plan and Section of railways;

(ii) Tabulated details in Forms I to XIV;

(iii) List of Questions and Answers in Form XV ;

(iv) Certificate by the General Manager of the concerned railway in Form XVI ;

(v) List of infringements of Maximum and Minimum Dimensions in Form XVII ;

(vi) Results of the bridge test in Form XVIII;

Explanation. - When sanction is required for the initiation of electric traction on a line already opened for passenger traffic, only such of the documents, as are required by the Commissioner, need be forwarded to him.

-25-

20. **Submission of Report to Central Government** - In respect of every reference made to him under sub-rule (3) of rule 3, the Commissioner shall submit an Inspection Report to the Central Government.

CHAPTER VI

SANCTION TO OPEN RAILWAY FOR PUBLIC CARRIAGE OF PASSANGERS

21. **Sanctioning of opening of railway** - (1) The Central Government may, after considering the Inspection Report of the Commissioner, sanction the opening of any railway or a portion of a railway for the public carriage of passengers.

(2) While sanctioning of the opening of any railway, the Central Government shall give due consideration to the suggestions or conditions subject to which the Commissioner has recommended the opening of the railway.

(3) Where the Commissioner has not recommended the opening of any railway, or has proposed to cancel the sanction already given, the Central Government shall confirm, modify or cancel the sanction given to the opening of such railway or a portion thereof and shall take steps to remove the defects or short comings pointed out by the Commissioner in his Inspection Report in the case of Government railway, and in the case of non-Government railway direct the General Manager concerned to remove the defects or short comings reported by the Commissioner.

(4) Where the defects or shortcomings are such that they cannot be removed unless the railway or a portion thereof is dismantled, then the Central Government shall order the closing of the railway forthwith for the public carriage of the passengers.

(5) A railway line, which is closed for the public carriage of passengers under section 25, shall not be reopened unless it is duly inspected by the Commissioner in accordance with the provisions of Chapter IV of these rules and the Commissioner recommends the reopening of such railway line.

(6) The actual date of opening of a new railway line or a section or portion

of such line for passenger traffic shall be notified by the concerned General Manager, after consulting the Central Government, by notification in the Official Gazette, and in the local news papers of the areas through which the railway line passes.

Explanation.- In this Chapter new lines of railway shall include -

(a) extensions of existing railways, new double, treble or other running lines laid alongside existing lines and conversion from one gauge to another;

(b) the initiation of electric traction on the existing line.

22. **Temporary opening of railways by Commissioner -** (1) The Commissioner may sanction the temporary opening of new railway lines for public carriage of passengers, subject to such conditions as he may impose during the period of inspection in the interest of the passengers.

(2) On receipt of the Inspection Report of the Commissioner, the Central Government may confirm, modify or cancel the sanction given under sub-rule (1) subject to such conditions, alterations or relaxation as may be considered necessary.

Para 22(2) deleted. *GSR 762(E) 24-8/10/2021.

23. **Sanction to use locomotive engines and rolling stock on new lines-** (1) The Commissioner may sanction the use of locomotive engines, rolling stock, or any other motive power under section 27 which is already running on any Zonal railway, or any division or section of any non-Government railway, or on any new lines in accordance with the provisions of the Indian Railways(Open Lines) General Rules,1976 or orders on the subject issued by the Central Government from time to time.

(2) Before according sanction under sub-section (1), the Commissioner shall ascertain that the application of the Indian Railways(Open Lines) General Rules,1976 by the concerned railway administration which operates the line has been previously sanctioned and notified in the Official Gazette.

-27-

CHAPTER VII

OPENING OF BRIDGES, MINOR WORKS, DIVERSIONS AND USE OF NEW TYPES OF ROLLING STOCK ON EXISTING RAILWAYS

24. **Notice of construction of deviation lines, etc.** - (1) Where it is proposed, on the railway which had been opened after inspection, to construct any deviation lines, stations, junctions or crossings on the level, or to make any addition, alteration or reconstruction materially affecting the character of any work and such work forms part of, or is directly connected with the working of that railway, the railway administration concerned shall give notice to that effect to the Commissioner.

(2) Before any such work, the execution of which may affect the running of trains carrying passengers, is put in hand, the concerned railway administration shall furnish to the Commissioner for his approval drawings or particulars of the work and of any temporary arrangements necessary for carrying it out.

(3) Every temporary deviation line irrespective of its length and any permanent diversion less than 2 kilometres in length, where no new station is involved, shall be treated as new minor works.

(4) In case of an accident, temporary diversions may be opened under section 24 after a responsible officer of the concerned railway certifies that the use of such diversion will not be attended with danger to passengers or to the railway servants.

(5) Where the use of the temporary diversion is likely to be extended to for more than three days, the Commissioner shall take action to inspect the diversion at the earliest opportunity.

25. **Power of Commissioner to open minor works** - (1) The

Commissioner may, without previous notice, sanction the opening of any minor work for passenger traffic, if he is satisfied, either with or without inspection, that the provisions of clauses (b),(c)and (d) of sub section (1) of section 22 have bee duly fulfilled.

(2) For the works opened without inspection, the Commissioner shall take steps for carrying out a subsequent inspection.

(3) The authority for opening any work shall be communicated in writing by the Commissioner to the concerned railway administration and a record of all works so authorised during each year, with particulars of the prior or subsequent inspection, if made, shall be maintained by the Commissioner.

26. **Infringements of Maximum and Minimum Dimensions** - No infringement of the Maximum and Minimum Dimensions shall be permitted without the prior sanction of the Commissioner or of the Central Government.

27. **Opening of new or strengthened bridges** - (1) No railway bridge shall be erected or re-opened to traffic, after strengthening, without the sanction of the Commissioner even though it is able to carry the loads without exceeding the stresses prescribed in the relevant Codes of Practice or in the absence of any such reference, the design criteria approved by the Central Government.

(2) No load shall be imposed on any railway bridge which would cause in any member thereof stresses greater than those specified in sub-rule (1), without the sanction of the Commissioner.

(3) Closure of an existing bridge shall require the sanction of the Commissioner.

28. **Use of new types of locomotives or rolling stock** - (1) Any railway administration which desires to use new types of locomotives or rolling stock different from those already running on any section or division of its railways, shall apply for sanction for the same to the Central Government through the Commissioner.

(2) The application under sub-rule (1) shall be accompanied by -

(i) such diagrams as may be necessary to give full particulars of the axle loads, wheel spacing, length over buffers and other principal dimensions of the rolling stock for which sanction is required;

(ii) a certificate signed by the Chief Engineer, the Chief Mechanical Engineer and the Chief Electrical Engineer (for Electric stock) of the concerned railway in the Form given below:-

"CERTIFICATE

Certified that it is safe to run _____(particulars of locomotive and rolling stock proposed to run) not exceeding ----------units (in the case of locomotive) coupled together on the section (station)_____to (station) from _____(km) to _____(km) of the ____Railway at a maximum speed of _____) km/h) against a maximum speed of _____(km/h) certified by Research, Designs and Standards Organisation, subject to the following speed restrictions and conditions:-

(a) Speed restrictions

Sl. No.	From Km. to Km.	Nature of speed restriction	Brief	Reason for restriction

(b) Special conditions

1 ...

2 ...

3 ...

4 ...

To be signed by -

1.The Chief Mechanical Engineer... 2.The Chief Engineer....

3.The Chief Electrical Engineer ... 4.The Chief Signalling and Telecommunications Engineer...

5.The Chief Operating Manager ...

Note 1. - The Chief Operating Manager and The Chief Signalling and Telecommunications Engineer should be associated when the increase in the speed of a loco/rolling stock is contemplated over the maximum sanctioned speed for a specific category of train (Passenger or Goods) over a particular section of the railway.

Note 2. - Over the railways where both the shop maintenance and open line maintenance of electric locos and Electric Multiple Unit rolling stock are under the control of the Electric Department only, the Chief Electrical Engineer, otherwise the Chief Mechanical Engineer should also sign.

Note 3. - When motive power with chopper control is to be used, the Chief Electrical Engineer and the Chief Signalling and Telecommunication Engineer should sign the certificate."

(iii) Such calculations and stress sheets showing

(a) the conclusions arrived at ;

(b) the external forces on which the stress calculations are based ;

(c) the stresses which will be produced in the various bridges over which the proposed rolling stock will run ; and

(d) the effects which the said rolling stock will have on various structures or tracks as compared with those caused by the rolling stock already in use, or allowed by the existing Government orders.

(iv) The calculations, stress sheets must show as to what allowance has been made for any secondary or deformation stresses in addition to the primary stresses caused by the external forces and what relief of stress, if any, has been included.

(v) The cost of modification to signalling and telecommunication installations necessitated by the use, if any, of chopper or thyristor control systems shall also be indicated.

(vi) An approximate estimate of the cost of such improvements in existing structures or track as the use of the proposed rolling stock is likely to render necessary on the railway concerned, whether immediately or in the near future.

(3) The proposal must be scrutinised by the Commissioner and his recommendations thereon shall be submitted to the Central Government for its orders.

(4) No new type of engine or rolling stock which would cause stresses

exceeding those specified in the IRS Bridge Rules, 1964, or the Standard Codes of Practice , or in the absence of any such reference, the design criteria approved by the Central Government for existing structures or excessive stresses in track shall be ordered until the sanction of the Central Government has been received through the Commissioner for doing so.

(5) (a) For permitting new designs of locomotives, the Commissioner may require oscillation trials to be conducted and call for the records for his scrutiny.

(b) The certificate referred to in clause (ii) of sub-rule (1) shall indicate clearly that the speed certified does not exceed the limits laid down by the Research, Designs and Standard Organisation. In addition, the maximum number of motive power units proposed to be coupled together for multiple operation shall be specifically mentioned.

Note.- Provisions contained in this clause shall also apply for increasing the speed of existing rolling stock by making improvements.

(c) For increase of speed beyond 100 km/hour on broad gauge and 75 km/hour on meter gauge of nominated trains on specific routes, the Commissioner may require route proving run by portable accelerometer or confirmatory oscillograph car run as per the instructions for the time being in force on the entire route at the maximum proposed speed. The Chief Signal and Telecommunication Engineer and the Chief Operations Manager shall sign the joint safety certificate in this case also.

(6) Any modification in the design of the coach which alters the system of operation and control over the rolling stock, like change in the braking system or change in the principle of traction shall be considered as a material modification and shall constitute a change in the type and design of the rolling stock.

(7) Any modification in the coach or rolling stock affecting the salient dimensions or suspension system or running gears and any other modifications including body, seating arrangements and the like irrespective of whether such modifications affect the riding quality of the rolling stock or not, shall also constitute a change in type or design of the rolling stock.

(8) Introduction of any train consisting of new coaching stocks of different design or type which are not already running on the section of a railway system shall also require the sanction of the Commissioner.

29. **Testing of bridges** - Before sanctioning the opening of new or strengthened bridges or the running of heavier loads over existing bridges, the Commissioner may require Card Deflection or Stress Recorder Test to be carried out as specified in Chapter IV. Tests on Pre Stress Concrete girder or composite girder bridge may also be carried out.

30. **Use of new types of Block Instruments** - (1) A railway administration, which desires to use a new type of block instrument, or main Signalling instrument, which is not an approved type, shall apply for sanction to the Commissioner.

(2) The application under sub-rule (1) must be accompanied by -

(i) a list of the requirements which the instrument fulfils, together with the results of the field trial conducted by the railway concerned;

(ii) a certificate from the Chief Signalling and Telecommunications Engineer in the form given below:-

" CERTIFICATE

Certified that it is safe to use (particulars of the equipment) at the station / on the section of the railway, with the following precautions:-

1.

2.

3.

4. etc.

[Sd/----]

The Chief Signalling and Telecommunications Engineer.

Note. - The application should be scrutinised by the Commissioner, who if satisfied, will communicate his sanction to the concerned railway. In case he is not fully satisfied, he will give his comments and recommendations for suitable further action.

".

(iii) A statement whether the equipment complies with the specifications approved by the Central Government.

(iv) A statement giving comments on the performance of the equipment as a result of bench trials conducted by Research, Designs and Standards Organisation.

(v) The circuit diagrams and other relevant diagrams and explanations, as may be necessary, to give full particulars of the principles of operation and safety features incorporated.

(vi) A copy of the instructions approved by the Chief Operating Manager, to be issued for the operation of the equipment by the operating staff, including those instructions for working under abnormal or failure conditions;

CHAPTER VII ~~VII~~ VIII (See errata)

REQUIREMENTS AND RECOMMENDATIONS FOR SIGNALLING AND INTERLOCKING INSTALLATIONS

31. **Signals** - (1) The number of signals provided and the height of such signals shall be limited to the extent to the actual necessity for safety and traffic purposes.

(2) The distance between the Distant/Warner and the first stop signal ahead shall be such that a train approaching the former at the highest authorised speed with due allowance for weight, braking power, gradient and sighting distance can be stopped before passing the latter.

(3) The subsidiary signals shall be readily distinguishable from the running signals.

(4)Where a signal or its back light is not visible to the railway servant operating the signals, the aspect of the signal and the condition of the light shall be repeated at the place of operation.

(5)It is desirable that the signalling at all block stations and interlocked level crossings in the same section shall conform to the same standard and type.

(6) Signals shall be so designed as to give the most restrictive aspect in the event of failure of any part of the mechanism, which operates them.

(7) The location and type of signals shall be in accordance with the provisions contained in Chapter VII of the Signal Engineering Manual, Part I and Chapter III of the Indian Railways(Open Lines) General Rules, 1976.

32. **Points** - (1) Points shall be so located that movements over them shall be within the view of the cabin or the location from which they are worked unless an approved alternative arrangement for direct vision is

provided.

(2) The points, locks and bars shall not be worked by wire but by reading or by power operation.

(3) Spring points shall not be used.

(4) Movable crossings and movable diamond crossings on passenger lines shall be provided with complete facing point equipment of approved type.

(5) The requirements of points as stipulated in Chapter VII of the Signal Engineering Manual, Part I, shall be followed.

33. **Interlocking** - (1) Signal and interlocking apparatus and installations shall be in accordance with Chapter VII of the Signal Engineering Manual, Part I.

(2) Apparatus provided for operation and control of signals, points, etc., shall be interlocked and arranged to comply with the essentials of interlocking and other requirements as laid down in Chapter VII of the Signal Engineering Manual, Part I.

(3) The operation of the signalling gears may be from a lever frame or a panel with individual operation of points, signals and other functions or a panel providing operation of route setting type or any other approved means in accordance with the provisions of Chapter VII of the Signal Engineering Manual, Part I.

(4) When a signal is controlled by more than one agency, it shall be possible for every such controlling agency to replace the signal to "ON" position.

(5) The Station Master shall be provided with interlocked mechanical or electrical control of the Home and Last Stop Signals except where the conditions stipulated in the Signal Engineering Manual, Paragraph 7.88.2 are fulfilled.

(6) Standards of signalling and interlocking shall be arrange complying with the requirements of the Signal Engineering Manual.

34. **Siding and trap points** - (1) Sidings shall be arranged in such a manner that shunting operations upon them shall involve the least possible use of, or obstruction to, running lines.

(2) Trap points shall be provided upon goods lines and sidings at their junctions with passenger lines, with the points normally set against the passenger lines and interlocked with the signals.

(3) Bay and loop platforms line and refuge loops shall be isolated from main through lines.

35. **Junctions** - Bars or other approved devices shall be provided in order to define the fouling points of junctions, loops, siding connections, crossings and the like.

36. **Provision for isolation at stations** - (1) The speed of trains running through stations shall be governed by the General Rules for all open lines administered by the railway administrations, both Government and the non-Government railways and shall be subject also to the restrictions relating to standards of interlocking prescribed in the Signal Engineering Manual.

(2) At no station at which isolation has not been provided through running trains shall be permitted unless the conditions laid down in the second paragraph of rule 4.11 of the General Rules are complied with.

(3) At any station where there is a speed restriction for through running trains different from neighbouring stations, a speed restriction board should be erected at the first approach signal or where no signals are provided, at full braking distance outside the first facing point.

(4) In order to maintain safety for through running, points for trap sidings must not be inserted in the main line or through line, except under approved Special Instructions in accordance with the Signal Engineering Manual, Part I.

(5) All passenger running lines shall be isolated from all goods lines or sidings connected thereto.

(6) All goods running lines may be isolated from all sidings connected thereto.

(7) It is not necessary to isolate one goods receiving line from another

(8) Isolation may be accomplished by -

(a) connection to another line or long siding;

(b) the provision of short dead end siding; or

(c) the provision of trap.

Note. -

(i) Whichever may be the method for isolation, a starter signal shall be provided, except when omitted under approved special instructions.

(ii) When a trap is provided, the trap switch should be located with the heel of the switch in rear of the fouling mark and preferably on the straight. The switch should be in the rail away from the line to be protected.

(9) The various methods of isolation are illustrated in the diagrams given in Appendix A attached to these rules and the following instructions shall apply to their use in the case of running lines, namely :-

Method A: This method shall apply to cases in which the line on which the train will run when the points are set for isolation of the through line, is kept clear for the adequate distance prescribed in Rule 3.40 of the Indian Railways(Open Lines) General Rules,1976.

Method B: When a short dead end siding is provided, it shall not ordinarily be long enough to permit of vehicles being stabled thereon. To obtain the adequate distance prescribed under rule 3.40 of the General Rules the points of the dead end siding shall be set for the cross over and against the siding, before a train is admitted on a line trapped by this method. Where it is necessary for the short dead end siding to be extended for the purpose of stabling vehicles, the above rule shall apply, unless a trap is provided on the dead end siding at a distance of not less than 180 metres (120 metres in case of stations provided with multi aspect signalling) from the starter signal where provided or from points leading to the main or through line. A train must be admitted on the running line unless the trap is set and locked against vehicles occupying

the further part of the dead end siding.

Method C: When a trap is used, a train must not be admitted on to the trapped line unless the trap has been closed, so that the train will not be derailed if the driver over shoots the trap.

(10) When Method A cannot be used, and for any reason it is not convenient to use Method B or Method C and to provide adequate distance by setting the points of the short dead end siding or trap for the cross over and against the siding or trap, a sand hump of approved design should be used as a substitute for adequate distance as provided in rule 3.40(4) of the Indian Railways(Open Lines) General Rules,1976. In that case the length of the siding should be at least one rail length and formation should be made up for a short distance beyond the hump.

37. **General** - (1) The requirements and regulation of Block Instruments shall be in accordance with section 'N' and section 'R' of Chapter VII of the Signal Engineering Manual, Part I.

(2) The requirements of Centralised Traffic Control shall be in accordance with section 'Q' of Chapter VII of the Signal Engineering Manual, Part I.

CHAPTER ~~VIII~~ IX

RULES FOR THE DESIGN AND INSPECTION OF EQUIPMENT FOR ELECTRIC TRACTION.

38. **Designs of electric installations** - (1) The design of all electrical installations, namely, transmission and distribution lines, substation, switching stations, Over Head Equipment, etc. shall be according to approved standards laid down by the Central Government and the Indian Electricity Rules, 1956 or any other relevant statutory rules for the time being in force. Wherever, any departure from accepted norms becomes necessary, approval of the Central Government shall be obtained.

(2) (a)Adequate protective arrangements shall be made to ensure that the public cannot come in contact with the electric equipment on line within the railway premises.

(b) Suitable protective screens shall be provided where live conductors pass under or over bridges.

(3) The structures supporting overhead equipment shall be designed in accordance with the relevant Indian Standards. The wind pressure to be adopted in such cases shall be generally in accordance with IS 875-64 except when a higher value is prescribed by the State Government, which should be ascertained by a reference to the State Government, unless a notification on the subject in connection with the electric installation other than the electric traction on railways is already issued by the State Government.

(4) When the distribution system involves overhead wires carried on steel structures including bridges and roofs and a return circuit via running rails or earth, all such structures, masts and associated tracks shall be effectively earthed and bonded or other precautions taken to

ensure that contact with the steel work of the structure will not be dangerous to the public and the railway staff. In AC traction earthing and bonding shall be as per the approved Code for Bonding and Earthing.

(5) Earthing arrangements at power supply installations shall strictly conform to the Indian Electricity Rules, 1956 and accepted Codes of Practice for Bonding and Earthing for AC traction.

(6) No earth wire shall cross any track. Where structures to be connected to an earthwire are located on opposite sides of a track, separate wire runs shall be used for connecting the structures. In complicated areas, structures may be connected to individual earthing stations.

(7) When over head lines transmitting electric power (other than lines forming part of the railway traction equipment) have to be carried across railway track, the details of the equipment provided in connection with such lines must be designed with the object of minimising danger in the event of breakage and in accordance with the regulations for the Electrical Crossing, 1987. These details must be approved of the Electrical Inspector to the Government of India(EIG)

Note. - The Chief Electrical Engineer of a Zonal Railway functions as the Electrical Inspector to the Government of India.

(8) Lighting arresters of standard or approved types shall be provided wherever they are necessary.

(9) All component parts of the equipment which carry live conductors shall be provided with devices approved by the Electrical Inspector to the Government of India to prevent unauthorised persons climbing them. Anti-climbing device shall also be provided, wherever necessary, on structures carrying high-tension equipment within railway premises.

(10) On both sides of roads at level crossings, gauges of suitable design shall be provided to ensure that no part of any road vehicle or its load shall come in contact with overhead equipment.

(11) Warning notices shall be erected in conspicuous positions at level crossings and the like indicating to the existence of live electrical equipment.

39. **Display of caution boards and notices** - The following caution board and notices written in English, Hindi and the regional language0 shall be displayed at the various locations indicated below:-

(a) "Treatment for electric shock" boards, giving instructions for treatment of electric shock at all railway stations signalling cabins, Offices of the Station Managers, the Assistant Station Managers, Senior Sectional Engineers(Permanent Way), the Senior Sectional Engineer (Works), the Senior Sectional Engineer (Signal), Over Head Equipment Maintenance depots, Over Head Equipment Inspection Car Sheds, substations, switching station cubicles, loco sheds and the like.

(b) General 'Caution notices' regarding danger of high voltage traction wires for public at various entrances to railway stations and for staff at prominent places at each station, particularly on stanchions or pillars supporting platform roof.

(c) "25 KV cautions Boards" shall be affixed on to the screen erected on foot over and road over bridges.

(d) "Danger" boards on level crossing height gauges.

(e) "Engine stop" boards, at termination of Over Head Equipment in the sections to be energised.

(f) "Caution-Unwired turn out" boards ahead of all unwired turn outs or crossovers taking off from wired tracks.

(g) "Warning" boards for neutral sections.

(h) Boards for "Switching on" and "Switching off" of power at neutral sections.

(i) "Danger" boards to be installed on Over Head Equipment near watering stations, if any.

(j) "25/2 x 25 KV caution" boards at substations and switching stations.

(k) "Caution" notices on all diesel, Electric and steam locos, which work on the energised section, including those owned by private parties.

(l) "Caution" boards at such signal posts where protective screening cannot be provided for signal and telecommunication staff.

40. **Protection of private property against inductive effects of AC traction** - Under 25/2 x 25KV AC traction, there is a heavy induction on all metallic structures and conductors in the vicinity of track. Inductive effects show themselves on any overhead conductor, such as metallic clothes lines, power lines, and the like belonging to private parties running parallel and close to the electrified tracks. Wide publicity shall be given to the effects of the induction, so that special precautions may be taken by private parties concerned against the possibility of electric shocks from conductors running in their premises.

41. **Approval of energizsation of High Tension installations** -

(1) Application shall be submitted at least a fortnight before energization to the Chief Electrical Engineer and the Electrical Inspector of the concerned railways for the following :-

(a) Formal approval, if not already received to the design and layout of all high voltage equipment including traction sub-stations, transmission lines, 25kv/2 x 25 kv feeders, switching stations, booster stations, etc ;

(b) Approval for energization of High Tension installations mentioned above including Over Head Equipment ;

(c) The application should be accompanied by documents as prescribed in Volume II(Part-1) of the Manual of AC Traction

Maintenance and Operation, 1994 (sub-paragraph 2 of paragraph 21007).

(2) On receipt of an application under sub-rule(1), the Electrical Inspector shall scrutinise and inspect the design and installations in respect of the following, namely :-

(a) The layout and design for substations, Over Head Equipment and other installations for compliance with the Indian Electricity Act, 1910 (9 of 1910) and the rules made thereunder;

(b) Inspection of the completed installations, either personally or by deputising his officers for compliance with the safety requirements.

(3) After conducting the inspection under sub-rule (2), the Inspector shall convey his approval for the engerization of 25 KV/2x25 feeder lines from traction sub-station to feeding posts, switching stations, booster transformer stations and Auxiliary transformer stations, subject to such directions as he may consider necessary.

42. **Submission of application to commissioner** - An application shall be submitted to the Commissioner with all relevant documents and certificates and notifications mentioned in paragraph 21008 and sub-paragraph 2 of paragraph 21009 of the Manual of AC Traction Maintenance and Operation, 1994, Volume II (Part I) alongwith the approval of the Electrical Inspector to the Government of India for energization.

43.**Procedure for a energization of traction installations**-(1)(i)After obtaining the sanction of the Electrical Inspector to the Government of India for energization under rule 41, the sub-station should be commissioned sufficiently in advance of the energization of Over Head Equipment.

(ii) Before energization of the sub-station, full communication facilities should be available and power supply authorities should be ready to give power supply.

(iii) On the appointed day necessary clearance certificate should be obtained from the Senior Divisional Electrical Engineer (Construction) and others who had been hitherto working in the sub- station premises to the effect that their staff had been withdrawn and the sub station could be energised.

(iv) After final measuring of the whole installation and check on the satisfactory operation of all equipments including protective relays, the traction sub stations and other installations may be energised.

(2) In addition to giving wide publicity through newspapers and other media, the Station Master shall -

(i) warn all passengers about the danger of 25/2 KV AC Over Head Equipment and not allow them to ride on tops of coaches;

(ii) advise all diesel and steam engine drivers not to climb on engines when they are under the Over Head Equipment;

(iii) warn all members of the staff engaged in watering not to climb on the carriages without power being made off and obtaining order of the concerned controlling authority.

(3) Energization of Over Head Equipment shall be progressively undertaken starting with 25/2x25KV feeders from the sub-stations to the feeding posts, bus bars of the feeding posts followed by one sub sector after another.

(4) Before running electric rolling stock on the newly electrified section a confirmatory field test for the proper operation of the protective relays shall be conducted.

(5) (i) The inspection of the entire section shall be carried out by means

of an Over Head Equipment Inspection Car by the Commissioner.

(ii) A responsible officer preferably the Chief Project Manager or the Chief Electrical Engineer (Construction) and a Senior Administrative Grade officer of Electrical Department nominated by the General Manager (open lines) should accompany the Commissioner throughout the inspection.

(iii) The engineers who had been in charge of the section during construction, the Divisional Railway Manager and concerned Divisional Officers should also be present.

(iv) During inspection, particular attention shall be paid to the safety and operational aspects of the train movements and to see that staff are in possession of statutory rule books, instructions books, registers, forms, etc. and the Transportation, Electrical, Permanent Way and Signalling and Telecommunications staff are fully acquainted with the duties to be carried out after A.C traction is introduced.

(6) Subject to the inspection being satisfactory an "all concerned message" may be issued by the Commissioner communicating his sanction for the introduction of commercial services under electric traction.

(7) The signalling and telecommunication requirements in 25 KV 50 Hz AC electrified sections shall be in accordance with the provisions of section 'R' of the Signal Engineering Manual, Part I and Telecommunication Manual for 25 KV 50 Hz AC Traction.

Note. - A catechism dealing with the requirements of signalling and Telecommunication installations for 25 KV 50 Hz AC electrified sections are enlisted as Appendices B and C to these rules.

SCHEDULE
(See rule 5(2))

Paragraphs 443 to 451 of the Indian Railways Code for the Engineering Department

443. Plans, Sections and Design for Works -- A set of plans and sections for a project should consist of :-

(i) General Map of the country traversed by the project scale about 25 km. to 1 cm.

(ii) Index Map, scale about 2.5 km. to 1 cm.

(iii) Index Plan and Sections.

(iv) Detailed Plans and Sections.

(v) Plans and Cross Section.

(vi) Plans of Station Yards.

(vii) Detailed Drawings of Structures.

(viii) Plans of Junction Arrangements.

444. As exceptions to this rule, Index Plans and Sections and plans of stations may be longer than 1200 mm if necessary, to enable all the information to be shown on one sheet. In such cases, however, the width of 840 mm should still be kept to, and the length in excess which however should not exceed 1020 mm should be folded so as not to project beyond the edges of the other sheets.

A Catalogue of maps published by the Survey of India is obtainable from the Director, Map Publication Survey of India, Hathibarkala Estate, Post Box No.28, Dehradun-248000.

2. The latest information on availability of maps and aerial photographs of the region would be available from the concerned Regional Director of Survey of India.

445. Throughout each set of plans and sections the kilometreage should be reckoned from the same fixed point. This fixed point should, if practicable, be at that end which is in the direction of the nearest sea port with which the line is in through communication by rail, and should be clearly defined on the Index Plan and section and on at least the first and last sheets of the Detailed Plans and sections. If the line takes off from an existing railway station the zero point should be fixed at the centre of the existing station yard, and when it ends at an existing station the end of the survey should be taken as the centre of that station. Each sheet should be plotted in the direction of the through kilometrage so that the kilometrage may be read from left to right.

446. The datum used for all plans and sections should be Mean Sea Level, and all heights should be referred to this datum in metres and decimals. If any other datum is adopted for temporary use during the progress of the survey the figures referring to such temporary datum should be reduced to Mean Sea Level before being entered on the plans and sections.

447. On each sheet should be noted a reference of letter, the name of the railway or section of the railway, the gauge and the scale. The scale may be described in words, and need not be drawn. The magnetic north should be indicated on each map and plan by a line not less than 150 mm in length.

448. The Index Plan and Section and the first and last sheets of the set of Detailed Plans and Sections should be signed and dated by the Engineer In-charge of the survey. Every sheet should be signed and dated by the officer responsible for its preparation.

449. Index Plan and Section -- The Index Plan and Section should be drawn to a scale of 0.5 km. to a cm. horizontal and 10 metres to a cm vertical, the plan being drawn above the section on the same sheet.

450. The Index Plan -- On the Index Plan should be shown all towns, roads, canals, rivers, hills boundaries of states and districts within a distance of 10 kilometres on each side of the railway. The centre line of the proposed railway should be indicated by a full red line 0.8 mm. in thickness. The degree and radius of all curves should be figured. The position of each station should be shown by a red block, the name of the station being given. The kilometrage from the "fixed point" should be marked and figured at every kilometre and the extent of each sheet of the detailed plan shown. Where practicable, the Index Plan should be traced from the sheets of the Survey of India Map published to a scale of 0.5 km. to a cm. The details in the immediate neighbourhood of the railway being filled in or corrected, if necessary, from the information given by the railway survey. For a districts where a map to the scale of 0.5 km. to a cm. Is not available, the information required should be plotted to that scale from such other maps or data as can be obtained.

451 The Index Section -- The Index Section should show the formation level by a red line; the gradients should be figured, and the height of formation above Mean Sea Level entered at each change of gradient. The position of each important bridge with the name of river and number and size of bridge spans should be indicated, also level crossings with their classification "as special", "A", "B", "C" or "D" class and position of each station with its name and distance from the "fixed point". The kilometrage from the "fixed point" should be marked and figured at every kilometrage.

FORM I
[See rule 5(1)(a)]
CURVE ABSTRACT

Railway
GAUGE:1.676 M

SECTION: LAKSHMIKANT PUR-KULPI STATION

LENGTH: 9.19 km

Degree of curvature and radius	Number of each	Length in kilometre of primary curve
1	2	3
1. 4.00 Degree (Radius 437.5M)	1	0.49KM
2. 3.00 Degree (Radius 583.33M)	3	1.13KM
3. 2.00 Degree (Radius 875 M)	2	1.30KM
Total	6	2.92KM

Ratio of Curved Length to Total Length of line 31.97%

-51-

FORM II
[See rule 5(1)(b)]
GRADIENT ABSTRACT

SECTION: LAKSHMIKANT PUR-KULPI STATION
LENGTH: 9.19 km

Railway
GAUGE:1.676 M

Gradient(compensated) and radius	Number of each	Length in km	Percentage to total length of line
1	2	3	4
1 in 100 or I percent	-	-	-
1 in 101 to 1 in 150	-	-	-
1 in 151 to 1 in 200	-	-	-
1 in 201 to 1 in 300	1	0.51	5.55%
1 in 301 to 1 in 400	2	0.64	6.96%
1 in 401 to 1 in 500	2	1.00	10.88%
1 in 501 to 1 in 1000	1	1.10	11.97%
1 in 1001 to Level	9	5.94	64.64%
TOTAL	15	9.19km	100.00%

Steepes Compensated Grade 1 in 3000(FALL)
Longest Continuous length of steepest Grade 0.51 km
Followed by: LEVEL for 0.10 km

-52-

FORM-III
[See rule 5(1)(c)]
BRIDGE ABSTRACT

Railway
GAUGE:1.676 M

SECTION: LAKSHMIKANTPUT-KULPI

LENGTH: 9.19 km

Class of Bridge	Clear span in Metre	Total Number of Spans	Water Way in lineal Metre	Loading standard for which designed	Reference to type plan in case of Girder Bridges
1	2	3	4	5	6
1. Steel Girder (Riveted)	-	-	-	-	
2. Steel Girder Welded	30.50	2	61.00	M.B.G. Loading	Drawing No.B.A-1123 to B.A-1124
3. P.S.C. Girder	-	-	-	-	-
4. Composite Girder	-	-	-	-	-
5. RC/PSC/SLAB/BOX	-	-		-	
(I) R.C.C Slab	5.00	1	5.00	M.B.G. Loading	
(II) R.C.C Slab	3.05	2	6.10	-do-	
(III) R.C.C Slab	2.00	9	18.00	-do-	
(IV) R.C.C Slab	1.83	2	3.66	-do-	
(V) R.C.C Box	3.05	2	6.10	-do-	
(VI) R.C.C Box	2.90	3	8.70	-do-	
6. Arches	-	-	-	-	
(Major Bridges)		2	61.00		
(Minor Bridges)		19	47.56		
Total		21	108.56		

Water Way per km.+ (Major Bridges): 6.64M
(Minor Bridges): 5.17M
Total: 11.81M

Note 1: "Major Bridges are those having a total water way of 18 lineal metres or upwards or having a clear opening of 12 lineal metres [illegible] span."

-53-

FORM IV
[See rule 5(1)(d)]
IMPORTANT BRIDGES
Bridges having a total waterway of 300 lineal metres or 1000 sq. metres or upward

SECTION: Railway
GAUGE:1.676.M

LENGTH: kms

Name of River	Kilometerage	Drainage area	Rise of ordinary flood above low water Number of each	Slop of bed per Km.	Mean velocity in flood per second	Sectional area in flood Sq.Metre.	Discharge per Second Cub Metre	Span		Height of under side of girder		Average depth of foundations below Low water level.
										above low water	above flood level	
		Sq. km.	Metre	Metre	Metre			Metre	No.	Metre	Metre	Metre
1	2	3	4	5	6	7	8	9	10	11	12	13

FORM V

[See rule 5(1) (e)]

BALLAST AND PERMANENT WAY :

Section_____ RAILWAY_____

Length: 8.78 km. GAUGE 1,676

1.The permanent way consists of 52 kg/90 UTS new rails of 'Indigenous Make' 13 M long (partly on single rails and partly on 3-Rail Welded Panels) laid on concrete sleepers with the density of M+7 (1540 sleepers per km) and 50 mm stone ballast with minimum cushion of 250 mm under the sleepers.

2. All the turnouts to be negotiated by passenger trains are of 1 in 12 (curved switch) elsewhere 1 in 8.5 Certified that Tested and approved P. Way materials have been used in this section.

Note: A brief description to be given of the rails, fastenings, sleepers and ballast provided. Details of dimensions of the rails, fishplates etc. should not be given in the case of the standard section. It should be stated whether any of the material is second hand and if so, its approximate age should be given.

In the case of new rails and fish plates manufactured in India, the name of the producer should be given. If they are imported, the name of the country of origin should be indicated.

A certificate should also be submitted by the Chief Engineer/Engineer-in-Chief that the materials are of tested and approved quality and comply with the accepted specifications.

2009 GI/2000—12

FORM VI
[See rule 5(1)(f)]
STATION AND STATION SITES

LAKSHMIKANT PUR-KULPI

LENGTH:9.19 Km

RAILWAY GAUGE:1.676M

Name of Station	Class E=Engine Changing X=Crossing F=Flag	Kilometerages from fixed point*	Distance Apart			Clear length of Crossing loop	Remarks
			sites	Crossing	Engine changing		
	2	3	4	5	6	7	8
LAKSHMIKANTPUR	X	61.48 km (from Sealdah)				686.00 M & 700.00M	
			5.35km				
UDAYRAMPUR	Halt	66.83 km (from Sealdah)					
			3.54km				
KULPI	Halt	70.67 (from Sealdah)					

* Note:- These should ordinarily agree with the kilometerage figured on kilometer posts and telegraph posts.

FORM VII
[See rule 5(1)(g)]
STATION ACCOMMODATION

SECTION: LAKSHIMKANT PUR-KULPI

RAILWAY
GAUGE:1.676 M

LENGTH: 9.19 km

Name of stations	Station Building				Goods Shed	Passenger Platforms		Goods Platform Length	Water Suplly for Passengers
	Station Offices	Waiting Room	Waiting Hall (2nd Cl.)	Toilets		Length	Height above Rail		
	Sq.M	Sq.M	Sq.M	Nos	Sq.M	M	M	M	
LAKSHMIKANTPUR	50.00	-	50.00	-	65	(P1)237.74M	H.L.(Common)	Nil	Hand Tube well on both the Platforms 300/200 mm.dia Deep Tubewell with 50,000 Gallons Capacity O.H Tank
						(P2)274.40M	H.L.(Common)		
UDAYRAMPUR	9.30	-	9.30	-	-	213.36 M	-DO-	NIL	One tubewell with hand Pump at Station
KULPI	26.10	-	29.67	-	-	275.00 M	-DO-	NIL	One Hand Tubewell on Platform

NOTE: (1) In case existing accommodation is to be utilised, indicate so by(a).

(2) The particulars shown above are illustrative.

FORM VIII
[See rule 5(1)(h)]
STATION MACHINERY

SECTION: LAKSHMIKANTPUR-KULPI

Railway GAUGE:1.676 M

LENGTH: 9.19 km

Names of Station	INTERLOCKING		SIGNALS						Type of Block working in use	Weigh Bridge No.&Capacity
	Inter-locked	Non-inter locked	Isolated	Warners/ Distant	Outers	Home	Starters	Advance Starter		
1	2	3	4	5	6	7	8	9	10	11
LAKSHMIKANTPUR	Yes	-	-	Yes	-	Yes	Yes	Yes	Single line Block Instrument	Nil
UDAYRAMPUR	No	Yes	-	-		-	-	-	Halt	Nil
KULPI	No	Yes	-	-		-	-	-	One Train only Working System	Nil

NOTE: The particulars furnished in this form are illustrative.

FORM IX
[See rule 5(1)(i)]
LEVEL CROSSING ABSTRACT

SECTION:

LENGTH:

RAILWAY
Gauge:1.676 M

No of crossing	Location Kilometres)	Class as prescribed in the permanent way manual	Length of the Guard Rail	Width of the Gates at right angle to the center line of Road	Distance of Gate Posts from centre line of nearest track	Wicket Gate provided or not	Length of straight portion of road outside Gates	Angle of Xing between Gates	Radius of centre line of road on approaches within (50M) of the centre lines of track	Interlocking of gates with signals or provision of telephone etc. against trains running through crossing	Gradient of Road way(a) between gates(b) out side gates	Width of metalling between gates	Distance of gate lodge from (i) centre of the nearest track (ii) edge of road metal	Whether road traffic has been warned about the proximity of level crossing	Provision of rumble strip/speed breaker
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

FORM X

[See rule 5(1) (j)]

BRIEF PARTICULARS OF TRACTION INSTALLATION

Section -	Tundla-Delhi	Northern Railway	
Length	292 RKM	Gauge	1676 mm

1. Total track kms electrified section – 650
2. Brief particulars of traction system:-

The type of Over Head Equipment installed on main line of the section is of the simple polygonal with swivelling brackets having tensions in the conductors regulated automatically. The tension in the catenary and contact wire is kept as 1000 kgf each. The contact wire has been given a presage of 103mm for a span of 72m (suitably reduced for smaller spans). On secondary lines and yards the Over Head Equipment is of fixed type and unregulated. The contact wire is grooved hard drawn copper with 107 sq. mm cross section supported by means of copper droppers from catenary which is standard (19.210mm) with 65mm cross section made up of cadmium copper having 80% conductivity. The maximum wind pressure for design of masts and foundation has been taken as 112.5 kg/sqm. maximum span adopted on main lines is 63 m. The Over Head Equipment has been designed for a maximum speed of 160 km/h.

The power supply is taken from UPSEB at a single point viz. Aligarh from where railways own transmission lines are run for feeding the sub stations located at Hathras, Khurja and Sahibabad. At each of the sub stations two power transformers 12.5 MVA, 132/25 KV are installed, one of them acting as standby. Standard arrangement of having neutral section 41m in length has been provided between two sub stations for separation of phases. From sectioning and isolating facilities sub sectioning and paralleling stations have been provided. All the switching operations at power supply stations are remote controlled from a single remote control centre located at Tundla.

Note: The Railway will provide suitable information as per sample.

-60-

FORM XI
[See rule 5(1)(k)]
POWER SUPPLY INSTALLATION ABSTRACT

SECTION: Tundla -Delhi

RAILWAY GAUGE:1.676mm

LENGTH: 292 km

Sl. No.	Type of Switching Stations	Total Nos.	Location and Nearest Railway Stations	Remarks
1	2	3	4	5
1	Traction substation and feeding stations	3		
2	Sectioning and paralleling stations	3		
3	Sub-sectioning and paralleling stations	14		
4	Sub-sectioning stations	Nil		
5	Booster transformer stations	12	(List to be attached)	
6	LT Supply transformer stations	23	(List to be attached)	

FORM XII
[See rule 5(1)(l)]
MAINTENANCE DEPOT ABSTRACT

SECTION: Tundla -Delhi

RAILWAY GAUGE:1.676mm

LENGTH: 292 km

S.No.	Location	Name of the nearest Railway stations and distance therefrom	Whether with OHE maintenance car (tower wagon provided or not	Remarks
1	2	3	4	5
1	km 1370/15-16	Hathras 2.0 kms towards Delhi	Yes	-
2	km 1454/7-8	Sakur Basti 1.5 km towards Delhi	No	-

FORM XIII
[See rule 5(1)(m)]
RESTRICTED OHE CLEARANCE ABSTRACT

SECTION: Tundla-Delhi

LENGTH: 292 km

RAILWAY
GAUGE:1.676M

A. Overline Structures

S.No.	Location of Overline Structure	Type of Structure	Clearance from R.L.to Bottom of Structure	Height of Contact wire below the structure	Whether Catenary is anohoted or Freely Running Below/Above the Structure	Minimum Static Clearance between 25 KV Live Parts & Earth	Remarks
1	2	3	4	5	6	7	8

B. Location of OHE where specified (2.0 m) working clearance are not available

S.No.	Location	Type of near rest earther part	Actual distance between live part and earth	Remarks
1	2	3	4	5
1	km.1172/3-4 Up line	OHE structure at location 1172/5-6 On line	1.85 m	

FORM XIV

[See rule 5(1)(n)]

ELECTRICAL CROSSING OVER ELECTRIFIED TRACKS ABSTRACT

SECTION : Tundla -Delhi

RAILWAY

LENGTH : 292 km.

GAUGE:1.676mm

S.No.	Location	Brief Tech.Particulars Inculding voltage	Whether with Guards OR w/o Guards	Owned by	Whether clearence as per the regulations for Electrical Crossing available	Remarks
1	2	3	4	5	6	7
1	1321/3-4	Three phase single circuit	w/o guards	UPSEB	No.	Relaxation given in terms of cl.22 of the regulations. The height of lowest conductor from Rail level is 11.4M
2	1327/13/14	Double circuit three phase 11 KV inside station area	with guards	Aligarh Electric Supply	Yes	

-63-

FORM XV

[See rule 5 (3)]

LIST OF QUESTIONS AND ANSWERS

SECTION

Length in km

Sl. No. (1)	Questions (2)	Answers (3)
	Formation Earthwork	
1	Are there any sections of the line over which special precautions to ensure safe working are necessary, owing to sharp curves or steep grades?	
2	What widths of formation have been adopted: (a) in bank, (b) in cutting (exclusive of side drains) ?	
3	Have any special precautions been taken against slips in cutting and embankments ?	
4.	Are side drains to the formation and catch water drains above the side slopes, provided for all cuttings ?	
5	Are trolley refuges necessary in any long cuttings, and if so, have they been provided at suitable intervals ?	
	TUNNELS	
6	Are there any tunnels not fully lined ? If so, are they safe without further lining ?	
7	Do any portions of the sides or roof of any tunnel infringe maximum and minimum dimensions ?	
8	Have adequate facilities been provided to enable workmen to escape from an approaching train without difficulty ?	
9	Have the tunnels been properly ventilated ?.	

2009 GI/2000—13

(1)	(2)	(3)
	BRIDGES	
10	Are the bridges/elevated structures designed in accordance with the provisions contained in Bridge Rules, having regard to the standards of loading which they are intended to carry? Full particulars should be appended of any case of departure from the requirements ?	
11	Has due care been taken to provide sufficient waterway to guard against scour ?	
12	Are free board and vertical clearance under bridge provided according to bridge sub structure code? If not, quote sanction number with date.	
13	Has due notice been taken of Railway affected works in the catchement of the waterways and all necessary safeguards provided for wash aways and breaches due to breaching of tanks/bunds ?	
14	Have the waterways provided been formally approved by the Local Government?	
15	Have sufficient head-way been provided for crafts plying or likely to ply, on navigable waters ?	
16	Are there any bridges intended for use by the public ? (a) If so, in the case of a road or pathway clear of the track, have adequate handrails or parapets been provided ? (b) Or in the case of a passage common with the track, have suitable gates across the roadway, and signals for trains been provided ?	
17	Are long bridges provided with adequate facilities to enable workmen to stand clear of an approaching train without difficulty ?	
18	Have trolley refuges been provided if necessary ?	

(1)	(2)	(3)
19.	Are the wooden sleepers, adequately protected from fire ?	
20	Are all girder bridges provided with guardrails? Are there any bridges where it is necessary to provide guard rails but these are not yet provided?	
21	Has information of the nature and depth of the foundation and hidden work in bridges, culverts and other structures likely to be exposed to scour, been recorded on the structures themselves ?	
22.	Have surplusing arrangements been made for canals crossing track ?	
23	Have completion drawings of all important bridges and other structures been prepared ? Do these contain all information regarding foundations and other hidden work as actually executed? Where are they recorded ?	
	LAND BOUNDARIES AND FENCING	
24	Have the boundaries of the Railway land been properly defined by suitable marks, which can readily be found and identified ?	
25	Have complete and accurate land plans been prepared and do they bear the signatures of the responsible Civil and Railway Officer concerned? Where are they recorded ?	
	LEVEL CROSSINGS	
26	Has the Local Government approved the sitting and classification of the level crossings ?	
27	Have all level crossings been constructed in accordance with the Standard Sepcifications for level crossings (vide Chapter IX of P. Way Manual) according to the class of crossing ?	

(1)	(2)	(3)
	If not, at which crossings and in what respects do they fall short of them ?	
	KILOMETER AND GRADIENT POSTS	
28.	Are proper Kilometer and gradient posts provided? (a) Are the telegraph posts numbered, and (b) can the figures be read with ease from passing trains and trolleys?	
29	From which fixed point has the Kilometrage been reckoned ?	
	BALLAST AND PERMANENT WAY	
30	Is the ballast provided of good quality and sufficient in quantity for the traffic anticipated ? Is there any departure from permanent way manual ?	
31	Is the permanent way properly laid, complete with fastenings, and is it suitable for the proposed speed & loads ?	
32	Are there any especially sharp curves at which checkrails are considered necessary? Have they been provided at all such curves ?	
33	Are the curves laid out with transition curves at each end ?	
34	Have all curves been adequately super elevated for the speeds in force? Is the super-elevation to be given to each curve indicated at site ?	
	STATION FACILITIES	
35	Have Maximum and Minimum Dimensions in station yards been observed ?	
36	Has suitable accommodation for passengers been provided at all stations ?	
37	Have latrines been provided on platforms, and are they properly situated, constructed and lighted ?	

(1)	(2)	(3)
38	Are there proper arrangements for supplying drinking water?	
39	Is foot over bridges or sub-ways for crossing the line provided where necessary? Are any landings provided* Are the rise and tread of steps properly proportioned? *If the total height of steps exceeds 4.57 metres, it is usually desirable that there should be an intermediates landing not less than 1.22 metres in length.	
40	Are the names of stations shown both in Hindi and English and in vernacular language, in large and distinct letters in conspicuous positions so as to be seen readily by passengers in the trains both during day and night ?	
41	Are clocks provided at all block stations?	
	SIGNALLING AND TELECOMMUNICATION /BLOCK WORKING	
42	Have the requirements and recommendations for signalling and interlocking, and the catechism for signalling and interlocking installations vide Chapter VII of these rules, and the appendix thereto, being fully complied with, according to the class of signalling and interlocking installed? If not, in what respect do the arrangements provided fall short of them?	
43	Have the requirements and recommendations for signalling and telecommunication installations in accordance with the instructions issued for the installations of S&T equipment in 25 kV 50 Hz electrified sections been complied with? If not, in what respect the arrangements provided fall short of them ?	

(1)	(2)	(3)
	STATION WORKING	
44	Is provision made, whether by trap points or other means, to prevent, vehicles standing on sidings, from fouling any running line?	
45.	Are there any stations situated on a steeper grade than 1 in 400? If so, what special safety devices are adopted and / or special rules enforced at those Stations? *	
46	What safety sidings are provided? Are they suitable? @ Are any others necessary? *Note1 : No station should be constructed nor should any siding join a passenger line on a steeper gradient than 1 in 260, except where it is unavoidable, and then only with the previous sanction of the Railway Board obtained through the Commissioner of Railway Safety, when a slip siding or other arrangements is made, sufficient to prevent accidents. @Note 2: At any station situated in the immediate neighbourhood of an incline steeper than 1 in 100 falling away from the station, a catch siding in the former case, and a slip siding in the latter case, should be provided, if necessary, in a suitable position. The take off points to a catch siding or a slip siding should normally be set and locked for the siding, except where required to be trailed through. "For the purpose of the footnotes marked* 1 and 2 the definition of a station yard as given in item 2	

L 1 in 80 falling towards the station and

(1)	(2)	(3)
	of Chapter II of Schedule of Dimensions shall apply".	
47	Are station yards so arranged that shunting past junctions or level crossings may be avoided as far as possible?	
48	Are shunting necks for goods working provided in large yards, where shunting operations cannot otherwise be carried on without interfering with incoming trains?	
	ROLLING STOCK	
49	Is the following information noted in a conspicuous position on each vehicle? (i)Passenger Carriages- The maximum number of passenger intended to be carried in each compartment of every description of carriage? * (ii) Goods wagons-The tare weight of the empty wagon (including wheels, axles and axle boxes and springs) and the maximum load, in tonnes, which the wagon is constructed to carry?	
50	Are means for communications between passengers and the guard, provided in all trains carrying passengers? **	
51	Have all engines and tenders, and all vehicles intended to run on passenger trains been fitted with the vacuum/air brake?	
52	Are all locomotive & motor coaches provided with: (a) Cattle guards (b) High power headlights (c) Other prescribed safety equipments. *Note: This information should be in the vernacular language as well as in English and Hindi.	

(1)	(2)	(3)
	**Except in the case of complete or partial failure of vaccume, trains carrying passengers may run without such means of communication, only in accordance with general Rule 4.18.	
	FACILITIES FOR BOOKING	
53	Are suitable arrangements made at all stations for the booking of passengers ?	
54	Are suitable weighing machines provided at all stations open for goods/parcel booking ?	
55	Are time and fare tables placed in a convenient position for inspection by the public at each station? Are these documents clearly exhibited in Hindi & English and also the vernacular language of the district ?	
56	Is a copy of the general rules for regulating the working of the railway available for inspection at every station ?	
57.	Is every station provided with station diagram, station working orders, coaching and goods tariffs, and all other necessary manuals or instructions, forms and registers for the work of the station ?	
58.	Do the working orders provide suitably for all special conditions met with at each station ?	
	ELECTRICAL	
59	Have the Rules for the Design and Inspection of equipment for Electric Traction (Vide Chapter VIII of these rules) been individually and fully complied with ? If not, where and in what respect, do the arrangements provided fall short of them?	
	GENERAL	
	What provision of Medical First Aid equipment has been made for use in the event of accident ?	

FORM XVI

[See rule 5(4)]

CERTIFICATES TO BE GIVEN BY GENERAL MANAGER

I do hereby certify :-

(i) that the Maximum Dimensions for railways in India have in every case been worked to, with the exceptions detailed in the statement herewith annexed. *

Also, that the Standard Dimensions will be observed in future, and that no work or structure infringing the Standard Dimensions will hereafter be permitted without the sanction of the Central Government .

(ii) that each bridge is of such design, dimensions and construction as will enable it to bear the dead load of the structure itself (with flooring, roadway, permanent way etc. complete), and in addition thereto, the equivalents of the live loads specified in the rules prescribing Standards of the Design and loading for Railway bridges, without exceeding the maximum permissible stress on the available material in any member or portion of the structure.

(iii) that more than two engines shall not under any circumstances be allowed at one time on the same track of one span of any bridge.

(iv) that every coaching vehicle constructed or procured for the use of the railway in mail and passenger trains is, and shall be provided with vacuum/air brake and effective means of communication between passengers, guard and driver.

Note: This item of certificate is not necessary for those light lines on which the use of vacuum or air brake has not been insisted upon.

(v) that one compartment or such number of berth or seats, as the railway administration may think fit, of a second class carriage of every train carrying passengers shall be reserved for the exclusive use of females.

(vi) that the railway shall be worked on the system known as Absolute Block System in accordance with the regulations prescribed in section Chapter VIII of the General Rules for Railways in India.

2009 GI/2000—14

Note: In the statement showing the cases in which the Maximum and Minimum dimensions have been infringed, full details for each case must be given, in the form attached (Form XVII) with explanation of the necessity for such infringements and a reference to the authority under which it was permitted. If there have been no infringements of the Maximum and Minimum Dimensions the words, "with the exception detailed in the statement herewith annexed", should be omitted or struck out.

(vii) # that the electric traction equipment can be used for the public carriage of passengers without danger to the public and that the rules for design and inspection of equipment for electric traction of Chapter VIII of these Rules) have been complied with.

(viii) that the signalling and telecommunication equipment have been installed in accordance with the approved instructions and they are safe for passing traffic.

(ix) that .....has been delegated to accompany the Commissioner of Railways Safety on his inspection and all information supplied or engagements entered into by him shall bear my authority.

Note: To be included only where applicable.

[Sd/- .....]

The General Manager

FORM XVII

[See rule 5(5)]

INFRINGEMENT OF MAXIMUM AND MINIMUM DIMENSIONS

RAILWAY
GAUGE:1.676 M

SECTION:

LENGTH:

Sl.No.	Location		Name of Structures which infringe	Prescribed maximum and Minimum Dimensions		Existing Actual Dimension	Amount of infringe-gement	Particu of sanc to Infri ment & Remar
	Division and Section	Kilo-meterage		Chapter/ Item	Maximum & Minimum			

-73-

FORM XVIII
[See rule 17(6) and 17(7)]
DEFLECTION TESTS OF BRIDGES

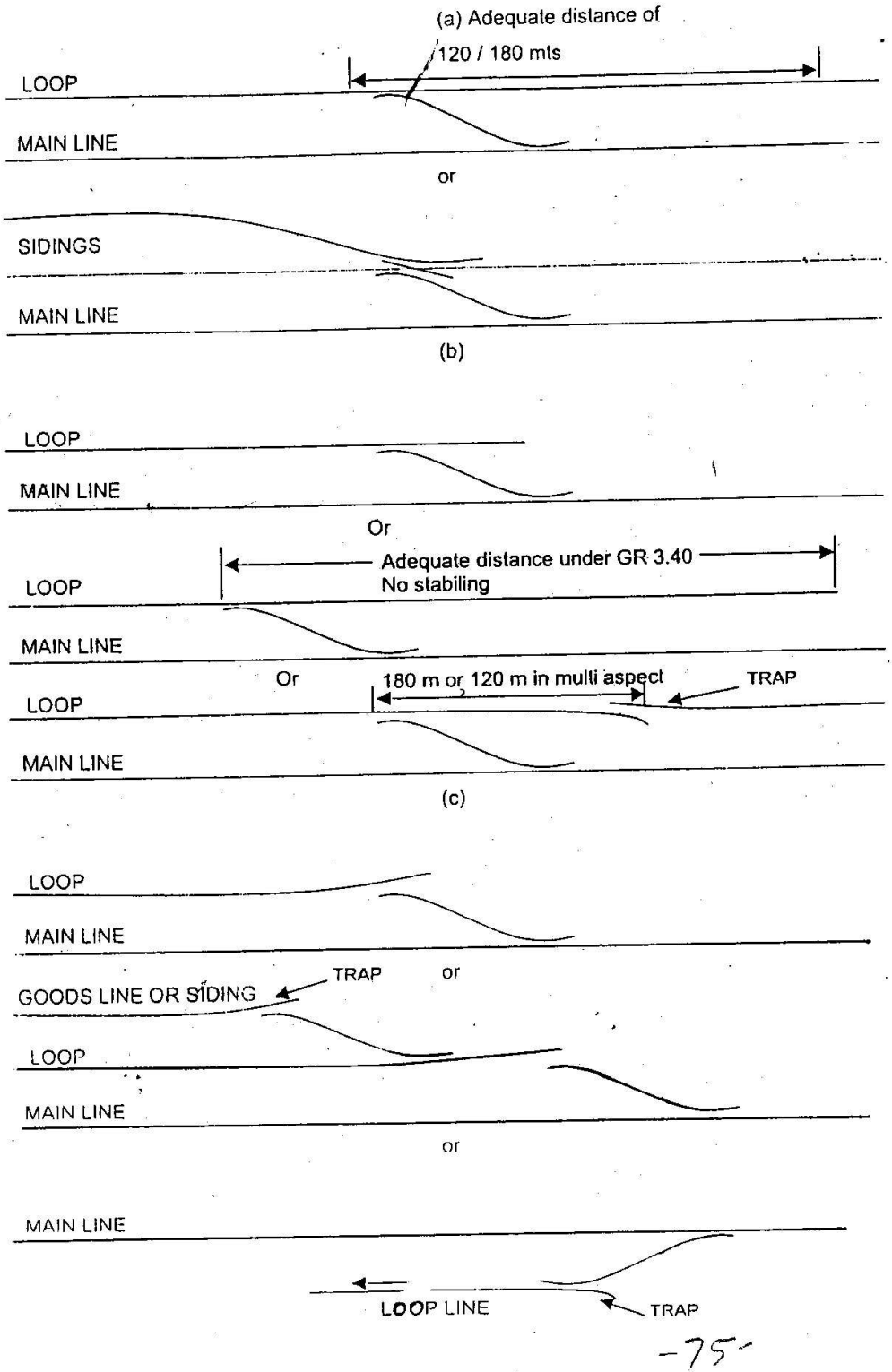
SECTION: Date of Tests..... Railway
GAUGE:1.676 M

LENGTH: Description of Test Load(Including Engine No.).....

Bridge Number	Kilometerage	Material of girders	Clear Span between bearing plates	Overall Depth of girders	Speed of train	Test Load EUDL	Deflection in M.M	Design load EUDL for B.M	Ratio of Design load B.M to test load B.M	Reduced Defection under design load(for Slow speed tests) =(8x10)	Theoretical (calculated) deflection (approx.) under designed load
1	2	3	4	5	6	7	8	9	10	11	12

- 74 -

APPENDIX A
[See rule 36(9)]
DIAGRAM ILLUSTRATING METHODS OF PROVIDING ISOLATION



-75-

APPENDIX B

[See rule 43 (7)]

CATECHISM FOR SIGNALLING AND INTERLOCKING INSTALLATIONS

INSPECTION AT THE SIGNALS:

(1) Are all running signals controlling trains placed in such a position and at such a height above rail level so that they can be clearly seen by Drivers in sufficient time and be readily distinguished by nigh or by day from the subsidiary signals?

(2) Are all signals constructed so that their normal position is at "ON" or most restrictive and that they stand at or return to this position in case of failure of any part of the signals or their connections?

Note: This paragraph does not apply to automatic signals, the normal position of which is "OFF"

(3) Do all signals come fully OFF" when worked and return freely to the "ON" position?

(4) In the case of slotted or controlled signals, can the signals be freely returned to danger by either of the controlling agencies?

Note: This paragraph does not apply where signals are controlled by key transmitters or similar form of control.

(5) Are signal counter weights, where possible, fixed out of reach?

(6) Is the facing side of the arms of all semaphore Signals (including miniature and disc signals) painted the same colour as the light exhibited in the "ON" position?

-76-

Note: This paragraph does not apply to calling on signals.

(7) Are signals not in use fixed at "ON" and distinguished by having two crossed bars attached to them each bar being not less than one 1 meter long and 100 millimetres wide?

(8) Are all signals of standard type and do they comply with the requirements as laid down in the General Rules and have they been passed by a Sighting Committee?

(9) (i)Are all fixed signals, the front light of which cannot be seen from the point from which they are worked, provided with a small white back light not larger than is actually necessary and visible only when the signal is at "ON"? Also is the fixed green light of every Warner, which is used by it, provided with a white back light? (ii) Do all the distant signals in Multiple Aspect area show two back lights in the "ON" position and no light in any other position or where electric lighting of distant signals is provided, it shows at least one back light in the 'ON' position?

Note: Colour light signals need not be provided with back lights since these are provided with visual indicators.

(10)Do miniature and dwarf signals, used to control shunting show the same front and back lights, as are prescribed for running signals and are the lenses small enough to make them distinguishable from running signals?

(11)Are signal lamp brackets fixed on the posts, and is suitable provisions made for lighting and cleaning lamps?

(12)If any signal is placed at more than 180m away from the facing points it controls, is arrangement made to keep the points locked until the train has passed them?

(13)Are all signal arms placed on the left-hand side of the post as seen

by the Driver of approaching trains to which the signals refer?

(14)Are all signal posts placed on the left-hand side of the track of approaching trains to which they refer? If placed otherwise, for what reason?

(15)Where two or more lines diverge, are the signals fixed on a bracket post or on separate doll posts carried on a signal bridge?

(16)Where two or more lines converge, are the signals fixed on altogether separate posts or on separate doll posts carried on a signal bridge?

(17)Are bracket and bridge signals arranged so that each signal from left to right, from the point of view of approaching trains applies to each corresponding line from left to right, and are they distinguished by "grouping" and by making the more important signals higher than those of lesser importance?

Note.- The highest arm must always refer to the straight line.

(18)In the case of two or more signals referring to parallel lines, are they arranged in transverse line as nearly as circumstances allow?

(19)Does any case occur of more than one signal referring to trains moving in the same direction being placed on the same post, other than Warner, shunt or calling on signals?

(20)(a) Are Warner Signals fixed 1.5 to 2m's below a stop arm or fixed green light?

(b)Are "Co-acting" or "Calling on" signals placed not less than 2.5 m below the Semaphore arm above?

(21)Are Warner Signals, which are un-worked, secured in the "ON" position?

(22)Are arrangements made to render it impossible for the Warner Arm to be taken off independently of the stop arm above it and

when the stop arm returns to danger, the Warner if "OFF" automatically returns to danger?

(23)At diverging junctions, is one Warner Signal only provided applying to the through line?

(24)(a) Do all signal lights show red in the "ON" position, Or yellow/double yellow in the case of Distant signals; or no light in the case of Calling on signals?

(b) Do all running signal lights show Green in the "OFF" position in two aspect signalling sections and yellow double yellow/green in multi aspect signalling sections?

(25)Are signals where necessary effectively guyed?

II. **INSPECTION AT THE POINTS:**

1. Is the locking of facing points such that the points cannot be or become unlocked while a train is passing over them ? i.e.

(a) are lock bars provided of a length exceeding the greatest distance between any two adjacent axles likely to be used on the line or alternatively is the point or lock lever electrically controlled by track Circuits?

(b) in the case of key locks, are the locks either under the train and therefore inaccessible; or if not place under the train, is the arrangement such that the key is used to release the signals and that it cannot be brought back to the points until such signals have been put to the "ON" position?

2. Is the arrangement such that the operation of the facing point lock depends on the correct operation of the lock bar where used, and is it impossible for the lock bar to be forced over while a train is passing over it?

3. Are the locks of a substantial pattern and make? Are they fixed in

such a manner as to ensure the necessary rigidity and are key sufficiently large and strong to minimise the chance of their being mislaid or broken?

4. Do key locks fitted to facing points on passenger running lines lock both switches?

5. Are switches adjusted to come tight against stock rails? Does the insertion of a 5mm obstruction piece between the switch and stock rails 150 mm from the toe of the switch prevent the points being locked and prevent the relevant signal from being taken "OFF", the giving of which is preceded by the locking of the points.

6. Do facing point lock plungers clear the stretcher blade when the points are unbolted and in the event of there being an obstruction at the points, it is impossible for the point lock plunger to enter the stretcher blade and for the point lock lever to be forced into its normal or reverse position?

7. Are all facing points fitted with a gauge tie plate where steel sleepers are not provided at the toe of the switches, and are they provided with split stretcher bars or other fitting giving equal security?

8. Are all point locks and detectors securely fixed?

9. (a) Are detectors fitted to all facing points and do they efficiently detect with both switches the signals controlling the movement of trains over them?

(b) In cases where the lock and switches are actuated by the same lever, do they detect the locking mechanism as well as switches ?

10. Are trailing points on passenger running lines used in the facing

2009 GI/2000—15

direction for shunting movements which are not fitted with facing points locks detected with the relative shunt signals?

11. Is it possible for any detector slide to enter a notch other than that intended for it?

12. Do point indicators show the prescribed indications i.e. while for the straight and green for the turn out in both directions and where fitted to trap points or to derails where these are still in use, red in both directions when the trap is open or the derail is on the line; and green in both directions when the trap is closed or the derail is off the line.

13. Where the point indicators of the directional type have been provided, has this been done under approved special instructions ?

III. INSPECTION ON THE TRACK :

1. Are all through lines isolated from each other, from other running lines and from all sidings?

2. Are running lines isolated from all sidings and goods lines, either by –

   (a) trapping into dead ends taking off the sidings or goods lines ; or

   (b) derailing switches, or derails placed on the lines giving access from the sidings or goods lines, to the running lines?

Note: - The use of details is now obsolete. Existing ones may, however, continue to be used but when they require replacement, trap points should be substituted.

1. Are dead ends traps, derailing switches or derails where these are still in use, so locked as to prevent any possibility of the running

line being fouled for which signals have been taken off?

2. Are the dead end traps, derailing switches or derails where these are still in use, fitted with indicators, or are they protected by signals?

3. Are these dead end traps, derailing switches or derails where these are still in use, placed in such a position as to ensure that any vehicles that may be derailed by them shall not foul any running line?

4. (i)Are all points worked by rodding within a distance of 320 m from the lever operating them or in case of facing points on a passenger running line operated and locked by the same lever within a distance of 180 m?

   (ii) If the distances are greater than those are specified above, are they within 460 m and 275 m respectively, and are a stroke of not less than 200 mm provided at the lever tail?

5. Is the rodding efficiently laid and properly compensated where necessary and mans for adjustment provided?

6. Are all signal connections efficiently installed and means for adjustment provided?

IV INSPECTION IN THE CABIN OR AT THE LEVER FRAME WHERE THERE IS NO CABIN

1. Is the signal cabin provided with the following essentials ? :-

   (a) A clock in cabins where train movements are registered.

   (b) A diagram correctly representing the arrangements of the points and signals worked from the cabin in their normal position and the number of the points and signals?

   (c) Lights so arranged as not to be mistaken for running

signals or interfere with their sighting?

1. Is there sufficient space in the cabin to allow the cabin man or operator freedom of movements for manipulating the levers or other apparatus in the cabin?
2. Is the gear leading off from the cabin or frame securely fixed?
3. Are the levers painted with distinguishing colours and in addition to its own number does each lever bear the number of the levers, which must proceed it, and in the proper order?
4. Is the cabin so located and built as to enable the cabin man to have the best possible view of all points and signals, the working of which he is responsible for and also for all movements under his control?
5. Are all signals, which are not visible form the cabin or frame electrically repeated? If so, does the repeater repeat the light as well as the arm?
6. Have instructions for working been issued to the staff and included in the Railway Working Instructions, and are they correct and sufficient?
7. Is the Station Master provided with interlocked mechanical or electrical control of the Home and Last Stop Signals?

V. TEST TO BE MADE IN THE LEVER CABIN OR AT THE LEVER FRAME:

Note: It is essential that the interlocking of all signals with the points must be so effected as to ensure the following conditions, which may be tested from the cabin or frame by pulling over the levers for each combination allowed by the locking table and checking the security of each such combination by attempting to infringe it.

1. Is it possible to take off conflicting signals at the same time?
2. Is it possible to take off a signal until -
   (a) all points on the running line including overlap are correctly set and the facing points locked?
   (b) all points, giving access to the running line from sidings and goods lines, are set against the running line?
   (c) Level Crossing gates, if included in or controlled by the interlocking, are locked across the roadway?
   (d) a signal lever, when operated locks or back locks as necessary, the levers operating the points and gate locks referred to in this paragraph ?
3. When all signals are "ON" are all points, which would be locked by the taking off of such signals, free for shunting purposes?
4. Is it possible to take off a Warner Signal until all the relative stop signals in advance have first been taken off and when off does it back lock such signals?
5. Does the locking in the frame correspond with that shown in the approved locking table?
6. Is the locking strong, durable and accurate, i.e. can any tappet enter a notch other than that for which it is intended, or can the locking be forced?
7. Does the locking in the lever frame act on the commencement of the movement of the lever in case of direct locking type of lever frames and pressing the catch handle in case of catch handle/DW type of lever frame?
8. Is release locking not effective before the completion of the movement of the lever?

2009 GI/2000—16

B. ADDITIONAL CATCHISM FOR POWER OPERATED POINTS AND SIGNALS

Note: - These rules must be followed in conjunction with those laid down in the catechism for signalling and interlocking installations so far as they are applicable to power working.

I. **SIGNALS :**

1. Is the mechanism case weather proof and protected form unauthorised interference?
2. Do the indication contacts close if the arm is more than +or-5 degrees from "ON or "OFF" position?
3. Is the signal and hold off mechanism so constructed, that in the even of a failure, the signal shall go to the "ON" position?
4. With the exception of motor commutators, etc. is a surface leakage distance of not less than 6mm provided between any exposed metallic part of the mechanism carrying current and any other metallic part thereof?

The following regulations shall apply to colour light signals only.

5. Are the signals so bright as to cause confusion in reading at night?
6. When lamps are operated at normal voltage, is the range (on a straight track) of signals used to govern high-speed trains, not less than 200m on a clear day with a bright sun at or near its zenith?
7. Are the signals so bright as to cause confusion in reading at night?
8. Does the signal give a distinct indication to drivers when approaching or stopped at a signal?

II. **POINTS :**

1. Is the switch operating mechanism of substantial design securely fixed and protected from unauthorised interference?
2. Is the mechanism provided with means for emergency operation in the event of a failure?
3. Does the use of the bank or other apparatus for emergency operation disconnect the power supply to the motor and prevent clearance of signal for which such points are required to be set.
4. With the exception of motor commutators, is there a surface leakage distance of not less than 6mm provided between any

exposed metallic part carrying current and any other metallic part of the mechanism?

5. Is the mechanism so constructed that it can be stopped reversed or obstructed at any point of its movement with damage?
6. Is the mechanism so constructed that it cannot give a "Normal" or "Reverse" indication, unless the closed switch be within 5mm of the stock rail and in the case of facing points the switches are properly locked?
7. In order to prevent the movement of points while a train is passing over them, are facing points provided with a lock bar, (alternatively) with track circuit locking of the point lever?
8. Where the movements of trains over the points are not within easy visibility of the cabin, is occupation of the section between the stop signals leading over the points and the fouling point ahead of such points, electrically indicated in the cabin?

III CABIN AND LEVER FRAME :

1. In the case of power interlocking frames, is the lever frame mechanism completely enclosed with removable covers giving free access to all parts and provision made for securing such covers against unauthorised opening?
2. Have all exposed metallic parts carrying current, not less than 6mm surface leakage distance between them and any other metallic part of the mechanism?
3. Are the levers operating power worked points provided with "Normal" and "Reverse" indication locks, adapted directly to prevent the full movement of the lever, unless the point mechanism has made the required movement and the points are in a position corresponding to that of the lever and in case of facing points unless they are securely locked?

   Note.- This test need not apply where approved alternative electric locking is provided.
4. Are levers operating power worked signals provided with "Normal" indication locks, adopted directly to prevent the full return movement of the lever to the normal position, unless the arm has returned to the "ON" position?

Note.- This test need not apply to a mechanical lever frame, if the signal is repeated at the place of operation through an arm and light repeater.

5. Are all electric locks mechanically replaced to the locking position?

6. Is all the wiring between different parts of the apparatus made with suitably insulated wire and efficiently protected?

7. Is the lever frame properly earthed and are efficient safeguards provided to prevent injury to the operator, in the event of a short circuit or other similar circumstances?

IV CABLES AND CIRCUITS :

1. Do all main cables terminate in properly sealed boxes?

2. Are circuits controlling the operating and indication of signals so arranged, that as far as practicable, a cross connection or a short circuit on any of the wires, cannot give a false "Clear" indication ?

3. Are circuits controlling the operation and indication of points so arranged that, as far as practicable, a cross connection or a short circuit, cannot operate the switch, or give a false indication of the position of the points?

4. Is the battery or power supply for line circuits, as far as practicable, arranged at the end of the circuit farthest from the operated unit?

5. (a) Are all main track circuits as far as practicable so arranged as to provide the best protection against broken rails, points crossings, etc.?

(b) Are the adjacent track circuits staggered in polarity ?

6. Are sidings and junctions tracks circuited up to the fouling mark or sidings derailing where this is till in use?

7. Are hand worked switches, in or leading to automatic signalling territory, equipped with a circuit controller operated by the normally closed switch.

8. Are such switches electrically locked by the approaching track circuits to prevent their movement in the face of an approaching train?

APPENDIX –C

[See rule 43(7)]

CATECHISM FOR SIGNALLING AND TELECOMMUNICATION INSTALLATIONS FOR 25 KV 50 HZ, SINGLE PHASE AC ELECTRIFIED SECTIONS

SECTION-I - SIGNALS :

1. Are the signals located in accordance with the approved instructions as per Manual of Instructions for installation of Signalling and Telecommunications Equipment in 25 KV, 50 Hz AC electrified sections?
2. Have the protective iron screens as required for signals/fittings within 2m of live conductor/parts been provided and earthed?
3. Where it is not possible to provide protective iron screens, has a caution board been provided on the signal posts in accordance with the approved instructions?
4. Has the "Signal Sighting Committee" certified that the driver's view of the signal is clear?
5. Have only multi aspect signals been used in colour light signalling area?
6. Is the AC power supply arrangement for the colour light signals of a type approved for Railway Electrified areas?

SECTION-II - POINTS :

Have the rodding transmission of points and other apparatus been insulated as per the approved instructions?

SECTION-III - ELECTRICAL SIGNALLING EQUIPMENT:

1. Does the design of signalling equipment and the circuits used in Railway Electrified areas provide for a safety factor of 1.5 against AC interference.
2. Has it been ensured that the signalling equipment not suitable for Railway Electrified areas on external circuits like banner type indicators, Luminous indicators, telephone type relays, electrical lever locks, rotary key transmitter, DC neutral polar relays, 250 ohms DC neutral line relays and door coils of IRS block Instrument etc. have not been used?

3. Has it been ensured that all stick relay have at least 4 front and 4 back contacts and their pick up transfer time is not less than 300 milli seconds?

SECTION-IV - CABLING AND WIRING OF CIRCUITS:

1. Have all telephone circuits, except cabin to cabin and cabin to ASM circuits, which may be retained on signalling cable, been transferred to separate underground telecommunication cable?
2. Have all overhead wire circuits been shifted or cabled as per the approved instructions?
3. Has it been checked that the voltages induced due to parallelism in the telecommunication cable under normal and short circuit conditions are within safe limits (limits specified by the Consulting Committee of International Telegraph and Telephones)?
4. Has it been ensured that the earth return circuits are not retained and have been replaced by metallic return circuits except the block circuits?
5. Has the principle of double cutting been used for all external-signalling circuits?
6. Have the external circuits and batteries been isolated from internal circuits and batteries?
7. Has it been ensured that the induced voltages in the length of inter cabin telephone circuits in signalling cables does not exceed 60 V?

SECTION-V - BATTERIES:

1. Has it been ensured that power supply for internal and external circuits and for each block instrument are isolated?
2. Has it been ensured that the battery for signalling equipment is separate from the battery for telecommunication equipment?

SECTION-VI - EARTHING:

1. Have the lever frames and other equipment been earthed in accordance with the approved instructions?
2. Has it been checked that no earthing pipe is less than 3 m away from any other earthing pipe?
3. Has it been tested that the earth resistance does not exceed 10 ohms for the signalling equipment and 1 ohm for telecommunication copper cable earth?

4. Has the screening of the telecommunication cable terminated at the sectionalising points and repeater stations been earthed in accordance with approved instructions?

SECTION-VII - TRACK CIRCUITS:

1. Has it been ensured that track circuits are of approved type?.
2. Have measurements of DC tray currents been taken before installations of DC single rail track circuits and whether these are within permissible limits?
3. Has the longitudinal and transverse bonding in track circuited areas been provided as per the approved instructions?
4. Have the DC single rail track circuits of closed type been installed in accordance with the approved instructions?
5. Have the protective measures like surge discharges (intervals off discharge) been provided on track circuits, where required, as per the approved instructions?

SECTION-VIII - EMERGENCY CONTROL:

Have emergency control telephone post been provided at correct regular intervals along the track in electrified areas as per the approved instructions?

SECTION-IX - BLOCK INSTRUMENTS:

1. Are the block instruments installed of a type approved for use in AC electrified sections?
2. Have block filters for single and double line block instruments been provided in accordance with the approved instructions?
3. Are the filter units of an approved design?
4. Have the line terminals of block filters been painted red to caution the maintenance staff against high voltages?
5. Where a block section falls between an electrified and non-electrified section, has it been ensured that block filters have been provided for block instruments at either ends of such block section?
6. Have the block telephones been provided on a separate pair of conductors in accordance with the approved instructions?
7. Have the block circuits been provided on underground cables as per the approved instructions?

8. Have position polarised relays of SGE block instruments been provided in accordance with the approved instructions?
9. Have the block release and advance starter control of block instrument been provided in accordance with the approved circuit?
10. Hs it been ensured that the circuits from a non electrified section approaching and electrified section and vice versa been cabled for a length of 1 km beyond the electrified sections.

SECTION-X - GENERAL SAFETY:

1. Has the chart on method of treating electric shock been displayed in cabins and relay rooms, etc.?
2. Has the rubber matting been provided in relay rooms, repeater stations and cable huts etc. as per the approved instructions?
3. Have special instructions been issued to the personnel that the accessible parts of the installation and apparatus in the repeater stations and cable huts, connected to the telecom cable are likely to attain an induced voltage of 150 V AC under 5 normal working conditions and have such parts of installation and apparatus suitably marked to indicate this?
4. Have the metallic cabinets/covers/frames of telecommunication equipments provided in railway electrified areas been earthed properly?
5. Are the protective devices installed on telephones provided at grid stations, 25 KV sub stations and switching posts as per the approved instructions?
6. Are the tools used by maintenance staff properly insulated?

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-91- (END)

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