



मध्य रेलवे /Central Railway

मंडल कार्यालय/ Divisional Office  
कार्मिक शाखा/ Personnel Branch  
सोलापुर/ Solapur.  
दिनांक:-14/11/2024

संख्या: SUR/P/General/ Notification

सभी सम्बंधित : सोलापुर मंडल

विषय: Formation of panel for the Group B post of AEN/ADEN (Group-B) Level-8 PB-9300-34800 GP-4800/- against 70% selection quota in Civil Engineering Department Vacancy cycle from 01/01/2025 to 31/12/2026.

संदर्भ: मुख्यालय कार्यालय द्वारा जारी पत्रांक P/CR/HQ/Gaz-Sel/260/3/AEN (70%)-2 दिनांक 13/11/2024.

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मुख्यालय कार्यालय द्वारा जारी पत्रांक P/CR/HQ/Gaz-Sel/260/3/AEN (70%)-2 दिनांक 13/11/2024 की प्रति अनुलग्नकों के साथ परिपत्रित की जाती है। समस्त जानकारी के लिए उपरोक्त अधिसूचना सोलापुर मंडल की वेबसाइट [www.cr.indianrailways.gov.in](http://www.cr.indianrailways.gov.in) पर अपलोड किया गया है, इस प्रकार से विजिट कर About us > Divisions > Solapur > Personnel > Notification सेक्शन में देखें।

अनुलग्नक : यथोक्त।

(रमेश नायर)

सहायक कार्मिक अधिकारी  
कृते मंडल रेल प्रबंधक (कार्मिक) सोलापुर

प्रतिलिपि :

DRM, ADRM सोलापुर, कृपया सूचनार्थ।

मंडल सचिव: NRMU, CRMS, AIOBCREA & AISCSTREA:सोलापुर, कृपया सूचनार्थ।

## NOTIFICATION

CENTRAL RAILWAY

Headquarters Office,  
Personnel Branch,  
CSMT Mumbai.

No. P/CR/HQ/Gaz-Sel/260/3/AEN(70%)-2

Date: 13.11.2024

DG IRICEN PA  
AGM PCE CAO(C) SDGM  
Secy to PCE  
DRM(P/Engg) BB, BSL, NGP, SUR, PA,  
Sr.DEN(Co) BB, BSL, NGP, SUR, PA,  
Dy CE(TM)BSL, CWM(E/W)MMR , ,  
Dy CE(C)DR, GC, PNVL, JNJ, BSL, Ajni/NGP, AMI, SUR, PA,  
Principal ZRTI BSL, Director RDSO/LKO, CPM/ RE/Ambala, ALD.

Sub: Formation of panel for the post of AEN/ADEN (Group 'B') Level-8/PB-9300-34800 GP-4800/- against 70% selection quota in Civil Engineering department - Vacancy cycle from 01.01.2025 to 31.12.2026.

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1. It has been decided to conduct a selection for promotion to Group 'B' services as AEN/ADEN, Level-8 (PB-9300-34800 PB-2+GP-4800/-) against 70% selection quota in Civil Engineering Department for the vacancies as per selection procedure laid down in Railway Board's letter No. E(GP)88/2/111 dated 20/08/1991, No.E(GP)2018/2/31 dated 19.03.2019, No. E(GP)2022/2/4 dated 28.06.2022 & No. E(GP)2024/2/28 dated 08.10.2024.

\* \* Break up of number of assessed vacancy is as under:

Post	Scheme	UR	SC	ST	Total	PwBD *
AEN	70% selection	28	08	04	40	04

\* PwBD is not shown separately but included in the total vacancies.

\* \* The vacancies notified are provisional including Communal Break up & PwBD, may vary before the closing date of Online application.

Railway Board vide letter dated 18.08.2022, has introduced the reservation to PwBD in promotion from Gr C to Gr B in selection as well as in LDCEs. Hence, the categories identified for the post of AEN are 02-LD and 02-HH (as indicated by PHOD) for the vacancy cycle for the period from 01.01.2025 to 31.12.2026. If suitable candidates of the said PwBD categories are not placed on the panel of 70% selection against the notification, these points of 02-LD and 02-HH will be carried forward in 30% LDCE quota.

2. As per Para 2(ii) of Railway Board's Rly. Bd's L. No: E(GP)2019/2/25 dated 27.12.2019 & E(GP)88/2/28 dated 08.10.2024, this selection is open to all Non Ministerial staff of Civil Engineering Department in Level-6 / PB-2 +4200/- and above who have completed 3 years Non fortuitous service (including non fortuitous service rendered in the corresponding pre revised grades) in level-6 /PB2+ GP Rs. 4200 and above as on 01.01.2025.

For the purpose of counting service for eligibility, time spent by Railway servants during pre-requisite training immediately before appointment to working post is counted as qualifying service (Railway Board's letter No. E(NG)I-2019/PM1/24 dated 25.06.2019).

Grade Pay in MACP will not be considered.



3. It has been decided to call applications online from the applicants and scrutiny of service particulars will also be done electronically at each level i.e division/workshop/Unit and Headquarter.

The employees may be advised to take utmost care while filling up of the proforma since incomplete/wrongly filled proforma will be rejected and no representations in this regard will be entertained.

4. The tentative schedule will be as under :-

Sr.No.	Subject	Scheduled date
1)	Date to open GOAL window	14.11.2024
2)	Last date to apply by the employee	03.12.2024
3)	Last date to forward the application by respective depots to their Bill preparing Unit.	05.12.2024
4)	Last date to forward the application after verification by Bill preparing Unit to HQ's office	18.12.2024
5)	Date of issue of Eligibility list	31.12.2024
6)	Date to raise objection on Eligibility list , if any	06.01.2025
7)	Pre-promotional Training for 60 Hrs./15 working days	In between 15 th Jan 2025 to 10 <sup>th</sup> Feb 2025
8)	Date of Examination (CBT)	09.03.2025
9)	Supplementary Examination	23.03.2025

The supplementary Examination will be held only for those candidates who could not appear in the main examination for reasons beyond their control, authorization of which will be decided by the Competent Authority.

## 5. MODE OF APPLICATION

### A: For staff of Open Line, Construction Unit and Workshop)

#### (I) HOW TO APPLY

The eligible staff should submit their application through **ONLINE MODE** only for which following steps should be followed.

1. Visit the Railnet site 10.31.3.3 /GOAL1/.
2. Go through the **NOTIFICATION**.
3. Click on **REGISTER**. Select Exam Code: ENGINEERING/AEN/SELECTION/2025-26 (Select Exam Code with utmost care )
4. Fill up **PF No as User ID**, Your Mobile No. (the Mobile No. linked with HRMS) and Registered Email and **Submit**.
5. You will get a default Password generated and display as 12345, immediately on another screen will show for change of password .
6. Now go to **Home Page** and select **APPLY/LOGIN**
7. Again use your **PF No. as User ID** and **Password**.





8. Fill up the Application form with utmost care and after completing all the fields, click on **Submit** tab.

9. Take a print out and keep it for your record.

This will complete the submission of application for the candidate.

## ( II ) HOW TO FORWARD APPLICATION.

For login, **each Division/Workshop/ Construction Unit** Incharge will obtain User ID and password from **APO(Gaz)**. After login **Division/Workshop/ Construction Unit Incharges** can view the details of applicants working under his/her control. To forward the application, just Click on **FORWARD** of each of the application. On Last date of submission of application by the candidate, respective **Division/Workshop/ Construction Unit Incharges** can get a summary of the applications which he/she has forwarded. He/She should take a print and keep it for the record with the signature of the Establishment incharge.

## (III) HOW TO VERIFY THE APPLICATIONS

For login, Office Superintendent of the **Division/Workshop/ Construction Unit** with whom Service Registers are maintained will obtain User ID and password from **APO(Gaz)**. After login, OS can **View** as well as **Edit** the details of all applicants whose Service Registers are maintained in that office. After verifying Service Particulars of each employee from Service Record, OS can change it in Edit application, if there is / are any deviation/s. He/She should put **sign ✓ in the box** if he/she made any change in the particulars filled by the applicant and same remarks should be added in the remarks column. After verification, to forward the application just click on **FORWARD BUTTON** of each of the application.

## ( IV ) HOW TO VALIDATE THE APPLICATIONS

For login, APO/Head of the Construction Unit with whom Service Registers are maintained will obtain User ID and password **from APO(Gaz)**. After login APO/Head of the Construction can view all applications whose Service Registers are maintained in that office and verified by his/her Office Superintendent. As per the Eligibility conditions for the selection for the post, APO/Head of the Construction Unit will valid or invalid the application by clicking on the **Valid/Invalid**. Then all the applications will be automatically forwarded to Headquarter for further scrutiny. On Last date of submission of application in Headquarter, Divisional Personnel Deptt / Workshop / Construction unit can get a summary of the applications he/she has forwarded. He/She should take a print and keep it for his/her record.

### B: For staff working in any other Railway/Non Railway Organisation on Deputation

The staff working in RE organization or any other Railway/Non Railway Organisation on Deputation etc. should also login into as per Para 5 of A and follow the steps from 1 to 9. One copy of the print out of the application should be verified by the concerned Bill preparing Unit i.e where SR is maintained and same should be sent to APO (Gaz) by Ordinary dak or per bearer so as to reach on or before 18.12.2024 and one copy should be forwarded to the Division or Workshop where the lien is maintained on Central Railway. Division/Workshop is advised to forward the applications received from the employees working in any other Railway/Non Railway Organisation on Deputation etc. by confirming lien maintained on that Division/Workshop/ Construction Unit Incharges on or before 18.12.2024.

For any queries regarding login/ forwarding/Editing/Validating application please contact on Phone no: 011-53228 (Office landline No) / Mobile Phone No:- 8828110621 - APO(Gaz)





(from 10.00 hrs to 18.00 hrs on working days)

6. After receipt of applications through online mode of all the volunteers, appearing for the selection, the same will be further scrutinized at Headquarters' level and the list of eligible volunteers will be published later. The final eligibility list will also be notified on RAILNET site 10.31.3.3/pers on 31.12.2024. The Objection on the eligibility list, if any, should be made on or before 06.01.2025.

In terms of Railway Board's letter No.E(GP)2022/2/4 dated 07.10.2022 & No: E(GP)2018/2/31 dated 19/03/2019, the following pattern of examination has been adopted for the 70% selections to be conducted through Centralised Computer Based objective type examination (CBT) in all departments. In terms of Railway Board's letter No: E(GP)2018/2/31, dated 19/03/2019 and 04.12.2023 the written examination shall comprise of one paper which shall have 100% Objective Type Multiple Choice Questions only. The paper will be of 100 marks.

a)	One Paper on Professional Subject including optional Questions of 10 marks on Official language policy	:	70 marks
b)	Establishment and Finance Rules	:	30 marks
c)	Qualifying marks	:	60 marks
d)	Duration of Examination	:	02 Hrs.

1 (one) mark will be allotted for every correct answer.

There will be no negative marking for incorrect answers (Authority: Rly Bd's No. E(GP)2024/2/28 dated 08.10.2024).

Railways-wise list of candidates along with marks scored by them in the written examination/CBT will be prepared by DG/NAIR.

Medical & Viva-voce of successful candidates will be conducted by the respective Zones and Panel will be prepared.

7. The candidates, who qualify in written test/CBT are required to undergo prescribed medical Examination in terms of Para 530 (a), 531 & 532 (1) of IRMM Vol I), before allowed to appear for viva-voce, and if found medically fit, as per Railway Board's letter No. E(GP)80/2/8 dated 31/10/1991 they will be called for viva voce.

In terms of Para 506 of IRMM (Vol I 2000 Edition), if a candidate is found medically unfit, an appeal against such a decision can be made within one month of the date of communication of medical unfitness and no appeal will be considered after the expiry of one month.

8. A copy of syllabus for professional subject for 70% selection in Gr B posts along with syllabus for Establishment and Finance prescribed by Board vide letter No: E(GP) 2022/2/4 dated 07.11.2022 is enclosed as **Annexure 'A'** for information and guidance of the candidates.
9. Since in the assessment post is reserved only for SC and ST, Pre-promotional training will be imparted to eligible SC and ST candidates (Railway Board's letter No. E(GP)2010/2/39 dated 28.08.2019).
10. A senior officer in all the offices & establishment may be nominated who will be responsible to ensure that this notification is brought to the notice of all the candidates/eligible employees working in their respective organizations. In case, any employee has been posted to another organization on transfer/deputation basis or working against Ex. cadre post, it will be the responsibility of their parent office / Establishment to ensure that the

notification is sent to that Establishment / Organization enjoining upon it to bring the same to the notice of concerned employee(s). Application of these employees, if any, should be obtained from these organizations and sent to this office duly verified for further scrutiny of their eligibility (Para 3(iii) of Railway Board's letter No. E(GP)87/2/72 dated 27/12/1991) on or before last date i.e. 18.12.2024.

11. The SRs, Leave a/c in favour of the employees, who apply in response to this notification should be updated in all respect (i.e. Educational Qualification) and kept ready to be sent to APO(Gaz), PCPO's office, at a short notice. Similarly, their APARs (in original) or attested copy of E-APAR where APARs are filled online for the last 7 years i.e. fiscal period ending 31.03.2018 to 31.03.2024 duly completed in all respect and countersigned by accepting authority i.e. HOD, DRM, ADRM etc., and also by disposing representations, if any, may also be kept ready to be sent to APO(Gaz), PCPO's office, at a short notice, whenever required, per bearer. While forwarding Service Register of the candidates belonging to reserved community, it may be ensured that Caste Certificate in prescribed format is available in their SR.
12. To ensure that the eligible staff avails the opportunity for appearing for selection, wide publicity should be given. Supervisor/Incharge should bring to the notice of all staff working under them about this selection.
13. As per Para 1 of PCPO's letter No.P/CR/HQ/RP/601-policy dated 05.08.2022 "Person belonging to reserved communities, who are appointed against selection on merit and not owing to reservation, will occupy the unreserved points and they should not be shown against reserved points".

The panel will be purely on provisional basis subject to further orders that may be passed by the Supreme Court in the Jarnail Singh batch of cases

Kindly acknowledge the receipt of this letter

DA :- As above

  
(Ajay Raj)  
APO(GAZ)  
/-PCPO

Copy to:

PCPO - for kind information please.

CPO(IR) CPO(G) - for kind information please.

APO(Mech/Engg)

Copy to SDGM (V) w.r.t his letter No. 2011/03/V2/MISC dated 03/03/11

**This information is available on RAILNET site 10.31.3.3/pers**



GOVERNMENT OF INDIA  
MINISTRY OF RAILWAYS  
(RAILWAY BOARD)

New Delhi, dt:07/11/2022

No. E(GP)2022/2/4

The General Managers,  
All Indian Railways/PUs.

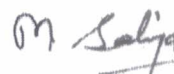
(Kind Attn.:All PCPOs/PFAs/Dy.CPO(G) & Dy.CAO(G))

Sub.: Promotions to Group 'B' posts on Indian Railways - Introduction of  
Centralized Computer Based Multiple Choice Objective type  
examination (CBT) in all departments having Organised Services

Board has prescribed syllabus for written examinations held as part of 30% LDCs for promotion to Group 'B' posts in all Organised Services. Besides this, syllabus for 70% Selection for promotion to Group 'B' post of APO has also been prescribed by Board. Now, in the context of introduction of Centralised CBT for 70% Selections and 30% LDCs for promotion to Group 'B' posts, Board has prescribed syllabus of 70% Selections and have also modified the syllabus for 30% LDCs for all Group 'B' posts in Organised Departments. Similarly, syllabus for Establishment & Financial Rules has also been prescribed.

2. A copy each of the Syllabus for professional subjects prescribed by Board for 70% Selections and 30% LDCs for promotion to Group 'B' posts in all Departments having Organised services along with the syllabus for Establishment & Financial Rules is enclosed for information. These syllabi are applicable for Selections & LDCs to be conducted w.e.f. 1.1.2023.

DA:As above

  
(Meenakshi Saluja)  
Dy. Director, Estt.(GP)-III  
Railway Board  
Ph. No. 233047250  
E.mail ID- meena.1964@gov.in

**Syllabus for promotion to Group- B posts - 70% selection and 30% LDCE.**

**Syllabus for Establishment Rules:**

1. Organization of the Personnel Department in Railways objectives functions and policies of Personnel Department.
2. Recruitment and Training, Classification of Services, Recruitment in Different services, Railway Recruitment Boards & Railway Recruitment Cells Compassionate Ground Appointments, Initial & In Service Training, Refresher Courses, Central Training Institutes, Training Centers in Zones, Divisions & Workshops, Training Modules for different posts, Training under Apprentices Act, Online Training, APARs.
3. General conditions of service in Railways, Seniority, Lien, Inter Railway & Inter Division transfers, Deputation, Promotion Policy & methods. Selection, Suitability, Trade Tests, Leave Rules, Pass Rules, Joining Time Reservation policy, HOER, Overtime, Payment of wages, current CPC Pay Rules, Advances in Railways.
4. Manpower planning, Rightsizing & Benchmarking, creation, extension and surrender of posts, creation of posts against new assets, different types of posts including workcharged posts.
5. The Railway Servants (Discipline & Appeal) Rules, 1968 and related instructions.
6. The Railway Services (Conduct) Rules, 1966 and related instructions.
7. Retirement benefits, qualifying service, pension, family pension, commutation gratuity, new pension scheme.
8. Staff welfare, SBF, Railway institutes, Railway schools, Ex-gratia payment, Incentive Bouns Scheme, Staff Grievances Redressal Mechanisms.
9. Industrial relations in Railways, recognized trade unions, industrial disputes. The Industrial Disputes Act, 1947. The Industrial Relations Code, 2020. The Trade Unions Act, 1926, PNM, PREM, JCM, Various Associations & Informal Meetings.
10. The Factories Act, 1948. The workmen's Compensation Act, 1923. Functions of Labour Enforcement Officers, Right to Information Act.
11. The scope of Information Technology in Railway e – office. HRMS, IPAS , LIMBS, ARPAN, CPGRAMS, ANUBHAV etc.



## **Syllabus for Financial Rules:**

1. Parliamentary Control over Railway Finance, Public Accountability, Canons of Financial Propriety.
2. Railway Budget - Budgetary terms, Types of Budgets, Budget cycle, Demand of Grants, Budgetary and Financial Reviews.
3. Rules of Allocation - Classification of expenditure - Control of expenditure - Responsibility Accounting - Performance Budgeting - Exchequer Control - Financial Results of Working lines.
4. Works Programme - Financial justification of Works - Surveys - Preparation of Estimates - Capital Budget - Control over Capital Expenditure - Reappropriation of Funds.
5. Financial control over Stores Expenditure - Purchase and Stores Keeping Procedure - Inventory Control and ABC Analysis.
6. Financial & Cost Control in Railway Workshops/Sheds/Units.
7. Rules and procedure relating to Tenders and contracts for execution of works and Procurement of Stores, M&P Programme and RSP.
8. Procedure for Possessing and finalizing Audit Objections and Draft Paras.
9. Delegation of Powers.
10. Losses, Frauds and Embezzlements.
11. General Financial Rules
12. Government e-Market (GeM)
13. Classification of Railway Revenue (Earnings)
14. Information Technology in general with specific reference to Railway's IT Applications
15. Taxation matters with special focus on GST & Income Tax
16. Organization of CGA and C&AG
17. Any other topic felt necessary from time to time

**SYLLABUS FOR 70% SELECTION FOR PROMOTION TO GR.B POST OF AEN IN  
CIVIL ENGINEERING DEPARTMENT.**

**(A) Civil Engineering (General)**

**1. Surveying**

**a. Types**

**i. Surveying basics**

Basic principles; base lines; check lines: perpendicular and oblique offsets; conventional signs; plotting of survey; true and magnetic bearings; open and closed traverses; recording plotting of traverse, closing errors.

**ii. Surveying equipment**

Auto level, Total station, DGPS, LIDAR.

**iii. Leveling -**

Level Lines - datum, bench marks, simple leveling, fly leveling; recording the levels in field book; method of reducing levels; arithmetical check; longitudinal and cross section contouring.

**iv. Theodolite Survey -**

Types of theodolites; measurement of horizontal angles, vertical angles, magnetic bearings and deflection angles; prolonging a straight line; traversing by method of included angles; balancing the survey - closing errors; calculations of latitude and departure.

**b. Curves-**

Elements of simple circular curves, setting out simple circular curves.

**c. Set out works -**

Setting out buildings, culverts, Central line of Railway alignment. Usage of GPS technology in setting out Centre line of Railway alignments.

**2. Strength of Materials, Structural Designs & Drawings**

**a) Strength of Materials:**

Stress, strain, Hooke's law, working stress, factor of safety; bending moment and shear force in simply supported beams and cantilevers; simple theory of bending.

**b) Structural Design & Drawing Drawings**

Different sizes of paper, folding and storage of drawing, plan, elevation, sections, isometric view.

**c) RCC Structures**

RCC, methods of design, Working Stress Method and Limit State Method. IRS Code



of Practice for RCC (Concrete Bridge Code).

#### **d) Steel Structures**

Rivets and welds. Sketch and detailing of connections different types of joints and strength determination. IRS Steel Bridge Code.

### **3. Construction material:**

Description, specification, properties and uses of building materials - stones, sand, timber, bricks, cement, lime, building hardware, paints varnishes, glasses, and tiles. Concrete mix design, placing, compaction and durability.

### **4. Foundation & Construction Engineering**

#### **a) Soil Mechanics**

Different type of Soils, Three phase diagram and their relationships, IS classification of soil, index and engineering properties of soil, compaction, consolidation, shear strength, earth pressure theories, slope stability. Specification and construction of earthwork in embankment and cuttings.

#### **b) Foundation Engineering**

Functions of foundation, different type of foundations - open foundations; well foundations and pile foundations, determination of safe bearing capacity, stress and settlement analysis, method of reducing differential settlements.

### **(B) Civil Engineering (Railways)**

#### **1. Railway Surveys & Construction**

Provisions in Engineering Code regarding - Classification of Surveys, Terms of Reference, Principles governing Railway alignment, Ruling gradients, Grade compensation for curves, Horizontal and vertical curves, Hill Surveys, Catch sidings, Tunnels, preparation of various maps and drawings, preparation of Survey reports for RECT, PECT and FLS, Project estimates.

#### **2. Railway Track.**

##### **(a) Track Structure and Components.**

Classification of Lines, Track Structure, Rail and Rail fastenings, Sleepers & Fastenings, Ballast- Specifications, Ballast Profile/Section/Depth of Cushion, Formation- Classification of Formation Requiring Treatment and Remedial Measures Suggested, Insulated joints & Switch expansion joints, Track structure on Bridges.

##### **(b) Duties.**

Duties of ADEN, Duties of SSE/P.Way (In-charge), Duties of JE/ SSE/ P.Way (sectional), Duties of JE/ SSE/ P.Way (Other than sectional), Duties of Gang mates, Keymen, Patrolmen, Gateman and Track maintainer.

##### **(c) Maintenance of Permanent way.**

Regular track maintenance, Handling and maintenance of rails, sleepers, fastenings & other misc. Items, Works incidental to regular track maintenance, Record keeping, Maintenance of track in track circuited areas, Maintenance of track in electrified

areas.

**(d) Special Maintenance Works.**

Alumino Thermit welding of rails, Flash-Butt welding of rails, Short welded Rails, Long welded Rails. USFD.

**(e) Curves and Turnout.**

Curves, Realignment of curves, Points and Crossing.

**(f) Track tolerances and Track Monitoring.**

**(g) Schedule of dimensions.**

Schedule-I Standard dimensions, Station Yards and extra clearance on curve.

**(h) CRS sanction for works affecting passenger running lines.**

**(i) Training and Competency of Permanent Way Staff.**

**(j) Permanent Way renewals.**

**(k) Engineering Restrictions and Indicators.**

**(l) Level Crossings and Gateman.**

**(m) Working of Trolleys, Lorries and Material trains etc.**

**(n) Track Management System.**

**(o) General:**

Reference to G & SR; types of signals and their significance; rules for working of trains; block working rules - types, Introduction of temporary single line working.

**(p) Accidents:**

Action during accidents including breaches, Restoration of through running, Pre-monsoon precautionary measures.

**3. Maintenance of Bridges**

**a) Maintenance of bridges:**

Responsibility of the Engineering officials, action to be taken after inspection of bridges; maintenance of substructure - abutments, piers, wing walls and return walls, maintenance of arches, dismantling of arches. Details of common repair techniques - cement pressure grouting, epoxy grouting, shotcreting / Guniting. Maintenance of RCC & PSC super structures - periodical maintenance, common defects and repair / strengthening techniques; maintenance of super structure (steel) girders - loss of camber in steel girders, cracks in steel works, strengthening of weak girders, replacement of loose rivets; maintenance of HSFG bolts, corrosion and its prevention, protective coatings by painting - periodicity and precautions, patch



painting, ordinary paints - for severe and no severe corrosion, metallising & epoxy based paints, Maintenance of welded girders; maintenance of composite girders. Various defects in bed blocks and their remedies; maintenance of bearings; Precautions while carrying out maintenance works on bridges.

#### **b) Inspection of bridges:**

Classification of bridges - major, minor, important; Inspection of Bridges by Permanent Way and Works Inspectors, by Bridge Inspectors (SSE/JE- P. Way, Works, Bridges) – Periodicity/ schedule and details of inspection, record of bridge inspection, registers to be maintained by the Bridge Inspectors, Certificate of inspection. Inspection by Assistant Divisional Engineers - Bridge Inspection Register, Numerical Rating System (NRS), Unique Rating Number, Condition Rating Number, Overall Rating Number, Certificate by the Assistant Engineer. Details of Inspection of Bridge –foundations, Flooring, masonry in substructure, under-water substructure inspection, arch bridges, protection works and water ways, girder alignment and seating, structural condition of girders, track on the bridge and its approaches, trolley and safety refuges, foot paths, painting, marking HFL and danger level, providing foundation particulars and bridge name boards, flood records at important bridges, road over/under bridges, concrete bridges, special Inspection during Monsoon, equipment required for inspection of bridges. painting of steelworks, laying of bridge sleepers; replacing cracked bed blocks.

#### **4. Rehabilitation of Bridges**

Reasons for Rehabilitation, special Strengthening, Imposition of speed restriction, Priority for rehabilitation of bridges, Special Inspection, Site Data, Execution of rehabilitation works, Precautions when working on bridges; rebuilding or alterations to bridges - design and execution of bridge works; temporary arrangements; false work for erection of girders; assembly and erection of girders; cranes for erection of girders; testing of girders; proposal for strengthening existing girder spans: methods of regirding major bridges, Strengthening of foundations, Strengthening/rebuilding of substructure, shaken/displaced/ cracked bed blocks, distressed arch bridges, replacement of nonstandard girders, replacement of pipe culverts, distress in parapets, replacement of small opening, distress in superstructure.

#### **5. Rivers & Floods**

Behavior of rivers; past history of bridges, danger level at bridges, watchman at important bridges, duties and equipment of bridge watchmen; special inspection during monsoon, action to be taken in the case of weather warning, pitching stone, boulder and monsoon reserve; vigilance during floods; flood records during and after the monsoon; survey of the course of river. Rivers and flood register, Flood Reports, rainfall data, provision of anemometer on bridges. River training works, Guide Bunds, Spurs (Groyes), Marginal Bunds, Closure Bunds, Assisted Cut-Offs, Boulder crates, Protection of approach banks, drop wall & curtain wall i.e. protection measures for minor bridges.

#### **6. Inspection and Maintenance of Tunnels and Deep Cuttings:**

a) **Tunnels** - Inspection by Engineering officials, items to be covered in the

Inspection, record of inspection, mobile staging for inspection, details of tunnel inspection, ventilation of tunnels, leakage in tunnels and methods of correction, works connected with the maintenance of tunnels.

**b) Deep Cuttings** - General, inspection register of vulnerable cuttings, points to be noted during Inspection of cuttings, action to be taken in the case of boulder drops, action to be taken after inspection of cutting, guarding of vulnerable cuttings.

## **7. Inspection and Maintenance of Building and Structures (Other than Bridges)**

- a) Inspection & Maintenance of buildings & structures (including steel structures).
- b) Building Registers
- c) Periodical maintenance of Works including repairs to leaky roof/water proofing of roofs.
- d) Standard Measurement Registers for Buildings.
- e) Dismantling of buildings/structures.
- f) Retro-fitting / structural repairs of existing weak buildings/structures.

## **8. Maintenance of sanitary and hygienic conditions in station and railway Colonies; water supply, drainage and sewerage**

### **a) Water Supply**

I. Standards of Quality of drinking water- physical; chemical and bacteriological standards of water, Water-borne diseases, water demand-methods of forecasting, sources of water; Method of treatment of water – aeration; sedimentation; filtration (slow and rapid sand filters); disinfection; hardness methods of removal etc.

#### **II. Conveyance and Distribution:-**

Preparation of Schemes for New Water Supply/ Augmentation of Existing Water Supply; Estimating Requirements of Water, water supply from outside sources, Types; Selection & Installation of Pumps; Capacity of Pumping, Conveyance of Water Rising mains; systems of distribution, residual pressure; different types of pipes and fittings; testing of pipes, Pipe laying and Fittings of Valves and Meters, Storage tanks; Capacity, Maintenance and Cleaning of Storage Tanks, Water-Supply Plans, maintenance and operation of water supply installation - responsibilities of Engineering department, Mechanical department and Electrical Department.

III. Rain water harvesting – legislation, necessity; advantage; types; techniques; estimation of capacity of rain water harvesting pits/ salient methods of recharging subsurface aquifer etc.

#### **IV. Water Audit and water Management:**

Conservation of Water, water reuse, water recycling, water recycling plant, flow measurement system, identification of losses & leakages.



**b) Sewerage:**

Preparation of schemes for sewerage, sewage & water collection and carriage; design of sewers; house connection; storm water drains; maintenance of sewerage and drainage, conservancy and sanitary arrangements, disposal of sewage – river pollution and control; sewage treatment; land irrigation, septic tanks, primary clarifier, sludge and scum removal, trickling filters, activated sludge process, sludge digesting, principles of anaerobic digestion, sludge gas, sludge drying and disposal.

**c) Sanitation:**

Formation of sanitation committee ; Inspection by sanitation committee , sanitary arrangements in stations and colonies, drinking water wells-protection; Cleaning of wells; disinfection; prevention of Infectious diseases; disinfection of quarters.

**9. Acquisition, management and disposal of land: General Codes, Manuals, rules:**

Ownership of Railway land; sanctioning authority for acquisition and relinquishment; Principles of acquisition and relinquishment; Procedure for acquisition and relinquishment; Land plans and schedule; Documents of Handing over and taking over Railway Land; Land Records- Responsibility and procedure for demarcation, verification of railway boundary , land plan etc. maintenance of right of way; religious structure. Management of railway Land leasing, licensing of land, way leave facility and easement rights, grow more food. Leasing licensing for merchants and vendors at stations, bulk oil installation. Encroachment and responsibly; rules for permission for construction of building near Railway land; instructions regarding cutting/trimming and sale of natural product like mature tree, dry trees within and outside railway boundary, near electric or telegraph lines , sale of grass right etc. Provisions of Land Acquisition Act. 1989, Right to fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013.

**10. Preparation of Plans and Estimates:**

**(a) Preparation of plans:**

General procedure; plan for other departments; size of drawings; titles and numbering of drawings; scale of drawings; details on drawings; symbols and colours in drawings; RDSO drawings; CE's plans; Plans of Divisional/Asst. Engineer's/inspector's Offices; completion drawings;

**(b) Preparations of estimates:**

Engineering code provisions, various types of estimates, technical details, rates and quantities; schedule of rates and price - listing of stores; report and justification; rent statement for staff quarters; special features of estimates for remodeling of station yards, track renewal works, deposit works: Urgency Certificate;

**11. Contract and Execution of Work:**

**a) Contract:**

Engineering code provisions, schedule of rates; analysis, non-schedules rates, tenders; types; tender documents, drawings and specifications, tender committees, acceptance of tenders, contracts; types, contract documents, General and special condition of contract; measurement and measurement books - code reference; recording measurements; 'on account' and final measurements; standard measurements books ; responsibilities of inspectors/JE/SSE) and Asst. Engineers for measurement of works; ballast measurement; computation quantities; preparation of abstract in measurement books; submission of bills; checking of bills; bill registers; Variations; PVC; Basics of Arbitration.

**b) Execution of Work:**

Engineering code provisions, agencies for executing works; responsibilities of executive officers; deposit works; excess and savings on estimates; attention to public interests; prevention of accidents; planning - activity, milestone, bar charts, critical path networks, PERT; departmental execution of work - record; progress reports, charges for stores and labour, execution of works in Engineering workshops; contracted works; issue of work orders; completion documents; zonal works.

**12. Track Machines:**

**a) Organizational structure, duties and inspection:**

Duties of Executive (XEN)/Assistant Executive Engineer (AXEN)/TM/Line, Duties of SSE/TM/SDI, Duties of SSE/JE/TM Working on Machines, Duties of SSE/JE Machine In-Charge Duties of Machine Assistant, Duties of Assistant Divisional Engineer (Open Line) ADEN, Duties of SSE/JE (P.Way) Deployed with the Machine, Inspection Schedule of Track Machine Officials, Inspection Schedule of Open Line Officials.

**b) Tamping machine and dynamic track stabilizer:**

Types of Tamping Machines, Tamping Mechanism, Tamping Parameters, ALC, Lining System, 4 Point Lining Method, Corrections to be Applied in 4 Point Lining Method, Modes of Tamping using 4-Point Lining Method (Only for curves), 3 Point Lining Method, Corrections to be applied in 3- Point Lining, Determination of Target Versine Values for the 3-Point Lining Method, Mode of Tamping using 3-Point Lining Method, Comparison between 3 Point and 4 Point Lining System, Levelling of Track, Mode of working for levelling, General Lift, Input of the Lifting Values, Survey and working of Tamping Machines in Design Mode, Works required Before, During and After Tamping, Working Principle of Dynamic Track Stabilizer, Modes of working of Dynamic Track Stabilizer, Working of DTS.

**c) Ballast cleaning and handling machines:**

Ballast Cleaning Machines (BCM), Types of Ballast Cleaning Machines, Working Principle and Capability of Ballast Cleaning Machines, Works Required Before, During and After Deployment of Ballast Cleaning Machines.



**d) Track relaying machines:**

Track Relaying Machines, Working Mechanism and Capability of Track Laying Equipment, Pre-Relaying Operations, Operation During Block, Post Relaying Operations, Working Mechanism of TRT, Operations Prior to Deployment of TRT, Operations During The Block of TRT, Post Block Operations for TRT, Precautions During TRT Working

**e) Rail Grinding Machines:**

Rail Grinding Machine (RGM) (Purpose & Advantage), Grinding Strategy, Working Parameters of RGM, Monitoring Equipment for Grind Quality, Quality Inspection of Grinding, Preparatory Works for Introduction of RGM, Pre-Block Activity Before Deploying RGM, Operation During RGM Block, Post Grinding Operation.

**f) Planning and deployment of Machines:**

Pre-requisites for Deployment of Track Machines on Construction Projects/Other Agencies, Minimum Duration of Blocks, Through Tamping and Spot Attention.

**g) Rules for movement and block working:**

Provision of G&SR, Operation and Working of Track Machine, Competencies of Track Machine Staff, Safety Equipment, Rules for Operation – General, Important Instructions and Precautions (Protection of Work Site, Fouling of Adjacent Lines, Information to Level Crossings etc), Failure and Accidents of Track Machines, Speed Certification for Track Machines, Special Precautions while working in Special Circumstances (Ghat Sections, Night Working)

**h) Periodical maintenance and associated infrastructural facility:**

Maintenance Schedule for Various Track Machine, Types of Workshops, Functions of Central Periodic Overhauling Workshop (CPOH), Functions of Zonal Machine Depot (ZMD), Functions of Satellite Depot, Functions of Mobile Workshop, Functions of Camping Coach Workshop.

**i) Track Machine Manpower**

Training (Officers, SSEs/JEs/TM(s), Technical Staff, Machine Assistant), Roster

**13. Miscellaneous:**

**a) Engineering plant:**

Control of plant and machinery, engineering plant reserve, plant register; valuation of plant; maintenance; storage and repairs; requisitioning of plants; use of plant at site; maintenance of log books; hiring out of engineering plant; examination of boilers of the engineering department.

**b) Explosives:**

Issue of Instructions on use of explosives; observance of rules, carriage of explosives, Protection of trains and Railway property, precautions to be observed

during blasting, Misfire with electrical method of firing, explosives disposal, destruction of explosives

**c) Management of Engineering Stores:**

Reference to code and Rules; procurement of stores; requisition; receipt and issue of challans; claims of short receipts; etc.; custody of stores - classification, handling and storage, Account head of stores - operation, records and returns; disposal of released and surplus stores - return to stores Depot, disposal by auction; verification of stock and adjustment for shortage/excesses.

**d) Law and Order**

Railway Police; lodging complaints; cooperation with railway police; cognizable offences; non cognizable offences; powers of arrest by railway staff; warrant against railway staff; action by railway staff in case of attempted sabotage; answering of court summons; Prevention of trespass disposal of human bodies found run over; disposal of cattle found dead on the line.