EAST COAST RAILWAY

Office of the
Principal Chief Personnel Officer
Rail Sadan, Bhubaneswar.

No.ECoR/Pers/Gaz/Civil/AEN-70%(CBT)/23-24 Dated: 26.12.2022

The PCE, CAO(C), CPD/RE, GM/RVNL/BBS.
The Dy.CE/Con-BBS, SBP, ANGL, JJKR, CTC & VSKP.
The Dy.CSO (Engg.)/BBS, Dy. CVO/BBS.
The Sr. DPO-KUR, WAT & SBP.
TheSr.DEN(Co-Ord.)-KUR, WAT & SBP.
The SPO (Con)/BBS & SPO/Con/VSKP.
The GM (P) & PCE-SER/GRC & SECR/BSP.

Sub: Formation of Gr.B/Civil Engg. Panel of AEN against 70% selection quota through CBT for the assessment period 2023-24 in Civil Engeering Department/ECoR.

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1. It has been decided by Railway Board to hold Centralized Computer based objective type examination (CBT) for formation of Group-B/ Civil Engg. Panel of 08 posts (04-UR, 01-SC & 03-ST) of AEN against 70% selection quota vacancy in Civil Engineering Department of East Coast Railway for the assessment period 2023-24.

2. As per Railway Board's letter No. E(GP)2022/2/4 dated 18.10.2022, the CBT Centralized Computer based objective type examination shall be held on 22.01.2023 (Sunday) by DG/NAIR. The time and venue of the CBT will be intimated in due course.

3. As per Railway Board's Letter No. E(GP)2022/2/20 dated 18.08.2022, one post is reserved for PwBD in the category of Hearing Impaired (HH).

4. Conditions of Eligibility:

I. As per Recruitment Rules for the Group-'B' post of Assistant Executive Engineer published by Railway Board vide Notification No. 2015/E(G)RR/15/2(Civil) dated 11.11.2020, Non-Ministerial Group-C staff of Civil Engineering Department holding the post in Level-6 and above in the pay matrix with three years of regular service in level-6 and above in the pay matrix, are eligible to appear for the selection.

II. Where juniors who have completed their qualifying or eligibility service and are being considered for promotion, their seniors would also be considered provided they are not short of the requisite qualifying or eligibility service by more than half of such qualifying or eligibility service or two years, whichever is less, and have successfully completed their probation period for promotion to the next higher grade along with their juniors who have already completed such qualifying or eligibility service.

III. The service will be reckoned as on **01.01.2023.**

5. A provisional list of 43 Nos. of eligible candidates (24 candidates in order of seniority as per Integrated Seniority list published vide letter No. ECOR/Pers/04/Eng/Integrated Seniority List/AEN 70% dated 03.11.2022 and 19 against twice failed candidates) of Civil Engineering Department who have completed minimum three years of non-fortuitous service in Pay Level-7 as on 01.01.2023 (Cut off date) and are coming in the zone of consideration for the assessment period of 2023-24 is enclosed at Annexure-A. Also an additional list of 43 Nos. of candidates, next in order of seniority of Civil Engineering Department of ECoR who have fulfilled the eligibility criteria are placed in the Stand-by List at Annexure-B. Against any unwilling candidate of Annexure-A, the willing candidate of Annexure-B may be considered for the CBT to the extent of making good the zone of consideration.

6. The candidature of the candidates is accepted provisionally. In case, any candidate is subsequently found ineligible for the above selection at any stage, his/her candidature will be rejected without any further notice.

7. The eligible candidates enlisted at Annexure-A & B should submit their options (willingness/unwillingness) **on or before 04.01.2023** in the attached format (Annexure-C) to the concerned Controlling Officers/Personnel Officers and the same should be forwarded to the Dy.CPO (Gaz) **on or before 09.01.2023** positively in a consolidated statement along with the individual options.

8. It is the employee's responsibility to advise his/her willingness/unwillingness to take the selection, and failure to respond or to provide the intimation within the period allowed will be treated as unwillingness on his/her part to take the selection. If willingness/unwillingness is not received within the above mentioned stipulated date, it will be deemed that the candidate has availed of the opportunity of appearing in the selection & it will be treated as his/her unwillingness to take the selection.

9. In case any candidate is on leave or on deputation to other Railways/Units/office or on sick list, the Controlling officer concerned and the offices where he/she last worked should send necessary advice to the authority under whom he/she is working or the Medical Authority as the case may be and an acknowledgement obtained. Options of the staff concerned need not be sent to this office directly. Controlling officers/Personnel officers should ensure that options received by their offices after **04.01.2023** should not be forwarded to this office under any circumstances. All the particulars filled by the applicants at Annexure- C (Option form) should be verified by Personnel Officers before forwarding to HQrs office. Their IPAS numbers, HRMS ID, Mobile numbers and e-mail ID should be verified since the examination will be conducted through CBT and all future correspondences with the applicants will be done with their IPAS, Mobile number and e-mail ID.

10. Pre-Promotional Training (PPT) for a period of 60 hours or 15 working days/On line/Off line to the enlisted and willing SC/ST candidates should be arranged by the Executive side in terms of Railway Board's letter No. E(GP)2022/2/4 dtd. 18.10.2022. **The same should be completed by 15.01.2023 positively and compliance report to be sent to this office immediately**. As it is mandatory, refusal, if any, should be obtained in writing.

11. **Objective and Scheme of Examination:** The examination aims at a comprehensive assessment of knowledge of the candidates related to their professional ability, Official language policy, Establishment and Financial Rules. ***The formation of the panel will be on the basis of 'Seniority-cum-Suitability'***. Selection of candidates for empanelment is based on a (i) CBT Examination on a single day, (ii) Viva-voce (with prior Medical Fitness test) and Assessment of Record of Service by the Selection Committee vide Para- 10.1 to Para 10.2 of Master Circular No. 68.

12. **CBT Examination:** In order to bring objectivity to the Selection process, it has been decided by Railway Board vide letter No. E(GP)2022/2/4 dtd. 07.10.2022 read with RBE No. 53/2019 that the CBT examination shall comprise of one Paper which shall have 100% Objective type Multiple Choice Questions only. The paper will be of 100 marks with distribution as given below:-

a) Professional Subject including optional questions of 10 marks on Official language policy & Rules : 70 marks

b) Establishment and Financial Rules : 30 marks

c) Qualifying marks : 60

d) All objective type questions carry equal marks.

e) There shall be negative marking for incorrect answers. One-third of the marks allotted for each question will be deducted for every wrong answer as per RBE No. 53/2019.

f) The duration of the examination for 70% selection through CBT shall be of **02 hours.**

g) **Syllabus:** The syllabus as prescribed by Railway Board vide letter No. E(GP)2022/2/4 dtd. 07.11.2022 for 70% selection for Group 'B' post of AEN including syllabus for Establishment & Financial Rules in S&T Department is enclosed.

13. Viva-voce & Record of Service:

	Maximum Marks	Qualifying marks
1. Viva-voce 2. Record of Service	25 25	30 (Including at least 15 marks in the record of Service)

14. The Controlling Officers/Sr.DPO/DPO/WPO/SPO of concerned Unit/Division should ensure that the ACRs/APARs of the candidates for the last five years i.e. 2017-18 to 2021-22 completed in all respects, SRs & Personal files are kept ready with them and they should send the same to Dy. CPO(Gaz) when called for.

15. In terms of Railway Board's letter No. E(GP)80/2/8 dtd. 31.10.91 only those candidates who qualify in the medical examination of prescribed standard are eligible to appear in the viva-voce test.

16. The above Notification is uploaded in ECoR website: www.eastcoastrailways.gov.in → Recruitment Info → Recruitment Information → Click Here for HQ Notifications.

Encl: (i) List of candidates (Annexure-A & B).
(ii) Application Format (Annexure-C)
(iii) Syllabus

26/11/22

(H.K. Mahanand)
Dy.Chief Personnel Officer (Gaz)
For Principal Chief Personnel Officer

Copy to: (1) Sr. System Manager (IT)/BBS for uploading in ECoR's website.
(2) The Genl. Secretary- ECoRSC/BBS, ECoRSU/BBS, AISCSTREA/BBS, AIOBCREA/BBS.
(3) Notice Board.

26/11/22

For Principal Chief Personnel Officer

ANNEXURE-A

List of candidates eligible for selection to the post of AEN(Gr.B) against 70% quota vacancies in Civil Engineering Department /ECoR for 2023-24

Sl. No.	Name (Shri)	Designation	Comm	Station/ Division	Date of Birth	Date of Appt.	Effective date of seniority
1	Rajesh Kumar Taunk	SSE(Works)	UR	EnHM/WAT	09.05.63	19.10.89	23.06.93
2	Kamala Kanta Parida	SSE(Works)	UR	BRGA/SBP	24.03.65	02.03.94	02.03.95
3	Sukanta Kumar Panda	SSE(Works)	UR	PUI/KUR	15.07.65	07.03.94	29.09.95
4	G. David Raju	SSE(Works)	SC	CHE/WAT	01.07.64	19.09.84	26.06.97
5	P. Eswari Bai	SSE(PW)	SC	DTS/WAT	19.06.69	29.01.91	27.03.98
6	Santosh Kumar Pradhan	SSE(Works)	UR	BLGR/SBP	13.10.64	19.05.87	06.11.98
7	Arjun Tudu	SSE(Works)	ST	SBP	16.06.69	27.01.98	27.01.99
8	R.Tamil Vanan	SSE(Estti)	SC	SBP	01.06.66	24.05.88	02.06.99
9	Somnath Mishra	SSE(Estti)	UR	SBP	13.05.63	03.03.94	02.06.99
10	C. Satyanarayana	SSE(Works)	UR	WAT	20.05.63	18.12.91	27.12.99
11	Ch.B.N. Prusty	SSE(Drg)	UR	HQ/BBS	12.07.65	29.01.90	18.01.00
12	Bobin Mohanty	SSE(Drg.)	UR	Con/HQ	06.02.65	26.11.93	03.03.00
13	K. Niranjan Rao	SSE(Works)	UR	PDT/WAT	24.08.63	19.05.88	25.06.00
14	J. Srinivasa Raju	SSE(Works)	ST	PDT/WAT	01.07.66	01.07.91	12.09.00
15	Nirmal Kumar	SSE(PW)	OBC	BLGR/SBP	05.12.68	14.01.00	14.01.01
16	P.K. Parichha	SE(TM)	UR	TMO/HQ	22.06.65	30.09.99	27.04.01
17	Rabindra Nath Sahoo	SSE(PW)	UR	HQ/BBS	01.05.68	25.01.93	06.03.02
18	Raghu Ram Panda	SSE/Bridge	UR	WAT	05.07.66	23.05.89	08.04.02
19	A.K. Bisoi	SSE(PW)	UR	KUR	03.06.66	21.01.92	04.04.03
20	Akul Mandal	SSE/Drg.	UR	HQ/BBS	16.09.63	20.04.95	17.04.03
21	K.G.P. Babu Rao	SSE(PW)	UR	WAT	15.02.66	17.06.94	24.04.03
22	Ram Suchit	SSE(PW)	SC	DWZ/WAT	01.01.65	18.06.94	24.04.03
23	Md. Khaza Mastan	SSE(PW)	UR	WAT	22.10.67	13.12.94	24.04.03
24	Danaraj Sahu	SSE(PW)	UR	WAT	10.05.65	14.10.94	24.04.03.
25	A. Srinivasa Rao	SSE(Works)	UR	KUR	16.06.64	24.12.87	01.11.03
26	P. Sreenivasa Rao	SSE/Works	UR	Con/WAT	01.07.65	01.01.88	01.11.03
27	D. Satyanarayana	SSE/Works	ST	Con/BLS	02.04.63	15.03.85	01.11.03
28	K.S. Srinivas	SSE/Works	UR	Con/WAT	20.08.65	24.05.88	01.11.03
29	V. Jagdish Kumar	SSE/Works	UR	Con/VSKP	25.12.66	01.01.88	01.11.03
30	Simanchal Patnaik	SSE/Bridge	UR	RGDA/WAT	24.04.65	24.05.89	01.11.03
31	Milan Kumar Giri	SSE(Works)	UR	Con/ROU/SER	23.10.63	23.05.88	15.09.04
32	K.A.V.T Rao	SSE/TM	UR	TMO/WAT	01.07.69	10.05.90	01.11.03
33	Biswajit Debnath	SSE/Bridge	UR	HQ/BBS	02.01.66	25.08.89	01.11.03
34	A.M.M. Rao	SSE/TM	UR	TMO/WAT	12.06.63	11.01.90	01.11.03.
35	B.D. Sahoo	SSE/TM	UR	TMO/WAT	23.02.64	11.01.90	01.11.03
36	Ratikanta Jena	SSE(PW)	UR	KUR	10.11.64	28.01.91	01.11.03
37	Aminul Hasan	SSE(PW)	UR	KUR	17.02.67	29.01.91	01.11.03
38	V. Srinivasa Rao	SSE(Works)	UR	WAT	20.08.64	18.05.88	01.11.03
39	V. Bhadra Rao	SSE(Works)	UR	WAT	14.02.64	20.06.88	01.11.03
40	V.S.N. Sarma	SSE/Drg.	UR	WAT	24.06.63	28.09.84	01.11.03
41	Manas Kumar Kundu	SSE(PW)	UR	DNKL/KUR	12.06.64	01.04.92	01.11.03
42	Nepal Roy	SSE(PW)	UR	JJKR/KUR	16.10.70	19.04.92	01.11.03
43	A.K. Tripathy	SSE(Drg.)	UR	RVNL/KUR	15.06.69	01.02.94	01.11.03

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ANNEXURE-B

List of standby candidates eligible for selection to the post of AEN(Gr.B) against 70% quota vacancies in Civil Engineering Department /ECoR for 2023-24

Sl. No.	Name(Shri)	Designation	Comm	Station/ Division	Date of Birth	Date of Appt.	Effective date of seniority
1	Kamala Kanta Tripathy	SSE(Estti)	UR	KUR	12.01.66	02.06.94	01.11.03
2	Sarat Chandra Badajena	SSE(PW)	UR	BHC/KUR	09.06.66	12.10.93	01.11.03
3	Subash Chandra Dash	SSE/TM	UR	TMO/WAT	23.02.67	02.06.93	01.11.03
4	S.R. Panda	SSE/TM	UR	TMO/WAT	17.11.68	02.06.93	01.11.03
5	Rashmi Ranjan Panda	SSE (PW)	UR	CVI/BBS	02.08.72	11.03.94	01.11.03
6	Rashmi Ranjan Dash	SSE(PW)	UR	CTC/KUR	14.06.68	26.11.93	01.11.03
7	Maruti Jhunjure	SSE/Works	ST	VBL/WAT	01.06.67	05.08.94	01.11.03
8	P. Naga Prasad	SSE/Works	UR	RGDA/WAT	21.05.73	17.10.95	01.11.03
9	Subash Agrawal	SSE/Estti	UR	KUR	05.01.71	03.09.97	01.11.03
10	U.C.Panda	SSE/Estti	UR	KUR/Cons	08.01.69	19.11.93	01.11.03
11	Pranab Kumar Saha	SSE/Esti	SC	KUR	02.04.75	05.02.98	01.11.03
12	Ashok Kumar Sahu	SSE/Esti	UR	KUR	05.10.68	13.02.98	01.11.03
13	Pradeep Kumar Samal	SSE/Esti	UR	KUR	02.07.68	24.02.98	01.11.03
14	A.K. Doharey	SSE(PW)	SC	PLH/WAT	12.05.63	17.06.94	22.04.04
15	Rajendra Kumar Patel	SSE(PW)	UR	BCHL/WAT	05.11.69	07.07.95	22.04.04
16	Ramesh Kumar Jadon	SSE(PW)	UR	ARK/WAT	11.10.64	30.08.96	22.04.04
17	Radhe Shyam Prasad	SSE(PW)	ST	PFU/WAT	26.12.75	18.05.95	22.04.04
18	A.S. Hedaoo	SSE(PW)	ST	KRPU/WAT	05.08.71	30.08.96	22.04.04
19	J. Prasanna Kumar	SSE/Drg.	SC	WAT	23.04.71	09.09.97	27.04.04
20	S.K.Awadhiya	SSE(PW)	UR	SBP	06.07.67	15.10.93	30.09.04
21	M.D.Verma	SSE(PW)	SC	MTI/SBP	01.07.63	16.06.94	30.09.04
22	Kishore Chandra Mishra	SSE(PW)	UR	CTC/KUR	13.05.69	11.03.94	22.11.04
23	Prasanta Kumar Sathua	SSE(PW)	UR	BBS/KUR	24.06.71	10.03.94	22.11.04
24	Dillip Kumar Swain	SSE(PW)	UR	KUR	14.05.70	11.03.94	22.11.04
25	P.C. Swain	SSE(PW)	UR	HQ	13.06.68	20.12.91	01.02.05
26	Bhupendra Prasad	SSE/PW	OBC	SBP	06.03.75	24.03. 04	24.03. 05
27	Rakesh Kumar	SSE/PW	UR	SBP	06.11.75	07.04. 04	07.04. 05
28	Ratnakar Mishra	SSE/TM	UR	HQ	14.03.63	19.12. 89	05.05. 05
29	K.Gangadri	SSE(PW)	ST	WAT	21.10.71	26.11.96	24.09.05
30	Ram Loachan Sahu	SSE/TM	OBC	HQ	01.03.80	02.11.04	05.12.05
31	Uday Kumar Sahoo	SSE/TM	UR	HQ	06.05.75	02.11.04	05.12.05
32	R.N.Mohapatra	SSE(Works)	UR	KUR	01.06.67	19.12.91	27.04.06
33	A.K.Rout	SSE(PW)	UR	HQ	08.04.71	11.03.94	14.07.06
34	S.K.Pradhan	SSE(Estt)	UR	HQ/RVNL	22.07.69	08.12.93	14.07.06
35	Padma Lochan Mishra	SSE(Works)	UR	KUR	15.12.68	07.07.98	31.07.06
36	Y.B.R. Srinivasa Rao	SSE(Works)	UR	WAT	06.09.66	20.06.88	22.08.06
37	B.Srinivas	SSE(Works)	UR	WAT	20.04.68	18.04.88	22.08.06
38	S.Srinivas	SSE(Works)	UR	WAT	05.12.67	20.06.88	22.08.06
39	G.V.R.Kumar	SSE/TM	UR	KUR	01.07.65	12.12.85	12.09.06
40	M.Madhava Rao	SSE/TM	UR	SBP	16.08.73	07.10.99	12.09.06
41	A.K.Saxena	SSE(PW)	UR	SBP	05.10.69	06.09.94	26.09.06
42	Sanjeev Bhargava	SSE(PW)	UR	SBP/RVNL-BPL	23.02.69	09.12.94	26.09.06
43	Devaki Nandan	SSE(PW)	SC	SBP/Cons	01.07.72	12.02.97	26.09.06

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Annexure-C

East Coast Railway

Application for Selection to Group-B post of AEN against 70% selection for 2023-24 (CBT)

OPTION: Whether Willing/Unwilling ……..……

1. Name of the Applicant :
2. Designation :
3. Place of posting :
4. Community (UR/SC/ST) :
5. Date of Birth (DD/MM/YYYY) :
6. IPAS No. (in 11 digits) :
7. HRMS ID :
8. Controlling Officer :
9. Unit/Division :
10. Mobile No. :
11. Email ID (in capital letters) :
12. Date :
13. Whether belongs to PwBD category : YES / NO (please tick)

(i) If yes, please specify the category with %age

(ii) Whether Scribe is required : YES / NO (please tick)

Signature of the candidate

Counter signature of the controlling officer:
(With Designation and seal)

(**Note: Willingness/Unwillingness to be submitted on or before 28.11.2022**)

Proforma of statement for submission of options by Divisions to HQs.

Sl. No	Name, Design/ station	I-PASS No.	Comm. (UR/SC/ ST)	Place of posting	DOB	HRMS ID	Controlling officer	Unit/ Division	Mobile No.	E-mail ID	Whether belong to PwBD (with Specification)

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, Cannons 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 Trollies, 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 regirdering 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 (Groynes), 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) <u>Water Supply</u>

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.