दक्षिण पूर्व मध्य रेलवे

South East Central Railway

मुख्यालय, कार्मिक विभाग, प्रथम तल, महाप्रबंधक कार्यालय, बिलासपुर (छ. ग.) 495004

HEADQUARTER, PERSONNEL DEPARTMENT, 1st FLOOR, GM's OFFICE, BILASPUR(C.G.) 495004

No. P-HQ/CON/452/E/e-71016/492 Dated:-14/06/2022

AGM, PCE, CAO (CON), SDGM/SECR Secretary TO GM/SECR,
CBE, CTE, CE(TM)/SECR, CPO (A), DRM/Bilaspur, Raipur, Nagpur
CWM/WRS/Raipur, CWM/MIB/Nagpur, Dy.CE(TM)/BSP, DY CPO (CON)/BSP,
PCPO/SER/GRC & PCPO/E.Co.Rly/BBS

Sub: - Selection for formation of a panel of AEN/AXEN (Gr "B") against 30% LDCE quota (6th cycle) of Civil Engineering department in South East Central Railway.

It has been decided to conduct a selection for 30% vacancies of AEN/AXEN (Group-"B") in SEC Railway earmarked to be filled in through Limited Departmental competitive Examination in Civil Engg. Department. The assessment of vacancies against 30% LDCE quota, as approved by GM/SECR is as follows.

Post	Vacancies			
	UR	SC	ST	Total
AEN/AXEN (Gr "B")	01	00	01	02

1. Eligibility Condition: - For Group "B" selection (30% LDCE quota), Group "C" employees (Technical) of Civil Engineering department working in grade the minimum of which is Rs. (5000-8000 5th PC)/ PB-2, 9300-34800 + GP Rs. 4200/- (6th PC) / Pay Level-6 of 7th PC and above with five (05) years of non fortuitous service in grade as on vacancy assessment 25/04/2022 (including non fortuitous service rendered in the corresponding pre revised grades) are eligible to participate in the above LDCE examination in terms of Railway Board's letter number E(GP)99/2/22 dated 29.03.2010 (RBE No.46/2010), circulated under SECR's Estt. Rule No. 55/2010.

2. Staff whose lien is maintained in S.E.C.Railway are only eligible to appear in the said selection. Besides, those employees whose lien is maintained in S.E.C.Railway, but working outside the jurisdiction of S.E.C.Railway are also eligible provided they submit their applications through the Personnel Branch of the division/ unit where their lien is maintained with proper certification of lien by concerned Division/Units.

3. **Date of submission of application and consolidated statement**: Application of willing and eligible staff, fulfilling the above conditions may apply in **Annexure-A**, which should reach to the concerned Personnel Offices on or before **14/07/2022**. The concerned Personnel Offices, after receipt of such applications should scrutinize the candidatures of the applicants and send the names of the eligible staff only in consolidated statement as per proforma attached **Annexure "B"**, so as to reach this office latest by **21/07/2022**. The concerned personnel officer should ensure that all the columns of the enclosed Annexure-B are properly filled in before forwarding the applications/ consolidated statement to this office.

4. Applications received directly from the staff will not be entertained by this office. Concerned Personnel Officers should ensure that applications received by them after the closing date mentioned above are not forwarded to Headquarters under any circumstances. All applications of construction organization should forwarded by Dy.CPO(CON)/BSP. Applications of staffs who do not fulfill the eligibility criteria as mentioned above need not be forwarded to this office. It may also be noted that incomplete statements furnished by the Divisions/ Units will not be entertained.

5. **Scheme of Examination/Selection Procedure:**

In terms of the instructions contained in Board's letter No. E(G)2018/2/31, dated 19.3.2019 (circulated under RBE No. 53/2019), the following scheme for conduct of 30% Limited Departmental Competitive Examination has been introduced:

5.1 **Pre-Qualifying Examination**

There shall be a pre-qualifying single paper examination of 100 marks, which shall have 100% Objective type Multiple Choice Questions only. The distribution of marks will be as under:-

Technical Subject	40 marks
General Knowledge, including optional questions on Official Language Policy	30 marks
Establishment & Financial Rules	30 marks

NOTE: There shall be negative marking for incorrect answers. One third of the marks allotted for each question will be deducted for every wrong answer.

5.2 **Qualifying Marks:**

The candidates scoring 75% marks and above in the Pre-Qualifying Examination shall be eligible for appearing in the main examination and for this number of candidates should be restricted to 5-times the number of respective vacancies in order of merit.

5.3 **Main Examination:**

The Pre-Qualifying Examination will be followed by one descriptive type paper on professional subject comprising of 100 marks and the qualifying marks in the written examination will be 60% and above.

5.4 **Syllabus for professional paper for LDCES:**

The Syllabus prescribed for selection for the post of AEN/AXEN Group 'B' (LDCE-30%) in Civil Engineering department of written examination (pre-qualifying as well as main examination) is enclosed as **Annexure-"C"** which may be circulated widely among the all concerned. It may be noted that this syllabus is indicative and not necessarily exhaustive.

5.5 This being selection against 30% LDCE, there shall be no supplementary examination, either pre qualifying or main examination, under any circumstances.

5.6 The candidates qualifying in the Main Written Examination shall be subjected to Viva-Voce, which will have the following distribution of marks against various heads:-

	Maximum marks	Qualifying marks
1. Record of Service	25	30 marks (including minimum 15 marks in Record of service)
2. Viva-voce	25	

5.7 It may be noted that this post (AEN/AXEN) is a safety category post, and accordingly candidates are required to qualify the prescribed medical fitness before appearing in viva-voce. Without medical fitness certificate, candidates will not be eligible for attending the viva-voce.

6. The concerned staff of the Divisions/ Units who deal with the staff establishment matters, should circulate the contents of this Notification to all concerned and invite applications from all the willing and eligible staff including those on Medical/ Leave/ Training/ Deputation and submit the consolidated statement in the proforma, prescribed as **Annexure "B"**. They may also ensure that the notification and all subsequent notification of this selection are circulated to all sub-units located in their territorial jurisdiction.

7. The pre-selection coaching for a period of 3-4 weeks to the reserved community candidates. (SC/ST) should be arranged by the Executive side i.e. PCE/SECR. This training is treated as mandatory and refusal, if any, should be taken in writing. On completion of pre-selection coaching, requisite completion report should invariably be sent to the PCPO (Gaz)/SECR.

8. **The notification is also available in this Railway's website-http\\www.secr.indian railways.gov.in/Recruitment-HQ-Gazetted Section. All unit-In charge and concerned Personnel Officers shall ensure that the notification is given wide publicity and also pasted in the Notice board.**

Encl: As above

14/06/22

(**Neeraj Anand**)
Deputy Chief Personnel Officer(Gaz)
for Principal Chief Personnel Officer

Copy forwarded for information and necessary action to:

1. Sr.DPO/Bilaspur, Raipur Nagpur, SPO (HQ), APO/HQ SECR
2. Sr. DEN (Co-Ord)/ Bilaspur, Raipur Nagpur, Principal MDTC/Bilaspur
3. WPO/WRS/Raipur, WPO/MIB/Nagpur
4. GS/DPMRMC/BSP, GS/SECRPOA, GS/AISC-ST/Association/Bilaspur
5. Notice Board.

Dated: 14/06/22
for Principal Chief Personnel Officer

ANNEXURE-'A'

South East Central Railway

Paste a photograph duly attested

PROFORMA for 30% LDCE

1	Name	
2	Father's Name	
3	Present Designation/Station/ Unit	
4	Community (UR/SC/ST)	
5	Lien holding Railway	
6	Date of Birth	
7	Date of appointment	
8	Designation in which initially appointed and scale (Rs.)	
9	PF NO	
10	Present scale (Vth PC) / Grade Pay (VIth PC) / Pay Level (7^{th} PC)	
11	Date of Regular Promotion or appointment in scale Rs. 5000-8000 (5^{th} PC), PB-2 Rs. 9300-34800, with GP Rs. 4200/-(6^{th} PC)/ Pay Level 6 of (7^{th} PC)	
12	Date of Regular Promotion or appointment in scale Rs. 6500-10500 (5^{th} PC), PB-2 Rs. 9300-34800, with GP Rs. 4600/- (6^{th} PC)/ Pay Level 7 of (7^{th} PC)	
13	Length of non-fortuitous service in scale Rs. 5000-8000 (5^{th} PC), PB-2 Rs. 9300-34800, with GP Rs. 4200/-(6^{th} PC)/ Pay Level 6 of (7^{th} PC) as on 25/04/2022 or in scale Rs.6500-10500/- (5^{th} PC), PB-2 Rs.9300-34800 + GP Rs. 4600/- (6^{th} PC)/ Pay Level-7 of (7^{th} PC) as on 25/04/2022	Year.....Month.....Days.....
14	Remarks Willing/ Un-willing	
15	Any DAR case is pending or otherwise	
16	Mobile No.:	

Signature of the candidates

Signature of the immediate supervisor forwarding application Office seal & Date:

Forwarded to controlling officer

Signature of Controlling Officer with seal

Forwarded to Headquarter

Forwarded to Dy.CPO(GAZ)/SECR/BSP. The particulars given by the employee against column No.1 to 16 have been scrutinized and found correct as per the service record and the above named employee is eligible/ not eligible to appear for the selection for the post of AEN/ AXEN (Gr.B) against 70% quota in Civil Engg. Department and it is certified that no Adhoc or fortuitous service has been taken in to account for computing the eligibility as on 25/04/2022. In case any variation in the service particulars this office shall be held responsible.

Signature and name with official stamp of
Controlling Officer i.e. Personnel Officer
of concerned Divn./ Unit

ANNEXURE "B"

PROFORMA (30% LDCE)

1	2	3	4	5	6	7	8	9
Sr.No	Name	Present Designation/ Station	Lien	Community (UR /SC/ ST)	Date of birth	Date of appointment & designation, grade to which appointed	P F No	Qualification

10	11	12	13	14	15	16
Date of promotion / appointment in Present Grade/ Scale	Date of regular promotion in present scale Rs. 5000-8000/- (5th PC) (pre-revised)/ GP-4200/- (6th th PC) Level-6 (7th PC)	Regular promotion in scale Rs. 5500-9000/- (5th PC) (pre-revised)/ GP-4200/- (6th th PC) Level-6 (7th PC)	Regular promotion/ appointment in scale Rs. 6500-10500/- & 7450-11500/- (5th PC) (pre-revised)/ GP-4600/- (6th th PC) Level-7 (7th PC)	Present grade Regular/ Ad-hoc	Remarks Eligible/ Not eligible	Willing/ Unwilling

Signature of controlling officer/
Concerned Personnel Officer

ANNEXURE- "C"

Syllabus for professional papers for 30% LDCE for promotion to Gr. B Post of AEN in Civil Engineering Department

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

1. **Surveying**

(a) **Types**

i) Chain and Compass survey-

Basic principles: base lines; check lines; tick 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) Plane Table Survey-

Techniques of using Distomat and total stations. Method of setting layouts & curves using these equipment.

iii) Levelling-

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

v) Curves

Elements of simple circular curves; setting out simple circular curves; different

vi) **Set out works-**

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

(b) Care & Custody of Survey Instruments-

Handling of instruments-Transport and protection; permanent adjustments; repairs and periodical overhaul

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

(a) Strength of Materials:

Stress, stain, Hooke's Law, working stress, factor of safety; bending moments and shear force in simply supported beams and cantilevers; simple theory of bending; moving loads on simply supported beams; influence lines for bending moment and shear force in statically determinate beams; short columns, long columns-empirical formulae.

(b) Structural Design & Drawing syllabus to be rearranged

(i) Drawings

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

(ii) RCC Structures

RCC, methods of design Working Stress Method and Limit State Method. Design of singly and doubly reinforced rectangular beams including T and L beams. Design of slabs. Design of columns. IRS Code of Practice for RCC (Concrete Bridge Code), Use of computer aided software such as STADD, FEM based software. Basic requirements for usage of these software.

(iii) Steel Structures

Rivets and welds, Sketch and detailing of connections. Different types of joints and strength determination. Design of tension member and compression member. Plate Girders. IRS Code of Practice for Steel Structures.

3. Construction materials:

Description, specification, properties and uses of building materials-stones, sand, timber, bricks, cement, lime, building hardware, paints varnishes, glasses, tiles,

4. Foundation & Construction Engineering

(a) Soil Mechanics

Different type of Soil, 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, methods of reducing differential settlements.

5. Hydraulics & Hydrology

a) Hydraulics-
Elements of hydraulics-Open Channel flow; flow in pipes, frictional loss, empirical formulae.

b) Hydrology
Rainfall and run-off; rainfall statistics; rain gauges, run-off calculations by empirical methods, flood discharge estimation; measurement of flood discharge-current meter.

c) Hydraulic structures
Design of bridges- alignment, number of spans; economic spans; waterway calculations; scour depth afflux; clearance; depth afflux; clearance; depth of foundations; BOX and Pipe Culverts, river training works-spurs, groynes, aprons levees. Water way calculations (i.e. estimation of design discharge based on para 4.3.4 of sub structure code namely using RDSO report RBF-16 for catchment size less than 25 sqkm and using flood estimation report (Synthetic unit hydrograph concept) for catchment size 25 sqkm to 2500 sqkm). In the sub topic river training works the following should be added. Guide bunds including launching aprons & protection works " drop wall & curtain wall i.e protection measures for minor bridges).

6. PUBLIC HEALTH ENGINEERING

A) Water Supply

i) Standards of Quality of drinking water-physical, chemical and bacteriological standards of water; water-born 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.

ii) Conveyance and Distribution:-

Preparation of Schemes for New Water Supply/Augmentation of Existing Water Supply; Estimating Requirements of Water; Types, Selection & Installation of Pumps; Capacity of Pumping, Conveyance of Water; systems of distribution, residual pressure; different types of pipes and fittings; testing of pipes, Pipe Laying and Fitting of Valves and Meters. Storage tanks; Capacity, maintenance and Cleaning of Storage Tanks, Water Supply Plans.

iii) Planning & design of layouts for rain water drains. Principles of rain water harvesting, methods, estimation of capacity of rain water harvesting pits/salient 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) <u>Sewerage</u>:

Preparation of Schemes of Sewerage, Sewage & waste water-collection and carriage; design of sewers; house connections; storm water drains; 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.

(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

Sl No.	Existing Syllabus	Suggested Syllabus	Remarks
1	**2. <u>Railway Track</u>:-** Description, specifications and functions of the structure elements; Rails, sleepers, fastenings ballast, formation and other sub-structures; points and crossings; geometry and design features Track layouts.	**2. <u>Railway Track</u>:-** Description, specifications and functions of the structural elements; Rails, sleepers, fastenings, ballast, blanket, formation (embankment/cutting), drainage system and other sub-structures; points and crossings; geometry and design features, and Track layouts.	Minor changes

3. **Maintenance of Permanent Way:-**

a) Duties:-

Duties of Assistant Divisional Engineers; duties of SSE/JE (P. Way); SSE/JE (Works), SSE/JE (Bridges), Gangmates, Keymen, Trackmen, Gatekeeper.

b) Maintenance of Permanent way:-

Methods of maintenance; Beater packing, Machine packing, Systems of maintenance; (conventional and mechanized), overhauling, systematic through packing, picking up slacks, Directed Track Maintenance; Miscellaneous works; lifting and lowering of track, shallow/deep screening of ballast; Maintenance of drains, lubrication of rail joints; adjustment of creep, maintenance of level crossings, Maintenance of points and crossings, track on bridges;

c) **Special Maintenance Works**:

Maintenance of short welded rails, long welded and continuous welded rails; maintenance of Switch Expansion joints, maintenance in electrified section; special precautions; maintenance of track circuited sections ; special precautions.

d) **Design, Maintenance of curved track and realignment of curves**: Curvature, transitions, super elevation of curves, safe speeds, cant deficiency, speed on curves with turnouts, Realignments of curves; method, extra clearances on curves

e) Testing Monitoring of track with by track recording car, frequency of recording based on category, OMS frequency, and category, interpretation of track recording charts results and exception reports; analysis of the charts TRC reports to improve track parameters. The allowable limits of parameters category-wise, prioritization of attention to track defects etc.

f) Heavy axle traffic and different types, precautions and checks to ensure safety of track and bridges.

g) Maintenance and working of various track machines.

h) Formation treatment works for Railway embankments-various methods, and their advantages and disadvantages of the methods.

4. Maintenance of Bridges

a) Maintenance of bridges:- Responsibility of the engineering officials, Action to be taken after inspection of bridges; Maintenance of foundations; Protective works and waterways- maintenance of foundations, maintenance of protective works, maintenance of waterways; Maintenance of substructure- abutments, piers, wing walls and return walls, maintenance of arches, Dismantling of arches, Details of common repair techniques- Cement pressure grounding, 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; Action taken for maintenance of composite girders; Various defects of bed blocks and their remedies; 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 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- Flooring and foundations, Masonry in substructure, Under-water substructure inspection, arch bridges, Protective works and water ways, Girder alignment and

seating, Structural condition of girders, Track on the bridge 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, Health Monitoring of Very Important Bridges, Special Inspection During Monsoon, Equipment Required For Inspection of Bridges.

Works connected with maintenance of bridges; Laying of bridge sleepers; Replacing cracked bed blocks; Painting of steelworks.

5. Inspection and Maintenance of Tunnels and Deep Cuttings:

a) Tunnels- Inspection by Engineering Inspectors, 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 funnels.

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.

6. Inspection and maintenance of turntable and weigh-bridge pits:

Coordination for satisfactory working of turntable; adjustments and overhauling of turntable; inspection and maintenance, erection and dismantling of turntables; Weighbridge pits and approaches- responsibility of engineering staff; inspection and maintenance of weigh bridge pits; drainage of weighbridge pits; construction of new weighbridges.

6.1 Track Management System:- Salient feature of TMS, pre-requisites for introducing TMS in division, advantage of TMS etc.

6.2 Mobility Index:- Concept, principles, methods of evolution etc.

7. Inspection & Maintenance of buildings & structures other than Bridges

The following is in addition to existing syllabus on this topic.

-Vacant Railway Buildings,
-Building Registers,
-Periodical Maintenance of Works including repairs to leak roof/water proofing of roofs
-Standard measurement Registers for Buildings,
-Dismantling of buildings/structures.
-Retro- fitting/structural repairs of existing weak buildings/structures,
-Seismic retro-fitting and repairs/strengthening of buildings/structures.

8. Maintenance of sanitary and hygienic conditions in station yards and railway colonies; water supply, drainage and sewerage:

a) 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.

b) Water supply:

Source of water supply; water sample analysis; open wells- sizes; pumping capacity, improving yield; shallow tube wells; deep tube wells; impounding reservoirs; storage capacity; flood discharge; record of water levels in wells; rainfall registers; high level storage tanks; precaution against pollution; pumps-types, selection, installation; aqueducts and pipelines-types, selection, laying, estimating requirements of water; layout of distribution systems; water supply from

outside sources; maintenance and operation of water supply installation-responsibilities of Engineering department, Mechanical department and Electrical Department.

c) Drainage and Sewerage:

Drainage systems, waterborne sewerage; sizes of sewage treatment systems; sewage disposals; sewage purification systems; surface drainage-layout, size of drains; disposal of sullage effluent; drainage of latrines; maintenance of sewerage and drainage systems; maintenance of open sullage drains; storm water drains; house connections; conservancy and sanitary arrangements; responsibilities of engineering staff.

9. Acquisition, management and disposal of land:

General code/Manual 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 of 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.

10. Large Scale Permanent Way renewals:

Classification of routes and tracks; track renewal programmes, factors governing permanent way renewal; preparation for relaying; preliminary work; systematic operation for complete relaying; speed restrictions to be observed during relaying; post relaying work; classification and disposal of released materials.

11. 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 of 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, Replacement of Meter Gauge Bridges.

12. Works Affecting Railway Safety and Opening New Works

General- Reference to rules; works requiring sanction of the CRS and notice there for application to the CRS-execution of works and Safety Certificates; documents to accompany application; submission of Safety Certificate; deviations from plans approved by CRS; applications for running of new types of locomotives and /or rolling stock and for increase in speed; notification to railway officials when opening works; works arising out of accidents including breaches; opening of new lines; Infringements to Schedule of Dimensions- condonation; procedure thereof; movement of ODCs- types and procedure for sanction for movement, precautions during movements.

13. Railway Operation:

a. General:

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

b. Engineering restrictions and indicators:

General- Definitions: Responsibility of the Inspector incharge; works of short duration protection of line in block section and procedure for passing trains; works of long duration; temporary engineering fixed signals; arrangement prior to commencement of work; protection in block section for speed restrictions; procedure for blocking lines for engineering purposes; works at times of poor visibility; temporary signals in emergency; periodical notices of engineering restrictions; permanent speed restriction indicators; review of permanent speed restrictions; indicators- General.

c. Level Crossings:

General- Classification, Standard Specifications; normal position of gates; level crossing equipment, traffic and engineering gates, siding gate lodges, appointment of gatemen; duties of gatemen; maintenance of level crossings; examination of gate equipment and gatemen in rules; level crossings register; road traffic census; manning/ demanning of level crossings.

d. Working of Trollies:

General Instructions: rules for working; distinction between trollies, lorries and motor trollies; Certificate of competency; officials permitted to use trollies and lorries; responsibility for safe working ; working at night or in bad weather; working on track circuited sections; conveyance of non-railway officials; trolley permits for private sidings; trolley refuges; protection; equipment on trollies and lorries; working of trollies and lorries; in block sections, in station limits.

e. Ballast and material trains

General- Rules for working; Restrictions in running ; ordering of ballast trains; issue of "fit to run" Certificate; equipment; testing of brake power; working in block sections; running on Ghat section; loading and unloading from hopper wagons ; planning of ballast and material train movements; training out materials and daily reports of ballast train working; charges for ballast trains; register of engineering vehicles.

14. Accidents:

General- Observance of rules; intimation of accidents by station masters; duties and responsibility of the engineering officials in the event of accident impairing through traffic action at site, reporting details of accident – provisions of Accident Manual; action in case of derailments; examination of site and preparation of sketches; recording track and rolling stock measurements- accident procedure; use of recorded data; restoration of through running; procurement and arrangement of labour and equipment; temporary arrangements at site of accident; transshipment; funds required during emergencies; attendance of police at accidents; driver's reports on defects in track; action on receipt of reports of defective track; abnormal occurrence attributable to oscillation of locomotives; accidents not impairing through traffic; records of accidents.

15. <u>Rivers & Floods, pre-monsoon precautionary measures and patrolling of Railway lines;</u>

<u>Rivers and Floods</u>: General- 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; river protection works; types, design, repairs and maintenance records- rivers and floods. Flooded Causeways/ Dips. Special precautions when track is submerged. Rivers and flood register, Flood Reports, Rainfall data, Provision of Anemometer on Bridges.

a) Pre-monsoon precautionary measures;

General precautions to be taken before monsoon, Vulnerable sections; materials for anticipated emergencies; monsoon emergency rakes; equipment tools, rail clusters temporary bridge spans; protective works; Railway affecting works and tanks; R.A.W tablet, joint inspection of WAR /RAT, inspection and vigilance over railway affecting tanks during heavy rain; pre-monsoon, during monsoon.

b) Monsoon and emergency patrol;

Types of Patrolling, Keymen's daily patrol, range patrol during abnormal rain; night patrolling during monsoon, Security patrolling during civil disturbances and for movement of VIP specials, Hot weather patrolling for LWR/CWR, stationary watchman at vulnerable points; Protection of line in case of Emergency, Commencement and termination, Preparation of Patrol Charts, Distribution of Petrol Charts, Patrol Books and Systematic Patrolling, duties of patrolmen and their equipment, review of patrolling systems and vulnerable locations, Selection of Patrolman, Certificate to be submitted by P.W.I (JE/SSE(P. Way), Duties of Patrolmen, reporting damage & obstruction on track to Station Masters; Action by A.E.N and P.W.I. on receipt of information regarding Damage to the Line, check over patrolling; inspection of equipment; surprise checking at night, Responsibility of Engineering Officials in the matter of Patrolling, Vulnerable locations (Points)

16. Preparation of Plans and Estimates:

Preparation of plans:
General procedure; plan for other departments; size of drawings; titles and numbering of drawings; scale drawings; details on drawings; symbols and colours of in drawings; RDSO drawings; CE's plan; Plans in Divisional/Asstt. Engineer's/ Inspector's Offices; Completion drawings; care filling of tracings/Ferro/Prints; preparations of estimates- code rules; technical details, rates and quantities; schedule of rates and price- listing of stores; report and justifications; rent statement for staff quarters; special features of estimates for remodeling of station yards, track renewal works, deposit works; Urgency Certificate; Supplementary Estimates, Revised Estimates.

17. Contracts and Execution of Works

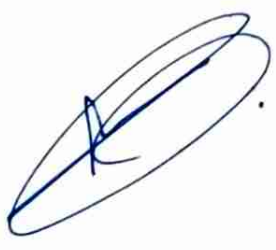
a) CONTRACTS

General- Code reference for contracts; 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 of quantities; preparation of abstract in measurement books; submission of bills; checking of bills; bill registers; Variations; PVC; Basics of Arbitration.

b) Execution of Works:

General instructions- Code rules; agencies for executing works; responsibilities of executive officers; deposit works; excess and savings on estimates; attention to public interest; prevention of accidents; planning- activity, milestone, barcharts, 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.

18. Miscellaneous:



a) Engineering plant;

General- code rules; 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:

General- Issue instructions on use of explosives; observance of rule of carriage of explosives; commonly used explosives; selection of explosives; storage and conveyance to work site; blasting operations; boring holes; amount of charge; preparation of charge; electrical and safety fuses' precaution to be observed during blasting; misfires; protection of trains and railway property; destruction of explosives; detonating signals- care and custody; use of detonators and test, competency certificates for handling explosives.

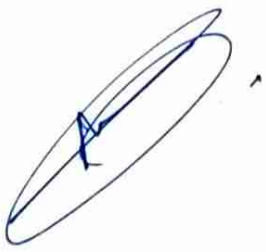
c) Management of Engineering Stores:

General- 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

19. Track Machines

i) Provisions of Indian Railway Track Machines Manual.
ii) Working principles and performance parameter of various Track Machines on Indian Railways.
iii) Controls and working systems of various Track Machines.
iv)Working of various Track Machines: Pre-requisites, pre- block preparatory works, and operations during block, post-block attention works.
v) Working of temping machines in design mode.
vi) Performance and quality parameters in tamping, squeezing pressure, squeezing time, vibration pressure and tamping depth.
vii) Maintenances schedules of various track machines.
viii) Troubleshooting
ix) Rules for movement and working of track machines.
x)Types of small track machines required for maintenance of track and their maintenance systems.

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