

पूर्व मध्य रेल
(निर्माण संगठन)

कार्यालय
मुख्य प्रशासनिक अधिकारी/निर्माण
पूमरे/महेन्द्रघाट, पटना

सं०:- ECR-HQ0CONS(ESTT)/84/2022(183227)

दिनांक 23.02.2023

- सभी मुइं/निर्माण/पूमरे/महेन्द्रघाट, पटना (N, S, NE, C, Plg., SE, NW,GB,SD, NC)
- उप मुइं/निर्माण/उत्तर एवं दक्षिण, डिजाइन, जनरल,
पीएम, आरओबी एवं सर्वे/महेन्द्रघाट, पटना
- उप मुइं/निर्माण/दानापुर, राजगीर, डीडीयू, बरकाकाना, धनबाद, रेणकुट, चोपन,
सिंगरौली, हजारीबाग-I, हजारीबाग-II, मुजफ्फरपुर, हाजीपुर-I, हाजीपुर-II,
समस्तीपुर-I, समस्तीपुर-II, समस्तीपुर-III समस्तीपुर-IV,नरकटियागंज, बेतिया।

विषय :- Selection for the post of Assistant Engineer(Group- 'B') in Level-08 of Pay Matrix as per 7th PC against 30% quota.

संदर्भ :- GM(P)/ECR/HJP's Letter No. ECR/HRD/GAZ/254/AEN(Gr.B)/LDCE 30%/2023
Date: 21.02.2023.

विषयांकित से संबंधित संदर्भित पत्र की छायाप्रति सूचना एवं अग्रेतर आवश्यक कार्रवाई हेतु इस पत्र के साथ संलग्न कर प्रेषित की जा रही है।

A copy of above referred letter on the subject matter is being forwarded herewith for information and needful onward action please.

संलग्नक—यथोपरि।

DA: As above.

Digitally Signed by Rupesh
Chandra

Date: 23-02-2023 18:06:37

Reason: Approved

(रूपेश चन्द्र)

वकाधि/निर्माण

कृते मुख्य प्रशासनिक अधिकारी/निर्माण

प्रतिलिपि :- निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।

- सचिव/CAO/Con/North को CAO/Con/North महोदय के सादर सूचनार्थ।
- सचिव/CAO/Con/South को CAO/Con/South महोदय के सादर सूचनार्थ।
- सचिव/CAO/Con/GLP, Patna को CAO/Con/GLP, Patna महोदय के सादर सूचनार्थ।
- सभी CSWI/Con/MHX.
- CA/Personnel - for uploading on WEBSITE of Construction Organisation.
- Ch. OS/R & D/Pers./Con/MHX.
- नोटिस बोर्ड।

East Central Railway

Office of the
General Manager(P)
Hajipur

Date 21.02.2023

No:- ECR/HRD/Gaz/254/AEN(Gr. B)/LDCE-30%/2023

Secy. to GM- for kind information of GM,
Dy.Secy. to AGM – for kind information of AGM.
PS-I to PCPO- for kind information of PCPO.
PCE/ECR/HJP, SDGM/ECR/HJP, PFA/ECR/HJP.
CAO/Con/South & North/MHX,
CAO/WPO/Patna, CAO/GLP/Patna.
DRM/ECR-DNR, DDU, DHN, SEE & SPJ.
All Chief Engineer/Con/MHX.
Sr. DENs/DENs/ECR-DNR, DDU, DHN, SEE & SPJ.
Sr.DPOs/ECR- DNR, DDU, DHN, SEE & SPJ.
CW/M/PD/ECR/DDU, WS/SPJ & CRW/HRT.
Chairman RRB/Patna & MFP. Chairman/RRC/Patna.
Principal/ZRTI/E.C.Rly/Bhuli & MFP.
SPO/Con/MHX/Patna.
APO(MPP)/ECR/HJP- for uploading on WEBSITE.
All Extra Divisional Units.
General Secretary/ECROA, ECRPOA & ECRKU.

Sub :- Selection for the post of Assistant Engineer (Group-'B') in Level-8 of Pay Matrix
as per 7th PC against 30% quota.

With the approval of General Manager, it has been decided to hold a selection LDCE for forming a panel of 03 persons for the post of AEN(Gr.-'B') against 30% quota over E.C.Railway, as per details given below:-

Selection	UR	SC	ST	Total
AEN (Gr.'B') 30%	Nil	01	02	03

As decided by Railway Board vide L/No. E(GP)2022/2/4 dated 28.06.2022, 06.09.2022 & 04.10.2022, that 30% selection for promotion to Group 'B' posts in all Organised departments in the vacancy cycle beginning from 01.01.2023 to 31.12.2024 are to be conducted through the Centralised Computer based Objective type examination by NAIR.

- (1) (a) Tentative date Of Examination (CBT) :- 14.05.2023
(b) Venue of Examination (CBT) & Date of Viva Voce :- Will be notified in due course

(2) Eligibility:-(As on 01.01.2023)

- (a) All permanent Group-"C" technical staff working in Civil Engineering Department including those working in other Railways/on deputation having lien and seniority on East Central Railway who have completed a minimum of 05 years of non-fortuitous service in Level- 6 of Pay Matrix (Pay Band Rs. 9300-34800 (PB-2) with Grade pay Rs. 4200/- as per 6th CPC) & above (including non-fortuitous service rendered in the corresponding pre-revised grades) as on 01.01.2023 are eligible to volunteer to appear in the selection against LDCE.
NB:- However, Those Gr.'C' employees who have been given financial up-gradation in Grade Pay 4200/- or above in PB-2 (9300-34800/-) under ACP/MACP are not eligible to volunteers for the above (LDCE) examination.
- (b) The cut-off date of eligibility for candidates for 30% LDCE is 01.01.2023, which is same as in the earlier part selection of 70% Quota.

Handwritten signature and date 21/2/23

- (c) As per Railway Board's letter No. E(GP)2005/2/74 dt.13.03.08(RBE 40/08) in case of persons transferred at his own request to a new unit in the same category of post and assigned bottom seniority therein, the service rendered by them in the previous unit may be reckoned for determining their eligibility wherever a minimum length of service is prescribed as a condition for promotion in the new unit, subject to the condition that the length of service which is so allowed to be counted does not exceed the length of service of their immediate senior in the new unit.
- (d) Those Railway employees who have come own request transfer/mutual transfer and joined E. C. Railway after the cut off date i.e. 01.01.2023 will not be eligible to appear in this examination.
- (3) Eligible staff who desire to volunteer for the above LDCE may submit their application through proper channel to their respective Personnel Branch officer where they hold their lien.
- (4) Eligible staff working in the Construction/Project Organization on deputation, training and any Ex-cadre Organization and having lien and seniority in ECR, who desire to volunteer for the above LDCE may also submit their application through proper channel i.e. their respective Personnel Branch officer, where they hold lien. The concerned Divisions/Units should send copy of notice to the staff who are on deputation after being released from that Divisions/Units.
- (5) When an employee is holding an ex-cadre post, details of his/her post in regular cadre with the grade and date of entry as a regular measure should be furnished. This may also be brought to the notice of all concerned. It may be ensured that wide publicity is given to this notification amongst all the eligible staff. It is the personal responsibility of the personnel Officers/Controlling Officers of the Units to ensure that the notification reaches to all the eligible employee well in time.
- (6) All the volunteers who fulfill the above mentioned conditions of eligibility will get the chance to compete in the said LDCE, without any restrictions to the number of eligible candidates to be allowed for appearing in the examination.
- (7) The above LDCE will be based on the candidate's performance in Written examination, viva-voce & record of service. Only the candidates, who qualify in the examination and found medically fit for Safety category of AEN (Gr.B) as prescribed in Indian Railway Medical Manual will be called for Viva-voce test. The placement of the candidates in the panel will be based on their performance in Written examination, Viva-voce test and Record of service as per extant instructions of Railway Board and will be strictly as per merit.
- (8) **Pattern of Examination:**
- (i) The Examination will be conducted as per guidelines/instructions contained in Railway Board letter No. E(GP)2018/2/31 dated 19.03.2019 (RBE No. 53/2019), E(GP)2022/2/4, dt. 28.06.2022, 06.09.2022 & 11.11.2022.
- The CBT/Written examination shall comprise of only one paper which shall have 100% objective type multiple choice question only. The paper will be of 150 marks and the distribution will be as under:-
- | | |
|--|----------|
| a) Technical (Professional) subject: | 80 marks |
| b) General knowledge including optional questions of 15 marks on official language Policy & Rules: | 40 marks |
| c) Establishment and Financial rules:- | 30 marks |
| d) Qualifying marks:- | 90 marks |
| e) Duration of examination:- | 03 Hours |

All Objective type questions will carry equal marks. There shall be negative marking for incorrect answers. One-third of the marks allotted for each question will be deducted for every wrong answer.

- (ii) Total marks and qualifying marks under the heading "Viva-Voce and Record of service" are as under:-

<u>Head</u>	<u>Maximum Marks</u>	<u>Qualifying Marks</u>
Record of Service -	25 } Total	30 in which 15 marks for Record of service will be essential.
Viva-voce test -	25 } 50 marks	

- (9) Syllabus: In terms of Rly. Bd's Letter No. E(GP)2022/2/4 dated 07.11.2022, copy of syllabus for above selection is attached as Annexure-'B'.
- (10)(a) The Controlling Officers should give the wide publicity of this notification amongst the eligible staff under their control and ensure submission of applications by the candidates in the prescribed Proforma (Specimen Copy enclosed as Annexure-"A").
- (b) The last date for submission of the application by candidates is 13.03.2023.
- (c) The Controlling officers are also advised that applications submitted by the candidates (in prescribed proforma) must be forwarded to concerned Personnel Branch/Unit office by 15.03.2023.
- (d) The applications should be scrutinized properly in Personnel Branch with the Service Record to avoid any factual errors and further complications. The applications should also be signed by the Controlling Officer with official seal and should have the counter signature of the concerned 'Personnel' Branch Officer to avoid any factual errors.
- (e) All the scrutinized applications should be sent in a bunch through special messenger to Dy.CPO/Gaz. /ECR/ HJP on or before 22.03.2023 positively. Applications forwarded after the target date will not be entertained under any circumstances.

It may also be noted that application other than in prescribed proforma, having incomplete information or without signed by controlling officer and countersigned by Personnel branch officer will not be entertained.

- (11) In case the service particulars furnished by the volunteers and certified to be in order by the concerned authority are found incorrect/false subsequently, the candidature of the volunteer will be liable to be cancelled at any stage and suitable departmental action will be initiated against him/her.

(12) ACTION TO BE TAKEN ON RECEIPT OF APPLICATION BY CONCERNED PERSONNEL OFFICERS/CADRE CONTROLLING OFFICERS:-

- (a) The Personnel Officer/Cadre Controlling Officer will check the correctness of all the particulars of the applications with the Service Records and other relevant records and certify the correctness of each column of the application. Without such certification, application received will summarily be rejected and the responsibility will be fixed for incorrect or incomplete certification against the Officer who will certify/verify. The Personnel Officer/Cadre Controlling Officer should invariably write "Checked and verified" in each and every application after checking and verifying the details duly attesting their signature and date of certification (the date of certification should invariably put in the application).

In case, the Personnel/Cadre Controlling Officers do not put the date after certification or merely forward the application without checking and verifying the details, the matter would be brought to the notice of PCPO and concerned PHOD for taking action against him.

- (b) It may please be noted that Controlling Officers/heads of the Units have no discretion to entertain any application beyond the last date. The applications of the employees who are eligible, should only be forwarded after verifying the other relevant particulars and ineligible application should not be forwarded.

- (c) The Personnel Officer/Cadre Controlling Officer should forward the scrutinized and checked applications in one bunch together under one covering letter furnishing the details in the following proforma addressed to Dy.CPO/Gaz./HQ by 22.03.2023 indicating therein the total number of applications forwarded. (The details should be sent in soft copy in (MS Excel format also as in the form given in item-D below). The applications rejected may be intimated to the individuals giving reasons thereof by the concerned Unit/Divn where lien and seniority of concerned staff held.

Handwritten signature and date: 21/2/23

D. Proforma:-

Sl. No.	Particular/details of candidates	To be filled
1.	Name of applicant	
2.	IPASS Number	
3.	HRMS ID	
4.	Designation	
5.	Mobile No.	
6.	Email.ID (clearly)	
7.	Place of posting	
8.	Division/workshop/unit	
9.	Controlling officer	
10.	DOB (DD/MM/YYYY)	
11.	DOA (DD/MM/YYYY)	
12.	Community (UR/SC/ST)	
13.	Date of regular promotion to Grade pay (4200/- & 4600/-)	
14.	Total service in (GP) Rs. 4200/- & above in Civil Engg. Deptt. as on 01.01.2023	

(13) TRAINING OF SC/ST CANDIDATES:-

In terms of Railway Board's letter no. E(GP)2022/2/4 dated 18.10.2022, before conducting written examination, mandatory Pre-promotional training classes of 60 hrs./15 working days to all SC/ST eligible candidates will be arranged by the department concerned. PCE/ECR/HJP will nominate an JAG or above officer of Civil Engineering Department as an in-charge of Pre-promotional training for the SC/ST candidates. The in-charge of Pre-promotional training will intimate the date and venue of the Pre-promotional training to the eligible SC/ST candidates in due course.

If any SC/ST candidate refuse to undergo Pre-promotional training, a written undertaking should be obtained from him/her and the same may be sent to Dy.CPO(Gaz.)/ECR/HJP as well as PCE/ECR/HJP. The Controlling Officers should ensure that the SC/ST candidates under their control are spared without fail on time to participate in such training.

The SC/ST candidates are also advised to insist their controlling officers, in their own interest to spare them for the said coaching.

(14.1) Duty of the in-charge of Pre-promotional training (Nominated by PCE):-

- To inform in writing through special messenger to the concerned SC/ST employee with details of date, time & venue of training.
- To obtain in writing unwillingness for training, if any, from the concerned SC/ST employees.
- To arrange sparing of the candidates and liaison with respective Controlling Officers/Supervisors.
- To chalk out training schedule and adhere to it.
- To ensure maintenance of daily attendance of SC/ST candidates on the attendance sheet, who attend the training.
- After completion of such training, the in-charge of the Pre-promotional training will give a written report along with all supporting documents/papers including attendance sheet of SC/ST participants to Dy.CPO(Gaz.)/ECR/HJP, immediately after completion of Pre-promotional training for records and further action. On receipt of compliance report of Pre-promotional training, written examination will be conducted.

(14.2) Duty of Controlling Officer:-

To spare the candidates under their control without fail in time with direction to participate in the Pre-promotional training as well as to appear in the written examination also.

21/2/23

(14.3) Duty of concerned SC/ST applicant:-

- (i) To arrange their sparing from duty by insisting their Controlling Officers in their own interest.
- (ii) If any problem occurs in sparing, the candidate should report in writing to concerned in-charge of Pre-promotional training on the same date. No representation will be entertained in case of failure to report to the concerned in-charge of Pre-promotional training and it will be deemed to be refusal for the same.
- (iii) Failure of concerned SC/ST employees to avail Pre-promotional training on any account including leave etc. will be considered on their part and no supplementary training will be organized in any circumstances.
- (iv) No appeal will be entertained by GM(P)/ECR/HJP after completion of Pre-promotional training.
- (v) After completion of Pre-promotional training, the in-charge of the Pre-promotional training will give a written report along with all supporting papers including attendance sheet of SC/ST participants to Dy.CPO/Gaz/HJP latest by 03.05.2023 for records and further action.
- (15) The eligible staff should also be advised that no absentee written examination would be held for the absentees under any circumstances. As per rule, there is no provision of absentee exam in LDCE.
- (16) The concerned Personnel Branch Officer & Controlling Officers should ensure the submission of service records and ACRs/APARs of last 05 years and DAR/SPE/Vigilance clearance in respect of staff declared qualified for the viva-voce in due course/immediately after publication of the result of written examination through special messenger to SPO/Gaz/ECR/HJP.
- (17) The above selection will be held as per procedure laid down in Master Circular No. 68, governing promotion from Gr. 'C' to Gr. 'B' issued by Railway Board and the instructions issued time to time. The said Master Circular is available on website www.indianrailways.gov.in....>ministry of railway...>railway board>Railway Board Directorates... >Establishment...>E(GP)circular → Master Circular. The department/division/unit should ensure the compliance of instructions of item 15 of Master Circular- 68.
- (18) Application received after the target date should not be entertained and the same should be disposed off at the Division/Extra Divisional level by rejecting them on account of late receipt under advice to this office.

Please acknowledge receipt.

- DA:- (i) Proforma of application (Annexure 'A').
(ii) Syllabus (Annexure 'B')



(Alok Srivastava)
SPO/GAZ
For General Manager(P)/HJP

PROFORMA OF APPLICATION AGAINST NOTIFICATION FOR THE POST OF AEN (Gr.'B') 30% QUOTA.

Information regarding candidate:

Sl. No.	Particular	Filled by candidates
01	Name of applicant (In Block letter)	
02	IPASS Number	
03	HRMS ID	
04	Designation	
05	Mobile No.	
06	Email ID	
07	Place of posting	
08	Division/workshop/unit	
09	Lien at	
10	Controlling officer	
11	DOB (DD/MM/YYYY)	
12	DOA (DD/MM/YYYY)	
13	Educational Qualification	
14	Community (UR/SC/ST) (if SC/ST, a copy of caste/Tribe Certificate duly attested by a Gazetted officer should be enclosed with application)	

2. Date of appointment/promotion to the following grade on regular basis (6th PC):-

	DDMMYYYY
(a) In PB-II GP-4200	
(b) In PB-II GP-4600	

3. Length of non-fortuitous service (Regular Promotion) to the following grade as on 01.01.2023.

	As on	Year(s)	Month(s)	Day(s)
(a) In PB-II GP-4200				
(b) In PB-II GP-4600				

4. Present pay & scale & Date of promotion to present scale. :-

5. Choice of language to answer the questions :-

(English/Hindi). The candidate should indicate his/her choice, either any one of the above two language.

6. **DECLARATION OF THE CANDIDATE:-**

I do hereby declare that the above particulars furnished by me are true to the best of my knowledge and belief. I further undertake that in the event of any entry above is found incorrect or improper, my candidature shall liable to be cancelled at any stage during pendency of the above selection.

SIGNATURE OF THE CANDIDATE (HINDI)**SIGNATURE OF THE CANDIDATE (ENGLISH)**(A) **Forwarding of application (filled-up) furnished by the candidate to the Personnel Branch Officer by his/her controlling officer:-**

The application is in prescribed proforma duly filled-up by the candidate, Shri/Smt. _____ Designation _____ received within the target date is hereby forwarded to his/her Personnel Branch Officer for verification with the service record available and for onward transmission to the General Manager (P)/ECR/HJP.

SIGNATURE OF CONTROLLING OFFICER

(With office seal & date)

(B) Certificate to be furnished by the Personnel Branch Officer:-
If the volunteer comes under the circumstances mentioned in Para 2 (c) of the notification the service rendered by immediate senior employee as on 01.01.2023 should be indicated invariably in the following format.

Sl. No.	Name of immediate senior (S/Shri)	Designation	Pay Band & GP	Year	Month	Day
			In PB-II GP 4200			
			In PB-II GP 4600			

It is certify that the Service Particulars/Bio-Data furnished by Shri/Smt. _____, Designation _____ in the prescribed proforma (Bio-data) have been verified with his/her service record and found correct.
The above mentioned candidate is eligible to appear in the said selection as per Notification and his/her application is hereby forwarded to GM (P)/Hajipur for further necessary action.

SIGNATURE OF THE CADRE ('P' BRANCH)

OFFICER (With office seal & date)

Note:- The application with any column unfilled will be summarily rejected

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(RAILWAY BOARD)

No. E(GP)2022/2/4

New Delhi, dt:07/11/2022

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% LDCEs 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% LDCEs for promotion to Group 'B' posts, Board has prescribed syllabus of 70% Selections and have also modified the syllabus for 30% LDCEs 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% LDCEs 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 & LDCEs 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 30% LDCE 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. 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 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. Design of singly and doubly reinforced rectangular beams including T and L beams. Design of slabs, design of column, 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. Design of tension member and compression member. Plate Girders, 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.

5. Hydrology and Hydraulics:

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 of foundations; BOX and Pipe Culverts, 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.

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 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) 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.