INDIAN RAILWAYS TECHNICAL SUPERVISORS' ASSOCIATION

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No:IRTSA/Memo-28 Date: 21.08.2025

Director General (HR)
Railway Board, New Delhi.

Respected Sir,

SUBJECT: IMPORTANT ISSUES OF DESIGN & DRAWING ENGINEERS ON RAILWAYS.

IRTSA wishes to bring to your kind notice regarding main demands of Junior Engineers and Senior Section Engineers in Railways of Design and Drawing wings of Technical Departments for your kind pursual and favorable decision.

1. **<u>Role of Design and Drawing Engineers</u>:**

   a) Design & Drawing Engineers (JE & SSE Design / Drawing) working in Mechanical, Electrical, Civil Engineering and Signaling Departments require high degree of technical expertise, intelligence and wisdom; and are responsible for initiation of new or improved designs of Rolling Stock, Locomotives, Jigs & Fixtures, Tools, Systems, Equipment and innumerable Fixed & mobile Assets on the Railways.

   b) Their duty starts right from survey to continual improvement in the system without any boundaries. Duties and responsibilities of Design & Drawing Engineers which includes many other duties as well – (as explained in Annexure-I).

   c) Indian Railways has been continuously upgrading its technology in train operations and maintenance, not only to provide safe and efficient services at the minimum cost but also to compete with other modes of travel including road transport and low budget airlines etc. Drawing & Design Engineers (JE & SSE Design / Drawing) play a vital role for this purpose for continuous induction of new technology and improvements are made & initiated by them continuously in the existing systems & technology.

   d) In the cadre of Design & Drawing Engineers with the entry qualification of Diploma in Engineering at JE level with one year on the job training; and Graduate in Engineering at SSE level with one year on the job training. Three grades are available in the category ie., JEs in Pay Level-6 and SSE in Pay Level-7 & 8. They have very meager avenues for further promotion to Group-B cadre.

2. **Considering entry as GP Rs.4600/level-7 for the purpose of MACP to all the directly recruited Graduate Engineers in Design and Drawing Cadre.**

   Engineering Graduates of Design & Drawing were recruited in the grade of Rs.5500-9000 in the pre-revised scale. From 1.9.1998 recruitment of Engineering Graduates is upgraded to Rs.6500-10500 in the 5th CPC scale, replacement Grade Pay of Rs.4600 in the Sixth Pay Commission scale. Engineering Graduates who were all appointed prior to 1.9.1998 will be getting financial up-gradation one grade below than that of those appointed after 01.09.1998. This is against the natural justice and the basic spirit of motivational element in the MACP. These graduate engineers are presently being equated with diploma engineers recruited in grade pay of ₹4,200/Pay Level-6. This parity does not adequately recognize the

higher academic qualifications, technical expertise, and responsibilities of graduate engineers. Hence, it is imperative to revise their grade pay to ₹4,600/Pay level-7 to ensure fair compensation and to reflect the value of their professional qualification

it is requested to treat Pay level-7 (Grade Pay of Rs.4600 / PB-2) as entry grade for the purpose of MACPS for all the direct recruited Engineering Graduates (numbering less than 100 in Railways) recruited before 01.09.1998 by ignoring the promotion earned from the pay scale of Rs.5500-9000 to Rs.6500-11500.

Detailed Memorandum on this subject is attached with this memorandum

3. Cadre Distribution on par with Technical Supervisors:

a) Design & Drawing Engineers perform the duties similar to that of Technical Supervisors in Civil, Mechanical, Electrical and S&T departments. In the past, Indian Railways have brought various designation like TXR, PWI, BRI, Loco foreman, Signal Inspector, Draftsman, etc under the umbrella of same designations (Junior Engineer and Senior Section Engineer) with suitable suffix, and granted the status of Technical supervisors and uniform cadre distribution.

b) But the Design & Drawing Engineers are the only category left out of the Technical Supervisors cadre with same designation. The cadre structure of the Design & Drawing Engineers were also brought on par with that of Technical Supervisors by abolishing/up-grading the scales below Rs.5000-8000 (pre-revised). Now Design & Drawing cadre is having the pay scales on par with Technical Supervisors. (JE in Pay level-6 & SSE in Pay level-7 and Pay Level-8).

c) It is requested that the Design & Drawing Engineers who are all part and parcel of Technical Department and invariably doing the technical work may also please be classified as Technical Supervisors and appropriate cadre distribution on par with Technical Supervisors may please granted.

4. Grant of PCO allowance / Incentive Bonus to the Design & Drawing Engineers working in Production units & Workshops:

a) Design & Drawing Engineers in Railway Workshops & Production Units play important roles in improving the production & productivity through improved materials, Tools, Templates, Jigs & Fixtures, designing of new components & prototypes of Rolling Stocks apart from their core work of Design. But all these staffs are not paid either any Incentive Bonus or the PCO Allowance like the other Technical Supervisors & Staff in the PCO *(Production Control Organisation).* Thus they get less take home pay than the rest of the technical staff in the Workshops & Production Units, in spite of substantial contribution & technological inputs to the productivity. This is a great injustice which is causing much heart burning frustration amongst them due to vide disparity in their take-home pay.

b) **It is, therefore, requested that the Design & Drawing Engineers in Workshops & Production Units be treated as part of Planning wings of PCO & paid either the PCO Allowance or Incentive Bonus at par with their counterparts working in PCO / Shop floor.**

Thank you, in Anticipation

Yours' truly

K.V.RAMESH
General Secretary, IRTSA
9003149578

Copy to – Secretary, Railway Board. – For kind information

Annexure-I

DUTIES & RESPONSIBILITIES OF DESIGN & DRAWING ENGINEERS

DUTIES AND RESPONSIBILITIES OF DESIGN ENGINEERS IN PRODUCTION UNITS

1. The Design Engineers are involved in product and tool design which calls for knowledge of CAD/CAM, FEA, Crash Analysis, Vehicle Dynamics, Electrical Engineering, Electronics, mastering in certain areas of technology such as metallurgy, metrology, production technology and tool engineering etc.
2. The design work is a creative job and is not a repetitive one, which requires continuous and intensive application of mind.
3. The Design Engineers are directly related to production activity. The various activities include design calculation of various parameters of strength of components under different conditions of loading, prototype manufacturing, verification and validation of design, before approving for batch production. The output of Design Engineers forms the basis for production and their role is vital in a production unit.
4. During the development of new concepts, even process planning group are not authentic enough to decide the sequence of operations, as no validated process is known at that time. But Design Engineers shoulders the responsibility to get the prototype manufactured; supervising the complete fabrication process on shop floor and giving on the spot solutions and decisions for the problems emerged out during the actual manufacture to avoid any type of delay in execution of the project. Furthermore, when the series production starts after the prototype manufacture, Design Engineers group monitor and supervise the online performance of newly developed products. The responsibility increases further to the tune of successfully completing the commissioning of newly built coaches in Indian Railways.
5. The Design Engineers are analyzing on day to day basis, the customer's functional and performance requirements execute the design such that it meets all the requirements and co-ordinate and interact with shop floor, in order to finalize improvements and modifications in the design of the coach and its components. Close coordination with shop floor activities is required from Design Engineers for the manufacture of prototype coach; conduct test & trials during the development stage.
6. Design Engineers carry out online inspection and studies.
7. Creating the specifications for the new materials and concepts in coach building, control of all RDSO and ICF specifications, standardization of components, raw materials etc are carried out by design staff only.
9. On the Jig & Tool design side, the design engineers are involved in design & development of all major assembly and sub-assembly fixtures, press tools to suit the new inventory machines, Drill jigs, other machining fixtures for mass production activity, machinery & plant drawings, handling equipment drawings etc. and also to coordinate with Tool room for proper manufacture of tools and provide necessary guidance to the shop floor staff for proper use of tools.
9. On the Electrical side, the Design Engineers are involved in creating equipment specifications, evolution of power, control and auxiliary schemes with protections, preparation of test procedures, commissioning instructions, Maintenance manual etc.
8. To establish adequacy of the design, the design engineers identify the right type of raw materials to be used, decide the process to be followed, Heat treatment to be given, protective coating to be given and final process of finish. By this way Design Engineers are involving in all processes of activities starting from evolution of basic design to the Process planning, tool planning, manufacturing, inspection, material handling, packing and delivery and preparing operating and maintenance manual and commissioning instructions for new builds.
9. Coordination with RDSO for evolving scheme for oscillation trails for coaches.
10. Even after the dispatch of coaches, Design Engineers are having continuous interaction with the customer railways in communicating the improvements/modifications carried out in

Design for keeping the Zonal railways updating of design changes and help them to carryout the maintenance by providing all related information. A close liaison is maintained with the user Railways in trouble shooting the problems observed during the service run of these coaches. Depending upon the feedback received from user Railways and reaction from passengers, design group is making consistent effort to improve the quality of the product in terms of better passenger amenities, better passenger safety measures and also to improve revenue earning.

SPECIFIC DUTIES OF DRAWING & DESIGN ENGINEERS *(TECHNICAL)*

1. Preparation of layout drawing for Sheds, Shops and Sick Lines for modification/extension.
2. Issue of Technical Standing Orders, Procedure Orders, Maintenance Orders, Alteration Sheets, Trail Sheets and following action on them.
3. Preparation of technical notes, graphs, charts etc., for Loco Standards Committee, Carriage & Wagon Committee, Diesel Group meetings, Corrosion Committee meetings, etc., investigation of derailment and engine failures and their remedial measures.
4. Selection of alternative material and specification for smooth and economical operation.
5. Suggestion and preparation of Drawing for anti-pilferage of Rolling Stock components.
6. Provision of safety devices for Rolling Stock to avoid accidents.
7. Fixing permissible clearances for meeting components and condemning limits thereof pertaining to Non-IRS and BESA locomotives.
8. To monitor trial of components in connection with procurement.
9. Visit Shops, Sheds, Sick Lines, etc. for collecting data to enable the issue of modification to components of Rolling stock and guide the technical staff.
10. Study & prepare report for standardization / rationalization of thousands of components of Rolling stock.
11. Discuss technical problems with officers in day to day working and difficulties faced by the Shops, Sheds and prepare drawings thereof.
12. Training of Apprentices in Drawing Sections.
13. Modification of Rolling stock components and maintain its up-to-date records. Drawing section of Mechanical Workshops have different cells and Head Junior Engineer/Drawings/Senior Designer supervise these different cells constituting the above nature of work and assist Chief Junior Engineer / Drawings / Designer in day to day work. In addition, the Section Engineer / Sr. Designer performs the following duties in common with their Counter-parts in Production Units of Railway viz., Integral Coach Factory, Chittaranjan Locomotive Works and Diesel Locomotive works.

GENERAL DUTIES:

1. General administration of Technical & Ministerial staff and supervision in the Drawing B.C. preparing the assembly and detail part drawings for manufacture of components.
2. Developments of indigenous components for import substitution and supervision, preparation of detailed working drawings from consulting Engineers and of Railways Design and standard Organisations Line Drawings and from samples supplied by the Shops and Sheds.
3. Co-ordination with Shops during manufacture of components and evolution of new methods for their manufacture and also handling correspondence with RDSO and Railway Board/Other Zonal Railways on Technical matters.
4. Compilation & maintenance of Tech. Data / Drgs. for thousands of items.
5. Supervision and supply of up to date drawings to Workshops, Sheds and to controller of stores for manufacture/procurement of material.
6. Technical scrutiny of tender papers for procurement of Rolling Stock components and inspection of materials as per specification.
7. Estimation of Railway materials and compilation of Rolling Stock components.

Functional justifications for improvement in Cadre Restructuring of Design & Drawing Engineers on Zonal Railways

The works listed / assigned requires a high level of technical acumen, forecasting ability and problem solving ability. This job requires high technical qualifications along with managerial skills. This point has been ignored all along and merely for convenience this Cadre has been placed with other general pay scales. A few of the jobs currently handled are as below:

- Technical Evaluation.
- Engineering Codal Provisions.
- Railway's Codal Provisions.
- Survey *(Reconnaissance, Preliminary & Final location)*
- Collection of Data.
- Planning.
- Design.
- Estimation.
- Works management.
- Feasibility Study.
- Economy Viability Study.
- Developmental works.

Preparation of General arrangement & detailed drawings related to:–

1. New projects and proposals
2. Modification and Restoration
3. Civil & Construction works
4. Track layout.
5. Track Maintenance
6. Electrical System
7. Signaling System
8. Network
9. Radio Signaling
10. Maintenance of M&P
11. Water Supply & Sanitation
12. Accident & Prevention
13. PERT & CPM charts.
14. Rain water harvesting.
15. Index section & plans.
16. Interaction with Field Engineers.
17. Exploring alternative methodology.
18. Thorough study of accidents and preventive measures.
19. Conducting trials regarding technical feasibility and economic viability.
20. Liaison with accounts for vetting.
21. Track monitoring works like OMS, Amsler, Oscillograph.
22. Processing to obtain CRS's sanction for works.
23. Processing to obtain Safety certificate from CRS for running of trains.
24. Preparation of specifications for all works.
25. Preparation of Work Instructions.
26. Job Analysis.

27. Asset Management & Development.
28. Preparation of system maps.
29. Preparation of special maps.
30. Technical assistance to special Committee.
31. Looking into safety aspect.
32. Preparing of technical standing order.
33. Preparation and analysis of technical reports.
34. Providing in-house training.
35. Workshop activities.
36. Preparation of Track Machine Deployment Charts.
37. Tender related activities.
38. Mooting out new proposals.
39. Issue of Coach alteration instructions(CAI)

Non-technical & out of scope works.

- Computer programming.
- Creating & maintaining Database.
- MIS data.
- Upkeep of computers.
- Progress of Works.
- Preparation of regular and special reports and minutes of meetings.
- Assisting Hon. MLA / MP Committee & members.
- Taking part in preparation of books from data entry to Dispatch.
- All sundry works assigned by the Administration.

DUTIES & RESPONSIBILITIES OF DESIGN & DRAWING ENGINEERS OF CIVIL ENGINEERING

Surveying

a. Reconnaissance
b. Technical feasibility
c. Final location
d. Acquisition of land
e. Curve setting
f. Location of station buildings
g. Alignment of pipelines
h. Flood investigation
i. Location of Bridges

Preparation of plans

a. Building
b. Track
c. OMS charts
d. Yard
e. Layouts
f. Land
g. W & S
h. Hydrants
i. GAD
j. Temporary Arrangement
k. PCS/RCC/Steel bridge
l. FOB
m. ROB/RUB

Structural designs

a. Structure
b. OHT
c. Bridge
d. Culvert
e. Track stress
f. Curves
g. PSC
h. Checking of 3rd party designs

Estimating

a. Rough cost estimate
b. Detailed estimate
c. Completion estimate
d. Urgency certificate
e. BCI

Tendering

a. Preparation
b. Scrutiny
c. Comparative statement
d. TC proceedings
e. Accounts vetting
f. Re tender
g. Risk tender

Completion plans

a. Plans

b. Estimate
c. Documents

Accounts concurrence

a. Estimate
b. Works programme
c. Variation statement
d. Vitiation statement

Collecting site details

a. Bridge data
b. Building data
c. Track data
d. Structure along track
e. FOB
f. ROB / RUB

TRC

a. Accompanying
b. Checking
c. Charts maintenance

M book

a. Measurement check
b. Cement schedule
c. Steel schedule
d. Certification of quantities

Works programme

Preparation of charts, booklets

a. MCDO
b. PCDO
c. VIP visit
d. Detailed Project Report

Land management

a. Maintenance of land plans
b. Removal of encroachments
c. Demarcation of land boundaries
d. Licensing & Leasing
e. Way leave facilities
f. Rent rules

Asset management
BSR
Data storage
Rate analysis
CRS sanctions
Safety certificate
Accidents & breaches

a. Collection of site details
b. Preparation of drawings
c. Attending enquiry with relevant data

Instrumentation
Track machines
ODC
Interaction with State Govt.