SECTION 8B

EMPLOYER'S REQUIREMENT – TECHNICAL SPECIFICATIONS

1. GENERAL

NAME OF WORK:

"Yeshwanthpur - Channasandra Doubling Project - Linking of BG track between Yeshwanthpur and Baiyyappanahalli "A" panel, including Yeshwanthpur, Lottegollahalli & Banaswadi Yards (excluding Hebbal Yard to Banaswadi) and Misc. works in Bangalore Division of South Western Railway"

&

" Baiyyappanahalli - Hosur Doubling Project - Linking of BG Track with Allied Works and Manufacturing, Supply & Stacking of Machine-Crushed Track Ballast conforming to RDSO Specification (IRS-GE-1) from Km 197/900 to Km 205/500 between Belandur Road (Excl.) and Baiyyappanahalli "A" Cabin (Incl.) in Bengaluru Division of South Western Railway"

The proposed work is part of the, Track Doubling Work between Yeshwanthpur - Channasandra and between Belandur Road (Excl.) and Baiyyappanahalli "A" Cabin (Incl.) Doubling Project. It is proposed to execute the Linking of BG track between Yeshwanthpur and Baiyyappanahalli "A" panel, including Yeshwanthpur, Lottegollahalli & Banaswadi Yards, (excluding Hebbal Yard to Banaswadi) and Misc. works and Linking of BG Track with Allied Works and Manufacturing, Supply & Stacking of Machine-Crushed Track Ballast conforming to RDSO Specification (IRS-GE-1) from Km 197/900 to Km 205/500 between Belandur Road (Excl.) and Baiyyappanahalli "A" Cabin (Incl.) which comes under the jurisdiction of BENGALURU DIVISION OF SOUTH WESTERN RAILWAY.

1.1 TECHNICAL SPECIFICATION FOR TRACK WORKS

1. This Contract shall be governed by the Indian Railway's General Conditions of Contract, Indian Railways P-Way Manual, Indian Railway Standard Track Manual, Schedule of Dimensions and the Standard Specifications for track works. In case of contradictions, the clauses under these Special Conditions shall prevail. All the latest correction slips for the above is also applicable.

2. The Tenderer in his own interest should visit the site of work with the concerned DGM/Senior Manager/Manager/Deputy Manager/Assistant Manager/Civil or with their authorized representatives after fixing up an appointment with them in advance and ascertain the nature and quantum of work, site conditions, availability of approach roads, availability of labour, water, electricity, land for labour camps, availability of P.Way materials, accessories, speed restrictions, market rate for various raw materials transport etc. before quoting the rates for this tender.

3. The total period of the contract execution is basically a period of validity of the contract. It needs to be understood that the actual execution period for the work has to be much less. The contractor should be able to complete the P-Way works within a period of 3 months from the date of supply of major chunk of long rails.

4. During the core-working period, i.e. after supply of long rails, the contractor should be able to mobilise adequate number of labour for various track activities till the section is finally commissioned and even beyond that for completing the remaining jobs if any and for removing / complying deficiencies noticed during joint inspections.

5. The contractor should be able to expeditiously link the Turnouts as soon as the Turnout sleepers are allotted. It is quite possible that supply of Turnout sleeper sets is completed only a month before the target date of commissioning. Thus, the

contractor should mobilise adequate number of batches who can independently take up the job of linking of Turnouts, assembling of SEJs etc.,

6. During pre-NI/NI works, contractor should mobilize adequate number of labour apart from rail lorries, JCBs, Poclains , Cranes, etc.

7. Immediately after commissioning of section, the contractor should keep adequate labour at each yard, so that all leftover works and balance works are completed, speed restrictions are relaxed to normal speed within 15 days to 30 days from date of commissioning.

8. Contractor should mobilise the required resources to execute the work as per the bar chart attached to the tender document.

9. The Contractor shall not start any work on the track under traffic conditions without the presence of the K-RIDE/PMC/Railway's supervisor at site. In case the contractor or his representative starts any work in the absence of the supervisor, it shall be treated as unauthorized and illegal tampering with the track and shall be liable for action under the Railway's Act.

10. No road vehicle/machines/road cranes should be allowed to work without safety barricading adjacent to the running track for carrying out works of doubling or any works adjacent to running tracks.

11. Barricading concrete posts if available at site along the track are to be used as protective fencing /barricading while carrying out track linking/ballasting works duly providing nylon rope, repainting the posts .This barricading shall be maintained in good condition throughout the contract period. No extra payment shall be paid for this.

12. If barricading is required to be provided in any stretch where no barricading posts were provided earlier, payment for providing barricading in such stretches only shall be made as per relevant item.

13. Dumping of ballast and spreading of ballast can be done only after carting of sleepers. The pace of dumping of ballast needs to be expeditious. Ballast required for the cribs and shoulders need to be dumped on the sides so that after linking of track, the extra ballast dumped on the sides can be brought into the cribs and on the shoulders. Thus, any additional topping / carting of the ballast should generally be avoided after linking of the track.

14. The lifting of PSC sleepers once allotted needs to be done expeditiously within a short period as it effects the allotment of PSC sleepers further. The contractor should complete the transportation of PSC sleepers within a period specified by the Engineer in-charge. The contractor shall make adequate transportation arrangements on day to day basis to the extent of loading capacity of Sleeper Factories for transportation of PSC Sleepers.

15. The contractor should complete the transportation of Class-II / Service Rails within a period specified by the Engineer in-charge. Class-II / Service Rails will be made available generally at the loading points where trailer can reach., However, this may involve some leading, contractor should make arrangements for leading of Rails.

16. The progress of works in station yards should match with the progress of works in mid-section to complete all the required works for presenting the section for CRS inspection.

17. Mobilisation for execution of civil works should be in line with the mobilization of track linking works so that both the works should be completed at same time.

18. In case trains are detained at or on the approach of the work spot or at station due to the reason that the work spot is considered unsafe on account of bad workmanship by the contractor or the track parameters being unsatisfactory for safe passage of trains or due to contractor leaving the work unfinished or due to the work being delayed beyond the allotted time, due to inadequate labour, then, under such situations Railway is at liberty to impose a penalty on the contractor on this account. However, the total amount of penalty thus imposed during the entire currency of the contract shall not exceed 10% of the agreement value. The penalty thus determined by the Railway shall be final & binding on the contractor.

19. Further, in case train accident occurs at a work spot and the Enquiry Committee set up by the Railway Administration to investigate the cause of the accident or Commissioner of Railway Safety decides that the cause of the accident is due to the contractors negligence or due to poor workmanship and if the contractor is held responsible, the contract is liable to be terminated forthwith not with standing the provision of clause 62 of the GCC. In addition, the amount of damages as decided by the Accident Enquiry Committee/ Commissioner of Railway Safety is liable to be recovered from the contractor. This amount of damage will be over and above the penalty specified under relevant clause.

20. Traffic blocks if required to carry out certain track works will be arranged by the Railways. Actual availability of block would depend on flow of traffic and there may be variations in availability of block vis-a-vis those planned. The labour should be judiciously deployed for other activities wherever block planned is not available and no compensation is payable in case block planned is not available. No claim on such account shall be considered.

21. The Contractor shall proceed with the work in a systematic manner so as to ensure that the stretch of track under speed restriction and its duration are kept to a minimum. The decision of the Engineer in this respect shall be final and binding. The Engineer may regulate certain activity / item of work till the track is attended to restrict the length under speed restriction. No compensation is payable when such restrictions are imposed on the progress of certain activity / item of work.

22. The work shall be so carried out that there is no infringement to the Railway's Schedule of dimensions and it should be ensured that no loose materials are left near the track without watch and ward.

23. The K RIDE shall arrange for protection of track(s) by their staff. In addition, the Contractor shall arrange for "Lookout man" for protection to warn his workers of any approaching train. No compensation will be paid by K RIDE in case of injury or death to the Contractor's labour. The contractor shall indemnify K RIDE of any responsibility in this regard. The Contractor may obtain Group Insurance in respect of his workers.

24. At each site of work, the Contractor shall employ and post one technical supervisor who should have adequate experience in execution of track works and safety rules. The name, technical qualification and details of experience of the technical supervisor as employed shall be advised to the Engineer. If in the opinion of the Engineer, the Supervisor is not fit to be in-charge of the work, he shall be forthwith replaced. In this matter, the decision of the Engineer shall be final and binding on the contractor.

25. The Contractor's technical Supervisor shall be present at the site, at all times when the work is being executed. The Contractor shall employ adequate number of qualified & experienced workers to give consistent and desired progress every day. The labour strength is to be suitably maintained as desired to match with the desired progress/availability of materials for works etc.,

26. For executing the works, the contractor has to arrange his own tools, plant and equipment.

27. The contractor has to arrange the following P.way tools required for the work with operators in sufficient quantity depending upon the number of sites in which the work is taken up and also according to the labour force.
    i) Rail tongs/Hooks
    ii) Crow bar
    iii) Spanners Double end including box spanners
    iv) Hammer Sledge
    v) Ball-Pen hammer
    vi) Beater iron
    vii) Shovel
    viii) Pan Mortar steel/similar for ballast
    ix) Track lifting jack
    x) Gauge cum level
    xi) Rail cutting machine with consumables including appropriate size of rail cutting Discs.
    xii) Rail drilling machine with consumables including drill bits etc.,
    xiii) Wire brush
    xiv) Wire claws (Powrah Ballast)
    xv) Painting brush/Mammoty Fork Ballast
    xvi) ERC extractor
    xvii) Chamfering Kit for holes
    xviii) T-Square steel
    xix) Linen Tape 30m,5m

28. However, K RIDE will issue at the depot (free) under acknowledgment, the Jim Crow as and when required and the contractor is responsible for collecting the same from the depot & return back the same at the depot under acknowledgment.

29. Contractor should mobilise 2 Nos of Blacksmith batches per yard.

30. The contractor shall arrange safe custody of the materials supplied / hired to him. In case of loss of K RIDE materials or damage, the K RIDE will recover the cost of the lost material or penalty for damage as per Rules. Once the K RIDE materials are issued to the contractor, he shall not move the materials to other workspot. Any violation in this regard will be viewed seriously.

31. Loose materials / tools shall not be allowed to be scattered along the line and these materials shall always be neatly stacked and watched with contractor's watchmen.
32. Issue of materials to the contractor or his nominated representative will be on vouchers and the materials thus issued are to be accounted for by the contractor either in the track as fitted or as surplus materials having been returned to the K RIDE under proper acknowledgment. He shall be responsible for any shortage till the track is taken over by the Engineer-in-charge.

33. Similarly, whenever any P-way is to be dismantled the inventory of the existing P-way material shall be jointly taken and signed by both the parties. Payment for dismantling item in the schedule will be considered only after handing over / reconciliation of the released materials.

34. Site Order Books, progress registers and materials issue registers shall be maintained at site and entries shall be recorded on day-to-day basis in the registers and signed jointly by K RIDE Supervisor and by the Contractor or his authorized representative. All details of various stages of work, impose and removal of speed restrictions, measurement of track parameters, accountable of released materials, etc., shall be recorded therein.

35. The contractor shall always comply with the instructions / directives issued by the Engineer's representative from time to time. In the event of non-compliance with the instructions / directives, apart from and in addition to other remedies available to the K RIDE as specified hereinabove, the Engineer's representative may employ at the worksite, the required workers with necessary equipment as considered appropriate and adequate by him to provide the requisite conditions for the safe and unhampered movement of railway traffic. The decision of the Engineer's representative in regard to the need, appropriateness and adequacy of the deployment of the required workers with necessary equipment shall be intimated in writing by the Engineer's representative to the contractor, soon after such deployment and the charges for the same shall be payable by the contractor.

36. If the contractor persistently does not comply with the instructions / directive of the Engineer's representative, apart from and in addition to the remedies available to the K RIDE as specified hereinabove without prejudice to the K RIDE rights in this regard, the Engineer's Representatives which for the purpose of this contract shall also include the Executive, Senior Executive, Assistant Manager, Deputy Manager, Manager, Senior Manager appointed by the K RIDE, can suspend the contractor's work till the Engineer's representative is satisfied that the Contractor has taken necessary steps to comply with the instructions / directives issued by the Engineer's representative. The decision of the Engineer's Representative in this regard shall be final, conclusive and binding on the contractor. The contractor shall not have any claim whatsoever against the K RIDE for such suspension of the work.

37. During such period of suspension of work, the contractor shall not in any manner attempt to carry out any work at the worksite. Any such attempt on the part of the contractor shall tantamount to tampering of the Railway track for which the contractor shall be liable for appropriate action under relevant provisions of the Railway's Act.

38. All items such as Rails, sleepers, cotters, Elastic Rail Clips, rubber pads, liners, fish plates, bolts, check blocks, bolts and nuts, keys, bearing plates, plate screws, other fittings etc. will be supplied at the nearest construction stores depot unless

otherwise expressly specified in the respective items of Annexure. The contractor has to lead the materials to the site of linking at his cost and the rate quoted shall include this.

39. Dip lorries to the extent available will be supplied by the K-RIDE free of charge at the nearest construction stores depot and these shall be returned by the contractor at his own expenditure to the same depot as directed by the Engineer-in-charge.

40. For drilling holes in rails and cutting rails the contractor should make his own arrangements for using drilling and cutting machines, rail cutting blades, drill bits etc. The department will not supply any of these items. Cutting of rails and drilling of holes by JIM CROW OR GAS IS NOT PERMITTED unless mentioned otherwise in the items for dismantling of track.

41. The fish bolt holes drilled for running rails shall be invariably chamferred by proper tools as per standard specification.

42. No extra payment will be made for crossing the tracks, or for lifts/descends while unloading, leading and stacking the materials.

43. Permanent way materials should be handled carefully without causing any damages. If any damage is caused, due to negligence of contractor which make these materials unfit for use on track, or for shortages, the cost thereof will be recovered from the Contractor as per extant orders. Decision of the Engineer-in-charge regarding damage or shortage will be final & binding on the Contractor.

44. The cost of Permanent way materials when got broken in handling/transport, except for negligence of Contractor, will not be recovered, but broken ones should be handed over to the K RIDE depot as nominated already or as may be directed. Whether the breakages have occurred due to negligence of the Contractor or not will be decided by the Engineer-in-charge and his decision is final and binding on the Contractor.

45. Materials liable to breakage, or damage by being dropped or thrown, shall be unloaded carefully by hand or other suitable means. All materials shall, after unloading, be stacked sufficiently clear of the track or the road, as the case may be and in the former case, shall remain without any possibility of infringing the minimum fixed structure dimensions when work is done near opened yards/lines.

46. The entire work will be done under the strict guidance of the Engineer-in-charge or his authorised representative. The daily progress of the work will be watched and any suitable corrective measures as directed by the Engineer-in-charge or his representative should be immediately carried out wherever necessary at no extra cost.

47. After each stage of lifting, in case the schedule involves lifting of track under traffic conditions, the ballast has to be properly packed and the level, gauge alignment and other track parameters are to be attended to ensure safe passage of trains.

48. Prior to commencement of work, the section Engineer-in-charge and the representative of the Contractor will jointly inspect the work spot and take note of missing fittings, if any. The contractor will be responsible for any further losses

till the work is completed in this length. The cost of such fittings at K RIDE rates will be recovered from Contractor's bills.

49. Wherever rails are unloaded they should be handled and stacked properly. The rails should be made to rest on the bottom flange and not on the sides. Support points should be fairly in one level not more than 6m apart. This will avoid permanent kinks and the need for cropping and welding of such kinks.

50. The tenderer/ contractor shall arrange to provide the in-section gadget (gauge-cum-level etc.) as in PIE-Roorkee kit (PWI tool Kit) or similar for the purpose of department officials to inspect and to check the quality of the track linking. One set of such TOOL kit should be handed over to K RIDE after the completion of the work wherever the agreement value of the work exceeds Rs.25 lakhs.

51. Rails, check rails, fish bolts and nuts, PSC/ST/CST-9/Wooden sleepers, Elastic rail clips, rubber pads, fish plates, check blocks, bolts and nuts and all other P.Way materials shall be supplied by the K RIDE as mentioned in the schedule. These materials will have to be led by the contractor by head loads or any other approved means at his cost.

52. Rails and other permanent way materials including fittings shall be issued to the contractors progressively as the work proceeds taking care to see that the contractor shall have at-least one week's stocks in hand at any time.

53. In case certain items are not available , Contractor has to suitably staggler/ regulate the activities, duly redeploying the labour for other activities and no compensation is payable due to non-availability of P-Way materials/ fittings.

54. Consumable stores like Paint Enamel, Grease 'O' Graphite oil etc., of approved quality required for the work will be arranged by the contractor at his cost.

55. On new track and diversion, spreading 50mm stone ballast to 250mm cushion (thickness) has to be done first and then rolling of ballast with contractors rollers shall be carried out. Sleepers are to be assembled and laid over the ballast to correct spacing. Rails shall be connected by means of a pair of fish plates using in the first instance only with two fish bolts and nuts, one in each rail or alternately with welding gap with single bolt. Before fishing the rail ends the fishing edges of fish plates and bolts shall be lubricated with grease, graphite and oil as directed. Correct expansion gap according to the rail temperature at the time of laying as directed by the Inspector / Engineers shall be ensured between ends of rails by inserting the liners supplied by the K RIDE. Cut rails will have to be used on inside of curves & drilling of fresh bolt holes in these rails shall be done by the contractor.

56. Rails shall be laid in such a way that arrows on the web face, face the direction of traffic, where so directed.

57. Paint marks shall be made on the rails with contractor's yellow paint as directed by the Inspector / Engineer to indicate the spacing of sleepers to be adopted.

58. On the track with PSC sleepers, wooden block with A.C bearing plates with keys shall be inserted under rails at every fish plated joints one on either side of the joint at close interval as directed and the rails fastened to the A.C/M.S bearing plates with plate screws/ rail screws or spikes. In the event of K RIDE deciding not to use wooden blocks at the joints, PSC sleepers shall be provided at the

joints. K RIDE wooden sleepers will be made available free of charge. Cutting & transportation & fixing is to be at contractor cost.

59. In the case of PSC sleepers, rails shall be laid on sleepers along with grooved rubber pads, fastening the rails to sleepers with elastic rail clips and grooved rubber pads GFN/Metal liners, shall be done by the contractor.

60. The track shall be lifted with crow bars and the sleepers thoroughly packed. The lifted portion of the track shall be properly eased out at both ends so as to achieve a longitudinal gradient not steeper than 1 in 360 degree and to the desired cross level as directed by Engineer-in-charge. Further lifting will also be done in similar manner until the track is lifted to correct rail levels as per level marks marked on the level pegs fixed along the alignment before the commencement of lift as directed by the Engineer-in-charge. At each stage, the alignment, gauge and cross levels will be checked and defects rectified.

61. The ballast shall be packed under the sleepers to the approved ballast cushion below each rail seat and 45cm on either side of the rails and the middle of the sleepers shall be packed loosely.

62. The alignment of the rails shall be finally corrected, the sleepers squared, the gauge adjusted as directed, cross levels checked, lifted and repacked wherever necessary.

63. The ballast section shall then be dressed to specified profile duly boxing the ballast as specified. Contractor shall ensure that sleeper top is visible while boxing.

64. Ballast section shall be uniform in height, width and side slopes and brought to standard section as directed by the Engineer – in – Charge with the quantity of ballast made available at site. No ballast shall be left on the cess, side slopes of bank or near toe of bank.

65. The initial packing and picking up sags after rolling by locomotive or otherwise is part of assembling and linking item in the schedule. Additional packings required, if any, will be decided by the Engineer-in-charge and executed under appropriate schedule items.

66. Any packing done earlier to rolling by locomotive/packing machine & rectification of defects developed subsequent to rolling shall be accounted as initial packing.

67. Wherever additional packing is ordered such item will be operated and paid only after the track is rolled with locomotive and the defects developed after rolling such as sags, cross level, alignment etc., are attended and rectified satisfactorily as certified by Engineer/PWI in-charge of the work.

68. Any sleepers which got shifted from its position or gone out of square shall be moved back and squared after loosening of the fastenings. The fastenings shall be tightened again after squaring. To correct all the above defects no extra payment is permissible.

69. The track shall be slewed to correct alignment by sighting along the rail head of the base rail. It should be ensured that track does not get lifted in the process of slewing.

70. Any defects developed in gauge and alignment shall be rectified. Re-gauging of PSC sleepers shall be done duly pushing the sleeper from ends under specific directions of the Inspector.

71. Any dip or low joint lifted correctly and packed duly packing the adjacent sleepers fully. After the base rail is thus packed for two or three rails length the cross levels shall be checked and opposite rail lifted wherever necessary and sleepers under the rail seat packed fully.

72. For SWP track the joint and shoulder sleepers shall be repacked and cross levels adjusted.

73. WITHOUT THE USE OF TRACK MACHINES the following laying standard of track geometry measured in floating condition should be achieved by the Contractor after rolling/testing of track with the help of locomotives / track machines.

a.	Gauge	Sleeper to sleeper variation	2mm
b.	Expansion gap	Over average gap worked out by recording 20 successive gaps.	± 2mm
c.	Joints	Low joints not permitted.	-
		High joints not more than	+2mm
		Squareness of joints on straight.	±10mm
d.	Spacing of sleepers	With respect to theoretical spacing.	±20mm
e.	Cross level	To be recorded on every 4th sleeper	±3mm
f.	Alignment	On straight on 10m chord	±2mm
		Variation over theoretical versines on curves of radius more than 600m (On 20 m chord)	5mm
		Variation over theoretical versines on curves of radius less than 600m (On 20 m chord)	10mm
g.	Longitudinal level	Variation with reference to approved longitudinal sections.	50mm

74. Gauge: Will be checked with standard gauge and should be 1676 mm on straight.

On curves: The gauge on curves shall be to the following standard:

On new lines gauge conversions, doublings and on lines where complete renewal or through sleeper renewal is carried out the track should be laid to a uniform gauge to the following standards.

Sl. No.	Radius in metres	Gauge
1	Straight including curves of radius upto 350m and more	-5mm to +3mm
2	For curves of radius less than 350m.	Upto +10mm

1.2 TECHNICAL SPECIFICATIONS FOR TRANSPORTATION OF P.WAY MATERIALS - SPECIAL CONDITIONS OF CONTRACT

1. The rails are to be handled carefully by hand or other suitable means without causing any damage and the contractor is solely responsible for the same while in his custody. Any loss or damage to the K RIDE materials will be recovered from the contractor's bills.

2. Whenever the rails are required to be pulled across the Railway tracks, the contractor has to arrange for lookout men to ensure safety of men & materials for which no extra rate will be paid. The work is to be done under traffic block under the supervision of K-RIDE supervisors and contractor's competent supervisors.

3. Lookout men should be posted at the site of work by the contractor at his own cost to warn the labourers' of approaching trains, etc. If the contractor fails to do so, the K-RIDE will arrange for lookout men and recover the cost from contractor's bills.

4. While working in the electrified sections all precautions as required to be taken in such sections while handling rails should be strictly followed by the contractor. Any loss or liability on account of non-observance of such precautions will be on contractor's account.

5. Break down to transport vehicles, if any, will be on contractor's account and contractor has to make alternate arrangements to maintain the progress to match the programme of work.

6. Accidents, if any, to his vehicles or to persons would be the responsibility of the contractor and K RIDE will not be responsible for any damage or compensation thereof.

7. The contractor must ensure the safety of labourers' engaged by him while crossing the track during the course of execution of work and the K RIDE will not be responsible for any injury sustained by the labourer or for any fatal accident and the contractor should bear all the loss & expenditure involved.

8. The contractor is deemed to adhere to the Workmen's Compensation Act, State Motor Vehicles Act, Railway Act,1989 etc., and any infringement to the same should be at his own risk & cost.

9. The unloading work should be commenced immediately on placement of wagons in the yard and completed within the stipulated free time. Any demurrage if charged will be at the contractor's account.

10. Transporting work should be commenced on receipt of the acceptance letter and advise given for the transportation from different sources.

11. Traffic rules and rules for interstate movements should be strictly followed and the contractor should indemnify the K RIDE from any claim due to accidents & unforeseen incidents.

12. The rules & regulations governing placement of vehicles at the points for loading & unloading operations and transport regulations shall be strictly adhered to and non-observance thereof shall be at the sole cost & risk of the contractor.

Contractor shall make his own arrangement to ascertain position of wagons to be loaded/unloaded duly keeping in touch with Station Master/Engineer-in-charge.

13. Rate for the work

The rate quoted shall be all inclusive covering rates for labour, transport, stacking, handling besides other charges/levies, imposed by local authorities or double handling in reasonably unavoidable cases during the course of execution.

14. The weight for payment will be assessed as per the theoretical weight and 5% will be reduced for wear & tear in the case of second hand materials. Wherever standard weight is not available, the payment will be based on weighment through authorised weigh bridge or sample weighment by the Engineer.

15. Location for unloading:-

All unloading/stacking shall be done in such a manner as not to cause infringement to moving dimensions of running train. In case materials are unloaded in midsection, the lead is calculated in block of 1 km. The value in excess of 500m will be rounded off to the next km., while less than 500m will be accounted to lower km.

The unloading of materials is to be done as directed by the Engineer-in-charge in the locations indicated with specific quantity for each location. In case the contractor unloads the materials in excess of required quantity at a particular location, the same is to be re-transported as directed by the Engineer-in-charge without any extra payment.

The unloading work may have to be coordinated with other contract agencies who will be executing work such as track linking, ballast collection, formation work, etc. There should be least interference for works by other agencies.

The distance for the lead to be reckoned will be through shortest practical motorable road which will be certified by Engineer-in-charge in advance, before actual commencement of the work. The actual route followed by contractor may be different but the lead will be paid as stated above, even if the route followed by the contractor is longer, as per certification of the Engineer-in-charge. The decision of the Engineer-in-charge shall be final & binding on the contractor.

1.3 Introduction of contract package

The proposed work is part of the, Track Doubling Work between Yeshwanthpur - Channasandra and between Belandur Road (Excl.) and Baiyyappanahalli "A" Cabin (Incl.) Doubling Project. It is proposed to execute the Linking of BG track between Yeshwanthpur and Baiyyappanahalli "A" panel, including Yeshwanthpur, Lottegollahalli & Banaswadi Yards (excluding Hebbal Yard to Banaswadi) and Misc. works and Linking of BG Track with Allied Works and Manufacturing, Supply & Stacking of Machine-Crushed Track Ballast conforming to RDSO Specification (IRS-GE-1) from Km 197/900 to Km 205/500 between Belandur Road (Excl.) and Baiyyappanahalli "A" Cabin (Incl.) which comes under the jurisdiction of BENGALURU DIVISION OF SOUTH WESTERN RAILWAY.

The track for doubling are proposed parallel to the existing track on the left/right side of existing single line.

It is proposed to execute this work, as it is important from the point of view of both Passenger and Freight traffic.

This work can be started immediately as major portion of land is available for execution of work.

i. Availability of Land :

The portion of the required land for the execution of works is available along the alignment. However, the contractor may have to take lease of the land temporarily for installation of his facilities etc. The bidders are advised to make detailed study and cater for such expenditure in the bid.

ii. **Approaches to the project site:**

The land acquired for the project caters for construction and operation of the proposed line. The contractor shall plan for approach roads to various sites of work conducting detailed survey and should include the cost of inputs for any such approach roads in his bid for the work. However, in case any existing road outside railway land has to be utilized for transportation of materials to the site of work and in the process the road gets damaged or needs to be strengthened and the authority owning the said road submits demand to GM(Civil)/K RIDE to carry out some specific works in order to strengthen/repair the road, GM(Civil)/K RIDE shall get such works executed through the existing contractor or any other agency and make payment for such work.

Bidders should find out the capacity of the quarries and accordingly plan procurement of coarse/fine aggerates either from the existing quarries or establish their own quarries and crushing arrangements

2. It is the responsibility of the contactor to thoroughly examine the site of work and all constraints before submitting the bid(s).

3. The Nature of Work :

The works to be executed can broadly be grouped as under:

3.1 Civil

A. Other Activities:

1. Providing and maintaining office accommodation, equipment and vehicles for the use of the Employer and their Assistants and Staff during the contract and defect liability periods.
2. Setting out the line and level of alignment for the proposed doubling and establishing working bench marks and alignment references, taking the details from bench marks and alignment references established by the Employer/ other designated contractors.
3. For carrying out accurate survey work, survey control points shall be established along the railway line using high end survey equipment such as DGPS or Total Station connected with nearest GTS Bench Mark. Also reference pillars are to be established for relocation. This work is meant for maintaining & checking proper alignment of mid-section & bridges for which the contractor is solely responsible.

4. Every precaution has to be taken such that there shall be least disturbance to road traffic during transportation of construction materials to the site of work.
5. Making and supply of 'As Built' drawings for the new assets created.

4. Special stipulations/features:

4.1 to 4.5 deleted

4.6 Power & Traffic Block:

i) Track occupation may be granted at any time during day or night to suit convenience of traffic operations and will ordinarily be granted over a distance covered by one or two consecutive block sections. Work trains will normally be allowed to take advantage of block shadows. Normally the total durations of block on any section will be max. of 1.5 to 2.5 hours at a stretch in a day, once or more than once. Block provided may be utilized for one or more work trains or track lorries or ladder trolleys to suit convenience of work.

ii) Blocks will not ordinarily be given for laying the feeders except where crossing of track is involved, which will have to be laid manually in general.

iii) Any Traffic / Power blocks, temporary speed restrictions and caution orders required in connection with execution of works by the Contractor, shall be got sanctioned from the Railway Authorities well in advance, through the Engineer. The Railways may sanction the same for specific sites within the overall recovery time available in the Railway's Working Time-Table. The Contractor shall have to schedule his programme according to the convenience of the Railways. No claim from the contractor for any delay / inconvenience / loss on this account shall be entertained by the Employer / Engineer.

iv) The contractor shall undertake the work involving Railway track, Railway Electrification installations in co-ordination with the Engineer and Railways in accordance with the programme of work. Where traffic / power blocks are involved, the Contractor shall ensure that interruption to Railway operations, if any, is kept to the bare minimum level.

v) In order to minimize blocking of the track for work/Material Trains, the Contractor shall consider the working conditions on the Section and assess use of alternative method of construction on a part or whole of the work. He should submit clear proposal along with financial implication ,if any, to the Employer for such special method of saving of blocks that could be obtained along with reduction / redundancy of the facilities being provided by the Railway / K RIDE.

vi) The protection required for block working i.e. flagmen, flags etc. shall be provided by the contractor. Competency for the above shall, however, be given by the Railway authority. Protection of track by banner flags etc shall be done in accordance with General Rules of Indian Railway and Subsidiary Rules of the concerned zonal Railway where work is being carried out. Contractor shall provide Safety helmet, Safety belt and Safety Shoes to their staff while working at site.

vii) In case of theft/breakdown, the contractor shall restore the traffic in minimum possible time. Failure to do so shall attract suitable penalty.

4.7 Provisional Acceptance:

i) Immediately after completion of works/such part of works, the Contractor shall certify and advise the Engineer in writing that the works are (i) complete (ii) ready for satisfactory commercial service and (iii) ready to be handed over. He will also place at the disposal of the Engineer the required staff for checking it and putting it into operation.

ii) The test or tests as stipulated in approved Technical Specifications shall be carried out jointly by the Railway / Engineer and the Contractor within a month after the receipt of the Contractor's notification as stated in sub-Para above.

iii) The provisions contained in the sub clause 10 of GCC shall be followed for taking over of the installations.

4.8 Use of Rejected/Sub Standard Items/ Equipment:

In the event of such rejection as aforesaid, the Engineer shall, without prejudice to his other rights and remedies and in particular without prejudice to his rights under the clause just preceding, be entitled to the use of the rejected/substandard equipment/item for a time reasonably sufficient to enable him to obtain other replacement. During such period, if the rejected/substandard equipment/item is used commercially the Contractor shall not be entitled to the payment on energisation until such rejected equipment is rectified and/or replaced, but the Engineer shall not be entitled to claim any damages arising out of rejected/ substandard equipment/item in respect of such period.

4.9 deleted

4.10 Accountal and disposal of released materials:

i) The Contractor shall liaison with the Engineer to finalize the procedure for taking over of the whole or part of the section and for disposal of the released materials.

ii) All released materials shall be handed over to the authorized Railway Representative through the Engineer at the nearest P.Way Depot or places nominated by Railway/PMC/K RIDE.

iii) The material released on account of modifications/alterations shall be accounted by the contractor in the presence of the Engineer and the Railway Representative, except for the material permitted to be re-used by the Engineer. For this material, only erection cost shall be paid, under the appropriate item of the Schedule.

iv) If any shortfall of released material is noticed at the time of completion of the work, the contractor shall be liable to pay for the shortfall as per the prevailing rates or the same shall be recovered from the final bill of the contractor as per the extant policy of K RIDE.

4.11 CODES & SPECIFICATIONS

The works shall be carried out as per Standard Specifications of Indian Railways/South Western Railway/ K RIDE (as detailed by K RIDE), which can be obtained on payment. Wherever reference is made in the Contract to specific standards and codes to be met by the goods and materials to be furnished and work performed or tested the provisions of the latest current edition or revision of the relevant standards and codes in effect shall apply, unless otherwise expressly stated in the Contract. Where such standards and codes are national or relate to a particular country or region, other authoritative standards which ensure an equal or higher quality than the standards and codes specified will be accepted subject to the Engineer's prior review and written approval. Differences between the standards specified and the proposed alternative standards must be fully described in writing by the Contractor and submitted to the Engineer at least 28 days prior to the date when the Contractor desires the Engineer's approval. In the event the Engineer determines that such proposed deviations do not ensure equal or higher quality, the Contractor shall comply with the standards specified in the documents.

All goods and materials to be incorporated in the goods be new, unused, and of the most recent or current models, and that they incorporate all recent improvements in design and materials unless provided for otherwise in the contract.

a) The Standard Specifications of Indian Railways/South Western Railway/K RIDE and the list of codes and manuals given in the annexure thereof shall be prime governing.
b) Where there is conflict between provisions in IRS & IS specifications, provisions in IRS specifications shall prevail.
c) Where there is no provision of specifications in IRS, provisions in IS specifications should be adopted. Where there are no provisions in IRS and IS Specifications, provisions in IRC Specifications should be followed.
d) For items not covered in IRS/IS/IRC specifications, BS-5400 Part 1 to 10 may also be considered.
e) The decision of Engineer shall be final and binding in the interpretation of the clause of the codes of practice and specifications of this tender and no claim whatsoever shall be entertained on this account from the Contractor.

4.12 SURVEY AND FIXING WORKING BENCH MARKS AND ALIGNMENT MARKERS.

4.12.1 The work of conducting survey and fixing bench marks and alignment markers before the start of any work on this tender is included in the works covered by the present Tender.

4.13 Bench marks:

4.13.1 All along the length of the proposed double line benchmarks have been set up by the Employer at intervals of about a kilometre. The details of these bench marks along with their reduced levels have been marked on the design drawings indicating the plan and 'L' section which form a part of the tender. The contractor along with the Engineer should verify the details of these bench marks in the first instance, soon after taking possession of the site. If any mistakes are detected in these details of these bench marks the same should be indicated to the Engineer. The mistakes detected should be corrected in consultation with the Engineer. These corrections should be got approved by the Engineer before starting of any other work.

4.13.2 The contractor shall then in presence of the Engineer establish working bench marks at short intervals, adequately connecting them to the reference bench marks set up by the Employer in the Project length. The working bench mark levels should be got approved from the Engineer. An up to date record of all bench marks including approved corrections if any, shall be maintained by the contractor and also the Engineer.

4.13.3 All levels taken for making out the longitudinal section and cross section should be related only to these working bench marks.

4.13.4 While doing the above mentioned work, the fact that similar work will have to be done once again on the completed earth work in formation for fixing up the longitudinal levels of the installed P. Way should be kept in view.

4.14 Alignment:

4.14.1 All along the length of the proposed double line at a intervals of about half a kilometre, alignment reference pillars have been set up the Employer; in addition five reference pillars have been erected for each of the curves to indicate the start & end of the over

all length of the curve and its circular portion and apex, by the Employer. In the design drawings showing the plan and 'L' section, which forms part of the tender, the co-ordinates for these pillars have also been given. This has been done to facilitate setting of the alignment of the proposed line. The contractor along with the Engineer should verify the details of these alignment pillars, soon after taking possession of the site. If any mistakes are detected in these details, the same should be indicated to the Engineer before starting any other work. These detected mistakes should be corrected by the Contractor in consultation with the Engineer. These corrections should be got approved from the Engineer.

4.14.2 The contractor shall then, in presence of the Engineer, establish working alignment reference markers at shorter intervals, adequately connecting them to the reference pillars set up by the Employer in the Project length. The location of these subsidiary alignment markers should be got approved from the Engineer. An up to date record of all alignment pillars, and corrections, if any done, shall be maintained by the contractor and also the Engineer.

4.14.3 The alignment for the double line should be related only to these working bench marks.

4.14.4 While doing the above-mentioned work, the fact that similar work will have to be done once again on the completed earth work in formation for fixing up the alignment of the installed P. Way should be kept in view.

4.14.5 After the formation has been constructed, the centre line of track both in Block Sections and Yards should be re-fixed taking guidance from already set up alignment references. Similarly, the rail levels of track both in the block sections and the yards should also be fixed with reference markers. These will be used for installation of track.

4.15 Responsibility for establishing and maintaining working bench marks and alignment markers

4.15.1 The Engineer when necessary will provide the contractor with the data necessary for setting out of the centreline. All dimensions and levels shown on the drawing or mentioned in the documents forming part of or issued under the contract shall be verified by the contractor on the site; he shall immediately inform the Engineer of any apparent errors or discrepancies noticed in such dimensions or levels. In consultation with the Engineer, the noticed mistakes should be corrected. These corrections should have the approval of the Engineer.

4.15.2 The contractor will be entirely responsible for accurate setting out of the works and safeguarding all survey monuments, bench marks, alignment references etc. The work of setting out shall be deemed to be a part of the general works preparatory to the execution of work and no separate payment shall be made for the same

4.15.3 The above-mentioned points have been repeated in the respective sections dealing with specifications for different works for laying emphasis on these items.

4.15.4 The contractor will be entirely responsible for accurate setting out of the works and safeguarding all survey monuments, bench marks, alignment references etc. The work of setting out shall be deemed to be a part of the general works preparatory to the execution of work and no separate payment shall be made for the same.

4.16 Issue of materials by Employer:

4.16.1 The issue of materials by the Employer to Contractor shall be governed by the following change.

4.16.2 The rails and other materials to be issued by the Employer to Contractor will be handed over at any convenient locations within Railway Land in the contract section. The contractor should collect the same from these locations and transport them to the work site as found necessary. He shall use only mechanical means for handling of rails during all stages of work to avoid any damages to the rails. Leading will be paid separately as per relevant item of BOQ.

4.17 Interfacing And Integrations of Works:

4.17.1 As a part of provision of this tendered work providing of road bed viz., earthwork & bridges, are to be executed by one Agency only. The interfacing for the purpose of integration of works between the partners of JV, in case the work is awarded to a JV or between the Contractor and his sub-contractors, (if permitted) will arise. This has to be kept in view.

4.17.2 Land is available throughout the section for carrying out the works. However, if additional land is required in yards/mid-section, necessary arrangements will be made for acquiring the land without affecting the progress of work.

4.17.3 This provisions shall not apply

4.17.4 The contractor shall take full responsibility in terms of organizing, managing, coordinating and administrating the interfacing of all components of works including all issues related to and arising out of such tasks and responsibility. The contractor shall interface with all concerned authorities and other contractors as required to complete the work satisfactorily within the stipulated period.

4.17.5 Under consideration and application of the above clause, the contractor shall and has also the obligation to liaise with the other contractors and Authorities to obtain all necessary technical information, all necessary information concerning organization of works, coordinating the works etc. which are necessary to assess, mitigate, take care of contractual obligations, risks, liabilities and whatsoever arising out of interfacing, engineering issues, organization of the works etc. The employer/engineer shall not be held liable in any way, throughout the preparation of the offer and/or execution of the works and/or maintenance period and/or defects liability period for any omissions, misunderstanding, negligence etc. arising out of interfacing, coordinating, organizing etc. of the works. The employer will not entertain any claim arising out of misunderstanding, miscommunication, omission, withholding of necessary/required information or whatsoever between the concerned contractors/Authorities concerning interfacing, organizing etc. of works. In case of any claim arising from any of the contractors, as aforesaid, referring to interfacing and/or interfacing related issues, the Employer will hold the concerned contractors liable for not taking care of their contractual obligation concerning interfacing, organizing, co-ordination etc. of the related works.

4.17.6 This provision shall not apply.

4.17.7 Needless to say that commissioning of this double line project requires close coordination among various agencies executing the works in this section, Engineer, Employer and the Railway authorities. The contractor shall therefore plan all his works requiring interfacing, like works in mid-section, station yards, with other agencies, meticulously, in consultation and coordination with all concerned parties, in advance, for expeditious execution, without causing any delay either to his works or those of others.

4.17.8 The contractor shall strictly adhere to the work plan made for works requiring interfacing. Any delay either on his part or on the part of other agencies and other bottlenecks that could affect the pace of works shall be informed to the Engineer in time so as to enable him to take corrective steps.

4.17.9 If, in the opinion of Engineer, any delay in execution of any part of the Project requiring interfacing is attributable to the failures of the contractor to take adequate steps for smooth execution of such works, then the Engineer shall have the right to take necessary steps to organize and streamline such works, including excluding the requisite portion of work from the scope of the Contractor and getting the same executed by other agencies, at the risk and cost of the contractor.

4.18 **Damage to property** : The contractor shall organize all his activities so as not to cause any damage to the property of Railway or that of other agencies or any third party. In spite of taking all precautions, in the unfortunate event of any damage to the property, then the contractor shall not only indemnify the Employer of the claims made by the affected parties but also settle the matters with the affected parties as per law. If the nature of damage is one of that affecting the train movements or causing a safety hazard to the public, then the situation will be treated as an emergency and the Engineer reserves the right to take all necessary steps as deemed necessary to restore train operations or to remove the hazardous situation or to mitigate the damage, at the risk and cost of the contractor.

4.19 **Survey Equipment :** The contractor should provide the survey equipment and other accessories as per the instructions of Engineer as and when required. He should also provide all necessary help as required by the Engineer for checking the works, whenever required.

4.20 **Power Line Crossing :** This provision shall not apply

4.21 All power requirements for execution of works shall be arranged by the Contractor from his own resources. Subject to availability of power, the Employer/Engineer will recommend to the Railway Authorities for providing power connection. The Contractor shall bear the cost of installation and payment of necessary charges for providing such power connections as per the Terms and Conditions of the Railway.

TECHNICAL SPECIFICATIONS FOR MANUFACTURING, SUPPLY & STACKING OF MACHINE-CRUSHED TRACK BALLAST CONFORMING TO RDSO SPECIFICATION (IRS-GE-1):

1. **General:**

1.1. The stone ballast (Granite or equivalent acceptable variety) to be supplied by the contractor shall be Machine Crushed, unless otherwise specified in the schedule of items in this contract, and shall strictly conform to the specifications furnished in tender document. Responsibility of ensuring supply conforming to the specifications lies totally with the contractor. Any representation from the contractor for waival or otherwise in this regard will not be entertained except as provided in the tender conditions.

1.2. Tenderer/Contractor is advised to visit the area thoroughly and get himself acquainted with the topography, roads, availability of transport, raw material, climatic conditions etc. All factors affecting in the market rates of labour, materials, laws, rules and regulations of State/Central Governments in respect of mines, minerals, forest and other departments, Specification and special conditions of the contract, and General Conditions Contract and other possibilities / aspects should be considered before quoting the rates and no claim due to any reasons whatsoever will be entertained afterwards. He is also advised to note and confirm himself the availability of stone ballast confirming to railway specification for supply under this tender.

2. **TECHNICAL SPECIFICATIONS :**

2.1 The execution of all works shall conform to the specifications and codes of practice/ manuals mentioned below as amended from time to time .

A. Specifications of Machine Crushed stone ballast at para 2.3 below.
B. Provisions /Instructions & Supplementary instructions of Railways to Indian Railway's Permanent Way manual.
C. General and Subsidiary Rules of Railway.
D. Standard Schedule of Dimensions.
E. Circulars and Engineering Standing orders issued in respect of stone ballast.

2. 2 KRIDE reserves the right to reject or alter any part of the work executed by the contractor which in the judgment of the KRIDE does not comply with the requirements of the above specifications. The decision of the KRIDE shall be final and conclusive for all purpose and binding on the contractor.

2.3 Specifications for Machine Crushed stone ballast for railway track are as under:- (Reference: RDSO's specification for track ballast issued vide report no. IRS-GE- I (2004) with all the correction slips/amendments up to date).

2.3.0 SCOPE : These specifications will be applicable for stone ballast to be used for all types of sleepers on normal track, turnouts, tunnels and deck slabs etc., on all routes. These specifications include guidelines for measurement, quality check and reference to other specifications as required. The details given below are not exhaustive and original RDSO specification vide Report No. IRS-GE-1 with all corrigendum/amendment/ corrections till date of opening of the tender shall apply along with the modifications herein.

2.3.1 DETAILED SPECIFICATIONS:

2.3.1.1 **Basic Quality:** Ballast should be hard durable of and as far as possible angular along edges/corners, free from weathered portions of parent rock, organic impurities and inorganic residues.

2.3.1.2 **Particle Shape :** Ballast should be cubical in shape as far as possible. Individual pieces should not be flaky and should have generally flat faces with not more than two rounded / sub-rounded faces.

2.3.1.3 **Mode of Manufacture :** Ballast shall be machine crushed.

2.3.2 **Physical Properties:**

2.3.2.1 Ballast should satisfy the following physical properties

Aggregate Abrasion value	*30% Max Value	IS:2386 Pt.IV-1963
Aggregate Impact value	*20% Max Value.	IS:2386 Pt.IV-1963
Water absorption	should not be more than 1%.	IS 2386 Pt III – 1963

2.3.3 **Size and Gradation :**

2.3.3.1 Ballast should satisfy the following size and gradation:

(a)	Retained on 65mm sq mesh sieve	5% Maximum
(b)	Retained on 40mm sq mesh sieve	40% to 60%
(c)	Retained on 20mm sq mesh sieve	Not less than 98%

2.3.3.2 Oversize Ballast:

(i) Retention on 65mm square mesh sieve:

i.	A maximum of 5% ballast retained 65mm sieve in any stack shall be allowed without deduction in payment.
ii.	In case ballast retained on 65mm sieve in any isolated stack exceeds 5% but does not exceed 10%, payment at 5% reduction in contracted rate shall be made for the full stack.
iii.	Stacks having more than 10% retention of ballast on 65mm sieve shall be rejected.

(ii) In case ballast retained on 40mm square mesh sieve exceeds 60% limit, payment at the following reduced rates shall be apply for the full stack in addition to the reduction worked out at(i) above.

i.	5% reduction in contracted rates if retention on 40mm sq. mesh sieve is between 60% (excluding) and 65% (including).
ii.	10% reduction in contracted rates if retention on 40mm sq. mesh sieve is between 65% (excluding) and 70% (including).
iii.	In case retention on 40mm square mesh sieve exceeds 70% the stack shall be rejected.

2.3.3.3 Under Size Ballast: Ballast shall be treated as undersize and shall be rejected if :-

(i)	Retention on 40mm Sq. Mesh sieve is less than 40%.
(ii)	Retention on 20mm square mesh sieve is less than 98%

2.3.4 Sieve Analysis of Ballast

2.3.4.1 The test sieves used for sieve analysis shall conform to the specifications given in Annexure-IV.

Specifications of Test Sieves used for Sieve Analysis of Ballast

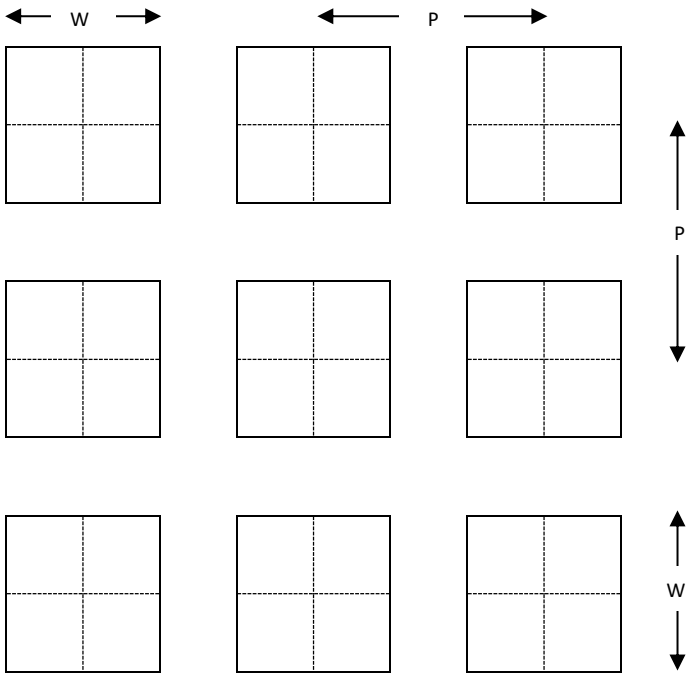
1. The test sieves shall be perforated plate sieve type with holes/apertures, mounted on a frame. The test sieves are designated by the nominal size of holes/apertures.

2. **Material of Perforated Plate:** The perforated plate for test sieves shall be manufactured from Brass Sheet or Steel Sheet or Stainless Steel Sheet or Galvanized Steel Sheet or Electroplated Steel Sheet.

3. **Plate Thickness**: The thickness of plate used for making test sieve and the tolerance permitted for this shall be as following:

   For 65mm Square Mesh Sieve – 3mm (Plus 1.0mm Minus 0.5mm)
   For 40mm Square Mesh Sieve – 2mm (Plus Minus 0.5mm)
   For 20mm Square Mesh Sieve – 2mm (Plus Minus 0.5mm)

4. Arrangement of Holes/Apertures: The square holes/apertures of size "W" in the perforated plate shall be arranged at Pitch "P" as per the sketch given below:



5. **Sieve Opening Size, Pitch of Openings and tolerances:** The nominal size of individual hole/aperture at mid-section (W), the Pitch of holes/apertures (P) and permissible tolerance for them shall be as under:

Test Sieve of Square Mesh Size	W		P	
	Nominal Size	Tolerance	Distance	Tolerance
65mm	65mm	(+/-)1.5 mm	80mm	(+)12.0mm (-) 8.0mm
40mm	40mm	(+/-)1.5mm	50mm	(+) 7.5mm (-) 5.0mm
20mm	20mm	(+/-)1.0mm	25mm	(+)4.0mm (-) 2.5mm

6. **Sieve Frame:** The frame of test sieves shall be manufactured from Hardwood or Steel Sheet or Brass sheet. The internal size of the frame (i.e. clear size of perforated plate mounted on frame) shall not be less than 100cm in length, 70cm in breadth and 10cm in height on sides.

7. **Marking on test sieves:** A label shall be fixed to the frame of each sieve, legibly marked with following information:
   i. Nominal Aperture Size,
   ii. Material of perforated plate,
   iii. Material of sieve frame,
   iv. Maker's Name or Trademark, and
   v. An Identification Number for the sieve.

2.3.4.2 While carrying out sieve analysis, the screen shall not be kept inclined, but held horizontally and shaken vigorously. The pieces of ballast retained on the screen can be turned with hand to see if they pass through but should not be pushed through the sieve.

2.3.4.3 The percentage passing through or retained on the sieve shall be determined by weight. The weighing equipment used shall not have least count more than 100 grams.

3.0 SUBMISSION OF TEST REPORT:

3.1 "The Tenderer is required to submit test report of ballast for impact value, abrasion value, water absorption value from approved laboratories mentioned in the tender documents as per provisions of "Specification of Track Ballast, IRS-GE-1, June 2004 – issued by RDSO/Lucknow (as amended upto date) failing which the offer is liable to be rejected.

3.1.1 The above Clause No.3.1 of submission of test report of Ballast is not applicable for tenders of mixed works and EPC tenders.

3.2 The Tenderer shall also furnish an undertaking that the ballast supply at all times will conform to the laid down Specifications for track ballast as specified by Railway.

4.0 QUARRY PERMITS & OTHER LEGAL MATTERS:

4.1 Contractor will at his own expense obtain requisite permits/licenses/ parwana for quarrying or for any other purpose as may be necessary to enable him to perform his part of the contract. Railway will not under any circumstances be liable to obtain any permit /licenses/ parwana whatsoever.

4.2 Contractor shall be responsible to follow the provisions of Mining Act and other relevant acts and the Railway will not be responsible for infringement of any of their provisions.

4.3 The contractor will ensure free access to quarry premises where stone is being quarried and crushed, to the Engineer–in-charge or his representative at all times.

5.0 CRUSHING & BREAKING:

5.1 Crushing and breaking of ballast shall be carried out by MECHANICAL CRUSHERS ONLY to be installed and operated by the contractor outside Railway land at his own cost. Railway is not responsible for arranging any licence, permission etc. for quarry or transporting and the contractor is fully responsible for arranging the same in time.

6.0 SERVICE ROADS & VEHICULAR MOVEMENT:

6.1 Necessary service roads for collection of ballast shall be made by the contractor at his cost. Any service roads available within railway land can be used free of cost. Width of Railway land may not be uniform and at some locations, it is interrupted by small streams/road ditches etc., Agency shall make suitable arrangements for plying across such obstructions . The rates quoted shall include costs for such arrangements and the contractor will not be entitled for any additional payment on this account.

6.2 In certain situations vehicles for supply of ballast need to be plied through private land also and if so the contractor shall have to make arrangements at his cost . The contractor may have to handle/re-handle the ballast before it reaches the final location of stacking . No additional payment whatsoever shall be admissible on this account.

6.3 In no case and under no circumstances, crossing of track by vehicles shall be allowed at unauthorized locations and contractor is solely responsible for all the consequences if he indulges into such unauthorized acts.

6.4 For movement of vehicles along the side of track or across, Contractor shall arrange necessary protection including watchman, protective measures and infringement to running trains shall entail heavy penalty on the contractor at the discretion of the Railway.

6.5 To ensure safety of Train operations on adjacent tracks, the earthwork contractors are required to provide barricading as per Drawing No. SWR/CN/BNC/SK/165-2018 shall be erected and maintained for the stretch of the work as directed by Engineer-in-Charge during the entire period of execution till completion/extended period of completion of earth work contract.

6.6 During execution of earthwork the contractors are required to ensure that the barricading is not disturbed/damaged due to any reasons whatsoever; and in case of any damages the same shall be repaired/replaced immediately and made good.

6.7 At the completion of earth work contracts, vertical posts of the barricading shall be retained at site in good condition and the nylon rope may be taken back by the earth work contractors.

6.8 Barricading concrete posts available at site along the track are to be used as protective fencing /barricading while carrying out track linking/ ballasting works

duly providing nylon rope, repainting the posts and replacing/repairing the damaged post, if any.This barricading shall be maintained in good condition throughout the contract period. No extra payment shall be paid for this.

6.9 If barricading is required to be provided in any stretch where no barricading posts were provided earlier for doing the earthwork, payment for providing barricading in such stretches only shall be made as per relevant item (new item if required).

6.10 After completion of the work, barricading shall be removed from site and disposed off suitably by the contractor at his own cost.

7.0 HECTOMETER/DEPOT WISE QUANTITY OF COLLECTION:

7.1 The quantity of ballast to be collected in each HM post /Depot /Sub Depot should be obtained from the Engineer-in-charge before starting the collection.

7.2 In case of cess supply, the collection and stacking of ballast should be completed in all respects in a HM length before measurements are taken, i.e. measurements in a particular HM length shall invariably be taken only once during currency of the contract.

7.3 Ballast shall be collected and stacked by the contractor accordingly, in specified quantities on the formation i.e bank / cutting or at the places i.e CESS/Depot/ yards as directed by the Engineer-in-charge in convenient stacks.

7.4 The contractor shall prepare a programme for collection in accordance with the above directions/stipulations and submit to railways for scrutiny and approval prior to collection.

8.0 SITE PREPARATION:

8.1 Stacking shall be done as far as possible on a neat, plain LEVEL and firm ground with good drainage alongside/near the Railway alignment in Railway land only. Sites/Plots for stacks (comprising cess / depot / semi-depots) shall be located as directed by Engineer- In-charge & shall be selected with a view to convenient dumping into track /loading into rail lorry/ballast train. **All the ballast shall be stacked only on the area identified as above with the written permission for stacking by Engineer -In - Charge on the Ballast Passing register.**

8.2 Stacks on sites not so approved will be rejected and the contractor shall restack the ballast at the specified sites as ordered.

8.3 Contractor will be required to develop the site for stacking the ballast with his own labour at locations as specified by the Engineer in charge or his supervisors by making approach roads, leveling, dressing of uneven and undulating ground and drainage arrangement ,clean the plots off the rubble/weeds, grass, organic matter, bushes, etc., at his own cost. and the rates quoted shall include costs for such arrangements. The contractor will not be entitled for any claim for earthwork or any other temporary work done by him in connection with development of site. No payment whatsoever shall be admissible on this account.

8.4 After expiry of contract, the contractor shall vacate the area and handover the land free of encroachments.

8.5 Ballast passing and ground balance registers will be maintained by the Engineer's representative which will be required to be jointly signed by the Railways representative and the contractor or his/their authorized representative

8.6 Site shall be developed in such a way that the ballast does not get intermixed with ballast collected by other agencies or already collected by other agencies .

8.7 Sketch of DEPOT : Depot ballast shall be collected in the specified yard or Kilometer as indicated in the schedule only. Before starting collection a sketch of depot shall be got approved from General Manager in-charge of the project.

8.7.1 For each Depot, a depot sketch shall be drawn clearly showing the sub-depots and plots with specific identification number for each of the plots, incorporating the necessary details , with proper drawing number and approval of General Manager - in-charge of the depot should be obtained.

8.7.2 In case of Depot with more than one contract , sub depots sketch shall be drawn in addition to over all Depot sketch. Each sub depot should be distinct and a physical barrier should be erected in between.

8.7.3 Each Depot/Sub Depot should be further divided into plots for stacking ballast such that there is only one stack in a plot.

8.8 Sketch of Cess/semi depots : In case of cess/semi depots along side for supply at LCs and other areas, cess supply sketch similar to depot sketch shall be drawn and got approved from Addl. General Manager in charge of project.

8.9 The contractor shall submit the sketch of depot/cess supply indicating the plots/stacks as per the directions issued by KRIDE as stipulated above. He shall take into account the requirements of the work and feasibility while marking the plots. However, KRIDE will decide the requirements and suitability of the proposal made by the Contractor for approval or make changes as required. The sketch for depot/cess shall clearly show the ballast of other agencies/railways (Open line) in order to avoid remeasurement of the same as supply in this contract. If any such remeasurement is made and comes to the notice of the KRIDE/Railway Administration subsequently, the contractor is fully responsible for any penal action by KRIDE.

8.10 After site preparation and leveling the ground and before commencement of ballast collection, the contractor shall arrange for inspection of site by the Engineer – In – Charge of work (test checked by DM/AGM KRIDE) and certification of levelness of ground. However, in spite of issue of such certificate, the responsibility lies on contractor to ensure levelness of ground before actual collection. In case of stacking area found not in one level/plane (before or after the stack is cleared) a minimum penalty of Rs.1000 per/each stack at the discretion of the engineer-in-charge will be imposed in addition to recovery of ballast lost due to such irregular grounds where stacks are made. No claim or representation from the contractor will be entertained and the decision of the railways is final and binding on the contractor.

9.0 NORMS FOR STACKING & SIZE OF STACK:

(Reference: Railway Board's Guide lines vide No. 2006/CE-II/MB/2 dated 25.5.2007 and RDSO's Guidelines IRS-GE-1)

9.1 The stacks shall be of uniform cross section conforming to the standard template dimensions.

9.2 Each stack shall be so formed that ratio of longer to smaller side does not exceed 2.5 except for areas where there is constraint of land width in which case the ratio upto 3.5 may be permitted.
9.3 The height of stack shall not be less than 1.0m except for hilly areas where it may be 0.5m
9.4 The height of ballast stack should not be more than 2.0m
9.5 The side slopes of stack should not be flatter than 1.5:1 (Horizontal: Vertical) normally.
9.6 The cubical content of each stack shall not be less than 30 cum in plain areas and 15 cum in hilly areas.
9.7 Top width of stack shall not be less than 1 metre.
9.8 Top of stack shall be kept parallel to the ground plane.
9.9 Stacks made shall not interfere with movement of Road or Railway traffic.

10.0 REGULATION OF COLLECTION:
(Reference: Railway Board's Guide lines and RDSO's Guidelines)

10.1 **DEPOT:**

10.1.1 For Ballast collection in depot & it's running out, instruction as given in Para 266 of IRPWM and guidelines issued by the Railway shall be adhered to.

10.1.2. Collection and Training out of the ballast in the same depot shall not progress simultaneously. In case depot is divided in to sub-depots, simultaneous supply and loading of ballast should only be permitted from separate sub-depots only under written approval by General Manager/KRIDE with a proper regulating system in place.

10.1.3 In case the area for stacking is not sufficient to stack all the ballast as per the agreemental quantities in one go in a depot, and if the ballast needs to be collected repeatedly in the available stacking ground in a depot to complete the agreemental quantity, after stacking the ballast once fully in the available stacking area by the contractor, measurement shall be taken. Ballast shall be trained out fully from all plots. Making of fresh stack will be permitted in this depot only after the earlier stacks are completely trained out and conditions for subsequent collection are fulfilled.

10.1.4 After the ballast is fully trained out and before authorizing the contractor to commence the second or further round of supply in the same depot, the Engineer – In – Charges shall inspect the site, make sure that all the stacks are fully trained out and record a clear certificate in the ballast passing /ground balance register. The contractor shall obtain written permission from General Manager to commence the next round of collection and stacking in a depot. Even in case a depot is subdivided as sub-Depots to cater separate contracts, the simultaneous supply and loading of ballast from separate sub-depots shall not be practiced. In exceptional and unavoidable circumstances, General Manager may authorize such simultaneous supply/loading with reasons recorded in writing and ensuring that a proper regulatory system is in place.

10.2 Cess Supply: -

10.2.1 For Ballast collection along cess & its running out, instruction as given in Para 267 of IRPWM and guide lines issued by the Railway shall be adhered to.

10.2.2 Written permission for stacking after site preparation shall be certified by Deputy Manager on the ballast passing register. Supply, as far as possible, shall be completed in one km continuous stretch at a time, without leaving any gaps in any HM and offered for measurement for ease of measurement and effective monitoring.

10.2.3 Subsequent collection at the same location is not permitted. For this purpose, proper planning should be made by the contractor and quantities should be collected with the due approval of the Addl. General Manger/KRIDE.

10.3 Other instructions as given elsewhere, in case dumping is in progress, ballast collection shall be regulated so that simultaneous collection and dumping does not take place.

11.0 SUPPLY SCHEDULE/MILE STONE PROGRAMME /PROGRESS:

11.1 Ballast shall be supplied as per the accepted programme and a steady supply of ballast to the requirement as per tender schedule shall be maintained and ballast must be collected in the sequence as prescribed by the Engineer-in-charge.

11.2 Contractor shall prepare a programme chart giving the activity wise details within seven days from the date of issue of acceptance letter. Programme shall be made carefully so that work can be progressed as planned. The progress shall be reviewed w.r.t this programme chart once in fortnight. The contractor shall update the progress fortnightly and continue to resubmit revised bar charts so that completion of each activity matches with stage targets agreed initially deploying additional resources as required.

11.3 Ballast supply shall be programmed and under taken in continuous stretches as MILESTONE TARGETS with an aim to progress uninterrupted supply with out leaving any gaps at bridges/LCs/other special locations . Contractor shall maintain the week/date wise planning in consonance with the above agreed MILESTONE stage targets.

11.4 Weekly/Daily progress of the work shall be reported to KRIDE and any suitable corrective measures as directed by the Engineer-in-charge or his representative should be immediately carried out wherever necessary at no extra cost.

11.5 During the course of supply of ballast by the contractor, the KRIDE Administration reserves the right to direct the contractor to stop supply or dumping of ballast for regulating the progress of work in the interest of the work.

11.6 The contractor is required to restack the disturbed ballast stacks at his own cost to facilitate recording of measurements for drawl of final bill in case of closing down of contract. In the event of failure of the contractor to comply with the above, restacking will be done by the Railway on its own or through any other agency and the actual cost involved with necessary supervision charges etc. will be recovered from contractor's bills, security deposit etc. or from any money payable under this or other contract with the Railways/Central Government.

11.7 KRIDE will monitor the supply and will impose penalties / fines as deemed if the progress is not commensurate with the programme as envisaged elsewhere in tender document.

12.0 SAMPLING AND TESTING:

(Reference: RDSO Guidelines RS/F/714/Vol.IV dated 6.6.2016)

12.1. **General**

12.1.1 The samples shall be drawn with due diligence and adequate precaution so that they represent the true nature and condition of the ballast.

12.1.2 Being a heterogeneous material, the gradation of ballast loaded in wagons and/or dumped/inserted in the track may not remain same as that initially checked in stacks, due to lifting, loading, transportation, unloading etc. Similarly, in case of direct loading into wagons, the gradation of ballast at destination may not remain same as that at source, due to loading, transportation etc. Therefore, the samples from wagons and track are not representative samples as far as gradation is concerned. Even in the same stack, results of two checks may not be same.

12.1.3. The samples from a stack taken after lapse of a long period of stacking are not true representative samples of the ballast initially supplied in the stack, due to settling down of smaller size particles in voids underneath, dirt/dust getting accumulated in the stack, rains etc.

12.2 Sampling Frequency

In order to ensure supply of uniform quality of ballast, the following norms shall be followed in respect of sampling, testing and acceptance.

12.2.1 On supply of the first 100 cum, the tests for Size & Gradation, Abrasion Value, Impact Value and Water Absorption (if prescribed) shall be carried out by Railway. Further supply shall be accepted only after this ballast satisfies the specifications for these tests. Railway reserves the right to terminate the contract as per GCC at this stage itself in case the ballast supply fails to conform with any of these specifications.

12.2.2 Subsequent test shall be carried out as follows:

Type of Tests	Supply in Stacks	**Supply in Wagons**
(a) Size and Gradation Tests	One for each 100 cum or part thereof in any stack	One for each 100cum or part thereof for quantity to be loaded in wagons
(b) Abrasion Value, Impact Value and Water Absorption Value (*)	One Test for every 2000 cum	

(*) These tests shall be done for the purpose of monitoring quality during supply. In case of the test results not being as per the prescribed specifications at any stage, further supplies shall be suspended till suitable corrective action is taken and supplies ensured as per specifications. The above tests can be carried out more frequently, at the discretion of Railway.

12.2.3. All tests for Abrasion Value, Impact Value and Water Absorption should be got done through approved laboratories or Railway's own laboratories (list of laboratories shall be mentioned in the tender document). These tests, subsequent to award of contract, shall be done at Railway's cost.

12.3. Supply of ballast in Stacks

12.3.1 Sampling Procedure

(i) At the time of formation of stacks, sufficient care should be taken to ensure that there is sufficient space around the stack to facilitate movement of JCB/Power

Equipment's. The length and width of each stack shall be kept in such a way that every part of the stack is accessible to the JCB/Power Equipment, to be deployed for drawing "Samples".

(ii) In case of ballast supply in stacks, three "Samples" each of 0.3 – 0.5 cum volume, one sample each from two sides and one from top after removing outer layer (150-200mm) should be collected from stack for every 100 cum or part thereof, by JCB or other suitable Power Equipment.

(iii) The location (in plan) and depths of sampling points shall be varied for different "Samples" and different stacks in a lot.

(iv) "Gross Sample should be prepared by thoroughly mixing the three "Samples" collected as in (ii) above, using JCB or other suitable Power Equipment, on a clean, flat and hard surface.

Note: In exceptional cases of site-specific constraints, approval of Competent Authority (Engineer-in-charge) shall be taken prior to invitation of tender for using manual means of for collection and mixing of "Samples", and this should be incorporated in the Tender Document.

(v) A "Test Sample" of volume 0.027 cum shall be drawn from each of the "Gross Sample", by the method described in Para 12.3.1 (iv), for carrying out Size & Gradation tests.

(vi) Method for drawing "Test Sample": The ballast in "Gross sample "shall be scooped into a cone shaped pile by taking care to drop each scoopful exactly over the same spot. After the cone is formed, it shall be flattened by pressing the top of cone with a smooth surface. Then it is cut into quarters by two lines which intersect at right angles at the centre of the cone. The bulk of sample is reduced by rejecting any two diagonally opposite quarters. The remaining ballast shall be mixed and "test sample" shall be drawn for testing. After drawing "test sample", the left over ballast of "gross Sample "shall be dumped back in the stack.

(vii) In case clean, flat and hard surface is not available then a tarpaulin or any other suitable sheet may be used on a flat surface for mixing, drawing and sieve analysis of samples.

12.3.2 In case of stacks of volume more than 100 cum, more than one "Test Samples" will be tested foe Size & Gradation. In such cases, the sieve analysis results of all the "Test Samples" shall individually conform to following gradiation, for acceptance/rejection of the whole stack:

(i) Retention on 20mm Sq. Mesh Sieve shall not be less than 98% for machine crushed ballast (not less than 95% for hand broken ballast).
(ii) Retention on 40mm Sq. Mesh Sieve shall be between 40% to 70%.
(iii) Retention on 65mm Sq. Mesh Sieve shall be more than 10%.

The full payment/reduced payment for the whole stack, as given in Para ---shall be decided based on of the sieve analysis results of all the "Test Samples" for a stack.

12.4 **Supply of ballast in Heaps for loading directly in Wagons**

12.4.1 **Sampling Procedure**

Samples of ballast shall be collected from heaps of ballast proposed to be loaded into wagons. For this, the contractor shall inform ADEN in-charge in writing sufficiently in advance before placement of rake, about the locations of ballast heaps from where it is to be loaded into wagons. ADEN in-charge shall decide the location of heaps from which sampling is to be done, judiciously covering the entire quantity of ballast to be loaded in rake.

12.4.2 Based on the approx. quantity of ballast to be loaded in the rake, methodology for sampling of ballast to be followed shall be the same as in Para 12.3.1 and 12.3.2 above.

12.4.3 **The test viz. determination of Abrasion value, Impact Value and Water Absorption should be got done through approved laboratories or Railway's own laboratories (List of approved laboratories are mentioned below):**

1	Railway Laboratories of Construction Organization	Bangalore Cantt
2	Indian Institute of Science, Department of Civil Engg.	Bangalore
3	University Visvesvaraya College of Engineering, Dept. of Civil Engineering, Bangalore University, Jnanabharati.	Bangalore
4	National Institute of Engineering	Mysore
5	Government Engineering College	Hassan
6	Malnad College of Engineering	Hassan
7	University B.D,T college of Engineering	Davangere
8	Government engineering college	Bellary
9	Government engineering college	Haveri
10	B.V.B. College of Engineering & Technology, Vidyanagar	Hubli
11	Government engineering college	Mandya
12	Government engineering college	Ramanagara
13	Government engineering college	Raichur
14	National institute of Technology	Suratkal
15	Jawaharlal Nehru National College of engineering	Shimoga
16	Sidda Ganga Institute of Technology	Tumkur
17	Kalpatharu College of Engineering	Tiptur
18	Dr. T. Thimmaiah Institute of Technology	Kolar
19	B. M. S. College of Engineering	Bangalore
20	R. V. College of Engineering	Bangalore
21	Bureau Veritas (India) Pvt. Ltd	Bangalore
22	Any other NABL accredited laboratories/institution approved by Engineer – In – Charge.	

12.4.4 All costs for sampling/testing through the approved laboratories initially and subsequent to award of contract during the course of supply /at the time of measurement / at the time of billing to ascertain that ballast supply conforms to standards shall be done at Contractor own cost. Contractor reserves the right of getting ballast tested from any of the laboratory from the approved list at their own cost. No extra payment will be made by K-RIDE.

13.0 MEASUREMENT OF BALLAST:

13.1 The contractor shall take representative samples from the stacks in the presence of Engineer- In – Charge seal the samples and arrange TEST reports before commencement of measurement representing that the ballast supplied conforms to prescribed specifications.

13.2 On the day of measurement of fresh stacks, the approved Depot/Sub-depot/Cess Supply sketch shall be augmented and submitted by the contractor for undertaking recording of measurements with the following:

(i) Stacks measured on date and yet to be paid for
(ii) Stacks measured earlier but not yet disturbed
(iii) Stacks measured earlier and already disturbed and
(iv) Stacks where the supply is in progress.

13.3 The diagram shall reflect all the stacks available on the section clearly by different color/ hatching at any time.

13.4 Besides signatures by Engineer – In – Charge , the sketch should be got signed by authorized representative of the contractor and DM, duly certifying that position of stacks on the date of measurement has been correctly incorporated. Availability of the aforesaid augmented sketch shall be a pre-requisite for processing of the bill for payment.

13.5 Measurement of ballast shall be done when the contractor has brought in sufficient quantity and stacked properly (say 10% of Agreement Quantity or more). No measurement of part stack shall be permitted.

13.6 All initial measurements for ballast shall be made and recorded by the in-charge in the Ballast Passing Register. The stacks so recorded shall be checked, remeasured and verified to 100% extent for measurements, quantity and quality by Addl General Manager in the presence of Contractor and he shall make suitable entries in the Ballast Passing Register before recording in the Measurement Books. All recordings/test checks shall normally be made in the presence of contractor. The records made by the Engineer – In – Charge and verified by Addl General Manager shall be binding on the Contractor. In case of any irregularity of dimension of stack/quality, minimum dimensions/parameters shall be taken into consideration for the purpose of payment. In case the Contractor is not accepting such measurements/quality, the Contractor shall replace/restack to proper standards to take measurement afresh.

13.7 If he fails to witness the measurements on the appointed date and time, the supply will be measured in his absence which shall be binding upon the contractor, whether or not he has signed the measurement book, provided always that any objection made by him to any measurement shall be checked/investigated and considered in the manner set out in the General Conditions of Contract.

13.8.1 **Test check :** Ballast so measured and details entered in Ballast Passing Register and MB, and accepted by Contractor will be test checked by Addl General Manager or higher officials as required in the order of 10% or more

of the recorded quantity in each bill, both in respect of measurements and quality before arranging payments and the same shall be binding on the Contractor.

13.8.2 Ballast may be counterchecked by any other agency either simultaneously or subsequently and results of the same will have binding on the Contractor under the conditions of General Conditions of Contract.

13.9 The volume of stacks based on measurements of ballast will be arrived as under:

$$V=\{(L1 + L3 + L2 + L4)/4\}X\{(B1 + B3 + B2 + B4)/4\}X\{(H1 + H3 + H2 + H4)/4\}$$

(i) L1, L3, L2, L4 are length of bottom and top on both sides respectively.
(ii) B1, B3, B2, B4 are the breadth of bottom and top on both sides respectively.
(iii) H1, H3, H2, H4 are the height taken from four different location s chosen at random.

However, if necessary, additional measurements may be taken if the stacks are irregular.

14.0 NUMBERING AND MARKING:

14.1 Soon after the stacks are measured and posted in Ballast Passing register, the stack no. shall be painted on a large sized stone/board as directed by the Engineer in charge. In addition, lime should be sprinkled along all the edges of the stack to indicate that the stack has been measured and posted in the above measures shall be maintained till the stack is cleared.

15.0 SERVICES TO BE RENDERED BY CONTRACTOR:

15.1 The Contractor shall supply adequate sets of measurement equipment's like screens of different sizes steel boxes, and weighting machine & weights, ballast forks, etc. . These equipment's must be handed over to the Engineer -In- Charger before the first measurement is made.

15.2 At any time required by the Engineer while collection & stacking, contractor shall provide adequate facilities for inspection of material being collected including the quarry and crushing premises.

15.3 At the time of measurement, the contractor shall supply labour to facilitate opening of stack upto ground level, if desired by Railways.

15.4 Transportation arrangements for the movement of sieves /gauges/inspecting tools etc. to site and adequate labour assistance for sieving, weighing, measurement, sampling, sealing, etc. shall be provided by the contractor.

16.0 SETTING UP OF LABORATORY BY CONTRACTOR:

16.1 Deleted.

17.0 REJECTION OF SUPPLIES AND RECTIFICATION/DISPOSAL.

17.1 It shall be understood that the accepted rates for ballast are for materials which conform in all respects with the specifications laid down. The contractor is

advised to bring only such material at the site which conform to the specifications, as given above. Any material which falls short of the prescribed standards will be rejected and will have to be removed by the contractor at his own expenses. It should be noted that all materials would be passed at the site of stacking only. No passing will be carried out at the sources or anywhere else.

17.2 If the Engineer or his representative deputed to measure the ballast supplied is not satisfied that any of above conditions and specifications are not fully complied with, he is at liberty to:

(a) Refuse to measure the ballast supplied after communicating his reasons in writing to the contractor, and

(b) Call upon in writing to bring the ballast up to the specifications by either re-screening the ballast to conform to the specified sizes

(c) Call upon in writing to remove the material and bring new material.

17.3 In case the material offered for supply by the contractor is rejected by the Engineer, the later will specify the date within which rejected material should be removed by the contractor. The contractor will be liable to pay wharfage/demurrage/ground rent and other damages as per general conditions of contract for the period beyond stipulated.

17.4 The Engineer shall mark all rejected ballast in any manner he thinks fit to prevent rejected ballast being mixed with good ballast and the contractor shall remove the rejected ballast to such places as may be directed by the Engineer within a specified period from the date of order of removal.

17.5 In the event of the contractor failing to do so, the Engineer may cause it to be removed and all cost of such removal shall be payable by the contractors to the Railway, without prejudice to the Railway to effect any recovery of the losses as per conditions of GCC.

18.0 ACCOUNTAL OF BALLAST & MAINTGENANCE OF REGISTERS:

18.1 BALLAST PASSING REGISTER

18.1.1 Details of authorization for stacking the ballast in a plot by the Addl General Manager, certification of levelness of ground by Engineer- In – Charge shall be entered. Similarly the details of measured ballast stacks shall be entered in a Ballast passing register/ Stack Measurement Register, at the time of Measurement in the field itself, and the Register should have columns for entering measurements and physical properties checked by DM/AGM/& GM. The register shall be an authentic initial record in the form of Measurement Book with machine numbered pages and instruction for preservation/custody etc. shall be incorporated. Manuscript ruled registers if required should be used only by proper machine numbering the pages. The registers shall be issued by Addl General Manger and each pages shall be pre-signed on top by Engineer – In-Charge.

18.1.2 The Ballast Passing register should bear the following information.

i. Reference to Agreement No.
ii. Date of measurement.
iii. Stack No. and hectometer/TP/Chainage/RHS or LHS.
iv. Measurement as recorded indicating the different dimensions and volume.
v. Results of the quantity check and qualitative check as per sieve analysis over size, quantity, dust etc.

18.1.3 There should be no overwriting in the register and if any correction is required, the old entry should be struck of by drawing a line over and a fresh entry made and initiated. No blank line should be left while recording. The recordings done at a time should be properly boxed by drawing a line at the start and close of the measurements. All entries made in Ballast Passing register should be entered in the Measurement Book subsequently, which shall form the basis for the contractors' bill.

18.1.4 The contractor shall sign the Ballast Passing register at the site of measurement and the Measurement Book later in token of acceptance of measurements for arranging payment by Railways.

18.2 GROUND BALANCE REGISTER :

18.2.1 DEPOT: In case of DEPOT supply, the quantity of ballast measured in each Plot should be entered in the Ground Balance Register. After subsequent training out of ballast from a Plot, the successive reducing balances in that Plot should be reflected date-wise. For the quantities loaded in BT/Rail lorry in the Plot, the reference of challan No. should be shown. After the entire quantity in Plot has been trained out, the ground balance should be reduced to zero and the Plot shown as vacant. Further stacking in the plot of DEPOT/ Sub Depot can start only after permission by Addl General Manager/Civil

18.2.2 CESS : Similarly in case of Cess/Semi Depot supply, the Ground Balance Register shall reflect the quantity of ballast measured , the successive reducing balances due to dumping, date-wise and balance available on date STACK WISE should be recorded. As far as possible the full quantity of ballast in a stack shall be dumped at a time in case of cess . Further stacking of ballast in the HM in case of Cess/Semi Depot supply after dumping is not permitted.

18.2.3 Availability of Depot/Cess supply diagram augmented at each time of supply/dumping/training out shall be pre-requisite for processing bill for payment both for supply & dumping..

19.0 DUMPING/TRAINING OUT:

19.1 Measured ballast shall not be trained out/dumped when collection is in progress in the Depot/Sub-depot/Yard. Ballast shall also not be dumped/moved when collection is in progress within FIVE Kms. of the dumping area.

19.2 Addl General Manager specific approval for dumping/training out shall be obtained in writing stack wise prior to commencement of dumping/training out from a stack/plot. Ballast training out from Depot/dumping from cess shall be permitted only after elapsing of 7 days of passing of bill and also ensuring that a minimum period of 15 days is elapsed of recording of the initial measurements in Ballast Passing Register by the Engineer – In – Charge

NOTE : 1. In urgent cases, where ballast needs to be dumped /trained out and the 7/15 days mandatory period cannot be adhered to or the required test check condition by Addl. General Manager for any bill cannot be complied with, a specific approval of General Manager/Civil shall be obtained with the reasons recorded in writing stack wise. In all such cases authorization shall specify the date on which the dumping is permitted.

NOTE : 2. There should be a buffer of at least FIVE Km between the locations of collection and running out/dumping of ballast at any point of time. Deviation from the above shall be permitted in case of urgency, only with the written approval of the General Manager/Civil, with reasons recorded in writing.

19.3 Instructions for training out/dumping as prescribed by the Railway from time to time should be complied with meticulously.

19.4 Ballast stacks once measured shall not be disturbed on any account except for dumping/training out after the authorization and disturbances otherwise, if any, will be treated as a case of theft and will be liable for prosecution.

19.5 No ballast stack shall be laterally or longitudinally moved by any other means other than BT/Rail lorry without written order of the General Manager/Civil at any stage. Movement of ballast longitudinally by road for facilitating loading in Rail lorry if found necessary, shall be done only with specific approval of the General Manager/Civil in writing and only with restacking and re-measurement in Ballast Passing Register at the cost of the Contractor who is dumping the ballast. No payment for such restacking/re-measurement will be made by the Railway. Any shortage if notice after re-measurement, will be at the cost of the contractor and will be recovered from his dues.

20.0 GUARDING OF BALLAST:

20.1 Till such time, the ballast is measured and taken over by the Railway; its custody shall be responsibility of the contractor.

20.2 Subsequent to making payment to the contractor, in case the ballast is found to be non-conforming to Specifications or if the Ballast is misappropriated in any form, recovery will be made immediately from contractor's bills/ security deposit etc. or from any money payable under this or other contracts at TWICE the rate paid. In case it is established that the contractor is involved in such fraudulent practices , he is liable to be BANNED from doing business with Railways/Other Central Govt depts.

20.3 The contractor shall keep regular watch on all measured stacks till the whole supply is effected and contract is successfully completed.

20.4 The contractor shall also keep watch on dumping being undertaken by him / other agencies and ensure that the works are properly done without any misappropriation / mismanagement and any other untoward incidents.

21.0 GENERAL PAYMENT TERMS

21.1 Unless and otherwise specified, the BASE rate quoted by the Contractor at the time of tendering and the agreement rate as concluded in the contract for all the items in the schedule shall include the cost of all labour, transportation, consumables, tools, plants, equipment's, machinery, all lead, lift, ascent, descent, jungle clearance, making of approach road, handling, re-handling, loading, unloading, transportation, crossing railway lines, crossing of nallahs, roads, any other obstructions and cost of protection, guarding and other any safety precautions required, seignories/royalty, etc**. The quoted rates shall include all taxes and duties as per the various provisions of the Central Goods and Service Tax Act,2017 (CGST)/Integrated Goods and Services Tax Act,2017(IGST)/ Land Mineral Tax/ Union Territory Goods and Services Tax Act 2017 (UTGST)/respective state's State Goods and Services Tax Act (SGST) also, as notified by Central /State Govt & as amended from time to time and applicable taxes. Tenderers will ensure that full benefit of Input Tax Credit (ITC) likely to be availed by them is duly considered while quoting rates.** Nothing extra will be payable on any account unless otherwise specified exclusively in the item of schedule.

21.2 **Contractor shall produce Mineral Revenue Clearance Certificate / Seignorage / Royalty payment receipts other statutory clearance as required along with each On Account bill. In case the contractor does not produce such clearance, recovery of seignorage/other charges as ascertained by KRIDE will be made from bills. Refunding of such recoveries shall be done** only with the clearance of the State Govt./Central Government agencies as required for which the Contractor is solely responsible and no claims/representation whatsoever in this regard shall be admissible.

21.3 No claims for extra payment will be entertained on account of interruption of work due to rain, floods, or any other cause. Contractor must nevertheless arrange to carry on this work in rainy season. No claim for work done in low lying water-logged area, local pits and depressions containing rain water, wet earth conditions etc., will be entertained by the KRIDE.

Annexure : B-1

AGGREGATE ABRASION VALUE (BASED ON IS:2386 IV 1963)

1.0 Apparatus

1.1 The abrasion test for track ballast shall be carried out using LOS Angeles machine as per fig.1.

1.2 The abrasive charge shall consists of 12 nos. cast iron or steel spheres approx. 48mm dia. and each weighing between 390 and 445 gm ensuring total weight of charge as 5,000 +/- 25gm.

1.3 IS sieves of sizes 50mm, 40mm, 25mm, and 1.70mm.

1.4 Drying Oven.

2.0 Test Sample.

2.1 The test sample of 10,000gm shall consist of clean ballast con-forming to the following grading:

Passing 50mm and retained on 40mm square mesh sieve.	5,000gm (@)
Passing 40mm and retained on 25mm square mesh sieve	5,000gm (@)

(@) Tolerance of +/- 2% permitted.

3.2 The sample shall be dried in oven at 100-110oC to a constant weight and weighed (Weight "A").

3.0 Test Procedure

3.1 The test sample and the abrasive charge shall be placed in the Los-Angles abrasion testing machine and the machine rotated at a speed of 20 to 33 revolutions/minute for 1000 revolutions. At the completion of test, the material shall be discharged and sieved through 1.70mm IS sieve.

4.0 Analysis and Reporting of the Result.

4.1 The material coarser than 1.70mm IS sieve shall be washed dried in oven at 100-110 c to a constant weight and weighed (Weight B).

4.2 The proportion of loss between weight A and weight B of the test sample shall be expressed as a percentage of the original weight of the test sample. This value shall be reported as:

$$\text{Aggregate Abrasion Value} = \frac{A - B}{A} \times 100$$

Annexure: B-2

AGGRAGATE IMPACT VALUE
(BASED ON IS: 2386 PART IV-1963)

1.0 Apparatus: The apparatus shall consist of the following:

1.1 (a) Impact testing machine conforming to IS:2386 part IV-1963 as per fig 2.
(b) IS sieves of sizes 12.5 mm, 10mm and 2.36mm.
(c) A cylinderical metal measure of 75mm dia and 50mm depth.
(d) A tamping rod 10mm circular cross section and 230mm length, rounded at one end.
(e) Drying oven

2 **Test Sample**

2.1 The test sample shall be prepared out of track ballast so as to conform to following grading:
- Passing 12.5mm IS sieve 100%
- Retention 10mm IS sieve 100%

2.2 The sample shall be oven dried for 4 hours at a temperature of 100-110 deg. C and cooled.

2.3 The measure shall be filled about one-third full with the prepared aggregate and tamped with 25 strokes of the tamping rod. A further similar quantity of aggregate shall be added and a further tamping of 25 strokes given. The measure shall finally be filled to overflowing, tamped 25 times and the surplus aggregate struck off, using tamping rod as a straight edge. The net weight of the aggregate in the measure shall be determined to the nearest gm. (Weight 'A').

3 **Test Procedure**

3.1 The cup of impact testing machine shall be fixed firmly in the position on the base of the machine and the whole of the test sample placed in it and compacted by 25 strokes of the tamping rod.

3.2 The hammer shall be raised 380 mm above the upper surface of the aggregate in the cup and allowed to fall freely on to the aggregate. The test sample shall be subjected to a total of 15 such blows, each being delivered at an interval of not less than one second.

4 Analysis and Reporting of the Result

4.1 The sample shall be removed and sieved through 2.36 mm IS sieve. The fraction passing through shall be weighed. (weight 'B'). The fraction retained on the sieve shall also be weighed (Weight 'C') and if the total weight (B+C) is less than the initial weight (weight 'A') by more than one gm., the result shall be discarded and a fresh test made.

4.2 The ratio of the weight of the fines formed to the total sample weight shall be expressed as a percentage.

$$\text{Aggregate Impact Value} = \frac{B}{A} \times 100 \qquad \text{---------}$$

4.3 Two such tests shall be carried out and the mean of the results shall be reported to the nearest whole number as the Aggregate Impact Value of the tested material.

Annexure: B-3

WATER ABSORPTION
(Based on IS:2386 Part III-1963)

1. **Apparatus:** The apparatus shall consist of the following:
   a. **Wire Basket -** Perforated, electroplated or plastic coated with wire hangers for suspending it from the balance.
   b. Water tight container for suspending the basket
   c. Dry soft Absorbent cloth 75 x 45 cm size 2 Nos
   d. Shallow Tray of minimum 650 square cm area
   e. Air tight container of capacity similar to basket.
   f. Drying Oven.
2. **Test Sample**
   A sample of not less than 2000gm shall be used.

3. Test Procedure

3.1 The sample shall be thoroughly washed to remove finer particle and dust, drained and then placed in the wire basket and immersed in distilled water at a temperature between 22-32 deg.C.

3.2 After immersion the entrapped air shall be removed by lifting the basket and allowing it to drop 25 times in 25 seconds. The basket and sample shall remain immersed for a period of 24 + 1/2 hours afterwards.

3.3 The basket & aggregate shall then be removed from the water, allowed to drain for few minutes, after which the aggregate shall be gently emptied from the basket on to one of dry clothes and gently surface dried with the cloth, transferring it to second dry cloth when the first will remove no further moisture. The stone aggregate shall be spread on the second cloth and exposed to atmosphere (away from direct sunlight) until it appears to be completely surface dry. The aggregate then shall be weighed (weight 'A')

3.4 The aggregate shall then be placed in an oven at a temperature of 100-110 deg.C for 24 hours. It shall then be removed from oven, cooled and weighed (weight 'B').

4. **Analysis and Reporting of the Result**

$$\text{Water Absorption} = \frac{(A-B)}{B} \times 100$$

4.1 Two such tests shall be made and individual and mean results shall be reported.

ANNEXURE: B-4

FORMAT FOR PRESENTING TEST RESULTS OF BALLAST SAMPLES WHILE TENDERING

1. Name of Laboratory :
2. Address :
3. Referred by :

	Unit (Cum/Kg.)
4. Quantity / Weight of ballast sample offered for testing	.....

5. Source :
6. Date offered for testing :
7. Date Tested :
8. Test Results in Percentage :
   i. Abrassion Value :
   ii. Impact Value :
   iii. Water Absorption :
9. Remarks :
10. Signature and Designation of the representative of the Laboratory