BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL

EASTERN ZONE, KOLKATA

ORIGINAL APPLICATION NO. 109/2023/EZ

IN THE MATTER OF:

SATRUGHAN MEHER …**APPLICANT**

Vs.

STATE OF ODISHA & ORS. **…RESPONDENTS**

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THROUGH

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COUNTER-AFFIDAVIT ON BEHALF OF RESPONDENT I.E. RSA SK JV

MOST RESPECTFULLY SHOWETH:

I, Sanjay Agrawal, S/o Shri Radhe Shyam Agrawal, R/o P-38, Avanti Vihar, Near Sharir Fitness, Raipur, Chhattisgarh, aged about forty-seven (47) years, do hereby solemnly affirm and state on oath as under:

(i) That I am the Director of the Respondent concern arrayed in these present proceedings and I am competent to file this affidavit.

(ii) The present Original Application has been preferred by the Applicant i.e. Shri Satrughan Meher, alleging certain purported environmental violation by the Respondent. Based on such allegations, the Applicant has, *inter alia,* prayed for this Hon'ble Tribunal to impose exemplary penalty and environmental compensation on the Respondent for allegedly violating environmental norms.

(iii) I say that the Applicant has preferred the Original Application with mala-fide and oblique objectives, in it's apparent bid to harass and vex the answering Respondent. In doing so, the Applicant has resorted to making false, distorted, vague and unsubstantiated allegations, which even otherwise are at variance with the express language of the documents relied upon by it.

(iv) *Per contra,* it is submitted that no illegality or environmental violation has been committed by the answering Respondent.

PRELIMINARY SUBMISSIONS

(v) I say that the answering Respondent (as a joint-venture) is executing a certain Project i.e. " *Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUB's, supply of track ballast, track linking works, construction of service buildings, transportation of P Way materials, supplying, fabrication and launching of steel girders, with allied associated works in connection with provision of fly-over at IB station of Bilaspur division*" (hereinafter referred to as the "**Project Works**") for the Indian Railways.

(vi) The said Project Works have been awarded to M/s RSA-SK JV by the South East Central Railway, acting as a Railway Administration within the ambit and meaning of Section 2 (32) of The Railways Act, 1989.

(vii) I further day that the Project Works were awarded to the project proponent *vide* Letter of Acceptance dated 03.11.2022 issued by the South East Central Railway. A

copy of the Letter of Acceptance dated 03.11.2022 is annexed herewith and marked as **Annexure-R/1**.

(viii) Pursuant to the issuance of the aforesaid Letter of Acceptance dated 03.11.2022, an Agreement dated 22.03.2023 was executed *inter se,* the South East Central Railway and the project proponent. A copy of the Agreement dated 03.11.2022 along with the conditions of contract are annexed herewith and marked as **Annexure-R/2(Colly.)**.

(ix) I say that the project proponent was mandated to complete the Project Works within a period of thirty (30) months from the date of issuance of the Letter of Acceptance i.e. from 03.11.2022. In view of such stipulation, the project proponent had commenced the Project Works immediately upon issuance of the Letter of Acceptance to meet the project completion timelines as brought out hereinabove.

(x) For the purposes of constructing the earth bed/embankment for laying of the railway tracks, the project proponent was required to use ordinary

earth/soil. Such ordinary earth/soil was lifted by the project proponent from the alleged plots for it's exclusive use towards the Railway Project works.

(xi) I say that, admittedly, no environmental clearance was sought or obtained by the project proponent prior to lifting of ordinary earth/soil from the allegation plots; for the reason that Railway Projects are exempted from seeking environmental clearance. I further say that it is not in dispute that the ordinary earth/soil was lifted by the project proponent for it's exclusive use in the Project works.

(xii) I say that since the Environment Protection Act, 1986 is not applicable on Railway Projects, no violation has been committed by the project proponent in lifting of the ordinary earth/soil for it's use in the Railway Project Works as set out above.

(xiii) The fact that railway projects are exempted from the need to obtain prior environmental clearance is evident from a bare perusal of the Notification dated 28.01.1993 issued by the Ministry of Environment & Forests

(MOEF) in which Railway Projects were included as a separate category which required environmental clearance. In the subsequent Notification dated 28.01.1994 issued by the MOEF, Railway Projects were consciously deleted. The same evidences the legislative intent, which was to consciously exclude Railway Projects from the need to seek or obtain prior environmental clearance. This aspect has been clarified by the Railway Board, Ministry of Railways, Government of India as far back as in 2008 by way of it's letter dated 10.12.2008. A copy of the letter dated 10.12.2008 issued by the Railway Board, Ministry of Railways, Government of India is annexed herewith and marked as **Annexure-R/3**.

(xiv) I further say that the said aspect has been re-iterated by the MOEF by way of it's Office Memorandum dated 06.10.2023 issued to the Ministry of Railways pursuant to a request made on behalf of the railway authorities seeking a clarification in this respect. The MOEF in the said Office Memorandum date 06.10.2023 has specifically stated that "Railway Projects are exempted from prior environmental clearance in terms of Section

11 of the Railway Act, 1989 which overrides every other law in force". Pursuant to the said clarification, the Railway Board, Ministry of Railways has *vide* it's letter dated 13.10.2023 issued to all Zonal Railways stated that Railway Projects are exempted from the application of the Environment Protection Act, 1986 including it's sub-legislation in view of Section 11 of the Railways Act, 1989. Copies of the Office Memorandum dated 06.10.2023 issued by the MOEF and the letter dated 13.10.2023 issued by the Railway Board are annexed herewith and marked as **Annexure-R/4(Colly)**.

(xv) Furthermore, the aspect of Railway Projects being exempted from the need to seek prior environmental clearance is also borne out of the answers given by the Ministers concerned in the Lok Sabha and the Rajya Sabha. It has been specifically stated by the Minister of Railways on 04.12.2019 in the Lok Sabha that "Railway Projects do not require environmental clearance. However, forestry/wildlife clearances are required whenever the diversion of forest land is involved". A copy of the question and answer provided by the Hon'ble Minister in the Lok Sabha on 04.12.2019 on the aspect

of environmental clearance for railway projects is annexed herewith and marked as **Annexure-R/5**.

(xvi) I further say that the said view was re-iterated in the Rajya Sabha wherein it was specifically answered by the Hon'ble Minister (pursuant to a question) that, "As per EIA Notification, 2006 Railways and Metro Rail Projects are exempted from obtaining prior EC." A copy of the question and answer provided by the Hon'ble Minister in Rajya Sabha on 07.04.2022 on the aspect of environmental clearance for railway projects is annexed herewith and marked as **Annexure-R/6**.

(xvii) It is submitted that owing to the fact that Railway Projects (including the Project Works in question) are exempt from the need to obtain prior environmental clearance, there is no question of violation of any "specific statutory environmental obligation" within the meaning of Section 2 (m) of the National Green Tribunal Act, 2010.

(xviii) In light of the above, it is submitted that the Applicant has wrongly invoked this Hon'ble Tribunal's jurisdiction

under Section 14 of the National Green Tribunal Act, 2010; since *firstly* there is no violation of a specific statutory environmental obligation by the answering Respondent and *secondly* owing to there being no violation of a specific statutory obligation, no "substantial question relating to environment" within the meaning of Section 14 arises for consideration in the present proceedings.

(xix) I say that the Applicant has canvassed that the answering Respondent's alleged act of not-obtaining environmental clearance prior to lifting of ordinary earth/soil from the alleged plots is also an offence under the Odisha Minor Mineral Concession Rules, 2016. Without prejudice to the contention that no illegality has been committed by the answering Respondent, it is submitted that the Environment Protection Act, 1986 specifically provides that in a given situation where any act or omission constitutes an offence punishable both under the Environment Protection Act as well as under any other Act, then such person (if found guilty) would be liable to be punished under the other Act and not under the Environment Protection Act. In such view of the matter,

it is submitted that even on demurrer, the Original Application preferred by the Applicant deserves to be rejected.

(xx) Further, even if it were to be assumed that Railway Projects are not exempted from seeking environmental clearance or that the answering Respondent was obligated to seek environmental clearance prior to lifting ordinary earth/soil for the Project works in question, it is submitted that Extraction of ordinary earth for use in linear projects had been exempted by MOEF from the need to obtain Environmental Clearance vide it's Notification bearing no. S.O. 1224(E) dated 28.03.2020. The said notification clearly and specifically stated that "extraction or sourcing or borrowing of ordinary earth for linear projects" shall be exempted. A copy of the Notification dated 28.03.2020 issued by the MOEF is annexed herewith and marked as **Annexure-R/7**. Thereafter, pursuant to the judgments passed by certain other benches of the Hon'ble National Green Tribunal in Noble M. Paikada vs Union of India, (2020 SCC OnLine NGT 2741) and in Rajiv Babasaheb Waman vs MoEF, O.A. No. 68/2020(WZ), another Notification dated

08.08.2022 titled as “Clarification on the applicability of the EIA Notification 2006 for excavation of ordinary earth from borrow areas for linear projects” was issued by the MOEF. By way of the said notification, so as to ensure that there was no blanket exemption for excavation, the MoEF laid down a Standard Operating Procedure to ensure environmental safety. It is submitted that the said notification laid down all appropriate safeguards which were relevant and imperative from the environmental standpoint. A copy of the Notification dated 08.08.2022 issued by the MOEF is annexed herewith and marked as **Annexure-R/8**. Thereafter, another Notification dated 21.08.2023 was issued by the MoEF whereby certain enforcement mechanism was set forth for ensuring that the Standard Operating Procure as contained in the notification dated 08.08.2022 were enforced in letter and spirit on the filed level. The said notification primarily directed that all project proponents ought to inform the concerned State Pollution Control Board before staring any excavation activity. That apart, the said notification also directed the concerned State Pollution Control Boards to independently monitor the compliance status of the aforementioned Standard

Operating Procedure and to further initiate legal action against the Project Proponents upon finding any violations in respect thereof. A copy of the Notification dated 21.08.2023 issued by the MOEF is annexed herewith and marked as **Annexure-R/9**.

(xxi) It is submitted that bids for the Project Works in question were invited by the South East Central Railways by floating a tender notice on 25.08.2022 as on which date the aforesaid Notifications dated 28.03.2020 and 08.08.2022 were still in vogue. Without prejudice to the answering Respondents submission that the provisions of the Environment Protection Act, 1986 are not applicable to Railway Projects (including the project in question); an additional reason for the conditions of contract not stipulating the requirement to obtain an environment clearance was the specific exemption granted by the MOEF by way of the aforementioned Notifications.

(xxii) It is further submitted that even as on the date of filing of the Original Application (i.e. 11.08.2023), the

aforesaid Notifications dated 28.03.2020 and 08.08.2022 were in effect and operative. It is pertinent to note that the Hon'ble National Green Tribunal which was seized of the issue of legality of the aforesaid Notifications (in Noble M. Paikada vs Union of India) had not stayed their operation. It is submitted that the answering Respondent had commenced the Project Works after 03.11.2022 (i.e. after the issuance of the Letter of Acceptance) and no lifting of ordinary earth/soil has been undertaken by the answering Respondent after filing of the Original Application.

(xxiii) In the aforesaid context, it is submitted that the project proponent had in good-faith and in a *bona-fide* manner, and keeping in view the existing legal and statutory regime resorted to lifting ordinary earth/soil from the alleged plots. It would be a grave miscarriage of justice and violative of natural justice, if the project proponent were to be penalized for acting as per the statutory and regulatory regime which was in force at the time. It is also well-settled that this Hon'ble Tribunal shall always guided by the principles of natural justice and therefore on such basis, it is submitted that the Original

Application preferred by the Applicant deserves to be rejected.

(xxiv) It is further submitted that the project proponent for the Project Works in question, is an "agent" of the "Railway Administration". The Railway Administration is the "principal". The "principal" and "agent" relationship between the railway authority and the project proponent can be easily inferred from a bare persual of the Agreement entered into between the parties. In such view of the matter and especially owing to the fact that the Agreement between the project proponent and the railways does not contain any stipulation regarding seeking an environmental clearance *qua* the Project Works in question, no fault can be found with the project proponents approach; since being an "agent", the project proponent is required to execute the Project Works in line with the specific terms of the Agreement.

(xxv) That apart, since the Project proponent had undertaken the works in question (including lifting of ordinary earth/soil without environmental clearance) in utmost good faith, the South East Central Railway is liable to

indemnify the project proponent; in the unlikely event that this Hon'ble Tribunal were to impose environmental compensation. The answering Respondent prays accordingly. The South East Central Railway is also estopped from contending that environmental clearance was required to be taken, in view of the clarifications issued by the Railway Board.

(xxvi) Further, in the facts of the present case and without prejudice to the above submissions, it is submitted that the Joint-Committee constituted by the Hon'ble NGT has recommended penalty despite not finding any environmental damage caused by the excavation undertaken by RSA. The Joint-Committee in this regard has, apart from recommending penalty, only recommended for directions to RSA to develop plantation of indigenous species for damaging natural vegetation. This would indicate that no damage (or at best, mild damage, if at all) has been caused to the ecology. It is also important to highlight that the Joint-Committee has whilst calculating the compensation taken the Risk Factor ("**RF**") as equivalent to that of a "severe case" of ecological damage. The said approach

is incorrect in as much as there is not even a whisper in the Joint-Committee report or in the affidavits filed by SEIAA or the SPCB about any damage to the ecology, least of all a severe damage. In addition to the foregoing, in calculating the compensation, the Joint-Committee has assumed that RSA has been undertaking excavation for the past five (05) years i.e. since 2019. Whereas, it is the admitted case of the Applicant that excavation has been undertaken by RSA for works of a railway project which has only been awarded to it in 2022 (the OA was filed in 2023 and no excavation has been undertaken during its pendency). As such, the calculation by the Joint-Committee is incorrect.

(xxvii) It is further submitted that the answering Respondent is placing the correct calculation on the alleged quantity of soil purportedly extracted (4,55,000 Cu/m) by the project proponent based on the "Mild" risk factor and discounting rate. Calculation of environmental compensation based on the "Mild" risk factor (0.25) and discounting rate (8%) is annexed herewith and marked as **Annexure-R/10**.

(xxviii) The Applicant has by way of it's Supplementary Affidavit canvassed that the Notifications issued by the MOEF granting exemption for borrowing of ordinary earth in respect of linear projects has been struck down by the Hon'ble Supreme Court. In this regard, it is submitted that the said decision of the Hon'ble Supreme Court ought to be read as having prospective operation; in the interests of justice and equity.

(xxix) Without prejudice to the above submissions, the answering Respondent is submitting it's paragraph wise response to the contents of the Original Application as under:

PARA-WISE RESPONSE

(xxx) The contents of paras I and II merit no response since the same relate to the respective addresses of the Parties for service of Notice.

(xxxi) The contents of para III are denied as being erroneous and misconceived. It is specifically denied that the answering Respondent is illegally lifting morrum, stone or sand without any environmental clearance. It is submitted that the answering Respondent has lifted

ordinary earth for it's exclusive use in the Project Works for the railway authorities. It is denied that lifting of ordinary earth without environmental clearance is illegal in any manner or that the tehsildar was required to take any penal action against the answering Respondent.

(xxxii) The contents of para 1 and 2 are denied save and except those that are matters of record. It is denied that the answering Respondent has indulged in illegal mining.

(xxxiii) The contents of para 3 are denied. It is submitted that the answering Respondent is undertaking only the Project Works as set out hereinabove. It is specifically denied that the answering Respondent has lifted 20 lakh cubic metres of morrum. The Respondent may be put to strict proof of it's assertions.

(xxxiv) The contents of para 4 are denied. It is specifically denied that the answering Respondent is illegally lifting morrum from government land in Jharsuguda tehsil. In this regard, it is submitted that the answering Respondent has lifted ordinary earth for it's exclusive

use in the Project Works for the railway authorities. Anything contrary is specifically denied.

(xxxv) The contents of para 5 are denied as being erroneous and ill-conceived. It is denied that the answering Respondent had carried out morrum mining at all or in any revenue forest land. It is further denied that any trees were felled by the answering Respondent for mining of morrum. It is submitted that the Applicant has made vague and unsubstantiated allegations about the answering Respondent undertaking mining in revenue forest land. There is not even a whisper of any purported mining carried out by the answering Respondent in the report filed by the Joint-Committee constituted by this Hon'ble Tribunal or in any of the affidavits filed be either the SEIAA, SPCB or the MOEF. The Respondent may be put to strict proof of it's allegations.

(xxxvi) The contents of para 6 are denied as being erroneous and misconceived. It is denied that the Applicant had made a any complaint to the Secretary, Water Resource Department. It is denied that the answering Respondent was extracting earth, soil from the alleged areas in

connivance with the officials of the irrigation department. It is submitted that the Respondent has made false and distorted allegations in the corresponding paragraph and that the same are thoroughly unsubstantiated. It is denied that despite complaints, no action had been taken by the officials of the irrigation department. It is specifically denied that the answering Respondent was carrying out illegal extraction of earth on a day to day basis. It is submitted that the answering Respondent had excavated ordinary earth from the plots as set out in the Joint-Committee report for it's exclusive use towards the Project Works for the railways. It is re-iterated that there is no requirement of seeking prior environmental clearance for railway projects and thus no environmental contravention has been made by the answering Respondent. The related contentions contained in the preceding portions of this counter-affidavit are re-iterated and re-affirmed since the same are not being repeated herein for the sake of brevity. It is further denied that the excavation of ordinary earth purportedly undertaken by the answering Respondent has led to erosion of soil in the reservoir area or anywhere. It is submitted that the report of the Joint-

Committee has made no such observations and the said allegations are merely the Applicant's *ipse dixit.* The Applicant may be put to strict proof of it's allegations. It is denied that the answering Respondent was required to obtain environmental clearance or prepare a mining plan prior to lifting ordinary earth. The preceding paragraphs of the present counter-affidavit are re-iterated and re-affirmed.

(xxxvii) The contents of para 7 are denied for want of knowledge.

(xxxviii) The contents of para 8 are denied as being erroneous and misconceived. It is denied that the answering Respondent has carried out any mining on forest land. The Applicant may be out to strict proof of it's allegations.

(xxxix) The contents of para 9 are denied as being erroneous and misconceived. It is denied that there is any loss of revenue being caused to the State, or that any laws and government orders were violated by the answering Respondent. It is further denied that the answering Respondent has indulged in any rat-hole mining in

different patches or that it has led to more abandoned sites. It is further denied that the answering Respondent is responsible for reclaiming the said patches which in the long run would be a purported death trap for stray animals and the people passing through those areas. It is also specifically denied that the answering Respondent has felled any trees or has made the area vulnerable to felling. As regards the Applicant's contentions regarding top-soil is concerned, it is submitted that no top-soil was encountered by the answering Respondent when it came to lift the already excavated earth. It is submitted that mining has been going on at the areas set out in the Joint-Committee report since 2019, whereas the answering Respondent had commenced lifting after 03.11.2022 (staring from January, 2023) and stopped when the Original Application was filed. It is thus clear that the answering Respondent has lifted ordinary earth/soil for less than a year from the sites as set out in the Joint-Committee report. It is submitted that the Applicant is hand in glove with miners from whom they extort money. The present Original Application has been preferred by the Applicant after the answering

Respondent refused to cave in to the ransom demanded by the Applicant and it's henchmen.

(xl) The contents of para 10 are denied as being erroneous and misconceived. It is denied that the answering Respondent has illegally lifted thousands of truckloads of morrum for the railway track. It is submitted that the answering Respondent has lifted ordinary earth from the sites as set out in the Joint-Committee report. Anything contrary is specifically denied. The preceding paragraphs of the present counter-affidavit are re-iterated and re-affirmed since the same are not being repeated for the sake of brevity.

(xli) The contents of para 11 are denied as being erroneous and misconceived. As regards the Applicant's contentions pertaining to the tehsildars demand note, it is submitted that the same is within the remit of the Odisha Minor Mineral Concession Rules and not under any environmental legislation. The same is accordingly irrelevant for the purposes of adjudication of disputes before this Hon'ble Tribunal.

(xlii) The contents of para 12 are denied as being erroneous and misconceived. It is denied that the answering Respondent had been extracting earth and morrum from different places which were not designated quarrying sites. It is re-iterated that the answering Respondent has excavated ordinary earth/soil from the sites as set out in the Joint-Committee report. It is denied that the answering Respondent was required to seek any permission from the tehsildar for lifting of ordinary earth/soil. It is specifically denied that the answering Respondent has been continuously extracting earth/morrum by engaging earth movers from Jamua Dungri or that Jamua Dungri is a site for migratory birds adjoining the Hirakud reservoir in the confluence of the rivers Eve and Eden. It is re-iterated that the answering Respondent has excavated ordinary earth/soil from the sites as set out in the Joint-Committee report. The Respondent may be put to strict proof of it's allegations.

(xliii) The contents of para 13 are denied as being erroneous and misconceived. It is denied that the answering Respondent has lifted Morrum from the alleged sites. It is re-iterated that the answering Respondent has

excavated ordinary earth/soil from the sites as set out in the Joint-Committee report. It is denied that the the answering Respondent could not have lifted such ordinary earth/soil without any environmental clearance, approved mining plan or consent from the State Pollution Control Board. It is specifically denied that the answering Respondent is undertaking mining discriminately or at all from places which are not designated sources without government approval. It is submitted that the answering Respondent had excavated ordinary earth from the plots as set out in the Joint-Committee report for it's exclusive use towards the Project Works for the railways. It is re-iterated that there is no requirement of seeking prior environmental clearance for railway projects and thus no environmental contravention has been made by the answering Respondent. In the said context, the preceding paragraphs relevant to the issue are re-iterated and re-affirmed and that the same are not being repeated herein for the sake of brevity.

(xliv) The contents of para 14 are denied as being erroneous and misconceived. It is submitted that the complainants

are hand in glove with miners from whom they extort money. The present Original Application has been preferred by the Applicant after the answering Respondent refused to cave in to the ransom demanded by the Applicant and it's henchmen that had addressed the letter dated 29.05.2023. The contents of the letter dated 29.05.2023 are specifically denied. The said contents are belied from the Joint-Committee report wherein no such observations had been made. Anything contrary is specifically denied.

(xlv) The contents of para 15 are denied as being erroneous and misconceived. It is denied that the answering Respondent had lifted soil/morrum from around the trees leaving them vulnerable to getting uprooted or that there is any soil erosion in the said area. It is denied that there were any trees in the site as set out in the Joint-Committee report. It is submitted that mining has been going on at the areas set out in the Joint-Committee report since 2019, whereas the answering Respondent had commenced lifting after 03.11.2022 (staring from January, 2023) and stopped when the Original Application was filed. It is thus clear that the answering

Respondent has lifted ordinary earth/soil for less than a year from the sites as set out in the Joint-Committee report. That apart, no instance of soil erosion etc. has been reported by the Joint-Committee in its report and neither has it been reported that any trees existed in the alleged site. The Respondent may be put to strict proof of it's allegations.

(xlvi) The contents of para 16 are denied as being erroneous and misconceived. It is submitted that the said news paper reports are motivated and misguided at the behest of the Applicant and it's henchmen.

(xlvii) The contents of para 17 are denied as being erroneous and misconceived. The guidelines referred to by the applicant pertain to sand mining and are therefore irrelevant for the purposes of the present proceedings.

(xlviii) The contents of para 18 are denied as being erroneous and misconceived. It is submitted that Extraction of ordinary earth for use in linear projects had been exempted by MOEF from the need to obtain Environmental Clearance vide it's Notification bearing

no. S.O. 1224(E) dated 28.03.2020. The said notification clearly and specifically stated that “extraction or sourcing or borrowing of ordinary earth for linear projects” shall be exempted. Thereafter, pursuant to the judgments passed by certain other benches of the Hon’ble National Green Tribunal in Noble M. Paikada vs Union of India, (2020 SCC OnLine NGT 2741) and in Rajiv Babasaheb Waman vs MoEF, O.A. No. 68/2020(WZ), another Notification dated 08.08.2022 titled as “Clarification on the applicability of the EIA Notification 2006 for excavation of ordinary earth from borrow areas for linear projects” was issued by the MOEF. By way of the said notification, so as to ensure that there was no blanket exemption for excavation, the MoEF laid down a Standard Operating Procedure to ensure environmental safety. It is submitted that the said notification laid down all appropriate safeguards which were relevant and imperative from the environmental standpoint. Another Notification dated 21.08.2023 was issued subsequently by the MoEF whereby certain enforcement mechanism was set forth for ensuring that the Standard Operating Procure as contained in the notification dated 08.08.2022 were enforced in letter and

spirit on the filed level. The said notification primarily directed that all project proponents ought to inform the concerned State Pollution Control Board before staring any excavation activity. That apart, the said notification also directed the concerned State Pollution Control Boards to independently monitor the compliance status of the aforementioned Standard Operating Procedure and to further initiate legal action against the Project Proponents upon finding any violations in respect thereof. It is submitted that bids for the Project Works in question were invited by the South East Central Railways by floating a tender notice on 25.08.2022 as on which date the aforesaid Notifications dated 28.03.2020 and 08.08.2022 were still in vogue. Without prejudice to the answering Respondents submission that the provisions of the Environment Protection Act, 1986 are not applicable to Railway Projects (including the project in question); an additional reason for the conditions of contract not stipulating the requirement to obtain an environment clearance was the specific exemption granted by the MOEF by way of the aforementioned Notifications. It is further submitted that even as on the date of filing of the Original Application (i.e.

11.08.2023), the aforesaid Notifications dated 28.03.2020 and 08.08.2022 were in effect and operative. It is pertinent to note that the Hon'ble National Green Tribunal which was seized of the issue of legality of the aforesaid Notifications (in Noble M. Paikada vs Union of India) had not stayed their operation. It is submitted that the answering Respondent had commenced the Project Works after 03.11.2022 (i.e. after the issuance of the Letter of Acceptance) and no lifting of ordinary earth/soil has been undertaken by the answering Respondent after filing of the Original Application. In the aforesaid context, it is submitted that the project proponent had in good-faith and in a *bona-fide* manner, and keeping in view the existing legal and statutory regime resorted to lifting ordinary earth/soil from the alleged plots. It would be a grave miscarriage of justice and violative of natural justice, if the project proponent were to be penalized for acting as per the statutory and regulatory regime which was in force at the time. It is also well-settled that this Hon'ble Tribunal shall always guided by the principles of natural justice and therefore on such basis, it is submitted that the Original Application preferred by the Applicant deserves to be

rejected. It is further submitted that the Applicant's reliance on the Hon'ble Supreme Court's judgment in Deepak Kumar's case is also illusory since the same is not an authority for the proposition as to whether or not there is a requirement to seek environmental clearance for railway projects or for excavation of earth towards it's use in railway projects.

(xlix) The contents of para 19 are denied as being erroneous and misconceived. It is denied that the answering Respondent has lifted morrum. It is further denied that the purported lifting of soil by the answering Respondent was illegal in any manner or that it warranted appropriate action by the tehsildar to the extent of seizure of vehicles, criminal proceedings. It is denied that collecting royalty is insufficient or that the same is not a deterrent. The paragraphs of the present counter-affidavit relevant to the issue are re-iterated and re-affirmed and that the same are not being repeated herein for the sake of brevity.

(l) The contents of para 20 are denied as being erroneous and misconceived. It is specifically denied that the answering Respondent is a habitual offender of illegal

extraction of minor minerals or that the answering Respondent continues to illegally exploit morrum. It is submitted that the answering Respondent is a reputed contractor and is executing the Project Works in question for the Railway authorities. It is denied that the answering Respondent is being penalized to a minimum amount or that the answering Respondent is committing theft of natural resources and government property. It is specifically denied that appropriate section of the Indian Penal Code ought to be invoked against the answering Respondent or that any seizure was/is warranted as is being asserted by the Applicant.

(li) The contents of para 21 are denied as being erroneous and misconceived. The guidelines referred to by the Applicant in the corresponding paragraph pertain to sand mining and are therefore irrelevant for the purposes of the present proceedings.

(lii) The contents of para 22 and 23 are denied as being erroneous and misconceived. It is denied that the Tehsil office being in the helm of affairs has grossly failed to discharge it’s responsibilities. It is submitted that the

Applicant has resorted to making false and distorted allegations, in respect of which the Applicant may be put to strict proof. It is further denied that the answering Respondent was obligated to obtain environmental clearance, consent to operate, consent to establish, environment management plan, district mineral survey report and mining plan. It is re-iterated that the ordinary earth was being lifted by the answering Respondent for it's exclusive use towards the Project Works for the railways and as such no environmental clearance was required to be obtained. The preceding paragraphs of the present counter-affidavit relevant to the issue are re-iterated and re-affirmed and that the same are not being repeated herein for the sake of brevity.

(liii) The contents of para 24 are denied as being erroneous and misconceived. It is denied that the answering Respondent has committed any illegality or that the same are in violation of the Hon'ble Supreme Court's judgment in Deepak Kumar's case or the other legislations referred to in the corresponding paragraph. The preceding paragraphs of the present counter-affidavit relevant to the issue are re-iterated and re-

affirmed and that the same are not being repeated herein for the sake of brevity.

(liv) The contents of para 25 to 27 merit no response since the same are mere reproduction of certain provisions of the Orissa Minor Mineral Concession Rules. The answering Respondent seeks liberty to reserve it's rights to make submissions on the said provisions during the course of oral arguments.

(lv) The contents of para 28 are denied as being erroneous and misconceived. It is specifically denied that the Tehsildar penalised the answering Respondent for peanuts and compounded the offence. It is denied that the answering Respondent has indulged in illegal mining. The preceding paragraphs of the present counter-affidavit relevant to the issue are re-iterated and re-affirmed and that the same are not being repeated herein for the sake of brevity.

(lvi) The contents of para 29 are denied as being erroneous and misconceived. It is denied that the answering Respondent has lifted ordinary earth/soil from forest

areas. The Applicant has resorted to making false and distorted allegations, in respect of which the Applicant may be put to strict proof. Anything contrary is specifically denied. The preceding paragraphs of the present counter-affidavit relevant to the issue are re-iterated and re-affirmed and that the same are not being repeated herein for the sake of brevity.

(lvii) The contents of para 30 merit no response since the same are a mere reproduction of certain paragraphs of the judgment referred to by the Applicant in the corresponding paragraph. The answering Respondent humbly seeks to reserve it's rights to make submissions in relation to the said judgment during the course of oral arguments.

(lviii) The contents of para 31 merit no response since the same are a mere reproduction of certain provisions of the Environment Protection Act, 1986. In this regard, it is re-iterated that the Environment Protection Act, 1986 is not applicable to railway projects. Anything contrary is specifically denied. The preceding paragraphs of the present counter-affidavit relevant to the issue are re-

iterated and re-affirmed and that the same are not being repeated herein for the sake of brevity.

(lix) The contents of para 32 are denied as being erroneous and misconceived. It is denied that the District Magistrate in the present case has failed to discharge his duties or that this Hon'ble Tribunal should call for a reply in that regard and direct the Chief Secretary to take appropriate action. In this regard, it is relevant to note that the necessary ingredient of Section 19 of the Environment Protection Act, 1986 are/were not met in the facts and circumstances of the present dispute before this Hon'ble Tribunal and as such Section 19 has no application. Anything contrary is specifically denied.

(lx) The contents of para 33 merit no response since the same are a mere reproduction of certain paragraphs of the judgment referred to by the Applicant in the corresponding paragraph. The answering Respondent humbly seeks to reserve it's rights to make submissions in relation to the said judgment during the course of oral arguments.

In view of the facts and circumstances as set out hereinabove, it is humbly prayed that this Hon'ble Tribunal may graciously be pleased to dismiss the present Original Application preferred by the Applicant.

CANCELLE

DEPONENT

VERIFICATION

I, the above-named Deponent, do hereby verify that the contents of all the paragraphs of the present counter-affidavit, are true and correct to the best of my knowledge and belief and nothing material has been concealed therefrom

Verified at Raipur on this 17th day of July, 2024.

DEPONENT

THROUGH

Ankur Upadhyay
Advocate
For RSA-SK JV Pvt. Ltd.
B-9, LGF
Lajpat Nagar-III
New Delhi-110024
advupadhyay2407@gmail.com
(+91)-9667823426

17 JUL 2024
Place: New Delhi
Date 17.07.2024

SOLEMONY AFFIRMED BEFORE ME WITHIN NAMED DEPONENT

Ishwar lal Sahu
Notary/Advocate
RAIPUR (C.G.)

NOTARY I.L. Sahu NOTARY/ADVOCATE RAIPUR (C.G.) INDIA REG. NO.-17985 EXP.-06/01/2025 GOVT. OF INDIA

NOTARY Registered Serial No. 10971G/20 Page No. 353

पहचानकर्ता गवाह

SOUTH EAST CENTRAL RAILWAY

By Regd. Post A/D

OFFICE OF THE
CHIEF ADMN. OFFICER(CON)/BILASPUR

NO: CEC/BSP/ER/T/22-23/19/IB Fly Over/ 510 (516) Dated: 03.11.2022

To
M/s RSA-SK JV
Shri Shyam Tower
Kavita Nagar, Main Road, Avanti Vihar
Raipur, Chhattisgarh-492001

Sub:-	Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division. Tender No: CEC/BSP/22-23/19 dated 25.08.2022. Ref: Technical bid opened on 22.09.2022, Price Bid opened on 14.10.2022 and e-Reverse Auction held on 18.10.2022

Dear Sirs

Your offer for the subject work has been accepted by the competent authority (i.e. Chief Administrative Officer/Con/SECR) for and on behalf of the President of India at the value of Rs 175,53,24,134.63.(Rs. One Hundred Seventy Five Crore Fifty Three Lakhs Twenty Four Thousand One Hundred Thirty Four and Sixty Three paise) at the following accepted rates:-

(i) At Par with a rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "1".

(ii) 7% (Seven Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "2".

(iii) 5% (Five Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "3".

(iv) 10% (Ten Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "4".

(v) 10% (Ten Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "5".

(vi) 5% (Five Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "6".

(vii) At Par with a rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "7".

(viii) At Par with a rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "8".

(ix) 10% (Ten Percent) above with rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "9".

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

(x) 5% (Five Percent) above with rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "10".

(xi) 8% (Eight Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "11".

(xvi) 15% (Fifteen Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "12".

(xvii) 20% (Twenty Percent) above with rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "13".

(xviii) 15% (Fifteen Percent) above with rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "14".

(xix) 8% (Eight Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "15".

(xx) 20% (Twenty Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "16".

(xxi) 10% (Ten Percent) above with rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "17".

Note: Accepted rates of Schedule 4, 5, 8,10,12, 14, 13, 15, 16 & 17 should not be referred in future tenders in isolation.

You are hereby authorized to commence the work on the strength of this letter to ensure the completion of above subject work within 30 (Thirty months) i.e. upto 03.05.2025. In this regard you are requested to contact Dy.Chief Engineer (Con)/Brajrajnagar for taking further instructions immediately.

The security deposit required for faithful fulfillment of the contract is Rs. 8,77,66,207/- which will be recovered from your on account bills as per extant rules.

You are requested to submit the Performance guarantee amounting to Rs. 5,26,59,724/- **within 21 days from date of issue of this Acceptance letter**, in the form of an irrevocable Bank Guarantee in the prescribed proforma given in the tender document or in any of the acceptable form mentioned in the tender document valid upto original completion period plus 60 days i.e. upto 03.07.2025.

You are requested to attend this office on any working day after submission of requisite Performance Guarantee for signing the contract agreement.

You are requested to obtain labour license from concern Labour Commissioner(Central) and to register your firm/company etc and upload details of letter of acceptance in 'Shramik Kalyan Portal' of Indian Railways.

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

Please note that, until a formal agreement is executed, acceptance of this tender shall constitute a binding contract between Railway and yourself, subject to modification as may be mutually agreed between us. No separate work order will be issued except for USSOR/SOR items.

Please acknowledge the receipt of this letter and confirm that the action is being taken by you accordingly.

Thanking you,

Encl: (i) Sch '1' to '17' with other tender conditions.

(R.K.Singh) 03.11.22
Chief Engineer (Con)/I/Bilaspur
FOR & ON BEHALF OF PRESIDENT OF INDIA
मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

Copy to:-

1. S.D.G.M./SECR for information and necessary action please.
Encl: Schedule Sch '1' to '17' and other tender conditions.

2. Dy.Chief Engineer/Con/Brajrajnagar/S.E.C. Railway for information and necessary action please.
Encl: Schedule Sch '1' to '17' and other tender conditions.

3. Asst. Labour Commissioner (Central), Jharsuguda, Odisha.

4. The Dy. Director Audit (Con)/Bilaspur.

5.The employment Exchange Officer/ Jharsuguda, Odisha.

6.Dy. FA&CAO(Con)/Bilaspur along with a spare copy of the letter.

7.Secy. to CAO(Con)/BSP for kind information of CAO(Con)/BSP

Chief Engineer (Con)/I/Bilaspur
03.11.22
मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

दक्षिण पूर्व मध्य रेलवे
कार्यालय मुख्य प्रशासनिक अधिकारी, बिलासपुर-495004

"By. Registered Post with A.D"

Office Of The,
Chief Administrative Officer/Con/Bilaspur

NO: CEC/BSP/22-23/19/579 Dated:24/03/2023

To
M/s. RSA –SK JV,
SRI SHYAM TOWER, KAVITA NAGAR,MAIN ROAD, AVANTI VIHAR
RAIPUR(C.G) - 492001

Dear Sir,

Sub: **Contract Agreement No: as mentioned below in connection with** "Execution of earth work in formation, construction of ROR, minor bridges, mojor bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying , fabrication and launching of Steel Girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division".
E-Tender Notice NO:CEC/BSP/22 - 23/19, Dated:25/08/2022 (Two Packet System)
Date & Time of Tender Closing: Up to 15:00 Hours on 22/09/2022.

*****

In reference to the above subject works one **Original Agreement copy of Contract NO: 456/ IB-FLY OVER/CEC/SECR/2023 , Date:22/03/2023** is sent here with for your information.

Therefore you are requested to acknowledge the receipt of the Agreement as above.

Encl: One Original C.A. as mentionedabove.

24.03.23

कृते उप-मुख्य अभियंता (निर्माण)/बी.एस.पी.,
ForDy.ChiefEngineer/Con/BSP,
दक्षिण पूर्व मध्य रेल्वे , बिलासपुर
S.E.C.Railway, Bilaspur

(1) Chief Engineer/Con/I/S.E.C.R/BSP with One True copy of Contract Agreement **NO:456/IB-FLY OVER /CEC /SECR/2023, Date:22/03/2023** for your kind information and necessary action please.
(2) Dy.Chief Engineer/Con/S.E.C.R/BRJN, with One Original Copy of Contract Agreement No: **456/IB-FLY OVER /CEC /SECR/2023, Date:22/03/2023** for your kind information and necessary action please.
(3) Executive Engineer/Con/II/SECR/Raigarh with One True Copy of Contract Agreement : **456/IB-FLY OVER /CEC /SECR/2023, Date:22/03/2023**for your information and necessary action please.
(4) Dy.FA & CAO/C/BSP with one Original & one True Copy Of Contract Agreement:456**/IB-FLY OVER/CEC/SECR/2023 ,Date:22/03/2023** Contractor had submitted (i) One **B.G NO:32460ILG006822 , Dated:23-11-2022 for Rs.5,26,59,724/- , Expiry date of B.G.22/08/2025 towards P.G. issued by PUNJAB NATIONAL BANK, RAIPUR (C.G) (In Original) (ii)** One Original Bank Verified copy of above mentioned B.G. **(iii) One Original copy of SD vide B.G NO:32460ILG005722 ,Dated:21/09/2022 ,Rs.94,49,900/- issued by Punjab National Bank -Raipur valid up to 21.03.2023 (iii) One Original Bank Verified Copy of above mentioned B.G.**
(5) O.S/CON/BILL/BSP with one True Copy of Contract Agreement **NO:456/IB-FLY OVER/CEC/SECR/2023 , Date:22/03/2023**for your necessary action.

Encl: As above.

कृते उप-मुख्य अभियंता (निर्माण)/बी.एस.पी.,
ForDy.ChiefEngineer/Con/BSP,
दक्षिण पूर्व मध्य रेल्वे , बिलासपुर
S.E.C.Railway, Bilaspur

Contract Agreement No.	456 /IB-FLY OVER/ CEC/SECR/2023.
Name and Address of the Contractor (s)	M/s RSA-SK JV Shri Shyam Tower Kavita Nagar, Main Road, Avanti Vihar Raipur, Chhattisgarh-492001
Name & place of work	Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.
Approximate value of contract	Rs 175,53,24,134.63 (Rs. One Hundred Seventy Five Crore Fifty Three Lakhs Twenty Four Thousand One Hundred Thirty Four and Sixty Three paise).
Date of completion	30 (Thirty months) i.e. from 03.11.2022 upto 03.05.2025
Chargeable Estimate No:	Modified RE/FLY OVER/IB/2020

मुख्य इंजीनियर (निर्माण) /I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

Draft Agn

SOUTH EAST CENTRAL RAILWAY (CONSTRUCTION BRANCH)

Contract Agreement No.	456 /IB-FLY OVER/CEC/SECR/2023. 628
Approximate value of contract	Rs 175,53,24,134.63 (Rs. One Hundred Seventy Five Crore Fifty Three Lakhs Twenty Four Thousand One Hundred Thirty Four and Sixty Three paise).
Initial S. D.	94,49,900/-
Reference to Security Deposit	As you have submitted an amount of Rs 94,49,900/- vide BG NO. 32460ILG005722 dated 21.09.2022 issued by Punjab National Bank, Raipur vaid upto 21.03.2023 (claim expiry date 21.06.2023).
Performance Gaurantee	Rs 5,26,59,724/-
Performance Gaurantee Ref:	BG NO. 32460ILG006822 dated 23.11.2022 issued by Punjab National Bank, Raipur vaid upto 22.08.2025 (claim expiry date 22.11.2025).
Name & place of work	Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.

ARTICLES OF AGREEMENT made this 22nd day of MARCH-2023 in the year Two thousand twenty three between the President of India acting in the premises through the Chief Engineer(Con)/I/BSP having his office at Bilaspur of the South East Central Railway Administration hereinafter called "The Railway" of the one part and M/s RSA-SK JV, Raipur hereinafter called the "Contractor" of the other part.

WHEREAS the contractor has agreed with the Railway during the period mentioned in the annexed Additional Special Conditions for the performance of such of the works named above and description in the said additional Special Conditions and at the rates as follows:-

(i) At Par with a rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "1".
(ii) 7% (Seven Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "2".
(iii) 5% (Five Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "3".
(iv) 10% (Ten Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "4".
(v) 10% (Ten Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "5".
(vi) 5% (Five Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "6".
(vii) At Par with a rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "7".
(viii) At Par with a rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "8".
(ix) 10% (Ten Percent) above with rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "9".

Signature of tenderer(s)/contractor(s)

Chief Engineer (Con)/I/BSP
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

VETTED
RSA-SK JOINT VENTURE
JOINT VENTURE PARTNER
For F A. & C.A.O. (Cons.)
S E C. Rly. Bilaspur (C.G.)

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
S.E.C. Railway, B

-2-

Draft Agt

(x) 5% (Five Percent) above with rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "10".

630

(xi) 8% (Eight Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "11".

(xii) 15% (Fifteen Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "12".

(xiii) 20% (Twenty Percent) above with rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "13".

(xiv) 15% (Fifteen Percent) above with rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "14".

(xv) 8% (Eight Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "15".

(xvi) 20% (Twenty Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "16".

(xvii) 10% (Ten Percent) above with rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "17".

Note: Accepted rates of Schedule 4, 5, 8,10,12, 14, 13, 15, 16 & 17 should not be referred in future tenders in isolation.

The Indian Railway Standard General Conditions of Contract, April-2022 and the Special Conditions/Specifications of works and SEC Railway Schedule of Labour & Material Rates (Revised Edition – 2006) Volume-I , South East Central Railway Unified Standard Schedule of Rates-2010 (Works & materials) of Engineering Department & Indian Railways Unified Standard Specifications (Works & materials) volume I & II of the year 2010 Up to date Correction Slip issued till opening of tender, the contents of which have been read and fully understood by the Contractor as forming part of this agreement and the Additional Conditions and Special Specifications annexed hereto and whereas the performance of the said works is an act in which the public are interested.

NOW THE INDENTUE WITNESSTH that in consideration of the payment to be made by the Railway, the Contractor will duly perform the said works mentioned in the said work order and shall execute the same with great promptness, care and accuracy in a workman like manner to the satisfaction of the Railway and will complete the same in accordance with the said specifications and said drawings and same conditions of contract on or before the time specified in the annexed Additional Special Conditions and/or in the work orders and will attend subsequent modifications in plans and drawings free of cost and submit with in the specified time limit and will observe, fulfill and keep all the conditions therein mentioned (which shall be deemed and taken to be part of this contract as if the same has been fully set forth herein and the railway doth here by agree that if the contractor shall duly perform the said works in the manner aforesaid and observe and keep the said terms and conditions, the railway will pay or cause to be paid to the contractor for the said works on the final completion thereof the amount due in respect thereof at the rates specified in the schedule referred to above.

D.A 1) Schedule '1' to '17' , Instruction to tenderer(s) and contractor(s),Rate sheet, General conditions of contract, Special conditions of contract etc.

Chief Engineer(Con)/I/BSP
FOR & ON BEHALF OF THE PRESIDENT OF INDIA.

M/s RSA-SK JV, Shri Shyam Tower
Kavita Nagar, Main Road, Avanti Vihar
Raipur, Chhattisgarh-492001

Name & address of witness.

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

Draft Agrt

SOUTH EAST CENTRAL RAILWAY

(CONSTRUCTION ORGANIZATION)

TENDER DOCUMENT

Name of the work:- Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings. Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.

*****

TENDER NOTICE NO.: CEC/ BSP/22-23/19 dated: 25.08.2022

OPEN TENDER (TWO PACKET SYSTEM)

DATE AND TIME OF CLOSING OF TENDER BID : 15.00 Hours on 22.09.2022

Signature valid
Digitally signed by BIDHAN CHANDRA
Date: 12/09/2022 18:36:25
Reason: KEPS-CRIS
Location: New Delhi

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

कार्यालयन अधिकारी (निर्माण)

Draft Agt

For Chief Engineer(Con)/I/BSP
मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

TOP SHEET

TENDER NOTICE NO: CEC/ BSP/22-23/19 dated 25.08.2022

Name of the work:- Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.

Approx. Tender Value	₹18599.81 lakhs
Bid Security	₹94,49,900/-.
Cost of Tender Document	Nil
Period of completion	**Thirty (30) Months including monsoon.**
Tender closing date	Up to 15.00 Hrs on 22.09.2022
Tender Opening Date (Opening of technical bid)	15.30 Hrs on 22.09.2022

Note:

1.0. E-Tender forms are non-transferable and the same is to be submitted with digital signature by the tenderer already registered with the site.

2.0 The submitted e-tender will be considered as digitally signed by the tenderer as a confirmation from the tenderer that the tenderer has read, agreed and accepted all the conditions under laid down documents as well as Schedule of Tender, General and Special Conditions.

3.0 Inclusion of "Letter of Credit" as Mode of Payment in Works Tenders or Service Tenders, is applicable to this tender and copy of the same is uploaded in IREPS Portal. (Ref to Rly Boards Lr.No.- 2018/CE-I/CT/9 dated 04.06.2018.

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

For Chief Engineer(Con)/I/BSP

सहा. इंजीनियर (निर्माण)/I
Asstt. Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

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TENDER NOTICE No. CEC/BSP/2022-23/19 Dated 25.08.2022

E-tender with two packet system with **Two Stage Reverse Auction** is invited on behalf of the President of India, for execution of the following works from the intending contractors who fulfils the following eligibility criteria for the works as detailed below.

Name of work	Approximate value (₹)	Bid Security (₹)	Tender closing date	Completion period
Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.	₹18599.81 lakhs	₹94,49,900/-	22.09.2022	Thirty (30) months including Monsoon.

1.0 Eligibility Criteria:

1.1 Technical Eligibility Criteria:

Technical criterion: The tenderer must have successfully completed or substantially completed any one of the following categories of work(s) during last 07 (seven) years, ending last day of month previous to the one in which tender is invited:

- Three similar works each costing not less than the amount equal to 30% of advertised value of each component of the tender.

OR

- Two similar works each costing not less than the amount equal to 40% of advertised value of each component of the tender.

OR

- One similar work costing not less than the amount equal to 60% of advertised value of each component of the tender.

Note: Separate completed works of minimum required values for each component shall also be considered for fulfillment of technical eligibility criteria.

For Technical eligibility purpose, the subject work is having three components having values more than Rs. 2.00 Crores each, i.e.

(A) Civil engineering works of Earthwork, Major and Minor Bridges, buildings, utility shifting works, Girder etc (Schedule '1' (Soil Testing – value as mentioned in the schedule against other than ROR works), Sch-2-(Earthwork); Sch-3- (Bridges- value as mentioned in the schedule against other than ROR works), Sch-4(N.S.Items - value as mentioned in the schedule against other than ROR works); Sch-5(Bridge works - value as mentioned in the schedule against other than ROR works); Sch-6 (Buildings etc); Sch-7 (Cement- value as

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mentioned in the schedule against other than ROR works), Sch-8 (Reinforcement - value as mentioned in the schedule against other than ROR works); Sch-9 (Girder work - value as mentioned in the schedule against other than ROR works); Sch-10(H Beam - value as mentioned in the schedule against other than ROR works), Sch-16 (Works under USSOR M-2010), Sch-17 (N.S. Items - value as mentioned in the schedule against other than ROR works) having value of Rs. 14859.00 Lakhs,

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(B) **Construction of ROR bridge:** (Schedule '1' (Soil Testing – value as mentioned in the schedule against ROR works), Sch-3- (Bridges- value as mentioned in the schedule against ROR works), Sch-4(N.S.Items - value as mentioned in the schedule against ROR works); Sch-5(Bridge works - value as mentioned in the schedule against ROR works); Sch-7 (Cement- value as mentioned in the schedule against ROR works); Sch-8 (Reinforcement - value as mentioned in the schedule against ROR works); Sch-9 (Girder work - value as mentioned in the schedule against ROR works); Sch-10(H Beam - value as mentioned in the schedule against ROR works), Sch-17 (N.S. Items - value as mentioned in the schedule against ROR works) having value of Rs. 2562.90 Lakhs

(C) **Execution of Track linking and related works:** Sch-11 (Linking works); Sch-12 (Welding of Rail Joints), Sch-13 (Transportation of Railway materials), Sch-14 (P.Way works - SOR-2006) and Sch-15 (Ballast supply) having value of Rs.1177.91 Lakhs.

Similar work for the purpose of Technical Eligibility Criteria, under Item no. 1.1 above, shall be as follows:

(i) Civil engineering works of Earthwork, Major and Minor Bridges, buildings, utility shifting works, Girder etc above, shall mean "Any Civil Engineering work having substantial quantum of earth work in excavation/ embankment and construction of bridges".

(ii) Similar work for the purpose of eligibility of 'Construction of ROR bridge, shall mean "Construction of Rail Over Rail/ Fly Over Bridge/ Road Over Bridge on running railway line and/or Road Under Bridge/ Limited Height Subway on Running Railway Line".

(iii) Similar work for the purpose of eligibility of 'Track linking work', shall mean "Permanent Way works with or without supply of ballast".

Note for item-1.1:

(i) Substantially completed work means an ongoing work in which payment equal to or more than 90% of the present contract value (excluding the payment made for adjustment of Price Variation (PVC), if any) has been made to the contractor in that ongoing contract and no proceedings of termination of contract on Contractor's default has been initiated. The credential certificate in this regard should have been issued not prior to 60 days of date of invitation of present tender.

(ii) Work experience certificate from private individual shall not be considered. However, in addition to work experience certificates issued by any Government Organisation, work experience certificate issued by Public Listed Company having average annual turnover of Rs.500 Crore and above in last three financial years excluding the current financial year,

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listed on National Stock Exchange or Bombay Stock Exchange, incorporated/ registered at least 5 years prior to the date of closing of tender, shall also be considered provided the work experience certificate has been issued by a person authorized by the Public listed Company to issue such certificates.

In case tenderer submits work experience certificate issued by public listed company, the tenderer shall also submit along with work experience certificate, the relevant copy of work order, bill of quantities, bill wise details of payment received duly certified by Chartered Accountant, TDS certificates for all payments received and copy of final/last bill paid by company in support of above work experience certificate.

Offers submitted by Joint Venture are permitted.

Eligibility criteria for Joint Venture Firms:

Technical, financial eligibility and Bid capacity of the JV shall be adjudged based on satisfactory fulfilment of the following criteria:

Technical Eligibility Criteria:

The technical eligibility for major component of work as per para-1.1 above, shall be satisfied by either the 'JV in its own name & style' or 'Lead member of the JV' and technical eligibility for other component(s) of work as per para 1.1 above , shall be satisfied by either the 'JV in its own name & style' or 'any member of the JV'. Each **other** (non-lead) member(s) of JV, who is/are not satisfying the technical eligibility for any component of the work as per para 1.1 above, shall have technical capacity of minimum 10% of the cost of any component of work mentioned in technical eligibility criteria, i.e., each non-lead member of must have satisfactorily completed or substantially completed during the last 07 (seven) years, ending last day of month previous to the one in which tender is invited, one similar single work for a minimum of 10% of cost of any component of work mentioned in technical eligibility criteria.

Note:- (i)The major component of the work for this purpose shall be the component of work having highest value. In case where value of two or more component of work is same, any one work can be classified as Major component of work.

(ii)Value of a completed work done by a Member in an earlier JV shall be reckoned only to the extent of the concerned member's share in that JV for the purpose of satisfying his/her compliance to the above mentioned technical eligibility criteria in the tender under consideration.

1.2 Financial Eligibility Criterion: The tenderer must have minimum average annual contractual turnover of V/N or 'V' whichever is less; where

V=Advertised value of the tender in Crores of Rupees.

N=Number of years prescribed for completion of work for which bids have been invited.

The average annual contractual turnover shall be calculated as an average of "total contractual payments" in the previous three financial years, as per the audited balance sheet. However, in case balance sheet of the previous year is yet to be prepared/audited,

the audited balance sheet of the fourth previous year shall be considered for calculating average annual contractual turnover.

The tenderer shall submit requisite information as per Annexure-VI, along with copies of Audited Balance Sheets duly certified by the Chartered Accountant/Certificate from Chartered Accountant duly supported by Audited Balance Sheet.

Financial Eligibility Criteria (For Joint Venture Firm):

The JV shall satisfy the requirement of "Financial Eligibility" mentioned at para-1.2 above. The "financial capacity" of the lead member of JV shall not be less than 51% of the financial eligibility criteria mentioned at para-1.2 above. The arithmetic sum of individual "financial capacity" of all the members shall be taken as JV's "financial capacity" to satisfy this requirement.

Note:- Contractual payment received by a Member in an earlier JV shall be reckoned only to the extent of the concerned member's share in that JV for the purpose of satisfying compliance of the above mentioned financial eligibility criteria in the tender under consideration.

1.3. **Bid Capacity**: For tenders having advertised value more than Rs.20 Crore wherein eligibility criteria includes bid capacity also, the tenderer will be qualified only if its available bid capacity is equal to or more than the total value of the present tender. The available bid capacity shall be calculated as under:-

Available Bid Capacity = [A x N x 2] (-)0.33 x N x B

Where-

A = Maximum value of construction works executed and payment received in any one of the previous three financial years or the current financial year (up to date of inviting tender), taking into account the completed as well as works in progress.

N = Number of years prescribed for completion of work for which bids has been invited.

B = Existing commitments and balance amount of ongoing works with tenderer as per the prescribed proforma of Railway for statement of all works in progress and also the works which are awarded to tenderer but yet not started upto the date of inviting of tender.

NOTE:-

(a) The Tenderer (s) shall furnish the details of –

(i) Maximum value of construction works executed and payment received in any one of the previous three financial years or the current financial year (up to date of inviting tender) for calculating A and.

(ii) Existing commitments and balance amount of ongoing works with tenderer as per the prescribed proforma of Railway for statement of all works in progress and also the works which are awarded to tenderer but yet not started up to the date of inviting of tender for calculating B. In case of no works in hand, a 'NIL' statement should be furnished.

The submitted details for (i) and (ii) above should be duly verified by Chartered Accountant.

(b) In case if a bidder is JV, the tenderer (s) must furnish the details of

(i) Maximum value of construction works executed and payment received in any one of the previous three financial years or the current financial year (up to date of inviting tender) by each member of JV for calculating 'A', and

(ii) Existing commitment and balance amount of ongoing work with each member of JV either in individual capacity or as a member of other JV as per the prescribed proforma of Railway for statement of all works in progress and also the works which are awarded to each member of JV either in individual capacity or as a member of other JV but yet not started up to the date of inviting of tender for calculating 'B'. In case of no works in hand a 'NIL' statement should be furnished.

The submitted details for (i) and (ii) above should be duly verified by Chartered Accountant.

(c) Value of a completed work/work in progress/work awarded but yet not started for Member in an earlier JV shall be reckoned only to the extent of the concerned member's share in that JV for the purpose of satisfying his / her compliance to the above mentioned bid capacity in the tender under consideration.

(d) The arithmetic sum of individual "bid capacity" of all the members shall be taken as JV's "bid capacity".

(e) In case, the tenderer/s failed to submit the above statement along with offer, their/ his offer shall be considered as incomplete **and will be Rejected Summarily.**

(f) The available bid capacity of tenderer shall be assessed based on the details submitted by the tenderer. In case, the available bid capacity is lesser than estimated cost of work put to tender, his offer shall not be considered even if he has been found eligible in other eligibility criteria /tender requirement.

Bid Capacity for Joint Venture Firm:- The JV shall satisfy the requirement of "Bid Capacity" requirement mentioned at para-1.3 of NIT. The arithmetic sum of individual "Bid capacity" of all the members shall be taken as JV's "Bid capacity" to satisfy this requirement.

NOTE:- Date of inviting tender shall be the date of publishing tender notice on IREPS website.

1.4 Credentials if submitted in foreign currency shall be converted into Indian currency i.e., Indian Rupee as under:

The conversion rate of US Dollars into Rupees shall be the daily representative exchange rates published by the Reserve Bank of India or entity authorized by RBI to do so for the relevant date or immediately previous date for which rates have been published. Where, relevant date shall be as on the last day of month previous to the one in which tender is invited. In case of any other currency, the same shall first be converted to US Dollars as on the last day of month previous to the one in which tender is invited, and the amount so derived in US Dollars shall be converted into Rupees at the aforesaid rate. The conversion rate of such currencies shall be the daily representative exchange rates published by the International Monetary Fund for the relevant date or immediately previous date for which rates have been published.

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Explanation for clause 1 including clause-1.1 to 1.4 - Eligibility Criteria:

1. Substantially completed work means an ongoing work in which payment equal to or more than 90% of the present contract value {excluding the payment made for adjustment of Price Variation (PVC), if any} has been made to the contractor in that ongoing contract and no proceedings of termination of contract on Contractor's default has been initiated. The credential certificate in this regard should have been issued not prior to 60 days of date of invitation of present tender.

2. *In case a work is started prior to 07 (seven) years, ending last day of month previous to the one in which tender is invited, but completed in last 07 (seven) years, ending last day of month previous to the one in which tender is invited, the completed work shall be considered for fulfilment of credentials.*
3. *If a work is physically completed and completion certificate to this extent is issued by the concerned organization but final bill is pending, such work shall be considered for fulfilment of credentials.*
4. *In case of completed work, the value of final bill (gross amount) including the PVC amount (if paid) shall be considered as the completion cost of work. In case final bill is pending, only the total gross amount already paid including the PVC amount (if paid) shall be considered as the completion cost of work.*
   In case of substantially completed work, the total gross amount already paid including the PVC amount (if paid), as mentioned in the certificate, shall be considered as the cost of substantially completed work.
5. *If a bidder has successfully completed a work as subcontractor and the work experience certificate has been issued for such work to the subcontractor by a Govt. Organization or Public listed company as defined in Note for item-1.1 above, the same shall be considered for the purpose of fulfilment of credentials.*

6. *In case a work is considered similar in nature for fulfiiment of technical credentials, the overall cost including the PVC amount (if paid) of that completed work or substantially completed work, shall be considered and no separate evaluation for each component of that work shall be made to decide eligibility.*
7. *In case of newly formed partnership firm, the credentials of individual partners from previous propriety firm(s) or dissolved previous partnership firm(s) or split previous partnership firm(s), shall be considered only to the extent of their share in previous entity on the date of dissolution / split and their share in newly formed partnership firm. For example, a partner ,A had 30% share in previous entity and his share in present partnership firm is 20%. In the present tender under consideration, the credentials of partner A will be considered to the extent of 0.3*0.2*value of the work done in the previous entity. For this purpose, the tenderer shall submit along with his bid all the relevant documents which include copy of previous partnership deed(s), dissolution deed(s) and proof of surrender of PAN No.(s) in case of dissolution of partnership firm(s) etc.*
8. *In case of existing partnership firm, if any one or more partners quit the partnership firm, the credentials of remaining partnership firm shall be re-worked out i.e., the quitting partner(s) shall take away his credentials to the extent of his share on the date of quitting the partnership firm (e.g. in a partnership firm of partners A, B & C having share 30%, 30% & 40% respectively and credentials of Rs.10 crore; in case partner C quits the firm, the credentials of this partnership firm shall remain as Rs.6*

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crore). For this purpose, the tenderer shall submit along with his bid all the relevant documents which include copy of previous partnership deed(s), dissolution deed(s) and proof of surrender of PAN No.(s) in case of dissolution of partnership firm(s) etc.

9. In case of existing partnership firm if any new partner(s) joins the firm, without any modification in the name and PAN/TAN No of the firm, the credentials of partnership firm shall get enhanced to the extent of credentials of newly added partner(s) on the same principles as mentioned in item-6 above. For this purpose, the tenderer shall submit along with his bid all the relevant documents which include copy of previous partnership deeds, dissolution/splitting deeds and proof of surrender of PAN No.(s) in case of dissolution of partnership firm etc.
10. Any partner in a partnership firm cannot use or claim his credentials in any other firm without leaving the partnership firm i.e., in a partnership firm of A&B partners, A or B partner cannot use credentials of partnership firm of A&B partners in any other partnership firm or propriety firm without leaving partnership firm of A&B partners.
11. In case a partner in a partnership firm is replaced due to succession as per succession law, the proportion of credentials of the previous partner will be passed on to the successor.
12. If the percentage share among partners of a partnership firm is changed, but the partners remain the same, the credentials of the firm before such modification in the share will continue to be considered for the firm as it is without any change in their value. Further, in case a partner of partnership firm retires without taking away any credentials from the firm, the credentials of partnership firm shall remain the same as it is without any change in their value.
13. In a partnership firm "AB" of A&B partners, in case A also works as propriety firm "P" or partner in some other partnership firm "AX", credentials of A in propriety firm "P" or in other partnership firm "AX" earned after the date of becoming a partner of the firm AB shall not be added in partnership firm "AB"
14. In case a tenderer is LLP, the credentials of tenderer shall be worked out on above lines similar to a partnership firm.
15. In case company 'A' is merged with company 'B', then company 'B' would get the credentials of company 'A' also.

2. Tenderer Credentials:

Documents testifying tenderer previous experience and financial status should be produced along with the tender.

Tenderer(s) who is / are not borne on the approved list of the Contractors of South East Central Railway (Construction organization) shall submit along with his / their tender:

(i) Certificates and testimonials regarding contracting experience for the type of job for which tender is invited with list of works carried out in the past.

(ii) Audited Balance Sheet duly certified by the Chartered Accountant regarding contractual payments received in the past.

(iii) The list of personnel / organization on hand and proposed to be engaged for the tendered work. Similarly list of Plant & Machinery available on hand and proposed to be inducted and hired for the tendered work.

(iv) A copy of certificate stating that they are not liable to be disqualified and all their statements/documents submitted along with deed are true and factual. Standard

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format of the certificate to be submitted by the bidder is enclosed as Annexure-II. Non submission of a certificate by the bidder shall result in **Summarily Rejection** of his/their bid. It shall be mandatorily incumbent upon the tenderer to identify, state and submit the supporting documents duly self-attested/digitally signed by which they/he are/is qualifying the Qualifying Criteria mentioned in the Tender Document.

(v) The Railway reserves the right to verify all statements, information and documents submitted by the bidder in his tender offer, and the bidder shall, when so required by the Railway, make available all such information, evidence and documents as may be necessary for such verification. Any such verification or lack of such verification, by the Railway shall not relieve the bidder of its obligations or liabilities hereunder nor will it affect any rights of the Railway there under.

(vi) (a) In case of any information submitted by tenderer is found to be false forged or incorrect at any time during process for evaluation of tenders, it shall lead to forfeiture of the tender Bid Security besides banning of business for a period of upto five years.

(b) In case of any information submitted by tenderer is found to be false forged or incorrect after the award of contract, the contract shall be terminated. Bid Security, Performance Guarantee and Security Deposit available with the railway shall be forfeited. In addition, other dues of the contractor, if any, under this contract shall be forfeited and agency shall be banned for doing business for a period of upto five years.

(vii) Declaration or An undertaking from the tenderer(s) that he is not blacklisted or debarred by Railways or any other Ministry / Department of Govt. of India from participation in tender on the date of opening of bids, either in individual capacity or as a member of the partnership firm or JV in which he or JV in which HUF was / is a partner/member. Concealment / wrong information in regard to above shall make the contract liable for determination under Clause-62 of the General Conditions of Contract.

(viii) PAN Card details- copy of PAN Card to be submitted

(ix) Bank A/c details of the tenderer(s):- Any payment to the contractor/tenderer including releasing of the EMD of un-successful tenderer(s) will be done through electronic transfer for which the tenderer/contractor must furnish the following details-

Sl. No.	Items	Details to be Furnished
1.	Name of the Account Holder	
2.	Name of the Bank	
3.	Branch of Bank and full address	
4.	Account Number as appearing in the Cheque Book	
5.	RTGS/IFSC Code	
6.	Account Type (i.e. Current or Saving)	

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Railway, Bilaspur

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Chief Engineer (Con.)/I

S.E.C. Railway, Bilaspur

Note:- Non-compliance with any of the conditions set forth therein above is liable to result in the tender being rejected.

3. **Bid Security:** Tender must be accompanied with Bid Security of requisite amount as mentioned in NIT deposited through Internet Banking or e-payment gateway only or submitted as Bank Guarantee bond (Format enclosed) from a Scheduled commercial bank of India. The Bank Guarantee shall be valid for a period of 90 days beyond the bid validity period. The scanned copies of the instruments are to be uploaded with tender document. Tenders not accompanied by requisite amount of Bid Security in acceptable form, will be **'Summarily Rejected'** and no correspondence what-so-ever will be entertained on this account. In case, submission of Bid Security in the form of Bank Guarantee, following shall be ensured:

(i) **A scanned copy of the Bank Guarantee shall be uploaded on e-Procurement Portal (IREPS) while applying to the tender.**

(ii) **The original Bank Guarantee should be delivered in person to the office of Chief Administrative Officer/Con/Bilaspur, Near Jagmal Chowk, Bilaspur within 05 (Five) working days of deadline of submission of Bids.**

(iii) **Non submission of scanned copy of Bank Guarantee with the bid on e-tendering portal** (IREPS) and/or non submission of original Bank Guarantee within the specified period shall **lead to 'Summarily Rejection' of bid.**

(iv) **The Tender Security shall remain valid for a period of 90 days beyond the validity period for the tender.**

(v) **The details of the BG physically submitted should match with the details available in the scanned copy and the data entered during bid submission time, failing which the bid will be rejected.**

(vi) **The Bank Guarantee shall be placed in an envelope, which shall be sealed. The envelope shall clearly bear the identification "Bid For the ****** Project" and shall clearly indicate the name and address of the bidder. In addition, the bid due date should be indicated on the Right Hand Top Corner of the envelope.**

(vii) **The envelope shall be addressed to the officer and address as mentioned in the tender document (Chief Engineer/Con/I/SECR/Bilaspur).**

(viii) **If the envelope is not sealed and marked as instructed above, the Railway assumes no responsibility for the misplacement or pre mature opening of the contents of the bid submitted and consequent losses, if any, suffered by the bidders.**

NOTE:-

(i) The Bid Security shall be rounded-off to the nearest ₹100. This Bid Security shall be applicable for all modes of tendering.

(ii) Any firm recognized by Department of Industrial Policy and Promotion (DIPP) as **'Startups'** shall be exempted from payment of Bid Security, as detailed above, on submission of Registration Certificate issued by appropriate authority.

(iii) Labour Cooperative Societies shall submit only 50% of above Bid Security detailed above.

(iv) Any other firms including MSME/NSIC registered firms, Government owned PSU (Public Sector Undertakings) shall have to deposit the requisite amount of Bid Security for this instant tender.

0 Documents mentioned & as required to be submitted with the offer which have been detailed in Chapter-II of the tender document.

5.0 The last date and time of submission tender: Upto 15.00 hours on 22.09.2022.

6.0 Date and time of opening of technical bid: At 15.30 hrs on 22.09.2022.

7.0 Completion period for the work is Thirty (30) months including monsoon.

8.0 Price variation clause : Price variation clause (PVC) will be applicable under this contract.

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

Draft Agmt

For Chief Engineer(Con)/I/BSP

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CHAPTER – I

INSTRUCTION TO TENDERER(S)

1. **General**

1.1 E-tender has been invited for and on behalf of the President of India through website www.ireps.gov.in for the work mentioned against the tender notice number available in the website. Tenderers are to bid online only in the above mentioned website. No Manual offer is acceptable against this tender. No Tender document in hard copy will be sold against this tender. Please read the Instructions to Tenderers for e-tendering, Indian Railway Standard General Conditions of Contract, April-2022, Special Conditions of Contract before filling the e-tender through online.

1.2 E-Tender forms are not transferable and the same is to be submitted with digital signature by the Tenderer already registered with the site.

1.3 The submitted e-tender forms will be considered as digitally signed by the tenderer as a confirmation from the tenderer that the tenderer has read, agreed and accepted all the conditions and laid down documents, as well as Schedule of Tender, General and Special Conditions.

1.4 The tender offer complete in all respect and with all documents is to be submitted online by e-tendering process through the website **www.ireps.gov.in** before the closing time/date of this tender as mentioned in the NIT (Notice Inviting Tender). Tenderer can revise the bids any number of times till the closing time/date of the tender. No manual offers shall be accepted.

1.5 The Railway may, of its' own or in response to any clarification requested/suggested by any person including that from the tenderer, may modify this tender document at its sole discretion at least 15 days before the due date of closing of the tender as corrigendum.

1.6 Corrigendum as required may be issued at least 15 days prior to the closing of the tender. These corrigenda of this tender, if any, as issued time to time will be available on website at least 15 days in advance of closing of tender. The tenderers are requested to check the website before submitting their offer whether any such corrigendum to the tender has been issued or not and revise the offer if required accordingly failure on the part of tender on this aspect will be solely tenderers responsibiiity.

1.7 This document is the Standard Tender Document which consists of the Instruction to the Tenderers, NIT (Notice Inviting Tender), General Conditions of the Tender, Special conditions of the tender, Tender schedules, Specifications of the works & various Annexures, drawings etc. All the above mentioned documents taken together shall constitute the complete tender document hereafter referred to as "Tender Document" and have to be read together and acted upon accordingly. No part of the tender document can be relied upon or acted upon in isolation.

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

कार्यपालन अभियंता (निर्माण) Executive Engineer (Con) दक्षिण पूर्व मध्य रेल S.E.C. Railway, Bilaspur

मु. अभियंता (निर्माण)/ Engineer (Con.)/ द. पू. म. रेलवे, बिलासपुर S.E.C. Railway, Bilaspur

1.8 The Railway and the website will have no responsibility for incorrect evaluation of cost and thereby incorrect cost of work and ranking of tenderers, if the schedule is not filled in correctly and unambiguously for each item. No claim or clarification of a tenderer regarding applicability, inclusion or exclusion of any element of tax or duty or any other change in the offer subsequently (after closing of the tender) will be entertained. For this the tenderers are advised to read the Instructions, General Conditions, Special Conditions and other Instructions carefully before submission of tender.

1.9 In case of any problem with the portal is faced while filling the e-tender, Tenderers are advised to contact with the Helpdesk of IREPS portal who will render all help and assistance related with the website and portal except that related with the details of the tender. Railway will not take any responsibility for non-participation in the e-tender online for the reasons related to the website and portal or server etc beyond the control of railways.

1.10 Railway and the IREPS website will not take the responsibility for any online payment made by the tenderer and debited from his/their account towards the tender cost or Earnest Money due to wrong or manipulation of the menus or any reasons related with the IT or found unsuitable for the tender etc. Railway and IREPS website will not entertain any claim in this regard or refund the paid amount.

1.11 The tenderer shall submit a copy of certificate stating that all their statements/documents submitted along with deed are true and factual. Standard format of Certificate to be submitted by the bidder is enclosed as **Annexure-II**. Non submission of above certificate by the bidder shall result in **Summarily Rejection** of his/their bids. It shall be mandatorily incumbent upon the tenderer to identify, state and submit the supporting documents duly self-attested/digitally signed by which they/he is qualifying the Qualifying Criteria mentioned in the Tender document.

1.12 With the submission of the certificate as mentioned above, the practice of verification of tenderer's documents by the Railway may be dispensed with. However, the Railway reserves the right to verify all statements, information and documents submitted by the bidder in his tender offer, and the bidder shall, when so required by the Railway, make available all such information, evidence and documents as may be necessary for such verification. Any such verification or lack of such verification, by the railway shall not relieve the bidder of its obligations or liabilities hereunder nor will it affect any rights of the railway there under.

2. **Inspection of drawings**

Drawings for the work can be seen in the office inviting this tender on any working day during working hours. The drawings are only for the guidance of tenderers. Detailed working drawings, if required based on the drawings mentioned above, will be given by the Engineer or his representative from time to time.

3. **Omissions and Discrepancies**

Should a tenderer find discrepancies in or omissions from the drawings or any of the Tender Forms or should he be in doubt as to their meaning, he should at once notify the authority inviting tenders. The tender inviting authority may, if deemed necessary, clarify the same to all tenderers. It shall be understood that every endeavour has been made to avoid any error

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which can materially affect the basis of tender and successful tenderer shall take upon himself and provide for the risk of any error which may subsequently be discovered and shall make no subsequent claim on account thereof.

4. Opening of E-tender:-

4.1 The e-tenders will be opened online using the IREPS portal. No representative is required to be present for opening of tender and details of rates quoted and ranking of all the bidders etc. shall be available to the bidders in the website after the opening of the tender.

4.2 In case the date of closing mentioned in the Notice Inviting Tender is declared a holiday/bandh/strike etc. on any account, the date of closing tender online will not be changed as the application in the website of IREPS does not permit submission of any offer after closing date and time of the tender. However, opening of tenders online will be on any convenient day after the closing date/time of tenders.

4.3 Tender with any special conditions may not be considered.

4.4 The tenderer(s) shall quote single percentage rate for each schedule on the rate sheet given in tender document indicating above or below or at Par and same shall be uniformly applicable on all individual items of tender schedule.

5. Validity of Offer

The Tenderer(s) shall keep the offer open for a minimum period of 45 days (in case of two packet system of tendering 60 days) from the date of opening of the Tender. It is understood that the tender documents have been issued to the Tenderer(s) and the Tenderer(s), is / are permitted to tender in consideration of the stipulation on his / their part that after submitting his / their tender subject to the period being extended further, if required by mutual agreement from time to time, he will not resile from his offer or modify the terms and conditions thereof in a manner not acceptable to the Chief Engineer/Dy. Chief Engineer/Divisional Engineer of South East Central Railway. Should the tenderer fail to observe or comply with the foregoing stipulation, the amount deposited as Earnest Money for the due performance of the above stipulation, shall be forfeited to the Railway.

6. Acknowledgement by Tenderers

It shall be deemed that by submitting the tender, the Tenderer has:

(a) made a complete and careful examination of the tender Document;

(b) received all relevant information requested from the Railway;

(c) acknowledged and accepted the risk of inadequacy, error or mistake in the information provided in the tender document or furnished by or on behalf of the Railway;

(d) acknowledged and agreed that inadequacy, lack of completeness or incorrectness of information provided in the tender document, hereinabove shall not form a basis for any claim for compensation, damages, extension of time for performance of its obligations, loss of profits etc. from the Railway, or a ground for termination of the Contract;

(e) agreed to be bound by the undertaking provided by it under and in terms hereof.

7. Care in Submission of Tenders:

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(a) (i) Before submitting a tender, the tenderer will be deemed to have satisfied himself by actual inspection of the site and locality of the works, that all conditions liable to be encountered during the execution of the works are taken into account and that the rates he enters in the tender forms are adequate and all inclusive to accord with the provisions in Clause-37 of the Standard General Conditions of Contract for the completion of works to the entire satisfaction of the Engineer.

(a)(ii) Tenderers will examine the various provisions of The Central Goods and Services Tax Act'2017(CGST)/ Integrated Goods and Services Tax Act'2017(IGST)/ 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 before bidding. Tenderers will ensure that full benefit of Input Tax Credit (ITC) likely to be availed by them is duly considered while quoting rates.

(a)(iii) The successful tenderer who is liable to be registered under CGST/IGST/UTGST/SGST Act shall submit GSTIN along with other details required under CGST/IGST/UTGST/SGST Act to railway immediately after the award of contract, without which no payment shall be released to the Contractor. The Contractor shall be responsible for deposition of applicable GST to the concerned authority.

(a)(iv) In case the successful tenderer is not liable to be registered under CGST/IGST/UTGST/ SGST Act, the railway shall deduct the applicable GST from his/their bills under reverse charge mechanism (RCM) and deposit the same to the concerned authority.

(b) When work is tendered for by a firm or company, the tender shall be signed by the individual legally authorized to enter into commitments on their behalf.

(c) The Railway will not be bound by any power of attorney granted by the tenderer or by changes in the composition of the firm made subsequent to the execution of the contract. It may, however, recognize such power of attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the Contractor.

8. Clarification on Bid

8.1 To assist in the examination, evaluation & comparison and pre-qualification of the Tender, the Railway may, at its discretion, ask any Bidder for a clarification of its Bid. Any clarification submitted by a Bidder that is not in response to a request by the Railway shall not be entertained or considered. The Railway request for clarification and the response of the bidder in this regard shall be in writing.

8.2 However, if a Bidder does not provide clarification of its bid by the date and time communicated in the Railway request for clarification, the bid shall be evaluated as per the documents submitted along with the bid.

9.0 Award of work

After selection, a Letter of Acceptance (the "LOA") shall be issued, in duplicate, by the Railway to the selected tenderer and the selected tenderer shall, within 10 (ten) days of the issue of the LOA, sign and return the duplicate copy of the LOA in acknowledgement thereof. In case the duplicate copy of the LOA duly signed by the selected tenderer is not received by the stipulated date, the Railway may, unless it consents to extension of time for submission thereof, forfeit and appropriate the EMD of such tenderer in full on account of failure of the selected tenderer to acknowledge the LOA, and cancel the LOA.

10. Execution of Contract Document-

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The tenderer whose tender is accepted shall be required to appear in person at the office of Chief Administrative Officer (Construction)/SECR or concerned Engineer, as the case may be, or if tenderer is firm or corporation, a duly authorised representative shall appear (there would be no need for appear in person if agreement is signed digitally) and execute the contract agreement within seven days of notice from Railway that the Contract Agreement is ready. Failure to do so shall constitute a breach of the agreement affected by the acceptance of the tender. The Contract Agreement shall be entered into by Railway only after submission of valid Performance Guarantee by the Contractor. In such cases the Railway may determine that such tenderer has abandoned the contract and thereupon his tender and acceptance thereof shall be treated as cancelled and the Railway shall be entitled to forfeit the full amount of the Bid Security and other dues payable to the Contractor under this contract. The failed Contractor shall be debarred from participating in the re-tender for that work.

11. **Novation Agreement-** The contractor(s) has to sign the Novation Agreement in addition to the contract agreement signed vide clause 11 above. Format of Standard Novation Agreement is given at Annexure- IV. This novation agreement is applicable to the works chargeable to EBR-IF fund. This novation agreement will be signed by (i) the Railway (ii) the Contractor and (iii) Indian Railway Finance Corporation Limited. As per Novation Agreement, the invoices shall be issued by capturing GSTIN of contractor (as the supplier) and GSTIN of IRFC (as the bill-to party). Also the contractor shall submit the invoice (2 copies), issued in the name of IRFC, to Railway for processing payment by Railway to contractor subject to applicable TDS under Income Tax, GST or any other applicable laws. IRFC shall be responsible to comply with Income Tax and GST laws in relation to filling of returns.

12. **Right of the Railway to deal with Tender:** The Railway reserves the right of not to invite tenders for any of Railway works or to invite open or limited tenders and when tenders are called to accept a tender in whole or in part or reject any tender or all tenders without assigning reasons for any such action. In case if tender is accepted in part by Railway Administration, Letter of Acceptance shall be issued as counter offer to the Tenderer, which shall be subject to acceptance by the Tenderer.

12.a. **Make in India Policy**: Provisions of Make in India Policy'2017 issued by Govt. o India, as amended from time to time, shall be followed for consideration of tenders.

12.b. **Permission to Bid for a bidder from a country which shares Land boundary with India**: Any bidders from the countries sharing a land border with India will be eligible to bid in any procurement of works (including turnkey projects) only if the bidder is registered with the Competent Authority. The Competent Authority for registration will be the Registration Committee constituted by the Department of Promotion of Industry and Internal Trade (DPIIT), Government of India. For interpretation of this para, Department of Expenditure, Ministry of Finance, Government of India letter F.No.6/18/2019-PPD dated 23.07.2020 shall be referred.

13. **Fraud and Corrupt Practices**

The Tenderers and their respective employees shall observe the highest standard of ethics during the selection process. Notwithstanding anything to the contrary contained in this tender document, the Railway shall reject a tender without being liable in any manner

whatsoever to the tenderer, if it determines that the tenderer has, directly or indirectly or through an agent, engaged in corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practice in the selection process. In such an event, the Railway shall, without prejudice to its any other rights or remedies, forfeit and appropriate the EMD or Security Deposit, as the case may be. For the purposes of this clause, the following terms shall have the meaning hereinafter respectively assigned to them:

(a) "corrupt practice" means (i) the offering, giving, receiving, or soliciting, directly or indirectly of anything of value to influence the action of any person connected with the selection process (for avoidance of doubt, offering of employment to or employing or engaging in any manner whatsoever, directly or indirectly, any official of the Railway who is or has been associated in any manner, directly or indirectly with the selection process or the LOA or has dealt with matters concerning the contract or arising there from, before or after the execution thereof, at any time prior to the expiry of one year from the date such official resigns or retires from or otherwise ceases to be in the service of the Railway, shall be deemed to constitute influencing the actions of a person connected with the Selection Process; or (ii) engaging in any manner whatsoever, whether during the selection process or after the issue of the LOA or after the execution of the contract, as the case may be, any person in respect of any matter relating to the Project(s) or the LOA or the Contract, who at any time has been or is a contractor of the Railway in relation to any matter concerning the Project(s);

(b) "fraudulent practice" means a misrepresentation or omission of facts or disclosure of incomplete facts, in order to influence the selection process;

(c) "coercive practice" means impairing or harming or threatening to impair or harm, directly or indirectly, any persons or property to influence any person's participation or action in the selection process;

(d) "undesirable practice" means (i) establishing contact with any person connected with or employed or engaged by the Railway with the objective of canvassing, lobbying or in any manner influencing or attempting to influence the Selection Process; or (ii) having a Conflict of Interest; and

(e) "restrictive practice" means forming a cartel or arriving at any understanding or arrangement among tenderers with the objective of restricting or manipulating a full and fair competition in the selection process.

14. **Other Instructions:**

i) The instructions to the Tenderer(s) shall be deemed to form a part of the tender document.

ii) It is desirable that Tenderer(s) should have a copy of USSOR-2010, Indian Railway Standard General Conditions of Contracts–April-2022 and tenderer have gone through all the conditions of contract and specifications etc. embodied therein. The copy of USSOR-2010 and Indian Railway Standard General Conditions of Contracts–April-2022 can be obtained on payment of an amount specified for copy of each Volume on any working day during office hours, subject to availability, in the office of General Manager (Engineering), S.E.C.Railway, Bilaspur. Further, the copy of Indian Railway Standard General Conditions of Contracts –April-2022 and the correction slips can be downloaded from web site www.indianrailways.gov.in.

iii) South East Central Railway does not bind itself to accept the lowest or any other tender nor does it undertake to assign reason for declining to consider the Tender.

Signature of Tenderer(s)/Contractor(s) 19 For Chief Engineer(Con)/I/BSP

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JOINT VENTURE PARTNER

कार्यपालन अभियंता (निर्माण)
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iv) The Railways reserve the right to accept the tender either for the full quantity of work or part thereof or divide the works amongst more than one tenderer(s) without assigning any reasons for any such actions.

v) Tender documents in which tenderer(s) submits offer on On-Line mode shall become the property of the Railway and the Railway shall have no obligation to return the same to the Tenderer(s).

vi) In case of non-acceptance of a tender by the Railway Administration for any reason whatsoever, the tenderer(s) cannot claim for the expenses incurred by him in submitting the tender offer for the work or for any other account.

vii) If the tenderer(s) deliberately gives / give the wrong information in his / their tender or creates / create circumstances for the acceptance of his / their tender, the Railway reserves the right to reject such tender at any stage.

viii) If any partner(s) of a partnership firm expires after the submission of its tender or after the acceptance of its tender, the Railway shall deem such tender as cancelled/contract as terminated under clause-61 of the Standard General condition of Contract, unless the firm retains its character as per partnership agreement. If a sole proprietor expires after the submission of tender or after the acceptance of tender, the Railway shall deem such tender as cancelled / contract as terminated under clause-61 of the Standard General Conditions of Contract.

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15. **Procedure for conduct and reporting of Reverse Auction.**

i) **Initial e-RA period**: This shall be the initial time interval for e-RA. E-RA shall be open for this duration. Initial e-RA period for the instant tender will be 04 hours.

ii) **Auto extension period**: In case any offer is received in the time period equal to auto extension period before close of initial e-RA period, the e-RA shall be extended for time equal to auto extension period from the time of last bid. There shall be no upper limit on number of auto extensions. When no offer is received in the last auto extension period, e-RA shall close. Auto extension period for the instant tender shall be 30 minutes.

iii) **Minimum decrement in percentage of value of the last successful bid**: 0.3

iv) Date and time for start of e-RA shall be communicated to the qualified tenderers by the department after evaluation of the Technical Bids.

v) After submission of Initial Price Bid, tenderers will not be allowed to revise the taxes and other levies.

vi) During auction period, identities of the participating tenderers will be kept hidden.

vii) Minimum admissible bid value will be last bid value minus minimum decrement as specified by the tendering authority before starting of reverse auction. Starting point of reverse auction shall be the lowest Initial Price Bid of the tenderer eligible for award of contract.

viii) After close of the RA, tabulation of last (minimum) bids received from all the tenderers will be generated and made visible to Railways and participating tenderers.

ix) Bidders shall not allowed to withdraw their last offer.

x) L-1 will be defined as the lowest bid obtained after the closure of R.A. session.

16. **Other details of Reverse Auction:**

i) Offers found eligible for award of contract/meeting eligibility criteria shall be categorized as Qualified for Award of Contract for the purpose of e-RA.
ii) Offers not complying with essential technical & commercial requirements of the tender shall be declared as Ineligible for award of contract.
iii) Initial Price Offer of only those bidders categorized as Qualified for Award of contract shall be opened and tabulated by system separately.
iv-a) Financial Bid: Financial bid shall comprise of Final Price Offer obtained through Reverse Auction. Following conditions and procedure shall be followed in selection of bidders for conduct of Reverse Auction:

Number of tenderers Qualified for Award of contract.	Number of tenderers to be selected for Reverse Auction	Remarks
Less than 3	NIL *	The bids disallowed from participation in the Reverse Auction shall be the highest bidder(s) in the tabulation of Initial Price Offer. In case the highest bidders quote the same, rate, the Initial Price Offer received last as per time log of IREPS, shall be removed first, on the principle of last in first out, by IREPS system itself.
3 to 6	3	
More than 6	50% of Vendors Qualified for award of contract (rounded off to next higher integer)	

* If the number of tenderers qualified for Award of Contract is less than 3, RA shall not be done and tender may be decided on the basis of Initial Price Offer(s).

b) MSE(Micro & Small Enterprises) Criteria: Not applicable for works contract.

c) Make in India Criteria: All bidders eligible for benefits under Public Procurement (Preference to Make in India) Order-2017, found Qualified for Bulk Order/Award of Contract and are within the specified range of price preference of lowest Initial Price Bid shall be permitted to participate in the Reverse Auction, irrespective of their inter se ranking on the basis of Initial Price Bid. Such bidders shall be over and above the number of vendors selected for Reverse Auction as per para (iv-a).

v) During Reverse Auction process, bidders shall not be allowed to bid a rate higher than the lowest Initial Price Offer.
vi) Reverse Auction among bids categorized as Qualified for award of contract shall be conducted on IREPS/Suitable Platform. Bidders shall be able to see the auction screens.

CHAPTER-II
DETAILS OF DOCUMENTS TO BE SUBMITTED ALONG WITH OFFER

(Tenderers are requested to read the following carefully)

For documents to be uploaded with tender offer, the tenderer(s) must read the NIT and instructions to tenderers in detail. For ready reference a concise listing of documents to be submitted along with offer are as under. However, these are not exhaustive and all document/certificate as detailed in the Tender Document and Indian Railway Standard General Conditions of Contracts, April-2022 should be submitted along with the offer duly mentioning the Annexure No. vide which it has been submitted.

Sl. No.	Item	To be mentioned by the tenderer as his Annexure No. (Annexure numbering by the tenderer as annexures attached with the offer to be same for that Annexures mentioned in this tender document).
1.0	**Documents in support of eligibility criteria:**	
(a)	**Document in support of Technical Criteria:** Completion/substantially completion certificate/certificates of similar nature of works (similar nature as defined in the NIT) completed in last seven years (ending last day of month previous to the one in which tender is invited). The certificate should be issued by the competent authority authorised by the concerned Organization, which will in general includes **(i)** Scope of works in details, **(ii)** date of award, **(iii)** completion period as per original agreement, **(iv)** actual date of completion, **(v)** value of work as per original agreement/revised sanctioned value if any, **(vi)** value of completed works etc. **(vii)** Final bill prepared or not; final bill paid or not and if paid then what was the amount etc. **(viii)** Work experience certificate for similar nature of work is also to be submitted with/supported by the Letter of Acceptance (LOA)/Contract Agreement duly enclosing the tender schedules for the said work claiming as similar nature of work in view of work experience certificate.	Annexure .....
(a). (i)	**In case of Partnership firm, for evaluation of technical eligibility following legal documents are to be submitted in terms of** *Explanation note for clause-10 including clause 10.1 to 10.5 - Eligibility Criteria of GCC-2022:*	Annexure .....

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Chief Engineer (Con.)/I
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S.E.C. Railway, Bilaspur

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

22 For Chief Engineer(Con)/I/BSP

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द. पू. म. रेलवे, बिलासपुर
S.E. Railway, Bilaspur

	The tenderer shall submit along with his bid all the relevant documents which include copy of previous partnership deed(s), dissolution deed(s) and proof of surrender of PAN No.(s) in case of dissolution of partnership firm(s) etc. (Refer sub-clause-6 to 14 of clause-10 of GCC-2022).	
(b)	The tenderer(s) having work experience certificate issued by Public listed company following documents must have been enclosed along with offer, otherwise the particular work experience certificate issued by Public listed company will not be considered as valid and no further correspondence will be made in this regard:	
(i)	Proof of having average annual turnover of Rs.500 crore and above in the last three financial years excluding the current financial year by Public listed company who have issued the work done certificate.	Annexure .....
(ii)	Proof regarding listing of the Public listed company on National Stock Exchange or Bombay Stock Exchange, incorporated/registered at least 5 years prior to the date of opening of tender.	Annexure .....
(iii)	Authorization of the person authorized by the Public listed company to issue such certificates.	Annexure .....
(iv)	Along with the work experience certificate, the tenderer must have submit, the relevant copy of work order, bill of quantities, bill wise details of payment received duly certified by Chartered Accountant, TDS Certificates for all payments received and copy of final/last bill paid by company in support of above work experience certificate.	Annexure .....
(c)	**Document in support of Financial Eligibility Criteria:** The tenderers shall submit requisite information as per **Annexure-VI**, along with copies of Audited Balance Sheet duly certified by the Chartered Accountant/Certificate from Chartered Accountant duly supported by Audited Balance sheet.	Annexure .....
(d)	Document in **support of Bid Capacity** as per format given in **Annexure-III of Chapter-VIII** of tender document duly verified by Chartered Accountant (If applicable as per NIT).	Annexure .....
2.0	**Bid Security / Earnest Money Deposit (EMD):**	
(i)	EMD is required. However, the tenderer(s) have to submit the **Bid Security Declaration in this regard in lieu of Earnest Money Deposit (EMD)** as annexed vide **Annexure-V of Chapter-VIII and also vide Chapter-III.**	Annexure .....
3.0	**Certificate as per Annexure-II of Chapter-VIII of Tender Document.**	Annexure .....
4.0	**Documents to be enclosed by Joint Venture firm along with**	Annexure .....

	tender in terms of clause-14 of Chapter-VI of this tender document.	
5.0	**Documents as prescribed vide clause-14 and 15 of Indian Railway Standard General Conditions of Contracts, April-2022– Part-I. Clause-14 & 15 of GCC-2022 are reproduced below:**	
6.1	**Documents to be submitted along with Tender (Clause-14 of GCC-2022):**	
(i)	The tenderer shall clearly specify whether the tender is submitted on his own (Proprietary Firm) or on behalf of a Partnership Firm / Company / Joint Venture (JV) /Registered Society / Registered Trust/Hindu Undivided Family (HUF) / Limited Liability Partnership (LLP) etc. The tenderer(s) shall enclose the attested copies of the constitution of their concern and copy of PAN Card along with their tender. Tender Documents in such cases are to be signed by such persons as may be legally competent to sign them on behalf of the firm, company, association, trust or society, as the case may be.	
(ii)	Following documents shall be submitted by the tenderer:	
(a)	**Sole Proprietorship Firm:** (i) All documents in terms of Para-10 of the Tender Form (Second Sheet) of GCC-2022.	Annexure .....
(b)	HUF: (i) A copy of notarized affidavit on Stamp Paper declaring that he who is submitting the tender on behalf of HUF is in the position of 'Karta' of Hindu Undivided Family (HUF) and he has the authority, power and consent given by other members to act on behalf of HUF. (ii) All documents in terms of para-10 of the Tender Form (Second Sheet) of GCC-2022.	Annexure ..... Annexure .....
(c)	**Partnership Firm:** The tenderer shall submit documents as mentioned in clause-18 of the Tender Form (Second Sheet) of GCC-2022. (i) The Partnership Firms participating in the tender should be legally valid under the provisions of the Indian Partnership Act. (ii) The partnership firm should have been in existence or should have been formed prior to submission of tender. Partnership firm should have either been registered with the Registrar or the Partnership deed should have been notarized prior to date of tender opening as per the Indian Partnership Act. (iii) The tenderer shall submit all documents as mentioned in para-18 of the Tender Form (Second Sheet) of GCC-2022. (v) A notarized copy of partnership deed or a copy of the Partnership deed registered with the Registrar. (vi) A notarized or registered copy of Power of Attorney in favour of the individual to tender for the work, sign the agreement etc and create liability against the firm (if not covered	Annexure ..... Annexure ..... Annexure ..... Annexure .....

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

	in the Partnership deed).	
(d)	(i) **Joint Venture (JV):** The tenderer shall submit documents as mentioned in para-17 of the Tender Form (Second Sheet) of GCC-2022. (ii) An undertaking that all the Members of JV are not blacklisted or debarred by Railways or any other Ministry / Department of Govt. of India from participation in tender/contract on the date of opening of bids, either in individual capacity or in any firm/LLP in which they were/are partners/members, as a member of the JV in which they were/are members. Concealment / wrong information in regard to above shall make the contract liable for determination under Clause-62 of the General Conditions of Contract.	Annexure ..... Annexure .....
(e)	**Company registered under Companies Act'2013:** (i) The copies of MOA (**Memorandum of Association**) / AOA (**Articles of Association**) of the company. (ii) A copy of Certificate of Incorporation (iii) A copy of Authorization/Power of Attorney issued by the Company (backed by the resolution of Board of Directors) in favour of the individual to sign the tender on behalf of the company and create liability against the company. (iv) All other documents in terms of explanatory notes in clause-10 of the Tender Form (Second Sheet) of GCC-2022.	Annexure ..... Annexure ..... Annexure ..... Annexure .....
(f)	**LLP (Limited Liability Partnership):** If the tender is submitted on behalf of a LLP registered under LLP Act-2008, the tenderer shall submit along with the tender: (i) A copy of LLP Agreement. (ii) A copy of Certificate of Incorporation. (iii) A copy of Power of Attorney/Authorization issued by the LLP in favour of the individual to sign the tender on behalf of the LLP and create liability against the LLP. (iv) An undertaking by all partners of the LLP that they are not blacklisted or debarred by Railways or any other Ministry / Department of Govt. of India from participation in tenders/contracts as on the date of submission of bids, either in their individual capacity or in any firm/LLP or in JV in which they were/are partners/ members. Concealment / wrong information in regard to above shall make the contract liable for determination under Clause-62 of the Standard General Conditions of Contract. (v) All other documents in terms of explanatory notes in para-10 of the Tender Form (Second Sheet) of GCC-2022.	Annexure ..... Annexure ..... Annexure ..... Annexure ..... Annexure .....
(g)	**Registered Society & Registered Trust:** The tenderer shall submit: (i) A copy of the Certificate of Registration.	Annexure .....

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

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	(ii) A copy of Memorandum of Association of Society/Trust Deed. (iii) A copy of Power of Attorney in favour of the individual to sign the tender documents and create liability against the Society/Trust. (iv) A copy of Rules & Regulations of the Society. **(v) All other documents in terms of explanatory notes in para-10 of the Tender Form (Second Sheet) of GCC-2022.**	Annexure ..... Annexure ..... Annexure ..... Annexure .....
	Note: **(i)** If it is NOT mentioned in the submitted tender that tender is being submitted on behalf of a Sole Proprietorship firm / Partnership firm / Joint Venture / Registered Company etc., then the tender shall be treated as having been submitted by the individual who has signed the tender. **(ii)** After opening of the tender, any document pertaining to the constitution of Sole Proprietorship Firm / Partnership Firm / Registered Company/ Registered Trust / Registered Society / HUF/LLP etc. shall be neither asked nor considered, if submitted. Further, no suo-moto cognizance of any document available in public domain (i.e., on internet etc.) or in Railway's record/office files etc. will be taken for consideration of the tender, if no such mention is available in tender offer submitted. (iii) A tender from JV / Partnership firm etc. shall be considered only where permissible as per the tender conditions. (iv) The Railway will not be bound by any change of power of attorney or in the composition of the firm made subsequent to the submission of tender. Railway may, however, recognize such power of attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the Contractor.	
6.2	**Clause-15 of GCC-2022** The tenderer whether sole proprietor / a company or a partnership firm / joint venture (JV) / registered society / registered trust / HUF/LLP etc. if they want to act through agent or individual partner(s), should submit along with the tender, a copy of power of attorney duly stamped and authenticated by a Notary Public or by Magistrate in favour of the specific person whether he/they be partner(s) of the firm or any other person specifically authorizing him/them to sign the tender, submit the tender and further to deal with the tender/contract upto the stage of signing the agreement except in case where such specific person is authorised for above purposes through a provision made in the Partnership Deed/ Memorandum of Under Standing/Article of Association/Board Resolution, failing which tender shall be **Summarily Rejected.** A separate Power of Attorney duly stamped and authenticated	Annexure ..... मुख्य इंजीनियर (निर्माण)/I Chief Engineer (Con.)/I द. पू. म. रेलवे, बिलासपुर S.E.C. Railway, Bilaspur

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

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For Chief Engineer(Con)/I/BSP

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
द.पू.म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

Draft Agrt

	by a Notary Public or by Magistrate in favour of the specific person whether he/they be partner(s) of the firm or any other person, shall be submitted after award of work, specifically authorizing him/them to deal with all other contractual activities subsequent to signing of agreement, if required. **Note:** A power of attorney executed and issued overseas, the document will also have to be legalized by the Indian Embassy and notarized in the jurisdiction whether the power of attorney is being issued. However, the power of attorney provided by bidder's from countries that have signed the Hague Legislation Convention'1961 are not required to be legalized by the Indian Embassy if it carries a conforming Apostille Certificate.	
7.0	**Employment/Partnership etc. of Retired Railway Employees:** Please refer clause-16 of Indian Railway Standard General Conditions of Contracts–April'2022–Part-I regarding employment of Retired Railway Employees and submit the information in this regard or submit statement to this effect that no such retired Engineer or retired gazetted officer is so associated with the tenderer, as the case may be. If information as required as per 16(a), 16(b) or 16(c) of GCC-2022 has not been furnished, contract is liable to be dealt in accordance with provision of clause-62 of the Standard General Condition of Contract-2022.	Annexure .....
8.0	**Certificate of Familiarization under Chapter-IV.**	Annexure .....
9.0	**Declaration or an undertaking from the tenderer(s) that he is not blacklisted or debarred by Railways or any other Ministry / Department of Govt. of India from participation in tender on the date of opening of bids, either in individual capacity or as a member of the partnership firm or JV in which he or JV in which HUF was / is a partner/member. Concealment / wrong information in regard to above shall make the contract liable for determination under Clause-62 of the General Conditions of Contract.**	Annexure .....
10.0	PAN Card details- copy of PAN Card to be submitted.	Annexure .....

CHAPTER-III
DECLARATION BY THE TENDERER(S)

Tender Notice No. CEC/BSP/22-23/19 Dated: 25.08.2022

Name of Work: Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.

To

The President of India,
Acting through the Chief Engineer(C)
S.E.C.Railway, Bilaspur.
Sir,

1. I/we _____ have read the various conditions to tender attached hereto and agree to abide by the said conditions. I/we also agree to keep this offer open for acceptance for a period of **90 days** from the date fixed for closing of the tender and in default thereof, I/we will be liable for forfeiture of my/our "Bid Security". I/We offer to do the work for South East Central Railway, at the rates quoted in the attached bill(s) of quantities and hereby bind myself/ourselves to complete the work in all respects within **'30 (thirty months'** from date of issue of acceptance letter' from the date of issue of letter of acceptance of the tender.

2. I/We also hereby agree to abide by the Indian Railways Standard General Conditions of Contract-April-2022, with all correction slips up-to-date and to carry out the work according to the Special Conditions of Contract and Specifications of materials and works as laid down by Railway in the annexed Special Conditions/Specifications, Standard Schedule of Rates (SSOR) with all correction slips up-to-date for the present contract.

3. **A Bid Security** of ₹ 94,49,900/- **has already been deposited online/submitted as Bank Guarantee bond.** Full value of the Bid Security shall stand forfeited without prejudice to any other right or remedies in case my/our Tender is accepted and if:

(a) I/We do not submit the Performance Guarantee within the time specified in the Tender document.
(b) I/We do not execute the contract documents within seven days after receipt of notice issued by the Railway that such documents are ready; and
(c) I/We do not commence the work within fifteen days after receipt of orders to that effect.

4. (a) I/We am/are a **'Startup'** firm registered by ..... Department of Industrial Policy and Promotion (DIPP) and my registration number is ..... valid upto ..... (Copy enclosed) and hence exempted from submission of Bid Security.

5. We are a Labour Cooperative Society and our Registration No. is ..... with ..... and hence required to deposit only 50% of Bid Security.

6. Until a formal agreement is prepared and executed, acceptance of this tender shall constitute a binding contract between us subject to modifications, as may be mutually agreed to between us and indicated in the letter of acceptance of my/our offer for this work.

7. I/We have read and understood Special Conditions of Contracts, Instructions to tenderer(s) and the stipulations made in the scope of work & Schedules of quantities and rates governing the works under this contract, in addition to and/or in part sub-cession of the SOUTH EAST CENTRAL RAILWAY-USSOR-2010, South East Central Railway Schedule of Labour and Material Rates-2006/Vol.1 (for P.Way works) and Indian Railways Standard General Condition of Contract April-2022 and Indian Railways Unified Standard Specification (Works & Materials) 2010-Volume- I & II (with latest amendment upto date of inviting of tender) and agree to carry out the work.

Signature of Witnesses:

(1) _____

(2) _____

_____
Signature of Tenderer(s)

Date _____

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

For Chief Engineer(Con)/I/BSP

कार्यपालन अधियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

Address of the Tenderer(s)

CHAPTER – IV

CERTIFICATE OF FAMILIARISATION
(To be submitted along with the offer)

Name of the work:- Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.

I/We hereby solemnly declare that I/We have visited the site of above work and have familiarised myself/ourselves of the working conditions there in all respects and in particular the following:-

(a) The area and the constraints therein.
(b) Availability of Service/approach passage.
(c) Soil Conditions at Site of the Work.
(d) Sources and Availability of construction materials like good earth, blanketing materials sand, aggregate etc.
(e) Rates & availability for Construction Materials.
(f) Availability of Local Labour Skilled/Unskilled and the Prevailing Labour Rates.
(g) Availability of Water & Electricity.
(h) Availability of Space for Putting-up Labour Camps, Offices, Store Go down, Engineering Yard etc.
(i) Likely site constraints in collecting materials and the working constraints etc.
(j) Existing Road Network (Highways or Other Type) and Availability of Service Roads etc.

Signature of Tenderer(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

कार्यपालक अभियंता (निर्माण)
Executive Engineer (Con)
S.E.C. Railway, Bilaspur

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मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

CHAPTER - V

(SCOPE OF WORK)

Name of the work:- Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.

1. Scope of work and salient features of tender :-

(a) **Execution of earth work in formation with blanketing material.**
(b) **Construction of 02 Nos of ROR of 61 m OWG & 45.7 m OWG.**
(c) Construction of 03 Major bridges of span 12.2 m Composite Girder 61 m OWG & 45.7 m OWG
(d) Construction of 08 Nos of minor bridges and 05 Nos of RUB/LHS.
(e) Supply of track ballast.
(f) Track linking work.
(g)Transportation of P.Way material.
(h) Construction of Service buildings.
(i) Supply, fabrication, erection/launching of Steel girders.
(j) Miscellaneous and other allied works.

2. Contractor should make arrangement for lighting the worksite during night hours for ensuring safety at worksite, also arrange to provide safety belt, helmets & all industrial safety measure at no extra cost.
3. Work is to be carried out in electrified BG Railway line & hence working arrangement should cater for this. The contractor has to take all safety measures to avoid infringement to the running track & Over Head Equipment (OHE).
4. Priority for the works to be executed under this contract will be decided by the Engineer-in-charge and instructions of Engineer-in-charge should be strictly followed.
5. The contractor shall on demand produce to the engineer original receipts/ vouchers/ invoices in respect of the supplies of materials etc. The contractor shall ensure the materials brought to the site are in sealed containers/packing's bearing manufacturers marking.
6. Conservancy cess is recoverable for this work.
7. Any defective work (not conforming to standard IRS/ISI specification) should be replaced by the Contractor at his own cost.
8. The contractor is entirely responsible to arrange for all necessary machinery, tools and plant and their spare parts required for the efficient and methodical execution of the work. Delay in procurement of such items due to their non-availability on account of import difficulties or any other cause whatsoever will not be taken as an excuse for slow or non-performance of the work.
9. Contractor has to provide communication facilities i.e. Telephone, Data Card/Internet connection with PC's etc. at site office.
10. The contractor shall provide all appliances, efficient and sufficient staffs & labour for setting out and shall set out the works or every part thereof and shall be responsible for the accuracy of the lines, levels and dimensions of the works in accordance with

कार्यपालन अभियंता (निर्माण) / इंजीनियर (निर्माण) /
Executive Engineer (Con.)/ Chief Engineer (Con.)/
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

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drawings, directions or instructions given at any time to him. And every facility shall be given to the Engineer-in-Charge and all persons duly deputed or authorized by him in writing for checking the same.

11. Contractor has to arrange the site office, inspection vehicle(s) as per the details given in special condition of contract.

12. Contractor may be asked to arrange reasonably good AC accommodation for night stay of railway officers/supervisors at nearby place during the period of PPNI/Pre-NI/NI period. This shall be payable under item No.35 of tender schedule and for payment of one unit of item No.35 (Supply and fixing of tent...../day) of Schedule-11 shall be equivalent to 04 (four) numbers AC room accommodation per day. Number of AC rooms shall be converted into equivalent of item No.35, for the purpose of payment. For booking of AC accommodation, a written authority of Dy.Chief Engineer (Con) concerned shall be required.

13. **LABOUR LICENSE**: Contractor may be advised by Engineer-in-Charge or his authorised representative to deploy resources at more than one site. The works are labour intensive and at a particular/specified time deployment of 100 nos. labours for P.Way linking works and 80 labours for other civil works or more may be needed. Thus contractor may be required to have arrangement of minimum 100 nos/80 nos labours against this contract and thus must have valid labour license for minimum 100 nos/80 nos labours. No particular/specified work in contract shall proceed without a valid labour license of minimum 100 nos/80 nos labours(as mentioned above) or actual numbers of labours deployed, if actual number is more than 100 nos/80 nos.

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

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CHAPTER-VI

GUIDELINES FOR PARTICIPATION OF JOINT VENTURE FIRMS IN WORKS TENDER.

This para shall be applicable for works tenders wherein a tender document provides for the same.	
1.	Separate identity/name shall be given to the Joint Venture.
2.	Number of members in a JV shall not be more than three, if the work involves only one department (say Civil or S&T or Electrical or Mechanical) and shall not be more than five, if the work involves more than one Department. One of the members of the JV shall be its Lead Member who shall have a majority (at least 51%) share of interest in the JV. The other members shall have a share of not less than 20% each in case of JV with upto three members and not less than 10% each in case of JV with more than three members. In case of JV with foreign member(s), the Lead Member has to be an Indian firm/company with a minimum share of 51%.
3.	A member of JV shall not be permitted to participate either in individual capacity or as a member of another JV in the same tender.
4.	The tender form shall be purchased and submitted only in the name of the JV and not in the name of any constituent member. The tender form can however be submitted by JV or any of its constituent member or any person authorized by JV through Power of Attorney to submit tender.
5.	Bid Security shall be submitted by JV or authorized person of JV either as : (i) Cash through e-payment gateway. (ii) Bank Guarantee bond either in the name of the JV, or in the name of all members of JV as per MOU irrespective of their share in the JV if the JV has not been constituted legally till the date of submission of tender.
6.	A copy of Memorandum of Understanding (MOU) duly executed by the JV members on a stamp paper shall be submitted by the JV along with the tender. The complete details of the members of the JV, their share and responsibility in the JV etc. particularly with reference to financial, technical and other obligations shall be furnished in the MOU. **(The MOU format for this purpose has been enclosed as Annexure- I-A).**
7.	Once the tender is submitted, the MOU shall not normally be modified/altered/terminated during the validity of the tender. In case the tenderer fails to observe/comply with this stipulation, the full Bid Security shall be liable to be forfeited.
8.	Approval for change of constitution of JV shall be at the sole discretion of the Railway. The constitution of the JV shall not normally be allowed to be modified after submission of the tender bid by the JV, except when modification becomes inevitable due to succession laws etc., provided further that there is no change in qualification of minimum eligibility criteria by JV after change of composition. However, the Lead Member shall continue to be the Lead Member of the JV. Failure to observe this requirement would render the offer invalid.

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

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For Chief Engineer (Construction)/I

कार्यपालन अभियंता (निर्माण) Chief Engineer (Con.)/I

Executive Engineer (Con) द. पू. म. रेलवे, बिलासपुर

दक्षिण पूर्व मध्य रेलवे, S.E.C. Railway, Bilaspur

S.E.C. Railway

Similarly, after the contract is awarded, the constitution of JV shall not be normally allowed to be altered during the currency of contract except when modification become inevitable due to succession laws etc. and minimum eligibility criteria should not get vitiated. Failure to observe this stipulation shall be deemed to be breach of contract with all consequential penal action as per contract conditions.

10. On award of contract to a JV, a single Performance Guarantee shall be submitted by the JV as per tender conditions. All the Guarantees like Performance Guarantee, Bank Guarantee for Mobilization Advance (if applicable), Machinery Advance (if applicable) etc. shall be accepted only in the name of the JV and no splitting of guarantees amongst the members of the JV shall be permitted.

11. On issue of LOA (Letter of Acceptance), the JV entity to whom the work has been awarded, with the same shareholding pattern as was declared in the MOU/JV Agreement submitted along with the tender, shall be got registered before the Registrar of the Companies under 'The Companies Act'2013' (in case JV entity is to be registered as Company) or before the Registrar/Sub-Registrar under the 'The Indian Partnership Act'1932' (in case JV entity is to be registered as Partnership Firm) or under 'The LLP Ac'2008' (in case JV entity is to be registered as LLP). A separate PAN shall be obtained for this entity. The documents pertaining to this entity including its PAN shall be furnished to the Railways before signing the contract agreement for the work. In case the tenderer fails to observe/comply with this stipulation within 60 days of issue of LOA, contract is liable to be terminated. In case contract is terminated railway shall be entitled to forfeit the full amount of the Bid Security and other dues payable to the Contractor under this contract. The entity so registered, in the registered documents, shall have, inter-alia, following Clauses:

11.1. Joint And Several Liability - Members of the entity to which the contract is awarded, shall be jointly and severally liable to the Railway for execution of the project in accordance with General and Special Conditions of Contract. The members of the entity shall also be liable jointly and severally for the loss, damages caused to the Railways during the course of execution of the contract or due to non-execution of the contract or part thereof.

11.2. Duration of the Registered Entity - It shall be valid during the entire currency of the contract including the period of extension, if any and the maintenance period after the work is completed.

11.3. Governing Laws - The Registered Entity shall in all respect be governed by and interpreted in accordance with Indian Laws.

12. Authorized Member - Joint Venture members in the JV MoU shall authorize **LEAD** members on behalf of the Joint Venture to deal with the tender, sign the agreement or enter into contract in respect of the said tender, to receive payment, to witness joint measurement of work done, to sign measurement books and similar such action in respect of the said tender/contract. All notices/correspondences with respect to the contract would be sent only to this authorized member of the JV.

13. No member of the Joint Venture shall have the right to assign or transfer the interest right or liability in the contract without the written consent of the other members and that of the Railway in respect of the said tender/contract.

14. **Documents to be enclosed by the Joint Venture firm along with the tender:**

14.1. In case one or more of the members of the JV is/are partnership firm(s), following documents shall be submitted:

Signature of Tenderer(s)/Contractor(s)

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JOINT VENTURE PARTNER

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कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

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For Chief Engineer(Con)/I/BSP

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

a. A notarized copy of the Partnership Deed or a copy of the Partnership deed registered with the Registrar.

b. A copy of consent of all the partners or individual authorized by partnership firm, to enter into the Joint Venture Agreement on a stamp paper.

c. A Notarized or registered copy of Power Attorney in favour of the individual to sign the MOU/JV Agreement on behalf of the partnership firm and create liability against the firm.

d. An undertaking by all the partners of the partnership firm that they are not black listed or debarred by Railways or any other Ministry/Department of the Govt. of India from participation in tenders/contracts as on the date of submission of bids, either in their individual capacity or in any firm/LLP in which they were/are partners/members. Any concealment/wrong information in regard to above shall make the bid ineligible or the contract shall be determined under clause-62 of the Standard General Condition of Contract.

14.2. In case one or more members is/are Proprietary Firm or HUF, the following documents shall be enclosed:

(i) A copy of notarized affidavit on Stamp Paper declaring that his Concern is a proprietary Concern and he is sole proprietor of the Concern OR he who is signing the affidavit on behalf of HUF is in the position of 'Karta' of Hindu Undivided Family (HUF) and he has the authority, power and consent given by other members to act on behalf of HUF.

14.3. In case one or more members of the JV is/are companies, the following documents shall be submitted:

(i). A copy of resolutions of the Directors of the Company, permitting the company to enter into a JV agreement,

(ii). A copy of **(MOA) Memorandum of Association/ AOA (Articles of Association)** of the Company.

(iii). A copy of Certificate of Incorporation.

(iv) A copy of Authorization/copy of Power of Attorney issued by the Company (backed by the resolution of Board of Directors) in favour of the individual to sign the tender, sign MOU/JV Agreement on behalf of the company and create liability against the company.

14.4. In case one or more members of the JV is/are LLP firm/s, the following documents shall be submitted:

(i) A copy of LLP Agreement.

(ii) A copy of Certificate of Incorporation of LLP.

(iii) A copy of resolution passed by partners of LLP firm, permitting the Firm to enter into a JV agreement.

(iv) A copy of Authorization /copy of Power of Attorney issued by the LLP firm (backed by resolution passed by the Partners) in favour of the individual, to sign the tender and/or sign the MOU/JV agreement on behalf of the LLP and create liability against the LLP.

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
S.E.C. Railway, Bilaspur

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(v) An undertaking by all partners of the LLP that they are not blacklisted or debarred by Railways or any other Ministry / Department of the Govt. of India from participation in tenders / contracts as on the date of submission of bids, either in their individual capacity or in any firm/LLP or JV in which they were / are partners/members. Any Concealment / wrong information in regard to above shall make the contract liable for determination under Clause-62 of the Standard General Conditions of Contract.

14.5. In case one or more members of the JV is/are Society/s or Trust/s, the following documents shall be submitted:

(i) A copy of Certificate of Registration.

(ii) A copy of Memorandum of Association of Society/Trust Deed.

(iii) A copy of Rules & Regulations of the Society.

(iv) A copy of Power of Attorney, in favour of the individual to sign the tender documents and create liability against the Society/Trust.

14.4. All the Members of JV shall certify that they are not blacklisted or debarred by Railways or any other Ministry / Department of the Government of India from participation in tenders/contract on the date of opening of bids either in their individual capacity or as a member of the JV in which they were/are members.

15. **Credentials and qualifying criteria:** Technical, Financial eligibility and Bid capacity of the JV shall be adjudged based on satisfactory fulfilment of the criteria mentioned in the NIT.

a) **Technical Eligibility Criteria:-** As mentioned in the NIT.
b) **Financial Eligibility Criteria:-** As mentioned in the NIT.
c) **Bid Capacity:-** As mentioned in the NIT.

Signature of Tenderer(s)/Contractor(s)

For Chief Engineer(Con)I/BSP

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
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RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

Annexure-I-A

MODEL FORMAT FOR MOU/JOINT VENTURE AGREEMENT.

1.	This Joint Venture Agreement executed on this ___ day of _____ 2022__ at _____ between M/s _____ represented by Shri ____ as the first party AND M/s _____ represented by Shri ____ as the second party AND (If other party then add next para) Note: The expression and words of the First and Second part shall mean and include their heirs, successors, assigns, nominees, executors, administrators and legal representatives respectively.
2.	That the name of JV Firm under this agreement shall be M/s .....Joint Venture.
3.	That the Parties mentioned above are desirous of carrying on the works jointly against the tender invited by ....., South East Central Railway, Bilaspur vide Tender Notice No ..... In connection with execution of .....
4.	That M/s .....having a majority (at least 51 %) share of interest in the JV and fulfils the stipulated 'technical eligibility criteria' and 'financial eligibility criteria' as mentioned in the tender notice/tender document shall be lead member.
5.	The share and responsibilities of the members of the JV firm shall be broadly as under: (i) The 1st party M/s .....having share of .....% responsible for ..... (ii) The 2nd party M/s .....having share of .....% responsible for .....(Add other parties if applicable).
6.	M/s ..... Shall deal with the tender, sign the agreement or enter into contract, to receive payment to witness joint measurements of work done, to sign the measurement books and also to make all sorts of correspondence on behalf of this JV firm with the Railway and all notices/correspondence with respect to the contract would be sent only to this authorized member.
7.	That on issue of LOA (letter of acceptance), the JV entity to whom the work has been awarded, with the same shareholding pattern as was declared in the MOU/JV agreement submitted along with the tender, shall be got registered before the Registrar of the companies under 'The Companies Act-2013' (in case of Company) or before the Registrar /sub-registrar under the 'The Indian Partnership Act'1932' (in case of Partnership Firms) or Under 'The LLP Act'2008' (in case of LLP). A separate PAN shall be obtained for this entity. The document pertaining to this entity including its PAN shall be furnished to the Railways before signing the contract agreement for the work.
8.	That all the parties to the JV shall be jointly and severally liable to the Railway for execution of the tendered project/works in accordance with the General and Special Conditions of the contract and also for the loss, damages caused to the Railways during the course of execution of the contract or due to non-execution of the contract.
9.	That all parties to JV shall not have the right to assign or transfer the interest, right or liability in the contract without written consent of the other parties to this JV and also Railways in respect of the said tender/contract.
10.	That all the members of JV certify that they are not blacklisted or debarred by Railways or any other Ministry/Department of the Government of India from participation in tender/Contract on the date of opening of bids either in their individual capacity or as a

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

For Chief Engineer(Con)/BSP

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	member of a JV or partnership firm.
11.	That the JV shall be valid during the currency of the contract including the period of extension if any and the maintenance period after the completion of work.
12.	That the Joint Venture agreement shall in all respect be governed by and interpreted in accordance with Indian Laws.

In witness, we signed, sealed and delivered.

..... Signature Name ..... M/s .....(Seal) Address	..... Signature Name ..... M/s .....(Seal) Address ..... (Add other parties if applicable)
1st Witness ..... Signature Name ..... Address	2nd Witness ..... Signature Name ..... Address .....

Note:- The Model Format for MOU/Joint Venture Agreement should be read in conjunction with provisions of Clause-17 of Indian Railways Standard General Condition of Contract published in April-2022 and the Guidelines for participation of Joint Venture Firms in Works tender.

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

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CHAPTER-VII
SPECIAL CONDITIONS OF CONTRACT

Price Variation Clause (PVC):

1. Applicability: Price Variation Clause (PVC) shall be applicable only in tender having advertised value above Rs.2 Crores. Provided further that, in a contract where PVC is applicable, following shall be outside the purview of price adjustments (i.e. shall be excluded from the gross value of the work for the purpose of price variation):

a) Materials supplied by Railway to the Contractors, either free or at fixed rate;

b) Any extra item(s) included in subsequent variation falling outside the purview of the Bill(s) of Quantities of tender, under clause-39(1)(b) of these Standard General Conditions, unless applicability of PVC and 'Base Month' has been specially agreed, while fixing the rates of such extra item(s).

2. Base Month: The Base Month for 'Price Variation Clause' shall be taken as the one month prior to closing of tender, unless otherwise stated elsewhere. The quarter for applicability of PVC shall commence from the month following the Base month. The Price Variation shall be based **on the average Price Index of the quarter under consideration.**

3. Validity: Rates accepted by Railway Administration shall hold good till completion of work and no additional individual claim shall be admissible except: **(a)** Payment/recovery for increase/decrease in GST on works contract or imposition/removal of any tax/cess on Works Contract as per Clause-37,

(b) Payment/recovery for overall market situation as per Price Variation Clause given hereunder.

4. Components of various items in a contract on which variation in prices be admissible, shall be steel, cement, ferrous material, non-ferrous material, insulators, zinc and other materials, labour, plant & machinery, fuel, explosives, detonators etc. Adjustment for variation in prices of these items shall be determined in the manner prescribed.

5. No price variation shall be admissible for fixed components.

6. The percentages of various components in various type of works shall be as specified for all item (s)/ Bill(s) of Quantities in tender document and the same shall be fixed as per table & classifications given below:

(I). For Civil Engineering Works

S. N.	Classification / Components		1A, 2 & 3A	4A	5A	6A		8A	9A	1B,3B,4B,5B, 6B,8B & 9B	1C,3C,4C,5C, 6C,8C & 9C	3D,4D,5D,6D ,8D & 9D	3E,4E,5E,6E, 8E & 9E
1	Fixed	*	15	15	15	15	15	15	15	15	15	15	15
2	Labour	L_c	20	25	30	20	50	20	20	0	0	10	25
3	Steel	S_c	0	0	0	0	0	0	0	85	0	50	0
4	Cement	C_c	0	0	15	0	0	0	0	0	85	0	0
5	Plant Machinery & Spares	PM_c	30	15	5	20	15	20	30	0	0	10	30
6	Fuel & Lubricants	F_c	25	15	5	15	15	20	15	0	0	10	20
7	Other Materials	M_c	10	15	30	30	5	25	20	0	0	10	0
8	Detonators & Explosives	E_c	0	15	0	0	0	0	0	0	0	0	0
	Total		100	100	100	100	100	100	100	100	100	100	100

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* It shall not be considered for any price variation.

The classification mentioned in the table above represents following type of item(s) in the work(s) –

1 Earthwork in Formation
1A All Item(s) excluding 1B or/and 1C
1B Item(s) for supply of Steel
1C Item(s) for supply of Cement

2 Ballast Supply Works

3 Tunnelling Works (Without Explosives)
3A All Item(s) excluding 3B or/and 3C or/and 3D or/and 3E
3B Item(s) for supply of Steel
3C Item(s) for supply of Cement or/and Grout
3D Item(s) for Fabrication & Erection of Structures including supply of Steel
3E Item(s) for Fabrication & Erection of Structures excluding supply of Steel.

4 Tunnelling Works (With explosives)
4A All Item(s) excluding 4B or/and 4C or/and 4D or/and 4E
4B Item(s) for supply of Steel
4C Item(s) for supply of Cement or/and Grout
4D Item(s) for Fabrication & Erection of Structures including supply of Steel
4E Item(s) for Fabrication & Erection of Structures excluding supply of Steel.

5 Building Works
5A All Item(s) excluding 5B or/and 5C or/and 5D or/and 5E
5B Item(s) for supply of Steel
5C Item(s) for supply of Cement
5D Item(s) for Fabrication & Erection of Structures including supply of Steel
5E Item(s) for Fabrication & Erection of Structures excluding supply of Steel.

6 Bridges & Protection work
6A All Item(s) excluding 6B or/and 6C or/and 6D or/and 6E
6B Item(s) for supply of Steel
6C Item(s) for supply of Cement
6D Item(s) for Fabrication, Assembly, Erection& Launching of Girders including supply of Steel
6E Item(s) for Fabrication, Assembly, Erection &Launching of Girders excluding supply of Steel

7 Permanent Way linking

8 Platform, Passenger Amenities
8A All Item(s) excluding 8B or/and 8C or/and 8D or/and 8E
8B Item(s) for supply of Steel item/fittings
8C Item(s) for supply of Cement Item
8D Item(s) for Fabrication & Erection of Structures including supply of Steel
8E Item(s) for Fabrication & Erection of Structures excluding supply of Steel

9 Any Other Works not covered in Classification 1 to 8

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9A All Item(s) excluding 9B or/and 9C or/and 9D or/and 9E
9B Item(s) for supply of Steel
9C Item(s) for supply of Cement or/and Grout
9D Item(s) for Fabrication & Erection of Structures including supply of Steel
9E Item(s) for Fabrication & Erection of Structures excluding supply of Steel

7 Formulae: The Amount of variation in prices in various components (labour, material etc.) shall be worked out by the following formulae:

(i) $L = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (L_Q - L_B) \times L_C}{L_B \times 100}$

(ii) $M = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (M_Q - M_B) \times M_C}{M_B \times 100}$

(iii) $F = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (F_Q - F_B) \times F_C}{F_B \times 100}$

(iv) $E = \frac{(W) \times (E_Q - E_B) \times E_C}{E_B \times 100}$

(v) $PM = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (PM_Q - PM_B) \times PM_C}{PM_B \times 100}$

(vi) $S = \frac{(W \text{ or } W_S \text{ or } W_{SF}) \times (S_Q - S_B) \times S_C}{S_B \times 100}$

(vii) $C = \frac{(W \text{ or } W_C) \times (C_Q - C_B) \times C_C}{C_B \times 100}$

(G) For Railway Electrification Works:

(viii) $T = [0.4136 \times (C_Q - C_B) / C_B] \times 85$

(ix) $R = [0.94 \times (R_T - R_O) / R_O + 0.06 \times (Z_T - Z_O) / Z_O] \times 85$

(x) $N = [(P_T - P_O) / P_O] \times 85$

(xi) $I = [(I_T - I_O) / I_O] \times 85$

(xii) $G = [(M_Q - M_B) / M_B] \times 85$

(xiii) $Er = [(L_Q - L_B) / L_B] \times 85$

Where, L Amount of price variation in Labour
M Amount of price variation in Materials
F Amount of price variation in Fuel
E Amount of price variation in Explosives
PM Amount of price variation in Plant, Machinery and Spares
S Amount of price variation in Steel Supply Item

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RSA-SK JOINT VENTURE

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C Amount of price variation in Cement Supply Item
T Percentage variation payable on the gross value of bill of Concreting (Bill(s) of Quantities for concrete items)
R Percentage variation payable on the gross value of bill of Ferrous Items (Bill(s) of Quantities for ferrous items)
N Percentage variation payable on the gross value of bill of Non-Ferrous Items (Bill(s) of Quantities for non-ferrous items)
I Percentage variation payable on the gross value of bill of Insulator (Bill(s) of Quantities for Insulator items)
G Percentage variation payable on the gross value of bill of General Works (Bill(s) of Quantities for General items)
Er Percentage variation payable on the gross value of erection (Bill(s) of Quantities for Erection Item)
Lc % of Labour Component in the item(s)
Mc % of Material Component in the item(s)
Fc % of Fuel Component in the item(s)
Ec % of Explosive Component in the item(s)
PMc % of Plant, Machinery and Spares Component in the item(s)
Sc % of Steel Supply item Component in the item(s)
Cc % of Cement Supply item Component in the item(s)

W Gross value of work done by Contractor as per on-account bill(s) excluding the Gross value of work under Ws or/and Wc or/and WSF or/and WF or/and WSFL or/and WFL and cost of materials supplied by Railway either free or at fixed rate,

Ws Gross value of work done by Contractor for item(s) of supply of steel.

Wc Gross value of work done by Contractor for item(s) of supply of cement and /or supply of grout material.

WSF Gross value of work done by Contractor for item(s) of Fabrication & Erection of Structures including supply of Steel.

WF Gross value of work done by Contractor for Fabrication & Erection of Structures excluding supply of Steel.

WSFL Gross value of work done by Contractor for item(s) of Fabrication, Assembly, Erection / Launching of Girders including supply of Steel.
WFL Gross value of work done by Contractor for item(s) of Fabrication, Assembly, Erection / Launching of Girders excluding supply of Steel.

LB Consumer Price Index for Industrial Workers - All India: Published in R.B.I. Bulletin for the base period

LQ Consumer Price Index for Industrial Workers - All India: Published in R.B.I. Bulletin for the average price index of the 3 months of the quarter under consideration

MB Wholesale Price Index: All commodities – as published in the R.B.I. Bulletin for the base period

Signature of Tenderer(s)/Contractor(s) 41 For Chief Engineer(Con)/I/BSP

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

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MQ Wholesale Price Index: All commodities – as published in the R.B.I. Bulletin for the average price index of the 3 months of the quarter under consideration

FB The average of official prices of Diesel available on the official website of 'Petroleum Planning and Analysis cell' under Ministry of Petroleum and Natural Gas for Delhi, Kolkata, Mumbai &Chennai, for the base period

FQ The average of official prices of Diesel available on the official website of 'Petroleum Planning and Analysis cell' under Ministry of Petroleum and Natural Gas for Delhi, Kolkata, Mumbai &Chennai, for the 3 months of the quarter under consideration

EB Index number of Monthly Whole Sale Price Index for the category 'Explosive' of (g). Manufacture of other chemical products under (J) MANUFACTURE OF CHEMICALS AND CHEMICAL PRODUCTS, published by Office of Economic Adviser, Govt. of India, Ministry of Commerce & Industry, Department of Industrial Policy & Promotion (DIPP), for the base period.

EQ Index number of Monthly Whole Sale Price Index for the category 'Explosive' of (g). Manufacture of other chemical products under (J) MANUFACTURE OF CHEMICALS AND CHEMICAL PRODUCTS, published by Office of Economic Adviser, Govt. of India, Govt. of India, Ministry of Commerce & Industry, Department of Industrial Policy & Promotion (DIPP), for the average price index of 3 months of the quarter under consideration.

PMB Index Number of Wholesale Prices in India by Groups and Sub Groups (Averages) for 'Manufacture of machinery for mining, quarrying and construction'– published in RBI (Reserve Bank of India) Bulletin, for the base period

PMQ Index Number of Wholesale Prices in India by Groups and Sub Groups (Averages) for 'Manufacture of machinery for mining, quarrying and construction'– published in RBI (Reserve Bank of India) Bulletin, for the average price index of 3 months of GCC April 2022 74 the quarter under consideration.

SB The average rate provided by the Joint Plant Committee for the relevant category of steel item as mentioned in Clause 46A.9 of GCC-April-2022; for the base period.

SQ The average rate provided by the Joint Plant Committee for the relevant category of steel item as mentioned in Clause 46A.9 of GCC-April-2022; for the 3 months of the quarter under consideration.

CB Index No. of Wholesale Price Index of sub-group Cement, Lime & Plaster as published in RBI Bulletin for the base period

CQ No. of Wholesale Price Index of sub-group Cement, Lime & Plaster as published in RBI Bulletin for the average price index of the 3 months of the quarter under consideration

PT IEEMA price index for Steel Blooms (size 150mmx150mm) for the month which is two months prior to date of inspection of material.

RSA-SK JOINT VENTURE

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Ro IEEMA price index for Steel Blooms (size 150mmx150mm)for the month which is one month prior to date of opening of tender.

Pt IEEMA price index for Copper wire rods for the month which is two months prior to date of inspection of material.

Po IEEMA price index for Copper wire rods for the month which is one month prior to date of opening of tender.

Zt IEEMA price index for Zinc for the month which is two months prior to date of inspection of material

Zo IEEMA price index for Zinc for the month which is one month prior to date of opening of tender

It RBI wholesale price index for the sub-group "Insulators" for the month which is two months prior to date of inspection of material

Io RBI wholesale price index for the sub-group "Insulators" for the month which is one month prior to date of opening of tender

8. The demands for escalation of cost shall be allowed on the basis of provisional indices as mentioned above. Any adjustment needed to be done based on the finally published indices shall be made as and when they become available.

9. (1) Relevant categories of steel for the purpose of operating Price Variation formula as mentioned in this Clause shall be as under:

SL	Classification	Rates to be used for calculating SQ or SB
1.	Reinforcement bars and other rounds	Average of per tonne rates of 10mm dia TMT & 25mm dia TMT; confirming IS1786; Fe 500
2.	All types and sizes of angles, channels and joists	Average of per tonne rates of 'Angle 75x75x6mm, Mild Steel Plate 10mm thickness and Channel 150x75mm; confirming IS2062, E250 Gr "A"
3.	All types and sizes of plates	Average of per tonne rates of 'MS Plates 10mm thickness and 25mm thickness; confirming IS2062, E250 Gr "A"
4.	Any other section of steel not covered in the above categories	Average of price for the 3 categories covered under SL 1, 2 & 3 in this table.

(2). Relevant city for referring "JPC (Joint Plant Committee)"rates of steel items (SQ /SB) in different Zonal Railways shall be as under :

SL	City	Railway
1.	Delhi	Northern , North Central, North Eastern, North Western
2.	Kolkata	Eastern, East Central, East Coast, Northeast Frontier, South Eastern, Southeast Central

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3.	Mumbai	Central, Western, West Central
4.	Chennai	Southern, South Central & South Western

10. Price Variation during Extended Period of Contract The price adjustment as worked out above, i.e. either increase or decrease shall be applicable upto the stipulated date of completion of work including the extended period of completion where such extension has been granted under Clause-17A of the Standard General Conditions of Contract. However, where extension of time has been granted due to Contractor's failure under Clause-17B of the Standard General Conditions of Contract, price adjustment shall be done as follows:

a. In case the indices increase above the indices applicable to the last month of original completion period or the extended period under Clause-17A, the price adjustment for the period of extension granted under Clause 17B shall be limited to the amount payable as per the Indices applicable to the last month of the original completion period or the extended period under Clause 17A of the Standard General Conditions of Contract; as the case may be.

b. In case the indices fall below the indices applicable to the last month of original/ extended period of completion under Clause-17A, as the case may be; then the lower indices shall be adopted for the price adjustment for the period of extension under Clause-17B of the Standard General Conditions of Contract.

Note:- Above Price Variation Clause should be read in conjunction with provisions of Clause-46A of Indian Railways Standard General Condition of Contract published in April-2022.

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Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

For Chief Engineer(Con)/I/BSP

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CHAPTER-VIII

Annexure-I

BANK GUARANTEE FORMAT (For PG)

(For the purpose of submission of Performance Guarantee after award of work and before execution of contract agreement by the successful tender)

1. In consideration of the President of India (hereinafter called "the Government") having agreed to exempt _____ (hereinafter called "the said Contractor/s") from the demand, under the terms and conditions of this Agreement dated _____ made between _____ and FA&CAO (Con)/ BSP for _____ (hereinafter called " the said Agreement"), of performance guarantee for the due fulfilment by the said Contractor(s) of the terms and conditions contained in the said Agreement, on production of a Bank Guarantee for Rs. _____ (Rupees_____) we, _____ (hereinafter referred to as (indicate the name of the bank) " the Bank") at the request of _____ (Contractor's) do hereby undertake to pay to the Government an amount not exceeding Rs. _____ against any loss or damage caused to or suffered or would be caused to or suffered by the Government by reason of any breach by the said Contractor(s) of any of the terms and conditions contained in the said Agreement.

2. We, _____ (indicate the name of bank) do hereby undertake to pay the to pay the amounts due and payable under this guarantee without any demur, merely on a demand from the Government (Railways) stating that the amount/claimed is due by way of loss or damage caused to or would be caused to or suffered by the Government (Railway) by reason of breach by the said contractor(s) of any of the terms or conditions contained in the said Agreement or by reason of the contractor(s) failure to perform the said agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this Guarantee shall be restricted to an amount not exceeding Rs._____.

3. We undertake to pay to the Government any money so demanded notwithstanding any dispute or disputes raised by the contractor(s)./supplier(s) in any suite or proceeding pending before any court or Tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and the contractor(s)/supplier(s) shall have no claim against us for making such payment.

4. We, _____ (indicate the name of the bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance/ of the said Agreement and that it shall continue to be

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

Draft Agt

मुख्य अभियंता (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

enforceable till all the dues of the Government under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged or till _____office/ Department) Ministry of _____ certifies that the terms and conditions of the said Agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this guarantee. Unless a demand or claim under this guarantee is made on us in writing on or before the _____we shall be discharged from all liability under this guarantee thereafter. .

5. We _____ (indicate the name of bank) further agree with the Government that the Government shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement or to extend time of performance by the said contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Government against the said Contractor(s) and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor(s) or for any forbearance, act or omission on the part of the Government or any indulgence by the Government to the said Contractor(s), or any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

6. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s)/Supplier(s).

7. We,_____ (indicate the name of the bank) lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Government/Railway in writing.

Dated the _____ day of _____19
For _____
(Indicate the name of the bank)

NOTES:

(1) If the tenderer submit Performance Guarantee in the shape of Bank Guarantee, then it will be accepted only if the same matches verbatim with the given format.

---

(2) The Bank Guarantee/extension of the B.G. if any in future to be submitted by the supplier(s)/ contractor(s) should be sent directly to the concerned authorities by the issuing Bank under Registered Post A/D.

मुख्य इंजीनियर (निर्माण) / I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

ANNEXURE – II

FORMAT FOR CERTIFICATE TO BE SUBMITTED / UPLOADED BY TENDERER ALONGWITH THE TENDER DOCUMENTS

I..... (Name and designation)** Appointed as the attorney/authorized signatory of the tenderer (including its constituents), M/s_____ (hereinafter called the tenderer) for the purpose of the Tender documents for the work of _____ as per the tender No._____ of South East Central Railway, do hereby solemnly affirm and state on the behalf of the tenderer including its constituents as under:

1. I/we the tenderer(s) am/are signing this document after carefully reading the contents.
2. I/We the tenderer(s) also accept all the conditions of the tender and have signed all the pages in confirmation thereof.
3. I/we hereby declare that I/we have downloaded the tender documents from Indian Railway website www.ireps.gov.in . I/we have verified the content of the document from the website and there is no addition, no deletion or no alteration to the content of the tender document. In case of any discrepancy noticed at any stage i.e. evaluation of tenders, execution of work or final payment of the contract, the master copy available with the railway Administration shall be final and binding upon me/us.
4. I/we declare and certify that I/we have not made any misleading or false representation in the forms, statements, and attachments in proof of the qualification requirements.
5. **I/We also understand that my/our offer will be evaluated based on the documents/credentials submitted along with the offer and same shall be binding upon me/us.**
6. **I/We declare that the information and documents submitted along with the tender by me/us are correct and I/we are fully responsible for the correctness of the information and documents, submitted by us.**
7. **I/We certified that I/We the tenderer(s) is/are not black listed or debarred by Railways or any other Ministry/Department of Govt of India from participation in tender on the date of submission of bids, either in individual capacity or as a HUF/member of the Partnership firm/LLP/JV/Society/Trust.**
8. I/we understand that if the contents of the certificate submitted by us are found to be forged/false or incorrect at any time during process for evaluation of tenders, it shall lead to forfeiture of the tender Bid Security besides banning of business for a period of upto five year. Further, I/we (*insert name of the tenderer*) **_____and all my/our constituents understand that my/our **offer shall be summarily rejected.**
9. I/we also understand that if the content of the certificate submitted by us are found to be false/forged or incorrect at any time after the award of the contract, it will lead to

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

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कार्यपालन अभियंता (निर्माण)

Draft Agrt

For Chief Engineer(Con)/I/BSP

मुख्य अभियंता-(निर्माण) / I
Chief Engineer (Con.) / I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

termination of the contract, along with forfeiture of Bid Security/Security Deposit and Performance guarantee besides any other action provided in the contract including banning of business for a period of upto five year.

10. I/We read the clause regarding restriction on procurement from a bidder of a country which shares a land border with India and certify that I am/We are not from a such country

or,

if from a country, have been registered with the competent authority. I/We hereby certify that I/We fulfil all the requirements in this regard and am/are eligible to be considered (evidence of valid registration by the competent authority is enclosed).

SEAL AND SIGNATURE
OF THE TENDERER

Place:
Dated:

** The contents in Italics are only for guidance purpose. Details as appropriate are to be filled in suitably by tenderer.

(This Certificate is to be given by each member of JV or Partners of Partnership firm/LLP/etc)

कार्यपालन अभियंता (निर्माण)/I
Executive Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
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कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
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S.E.C. Railway, Bilaspur

JOINT VENTURE PARTNER

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ANNEXURE – III

Proforma for Bid Capacity

Bid Capacity (If applicable as per NIT): The Bid Capacity of the tenderer for the tenders having advertised value more than Rs.20 crores may be submitted in the following format duly enclosing documents mentioned in this regard in the NIT.

List of Works in Hand

Sl. No	Name of work and contract agreement no. with date	Name and address of employers	Contractual Agreemental value in Cr	Revised value if any in Cr	Completion time as per original agreement and any extension granted.	Payment received upto date of opening of this tender in Cr	Balance Amount of ongoing work to be completed in next 'N' years. in Cr
1	2	3	4	5	6	7	8

Available Bid Capacity = [A x N x 2] (-) 0.33 x N x B

Where

A = Maximum value of construction works executed and payment received in any one of the previous three financial years or the current financial year (up to date of inviting tender), taking into account the completed as well as works in progress.

N = Number of years prescribed for completion of work for which bids has been invited.

B = Value of existing commitments and balance amount of ongoing works with the tenderer as on date one month prior to the tender closing date to be completed in next 'N' Years.

NOTE:

(a) The Tenderer (s) shall furnish the details of –

(i) Maximum value of construction works executed and payment received in any one of the previous three financial years or the current financial year (up to date of inviting tender) for calculating 'A' and.

(ii) Existing commitments and balance amount of ongoing works with tenderer as per the prescribed proforma of Railway for statement of all works in progress and also the works which are awarded to tenderer but yet not started up to the date of inviting of tender for calculating 'B'. In case of no works in hand, a 'NIL' statement should be furnished.

Signature of Tenderer(s)/Contractor(s) 49 For Chief Engineer(Con)/I/BSP

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

RSA-SK JOINT VENTURE

Draft Agt

JOINT VENTURE PARTNER

मुख्य कार्यालय (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

The submitted details for (i) and (ii) above should be duly verified by Chartered Accountant.

(b) In case if a bidder is JV, the tenderer (s) must furnish the details of

(i) Maximum value of construction works executed and payment received in any one of the previous three financial years or the current financial year (up to date of inviting tender) by each member of JV for calculating 'A', and

(ii) Existing commitment and balance amount of ongoing work with each member of JV either in individual capacity or as a member of other JV as per the prescribed proforma of Railway for statement of all works in progress and also the works which are awarded to each member of JV either in individual capacity or as a member of other JV but yet not started up to the date of inviting of tender for calculating 'B'. In case of no works in hand a 'NIL' statement should be furnished.

The submitted details for (i) and (ii) above should be duly verified by Chartered Accountant.

(c) Value of a completed work/work in progress/work awarded but yet not started for Member in an earlier JV shall be reckoned only to the extent of the concerned member's share in that JV for the purpose of satisfying his / her compliance to the above mentioned bid capacity in the tender under consideration.

(d) The antiemetic sum of individual "bid capacity" of all the members shall be taken as JV's "bid capacity".

(e) In case, the tenderer/s failed to submit the above statement along with offer, their/ his offer shall be considered as incomplete and will be **Rejected Summarily.**

(f) The available bid capacity of tenderer shall be assessed based on the details submitted by the tenderer. In case, the available bid capacity is lesser than estimated cost of work put to tender, his offer shall not be considered even if he has been found eligible in other eligibility criteria /tender requirement.

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

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ANNEXURE – IV

NOVATION AGREEMENT TO PRINCIPAL AGREEMENT

Articles of agreement made on this day..... in the year Two Thousand and Twenty between the President of India, acting through the ..... (Railway Administration) having its office at Bilaspur herein after called the 'Railway' of the first part and ..... hereinafter called the 'Contractor' of the second part and **Indian Railway Finance Corporation Limited** herein after called the 'IRFC' of the third part having its office at New Delhi with GSTN-**22AAACI0681G1Z9**.(GSTN of billing unit(IRFC).

First part, second part and third part collectively hereinafter called the 'Parties'.

Whereas the party hereto of the second part executed an agreement with the party hereto of the first part being agreement No....., dtd: ..... with contract cost of Rs..... (Rupees .....) for performance of .....(name of work) hereinafter called the 'Principal Agreement'.

Now it is hereby agreed by and between the parties that Indian Railway Finance Corporation shall be made an additional party to the Principal Agreement executed between Railway and Contractor with effect from date of this agreement.

It is agreed by and between the parties that Railway shall continue to be held responsible for all obligations, risk and liabilities, whatsoever, arising out of or in connection with the Principal Agreement and this Novation Agreement, whether during the progress of work or after its completion.

It is further agreed and understood by and between the parties that IRFC shall be owner of assets, if any, arising out of execution of works as defined in the Principal Agreement, except the land whose ownership shall continue with Railway. Accordingly, the invoices shall be issued by capturing GSTIN of contractor (as the supplier) and GSTIN of IRFC (as the bill-to-party). Also, the contractor shall submit the invoice, issued in the name of IRFC, to Railway for processing payment by Railway to contractor subject to applicable TDS under the income Tax, GST or any other applicable laws.

It is further agreed by and between the parties that IRFC shall be responsible to comply with Income Tax and GST laws in relation to filing of returns.

It is further agreed and understood by and between the parties that, except for the amended obligations as mentioned above, the terms of the Principal Agreement for all kind of contractual/performance and legal obligations shall remain in full force and effect.

All the communication in relation to the Principal Agreement and said Novation Agreement, would only be between party hereto of first part and second part.

Signature of contractor	For & on Behalf of the Indian Railway Finance Corporation	Chief Engg./Con/I/BSP S.E.C.Railway/Bilaspur For & on behalf of President of India

Witness
1.
2.

Witness
1.
2.

Witness
1.
2.

Signature of Tenderer(s)/Contractor(s)

For Chief Engineer(Con)/I/BSP

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

मुख्य अभियन्ता (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

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Format for Bid Security (Annexure-V)

Bank Guarantee bond from any scheduled commercial bank of India

(On non-judicial stamp paper, which should be in the name of the Executing Bank)

Name of the Bank: -----

President of India,
Acting through Chief Engineer (Con)/S.E.C.Railway,
Bilaspur, Chhattisgarh,

Beneficiary: South East Central Railway
Date: .....

Bank Guarantee Bond No.: **Date: ----------**

In consideration of the President of India acting through Chief Engineer (Con)/S.E.C.Railway, Bilaspur ***(Designation & address of Contract Signing Authority)***, South East Central Railway, Bilaspur **(hereinafter called "The Railway")** having invited the bid for _____ through Notice inviting tender (NIT) No. _____, We have been informed that ..... ***[Insert name of the Bidder]*****..... (hereinafter called "the Bidder")** intends to submit its bid (hereinafter called "the Bid").

WHEREAS, the Bidder is required to furnish Bid Security for the sum of Rs -------[Insert required Value of Bid Security/, in the form of Bank Guarantee, according to conditions of Bid.

AND

WHEREAS, ... ***[Insert Name of the Bank],*** with its Branch ..... ***[Insert Address]*** having its Headquarters office at ..... ***[Insert Address],*** hereinafter called the Bank, acting though ..... ***[Insert Name and Designation of the authorised persons of the Bank],*** have, at the request of the Bidder, agreed to give guarantee for Bid Security as hereinafter contained, in favour of the Railway:

1. KNOW ALL MEN that by these present that I/We the undersigned ***[Insert name (s) of authorized representative of the Bank],*** being fully authorized to sign and incur obligations for and on behalf of the Bank, confirm that the Bank, hereby, unconditionally and irrevocably guarantee to pay to the Railway full amount in the sum of Rs ------***[Insert required Value of Bid Security]*** as above stated.

2. The bank undertakes to immediately pay on presentation of demand by the Railway any amount upto and including aforementioned full amount without any demur. reservation or recourse. Any such demand made by the Railway on the Bank shall be final, conclusive and binding, absolute and unequivocal on the Bank notwithstanding any disputes raised/ pending before any Court, Tribunal, Arbitration or any Authority or any threatened litigation by the Bidder or Bank.

3. The Bank shall pay the amount as demanded immediately on presentation of the demand by Railway without any reference to the Bidder and without the Railway being required to show grounds or give reasons for its demand of the amount so demanded.

4. The guarantee hereinbefore shall not be affected by any change in the constitution of the Bank or in the constitution of the Bidder.

5. The bank agrees that no change, addition, modifications to the terms of the Bid document or to any documents, which have been or may be made between the Railway and the Bidder, will in any way absolve the Bank from the liability under this guarantee, and the Bank,

कार्यपालक अभियंता (निर्माण) Chief Engineer (Con.)/I
Executive Engineer (Con) द. पू. म. रेलवे, बिलासपुर
दक्षिण पूर्व मध्य रेलवे बिलासपुर S.E.C. Railway, Bilaspur
S.E.C. Railway, Bilaspur

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

hereby, waives any requirement for notice of any such change, addition or modification made by Railway at any time.

6. This guarantee will remain valid and effective from ..... ***[Insert date of issue]*** till -- ---------***[insert date which should be minimum 90 days beyond the expiry of validity of Bid].*** Any demand in respect of this Guarantee should reach the bank within the validity period of Bid security.

7. The Bank Guarantee is unconditional and irrevocable.

8. The expressions Bank and Railway herein before used shall include their respective successors and assigns.

9. The Bank hereby undertakes not to revoke the guarantee during its currency, except with the previous consent in writing of the Railway. This guarantee is subject to the Uniform Rules for demand Guarantees, ICC Publication No.758.

10. The Bank hereby confirms that it is on the SFMS (Structured Financial Messaging System) and shall invariably send the advice of this Bank Guarantee to the following band details-

IFSC CODE	SBIN000RAIL
IFSC TYPE	BRACH
BANK NAME	STATE BAND OF INDIA
BRANCH NAME	RAIL
CITY NAME	NAVI MUMBAI
ADDRESS	SECTOR-11, CBD BELAPUR, NAVI MUMBAI
DISTRICT	NAVI MUMBAI
STATE	MAHARASHTRA
BG ENABLED	YES

11. The Guarantee shall be valid in addition to and without prejudice to any other security Guarantee(s) of Bidder in favour of the Railway. The Bank, under this Guarantee, shall be deemed as Principal Debtor of the Railway.

Date .....
Place.....

.....
Bank Seal and authorized signature(s)
[Name in Block letters] .....
[Designation with Code No.] .....
[P/Attorney] No

Witness:
1. Signature, Name & Address & Seal
2. Signature, Name 7 Address & Seal

Bank Seal
[P/Attorney] No.

Note: All italicized text is for guidance on how to prepare this bank guarantee and shall be deleted from the final document.

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

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Draft Agt

For Chief Engineer(Con)/I/BSP

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

(Annexure-VI)

(Reference Para-10.2 & 17.15.2 of Tender Form (Second Sheet) of GCC-2022)

Each Bidder or each member of a JV must fill in this form separately:

NAME OF BIDDER/JV PARTNER:

Annual Contractual Turnover Data for the Previous 3 / 4 Years (Contractual Payment Only)			
Year	**Amount Currency.**	**Exchange Rate**	**Indian National Rupees Equivalent.**
Average Annual Contractual Turnover for last 3 years			

1. The average annual contractual turnover shall be calculated as an average of "total contractual payments" in the previous three financial years. However, in case balance sheet of the previous year is yet to be prepared/audited, the audited balance sheet of the fourth previous year shall be considered for calculating average annual contractual turnover.
2. The information supplied shall be substantiated by data in the audited balance sheets and profit and loss accounts for the relevant years in respect of the bidder or all members constituting the bidder.
3. Contents of this form should be certified by a Chartered Accountant duly supported by Audited Balance Sheet duly certified by the Chartered Account.

SEAL AND SIGNATURE OF THE BIDDER

Certified that all figures and facts submitted in this form have been furnished after full consideration of all observations/notes in Auditor's reports.

(Signature of Chartered Accountant)
Name of CA:
Registration No:
(Seal)

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

CHAPTER - IX

SPECIAL CONDITIONS OF CONTRACT

1.	**General:** The following documents (including addendum slips, Correction slips, Corrigendum slips issued upto date of opening of the tender) shall govern the works under this contract, in addition to and /or in part suppression of the USSOR – 2010 of South East Central Railway & Indian Railways Standard General Conditions of Contract published in April-2022. In a tender/contract, in case of any difference, contradiction, discrepancy, with regard to Conditions of tender/contract, Specifications, Drawings, Bill of quantities etc., forming part of the tender/contract, following shall be the order of precedences: (i) Letter of Award/Acceptance (LOA). (ii) Bill(s) of Quantities. (iii) Special conditions of contract. (iv) Technical Specifications as given in tender documents. (v) Drawings. (vi) Indian Railways Standard General Conditions of Contract updated with correction slip issued upto date of inviting tender or as otherwise specified in the Tender Documents. (vii) Indian Railways Unified Standard Specifications (Works and Materials)-2010), Vol. I & II, updated with correction slips issued upto date of inviting tender or as otherwise specified in the Tender Document. if applicable in the contract. (viii) CPWD Specifications'2019, Vol-I & II updated with correction slips issued up to date of inviting tender or as otherwise specified in the tender documents, if applicable in the contract. (ix) IR Specifications/Guidelines updated with correction slips issued upto date of inviting tender or as otherwise specified in the Tender Documents. (x) Relevant B.I.S. Codes updated with correction slips issued upto date of inviting tender or as otherwise specified in the Tender Documents. (xi) S.E.C. Railway SOR-2006 (For P. Way work) In case of conflict between provisions of IRS/IRC/IS specifications the precedence will be in the same order. Any specifications/conditions stated by the Tenderer(s) in the covering letter submitted by him along with the tender shall be deemed to be a part of the contract only to such an extent as has been expressly accepted by the Railway. In case of any ambiguity, the decision of Chief Administrative Officer (Construction)/South East Central Railway/Bilaspur shall be final & binding.
2.	All measurements, methods of measurements, meaning and item of specifications and interpretation of Special Conditions of Contract made by the Engineer on behalf of the Railway shall be final and binding and shall be considered as "Excepted matters" in terms of clause No.63 of Indian Railways Standard General Conditions of Contract published in April-2022.
3.	**Change of address:** Any change in the address of the Contractor, shall be forthwith intimated in writing to Engineer. The Railway will not be responsible for any loss or

Signature of Tenderer(s)/Contractor(s) कार्यपालन अभियंता (निर्माण) For Chief Engineer(Con)/I/BSP

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

Draft Agt

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

	inconvenience suffered by the Contractor on account of his failure to comply with this.
4.	**Office communication:** The contractor shall maintain Mobile number, a FAX machine, e-mail on registered email ID and a telephone connection in his office in working condition throughout the currency of the contract through which the Railways may be able to pass on any instructions to him. In case of any change, the same shall be advised to the Railway. As a measure to improve quality and progress of work, mobile communication should be available with the contractor's site engineer so that he can be contacted by railway.
5.	**Deployment of plant and machinery:** The deployment of plant and machinery including moving machines shall be such as not to infringe or cause damage to Railway track or any other Government or private properties. Operation of such equipment involving infringement to moving dimensions prescribed in the Schedule of Dimensions of the Railway shall not be undertaken without the prior approval of the Engineer. Contractor/s shall be wholly responsible for any loss or damage resulting from violation of this clause.
6.	**Damages By Accidents/Rain/Flood/Cyclones/Earthquake etc.:**
6.1.	The contractor(s) shall take all precautions against damages from accidents, rain, floods, cyclone earthquake or tides etc. No compensation shall be allowed to the contractor for his tools, Plants, materials, machines other equipment lost or damaged by any cause whatsoever. The contractor(s) shall make good the damages to any structure, plant or materials of every description belonging to the Railway Administration, lost or damaged by any cause during the course of construction work. Contractors are solely responsible for safety and security of his all resources and have to arrange to same in case any loss or damage so as to adhere to the program of completion of the work. Neither party shall by reason of such event be entitled to terminate the contract.
6.2.	The Railway Administration will not be liable to pay the contractor any charges for rectification or repairs that may have occurred from any cause whatsoever, to any part of the new structures during currency of contract. No claims in this regard will be arbitrable.
7.	The contractor has to take all precautions required to be taken for working in the electrified territories. Railways will not be responsible for any loss to life of Contractor's workmen. In case of any mishap, the decision of the Railway will be final & the agency has to bear the cost of the damages for which it is held responsible by the Railways.
8.	The contractors have to make their own arrangement for barricading/protection arrangements required for safety of their labour, tools, plants and machineries, as well as the train/road traffic from any mishap due to any reason.
9.	In case of emergency , such as in the event of any accident or failure of contractor for completion or maintenance of the works which is in the opinion of the Engineer requires immediate attention, the Railway may bring its own workmen or other agency to execute such work or part of the necessary work or carry out repairs, if the Engineer considers that the Contractor/s is/are not in a position to do so in time and charge the cost thereof to the contractor(s), as shall be determined by the Engineer-in-charge to the Contractor.
10.	**Night work:** The Contractor shall not carry out any work between sun-set and sun-rise without the previous permission of the Engineer. However, if the Engineer is satisfied that

	the work is not likely to be completed in time except by resorting to night work, he may order the same without confirming any right on the Contractor for claiming any extra payment for the same. The Contractor at his own cost shall make all arrangements including adequate lighting in this connection. He will be responsible for safety and security of the labour and equipments and take all precautions for the same.
11.	**Service Roads:** The Contractor(s) will be permitted to make use of the service roads already existing in the possession of the Railway. All service roads required by the contractor within or outside Railway boundary shall be constructed by the Contractor at his own risk and cost and all these roads shall be maintained by the Contractor at his own cost. The Railway reserves the right to make use of the service roads as and when necessary without any additional payment to the Contractor. All approaches to take the tools and plants to the site of work/river bed shall be made by the Contractor(s) and no extra payment will be made for this.
12.	**Recovery of water charges:** The contractor shall be responsible for the arrangements to obtain supply of water necessary for the work. In case the Railway arrange supply of water, the cost will be recovered at the rate of *Rs.2/-(Rupees Two only) per 4546 liters (1000 gallons*) subject to the conditions stipulated in Clause –31 of the Indian Railway Standard General Conditions of the Contract, April-2022. *In the event of water being used from Railway well/other source either in use or abandoned recovery at the rate of Rs.2/- per 4546 liters (1000 gallons) will be made.*
13.	**Electricity** (a) Any electric supply required at site for whatsoever purpose, shall be arranged by the Contractor/s. The Contractor/s shall be responsible for the arrangements for obtaining electric supply at his own cost, and rates quoted shall include the cost of providing electric supply arrangements required for the work. If required by Contractor/s, the Railway Administration may give required assistance in recommending to State Electricity Board for giving necessary electric connection to the Contractor for execution of works. (b) Electric Supply from the Railway System: The Railway may supply to the Contractor part or whole of the electric power wherever available and possible, required for execution of works from the Railway's existing electric supply systems at or near the site of works on specified terms and conditions and such charges as shall be determined by the Railway and payable by the Contractor provided the cost of arranging necessary connections to the Railway's Electric Supply systems and laying of underground/overhead conductor, circuit protection, electric power meters, transmission structure, shall be borne by the Contractor and that the Contractor shall not be entitled to any compensation for interruption or failure of the Electric supply system.
14.	**Loss of Work Orders:** If the original work order issued to the contractor is lost by him for any reason whatsoever and the Contractor demands for supply of a duplicate of the same, a penal levy of *Rs.100/- (Hundred only*) for each work order shall be imposed on him

Signature of Tenderer(s)/Contractor(s) For Chief Engineer(Con)/I/BSP

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

मुख्य इंजीनियर (निर्माण) / I
Chief Engineer (Con.)/I
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S.E.C. Railway, Bilaspur

	for the issue of a duplicate copy.
15 (a).	**Income Tax Deduction:** In respect of works, the contract value of, which is more than *Rs.10,000/-* each, a deduction of 2% and cess if any at the extant rate on the gross payment from each of the Contractor's bills shall be made in terms of section 194(e) of the Income Tax Act of 1961 & 1991.
15 (b).	**GST:** The contractor shall get himself registered with appropriate Authority for the purpose of Goods & Service Tax as the case may be and submit the proof of such registration for the information of Railway. The Tax at the prescribed percentages will be deducted from contractor's bills as per the respective State Government acts.
16.	**Provision of Efficient and Competent staff at Work Sites by the Contractor:**
16.1.	The Contractor shall place and keep on the works at all times efficient and competent staff to give the necessary directions to his workmen and to see that they execute their work in sound & proper manner and shall employ only such supervisors, workmen & labourers in or about the execution of any of these works as are careful and skilled in the various trades.
16.2.	The Contractor shall at once remove from the works any agents, permitted sub-contractor, supervisor, workman of labourer who shall be objected to by the Engineer and if and whenever required by the Engineer, he shall submit a correct return showing the names of all staff and workmen employed by him.
16.3.	In the event of the Engineer being of the opinion that the Contractor is not employing on the works a sufficient number of staff and workmen as is necessary for proper completion of the works within the time prescribed, the Contractor shall forthwith on receiving intimation to this effect deploy the additional number of staff and labour as specified by the Engineer within seven days of being so required and failure on the part of the Contractor to comply with such instructions will entitle the Railway to rescind the contract under Clause 62 Indian Railway Standard General Conditions of Contract published in April-2022.
17.	**Hire of Railway's Plant & Machinery:** It would be clearly understood that it is entirely the Contractor's responsibility and liability to procure all the machinery, tools and plants, and their spare parts that are required for the efficient and methodical execution of the work. Delay in procurement of such items due to their non-availability or due to difficulty in importing or any other causes whatsoever, will not be taken as an excuse for slow or nonperformance of work. The Railway may at their discretion give on hire to the Contractor any plant as considered necessary by the engineer, if available with Railway. However it does not guarantee hiring any machinery and it shall not entertain any claim or compensation due to Railways inability to supply any plant/machinery or the condition of the railway's plant/machinery supplied on hire shall not be taken as an excuse for slow progress or for non- performance of the work.
18.	**Hire charges of Plant & Machinery:** The railway administration shall charge the contractor for the hire of machinery and plant supplied to him. The rate of hire charge for

	the plant and machinery given by the railway will be evaluated by the Railway Administration and intimated to the contractor in advance.
19.	**Running expenses**: - Running expenses including fuel, lubricant and other stores and labour if any supplied by the Railway will also be paid for by the contractor at rates to be determined by the Railway. The contractor should make his own arrangement for taking delivery of fuel, lubricant and other stores, transporting the same to site of work and storing or use as per prescribed rules. In case of such supply of fuel, lubricant and other stores the actual cost plus 7% (for storing etc.) increased by 12% for supervision charges and for the labour supplied, the actual pay and allowances granted to the Railway servant with additional percentage charges laid down in Para 258 of the Indian Railway Establishment code volume- II plus 12% supervision charges shall be charged. Recoveries on this account will be made from the contractor's running bills. It must be noted that no claims will lie with the Railway for it's liability to supply fuel, lubricant and other stores aforesaid for late supply.
20.	**Right to Recall:** The Railway shall reserve to itself the right to recall any plant/machinery without assigning any reasons by giving one month's notice or at any time without notice in the event of its being required by the Railway for an unforeseen emergency. In either case, the Railway shall not be liable to pay any compensation to hirer for the loss that may be caused by the withdrawal of the plant.
21.	**Statutory Certificate Etc.:** While the machine(s) is/are in the possession of the contractor(s), he/they shall be responsible for seeing that any inspection certificate or license required under any Government Act is obtained in due time. The contractor shall also be responsible for seeing that all required precautions are observed in using the plant as well, and he shall be responsible for any accident that may occur from the use of the plant.
22.	**Storage of Railway Materials:** The Contractor shall make his own arrangements at the site of work for the safe storage and custody of Railway material issued to him. Such Railway materials issued to the Contractor and stored at the site of work shall be open for inspection by the Engineer or his representative at all times.
23.	Released materials such as boulders from existing pitching, if dismantled, trees if cut, etc will be Railways property. The materials have to deposited at the nearest Railway store depot/Railway station or as desired by the Engineer-in-Charge and payment for leading/transportation will be made as per USSOR-2010. No extra rates for cutting trees or jungle clearance will be paid. Weighment arrangements will have to be made by the contractor and the cost of such weighment is deemed to have been included in the rates.
24.	**Maintenance Period:** The maintenance period is subject to the conditions stipulated in Clause-47 of the Indian Railway Standard General Conditions of the Contract, April-2022. In this case the

	maintenance of the assets/tracks/lines etc. as laid/constructed will be as per the item No.15 of Schedule-'1' on the payment basis. Monsoon period is defined as from 15th June to 15th September.
25.	**Extension of time of Contract-** Extension of time in contract will be governed by the Clause No.17, 17-A & 17-B of Indian Railway Standard General Condition of Contract, April-2022.
26.	**IS/IRS Specifications:** Wherever any reference to Code, specification etc. is made in this document, it shall be taken as a reference to the version issued upto the date of publication of Tender Notice. If any other version of the code or specification is to be made applicable for any item(s), the rates for that item(s) shall be mutually negotiated.
27.	**Tree Cutting:** If the section passes through forest land, the contractor or his labour is prohibited to cut the trees for the purpose of firewood or for any other purpose. Cutting of trees as required under the items of works indicated in the tender schedules may be carried out strictly as directed by the Engineer or his representative of the work. Unauthorised felling of trees will result in prosecution and imprisonment. It is the contractor's responsibility to cause no damage to the forest growth and any fuel required by the Contractor for his own use or for the use by his labourers, or for the work shall be arranged by the Contractor at his own cost. The Contractor shall take this aspect into consideration while quoting the rates against the tender.
28.	**Approval of Samples of Material:** All materials to be used in the work by the Contractor shall be subject to the prior approval of the Engineer. Contractor shall submit samples of materials to be used in the work.
29.	**Mode of payment for running/final bills:** All the payments will be made through Electronic Fund Transfer /DD/Remote pay out by State Bank of India or as decided by the Railway Administration.
30.	**Royalty clearance certificate:** Payment of final bills for materials supplied /or for works done with materials collected from outside Railway shall be subject to submission of a royalty clearance Certificate by the contractors from concerned Civil Authorities. However, Railway may ask for such royalty clearance certificates any time during the currency of the Agreement. If royalty clearance certificate is not submitted at the time of preparation of bills, the royalty shall be deducted at prevailing rates and shall be refunded after production of royalty clearance certificate in original from State Government.
31.1.	**Security Deposit:** The Security Deposit shall be **5% of the contract value.** The Bid Security submitted by the contractor with his tender will be retained/encashed by the Railways as part of Security for the due and faithful fulfilment of the contract by the contractor. Provided further that, if

contractor submits the cash or Term Deposit Receipt issued from a Scheduled Commercial Bank of India or irrevocable Bank Guarantee bond from a Scheduled Commercial Bank of India, either towards the Full Security Deposit or the Part Security Deposit equal to or more than Bid Security, the Railway shall return the Bid Security, to the contractor.

Balance of Security Deposit may be deposited by the Contractor in cash or Term Deposit Receipt issued from Scheduled Commercial Bank of India or irrevocable Bank Guarantee bond issued from Scheduled Commercial Bank of India or may be recovered at the rate of **6% of the bill amount till the full Security Deposit is recovered.** Provided also that in case of defaulting Contractor, the Railway may retain any amount due for payment to the Contractor on the pending "on account bills" so that the amounts so retained (including amount guaranteed through Performance Guarantee) may not exceed 10% of the total value of the contract.

The irrevocable Bank Guarantee submitted towards security deposit shall be initially valid upto the stipulated date of maintenance period plus 60 days and shall be extended from time to time, depending upon extension of contract granted in terms of Clause-17A & 17B of the Standard General Conditions of Contract.

Note: Security Deposit deposited in cash by the contractor to recover from the running bills of a contractor or submitted by contractor as Term Deposit Receipt(s) can be refunded/returned to the contractor, in lieu of irrevocable Bank Guarantee bond issued from Scheduled Commercial Bank of India, to be submitted by him, for an amount equal to or more than the already available Security Deposit, provided however that, in a contract of value less than Rs.50 Crores, such refund/return of the already available Security Deposit is permitted upto two times and in a contract of value equal to or more than Rs.50 Crores, such refund/return of the already available Security Deposit is permitted upto 3 times.

31.2. **Refund of Security deposit:**

(i) Security Deposit mentioned in para-31.1 above shall be returned to the Contractor along with or after the following:

(a) Final Payment of the Contract as per clause-51(1) of Indian Railways Standard General Conditions of Contract, April-2022 **and**

(b) Execution of Final Supplementary Agreement or Certification by Engineer that Railway has No Claim on Contractor **and**

(c) Maintenance Certificate issued, on expiry of the maintenance period as per clause-50(1) of Indian Railways Standard General Conditions of Contract, April-2022, in case applicable.

(ii) Forfeiture of Security Deposit: Whenever the contract is rescinded as a whole under clause-62(1) of these conditions as per GCC-2022, the Security Deposit already with railways under the contract shall be forfeited. However, in case the contract is rescinded in part or parts under clause-62(1) of these conditions asper GCC-2022, the Security Deposit shall not be forfeited.

(iii) No interest shall be payable upon the Bid Security and Security Deposit or

	amounts payable to the Contractor under the Contract, but Government Securities deposited in terms of Sub-Clause-16.(4)(b) of Indian Railways Standard General Conditions of Contract, April-2022 will be payable with interest accrued thereon.
32.	**Performance Guarantee:** The procedure for obtaining Performance Guarantee is outlined below: (a) The successful bidder shall have to submit a Performance Guarantee (PG) within 21 (Twenty one) days from the date of issue of Letter of Acceptance (LOA). Extension of time for submission of PG beyond 21 (Twenty one) days and upto 60 days from the date of issue of LOA may be given by the Authority who is competent to sign the contract agreement. However, a penal interest of 12% per annum shall be charged for the delay beyond 21(Twenty one) days, i.e. from 22nd day after the date of issue of LOA. Further, if the 60th day happens to be a declared holiday in the concerned office of the Railway, submission of PG can be accepted on the next working day. In all other cases, if the Contractor fails to submit the requisite PG even after 60 days from the date of issue of LOA, the contract is liable to be terminated. In case contract is terminated railway shall be entitled to forfeit Bid Security and other dues payable to the contractor against that particular contract, subject to maximum PG amount. In case a tenderer has not submitted Bid Security on the strength of their registration as a Startup recognized by Department of Industrial Policy and Promotion (DIPP) under Ministry of Commerce and Industry, DIPP shall be informed to this effect. The failed Contractor shall be debarred from participating in re-tender for that work. (b) The successful bidder shall submit the Performance Guarantee (PG) in any of the following forms, **amounting to 3% of the original contract value:** (i) A deposit of Cash; (ii) Irrevocable Bank Guarantee; (iii) Government Securities including State Loan Bonds at 5% below the market value; (iv) Pay Orders and Demand Drafts tendererd by any Scheduled Commercial Bank of India; (v) Guarantee Bonds executed or Deposits Receipts tendered by any Scheduled Commercial Bank of India; (vi) Deposit in the Post Office Saving Bank; (vii) Deposit in the National Savings Certificates; (viii) Twelve years National Defence Certificates; (ix) Ten years Defence Deposits; (ix) National Defence Bonds and (xi) Unit Trust Certificates at 5% below market value or at the face value whichever is less.

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Chief Engineer (Con.)/I
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S.E.C. Railway, Bilaspur

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

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Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

	Also, FDR in favour of FA&CAO/Con/SECR (free from any encumbrance) may be accepted. (c) The Performance Guarantee shall be submitted by the successful bidder after the Letter of Acceptance (LOA) has been issued, but before signing of the contract agreement. This P.G. shall be initially valid upto the stipulated date of completion plus 60 days beyond that. In case, the time for completion of work gets extended, the Contractor shall get the validity of P.G. extended to cover such extended time for completion of work plus 60 days. (d) **The value of PG to be submitted by the Contractor is based on original contract value and shall not change due to subsequent variation(s) in the original contract value.** (e) The Performance Guarantee (PG) shall be released after physical completion of the work based on 'Completion Certificate' issued by the competent authority stating that the Contractor has completed the work in all respects satisfactorily. (f) Whenever the contract is rescinded, the Performance Guarantee already submitted for the contract shall be encashed in addition to forfeiture of Security Deposit available with railway. (g) The Engineer shall not make a claim under the Performance Guarantee except for amounts to which the President of India is entitled under the contract (not withstanding and/or without prejudice to any other provisions in the contract agreement) in the event of: (i) Failure by the Contractor to extend the validity of the Performance Guarantee as described herein above, in which event the Engineer may claim the full amount of the Performance Guarantee. (ii) Failure by the Contractor to pay President of India any amount due, either as agreed by the Contractor or determined under any of the Clauses/Conditions of the Agreement, within 30 days of the service of notice to this effect by Engineer. **(iii)** The Contract being determined or rescinded under clause 62 of these conditions.
33.	If contractor fails to apply for extension of time on valid and reasonable grounds as acceptable to the railway after expiry of the date of completion/ extended date of completion, in such situation, Railway reserves the right to terminate the contract agreement without issuing seven days and forty eight hours. It may be noted that for non-fulfilment of the contract the railways reserve the right to claim the damages under clause-62 of GCC in addition to any other rights available to it under law.
34. 34.1	**Variations in Extent of Contract** **Modification to Contract to be in Writing:** In the event of any of the provisions of the contract required to be modified after the contract documents have been signed, the modifications shall be made in writing and signed by the Railway and the Contractor and no work shall proceed under such modifications until this has been done. Any verbal or written arrangement abandoning, modifying, extending, reducing or supplementing the contract or any of the terms thereof shall be deemed conditional and shall not be binding on the Railway unless and until the same is incorporated in a formal instrument and signed by

	the Railway and the Contractor, and till then the Railway shall have the right to repudiate such arrangements.
34.2	**Powers of Modification to Contract:** The Engineer on behalf of the Railway shall be entitled by order in writing to enlarge or extend, diminish or reduce the works or make any alterations in their design, character position, site, quantities, dimensions or in the method of their execution or in the combination and use of materials for the execution thereof or to order any additional work to be done or any works not to be done and the Contractor will not be entitled, to any compensation for any increase/reduction in the quantities of work but will be paid only for the actual amount of work done and for approved materials supplied against a specific order.
	(i) Unless otherwise specified in the special conditions of the contract, the accepted variation in quantity of each individual item of the contract would be upto 25% of the quantity originally contracted, except in case of foundation work (in which no variation limit shall apply). However, the rates for the increased quantities shyall be as per sub – para (iii) below:
	(ii) The Contractor shall be bound to carry out the work at the agreed rates and shall not be entitled to any claim or any compensation whatsoever upto the limit of 25% variation in quantity of individual item of works.
	(iii) In case an increase in quantity of an individual item by more than 25% of the agreement quantity is considered unavoidable, then same shall be executed at following rates.
	(a) Quantities operated in excess of 125% but upto 140% of the agreement quantity of the concerned item, shall be paid at 98% of the rate awarded for that item in that particular tender;
	(b) Quantities operated in excess of 140% but upto 150% of the agreement quantity of the concerned item shall be paid at 96% of the rate awarded for that item in that particular tender;
	(c) Variation in quantities of individual items beyond 150% will be avoided and would be permitted only in exceptional unavoidable circumstances and shall be paid at 96% of the rate awarded for that item in that particular tender.
	(d) Variation to quantities of Minor Value Item: The limit for varying quantities for minor value items shall be 100% (as against 25% prescribed for other items). A minor value item for this purpose is defined as an item whose original agreement value is less than 1 % of the total original agreement value. (d) (i) Quantities operated upto and including 100% of the agreement quantity of the concerned minor value item, shall be paid at the rate awarded for that item in that particular tender; (d)(ii) Quantities operated in excess of 100% but upto 200% of the agreement quantity of the concerned minor value item; shall be paid at 98% of the rate awarded for

Signature of Tenderer(s)/Contractor(s)
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For Chief Engineer(Con)/BSP
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Executive Engineer (Con)
S.E.C. Railway, Bilaspur

Chief Engineer (Con.)/I
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	that item in that particular tender; (d)(iii) Variation in quantities of individual minor value item beyond 200% will be avoided and would be permitted only in exceptional unavoidable circumstances and shall be paid at 96% of the rate awarded for that item in that particular tender.
	(iv) In case of earthwork, the variation limit of 25% shall apply to the gross quantity of earthwork items and variation in the quantities of individual classifications of soil shall not be subject to this limit.
	(vi) As far as Standard Schedule of Rates (SSOR) items are concerned, the variation limit of 25% would apply to the value of SSOR schedule as a whole and not on individual SSOR items. However, in case of Non Standard Schedule of Rates (SSOR) items,, the limit of 25% would apply on the individual items irrespective of the manner of quoting the rate (single percentage rate or individual item rate).
34.3.	**Valuation of Variations**: The enlargements, extensions, diminution, reduction, alterations or additions referred to in para-34.2 above of this Clause shall in no degree affect the validity of the contract; but shall be performed by the Contractor as provided therein and b subject to the same conditions, stipulations and obligations as if they had bee iginally and expressively included and provided for in the Specificatio and Drawings and the amounts to be paid therefor shall be calculated in accordance with the accepted Bill(s) of Quantities. Any extra items/quantities of work falling outside the purview of the provisic ns of para-34.2 above shall be paid for at the rates determined under Clause-39 of Indian Railways Standard General Conditions of Contract, April-2022.
35.	**Vitiation during variation in Contract Quantities**: As a result of variations, a contract shall be considered "vitiated" only when, the following percentage variation in contract value between tenderers are noticed to have been exceeded.

Sl. No.	Value of Contract	Percentage difference between present Contractor and new L-1 as a result of variation (percentage shall be calculated with base as the revised contract quantities multiplied by the rates of the present contractor).
1.	Small value contracts (Tender value less than Rs. 50 lakh)	10
2.	Other than small value contracts (Tender value equal to or more than Rs. 50 lakh)	5

When the percentage difference between present Contractor and new L-1 is noticed as becoming beyond the values specified above, Railway may take decision at its' discretion whether fresh tender shall be invited for the extra quantities or to negotiate the rates with the existing contractor and decision of Railway Administration in this regard shall be final and binding to the contractor. The ca shall be decided by the tender accepting authority

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	(competent for the revised quantity) and shall not be treated as a case of single tender. However, the Executives while executing the work shall make all efforts to ensure that no vitiation takes place in normal circumstances. Vitiation should be an exception rather than a routine affair. Vitiation should always be computed with respect to the items, rates, quantities and conditions as available at the time of tender opening and subsequent changes/additions by way of new items will not be counted for computing vitiation.
36.	(A) **MOBILISATION ADVANCE & INCENTIVE CLAUSE**: Mobilization advance and incentive clause will not be applicable under this contract. (B) **Measurement of works**: Measurement by the contractor for the works executed will not be allowed for this contract.
37.	**Provisions of "The Building and other construction Workers (Regulation of Employment and conditions of Service) Act'1996 and "The Building and other Construction Workers" Welfare Cess Act'1996":** The tenderers for carrying out any construction work must get themselves registered from the Registering Officer under Section-7 of the Building and other Construction Workers Act'1996 and rules made thereto by the concerned State Govt. and submit certificate of Registration issued from the Registering Officer of the concerned State Govt. (Labour Deptt.). The cess shall be deducted from contractor's bills as per provisions of the Act.
38.	**Employees' Pension Scheme'1995 :** Para 3(1) : From and out of the contributions payable by the employer in each month under Section-6 of the "Act" or under the rules of the Provident Fund of the establishment which is exempted either under clauses (a) and (b) of sub-section (1) of Section-17 of the Act or whose employees are exempted under either paragraph-27 or paragraph-27-A of the Employees' Provident Fund Scheme'1952, a part of contribution representing 8.33 per cent of the Employee's pay shall be remitted by the employer to the Employees' Pension Fund within 15 days of the close of every month by a separate Bank Draft or Cheque on account of the Employees' Pension Fund contribution in such manner as may be specified in this behalf by the Commissioner. The cost of the remittance, if any, shall be borne by the employer. Para 3(2) : The Central Government shall also contribute at the rate of 1.16 per cent of the pay of the members of the Employees' Pension Scheme and Credit the contribution to the Employees' Pension Fund: Provided that where the pay of the member exceeds Rs.6,500/- (Rs Six thousand and five hundred) per month, the contribution payable by the employer and the Central Government be limited to the amount payable on his pay of Rs.6,500/- (Rs. Six thousand and five hundred) only. Para 4 : Payment of Contribution: The employer shall pay the contribution payable to the Employees' Pension Fund in respect of each member employed by him directly or by or through a contractor. It shall be the responsibility of the principal employer to pay the contributions payable to the Employees' Pension Fund by himself in respect of the employees directly employed by him also in respect of the employees employed by or through a contractor.
39.	**Employees' Deposit Linked Insurance Scheme'1976:**

Signature of Tenderer(s)/Contractor(s)

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For Chief Engineer(Con)/I/BSP

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	Para 7: Contribution: (1) The contribution payable by the employer and the Central Government under sub-section (2) and sub-section (3) of Section 6-C of the Act, shall be calculated on the basis of the basic wages, dearness allowance (including the cash value of any food concession) and retaining allowance, if any, actually drawn during the whole month whether paid on daily, weekly, forthrightly or monthly basis. Provided that where the monthly pay of an employee exceeds six thousand five hundred rupees, the contribution payable in respect of him by the employer and the Central Government shall be limited to the amounts payable on a monthly pay of six thousand five hundred rupees including dearness allowance, retaining allowance (if any) and cash value of food concession. Para 8: Mode of Payment of Contribution: The contribution by the employer shall be remitted by him together with administrative charges at such rate as the Central Government may fix from time to time under sub-section-4 of Section 6-C of the Act, to the Insurance Fund within fifteen days of the close of every month by a separate Bank Draft or cheque or by remittance in cash in such manner as may be specified in this behalf by the Commissioner. The cost of remittance, if any, shall be borne by the employer. It shall be the responsibility of the employer to pay the contribution payable by himself in respect to the employees directly employed by him and also in respect of the employees employed by or through a contractor.
40.	**Following should be complied under this contract:** (i) Payment to the contract labourers should be made through bank/cheque. (ii) Identity Card should be issued to all contract workers. (iii) Necessary step should be taken to deduct Provident Fund from the payment made to the contract labour and ensure that the same is credited to their Provident Fund Account. (iv) Medical facilities from ESI, if applicable.
41.	**Provisions of Payments of Wages Act:** The Contractor shall comply with the provisions of the Payment of Wages Act'1936 and the ruses made there under in respect of all employees employed by him either directly or through petty Contractors or sub-contractors in the works. If in compliance with the terms of the contract, the Contractor directly or through petty Contractors or sub-contractors shall supply any labour to be used wholly or partly under the direct orders and control of the Engineer whether in connection with the works to be executed hereunder or otherwise for the purpose of the Engineer , such labour shall nevertheless be deemed to comprise persons employed by the Contractor and any moneys which may be ordered to be paid by the Engineer shall be deemed to be moneys payable by the Engineer or behalf of the Contractor and the Engineer may on failure of the Contractor to repay such money to the Railways deduct the same from any moneys due to the Contractor in terms of the contract. The Railway shall be entitled to recover the same form Contractor's bills/ Security Deposit or any other dues of Contractor with the Government of India all moneys paid or payable by the Railway by way of compensation of aforesaid or for costs of expenses in connection with any claim thereto and the decision of the Engineer upon any question arising out of the effect or force of this Clause shall be final

Signature of Tenderer(s)/Contractor(s) For Chief Engineer(Con)/I/BSP

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मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
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	and binding upon the Contractor.
41.1.	**Provisions of Contract Labour (Regulation and Abolition) Act, 1970:**
41.1.1	The Contractor shall comply with the provision of the contract labour (Regulation and Abolition) Act, 1970 and the Contract labour (Regulation and Abolition) Central Rules 1971 as modified from time to time, wherever applicable and shall also indemnify the Railway from and against any claims under the aforesaid Act and the Rules.
41.1.2	The Contractor shall obtain a valid license under the aforesaid Act as modified from time to time before the commencement of the work and continue to have a valid license until the completion of the work. Any failure to fulfill the requirement shall attract the penal provision of the Act.
41.1.3	The Contractor shall pay to the labour employed by him directly or through subcontractors the wages as per provision of the aforesaid Act and the Rules wherever applicable. The Contractor shall notwithstanding the provisions of the contract to the contrary, cause to be paid the wages to labour, indirectly engaged on the works including any engaged by subcontractors in connection with the said work, as if the labour had been immediately employed by him.
41.1.4	In respect of all labour directly or indirectly employed in the work for performance of the Contractor's part of the contract, the Contractor shall comply with or cause to be complied with the provisions of the aforesaid Act and Rules wherever applicable.
41.1.5	In every case in which, by virtue of the provisions of the aforesaid Act or the rules, the Railway is obliged to pay any amount of wages to a workman employed by the Contractor or his sub-contractor in execution of the work or to incur any expenditure on account of the contingent, liability of the Railway due to the Contractor's failure to fulfil his statutory obligations under the aforesaid Act or the rules, the Railway will recover from the Contractor, the amount of wages so paid or the amount of expenditure so incurred and without prejudice to the rights of the Railway under the Section 20, Sub-Section (2) and Section 2, Sub-Section (4) of the aforesaid Act, the Railway shall be at liberty to recover such amount or part thereof from Contractor's bills/Security Deposit or any other dues of Contractor with the Government of India. The Railway shall not be bound to contest any claim made against it under Sub-Section (1) of Section 20 and Sub-Section (4) of Section 21 of the aforesaid Act except on the written request of the Contractor and upon his giving to the Railway full security for all costs for which the Railway might become liable in contesting such claim. The decision of the Chief Engineer regarding the amount actually recoverable from the Contractor as stated above shall be final and binding on the Contractor.
41.2.1	**Provisions of Employees Provident Fund and Miscellaneous Provisions Act, 1952**:The Contractor shall comply with the provisions of Para 30 & 36-B of the Employees Provident Fund Scheme, 1952; Para 3 & 4 of Employees' Pension Scheme, 1995; and Para 7 & 8 of Employees Deposit Linked Insurance Scheme, 1976; as modified from time to time through enactment of "Employees Provident Fund & Miscellaneous Provisions Act, 1952", wherever applicable and shall also indemnify the Railway from and against any claims under the aforesaid Act and the Rules.
41.2.2	Contractor is to abide by the provisions of various labour laws in terms of above clause 54, 55, 55-A and 55-B of Indian Railways Standard General Conditions of Contract. In order to ensure the same, an application has been developed and hosted on website

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	'www.shramikkalyan.indianrailways.gov.in'. Contractor shall register his firm/company etc. and upload requisite details of labour and their payment in this portal. These details shall be available in public domain. The Registration/ updation of Portal shall be done as under: (a) Contractor shall apply for onetime registration of his company/firm etc. in the Shramikkalyan portal with requisite details subsequent to issue of Letter of Acceptance. Engineer shall approve the contractor's registration in the portal within 7 days of receipt of such request. (b) Contractor once approved by any Engineer, can create password with login ID (PAN No.) for subsequent use of portal for all Letter of Acceptances (LoAs) issued in his favour. (c) The contractor once registered on the portal, shall provide details of his Letter of Acceptances (LoAs) / Contract Agreements on shramikkalyan portal within 15 days of issue of any LoA for approval of concerned Engineer. Engineer shall update (if required) and approve the details of LoA filled by contractor within 7 days of receipt of such request. (d) After approval of LoA by Engineer, contractor shall fill the salient details of contract labours engaged in the contract and ensure updating of each wage payment to them on shramikkalyan portal on monthly basis.
	(e) It shall be mandatory upon the contractor to ensure correct and prompt uploading of all salient details of engaged contractual labour & payments made thereof after each wage period.
41.2.3	While processing payment of any 'On Account Bill' or 'Final Bill' or release of 'Advances' or 'Performance Guarantee / Security deposit', contractor shall submit a certificate to the Engineer or Engineer's representatives that "I have uploaded the correct details of contract labours engaged in connection with this contract and payments made to them during the wage period in Railway's Shramikkalyan portal at 'www.shramikkalyan.indianrailways.gov.in' till ____Month, ____Year."
42.	**Provision of Workmen's Compensation Act:** In every case in which by virtue of the provisions of Section 12 Sub-Section (1) of the Workmen's Compensation Act 1923, Railway is obliged to pay compensation to a workman directly or through petty Contractor or subcontractor employed by the Contractor in executing the work, Railway will recover from the Contractor the amount of the compensation so paid, and, without prejudice to the rights of Railway under Section 12 Sub section (2) of the said Act, Railway shall be at liberty to recover such amount or any part thereof from Contractor's bills/Security Deposit or any other dues of Contractor with the Government of India. Railway shall not be bound to contest any claim made against it under Section 12 Sub-Section (1) of the said Act except on the written request of the Contractor and upon his giving to Railway full security for all costs for which Railway might become liable in consequence of contesting such claim.
43.	**Reporting of Accidents:** The Contractor shall be responsible for the safety of all employees directly or through petty Contractors or sub-contractor employed by him on the works and shall report serious accidents to any of them however and wherever occurring on the works to the Engineer or the Engineers Representative and shall make every arrangements to render all possible assistance.
44.	**INSPECTION VEHICLES** The contractor shall be responsible to provide **02 nos. inspection vehicle(s)**

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Draft Agmt

	(Scorpio/Bolero or equivalent) in good condition (Model not more than 3 years old) for the full contract period including further Extension of Times (EOTs) exclusively for the movement of Railway Engineer or his authorized representative from office/home to work sites and to & fro movement at various sites and bear all expenditures in this regard including running cost up to 3500 Kms. per month (but may exceed over 3500 Km.) on all days/working days. No separate payment shall be admissible on this account. If vehicle(s) not provided from the day of start of work execution or vehicle(s) not provided in any day or at any time/instances during the entire period of execution of work/contract, then penalty of Rs.2000/- per day/per occasion per vehicle will be imposed. Vehicle(s) to be provided as per the direction of Engineer-in-Charge.
45.	**SITE OFFICE** The contractor will set up a reasonably furnished site office of area about 50 Sqm. as directed by the Engineer at a central location either by hiring a building or by erecting temporary building/Pre-fab-building with proper electric arrangement, water supply and sanitary fittings with good roofing & flooring for exclusive use of the Engineer and his representative. Minimum 03 Nos computers and 02 No printer should be available at this office. The same shall be handed over to Railways on completion of the work.
46.	The contractor shall provide and keep on the works, during the execution of the works, efficient and competent Engineers to ensure that the work is executed strictly as per provisions of the contract. It shall be the obligation on the part of the contractor to provide the following minimum engineering staff at site: -

Sr. No.	Position/Qualification/Experience	Minimum nos. to be deployed
1	Project Manager -- Degree holder with minimum experience of 10 years in the field Railway/Highway.	1
2	Site Degree Engineer(Civil) -- Degree holder with minimum experience of 4 years.	2
3	Engineer (Quality Control) – Degree holder with minimum experience of 2 years/Diploma holders with minimum experience of 3 years experience in the field.	1
4	Site Diploma Engineer (Civil) –Diploma holders with minimum experience of 5 years in the field.	2

Out of 02 Degree/Diploma Engineers one should be experienced in P.Way works.
In addition to the above, requisite number of staff for laboratory and other supervisory staff shall be deployed by the contractor. The technical staff shall be got approved in writing from the Engineer (whose approval may be withdrawn any time) for supervision of works and to receive direction from the Engineer or his representative of the work on behalf of the contractor. The supervisory staff of the contractor will not be changed without the approval of the Engineer.
In addition to above, 06 (Six) skilled labourers for assisting in various works related

with instant tender such as taking levels, measurements, chowkidar, security patrolling, night watch man etc. as the requirement may be and decided by Engineer. These twelve labourers shall be provided by contractor but shall be deployed and controlled by the Assistant Executive Engineer/Executive Engineer as per requirement. These skilled labourers shall report to Engineer's representative and normally shall not be changed frequently as they are to be trained and made familiar with Railway's requirement. In case the contractor failed to provide above said labourers, a recovery @ notified by Government (Labour rate) shall be done. In this regard decision of Executive Engineer/Assistant Executive Engineer shall be final and binding.

2.1 The contractor has to deploy the Project Manager, Construction Manager, Engineer (Quality Control) and Survey Engineer within one month of issue of the letter of acceptance. The site engineers shall be deployed by the contractor as per the deployment program/method statement approved by the Engineer. In case, the contractor fails to deploy sufficient Engineers as described above, the Engineer shall be entitled to recover the following amount from the dues of the contractor:-

1	Non Deployment of Project Manager	Rs. 60,000/- per month or part thereof
2	Non Deployment of Site Degree Engineer	Rs. 40,000/- per month or part thereof
3	Non Deployment of Site Diploma Engineer/Engineer (Quality Control)	Rs. 25,000/- per month or part thereof

The decision of the Engineer as to the period for which the required technical staff was not employed by the contractor and as to reasonableness of the amount to be deducted on this account shall be final and binding on the contractor.

47. The contractor will submit within 15 days of issue of LOA, the bar chart/mile stone, preferably in M.S. Project, for the various activities showing the completion of the work within the stipulated completion period for the approval of the Engineer.

48. **LABORATORY**

Contactor shall establish a Central laboratory for carrying out testing to ensure compliance as per the Quality Assurance Plan (QAP) as per details in this document. The laboratory should be well equipped for the testing facilities for the following in addition to the other requirements as per QAP:

Concrete – Set of IS Sieves for coarse and fine aggregate, slump cone, cube moulds, Compression strength testing machine.

Earth Work – Grain size analysis, Atterberg Limits, Modified Proctor density (OMC & MDD), Field Density (OMC & MDD), CBR test equipment etc.

The above central laboratory shall have facility for carrying out all tests required, as per Specifications or as stated elsewhere in the contract, including supply of laboratory equipment and also provision of adequate number of qualified personnel, erection, maintenance and running of laboratory including all consumable like chemicals and reagents. If the laboratory is not provided within one month of issue of letter of acceptance, a deduction of ₹2,00,000/- will be made on monthly basis. In addition of these, field testing equipment's are also to be arranged wherever required and instructed by Engineer. Further, cost of tests and all incidental and departmental charges etc. carried out at any other

	approved laboratory/test house shall be borne by the contractor.
49.	**Video recording/Ortho-photogrammetry** During the Construction Period, the Contractor shall provide to the Railway for every calendar quarter, a video recording/drone mapping & Ortho-rectified & geo-referenced photography/videography by UAV-drone as advised by the Engineer, which will be compiled into a 3 (three) hour digital video disc or any substitute thereof, covering the mapping & recording of section before start of work and then status & progress of Works in every quarter. This video recording/drone mapping & Ortho-photogrammetry is applicable for major construction project and not for the building work/small work.
50.	For protection of track during construction at sites adjacent to the existing running railway tracks sufficient nos. banner flags, red hand flags, tri-color torches for night time to be kept at all such sites.
51.	**Certificate of completion of Works**: As soon as in the opinion of the Engineer, the work has been completed and has satisfactorily passed any final test or tests that may be prescribed, the Engineer shall issue a certificate of completion duly indicating the date of completion in respect of the work and the period of maintenance of the work shall commence from the date of completion mentioned in such certificate. The certificate, inter alia, should mention that the work has been completed in all respects and that all the contractual obligations have been fulfilled by the Contractor and that there is no due from the Contractor to Railways against the contract concerned. The Engineer may also issue such a certificate indicating date of completion with respect to any part of the work (before the completion of the whole of work), which has been both completed to the satisfaction of the Engineer and occupied or used by the Railway. When any such certificate is given in respect of part of a work, such part shall be considered as completed and the period of maintenance of such part shall commence from the date of completion mentioned in the completion certificate issued for that part of the work.
51.1	**Rates for Extra Items of Works:** **(a) Standard Schedule of Rate (SSOR) Items:-** Any item of work carried out by the Contractor on the instructions of the Engineer which is not included in the accepted Bill(s) of Quantities but figures in the Standard Schedule of Rates (SSOR), shall be executed at the rates set forth in the " Schedule of Rates of Railway" modified by the tender percentage as accepted in the contract for that chapter of Standard Schedule of Rates (SSOR). However, the cumulative value of all such extra item(s) together (modified by the respective tender percentage) shall not exceed 10% of the original contract value. For item(s) not covered under this sub-clause, the rate shall be decided as agreed upon between the Engineer and the Contractor before execution of such items of work as sub-clause (b) below. **(b) Other Items:-** For any item of work to be carried out by the Contractor but not included in the accepted Bill(s) of Quantities and also not covered under sub-clause-(a) above, the Contractor shall be bound to notify the Engineer at least seven days before the necessity arises for the execution of such items of works that the accepted Bill(s) of Quantities does not include rate or rates for such extra work involved. The rates payable for such items shall be decided at the meeting to be held between the Engineer and Contractor, in as short a period as possible after the need for the special item has come to the notice. In case the Contractor fails to attend the meeting after being notified to do so or in the event of no settlement being arrived at, the Railway shall be entitled to execute the extra works by other means and the Contractor shall have no claim for loss or damage that may result from such procedure.

	The assessment of rates for extra items shall be arrived at based on the prevailing rates of labour, machinery & materials and by taking guidance from the following documents in order of priority: (i) Analysis of Rates for "Unified Standard Schedule of Rates of Indian Railways (USSOR)". (ii) Analysis of Rates for "Delhi Schedule of Rates issued by CPWD (DSR". (iii) Market Analysis.
51.2.	Provided that if the Contractor commences work or incurs any expenditure in regard thereto before the rates as determined and agreed upon as lastly hereunto fore-mentioned, then and in such as case the Contractor shall be entitled to be paid in respect of the work carried out or expenditure incurred by him prior to the date of determination of the rates as aforesaid according to the rates as shall be fixed by the Engineer. However, if the Contractor is not satisfied with the decision of the Engineer in this respect, he may appeal to the Chief Engineer within 30 days of getting the decision of the Engineer, supported by analysis of the rates claimed. The Chief Engineer's decision after hearing both the parties in the matter would be final and binding on the Contractor and the Railway.
52.	**Display Board:** The Contractor shall be responsible for displaying the details of works i.e. name of work, approximate cost, expected date of completion, name and address of the Contractor and address of Engineer on a proper steel Board of size not less that 1m x 1m
53.	**Offloading of Part(s) of Work:-** At the final stage of completion / commissioning of work, in case the contractor fails to complete the final part(s) of the work and the value of such part(s) of the work is limited to 5% of the original contract value, the Engineer may allow/decide for offloading of such part(s) of works, either after the Contractor's request in writing to do so or after serving a 14 (Fourteen) days suo-moto notice (as per annexure- VIIA in GCC-2022), if the Engineer is of the opinion that :- (i) Such Offloading of works (up to 5% of original contract value) would enable successful completion of contract/work, (ii) Termination/ Part termination of the contract at this stage is not be in the interest of the Railway/work: and (iii) The anticipated additional cost for execution of such works through other mode would not be substantial and can be recovered from the pending dues of the contractor; The Contractor shall be informed, in due course, by the Engineer of the mode and cost of execution of such offloaded work through other agency(ies) (as per annexure- VIIB in GCC-2022). The extra expenditure so incurred in execution of the offloaded work, shall be recovered from subsequent Bill(s) or any other dues of the Contractor, but not exceeding the value of Performance Guarantee available in the contract. There shall be no other repercussion of such offloading on execution of the balance contract. The Contractor shall have no claim on account of above mentioned offloading of works.

CHAPTER - X

SPECIAL CONDITIONS OF CONTRACT

(SAFETY PRECAUTIONS)

PRECAUTION WHILE PLYING VEHICLES ADJACENT TO RUNNING TRACK

1. General

The Contractor shall not allow any road vehicle belonging to his or his suppliers etc., to ply in railway land next to the running line. If for execution of certain works viz., earthwork for parallel railway line and supply of ballast for new or existing rail line gauge conversion etc., road vehicles are necessary to be used in Railway land next to the Railway line, the Contractor shall apply to the Engineer-in-Charge for permission giving the type & No. of individual vehicles, names and License particulars of the drivers, location, duration & timings for such work/movement. The engineer in charge or his authorized representative will personally counsel, examine & certify, the road vehicle drivers, Contractor's flagmen & Supervisor and will give written permission giving names of road vehicle drivers, Contractor's flagmen and Supervisor to be deployed on the work, location, period and timing of the work. This permission will be subject to the following obligatory conditions.

1.1 The road vehicles will ply in between sunrise & sunset.

1.2 Nominated vehicles & drivers will be utilized for work in the presence of at least one flagman & one supervisor certified for such work.

1.3 The vehicles shall ply 6.0m clear of track. If any movement/work is required to be carried out at distance less than 6.0m and up to 3.5m clear of track centre, it shall be done only in the presence of railway employee authorized by the Engineer-in-Charge. No part of the road vehicle will be allowed at less than 3.5m from track centre. Cost of such railway employee shall be borne by the railway.

1.4 The Contractor shall remain fully responsible for ensuring safety & in case of any accident, shall bear cost of all damages to his equipment and also damages to Railway & its passengers.

1.5 The Contractor shall also be bound by the provisions of this agreement to ply the road Vehicles only with adequate margin of safety, well clear of the fixed structure profile of infringements, as stipulated in the rules made under the Indian Railways Act and to seek and be guided by the Signals and other directions of any look-out men or other personnel retained for the purpose of ensuring safety, and to ensure extra care and vigilance while turning, reversing or moving the road Vehicles Track or the siding, as the case may be. The Contractor shall employ necessary lookout men also at his own cost, irrespective of any other arrangement that Railway may make in this regard.

Any breach of these conditions by the Contractor and/or his agents affecting the safety of movement of Trains, engines, or other rolling stock of the railway shall constitute a breach of Contract by the Contractor entailing liability for termination of contract for default on the part of the Contractor.

2. PROVISION OF FENCING: If desired by the Engineer-in-Charge, the work site is to be protected by providing and maintaining fencing cost of which will be made separately as per provision in the schedule of work. Sturdy fencing shall be provided as per CE/C/BSP's Drg. No.5808/2018 and the payment will be made separately.

3. "JOINT PROCEDURE ORDER FOR UNDERTAKING DIGGING WORK IN THE VICINITY OF UNDERGROUND SIGNALING, ELECTRICAL AND TELECOMMUNICATION CABLES"

3.1. Number of Engineering works in connection with third/fourth line is in progress, which requires extensive digging work near the running track, in close vicinity of the working S&T cables carrying vital safety circuits as well as electrical cables feeding the power supply to cabins, ASM room, RRI Cabin, Intermediate Block Huts (IBH) etc. Similarly, S&T organisation under open line or construction units under CAO/C, are executing various Signalling and Telecom works requiring digging of earth for laying of cables or casting of foundations for the erection of signal posts etc. On certain sections digging is also required for laying of electrical cable and casting of foundation for the erection of OHE masts. Generally, these works are executed by Contractors.

3.2. However, while carrying out these works in the vicinity of working signalling, telecommunication and electrical cables, at times, cable cuts take place due to JCB machines working along the track or during the digging work being done by Contractors carrying out the Civil Engineering Works. Similarly, such cable cuts are also resulting due to works undertaken by S&T or Electrical Contractors. Such cable faults result in the failure of vital signalling and telecommunication circuits & electrical installations.

3.3. Following joint procedure shall be followed by Engineering, Electrical and S&T Contactors, while carrying out any digging work near to existing signalling & telecommunication and electrical cables, so that the instances of cable cut due to execution of works, can be controlled and minimized.

3.4. S&T Department and Electrical department shall provide a detailed cable route plan showing exact location of cable at an interval of 200m or wherever there is change in alignment so that the same is located easily by the Engineering official/Contractor. In addition, S&T department and Electrical department shall also provide cable markers along the alignment of the cable.

3.5. Before taking up any digging activity on a particular work by any agency, Sr.DSTE/DSTE or Sr.DEE/DEE of the section shall be approached in writing by the concerned Engg. or S&T or Electrical officer for permitting to undertake the work. Sr.DSTE/DSTE or Sr.DEE/DEE, after ensuring that the concerned executing agencies including the Contractor have fully understood the S&T and Electrical cable route plan shall permit the work in writing within 07 days of the request by concerned department.

3.6. After getting the permission from S&T or Electrical department as the case may be, the relevant portion of the cable route plan shall be attached to the letter through which permission is issued to the Contractor by

concerned Engg. official for commencement or work and ensuring that the Contractors have fully understood the cable route plan and precautions to be taken to prevent damage to the underground cables. The Contractor shall be asked to study the cable plan and follow it meticulously to ensure that the safety of the cable is not endangered. Such a provision, including any penalty for default, should form part of agreement also.

3.7. The SE/P.Way or SE/Works shall pass on the information to the concerned SE/Sig SE/Tele about the works being taken up by the Contractors in their sections at least 03 days in advance of the day of the work. In addition Engineering control shall also be informed by SE/P.Way or SE/Works, who in turn shall pass on the information to the test room/network operation centre TPC/Elect. Control.

3.8. On receiving the above information, SE/Sig or SE/Tele or shall visit the site on or before the date of taking up the work and issue permission to the Contractor to commence the work after checking that adequate precautions have been taken to avoid the damage to the cables. The permission shall be granted within 03 days of submission of such requests.

3.9. The name of the Contractor, his contact telephone number, the nature of the work shall be notified in the Engineering control as soon as the concerned Engineering officials issue the letter authorizing commencement of work to the Contractor. Test room shall be given copies. Test room shall collect any further details from the Engineering Control and shall pass it on to S&T and Electrical officials regularly. In case the supervisors of concerned departments do not turn up on the day as advised in terms of para-3.5 to 3.8 above, the works of Contractor should not be stopped on this account.

3.10. In case of works being taken up by the State Government, National Highway Authority etc., the details of the permission given i.e. the nature the work, kilometer etc. be given to the Engineering control including the contact person's number so that the work can be done in a planned manner. The permission letter shall indicate the contact numbers of Test room/network Operating Centre of TPC/Elect. Control.

3.11. Where the nature of the work taken up by the Engineering department is such that the OFC or other S&T cables or Electrical cables is to be shifted and relocated, notice of minimum one week shall be given so that the Division /Construction can plan the works properly for shifting. Such shifting works shall in addition, for security and integrity of the cables, be supervised by S&T supervisors/Electrical Supervisors.

3.12. The concerned SE(P.Way)/SE(Works)/SE(Sig)/SE(Tele) supervisors supervising the work of the Contractor shall ensure that the existing emergency sockets are not damaged in view of their importance in providing communication during accident/emergency.

3.13. In case of minor nature of works where shifting of cable is not required, in order to prevent damage to the cable, the Engineering Contractor shall take out the S&T or optical fibre cable or Electrical cable carefully from the trench and place it properly alongside at a safe location before starting the earthwork under the supervision of SE/Sig or SE/Tele. The cable shall be

reburied soon after completion of excavation with proper care including placement of the brick over the cable under the supervision of S&T or Electrical supervisors. However, the work will be charged to the concerned engineering works. The responsibility for ensuring availability of SE (Signal), SE as per para-3.5 to 3.8 above, lies with the respective department. The Contractor will go ahead with the shifting of cables as per the program decided and he will not be held responsible for any cable cut.

3.14. In all the sections where major project are to be taken up/going on S&T department shall deploy their official to take preventive/corrective action at site of work. As regards Electrical Department, the official may be deputed on need basis.

3.15. No new OFC or quad cable shall be laid close to existing track. It shall be laid close to the Railway boundary on one side of the Railway track to the extent possible to avoid any interference with the future works. It shall be ensured in the new works of cable laying that the cable route is properly identified with electronic or concrete markers. Wherever multiple cables are laid in a trench, RFID markers may be provided for easy identification of the cable. Henceforth, wherever cable laying is planned, before undertaking the cable laying work, the cable route plan of the same shall be prepared by the Dy. STE/CON or Dy.CEE/CON and shall be got approved from the concerned Sr. DSTE/DSTE or Sr.DEE/DEE and also from the concerned Dy.CE/CON for new lines and from the concerned Sr.DEN/DEN for all other projects including GC etc., to avoid possible damages in future. Such approvals shall be granted within 15 days of the submission of the request.

3.16. The works of excavating the trench and laying of the cable should proceed in quick succession, leaving a minimum time between the two activities.

3.17. In case damage caused to OFC/Quad cable or Electrical cable during execution of the work, the Contractor is liable to pay a penalty for damaging the cable. Penalty shall not be levied in case of the following: -

(i). Detailed cable route plan as per para-3.4 not provided by concerned department or cable is not protected as per laid down procedures.

(ii). The alignment of the cable does not tally with the information provided to the Contractor.

(iii). The cable depth is found to be less than 800mm from normal ground level.

(iv). No representative of S&T department was available at site guarding the cables on the fixed pre-determined date and time.

3.18. Penalty to be imposed for damages to cable shall be as under:-

Cable damaged	Penalty per location
Only Quad cable or signalling cable	₹1.0 lakh
Only OFC	₹1.25 lakh
Both OFC and Quad	₹1.5 lakh
Electrical Cable	₹1.0 lakh

Necessary debit in this regard shall be raised on the department undertaking the work who shall in turn levy the penalty on the defaulting Contractor. S&T department shall raise the debits in case of damage to OFC or Quad or Signalling cable and Electrical department shall raise the debits in case of damage to Electrical cable.

3.19. Railways will not lodge FIR with RPF in case of works being executed by authorized Contractors of Railways who have been duly permitted to execute the works in accordance with this JPO. Joint note by the supervisors of the concerned department shall be prepared and the responsibility of the cable cut should be decided without involving RPF. The joint note deciding the fact whether the contactor should be penalized shall be completed in a day's time from the occurrence of cable cut.

In all other cases, when the cable is cut by an agency that was not permitted to execute any work, FIR should be lodged with RPF.

3.20. While giving permission for taking up the works, concerned departments may note that earthwork by engineering Contractors will normally be done by machines except in a few isolated locations where the quantity of earth work is very less.

3.21. Railways shall make necessary correction in their future contract so that this JPO can also be enforced contractually.

3.22. All types of signalling & OHE bonds i.e. rail bond, cross bond and structure bond shall be restored by the Contractor with a view to keep rail voltage low to ensure safety of personnel.

3.23. Above joint circular shall be applicable for construction as well as open line organization of Engineering, S&T and Electrical.

3.24. S&T cable and electrical cable route plan should be prepared by the concerned S&T and Electrical officers respectively and got approved as stipulated before undertaking the work. The completion cable route plan should be finalized block section by block section as soon as the work is completed.

3.25. All cable laying works shall be executed as per laid down technical specifications, such as protection measures/protective cover, compaction of refilled material etc.

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CHAPTER – XI
SPECIAL CONDITIONS OF CONTRACT
QUALITY ASSURANCE, MONITORING AND SUPERVISION

1.1. Quality of Materials and workmanship

1.1.1 The Contractor shall ensure that the Construction, Materials and workmanship are in accordance with the requirements specified in this Agreement, Specifications and Standards and Good Industry Practice.

1.1.2 The Contractor warrants that all Materials shall be new, unused, not reconditioned and in conformity with Specification and Standards, Applicable Laws and Good Industry Practice, and that the Contractor shall not use any materials which are generally recognized as being deleterious under Good Industry Practice.

1.2 Quality control system

1.2.1 The Contractor shall establish a quality control mechanism to ensure compliance with the provisions of this Agreement as **Quality Assurance Plan** or **QAP**.

1.2.2 The Contractor shall, within 15 (fifteen) days of the issue of letter of Acceptance of this tender, submit to the Engineer its Quality Assurance Plan which shall include the following:

(a) organization, duties and responsibilities, procedures, inspections and documentation;

(b) quality control mechanism including sampling and testing of Materials, test frequencies, standards, acceptance criteria, testing facilities, reporting, recording and interpretation of test results, approvals, check list for site activities, and proforma for testing and calibration in accordance with the Specifications and Standards and Good Industry Practice; and

(c) internal quality audit system.

The Engineer shall convey its' comments to the Contractor within a period of 21 (twenty-one) days of receipt of the QAP stating the modifications, if any, required, and the Contractor shall incorporate those in the QAP to the extent required for conforming with the provisions of this Clause-1.2.

1.2.3 The Contractor shall procure all documents, apparatus and instruments, fuel, consumables, water, electricity, labour, Materials, samples, and qualified personnel as are necessary for examining and testing the Project Assets, Materials and workmanship in accordance with the Quality Assurance Plan.

1.2.4 The cost of testing of Construction, Materials and workmanship shall be borne by the Contractor.

1.3 Methodology

The Contractor shall, at least 07 (seven) days prior to the commencement of any construction activity, submit to the Engineer for review the method statement proposed to be adopted for executing the Work, giving details of inspection checklist, quality parameters, engineers/staff/labour/equipment to be deployed, traffic management and measures for ensuring safety. The Engineer shall complete the review and convey its comments, if any, to the Contractor within a period of 10 (ten) days from the date of receipt of the proposed method statement from the Contractor. The Contractor shall revise the method statements by incorporating these comments or else will advise the Engineer reasons for not/partially including

the same.

1.4 Inspection and technical audit by the Railway

The Engineer or his representative may inspect and review the progress and quality of the construction of Works and issue appropriate directions to the Contractor for taking remedial action in the event the Works are not in accordance with the provisions of this Agreement.

1.5 Inspection of construction records

The Engineer shall have the right to inspect the records of the Contractor relating to the Works.

1.6 Monthly progress reports

During the Construction Period, the Contractor shall, no later than 10 (ten) days after the close of each month, furnish to the Engineer a monthly report on the progress of Works and shall promptly give such other relevant information as may be required by the Engineer.

1.7 Inspection

1.7.1 The Engineer and Engineer's Representative shall at all times:

(a) have full access to all parts of the Site and to all places from which natural Materials are being obtained for use in the Works; and

(b) during production, manufacture and construction at the Site and at the place of production, be entitled to examine, inspect, measure and test the Materials and workmanship, and to check the progress of manufacture of Materials.

1.7.2 The Contractor shall give the Engineer and his representative's access, facilities and safety equipment for carrying out their obligations under this Agreement.

1.7.3 The Engineer shall submit a monthly inspection report to the Contractor bringing out the results of inspections and the remedial action taken by the Contractor in respect of Defects or deficiencies. For the avoidance of doubt, such inspection or submission of Inspection Report by the Engineer shall not relieve or absolve the Contractor of its obligations and liabilities under this Agreement in any manner whatsoever.

1.8 Samples

The Contractor shall submit the following samples of Materials and relevant information to the Engineer for review:

1.8.1 manufacturer's test reports and standard samples of manufactured Materials; and

1.8.2 samples of such other Materials as the Engineer may require.

1.9 Tests

1.9.1 For determining that the Works conform to the Specifications and Standards, the Engineer shall require the Contractor to carry out or cause to be carried out tests, at such time and frequency and in such manner as specified in this Agreement and in accordance with Good Industry Practice for quality assurance. The Contractor shall, with due diligence, carry out all the tests in accordance with the Agreement and furnish the results thereof to the Engineer. Of the total tests for each category or type to be undertaken by the Contractor under the provisions of this Agreement and Good Industry Practice, the Engineer shall (a) carry out or cause to be carried out, test checks equal to about 10% (ten per cent) of the number of the tests required to be undertaken by the Contractor; and (b) witness or participate in at least 10% (ten per cent) of the number of such tests conducted or caused to be conducted by the Contractor.

1.9.2 In the event that results of any tests conducted under this Clause-1.9 establish any Defects or deficiencies in the Works, the Contractor shall carry out remedial measures and furnish a report to the Engineer in this behalf. The Engineer shall require the Contractor to carry out or cause to be carried out tests to determine that such remedial measures have brought the Works into compliance with the Specifications and Standards, and the procedure shall be repeated until such Works conform to the Specifications and Standards. For the avoidance of doubt, the cost of such tests and the remedial measures in pursuance thereof shall be solely borne by the Contractor.

1.10 **Rejection**

1.10.1 If, as a result of an examination, inspection, measurement or testing, any Plant, Material, design or workmanship is found to be defective or otherwise not in accordance with the provisions of this Agreement, the Engineer may reject such Plant, Material, design or workmanship by giving notice to the Contractor, with reasons. The Contractor shall then promptly make good the Defect and ensure that the rejected item complies with the requirements of this Agreement.

1.10.2 If the Engineer requires the Plant, Material, design or workmanship to be retested, the tests shall be repeated on the same terms and conditions, as applicable in each case. If the rejection and retesting cause the Railway to incur any additional costs, such costs shall be recoverable by the Railway from the Contractor and may be deducted by the Railway from any money due to be paid to the Contractor.

1.10.3 The Contractor shall not be entitled to any extension of time on account of rectifying any Defect or retesting as specified above.

1.10.4 No examination, inspection, measurement or testing of any Plant, Material, design or workmanship by the Engineer or its failure to convey its observations or to examine, inspect, measure or test shall relieve the Contractor of its obligations and liabilities under this Agreement in any manner nor shall the Railway be liable for the same in any manner.

1.11 Remedial work

1.11.1 Notwithstanding any previous test or certification, the Engineer may instruct the Contractor to:

(a) remove from the Site and replace any Plant or Materials which are not in accordance with the provisions of this Agreement;

(b) remove and re-execute any work which is not in accordance with the provisions of this Agreement and the Specification and Standards; and

(c) execute any work which is urgently required for the safety of the Railway Project, whether because of an accident, unforeseeable event or otherwise; provided that in case of any work which is required on account of a Force Majeure Event, the provisions of Clause-17 of Part-II of Indian Railway Standard General Condition of Contract, September-2019 shall apply.

1.11.2 If the Contractor fails to comply with the instructions issued by the Engineer under Clause-1.11.1 within the time specified in the Engineer's notice or as mutually agreed, the Engineer may decide to have the work executed by another agency. The cost so incurred by the Railway for undertaking such work shall be recoverable from the Contractor and may be deducted by the Railway from any monies due to be paid to the Contractor.

1.12 Quality control records and Documents

The Contractor shall hand over to the Engineer a copy of all its quality control records and documents after completion of the work.

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CHAPTER-XII

SPECIAL CONDITION OF CONTRACT

EARTHWORK

DESIGN OF FORMATION & SPECIFICATIONS FOR FORMATION LAYERS COMPREHENSIVE GUIDELINESAND SPECIFICATIONSFOR

RAILWAY FORMATION

Specification No. RDSO/2020/GE: IRS-0004

Earth work is to be executed as per Specification No. RDSO/2020/GE:IRS-0004 and extract of which are furnished below:

3.1 General

Formation comprises of Blanket and, Prepared subgrade/Subgrade. Depending upon techno-economic considerations, it can be Single layer or Two-layer construction as shown in Fig-**3.1 & 3.2** below. For construction of a new line, it is important to ensure that the track bed layers (Blanket/Prepared subgrade/Subgrade) have the appropriate mechanical characteristics and are of adequate thickness. For Indian Railway Formation, it has been stipulated & described in detail in Para 3.10 of this Chapter

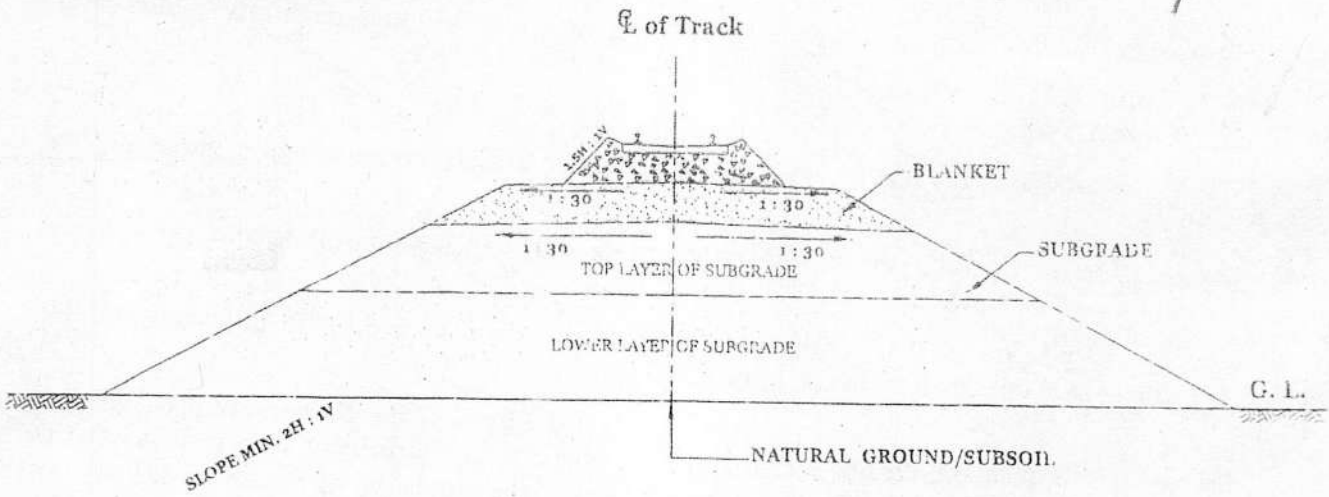

Fig-3.1: Single layer construction

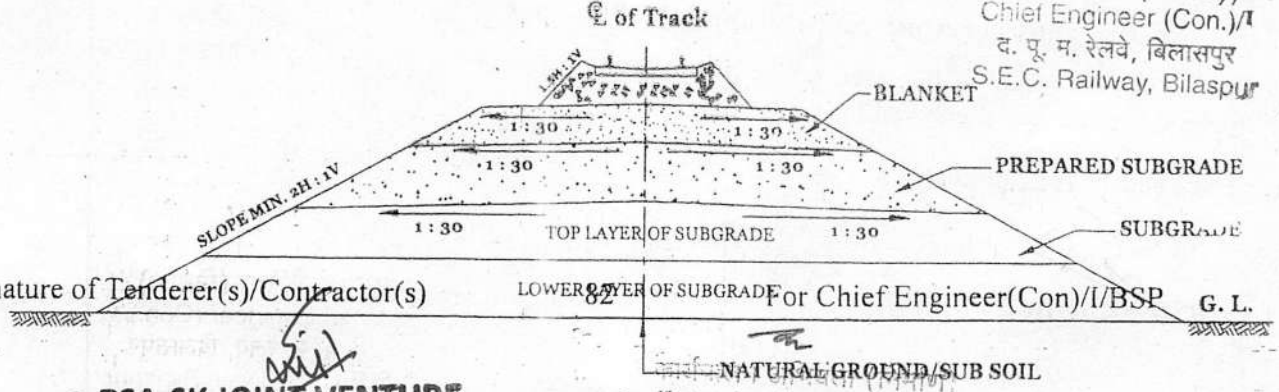

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Fig-3.2: Two layer construction

3.2. Pressure on Formation and sub-soil

As good design practice, typical values for the maximum pressure on formation at bottom of ballast should not exceed 0.3MN/m^2 or 3 kg/cm^2, and the pressure on sub-soilshould not exceed 0.1MN/m^2 or 1 kg/cm^2 generally.

3.3 Top Width of Formation

a) It should be adequate enough to accommodate tracks laid with concrete sleepersand standard ballast section (minimum 35cm depth) and have minimum cess width of 90cm on either side.

b) Additional Width of formation will have to be provided to cater for increase in extra widening of ballast shoulder and extra clearances required on curves.

It shall be regulated/provided in accordance with extant instructions as per Indian Railway Schedule of Dimensions (IRSOD) & Indian Railway permanent Way manual (IRPWM).

3.4 Cross Slope of Formation

Top of formation should have a cross slope of 1 in 30 from centre of formation towards both sides for single line/multiple line in new construction. In case of doubling or multiple line construction work in existing lines, the cross slope of 1 in 30 should continue from the edge of existing formation towards cess/drain side (single slope) to avoid any stagnation of w between two ..cks. However, if the cross slope ofexisting embankment is steeper than 1 in 30 due to any reason, the configuration of 1 in

30 cross slope shall be maintained in the new line while ensuring proper drainage conditions at the same time so as to avoid any stagnation of water in between tracks, byadopting appropriate measures as per site conditions.

Further elaboration on drainage is given in Chapter 6 for Execution of Earthwork.

3.5 Erosion Control System

The design should provide for a suitable and cost-effective erosion control system considering soil matrix, topography and hydrological conditions. Further elaborations given in chapter-8 (Erosion control of slopes).

3.6 Borrow Pits

It will be necessary to keep borrow pits sufficiently away from the toe of the embankments as far as possible at the extreme of Railway land but normally not less than 3m plus height of the embankment to prevent base failures due to lateral escapement of the soil. Existing borrow pits, close to the toe of bank may be filled or its depth should be taken into account in analysing slope stability of the bank.

3.7 Soils to be normally avoided

a) There are some soils, which are normally unsuitable for construction of formation as listed below:

i) Organic clays, organic silts, peat, chalks, marl, dispersive soils and soil containing soluble material (e.g. rock salt or gypsum).

ii) Poorly graded sand and gravel with Cu < 2.0, should not be used to safeguard against liquefaction. Generally, most liquefiable soils as falling in gradationzone as indicated in the Fig-L1 of Appendix-L & having coefficient of uniformity, Cu < 2 shall not be used. (Reference Sketch given in Appendix-L).

iii) Clays and Silts of high plasticity (CH & MH) in top 3m of Embankment.

iv) Shales and soft rocks which become muddy after coming into contact with water.

b) There may be some typical situations in construction of formation & cuttings, whereit is not possible to avoid conditions as given below, for economical or any other reason, then Railway may decide special investigations and other measures to formulate suitable scheme of construction.

i) Cuttings passing through unsuitable soils as defined in para 3.7 (a).

ii) Construction of embankment on subsoil of unsuitable types of soils.

3.8 Blanket Layer

3.8.1 Need and functions of Blanket Layer

a) It reduces traffic-induced stresses to a tolerable limit (i.e. threshold stress) on thetop of subgrade, thereby, prevents subgrade failures.

b) It prevents penetration of ballast into the subgrade and also prevents upward migration of fine particles from subgrade into the ballast under adverse conditions, during service. This prevents mud pumping by separating the ballast and subgrade soil.

c) It results in increased track modulus and thereby reduces the track stresses & deformations.

d) It facilitates drainage of surface water and reduces moisture variations in subgrade, thereby reducing track maintenance problems.

e) It facilitates dissipation of excess pore water pressure developed in subgrade on account of cyclic loading and leads to increase in shear strength of subgrade soil.

3.8.2 Blanketing Material

It is difficult to get natural blanket material. Normally, the blanket material shall be produced mechanically by crushing the stones and/or by mixing, naturally available materials using suitable equipment/plants like pug mill, wet mix plant, crusher etc. However, if naturally available material conforms to the specifications, the same can also be used. The type of blanket material to be used whether natural or manufactured (mechanical crushing and/or blending) may be indicated clearly before start of the work and should be indicated in tender document. Some Typical methodsused for mechanized production of blanket material are given in **Appendix-A.**

Decisions to use natural blanket material or manufactured blanket material shallbe taken on the basis of site conditions or final location survey report.

3.8.3 Requirement of Blanket Layer

a) The provision of blanket layer shall not be needed when formation/earth fill embankment have:

i) Rocky beds except those, which are very susceptible to weathering e.g. rocks consisting of shale and other soft rocks, which become muddy after coming into contact with water.

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ii) Soils conforming to specifications of Blanket layer as given in Table 3.3 to3.6.

b) For other conditions, the system of layered construction of embankment (Singlelayer/ Two layer) shall normally be followed.

3.9 Soil Quality

For Design of Railway Formation, the soils for their use in Indian Railway Embankmenthave been grouped based on percentage of fines present in the soil, as given below:

Description of Soil Quality Class

Description w.r.t. Fine-Particles (size less than 75 micron)	Soil Quality Class,
Soils containing fines > 50 %	SQ1
Soils containing fines from 12% to 50%	SQ2
Soils containing fines < 12%	SQ3

3.10 Specifications and Thickness of Formation Layers:

(A) The Railway Formation may be constructed with Single Layer System or Two Layer System based on availability of local soils/materials and on economic considerations. The thickness of the prepared sub-grade and blanket layer has been rationalized based on UIC-719R calculation for ballast cushion of 350 mm. The specifications and thickness of Blanket layer, Prepared subgrade, Subgrade (Top Layer & Lower layer) and Sub-Soil are tabulated for Single layer system and Two-layer system for 25T and 32.5T Axle load as below:-

Table-3.1: For 25 T Axle Load

S. No.	Soil type Category in Sub-grade	Prepared Sub-grade		Recommended Blanket Thickness (mm)	Remarks
		Soil Type	Thickness (mm)		
1.	SQ1	SQ1*	--	550	Single layer
2.	SQ1	SQ2	500	400	Two layer
3.	SQ1	SQ3	500	300	Two layer
4.	SQ2	SQ2*	--	400	Single layer
5.	SQ2	SQ3	350	300	Two layer
6.	SQ3	SQ3	--	300	Single layer

* Subgrade soil is continued upto blanket layer

Table-3.2: For 32.5 T Axle Load

S. No.	Soil type Category in Sub-grade	Prepared Sub-grade		Recommended Blanket Thickness (mm)	Remarks
		Soil Type	Thickness (mm)		
1.	SQ1	SQ1*	--	700	Single layer
2.	SQ1	SQ2	500	550	Two layer
3.	SQ1	SQ3	500	450	Two layer

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4.	SQ2	SQ2*	--	550	Single layer
5.	SQ2	SQ3	350	450	Two layer
6.	SQ3	SQ3*	--	450	Single layer

* Subgrade soil is continued upto blanket layer

(B) Formation for 25T axle load

Table 3.3: Specification and Thickness of Formation Layers for 25T axle load:Single layer system

Layers	Specification	Thickness
Blanket	i) C_U> 7 and C_C between 1 and 3. ii) Fines (passing 75 microns) :3% to 10% iii) Minimum soaked CBR value ≥ 25, (Soil compacted at 100% of MDD * in Lab) iv) Los Angeles Abrasion value < 40% v) Field Compaction :Min. 100% of MDD * in field trial vi) Minimum Ev_2 **= 100 MPa vii) Size gradation - within specified range (as table-3.7) or should lie more or less within enveloping curves (as Fig-3.8) viii) Filter criteria (***Optional) should be satisfied with sub-grade layer as given below: Criteria-1: D_{15} (blanket) < 5xD_{85} (sub-grade) Criteria-2: D_{15} (blanket) > 4 to 5xD_{15} (sub-grade) Criteria-3: D_{50} (blanket) < 25xD_{50} (sub-grade)	**30 cm** over SQ3 s ub-grade **40 cm** over SQ2 sub-grade **55 cm** over SQ1 sub-grade
Sub-grade	SQ1/SQ2/SQ3 soil	
Top Layer	SQ1 soils (To be used only with dispensation ofPCE/ CAO) i) For SQ2/SQ3 soil, CBR ≥6 (soil compacted at98% of MDD *) ii))RU 641 VRiO, &%5 I VRiO FRPSDFWHG DW 98% RI ODD *	100 cm

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ower layer (fill)	iii) Field Compaction : Min. 98% of MDD * iv) Minimum Ev_2 = 45 MPa (for SQ1) 60 MPa (for SQ2/SQ3) SQ1/SQ2/SQ3 soil (+) i) CBR≥ 3 (soil compacted at 97% of MDD *) ii) Field Compaction :Min. 97% of MDD *	As per Embankment height
Ground Soil/Sub-soil Strata	i) Undrained Cohesion of soil (c_u) □ 25 K3D (RQO\ IRU soils having particles finer than 75 micron exceeding 12%) ii) Ev_2 (GHWHUPiQHG IURP 3/7) □ 20 03D iii) I (GHWHUPiQHG IURP 637) □ 5 Ground Improvement is required, if any of the above parameters not complied with	--

* MDD mentioned in the above table

(a) For determination of CBR - MDD achieved in Lab

(b) For field compaction - MDD achieved in field compaction trials which should not be lessthan 98% of MDD in lab.

**Ev_2 is Modulus of deformation (Para 2.0 of Appendix-H)

*** With the application of Non-woven Geotextile as a separator layer below the blanket,filter criteria will not be required or mandatory.

+ No dispensation of PCE/CAO required for use of SQ1 soil in Lower layer (fill) of Subgrade.

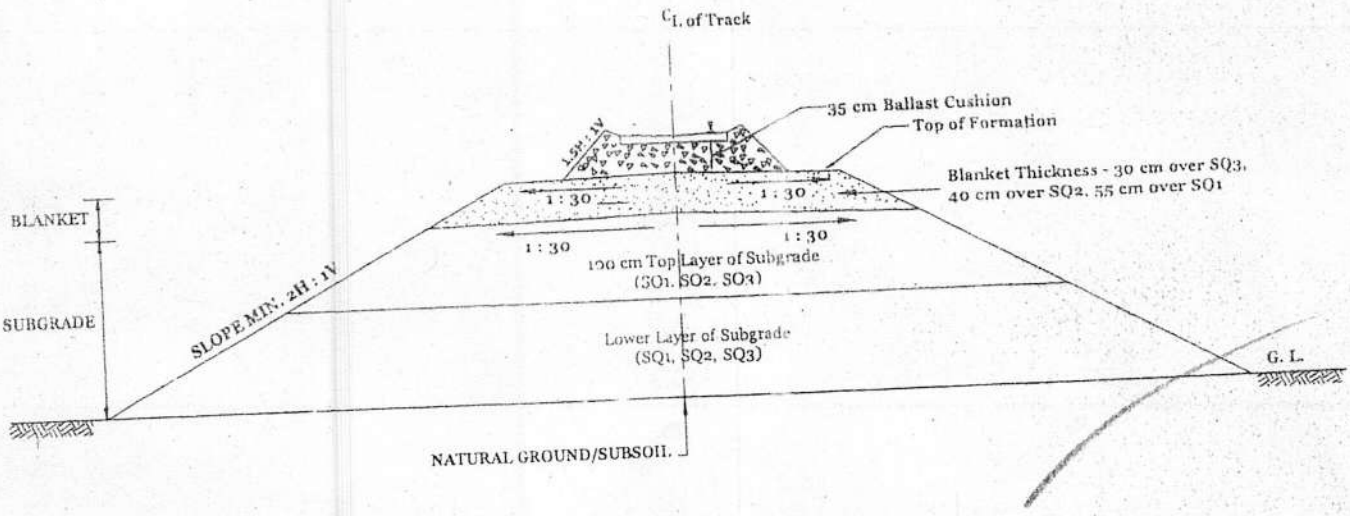

Fig-3.4: Track Formation for 25 T Axle Load (Single layer system)

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Table 3.4: Specification and Thickness of Formation Layers for 25T axle load: Two layer system

Layers	Specification	Thickness
Blanket	i) C_U > 7 and C_C between 1 and 3. ii) Fines (passing 75 microns) : 3% to 10% iii) Los Angeles Abrasion value < 40% iv) OiQiPXP VRDNHG &%5 YDOXH □ 25, (VRiO FRPSDFWHG DW 100% RI ODD * in lab) v) Field compaction: 100% of MDD* in field trial vi) Minimum Ev_2 **= 100 MPa vii) Size gradation – within specified range (as table-3.7) or should lie more or less within enveloping curves (as fig.-3.8) viii) Filter criteria **(***Optional)** should be satisfied with prepared sub-grade layer as given below: Criteria-1: D_{15} (blanket)<5xD_{85} (prepared sub-grade) Criteria-2: D_{15} (blanket) > 4 to 5xD_{15} (prepared sub-grade) Criteria-3: D_{50} (blanket) < 25xD_{50} (prepared sub-grade)	**30 cm** over SQ3 Prepared Sub-grade **40 cm** over SQ2 Prepared Sub-grade
Prepared Subgrade	SQ2/SQ3 i) &%5 □ 8 (VRiO FRPSDFWHG XSWR 98% RI ODD *) ii) 3ODVWiFiW\ IQGH[□ 12 iii) Field Compaction :Min. 98% of MDD * iv) Minimum Ev_2 = 60 MPa	**50 cm** over SQ1 fill **35 cm** over SQ2 fill
Subgrade Top Layer	SQ1/SQ2/SQ3 (SQ1 soils (To be used only with dispensation of PCE/ CAO) i) CBR ≥ 5 (soil compacted at 97% of MDD *) for SQ2/SQ3 soils ii) For SQ1 soil, CBR ≥ 4 (soil compacted at 97% of MDD *) iii) Field Compaction : Min. 97% of MDD * iv) Minimum Ev_2 = 30 MPa (for SQ1) 45 MPa (for SQ2/SQ3)	50 cm
Lower layer (fill)	SQ1/SQ2/SQ3 soil (+) i) CBR≥ 3 (soil compacted at 97% of MDD *) ii) Field Compaction :Min. 97% of MDD *	As per Embankment height

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Ground Soil/Sub-soil Strata	i) Undrained Cohesion of soil (cu) □ 25 K3D (RQO\ IRU soils having particles finer than 75 micron exceeding 12%) ii) Ev2 (determined from PLT) ≥ 20 MPa iii) N (determined from SPT) ≥ 5 Ground Improvement is required, if any of the above parameters not complied with	--

* MDD mentioned in above table

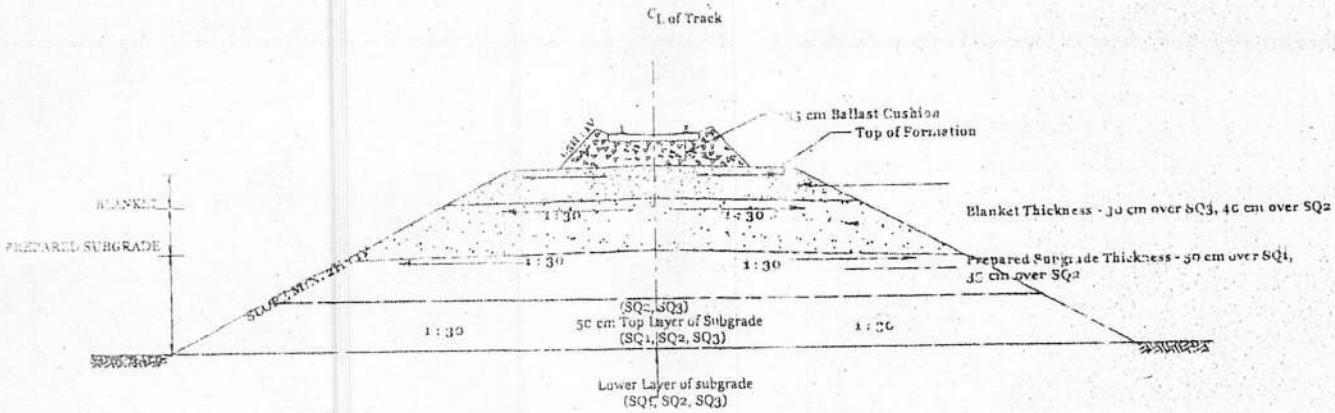
a) For determination of CBR - MDD achieved in Lab,

b) For field compaction - MDD achieved in field compaction trials which should notbe less than 98% of MDD in lab.

Ev_2 is Modulus of deformation **(Para 2.0 of Appendix-H)

*** With the application of Non-woven Geotextile as a separator layer below the blanket, filter criteria will not be required or mandatory.

+ No dispensation of PCE/CAO required for use of SQ1 soil in Lower layer (fill) of Subgrade.



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NATURAL GROUND/SUBSOIL

Fig-3.5: Track Formation for Two layer system (for 25 T Axle load)

(C) Formation for 32.5T Axle load

Table 3.5: Specification and Thickness of Formation Layers for 32.5T axleload: Single layer system

	RI ODD * iQ Lab.) (vi) Field Compaction: 100% of MDD * in field trial (vii) Minimum E_{v2} ** = 120Mpa (viii) Filter Criteria **(***Optional)** should be satisfied with subgrade layer, as given below : Criteria–1: D_{15} (blanket) < 5 x D_{85} (sub-grade) Criteria–2: D_{15}(blanket) >4to5 D_{15} (sub-grade) Criteria–3: D_{50}(blanket) < 25 x D_{50} (sub-grade)	
Subgrade Top Layer	SQ1/SQ2/SQ3 soil (SQ1 soils (To be used only with dispensation of PCE/ CAO) i) &%5 □ 6, IRU 642/643 VRiO FRPS□FWHG DW 98% RI ODD *) ii) &%5□ 4, IRU 641 (VRiO FRPSDFWHG DW 98% RI ODD *) iii) Field Compaction : Min. 98% of MDD* iv) Minimum E_{v2} ** = 45 MPa (for SQ1 soil) 60 MPa (for SQ2/SQ3)	100 cm
Lower layer (fill)	SQ1/SQ2/SQ3 soil (+) i) &%5 □ 3 (VRiO FRPSDFWHG DW 97% RI ODD*) ii) Field Compaction: min 97% of MDD*	As per Embankment height
Ground Soil/Sub-soil	i) Undrained Cohesion of soil (c_u) □ 25 K5ƀ (RQO\ IRU soils having particles finer than 75 micron exceeding 12%) ii) E_{v2} (GHWHUPiQHG IURP 3/7) □ 20 03D iii)1 (GHWHUPiQHG IURP 637) □ 5 Ground Improvement is required, if any of the above parameters not complied with	--

* MDD mentioned in above table

a) For determination of CBR - MDD achieved in Lab,

b) For field compaction - MDD achieved in field compaction trials which should not beless than 98% of MDD in lab.

** Ev2 is modulus of deformation (**Para 2.0 of Appendix-H**)

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*** With the application of Non-woven Geotextile as a separator layer below the blanket,filter criteria will not be required or mandatory.

+ No dispensation of PCE/CAO required for use of SQ1 soil in Lower layer (fill) of Subgrade.

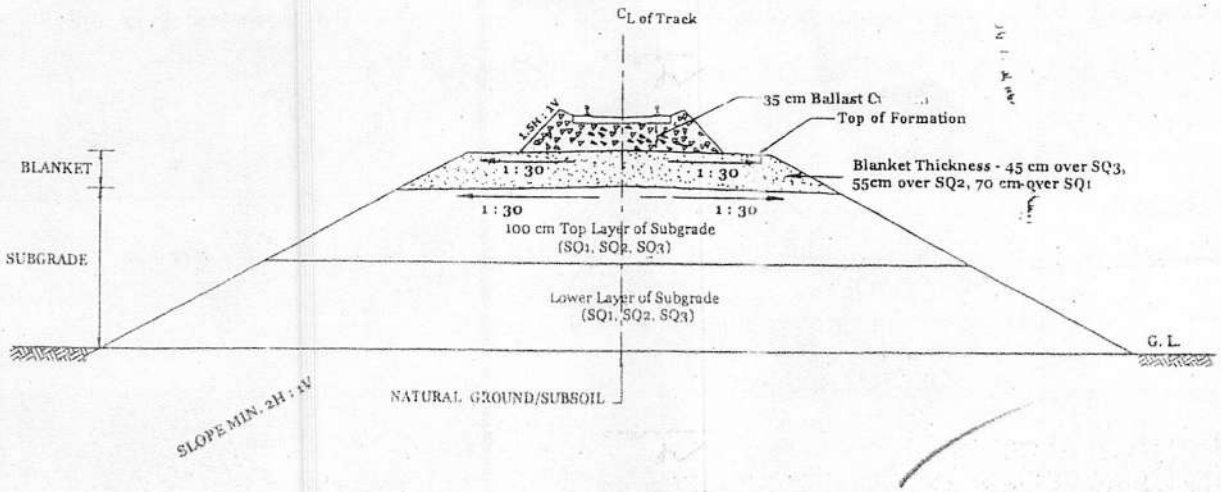

Fig-3.6: Track Formation for single layer system (for 32.5 T Axle load)

Table 3.6: Specification and Thickness of Formation Layers for 32.5T axleload: Two layer system

Layers	Specification	Thickness
Blanket	i) C_U > 7 and C_C between 1 and 3. ii)Fines (passing 75 microns) :3% to 10% iii) Size gradation – within specified range as given in Table 3.7or should lie within enveloping curves as given in Fig. 3.8 iv) Los Angeles Abrasion value< 40% (v) Minimum soaked CBR value ≥ 25 (Soil compacted at 100% of MDD* in Lab.) (vi) Field Compaction: 100% of MDD* in field trial (vii) Minimum E_{v2} ** = 120MPa (viii) Filter Criteria **(***Optional)** should be satisfied with subgrade layer, as given below : Criteria 1: D_{15} (blanket) <5xD_{85} (prepared sub-grade) Criteria-2: D_{15}(blanket) >4 to 5 D_{15} (prepared sub-grade) Criteria-3: D_{50}(blanket) <25xD_{50} (prepared sub-grade)	45cm over SQ3 prepared subgrade 55cm over SQ2 prepared subgrade

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Prepared Subgrade	SQ2/SQ3 Soil i) &%5 □ 8 (VRiO FRPSDFWHG DW 98% RI ODD*) ii) Field Compaction :Min. 98% of MDD* iii) 3ODVWiFiW\ IQGH[□ .12 iv) Minimum E_{v2} = 60 MPa	**50 cm** over SQ1 fill **35 cm** over SQ2 fill
Subgrade Top layer	SQ1/SQ2/SQ3 Soil (SQ1 soils (To be used only with dispensation	**50 cm**
Lower layer (fill)	of PCE/ CAO) i) &%5 □ 5 (VRiO FRPSDFWHG DW 97% RI ODD *) for SQ2/SQ3 soil ii) &%5□ 4, IRU 641 (VRiO FRPSDFWHG DW 97% RI ODD *) iii) Field Compaction : Min. 97% of MDD* iv) Minimum Ev_2** = 30 MPa (for SQ1 soil) 45 MPa (for SQ2/SQ3) SQ1/SQ2/SQ3 Soil (+) i) &%5 □ 3, (VRiO FRPSDFWHG DW 97% RI ODD*) ii) Field Compaction : Min. 97% of MDD*	As per Embankment height
Ground Soil/Sub-soil Strata	i) Undrained Cohesion of soil (c_u) □ 25 K3D (RQO\ IRU soils having particles finer than 75 micron exceeding 12%) ii) Ev_2 (GHWHUPiQHG IURP 3/7) □ 20 03D iii) I (GHWHUPiQHG IURI 537) □ 5 Ground Improvement is required, if any of the above parameters not complied with	--

* MDD mentioned in above table

a) For determination of CBR - MDD achieved in Lab,

b) For field compaction - MDD achieved in field compaction trials which should not beless than 98% of MDD in lab.

** Ev2 is Modulus of deformation **(Para 2.0 of Appendix-H)**

*** With the application of Non-woven Geotextile as a separator layer below the blanket,filter criteria will not be required or mandatory.

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No dispensation of PCE/CAO required for use of SQ1 soil in Lower layer (fill) of Subgrade.

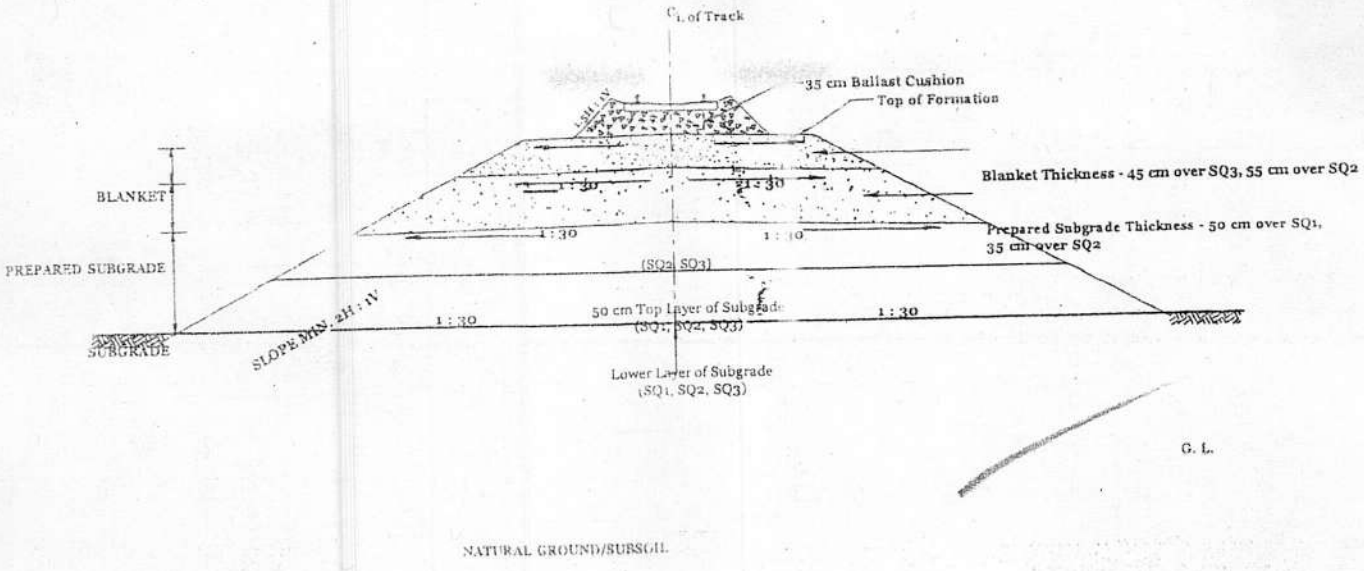

Fig-3.7: Track Formation for Two layer system (for 32.5 T Axle load)

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Table-3.7: Gradation Percentage of Blanket Material

SL	IS Sieve Size	Percent Passing (by weight)
1.	40 mm	100
2.	20 mm	80 – 100
3.	10 mm	63 – 85
4.	4.75 mm	42 – 68
5.	2 mm	27 – 52
6.	600 micron	13 – 35
7.	425 micron	10 – 32
8.	212 micron	6 – 22
9.	75 micron	3 – 10

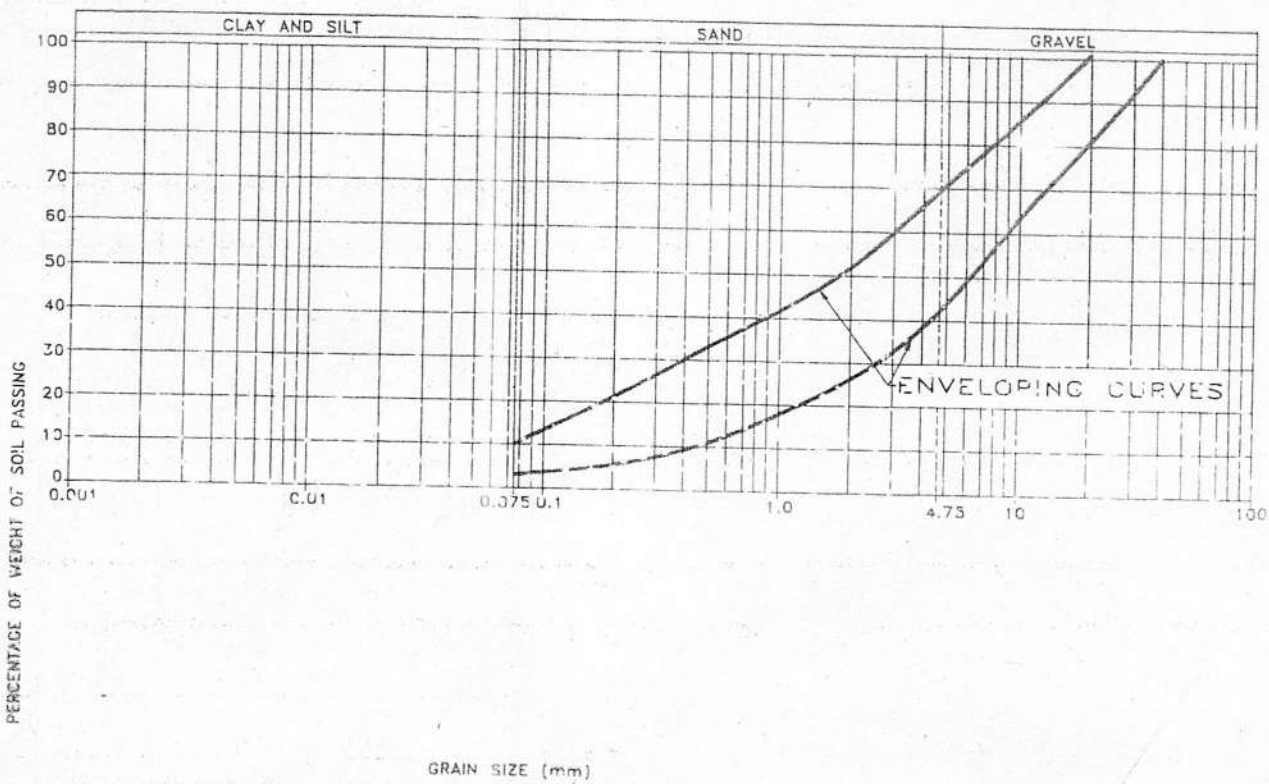

Fig-3.8: Enveloping Curves for Blanket Material

(D) When the subgrade/prepared subgrade is of SQ1 or SQ2 category soil (in table 3.3 to 3.6), a suitable non-woven geo-textile layer may be used as "separator layer" on the top of subgrade to prevent upward migration of the fines from subgrade/prepared subgrade causing contamination of blanket layer on top of it and also to prevent penetration of coarse particles of layer on top of subgrade into soft/fine grained particles of sub-grade below. Specifications of Non-Woven

Geotextile to be used as "separator layer" given in APPENDIX-C.

(E) Design of formation, including adoption of single layer or two layer system, and use of SQ1 soil (in top layer of subgrade) as given in above paras shall be decided by PCE/CAO (Con) on the basis of soil investigation.

In case of the projects being executed by PSUs, the powers of PCE/CAO shall be exercised at appropriate level of authority as nominated by CMD/MD of the PSU.

(F) In case of cutting also, blanketing shall be provided as required & as specified in this Para 3.10, based on the type of soil just below the blanket.

3.11 Height of Embankment and Formation Layer thickness:

i) In case of New Line construction projects, minimum height of embankment above ground level or highest flood level (HFL) whichever is higher should not be less than one meter

to ensure proper drainage and avoid trespassing. However, in case of Doubling / Quadrupling and Gauge Conversions projects, minimum height of embankment should be decided by Chief Engineer/Construction Incharge of the project, ontech... economical consideration with the approval of CAO/C. (AC'S No.1 dt.16.12.2013)

ii) Total required thickness of formation layers as specified in **Para 3.10** for blanket, prepared sub-grade & Subgrade-Top Layer, should be provided/ensured uniformly in embankment/cutting for effective stress dispersal.

iii) The specification of soil strata below the ground level (GL) must be ascertained from the results of soil exploration.

iv) For effective stress dispersal, required total uniform thickness of formation layer (Blanket, Prepared sub-grade & Subgrade/Top Layer) shall be ensured in cuttings as well as in embankments, even where embankment height is less than about 1.5m or total uniform required thickness. It is further explained as below:

a) **For Embankment (where height of embankment is less than required total uniform thickness):** If the specification of sub-soil meets the required specification of blanket/prepared subgrade/subgrade-top layer, upto required total depth of uniform thickness below ground level, then there will be no need of excavation, else the excavations will be done below ground level as per the requirement, to satisfy the provision of total uniform thickness for effective stress dispersal. Detailed description & few examples are as given in **APPENDIX-B**.

b) **For Cutting:** If the specification of sub-soil does not meet the required specification of blanket/prepared subgrade/subgrade-top layer i.e. total required uniform thickness, below the proposed level of excavation in cuttings, the excavation level for cuttings shall be enhanced to the level so as to satisfy the total required uniform thickness requirement. Detailed description & few examples are as given in **APPENDIX-B**.

v) Suitable drainage arrangement shall be ensured.

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EXECUTION OF EARTHWORK

6.1 General

Before taking up of actual execution of work, detailed drawings need to be preparedfor the entire length of the project to give alignment, formation levels, formation widthat ground level, cross sections of catch water drains & side drains, cross section & levels of subgrade, blanket levels, etc. to facilitate smooth execution at site. Execution of work has to be carried out in a systematic manner so as to construct formations of satisfactory quality which would give trouble free service.

6.2 The activities and adoption of good practices involved in execution of earthwork are covered under following headings

i) Preliminary works
ii) General aspects
iii) Compaction of earth work
iv) Sandwich Construction of Embankments with Cohesive Soils
v) Placement of Back-Fills on Bridge Approaches and Similar Locations
vi) Drainage Arrangement in Embankme... Cutting
vii) Finishing and Blanketing
viii) Setting up of GE lab at Construction Site
ix) Maintenance of Records

6.2.1 Preliminary Works

A. Preparation of Natural Ground

Preparation of natural ground surface may be carried out as follows:

(i) **Site clearances:** Full formation width at ground level plus additional extra width of 1 m on both sides should be cleared of all obstructions viz. vegetation, trees, bushes, building, fences, abandoned structures etc. and thereafter it should be dressed and leveled. Depressions if any should be filled with suitable soil duly compacted. Finally, the leveled surface should be p... perly compacted by mechanical means to get a leveled and uniformground surface.

(ii) **When Embankment is constructed on Ground having steep slope,** then the ground surface should be suitably benched so that new material of embankment gets well bonded with the existing ground surface.

Surface drainage shall be constructed, wherever required, so as to maintain the natural water drainage facilities and limit the introduction of water into the earthworks.

B. Setting out of Construction Limits

Centerline of the alignment (@200 m c/c or so) and full construction width should be demarcated with reference pegs/dug belling about 90 cm away from proposed toe of the embankment. Care should be taken not to disturbed the pegs during construction. Pegs should be preferably painted for identification.

C. Selection of Borrow Area

(i) Borrow area should be selected sufficiently away from the alignment, as for as possible at the extreme of Railway land but normally not less than 3 m plus height of the Embankment to prevent base failure due to lateral escapement of the soil.

(ii) Borrow area should be selected for soil suitable to be used in construction. Embankment is to be constructed normally with soil available in nearby area, with properly designed slope. However, there are some soils, which are normally unsuitable for construction of formation & hence it is to be normally avoided (as described in Para 3.7 of Chapter 3).

6.2.2 General Aspects

(i) A field trial for compaction on a test section shall be conducted on fill material to assess the optimum thickness of layer and optimum number of passes for the type of roller planned to be used to arrive at desired density. It optimises compaction efforts of earthwork while achieving desired level of density based on lab tests. Procedure for field compaction trials is given in para 6.2.3 below.

(ii) If the soil has less than required moisture content, necessary amount of water shall be added to it either in borrow pits or after the soil has been spread loosely on the Embankment. Addition of water may be done through flooding or irrigating the borrow areas or sprinkling the water on the Embankment through a truck mounted water tank sprinkling system. Use of hose pipes for water need to be avoided.

(iii) If the soil is too wet, it shall be allowed to dry till the moisture content reaches acceptable level required for the compaction.

(iv) Placement moisture content of soil should be decided based on the field trial and site conditions. The objective should be to compact near OMC to achieve uniform compaction with specified density in the most efficient manner.

(v) Clods or hard lumps of soil of the borrow area shall be broken to 75 mm or lesser size before placing on Embankment.

(vi) Each layer should be compacted with recommended type of roller upto required level of compaction, commencing from the sides, before putting the next upper layer.

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(vii) Extra embankment width of 500mm on either side shall be rolled/compacted toensure proper compaction at the edges. The extra soil should be cut and dressed mechanically to achieve regular side slope and the slope shall be compacted with 6-8 passes of slope compactors (10-20 ton capacity). Details of some of the slope compactors are annexed at **Appendix-E.**

(viii) Backfill behind abutments: To avoid differential settlement in the approaches of bridges, compaction should be carried out with the help of vibratory plate compactors.

(ix) In areas susceptible to flooding, the sides of an Embankment (except approachbank of bridges) should be protected with a layer of rockfill or stones with an intermediate granular layer upto 1 m above HFL. For other conventional methods of Erosion Control of slopes in such cases, Para 8.3.1 of Chapter 8 of this document shall be referred to.

6.2.3 Compaction of Earthwork

Performance of the Embankment would depend to large extent on the quality ofcompaction done during execution.

A. Advantages of Compaction

(i) Compaction is the process of increasing the density of soil by mechanical means by packing the soil particles closer together with reduction of air voidsand to obtain a homogeneous soil mass having improved soil properties. Compaction brings many desirable changes in the soil properties as follows:

a) Helps soils to acquire increase in strength in both bearing resistance andshear strength.
b) Reduces compressibility, thus minimising uneven settlement duringservice.
c) Increases density and reduces permeability, thereby reducingsusceptibility to change in moisture content.
d) Reduction in Erodibility.
e) Results in homogenous uniform soil mass of known properties.
f) Reduction in frost susceptibility in cold regions

(ii) However, while compaction of earthwork is a necessary condition to achieve astable formation, it does not help in checking against the following causes which needs to be taken care during the design of embankment or cutting:

a) Excessive creep or slipping of slopes.
b) Swelling and shrinkage characteristic of soils due to variation in moisture content because physio-chemical properties of a soil do not change on compaction.
c) Mud pumping at ballast - soil interface.
d) Settlements due to consolidation of embankment and subsoil that can occur even for a few years after construction of the embankment.

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B. Factors Affecting Compaction in the Field

Compaction of a particular soil is affected by moisture content, compacting effort,type of roller etc as explained below:

(i) **Compacting Effort:** In modern construction projects, heavy compaction machinery is deployed to provide compaction energy. Types of machinery required are decided based on the type of soil to be compacted. The methodof compaction is primarily of four types i.e. kneading compaction, static compaction, dynamic or impact compaction and vibratory compaction. Different type of actions is effective in different type of soils such as for cohesive soils, Sheepsfoot rollers or pneumatic rollers provide the kneading action. Silty soil can be effectively compacted by Sheepsfoot roller/pneumatic roller or smooth wheel roller. For compacting sandy and gravelly soil, vibratory rollers are most effective. If granular soil has some fines, both smooth wheeled and pneumatic rollers can be used.

(ii) **Moisture Control:** Proper control of moisture content in soil is necessary for achieving desired density. Maximum density with minimum compacting effort can be achieved by compaction of soil near its OMC (Optimum Moisture Content). If natural moisture content of the soil is less than the OMC, a calculated amount of water should be added with sprinkler attached to the water tanker and mixed with soil by motor grader for uniform moisture content. When soil is too wet it is required to be dried by aeration to reach up to OMC.

(iii) **Soil Type:** Type of soil has a great influence on its compaction characteristics. Normally, heavy clays, clays and silts offer higher resistance to compaction, whereas, sandy soils and coarse grained or gravelly soils are amenable for easy compaction. Coarse-grained soils yield higher densities in comparison to clay. A well-graded soil can be compacted to higherdensity.

(iv) **Thickness of Layer:** Suitable thickness of soil of each layer is necessary to achieve uniform compaction. Layer thickness depends upon type of soilinvolved and type of roller, its weight and contact pressure of its drums. Normally, 200 – 300 mm layer thickness is optimum in the field for achievinghomogenous compaction.

(v) **Number of Passes:** Density of soil will increase with the number of passes of roller but after optimum number of passes, further increase in density is insignificant for additional number of passes. For determination of optimum number of passes for given type of roller and optimum thickness of layer at a predetermined moisture content, a field trial for compaction is necessary.

C. Field Compaction Trial

(i) General

Field compaction trial is carried out to optimize compaction efforts ofearthwork while achieving desired level of density based on Lab tests (Heavy

compaction test, IS:2720 (Part-8) and Relative Density Test, IS:2720 (Part - 14). Type of roller to be used for compaction has to be decided depending onthe type of soil to be compacted in execution of earthwork.

(ii) Determination of compaction efficiency

The increasing trend of density with increase in number of passes of a compactor tends to diminish gradually and a 'diminishing return stage' is reached. This will determine the type of compactor, optimum thickness of layer, corresponding water contents and number of roller passes.

(iii) Methodology for conducting field compaction trial includes fol' ing steps:

Step 1: Construct a test ramp about 20-30m long, 10-12m wide & 0.15m thick on one end & 0.55m on other end, preferably at the constructionsite, over a level ground surface clear of bushes, depressions etc. under nearly identical conditions as shown in **Appendix-D (Fig-D1).**

Step 2: Divide the ramp equally into the desired number, say, four segments, longitudinally of about 2.5m width (more than width of roller). Each strip will be used for conducting trials at specific moisture content,viz. OMC (Lab test value), OMC ±4% and (PL - 2%) etc.

Note: ***Experience shows that most suitable water content falls within a small rangeof 3% below to 1% above the OMC for most of the- soil.***

Step 3: Start a compaction trial on the first segment at a particular moisture content (Step 2).

Step 4: Fix four number sampling points on this strip at locations where layer thickness of about 225, 300, 375 & 450 mm are to be obtained after rolling. **Appendix-D (Table-D4).**

Step 5: Collect samples around the sampling points (Step 4). Determine moisture content by any suitable standard method

Step 6: Compare the moisture content with that of the relevant desiredmoisture content (Step-3).

Step 7: Wait for natural drying if moisture content is on higher side or sprinkle appropriate amount of water uniformly followed by ploughing etc. andleave for 5 to 30 minutes depending on type of soil, in case the moisture content is on lower side (Step 3).

Step 8: Determine moisture content once again at sampling points before rolling. Observations of determination of moisture content are recorded as per **Appendix-D (Table – D2)**

Step 9: Roll the strip and measure the dry density (by any standard method)of the soil after every two passes commencing from four roller passes. The observations are recorded as per **Appendix-D (Table–D3).**

Note: ***Measurement of dry density and moisture content are taken after removing the top 5 cm layer of earth with least possible disturbance. If the layer thickness is small, density ring should be used.***

Step 10: Carry out testing on each strip at different specific moisture content asfor the first strip explained above. Compile the results of trial of all strips as per **Appendix-D (Table–D3).**

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Step 11: From these test results, two sets of graph are plotted

First set of graphs: Dry density v/s number of roller passes for eachwater content and layer thickness. For each layer, there would be four (depending on range of moisture content chosen) curves for different moisture content. **Appendix-D (Fig-D2).**

Second set of graphs: Maximum dry density vs moisture content for each layer thickness. **Appendix-D (Fig-D3).**

Step 12: Second set of graphs will give field moisture content, maximumattainable field dry density and optimum layer thickness. From this field values minimum no. of passes of particular roller **Appendix-D (Fig-D2)** are read from the first set of graphs.

D. Compaction Procedures for Different Soils

The Embankments are constructed with locally available soils provided it fulfils thespecified requirements. Procedure of compaction to be adopted will depend on thetype of soil being used in construction. General guidelines to deal with compaction of various types of soils for attaining optimum dry density/relative density at minimum effort have been briefly given as under:

i) Compaction of Cohesionless Gravely and Sandy Soil

Sandy & gravely soils should be compacted with vibratory rollers. If fines areless in these types of soils, it can be compacted with minimum number of passes of vibratory rollers without strict control of moisture to achieve desired Relative Density. With higher percentage fines, sandy and gravely soils need to be brought to OMC level to get effective compaction. Uniformly graded sand and gravel are difficult to be compacted. Top layer of sand and gravel remains loose in vibrating compaction. Therefore, in final pass the roller should move smoothly without vibration. Dry densities obtained in field trials normally should be around MDD/ specified Relative Density as obtained from laboratory tests and should form the basis for specification andquality control.

ii) Compaction of Silty - Clayey Soils

Silty soil is a fine-grained soil. These can be plastic or non-plastic depending upon the clay content in it. Silts and fine sands with high water content have a tendency to undergo liquefaction under vibrating rolling due to the pore water pressure generated by mechanical work. Silty soils can be compacted satisfactorily near about OMC either with smooth rollers or vibratory rollers. Vibratory roller will give high degree of compaction and higher lift. Compaction of silty clays will have to be handled in a manner similar to clays.

iii) Compaction of Clays

a) Water content plays a very important role in compaction of clays. Main objective of compacting predominantly clays is to achieve uniform mass of soil with no voids between the lumps of clays. If moisture content is too high, roller tends to sink into the soil and if too low the chunks would

not yield to rolling by rollers. Appropriate water content i.e. OMC of the soil is in the range of about plastic limit plus two percent. Sheep foot rollers are most effective in breaking the clods and filling large spaces.

b) Thickness of layer should not be more than depth of feet of roller plus 50mm.

iv) In case of such soils, the MDD and OMC, as determined in the Laboratorymay not be very relevant and therefore achievable MDD and practicable moisture content at which such soils can be compacted effectively should be determined by conducting field trials.

v) **Selection of Compacting Equipment:** The performance of roller is dependent mainly on the type of soil used in construction. Guidelines on selection of compacting equipment are given in **Appendix-F**. Vibratory rollers which can be used in static as well as dynamic mode with plain & pad drum are now being manufactured by reputed Indian Companies also. Salient features of some of the models are given in **Appendix-E**.

vi) **Use of Construction Equipments for Execution of Earthwork**

Any manual methods of construction cannot achieve the desired quality of earthwork. It would be necessary to deploy modern equipment such as earthmover, motor graders, scraper, dumpers, mobile water sprinklers, vibratory rollers, sheep foot rollers etc. as per need, on all projects, so that the quality of work is as per laid down standards. It would be desirable to maintain records of work done by various equipment at a particular site to assess the output and quality control.

6.2.4 Sandwich Construction of Embankments with Cohesive Soils

Sandwich type of construction may be adopted for construction of Embankments with cohesive soils having very low permeability (less than or equal to 10^{-7} cm/sec.) (As given in Fig-6.1) and where height of the embankment is greater than 3m. In such situations, a layer of coarse sand (Cu > 2) of about 20 to 30 cm thick should be provided at embankment height intervals of 2 to 3m. Fig-

6.1 given below provides Guidelines for sandwich construction for different heights to improve the factor of safety against slope failure, drainage and dissipation of pore water pressure. It is desirable to have a bottom layer of coarse sand in all cases where soils of low permeability are used even for depths upto 3m. However, before adopting such construction, it may be necessary to carry out a detailed technical study along with economics of sandwich construction, depending on site conditions and availability of material, ifrequired, in consultation with RDSO.

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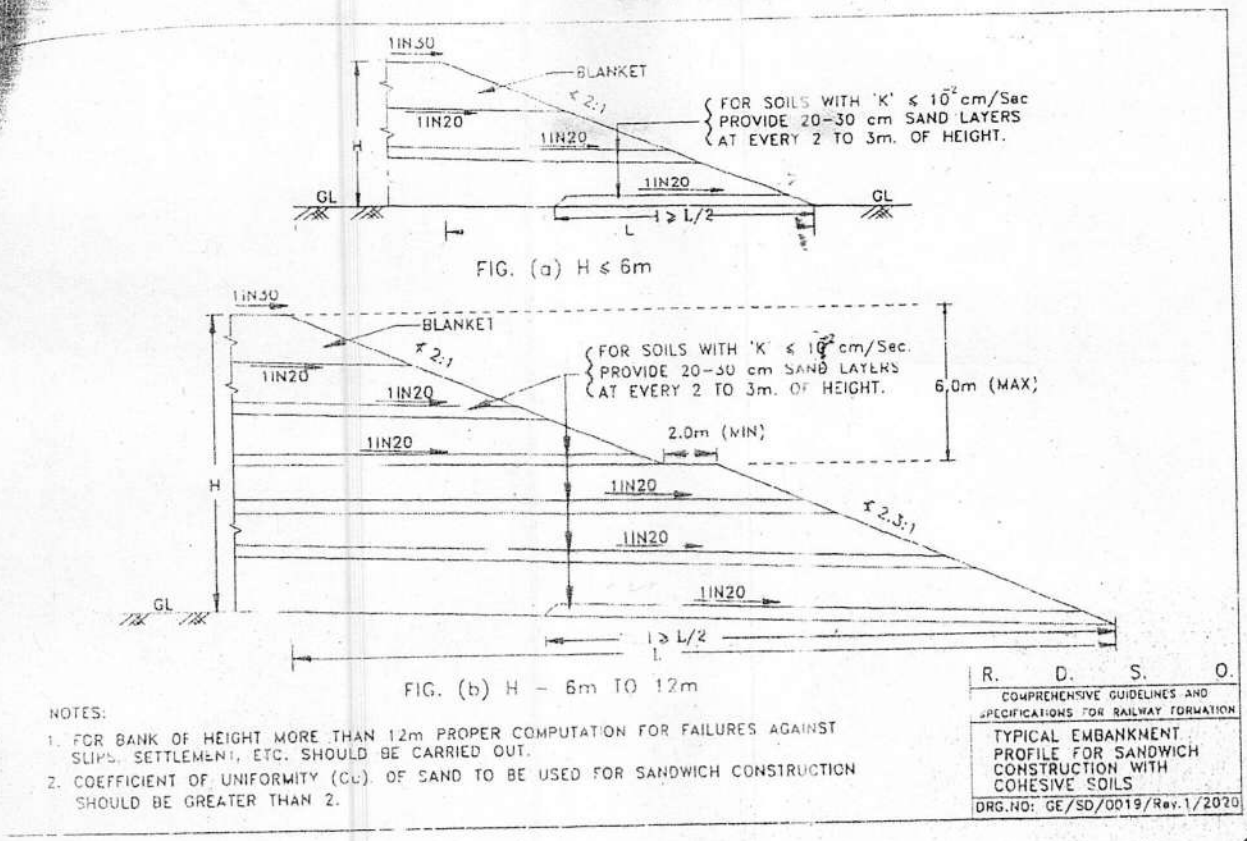
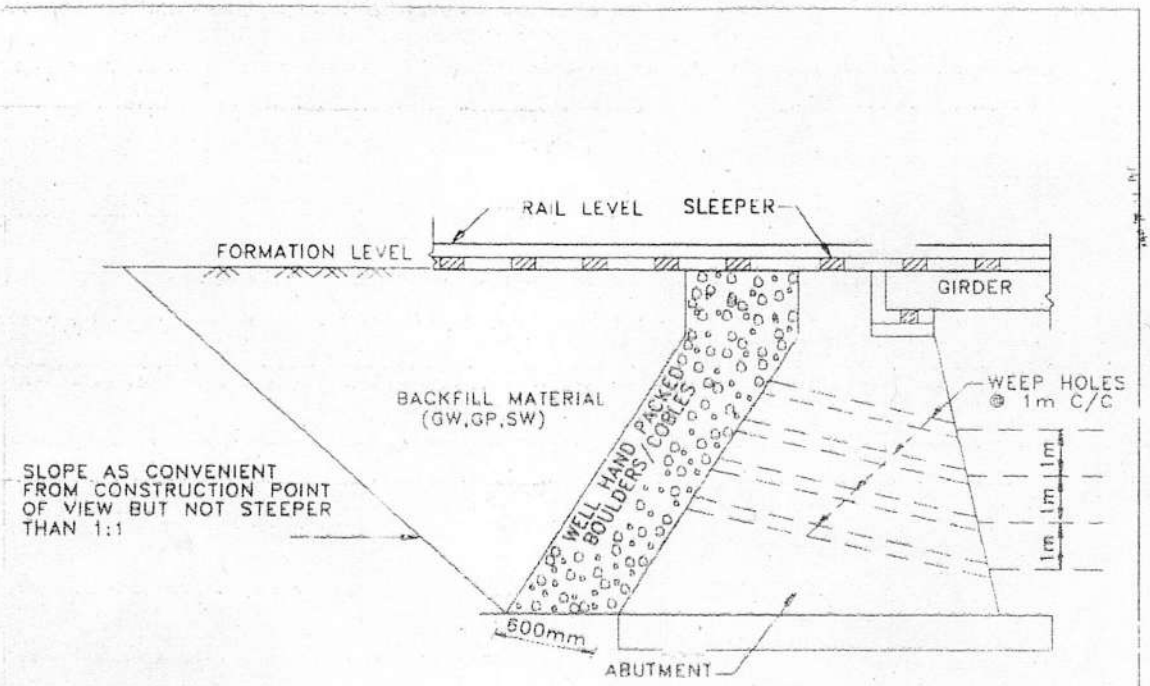


Fig-6.1 Typical embankment profile for sandwich construction with cohesive soil

6.2.5 Placement of Back-Fills on Bridge Approaches and Similar Locations

i) The back fills resting on natural ground may settle in spite of heavy compaction and may cause differential settlements, vis-a-vis, abutments, which rest on comparatively much stiffer bases. To avoid such differential settlements, while on one hand it is essential to compact the back fill in the properly laid layers of soil for Settlements within tolerable limits so that Coefficient of subgrade reaction should have gradual change from approach to the bridge.

ii) Back-fills on bridge approaches shall be placed in accordance to Para 7.5 of Bridge Substructure code (including latest correction slips). Sketch for details given in **Fig-6.2** below.



NOTE:- 1. BEHIND ABUTMENTS, WING WALLS AND RETURN WALLS, BOULDER FILLING AND BACKFILL MATERIALS SHALL BE PROVIDED UPTO FULL HEIGHT.

2. THE BOULDER FILLING SHALL CONSIST OF WELL HAND PACKED BOULDERS & COBBLES TO THICKNESS NOT LESS THAN 600mm WITH SMALLER SIZE TOWARDS THE BACK. BEHIND THE BOULDER FILLING, BACKFILL MATERIALS, SHALL CONSIST OF GRANULAR MATERIALS OF GW, GP, SW GROUPS AS PER IS: 1498–Latest Edition

R. D. S. O.	
COMPREHENSIVE GUIDELINES AND SPECIFICATIONS FOR RAILWAY FORMATION	
DETAIL OF BACKFILL BEHIND BRIDGE ABUTMENT	
NOT TO SCALE	DRG. NO. GE/SD/C006/Rev.2/2020

Fig-6.2 Details of backfill behind bridge abutment

iii) Fill material being granular and sandy type soil, therefore need to be placed in 150mm or lesser thick layers and compacted with vibratory plate compactors.

iv) While placing backfill material benching should be made in approach Embankment to provide proper bonding.

v) Geocomposite drain (vertical) can replace the natural graded filters (consisting of 600mm thick boulders/cobbles etc. as shown in Fig 6.2 above), provided behind bridge abutment and/or retaining walls for drainage in places where availability of graded filters is matter of concern. Detailed elaboration is given in Appendix-C

6.2.6 Drainage Arrangement in Embankments and Cuttings

Drainage is the most important factor in the stability of embankment/cutting in railway construction. Effective drainage of the rainwater in the monsoon season is very important to safeguard embankment/cutting from failure. Railway formation is designed for fully saturated soil condition. However, Stagnation of water for long time on formation is not desirable. Therefore, the drainage system should be efficient enough to prevent stagnation and allow quick flow of water. Some guidelines on this aspect are given as follows:

i) **Drainage of Embankment:** In embankment cross slope is provided to drain out surface water. Therefore, normally there is a need of side drains in case of embankment.

Top of formation should have a cross slope of 1 in 30 from centre of formation towards both sides for single line/multiple line in new construction.In case of doubling or multiple line construction work in existing lines, the cross slope of 1 in 30 should continue from the edge of existing formation towards cess/drain side (single slope) to avoid any stagnation of water between two tracks. However, if the cross slope of existing embankment is steeper than 1 in 30 due to any reason, the configuration of 1 in 30 cross slopeshall be maintained in the new line while ensuring proper drainage conditionsat the same time so as to avoid any stagnation of water in between tracks, by adopting various measures as per site conditions.

In case of double line construction, central drain between the tracks should be avoided to extent possible (even if it means resorting to additional earthwork to facilitate flow of water) as it is not only difficult to construct but also difficult to maintain for continuous vibrations caused by moving traffic, problem in proper curing of concrete etc. Only in very rare situations, when drainage of water is not possible without construction of drain, suitable arrangements for construction of drain with pre-cast concrete channel/ subsoil drains along with proper outfall should be made. If the distance between adjacent tracks is large enough, suitable slopes should be provided in the ground to make rain water flow in a natural manner. Wherever, there is level difference between two adjacent tracks, suitable non-load bearing dwarf walls may be constructed to retain earth.

ii) **Drainage in Cuttings**

a) **Side Drains:** In case of cuttings, properly designed side drains ofrequired water carrying capacity are to be provided. If height of the

cutting is less (say up to 4m), normally only side drains on both sides of the track are to be provided. In case of deep cuttings, catch water drainsof adequate water carrying capacity are also required along with side drains. A typical sketch of side drain and catch water drain is given in Fig-

6.3 below. It is to be noted that blanket material is to be placed like fill/embankment and top of side drains has to remain below the bottom ofblanket material.

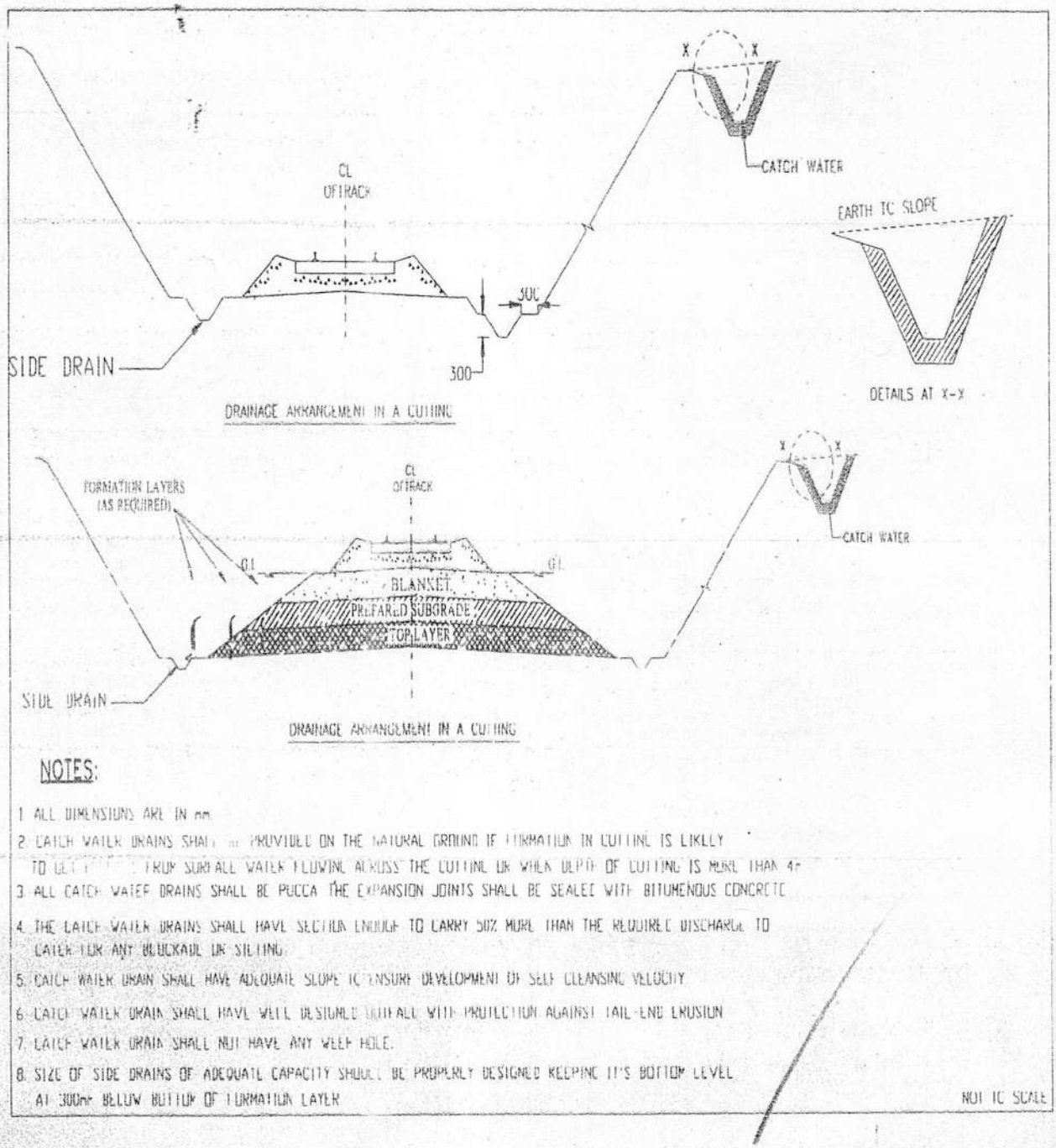


Fig-6.3: Arrangement of drainage in cutting

b) **Catch Water Drains:** Surface water flowing from top of hill slope towards the track in huge quantities needs to be controlled. It is also not possible to allow water from the hillside to flow into the side drains, whichare not designed for carrying such huge quantity of water. Therefore, it is essential to intercept and divert the water coming from the hill slopes; accordingly, catch water drains are provided running almost parallel tothe track. Depending on site condition, water from the catch water drains may require to be diverting by sloping drains and carrying across the track by means of culvert. In some of the situations, depending on topography of top of cutting, there may be requirement of construction of net of small catch water drains which are subsequently connected to maincatch water drain so that there is no possibility of water stagnation/ponding upto distance approximately three times depth ofcutting from its edge. Catch water drains should be made pucca/lined with impervious flexible material locally available.

c) **Considerations in Design of Catch Water Drains:** These should be properly designed, lined and maintained. If catch water drains are kuchha/ broken pucca drains, water percolates down to the track through cracks, dissolving the cementing material resulting into instability in the cuttings. Catch water drains should be located slightly away (as per site conditions) from the top edge of cutting and water flow should be led into the nearby culvert or natural low ground. Some additi....l salient features to be observed are as follows:

i) Catch water drains shall have adequate slope to ensure developmentof self-cleansing velocity.
ii) Catch water drains shall not have any weep hole.
iii) The expansion joints, if provided, shall be sealed with bituminous concrete.
iv) Regular inspection and maintenance work, specially before onset of monsoon, should be carried out to plug seepage of water.
v) Catch water drains shall have well designed out fall with protection against tail end erosion.

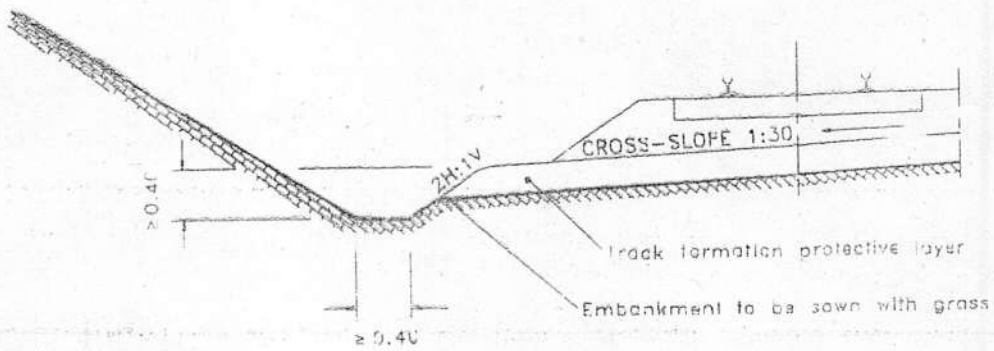
Though capacity and section will depend on terrain characteristics, rainfall etc. but following parameters are important for design of catch water drains:

i) Intensity and duration of rainfall.
ii) Catchment area- shape, size, rate of infiltration etc.
iii) Velocity of flow which should satisfy the Manning's formula
iv) Minimum gradient of drain should be about 1 in 300.
v) Normally catch water drains should be of trapezoidal cross section.
vi) The catch water drain should not be given gradient more than about 1 in 50 (but in no case more than 1 in 33) to avoid high watervelocity and possibility of washout of lining material
vii) Rugosity coefficient should be about 0.03.

d) Alignment plan, longitudinal section and soil survey records of catch water drain should be updated from time to time as per development in the area of influence.

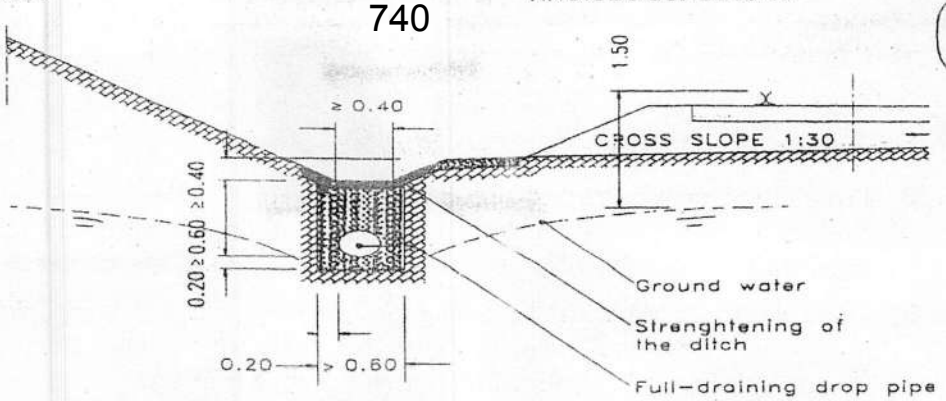
e) Stable slopes and adequate drainage arrangements in cutting areas should be provided as per details given in 'Guidelines for Cuttings in Railway Formations - No. GE: G-2, August 2005'.

iii) **Other Drainage Systems:** Open Drainage system typical as shown in Fig-6.4 below, will facilitate collection of rainwater from embankment, cuttings and side of cuttings and lead it away. Sub-soil Drain System typical as shown in Fig-6.5 below are installed where the groundwater level has to be lowered (from depth < 1.5 m below the rail top), where the soil surrounding the track formation has to be drained or where percolating and layer water has to be drained away.



(All Dimensions of side drain in 'm')

Fig-6.4: Open Longitudinal Drain at Toe of Formation



(Dimensions of side drain in 'm')

Fig-6.5: Sub-soil Longitudinal Drainage System

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6.2.7 Finishing and Blanketing

i) Providing Camber/Cross Slope below Blanketing: Top of the formation should be finished to desired cross slope of 1 in 30. Cross slope should be within 1 in 28 to 1 in 30. Camber may be checked at site through use of a cross-section camber board.

ii) Once the top surface of the formation has been finished to proper slope and level, movement of material vehicle for transportation of ballast, sleepers etc. should be avoided, these movements will cause development of unevenness, ruts on the surface which will accumulate water and weaken the formation.

iii) Provision of Blanket Layer: The specifications for the material to be used as Blanket and thickness of blanket layer shall be as per relevant provisions given in **Chapter 3.**

6.2.8 Setting up of GE lab at Construction Site

A well-equipped Geo-technical Engineering (GE) Field Laboratory shall be set up at all construction projects connected with new lines, doubling and gauge conversion works as well as, where rehabilitation of failing formation is being undertaken. Number of such GE labs to be established on a particular project/work site should be so decided that all quality control checks can be performed effectively. The field lab should be manned adequately by trained officials & staff capable of carrying out required investigation, soil testing and quality control at site.

i) Aspects to be looked after by field GE lab are as under:

a) To ensure that the quality of supplied soil and blanket material conforms to the accepted limits of gradation, classification, plasticity, etc.
b) To evaluate methods of compaction by conducting tests in connection with field trials.
c) To exercise moisture and density control as the earthwork proceeds in layers rolled with the suitable equipment.

ii) Field lab shall be equipped with minimum equipment as listed in Appendix-K, to facilitate the following minimum tests:

a) Gradation Analysis-Sieve and Hydrometer.
b) Atterberg's Limits - Liquid Limit & plastic Limit
c) Optimum Moisture Content (OMC), Maximum Dry Density (MDD) and Relative Density.
d) Placement moisture content & in-situ Density.
e) CBR test

6.2.9 Maintenance of Records

At the work site, details of works along with materials being used are to be properly recorded so that work of satisfactory quality can be achieved which can also be verified at later stage. Records are also required to develop completion drawings and other details, which would become permanent records of the section and could be helpful in future to plan developmental activities and remedial measures if need be.

QUALITY CONTROL OF EARTHWORK

7.1 General

Quality of execution of formation earthwork shall be controlled through exercise of checks on the borrow material, blanket material, compaction process, drainage system, longitudinal & cross sectional profiles of the finished embankment. The details of quality control procedure are as follows:

7.2 Quality Control test on Construction Material

This is required to ascertain the suitability of the material for construction of Embankment and to decide the OMC/MDD and other relevant tests, which becomes thequality control inputs. Quality control tests are required to be conducted on borrow material as well as on blanket material.

7.3 Suitability tests at source

7.3.1 Borrow Material (Embankment fill as well as prepared subgrade)

a) **Following specific tests to be conducted on borrow Material**

i) Sieve analysis

ii) Hydrometer analysis

iii) Consistency limits

iv) CBR test

v) Test for organic content in soil

vi) Crumb test, double hydrometer test, pin hole & chemical test - forDispersive soil only

vii) OMC/MDD

Fill material proposed to be used either from Railway land or from outside wouldhave to be assessed for its suitability as well as to decide thickness of the blanket layer after conducting soil classification and other relevant tests as per site requirement. On the basis of the tests, areas for borrow material, especially from outside the Railway land, need to be earmarked. Once the material has been found fit for use as fill material for Embankment, further lab tests, to assess OMC, MDD/ Relative Density, need to be conducted.

In case, slope stability analysis, as explained in Chapter - 5 is required, triaxial shear test will also need to be done to find effective shear strength parameters.

b) **Frequency of Testing:** The frequency of testing before laying for borrow material should be as detailed in Table 7.2.

Note: It would be in the interest of the execution agency to have frequent tests conducted at source/manufacturing point on his own to judge the suitability of the material to avoid any complication at a later stage. However the final acceptance of the borrow material should be at the site before laying.

Signature of Tenderer(s)/Contractor(s) For Chief Engineer(Con)/I/BSP

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7.3.2 Blanket Material: The source(s) of blanket material needs to be identified basedon the final location survey report, tests & studies conducted and conformity to the Specification as stipulated in **Table 3.3 to 3.6.**

a) Method of Test: Blanket material should be tested as per IS: 2720 (Part 4) to plot particle size distribution curve, so as to assess its suitability. It would be necessary to carry out wet analysis to assess the actual percentage of fines.

b) Frequency of Tests: The frequency of testing at site before laying for blanketmaterial should be as detailed in **Table 7.2.**

c) Following tests/checks are to be conducted

i) Sieve analysis and hydrometer analysis to determine C_C, C_U & percentagefines
ii) CBR test
iii) Los Angeles Abrasion value,
iv) Filter criteria, as required
v) Gradation Analysis,
vi) Check for conformity with enveloping curves

Note: It would be in the interest of the execution agency to have frequent tests conducted at source/manufacturing point on his own to judge the suitability of the material to avoid any complication at a later stage. However the final acceptance of the blanket rial should be a... site before laying.

7.4 Quality Control Checks on Fi...hed Earthwork

7.4.1 Compacted Earth: Degree of compaction of each layer of compacted soil should be ascertained by measurement of dry density/Relative Density of soil at locations selected in specified pattern. The method of sa..pling, frequency of tests, method of tests to be conducted and acceptance criteria to be adopted are as under

a) Method of Sampling

i) Various methods of selection of sample points for checking the field dry density are in practice. These methods are shown in **Fig-7.1.** The sampling method should be such that the effectiveness of compaction for the entire area of compacted earthwork can be judged properly. The Engineer in-charge should specify the sampling method depending on the site conditi...s.

ii) For each layer, a minimum of one sample at a predetermined interval along the centerline of the alignment would be taken in a staggered pattern so as to attain a minimum frequency of tests as given in the note belo.. table 7.2. For subsequent layer, the stagger should be such that the point of sampling does not fall vertically on the earlier sampling points of the layer immediately below. The process of sampling is explained in **Fig-7.1** for guidance. Additional sampling points can be taken, as considered necessary.

iii) In case of embankment widening, sampling should be done at an interval of minimum 200metres on the widened side(s) of Embankment.

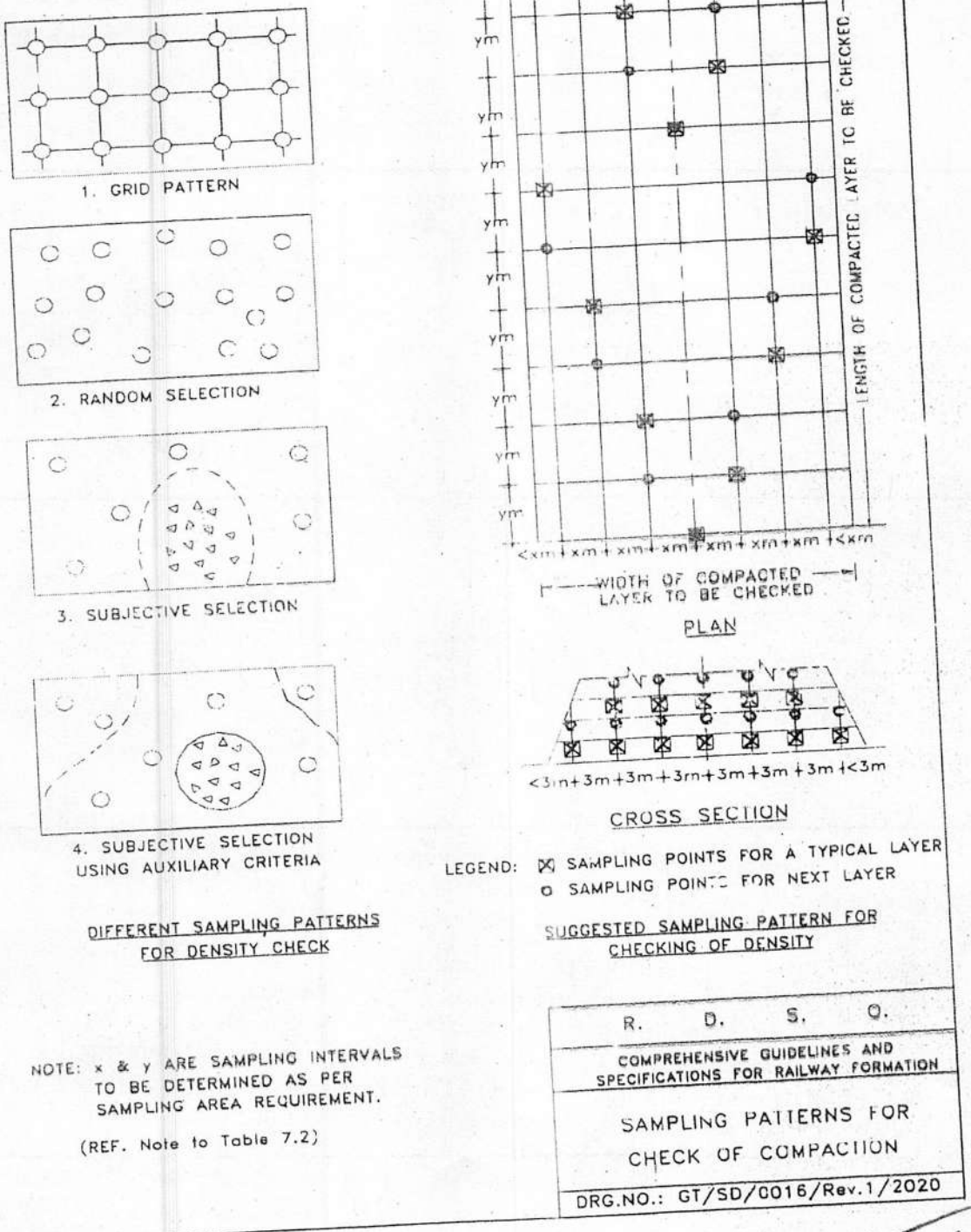

Fig-7.1: Sampling pattern for compaction check

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b) **Methods of In-situ Dry Density Measurements:** Any of the following methods could be adopted as per the requirements at site.

Table-7.1

Method of measurement	Procedure of test	Parameters to be measured	Remarks
i) Sand Replacement Method	As per IS-2720 (Part 28) - latest version	In-situ Dry Density Moisture Content	May be adopted for alltype of soils
ii) Core Cutter Method	As per IS-2720 (Part 29) - latest version	-do-	In some of the coarse- grained soils (with little fines) taking core cutter samples is difficult. In such cases, a sand replacement method may be used for density measurement.
iii) Nuclear Moisture Density Gauge	As per Appendix-H	a) Bulk density b) Moisture Content c) Dry density d) Degree of compaction	It is a faster Method and should be widely used for large construction projects.

c) Acceptance Criteria

i) Coarse grained soils which contain fines passing 75 micron IS Sieve, upto 5 percent should have the Density Index (Relative Density) a minimum of 70% as obtained in accordance with IS: 2720 (Part 1[4]) – 1983 (Reaffirmed2015).

ii) In field compaction trial, the maximum attainable dry density should not be less than 98% of MDD value as obtained by Heavy Compaction Test (IS: 2720 (Part 8) – (Reaffirmed 2015) in the laboratory. In case, there are difficulties in achieving 98% of the MDD values as obtained by Laboratory test, in the field trials, the same may be relaxed upto 95% of MDD with thespecific approval of Chief Engineer/Construction, recording reasons for such relaxation. The level of compaction to be achieved in field, as a percentage of MDD value achieved in field compaction trial, for various layers shall be as per Table 3.3 to 3.6 of Chapter 3. In case of PSU, existing provision of Equivalent authority for acceptance criteria shall continue.

iii) During widening of embankment in case of gauge conversion and rehabilitation of unstable formation, compaction of earthwork should be minimum 95% of MDD as obtained by Laboratory test as per Heavy Compaction Test (IS: 2720 Part 8 – 2013) or 70% Relative Density for

Coarse grained soils which contains fines (passing 75 micron IS Sieve) upto5 percent (IS: 2720 (Part 14) –1983 (Reaffirmed 2015).

7.4.2 Deformation Modulus (Ev_2) measurement

It is a parameter expressing the deformation characteristics of a soil. It is calculated taking values from the load settlement curve obtained from thesecond cycle of loading in the Plate Load Test (Details given in **Appendix-H**). It is to be determined in the field on top of each formation layer i.e. at top of compacted Blanket layer/Prepared sub-grade/Subgrade- Top & Lower layer in accordance with DIN: 18134-2012.

7.4.3 Frequency of Tests

The frequency of testing at finished earthwork should be as specified in theTable **7.2** given below.

7.5 Qualifying and Quality assurance Tests

Qualifying tests as part of pre-selection of good earth for Blanket, Prepared sub-grade, Subgrade is required to be carried out. Also quality of execution of formation earthwork shall be controlled through exercise of checks on the borrow material, blanket material, compaction process to ensure good quality construction. The quality control procedures are summarised in **Table-7.2** below.

Table–7.2: Summary of quality control tests in Borrow material/ finished earth work

Item / Material	Parameters to be determined	Location of sampling for quality control	IS Code Ref. (Latest version)	Frequency of test	Acceptance Criteria
(i) Borrow material					
(a) Subgrade / Prepared Subgrade	(i) Soil classification	At site before laying	IS: 1498	At least one test at every change of subgrade/ prepared-subgrade material subject to minimum of one test for every 5000 cum.	Soil should not be "unsuitable type" as given in Para 3.7 and should conform to specification given in Para 3.10 for 25T/32.5T Axle load of Chapter 3
	(ii) CBR		IS: 2720-Part-16		
	(iii) Plasticity Index (Prepared Subgrade)		IS: 2720- Part-5		
	(iv) OMC & MDD		IS: 2720 – Part-8		
(b)Blanket material	(i) Gradation	At site before laying	IS: 2720-Part-4	Minimum one test for every 500 cum or part thereof	
	(ii) Cc & Cu				
	(iii) Fines (passing 75 μ)				
	(iv) Abrasion value		IS:2386 – Part-4		
	(v) CBR		IS: 2720-Part-		

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	(vi) Filter criteria		IS:2720 – Part-4		
	(vii) OMC & MDD		IS: 2720 – Part-8		
	(viii) Y_{max} & Y_{min} (Determined in Relative Density test If fines are upto 5%)		IS:2720-Part-14		
(ii) Finished earthwork					
(Subgrade /Prepared Subgrade/ Blanket)	(i) Ev_2	Top of final finished surface of Blanket/ Prepared subgrade & Subgrade	DIN 18134 – 2012	One test per Km (*)	Acceptance Criteria as specified in Para 3.10 of Chapter 3
	(ii) Compaction	Every compacted layer	IS: 2720 (Part-28/29) or NMDG(as per Procedure issued by RDSO)	As per note given below	
	(iii) Density Index (Relative Density if fines are upto 5%)	Every compacted layer	IS: 2720 – Part-14		Minimum 70%

** Additionally this test can also be done by third party (i.e. IIT, NIT, Govt. Labs or any NABL approved Lab) having testing facilities, to cross check the results achieved at site. Frequency of testing in this case shall be decided/approved at the level of Chief Engineer (Con) In PSUs, frequency of such tests shall be decided as per existing delegations for testing.*

Note: Frequency of Tests: Density check would be done for every layer of compactedfill/blanket material as per following minimum frequency:

i) At least one density check for every 30 m length for blanket layers and top one metre of prepared subgrade/subgrade along the alignment in a staggered pattern of each compacted layer.

ii) At least one density check for layers other than as specified in(i) above, every 500 m^2 or 75 m c/c whichever occurs earlier along the alignment in a staggered patternof each compacted layer.

iii) In case of important bridge approaches (100 m length on either side), at least one density check for every 25 m length shall be adopted.

7.6 Formation Level: Finished top of sub-grade level may have variation from design level by ± 25 mm and finished top of blanket layer may also be permitted to have variation from design level by plus 25 mm only. The ballast should be placed only on level formation without ruts or low pockets.

7.7 Cross Slope: Cross slope should be within 1 in 28 to 1 in 30.

7.8 Side Slopes: Side slope should be 2H: 1V or flatter as per design.

7.9 Formation Width: Formation width should not be less than the specified width.

7.10 Quality Control Records: At least, following records of quality control as per proforma given **in Appendix- D & G** needs to be maintained.

i) Characteristics of borrow materials as per proforma No. G-1.

ii) Quality of blanket materials as per proforma No. G-2.

iii) Field compaction trial computation sheet details as per **Table D-4** of **Appendix-D.**

iv) Quality of compaction of earthwork including blanket material as per proforma no. G-3 for core cutter method & proforma no. G-4 for sand replacement method.

v) Quality of material and its compaction for backfill behind bridge approaches etc. asper proforma no. G1, G2, G3 & G4.

vi) Details of machineries engaged in execution of earth work including its output asper proforma decided by field engineers.

7.11 Setting up of GE Lab at Construction/Rehabilitation Site

A well-equipped Geo-technical Engineering (GE) Field Laboratory shall be set up at all construction projects connected with new lines, doubling and gauge conversion works as well as, where rehabilitation of failing formation is being undertaken. (Details are given in Para 6.2.8 of Chapter 6).

7.12 Certification for quality of earthwork

Certification for quality of earthwork in formation in respect of new lines, Gauge Conversion and Doubling projects etc. will be done by Executive authority at SAG level (i.e. CE/Con of respective projects). CE/Con will submit details for certification of quality of earthwork to CRS as per RDSO checklist.

7.13 Checklist for certification of quality of earthwork

Checklist for certification of quality of earthwork in Railway projects was issued by RDSO vide letter no RS/G/95/Main, dated: 11.06.2004. This Checklist has been revised and placed at Appendix –M.

7.14 Special design problems related with construction of formations

Any special design problems related with construction of formations may be referred toRDSO for guidance and advice, if required.

APPENDIX- M

CHECKLIST FOR CERTIFICATION OF QUALITY OF EARTHWORK IN RAILWAY PROJECTS

(NEW LINES/ DOUBLING/ GAUGE CONVERSION PROJECTS)

(As per Guideline & Specification for Railway Formation No. RDSO/2020/GE: IRS-0004, June2020)

1.0 GENERAL INFORMATION:

i) Name of the Project :

ii) Length of the Project :

iii) New Line/Doubling/Gauge Conversion :

iv) Section & Length being certified :

2.0 SOIL EXPLORATION:

(As per Chapter 1 of RDSO/2020/GE: IRS-0004)

(i) Is soil survey carried out as per para 1.2 of Chapter 1 of RDSO/2020/GE: IRS-0004. :

(ii) Reference of record/report of soil exploration :

(iii) Any problematic soils encountered in soil exploration such as soft soil, Organic clays & silts etc. :

(iv) Whether results of soil exploration taken into account in project formulation and alternatives explored. :

(v) Whether geological investigations carried out in case of hilly terrain. :

(vi) Reference of record/report of geological investigation :

(vii) Reference if any, to RDSO for proof checking & consultancy report submitted by private agencies. :

3. FIELD COMPACTION TRIALS

(As per para 6.2.3 (c), Chapter 6 of RDSO/2020/GE: IRS-0004)

(I) Whether field trials conducted :

(ii) Details of field trial (indicate) :

(a) Classification of soil
(b) Type of roller used and its weight
(c) Optimum thickness of layer achieved

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(d) Optimum number of passes of the roller used :

(e) Field moisture content :

(f) Maximum attainable field dry density :

(iii) Whether field compaction trial taken into accou... execution. :

(iv) Reference of record of field trials :

(v) Reference of record of field compaction trails (maintained as given in Annexure III, IV, V & VI) :

4. QUALITY CHECK OF EARTH WORK

(As per Para 6.2.8, Chapter 6 of RDSO/2020/GE: IRS-0004)

(i) Whether GE Field Laboratory has been set up at site for quality check. :

(ii) Whether equipment available in the GE Lab is as per Annexure –VIII (attached). :

(iii) Dates of inspection of GE Lab by CE/Con based on which item Nos (i) & (ii) above is certified. :

4.1 BORROW MATERIAL

(As per para 7.3.1, Chapter 7 of RDSO/2020/GE: IRS-0004)

(i) Type of fill material (indicate classification as per IS-1498):used in the earth work.

(ii) Is soil suitable for embankment (As per Para 3.7 of Chapter 3 of RDSO/2020/GE: IRS-0004) :

(iii) Frequency of testing at site to assess the suitability of fill materials (As per Table 7.2 Chapter 7 of RDSO/2020/GE: IRS-0004) :

(a) Total quantum of earthwork involved :

(b) Minimum number of test required (at least one test at every change of subgrade/ Prepared subgrade material subjected to minimum of one test per 5000 cum) :

(c) Number of tests actually done :

(iv) Maximum size of materials used in the bank in case of cobbles/boulders/rock etc. :

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(v) Is it certified that record of quality of fill material has been maintained as given in format in Annexure VII (A), attached record of testing is preserved in the reference

4.2 BLANKET MATERIALS
(As per para 7.3.2, Chapter 7 of RDSO/2020/GE: IRS-0004)

(i) Source of blanket material

(ii) Type of blanket material used (Natural/Mechanically Crushed/ Blended)

(iii) Whether quality of blanket material selected in conforming :to specification as given in para (As per table 3.3, 3.4, 3.5 & 3.6, Chapter 3 of RDSO/2020/GE: IRS-0004)

(iv) Thickness of blanket layer
(a) Type of sub-grade (in top 1m)

(b) Thickness required (As per table 3.3, 3.4, 3.5 & 3.6, Chapter 3 of RDSO/2020/GE: IRS-0004)

(c) Thickness actually provided

(d) Deviation from prescribed thickness, if any

(v) Frequency of testing to assess the suitability of blanket :material (As per Table 7.2, Chapter 7 of RDSO/2020/GE: IRS-0004)
(a) Total quantum of blanket material involved in cum
(b) Minimum number of test required (at least one test per 5000 cum)
(c) Number of tests actually done

(vi) Reference of record of testing where quality of blanket :material has been maintained as given in format in Annexure VII (B) attached.

4.3 QUALITY CONTROL CHECKS ON FINISHED EARTHWORK
(As per Para 7.4, Chapter 7 of RDSO/2020/GE: IRS-0004)

4.3.1. For Soil

(i) Frequency of tests for degree of compaction (As per :Table 7.2, Chapter 7 of RDSO/2020/GE: IRS-0004)

(a) Total area of earth work involved (Cumulative for :every layer in Sqm.)

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(b) Minimum number of density test required (at least one per 200 sqm for top one metre of subgrade and one per 500 sqm for balance) :

(c) Number of density test check actually done :

(d) Number of test where degree of compaction is less than 98% of MDD :

(e) Action taken in case of (d) :

(ii) Reference of record where report of checking of degree of compaction has been preserved as given in format in Annexure VII (C) (enclosed) :

(iii) Soil used as subgrade (SQ1/SQ2/SQ3) :

(iv) Ev_2 Value on top of subgrade (As per Table 7.2, Chapter 7 of RDSO/2020/GE: IRS-0004) :

(v) Compaction at top layer of subgrade(As per Table 7.2, Chapter 7 of RDSO/2020/GE: IRS-0004) :

4.3.2 For Ballast

Ballast Cushion Thickness :

4.3.3 For Blanket

(i) Frequency of tests for degree of compaction / Relative Density done (As per Table 7.2, Chapter 7 of RDSO/2020/GE: IRS-0004) :

a) Total area of blanket involved :

b) Minimum number of density test required (at least one par 200 sqm for every blanket layers) :

c) Number of density check actually done :

d) Number of test where degree of compaction is less than 98% of MDD or 70% of Relative Density (RelativeDensity should be calculated if fines in the soil are less than 5%) :

e) Action taken in case of (d) :

(ii) Reference of record where report of checking of degree of compaction has been maintained as given in format in Annexure VII (D) attached. :

(iii) Compaction of blanket layer (100% of MDD(As per Table 7.2, Chapter 7 of RDSO/2020/GE: IRS-0004) :

(iv) Blanket material specification test Report : Y/N

(v) Blanket thickness (Single layer/ Two layer) :

(vi) Ev_2 Value on top of blanket layer (As per Table 7.2, Chapter 7 of RDSO/2020/GE: IRS-0004) :

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4.3.4. Prepared Subgrade (As per table 3.4 &3.6 of RDSO/2020/GE: IRS-0004)(**For Two Layer Formation system only**)

(i) Prepared sub grade specification and test report : Y/N
(ii) Soil used as prepared sub grade (SQ2/SQ3) :
(iii) Prepared sub grade thickness :
(iv) Compaction of Prepared Sub-grade :
(v) EV2 Value on top of Prepared Sub-grade :

4.3.5. Formation level (As per para 7.6, Chapter 7 of RDSO/2020/GE: IRS-0004)

(i) Has it been ensured that finished top sub grade level is within ± 25 mm of designed level and finished top of blanket layer is within +25 mm from designed level and top of formation is level without ruts of low pocket. :
(ii) Reference of level book maintained to ensured item (i) above :

4.3.6 Cross Slope (As per para 7.7 of RDSO/2020/GE: IRS-0004) :

4.3.7. Side Slope (As per para 7.8 of RDSO/2020/GE: IRS-0004) :

4.3.8. Formation System (As per para 3.1 of RDSO/2020/GE: IRS-0004)
Single layer/ Two layer :

4.3.9. Formation width (As per IRSOD latest version) :

4.3.10 Cess Width (90cm Min.):
(As per Para 3.3 (a) of RDSO/2020/GE: IRS-0004)

4.3.11 a) Provision of Berm (for more than 6m High embankment): Y/N
b) **Berm Width** (2.0m Min.)
(As per Para 5.1.2 of RDSO/2020/GE: IRS-0004 :

5.0 SLOPE STABILITY FOR EMBANKMENT/ CUTTING
(As per chapter 5 of RDSO/2020/GE: IRS-0004)

(i) Maximum height of bank (at chainage) :
(ii) Maximum depth of cutting (at chainage) :
(iii) Designed side slope in bank/cutting as per slope stability analysis (attach profile duly approved) :
(iv) Agency which carried out slope stability analysis :
(v) Actual side slope provided in bank/cutting at site (attach profile duly approved) :

6.0 EROSION CONTROL MEASURES
(As per para 8.3, Chapter 8 of RDSO/2020/GE: IRS-0004)

(i) Type of soil used in earth work :
(ii) Chainage where erosion control measures required : Y/N

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(iii) Chainage where erosion control measures planned :

(iv) Type of erosion control measures provided chainage wise:

7.0 Slope Protection Measures

(Ref: RDSO Guidelines for Cuttings in Railway Formations, GE: G-2)

(i) Slope protection measures required : Y/N

(ii) Slope protection planned :

(iii) Slope protection provided :

8.0 Drainage system (As per para 6.2.6, Chapter 6 of RDSO/2020/GE: IRS-0004)

(i) Drainage system required : Y/N

(ii) Catch water Drain System Planned :

(iii) Catch water Drain System Provided :

(iv) Side drain planned :

(v) Side drain Provided :

9.0 CUTTINGS (Ref: Para 8.4, Chapter 8 of RDSO/2020/GE: IRS-0004 & GE: G-2)

(i) Details of cutting as per **Annexure –I** enclosed :

(ii) Attach copy of designed & approved cutting profiles :

(iii) Details of deviation, if any, to recommendation of Geologist investigation. :

10.0 BACKFILL BEHIND BRIDGE ABUTMENT/WING WALLS/ RETURN WALL

(As per Para 6.2.5, Chapter 6 of RDSO/2020/GE: IRS-0004)

(i) Details of backfill behind bridge approach **Annexure -II** enclosed :

11 GE LAB AT SITE (Para 6.2.8, Chapter 6 RDSO/2020/GE: IRS-0004)

(i) Organization :

a) In Charge :

b) Total Staff strength with particular :

c) Qualification and training of personnel :

(ii) Period for which lab at site was in operation :

(iii) Total number of tests carried out at site :

(iv) Reference of record of tests :

(v) Equipments (As per Annexure VIII attached) :

12.0 GENERAL SITE DETAILS

(i) Pond/Ditches/ Borrow pits along the Alignment (distance from toe of bank) (As per para. 3.6, Chapter 3 of RDSO/2020/GE: IRS-0004) :

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(ii) Rain cuts on slope : Y/N (if Y chainage)

(iii) Cracks on formation and slope : Y/N (if Y chainage)

(iv) Details of benching in case of doubling :

(v) Minimum center to center distance between tracks :

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13.0 BRIEF DETAILS OF DEVIATIONS

S. No.	Nature of Deviations	Approved by	Reference of approval.
1.			
2.			
3.			
4.			

It is certified that the earthwork and blanketing from chainage ------ to chainage i.e. ------km have been done strictly as per prescribed specification, stipulated in (as per RDSO Guideline & Specification No. RDSO/2020/GE: IRS-0004) under my active administrative and technical control except minor deviations as stated in para. 13.0 above for which approval of the component authority has been obtained and necessary precautions for ensuring safety on the account of deviation have been taken.

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DETAILS OF CUTTING

Location Chainage/Km	Max Depth of Cutting	Geological investigation carried out	Details of Beam provided (Not less than 4-5m)	Type of Rock/ soil strata	Side slope		Side Drain		Catch Water Drains				Other measures taken like gabions, R/walls, etc.
					Designed (V/S)	Actual at site	Designed	Provided	Required	Designed	Provided	Katcha /Lined	

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BACK FILL BEHIND BRIDGE ABUTMENT

Bridge No.	Boulder Shape	Boulder Size	Packing of Boulders	Thickness of Boulder packing	IS classification of back fill in triangular zone	Weep holes	Any special treatment like toe pitching, toe wall etc.

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ANNEXURE- VII

A) DETAILS OF BORROW SOIL/ FORMATION SUBGRADE/PREPARED SUBGRADE

S. no	Date of taking sample	Location layer Ch./Km	Soil type				Soil classification	LL	PL	PI
			Gravel %	Sand %	Silt %	Clay %				
1	2	3	4	5	6		7	8	9	10

CBR value	Whether of dispersive nature	Suitable/ Non suitable	Signature and name of Engineer's representative	Signature and name of contractor representative	Remarks
11	12	13	14	15	16

B) QUALITY OF BLANKET MATERIAL

1. Type of material: Manufactured/Naturally available
2. Source location:

S.no	Date of taking sample	Location of laying	Soil type			C_u	C_c	Abrasion Value
			Gravel %	Sand %	Fines passing 75 micron sieve %			
1	2	3	4	5	6	8	9	10

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CBR value	Signature and name of Rly official	Signature and name of contractor	Remarks
11	12	13	14

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(C) PROFORMA FOR FIELD COMPACTION RECORD

Chainage / km from ..... to .....

Soil Classification:

Height of bank: OMC:

Type of roller being used: Lab. MDD/ Field Trial MDD:

CORE CUTTER METHOD

Date of Laying	Layer no.	location coordinate for check	Placement moisture content (%)	No. of passes	Wt. of core cutter+ wet soil (W_s) (g)	Wt. of core cutter (Wc) (g)	Wt of wet soil ($W_s - W_c$) (g)	Vol. of core cutter (V_c) (cc)	Bulk density, $\gamma_b = \frac{(W_s - W_c)}{Vc}$ (g/cc)
1	2	3	4	5	6	7	8	9	10

Moisture content of compacted layer (w) (%)	Dry Density(γ_d) = $\gamma_{b\ /\ 1+w}$ *100 (g/cc)	Degree of compaction (%)	Sig. and name of Rly officer	Sig. and name of contractor	Remarks
11	12	13	14	15	16

Note. 1. In case of compaction of blanket material, percentage of fines should also be mentioned in a column.

2. Determination of Dry Density, (yd) of soil in above table is done as per IS: 2720 Pt 29 – 1975 (latest version) titled as Determination of Dry Density of Soils In-Place By The Core-Cutter Method

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(D) PROFORMA FOR FIELD COMPACTION RECORD

Chainage /km from ..... to .....

Soil Classification: Height of embankment:

SAND REPLACEMENT METHOD

Location	Bulk density of sand, (y_s) g/cum	Wt of wet soil from hole, W_w (g)	Wt of Cylinder + Sand, before pouring W_1 (g)	Wt of sand + Cylinder after pouring W_2 (g)	Mean weight of sand in cone W_3 (g)	Wt of sandin hole W_b = W1 - W2- W3	Bulk Density ofsoil $y_b = (W_w/Wb) * y_s$
1	2	3	4	5	6	7	8

Moisture content of soil (w), %	Dry Density of soil $y_d = yb/1+w$	Relative Density I_D	Sign. and name of Rly Official	Sign and name of contractor	Remarks
9	10	11	12	13	14

Ref: IS: 2720 (Pt 28)1974 (latest version)

(Determination of dry density (y_d) of soils in-place, by the sand Replacement method)

Note: 1. Density Index (Relative Density) shall be find out as per IS 2720 (Part 14) -1963 – (latest version).

2. The density index, Id (relative density) expressed as a percentage should becalculated as follows:

$$\text{Relative density (ID)} = \frac{y_{max}(y_d - y_{min})}{y_d (y_{max} - y_{min})} \times 100$$

- y_{max} (from lab as per IS 2720 (Part 14) .....
- y_{min} (from lab as per IS 2720 (Part 14) .....
- y_d determined in field as shown in above table by the sand Replacementmethod.

Signature of Tenderer(s)/Contractor(s)

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CHAPTER– XIII

SPECIAL CONDITION OF CONTRACT

SPECIFICATIONS FOR CONCRETE WORK/ BRIDGE WORK / PROTECTION WORK

1.1. Codes & References.

1.1.1. Production, sampling, testing and quality control of concrete shall be governed by provisions of IRS Concrete Bridge Code-1997 with upto date correction slip. Acceptance criteria for concrete work shall be as given in IRS Concrete Bridge Code. For this tender, IRS Concrete Bridge Code-1997 with upto date correction slip is Part & Parcel of this tender document. This code is available in the Office of the Chief Engineer (Con) SEC Railway, Bilaspur and may be seen or purchased. The works of this contract shall be executed as per standard specifications. For execution, quality control and testing relevant IS Codes and Railway Codes shall be followed.

1.1.2 For specifications on material to be used in structures 'Indian Railways Unified Standard Specification (Works and Materials-2010) Vol-I and Vol-II' with latest amendment should be referred.

1.2. General:

1. Prior to start of construction, the contractor shall design the mix as per IS:10262-2019 and submit to Engineer for review, the proportions of materials, including admixtures to be used. For mix design purposes, the exposure condition for all the proposed bridges is considered as moderate. All codal provisions corresponding to moderate exposure condition would be applicable in this contract.

1.3. Cement

1.3.1. The cement used shall be any of the following. However the prior approval of the Engineer shall be taken for use of any of the cement.

- 43 Grade Ordinary Portland Cement conforming to IS:8112.
- 53 Grade Ordinary Portland Cement conforming to IS:12269.
- Portland Slag cement conforming to IS:455 (See Notes below).
- Portland Pozzolana cement confirming to IS:1489.

1.3.2. In aggressive environment, where SO_3 and Cl ion are present in abundance, preferably ordinary Portland cement with moderate sulphate resisting properties conforming to specifications as given in Table 1 below may be used.

1.3.3. NOTE:

(1). Mixing of 50% blast furnace slag with OPC cement at site shall not normally be permitted. However, in exceptional cases for bridges requiring higher levels of durability using blended cement which is not available from manufacturers, blending at site may be permitted subject to

ensuring dedicated facilities and complete mechanized process control to achieve specified quality with the special permission of Chief Engineer/Chief Bridge Engineer".

(2). Portland Pozzolana cement shall not be used for PSC (Pre-stressed Concrete) works. When Portland Pozzolana cement is used in plain and reinforced concrete, it is to be ensured that proper damp curing of concrete at least for 14 days and supporting form work shall not be removed till concrete attains at least 75% of the design strength.

(3). The sulphate resisting cement conforming to IS:12330 shall be used only in such conditions where the concrete is exposed to the risk of excessive sulphate attack e.g. concrete in contact with soil or ground water containing excessive amount of sulphate. It shall not be used under such conditions where concrete is exposed to risk of excessive chlorides and sulphate attack both.

(4). The rate of development of strength is slow in case of blended cement i.e. Portland Pozzolana Cement and Portland slag cement, as compared to ordinary Portland cement. This aspect should be taken care while planning to use blended cement. Accordingly stage of pre-stressing, period of removal of formwork and period of curing etc. should be suitably increased.

(5). Compatibility of chemical admixtures and super plasticizers with Portland Pozzolana Cement and Portland Blast Furnace Slag Cement shall be ensured by trials before use.

(6). Some other properties of concrete such as modulus of elasticity, tensile strength, creep and shrinkage are not likely to be significantly different. For design purposes, it will be sufficiently accurate to take the same value as those used for concrete made with OPC.

Signature of Tenderer(s)/Contractor(s)

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Table 1:
Specification for Ordinary Portland Cement
(With Moderate Sulphate Resisting Properties)

Sl. No.	Characteristics	Limits	
		Not less than	Not more than
1.	Ratio of Percentage Of Lime To Percentage Of Silica, Alumina And Iron Oxide, When Calculated By The Formula Given In IS:269.	0.80	1.02
2.	Ratio of percentage of Alumina to that of Iron Oxide.	0.86	--
3.	Magnesia, (% by Wt.)	--	5.0
4.	Loss on ignition (% by Wt.)	--	4.0
5.	Tricalcium aluminate content (C_3A) (%)	6.0	10.0
6.	Tricalcium silicate contents (C_3S) (%)	40.0	--
7.	Physical properties fineness (cm^2/g)	2800	3200
8.	Soundness 'Le Chatalier' method (mm)	--	5
9.	Setting Time		
(a)	Initial (in minutes)	60	--
(b)	Final (in minutes)	--	600

The method of testing to determine the above characteristics and ascertaining the results, shall conform to the procedure prescribed in IS:269, IS:4031 & IS:4032.

1.4. Pre-stressing Steel

1.4.1. The pre-stressing steel shall be 12.7mm dia class-II uncoated stress relieved low relaxation seven-ply strand conforming to IS:14268-1995.

1.4.2. All pre-stressing steel shall be free from splits, harmful scratches, surface flaws, rough, jagged and imperfect edges and other defects likely to impair its use in Pre-stressed Concrete.

1.5. Coarse Aggregates

1.5.1. For plain and reinforced cement concrete or Pre-stressed concrete works, coarse aggregate shall consist of clean, hard, strong, dense, non-porous and durable pieces of crushed stone, crushed gravel, natural gravel or a suitable combination thereof or other approved inert material. They shall not contain pieces of disintegrated stones, soft, flaky elongated particles, salt, alkali, vegetable matter or other deleterious materials in such quantities as to reduce the strength of durability of the concrete, or to attack the steel reinforcement. All coarse aggregates shall be tested to conform to IS: 383. Coarse aggregate having positive alkali – silica reaction shall not be used.

1.5.2. For reinforced cement concrete works, the maximum size of the coarse aggregate can be in the limits of 4.75 to 40 mm **but in no case should be greater than one quarter of the minimum**

thickness of the member, provided that the concrete can be placed without difficulty so as to surround all reinforcement thoroughly and to fill the corners of the form work.

1.5.3. The preferred nominal size of aggregate is 20mm for reinforced cement concrete works. Larger sizes up to 31.5mm may be permitted in special cases where there is no restriction to flow of concrete in a section. If smaller sizes are necessary for any element, 10mm and 12.5mm may be used.

1.5.4. For plain cement concrete works, preferred nominal sizes shall be 20 and 40 mm. larger sizes may be permitted only in special cases, subject to supplemental specifications and precautions.

1.5.5. For pre-stressed concrete works, the nominal maximum size of aggregate shall usually be restricted to 10mm less than the minimum clear distance between individual cables or individual un-tensioned steel reinforcement or 10mm less than the minimum clear distance between individual cables or individual un-tensioned steel reinforcement or 10mm less than the minimum cover to un-tensioned steel reinforcement whichever is smaller. A nominal size of 20mm coarse aggregate shall generally be considered satisfactory for pre-stressed concrete works. Primary or Secondary stone crusher should be employed for getting proper size and grading of coarse aggregates.

1.6. **Sand/Fine Aggregates**

1.6.1. For masonry work, sand shall conform to the requirement of IS:2116. For plain and reinforced cement concrete or pre-stressed concrete works, fine aggregates shall consist of hard, strong, durable, clean particles of natural sand, crushed stone or crushed gravel or suitable combination of natural sand and crushed stone or gravel. They shall not contain dust, lumps, soft or flaky materials, mica and other deleterious materials in such quantities as would reduce the strength or durability of concrete or attack the embedded steel. Motorized sand washing machines should be used for removing impurities from sand, if required. All fine aggregates shall be tested to conform to IS:333.

1.7. Water

1.7.1. Water used for mixing and curing shall be clean and free from injurious amounts of oils, acids, alkalis, salts, sugar, organic materials or other substances that may be deleterious to concrete or steel. Potable water is generally considered satisfactory for mixing concrete. As a guide, the following concentrations represent the maximum permissible values.

1.7.2. To neutralize 200 ml sample of water, using phenolphthalein as an indicator, it should not require more than 2 ml on 0.1 normal NaOH.

1.7.3. To neutralize 200 ml sample of water using methyl orange as an indicator, it should not require more than 10 ml of 0.1 normal HCL.

1.7.4. The permissible limits for solids shall be as follows:

Item	Permissible limits (Maximum)
Organic	200 mg/lit

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Inorganic	3000 mg/lit
Sulphates (SO_4)	500 mg/lit
Chlorides (Cl)	2000 mg/lit (for PCC) or 1000 mg/lit (for RCC)
Suspended matter	2000 mg/lit

1.7.5. In case of structures of length 30 m and below, the permissible limit of chlorides may be 1000 mg/lit.

1.7.6. All samples of water (including potable water) shall be tested and suitable measures taken where necessary.

1.7.7. The PH value shall generally be not less than 6. Whenever necessary tests should be done as per IS:3025. Mixing and curing with seawater shall not be permitted.

2. **Sampling, Strength, Tests and Acceptance Criteria:**

Shall be done as per clause-8.7 of IRS Code of Practice for Plain, Reinforced & Pre-stressed Concrete for General Bridge Construction (Concrete Bridge Code-Reprint'2014). Minimum frequency of samples of concrete and criteria for acceptance shall be as per IS:456.

3. **Testing of Concrete**

(i) The rate for concrete works shall be deemed to include all charge for testing of aggregates and the concrete as required to be in accordance with specification including the cost of labour, material, equipment, moulds, transport, curing etc. for this purpose the contractor shall set up a testing laboratory at his work site at the location to be decided by the Engineer. The contractor shall also make adequate arrangements for curing of test cubes, so prepared as per the direction of the Engineer. The contractor shall prepare at his own cost standard cubes of concrete according to the directions of the Engineer-in-charge both for (1) preliminary test and (2) the works test. All such tests shall be carried out by the contractor in the presence of the engineer or his representative and a proper record duly signed by the contractor or his/their representative and Engineer or his representative shall be maintained by the contractor as per the direction of the Engineer.

(ii) The contractor shall provide without any extra charge all materials, tools, labours and assistance of every kind which Engineer may demand from him for any test and examination, other than special or independent test, which he shall require to make on the contractor's premises and the contractors shall bear and pay all costs thereon. If the contractor fails to comply with the condition as aforesaid, the Engineer shall at his own judgment be entitled to take and examination any of the material/ test sample to any premises other than Contractor's and in all such cases, the contractor shall bear the of transportation and/ or carrying out such test elsewhere. A certificate in writing of the Engineer that the contractor has failed to proved facilities and the means for the tests and the examination shall be final.

(iii) The contractor shall also provide and deliver for tests, free of charge at such places other than his premises as the engineer may specify such materials or cubes as he may require.

(iv) The engineer, at his discretion may decide to perform some of the test on aggregate or concrete at his own laboratory or any other agency he may consider necessary. In all such cases, the

contractor shall provide and deliver for tests for such materials or concrete cubes duly cured, free of charge at the premises as may be specified by the Engineer. Any further cost incurred for such tests, shall be recovered from the contractor's bills.

(v) The contractor shall set up a field laboratory as per the details given in this tender document.

(vi) Calibration of compression testing machine should be done at specified intervals (Not more than 6 months) as per the direction of the Engineer-in-charge in approved laboratory/IIT/any University.

(vii) Contractor should quote the rate considering the cost of above equipment and cost of calibration charges. The rate for the above testing and equipments has been already included in the respective items of works, for which separate payment will not be made.

(viii) Immediately after receipt of formal acceptance letter, the Tenderer/Contractor has to arrange the sample in bags of specified quantity of fine, coarse aggregate and cement for testing and mix-design .(Details such as name of quarry from which coarse aggregate and fine aggregate procured, cement brand name etc, should be furnished to railway).

4. **Workability of Concrete**

4.1. The concrete mix proportions chosen should be such that the concrete is of adequate workability for the placing conditions of the site/structure and can be properly compacted with the means available.

4.2. Suggested ranges of workability of concrete for some placing conditions are given in Clause 5.3.1 of IRS Code of Practice for Plain, Reinforced & Pre-stressed Concrete for general bridge construction.

5. **Durability**

5.1. The durability of concrete depends on its resistance to deterioration and the environment in which it is placed. The resistance of concrete to weathering, chemical attack, abrasion, frost and fire depends largely upon its quality and constituents materials. Susceptibility to corrosion of the steel is governed by the cover provided and the permeability of concrete. The cube crushing strength alone is not a reliable guide to the quality and durability of concrete. It must also have adequate cement content and a low water-cement ratio. The general environment to which the concrete will be exposed during its working life is classified and will be governed by Indian Railway Code of Practice for Plain Reinforced and Pre-stressed concrete for General Bridge construction.

5.2. **Permeability:-**

5.2.1. One of the main characteristics influencing the durability of any concrete is its permeability. Therefore, tests for permeability shall be carried out for concrete bridges as recommended in clause 5.2.2 mentioned below with strong dense aggregates, a suitability low permeability is achieved by having a sufficiently low water cement ratio, by ensuring as through compaction of the concrete as possible and by ensuring sufficient hydration of cement through proper curing methods. Therefore, for given aggregates, the cement content should be sufficient to provide adequate workability with a low water-cement ratio so that concrete can be completely compacted by vibration. The depth of penetration of moisture shall not exceed 25 mm.

5.2.2. Permeability test:

i. Permeability test shall be mandatory for all RCC/PSC bridges under severe, very severe and extreme environment.

ii. Under mild and moderate environment, permeability test is desirable to the extent possible.

iii. Permeability test is required for RCC/PSC structural element only.

iv. All tests required for permeability of concrete to be done from outside in any approved laboratory with contractor's cost.

5.2.3. Maximum Water-Cement Ratio: The limits for maximum water cement ratio for design mix shall be based on environmental conditions as defined in Clause-5.1 or clause-5.4.1 of IRS Code for Plain, Reinforced & Pre-stressed Concrete for General Bridge Construction (Concrete Bridge Code-Reprint'2014).

The limits for maximum water-cement ratio for different environments shall be governed by the Indian railway Code of Practice for Plain, Reinforced and Pre-stressed Concrete for General bridge construction.

5.2.4. Cementitious material content: Depending upon the environment to which the structure is likely to be exposed during its service life, minimum cementitious material content and Maximum cementitious material content in concrete shall be governed by the Indian railway Code of Practice for Plain, Reinforced and Pre-stressed Concrete for General bridge construction -1997.

5.2.5. Total chloride contents: The total chloride content by weight of cement shall not exceed the following values:

(a) For pre-stressed concrete works: -

i) Under extreme environment 0.06%

ii) Under severe and moderate environment 0.10%

(b) For RCC works 0.15%

5.2.6. Coating for concrete (As per IRS Concrete Bridge Code):

In order to provide adequate resistance against corrosion of embedded material in RCC structures, concrete shall be provided with suitable coating depending upon the environmental conditions. The recommended coating is as under:

Aggressive Environment (Severe & Extreme)		Non aggressive environment (Moderate)
Super structure of bridges	Substructure of bridges (in affected part only)	All structures

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Epoxy – Phenolic IPN – coating CECRI Integrated four coat System	Coal tar epoxy coating	No coating is necessary.

In this area no coating is generally required, however in case of requirement of coating, the payment for the same will be made separately.

5.3. Concrete Mix Proportions.

5.3.1. Mix Proportion: The mix proportions shall be selected to ensure that the workability of the fresh concrete is suitable for the conditions of handling and placing, so that after compaction its surrounds all reinforcements and completely fills the formwork. When concrete gets hardened, it shall have the required strength, durability and surface finish.

5.3.2. The determination of the proportions of cement, aggregates and water to attain the required strengths shall be made as follows: -

5.3.3. By designing the concrete mix; such concrete shall be called 'Design mix concrete'; or

5.3.4. By adopting nominal concrete mix; such concrete shall be called 'Nominal mix concrete'

5.3.5. Design mix concrete is preferred to nominal mix. Nominal mixes when used are likely to involve higher cement content. Concrete of grades richer than M-20 shall only be designed as design mix concrete.

5.4. Design Mix Concrete:

5.4.1. The mix shall be designed to produce the grade or concrete having the required workability, durability and a characteristic strength. The procedure given in IS:10262-2019 may be followed for mix design.

5.4.2. Nominal Mix Concrete: Nominal Mix Concrete may be used for concrete of grade M 20 or lower. The proportions of materials for nominal mix concrete shall be in accordance with Concrete Bridge Code.

5.5. Mix Design

5.5.1. Concrete mix shall be designed on the basis of preliminary tests. The proportions for ingredients chosen shall be such that concrete has adequate workability for conditions prevailing on the work in question and can be properly compacted with the means available.

5.5.2. The mixing plant and the methods of transporting and depositing the concrete to be employed in the work shall be used to simulate working conditions with the trial mixes.

5.5.3. All these preliminary tests, approval etc. shall be got done in advance by the contractor before any concreting is contemplated. Failure on the part of the Contractor to do so and the

consequent delay in the completion of the works will not entitle him for any compensation whatsoever, either financially, or by way of extension of time.

5.6. Design Mix proposals:

5.6.1. Based upon the successful preliminary crushing and workability tests, the Contractor shall submit design mix proposals to the engineer, who will have the right to reject any trial mix not deemed satisfactory. Selection of the trial mix to the complete satisfaction of the Engineer shall be the ultimate responsibility of the contractor.

5.6.2. Except where it can be shown to the satisfaction of the Engineer that supply of properly graded aggregate of uniform quality can be maintained till the completion of work, grading of aggregate should be controlled by obtaining the coarse aggregate in different sizes and blending them in the right proportions as required. Different sizes, however, shall be stocked in separate stock well. Required quantity of materials shall be stocked preferably a day before use. Grading of coarse and fine aggregate shall be checked as frequently as possible, frequency for a given job being determined by the engineer to ensure that the suppliers are maintaining uniform grading as approved for samples used in the preliminary tests.

5.6.3. In proportioning concrete, the quantity of both cement and aggregate shall be determined by weight. Where the weight of cement is determined by accepting the maker's weight per bag, a reasonable number of bags shall be weighed separately to check the net weight. Where cement is weighed from bulk stocks at site and not by bags, it shall be weighed separately from the aggregates. Water shall either be measured by volume in calibrated tanks or weighed. All measuring equipment shall be maintained in a clean and serviceable condition. Their accuracy shall be periodically checked.

5.6.4. It is most important to keep the specified water cement ratio constant and at its correct value. To this end, moisture content in both fine and coarse aggregates shall be determined as frequently as possible, frequency for a given job being determined by the Engineer according to the weather conditions. The amount of mixing water shall then be adjusted to compensate for variations in the moisture content for the aggregates and IS:2386 (Part III) shall be referred to. Suitable adjustments shall also be made in the weights of aggregates to allow for the variation in weight of aggregates due to variation in their moisture content.

5.7. Mixing concrete

5.7.1. Batching and mixing of the concrete shall be done with weigh batching system as per the design mix.

5.8. Proportioning of materials

5.8.1. In case weekly quantity of concrete to be done is more than 200 CUM or daily concreting is more than 40 CUM, or bulk structures are to be cast, proportioning of materials shall be done on the batching plant by weight, each type of material being weighed separately. Water shall be

measured by volume. High capacity mixer like RM-800 or equivalent is to be used as batching plants.

5.8.2. The capacity of batching and mixing plant shall be at least 25 percent higher than the capacity for transportation and laying of concrete.

5.8.3. All drums that have been out of use for more than 30 minutes shall be thoroughly cleaned before any fresh concrete is mixed in them.

5.9. Transporting, placing and compaction of concrete.

5.9.1. Tremie shall be used in concreting of piles, high piers/ abutments will have combination of chutes and hoists for transportation of concrete. If there is specific schedule item, specifying use of concrete pump, then the same shall be deployed for transportation of concrete.

5.9.2. The Engineer shall approve the method of transporting and placing concrete. Concrete shall be so transported and placed that no contamination, segregation or loss of its constituent materials takes place. All formwork cleaned and made free from standing water, dust, snow or ice immediately before placing of concrete.

5.9.3. No concrete shall be placed in any part of the structure until the approval of the Engineer has been obtained.

5.9.4. If concreting is not started within 24 hours of the approval being given, it shall have to be obtained again from the Engineer. Concreting then shall proceed continuously over the area between construction joints. Fresh concrete shall not be placed against concrete that has been in position for more than 30 minutes unless a proper construction joints is formed.

5.10. Concreting under Water

5.10.1. When it is necessary to deposit concrete under water, the methods, equipment, materials and proportions of the mix to be used shall be got approved from the Engineer before any work is started

5.10.2. Concrete shall not be placed in water having temperature below 5°C. The temperature of the concrete, when deposited, shall be not less than 16°C & not more than 40°C.

5.10.3. The material shall be so proportioned as to produce a concrete having a slump of not less than 150 mm, and not more than 180 mm. The slump shall be tested as per IS: 516.

5.10.4. Cofferdams or forms shall be sufficiently tight to ensure still water conditions, if practicable, and in any case to reduce the flow of water to less than 3 meters per minute through the space into which concrete is to be deposited. Cofferdams or forms in still water shall be sufficiently tight to prevent loss of mortar through the joints in the walls. Pumping shall not be done while concrete is being placed, or until 24 hours thereafter.

5.10.5. All under water concreting should be carried out by tremie method only, with tremie of appropriate diameter. The number and spacing of the tremie should be worked out to ensure proper concreting. The tremie concreting when started should be continued without

interruption for the full height of the member being concreted. The concrete production and placement equipment should be sufficient to enable the underwater concrete to be completed uninterrupted within the stipulated time. Necessary stand-by equipment should be available for emergency situation.

5.10.6. The top section of the tremie shall be a hopper large enough to hold one full batch of the mix or the entire contents of the transporting bucket if any. The tremie pipe shall not be less than 200 mm in diameter, and shall be large enough to allow a free flow of concrete and strong enough to withstand the external pressure of the water in which it is suspended, even if a partial vacuum develops inside the pipe. Preferably, flanged steel pipe of adequate strength for the job shall be used. A separate lifting device shall be provided for each tremie pipe with its hopper at the upper end. Unless the lower end of the pipe is equipped with an approved automatic check valve, the upper end of the pipe shall be plugged with a wadding of gunny sacking or other approved material before delivering the concrete to the tremie pipe through the hopper, so that when the concrete is forced down from the hopper to the pipe it will force the plug (and along with it any water in the pipe) down the pipe and out of the bottom end, thus establishing a continuous stream of concrete. It will be necessary to raise slowly the tremie in order to allow in uniform flow of concrete, but it shall not be emptied so that water enters above the concrete in the pipe. At all times after the placing of concrete is started and until all the required quantity has been placed, the lower end of the tremie pipe shall be kept below the surface of the plastic concrete. This will cause the concrete to build up from below instead of flowing out over the surface, and thus avoid formation of layers of laitance. If the charge in the tremie is lost while depositing, the tremie shall be raised above the concrete surface, and unless sealed by a check valve it shall be replugged at the top end, as at the beginning, before refilling for depositing further concrete

5.10.7. To minimize the formation of laitance, great care shall be exercised not to disturb the concrete as far as possible while it is being deposited.

5.11. Protection and Water curing

5.11.1. Curing is the process for preventing the loss of moisture from the concrete. The prevention of moisture loss from the concrete is particularly important if the water-cement ratio is low.

5.11.2. Curing and protection shall start immediately after the compaction of the concrete to protect it from

5.11.3. Premature drying out, particularly by solar radiation and wind.

5.11.4. High internal thermal gradients.

5.11.5. Leaching out by rain and flowing water.

5.11.6. Rapid cooling during the first few days after placing.

5.11.7. Low temperature or frost.

5.11.8. Vibration and impact, which may disrupt the concrete and interfere with its bond to the reinforcement.

5.11.9. Where members are of considerable size and length, with high cement content, accelerated curing methods are to be applied, as approved in detail by the Engineer.

5.11.10. Exposed surfaces of concrete shall be kept continuously in a damp or wet condition by ponding or by covering with a layer of sacks, canvas, hessian, or similar materials and shall be kept constantly wet for a period of not less than fourteen days from the date of placing of concrete.

5.11.11. Special attention should be paid to curing of concrete in order to ensure maximum durability and to minimize cracking.

5.11.12. Seawater shall not be used for curing. Seawater shall not come into contact with concrete members unless it has attained the desired strength.

5.11.13. Masonry work over the foundation concrete may be started after 48 hours of its' laying but the curing of concrete shall be continued for a minimum period of 14 days.

5.11.14. Wherever possible, use of water sprinklers or perforated pipes should be encouraged for curing of concrete. Such arrangements must be maintained for a minimum period of 14 days after concreting.

5.11.15. Approved concrete curing compounds should be preferred where water curing cannot be done reliably.

5.12 Working in Extreme Weather

5.12.1. Where concrete is to be deposited at or near freezing temperatures, precautions shall be taken to ensure that at the time of placing it has a temperature of not less than 5° C and that the temperature of the concrete shall be maintained above 4° C until it has thoroughly hardened. When necessary, concrete ingredients shall be heated before mixing. Cement shall however not be heated other than by the heat transmitted to it from other ingredients of the concrete. In general, heating the mixing water along to about 66° C may suffice for this purpose. Dependence shall not be placed on salt or other chemicals for the prevention of freezing. Calcium chloride up to one and a half per cent by weight of the cement can be used to accelerate the rate of hardening provided it does not accelerate corrosion. Use of calcium chloride in excess of this percentage is considered harmful. No frozen material or materials containing ice shall be used. All concrete damaged by frost shall be removed. It is recommended that concrete exposed to freezing weather shall have entrained air and the water content of the mix shall not exceed 30 liters per 50 Kg of cement.

5.12.2. When depositing concrete in very hot weather, precautions shall be taken so that the temperature of wet concrete does not exceed 40° C while placing. This shall be achieved by stacking aggregate under the shade and keeping them moist, using cold water, reducing the time between mixing and placing to the minimum, cooling formwork by sprinkling water, starting curing before concrete dries out and restricting concreting, as far as possible, to mornings and evenings.

6. Storage, testing and acceptance of Materials

General

6.1. All materials may be stored in proper places so as to prevent their deterioration or intrusion by foreign matter and to ensure their satisfactory quaiity and fitness for the work. The storage space must also permit easy inspection, removal and storage of the materials. All such materials even though stored in approved godowns/places, must be subjected to acceptance test prior to their immediate use.

7. **Cement**

7.1. Cement shall be transported, handled and stored on the site in such a manner as to avoid deterioration or contamination. Cement shall be stored above the ground level in perfectly dry and watertight sheds and shall be stacked not more than eight bags high. Wherever bulk storage containers are used their capacity should be sufficient to cater to the requirement at site and should be cleaned at least once every 3 to 4 months.

7.2. Each consignment shall be stored separately so that it may be readily identified and inspected and cement shall be used in the sequence in which it is delivered at site. Any consignment or part of a consignment of cement that has deteriorated in any way, during storage, shall not be used in the works and shall be removed from the site by the contractor without any extra cost to Railways.

8. **Bending of Reinforcement**

8.1. Reinforcing steel shall conform accurately to the dimensions given in the Bar Bending Schedules shown on relevant drawings.

8.2. Bars shall be bent cold to the specified shape and dimensions or as directed the Engineer using a proper bar bender, operated by hand or power to attain proper radii of bends.

8.3. Bars shall not be bent or strengthened in a manner that will injure the material.

8.4. Bars bent during transport or handling shall be straightened before being used on work, they shall not be heated to facilitate bending.

8.5. Unless otherwise specified the type of hook to be provided at the end of each bar shall be indicated in the bar bending schedule. The hook shall be suitably encased to prevent any splitting of concrete.

9. **Placing of reinforcement**

General

9.1. All reinforcement shall be free from rust, loose mill scale or coats of oil, paints etc. and chloride contamination, which may destroy bond. This may be ensured either by using reinforcement fresh from the factories or thoroughly cleaning all reinforcement to remove all the rust using any effective method such as sand blasting.

9.2. The reinforcement cage should generally be fabricated in the yard at ground level and then shifted and placed in position. The reinforcement shall be provided strictly in accordance with the drawings and shall be assembled in position only when the structure is otherwise ready for placing of concrete. Prolonged time gap between the assembling of reinforcements and placing of concrete that may result in rust formation of the surface shall not be permitted.

9.3. Reinforcement bars shall be placed accurately in position as shown in the drawings. The bars, crossing one another shall be tied together at every intersection with galvanized wire of not less than 1 mm in dia and conforming to IS: 280 to make the skeleton of the steel work rigid so that the reinforcement does not get displaced during the deposition of concrete, or any other operation of the work.

9.4. The bars shall be kept in position by the following paragraphs maintaining cover.

9.5. Cover blocks of specified thickness should be cast in advance with same design mix of structure for ensuring specified cover to all RCC and PSC works for which separate payment will not be made as the rate of all RCC and PSC works are inclusive of this element.

9.6. In case of dowels for columns and walls, the vertical reinforcement shall be kept in position by means of timer templates with slots accurately cut in them; or with cover blocks tied to the reinforcement. Timber templates shall be removed after the concrete has progressed up to a level just below them

9.7. Spacer bars shall separate layers or reinforcements at approximately 1000 mm intervals. The minimum diameter of spacer bars shall be 12 mm or equal to maximum size of main reinforcement or maximum size of coarse aggregate whichever is greater.

9.8. Necessary stays, blocks, metal chairs spacers, metal hangers, supporting wires etc., or other subsidiary reinforcement shall be provided to fix the reinforcements firmly in its correct position.

10. Precautions:

10.1. Main reinforcement shall not be allowed to sag between supports.

10.2. Reinforcements projecting from surface of newly placed concrete shall be supported in such a way that there is no sag or kink or damage to the newly placed concrete. In severe environment, such projecting reinforcements that are likely to remain exposed for a long time shall be protected by cement grout/anti-corrosive treatment. In case of cement grout the same shall be thoroughly cleaned and wire brushed before depositing fresh concrete.

11. Admixtures

11.1. Use of admixtures and super-plasticizers for concrete shall be done in conformity of mix design to improve workability, quality and reliability.

11.2. The plasticizer/retarder/admixture shall conform to IS:6925 & IS:9103. They should be chloride free and low in sulphate content. The contractor at his cost shall test each lot of

admixture. The use of admixture shall be made as per the manufacturer's guidelines. Prior approval of engineer is necessary for its uses.

12. Formwork:

12.1. **Description**: Formwork shall include all temporary or permanent forms required for forming the concrete in the shape, dimension and surface finish as shown on the drawing or as directed by the Engineer, together with all props, staging, centering, scaffolding and temporary construction required for their support.

12.2 **Materials**: For major bridges only steel shuttering is to be used, for building works and minor bridges 12mm thick marine ply wood or equivalent type shuttering can also be allowed. All materials shall comply with the drawings/ instructions of the Engineer. Materials and components used for formwork shall be examined for damage or excessive deterioration before use and shall be used only if found suitable after necessary repairs. In case of marine ply wood formwork, the inspection shall not only cover physical damages but also signs of attack by decay, rot or insect attack or development of splits. In case of steel shuttering, the metal used for forms shall be of 3.15 to 4mm thickness that the forms remain true to shape. In case 2mm plates are used the same shall be stiffened by flats of 50mm x 6mm and angles of 50mm x 50mm x 6mm. All bolts should be countersunk. The use of approved internal steel ties or steel or plastic spacers shall be permitted. **Structural steel tubes used as supports for forms shall have a minimum wall thickness of 2mm.**

12.3 Workmanship:

(i) The formwork shall be robust and strong and the joints shall be leak proof.

(ii) **Bally should not be used either as staging or as support for fixing of formworks. Only tubular shafts of adequate diameter with proper coupling system should be used for fixing of formworks as well as for staging. Staging must have cross bracing and diagonal bracing in both directions.**

(iii) If proprietary system of formwork is used, detailed information shall be furnished to the Engineer for approval.

(iv) The contractor shall be entirely responsible for the adequacy and safety for formwork notwithstanding any approval or review by the Engineer of his drawing and design.

(v) **The number of joints in the formwork shall be kept to a minimum by using large size panels. The design shall provide for proper 'soldiers' to facilitate alignment. All joints shall be leak proof and must be properly sealed. Use of PVC JOINT sealing tapes, foam rubber or PVC T- section is essential to prevent leakage of grout.**

(vi) As far as practicable, clamps shall be used to hold the forms together. Where use of nails is unavoidable, minimum number of nails shall be used and these shall be left projecting so that they can be withdrawn easily. Use of double headed nails shall be preferred.

(vii) Unless otherwise specified, or directed, chamfers or fillets of sizes 25mm x 25mm shall be provided at all angles of the formwork to avoid sharp corners. The chamfers, bevelled edges

and moulding shall be made in the formwork itself. Opening for fixtures and other fittings shall be provided in the shuttering as directed by the Engineer.

(viii) If centering trusses or launching trusses or floating cranes are adopted for erection of superstructure, the joints of the erection system, whether welded, riveted or bolted, should be thoroughly checked periodically. Also, various members of the erection system should be periodically examined for proper alignment and unintended deformation before proceeding with the concreting. They shall also be periodically checked for any deterioration in quality due to steel corrosion.

(ix) For distribution of load and load transfer to the ground through staging, an appropriately designed base plate must be provided which shall rest on firm sub-stratum. Water used for curing should not be allowed to stagnate near the base plates supporting the staging and should be properly drained

(x) The formwork shall be made so as to produce a finished concrete true to shape, line levels, plumb and dimensions as shown on the drawing, subject to the following tolerance, unless otherwise specified in these documents or drawings or as directed by the Engineer

a)	Sectional dimension	± 5mm or 2% of dimension whichever is less
b)	Plumb	± 1 in 1000 of height
c)	Levels	± 3 mm before any deflection has taken place.

(xi) Tolerance given above are specified for local aberration in the finished concrete surface and structure taken as a whole or for the setting and alignment of formwork which should be as accurate as possible to the entire satisfaction of the Engineer

(xii) Where metal forms are used, all bolts and rivets shall be countersunk and well ground to provide a smooth, plane surface.

(xiii) Forms shall be made sufficiently rigid by the use of ties and bracings to prevent any displacement or sagging between supports. They shall be strong enough to withstand all pressure, ramming and vibration during and after placing the concrete. Skew jacks or hard wood wedges, where required, shall be provided to make up any settlement in the formwork either before or during the placing of concrete.

(xiv) The formwork shall be coated with an approved release agent that will efficiently prevent sticking and will not stain the concrete surface. Lubricating (machine oils) shall be prohibited for use as coating.

12.4 Form surface & finish:

(i) 20mm x 5mm wide rubber flats should be placed between the shutters for proper joining to arrest leakage of cement slurry during concreting and compaction. Before laying the concrete all the gaps of shutters are to be packed with jute/ cotton waste and should be applied with grease and cement slurry to arrest leakage of cement-water through joints and other holes.

Synthetic adhesive packing tape should be used for covering the joints in ply wood / iron shuttering for slabs after packing the joint with jute. Cost for the above should be included while quoting the rate by Contractor.

(ii) The Contractor shall submit shuttering drawings and details of pattern and the method of forming joints in the exposed (form-finish) concrete to the Engineer for his approval and all changes and modification by the former and final approval thereof obtained, from the Engineer.

(iii) The repetitive usage's of the same formwork to cast form finished exposed concrete shall be as decided by the Engineer and in no case the formwork not guaranteed to produce the required form finish to the satisfaction of the Engineer shall be used.

12.5 Precautions:

i. Provision shall be made for safe access to and about the formwork at the levels as required.

ii. Close watch shall be maintained to check for settlement of formwork during concreting. Any settlement of formwork during concreting shall be promptly rectified.

iii. Water used for curing should not be allowed to stagnate near the base plates supporting the staging and should be properly drained.

12.6 Preparation of formwork before concreting:

The inside surfaces of forms shall, except in the case of permanent form work or where otherwise agreed to by the Engineer, be coated with a release agent supplied by approved manufacturer or of an approved material to prevent adhesion of concrete to the formwork. The release agent shall be applied strictly in accordance with the manufacturer's instructions and shall not be allowed to come into contact with any reinforcement or pre-stressing tendons and anchorages. Different release agents shall not be used in formwork of exposed concrete.

Before reuse of forms, the following action shall be taken:

(a) The contact surface of the forms shall be cleaned carefully and dried before applying a release agent.

(b) It should be ensured that the release agent is appropriate to the surface to be coated. The same type and make of release agent shall be used throughout on similar formwork materials and different types should not be mixed.

(c) The form surface shall be evenly and thinly coated with release agent. The vertical surface shall be treated before the horizontal surface and any excess wiped out.

(d) The release agent shall not come in contact with reinforcement or the hardened concrete.

12.7 Removal of formwork:

(i) The scheme for removal of formwork (i.e., de-shuttering and De-centering), shall be planned in advance and furnished to the Engineer for scrutiny and approval. No formwork or any part thereof shall be removed without prior approval of the Engineer.

The formwork shall be so removed as not to cause any damage to the concrete. Centering shall be gradually and uniformly lowered in such a manner as to permit the concrete to take stresses due to its own weight uniformly and gradually to avoid any shock or vibration.

Where there are re-entrant angles in the concrete sections, the formwork shall be removed at these sections as soon as possible after the concrete has set, in order to avoid cracking due to shrinkage of concrete.

(ii) The following guidelines for OPC may be followed to determine the time of removal of formwork:

a)	Walls, piers and abutment columns and vertical faces of structural members	48 hrs
b)	Soffits of slabs	14 days
c)	Soffits of beams	21 days

For other than OPC, the removal of formwork shall be done as per direction of Engineer in charge

12.8 **Finishing:**

(i) Immediately after removal of forms, exposed bars or bolts, if any, shall be cut inside the concrete member to a depth of at least 50mm below the surface of the concrete and the resulting holes filled with cement mortar of dry pack consistency.

All construction and expansion joints in the complete work shall be left carefully tooled and free from any mortar and concrete. Expansion joint filler shall be left exposed for its full length with clean and true edges.

The finished surface of concrete after removal of formwork should be such that no touching up is required. All fines caused by form joints, if any, shall be ground using electric surface grinder.

Immediately on removal of form. the concrete work shall be examined by the Engineer before any defects are made good.

(a) The work that has sagged or contains honey combing to an extant detrimental to structural safety or of architectural appearance shall be rejected.

(b) Surface defect of a minor nature may be accepted. On acceptance of such work by the engineer, the same shall be rectified as directed by the Engineer.

12.9. All construction and expansion joints in the completed work shall be left carefully tooled and free from any mortar and concrete. Expansion joint filler shall be left exposed for its full length with clean and true edges.

13. Temporary Structures

13.1. Before start of work contractor should submit a detailed layout plan of Camp/Structure being created to facilitate completion of work to Engineer. The plan should be elaborate and along with design. This should include camp, casting yard, batching plant, temporary sheds and temporary bridges etc.

14. Setting out of Bridge

14.1. Set out for the bridge would be given by the contractor based upon reference points that would be established by them. Detailed Scheme of set out, establishment of reference points etc would however be submitted to Engineer for their approval.

14.2. Permanent pillars would be established which should facilitate easy checking of alignment/centre point/Level at each stage of work.

14.3. Maintaining correct line and level of all the Bridge would be responsibility of contractor not withstanding alignment/centre line/level is checked by Engineer at regular intervals.

14.4. Contractor should make available all necessary facilities namely instruments, labour etc to Engineer/his representative to enable them check of alignment/Center point/Level at every stage.

15. The necessary field registers will be supplied by the contractor free of cost which shall be maintained for this work by Railway. Contractor/authorized representative has to sign with his remarks if any in each register as a token of acceptance of details/instructions entered by Engineer or Railway representative (DY.CE/ XEN/ AXEN/SSE/ JE(Con)).

(a) **Site order book-** For recording the instructions issued to the contractor with replies on opposite side.

(b) **Daily progress, labour & machinery register** – For recording the daily progress of each work executed on every day, details of labour engaged (skilled/unskilled) and machinery mobilized on each and every day along with description of works and approximate quantity of work done and condition of weather.

(c) **Cement consumption register** – For recording the details of receipts, consumption towards the work, and balance of cement in store godown on every day for different works along with clear description of work and approximate quantity of work done for different mix proportions etc.

(d) **Reinforcement register** – For recording the reinforcement consumed in RCC/PSC and other works.

(e) **Quality control register** – For recording the details of field test conducted on concrete cubes, and aggregate etc., are to be recorded in the register. Field tests are (a) checking the

compressive strength of concrete cubes for 7 days & 28 days, (b) Sieve analysis for fine and coarse aggregate (c) silt content in sand, (d) determination of moisture content in sand for calculating the actual quantity of sand to be used in design mix at site, (e) slump test (f) compaction factor test, (g) concrete permeability test, (h) specific gravity tests and other tests if any.

(f) For PSC Girders:

(i) **Stressing Register**: For recording the elongation of strands and load etc.

(ii) **Load testing Register:** For recording the details of loads applied, and deflections noticed under particular load etc.

(g) In addition to the above, any new register (s) if required, the same will have to be maintained as per the direction of the Engineer-in-charge.

(h) The pages of each and every register should be machine numbered and top initialled on the first page of the register by the Engineer-in-charge /field officer. Entries in the each page should be signed jointly by authorized representative of Engineer in Charge of work and contractor/his authorized representative.

16. Ready Mixed Concrete

16.1. Ready mixed concrete may be used subject to prior review of the Engineer. It shall conform to the specifications of concrete as specified in IS:4926. BS-23 guidelines on use of ready mixed concrete should be followed.

16.2. The quality of admixtures like water reducing agent, retarders, super-plasticizers-cum retarders etc should meet the requirement of the material specification as given in IRUSS (Works and Materials-2010) Vol-I and Vol-II (with latest amendment) ant its suitability should be tested as per IS:9103 at the time of finalizing the mix design.

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Signature of Tenderer(s)/Contractor(s) 149 For Chief Engineer(Con)/I/BSP

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

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CHAPTER – XIV
SPECIAL CONDITION OF CONTRACT
FOR TRACK BALLAST

1. 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.

2. DETAILED SPECIFICATIONS:

2.1 GENERAL

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

2.1.2 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.

2.1.3 Mode of manufacture: Ballast for all BG main lines and running lines, except on 'E' routes but including 'E' special routes, shall be machine crushed. For other BG lines and MG/NG routes planned/sanctioned for conversion, the ballast shall preferably be machine crushed. Hand broken ballast can be used in exceptional cases with prior approval of Chief Track Engineer/CAO/C. Such approval shall be obtained prior to invitation of tenders.

On other MG and NG routes not planned/sanctioned for conversion, hand broken ballast can be used for which no approval shall be required.

2.2 PHYSICAL PROPERTIES

2.2.1 Ballast sample should satisfy the following physical properties in accordance with IS:2386 Pt.IV-1963 when tested as per the procedure enclosed below.

	BG,MG & NG (planned/ sanctioned conversion)	NG & MG (other than those planned for conversion)
Aggregate Abrasion value	30% Max.*	35% Max.
Aggregate Impact value	20% Max *	30% Max.

* In exceptional cases, on technical and/or economic grounds relaxable upto 35% and 25%respectively by CTE in open line and CAO/C for construction projects. The relaxation in Abrasion and Impact values shall be given prior to invitation of tender and should be incorporated in the Tender document.

2.2.2 The 'Water Absorption' tested as per IS 2386 Pt.III-1963 following the procedure enclosed below should not be more than 1%. This test however, *to be prescribed at the discretion of CE/CTE in open line and CAO/Con. For construction projects.*

2.3 SIZE AND GRADATION

2.3.1 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%-60%
c) Retained on 20mm Sq.mesh sieve	Not less than 98% for machine crushed Not less than 95% for hand broken

* For machine crushed ballast only.

2.3.2 Oversize ballast

i) Retention on 65mm square mesh sieve.

A maximum of 5% ballast retained on 65mm sieve shall be allowed without deduction in payment.

In case ballast retained on 65mm sieve exceeds 5% but does not exceed 10%, payment at 5% reduction in contracted rate shall be made for the full stack. Stacks having more than 10% retention of ballast on 65mm sieve shall be rejected.

ii) In case ballast retained on 40mm square mesh sieve (machine crushed case only) exceeds 60% limit prescribed in 2.3.1 (b) above, payment at the following reduced rates shall be made for the full stack in addition to the reduction worked out at i) above.

- 5% reduction in contracted rates if retention on 40mm square mesh sieve is between 60% (excluding) and 65% (including).
- 10% reduction in contracted rates if retention on 40mm square 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.

iv) In case of hand broken ballast supply, 40mm sieve analysis may not be carried out. The executive may however ensure that the ballast is well graded between 65mm and 20mm size.

2.3.3 Under Size Ballast: The 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% (for machine crushed) or 95% (for hand broken).

2.3.4 Method of Sieve Analysis (As per correction slip No.:-04)

2.3.4.1 Sieve Analysis of Ballast

The test sieves used for sieve analysis shall conform to the specifications given in **Annexure –SPL**.

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 though 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.

ANNEXURE-SPL

SPECIFICATION OF TEST SIEVES USED FOR SIEVE ANALYSIS OF BALLAST

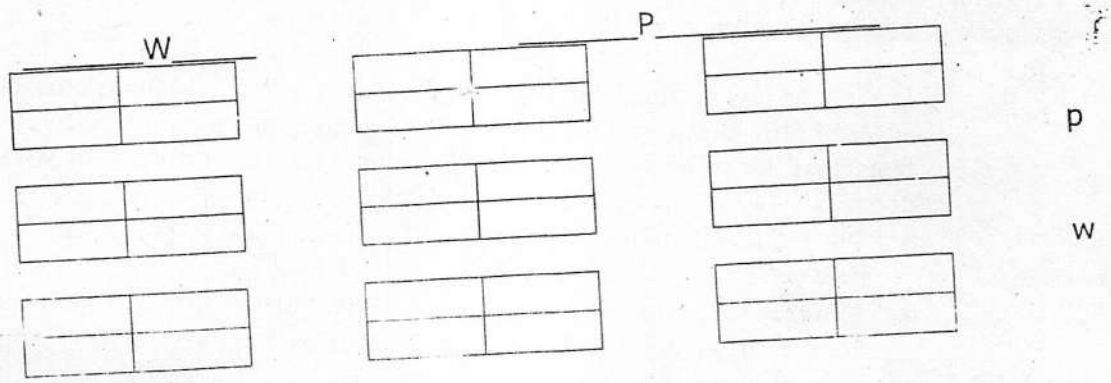
1. The test sieves shall be perforated plate sieve type with square holes/apertures, mounted on a frame. The test sieve are designated by the Nominal size of holes/apertures.

2. **MATERIAL OF PERFORATED PLATE** : the perforated plate for test sieve shall Be manufactured from brass sheet or steel sheet or stainless steel sheet or Galvanized 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:



5.0 SIEVE OPENING SIZE PITCH OF POENING 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
65 MM	65 MM	(±) 1.5 MM	80 MM	(+) 12.0 MM (-) 8.0 MM
40 MM	40 MM	(±) 1.5 MM	50 MM	(+) 7.5 MM (-) 5.0 MM
20 MM	20 MM	(±)1.0 MM	25 MM	(+) 4.0 MM (-) 2.5 MM

6.0 SIEVE FRAME: the frame of test sieves shall be manufactured from H...wood 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.

7.0 MARKING ON TEST SIEVE: A label shall be fixed to the frame of each sieve, legibly marked with following:

(i) Nominal Aperture size,
(ii) Material of perforated plate,
(iii) Maker's Name or trademark, and
(iv) Material of sieve frame,
(v) An Identification Number for the sieve.

3. CONDITIONS FOR SUBMISSION OF TENDER

3.1 The tenderer shall furnish an undertaking as incorporated in the tender document that the ballast supply at all times will conform to Specifications for Track Ballast as specified by the Railway.

4. METHOD OF MEASUREMENT

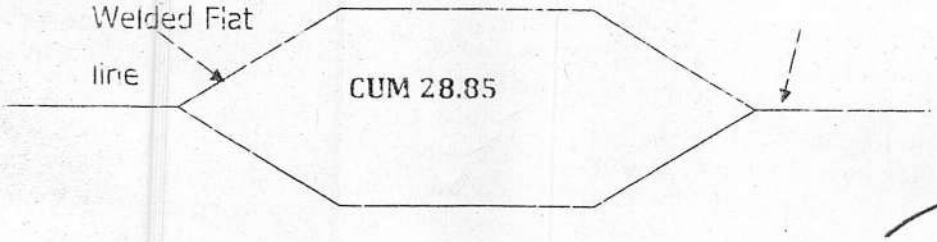
4.1 Stack Measurement

Stacking shall be done on a neat, plain and firm ground with good drainage. The height of stack shall not be less than 1m except in hilly areas where it may be 0.5m. The height shall not be more than 2.0m. Top width of stack shall not be less than 1.0m. Top of stack shall be kept parallel to the ground plane. The side slopes of stack should not be flatter than 1.5:1 (Horizontal: Vertical). Cubical content of each stack shall normally be not less than 30 cum in plain areas and 15 cum in hilly areas.

4.2 Wagon Measurement

4.2.1 In case of ballast supply taken by direct loading into wagons, a continuous white line should be painted inside the wagon to indicate the level to which the ballast should be loaded. The cubical content in cubic meter corresponding to white line should also be painted on both sides outside the wagon.

4.2.2 In addition to painted line, mentioned in para 4.2.1. short pieces of flats (cut pieces of tie bars or otherwise) with cubical contents punched shall be welded at the centre of all the four sides as permanent reference. In case the supply is taken in general service wagon, actual measurements will be taken.



4.3 Shrinkage Allowance

Payment shall be made for the gross measurements either in stacks or in wagons without any deduction for shrinkage/voids. However, when ballast supply is made in wagons, shrinkage upto 8% shall be permitted at destination while verifying the booked quantities by the consignee.

5. SAMPLING AND TESTING

5.1 General

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

5.1.2 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 , loaded , transported , 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.

5.1.3 The samples from a stack taken after lapse of a long period of stacking are not 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.

5.2 Sampling Frequency

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

5.2.1 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.

5.2.2 Subsequent test shall be carried out as follow:

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 100 cum or part thereof for quantity to be loaded in wagons
(b) Abrasion value, Impact value and 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 the prescribed specifications at any stage, further supplies shall be suspended till suitable corrective action is taken and supplies ensured as per specification. The above test may be carried out more frequently, at the discretion of Railway.

5.2.3 All tests for Abrasion value, Impact value and water Absorption should be got done through Railway's own laboratory at Bilaspur or at other laboratory as decided by Engineer-in-Charge. These tests, subsequent to award of contract, shall be done at Railway's cost. However, transportation of sample to the designated laboratory has to be done by the contractor at his own cost.

5.3 Supply of Ballast in stacks

5.3.1 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 equipments. The length and the width of each stack shall be kept in such a way that every part of the stack is accessible to the JCB of 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 sample from top after removing outer layer(150 200 mm) should be collected from stack for every 100 cum or part thereof , by JCB of ether 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 bucket of any 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 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 5.3.1 (vi), for carrying out size & Gradation tests.

(vi) Method of 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 flatten 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 center of the cone. The bulk of the 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 "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 in a flat surface for mixing, drawing and sieve analysis of samples.

5.3.2 In case of stacks of volume more than 100 cum, more than one "Test Samples" will be tested for Size and gradation. In such cases, the sieve analysis results of all the "Test Samples" shall individually conform to following gradation, 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 not be more than 10%.

The full payment/reduced payment for the whole stack, as given in Para 2.3 of the "Specification for Track Ballast (IRS-GE-1, June-2016), shall be decided based on the average of the sieve analysis results of all the "Test Samples" for a stack.

5.4 Supply of ballast in Heaps for loading directly in Wagons

5.4.1 Sampling Procedure

Samples of ballast shall be collected from heaps of ballast proposed to be loaded into the 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 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 the rake.

5.4.2 Based on the approx. quantity to be loaded in the rake, methodology for sampling of ballast to be followed shall be the same as in para- 5.3.1 and 5.3.2 above.

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SOUTH EAST CENTRAL RAILWAY

T.NO.CEC/BSP/22-23/19

Aggregate Abrasion Value
(Based on IS:2386 Part IV-1963)

1. Apparatus

1.1 The abrasion test for track ballast shall be carried out using Los-Angeles Machine.

1.2 The abrasive charge shall consist 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. Test Sample

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

- Passing 50mm and retained on 40mm square mesh sieve — 5,000 gm@
- Passing 40mm and retained on 25mm square mesh sieve — 5,000 gm@

@ tolerance of ±2% permitted.

2.2 The sample shall be dried in oven at 100 – 110 °C to a constant weight and weighed (Weight 'A').

3. Test Procedure

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

4. 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:

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

Signature of Tenderer(s)/Contractor(s)
RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

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Aggregate impact value
(Based on IS:2386 Part IV-1963)

1. Apparatus

The apparatus shall consist of the following

a) Impact testing machine conforming to IS:2386 part IV-1963 as per fig.2.
b) IS Sieve of sizes 12.5mm, 10mm and 2.36mm.
c) A cylindrical metal measure of 75mm dia & 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°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 and 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 380mm 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 2.36mm 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.

Aggregate Impact Value = (B/A) X 100

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.

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 75x45 cm size 2 nos.
d) Shallow Tray of minimum 650 square cm area.
e) Air tight container of capacity similar to basket.

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Signature of Tenderer(s)/Contractor(s) 157 For Chief Engineer(Con)/I/BSP

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

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Draft Agt

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°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 ± ½ hours afterwards.

3.3 The basket and 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 100 - 110°C for 24 hours. It shall then be removed from oven, cooled and weighed (weight 'B').

4. Analysis and Reporting of the Result

Water Absorption = {(A-B)/ B}x100

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

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SOUTH EAST CENTRAL RAILWAY T.NO.CEC/BSP/22-23/19

UNDERTAKING

I hereby give an undertaking that ballast supply at all times shall conform to specifications for track ballast as specified by Railway

Signature of tenderer(s)
Address.

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
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S.E.C. Railway, Bilaspur

Signature of Tenderer(s)/Contractor(s) 159 For Chief Engineer(Con)/I/BSP

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

Draft Agt

CHAPTER- XV

SPECIAL CONDITIONS OF CONTRACT

(SPECIFICATION FOR LINKING OF TRACK)

1.1. **Unless otherwise specified, the provisions contained in the Indian Railways Permanent Way Manual (IRPWM), LWR manual and other Codes, Manual & guidelines issued with latest correction upto date by Railway Board is applicable in this contract.**

1.2. Unless otherwise specified, the rates shall be for the finished work and shall be inclusive of all materials, labour, tools, machinery & plants, taxes, water & electricity charges, supervision & overhead charges, crossing of existing tracks and temporary and enabling arrangements required to be made for completing the work.

1.3. Materials will be issued contractor or his nominated representative on voucher. The materials thus issued, are to be accounted for by the contractor and he shall be held responsible for any shortage or breakage till the track is taken over by the Inspector

2.0 DISMANTLING OF TRACK

2.1. The joint inventory of the existing material in track to be dismantled shall be taken prior to commencement of the dismantling of track by the authorized representative of Engineer–in-Charge and contractor and handed over to the contractor before dismantling for accountal of P.Way material involved. The released materials shall be transported to nominated P.Way store depot as directed by Engineer-in-Charge at site and shall be handed over to Nominated store depot in properly stacked manner.

2.2. It shall be the responsibility of the contractor to safeguard the released materials till they are finally handed over to the Railway's representative. The cost of any damage or loss of the material while it is in the custody of the contractor shall be borne by him and will be recovered from the running bills of the contractor. The cost shall be decided by the Engineer–in-Charge as per the prevailing rules and same will be final and binding in the contractor.

2.3. While dismantling, the contractor shall take all the precautions in order to avoid any damage/development of unsafe conditions for adjacent running lines, communication system or any other Railway property. In case any damage occurs due to negligent working of the contractor, he shall have to bear the cost of such damage as assessed by Engineer –in-Charge.

2.4. The released material shall be stacked separately type wise and classification wise (serviceable/unserviceable) in countable manner at the locations indicated by the authorized representative of Engineer –in-Charge.

3.0 TRACK Linking

3.1 Concrete sleepers should be unloaded with great care. Use of rubber tyres and any other similar arrangements are to be used for preventing shock loading.

3.2 Grooves of the rubber pad should be placed along the length of the rail.

3.3 Driving of the ERC (after greasing with approved graphite grease to prevent rust & binding with inserts) should be in such a way that ends of central leg and the heel are

flush with the two edges insert.

3.4 Hammer of desired weight (1.9 to 2.0 Kg.) should be used for driving ERCs.

3.5 Before undertaking actual linking, line & level pegs should be fixed as indicated below:

i) Level pegs at the beginning, end and at every 10m internals for vertical curves & 30m on either side of bridge approach.

ii) Centre line pegs at every 30m intervals on straight and 10m interval on curve.

iii) Centre line pegs at the following locations should be concreted for future reference:-

a) The beginning & end of transitions.

b) Every 30m on curves.

c) Approaches of bridges & level crossing.

d) Every half Km. on straights.

3.6. The rail shall first be straightened for removal of kink with the help of Hydraulic Jim crow of adequate capacity.

3.7. The rails shall be connected by means of a pair of fish plates using in the first instance only 02 fish bolts and nuts one in each rail. Before fishing the rail ends, the fishing edges of the fish plates the rail ends and fish bolts shall be lubricated with grease, graphite and oil of approved quality & grade as directed by the Inspector at site of work. Correct expansion gaps as directed by the Inspector shall be ensured between ends of rails by inserting liners.

3.8. Paint marks shall be made on the rails with paint as directed by the Engineer to indicate the spacing of sleepers to be adopted on curves mark on the outer rails to ensure radial spacing while transferring it by "T" square on the other rail.

3.9. The linked track shall be aligned correctly to the line pegs. Hammering of the sleepers out of square should be avoided.

4.0 Ballasting and Initial Packing

4.1 Ballast should be first spread over the formation as per required thickness approved by Engineer in charge & rolled by using a road roller to ensure uniform & compact ballast cushion under the sleepers.

4.2 Full ballast sections and profile as prescribed for different types of track, i.e., SR/SWR/LWR is to be provided as per the provisions of IRPWM & LWR manual including the provisions regarding extra shoulder width on curves.

4.3. Initial packing should be of such standard so as to make track fit for 20 KMPH.

4. 4. The ballast should be spread over the linked track covering it completely to a uniform height and width as directed by the Engineer or his authorized representative.

4.5. Lift the track correctly as directed by the Engineer or his authorized representative.

4.6. Pack the ballast under the sleepers. In the case of the CST-9 sleepers the ballast shall be worked into the bowles on either side of the heep of the plate and packed in from outside until the bowls are full and hard packed and no more ballast can be packed in.

4.7 Correct the alignment of rails square the sleepers, adjust gauge as directed by the Inspector. Check cross levels and lift and repack wherever necessary.

5.0 FINAL ADJUSTMENT AND PACKING

5.1. "Pick-up" slacks after running of test trains which may consist of ballast trains rolling by Diesel/Electric Powers after each packing. The 1st/2nd/3rd packing is considered to be completed once the slacks picking up is completed and certified by the Engineer-in-charge, after each packing. The back packing work is normally required to be completed within 02 (two) months after linking of the track and initial packing thereof.

5.2. Test the track with loaded dip-lorry as directed by the Inspector and lift the track and pack wherever sags have formed.

5.3. Any sleepers which have shifted from correct spacing or gone out of square shall be moved back and squared after loosing the fastenings. The fastenings shall be tightened again after squaring. No hammering of sleepers to be done.

5.4. The track shall be slewed to correct aiignment 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.

5.5. Alignment on curves & transitions is to be checked and minor adjustment are to be made.

5.6. Alignment kinks and gauge kinks to be rectified to avoid permanent set.

5.7. Track is to be attended after rolling of the engine & departmental trains to avoid permanent set.

5.8. Lubrication of gauge track is to be done.

5.9. All steps of through packing given in IRPWM shall how to be followed.

6.0 SPECIFICATION FOR FINISHED WORK

6.1. **Ballast Section.**

The ballast section should be uniform in height, width and side slopes and brought to standard section as directed by the Inspector with the quantity of ballast made available No ballast shall be left on the cess side slopes of bank or near toe of bank.

6.2 The track geometry will be recorded in floating condition after running of train & the track parameters should be within the following tolerances:-

Sl. No.	Track parameters	Items	Laying standard
1.	Gauge	Sleeper to sleeper variation	2 mm.
2.	Expansion gap	Over average gap worked out by recording 20 successive gaps	± 2 mm.
3.	Joints	(i) Low joints not permitted. (ii) High joints not more than. (iii) Squareness of joints on straight	 ± 2 mm. ± 10 mm.
4.	Spacing of sleepers	With respect to theoretical spacing	± 20 mm.
5.	Cross level	To be recorded on every 4th sleeper	± 3 mm.

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6.	Alignment	(i) On straight on 10M Chord. (ii) On curves of Radius more than 600M (on 20M Chord). Variation over theoretical versines: (iii) On curves of Radius less than 600M (on 20M Chord). Variation over theoretical versines:	± 2 mm. 5 mm. 10 mm.
7.	Longitudinal level	Variation in longitudinal level with reference to approved longitudinal sections.	50mm.

7.0 HANDLING INSTRUCTIONS FOR 90- UTS AND HEAD HARDENED RAILS.

7.1. The 90 UTS head hardened and 110 UTS rails are comparatively brittle having less fracture toughness as compared to 72 UTS (MM) Rails. Therefore, such rails require special care in handling.

7.2. **Following procedure should be followed for handling the rails:**

- Keep rails horizontal and straight while lifting/moving
- Stack rails of same length on firm level base of well drained platform preferably of concrete.
- Stack subsequent layers on uniformly placed spacers in vertical alignment with base support.
- Keep rail ends in vertical alignment.
- Place rails of shorter length in upper layers.
- Protection of rail surface. Surface notches of even less than 0.75 mm in depth are liable to cause rail fracture in service.
- Flame cutting when found essential after preheating minimum of 10cm. of rail length on either side of the cut to about 250-350 degree Centigrade (by uniform movement of heating torch).
- Rails should be protected from contact with injurious substances.
- The overhang beyond the outer lifting point should not be greater than one half the distance between lifting points. Recommended locations of lifting points for various rail lengths are as under:-

Rails length Metres (m)	No. of Lifting points	Distance between two adjacent lifting points (m)	Max. rail end over hang (m)
12-13	2	6-6.5	3-3.25
26	4	6.5	3.25
39	6	6.5	3.25
130	20	6.5	3.25
260	40	6.5	3.25

Lifting beams fitted with slings of uniform length should be used to ensure that rails remain horizontal & straight.

Prevention of metallurgical damage. These rails are thermally very sensitive and are likely to develop metallurgical defects. If exposed to localized heating which produce very hard brittle and cracked metallurgical structures which may lead to sudden failures, therefore flame cutting is prohibited on these rails. If unavoidable, a minimum length of 100mm either side of cut should be pre heated to 250-300°C by uniform movement of heating torch before start of cutting operation.

*	While carrying out heating & welding operations on 90 UTS rails, it should be ensured that after heating 90 UTS rails above 700° C, rails are slowly cooled to 550 to 560° C.
7.3.	Barely visible straightness deviation of 0.75mm over 1.5metre span renders rail unacceptable and require careful handling and stacking.

Following activities should be avoided.

2 Heavy static loading
- Sudden Impact or dynamic loading
- Localized point or line contact loading in stacking
- Excessive end drop and flange over laps while lifting/moving
- Cross over stacking of rails of alternative layers at right angle as far as possible
- Heating flame cutting on or adjacent to rails.
- Contact with electric arcs and molten metals splashes i.e. from loose cables or adjacent welding operations.
- Contact with injurious substances which produce high corrosion of steel i.e. acids, alkalis, salts etc.

(1). Single point slinging.
* Excessive overlay while lifting/moving.
* Round link chain slings for security.
* Surface notches caused by impact abrasion.
* Heating, flame cutting on or adjacent to rails.
* Contact with injurious substances which broad use high cohesion of steel
* Standing under suspended loads.

8.0 USE OF SMALL MACHINES FOR LINKING OF TRACK

8.1. The contractor shall use following small track machines during execution of above work as per the requirement. In case the contractor fails to provide the following machines, penalty will be levied to the contractors at the following rates as mentioned below:

	Name of equipment/machineries	Penalty per machine per month or part thereof.
(i)	Abrasive Rail cutter (02 Nos.)	Rs.10,000/-
(ii)	Rail drilling machine (02 Nos.)	Rs.5,000/-
(iii)	Rail cutting machine (Saw type) (02 Nos.)	Rs.5,000/-
(iv)	Hydraulic Rail Bender (Jim Crow) Heavy duty (60 T) (02 Nos.)	Rs.3,500/-
(v)	Double Action Weld Trimmer (02 Nos.)	Rs.15,000/-
(vi)	Rail Profile Weld Grinder (02 Nos.)	Rs.5,000/-

(vii)	Rail Tensor (Mechanical) or Hydraulic (Non infringing type) (02 Nos.)- If advised by Engineer or his representative.	Rs.25,000/-
(viii)	Hydraulic Track Jack (02 Nos.)	Rs.2,500/-
(ix)	Attachment with Rail Dolley for transportation of concrete sleepers (BG) (06 Nos.)	Rs.500/-
(x)	2.5 tonne vibratory roller to roll the bottom layer of ballast before linking of track (01 Nos.)	Rs.50,000/-
(xi)	Off track tamping machine (02 Sets)	Rs.35,000/- per set
(xii)	Modified rail mounted dumper for ballasting.	Rs.20,000/-
(xiii)	Rollers as required for pulling of rails and distressing.	

8.2. The contractor shall bring all the required small track machines indicated above at the beginning of the work. The contractor should start the work only after satisfaction of Engineer-in-charge or his authorized representative that the equipments have been brought to site.

8.3. It will be the responsibility of contractor to maintain all the small track machines and keep them in working condition during execution of the work. Delay in procurement of spare parts due to any reason whatsoever may be, shall not be taken as an excuse for not using above small track machines.

9.0 SPREADING OF CESS BALLAST

9.1. The centerline, ballast toe lines shall be marked by the contractor with line as per the directives of Engineer –in-Charge or his authorized representative

9.2. The ballast shall be spread on formation centrally to the central line of the proposed track, in a width of 4720/4870/7800/7850mm etc. as the case may be. Initial spreading of the ballast shall be for a loose thickness of 175/200mm or upto the pre-determined marks on reference posts, so that after rolling at ieast 150mm thick ballast bed is available for P.Way linking.

9.3. Ballast shall spread uniformly ensuring that no muck from the ballast tracks comes to the track. While picking up the ballast from bottom layer of stacks, proper care shall be taken not to lift the ballast along with earth, dust etc. the same shall be carried out at contractors cost and for which no extra payment shall be made. While picking up the ballast from the stacks, no ballast shall be left to waste at the stacking ground and on the slopes of banks or in cuttings.

9.4. The balance quantity of the ballast shall be spread after P.Way linking in stages in order to achieve the required cushion and ballast profile.

9.5. The work of carrying and spreading the ballast from stacks shall include all lead, lift, decent crossing of tracks, roads and nullahs complete with contractor's own labour, tools and equipment, payment of taxes, incidental charges etc.

9.6. Once measured ballast stacks are handed over to the contractor, he shall be responsible for the safe custody of the same and putting in the track as directed by Engineer–in-Charge.

10.0. DESTRESSING OF LWR

10.1. Destressing of LWR /CWR shall be done as per the procedure prescribed in LWR Manual.

10.2. For making the closer rail to be put behind the SEJ abrasive rail cutting machine shall be used

10.3. The joints in LWR shall be welded immediately after distressing.

11.0. Track layouts in station yards and PPNI/PNI/NI working-

11.1. Station yards shall be constructed as per the final approved Engineering Scale Plans (ESP). The ESP are to be strictly adhered for the work and any modification shall be notified to the Authority Engineer/Engineer-in-charge for specific approval.

11.2. The marking of the bridges and LCs in the yards on the plan and profile sheets indicates only the locations. All bridges in the yards should have sufficient barrel length to cover all the lines of the yards, platforms, roads etc.

11.3. The Contractor shall ensure completion of all pre-requisite works, activities and deployment of required man-power, machineries, material and other resources as agreed in approved block planning / PPNI, PNI & NI programme / disconnection, at least one day in advance. Authority Engineer/Engineer-in-charge shall then demand block accordingly for the particular day. Contractor shall inform at least 48 hours in advance if he is not able to use the planned/ permitted block.

11.4 The planned scope of work within the agreed & allowed block/disconnection period shall be carried out completely without any block bursting. After completion of particular planned activity, the part/section of track shall be commissioned after thorough examination & testing as required by the Engineer.

11.5. Block disconnection and speed restriction shall be provided for machine working, material trains, insertion of RUB, Pre-NI, NI and post NI working, works where existing track or embankment is tampered or disturbed, shifting of lifting barrier, gate goomties and other works as agreed and approved by Authority Engineer/Engineer-in-charge.

11.6. During PPNI/PNI/NI period work shall be executed round-the-clock continuously i.e. day and night.

The following shall be necessarily arranged by the Contractor during the PPNI/PNI/NI period:

(a) Oxyacetylene / LPG cutting equipment with torches and spare gas cylinders.
(b) Road crane / hydra for transporting of materials.
(c) Whistles and loudspeakers.
(d) Arrangement of lighting.
(e) Provision of tents about 05 nos. or as per requirement at NI Station with required Nos of chair and tables.
(f) Free of cost Drinking water for staff deputed for NI/PNI working.
(g) P Way labour in adequate numbers in each shift during block period with sufficient tools and equipments.
(h) The Contractor shall provide following sufficient small track machines in

working condition as per the requirement during PPNI/PNI/NI work:

a. Abrasive rail cutter
b. Rail drilling machine
c. Rail cutting machine (saw type)
d. Hydraulic rail bender (Jim Crow) heavy duty (60T)
e. Double action weld trimmer
f. Rail profile weld grinder
g. Rail tensor (mechanical) or hydraulic (non infirming type)
h. Hydraulic track jack
i. Rail dolley with attachment for transportation of concrete sleepers (BG)

11.7. Contractor shall make provision of the temporary goomties (water proof) with seating arrangement i.e. table and chairs, water arrangement, and lighting arrangement at the locations as directed by the Authority Engineer/Engineer-in-charge for the purpose of the operating and other staff during PPNI/PNI/NI period.

11.8. Necessary **penalty @ Rs.800/- per manday** shall be recovered for non-mobilization of adequate labour.

12. WELDING OF RAILS

12.1. The welding is to be carried out as per "Manual for fusion Welding of Rails by the Alumino Thermic Process (Revised-2012) with upto latest corrections" in strict technical supervision of competent authority having a valid competency certificate for the particular category of welding technique issued by DG (M&C)/RDSO/Lucknow for firms and by Thermit Portion Plat of Northern Railway, Lucknow for Zonal Railways. The work of welding of rail joint shall be carried either on cess/track with free of traffic condition or under traffic as per the directions of Engineer-in-charge.

12.2. Contractor shall arrange approved welding portions, prefabricated moulds, consumables, equipments and actual execution of welding from the firms approved by RDSO for manufacturing of the portions and execution of the welding.

12.3. The contractor shall be responsible for removal of all kinks and twists in the rails, particularly within 1.8m from either end. Once the rails to be welded have been aligned, levelled, cleaned and provided with the specified amount of gap, it shall be the responsibility of the contractor to weld the joint and to guarantee its satisfactory performance as given below.

12.4. Maximum percentage of defective welds (Rail joints welded by a firm shall be guaranteed against failure which includes failures in execution, acceptance, acceptance & regular ultrasonic testing and during service upto 02 years from the date of welding the joints in track or from the date such welded joints made 'in cess' and inserted in the track are open to traffic) & during initial weld testing should not exceed 2% (Cummulative number of failed AT welds including rewelded joints in criteria under Guarantee as per the manual provisions upto 02 years, shall not exceed 2% of the total quantity of joints in a particular contract). In addition to free replacement of defective weld, a penalty shall also be imposed for each defective weld beyond 2% as per the criteria & provisions of the said AT weld manual (Cummulative number of failed AT welds including rewelded joints in criteria under Guarantee as per the manual provisions upto 02 years, shall not exceed 2% of the total quantity of joints in a particular contract. A penalty of Three Times the rate of supply and

execution of joints shall be payable by the firm for each joint failing in above criteria). The defective percentage be calculated as per the criteria & provisions mentioned in the manual.

Also as per the "Manual for fusion Welding of Rails by the Alumino Thermic Process (Revised-2012) with upto latest corrections" welds to be done and to be passed as per the Acceptance Test mentioned in the manual, Ultrasonic flaw detection test, to follow the criterion for Defective/fractured joints, Rewelding of defective joints to be done as per the manual provisions, Guarantee against the failure for the rail joints welded by a firm is to be as per the manual provisions etc.

12.5. The contractor shall not carry out any welding work between sun-set to sun-rise. He should make his own arrangements to protect the work against wind and weather in the course of execution. No welding work shall be done during heavy rains. Work during light rain may done in accordance with the local instructions. However the contractor shall keep ready all protective arrangements such as trolley umbrella, non-woven thick polyethylene tarpaulin etc. at his own cost.

12.6. A finished AT welded joints will be accepted as good on considerations of dimensional accuracy, if it satisfied the following tolerances.

(i) Finishing of top surface : +0.4mm, -0.0mm mm measured at end of 10cm straight edge.

(ii) Head finishing on sides : ±0.3mm over gauge side of the rail head measured at the centre of 10cm straight edge.

(iii) Vertical Alignment : Variation not more than +1.0mm, -0.0mm measured at the end of 1.0 metre straight edge.

(iv) Lateral Alignment : Variation not more than ±0.5mm measured at the centre 1.0metre straight edge.

The aforesaid tolerances are only applicable in case of new rails but in case of existing rails where there is depression of more than 1.0mm measured with 1.0meter long straight edge placed centrally on the rail head before welding the tolerances would be decided at site between contractor and Railway Engineer.

Tolerances for the rail ends before & after the welding of joints for new or old rails to be as per the provisions of AT welding manual, guidelines etc.

12.7. In case of in-situ welding the rail fastening for the least 7 sleepers on either side of the proposed weld shall be loosened.

13.0 Laying of LWR

13.1 LWR should be laid as per the LWR plan approved and as per the instructions contained in LWR manual.

13.2 Before laying SEJs, they should be completely oiled and greased.

13.3. Greasing Rails, ERC & M.S. Liners.

13.4 No ERC & M.S. Liners is to be but into the track without greasing. ERC & M.S. Liners are to be greased as per the procedure laid down in IRPWM & as per the instruction of Engineer-in-charge.

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13.5 Grease graphited used for ERC clips and liner shall be as per IS:408, Grade 'O'.

14.0 Track Tamping by Machines

14.1. Pre-tamping attention

The Contractor shall carry out the following preparatory work before taking up the tamping:-

(a) Ballasting wherever is shortage of ballast.
(b) Heaping up of ballast in the tamping zone, to ensure effective packing.
(c) Making up of low cess.
(d) Cleaning of pumping joints and providing additional clean ballast, where necessary.
(e) Attending to Hogged joints before tamping.
(f) Tightening of all fittings and fastenings like fish bolts and keys, splitting of cotters and replacement of worn out fittings.
(g) Renewal of broken and damaged sleepers.
(h) Squaring of sleepers and adjustment of spacing of sleepers, re-gauging to be done if required.
(i) Adjusting creep and expansion gap in rails.
(j) Examination of rails for cracks etc.
(k) Realigning of curves which are badly out of alignment.
(l) Clearing of ballast on sleepers to make them visible to the operator.
(m) All obstructions such as signal rods, cables, pipes, level crossing check rails etc., likely to be damaged by the tampers should be clearly marked and made known to the tamping operator before he starts the work. Tight overhead clearance should also be brought to his notice; the beginning and end of transitions should be marked. Super elevation should be marked on every second sleeper so that it can guide the operator for levelling up correctly.

14.2. Post Tamping Attention –

The Contractor shall pay attention to the following points:

(a) As some of the rigid fastenings might get loose, tightening of fittings should be done immediately after tamping.

(b) Any broken fitting should be replaced.

(c) Proper quality check of work done by tamping machine is important. Immediately after the tamping work, the track should be checked. in respect of cross levels and alignment, and action taken as considered necessary.

(d) The ballast should be dressed neatly and proper boxing of ballast between the sleepers should be done.

15.0 Assembly and laying of turnouts

i. The turnouts procured by the Contractor should be assembled on uniform layer of stone ballast of specified thickness.
ii. The stock joint of the switch to be kept perfectly square.

iii. All fittings and components as per standard drawing of turnouts are to be provided and they will be fully tightened.

iv. Rail closer for turnouts will be cut as per standard drawing for the turnouts on PSC sleepers.

v. Provision of stretcher bars and allied fixtures will have to be done in collaboration with S&T department.

vi. The Turnouts shall be assembled as per applicable RDSO Drg. No.

vii. Tongue rail will have to be set flush with stock rails over tapered portion of tongue rail by jim-crowing and other adjustment like packing, lifting of adjoining switch and the length of stretcher bars etc.

viii. Opening of 115mm will be provided at both LH & RH sides of the toe of the switches. Minimum and maximum openings to be provided as per the given provisions of Manuals, guidelines, IRSOD etc.

ix. The gap between the top of leading stretcher bar and bottom of stock rail should not be more than 1.5mm on both LH and RH sides.

x. Laying and assembling of Turnout will includes fixing of gauge tie plate on switch portion, stretcher bars and may involve filing of butt plate, drilling of additional hole etc. to setting of switch.

xi. In switch portion Contractor has to carry out all ancillary works for S&T requirement i.e. housing of tongue rail with stock rail, for adequate length, grinding of head of stud bolt, grinding of special chair etc. as directed by Site Engineer. This work should be finished during traffic block only.

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CHAPTER XVI
SPECIAL CONDITIONS OF CONTRACT

SPECIFICATION & GUIDE LINES FOR FABRICATION AND ERECTION OF STEEL GIRDER BRIDGES

1. Specification & Interpretation

1.1 This specification is intended mainly to cover technical provisions relating to fabrication and erection of steel girder bridges including supply of the materials through contract.

1.2 This specification makes reference to the Indian Standard (IS), Indian Railway Standard (IRS),RDSO's Specifications (M&C) & RDSO Guidelines (BS).

1.3 Wherever reference to the standards mentioned in clause ie IS, IRS & RDSO Specification, it shall be taken as a reference to the latest version of the standards.

1.4 Any revision or addition or deletion of the provisions of this Specification shall be issued only through correction slip. No cognizance shall be given to any policy directives issued through other means.

2.. Responsibility for Completeness / Contractor(S) liability

a) The Contractor shall be entirely responsible for the execution of the contract in all respects in accordance with the terms of this Specification and the conditions of contract, not withstanding any approval which the Engineer/ Inspecting Officer may have given to the detailed drawings prepared by the Contractor or Sub- Contractor for materials or other parts of the work involved In the contractor for tests carried out, either by the Contractor or by the Engineer/Inspecting Officer.

b) Any fitting, accessory or apparatus which may not have been mentioned in this Specification, but which are usual or necessary in the execution of such work, are to be provided by the Contractor without extra charge. The whole work must be completed in all details, whether mentioned in this Specification or not, with the exception of such work as has been specified in the Schedule of Requirements to be separately provided for by the Engineer.

c) It has been tried to detail the relevant procedures regarding the various aspects involved in this work. However, in case of any missing details, relevant documents of the IRS, BIS or other relevant codal provisions will prevail and it is binding upon the renderers to follow the same. In case of any details missing therein as well, procedures will be decided by the tendered and thereafter put up to Engineer for approval. Decision of the Engineer will be final.

Even after following up the procedures, contractor will not absolve from his responsibility in case some failure takes place. As such, the contractor should follow due care in doing the various works as per contents of the tender documents

2.2 Fabrication Drawings

The Contractor shall prepare detailed shop drawings including drawing office dispatch lists (DODL's) on the basis of design drawings supplied by Engineer, in such size and in such details as may be

Signature of Tenderer(s)/Contractor(s)

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specified by Engineer. The shop drawings shall be submitted to Engineer in triplicate, one copy of which will be returned after scrutiny and approval. The fabrication drawings shall indicate member sizes prior and after flame cutting, machining to obtain correct length and shape, tolerance provisions, welding sequence, type and size of welding. No work of fabrication will be started without such approval being obtained. Engineer will make all efforts to approve the drawings submitted by the Contractor within reasonable time but no claim from Contractor for any delay on this account shall be entertained by Engineer. For Engineer's use and record, the Contractor shall supply free of charge, four sets of prints on strong paper and one set of neatly executed tracings of all approved detailed drawings and fabrication drawings, soon after communication of approval, for use at site.

2.3 Maintenance of records by Fabricators

The records of fabrication shall be maintained in the registers as per the formats given in the Appendix I of B-1 Specification. For ready reference, extract of the same has been given in the end of this specification as well.

3. 0 Structural Steel:-

3.1. Only weldable steel conforming IS:2062-2011 , Quality 'A' Grade Designation E250 as rolled semi killed or killed shall be used for Foot Over Bridges and other structures subjected to non-critical loading.

3.2. Only wieldable steel conforming IS:2062-2011, Quality 'B0' Grade Designation E250 fully killed and with normalizing/normalizing rolling/controlled rolling where service temperature does not fall below 0°C shall be used for welded/riveted girders subjected to Railway loading. Plates less than 12 mm thick need not be with normalizing/normalizing rolling/controlled rolling.

3.3. Only wieldable steel conforming IS:2062-2011, Quality 'C' Grade Designation E250 fully killed and with normalizing/normalizing rolling/controlled rolling ensuring impact properties at (-) 20°C, shall be used for sub-zero temperature areas for welded/riveted girders subjected to Railway loading. Plates less than 12 mm thick need not be with normalizing/normalizing rolling/controlled rolling.

Note 1: In case Rolled Steel Section confirming to IS: 2062-2011 Quality B0' or 'C' are not available in market, steel confirming to IS:2062-2011 Quality 'BR' may be used with the prior approval of CAO(Con) and in such case a reduction @ Rs 2,000/- (Rupees two thousand) per MT will be made from Contractor's bills.

Note 2: In case Rolled Steel Section confirming to IS: 2062 Quality 'BR' is also not available in market, steel confirming to IS:2062 Quality 'A' may be used with the prior approval of CAO(Con) and in such case a further reduction @ Rs 2,000/- (Rupees two thousand) per MT in addition to reduction mentioned vide Note 1 above will be made from Contractor's bills.

3.4. High tensile steel shall comply in all respects with the requirement of IS:2062 Grade Designation E410 Quality 'B0' or 'C' (copper bearing quality) for the welded work.

3.5.i. Independent tests shall be conducted, where ever required, to ensure that the materials procured conforms to the specifications and cost of testing to be borne by the Contractors. (If the test result does not satisfy the required specification and the steel supplied is rejected.)

3.5.ii. The steel to be procured for the work shall be manufactures by one of the following, which are Established, reliable, Indigenous & Primary Producers of Steel, having Integrated Steel Plants (ISP), using iron ore as the basic raw material and giving in-house iron rolling facilities, followed by production of liquid steel and crude steel, as per Ministry of steel's guidelines.

Sl No	Name of Company	Location	State
1.	Steel Authority of India Limited	HSCO, Burnpur	West Bengal
2.	Steel Authority of India Limited	Bokaro	Jharkhand
3.	Steel Authority of India Limited	Bhilai	Chhattisgarh
4.	Steel Authority of India Limited	Rourkela	Orissa
5.	Steel Authority of India Limited	Durgapur	West Bengal
6.	Rashtriya Ispat Nigam Limited	Visakhapatanam	Andhra Pradesh
7.	Tata Steel Limited	Jamshedpur	Jharkhand
8.	Essar Steel Limited	Hazira	Gujrat
9.	JSW Steel Limited	Vijayanagar	Karnataka
10	Jindal Steel & Power Limited	Raigarh	Chhattisgarh
11	Ispat Industries Ltd	Dolvi	Maharashtra
12	Bhushan Power & Steel Limited	Jharsuguda	Orissa
13	Bhushan Steel Limited	Angul-Dhenkanal	Orissa
14	Shri Bajrang Power &Ispat Ltd	Raipur	Chhattisgarh
15	Shyam Industries Ltd	Durgapur	West Bengal
16	Electrosteel Ltd	Bokaro	Jharkhand
17	Real Ispat & Power Ltd	Raipur	Chhattisgarh
18	Bajrang Power & Ispat Ltd	Raipur	Chhattisgarh
19	Shyam Mettalics & Enegry Ltd	Sambalpur	Odisha
20	Rasmi Metalics Ltd	Midnipur	West Bengal
21	Reliable Sponge P Ltd	Kalunga	Odisha
22	Shyam SEL & Power Ltd	Burdwan	West Bengal
23	Sri Nakoda Ispat Ltd	Raipur	Chattisgarh

3.5.iii. Any other approved vendors works/plant registered with RDSO as Primary steel producers having ISP. On the date of purchase, firm should have been in approved list of RDSO.

3.5.v However, only certain isolated sections of structural steel, not being rolled by ISPs, can be procured from the authorized re-rollers of ISPs or authorized licensee of BIS having traceability system and who use billets produced by ISPs.

3.5.v. The contractor shall disclose the source from where supplies of Steel is received by him and maintain a detailed record of receipt of steel from different sources and shall keep the challan, Railway receipts number of lorry number, etc. and store balance in a register as directed by the Engineer-in-charge and produce the same to the Engineer as and when demanded. A copy of purchase document shall have to be submitted along the bill for claiming payment against these items. Railway reserves the right to inspect contractor'.

3.5.vi. Material to be used should be purchased from authorized sources only. The contractor must submit Manufacturer's Test Certificates and Vouchers. All structural steel shall be free form rust, scales, laminations , cracks and other surface defects.

Signature of Tenderer(s)/Contractor(s) 173 For Chief Engineer(Con)/I/BSP

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JOINT VENTURE PARTNER

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4. Stacking Materials

4.1.1 On receipt of materials at the bridge yard they shall be carefully unloaded examined for defects, checked, sorted and stacked securely on a level bed out of danger from flood or tide and out of contact with water or ground moisture. All material shall be available for inspection by the Engineer or Inspecting Officer.

4.1.2 Materials shall be verified with the markings shown on the marking plan of part list, which shall be supplied by the manufacturers or the Engineer.

4.1.3 Any material found damaged during transit or while unloading should be stacked separately and damaged portions shall be indicated by paint with distinctive colour. All such materials shall be dealt with under the orders of the Engineer without delay. If any component after receipt at site, has in the opinion of the Engineer or Purchaser, been damaged in transit, such component shall be replaced or repaired to the satisfaction of the Engineer or Purchaser free of cost.

4.1.4 All such damaged material shall be dealt with as per the orders of the Engineer. Badly damaged portions may require replacement. Slightly distorted parts may be straightened by gradual pressure without heat or annealing. Badly distorted or broken parts must be dealt with as the case demands and as directed by the Engineer.

4.1.5 Where the work has been passed in the manufacturer's works as strictly interchangeable, all members bearing the same marks can be stacked together without reference to any particular span.

4.1.6 The Contractor shall unload the material promptly on delivery; otherwise he/she shall be responsible for demurrage charges.

4.1.7 On receipt of rolled steel at workshop or fabrication yard they shall be carefully unloaded and stacked properly to avoid bending, twisting, corrosion etc.

5. Leading to Site

5.1 Care must be taken by the Contractor to see that the parts at site are available in proper sequence.

6. Lines and Levels

6.1 All lines and levels should be given by the Engineer and all stakes and marks so given shall be carefully preserved by the Contractor who shall give all necessary assistance and facilities to establish or check the lines and levels and to measure the work.

7. Pins and Expansion Rollers

7.1 Pins and Expansion Rollers shall be made from steel conforming to IS:2004 (Class 3 steel).

7.2 Expansion rollers may, alternatively be turned from approved carriage and wagon axles. Only axles manufactured after 1931 shall be used for the manufacture of rollers. USFD test shall be conducted to ensure freeness from internal flaw. Test pieces shall be left as an integral part of the roller with the stamp of the supplier on it so that the Accepting Authority can cut-off the test pieces and check if required.

Manufacture

8.1 The whole work shall be representative of the highest class of workmanship. The greatest accuracy shall be observed in the design, manufacture and erection of every part of the work to ensure that all parts will fit accurately together on erection. For manufacture of the components of all spans to be made strictly interchangeable as specified in clause 33, approved set of same jigs and assembly fixtures shall be used. The tolerances in manufacture shall be in accordance with as shown in **Appendix II of IRS Specification for Bridge Fabrication and Erection of steel girders serial No.B1-2001**. The Contractor shall state which of the following alternative methods of manufacture he/she intends to adopt.

i) The whole of work to be erected complete and pieces marked to place.

ii) All spans to be made strictly interchangeable as specified in clause 33.

8.2 The Contractor shall maintain a master steel tape of approved make for which he/she has obtained a certificate of accuracy from any National Test House or Government recognized institutions competent to do so.

9. Templates

9.1 The templates throughout the work shall be of steel. The template shall be used for marking of cutting material and as well as profile machining for girders of railway loading. Templates shall be used for marking of drilling holes in steel structures other than girder of Railway loadings. In case where actual materials from a bridge have been used as templates for drilling similar pieces the Inspecting Officer will decide whether they are fit to be used as part of the finished structure.

10. Flattening and Straightening

10.1 All steel materials, plates, bars and structural's shall have straight edges, flat surfaces and be free from twist. If necessary, they shall be cold straightened or flattened by pressure before being worked or assembled unless they are required to be of curvilinear form. Pressure applied for straightening or flattening shall be such as it would not injure the material and adjacent surfaces or edges shall be in close contact or at uniform distance throughout.

10.2 Flattening and straightening under hot condition shall not be carried out unless authorized and approved by the Inspecting Officer.

11. Planning and Shearing

11.1 Except where otherwise indicated, cutting of all plates and sections shall be affected by shearing or sawing. All edges shall be clean, reasonably square and true. Wherever possible the edges shall be cut in a shearing machine, which will take the whole length of the plate in one cut.

11.2 Should the inspection find it necessary, the cut edges shall be ground afterwards.

11.3 Planning or machining of the edges or surface shall be carried out when so specified in the contract drawings or where specifically ordered by the Engineer. Where machining is specified, the plates or all sections shall be cut in the first instance to such a size so as to permit not less than 3mm of metal being removed from each sheared edge or end, in the case of plates or sections of

12mm or less in thickness and not less than 6mm of metal being removed in the case of plates and sections exceeding 12mm in thickness.

11.4 The butting ends of all booms and struts where spliced shall be faced in an end milling machine after members have been completely fabricated. In the case of compression members the face shall be machined so that the faces are at right angle to the axis of the members andthe joint when made, will be in close contact throughout. At the discretion of the Inspecting Officer, a tolerance of 0.4mm may be permitted at isolated places on the butting line.

12. Flame Cutting

12.1 Flame cutting by mechanically controlled torch/torches shall be accepted both in the case of mild steel and high tensile steelwork. Provided the edge as given by the torch is reasonably clean and straight, plates may be cut to shape and beams and other sections cut to length with a gas cutting torch, preferably oxyacetylene gas should be used.

12.2 All flame cut edges shall be ground to obtain reasonably clean square and true edges. Dragiines produced by flame cut should be removed.

12.3 Unless machining has been specifically provided for, special care is to be taken to ensure that ends of all plates and members are reasonably in close contact and the faces are at right angles to the axis of the members and joints, when made, are also reasonably in close contact.

12.4 Use of multi-head flame cutting machine having multiple oxy acetylene torches is desirable for higher productivity and reducing the distortion due to cutting operation. Plasma arc cutting method can also be employed. This process offers less heat input causing less distortion.

13. Drilling and Sub-punching

13.1 All holes shall be drilled but the Contractor may, if he/she so prefers sub-punch them to a diameter 6mm less than that of finished holes, e.g. a punched hole which is to be drilled out to 25mm in diameter shall not exceed 19mm in diameter at the die end. When the rivet holes are to be sub-punched, they shall be marked with a centre punch and made with a nipple punch or preferably, shall be punched in a machine in which the position of the hole is automatically regulated. The punching shall be so accurate that when the work has been put together before drilling, a gauge 1.5mm less in diameter than the size of the punched holes can be passed easily through all the holes. Holes for countersunk heads of rivets, bolts or screws shall be drilled to the correct profile so as to keep the heads flush with the surface Holes for countersunk heads of rivets, bolts or screws shall be drilled to the correct profile so as to keep the heads flush with the surface
13.2 No sub-punching shall be allowed in the main truss members of open-web girders.

13.3 Holes for turned bolts, should be 1mm under drilled in shop and should be reamed at site to suit the diameter of turned bolt.

13.4 Where the number of thicknesses to be riveted exceeds three or the total thickness is 90mm or more, the rivet holes, unless they have been drilled through steel-bushed jigs, shall be drilled out in place 3mm all round, after assembling. In such cases the work shall be thoroughly bolted together.

13.5 The steel bushes shall be case hardened by an approved process and checked for diameter after the heat-treatment. The bores of bushes shall initially have a tolerance of -0mm, 0.1mm. The tolerance shall be checked from time to time and when the bores exceed a tolerance of, 0mm, +0.4mm, the bushes shall be rejected. For this purpose, go and no-go gauges are to be used. Tolerances for checking jigs from master plates shall be +0mm- 0.13mm.

13.6 The work shall be taken apart after drilling and all burrs left by the drill and the sharp edges of all the rivet holes completely removed.

14. Parts in Contact

14.1 All steel work intended to be riveted or bolted together shall be in contact over the whole surface.

14.2 Drifts as shown in **Fig. 2 of IRS Specification for Bridge Fabrication and Erection of steel girders serial No.B1-2001** may be used for drawing light members into position but their use on heavy members should be restricted to securing them in their correct positions. In no case, shall drifting be allowed to such an extent that holes are distorted.

14.3 Drifting to enlarge unaired holes is prohibited. The holes that will have to be enlarged to admit rivets should be reamed provided the Engineer permits such reaming after satisfying himself about the extent of inaccuracy and the effect of reaming on the soundness of the structure. The Purchaser retains the right to reject all steel work if the holes are not properly matched.

15. Making of Joints

15.1 Cleaning of permanent contact surfaces:- Surfaces which will have permanent contact shall be removed of paints and mill scale down to bare metal, clean and dried and immediately a coating of zinc chrome red oxide priming to IS:2074 shall be applied. Care shall be taken to see that all burrs are removed and no surface defects exist before the parts are assembled.

15.2 Bolting and Drifting:- Only barrel drifts as per **Fig. 2 of IRS Specification for Bridge Fabrication and Erection of steel girders serial No.B1-2001** shall be used in erection. They may be used for drawing light members into position; but their use on heavy members shall be restricted to securing them in their correct position. Any apparent error in shop work, which prevents the assembling and fitting up of the parts by the proper use of these drifts, shall be investigated immediately. As all work is rigidly inspected in the manufacturers work before despatch, these difficulties should not arise and the cause should be first be sought in the use of incorrect components or the transposition of a correct part. It is usually important that parts should be correctly handled. Should error still persist, the matter shall be immediately reported to the Engineer who will decide what action is to be taken. No reaming shall be undertaken without the written authority of the Engineer, except for the under drilled holes meant for turned bolts. If approved, the Contractor shall supply, at his/her own expense, any special rivets that maybe required. Copies of all correspondence relative to the recourse to reaming and the use of over-size rivets shall invariably be sent by the Engineer for information to the inspectorate concerned.

15.3 Joints shall normally be made by filling not less than 50% of the holes with service bolts and barrel drifts in the ratio of four to one. The service bolts are to be fully tightened up as soon as the joint is assembled.

15.4 Special methods of erection other than described in **Appendix III of IRS Specification for Bridge Fabrication and Erection of steel girders serial No.B1-2001.** In cases where the joints have to withstand stresses arising from special method of erection, provision is to be made to take the whole stress that will or may occur. Cylindrical drifts and turned bolts shall be used to withstand such stresses and no reliance is to be placed on the service bolts for this purpose. Upto maximum of 40% of the holes of each member of the joint are to be filled with drifts and balance of strength required is to be attained with turn bolts. The position and number of the drifts and bolts will be intimated by the Engineer. The condition of clause 20.1 must be observed and the bolt fully tightened up as soon as the joint is made.

15.5 Where the manufacturing of girders has been done in accordance with clause 33 relating to steel girder bridges, the erection shall be done in accordance with **Appendix III of IRS Specification for Bridge Fabrication and Erection of steel girders serial No.B1-2001.** However, if the Contractor desires to adopt any other method of erection, he/she shall submit the scheme and obtain the approval of the Engineer. It shall be ensured that when in position,the girder has the camber as per drawing.

15.6 Emergency Jointing:- In the event of an emergency arising such as the staging is in danger of being carried away by floods before the rivetting can be completed, the joints shall be made secure by filling 40% of the holes with cylindrical drifts and equal number with service bolts fully tightened .

16. Erection and Equipment

16.1 The Contractor shall provide at his/her own cost all tools, machinery, equipment and erection material necessary for the expeditious execution of the work and shall erect the structural steel and iron work, in every respect as covered by the contract and in accordance with the drawings and specifications.

16.2 If any labour, material, plant staging haulage and storage facilities are to be provided by the Purchaser, details of such items and the conditions under which these are to be supplied shall be clearly specified in the contract agreements. In the absence of any such provisions in the agreement, the Contractor shall make his/her own arrangement for such items.

16.3 Before starting the work, the Contractor shall advise the Engineer fully as to the method he/she proposes to follow and the amount and character of equipment he/she proposes to use, which shall be subjected to the approval of the Engineer. The approval of the Engineer shall not be considered as relieving the Contractor of the responsibility for the safety of his/her method or equipment or from carrying the work in full accordance with the drawings and specifications.

16.4 All temporary work shall be properly designed and substantially constructed for the loads, which it will be called upon to support. Adequate allowance and provision of a lateral forces and wind loads shall be made according to local conditions and ensure that support shall not settle during erection.

16.5 Careful and periodical inspection of plants shall be made by the Contractor to ensure that all tackle, ropes, chains and other important lifting gear and machinery are in good order and fit for service and well up to the capacity for which they are required.

16.6 When chains are used for lashing, care must be taken to protect the edges of members to avoid the marking and distortion otherwise caused.

16.7 Span erected upon staging shall be supported upon suitable blocks, which shall ensure that the girders shall be at the correct elevation and alignment when completed. If other methods of erection be adopted where staging in situ is not employed, special means shall be used to ensure this.

16.8 The method used for lifting and slinging flexible members shall be brought to the notice of the Engineer and shall be subject to his/her approval.

16.9 Temporary bracing shall be provided to take care of stresses from erection equipment or other loads carried during erection.

17. Bearings and Anchorages

17.1 Bed plates shall be set to required level and fixed accurately in position by giving full and even bearing by setting them on a layer of cement sand and cast iron chips as approved and directed by the Engineer.

17.2 The Contractor shall drill the holes where necessary and set the anchor bolts. The bolts shall be set accurately and fixed with cement grout or any other grouting material as approved by the Engineer completely filling the holes.

18. Field Rivets, Bolts, HSFG Bolts, Nuts and Service Accessories

18.1 The work is to include supply of all units, bolts, HSFG Bolts, nuts, washers etc. required to complete erection at site with an allowance for wastage etc. of 12.5% of the net number of field rivets, bolts and washers required subject to a minimum number of five in each item.

18.2 The Contractor shall be responsible for supplying site rivets/ HSFG Bolts of approved length. The length of such rivets/HSFG bolts shall be verified by snapping a few rivets/ HSFG bolts of each length in the presence of the Inspecting Officer. In the case of rivets with long grips (with grip exceeding 6 times the diameter) specimen rivets on the test piece shall be cut to see if the holes are totally filled even though the rivets are tight under the usual hammer tests.

18.3 Black hexagonal bolts (Service bolts) with nuts and ordinary platter's washers and drifts for use in the erection of the work shall also be supplied at 60% (45% bolts and 15% drifts) of the number of field rivets per span in each size (this includes wastage). The Purchaser may however, specify a reduction in the quantities of service bolts etc. if more than one span of each type is ordered.

19. Smithed Work

19.1 All joggles shall be performed by pressure. Craned sections or knees can be formed by forging or by gas cutting and welding by any approved electric arc process. Any bending, forging, cutting or welding shall be carried out in such a manner as not to impair the strength in the metal. Forging shall be annealed as indicated in the drawing.

19.2 If drop forging through dies is resorted to, excessive forging in one operation shall be avoided. Where necessary, a series of intermediate stage dies shall be manufactured and used.

20. Welding

20.1 The welding work shall conform to IRS steel bridge code, IRS welded bridge code, and relevant IS code. Electrode/Coil used for welding shall be approved type and procured from RDSO approved firms only. In the case of welded fabrication, shop welding shall be adopted whenever possible. In fabricating components and sub members, welding shall be done by Submerged Arc Welding (SAW).

If SAW is not possible then CO2 (MAG) or MMAW are to be used.

QAP,WPSS,WPQR (as per RDSO specification) must be submitted by the contractor before starting the fabrication work.

20.2 Welded construction work shall be carried out generally in accordance with the provisions of Indian Railway Standard Welded Bridge Code and subject to further specifications given in the following paragraphs.

20.3 All welds should be done by submerged-arc welding process either fully automatic or semi-automatic. Carbon di oxide welding or manual metal-arc welding may be done only for welds of very short runs or of minor importance or where access of the locations of weld do not permit automatic or semi-automatic welding.

20.4 Except for special types of edge preparation, such as single and double 'U' single and double 'J' the fusion edges of all the plates which are to be joined by welding may be prepared by using mechanically controlled automatic flame cutting equipment and then ground to a smooth finish. Special edge preparation should be made by machining or gouging.

20.5 Welding procedures:- The welding procedure shall be such as to avoid distortion and minimize residual shrinkage stresses. Properly designed jigs should be used for assembly. The welding techniques and sequence, quality, size of electrodes, voltage and current required shallbe as prescribed by manufacturers of the material and welding equipment. The Contractor should submit full details of welding procedure in proforma given at **Apppendix V of IRS Specification for Bridge Fabrication and Erection of steel girders serial No.B1-2001.**

20.6 Site welding should not be undertaken except in special circumstances with the approval of the Chief Bridge Engineer. Site welding should be confined to connections having low stresses, secondary members, bracings etc.

20.7 Manual metal arc welding may be done taking adequate precautions as per IS:9595 and under strict supervision.

21. Sequence of Welding and Weld Pass

21.1 For fabrication of welded composite girders, shear STUD connectors shall be welded on top flange plate prior to assembly of I-section. This facilitates correction of any distortion of flange plate developed during the welding of channel shear connectors.

21.2 In making a typical I-section four fillet welds are to be made. The welding sequence to be followed is indicated by number 1 to 4 as shown in the **Fig. 3 of IRS Specification for Bridge Fabrication and Erection of steel girders serial No.B1-2001.**

21.3 Whenever a square butt weld in a 10 or 12mm thick plate is required to be made, the sequence to be adopted is shown in **Fig. 3 of IRS Specification for Bridge Fabrication and Erection of steel girders serial No.B1-2001.**

22. Bolts, Nuts and Washers

22.1 Bolts, Nuts and Washers shall be in accordance with the following specifications:-
(i) Black hexagonal bolts to IS:6639 and Nuts to IS:1363.
(ii) Precision and turned bolts with nuts and hexagonal screws to IS:1364.
(iii) Plain washers to IS:2016 and IS:5369.
(iv) Spring washers - IS:3063.
(v) Taper washers - IS:5372 and IS:5374.

22.2 Manufacture, workmanship, Marking, Packing etc. for Bolts and Nuts shall comply with the requirements of IS:1367.

22.3 Where the head and nuts bear on timber, square washers having the length of each side not less than three diameters of the bolt and the thickness not less than one quarter of the diameter shall be provided. Steel, wrought iron or malleable cast iron taper washers shall also be provided for al heads and nuts bearing on bevelled surfaces.

22.4 For black bolts a clearance (difference in diameter) of 1.5mm for all sizes of bolts shall be allowed.

22.5 Where turned bolts are required they shall be carefully turned and shall be parallel throughout the barrel. Holes for turned bolts should be 1mm under drilled in shop and should be reamed at site to suit the diameter of the turned bolts.

22.6 The following limits of tolerances, shall be permitted upon the diameter of the shank of turned bolts and of the holes which they are to fit:

Limit of tolerance Shank of bolt(mm) Hole(mm)	High 0.000 +0.125	Low - 0.125 0.000
The shank of each turned bolt shall be of such a length that it is in full		
Limit of tolerance Shank of bolt(mm) Hole(mm)	High 0.000 +0.125	Low - 0.125 0.000

22.7 The shank of each turned bolt shall be of such a length that it is in full contact with the work, throughout, the screwed portion being made at least 1.5mm less in diameter than the shank or to suit the next smaller size of screw thread. The shank portion shall be joined to the threaded portion by a 45 degree chamfer within the thickness of the washer. Washers with perfectly flat faces should be provided with all turned bolts.

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

181 For Chief Engineer(Con)/I/BSP

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22.8 The washers under the nut shall have a hole of 1.5mm larger in diameter than the shank of the bolt and shall have a thickness of not less than 6mm so that the nut, when screwed up, shall not bear on the shoulder of the bolt.

22.9 Supply of High Strength Friction Grip (HSFG) Bolts

22.9.1 Reference Codes:
(I) RDSO'S BS111 (REV.6)
(ii) IS 1367 (Part 6) – 1994 (reaffirmed 2004) – Mechanical Properties and test methods for nuts with specified proof loads
(iii) IS 1367 (Part 8): 2002 – Prevailing Torque type Steel Hexagon Nuts – Mechanical and Performance Properties.
(iv) IS 1367 (Part XII):1983(reaffirmed 2001) – Phosphate Coatings for Threaded Fasteners.
(iv) IS 3757 – 1985 (reaffirmed 2003) – Specifications for High Strength Structural Bolts.
(v) IS 4000: 1992 – High Strength Bolts in Steel Structures – Code of Practice.
(vi) IS 6623:2004 - High Strength Structural Nuts – Specifications
(vii) IS 6649:1985 - Specification for Hardened and Tempered Washers for High Strength Structural Bolts and Nuts.

22.9.2 Hierarchy of Codes: The hierarchy of codes shall be as follows:
(i) Provisions of IRS codes.
(ii) Where IRS codes are silent, relevant IS codes.
(iii) Where both IRS and IS codes are silent, relevant EN codes.

22.9.3 Definition: HSFG bolts are high strength structural bolts which have been tightened such as to induce predefined tension in the bolt shank. Provisions in this code apply to non -- galvanized bolts of dia. M12 to M36 only.

22.9.4 Types of Bolts: For the purpose of HSFG connections, only high strength structural bolts of two property classes: 8.8 and 10.9 can be used. Bolts shall conform to IS 3757. The bolts shall have the following characteristics

(i) **Identification:** The property class of bolts (8.8 or 10.9) shall be embossed or indented as 8S or 10S respectively on the top of head along with the manufacturer's identification symbol. Alternately, marking '8.8 S' or '10.9 S' are also acceptable. The suffix 'S' here denotes that the bolt is high strength structural bolt with a large series hexagon.

(ii) **Length:** The length of bolt shall be chosen such as to hold the steel members in position, with provision for the nut, washer(s) and some projection beyond the bolt. Along with the overall length of the bolt, the thread length has to be specified. At least 4 full threads shall remain clear between the bearing surface of the nut and unthreaded part of the shank Further, minimum one full thread pitch must protrude from the nut after tightening.
(iii) The minimum length of bolt shall be worked out on the basis of maximum grip length (covering ply thicknesses and all washers) plus an additional allowance as per table 1 of IS:4000.
(iv) Maximum grip length of all plies, including packings and packing washers, shall not exceed 10 times the nominal diameter of the bolt.

(v) **Surface Finish:** All bolts shall be supplied with coating consisting of zinc phosphate that is used in conjunction with suitable oil of rust preventive type as per IS 1367 (Part XII).

22.9.5 Nut: Each bolt shall be tightened using a high strength nut, conforming to IS 6623. The nut has to be strong enough to be able to impart the necessary torque to the bolt and also withstand the force during the life of the structure. Further, the threads in nut shall be matching with the threads in the HSFG bolt and the nut shall be free running on the threads of the HSFG bolts. Nuts shall have following characteristics:

(i) **Property Class:** For HSFG bolts, the property classes to be used are 8 and 10 as specified in IS 1367 (Part 6), suitable for bolts of property class 8.8 and 10.9 respectively. Normal height of nut shall be more than 0.8 times the nominal bolt diameter.

(ii) **Identification of Nut:** The nuts have the following markings:
(a) Manufacturer's identification symbol.
(b) Property class, marked as '8S' or '10S'. (The suffix 'S' denotes a high strength structural nut with a large series hexagon.) Alternately, '8.8 S' or '10.9 S' are also acceptable. The marking shall be either on the top or the bottom face of double chamfered nuts and shall be either indented or embossed on nonbearing surface of washer faced nuts.

(iii) **Surface of Nut:** All nuts shall be supplied with coating consisting of zinc phosphate that is used in conjunction with suitable oil of rust preventive type as per IS:1367 (Part XII).

(iv) **Position of nut in bolt:** Nuts shall be provided in bolts preferably as follows:
(a) **In girder web:** Towards outside of the girder.
(b) **In flanges:** Towards bottom (Except when in composite construction).
(c) **In composite construction:** Towards inside of concrete.
(d) **In bracing:** Towards the rolled section side so that the space for rotation of the nut is not readily available.
(e) Where **Tapered washer** is used, the nut shall preferably be on the other side.

22.9.6 Washer: Annular rings which are provided between the bolt head/ nut and the members being joined are called washers. Washers for HSFG bolts shall conform to IS 6649. The washers have the following characteristics:

(i) Types: Three types of washers have been specified in IS 6649, clause 2:
a) Type A: Plain hole circular washers
b)Type B: Square taper washers for use with channels (60 taper)
c)Type C: Square taper washers for use with I-beams (80 taper)

Identification: Type A washers shall be identified by provision of two nibs (small projections) and manufacturer's identification symbol in indented character. The type B and C washers shall be identified by the type identification symbol, B or C and the manufacturer's identification symbol.

(ii)Categories of washers:

a) **Plain washer:** Plain washers are used as per provisions of clause 28.10.2 where other types of washers are not suitable. HSFG bolts shall be provided with minimum one washer.

b) Packing washers: If the bolt is longer than required, plain washers may be used as packing washers also. **However, the maximum number of packing washers shall be limited to 3, with maximum total combined thickness of 12 mm.**

c) Tapered Washer: Where the angle between the axis of bolt and the joint surface is more than 3 degree off normal, a tapered washer shall be used against the tapered surface. Non rotating surface shall preferably be placed against tapered washer.

d) Direct Tension Indicators (DTI): The Direct Tension Indicators are special type of washers with projections which get pressed when tension is applied. The pressing of projections to required level indicates that the required tension has been applied in the bolts. DTIs have multiple projections, between which the feeler gauge is to be inserted to check if the bolt has been sufficiently tightened or not. The projections shall be kept in the direction of nut/head of bolt and not towards member.

(iii) Calibration of Direct Tension Indicator: Before the DTI are brought to site, the same shall be tested in the presence of engineer. Three nos. bolts of similar diameter and property class as to be used in the work shall be taken and installed with DTI. The installation procedure to be followed shall be similar to the one given for plain washers. On full tightening, th projections on DTI washers shall meet the requirements of checks specified after second stage tightening using DTIs. Alternately, calibrated load cells may be used to check the calibration of DTI washer. **Only the DTIs which satisfy the calibration shall be brought to site for work.**

(iv) Surface Finish: All washers (except Direct Tension Indicators i.e. DTIs which may have any surface finish, as specified by manufacturer, with condition that the surface finish shall be compatible with the metallurgy of the steel structure and the HSFG bolt/ nut) shall be supplied with coating consisting of zinc phosphate that is used in conjunction with suitable oil of rust preventive type as per IS 1367 (Part XII).

22.10 Fabrication and Assembly of High Strength Friction Grip (HSFG) Bolts

22.10.1 Holes for HSFG Bolts: Normal holes in the steel members being connected by the rivets shall be used for HSFG bolts also, subject to the following:

(a) **Making of holes:** The holes shall be made by drilling only.

(b) **Nominal Diameter of Hole:** The nominal diameter of hole shall be 1.5 mm more than the bolt diameter for less than 25mm bolt and 2mm more than the nominal diameter of the HSFG bolt for larger diameters.

(c) **Oversize Holes:** In case the bolts are to be provided in existing structure, the maximum size of hole shall not exceed 1.25 d or d + 4 mm whichever is less.

22.10.2 Number of washers and their fixing:

(i) DTIs are very good method of ensuring that the bolts are tightened properly, and this method of tightening shall be preferred over the method with plain washers. Hence DTI washers shall be preferably used. If there is some problem with availability of DTIs, plain washers may be used for installation of HSFG bolts after approval of SAG officer in-charge of the work.

(ii)The DTIs used shall be the ones which are compatible metallurgically and also suitable for the bolts of property class 8.8 and 10.9. Suitable markings identifying the bolt manufacturer, property class of DTI and its diameter shall be engraved suitably on the DTI.

(iii) **Number of washers to be provided:**
(a)Two washers shall be provided, one against head and one against the nut.
(b)One DTI shall be used in one bolt. In case DTI is being provided, the same will count as one washer i.e.,one DTI and one plain washer shall be provided.
(c) DTIs shall normally be provided below the head of the bolt (with projections towards bolt head) in case nut is rotated. In case the bolt is to be rotated, DTI shall normally be provided under nut (with projections towards nut). In case other side is not accessible for measuring projection gap in DTI, the DTI may be provided under nut which is being rotated. In this case, an additional washer shall be provided on the DTI side to protect the projections from damage due to the abrasion during bolt tightening.

22.10.3 Surface preparation for steel interface before providing HSFG bolts:

The steel interface between the plies which form a joint having HSFG bolts shall have special surface preparation so that sufficient slip factor is available. The surface preparation shall be as assumed by designer in design, based on slip factor specified in Table XIII of Steel Bridge Code. The following surface preparation are recommended:

(i). **New construction:** The interface between the plies which are connected together by the HSFG bolts shall be "Aluminum metalized without any over coating". The aluminum metalizing shall be as per para 39.2.1

(ii). **Existing structures:** The interface of plies which are to be included in the HSFG bolts shall be cleaned by wire brushing/ flame cleaning equivalent to the surface specified in IRBM para 217, 1 (b), (i) to (iv). The surfaces shall be cleaned to remove all loose rust and paint layers (Only isolated patches of coatings/ rust can remain). If, however, in existing structures, rivets are to be replaced by bolts but no surface preparation is possible, the slip factor shall be suitably reduced as per Table XIII of Steel Bridge Code.

22.10.4 Personnel For Tightening: The tightening of HSFG bolts is a technical procedure. Only trained personnel who understand the procedure shall carry out the installation of HSFG bolts. Before any person is deployed for installation, his knowledge of the procedure for tightening shall be checked and if found satisfactory, a competency certificate shall be issued by an engineer not below the rank of ADEN or equivalent. The competency certificate once issued shall be valid for six months. Any person deployed for installation of HSFG bolts must possess a valid competency certificate.

22.10.5 Procedure for tightening: Bolts shall be tightened so as to impart bolt tension as specified in para 7.12.6 of IRS Code Of Practice For The Design Of Steel Or Wrought Iron Bridges carrying Rail, Road Or Pedestrian Traffic. The following steps shall be followed for tightening of bolts:

(i) The holes shall be brought in alignment by using drifts etc. such that the bolt threads are not damaged during insertion of bolts. Drifting shall not distort the metal or enlarge the holes.

(ii) The members being joined shall be held in position by insertion of few HSFG bolts (tightened to first stage (as defined in para 28.10.5) only). These bolts shall not be tightened to second stage as defined in para 28.10.5 till all the bolts in a joint are inserted and tightened to first stage.

(iii) After the alignment/ geometry of members is verified to be correct as per drawings, balance bolts shall be inserted and tightened upto first stage of tightening. The drifts inserted as above shall also be replaced by HSFG bolts one by one.

(iv) **Clearance between plies:** The final tightening shall not proceed until the gap between the plates has been closed. Residual gap, if any, shall be less than 2 mm at edges. There shall, however, be no gap in the central portion. In case the central portion is not in close contact or gap at edges is more than 2 mm, straightening of members may be done after opening out the bolts inserted and the entire procedure i) to iii) above shall be repeated.

(v) **Sequence of tightening:** During tightening of bolts also, the steel members can continue to deform and hence the tightening of subsequent bolts can lead to loosening of already tightened bolts. In order to minimize the loosening of already tight bolts, tightening in the two stages shall be done starting from the stiffest part to the free edges. Stiffest parts of joint are generally towards the center of the joint.

22.10.6 Procedure for Installation of HSFG Bolts Using Direct Tension Indicator: The tightening is done in two stages so that the bolts already tightened do not get loose when the subsequent bolts are tightened. The procedure shall be as follows:

(a) **First Stage of Tightening:** As a first stage, all bolts in the joint shall be tightened to 'snug tight' condition in proper sequence for tightening. Snug tight condition means the nut is tightened using an ordinary wrench by an average worker, applying maximum force on the wrench. This stage is required to bring the plies in close contact.

(b)**Checks after First stage tightening:** After first stage of tightening, the joint shall be checked to see if the plies are in close contact and the clearances are not exceeded.

(c) **Second Stage of Tightening:** During the second stage of tightening, torque wrench is used to tighten the bolts until the indentations on the DTI indicate full tightening. The bolts shall be tightened in proper sequence of tightening.

(d)**Checks after Second stage tightening:** 0.40 mm thick feeler gauge shall be used to check 100% of the bolts for proper tightening. If 0.40 mm thick feeler gauge cannot be inserted in the space between indicator positions on a DTI, it is called a 'refusal'. If a 0.10 mm thick feeler gauge cannot be inserted in the space between indicator positions on a DTI, it is called 'full compression of the indicator'. The joint/bolts shall be said to be properly tightened if the following condition is met with:

Number of indicator positions in DTI washer	Minimum number of feeler gauge refusals *
4	3
5	3

6	4
7	4
8	5
9	5
*No more than 10% of the indicators in a connection bolt group shall exhibit full compression of the indicator.	

22.10.7 Procedure for Installation of HSFG Bolts without DTI washers: The tightening shall be done in two stages so that the bolts already tightened do not get loose when the subsequent bolts are tightened.

i. **First Stage Tightening:** In the first stage, a calibrated wrench with an accuracy of ±10% shall be set to 75% of the torque computed for the complete tightening of the bolt. The torque computed shall be as per manufacturer recommendation, duly certified to impart the bolt tension specified in para 7.12.6 of IRS Steel Bridge Code. All the bolts in the joint shall be tightened to this torque in proper sequence for tightening. After checking all bolts after the first stage, permanent marks shall be made with suitable marker on the bolt as well as nut steel member to indicate the relative position of the two. The mark shall be such that the same shall be visible for inspection upto 1 year after the date of installation.

ii. **Checks after first stage:** After the first stage of tightening, following shall be checked:

b) The steel members that make up the plies of the joint with HSFG bolts shall be checked for proper contact as specified in para 28.10.4 (iv).

b) 10% bolts, subject to minimum 2 per joint shall be tried to be rotated with a separate calibrated torque wrench set at 75% of the proof load for the bolt. Any bolt turning by more than 150 during the check shall be rejected. If the improperly tightened bolts thus found are more than 5 but less than 1% of the total, another 10% of the bolts shall be checked. If the total improperly tightened bolts thus found exceed 1% of the total, the tightening procedure and personnel involved shall be reviewed, the torque wrench used for tightening shall be calibrated afresh and the entire lot shall be checked for tightness.

iii. **Second Stage Tightening:** The bolts tightened to first stage shall be turned by a further amount in proper sequence of tightening as specified below:

Total nominal thickness "t" of parts to be connected (including all packing and washed), d = dia of bolt	Further rotation to be applied during the second stage of tightening	
	Degree	Part turns
$t < 2d$	60	1/6
$2d \leq t < 6d$	90	1/4
$6d \leq t \leq 10d$	120	1/3

iv. **Checks after second stage tightening:** After the second stage of tightening, following shall be checked:

a) 100% bolts shall be checked and certified to have been turned through the requisite amount by verifying the permanent marks on the bolt and the nut/steel member.

b) 1% of the bolts, subject to minimum of 10 per size of bolts shall be checked for gross under tightening as per procedure given in Annexure D of IS 4000.

28.10.8(i) Painting during initial installation: In case of HSFG bolts with "Direct Tension Indicating" device, the final coat in field applied on complete structure may be applied on HSFG bolts also. In case part turn method of tensioning is used without "Direct Tension Indicating" device, the HSFG bolts shall not be painted and the permanent location marks made on the bolts shall be visible after 1 year of installation.

22.10.8(ii) Painting in service: HSFG bolts shall be painted as per normal painting schedules and painting methodologies as specified in the Indian Railways Bridge Manual for the girder as a whole.

22.10.9 Retensioning of bolts:

i. The HSFG bolts are tightened beyond yield stress level and undergo plastic deformation once tightened fully. If the bolt is opened out after complete tightening, its length gets increased permanently as compared with the initial length. The initial few threads which transfer the load from the nut to the bolt suffer the maximum damage. **Therefore, a bolt completely tightened shall not be reused under any circumstances.**

ii. A bolt which has been snug tightened or partially tightened (tightened to first stage of tightening) and then opened out will not be considered to have been fully tensioned and reuse of such bolt will be permissible in the same or different hole, as required.

22.10.10 Specifications of torque wrench: Except for works of minor nature where number of HSFG bolts to be installed in very less, only mechanical torque wrenches (pneumatic, hydraulic, electronic etc.) shall be used for tightening of bolts. For small quantum of work, manual torque wrenches may be used with permission of site-in-charge.

22.10.11 Calibration of torque wrench: Calibrated torque wrenches, accompanied with a certificate to the effect, shall be brought to site. Torque wrenches shall be calibrated periodically at least once in a year to an accuracy of }10%. These shall be recalibrated in case of any incidence involving the wrench during use resulting in heavy impact (such as fall, mishandling etc.,) or if the joint is found to have been improperly tightened using the same. The procedure for calibration of torque wrench shall be as specified by the manufacturer.

23. Connecting Pins

23.1 All connecting pins shall be finished accurately to gauge and parallel throughout, straight and with smooth surface entirely free from flaws and of sufficient length to ensure that all parts connected thereby shall have a full bearing on the pin. They shall be turned to a smaller diameter at the end for the thread and driven to place with a pilot nut, where necessary to preserve the thread.

24. Pin Holes

24.1 Pinholes shall be bored smooth straight and true to gauge and at right angles to the axis of the member. Boring shall only be done after the member has been rivetted up and the diameter of the pin shall not be less than that of the hole by more than 0.5mm

25. Bearing and Expansion Gear

25.1 All steel bed and bearing plates or plates over saddle castings, shall be made perfectly level and all rivet heads on their bearing surfaces shall countersunk and dressed flush.

25.2 The saddles, knuckle-bearers and roller bed-plates shall be planed on all bearing surfaces and elsewhere as indicated on the Contract Drawings and all bolt-holes shall be drilled. The bottom edge of ribs should be machined and welded to the bottom slabs after which the top edges of the ribs should be machined as a whole and the top plate welded. Subsequently the top and bottom surfaces should be machined to the specified tolerances as given in **Appendix VI of IRS Specification for Bridge Fabrication and Erection of steel girders serial No.B1-2001**. Generally in connection with the bearing gear all meeting surfaces including the sides of the roller frames, shall be machined, all bolts except anchor bolts turned and fitted, all washers faced, the rollers knuckles and pins polished to smooth surface and the whole finished in the style of first class machined work.

25.3 Tolerances shall be as specified in **Appendix VI of IRS Specification for Bridge Fabrication and Erection of steel girders serial No.B1-2001** and shall be shown on the drawings.

26. Erection in Contractor's Works

26.1 The work shall be temporarily erected complete at the Contractor's Works for inspection by the Inspecting Officer, with the exception of such riveting as has to be done at site, so that accuracy of fit and perfection of workmanship may be assured. The work shall be put together with sufficient numbers of parallel drifts or turned bolts or both to bring the pieces into place. When so erected all holes left to be filled at site shall be so fair that a parallel gauge turned to a diameter 0.8mm less than that of the hole, of a length equal to the depth of the hole, can be passed through them without difficulty. No drift shall be used anywhere in the work larger in any part than the hole in which it is to be driven. Holes for turned bolts, which have been 1 mm under drilled in shop, should be reamed at site by the erecting agency.

27. Interchangeability

27.1 Every span is to be temporarily erected complete in Contractor's works adopting the method of giving camber as explained in clause 34 and all parts as marked to their place, unless the whole of the work is made completely interchangeable by the use of steel jigs and hard steel bushes controlled by master gauges, in which case the first span must be completely erected to test the accuracy of the templates. Further spans or part span assemblies built from parts selected at random by the Inspecting Officer shall be erected from time to time to check the accuracy of the work as the Inspecting Officer may require.

27.2 If the work is considered interchangeable by the Inspecting Officer a simplified scheme of marking will be permitted, i.e. all pieces which are identical shall bear one distinguishing mark irrespective of the span to which they belong. Should the interchangeability not to the satisfaction of the Inspecting Officer, the whole of the spans must be erected complete and all parts marked to their place without additional charge. The renderers must state in their tenders whether they intend to adopt complete interchangeability or not.

27.3 Under special arrangement with the Purchaser, it shall be permissible for approved

portions of the work to be dispatched before complete erection of the first span, provided the Contractor satisfies the Inspecting Officer that such portions of the work are strictly interchangeable and will assemble correctly and accurately in the complete structure.

28. Camber

28.1 In order to ensure that the fabrication and erection of main girders shall be such as to eliminate secondary stresses in the loaded span, the nominal length (i.e. the lengths which will give no camber) of member shall be increased or decreased by the amount shown on the camber diagram supplied by the Purchaser.

28.2 For setting of the angles of intersection of the chords and web members and also for templating the gusset, full size of panels with nominal lengths of the members, shall be used. Similarly, the machining of all chords butts shall be to suit the nominal outline as defined in clause No. 34.1.

28.3 The procedure for erecting the span at Contractor's work shall be as specified. The site riveting holes shall be riveted or bolted and drifted as specified in **Appendix III of IRS Specification for Bridge Fabrication and Erection of steel girders serial No.B1-2001.**

28.4 When supported on blocks or staging's, the girders shall be erected to the camber specified in the fabrication drawings according to which the girders have been manufactured. A camber diagram indicating the relevant height of each panel point when erected on blocks at the manufacturing works shall be supplied by the Engineer.

28.5 The cambering of the main girders along with pre–stressing, when all panel points are supported on the blocks or staging's, shall be carried out in accordance with Appendix 'A' of Steel Bridge Code.

28.6 Special methods of erection will require special erection drawings approved by the Engineer, which must not be deviated from.

28.7 In the case where the girders are erected on yielding supports such as a service span, due allowance shall be made for the anticipated yield when the camber blocks are set out.

28.8 Frequent checks shall be made of the camber of girders during erection and care taken to see that the camber as per drawing is obtained when the girder is completely assembled. When span is supported on ends and intermediate supports are removed the dead load camber shall be recorded and entered in bridge register. This will provide the reference to compare the camber checked during technical inspection to ascertain the loss of camber.

29. Testing

29.1 The Inspecting Officer shall be empowered, at his/her discretion to make or have made under the supervision, any of the tests specified in the specifications mentioned herein in addition to such other tests as he/she may consider necessary, at any time upto the completion of the contract and to such an extent as he/she may think necessary to determine the quality of all materials used therein. In doing so, he/she shall be at liberty under any reasonable procedure, he/she may think fit to select, identify, have cut-off and take possession of test pieces from the material either before, during or after its being worked up into the finished product.

29.2 He shall also be empowered to call for a duly authenticated series of mechanical tests to be obtained from the maker for this materials used in the work and to accept the same in lieu of other tests to the extent he/she deems fit. The Contractor shall supply the material required for the test pieces and shall also prepare the test pieces necessary.

29.3 The test shall be carried out by the Contractor, for which Contractor shall provide all facilities including supply of labour and plant. Inspecting officer may at his/her discretion direct the Contractor to dispatch such tests pieces as he/she may require to the National Test House or elsewhere as he/she may think fit for such testing purposes.

30. Check on Tests Made at Contractor's Work

30.1 The Inspecting Officer may at his/her discretion, check test results obtained at Contractor's work by independent tests at National Test House/NABL.

30.2 The Inspecting Officer shall at all times be empowered to examine and check the working of the Contractor's plant before and after using it. Should the Contractor's plant be found, in the Inspecting Officer's opinion, unreliable, he/she is empowered to cancel any tests already carried out in this contract and have these tests carried out at any National Test House/NABL or elsewhere, as he/she may think fit.

31. Analysis

The Contractor shall supply authenticated copies of analysis of any materials used in the contract when required to do so by the Inspecting Officer who shall be empowered to accept them to the extent he/she thinks fit. In addition to the above samples may, at the Inspecting Officer's discretion be subjected to complete analysis at the National Test House or elsewhere as the Inspecting Officer may determine, the cost of the same to be borne by the Purchaser.

32. Inspection – General

The Inspecting Officer shall have free access to the works of the Contractor at all reasonable times and shall be at liberty to inspect the process of manufacture at any such time and to reject in whole or part, any work or material that does not conform to the provisions of this Specification and may order the same to be removed, replaced or altered at the expense of the Contractor. All gauges and templates necessary to satisfy the Inspecting Officer of the complete interchangeability of parts must be supplied by the Contractor free of cost.

33. Oiling, Painting and Metalizing

33.1 No part of the work shall be painted or coated, packed or dispatched, until it has been finally inspected and approved by the Inspecting Officer. Dry Film Thickness shall be measured by digital elcometer or any other approved method.

33.2 When so specified by the Purchaser, the whole of the work except machined surfaces shall be given protective coating using one of the systems of painting or metalizing given in clauses 39.2.1 to 39.2.4 of IRS B1. Prior to the application of protective coating , the surface of work shall be carefully prepared removing mill-scale, rust, etc. using wire brushes, sand or grit blasting as stipulated and approved by the Purchaser.

33.2.1 For locations where the girders are subjected to salt spray such as in close vicinity of the sea and/or over creeks etc. the protective coating by metalizing with sprayed aluminum as given in the **Appendix VII of IRS Specification for Bridge Fabrication and Erection of steel girders serial No.B1-2001** followed by painting as per painting schedule given below may be applied:

(i) One coat of etch primer to IS:5666.

(ii) One coat of zinc chrome primer to IS:104 with the additional provision that zinc chrome to be used in the manufacture of primer shall conform to type 2 of IS:51.

iii) One coat of aluminum paint to IS:2339 brushing or spraying as required. After the steel work is erected at site, the second finishing coat shall be applied after touching up the primer and the finishing coat if damaged in transit.

33.2.2 For locations where girders are exposed to corrosive environment i.e. flooring system of open web girders in all cases, girders in industrial, suburban or coastal areas etc., protective coating by metalizing followed by painting as mentioned in clause 39.2.1 or by painting using epoxy based paints as per the following painting schedule may be applied:

(i) Surface Preparation

a) Remove oil/grease from the metal surface by using petroleum hydrocarbon solvent to IS:1745.

b) Prepare the surface by sand or grit blasting to Sa 2-1/2 to IS:9954 i.e. near white metallic surface.

(ii) Painting

(a) Primer Coat

Apply by brush/airless spray two coats of Epoxy Zinc Phosphate primer to RDSO Specification No. M&C/PCN/102/86 to 60 microns min. dry film thickness(DFT) giving sufficient time gap between two coats to enable the first coat of primer to hard dry.

(b) Intermediate Coat

Apply by brush/ airless spray one coat of Epoxy Micaceous Iron Oxide paint to RDSO Specification No. M&C/PCN/ 103/86 to 100 microns minimum DFT of 100 and allow it to hard dry.

(c) Finishing Coat

Apply by brush/airless spray two coats of polyurethane aluminum finishing to RDSO Specification No. M&C/PCN-110/88 for coastal locations or polyurethane red oxide (red oxide to ISO 446 as per IS:5) to RDSO Specification M&C/PCN-109/88 for other locations to 40 microns minimum DFT giving sufficient time gap between two coats to enable the first coat to hard dry. The finishing coats to be applied in shop and touched after erection if necessary.

33.2.3 For other locations, protective coating by painting as per painting schedule given below may be applied:

a) Primer coat

One coat of ready mixed paint zinc chrome priming to IS:104 followed by one coat of ready mixed paint red oxide zinc chrome priming to IS:2074. Or Two coats of zinc chromate red oxide primer to IRS:P-31.

b) Finishing Coat
Two finishing coats of red oxide paint to IS:13607 with color/shade to be specified by Zonal Railway or of any other approved paint shall be applied over the primer coats. One coat shall be applied before the fabricated steel work leaves the shop. After the steel work is erected at site the second finishing coat shall be applied after touching up the primer and the finishing coat if damaged in transit.

33.2.4 Where the life of protective coating is required to be longer to avoid frequent paintings, the problem of accessibility of locations and for other locations where metalizing or epoxy based painting is recommended vide Clause 39.2.2 but there are no facilities available for the same, protective coating by painting as per following painting schedule may be applied with the approval of the Purchaser:
a) Primer coat
One coat of ready mixed zinc chrome priming to IS:104 followed by one coat of zinc chrome red oxide priming to IS:2074.
b) Finishing Coat
Two coats of aluminum paint to IS:2339 shall be applied over the primer coats. One coat shall be applied before the fabricated steel work leaves the shop. After the steel work is erected at site, the second coat shall be applied after touching up the primer and the finishing coat if damaged in transit.

33.3 Surfaces which are inaccessible for cleaning and painting after fabrication shall be applied one heavy coat of zinc chrome red oxide priming to IS:2074 before being assembled for riveting/welding.

33.4 For site painting the whole of the steel work shall be given the second finishing coat after finally passing and after touching up the primer and finishing coats if damaged in transit.

34. Name Plate

A neat casting bearing the name of the Contractor, the place and year of manufacture, drawing number, the contract number and the standard of loading to be specified by the Purchaser shall be bolted conspicuously on each span. The drawing of the name plate shall be approved by the Engineer.

35. Erection Mark

Every portion of the work shall be distinctly stenciled with paint with letter size not less than 10 mm for guidance in the erection in the field, and stamped with the letters specified in the drawings. In the case of non-interchangeable work, the system of marking shall be in accordance with the drawings prepared by the tenderer and approved by the Purchaser.

36. Packing

36.1 All projecting plates or bars shall be kept in shape by timber or angle bars spiked or bolted to them , and the ends of the chord lengths, end posts and plate girders at their shipping joints shall be protected and stiffened so as to prevent damage or distortion in transit as the Inspecting Officer may direct.

36.2 All threaded ends and machined surfaces are to be efficiently protected against damage in transit. The parts shall be sent out in lengths convenient for transport.

36.3 All straight bars and plates except small pieces are to be sent out in convenient bundles temporarily riveted or bolted together or bound with wrought iron or suitable wire as the Inspecting Officer may direct. All rivets, bolts, nuts, washers, plates under 300 mm square and small articles generally are to be packed separately for each span in cases each weighing, when full, not more than 350 kg, or in strong petroleum casks, or in barrels approved by the Inspecting Officer. If not entirely filled by the contents the space left shall be closely packed with wood shaving or other suitable material. Bolts and rivets of different sizes shall be separately packed in bags, each bag having a label indicating its contents. A list of the contents shall be placed in the top of each case or cask.

36.4 In the case of imported material all cases shall be made of 32mm boards with ends nailed with 90mm wire nails strengthened by battens and 38mmx 1.6mm (No. 16 BG) hoop -iron and made thoroughly secure for transit to India. All casks shall be in sound condition, and if not entirely filled by the contents the space left shall be closely packed with wood-wool or other suitable material. The heads shall be firmly secured by means of hoops in the usual way, and in addition each head shall be further secured by a strong wooden batten and not less than two strips of 1.6mm(No.16 BG) hoop-iron passing over the head and nailed to the staves on both sides. The hop-iron shall be long enough to pass over two hoops on each side of the cask and be nailed in such a manner that the hoops cannot slack back. Bolts and rivets of different sizes shall be packed in a separate canvas bags, each bag having a label in dictating its contents. End field holes to be bolted in case of members having split in plate and channels.

37. Dispatch or Shipping Marks

Each package, case or bundle is to have clearly stenciled on it in good oil paint the address as stated in the order of contract, gross and net weight description of contents and such marks as may be required by the Purchaser must be shown against each item in the invoice. The Contractor is to provide necessary stencil plates for marking. Every piece of bundle shall be marked and in the case of material (shipped to India) all cases or casks shall be clearly cut or branded, not merely painted, with their net and gross weights and with such shipping marks and other particulars as the Inspecting Officer may direct and each bundle shall also have a metal label securely attached with wire stamped with similar marks. The marking shall be done with thick oil paint and in such a manner that it cannot be washed off or obliterated.

38. Loading

38.1 All trucks or wagons are to be loaded to as near their full capacity as is consistent with safe transport. While loading the material in wagon, truck or trailor, care should be taken that heavier material is loaded first and lighter material is kept on top so that lighter material is not damaged due to heavy weight. While transporting the material by road, adequate safety precautions shall be taken as per extant instructions.

38.2 The Contractor shall apply all dunnage and lashing required to hold the material securely in position free of charge.

38.3 While handling any girder or girder component it shall be ensured no damage to material

takes place in the form of dent/cut mark etc. Wooden blocks, rubber pads shall be used to avoid direct contact between materials to be handled and handling equipment.

39. Weight of Steel Work for Payment

39.1 Any steel work the weight of which differs by more than 2.5% from the calculated weight determined from the nominal weight of the sections shall be liable to rejection.

39.2 Payment shall be made on the tendered weight to be calculated in accordance with the nominal weight of the sections as specified on the contract drawings. An addition in weight for welds/HSFG Bolts and rivet heads should either be specified in the schedule or be made as follows:

a) 3% in case of riveted or composite (riveted /bolted and welded) work; and
b) 1 % in case of purely welded work.

39.3 The actual weight fall short of the calculated weight by more than 2.5%, if material accepted, then will be paid for the actual weight only. The actual weight exceed the calculated weight, payment will be made for calculated weight only.

39.4 No separate payment shall be made for the items mentioned in clause 18 (Field rivets, Bolts, HSFG Bolts, Nuts and Service Accessories.)

39.5 In the event of a dispute arising as to the weight of a portion of steelwork, a weighment shall be made in the presence of the Inspecting Officer.

40. Quantities

In case where the estimated quantities are given with the schedule, it must be understood that the Purchaser will not be responsible for their accuracy and if the Contractor makes use of them in preparing his/her tender, he/she does so at his/her own risk, as he/she will not be entitled to make any claim or demand nor to raise any question whatsoever, on account of any error or miscalculations in or misunderstanding of the said quantities, as these are given for the convenience of the Purchaser.

41. Tracings and Printings

Excepting in the case of standard spans fabricated without any modifications to the standard drawings the Contractor shall supply free of charge, one set of neatly executed tracing on linen. They shall be fully dimensioned and contain all erection marks, notifications as to the colour the work has been printed, the name of the Contractor and any alterations from the contract drawings, which may have been made in executing the work. The drawings shall conform to standard sizes as given in IS:962 and shall not exceed AO size. The drawings shall not be folded but rolled outwards on a roller, in addition to three sets of full size copies on strong paper made by an approved process.

42. Rivets and Bolts Lists

The Contractor shall also supply, without charge, three complete lists of the rivets, bolts,

HSFG bolts, service bolts, washers and drifts required for erecting the work at site, showing the parts of the work to which the various rivets and bolts belong and having each item marked so as to indicate the particular case in which it will be found.

43. Photographs

If required by the Purchaser the Contractor shall also supply without charge, two sets of large well-executed, uncounted photographs of the first span of each description of plate girder or truss bridge when erected, taken from two points of view and showing the erection marking as clearly as possible Photographs of rolled beam, trough girder or trough plate girder bridges will not be required.

44. Attestation of Tracings etc.

The tracings, photographs and lists shall be examined and signed by the Inspecting Officer. They shall be supplied with the first installment of the work delivered.

45. Deviations from this Specification

45.1 Should a tenderer desire to depart in any respect from the provisions of these Specifications either on account of manufacturing practice or for any other reasons, he/she must do so in an alternative tender which may not be considered, with a covering letter explaining in detail each and every departure he/she proposes to make from the Specification.

45.2 Manufacturer's standard specification may be submitted but all discrepancies must be carefully drawn attention to, both in covering letter and in appendices to be annexed to the specification.

45.3 The intention is to adopt manufacturer's standard equipment as far as possible but these standards must in all respects comply with the conditions of this Specification regarding safety from break-down, output, capacity, performance etc.

46. Alterations in Work

46.1 The Contractor shall not in any case or in any circumstances have authority to make any alterations in, modifications of, substitution for, addition to, or omission of work or any method or system of construction, unless an alteration order in writing directing such alteration modification, substitution, addition, omission or change shall have been given by the Purchaser prior to the commencement of the work or part of work nor shall the Contractor be entitled to any payment for or in respect of any such alteration, modification, substitution, addition, omission or change may have been actually made and executed and no course of conduct shall be taken to be a waiver of the obligation and conditions hereby imposed.

46.2 All altered, modified, substituted, additional and changed work, labour and materials and all omitted work shall be valued by the Purchaser on the basis of the rates specified in the schedule.

47. Elastomeric Bearings:

Elastomeric bearings are to be supplied as per the Design of UIC -772-2R and testing shall be done as per IRC-83-1987 part-II with latest correction slips. Materials used in manufacture of bearings shall be confirmed to the specification indicated in IRC Code. Contractor has to submit the manufactures test certificate bearing the information contained in appendix-3 of IRC. In addition to this, physical testing shall be done either in IIT, DGS&D or any other Govt. Institution as indicated by Engineer-in-charge. Fixing of the bearings to precast concrete surface may be done by application of epoxy resin adhesive to interface, after specified surface preparation. The specification of adhesive material workmanship and contract shall be approved by the Engineer. Supplying, Acceptance inspection & Testing, and Installation of Elastomeric Bearings will be also govern by para 22.3 of Indian Railways Unified Standard Specifications (Works and Materials) 2010.

48. The contractor shall procure one copy each of the following IS codes and shall be available at working site.

(i)	IRS :- Bridge Rules – 1964.
(ii)	IRS :- Welded Bridge Code – 1972.
(iii)	IRS :- Steel Bridge Code – 1941/
(iv)	IRS :- Schedule of Dimensions (BG) – 2004.
(v)	IRS :- Indian Railway Standard Specification for Fabrication and Erection of Steel Girder Bridges and Locomotive Turn – Tables B – 1 -2001.
(vi)	IS :- 2062 – 2011 – Hot Rolled Medium and High Tensile Structural Steel – Specification. IS :- 8910 – 2010 – General Technical Delivery Requirements for Steel and Steel Products.
(vii)	IS :- 800 – 2007 – General Construction in Steel -- Code of Practice.
(viii)	IS :- 814 – 2004 – Covered Electrodes for Manual Arc Welding of Carbon and Carbon Manganese Steel – Specification.
(ix)	IS :- 9595–1996 -- Metal Arc Welding of Carbon and Carbon Manganese Steel – Recommendation.
(x)	IS 822-1970 -Code of procedure for Inspection of welds.
(xi)	IS 816-1969 –Code of Practice for use of Metal Arc welding for General Construction in mild steel.
(xii)	IS :- 7310 (Part-I) – 1974 – Approved Test for Welders Working to Approved welding.
(xiii)	IS :- 7318 (Part – I) – 1974 – Approved Test for Welders when welding procedure approval is not required.
(xiv)	IS :- 4000 – 1992 – High strength bolts in steel structures – code of practice.
(xv)	IS :- 3757 – 1985 – Specification of high strength structural bolts.
(xvi)	IS :- 6649 – 1985 – Specification of Hard end and tempered washers for high strength structural bolts and nuts.
(xvii)	IS :- 6623 – 1985 – Specification for high strength structural nuts.
(xviii)	IS :- 7215 – 1974 – Tolerances for fabrication of Steel structures.
(xix)	IS :- 2004 – 1991 – Carbon steel forgings for general engineering purpose-specification.
(xx)	IS :- 7205 – 1974 – Safety code for erection of structural steel works.
(xxi)	IS :- 4353 – 1995 – Submerged arc welding of mild steel and low alloy steels - recommendation.
(xxii)	IS :- 10178 – 1995 – CO2 gas shielded metal arc welding of structural Steel –

	recommendation..
(xxiii)	IS :- 104 – 1979 – Ready mix zinc chrome paint.
(xxiv)	IS :- 2074 – 1992 – Ready mix red oxide zinc chrome paint.
(xxv)	IS :- 2339 – 1963 – Aluminium Paint.
(xxvi)	IS :- 739 – 1992 – Wrought Aluminium and Aluminium Alloy – wire for general engineering purpose – specification.
(xxvii)	IS:- 5666 – 1970 – Specification for each ETCH (pre-treatment) primer.
(xxviii)	IS :-1148 – 1982 – Specification for hot rolled steel rivet bars for structural purpose.
(xxix)	IS :- 1149 – 1982 – Specification for high tensile steel rivet bars for structural purpose.
(xxx)	BS :- 111 (R-6)– Specification for HSFG Bolts.
(xxxi)	BS :- 110 R – For fabrication of steel Girders.
(xxxii)	BS :- 115 (R-1) – Specification for Stud shear connectors.
(xxxiii)	IS :- 3502 – 2009 Steel Chequered Plates
(xxxiv)	BS:- 45- Fabrication of steel channel sleepers

Note: The books of reference shall also include further references mentioned in above-mentioned books of references. All the books, references and codes shall be of latest edition with up to date correction slips

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CHAPTER-XVII

Additional Special Condition of Contract Specification
FABRICATION OF STEEL GIRDERS

The fabrication of steel girder bridges is being done by various Railway through trade. The fabrication is governed by the provisions of;

i) Indian Railway Standard specification for fabrication and erection of steel girder bridges and locomotive turn-tables. (B1-2001).

ii) Indian Railway Standard Code of Practices for metal arc welding for structural steel bridges carrying rail cum road or pedestrian traffic (Adopted 1972 Revised 2001).

All Rly engineers associated with fabrication are advised to understand the provision of IRS B1-2001 and Welded Bridge Code and take help from these guidelines. Engineer of contractors should also have good understanding of various provisions of above Railway codes other related codes and Guide lines on Fabrication RDSO-BS-110(R).

ITEM REQUIRING ATTENTION BY RAILWAY FIELD ENGINEERS AND CONTRACTORS & ENGINEERS DURING FABRICATION OF STEEL GIRDERS

A. Approved Drawing to be used for fabrication:

Field/Workshop Engineer associated with fabrication should have all the relevant drawings, Codes & Specifications with latest Correction Slips prior to the start of work. On the basis of structural drawings, fabrication drawings should be prepared by fabricator. Plate Girder Drawings to be checked for intermediate stiffeners whether riveted or welded.

B. Quality Assurance Programme (QAP) of Steel Girder Fabrication:

To ensure the proper quality of fabrication Quality Assurance Plan (QAP) is prepared. QAP must indicate stage wise manufacturing process covering various steps, tests, checks & their frequency, sampling plan, authority for grant of clearance etc. for all activities from inspection and testing of raw material to trial assembly and erection. The QAP must cover following aspects.

1. Brief Details of project
2. Contract Agreement No.
3. Loading Standard
4. Governing Specification
5. Drawing references
6. Roles and responsibilities of various agencies involved in fabrication erection & inspection.

A sample QAP for 30.5m welded open web girder is given at **Annexure-I of Guidelines on Fabrication of Steel Girder BS-110 (R) issued by RDSO B&S Directorate.**

QAP is to be scrutinized and approved by the inspection agency. In case of welded girder it is to be done by RDSO, as per prevailing orders.

Field Engineer should ensure that work is carried out strictly as per the approved QAP and no Deviation takes place from QAP. All the stages should be studied in detail, prior to start of work.

C. Scrutiny & Approval of Welding Procedure Spec. Sheet (WPSS) (final approval to be done by RDSO):

WPSS is process sheet indicating plate/section used, welding process, type of joint, welding consumables quality, welding parameters, acceptance standard, tests applicable etc. Field Engineer should ensure that welding is carried out as per approved WPSS. It is to be ensured that welding consumables to be used are from approved source and a proper record of their consumption is maintained. A sample Performa for record keeping of consumables is enclosed as **Annexure –II of Guidelines on Fabrication of Steel Girder BS-110 (R) issued by RDSO B&S Directorate.**

D. Welding Procedure Qualification Records (WPQR) (final approval to be done by RDSO):

WPQR is the document indicating approval of various welders who are to be deployed for carrying out welding work for fabrication. It contains Name of the welder with photograph, qualification, experience, qualification tests and records for each welding process and joint, welding parameter. Tests are conducted by RDSO Official from M&C Directorate before qualifying the welders and then approval is granted through WPQR. Field engineer should ensure that welding is done only by approved welders and no deviation takes place.

E. Raw Material and Gauge Certification

Inspection of Raw Materials:-Passing of raw material is done on the basis of visual inspection and lab test for mechanical properties, chemical composition, ultrasonic examination, Charpy Impact Test, lab test report etc. Rivets and other consumables like paint etc. should also be got tested from NABL Lab as per relevant codes/specification. All the required test should be got done through independent NABL Labs and compared with the mill test results given by the supplier before passing the material for use. Material test certificate register must be maintained by fabricator as per Annexure available in IRS:B1-2001(appendix-I,Performa-7)and signed by railway representative as well as fabricator. All angle/channel, rolled section to be used for open web girder fabrication shall be checked for rolling tolerance as stipulated in IS:1852. In addition to above visual inspection shall be done to ensure that steel is free from surface defects like pitting, laminations, imperfect edges, twist, other harmful defects etc. and recorded in the register.

F. Item requiring attention before Fabrication of Girder.

F1. Inspection of Layout on template floor–Field engineer has to ensure that the Template floor is level. Nominal and camber layout are drawn with the calibrated steel tape. The certificate of calibration from a authorized agency should be kept in record. For squareness, diagonal measurement are also checked. It should be remembered that tape should not be changed during the various stages of measurement. Running measurement should be recorded with a long tested tape having minimum length suitable for half span/full span measurement as per the case.4 lbs pull is to be applied for stretching the tape. Suitable device should be used for this purpose.

F2. Inspection of Jigs, Fixtures and Master Plates-Master Gussets should be checked on nominal layout and transfer of all inter section line/points to be done with great care and accuracy. If gussets are symmetrical then 1/4 or half hole marking is to be done and same will be transferred

to complete the gusset marking. Dimensional Inspection of Jigs, Fixtures, Master Plates used in manufacture of girder should be done very carefully to ensure accuracy. It should be remembered that jigs of main members of the open web girders are fabricated on the camber length with the adoption of the field holes at nominal length layout through master gussets.

F3. Layout of joints is drawn as per drawing on 1:1 scale on a level ground to check for ;

i)Any infringement of rivets, adjoining edges etc.

ii)Position of holes in master plates for jigs as per layout.

iii) The bore of bushes shall initially have tolerances of - 0mm to + 1mm. Fairing of bushes with holes of master plate shall conform to tolerances of – 0.13mm using a 'GO' gauge of 0.13mm less than hole diameter. Bushes of jigs during service should be maintained within acceptable limit (D+0.4mm) which shall be checked at regular intervals.

F4. Certification of Jigs, Fixtures and Master Plates-Stamping of Master Plates by the inspection official should be ensured prior to their use. The jigs should be checked by fabricator and field engineer from time to time for their wear and tear for maintaining accuracy during work.

G. Item requiring attention during fabrication of girder:
Workshop engineer should keep a watch and maintain proper record for-

(i)Ensuring Use of Approved Raw Material-Only raw material cleared originally to be used during fabrication.

(ii)Ensuring use of Approved Welding Consumables-Type of consumables, source, quality, approval status, and grade, suitability for fabrication as per WPSS etc. to be frequently checked and recorded.

(iii)Ensuring use of Approved Welders-Checking of welder's certificate, records, skill and procedure adopted for welding as per WPSS

(iv)Ensuring use of Approved WPSS & Welding Parameters-Checking, welding parameters and equipment used for correctness of joint preparation etc.

Important Checks for Tack Welding:

i) Check that top & bottom flange plate are perfectly perpendicular with reference to web throughout the length of I Section.

ii) Check the squareness i.e. 90° angle between flange & web of top and bottom flange plate to avoid out of squares flanges.

iii) Check with filler gauge throughout the length of top & bottom flange connection for uniform contact throughout the web plate.

Points requiring attention during full welding:

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i) Thorough cleaning of tack welded member should be done with appropriate tool like wire brush, before shifting for full welding. Minimum width of 75mm throughout the length shall be cleaned to ensure that the surface is free from dust, mill scale, grease, oil and paint to ensure sound quality of weld.

ii) Full welding shall be carried out in flat position with SAW process as per sequence mentioned in WPSS/WPQR using manipulator/special welding fixture.

iii) The sequence of welding shall be shown in WPSS/WPQR marked as 1, 2, 3 & 4 in the order of welding.

iv) The welding should be done in proper sequence.

v) Minor welds/ Inaccessible location welds shall be made by CO2weldingor other type of welding as per approved WPSS.

Good Working practice for prevention of distortion in welded girders:

i) By pre-bending of flange plate of welded girder using appropriate fixture.

ii) By clamping the flange plate to fixture.

(Fixture developed by MMR Workshop is given at **Annexure.III of Guidelines on Fabrication of Steel Girder BS-110(R) issued by RDSO B&S Directorate.**)

Radiographic Exam. of Butt Weld Joints-Any butt welding provided as per approved WPSS should be subjected to radiographic testing by authorized agency only. The film should be preserved for examination, sensitivity, defect interpretation and acceptance decision based on prescribed criteria.

Ensuring use of Approved set of Jigs & Fixtures-To permit the inter changeability of the components and ensure pre-stressing in open web girders and to avoid distortion, it should be ensured that only approved Jigs & fixture are used and proper clamping arrangement are provided in jigs/fixtures.

H. Item requiring attention after fabrication of girder: stacking of component should be proper and shipping mark is properly stencilled on component for identification.

Field/Workshop engineer should ensure that:-

While cutting the plates or other section the heat/cast mark should be transferred to all cut members while using these members for fabrication. Proper record of heat mark should be maintained/ correlating it with the components of girder. Visual Exam of Welds-Quality of weld, uniformity of weld bead, size of the weld, weld defects e.g. under cut, blow hole, porosity, spatter, crack etc. should satisfy para 31 and Appendix C of welded bridge code. Metallographic and NDT Exam of Fillet Welds-Macro etching on girder, run-on, run-off tabs for ensuring proper weld quality, Dye penetrate examination etc. should be arranged by fabricator, for independent inspection. Structural and dimensional inspection-Dimensional check should be carried out by field engineer to

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ensure conformance to drawing dimensions including diagonal checks for squareness etc. before offering girders for final inspection.

I. Trial Assembly: for open web girder.

First span is always trial assembled to check whether fabrication process is proper or require any correction in jigs, workmanship or procedures to ensure regular quality output. Following important parameters are checked during trial assembly:-

(i) Camber:
Camber shall be checked while the girder is supported on the nodal points on camber jacks and after releasing jacks i.e. for residual camber with girder resting on bearing ends. The camber measurements should be done with appropriate leveling instrument:

(ii) Dimensional check:
i) Overall length
ii) Bearing centers
iii) Height
iv) Truss center
v) Center to center distance of rail bearers
vi) Center to center distance of panel points
vii) Squareness
viii)Alignment of the girder
ix) Fairing of holes
x) Verticality
xi) Infringement, if any
xii) Butting of compression flange.

(3) Component Inspection of first span- Detailed inspection of dismantled components of trial erected span is carried out to see the integrity of components. There should not be any elongation of holes, tearing of edges or other defects after dismantling of trial assembly.

(4) Component inspection of 2nd span onwards:- Once fabrication process is found satisfactory i.e all steps from A to J are proved during trial assembly and its component inspection, then only components of 2nd span and onwards should be fabricated with the approved sets of jigs and fixture, the tested WPSS and WPQR as laid out in steps earlier. Field engineer should do the components inspection and ensure all record are available before giving final inspection call inspecting authority.

Plate girder check.
i) Overall length
ii) Bearing centers
iii) Height
iv) Girder center
v) Squareness
vi) Fairing of holes
vii) Verticality
viii)Infringement, if any
i) Butting of compression flange.

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L. Anti Corrosive Treatment- Surface preparation, metalizing and or painting as per applicable painting schedule. Should be done as per provision given in para 39 of IRS:B1-2001. It should be ensured that paint are procured only through RDSO approved sources. The list of approved vendors by M&C Directorate of RDSO is available on web site.

M. Some important DOs & DON'TS are given here for guidance:-

DOs-

- Use proper fixtures and clamps to hold the members firmly at desired location while welding. The clamps and fixtures must be strong enough to prevent any distortion of the member while cooling of the welding joint. The clamps and fixtures are only to be removed when the joint is cooled to ambient temperature.
- Do the welding work in a warm and dry place so that rain water or other atmospheric elements may not come in contact while welding is in progress.
- While welding in very cold weather pre-heat the material before welding and apply post heating to prevent the weld joint from rapid cooling and develop stress raiser due to sudden contraction.
- Cross level of bearing plates in the welded plate girders should be checked properly for proper sitting over bed plate.
- To co-relate use of steel and welders in different members proper records should be maintained.
- Drilling of holes through approved set of jig particularly long members should be ensured. No fabrication should be done with unapproved jig.
- Drain hole in the portal girders at proper locations should be ensured.
- Fairing of holes and removal of drill burrs through initial assembly should be ensured.
- Proper edge finishing with grinding/ special attention in top chord compression members butting by end milling should be carried out
- At site during the erection of girders particularly open web girders due and adequate care should be taken to achieve the required camber values.
- Camber Jacks should be provided at all the nodal points during trial assembly.
- Butting of compression members, X-levels of stringers and alignment of stringers to be checked properly in the trial erection.
- Application of paint on permanent contact surface should be ensured after proper surface preparation visual inspection is very important tool.
- The plates should be perfectly horizontal while drilling the holes to ensure horizontal verticality of holes.
- Steel with proper test certificate/ reports should be used. Commercially available steel in the market should not be used.
- Steel received from the rolling mills has generally punch heat mark numbers. These numbers should be legibly marked again with paint for easy identification. Heat mark numbers should be transferred to cut members with paints.
- Members of the open web girders should be fabricated on the camber length with the
adoption of the field holes of nominal length.

- Consistency of weld quality is higher in Submerged Arc Welding Process and chances of human errors are also eliminated. Therefore, welding of the girders should be done by SAW process. Whenever not possible then only CO2 welding or MMAW may be adopted if provided in app. WPSS.
- Stage inspection during fabrication should be properly ensured to avoid rejection at later stage.
- Skilled and qualified welders, drillers, fitter should be deployed for welding drilling and marking works. The welder should be individually approved by authorized agency i.e. M&C Directorate of RDSO.
- Selection of Angles in fabrication of cross girders and stringers of open web girders requires special attention, drooping in angles either acute or obtuse should not be permitted. It will cause improper sitting of sleepers on the stringers.

DON'T's-

- Use of pitted/ corroded material should not be done because it gives rise to concentration of stresses and results in poor fatigue strength.
- Tack welds in fabrication of riveted open web girders should be avoided.
- Do not hammer the distorted joints for rectification. It may lead to the development of cracks and failure of the joints.
- Do not do the welding in chilled weather, as due to sudden cooling of welded joints they are liable to be brittle and develop cracks. The joints may also suddenly fail under dynamic loading without any prior warning.
- Do not weld with un-controlled welding parameters, these will affect the quality of welding and make the joints weak and may yield in dynamic loading on the structure.
- Do not weld the joint haphazardly without following the proper welding sequence. This will lead to uncontrolled and irreparable distortion, of the proper geometry of the joint.
- Sharp notches in the member should be avoided.

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CHAPTER- XVIII

SCHEDULE OF TECHNICAL REQUIREMENTS for SUPPLY OF TMT REINFORCEMENT BARS TO IR.

A. ELIGIBILITY CRITERIA :

I. "The vendor, should be a producer of steel, irrespective of process route, starting their operations from iron making, using iron ore, virgin or processed, with necessary refining facilities/ methodology and rolling / processing facilities at a single location or else in multiple locations provided that the entire gamut of iron & steel production, from iron making to finished steel production, is owned by the same company or its subsidiary company (ies) and provided that the iron making capacity is sufficiently matching the steelmaking capacity. Further, downstream units should use material from the upstream units of the same company or its subsidiaries with traceability system".

TMT reinforcement bars should comply to IS: 1786 (latest) as well as Para 5.3 of IS: 13920 (latest) for all seismic zones i.e. II, III, IV or V.

For DRI – EIF process route of steelmaking - Refining facilities such as LRF or any other established technology being used by the firm.

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Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

Signature of Tenderer(s)/Contractor(s) For Chief Engineer(Con)/I/BSP

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

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Executive Engineer (Con)
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CHAPTER- XIX
SCHEDULE SUMMERY/RATE SHEET

Name of the work:- **Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.**

Sl. No.	Description of work	Departmental value	Accepted Rates
1.	Execution of all works covered under Schedule - '1' (Soil Testing).	₹13,48,056.55	At Par with a rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "1".
2.	Execution of all works covered under Schedule - '2' (Earthwork and allied Works).	₹63,38,78,612.92	7% (Seven Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "2".
3	Execution of all works covered under Schedule - '3' (USSOR-2010 various items for bridges).	₹17,92,35,424.86	5% (Five Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "3".
4.	Execution of all works covered under Schedule - '4' (N.S.Items).	₹9,72,96,916.78	10% (Ten Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "4".
5.	Execution of all works covered under Schedule - '5' (USSOR-2010 various items for bridges).	₹4,15,86,341.69	10% (Ten Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "5".
6.	Execution of all works covered under Schedule – '6' (Retaining wall, drain, Stations, other Service buildings and Residential Buildings).	₹8,91,78,914.29	5% (Five Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "6".
7.	Execution of all works covered under Schedule - '7' (Cement).	₹13,29,56,995.85	At Par with a rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "7".
8	Execution of all works covered under Schedule - '8' (Reinforcement Steel).	29,74,08,883.20	At Par with a rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "8".
9	Execution of all works covered under Schedule - '9' (Steel Girder).	14,05,21,786.43	10% (Ten Percent) above with rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "9".
10	Execution of all works covered under Schedule - '10' (H Beam).	1,13,52,516.30	5% (Five Percent) above with rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "10".
11	Execution of all works covered under Schedule - '11' (P.Way works).	2,88,96,909.00	8% (Eight Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "11".

VETTED
For F.A. & C.A.O. (Cons.)
S.E.C. Rly. Bilaspur (C.G.)

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Signature of Tenderer(s)/Contractor(s)
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JOINT VENTURE PARTNER

For Chief Engineer(Con)/I/BSP

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12	Execution of all works covered under Schedule - '12' (Welding of Rail Joints).	40,87,190.30	15% (Fifteen Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "12".
13	Execution of all works covered under Schedule - '13' (Transportation of P.Way materials).	2,59,59,943.00	20% (Twenty Percent) above with rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "13".
14	Execution of all works covered under Schedule – '14' (P.Way works under Z-section of SOR-2006 items).	55,59,000.00	15% (Fifteen Percent) above with rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "14".
15	Execution of all works covered under Schedule - '15' (Ballast supply).	5,32,88,400.00	8% (Eight Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "15".
16	Execution of all works covered under Schedule - '16' (USSOR-2010 various items).	7,87,73,819.59	20% (Twenty Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "16".
17	Execution of all works covered under Schedule - '17' (N.S. items).	3,86,51,325.13	10% (Ten Percent) above with rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "17".
	Total Departmental Value	₹185,99,81,035.89	
Note: Accepted rates of Schedule 4, 5, 8,10,12, 14, 13, 15, 16 & 17 should not be referred in future tenders in isolation.			

Note:-

(1) The quantities indicated in the Schedule of Rates are approximate. The Railway reserves the right to alter the same as per the requirements and site conditions for successful completion of the work.

(2) Rates indicated for all the Non-SOR items are including all elements of cost such as all lead, lift, ascent, descent, crossing of rivers/railway track/nallahs, handling, re-handling, royalty and all taxes etc.

(3) The rates are included of Octroi, royalty and men, material and machines, as a complete job and nothing extra to the rate quoted by the tenderer in the above proforma, will be paid.

(4) Unless otherwise specified in the Schedule of Items, the rate quoted by the tenderer(s) includes:-

(i) All labour, tools, plant equipment, machinery, materials, cement etc.

(ii) All lead, lift, ascent, descent, jungle clearance and making approach roads etc.

(iii) Loading, unloading, handling, re-handling, and transportation of Railway materials from Railway depot to site of work and vice-a-versa.

(iv) All royalty, octroi and other necessary taxes on material and products.

(v) Clear and suitable water required for the work.

(5) The material supplied by the Contractor must conform to concerned IS and IRS Codes, policy guidelines etc.. The rate includes testing of materials as per the Codes.

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F.A. & C.A.O. (Const.)
Rly. Bilaspur (C.G.)

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(6) In case of any difference in rates/units/item description/specifications of USSOR/SOR/IRUSS items in the schedules etc. and as mentioned in the published book of USSOR-2010/IRUSS-2010/SOR-2006, the rate/unit/item description/specification as mentioned in the published book of USSOR-2010/IRUSS-2010/SOR-2006 will be taken as correct.

(7) For Detailed specification refer Special Conditions of Contract under various chapter of this tender document and SECR/USSOR-2010/IRUSS-2010/SOR-2006 specifications. Also, for detailed description of the USSOR/SOR items, S.E.C.Railway Unified Standard Schedule of Rates (Works and Materials)-2010 & SOR-2006 shall be referred.

VETTED
For F.A. & C.A.O. (Cons.)
S.E.C.Rly. Bilaspur (C.G.)

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JOINT VENTURE PARTNER

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SOUTH EAST CENTRAL RAILWAY

T.NO.CEC/BSP/22-23/19

Name of the work:- Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.

SCHEDULE-"1" (Geotech Investigation & Design of Bridges)

Sl. No	Description of work	Qty	Unit	Departmental Rates	Amount (Rs.)
1.	Drilling of 150 mm/100mm dia. bore holes, in overburden through all types of soils to refusal depth including collection of undisturbed /SPT samples along with submission of necessary test results and bore logs for each type of strata encountered and to recommend the safe bearing capacity of each strata.				
	For ROR	40	RM	1214.94	48,597.60
	For other than ROR	160	RM	1214.94	1,94,390.40
2.	Drilling of NX size bore holes with T.C. Bit through refusal strata, boulder strata and soft/weathered rocks having core recovery from NIL to 40% including supply of core boxes for preserving cores obtained and testing of specimen for crushing strength along with submission of necessary test result and bore logs of each type of strata encountered and to recommend safe bearing capacity.				
	For ROR	25	RM	1503.87	37,596.75
	For other than ROR	85	RM	1503.87	1,27,828.95
3.	Drilling of NX size bore holes with diamond bit in medium /hard rock having Core Recovery more than 40% including supply of core boxes for preserving cores obtained and testing of specimen for crushing strength along with submission of necessary test result and bore logs of each type of strata encountered and to recommend safe bearing capacity.				
	For ROR	10	RM	1788.07	17,880.70
	For other than ROR	30	RM	1788.07	53,642.10
4	Erection of disposable working platform to drill bore through flowing /standing water through river bed if necessary and dismantling after completing the work and removing from the site to clear the water way.				

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Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

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Executive Engineer (Con)
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for FA. & C.A.O. (CORS.)
S.E. Rly. Bilaspur (C.G.)

	For other than ROR	2	Each	16,977.45	33,954.90

Note for item No 1 to 4:

(a) Any damage caused to any of the existing/ temporary structures shall be repaired to bring to the original standard by contractor at their own cost. Waterway to be kept clear of any infringement.

(b) The cost include all field & laboratory tests involved in core drilling to provide detail of strata, core recovery, rock quality designation, specific gravity, unconfined compressive strength, C, Ø value, coefficient of consolidation, standard penetration test, water loss, consistency limit, bulk density of soil, particle size distribution, bearing capacity and other test parameters required for design of foundation including taking of all disturbed and undisturbed samples. The core drilling information and Engineering test results are to be prepared and presented as mentioned in IS Code no. 4464-1985, IS:11315-1985 & IS:2131-1981.

(c) The quantities given in the above schedule are approximate only, and the actual quantities to be executed will depend on the actual soil strata encountered and as decided by the Engineer in charge.

(d) All samples of bore logs for each strata and depth wise to be submitted to Railway in containers and in boxes/trunks.

Documents to be submitted:

(i) Geotechnical reports showing bridge wise details of each bore log recommending safe bearing capacity and type of foundations to be adopted.

5 Detailed designs of Railway major/Important bridges for 25 T Loading - 2008 Standard including calculations in accordance with relevant IRS, IRC and IS codes including preparation/ submission of detailed execution drawings and specification.

1. Scope of work for item no.5 :

a. Visiting the site of bridge and study of topography of area, catch water area.
b. Study of Geo technical investigation report and interpretation of its results, which shall be payable under item No 1 to 4 of this schedule.
c. Preparation of design and General Arrangement Drawings (GAD)
d. Preparation and submission of detailed structural design and drawings of foundation, substructure, superstructure and protection works.
e. The design/ drawings including structural design calculations and the criteria for deciding spans/ water way/ head way and protection works, etc., will be got checked and approved by the tenderer/ contractor from reputed Engineering college consisting of either IIT/NIT designed as approved by Engineer in Charge.
f. A set of design calculations in 3 copies shall be submitted by the contractor. Six prints of each working drawing along with one reproducible tracing print of each working drawing shall be submitted.
g. The design and drawing will become property of Railways and the railway shall be at liberty to refer and follow these drawings as and when required.
h. Design calculations and drawings for load testing shall be given separately by the contractor for each bridge as required.

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RSA-SK JOINT VENTURE

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Asst. F.A. & C.A.O. (Cons.)
S.E.C. Railway, Bilaspur (C.G.)

	i. All the documents and drawings as asked above shall be submitted in soft copy also. j. Design of Superstructure is not required to be done by the tenderer (in superstructure design Standard PSC/steel girders cleared by RDSO are to be used mentioning the drawing number etc.) k. Final designs and drawings on reproducible tracing papers etc are to be submitted.				
	For other than ROR	23	Each pier/abutment with return wall/RCC/opening of RCC BOX with return wall	Rs. 36,268.05	8,[illegible]165.15
	Total of Schedule '1' (Total for ROR = Rs 1,04,075.05 & for other than ROR = Rs 12,43,981.50)				13,48,056.55

2. Payment Schedule & note for item no. 5 :

(a) On submission of design and drawing duly approved by an IIT or NIT (as per clause (e) of scope of work) - 35%

(b) On approval of design and drawings by the Railway - 55%

(c) On submission of RTP's Drawings, etc- 10%

NOTE: i) The payment will be released after completion of above work for the whole bridge, i.e., when the process is completed for all the spans of a bridge. Partial payment will not be admissible for a part of a bridge.

ii). GAD of the bridge including bore log details has to be submitted within one month from the date of acceptance of tender. No separate payment for preparation of GAD shall be made as it is in the scope of the item

iii). Detailed structural drawing of foundation and substructure for all abutments and piers has to be submitted duly proof checked from IITs/NITs within six weeks from the date of acceptance of tender.

iv). Complete set of design and drawing of the bridge foundation, substructure and related drawings in all aspects has to be submitted within eight weeks from the date of acceptance of tender.

v). In case of any delay in submission from the above scheduled date, penalty of ₹. 2,500/- per week per unit quantity shall be imposed. This shall also be applicable for GAD of bridges.

VETTED
For F.A. & C.A.O. (Cons.)
S.E.C. Rly. Bilaspur (C.G.)

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Name of the work:- Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.

SCHEDULE-"2" (Earthwork and allied Works)

Sl. No.	Name of items	Unit	Rate	Qty	Amount	Ref.
1	Earthwork in cutting (Classified) in formation, trolley refuges, side drains, level crossing approaches, platforms, catch water drains, diversion of nallah & finishing to required dimension and slopes to obtain a neat appearance to standard profile inclusive of all labour, machine and materials and removing & leading all cut spoils either to make spoil dumps beyond 10m. from cutting edge or for filling in embankment with all leads within the section limit, lifts, ascent, descent, loading, unloading, all taxes/royalty, clearance of site and all incidental charges, bailing & pumping out water if required, etc., complete as per directions of the Engineer-in-Charge. The work is to be executed as per Latest / updated edition of "Guidelines for Earthwork in Railway Projects" issued by RDSO, Lucknow. Cut trees shall be property of Railways and to be deposited in the railway godown unless specified otherwise in the Special conditions of contract					
(i)	In all conditions and classifications of soil except rock.	CUM	143.81	100	14,381.00	013111
(ii)	Soft rock not requiring blasting in all Conditions	CUM	226.48	25	5,662.00	013112
(iii)	In rock and very hard rock with hammer / chisel / pavement breaker etc. where blasting is not permitted due to special circumstances and if specifically ordered in writing incl. drilling and all incidental work in all conditions	CUM	489.64	25	12,241.00	013114
2	Earthwork in filling in embankment, guide bunds, around buried type abutments, bridge gaps, trolley refuges, rain bunds if provided, platforms etc. with earth excavated from outside railway boundary entirely arranged by the contractor at his own cost as per RDSO's latest guidelines and specifications and special condition of contract including all leads, royalty, lifts, ascents, descents, crossing of nallahs or any other obstructions. The rates shall include all dressing of bank to final profile, demarcation and setting out of profile, site clearance, removing of shrubs, roots of vegetations growth, heavy grass, benching of existing slope of old bank, all handling/re-handling. taxes, octroi and royalty etc. as a complete job. Cut trees shall be property of railways and to be deposited in the railway go down unless specified otherwise in the Special conditions of contract					
		CUM	201.65	2126780	42,88,65,187.00	013120
3	Extra for mechanical compaction of earth/blanketing material filled in embankment with contractor's rollers of suitable capacity, type and size to achieve specified density as per specification, testing as per IS codes incl. cost of water, T&P consumable material and all labour as a complete job. The work is to be executed as per Latest edition of "Guidelines for Earthwork in Railway Projects" issued by RDSO, Lucknow					
		CUM	14.29	2176640	3,11,04,,185.60	013130
4	Turfing / planting, including all lead and lift, and watering as required until properly rooted, with. Note -					

Signature of Tenderer(s)/Contractor(s)

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For Chief Engineer(Con)/I/BSP

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S.E.C. Railway, Bilaspur

	Initially payment of only 40% will be made. Balance 60% will be paid only after 3 months of maintenance period if the turfing is properly rooted.					
	Turfing with planted doob grass	Per 100 Sqm	4733.01	7567.69	3,58,17,952.45	014052
5	Providing and removing barricading with the help of portable fencing along the running track where the work is to be done in close vicinity of the track. Fencing shall consist of self supporting steel angles of size, 50 x50x6mm, 1.5m long provided with hooks etc. and embedded in CC 1:2:4 block of size 0.23x0.23x0.23M placed at c/c distance of 2.0 M along the track, 12 mm dia rods in three horizontal layers tack welded with the angle posts including providing Retro-reflective tapes in Horizontal & vertical direction. Note : Released material will be the property of the contractor after the completion of work. Cost of cement to be paid separately.					
		RMT	219.52	3000	6,58,560.00	014110
6	Felling trees of girth (measured at a height of 1 m above ground level) including lead and stacking of material withing 100 m. Note: 1. When stumps are grubbed up in addition, the rates shall be doubled for trees cut and grubbed. 2. Payment for grubbing shall only be made where specially ordered. 3. Grubbing shall be ordered only where it is essentially to remove the stumps, including the roots, as per specification. 4. Grubbing shall include removal of roots of trees and saplings to a depth of 60 cm below ground level or 30 cm below formation level or 15 cm below sub grade level, whichever is lower.					
(i)	Girth over 30 cm and upto 60 cm	Each	99.70	500	49,850.00	014031
(ii)	Girth over 60 cm and upto 1.5 m	Each	272.10	250	68,025.00	014032
(iii)	Girth over 1.5 m and upto 3.0 m	Each	540.40	250	1,35,100.00	014033
	Sub total				**49,67,31,144.05**	
	Departmental escalation @ 27.61% above for all items under this schedule				**13,71,47,468.87**	
	Total Basic cost of Schedule "2"				6338-78,612-92 **63,39,78,612.92**	

Note: Item No.2 :- Not less than SQ2 group soil is permitted under this item (i.e. SQ3 & SQ2 type of soil are only permitted under this item. Detailes specifications/Soil group type are given in the Tender document.)
In case contractor is not able to procure SQ2 type soil, in such circumstances, the engineer can accept SQ1-soil group. However there shall be a reduction of 20% on the payable rate of this item.

1. **Payment for earthwork/blanketing:**

(i) 12% (Twelve percentage) deduction will be made for the quantities of earthwork executed at the "On account" bill stage.

These quantities will be released progressively as per the following percentage as and when the following enabling works are completed.

(ii) **Embankment:-**

i) Dressing of side slopes including turfing/pitching = 10%
ii) Dressing of top level of formation. = 2%.

For FA. & C.A.O. (Cons.) S.E.C. Rly. Bilaspur (C.G.)

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

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मुख्य अभियन्ता (निर्माण)/I
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(iii) Excavation:-

i) Dressing of side slopes including turfing/pitching =10%

ii) Dressing of the formation after construction of side drains inside the cuttings = 2%

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S.E.Rly. Bilaspur (C.G.)

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SOUTH EAST CENTRAL RAILWAY T.NO.CEC/BSP/22-23/19

Name of the work:- Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.

SCHEDULE-"3" (Plain Cement Concrete/ Reinforced Cement Concrete Work in Bridges)

Sl. No.	Name of items	Unit	Rate	Qty	Amount	Ref.
1	Providing and laying Plain Cement Concrete 1:3:6 with graded stone aggregate of 40 mm nominal size, in foundation and floors, retaining walls of bridges including mechanical mixing, vibrating, pumping and bailing out water where ever required with all materials and labour complete but excluding the cost of cement and shuttering as per drawings and technical specifications as directed by Engineer.					
(i)	For ROR	Cum	1373.17	180	2,47,170.60	192030
(ii)	For other than ROR	Cum	1373.17	1012	13,89,648.04	192030
2	Providing and laying in position machine mixed, machine vibrated and machine batched Design Mix Cement Concrete M20 grade (Cast - in Situ) using 20 mm graded crushed stone aggregate and coarse sand of approved quality in Abutment, pier, wing walls and return walls of Mass cement concrete above RCC raft Including finishing complete as per specifications and direction of the Engineer in charge. Payment for cement, reinforcement and shuttering shall be paid extra.					
(i)	For ROR	Cum	1592.73	188	2,99,433.24	192050
(ii)	For other than ROR	Cum	1592.73	6039	96,18,496.47	192050

VETTED
For F.A. & C.A.O. (Cons.)
S.E.C. Rly Bilaspur (C.G.)

Signature of Tenderer(s)/Contractor(s) 216 For Chief Engineer(Con)/I/BSP

RSA-SK JOINT VENTURE
JOINT VENTURE PARTNER

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

मुख्य अभियंता (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

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3.	Providing and laying in position machine mixed, machine vibrated and machine batched Design Mix Cement Concrete M35 grade (Cast - in Situ) InBottom/top slab, side walls, toe wall and sumps haunch filling head walls or any other component using 20 mm graded crushed stone aggregate and coarse sand of approved quality of cast-in-situ RCC box of size up to 5 M (bigger inside dimension) including finishing, Admixtures in recommended proportions (as per IS 9103), if approved in Mix design, to accelerate, retard setting of concrete, improve workability without impairing strength and durability, complete as per drawings and technical specifications as directed by Engineer in charge. Payment for cement, reinforcement and shuttering shall be paid extra (For other than ROR)	Cum	1592.73	3585	57,09,937.05	194010
4.	Providing and laying in position machine mixed, machine vibrated and machine batched Design Mix Mass Cement Concrete M20 grade (Cast - in Situ) using 20 mm graded crushed stone aggregate and coarse sand of approved quality in Drop and curtain wall and alike structures below bed level, Including the cost of centering, shuttering and finishing complete as per drawings and technical specifications as directed by Engineer. Payment for cement & reinforcement shall be paid extra (For other than ROR)	Cum	1592.73	1715	27,31,531.95	194020
5.	Providing and laying in position machine mixed, machine vibrated and machine batched Design Mix Cement Concrete M35 grade (Cast - in Situ) using 20 mm graded crushed stone aggregate and coarse sand of approved quality in RCC raft foundation & Pile cap including finishing, Using Admixtures in recommended proportions (as per IS 9103), if approved in Mix design to accelerate or retard setting of concrete and/or improve workability without impairing strength and durability complete as per specifications and direction of the Engineer in charge. Payment for cement, reinforcement and shuttering shall be paid extra.					
(i)	For ROR	cum	1592.73	2618	41,69,767.14	192040
(ii)	For other than ROR	cum	1592.73	3524	56,12,780.52	192040

मुख्य इंजीनियर (निर्माण)/I
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For Chief Engineer(Con)/I/BSP
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Executive Engineer (Con)
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3.	Providing and laying in position machine mixed, machine vibrated and machine batched Design Mix Cement Concrete M35 grade (Cast - in Situ) InBottom/top slab, side walls, toe wall and sumps haunch filling head walls or any other component using 20 mm graded crushed stone aggregate and coarse sand of approved quality of cast-in-situ RCC box of size up to 5 M (bigger inside dimension) including finishing, Admixtures in recommended proportions (as per IS 9103), if approved in Mix design, to accelerate, retard setting of concrete, improve workability without impairing strength and durability, complete as per drawings and technical specifications as directed by Engineer in charge. Payment for cement, reinforcement and shuttering shall be paid extra (For other than ROR)	Cum	1592.73	3585	57,09,937.05	194010
4.	Providing and laying in position machine mixed, machine vibrated and machine batched Design Mix Mass Cement Concrete M20 grade (Cast - in Situ) using 20 mm graded crushed stone aggregate and coarse sand of approved quality in Drop and curtain wall and alike structures below bed level, Including the cost of centering, shuttering and finishing complete as per drawings and technical specifications as directed by Engineer. Payment for cement & reinforcement shall be paid extra (For other than ROR)	Cum	1592.73	1715	27,31,531.95	194020
5.	Providing and laying in position machine mixed, machine vibrated and machine batched Design Mix Cement Concrete M35 grade (Cast - in Situ) using 20 mm graded crushed stone aggregate and coarse sand of approved quality in RCC raft foundation & Pile cap including finishing, Using Admixtures in recommended proportions (as per IS 9103), if approved in Mix design to accelerate or retard setting of concrete and/or improve workability without impairing strength and durability complete as per specifications and direction of the Engineer in charge. Payment for cement, reinforcement and shuttering shall be paid extra.					
(i)	For ROR	cum	1592.73	2618	41,69,767.14	192040
(ii)	For other than ROR	cum	1592.73	3524	56,12,780.52	192040

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RSA-SK JOINT VENTURE

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S.E.C. Railway, Bilaspur

6.	Providing and laying in position machine mixed, machine vibrated and machine batched Design Mix Cement Concrete M35 grade (Cast - in Situ) using 20 mm graded crushed stone aggregate and coarse sand of approved quality for the following Reinforced cement concrete structural elements up to height of 10 M from foundation top level, including finishing, Using Admixtures in recommended proportions (as per IS 9103), if approved in Mix design to accelerate or retard setting of concrete and/or improve workability without impairing strength and durability complete as per specifications and direction of the Engineer in charge. Payment for cement, reinforcement and shuttering shall be paid extra					19206
(i)	Abutment & Pier					
	For ROR	cum	[illegible].37	550	9,19,803.50	192061
	For other than ROR	cum	672.37	950	15,88,751.50	192061
(ii)	Wing wall and Return wall					
	For ROR	Cum	1752	1114	19,51,728.00	192062
	For other than ROR	Cum	1752	1329	23,28,408.00	192062
(iii)	Abutment Cap, pier Cap, Inspection Platform & Pedestal over Pier cap, Fender wall, Diaphragm wall, etc.					
	For ROR	Cum	1831.64	68	1,24,551.52	192063
	For other than ROR	Cum	1831.64	167	3,05,983.88	192063
(iv)	Approach slab at formation level, dirt wall/ ballast wall at formation level.					
	For ROR	Cum	1911.27	36	68,805.72	192064
	For other than ROR	Cum	1911.27	140	2,67,577.80	192064
7.	Centering and shuttering including strutting, propping etc. and removal of form for					
(i)	RCC raft foundation & Pile cap					
	For ROR	Sqm	120.70	980	1,18,286.00	195031
	For other than ROR	Sqm	120.70	1327	1,60,168.90	195031
(ii)	Abutment, pier, wing walls and return walls					
	For ROR	Sqm	206.50	5409	11,16,958.50	195032

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

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For Chief Engineer(Con)/I/BSP

Executive Engineer (Con)
दक्षिण पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

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	For other than ROR	Sqm	206.50	7256	14,98,364.00	195032
(iii)	Abutment cap, Pier Cap, Inspection Platform & Pedestal over Pier cap, Fender wall, Diaphragm wall, etc.					
	For ROR	Sqm	211.62	146	30,896.52	195033
	For other than ROR	Sqm	211.62	209	44,228.58	195033
(iv)	Approach slab at formation level, Dirt wall/ ballast wall at formation level					
	For ROR	Sqm	120.70	166	20,036.20	195034
	For other than ROR	Sqm	120.70	247	29,812.90	195034
8.	Providing, Driving and installing Bored cast in situ Reinforced Cement Concrete piles of specified diameter and length below pile cap in M- 35 grade Design Mix Cement Concrete , using 20 mm graded crushed stone aggregate and coarse sand of approved quality, to carry a safe working load not less than specified, excluding the cost of casing pipe but including the cost of shoe and length of pile to be embedded in pile cap etc complete, concreting by machine batching, machine mixing, scaffolding, using Admixture in recommended proportion(as per IS 9103), if approved in design Mix, placing with tremie pipe, chipping off of pile top to remove laitance concrete above cut off level etc, pumping and bailing out water, with all labour material complete including crossing of tracks if required, as per approved drawing, specification and direction of the Engineer in charge. Length of the pile for payment shall be measured Up to the bottom of pile cap excluding the mud mat. Payment for cement, casing pipe & reinforcement shall be paid extra					192070
	1200mm diameter					
	For ROR	Metre	9781.23	1296	1,26,76,474.08	192072
	For other than ROR	Metre	9781.23	2088	2,04,23,208.24	192072
9.	Providing, fabricating and installing of casing pipe for bored piles for all diameters with specified thickness of steel plate including all labour, materials, pumping and bailing out water where ever required,					

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S.E.C. Railway, Bilaspur

RSA-SK JOINT VENTURE
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	complete as per technical specifications as directed by Engineer in charge. This will include the weight of plate only and no cognizance will be given for the fittings i.e. rivets and welding etc.					
	For ROR	MT	55653.63	205	1,14,08,994.15	192080
	For other than ROR	MT	55653.63	331	1,84,21,351.53	192080
10.	Extra for chieselling in addition to boring of piles if chiseling is resorted to in hard rock big stone boulders larger than 30 cm depth by any means i e. by chiesel or manual chiesel and hammer method.					192090
	1200mm Diameter pile					
	For ROR	Metre	1378.81	259	3,57,111.79	192091
	For other than ROR	Metre	1378.81	493	6,79,753.33	192091
11	Providing and laying in position cement concrete					
12	Centering and shuttering including strutting, propping etc:					
	Foundations , footings, bases of columns, raft foundation (For other than ROR).	sqm	120.7	1692	2,04,224.40	042011
	Walls (any thickness) including attached plasters (For other than ROR).	sqm	205.30	6874	14,19,481.00	042012

	Total (For other than ROR = Rs 7,24,33,608.09 & For ROR = Rs 3,35,10,017.01)	10,59,43,625.10
	Departmental escalation @ 69.18% above for all items under this schedule	7,32,91,799.84
	Total Basic cost of Schedule "3"	17,92,35,424.85
	Total Basic cost For other than ROR Work is Rs 12,25,43,178.17 & For ROR Work is Rs 5,66,92,246.69	

VETTED
for F.A. & C.A.O. (Cons.)
S.E.C. Rly Bilaspur (C.G.)

Signature of Tenderer(s)/Contractor(s) 220 For Chief Engineer(Con)/(BSP)/ (निर्माण) /१
RSA-SK JOINT VENTURE
JOINT VENTURE PARTNER
Chief Engineer (Con.)/१
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

Draft Agt.

T.NO.CHC/BSP/22-23/19

Name of the work:- Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.

Sl No.	Item description	Unit	Rate	Qty	Amount
	SCHEDULE-"4" (NS Items for Supply of Blanketing Materials and Bridge related items)				
1	Supplying and spreading of blanketing material of approved quality and grading as per latest guide lines of RDSO vide report no. RDSO/2007/GE:0014 issued on Nov. 2009 (mechanical mixing of granular materials like coarse sand/moorum/crushed stone materials in suitable proportions is to be done to obtain the gradation & specifications) brought from outside the railway land and to spread on the formation in cutting and embankment in layers not exceeding 30cm each in thickness using graders and compaction using adequate capacity vibratory compactors so as to achieve minimum in situ dry density of 98% of MOD (compaction will be paid for separately) as directed by the Engineer-in-Charge or his representative including all leads, lift, descent, loading, unloading royalty, tools plants, labour, machinery and materials required including dressing of bank to final dimensions and designed profile, benching of existing bank etc. complete as required. The agency has to establish batching plant/blending machines for mixing of raw materials to produce uniform blanketing materials of desired specifications.				
	For ROR	CUM	1018.86	12012	38,546.32
	For other than ROR	CUM	1018.86	71848	7,32,03,053.28
2	Driving of Railways Unserviceable rails by hammering with the help of monkey hammer or by any other means into ground of all kinds of soil strata upto the depth specified by the Engineer-in charge or his authorised representative with contractors tools and plants, equipments, labour etc complete as per direction of the Engineer in charge. The rate includes cutting of rails, making V-shape of the driving edge of the rails. Rate includes all consumables such as diesel mobile etc. The rate also includes shifting of rails within the yard with maximum lead of 100m. Transportation of rails from other places if any will be paid against SECR-USSOR-2010 under relevant schedule and rate includes removal of infringement above ground level.				
	For ROR	MT	520.26	2500	12,40,520.00
3	Fixing of contractors good quality MS sheet 6mm/8mm thick in rail piling by welding with contractors welding machine, consumbales, labour, electrodes and all other incidental charges etc. complete				
	For ROR	MT	75337.44	47	35,40,859.86
4	Delaunching/launching of FOB girder by road crane with 140 to 300 MT crane capacity. The rate includes all types of machinery equipments, labour, consumable, spare, lead, lift, octroy and all taxes etc complete. The work will be done as per availability of traffic block, Railway will not be responsible for idling of men and machinery. Work has to be done in short notice of 07 days in advance.				
	For other than ROR	MT	28,295.75	250	70,73,937.50
	Note for item no 3:- These items will be operated for excavation very near to the track only, where safety of running trains in endangered. For excavation in other places/conditions, shoring etc may be done. Engineers decision regarding operation of item no.3 shall be final.				
	Total value of Schedule-"4" (For ROR =Rs 2,40,93,863.50 & For other tan ROR = Rs 7,32,03,053.28)				9,72,96,916.78

VETTED
For F.A. & C.A.O. (Con.)
S.E.C. Rly. Bilaspur (C.G.)

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
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RSA-SK JOINT VENTURE
Signature of Tenderer(s)/Contractor(s)
JOINT VENTURE PARTNER

221 For Chief Engineer(Con)/I/BSP
कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
S.E.C. Railway, Bilaspur

Name of the work:- Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.

SCHEDULE – '5' (Other Items for Bridges)

Approximate quantities of main items are given below, these may vary as per site requirement. For Detailed specification refer special conditions of earthwork and SECR USSOR-2010 specifications .Also, for detailed description of the USSOR items, SEC Railway Unified Standard Schedule of Rates (Works and Materials) 2010 may be referred.

Sl No	Item	Unit	Basic Rate	Qty	Amount	USSOR Item no.
1	Earth work in excavation for foundations and floors of the bridges, retaining walls etc., including setting out, dressing of sides, ramming of bottom, getting out the excavated material, back filling in layers with approved material and consolidation of the layers by ramming and watering etc. incl. all lift, disposal of surplus soil upto a lead of 300 M, all types of shoring and strutting with all labour and material complete as per drawing and technical specification as directed by Engineer in charge					
a.	All kinds of soils					
	For ROR	cum	190.03	6720	12,83,049.60	192011
	For other than ROR	cum	190.93	17109	32,66,621.37	192011
b	Ordinary rock....					
	For ROR	cum	213.89	960	2,05,334.40	192012
	For other than ROR	cum	213.89	2540	5,43,280.60	192012
c	Hard rock (blasting prohibited					
	For ROR	cum	496.02	1920	9,52,358.40	192014
	For other than ROR	cum	496.02	10360	51,38,767.20	192014
2	Supplying Stone Boulder Weighing minimum 35 Kg Each					
	For ROR	Cum	546.06	911	4,97,460.66	452390
	For other than ROR	Cum	546.06	3772	20,59,738.32	452390
3.	Supplying, spreading and filling coarse sand (No cohesive materials to be used) of approved quality including watering and ramming in foundation, plinth, behind the abutment, wing wall, retaining wall in layers not exceeding 150mm thick including its compaction.					
	For ROR	cum	810.45	742	6,01,353.90	192213
	For other than ROR	cum	810.45	1725	13,98,026.25	222280

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S.E.C. Rly. Bilaspur (C.G.)

Signature of Tenderer(s)/Contractor(s) 222 For Chief Engineer(Con)/I/BSP

RSA-SK JOINT VENTURE

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कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
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S.E.C. Railway, Bilaspur

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

4.	Providing and applying two coats of coal tar or bitumen confirming to IS 3117 - 1965 on the top and sides of RCC box/slabs @ 1.70 Kgs / Sqm after cleaning the surface with all labour and materials complete job as directed by the Engineer					195020
	For ROR	Sqm	102	1626	1,65,852.00	195020
	For other than ROR	Sqm	102	15166	15,46,932.00	195020
5.	Providing cast in situ bridge number plaques as per Railway drawing in cement concrete 1:2:4 mix using 20mm hard stone aggregate embedded in 30mm notch in Bridge parapet coping duly engraving the letter and figures and an arrow indicating the direction of					
	For ROR	Each	500.11	4	2,000.44	222240
	For other than ROR	Each	500.11	19	9,502.09	222240
6.	Providing weep holes by making suitable opening or drilling in existing Brickmasonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia AC pipe, ... full width of the structure complete					
	For ROR	Metre	276.16	1070	2,95,491.20	222160
	For other than ROR	Metre	276.16	10635	29,36,961.60	222160
7.	Dismantling concrete kerb stones/rail level platform stones /concrete beams / slabs or similar light structural parts/ stones without appreciable damage including stacking..					
	For other than ROR	cum	481.38	150	72,207.00	181023
8.	Dismantling dressed stone work, ashlar face stone work, marble work, including stacking of serviceable and disposal of unserviceable material within 50m lead					182040
	In cement mortar					
	For other than ROR	cum	528.29	680	3,59,237.20	182042

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S.E.C. Rly. Bilaspur (C.G.)

9.	Demolishing R.C.C. work including cutting and stacking of steel bars and disposal of unserviceable material within 50m lead. (Extra payment for scraping, cleaning and straightening of bars to be made separately)					
	For other than ROR	CUM	654.01	433	2,83,186.33	181030
10.	Conducting load testing of a single pile Up to following capacity in accordance with IS 2911(Part IV) including installation of loading platform and preparation of pile head or construction of test cap and dismantling of test cap after test etc with all I					192100
a)	Initial load test above 100 ton capacity Up to 250 ton capacity pile					
	For ROR	Each	69399.63	4	2,77,598.52	192103
	For other than ROR	Each	69399.63	6	4,16,397.78	192103
b)	Extra for every increase of 50 T in pile capacity or part thereof over 250 T					
	For ROR	Each	11150.40	4	44,601.60	192104
	For other than ROR	Each	11150.40	6	66,902.40	192104
11.	Routine Load Test above 100 ton capacity Up to 250 ton capacity pile					
	For ROR	Each	64277.41	4	2,57,109.64	192107
	For other than ROR	Each	64277.41	6	3,85,664.46	192107
12	Providing cast in situ plaques for bridge foundations details of size 45x45x5 cm in cement concrete 1:2:4 mix using 20mm hard stoneaggregate embedded in 30mm deep [illegible] abutment & piers, engraving the letters & figures with CM 1:3 and finished smoth					
	For ROR	Each	643.03	4	2,572.12	222250
	For other than ROR	Each	643.03	16	10,288.48	222250
13.	Pulse Echo Test (PET) for integrity testing of piles with contractor's men, materials and machines. The rate includes cost of Inspection of site, preparation of pile head and any other unforeseen cost required for the test, submission of reports in tripli					

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Executive Engineer (Con)
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S.E.C. Railway, Bilaspur

Signature of Tenderer(s)/Contractor(s) 224 For Chief Engineer(Con)/I/BSP

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मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
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S.E.C. Railway, Bilaspur

SOUTH EAST CENTRAL RAILWAY T.NO.CEC I/BSP/22-23/19

For ROR	Each	25204.55	64	16,13,091.20	192120
For other than ROR	Each	25204.55	124	31,25,364.20	192120
Total (For ROR = Rs 61,97,873.68 & for other than ROR = Rs 2,16,19,077.28)				2,78,16,950.96	
Add 49.5% for all items				1,37,69,390.73	
Total of Schedule 5 (For ROR = Rs 92,65,821.15 & for other than ROR = Rs 3,23,20,520.53)				4,15,86,341.69	

VETTED
For F.A. & C.A.O. (Cons.)
S.E. Rly. Bilaspur (C.O.)

सहा. इंजीनियर (निर्माण)/I
Asstt. Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

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RSA-SK JOINT VENTURE
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For Chief Engineer(Con)/I/BSP

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
S.E.C. Railway, Bilaspur

SOR: SOUTH EAST CENTRAL RAILWAY T.NO.CEC/BSP/22-23/19

Name of the work:- Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.

SCHEDULE – 6 (Retaining wall, drain, Stations, other Service buildings and Residential Buildings)

Sl No	Description of work	Unit	Basic Rates	Qty.	Amount (Rs.)	USSOR No.
	EARTHWORK : STATIONS AND OTHER SERVICE BUILDINGS					
1	Earth work in excavation as per approved drawings and dumping at embankment site or spoil heap, within railway land, including 50m lead and 1.5m lift, the lead to be measured from the centre of gravity of excavation to centre of gravity of spoil heap: the lift to be measured from natural ground level and paid for in layers of 1.5m each, including incidental work, as per specifications-in					011010
(i)	All kinds of soils	Cum	88.16	11342	9,99,910.72	011011
(ii)	Ordinary Rock (Not requiring blasting)	Cum	265.87	4561	12,12,633.07	011012
2	Extra over item 011019 for excavation in foundations for buildings and bridges to cover dressing to neat dimension and plumbing sides etc. Note : Dressing under this item is payable for the total quantity of excavation in foundation and not partly.	Cum	9.20	10592	97446.40	012016
3	Supply of Moorum	Cum	293.14	760	2,22,786.40	252020
4	Extra for watering and ramming earth in foundation and floors in 15cm layers. Note : This item is payable where ramming is not included in the original rate for earthwork in filling.	Cum	16.40	760	12,464.00	012030
5	Supplying and filling sand in plinth and under floors	Cum	612.39	1375	8,42,036.25	012050

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE
VETTED
JOINT VENTURE PARTNER

226

For Chief Engineer(Con.)/BSP

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे
S.E.C. Railway, Bilaspur

	including watering, ramming, consolidating and dressing complete.					
	P.C.C./R.C.C. WORKS: STATIONS AND OTHER SERVICE BUILDINGS					
6	Providing and laying in position cement concrete of specified proportion excluding cost of cement, centering and shuttering - All works upto Plinth level :					
	1:3:6 (1 cement : 3 sand : 6 graded stone aggregate 20mm nominal size)	Cum	1578.23	3505	55,31,696.15	031011
(i)	1:3:6 (1 cement : 3 sand : 6 graded stone aggregate 40mm nominal size)	Cum	1539.01	280	4,30,922.80	031012
7	Providing and laying cement concrete, up to plinth in retaining walls, walls (any thickness) including attached plasters, columns, pillars, posts, struts, buttresses, string or lacing courses, parapets, coping, bed blocks, anchor blocks, plain window sills, fillets etc, excluding the cost of cement and of shuttering, centering.					
(i)	1:2:4 (1 cement : 2 sand : 4 graded stone aggregate 20mm nominal size)	Cum	1792.28	870	15,59,283.60	031023
8	Providing and laying in position cement concrete of M 20 grade, excluding the cost of cement and of centering and shuttering, as per direction of the Engineer in charge					031050
(i)	All works upto Plinth level	Cum	1730.80	400	6,92,320.00	031051
(ii)	All works above plinth level in retaining walls, walls (of any thickness) including attached pilasters, columns, pillars, posts, struts, buttresses, anchor blocks, parapets, copings, bed blocks, string or	Cum	1872.17	115	2,15,299.55	031052

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S.E.C. Rly, Bilaspur (C.G.)

	facing courses window sills, fillets, kerbs, steps etc.					
	Providing and fixing at or near ground level, Precast M 20 grade cement concrete as per approved design and setting in position with cement mortar 1:3 (1 cement : 3 coarse sand), including the cost of required centering and shuttering complete but excluding the cost of cement.(cast at site).					032030
(i)	in ash pit stones, platform coping stones etc.	Cum	2326.93	10	23,269.30	032032
10	Providing and laying in position M 20 Grade concrete for reinforced concrete structural elements but excluding cost of centering, shuttering, reinforcement and Admixtures in recommended proportion (as per IS:9103) to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per direction of Engineer in charge.					041010
(i)	All work upto plinth level, including raft foundation of washable aprons, HS tank, pile cap, footings of FOB, and Platform shelter etc.	Cum	1974.71	5252	1,03,71,376.92	041011
(ii)	All work in buildings above plinth level upto floor two level.	Cum	2185.37	7010	1,53,19,443.70	041012
11	Providing, hoisting and fixing in position upto floor two level M20 Grade precast RCC work including setting in cement mortar 1:3 (1 cement : 3 coarse sand) and finishing smooth with 6mm thick cement plaster 1:3 (1 cement : 3 fine sand) on exposed surfaces complete including cost of centering, shuttering, finishing,					043010

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RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

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	Admixtures in recommended proportion (as per IS:9103) to accelerate, retard setting of concrete, improve workability without impairing strength and durability, excluding cost of cement and steel reinforcement, as per approved plan & direction of Engineer incharge.					
(i)	In slabs for drain covers, manhole covers, flue tops etc.	cum	2485.88	158	3,92,769.04	043015
12	Providing & applying Pre-Construction Anti-Termite treatment to proposed structure, with application of Imidacloprid 30.5% SC @ 0.05% concentration mixed with water in ratio of 1:475, as per detailed specifications given in Indian Railways Standard Specifications, so as to create a chemical barrier below and around the structure by an approved agency. (Plinth Area/Basement floor area shall be considered for Payment)	Sqm	80.61	4147	3,34,289.67	171690
	FORMWORK .STATIONS AND OTHER SERVICE BUILDINGS					
13	Centering and shuttering including strutting, propping etc. and removal of form for :					042010
(i)	Foundations, footings, bases of columns, raft foundation of washable aprons, Pile caps, Footings of FOB etc.	Sqm	120.70	19322	23,32,165.40	042011
(ii)	Walls (any thickness) including attached plasters, buttresses, plinth and string courses etc.	Sqm	206.50	18360	37,91,340.00	042012
(iii)	Suspended floors, roofs, landings, balconies, FOB slabs, walkway slabs and access platform	Sqm	211.62	952	2,01,462.24	042013
(iv)	Lintels, beams, plinth beams, bed blocks, girders, bressumers and cantilevers	Sqm	186.30	457	85,139.10	042014

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S.E.C. Railway, Bilaspur

Signature of Tenderer(s)/Contractor(s) 229 For Chief Engineer(Con)/I/BSP

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(v)	Columns, pillars, , posts and struts	Sqm	256.80	288	73,958.40	042015
(vi)	Stairs (excluding landings) except spiral-staircases	Sqm	229.40	150	34,410.00	042016
(vii)	Edges of slabs and beams in floors and walls under 20 cm wide.	metre	67.10	90	6,039.00	042025
14	Extra for additional height in centering, shuttering wherever required with adequate bracing, propping etc. including cost of de-shuttering and de-centering at all levels, over a height of 3.5m, for every additional height of 1 metre or part thereof in Suspended floors, roofs, landing, beams and balconies (Plan area to be measured)	Sqm	82.50	952	78,540.00	042030
15	Supplying and applying shuttering oil for mould releasing, having (Flash point 54 degree C and specific gravity 0.88±0.02) for concrete formwork to be applied either by brush or with spray machine to the entire satisfaction of Engineer Incharge	Sqm	5.81	39362	2,28,693.22	042040
	MASONARY WORKS : STATIONS AND OTHER SERVICE BUILDINGS					
16	Brick work with non-modular (FPS) bricks of class designation 7.5 in foundation and plinth in :					051010
(i)	Cement mortar 1:4 (1 cement : 4 fine sand)	Cum	2149.85	90	1,93,486.50	0501014
(ii)	Extra over item 051010 & 051020 for brick work in superstructure beyond plinth level upto floor two level :	Cum	150.26	621	93,311.46	051040
(iii)	Extra for brick work in superstructure beyond second floor level for every 3m or part thereof :	Cum	287.47	51	14,660.97	051050

वरिष्ठ इंजीनियर (निर्माण)/I
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S.E.C. Railway, Bilaspur

Signature of Tenderer(s)/Contractor(s) 230 For Chief Engineer(Con.)/I/BSP

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RSA-SK JOINT VENTURE
JOINT VENTURE PARTNER

कार्यपालन अभियंता (निर्माण)
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17	Half brick masonry with bricks of class designation 7.5 in foundations and plinth in :					051180
(i)	Cement mortar 1:3 (1 cement : 3 coarse sand)	Sqm	248.91	72	17,921.52	051181
(ii)	Extra for half Brick masonry in superstructure above plinth level upto floor two level	Sqm	41.55	172	7,146.60	051191
(iii)	Extra for half brick masonry in superstructure above floor two level for every floor or part thereof.	Sqm	15.33	10	153.30	051200
	DOORS AND WINDOWS : STATIONS AND OTHER SERVICE BUILDINGS					
18	Providing wood work in frames of doors, windows, clerestory windows and other frames and trusses, wrought, framed and fixed in position :					071010
(i)	Second Class teak wood	cudm	79.02	50	3,951.00	071011
(ii)	Sal wood	cudm	44.09	50	2204.50	071012
19	Providing and fixing panelled/glazed or panelled and glazed shutters for doors, windows and clerestory windows including ISI marked black enamelled M.S. butt hinges with necessary screws excluding panelling/glazing which will be paid for separately					072010
(i)	Second class teak wood, 35mm thick	Sqm	2055.36	25	51,384.00	072011
(ii)	Second class teak wood, 30mm thick	Sqm	1817.97	25	45,449.25	072012
20	Providing and fixing to IS: 2202 Part-1 marked flush door shutter decorative type, core of block board construction with frame of 1st class hard wood and well matched teak 3ply veneering with vertical grains or cross bands and face					072140

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For F.A. & C.A.O. (Cons.)
S.C. Rly. Bilaspur (C.G.)

	veneers on both faces of shutters					
	35mm thick including ISI marked stainless steel butt hinges with necessary screws	Sqm	1906.02	100	1,90,602.00	072141
21	Providing and fixing factory made P.V.C. door frame of size 50x47mm with a wall thickness of 5mm, made out of extruded 5mm rigid PVC foam sheet mitered at corners and joined with 2 Nos. of 150mm long brackets of 15x15mm M.S. square tube, the vertical door profiles to be reinforced with 19x19mm M.S. square tube of 19 gauge. EPDM rubber gasket weather seal to be provided throughout the frame. The door frame to be fixed to the wall using M.S. screws of 65/100mm size complete as per manufacturers specification and direction of Engineer-in-Charge	metre	439.79	50	21,989.50	078130
22	Providing and fixing to existing door frames 30mm thick factory made panel PVC door shutter consisting of frame made out of M.S. tubes of 19 gauge thickness and size of 19mm x 19mm for styles and 15x15mm for top & bottom rails. M.S frame shall have a coat of steel primer. M.S. frame covered with 5mm thick heat moulded PVC Foam sheet 'C' channel as per drawing given in IR Standard Specifications complete in all respect	Sqm	2478.31	50	1,23,915.50	078140
23	Providing and fixing ISI -1378 marked oxidised M.S. pressed butt hinges with necessary screws etc, complete, of size.					075140

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S.E.C. Railway, Bilaspur

Signature of Tenderer(s)/Contractor(s) 232 For Chief Engineer(Con)/I/BSP

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

कार्यपालन अभियंता (निर्माण)
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	125x65x2.12 mm	Each	31.13	90	2,801.70	075141
24	Providing and fixing M.S. tower bolts generally conforming to IS:204 (Part I) with necessary screws etc. complete of size.					075060
	250x10 mm	Each	52.16	30	1,564.80	075061
25	Providing and fixing M.S. door handles with necessary screws etc. complete.					075070
	125mm	Each	17.52	25	438.00	075071
26	Providing and fixing ISI - 1378 marked oxidised M.S. tower bolts black finish (Barrel type) with necessary screws etc. complete of size.					075200
	200x10	Each	100.38	15	1,505.70	075052
27	Providing and fixing in position collapsible steel shutters with vertical channels 20x10x2mm and braced with flat iron diagonals 20x5mm size with top and bottom rail of T-iron 40x40x6mm with 40mm dia. steel pulleys complete with bolts, nuts, locking arrangement, stoppers, handles and hold fasts including applying a priming coat of approved steel primer	Sqm	2890.17	50	1,44,508.50	081180
28	Kota stone slab flooring of size up to 60x60cm over 20mm (average) thick base of 1:4 cement mortar (1cement: 4coarse sand) and jointed with grey cement slurry mixed with pigment to match the shade of the slab including rubbing and polishing complete 25mm thick	Sqm	926.27	250	2,31,567.50	096072

Pay F.A. & C.A.O. (Cons.) S.C. Rly. Bilaspur (C.G.)

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

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For Chief Engineer(Con)/I/BSP

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Gen)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

मुख्य अभियंता (निर्माण) /
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29	Cement concrete flooring 1:2:4 (1cement: 2coarse sand: 4graded stone aggregate) finished with a floating coat of neat cement including cement slurry, but excluding the cost of nosing of steps etc. complete 40mm thick with 20mm nominal size stone aggregate	Sqm	113.80	180	20,484.00	092012
30	CEMENT PLASTER (IN FINE SAND) : 1:6 (1cement: 6fine sand)	Sqm	60.32	960	57,907.20	111012
31	15 mm cement plaster on the rough side of single or half brick wall of mix - 1:6 (1cement: 6 fine sand)	Sqm	69.37	1650	1,14,460.50	111022
32	Finishing walls with textured exterior paint of required shade on new work (Two or more coats applied @ 3.33 ltr/10 sqm) over and including base coat of water proofing cement paint applied @ 2.20 kg/10sqm	Sqm	115.11	1650	1,89,931.50	115140
33	Distempering with oil bound washable distemper of approved brand and manufacture to give an even shade New work (two or more coats of distemper) over and including priming coat with cement primer	Sqm	61.03	960	58,636.80	115091
34	Providing and fixing pressed steel door frames manufactured from commercial mild steel sheet of 1.25mm thickness including hinges jamb, lock jamb, bead and if required angle threshold of mild steel angle of section 50x25mm, or base ties of 1.25mm pressed mild steel welded or rigidly fixed together by mechanical means, adjustable lugs with split end	metre	624.20	91	56,802.20	031232

For Chief Engineer (Con)/I/BSP

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RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

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	tail to each jamb including steel butt hinges 25mm thick with mortar guard, lock strike-plate and shock absorbers as specified and applying a coat of approved steel primer after pretreatment of the surface as directed by the Engineer-in-Charge Profile-B (125x60mm) Single rebate					
35	Providing and fixing T-iron frames for doors, windows and ventilators of mild steel Tee-sections, joints mitered and welded with 15x3mm lugs 10cm long embedded in cement concrete blocks 15x10x10cm of 1:3:6 (1cement : 3 coarse sand : 6 graded stone aggregate 20mm nominal size) or with wooden plugs and screws or rawl plugs and screws or with fixing clips or with bolts and nuts as require including fixing of necessary butt hinges and screws and applying a priming coat of approved steel primer	kg	99.13	900	89,217.00	081270
36	Steel work welded and buitup section/framed work including cutting ,hoisting , fixing in position and applying a priming coat of approved steel primer in gratings ,frames, guard bar, ladders, railings ,brackets, gates and similar works.	kg	80.90	1400	1,13,260.00	081412
37	Providing and fixing glazing in aluminium door, window, ventilator shutters and partitions etc. with PVC/neoprene gasket etc. complete as per the architectural drawings and the directions of engineer – in – charge. (Cost of aluminium					

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	snap beading shall be paid in basic item.)					
	With float /frosted glass panes of 4 mm thickness (weight not less than 10.0 kg/sqm)	Sqm	722.26	40	28,890.40	082031
38	Providing and fixing glazed or unglazed full body homogenous anti-algal, all weather resistant ceramic landscaping/facia vitrified tiles (Cladding), conforming to tests as per IS:4457-2007, having water absorption < 0.5%, having sizes as 300mm x 300mm x 8mm, 200mm x 400mm x 9mm, 400mm x 400mm x 9mm and 300mm x 600mm x 10mm & 240mm x 60mm x [illegible]mm in approved shade, colour & quality. Tiles to be laid on 20 mm average thick cement mortar bed of 1:4 (1 cement : 4 coarse sand) and joints filled with polymer based cementitious grout with all labour, material complete job.	Sqm	914.41	160	1,46,305.60	172030
39	Drilling of bore well for specified depth in all types of soil and rock mechanically with all contractor's tools, plants, material and labour up to 75 meters For 150 mm dia	metre	205.00	450	92,250.00	171521
40	Providing, supplying and fixing mild steel plug or screw cap of standard make on top of casing pipe on completed bore as directed by Engineer-In-Charge. 150mm dia	Each	115.57	3	346.71	171562
41	Polyethylene Vinyl Chloride water storage tank with cover and suitable locking arrangement	litre	6.67	2000	13,340.00	257050

Signature of Tenderer(s)/Contractor(s)

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S.E.C. Rly. Bilaspur
JOINT VENTURE PARTNER

236 कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
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Chief Engineer(Con)/I/BSP

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42	Hoisting, fitting and fixing in position plastic moulded water storage tank including making connection of intake, delivery, outlet and overflow .pipes etc. with all lead and lift upto all stories. Cost of tanks/fittings to be paid separately 2000 ltr capacity tank	Each	1332.71	2	2,665.42	138044
43	Providing and fixing Ist quality ceramic tiles conforming to Group B-III (Ceramic Wall Tiles) of IS:15622 of manufacturers approved by railway in all colours, shades, and design as approved by the Engineer-in-Charge in skirting, risers of steps and dado over 12mm thick bed of cement mortar 1:3 (1cement: 3coarse sand) including pointing in white cement mixed with pigment of matching shade complete 200x300 mm	Sqm	531.45	90	47,830.50	095012
44	Of Group B-I-a of IS . 15622 (Vitrified tiles) of size abcv0c 400x400mm upto 600x600 mm	Sqm	930.11	320	2,97,635.20	095026
45	Providing and fixing square-mouth S.W. gully trap grade 'A' complete with C.I. grating brick masonry chamber with water tight C.I. cover with frame of 300x300mm size (inside) the weight of cover to be not less than 4.50kg and frame to be not less than 2.70kg as per standard design 100x100mm size P type With F.P.S. bricks class designation 75	Sqm	1038.29	6	6,229.74	141051
46	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) Large diameter pipes, having thermal stability for hot & cold water	metre	2218.45	75	1,66,383.75	131122

मुख्य इंजीनियर (निर्माण)/द
Chief Engineer (Con.)/B
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S.E.C. Railway, Bilaspur

VETTED
C.A.O. (Cons.)
S.E.C. Rly. Bilaspur (C.G.)
For F.A. & C.A.O.

RSA-SK JOINT VENTURE
JOINT VENTURE PARTNER

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Executive Engineer (Con)
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S.E.C. Railway, Bilaspur

	supply including all CPVC plain & brass threaded fittings. This includes jointing of pipes & fittings with one step CPVC solvent cement, trenching, refilling and testing of joints complete as per direction of Engineer-in-Charge. External work (higher dia) 100mm nominal outer dia. Pipes					
47	Providing and fixing water closet squatting pan (Indian type W.C. pan) with 100mm sand cast iron P or S trap, 10litre low level white P.V.C. flushing cistern with manually controlled device (handle lever) conforming to IS : 7231, with all fittings and fixtures complete including cutting and making good the walls and floors wherever required White Vitreous China Orissa pattern W.C. pan of size 580x440-mm with integral type foot rests	Each	2826.52	6	16,959.12	151011
48	Providing and fixing 600x450mm bevelled edge mirror , 5.5 mm thick of float glass (of approved quality) complete with 6mm thick hard board ground fixed to wooden cleats with C.P. brass screws and washers complete	Each	762.23	6	4,573.38	152110
49	Providing and fixing wash basin with C.I./ M.S. brackets, 15mm C.P. brass pillar taps, 32mm C.P. brass waste of standard pattern, including painting of fittings and brackets, cutting and making good the walls wherever required white, vitreous china wash basin size 630x450mm with a pair of 15mm C.P. brass pillar	Each	1763.15	12	21,157.80	151071

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	taps					
50	Providing and fixing C.P. brass bib cock, 15mm nominal bore, of approved quality conforming to IS:8931	Each	243.39	12	2,920.68	132180
51	Providing and fixing Towel rail (C.P.)brass15 mm dia x 600 mm long having approx. wt.500 gm	Each	391.08	6	2346.48	153410
52	Providing and fixing medium grade G.I. pipes complete with G.I. fittings including trenching and refilling etc. External Work 20 mm dia. nominal bore	Rmt	173.51	50	8,675.50	131152
	25 mm dia. nominal bore	Rmt	230.26	50	11,513.00	131153
	32 mm dia. nominal bore	Rmt	271.84	150	40,776.00	131154
	40 mm dia. nominal bore	Rmt	317.67	50	15,883.50	131155
	50 mm dia. nominal bore	Rmt	397.76	50	19,888.00	131156
53	Providing and fixing medium grade G.I. pipes complete with G.I. fittings and clamps, including cutting and making good the wall etc. Concealed pipe including painting with anti corrosive bitumestic paint, cutting chase and making good the wall 15 mm dia. nominal bore	Rmt	186.96	40	7,478.40	131141
	20 mm dia. nominal bore	Rmt	223.03	40	8,921.20	131142
54	Preparation of subgrade by excavating earth upto 22.5cm depth, dressing to camber and consolidating with power road roller of 8 to 12 tonne capacity including making good the undulations etc. and disposal of surplus earth with lead upto	Sqm	40.96	11000	4,50,560.00	231010

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मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

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	taps					
50	Providing and fixing C.P. brass bib cock, 15mm nominal bore, of approved quality conforming to IS:8931	Each	243.39	12	2,920.68	132180
51	Providing and fixing Towel rail (C.P.)brass15 mm dia x 600 mm long having approx. wt.500 gm	Each	391.08	6	2346.48	153410
52	Providing and fixing medium grade G.I. pipes complete with G.I. fittings including trenching and refilling etc. External Work 20 mm dia. nominal bore	Rmt	173.51	50	8,675.50	131152
	25 mm dia. nominal bore	Rmt	230.26	50	11,513.00	131153
	32 mm dia. nominal bore	Rmt	271.84	150	40,776.00	131
	40 mm dia. nominal bore	Rmt	317.67	50	15,883.50	131155
	50 mm dia. nominal bore	Rmt	397.76	50	19,888.00	131156
53	Providing and fixing medium grade G.I. pipes complete with G.I. fittings and clamps, including cutting and making good the wall etc. Concealed pipe including painting with anti corrosive bitumestic paint, cutting chase and making good the wall 15 mm dia. nominal bore	Rmt	186.96	40	7,478.40	131141
	20 mm dia. nominal bore	Rmt	223.03	40	8,921.20	131142
54	Preparation of subgrade by excavating earth upto 22.5cm depth, dressing to camber and consolidating with power road roller of 8 to 12 tonne capacity including making good the undulations etc. and disposal of surplus earth with lead upto	Sqm	40.96	11000	4,50,560.00	231010

VETTED
for F.A. & C.A.O. (C.R.W.) Bilaspur

मुख्य इंजीनियर (निर्माण) /I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

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	50 metres					
55	Consolidation of subgrade with power road roller of 8 to 12 tonne capacity including making good the undulations etc. with earth or quarry spoils etc. and re-rolling the subgrade	Sqm	1.46	11000	16,060.00	231020
56	Drilling of bore well for specified depth in all types of soil and rock mechanically with all contractor's tools, plants, material and labour up to 75 meters for 200 mm dia	mtr	431.21	343	1,47,905.03	171522
57	Providing supplying, lowering and fixing in bore G.I.B Class perforated casing pipe 6 mm thickness up to specified depth below ground level with all contractor's tools, plants, material and labour etc. complete 200 mm internal pipe	mtr	1488.42	169	2,51,542.98	171533
58	Providing supplying, lowering and fixing in bore unperforated MS casing pipe 6 mm thickness up to specified depth below ground level with all contractor's tools, plants, material and labour etc. complete 200 mm internal pipe	Mtr	1118.18	153	1,71,081.54	171543
59	Supplying, boring, sinking & installation of 40 mm dia hand tube well pump assembly having total depth of 50 metres with the following components as per IS:9301 : i) Double guided head stroke / 80 mm x 40 mm deep tubewell hand pump No. 6 of complete. ii) Brass strainer mesh type "Dinco" or equivalent made of long slotted medium B class G.I. pipes with 80-mesh brass wire net wrapping around the	Each	44081.17	3	1,32,243.51	171450

Signature of Tenderer(s)/Contractor(s) For Chief Engineer(Con)/I/BSP

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
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S.E.C. Railway, Bilaspur

	perforated pipe and jacketed by 26 / 28 SWG brass perforated sheet. 40 mm dia- 2 lengths each of 1.83 m connected with G.I. socket. iii) All brass cylinder 65 mm dia 450 mm long with brass plunger, plunger rod socket, all brass poppet/lower valve bucket leather complete. iv) G.I. Casing pipe ISI marked 80 mm dia medium quality 18 m long. v) G.I. pipe ISI marked 40 mm dia medium quality 28.35 m long. vi) 80 mm x 40 mm dia G.I. Reducing socket of approved quality. vii) 12 mm dia bright bar electro galvanised connecting rod "Dinco" / BJH" or equivalent, 3.0 m long each with G.I. coupling of length as required at site of work					
60	Extra / Less for sinking including drilling, supplying, fitting, fixing & installing of G.I. casing pipe 80 mm dia medium ISI marked over 18 m	mtr	578.35	72	48,841.20	171460
61	Demolishing brick work including stacking of serviceable material and disposal of unserviceable material within 50m lead In cement mortar	cum	378.50	442	1,67,297.00	182013
	Road					
62	Providing corrugated G.S. sheet roofing, including vertical/curved surface, fixed with polymer coated J or L hooks, bolts and nuts 8mm diameter with bitumen and G.I. limpet washers or with G.I. limpet washers filled with white lead and including a coat of approved steel primer and two coats of approved paint on	sqm	809.92	1200	9,71,904.00	101011

VENTURE

Sr. C.A. (Civil) Bilaspur

(मुख्य इंजीनियर (निर्माण) /I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

	overlapping of sheets complete (upto any pitch in horizontal/vertical or curved surfaces) excluding the cost of purlins, rafters and trusses and including cutting to size and shape wherever required 1.00mm thick with zinc coating not less than 275gm/ sqm					
63	Supplying and fixing lewis/ holding down bolts of approved design with nuts and washers complete	kg	58.52	143	8,368.36	081140
64	Structural steel work riveted or bolted in built up sections, trusses and framed work, girders, staging, racks etc including cutting, bending, straightening, drilling, rivetting, bolting, hoisting, fixing in position including applying a priming coat of approved steel primer complete - upto 6m height above GL In RSJ, tees, angles and channels	kg	61.74	11286	6,96,797.64	081021
65	Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. all complete Fixed to opening/ wooden frames with rawl plugs screws etc.	kg	75.02	1300	97,526.00	74232
66	Providing and fixing ISI standard steel glazed doors, windows and ventilators of standard rolled steel sections (shutters & frame), joints mitered and welded with 15x3mm lugs, 10cm long, embedded in cement concrete blocks 15x10x10cm of 1:3:6 (1cement: 3coarse sand: 6graded stone aggregate 20mm					81250

VETTED
for F.A. & C.A.O. (Cons)
S.E.C. Rly Bilaspur (C.G.)

Signature of Tenderer(s)/Contractor(s) 242 For Chief Engineer(Con)/I/BSP

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
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S.E.C. Railway, Bilaspur

	nominal size) or with wooden plugs and screws or rawl plugs and screws or with fixing clips or with bolts and nuts as required, including providing and fixing glass panes with glazing clips and special metal sash putty of approved make, necessary fittings such as brass handles, brass peg stays, brass spring catch, bolts, hinges, locks etc as required, applying a priming coat of approved steel primer but excluding the cost of metal beading					
(a)	Doors	Sqm	2486.42	25	62,160.50	81251
(b)	Windows fixed	Sqm	1782.37	41	73,077.17	81252
	Ventilators-top hung	Sqm	2469.30	25	61,732.50	81254
	Supplying and laying interlocking pre-cast CC block pavers of approved design factory manufactured of specified grade cement concrete on passenger platform, foot paths, circulating area, etc, including setting in position over 25mm thick bedding layer of fine sand, filling the joints with fine sand, leveling including compaction as per IS 15658 60 mm thick blocks of M30 grade for light traffic	Sqm	401.69	200	80,338.00	98021
68	Providing & fixing Precast Chequered tiles conforming to IS:13801:1993, manufactured under mechanical vibration & hydraulic pressing machine in double layer; top layer of 10 to 12 mm thickness of Dolomite Powder, graded chips, fibre and UV stabilised iron oxide Lanexess colour and bottom layer of 1:3 CC mixed with	Sqm	595.51	100	59,551.00	94062

For F.A. & C.A.O. (C.G.)
S.E.C. Rly. Bilaspur (C.G.)

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
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KSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

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	galvanised steel fibre of approved quality, jointed with neat cement slurry mixed with pigment to match shade of tiles including rubbing and cleaning etc. complete on 20mm thick bed of cement mortar 1:4 of sizes : 300mm x 300mm x 30mm thick					
69	Providing and fixing 18mm thick mirror polished, machine cut for kitchen platforms, vanity counters facias, dados and skirtings and similar locations of required size of approved shade, colour and texture laid over 20mm thick base cement mortar 1:4 (1cem					99035
(i)	Granite Black. Area of slab over 1.0 Sqm but upto 2.0 Sqm or larger	Sqm	2761.49	10	27,614.90	099035
(ii)	Providing and applying plaster of Paris putty of 2mm average thickness over plastered surface to prepare the surface even and smooth complete	Sqm	72.86	1650	1,20,219.00	112040
70	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade Two or more coats on new work	sqm	47.68	10109	4,81,997.12	121051
71	Providing and fixing brass stop cock of approved quality 20 mm nominal bore	Each	295.82	50	14,791.00	132022
72	Providing and spreading 6mm thick layer of red bajri/ moorum, watering and rolling with 3 T roller or light power roller complete including preparation of the surface rolling.	sqm	22.70	2315	52,550.50	231080

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for F.A. & C.A.O. (Con.)
S.E.C. Rly Bilaspur (C.G.)

Signature of Tenderer(s)/Contractor(s) 244 For Chief Engineer(Con.)/BSP

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

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Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

73	Structural steel work welded in built up sections, trusses and framed work, girders, stagings, racks, etc including cutting, bending, straightening, hoisting, fixing in position, including applying a priming coat of approved steel primer, complete - upto 6m height above GL					081030
	In RSJ, tees, angles and channels	kg	81.67	34022	27,78,576.74	081031
74	Stone Boulder Weighing minimum 35 Kg Each					
		Cum	546.06	6557	35,80,515.42	252390
	Total				5,84,54,977.90	
	Departmental escalation @ 52.56% above for all items under this schedule				3,07,23,936.39	
	Total of Schedule "6"				8,91,78,914.29	

Note: (i) The contractor has to submit the structural design and drawings including foundation design of service buildings/structures if required, duly proof checked by IIT/NIT. No additional payment for it shall be admissible.

(ii) In case there is any difference between basic rates/units of above items when compared to USSOR-2010, the rates/units mentioned in the printed copy of USSOR-2010 will be considered as correct and payment will be made as per rates/units mentioned in the printed copy of USSOR-2010.

VETTED
For F.A. & C.A.O. (Cons.)
S.E.C. Rly. Bilaspur (C.G.)

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
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S.E.C. Railway, Bilaspur

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

245 For Chief Engineer(Con)/I/BSP

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

Name of the work:- Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.

Schedule 7 –Cement

Sr. No	Item	Unit	Basic Rate	Quantity	Amount	USSOR Item Ref
	Supply and using Cement at work site					
1	OPC 43					
	For ROR	Ton	5750.00	2634	1,51,45,500.00	033061
	For other than ROR	Ton	5750.00	6647	3,82,20,250.00	033061
2	PPC					
	For ROR	Ton	5635.00	115	6,48,025.00	033063
	For other than ROR	Ton	5635.00	12161	6,85,27,235.00	033063
	Total (For ROR = Rs 1,57,93,525/- & for other than ROR = Rs 10,67,47,485/-)				**12,25,41,010.00**	
	Departmental escalation @ 8.5% above for all items under this schedule				1,04,15,985.85	
	Total departmental value of schedule "7" (For ROR = Rs 1,71,35,974.63 & for other than ROR = Rs 11,58,21,021.22)				**13,29,56,995.85**	

Note: Portland slag cement (PSC) can be supplied & used in place of PPC at the same rate of PPC and no extra payment will be made.

Note :-

i) **Contractor should procure cement from IS approved Firms or from their authorized distributors only. Proof of procurement i.e. vouchers etc. will be submitted by the contractor.**

ii) **Empty cement bag will be the property of the contractor(s). However, an amount of Rs. 1.65 (Rupees one and paise sixty five) per bag will be recovered from contractor's bill towards cost of empty cement bag.**

iii) Payment towards cement will be made on the basis of actual consumption according to design mix and no wastage on any of the materials supplied and used in the work by the contractor including cement is payable by the Railway. The contractor shall make his own arrangements for storing cement.

iv) The manufacture's test certificate containing the batch, date of manufacturing etc. must be submitted by the Contractors at the time of supply.

v) Test Certificate for Cement used should be produced which should conform to IS: 1489 for PPC, & IS 8112 for OPC 43 grade as the case may be.

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For F.A. & C.A.O. (Const.)
S.E.C. Rly. Bilaspur (C.G.)

Signature of Tenderer(s)/Contractor(s)

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For Chief Engineer(Con)/BSP

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

Name of the work:- **Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.**

SCHEDULE '8' – Reinforcement Steel

SrNo.	Item	Unit	Basic Rate	Quantity	Amount
1	Supplying reinforcement for R.C.C work Chapter No. 04 & USSOR-2010 item No. 045016				
	For ROR	kg	52.48	922000	4,83,86,560.00
	For other than ROR	kg	52.48	3041000	15,95,91,680.00
					20,79,78,240.00
	Departmental escalation @ 43% above for all items under *this schedule*				8,94,30,643.20
	Total departmental value of schedule "8" (For ROR = Rs 6,91,92,780.80 & for other than ROR = Rs 22,82,16,102.40)			Rs.	29,74,08,883.20

NOTE:-

i) All Reinforcement Steel (TMT Bars) and Structural steel shall be procured as per specifications mentioned in BIS's document - IS: 1786/2008 (minimum grade Fe 500) and IS: 2062/2011 respectively. Independent tests shall be conducted, where ever required, to ensure that the materials procured conforms to the specifications and cost of testing to be borne by the Railway.(If the test result does not satisfy the required specification and the steel supplied is rejected, such cost of testing will be deducted from contractor's dues.

ii) These steel shall be procured only from those firms, which are Established, reliable, Indigenous & Primary Producers of Steel, having Integrated Steel Plants (ISP), using iron ore as the basic raw material and giving in-house iron rolling facilities, followed by production of liquid steel and crude steel, as per Ministry of steel's guidelines.
However, only certain isolated sections of structural steel, not being rolled by ISPs, can be procured from the authorized re-rollers of ISPs or authorized licensee of BIS having traceability system and who use billets produced by ISPs. Traceability shall be ensured by an officer specially authorized by the concerned SAG officer of the Zonal Railway on case to case basis for this purpose.

iii) The contractor shall disclose the source from where supplies of Steel is received by him and maintain a detailed record of receipt of steel from different sources and shall keep the challan, Railway receipts number of lorry number, etc. and store balance in a register as directed by the Engineer-in-charge and produce the same to the Engineer as and when demanded. A copy of purchase document shall have to be submitted along the bill for claiming payment against these items. Railway reserves the right to inspect contractor'

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S.E.C. Railway, Bilaspur

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

247 For Chief Engineer(Con)/I/BSP

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

iv) Payment towards Steel will be made on the basis of actual consumption (**payment of overlaps and chairs will also be made**) and no wastage on any of the materials supplied and used in the work by the contractor including steel is payable by the Railway. The contractor shall make his own arrangement for storing Steel.

v) In case of any doubts regarding quality of Steel, the Railway may order it to be tested and acceptance of the supplied steel shall be subject to such test results and cost of testing will have to be borne by the Contractor.

vi) The quantity will be calculated using standard weight per running metre OR actual weight which ever is less and minimum required over laps will be provided as per IS 456 (Latest revision). The quantity of chairs shall be payable as per drawing showing layout of chair locations duly approved in advance by the Engineer-in-charge.

vii) Manufacturer's Test certificate for steel used should be produced and the same should conform to IS-1786/2008.

viii All reinforcement used should be free from loose Mill scale, loose rust, paints and oil coating etc.

Contractor has to used Galvanized wire not less than 1mm dia for binding of reinforcement steel. No extra payment shall be applicable for the binding wire.

ix) **The reinforcement bars to be supplied should satisfy the technical requirement as mentioned in Chapter XVIII of this document. A List of vendors are being enclosed herewith from which the reinforcement bars can be purchased and supplied with approval of Chief Engineer(Con). If the tenderers intends to supply reinforcement bars from other firms, in such case prior and written approval of Chief Engineer(Con) is to be obtained.**

Sl. No.	Name of Company	Location	State
1.	Steel Authority of India Limited.	HSCC, Burnpur	West Bengal
2.	Steel Authority of India Limited	Bokaro	Jharkhand
3.	Steel Authority of India Limited.	Bhilai	Chhattisgarh
4.	Steel Authority of India Limited.	Rourkela	Odisha
5.	Steel Authority of India Limited.	Durgapur	West Bengal
6.	Rashtriya Ispat Nigam Limited.	Visakhapatanam	Andhra Pradesh
7.	Tata Steel Limited.	Jamshedpur	Jharkhand
8.	Essar Steel Limited.	Hazira	Gujrat
9.	JSW Steel Limited.	Vijayanagar	Karnataka
10.	Jindal Steel & Power Limited.	Raigarh	Chhattisgarh
11.	Ispat Industries Ltd.	Dolvi	Maharashtra
12.	Bhushan Power & Steel Limited.	Jharsuguda	Odisha
13.	Bhushan Steel Limited.	Angul-Dhenkanal	Odisha
14.	Shri Bajrang Power & Ispat Ltd.	Raipur	Chhattisgarh
15.	Shyam Steel Industries Ltd.	Durgapur	West Bengal
16.	Elextrosteel Steels Limited.	Bokaro	Jharkhand
17.	Real Ispat & Power Ltd.	Raipur	Chhattisgarh
18.	SRMB SRIJAN Pvt. Ltd.	Kolkata	West Bengal
19.	Shyam Mettalics & Energy Ltd.	Sambalpur	Odisha
20.	Rasmi Metalics Ltd.	Midnapur	West Bengal
21.	Reliable Sponge Pvt. Ltd.	Kalunga	Odisha
22.	Shyam SEL & Power Ltd.	Burdwan	West Bengal
23.	Sri Nakoda Ispat Ltd.	Raipur	Chhattisgarh

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

248 कार्यपालन अभियंता (निर्माण) / For Chief Engineer(Con)/BSP
Executive Engineer (Con) Chief Engineer (Con.)/I
दक्षिण पूर्व मध्य रेलवे, बिलासपुर द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur S.E.C. Railway, Bilaspur

24.	Super Smelters Ltd.	Burdwan	West Bengal
25.	Adhunik Industries Ltd.	Durgapur	West Bengal
26.	MS Agarwal Foundries (P) Ltd.	Medak	Telangana
27.	MSP Steel & Power Ltd.	Raigarh	Chhatisgarh
28.	Jai Balaji Industries Ltd.	Burdwan	West Bengal
29.	Hi Tech Power & Steel Ltd.	Raipur	Chhatisgarh

मुख्य इंजीनियर (निर्माण)/I
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S.E.C. Railway, Bilaspur

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

Name of work:- Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings. Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.

Schedule-9 (Steel Girder)

Sl. No	Description of works	Unit	Qty	Rate	Amount
1	Providing, fabricating, Trial Assembly, Transporting and launching in position on piers/abutments as per drawing – duly applying protective coating on all parts of structural steel of bridge structure; complete with contractor's own steel , all materials, machineries, tools & tackles, consumables, energy/power, all leads and lifts, labour etc. complete in all respect as per approved drawings & specifications, relevant clauses of the contract and RDSO Guidelines. The fabrication & erection cost shall include all the types of stiffeners, packings, diaphragm, T&F bolts, steel drifts, shop welds, shop and field rivets/bolts, templates, jigs, fixtures, back up supports, accessories etc. The job includes preparation of fabrication drawings & approval of same (as decided/appointed by Client), fabrication of steel girders, erection of girders and launching in position on piers/abutments as per drawing. The elements should be Aluminum metalized (as per cl.:39.2.1 of RDSO;B1 and as per the RDSO stipulation vide letter No. CBS/MPP/Meeting; dt.10.4.14) preceded by surface preparation by compressed air blasting/centrifugal blasting with suitable abrasive material (as per cl.:39.2.1 Appendix VII of RDSO;B1). The metalizing shall be followed by, one coat of Etch primer to IS:5666 and one coat of zinc primer to IS:104. This shall be followed by two coats of aluminum paint to IS:2339 after touching up the primer and finishing coat if damaged in transit (as per RDSO;B-1:cl.39.2.1).The above Painting/Oiling/ Metallizing scheme is a brief outline – but these will be guided by all the provisions as detailed in cl.39.2 and 39.2.1 of RDSO;B-1 along with relevant appendices and other codes mentioned therein. The rate shall include all material testing, preparation of QAP and getting it approved by RDSO or any other agency as decided by the client. No part of the work shall be painted or coated, packed or dispatched until it has been finally				

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S.E.C. Rly. Bilaspur (C.G.)

Signature of Tenderer(s)/Contractor(s)
RSA-SK JOINT VENTURE
JOINT VENTURE PARTNER

For Chief Engineer(Con)/I/BSP
मुख्य इंजीनियर (निर्माण)/I
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द.पू.म.रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

	inspected and approved by the inspecting officer as per QAP – The rate shall also include the cost of approval by RDSO/any other agency as decided by the client. All other relevant guidelines of (RDSO;B-1) shall be followed. Rate shall include all activities for delivering the end product as per the relevant drawings mentioned or any other revised drawings of RDSO as per Client requirements, except bearings, which shall be paid separately. **Note: Payment to be made in stages as given below**				
a)	12.2 M span (As per RDSO drawing No. 11752/R1 "Other than ROR"	MT	14	152496.68	21,34,953.52
b)	45.7 M span (as per RDSO drawing no 17181/R 2X61 M span (as per RDSO drawing no 17182/R				
(i)	Qty. for Other than ROR	MT	380	167445.76	6,36,29,388.80
(ii)	Qty. for ROR	MT	380	167445.76	6,36,29,388.80

Note: Payment to be made in stages as given below for item no. 1 (a) & (b).

1. Specification of works, which are to be executed as per this schedule, have been detailed in various chapters of this document etc. The rates are inclusive of all loading, unloading, ascent, decent, lead, lift, labour, material, tools, plant, shuttering, machineries, consumables, taxes, royalty etc. complete, if not specified otherwise
2. Unless otherwise specified in this Schedule, the rates are inclusive of cutting of vegetation, uprooting of tree etc.
3. The rates are inclusive of pumping out water if any required in connection of work, unless specified otherwise.
4. Cut spoil be dumped in Railway land as per direction of Engineer-in-charge so as not to obstruct waterway.
5. No separate payment shall be made for crossing of Railway lines required, If any, in connection of the work.
6. No separate payment shall be made for making working platforms, damage caused to foundation/ sub structure due to any reason, will have to be made good at contractor's cost.
7. No separate payment shall be made for making approaches / temporary bridges to various locations and maintenance thereof.
8. Any damage caused to the existing/ temporary structures shall be repaired and bring to the original standard by contractor at their ow.. cost. Waterway to be kept clear if any infringement is their due to heaping of spoils etc.

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S.E.C. Railway, Bilaspur

9. Contractor has to apply IS Codes IS:6586, IS:9954, IS 2590, IS:739, IS:5666, IS:104, IS:2339 and ISO-8501-2007 or IS: SS055900 (Standard comparator) with matching prints, free of cost to Railway as directed by Engineer-in-charge. Other codes, manuals, guidelines etc. if required and pertaining/ relating to the execution of work will have also to be provided by the contractor to railways as per the direction of Engineer-in-charge.

10. (a) The work of fabrication of steel girders etc. is to be done at RDSO approved firm & fabricator's workshop / premises (Fabricating Agency) only with having valid RDSO approval certificate for the same. The inspection of fabrication work etc. as done at RDSO approved workshop/premises is to be done by specialized third party Inspecting Agency i.e. RDSO, Welding Research Institute (WRI), Certificate Engineers International Limeted (CEIL), 'Inspection Wing' of RITES Limited, 'Inspection Division' of Konkan Railway Corporation Limited (KRCL)/India, or any other expert public sector undertaking, only with due intimation & approval of Railway i.e. Engineer –in –charge QAP & WPSS is to be prepared by Fabricating agency & to be got approved by the inspecting agency i.e. specialised third party with due intimation/approval of Railway i.e. Engineer –in-charge. Inspection of fabrication works etc. As to be done by the engaged specialised third party, Railway i.e. Engineer –in –charge or his authorised representative may also do the inspection with the engaged specialised third party or independently as per the direction/decision of Engineer in charge. The inspection charges & all other charges etc. Related with that as to be incurred/raised by this engaged specialised third party for inspection etc. Will have be borne by the contractor itself and rates to be quoted by the tenderer (s) reckoning all these expenses including all other type of takes etc. If any & rates will be included of all these expenses. No other extra amount /charges railway will be included of all these expenses. No other extra amount /charges railway will pay for the same. Any claim in this regard in future by contractor will not be admissible & payable by railway .it is also to be mentioned here that, if railway will pay for the inspection charges etc. To the inspecting agency as charges/amount .....will be deducted by railway from the contractor .....

(b) Fabrication of steel girder etc for bridges to be fabricated as per the direction of Engineer in charge reckoning the target date of commissioning of bridge and fabrication of girder etc is to be done in RDSO approved workshop. Workshop should have valid RDSO approval certificate and to be borne in the approved vendor list of RDSO for the same. Parallelly 3rd party inspection agency also to be engaged and deployed for both the workshops as mentioned above in para 10(a). Contractor shall quote the rates accordingly reckoning all these above factors and nothing extra will be paid on these account (s) anytime in future.

(c) The fabrication of steel girder & its components etc. Is to be carried out in the approved workshop of vendors borne on current master list of approved vendors published by quality assurance – civil Directorate of Research Design & standered Organisation (RDSO), Lucknow - 226001 for "STEEL BRIDGE GIRDERS" only.

Before taking up Girder fabrication and welding, the contractor has to submit Quality Assurance Plan (QAP), Welding Procedure Specification sheet (WPSS) and Welding Procedure Qualification Records (WPQR) to Inspecting Agency as mentioned above for approval. Fabrication of steel

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For F.A. & C.A.O. (Cons) S.E.C. Rly. Bilaspur (C.G.)

girders shall be taken up only after receipt & communication of approval of the same. Inspection charges will be borne by Contractor.

11. The steel girders fabrication and welding etc shall be inspected and certified by as mentioned in above para 10 in accordance with IRS authorised representative as per IRS welded Bridge code 2001 & IRS: B1-2001 with latest correction slips all testing facilities and tests will be carried out by the contractor at his own cost & inspection charges will be borne by the contractor only as mentioned in the above para10.

12. The girder components/girders may also be inspected by Railway's authorized representative as per IRS welded Bridge Code 2001 & IRS: B1-2001 with latest correction slips, as mentioned in the above para.10.

13.The work should be done as per quality assurance plan (QAP), Welding Procedure Specification sheet (WPSS), Welding Procedure Qualification Records (WPQR) Prepared by the Fabricating agency and approved by the inspecting agency as mentioned in the above para 10.

14.Records & instruction to be maintained /followed as per the IRS Specification for fabrication and erection of steel girder bridge manual/codes, manuals, policy guidelines, instructions, CE's circulars etc. In this regard

15. The Contractor will submit the launching scheme of the girders and will be approved by the Railways.

16.The contractor has to supply two (02) nos new in good working condition & calibrated digital Elcometers before metalizing /painting of structural members are started .These Elcomemters then shall have to hand over to Railway.

17.The bar chart to complete the entire work within stipulated time frame to be submitted after award of contact as per the contract conditions & provisions of GCC.

18 Method of Measurement and Stage Payment for item No.01.

18.1 Measurement

The cost of all supply of materials, painting, the supply and fixing of members for the temporary strengthening of girder members, temporary erection, launching in position and tests at the Contractor's works, marking, packing and delivery F.O.R. or C.I.F. as called for in the schedule is to be included in the price quoted in the tender.

18.2 Wastage allowance

Payment will be made for tonnage of girders components fabricated as per standard drawing. Whatever occurred on scrap will not be paid.

However scrap/wastage will be contractor's materials and he will disposed as per their convenience.

18.3 Payment shall be made for quantity of items completed as per BOQ completed in all respect as per the schedule of stage payments for fabrication as given below-

(i)	Procurement of material (on receipt in fabrication workshop (RDSO approved) subject to maximum of quantities as indicated in approved fabrication drawings and also as indicated in schedule) against Indemnity bond.	25%
(ii)	On fabrication of girder components including metalized(except final coat of IS: 2339) as per specifications and its actual certification & passing by Engineer against Indemnity bond and on successful test assembly, checking of camber and then dismantling and marking of components	5%
(iii)	On receipt of fabricated material in good condition at site on certification by authorized representative of Engineer	5%

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	regarding physical receipt of fabricated materials.	
(iv)	On completion of assembly of girder parts on service bolts/drifts.	5%
	Balance stages for payment	
(i)	On making the arrangements complete in all respects for launching of girders and keeping it ready for launching and on completion of field HSFG(with DTI washer)bolting as per Railway specifications.	10%
(ii)	After final launching of all the girders and aligning them in proper position over the respective supports before lowering on the bearing.	25%
(iii)	On removal of temporary arrangements and placement of girders on bearing, anchoring the bearing to girder to the correct line and level, completing the balance riveting.	10%
(iv)	After providing misc. works such as pathway, railings final coat of painting etc, cleaning of site of all obstructions.	11%
(v)	On successful load testing.	4%

Note: Pro- rate payment shall be made in intermediate stages as decided by the Engineer –in – charge.

If fabrication is done at the contractor's workshop /factory premises, the payment in stages as prescribed above shall be released subject to submission of the indemnity bond Complete responsibility of the safe keep and custody of the material at Contractor's workshop and during transit and also on receipt at Bridge site shall be of the contractor and the Engineer will not have any responsibility on this account for loss or damages. The contractor shall make good for any loss or damages to the Material at his own cost.

2.	Rocker & roller bearing : Supplying, fitting and fixing in position true in line and level complete as per drawing (No. RDSO/B/111764) and approved Technical Specifications including all scaffolding, material, labour & machineries etc., **Note:** 1. Work is to be done strictly in presence of Railway's 254uthorized representative. 2. The bearing shall be taken from reputed firms in consultation with Engineer-in-charge at site after inspection and passed by RITES. 3. The rate also includes greasing of knuckle and roller of free bearing and knuckle of fix bearing by approved grease graphite and painting the bearings as per the schedule of painting of girder.				

VERIFIED
For F.A. & C.A.O. (Cons.)
S.E.C. Rly. Bilaspur (C.G.)

Signature of Tenderer(s)/Contractor(s)

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For Chief Engineer(Con)/I/BSP

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(i)	Qty. for Other than ROR	MT	11	158323.70	17,41,560.70
(ii)	Qty. for ROR	MT	11	158323.70	17,41,560.70
3	Supplying and fixing in position **neoprene/ elastomeric bearing** pads of approved quality under the steel Girders inclusive of all labour and materials, cutting and drilling holes and lead, lift, loading, unloading, ascent, decent, etc. complete. The size and thickness of the bearing pad shall conform to the detailed design calculation and drawing approved by the Railway. The rate includes the reinforcement plates/laminates in the bearing pad and the entire bearing acts as a single homogeneous block etc. complete. The elastomeric bearing should confirm to the provisions of IRC (Pt-II) with latest amendments. The rate also includes fixing of the bearing with adhesive mortar (if required) on bed block/pedestal				
	Other than ROR	Cubic cm	40000	1.32	52,800.00
4	Testing of neoprene/elastomeric bearing at any of the IITs/ NITs/ other reputed Govt. Engineering laboratories as per the instruction of Engineer in charge. Tests are to be conducted as per IRC-83 (Pt.II) with latest amendments. Cost of the bearing shall be paid under item 3 of this schedule **Note for item No 3 & 4.** 2. Testing of elastomeric bearings/ POT bearings shall be done as per IRC: 83 Part II & Part III respectively. 3. It is deemed that the contractor will supply the elastomeric bearing in a single lot so that one test each is necessary. If due to some reasons contractor supplies the material in different lots at different period of time then the cost of all these tests will have to be borne by the contractor. iii) If after test results, the material is not found confirming to any of the required specification, the whole lot will be rejected & the contractor will have to arrange all materials & their testing				

Signature of Tenderer(s)/Contractor(s)

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For Chief Engineer(Con)/I/BSP

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	at his own cost till the material supplied confirm to the required specifications. iv) In case the agency wants to get the bearings tested at manufacturer's laboratory, they can do so provided:- 4. Facilities for testing as required by IRC :83 Part I, II,& III are available in manufacturer's laboratory and a certificate enumerating the facilities available issued by the manufacturer is submitted to Chief Engineer/Con/Bilaspur for his appraisal & 5. Chief Engineer/Con/Bilaspur if satisfied with the certificate may depute Railway Supervisor to inspect and verify the available facilities for testing & IChief Engineer/Con/Bilaspur satisfied with the report of Railways Supervisor w.r.t. level of testing facilities & The agency has to tie up with supplier regarding the date of testing of the batch of bearings from which the agency intends to procure the bearings so that Railway's can depute its representative to witness the testing & In such case this item will not be operated. case the testing facilities at the manufacturer's work are not to the satisfactions of Railway the bearing will be got tested at the approved laboratory as per this item & payment will be made under this item after bearings are found satisfactory after this test.				
(i)	er Than ROR	No	1	19370.51	19,370.51
5.	UD SHEA5R Connector:- Supplying nufacturing. fabrication, testing and welding with ded by STUD welding machine (with all ttractor consumable) compatible with type of UD on composite steel girder, conforming to IS : 35 – 1966 of diameter 25 mm and height 200 mm d as per **RDSO drawing No RDSO/B – 752/3R** with all alteration and as per approved awing of railway and as per direction of Engineer in – charge inclusive all. The stud should pass the est prescribed in above mentioned drawing.				

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for F.A. & C.A.O. (Cons.)
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Signature of Tenderer(s)/Contractor(s)

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For Chief Engineer(Con)/I/BSP

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	Note : 1. The tensile strength of STUD steel should be 4600 Kg/CM (Min.) , Yield strength -3500 Kg/CM^2 (Min.) Elongation – 20 % (Min.) 2. The STUD welding should be done by "Drawn ARC STUD welding ceramic ferrules" technique. 3. The STUD shear connector and ceramic ferrules confirm to type SD3/UF as per BS EN ISO13918 4. The mechanical properties of STUD shear connector shall be as per ISO 6892/BS EN ISO13918 5. The shape of tip of STUD may be chosen by manufacture .yhe stud tip shall be supplied with flux in the form of press – fitted aluminium bar or aluminium spray coating. 6. The diameter of ceramic ferrule D7 as per figure-13/table-18 of BS EN ISO13198 shall be 26MM (+0.5 mm & -0.0 mm)				
(i)	Other than ROR	No.	1500	414.63	6,21,945.00
	Supplying, fabricating and fixing any type of minor structural components like trolley refuge / man refuge, inspection ladders, chequered steel sheets, and gussets etc. with two code of primer IS104, IS2074 and two finishing code of IS2339 as per Railway's specifications for Material confirming to IS Codes and specifications listed in tender documents.				
(i)	Qty. for Other than ROR	MT	30	98610.44	29,58,313.20
(ii)	Qty. for ROR	MT	30	98610.44	29,58,313.20
	Carrying out of deflection test as per the approved arrangement with contractors own materials tools and plants, labour etc complete.				
(i)	Qty. for Other than ROR	One complete Job	3	110119.82	3,30,359.46
(ii)	Qty. for ROR	One complete Job	2	110119.82	2,20,239.64

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C.A.O. (Cons.)
For F.A. & C.A.O. (Cons.)
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Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

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For Chief Engineer(Con.)/BSP

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S.E.C. Railway, Bilaspur

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8	Providing, fixing, leaving and grouting of various sizes of holding down bolts, saddle plates in concrete column or in other structural steel member with proper nuts, bolts, washers/plates as a complete job. Note:- Epoxy/cement grouting will be paid separately under USSOR				
(i)	Qty. for Other than ROR	Kg	600	228.81	1,37,286.00
(ii)	Qty. for ROR	Kg	400	228.81	91,524.00
9	Manufacturing and supplying various engineering indicator boards, partially retro reflective of Engineering grade having stove enameled background and 12mm dia holes drilled for fixing with bolt & nut of 10mm dia made out of 16 SWG M.S/C.R. Sheet, painted with non peel able weather proof one coat of zinc chromate stoving primer on both sides, and two coats of yellow are required colour background on both side black letter, black band and any other black part of front face all stove enamel painted on front side and grey stove enamel on back side to IS shade No. 630 French grey conforming to respective drawings complete with contractor's labour, materials, tools & plants, lead/lift, taxes/octroi etc.				
(i)	Qty. for Other than ROR	Sqm	5	9263.29	46,316.45
(ii)	Qty. for ROR	Sqm	5	9263.29	46,316.45
10	RCC M35 or richer design mix with contractors well graded machine crushed aggregate of size 20mm and below, sand of approved quality with contractor's cement and steel and including contractor, staging, formwork/shuttering complete in deck slab and at any other places as directed by the Engineer in charge etc as per approved drawings. The rate includes all labor and materials with all lead, lift, royalty, taxes, etc complete as required. The contractor has to arrange water with any lead with their own cost. (The payment for enforcement and cement used will be made separately under relevant items of the tender schedule).				
(i)	Qty. for Other than ROR	Cum	30	5405.00	1,62,150.00

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For F.A. & C.A.O. (Cons.)
S.E.C. Rly, Bilaspur (C.G.)

Signature of Tenderer(s)/Contractor(s)

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JOINT VENTURE PARTNER

For Chief Engineer(Con)/I/BSP
Executive Engineer (Con) मुख्य इंजीनियर (निर्माण) /I
Chief Engineer (Con.)/I
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Total Departmental value of schedule "9" (For Other than ROR= Rs 7,18,34,443.74 & For ROR = Rs 6,86,87,342.79)		14,05,21,786.53

Note:

1. Specifications of works, which are to be executed as per this schedule, have been detailed in various chapters of this document. The rates are inclusive of all loading, unloading, ascent, decent, lead, lift, labour, material, tools, plant, shuttering, machineries, consumables, taxes, royalty etc complete, if not specified otherwise.

2. Unless otherwise specified in this Schedule the rates are inclusive of cutting of vegetation, uprooting of trees etc.

3. The rates are inclusive of pumping out water if any required in connection of work, unless specified otherwise.

4. Cut spoil shall be dumped in Railway land as per direction of Engineer-in-charge so as not to obstruct waterway.

5. No separate payment shall be made for crossing of Railway lines required, if any, in connection of the work.

6. No separate payment shall be made for making working platforms. Damage caused to foundation/ substructure due to any reason, will have to be made good at contractor's cost.

7. No separate payment shall be made for making approaches/ temporary bridges to various locations and maintenance thereof.

8. Any damage caused to any of the existing/ temporary structures shall be repaired to bring it to the original standard by contractor at their cost. Waterway to be kept clear if any intringement.

9. Contractor had to supply IS codes IS:6585, IS::9954, IS:2590, IS:739 IS:5666, IS:104, IS:2539, and ISO-8501-1-2007 or IS:SS055900 (Standard comparator) with matching prints, free of cost to Railway and/or as directed by Engineer-in-charge

10. The fabrication of steel girders is to be carried out in the approved workshop of vendors borne on current Master list of approved vendors published by Quality Assurance – Civil Directorate of Research Designs & Standards Organization (RDSO), Lucknow-226001 for "STEEL BRIDGE GIRDERS" only.

Before taking up Girder fabrication and welding, the contractor has to submit Quality Assurance Plan (QAP), Welding Procedure Specification Sheet (WPSS), Welding Procedure Qualification Records (WPQR) to RDSO through Railway for approval. Fabrication of girders shall be taken up only after receipt of approval of RDSO. Inspection charges will be borne by Contractor.

11. The girder fabrication and welding shall be inspected and certified by Research Design and Standards Organization, Manak Nagar, Lucknow in accordance with IRS welded Bridge code 2001 & IRS B1-2001 with latest correction slips. All testing facilities and tests will be carried out by the contractor at his own cost. The inspection charges will be borne by the Contractor.

Signature of Tenderer(s)/Contractor(s) For Chief Engineer(Con)I/BSP

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12. The girder components/girders shall also be inspected by Railway's authorized representative as per IRS welded Bridge code 2001 & IRS B1-2001 with latest correction slips.

13. The work should be done as per Quality Assurance Plan (QAP), Welding Procedure Specification Sheet (WPSS), Welding Procedure Qualification Records (WPQR) prepared by the agency and approved by RDSO.

14. Records & instructions to be maintained/followed as per IRS-Specification for fabrication and erection of steel girder Bridge manual/codes.

15. **The contractor will submit the launching scheme of the girder and will be approved by the Railways.**

1.0 Method of Measurement and Stage Payment for item No 01

1.1 Measurement

The cost of all supply of materials, painting, the supply and fixing of members for temporary strengthening of girder members, temporary erection, launching in position and tests at the Contractor's works, marking, packing and delivery F.O.R. or C.I.F. as called for in the schedule is to be included in the price quoted in the tender.

1.2.Wastage allowance

Payment will be made for tonnage of girders as per drawings. Whatever wastage on scrap will not be paid. However scrap/wastage will be contractor's material and he will dispose as per their convenience.

1. If fabrication is done at the Contractor's workshop/factory premises, the payment in stages as prescribed in Para 1.3.1 (i) to (ii) shall be released subject to submission of the Indemnity bond. Complete responsibility of the safe keep and custody of the material at Contractor's workshop and during transit and also on receipt at Bridge site shall be of the Contractor and the Engineer will not have any responsibility on this account for loss or damages. The Contractor shall make good any loss or damages to the material at his own cost.

2. **Contractor has to ensure provision of camber as per desig... In case camber becomes negative, the complete girder will be rejected and contractor has to fabricate new girder at his own cost including erection.**

VETTED
For F.A. & C.A.O. (Cons.)
S.E.C. Rly. Bilaspur (C.G.)

Signature of Tenderer(s)/Contractor(s) - कार्यपालन अभियंता/एफ.ओ. Chief Engineer(Con)/A/BSP /
Executive ... Con) Chief Engineer (Con.)/
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Name of work:- Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.

	SCHEDULE- '10' (Fabricating, supplying and fixing of Galvanized "H' Beam steel Sleepers)				
Sl.No.	**Description of works**	**Unit**	**Qty.**	**Rate (in ₹)**	**Amount (in ₹)**
1.	Fabricating, manufacture & supply and fixing of Galvanized "H" Beam Steel Sleepers made out of the materials as per the specification given and as per approved drawing No. RDSO/B/1636/4/R and fixing on the nominated girder bridges with maximum clear spacing of 450mm as per the instruction of Engineer-in-Charge including supply, fixing galvanised zero toe load fastening as per approved drawings, M.S. canted base plates, special liners, rails pads with embedded steel plate, galvanized elastic rail clips, elastomeric pads for running rail and guard rail etc., including welding, riveting drilling holes wherever necessary with all contractors labour, tools, Plant, machinery, transportation to bridge site, lead, lift, loading and unloading etc. complete and as directed by Engineer-in-charge.				
(i)	Qty. for Other than ROR	Each	195	27476.20	53,57,859.00
(ii)	Qty. for ROR	Each	195	27476.20	53,57,859.00

NOTE :-

(I) IS:H8-200 Sleepers Should be made of standard rolled section confirming to IS:2062 E250 B0 Beams and MS Plates to IS:2062 E250 B0 fully killed and normalized.

(II) Galvanizing should be done after welding MS Pad Plates to H-Beam Sleepers by Hot dip process for the minimum thickness of 100 (+/- 5) micron with Zinc conforming to IS:869-77 & IS:2628-85.

(III) The elastomeric pads of steel sleepers shall be procured from RDSO approved sources only. The list of RDSO approved firms can be ascertained at the time of execution.

(IV) The steel fittings of H-Beam Steel sleepers shall be inspected & certified by RITES and by the consignee if required as per the direction of Engineer-in-charge. Contractor has to arrange for inspection at their own cost.

(V) H-Beam sleepers shall be inspected by the consignee before and after galvanizing for quality check as per the norms and specifications.

(VI) 70% of payment would be made after the 'H' Beam sleepers are brought to site in good condition. The 'H' Beam sleepers would also be inspected at site by Railway's authorised representative and an indemnity bond has to be given/submitted by contractor to Railway for assuring the safe custody of the steel channel sleepers by contractor, till the time it is fixed at the top of the already launched girder in position, for payment of this part payment.

For P.A. & C.A.O. (Cons.)
S.E.C. Rly. Bilaspur (C.G.)

RSA-SK JOINT VENTURE
JOINT VENTURE PARTNER

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S.E.C. Railway, Bilaspur

2.	Supply of Hook Bolts 28mm with nut & single coil spring washer as per RDSO Drg. No. RDSO-B-1636/5				
(i)	Qty. for Other than ROR	Each	780	372.19	2,90,308.2
(ii)	Qty. for ROR	Each	780	372.19	2,90,308.2

For One "H" Beam Steel Sleeper

Sr. No.	Description	Drawing No.	Quantity
1.	"H" Steel Sleeper	RDSO-1636/4/R	1
2.	Embedded Rail Pad	RH-1154/T-8761	2
3.	SPL liner (inner)	RH-991/T-8762	2
4.	SPL liner (outer)	RH-992/T-8763	2
5.	ERC MK-III	RDSO/T-3701	4
6.	Elastomeric Pad	RDSO-B-1636/5	2
7.	6mm thick (300m X 305 X 25) GR Pad for guard Rail (Size- 136x6x146)	T-5163	4

Zero toe load fittings

1.	Bolt, Nut & split pin for guard rail (25 dia. x130 long)	T-5164	4
2.	Taper washer for guard rail (50mm x 60 mm x 18 mm)	T-5161	4
3.	Taper steel washer for guard Rail	T-5162	4
4.	Single coil spring washer for Hook bolt & Guard Rail Bolt	T-10773	12
5.	Nut for 28 dia. Hook Bolt	RDSO/B-1636/5	8
6.	Hook Bolt – 28mm dia. X 360mm approx.	RDSO/B-1636/R2	4
7.	Tapered split pin for Hook Bolt & Guard Rail		3

3. Manufacturing and supplying following fittings as per specifications and as per RDSO approved drawings with all lead, lift, labours, transportation charges and all taxes. The work includes cutting of steel to size and shape, drilling, assembling, welding, riveting, bolting, holing, milling, grinding, galvanizing of steel components and machining etc. in complete.

A.	Anti-sabotage devices as special nut for fish bolts.(Qty. for Other than ROR)	Each	530	104.37	55,316.10
B.	Special key for anti-sabotage nut @ 1 no. per 50 nos. nut.(Qty. for Other than ROR)	Each	18	48.10	865.80

Total cost of Schedule '10' : Rs.1,13,52,516.30

(For Other than ROR= Rs 57,04,349.10 & For ROR = Rs 56,48,167.20)

Note:- These items shall be procured only from RDSO approved sources/suppliers as circulated under RDSO's letter No. CF/EF/POLICY, dated: 13.03.96 (Amended up to date).

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

262

For Chief Engineer(Con)/I/BSP

कार्यपालन अभियंता (निर्माण)

Executive Engineer (Con.)

मुख्य इंजीनियर (निर्माण) /I

Chief Engineer (Con.)/I

द. पू. म. रेलवे, बिलासपुर

S.E.C. Railway, Bilaspur

For F.A. & C.A.O. (Con.)
S.E.C. Rly. Bilaspur (C.G.)

SOUTH EAST CENTRAL RAILWAY

T.NO.CEC/BSP/22-23/19

536

Name of work:- Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division

Schedule - "11" (P.Way Linking, Spreading of ballast and misc. P.Way works)

Sl. No.	Description of items	Qty.	Unit	Basic Rate	Amount
01.	Linking of new B.G. P.Way Track with 52 Kg/60 Kg Rails with PSC normal/wider base sleeper and fittings and Elastic fastenings of any sleeper density in straight, curve and on bridges to correct alignment and longitudinal level including providing super elevation in curves with, rails and sleepers available on top of the cutting or bottom of the bank away from track including crossing of running railway lines, transportation and distribution of small P.Way fittings from PWI's store depot at BSP/KHS/ROB/SKT/RIG or from any other depot as per the direction of Engineer-in-charge to works site, including fixing of all fittings/fastenings, removal of kinks in rails by hydraulic Jim crows, initial packing as directed by the Engineer -in-Charges and lifting of track not more than 50 mm at a time in stages to bring the correct longitudinal profiles and cross levels within tolerance as specified by Engineer-in-Charge for making track fit for introduction of tamping machines/ballast trains including dressing of ballast profile, all lifts, descents, ascents, rise, fall, labour, tools, plants, equipment, taxes and all other incidental charges etc. complete.				
(a)	In Main lines with 1660 nos. per Km sleeper density.	9500	Per track metre	₹ 500.00	47,50,000.00
(b)	In Loop lines with 1540 nos. per Km sleeper density.	500	Per track metre	₹461.46	2,30,730.00

Note: (a) Contractor should provide hydraulic Jim crow fit for straightening 60 Kg/52 Kg. Rails before commencing the work.

(b) The rate includes contractor's labour tools and plants etc. complete.

(c) The rate includes oiling and greasing of fish bolt holes, fish plates etc complete with contractor's oil and grease of approved quality.

(d) The rate includes free lead upto 70 metre and beyond this additional lead will be paid as per relevant item of this schedule

(e) The rate includes providing initial packing to concrete sleeper track involving opening of ballast, squaring sleepers, slewing track to correct alignment, gauging, tightening of fittings, levelling of track to required cross levels, packing the sleepers and boxing of ballast to standard ballast profile as per P.Way manual as directed by Engineer-in-Charge.

(f) The rate includes lifting of track into stages including packing required for proper longitudinal levels and for providing adequate ballast cushion as directed by Engineer-in-Charge or his representative.

(g) The rate includes pairing of rails.

(h) Transportation of all P.Way fittings from anywhere in the yard to work site including distribution and return of excess fittings to store depot at BSP/handing over to nearest Open Line PWI shall have to be done by contractors, cost of which is included in the above rate.

(i) Necessary safety precautions shall have to be taken by contractors.

(j) Safety items, e.g., banner flag, hand flags, H.S. lamps, speed indicator boards, caution board etc. shall be procured by contractor for execution of work and is included in the rate.

(k) One round of through packing will be done after linking, lifting, initial packing to bring the track in prescribed tolerance(s) as per IRPWM and for additional lifting/packing, separate payment will be made under item No. 5 & 8 of section 'Z' of SECR-SOR-2006. Initial laying and initial packing, will be done in a manner so that during one round of packing lifting of not more than 75mm is required. The items no.5 & 8 will be operated after the approval of Engineer-in-Charge.

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

For Chief Engineer(Con)/I/BSP

VETTED

for F.A. & C.A.O. (Cons.)
S.E.C. Rly. Bilaspur

	(I) Dip lorry/Rail dollies are to be arranged by the contractors himself.				
	PAYMENT SCHEDULE FOR ITEM NO.1 ABOVE.				
	(i) After placement of concrete sleeper to required spacing, squaring of concrete sleeper to required density: 30% of the accepted rate.				
	(ii) After pairing and butting of rails and fixing of rails in position to correct gauge with all P.Way fittings: 40% of the accepted rate.				
	(iii) After initial through packing, lifting, bringing longitudinal levels and cross levels within tolerance as specified by Engineer-in-Charge including dressing of ballast profile: 25% of the accepted rate.				
	(iv) After greasing of pandrol clips, liners and eyes of inserts with graphite grease as per IS:408Gr'O' and completing the item in all respects: 5% of the accepted rate.				
	(v) Payment for item No.1(a)&(b) above will be made only after recording of joint reading of track (i.e. longitudinal levels at every 10metres, gauge and cross levels at every 4th sleeper and versines of curves).				
	Note:- Handling of 90 UTS rails should be done as per special conditions annexed herewith.				
2.	Laying of broad gauge 52 Kg/60 Kg. Points & crossings during traffic block or without traffic block, including intermediate portion of track (with PSC layout to railway's specification). The rate includes giving pre-curvature to stock and tongue rail with hydraulic Jim crow if required, levelling, fixing slide chairs, bearing plates, check blocks, heel blocks etc. fixing up of railway's gauge and crossing tie plates, fixing of one set of points and crossings with straight or curved switches, stretcher bars, switch anchors, any other safety fittings including fixing of junction fish-plates and points and crossings fittings as required as ordered by the Engineer-in-Charge. The rate includes lead upto 1/2 Kilometer, all lifts of P.Way materials consisting of rails, crossings, switches, PSC sleepers, turn out keys and all sorts of fittings etc. to be brought to the location from anywhere within the yard limits, crossing Railway lines etc. complete as required. The points and crossings set means length of track between stock joint and end of crossing joint. Nothing extra is payable for the works executed in running lines under blocks.				
	(a) 1 in 12				
	(i) Under traffic block.	8	Per Set.	₹ 102,653.74	8,21,229.92
	(ii) Without traffic block.	2	Per Set.	₹ 93,445.48	1,86,890.96
	(c)Derailing switch Without traffic block.	2	Per Set.	₹ 22,169.86	44,339.72
	(d) Derailing switch With traffic block.	01	Per Set	₹ 31,940.37	31,940.37

VETTED
For F.A. & C.A.O. (Cons.)
S.E.C. Rly. Bilaspur (C.G.)

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

264

For Chief Engineer(Con)/I/BSP

कार्यपालिन अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

	Note:- Transportation and distribution of all P.Way fittings from anywhere in the yard to the site of actual use and return of excess fittings to BSP depot/handing over to nearest Open Line PWI or any depot/location as per the direction of Engineer-in-charge shall have to be done by contractor and nothing extra will be paid on this account. For lead beyond 0.5 KM for Points & Crossings/Rails/PSC normal/wide base Sleepers, will be paid as per relevant item of this schedule. The laying of long sleepers and track beyond Crossing joint will be paid as per item No.1. ALTERNATIVELY (IN PLACE OF ITEM NO.2) In case Railway's turnout laying machine (T-28) is available, the work has to be done by machine method i.e. renewal & laying of points & crossing by machine. The item include leveling of ground by doing sufficient earthwork and making staging of wooden sleepers and rails supplied by Railway and assemble point & crossing over leveled ground over staging as directed by the Engineer-In-Charge or his authorized representative at site. If item is operated with machine working, the departmental rate for the item shall get reduced by 25% and accepted tender increase or decrease shall be applicable over such departmental rate.				
3.	Packing of points and crossings i.e. for attending of track after laying with PSC layouts and stone ballast.				
A.	For 1 in 12 Points & Crossings.				
	(i)Initial packing	10	per Set	₹ 20,085.45	2,00,854.50
	(ii)First packing	10	per Set	₹ 13,929.42	1,39,294.20
	(iii) Second packing	10	per Set	₹ 13,929.42	1,39,294.20
	(iv)Third packing	10	per Set	₹ 13,929.42	1,39,294.20
	Note:-Payment; for item no. (i) to (iv) will be made after recording of joint reading after each packing.				
4.	Unloading of stone ballast from Railway's hopper type wagons on the formation; in the section/ yards as directed by the Engineer-in-Charge with contractor's labour, tools, & plants and all other incidental charges etc. complete.				
		4000	Per Cum.	₹ 32.31	1,29,240.00
	Note:- The contractors is required to unload the stone ballast within the stipulated time as and when the wagons are placed failing which they have to pay demurrage charges resulting due to their failure to load/unload the materials within the specified free time allotted. From Railway's side every endeavourer will be made to furnish intimation at least 24 hours in advance before the placement of wagons to the contractors. However the contractor(s) should be in contact with the Engineer-in-Charge/SM to ascertain the arrival of the wagons.				
5.	Spreading of stone ballast on track and Points & Crossing from the quantity available on the formation/or toe of bank or top of cutting within Railway land/outside land on the formation in bank and cuttings as directed by the Engineer-in-Charge with a free lead up to 100 metre and lift upto 3.0 metres inclusive of descent, loading, unloading, labour and materials required including crossing one or more running Railway lines if required etc. complete.				
		30000	Per Cum.	₹ 144.19	43,25,700.00
6.	Rolling of spreaded stone ballast with contractor's power driven roller of capacity 3 tonnes or above (as directed by Engineer in charge) with minimum three passes or as directed by the Engineer-in-Charge with all contractor's labour, tools & plants and all other incidental charges etc. complete.				

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

For P.A. & A.O. (Con.)
S.E.C. Rly. Bilaspur (C.G.)

For Chief Engineer(Con)/I/BSP

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

Draft Agt.

		42500	Per Sqm.	₹ 4.47	1,89,975.00
7.	Casting of foundation block of size 300mm x 300mm x 450mm in plain cement concrete of proportion 1:3:6 with contractor's cement, sand, aggregate and other materials of approved quality as required, excavation and fixing of indicator board for curves, SEJ, points & crossings etc. including transportation of boards from Railway's store depot to the site of fixing as indicated by the Engineer-in-Charge or his authorized representative with contractor's labour tools & plants, equipment, leads, lifts, etc. complete. The rate includes cost of cement and other materials.				
		100	Each	₹ 536.19	53,619.00
8.	Extra lead for spreading of ballast/ mooram for every additional lead of 50 meters or part thereof over initial free lead of 100 meters upto 500 meters. The rates included contractor's labour, tools and plants, crossing of running Railway tracks if any and all other incidental charges etc. complete. (Approximate 8 lead)				
		80000	Per Cum per lead	₹ 16.28	13,02,400.00
9.	Extra lift for spreading of ballast beyond free lift up to 3 .0meter with contractor's tools and plants etc.				
	For lift beyond 3.0 m up to 6.0 m.	10000	Per Cum	₹ 13.80	1,38,000.00
10.	Greasing of all four pandrol clips and eye of MCI insert on the PSC sleeper with contractor's approved quality graphite grease as per IS:408 Gr 'O' including removing and re-fixing of pandrol clips with appropriate tools, plants, equipment, labour, leads, lifts etc. complete.				
		16000	Per Sleeper	₹ 9.35	1,49,600.00
11.	Greasing of all four MS Liners on the PSC sleeper with contractor's approved quality graphite grease as per IS:408 Gr 'O' including removing and re-fixing of liners with appropriate tools, plants, equipment, labour, leads, lifts etc. complete.				
		14500	Per Sleeper	₹ 9.49	1,37,605.00
12.	Greasing of gauge faces of rails with contractor's approved quality graphite grease as per IS:480 Gr 'O' with all contractors labour, tools & plants, all leads, and all other incidental charges etc. complete.				
		9500	Per Track metre.	₹ 5.14	48,830.00
	NOTE:-This item shall be executed before commissioning of track as directed by the Engineer-in-Charge.				
13.	Carrying out pre-tamping, during tamping and post tamping attention with Railway's tie-tamping machine for attending the Points & Crossing which invclves heaving of ballast in tamping zone, squaring of sleepers, required tightening of fittings as necessary and boxing/compaction of ballast slopes and cribs standard ballast profile as per P.Way manual as directed by Engineer-in-Charge.				
	(A) 1 IN 12				
	(i) First round	10	Per Set.	₹ 3246.21	32,462.10
	(ii)Second round	10	Per Set.	₹ 2697.91	26,979.10

	(iii)Third round	10	Per Set.	₹ 2655.51	26,555.10
14.	Dismantling of existing track including any type of rails, any type of sleepers with any density, any type of fittings and fastenings, points and crossings derailing switches/single trap switches cutting of jammed blots, fish plates and taking out rails, sleeper fittings etc. complete including extracting from if buried in earth and stacking the same within 30 mtr. at places free of moving dimensions as shown by Engineer-in-Charge.				
	(a)Track of any type / standard	1.2	Per Track KM	₹ 136393.62	1,63,672.34
15.	Maintenance of track to the prescribed standards as per IRPWM for safe and satisfactory running of trains. The rate includes maintenance operations like packing of track, attending low spots, attending alignment and gauge defects, casual renewal of sleepers, rails and fittings, maintenance of level crossings, points & crossings, adjustment of gauge, level, super elevation, dressing of ballast etc. compete as directed by the Engineer - in- charge or his representative at site (This includes that portion of existing track for which renewal of sleepers are to be done for track circuiting).				
	(a)For all seasons other than monsoon for 09 months x 10Track Km.	90	Per Track KM/Per months.	₹ 34007.57	30,60,681.30
	(b)For 03 months (during monsoon) x 10Track Km.	30	Per Track KM/Per months.	₹ 64565.96	19,36,978.80
Note for item No.15 :-					
(i)	The contractors will provide all the plants and machinery required for maintenance and nothing extra will be paid on this account.				
(ii)	For maintenance work the Contractor have to deploy minimum two skilled labours per Kilometer for all seasons other than monsoon and minimum four skilled labours per Kilometer for monsoon. The labour should be skilled and experienced in this regard.				
(iii)	The following weight age will be given for Points & Crossings:-				
a.	One Turn Out (i.e. from SRJ to Heel of Crossing) shall be treated as 100 track metres for 1 in 12 and 80 track metres for 1in 8.5.				
b.	One Derailing Switch is treated as 20 metre.				
(iv)	One mate/ supervisor should be deployed for supervision of the work of the gang.				
(v)	One-day rest per week will be given. However, the railway supervisor can shift the rest day.				
(vi)	If the manpower deputed is less than required, the deduction will be made @ Rs.800/- per man per day.				
(vii)	The labour supplied above can be utilized in any other work at the discretion of the engineer - In - charge or his representative.				
16.	Painting plain letters with contractor's paint, men and materials including painting two or more coats for surface preparation.				
	(a)Up to 25 mm. Height				
		4000	Per letter	₹ 1.85	7,400.00
	(b)Extra above 25mm height	1500	Per letter	₹0.98	1,470.00

For F.A. & C.A.O. (Cons.)
S.E.C. Rly. Bilaspur (C.G.)

Signature of Tenderer(s)/Contractor(s) 267 For Chief Engineer(Con)/I/BSP

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

कार्यपालन अभियन्ता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

मुख्य इंजीनियर (निर्माण) / I
Chief Engineer (Con.) / I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

17.	Lifting of Pts. & Crossing exceeding 75mm, and upto 225 mm in stages of not more than 50mm at a time including one through packing with contractor's labour, tools and plants, lead, lift, loading, un-loading, initial packing, aligning, gauging and all incidental charges etc. complete.				
	(i)1in 12 (Approx. 03 lifts in stages of not more than 50mm.)				
		3	Per Set per lift	₹ 4827.51	14,482.53
	Note:- This item may be executed if required for matching long-level of existing points with newly laid points as per prior permission of engineer- in-charge.				
18.	Manufacturing and supplying various engineering indicator boards, fully/partially retroreflective having stove enamelled background and 12 mm dia. Holes drilled for fixing bolt & nut of 10 mm diameter made out of 16 SWG mild steel cold rolled sheet, painted with non-peelable weather proof one coat of zinc, chromate stoving primer and two coats of yellow or required colour background on both sides, black letters, black band any other black part of front face all stove enamel painted on front side and gray stove enamel on back side to IS shade No.630 French gray. All around of the sign board areas 25mm Thick Border and all around Black Letters and Black Band 10 mm wide Engineering Grade Retro reflective enclosed lens type sheeting lining shall be provided of required colours conforming to respective drawings complete with contractor's labour, materials, tools & plants, lead/lift, taxes/octroi etc.				
18.1	Caution Indicator boards with 4 Nos. G.I. Bolt & Nut of size 10mm dia. & 20 mm long. (Size 1400mm x 400 . Drg. No. 2000/NGP/2000).				
		10	Each	₹ 8634.45	86,344.50
18.2	Speed indicator board with 4 Nos. bolt & nut of size 10 mm dia. & 20 mm long. (Size 1000mm, Equilateral Triangle. Drg. No. 2881/NGP/2000).				
		10	Each	₹ 7717.33	77,173.30
19.	Through packing for Derailing switch i.e. for attending of track after lying with PSC laycuts and stone ballast.				
	(i)Initial packing	3	Per Set	₹ 12032.33	36,096.99
	(ii)First packing	3	Per Set	₹ 9607.47	28,822.41
	(iii)Second packing	3	Per Set	₹ 9607.47	28,822.41
	(iv) Third packing	3	Per Set	₹ 9607.47	28,822.41
20.	Manufacturing and supplying various engineering indicator boards, partially/fully retroreflective of Engineering grade having stove enamelled background and 12mm dia. holes drilled for fixing with bolt & nut of 10mm dia. made out of 16 SWG M.S/C.R. Sheet, painted with non-peelable weather proof one coat of zinc chromate stoving primer on both sides, and two coats of yellow are required colour background on both side black letter, black band and any other black part of front face all stove enamel painted on front side and grey stove enamel on back side to IS shade No.630 French grey conforming to respective drawings complete with contractor's labour, materials, tools & plants, lead/lift, taxes/octroi etc.				
	LWR/CURVE BOARD/GANG BOARD/POINT BOARD/Bridge Name board/Jurisdiction Board or any other board of various sizes as per approved drawings.				
		100	Sqm.	₹ 11357.17	11,35,717.00

21.	Manufacturing and supplying angle iron post of size 50mm x 50mm x 5mm, with back support of angle iron size 35mm x 35mm x 3mm of 900mm long spot welded at 450 mm away from bottom of post, inflated at bottom, drilled on top and smaller size angle iron for Curves, LWR, points, gang board etc. as advised by Engineer-in-charge and painted with one coat of red oxide primer and alternate two coats of white & black bands of 300mm width of synthetic enamel paint, with required G.I. bolt & nut of size 10mm diameter &20mm Long for various indicator sign board confirming to the respective drawings complete with contractor's labour, materials, tools & plant, lead/lift, taxes/octroi, etc.				
	For Bump, Level Crossing, Guard Indicator, Stop Danger Board, Caution Indicator, Speed Indicator, Whistle Indicator.				
		1250	Per Kg.	₹ 160.40	2,00,500.00
22.	Providing of Semi-skilled labour for Push troll eying with Railways push trolley, Miscellaneous work during NI work, PPNI/pre-NI working, store keeper during night etc.				
		2000	Man days	₹ 484.68	9,69,360.00
23.	Trolleying rails & Sleeper by rail dolly without traffic block including collection, unloading and stacking at the destination as the directed by engineer in charge with free lead upto 30m and carrying upto 1.0 Km. with contractor's labour tools & plants etc. complete.				
		4000	MT	₹ 558.58	22,34,320.00
24.	Carrying out pre-tamping, during tamping and post tamping attention with Railway's tie-tamping machine for attending the track which involves heaping of ballast in tamping zone,				
	Squaring of sleepers, required tightening of fittings as necessary and boxing/compaction of ballast slopes and cribs standard ballast profile as per P.Way manual as directed by Engineer-in-Charge.				
	(a)First round	9500	Per track metre.	₹ 53.71	5,10,245.00
	(b) Second round & subsequent round.	19000	Per track metre.	₹ 44.55	8,46,450.00
25.	De stressing of LWR/CWR panels of varying length laid on 60 Kg./52 Kg. Rails on PSC sleepers with contractor's labour, tools and plants etc. complete.				
		10	Per track Km.	₹ 24223.42	2,42,234.20

Note:- The following operations are to be carried out during distressing of LWR/CWR panels.

(i) During destressing operation the closure rails attached to SEJs are to be disconnected and SEJ is to be adjusted to mean position.

(ii) The sleeper fastenings on both the rails are to be removed, starting from SEJ to the centre of LWR/CWR including LC, bridge etc. if any.

(iii) Rails are to be lifted and placed on the rollers to permit free expansion of the rails and are to be struck with wooden hammers.

(iv) When the rails are destressed, the rollers are to be removed and the fastenings are to be tightened starting from centre of LWR to SEJs. This shall be done within the rail temperature of Tm degree Celsius to Tm + 5 degree Celsius.

(v) Adequate gaps to be kept in the closure rails to permit welding of the joints.

(vi) Welding of the closure rails will complete the process of destressing.

(vii) After destressing, the disturbed sleepers are to be spaced and squared properly.

(viii) Slacks formed are to be picked up and boxing of entire length of LWR is to be done including

compaction of shoulders and crib ballast.					
(ix) The destressing operation is to be done between rail temperature (Tm °C & Tm+5 °C).					
26.	Fixing of sign board having single leg in correct position by excavation of foundation of size 0.6mm x 0.6mm x 1.0mm in any type of soil and filling the trench with 1:3:6 cement concrete with contractor's cement and other material, labour, tools, plants etc. complete as directed by Engineer-in-charge.				
		10	Each	₹ 1366.79	13,667.90
	Note:- Fixing of Sign Board having two legs (Bridge Name Board, Jurisdiction Board of SSE (P.Way), AEN, Sr. DEN & Division), rate payable shall be two (02) times of the above rate.				
27.	Removal of 90R/52 Kg./60 Kg. Points and crossings with existing steel/ wooden/PSC sleepers and fastenings thereon, stretcher bars, check rails etc. complete in running/non-running track including switches (straight or curved) & crossing and lead rail portion and stacking the dismantled Pts. &Xings including switches, crossing, sleepers and rails at places as directed by the Engineer-in-charge with a free lead up to 30metres with contractor's labour, tools and plants.				
	(i)1 in 8.5	1	Each Set	₹ 25418.19	25,418.19
	(iii)Derailing switch	4	Each set	₹ 10649.00	42,596.00
28.	Construction of buffer end as per CE's Drg. No. 23772 with Rly's Rail of 90R/52 Kg with 1:3:6 concrete the rate includes cutting of rails of required length, bending of rails as per the drawing, transportation of rails from Rly, store depot to site, fixing of wooden sleepers, fish plates, nuts and bolts, cleats, white wash and painting of wooden sleepers, excavation of foundation to the required depth etc., including all taxes, levies, labour charges income tax, sale tax etc. complete. (Wooden sleepers will be supplied by Railway) (Cement will be paid separately).				
		1	Each Nos.	₹ 91994.89	91,994.89
29.	Laying/insertion of glued joint with 60/52 Kg. rail section complete with fittings on any type of sleeper with or without traffic block including carrying of glued joints within yards fitting from Rly's store depot to work site, with contractor's labour, tools & plants, leads, lifts, loading, unloading, initial packing, aligning, gauging and all incidental charges etc. complete.				
		85	Each	₹225.41	19,414.85
	Note:- Payment for cutting, drilling of holes, welding of glued joints required for laying/insertion of glued joints, transportation of glued joints from store depot to yard shall be made separately.				
30.	Laying switch expansion joint with 60Kg/52 Kg. Rail section complete with fittings on PSC sleeper with or without traffic block including carrying rails, sleepers, fittings, SEJs, available in the yard, with contractors labour, tools and plants, leads, lifts, loading, unloading, initial packing, aligning, gauging and all incidental charges etc. complete. The work also includes fixing of angles and reference pillars.				
		14	Per Set	₹ 10986.95	1,53,817.30
31.	Cutting of Rail with Abrasive rail cutter 60Kg/52 Kg. Rail section complete with or without traffic block with contractors labour, tools and plants, Petrol, leads, lifts, loading, unloading, aligning and all incidental charges etc. complete.				
		800	Each	₹ 920.73	7,36,584.00
32.	Providing of 5 KVA Diesel A.C. Generator for night working				
	08 Sets x 20 Nights	40	Per set Per Night	₹ 3541.29	1,41,651.60
33.	Running cost of generator with Contractor's fuel, lubricants and all consumable and				

Signature of Tenderer(s)/Contractor(s) 270 For Chief Engineer(Con)/(BSP)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

Draft Agt

सहायक अभियंता (निर्माण)

मुख्य इंजीनियर (निर्माण)
Chief Engineer (Con)
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

Per P.A. & C.A.O. (Const.)
C. Rly Bilaspur (C.G.)

	maintenance of generators. The contractor is to employ the generator operator and helpers, the rate includes the same and nothing extra will be paid on this account.				
		300	Per set per hour	₹ 156.44	46,932.00
34.	Providing and fixing of 500 W Halogen light including wiring and fixing of lights at appropriate height and supply of all materials with all lead, lift complete without infringing the track				
		200 Nos.	Each light per night	₹ 156.44	31,288.00
35.	Supply and fixing of Tent items in hire basis for NI and Pre-NI work at IB & BXQ yard. Requirement of items per day:				
A.	Water proof pandal	800	Sq. ft.		
B.	Bucket with mug	04	Sets		
C.	Chairs	12	Nos.		
D.	Side parade	32	Nos.		
E.	Kanath	12	Nos.		
F.	Dari	08	Nos.		
G	Table	06	Nos.		
		20	Day Nos. per day	₹ 9403.52	1,88,610.40
36.	Leading of P.Way materials i.e. sleeper, rails, switches, Pts & Crossings, or any other materials over initial free lead(70 mtr in case of linking and 30 mtr in case of stacking of released materials and 500 mtrs in case of Points and crossings) with contractors labour , tools and plants, including all lead, ascent , descent, loading and unloading, stacking, if required , crossing one or more railway lines if required etc. complete.				
	(a) For first 100 mtr beyond initial free lead.				
		3000	Per Metric ton	₹ 54.63	1,63,890.00
	(b)For every additional 100 mtr. or part thereof upto 1000 mtrs. (Lead to be counted beyond 130/170/600 metre as the case may be Approx. 09 lead.				
		27000	Per Metric ton	₹ 36.57	9,87,390.00
	(c)For every additional 500 mtr.or part thereof upto 1000 mtrs. (Lead to be counted beyond 1030/1070/1500 metre as the case may be Approx. 01 lead				
		1000	Per Metric ton	₹ 60.96	60,960.00
37.	Laying and fixing of guard rails including all leads, lifts etc. complete as directed by Engineer-in-charge at site.				
	(a)straight portion	250	Per meter	₹181.64	45,410.00
	(b)On approaches of bridges	5	Per Bridge	₹ 4786.55	23,932.75

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

271

For Chief Engineer(Con)/I/BSP

कार्यपालन अभियंता (निर्माण)

Executive Engineer (Con.)

मुख्य इंजीनियर (निर्माण)/I

Chief Engineer (Con.)/I

द. पू. म. रेलवे, बिलासपुर

S.E.C. Railway, Bilaspur

39.	Fixing of distances pieces made of Railway's released wooden sleeper in between edge of platform and Rail and yard limit. Including making in size and other necessary fixing arrangement etc. Complete as directed by Engineer-in-charge. The rate includes all labour, tools and plants, lead etc. complete.				
		5	Each	₹ 237.00	1,185.00
40.	Supply of push trolley broad gauge as per the technical specification of RDSO.				
		01	Each	₹ 96861.90	96,861.90
41.	Slewing & realigning of existing P.Way track consisting of PSC sleeper, 60 Kg./52 Kg. Single rail/SWR/LWR with or without traffic block in curves of in straight to correct alignment as directed by the Engineer-in-charge with contractor's labour, tools and plants as required with lift up to 25 mm the rate includes one round of through packing, loosening /tightening of P.Way fittings if required and all other incidental charges involved.				
	(a) For slewing above 0.1m and up to 0.5m	200	Per track Meter	₹ 249.25	49,850.00
	(b)For slewing above 0.5m and up to 1.0m	300	Per track Meter	₹ 309.56	92,868.00
	(c)For slewing above 1.0m and up to 1.5m	400	Per track Meter	₹ 369.86	1,47,944.00
	(d) For every additional slew of 0.5m or part there of	600	Per track Meter	₹ 400.00	2,40,000.00
42.	Insertion of GFN liners in existing track circuiting work in place of metal liner including opening of ERC & greasing, re-fixing and tightening with contractor's, labour, tools & plants, leads, lifts, loading, unloading and carrying the released metal liner to Railway Store as directed by Engineer-in-charge.				
		2000	Each	₹ 4.03	8,060.00
43.	Deep screening of track ballast 200mm(+/-10mm)below bottom of sleepers and screening of complete ballast section i.e. From toe of existing ballast profile on cess side to mid of fairway of two lines of ballast through sieve of specified size. This include opening of ballast, digging down 200mm below the bottom of sleepers, taking out caked-up ballast and muck etc. from the entire existing ballast section, putting back screened ballast as per the required ballast profile, redistribution it within a free lead of 100mtr. whenever required as per direction of Engineer-in-charge or his authorized representative at site, grading the formation bed in a slope of 1 in 30 to the edge of formation, cutting of cess, if required for ensuring cross slope and effective drainage, dressing of cess and ballast to proper profile as per direction of Engineer-in-charge or his authorized representative at site. The work also includes kutcha packing followed by one round of through packing.				
	(i) Deep screening at difficult location (KDTR & BEF Yards etc.)	200	Per Track meter	₹ 808.73	1,61,746.00
	Note:- 1. If the depth of the deep screening below bottom of sleeper is 250mm (+/- 10mm) then the payment will be made 10% higher than the accepted rate for above item. 2. If the depth of the deep screening below bottom of sleeper is 150mm (+/- 10mm) then the payment will be made 10% lower than the accepted rate for above item.				
46.	Cleaning of Jungle/Vegetation from both side cess of track, yard etc.				
	Cleaning of Jungle/Vegetation.	20000	Per Sqm.	₹ 1.73	34,600.00

Signature of Tenderer(s)/Contractor(s) 272 For Chief Engineer(Con)/T/BSP

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

कार्यपालन अभियंता (निर्माण) Executive Engineer (Con) Chief Engineer (Con.)/T द. पू. म. रेलवे, बिलासपुर S.E.C. Railway, Bilaspur

For F.A. & C.A.O. (Con) S.E.C. Rly. Bilaspur (C.G.)

47.	Supply of powered material Trolley/Motor Trolley consists of a platform made of light steel/Aluminium alloy structure and chequered plates, four wheels, seats, braking arrangement fitted on the wheels and an air cooled engine to run the trolley as per RDSO specification no. TM/SM/33, dtd.:06.06.1996 & as per the direction of Engineer-in-charge.	01	Each	₹2,66,548.78	₹2,66,548.78
48.	Supply of BG light weight self propelled Moped Trolley for Broad Gauge as per the RDSO specifications & as per the direction of Engineer-in-charge.	01	Each	₹1,69,260.88	₹1,69,260.88
	Total department value of Schedule- '11'				**₹2,88,96,909.00**

VETTED
Sr. F.A. & C.A.O. (Cons)
S.E.C. Rly Bilaspur (C.G.)

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

Name of work:- Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.

Schedule - "12" (Welding of Rail Joints)

1. Welding of Rail joints 52Kg./60Kg. - Single Rails/3 rail panel/in-situ/on cess for R260 to R260, 90UTS to 90UTS & R260 to 90UTS rail with SKV process with Contractor's portion approved by RDSO (to be supplied by authenticated certificate), three piece pre-fabricated dry moulds manually pressed (zircon washed) using single shot crucible fitted with auto-tapping thimble developed by any RDSO approved firm, petrol, welders, (possessing competency certificate issued by RDSO) skilled luter, welder, moulder, cutter, chipper, aligner, striker/hammer man, semi-skilled staff, unskilled labour with contractor's tools and plants, and all consumable materials including petrol, including all leads, lifts, carrying of materials to the site of work etc. all complete.

(a) R260/60 Kg. Rails.	500	Per Joint.	₹8015.81	₹40,07,905.00
(b) 52 Kg. Rails.	10	Per Joint.	₹7928.53	₹79,285.30

NOTE:- Rate will be increased if the work will be executed as under:-
(i)10 rail panel to LWR- ₹290/- (Two hundred and ninety only) per joint.
(ii) 20 rail panel to LWR- ₹850/- (Eight hundred and fifty only) per joint.

(iii) The rate is inclusive of all taxes and other charges leviable by the Central/State Government.

(iv) No extra lead, lift, or any other charges will be paid to the Contractors.

(v) Engineer in Charge will decide the numbers of tanks to be operated as per requirement.

(vi) The Contractors shall make their own arrangements at their cost to transport the materials required for work such as portions, welding equipment, mould boxes etc., to the site of work.

(vii) All gang tools required should be arranged by the Contractors.

(viii) Finishing of weld joints has to be done to the following tolerances:-

(a) Finishing of top surface . +0.4mm, -0.0mm mm measured at end of 10cm straight edge.
(b) Head finishing on sides : ±0.3mm over gauge side of the rail head measured at the centre of 10cm straight edge.
(c) Vertical Alignment : Variation not more than +1.0mm, -0.0mm measured at the end of 1.0 metre straight edge.
(d) Lateral Alignment : Variation not more than ±0.5mm measured at the centre 1.0metre straight edge.

(ix) The Contractors shall paint the weld-collar and write after completion of work on the Rail floor (outside) the number of joint and the date of welding in the form No. DD/NY/YY/TTC with Contractors paint with all labour without any extra payment.

(x) Work shall not be done during rains, if required, proper protection will be done.

(xi) Specifications as laid down in RDSO's manual for welding of rails joints by SKV process shall be followed.

(xii)The rates includes shifting the joint sleepers upto 30cm on either side, providing suitable gaps of about 24mm to 26mm by pulling back of rails including removing, fastening, chipping the excess materials if required, bringing the shifted joint sleepers to the specific packing and backing them to the required specifications as directed including adjustment of the required gaps for welding, aligning, levelling etc. complete including filling / grinding after filling and supplying of kerosene and HSD oil etc. for weld trimmer and profile grinder in required quantity. It also

Signature of Tenderer(s)/Contractor(s) 274 For Chief Engineer (Con.)/I/BSP

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

Chief Engineer (Con.)/I
S.E.C. Railway, Bilaspur

VETTED
for F.A. & C.A.O. (Con.)
S.E.C. Rly. Bilaspur (C.G.)

	includes wire brushing of welded area to remove dust, loose rust, mill scales etc. and apply anti-corrosive paint/weld collar painting on 10cm on either side of the weld with contractor's material complete.
	(xiii) All the welded joints shall be ultrasonically tested by the Railway in terms of clause-18.2 of IRS T-19-1994 as per the procedure given at Annexure-1 of Indian standard specification T-19-1994 or as per the extant codes, manual, specification & guidelines.
	(xiv) All the joints, which are found to be defective, shall be cut and re-welded by the firm /agency/contractor using their portion, equipment, labour and consumable, free of cost. Where one defective joint is required to be replaced by two new joints, the entire cost of both the joints shall be borne by the firm. Such re-welded joints shall also be tested ultrasonically and if found defective, shall again be cut and re-welded free of cost.
	Mode of payment: Payment shall be admissible for only welded joints passing through visual inspection, dimensional check and USFD test etc. However 85% payment for joints welded shall be released after passing through visual inspection and dimensional check after filing &grinding and 10% payment after wire twisting, painting and numbering of welded joint and balance 5% payment for joints, payment shall be released after passing through USFD test etc.
	Any joint not conforming to any one of the above stipulations shall be cut and re-welded by the contractor at his own cost and/or otherwise will be liable to impose penalty as per the contract conditions/Manual provisions/Policy guidelines etc.

Total of Schedule-'12' : ₹ 40,87,190.30

VETTED

For F.A. & C.A.O. (Cons.)
S.E.C. Rly. Bilaspur (C.G.)

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

Signature of Tenderer(s)/Contractor(s) 275 For Chief Engineer(Con)/I/BSP

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

SOUTH EAST CENTRAL RAILWAY

Name of work:- Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.

Schedule- '13' (Transportation of Materials).

Sl. No.	Description of items	Quantity	Unit	Basic Rate	Amount
1.	Transportation of B.G. Track Wide Base PSC Sleepers/Bridge sleepers (PSC), Level crossing sleepers (PSC) for 52 Kg/60 Kg. Rail sections from concrete sleeper plants from ANARA/or PURULIA and/or NEAR KHARAGPUR or at other places to anywhere in/from the jurisdiction of S.E.C. Railway & S.E. Railway with contractor's labour, tools and plants including transportation, equipment, fuel etc. and unloading of the same along the alignment or on the top of the new formation or any other locations at the destination point as directed by the Engineer-in-charge. Crossing one or more railway tracks if required with all leads, lifts, ascent, descent and all other incidental charges etc. complete as directed by the Engineer-in-Charge of the works.				
(a)	For first one Kilometer or part thereof	5600	Per Metric tonne Per Kilometer	₹142.41	₹7,97,496.00
(b)	For each Km or part thereof for lead beyond 1.0 Kilometer but upto 20 Kilometer.	5600 x 19	Per Metric tonne Per Kilometer	₹5.15	₹5,47,960.00
(c)	For each Km or part thereof for lead beyond 20 Kilometer but upto 70 Kilometer.	5600x 50	Per Metric tonne Per Kilometer	₹4.65	₹13,02,000.00
(d)	For each Km or part thereof for lead beyond 70 Kilometer to 310 Km. (Approx. lead 240 Kms.)	5600 x 240	Per Metric tonne Per Kilometer	₹4.19	₹56,31,360.00
(e)	For each Km or part thereof for lead beyond 310 Kilometer to 600 Km. (Approx Av. lead 155Kms.).	870000	Per Metric tonne Per Kilometer	₹4.19	₹36,45,300.00
(f)	Loading of sleepers into truck/trailor.	1000	Per MT (One metric tonne)	₹103.40	₹1,03,400.00
2.	Transportation of PSC sleepers for Points & crossings for 52 Kg./60 Kg. Rail section. PSC Sleepers for SEJs, Bridges, Derailing Switch or other non -standard PSC Sleepers from concrete sleeper plants at Dongargarh and/or Raipur and/or Jharsuguda and/or at other places to anywhere in the Jurisdiction of S.E.C.Railway or at/from any other places with contractor's labour, tools and plants including transportation, equipment, fuel etc. and unloading the same along the alignment or on the top of the new formation or any other location at the destination point as directed by the Engineer-in-Charge.				
(a)	For first one Kilometer or part thereof	600	Per Metric tonne Per Kilometer	₹138.55	₹83,130.00

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

For Chief Engineer (निर्माण)/BSP
Chief Engineer (Con.)/B
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

VETTED
for FA. & C.A.O. (Cons.)
S.E.C. Rly. Bilaspur (C.G.)

(b)	For each Km or part thereof for lead beyond 1.0Kilometer but upto 20 Kilometer.	600 x 19	Per Metric tonne Per Kilometer	₹5.20	₹59,280.00
(c)	For each Km or part thereof for lead beyond 20 Kilometer but upto 70 Kilometer.	600 x 50	Per Metric tonne Per Kilometer	₹4.56	₹1,36,800.00
(d)	For each Km or part thereof for lead beyond 70 Kilometer. (Approx lead 300 Kms.)	600 x 300	Per Metric ton Per Kilometer	₹3.98	₹7,16,400.00
	NOTE :- Loading into truck/trailers of PSC Sleepers under Item No. 1 to 2 at the loading points are not required to be carried out by the contractors, loading of sleepers into trucks/trailers will be done by the concrete sleepers plants. However where loading is to be done by the contractors (such as in case of transportation of PSC Sleepers other than from Sleeper Plants) extra rate as provided against item No. 1(f) above will be paid.				
3.	Transportation of all types of Railway materials such as SEJs glued Joints, ERC clips, G.R.Pads, liners, and Points & crossing etc. from any place within the jurisdiction of SEC Rly to the site of work/PWI/IOW stores depot within the jurisdiction of CE(Con)/BSP including loading, unloading and stacking as per the direction of the Engineer-in-Charge. The rates includes all leads, loading, unloading, lifts, ascent, descent, all taxes, labour tools and plants, crossing one or more railway line if required and all incidental charges etc. complete.				
(a)	For first one Kilometer or part thereof	300 MT.	Per MT Per KM	₹96.61	₹28,983.00
(b)	For each Km or part thereof for lead beyond 1 KM but upto 100 Km	99x300 MT.	Per MT Per KM	₹10.69	₹3,17,493.00
(c)	For each Km or part thereof for lead beyond 100 KM (Approx. lead 200Kms.)	200x300 MT.	Per MT Per KM	₹8.17	₹4,90,200.00
4.	Transportation of Rails up to 13 m & switches by tailors from any place within the jurisdiction of S.E.C.Railway to the site of work/PWI/IOW' stores depot within the jurisdiction of CE(Con)/BSP including loading, unloading and stacking as per the direction of the Engineer-in-Charge. The rate includes all leads, lifts, ascent, descent, all taxes, labour tools and plants, crossing one or more railway lines if required, loading, unloading and all incidental charges etc. complete.				
(a)	For first one Kilometer or part thereof	1500 MT.	Per MT Per KM	₹98.55	₹1,47,825.00
(b)	For each Km or part thereof for lead beyond 1 KM but upto 140 Km.	139x1500 MT	Per MT Per KM	₹20.40	₹42,53,400.00
(c)	For each Km or part thereof for lead beyond 140KM (Approx. lead	260x1500 MT.	Per MT Per KM	₹19.66	₹76,67,400.00

	400Kms.)				
5.	Unloading of PSC sleepers for points and crossings, SEJ, PSC sleepers for 52/60 Kg. Rails section from the truck/lorries in countable manner along the toe of alignment or any other locations at the destination points as directed by the Engineer-in-Charge keeping without infringing of existing track structure and keeping enough space for plying trucks for transportation purpose, with all leads, lifts, labour tools and plants descent, all incidental charges etc. complete. Payment will be made as per standard weight of PSC sleepers.				
		200 MT.	Per Metric tonne.	₹54.99	₹10,998.00
6.	Unloading of standard single length rails upto 13 metre length, points and crossings, SEJ from the truck/lorries in countable manner along the toe of alignment or any other locations at the destination points as directed by the Engineer-in-Charge keeping without infringing of existing track structure and keeping enough space for plying trucks for transportation purpose, with all leads, lifts, labour, tools and plants, descent, all incidental charges etc. Complete. Payment will be made as per standard weight of materials.				
		200 MT.	Per Metric tonne.	₹102.59	₹20,518.00
(a)	**Note for item No.5 and 6:** Rates for item No.1 to 4 above are inclusive of unloading. Item No. 5 and 6 will be operated if sleepers/rails are transported through Railway's truck or by any other agencies fixed by Railway.				
(b)	Lead calculation for above items will be done as following example. For 100 KM lead against item No.1 payment will be made as per follows : (1 KM x ₹130.18+ 19 KM. x₹4.71 + 50 Km x ₹4.25 + 30 Km. x ₹3.83) plus accepted tender premium/increase.				
			Total departmental value Schedule- "13" = ₹2,59,59,943.00		
	CONDITIONS :-				
1.	Loading into trucks/trailers of PSC sleepers under item No. 1&2 above at the loading points are not required to be carried out by the contractors; loading of sleepers into trucks/trailers will be done by the concrete sleeper plants.				
2.	No extra payment is admissible for carrying out the materials in extreme conditions of climate and weath...				
3.	It is contractor's responsibility to see that all Railways, materials entrusted to him/them are carried safely and expeditiously to the destination points.				
4.	If the Railway's materials are lost, stolen or damaged while on transit or during unloading the cost of the same at the prevailing market rate will be recovered from the contractor's dues and the contractors will have no claims what-so-ever on this account.				
5.	The contractors must distribute the sleepers uniformly along the alignment.				
6.	The materials may have to be transported from one place to another place by crossing inter-state borders and any toll tax octroi/Sale tax and any other tax levy cess/levied by Govt. from time to time has to be borne by the contractor and no extra payment will be made to the contractor for this.				
7.	The destination will be under the Jurisdiction of S.E.C. Railway (all divisions).				
8.	Contractor has to execute the work as per the direction of Engineer-in-Charge and as per the priority given by him.				
9.	Payment to the contractor will be made as per the standard weight of the materials.				
10.	The sleepers/rails should be unloaded by cranes in such a manner as to facilitate easy counting.				
11.	Contractors should prepare road by minor cutting and filling, if necessary to approach the locations of unloading of rails/sleepers and nothing extra will be paid on this account.				

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

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कार्यपालक अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

Draft Agmt

For Chief Engineer(Con)/I/BSP.

मुख्य इंजीनियर (निर्माण) /I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

For P.A. to C.A.O. (C) S.E.C. Rly. Bilaspur (C.G.)

12.	The rates for transportation of sleepers are for transporting the materials by truck or by cart or trailers and re-handling of the same if necessary to deliver it at the destination points as directed by the Engineer-in-Charge.
13.	**Sales Tax/Service Tax/Entry Tax/GST or any other taxes:** The Contractor shall bear in full all taxes and royalties as levied by the State Government and/or Central Government from time to time. This would be entirely a matter between the contractor and State Government/or Central Government. Railway will recover the taxes and royalties through running account bills and pay them to Government if the contractor fails to pay the taxes and royalties to the government.

SPECIAL CONDITIONS OF CONTRACT (Transportation of Materials)

1. The contractor shall have to transport all the materials from originating station to the destination through the shortest possible route. The actual lead shall be decided by the AXEN/XEN in the field basing on the actual measurement/authentic record wherever available. In case any detour is made for any reason no extra payment will be made.
2. The contractor shall make his own arrangement for safe custody of materials issued to him at the originating station for transporting to the work site. The contractor shall maintain proper ledger for accountal of materials issued to him in a manner as desired by the Engineer-in-charge.
3. The contractor has to transport the materials upto the location as decided by the Engineer-in-charge. This may mean using different type of vehicles for transportation suiting the site requirement, loading/ unloading etc.
4. The material may have to be transported from one place to another by crossing inter-state borders and any toll tax/octroi/ sales tax and any other tax levied by Government from time to time has to be borne by the contractor and no extra payment will be made to contractor for this.
5. The contractor shall submit an **Indemnity Bond** in the prescribed form and indemnify to the Railway from any loss or damage to the Railway materials issued for transportation.
6. The work involves working in the vicinity of Running Railway track. The contractor shall take all the safety and precautionary measures while working in such conditions as directed by the Engineer-in-charge. The contractor shall also take all safety measures for his labour while handling and transporting the materials.
7. Payment to the contractor will be made as per the standard weight of the material.
8. The contractor should prepare road by minor cuttings and filling if necessary to approach the locations of unloading.

VETTED
for F.A. & C.A.O.(Cons.)
S.E.C. Rly. Bilaspur (C.G.)

मुख्य अभियंता (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

Signature of Tenderer(s)/Contractor(s) RSA-SK JOINT VENTURE JOINT VENTURE PARTNER

For Chief Engineer(Con)/I/BSP

SOUTH EAST CENTRAL RAILWAY					
Name of work:- Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.					
SCHEDULE – '14' (P.Way works under Z-section of SOR-2006 Items)					
Sl. No	Description of Items	Qty.	Unit	Rate in Figure (₹)	Amount
1.	Execution of all work connected with above work covered under Z-section of S.E.C. Railway SOR-2006/VOL.1 against the basic rate of Bilaspur division basic value of rupees.				
		₹ 20,00,000.00	As per S.E.C.R./ SOR-2006/VOL.01	177.95% above	₹55,59,000.00

Total departmental value of Schedule- '14'= ₹55,59,000.00

Scope of S.E.C.Railway/SOR-2006 various items

Tentative items to be operated along with approx quantity are as below :-

1	Z/5	Through packing of screened--------- as per requirement	Per Sleeper	8.05	16000	1,28,800.00
2	Z/6	Through packing of screened ------ 2nd and 3rd packing.	Per Sleeper	6.80	16000	1,08,800.00
3	Z/8	Extra over and above items 5 or 05 or 07----- the track as per 05 or 06 or 07.	Per Sleeper	3.65	16000	58,400.00
4	Z/13	Pairing and butting 52kg----- over lead of 250m				
		For more than 39m length but upto 130m length	Per Metre of Rail	12.90	19000	2,45,100.00
5	Z/20	Inserting 60/52KG rails including dismantling existing rails 52/60 kg-For rails more than 40m length	Per M of Rails	21.15	19000	4,01,850.00
6	Z/23	Renewal of Concrete sleeper ---------- existed and to be provided for.	Each Sleeper	61.55	200	12,310.00
7	Z/28	Loading of rail------ upto 30m	Per Metre	43.05	100	4,305.00

मुख्य इंजीनियर (निर्माण)/I
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S.E.C. Railway, Bilaspur

Signature of Tenderer(s)/Contractor(s) For Chief Engineer(Con)/I/BSP

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

8	Z/32	Unloading of rail from BFRs ------- a lead upto 30m	Per Mt	43.30	1200	51,960.00
9	Z/48	Drilling holes 32mm---- Running track.	Each Hole	27.25	500	13,625.00
10	Z/49	Drilling holes 32mm---- Outside track.	Each Hole	22.60	3000	67,800.00
11	Z/54	Cutting 60/65 kg ------ outside track.	Each Cut	45.80	2000	91,600.00
12	Z/55	Cutting 60/65 kg ------ running track.	Each Cut	60.45	200	12,090.00
13	Z/74	Trollying rails and sleeper------ upto 1km.	Per MT	145.95	2000	2,91,900.00
14	Z/75	Extra over items74------ beyond 1km.	Per MT	24.30	10000	2,43,000.00
15	Z/82	Rendering track circuit bond-------- programme.	Per Hole	27.72	100	2,772.00
16	Z/96	Dismantling of buffer	Per Set	676.20	2	1,352.40
17	Z/87	Inserting an additional PSC sleeper -----including all labour& materials.	Per Sleeper	42.80	50	2,140.00
18	Z/115	Lifting of track exceeding 75mm.....including one through packing (for each 50mm ao partthereof)	per track meter	13.85	500	6,925.00
19	Z/1	Deep screening of track ballast 300m below bottom of sleeper and screening of complete ballast section ..... Including one round of kutcha packing with screened ballast.	Per Track meter	67.60	0	-
20	Z/98	Scrapping rust etc. from rails with anticorrosion paints i.e. one coat of Zinc Chromate Primer followed by two coats of bituminous emulsion with 20% mica (Outside running track).	Per M. of rail	7.80	19000	1,48,200.00

VERIFIED

For P.A. to CAO (Cons.) S.E.C. Rly. Bilaspur (C.G.)

मुख्य अभियंता (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रलवे, बिलासपुर
S.E.C. Railway, Bilaspur

Signature of Tenderer(s)/Contractor(s)
RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

For Chief Engineer(Con)/I/BSP
कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con.)

21		Others work				1,07,070.60
						20,00,000.00

The list of the items are tentative and may change or used other items as per the site condition/requirement.

VETTED
For F.A. & C.A.O. (Cons.)
S.E.C. Rly. Bilaspur (C.G.)

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

Draft Agmt

Name of work:- Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.

SCHEDULE – 15

(SUPPLY OF BALLAST)

Sl. No.	Description of items	Unit	Quantity	Basic Rate	Amount
1	Supply and delivery and stacking of hard quarried machine crushed stone ballast angular in shape, without any quarry skin and strictly conforming to the standard specification of track ballast of JUNE- 2004(corrected up to date) issued by RDSO as given along with this document and of approved quality to be brought from outside Railway land and stacking the same on completed formation and / or either along the toe of the bank or at the top of cutting along the edge of cutting or as directed by the Engineer - in-charge including cost of all labour and materials, required, leads, lifts, loading, unloading, octroi, sales tax, royalty and other taxes and crossing of Railway tracks if required and all other incidental charges etc. complete as required.				
		Cum	30000	1776.28	5,32,88,400.00
	Total of Schedule-15				**Rs.5,32,88,400.00**

Note for Schedule : -

Note	(1) Contractor shall have to submit ballast sample in advance wherever and whenever there is any change in quarries or in quality of stone.
	(2) The rates shall include all leads, lifts, making service roads, cleaning and leveling of land for ballast stacking, crossing railway tracks, nullahs and all other charges/ taxes leviable by Central/State Government or local bodies, including royalty.
	(3) If sufficient Railway land is not available along the track, contractors shall have to make arrangement with private land owner of adjacent area for temporary stacking of ballast and nothing extra will be paid on the is account. Contractors should indemnify the railway administration from any disputes, damages, loss and claims arising out of such stacking.

VETTED
for F.A. & C.A.O. (Cons.)
S.E.C. Rly. Bilaspur (C.G.)

मुख्य अभियंता (निर्माण) / I
Chief Engineer (Con.) / I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

Signature of Tenderer(s)/Contractor(s) 283 For Chief Engineer(Con)/I/BSP

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

Draft Agt

Name of the work:- Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.

SCHEDULE –"16" (Works under USSOR)

SL.NO	Description of works	Unit	Qty	Rate	Amount
1	**SCHEDULE:"16".** Execution of all works connected with above work covered under USSOR-2010 (Works & Materials) of S.E.C.Rly, excluding the items covered under various Schedule (Deptt. Value assessed as per basic value of USSOR -2010 of S.E.C. Railway	AS per USSOR-2010.	5,14,08,875.28	At Par	5,14,08,875.28
			Total Basic cost of Schedule - "16"		5,14,08,875.28
	Departmental escalation @ 53.23% above for all items under this schedule				2,73,64,944.31
	Total Departmental value of schedule "16":				**7,87,73,819.59**

Scope of S.E.C.Railway/USSOR-2010 various items

Tentative items to be operated along with approx. quantity are as below :

Sl. No.	USSOR No.	Description	Unit	Approx. Qty.	Rate (in ₹)	Amount (in ₹)
	21090	Leading Ballast/Kankar...lead beyond 500 mtr.	Per Cum	10000	₹ 78.15	₹ 7,8...00.00
	21070	Loading/Unloading ballast/Kankar.....	Per Cum	10000	₹ 41.23	₹ 4,12,300.00
	021070-021360	Unloading of Ballast/Kankar....	Per Cum	10000	₹ 29.06	₹ 2,90,600.00
	191052	Conducting in situ full size plate load test (PLT) at scheduled location as per IS:1888 including making loading arrangements & casting of RCC/cast in situ concrete footing as per codal provisions including excavation and refilling of trial pit. Plate size 45cmX45cm.	Each	9	₹ 24,939.73	₹ 2,24,457.57

VETTED
For F.A. & C.A.O. (Const.)
S.E.C. Rly. Bilaspur (C.G.)

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

For Chief Engineer(Con)/I/BSP

Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

मुख्य इंजीनियर (निर्माण) / I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

	191070	Conducting SCPT for soil as per IS:4968	Each	9	₹ 35,201.81	₹ 3,16,816.29
	191080	Conducting DCPT for soil as per IS:4968	Each	9	₹ 32,382.62	₹ 2,91,443.58
	142035	Providing and laying non-pressure NP3 class (medium duty) R.C.C. pipes including bends etc. with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1cement: 2fine sand) including testing of joints etc. complete upto 800mm dia.	Mtr	50	1201.09	₹ 60,054.50
		600mm dia. R.C.C.pipe				
	142044	Providing and laying non-pressure NP3 class (medium duty) R.C.C. pipes including bends etc. with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1cement: 2fine sand) including testing of joints etc. complete above 800mm dia.	Mtr	42	3596.39	₹ 1,51,048.38
		1200mm dia. R.C.C. pipe				
	222330	Supplying and placing of Mechanically Woven Double Twisted hexagonal shaped wire mesh Gabion Boxes of required sizes, Mesh type 10cmX12cm, Zn and PVC coated Mesh Wire dia. 2.7/3.7mm (ID/OD), edges of meshes mechanically edged/selvedged with heavy coating of galvanization as per EN 10223-3/ASTM A 975 with partition at every 1m interval and properly packed with approx. 150mm size boulders including transportation and placing at indicated places as pr direction of engineer-in- charge including contractor's tools , plants, labour, royalty charges etc. complete in all respect and stitching, with lacing wire of dia. 2.2/3.2mm (ID/OD) @ 5% by weight of Gabion boxes ,carrying the material by head lead from nearest approach with all safety precautions and all leads and lifts	Cum	3375	2567.52	₹ 86,65,380.00
	105191	Grading roof for water proofing treatment with cement concrete 1:2:4 (1 cement 2 coarse sand and 4 graded stone aggregate of 20mm nominal size)	Cum	28	1593.82	₹ 44,626.96

For F.A. & C.A.O. (Con.)
S.E.C. Rly, Bilaspur (C.G.)

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

For Chief Engineer(Con)/I/BSP

		Providing and laying water bound macadam with specified stone aggregate, stone screening and binding material including screening, sorting, spreading to templete and consolidation with power road roller of 8to 10 tonne capacity etc. complete.				
	231042	Base course with 63mm to 22.....l size including stone screening 13.2mm size.	Cum	3000	1072.49	₹ 32,17,470.00
	231043	Base course with 53mm to 45mm size including stone screening 11.2mm size.	Cum	3000	1114.45	₹ 33,43,350.00
	238021	Providing and laying Dense Bituminous concrete on prepared surface with specified graded stone aggregate for wearing course, mixing of bitumen, filler & stone aggregate in hot mix plant, transporting the mixed material and laying with mechanical paver finisher fitted with electronic sensing device to the required level and rolling with road rollers, as per specification, to achieve the desired density and compaction but excluding cost of primer/ tack coat.				
		40mm/ 50mm compacted thickness with bitumen of grade 60/70 @6.5% and lime @ 3% by weight of total mix.	Cum	1200	8145.53	₹ 97,74,636.00
	238032	Providing and laying bitumen mastic wearing course (as per specifications) with industrial bitumen of grade 85/25 conforming to IS: 702 prepared by using mastic cooker and laid to required level and slope including providing antiskid surface with bitumen precoated fine grained hard stone chipping of approved size at the ... of 0.005 cum ..., 10sqm and at approximate spacing of 10 cm centre to centre in both directions, pressed into surface protruding 1mm to 4mm over mastic surface, including cleaning the surface, removal of debris etc. all complete. (considering bitumen using 10.2% as per MORTH specification)				
		40 mm thick	Sqm	1200	1112.66	₹ 13,35,192.00
		Other Works	LS			₹ 2,25,00,000.00
						₹ 5,14,08,875.28

Signature of Tenderer(s)/Contractor(s) 286 For Chief Engineer (Con.)/BSP

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

Draft Agd

मुख्य इंजीनियर (निर्माण)/बीएसपी
Chief Engineer (Con.)/BSP
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

VETTED

Name of the work:- Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, supply of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division.

SCHEDULE –"17" (N.S.Items)

Sl.No.	Description of works	Unit	Qty.	Rate (in₹)	Amount (in ₹)
	Supplying, transportation, installation commissioning, maintenance and removal including contractor's profit,GST and all other necessary charges of state and central government for -EURO Barriers (NJB) Dimension Length:-2000mm Width:400mm Height:1000mm Water Ballast: 100 letters with 70mm High reflective chevron tape. Weight 16kg				
	Other than ROR	Nos	175	4200.00	735000.00
	Supplying, transportation, installation commissioning, maintenance and removal including contractor's profit,GST and all other necessary charges of state and central government for -Safety Cone (1000mm) FTC-Mega- Height: 1000mm, Square Base: 470min, with Retro Reflective tape. Weight: 7.5Kgs.				
	Other than ROR	Nos	234	770.00	180180.00
	Supplying,transportation, installation commissioning, maintenance and removal including contractor's profit,GST and all other necessary charges of state and central government for -Solar Flasher/Blinker Ø LED Cluster:127 pcs of Ultra Bright LEDs with Long Life more than 50000 Hrs Ø Aspect Dia:300mm Ø LED Color: Amber(Yellow) Ø Battery Capacity: 12V, 7 Ah, Ø Battery: In built long life, Maunenance Free Battery, Ø Solar Module:12V, 15 Wp, Ø Charge Controller: PWM Base Charge Controller Ø Working Hours: 24 Hrs@ Day Night Time, Ø Autonomy Backup: 2 Days in Monsoon Period, Ø Dusk to Down Function or Optional Activation Switch On/Off. Ø Accessories: Controller, Mounting Clamp & Connector etc, Ø Visibility: 500 Meters, Ø MS Pole Height: 14 Feet, OD 110mm, 3mm Thickness with 2 Coat of Yellow Paint.				
	Other than ROR	Nos	4	10500.00	42000.00

Signature of Tenderer(s)/Contractor(s) 287 For Chief Engineer(Con)/I/BSP

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

मुख्य कार्यालय अधिकारी (निर्माण) / I
Chief Engineer (Con.) / I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

4	Supplying,transportation, installation commissioning, maintenance and removal including contractor's profit,GST and all other necessary charges of state and central government for -Consticuty Tape (3M – 983)Diamond Grade, Size 2"*50 Meter				
	Other than ROR	Nos	5	700.00	3500.00
5	Supplying,transportation, installation commissioning, maintenance and removal including contractor's profit,GST and all other necessary charges of state and central government for -Poly Speed Bump: (FSB-246) Length: 250mm, Width: 450mm, Height: 60mm, Reflector: 2Pcs. Reflective tape.				
	Other than ROR	Mtr	44	2450.00	107800.00
6	Supplying,transportation, installation commissioning, maintenance and removal including contractor's profit,GST and all other necessary charges of state and central government for -Traffic Safety Batons Light with 2 Flashing Modes, Polycarbonate Material, Size :- 45 cm Available with power support of 2 x 1.5V D size battery Three-stage switch for providing off, flashing or steady light Non-slip textured grip with built-in belt clip and wrist strap Weather-resistant body finish Made of A.B.S. high-impact plastic				
	Other than ROR	Nos	6	910	5460.00
7	Supplying & laying of drainage composite for use behind abutments, wing walls, return walls and Retaining walls Geocomposite drain (vertical) as per RDSO Specification No. RDSO/2018/GE:IRS-0006 latest version with all material, labour, equipment, tools and plants, lead, lift etc. complete in all respects as per the direction of Enginner-in-Charge.				
	For ROR	Sqm	400	681.07	272428.00
	Other than ROR	Sqm	600	681.07	408642.00
8	Earth work in filling in embankment from Railway land for repairing of cess/formation/level crossing, rain cuts etc. to make the surface to the desired level and slope to the entire satisfaction of Engineer-in-charge. The rate will include free lead upto 200m, all lifts, descends, ascends, crossing of track/road/nallah etc. including breaking of clods etc and compaction by rollers/rammers etc. Note - This item is only to be paid when specially ordered in writing if situation so demands.				
	For ROR	Sqm	400	193.14	77256.00
	Other than ROR	Sqm	1200	193.14	231768.00

Signature of Tenderer(s)/Contractor(s)

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

For Chief Engineer (Con.)/I/BSP

मुख्य इंजीनियर (निर्माण)/I/बीएसपी

Chief Engineer (Con.)/I

द. पू. म. रेलवे, बिलासपुर

S.E.C. Railway, Bilaspur

ATTESTED

9	Conducting determination of California Bearing Ratio as per IS:2720				
	For ROR	Each	30	1337.94	40138.20
	Other than ROR	Each	400	1337.94	535176.00
10	Conducting standard penetration test as per IS:2131 at approximate1.5m intervals in bore holes, as directed by the Engineer in charge.				
	For ROR	Each	4	802.76	3211.04
	Other than ROR	Each	19	802.76	15252.44
11	Conducting in-situ Portable Impulse Plate Load Test with 'Light Drop Weight Tester', having plate size of 300mm & weight of 10 Kg at identified locations as per ASTM E2835-11, for measurement of compaction quality of soil {modulus of deformation (Evd) for correlation to Dpr%} and for evaluation of load carrying capacity in stages of formation construction				
	For ROR	Each	6	563.23	3379.38
	Other than ROR	Each	94	563.23	52943.62
12	Lateral load testing of single pile in accordance with "IS Code of practice IS:2911 (Part-IV) for determining safe allowable lateral load of pile" with all labour, material, tool & plants, equipment, machinery, etc complete as per drawing and specification as directed by the Engineer				
a	Piles with lateral load capacity of upto 50 ton				
	For ROR	Each	4	20537.34	82149.36
	Other than ROR	Each	6	20537.34	123224.04
b	Piles with lateral load capacity of upto 50 ton				
	For ROR	Each	4	32297.82	129191.28
	Other than ROR	Each	6	32297.82	193786.92
13	Supplying, spreading and compacting well graded hard stone of 63mm average size (maximum upto 80mm size) in the bottom of foundation of box culverts, bridges etc. including all lead, lift, ascent, descent etc. complete job as per directions of Engineer In-charge				
	Other than ROR	Cum	50	1332.13	66606.50
14	Load testing of one or more spans of bridge as selected by the Engineer as per approved load test procedure following relevant IS/IRC/Railway codes with contractor's labour, deflection measuring instruments, loading materials, recoding and analyzing the load testing results including all lead & lift, etc. complete as required. The rates are all inclusive and will be paid after load test is finished and girder is cleared of the kentledges/loading material etc. The load shall be 1.25 times the stipulated design load				
A	For Span design load upto 100 MT				
	For ROR	Each	2	76146.71	152293.42
	Other than ROR	Each	3	76146.71	228440.13

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

Signature of Tenderer(s)/Contractor(s)

For Chief Engineer (Con.)/I/BSP

मुख्य इंजीनियर (निर्माण)/I
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S.E.C.Railway, Bilaspur

B	Extra for every increase 1 MT or part thereof in the span design load capacity upto 800 MT				
	For ROR	Each	4	750.93	3003.72
	Other than ROR	Each	6	750.93	4505.58
15	Providing and fixing in position GI Drainage Spouts of required length with Grating in RCC slab and filling bitumen along kerb as shown in drawing with contractor's pipes, bitumen, tools, equipment, lead, lifts etc. complete as per specifications and as directed by Engineer in-charge				
	50mm dia. Drainage Spouts				
	Other than ROR	Mtr	20	531.10	10622.00
16	Applying Epoxy Poly-sulphate Paint three coats on existing bottom surface of deck slab including cleaning surface of dirt, dust & other foreign matter, sand papering, wire brushing as required with all contractor's materials tools, machinery, scaffolding, lead, lifts etc. complete as per specifications and as directed by Engineer in-charge				
	Other than ROR	Sqm	450	309.87	139441.50
17	Providing and laying Pitching with Stone Boulders, weighing not less than 35kg each on slopes laid over prepared filter media including boulder apron laid dry in front of toe of embankment complete as per drawing and Technical Specifications (filter media to be paid separately under the relevant item).				
	For ROR	Cum	2000	2114.26	4228520.00
	Other than ROR	Cum	12000	2114.26	25371120.00
18	Providing Boulder Backing behind wing wall, return wall, retaining wall with hand packed boulders &cobbles with smaller size boulders toward the back including all lead, lift, labour& other incidental charges as complete work in all respect. Payment for boulder/cobbles will be done extra.				
	For ROR	Cum	1000	454.35	454350.00
	Other than ROR	Cum	10240	454.35	4652544.00
19	Dewatering of natural or accumulated water from any location. Payment to be done for Horse power of pump multiplied by pumping hours.				
	For ROR	Per HP Per Hrs	600	40.58	24348.00
	Other than ROR	Per HP Per Hrs	1800	40.58	73044.00
	Total for Schedule 17(For ROR = Rs 54,70,268.40 and For Other than ROR = Rs 3,31,81,056.73)				**3,86,51,325.13**

END OF TENDER DOCUMENT

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

Signature of Tenderer(s)/Contractor(s)

For Chief Engineer(Con)/I/BSP

मुख्य इंजीनियर (निर्माण)/I

Chief Engineer (Con.)/I

द. पू. म. रेल्वे, बिलासपुर

S.E.C.Railway, Bilaspur

SOUTH EAST CENTRAL RAILWAY

By Regd. Post A/D

OFFICE OF THE
CHIEF ADMN. OFFICER(CON)/BILASPUR

NO: CEC/BSP/ER/T/22-23/19/IB Fly Over/ 570 Dated: 03.11.2022

To
M/s RSA-SK JV
Shri Shyam Tower
Kavita Nagar, Main Road, Avanti Vihar
Raipur, Chhattisgarh-492001

Sub:-	Execution of earth work in formation, construction of ROR, minor bridges, major bridges, RUBs, suppiy of track ballast, track linking works, construction of service buildings, Transportation of P.Way materials, supplying, fabrication and launching of Steel girders with allied associated works in connection with provision of Fly Over at IB Station of Bilaspur Division. Tender No: CEC/BSP/22-23/19 dated 25.08.2022. Ref: Technical bid opened on 22.09.2022, Price Bid opened on 14.10.2022 and e-Reverse Auction held on 18.10.2022

Dear Sirs

Your offer for the subject work has been accepted by the competent authority (i.e. Chief Administrative Officer/Con/SECR) for and on behalf of the President of India at the value of Rs 175,53,24,134.63.(Rs. One Hundred Seventy Five Crore Fifty Three Lakhs Twenty Four Thousand One Hundred Thirty Four and Sixty Three paise) at the following accepted rates:-

(i) At Par with a rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "1".

(ii) 7% (Seven Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "2".

(iii) 5% (Five Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "3".

(iv) 10% (Ten Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "4".

(v) 10% (Ten Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "5".

(vi) 5% (Five Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "6".

(vii) At Par with a rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "7".

(viii) At Par with a rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "8".

(ix) 10% (Ten Percent) above with rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "9".

RSA-SK JOINT VENTURE
JOINT VENTURE PARTNER

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

(x) 5% (Five Percent) above with rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "10".

(xi) 8% (Eight Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "11".

(xvi) 15% (Fifteen Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "12".

(xvii) 20% (Twenty Percent) above with rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "13".

(xviii) 15% (Fifteen Percent) above with rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "14".

(xix) 8% (Eight Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "15".

(xx) 20% (Twenty Percent) below with further rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "16".

(xxi) 10% (Ten Percent) above with rebate of 1.93% (One point Nine Three Percent) against departmental rates for all items under Schedule "17".

Note: Accepted rates of Schedule 4, 5, 8,10,12, 14, 13, 15, 16 & 17 should not be referred in future tenders in isolation.

You are hereby authorized to commence the work on the strength of this letter to ensure the completion of above subject work within 30 (Thirty months) i.e. upto 03.05.2025. In this regard you are requested to contact Dy.Chief Engineer (Con)/Brajrajnagar for taking further instructions immediately.

The security deposit required for faithful fulfillment of the contract is Rs. 8,77,66,207/- which will be recovered from your on account bills as per extant rules.

You are requested to submit the Performance guarantee amounting to Rs. 5,26,59,724/- **within 21 days from date of issue of this Acceptance letter**, in the form of an irrevocable Bank Guarantee in the prescribed proforma given in the tender document or in any of the acceptable form mentioned in the tender document valid upto original completion period plus 60 days i.e. upto 03.07.2025.

You are requested to attend this office on any working day after submission of requisite Performance Guarantee for signing the contract agreement.

You are requested to obtain labour license from concern Labour Commissioner(Central) and to register your firm/company etc and upload dec. of letter of acceptance in 'Shramik Kalyan Portal' of Indian Railways.

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

VETTED
Sr. F.A. & C.A.O (Cons.)
S.E.C. Rly Bilaspur (C.G.)

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con)
दक्षिण पूर्व मध्य रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

मुख्य इंजीनियर (निर्माण)/I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

RSA-SK JOINT VENTURE

JOINT VENTURE PARTNER

Please note that, until a formal agreement is executed, acceptance of this tender shall constitute a binding contract between Railway and yourself, subject to modification as may be mutually agreed between us. No separate work order will be issued except for USSOR/SOR items.

Please acknowledge the receipt of this letter and confirm that the action is being taken by you accordingly.

Thanking you,

Encl: (i) Sch '1' to '17' with other tender conditions.

03.11.22

(R.K.Singh)
Chief Engineer (Con)/I/Bilaspur
FOR & ON BEHALF OF PRESIDENT OF INDIA

मुख्य इंजीनियर (निर्माण) / I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

3.11.22

Copy to:-

1. S.D.G.M./SECR for information and necessary action please.
Encl: Schedule Sch '1' to '17' and other tender conditions.

2. Dy.Chief Engineer/Con/Brairajnagar/S.E.C. Railway for information and necessary action please.
Encl: Schedule Sch '1' to '17' and other tender conditions.

3. Asst. Labour Commissioner (Central), Jharsuguda, Odisha.

4. The Dy. Director Audit (Con)/Bilaspur.

5 The employment Exchange Officer/ Jharsuguda, Odisha.

6.Dy. FA&CAO(Con)/Bilaspur along with a spare copy of the letter.

7.Secy. to CAO(Con)/BSP for kind information of CAO(Con)/BSP

Received Sanj 03/11/2022

03.11.22

Chief Engineer (Con)/I/Bilaspur

मुख्य इंजीनियर (निर्माण) / I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

मुख्य इंजीनियर (निर्माण) / I
Chief Engineer (Con.)/I
द. पू. म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

3.11.22

RSA-SK JOINT VENTURE
JOINT VENTURE PARTNER

07.11.22

कार्यपालन अभियंता (निर्माण)
Executive Engineer (Con.)
द.पू.म. रेलवे, बिलासपुर
S.E.C. Railway, Bilaspur

Draft Agt

ANNEX- 'E'

भारत सरकार (GOVERNMENT OF INDIA)
रेल मंत्रालय (MINISTRY OF RAILWAYS)
रेलवे बोर्ड (RAILWAY BOARD)

No.2003/W-I/POL/NF/DONER/1. New Delhi, dated 10.12.08

The General Manager(Const)
N.F. Railway,
Maligaon,
Guwahati.

Sub: Environmental clearance for Railway Projects.

Enclosed please find herewith a copy of Gazette Notification No.42 Part II-Section 3-Sub-section (ii) regarding the requirement of environmental clearance for projects to be undertaken in Indian Territory. This is a negative list and Railway projects are not mentioned in the list of projects required to obtain environmental clearance before taking them up.

In the Draft Notification issued by MOEF on 28th Jan., 1993, Railway line involving acquisition of Non-Railway land and underground Railways were also mentioned in the list of projects requiring Environmental clearance from the Central Govt. But it was deleted from the final notification issued by MOEF on 27th Jan., 1994.

DA: As above

10/12/08
(Vijay Garg)
Director (Works)
Ph/Fax No.23383833

Annex I

MINISTRY OF ENVIRONMENT AND FORESTS

NOTIFICATION

New Delhi, the 27th January, 1994
(As amended on 04/05/1994, 10/04/1997, 27/1/2000 and 13/12/2000)

1. S.O. 60 (E) Whereas a notification under clause (a) of sub-rule (3) of rule 5 of the Environment (Protection) Rules, 1986 inviting objections from the public within sixty days from the date of publication of the said notification, against the intention of the Central Government to impose restrictions and prohibitions on the expansion and modernization of any activity or new projects being undertaken in any part of India unless environmental clearance has been accorded by the Central Government or the State Government in accordance with the procedure specified in that notification was published as SO No. 80(E) dated 28th January, 1993;

And whereas all objections received have been duly considered;

Now, therefore, in exercise of the powers conferred by sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986) read with clause (d) of sub-rule (3) of rule 5 of the Environment (Protection) Rules, 1986, the Central Government hereby directs that on and from the date of publication of this notification in the Official Gazette, expansion or modernization of any activity (if pollution load is to exceed the existing one, or new project listed in Schedule I to this notification, shall not be undertaken in any part of India unless it has been accorded environmental clearance by the Central Government in accordance with the procedure hereinafter specified in this notification;

2. Requirements and procedure for seeking environmental clearance of projects:

I(a) Any person who desires to undertake any new project in any part of India or the expansion or modernization of any existing industry or project listed in the Schedule-I shall submit an application to the Secretary, Ministry of Environment and Forests, New Delhi.

The application shall be made in the proforma specified in Schedule-II of this notification and shall be accompanied by a project report which shall, inter alia, include an Environmental Impact Assessment Report, an ** Environment Management Plan and details of public hearing as specified in Schedule-IV**

prepared in accordance with the guidelines issued by the Central Government in the Ministry of Environment and Forests from time to time.

(b) Cases rejected due to submission of insufficient or inadequate data and *Plans may be reviewed as and when submitted with complete data and *Plans. Submission of incomplete data or plans for the second time would itself be a sufficient reason for the Impact assessment Agency to reject the case summarily.

II In case of the following site specific projects:

(a) mining;
(b) pit-head thermal power stations;
(c) hydro-power, major irrigation projects and/or their combination including flood control;
(d) ports and harbours (excluding minor ports);
(e) *prospecting and exploration of major minerals in areas above 500 hectares; *

The project authorities will intimate the location of the project site to the Central Government in the Ministry of Environment and Forests while initiating any investigation and surveys. The Central Government in the Ministry of Environment and Forests will convey a decision regarding suitability or otherwise of the proposed site within a maximum period of thirty days. *The said site clearance shall be granted for a sanctioned capacity and shall be valid for a period of five years for commencing the construction, operation or mining. *

III. (a) The reports submitted with the application shall be evaluated and assessed by the Impact Assessment Agency, *and if deemed necessary it may consult* a committee of Experts, having a composition as specified in Schedule-III of this Notification. The Impact Assessment Agency (IAA) would be the Union Ministry of Environment and Forests. The Committee of Experts mentioned above shall be constituted by the Impact Assessment Agency or such other body under the Central Government authorised by the Impact Assessment Agency in this regard.

(b) The said Committee of Experts shall have full right of entry and inspection of the site or, as the case may be, factory premises at any time prior to, during or after the commencement of the operations relating to the project.

**(c) The Impact Assessment Agency shall prepare a set of recommendations based on technical assessment of documents and

data, furnished by the project authorities, supplemented by data collected during visits to sites or factories if undertaken, and details of public hearing.

The assessment shall be completed within a period of ninety days from receipt of the requisite documents and data from the project authorities and completion of public hearing and decision conveyed within thirty days thereafter.

The clearance granted shall be valid for a period of five years for commencement of the construction or operation of the project. **

III A. No construction work, preliminary or otherwise, relating to the setting up of the project may be undertaken till the environmental and site clearance is obtained.

IV. In order to enable the Impact Assessment Agency to monitor effectively the implementation of the recommendations and conditions subject to which the environmental clearance has been given, the project authorities concerned shall submit a half yearly report to the *Impact Assessment Agency. Subject to the public interest, * the Impact Assessment Agency shall make compliance reports publicly available.

V. If no comments from the Impact Assessment Agency are received within the time limit, the project would be deemed to have been approved as proposed by project authorities.

3. Nothing contained in this Notification shall apply to:

(a) any item falling under entry Nos. 3, 18 and 20 of the Schedule-I to be located or proposed to be located in the areas covered by the Notifications S.O. No.102 (E) dated 1st February, 1989, S.O. 114 (E) dated 20th February, 1991; *S.O. No. 416 (E) dated 20th June, 1991* and S.O. No.319 (E) dated 7th May, 1992.

(b) any item falling under entry Nos.1,2,3,4,5,9,10,13, 16,17,19,*21*,25 and 27 of Schedule-I if the investment is less than Rs.50 crores.

(c) any item reserved for Small Scale Industrial Sector with investment less than Rs. 1 crore.

(d) defence related road construction projects in border areas.

4. Concealing factual data or submission of false, misleading data/reports, decisions or recommendations would lead to the project being rejected. Approval, if granted earlier on the basis of false data, would also be revoked. Misleading and wrong information will cover the following:

- False information
- False data

- Engineered reports
- Concealing of factual data
- False recommendations or decisions

[No.Z-12013/4/89-IA-I]

SCHEDULE-I

(See paras 1 and 2)

LIST OF PROJECTS REQUIRING ENVIRONMENTAL CLEARANCE FROM THE CENTRAL GOVERNMENT

1. Nuclear Power and related projects such as Heavy Water Plants, nuclear fuel complex, Rare Earths.
2. River Valley projects including hydel power, major Irrigation and their combination including flood control.
3. Ports, Harbours, Airports (except minor ports and harbours).
4. Petroleum Refineries including crude and product pipelines.
5. Chemical Fertilizers (Nitrogenous and Phosphatic other than single superphosphate).
6. Pesticides (Technical).
7. Petrochemical complexes (Both Olefinic and Aromatic) and Petro-chemical intermediates such as DMT, Caprolactam, LAB etc. and production of basic plastics such as LLDPE, HDPE, PP, PVC.
8. Bulk drugs and pharmaceuticals.
9. Exploration for oil and gas and their production, transportation and storage.
10. Synthetic Rubber.
11. Asbestos and Asbestos products.
12. Hydrocyanic acid and its derivatives.
13. (a) Primary metallurgical industries (such as production of Iron and Steel, Aluminium, Copper, Zinc, Lead and Ferro Alloys).
    (b) Electric arc furnaces (Mini Steel Plants).
14. Chlor alkali industry.
15. Integrated paint complex including manufacture of resins and basic raw materials required in the manufacture of paints.
16. Viscose Staple fibre and filament yarn.
17. Storage batteries integrated with manufacture of oxides of lead and lead antimony alloys.
18. All tourism projects between 200m—500 metres of High Water Line and at locations with an elevation of more than 1000 metres with investment of more than Rs.5 crores.
19. Thermal Power Plants.
20. Mining projects *(major minerals)* with leases more than 5 hectares.
21. Highway Projects **except projects relating to improvement work including widening and strengthening of roads with marginal land acquisition along the existing alignments provided it does not pass through ecologically sensitive areas such as National Parks, Sanctuaries, Tiger Reserves, Reserve Forests**

22. Tarred Roads in the Himalayas and or Forest areas.
23. Distilleries.
24. Raw Skins and Hides
25. Pulp, paper and newsprint.
26. Dyes.
27. Cement.
28. Foundries (individual)
29. Electroplating
30. Meta amino phenol

SCHEDULE-II

[See Sub-para I (a) of para 2]

APPLICATION FORM

1. (a) Name and Address of the project proposed:
   (b) Location of the project:
   Name of the Place:
   District, Tehsil:
   Latitude/Longitude:
   Nearest Airport/Railway Station:
   (c) Alternate sites examined and the reasons for selecting the proposed site:
   (d) Does the site conform to stipulated land use as per local land use plan:

2. Objectives of the project:

3. (a) Land Requirement:
   Agriculture Land:
   Forest land and Density of vegetation.
   Other (specify):
   (b) (i) Land use in the Catchment within 10 kms radius of the proposed site:
   (ii) Topography of the area indicating gradient, aspects and

GOVERNMENT OF INDIA/भारत सरकार
MINISTRY OF RAILWAYS/रेल मंत्रालय
(RAILWAY BOARD/रेलवे बोर्ड

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No 2023/Proj./MUTP-III/VR-DRD/1/4 **New Delhi Dated:-13.10.2023**

To,
CAO/Cons./All Zonal Railways
CMDs/MDs/PSUs.

Sub:-Clarification on exemption of Railway Projects from the requirement of Environment Clearance (EC) and Coastal Regulation Zone(CRZ) Clearance as per Section 11 of Railways Act 1989-reg.

Please find enclosed an OM No IA3-12/3/2023-IA.III dated 06th October 2023 from M/o Environment, Forest and Climate Change(MOEFCC) on exemption from the application of the provision of Environment Protection Act, 1986 including its sub legislation to Railway projects as per Section 11 of Railways Act 1989.

In this context, it is submitted that due to Hon'ble High Court's decision for obtaining environment clearance prior to work execution on an ongoing railway project, the matter was referred to MOEFCC for issuing necessary clarification under the ambit of Section 11 of Railways Act 1989 .

Accordingly, as per OM above, MOEFCC has clarified that Railway Projects covered under Railways Act 1989 shall not attract CRZ Clearance. However, other statutory clearances as applicable needs to be obtained. Other content of the OM are self explanatory.

The above is for information and may be forwarded to all concerned down the line for information and necessary action thereof.

DA:- As above

(F.A. Ahmed)13.10.23
Director/GS(Civil-IV)
Railway Board
☎011-47845480
Email:-dmtp@rb.railnet.gov.in

F.No. IA3-12/3/2023-IA.III (E-220190)
Government of India
Ministry of Environment, Forest and Climate Change
IA-III Section (CRZ)

Indira Paryavaran Bhawan
Jor Bagh Road,
New Delhi – 110003
Dated: 06th October, 2023

OFFICE MEMORANDUM

Subject: Clarification on exemption of Railway Projects from the requirement of Environmental Clearance (EC) and Coastal Regulation Zone (CRZ) Clearance as per Section 11 of Railways Act 1989– regarding.

The Ministry is in receipt of a request for clarification received from Ministry of Railways, regarding exemption from the application of the provisions of Environment Protection Act, 1986 including its sub-legislations to Railway Projects as per Section 11 of Railways Act, 1989.

2. Railway Projects are exempted from prior environmental clearance in term of Section 11 of Railway Act 1989 which overrides every other law in force with the phrase "Notwithstanding anything contained in any other law for the time being in force". The Ld. Attorney General of India has also inter-alia opined that the Section 11 of the Act overrides every other law in force.

3. In this context, Hon'ble High Court, Bombay in the Goa Foundation Vs Konkan Railway (Writ Petition No. 170 of 1992 decided on 29th April 1992) has inter-alia held that:

> *...the provisions of the Environment Act have no application in respect of work undertaken in exercise of powers conferred under Section 11 of the Railways Act, 1989. ..... The wide ambit of the provisions of Section 11 and the non-obstante Clause makes it extremely clear that the provisions of the Environment Act do not bind the construction or maintenance of a railway line. The Railways Act (1989) is a legislation enacted subsequent to the Environment Act (1986) and the Corporation is right in claiming that for the purpose of providing railway line, clearance is not required even though the line passes over the railways, rivers, creeks, etc. in view of the specific provisions of Section 11 of the Railways Act.*

4. Further, Hon'ble High Court of Bombay vide order dated 3rd August 2022, in WP No.15 of 2021 in the matter of Ganv Bhavancho Ekvott & Ors vs South West Railways & Ors inter-alia stating that South Western Railway and Rail Vikas Nigam Limited (RVNL) are not under any statutory compulsion to obtain environmental clearance from the GCZMA or any building permissions or other permissions from any uthority under the diverse legislation.

5. Ministry *vide* OM 19-172/2018-IA.III dated 28th May 2020 has also clarified the non-requirement of Environment Clearance for the Commercial development of the Railway Stations, subject to preparation of comprehensive Environmental Management Plan (EMP) by the Environment and Housekeeping Management (EnHM) Directorate of the Ministry of Railways and fulfilling the standard environmental safeguards as prescribed in the OM dated 28th May 2020.

6. The matter has been once again examined in the Ministry. Based on the facts mentioned above, it is clarified that Railway Projects, covered under Railways Act 1989, shall not attract CRZ Clearance. However, other statutory clearances, as applicable, need to be obtained.

7. This is issued with the approval of the Competent Authority.

(Dr. H. Kharkwal)
Scientist 'E'

To

1. Chairman/Member Secretary, CPCB.
2. Chairperson/Member Secretaries of all the State/UT, PCBs/PCCs
3. Chairperson/Member Secretaries of all the EACs.
4. Chairperson/Member Secretaries of all the SEIAAs/ SEACs.
5. All Officers of IA Division

Copy to:

1. PS to Hon'ble MEFCC
2. PS to Hon'ble MoS (EF&CC)
3. Sr PPS to Secretary (EF&CC)
4. Sr PPS to DGF&SS (EF&CC)
5. PPS to AS(TK)/Sr PPS to JS(SKB)
6. Website, MoEF&CC/Guard File

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GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

LOK SABHA
UNSTARRED QUESTION NO.2740
TO BE ANSWERED ON 04.12.2019

ENVIRONMENTAL CLEARANCE FOR RAILWAY PROJECTS

†2740. SHRI RAVI KISHAN:
SHRI CHANDRA PRAKASH JOSHI:

Will the Minister of RAILWAYS be pleased to state:

(a) whether the ambitious projects of the Railways for capacity expansion by way of gauge conversion and doubling of railway lines has come to a standstill for non-receipt of environmental clearance;

(b) if so, the location/project-wise details thereof;

(c) whether the revenue loss and the occurrence of delay has been assessed;

(d) if so, the details thereof;

(e) whether the Ministry of Environment has been urged by the Railways to speed up the process of granting approval in a time-bound manner on a fast-track mode;

(f) if so, the reaction thereto; and

(g) the other measures taken to obtain environmental clearance to the said projects?

ANSWER

MINISTER OF RAILWAYS AND COMMERCE & INDUSTRY

(SHRI PIYUSH GOYAL)

(a) to (g): A Statement is laid on the Table of the House.

*****

STATEMENT REFERRED TO IN REPLY TO PARTS (a) TO (g) OF UNSTARRED QUESTION NO.2740 BY SHRI RAVI KISHAN AND SHRI CHANDRA PRAKASH JOSHI TO BE ANSWERED IN LOK SABHA ON 04.12.2019 REGARDING ENVIRONMENTAL CLEARANCE FOR RAILWAY PROJECTS

(a), (b) and (g): Railway projects do not require environmental clearance. However, forestry/wild life clearances are required, wherever the diversion of forest land is involved. Taking permission from Ministry of Environment, Forest and Climate Change (MoEF&CC) is an integral part of project execution.

Presently, Indian Railways have taken up 18 doubling and 05 gauge conversion projects with Ministry of Environment, Forest and Climate Change (MoEF&CC) and concerned State Governments for obtaining forestry/wild-life clearance/tree cutting permission. List of projects for which forestry/wild-life clearance/tree cutting permission has been taken up is appended.

In this regard, regular meetings with the officials of MoEF&CC and State Governments are being held to expedite forestry/wild-life clearance/tree cutting permission for Railway Projects, so that, Railway Projects are completed expeditiously.

(c): No, Sir.

(d): Does not arise.

(e): Yes, Sir.

(f): MoEF&CC has issued instruction to zonal units, advising them that, if the land is Railway land (i.e. ownership of the land vests with Railways) and which is under 'non-forest use' before 25th October 1980, then, provisions of Forest Conservation Act would not apply.

*****

APPENDIX REFERRED TO IN REPLY TO PART (a), (b) AND (g) OF UNSTARRED QUESTION NO.2740 BY SHRI RAVI KISHAN AND SHRI CHANDRA PRAKASH JOSHI TO BE ANSWERED IN LOK SABHA ON 04.12.2019 REGARDING ENVIRONMENTAL CLEARANCE FOR RAILWAY PROJECTS

(a), (b) and (g): List of projects for which forestry/wild-life clearances/tree cutting permission is being obtained from Ministry of Environment, Forest and Climate Change is as under:-

SN	Plan Head	Name of Projects
1	Doubling	Jagdalpur - Kirandul Doubling
2	Doubling	Tilak Bridge-AnandVihar 3rd & 4th Line
3	Doubling	New Bongaigaon - Golpara - Kamakhya Doubling project
4	Doubling	Hospet- Tinaighat-Vasco Railway doubling project
5	Doubling	Katni-Singrauli Doubling
6	Doubling	Bondamunda – Ranchi Doubling
7	Doubling	Patratu- Sonnagar - 3rd line
8	Doubling	6th Line Project from Mumbai Central-Borivali
9	Doubling	Kalyan-Kasara 3rd line
10	Doubling	Nagpur-Itarsi 3rd line
11	Doubling	Kazipet-Ballarshah 3rd line projevt
12	Doubling	Banspani-Daitari-Tomka-Jakhapura
13	Doubling	Bhadrak - Nirgundi 3rd line
14	Doubling	Salegaon-Budhapank 3rd & 4th Line
15	Doubling	Jarapada - Budhapank 3rd & 4th line
16	Doubling	Viziyanagaram - Titilagarh 3rd line
17	Doubling	Eranial - Nagarcovil
18	Doubling	Mathura - Palwal 4th line work
19	Gauge conversion	Gauge conversion with Railway Electrification between Khijadiya-Visavadar
20	Gauge conversion	Gauge conversionwith Railway Electrification between Veraval-Talala-Visavadar
21	Gauge conversion	Gauge conversionwith Railway Electrification between Junagadh-Visavadar
22	Gauge conversion	Ratlam-Mhow-Khandwa-Akola Gauge Conversion Project
23	Gauge conversion	Lucknow Pilibhit via Sitapur, Lakhimpur, Gauge conversion

*****

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GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

RAJYA SABHA
UNSTARRED QUESTION No. 4043
TO BE ANSWERED ON: 07.04.2022

Environmental clearance for public transport projects

4043. DR. V. SIVADASAN:

Will the Minister of ENVIRONMENT, FOREST AND CLIMATE CHANGE be pleased to state:

(a) the measures taken by Government to reduce the pollution caused by vehicles;
(b) whether any measures or campaigns have been taken by Government to encourage the travel by public transport system;
(c) whether environmental clearance is required for the implementation of public transport projects;
(d) whether environmental clearance is exempted for the implementation of railway projects; and
(e) if so, the details thereof, and if not, the reasons therefor?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
(SHRI ASHWINI KUMAR CHOUBEY)

(a)& (b)
The Central Government has taken several measures to reduce pollution caused by vehicles which *inter alia* include:

(i) Leapfrogging from BS-IV to BS-VI norms for fuel and vehicles since April, 2020.
(ii) Introduction of cleaner/alternate fuels like CNG, LPG, ethanol blending in petrol.
(iii) Roll-out of Faster Adoption and Manufacturing of Electric Vehicles (FAME) -2 scheme.
(iv) Vehicle Scrapping Policy for creation of an ecosystem to phase out older, unfit polluting vehicles.
(v) Enhancement of Metro rails network for public transport.
(vi) Development of Expressways and Highways.
(vii) Exemption of electric vehicles from permit requirement.
(viii) Promotion of public transport, improvements in roads and building of more bridges to ease congestion on roads.

Also, the Central Government has launched National Clean Air Programme (NCAP) to improve air quality across the country. Under NCAP, City-specific Action Plans (CAPs) have been put in place in 132 non-attainment cities. These CAPs include the steps to reduce the pollution caused by vehicles.

A number of campaign and awareness generation programme have been organised regarding bringing improvement in air quality. These programme viz. Clean Air for Delhi Campaign; Switch Delhi Campaign; 'Swachh Pawan, Neel Gagan'-International Day of Clean Air for Blue Skies etc.include awareness on reducing pollution from vehicles also.

(c) to (e)
As far as Infra-2 sector is concerned, public transport systems namely Airports and Aerial Ropeways come under the purview of EIA Notification, 2006.In addition, in case of public transport associated infrastructures namely Bus terminal, Railway stations and Metro stations, where the authorities allot land to private builders & developers to build a shopping mall along with Bus terminal, Railway station and Metro Stations and the built up area of such activity is more than 20,000 sqm, obtaining prior Environment Clearance (EC) under schedule 8a (Building and Construction projects) of EIA Notification, 2006 is mandatory.

As per EIA notification, 2006, Railways and Metro Rail projects are exempted from obtaining prior EC with reference to O.M. dated 02.07.2009. Copy of the O.M. attached as Annexure.

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पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

अधिसूचना

नई दिल्ली, 28 मार्च, 2020

का.आ. 1224(अ).—खनिज विधि (संशोधन) अधिनियम 2020 (2020 का 2), खान और खनिज (विकास और विनियमन) अधिनियम, 1957 (1957 का 67) (जिसे इसमें इसके पश्चात् एमएमडीआर अधिनियम कहा गया है) द्वारा 10 जनवरी, 2020 से प्रभावी संशोधन किया गया है और अन्य बातों के साथ कानूनी निर्बाधन के अंतरण के लिए उपबंधों से संबंधित नई धारा 8ख का अंत:स्थापन किया गया है;

और, एमएमडीआर अधिनियम की धारा 8ख की उप-धारा (2) यह उपबंध करता है कि इस अधिनियम में या तत्समय प्रवृत्त किसी अन्य विधि में अंतर्विष्ट किसी बात के होते हुए भी, धारा 8क की उप-धारा (5) और उप-धारा (6) के उपबंधों के अधीन अवसान होने वाले खनन पट्टे का सफल बोली लगाने वाला और उस अधिनियम के अधीन या तद्धीन बनाए गए नियमों के अधीन उपबंधित प्रक्रिया के अनुसार नीलामी के माध्यम से अर्जित सभी विधिमान्य अधिकार, अनुमोदन, निकासी, अनुज्ञप्ति और इसी प्रकार दो वर्ष की अवधि के लिए पूर्ववर्ती पट्टेदार पर निहित होना समझा जाएगा;

और, एमएमडीआर अधिनियम की धारा 8ख की उप-धारा (3) यह उपबंध करता है कि तत्समय प्रवृत्त अन्य विधि में अंतर्विष्ट किसी बाते के होते हुए भी, यह उस भूमि पर जिसमें नया पट्टा के प्रारंभ से दो वर्ष की अवधि के लिए पूर्ववर्ती पट्टादार द्वारा खनन संक्रियाएं कार्यान्वित किए जा रहे थे, निरंतर खनन संक्रियाओं को नए पट्टेदार के लिए विधिपूर्ण किया जाएगा;

और, एमएमडीआर अधिनियम को पूर्वोक्त संशोधन के प्रयोजन के लिए केंद्रीय सरकार, भारत सरकार के तत्कालीन पर्यावरण और वन मंत्रालय की अधिसूचना सं. का. आ. 1533 (अ), तारीख 14 सितंबर, 2006 (जिसे इसमें इसके पश्चात् ईआईए अधिसूचना, 2006 कहा गया है) के सुसंगत उपबंधों को सम्मिलित करने के लिए आवश्यक समझती है।

और, पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय में सड़कों के लिए साधारण पृथ्वी का उपयोग करने के लिए पूर्व पर्यावरणीय अनापत्ति की अपेक्षा के अधित्याग के लिए अभ्यावेदनों की प्राप्ति पर; और पारंपरिक समुदाय द्वारा अंतर ज्वारीय क्षेत्र के भीतर चूने के गोले (मृत भू-पटल), पवित्र स्थानों, आदि के मैनुअल निकासी;

अत:, अब, केन्द्रीय सरकार, पर्यावरण (संरक्षण) नियम, 1986 के नियम 5 के उप-नियम (4) के साथ पठित पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 3 की उप-धारा (1) और उप-धारा (2) के खंड (v) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, लोकहित में, उक्त नियमों के नियम 5 के उप-नियम (3) के खंड (क) के अधीन सूचना की अपेक्षा से अभिमुक्ति के पश्चात् और अधिसूचना सं. का. आ. 4307 (अ), तारीख 29 नवंबर, 2019 को अधिक्रांत करते हुए, ईआईए अधिसूचना, 2006 में निम्नलिखित संशोधन करती है, अर्थात् :-

उक्त अधिसूचना में, -

(i) पैरा 11 में, उप-पैरा (2) के पश्चात् निम्नलिखित उप-पैरा अंत:स्थापित किया जाएगा, अर्थात् :-

"(3) खान और खनिज (विकास और विनियमन) अधिनियम, 1957 (1957 का 67) की धारा 8क की उप-धारा (5) और उप-धारा (6) के उपबंधों के अधीन अवसान होने वाले खनन पट्टे का सफल बोली लगाने वाला और उस अधिनियम के अधीन और तद्धीन बनाए गए नियमों के अधीन उपबंधित प्रक्रिया के अनुसार नीलामी के माध्यम से चयनित नया पट्टा के प्रारंभ की तारीख से दो वर्ष की अवधि के लिए पूर्ववर्ती पट्टेदार पर निहित पूर्व पर्यावरणीय अनापत्ति विधिमान्य अर्जित किया गया समझा जाएगा और यह नया पट्टा प्रारंभ की तारीख से दो वर्ष की अवधि के लिए या उसमें उल्लिखित निबंधनों शर्तों के अनुसार नया पर्यावरणीय अनापत्ति, नया निकासी अभिप्राप्त होने तक, इसमें से जो भी पूर्वतर हो, उक्त पट्टा क्षेत्र पर पूर्ववर्ती पट्टेदार का स्वीकृत पर्यावरणीय अनापत्ति के निबंधनों और शर्तों के अनुसार निरंतर खनन संक्रिया नया पट्टेदार के लिए विधिपूर्ण होंगी;

परन्तु, सफल बोली लगाने वाला नया पट्टा मंजूर करने की तारीख से दो वर्ष की अवधि के भीतर विनियामक प्राधिकरण से पूर्व पर्यावरणीय अनापत्ति के लिए आवेदन करेगा और अभिप्राप्त करेगा।";

(ii) अनुसूची के मद 1 (क) के सामने, स्तंभ (5) के खंड (2) के टिप्पण के पश्चात् निम्नलिखित खंड अंत:स्थापित किया जाएगा, अर्थात् :-

"(3) उक्त पट्टा के अवसान के पश्चात् पूर्ववर्ती पट्टेदार द्वारा खनन और खनिज (विकास और विनियमन) अधिनियम, 1957 (1957 का 67) के उपबंधों के अधीन खनन पट्टे के अवसान होने तक भीतर पड़ी पहले से ही खनिज वाह्य सामग्री का निष्क्रमण या निष्कासन और परिवहन उस अधिनियम के अधीन और तद्धीन बनाए गए नियमों के अधीन उपबंधित प्रक्रिया के अनुसार नीलामी के माध्यम से चयनित सफल बोली लगाने की इस प्रकार अनुज्ञात खनन हैसियत के भाग के रूप में नहीं होगा।"

(iii) परिशिष्ट – IX के लिए, निम्नलिखित परिशिष्ट प्रतिस्थापित किया जाएगा, अर्थात् :-

"परिशिष्ट – 9

कतिपय मामलों के पर्यावरणीय अनापत्ति की अपेक्षा से छूट

निम्नलिखित मामलों को पूर्व पर्यावरणीय अनापत्ति की अपेक्षा नहीं होगी, अर्थात् :-

1. मैनुअल खनन द्वारा साधारण मिट्टी या बालू की कुम्हारों द्वारा मिट्टी के घड़े, लैम्प, खिलौने, आदि बनाने के लिए उनकी प्रथाओं के अनुसार निकासी ।

2. मैनुअल खनन द्वारा मिट्टी की टाइलें बनाने द्वारा जो मिट्टी की टाइलें बनाते हैं, के लिए साधारण मिट्टी या बालू की निकासी।

3. किसानों द्वारा बाढ़ के पश्चात् कृषि भूमि से बालू के जमाव को हटाना।

4. ग्राम पंचायत में अवस्थित स्रोतों से बालू और साधारण मिट्टी को वैयक्तिक उपयोग या ग्राम में समुदाय कार्य के लिए प्रथा के अनुसार खनन।

5. सामुदायिक कार्य जैसे ग्रामीण तालाबों या टैंकों से गाद हटाना, महात्मा गांधी राष्ट्रीय ग्रामीण रोजगार और गारंटी स्कीमों, अन्य सरकारी स्कीमों, प्रायोजित तथा सामुदायिक प्रयासों द्वारा ग्रामीण सड़कों, तालाबों या बांधों का संनिर्माण।

6. सड़क, पाइपलाइन, आदि जैसे रेखीय परियोजनाओं के लिए साधारण मिट्टी की निकासी, निष्कासन या प्रयोग करना।

7. बांधों, तालाबों, मेड़ों, बैराजों, नदी और नहरों की उनके अनुरक्षित तथा आपदा प्रबंधन के प्रयोजन के लिए तलमार्जन और गाद निकालना।

8. गुजरात में गुजरात सरकार की तारीख 14 फरवरी, 1990 की अधिसूचना सं. जीयू / 90 (16)/ एमसीआर–2189 (68) / 5 – सीएचएच द्वारा बंजारा और ओड द्वारा बालू के पारंपरिक उपजीविका कार्य।

9. पारंपरिक समुदाय द्वारा अंतर ज्वारीय क्षेत्र के भीतर चूने के गोलों (मृत भू-पटल), पवित्र स्थानों, आदि के मैनुअल निकासी।

10. सिंचाई या पेयजल के लिए कुओं की खुदाई।

11. यथास्थिति, ऐसे भवनों की नींव के लिए खुदाई जिनके लिए पूर्व पर्यावरणीय अनापत्ति अपेक्षित नहीं है।

12. जिला कलेक्टर या जिला मजिस्ट्रेट या किसी अन्य सक्षम प्राधिकारी के आदेश पर किसी नहर, नाला, ड्रेन, जल निकाय, आदि में होने वाली दरार को भरने के लिए साधारण मिट्टी या बालू का उत्खनन ताकि किसी आपदा या बाढ़ जैसी स्थिति से निपटा जा सकें।

13. ऐसे क्रियाकलाप, जिन्हें राज्य सरकार द्वारा विधान या नियमों के अधीन गैर खननकारी क्रियाकलाप के रूप में घोषित किया गया है।"

[फा. सं. जेड–11013 / 47 / 2018–आई. ए. II (एम)]

गीता मेनन, संयुक्त सचिव

टिप्पण : मूल अधिसूचना भारत के राजपत्र, असाधारण, भाग II, खंड 3, उप-खंड (ii) में सं. का. आ. 1533 (अ), तारीख 14 सितंबर 2006 द्वारा प्रकाशित की गई थी और निम्नलिखित सं. द्वारा पश्चात्वर्ती संशोधन किया गया :-

1. का. आ. 1949 (अ), तारीख 13 नवंबर, 2006;
2. का. आ. 1737 (अ), तारीख 11 अक्तूबर, 2007;
3. का. आ. 3067 (अ), तारीख 1 दिसंबर, 2009;
4. का. आ. 695 (अ), तारीख 4 अप्रैल, 2011;
5. का. आ. 156 (अ), तारीख 25 जनवरी, 2012;
6. का. आ. 2896 (अ), तारीख 13 दिसंबर, 2012;
7. का. आ. 674 (अ), तारीख 13 मार्च, 2013;
8. का. आ. 2204 (अ), तारीख 19 जुलाई, 2013;
9. का. आ. 2555 (अ), तारीख 21 अगस्त, 2013;
10. का. आ. 2559 (अ), तारीख 22 अगस्त, 2013;
11. का. आ. 2731 (अ), तारीख 9 सितंबर, 2013;

12. का. आ. 562 (अ), तारीख 26 फरवरी, 2014;
13. का. आ. 637 (अ), तारीख 28 फरवरी, 2014;
14. का. आ. 1599 (अ), तारीख 25 जून, 2014;
15. का. आ. 2601 (अ), तारीख 7 अक्तूबर, 2014;
16. का. आ. 2600 (अ), तारीख 9 अक्तूबर, 2014;
17. का. आ. 3252 (अ), तारीख 22 दिसंबर, 2014;
18. का. आ. 382 (अ), तारीख 3 फरवरी, 2015;
19. का. आ. 811 (अ), तारीख 23 मार्च, 2015;
20. का. आ. 996 (अ), तारीख 10 अप्रैल, 2015;
21. का. आ. 1142 (अ), तारीख 17 अप्रैल, 2015;
22. का. आ. 1141 (अ), तारीख 29 अप्रैल, 2015;
23. का. आ. 1834 (अ), तारीख 6 जुलाई, 2015;
24. का. आ. 2571 (अ), तारीख 31 अगस्त, 2015;
25. का. आ. 2572 (अ), तारीख 14 सितंबर, 2015;
26. का. आ. 141 (अ), तारीख 15 जनवरी, 2016;
27. का. आ. 648 (अ), तारीख 3 मार्च, 2016;
28. का. आ. 2269 (अ), तारीख 1 जुलाई, 2016;
29. का. आ. 2944 (अ), तारीख 14 सितंबर, 2016;
30. का. आ. 3518 (अ), तारीख 23 नवंबर, 2016;
31. का. आ. 3999 (अ), तारीख 9 दिसंबर, 2016;
32. का. आ. 4241 (अ), तारीख 30 दिसंबर, 2016;
33. का. आ. 3611 (अ), तारीख 25 जुलाई, 2018;
34. का. आ. 3977 (अ), तारीख 14 अगस्त, 2018;
35. का. आ. 5733 (अ), तारीख 14 नवंबर, 2018;
36. का. आ. 5736 (अ), तारीख 15 नवंबर, 2018;
37. का. आ. 5845 (अ), तारीख 26 नवंबर, 2018;
38. का. आ. 345 (अ), तारीख 17 जनवरी, 2019;
39. का. आ. 1960 (अ), तारीख 13 जून, 2019;
40. का. आ. 236 (अ), तारीख 16 जनवरी, 2020;
41. का. आ. 751 (अ), तारीख 17 फरवरी, 2020; और
42. का. आ. 1223 (अ), तारीख 27 मार्च, 2020 ।

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 28th March, 2020

S.O. 1224(E).—WHEREAS, *vide* the Mineral Laws (Amendment) Act, 2020 (2 of 2020), the Mines and Minerals (Development and Regulation) Act, 1957 (67 of 1957) (hereinafter referred to as MMDR Act) has been amended with effect from the 10th day of January, 2020 and, *inter alia*, new section 8B relating to the provisions for transfer of statutory clearances has been inserted;

AND WHEREAS, sub-section (2) of section 8B of the MMDR Act provides that notwithstanding anything contained in this Act or any other law for the time being in force, the successful bidder of mining leases expiring under the provisions of sub-sections (5) and (6) of section 8A and selected through auction as per the procedure provided under this Act and the rules made thereunder, shall be deemed to have acquired all valid rights, approvals, clearances, licences and the like vested with the previous lessee for a period of two years;

AND WHEREAS, sub-section (3) of section 8B of the MMDR Act provides that notwithstanding anything contained in any other law for the time being in force, it shall be lawful for the new lessee to continue mining operations on the land, in which mining operations were being carried out by the previous lessee, for a period of two years from the date of commencement of the new lease;

AND WHEREAS, in pursuance of the aforesaid amendment to the MMDR Act, the Central Government deems it necessary to align the relevant provisions of the notification of the Government of India in the erstwhile Ministry of Environment and Forests number S.O. 1533 (E), dated the 14th September, 2006 (hereinafter referred to as the EIA Notification, 2006);

AND WHEREAS, the Ministry of Environment, Forest and Climate Change is in the receipt of representations for waiver of requirement of prior environmental clearance for borrowing of ordinary earth for roads; and manual extraction of lime shells (dead shell), shrines, etc., within inter tidal zone by the traditional community;

Now, therefore, in exercise of the powers conferred by sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986), read with sub-rule (4) of rule 5 of the Environment (Protection) Rules, 1986, the Central Government, after having dispensed with the requirement of notice under clause (a) of sub-rule (3) of the rule 5 of the said rules, in public interest, and in supersession of the notification number S.O. 4307(E), dated the 29th November, 2019, hereby makes the following further amendments in the EIA Notification, 2006, namely:-

In the said notification,-

(i) in paragraph 11, after sub-paragraph (2), the following sub-paragraph shall be inserted, namely:-

"(3) The successful bidder of the mining leases, expiring under the provisions of sub-sections (5) and (6) of section 8A of the Mines and Minerals (Development and Regulation) Act, 1957 (67 of 1957) and selected through auction as per the procedure provided under that Act and the rules made thereunder, shall be deemed to have acquired valid prior environmental clearance vested with the previous lessee for a period of two years, from the date of commencement of new lease and it shall be lawful for the new lessee to continue mining operations as per the same terms and conditions of environmental clearance granted to the previous lessee on the said lease area for a period of two years from the date of commencement of new lease or till the new lessee obtains a fresh environmental clearance with the terms and conditions mentioned therein, whichever is earlier:

Provided that the successful bidder shall apply and obtain prior environmental clearance from the regulatory authority within a period of two years from the date of grant of new lease.";

(ii) in the Schedule, against the item 1(a), in the column (5), after clause (2) of the Note, the following clause shall be inserted, namely:-

"(3) The evacuation or removal and transportation of already mined out material lying within the mining leases expiring under the provisions of the Mines and Minerals (Development and Regulation) Act, 1957 (67 of 1957), by the previous lessee, after the expiry of the said lease, shall not form the part of the mining capacity so permitted to the successful bidder, selected through auction as per the procedure provided under that Act and the rules made thereunder.";

(iii) for Appendix-IX, the following Appendix shall be substituted, namely:-

"APPENDIX-IX

EXEMPTION OF CERTAIN CASES FROM REQUIREMENT OF ENVIRONMENTAL CLEARANCE

The following cases shall not require Prior Environmental Clearance, namely:-

1. Extraction of ordinary clay or sand by manual mining, by the Kumhars (Potter) to prepare earthen pots, lamp, toys, etc. as per their customs.
2. Extraction of ordinary clay or sand by manual mining, by earthen tile makers who prepare earthen tiles.
3. Removal of sand deposits on agricultural field after flood by farmers.
4. Customary extraction of sand and ordinary earth from sources situated in Gram Panchayat for personal use or community work in village.
5. Community works, like, de-silting of village ponds or tanks, construction of village roads, ponds or bunds undertaken in Mahatma Gandhi National Rural Employment and Guarantee Schemes, other Government sponsored schemes and community efforts.
6. Extraction or sourcing or borrowing of ordinary earth for the linear projects such as roads, pipelines, etc.
7. Dredging and de-silting of dams, reservoirs, weirs, barrages, river and canals for the purpose of their maintenance, upkeep and disaster management.
8. Traditional occupational work of sand by Vanjara and Oads in Gujarat vide notification number GU/90(16)/MCR-2189(68)/5-CHH, dated the 14th February, 1990 of the Government of Gujarat.
9. Manual extraction of lime shells (dead shell), shrines, etc., within inter tidal zone by the traditional community.
10. Digging of wells for irrigation or drinking water purpose.
11. Digging of foundation for buildings, not requiring prior environmental clearance, as the case may be.
12. Excavation of ordinary earth or clay for plugging of any breach caused in canal, nallah, drain, water body, etc., to deal with any disaster or flood like situation upon orders of the District Collector or District Magistrate or any other Competent Authority.
13. Activities declared by the State Government under legislations or rules as non-mining activity."

[F. No. Z-11013/47/2018-IA.II (M)]

GEETA MENON, Jt. Secy.

Note: The principal notification was published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (ii) *vide* number S.O. 1533 (E), dated the 14th September, 2006 and subsequently amended *vide* the following numbers:-

1. S.O. 1949 (E), dated the 13th November, 2006;
2. S.O. 1737 (E), dated the 11th October, 2007;
3. S.O. 3067 (E), dated the 1st December, 2009;
4. S.O. 695 (E), dated the 4th April, 2011;
5. S.O. 156 (E), dated the 25th January, 2012;
6. S.O. 2896 (E), dated the 13th December, 2012;
7. S.O. 674 (E), dated the 13th March, 2013;
8. S.O. 2204 (E), dated the 19th July, 2013;
9. S.O. 2555 (E), dated the 21st August, 2013;
10. S.O. 2559 (E), dated the 22nd August, 2013;
11. S.O. 2731 (E), dated the 9th September, 2013;
12. S.O. 562 (E), dated the 26th February, 2014;
13. S.O. 637 (E), dated the 28th February, 2014;

14. S.O. 1599 (E), dated the 25th June, 2014;
15. S.O. 2601 (E), dated the 7th October, 2014;
16. S.O. 2600 (E), dated the 9th October, 2014;
17. S.O. 3252 (E), dated the 22nd December, 2014;
18. S.O. 382 (E), dated the 3rd February, 2015;
19. S.O. 811 (E), dated the 23rd March, 2015;
20. S.O. 996 (E), dated the 10th April, 2015;
21. S.O. 1142 (E), dated the 17th April, 2015;
22. S.O. 1141 (E), dated the 29th April, 2015;
23. S.O. 1834 (E), dated the 6th July, 2015;
24. S.O. 2571 (E), dated the 31st August, 2015;
25. S.O. 2572 (E), dated the 14th September, 2015;
26. S.O. 141 (E), dated the 15th January, 2016;
27. S.O. 648 (E), dated the 3rd March, 2016;
28. S.O. 2269(E), dated the 1st July, 2016;
29. S.O. 2944(E), dated the 14th September, 2016;
30. S.O. 3518 (E), dated 23rd November 2016;
31. S.O. 3999 (E), dated the 9th December, 2016;
32. S.O. 4241(E), dated the 30th December, 2016;
33. S.O. 3611(E), dated the 25th July, 2018;
34. S.O. 3977 (E), dated the 14th August, 2018;
35. S.O. 5733 (E), dated the 14th November, 2018;
36. S.O. 5736 (E), dated the 15th November, 2018;
37. S.O. 5845(E), dated the 26th November, 2018;
38. S.O. 345(E), dated the 17th January, 2019;
39. S.O. 1960(E), dated the 13th June, 2019;
40. S.O. 236(E), dated the 16th January, 2020;
41. S.O. 751(E), dated the 17th February, 2020; and
42. S.O. 1223(E), dated the 27th March, 2020.

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F. No. 3-70/2020-IA.III [141127]
Government of India
Ministry of Environment, Forest and Climate Change
(IA Division)

Indira Paryavaran Bhawan
Jor Bagh Road, Aliganj,
New Delhi – 110003

Dated: 8th August, 2022

OFFICE MEMORANDUM

Subject: Clarification on the applicability of EIA Notification 2006 for excavation of Ordinary Earth from borrow area for linear projects – reg.

The Ministry, vide Notification S.O. 1224 (E) dated 28.03.2020, amended the appendix IX of EIA Notification to inter-alia provide exemption from Environmental Clearance (EC) for "*extraction or sourcing or borrowing of ordinary earth for linear projects such as roads, pipelines etc.*"

2. Subsequently, the above mentioned Notification was challenged before the National Green Tribunal, Principal Bench in Original Application No. 190/2020 in the matter of Noble M. Paikada Vs. Union of India & Ors., wherein the Hon'ble Tribunal while disposing of the application vide order dated 28/10/2020, *inter-alia* held that "*…..the exemption should strike balance and instead of being blanket exemption, it needs to be hedged by appropriate safeguards such as the process of excavation and quantum…*" and directed to revisit the impugned notification dated 28.03.2020.

3. Subsequently vide order dated 31/05/2022, the Hon'ble NGT in M.A. No. 07/2022(WZ) & M.A. No. 08/2022(WZ) in Original Application No. 68/2020(WZ) titled Shri Rajiv Babasaheb Waman & Ors. vs. Ministry of Environment, Forest & Climate Change & Ors inter-alia held that "*… that excavation of earth and mining of sand and other minor minerals being hazardous activity having serious adverse impact on environment in view of 'Precautionary' and 'Sustainable Development' principles, such activity cannot be left unregulated by statutory enforceable mechanism. Blanket exemption is against ecologically sustainable development norms and judgment of Hon'ble Supreme Court…*"

4. The matter was referred to the concerned Expert Appraisal Committee (EAC) for deliberation. After due deliberation, the EAC was of the opinion that if such linear project has obtained EC based on EIA studies incorporating such sourcing of construction material or other activities, necessary safeguards are already incorporated in the EC appraisal process. However, if such sourcing of material is not considered in the EIA or such linear project does not attract provisions of EC, then

such individual activities will be subject to extant environmental regulations as per EIA Notification 2006, as amended and/or applicable environmental safeguard related directions issued by the State Government /SPCB which need to be observed while sourcing construction material.

5. Based on the recommendations of the EAC and keeping in view the direction of Hon'ble NGT, the matter has been examined by the Ministry in detail and it has been decided that the exemption from EC provided vide S.O. 1224 (E) dated 28.03.2020 for "*extraction or sourcing or borrowing of ordinary earth for linear projects such as roads, pipelines etc.*" shall be subject to Standard Operating Procedure (SOP) as enclosed to this Office Memorandum.

6. This is issued with the approval of the Competent Authority.

Encl: as above.

8/8/22

(Sundar Ramanathan)
Scientist 'E'

To

1. Chairman and Member Secretaries of SEIAA/ SEACs.
2. Chairman, Central Pollution Control Board (CPCB).
3. Chairpersons/Member Secretaries of all SPCBs/UTPCCs
4. All the Officers of I.A. Division

Copy for information to:

1. PS to Hon'ble Minister for Environment, Forest and Climate Change
2. PS to Hon'ble MoS (EF&CC)
3. PPS to Secretary (EF&CC)
4. PPS to DGF&SS (EF&CC)
5. PPS to AS(TK)/PPS to JS (SKB)
6. Website, MoEF&CC/Guard file

ANNEXURE

SOP for Borrow Area Identification; its operation, safety and redevelopment

The activity relates to identification of borrow areas to obtain earth/soil materials; its operation, safety and redevelopment shall be carried out as per the following criteria:

1. **Selection of site, operation and site-specific measures to adopt**

i. Environmental issues like siting borrow pit location, soil erosion aspects, accumulation of run-off and associated problems, disposal of debris by local community in open borrow area, transport of borrow earth to construction site, preservation of top soil of 15m depth and reuse for plantation, reinstatement of borrow pits and sites shall be considered before selection of site.
ii. Guidelines, Manuals, Notifications etc issued by various agencies from time to time like IRC, MoRTH, MoEFCC etc shall be followed.
iii. For selection of the site for the borrow area, agricultural land, cut material available from other road construction projects, dredging material from dredging operations of ponds, lakes, rivers and canals, material from barren land or land without tree cover outside the road RoW, material from excavation of proposed culverts can be considered. Provided further that, highly productive top-soil shall be stored separately and used for planation activity.
iv. Borrowing shall be avoided on the lands close to toe line, irrigated agricultural lands, grazing land, lands within settlements, 1 Km from environmentally sensitive areas such as Reserve Forests, Protected Forests, Sanctuary, National Parks, Conservation Reserve, Wetlands etc, unstable and fragile side-hills, streams and seepage areas, areas supporting rare plants/ animal species. It should be ensured that unsuitable soft rock is not prominent within the proposed depth of excavation which will render rehabilitation difficult.

2. **The General Guidelines**

i. The preservation of topsoil will be carried out in stockpile.
ii. A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal).
iii. Preservation of Top Soil of 15cm depth and its reuse for plantation
iv. Validation of the work of re-use of Top Soil by the AE/IE. Competent authority to check the re-use anytime if warranted.
v. Borrowing of earth will be carried out up to a depth of 2m from the existing ground level.
vi. Borrowing of earth will not be done continuously throughout the stretch.
vii. Ridges of not less than 8m widths will be left at intervals not exceeding 300m.
viii. Small drains will be cut through the ridges, if necessary, to facilitate drainage.
ix. Depends upon the location of borrow areas, the safeguard measures & management specific treatment as a particular borrow area depending upon its

location viz Agriculture Land, Elevated Land, Waterbody, near Settlement and along the alignment.

3. **Re-development of Borrow Areas**

The objective of the rehabilitation programme is to return the borrow pit sites to a safe and secure area, which the general public should be able to use safely. Securing borrow pits in a stable condition is fundamental requirement of the rehabilitation process. This could be achieved by filling the borrow pit approximately to the road level. Following measures shall be taken for Rehabilitation:

i. Borrow pits shall be backfilled with rejected construction wastes (unserviceable materials) including fly ash, compacted and will be given a turfing or vegetative cover on the surface. If this is not possible, then excavation slope should be smoothened, and depression is filled in such a way that it looks more or less like the original ground surface.
ii. During works execution, the Contractor shall ensure preservation of trees during piling of materials; spreading of stripping material to facilitate water percolation and allow natural vegetation growth; re-establishment of previous natural drainage flows; improvement of site appearance; digging of ditches to collect runoff; and plantation may be carried out wherever feasible or pit may be developed for water storage as per Amrit Sarovar Scheme of MoRTH.

4. **Development of Amrit Sarovar**

Under Amrit Sarovar Programme, water bodies are being developed by MoRT&H/NHAI/other road development agencies and the desilting of existing water body is also being taken up for water harvesting and re-charge of ground water. The earth available from development of such water bodies is to be utilised for road works and plantations as per suitability of soil. The State Authorities have already been advised not to levy any royalty for borrowing of earth for development of water bodies under Amrit Sarovar Programme.

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F. No. 3-70/2020-IA.III [141127]
Government of India
Ministry of Environment, Forest and Climate Change
(IA Division)

Indira Paryavaran Bhawan
Jor Bagh Road, Aliganj,
New Delhi – 110003

Dated: 21st August, 2023

OFFICE MEMORANDUM

Subject: **Monitoring and enforcement mechanism for the Standard Operating Procedure (SoP)/environmental safeguards issued for (i) Extraction or sourcing or borrowing of ordinary earth for the linear projects such as roads, pipelines, etc. and (ii) dredging and de-silting of dams, reservoirs, weirs, barrages, rivers and canals for the purpose of their maintenance, upkeep and disaster management – reg.**

The Ministry vide Notification S.O. 1224 (E) dated 28/03/2020 had *inter-alia* provided exemption from prior Environmental Clearance for extraction or sourcing or borrowing of ordinary earth for the linear projects such as roads, pipelines, etc., and dredging and de-silting of dams, reservoirs, weirs, barrages, rivers and canals for the purpose of their maintenance, upkeep and disaster management.

2. Subsequently, in pursuance to the order dated 28/10/2020 of Hon'ble National Green Tribunal, Principal Bench in Original Application No. 190/2020 in the matter of Noble M. Paikada Vs. Union of India & Ors, the MoEF&CC issued Office Memoranda of even number dated 8/8/2022 and 12/07/2023 respectively regarding the Standard Operating Procedure (SoP)/environmental safeguards to be followed for the entries 6 and 7, as mentioned below, under the Appendix IX of the EIA Notification, 2006 which have been exempted from the requirement of obtaining environment clearance vide Notification dated 28/03/2020 :

6. *Extraction or sourcing or borrowing of ordinary earth for the linear projects such as roads, pipelines, etc.*
7. *Dredging and de-silting of dams, reservoirs, weirs, barrages, river and canals for the purpose of their maintenance, upkeep and disaster management.*

3. The Ministry deems it necessary to ensure that aforementioned SoP/environmental safeguards are implemented in letter and spirit at the field level, for which a monitoring and enforcement mechanism needs to be put in place.

4. In this regard, it is enjoined upon all the Project Proponents availing of the aforesaid provisions and carrying out activities related to entries 6 and 7 of Appendix IX of the EIA Notification, 2006 to inform the concerned State Pollution Control Board(SPCBs) /Pollution Control Committees(PCCs) at least a fortnight before start of such activities in writing giving details of such activities and the environment safeguards being observed by them as laid out in the applicable SOP referred to in the para number 2 above.

5. All the State Pollution Control Board(SPCBs) /Pollution Control Committees(PCCs) shall independently monitor the compliance status of the aforementioned SoP/environmental safeguards as the case may be. All the State Pollution Control Board(SPCBs) /Pollution Control Committees(PCCs) shall also monitor the aforementioned SoP/environmental safeguards while monitoring the compliances of the CTE (Consent to Establish) and CTO (Consent to Operate) conditions. Further, the SPCBs/PCCs shall initiate legal action against the project proponent under the relevant provisions of Environment (Protection) Act, 1986 for the projects not complying with the aforesaid SoP/environmental safeguards, as may be applicable.

6. This is issued with the approval of the Competent Authority.

21/8/25

(Sundar Ramanathan)
Scientist 'E'

To

1. Chairman, Central Pollution Control Board (CPCB)
2. Chairman and Member Secretaries of SEIAA/ SEACs
3. Chairpersons/Member Secretaries of all SPCBs/UTPCCs
4. All the Officers of I.A. Division

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5. PPS to AS(TK)/PPS to JS (SKB)
6. Website, MoEF&CC/Guard file

Calculation Of Environmental Compensation Based On The "Mild" Risk Factor (0.25) And Discounting Rate (8%)

Market Value of Illegally Mined Mineral as alleged **(D) The quantity id disputed and the same may not be construed as an admission by the answering Respondent**	4,44,907 cu/m x Rs. 62	= Rs. 2,75,84,234/-
Annual value of foregone ecological values (D * RF) i.e Risk factor taken as 0.25 for mild case	Rs. 2,75,84,234 x 0.25	=Rs. 68,96,058.5

Present value of foregone ecological values at 8% discount rate of 5 years

$= 6896058.5/(1.08)^1 + 6896058.5/(1.08)^2 + 6896058.5/(1.08)^3 +$

$6896058.5/(1.08)^4 + 6896058.5/(1.08)^5$

$=$ 6385239.35 + 5912258.66+5474313.57+5068808.86+ 4693341.53

= Rs. 2,75,33,961.97 (**PV**)

NPV = PV – D

Rs. 2,75,33,961.97 (PV) - Rs. 2,75,84,234/- (D)

= (-) Rs. 50,272.03/-

(Since this value is coming in the negative, nothing is recoverable)

BEFORE THE NATIONAL GREEN TRIBUNAL
EASTERN BENCH, KOLKATA
ORIGINAL APPLICATION NO. 109/2023/EZ

In the matter of:

SATRUGHAN MEHER ... **APPLICANT**

VERSUS

STATE OF ODISHA AND ORS. ... **RESPONDENTS**

VAKALATNAMA

KNOW ALL to whom these present shall come that I, Sanjay Agrawal, Director of M/s RSA-SK JV Pvt. Ltd. having registered offices at Shree Shyam Tower, Kavita Nagar, Avanti Vihar, Main Road, Raipur, Chhattisgarh, the Respondent No. 10 in the present proceedings do hereby appoint (herein after called the advocate/s) to be my/our Advocate in the above noted case authorizing him:-

ADVOCATES

Mr. Ankur Upadhyay, Advocate (D/1506/18)
Offices at B-9, Lower Ground Floor, Lajpat Nagar-III,
New Delhi-110024,
Mob:- (+91)- 9667823426 / (+91)-8051846447,
Advupadhyay2407@gmail.com

To act, appear and plead in the above-noted case in this Court or in any other Court in which the same may be tried or heard and also in the appellate Court including High Court or the Supreme Court as the case may be, subject to payment of fees separately for each Court by us. To sign, file verify and present pleadings, appeals' cross objections or petitions for execution review, revision, withdrawal, compromise or other petitions or affidavits or other documents as may be deemed necessary or proper for the prosecution of the said case in all its stages.

To file and take back documents to admit and/or deny the documents of opposite party.

To withdraw or compromise the said case or submit to arbitration any differences or disputes that may arise touching or in any manner relating to the said case. To take execution proceedings.

The deposit, draw and receive money, cheques, cash and grant receipts thereof and to do all other acts and things which may be necessary to be done for the progress and in the course of the prosecution of the said case.

And I/We undertake that I/we or my /*our* duly authorized agent would appear in the Court on all hearings and will inform the Advocates for appearance when the 'case is called.

And I/*we* undersigned do hereby agree not to hold the advocate or his substitute responsible for' the result of the said case. The adjournment costs whenever ordered by the Court shall be of the Advocate which he shall receive and retain himself.

And I/we the undersigned do hereby agree that in the event of the whole or part of the fee agreed by me/us to be paid to the Advocate remaining unpaid he shall be entitled to

withdraw from the prosecution of the said case until the same is paid up. The fee settled is only for the above case and above Court. We hereby agree that once the fee is paid. I/we will not be entitled for the refund of the same in any case whatsoever. If the case lasts for more than one year, the advocate shall be entitled for additional fee equivalent to half of the agreed fee for every addition three years or part thereof.

IN WITNESS WHEREOF I/We do hereunto set my/our hand to these presents the contents of which have been understood by me/us on this 17th day of July, 2024.

Accepted subject to the terms of the fees.

ADVOCATES

CLIENT

RSA - SK - JAIPUR

959

Gmail

Ankur Upadhyay <advupadhyay2407@gmail.com>

OA 109/2023/EZ- Satrughan Meher vs State of Odisha & Ors

1 message

Ankur Upadhyay <advupadhyay2407@gmail.com> Thu, Jul 18, 2024 at 4:37 PM
To: Sankar Pani <sankarprasadpani@gmail.com>, Dipanjan Ghosh <dpnjnghsh0@gmail.com>, apurba ghosh <apu7law@gmail.com>, rashmibothra24@gmail.com

Dear Sir(s)/Mesdames

Please treat this as formal service of counter-affidavit on behalf of Respondent No. 9 (i.e. M/s RSA Infra Projects Private Limited) and RSA-SK JV.

Thanking you

Yours Sincerely

Ankur Upadhyay
Partner
Themis Partners
Advocates & Solicitors
(+91)-9667823426

Counter affidavit RSA Infra.pdf

Counter affidavit RSASKJV.pdf

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