TENDER FORM

Tender No. No.S-2/BWP/MUT/TP/2015

Due on: 18.05.2015

Welding of 60 Kg 90 UTS new/SH rails in 260 M Rail panels in FBWP/MUT with firm's own mobile Flash Butt Welding Plant having Sound Proof (Noise less) Generator for Power supply. Welding includes end cleaning, grinding and finishing, drilling 32mm holes including chamfering in panel ends, pre/post straightening of rails, transporting loose rails(13 M/26 M ) to welding site (maximum lead not exceeding 500 M), and any other incidental work required to achieve the welding as per FBW Manual 2012 as amended up to date.

TENDER FORM COST Rs. 10,000/- (Ten Thousand only)

Total Tender document Pages – 1 to 21 = 21 Nos.
NORTHERN RAILWAY

Tender Notice No. S-2/BWP/MUT/TP/2015

Dated: 13.04.2015

Chief Track Engineer, Northern Railway, New Delhi on behalf of President of India invites Sealed "OPEN TENDER" in Prescribed Form from bonafide firms/contractors/companies for the following work:

Description of work: Welding of 60 Kg 90 UTS rails in 260 M Rail panels in FBWP/MUT with firm's own Mobile Flash Butt Welding Plant having Sound Proof (Noise less) Generator for Power supply. Welding includes end cleaning, grinding and finishing, drilling 32mm holes including chamfering in panel ends, pre/post straightening of rails, transporting loose rails(13 M/ 26M) to welding site (maximum lead not exceeding 500 M), and any other incidental work required to achieve the welding as per FBW Manual 2012 as amended up to date.

Due on 18.05.2015

Place of work Northern Railway’s Flash Butt Welding Plant, Meerut Cantt (U.P.)

Approx Cost of work Rs 822,936 Lacs (Rs. Eight Twenty Two lac & Nine thirty Six thousand only)

Date of completion 2 years from the date of issue of LOA

Date of availability of tender documents On any working day from 10.00 hrs to 17.00 hrs From 15.04.2015 to 17.05.2015

Last date & time of submission of tender 18.05.2015 at 14.30 hrs on available box at Room No.414 (4th Floor) Annex-I, Baroda House, New Delhi.

Date of opening of Tender 18.05.2015 at 15.00 hrs at Room No.414 (4th Floor) Annex-I, Baroda House, New Delhi.

Earnest money Rs.5,61468 lacs (Rs. Five lac, sixty one thousand, four hundred sixty eight only)

Cost of tender documents Rs.10,000 (Ten Thousand only)

Cost of Postage charges Rs.500/- (Five Hundred only)

Contact information of person, who is responsible for the Tender

<table>
<thead>
<tr>
<th>Name</th>
<th>Ashish Srivastva /Dy. Chief Engineer/TP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telephone No.</td>
<td>9717630230</td>
</tr>
<tr>
<td>Address</td>
<td>Room No 440 Engineering Branch, N.Rly./Hqts. Office/Baroda House/ New Delhi</td>
</tr>
</tbody>
</table>
NORTHERN RAILWAY


| Name of work | Welding of 60 Kg 90 UTS new/SH rails in 260 M Rail panels in FBWP/MUT with firm’s own Mobile Flash Butt Welding Plant having Sound Proof (Noise less) Generator for Power supply. Welding includes end cleaning, grinding and finishing, drilling 32mm holes including chamfering in panel ends, pre/post straightening of rails, transporting loose rails(13 M/26 M) to welding site (maximum lead not exceeding 500 M), and any other incidental work required to achieve the welding as per FBW Manual 2012 as amended up to date. |
| Approx. Cost of work | Rs. 822.936 Lacs (Rs. Eight Twenty Two lac & Nine thirty Six thousand only) |
| Date of completion | 2 years from the date of issue of LOA |

<table>
<thead>
<tr>
<th>SN</th>
<th>Description of work</th>
<th>Qty.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Welding of 60 Kg 90 UTS new/SH rails in 260 M Rail panels in FBWP/MUT with firm’s own Mobile Flash Butt Welding Plant having Sound Proof (Noise less) Generator for Power supply. Welding includes end cleaning, grinding and finishing, drilling 32mm holes including chamfering in panel ends, pre/post straightening of rails, transporting loose rails(13 M/26 M) to welding site (maximum lead not exceeding 500 M), and any other incidental work required to achieve the welding as per FBW Manual 2012 as amended up to date.</td>
<td>40,800</td>
<td>Joints</td>
</tr>
</tbody>
</table>

Complete detail of the tender can be seen at Northern railway Website [http://www.nr.indianrailways.gov.in](http://www.nr.indianrailways.gov.in) and can also be seen/purchased at a cost of Rs. 10000/- in the office of Chief Track engineer/Northern railway/Baroda House/New Delhi, Room No. 440 (Annexe-I) between 11.00 hrs. to 17.00 hrs.

(Ashish Srivastva)
Dy. CE/TP
1. **TERMS AND CONDITIONS:**

A (i) **FOR WELDING OF RAILS WITH MOBILE FLASH BUTT WELDING PLANT:**

1. Firm should provide adequate mobile Welding Plants in working order for the entire period of the contract and should be able to replace with new/working mobile plant within 15 days in case of major failure of any working plant.
2. Railway will provide suitable working space within the plant premises for working and storing the materials in godown.
3. The contractor has to work from 6.00 AM to 6.00 PM generally. He may be permitted up to 11.00 PM, if not objected to, by any court / local authority, but the contractor will not claim for this extended time in case of curtailment.
4. The Contractor will give the computer print of welds done with mobile plant (showing weld parameters) for each day’s work, so that only those rail panels, having good welds parameters, can be loaded & dispatched. Contractor will bring all machines & tools at his own cost & no any way form will be supplied / arranged by Railway on this account.
5. **Progress of works:** Rails shall be made available for welding by the Railway. Progress of work should be approximately 1700 or more good welds per month and 5100 or more good welds per quarter. A penalty of Rs. 500 per Weld would be imposed, if the progress is less than 5100 welds in a Quarter.
6. A. Though all the efforts will be made to ensure the supply of free rails for welding purpose, no claim due to stoppage of work for reasons such as non-availability of rails or any other reason will be entertained. No compensation will be paid to the contractor for stoppage of work on these accounts.
7. **Inspection:** Each day’s work done will be inspected on same day/next day by Rly. Supervisor/Engineer and approval there of conveyed in writing immediately after the inspection to the contractor.
8. Immediately after welding of 260 M rail panel, the panel will be lifted by the contractor with BWP/MUT Hoist/T&P so that working of the Stationary welding plant/Rail panel DMT loading does not suffer.

8. The contractor shall pay the cost of Man, Machinery, Electricity & Material & all type of tests required for welding of joints as per prescribed frequency of testing given in Manual for ‘Flash Butt Welding of rails’ issued by RDSO/LKO. The cost of each test is given as under:-

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transverse Test</td>
<td>Rs. 6000.00 per test</td>
</tr>
<tr>
<td>Macro Test</td>
<td>Rs. 2500.00 per test</td>
</tr>
<tr>
<td>Hard Test</td>
<td>Rs. 500.00 per test</td>
</tr>
</tbody>
</table>

A (ii) **GENERAL:**

1. The tenderer is advised to inspect the Plant site before tendering and quoting the rates.
2. Generally, the contractor is required to work from 6.00 AM to 06.00 PM and the contractor will be allowed to work from 6.00 AM to 11.00 PM on working days to complete the work within DOC. The contractor will have no claim for the extra time permitted to him for continuing welding.
3. The contractor will have no claim for wastage of his labour due to electricity failure or of any machine failure.

4. The Railway will provide ordinary lighting for day to day work as available in the plant. Any Lighting as required by the contractor over and above the General lighting as available in the plant will be at his own cost.

5. The Contractor will arrange proper identity cards to his labourers and will submit the copy of same to SSE/BWP/MUT. For this work a register will be maintained by the contractor showing details of each worker including his photo & permanent residential address. This is necessary for entry to Flash Butt Welding Plant, Meerut Cantt.

6. The type of Head to be used & Q A P for that particular head is to be submitted by agency at the time of tendering in accordance with para No. 5.6 of FBW Manual 2012 as amended up to date.

7. No post tender correspondence for submission of additional documents shall be entertained after opening of the Technical & Commercial offers. Even suo-moto post tender letters of the tenders shall be treated as NULL & Void.

B. QUALIFYING REQUIREMENTS OF TENDERERS:

1.1 The tenderer shall provide satisfactory documentary evidence to show that:

(a) Tenderer has adequate technical knowledge and practical experience.

(b) Tenderer would provide Mobile Flash Butt Welding Plants & machinery at site having adequate capacity to complete the work within the minimum time prescribed.

(c) Tenderer has established quality control system and organization to ensure that there is adequate control at all stages of the service process.

1.2 Eligibility Criteria:-

1.2.1 (a) As a proof of technical experience/competency, the tenderer should have physically completed at least one similar single work of minimum value of 35% of advertised tender value, inclusive of the all cost in last three financial years (i.e. current year and three consecutive previous years) upto the date of opening of tender.

1.2.1(b) As a proof of sufficient financial capacity and organizational resources, the contractor should have submitted details of the total payments received against the satisfactory execution of completed/on going of all types of work (Not confined to only similar works) during the last three financial years and in the current financial year (upto the date of opening of tender), of a value not less than 150% of the advertised cost of the work including all costs.

1.2.2. The similar nature of work is defined as under:-

"Welding of Rails with Mobile Flash Butt Welding Plant".

When the work has been physically completed and final bill to be passed, the value of the work judging the eligibility criteria will be considered as under:-
1.2.2(i) Cases where measurement have not been recorded and final measurement with negative variation, the value of the work will be taken as amount paid including statutory deduction.
1.2.2(ii) Cases where measurement have been recorded and the work has been completed with positive variation but variation has not been sanctioned the value of the work will be taken as original contractual value.

1.2.3 For purpose of Para 1.1, the tenderers should additionally submit:
   a) A performance statement giving a list of similar work done(Flash Butt Welding of 60 Kg/52 Kg or higher section of rails with mobile flash butt welding plant) in the last three years giving the details of the clients name, address, order number, date, the quantity executed and whether the work was completed within the time schedule.
   b) A statement indicating the details of equipment deployed and quality control measures adopted.
   c) In addition to the above, further information regarding capacity/capability, if required by the Railway shall be promptly furnished by the tenderer.
   d) The tenderer, who shall not submit the requisite information and not confirm to the performance standard specified, shall be liable to rejection.
   e) The documents to be submitted by tenderers: the documents required under the tender condition for submission along with the tender are listed below. The tenderers are advised to examine the various conditions of tender documents and submit necessary documents accordingly.
      i) The tender document; in original, duly filed in, stamped, dated and signed on each page.
      ii) Deviation sheet, if any.
         a. Details of sources of mobile welding plant and other machinery.
         b. Details of inspection and testing proposed to be carried out.
      v) List of equipments including facilities for testing.
      vi) Tenderers previous experience certificates in terms of clause B-1.1
      vii) Financial status as certified by banker.
      viii) Performance statement in terms of clause B-1.1.
      ix) List of competent personnel having expertise in requisite area.
      x) Partnership deed/incorporation certificate & memorandum of Article of Association.
      xi) Any other document which tenderers feel fit.

NOTE: The total value of similar nature of work completed during the qualifying period and not the payment received within qualifying period, shall be considered.

C) **Validity of offer:** Offer should be remain 180 days from the date of opening of the tender.

**PRE-REQUISITES FOR THE TENDERERS**

Being a work of highly technical in nature, tenderer must have adequate past experience of such repair, maintenance and commissioning of Flash Butt Welding Plants or similar kind of machines and ancillary units and also experience in flash butt welding of rails, will be preferred.
3. Earnest money of Rs. 5.61468 lacs (Rs. Five lac, sixty one thousand, four hundred and sixty eight only) in the form of FDR, in the name of FA&CAO, Northern Railway, New Delhi, should be submitted along with the tender. Tender without earnest money shall be rejected.

4. The tenderers should note that Railway reserves its right to either accept or reject any bid without assigning any reason, whatsoever, and tenders shall have no claim on this account.

5. The Tenderers can visit Flash Butt Welding Plant at Meerut Cantt, to see the site at their own cost.

6. Prospective tenderers may contact Dy. Chief Engineer/TP/HQ, XEN/TP, Baroda House, New Delhi for obtaining further clarification, if any.

7. Maintenance of machine and consumables: All charges, towards maintenance of the mobile Flash Butt Welding Plant, grinding machine & other machines etc and their consumable will be to firm's account.

8. Firm will have to start the work within 30 days from the date of signing of the contract.

9. Firm shall complete the work of 40,800 joints within a period of two years from the date of work award of i.e. approximately 20,400 joints per year.

10 Variation In Quantities Of Items Of Contracts: As per para 42 (4) of Part-II of Indian Railway standard General Condition of Contract-July, 2014.

11. Firm may be allowed to put up camping accommodation for staff on the Railway land at Meerut Cantt., Outside the Butt Welding Plant premises if needed, on temporary basis only.

12. Firm will be allowed electricity and water free of charges for its use for the execution of work including use of grinding machines, Hoists, lighting except for running of flash butt welding machine & its Generator. Firms should use only silent generators for operation of their Mobile welding plants.

13. Prices:

   (i) Prices are inclusive of all Central/State Govt. taxes, Service tax, turnover tax, Excise duty, VAT etc. or any statutory levies imposed by Central/State Govt. or any other Authority.

   (ii) No claim for any tax or duty not stipulated in the quotation will be admitted at any stage on any grounds whatever as covered under new imposts.

   (iii) Any statutory or new imposts as a result of revision of any order of the Govt. will be to purchase account during original execution period of contract. This is payable on production of the proof of the same have been paid by firm. However, new impost offer original delivery period shall be to supplier/Contractor's account only unless otherwise sanctioned by competent authority while extend nil execution period.

13.1 INCOME TAX DEDUCTION
Under section 194-C of the Income Tax Act, 1961, deduction of tax and surcharge as applicable shall be made at source from each bill unless otherwise authorized by Income Tax department.

14. PRICE : VARIATION CLAUSE

As per para 46 (A) of Part-II of Indian Railway standard General Condition of Contract-July, 2014.

Note:- The percentage of labour component, material component, fuel component etc. will be taken as “Other Works Contract”.

15. If any welded joint fails within three years of its welding, firm would reimburse an amount of Rs.5,000/(Rs. Five thousand only) per joint. Thus performance Guarantee should be valid for completion period plus 03 (three) years so that amount of reimbursed can be recovered if firm does not reimburse. Instructions to avoid defects in flash butt welded joints, given in Annexure-III, shall be strictly adhered to.

16. Earnest Money:

The tenderer(s) shall be required to deposit earnest money a sum of Rs. 5.61468 lacs (Rs. Five lac, sixty one thousand, four hundred and sixty eight only) with the tender for the due performance with the stipulation to keep the offer open till such date as specified in the tender i.e. 2% for works estimated to cost up to Rs.1 crore and Rs. 2 lac plus ½ % of the excess of the estimated cost of the work beyond 1 crore subject to a maximum of 1 crore. The earnest money shall be rounded to the nearest Rs. 10. This earnest money shall be applicable for all modes of tendering.

Rest of the condition will be applicable as per para 5 of Part-I of Indian Railway standard General Condition of Contract-July, 2014.

17. Security Deposit

The Earnest Money deposited by the Contractor with his tender will be retained by the Railways as part of security for the due and faithful fulfillment of the contract by the contractor. The balance to make up the security deposit, the rates for which are given below, may be deposited by the Contractor in cash or may be recovered by percentage deduction from the Contractor’s Óon accountÓ bills. Provided also that in case of defaulting contractor the Railway may retain any amount due for payment to the Contractor on the pending Óon account billsÓso that the amounts so retained may not exceed 10% of the total value of the contract.

Rest of the condition will be applicable as per para 5 of Part-I of Indian Railway standard General Condition of Contract-July, 2014.

18. Performance Guarantee:

The procedure for obtaining Performance Guarantee is applicable as per para 16 (4) of Part-I of Indian Railway standard General Condition of Contract-July, 2014.
19. **Exemption of Earnest money & Security Deposit:**

Public Sector Undertakings wholly owned by Railways, like RITES, IRCON, Konkan Railway Corporation Limited, CRIS, Rail-Tel Corporation etc. are exempted from deposit of Earnest money & Security Deposit.

20. Unless otherwise specified in the special conditions, If any, the Security deposit/rate of recovery/mode of recovery shall be as under:-

   (a) Security Deposit for each work should be 5% of the contract value.

   (b) The rate of recovery shall be at the rate of 10% of the bill amount till the full security deposit is recovered.

   (c) Security Deposit will be recovered only from the running bills of the contract and no other mode of collecting SD, such as in the form of BG, FD etc. shall be accepted towards Security Deposit.

21. Security Deposit shall be returned to the contractor after physical completion of the work plus 60days as certified by the Competent Authority. The Competent Authority shall normally be the authority who is competent to sign the contract. If this Competent Authority is of the rank lower than JA Grade, then a JA grade Officer (concern with the work) shall issue the certificate. The certificate, inter alia, shall mention that the work has been completed in all respects and that all the contractual obligations have been fulfilled by the contractors and that there is no due from the contractor to Railways against the contract concerned, Before releasing the SD, an unconditional and unequivocal, no claim certificate from the contractor concerned should be obtained.

22. No interest will be payable upon the Earnest money and security Deposit or amounts payable to the Contractor under the Contract.

23. Following shall be applicable to this contract and must be strictly adhered to.

   i) Northern Railway’s General Conditions of Contract, regulations and instructions to the tenderers and standard forms of contract 2014 edition as amended up to date and the special conditions as listed above.

   ii) Precautions to avoid defect in Flash Butt Welding & Quality control & passing of welds is given in Annexure-III.

   iii) Manual for Flash Butt Welding of Rails 2012 as amended up to date.

24. **SUBMISSION OF OFFERS:**

24.1 All offers shall be either typed or written neatly in indelible ink.

24.2 Any individual(s) signing the tender or other documents connected therewith, shall specify whether he is signing.

   i) As sole proprietor of the concern or as attorney of the sole proprietor of the concern or as attorney of the sole proprietor:

   ii) As a partner or partners of the firm.
24.3 As a Director, manager or Secretary in the case of a Limited Company duly authorized by a resolution passed by the Board of Directors or in pursuance of the authority conferred by the memorandum of Association.

25. In the case of Firm not registered under the Indian Partnership Act, all the partners or the attorney duly authorized by all of them shall sign the tender and all other connected documents. The original power of attorney or other documents empowering the individual or individuals to sign should be furnished to the purchaser or verification if required.

26. Onwards import of the Mobile Flash Butt Welding Plant, Custom import duty, Clearance charges, any other statutory levies if any, unloading and loading transportation by Rail, road and unloading at site in India and return of the same after completion of the work, including all incidents related to import of their welding plant and other connected equipment, shall be borne by the Agency (Tenderer).

27. **LAST DATE OF RECEIPT OF THE TENDER**

The offers complete in all respects should reach upto 14.00 hrs on date --------- to The Chief Track Engineer, Northern Railway, New Delhi and should be deposited in; the tender box allotted for the purpose in room NO.414 in the office of the Chief Track Engineer, Northern Railway, Baroda House, New Delhi.

**NOTE:** No extra payment will be made, whatsoever for following above and rates are inclusive of all above stipulation.
ANNEXURE-I

REVISED MODEL FORM OF BANK GUARANTEE BOND

GUARANTEE BOND

1. In consideration of the President of India acting through Dy. Chief Engineer (TP), Northern Railway, HQts. Office, Baroda House, New Delhi (hereafter called "the Government") having agreed to exempt M/s __________________________ (hereafter called "the said Contractor") from the demand, under the terms and conditions of an Agreement, dated ___________ made between ___________________________ and ________________________ for ________________________________ (hereafter called "the said Agreement") of security deposit for the due fulfillment by the said Contractor(s) of the terms and conditions contained in the said Agreement, on production of a bank Guarantee for Rs. ______________ (Rupees __________________ only)

We ____________________________ (indicate the name of the bank) hereinafter referred to as "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 or conditions contained in the said Agreement.

2. We, (Indicate the name of the bank) ______________ do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from the Government stating that the amount claimed is due by way of loss or damage caused to or suffered by the Government 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 suit or proceeding pending before any Court of Tribunal relating there to 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 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 the bank) further, agree with the Government shall have the fullest liberty without our consent and without effecting 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 by 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)/Suppliers(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 in writing.

Dated the ________________day of ________________20____

For__________________________________________ (indicate the name of the bank)
FORMS

ANNEXURE-II

FORM NO.E-5
Appendix-VIII

Electronic Clearing Service (Credit Clearing)
Model mandate Form

(Investor/customer’s option to received payments through Credit Clearing mechanism)

Name of the scheme and the periodicity of payment

1) Investor/customer’s name :

2) Particulars of Bank account :

A Name of the Bank :

B Name of the branch :

Address :

Telephone No. :

C 9-digit code number of the bank and branch:

Appearing on the MICR cheque issued by the bank:

D Type of the account (S.B., Current or Cash Credit)

With code (10/11/13)

E Ledger and Ledger folio number:

F Account number (As appearing on the cheque book)

(In lieu of the bank certificate to be obtained as under, Please attach a blank cancelled cheque or photocopy of a cheque or front page of your savings bank pass book issued by your bank for verification of the above particulars).

3. Date of effect : I hereby declare that the particulars given above are correct and complete. If the transaction is delayed or not effected at all for reasons of incomplete or incorrect information, I would not hold the user institution responsible. I have read the option invitation letter and agree to discharge the responsibility expected of me as a participant under the scheme.

Date: _______________________

Signature of the Investor Customer

Certified that the particulars furnished above are correct as per our records

Bank’s stamp
SPECIAL CONDITIONS ABOUT MOBILE FLASH BUTT WELDING PLANT TO BE OWNED BY FIRM (TENDERER):

1. The welding machine should be capable of handling 13/26 M rails.

2. If required, it should be able to weld, head-hardened rails & upto 110 UTS rails.

3. It should be able to weld 52 kg to 75 kg rails.

4. It should be able to achieve 8 or more welds per hour, with an annual progress of approx. 20400 welds or more, duly certified by the manufacturer of the mobile welding plant.

5. Machine should be able to weld new and old Rails.

6. It should have accurate rail-alignment mechanism.

7. The entire welding process should be computer controlled, to give accurate welds.

8. Provision for displaying computer weld-data for each weld and also a printout, of all the weld parameters.

9. The computer itself should be able to diagnose, the performance of weld good or liable for rejection, as per parameters fed in the computer.

10. Machine should be sturdy enough to work 2/3 shifts per day, over a prolonged period of time and should have a proven performance record to justify this.

11. The firm shall be required to submit full technical details and performance credentials along with the tender.

12. Flash Butt Welding will be governed by the Manual for Flash Butt Welding of Rails (2012 as amended up to date) issued by Research Design and Standard Organization (RDSO), Ministry of Railway, Government of India hereinafter referred to as the manual.

13. Parameters for welding of Rails of Flash Butt Welding machine should be RDSO approved.

14. Contractor should provide sound proof (Noise less) D.G. sets for welding machine.

15. Contractor should provide a temporary shed on working space of welding machine for proper functioning.

16. Contractor should make drilling & chamfering arrangement of 32 mm dia hole at both ends of each rail panel.

17. Rollers etc required for welding of panels & sliding of rails, will have to be arranged by the contractor.
18. All rails to be used for welding shall be examined prior to welding. Rails not meeting with the Rail end geometry as stipulated in clause 3.4 of the FBW manual, shall be straightened as approved by Engineer that shall cause no damages or indentation to the Rails. Any rail which can not be straightened to within the above tolerances shall be cut to a sufficient distance to get the required alignment. All straightening or cutting shall be done prior to welding. The rail shall be cut clean and square by means of rail saws, abrasive disc cutter. Gas torch cutting of Rails is strictly prohibited.

19. Stacking of welded panels to be carried out with the help of Gantries, situated at 6.5 M intervals, to suitable place indicated for stacking/Feeding loose rails for welding.

20. The weld shall be finished to final profile by controlled grinding as approved by the Engineer. The finished weld alignment shall be as per tolerances specified in Para 8 of flash Butt Welding Manual. Rail head profile grinding to make the finished alignment shall not be more than 300mm (Three Hundred) on either side on the weld.
Annexure-IV

Instruction to avoid defects in Flash butt Welded Rail joints:

Following precautions shall be taken to avoid various defects in the welded joints:-

1. **Oxide inclusion**: The rail end faces and the adjoining surface of the rail profile to a width of about 25mm shall be cleaned properly by portable grinders or brushing machine or shot blasting to remove loose scale, rust, scabs, dust, paint etc. Oil and grease, if present, shall be removed by carbon tetrachloride or Benzene.

2. **Lack of fusion**: Preheating cycle and time, flashing, and butting stroke as standardized shall be strictly maintained during welding, to avoid this defect.

3. **Poor joints due to defect in rails**: Rails end having cracks and visible rolling defects should be cropped before welding.

4. **Notches and Chisel marks adjacent to the weld joints**: During stripping by chiseling and finishing by grinding, care should be taken that notches, dents or chisel marks, are not formed on the rail surface, as such flaws may act as stress in service results leading to premature failure.

5. **Copper penetration/arcing on rail foot bottom surface**: During butt welding, the two copper blocks (electrodes) below the rails get worn out and develop scratches/dents due to rails movement. Besides this, after the flashing/burning off operations, lot of loose oxides of metal is deposited on the copper blocks. Due to the above reasons, current flow between the rail foot surfaces and the copper blocks is not continuous resulting in arcing and formation of local melting/denting and even copper penetration at the rail foot surface. Such affected area results in premature fracture. Therefore, after each operation, loose oxide/metal shall be cleaned by brushing the copper block surfaces and the copper blocks must be replaced and machine whenever surface depressions exceeding 1.00 mm in depth are formed due to wear. For this purpose adequate spare electrodes should be kept in the plant.

6. There is a residential colony Kankar Khera near BWP/MUT, so there is need for sound proof (Noise less) DG set to avoid noise pollution, also constant efforts should be made to reduce noise in each & every operation.

7. **FINISHING TOLERANCES FOR WELDS** - Welds with new/SH rails:-

The tolerances will be checked as per Annexure iv (Para 8) of *Manual for Flash Butt Welding of Rails* (2012 as amended up to date) issued by Research Design and Standard Organization (RDSO), Ministry of Railway, Government of India hereinafter referred to as the manual.

8. **Transverse Test**: - The finished weld samples, not less than 1.5 metre long with the weld at the center, shall be subjected to transverse load test in a transverse testing machine in the manner as specified in Para 10.2.2 of FBW Manual 2012 as amended up to date.
9. **Macro examination:**- One test joint for every 5000 joints welded is subjected to macro examination of 150 mm length of rail with weld at center, shall be cut and the sample shall be sectioned in vertical longitudinal direction through the weld. One of the sections shall be etched with 5-10% Nitric acid and also subjected to magnaflux test, to ensure freedom from cracks, lack of fusion or oxide inclusion. Extent of heat affected zone, shall be measured for head, foot and web of the rail results shall be maintained in a register as per proforma given in FBW Manual.

10. **Handling of high strength rails (90 UTS and 110 UTS):**-

11.1 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 rail requires special care in handling as per para No. 11.1 of Manual for FBW of rails.

11.2 Causes for failure, either of weld and corrective action taken, before regular welding is continued. Some common causes for failure and the precautions to be taken, are listed in below for guidance. Acceptance test comprises of all the welds being checked by visual inspection, dimensional tolerance and ultrasonic test. Sample welds should be subjected to transverse bending test and detailed metallurgical tests in a laboratory as a quality assurance measure. Results of all the tests shall be maintained in register by the plant in charge, assisted by quality control supervisor. Details and method of conducting the test are as follows:

11. **Tests for every Joint:**-

11.1 **Visual inspection:** - After finish grinding, all welds shall be visually inspected for possible cracks, lack of fusion and other surface defects like notching, damage in heat affected zone etc, welds with visible defects shall be rejected.

11.2 **Dimensional check:** - All welds shall be inspected using standard 1 m and 10 cm straight edges and feelers gauges, for compliance geometrical standards as given in item No.8, welds not meeting these standards, if rectifiable by grinding can be re-ground, failing which they shall be rejected results shall be maintained in a register as per Performa given in Annexure VI A (Para 10.1.2) of Manual for Flash Butt Welding of Rails.Ô(2012 as amended up to date).

11.3 **Ultrasonic test (USFD):**- All welds shall be subjected to ultrasonic testing, for detecting presence of internal defects in the weld. This test can be done by installing on line USFD equipment or as an interim measure manually with portable USFD machine, cross section of the rail i.e. head, web, and foot shall be tested by trained personnel, as per procedure laid down in USFD manual. Welds having defects shall be rejected. Results shall be maintained in a register. Defective joint shall be distinctly marked and panels with defective joints shall be separately stacked. The defective joint shall be cut and removed, before the panel is dispatched from the Flash butt welding plant.

11.4 **Test on sample joint:** - Sample test joints shall be made on piece rails of similar section and conforming to the same specification as the rails being welded. The length of each piece shall not be less than 750mm. Following test shall be carried out on sample test Joint in a
manner and at a frequency as specified in Para 10.2 of Manual for Flash Butt Welding of Rails (2012 as amended up to date). These tests shall also be carried out whenever there is a change in type of rail being welded. In case, a sample joint does not comply quality with the requirements of the test, two more sample joints, will be made and tested. If both the sample joints meet the requirements of the test, welding may be continued. In case of failure of any of the sample joints, RDSO should be consulted for investigation and fixing revised welding parameters.

11.5 **Hardness Test**: Brinnel hardness test shall be conducted on the weld sample before conducting the transverse load test. The hardness value in HAZ, shall not vary from the hardness of the parent rail by more than 20 BHN. Results shall be maintained in a register.

12. Changing weld parameters arbitrarily like changing platen travel, increasing duration and/or number of preheat cycles so as to increase interface temperature to achieve fusion with lower butting pressure (wherever butting capacity of the plant is low) or to retain head in weld for easy upset metal removal when striping is done away from welding machine, shall strictly be prohibited.

13. **Record of welds**: Record of all the joints shall be maintained in a register. The register shall be signed daily by the welder at the end of the shift and shall be verified and countersigned by the supervisor incharge. For those welding plants that are equipped with automatic weld recorder, the chart of the weld recorder shall be analyzed every day with respect to voltage, current, upsetting force and platen travel for each weld. Any parameter not conforming to the standard parameter should be set right. The chart shall also be preserved in addition to the register to facilitate investigations and in case of defective joint failing in service.

14. **Post weld straightening**: A post straightening machine shall be installed at suitable distance from the welding machine for straightening the joint if required to achieve required geometrical tolerances in vertical / lateral alignments.

15. **Finishing**: The top, side and bottom surfaces of the railhead shall be ground smooth, so that the weld surface is absolutely flush with the parent rails surfaces. After grinding, the top table and the sides of the railhead shall comply with the geometrical standards as specified. Grinding shall be done preferably using a profile grinding trolley, in the absence of which manual grinding can be done using a cup grinder, in emergency only. Depending upon whether it is done mechanically or manually, grinding may be done in stages.

16. **Marking of joints**: Every joint shall have a distinctive mark, indicating the welding number, month and year of welding and the code of the plant as shown below. This should preferably be one by punching on an Aluminum strip, which should be fixed to the web of the rail with suitable epoxy adhesive beyond 300 mm from joint. 

XXXXMMYYAAA
The first four digits indicate the weld number, starting from 0001 for first weld of every month, the two digits month of welding followed by last two digits of the year of welding. The letters in the end shall be code of the welding plant.

17. **Testing of Welds:-** It shall be the responsibility of the Plant in charge and the quality control supervisor to decide adequate stage inspections before final acceptance of tests.

18. **Flashing:-** Flashing consists of moving the rail in continuous moving, initially at the fixed speed but during the last few seconds, at an accelerated rate. The flashing speed is so arranged that the rail ends bump off without short circuiting or giving rise to an open circuit condition.

19. **Forging (upsetting):-** Immediately following flashing, the platen movement is accelerated, so that the rail ends are butted together to a stage of fusion under a heavy butting force, whose magnitude depends on the make of the welding plant. The welding current automatically gets cut off during the later part of the forging operation. The joint should be left undisturbed, the clamped position for ten seconds after the welding cycle.

20. The recommended butting pressure for different type of rails shall be as per Para 5.3.4.1 of FBW Manual.

21. **Stripping:-**
   
a) **Automatic striper:-** A striper, which may be integral with welding plant of installed either just adjacent to welding machine or at 13/26 Mts. Distance from it, shall strip the hot upset metal all round the rail section, in such a way that minimum grinding is required to achieve final finished profile at weld.

   b) **Manual removal of upset metal:-** Wherever automatic stripper is not in working order, the manual chipping using pneumatic chisel may be adopted in emergency only. Necessary repairs done & only automatic Stripping should be restored. Recommended width of flat chisel is 50mm for removal of upset metal from junction of head, web and foot of the rail, half found chisel should be used. Care should be taken to ensure, that chipping does not create any notches or under cutting. However, hot upset metal all round the rail shall be stripped.

22. **Post weld heat treatment**: - 90 UTS rail do not require special post weld heat treatment. However, alloy steel rails of 110 UTS and head hardened rails need heat treatment to ensure variation in hardness within acceptable limits in heat affected zone.

23. **Weld Parameters**: - Welding parameters will depend on section metallurgy of rail to be welded and they shall be as per manufacturer's recommendation of as fixed by RDSO.

**QUALITY CONTROL AND PASSING OF WELDS:-**

(A) Railway's supervisor or other staff will check each and every weld produced with assistance of contractor staff after welding is over. The checking will be with respect to vertical and lateral alignment and other specified tolerances. For every joint so checked the railway staff and contractor's representative will jointly sign the register maintained for this purpose.

(B) The Railway's supervisor will ultrasonically test each and every welded joint. The efforts will be made to arrange testing on conveyor line itself. But if the USFD testing is done on
stacks, facilities for USFD testing will be provided by the contractor. The contractor’s representative and Railways supervisor will jointly sign each and every weld so tested.

(C) The quality and payment terms for each weld will be decided based on the vertical and lateral misalignment at the centre of weld with 1.0 Mts. Long straight edge. According to vertical and lateral misalignment at the centre of weld, the quality of weld will be categorized as below:-

<table>
<thead>
<tr>
<th>MISALIGNMENT</th>
<th>CATEGORY OF WELD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lateral</td>
<td>Vertical</td>
</tr>
<tr>
<td>0.00 mm to + 0.30 mm</td>
<td>0.0 mm to + 0.30 mm - 0.00 mm</td>
</tr>
</tbody>
</table>

REJECTED WELD JOINTS:

All the welds which are not found confirming to the alignment criteria as laid down in Para 8 of “Manual for Flash Butt Welding of Rails.” (2012 as amended up to date). Or declared failed after USFD examination or due to process failure, unstripped, or having surface crack will be termed as rejected weld joints. Such rejected joints will not be dispatched and no payment will be made to the contractor for these rejected joints.

The contractor will ensure that all rejected/spoiled joints are cropped and re-welded within two week of identification of such joints at no extra cost. No extra payment will be made to the contractor for cropping of rejected/spoiled joints, shifting of rejected panels, and re-welding of rejected/spoiled joints. In case the contractor fails to cut/crop defective welds and re-weld the defective panels within 2 weeks of identification of rejected/spoiled joints, the payment may be deducted by Railways @ Rs10/- per day per joint for any delay beyond 2 weeks of identification. If contractor further fails to cut/crop defective joints and re-weld such spoiled joint within further 2 weeks, then recovery @ Rs1000/- or more as decided by Railway per rejected joint may be made from the contractor’s bill. Cutting and re welding of defective joints up to 0.1% is permissible and beyond that a penalty of Rs. 2000/- per defective joint in addition to cutting and re-welding may be imposed. This will be computed on every monthly basis.

In case the percentage of defective welds exceeds 5%, the Railway Administration will reserve the right to terminate/suspend the contract and all the damages/losses caused to the Railway on this account will be realized from the contractor.

(D) The Railway shall not be responsible for absorption of the labour/staff employed by the contractor either during continuance of the contract/termination of the contract, completion/expiry of the contract. For which the contractor should submit undertaking of the declaration at the time of their engagement. The declaration so received will be submitted to the Railway before start of work.
(E) SANITATION
Sanitation, cleanliness and ensuring hygienic condition within plant premises including administrative buildings shall be the responsibility of the contractor and he will ensure as per full satisfaction of the Railway Engineer in charge. He will be required to deploy two numbers of sweepers for this purpose.

(F) SECURITY
Security of the complete machines, plants, equipment, accessories, outdoor electrical installations including lighting works etc. will be the responsibility of the contractor and for this purpose he will be required to deploy minimum three watchmen during night. Over and above Railway will make security arrangements as deemed necessary.

NOTE:- All the tests on welds will be done by Railways with Railways Plant and machinery

END OF TENDER DOCUMENT