

**SPECIFICATIONS & DETAILED SCOPE OF WORK**  
**FOR NALCO'S RAIL TRANSPORT SYSTEM AT S&P COMPLEX, ANGUL**

**1.0 INTRODUCTION:**

- 1.1 National Aluminium Company Limited (NALCO) has a comprehensive Rail Network for transporting raw-materials and finished goods from its plants viz. namely Mines & Refinery Complex at Damanjodi and Smelter and Captive Power Plants at Angul.
- 1.2 The network of Smelter and Captive Power Plant takes off from Budhapank Exchange yard between Talcher and Meramandali stations on the Talcher-Barang section of East Coast Railways. To ensure take off of trains from/ into exchange yard, Budhapank station has been converted into crossing station from the old flag station. The exchange yard and network beyond the Budhapank station as well as other facilities are all owned by NALCO.
- 1.3 The Captive Railway System is to transport coal from M/s MCL, Bharatpur block of Talcher coalfield to Captive Power Plant. The complete Captive Rail System (CRS) from the coalfield to Captive Power Plant, along with its related facilities of two stations of CRS is owned by NALCO.

**2.0 SCOPE OF WORK:**

The general scope of work under this tender is broadly as follows:

- 2.1 Traffic operation and management of Coal transportation at Captive Rail System as specified in detailed scope of work.
- 2.2 Traffic Operation and management of material movement at S&P Complex as specified in detailed scope of work.
- 2.3 Maintenance and management of Tracks & Permanent way for S&P complex for in plant rail network at both CPP & Smelter etc. as specified in detailed scope of work.
- 2.4 Operation & maintenance and management of Inter-communication system and signaling system at S&P complex as in detailed scope of work.

Detail scope of work shall be as per the details mentioned in different groups in the Tender document.

**A. TRAFFIC OPERATION**

**A.1. CRS OPERATION (for Coal movement) (Covered in Part-I of BOQ)**

**1. INTRODUCTION:**

1.1 Nalco is having it's own merry-go-round system to transport coal from M/s Mahanadi Coalfields Ltd (MCL) through out the year on round the clock basis as per the annual requirement plan. Transportation of coal is done by coal rakes on round the clock basis.

1.2 Annual coal transportation target will be intimated to the contractor at the beginning of every financial year and the contractor is to operate coal rakes to transport the required quantity of coal.

**2.0 DETAIL SCOPE OF WORK:**

2.1 The entire operation, its maintenance and management of Captive Rail System (CRS) is under the scope of work in the contract. CRS operation will be carried out round the clock on all the days utilising the coal rakes available to achieve the target.

2.2 The contractor has to bring the requisite quantity of coal from MCL to CPP yard as per requirement / instruction of Engineer-in-charge. If the contractor fails to execute the coal rake movement for a day or more due to any fault / reason attributed to the contractor, the money will be deducted on pro-rata basis from the subsequent RA Bill of the contractor for the days the rake movement not executed.

2.3 Safety of the system and operation and restoration of normalcy within stipulated time fixed by Engineer-in-charge in case of derailment / accidents.

2.4 The rakes operation shall be as per instruction of Engineer-in-charge. Operation of each locomotive will always be with one driver and one assistant.

2.5 One wagon fitter shall also accompany each coal rake and attend any enroute problem in loco or wagon. He will ensure proper closing of coal discharging door after unloading, hot axles etc. if any. He will also open the lock for operation of door mechanism opening and closing by the unloading contractor at CHP and again put back the lock in position. The keys will be retained by the wagon fitter. To attend the enroute problems contractor shall keep and maintain a toolbox with requisite hand tools in every rake. The defects in loco or wagons, which cannot be attended enroute, must be communicated to CRS control room immediately.

2.6 If the coal wagon doors open during loading at Silo or in running rake, the contractor shall attend immediately to clean the coal and rail track and arrange to transport the reclaimed coal from site to CPP coal yard at his own cost. A committee formed by the Dy. General Manager in-charge of the department will find out the cause of door opening and other damages and to fix responsibility. Any loss including the cost of coal and damages if found attributable to the contractor as per committee report shall be recovered from contractor's subsequent RA Bill.

- 2.7 Manning the CRS, Smelter and Budhapank control rooms round the clock in shifts with one controller/ SM and one attendant with minimum qualification of Class 10<sup>th</sup> pass. They should be conversant with operation of the telephones, VHF sets and should be sole custodian of the equipments available such as telephones, VHF sets, Battery charger etc.
- 2.8 Manning the railway stations and all level crossings round the clock as per the railway norms and they should operate the signalling and interlocking with manual handles. They would safeguard the equipment available in these stations / all level crossings and penal action will be imposed if found missing.
- 2.9 The operation and safeguard of manned / unmanned level crossings is in the scope of work. The contractor shall operate gates/level crossings by deploying suitable manpower. Contractor will be liable to penal action in case of accident in level crossings except in case of gate crashing. For level crossings not provided with gates adequate precaution is to be taken by the contractor.
- 2.10 All implements for operation such as set of flags, danger lights, token pouch, whistles, lights, torches, tail lamps for last vehicle etc. as per railway norms shall be supplied and maintained by the contractor at his cost.
- 2.11 Operating personnel of the contractor should not be above the age of 62 years and their suitability has to be assessed by a committee consisting of Engineer-in-charge / Medical Officer (NALCO)/ HOD. If not found suitable, they should be immediately replaced.
- 2.12 If situation arises to transport the coal through railway the contractor is to liaison and co-ordinate with the Railway to carry out the job as per instruction of Engineer-in-charge. Non-cooperation in this regard will call for penal action against the contractor and will be done by the executive authority.
- 2.13 The operating contractor will handover/takeover the rolling stocks at CRS/Smelter siding for its maintenance and will receive it from the maintenance contractor after the maintenance is done as per guidance of Engineer-in-charge and shift it to respective site without any delay to attach in rakes. If any delay is accounted for the negligence of the operating contractor, he will be liable to penal action as per the decision of the Engineer-in-Charge.
- 3.0 TOOLS & PLANT:**
- 3.1 Contractor shall operate the diesel motor trolleys on railway track as when required as per instruction of Engineer-in-charge for inspection / patrolling etc.
- 3.2 Contractor must ensure the healthiness of trolleys at any point of time for operation. Required routine and statutory maintenance/periodic overhauling / other repair works and the repairs in case of breakdowns will be done by the contractor free of cost. The maintenance checklists are to be submitted to Engineer-in-charge duly filled in after

the work. All the above work must be carried out as per the decision of Engineer- in – charge.

- 3.3 The Re-railing equipment set along with it’s accessories will be under custody of the contractor through out the contract period. The safety of the equipment and it’s maintenance / repair will be contractor’s responsibility and it will be done free of cost as and when required to make the equipment available all the time. The spare parts including its repair kits required for Re-railing equipment set will be provided by Nalco free of cost for the cost of spare parts above Rs.500/- under requisition by contractor. Hydraulic oil will be supplied by Nalco free of cost. But the lubricants, diesel/petrol (fuel) etc. for the power pack will be supplied by the contractor free of cost.
- 3.4 At present there are two nos. of power packs available for the re-railing set in which 10 HP Greaves engine as the main prime mover. The contractor is to maintain / repair/ periodically overhaul the engine free of cost and ensure the healthiness of power pack all the time.
- 3.5 The contractor is to operate and maintain log books / log sheets, records for the areas of concern and the same shall be produced before Engineer – in – charge as and when required.
- 3.6 Fuelling of locomotives and diesel trolley as and when required is contractor’s responsibility. The diesel and lubricants (for locos only) as required will be issued by Nalco free of cost under requisition by the contractor. But the lubricants for the diesel trolley will be supplied by the contractor free of cost.
- 3.7 The contractor to ensure submission of reconciliation statements of all Free issue items issued to them on monthly basis along with the RA Bill.
- 3.8 The efficiency of Plant productivity is dependant upon the movement of traffic both inward & outward. The contractor is expected to carry out the jobs specified in the scope efficiently without any intervention to achieve the same. The contractor is liable for penalty if they fail to discharge their duty at any point of time. The decision of Engineer-in-Charge will be final & binding in this regard.
- 3.9 Penalty on any such ground will be charged on the contractor pro-rata basis.
- 3.10 Adequate technical executive heads must be engaged exclusively for monitoring day-to-day maintenance works as per the decision of Manager-in-charge.
- 3.11 Responsible executive(s)/ head must be provided with mobile/cell phone for prompt and better communication as and when required.

**TRAFFIC REQUIREMENT AT CPP**

	In lakh MT				
Material	1 st year	2 nd year	3 rd year	4 th year	5 th year
Coal	50.00	50.00	50.00	50.00	50.00

**A.2. SMELTER TRAFFIC (Covered in Part-II of BOQ)**

**1.0 INTRODUCTION:**

1.1 National Aluminium Company Limited ( NALCO ) has a comprehensive Rail network for transporting raw materials and finished goods to and from its plants at Damanjodi, Vishakhapatnam and Angul.

**2.0 TRAFFIC LOAD & INFRASTRUCTURE AVAILABLE:**

- 2.1 The present capacity of Aluminium Smelter is 3.45 lakh tones per annum.
- 2.2 The enclosed table indicates tentative movement requirements [Traffic load. However the Traffic load may vary to any extent.
- 2.3 The contractor will arrange manpower for the locos in operations as and when required.
- 2.4 Non-availability of manpower for any loco may affect the normal operations. Hence the contractor should ensure availability of the same. In case of non-availability occurs, an amount equivalent to the wages/salaries of the concerned persons will be deducted based on their pay structure for the absenteeism.
- 2.5 Above category wise manpower is minimum for operation requirement. However the contractor may work out if any additional persons are required for efficient working.

**3.0 SCOPE OF WORK & JOB SPECIFICATION:**

3.1 The board scope of work includes but not limited to operation, supervision, including marshalling and placement of rakes/wagons at loading/unloading points at Budhapank Exchange Yard, NALCO's Smelter plant etc. for effective movement of all materials [both inward and outward] as per NALCO's Traffic Deptt. requirement, round the clock as per direction of the Manager/Engineer-In-Charge, Traffic Department with necessary follow up with Budhapank Railway Station/Divisional Head Quarters at Khurda.

**3.2.1 OPERATION OF BTAP WAGONS:**

- [a] The contractor shall interface with the Railways in all matters relating to running of BTAP wagons including detachment enroute for any reason whatsoever and to ensure that the wagons so detached enroute are dispatched by Railways expeditiously to either of the three destinations namely Angul or Damanjodi as the case may be.
- [b] Loaded Alumina wagons shall be required to move from Damanjodi to Angul as and when necessary for facilitating transport of Alumina in time.
- [c] The contractor shall maintain books and records and submit reports/returns as required by Railways and NALCO in existing format for these.

**3.2.2 OPERATION OF BUDHAPANK SIDING:**

- (a) Taking over and handing over of wagons after joint examination with Railways at exchange yard.

- (b) Reporting of any loss by damage, theft, fraud etc. not attributable to the contractor to concerned Engineer-In-Charge of NALCO.
- (c) Assisting in lodging claims on Railway pertaining to loss of parts of NALCO owned during the transit on Railway network, as and when necessary and pursuing the claims on behalf of NALCO.
- (d) Repairing or making good the loss attributable to the contractor on the wagons while in operation in Budhapank sidings of NALCO.
- (e) Maintenance of books and records jointly with Railways, regarding arrival/departure of rakes to/from Exchange Yard.
- (f) Assisting NALCO to lodge claims with Railways for loss, theft, pilferage and non-receipts of the consignment in part or in whole.
- (g) Assist open/assessment delivery of materials from Railways whenever specifically requested by NALCO. Necessary transportation cost shall be borne by NALCO.
- (h) Operation, marshalling and placement of wagons at loading/unloading points and at weighbridge.
- (i) Safety of the system and operation and also the restoration of normalcy within reasonable time in case of derailment/accidents.
- (j) Ensuring that the contractor's responsibilities in operations are fulfilled within the free time apportioned to him.
- (k) Fulfillment of commercial formalities with the Railways like deposit of wagon registration fee/placement of indents, release of materials against Rail Road Transports, and follow up with Railways regarding invoicing, rating, routing, compliance of restrictions [both civil and Railways authorities].
- (l) Giving at least two hours warning about arrival of every rake to prepare themselves for loading/unloading etc. The Officer –in-Charge of ALCO shall be notified in due course.

### **3.2.3 SIDING OPERATION:**

- [a] The time allowed for drawing wagons/rakes from Exchange Yard, placement for withdrawing wagons and subsequent transfer to Exchange Yard will be as per agreed schedule to be mutually agreed.
- [b] If the contractor exceeds the allowed time limit, without having any specific reasons for rake movement he will be responsible for any abnormal delay, if the same is attributable to contractor and does not come in force majeure and

demurrage charges of Rs.50/- per wagon per hour will be charged to the contractor.

**4.0 SIMULTANEOUS OPERATION:**

Contractor may note that at any given point of time there may be more than one rake of Alumina or empty rakes & coal. The contractor has to organize his operation in such a way that all rakes are handled in the prescribed time limits.

**5.0 CO-ORDINATION WITH NALCO WEIGHBRIDGE:**

The Shift In-Charge of the Contractor will interact with the I/C of NALCO in motion weighbridge at the beginning of the shift to finalise the movement plant and at the end of the shift to apprise him the progress.

**6.0 JOB SPECIFICATION/STANDARDS/ QUALITY OF WORK:**

The entire operation scope of work of Rail system at Angul Smelter should be executed as per relevant Railway guidelines, standards & safe working practices.

**7.0 INTERACTION WITH MAINTENANCE WING :**

The operation I/C [Traffic] of the contractor should have close interaction with the track maintenance & loco /wagons maintenance wings of the contractor to ensure optimum availability/utilization of the Rail system infrastructure.

**TRAFFIC REQUIREMENT AT SMELTER SIDING**

in MT/ KL

S.No	Material	1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>rd</sup> year	4 <sup>th</sup> year	5 <sup>th</sup> year
<b>A.</b>	<b>Inward Traffic</b>					
1.	Alumina	6,60,000	6,60,000	6,60,000	6,60,000	6,60,000
2.	Fuel oil / LSHS / LDO	1,00,000	1,00,000	1,00,000	1,00,000	1,00,000
3.	C.P.Coke	1,50,000	1,50,000	1,50,000	1,50,000	1,50,000
4.	Others like Cryolite, Aluminium Floride, Soda, Ash, Cement, Steel etc.	25,000	25,000	25,000	25,000	25,000
	<b>Total</b>	<b>9,35,000</b>	<b>9,35,000</b>	<b>9,35,000</b>	<b>9,35,000</b>	<b>9,35,000</b>
<b>B.</b>	<b>Outward Traffic</b>					
1.	Aluminium Metal	1,65,000	1,65,000	1,65,000	1,65,000	1,65,000
	<b>Grand Total</b>	<b>11,00,000</b>	<b>11,00,000</b>	<b>11,00,000</b>	<b>11,00,000</b>	<b>11,00,000</b>

**B. O&M TELECOMMUNICATION/ SIGNALLING SYSTEM (Covered in Part - III of BOQ)**

**1.0 SCOPE OF WORK:**

- 1.1 The party has to do telecommunication and maintenance job inclusive of magneto telephone, VHF & signaling system and inter locking system for CPP, Smelter & Budhapank of S&P sector.
- 1.2 The magneto telephone having one pair of G.I. conductor for 500 mtrs. of length from CRS control room to CPP cabin on overhead line including two nos. magneto telephone sets & its accessories.
- 1.3 The contractor should arrange periodic check up and maintenance of the three batteries kept for VHF sets at Budhapank Railway station and one battery at CRS control room at CPP and one battery at Bharatpur Cabin. In case of loss/theft or any eventuality the cost of the equipment will be recovered from the contractor.
- 1.4 The contractor has to maintain two signaling and inter locking system at CPP cabin (complete) and at Bharatpur cabin (inter locking).
- 1.5 The daily report should be filled up and submitted to the Engineer-In-Charge for the preceding day for signature with complete entry in log book, history sheet etc. as per the schedule given with the W.O.
- 1.6 The contractor should provide the tools and tackles for the work like electrical insulated pliers, screw driver, soldering iron, multimeter, spanner, ladder, hacksaw, measuring tape, tester, torch light etc. as required on the work spot. Any special tools and tackles and instruments required from NALCO, if available will be supplied on free of cost on returnable basis.
- 1.7 The materials required for the contract like VHF set, battery, pulley, G.I.wire, channel, signal post, signal glass, signal lantern, signal ladder signal arms, top roller, bottom roller, inter lock rod, stand and other spares will be supplied by NALCO.
- 1.8 But if the above spare is not available with NALCO the contractor will supply the spares for not hampering the work on chargeable basis. The materials supplied by the contractor will complete all formalities like gate entry, store entry, inspection of concerned engineer, cost reasonability etc.

The transportation of NALCO materials is in the contractor's scope for carrying the materials from the stocking spot to work spot and vice versa.

- 1.9 The contractor has to make his own arrangement for consumables like flux, solder, cleaning agent, grease, kerosene oil, insulating tape, marking cloth, fuse, paints, thinner, nut & bolts, torch shell, 'U' links, burnt mobile etc. required for the job with battery charging of VHF set.

- 1.10 The contractor has to make his own arrangement for repairing of magneto telephones with supply of consumables and spares as required for the job. Repairing and breakdown attending for signaling and inter locking are in the scope of contractor with supply all consumables required for the job. Replacement/repair of overhead line from CRS control room to CPP cabin is in the scope of contractor. Attending day to day breakdown in the telecommunication system is in the scope of contractor including battery replacement.
- 1.11 The contractor will maintain the system effectively as per the schedule enclosed with the contract.
- 1.12 The breakdown should be liquidated within five hours of the complaint.
- 1.13 The supervisor cum mechanic should have five years of experience in the connected job and competent enough for handling the job & the faults for managing the total system. He is responsible for total management and maintenance of work. The semiskilled workers should have three years of connected experience for handling the required works for the contract. The unskilled workmen should have knowledge for identifying the tools, tackles, spares etc. The telephone mechanic should be well experiences to repair the telephones sets and other telecom instruments of the work.
- 1.14 The contractor should supply all safety appliances to his workmen like safety shoe, gum boot, safety helmet etc. as required for the work. The contractor should ensure that all his workmen are using safety appliances while executing work.
- 1.15 The waste materials such as markin cloths, pieces of wire, conductor and tape should be removed from site and stored in the designated place. The party should read the environmental policies of NALCO & general environmental requirements attached to the NIT and execute the work accordingly.

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**C. TRACK MAINTENANCE & ALLIED CIVIL WORKS**

**(Covered in Part-IV & V of BOQ)**

**1.0 SCOPE OF WORK:**

1.1 The scope of work under this group shall comprise of the following:

- (a) Total Permanent way including Sidings/Exchange Yards/ Marshalling Yards/Holding Yards/In plant Network for both Smelter & Captive Power Plant and CRS etc., shall be maintained as per Railway standards for a minimum speed of 60 Km/hr, including labour, T&P, Supervision etc.
- (b) The railway track at Angul complex comprises of EQUATED Track length of approximately 52.5 kms. i.e. about **26.5 kms.** in CPP and **26 kms** in Smelter along with connected permanent way materials.
- (c) All maintenance spares, fitment and track materials except ballast shall be supplied by NALCO at NALCO Store free of cost. Collection and transportation of materials shall be the contractor's responsibility. Any spares costing more than Rs.500/- shall be supplied by NALCO and others shall be to Contractor's account.
- (d) Maintenance of P.Way shall include through packing and running of ballast, carrying out replacement of damaged sleepers, replacing missing fittings, turn outs, points and crossings, cess cutting, etc.
- (e) Grass, bush and tree cutting from and near the track and cleaning etc. The rail way track / yards including the control cabins must be visible from any point of assessment. The Intensive Examination area must be kept cleaned always with a minimum of 10m distances from the track.
- (f) Maintenance of all level crossings and operation of manned/ unmanned level crossings. The contractor shall operate gates by deploying suitable manpower. Contractor will be liable for legal action in case of accident in level crossings except in case of gate crashing.
- (g) Supply and stocking of ballast at mutually agreed locations.
- (h) Maintenance of railway embankments/cuttings and desalting of drains as per specification enclosed.

**2.0 PREAMBLE OF SCHEDULE OF RATES:**

2.1 The network of Smelter & Captive Power Plant takes off from Budhapank Exchange yard between Talcher and Meramundali stations on the Talcher-Barang Section of East cost Railways To ensure take off of trains from/into exchange yard, Budhapank station has been converted into crossing station from the old flag station. The exchange yard and network beyond the Budhapank station as well as other facilities are all owned by NALCO.

2.2 The Captive Railway System is to transport coal from Mahanadi Coal Fields Ltd of Talcher coalfield to Captive Power Plant. The complete Captive Rail System[CRS] from the coalfield to Captive Power Plant, along with its related facilities of CRS are owned by NALCO.

- Note:**
- i) Details of the items in this schedule shall be read in conjunction with the corresponding specifications, drawings, if any and other tender documents.
  - ii) The work shall be carried out as per drawings, specifications, the description of the items in this schedule and/or Manager-In-Charge's instructions. However the decision of Manager-in-charge will be final and binding. Drawings, whenever required will be issued progressively during the execution of the work.
  - iii) Items of work provided in this schedule but not covered in the specification shall be executed strictly as per instruction of the Manager-In-Charge.
  - iv) Unless specifically mentioned otherwise in the contract, the tenderer shall quote rates for the items and shall provide for the complete cost towards power, fuel, tools, tackles, equipment, plant, temporary works, labour, materials, levies, taxes, transport, layout, repairs, rectification, maintenance till handing over, supervision, establishments, services, temporary roads, revenue expenses, contingencies, overheads, profits and all incidental items not specifically mentioned but reasonably implied and necessary to complete the work according to the contract.
  - v) The quantities of the various items mentioned in the schedule are approximate and may vary up to any extent or be deleted altogether. Any increase or decrease in the quantities shall neither form the basis of claims nor form the basis of alterations of the rates quoted and accepted. The quoted rates of each item, shall remain firm subject to the escalation, agreed between both the parties before the award of the contract.
  - vi) The equated length of track in CPP shall be considered as 26.5 ETKM. The same for Smelter shall be considered as 26.00 ETKM.
  - viii) Manager-In-Charge's decision shall be final and binding on the contractor regarding clarification of items in this schedule with respect to other sections of the contract/specification.
  - ix) The specification shall be read in conjunction with the description of items in the schedule. The schedule of items shall have precedence over any contrary statement mentioned anywhere in the document.

**3.0 TECHNICAL SPECIFICATION FOR CIVIL ITEMS:**

Permanent way shall be maintained as per the specifications enclosed herewith to give a comfortable and safe ride. The specification covers maintenance of track, ballast cushion of track. Track fittings, drains, catch water drains, major/minor bridges, culverts, slopes of formation in cutting, embankment, level crossings rectification of rain cuts, cess repair, overhauling of track, removal and cleaning of coal / dust / grease, grass, bush, trees etc. from track with its embankment.

**3.1 BRIEF SPECIFICATION FOR ITEM NO.1:**

**3.1.1 Track:**

Track or permanent way of NALCO consists of 52 Kg rail or BG (1.676 m. gauge length), sleepers, fittings and fastenings, ballast and formations.

**3.1.2 MAINTENANCE OF TRACK:**

Track is to be maintained through manual effort. It must be maintained as per railway standard and to the satisfaction of Manager-In-Charge for comfortable & safe ride of train with a minimum speed of 60 kms/hr. The maintenance includes the following activities.

**3.1.2.1 ADJUSTMENT OF JOINT GAPS:**

The joint gaps should be maintained in following procedure:

The permissible value of gaps in rail joints in 6mm with a tolerance limit of (+) or (-) 2mm. If any deviation from the permissible tolerance is noticed, then it should be adjusted by pulling back the rail in opposite direction.

**3.1.2.2 ALIGNMENT OF THE TRACK:**

The alignment to be straight and free of kinks. The alignment of the track is to be checked by “ Eye judgment” sighting the rail from a distance of about 4 rail lengths or so. Small error in the alignment may be corrected by slewing the track after loosening the cores at ends and drawing out sufficient ballast at the ends of sleepers. Creep if any is to be rectified.

**3.1.2.3 GAUGING:**

Gauge to be kept correct and uniform within following permissible tolerance limit.

Sl.No	Type of track	Tolerance prescribed for Gauge variation [wherever applicable]
A	Straight track	3 mm tight to 6 mm slack
B	On curves with radius of more than 400 metres	3 mm tight to 15 mm slack
C	On curves with radius of less than 400 metres	Up to 20 mm slack

**3.1.2.4 Fitting & Fixtures:**

The key men should inspect the track every day. If any damage/missing of rail/fixtures or any miscreant activity is noticed in the permanent way, the same should be intimated and immediate action for the safety of track is to be taken for

fitting of fixtures. Proper record should be maintained regarding the materials used in track.

**3.1.2.5 Alignment of track:**

The longitudinal and cross-levels should be so adjusted that it will give a safe and comfortable movement to traffic. The alignment is to be straight and free of kinks. The alignment of the track is to be checked by “Eye judgment” sighting the rail from a distance or about four rail lengths or so. Small error in the alignment may be corrected by slewing the track after loosening the cores at the ends and drawing out sufficient ballast at the end of sleepers. Creep, if any, is to be rectified.

**3.1.2.6 Cross-Levels and Super-elevation:**

Proper cross levels of the track in straight portion as well as required super-elevation in curves, are to be maintained for smooth and safe movement of traffic.

**3.1.2.7 Maintenance of point & crossings :**

For proper maintenance of point & crossings, the following points are to be checked and maintained.

- i) Point and crossings should be within 1 in 20 cant.
- ii) The gauge should be uniform, except at a point just ahead of toe of the switch where it will be slightly slack (enough to house the tip of tongue rail)
- iii) The clearance, at the toe, heel of switch, at checkrail and wing rail must be maintained.
- iv) Packing under the sleepers should be checked. It must not be loose/defective especially under the crossing and the switch.
- v) The chairs and fastenings and all other fittings must be checked properly. The chairs loose/missing fittings are to be tightened (as required)/ fitted new immediately.
- vi) Creep anchors must be checked regularly and creep should not be allowed.
- vii) Maintenance of switches: The conditions of stock and tongue rail should be carefully examined. Bend tongue rail should be straightened wherever possible. Badly worn and damaged stock and tongue rails are to be replaced by serviceable ones. Lubrication of the gauge face of the tongue rail should be done to reduce wear on switches. All the bolts on switch should be kept tight except those of the heel of loose type switches, where the first two bolts in switch rail should be finger tight and the other two in the lead rail spanner tight. Cleaning & lubrication of slide chairs are to be done periodically.

viii) Gauge over the turnouts are to be maintained uniformly. Track portions on concrete sleepers shall preferably be maintained by packing the ballast. Rails found defective shall be changed.

**3.1.2.8 Inspection of Curves and its maintenance:**

The curves are to be inspected periodically (once at least in three months) and super elevation is to be corrected, whenever and wherever required.

**3.1.2.9 Picking up slacks:**

Picking of slacks has to be done where the alignment is kinky or top level is uneven to restore the track to normal condition. The lifting up of sleepers should be done as in through packing. Care is to be taken that the packing of adjacent sleepers does not get disturbed.

**3.1.2.10 Maintenance of cleanliness of track:**

For easy visual inspection of all fittings and fixtures, the grass and weed growth in the track for a width up to cess on either side including the gauge width should be removed and unwanted debris if any should be cleaned.

**3.1.2.11 Extra conditions:**

1. One Project Manager track must be engaged exclusively for monitoring of day-to-day track works in addition to PWIs.
2. Chief Project Manager and Project Managers should be provided by mobile cell phones for better communication.
3. Item no. 1 is a composite item and if any activity under the scope of item no.1 is left unattended by the contractor, they will be penalized as under.
  - (a) The specific work will be got executed through some other agency at the risk and cost of the contractor, besides initiating action for failure.
  - (b) Deduction at penal recovery for the unattended activities shall be made from the RA bills.
    - (i) Slack packing - Rs.100.00 per joint
    - (ii) Lubrication of joints/ outer rails of curves - Rs.2000.00 per KM
    - (iii) Regular maintenance of turnouts - Rs.5000.00 Each
    - (iv) Alignment of curves - Rs.10.00/Mtr length of curve
    - (v) Regular maintenance of levels, gauge etc. - Rs20.00/Mtr length
    - (vi) Joint gap adjustment by pulling back - Rs.10.00/Mtr length.

(vii) Proper maintenance of track component/ fixtures - Rs.10.00/Mtr

4. Any other item not specifically mentioned but needs to be attended for safe movement of traffic has to be attended under item no.1 only.

**3.2.0 THROUGH PACKING – ITEM NO. 02:**

Packing will be done once in a year for the entire length of track. Procedure for through packing shall be as per Indian Railways. The following brief specification is for over all guidance. Through packing consists of the following works being done systematically in the order given below:

(i) **OPENING OF TRACK:**

The ballast should be removed from either side of the rail sheets to a depth of 50mm below the bottom of sleeper without disturbing the cores under the sleeper and the width up to an extent 450mm inside the rail sheet to end of sleeper including removal of grass, weeds or any other vegetation from the track.

(ii) **EXAMINATION OF RAILS, SLEEPERS AND FASTENINGS:**

a) The rails should be examined, the under side for corrosion, the ends for cracks, the head for top and side wear, rail joints for cracks for fishing planes, fish bolts, for tightness. If rails on curves wear at an unusually rapid rate, lubrication of the gauge face should be done. Rust and dust must be removed from the corrode rails by using wire brush. Kinks in rails should be removed.

b) Sleepers should be inspected for their condition and soundness, particularly at the rail sheet. All fastenings and fittings should be examined to ensure that they are in good order, appropriately tightened so that they firmly hold the rails. Broken or missed fittings should be replaced immediately.

(iii) **SQUARING OF SLEEPERS:**

Squaring of sleepers should be maintained properly. Under no circumstances sleeper should be hammered. Sleepers that are squared should be re-gauged immediately, the fastenings tightened and sleepers to be repacked.

(iv) **GAUGING:**

Specification same as specified item No.1.

(v) **PACKING OF SLEEPERS:**

Packing to be done thoroughly by manual effort. The sleepers are packed by “scissors packing method”. Four men should be tackle one sleeper simultaneously, two at each rail seat standing diagonally, one in side and one out side the rail. The ballast under the sleeper bed should be properly packed by the men standing back to back and working their beaters diagonally. While carrying out packing, the second rail is brought to the correct cross-levels thereby ensuring a perfect surfacing of the track.

As soon as the packing is completed, site distortions in alignment and top should be checked and corrected. Finally proper dressing and boxing of ballast should be done.

(vi) **CLEANING OF GRASS, WEEDS, PLANTS:**

Grass, weeds, plants etc. from the track and both side cess up to a distance of 10 m. on either side of the outside end of the cess to be removed/up rooted as the direction of M.I.C. However the entire area of CRS, CPP yard and Smelter yard must be free of grass, weeds and plants always for clear visibility of cabins, points and all the rail networks from one end to other.

**3.3.0 SUPPLY & SPREADING OF BALLAST ITEM NO.3 & 4:**

**3.3.1 SUPPLY OF BALLAST:**

The stone ballast shall be hard granite stone, which are durable, resistant to impact and free from adherent coating. Material likely to disintegrate decomposed or chemically reactive shall not be acceptable.

- (a) The stone ballast shall be 50mm gauge & shall pass 90% through 50mm square mess sieve and 100% through 60mm square mess sieve.
- (b) All materials passing through 10mm square mesh shall be classified as dust.
- (c) Stone ballast must confirm to the approved sample and shall not contain more than 10% dust, otherwise, the same shall be rejected.
- (d) Ballast will be stacked along the track at required locations in available space in NALCO's land on a level bed. Measurement will be made in cubic metre.
- (e) 7.5% of the stack measurement shall be deducted for voids to arrive at the quantity for payment.

**3.3.2 SPREADING OF BALLAST:**

Spreading of screened ballast to be done at required locations of the track evenly as and when required. After spreading the ballast is to be packed and dressed including boxing of ballast.

**3.4 SPECIFICATION FOR ITEM NO.5 (Replacement of sleepers):**

All types of damaged sleepers are to be replaced with new ones as per the requirement at different locations of the track, including fitting of all fixtures, proper packing of ballast beneath the sleepers as per the requirement, dressing and boxing etc. In case of missing sleepers, the above procedure shall be carried out for replacement of new ones. The released sleepers, fittings, fixtures are to be returned to NALCO's store.

**3.5 ITEM 8, i.e. "OVERHAULING":**

Overhauling consists of the following operation in sequence:

- (i) The ballast will be opened out full depth in shoulders and between the sleepers to a depth of 50mm to 75 mm below the bottom surface of sleepers. Removed ballast will be screened and put back.
- (ii) Where drains across the track exist, these will also be cleaned and filled with boulders and ballast to prevent packing getting loose and forming slacks.
- (iii) Unusable materials generating out of opening of ballast for full depth shall be disposed off.
- (iv) Replacement of damaged or broken fittings.
- (v) Adjustment of gaps including joint gap survey & adjustment of creep will be done prior to systematic overhauling.
- (vi) Lubrication of rail joints and re-alignment of curves. Cess should be checked and corrected.

**3.6 MAINTENANCE OF LEVEL CROSSINGS ITEM No.9:**

Each level crossing must be opened out and the condition of sleepers and fittings, rails and fastenings is to be inspected. In all cases rails and fastenings in contact with road shall be thoroughly cleaned with wire brush and a coat of coaltar/ anti-corrosive paint is to be applied. After inspection the level crossing is to be refixed including the necessary replacement of damaged/worn out fitting by new one and the flange way clearance, cross level, gauge and alignment is to be checked and corrected as necessary. Then the track is to be packed thoroughly before re-opening the level crossing for the road traffic. All the trees, bushes or undergrowth that interfere or tend to interfere with the view from the railways or roadways when approaching the level crossings shall be cut down.

**3.7 ITEM NO. 13,14,15: (MODIFICATION OF PENDROL CLIPS, M.S. LINERS, WELDING OF FITTINGS & REMOVAL OF WELDED FITTINGS):**

Modification of pendrol clips and M.S. liners are to be done by welding a M.S. flat pieces of size 19mmx10mmx5mm to pendrol clips and holes of required size are to be cut in M.S. liners for locking of pendrol clips. The modified liners are then to be fitted in the track and one side of the liner is to be welded (40mm length) with the flange of rail. Arrangements for diesel generator, welding machine, gas cutter & gas cylinder etc. including transportation of the same to the work spot, anywhere on CRS track with all tools, tackles, fuel and accessories are to be made by the contractor at their own cost.

Besides the above, the specification of Indian Railways for maintenance of siding/exchange yard/marshalling yard, holding yards/ in plant network shall also be applicable to the work in case specific guide lines are neither available in the technical specification given herein nor in the CPWD latest specification.

**3.8 OTHER ITEMS:**

Other items not explained in the above detail specifications shall be executed as per latest CPWD specifications.

**4.0 PERMANENT WORK :**

**4.1 MATERIALS:**

- (i) Track materials, fittings, fastenings, etc. (costing more than Rs500/-) required for the track will be issued at NALCO stores as free issue basis except ballast and stones. The contractor at his own cost shall return the rejected materials to NALCO's store within 3 months and produce the reconciliation statement otherwise the RA bill will not be processed.
- (ii) The contractor must give the materials requirement to Nalco at least 6 months before the actual consumption. In case of non-availability of material in Nalco store, the contractor has to supply the emergent track materials as per advice of Manager-in-charge which will be reimbursed as per actual plus 15% overhead.

4.2 Materials reconciliation statement shall be made which will be account for the total issue, consumption and return of materials. The cost of unaccountable materials shall be recovered from the contractor at book value + 25%.

**5.0 METHOD OF MEASUREMENT:**

A - Track length measurement for item No.1 will be made as follows:

- (i) The unit of measurement for track length shall be kilometers. For this purpose, the track shall be jointly measured. It is to be noted that a measurement of one kilometer on left and right rail of the track untidily will constitute 1 KM of track length. This shall NOT BE considered as 2 Kms.

Further the following co-efficient/ weightage shall be considered in measurement of track length.

- (ii) Weightage of non-running lines like sick siding and concrete paved portions of track hopper, fuel oil unloading area, pits of workshop etc. 0.40 and for marshalling siding and b-way yards 0.70.
- (iii) Weightage of running lines – 1.
  - a) Points and crossing by equating 10 sets of points and crossing to one track Km i.e. 1 set = 100 mtrs.
  - b) For concrete paved portion where maintenance is not required shall be decided by the engineer- in- charge and shall not be paid for.
- (v) In case the track length decreases/increases as per the joint measurement and the method of measurement specified herein, the lump sum rate shall be decreased/increased in a proportionate manner accordingly. Since the expansion of Rail network is underway, the extra rail length being handed over shall be considered on prorated basis for payment in Item No.1.

- (vi) All other measurement unless otherwise specified shall be in accordance with the methods stated in CPWD/IRS specification latest.

In case where the method of measurement is not provided in the said specification or in the technical specification given herein, the method to be adapted to shall be as per similar work/ or as per the instruction of the engineer-in-charge.

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**D. MAINTENANCE OF ROLLING STOCK (Part VI, VII & VIII of BOQ)**

**INTRODUCTION:**

1. Any modification / alteration issued by RDSO/Nalco after the date of submission of tender is to be carried out by the contractor and they shall be paid extra as per actual cost(Labour +Material) + 15% overheads.
2. Labour / resources / testing facility will be provided by the contractor free of cost as and when required by Nalco.
3. It is the responsibility of the contractor for obtaining the fitness certificate for brake power etc. from Railways for BTAP wagons after the maintenance and other connected rakes before plying into the railways.  
It will be done free of cost by the contractor.
4. The contractor shall attend all special repairs / breakdowns / major repairs of BTAP & coal wagons arising from Intensive Examinations till end of the contract as per following condition.
  - (A) All the special repairs / breakdown repairs / major repairs shall be done free of cost by the contractor if any of the POH or ROH has been attended to that particular wagon earlier by the contractor himself.
  - (B) If no POH or ROH has been attended by the contractor himself before to that, it will be treated as extra payment as per actual material cost + labour + 15% overhead. This amount will be recovered from earlier contractor if the repair is done within the defect liability period i.e. 1 year as per G.C.C.
5. Replacement of wheel bearing during special repair, wheel changing, breakdown repair (other than accident / derailment) as and when required for BTAP and coal wagons. These will be done free of cost by the contractor.
6. Servicing / Re-greasing of wheel axle bearings as and when required during special repairs/ breakdown repairs etc. shall be attended by contractor free of cost including the supply of consumables etc.
7. Wheel axle changing in wagons as and when required shall be done by the contractor free of cost.
8. Repairs arising out of accidents / derailments of wagons and locomotives shall be attended by the contractor soon after the occurrences and it will be paid as extra as per actual (material cost + labour cost) + 15% overheads which shall be dealt as extra item in term of G.C.C.
9. There is no extra payment for any type of special repairs / breakdown repairs arise in normal service from the first ROH or POH, (whichever is attended first by the contractor) of BTAP wagons till the end of the contract period.

10. The contractor shall provide the materials or spares (which are under scope of Nalco) to reduce the down time of the equipment in case of non-availability with Nalco on formal advice from engineer-in-charge. Cost of the material + 15% overhead will be reimbursed against submission of bill and documents. This clause will apply for locomotive and workshop equipment maintenance also.
11. Any backlog in schedule maintenance of BTAP or coal wagons from old contract, will be carried out by the contractor with 1st year rate of contract.
12. **Loss, damage or theft to the wagon components:**  
The contractor shall maintain a list of missing wagon components while carrying out I.E. and submit it before Engineer-in-charge duly witnessed and acknowledged by the operating contractor. The missing items must be made good by the Maintenance contractor before handover to run in the circuit. The required items will be supplied either by contractor or Nalco as per their scope of supply.
- 13.0 House keeping must be maintained as per ISO standard. Cleaning of all floor of locos and wagons shed and all other auxiliary buildings and keeping free of unsightly shrubs/debris with minimum 25m around shed, cleaning the drains all around, maintaining the scrap yards and store yards etc is the contractor's responsibility free of cost to Nalco.
- 14.0 **PENALTY:**
- 14.0.1 **Penalty for excessive no of ineffective wagons:**  
The contractor shall ensure timely repair/maintenance to ensure the availability of maximum number of wagons for operation. The number of holding of wagons by the contractor due to any reason attributable to him shall not to be exceeded the following limits pertaining to S&P complex.
- [1] BTAP wagon at CRS = 12 Nos
- [2] BTAP wagon at Smelter = 3 Nos
- [3] Coal wagon = 4 Nos
- Penalty shall be deducted from RA Bill @ 500/- per wagon per day[24 hrs] against excess holding of wagon as per the above limit.
- 14.0.2 Any slip of schedule maintenance of POH, ROH and painting of BTAP wagon and coal wagon as per given programme in the month should be completed one month positively from the date of possession. Otherwise 10% amount of the schedule of rate / price per month per wagon shall be deducted from R.A. bill in every subsequent month. In case of non-availability of wagon spares under Nalco's scope, this clause will not be applicable.

- 14.0.3. The contractor shall maintain all records like maintenance schedule forms, registers, material reconciliation statement, store records and submit reports / returns as per ISO 9002 requirement by NALCO or as required by Railways and other maintenance documents in existing formats. The contractor shall also fulfil the ISO 9001- 2000 and 14001 requirement of NALCO and upkeep the records accordingly.
- 14.0.4. Adequate technical executive heads must be engaged exclusively for monitoring day to day maintenance works.
- 14.0.5 Responsible executive heads must be provided with mobile cell phone for prompt and better communication as and when required.

## **D.1 MAINTENANCE OF LOCOMOTIVES**

### **DETAIL SCOPE OF WORK**

- 1.0.1 All maintenance programmes including schedules from weekly to three yearly schedules (except POH). The activities of schedules is to be carried out as per Railways guidelines, procedures, standards and instructions of Engineer-in-charge and ISO 9001-2000 requirement. The periodicity of POH will be decided by Nalco depending upon the running of locomotives; till that period, contractor has to carry out all the schedules as per programme given by Engineer-in-charge as stated above. The documents for latest revisions/ modifications in schedule activities should be collected from the sources and updated accordingly by the contractor.
- 1.0.2** Attending all types of running repairs enroute promptly during loco operation as soon as he gets the information and making healthy for further operation.
- 1.0.3 Attending all types of breakdown repairs / maintenances free of cost for which the M&P, special tools tackles and materials are either available at CRS or can be provided which are under scope of Nalco or can be arranged by the contractor as per decision of Engineer-in-charge.
- 1.0.4 In case of major breakdown maintenances/repairs of engine block, crank shaft, traction generator, traction motors and chassis etc. for which facilities are not available at CRS, the contractor has to co-ordinate and carry out such repair jobs by arranging the special tools, tackles, M&P and materials required for the job. The contractor shall be paid extra as per actual (labour & materials) plus 15% overhead.
- 1.0.5 The availability of locos at all times will be as under; depending upon the fleet strength.

When the fleet strength is 7

05 under operation  
01 for operational reserve  
01 under schedule -cum- out of coarse repair.

When the fleet strength is 8

06 under operation  
01 for operational reserve  
01 under schedule -cum- out of coarse repair.

- 1.0.6 Duration of schedule maintenances will be as under;
- |                      |             |
|----------------------|-------------|
| (i) Weekly (Trip)    | = ½ day     |
| (ii) Fortnightly     | = ½ day     |
| (iii) Monthly sch.   | = 1 shift   |
| (iv) Quarterly sch.  | = 2 shifts  |
| (v) Half yearly sch. | = 3 shifts  |
| (vi) Yearly sch.     | = 20 shifts |
| (vii) 2 yearly sch.  | = 30 shifts |
| (viii) 3 yearly sch. | = 45 shifts |
- 1.0.7 The contractor has to stick to the above schedule times to ensure the loco availability. Failing which a penalty on pro-rata basis of the schedule of quantity will be charged for the periods exceeding the stipulated period on per shift basis. No amount will be paid for the period the loco is absent for maintenance at Angul sector either for POH or any reason under jurisdiction of Nalco.
- 1.0.8 Duration of the breakdown repair / maintenances will be calculated jointly by the contractor and Nalco depending upon the quantum of the job. Contractor has to stick to the time period; failing which penalty will be charged on pro-rata basis of the schedule of quantity for the period exceeding the above on per shift basis.
- 1.0.9 Establish, maintain and operate a laboratory at CRS to meet the requirement of loco maintenance. The instruments used in laboratory shall be duly calibrated and tested from time to time as per ISO 9001-2000 and 14001 requirements.
- 1.0.10 Record keeping and maintenance of loco schedule forms, loco log books, other maintenance documents, lube oil consumption and balance sheet, fuel oil consumption, spares consumption records, on daily basis as per ISO-requirements and latest railway guide lines. Collection of above documents including its printing is contractor's responsibility.
- 1.0.11 Providing all types of cleaning materials and washing the locomotive once in a month. House keeping on regular basis and keeping the equipments/spares in order must be ensured all the time. The working environment must be maintained.
- 1.0.12 Maintenance and calibration of all the instruments / gauges / measuring equipments either fitted or in case of new installations in locos shall be done by the contractor free of cost as per the requirement.
- 1.0.13 The repairs arise due to accident/derailments shall be made good promptly by the contractor including any alteration/modification in system design and the contractor shall be paid extra as per actual cost incurred (labour & material) plus 15% overheads.
- 1.0.14 (i) Contractor will have to provide all work labours, supervisions, consumables, paints and painting materials, battery electrolyte and chemicals, varnish, epoxy gel coat

red/grey, cleaning / washing materials, non fluffy clean cloth for cleaning electrical equipments, orien-77/CRC lectra clean, electrical-88, safety solvents, hand tools and all maintenance aids, PPEs and instruments etc. free of cost to execute all above jobs in locomotive maintenances.

- (ii) The items / spares / materials like 'O' rings, diaphragms, oil seals, gaskets, rubber/ rubber bonded materials (except rubber rollers) etc and hardware items, fasteners, pipe fittings such as nipples, elbows, Tees, adopters etc , will be supplied by the contractor free of cost as and when required for the maintenance / repair of locomotive. Any spares costing more than Rs500/-shall be supplied by NALCO and others shall be to contractor's account.
- (iii) Contractor must submit the incoming evidences of materials and material stock position every month before processing the RA Bill.

- 1.0.15
- (i) Balance items/spares including repair / maintenance kits for brake valves etc. required for all the maintenances of locos will be provided by Nalco free of cost if found beyond economic repair. But the contractor has to give the specific requirement of spares at least eight month in advance. In exigencies if the contractor is asked to supply the spares, he will be paid 15% extra over and above the cost of the item.
  - (ii) The contractor has to do all the repair/ maintenance jobs of the Electrical / C&I items and electronic cards etc. free of cost and the same shall be provided new by Nalco if found beyond economical repair or as per the decision of Engineer - in – charge.
  - (iii) In case of repair arise in course of maintenance / breakdowns in electrical items like motors, generators, control equipments etc. the contractor has to do it at his own risk and cost.(within the amount of Rs.10,000/-).[ This clause no. 1.0.15 is applicable to W/s equipments and in wagon maintenances also.]
- 1.0.16
- All the lubricants / hydraulic oil / fuel oil required for locomotives shall be provided by Nalco free of cost on requisition by contractor. However used oil / lubricants removed from equipments is to be collected and stored sincerely and it is to be returned to Nalco Central store along with the containers periodically. Collection of drainage oil from oil-water separator is also to be done by the contractor periodically. Lubrication balance sheet is to be submitted monthly by the contractor.
- 1.0.17
- Demineralised water used, as locomotive engine coolant, shall be provided by Nalco free of cost.
- 1.0.17
- Contractor has to submit the materials reconciliation statements in every month before processing the RA bills.

- 1.0.18 On arrival of any additional/ New locomotive in the fleet, the same will be taken over by the contractor and the maintenance of the same as stated above shall be carried out by them. The amount payable due to the same shall be governed as per the rate prevailing in the BOQ.

**D.2. MAINTENANCE OF WORKSHOP EQUIPMENTS:**

**Detail Scope of Work:**

- 2.0.1 A list of major equipments, M&P installed / available at CRS is given in annexure-I and it is not exhaustive. All the above equipments may be utilised by the contractor free of cost to carry out day-to-day maintenance work.

- 2.0.2 (i) The contractor has to do all types of Elect./Mech./C&I repairs/ maintenances such as preventive maintenances, break down repairs/ maintenances, minor maintenances, periodic overhauling etc. including painting whenever necessary to all the workshop equipments and plant & machineries as per schedule planning, Manufacturers guidelines ,procedures or as per instruction of Engineer-in-charge failing which an amount of Rs.500/- per equipment per month shall be deducted after transition period of one month as penalty from contractor's RA Bill. The contractor must ensure the availability of all the equipments all the time.

(ii) Contractor will have to provide all work labours, supervisions, consumables, paint and painting materials, battery electrolyte and chemicals, varnish, epoxy gel coat red/grey, cleaning materials, non fluffy clean cloth for cleaning electrical equipments, Orien-77/CRC Lectra clean, electrical-88, safety solvents, hand tools and all maintenance aids, PPEs and instruments, paints & painting materials and maintenance aids etc.free of cost to execute all above jobs in Workshop equipment maintenances.

(iii) The items / spares / materials like 'O' rings, gaskets, diaphragms, oil seals, hoses, filters, wipers, u/v – cup packing, lip rings, guide rings, scrapper rings, rubber / rubber bonded materials, etc and hardware items, fasteners, pipe fittings such as nipples, elbows, Tees, adopters, pressure gauges and other low valued items etc. required for repair / maintenance of workshop equipments / machineries shall be supplied by the contractor free of cost as and when required. Any spares costing more than Rs500/- shall be supplied by NALCO and others shall be to contractor's account.

(iv) Contractor must submit the incoming evidences of materials and material stock position every month before processing the RA Bill.

- 2.0.3 Other than the above spare parts required for maintenance of workshop equipments will be supplied by Nalco free of cost if found beyond economic repair. But the contractor has to give the requirements eight months in advance from the actual date of consumption. In exigencies if the contractor is asked to supply the spares he will be paid 15% extra over and above the cost of the item.

- 2.0.4 All the lubricants / hydraulic oil required for workshop equipments shall be provided by Nalco free of cost. However used oil / lubricants removed from equipments is to be collected and stored sincerely and it is to be returned to Nalco Central store along with the containers periodically. Collection of drainage oil from oil-water separator is also to be done by the contractor periodically.
- 2.0.5 Contractor has to carry out the tests for all the lifting equipments, tools and tackles, pressure parts as per factory rules, and calibration of control instruments from time to time as per ISO requirement and maintain it.
- 2.0.6 Keeping and maintaining all the maintenance schedule forms, maintenance logbooks and other relevant records as per ISO requirements.
- 2.0.7 In case of erection/commissioning of new equipments, the contractor has to carry out all the activities and contractor shall be paid extra as per actual expenditure (labour & material) plus 15% overheads.

**LIST OF MAJOR EQUIPMENTS AND PLANTS AVAILABLE IN  
CRS WORKSHOP**

Sl.No	Description	Make	Qty.
1.	EOT crane 40/10 Ton capacity	FAFECO, Bombay	01 no.
2.	EOT crane 25/3 Ton capacity	FAFECO, Bombay	01 no.
3.	Wheel turning lathe LW 140 -B	HEIGHENS, Germany	01no.
4.	Wheel flange welding machine	ESAB INDIA, Cal	01 no.
5.	Air Compressor(Stationary),BT-4	Atlas Copco	02 nos.
6.	Air compressor(Stationary)	CPT	01 no.
7.	Centre lathe, LB-17	Chamundi, HMT	01 no.
8.	Centre lathe, NH-26	HMT	01 no.
9.	Shaping machine	COOPER	01 no.
10.	Heavy duty drilling machine	HMT	01 no.
11.	Pedestal grinding machine	AMC	01 no.
12.	Synchronous jack, 30 ton capacity	METCO, Cal	05 nos.
13.	Rectifier electric welding machine	BERCO	01 no.
		Advani Orilikon &	

Sl.No	Description	Make	Qty.
14.	Generator welding machine	Kirloskar	02 nos.
15.	Motorised winch		02 nos.
16.	100T Hydraulic press	PEECO Hydraulic, HWH	01 no.
17.	Jib crane 1 ton capacity		03 nos.
18.	Electric oven	AMUR	01 no.
19.	CI surface plate		01 no.
20.	Lapping machine	Hiffin, USA	01 no.
21.	Woodward Governor Test Stand	Woodward, Japan	01 no.
22.	Fuel injection pump test stand	Alco, USA	01 no.
23.	Nozzle test stand	MICO	01 no.
24.	Distributor valve test stand	ESCORT	01 no.
25.	Distributor valve test stand	S.D. Technical	01 no.
26.	Single car test stand	ESCORT	01 no.
27.	Brake testrig	S.D. Technical	01 no.
28.	Turn Tables		
29.	MFD re-railing equipments with diesel(indigenous) and petrol(Imported) power packs		01 set
30.	Battery charger for loco	AFCOSET	01 no.
31.	Battery charger for diesel trolley		01 no.
32.	Battery charger for telecom battery		02 nos.
33.	Loco valve face grinding machine	SIOUX,USA	01 no.
34.	Battery charger for VHF set		01 no.
35.	Bearing puller for wagon bearings	Santragachhi Engg., HWH	01 no.
36.	Air Screw Compressor	K.G.Khosla	01 no.
37.	Battery Charger for Jumbo Trolley		01 no.

### **D.3. MAINTENANCE OF BTAP WAGON:**

#### **Detail Scope of Work:**

##### **POH of BTAP Wagon**

- 1.0 (a) POH of BTAP wagon on due date or within  $\pm 3$  months of due date as per the schedule programme including wheel flange rebuilding and turning and ultrasonic flaw testing as per railway standard and practice/ RDSO manual G-82,83 & G-95/manufacture's manual / schedule format or as per instruction of engineer-in-charge. The duration of POH activities will be 6 days.
- (b) Reconditioning of rotational spares like wheel axle, distributor valve, slack adjuster, brake cylinder, VTA valve, CBC complete (body, yoke, striker casting, knuckle, draft gear assy etc.), axle bearings, bogie, fluidising system and all other parts etc. as per railway standard and practice / RDSO manual G-82,83 & G-95/manufacture's manual or as per instruction of engineer-in-charge. Wheel flange rebuilding and wheel turning as and when required.

##### **ROH of BTAP Wagon**

- 2.0 (a) ROH of BTAP wagons on due date or within  $\pm 3$  months of due date as per the maintenance programme including reconditioning and fitment of bogie, wheel axle, bearings, brake cylinder, Distributor valve & VTA valve (load sensing device), wheel flange rebuilding and turning etc. as and when required as per Railway standard and practice indicated in maintenance manual / RDSO manual G-82,G-83, G-95 / schedule format or as per instruction of engineer-in-charge. The duration of ROH activities will be 3 days
- 3.0 **Wheel flange rebuilding** of wagons as per Railways Standard as and when required (besides ROH, POH of BTAP wagon, POH & schedule maintenance of coal wagon) for doing the wheel changing ,special repair, breakdown repair, accident repair of coal wagon, BTAP wagon and for outside agency (with loading and unloading from truck/carrier etc.)if required by Nalco.
- 4.0 **Wheel reprofiling(turning)** of wagons as per Railways Standard as and when required (besides ROH, POH of BTAP wagon, POH & schedule maintenance of coal wagon) for doing the wheel changing ,special repair, breakdown repair, accident repair of coal wagon, BTAP wagon and for outside agency (with loading and unloading from truck/carrier etc.)if required by Nalco.
- 5.0 **Intensive Examination (IE)** of BTAP wagons as per the scope of I.E. at Budhapank / Smelter yard and attending repairs arising thereof and reconditioning of rotational spares etc. The repairs arise from I.E. which require lifting of wagon by crane/EOT crane & requires D.V. test stand, brake cylinder test stand, SAB test stand, single car test stand will be done at CRS. Balance works can be done at respective site depending upon the availability of facilities. To transport the ineffective wagons to CRS shed the contractor has to follow the prevailing traffic rules and give memos to the operating contractor for the purposes.

6.0 Attending all the special / breakdown repairs. The repairs arise due to accident/derailment will be dealt as specified elsewhere.

7.0 **Painting of BTAP Wagons:-**Painting of wagons will be done with two coats of epoxy based primer and one coat of polyurethane paint by spray painting after removing the old paint and cleaning the surface thoroughly and scaffolding etc. complete. The under frame chassis shall be painted with two coat of epoxy based primer & one coat of polyurethane paint.. Lettering as per drawing or as per direction of Engineer in charge. Necessary enclosures, spray painting equipments and apparatus, primers, paints & chemicals to be provided by the contractor at his own cost. For paints, one of the following companies will be selected by engineer in charge,

- (1) Berger
- (2) Asian
- (3) Shalimar
- (4) Goodlass Nerolac

Siding, compressed air, power, lighting, water shall be provided by Nalco and contractor has to look after its day to day maintenance including supply of its consumables at his own cost. In case of painting not possible by sand blasting due to rainy weather, compressed air problem the painting will be done after thorough cleaning/ washing as per decision of Engineer-in-charge and decision of Engineer-in-charge will be binding. Payment will be made accordingly. Contractor has to foresee the non-availability dry sand in rainy season and store adequate quantity of dry sand for the rainy season. The duration of painting activities will be 5 days

8.0 The contractor is to carry out all the maintenance works of BTAP wagons as elaborated in above clauses (not exhaustive) at his own risk and cost including labours, work supervision, overheads. Supply of materials, Tools & Plants, all the consumables etc.

9.0 For day to day maintenance work the Contractor shall provide the following items / spares free of cost:

- (i) All the hardware items including split pins, cotters, & steel item spares, rivets, wear plates, liners, fasteners, pins, washers, bushes, pipes & hose fittings, hoses, seals, coupling washers, pr.gauges gaskets, packing,stay plates, all consumables including cleaning and washing materials, wagon lubricants(other than grease), testing materials, welding materials including flux and electrodes. Any spares costing more than Rs 500/- shall be supplied by NALCO and others shall be to contractor's account.
- (ii) The contractor must maintain all the documents and submit the material incoming evidences and materials stock position every month before processing the RA Bill.

- 10.0 Balance all the materials including axle-bearing seals and composite brake blocks shall be supplied by Nalco free of cost for above maintenance/repair activities.
- 11.0 Supply of all existing lifting & packing materials like tressels and sleepers for wagon and loco maintenance will be responsibility of Nalco free of cost. However in case of new fabrication / repair work for above purpose the contractor has to do it at their own risk and cost. Only the raw materials will be provided by Nalco free of cost to the contractor.
- 12.0 All the above scope of works are meant to be executed on day to day basis to the satisfaction of Engineer-in charge. If the contractor fails to discharge his duty he will be liable for penalty as per the decision of Engineer-in-charge.

#### **D.4 COAL WAGON MAINTENANCE**

##### **DETAIL SCOPE OF WORK:**

The contractor has to carry out the followings;

- 1.0 **All the maintenances** of coal wagon including schedule maintenance(POH work is elaborated below) as per specification laid down by the manufacturer/RDSO manual or as per instruction of Engineer-in-charge. The duration of schedule maintenances are as follows;
- Schedule I** - Quarterly - 1 shift  
**Schedule II**- Yearly - 2 shifts
- 2.0 **Intensive Examination** of each wagon in the coal rake once in a day and all repairs arise thereof including breakdown repairs, wheel changing, bearing replacement & bearing regreasing etc. as and when required.
- 3.0 **POH of coal wagon** as per the schedule programme including reconditioning of wheel axle, bogie, bearings, Distributor valve, brake cylinder, CBC items (body, yoke, draft gear assy, knuckle, striker casting etc), DOM cylinder, spool valve, auto drain valve and other DOM spares and testing equipments as per RDSO manual/ manufacturer maintenance manual or as per the instruction of Engineer-in-charge. The duration of POH schedule will be 5days.The POH shall be carried out within  $\pm 3$  months of the due return date or as per the decision of Engineer -in-charge.
- 4.0 **Painting of coal wagon** as per the manufacturer's specification/drawing. Painting will be done with two coats of red oxide primer and two coats of finished enamel paints and two coats of black bituminous paint at under frame and door. Lettering will be as per drawing/specification. Cleaning and removal of old paints etc. will be done manually/ by sand blasting as per decision of Engineer-in-charge. Arrangement of cleaning agents, facilities like scrap folders, brushes etc. and sand blaster with all accessories is the responsibility of the contractor. All paints etc. will be supplied by

the contractor free of cost. Paints of the following approved companies are to be used as per decision of Engineer-in-charge.

- (1) Berger
- (2) Asian
- (3) Shalimar

Nalco will provide electricity, water, compressed air and siding. Duration of painting will be 5 days.

- 5.0 The contractor is to carry out all the maintenance works of Coal wagons as elaborated in above clauses (not exhaustive) at his own risk and cost including labours, work supervision, overheads. Supply of materials, Tools & Plants, all the consumables etc are also in the scope of contractor as specified elsewhere.
- 6.0 For day to day maintenance work the Contractor shall provide the following items / spares free of cost;
  - (i) All the hardware items including split pins, cotters, & steel item spares, rivets, wear plates, liners, fasteners, pins, washers, bushes, pipes & hose fittings, hoses, seals, coupling washers, pressure gauges, gaskets, packings, stay plates, all consumables including cleaning and washing materials, wagon lubricants (other than grease), testing materials, welding materials including flux and electrodes. Any spares costing more than Rs.500/- shall be supplied by NALCO and others shall be to Contractor's account.
  - (ii) The contractor must maintain all the documents and submit the material incoming evidences and materials stock position every month before processing the RA Bill.
- 7.0 Balance materials including axle bearing seals and composite brake blocks shall be supplied by Nalco free of cost for above maintenance/repair activities.
- 8.0 All the above scope of works is meant to be executed on day-to-day basis to the satisfaction of Engineer-in charge. If the contractor fails to discharge his duty he will be liable for penalty as per the decision of Engineer-in-charge.
- 9.0 The contractor should obey and follow the maintenance time schedule strictly as mentioned elsewhere to ensure the maximum availability of wagons for operation. Otherwise the contractor will be liable for penal action as per decision of Engineer-in-charge.

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**Tender for Operation, maintenance &  
Management of Rail Transport System at  
NALCO.**

**TENDER NO. NBC/P&T/ 30/007/ 1723**

**BILL OF QUANTITIES &  
SCHEDULE OF RATES FOR  
S& P COMPLEX**

**CRS OPERATION**

**PART – I (BOQ for ONE year)**

Sl. No	Item Description	Unit	Qty	Rate per month (Rs.)		Total Amount (Rs.)
				IN FIG	IN WORDS	
1.	Traffic Operation, its maintenance and Management in CPP including maintenance of diesel motor trolley as per detail scope of work.	L.S. per month	12 months			
				<b>SUB-TOTAL</b>		
				<b>SERVICE TAX + EDUCATIONAL CESS</b>		
				<b>TOTAL</b>		

**Total for Five years – Rs..... X 5 = Rs..... (I)**

**In words Rupees .....**

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### SMELTER TRAFFIC OPERATION

PART – II (BOQ for ONE year)

Item No.	Description	Unit	Qty	Rate per month (In Rupees)		Total Amount (in Rs)
				In Fig	In Words	
1.	Operation, supervision and liasioning with the railways for all traffic movements including marshalling and placement of rake(s), wagon(s), at loading / unloading points of Budhapank exchange yard / Nalco's in-plant yard for effecting movement of all material (both inward & outward) as per Nalco's traffic requirement stipulated on round the clock basis as per direction of Engineer-in-charge.	L.S. per month	12 months			
						<b>SUB-TOTAL</b>
						<b>SERVICE TAX + EDUCATIONAL CESS</b>
						<b>TOTAL</b>

**Total for Five years – Rs..... X 5 = Rs.....**  
**In words Rupees .....**

**(II)**

TECH SPEC & BOQ FOR S&P

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**MAINTENANCE OF CRS OVERHEAD MAGNETO TELEPHONE SYSTEM, SIGNALLING AND INTERLOCKING SYSTEM AND VHF SYSTEM.**

PART – III (BOQ for ONE year)

Sl. No.	Item Description	Unit	Qty.	Rate (in Rs.)		Amount
				In Fig	In words	
1.	Maintenance of test panel for CPP. This includes checking of fuses & lightening arrestors with their cleaning, replacement & adjustment of required items in the panel including wiring and faulty components.	Weekly	52			
2.	Way station maintenance for CPP: (a) This includes for checking of voltage, circuit component, Wiring, links, fuses etc. with replacement & repairing including cleaning.	Weekly	52			
	(b) This includes opening, cleaning, adjusting, oiling, checking & repairing of magneto telephones.	Weekly	52			

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Sl. No.	Item Description	Unit	Qty.	Rate (in Rs.)		Amount
				In fig	In words	
	(c) This includes taking of cell voltage, specific gravity, & temp. including cleaning, tightening, topping of cells with electrolyte/distilled water & applying petroleum jelly on the terminals of the batteries.	Monthly	12			
3.	Overhead Line Maintenance for CPP:					
	a) This includes checking of O/H line and cables with multimeter [Megger if required] including repairing.	Daily	365			
	b) This includes testing of rings & speech of two nos. magneto telephones with repairing if required.	Daily	365			
	c) Attending the breakdown promptly & sincerely for quick restoration of communication & attending breakdown of two nos. lead acid battery of VHF set of CRS & BTPR cabin	Monthly	12			

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Sl. No.	Item Description	Unit	Qty.	Rate (in Rs.)		Amount
				In fig	In words	
4.	Signaling and Interlocking maintenance of CPP: (a) This includes cleaning, oiling, checking & adjusting with repairing if required for normal operation of signaling & interlocking [two sets].	Weekly	52			
	(b) Attending breakdown promptly & sincerely for quick restoration of two sets of system as per Railway norms including manual handles.	Monthly	12			
	(c) Cleaning, oiling, checking & adjusting with repairing if required for normal operation of manual handles.	Weekly	52			
	(d) Cleaning, checking, filling of kerosene & putting in service of lanterns in the evening.	Daily	365			
	(e) Cleaning applying primers & painting signal posts & connected parts.	Yearly	1			

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Sl. No.	Item Description	Unit	Qty.	Rate (in Rs.)		Amount
				In fig	In words	
5.	Maintenance of battery of VHF set at Budhapank, which includes charging from outside agency [if required], filling of distilled water, checking of cell voltage, specific gravity, applying jelly to the terminals etc.[frequency of maintenance	F/Nightly	24			
<b>SUB-TOTAL</b>						
<b>SERVICE TAX + EDUCATIONAL CESS</b>						
<b>TOTAL</b>						

**Total for Five years – Rs..... X 5 = Rs..... (III)**

**In words Rupees .....**

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**MAINTENANCE OF PWAY & OTHER CIVIL ITEMS (CPP PORTION)**

**PART – IV (BOQ for ONE year)**

Sl. No.	Item Description	Unit	Qty.	Rate (in Rs.)		Amount
				In Fig	In words	
01.	Maintenance of permanent way as mentioned in the technical specification (enclosed herewith) inclusive of lubrication of joints, switches, replacement of missing/ damaged fittings and fastenings all defective components of point and crossings etc. as required (excluding replacement of sleepers) and return of released fittings to Nalco store, with all labour, supervision, T&P etc. complete with transportation of materials/ movement of rolling stocks. Track materials will be supplied / issued on free issue basis from Nalco stores all completed as per the direction of Engineer-in-charge.	LS Per Month	12			
02.	Through packing of track as mentioned in technical specification (enclosed herewith) with all labour, T&P, complete as per the direction of Engineer-in-charge.	KM	25			

TECH SPEC & BOQ FOR S&P

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Sl. No.	Item Description	Unit	Qty.	Rate (in Rs.)		Amount
				In Fig	In words	
03.	Supplying and stacking of graded hard granite stone ballast at jointly identified locations with all lift and lead of along railway track inclusive of all labour, supervision, material, T&P (Void deduction to arrive net quantity for payment shall be as per technical specification all complete as per the direction of Engineer-in-charge	CUM	2400			
04.	Leading ballast from above stacks, putting in to track and thorough packing inclusive of all labour, supervision and Tools & Plant in NALCO Railway siding at Damanjodi including levelling etc. all complete from all leads.	CUM	2400			

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Sl. No.	Item Description	Unit	Qty.	Rate (in Rs.)		Amount
				In Fig	In words	
05.	Replacement of sleepers at jointly identified spots with opening of ballast, removal and refixing of rails with all fittings and fixtures, repacking of ballast etc. complete as per technical specification with all labour, T&P, supervision etc. including return of salvageable material at Nalco stores complete as per the direction of Engineer-in-charge.					
	(A) CST-9 Sleepers	NOS	300			
	(B) Wooden sleepers	NOS	100			
	(C) Steel/ pre-stressed concrete turnout sleepers for 1 in 8.5 turnouts.	SET	3			
	(D) Prestressed concrete sleepers.	NOS	600			
	(E) Bridge timber/ steel channel sleepers on bridges.	NOS	100			

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Sl. No.	Item Description	Unit	Qty.	Rate (in Rs.)		Amount
				In Fig	In words	
06.	Cleaning of masonry drains, catch water drains, culverts by taking out loose-earth, soft debris, broken stone/ brick, sand, silt and other foreign materials up to all depths and dis posing off at designated locations within a lead of 100 meters and at any lift as per instruction of Engineer-in-Charge.	KM	41			
07.	Earth work in rough excavation, banking excavated earth in layers not exceeding 20cm in depth, breaking the clods, watering, compacting and dressing up in embankments for repair of cess, formation, roads, flood banks/ embankments etc. along/ adjacent to CRS track including all labour, tools, tackles etc. complete with all lead with lift as directed by Engineer-in-charge	CUM	1500			
08.	Overhauling of track as per technical specification at jointly identified locations including return of salvageable materials at Nalco stores with all complete as per the direction of Engineer-in-charge	KM	8			

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Sl. No.	Item Description	Unit	Qty.	Rate (in Rs.)		Amount
				In Fig	In words	
09.	Maintenance of level crossing and the approaches including opening of the level crossing with sleepers, fittings, check rails and fastenings, inspecting the same thoroughly and refixing of the same with renewal if required, maintenance of proper flange way clearance, cross level, gauge and alignment etc. and return of all salvageable materials to Nalco stores with all cost complete as per direction of Engineer-in-charge.	NOS	15			
10.	Supplying and stacking of sand at jointly identified locations along railway track with all lead and lift inclusive of all labour, T&P, supervision etc. complete as per specification and direction of Engineer-in-charge	CUM	300			
11.	Leading and spreading of sand from above stacks in track and packing, dressing etc. at jointly identified locations inclusive of all labour supervision and T&P complete as per specification and direction of Engineer-in-charge.	CUM	300			

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Sl. No.	Item Description	Unit	Qty.	Rate (in Rs.)		Amount
				In Fig	In words	
12.	Painting to wood/ steel structures excluding bridge structures with ready mixed paint of approved brand and manufacture in all shade to give an even shade with Black anticorrosive/ synthetic enamel paint inclusive of necessary scaffolding, scrapping, cleaning, taking all safety precautions etc. with all labour, supervision materials, T&P etc. complete as per the specification and direction of Engineer-in-charge.	SQM	200			
13.	Welding of railway track fittings, fixtures and steel members at any location on CRS Track including transportation of contractor's own diesel generator and welding machine to work spot with all tools, tackles, fuel and accessories all complete as per direction of Engineer-in-charge	CM	10000			

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Sl. No.	Item Description	Unit	Qty.	Rate (in Rs.)		Amount
				In Fig	In words	
14.	Removal of the welded fittings wherever required from railway track by gas cutter or by any other approved means including arranging and transporting the cutting tools & gas cylinders to any location on CRS Track by contractor's own arrangements with all tools, tackles, fuel and accessories all complete as per direction of Engineer-in-charge	NOS	10000			
15.	Modification of MS liner for 52kg rail with welding of MS flat piece of 19mm x 10mm x 5mm to pendrol clip, cutting required size holes in MS liners for locking of pendrol clips etc. all cost complete as per the direction of Engineer-in-charge.	NOS	10000			
16 (A)	Earth work in excavation in over areas, foundation, trenches or drains including all labour, tools, tackles etc. complete with dressing of sides/ top and ramming of surfaces, at all lead and lift in all kinds of soil, soft rock along/ adjacent to CRS Track including disposal of surplus excavated soil beyond track area as directed by Engineer-in-charge.	CUM	1200			
16 (B)	Same as per item no. 17.A but for hard rock (Blasting prohibited)	CUM	50			

TECH SPEC & BOQ FOR S&P

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Sl. No.	Item Description	Unit	Qty.	Rate (in Rs.)		Amount
				In Fig	In words	
17.	Surface dressing of the ground including removal of vegetation and inequalities not exceeding 150mm deep and disposal of rubbish within a lead of 200mtrs leads and all lift in all kinds of soil at jointly identified areas with all tools, tackles, labour etc. complete as per the specification and direction of Engineer-in-charge.	100 SQM	15000			
18.	Renewal of worn-out rails with new rail including transportation of materials from Nalco stores up to site, dismantling the worn out rail and fixing the new one with drilling required holes, cutting to required shape and size, fitting with all fixtures, lubricating, complete with all tools, tackles and labour etc. complete and return of dismantled materials at Nalco stores as per the direction of Engineer-in-charge.	RM	390			
19.	Supplying and stacking of murrum at jointly identified locations along/ adjacent to railway track with all lead and lift inclusive of all labour, T&P, supervision etc. complete as per specification and direction of Engineer-in-charge	CUM	200			

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Sl. No.	Item Description	Unit	Qty.	Rate (in Rs.)		Amount
				In Fig	In words	
20.	Leading and spreading of murrum from above stacks in track and packing, dressing etc. at jointly identified locations inclusive of all labour supervision and T&P complete as per specification and direction of Engineer-in-charge	CUM	200			
21.	Painting of sign boards, such as level crossing, W/L, yard layout, chainage with first grade enamel paint over a coat of red oxide and two coats of synthetic enamel paint.	SQM	25			
22.	Cleaning of grass, weeds, bushes etc. including uprooting of trees up to girth 150mm from CRS track/ permanent way and adjacent areas. Disposal of the rubbish to designated places within a lead of 1.0 KM as directed by Engineer -in-charge.	100 SQM	100000			

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Sl. No.	Item Description	Unit	Qty.	Rate (in Rs.)		Amount
				In Fig	In words	
23.	Providing and laying plain cement concrete in foundations, pavement, formations, walls, drains, slabs etc. including tamping, vibrating, compacting, leveling the top surface, curing etc. up to a depth of 3.0M and height of 5.0M from G.L with all labours, tools, tackles etc. excluding the cost of centering and shuttering complete as per specification and direction of Engineer-in-charge.					
	(A) PCC 1:5:10 (1 cement: 5 coarse sand: 10 grade d stone aggregate 40 mm nominal size)	CUM	40			
	(B) PCC 1:3:6 (1 cement: 3 coarse sand: 6 graded stone aggregate 20 mm nominal size)	CUM	30			
	(C) PCC 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm nominal size)	CUM	20			

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Sl. No.	Item Description	Unit	Qty.	Rate (in Rs.)		Amount
				In Fig	In words	
24.	Providing and laying in position RCC 1:1.5:3 (1 cement: 1.5 coarse sand: 3 graded stone aggregate, 20mm nominal size) cast in situ / precast structures including all material, labour, tools, tackles, curing etc. complete excluding the cost of centering, shuttering all complete as per specification and direction of Engineer-in-charge	CUM	10			
25.	Providing and laying brick masonry work with locally available KB brick in cement mortar 1:6 in foundation and super structure all lead and lift for drain walls/ parapet walls etc. including racking out joints, curing, temporary scaffolding etc. with all material, labour, tools, tackles, etc. complete as per specification and direction of Engineer-in-charge	CUM	25			

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Sl. No.	Item Description	Unit	Qty.	Rate (in Rs.)		Amount
				In Fig	In words	
26 (A)	Providing and laying Random rubble masonry with hard granite stone in cement mortar 1:6 (1 cement: 6 coarse sand) including providing recesses, opening perfect line and level in all locations, scaffolding, racking out joints/ flushing of joints, curing etc. at all depth and heights, all labour, T&P etc. complete as per specification and direction of Engineer-in-charge	CUM	100			
26. (B)	Same as item no. 27 (A) but using the available stone / boulders from dismantled works.	CUM	50			
27.	Dismantling of RR masonry work including stacking of serviceable materials and disposal of unserviceable materials at designated areas within a lead of 100mtrs all complete as per specification and direction of Engineer-in-charge	CUM	50			
28.	Plastering with cement sand mortar in 1: 6 proportion, including all material, labour, tools, tackles, watering, curing etc. complete as per specification and direction of Engineer-in-charge					
	(A) 12 mm thick	CUM	100			
	(B) 15 mm thick	CUM	100			

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Sl. No.	Item Description	Unit	Qty.	Rate (in Rs.)		Amount
				In Fig	In words	
29.	Providing and placing in position for steel reinforcement for RCC work including straightening, cutting, bending to required shape, binding with contractors won binding wires with proper cover blocks, supports, chairs, spacers etc. at all depth and heights including transportation, loading and unloading etc. all complete as per specification and direction of Engineer-in-charge	MT	3			
30.	Providing and fixing centering and shuttering including strutting, propping etc. and removal of form work for walls, suspended floors, slabs etc. at all depth and heights all complete as per direction of Engineer-in-charge.	CUM	300			
31.	Providing and laying of non pressure NP-2 class RCC pipes with collar joint with stiff mixture of cement mortar in proportion of 1:2 (1 cement: 2 fine sand) with all labour, tools, tackles curing etc. as per direction of Engineer-in-charge.					
	(A) 150 mm dia	RM	20			
	(B) 300 mm dia	RM	60			
	(C) 600 mm dia	RM	15			

TECH SPEC & BOQ FOR S&P

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Sl. No.	Item Description	Unit	Qty.	Rate (in Rs.)		Amount
				In Fig	In words	
32.	Dry stone pitching 22.5cm thick including supply of stone and preparing surface to proper line and level with compaction all complete as per specification and direction of Engineer-in-charge	SQM	400			
33.	Flush pointing on stone works with cement mortar 1:3 (1 cement: 3 fine sand) including all materials, labour, T&P, curing etc. complete as per specification and direction of Engineer-in-charge	SQM	400			
34.	White washing with lime to give an even shade (Three or more coats)	SQM	200			
35.	Finishing wall with water proofing cement paint of approved brand and manufacture and of required shade to give an even shade (Two or more coats)	SQM	200			

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Sl. No.	Item Description	Unit	Qty.	Rate (in Rs.)		Amount
				In Fig	In words	
36.	Painting to all types of steel works on bridges/ girders with two coats of ready mixed paint of approved brand and manufacture inclusive of necessary scaffolding, scrapping, cleaning, taking all safety precautions etc. with all labour, supervision, materials, T&P etc. complete as per the specification and direction of Engineer-in-charge.	SQM	1000			
<b>SUB-TOTAL</b>						
<b>SERVICE TAX + EDU. CESS</b>						
<b>TOTAL</b>						

**Total for Five years – Rs..... X 5 = Rs..... (IV)**

**In words Rupees .....**

**Note:** Required track fittings, fixtures, rails, sleepers, components of turnouts, cement and steel reinforcement etc. will be issued from Nalco stores on free issue basis as per GCC to the contractor.

TECH SPEC & BOQ FOR S&P


	<p style="text-align: center;"><b>Tender for Operation, maintenance &amp; Management of Rail Transport System at NALCO.</b></p> <p style="text-align: center; border: 1px solid black;">TENDER NO. NBC/P&amp;T/ 30/007/ 1723</p>	<p style="text-align: center;"><b>BILL OF QUANTITIES &amp; SCHEDULE OF RATES FOR S&amp; P COMPLEX</b></p>
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**MAINTENANCE OF PWAY & OTHER CIVIL ITEMS (SMELTER PORTION)**


**PART – V (BOQ for ONE year)**

Sl. No.	Description of Items	Unit	Quantity	Rate		Amount
				In Fig	In Words	
01.	Maintenance of permanent way as mentioned in the technical specification (enclosed herewith) inclusive of lubrication of joints, switches, replacement of missing/ damaged fittings and fastenings all defective components of point and crossings etc. as required (excluding replacement of sleepers) and return of released fittings to Nalco store, with all labour, supervision, T&P etc. complete with transportation of materials/ movement of rolling stocks. Track materials will be supplied / issued on free issue basis from Nalco stores all completed as per the direction of Engineer-in-charge.	LS Per Month	12			
02.	Through packing of track as mentioned in technical specification (enclosed herewith) with all labour, T&P, complete as per the direction of Engineer-in-charge.	KM	28			

TECH SPEC & BOQ FOR S&P

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Sl. No.	Description of Items	Unit	Quantity	Rate		Amount
				In Fig	In Words	
03.	Supplying and stacking of graded hard granite stone ballast at jointly identified locations with all lift and lead of along railway track inclusive of all labour, supervision, material, T&P (Void deduction to arrive net quantity for payment shall be as per technical specification all complete as per the direction of Engineer-in-charge	CUM	2000			
04.	Leading ballast from above stacks, putting in to track and thorough packing inclusive of all labour, supervision and Tools & Plant in NALCO Railway siding at Damanjodi including levelling etc. all complete from all leads.	CUM	2000			

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Sl. No.	Description of Items	Unit	Quantity	Rate		Amount
				In Fig	In Words	
05.	Replacement of sleepers at jointly identified spots with opening of ballast, removal and refixing of rails with all fittings and fixtures, repacking of ballast etc. complete as per technical specification with all labour, T&P, supervision etc. including return of salvageable material at Nalco stores complete as per the direction of Engineer-in-charge.					
	(A) CST-9 Sleepers	NOS	200			
	(B) Wooden sleepers	NOS	100			
	(C) Steel/ prestressed concrete turnout sleepers For 1 in 8.5 turnouts.	SET	3			
	(D) Prestressed concrete sleepers.	NOS	300			

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Sl. No.	Description of Items	Unit	Quantity	Rate		Amount
				In Fig	In Words	
06.	Cleaning of masonry drains, catch water drains, culverts by taking out loose-earth, soft debris, broken stone/ brick, sand, silt and other foreign materials up to all depths and disposing off at designated locations within a lead of 100 meters and at any lift as per instruction of Engineer-in-Charge	KM	35			
07.	Earth work in rough excavation, banking excavated earth in layers not exceeding 20cm in depth, breaking the clods, watering, compacting and dressing up in embankments for repair of cess, formation, roads, flood banks/ embankments etc. along/ adjacent to CRS track including all labour, tools, tackles etc. complete with all lead with lift as directed by Engineer-in-charge	CUM	1500			
08.	Overhauling of track as per technical specification at jointly identified locations including return of salvageable materials at Nalco stores with all complete as per the direction of Engineer-in-charge	KM	10			

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Sl. No.	Description of Items	Unit	Quantity	Rate		Amount
				In Fig	In Words	
09.	Maintenance of level crossing and the approaches including opening of the level crossing with sleepers, fittings, check rails and fastenings, inspecting the same thoroughly and refixing of the same with renewal if required, maintenance of proper flange way clearance, cross level, gauge and alignment etc. and return of all salvageable materials to Nalco stores with all cost complete as per direction of Engineer-in-charge.	NOS	12			
10.	Supplying and stacking of sand at jointly identified locations along railway track with all lead and lift inclusive of all labour, T&P, supervision etc. complete as per specification and direction of Engineer-in-charge	CUM	300			
11.	Leading and spreading of sand from above stacks in track and packing, dressing etc. at jointly identified locations inclusive of all labour supervision and T&P complete as per specification and direction of Engineer-in-charge.	CUM	300			

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Sl. No.	Description of Items	Unit	Quantity	Rate		Amount
				In Fig	In Words	
12.	Painting to wood/ steel structures excluding bridge structures with ready mixed paint of approved brand and manufacture in all shade to give an even shade with Black anticorrosive/ synthetic enamel paint inclusive of necessary scaffolding, scrapping, cleaning, taking all safety precautions etc. with all labour, supervision materials, T&P etc. complete as per the specification and direction of Engineer-in-charge.	SQM	200			
13.	Welding of railway track fittings, fixtures and steel members at any location on CRS Track including transportation of contractor's own diesel generator and welding machine to work spot with all tools, tackles, fuel and accessories all complete as per direction of Engineer-in-charge	CM	500			

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Sl. No.	Description of Items	Unit	Quantity	Rate		Amount
				In Fig	In Words	
14.	Removal of the welded fittings wherever required from railway track by gas cutter or by any other approved means including arranging and transporting the cutting tools & gas cylinders to any location on CRS Track by contractor's own arrangements with all tools, tackles, fuel and accessories all complete as per direction of Engineer-in-charge	NOS	500			
15.	Modification of MS liner for 52kg rail with welding of MS flat piece of 19mm x 10mm x 5mm to pendrol clip, cutting required size holes in MS liners for locking of pendrol clips etc. all cost complete as per the direction of Engineer-in-charge.	NOS	500			
16. (A)	Earth work in excavation in over areas, foundation, trenches or drains including all labour, tools, tackles etc. complete with dressing of sides/ top and ramming of surfaces, at all lead and lift in all kinds of soil, soft rock along/ adjacent to CRS Track including disposal of surplus excavated soil beyond track area as directed by Engineer-in-charge.	CUM	500			

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Sl. No.	Description of Items	Unit	Quantity	Rate		Amount
				In Fig	In Words	
16. (B)	Same as per item no. 17.A but for hard rock (Blasting prohibited)	CUM	50			
17.	Surface dressing of the ground including removal of vegetation and inequalities not exceeding 150mm deep and disposal of rubbish within a lead of 200mtrs leads and all lift in all kinds of soil at jointly identified areas with all tools, tackles, labour etc. complete as per the specification and direction of Engineer-in-charge.	100 SQM	15000			
18.	Renewal of worn-out rails with new rail including transportation of materials from Nalco stores up to site, dismantling the worn out rail and fixing the new one with drilling required holes, cutting to required shape and size, fitting with all fixtures, lubricating, complete with all tools, tackles and labour etc. complete and return of dismantled materials at Nalco stores as per the direction of Engineer-in-charge.	RM	250			

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Sl. No.	Description of Items	Unit	Quantity	Rate		Amount
				In Fig	In Words	
19.	Supplying and stacking of murrum at jointly identified locations along/ adjacent to railway track with all lead and lift inclusive of all labour, T&P, supervision etc. complete as per specification and direction of Engineer-in-charge	CUM	500			
20.	Leading and spreading of murrum from above stacks in track and packing, dressing etc. at jointly identified locations inclusive of all labour supervision and T&P complete as per specification and direction of Engineer-in-charge	CUM	500			
21.	Painting of sign boards, such as level crossing, W/L, yard layout, chainage with first grade enamel paint over a coat of red oxide and two coats of synthetic enamel paint.	SQM	25			
22.	Cleaning of grass, weeds, bushes etc. including uprooting of trees up to girth 150mm from CRS track / permanent way and adjacent areas. Disposal of the rubbish to designated places within a lead of 1.0KM as directed by Engineer-in-charge.	100 SQM	50000			

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Sl. No.	Description of Items	Unit	Quantity	Rate		Amount
				In Fig	In Words	
23.	Providing and laying plain cement concrete in foundations, pavement, formations, walls, drains, slabs etc. including tamping, vibrating, compacting, leveling the top surface, curing etc. up to a depth of 3.0M and height of 5.0M from G.L with all labours, tools, tackles etc. excluding the cost of centering and shuttering complete as per specification and direction of Engineer-in-charge.					
	(A) PCC 1:5:10 (1 cement: 5 coarse sand: 10 graded stone aggregate 40 mm nominal size)	CUM	10			
	(B) PCC 1:3:6 (1 cement: 3 coarse sand: 6 graded stone aggregate 20 mm nominal size)	CUM	10			
	(C) PCC 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm nominal size)	CUM	10			

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Sl. No.	Description of Items	Unit	Quantity	Rate		Amount
				In Fig	In Words	
24.	Providing and laying in position RCC 1:1.5:3 (1 cement: 1.5 coarse sand: 3 graded stone aggregate, 20mm nominal size) cast in situ / precast structures including all material, labour, tools, tackles, curing etc. complete excluding the cost of centering, shuttering all complete as per specification and direction of Engineer-in-charge	CUM	10			
25.	Providing and laying brick masonry work with locally available KB brick in cement mortar 1:6 in foundation and super structure all lead and lift for drain walls/ parapet walls etc. including racking out joints, curing, temporary scaffolding etc. with all material, labour, tools, tackles, etc. complete as per specification and direction of Engineer-in-charge	CUM	10			

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Sl. No.	Description of Items	Unit	Quantity	Rate		Amount
				In Fig	In Words	
26. (A)	Providing and laying Random rubble masonry with hard granite stone in cement mortar 1:6 (1 cement: 6 coarse sand) including providing recesses, opening perfect line and level in all locations, scaffolding, racking out joints/ flushing of joints, curing etc. at all depth and heights, all labour, T&P etc. complete as per specification and direction of Engineer-in-charge	CUM	25			
26. (B)	Same as item no. 27 a) but using the available stone / boulders from dismantled works.	CUM	10			
27.	Dismantling of RR masonry work including stacking of serviceable materials and disposal of unserviceable materials at designated areas within a lead of 100mtrs all complete as per specification and direction of Engineer-in-charge	CUM	10			

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Sl. No.	Description of Items	Unit	Quantity	Rate		Amount
				In Fig	In Words	
28.	Plastering with cement sand mortar in 1:6 proportion, including all material, labour, tools, tackles, watering, curing etc. complete as per specification and direction of Engineer-in-charge (A) 12 mm thick	CUM	200			
	(B) 15 mm thick	CUM	200			
29.	Providing and placing in position for steel reinforcement for RCC work including straightening, cutting, bending to required shape, binding with contractors own binding wires with proper cover blocks, supports, chairs, spacers etc. at all depth and heights including transportation, loading and unloading etc. all complete as per specification and direction of Engineer-in-charge	MT	1			

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Sl. No.	Description of Items	Unit	Quantity	Rate		Amount
				In Fig	In Words	
30.	Providing and fixing centering and shuttering including strutting, propping etc. and removal of form work for walls, suspended floors, slabs etc. at all depth and heights all complete as per direction of Engineer-in-charge.	CUM	100			
31.	Providing and laying of non pressure NP-2 class RCC pipes with collar joint with stiff mixture of cement mortar in proportion of 1:2 (1 cement: 2 fine sand) with all labour, tools, tackles curing etc. as per direction of Engineer-in-charge.					
	(A) 150 mm dia	RM	10			
	(B) 300 mm dia	RM	10			
	(C) 600 mm dia	RM	5			

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Sl. No.	Description of Items	Unit	Qty	Rate		Amount
				In Fig	In Words	
32.	Dry stone pitching 22.5cm thick including supply of stone and preparing surface to proper line and level with compaction all complete as per specification and direction of Engineer-in-charge	SQM	200			
33.	Flush pointing on stone works with cement mortar 1:3 (1 cement: 3 fine sand) including all materials, labour, T&P, curing etc. complete as per specification and direction of Engineer-in-charge	SQM	300			
34.	White washing with lime to give an even shade (Three or more coats)	SQM	100			
35.	Finishing wall with water proofing cement paint of approved brand and manufacture and of required shade to give an even shade (Two or more coats)	SQM	100			
<b>SUB-TOTAL</b>						
<b>SERVICE TAX + EDUCATIONAL CESS</b>						
<b>TOTAL</b>						

**Total for Five years – Rs..... X 5 = Rs..... (V) In words Rupees .....**

*Note:* Required track fittings, fixtures, rails, sleepers, components of turnouts, cement and steel reinforcement etc. will be issued from Nalco stores on free issue basis as per GCC to the contractor.

TECH SPEC & BOQ FOR S&P

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### LOCOMOTIVE & WORKSHOP EQUIPMENT MAINTENANCE

PART – VI (BOQ for ONE year)

Sl. No	Item Description	Unit	Quantity	Rate in Rs.		Amount in Rs.
				In Fig	In words	
1.0	Maintenance of WDS-6 Locomotives and workshop equipment, plant & machinery etc complete as per scope of work (excluding that are covered in following items)	LS per loco per month	7 x 12 =84			
2.0	Maintenance of Wheel Surface Lathe – 1 no	LS per month	12			
3.0	Maintenance of Flange Welding Machine – 1 no	LS per month	12			
4.0	Maintenance of Overhead Crane –2 nos	LS per crane per month	2 x 12=24			
5.0	Maintenance of Air Compressor - 5 nos	LS per compressor per month	5 x 12=60			
6.0	Maintenance FIP Test Stand – 1 no	LS per month	12			
<b>SUB-TOTAL</b>						
<b>SERVICE TAX + EDU. CESS</b>						
<b>TOTAL</b>						

**Total for Five years – Rs..... X 5 = Rs..... (VI)**

**In words Rupees .....**

TECH SPEC & BOQ FOR S&P


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### BTAP WAGON MAINTENANCE

PART – VII (BOQ for ALL FIVE year)

Sl.No	Description of Item		Quantity						Rate in Rs		Amount In Rs.
			1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>rd</sup> year	4 <sup>th</sup> year	5 <sup>th</sup> year	TOTAL	In fig	In words	
1.	POH of BTAP wagon as per the detail scope of work with supply of spares.	Nos.	70	118	89	30	24	331			
2.	ROH of BTAP wagon as per the detail scope of work with supply of spares.	Nos.	106	78	163	147	141	635			
3.	Wheel Flange Rebuilding of wagon wheel set as per the detail scope of work with supply of spares.	Nos.	50	50	50	50	50	250			
4.	Wheel re-profiling(Turning) of wagon wheel set as per the detail scope of work with supply of spares.	Nos.	150	150	150	150	150	750			

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Sl. No	Description of Item		Quantity					TOTAL	Rate in Rs		Amount In Rs.
			1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>rd</sup> year	4 <sup>th</sup> year	5 <sup>th</sup> year		In fig	In words	
5.	Intensive Examination of BTAP wagon as per the detail scope of work with supply of spares.	Nos.	12000	12000	12000	15000	15000	66000			
6.	Painting of BTAP wagon as per the detail scope of work with all materials.										
	(i) With sand blasting	Nos.	60	98	74	25	19	276			
	(ii) Without sand blasting	Nos	10	20	15	05	05	55			
									<b>SUB-TOTAL</b>		
									<b>SERVICE TAX + EDUCATIONAL CESS</b>		
									<b>TOTAL</b>		

**Total for all Five years      Rs.....      (VII)**

**In words Rupees .....**

TECH SPEC & BOQ FOR S&P


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### COAL WAGON MAINTENANCE

PART – VIII (BOQ for ALL FIVE year

Sl. No.	Description of items	Unit	Quantity						Rate in Rs.		Amount in Rs.
			1st year	2nd year	3rd year	4th year	5th year	TOTAL	In Fig	In words	
1.	Maintenance of coal wagon (excluding POH) as per the scope of work including supply of spares.	NO	538	536	531	515	534	2654			
2.	Intensive Examination of one wagon in coal rake as per scope of work including supply of spares.	NO	540	540	540	540	540	2700			
3.	POH of coal wagon as per the scope of work including supply of spares.	NO	02	04	09	25	06	46			
4.	Painting of Coal wagon as per scope of work. (i) with sand blasting (ii) without sand blasting	NO	02	04	09	25	06	46			
<b>SUB - TOTAL</b>											
<b>SERVICE TAX+EDU. CESS</b>											
<b>TOTAL</b>											

**In words Rupees ..... (VIII)**

	<p style="text-align: center;"><b>Tender for Operation, maintenance &amp; Management of Rail Transport System at NALCO.</b></p> <p style="text-align: center; border: 1px solid black;">TENDER NO. NBC/P&amp;T/ 30/007/ 1723</p>	<p style="text-align: center;"><b>BILL OF QUANTITIES &amp; SCHEDULE OF RATES FOR S&amp; P COMPLEX</b></p>
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### ABSTRACT OF PRICED SCHEDULE

SL NO	DESCRIPTION	AMOUNT IN RS.
01	CPP & CRS OPERATION (I)	
02	SMELTER TRAFFIC OPERATION (II)	
03	MAINTENANCE OF OH MAGNETO PHONES SYSTEM & OTHER SIGNALLING SYSTEM ETC. (III)	
04	MAINTENANCE OF PWAY & OTHER CIVIL ITEMS (CPP PORTION) (IV)	
05	MAINTENANCE OF PWAY & OTHER CIVIL ITEMS (SMELTER PORTION) (V)	
06	LOCOMOTIVES & WORKSHOP MAINTENANCE (VI)	
07	BTAP WAGON MAINTENANCE (VII)	
08	COAL WAGON MAINTENANCE (VIII)	
	<b>TOTAL</b>	

**TOTAL IN WORDS RUPEES .....**

**SIGNATURE OF BIDDER**

TECH SPEC & BOQ FOR S&P