

# RFQ / TENDER

Tender No: BH02/2013



Vendor No: 11001386

BOARD LIST  
BOARD LIST  
TRANSNET FREIGHT RAIL  
PROCUREMENT DEPARTMENT  
2000

Purchaser : Buyisiwe Hlatshway  
Telephone : 011 584 0665  
Fax Number:

Please quote reference:  
DJ2/6000585049

Deliver to:  
TFR Head Office  
Supply Chain Services  
2000 Johannesburg

Closing Date : 29.01.2013  
Validity Date : 30.04.2013  
RFQ No : 6000585049

Currency: ZAR

RFQ/TENDER: BH 02/2013

SUPPLY AND DELIVERY FOR TRACK WELDING EQUIPMENT TO ELANDSFONTEIN DEPOT

TENDERS ARE HEREBY INVITED TO QUOTE AND SUBMIT QUOTATION/S AT INYANDA HOUSE 1, 21 WELLINGTON ROAD, PARKTOWN-JOHANNESBURG, NOT LATER THAN TUESDAY 29 JANUARY 2013 AT 10:00 AM, N.B. TENDER BOX IS OPEN FOR 24 HOURS PER WEEK FOR DELIVERING YOUR QUOTATION/S. NB: PLEASE QUOTE AS PER ATTACHMENT SPECIFICATIONS.

1. RETURN OF QUOTATION/S PLEASE FAX: 011 774 9129 OR 774 9186 OR

E-MAIL TO: thuli.mathebula@transnet.net

1.1 QUOTATION/S MUST BE SUBMITTED PUNCTUALLY AT 10:00 ON THE CLOSING DATE AND LATE QUOTATIONS WILL NOT BE CONSIDERED.

1.2 IF DELIVERED BY HAND:

TRANSNET FREIGHT RAIL, SUPPLY CHAIN SERVICES  
GROUND FLOOR  
INYANDA HOUSE 1  
21 WELLINGTON ROAD  
PARKTOWN  
2193

2. CONDITIONS:

2.2 ANY PURCHASE ORDER PLACED AS A RESULT OF YOUR QUOTATION WILL BE SUBJECT TO THE STANDARD TERMS AND

CONDITIONS OF CONTRACT, FORM US7(LATEST), GENERAL TENDER CONDITIONS, FORM CSS5 (LATEST ) AND CONDITIONS MENTIONED HEREIN.

2.3 TENDERERS MAY OFFER AN EARLIER VALIDITY DATE, BUT THEIR QUOTATION MAY, IN THAT EVENT, BE DISREGARDED

DATE: .....

SIGNATURE OF TENDERER(S): .....

CONTACT PERSON: ..... TEL No: .....

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FOR THIS REASON.

2.4 TENDERERS ARE REQUIRED TO OFFER ONLY FIRM PRICES. PRICES SUBJECT TO REVIEW IN TERMS OF CLAUSE 32 OF FORM US7 WILL ONLY BE CONSIDERED SHOULD THE DELIVERY PERIOD REQUIRED EXCEED 6 MONTHS.

2.5 BEST DELIVERY TIME MUST BE OFFERED.

2.6 DISCOUNT (TRADE DISCOUNT), VALUE ADDED TAX (VAT) MUST BE SHOWN SEPARATELY.

2.7 TRANSNET RESERVES THE RIGHT TO NEGOTIATE PRICES AND COMMERCIAL ASPECTS AFTER THE CLOSING DATE OF THE QUOTATION.

2.8 DIRECT DELIVERY INTIMATES DELIVERY BEING EFFECTED INTO THE WAREHOUSE OR THE ACTUAL POINT OF SUPPLY AND SHOULD THEREFORE INCLUDE ANY TRANSPORTATION MODE DEEMED NECESSARY IN EXECUTING THIS METHOD OF DELIVERY BASIS IN ORDER TO MEET THE REQUIRED DELIVERY DATE. TAX CLEARANCE CERTIFICATES: The Regulations in

terms of the Public Finance Management Act, 1999: Framework for Supply Chain Management as published in Government Gazette No. 25767 dated 5 December 2003, Clause 9 (1) (d), stipulates that the accounting authority of an institution to which these regulations apply must reject any bid from a supplier who fails to provide written proof from the South African Revenue Service that the supplier either has no outstanding tax obligations or has made arrangements to meet outstanding tax obligations.

Tenderers will be disqualified if a valid tax clearance certificate or written proof from the South African Revenue Service that supplier has made arrangements to meet outstanding tax obligations is not submitted with the tender. COMPANY DETAILS:

NAME OF COMPANY: \_\_\_\_\_ CONTACT PERSON: \_\_\_\_\_ TEL. \_\_\_\_\_

No. \_\_\_\_\_ FAX No. \_\_\_\_\_ REG. No. \_\_\_\_\_ BROAD BASE BLACK

ECONOMIC EMPOWERMENT (BBBEE) Transnet fully endorses and supports the Government's Broad-based Black Economic Empowerment Programme and it is strongly of the opinion that all South African Business Enterprises have an equal obligation to redress the past. Transnet will therefore prefer to do business with local business enterprises who share these same values.

Transnet will endeavour to do business enterprises that possess a BBBEE "recognition level" of at least a level 5. Transnet urges Tenderers (large enterprises and QSE's- see below) to have themselves accredited by any one of the various Accreditation Agencies available, who do their BBBEE ratings in accordance with the latest Codes (i.e. those promulgated on 9 February 2007) and whose names appear on the present ABVA (Association of BEE Verification Agencies)-"List of Full Members" as displayed on the ABVA website ([www.abva.co.za](http://www.abva.co.za)) Although no agencies have, as yet, been accredited by SANAS (SA National Accreditation System), Transnet will, in the interim, accept rating certificates of tenderers who have been verified by any of the listed agencies. Enterprises will be rated by such agency based on the Following: 1. Large Enterprises (i.e. annual turnover > R 35 million: "Rating level base on all seven elements of the BBBEE scorecard. 2. Qualifying Small Enterprises-(QSE)(i.e. annual turnover > R5M but < R35m "Rating based on any four elements of the BBBEE scorecard. NB:

3. Emerging Micro Enterprises-(EME) (i.e. annual turnover < R5m) are exempted from being rated/verified: "Automatic rating of Level 4 BBBEE irrespective of race of ownership, i.e. 100% BBBEE recognition

"Black ownership > 50% or Black Women ownership > 30% automatically qualifies as level 3 BBBEE, i.e. 110% BBBEE recognition.

"EME's should provide certified documentary proof of annual turnover (i.e. audited financials) plus proof of Black ownership if Black ownership > 50% or Black Women ownership > 30% from the EME's Auditor/Accounting Officer.

4. In addition to the above, Tenderers who wish to enter into a Joint Venture or subcontract portions of the contract to BBBEE companies, must state in their tenders the percentage of the total contract value that will be allocated to such BBBEE companies should they be successful in being awarded any business. A rating certificate in respect of such BBBEE JV-partners and /or sub-contractor/s, as well as a breakdown of the distribution of the aforementioned percentage must also be furnished

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In view of the high emphasis which Transnet places on Broad-based Black Economic Empowerment, Transnet will allow certain preference points for BBBEE in the evaluation of all responses. Depending upon the value of the ensuing business award (i.e. below or in excess of R2m), the 80/20 or 90/10 point preference systems will be utilized where BBBEE will count out of 20 or 10 respectively in the evaluation process.

EACH RESPONDENT IS REQUIRED TO FURNISH PROOF OF THE ABOVE TO TRANSNET  
FAILURE TO DO SO WILL RESULT IN A SCORE OF ZERO BEING ALLOCATED FOR BBEE  
Turnover: Kindly indicate your company's annual turnover for the past year R \_\_\_\_\_

"If annual turnover < R5m, please attach certified confirmation from your Auditor/Accounting Officer

"If annual turnover > R5m please attach original or certified copy of accreditation certificate and detailed scorecard by an ABVA accreditation agency (registered as a "Full Member")

### PAYMENT TERMS

The following payment terms will apply as from 1 October 2008.

"All suppliers will be paid 30 days from receipt of month end statement.  
i.e. payment term F055

### CONDITIONS:

This quotation is subject to the provisions of the Standard Terms and Conditions of Contract, Form US7, (Latest) and the General Tender Conditions, Form CSS5 (Latest) and any other standard or special conditions mentioned and/or embodied in the quotation request.

### SCHEDULE OF REQUIREMENTS

TENDERERS SHOULD INSERT THEIR PRICE/S UNDER THE APPROPRIATE HEADING HEREUNDER;

IN THIS REGARD THE TENDERER'S ATTENTION IS DIRECTED TO PARAGRAPH 16 OF FORM CSS5 (LATEST).

NB. TENDERERS OFFERING GOODS FROM IMPORTED SUPPLIES MUST SUBMIT THEIR PRICES ON THE DELIVERY BASIS APPEARING UNDER COLUMN (C) OF THIS SCHEDULE OF REQUIREMENTS.

TRANSNET INSISTS ON HONESTY AND INTEGRITY BEYOND REPROACH AT ALL TIMES AND WILL NOT TOLERATE ANY FORM OF IMPROPER INFLUENCING, BRIBERY, CORRUPTION, FRAUD, OR ANY OTHER UNETHICAL CONDUCT ON THE PART OF BIDDERS /TRANSNET EMPLOYEES. IF, IN THE OPION OF TRANSNET,S CHIEF OPERATING OFFICER, A TENDERER/CONTRACTOR/SUPPLIER HAS OR CAUSED TO BE PROMISED, OFFER OR GIVEN TO ANY TRANSNET EMPLOYEE, ANY BRIBE, COMMISSION, GIFT LOAN ADVANTAGE OR OTHER CONSIDERATION,TRANSNET SHALL BE ENTITLED TO REVOKE THE TENDER/CONTRACT BY FOLLOWING ITS INTERNAL POLICIES THAT

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GOVERN THE ECLUSION PROCESS.IN SUCH AN EVENT TRANSNET WILL BE ENTITLED TO PLACE ANY TENDERER/CONTRACTOR/SUPPLIER WHO HAS CONTRAVENED THE PROVISIONS OF TRANSNET'S BUSINESS ETHICS ON ITS LIST OF EXCLUDED TENDERERS.THIS LIST WILL ALSO BE DISTRIBUTED TO ALL OTHER STATE OWNED ENTERPRISES AND GOVERNMENT DEPARTMENTS.

TRANSNET INVITES ITS VALUED SUPPLIERS TO REPORT ANY ALLEGATIONS OF FRAUD, CORRUPTION OR OTHER UNETHICAL ACTIVITIES TO TRANSNET TIP-OFFS ANONYMOUS, AT ANY OF THE FOLLOWING ADDRESSES/ CONTACT NUMBERS:

TOLL-FREE ANONYMOUS HOTLINE-0800 003 056  
EMAIL-transnet@tip-offs.com  
FAX NUMBER-0800 007 788  
FREEPOST DBN 298, UMHLANGA ROCKS, 4320

ADDITIONAL INFORMATION REQUIRED:(WHERE APPLICABLE)  
3.1 THE FOLLOWING ADDITIONAL INFORMATION IS REQUIRED:

- (A) DISCOUNT:-----
- (B) SETTLEMENT DISCOUNT:-----
- (C) PRICE/S FIRM:-----
- (D) PRICE/S FIRM UNTIL:-----THEREAFTER SUBJECT TO REVIEW.
- (E) PRICE/S NOT FIRM:-----
- (F) SABS MARK:-----
- (G) SABS PERMIT NO:-----
- (H) BRAND/MAKE/TYPE:-----
- (I) FULL NAME AND ADDRESS OF MANUFACTURER:-----  
-----  
-----

(J) FULL NAME AND ADDRESS OF INSPECTION POINT:  
-----  
-----  
-----

(K) COUNTRY OF ORIGIN:-----

(L) YEAR 2000 CONTRACT COMPLIANCE:

Vendor/proposers shall indicate their year 2000 compliance with:

- A. Technology Products.
- B. Equipment, products, components or parts
- C. Products and Services

Non-compliance with either (A) or (B) shall result in your bid/proposal being deemed non-responsive. Non-Compliance with (C) may cause you bid/proposal to be deemed non-responsive. If you indicate that none of the following apply, please provide a written justification for your determination. Transnet will review this justification and will make a final determination.

Year 2000 Compliance means that (A) the information Technology,

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(B) Equipment/Products/Components/Parts (Collectively Products) supplied.

(C) Products and Services contracted, will accurately process date and time data from into and between the 20th and 21th centuries. The year 1999 and 2000 and for all leap year. Process date and time includes, but is not limited to, data calculation, logistical functions, program branching, format conversion, edits and validations and the use of dates in comparasons, sorting sequencing, merging, retrieving, searching and indexing. Furthermore year 2000 compliance when (A) used in combination with other information technology, (B) used in combination with other products, (C) used in combination with their(Vendor) other date required interfaces, shall accurately process date and time data (A) if the other technology, (B) If the other products, (C) either passed to or received from their other customers/suppliers, properly exchange date and time data with it/ them.

Comply: \_\_\_\_\_ Does not Comply: \_\_\_\_\_ Not Comply: \_\_\_\_\_

Justification:-----

### (M) SURPLUS MATERIAL:

TENDERERS MUST INDICATE IF THEY WILL BE PREPARED TO PURCHASE BACK FROM TRANSNET ANY SURPLUS MATERIAL WHICH MAY BECOME AVAILABLE FROM ANY RESULTING PURCHASE ORDER/CONTRACT ORIGINATED FROM THE QUOTATION SUBMITTED:

### (N) PAYMENT OVERSEAS:

ONLY IF TRANSNET LIMITED IS REQUESTED BY THE TENDERER TO EFFECT PAYMENT OVERSEAS DIRECT TO THE TENDERER'S PRINCIPAL/SUPPLIER THE FOLLOWING INFORMATION IS REQUIRED:

- \* EXCHANGE RATE ON WHICH THE QUOTATION PRICE IS BASED:R 1.00 SA CURRENCY BEING EQUAL TO----- (FOREING CURRENCY).
- \* PERCENTAGE IN RELATION TO THE QUOTATION PRICE TO BE REMITTED OVERSEAS:

\* NAME OF COUNTRY TO WHICH PAYMENT IS TO BE MADE:

-----

\* APPLICABLE DATE OF EXCHANGE RATE:

-----

\* BENEFICIARY'S NAME AND FULL ADDRESS:

-----

-----

\* BENEFICIARY'S BANKERS AND FULL ADDRESS:

-----

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\* APPLICABLE ACCOUNT NUMBER:  
.....

(O) DELIVERY DATE:

TENDERERS MUST FURNISH THEIR ACTUAL DELIVERY AND MANUFACTURING PERIOD  
HEREUNDER NOTWITHSTANDING THE DELIVERY DATES SPECIFIED BY TRANSNET.

THE FOLLOWING MUST ALSO BE FURNISHED IN REGARD TO THE ABOVE:

1. PERIOD REQUIRED TO OBTAIN RAW MATERIAL.----(DAYS)
2. MANUFACTURING PERIOD.------(DAYS)
3. PERIOD TO TRANSPORT MATERIAL TO DESTINATION.-(DAY)

MATERIAL NO.	1.(PERIOD)	2. (PERIOD)	3. (PERIOD)

Item	Qty	Material	Description
00010	1	Mechanised track welding machine	R..... Each
<b>Delivery Date:</b> 01.02.2013			
<b>FULL DETAILS OF DESCRIPTION</b>			
00020	4	Hydraulic Rail crossing grinder	R..... Each
<b>Delivery Date:</b> 01.02.2013			
<b>FULL DETAILS OF DESCRIPTION</b>			
00030	4	Hydraulic rail profile grinder	R..... Each
<b>Delivery Date:</b> 01.02.2013			
<b>FULL DETAILS OF DESCRIPTION</b>			
00040	4	Hydraulic rail weld shearing machine	R..... Each
<b>Delivery Date:</b> 01.02.2013			

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Item	Qty	Material	Description
------	-----	----------	-------------

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FULL DETAILS OF DESCRIPTION

00050	1		6.5 KVA petrol generator,single phase
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R.....  
Each

Delivery Date: 01.02.2013

FULL DETAILS OF DESCRIPTION

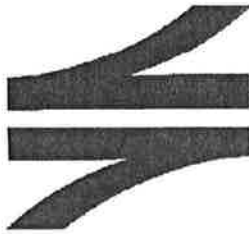
“PREVIEW COPY ONLY”

DATE: .....

SIGNATURE OF TENDERER(S): .....

.....





**SPOORNET**

A DIVISION OF TRANSNET LIMITED  
**PLANNING AND TECHNOLOGY**  
**RAILWAY ENGINEERING**

**SPECIFICATION CONTROL PAGE**

**COMPACT MECHANISED WELDING UNIT FOR  
HARDFACING AND REPAIR OF PROFILES AND  
CROSSINGS**

**Statement of authorisation:**

There is no SABS specification available for similar material / equipment and as far as can be ascertained no other specification / standard suitably covers Spoornet requirements. The specification has been compiled in a manner which shall favour / encourage local manufacture of material / equipment to a maximum degree.

Author: Chief Engineering Technician  
Locomotive Electrical Power  
Supplies

J. Rothman

Approved: Senior Engineer  
Locomotive Electrical Power  
Supplies

L.O.Borchard

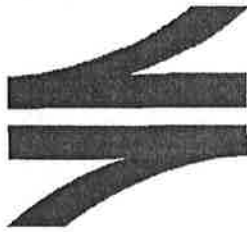
Authorised: Principal Engineer  
Locomotive Electrical Power  
Supplies

W.A Coetzee

Date: 19 October 2000

This page is for control purposes only and shall not be issued with the specification.





**SPOORNET**

A DIVISION OF TRANSNET LIMITED  
**PLANNING AND TECHNOLOGY**  
**RAILWAY ENGINEERING**

**SPECIFICATION**

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**COMPACT MECHANISED WELDING UNIT FOR  
HARDFACING AND REPAIR OF PROFILES AND  
CROSSINGS**

---

**“PREVIEW COPY ONLY”**

Circulation restricted to:

R & TS: Operational Maintenance (Infrastructure)

Planning and Technology: Railway Engineering

: Maintenance

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## 1.0 SCOPE

- 1.1 This specification covers the supply, installation and commissioning of a total automatic programmable welding unit for the mechanisation of the repair and hard facing of railway rail profiles.

## 2.0 BACKGROUND

- 2.1 Because of the many problems encountered with manual track welding e.g. uncomfortable welding positions, pressure of time difficult environmental conditions and difficulty in obtaining consistent welding, a need has arisen for the purchase of a cost effective automatic programmable welding unit. The welding unit will be able to mechanise the repair and hardfacing of rail profiles smoothly and efficiently.
- 2.2 To cope with the demands involved with track welding the system must have the following characteristics: Flexibility and versatile use, programming potential for different rail steels, rapid setting up, ease of programming, ease of operation, low weight and safe to use.
- 2.3 It is expected that less grinding and reduced material loss will result as well as less risk from grinding damage. Large cost savings and easier job planning will also be achieved.

## 3.0 STANDARDS AND PUBLICATIONS

- 3.1 Unless otherwise specified all material used and equipment supplied shall comply with the current edition of the relevant SABS where applicable.
- 3.2 The following publications are referred to in this specification.

### 3.2.1 SOUTH AFRICAN BUREAU OF STANDARDS

SABS 0142                      Wiring of Premises

## 4.0 DEFINITION

- 4.1 In this specification the word "shall" is always used to express a mandatory requirement; the words "should", "may" or "is to be" are used for expression of non-mandatory requirements i.e. preferences.

## 5.0 SERVICE CONDITIONS

- 5.1 Atmospheric service conditions.

The units shall be of a rugged design and rated for continuous specified values under the following conditions.

- |       |                      |   |                                   |
|-------|----------------------|---|-----------------------------------|
| 5.1.1 | Altitude             | - | 0 to 1800 metre above sea level   |
| 5.1.2 | Ambient temperature  | - | 10 degC to + 50 degC              |
| 5.1.3 | Relative humidity    | - | 10% to 90% non-condensing         |
| 5.1.4 | Air pollution        | - | Industrial environment and dust   |
| 5.1.5 | Lightning conditions | - | 12 Flashes/km <sup>2</sup> /annum |

- 5.2 Mechanical service conditions

The equipment will be used throughout Spoornet and will be subjected to extensive transportation over very rough roads, railway lines and service paths.

- 5.2.1 The equipment will be used on the railway line for repairs and often will be used next to adjacent railway lines. The equipment will therefore be subjected to vibration.

## 6.0 TECHNICAL DESCRIPTION OF EQUIPMENT

Although the equipment will be made up of separate individual modules such as the wire feed unit engine-driven welder, automatic programmable equipment and welding gun. For purposes of the specification, the system shall be considered to be one unit and shall be tendered for as such, with the successful tenderer being responsible for the supply installation commissioning and supply of a full back up service.

- 6.1 The system consists of a diesel engine driven welder coupled to a continuous wire feed unit with a maximum wire spool capacity of 18 kg.
- 6.2 It is intended to utilise a 500 amp air cooled welding gun and resin cored AWC welding wire for high carbon steel rails as well as a welding wire suitable for high manganese 13% Austenetic steel.
- 6.3 The welding gun will be fitted to a compact programmable unit, which will have a minimum of four specifically adapted programmes and control via a remote control unit with pushbuttons.
- 6.4 The system furthermore comprises of two snap fasteners, an aluminium rail profile, a carriage control electronics, a weaving unit and remote control which are synchronised to enable a number of weaving patterns to be programmed.
- 6.5 The programmed weaving movements start from a laterally adjusted Zero-line either on the outer or innerside of the rail. The Zero line can also be moved laterally during welding. Different speeds must be able to be used to produce the most consistent weld metal thickness.
- 6.6 The rail profile is flexible and can be fixed to the rail in several different ways namely magnets, screws, or vacuum suction cups.
- 6.7 Standard lengths of profile should be approximately 2,5 metros in length and adjustable.

## 7.0 TECHNICAL SYSTEM REQUIREMENTS

- 7.1 The technical requirements will be broken up into various operating modules namely:

- Diesel engine driven welder
- Wire feed unit
- Welding gun
- Welding electrodes
- Welding cable
- Automatic programmable unit

### 7.2 DIESEL ENGINE DRIVEN DC WELDER

The welder shall be of the constant current and constant voltage type.

#### 7.2.1 DC welding constant current

The current range (continuous) shall be in the range from a minimum of 20 Ampere to 350 Ampere, as required open circuit voltage.

The minimum open circuit voltage shall be 60 V

**7.3 DUTY CYCLE (INTERMITTANT)**

The intermittent welding duty cycle shall be at least 350A at 35%, 320A at 60% and 270A at 100% i.e. continuous welding.

Electrode diameter:

The electrode diameter shall be able to vary from 2 mm to 5 mm.

**7.4 DC WELDING CONSTANT VOLTAGE**

The current in the constant voltage range shall be 270A at 100 % duty cycle.

The constant voltage range shall vary between approximately 15 – 35 volts as required.

**7.5 AC GENERATION**

The generation shall be by means of an asynchronous, three phase, self-excited self-regulated brushless machine, with class H insulation.

**7.6 THREE PHASE GENERATION**

While welding at the continuous rated value the machine shall generate at least 12 kVA at 400 volts three phase.

**7.7 SINGLE PHASE GENERATION**

The machine shall generate a minimum of 7 kVA at 230 volt, which can be utilised for power tools, and other general requirements.

**7.8 PLUGS**

The successful tenderer shall supply two 400 V, 3 phase plugs and two single phase 230 volt plugs for power tools and auxiliaries as required.

**7.9 EARTH LEAKAGE RELAY**

The welder shall be equipped with an earth leakage relay, which will protect against earth faults on the machine or at the plugs.

**7.10 DIESEL ENGINE**

The engine shall be diesel powered 4-stroke water cooled with an output of at least 16,6 kilowatts at sea level.

**7.11 GENERAL ENGINE AND FUEL TANK CAPACITY SPECIFICATIONS**

The fuel tank capacity shall be sufficient to ensure that the diesel engine has at least a 10-hour running time at 60 % loading. It is expected that the tank will be 30 litres or more.

7.11.1 The mass of the diesel engine driven welder shall not exceed 550 kg to ensure handling capability and ease of transport.

7.11.2 The tenderer must include the supply of skids and a supporting frame for transporting the Diesel engine on the back of a vehicle.

**7.12 STANDARD EQUIPMENT**

The Diesel engine generator shall have the following equipment and functions as standard:

- Electronic regulation of welding current
- Water cooling

- Electric starter
- 12/24 v battery, protected against accidental short circuits
- Battery charger indicator
- Hour meter
- Engine protection, auto idle, which ensures that the engine returns to idle revolutions after welding
- Oil pressure indicator
- Low fuel indicator
- Warning light for pre-heating
- Sufficiently rated central lifting eye for crane or host
- Stick or MIG-MAG switchable welding facility
- Asynchronous alternator
- Earth leakage relay
- One 400 volt EEC socket
- One 230 volt EEC socket
- Overtemperature thermal cut off
- Voltmeter
- 400v EEC socket – on request
- 230v EEC socket – on request

#### 7.13 AUXILLARY VOLTAGE SUPPLIES

The welder shall supply the wire feed unit and the automatic programmable equipment with approximately 42 VAC and 30 to 46 volt AC / 36-60 volt DC as required. This value may vary from system to system.

The voltages shall be connected to the wire feed unit and programmable unit by high quality quick connect, quick release plugs and sockets and shall not be permanently connected.

#### 7.14 CONTROL PANEL AND MARKING

All the various functions shall be clearly marked and engraved to enable ease of operation. High quality materials shall only be used for the control panel.

The potentiometers for voltage and current shall be of the highest quality and wire wound potentiometers are preferred.

#### 7.15 WEATHERPROOFING

The control panels shall be weatherproofed and dust proofed to prevent ingress of moisture or dust into the control panel.

**8.0 WIRE FEED UNIT**

- 8.1 The wire feed shall be suitable for semi-automatic and programmable equipment for the welding and repair of rails.
- 8.2 The wire feed unit shall be rugged, portable and totally enclosed and shall be air-cooled.
- 8.3 The maximum wire spool capacity shall not be less than 18 kg with a 300mm spool.

**8.4 WIRE FEED SETTINGS**

- 8.4.1 All the necessary settings shall be made on the feeder unit front panel.
- 8.4.2 The voltage settings shall be logarithmic to provide precise voltage in the low ranges
- 8.4.3 The wire feeder shall be equipped with 2/4 stroke, pre and post gas flow, adjustable backburn time, creep start and crater filling as standard functions.
- 8.4.4 The wire feed shall be equipped with quick-locking connections to enable a very short set-up and connection time.
- 8.4.5 To ensure that solid stable wire feeding occurs the wire feed shall have a 4-wheel feeder mechanism.  
  
The wire feed unit shall have an adjustable backburn time to ensure that the correct length of welding wire is always sticking out in preparation for welding.
- 8.4.6 The wire feed unit shall be equipped with a digital volt/ammeter for indicating and control purposes.

**8.5 TECHNICAL DATA**

- 8.5.1 The connection voltage shall be between 40 v – 45 v AC
- 8.5.2 Wire spool capacity shall be a maximum of 18 kilogram.  
  
The outside spool diameter shall be a maximum of 30 centimeters.
- 8.5.3 Wire feed speed:  
  
The feed speed shall be between 2,0 to 25 m/min adjustable by means of a potentiometer.
- 8.5.4 The backburn time:  
  
The backburn time shall be between 0 to 0,5 seconds. This will ensure correct stickout of the welding wire.
- 8.5.5 Crater filling facility:  
  
The wire feeder shall have a crater filling facility as standard and shall be adjustable from 0-5 seconds.
- 8.5.6 Weight:  
  
To ensure that the wire feeder is portable the weight of the feeder shall not exceed 15 kilogram.
- 8.5.7 Torch connection:  
  
The torch connection shall be the Euro connection method.

**9.0 WELDING GUN SYSTEM**

- 9.1 The successful tenderer shall supply a self-cooled welding gun rated at 500 ampere at 60% duty cycle with an Argon Mixture.
- 9.2 The welding gun shall be able to weld with welding wire with diameters varying from 1,0 mm to 2,4 mm in diameter or more.
- 9.3 The welding hose length which shall be connected with a Euro connection not less than 3 metro in length. If any other connection is offered Spoornet staff shall take the decision as to its acceptance.
- 9.4 To ensure a more efficient contact with the welding wire Spoornet requires the "Helix" type of contact tip with adapter. The tenderer shall provide for one "Helix" contact tip per welder in the initial quotation.

**10.0 TUBULAR CORED WELDING ELECTRODE WIRE**

Spoornet intends to repair both carbon steel and high manganese austenetic steel rails and requires the correct tubular cored electrode wire for both applications. Both electrode type polarities shall be DC positive, (DC(+))

**10.1 CARBON – STEEL ELECTRODE WIRE**

The carbon steel rail will require a chromium–nickel-molybenum alloyed weld metal with a martensitic-bainitic structure.

- 10.2 The chemical composition of the weld metal shall be within the following percentages:

Carbon 0,12 – 0,18%	Manganese 0,9 – 1,3%
Chrome 0,75 – 1,25%	Nickel 2,0 – 2,5%
Molybenum 0,4 – 0,6% and	Alluminium 1,0 – 1,8%
Traces of Silicon, Phosphorous and	Sulphur will be acceptable.

**10.3 FILL TYPE**

The fill type shall be slag forming, basic fluourspar

**10.4 ALLOY TYPE**

Surfacing alloy: martensitic steel weld metal

**10.5 HIGH MANGANESE (13%) AUSTENETIC STEEL**

The high manganese rail will require a work-hardening austenic weld material which has high wear and impact resistance.

- 10.6 The chemical composition of the weld metal shall be within the following percentages:

Carbon 0,25 – 0,35%	Silicon 0,35 – 0,75%	Manganese 12,5 – 14,5%	Chrome 13,5 – 15,5%
Nickel 1,0 – 2,0%	Molybdenum 0,5 – 1,0%	Vanadium 0,2 – 0,6%	and traces of Phosphor and Sulphur.

**10.7 FILL TYPE**

Low slag rutile

Alloy type

Surfacing alloy: 14% Mn 14% Cr steel weld metal.



**11.0 WELDING CABLE**

The successful tenderer shall supply high quality correctly rated 15 metre long welding cables, terminated with the correct fittings, connectors or plugs as required for the welding system.

The rating of the welder: duty cycle (intermittent) shall be in the order of 350A – 35%, 320A – 60% and 270A – 100%

**12.0 PROGRAMMABLE EQUIPMENT FOR THE HARDFACING AND REPAIR OF RAIL PROFILES**

- 12.1 The system shall comprise of two rail fasteners, a stable aluminium profile, a carriage with a weaving unit, control electronics and remote control panel.
- 12.2 The weaving unit and control electronics shall be fully synchronised to enable the weaving programs to be pre-programmed.
- 12.3 The weaving movements shall start from a laterally adjustable zero-line, either on the outer side or the inner-side of the rail. This zero-line must also be able to be moved laterally during welding.
- 12.4 The equipment shall be fitted with different variable speed adjustments, which can be used in each program to produce a consistent weld thickness.
- 12.5 The remote control unit shall enable the welding personal to have full control of the machine without lifting his welding helmet.
- 12.6 Spoonet requires the following performance specification:

**TECHNICAL DATA**

Power supply	30 – 50 v AC
Weight of equipment excluding rail	7 – 10 kg
Welding speed	100 – 1500 mm/min
Quick transport movement, rapid	1500 mm/min
Weaving speed	300 – 3000 mm/min
Weaving width	1 – 80 mm
Zeroline adjustment	25 mm (+/- 12,5)
Edge length	60 – 990 mm
Crater filling time	0 – 9,00 seconds

**12.7 NUMBER OF PROGRAMS**

The successful tenderer shall incorporate 4 pre-programmed welding programs in the equipment. The programs shall be fixed, and shall be embedded in the unit by means of Firm ware, E.E. Proms or Proms.

**12.8 FORMAT OF PROGRAMS**

Program 1 – (P1)	Shall be a normal weaving program
Program 2 – (P2)	Shall be trapesoidal with both positive and negative inclinations of 45 degrees. Normal weaving shall be possible

Program 3 – (P3)	Positive inclination with desired slope and normal weaving.
Program 4 - (P4)	Facility to program a unique program with desired pattern and motions.

12.9 The programs shall be installed in the unit prior to the delivery of the equipment.

**12.10 SELECTION OF PROGRAM**

Each individual program shall be selectable from an electronic weaver unit and travel unit control box.

**13.0 ELECTRONIC WEAVER UNIT**

The weaver unit control panel shall have facilities for:

Weaving speed: In % of maximum speed (adjustable)

Menu selection: For different menus for programming of weaving unit.

Weaving unit on/off: LED indicators

Zeroline position: Setting of the zero line automatically

13.1 The weaving unit shall have suitably dimensioned digital displays which will indicate: The programme number, weaving width in mm dwell time in seconds, zero line, straight weld, normal weaving and positive and negative inclinations.

**14.0 ELECTRONIC TRAVEL UNIT**

The programmable unit shall be equipped with a facility to control the speeds and travel direction, and shall be adjustable by means of a menu and keyboard control. The electronic unit control panel shall have facilities for:

**14.1 SPEED/WEAIVING DISTANCE**

If programmed for a straight weld the speed shall be programmed in cm/minute. When welding with weaving, the distance between each stroke shall be programmed in steps of 0,1 millimeter.

**14.7 PROGRAMME SELECTION**

A choice of 4 programmes shall be able to be selected (P1 – P4)

**14.2.1 Direction**

The unit shall select the running direction of the carriage.

**14.2.2 Welding on/off**

Selects if welding is on or off.

**14.2.3 Rapid speed**

If the rapid speed button is depressed the carriage shall run at maximum speed.

**15.0 REMOTE CONTROL BOX**

The programmable welding equipment shall be fitted with a remote control box, which shall be able to initiate the following functions.

**15.1 Selection of the direction of movement**

In both normal programmable speed plus rapid traverse if selected.

**15.2 SELECTION OF DIRECTION OF WELD**

Selection of the direction, of the weld shall be possible by means of pushbutton.

**15.3 WELDING SPEED AND WEAVING STROKE**

Shall be able to increase/decrease the welding speed or the weaving stroke distance after start.

**15.4 WEAVING WIDTH**

The remote control box shall be able to adjust the weaving width smaller and wider.

**15.5 ZERO LINE ADJUSTMENT**

The remote control box shall have facilities for the Zero-line both inwards and outwards.

**15.6 POSITIVE AND NEGATIVE INCLINATION**

The remote control shall have facilities to start welding with both negative and positive inclination.

**15.7 RAPID RETURN**

The remote control unit shall have facilities for impulse start of welding after rapid return and impulse rapid return after welding.

**15.8 START/STOP**

The remote control unit shall be able to start or stop unit without welding.

**16.0 RAIL PROFILE**

16.1 The programmable unit consists of a travel carriage, which runs on an aluminium profile bar. A minimum of two different types of attachment namely a cross slide attachment for "x" and "y" adjustment (forward and forward reverse) and an electronic operated weaver device with a linear slide (forward weaver and forward reverse weaver) shall be able to be fitted to the profile.

16.2 The rail profile shall be able to be attached to the rail in various different ways, namely; magnets, screws or vacuum cups. The successful tenderer shall supply the required attachments. The standard length of the aluminium profile shall be between 2 metres and 2,5 metres long.

16.3 The rail profile system shall include a universal torch holder, torch cable relief, magnetic brackets with release mechanism, and sufficient locking screws as required.

**17.0 TRAINING**

17.1 The cost of training shall be included in the supplier's quotation for the programmable welding equipment.

17.2 The training shall contain sufficient practical and theoretical content to enable staff to carry out basic level one repair and adjustments.

17.3 The training shall enable staff to troubleshoot down to module level, interpret displays, emergency and fault conditions and other necessary functions.

17.4 The supplier shall submit a proposed training schedule, duration and any special requirements required.

**18.0 DOCUMENTATION AND DIAGRAMS**

- 18.1 The supplier shall supply 3 full sets of relevant diagrams, documentation and operating manuals to the relevant Spornet staff.
- 18.2 The content of the diagrams and documentation shall have fault finding, flow charts, and faultfinding methods to assist with maintenance of the system.
- 18.3 The documentation shall have a full description of the operation of the equipment as well as all the displays on panels, remote panels, pushbuttons as well as any operational function, which enables the unit to work.

**19.0 METHOD OF TENDERING**

- 19.1 The tenderer shall submit with his tender a schedule of compliance with every clause of this specification and clearly indicate the extent of the compliance in the case of non-compliance.

**20.0 QUALITY ASSURANCE AND INSPECTIONS**

- 20.1 Spornet reserves the right to inspect the tenderers facilities prior to awarding the contract.
- 20.2 The issuing of acceptance certificates will be authorised by the Quality Assurance section of Spornet.

**21.0 GUARANTEE**

- 21.1 The contractor shall guarantee the equipment against faulty workmanship faulty operation or operation of the equipment outside of specification.
- 21.2 Disputes shall be settled between Spornet staff and the supplier with Spornet retaining the right to make final decisions on guarantee issues.

**22.0 SPARES**

The successful tenderer shall supply a comprehensive spare parts catalogue, and make recommendations as to what Spornet should hold as emergency spares.

The successful tenderer shall guarantee that he will supply backup and hold spares for the equipment for a period of not less than 10 years.

**23.0 LIST OF COMPANIES AND RAILWAYS WHICH EQUIPMENT HAS BEEN PREVIOUSLY SUPPLIED TO**

- 23.1 The tenderers shall supply a comprehensive list of clients to which the equipment has been supplied. Dates of installation and how the system is being utilised shall be supplied.

END



## INFRASTRUCTURE MAINTENANCE

### SPECIFICATION

# Specification For A Hydraulic Driven, Double Bladed Weld Shearing Machine

**Author:** Chief Engineering Technician  
Small Plant & Equipment

**Approved:** Senior Engineer  
Technology Management

**Authorised:** Senior Engineer  
Technology Management

Ashwin Singh

Colin Blandford

Colin Blandford

Handwritten signature of Ashwin Singh in black ink.

Handwritten signature of Colin Blandford in black ink.

Handwritten signature of Colin Blandford in black ink.

Date: 08 September 2008

Circulation Restricted To:

Transnet Freight Rail - Infrastructure

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## 1. General Requirements

- 1.1 This specification outlines the requirements of a heavy-duty, hydraulically operated rail profile grinding machine.

## 2. Operating Conditions

- 2.1 Machines will be operated in all weather conditions at altitudes varying from sea level to 1850 m above sea level, relative humidity 10% to 90% and atmospheric conditions which vary from heavily saline to dry and dusty.
- 2.2 Ambient air temperatures ranging from -5° C to 45° C.

## 3. Qualifications

- 3.1 The design of the machine is to be that of the manufacturer, but must be of robust construction in order to meet the sustained heavy-duty demands of railway infrastructure maintenance.
- 3.2 A “no-tool” adjustment machine is preferred.
- 3.3 Machines will be acceptable in standard factory production finish and colour. Details to be furnished.
- 3.4 Only products proven in service will be considered. A list of users, both South African and international, is to be submitted.

## 4. Performance

- 4.1 A service life of not less than 7 years is expected from each machine. The actual design life of the machines is to be stated.
- 4.2 The machines are to be easily and economically maintained with standard workshop tools and equipment.
- 4.3 The machine must be compatible with hydraulic oil of viscosity grades 46 and 68 – details as per SANS 1218:2005 (Hydraulic Oil – Anti-wear Type).



## 5. General Requirements

- 5.1 This specification outlines the requirements of a heavy-duty hydraulically operated, double bladed weld shearing machine.
- 5.2 The machine will be used to shear excess metal from rails after exothermic welding.

## 6. Detailed Requirements

### 6.1 Preferred Mass

- 6.1.1 The mass of the grinder, including shearing blades, must not exceed 40 kg.

### 6.2 Hydraulic System Requirements

- 6.2.1 The machine must comply to HTMA standards for hydraulic tool operation.
- 6.2.2 The machine must operate on the "Open Centre Circuit" hydraulic system.
- 6.2.3 The hydraulic supply will meet the requirements of HTMA Type RR System and the rail drill must operate effectively on this standard.
- 6.2.4 The grinder must be equipped with 12mm ( $1/2$ " ) hydraulic whip hoses that comply to DIN EN 853 - 2SN (Rubber Hoses and Hose Assemblies - Wire Braid Reinforced Hydraulic Type).
- 6.2.5 The whip hoses must be 400mm long.
- 6.2.6 The whip hoses must be fitted with 12mm ( $1/2$ " ) fixed male and female quick release flat-face fittings that comply to HTMA standards. The quick release fittings must be fitted with dust caps.
- 6.2.7 Hose connections must be placed in a position that would assist in the balance of the machine and make it easy for the operator to handle and move the machine.
- 6.2.8 Coupling points are to indicate whether they are supply or return points.

### 6.3 Mobility

- 6.3.1 Heavy duty clamps must be provided to clamp the machine under the rail head while at the same time, allowing horizontal movement of the machine when shearing takes place.

### 6.4 Noise Emission

- 6.4.1 The grinder must comply to BS EN ISO 4871:1997 (Declaration and verification of noise emission values of machinery and equipment).

## 6.5 Shear Blades

- 6.5.1 Each machine must be supplied with a set of shearing blades suitable for 48 kg/m and 57 kg/m rails – profiles as per Annexure A. However the use of these machines will not be limited to the above two rail profiles
- 6.5.2 The shear blades to consist of a casting that matches the profile of the rail and must be so designed that cutting below the running surface and flanks is not possible.
- 6.5.3 The cutting edges of the shear blades to be of heat resistant steel and must be able to be re-sharpened.
- 6.5.4 Sufficient weld material must be left on the rail surface and flanks after trimming to enable proper grinding of the rail profile.

## 6.6 Shearing Force

- 6.6.1 The machine must have a shearing force sufficient to effectively shear excess exothermic weld on the various rail profiles as per Annexure A.

## 6.7 Stroke

- 6.7.1 The minimum stroke of the cutting blades must be 140mm.

## 6.8 Positioning of Controls

- 6.8.1 The controls must be easily accessible to the operator and must give a clear indication whether the shearing blades are in the advance or retract phase.

## 6.9 Component Markings

- 6.9.1 The machine is to be clearly marked in respect of hydraulic oil flow required.
- 6.9.1 Coupling points are also to indicate whether they are supply or return points.

## 6.10 Body

- 6.10.1 The frame and components of the machine must be robust.
- 6.10.2 The machine must be well protected against rust.
- 6.10.3 The grip on the handles must have a non-slip surface.
- 6.10.4 The machines will be accepted in standard factory finish and colour.  
Due cognisance must be given to the life requirement of the machine.

## 6.11 Ergonomics

- 6.11. The tool must be ergonomically designed for maximum operator productivity, safety and transportability.

## 7. Quality Control

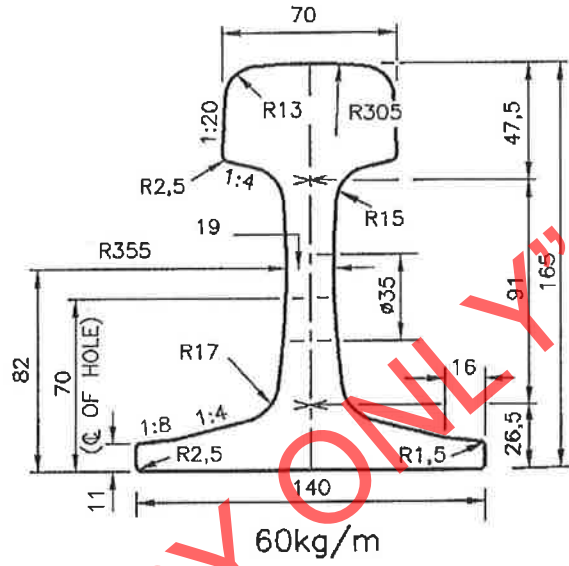
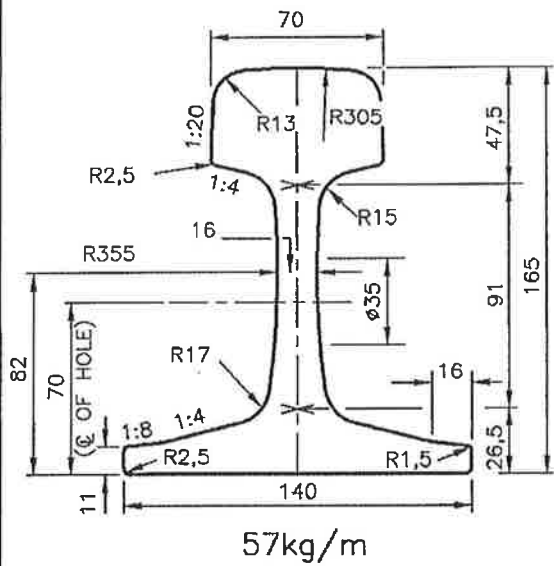
- 7.1 All machines must be manufactured in an environment that complies to the latest ISO 9000 to ISO 9004 or similar quality control standards. Details must be furnished.
- 7.2 Machines will be subject to a technical evaluation and the final decision will, amongst others, be based on these findings.

## 8. Legal and Operational

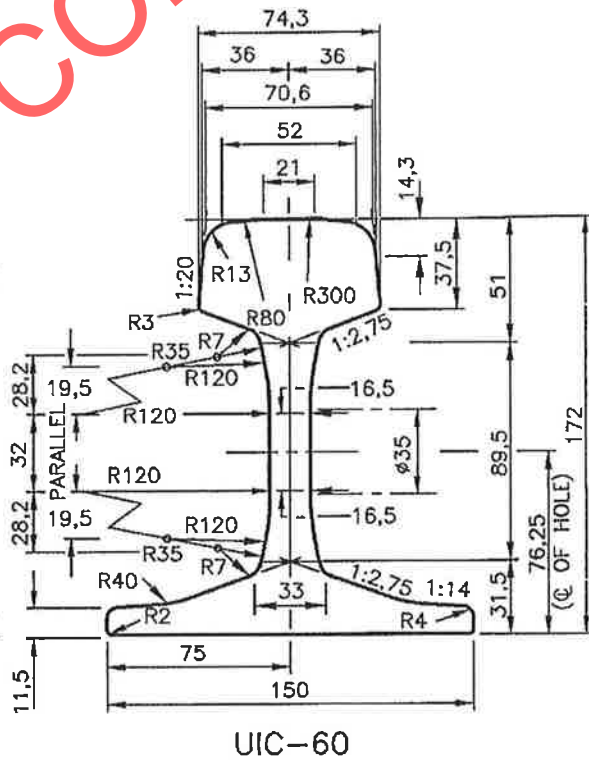
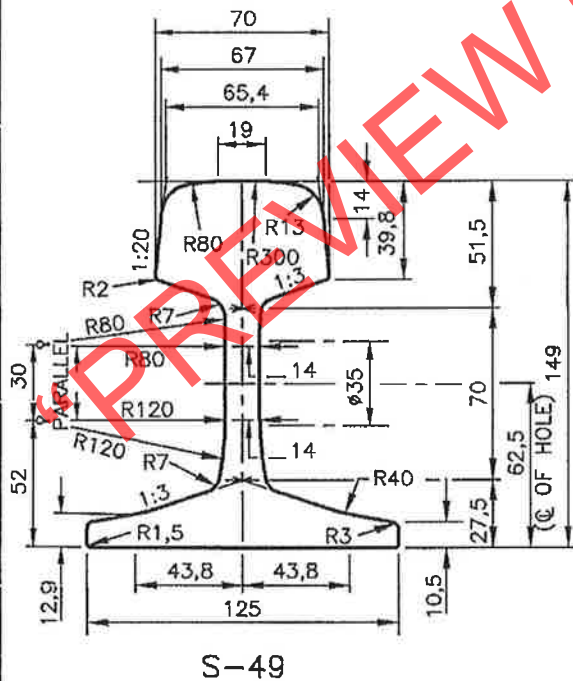
- 8.1 All machines must comply with the requirements of the Machinery and Occupational Safety Act, (Act 85 of 1993 – General Machinery Regulations) and The Machinery Directive 98/37/EC.
- 8.2 The rail drill must be completely assembled and filled with lubricants and ready for service in all respects.
- 8.3 Where grease nipples are fitted these are to be to DIN 71412 in easily accessible positions. Full details of lubrication applicable to machines on offer to be submitted.
- 8.4 An operator's handbook, service manual and spare parts list must be supplied with each machine in order to ensure that the machine is operated in accordance to the manufacturer's instructions.
- 8.5 All machines and equipment must be supplied complete with essential tools such as allen keys, spanners etc. in order to make essential adjustments as well as to fit or remove consumable items.
- 8.6 Suppliers of hydraulic machinery will be required to stock a full range of readily available spare parts required for the maintenance of these machines throughout their life span. Full details of service organisation is to be submitted.
- 8.7 Consumable items must be available locally and must be of standardised format in order to be used on equipment of more than one supplier.
- 8.8 All machines and equipment is to be guaranteed for a minimum period of 12 months against faulty material and workmanship - fair wear and tear excluded. Full details of guarantee is to be submitted.
- 8.9 The information as requested by the various clauses in this specification are to be supplied in the form of technical data, pamphlets and/or drawings. If this is not complied to, offers may be overlooked.
- 8.10 Each machine purchased will be issued with a project number consisting of 20 characters which must be stamped or engraved directly onto the machine or on the manufacturer's data plate or a separate riveted plate on the particular machine.
- 8.11 Sufficient training must be given to all operators of these machines.
- 8.12 Machines not already in service with Transnet Freight Rail must be made available for testing/evaluation during the adjudication of the tender. Technical improvements on existing machines/equipment is to be substantiated by physical examples.

Annexure A

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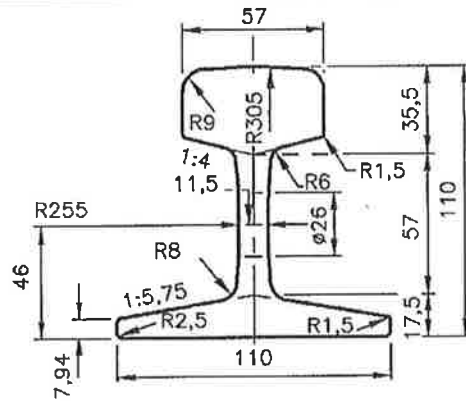


(FLEXIBLE POINTS BLADE  
AND UNDERCUT STOCK RAIL)

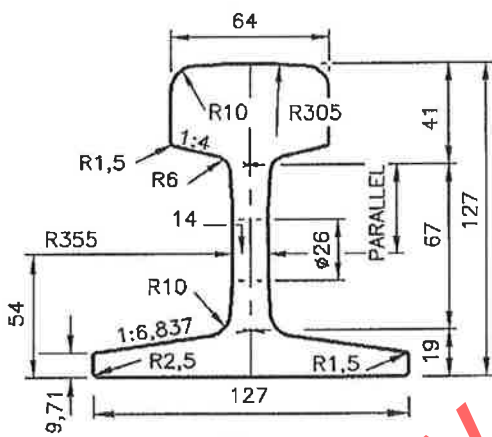


REMARKS:

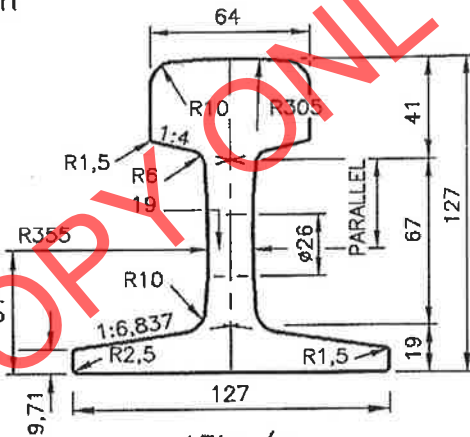
1. FOR PROPERTIES SEE ANNEXURE 14 SHT 4.



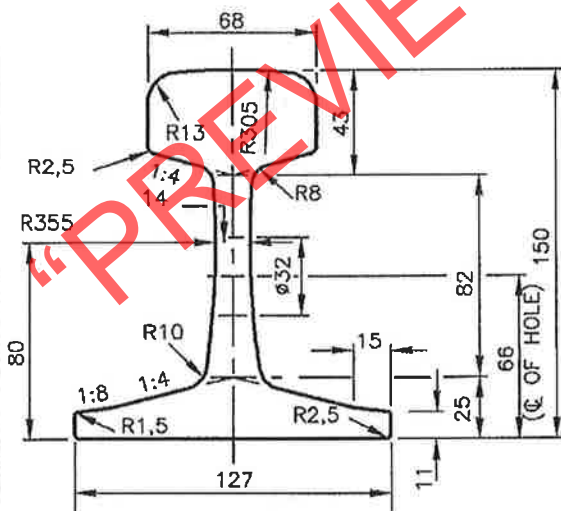
30kg/m



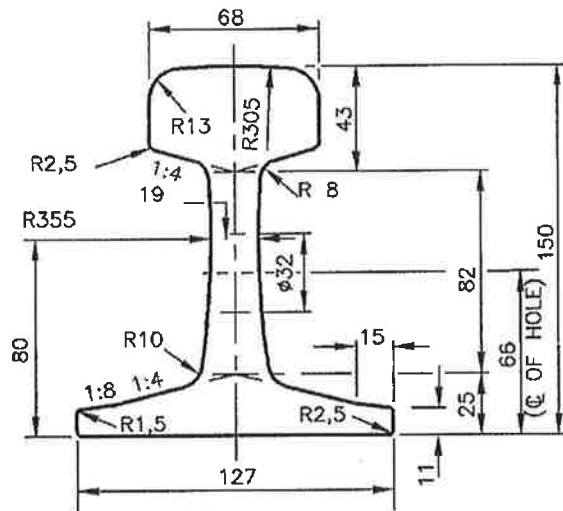
40kg/m



43kg/m  
(HARBOUR AREAS)



48kg/m

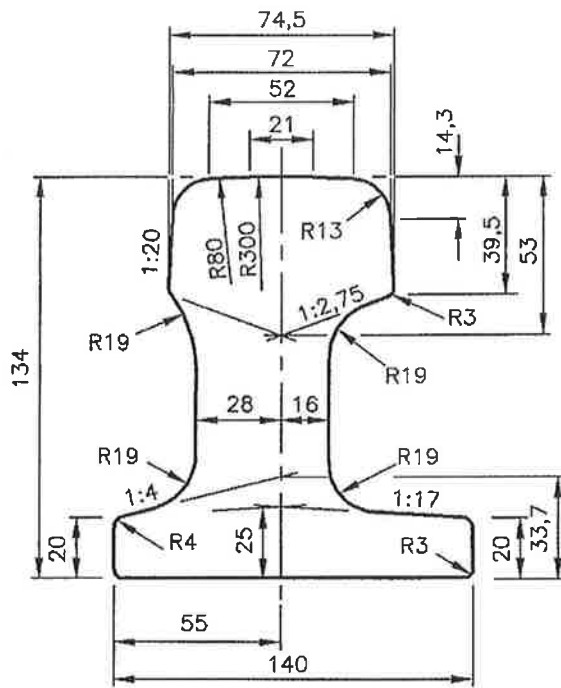


51kg/m  
(FLEXIBLE POINTS BLADE  
AND UNDERCUT STOCK RAIL)

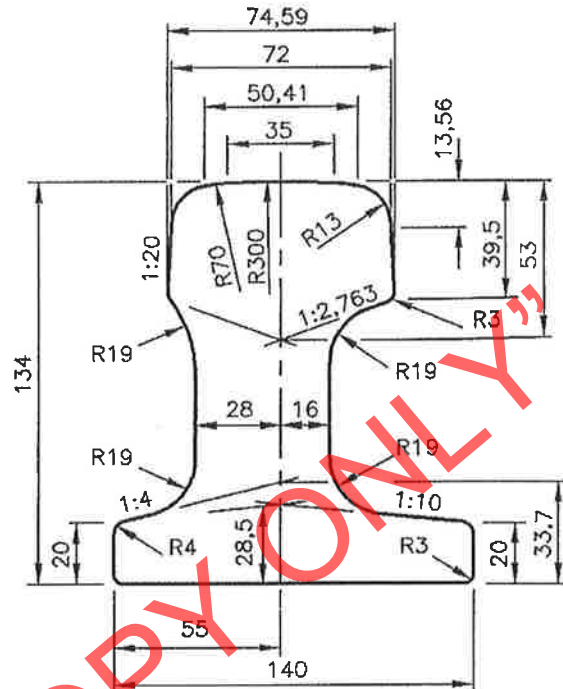
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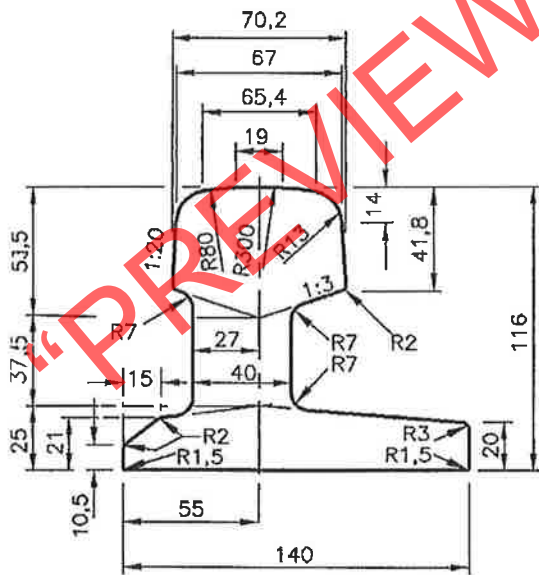




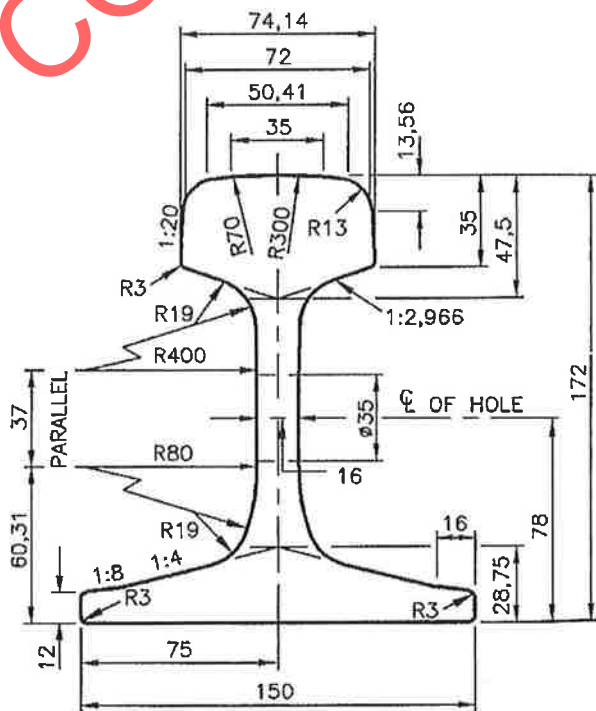
Zu-1-60



Z-S60-SAR



Zu-2-49



S-60-SAR

REMARKS:

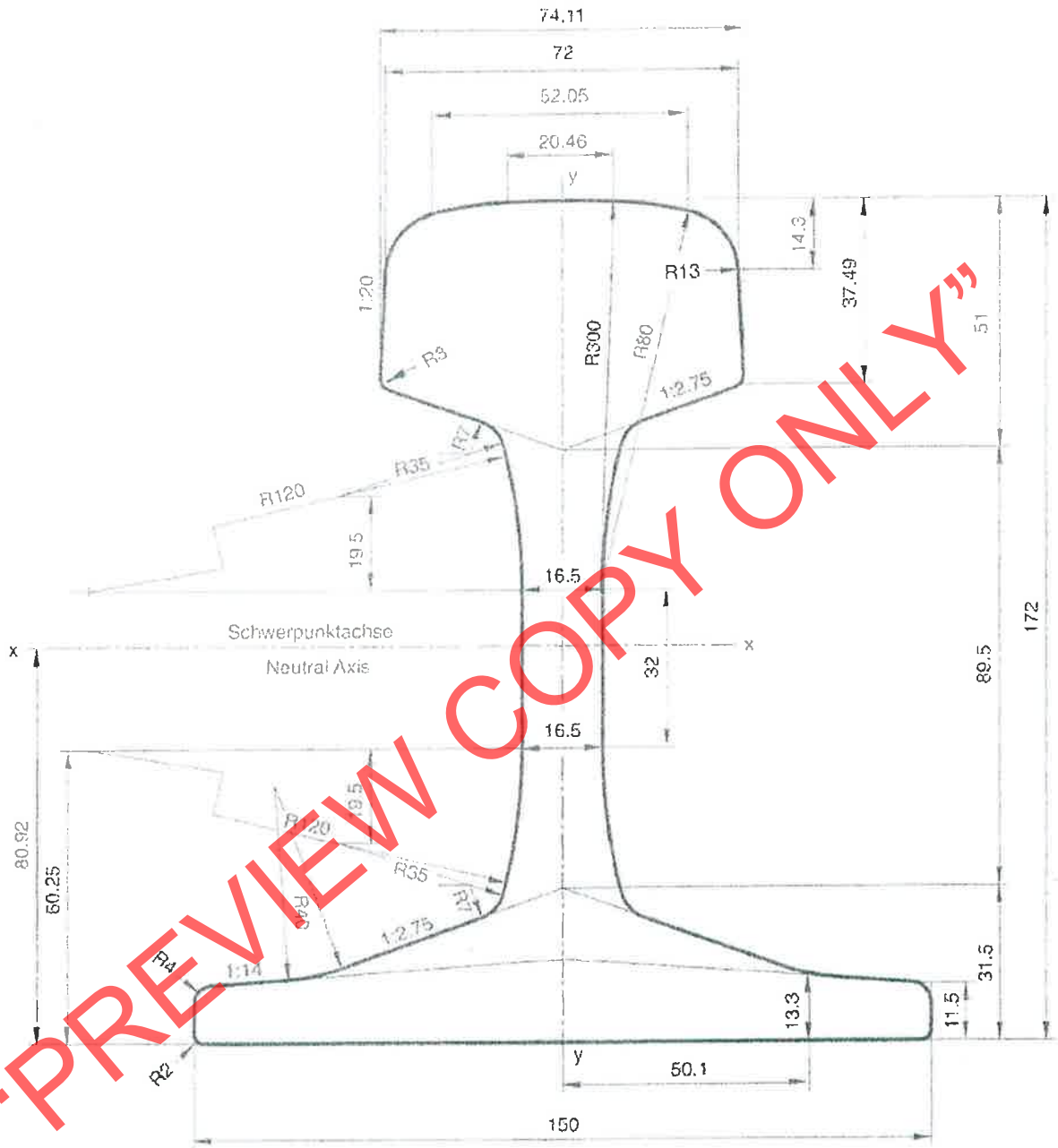
1. FOR PROPERTIES SEE ANNEXURE 14 SHT 4.





# 60E1

VIGNOLSCHIENE. FLAT BOTTOM RAIL, RAIL VIGNOLE

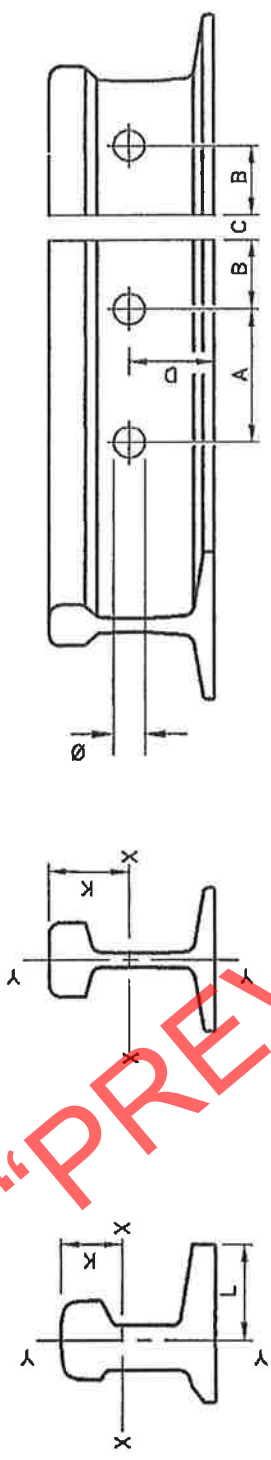


A = 76.7 cm<sup>2</sup>  
 G = 60.21 kg/m  
 I<sub>x</sub> = 3038.3 cm<sup>4</sup>  
 W<sub>x</sub> = 333.6 cm<sup>3</sup>

Scale: 1 : 1.25  
 Edition: 8/97



RAIL PROPERTIES



RAIL	MASS (kg/m)	HOLING										AREAS					PROPERTIES					DRAWING
		A	B	C	D	Ø	NUMBER	HEAD (%)	WEB (%)	FLANGE (%)	SECTION	I (cm <sup>4</sup> )		Z (cm <sup>3</sup> )	K (mm)	L (mm)						
												X - X	Y - Y									
30kg	30	100	47	6	46	26	4	45,11	18,87	36,02	38,537	626,89	158,18	110,94	56,36	-	E-192M					
40kg	40	100	47	6	54	26	4	44,86	19,44	35,70	51,715	1 115,38	281,56	169,20	65,92	-	E-346					
43kg	43	100	47	6	54	26	4	42,42	24,03	33,55	55,230	1 129,00	280,30	170,10	66,35	-	E-3215M					
48kg	48	100	67	6	66	32	4	41,55	22,65	35,80	60,180	1 822,00	316,04	234,18	78,50	-	E-358M					
51kg	51	100	67	6	66	32	4	39,00	27,80	33,20	64,850	1 844,00	320,50	234,60	78,60	-	E-358M					
57kg	57	100	67	6	70	35	4	41,55	23,02	35,43	73,240	2 650,80	442,00	336,46	86,21	-	E-3232M					
60kg	60	100	67	6	70	35	4	40,14	25,69	34,17	76,125	2 703,27	445,39	343,97	86,41	-	E-3232M					
S-60-SAR	60,34	100	67	6	78	35	4	37,53	24,02	38,45	77,020	3 097,82	550,40	395,63	93,70	-	E-3326					
Z-S60-SAR	72,83	-	-	-	-	-	-	34,88	30,63	34,47	92,980	1 734,40	746,94	292,98	74,80	82,70	-					
UIC-60	60,34	100	67	6	76,25	35	4	40,22	22,55	37,23	76,860	3 055,00	512,90	335,50	91,05	-	700-E-736					
Zu-1-60	73,00	-	-	-	-	-	-	-	-	-	93,000	1 728,00	743,50	229,90	75,15	82,24	-					
S-49	49,43	100	67	6	62,5	35	4	47,45	17,56	34,99	62,970	1 189,00	320,00	240,00	75,70	-	700-E-722					
Zu-2-49	62,20	-	-	-	-	-	-	-	-	-	79,260	1 075,00	700,00	162,00	66,30	81,00	-					