



**DESIGN, MANUFACTURE, SUPPLY, DELIVERY,
INSTALLATION, TESTING, CALIBRATION AND
COMMISSIONING OF A HEAVY DUTY
ELECTRO-HYDRAULIC 400 TON
SYNCHRONIZED CNC PRESS BRAKE.**

311 SOLOMON MAHLANGU DRIVE, ROSSBURGH.

REFERENCE NO.: FAI_DBN_SOW_051

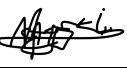
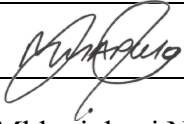
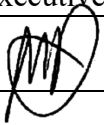
Scope Revision: 0

Date of release: JULY 2026

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DOCUMENT AUTHORITIES

Department	Facilities and Infrastructure
Effective date	July 2026
Compiled by	Zolani Mngqiti
Designation	Engineering Technician
Signature & Date	 14.07.2026
Reviewed by	Mzwenkosi Mapuko
Designation	Senior Project Manager
Signature & Date	 14.07.2026
Approved by	Mhlonipheni Nxumalo
Designation	Executive Manager
Signature & Date	 14/07/2026

1. INTRODUCTION

This scope of work is for the:

#	TASK	REQUIRED
1	Engineering survey, structural assessment	
2	Manufacture	✓
3	Design	✓
4	Supply	✓
5	Delivery	✓
6	Installation	✓
7	Documentation	✓
8	Testing	✓
9	Training	✓
10	Commissioning	✓
11	AIA Report	

Of the specified:

No.	ITEM
1	Design, manufacture, supply, delivery, installation, testing, calibration and commissioning of a heavy duty electro-hydraulic 400 ton synchronized CNC press brake
2	Training for 10 Transnet Engineering personnel on how to use the supplied equipment
3	Submission of project completion documents.

2. TECHNICAL REQUIREMENTS

2.1 The Contractor shall comply with the latest editions of all applicable South African legislation, regulations, standards, codes of practice, and recognised international standards relevant to the design, manufacture, supply, delivery, and installation of a heavy duty electro-hydraulic 400 ton synchronized CNC press brake:

- Occupational Health and Safety Act, Act 85 of 1993,
- SANS 10142-1 – The Wiring of Premises: Low-Voltage Installations,
- SANS 13849-1 (EN ISO 13849-1) – Safety of Machinery: Safety-Related Parts of Control Systems,
- SANS 62061 (IEC 62061) – Functional Safety of Safety-Related Control Systems,
- SANS 50126-22 / EN 12622 – Safety of Machine Tools: Hydraulic Press Brakes,
- SANS 347 – Categorization and Conformity Assessment Criteria for Pressure Equipment, and all other applicable regulations and standards.

3. SPECIFIC REQUIREMENTS

Item no.	Minimum Requirements																																						
3.1	Scope of supply: 1. One new heavy duty electro-hydraulic synchronised press brake complete with tooling. 2. CNC controller with graphical programming capability. 3. Back gauge system. 4. Hydraulic, electrical, and safety systems. 5. Installation, alignment, testing, and commissioning. 6. Operation and maintenance manuals. 7. Operator and maintenance training. 8. Recommended spare parts list.																																						
3.1.1	Minimum Technical Requirements: <table border="1"> <thead> <tr> <th>Parameter</th><th>Requirement</th></tr> </thead> <tbody> <tr> <td>Machine type</td><td>Electro-hydraulic synchronized CNC press brake</td></tr> <tr> <td>Tonnage Capacity</td><td>400 tons (4000 kN)</td></tr> <tr> <td>Bending length</td><td>Minimum 4000 mm</td></tr> <tr> <td>Distance between housings</td><td>Minimum 3100 mm</td></tr> <tr> <td>Throat depth</td><td>Minimum 400 mm</td></tr> <tr> <td>Ram stroke</td><td>Minimum 300 mm</td></tr> <tr> <td>Open height</td><td>Minimum 570 mm</td></tr> <tr> <td>Approach speed</td><td>Minimum 100 mm/s</td></tr> <tr> <td>Pressing speed</td><td>Minimum 8-10 mm/s</td></tr> <tr> <td>Return speed</td><td>Minimum 90-100 mm/s</td></tr> <tr> <td>Positioning accuracy</td><td>±0.01 mm or better</td></tr> <tr> <td>Repeatability</td><td>±0.005 mm or better</td></tr> </tbody> </table> CNC Axes Minimum axis configuration: <table border="1"> <thead> <tr> <th>Axis</th><th>Function</th></tr> </thead> <tbody> <tr> <td>Y1, Y2</td><td>Independent ram synchronization</td></tr> <tr> <td>X</td><td>Backgauge horizontal positioning</td></tr> <tr> <td>R</td><td>Backgauge vertical positioning Z1,</td></tr> <tr> <td>Z1</td><td>Independent finger positioning Crowning</td></tr> <tr> <td>Automatic</td><td>compensation axis</td></tr> </tbody> </table> Preferred configuration: 6+1 or 8+1 axis system including Z1/Z2 backgauge finger positioning and sheet support control.	Parameter	Requirement	Machine type	Electro-hydraulic synchronized CNC press brake	Tonnage Capacity	400 tons (4000 kN)	Bending length	Minimum 4000 mm	Distance between housings	Minimum 3100 mm	Throat depth	Minimum 400 mm	Ram stroke	Minimum 300 mm	Open height	Minimum 570 mm	Approach speed	Minimum 100 mm/s	Pressing speed	Minimum 8-10 mm/s	Return speed	Minimum 90-100 mm/s	Positioning accuracy	±0.01 mm or better	Repeatability	±0.005 mm or better	Axis	Function	Y1, Y2	Independent ram synchronization	X	Backgauge horizontal positioning	R	Backgauge vertical positioning Z1,	Z1	Independent finger positioning Crowning	Automatic	compensation axis
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3.1.2	Frame and Mechanical Construction The machine frame shall be designed to provide the structural strength, rigidity, and dimensional stability required for continuous operation at the rated capacity without permanent deformation or excessive deflection. The frame and ram guidance system shall maintain precise alignment and consistent bending accuracy over the full working length throughout the machine's service life.
3.1.3	Hydraulic System The hydraulic system shall at a minimum include: • Electro-hydraulic servo synchronization of the ram (Y1/Y2 axes). • Proportional hydraulic valves. • Overload protection. • Pressure relief and overflow protection. • Oil level and temperature monitoring. • Leak-free hydraulic piping and fittings. Continuous-duty operation capability at rated load.
3.1.4	CNC control system The CNC press brake shall be equipped with a modern, industrial-grade CNC control system from a globally recognized manufacturer. The preferred control systems are the Delem DA-53T, DA-58T, DA-66T or approved equivalent, ESA S630, S640 or approved equivalent and Cybelec ModEva series or approved equivalent. Bidders may, however, offer a similar or equivalent CNC system. The proposed CNC control system shall provide, as a minimum, the following functionality: • Graphical touch-screen interface with intuitive operator navigation. (minimum 15" display). • Programming and storage of multiple bending programs, tooling libraries, and material databases. • Automatic bend sequence calculation and graphical part programming (2D as a minimum). • Automatic calculation of bend allowances, back-gauge positioning, and crowning compensation. • Multi-axis control capable of controlling all machine axes required to achieve the specified machine performance. • USB and/or Ethernet connectivity for program backup, software updates, and data transfer. • Diagnostic and fault-finding functions to assist maintenance personnel. • Compatibility with offline programming software where supported by the OEM. • English language user interface, operating manuals, and OEM technical support.
3.1.5	Minimum requirements for Back gauge System The back gauge shall: • Include at least two adjustable back gauge fingers. • Be servo-driven • Use precision ball screws and linear guideways. • Provide positioning accuracy better than ± 0.05 mm. Be capable of automatic movement between bends.
3.1.6	Crowning System The machine shall at a minimum include: • CNC-controlled hydraulic or mechanical crowning system. • Automatic compensation for table and ram deflection. Manual crowning systems will not be accepted.

3.1.7	Tooling The supplier shall provide the following tools: <table><tr><th>Item</th><th>Description</th><th>Quantity</th></tr><tr><td>1</td><td>Standard 88° segmented upper punch</td><td>1 Complete Set</td></tr><tr><td>2</td><td>Gooseneck segmented upper punch for return bends and channels</td><td>1 Complete Set</td></tr><tr><td>3</td><td>Multi-V lower die (16, 22, 35 and 50 mm V-openings or equivalent)</td><td>1 Complete Set</td></tr><tr><td>4</td><td>Heavy-duty single-V die (80 mm or 100 mm opening) for thick plate</td><td>1 Set</td></tr><tr><td>5</td><td>Offset (Z-bend) tooling</td><td>1 Set</td></tr><tr><td>6</td><td>Hydraulic quick-change upper clamping system</td><td>Complete</td></tr><tr><td>7</td><td>Precision lower die clamping system</td><td>Complete</td></tr><tr><td>8</td><td>Front sheet support arms</td><td>2</td></tr><tr><td>9</td><td>Adjustable back-gauge fingers</td><td>4</td></tr><tr><td>10</td><td>Tool storage cabinet or tooling rack</td><td>1</td></tr></table>	Item	Description	Quantity	1	Standard 88° segmented upper punch	1 Complete Set	2	Gooseneck segmented upper punch for return bends and channels	1 Complete Set	3	Multi-V lower die (16, 22, 35 and 50 mm V-openings or equivalent)	1 Complete Set	4	Heavy-duty single-V die (80 mm or 100 mm opening) for thick plate	1 Set	5	Offset (Z-bend) tooling	1 Set	6	Hydraulic quick-change upper clamping system	Complete	7	Precision lower die clamping system	Complete	8	Front sheet support arms	2	9	Adjustable back-gauge fingers	4	10	Tool storage cabinet or tooling rack	1
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3.1.8	Electrical System The electrical system shall: • Operate on 400 V ±10%, 50 Hz, 3-phase power supply. • Include a main isolator switch. • Use industrial-grade components from recognized manufacturers. • Be wired and laid out exactly in accordance with the electrical schematics. • Comply with OSHACT and SANS 10142-1. Power Supply to Machine Transnet will supply a supply point within 10 meters of the location of the machine, that the bidder shall connect to. The supplier shall: • Supply and install power cabling from the Transnet Engineering supply point (within 10 m of the machine location) to the machine. • Supply and install suitable cable trunking between the electrical distribution board and the machine. • Supply and install a lockable fused isolator, with provision for locking each of the three phases. • Test the complete electrical installation and issue an Electrical Certificate of Compliance (CoC) in accordance with SANS 10142-1. • Provide Type 1 + Type 2 surge protection for the machine power supply. • Provide a suitable EMC supply filter to ensure compliance with applicable electromagnetic compatibility (EMC) standards.																																	

3.1.9	Safety Requirements The machine shall comply with applicable safety standards and include: • CE conformity or equivalent international safety certification. • Front laser or light-curtain guarding. • Emergency stop buttons at operator stations • Two-hand or foot-pedal control with safety interlock. • Hydraulic overload protection. • Hydraulic cylinders skew protection • Guarding of moving and pinch-point areas with safety interlocks • Well tired or safety rated components and safety principles must be employed for safety critical machine components • Monitoring of safety critical components to detect faults • Fail safe design and diagnostic coverage • Dual-channel redundancy must be employed on safety critical components • Safety electrical interlocks along each axis to prevent overtravel and unsafe machine recovery
3.1.10	Performance Requirements The machine shall be capable of: • Producing repeatable bends within specified tolerances. • Moving the ram and back gauges at specified speeds • Stopping the machine fast enough and reliably to stop the machine when emergency stops, safety devices and end of travel limits are triggered • Performing multi-step and complex bend sequences using CNC programming.

3.1.11	Training The Supplier shall provide comprehensive Operator and maintenance training for a minimum of ten (10) Transnet Engineering personnel following successful installation and commissioning of the machine. The training shall be conducted on the installed machine at the Transnet Engineering site by suitably qualified OEM or OEM-authorized instructors
3.1.13	Warranty Period. The Supplier shall provide a comprehensive minimum warranty period of twelve months (12) from the date of successful commissioning and formal acceptance of the machine by Transnet Engineering. The warranty shall cover the complete machine, including but not limited to the structural frame, hydraulic system, electrical system, CNC controller, servo drives and motors, backgauge system, tooling supplied under this contract, lubrication system, safety systems, sensors, PLC/HMI equipment, and all other mechanical, electrical, hydraulic, and electronic components supplied as part of the machine. During the warranty period, the Supplier shall: • Rectify, at no cost to Transnet Engineering, any defects arising from faulty design, materials, workmanship, manufacturing defects, software, or installation. • Supply all replacement parts, consumables required for warranty repairs, labour, specialist technicians, travel, accommodation, and transportation necessary to restore the equipment to full operational condition. • Respond to warranty breakdowns within 24 hours of notification and have qualified technical personnel on site within 72 hours, unless otherwise agreed by Transnet Engineering. • Provide remote diagnostic support where available and maintain adequate spare parts availability to minimise equipment downtime. • Repair or replace any failed component with new OEM-approved components of equivalent or better specification. • Perform all warranty repairs without invalidating any remaining warranty on the equipment or replaced components. Any component repaired or replaced during the warranty period shall carry the greater of the remaining original warranty period or an additional twelve (12) months from the date of repair or replacement. The warranty shall only commence upon successful completion of installation, testing, calibration, commissioning, operator and maintenance training, and formal handover accepted by Transnet Engineering. Any equipment downtime resulting from warranty-related failures shall not reduce the warranty period, and the warranty shall be extended by the cumulative duration that the equipment is unavailable for normal production due to warranty repairs.
3.1.14	Testing and commissioning The Supplier shall carry out all testing, calibration, commissioning, and performance verification necessary to demonstrate that the machine complies fully with this specification before final acceptance by Transnet Engineering. The testing and commissioning shall include, as a minimum: • Verification of the correct installation, alignment, levelling, and mechanical integrity of the machine. • Electrical testing to confirm compliance with SANS 10142-1, including insulation resistance, earthing, electrical protection, and correct operation of all electrical systems. • Hydraulic system testing to verify operating pressures, leak-free performance, overload

	protection, and continuous operation under rated load. • Calibration and verification of all CNC-controlled axes to demonstrate compliance with the specified positioning accuracy and repeatability. • Functional testing of the CNC controller, backgauge, crowning system, tooling clamping, diagnostics, alarms, and all machine operating modes. • Verification of all safety systems, including emergency stops, safety interlocks, light curtains or laser guarding, overload protection, and fail-safe operation in accordance with applicable safety standards. • Performance testing using representative production workpieces to demonstrate the machine's bending capacity, dimensional accuracy, repeatability, and continuous operation at its rated capacity. • Practical operator and maintenance training, including safe operation, CNC programming, routine maintenance, fault diagnosis, and backup and restoration of machine parameters and programs. • Submission of all commissioning reports, calibration certificates, test records, software backups, and other required documentation. Final acceptance shall only be granted after the successful completion of all testing and commissioning activities, rectification of any identified defects, completion of operator training, and formal acceptance by Transnet Engineering. The warranty period shall commence only upon successful final acceptance of the machine.
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3.1.15	Documentation to be provided on project completion
	Operation Operational Manual with detailed operation of the machine, 3 Hardcopy + 1 PDF
	Maintenance: - Maintenance Manual with procedures of detailed maintenance, 3 Hardcopy + 1 PDF - Maintenance Schedule of when Maintenance will be required, 3 Hardcopy + 1 PDF - List of all passwords to gain full access to the Machine, 3 Hardcopy + 1 PDF - Recommended spare parts list, 3 Hardcopy + 1 PDF - Lubrication Chart with list of Lubricants, Lubrication points and frequency, 3 Hardcopy + 1 PDF - Error list with Causes and corrective procedures, 3 Hardcopy + 1 PDF
	Electrical - Electrical Schematics, 3 Hardcopy + 1 PDF - Electrical Parts List (with OEM part numbers), 3 Hardcopy + 1 PDF - Cable schedules, 3 Hardcopy + 1 PDF
	Hydraulics - Hydraulic Schematics, 3 Hardcopy + 1 PDF - Hydraulic Parts list (With OEM Part numbers), 3 Hardcopy + 1 PDF
	Mechanical - Mechanical Assembly diagrams of all parts of the machine, 3 Hardcopy + 1 PDF - Mechanical Parts list (with OEM part numbers), 3 Hardcopy + 1 PDF
	CNC - OEM CNC Manuals, 1 Hardcopy + 1 PDF - Backup of any CNC programs, Installable Backup + 1 PDF - Backup of Parameters, Installable Backup + 3 Hardcopy + 1 PDF
	PLC - PLC Program Installable Backup + 1 PDF Copy - PLC Program project file for fault finding
	HMI HMI Project file
	Drives Drive parameter backup, 3 Hardcopy + 1 PDF
	3rd Party Documentation All Operational, maintenance manuals and Specifications for any third-party equipment installed, 3 Hardcopy + 1 PDF
	Specialist Controller (Controller for specific purpose) - Operational manual, 3 Hardcopy + 1 PDF - Maintenance manual, 3 Hardcopy + 1 PDF - Backup of Parameters/Settings/Programs on the controller
	Training - Training manuals 1 PDF copy - Register of personnel trained - Certificates of personnel Trained on the machine. 1 Hardcopy + 1 PDF

4.OTHER INFORMATION RELATED TO THE SCOPE

- 4.1 Any matter relating to this work, which requires a decision from Transnet Engineering shall be presented to the Project Manager in charge.
- 4.2 All offers shall be completed in every respect with this specification. Only completed tenders shall be considered.

5.HEALTH AND SAFETY REQUIREMENTS

- 5.1 All equipment whether detailed in this specification or not shall comply with the requirements of the Occupational Health and Safety Act 85 of 1993 as amended and all other applicable legislation including specific set of regulations and local authority bylaws where applicable.
- 5.2 All the necessary safety equipment such as guards over rotating equipment shall be supplied and the equipment shall comply fully with all the requirements of the South African Occupational Health and Safety Act, Act 85 of 1993 and all other applicable legislation including specific set of regulations and local authority bylaws where applicable.

6.GENERAL

- 6.1 The successful tenderer will be subjected to a workshop inspection by Transnet Engineering to ensure that the facilities are to the satisfaction of the Transnet Engineering in terms of the quality control and equipment capabilities for manufacturing such type of equipment.
- 6.2 The tenderers shall guarantee that the rating and size etc. of the equipment offered, will be adequate to perform the duties required.
- 6.3 Operation will be in the following conditions:

Altitude	Sea level
Ambient temperature	0°C to 45°C
Relative humidity	50% to 100%
Atmosphere	Heavy saline

7. DEFINITIONS AND ABBREVIATIONS

- 7.1 CLIENT: Transnet Engineering Durban
- 7.2 TECHNICAL OFFICER: Project Manager, Transnet Engineering Durban
- 7.3 CONTRACTOR: Contractor appointed under this specification document