**Załącznik nr 5**

**Specyfikacja Techniczna (Technical Specification)**

Postępowania nr EU/35/Ro-Ro/ZZ/2025 o udzielenie zamówienia w trybie przetargu nieograniczonego na dostawę

**4 sztuk Ciągników Terminalowych Ro-Ro**

**w ramach projektu pt:**

**„Wyposażenie terminalu intermodalnego BCT w nowoczesne urządzenia przeładunkowe „**

Signature Not Verified

Digitally signed by Adam Kaliszewski
Date: 2025.07.29 14:21:04 CEST

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Dokument podpisany przez MICHAŁ KUŻAJCZYK
Data: 2025.07.29 14:29:25 CEST

# Baltic Container Terminal Ltd.

# Technical Specification for the Supply of Four TERMINAL TRACTORS Ro-Ro 4x4 July 2025

**Baltic Container Terminal Ltd.**
**Kwiatkowskiego Str. 60,**
**81-127 Gdynia,**
**Poland**

## Engineering Department

BCT-Bałtycki Terminal Kontenerowy
Spółka z o.o.
Z-CA DYREKTORA
ds. Technicznych
Zdzisław Mejer

**PROJECT**
Supply of the following equipment defined within the Technical Specification:

Four (4) Terminal Tractors Ro-Ro 4x4 drive

**CAPACITY**

| | |
|---|---|
| Fifth wheel load min. | 36,000kg |
| Towing a gross combination weight (GCW) | 70,000kg |

**DIMENSIONS**

| | |
|---|---|
| Length | maximum 6,0 m |
| Width | maximum 2,6 m |
| Height | maximum 3,2 m |
| Wheel base | minimum 3,2 m |
| Turning radius | maximum 7,0 m |

**SPEEDS**

| | |
|---|---|
| Maximum speed | up to 35 km/h |

**ELECTRICAL SYSTEMS**

| | |
|---|---|
| Main Voltage | 24V |
| Tractors monitoring | On-board and remote |

**FEATURES**

| | |
|---|---|
| Driving gear | 4x4 |
| Gear ratios | minimum 4 forward / minimum 3 reverse |
| Engine block heater | heater 230 V |
| Swivelling driver seat | 180° |
| Active tilt boom for using gooseneck | minimum +/-5 deg |
| Automatic grease system | incl. 5th wheel |
| TPMS system | tire monitoring |
| Extra hinged seat in cab | for the instructor |
| Front mounting plate for snow plow | |
| Front hydraulic outlets to control snow plow operation | 2 hyd. function |
| Rear hydraulic outlet for driving a sand spreader | 1 hyd. function |

**SITE CONDITIONS**

| | |
|---|---|
| Ambient Temperature | Range -25°C to +45°C |
| Humidity | Up to 95% |
| In Service Wind | Sustained 22m/sec, Gust 25m/sec |

**DEFECT LIABILITY PERIODS (DLP)**

| | |
|---|---|
| Entire tractor & accessories after taking-over | 2 Years |
| Structure | 5 Years |
| Components repaired during DLP | 1 Year or balance of DLP |
| Software upgrades | Throughout DLP |
| Paint | 5 Years |
| Galvanizing | 5 Years |

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# 1 TERMINAL TRACTOR TECHNICAL SPECIFICATION

## GENERAL TECHNICAL SPECIFICATION

### 1.1 MATERIALS

1.1.1 Materials used in the tractor shall be new and of the best quality, suitable for the duty.

1.1.2 Materials shall be free from flaws. All castings shall be smooth, sharp and free from blowholes, with ample fillets, and correctly centralized cores. All structural sections and plate shall be free from scale.

1.1.3 No plates, flat bars or angles used in load bearing structural members, including platform supports, shall be less than 6mm thick.

### 1.2 WORKMANSHIP

1.2.1 Workmanship shall be of the highest standard
All plates, sections, etc. shall be straightened or curved as may be required by pressure and not by hammering.

1.2.2 Burrs on all material shall be removed before painting. Screw threads shall be accurately produced in accordance with designer's specification and classification.

### 1.3 QUALITY CONTROL AND INSPECTION

1.3.1 The manufacturer shall submit evidence that a formal system of quality control is applied to all purchased materials and equipment.

1.3.2 Reasonable access shall be provided by the manufacturer to the Purchaser's inspecting authority which may be requested to attend the manufacturer's works, or works of the manufacturer's sub-contractors, during construction.

1.3.3 Load tests shall be carried out prior to shipment. Notwithstanding this the unit will again be checked and will undergo a full operational inspection including proof load test on arrival at the Purchaser's site.

1.3.4 The following definitions determine the extent to which substitutions may be produced.

"OR APPROVED EQUAL" material, products, or service require approval by addendum prior to the proposal due date. Materials, products or services which the Vendor proposes to substitute, and which he/she considers equal to those specified, must be submitted to the Purchaser, Baltic Container Terminal (BCT), Head of Engineering, not later than 10 days prior to the proposal submittal due date. Requests shall be accompanied by complete technical data and such pertinent information and/or samples as necessary, or as specifically specified, to fully identify and apprise the material, product, or service. Approval of materials, products, or services deemed equivalent will be issued by addendum prior to the proposal submittal due date.

"OR EQUAL" materials, products, or services do not require approval prior to the proposal submittal due date. Materials, products, or services which the Vendor proposes to substitute and which he/she considers equal to those specified shall be submitted to BCT, Head of Engineering for approval. The proposed substitution shall anticipate necessary lead-time required for approval by the Terminal and procurement by the vendor. Such submittal shall be accompanied by complete technical data and such pertinent information as necessary to fully identify and

appraise the material, product, or service. No increase in the contract price or time will be considered when substitution is not approved.

# 2 MECHANICAL TECHNICAL SPECIFICATION

## 2.1 MECHANICAL DESIGN

This section covers the provision by the Contractor for all labor and materials supplied:

2.1.1 to design, manufacture, ship and install the necessary mechanical materials, equipment and appurtenances;

2.1.2 to shop test as far as practicable and to field-test the entire mechanical equipment of the tractor.

## 2.2 GENERAL

2.2.1 Responsibility for the reliable operation of the equipment in accordance with the requirements of this Specification shall be borne entirely by the Contractor. The Contractor shall demonstrate with his drawings and specifications and with the required tests that the equipment is capable of performing all of the required functions with minimum of downtime.

2.2.2 The mechanical equipment shall be designed to be fully capable of operating the Tractor reliably at the specified requirements on a continuous duty cycle, safely with minimum noise, vibration and maintenance.

2.2.3 All parts of the mechanical equipment shall be designed so that they may be easily assembled, adjusted, removed for replacement and easily accessible for lubrication, inspection, maintenance, and repair. Emphasis shall be placed upon quick replacement of faulty or worn parts as opposed to repair in place. Where necessary for access, permanent platforms, walkways, handrails, stairways and ladders shall be provided.

2.2.4 The design shall be system safe as far as practical so that the failure of a component or loss of power precludes accidental lowering or coasting out of control.

2.2.5 Parts, components, and purchased sub-systems shall be readily accessible in the country of operation.

2.2.6 All materials shall be identified by reference to the specification of an internationally recognized standard association with indication of equivalence to a local standard where applicable.

## 2.3 DESCRIPTION OF WORKS

2.3.1 The Terminal Tractor shall comply with the requirements of the European Machine Guidelines, particularly Machinery Directive 2006/42/EC, Technical Specifications, appropriate National and Local Standards, Statutory Orders, Regulations, Acts and Codes that apply. The tractors have to be provided with a declaration of conformity and the CE marking and symbol according to the relevant annexes of the Machinery Directive.

A certificate of conformity shall be supplied with the tractor on delivery.

## 2.4 AREA OF USE

2.4.1 The tractor will be required to operate only within the confines of the Purchaser's port boundaries.

## 2.5 GENERAL DESCRIPTION

2.5.1 The tractor shall be designed as a container-handling unit for heavy-duty terminal applications. It shall be mounted upon pneumatic rubber-tired wheels and shall be powered by a diesel engine via an automatic transmission unit. It shall be complete with a single forward facing, forward control, fully enclosed left hand drive cab.

2.5.2 The tractor shall be fitted with an elevating and active fifth wheel table and shall be capable of withstanding an imposed fifth wheel load of min. 36,000kg and towing a gross combination weight (GCW) of 70,000kg.

2.5.3 The driver shall be able to operate all the main motions from within the cab including the hydraulic rams used to raise and lower the fifth wheel table which locates and supports the mating terminal trailer. The tractor shall be designed to supply the electrical and compressed air circuits needed to control the standard road lighting and braking systems of the associated terminal trailer.

2.5.4 The design of the terminal tractor shall recognize that the machine will be subjected to an arduous duty cycle. Particular attention shall be given to maintainability.

The tractor will be operating on a continuous 24 hour day, 7 days per week operation interrupted only as required for Contractors recommended maintenance.

2.5.5 The tractor shall be designed for use with a fifth wheel terminal trailer to form a combined unit mainly for transferring ISO Freight Containers between ship to shore cranes and stacking areas. This distance varies between 250m to 5 km.

## 2.6 STRUCTURE

2.6.1 The tractor shall be constructed from standard hot-rolled steel sections. The steel grades shall be of weldable quality not requiring special temperature conditions for repair works.

2.6.2 The structure shall be so designed that water pockets are not formed in any member or by the inter-section of members and be such that there shall be no unsealed blind areas where paint cannot be applied. Adequate drainage holes shall be provided to discharge water clear of the structure in all cases where there is a tendency for water to collect.

## 2.7 LOAD CAPACITY

2.7.1 The tractor shall be designed to tow a gross trailer weight of 70,000 kg when connected to the load by the fifth wheel table locking mechanism.

2.7.2 The tractor shall also be capable of towing a gross weight of 70,000 kg through the standard towing attachments provided at the rear of the tractor.

## 2.8 SPEED OF OPERATION

2.8.1 Unladen

The maximum speed when traveling unladen shall be up to 35kph limit.

2.8.2 Laden

When towing a gross trailer weight of 70,000 kg the maximum speed of the combined unit shall be no less than 24 km/h.

2.8.3 Fifth Wheel Raise/Lower

When fully laden the time to raise the fifth wheel from its lowest to its highest position shall be about 10 seconds as measured with tractor stationary in neutral gear.

## 2.9 OPERATORS CABIN

2.9.1 The tractor shall be provided with a weather-tight, totally enclosed, forced ventilated, air conditioned, single man, forward facing, forward control, left hand drive operator cabin, robustly designed and constructed to provide the Operator with a safe, practical and efficient working environment.

2.9.2 The air conditioning unit shall be sized to maintain internal cab temperature of 20°C maximum under all external ambient temperature conditions up to and including 45°C. An adjustable thermostat, within reach of a seated operator shall be provided.

2.9.3 Access

The cabin shall be equipped at least with a rear sliding door opening onto an access platform or similar system to facilitate the easy coupling/uncoupling of trailer brake and lighting connections without necessitating the operator to dismount from the tractor. An additional driver side door is also acceptable.

2.9.4 Mountings

The cabin shall be isolated from the engine compartment and the tractor chassis, by heavy-duty rubber cushioned mountings and a rear cabin air suspension. To provide access required to maintain and or remove the engine and transmission easily, the cab shall be arranged to tilt forward by 45 degrees. The tilting mechanism shall be an electric over hydraulic pump system.

2.9.5 Noise Level

The maximum noise level at the operator's head level shall not exceed the following decibel levels at the defined governed engine speeds with the tractor stationary on either concrete or asphalt pavement:

i) At operator's head level with doors and windows closed

| | |
|---|---|
| In operator's cabin – engine idle speed | max 68 db (A) |
| In operator's cabin – engine governed speed | max 75 db (A) |

These noise levels shall be the maximum levels occurring while the tractor is operating on either a concrete or asphalt surface.

The combination of sound insulation, covering material and associated adhesives shall comply with local Health and Safety Requirements and the Contractor shall state the classification of this combination.

2.9.6 Windows

The cabin shall be fitted with fixed laminated front, rear and roof screens, door and off-side sliding windows mounted in rubber. All windows should be equipped with sun visors.

2.9.7 Windscreen Wipers and Washers

Electrically operated, self-parking windscreen wipers shall be provided for the front and rear windows.

2.9.8 Seat

An air suspended seat approved by Purchaser unit shall be fitted which has adjustments for height, distance from the front window, angle of squab, back rest and degree of suspension. The seat shall be covered in black ventilated, non-slip type material. The operator seat shall be swivel type. The swivel seat together with the steering column, accelerator and brake pedals shall enable the tractor to be driven in reverse direction with the operator also facing the reverse direction.

2.9.9 Mirrors

A rear view mirror shall be provided inside the cabin together with two external heavy duty glass mirrors mounted on robust brackets one each side of the cabin (mirrors 400 mm H x 175 mm W minimum view) to provide a clear view along both sides of a connected terminal trailer. Mirrors should be equipped with heating system

2.9.10 Air Conditioning and Ventilation

An adequate system of air conditioning and ventilation shall be provided such that the temperature inside the cabin can be maintained at 20$^{o}$C in ambient temperature up to 45$^{o}$C.

Air-flow shall be arranged such that de-frosting and de-misting operations may be efficiently carried out on all primary windows.

2.9.11 Controls and Instruments

The Operator's cabin shall be equipped with the following controls, instruments and warning alarms as a minimum requirement:

Engine Gauge and Warning Panel:

Coolant Temperature Gauge
Oil Pressure Gauge
Speedometer in KPH
Tachometer
Air Pressure
Transmission Temperature
Engine Oil Temperature
Fuel Gauge
Air Diffuser Control
Headlight Switch
Panel Lights Dimmer
Water in Fuel
Check Engine Indicator Light
Stop Engine Indicator Light
LH Turn Signal Indicator Light
Low Fuel Level Light
Headlight High Beam Indicator
Reversing Alarm

Cab Control Panel:

Voltmeter
Hour meter
Floodlight Switch
Ignition Switch
Heater Controls
Hi Beam Indicator Light
RH Turn Signal Indicator Light
Heater Fan Control
Transmission Temperature Indicator Light
Brake Air Indicator Light
Wipers Switch
Hazard Light Switch
Horn
Air Conditioning Controls
4x4 drive indicator light and switch
Switch lock and indicator light for active tilt boom system
Gearshift lever on the right side of the steering column
The accelerator pedal on the right side of the steering column
The brake pedal on the left side of the steering column

Brake Control Panel:

Standard Air Gauge
Tractor Park Control
Trailer Park Control

Operations Panel:

5th Wheel Control
5th Wheel Latch
PTO/Air PTO Control

Warning alarms:

High water temperature buzzer
Low coolant level warning light and buzzer
Low engine oil level warning light and buzzer
Low engine oil pressure light and buzzer
Low air pressure light and buzzer
Low fuel level indicator light and buzzer
Fifth wheel 'Locked' and 'Unlocked' indicator lights

All warning alarm indications shall be mounted in the dashboard and grouped together whereby all the warning lights and labeling can be easily read and identified by the operator without movement of his head away from the front windscreen.

2.9.12 Flooring

To be designed to promote cleanliness by the elimination of recesses into which debris is likely to collect and where ribbed flooring is used to ensure that the ribs can be swept easily towards the door of the cabin.

2.9.13 Mobile Radio and Terminal RF Supply

Permanent mounting shall be provided inside the drivers' cabin at the front right hand side at roof level in order that Purchaser can install a mobile communications radio unit. The enclosure shall permit a radio with the following maximum dimensions, H 6cm x W 19m x D 26cm, to slide into position and allow electrical connections to be made at the rear.

A regulated two Power Supply within the range 12 to 13.6 Volts DC (Negative Ground) shall be installed and protected through an appropriately sized circuit breaker. A cable shall be routed from a dedicated Circuit Breaker to the radio

enclosure. Current drain characteristics for this type of radio equipment shall not exceed 10 Amps.

An aperture shall be provided at or near radio location for installation of coaxial R 58 cable connecting to an externally mounted aerial. Aperture shall be fitted with appropriate waterproof fitting ready for acceptance of coaxial cable.

2.9.14 Additional Fitments

i) Strobe Light with amber lens strobe shall be fitted to the top of the cabin. Vertical light shall be restricted by an overhead shield to prevent glare for Crane Operators.

ii) Floodlight mounted onto the rear of the cabin to illuminate the 5th wheel table area.

ii) Fire extinguisher - one (1) ABC powder type fire extinguisher of 2 kg capacity shall be mounted inside the cabin.

## 2.10 ENGINE

2.10.1 The engine shall be specified in force emission standards ( EU Stage V) and in full compliance with all latest Site, Region and/or Country environmental regulations applicable today and in near future.

2.10.2 The tractor shall be powered by a diesel engine appropriately rated to provide continuous operation according to the specification hereby defined.

2.10.2 Exhaust shall be heavy-duty upswept type manufactured from stainless steel.

2.10.3 The engine shall be fitted with automatic shutdown "safety circuits" in event of loss of oil pressure, low coolant level or high water temperature. The system shall be "circuit safe" whereby interruption of an electrical signal will identify an unhealthy condition and shut down the engine. Indicators shall identify the reason for shut down and remain illuminated after the engine has stopped.

## 2.11 FUEL TANK

2.11.1 A fuel tank shall be provided giving good access for refilling and maintenance yet suitably protected against impact damage. A strainer shall be incorporated into the filler neck and an inspection plate which will permit access for cleaning inside the entire tank. The capacity of the tank shall be minimum 180 liters. An easily accessible water trap shall be provided in the fuel line designed to collect all impurities before the fuel reaches the injectors. The diameter of the fuel filler should be 70 mm.

## 2.12 TRANSMISSION/TORQUE CONVERTER

2.12.1 The tractor shall be fitted with fully automatic transmission system incorporating a torque converter giving minimum 4 speeds 'forward' and minimum 3 speed 'reverse'.

2.12.2 Convenient access to the dipstick/filler shall be provided.
Oil cooling shall be provided.

2.12.3 An inhibitor shall be fitted to prevent reverse direction selection whilst road wheels are rotating forward (and vice versa).

## 2.13 AXLES AND SUSPENSION

2.13.1 Front axle

Heavy duty drive axle with semi-elliptical laminated leaf springs or parabolic leaf springs to provide the suspension system in conjunction with shock absorbers. Gearbox type power steering with mechanical backup. Switching on the drive front axle via a switch located in the terminal tractor cabin.

2.13.2 Rear axle

Heavy duty reduction drive axle incorporated within the tractor chassis frame, shall be capable of absorbing maximum fifth wheel load at full rated speed and be fitted with an approved form of pneumatic suspension, which provides positive suspension until the load applied to the fifth wheel table reaches a pre-set value which shall be no less than 9,000 kg. When a load in excess of 9,000 kg is imposed upon the fifth wheel then the axle shall make contact with rubber faced chassis pads effectively making a solid mounting arrangement. Should possess an axle drive lock.

## 2.14 WHEELS AND TIRES

2.14.1 Spigot mounted wheels shall be supplied for both front and rear assemblies. The Contractor shall determine the tire/rim size to suit the duty specified. Each terminal tractor must be equipped with a complete spare wheel.

## 2.15 BRAKING SYSTEM

2.15.1 A 'dual circuit' air operated tractor braking system with dual controlled brake connection for the trailer braking controls shall be provided.

2.15.2 Normal service braking

Both brakes on the tractor axles, which shall be of the direct air-operated type and the trailer service line, shall be actuated via a pedal-operated valve. The tractor brakes shall be of the cam-operated type or equivalent.
Ratchet brake self-adjustable type shall be installed in all wheels.

2.15.3 Parking and Emergency braking

An independent, hand-operated valve shall be provided to actuate all tractor brakes and the trailer service line.

2.15.4 Trailer connections

Standard SAE/SMMT palm type forged couplings for a two-line braking system shall be provided complete with yellow and red 'Susie' flexible hoses fitted with a 150 mm long rigid tube between the hose end and the coupling to facilitate connection. Three (3) dummy housings in the form of a vertically mounted open steel tube approximately 100 mm inside diameter shall be mounted at the rear of the cabin to locate and secure each coupling when not in use.

2.15.5 Auxiliary air connection

A connection shall be provided at the front or side of the tractor to enable the air reservoirs to be pressurized from an external source, thus enabling the brakes to be released without running the machine's engine.

The connection shall be a standard forged type palm coupling (glad hand) with a non-return valve.

2.15.6 Drain valves

Drain valves shall be fitted to the compressed air circuits and shall be located at an easily accessible point to facilitate regular manual draining.

Air reservoirs shall be equipped with automatic moisture ejector valves.

2.15.7 Air dryer for compressed air circuit

To reduce problems associated with the condensation of water vapor within the compressed air circuit a thermostatically controlled air dryer shall be provided.

## 2.16 SEMI-TRAILER COUPLING (5TH WHEEL)

2.16.1 A min 36,000 kg capacity fifth wheel plate shall be mounted onto the tractor lifting arm assembly which shall be designed, as a minimum, for a minimum imposed fifth wheel load of 36,000 kg. Should also be able to use gooseneck

2.16.2 The fifth wheel plate shall be designed for 50.8 mm (2") diameter kingpins. A well-protected air-operated release mechanism actuated from the operator cabin by a push-button control station well-guarded against accidental operation shall be provided.

2.16.4 Warning lights shall be provided in the Operator's cabin to indicate that the fifth wheel is locked or unlocked when the light is illuminated.

2.16.5 Tractors shall be supplied with 460mm of table lift: The fifth wheel height when fully lowered shall be no greater than 1155mm. When fully raised, height shall be no less than 1600mm.

## 2.17 BODYWORK

2.17.1 Heavy duty rolled steel sections and steel plate covers shall be provided to give full all round mechanical protection to the chassis members and to the side fittings such as air reservoirs, fuel tanks, batteries and hydraulic tanks.

Where steel plate covers are used to protect components, which require regular inspection, maintenance or replenishment then a means of easy access shall be provided. Particular care shall be given to the selection of hinges, which may be subjected to wear or corrosion because of the prevailing conditions.

2.17.2 Access, platforms, stairways and handrails shall comply with European Machinery Directives and European Standard EN 13586:2009-05.

2.17.3 All horizontal steel cover plates, which may be used for access, shall be treated with a proven, durable anti-slip surface.

2.17.4 Built-in recesses and/or steps shall be provided for access to and from ground level and where required corrosion resistant 'hand-holds' shall be fitted.

2.17.5 Where sections of the engine exhaust system are adjacent to an access route or where they may be used as handholds then substantial temperature shielding shall be provided.

## 2.18 MUDGUARDS

2.18.1 Mudguards shall be fitted over both front and rear wheels.

At the front of the tractor the mudguards shall be fabricated as an integral part of the bodywork incorporated into the access walkways and mechanical protection system

At the rear synthetic material molded to form a mudguard shall be used supported by a rigid mounted tubular construction bolted to the main chassis frame.

2.18.2 Mud deflectors are to be fitted to protect the engine, hydraulic tank, air filter and dryer and side of bodywork.

### 2.19 TOWING FACILITIES

2.19.1 The tractor shall be provided with towing facilities at both front and rear. Where practical these shall be formed as an integral part of the front and rear bumpers respectively and recessed into those members. The rear shall be designed to tow trailers or rolling stock of gross weight up to 70,000 kg and shall be complete with captive carriage pins.

2.19.2 The towing facility shall be designed to provide a suspended tow from the front or rear attachment in the event the tractor has to be lifted following a failure.

## 3 ELECTRICAL SPECIFICATION

### 3.1. ELECTRICAL SUPPLY SYSTEM

The electrical system shall be designed and installed in compliance with Society of Automobile Engineers current standards.

3.1.1 Supply Capacity

A 24 volts D.C. supply system shall be provided by adequately sized two 12 volt batteries each with a minimum inrush current of 140 Ampere.

3.1.2 Isolation Switch

A battery isolation switch shall be provided in an accessible and clearly marked position outside the cabin.

3.1.3 Lighting

The headlights shall be of highway standard with both dipped beams and head beams. Stop and tail lights incorporating reflectors shall be all wired through the key switch.

The head lamps shall be able to withstand the vibration encountered in this type of operation.

Directional indicators, flashing type front and rear.

Floodlight LED type equivalent of 65 watts, 24 volts, mounted adjacent to the roof of the cabin via a bracket.

Cabin interior dome light shall be of the type which has the lens secured by recessed Allen screws.

All externally mounted driving lights shall be recessed into the structure and protected against impact damage.

Anti-theft mountings shall be provided where practical.

3.1.4. Audible Alarms

i) Electrically actuated, pneumatically operated warning horns shall be provided. These horns shall be directly connected into the main pneumatic system of the tractor.

ii) An electrically operated audible reversing alarm shall be fitted which shall be automatically actuated when 'reverse' gear is selected.

3.1.5. Strobe Beacon

An amber, cab-roof mounted, rotating beacon shall be supplied complete with an overhead shield, mounted to withstand vibration.

3.1.6. Trailer Connections

The tractor shall be provided with a standard 7 pin compatible socket with a complete with flexible lead, hardwired one end. A dummy housing shall also be provided on the tractor to locate the socket when not in use. More details will be provided on the later stage of tender.

3.1.8. Wiring

Electrical Wiring shall be designed and installed according to National and Local Standards, Statutory Orders, Regulations, Acts and Codes that apply in compliance with the following recommended practice, inclusive of color code & circuit identification.

# 4 HYDRAULIC SYSTEM

## 4.1. HYDRAULIC SYSTEM

4.1.1. Pump

Main hydraulic system pressure shall not exceed 225 Bar. The hydraulic system shall consist of one separated pump. To ensure safe maneuverability at all moments, priority supply while tractor is driving shall be directed to the steering system.

4.1.2. Lifting rams

The tractor shall be supplied with two heavy-duty double-acting, single stroke lifting rams which shall be mounted on gimbals in the chassis frame or in a alternative manner to facilitate replacement. Particular attention should be given to the clearance beneath the rams in order to minimize ground impact damage. Lifting rams have to equipped with active tilt boom system which bevel fifth wheel in range minimum +/- 5 degrees. The switch lock for active tilt boom system should be located in tractors cabin.

4.1.3 Fifth Wheel Inhibit

A 5th wheel inhibit mechanism shall be set to 225mm lift to prevent the fifth wheel being lowered below specified height when driving.

## 4.2. STEERING

4.2.1 Steer System

The tractor shall be provided with a heavy-duty orbitrol hydrostatic steering system to the front wheels and mounted outside of the cab.The hydraulic steering circuit shall be independent of the other systems and be equipped with a pressure relief valve to limit the maximum system pressure.

# 5 PAINTING SYSTEM

## 5.1. PAINTING SYSTEM

5.1.1 During construction and after fabrication has been completed, the tractor shall be thoroughly cleaned and painted in a manner as specified using paint products approved by the Purchaser and in accordance with paint manufacturer's instructions.

5.1.2 Painting system shall be suitable for "Exterior exposed polluted coastal atmosphere" and in accordance with the standard.

Typical time to first maintenance 10 years.

5.1.3 Color

The color scheme for the Tractors shall be:

i) Chassis including bumpers

Traffic Black RAL 9017

ii) Operator's Cab and wheels

Traffic Orange RAL 2009

Refer to Appendix Two for details of paint scheme, Purchasers logo and asset number location.

5.1.4. Logo and Identity Number

The Purchasers Logo to be applied as defined in Appendix Two

Plant Identity Numbers shall be applied as shown in Appendix Two.

**Note: Exact location of logo and plant numbers may vary according to tractor design, but the contractor shall submit drawings to Purchaser for approval.**

# 6 SAFETY, INSPECTION, DRAWINGS AND MAINTENANCE MANUALS

## 6.1. SAFETY PROVISIONS

6.1.1 In the design and construction of the tractor, all local safety legislation shall be observed.

## 6.2. INSPECTION

6.2.1 Contractor shall submit a "Tests on Completion" schedule 4 weeks prior to "in house" testing for Purchasers review.

6.2.2 The Purchaser may carry out of inspections prior to and during manufacture at the Contractor's works either with one of his own inspectors or by an outside appointed inspector. The contractor shall allow access for the purpose of these inspections.

## 6.3. DRAWINGS

6.3.2 Following placement of the order, the contractor shall submit for review to the Purchaser general arrangement, fully dimensioned detail drawings and schematic diagrams.

6.3.3 The drawings and diagrams shall be checked by the purchaser so far as it is possible with the information in his possession.

6.3.4 Approval of drawings, whilst made in good faith, does not remove from the contractor his responsibilities and does not carry with it responsibility for subsequent alterations which the contractor may find necessary as the work proceeds.

6.3.5 The contractor shall provide two copies of the above drawings as modified and approved immediately prior to commencement of Acceptance Testing.

6.3.6 On completion of the contract, a copy of 'as made' drawings shall be supplied on disc in PDF Format, and copies of spare part schedules shall be supplied at the Contractor's expense to the purchaser within one month of Completion.

6.3.7 The drawings shall include such details as:

i) Circuit diagrams, wiring diagrams and schematic diagrams of all electrical equipment.

ii) Hydraulic schematics, piping diagrams.

iii) Fully dimensioned detail drawings of all major components and assemblies.

iii) General Arrangement of the tractor.

## 6.4. MAINTENANCE AND OPERATION MANUALS

6.4.1 Two copies of good quality printed maintenance instruction manuals per contract in English and Polish language covering in detail the operation and maintenance of the tractor shall be provided immediately prior to Acceptance Testing. A PDF copy of the maintenance manual shall also be provided separately.

6.4.2 The following shall be included in the Maintenance Manual:

i) Index.

ii) Full technical specification and detailed description of the terminal tractor as a whole and of each item of machinery and equipment for guidance of the maintenance staff and management. Where the Contractor's standard published literature is used, it shall be suitably edited to delete irrelevant information.

iii) General arrangement and layout drawings in PDF format (Minimum A2 size), with appropriate cross-referencing to other drawings), schematic diagrams for power and control circuits whether electrical or hydraulic etc. The control sequence shall be fully described. General arrangement drawings shall show all leading dimensions, and a visual chart of safe working loads.

iv) Performance characteristics, copies of Works and Site Test Certificates, recommended settings of adjustable features, necessary.

v) Detailed list of all "As-Fitted" drawings as called for under the contract and supplied separately.

vi) Recommended schedules and programs for inspection, lubrication and routine maintenance. Lubrication charts and specifications. Full technical details for operation, adjustment, maintenance and testing of equipment and control.

vii) A means shall be provided for systematic trouble shooting, to enable detection and analysis of faults, with recommendations as to dealing with different types of problems likely to arise. This shall take the form of a compendium of cause/effect/solutions based upon experiences reported by users of the equipment split between electrical and mechanical systems.

viii) Dismantling, repair, assembly, setting up and testing procedures and instructions, including electronic 'black box' units, for the whole of the equipment being purchased, fully illustrated. These shall include exploded views of all main components with part numbers shown to assist in dismantling and re-assembling complicated items and for identifying replacement parts.

ix) Spare parts lists, Contractor's part numbers and the actual source manufacturers (if applicable), part numbers, together with source manufacturers address for ease of cross reference identification when ordering.

x) Special tools and instruments required, if any, for testing, maintenance and repair work.

xi) Description of special safety features such as safety interlocks; limits; indication; warning and cut-out devices, etc. Testing adjustment and maintenance procedures for such devices and circuits. Special hazards and precautions to be taken by maintenance staff.

6.4.3 Two copies of good quality printed Operation Manual per tractor in English and local language /Polish/ covering in detail the operation and maintenance of the tractor shall be provided immediately prior to Acceptance Testing. A PDF copy of the maintenance manual shall also be provided separately.

6.4.4 The following shall be included in the Operation Manual:

i) Index

ii) Full technical specification and detailed description of the terminal tractor as a whole and of each item of machinery and equipment for guidance of the Operation staff and management. Where the manufacturer's standard

published literature is used, it must be suitably edited to delete irrelevant information.

iii) Description of special safety features such as safety interlocks; limits; indication; warning and cut-out devices, etc. Operating procedures for terminal tractor. Special hazards and precautions to be taken by Operation staff.

(iv) The operating instruction manual shall clearly state the start up procedure of every device on the Terminal Tractor including all bought-in equipment, and all the points to be observed or checked during the start up.

(v) Corrections shall be made for any changes made in the instructions during the commissioning period, and the revised instruction books shall be submitted one (1) month after the notification of successful completion of the Tests on Completion of the first Terminal Trailer(s)

| **Manuals** | **Language** | **Copies / Order** |
|---|---|---|
| Operators manual | **Polish & English** | **2** |
| Maintenance manual | **Polish & English** | **2** |
| Spare parts manual | **English** | **2** |

# 7 TRAINING

## 7.1. PRODUCT TRAINING

7.1.1 The Contractor shall provide detailed product training for four Purchaser's engineers at the Purchaser's Site for a period of three full working days.

7.1.2. The following shall be included;

i) Training documentation and or materials as required.

ii) Certificate of Attendance for each attendee of manufacturers training completed.

iii) Details of course content shall be submitted to the Engineer at least 1 months before the scheduled delivery date.

# 8 MAINTENANCE TOOLS

## 8.1 ELECTRICAL/ELECTRONIC TOOLS

(i) One laptop /diagnostic tool/ with original software to communicate with Engine Control Module (ECM) and Transmission Control Module (TCM) shall be provided along with any instructions for use. The operating license shall be assigned to the Purchaser and training shall be provided for its application.

## 8.2 MECHANICAL TOOLS

The following mechanical tools shall be provided per contract:

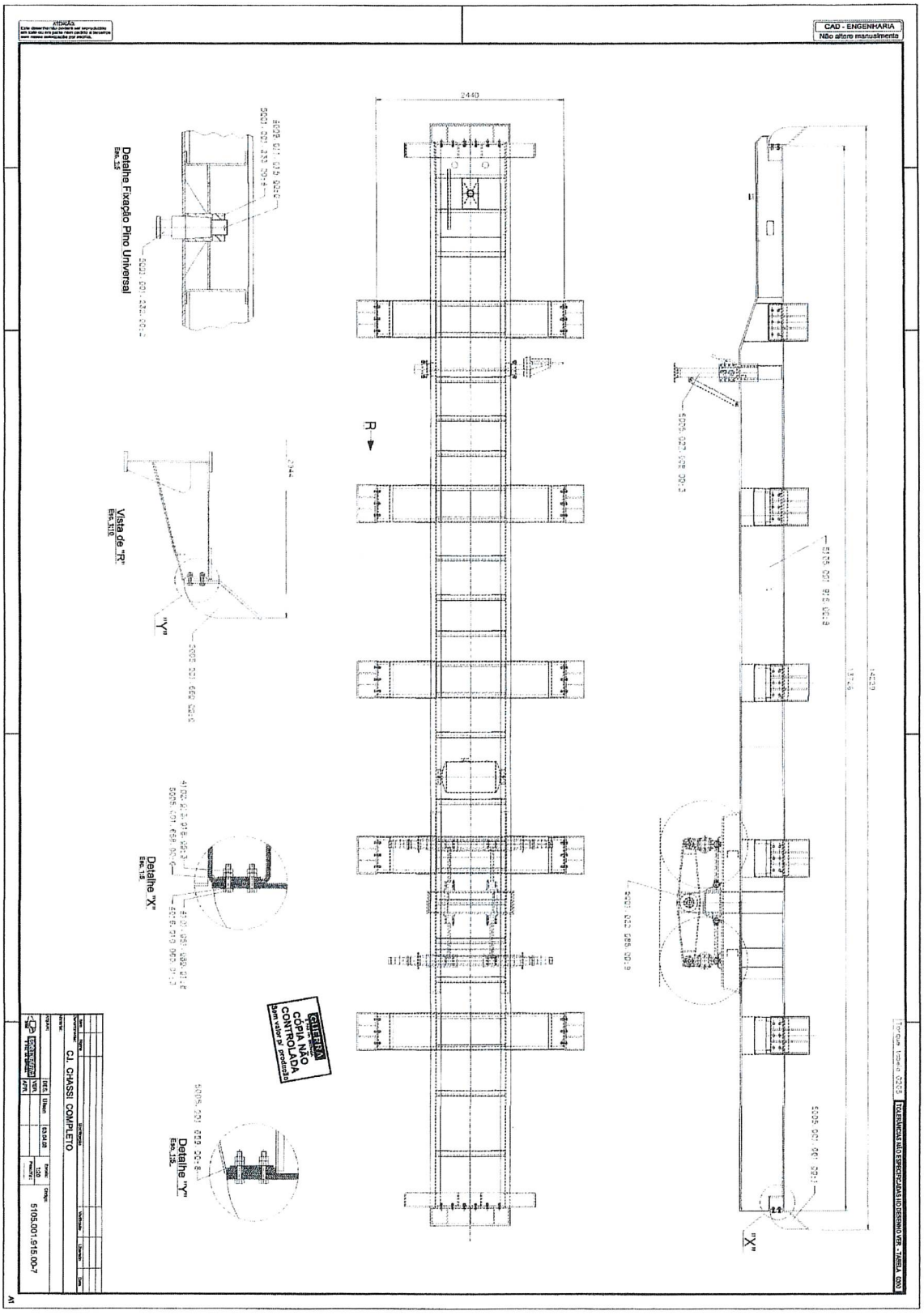
(i) Plug-in pressure gauges for the Hydraulic System - two (2) sets.

(ii) Set of long access Allen and Torx Keys to adjust hydraulic pumps, fit solenoids and maintain other hydraulic components - two (2) sets.

(iii) Torque Wrench with socket sets – two (2) sets.

(iv) Tool Box – two (2) sets.

# 9 Appendix One – Drawing of Chassis



# 10 Appendix Two – Corporate Livery and Identification

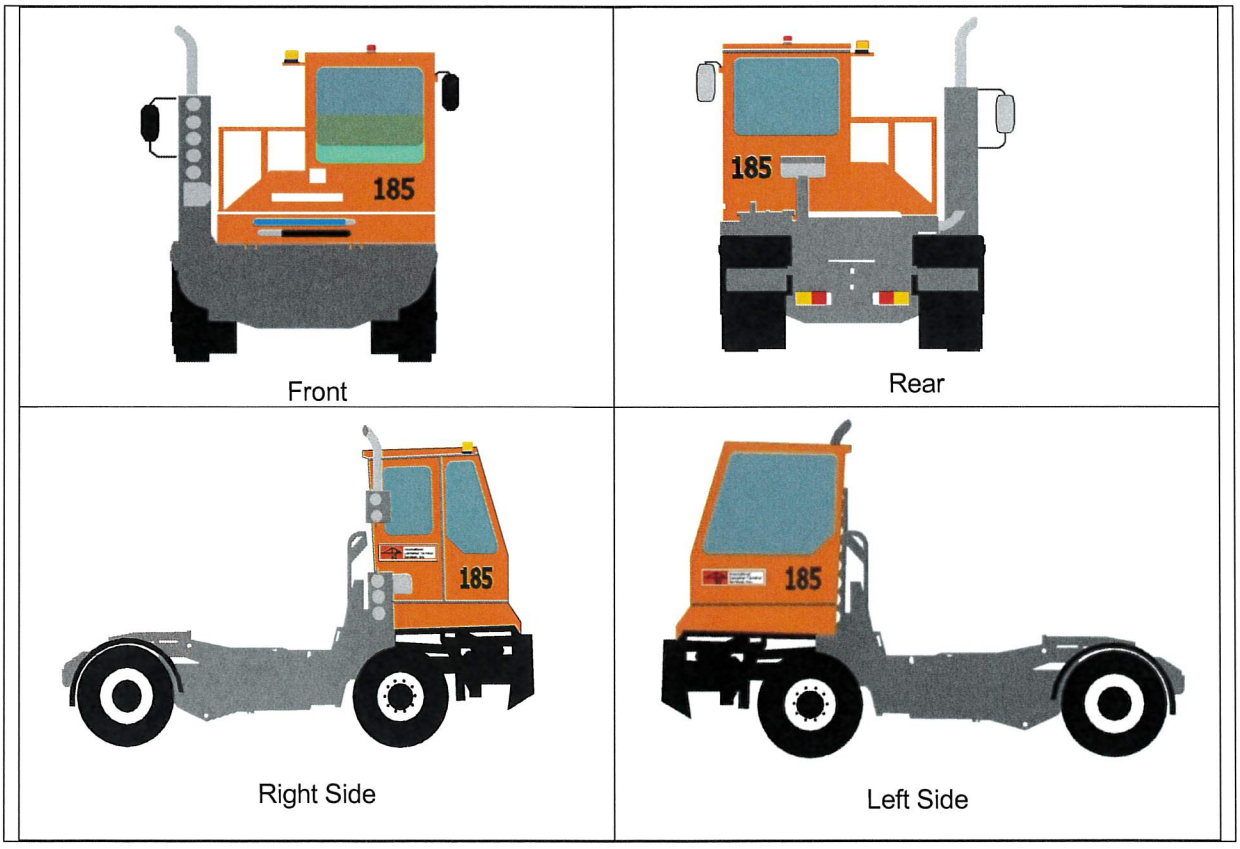
The following paint color scheme based on the RAL standard shall be used for the final finish coat. For comparison, the original register cards issued by RAL shall be the controlling reference.

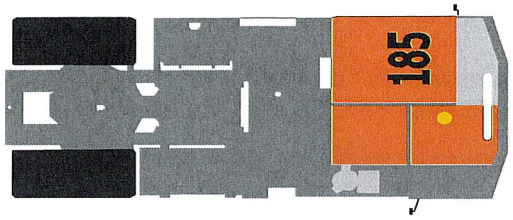
| PAINT COLOR | ITEM | COMMENTS |
|---|---|---|
| | | |
| Traffic Orange<br>RAL 2009 | Main Cab Structure | Exterior Only |
| Traffic Black<br>RAL 9017 | Chassis | |
| Traffic White<br>RAL 9016 | Wheel Rim | |

## Asset Number and Decals:

| Description of Equipment | Purchaser's Asset Number | Comment |
|---|---|---|
| | | |
| Terminal Tractor No. 1 | | |
| Terminal Tractor No. 2 | | |
| Terminal Tractor No. 3 | | |
| Terminal Tractor No. 4 | | |
| Terminal Tractor No. 5 | | |
| Terminal Tractor No. 6 | | |
| | | |
| **Asset Numbers color is Traffic Black RAL 9017 in Arial Bold Font x 250mm High** | | |

## Livery Designation






Top Side

BCT BALTIC CONTAINER TERMINAL GDYNIA

An ICTSI Group Company

**- END -**