

# TECHNICAL AND FINANCIAL FILE (TFF)

## CONSTRUCTION AND ENHANCEMENT OF INLAND CONTAINER DEPOTS IN ILALA, SHINYANGA AND MWANZA SOUTH

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## GLOSSARY

BTC	-	Belgian Technical Co-operation
CXR	-	TRC Wagon Maintenance Workshop (former EAR terminology)
EOB	-	Embassy of Belgium
GOB	-	Government of Belgium
GOT	-	Government of Tanzania
ICD	-	Inland Container Depot
IDCP	-	Indicative Development Cooperation Program
JLPC	-	Joint Local Partner Committee
JLCB	-	Joint Local Consultative Body
LEAT	-	Lawyers Environmental Action Team
NEMC	-	National Environment Management Council
NSGRP	-	National Strategy for Growth and Reduction of Poverty
MID	-	Ministry of Infrastructure Development
MSC	-	Mediterranean Shipping Company
MOF	-	Ministry of Finance
OECD	-	Organization for Economic Cooperation and Development
PFT	-	Project Formulation Team
PID	-	Project Identification Document
PMU	-	Project Management Unit
PPP	-	Public Private Partnership
PSRC	-	Presidential parastatal Sector Reform Commission
RAHCO	-	Reli Assets Holding Company Ltd.
RRP	-	Railway Restructuring Programme
TICTS	-	Tanzania International Container Terminal Services
TRC	-	Tanzania Railways Corporation
Tsh	-	Tanzanian Shilling (TZS)

## 1. EXECUTIVE SUMMARY

<b>Title of The Intervention</b>	Construction and enhancement of Inland Container Depots (ICD) in Ilala, Shiyanga and Mwanza South		
<b>Partner Country</b>	Tanzania		
<b>National Number DGDC</b>	NN 3000524/11		
<b>Navision Code BTC</b>	TAN 04 014 11		
<b>Sectorcode</b>	210	Subsector	21030
<b>Partner Institution</b>	Tanzania Railway Corporation (TRC)		
<b>Contribution of Partner Country</b>	565.000 EUR (equivalent in TZS)		
<b>Belgian Contribution</b>	1.981.280 EUR		
<b>Total Contribution</b>	<b>2.546.280 EUR</b>		
<b>Estimated Starting Date</b>	September 2006		
<b>Total Duration</b>	24 Months		

The project is aiming to enhance the capacity of the existing Ilala ICD and two build two new ICD's, one in Shinyanga and another one in Mwanza South.

The objectives of the Project are:

- General Objective: Enhance TRC's capacity to transport containerised domestic and transit freight
- Specific Objective: Reduce the turnaround of container wagons from the current 13.9 to 9 days between loadings

## 2. CONTEXT

### 2.1. The situation

Tanzania is a country in the southeast of Africa with an area of 945,087 km<sup>2</sup> of which 6.25% is water and an approximate population of 33 million people. Arable land accounts for 4.3 % of the total land area while the land under permanent cultivation is just above 1% with irrigated land covering 1.550 km<sup>2</sup> (0.2%). Eighty percent of the country is still considered rural.

The Indian Ocean beach of 700 km to the East, Kenya to the North, Malawi, Zambia and Mozambique to the South, Democratic Republic of Congo and Burundi to the West, Rwanda and Uganda to the North West borders Tanzania. These countries form the East and Central African region.

The country is governed under a multiparty political system. Its main activity is agriculture. It is rated among the poorest countries of the world. The Human Development Index in 2005 was 0.418, which ranks the country 164th out of 177 countries. With a GDP of 300 US \$ per capita Tanzania ranks 175th out of 177.

Because of the poor transport infrastructure in Tanzania development is hindered by not being able to deliver its agricultural produce to the market place at affordable prices. Prices in terms of transport are known to be 50% over and above world rates. Some basic import products double in price only because of the malfunctioning of the transport system, thus hampering investment projects and trade in general.

The transport infrastructure is not adequate to cover all the needs of the country. Tanzania has a few thousand kilometres of all weather roads of which only 3,000 km are asphalted. There is also a single-track railway line of 2,700 km with metric gauge (TRC) and 989 km with a 1.067 meter gauge on the 1,860 km long TAZARA railway connecting Tanzania to Zambia.

TRC transport services assure transportation of goods within the country (60% of TRC transport services) and to the neighbouring countries (30% of TRC transport services) and the passenger's traffic (10% of TRC transport services).

TRC has enjoyed the benefits of a multi donor funding for the Railways Restructuring Programme and of the Belgian Government. At present all major donors have put their assistance on hold awaiting the Concession of TRC, except for Belgium and the Netherlands that are assisting TRC during the period of concession.

## 2.2. Tanzanian Government Transport Policy

The Tanzanian government policy in the transport sector is to develop and improve the transport infrastructure to enable its peasantry farmers to bring their produce to the markets at affordable prices and to reduce inland transport costs in general.

To this end the government wishes to privatise the railways operation by the end of the year 2006 in order to make it more competitive compared to other modes of transport.

Privatisation is spearheaded by the presidential Parastatal Sector Reform Commission (PSRC) and is funded by the World Bank who also partly funded the Railways Restructuring Programme (RRP) for rehabilitation of both railways infrastructure and the rolling stock.

## 2.3. Belgian funded Transport Projects

Belgium already took part in transport infrastructure development programs in Tanzania, more specifically in development programs of the lake ports (Kigoma, Mwanza), dry ports and railway infrastructure.

From 1998 to 2005 Belgium provided technical assistance to Tanzania Railways Corporation (TRC) and during this period it also financed the replacement of 280 turnouts on the central and main corridor of the Tanzanian Railways from Dar es Salaam to Mwanza (lake Victoria) and Kigoma (lake Tanganyika).

This technical assistance and the turnout support made TRC more efficient. It led TRC to a growth of the freight tonnage from 1.13 to 1.45 million tonnes between 1999 and 2002.

The success of previous projects with TRC and the recent turnout project led to Belgium financing this ICD project.

Initially, this project was not part of the Indicative Development Cooperation Program (IDCP) 2003-2008. But, during the Annual Consultation on Development Cooperation in November 2004 Tanzania requested additional funding for the ICDs in Ilala, Mwanza and Shinyanga. After some adjustments in the IDCP, Belgium and Tanzania approved this request.

## 2.4. Coherence with other development programs

Rail transportation services are closely tied up with the Tanzanian national development programme and the development of the landlocked neighbouring countries of Burundi, Rwanda and Uganda.

Railway infrastructure projects are in line with :

- **The Tanzania Development Vision 2025** aiming to build a strong and competitive economy through the development of modern and efficient transport and communication infrastructure.
- **The National Strategy for Growth and Reduction of Poverty (NSGRP)** aiming to improve the quality of transport, communications and energy services. More specifically rail, marine, air and road transport networks will be expanded and maintained to international standards.

Macroeconomic and structural reforms, including privatisation of the Tanzania Railways Corporation, are an essential part of the strategy framework.

## 3. PROJECT DESCRIPTION

### 3.1. General objective

The formulation mission has validated the general objective mentioned in the identification document and in the specific agreement signed on 8/12/2005.

The general objective of the project remains:

**“Enhance TRC’s capacity to transport containerised domestic and transit freight ”**

### 3.2. Specific objective

The formulation mission has validated the specific objective mentioned in the identification document and in the specific agreement signed on 8/12/2005.

The specific objective of the project remains:

**“Reduce the turnaround of container wagons from the current 13.9 to 9 days between loadings”**

### 3.3. Beneficiaries

The following beneficiaries will directly or indirectly benefit from the project:

#### Direct beneficiaries

- The Industry and the Farmers: through lower transport costs and better quality of transport (less damage and quality loss, reduced risk of pilferage, faster transit, etc.).
- The Railways (TRC or concessionaire): increased income through better performance in well paying sector of container transport, especially for transit goods.
- The Government of Tanzania, through a railway requiring less government support.

#### Indirect beneficiaries

- The population of Tanzania through: improved way of live, disease reduction and gender equality.
- The road transport sector: through increased haulage capacity with equal capital investment. Long haul of containers is done by railways, local delivery by truck.
- TICTS container terminal in Dar es Salaam: increased container handling capacity at maritime berths through better evacuation of import containers by the railway to inland destinations. Land occupation is now a major concern to the management of the terminal (interview with Managing Director David Cotty on Feb 7)

### 3.4. Results and Activities

#### 3.4.1. THE ILALA ICD HAS BEEN ENHANCED

The PID shows for Ilala the procurement of:

- one reach stacker of 35 Tonnes lifting capacity
- one fork lift for empty containers of 8 Tonnes capacity
- one Coles crane for universal use on the Ilala freight terminal (not specific for ICD project)

The PFT proposed to use the available budget only for the ICD project, and the Coles crane was not considered as an essential tool in the operation of the ICD (as confirmed by the Terminal Managers both in Ilala and Isaka). The Coles cranes in both locations have been out of service for many months now.



The PFT also proposed to only procure heavy lift equipment (reach-stacker). Indeed, if an ICD is equipped with a fork-lift/empty stacker and a reach-stacker/front-loader, than the operation of an ICD may be interrupted frequently as both machines are operationally not compatible: a reach stacker can handle empty units, but a fork-lift or empty stacker can not handle loaded containers: a major handicap in remote area's.

Maintenance of the lift equipment is done by TRC under its Mechanical Engineering Department and the feed-back the PFT got from the terminal managers was very positive. The PFT concludes no specific action or training is needed in this area.

The PFT verified with the importers of excavators and other heavy equipment in Dar es Salaam on the availability of spare parts, as most reach stacker are equipped with standard parts (motor, axles, gear-box, brakes). There is no problem to obtain spares in Tanzania, and no actions have to be taken in this area.

The PFT recommended for the supplier of the stackers to provide a short instruction course on:

- operational aspects of the machine, including the training of a small team of crane drivers
- mechanical aspects of the machine, including the training of a small team of mechanics, in charge of the maintenance of the machines on the ICD's

#### **Activity R.1.1.** Provision of additional container handling equipments

The project will provide one Reach-Stacker for the Ilala ICD. The TRC procurement procedures shall apply and the recommendations for the procurement of the reach-stacker, formulated by the PFT, will have to be taken into account. The procurement guidelines drafted by the PFT should be taken into account. (annex 8.5).

The PFT estimated the total cost for this activity and result at **350.000 €**.

#### **Activity R.1.2.** Improvement of the ICD hard-stand

The Tanzanian contribution will be used for the repair of the concrete slab (hard-stand) of the Ilala ICD

The PFT estimated the total cost for this activity and result at **40.000 €**.

### 3.4.2. THE MWANZA DEPOT HAS BEEN PUT INTO OPERATION

The PID proposes for Mwanza a shed of 2500 m<sup>2</sup>, 4000 m<sup>2</sup> of hard standing and 164 m of railway line.

The PFT visited the Port of Mwanza South and discovered an area perfectly suited to operate an ICD and already equipped with a shed of 980 m<sup>2</sup>, in very good condition.

The PFT, in accordance with Ministry of Finance and Ministry of Infrastructure and Development representatives, changed the nature of the Tanzanian contribution from operational costs to budget costs.

Following principles have been adopted for the implementation of the Mwanza ICD:

- to buy identical handling devices;
- to address environmental issues in the detailed studies, as the drainage systems leads directly to the lake;

After discussions with local TRC staff, stakeholders and business people, the PFT proposed to equip the Mwanza ICD with:

- a hard-stand of 6000 m<sup>2</sup> (parts of a former hard stand have to be rebuilt, and this surface is included in the proposed 6000 m<sup>2</sup>);
- office equipment and lighting.
- fencing: the whole site is part of the port area and is already fenced;
- power: the Port has its own back-up generator, and feeds TRC as well;
- rail-siding is existing but has to be improved;
- the shed is in good condition but needs minor improvements/repair work (interior lighting, etc.).
- two new reach stackers;

As the Mwanza region is mainly an import and transit region, the ICD could also function as a hub for transit containers.

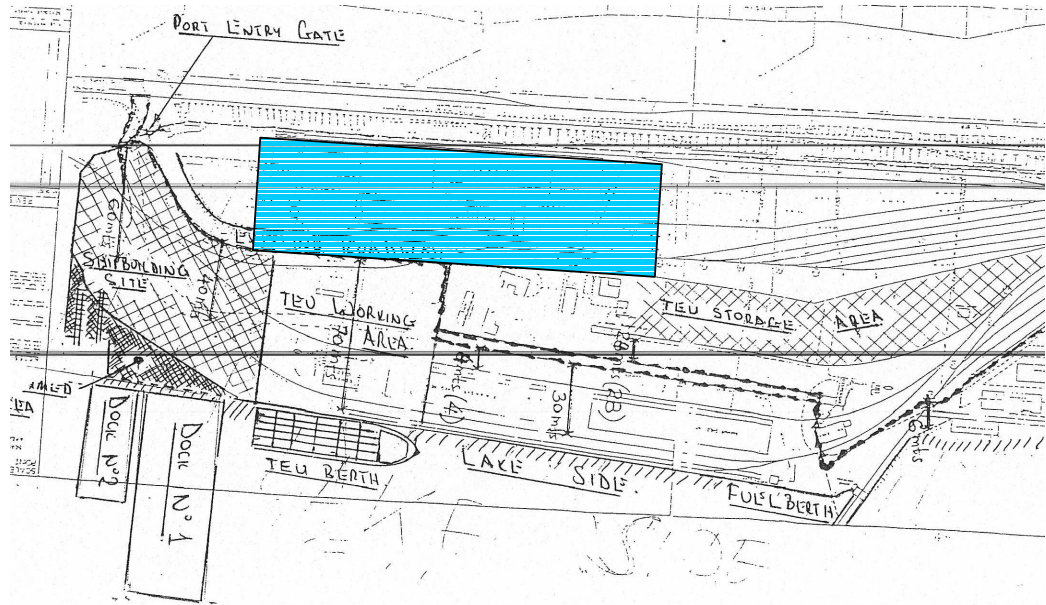
One very interesting project, under development by the Speke Shipping Company, is the construction of a lake container terminal, adjacent to the proposed rail ICD.

Synergy between the two terminals, if built, is obvious in the following areas:

- commercial: containers can be transferred from rail to ship for destinations such as Kampala, Bukoba, etc.
- operational: both sites will use reach-stacker, thus improving operational reliability
- costs: improved cost management through combined negotiating force (ex: rubber tyres)
- staff: exchange of staff in case of illness, accidents, .. but also for training purposes, experience sharing, maintenance, etc.

- a PPP for the later enhancement of the Mwanza south ICD can be envisaged as well

The proposed location of the ICD and the lake terminal is shown below:



The blue zone indicates the location of the ICD, and the lake container terminal is indicated as TEU working area. The two zones are separated by an existing roadway, and this point may need further study in the future. The dotted line shows the proposed split of land between TRC (north of this line) and Marine Services Co (south of the line)

## Activities

### R.2.1. Execution of detailed engineering studies

The engineering studies will be financed on the Belgian “Study Fund”

The recommendations for the engineering study, formulated by the PFT, will have to be taken into account. (annex 8.4)

Total estimated cost: 18.800 EUR

### R.2.2. Implementation of infrastructure works

The TRC procurement procedures for works shall apply and the recommendations formulated by the PFT will have to be taken into account.

The infrastructure works studies will be financed on both the TRC and Belgian budget.

- cost estimate on the TRC budget: 250.500 EUR
- cost estimate on the Belgian budget: 36.500 EUR

### R.2.3. Provision of container handling equipments

The TRC procurement procedures shall apply and the recommendations for the procurement of the reach-stackers, formulated by the PFT, will have to be taken into account. (annex 8.5)

The container handling equipments will be financed on the Belgian budget.

Total estimated cost: 710.000 EUR

ICD Mwanza	Type/description	Unit Cost	Qty	Belg.Funds	Tanz. Funds	Remarks
R.2.1.	Engineering	18.800				Study Fund
R.2.2.	Hard standing (€/m <sup>2</sup> )	41	6.000		246.000	solid underground
	Shed			15.000		minor repairs
	Rail siding (€/m)	15	300		4.500	existing siding
	Lighting			21.500		
	Fencing (€/m)			0		site is fenced
				<b>36.500</b>	<b>250.500</b>	
R.2.3.	Reach-stacker	350.000	2	700.000		
	Office equipment			10.000		
				<b>710.000</b>		
	<b>Total</b>			<b>746.500</b>	<b>265.300</b>	

### 3.4.3. THE SHINYANGA DEPOT HAS BEEN PUT INTO OPERATION

The PID shows a total investment of 701.640 € for the Belgian contribution and 185.000 € for the Tanzanian contribution.

The PFT, in accordance with Ministry of Finance and Ministry of Infrastructure and Development, changed the nature of the Tanzanian contribution from operational costs to budget costs covering:

- detailed engineering study
- building of hard-stands
- construction/improvement of rail-sidings (using recovered track materials)

In line with what has been set out in point 3.4.1 the PFT proposed to procure two reach-stackers instead of one reach-stacker and one fork-lift for empty containers.

The size of the hard-stand and the covered shed had to be determined, based on the expected traffic volume. Through the work-shop in Shinyanga, the PFT came to the conclusion that:

- the regular import volume, susceptible to be carried by containers, was about 2.500 units per year;
- the export volume, from Shinyanga, without strong seasonal variations had to be about 2.500 containers per year as well;

- the seasonal export volume of cotton, that can be ‘containerised’, was estimated by the participants at the workshop at about 5.000 containers per year;

These volumes can be handled on an ICD of 4000 m<sup>2</sup> (as proposed in PID) and a shed of 400 m<sup>2</sup> (instead of the proposed 2.500 m<sup>2</sup> - in Isaka the shed is only 400 m<sup>2</sup> and cover the needs adequately).

The PFT further concluded that the ICD should be fully fenced, lighted and be equipped with PC, fax and copier. A small back-up generator is also included in the budget.

The original location proposed in the PID was not suitable because the available land was not allowing any extension at all (even the 4000 m<sup>2</sup> was problematic, without the shed), and the rail-siding required multiple shunting operations.

The PFT proposed the large area, opposite of the TRC main line, for construction of the ICD. Here at least 6000 m<sup>2</sup> of land, fully owned by TRC can be made available for the ICD, and still allowing future expansion (the size can be doubled if needed). The only disadvantage is that a rail-siding of approximately 400 m has to be built. TRC can use recovered materials to complete this job.

Particular attention has to be paid on how the effects of possible spills of hazardous cargo can be limited or avoided. The water is drained into a nearby Kidalu river and the engineering study should look to develop a cheap but effective system to prevent contamination of the river.

As the proposed level of the site needs to be raised, the stability of the soil has to be taken into account, especially because of the extreme high axle loads (a reach stacker weighs 70 tonnes, without container and has a lifting capacity of > 35 tonnes).

## Activities

### R.3.1. Execution of detailed engineering studies

The engineering studies will be financed on the Belgian “Study Fund”

The recommendations for the engineering study, formulated by the PFT, will have to be taken into account. (annex 8.4)

Total estimated cost: 21.200 EUR

### R.3.2. Implementation of infrastructure works

The TRC procurement procedures for works shall apply and the recommendations formulated by the PFT will have to be taken into account.

The infrastructure works studies will be financed on both the TRC and Belgian budget.

- cost estimate on the TRC budget: 277.500 EUR
- cost estimate on the Belgian budget: 97.350 EUR

### R.3.3. Provision of container handling equipments

The TRC procurement procedures shall apply and the recommendations for the procurement of the reach-stackers, formulated by the PFT, will have to be taken into account. (annex 8.5)

The container handling equipments will be financed on the Belgian budget.

Total estimated cost: 730.500 EUR

ICD Shinyanga	Type/description	Unit Cost	Qty	Belg.Funds	Tanz. Funds	Remarks
R.3.1.	Engineering	21.200				<i>Study Fund</i>
R.3.2	Hard standing (€/m <sup>2</sup> )	50	4.000		200.000	check soil stability
	Rail siding (€/m)	40	400		16.000	to be built
	Turn-out				7.500	recovered
	Stop				1.500	recovered
	Office building (€/m <sup>2</sup> )	350	150		52.500	to be built
	Shed (€/m <sup>2</sup> )	145	400	58.000		to be built
	Lighting			21.500		
	Fencing (€/m)	35		17.850		
				<b>97.350</b>	<b>277.500</b>	
R.3.3.	Reach-stacker	350.000	2	700.000		
	Stand-by generator			12.500		
	Housing/cabling for generator			8.000		
	Office equipment			10.000		
				<b>730.500</b>		
	<b>Total</b>			<b>827.850</b>	<b>277.500</b>	

## 3.5. Indicators and means of verification

Indicators have been developed for the specific objective and the results. At the beginning of the implementation a baseline survey should be available or elaborated in order to measure the progress during the implementation of the project.

The means of verification indicate where and how information can be gathered in order to gauge the degree of achievement of the specific objective and the results.

The indicators and means of verification have been inserted in point 7, the logical framework.

## 4. PRECONDITIONS, ASSUMPTIONS AND RISKS

### 4.1. Preconditions

Preconditions are external conditions, which must be fulfilled before the activities can start. First instalment will not be made as long as the preconditions are not fulfilled.

Following precondition will be inserted in the logical framework.

**“Budgetary means of both governments are made available”**

The Belgian budgetary means (1.981.280 €) have been reserved for this project and the release of this budget is not considered to be a risk.

The local contribution, (565.000 €), initially shown as an operational expense in the PID, has been confirmed by the Government, through the Ministry of Infrastructure Development and the Ministry of Finance to be available to build the hard standing for the platforms.

The MID has been requested to provide the equivalent of 565,000 € in her 2006/7 development budget. Failure of the GOT to release these funds would stop the project.

### 4.2. Assumptions and risks

Assumptions and risks are suppositions deduced from external factors that may influence the progress, the success or the failure of the project. The assumptions connect the different levels of the logical framework, where each assumption has been placed at the appropriate level.

The assumptions and risks, listed and explained below, are inserted in point 7, the logical framework.

Follow-up of the assumptions will enable the Steering Committee to adapt the logical framework in a suitable and timely way.

Following assumptions will be inserted in the logical framework.

**Specific objective assumption.**

**“Complementary budgetary means will be available to upgrade the railway system”**

Effectively, for the moment the Tanzanian Government through TRC, cannot upgrade the whole railway system.

Donors and the private sector must provide complementary budgetary means.

Therefore, a further delay in the privatisation process is considered to be a serious risk to the achievement of the General Objective of the project.

#### **Results assumptions.**

##### **“Wagons and locomotive power are made available”**

The risk that the Tanzanian Government, through TRC, cannot provide enough wagons and locomotives to “feed” the ICD’s is eminent.

Donors and the private sector must provide complementary budgetary means.

A further delay in the privatisation process is considered to be a serious risk to the achievement of the Specific Objective of the project.

As regards the privatisation process, M/S RITES of India Consortium were awarded the concession on 6<sup>th</sup> March, 2006. Signing of the Agreement is expected in June, 2006 and handover of operations in August, 2006.

## **5. IMPLEMENTATION MODALITIES**

### **5.1 Management modalities**

According to article 6 of the Specific Agreement on “The construction and enhancement of Inland Container Depots in Ilala, Shinyanga and Mwanza South” signed on 8th December 2005, the project will be co- managed through two implementation bodies, the Joint Local Partner Committee (JLPC) and the Project Management Unit (PMU).

### **5.2 Legal framework**

#### **5.2.1 REGULATIONS ON PERSONNEL RECRUITMENT**

The local staff is recruited as per the national rules and regulations.

The BTC will provide a technical advisor on a part time basis (4 weeks) and local and international consultants in order to give technical assistance the Tanzanian team leader. The provisions of the General Agreement signed between the Tanzanian and the Belgian Government shall prevail.



## 5.2.2 TENDER REGULATIONS

According to article 7 of the Specific Agreement on “The construction and enhancement of Inland Container Depots in Ilala, Shinyanga and Mwanza South” signed on 8th December 2005, the Tanzanian public tendering rules shall apply for the awarding of supply, works or services contracts.

In accordance to art. 7.1.d of the Specific Agreement, the preliminary agreement of the Tanzanian authorising officer and the BTC Resident Representative in Tanzania will be required for orders financed on the Belgian Contribution, totalling the equivalent in Tanzanian Shilling (TZS) of 25.000 EUR or more.

The preliminary agreement will be required for:

- The contract awarding procedure (open or restricted national or international tender) and the tender document including the awarding criteria.
- The list of companies to be consulted in a restricted procedure and the selection criteria applied in establishing this list.
- The tender analysis and award proposals

## 5.2.3 FINANCIAL MECHANISM

According to article 7.1. of the Specific Agreement on “The construction and enhancement of Inland Container Depots in Ilala, Shinyanga and Mwanza South” signed on 8th December 2005, the non-refundable Belgian contribution will be jointly managed by a Tanzanian authorising officer responsible for approving payments and settling the bills chargeable to the Belgian contribution and the Resident Representative of BTC in his/her capacity of co-authorising officer.

The Ministry of Infrastructure Development (MID) will appoint the Tanzanian authorising officer.

The Belgian contribution shall be transferred by BTC in instalments to a commercial bank account opened in the name of the project by the MID. This account will operate by dual signature of both the authorising and co-authorising officer.

## 5.3 Implementation and follow-up structures

### 5.3.1 JOINT LOCAL PARTNER COMMITTEE (JLPC)

The JLPC will oversee the proper implementation of the project activities.

According to art. 6.1 of the Specific Agreement, the JLPC will be composed by:

- a representative of the Ministry of Infrastructure Development (MID), chairperson
- a representative of the Ministry of Finance (MOF)
- a representative of TRC
- the Attaché for International Cooperation within the Belgian Embassy
- the Resident Representative of the Belgian Technical Cooperation in Tanzania

The tasks and responsibilities of the JLPC are listed in art 6.2 of the Specific Agreement

### 5.3.2 PROJECT MANAGEMENT UNIT (PMU)

The second management level consists of the **Project Management Unit** (PMU).

The PMU facilitates and manages the daily implementation of the project. It is responsible for assuring the good governance of all project resources (human and material). It provides conceptual inputs with regard to project design & strategy and makes policy recommendations.

The PMU is composed of a Tanzanian Team Leader designed by TRC and a Technical Advisor designed by BTC.

The PMU assumes following tasks:

- Overall planning of the project activities;
- Organizing, coordinating and supervising the implementation of project activities in accordance with the approved project work plans;
- Technical guidance on project methodology and strategy;
- Prepare and tender contracts for procurement of works, goods and services;
- Submit monthly financial reports according to a BTC imposed format;
- Provide financial management, accounting and timely compilation of quarterly progress reports and budgeted work plans for the following period for consideration by the PSC;
- The secretariat of the JLPC (dissemination of reports, proposal of agenda, drafting of minutes of JLPC meetings etc);
- Compilation of the project final report at the end of the project;

- Coordination and networking with other national and international partners.

The PMU will be assisted by International or Senior Local Consultants who will provide a complementary high level technical assistance to the PMU. They will be selected by the BTC on basis of their C.V. , skills and experience.

## 5.4. Project monitoring and evaluation

The project monitoring and evaluation procedures are listed in the following table.

<i>Report</i>	<i>Responsible</i>	<i>Content</i>	<i>Destination</i>
Monthly expenses report	Project Management Unit (PMU)	Financial Statements	BTC
Quarterly activity reports	PMU	Activity planning and progress	BTC
Bi-annual reports	PMU	Activity planning and progress	Joint Local Partner Committee (JLPC)
Final evaluation report	PMU & Consultants	Provisional reception of project activities	JLCB, BTC and DGDC

## 6. RESOURCES

### 6.1. Human Resources

The PMU is composed of a Tanzanian Team Leader designed by TRC and a Technical Advisor designed by BTC

TRC should provide the necessary staff to complete the civil engineering study within the proposed time frame. The Belgian study will finance the sub-contracted part of the study for a total amount of 40.000 EUR.

The PMU will be assisted by International or Senior Local Consultants who will provide a complementary high level technical assistance to the PMU. They will be selected by the BTC on basis of their C.V. , skills and experience.

### 6.2. Financial Resources

#### 6.2.1. TANZANIAN CONTRIBUTION

The Tanzanian contribution consists of the provision of:

- land for the construction of the Inland Container Depots.
- appropriate infrastructure and operational costs of the PMU office infrastructure and equipment.
- civil works to improve the hardstand of the Ilala ICD
- most of the civil works of the Shinyanga and Mwanza ICD's

The Tanzanian contribution should be secured and made available at the start of the project, as the civil works needs to be completed before the procurement of the handling devices for Ilala, Shinyanga and Mwanza South.

The completion of the civil works is an essential milestone in the project. If these works are not fully completed there is no need to provide the equipment for the ICD's.

The Tanzanian Government will exempt all goods, equipment and services purchased for the project from all custom duties and taxation.

The overall Tanzanian contribution has been estimated at **565.000 EUR**.

### 6.2.2 BELGIAN CONTRIBUTION

The Belgian contribution will finance following project activities:

- container handling equipments for the Ilala, Shinyanga and Mwanza ICD's
- part of the civil works of the Shinyanga and Mwanza ICD's

The total cost of these activities has been estimated at **1.981.280 EUR**.

The Belgian Study Fund will finance the engineering studies of the Shinyanga and Mwanza ICD, for a total amount of **40.000 EUR**

## 7. LOGICAL FRAMEWORK

Enhance TRC's capacity to transport containerised domestic and transit freight			
Specific Objective	Indicators	Means of verification	Risks & Assumptions
Reduce the turnaround of container wagons from the current 13,9 to 9 days between loadings	The container turnaround figures	TRC Railtracker system	Budgetary means will be available to upgrade the railway system

Results	Indicators	Means of verification	Risks & Assumptions
<b>R1. The Ilala ICD has been enhanced</b>	New equipment has been put into operation	Quarterly implementation reports	Wagons and locomotive power are available
Activities	Means	Belgian budget	Tanzanian budget
1.1. Provision of additional container handling equipments	Supplier	350.000 €	
1.2. Improvement of the ICD hardstand	Supplier		37.000 EUR

Results	Indicators	Means of verification	Risks & Assumptions
<b>R2. The Mwanza ICD has been put into operation</b>	Detailed engineering study completed Hard-standing completed Equipments been put into operation	Quarterly implementation reports	Wagons and locomotive power are available
Activities	Means	Belgian budget	Tanzanian budget
2.1. Detailed engineering study	Study Fund		
2.2. Infrastructure works	Contractor	36.500 €	250.500 € equivalent in TZS
2.3. Provision of container handling equipments	Supplier	710.000 €	

<b>R3. The Shinyanga ICD has been put into operation</b>	Detailed engineering study completed Hard-standing completed Equipments been put into operation	Quarterly implementation reports	Wagons and locomotive power are available
Activities	Means	Belgian budget	Tanzanian budget
3.1. Detailed engineering study	Study Fund		
3.2. Infrastructure works	Contractor	97.350 €	277.500 € equivalent in TZS
3.3. Provision of container handling equipments	Supplier	730.500 €	

**Precondition**

Budgetary means of both governments are available

<b>Global Means</b>			
<b>Activities</b>	<b>Means</b>	<b>Belgian budget</b>	<b>Tanzanian budget</b>
Z.1 BTC supervision missions	BTC infrastructure advisor	21.930 €	
Z.2. Consultancy missions	National or international Consultants	20.000 €	
2.3. Final project evaluation mission	Consultants, BTC and TRC	15.000 €	



## 8. ANNEXES

### 8.1. Implementation Planning

Construction and Enhancement of Inland Container Depots (ICD) in Ilala, Shinyanga and Mwanza South										
BTC Navision Code : TAN 04 014 11										
	Activities	Project planning (trimesters)								
		1	2	3	4	5	6	7	8	
<b>PART A:</b>										
<i>R1 result.1. The Ilala ICD has been enhanced</i>										
A/R1/BL1	Provision of additional container handling equipments									
A/R1/BL2	Improvement of the ICD hardstand									
<i>Résult 2 : The Mwanza ICD has been put into operation</i>										
A/R2/BL1	Detailed engineering study									
A/R2/BL2	Infrastructure Works									
A/R2/BL3	Provision of container handling equipments									
<i>Résult 3 : The Shinyanga ICD has been put into operation</i>										
A/R3/BL1	Detailed engineering study									
A/R3/BL2	Infrastructure Works									
A/R3/BL3	Provision of container handling equipments									
<b>PART Z : Global Means</b>										
Z/RZ/BL1	BTC supervision missions									
Z/RZ/BL2	Consultancy missions									
Z/RZ/BL3	Final evaluation mission									

## 8.2.Detailed Budget

Construction and Enhancement of Inland Container Depots (ICD) in Ilala, Shinyanga and Mwanza South		Partner Country :	Tanzania	Project start date : 2006	
BTC Navision Code : TAN 04 014 11		N.I. DGCI :	NN 3000524/11	Estimated project duration : 24	
Budget Name :		Currency :	EUR		
Development Themes %					
HIV	%	Environnement	10%		
Social Economy	30%	Others	60%		
Gender	%				

Budget Code	Budget items	Mode	Belgian Contribution	Tanzanian Contribution	Repartition per year	
					Year 1	Year 2
<b>PART A:</b>						
<i>R1result.1. The Ilala ICD has been enhanced</i>						
A/R1/BL1	Provision of additional container handling equipments	co-managed	350.000,00		350.000,00	
A/R1/BL2	Improvement of the hard-stand			37.000,00	37.000,00	
<b>Total Résult 1</b>			<b>350.000,00</b>	<b>37.000,00</b>	<b>387.000,00</b>	
<i>Résult 2 : The Mwanza ICD has been put into operation</i>						
A/R2/BL1	Detailed engineering study		<i>Study Fund</i>		18.800,00	
A/R2/BL2	Infrastructure Works		36.500,00	250.500,00	36.500,00	250.500,00
A/R2/BL3	Provision of container handling equipments	co-managed	710.000,00			710.000,00
<b>Total Résult 2</b>			<b>746.500,00</b>	<b>250.500,00</b>	<b>36.500,00</b>	<b>960.500,00</b>
<i>Résult 3 : The Shinyanga ICD has been put into operation</i>						
A/R3/BL1	Detailed engineering study		<i>Study Fund</i>		21.200,00	
A/R3/BL2	Infrastructure Works		97.350,00	277.500,00	97.350,00	277.500,00
A/R3/BL3	Provision of container handling equipments	co-managed	730.500,00			730.500,00
<b>Total Résult 3</b>			<b>827.850,00</b>	<b>277.500,00</b>	<b>97.350,00</b>	<b>1.008.000,00</b>
<b>Total Part A</b>			<b>1.924.350,00</b>	<b>565.000,00</b>	<b>520.850,00</b>	<b>1.968.500,00</b>
<b>PART Z : Global Means</b>						
Z/RZ/BL1	BTC supervision missions	BTC managed	21.930,00		10.000,00	11.930,00
Z/RZ/BL2	Consultancy missions	BTC managed	20.000,00		10.000,00	10.000,00
Z/RZ/BL3	Final evaluation mission	BTC managed	15.000,00			15.000,00
<b>Total Part Z</b>			<b>56.930,00</b>	<b>0,00</b>	<b>20.000,00</b>	<b>36.930,00</b>
<b>TOTAL PART A + PART Z</b>			<b>1.981.280,00</b>	<b>565.000,00</b>	<b>540.850,00</b>	<b>2.005.430,00</b>
<b>BTC Managed</b>			<b>56.930,00</b>		<b>20.000,00</b>	<b>36.930,00</b>
<b>Co-Managed</b>			<b>1.924.350,00</b>		<b>483.850,00</b>	<b>1.440.500,00</b>
<b>TRC Managed</b>				<b>565.000,00</b>	<b>37.000,00</b>	<b>528.000,00</b>

### 8.3. First Year Belgian Contribution

Construction and Enhancement of Inland Container Depots (ICD) in Ilala, Partner		Tanzania	Project start date : 2006	
Shinyanga and Mwanza South		Country :		
BTC Navision Code : TAN 04 014 11		N.I. DGCI :	NN 3000524/11	
Budget Name :		Currency :	EUR	
Development Themes %				
HIV	%	Environnement	10%	
Social Economy	30%	Others	60%	
Gender	%			

Budget Code	Budget items	Mode	Detailed Belgian Contribution (first year)			
			1	2	3	4
<b>PART A:</b>						
<i>Résultat 1. The Ilala ICD has been enhanced</i>						
A/R1/BL1	Provision of additional container handling equipments	co-managed		350.000,00		
A/R1/BL2	Improvement of the ICD hardstand					
	<b>Total Résultat 1</b>			<b>350.000,00</b>		
<i>Résultat 2 : The Mwanza ICD has been put into operation</i>						
A/R2/BL1	Detailed engineering study					
A/R2/BL2	Infrastructure Works				36.500,00	
A/R2/BL3	Provision of container handling equipments	co-managed				
	<b>Total Résultat 2</b>				<b>36.500,00</b>	
<i>Résultat 3 : The Shinyanga ICD has been put into operation</i>						
A/R3/BL1	Detailed engineering study					
A/R3/BL2	Infrastructure Works					97.350,00
A/R3/BL3	Provision of container handling equipments	co-managed				
	<b>Total Résultat 3</b>					<b>97.350,00</b>
	<b>Total Part A</b>		<b>0,00</b>	<b>350.000,00</b>	<b>36.500,00</b>	<b>97.350,00</b>
<b>PART Z : Global Means</b>						
Z/RZ/BL1	BTC supervision missions	BTC managed	5.000,00		5.000,00	
Z/RZ/BL2	Consultancy missions	BTC managed	5.000,00		5.000,00	
Z/RZ/BL3	Final evaluation mission	BTC managed				
	<b>Total Part Z</b>		<b>10.000,00</b>		<b>10.000,00</b>	<b>0,00</b>
<b>TOTAL PART A + PART Z</b>			<b>10.000,00</b>	<b>350.000,00</b>	<b>46.500,00</b>	<b>97.350,00</b>
<b>BTC Managed</b>			<b>10.000,00</b>		<b>10.000,00</b>	<b>0,00</b>
<b>Co-Managed</b>			<b>0,00</b>	<b>350.000,00</b>	<b>36.500,00</b>	<b>97.350,00</b>

## 8.4. Detailed Engineering Studies (ToR)

### Terms of Reference for the Engineering Study of the Shinyanga and Mwanza South Inland Container Depots.

#### 1. Introduction

a. This document describes the issues that should at least be taken into consideration during the detailed engineering study to be carried out before the implementation of the ICD project can start.

#### b. Scope

The engineering study will include:

##### i. Hardstands:

- check of soil stability through available documents or by test drilling taking the extremely high axle loads of reach stacker into account
- drainage of hardstand (minimum slope) and how to integrate drain in hard-stand (see Isaka),
- evacuation of drainage water into river/lake
- environmental protection measures to be taken to avoid spillage of contaminated water into Kidalu River in Shinyanga or Lake Victoria in Mwanza South
- separation of oil and grease from drainage water if imposed by authorities.
- special attention should also be given to the fuelling area.
- spills must be contained so that a later clean up is possible without water/soil contamination.

##### ii. Covered sheds:

- stability of the structure
- fire protection measures (especially for Shinyanga – cotton exports)
- water evacuation.

iii. Lighting: to be done in accordance with legal regulations, cabling, select lighting type to reduce power consumption, etc.

iv. Fencing: type and materials to be used to ensure safety of goods stored at the terminal and to prevent people accessing hazardous cargo and causing spills.

v. Covered structure/housing for back-up generator, cabling, fuel storage, fuelling devices, etc.

vi. Access to the ICD's.

Although the access roads will be build by the MID, the study should take the access into account, especially to identify the impact of the access on

the fencing and the lighting system. This should also be the location where the entry check of a container on the terminal is to be done.

Remarks:

- 1) In Shinyanga extensive levelling works have to be done, and the impact of these works on the stability of the soil and the evacuation of water from the station area across the yard, have to be studied. A large duct is located exactly where the terminal is to be build.
- 2) The water evacuation system in Mwanza must be designed such that accidental spills of hazardous cargo cannot result in an ecological disaster. A spill containment system that can hold the contents of one tank container (approx. 25.000 litres) has to be included in the drainage system.
2. Timing: the engineering study will start right after the TFF has been approved and attached to the Specific Agreement.
3. The costs for the Engineering study are estimated at 40.000 € and will be funded by the Belgian study fund.
4. The engineering study should make sure that the design of the infrastructures complies with the National Environmental Act of 1997. As there is no Tanzanian general framework for environmental protection the Engineers are invited to comply at least with the Guidelines of the National Environment Management Council (NEMC) and with the Draft Tanzanian Environmental Protection Act of the Lawyer’s Environmental Action Team (LEAT).

<p><b>National Environment Management Council</b>                  P.O. Box 63154,  <b>Dar es Salaam.</b>  <b>TANZANIA.</b>                  E-mail: <a href="mailto:nemc@simbanet.net">nemc@simbanet.net</a>  <a href="mailto:nemc@nenactz.org">nemc@nenactz.org</a>                  Tel: +255(022) 2134603                  0741-608930/2323210                  Fax: +255 (022) 2134603                    Website: <a href="http://www.newctz.org">www.newctz.org</a></p>	<p><b>Lawyers' Environmental Action Team (LEAT)</b>    <b>Mazingira House, Mazingira Street</b>  <b>Mikocheni Area</b>                  P. O. Box 12605                  Dar es Salaam  <b>Tanzania</b>  <a href="mailto:leat@mediapost.co.tz">leat@mediapost.co.tz</a></p>
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## 8.5.Reach Stacker Specifications

DRAFT TENDER DOCUMENT  
FOR MANUFACTURE, SUPPLY, INSTALL, TEST  
AND COMMISSIONING OF  
**FIVE REACHSTACKERS**

### SECTION 1

**(draft to be reviewed according to the Tanzanian Public Tendering rules)**

#### 1.1 DEFINITION OF TERMS

**i. Delivery**

Delivery occurs on full receipt of all requirements defined in the contract, at locations specified in the Purchase Order. Buyer takes possession of the equipment at this point.

**ii. Commissioning**

Commissioning occurs on satisfactory demonstration of performance and fitness for purpose

**iii. Hand over Certificate**

Contractor and Buyer certify satisfactory delivery and commissioning. Risk and Title to the equipment transfer to the Buyer with this certificate.

**iv. Due Date**

A date for delivery agreed between Buyer and Contractor and specified in the Purchase Order.

#### 1.2 LOCATION OF SITE

The units will be positioned at the Ilala, Shinyanga and Mwanza Inland Container Depots according to a time schedule defined by the buyer. The units will have to be delivered as shown below:

1. one unit at Ilala terminal (Dar es Salaam)
2. two units in Shinyanga
3. two units in Mwanza South Port

### 1.3 SCOPE OF SUPPLY

Five container handling Reachstackers are required.

Delivery and handover on site shall be within 6 months after signing of contract.

The Reachstackers are to be fully designed and manufactured in plants that are fully owned by the Bidder or its Official agent. Bidders have to have a proven record for the design and manufacture of this type of equipment. Tenderers shall include a list of current users of similar equipment in Africa and the duration since introduction into service, cf. 1.6

The work shall comprise everything necessary for the design, construction, erection, transportation to site, testing and guaranteeing of performance, and any extra work which may be ordered and shall include the following:

- 1 Warranty for the duration of the Defects Liability Period.
- 2 Driver/Maintenance personnel Training and Instruction.
- 3 Special or Dedicated Maintenance Tools.
- 4 Operating, Maintenance and Spare Parts Manuals both in hard copy and in electronic format, Windows accessible.

Tenders shall be submitted in duplicate and the validity of the offer shall not be less than two months.

### 1.4 PRINCIPAL DUTY

The machines are required to have a lifting capacity of 45 tons under the spreader and to be designed to handle ISO containers of 20 feet, 30 feet and 40 feet length.

The principal duty, for which the Reach Stackers are intended, is to load and unload containers on a continuous basis from ground level or from terminal tractor-trailers, road trailers, from stack and eventually from rail cars.

### 1.5 PERMITS, CERTIFICATES & OTHER LIKE CONSENTS

The equipment shall be accompanied with certificates of origin.

### 1.6 REFERENCES, TRAINING, LOCAL SUPPORT

The Tenderer shall include a list of identical or similar equipment delivered and operational in African countries. Each listed unit shall state date of delivery and company name & address of its actual user.

The Tenderer shall perform adequate professional training

- to at least 2 local technicians
- to at least 3 local drivers

The Tenderer must have proven records of providing local delivery of components and local technical support in case of standstill by breakdown of the equipment. Thereto the Tenderer shall describe in detail the location of his subsidiary, its workforce and repairing capabilities.

## 1.7 TESTS & TEST CERTIFICATES

Reach stacker shall be delivered complete with appropriate certificates conform to Tanzanian safety standards and warranty certificates for components such as the diesel engine, transmission, axles etc.

## 1.8 DRAWINGS & MANUALS

Operating, maintenance and parts manuals will be handed over to the Buyer for approval four weeks before the completion of Works as per the Work Schedule.  
In total 6 complete sets shall be provided, all in English language.

## 1.9 CODES & STANDARDS

All Codes and Standards applicable to Tanzania and, should the case be the Region where the Reachstacker will be operating shall be adhered too. The Codes and Standards to be used in the design and manufacture of the Reach Stackers shall be clearly stated by tenderers in their offer submission.

## 1.10 INSURANCES

The Contractor shall indemnify and save the Buyer against all claims arising from the injury or death of employees, workmen, licensees and all other persons in or about the Contract work from damage to or loss of property of Third Parties due to the act, neglect or default of the Contractor, its employees, its sub-Contractors or their employees.

## 1.11 POLLUTION

The Contractor shall be held responsible for any claims, litigation arising, to any party(s), relating to pollution of the sea by spillage of fuels, lubricants, greases etc. or other related pollutants during the commissioning process.

## 1.12 WARRANTY

Tenderers shall clearly state the warranty periods offered in their proposal. Warranty is to start from the date of the Hand Over Certificate.

## 1.13 TIMELINESS

Completion and delivery of the equipment within the agreed time table and scope of supply is of paramount importance.

**In the event of the Contractor missing the due date for complete delivery as defined in the Purchase Order, the Buyer reserves the right to apply either of these 2 options:**

- i. **Debit 0.05% of total contract price for each day overdue. The amount will not exceed 10% of total contract price.**
- ii. **Obtain on a temporary basis suitable equipment to allow the Buyer to service its customers as planned. This temporary provision of equipment is to be normally supplied by the Contractor but if this is not possible, the Buyer will hire the equipment and charge the cost of hire to the Contractor.**



**1.14 COMMISSIONING**

On complete delivery and successful commissioning of the equipment, the Buyer will sign off the Certificate of Hand-Over and authorise the payment of the due amount specified in “1.15 PAYMENTS” below.

**1.15 PAYMENT, CURRENCY, SHIPPING**

The Tenderer shall quote the sales price according to and including the details of these documents in Euro currency, for delivery C.I.F. Port of Antwerp, C.I.F. Port of Dar es Salaam, CIF Shinyanga and C.I.F. Port of Mwanza South

The Buyer performs payments as follows :

- |  |     |
|--|-----|
| • Down payment within 21 days after contract signing | 25% |
| • Delivery as specified in Purchase Order            | 50% |
| • Hand-Over Certificate at commissioning             | 25% |

**1.16 FORCE MAJEURE**

Force Majeure means circumstances beyond the control of the parties to this contract.

**i. Effect of Force Majeure**

Neither party shall be considered to be in default or in breach of his obligations under the Contract to the extent that performance of such obligations is prevented by any circumstances of Force Majeure which arise after the date of the Letter of Acceptance or the date when the Contract becomes effective, whichever is the earlier.

**ii. Notice of Occurrence**

If either party considers that any circumstances of Force Majeure have occurred which may affect performance of his obligations he shall promptly notify the other party and the Engineer thereof.

**iii. Performance to Continue**

Upon the occurrence of any circumstances of Force Majeure the Contractor shall endeavour to continue to perform his obligations under the Contract so far as reasonably practicable. The Contractor shall notify the Engineer of the steps he proposes to take including any reasonable alternative means for performance which is not prevented by Force Majeure. The Contractor shall not take any such steps unless directed so to do by the Engineer.

## SECTION 2

### 2.0 GENERAL DESCRIPTION

Container front lifting mobile unit, known as Reachstacker, shall be of the diesel engine/transmission powered, axle/tyred wheel supported type with a telescopic boom and an extendable 20ft to 40ft spreader, suitable for handling I.S.O. 20 ft., 30ft., and 40 ft containers.

Reachstackers shall be suitable for intensive general container handling duties within the terminal which will include the following: -

- Primarily lifting empty/loaded containers from rail cars to truck or vice versa.
- Handling of mainly empty containers to/from yard tractor/trailers .
- Handling/moving of containers in stacking area of ICD's.

### 2.1 LEADING PARTICULARS

Lifting height under spreader	5 high 8ft 6in with 45 tons SWL
Second row capacity	not less than 27 tons , 4 high
Third row capacity	not less than 13 tons , 3 high
Travel Speed – laden/empty	20/25 km/hr.
Gradeability - laden	20%
Boom angle	0 to 60°
Spreader Sideshift	± 800mm
Spreader Rotation angle min.	-100° to +190°
Spreader free handling angle	± 5°
Lifting speed rated laden/empty	min. 0.25 / 0.40 m/sec
Lowering speed rated laden/empty	max. 0.35 m/sec

### 2.2 DESIGN REQUIREMENTS

The Reach Stacker shall be designed for reliability, safety and simple maintenance, due regard being given to the need for easy access for inspections, cleaning and repair.

All structural steelwork shall be designed so as to eliminate moisture-retaining pockets with particular emphasis on the underneath of wheel arches and structural joints.

Overall machine dimensions shall be kept to the minimum in order to facilitate operating in confined spaces.

The dynamic safety factor of 60% shall be used when travelling with maximum load at the maximum speed and the brakes are suddenly applied. For this exercise it shall be assumed that the load is swinging.

The machine shall be fitted with an interlock that does not allow the lifting or lowering operation if the four twistlocks are not either completely open or completely closed.

A safety interlock shall be fitted to prevent the operator from lifting a load in excess of the Safe Working Load.

With 20 ft containers maximum design capacity shall also be achievable when lifting on the same axis as the machine axis at maximum spreader slew.

The boom shall be capable of hoisting and extending at the same time.

The boom telescopic action shall be achieved by the use of the hydraulic cylinders. Designs utilising chain operation for boom extension shall not be considered.

### 2.3 MAIN FRAME

The main frame shall be designed and built to withstand the torsion stresses experienced during container handling. Provisions shall be made for mounting the power train and insulating the body from the vibrating and rotating components. All compartments shall be so designed to gain easy access to the engine, transmission, hydraulic assemblies, batteries etc.

The counter weight shall be so designed to diminish any chance of contact with stationary objects in close vicinity while turning in confined spaces.

All access stairway steps onto the machine/cabin shall be flat treads with anti-slip surfaces.

There shall be no underbody covers.

### 2.4 ENGINE

The Reach Stacker shall be powered by an industrial diesel engine manufactured by Cummins or Volvo Penta . The coupling between the engine flywheel and the transmission shall be by flexible steel plates. Fibre ring shall not be used.

The engine, if need be, shall be modified to operate under tropical conditions. It shall be possible to check oil level and add oil to the engine without displacing the cabin.

All engine covers shall be separate and easy to remove.

Engine compartment shall be free from any insulation material, which could be a fire hazard when exposed to oil and fuel.

A safety shutdown system shall be fitted to protect and stop the engine in the event of low lubrication oil level, for engine and transmission, excessive coolant temperature and low coolant level.

### 2.5 FUEL SYSTEM

The fuel tank shall have a useable capacity not less than 500 litre and incorporate the following: -

- Large drain point
- All fuel suction pipes must be steel with minimum diameter of 20mm.
- All fuel hoses must be reinforced
- A fuel level sight gauge shall be mounted in such a manner that damage will not cause fuel leakage or spill.

### 2.6 COOLING SYSTEM

The cooling system shall be designed to suit tropical working conditions and shall consist of a full radiator system. A header tank shall be supplied to compensate for high temperature fluctuations. The radiator assembly shall be mounted on rubber shock pads.

Transmission oil cooler shall be provided as a separate unit to the radiator frame thus making its maintenance simple.

The radiator and the transmission oil cooler shall be mounted in such a manner that they can be cleaned easily. The cooling fan shall have the maximum allowable diameter for the chosen engine.

## 2.7 EXHAUST SYSTEM

The exhaust system shall have a heavy-duty muffler and be of the upswept type. The system shall be fitted with safety protection grid. It shall be designed and manufactured so as to minimise noise output without affecting the efficiency of the machine.

## 2.8 TRANSMISSION

Transmission shall be of hydrodynamic type, fitted with an automatic gear shifting system, integrated converter and gearbox flanged to the engine with the use of appropriate bolts. The unit shall incorporate:

- Power take-offs for hydraulic system
- Automatic Gearshift 4-speed forward and reverse with in-built shift inhibitor.
- High capacity oil cooler with thermostatically controlled separate fan
- Selective inching approach control system

## 2.9 CHASSIS AND AXLES

Front axles shall be Kessler model 102 with heavy duty reinforced wheel rims and have design capacity to take care of all requirements. The axle capacity shall be sufficient for maximum speed of the power train in unrestricted conditions.

## 2.10 STEERING

The steering shall be fully hydrostatic with effective full right / left lock whilst the machine is stationary and such lock should be achieved with fingertip control.

## 2.11 HYDRAULIC SYSTEM

All hydraulic components shall comply with international standards. It is essential that the movement of hydraulically operated mechanism shall be smooth and infinitely variable through the complete range.

Hydraulic system shall be protected by suitable full flow, return type 10 micron cartridge filters. Filter clogging indicator and bypass valve shall be fitted. All filters shall be readily accessible and grouped together for service.

Hydraulic tank shall be constructed from thick gauge steel plate. It shall have sufficient volume to ensure oil temperature is maintained within normal range when working continuously and incorporate a visual level gauge. The tank shall have a large drain point, a magnetic drain plug and a top bolt-on inspection plate of minimum  $\Phi 300$ mm. All hydraulic oil returns and bleed offs from cylinders must be returned to the tank with suitable hoses and pipes of construction such that collapse or restriction of flow does not occur.

All hydraulic lines shall be reinforced against chafe and kink and all main delivery lines shall be triple braid hose and shall be permanently and firmly located. Hoses must not be allowed to chafe against other surfaces or edges and shall be well protected from high heat sources thus minimising the likelihood of fire in the event of a hose/pipe failure. Hydraulic pipes run on

the underside of the boom shall be protected from accidental contact with a container or the spreader by installing inside a rugged steel channel or equivalent protector.

At suitable locations, provision shall be made for hydraulic test equipment.

Piston rods and/or rams of hydraulic cylinders shall have hard chrome min.200  $\mu$  surfaces or equivalent.

## 2.12 BRAKE SYSTEMS

The brake system shall include the service brakes, emergency brake and the parking brake. The service brake system chosen shall be field proven. Front axle shall be fitted with easily serviceable wet disc brakes. Tenderers shall submit complete details of any proposed system.

The machine shall be provided with failsafe brakes, which engage mechanically and render the machine immobile in the event of loss of pressure.

## 2.13 FILTERS

The air induction filters shall be mounted outside the engine compartment to ensure a clean, cool air supply to the engine. The air intake system shall be of rigid pipe connected with rubber bellows or sleeves. Flexible hose shall not be used. Hose clamps between the rubber bellows or sleeves and the intake piping shall have a sufficiently wide clamping band too avoid cutting into the rubber coupling.

All engine oil and fuel filters shall be mounted in such a way that access is easy.

Hydraulic filters and air/water separator shall be grouped, where practicable, at one service point. Filter drains shall be so designed and located that discharge onto components is prevented.

All filters, drain valves etc. shall be clearly labelled with metal plates in the English language.

## 2.14 CABIN

The design and positioning of the cabin shall be such that it will give the operator comfort and the best possible vision during the course of carrying out his duties.

The cabin shall incorporate the following:

Minimum of 1.0m of clearance between top of seat cushion and lowest point on cab ceiling. A minimum of 1.5m between cab floor and lowest point of ceiling above driver.

Ergonomically designed controls and a fully adjustable air cushion type, or equivalent, seat. Windscreen washers with heavy duty, multi speed wide sweep windscreen wipers on front, rear and rooftop of the cabin as appropriate.

Tinted laminated safety glass windows shall be fitted. All glasswork shall be positively and firmly secured. A sun visor shall also be fitted.

All foot pedals shall be positioned such that accidental pressing of the wrong pedal is eliminated.

Provision shall be made such that the driver can positively secure the doors both in the open and closed position whilst seated in the driver's seat. Robust latches and locks shall be fitted to all doors.

The cabin shall be insulated against heat and noise. The sound proofing shall ensure that the sound level inside the cab shall be less than 81dB(A).

The cabin shall be adequately heated with a demist facility. The air-conditioning unit shall be of rugged, proven design.

The machine shall be equipped with large size rear vision mirrors.

## 2.15 INSTRUMENTATION

All instruments and the control panel shall be ergonomically designed for simultaneous operations. Full instrumentation shall, but not by way of limitation, include the following:

- Ammeter/voltmeter
- Analogue horameter
- Fuel tank level gauge
- Engine oil pressure gauge
- Engine low oil pressure warning light
- Transmission temperature gauge
- Transmission low oil pressure warning light
- Coolant temperature
- Low coolant level
- Hydraulic circuit pressure gauges in front of return filters
- Oil filter obstruction warning lights
- Twist lock position warning lights
- Spreader position warning lights
- Brake pressure gauges and warning lights
- Parking brake ON indicator
- Traffic light switch and working lights switch
- Overload warning device

## 2.16 MACHINE MANAGEMENT SYSTEM

A Machine Management System capable of providing as a minimum fault diagnostics, service maintenance, operational data and condition monitoring. Full description of the system and its capabilities shall be included in the tender.

## 2.17 AUTO-ELECTRICAL SYSTEM

A heavy duty 24 volts system shall be provided including voltage regulator, electric starter, alternator with a minimum charge of 70 amps. A device that automatically prevents the starter being reactivated, when the engine is running, shall be provided. Heavy duty batteries, 200 Ah, shall be installed and located in a lockable compartment.

Each individual circuit shall be protected by circuit breakers with 30% overload capacity. Automatic Circuit breakers shall, where applicable, be located in a common box and shall be permanently and clearly identified.

All wiring shall be number coded according to electrical drawings.

The electrical wiring must be located and secured such that

- They are readily accessible for maintenance and replacement, and wiring should be in the form of looms or harnesses.
- Where the wiring passes through apertures or over sharp edges, suitable protection such as grommets shall be provided.
- In high temperature areas suitable protection, such for the wiring shall be provided.
- Wiring must be protected from oil and must be secured to prevent damage due to vibration, slackness and chafing.
- All wiring terminations shall be adequately protected from water ingress.

All wire ends shall be fitted with soldered ring type terminal connections or equivalent where applicable. Number, colour or other suitable means must identify all terminals.

Headlamps shall be of halogen type and the indicator lamps shall be large and easily seen from a distance. Stop, tail and reverse lights inside the contour of the machine shall be mechanically protected.

The following flashing lights shall be fitted:-

- One at direct end of boom
- One either side of boom, behind clevis point of hoist cylinders.
- All lights and fittings shall, wherever possible, be readily available from the local suppliers preferably Bosch or Hella.

## 2.18 WHEELS AND TYRES

All wheels and tyres shall be capable of accepting the designed loads.

The tyre size chosen shall be the one that will reduce the ground loads to the minimum within the overall design criteria. (Preferred size is 18.00 X 25)

Wheel nuts, if no wheelclamps in use, are to be of tapered design.

## 2.19 SPREADER

The complete spreader shall be manufactured & approved by the ReachStacker manufacturer. The spreader is capable of handling 20ft, 30ft and 40ft I.S.O. containers, and feature a nominal capacity of min. 45tonnes under twistlocks. Spreader shall be capable of safely lifting an eccentrically loaded container without permanent deflection. Tenderers shall advise maximum allowable eccentricity, both longitudinal and transverse, when lifting a fully loaded container.

Spreader rotation shall be effected by two rotatorheads and protected by gas accumulators to avoid damage from collision.

The spreader beam shall incorporate locating devices to facilitate the correct positioning of the twistlock over the container corner casting.

All hydraulic operations on the spreader shall be controlled from the operator's cabin.

Anti sway system shall be provided to prevent the sway of the spreader when travelling with a container.

A boom lowering stop device shall be provided and activated when the spreader is seated on the container.

Overload protection shall also be provided.

Each spreader shall incorporate the following features: -

- Side shifting minimum 1600mm.(±800mm)
- Rotation of minimum  $\pm 150^\circ$
- Floating twistlock and guide.
- Hydraulic cylinder driven extension
- Automatic centering mechanism activated by pushbutton in cabin
- All electrical boxes must be from stainless steel or reinforced plastic, shock absorbent mounted with cable glands
- Positioning switches must be of the proximity type
- Extension positioning to be protected by mechanical lock in 20°,30°,40° position
- 4 heavy duty 10T SWL lifting eyes

The following safety devices designed to fail to safety shall be fitted: -

- Indication in the operator's cabin that the spreader is correctly positioned on top of the container ready for the twistlocks to be engaged
- Indication that the twistlocks are locked/unlocked with interlock to prevent lift if any twistlocks are not engaged
- A positive mechanical interlock to prevent the twistlocks being turned when a container is suspended on a spreader beam.
- The weight and the safe working load of the spreader shall be prominently displayed.

## **2.20 LUBRICATION**

As far as it is practicable all moving parts of the Reach Stacker including the spreader shall be easily accessible for lubrication.

## **2.21 FIRE EXTINGUISHERS**

A minimum of 5 kg. CO2 fire extinguisher shall be mounted on the machine in a readily accessible position outside cabin.

## **2.22 WARRANTY / SPARE PARTS**

Manufacturer is expected to provide the following warranties: -

Twelve months for labour and components, 36 months on brake system.

Tenderers shall provide a list of fast moving spares, including costs and quantities for two years spares requirement.

The Buyer requires that Tenderers indicate the amount, cost and type of spares they are prepared to provide on consignment for two years at Buyer's site.



## 2.23 TECHNICAL DATA AND CALCULATIONS

The following drawings and other data shall be provided by the Manufacturer.

General Arrangement of the Reachstacker.  
Detailed calculations for axle loads including the safety factor.  
Maintenance, repair and parts manuals in English language.

Information supplied shall, when read in conjunction with the maintenance manuals, enable all necessary repairs, disassembly, reassembly, fault finding procedures and any other reference to further documentation.

## 2.24 SURFACE PREPARATION AND PAINTING

All painting materials to be used in the protective coating shall be purchased from an approved paint supplier. Tenderer to describe the paint system used and the standard colour scheme in RAL indication.

Metal surfaces to be painted shall be blast cleaned to Grade Sa 2.5.

## 2.25 SIGN-WRITING AND MARKING

The ReachStackers shall be equipped with safety-decals in order to avoid maltreatment of the unit. Safety decals shall have a bright signal-background.

The recommended tyre pressures shall be clearly marked on safety decals adjacent to each wheel in k.pa or bar.

## 2.26 OPTIONS

Pricing for the following options shall be provided:

Spare wheel(s)

Recommended Spare parts list