

10969-001-2040-R-0003 RevT1

SAFDA MKHUZE RAIL SIDING PROJECT

ENGINEERING SPECIFICATION VEHICLES

# **TABLE OF CONTENTS**

10.	Two Weekly Progress Reporting	13
9.	Project Management and Progress Reporting	13
8.1	Completion and Final Acceptance	13
8.	Performance Testing and Final Acceptance	
7.7	Provisional Acceptance Certificate	12
7.4 7.5 7.6	Pre-Commissioning Tests  Commissioning Tests  Trial Operation	11
7.1 7.2 7.3	Commissioning and Testing plan  Commissioning and Testing manual  Bidder's Commissioning Supervision	10 11
<b>7.</b>		
6.12 6.13	Installation Supervision  Training  Tests on Completion and Provisional Acceptance	9
6.10 6.11	Quality ControlInspection and Inspection Authorities	9 9
6.8 6.9	Spare Parts	8
6.5 6.6 6.7	Safety Guards and Noise Levels  Ease of Operation and Maintenance  Post Installation Support and Breakdown Response	8
6.2 6.3 6.4	Materials and FinishingLife SpanCorrosion Allowance	
<b>6.</b> 6.1	General Requirements Units	7
5.2	Mechanical	7
<b>5.</b> 5.1	Process	
<b>5.</b>	Detailed Scope of Works	
<b>4.</b> 4.1	Design and Operation	
3.2 <b>4.</b>	Scope Exclusions  Overall Design Parameters	6
3.1	Scope Inclusions	
3.	Scope OF Work	
2.1	Background and Overview	
2.	INTRODUCTION	
1.1	Terms and Definitions	
1.	TERMS AND DEFINITIONS	No.
		Page



10.1	Progress Meetings	14
10.2	Documents to be supplied by Bidder	
ANNEX	XURE 1 – OVERALL SITE LAYOUT	15
ANNEX	XURE 2- VEHICLES DATASHEETS [RETURNABLE]	16



#### **TECHNICAL SPECIFICATION**

#### 1. TERMS AND DEFINITIONS

The following terms and definitions shall apply for this contact:

#### 1.1 Terms and Definitions

In interpreting this specification, the following words shall have the meanings herein assigned:

**Bidder**: means the natural or juristic person supplying the Goods and/or services as indicated in the contract.

**Company**: means South African Farmers Development Association

**Connection elements**: means all holding down, anchor or connection bolts including all washers, nuts, screws, spacers, shims etc.

Goods: includes all equipment, materials, plant and temporary works

**Drive Assemblies**: means all motors, gearboxes, couplings, bearings, torque arms, guards and base plates.

#### 2. INTRODUCTION

The project entails construction of a transloading facility at Mkhuze Rail siding, where cane will be transferred from road trucks to rail wagons and transported by Transnet Freight Rail to the mill, a total journey length of 350kms.

### 2.1 Background and Overview

The cane grown in the Makhathini region currently being transported to the Felixton mill by road requires a more economically, sustainable, and efficient way of transporting the cane to the mill as of March 2021.

#### 3. SCOPE OF WORK

The specification covers the minimum requirements for the Supply, Delivery and training four heavy duty cane and wagon handing vehicles for the Mkhuze Rail Siding project.

The technical specification is to be read in conjunction with all of its Annexures in order to obtain a complete view of the scope of work. The Equipment to be supplied by the Bidder shall include:

- One excavator-based cane loader
- One in field type cane loader
- Two off rail wagon shunting tractors



Note the information supplied in this Technical Specification in the form of data, drawings, descriptions, and Equipment sizes, etc, is intended to serve as a guide to the requirements of the Purchaser. The Bidder shall however be responsible for the performance of the Equipment and shall verify and confirm all size selections. Should the Bidder not be in agreement with the concepts presented, alternative concepts and designs shall be offered with full justification for the change.

It is preferred that only proven technologies be incorporated into the design of all Equipment. However, if the Bidder believes that there are significant savings to be made by offering alternative technologies, it is encouraged to include details of these alternatives clearly outlining their advantages and cost implications in the tender submission, in addition to the proven/requested technology option.

The acceptance of the information in this Technical Specification shall in no way relieve the Bidder of its responsibilities and obligations in terms of the design and engineering performance of the Works.

## 3.1 Scope Inclusions

- a) Project management of this Contract's scope of work including planning, scheduling and reporting to the Purchaser and the Engineer;
- b) Implementation of an appropriate quality system and quality control;
- Submission of all documentation and technical data included in this Technical Specification as well as those required for statutory regulation and project control;
- d) Selection of suitable materials of construction and appropriate codes of practice, standards and specifications applicable to the Works where not already specified herein;
- e) Design, Manufacture, Procurement, Supply, training of staff and first fills;
- f) Supply of all related software and licences if applicable;
- g) Surface preparation, protection coatings, painting and finishing of all Equipment;
- h) Workshop and Site inspections including NDT as per the relevant codes and standards:
- i) Packing, marking and protection of all Equipment for shipping/transport including loading supervision were necessary;
- j) Training of the Purchaser's/Client's staff;
- Pre-commissioning, commissioning, trial operation, performance testing and any punch listing activities required;
- The supply of any special Equipment required for commissioning and/or performance testing of the Equipment as required;



- m) Performance Guarantee and Warranty;
- n) A programme indicating manufacturing and delivery schedule; and
- o) Supply of all equipment and personnel required to comply with all local regulations;

### 3.2 Scope Exclusions

The following nominated items are excluded from the scope of supply:

- a) Overall project management of this project;
- b) Construction power and water;
- c) Environmental impact assessments;
- d) Environmental impact management plans;
- e) Civil Works foundations, grouting, concrete floors and earth works;

#### 4. OVERALL DESIGN PARAMETERS

The design of the vehicles shall meet the following minimum parameters:

- 2400 tons cane a day to be spilt from a Hilo unloader (supply by others) over 16 hours, 36 weeks per annum, 6 days per week;
- Spilt cane to be picked up and transferred and compacted into rail wagons (excavator-based cane loader) over a 16.7 m wide concrete surfaced cane yard, refer to ANNEXURE 1 – SITE LAYOUT;
- Loose cane clean-up of yard, weighbridges and rail track (in field type cane loader):
- Placement of incoming empty, then filled, rail wagons arriving and departing in trains of 40 wagons each twice a day (two off shunting tractors); and
- Ability to shunt two wagons at a time each 60 tons

#### 4.1 Design and Operation

All Equipment shall be designed for reliable continuous operation based on a 6-day work week, with 16 hours of operation per day and 98% availability. When designing and selecting Equipment the Bidder shall take into account commonality between Equipment to reduce spares holdings as well as a very dusty working environment.

### 5. DETAILED SCOPE OF WORKS

#### 5.1 Process

The cane is to be delivered by truck and double trailer rigs to be spilt 15 tons at a time over a 20m long steel retaining wall onto a concrete-paved cane yard (original Mkhuze siding).



The spilt cane is to be picked up by an excavator loader (equipped with grapple jaws) and transferred to a waiting rail wagon. The loader would be stationed ideally so as to travel the length (as opposed to the width) of the cane yard such that it would pick up and load the cane with a single 180° boom slew. It would simultaneously compact the cane into the wagons when required to achieve maximum payloads.

The spiller is capable of 190 tons cane an hour and the cane loader will need to match this off-loading rate.

The rail wagons arrive in a series of two by 40 wagon trains which are placed in a dedicated 'empties' siding from where they are shunted to the loading area by a shunting tractor. They are then shunted one at a time through the loading area from where, once full, they are shunted to a 'wagon full' siding awaiting collection by South African Railways for haulage to Felixton mill.

Spillage and cleanliness of the operation is maintained by the in-field type cane loader which sweeps and collects cane droppings.

#### 5.2 Mechanical

- a. There shall be four new vehicles supplied under this contract.
- b. The Vehicles will be operating in an outdoor moderate to highly corrosive environment (cane juice) and the bidder must indicate what form of corrosion protection he is offering.

#### 6. GENERAL REQUIREMENTS

### 6.1 Units

The metric system of units shall be adopted for this project.

### 6.2 Materials and Finishing

Materials of construction and finishes shall be selected to withstand all environmental exposure conditions, internally and externally. All inside and outside surfaces shall be painted in accordance with the Project Specific Standards unless otherwise approved by the Purchaser and the Engineer. All materials, where applicable, shall conform to the Project Specific Standards in respect to quality, manufacture, testing and performance unless otherwise approved by the Purchaser and the Engineer.

### 6.3 Life Span

All Equipment shall be designed for a minimum lifespan of 10 years.



#### 6.4 Corrosion Allowance

The Bidder shall submit a Painting and Corrosion Protection specification, with the tender, for approval by the Engineer.

### 6.5 Safety Guards and Noise Levels

The Bidder shall make allowance for the necessary safety protection equipment such as guards, covers, etc in accordance with the Factories Act. In addition, the noise level associated with all Equipment shall be less than 85 dBA when measured at any point further than three (3) metres from the source(s) of the noise.

## 6.6 Ease of Operation and Maintenance

The Equipment shall be designed and constructed for ease of operation and maintenance to ensure the availability, reliability, operating requirements and time efficiencies stated in this Technical Specification are achieved and maintained throughout the lifetime of the Equipment.

The Bidder shall provide as part of the operation and maintenances manual, a specification and procedure for the safest and most efficient way to carry out maintenance and cleaning of all Equipment. In addition, the Bidder shall supply all specialised tools and facilities (fixed and mobile) to enable safe access and efficient maintenance of the Equipment.

### 6.7 Post Installation Support and Breakdown Response

The ability of the bidder to provide post installation support, servicing and response to breakdowns will be an important consideration in the adjudication of bids.

The bidder is to indicate the nearest location to the site and capability of his support centres and give a guarantee of response time in the event of a breakdown call-out

### 6.8 Spare Parts

The Bidder shall make allowance for the supply of all necessary spares, which will be required during the start-up, commissioning and trial operation of the Works and until the Works are suitable for commercial operation.

The bidder will indicate the essential spares he will hold in stock in his local agency/support premises

### 6.9 Codes and Standards

Unless specified otherwise, all materials and workmanship shall be of a standard recognised within the industry generally as being the most appropriate standard for the type of work concerned and completely fit and suitable for the duties required of the Equipment.



## 6.10 Quality Control

The Bidder shall be required to submit to the Engineer for approval a Quality Control Plan (QCP) that shall conform to the requirements of ISO 9001 (2000).

The Bidder shall maintain the Manufacturer's Data Book for the Equipment at all times, and it shall be made available to the Purchaser and/or the Engineer as well as the Third-Party Inspector for review and approval as required.

### 6.11 Inspection and Inspection Authorities

The Bidder shall give the Engineer and the Purchaser full opportunity to inspect progress, measurements, materials and workmanship associated with the Works.

## 6.12 Installation Supervision

The Bidder shall provide an experienced and skilled installation supervisor/s as required to monitor, advice and assist the main contractor where necessary.

The Bidders Installation Supervisor/s in consultation with the Purchaser's Site Manager and the Engineer shall be required to make such adjustments as are necessary.

The Bidders Installation Supervisor/s shall be fluent in the English language.

## 6.13 Training

The Bidder shall develop and submit to the Purchaser and the Engineer a comprehensive training manual in English for all Equipment to be supplied which shall include but may not be limited to the following:

- A training programme which outlines all training procedures, checks, activities and their durations.
- The minimum number of personnel to be provided by the Purchaser/Client for the respective training activities outlined in the training programme.
- The minimum skill, knowledge and experience requirements of the Purchaser's/Client's personnel to be responsible for operating, maintaining, trouble-shooting, emergency and supervisory activities.
- All training schedules and procedures to enable operational, maintenance, technical and supervisory staff to safely operate, maintain and trouble-shoot each piece of Equipment and correspondingly the Works following Provisional Acceptance by the Purchaser/Client. The training procedures shall also include emergency situations and activities.
- Training completion certificates which are to be signed by all Purchaser's/Client's staff that are successfully trained by the Bidder.

In addition, the Bidder shall lead, direct and implement all training activities up to the point of Provisional Acceptance by the Purchaser/Client. Training shall be carried out using the Bidder's own resources, the resources of the Installation Contractor and the Purchaser's/Client's future operating, maintenance and supervisory personnel, as selected. If necessary or required, the Bidder shall carry out any classroom sessions to ensure the Purchaser's/Client's personnel



have a proper understanding of the operation and functionality of the Equipment. The Bidder shall also be required to contribute to the design and development of the Purchaser's/Client's personnel selection process if necessary.

The Works shall not be considered to be completed for the purposes of Provisional Acceptance until the training obligations of the Bidder have been completed. This is to ensure that the Purchaser's/Client's Personnel responsible for operating the Works have sufficient skills to operate the Works in a safe and proper manner. The Bidder shall also issue the Purchaser/Client with a training completion and competency certificate to validate the training.

#### 7. TESTS ON COMPLETION AND PROVISIONAL ACCEPTANCE

The required Tests on Completion shall consist of the following:

- · Pre-commissioning tests;
- · Commissioning tests;
- · Trial operation.

In order to achieve this successfully, the Bidder shall fulfil requirements that include but are not limited to the following:

- Implement a formal completion and handover documentation procedure (i.e. Notice of Completion Certificate, etc.);
- Appoint a Commissioning Supervisor who will carry out and co-ordinate commissioning activities on behalf of the Bidder;
- Carry out all pre-commissioning, commissioning and trial operation activities

### 7.1 Commissioning and Testing plan

The commissioning of the Equipment will take place after the Bidder has issued a Notice of Completion Certificate and in accordance with an integrated commissioning plan for the entire project.

### 7.2 Commissioning and Testing manual

The Bidder shall be required to submit to the Purchaser/Purchaser's Commissioning Manager a commissioning and testing manual. This manual shall include but may not be limited to the following:

- The number of trained personnel required to be provided by the Purchaser/Client for all commissioning and testing activities as outlined in the commissioning and testing plan;
- All pre-commissioning, commissioning and trial operation check sheets required to ensure that the Equipment is safe for operation and is performing in accordance with all the relevant specifications, standards and the Project Specific Standards;



- All commissioning activities and procedures for all Equipment and their associated components;
- All settings required for the commissioning and safe operation of the Works;
- All punch listing forms as required by the Bidder to ensure that defects can be captured and remedied prior to the Purchaser/Engineer punch listing the Works.

## 7.3 Bidder's Commissioning Supervision

The Bidder shall appoint an appropriately skilled and experienced Commissioning Supervisor/s as soon as is practicable after this Contract has been awarded to lead, co-ordinate and carry out the various commissioning activities which shall include but may not be limited to the following:

- Inspection and checking of the Works and co-ordinating with the Purchaser's commissioning activities such as the supply of utilities:
- Provide the Purchaser's Commissioning Manager with Notice of Completion Certificates and requesting the supply of the raw materials required for commissioning at least 7 days prior to the commissioning test being carried out;
- Execution of commissioning activities according to the commissioning and testing plan, the commissioning and testing manual and good engineering practices:
- Issuing of all setting up, testing and checking information as required;
- The supply of any additional information, advice, or consultation, which the Purchaser/Client may reasonably request relating to the Works provided by the Bidder to meet its operational capability and performance guarantee parameters.

**Note:** The Bidder/Bidders commissioning supervisor shall not be relieved of any responsibilities, obligations or liabilities under the Contract when the Purchaser's/Client personnel are operating the Equipment under the direction or supervision of the Bidder during Training or Test on Completion.

## 7.4 Pre-Commissioning Tests

The pre-commissioning tests shall be carried out after the Bidder has issued the Purchaser's Commissioning Manager with commissioning and testing manuals.

Punch list items shall be compiled during these pre-commissioning tests and **Punch List** items attended to prior to the commencement of the commissioning tests.

### 7.5 Commissioning Tests

The Bidder shall, as soon as is practicable after carrying out the precommissioning tests on the Equipment/Works and once all **Punch List** items have been attended to, carry out the commissioning tests.



The commissioning tests may also include separate trial operation of certain areas of the Works, in preparation for the trial operation to demonstrate that the Works perform reliably and in accordance with the Contract.

Any new punch list items shall be compiled during these commissioning tests and all **Punch List** items attended to prior to the commencement of the trial operation of the Works/Equipment.

## 7.6 Trial Operation

As soon as practicable after completion of the commissioning tests, a 72 (seventy-two) hour trial operation of the Equipment shall take place. During this period the Bidder/Bidder's Commissioning Supervisor shall operate the Equipment/Works with the assistance of the Installation Contractor. These tests shall demonstrate to the Purchaser and the Client that the Equipment/Works and systems are complete, free of defects, safe for operation and operate in accordance with the Requirements outlined in this Technical Specification.

A noise level tests may be conducted by the Purchaser during the trial operation to ensure that a level of 85dB (A) is not exceeded when measured at a reference distance of 3m away from the individual items.

### 7.7 Provisional Acceptance Certificate

The Works shall be provisionally accepted when all pre-commissioning, commissioning and trial operation tests have been passed and all **Punch List** items have been attended to. Prior to Provisional Acceptance the Bidder shall demonstrate to the Purchaser and/or the Engineer, the following:

- That the Bidder has completed all Works, supplied all Equipment and carried out all commissioning and testing activities, except for items of an unimportant nature which do not affect the safe and reliable start-up and commercial operation of the Works and which are not required in terms of the Laws to be completed by start-up and for commercial operation of the Works
- That the Equipment is ready for commercial operation;
- That the Purchaser's Commissioning Manager has accepted that the Works have passed all pre-commissioning, commissioning and trial operation testing and checks;
- That the Works are safe for use and have been accepted by the Purchaser's Commissioning Manager;
- That the Bidder has conducted the training of the Purchaser's/Client's personnel as required to operate the Works properly and safely and in accordance with the training manuals supplied by the Bidder.



- The Bidder has supplied to the Client all manuals, Data books, and other data required to operate and maintain the Works along with all specialised tools as required;
- All QCP documents have been completed and signed off by the relevant Parties;

Thereafter the Purchaser shall arrange for performance testing to be conducted as soon as practicable after a Provisional Acceptance Certificate has been issued.

### 8. PERFORMANCE TESTING AND FINAL ACCEPTANCE

Performance testing shall be carried out by the Client/Purchaser and the Client's/Purchaser's staff as soon as reasonably practicable after a Provisional Acceptance Certificate has been issued and as mutually agreed upon with the Bidder.

**Punch List** items shall be compiled during these performance tests and attended to by the Bidder with any outstanding defects during the Defects Notification Period.

## 8.1 Completion and Final Acceptance

Upon the performance of the Works reaching Performance Parameters as stipulated in this Technical Specification and the completion of all Punch List items, the Equipment shall be deemed to be completed. Upon successful completion the Purchaser shall execute and provide the Bidder with a Final Acceptance Certificate.

If the Purchaser does not issue the Final Acceptance Certificate within the period of ten (10) business days following the completion of the Works, then the Final Acceptance Certificate shall be deemed executed and delivered at the end of the above period of ten (10) business days

#### 9. PROJECT MANAGEMENT AND PROGRESS REPORTING

The Bidder shall in the tender document confirm its company's ability to implement and maintain a recognised project management, reporting and planning system, to ensure that all facets associated with this Contract are controlled from implementation through to Final Acceptance.

### 10. TWO WEEKLY PROGRESS REPORTING

The Bidder shall maintain a system of reporting to the Purchaser and or the Engineer on a two-weekly basis.



The Purchaser and the Engineer are to be notified immediately in the event that an issue, delay or potential risk arises during the execution of this Contract which may have a major effect on the project or its completion date.

## 10.1 Progress Meetings

The Bidder shall maintain a system of project meetings with the Purchaser /Engineer

### 10.2 Documents to be supplied by Bidder

### 10.2.1 Operating and Maintenance Manual

For all Equipment supplied under this Contract, the Bidder shall provide the Purchaser/Engineer with the operating and maintenance manuals. Special cognisance shall be taken to locality and skills levels of the Client's staff. The Equipment shall not be considered to be complete to commence Test on Completion and ultimately Provision Acceptance until such documents have been supplied and accepted by the Purchaser/Engineer.

### 10.2.2 Data Books

The Bidder shall be required to submit to the Purchaser individual Data Books for all Equipment covered by this Contract. These Data books shall include but may not be limited to the following:

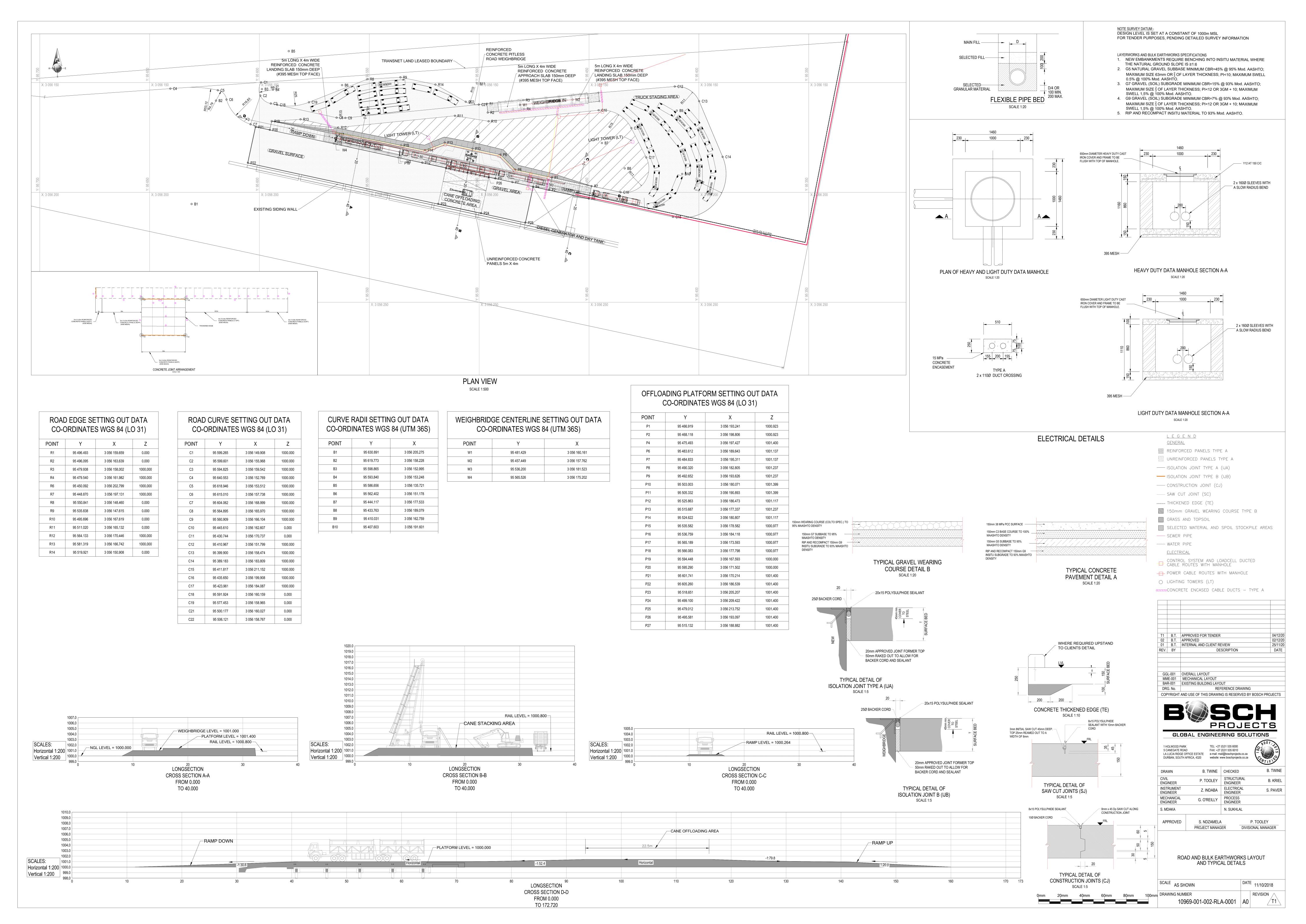
- All Manufacturer's Data Books
- A copy of the training manual and training certifications
- A copy of the operation and maintenance manual.
- All QCP documentation as signed off by the relevant parties

B@GCH

### **ANNEXURE 1 – SITE LAYOUT**

10969-001-002-RLA-0001 RevT1 - Roads and Bulk Earthworks





# **ANNEXURE 2- VEHICLES DATASHEETS [RETURNABLE]**





	BUSCH						
Data Sheet							
	t: South Africa Farmers Development Association	Tender No.	10969/1/2/M1				
		Data Sheet	1				
Proje	ct No.: 10969-001-02	Date.	12/11/2020				
		<u> </u>					
		r Based Cane L		COMMENTS			
Item	Description	Units	Input	COMMENTS			
	Process Parameters		N				
1	Product retrieved	tons	Whole stick cane				
2	Product flow rate	TPH	190				
3	Product bulk density	kgs/m3	350				
4	Cabin	yes	air conditioned				
5	Maximum reach along ground	m	9				
6	Maximum loading height	m	5				
7	Bucket type		cane grapple				
8	Bucket capacity	tons	1.5 - 2.0				
9	Radiator fan	Specify					
	Air filter	Specify					
11	Automatic grease lubrication	Specify					
12	Maintenance service plan	Specify					
13	Emergency fire extinguisher system	Specify					
14	High engine temperature alarm	Specify					
15	First fill of all lubricants and oil	Specify					
16	Vehicle Max Fuel Consumption	L/hr					
	Additional Information Required	_					
	Allowance for training of Client's/Purchasers staff	Days					
18	Allowance for supply of operation & maintenance manuals	Specify					
19	Post installation support	Specify					

hours

20 Response time in the event of break down

	Shunti	ng Tractors (2 off		
tem	Description	Units	Data	Bidder's In put
	Process Parameters			
1	Shunting capability	tons	3 x 60T rail wagons	
2	Tractor mass	tons	<u> </u>	
3	Engine power	KW		
4	Cabin	Specify		
5	Air filter	Specify		
6	Automatic grease lubrication	Specify		
7	Maintenance service plan	Specify		
8	Emergency fire extinguisher system	Specify		
9	High engine temperature alarm	Specify		
10	First fill of all lubricants and oil	Specify		
11	Vehicle Max Fuel Consumption	L/hr		
	Additional Information Required			
12	Allowance for training of Client's/Purchasers staff	Days		
13	Allowance for supply of operation & maintenance manuals	Specify		
14	Post installation support	Specify		
15	Response time in the event of break down	hours		
		Field Loader		
tem	Description	Units	Data	Bidder's In put
	Process Parameters			
1	Grab capacity	kgs	1000	
2	Engine power	KW	>40	
3	Air filter	Specify		
4	Maintenance service plan	Specify		
5	Emergency fire extinguisher system	Specify		
6	High engine temperature alarm	Specify		
7	First fill of all lubricants and oil	Specify		
8	Vehicle Max Fuel Consumption	L/hr		
	Additional Information Required			
	Allowance for training of Client's/Purchasers staff	Days		
9				
10	Allowance for supply of operation & maintenance manuals	Specify		
		Specify Specify		